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CITY OF EDGEWATER

COMPREHENSIVE STORMWATER MASTER PLAN

FLOOD RISK REDUCTION MASTER PLAN

City of Edgewater | April 2026

CITY OF EDGEWATER
COMPREHENSIVE STORMWATER AND
FLOOD RISK REDUCTION MASTER PLAN

Hazard Mitigation – Resilience – Capital Improvement Strategy

Prepared for:

City of Edgewater

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Edgewater, Florida 32132

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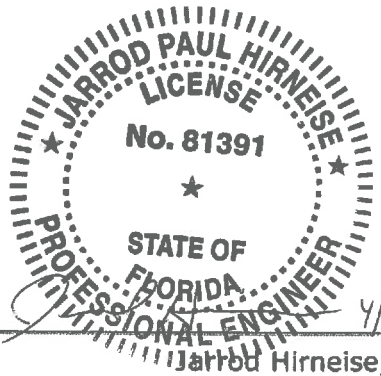
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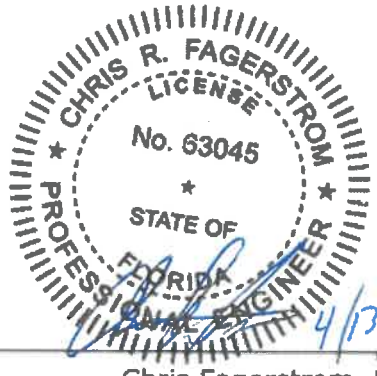
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APPENDICES

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ACRONYMS

AMS	Asset Management Software
ASCE	American Society of Civil Engineers
BFE	Base Flood Elevation
BMAP	Basin Management Action Plan
CAD	Computer-Aided Design
C-CAP	Coastal Change Analysis Program
CCTV	Closed-Circuit Television
CFS	Cubic Feet per Second
CIP	Capital Improvement Plan
CN	Curve Number
DCIA	Directly Connected Impervious Area
DEM	Digital Elevation Model
DRO	Direct Runoff
ECFRPC	East Central Florida Regional Planning Council
EOPCC	Engineer's Opinion of Probable Construction Costs
ERCP	Elliptical Reinforced Concrete Pipe
ERP	Environmental Resource Permit
ESA	Environmental Sciences Associates
FAA	Federal Aviation Authority
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FEC	Florida East Coast Railway
FEMA	Federal Emergency Management Agency
FFE	Finished Floor Elevation
FIU	Florida International University
FM	Force Main

FPID	Financial Project Identification
FPLOS	Flood Protection Level-of-Service
FS	Florida Statutes
FY	Fiscal Year
FTE	Full-Time Equivalent Employee
GIS	Geographic Information System
H&H	Hydrologic and Hydraulic
HGL	Hydraulic Grade Line
HSG	Hydrologic Soil Group
ICPR	Interconnected Channel and Pond Routing Version
IFAS	Institute of Food and Agricultural Sciences
IRL	Indian River Lagoon
IWR	Impaired Waters Rule
Lb/yr	Pound per Year
LID	Low Impact Development
LiDAR	Light Detection and Ranging
LOMR	Letter of Map Revision
LOS	Level-of-Service
LULC	Land Use and Land Cover
MHHW	Mean Higher High Water
ML	Mosquito Lagoon
MLRAP	Mosquito Lagoon Reasonable Assurance Plan
MS4	Municipal Separate Storm Sewer System
NAD83	North American Datum of 1983
NAVD88	North American Vertical Datum of 1988
NAIP	National Agriculture Imagery Program
NEXRAD	Next Generation Weather Radar
NGVD29	National Geodetic Vertical Datum of 1929

NIRL	North Indian River Lagoon
NO2	Nitrogen Dioxide
NO3	Nitrate
NOAA	National Oceanographic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
O&M	Operation and Maintenance
PEC	Professional Engineering Consultants
PFDS	Precipitation Frequency Data Server
QLH	Quentin L. Hampton Associates
RAP	Reasonable Assurance Plan
RCP	Reinforced Concrete Pipe
ROM	Rough Order of Magnitude
ROW	Right-of-Way
RR	Railroad
RTK	Real-Time Kinematic
SHWT	Seasonal High Water Table
SFWMD	South Florida Water Management District
SIMPLE	Spatially Integrated Model for Pollutant Loading Estimates
SJRWMD	St. Johns River Water Management District
SKT	Seasonal Kendall Tau
SLR	Sea Level Rise
SR	State Road
SSMC	Southeastern Surveying and Mapping Coordination
SSURGO	Soil Survey Geographic Database
SWIL	Spatial Watershed Integrated Model
SWMP	Stormwater Master Plan
SWRA	Surface Water Resource Assessment

Tc	Time of Concentration
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
TR-55	Technical Release 55
UCIA	Unconnected Impervious Area
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USGS	United States Geological Survey
VC	Volusia County
WBID	Water Body Identification Number
WIN	Watershed Information Network
WM	Water Main
WWTP	Wastewater Treatment Plant

EXECUTIVE SUMMARY

The City of Edgewater's Comprehensive Stormwater and Flood Risk Reduction Master Plan provides a long-range strategy to reduce flooding, improve resilience, support water quality compliance, and guide stormwater infrastructure investment across the community. Edgewater's stormwater challenges are the product of several factors: flat terrain, historically altered drainage patterns, aging infrastructure, legacy development that predates modern stormwater standards, and increasing exposure to extreme rainfall and tidal influences. These factors create recurring flood risk throughout the City and require a coordinated, Citywide improvement plan. The City partnered with Jones Edmunds and its subconsultants Mead & Hunt and Environmental Sciences Associates (ESA) to develop the Comprehensive Stormwater Master Plan (SWMP) to improve flood resilience, protect water quality, and provide a clear path for long term stormwater infrastructure investment.

This Master Plan integrates flood risk reduction, hazard mitigation, resilience planning, water quality management, and capital improvement planning into a single decision-making framework. It is intended to serve as a living planning document that can guide near-term projects, support grant and funding applications, improve day-to-day system management, and position the City to adapt over time as development patterns, regulatory requirements, and climate-related conditions evolve.

Planning Approach and Technical Foundation

The plan is based on a technical effort that combines prior studies, geographic information system (GIS) datasets, Light Detection and Ranging (LiDAR) topography, land use and soils data, drainage infrastructure inventories, public input, and field reconnaissance. Using these data, Jones Edmunds developed a new Citywide hydrologic and hydraulic (H&H) model in StormWise Version 4.08.03 to evaluate how runoff moves through Edgewater's interconnected system of canals, ditches, ponds, swales, culverts, pipes, and outfalls under both existing and future conditions. The model includes 1,973 basins, 2,276 nodes, and 6,166 hydraulic links, making it the most comprehensive planning-level stormwater modeling tool for the City.

The H&H model was calibrated and verified using recent extreme storm events, including Hurricane Milton (2024) and the September 2024 rainfall event. This allowed modeled flooding results to be compared to observed flooding impacts and confirm that the model reasonably reflects actual drainage behavior. The calibrated model was then used to map existing inundation, assess level of service (LOS), identify system deficiencies, and test the effectiveness of potential improvement alternatives. Future condition scenarios were also evaluated to understand how sea level rise (SLR), increasing rainfall intensity, and planned development may affect the City's flood risk over time.

Existing Flood Risk and System Deficiencies

The study confirms that Edgewater's most significant flooding problems are concentrated in older, low-lying neighborhoods with historically altered wetland areas where drainage systems were not originally designed to meet current stormwater performance criteria. Major flooding areas identified in the Master Plan include Florida Shores South of Indian River Boulevard, Florida Shores North of Indian River Boulevard, Florida Shores West Side, Edgewater Acres, the G2/G11 Canal area, and Pelican West. In many of these locations, the

flooding drivers include insufficient storage, undersized or poorly connected conveyance systems, limited positive outfall, "bowl" topography that traps water, and sensitivity to both extreme rainfall and tailwater conditions.

Using the City's adopted level-of-service framework and a flood protection level-of-service (FPLOS) analysis, Jones Edmunds identified 25 drainage problem areas and prioritized them as either Tier 1, Tier 2, or Tier problems with Tier 1 being the highest priority areas that experience the most significant predicted structure flooding. Under existing conditions, the model predicts that approximately 191 structures experience flooding above finished floor elevation (FFE) during the 25-year/24-hour storm event, and approximately 610 structures experience flooding above FFE during the 100-year/24-hour storm event. These findings confirm that the City's flooding issues are not isolated nuisance conditions; rather, they represent a broad system capacity deficiency with direct implications for residents, businesses, public safety, and emergency access.

Capital Improvement Strategy

To address these deficiencies, the Master Plan recommends a phased capital improvement program extending from 2026 through 2055. The overall capital program is estimated at approximately $370 million, excluding voluntary property acquisition costs that may be required for certain projects. The recommended projects include a combination of regional and local improvements such as new stormwater storage areas, pump stations, conveyance upgrades, culvert improvements, outfall enhancements, and associated system modifications that improve how water is stored, routed, and discharged during major storm events.

The program includes a total of 25 improvement projects organized into four implementation phases over an approximately 30-year planning horizon. Phase-level costs identified in the Plan are approximately:

- Phase 1 – $152.5 million.
- Phase 2 – $62.5 million.
- Phase 3 – $23 million.
- Phase 4 – $130 million.

Early-phase projects focus on improvements that can be advanced more readily, are expected to provide immediate flood reduction benefits, and do not rely on upstream or downstream companion projects to function effectively. Later phases include larger, more complex, and more resilience-oriented improvements that may require additional coordination, land acquisition, permitting, or dependence on earlier system upgrades. This sequencing is intended to reduce risk in the most effective order, avoid creating new downstream problems, and align the City's infrastructure program with realistic funding and delivery constraints.

Notable project concepts evaluated in the Master Plan include major storage projects in Florida Shores, new or improved pump stations, upgrades to the 18th Street Canal system, improvements associated with the Mango and Massey areas, conveyance and storage enhancements in the G2/G11 system, and Pelican West flood reduction improvements. Several of these projects also carry significant permitting and interagency coordination needs, including potential involvement from the United States Army Corps of Engineers (USACE), St. Johns River Water Management District (SJRWMD), Florida Department of

Transportation (FDOT), the Florida East Coast Railway (FEC), and the Federal Aviation Administration (FAA) depending on final design and location.

When fully implemented, the Master Plan estimates that the recommended program could reduce structure flooding by approximately 80 to 90 percent for the 25-year and 100-year/24-hour storms, representing a significant improvement in the City's flood resilience. The City has identified a plan to incrementally improve drainage and reduce flood risk across its most vulnerable neighborhoods if long-term implementation can be achieved.

Operations, Maintenance, and Asset Management

The Master Plan also recognizes that capital projects alone will not solve Edgewater's stormwater challenges. Long-term performance depends on operations, maintenance, inspection, and asset management practices across the City's stormwater system, which includes approximately 25 miles of ditches, 30 miles of pipes, 1,300 structures, 300 ponds, and 150 miles of swales. To support this need, the Plan recommends a formalized maintenance program that includes standardized inspection procedures, condition scoring, preventive maintenance schedules, post-storm response protocols, and integration of GIS-based asset management tools.

The maintenance strategy emphasizes actions that improve system performance and extend infrastructure life. Examples include routine mowing and debris removal for ditches and waterways, scheduled cleaning and rehabilitation cycles for pipes and culverts, condition-based inspections of structures and outfalls, and more consistent maintenance of roadside swales, ponds, and drainage easements. These improvements are important in a system where localized blockages, sedimentation, and deferred maintenance can worsen already limited hydraulic capacity.

To fully implement the recommended operations and maintenance (O&M) program, the plan estimates a need for approximately 15 full-time equivalent staff and an annual stormwater maintenance program budget of approximately $3.7 million, which represents an increase of 4 full-time staff and approximately $1.0 million in budget.

Water Quality and Regulatory Compliance

In addition to flood risk reduction, the Master Plan addresses Edgewater's water quality responsibilities in receiving waters such as Mosquito Lagoon and the North Indian River Lagoon (NIRL). The study ties stormwater planning to compliance with the Mosquito Lagoon (ML) TMDL and the NIRL Basin Management Action Plan (BMAP), recognizing that runoff control, treatment improvements, and watershed management all contribute to regional restoration goals. This integration is important because many stormwater investments can reduce flood damage while also reducing nutrient loading.

The plan estimates annual stormwater-related pollutant loadings of approximately 72,000 pounds per year of total nitrogen (TN) and 9,500 pounds per year of total phosphorus (TP). Although some reductions have already been achieved through prior and ongoing water quality initiatives, phosphorus remains above applicable criteria and continued progress will be needed to meet long-term restoration objectives. Accordingly, the Master Plan supports a coordinated approach in which flood mitigation projects, maintenance practices, and future retrofit opportunities are evaluated not only for hydraulic benefit, but also for their ability to contribute to nutrient reduction and regulatory compliance.

Resilience and Future Conditions

The Master Plan evaluates future scenarios that account for SLR, increased rainfall intensity, and planned development to better understand how today's drainage decisions may perform in coming decades. The plan incorporates National Oceanographic and Atmospheric Administration (NOAA)-based SLR assumptions and identifies planning-level conditions under the selected scenario. These future analyses reinforce the need for adaptive infrastructure planning, especially in tidally influenced portions of the system and in neighborhoods already vulnerable to backwater effects and limited outfall capacity.

The Master Plan is structured as an adaptive framework rather than a one-time static report. The City is encouraged to update the model and the implementation strategy as new development occurs, new data become available, regulatory requirements change, and climate science continues to evolve. This "living document" approach will help the City maintain the relevance of the Master Plan over time and ensure that stormwater investments continue to reflect actual conditions.

Implementation Outlook

Implementation of the Master Plan will require aggressive pursuit of outside funding. The total cost of the recommended program is substantial, but it is proportionate to the scale of the flooding problems documented in the City and to the long-term benefit. The Master Plan positions Edgewater to compete for state and federal grants, legislative appropriations, and other external funding sources by providing a clear technical basis, phased project roadmap, and defensible prioritization process.

The City of Edgewater Comprehensive Stormwater and Flood Risk Reduction Master Plan provides a roadmap for addressing one of the City's most pressing infrastructure challenges. It establishes the scale of current flood risk, identifies the neighborhoods and system components most in need of improvement, recommends a phased and prioritized capital program, strengthens the operational framework needed to maintain system performance, and links flood mitigation with water quality and resilience goals. With consistent implementation, the plan gives the City a path toward lower flood risk, stronger regulatory compliance, better stewardship of public infrastructure, and a more resilient future for the City.

1 INTRODUCTION

1.1 PROJECT SCOPE

The City of Edgewater faces several stormwater-related challenges including flooding concerns recently exacerbated following the widespread flooding experienced during Hurricanes Ian (2022) and Milton (2024), managing the impacts of new development on the City's stormwater system, operating and maintaining an aging stormwater system, and meeting total maximum daily load (TMDL) and basin management action plan (BMAP) nutrient reduction requirements for Mosquito Lagoon (ML) and Turnbull Hammock. With these challenges in mind, the City hired Jones Edmunds to complete a Comprehensive Stormwater Master Plan (SWMP). The primary goals/objectives of the SWMP are to:

- Review and build on existing City stormwater related studies and data.
- Develop a detailed Citywide hydrologic and hydraulic (H&H) stormwater model to determine existing flood risk, evaluate flood protection alternatives, and manage stormwater impacts of new development. The H&H model will include the Watersheds that flow into and out of the City, including but not limited to Gabordy Canal, Ariel Canal, and Turnbull Hammock.
- Assess the drainage level-of-service (LOS) provided by the City's existing stormwater system and determine priority areas for improvement alternatives.
- Develop improvement alternatives to enhance the drainage level-of-service in priority areas.
- Identify projects to reduce the City's pollutant loading to ML and Turnbull Hammock to meet regulatory requirements.
- Rank and prioritize proposed water quantity and quality improvement projects and develop a Capital Improvement Plan (CIP).
- Develop a system for evaluating/rating the condition of the individual components of the City's stormwater system (pipes, inlets, ditches, etc.).
- Develop a system for the City and the local development community to leverage the new stormwater model to assess/manage the impacts of growth on the City's stormwater system.

To accomplish these goals/objectives, Jones Edmunds and our team of subconsultants scope of services included the following tasks.

- Data Collection – Gathering available existing data required for completion of the SWMP. This includes previous stormwater studies, elevation data, permit data, geographic information system (GIS) data from various agencies, etc.
- H&H Model Schematic Development – Developing an initial Citywide H&H model schematic at the City's desired level of detail.
- H&H Model Field Data Collection – Completing field reconnaissance surveys as needed to verify hydraulic system parameters (e.g., structure locations, sizes, shapes, materials, etc.) as well as basin delineations not evident in the available desktop data. Where needed, this will also include collecting vertical elevation data using high-precision global positioning system (GPS) units or traditional survey methods.
- H&H Model Development – Once the model schematic was approved and field data collection was complete, a fully parameterized 1-D H&H model was developed using the

H&H modeling software StormWise Version 4.08.03, formerly known as Interconnected Channel and Pond Routing Version 4 (ICPR4). StormWise is widely used across Florida and has become the industry standard for 1-D H&H models. This task also includes modeling and mapping existing and future conditions inundation City-wide for the mean-annual, 10-year, 25-year, 100-year, and 500-year 24-hour design storm events.

- Flood Protection Level-of-Service (FPLOS) and Problem Area Identification – Identifying locations where the City's stormwater LOS is unmet and identifying/ranking drainage problem areas.
- Surface Water Resource Assessment (SWRA) – Jones Edmunds subconsultant, Environmental Science Associates (ESA), completed a City-wide SWRA to review existing water quality data/regulations and identify water quality problem areas.
- Improvement Alternatives and Stormwater CIP – Jones Edmunds subconsultant Mead & Hunt developed and ranked/prioritized conceptual improvement alternatives to reduce flooding and improve water quality for the City. The proposed improvements were used to develop a 30-year stormwater CIP.
- Operation and Maintenance (O&M) Review and Condition Assessment Criteria – Reviewing the City's existing O&M program and developing recommendations for improving the City's stormwater infrastructure, maintainable ditches and waterways, and drainage easements. This also includes developing recommended scoring system templates for assessing the condition of the City's stormwater infrastructure.
- Draft and Final SWMP Report – Development of the draft and final comprehensive master report summarizing the work performed in the tasks above. This includes up to two public meetings to present the report to the public.

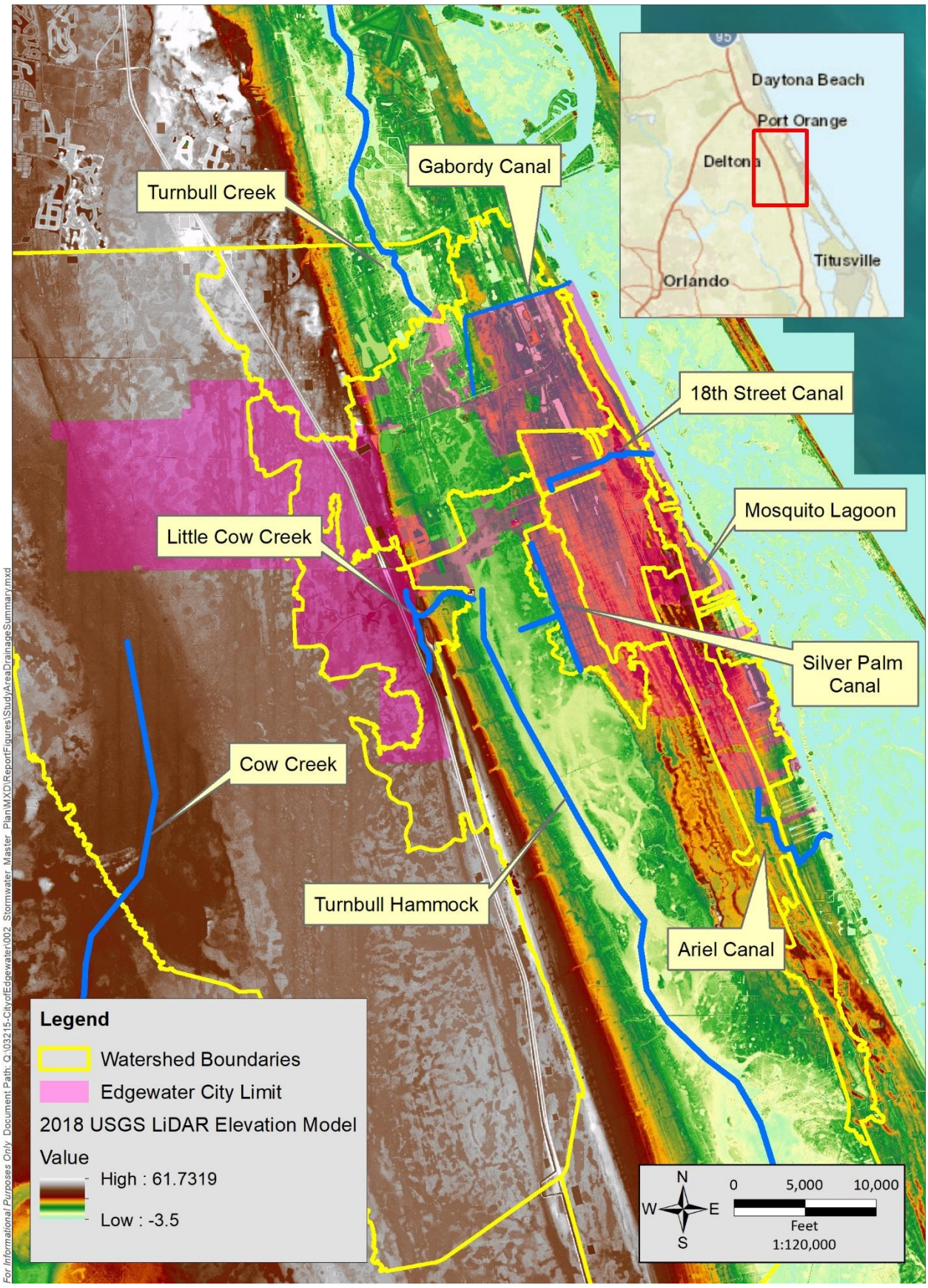
1.2 Summary of the Project Area

The City covers an area of 22.6 square miles in southeast Volusia County (VC). The City consists of mostly medium-density residential and undeveloped wetland and/or forested land uses with pockets of commercial and services areas along US-1/Ridgewood Avenue, Park Avenue, State Road (SR)-442/Indian River Road, and the Florida East Coast (FEC) Railway corridor. Most of the City was developed before modern stormwater regulations requiring on-site retention/detention systems for flood protection and water quality treatment. This is a major cause of the flooding issues within the City today.

Stormwater runoff in the City conveys through roadside swales, driveway culverts, and piped collection systems, which discharge into the primary canal/ditch systems and/or surface waterbodies. As shown in Figure 1, the City's drainage system contributes to nine primary Watersheds including the:

- Gabordy Canal Watershed.
- 18th Street Canal Watershed.
- Silver Palm Canal Watershed.
- ML Watershed.
- Ariel Canal Watershed.
- Turnbull Hammock Watershed.
- Turnbull Creek Watershed
- Little Cow Creek Watershed.
- Cow Creek Watershed.

Figure 1 Study Area Drainage Summary



2 EXISTING DATA COLLECTION

Jones Edmunds collected available data to complete the tasks included in the SWMP. A variety of data sources and types were collected, summarized in the subsections below.

2.1 EXISTING STORMWATER STUDIES AND MODELING DATA

The City provided Jones Edmunds with reports and modeling data from several previously completed drainage-related studies. The reports and modeling data were reviewed for useful information that could be applied to this SWMP and are briefly summarized below.

2.1.1 18TH STREET AND SILVER PALM CANAL WATERSHEDS EXISTING CONDITIONS ANALYSIS

This Study was completed in 2006 by Professional Engineering Consultants (PEC) and was funded by the City and the St. Johns River Water Management District (SJRWMD). The Study included an H&H modeling analysis for the 18th Street and Silver Palm Canal Watersheds to characterize existing flooding conditions within the modeled areas. The model was developed using the H&H modeling software ICPR3. A significant amount of survey data were collected for the primary ditch and canal systems and major culvert crossings along these systems. Jones Edmunds reviewed and deemed the survey data representative of current conditions for this Study, so the data were used for developing the updated H&H model. Updated land use, topography, and rainfall data have been released since the model was developed in 2006. Therefore, these data from the 18th Street and Silver Palm Canal Study were not used.

Based on their analysis, PEC developed six recommendations for the City.

- FEMA – PEC noted that the City could obtain a Federal Emergency Management Agency (FEMA) Letter of Map Revision (LOMR) to update FEMA's floodplains in the Study areas to more accurately reflect flooding exposure in the Watersheds. PEC warned that this would result in a significant increase in residents required to carry flood insurance, which can be a heavy financial burden.
- Development Issues – PEC emphasized the importance of preserving flood storage volume in the basins and noted that the City should be diligent when reviewing and approving new development and re-development to ensure adequate compensating storage is provided.
- Flood Protection Deficiencies – PEC recommended collecting finished floor elevation (FFE) data to more accurately quantify FPLOS deficiencies.
- Conveyance Deficiencies – PEC noted that due to the expansive flooding predicted for the 100-year storm event, conveyance improvements for the 10-year storm event may be more realistic. They also noted that conveyance improvements to the existing ditches are likely impractical due to the lack of space.
- Water Quality Deficiencies – PEC noted that most of the City was developed before modern stormwater regulations requiring stormwater treatment, which can lead to significant stormwater pollutant loading. Regional stormwater treatment ponds were discussed but deemed infeasible due to lack of undeveloped land in the Watersheds. PEC recommended continuing to seek opportunities to implement smaller more dispersed water quality improvements.

- Maintenance-Related Deficiencies – PEC noted that several of the City's metal culverts need replacement. A recommendation was made to identify culverts needing replacement and use the H&H model to determine if upsizing the culverts is beneficial.

2.1.2 Gabordy Canal Watershed Stormwater Management Plan Existing Conditions Analysis

This Study was completed in 2005 by PEC and was jointly funded by the City, VC, and the City of New Smyrna Beach. The Study included a H&H modeling analysis for the Gabordy Canal Watershed to characterize existing flooding conditions within the modeled areas. The model was developed using ICPR3. A significant amount of survey data were collected for the primary ditch and canal systems and major culvert crossings along these systems. Jones Edmunds reviewed and deemed the survey data representative of current conditions for this Study, so the data were used for developing the updated H&H model.

Based on their analysis, PEC developed six recommendations for the City, which were the same or very similar to the recommendations provided for the 18th Street and Silver Palm Canal Study summarized in Section 2.1.1.

2.1.3 2013 City SWMP Update

This Study was completed in 2013 by Quentin L. Hampton Associates (QLH). The Study was an update of the City's SWMP, which was previously developed in 2007 by PEC. The 2013 update included a review of the City's progress and identified additional deficient areas that had come to the City's attention. The primary goal of the project was to provide updated information for stormwater planning by re-evaluating the problem areas and providing updated costs for the previously recommended improvement projects to update the City's stormwater CIP. Jones Edmunds reviewed the problem areas and recommended improvements identified in the Study to ensure sufficient detail in the stormwater model in previously identified problem areas. No other data were used from this Study.

2.1.4 ML Reasonable Assurance Plan

Jones Edmunds and Janicki Environmental completed this study in 2019 for VC. The Study describes local stakeholders' efforts to develop a robust plan to restore water quality in ML. Implementation of the restoration activities and projects included in the plan provided a more cost-effective and locally driven path toward attaining water quality standards. The plan included a description of the concentration- and load-based targets to be achieved through restoration and corrective measures if established goals were unmet. This Study was used to inform the SWRA summarized in Section 7.

2.1.5 ML Reasonable Assurance Plan Pollutant Load-Reduction Projects Report

Jones Edmunds completed this Study in 2018 for VC to develop pollutant load-reduction projects to help achieve water quality targets for ML. Jones Edmunds identified ten project options, five of which are within the City's limits. Rough Order of Magnitude (ROM) cost estimates and pollutant loading reduction estimates were developed for each of the project options. This Study was used to inform the SWRA summarized in Section 7.

2.1.6 G2–G11 Stormwater Improvements Modeling

The City recently constructed stormwater improvements in the G2 and G11 Canal systems designed and permitted by Mead & Hunt. The design and permitting of these improvements

included developing an ICPR Version 4 (ICPR4) H&H model. The G2-G11 model was developed from the ICPR3 model created by PEC for the Gabordy Canal Watershed with detail added in the project area. Jones Edmunds received and used a copy of the ICPR4 model and geodatabase of the model schematic to develop the updated stormwater model. Elevation and structure data from the G2-G11 model were incorporated into the updated model when considered relevant and accurate.

2.2 United States Geological Survey Light Detection and Ranging Data

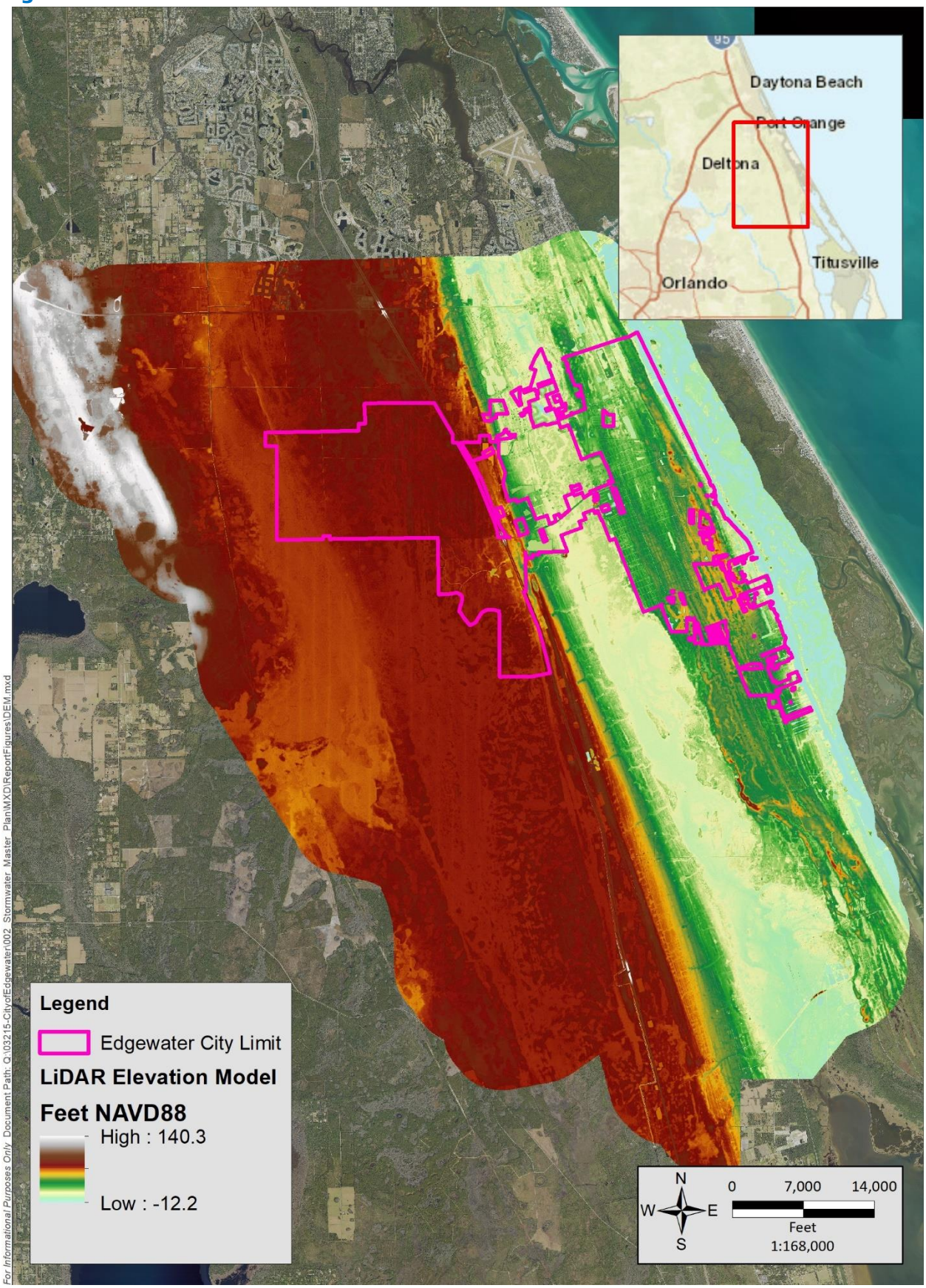
Jones Edmunds reviewed available Light Detection and Ranging (LiDAR) topographic datasets and determined that the most recent available data were the US Geological Survey's (USGS) 2018 VC and Brevard County datasets. Jones Edmunds downloaded copies of these data from the USGS website in 2018 and 2019. The data coordinate reference system is as follows:

- The horizontal datum is the North American Datum of 1983 with the 2011 Adjustment (NAD83 [2011]).
- The vertical datum is the North American Vertical Datum of 1988 (NAVD88).
- The coordinate system is NAD83 (2011) State Plane Florida East (US Survey Feet).
- The geoid model is Geoid12B.

The vertical accuracy of the LiDAR was reported as a root-mean-square-error relative to non-vegetated checkpoints of 0.64 foot at the 95 percent confidence interval. The LiDAR was provided as a 2.5-foot by 2.5-foot digital elevation model (DEM).

Jones Edmunds merged the Volusia and Brevard County datasets into one 2.5 foot-by-2.5-foot raster DEM and clipped the DEM to cover the extents of the H&H stormwater model. Figure 2 shows the merged and clipped raster DEM used for the project.

Figure 2 2018 USGS LiDAR DEM



2.3 Infrastructure Asset Inventory Datasets

Jones Edmunds received copies of the following critical infrastructure GIS asset datasets from the City, VC, and the City of New Smyrna Beach.

- City Stormwater Assets – The data included locations of stormwater pipes and structures within the City. The datasets included fields identifying the entity responsible for maintaining the assets. Based on a review of the asset data versus the inventory data developed by Jones Edmunds for the O&M Review summarized in Section 9, the City's stormwater asset data cover approximately 40 percent of the stormwater collection system network.
- City Water and Sewer Assets – The data included locations of sewer gravity mains, sewer FMs (FMs), water mains (WMs), and reclaimed WMs.
- VC Stormwater Assets – The data included locations of stormwater ditches, channels, National Pollutant Discharge Elimination System (NPDES), outfalls, culverts, retention ponds, and structures. Pipe invert elevation data are available for approximately 5 percent of the pipes in the inventory.
- City of New Smyrna Beach Stormwater Assets – The included locations of stormwater outfalls, ponds, pumps, inlets, pipes, structures, and possible problem areas.

Jones Edmunds used the stormwater asset datasets to inform the development of the H&H stormwater model, and the water and sewer asset datasets were used in development of improvement alternatives.

2.4 Existing Plan/As-Built and Survey Data

Jones Edmunds collected relevant existing plan, as-built, and survey data from previous stormwater Studies, the City, and available data from the SJRWMD records. Table 1 summarizes the data collected and the sources. These data were used to develop the City's updated H&H stormwater model. The developments included in Table 1 represent all the major permitted developments within the model boundary.

Table 1 Existing Plan/As-Built and Survey Data Summary

Source	Project Name	Description of Data Collected
Previous Stormwater Studies	18th Street and Silver Palm Canal Watersheds Existing Conditions Analysis	Survey data of the primary ditches/canals and culvert crossings in the Watershed. Stormwater basin and structure location maps.
	Gabordy Canal Watershed Stormwater Management Plan Existing Conditions Analysis	Survey data of the primary ditches/canals and culvert crossings in the Watershed. Stormwater basin and structure location maps.
City of Edgewater	Edgewater Preserve Phases 3–5	Site development plans and drainage report.
	Airpark Village	Site development plans, CAD files, and drainage report.
	Crestwood	Site development plans and drainage report.
	Riverfront Estates	Site development plans and drainage report.
	Smyrna Creek/Sandalwood	Site development plans, as-builts, and drainage report.
	Havensound	Preliminary site development plans and drainage report.
	Space Coast Commerce	Site development plans and drainage report.

Source	Project Name	Description of Data Collected
	Deering Park	Site development plans, drainage report, stormwater modeling files, and site survey files.
	New Edgewater Public Works Facility	Site development plans and drainage report.
SJRWMD	10th Street Improvements	Roadway design plans.
	30th Street Sidewalk (Silver Palm Drive to India Palm Drive)	Site development plans.
	430678-1 SR 5 from South Street to Magnolia Avenue/Shangri-La Drive	Roadway design plans.
	Airpark Village	Site development plans and as-builts plans.
	Aldi Food Market	Site development plans.
	Boston Whaler	Site development plans.
	Central Fire Station	Site development plans.
	City of Edgewater Gymnasium Complex	Site development plans.
	City of Edgewater Hawks Park	Site development plans.
	City of Edgewater - Monson and Riverview Drives Stormwater Improvements	Site development plans.
	City of New Smyrna Beach Corbin Park Stormwater Improvements	Site development plans.
	Coral Trace	Site development plans.
	Dale Avenue to 10th Street Trail	Site development plans.
	Dollar Tree	Site development plans.
	Eastern Shores Stormwater Improvements Project	Site development plans.
	Edgewater Boat and RV	Site development plans.
	Edgewater Lakes Subdivision	Site development plans.
	Edgewater Landing Subdivision	Site development plans.
	Edgewater Preserve Phase 1/2A	Site development plans.
	Edgewater Sidewalks FPID 430183-1-58-01	Roadway design plans.
	Edgewater Storage Phase 1/2	Site development plans.
	Edgewater Terrace Subdivision	Site development plans.
	Elegant Manor	As-built plans.
	Florida Inland Navigation District V-26 Containment Site	Site development plans.
	Florida Roadhouse Grill	Site development plans.
	Florida Shores Drainage Improvements	Site plans and as-built plans.

Source	Project Name	Description of Data Collected
SJRWMD	Gabordy Canal 10th Street Stormwater Treatment Area	Site development plans.
	Glenbrooke Subdivision	Site development plans.
	Hacienda Del Rio	Site development plans and as-builts plans.
	Hart Avenue Drainage and WM Improvements	Site development plans.
	I-95 (Brevard/Volusia County Line to SR 44), FPID 406869-4-32-01	Roadway design plans.
	Indian River Boulevard Roadway Improvements	Roadway design plans.
	Indian River Self Storage	Site development plans.
	Lake Waterford Estates	Site development plans.
	Lamont and Hubbell Street Stormwater Improvements	Site development plans.
	Liberty Village	As-built plans.
	Lineman College Parking Area	Site development plans.
	Majestic Oaks	Site development plans.
	Mariners Gate Subdivision	Site development plans.
	Massey Parcel Roadway, Drainage, and Utility Development	Site development plans.
	Meadow Lake Subdivision	Site development plans.
	Newport Sound Apartments	As-built plans.
	New Smyrna Beach High School	Site development plans.
	Oakleaf Preserve	Site development plans and as-builts plans.
	Parking Lot for Rotary Park	Site development plans.
	Parktowne Industrial Center	Site development plans.
	Rix Development (Office/Warehouse)	Site development plans.
	Riverfront Estates	Site development plans.
	Stor 4 Dayz	Site development plans.
	Villas Massey Ranch	Site development plans.
	West Park Avenue	As-built plans.
	West Park Storage	As-built plans.
	Woodbridge Lake	Site development plans and as-builts plans.

Note: CAD = Computer-Aided Design; FPID = Financial Project Identification.

2.5 FDEP Land Cover Land Use

Jones Edmunds obtained the 2022 Florida Department of Environmental Protection (FDEP) land cover layer, which is the most recent land use layer for the City. The east part of the City is predominantly characterized by urban and built-up land uses, and the City west of I-95 is characterized by upland forest and wetland land uses. Figure 3 summarizes the land use data, which will be used to develop input data for the hydrologic model. The data were reviewed against the 2023 United States Department of Agriculture (USDA) National Agriculture Imagery Program (NAIP) imagery and Nearmap imagery for accuracy. Nearmap

is a subscription-based aerial imagery service that provides high-resolution aerial imagery in populus areas throughout the US. Updates to the land-use polygons and land-use classifications were made where land use had obviously been changed since the dataset was originally developed. Most of the updates were made at locations of new development within the Watershed.

2.6 Natural Resources Conservation Service Soils Data

Jones Edmunds downloaded the most recent (2025) Natural Resources Conservation Service (NRCS) soils data for the Edgewater Watershed from the Soil Survey Geographic Database (SSURGO). The SSURGO data spatially identify soil types and characterize many different soil properties. Specifically, the SSURGO data designate a hydrologic soil group (HSG) (A-D) for each soil unit. This HSG was originally assigned based on measured infiltration data and is commonly used in hydrologic models to predict runoff response. The soil groups are as follows:

- Group A – Soils in this group have low runoff potential when thoroughly wet. Water is transmitted freely through the soil. These soils typically contain less than 10 percent clay and more than 90 percent sand or gravel.
- Group B – Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is generally unimpeded.
- Group C – Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission in the soil is somewhat restricted. These soils typically contain 20 to 40 percent clay and less than 50 percent sand.
- Group D – Soils in this group have high runoff potential when thoroughly wet. Water transmission in the soil is restricted or very restricted. These soils typically contain greater than 40 percent clay and less than 50 percent sand.

Some soils have dual classifications such as groups A/D, B/D, and C/D if they can be adequately drained. These soils are wet under natural conditions and are classified as D soils under natural conditions based on the presence of water-table depths within 2 feet of the surface despite the soil's hydraulic conductivity. The first letter denotes the condition in which the soil is adequately drained (i.e., the seasonal high-water table is kept at least 2 feet below the surface), and the second letter is the condition when the soil is undrained. Figure 4 summarizes the HSG designations for the City. The HSG parameter was used to calculate runoff response parameters for the H&H model. The methodology used is summarized in Section 5.1.4 of this SWMP.

Figure 3 FDEP 2022 Land Use Summary with Post-2022 Developments

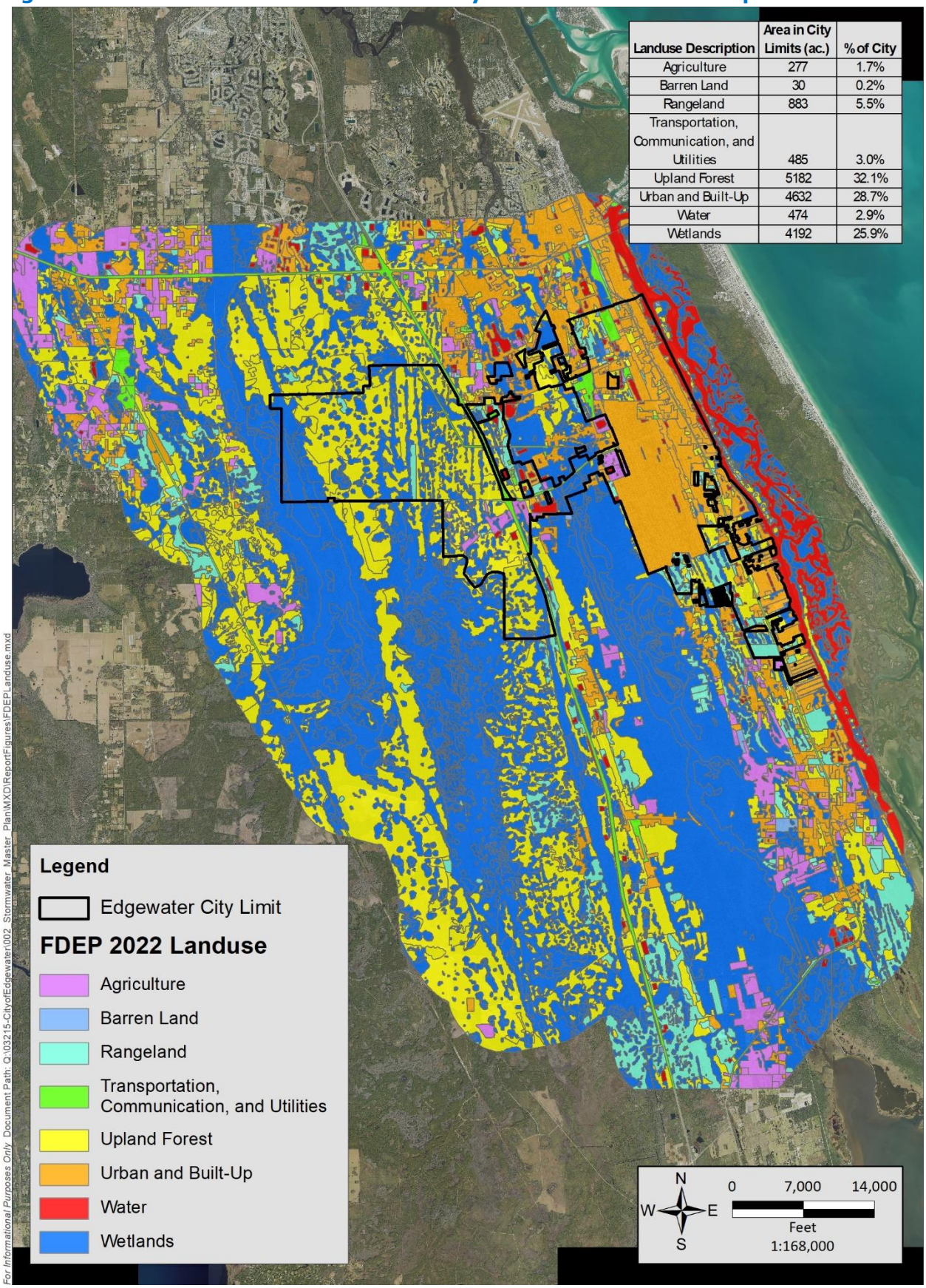
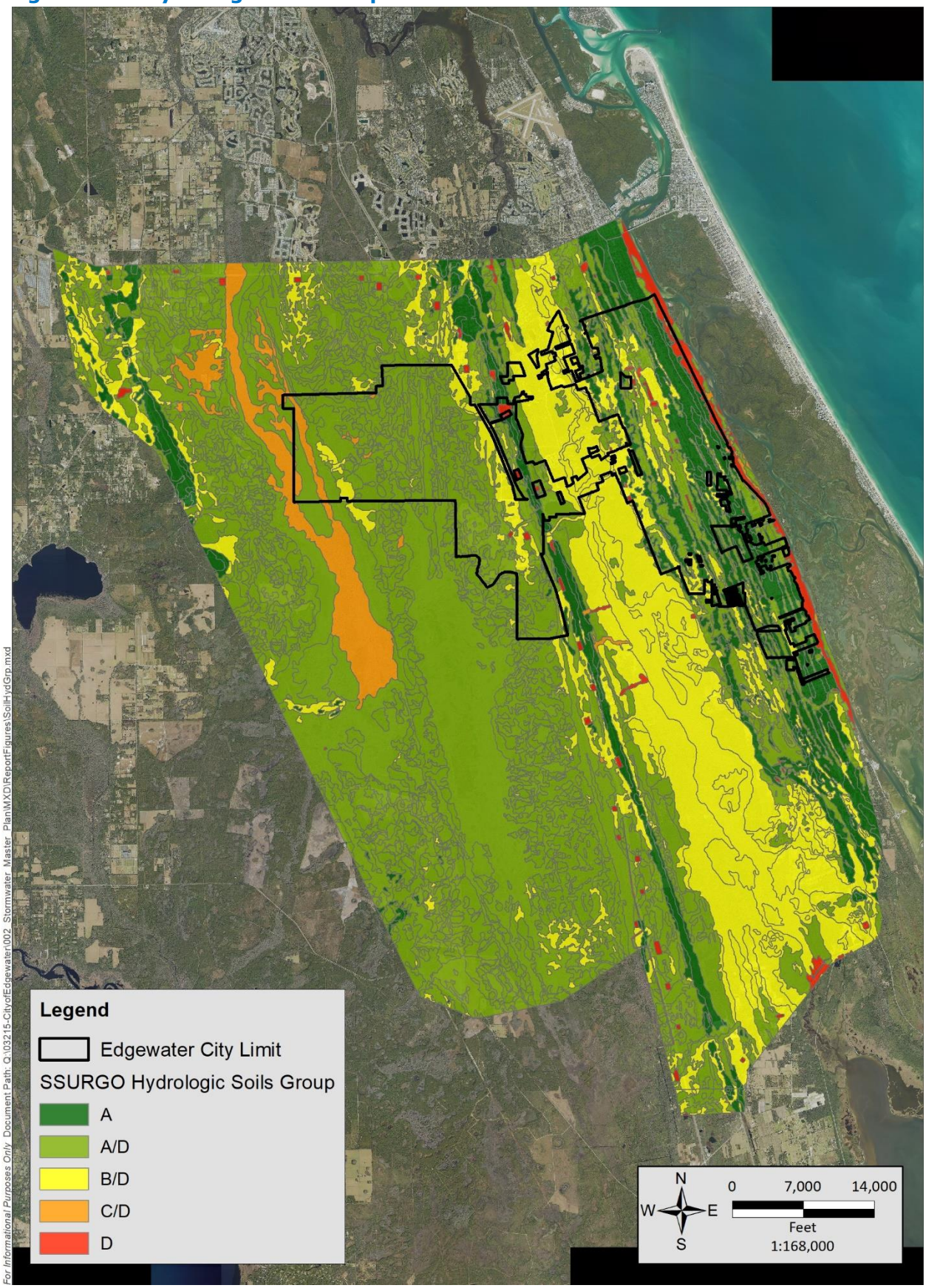


Figure 4 Hydrologic Soil Group Classifications



2.7 AERIAL IMAGERY

Jones Edmunds collected the following aerial imagery datasets that cover the Edgewater Watershed:

- 2021 Florida Department of Transportation (FDOT), VC aerial imagery.
- 2023 USDA NAIP imagery.

Jones Edmunds also used imagery from Nearmap, with the most recent aerial imagery available for the City collected on November 21, 2024.

2.8 VC PARCELS

Jones Edmunds downloaded the current (2024) shapefile of VC parcels from the VC Open Data Site data portal and used the data to assess the FPLOS for the City, identify City-owned parcels, and develop proposed stormwater improvement alternatives.

2.9 EXISTING FLOODING DOCUMENTATION

Jones Edmunds collected documentation of past flooding in the City from:

- Previous stormwater studies,
- Flood documentation data provided by the City,
- Videos of previous City Council meetings and workshops related to recent flooding,
- Internet sources.

The following Subsections summarize the information and data collected from each of the sources.

2.9.1 PREVIOUS STUDIES

2.9.1.1 18th Street Canal and Silver Palm Canal Watersheds Existing Conditions Analysis

The 18th Street Canal and Silver Palm Canal Study provided important historical context regarding the development of the City's drainage system, an inventory of 19 identified drainage problem areas within the subject basin, and a summary of the completed H&H modeling.

Historical Context of the 18th Street Canal and Silver Palm Basins

The text below was taken directly from the Study report and summarizes the historical perspective of the City's drainage.

> *During the third quarter of the 18th Century, what is now southeastern VC was the site of one of the most ambitious attempts by the British to colonize the New World. It was here, in 1768, that Scottish physician Dr. Andrew Turnbull and 1,255 colonists founded what eventually became the present day City of New Smyrna Beach. The Turnbull colony, although abandoned after only 9 years, was one of the grandest agricultural enterprises undertaken during the British occupation of East Florida (reference www.volusihistory.com).*
>
> *Many of the existing drainage systems in the vicinity of the City of Edgewater were implemented by the Turnbull colonists to improve the land for agricultural purposes. Over time and as agricultural uses of the land progressed, additional ditches and canals were constructed within the City of Edgewater, most of which now forms the backbone of the primary drainage*

system. Most of these ditches and canals were historically excavated to lower the naturally high-water table and improve the land for cultivation or development purposes.

As the City of Edgewater developed, the amount of impervious surface increased, which caused a corresponding increase in stormwater runoff. Because the historical network of canals and ditches were created in a somewhat haphazard manner without the benefit of master planning, conveyance of stormwater runoff in accordance with current development regulations is most often inadequate. Many areas were developed without regard for the ability of downstream facilities to carry the increased stormwater runoff. As a result, localized and nuisance flooding became more widespread and frequent.

In support of development activities within the City of Edgewater and surrounding areas… the construction of roadways has also caused some major changes to the historical drainage patterns. Interstate 95, Sr 5 (US-1), and SR 442 (Indian River Boulevard) have all modified the historical drainage patterns to some extent.

During the 1950's, construction began on canals within the 18th Street Canal System and the Turnbull Hammock (Silver Palm) Canal System to lower the groundwater table and to provide drainage for Florida Shores. This construction served the pre-development Gabordy Basin and created a new basin, designated as the 18th Street Canal Basin. Additionally, the existing drainage pattern of the western portion of Florida Shores into Turnbull Hammock was enhanced. Several sources have indicated that these canals were not designed to convey the stormwater runoff generated by the present degree of development within the City, nor that proposed for the future. The canals were primarily created to lower the water table or provide irrigation. Conveyance of stormwater was a secondary consideration (reference reports entitled History of New Smyrna, Gary Kuther and Drainage Report of the City of Edgewater, Marshal Engineers dated October 1985).

Later in the report, the following excerpt was referenced from a report titled *Stormwater Master Plan for the City of Edgewater* (Dyer, Riddle, Milles, and Precourt dated April 1990).

The 18th Street Basin contains some retention/detention ponds, primarily as a result of new commercial development along US-1. Additionally, there area a few subdivisions west of US-1 that have provided retention/detention ponds. However, the basin are served by retention/detention ponds is a small fraction of the total area. This condition exists because the vast majority of the area within the 18th Street Basin is comprised of the Florida Shores development, which was platted prior to the present stormwater management criteria. As such, single family lot development within Florida Shores is exempt from retention/detention criteria.

The Turnbull Hammock (Silver Palm) Basin is entirely within the Florida Shores development. For this reason, there are no retention/detention facilities anywhere within this basin and currently, none are required in the future. Therefore, the ultimate buildout of the undeveloped land within this basin will result in greatly increased runoff.

This historical context is important for City officials and residents to understand. The City's drainage canals, which provide the primary conveyance for stormwater, were implemented before modern stormwater design standards and were not designed to provide flood protection for the highly urbanized areas that drain to them now. This is the primary cause of the flooding that the City experiences in these Watersheds.

The 18th Street Canal and Silver Palm Canal Study identified two specific historical storm events that caused significant flooding in the City.

- Hurricane Dora on September 9, 1964, resulted in storm surge flooding with recorded high-water levels exceeding 7 feet per National Geodetic Vertical Datum of 1929 (NGVD29) at Ponce Inlet. These flood levels were not used as a comparison for the updated H&H modeling results because the flooding during Hurricane Dora was primarily storm surge driven.
- Tropical Storm Gordon in 1994 caused significant flooding due to tidal surge and peak stormwater runoff occurring simultaneously.

Drainage Problems Identified in the Basins

An inventory of 19 drainage problems was included in the 18th Street Canal and Silver Palm Canal Study. The problem areas were identified from a series of public meetings conducted in 2000–2001. The problems were split into four categories:

- Nuisance Flooding (Category #1) – Flooding of the public/private roadway, driveway and/or yard.
- Minor Flooding (Category #2) – Same as Category #1 but including garage flooding.
- Major Flooding (Category #3) – Same as Category #2 but including structure flooding.
- Other (Category #4) – Anything not included within Categories #1, #2, or #3.

Figure 5 shows the identified locations and assigned Categories. No quantitative analysis was conducted for categorizing the drainage problem areas.

Figure 5 Drainage Problem Areas from the 18th Street and Silver Palm Canal Study

18th Street Canal Watershed

Location 4 (1106 15th Street)	Category #1 Flooding
Location 7 (1001 Indian River Boulevard)	Category #1 Flooding
Location 8 (Industrial Street)	Category #1 Flooding
Location 9 (2429 Kumquat Drive)	Category #1 Flooding
Location 11 (2320 Orange Tree Drive)	Category #1 Flooding
Location 12 (2913 to 2933 Orange Tree Drive)	Category #1 Flooding
Location 13 (3004 Orange Tree Drive)	Category #1 Flooding
Location 16 (Queen Palm Drive, Between 21st and 22nd Streets)	Category #1 Flooding
Location 31 (30th Street, between Queen Palm Drive and Mango Tree Drive)	Category #1 Flooding
Location 35 (3326 Umbrella Tree Drive)	Category #1 Flooding
Location 41 (2936 Queen Palm Drive)	Category #2 Flooding
Location 46 (2109 Pine Tree Drive)	Category #2 Flooding
Location 47 (Rowe Industrial Park)	Category #3 Flooding
Location 48 (2218 Sabal Palm Drive)	Category #3 Flooding
Location 50 (1730 Pine Tree Drive)	Category #4 Flooding

Silver Palm Canal Watershed

Location 32 (32nd Street and Tamarind Drive)	Category #1 Flooding
Location 33 (2523 Unity Tree Drive)	Category #1 Flooding
Location 34 (2527 Unity Tree Drive)	Category #1 Flooding
Location 37 (2934 Vista Palm Drive)	Category #1 Flooding

H&H Model Results

As discussed in Section 2.1.1, the Study included a H&H modeling analysis for the 18th Street and Silver Palm Canal Watersheds to characterize existing flooding conditions within the modeled areas. The model was developed using ICPR3 and simulated for the 10-, 25-, and 100-year/24-hour design storm events. Design storm rainfall depths were taken from Technical Publication SJ 88-6, which was developed by SJRWMD in 1988.

Inundation areas and peak flood stages were mapped in the 18th Street and Silver Palm Canal Watersheds for the 100-year/24-hour event. Figure 6 shows the 100-year/24-hour inundation mapping in the red hatched areas. As shown in the figure, extensive flooding is predicted in both Watersheds, which aligns with recent flooding that has occurred in the basins. Figure 7 shows the updated H&H model inundation areas for the 100-year/24-hour storm event overlaid on the results from the 18th Street and Silver Palm Canal Study. Figure 7 shows that the updated model inundation extents align well with the previous model extents south of Indian River Boulevard, but the updated model shows more extensive flooding north of Indian River Boulevard. This is likely due to the boundary condition that was used for the 18th Street model north of 12th Street, which was set to 8.0 feet-NGVD29 based on the Gabordy Canal model. The Gabordy Canal model did not account for overtopping flow from south of 12th Street flowing into the Gabordy Canal Watershed, which caused the 100-year peak stage to be under-predicted and ultimately allowed more flow to leave the Watershed in the 18th Street model results.

Model input data and results for the 18th Street and Silver Palm Canal study are relative to the NGVD29. Model results and input data used from this model for the new H&H model were converted to NAVD88.

2.9.1.2 Gabordy Canal Watershed Stormwater Management Plan Existing Conditions Analysis

The Gabordy Canal Study provided important historical context regarding the development of the City's drainage system, a summary of documented flooding within the subject basin, and included a summary of the completed H&H modeling.

Historical Context of the Gabordy Canal Basins

The Gabordy Canal Study echoed the historical perspective included in the 18th Street and Silver Palm Canal Study. In addition, the following language was included specific to the Gabordy Canal Watershed.

> *Many of the existing drainage systems within the Gabordy Canal Watershed were implemented by the Turnbull colonists to improve the land for agricultural purposes. Although excavation of the Gabordy Canal "proper" was completed in the 1830's, additional tributaries have been excavated over the years that extend farther into VC, the City of Edgewater, and the City of New Smyrna Beach. Considering the timeframe during which many of the canal systems were implemented, combined with the fact that the canals were originally intended to lower water tables for agricultural purposes, conveyance of stormwater runoff in accordance with current development regulations is most often inadequate.*

This historical context is important for City officials and residents to understand. The City's drainage canals, which provide the primary conveyance for stormwater, were implemented before modern stormwater design standards and were not designed to provide flood protection for the highly urbanized areas that drain to them now. This is the primary cause of the flooding that the City experiences in this Watershed today.

Documented Flooding

The Gabordy Canal Study summarized documented flooding that occurs in the portions of the City within the Gabordy Canal Watershed. The following areas were specifically identified as drainage problems.

- Wildwood Subdivision
- Shangri-La Subdivision
- Hart Avenue
- Mango Tree Drive
- The area south of 10th Street, west of the railroad, and east of Tatum Boulevard.

H&H Model Results

As discussed in Section 2.1.2, the Study included a H&H modeling analysis for the Gabordy Canal Watershed to characterize existing flooding conditions within the modeled areas. The model was developed using ICPR3. The model was simulated for the 10-, 25-, and 100-year/24-hour design storm events. Design storm rainfall depths were taken from Technical Publication SJ 88-6, which was developed by SJRWMD in 1988. Inundation areas and peak flood stages were mapped in the Gabordy Canal Watershed for the 100-year/ 24-hour event, but the map was not included in the Study data provided to Jones Edmunds. The report also includes a hydraulic grade line (HGL) for the G1 tributary that shows the peak water surface elevation for the 100-year/24-hour design storm. Figure 8 shows the HGL, which extends along the Gabordy Canal from ML to Massey Road. A constant time-stage boundary condition of 2.0 feet NGVD29 was assumed for ML, which was representative of a 1-year stillwater elevation at the time. The Gabordy Canal is included in the updated H&H model, and 100-year/24-hour water surface elevations have been recalculated along the tributary.

Model input data and results for the Gabordy Canal Study are relative to the NGVD29. Model results and input data used from this model for the new H&H model were converted to NAVD88.

Figure 6 100-Year/24-Hour Inundation Mapping from the 18th Street Canal and Silver Palm Canal Study

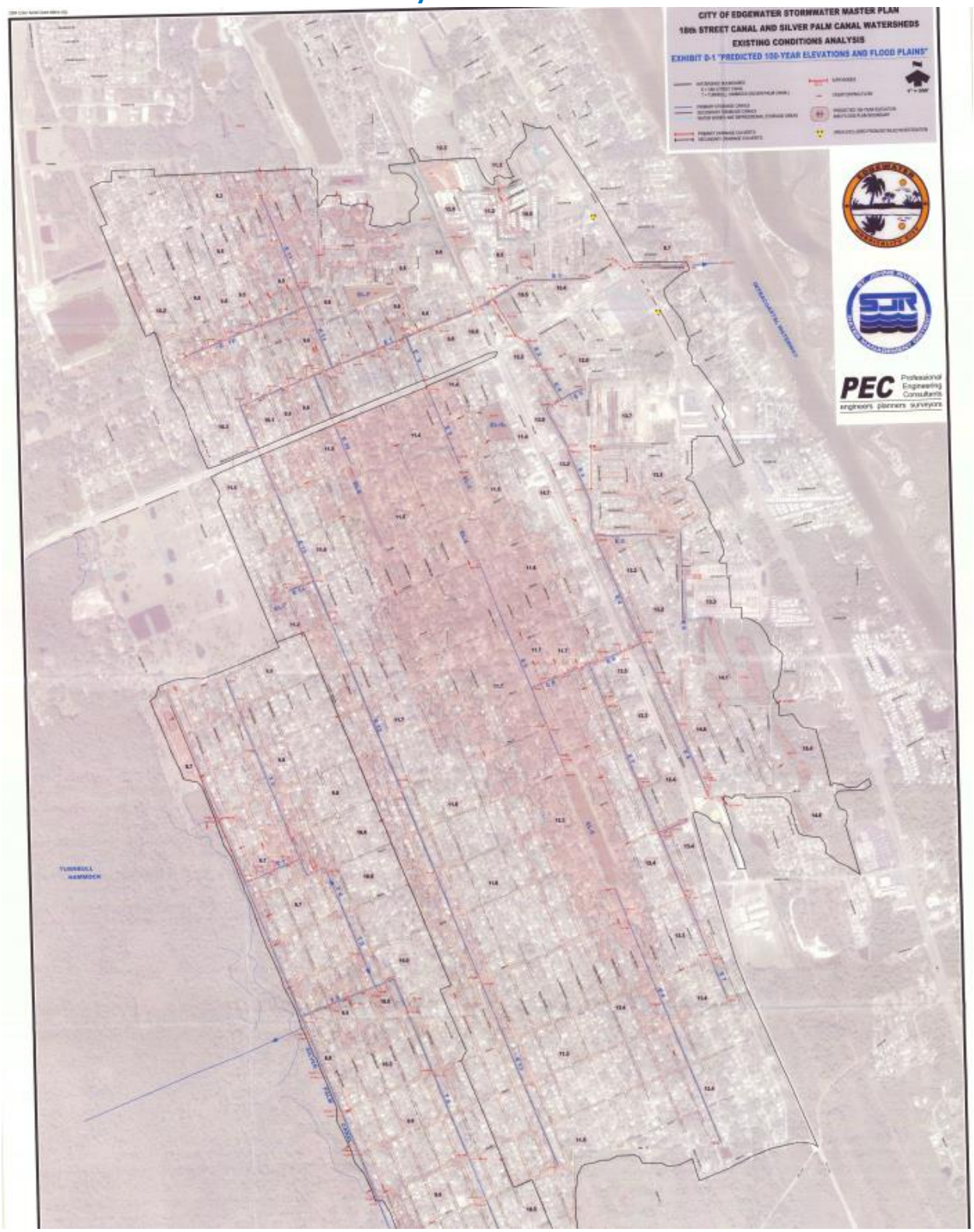
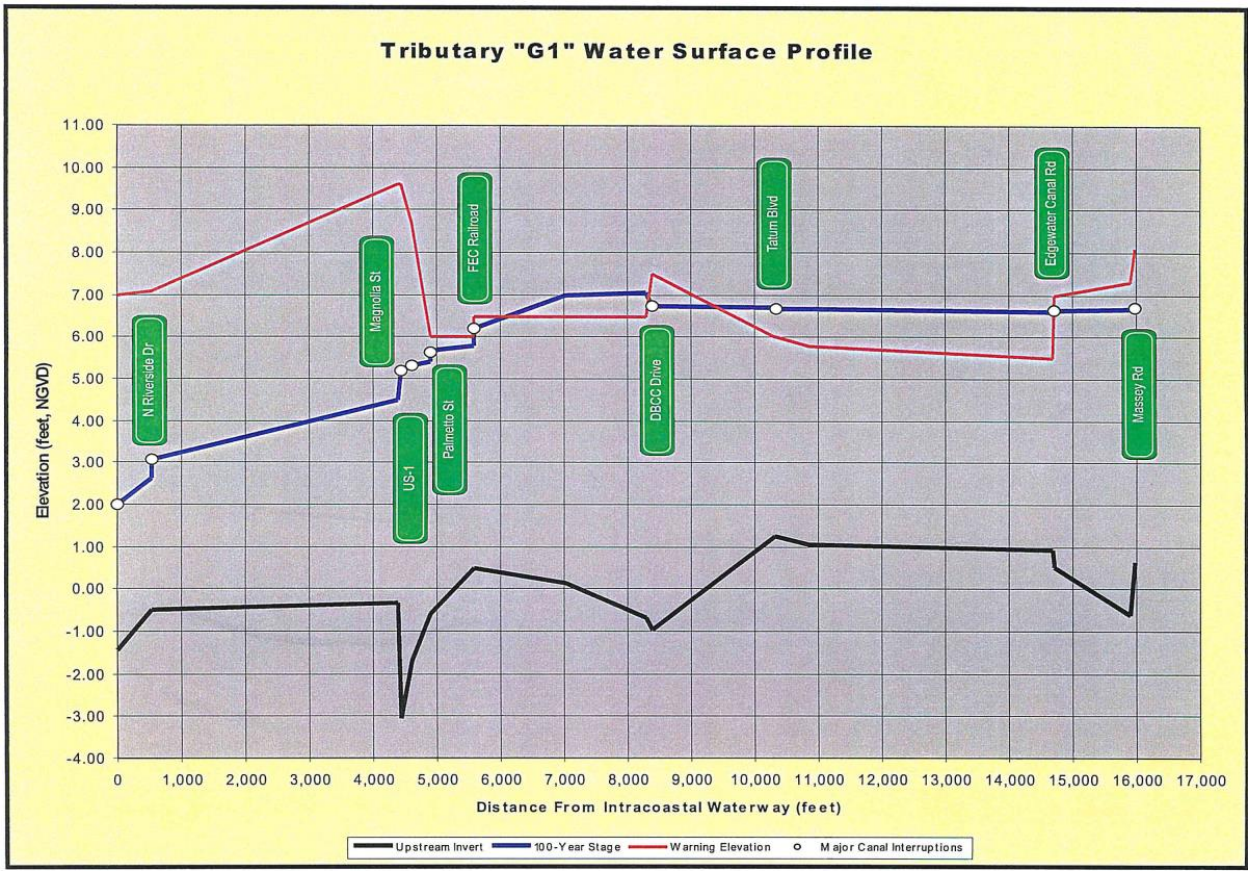


Figure 7 18th Street and Silver Palm Model versus Updated H&H Model – 100-Year/24-Hour Inundation Comparison



Figure 8 Gabordy Canal 100-Year/24-Hour HGL



2.9.1.3 2013 City SWMP Update

The 2013 City SWMP Update included an inventory of 52 drainage problems identified from a series of public workshops held by the City. The problems were split into four categories:

- Nuisance Flooding (Category #1) – Flooding of the public/private roadway, driveway and/or yard.
- Minor Flooding (Category #2) – Same as Category #1 but including garage flooding.
- Major Flooding (Category #3) – Same as Category #2 but including structure flooding.
- Other (Category #4) – Anything not included within Categories #1, #2, or #3.

Drainage problem areas were not categorized using quantitative analysis. At the time of the 2013 Study, The City determined that 22 of the drainage issues had been solved, 19 had been identified as only occurring during tropical storms, and the remaining problems were typically isolated problems. Figure 9 and Figure 10 show the summary tables provided in the 2013 Study. As shown in the figures, only six major flooding issues were identified in the 2013 Study. Based on H&H modeling results and recent flooding that the City has experienced, the list of problem areas in the 2013 Study did not fully capture the extent of the major flooding issues that the City faces.

Figure 9 Drainage Problem Areas from the 2013 SWMP

Problem Definition Technical Memorandum Status Update - September 4, 2012
City of Edgewater Stormwater Master Plan CIP Update

TABLE 1-1 - UPDATED SUMMARY OF DRAINAGE PROBLEMS(alphabetical and unprioritized)

Count	Address	Status
	PROBLEM CATEGORY #1 (NUISANCE FLOODING)	
1	East Pine Bluff	City bought house and made detention pond on property
2	108 East Thomas St.	City placed berm in driveway to prevent water from running down driveway and into house.
3	702 Fernald St	Exfiltration system constructed
4	1106 15th St.	Low area - Only floods during tropical events
5	401 Hart Ave.	Catch Basin must remain cleaned during high rain events. Proposed drainage improvements
6	Hibsicus Drive (Near W. Ocean Ave)	W. Ocean is nowhere near Hibiscus Drive - Unknown Issue
7	1001 Indian River Blvd.	SR #442 widening seems to have corrected the problem
8	Industrial St.	Corrected with Eastern Shores Project
9	2429 Kumquat Dr	Swale work corrected problem
10	1006 Lake Avenue	Exfiltration system constructed - Doesn't work well when groundwater table is high
11	2320 Orange Tree Ave	Rear Property Issue - During Heavy Rains
12	2913 to 2933 Orange Tree Dr	Rear Property Issue
13	3004 Orange Tree Dr	Tropical Storm Event
14	128 Palm Breeze Dr	Flooding occurs during hurricane events when it is high tide and water cannot recede
15	Palmetto Street	Low area - Only floods during tropical events
16	Queen Palm Dr (21st - 22nd st)	Maintenance Issue - only during tropical events
17	Riverview Dr****	Still an issue
18	133 Shangri La Circle	Flooding occurs during hurricane events when it is high tide and water cannot recede
19	135 Shangri La Circle	Flooding occurs during hurricane events when it is high tide and water cannot recede
20	141 Shangri La Circle	Flooding occurs during hurricane events when it is high tide and water cannot recede
21	145 Shangri La Circle	Flooding occurs during hurricane events when it is high tide and water cannot recede
22	402 Shangri La Circle	Flooding occurs during hurricane events when it is high tide and water cannot recede
23	901 South Ridgewood Avenue	Corrected by homeowner
24	S. Riverside between Rhode Island and Virginia*****	Still an issue - City cleaned pipes which helps
25	1400 South Riverside Dr	Swale work corrected problem
26	1531 South Riverside Dr	Swale work corrected problem
27	1601 South Riverside Dr	Swale work corrected problem
28	1715 South Riverside Dr	Pipe cleaned. Driveway still floods during heavy rains
29	1717 B South Riverside Dr	Only an issue during tropical events
30	1909 S Riverside Dr	Unknown issues - Not defined in the Original SWMP
31	30th Street between Queen Palm & Mango Tree	Unknown issues - During major events-possibility of flooding
32	32nd Street & Tamarind Drive	Tropical Storm Event - Retention ponds were full
33	2523 Unity Tree Drive	Only an issue during tropical events
34	2527 Unity Tree Drive	Only an issue during tropical events
35	3326 Umbrella Tree Drive	Tropical Storm Event and canal cleaning completed.
36	414 Village Court	Rear Property Issue-blamed industrial area behind them, but they were draining onto the Industrial Area - neighbor blocking water with fence. Owner corrected.
37	2934 Vista Palm Drive	Rear Property Issue - During Heavy Rains

Figure 10 Drainage Problem Areas from the 2013 SWMP (continued)

Problem Definition Technical Memorandum Status Update - September 4, 2012
City of Edgewater Stormwater Master Plan CIP Update

TABLE 1-1 - UPDATED SUMMARY OF DRAINAGE PROBLEMS(alphabetical and unprioritized)

Count	Address	Status
38	135 Wildwood Drive	City bought house and made detention pond on property
39	1508 Monroe Drive	Still an issue - project needed
PROBLEM CATEGORY #2 (MINOR FLOODING)		
40	402 Hart Avenue	No address of this property - Unknown issues
41	1018 Lake Avenue	Problem Corrected
42	2936 Queen Palm Drive	Rear property issue-owner ran 4" pipes from backyard to front.
43	1717 South Ridgewood Avenue	Pipe cleaned. Driveway still floods during heavy rains
44	201 Virginia Street	Berm constructed in driveway to prevent water running into garage
PROBLEM CATEGORY #3 (MAJOR FLOODING)		
45	103 Carlson Cover ****	Still an issue
46	125 Cheeta Drive *****	Still an issue-house needs to be bought and removed
47	2109 Pine Tree Drive	Corrected by homeowner
48	Rowe Industrial Park 333 W. Marion Ave	Eastern Shores alleviated most of the problems - only an issue during tropical events
49	2218 Sabal Palm Drive	Older home is lower than adjacent. Haven't had any problems recently. Believe it is a tropical storm event issue.
50	1719 South Riverside Drive	Area that is flooding is retention pond for the houses. Water overflows during tropical events.
PROBLEM CATEGORY #4 (OTHER)		
51	1730 Pine Tree Drive	Neighbor complaint about them throwing debris in canal. Should not have been included in report.
52	Gabordy Canal	New Smyrna Beach has contracted someone to dredge the canal

**** Needs to be investigated for project.

2.9.2 Flood Documentation Provided by the City

The City provided data that documented observed flooding and/or flood impacts for three recent storm events.

- Hurricane Ian.
- A rainfall event that occurred on September 14, 2024.
- Hurricane Milton.

For Hurricane Ian, the documentation of flooding included a GIS shapefile that identified parcels impacted during the event. The shapefile included fields identifying the property type (e.g., residential, governmental, business), the level of impact (affected, minor, or major), and dollar amount of the actual damage. The shapefile did not indicate whether the damage was caused by flooding, wind, or other means.

For the September 14, 2024, event, the documentation included 11 photographs of flooding that occurred at various locations in Florida Shores. Table 2 summarizes the locations of the photographs that were provided. As discussed in Section 5.4.1, the City-provided photographs and videos were cross-referenced with modeled flood extents to calibrate/verify the model.

Table 2 Flood Documentation Photographs from September 14, 2024, Event

Photograph Location
1426 Pine Tree Drive
2111 Queen Palm Drive
2216 Umbrella Tree Drive
2226 Tamarind Drive
2303 Queen Palm Drive
2410 Unity Tree Drive
2417 Pine Tree Drive
2516 Unity Tree Drive
2631 Lime Tree Drive
3015 Yule Tree Drive

For Hurricane Milton, the documentation included 10 photographs and one video of flooding that occurred at various locations in Florida Shores. Table 3 summarizes the locations of the provided photographs and video. As discussed in Section 5.4.2, the photographs and videos provided by the City were cross-referenced with modeled flood extents to calibrate/verify the model. Additionally, the City provided a copy of the damage assessments collected by City staff following the storm event. The assessment identifies impacted properties and, in some cases, includes measured flood depths collected adjacent to structures or at the centerline of the roadway. City staff collected the data on October 10 and 11, 2024. No photographs were provided to accompany the depth measurements, so determining exactly where the measurements were taken is difficult.

Table 3 Flood Documentation Photographs from Hurricane Milton

Photograph/Video Location
1014 Regent Street (Video)
1202 12th Street
1426 Pine Tree Drive
1718 Lime Tree Drive
2714 Mango Tree Drive
2905 35th Street
3410 Woodland Drive
Palmetto Street
33rd Street and Woodland Drive Looking Toward Vista Palm Drive
33rd Street and Woodland Drive Looking Toward Yulee Tree Drive

2.9.3 Council Meeting and Workshop Videos

Following the September 14, 2024, rainfall event, the City Council held special meetings on September 16 and September 20, 2024. The primary focus of these meetings was to discuss the City's flooding problems, including time for public comments. During the public

comment period, many residents described flooding they experienced on and around their property during the recent extreme storm events. Jones Edmunds reviewed the video recordings of these meetings and documented the location and nature of the specific flooding issues brought to the Council during the meetings. Table 4 below summarizes the locations and corresponding descriptions of flooding provided during the meetings.

Table 4 Flooding Locations Identified from Council Meeting Videos

Address	Comment
3017 Unity Tree Drive	Knee-deep flooding experienced.
460 Palmetto Street	Road floods and goes into resident's yard.
1937 Edgewater Canal Road	Resident noted 42 inches of water in yard and lapping at foundation and fish and turtles in yard.
3103 Unity Tree Drive	Knee- to waist- deep water noted at this location.
3230 Woodland Drive	Waist-deep water with vehicles going into garage.
2825 Victory Palm Drive	Resident needed a kayak to get down street. Noted 14 inches of water over the center of the road.
2092 Oak Branch Drive	Resident noted past flooding in this area.
3422 Umbrella Tree Drive	Dirt from construction runs down the road, neighbor's yard filled with mud, no maintenance on the retention pond at end of the street, and pipes clogged under the driveway.
518 Seagull Court	Water fills up street and people dump pool water into the street.
2904 Willow Oak Drive	Resident noted that pipes are blocked and ditches are flooding to the west.
2319 Unity Tree Drive	Resident noted there was 17 inches of rainwater.
2129 Pine Tree Drive	Flooded during Ian; many pipes currently covered up in the area.
3222 Willow Oak Drive	One foot of water in the street, manhole cover bouncing, and yard had 8 inches of water.
3413 Vista Palm Drive	Resident noted that their entire yard floods.
3410 Woodland Drive	Kids in kayaks on the street during the last storm.
3320 Lime Tree Drive	16 inches of water on the backside of the home.
1868 Pine Tree Drive	24 inches outside and 36 inches flooded into the garage.
2613 Juniper Drive	Resident wants the City to clean out sides of the canals. Water was halfway up driveway. 23 inches of rainfall. Last rain was 7 inches, and the water didn't flow through the canal.
2216 Umbrella Tree Drive	Ditch in front yard filling up and it took 10 minutes to get to front door. Water was up to their knees in their driveway.
3411 Tamarind Drive	Water was not moving and water was scooped out of the yard by resident.
1225 Volco Road	Resident says they see water flowing north to the shores during storms.
3507 Victory Palm Drive	Flooding occurs here, and the resident does not like the new development
3103 Silver Palm Drive	No cleaning of ditches. Resident digs their own trenches and some for neighbors. Culverts are too high in the canal and water does not flow through.
2801 Lime Tree Drive	Has flooding in home.
1411 Royal Palm Drive	Always floods, culvert pipes not maintained, and house behind theirs experienced worse flooding.
3431 Victory Palm Drive	Standing water from the storm.
1404 Mango Tree Drive	Ditch never cleaned around the area.
2125 Needle Palm Drive	Retention ponds not drained in the area.

Address	Comment
2918 Pine Tree Drive	Water came to back door of their house and was pumped out of the house.
2830 Orange Tree Drive	Flooding happened at this location during the last storm.
223 Flager Avenue	House flooded during the storms.
306 Silver Palm Drive	House is on the canal and will flood in the front and the back.
1850 Kumquat Drive	Drainage here is not great with standing water.
1530 Sabal Palm Drive	Location does not drain with inundation after storms.

2.9.4 Internet Sources

Jones Edmunds used Google searches to look for relevant flood documentation (i.e., photographs, videos, etc.) from the recent extreme storm events. Ideally, the documentation would include photographs or videos identifying the location and time that the documentation was collected. Jones Edmunds found several news reports showing the flooding, but in many cases, determining from where or when the reports were taken was not possible. Some useful information from news reports was found for the September 14, 2024, event that was used for calibrating the H&H model. Table 5 provides the weblinks and locations of the flooding reports.

Table 5 Flooding Documentation from Internet Sources

Location	Weblink
3230 Woodland Drive	https://www.cfpublic.org/politics/2024-09-18/after-weekend-flood-edgewater-calls-for-special-meeting-to-address-concerns
2505 Pine Tree Drive	https://www.clickorlando.com/news/local/2024/09/17/flooded-edgewater-residents-demand-action-during-city-council-meeting/

2.10 Existing FEMA Floodplains

Jones Edmunds downloaded a copy of the latest FEMA Flood Hazard Zone GIS polygons for the City. Figure 11 shows the flood zones in the City's limits. As shown in Figure 11, the only parts of the City that have detailed mapping with base flood elevations (BFEs) are small pockets at the north and south ends of the City and the entire east edge of the City along ML. Based on observed recent flooding and modeling performed for this Study and previous City stormwater studies, a significant flood-prone portion of the City is not included in the FEMA Flood Hazard Zones. Figure 11 also compares the 100-year/24-hour inundation that was mapped based on the updated H&H modeling completed for this SWMP. The areas shown in red identify locations that are inundated based on the updated H&H model results but not mapped in the FEMA flood zones.

2.11 Building Footprints and Impervious Datasets

Jones Edmunds downloaded a copy of the 2023 Microsoft Building Footprint GIS dataset. The dataset is publicly available and is derived from satellite imagery processed using machine learning to delineate building footprints. Jones Edmunds used these data to assess the FPLOS for the City. Figure 12 shows the building footprint mapping for the City.

Jones Edmunds also downloaded a copy of the National Oceanographic and Atmospheric Administration (NOAA) Coastal Change Analysis Program's (C-CAP) high-resolution land

cover data, which maps impervious areas with a 1-meter resolution. Jones Edmunds used these data to develop hydrologic parameters for the updated H&H stormwater model.

Figure 13 shows the impervious area mapping for the City. Based on the C-CAP data, approximately 2,000 acres of impervious area are within the City's limits, which covers approximately 12 percent of the City. Table 6 summarizes the total impervious area and impervious percentage by Watershed.

2.12 Comprehensive Plan

Jones Edmunds downloaded a copy of the City's Comprehensive Plan from the City's website. Local governments are required by Florida Statutes (FS) to adopt and maintain a Comprehensive Plan. The goal of the plan is to guide the development and management of the municipality over a long-term planning horizon. The City's Comprehensive Plan includes Elements for Future Land Use, Stormwater, Coastal Management, Conservation, and Capital Improvements, which are relevant to stormwater master planning.

Table 6 Impervious Summary By Watershed

Watershed	Total Impervious Area (acres)	Percent Impervious Area
18th Street Canal	766	33.5%
Ariel Canal	135	9.5%
Cow Creek	277	0.7%
Gabordy Canal	790	12.1%
Little Cow Creek	81	2.4%
ML	564	24.1%
Silver Palm Canal	177	19.6%
Turnbull Creek	384	10.6%
Turnbull Hammock	282	1.4%

2.13 Relevant Water Quality Data

Jones Edmund's subconsultant ESA collected water quality data to complete the SWRA task. Section 7.1 summarizes the relevant water quality data collected by ESA.

Figure 11 FEMA Flood Hazard Zones

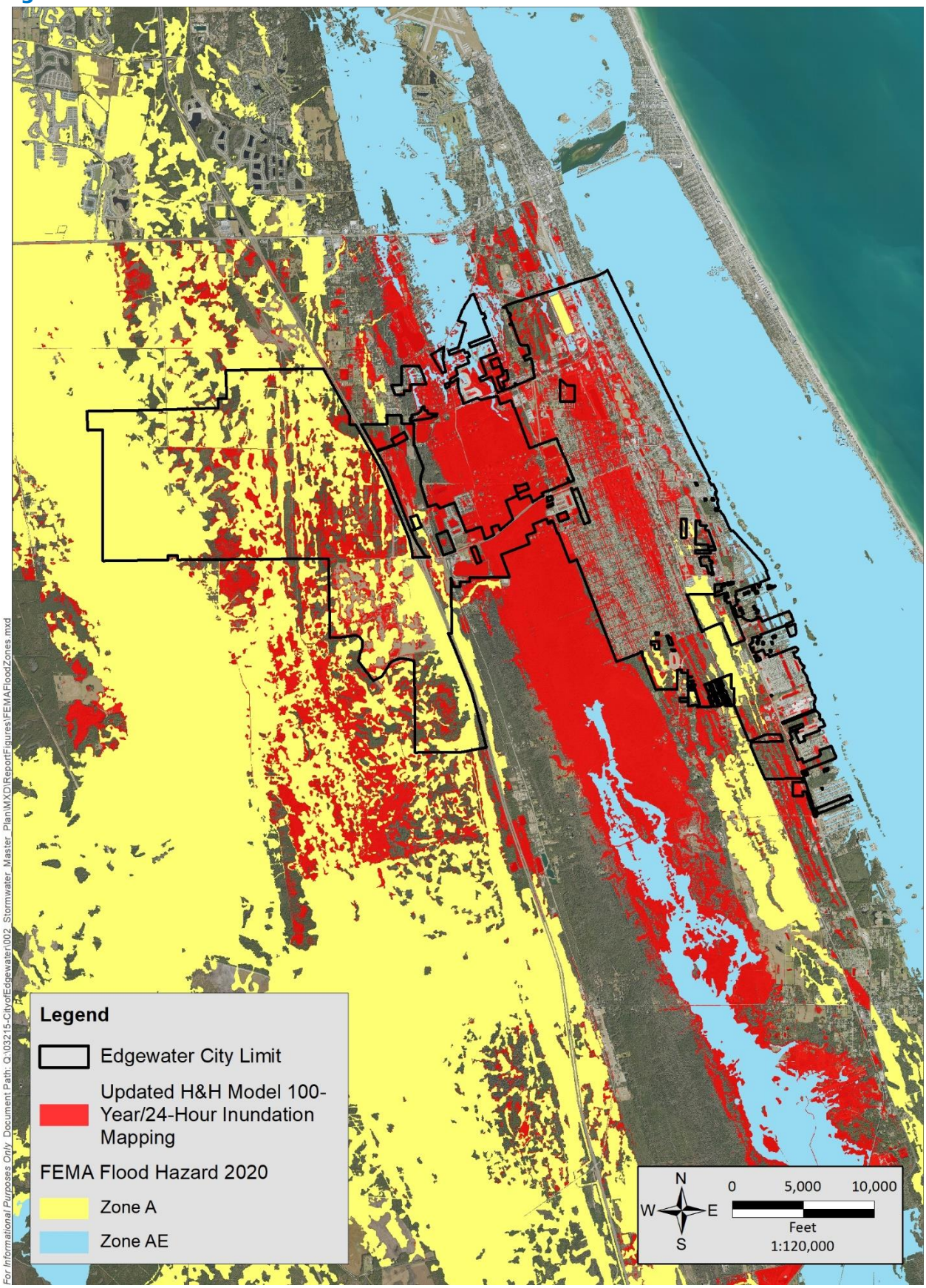


Figure 12 Microsoft Building Footprints

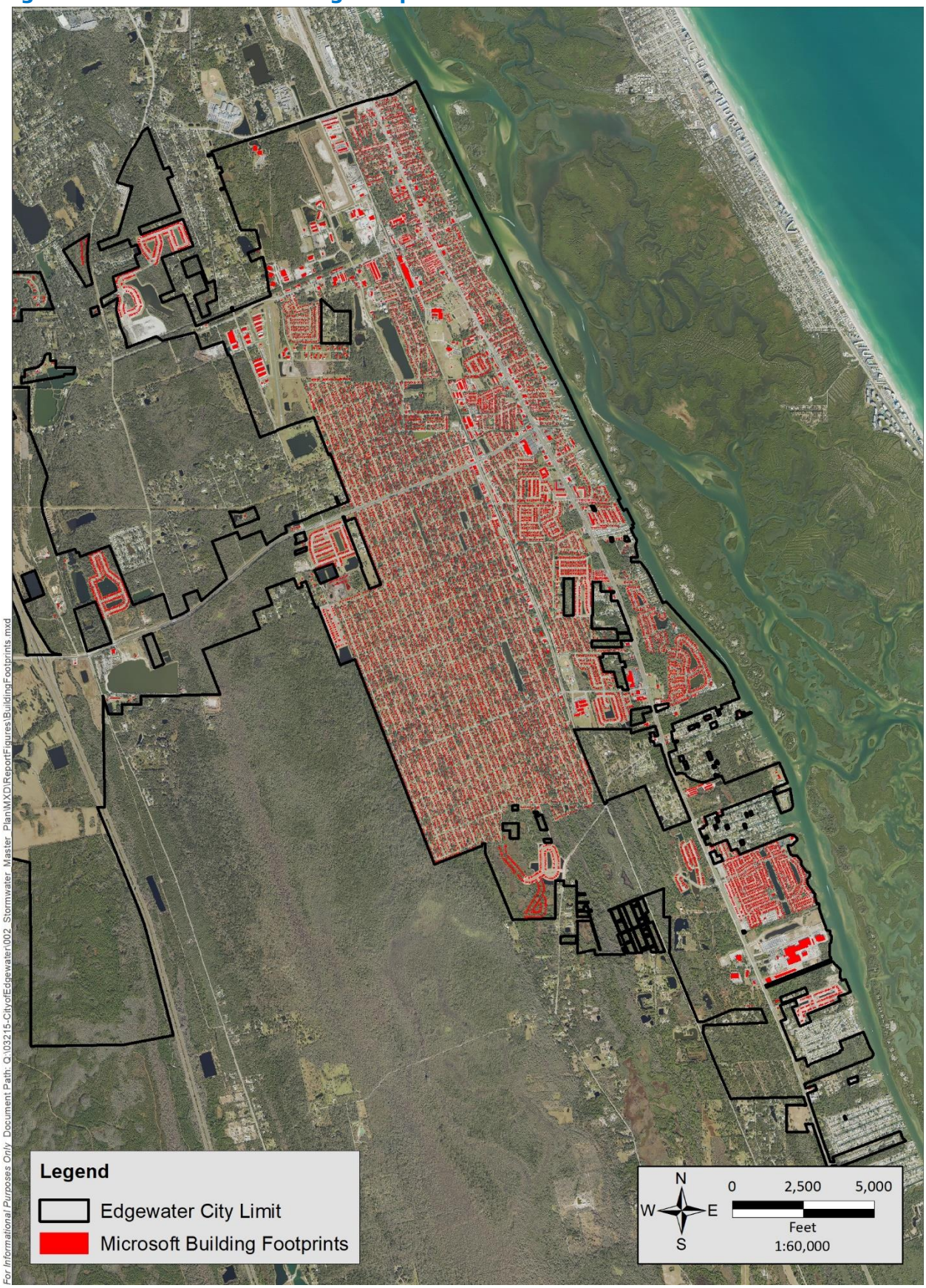
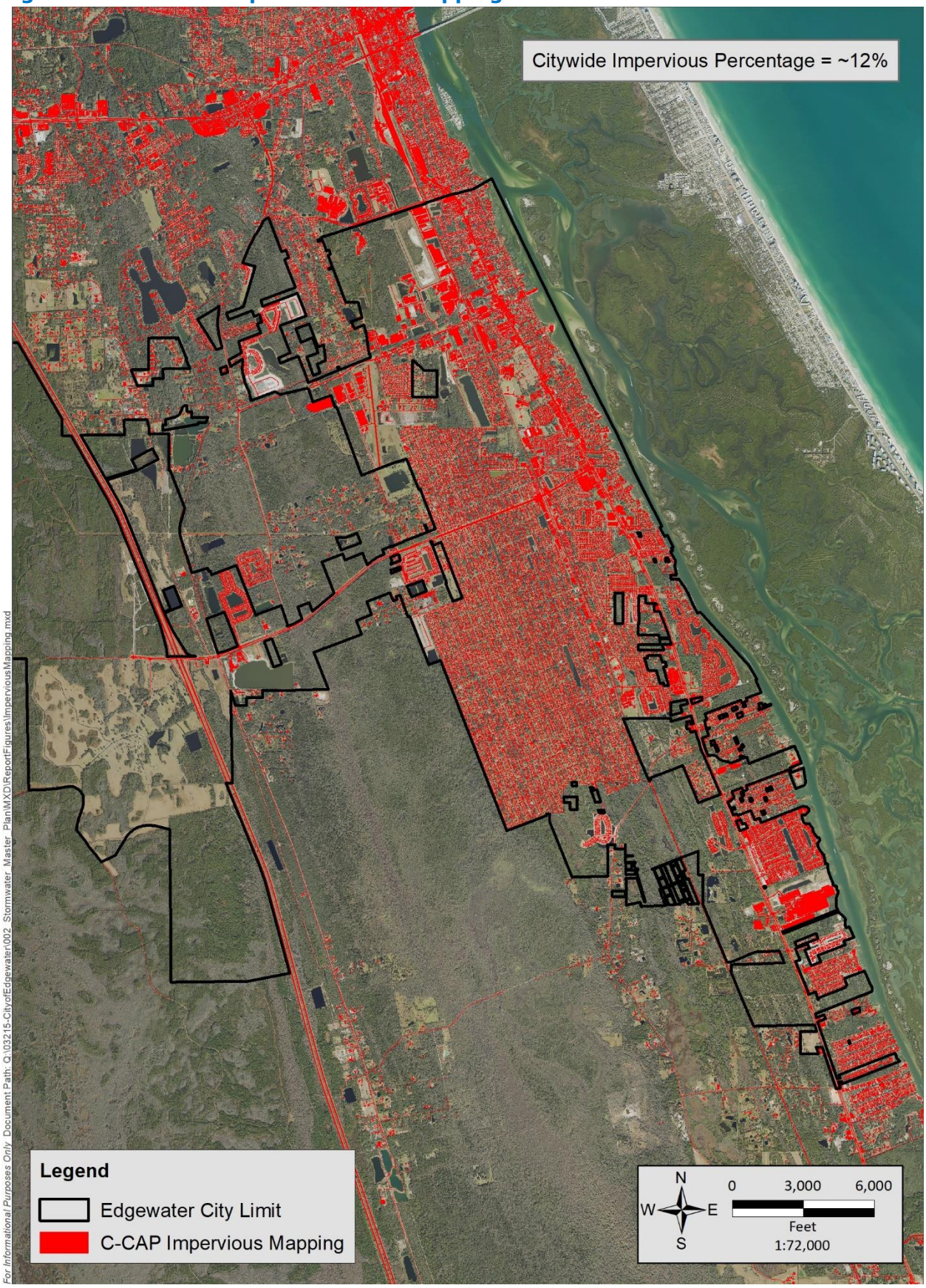


Figure 13 C-CAP Impervious Area Mapping



3 H&H MODEL SCHEMATIC DEVELOPMENT

Jones Edmunds generated the H&H model schematic in ArcGIS within a File Geodatabase developed by Streamline Technologies. This database schema allows the model data to be exported directly into StormWise.

H&H model schematics include sub-basins, nodes, and links. Sub-basins are the primary model feature used by the hydrologic model to characterize the rainfall-runoff response of a drainage system. Nodes and links are the primary model features used by the hydraulic model. Nodes represent surface storage within each sub-basin and links represent surface and sub-surface interconnections between nodes. The hydraulic model routes the runoff generated from the hydrologic model through the modeled stormwater system's hydraulic features and calculates flows through the links and stages at the nodes. This Section describes the methods and data used to develop the components of the H&H model schematic, which includes identifying and updating the LiDAR DEM for topographic voids (topovoids) where the ground surface has been modified since the LiDAR data were collected.

3.1 TOPOVOID UPDATES

The LiDAR DEM is critical for developing the H&H model schematic and model parameters. At topovoid locations, the DEM no longer reflects existing ground conditions and needs to be manually updated based on available updated topographic data, typically construction plans or as-built plans. Jones Edmunds reviewed the DEM against the 2023 NAIP aerial imagery, the most recent Nearmap aerial imagery, and the design plans/as-builts of new developments provided by the City. Based on this review, Jones Edmunds identified 17 topovoids where the DEM needed to be updated. Figure 14 shows the topovoid locations where the DEM was updated with a unique identifier assigned to each location. Table 7 identifies the name of the development and the source of the topographic data used to update the DEM for each location.

Figure 14 Topovoid Update Locations

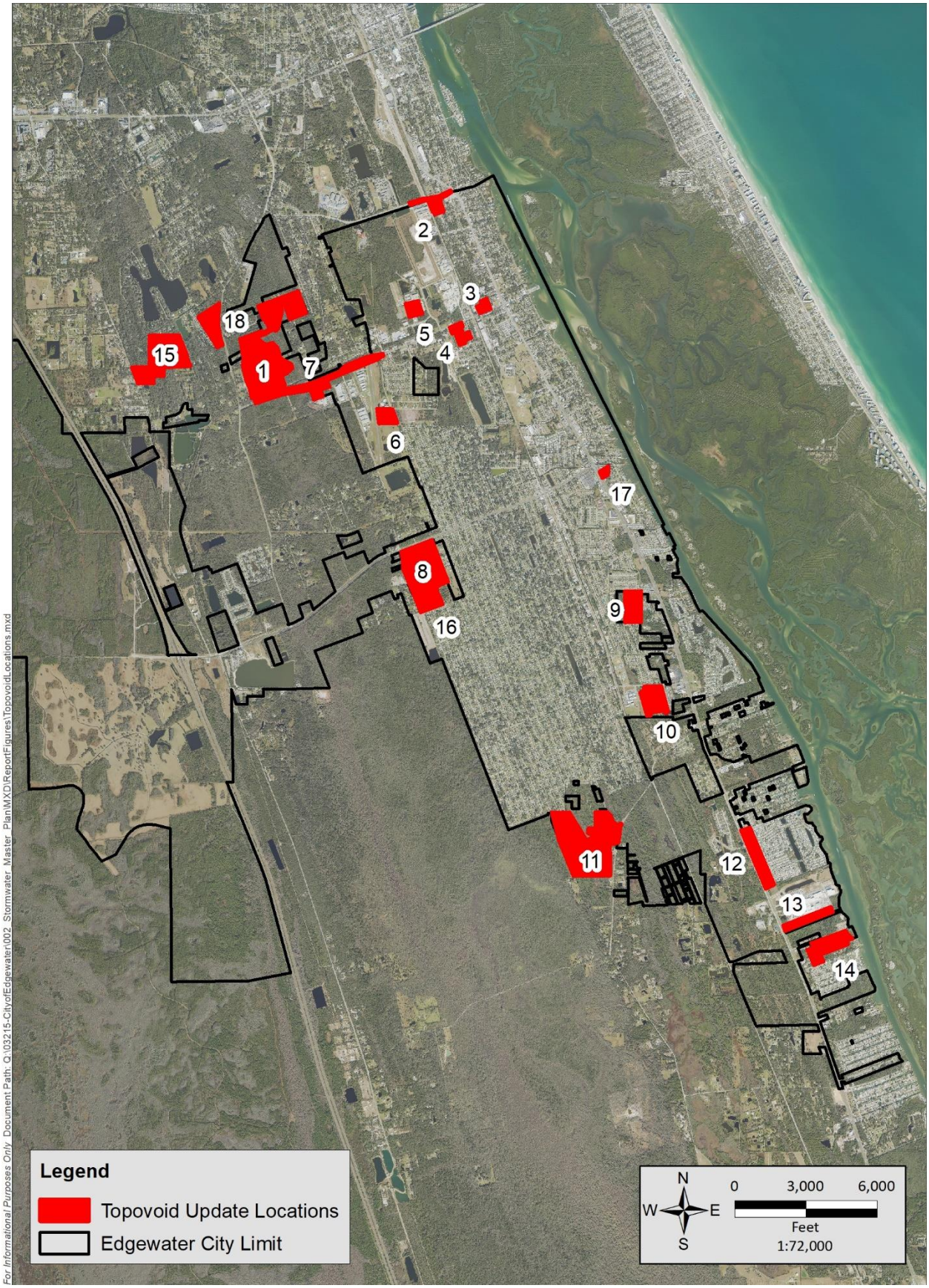


Table 7 Topovoid Update Data Summary

Map ID	Development Name	Updated Topographic Data Source
1	Oakleaf Preserve Subdivision	Site development plan from SJRWMD website.
2	10th Street Roadway Improvements and Gabordy Canal Treatment Area	Site development plan from SJRWMD website.
3	West Park Storage	As-built plan from SJRWMD website.
4	Barracuda Boat and RV Storage	Site development plan from SJRWMD website.
5	Lineman College Parking Lot	Site development plan from SJRWMD website.
6	Villas at Massey Ranch Phase 2	Site development plan from SJRWMD website.
7	West Park Avenue Roadway Improvements	As-built plan from SJRWMD website.
8	Glenbrooke Subdivision	Site development plan from SJRWMD website.
9	Majestic Oaks Subdivision	Site development plan from SJRWMD website.
10	Woodbridge Lakes Subdivision	As-built plan from SJRWMD website.
11	Edgewater Preserve Subdivision	Site development plans from the City and SJRWMD website.
12	Hacienda Del Rio Subdivision	Site development plan from SJRWMD website.
13	StorQuest Self Storage	Site development plan from SJRWMD website.
14	Riverfront Estates Subdivision	Site development plan from SJRWMD website.
15	Liberty Village Subdivision	As-built plan from SJRWMD website.
16	Airpark Village Subdivision	As-built plan from SJRWMD website.
17	Aldi Grocery Store	Site development plan from SJRWMD website.
18	Smyrna Creek Preserve	Site development and as-built plans provided by the City.

3.2 Hydrologic Characterization: Sub-Basin Delineation

Sub-basins spatially define the area from which runoff will collect within each sub-basin. The sub-basin delineations will be used to develop the hydrologic parameters that characterize the hydrologic runoff response within each sub-basin.

On average, the sub-basins were delineated at an intermediate scale, between larger regional-scale sub-basins (e.g., average sub-basin area of 100 acres or greater) and smaller local-scale sub-basins (e.g., average sub-basin area less than 10 acres). The sub-basin delineation scale varies significantly depending on location. Sub-basins in developed areas within the City's limits were typically delineated at the local scale to provide a higher model resolution in developed areas that have experienced significant flooding. Sub-basins in undeveloped areas within the City's limits were typically delineated at the intermediate scale and sub-basins in undeveloped areas outside of the City's limits were typically delineated at the regional scale. The resolution of the sub-basin delineations defines the level of detail and effort that was required to model the hydraulic system. The City wants to use the H&H model to evaluate existing flooding conditions within the City, develop improvement alternatives to alleviate flooding in the City, and assess/manage the impacts of growth on the City's stormwater system. The sub-basin scale is appropriate for achieving the City's goals for this Study. If needed in the future, portions of the model can be modified to a finer scale to support stormwater project design or development review.

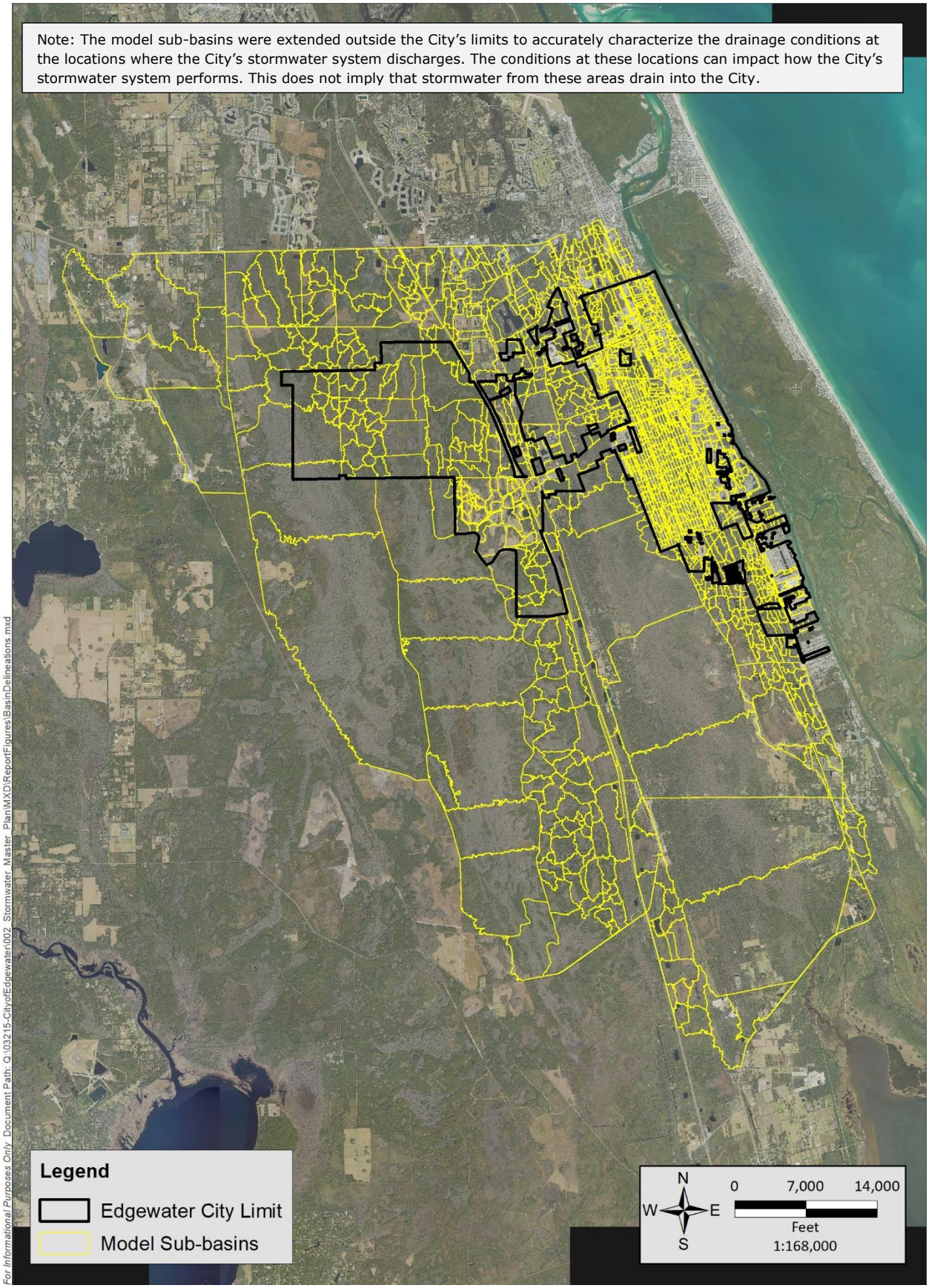
The following data sources were used in a GIS to delineate the sub-basins:

- The topovoid updated 2.5-foot-by-2.5-foot DEM generated by Jones Edmunds from the 2018 Volusia and Brevard County LiDAR data.
- The City, VC, and New Smyrna Beach stormwater GIS asset databases.
- 2023 NAIP aerial imagery.
- Environmental Resource Permit (ERP) as-built and construction plan data downloaded from SJRWMD.

Jones Edmunds also conducted field visits to verify sub-basin delineations and drainage conditions on the ground where the existing electronic data sources were not sufficient.

The model schematic contains 1,973 basins covering approximately 81,000 acres (126 square miles) with an average area of approximately 41 acres, a minimum area of 0.16 acre, and a maximum area of 5,912 acres. Figure 15 shows the delineations for the model sub-basins. As shown in Figure 15, the model sub-basins extend well outside the City's limits to the north, south, and west. To the north, the basins extend to SR-44; to the south, the basins extend to US-1 and Maytown Road; and to the west, the basins extend past Hunting Camp Road. The areas included in the model outside the City's limits do not necessarily drain into the City's stormwater system, but rather the basins were extended to these limits to accurately characterize the drainage conditions where the City's stormwater system discharges. The conditions at these locations can impact how the City's stormwater system performs. The City's limits contain 1,370 model sub-basins with an average area of 10.5 acres, and 603 model sub-basins with an average area of 110 acres are outside the City's limits.

Figure 15 Model Sub-Basin Delineations



3.3 HYDRAULIC MODEL CONNECTIVITY: NODES AND LINKS

Hydraulic connectivity characterizes stormwater flows between basins through storage (e.g., ponds, low areas) and conveyance features (e.g., pipes, ditches) and is represented in the H&H model schematic by a network of nodes and links. Within the H&H model, stormwater runoff accumulates at nodes and is conveyed between nodes by links. A node must be at each end of a link. At least one node will exist within each basin. Multiple nodes may be required within a basin to adequately characterize hydraulic features. Water-surface elevations are calculated at nodes and can be used to generate floodplains.

For modeling, nodes can be broken into the following broad categories:

- Loading node – a node assigned the hydrologic response (runoff hydrograph) and hydraulic storage (stage-area relationship) for a basin.
- Junction node – a node used to connect links (e.g., connecting a channel link to a pipe link).
- Boundary node – a node at which a model boundary condition is established.

Jones Edmunds positioned the loading node within a basin based on the type of basin. Within an open basin (a basin with positive outfall), the loading node was typically placed near the centroid of the basin representing the average hydrologic loading point for the basin. Within a closed basin (internally drained like a bowl), the loading node was typically placed at the lowest point within the basin as a representative loading point for the larger storage feature. For closed basins with significant stormwater infrastructure, the loading node may have been placed at the structure junctions to best represent the loading point.

Boundary nodes were placed near the physical boundary condition location (e.g., within a water body or large depression considered to be the boundary condition or at the location of a gauge used to establish the boundary condition). The model is bounded to the north by Turnbull Creek and Turnbull Bay, to the east by ML, to the west by Cow Creek, and to the south by Indian River Lagoon (IRL). Boundary nodes were placed at the locations where the model discharges into these systems.

Jones Edmunds placed junction nodes as needed to facilitate placement of links. Nodes were placed immediately upstream and downstream of hydraulic control structures interrupting a channel reach.

Links represent a hydraulic feature (e.g., bridge, channel, pipe, drop structure, weir) and connect nodes upstream and downstream of the hydraulic feature location. Jones Edmunds digitized links along the apparent flow path between nodes. Discharge from open basins typically occurs via a channel, pipe, or bridge link. All known hydraulic structures crossing basin boundaries were included in the model schematic. Discharge from closed basins typically occurs via hydraulic structure links (e.g., pipe, drop structure, pumps, weir) and overland weir links. Hydraulic structures are not always present. Overland flow across basin boundaries where a defined channel is not present was modeled as weir flow via overland weir links. Jones Edmunds generally digitized overland weir links to cross basin boundaries at local topographic low points—the basin spill point.

The model schematic contains 2,276 nodes and 6,166 links. Table 8 provides a breakdown of the number of links by type included in the model schematic. Figure 16 shows the final model schematic with the basin, links, and nodes.

Table 8 Summary of Model Links

Link Type	Count
Pipe	1,222
Weir	4,372
Drop Structure	209
Channel	363
Total	**6,166**

3.4 Model Schematic Naming Convention

An alphanumeric naming convention was developed for model basins, links, and nodes. The Watershed was split into 47 subwatersheds based on the primary ditches, canals, and/or waterbodies within the Watershed. Figure 17 shows the subwatershed boundaries.

The naming convention starts with the basin. Each basin was assigned a name that starts with "B_" followed by a three-letter/number code denoting the subwatershed it is within and finishes with a four-digit number starting at 1,000 for each subwatershed (and increasing by 10 for each consecutive basin in that subwatershed). For example, the first basin in the E1 Canal subwatershed was assigned B_E01_1000. Table 9 shows the three-letter/number code assigned to each subwatershed.

The node names are based on which basin they are in and which type of node they are (either loading or junction). We assigned the loading node for each basin using the name of the basin with the letter "B" at the beginning replaced with the letter "N" for node (e.g., N_E01_1000). Junction nodes numerically rise from the loading node in the basin. The number increases by one for each junction node (e.g. N_E01_1001, N_E01_1002).

Links comprise the last part of the schematic names. We assigned names based on the node name from which they originate (i.e., "from node"), link type, and the number of links leaving each node. Link names were generated by dropping the "N" at the beginning of the "from node" name and replacing it with an "R" for reach. We also added an underscore followed by an abbreviation for the link type and another underscore followed by the link number leaving from the "from node." The model contains four link types: pipes (P), channels (C), weirs (W), and drop structures (D). For example, if the first link leaving node N_E01_1000 was a pipe, the name R_E01_1000_P_1 would be assigned. The names of the model schematic features should help users locate the subject feature and recognize the type of structure.

Figure 16 Model Schematic

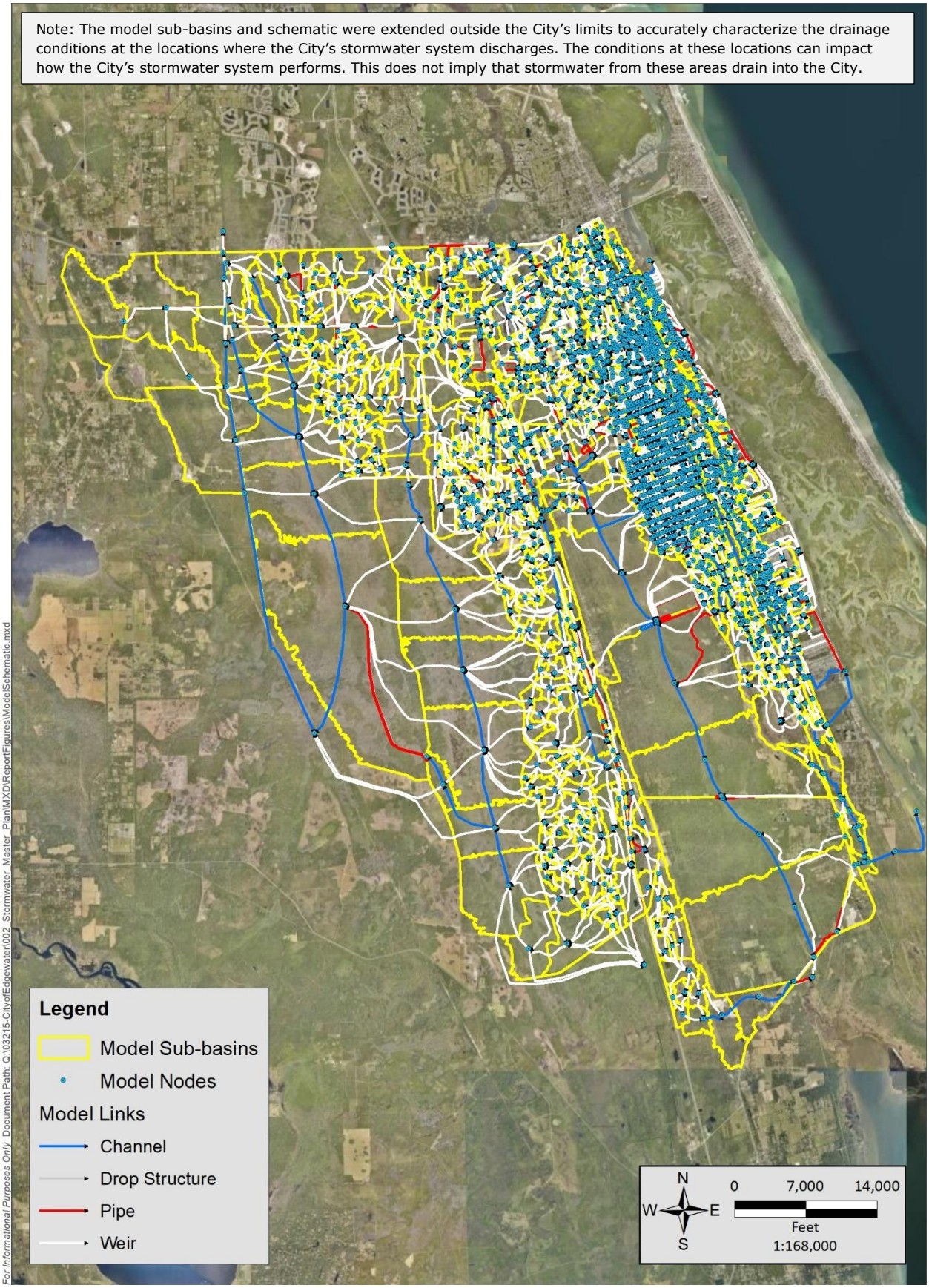


Figure 17 Model Subwatersheds

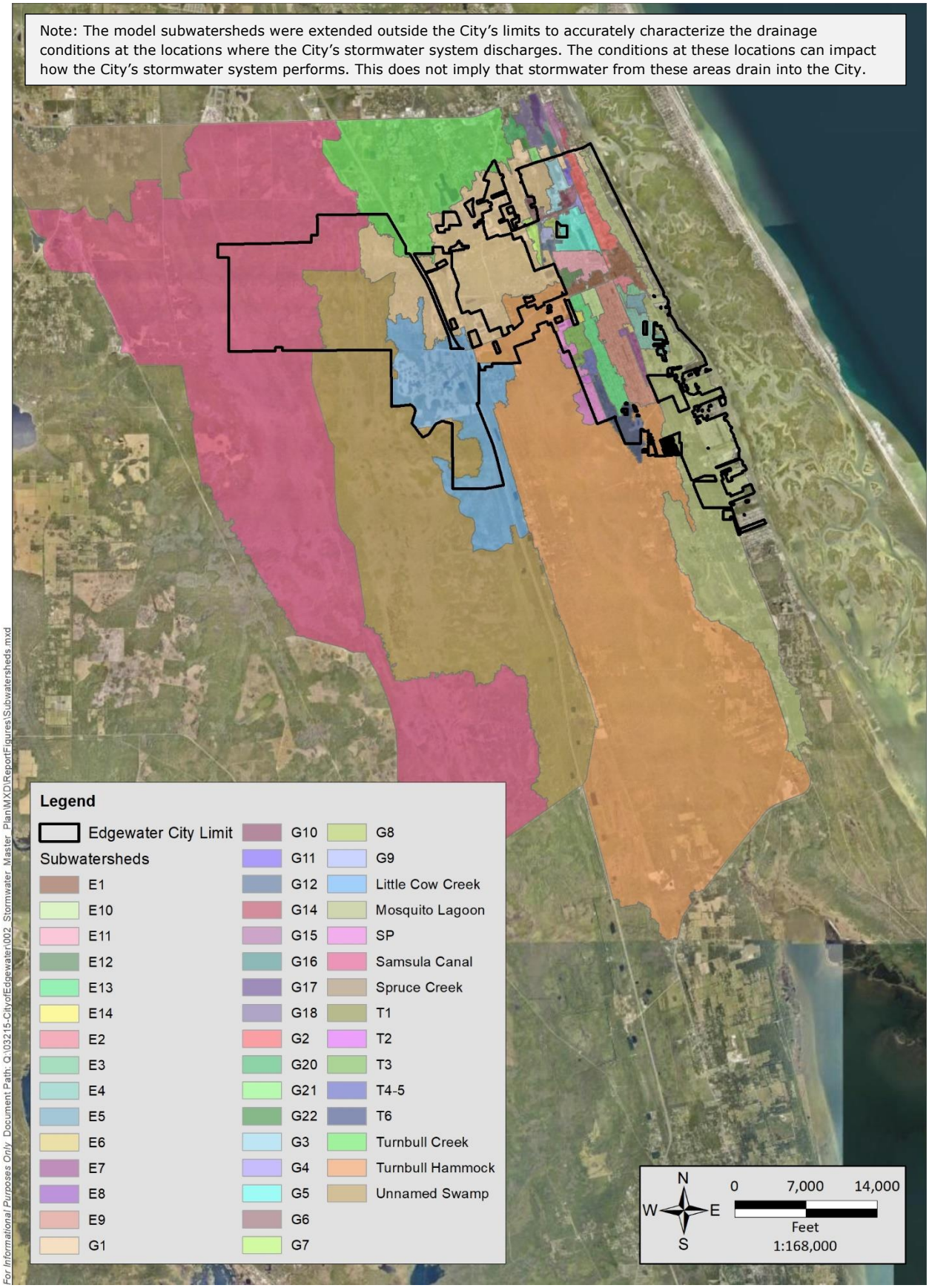


Table 9 Subwatershed Naming Codes

Subwatershed Name	3 Letter/Number Code
E1 Canal	E01
E10 Canal	E10
E11 Canal	E11
E12 Canal	E12
E13 Canal	E13
E14 Canal	E14
E2 Canal	E02
E3 Canal	E03
E4 Canal	E04
E5 Canal	E05
E6 Canal	E06
E7 Canal	E07
E8 Canal	E08
E9 Canal	E09
G1 Canal	G01
G10 Canal	G10
G11 Canal	G11
G12 Canal	G12
G14 Canal	G14
G15 Canal	G15
G16 Canal	G16
G17 Canal	G17
G18 Canal	G18
G2 Canal	G02
G20 Canal	G20
G21 Canal	G21
G22 Canal	G22
G3 Canal	G03
G4 Canal	G04
G5 Canal	G05
G6 Canal	G06
G7 Canal	G07
G8 Canal	G08
G9 Canal	G09
Little Cow Creek	LCC
ML	MOL
Samsula Canal	SAC
Silver Palm Canal	SIP
Spruce Creek	SPC

Subwatershed Name	3 Letter/Number Code
T1 Canal	T01
T2 Canal	T02
T3 Canal	T03
T4-5 Canal	T45
T6 Canal	T06
Turnbull Creek	TUC
Turnbull Hammock	TUH
Unnamed Swamp	UNS

4 H&H MODEL FIELD DATA COLLECTION

Jones Edmunds reviewed existing construction plans, as-built plans, H&H models, and stormwater asset databases relative to the model schematic to determine where field data collection was required to develop the H&H model. Jones Edmunds completed field reconnaissance surveys as needed to verify hydraulic system parameters (i.e., structure locations, sizes, shapes, materials, etc.) as well as basin delineations unclear from available desktop data. Where needed, Jones Edmunds collected vertical elevation data using high-precision GPS units or traditional survey methods performed by Southeastern Surveying and Mapping Corporation (SSMC).

4.1 SURVEY IDENTIFICATION

Jones Edmunds reviewed the model schematic and determined the expected source of elevation data for parameterizing all hydraulic control features (i.e., pipes, pond outfall structures, channels, etc.). Elevation data can be taken from multiple existing sources including:

- Construction plan or as-built plan data taken from SJRWMD permitting website.
- Construction plan or as-built plan data provided by the City.
- Survey data collected for previous stormwater modeling efforts within the Watershed.

Jones Edmunds reviewed the hydraulic control features in the model schematic to determine if existing elevation data were available. If not, we reviewed the feature's impact on H&H dynamics and location to determine if estimation methods were acceptable or if survey data were required. Generally, features missing elevation data, outside of the City's boundary, and not easily accessible were deemed acceptable for estimation. Elevation data were estimated for 62 hydraulic structures. If existing elevation data were not available and estimation methods were deemed inappropriate, Jones Edmunds identified the feature as needing survey data collection by either GPS Real-Time Kinematic (RTK) methods or traditional survey methods.

4.2 JONES EDMUNDS GPS RTK DATA COLLECTION

Jones Edmunds performed RTK data collection and field reconnaissance for 1,028 locations where hydraulic structures had been identified or were likely to exist but had no available existing data. The RTK data collection effort primarily focused on easily accessible cross-culverts, stormwater collection systems, and pond outfall control structures in locations with limited tree cover and shallow standing water. The data collection efforts occurred over 6 weeks, from December 16, 2024, to February 28, 2025. The data was collected using a high-precision pole-mounted GPS RTK unit with a vertical accuracy of +/- 0.2 foot for hard surfaces. The following data was collected at each location as applicable:

- Horizontal/vertical accuracy for each data point.
- Point type (i.e., invert, top of structure, weir crest, etc.).
- Pipe shape (i.e., circular, elliptical, etc.).
- Weir shape (i.e., rectangular, trapezoidal, etc.).
- Pipe rise and span in inches.

- Weir rise and span in inches.
- Pipe material (i.e., reinforced concrete, corrugated metal, etc.).
- Pipe end treatment (i.e., headwall, projecting, etc.).
- Elevation as recorded by the RTK unit.
- Measure down in feed from the recorded RTK elevation location to the elevation of interest.
- Information regarding the structural and functional maintenance condition of the feature (i.e., cracked, crushed, rusted, silted, vegetated, etc.).
- Photographs of the features being inventoried.

The collected data were stored in a file geodatabase, allowing it to be accessed and viewed in GIS. Field photographs are included in the database as attachments to the points of collection. Figure 18 shows where Jones Edmunds completed RTK data collection, and Figure 19 shows an example of data and photographs that were collected.

Figure 18 RTK Data Collection Locations

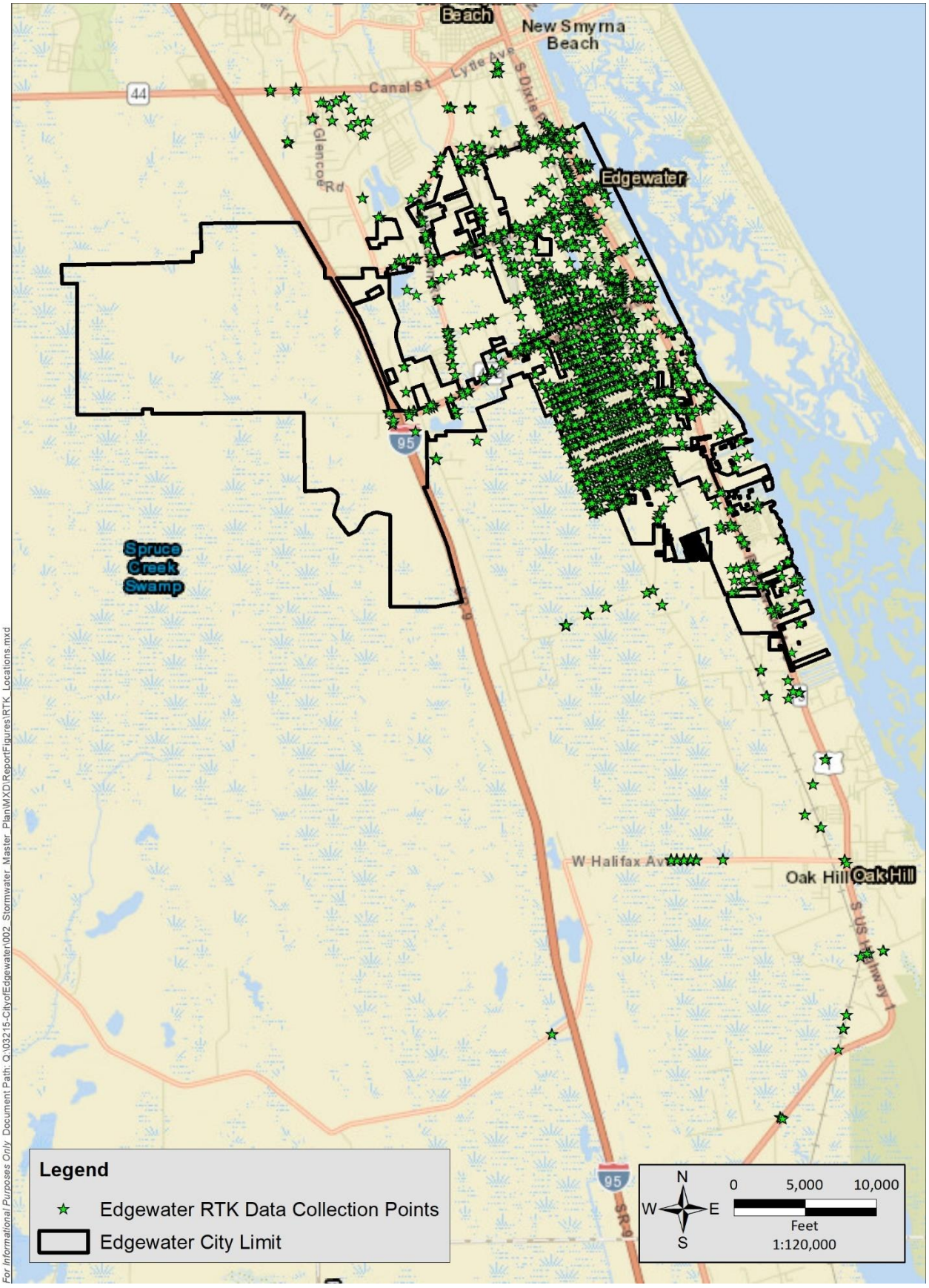
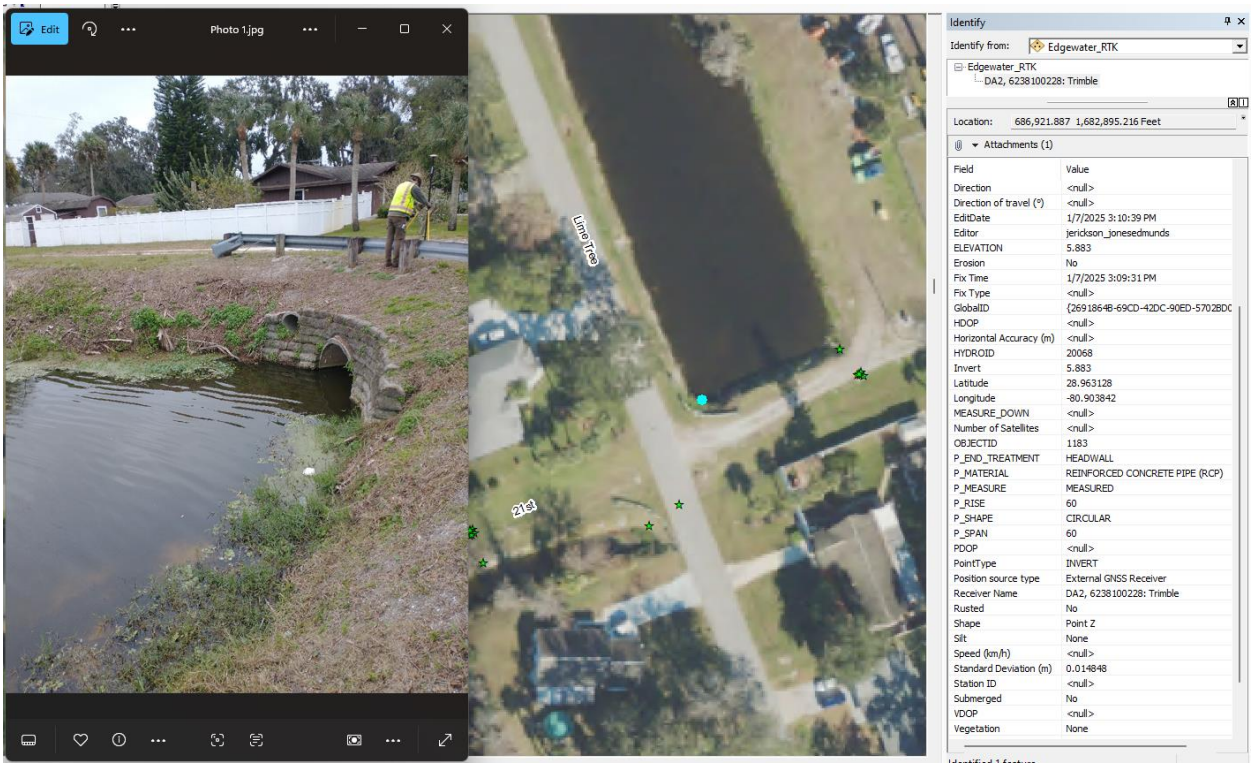


Figure 19 RTK Data Collection Example



4.3 SSMC Data Collection

Jones Edmunds identified 28 hydraulic structure locations and 79 channel cross-section locations where SSMC used traditional survey methods to collect elevation data. The SSMC survey-data collection efforts were focused on channel cross-section locations and adjacent hydraulic structures, because channel cross-sections are typically harder to access and collect data due to standing water. The SSMC data collection efforts occurred between February 3, 2025, and February 26, 2025. The data collected and delivered by SSMC included the following as applicable:

- PDFs showing each of the channel cross-section profiles.
- PDFs of the surveyor field notes.
- A file geodatabase with the hydraulic feature and cross-section data points collected in the field. These data included:
  - Cross-section points with X, Y, and Z data and a description of the data collected at each point. Cross-section points were collected at an interval of 5 feet or less and major changes in grade (top-of-bank, toe-of-slope, channel center line) were captured.
  - Hydraulic feature points with X, Y, and Z data and a description of the data collected at each point.
- Photographs of the upstream and downstream ends at each of the hydraulic structure locations.

Figure 20 shows the locations where survey data collection was completed by SSMC, and Figure 21 shows an example of the data collected at one of the hydraulic structure locations.

Figure 20 SSMC Survey Data Collection Locations

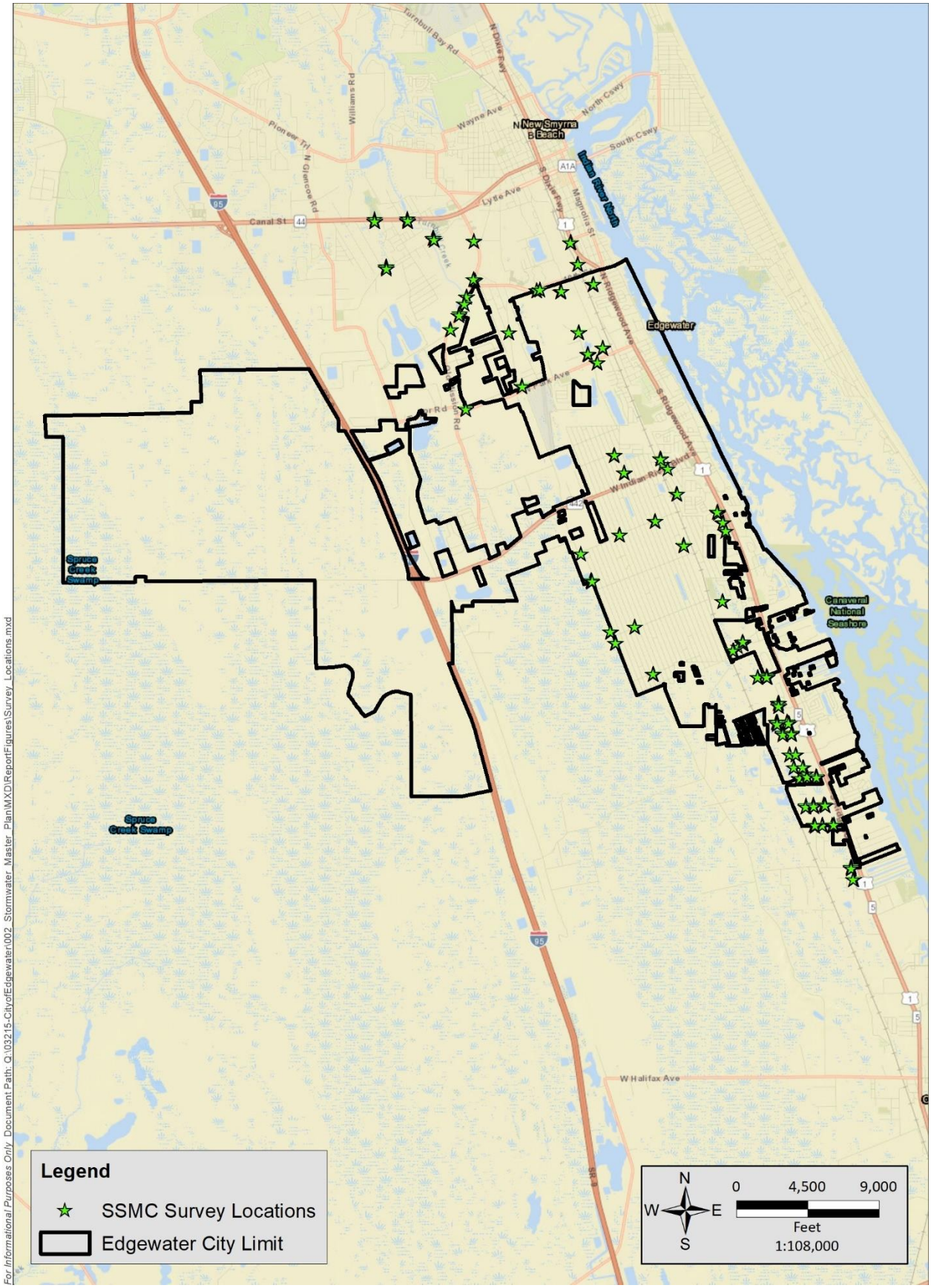
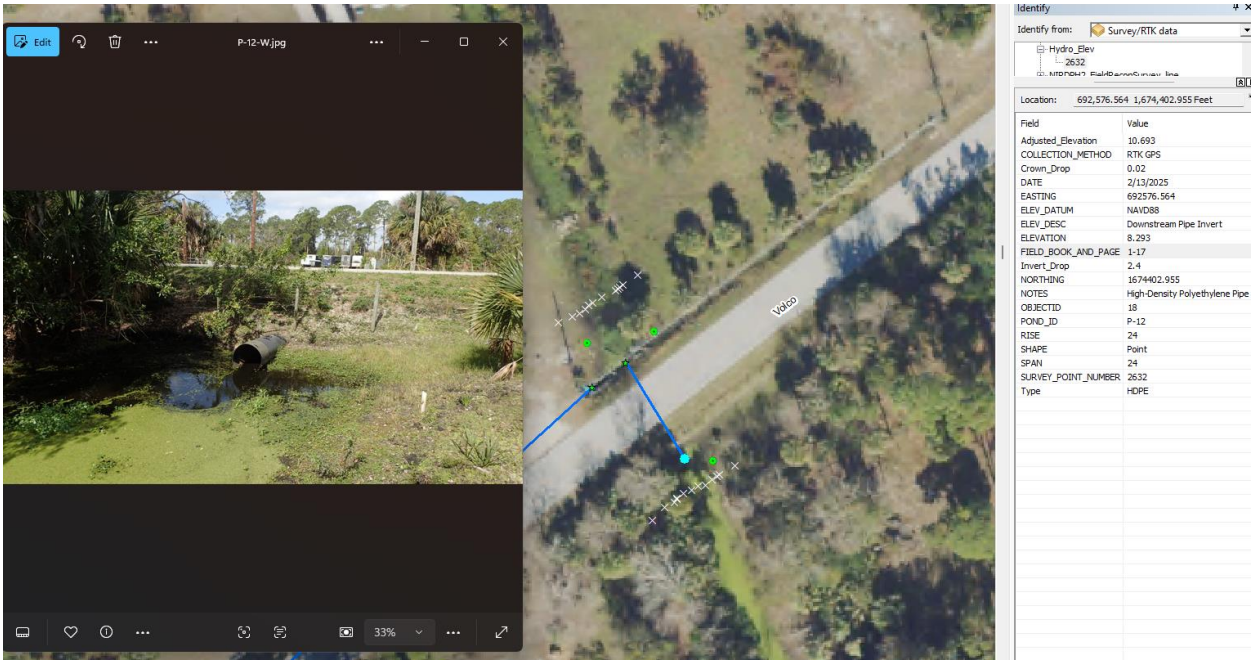


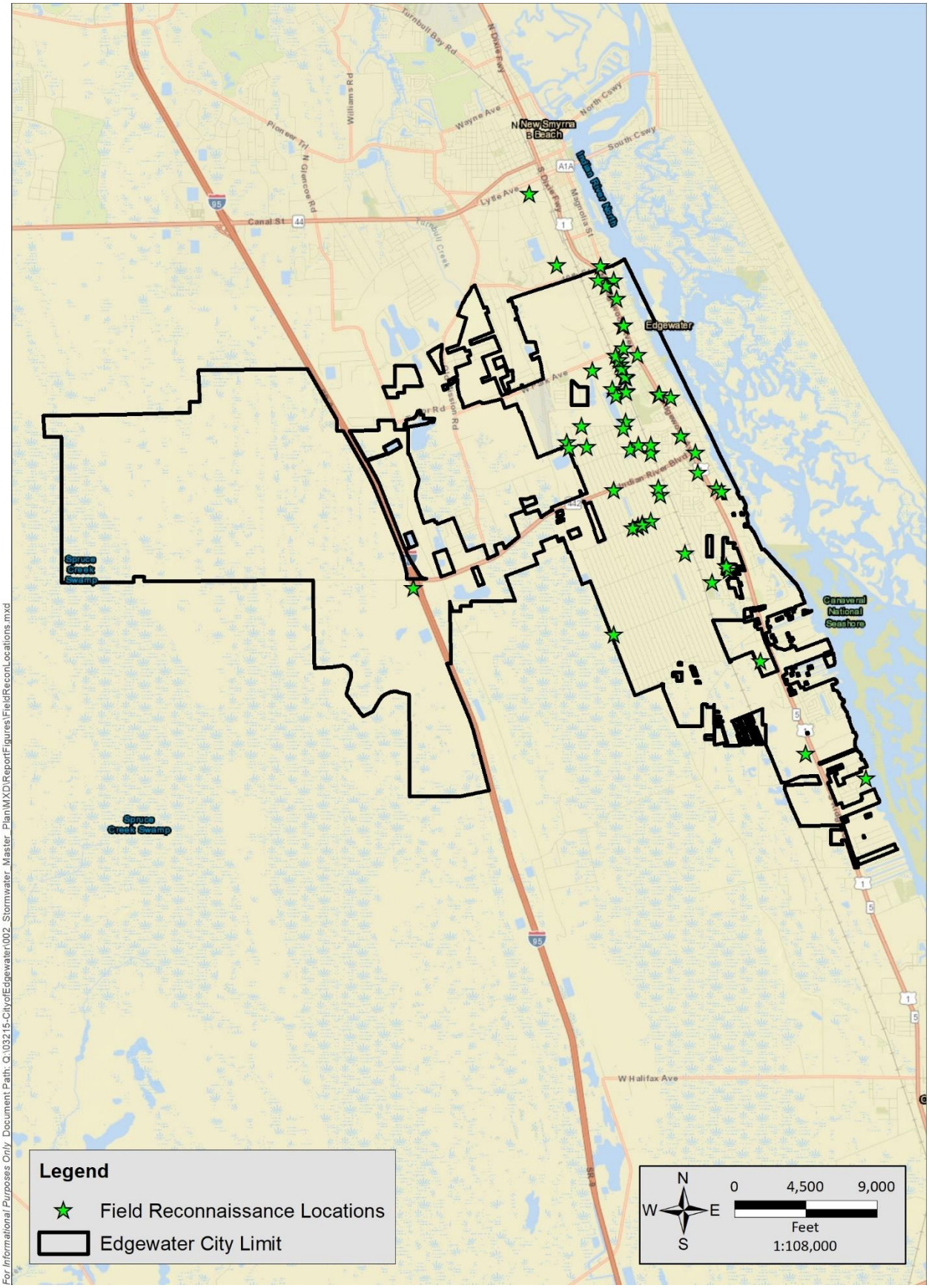
Figure 21 SSMC Survey Data Collection Example



4.4 General Field Reconnaissance

Jones Edmunds identified an additional 60 locations where field investigations were needed to determine if hydraulic structures were present and/or verify drainage patterns to finalize the model basin delineations. Jones Edmunds visited these locations while the RTK GPS data was collected. If hydraulic structures were identified that needed to be included in the model, data were collected using the RTK GPS unit as detailed in Section 4.2. Figure 22 shows where general field reconnaissance was completed.

Figure 22 General Field Reconnaissance Locations



5 H&H MODEL DEVELOPMENT

Once the model schematic was finalized and field data collection was complete, Jones Edmunds developed a fully parameterized one-dimensional (1-D) H&H model. A fully 1-D model was selected despite some areas in the City experiencing 2-D overland flow and significant surface ponding. Overland flow paths were represented in the model with 1-D overland flow weir links and surface ponding was accounted for by extracting stage-storage relationships from the DEM for each basin and assigning the storage relationships to the nodes representing the primary storage areas within the basins. This method was selected to reduce model run times and model complexity. 2-D models require more computer processing power, which results in significantly longer model run times and higher performance computer requirements. 2-D models are also more complex to develop and manipulate, which makes it challenging for third parties use the model for development review, alternative improvement development, floodplain mapping activities, etc.
Jones Edmunds also reviewed the results from the 1-D model to determine if areas exist where 2-D modeling was necessary to more accurately characterize flooding. Based on the 1-D results, 2-D modeling would not significantly improve the overall accuracy of the model. Flooding in the City primarily occurs in topographic "bowls" where flood waters stage up and ponds at the same water surface elevation across many basins. When this is the case, 1-D modeling and 2-D modeling should yield the same or very similar results.

The model was developed for StormWise. The model inputs and spatial data were developed and stored in a GIS compatible file geodatabase with a schema specifically designed for import into StormWise. The fully developed model was calibrated/verified to observed flooding conditions from two recent extreme storm events (Hurricane Milton and the September 14, 2024 event). The calibrated model was then used to simulate design storm events and map existing conditions inundation Citywide. Future conditions models were developed for 2040, 2070, and 2100 conditions based on predicted future tidal conditions, predicted future rainfall depths, and planned future development. The following sections summarize the development of the existing and future conditions models.

5.1 HYDROLOGIC MODEL PARAMETERIZATION

The hydrologic model characterizes the rainfall-runoff response that is routed through the hydraulic portion of the model. The runoff response varies based on soil characteristics, land cover characteristics, rainfall depth, and rainfall distribution. Jones Edmunds used the NRCS curve number (CN) and unit hydrograph methods to simulate the hydrologic conditions of the Watershed. These methods calculate total runoff depth, runoff hydrograph, and peak discharge. Information required (at the sub-basin level) to run these methods in StormWise include the storm duration (e.g., 24 hours), rainfall depth, and rainfall distribution, as well as time of concentration (Tc), sub-basin area, runoff CN, directly connected impervious area (DCIA), and peaking factor.

5.1.1 TIME OF CONCENTRATION

The Tc for a sub-basin is the time for runoff to travel from the hydraulically most distant point of the sub-basin to the sub-basin outlet. The Tc influences the shape and peak of the runoff hydrograph for a given sub-basin. The Tc values for each sub-basin were generated using NRCS Technical Release 55 (TR-55) methodology.

TR-55 methodology divides the flowpath into three main components: overland flow (i.e., sheetflow), shallow-concentrated flow, and open-channel flow. Jones Edmunds generated longest flowpath lines for each basin based on the DEM, and we calculated travel times for each of the flow regimes as defined in TR-55. We applied a minimum Tc value of 6 minutes, and the values ranged from 6 to 304 minutes with an average of 24 minutes.

5.1.2 Rainfall Depth and Distribution

Jones Edmunds used rainfall depth-frequency data from *NOAA Atlas 14,* Volume 9 Version 2, published in 2013, to determine rainfall depths for the mean-annual (2.33-year), 10-year, 25-year, 100-year and 500-year/24-hour events. Table 10 summarizes the rainfall depths used.

Table 10 Design Storm Rainfall Depths

Rainfall Event	Rainfall Depth (inches)
Mean Annual/24-hour	4.7
10-Year/24-Hour	7.4
25-Year/24-Hour	9.4
100-Year/24-Hour	13.1
500-Year/24-Hour	18.2

We used the Florida Modified Rainfall Type II rainfall distribution to generate synthetic storm hyetographs for the 24-hour events. This is the industry standard rainfall distribution used for stormwater master planning in Florida and by permitting agencies in the City's jurisdiction and has proved reasonable for determining flood risk across the State.

5.1.3 Peaking Factor

Most of the Watershed is flat and developed. Based on prior local modeling experience with calibrating H&H models to observed stage recorder data in similar watersheds in Florida, a peaking factor of 256 was applied for the entire Watershed. This parameter can be used to calibrate the runoff response and peak stage timing to water-level gauge data, but no gauge data was available for this Study. If the City were to collect water level data in the future, this parameter could be revisited and adjusted.

5.1.4 Impervious/DCIA, Direct Area, and NRCS CN Calculations

We used the NRCS's TR-55 CN methodology, total impervious areas percentage, DCIA percentage, and direct area percentage to generate runoff in the StormWise model. These parameters were generated for each of the sub-basins in the Watershed using data from the following sources:

- NRCS SSURGO soils data.
- UF IFAS Soils database.
- 2022 FDEP Land Use and Land Cover (LULC).
- 2023 NAIP aerial imagery.

- Nearmap aerial imagery.
- NOAA's C-CAP high-resolution impervious land cover data.

NOAA's C-CAP high-resolution impervious land cover layer was the starting point for characterizing impervious area in the Watershed. The layer was manually reviewed against the aerial imagery and updated to include any missing driveway areas, parking lots, and other large impervious areas. The finalized impervious layer was then intersected with the model sub-basins. The resulting intersected layer was reviewed, and each of the impervious areas was classified as DCIA or unconnected impervious area (UCIA). This layer was then used to calculate the total impervious area percentage and DCIA percentage for each basin. The average total impervious percentage for sub-basins within the City was 22 percent with a minimum of 0 percent and a maximum of 100 percent. The average DCIA percentage for sub-basins within the City was 3 percent with a minimum of 0 percent and a maximum of 100 percent.

The direct area percentage quantifies the area within a basin that applies rainfall directly to the basin outlet (e.g., rainfall falling directly on the surface of a wet pond) and bypasses any type of basin hydrograph techniques like the NRCS unit hydrograph method. A direct area layer was developed within ArcGIS using the waterbody land use categories from the 2022 FDEP LULC layer. The layer was reviewed against the aerial imagery and updated where waterbodies directly connected to the basin outfall were not captured. Additionally, waterbodies not captured in the layer and not directly connected to the basin outfall were excluded. The direct area layer was then intersected with the model sub-basins, and the resulting intersection was used to calculate a total direct area percentage for each basin. The average direct area percentage for sub-basins within the City was 2 percent, with a minimum of 0 percent and a maximum of 81 percent.

An area-weighted CN was developed for the open area in each basin. An open area layer was developed in ArcGIS by erasing the impervious and direct area layers from the sub-basins layer. The resulting layer was then intersected with the NRCS soils layer and the 2022 land use layer to create hydrologic response units. An open land CN was applied to each response unit based on one of two methods.

Land Use and Soil HSG Based – Based on the land use description type from the SJRWMD LULC, Jones Edmunds assigned the polygons a landcover type of open land, wooded, or water. Developed land uses are typically assigned the open land landcover type, and undeveloped land uses are typically assigned the wooded landcover type. Jones Edmunds spatially reviewed all soil polygons with dual HSGs against the aerials, LULC polygons, and DEM to determine which HSG should be applied. Generally, for dual HSGs, soils were modeled as drained in developed area and undrained in undeveloped areas. A CN value was assigned to each polygon based on the combination of landcover type and HSG.

Table 11 summarizes the assigned open land CNs.

Table 11 Open Land Use CN Assignments

Landcover	HSG	CN
Open Land	A	39
	B	61
	C	74
	D	80
Water	A	98
	B	98
	D	98
Wooded	A	30
	D	77

- Soil Storage Based – Available soil storage in inches was calculated for each response unit based on the depth to seasonal high water table (SHWT) data provided in the SSURGO soils data, soil field capacity from the IFAS soils database, and soil porosity from the IFAS soils database. The CN was then calculated for each response unit based on the available soil storage depth and solving for CN in the TR-55 equation below, where S represents the available soil storage in inches.

$$S = (1000/CN) - 10$$

The open land CN was calculated for each response unit based on both methods. An area-weighted open land CN was then calculated for each basin using the response units and the maximum of the open land CNs calculated from the two methods previously described. The average weighted open land CN for the modeled basins in the Watershed was 68, with a minimum CN of 30 and a maximum CN of 98.

5.2 Hydraulic Model Development

The hydraulic model characterizes the surface and sub-surface hydraulics using nodes and links. Nodes represent surface storage within each sub-basin, and links represent surface and sub-surface interconnections between nodes. The hydraulic model routes the runoff generated from the hydrologic model through the modeled stormwater system's hydraulic features and calculates flows through the links and stages at the nodes. To characterize the hydraulic conditions in the entire model area, 6,166 model links and 2,276 model nodes were parameterized.

The hydraulic network was developed by incorporating the information compiled from existing construction plans/as-builts, stormwater asset geodatabases, field data collection, survey data collection, and previous model data. Information from the DEM supplemented the hydraulic data, including parameterization of the storage areas and overland weir connections.

5.2.1 Pipe and Drop Structure Links

The model links included 1,222 pipes and 209 drop structures. Drop structures represent a combination of pipes and weirs where water must first flow through a weir(s) and then through a pipe(s). Drop structure links most commonly represent outfall control structures

on stormwater ponds. Overall, the model included approximately 164,200 feet of pipe. Pipe and drop structure weir size, shape, material, and invert parameters were determined using the GIS asset data, as-built plans, field observations, construction plans, field survey data, previous model survey data, or estimated where deemed acceptable. Where invert elevation data were taken from as-built or construction plans, the data were converted to NAVD88 from NGVD29 using a 1.20-foot conversion factor.

All pipes and drop structure weirs were assumed to be in well-maintained functional condition. The maintenance condition of the City's stormwater system is dynamic, and accurately characterizing the maintenance condition of the entire system within the model is not possible. Additionally, one of the primary goals of the model is to evaluate the system's hydraulic capacity and determine where significant capacity improvements are needed. If flooding is caused by a maintenance issue, it should be identified as part of the City's stormwater maintenance inspections and activities and typically can be fixed without significant capital improvement needs.

5.2.2 Overland Weir Links

Overland weir links allow water to flow between basins when node elevations exceed the surface elevations along the hydrologic basin boundaries, preventing water from artificially stacking up or *glass-walling* along the boundary. The model links include 4,372 overland flow weir links. Overland flow connections were represented using irregular weir cross-sections extracted from the 2.5-foot-by-2.5-foot DEM in GIS. Fifteen of the modeled overland flow weir links were modified to incorporate structural weirs built into pond berms. Figure 23 summarizes an example where a structural weir was incorporated into the overland weir cross-section.

We categorized each weir (structural and overland) based on its flowpath type for weir equation and weir coefficient assignment. Weir categorization was performed by reviewing the available aerial imagery. Table 12 shows the weir equations and coefficients used in the model. For model stability, the Mavis equation was applied for all overland weirs in place of the Gravel or Paved equations to minimize the effects of sloshing if water levels equalize at the two nodes connected by the weir. Sloshing refers to numerical oscillations caused by repeated flow reversals over a weir. With long, flat, overland weirs—on the order of hundreds of feet or more in length—a small change in elevation—on the order of 0.01 foot or less—can result in movement of large volumes of water across the weir. This numerical movement of water may happen multiple times as water surface elevations on either side of the weir achieve equilibrium.

Figure 23 Structural Weir Cross-Section Example

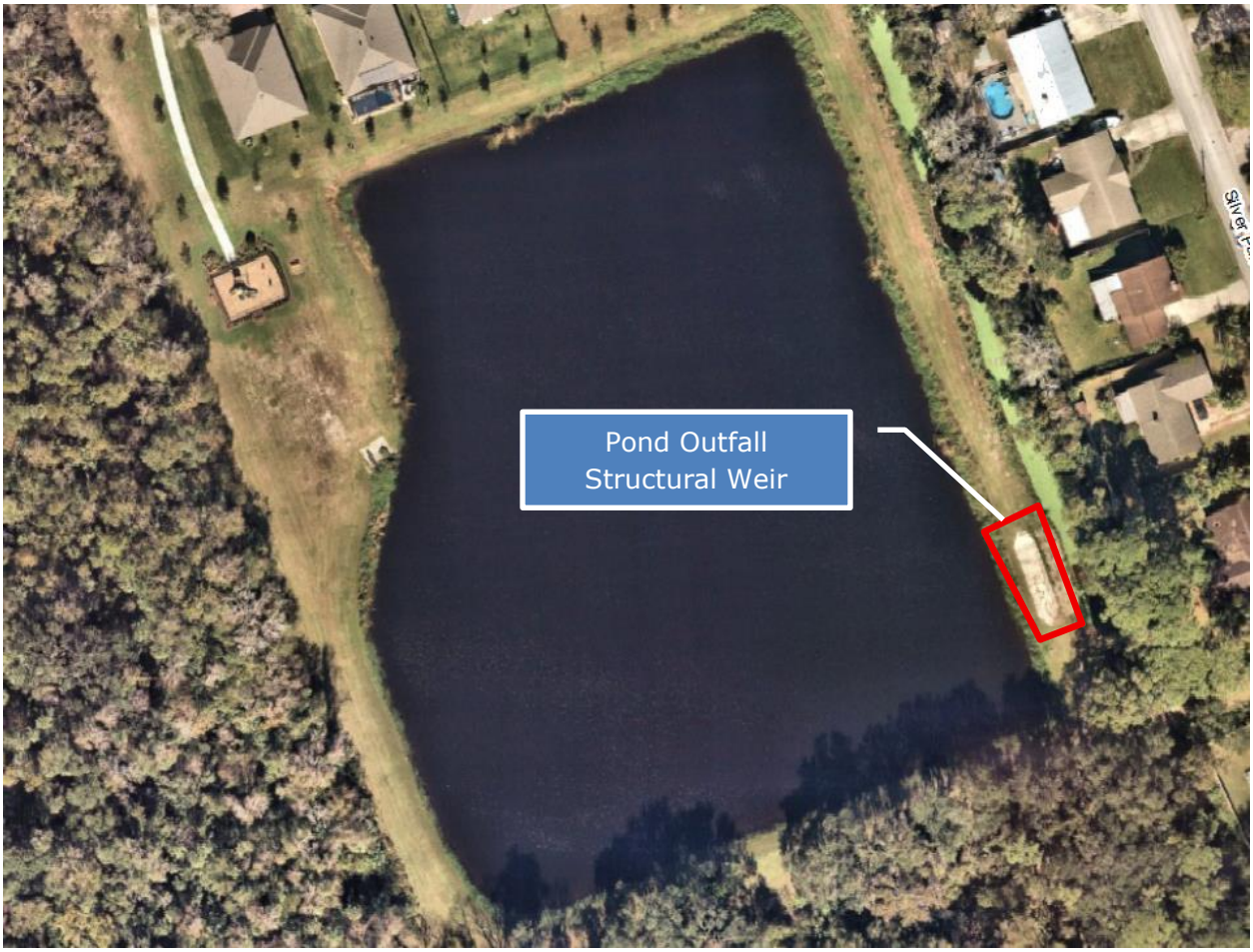


Figure 24 Structural Weir Cross-Section Example (continued)

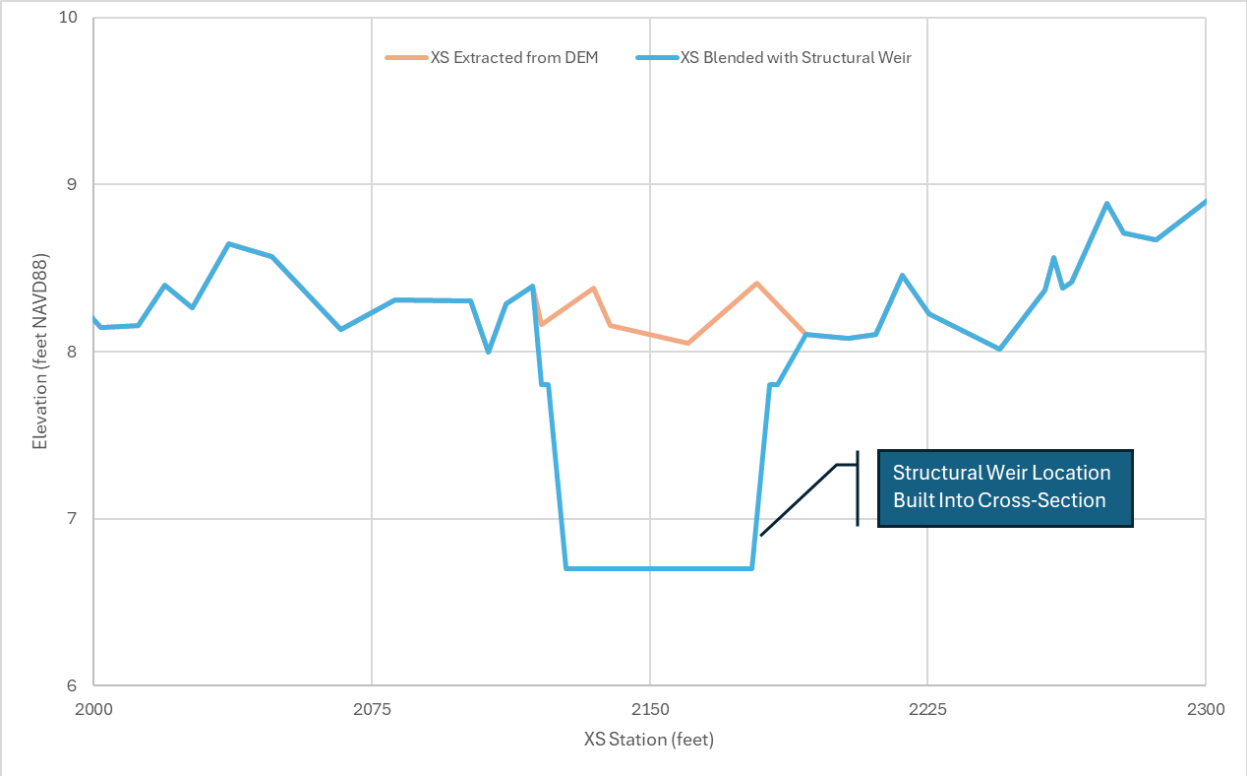


Table 12 Weir Equations and Coefficients

Weir Type	Equation	Coefficient
Overland	Mavis	2.5
Unpaved Road (dirt or gravel)	Mavis	2.8
Pond Berm	Mavis	2.8
Paved Road	Paved	3
Structures	Mavis	3.1
Drop Structure Tops	Horizontal	3.1

We set the orifice coefficient to 0.6. For irregular weirs with cross-sections, we set the invert elevation and control elevation equal to the elevation of the lowest point in the cross-section.

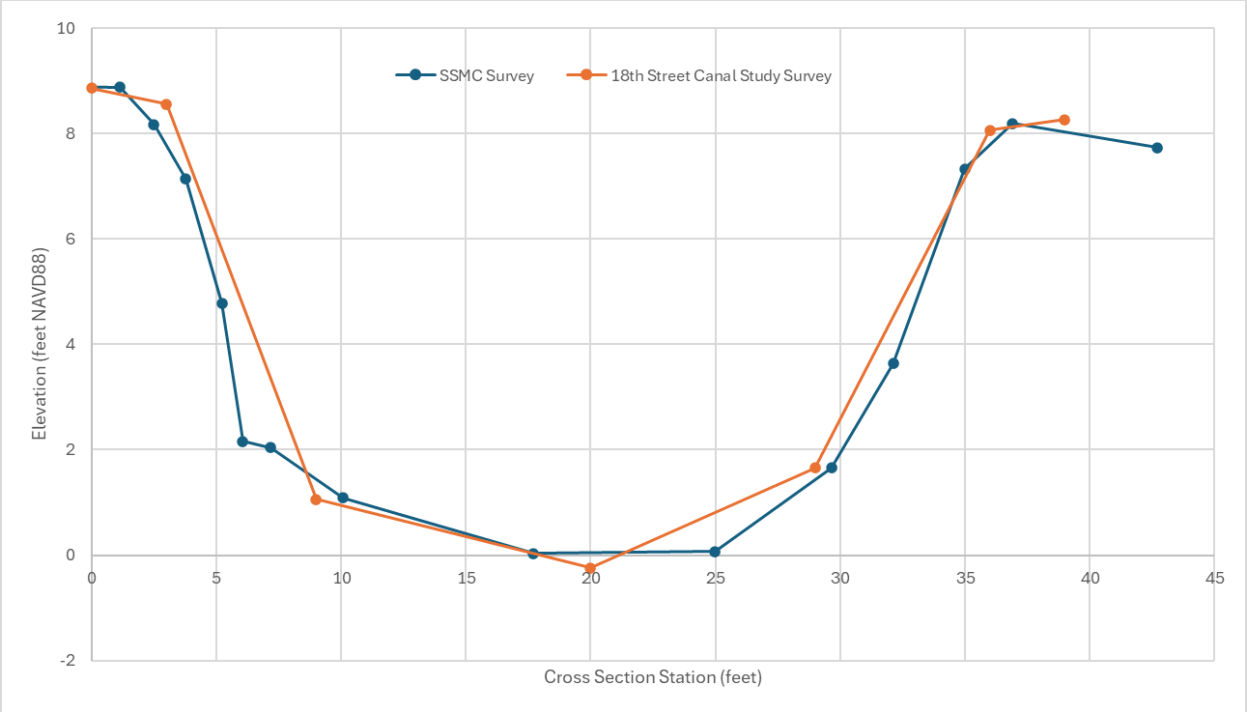
5.2.3 Channel Links

Channels are represented with upstream and downstream cross-sections in StormWise. A single cross-section (i.e., duplicate upstream and downstream cross-sections) may be used to characterize the upstream and downstream cross-section shape if the cross-section does not change significantly from upstream to downstream or if the single section is representative of the overall reach. The model links include 363 channel links.

SSMC collected survey data for channel cross-sections and additional channel survey data was used from the 18th Street and Silver Palm Canal model and the Gabordy Canal model.

To verify that the survey cross-section data from the previous models was still valid, Jones Edmunds had SSMC re-collect channel cross-section data for nine sections included in the 18th Street and Silver Palm Canal model and three sections included in the Gabordy Canal model, which is approximately 3 percent of the 285 cross-sections where survey data were available from the existing models. The new survey data was compared to previously collected data. Based on this comparison, we determined that the data from the previous models was still valid. Figure 25 shows an example of the survey comparison at one of the cross-section locations.

Figure 25 SSMC Survey Compared to Previous 18th Street Canal Survey



Jones Edmunds used the lowest point in a cross-section as the invert elevation. In most cases where survey data were not available at the upstream or downstream location of a channel link, we applied the nearest representative surveyed cross-section and interpolated channel inverts using surveyed inverts upstream and/or downstream of the location. Such interpolation is appropriate when the channel geometry does not significantly change between locations. The vertical shifts in cross-section elevations resulting from interpolation were not always appropriate across the entire cross-section. We checked these shifts against the DEM by comparing top-of-bank elevations. When interpolation was not appropriate, we edited the cross-section geometry to best reflect physical conditions, considering changes in both invert elevation and top-of-bank elevation. Typically, we modified the bottom portion of the primary or incised portion of the channel to maintain the top-of-bank elevation and overbank floodplain storage/conveyance.

Where necessary, we augmented surveyed cross-sections with data derived from the DEM. In these cases, the survey characterizes the primary or incised portion of the channel. The LiDAR data were used to characterize the area in flow in the overbank discharge beyond the extent of the surveyed channel.

We used data derived from the DEM exclusively in some areas where survey data were not collected, such as wetland sloughs modeled as channel conveyance. When data derived from the DEM were used exclusively, we did not perform any interpolation, extrapolation, or other manipulation of channel geometry. In these areas, collecting survey data is not expected to suggest different cross-section geometry than that derived from the DEM. Our comparison of surveyed elevations to DEM elevations in areas of heavy canopy, similar to the sloughs, indicated the difference between survey and adjacent DEM elevations was typically within 0.5 foot in the absence of a significant depth of water. Several channels were identified where DEM elevations differed significantly from the survey data. Where we observed differences greater than 0.5 foot, engineering judgment was used to combine survey data with LiDAR data to produce an appropriate cross-section.

We assigned variable Manning's n values for each conveyance modeled as a channel. We categorized channel links and assigned Manning's n values using the aerial imagery and photographs collected during field reconnaissance and survey. Typically, we modeled conveyance in swales and ditches with a constant roughness value from top of bank to top of bank. Manning's n values were not varied to account for vegetation density changes within the defined channel section. Most cross-sections had uniform vegetative conditions. Also, varying channel Manning's n values too much within the channel banks can lead to computational instabilities in the StormWise model. Table 13 summarizes the Manning's n values used by channel type. We set the contraction coefficient to 0.1 and the expansion coefficient to 0.3, representing the recommended settings within ICPR. We generally set entrance and exit loss coefficients to 0, though some exit losses were increased due to downstream conditions.

Five bridges and two con-span culverts were identified in the Watershed and modeled as channel links with lids applied to the channel cross-sections to represent reduction in flow area from the bridge section. All five of the bridges are outside the City limits and the con-spans are in the Parktowne Industrial Center.

Table 13 Channel Manning's n Values

Channel Description	Manning's n Value
Excavated Channel – Clean, Straight, Short Grass	0.03
Excavated Channel – Not Maintained, Clean Bottom, Brush on Sides	0.05
Floodplains – Medium-to-Dense Brush	0.07
Floodplains – Tress	0.15

5.2.4 Node Storage

The StormWise model represents surface storage as a stage-area relationship associated with a node. These relationships represent the flood storage available in lakes, wetlands, stormwater ponds, and other surface storage areas.

Jones Edmunds determined stage-area relationships for loading nodes based on the 2.5-foot-by-2.5-foot DEM, basins from the model schematic, and storage exclusion areas

where applicable. Storage exclusions represent area-associated volumes included in channel link conveyance calculations. For StormWise, channel links include storage volume represented by cross-sectional areas along the length of the link. We delineated storage-exclusion areas to encompass areas defined by the flow paths of the channel links and their associated cross-sections. To avoid double-counting storage in the model, these exclusion areas were not considered in the stage-area relationships assigned to nodes.

We reviewed the stage-area relationships to ensure the minimum stage was below the node's initial condition. Our review focused on nodes representing stormwater ponds or other large depressions, since water surface breakline elevations associated with the terrain data were commonly established at elevations higher than those appropriate for the associated node initial condition (e.g., water surface above pond bleed-down elevation or normal water elevation). Typically, the difference between the breakline elevation and initial condition was less than 1 foot and we used the pond footprint area established by the breakline as the area corresponding to the initial condition stage. When the difference between the breakline elevation and initial condition was greater than 1 foot, we decreased the area at the initial condition stage to appropriately account for the pond's bank slope.

We assigned junction nodes a minimal amount of storage (0.001 acre) except in a few locations where that value may create instabilities by causing an inaccurate calculation of change in stage with respect to time (i.e., dh/dt). Link and node stability was reviewed to determine if additional storage needed to be added to the junction nodes to improve model stability. In most cases, only minimal additional storage (0.01 acre) was added to junction nodes for model stability. If storage greater than 0.01 acre was needed to stabilize a link, the model schematic was reviewed for potential modification.

5.2.5 Node Initial Water-Surface Elevations

Initial stage represents the starting water surface elevation at a node. Jones Edmunds established initial stages to represent a no-flow or static condition (i.e., no initial or base flow) at the normal water elevation.

To achieve a normal water level static starting condition for closed basins, Jones Edmunds set initial stages based on the presence or absence of standing water (e.g., a wetland, lake, or pond). We reviewed the 2023 NAIP aerial imagery to determine areas of standing water and wetland plant signatures within the Watershed. Initial stages for nodes within closed basins not containing standing water or wetland plant signatures were set at the lowest elevation within the basin.

Nodes in closed basins containing standing water or wetland plant signatures were set at the lowest link-control elevation, which approximates the normal water elevation. We determined the lowest link-control elevations as the lowest elevation of the following:

- Control elevation of links connected to the basin node.
- Bleed-down orifice elevation.
- Seasonal high-water elevation.

We established link-control elevations based on survey data collected for this project or previously documented elevation data. When survey data and as-built information were not available, we estimated link-control elevations using photographs collected during field

reconnaissance, the DEM, and aerial imagery. Estimated elevations for bleed-down orifices were typically based on collected photographs. Estimated elevations for SHWT were typically based on the DEM and aerial imagery.

Jones Edmunds set the initial stages for open basins (e.g., basins with a positive outfall such as a pipe or channel) based on downstream control elevations, which approximate the normal water elevation in the pipe or channel. Downstream control elevations included hydraulic constrictions (e.g., pipe, drop structure, or weir) and the boundary condition elevations. If no downstream control elevation was above the channel invert, we set initial stages at the channel invert.

5.2.6 Boundary Conditions

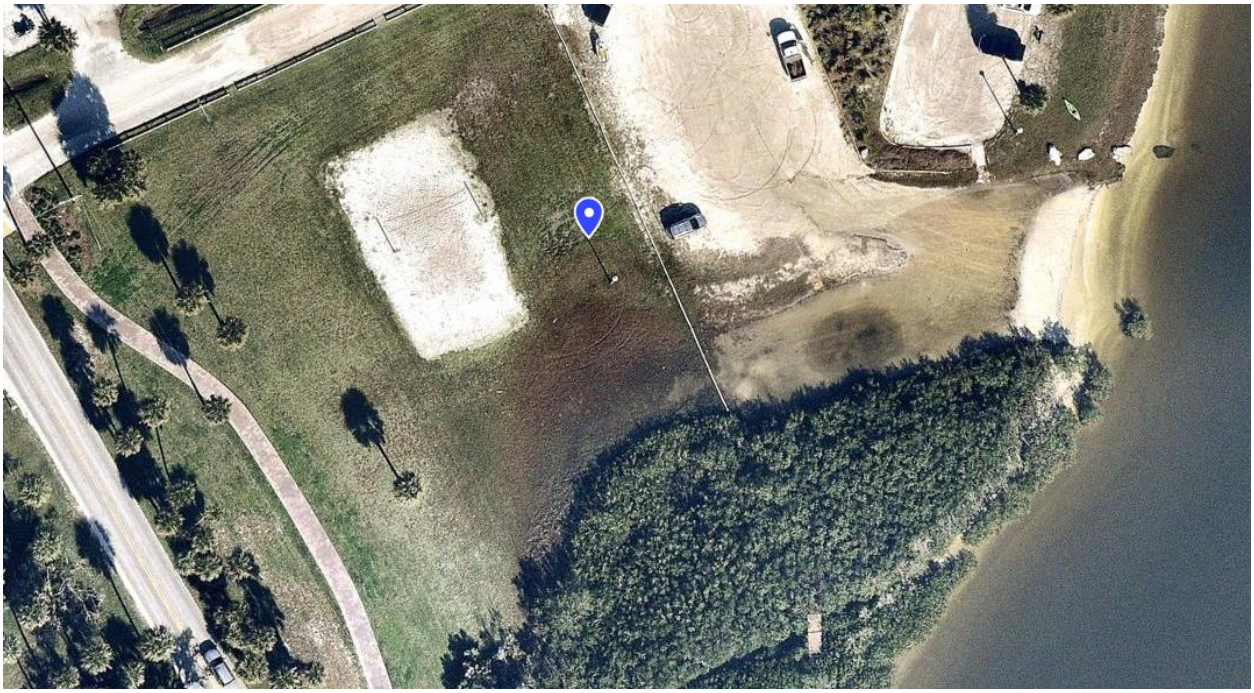
Jones Edmunds assigned time-stage relationships to boundary nodes. The model includes 16 boundary nodes with eight different boundary conditions assigned.

One boundary node is in the IRL at the south end of the Watershed where the Turnbull Hammock discharges under US-1. The boundary condition at this location was set to -0.16 feet NAVD88, which represents the mean higher high water (MHHW) elevation in the IRL. The MHHW elevation calculation was based on 15-minute water level data from April 1, 2015, to March 31, 2024, at the USGS Haulover Canal water level gauge approximately 8.5 miles southeast of the model boundary. The Haulover Canal gauge is a good representation of the IRL boundary condition due to its proximity to the model boundary. The gauge is within the IRL, into which the model discharges directly. Stages at the Haulover Canal gauge and the model boundary condition location should vary little, if at all, given the size of the IRL, which causes a level-pooling effect with very little change in water surface elevation across the lagoon. A sensitivity analysis was not conducted to determine if modeled stages in the City would be impacted by slight variations (less than 0.5 foot) to the boundary condition elevation. This was not deemed necessary because the IRL model boundary condition is approximately 9 miles south of the City limits and the boundary elevation is approximately 5 feet below the surface elevations in the Turnbull Hammock at the City boundary. We would not expect minor stage changes in the IRL to create a backwater effect in the Turnbull Hammock that would impact modeled stages in the City's limits.

Seven boundary nodes exist in ML along the east border of the modeled Watershed and two boundary nodes on the north border in Turnbull Creek, which discharges near Ponce Inlet. The boundary conditions at these locations were set to 1.6 feet NAVD88, which represents the MHHW elevation in north ML. The MHHW elevation was calculated based on hourly water level data from January 1, 2020, to December 31, 2024, at the NOAA Trident Pier water level gauge, which is approximately 50 miles south of Ponce Inlet. Ponce Inlet provides a direct connection to the Atlantic Ocean at the north end of ML and is less than 5 miles north of the north Watershed boundary. The trident pier water levels are reflective of stages in the Atlantic Ocean and should be very similar to stages experienced at Ponce Inlet and in north ML. To confirm that the Trident Pier water level data are reflective of boundary conditions in the ML, Jones Edmunds reviewed historical high-resolution aerial imagery from Nearmap at the Menard-May Park boat launch against the DEM to estimate tidal staging condition in the ML. The estimated stages observed in the aerial imagery were then compared to the recorded stages at the Trident Pier gauge. Figure 26 shows the Nearmap

aerial imagery collected on December 6, 2017, at the boat launch. The blue marker in the imagery shows the approximate limit of tidal inundation that occurred on that day based on the dark discoloration of the grass in the area, indicating that it was recently submerged. The elevation of this location is based on the DEM is 2.3–2.4 feet-NAVD88 (ft-NAVD88), which aligns very well with the observed peak stage of 2.5 ft-NAVD88 at the Trident Pier gauge on that day.

Figure 26 Nearmap Aerial Imagery at Menard-May Park – December 6, 2017



Four additional boundary nodes are along the north boundary of the Watershed near SR-44. One is in the ditch east of Hughes Road and has a boundary stage of 14 feet NAVD88 based on DEM elevations in the ditch. Another is at the northwest corner of the intersection of SR-44 with I-95 and has a boundary stage of 27 ft-NAVD88 based on DEM elevation of the surface there. Another is in a wetland south of Findley Street east of Old Mission Road and has a boundary stage of 5.5 ft-NAVD88 based on DEM elevations in the wetland. The last is in an isolated wetland south of SR-44 on the west side of Slaton Street with a boundary stage of 5 ft-NAVD88 based on DEM elevations in the wetland. All four locations are far enough north of the City to not significantly impact the H&H model results in the City.

Two additional boundary nodes are along the south boundary of the Watershed west of I-95: one is in the wetlands south of Maytown Road and has a boundary stage of 23.9 based on DEM elevations in the wetland. The other is in Cow Creek south of Hunting Camp Road and has boundary stage of 21 ft-NAVD88 based on DEM elevations in the area. Both locations are far enough south of the City to not significantly impact the H&H model results within the City.

5.3 Model QA/QC

Once the model was fully parameterized, it was exported from the GIS database into StormWise, and initial model runs for the 2-, 10-, 25-, 100-, and 500-year/24-hour design storm events were completed. Jones Edmunds reviewed results from these simulations,

focusing on the 100-year/24-hour and 500-year/24-hour design events for some of the more detailed quality-control reviews. We completed the checks outlined in this section to assess accuracy of the model schematic, parameterization, and results. Our review of model results focused on large design storms, such as those that will be subsequently used for inundation polygon development.

5.3.1 Initial Flows

Jones Edmunds executed a routing simulation with no hydrology simulation results to assess initial flows. Flows occurring at time step 0 hours with no hydrologic inputs represent differences in adjacent initial conditions. We examined all links with initial flows for possible initial condition errors. We adjusted initial conditions where necessary to prevent initial flows.

5.3.2 Numeric Instabilities

Jones Edmunds reviewed all node and link time-stage and time-discharge hydrographs resulting from the 100-year/24-hour design event for numeric instabilities and reviewed nodes for extrapolation or performance errors. Resulting time-stage hydrographs for the nodes were stable and no extrapolation errors were present.

Some resulting discharge hydrographs contained minor numeric instabilities representing near-zero-head-difference flow oscillations. These minor instabilities were present in multiple links during either the initial or final hours of model simulations. We determined that these minor instabilities did not affect peak flow, peak-flow timing, and flood-stage results.

5.3.3 Mass Balance

Mass-balance errors occur when stage-area relationships do not cover the range of model stages or when solutions cannot converge within simulation control time-step criteria (numeric instabilities). Large mass-balance percentage errors may occur in the first few time steps of a simulation due to a relatively small change in storage, but these errors may be insignificant in absolute magnitude (water volume). Jones Edmunds reviewed mass-balance results for all simulations, plotted in Figure 27. As shown in Figure 27, the largest mass balance error at any time-step was 0.04 percent, well below the industry standard for H&H models.

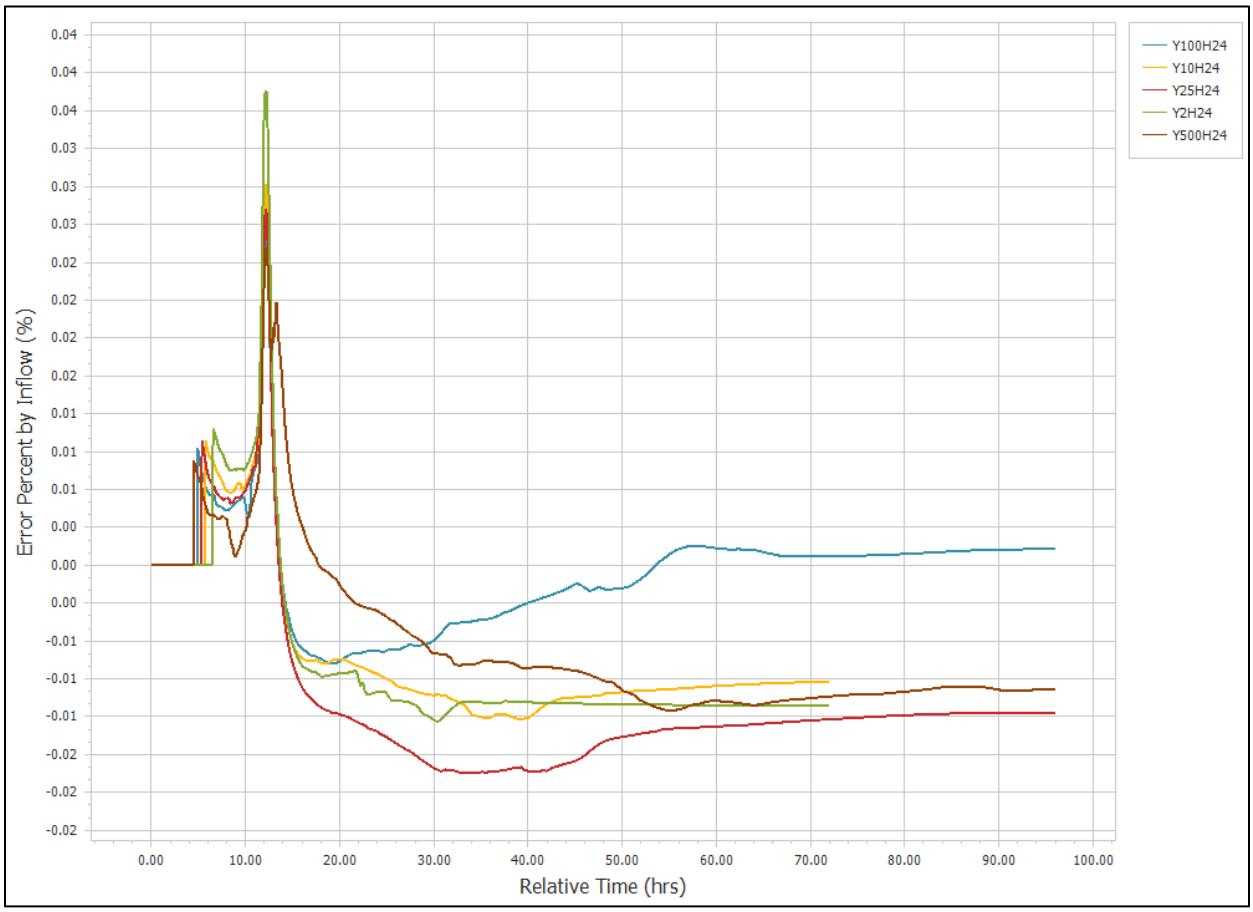
5.3.4 Missing Basin Interconnections

Basin interconnections occur when flow is exchanged across basin boundaries. Basin interconnections may occur via a human-made structure—such as a pipe, channel, weir, or pump—or via overland flow. Interconnections via overland flow occur when water-surface elevations in one basin exceed the lowest elevation along the basin boundary. Jones Edmunds modeled these interconnections as weirs. To accurately characterize H&H processes in a Watershed, potential locations for interconnections must be included in the model.

We checked for interconnections using the modeled peak stages from the 500-year/24-hour simulation to identify missing overland flow interconnections between basins within the Watershed. Any missing interconnections identified were added to the model and the model

was rerun. Model simulations and missing interconnection checks were performed iteratively until no missing interconnections were identified.

Figure 27 Model Mass Balance Results



5.4 Model Calibration/Verification

The fully developed H&H model was verified against documented flooding conditions (photographs, videos, high water marks, etc.) that occurred during two recent extreme rainfall events—the September 14, 2024, event and Hurricane Milton. The H&H model was used to simulate the actual rainfall and tailwater conditions that occurred during these events, and the results were compared to the available flooding documentation.

The City also experienced significant flooding impacts during Hurricane Ian, but limited documentation of flooding was available to verify the model results. This event was simulated in the H&H model, but a results comparison to observed flooding was not completed due to the limited documentation.

Table 14 summarizes for each of the storm events the total rainfall, rainfall duration, and approximate return-period from the *NOAA Atlas 14* Precipitation Frequency Data Server (PFDS). Each of these events caused flooding throughout the City, particularly within Florida Shores, where several hundred homes flooded during Hurricane Ian. As shown in Table 14, the approximate return periods for all three of these rainfall events exceed the 25-year return period, with Hurricane Ian and the September 14, 2024, event exceeding a 200-year event. The City's stormwater system, like most municipal stormwater systems constructed

in the 1950s and 1960s before modern stormwater regulation and design standards, was not designed to handle these types of events without widespread flooding.

Table 14 Summary of Recent Extreme Rainfall Events in Edgewater

Storm Event	Rainfall Total (inches)	Rainfall Duration (hours)	Approximate Return Period (years)
Hurricane Ian	19	30	200–500
September 14, 2024	7	3.5	200–500
Hurricane Milton	10	24	25–50

Based on the modeled-versus-observed peak stage comparison results summarized in the following sub-sections for the September 14, 2024, event and Hurricane Milton, we are confident that the StormWise model provides an accurate representation of the City's stormwater drainage system.

5.4.1 September 14, 2024

The September 14, 2024, event was an isolated storm that caused widely varying rainfall depths between 2.5 and 7.05 inches across the City within 3.5 hours. Jones Edmunds verified the relative accuracy of the model results against photographs of flooding in the Florida Shores neighborhood provided by the City and online news articles.

Jones Edmunds downloaded 5-minute interval rainfall data from Wunderground.com from 15 weather stations in or just outside the modeled Watershed that appeared to have captured reliable data for the event. We used the data to develop rainfall distribution for the event for each weather station. We used the Thiessen polygon function within ArcGIS and the weather station locations to assign a rainfall distribution to each of the model sub-basins.

Figure 28 shows the locations of the weather stations with the station names and recorded rainfall depths at each station. The flooding during this event was rainfall-driven with normal tidal conditions in ML and the IRL. Therefore, no adjustments to node initial conditions or boundary time-stage relationships were made.

We simulated the event using the StormWise model and the Wunderground.com-derived rainfall distributions. Inundation areas were mapped based on the modeled node peak stages and the LiDAR DEM, and the inundation extents were compared to documented flooding at the following locations, which had photographs documenting the flooding extents. No surveyed high water mark data or water level recorder data were available to compare to for this event.

Figure 29 through Figure 36 compare the modeled flooding to the photographs at each of these locations. As shown in the figures, the modeled inundation aligns well with the observed flooding at each of these locations.

- 1426 Pine Tree Drive
- 2216 Umbrella Tree Drive
- 2303 Queen Palm Drive
- 2417 Pine Tree Drive
- 2505 Pine Tree Drive
- 2516 Unity Tree Drive
- 3015 Yulee Tree Drive
- 3230 Woodland Drive

Figure 28 September 14, 2024, Rainfall Gauge Locations and Rainfall Depths

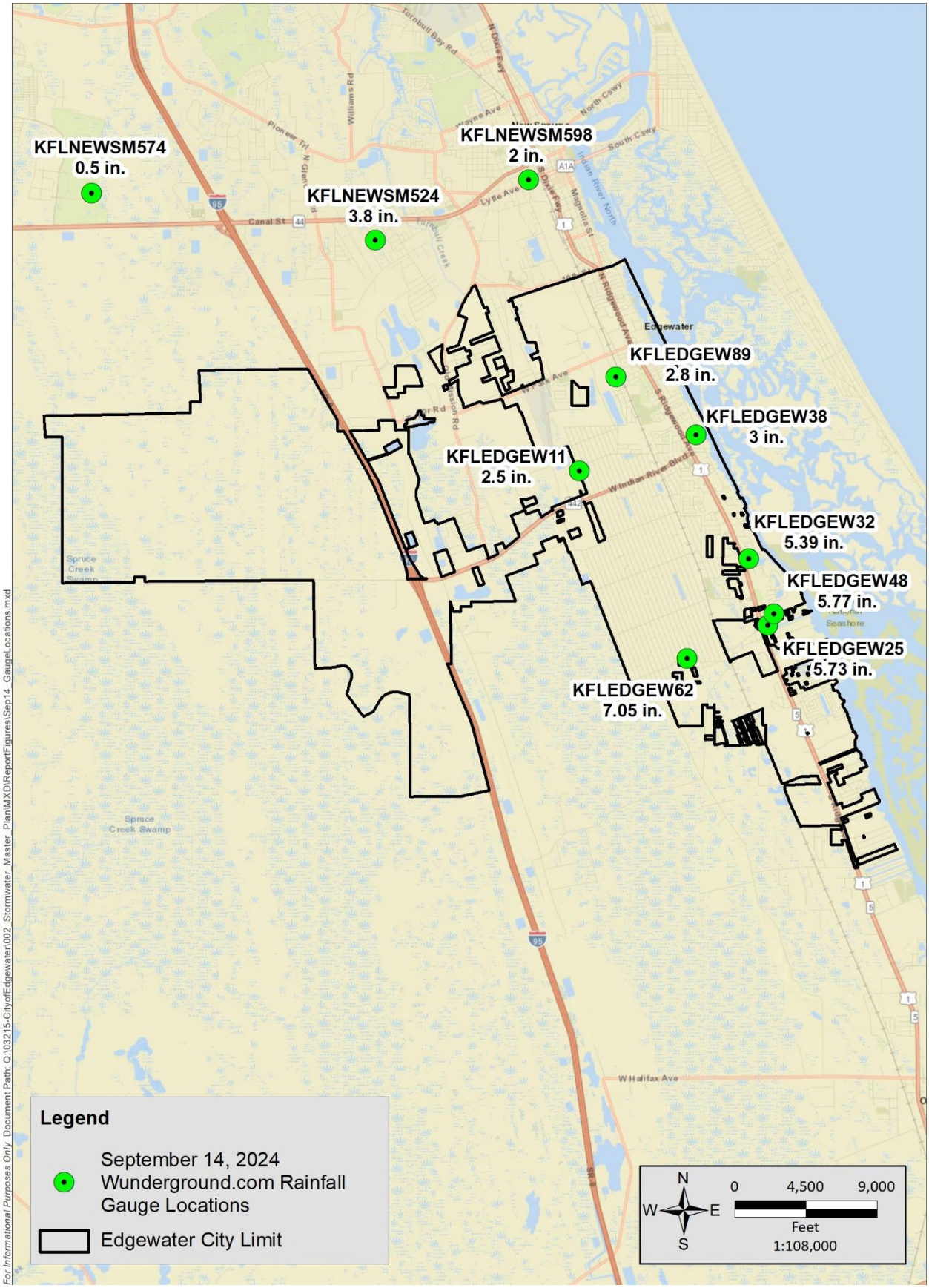


Figure 29 September 14, 2024, Flood Comparison at 1426 Pine Tree Drive





Figure 30 September 14, 2024, Flood Comparison at 2216 Umbrella Tree Drive



Figure 31 September 14, 2024, Flood Comparison at 2303 Queen Palm Drive

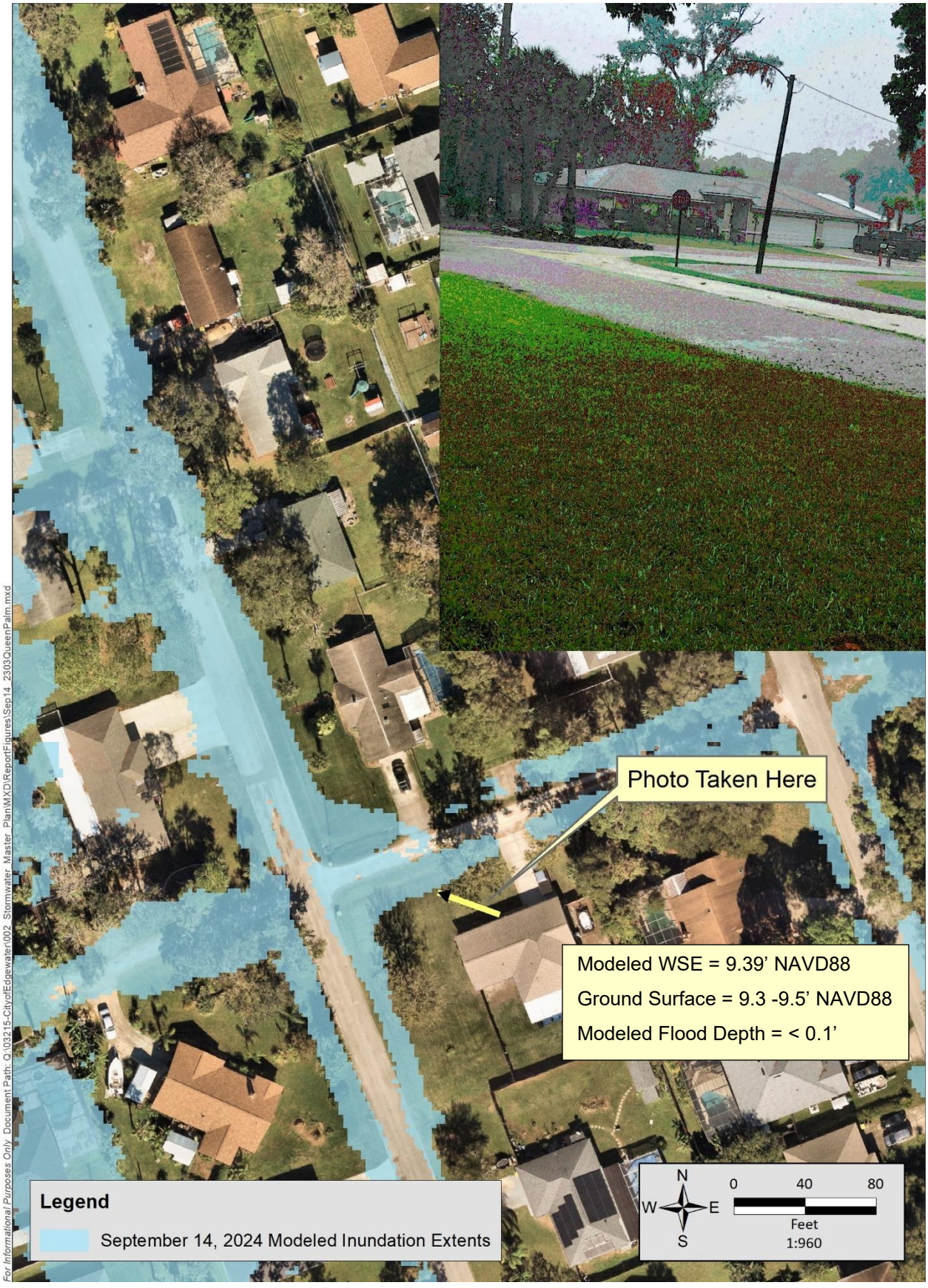


Figure 32 September 14, 2024, Flood Comparison at 2417 Pine Tree Drive



Figure 33 September 14, 2024, Flood Comparison at 2505 Pine Tree Drive

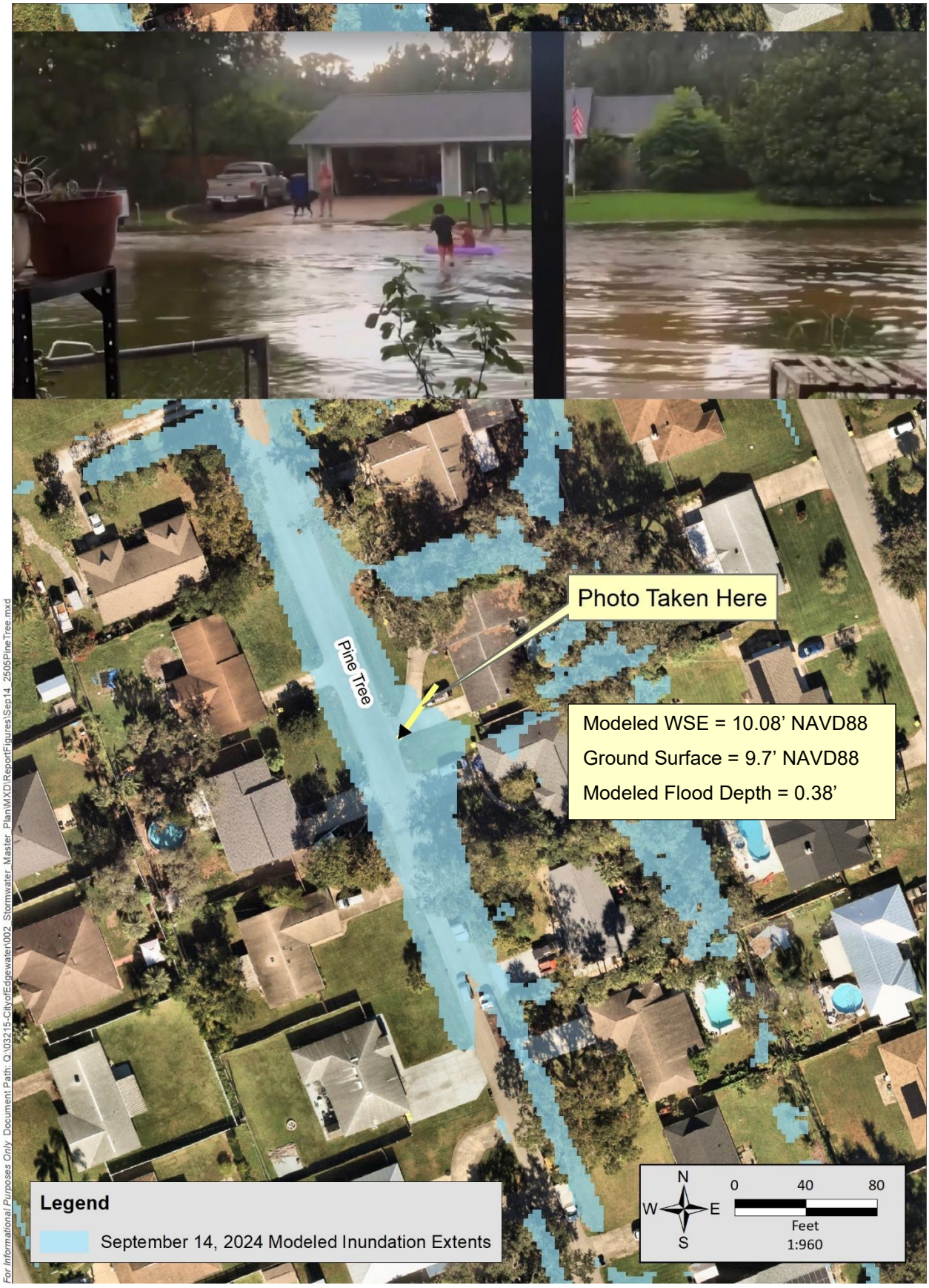


Figure 34 September 14, 2024, Flood Comparison at 2516 Unity Tree Drive



Figure 35 September 14, 2024, Flood Comparison at 3015 Yulee Tree Drive

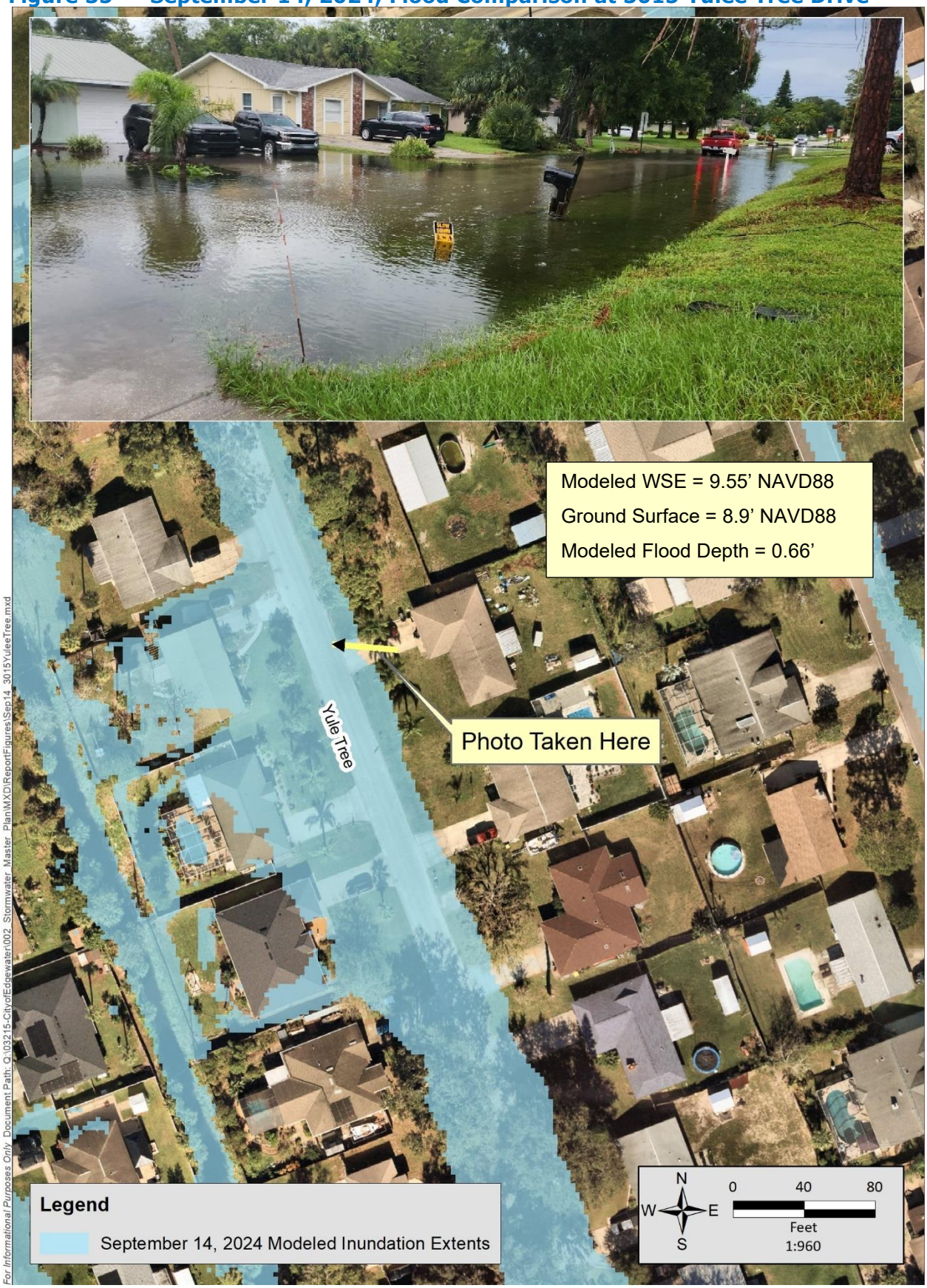


Figure 36 September 14, 2024, Flood Comparison at 3230 Woodland Drive



5.4.2 HURRICANE MILTON

Hurricane Milton created elevated tidal conditions in ML and IRL and dropped 8.8 to 13.0 inches of rainfall across the City between October 9 and October 10, 2024. Jones Edmunds used hourly Next Generation Weather Radar (NEXRAD) data from SJRWMD to develop rainfall distributions for each of the NEXRAD pixels within the modeled Watershed. The model sub-basins were spatially joined to the NEXRAD pixels to assign the appropriate NEXRAD rainfall distributions to the sub-basins. Figure 37 shows the NEXRAD pixels with the total rainfall depth distribution for the event. We also downloaded observed tidal gauge time-stage data for the event from the Haulover Canal USGS gauge (ID 2248380) and the Trident Pier NOAA gauge (ID 8721604). We used the data from Haulover Canal gauge to create a time-stage boundary condition for the IRL and the Trident Pier data to create a boundary condition for ML. Node initial conditions were updated as-needed based on the initial stages in the boundary node time-stage relationships. Figure 38 shows a plot of the cumulative rainfall distribution for one of the NEXRAD pixels in the Florida Shores neighborhood and boundary time-stage for ML and the IRL.

The storm event was simulated using the StormWise model, NEXRAD rainfall distributions, and tide gauge time-stage data for boundary conditions. Inundation areas were mapped based on the modeled node peak stages and the LiDAR DEM, and the inundation extents were compared to documented flooding at the following locations with photographs documenting the flooding extents. No surveyed high water mark data or water level recorder data were available to compare to for this event.

Figure 39 through Figure 45 compare the modeled flooding to the photographs at each of these locations. As shown in the figures, the modeled inundation aligns well with the observed flooding at each of these locations.

- Woodland Drive and 33rd Street
- Woodland Drive and 34th Street
- 2905 35th Street
- 1718 Lime Tree Drive
- 1426 Pine Tree
- 1202 12th Street
- Palmetto Street

Figure 37 NEXRAD Pixels with Total Rainfall Depths from Hurricane Milton

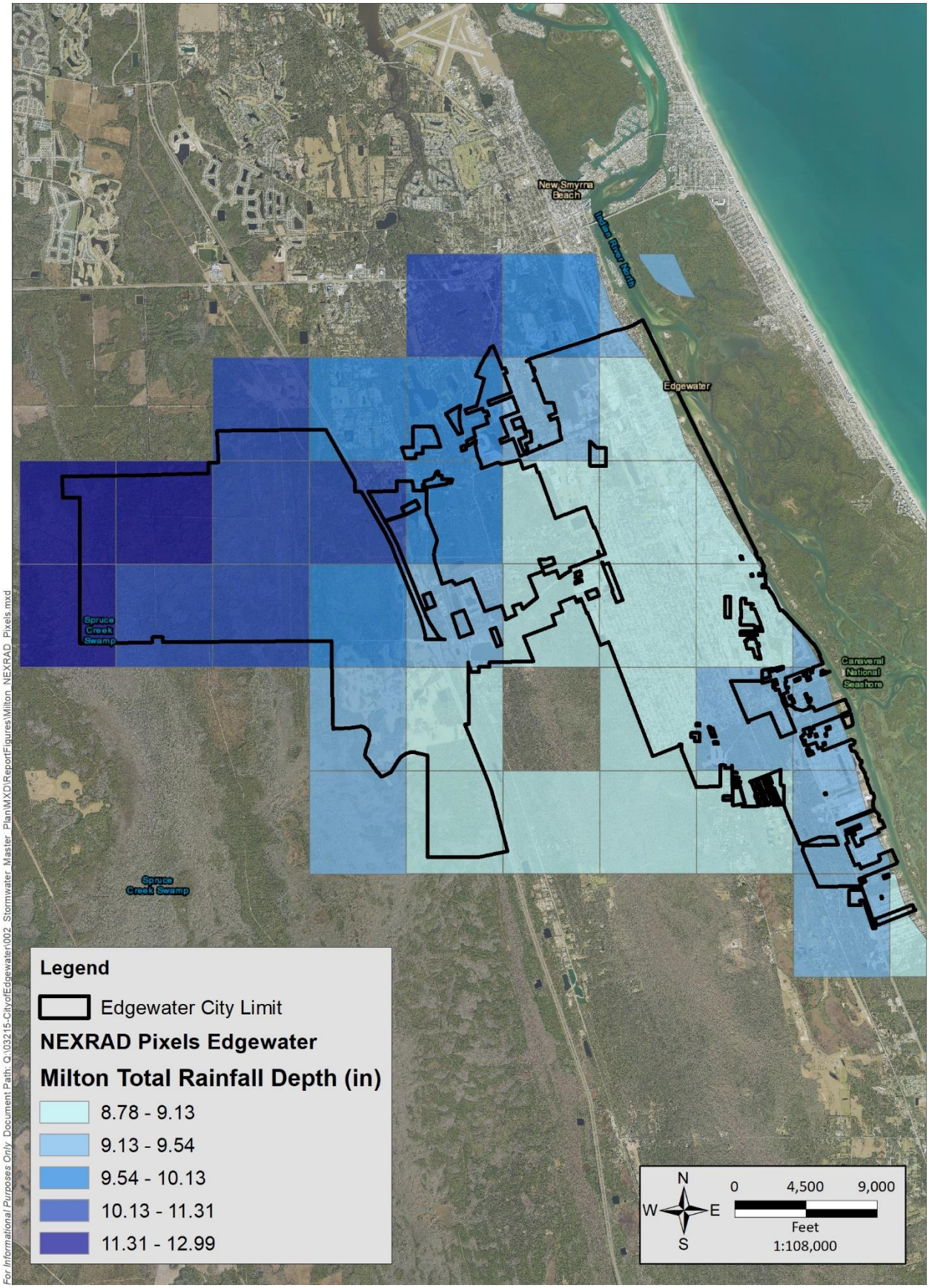


Figure 38 Hurricane Milton Rainfall Distribution and Tidal Boundary Conditions

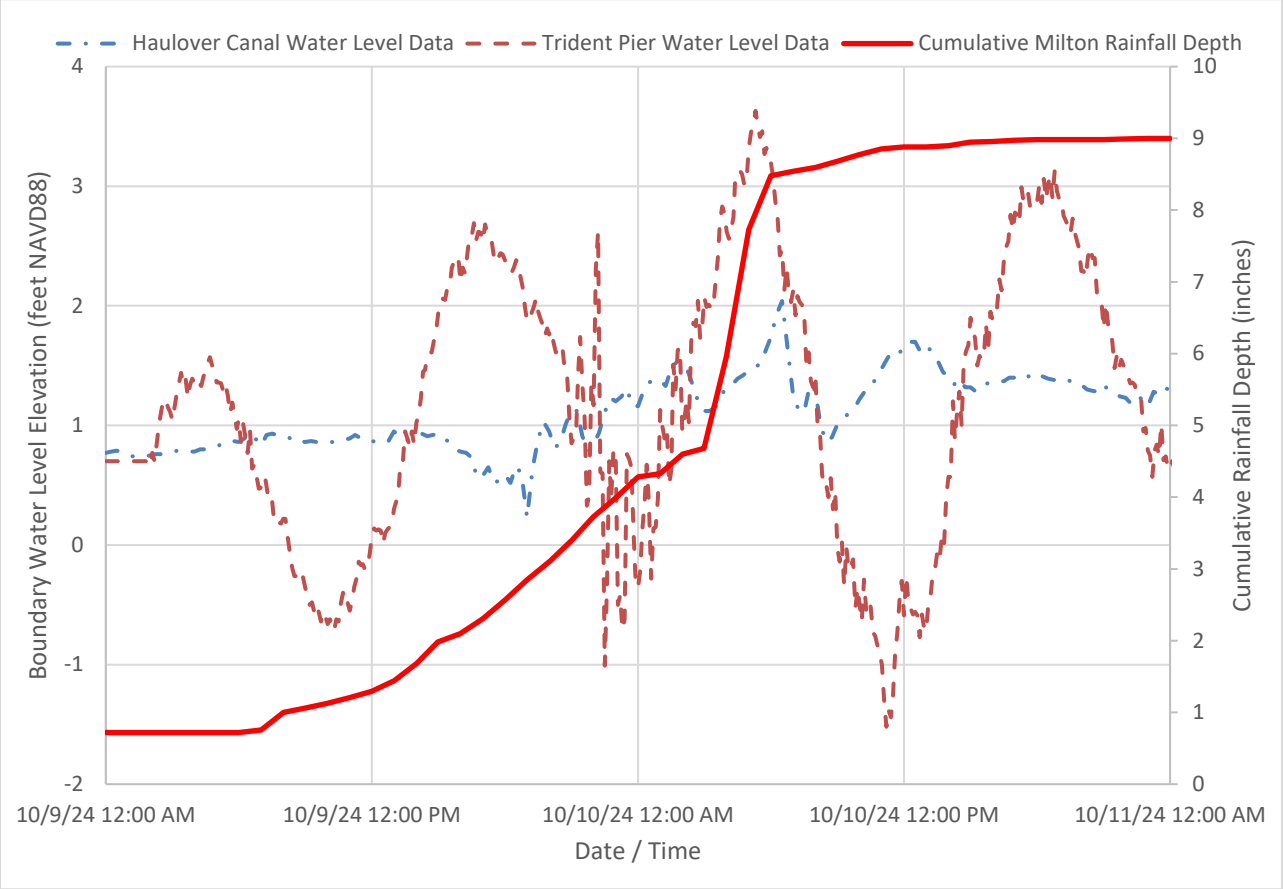


Figure 39 Hurricane Milton Flood Comparison at Woodland Drive and 33rd Street



Figure 40 Hurricane Milton Flood Comparison at Woodland Drive and 34th Street

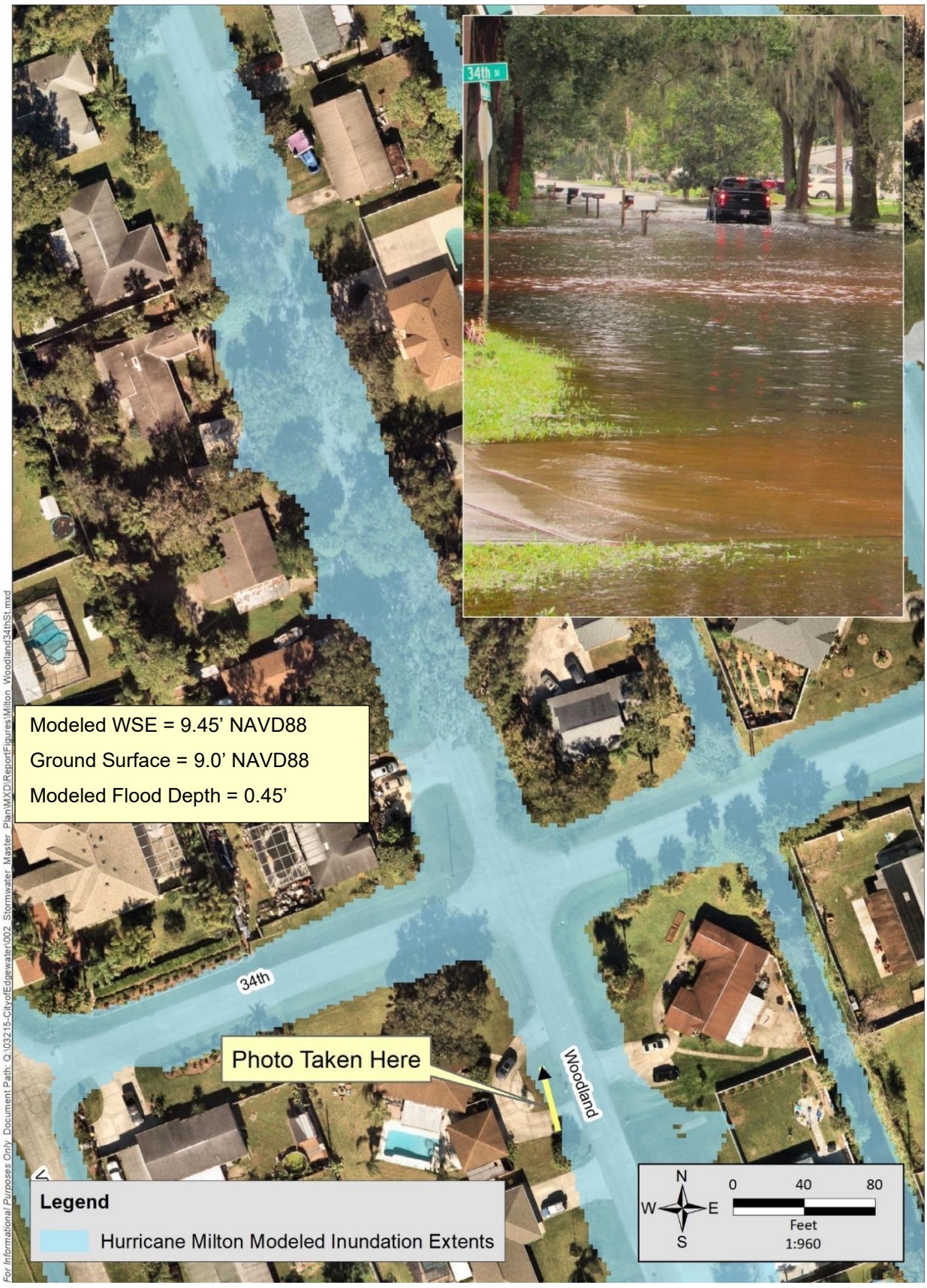


Figure 41 Hurricane Milton Flood Comparison at 2905 35th Street

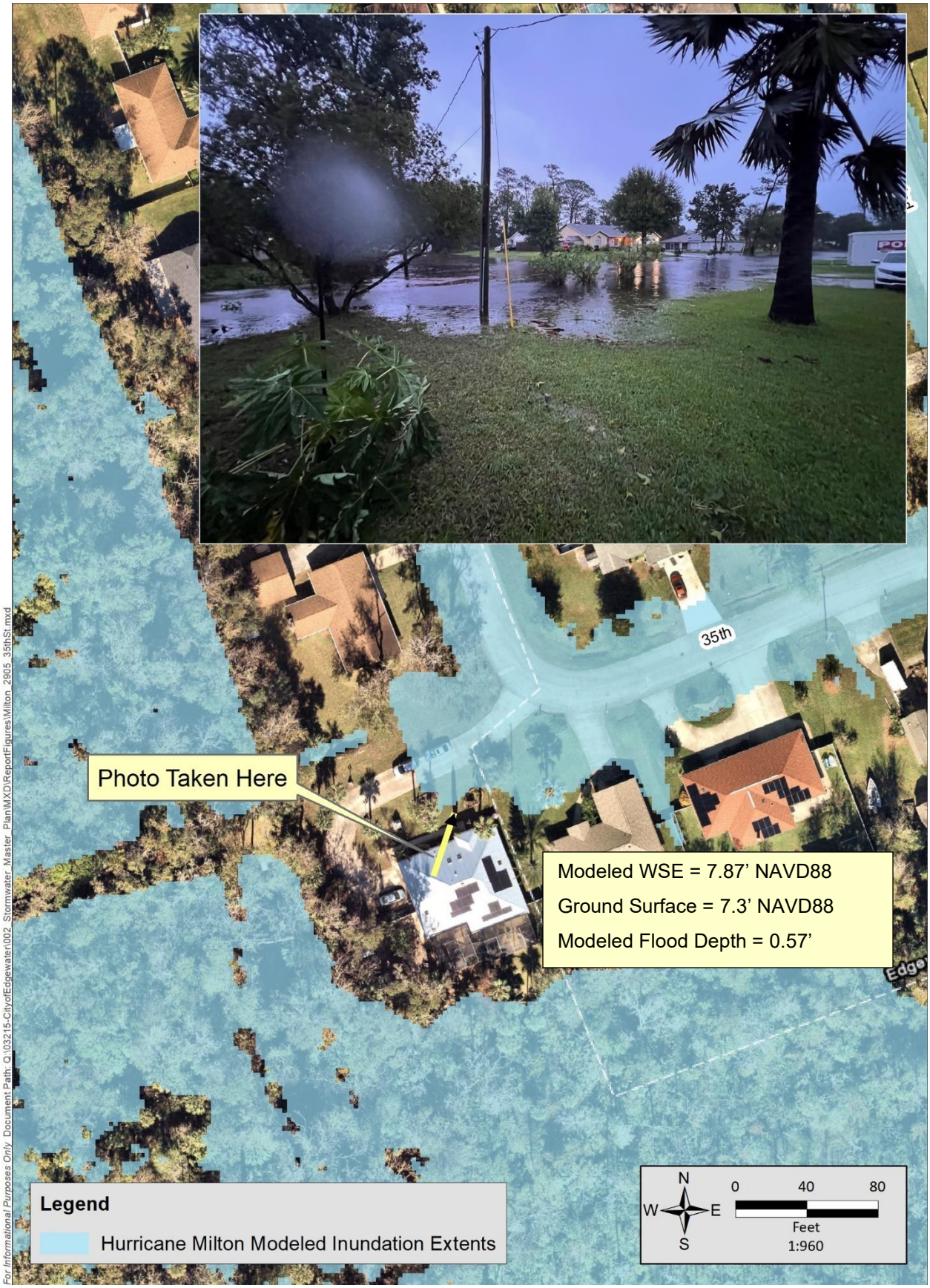


Figure 42 Hurricane Milton Flood Comparison at 1718 Lime Tree Drive



Figure 43 Hurricane Milton Flood Comparison at 1426 Pine Tree Drive



Figure 44 Hurricane Milton Flood Comparison at 1202 12th Street

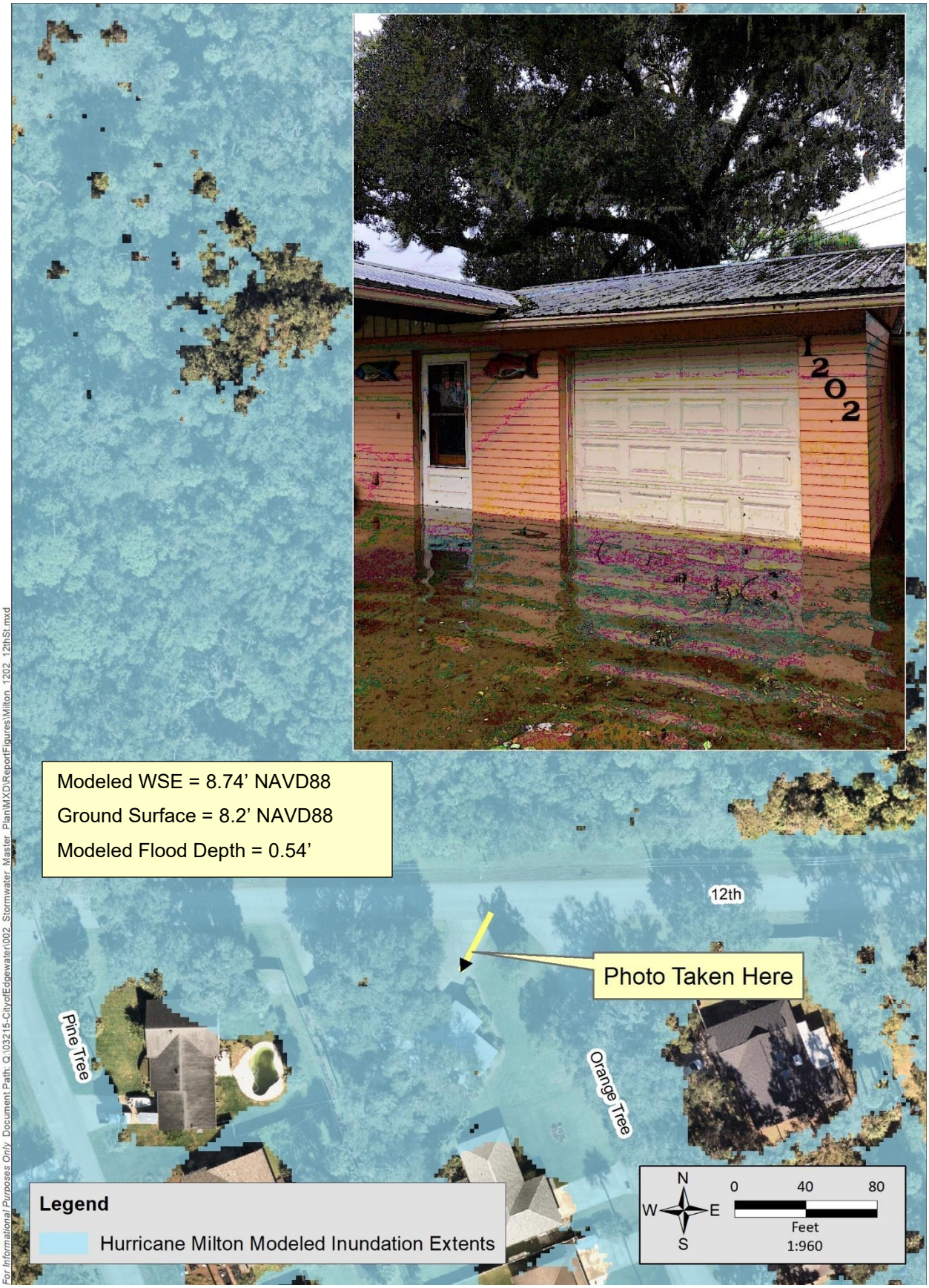


Figure 45 Hurricane Milton Flood Comparison at Palmetto Street



5.5 Design Storm Events and Inundation Mapping

Once the H&H model was developed, QA/QC'd, and verified, Jones Edmunds simulated the 2-year, 10-year, 25-year, 100-year, and 500-year 24-hour design storm events. We exported the node peak water surface elevations from StormWise for each of the events and plotted inundation areas within ArcGIS. The inundation areas represent where we would expect water to be ponded above the ground surface. They were plotted where the node peak water surface elevations exceeded the ground surface elevations in the LiDAR DEM. Figure 46 through Figure 50 show the plotted inundation areas for each of the design storm events.

Figure 46 2-Year/24-Hour Modeled Inundation Extents

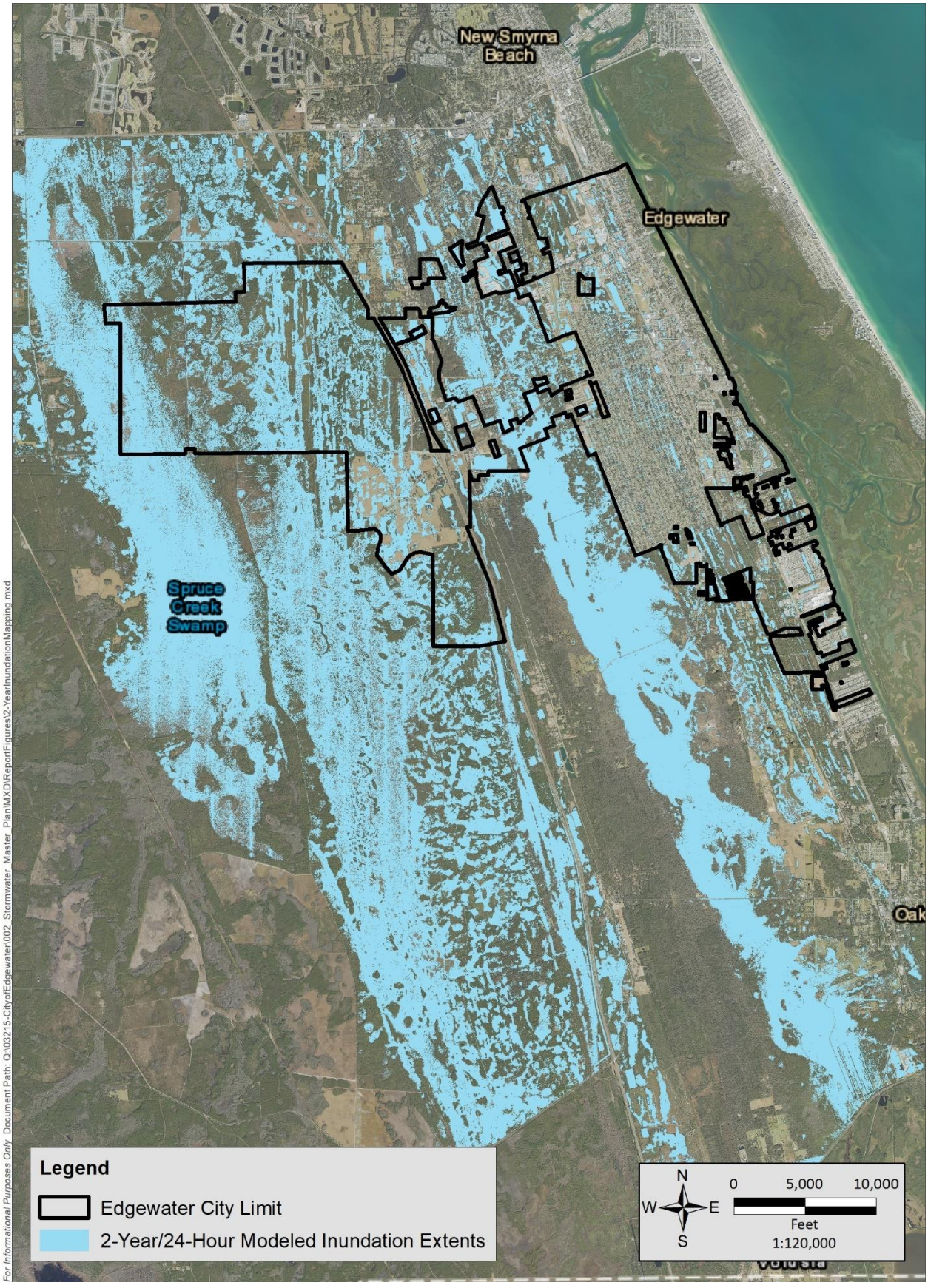


Figure 47 10-Year/24-Hour Modeled Inundation Extents

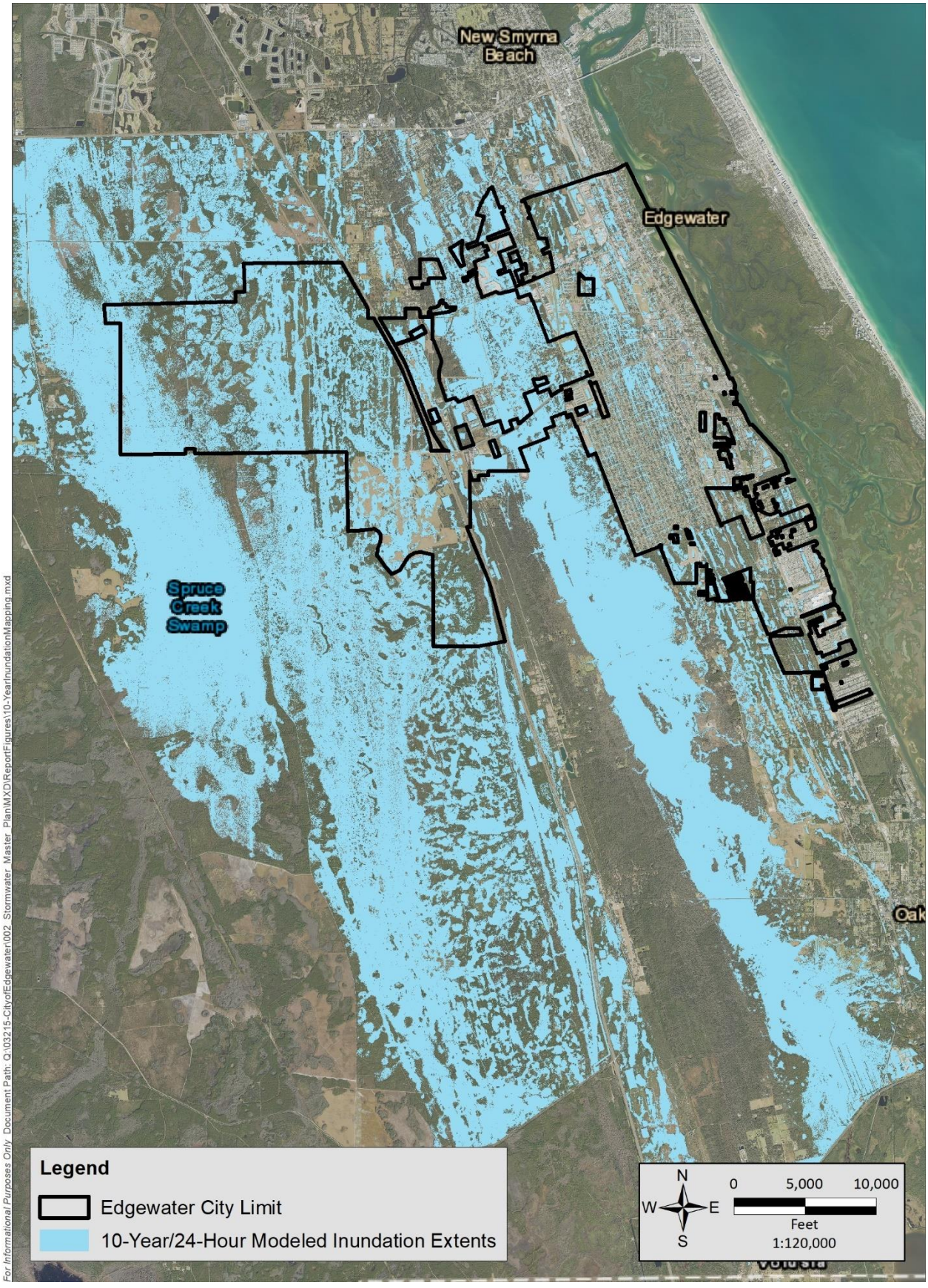


Figure 48 25-Year/24-Hour Modeled Inundation Extents

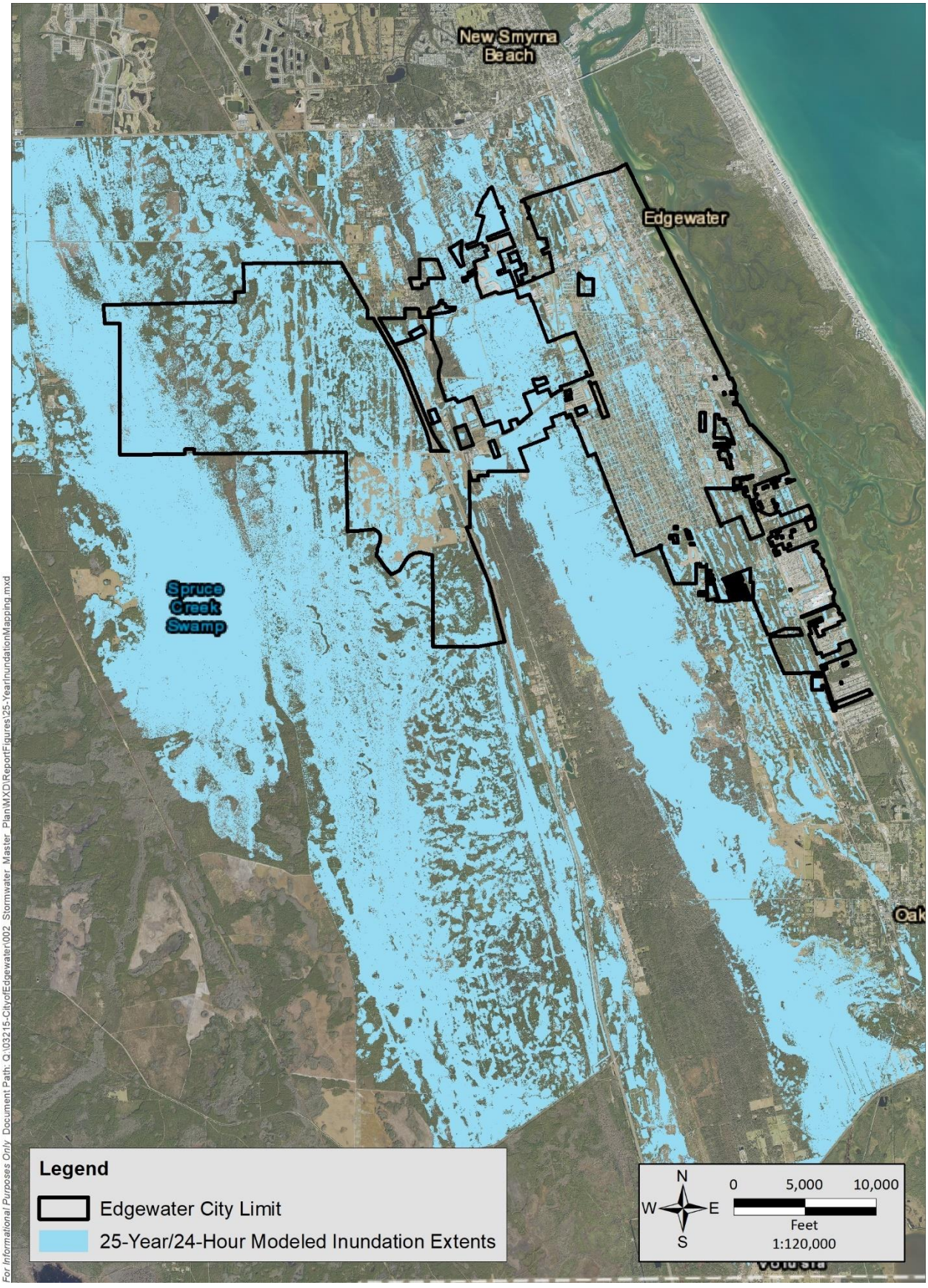


Figure 49 100-Year/24-Hour Modeled Inundation Extents

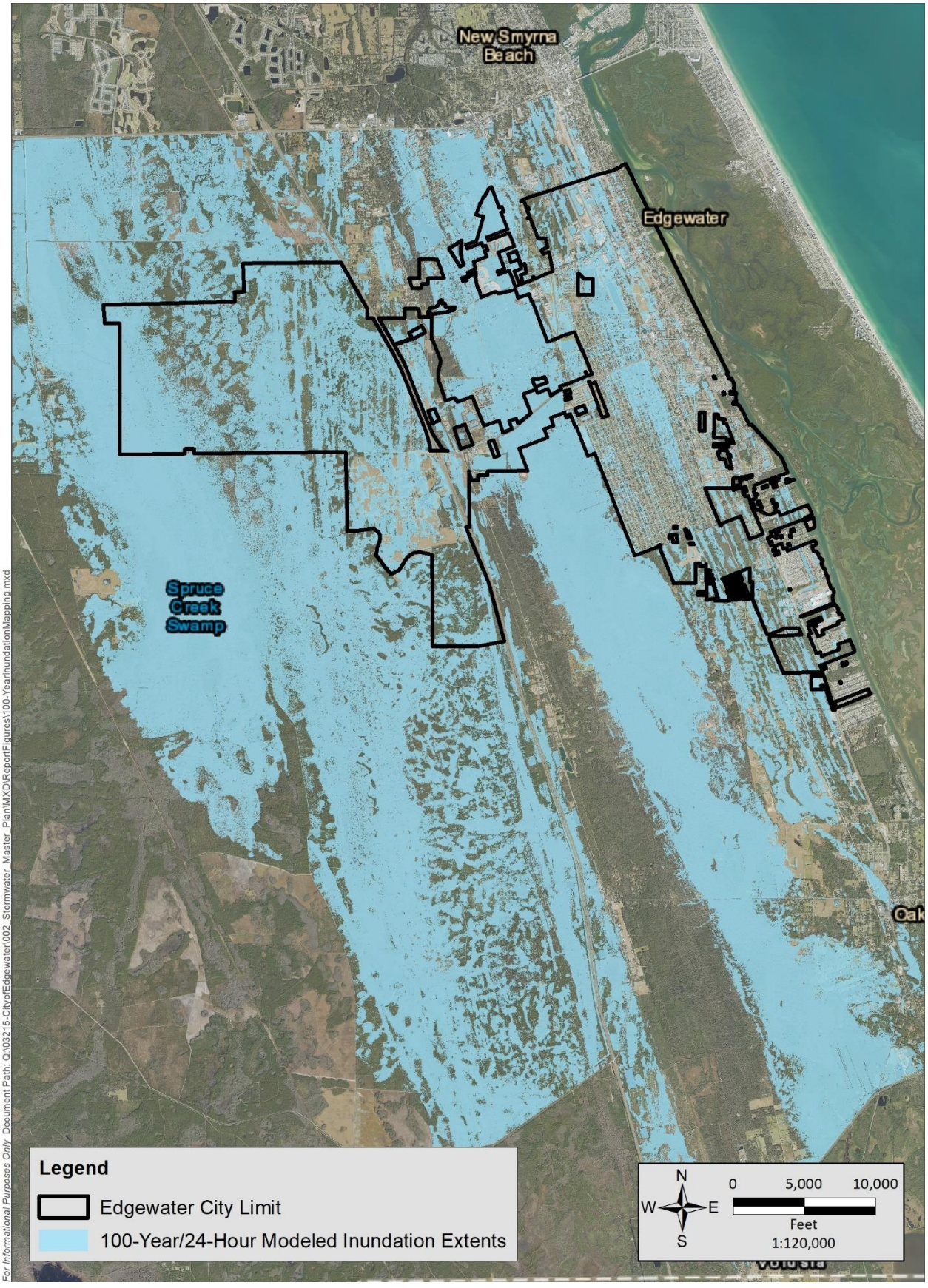
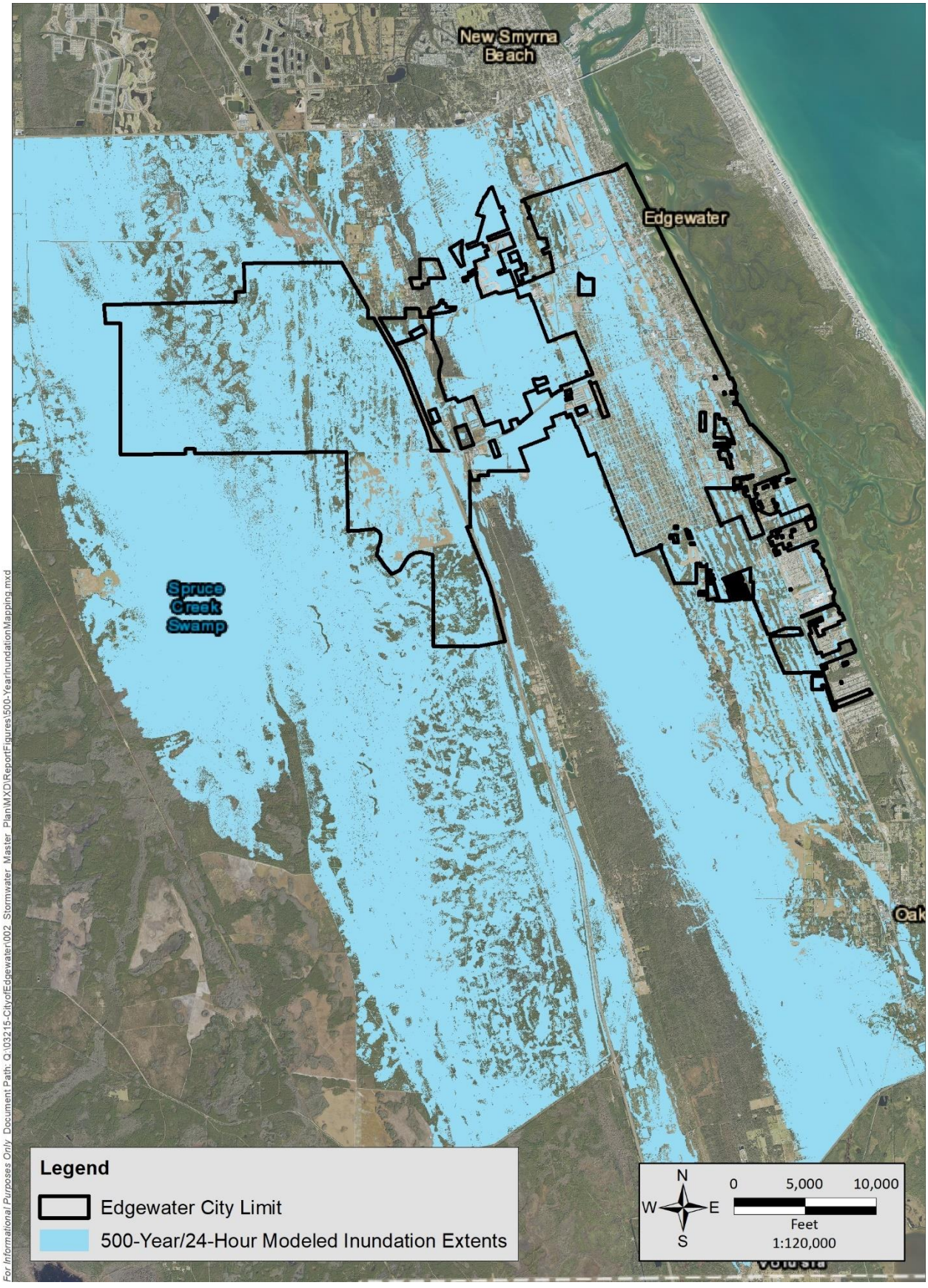


Figure 50 500-Year/24-Hour Modeled Inundation Extents



5.6 Future Conditions Modeling

Jones Edmunds developed future conditions model scenarios using the fully developed model to simulate 2040, 2070, and 2100 conditions with intermediate-low and intermediate sea level rise (SLR) projections. Updates to the model to simulate the future conditions scenarios included:

- Updating the tidally-influenced model boundary conditions to account for predicted future SLR based on NOAA's 2022 intermediate-low and intermediate SLR projections for each planning horizon.
- Incorporating planned future developments provided by the City into the model.
- Adjusting hydrologic parameters to account for soil storage reduction from projected SLR.
- Increasing design storm rainfall depths based on change factors from the Florida International University (FIU) Sea-Level Solutions Center (Updating the Statewide Extreme Rainfall Projections | Tableau Public) and the 50th percentile CORDEX model for the northcentral region.

The future conditions models were simulated for the 2-year, 10-year, 25-year, 100-year, and 500-year/24-hour design storm events and inundation areas were mapped for each scenario. The following sub-sections summarize the methodologies used to develop the future conditions model scenarios.

5.6.1 Tidally Influenced Boundary Condition Updates

Jones Edmunds downloaded the NOAA 2022 SLR projections for the Trident Pier tide station approximately 50 miles south of the Watershed. The projected change in sea level was calculated for 2040, 2070, and 2100 planning horizons using the intermediate-low and intermediate SLR scenario curves. The tidally influenced time-stage boundary conditions in ML and the IRL were updated for each future conditions scenario by adding the projected change in sea level to the MHHW values used for the existing conditions model. Table 15 summarizes the updated tidal boundary conditions used for each of the future condition scenarios.

Table 15 Future Conditions Model Tidally Influenced Boundary Conditions

Boundary Location	Existing MHHW Boundary Condition (NAVD88)	SLR Projection Scenario	Future Condition Planning Horizon MHHW Boundary Condition (NAVD88)		
			2040	2070	2100
ML	1.6	Intermediate-Low	1.99	2.64	3.30
		Intermediate	2.01	3.06	4.83
IRL	-0.16	Intermediate-Low	0.23	0.88	1.54
		Intermediate	0.25	1.30	3.07

5.6.2 Future Developments

Jones Edmunds received initial design plans, stormwater design calculations, and/or stormwater modeling data for five new developments that are currently in the planning

process within the City's limits. The new developments include the following, also shown in Figure 51:

- Crestwood – A proposed 254-unit subdivision in south Edgewater between US-1 and the FEC railroad south of Clinton Cemetery Road.
- Havensound – A proposed 135-lot single family home subdivision in the City, northeast of the US-1 and Myrtle Street intersection.
- Space Coast Commerce – A proposed 83-acre commercial/industrial site at the north end of Parktowne Boulevard.
- City Public Works Facility – A proposed new 20-acre public works facility for the City at the north end of Dale Street.
- Deering Park North and Deering Park Center – A proposed mixed-use planned unit development west of I-95 with approximately 1,400 acres of developed land use.

Jones Edmunds incorporated each of the proposed new developments into the City's StormWise model based on site development and stormwater design information available at the time of the future conditions model development. Table 16 summarizes the impervious percentage, discharge location, and modeled buildout status for each of the future developments.

Table 16 Summary of Future Development Impervious/DCIA, Discharge Location, and Modeled Buildout Status

Future Development	Total Impervious Percentage	Outfall Location Description	Buildout Status
Crestwood	39	Outfalls into the Ariel Canal ditch system.	Full Buildout Modeled
Havensound	28	Outfalls to the ML.	Full Buildout Modeled
Space Coast Commerce	30	Outfalls to the Gabordy Canal.	Full Buildout Modeled
City Public Works Facility	60	Outfalls to the wetlands east of the proposed site.	Full Buildout Modeled
Deering Park North and Deering Park Center	58	Outfalls into Little Cow Creek west of I-95.	Full Buildout Modeled but does not include other future Deering Park Phases.

5.6.3 Hydrologic Parameter Adjustments for Reduced Soil Storage

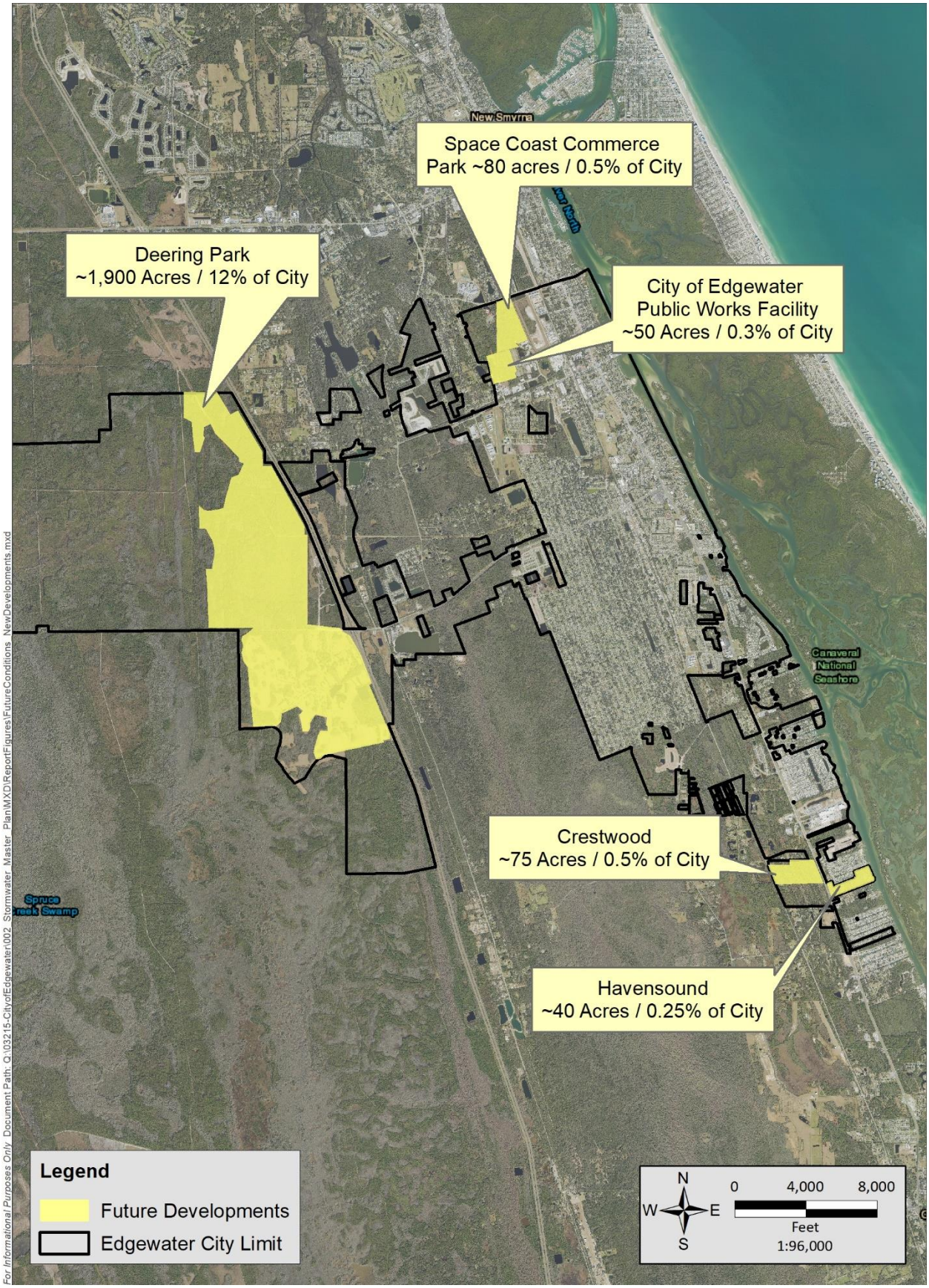
Jones Edmunds adjusted basin CNs to reflect hydrologic conditions with decreased soil storage from higher groundwater tables created by SLR. We expect that groundwater levels will be higher because of consistently higher tides holding water back in the soil column. This will reduce the amount of soil storage available for runoff to infiltrate into and will increase the amount of runoff during storm events. The decrease in soil storage will be more marked in lower-lying areas directly adjacent to tidally influenced waterbodies and ditches.

We assumed that the increase in groundwater table elevation would not impact areas with a surface elevation above 10 feet NAVD88, as they would be high enough above sea level to

experience impacts from SLR. We assumed that the increase in groundwater table elevation will decrease at a linear rate as the surface elevation increases, with the change going to 0 once the surface elevation reaches 10-feet NAVD88. These assumptions are planning-level assumptions based on our engineering judgment. A detailed groundwater model would be required to understand the effects of SLR on groundwater table elevations but is outside the scope and budget of this project. We could not identify any research that had already been completed in this region to estimate the relationship between the increases in groundwater level from SLR versus reduction in soil storage.

We calculated the increase in groundwater table elevation throughout the Watershed based on this linear relationship. We used the increase in groundwater table elevation and the UF IFAS soil properties to calculate the soil storage reduction that would occur at 1-foot increments of elevation change from elevation 0 to elevation 10 feet NAVD88 in each basin. We calculated the resulting total soil storage available for runoff infiltration at each 1-foot increment and used TR-55 CN relationships to calculate the resulting open land CNs that would result from the reduced soil storage capacity at the 1-foot increments. Finally, we recalculated weighted composite CNs for all the basins using the updated CNs for the 1-foot elevation increment and the existing basin CN for the areas greater than 10 feet NAVD88. The average open land CN increased from 65 in the Existing Conditions Model to 66 in the 2040 Conditions Models, 68 in the 2070 Conditions Models, and 69 in the 2100 Conditions Models.

Figure 51 Future Conditions Model New Development Locations



5.6.4 Rainfall Depth Updates

To model future conditions rainfall-induced flooding, Jones Edmunds collected rainfall change factors from FIU's Sea-Level Solutions Center (Updating the Statewide Extreme Rainfall Projections | Tableau Public) based on the 50th percentile CORDEX model for the northcentral region. The CORDEX dataset includes many model projections of future rainfall changes from different climate models and scenarios. The 50th percentile values represent the average change factors from the models and scenarios that were evaluated. Table 17 shows the change factors that we used from the FIU website and the resulting rainfall depth ranges for the required 2040, 2070, and 2100 planning horizons.

Table 17 Rainfall Change Factors and Future Conditions Rainfall Depths

Storm Event	2040 Change Factor	2070 Change Factor	2100 Change Factor	Existing Rainfall Depth (inches)	2040 Rainfall Depth (inches)	2070 Rainfall Depth (inches)	2100 Rainfall Depth (inches)
2-Year/24-Hour	1.14	1.24	1.24	4.7	5.36	5.83	5.83
10-Year/24-Hour	1.15	1.26	1.26	7.4	8.51	9.32	9.32
25-Year/24-Hour	1.17	1.29	1.29	9.4	11	12.13	12.13
100-Year/24-Hour	1.2	1.35	1.35	13.1	15.72	17.69	17.69
500-Year/24-Hour	1.21	1.38	1.38	18.2	22.02	25.12	25.12

5.6.5 Future Conditions Design Storm Events and Inundation Mapping

Once the future conditions H&H model scenarios were developed, we simulated the 2-year, 10-year, 25-year, 100-year, and 500-year 24-hour design storm events for each scenario. We exported the node peak water surface elevations from StormWise for each of the events and plotted inundation areas within ArcGIS. The inundation areas represent where we expect water to be ponded above the ground surface. They were plotted where the node peak water surface elevations exceeded the ground surface elevations in the LiDAR DEM. Figure 52 through Figure 66 show the plotted inundation areas for each of the design storm events for the Intermediate SLR scenarios relative to the existing conditions model inundation results.

Figure 52 2-Year/24-Hour Inundation – 2040 Intermediate SLR

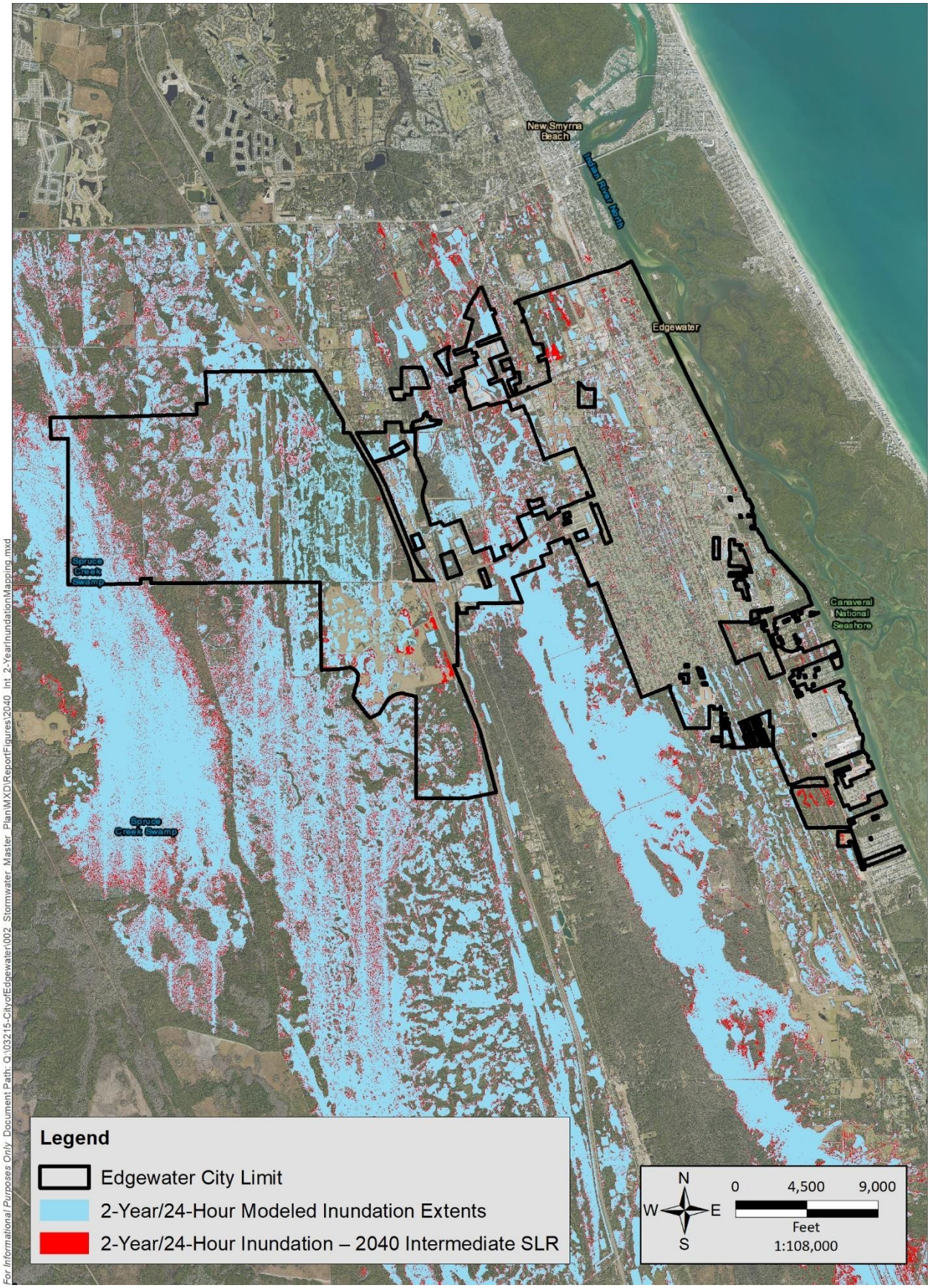


Figure 53 10-Year/24-Hour Inundation – 2040 Intermediate SLR

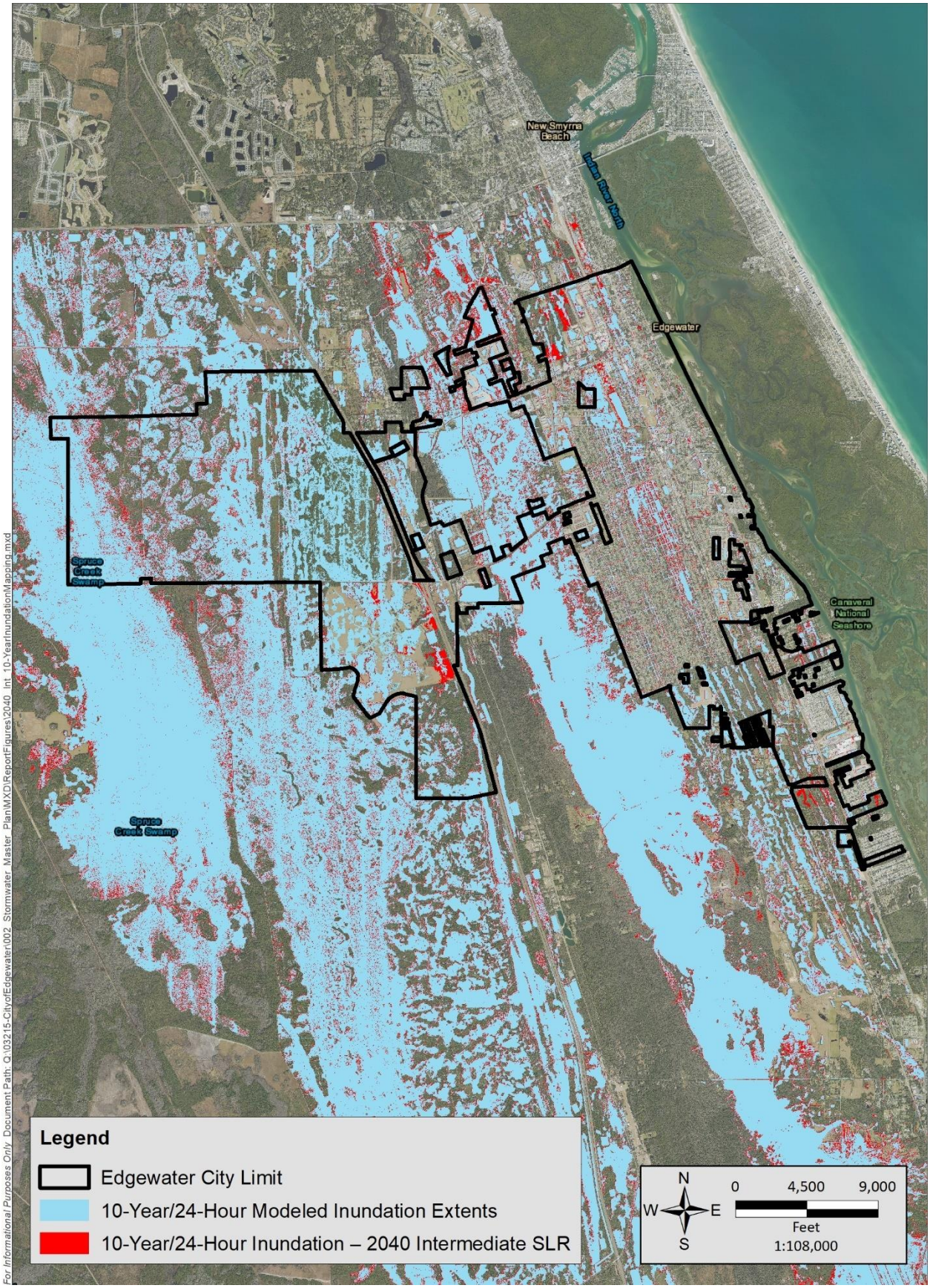


Figure 54 25-Year/24-Hour Inundation – 2040 Intermediate SLR

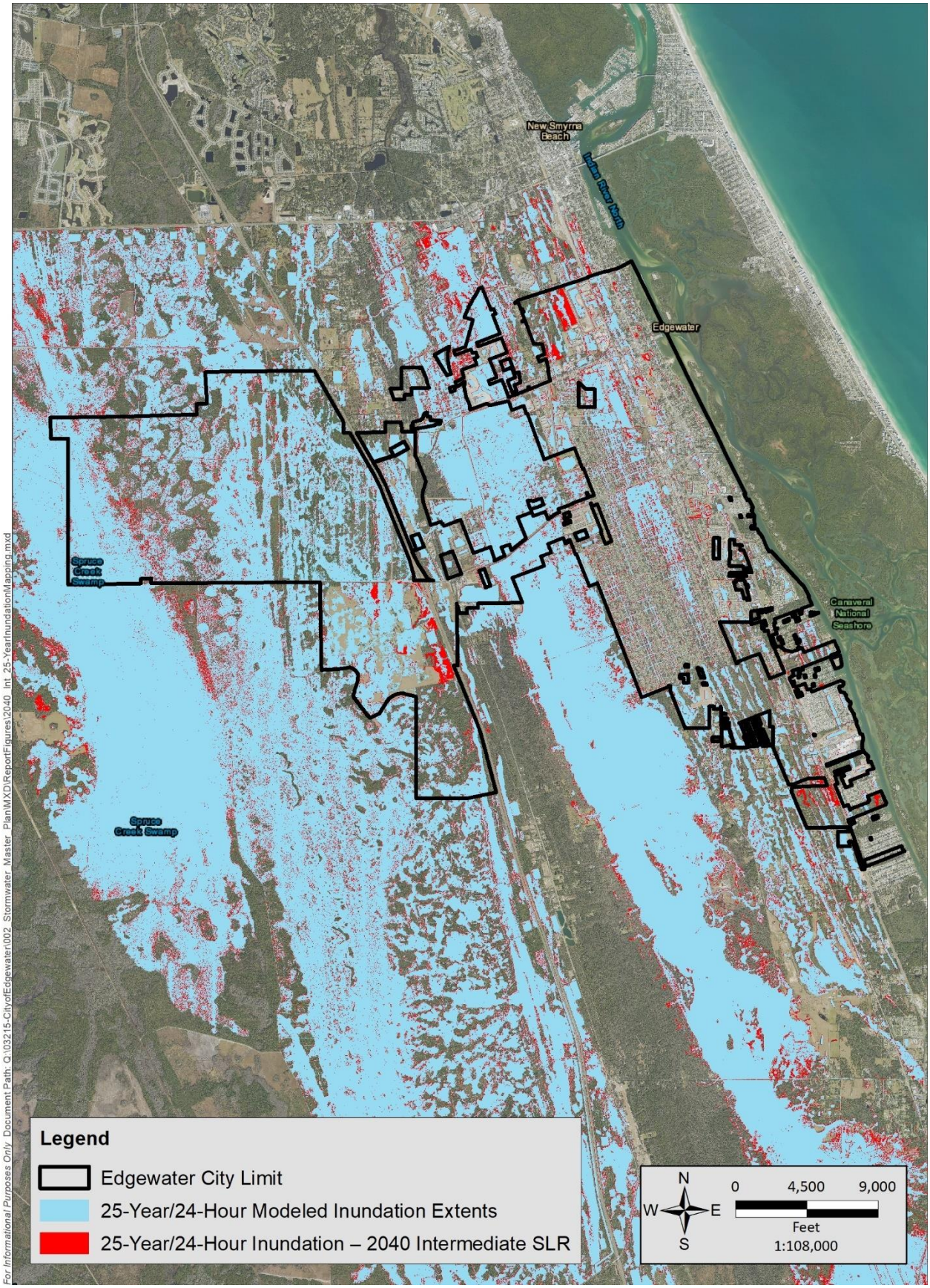


Figure 55 100-Year/24-Hour Inundation – 2040 Intermediate SLR

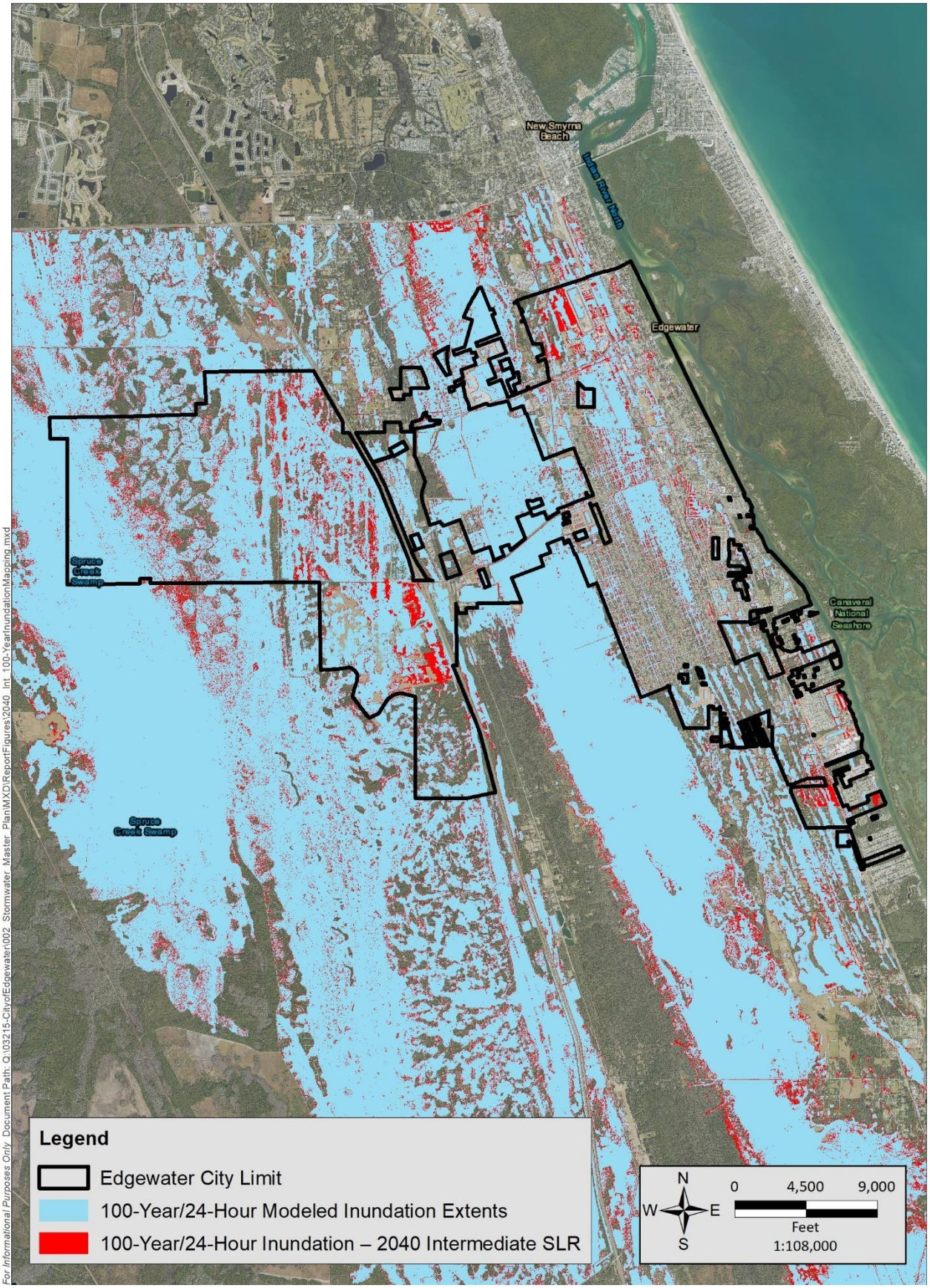


Figure 56 500-Year/24-Hour Inundation – 2040 Intermediate SLR

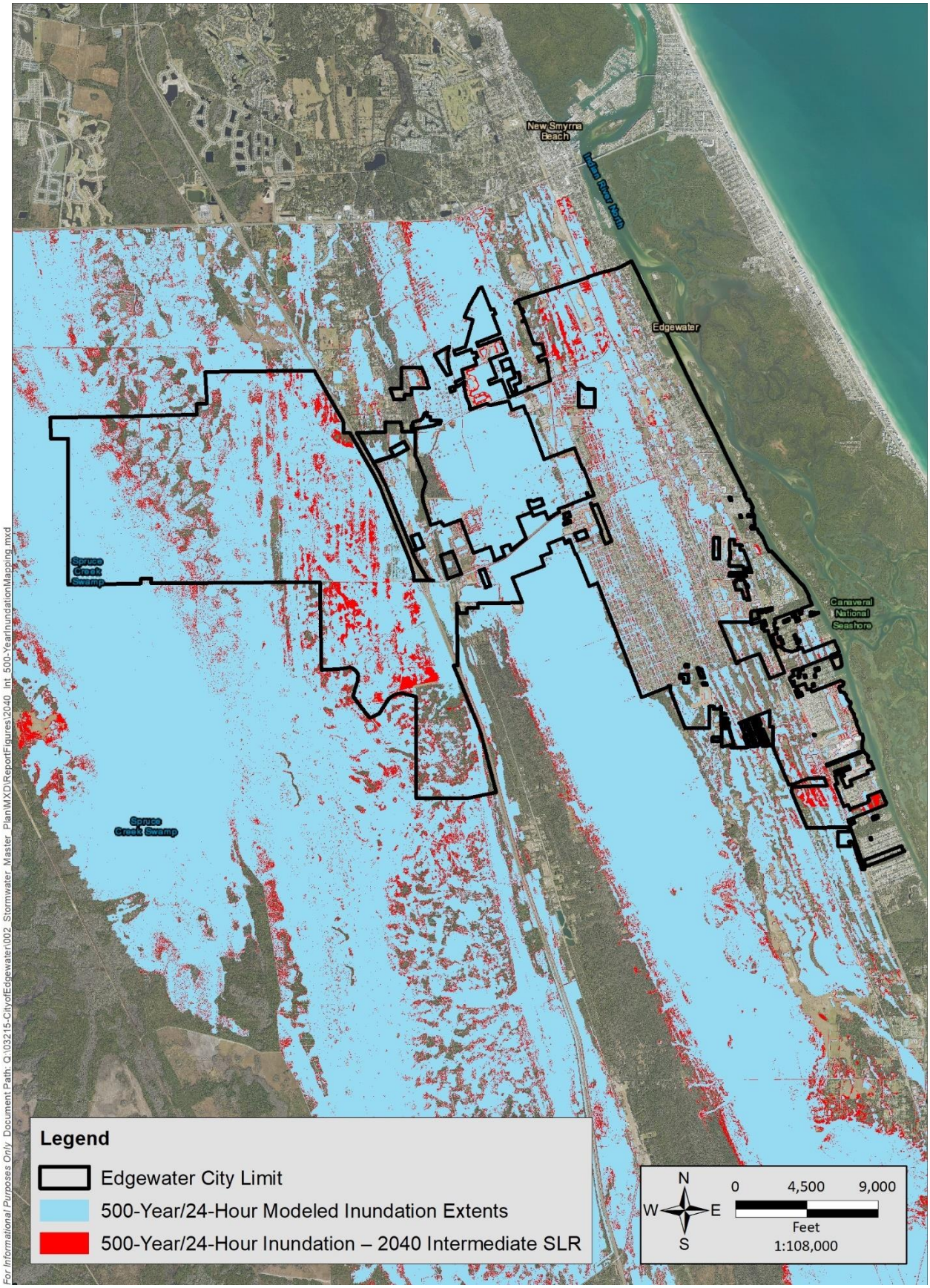


Figure 57 2-Year/24-Hour Inundation – 2070 Intermediate SLR

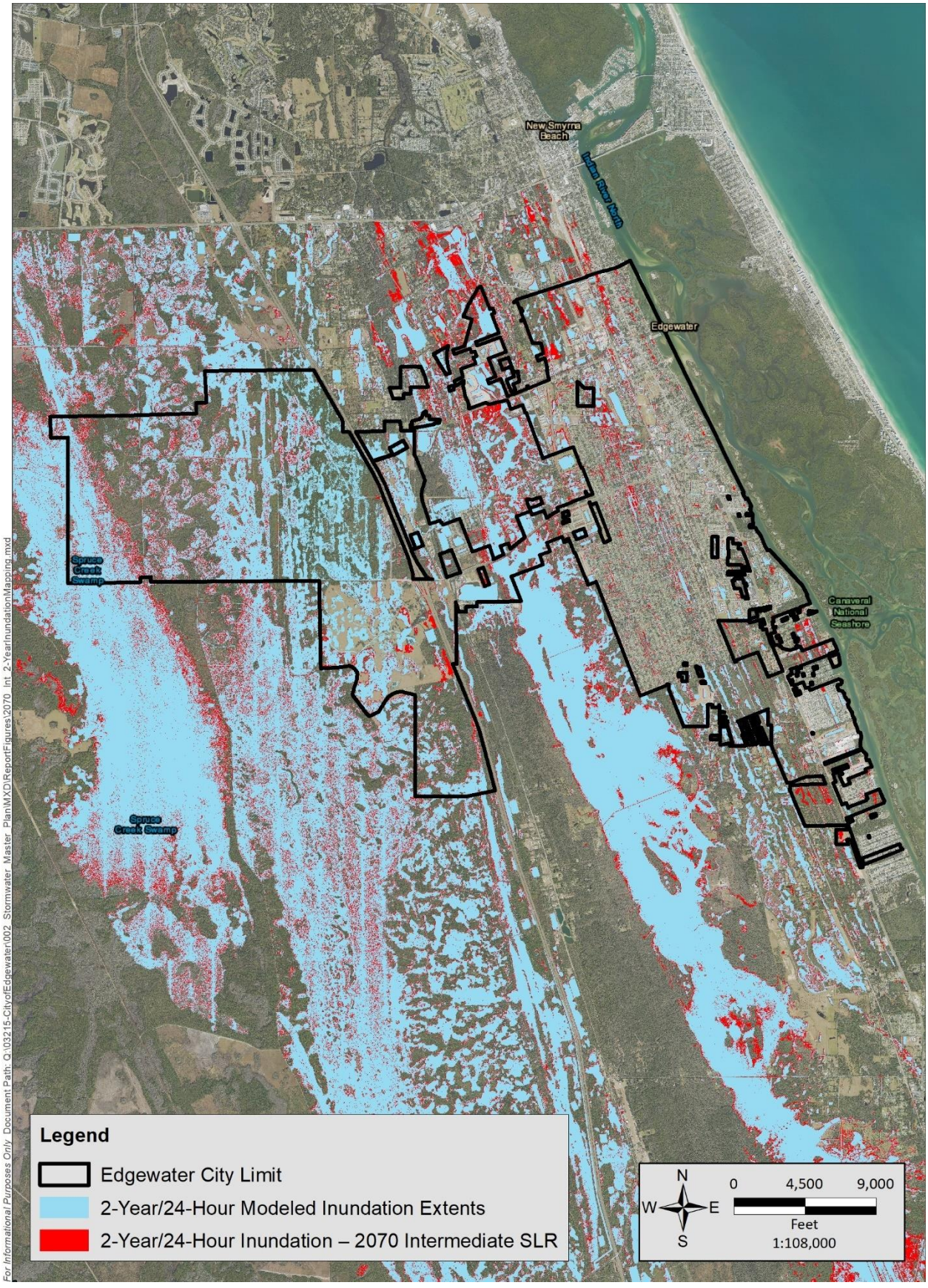


Figure 58 10-Year/24-Hour Inundation – 2070 Intermediate SLR

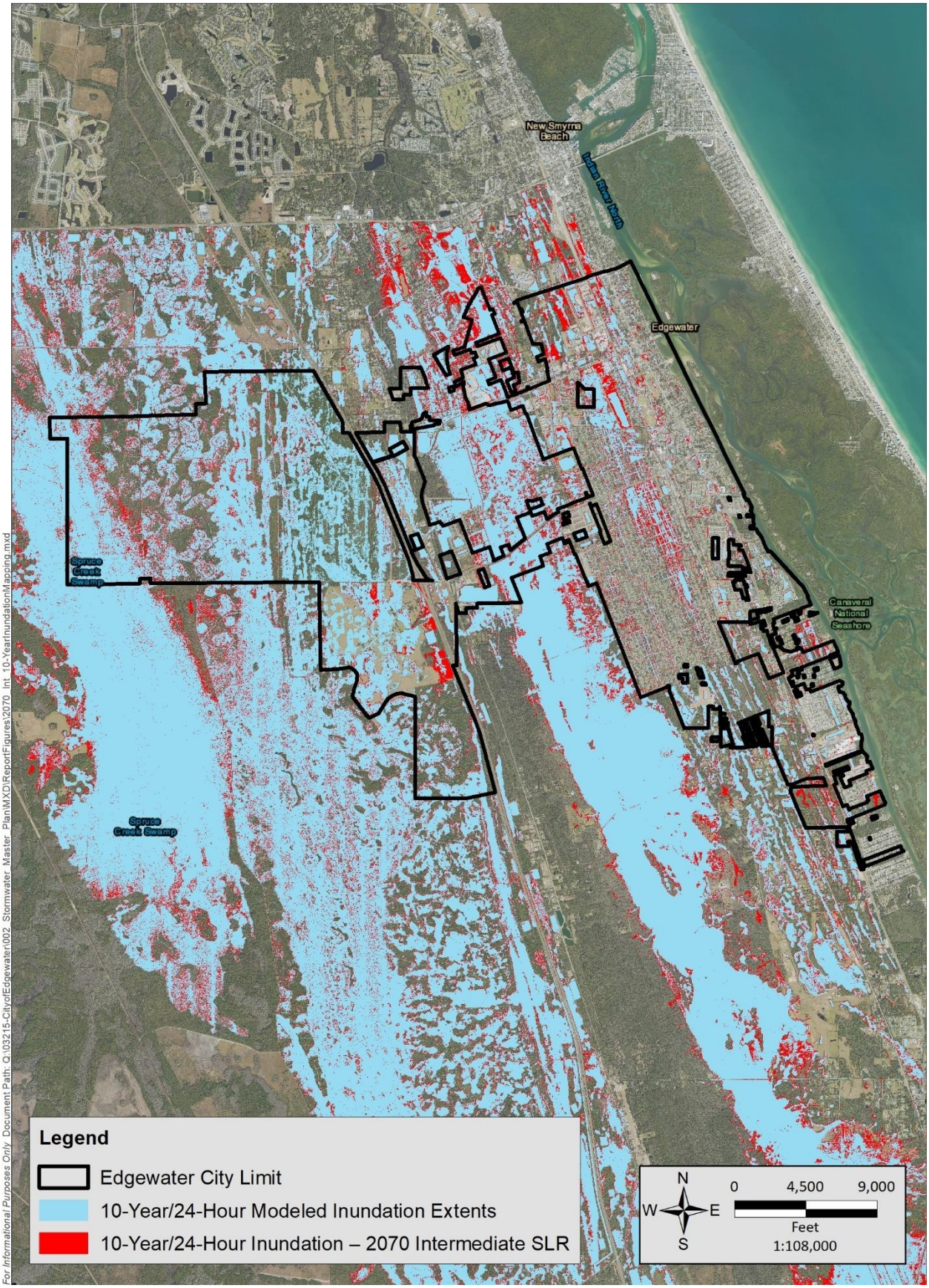


Figure 59 25-Year/24-Hour Inundation – 2070 Intermediate SLR

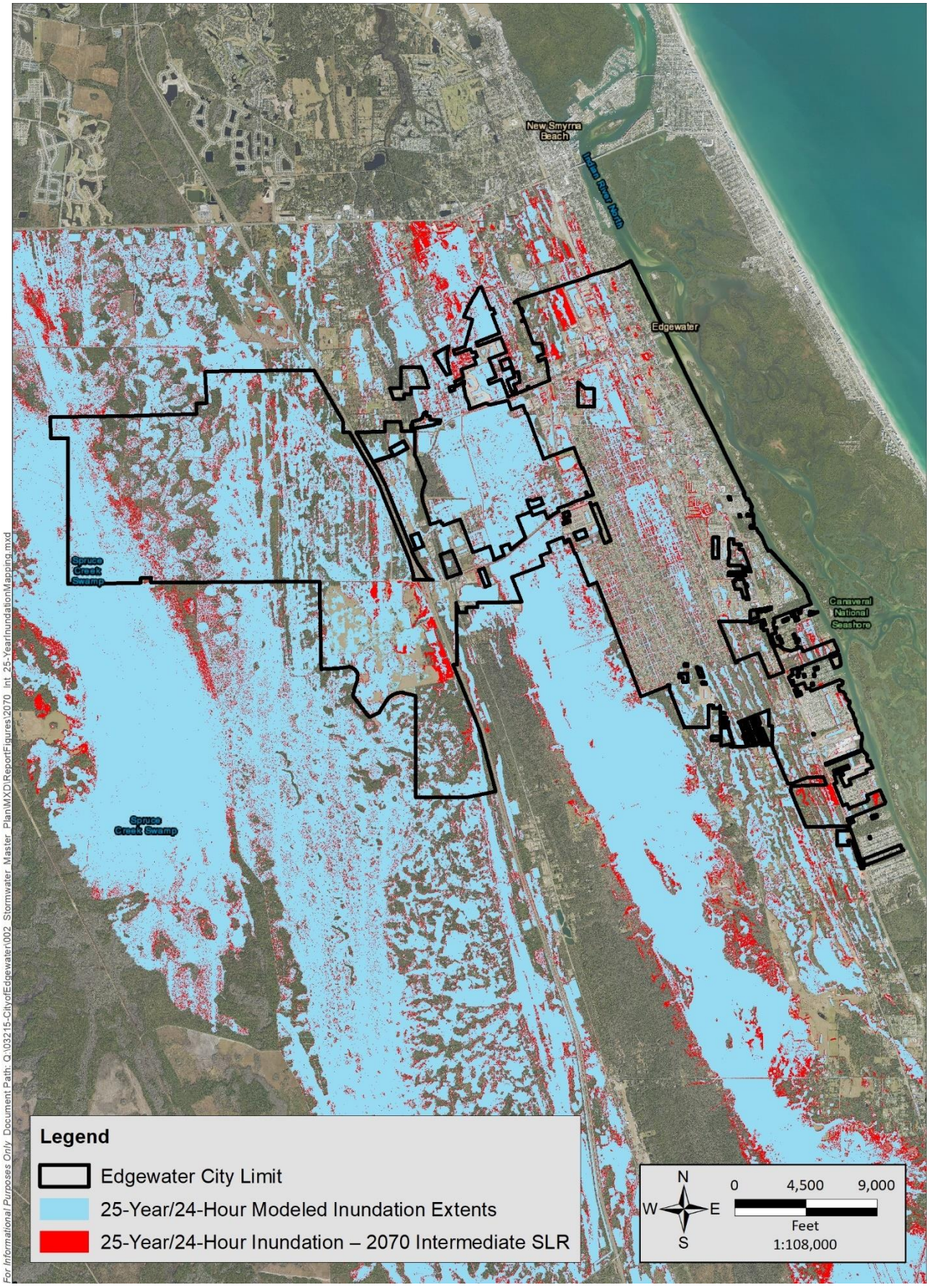


Figure 60 100-Year/24-Hour Inundation – 2070 Intermediate SLR

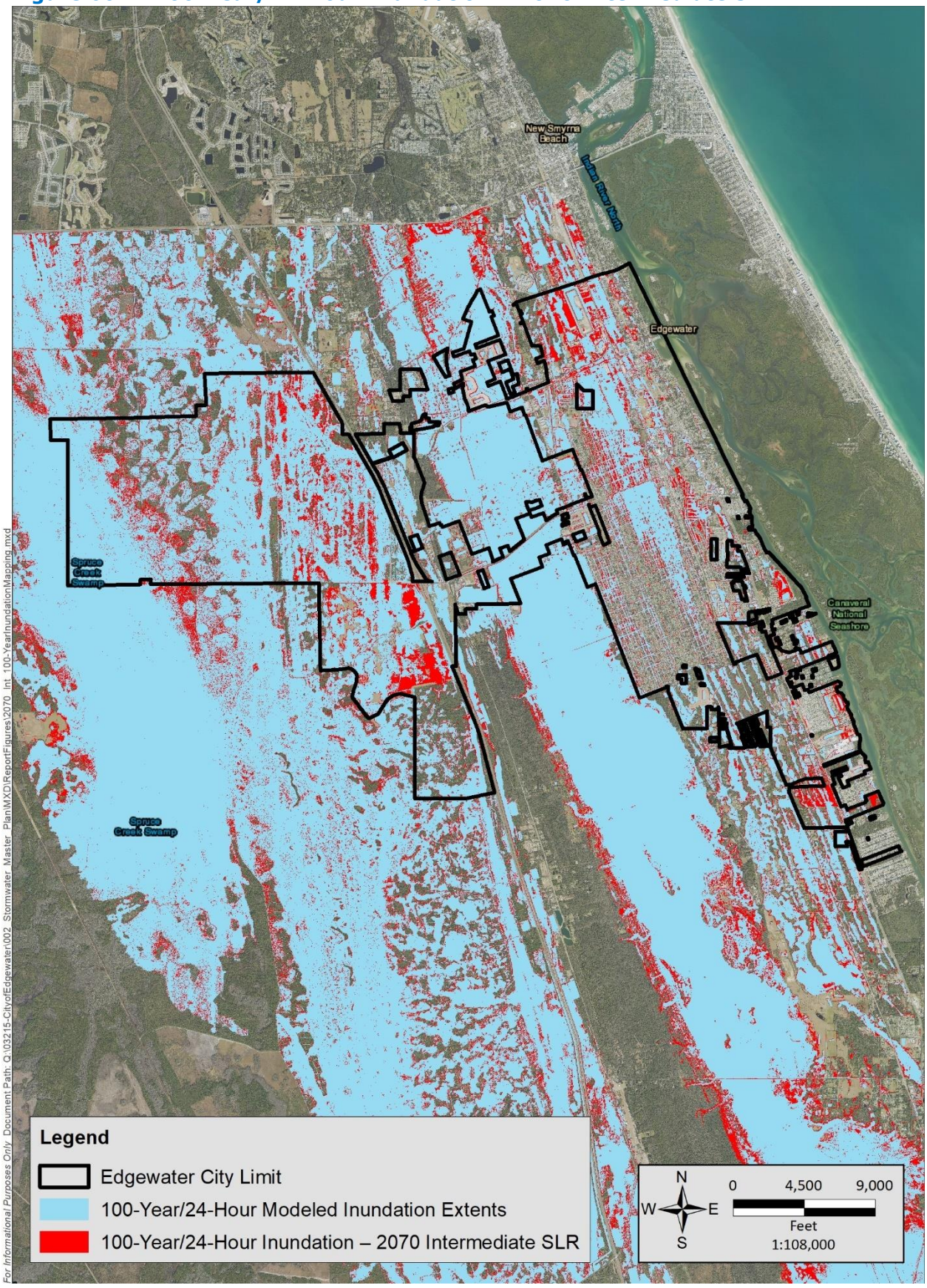


Figure 61 500-Year/24-Hour Inundation – 2070 Intermediate SLR

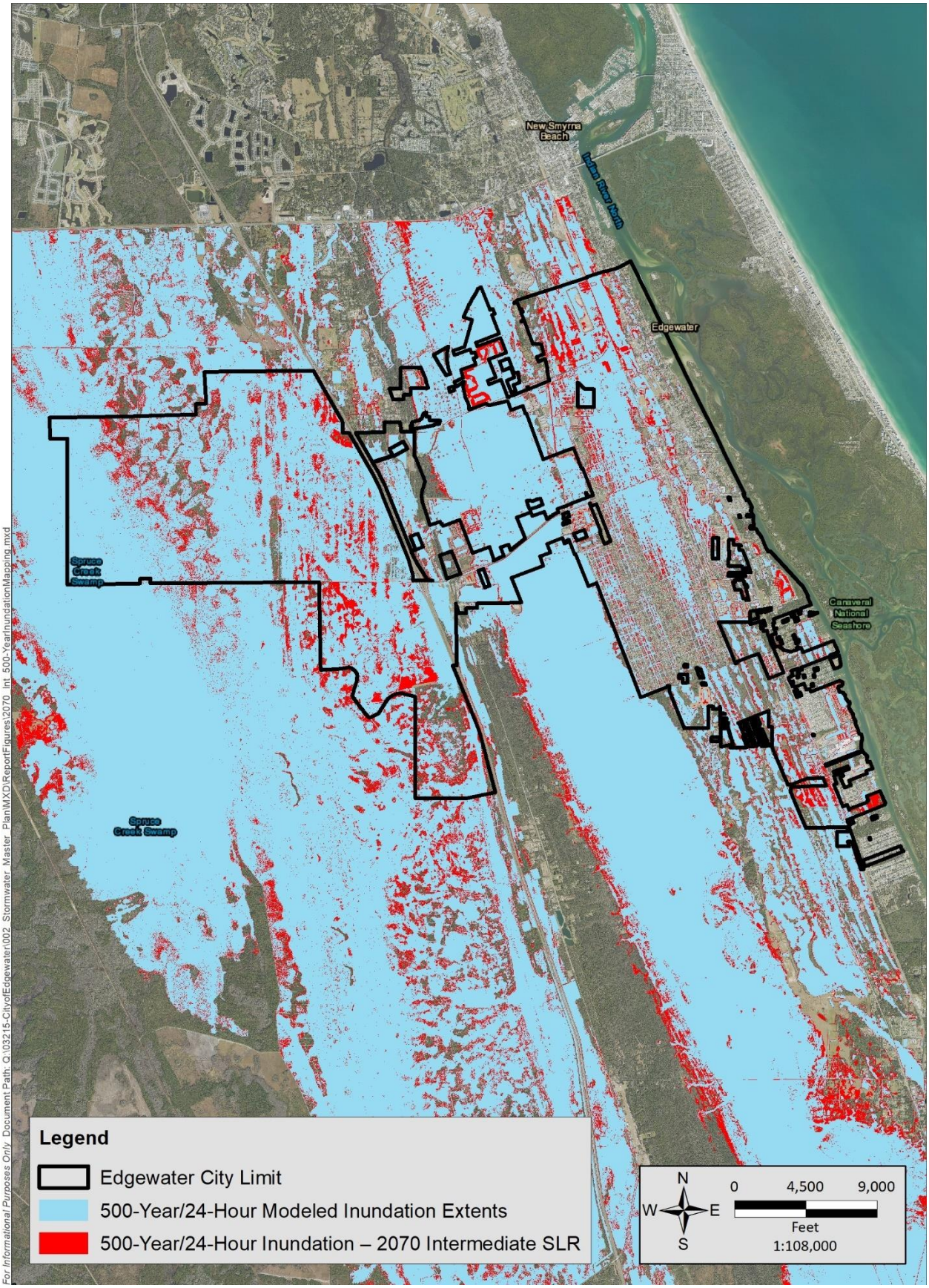


Figure 62 2-Year/24-Hour Inundation – 2100 Intermediate SLR

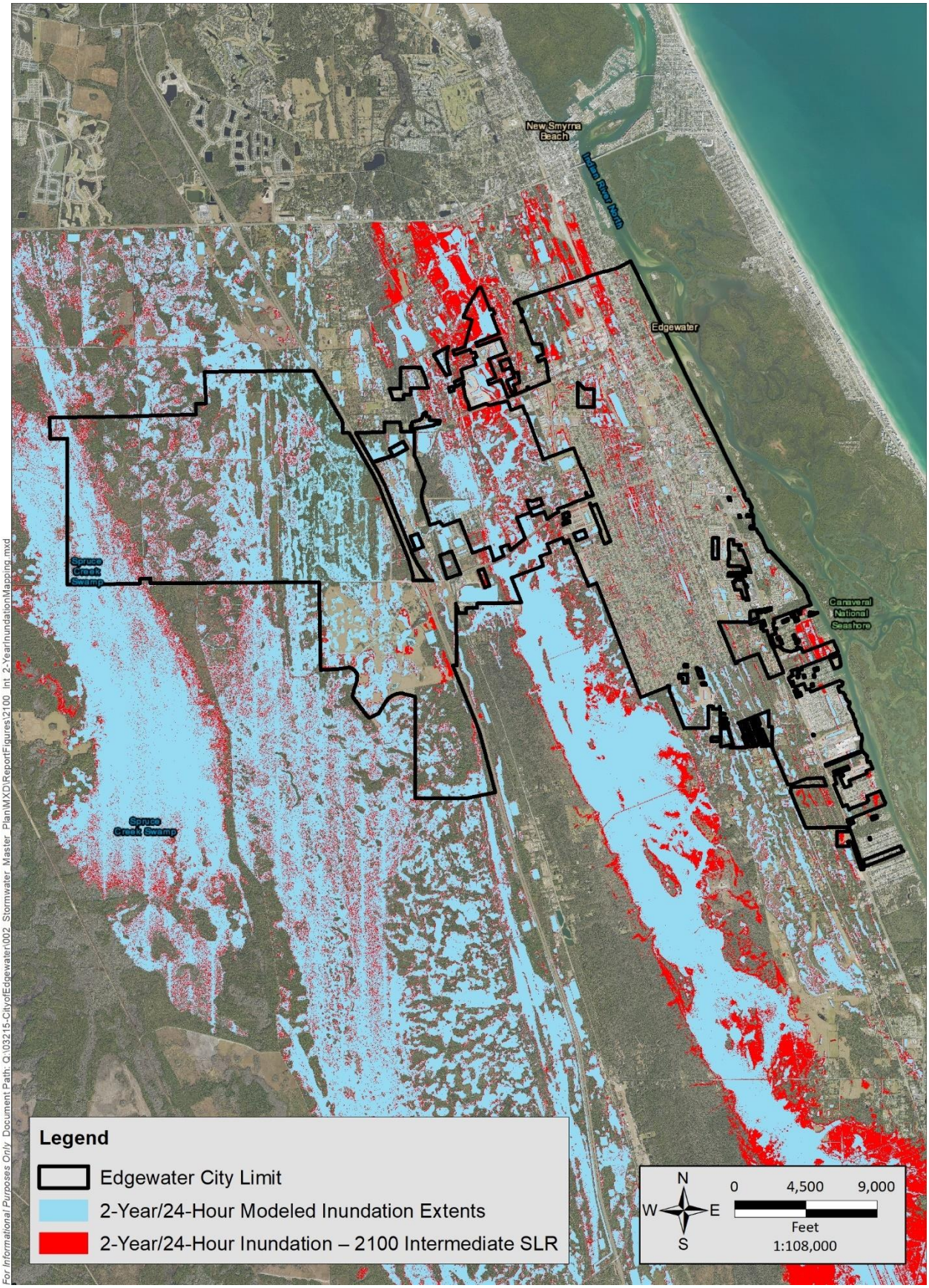


Figure 63 10-Year/24-Hour Inundation – 2100 Intermediate SLR

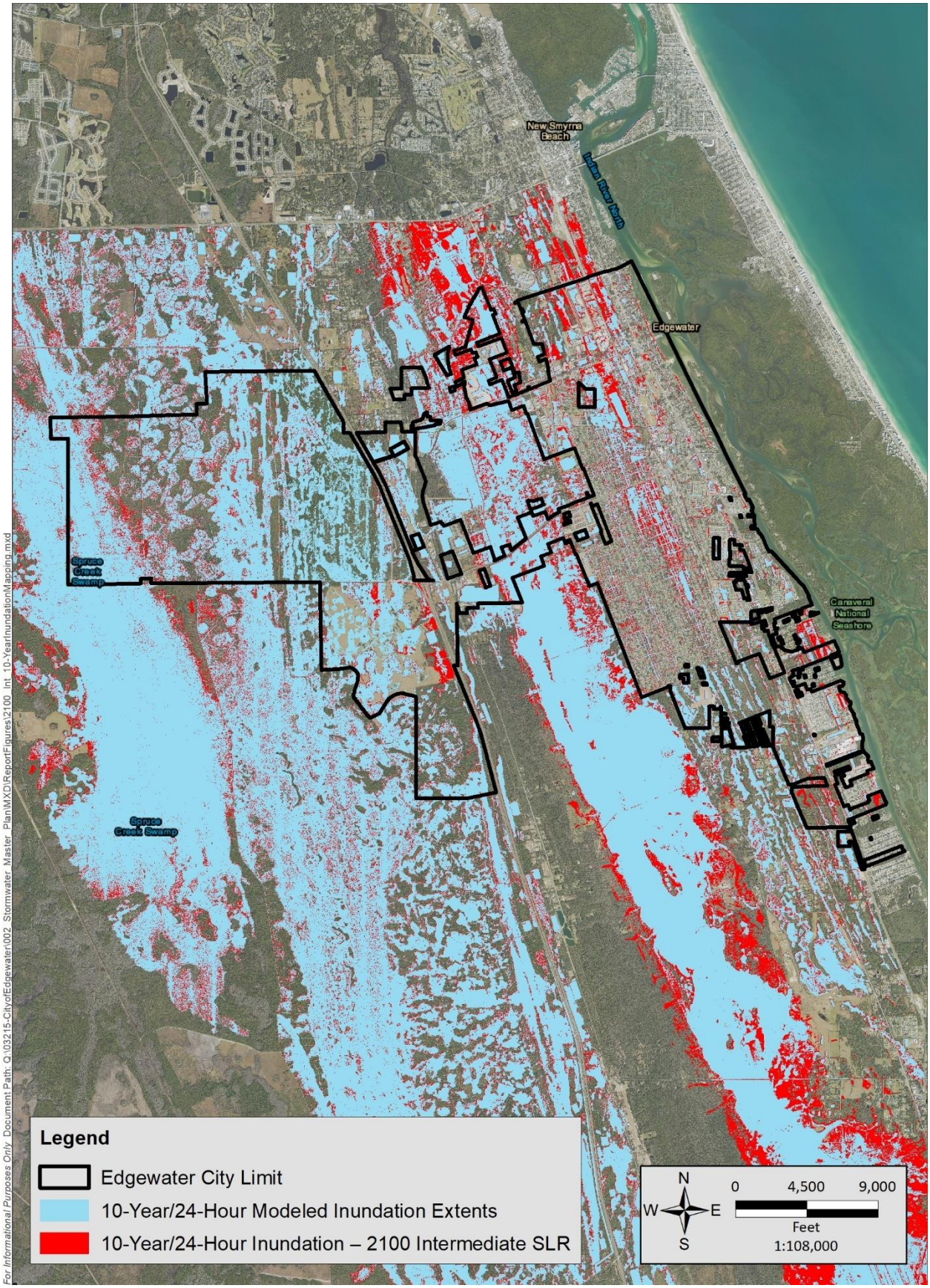


Figure 64 25-Year/24-Hour Inundation – 2100 Intermediate SLR

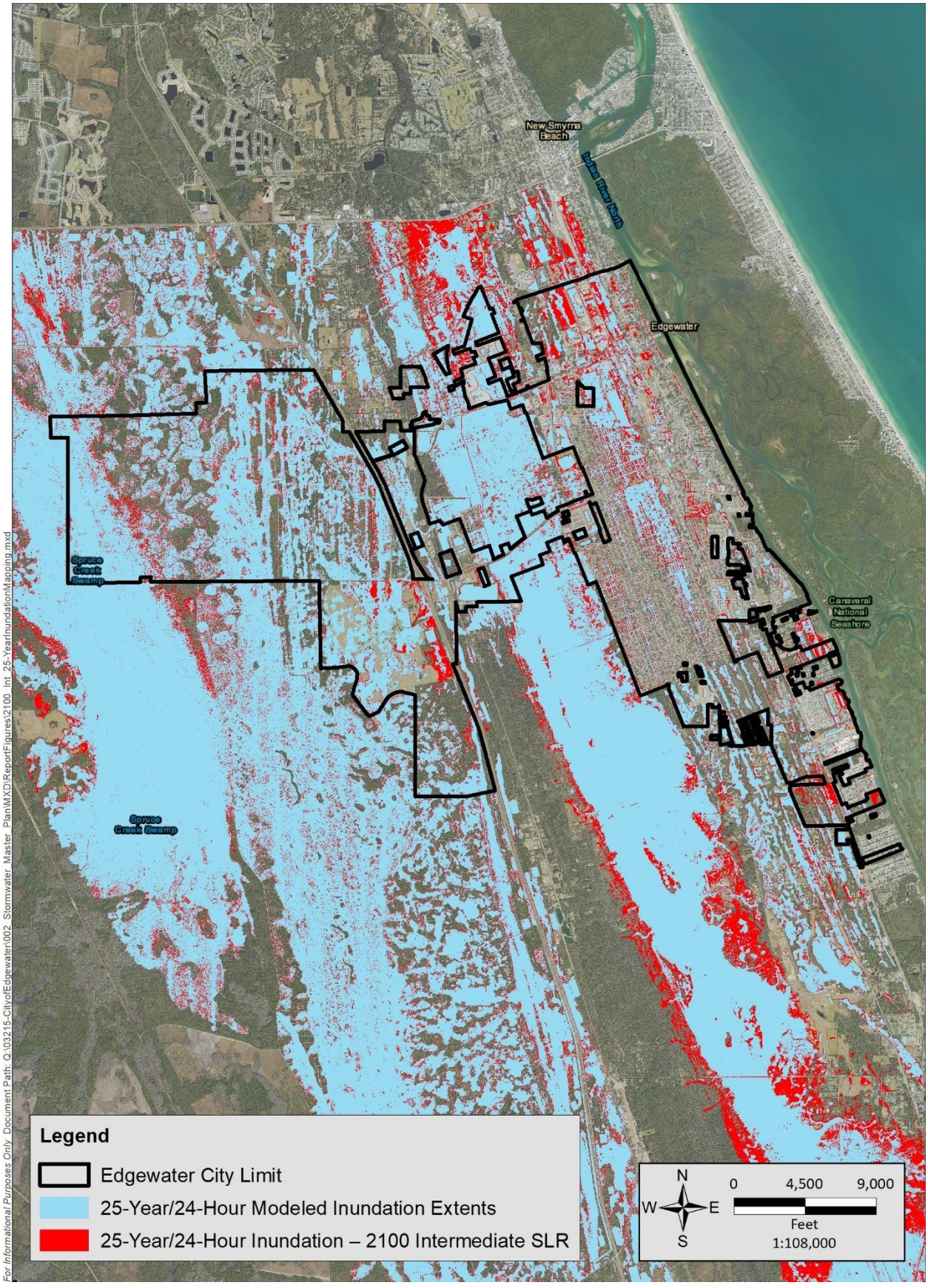


Figure 65 100-Year/24-Hour Inundation – 2100 Intermediate SLR

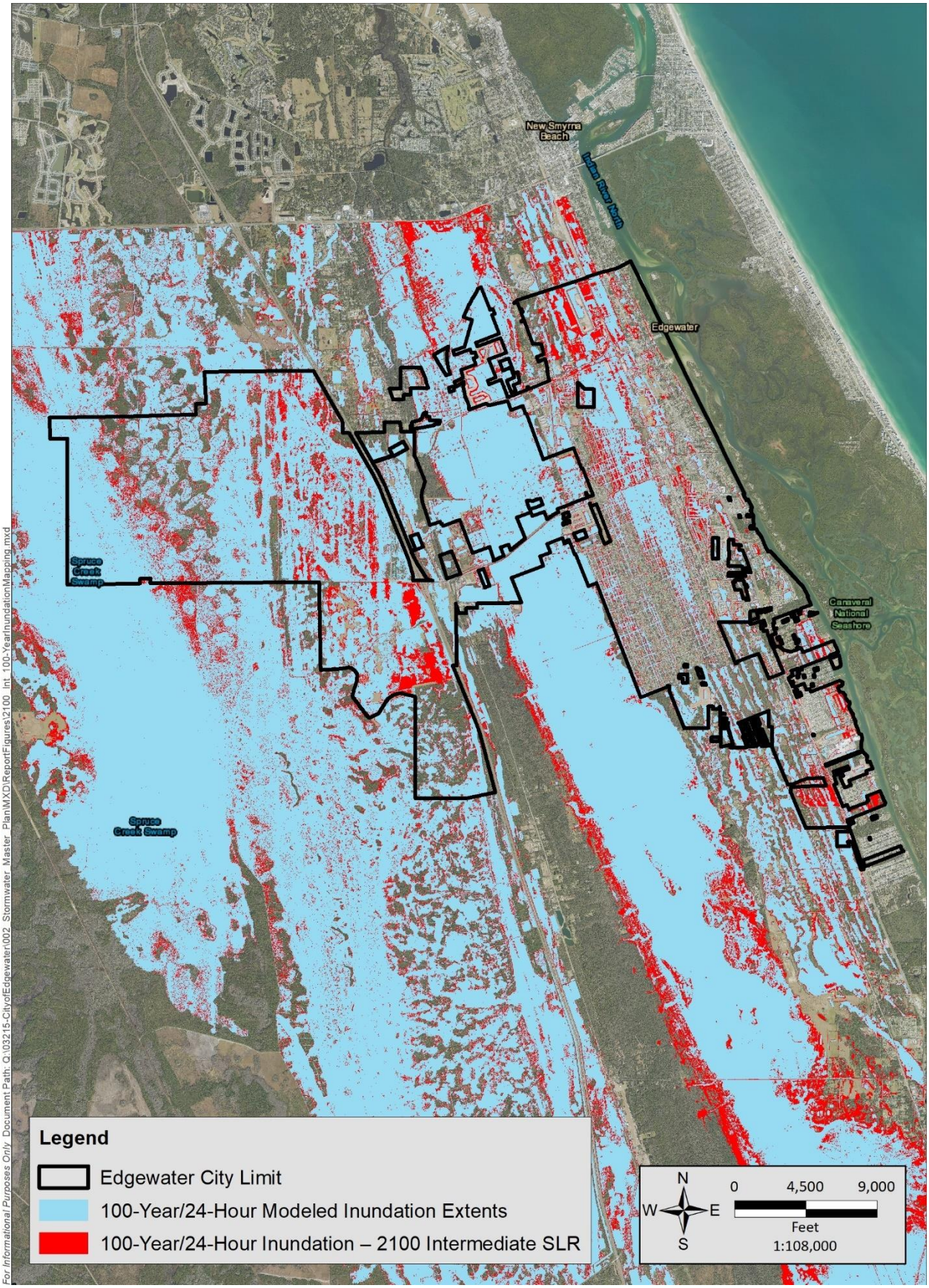
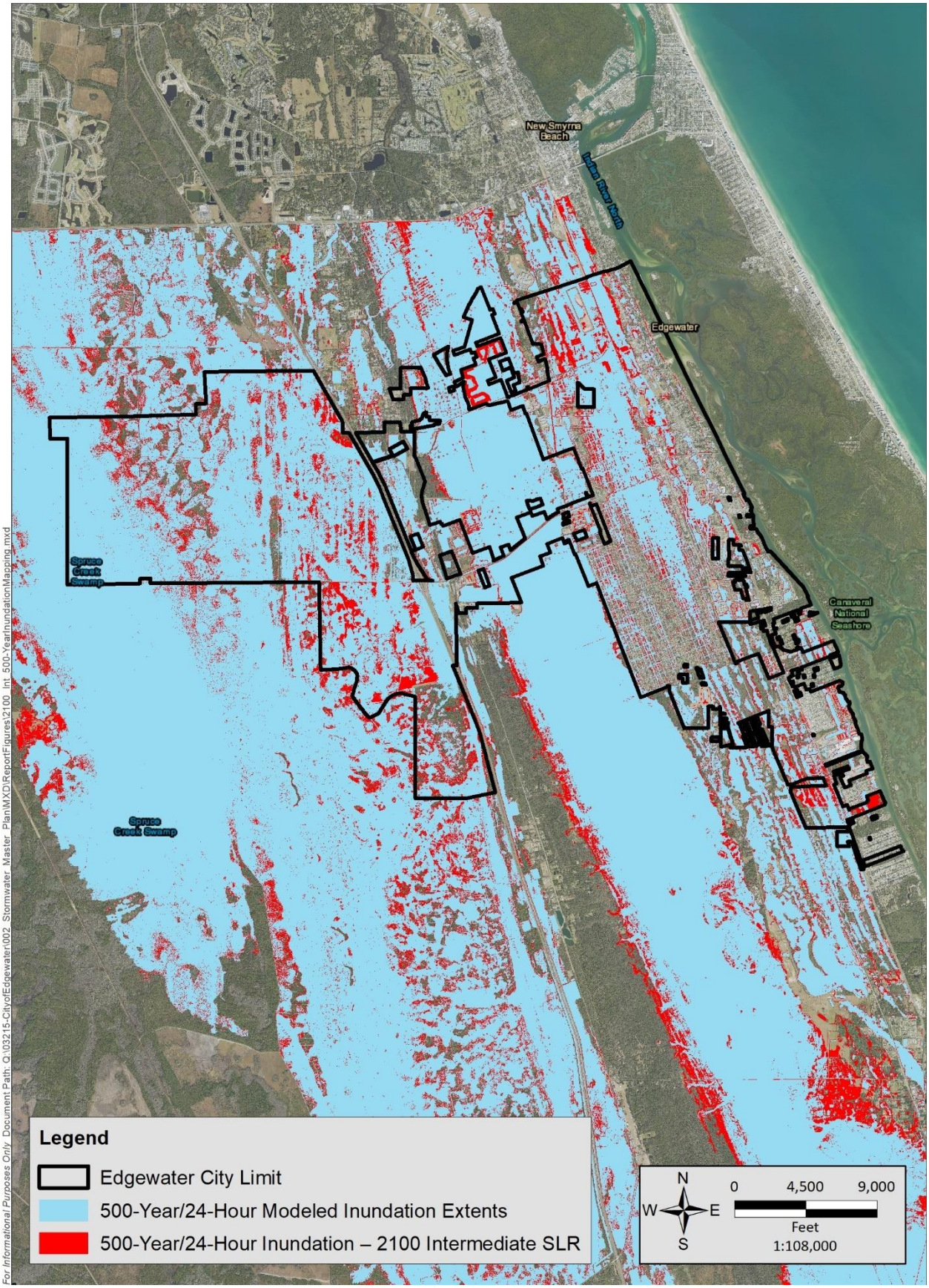


Figure 66 500-Year/24-Hour Inundation – 2100 Intermediate SLR



5.7 Deering Park Modeling Analysis

At the City's request, Jones Edmunds completed a modeling analysis to determine how modeled peak stages would be impacted by the proposed Deering Park development in the City limits west of I-95. The development is a mixed-use planned unit development with approximately 1,900 acres of developed land use. Jones Edmunds created an existing conditions model scenario with the proposed Deering Park development stormwater management system incorporated based on the proposed conditions stormwater model provided to Jones Edmunds on October 31, 2025. Figure 67 shows the existing conditions model schematic at the Deering Park site, and Figure 68 shows the model schematic with Deering Park incorporated. The primary discharge locations for the proposed stormwater system are on the west side of I-95 at two existing culverts that cross under I-95 and discharge into Little Cow Creek. Figure 67 and Figure 68 highlight these discharge locations.

The proposed Deering Park model was simulated for the 10-, 25-, and 100-year/24-hour design storm events, and node peak stages were compared to the existing conditions model peak stages to determine the development's impacts on flood staging in the adjacent areas. Figure 69 through Figure 71 show the changes in node peak stages between existing and proposed conditions for the design storm events. Nodes with a negative stage change represent locations where peak stages decreased and nodes with a positive stage change are locations where stages increased by the Deering Park development. As shown in the comparison figures, peak stages for the design storm events decreased along Little Cow Creek, Turnbull Hammock, and north of Indian River Boulevard. The nodes in Florida Shores generally had no change in peak stage, with a few nodes along the west side having stage decreases of 0.01 to 0.02 foot. The maximum node peak stage increase for the 10-year/24-hour event was 0.34 foot at the southwest corner of Deering Park Center. The stage increase occurs on land owned by Deering Park. The maximum node peak stage decrease for the 10-year/24-hour event was 1.9 feet at the south discharge location. The maximum node peak stage increase for the 25-year/24-hour event was 0.27 foot at the southwest corner of Deering Park Center. The stage increase occurs on land owned by Deering Park. The maximum node peak stage decrease for the 25-year/24-hour event was 1.84 feet at the south discharge location. The maximum node peak stage increase for the 100-year/24-hour event was 0.16 foot at the southwest corner of Deering Park Center. The stage increase occurs on land owned by Deering Park. The maximum node peak stage decrease for the 100-year/24-hour event was 1.68 feet at the north discharge location.

Based on these results, the proposed Deering Park development stormwater system incorporated into the model appears to reduce peak staging in the City's limits east of I-95 and has little to no impact on peak staging in Florida Shores. These findings can generally be attributed to the following:

- The proposed development includes approximately 1,900 acres of developed land. Based on the data provided, approximately 400 acres, or 21 percent, of the development is being used for stormwater management ponds. The proposed ponds provide flood attenuation that reduces the peak discharge rate from the developed area and thus reduces the downstream stages. Based on the modeling, Table 18 summarizes the total peak inflow rates at the primary discharge points on the west side of the I-95 cross-culverts for existing and proposed conditions during the 10-, 25-, and 100-year/24-hour storm events. As shown in Table 18, the peak discharge rate at each

location is reduced for all of the design storm events, which results in the stage changes shown in Figure 69 through Figure 71.

- The flood staging in Florida Shores is not negatively impacted because stages in the Turnbull Hammock are reduced. Numerous hydraulic constrictions within the Florida Shores stormwater system control peak flood stages, making them insensitive to small changes in tailwater conditions in Turnbull Hammock. In addition, a topographic ridge along Willow Oak Drive acts as a hydraulic boundary separating Florida Shores east of Willow Oak Drive from those to the west. Stormwater east of Willow Oak Drive drains north into the 18th Street Canal and has no hydraulic connection to Turnbull Hammock so is not sensitive to stage changes in Turnbull Hammock.

These findings may change if the proposed Deering Park stormwater system differs significantly from the system represented in the City's model.

Figure 67 Deering Park Existing Conditions Model Schematic

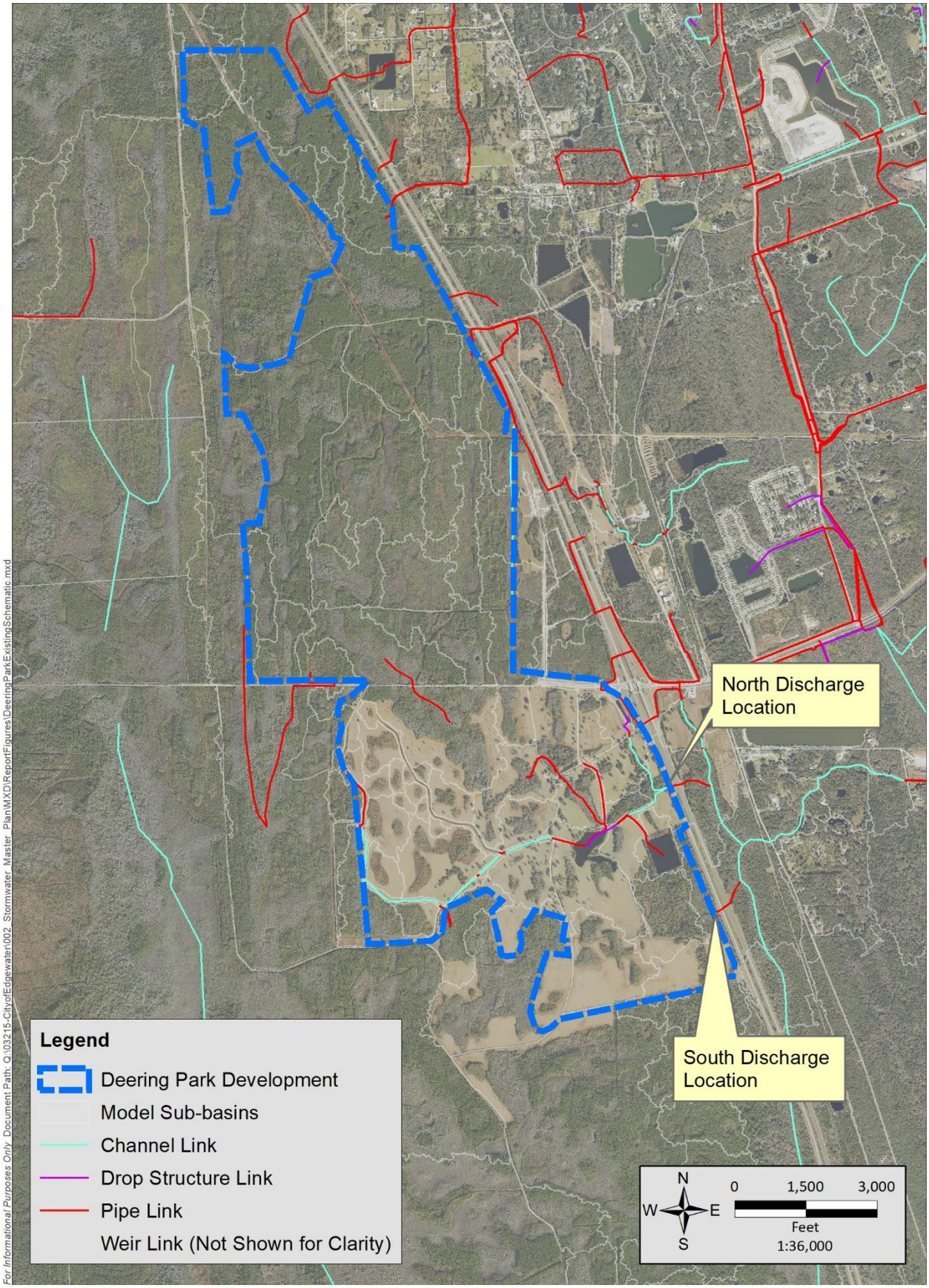


Figure 68 Deering Park Proposed Conditions Model Schematic

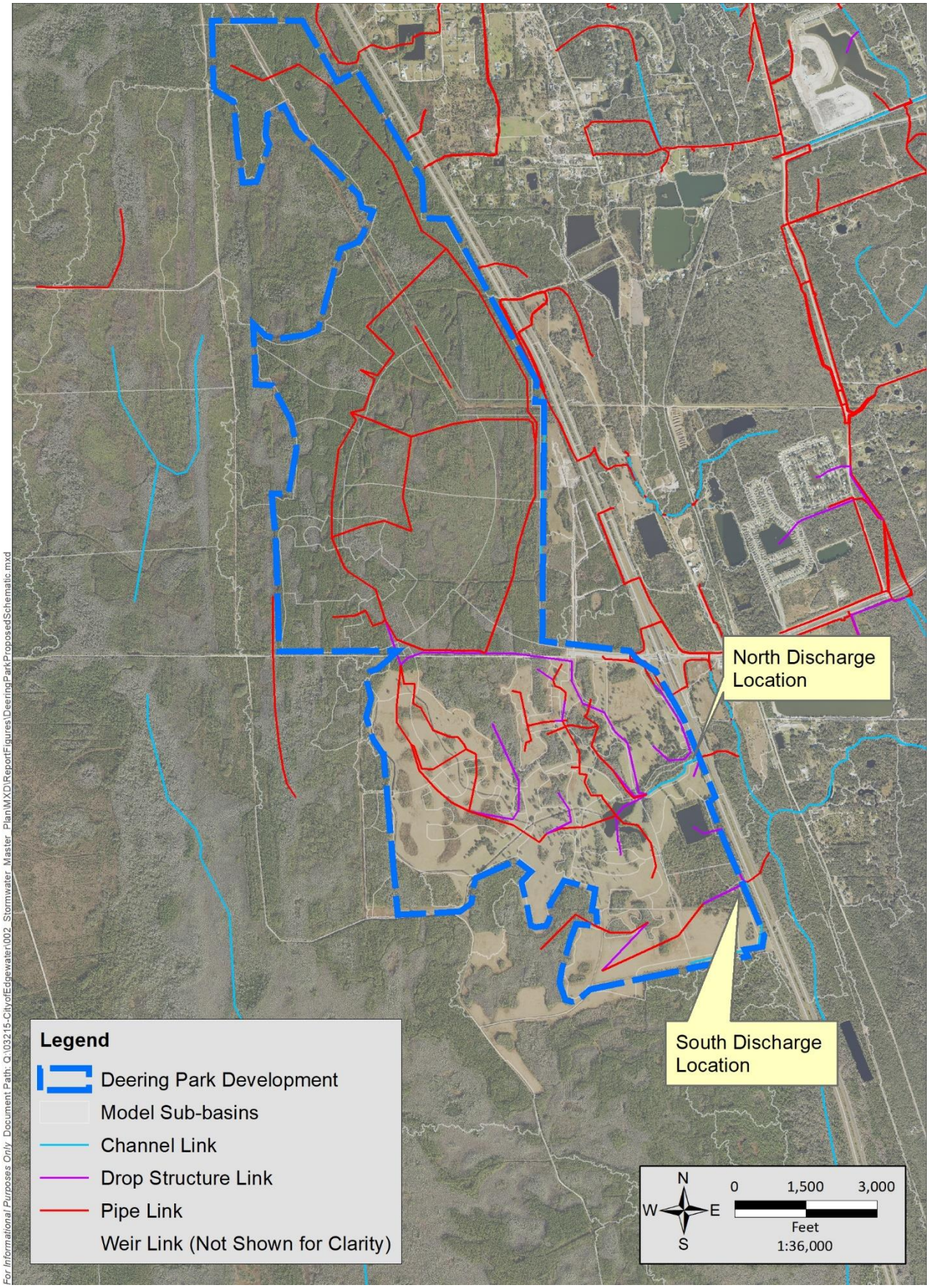


Figure 69 Deering Park Existing versus Proposed Modeled Peak Stages for the 10-Year/24-Hour Design Storm

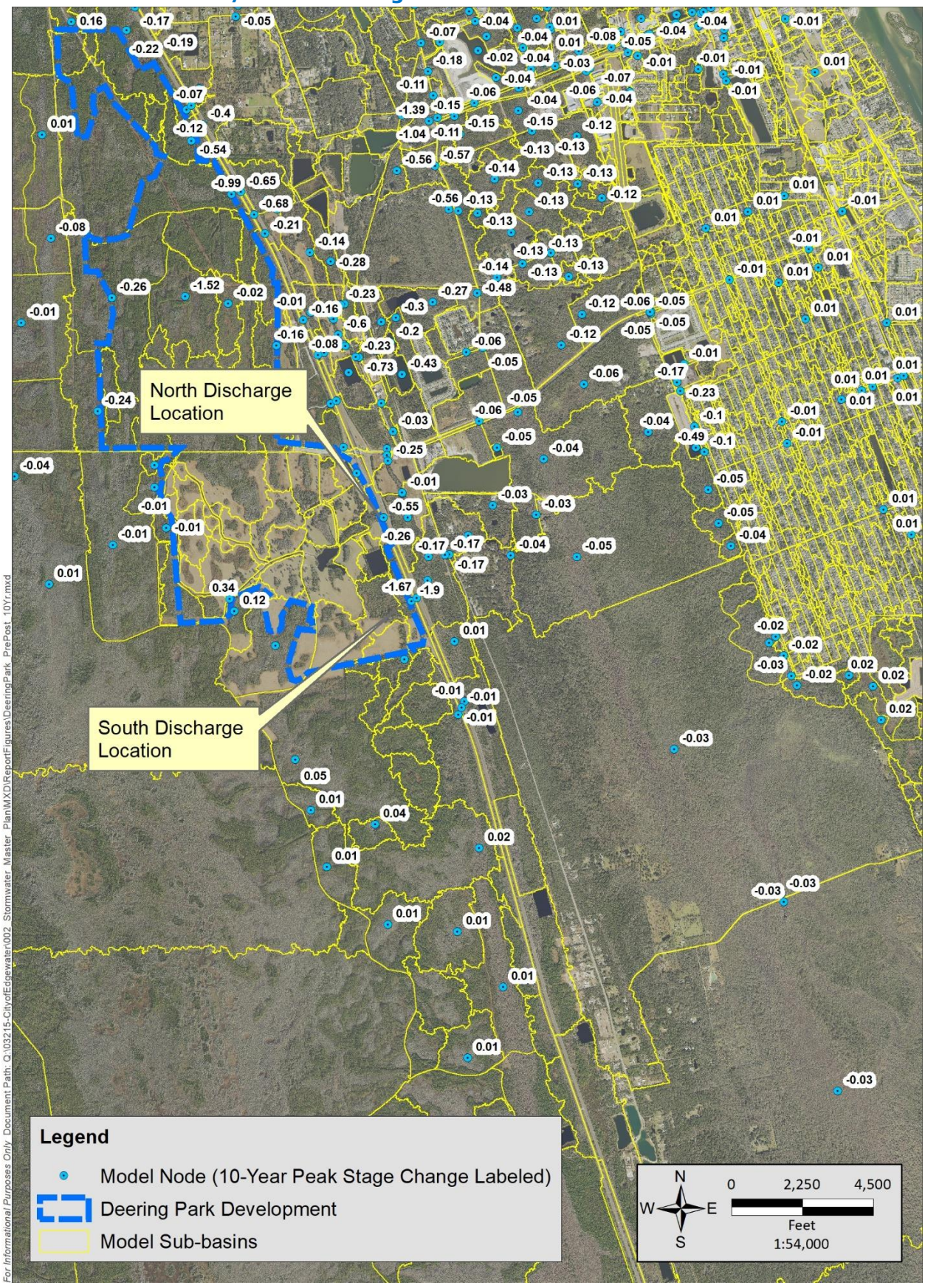


Figure 70 Deering Park Existing versus Proposed Modeled Peak Stages for the 25-Year/24-Hour Design Storm

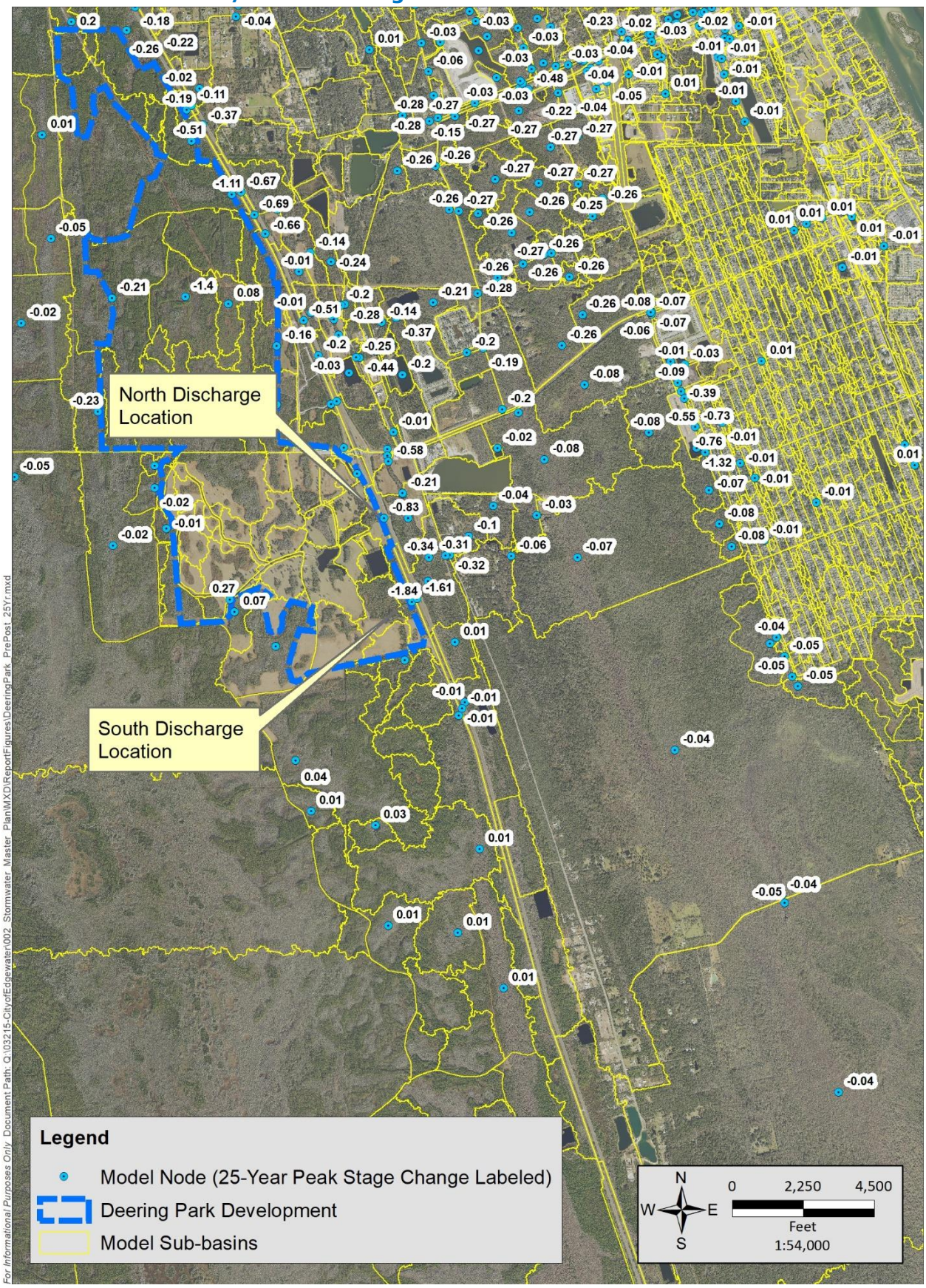


Figure 71 Deering Park Existing versus Proposed Modeled Peak Stages for the 100-Year/24-Hour Design Storm

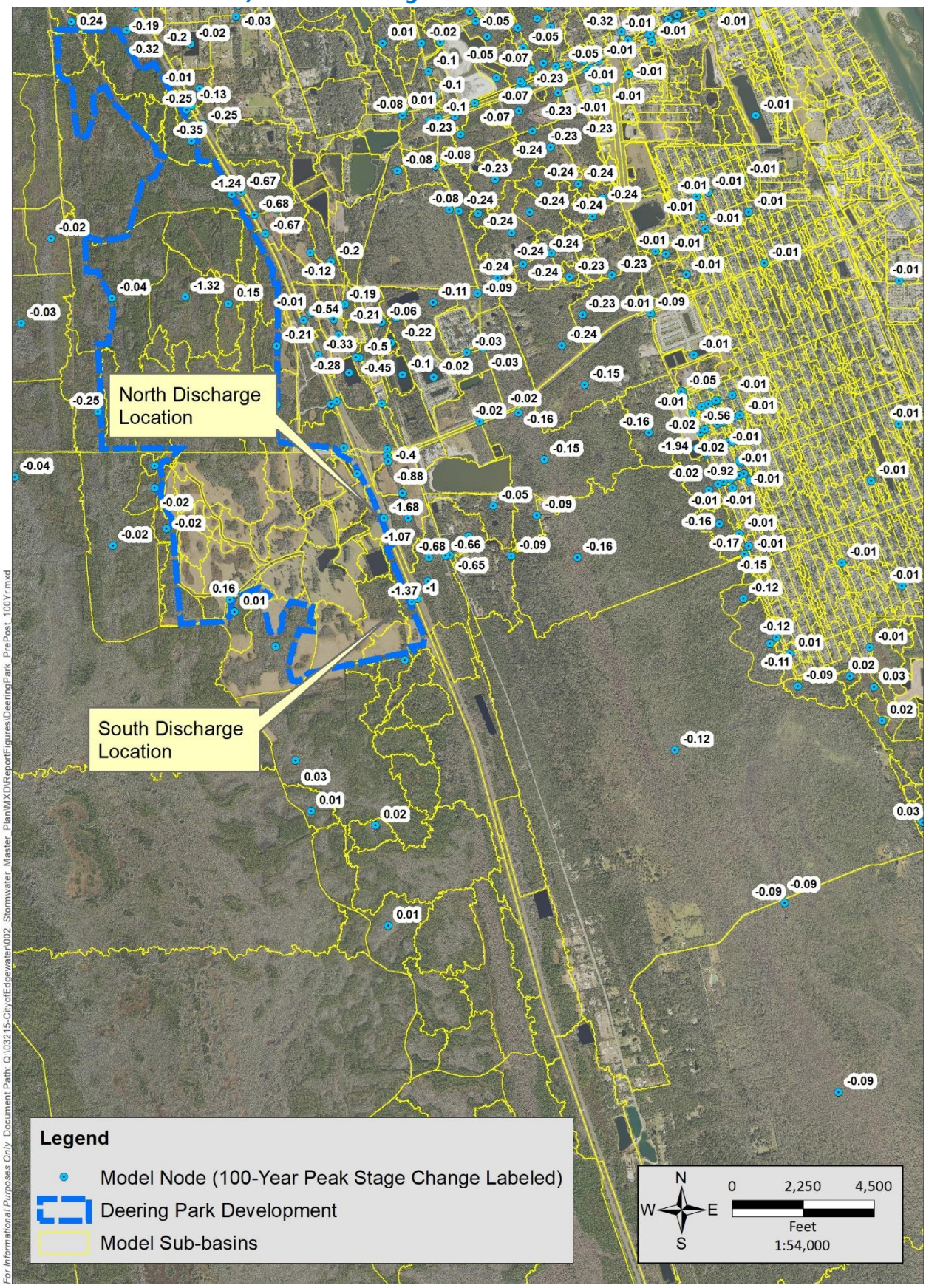


Table 18 Deering Park Pre- versus Post-Development Peak Discharge Comparison

Storm Event	North Discharge Location Peak Inflow Rate (cfs)			
	Existing	Proposed	Difference	% Difference
10-Year/24-Hour	181	137	-44	-24%
25-Year/24-Hour	246	169	-77	-31%
100-Year/24-Hour	474	228	-246	-52%
Storm Event	South Discharge Location Peak Inflow Rate (cfs)			
	Existing	Proposed	Difference	% Difference
10-Year/24-Hour	234	110	-124	-53%
25-Year/24-Hour	334	156	-184	-55%
100-Year/24-Hour	535	292	-243	-45%

Note: cfs = cubic feet per second.

5.8 Modeling Assumptions, Limitations, and Uncertainty

This section documents assumptions, limitations, and sources of uncertainty for the 1-D H&H modeling that was completed for the SWMP.

- The model is intended to be used for planning-level analysis of the City's drainage system. Use of the model for design purposes requires further refinement based on site-specific data.
- The model could be used as a basis for future FEMA map updates, but additional refinement and data packaging may be required.
- Design storm rainfall depths were assumed to be uniform across the entire modeled Watershed.
- Sub-basin CN values represent composite conditions and may not represent parcel-specific drainage conditions.
- Sub-basins were delineated at the intermediate-scale using LiDAR-derived topographic data. Local-scale features such as yard grading, swales, driveway culverts, and small-diameter pipes are generally not modeled explicitly.
- The model estimates complex 2-D surface flow using 1-D weir and/or channel links. 2-D flowpaths/transition zones between sub-basins may be under-represented in the mapped inundation extents.
- Tidally influenced tailwater conditions are set as constant time-stage nodes and assume MHHW conditions. Rainfall-driven flood stages could vary if water surface water elevations in these receiving water bodies are significantly higher or lower than MHHW conditions.
- Structure and channel invert elevation inaccuracies or undocumented field modifications may affect localized model results.
- Channel and pipe Manning's n values were estimated based on literature values. Actual roughness may vary based on maintenance conditions.
- Pipes and other hydraulic structures were modeled assuming full capacity. Sedimentation and other site-specific maintenance deficiencies were not accounted for.
- Groundwater interactions were not explicitly modeled. This is typical for design storm event H&H model where groundwater flows are minimal compared to rainfall runoff flow.

- The model was validated based on recent storm events and available flood documentation. Model confidence is highest for storms with similar magnitudes and is less certain for events outside that range.
- Future conditions modeling inputs were based on literature values where available and are inherently uncertain due to uncertainty in future climate change, development, and SLR. Actual future flooding conditions may vary.

6 FPLOS AND PROBLEM AREA IDENTIFICATION

Jones Edmunds completed an FPLOS analysis based on the results from the StormWise model and used the analysis results to identify flooding problem areas. The FPLOS analysis helps determine the relative level of protection against flooding provided from the City's existing stormwater infrastructure at the drainage-basin scale. Model sub-basins were prioritized based on specific FPLOS criteria related to building, roadway, and residential yard flooding. The basin prioritization serves to highlight drainage problem areas that may need stormwater system improvements.

6.1 FPLOS CRITERIA

The FPLOS analysis criteria were developed based on the City's stormwater management LOS standards in the City's Comprehensive Plan. The latest version of the City's Comprehensive Plan states that the 100-year/24-hour storm event should be used to evaluate the existing drainage system to determine future needs and implement improvements to the stormwater management system. The following LOS standards are established for the City's stormwater management system, with LOS A being the best and LOS D being the worst.

- LOS A – No significant street flooding.
- LOS B – No major residential yard flooding.
- LOS C – No significant structure flooding.
- LOS D – No limitation on flooding.

Jones Edmunds used the criteria listed above to develop a LOS prioritization system at the sub-basin level. The system evaluates the LOS in each sub-basin for the 2-, 10-, 25, and 100-year 24-hour storm events. The system includes scoring criteria to evaluate the severity of building, residential yard, and roadway flooding in each sub-basin for each design storm event. Weighting factors are applied to prioritize flooding that occurs in more frequent return period storms (i.e., building flooding that occurs in a 10-year storm event would be weighted higher than building flooding that occurs in the 100-year storm event) and to prioritize the types of flooding to match the prioritization in the City's LOS criteria (i.e., building flooding is weighted higher than street or yard flooding and yard flooding is weighted higher than street flooding). Table 19 summarizes the scoring criteria applied for building, residential yard, and roadway flooding, Table 20 summarizes the weighting factors applied to the storm events, and Table 21 summarizes the weighting factors applied to the types of flooding.

Table 19 LOS Scoring Criteria for Building, Residential Yard, and Roadway Flooding

Building Flooding	
Flooding Severity	**Score**
No Building Flooding	0
Flooding Touches the Building, Below FFE[1]	1.5
Building Flooding Above FFE	3
Residential Yard Flooding	
Flooding Severity	**Score**
No Yard Flooding	0
0-33% of Yard Flooded	1
33–66% of Yard Flooded	2
Greater than 66% of Yard Flooded	3
Roadway Flooding	
Flooding Severity	**Score**
No Roadway Flooding	0
Roadway Flooding, Depth Less Than 6 Inches	1.5
Roadway Flooding, Depth Greater Than 6-Inches	3

Note: [1]This category represents structures where the building footprint touches the inundation mapping, but the peak flood elevation is below the building FFE.

Table 20 Storm Event Weighting Factors

Storm Event	Weighting Factor
2-Year/24-Hour	4
10-Year/24-Hour	3
25-Year/24-Hour	2
100-Year/24-Hour	1

Table 21 Flood Type Weighting Factors

Type of Flooding	Weighting Factor
Building	3
Residential Yard	2
Roadway	1

6.2 FPLOS Criteria Application

The model results and inundation mapping summarized in Section 5.5 and the methodology summarized in this section were used to identify instances of building, residential yard, and roadway flooding across the City for the 2-, 10-, 25-, and 100-year/24-hour events. For each instance of flooding identified, the scoring criteria in Table 19 were applied.

6.2.1 Building Flooding

To identify the locations of model-predicted building flooding in the City and assign the scoring criteria in Table 19, we used the following methodology:

- Developed a Citywide GIS inventory of all building footprints in the City. We used 2023 Microsoft building footprint data as a starting point for the inventory. We reviewed the footprints against the 2023 NAIP and Nearmap aerial imagery for digitization errors and missing footprints, updating the building footprint polygons where necessary. A total of 11,895 building footprints were identified in the City.
- Determined which model basin each building footprint is within. For building footprints that intersect multiple basins, the basin with the larger modeled peak stages were typically assigned.
- Assigned the flood peak stage values for the 2-, 10-, 25-, and 100-year/24-hour storm events to each of the building footprint polygons based on the model node peak stages for the appropriate adjacent node to each building footprint.
- Estimated the FFE for each building using the 2018 LiDAR DEM. The FFEs were initially estimated by taking the average elevation within 5.0 feet of the edge of the building footprint and adding 0.5 foot to obtain the estimated FFE. Generally, we would expect this method to estimate the FFE within ±1.0 feet of the actual FFE. To improve the accuracy of the estimated FFEs for buildings at risk of flooding, we reviewed the estimated FFEs for each of the building footprints within the 100-year floodplain using Google Streetview to determine if manual adjustments were needed for table buildings elevated considerably more or less than 0.5 foot from the surrounding surface. Adjustments were made case-by-case based on the data available. Jones Edmunds also downloaded and reviewed FDEM's statewide elevation certificate database to identify locations where surveyed FFE data were available. FFEs were adjusted for 19 building footprints based on the available FDEM data.
- Compared the flood peak stage values for the design storm events to the estimated FFE for each building to determine if the building was flooded during those events.
- Determined if each building footprint is touching the mapped inundation for each of the design storm events.
- Assigned the appropriate score from Table 19 to each building footprint for each of the design storm events. Buildings with flooding above the estimated FFE were assigned a score of 3, buildings touching the inundation extent with flooding below the FFE were assigned a score of 1.5, and buildings outside of the inundation extents were assigned a score of 0.

6.2.2 Residential Yard Flooding

To identify the locations of model-predicted residential yard flooding in the City and assign the scoring criteria in Table 19, we used the following methodology:

- Developed a Citywide GIS inventory of all the residential parcels. We started with the VC GIS parcel layer and identified the parcels considered residential. A total of 10,055 residential parcels were identified in the City.
- Developed a residential yard layer by erasing the building footprints, waterbodies from the 2022 land use layer, and roadways from the residential parcel layer.
- Determined the area and percentage of each yard inundated for each of the design storm events.
- Intersected the residential yard layer with the model sub-basins to determine which basins to which flooding should be assigned. The flooded area was recalculated for each of the intersected yard/basin polygons. For yards that intersected multiple basins, the

flooding percentages calculated for the whole yard were assigned to each yard/basin polygon unless there was no flooding in the yard/basin polygon. This method applies the total yard flooding percentage for an individual parcel to each basin that contributes to the yard flooding for that parcel. This method could potentially identify residential yard flooding in basins that contribute only a fraction of the overall flooding that occurs on an individual parcel. The alternative to this method would be to calculate and use the percentage of flooding for each yard/basin polygon. This method was not used because parcels with minimal flooding could have one small yard/basin polygon with a high flooding percentage. This could result in a high residential yard flooding score being applied to the basin when very little yard flooding is occurring at that location. Overall, the method that was selected yielded good FPLOS results that were reflective of observed flooding in the City.

- Assigned the appropriate score from Table 19 to each yard/basin polygon for each of the design storm events. Yard/basin polygons with greater than 66 percent of the total yard flooded were assigned a score of 3, yard/basin polygons with 33–66 percent of the total yard flooded were assigned a score of 2, yard/basin polygons with 0–33 percent of the total yard flooded were assigned a score of 1, and yard/basin polygons with no yard flooding were assigned a score of 0.

6.2.3 Roadway Flooding

To identify the locations of model-predicted roadway flooding in the City and assign the scoring criteria in Table 19, we used the following methodology:

- Developed a Citywide roadway polygon layer. We used the NOAA C-CAP high-resolution impervious data as a starting point and extracted the impervious polygons covering the roadways. We reviewed the roadway layer against the 2023 NAIP and Nearmap aerial imagery for digitization errors and missing roadways. Updates to the roadway polygons were made where necessary.
- Intersected the roadway polygon layer with the model basins.
- Determined the maximum depth of flooding within each roadway/basin polygon for each of the design storm events. The maximum depth of flooding is representative of the flood depth at the lowest within the roadway/basin polygon.
- Assigned the appropriate score from Table 19 to each roadway/basin polygon for each of the design storm events. Roadway/basin polygons with a maximum flood depth greater than 6 inches were assigned a score of 3, polygons with a flood depth less than 6 inches were assigned a score of 1.5, and polygons with no flooding were assigned a score of 0.

6.3 FPLOS Results

This Section summarizes the Citywide FPLOS results for building, residential yard, and roadway flooding for each of the design storm events.

6.3.1 Building Flooding Results

Jones Edmunds identified 610 locations (approximately 5 percent of the City's buildings) where flooding above the estimated FFE was predicted during the 100-year/24-hour or more frequent storm events and 2,401 locations (approximately 20 percent of the City's buildings) where building footprints intersect the 100-year/24-hour inundation extent. Table 22 summarizes the building flooding results relative to the FPLOS criteria in Table 19

for each of the design storm events. Table 22 shows that a significant number of buildings are predicted to touch the inundation extents but not have flooding above the FFE. This does not imply that structural damage will occur at these locations but identifies where buildings are at risk of flooding. Figure 72 shows where building flooding above the FFE is predicted, with building footprints symbolized by the smallest design storm event at which flooding is expected to occur.

Figure 72 Building Flooding Above Estimated FFE – Smallest Storm Event

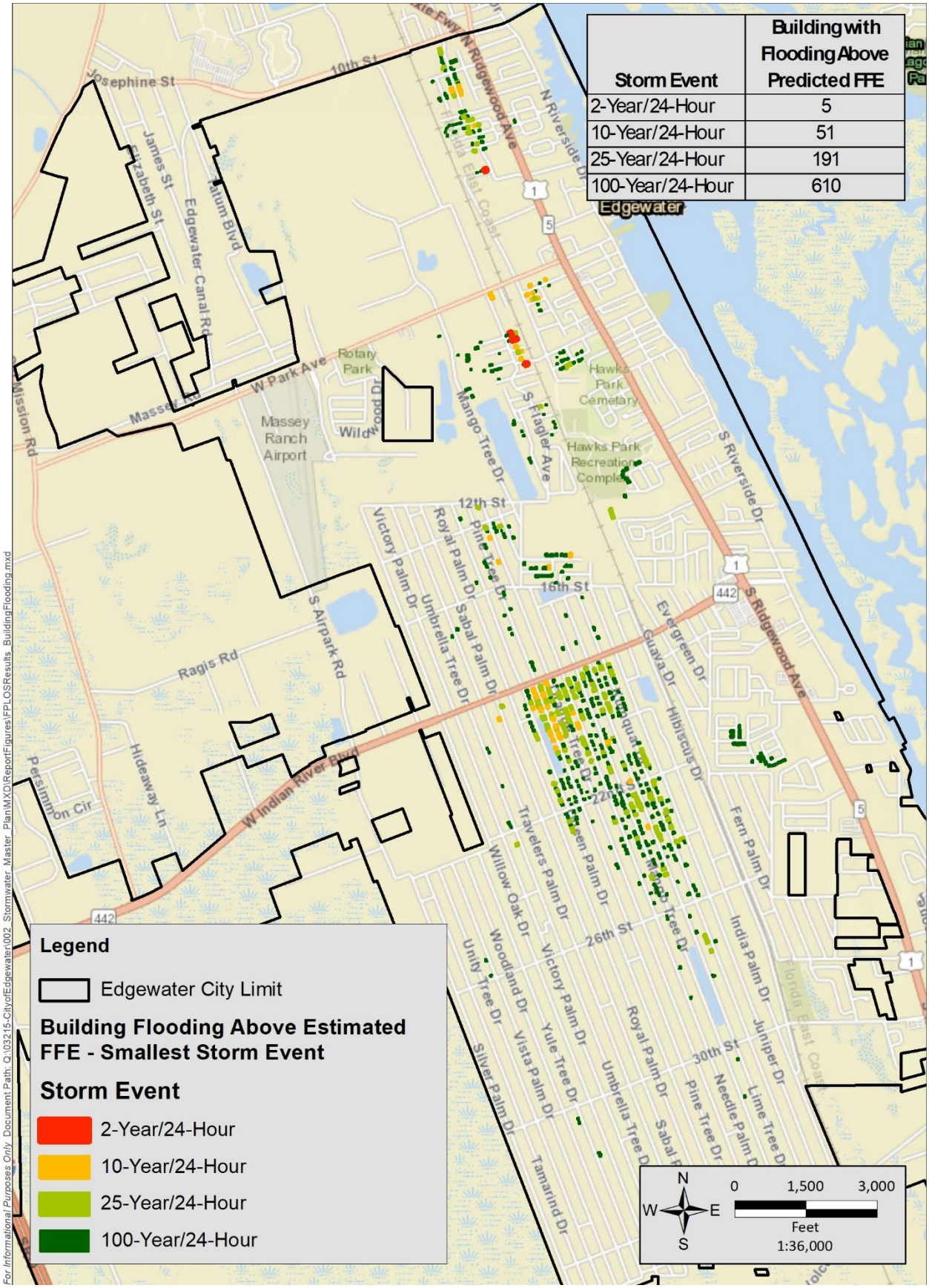


Table 22 Summary of Building Flooding FPLOS Results

Flooding Severity	Number of Occurrences			
	2-Year/ 24-Hour	10-Year/ 24-Hour	25-Year/ 24-Hour	100-Year/ 24-Hour
Flooding above FFE	5	51	191	610
Flooding Below FFE, Touches Building Footprint	255	813	1,283	1,791
No Building Flooding	11,635	11,031	10,421	9,494
Flooding Severity	**Percentage of Total Buildings**			
	2-Year/ 24-Hour	10-Year/ 24-Hour	25-Year/ 24-Hour	100-Year/ 24-Hour
Flooding above FFE	0.04%	0%	2%	5%
Flooding Below FFE, Touches Building Footprint	2%	7%	11%	15%
No Building Flooding	98%	93%	88%	80%

6.3.2 Residential Yard Flooding

Jones Edmunds identified 2,459 locations (approximately 24 percent of the City's residential yards) where residential yard flooding was predicted to cover 33 percent or more of the yard in the 100-year/24-hour storm event. Table 23 summarizes the residential yard flooding results relative to the FPLOS criteria in Table 19 for each of the design storm events. Figure 73 shows the locations where residential yard flooding is greater than 33 percent, with the yards symbolized based on the smallest storm event that flooding greater than 33 percent is predicted to occur.

Table 23 Summary of Residential Yard Flooding FPLOS Results

Flooding Severity	Number of Occurrences			
	2-Year/ 24-Hour	10-Year/ 24-Hour	25-Year/ 24-Hour	100-Year/ 24-Hour
Yard Flooding 0–33%	2,020	3,271	3,527	3,613
Yard Flooding 33–66%	254	742	1,058	1,344
Yard Flooding 66–100%	50	477	1,028	2,055
No Yard Flooding	12,081	9,915	8,792	7,393
Flooding Severity	**Percentage of Total Yards**			
	2-Year/ 24-Hour	10-Year/ 24-Hour	25-Year/ 24-Hour	100-Year/ 24-Hour
Yard Flooding 0–33%	14%	23%	24%	25%
Yard Flooding 33–66%	2%	5%	7%	9%
Yard Flooding 66–100%	0.3%	3%	7%	14%
No Yard Flooding	84%	69%	61%	51%

6.3.3 Roadway Flooding

Jones Edmunds identified 990 roadway/basin polygons where roadway flooding greater than or equal to 6-inches was predicted in the 100-year/24-hour storm event. Table 24 summarizes the roadway flooding results relative to the FPLOS criteria in Table 19 for each

of the design storm events. Figure 74 shows the locations where roadway flooding greater than 6-inches occurs based on the smallest storm event during which flooding greater than 6-inches is predicted to occur.

Table 24 Summary of Roadway Flooding FPLOS Results

Flooding Severity	Number of Occurrences			
	2-Year/ 24-Hour	10-Year/ 24-Hour	25-Year/ 24-Hour	100-Year/ 24-Hour
Roadway Flooding Greater than 6-inches	114	441	656	990
Roadway Flooding Less than 6-inches	385	617	629	558
No Roadway Flooding	1,897	1,338	1,111	848
Flooding Severity	Percentage of Total Road/Basin Polygons			
	2-Year/ 24-Hour	10-Year/ 24-Hour	25-Year/ 24-Hour	100-Year/ 24-Hour
Roadway Flooding Greater than 6-inches	5%	18%	27%	41%
Roadway Flooding Less than 6-inches	16%	26%	26%	23%
No Roadway Flooding	79%	56%	46%	35%

Figure 73 Residential Yard Flooding Greater Than 33 Percent – Smallest Design Storm Event

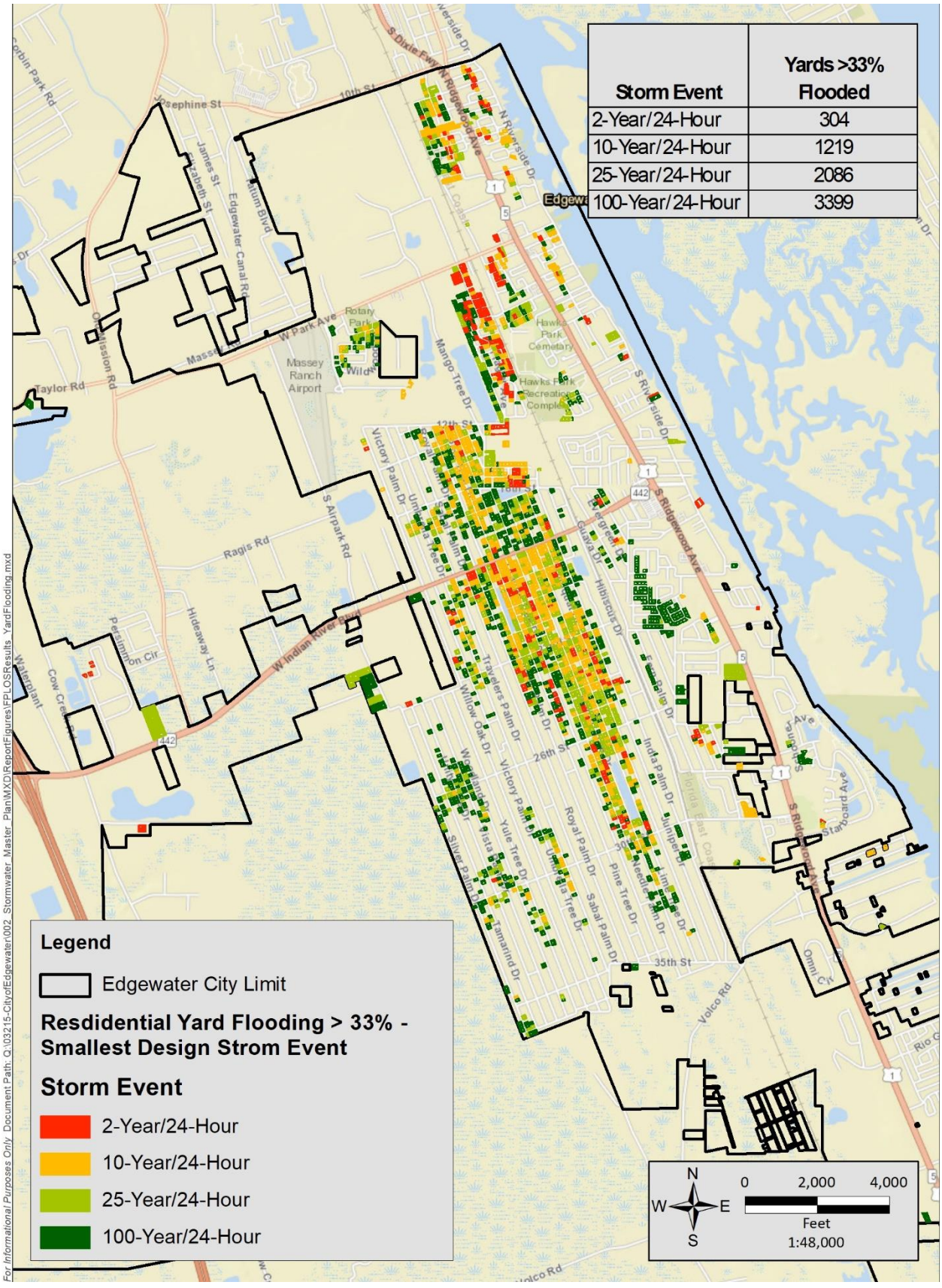
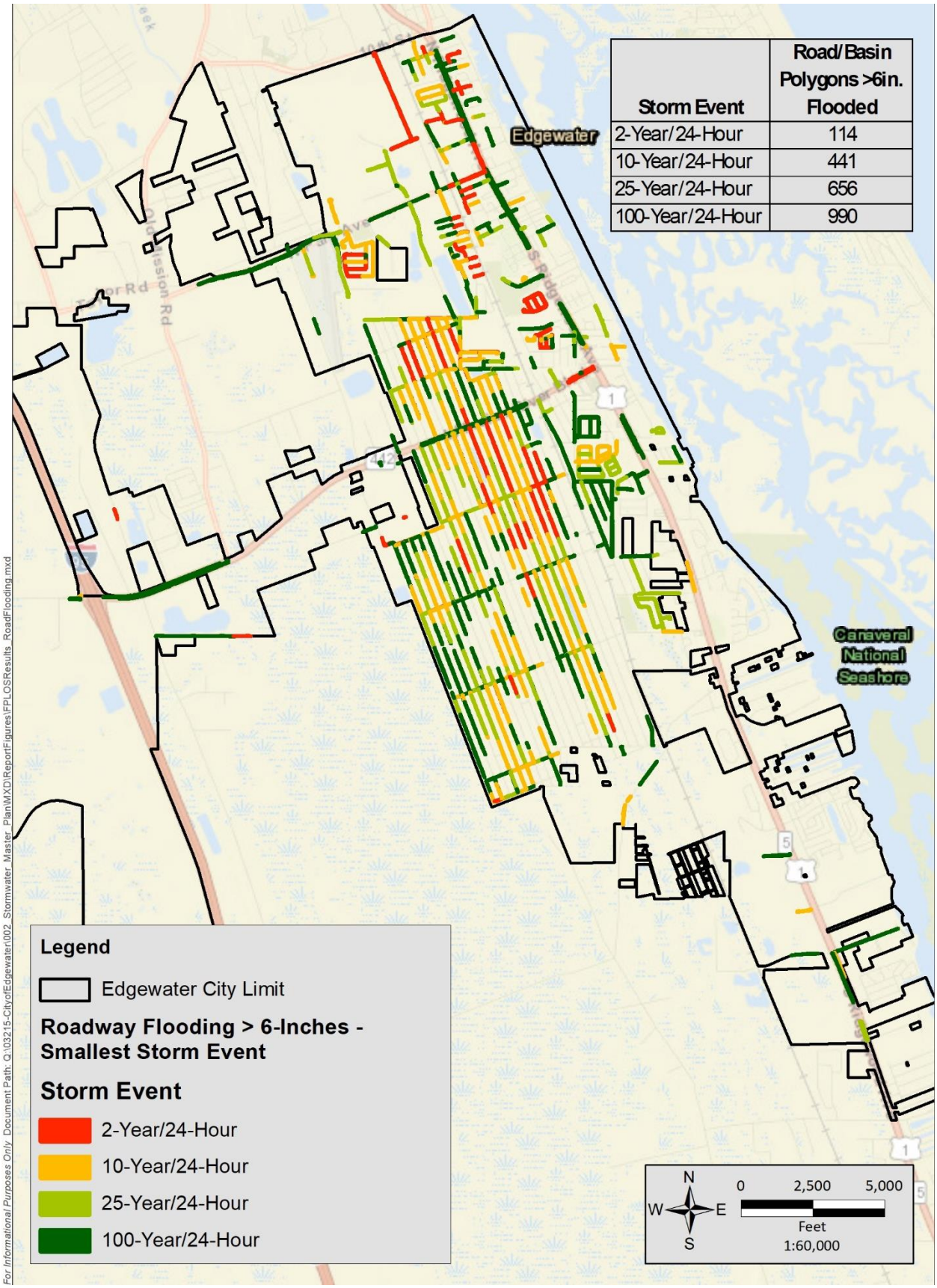


Figure 74 Roadway Flooding Greater Than 6 Inches – Smallest Design Storm Event



6.4 FPLOS Sub-Basin Results and Prioritization

To prioritize the FPLOS results, Jones Edmunds aggregated the results at the model sub-basin level using the scoring criteria and weighting factors in Section 6.1. For each sub-basin, the score of the maximum modeled flooding condition of building, residential yard, and roadway flooding within the basin was identified and assigned to the basin for each storm event. For example, if building flooding above the FFE was predicted to occur in a basin in the 100-year/24-hour event, the basin would be assigned a score of 3 for that event and flood type. The maximum modeled flooding condition basin scores for each storm event and type of flooding were then multiplied by the event-specific weighting factors in Table 20 and summed for each type of flooding to determine a basin-specific total score for building, residential yard, and roadway flooding. The building, residential yard, and roadway flooding total scores were then multiplied by the weighting factors in Table 21 based on the flooding type and summed to determine the final basin score. Table 25 provides an example breakdown of how the scoring system was applied to each basin.

Once the total scores were calculated for each of the sub-basins, a priority rating was assigned. The sub-basins were assigned a priority rating of highest, high, medium-high, medium, medium-low, lowest, or N/A based on their total score. Sub-basins with a score of 0 were assigned a rating of N/A, meaning they did not contain any FPLOS deficiencies in any of the storm events. The rest of the sub-basin priorities were assigned based on the criteria in Table 26, which also shows the number of sub-basins assigned to each priority rating. For the basins not assigned to the N/A rating, approximately 50 sub-basins with the highest scores were assigned to the highest priority rating and approximately 190–210 sub-basins were assigned to each of the remaining priority ratings. Figure 75 maps the sub-basins based on the assigned priority ratings providing a spatial representation of FPLOS results.

Table 25 Example of Sub-Basin FPLOS Scoring Calculation

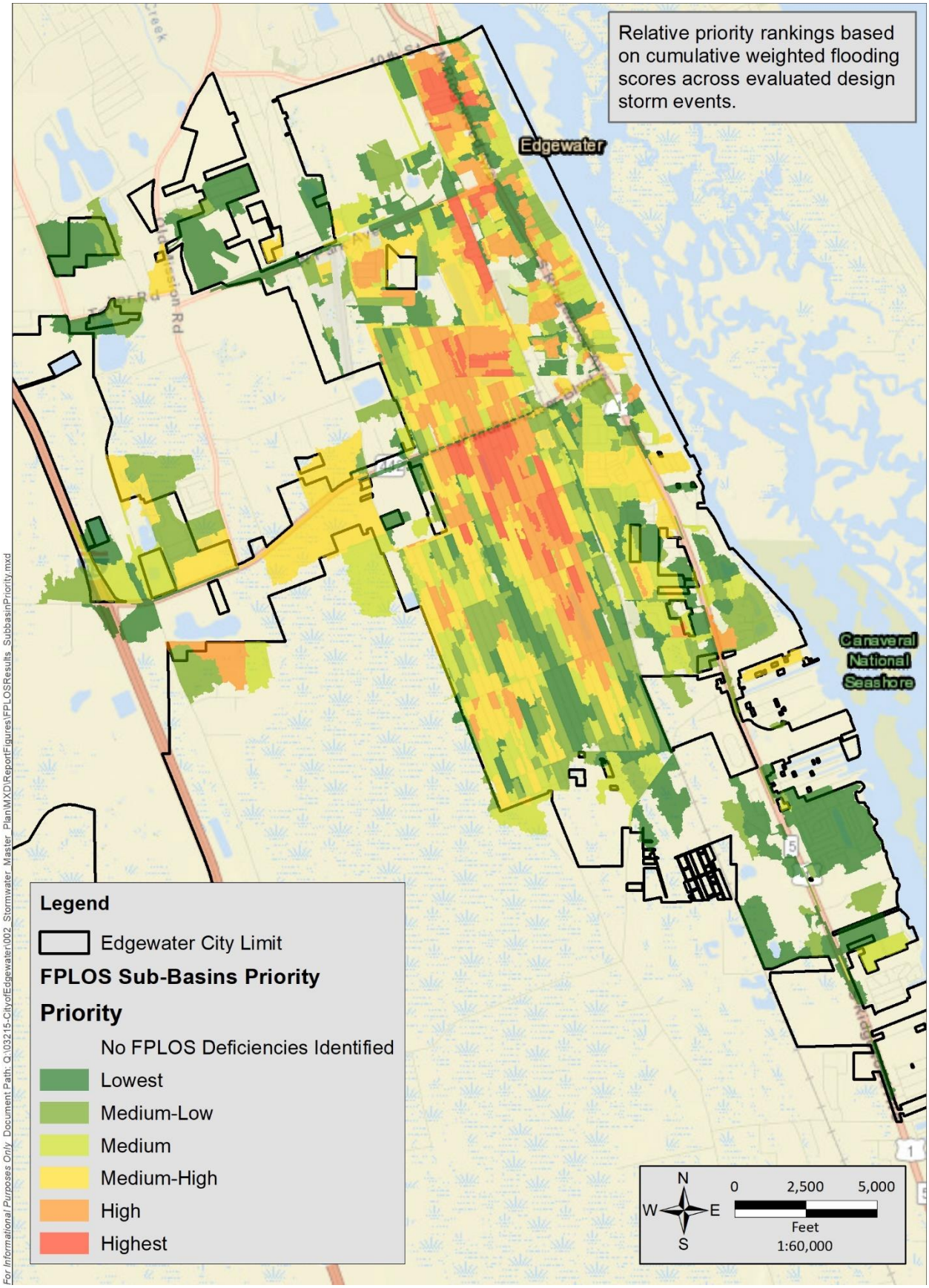
Flooding Type	Storm Event	Predicted Maximum Modeled Flooding Condition in Basin	Maximum Modeled Flooding Condition Score		Storm Event Based Weighting Factor		Score x Weighting Factor	Flood Type Total Score		Flood Type Weighting Factor		Flood Type Weighted Score	Total Basin Score
Building	2-Year/ 24-Hour	No Building Flooding in Basin	0	x	4	=	0	13.5	x	3	=	40.5	**102.5**
	10-Year/ 24-Hour	Building Flooding Below FFEs in Basin	1.5	x	3	=	4.5						
	25-Year/ 24-Hour	Building Flooding Above FFEs in Basin	3	x	2	=	6						
	100-Year/ 24-Hour	Building Flooding Above FFEs in Basin	3	x	1	=	3						
Residential Yard	2-Year/ 24-Hour	Yard Flooding 0-33% in Basin	1	x	4	=	4	22	x	2	=	44	
	10-Year/ 24-Hour	Yard Flooding >=66% in Basin	3	x	3	=	9						
	25-Year/ 24-Hour	Yard Flooding >=66% in Basin	3	x	2	=	6						
	100-Year/ 24-Hour	Yard Flooding >=66% in Basin	3	x	1	=	3						
Roadway	2-Year/ 24-Hour	No Roadway Flooding in Basin	0	x	4	=	0	18	x	1	=	18	
	10-Year/ 24-Hour	Roadway Flooding Greater Than 6-inches	3	x	3	=	9						
	25-Year/ 24-Hour	Roadway Flooding Greater Than 6-inches	3	x	2	=	6						
	100-Year/ 24-Hour	Roadway Flooding Greater Than 6-inches	3	x	1	=	3						

Note: Weighting factors are applied to prioritize flooding that occurs in more frequent return period storms (i.e., building flooding that occurs in a 10-year storm event would be weighted higher than building flooding that occurs in the 100-year storm event) and to prioritize the types of flooding to match the prioritization in the City's LOS criteria (i.e., building flooding is weighted higher than street or yard flooding and yard flooding is weighted higher than street flooding).

Table 26 Sub-Basin Priority Categories and Score Thresholds

Priority Rating	Sub-Basin Score Range	Number of Sub-Basins
N/A	0	963
Lowest	0–12.5	206
Medium-Low	12.5–23	186
Medium	23–40	192
Medium-High	40–70	184
High	70–125	189
Highest	125–200	53

Figure 75 Modeled Sub-Basin Flooding Priorities



6.5 Observed Flooding versus Modeled FPLOS Deficiencies

Based on flood documentation and discussions with City staff, the FPLOS results align very closely with observed flooding throughout the City during recent extreme storm events. The areas with the greatest density of sub-basins in the highest and high priority categories from the FPLOW include:

- Florida Shores south of Indian River Boulevard between Victory Palm Drive and India Palm Drive.
- Florida Shores north of India River Boulevard.
- The area between 12th Street and Park Avenue east of Mango Tree Drive and west of the FEC railroad tracks.
- The area along the G2 and G11 Canals between south of 10th Street, north of Shangri La Circle, east of the FEC railroad tracks, and west of US-1.
- The west side of Florida Shores south of 22nd Street and west of Umbrella Tree Drive.

These areas all experienced well-documented roadway, residential yard, and structure flooding during Hurricane Ian, Hurricane Milton, or the September 14, 2024, storm event. The City documented that approximately 200 homes flooded during Hurricane Milton. The FPLOS results showed that approximately 130 structures had flooding above the estimated FFE and approximately 220 structures had flooding above the estimated FFE or within 0.2 foot of the estimated FFE when compared to the modeled peak stage for Hurricane Milton. The City also documented that approximately 1,200 homes experienced flooding during Hurricane Ian. The FPLOS results showed that approximately 1,000 structures had flooding above the estimated FFE and approximately 1,260 structures had flooding above the estimated FFE or within 0.2 foot of the estimated FFE when compared to the modeled peak stage for Hurricane Ian. The estimated FFE is meant to represent the elevation of the finished structure living space and does not capture instances where flooding may have occurred in attached garages or where flooding was caused by wave effects from cars driving through flooded streets. Overall, these comparisons show that the observed flooding aligns well with the modeled FPLOS deficiencies.

6.6 Drainage Problem Area Identification

Drainage problem areas were identified based on the FPLOS results summarized in Section 6.4 to help the City determine where to focus on developing and implementing future drainage improvement alternatives. A total of 25 drainage problem areas were identified throughout the City. Table 27 summarizes the problem area locations and FPLOS results for predicted home flooding based on the existing conditions model results, and Figure 76 shows the problem areas spatially. Each of the problem areas were assigned a unique ID and a descriptive name based on their location. Jones Edmunds met with City staff to review and prioritize the drainage problem areas. The problem areas were assigned a priority of Tier 1, Tier 2, or Tier 3, with Tier 1 being the highest priority and Tier 3 being the lowest priority. The prioritization was based on results from the FPLOS and the City staff's understanding of where the worst flooding has occurred in the recent storm events. Tiers were generally assigned based on the criteria below:

- Tier 1 – These areas experience widespread roadway, yard, and structure flooding. Structure flooding occurs in design storm events that are more frequent than the 100-year/24-hour event for most of these problem areas.
- Tier 2 – These areas experience widespread roadway and yard flooding with limited structure flooding. Structure flooding begins in the 100-year/24-hour event.
- Tier 3 – These areas experience roadway and yard flooding with very little or no structure flooding in any of the design storm events.

More detailed descriptions of the existing drainage conditions, magnitude of flooding, and causes of flooding for the Tier 1 and Tier 2 drainage problem areas are provided in the following sub-sections. Flood reduction alternatives were evaluated and recommended for the Tier 1 and Tier 2 drainage problem areas and are summarized in Section 8. Where appropriate, problem areas were combined geographically resulting in the following six groups of problem areas.

- Florida Shores South of Indian River Boulevard – This group includes drainage problem areas 1000, 1009, 1006, and 1022, which are in Florida Shores south of Indian River Boulevard and drain to the E1 Canal through the E10, E9, or E13 Canals.
- Florida Shores North of Indian River Boulevard – This group includes drainage problem areas 1003, 1010, and 1013, which are in Florida Shores north of Indian River Boulevard and drain to the E1 Canal through the E11 Canal, the E12 Canal, or the Bond Street Ponds.
- Florida Shores West Side – This group includes drainage problem areas 1019 and 1020, which are in Florida Shores west of Willow Oak Drive and drain to the Silver Palm Canal through the T1, T2, T3, T4, T5, and T6 Canals.
- Edgewater Acres – This group includes drainage problem areas 1004 and 1021, which are north of 12th Street between Mango Tree Drive and the FEC railroad tracks and drain north through the G5 Canal.
- G2 and G11 Canals – This group includes drainage problem areas 1001, 1002, and 1015, which are between the FEC railroad tracks and US-1 south of 10th Street and drain north to the Gabordy Canal through the G2 Canal.
- Pelican West – This only includes drainage problem area 1023, which is north of 22nd Street on the east side of the FEC railroad tracks and drains north to the E1 Canal through the E5 and E3 Canals.

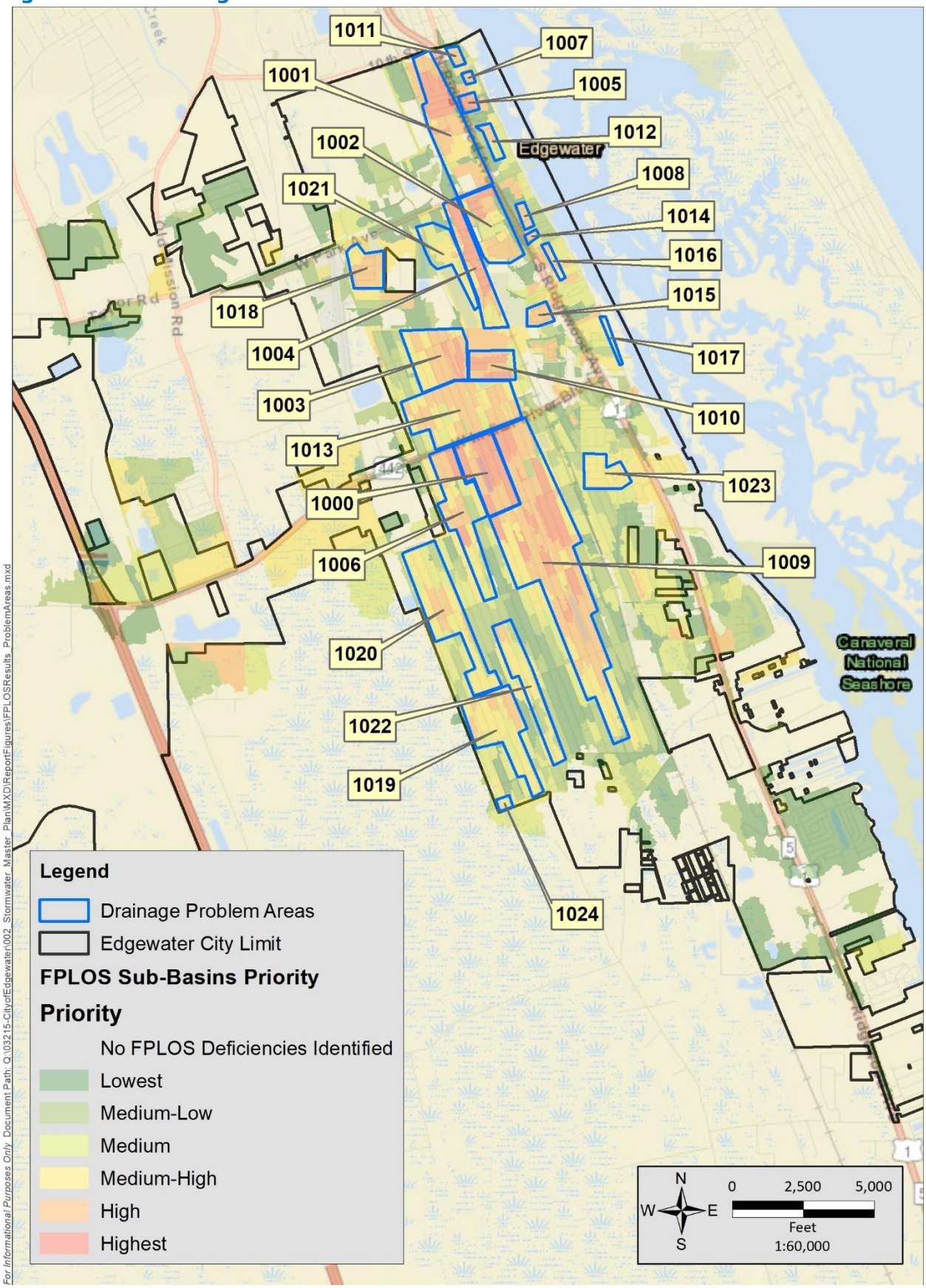
Table 27 Summary of Tiered Drainage Problem Areas and Predicted Building Flooding Above FFE

Problem Area Id	Priority	Name	Location Description	Total # of Buildings in Problem Area	Number of Buildings with Flooding Above FFE			
					2-Year/ 24-Hour	10-Year/ 24-Hour	25-Year/ 24-Hour	100-Year/ 24-Hour
1000	Tier 1	South Florida Shores: E10 Canal	South Florida Shores. E10 Canal basins between Indian River Boulevard (north), 22nd Street (south), Sable Palm Drive (west), and Needle Palm Drive (east).	210	0	19	62	113
1001	Tier 1	G2 Canal North	G2 Canal basins between 10th Street (north), Park Avenue (south), railroad tracks (west), and US-1 (east).	226	1	9	23	67
1002	Tier 1	G2 Canal South	G2 Canal basins between Park Avenue (north), Connecticut Avenue (south), railroad tracks (west), and US-1 (east).	237	0	6	10	29
1003	Tier 1	North Florida Shores: E11 Canal North of 16th Street	North Florida Shores. E11 Canal basins between 12th Street (north), 16th Street (south), Travelers Palm Drive (west), and Mango Tree Drive (east).	237	0	2	5	20
1004	Tier 1	Edgewater Acres East	Unnamed ditch basins between Park Avenue (north), Beulah Drive (south), railroad tracks (east), and Lake Avenue (west).	189	4	9	12	22
1009	Tier 1	South Florida Shores: E9 Canal	South Florida Shores. E9 Canal basins between Indian River Boulevard (north), 34th Street (south), Royal Palm Drive (west), and India Palm Drive (east).	1,032	0	3	74	254
1010	Tier 1	North Florida Shores: Bond Street	Florida Shores North. Bond Street pond basins between Regent Street (north), 16th Street (south), Mango Tree Drive (west), and railroad tracks (east).	66	0	2	2	20

Problem Area Id	Priority	Name	Location Description	Total # of Buildings in Problem Area	Number of Buildings with Flooding Above FFE			
					2-Year/ 24-Hour	10-Year/ 24-Hour	25-Year/ 24-Hour	100-Year/ 24-Hour
1006	Tier 1	South Florida Shores: E13 Canal	South Florida Shores. E13 Canal basins between Indian River Boulevard (north), 26th Street (south), Willow Oak Drive (west), and Royal Palm Drive (east).	292	0	1	2	7
1013	Tier 1	North Florida Shores: E1, E11, and E12 Canals South of 16th Street	North Florida Shores. E1, E11, and E12 Canal basins between 16th Street (north), Indian River Boulevard (south), Willow Oak Drive (west), and Juniper Drive (east).	413	0	0	0	16
1015	Tier 2	Shangri La Village Subdivision	Shangri La Village Subdivision basin.	46	0	0	0	8
1019	Tier 2	South Florida Shores: T6 Canal South of 30th Street	South Florida Shores. T6 Canal basins between 30th Street (north), 36th Street (south), Silver Palm Drive (west), and Willow Oak Drive (east).	282	0	0	0	4
1020	Tier 2	South Florida Shores: T1, T2, T3, T4, and T5 Canals	South Florida Shores. T1, T2, T3, T4, and T5 Canal basins between 22nd Street (north), 30th Street (south), Silver Palm Drive (west), and Woodland Drive (east).	351	0	0	0	2
1021	Tier 2	Edgewater Acres West	G5 Canal basins between Park Avenue (north), 12th Street (south), Mango Tree Drive (west), and Lake Avenue (east).	78	0	0	0	21
1022	Tier 2	E13 Canal between 27th Street and 34th Street	South Florida Shores. E13 Canal basins between 27th Street (north), 34th Street (south), Victory Palm Drive (west), and Travelers Palm Drive (east).	197	0	0	0	0
1023	Tier 2	Pelican Cove Subdivision	Pelican Cove Subdivision basins that drain into the E5 Canal.	129	0	0	0	21

Problem Area Id	Priority	Name	Location Description	Total # of Buildings in Problem Area	Number of Buildings with Flooding Above FFE			
					2-Year/ 24-Hour	10-Year/ 24-Hour	25-Year/ 24-Hour	100-Year/ 24-Hour
1005	Tier 3	Erskine Drive and Rio Vista Drive	Isolated depression at the intersection of Erskine Drive and Rio Vista Drive east of US-1.	29	0	0	0	1
1007	Tier 3	Yelkca Terrace and Dixwood Avenue	Isolated depression between East Yelkca Terrace and Dixwood Avenue.	12	0	0	0	0
1008	Tier 3	Merimac Street, East Ocean Avenue, and East Connecticut Avenue	Isolated depressions between Francis Drive (north) and East Connecticut Avenue (south).	23	0	0	0	0
1011	Tier 3	Sanchez Avenue and East Knapp Avenue	Isolated depressions between Hamilton Road (north) and Richport Lane (south).	26	0	0	0	0
1012	Tier 3	Evergreen Avenue	Isolated depression between Riverview Drive (north) and Plaza Lane (south).	27	0	0	0	0
1014	Tier 3	Hotel Street	Isolated depressions along Hotel Street between US-1 and Fernald Street.	19	0	0	0	0
1016	Tier 3	Fernald Street	Isolated depressions along Fernald Street between New Hampshire Street (north) and East Turgot Avenue (south).	25	0	0	0	0
1017	Tier 3	Riverside Drive	Riverside Drive between East Marion Avenue (north) and Virginia Street (south).	4	0	0	0	0
1018	Tier 3	Wildwood Subdivision	Wildwood Subdivision Basins	149	0	0	0	0
1024	Tier 3	Silver Palm Drive and 35th Street	Intersection of Silver Palm Drive and 35th Street.	15	0	0	0	1

Figure 76 Drainage Problem Areas



6.6.1 Florida Shores South of Indian River Boulevard

This group of drainage problem areas includes the area in Florida Shores south of Indian River Boulevard that drains to the E9, E10, or E13 Canals. The E9 Canal drains approximately 765 acres of medium-density residential area with an average CN of 69 and an average impervious area percentage of 33 percent. The E10 Canal drains approximately 88 acres of medium-density residential area with an average CN of 87 and average impervious area percentage of 32 percent. The E13 Canal drains approximately 400 acres of medium-density residential area with an average CN of 55 and average impervious area percentage of 34 percent. In total, the canals drain approximately 1,300 acres with an average CN of 65 and an average imperious percentage of 33 percent. The landscape in these basins predominantly slopes from south to north with topographic ridges running north-south along the east and west sides of the E13 Canal Watershed and along the east side of the E9 Canal Watershed. The lowest points in these basins are at the north end along Pine Tree Drive near Indian River Boulevard, with elevations between 7.5- and 8.0-ft-NAVD88 based on the DEM. Figure 77 shows the drainage Watersheds that contribute to the canals overlaid on the LiDAR DEM.

Runoff from these areas flows north toward Indian River Boulevard through the three primary drainage canals and several cross-culverts where roadways intersect the canals. Runoff then crosses under Indian River Boulevard to the north through three culvert crossings, one for each canal. The crossing at the E13 Canal is a single 54-inch concrete culvert, the crossing at the E10 Canal is a single 36-inch culvert and the crossing at the E9 Canal is a double barrel 48-inch culvert. Based on the H&H model results, these culverts are not equipped to handle the flow from these drainage basins during large storm events like the 25-year and 100-year/24-hour events. The modeled head loss across these culverts in the 25-year and 100-year/24-hour events is greater than 1-foot, which results in water "stacking" up south of Indian River Boulevard. Based on the LiDAR DEM, the centerline elevation of Indian River Boulevard is between 10.5- and 11-ft-NAVD88, essentially creating a dam for the stormwater runoff in this area when the culverts become overwhelmed.

Figure 78Figure 78 shows the model predicted 100-year 24-hour inundation extents, and Figure 79 shows the 25-year 24-hour inundation extents for the Florida Shores South of Indian River Boulevard drainage problem areas with node peak stages labeled along the E9, E10, and E13 Canals. Figure 80 shows the building, residential yard, and roadway FPLOS deficiencies identified in this area. As shown in the figures, significant flooding occurs in these problem areas with the worst of the flooding occurring along the E9 and E10 Canals between Indian River Boulevard and 30th Street. Jones Edmunds used the inundation mapping results, modeled peak stages, and DEM to estimate the cumulative volume of stormwater on the ground surface outside of existing stormwater ponds at the peak stages during the 100-year/24-hour and 25-year/24-hour design storm events. This is representative of the volume of flooding on the surface if all the model nodes peaked at the same time step in the model. This is a slightly conservative assumption but close to reality given the relatively flat landscape and stagnation of flood waters that has been observed. Table 28 summarizes the results, which represent a rough approximation of the surface storage deficit in this area. For the 100-year storm event, there is approximately 400 acre-feet of stormwater runoff stored on the surface outside of the existing stormwater ponds and ditches. This is equivalent to approximately 80 acres of stormwater pond with 5-feet of storage depth or the volume of approximately 200 Olympic-sized swimming pools.

Figure 77 Drainage Basin Delineation and Existing Topography – Florida Shores South

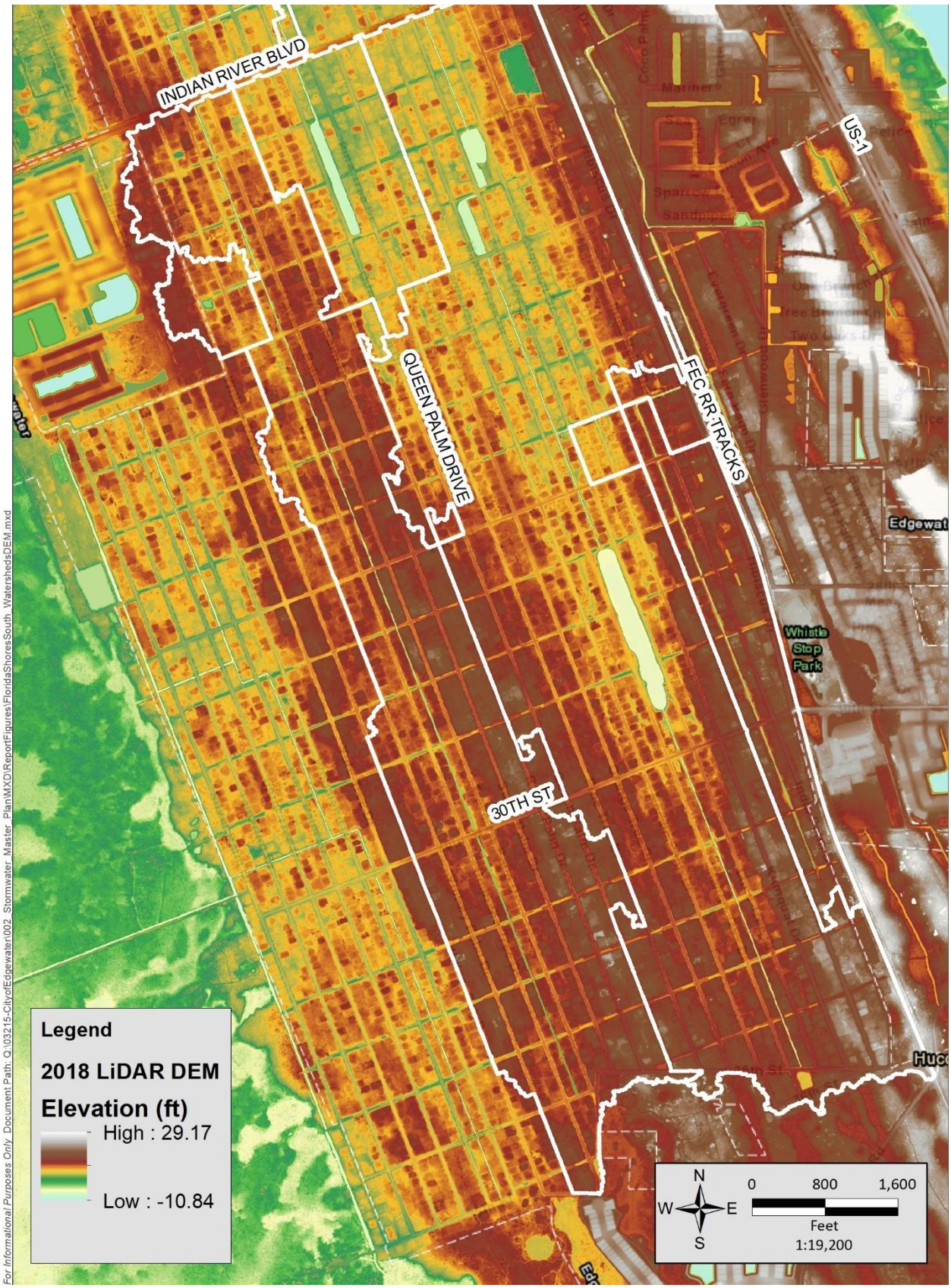


Figure 78 100-Year Existing Conditions Flooding – Florida Shores South



Figure 79 25-Year Existing Conditions Flooding – Florida Shores South

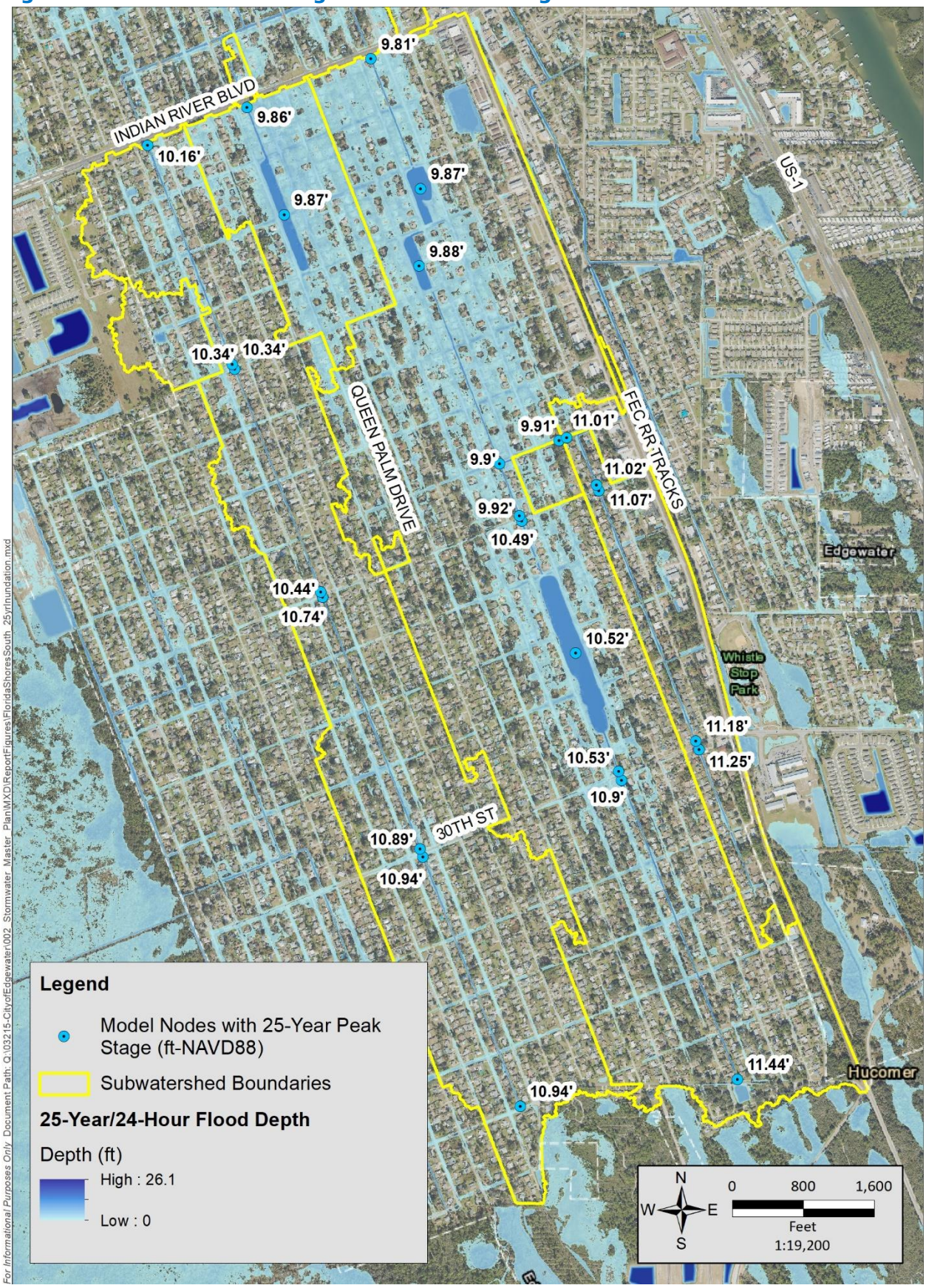


Figure 80 Building, Yard, and Roadway Flooding Results (FPLOS) – Florida Shores South

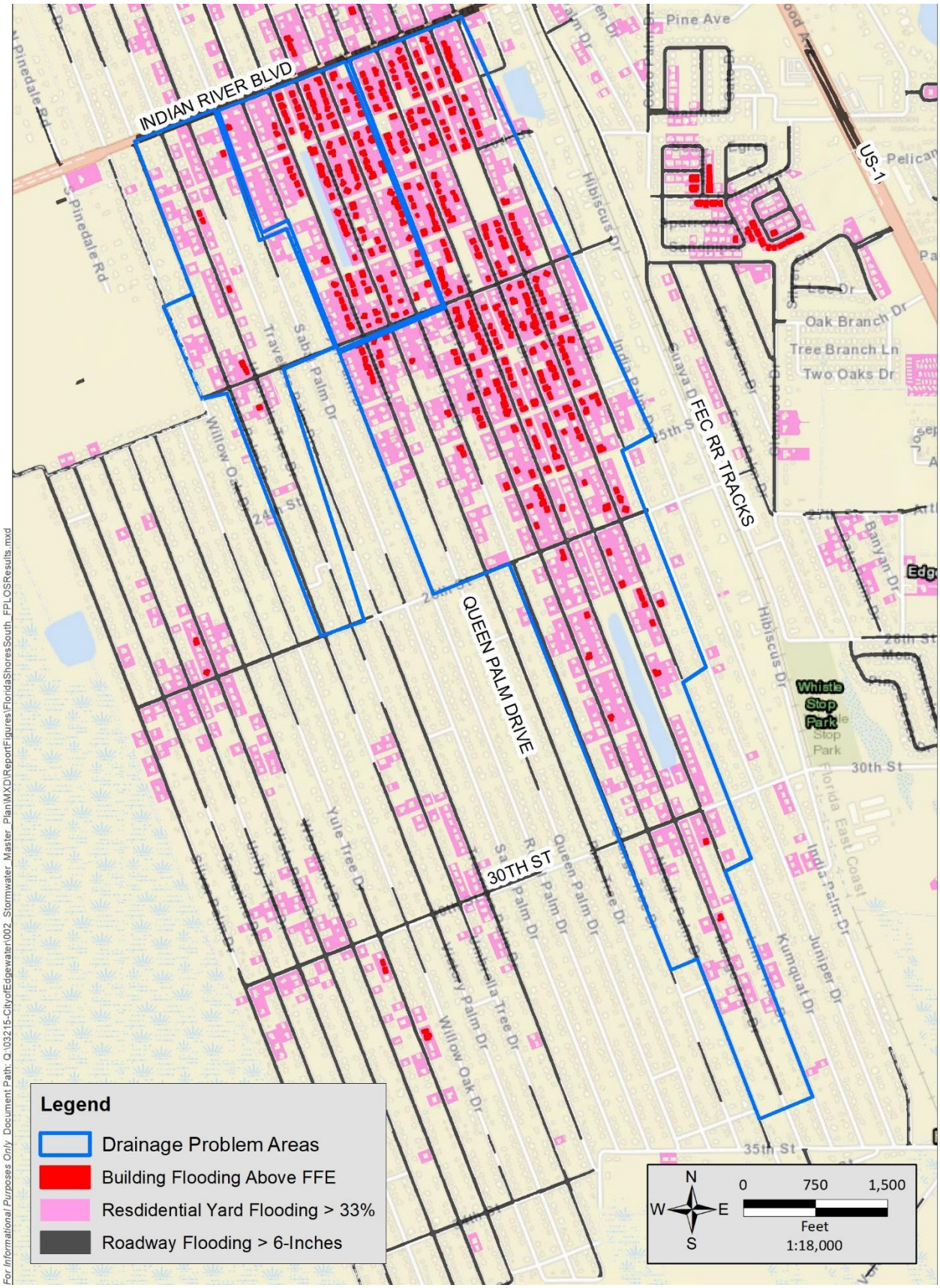


Table 28 Estimated Surface Flooding Volumes in the Florida Shores South of Indian River Boulevard Problem Areas

Storm Event	Surface Flooding Volume (acre-feet)
25-Year/24-Hour	228
100-Year/24-Hour	403

The modeled predicted flooding in this area is extensive but corresponds with the flooding that residents have experienced in recent storm events. The flooding in this area can be attributed to several factors including:

- Limited stormwater pond storage capacity – Engineers typically budget approximately 15–20 percent of a proposed new development site for stormwater ponds. The basin that drains to this area is approximately 1,300 acres, which would require approximately 195–260 acres of planned stormwater ponds if developed today. Approximately 36 acres of stormwater ponds exist in this area, with 13 acres being shallow dry-retention areas designed for water quality treatment and offering minimal storage capacity. Table 28 approximates the area's significant deficiency in stormwater storage capacity for the 25-year and 100-year/24-hour events.
- Limited hydraulic conveyance capacity – The hydraulic capacities of the primary drainage canals and cross-culverts in this area and the E1 Canal are significantly undersized for the stormwater runoff produced from this drainage area. These conveyance systems were primarily constructed in the 1950s and 1960s before modern stormwater regulations and planning requirements. The primary drainage ditches were designed to dewater these low-lying areas and provide mosquito control rather than provide stormwater protection.
- Topographic challenges – Much of this area is low-lying with topographic ridges to the north, south, east, and west, which creates a "bowl" where stormwater collects and creates flooding. Based on a review of available historical aerial imagery from 1952, the lowest-lying areas where flooding now occurs were historically wetlands and natural floodplain where inundation would be expected. Figure 81 shows the drainage problem area boundaries overlayed on the 1952 aerials.
- Increases in impervious area within Florida Shores – Based on a review of historical imagery, Florida Shores was originally developed in the late 1950s. In the more than 60 years since, the area has progressively been built out to its current conditions with impervious homes, paved roadways, driveways, etc. The Florida Shores stormwater system was not designed to handle the full-buildout condition that exists today. Figure 82 shows how impervious conditions have changed over time based on historical and current aerial imagery.
- Loss of surface storage in Florida Shores – Surface storage has continually reduced in Florida Shores as new homes are constructed. Typically, when new homes are constructed on empty lots, owners bring in fill to build their homes up higher and effectively reduce the surface storage for stormwater management.

Figure 81 Florida Shores South of Indian River Boulevard 1952 Aerials

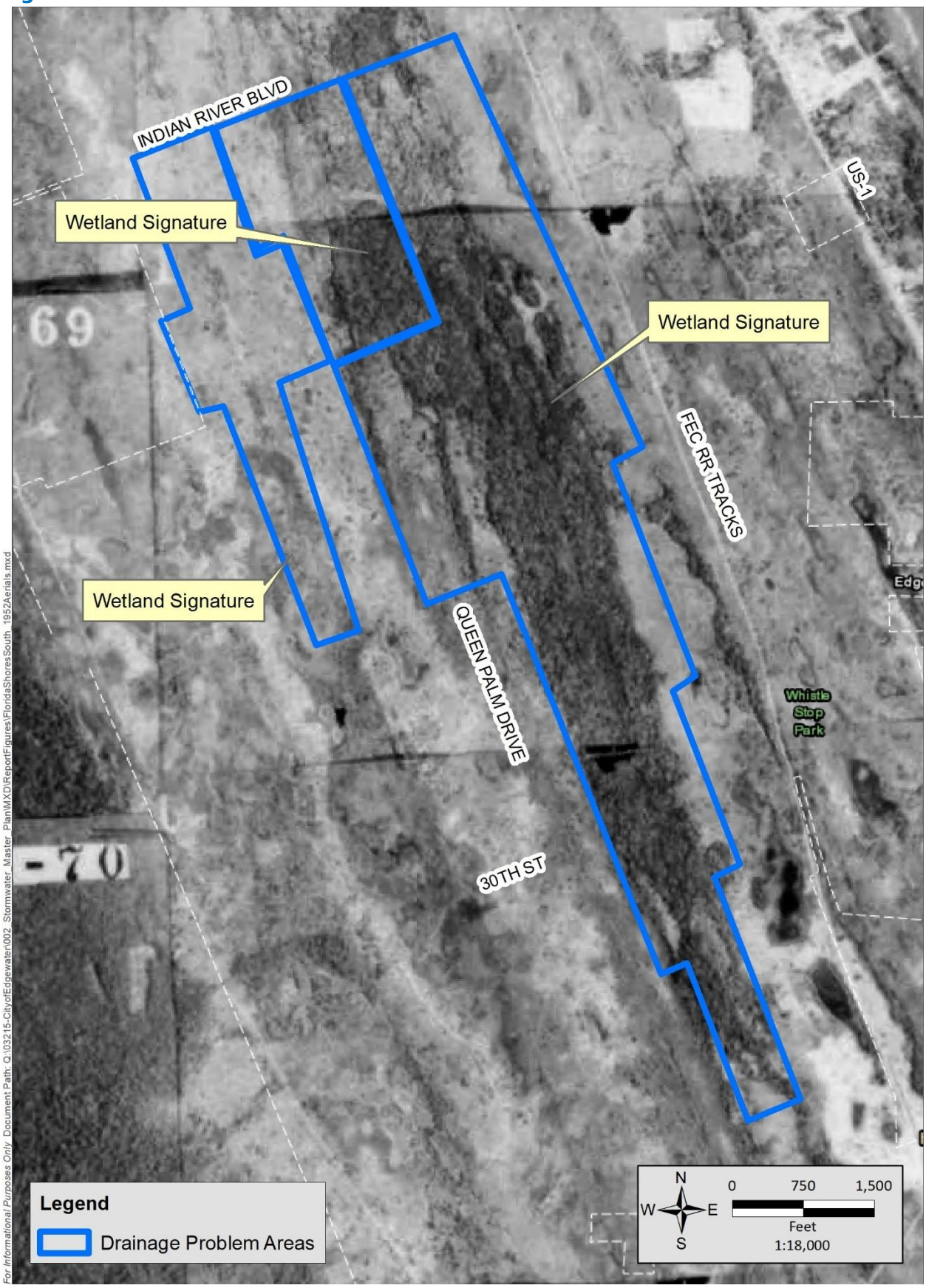


Figure 82 Florida Shores South of Indian River Boulevard Historic Aerial Timelapse



Some discussion related to flooding in this part of Florida Shores has centered around offsite flows coming into the Shores from south of 35th and 36th Streets and the impact it has on flooding in the area. In general, Florida Shores south of Indian River Boulevard receives runoff volume from outside Florida Shores from two locations. Inflow occurs from the wetland areas south of 35th Street and in some events runoff comes into the Shores through the E06 Canal where two 48-inch-by-78-inch elliptical culverts connect the E4 and E6 Canals under the FEC railroad tracks. Figure 83 shows where runoff from outside Florida Shores south of Indian River Boulevard can flow into Florida Shores. Jones Edmunds used the StormWise model to determine how sensitive flood stages in Florida Shores South are to the inflow from south of 35th and 36th Streets. Jones Edmunds ran the StormWise model for two scenarios and compared the peak stages.

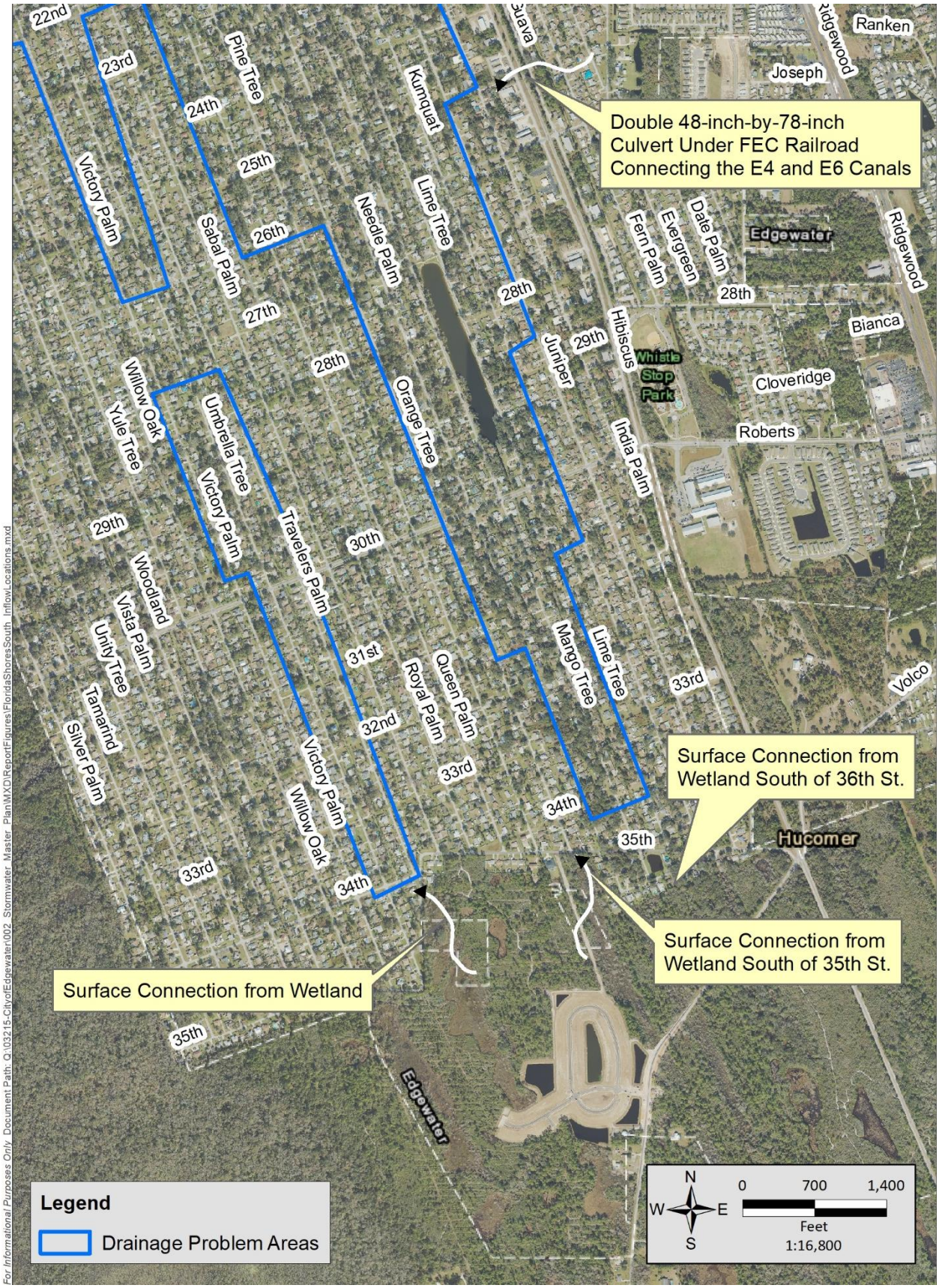
- Wetlands south of 35th and 36th Streets full – This scenario assumes the wetlands south of 35th and 36th Streets are full at the beginning of the model simulations, which is the worst-case scenario for impacts to Florida Shores. Rainfall in the wetlands would immediately discharge north into Florida Shores without being attenuated by storage in the wetlands.
- Hydraulic connections from south of 35th and 36th Streets turned off – This scenario assumes that the overland weir and pipe connections from south of 35th and 36th Streets do not exist, and water is unable to flow into Florida Shores from the south. This effectively eliminates any impact that the offsite flow from the south would have. Hydraulic links (weirs and pipe connections) conveying flow from south of 35th and 36th Streets into Florida Shores were removed from the model to simulate no offsite inflow conditions.

We then compared the node peak stage results from the two scenarios to determine the worst-case scenario impact that the inflow from south of 35th and 36th Streets has on stages in this area. The maximum peak stage difference between the two model scenarios occurred at the nodes that receive the flow directly from the wetlands along 35th and 36th Streets. The maximum changes in peak stage were 0.09 foot for the 10-year event, 0.19 foot for the 25-year event, 0.07 foot for the 100-year event, and 0.14 foot for the 500-year event. The changes in peak stage are summarized in Table 29. These increases were isolated to a small area at the very south end of Florida Shores. The average difference for the rest of the nodes that had impacts were 0.02 foot for the 10-year event, 0.03 foot for the 25-year event, 0.02 foot for the 100-year event, and 0.02 foot for the 500-year event. These results indicate that the inflow from south of 35th and 36th Streets has very little impact on flood stages in Florida Shores south of Indian River Boulevard.

Table 29 Maximum and Average Node Stage Differences – Florida Shores Southend Inflow Sensitivity Analysis

Storm Event	Average Node Stage Difference (ft)	Maximum Node Stage Difference (ft)
10-Year/24-Hour	0.02	0.09
25-Year/24-Hour	0.03	0.19
100-Year/24-Hour	0.02	0.07
500-Year/24-Hour	0.02	0.14

Figure 83 Offsite Inflow Connection Locations – Florida Shores South of Indian River Boulevard



6.6.2 Florida Shores North of Indian River Boulevard

This group of drainage problem areas includes the area in Florida Shores north of Indian River Boulevard that drains to the E1 Canal (AKA 18th Street Canal) through the E11 Canal, the E12 Canal, or the Bond Street Ponds. The E11 Canal drains approximately 256 acres of medium-density residential area, with an average CN of 78 and an average impervious area percentage of 31 percent. The E12 Canal drains approximately 56 acres of medium-density residential area, with an average CN of 68 and average impervious area percentage of 34 percent. The E1 Canal in this area drains approximately 106 acres of medium-density residential area, with an average CN of 71 and average impervious area percentage of 37 percent. In total, the canals drain approximately 420 acres, with an average CN of 75 and an average imperious percentage of 33 percent. The landscape in these basins predominantly slopes from south to north, with topographic ridges that run north-south along the east and west sides of Florida Shores. The lowest points in these basins are primarily in the center of this area along Pine Tree Drive, with roadway elevations between 7.0- and 7.5 ft-NAVD88 based on the DEM. The area around Regent Street and Bond Street is also low-lying, with roadway elevations between 7.0- and 7.5 ft-NAVD88. Figure 84 shows the drainage basins for each of the canals overlaid on the LiDAR DEM.

Runoff from these areas collects in the 18th Street Canal, E11 Canal, and E12 Canal and flows east in the 18th Street Canal, which ultimately discharges into ML. The 18th Street Canal has 17 major culvert crossings between Travelers Palm Drive and Riverside Drive before it discharges into ML, including crossings at the FEC railroad tracks and US-1 not owned by the City. The 18th Street Canal is also the primary outfall for Florida Shores south of Indian River Boulevard, which discharges under Indian River Boulevard through three existing cross-culverts. Based on the StormWise model results, a significant amount of flow can also discharge north via roadway overtopping (overland flow) over 12th Street, which has a centerline elevation of approximately 7.5 ft-NAVD88.

Figure 85 shows the model predicted 100-year 24-hour inundation extents, and Figure 86 shows the 25-year/24-hour inundation extents for the Florida Shores North of Indian River Boulevard drainage problem areas with node peak stages labeled along the E1, E11, and E12 Canals. Figure 87 shows the building, residential yard, and roadway FPLOS deficiencies identified in this area. As shown in the figures, significant flooding occurs in these problem areas, with the worst flooding occurring along Pine Tree Drive, Orange Tree Drive, Needle Palm Drive, Bond Street, and Regent Street. Jones Edmunds used the inundation mapping results, modeled peak stages, and DEM to estimate the cumulative volume of stormwater on the ground surface outside existing stormwater ponds at the peak stages during the 100-year/24-hour and 25-year/24-hour design storm events. This is representative of the volume of flooding on the surface if all the model nodes peaked at the same time step in the model. This is a slightly conservative assumption but close to reality given the relatively flat landscape and stagnation of flood waters that has been observed. Table 30 summarizes the results, which represent a rough approximation of the surface storage deficit in this area. For the 100-year storm event, approximately 132 acre-foot of stormwater runoff is stored on the surface outside the existing stormwater ponds and ditches. This is equivalent to approximately 26 acres of stormwater pond with 5-feet of storage depth or the volume of approximately 65 Olympic-sized swimming pools.

Figure 84 Drainage Basin Delineation and Existing Topography – Florida Shores North

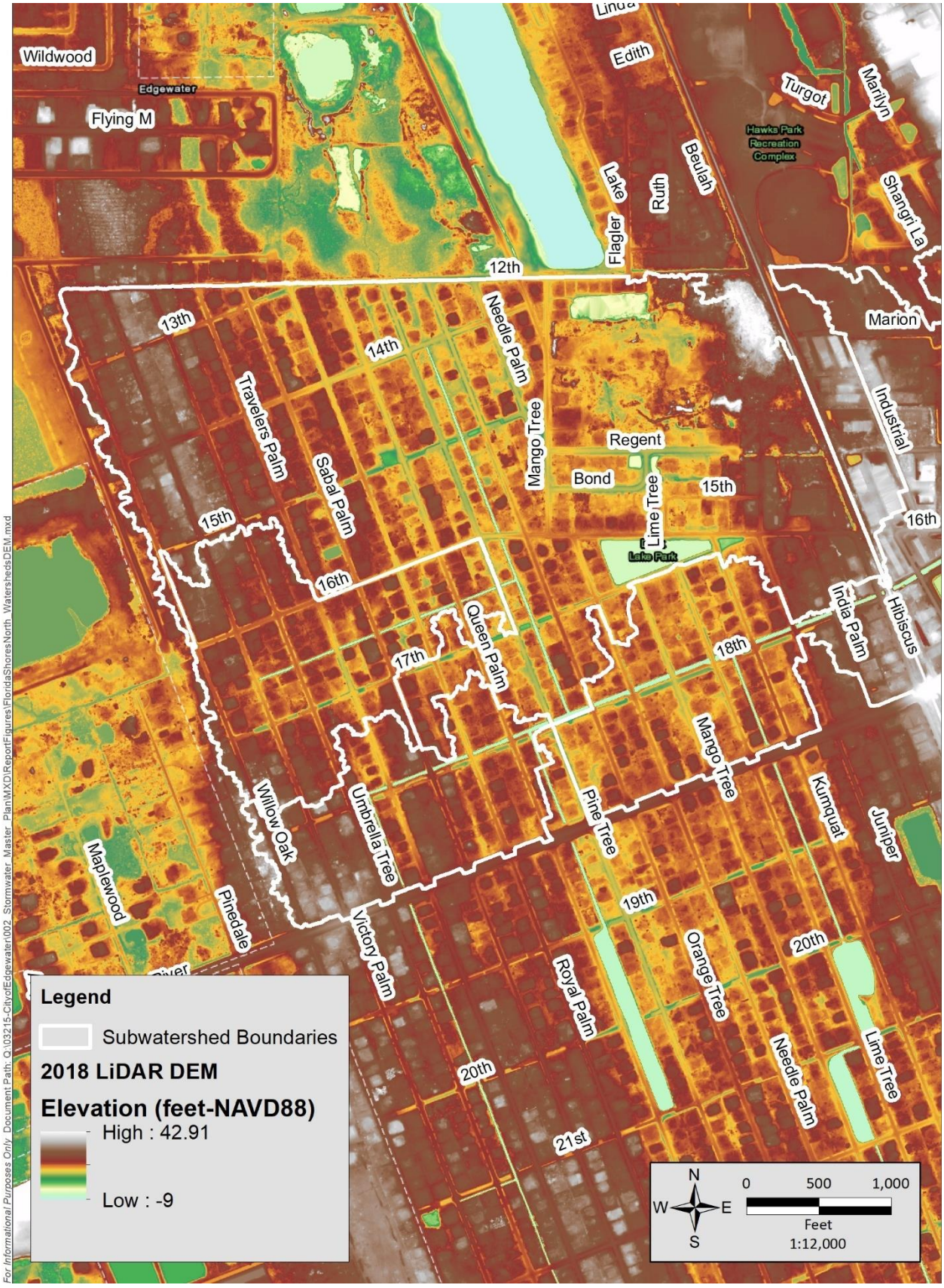


Figure 85 100-Year Existing Conditions Flooding – Florida Shores North

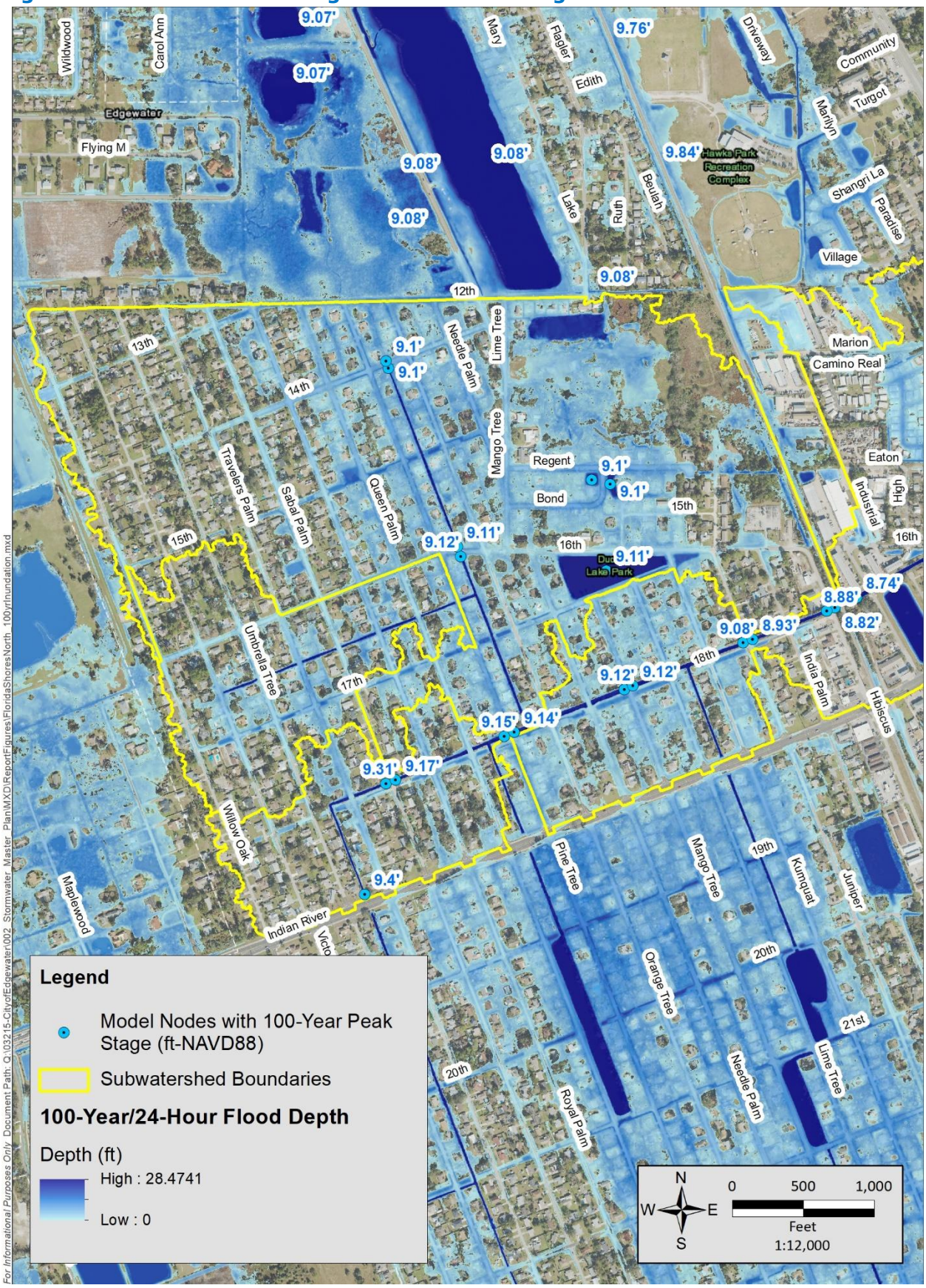


Figure 86 25-Year Existing Conditions Flooding – Florida Shores North



Figure 87 Building, Yard, and Roadway Flooding Results (FPLOS) – Florida Shores North

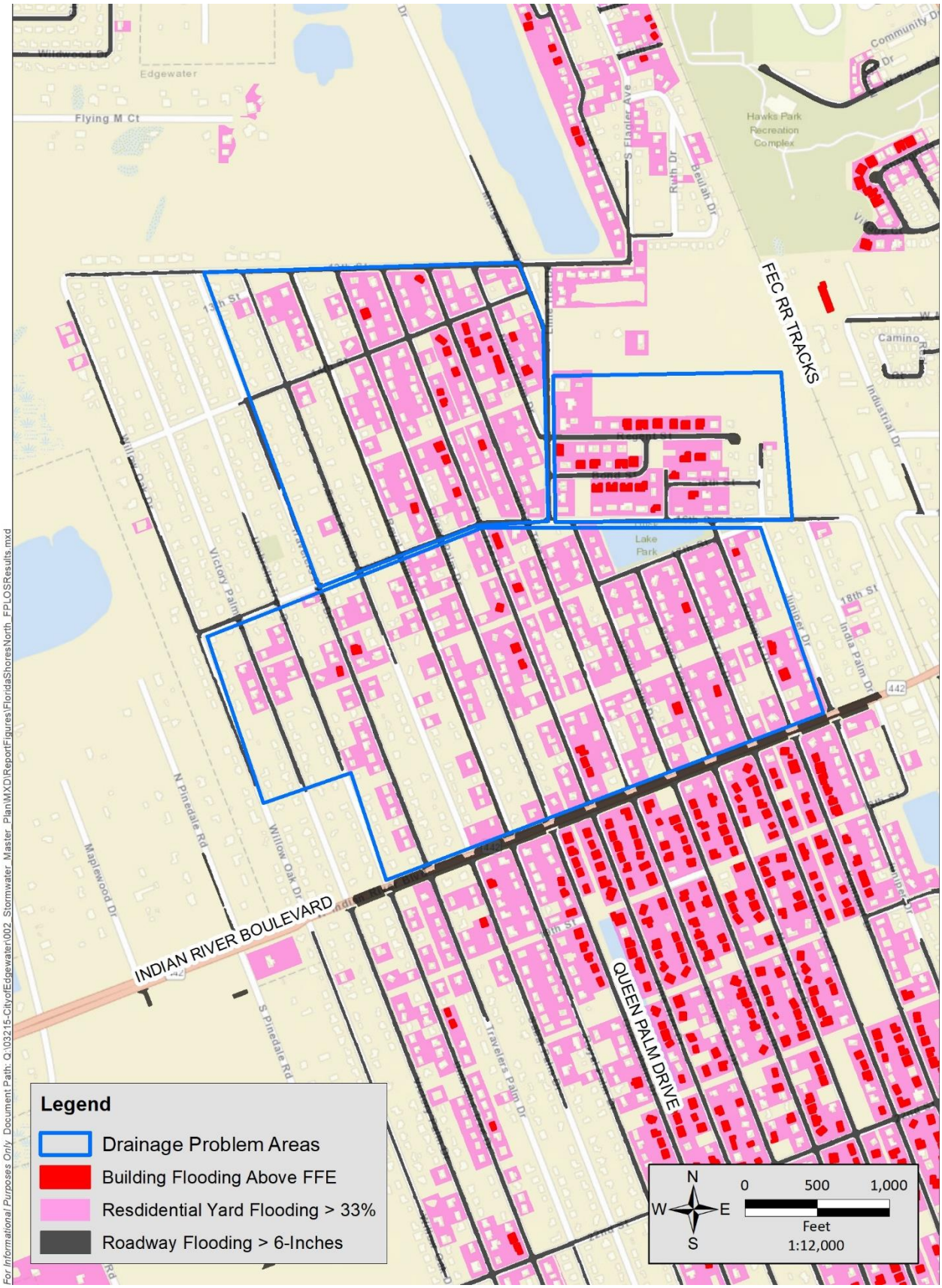


Table 30 Estimated Surface Flooding Volumes in the Florida Shores North of Indian River Boulevard Problem Areas

Storm Event	Surface Flooding Volume (acre-feet)
25-Year/24-Hour	71
100-Year/24-Hour	132

The modeled predicted flooding in this area is extensive but corresponds with the flooding that residents have experienced in recent storm events. The flooding in this area can be attributed to several factors including:

- Limited stormwater pond storage capacity – Engineers typically budget approximately 15–20 percent of a proposed new development site for stormwater ponds. The basin draining to this area covers approximately 420 acres, which would require approximately 63–84 acres of planned stormwater ponds if developed today. Currently, approximately 7 acres of stormwater ponds are in this area, with 3 acres of shallow dry-retention areas designed for water quality treatment and offering minimal storage capacity. This area has a significant deficiency in stormwater storage capacity, which is approximated in Table 30 for the 25-year and 100-year/24-hour events.
- Limited hydraulic conveyance capacity – The hydraulic capacities of the primary drainage canals and cross-culverts in this area and along the 18th Street Canal to the ML are significantly undersized for the stormwater runoff produced from this drainage area and the drainage area south of Indian River Boulevard. These conveyance systems were primarily constructed in the 1950s and 1960s before modern stormwater regulations and planning requirements. The primary drainage ditches were designed to dewater these low-lying areas, not to provide stormwater protection. Figure 88 shows the hydraulic grade line along the 18th Street Canal from ML to Travelers Palm Drive for the 10-, 25-, 100-, and 500-year/24-hour storm events. As shown in the Figure, the most significant headloss occurs between ML and the upstream end of the US-1 box culvert west of Alamanda Drive. Table 31 summarizes the hydraulic conditions at each of the cross-culvert locations.
- Topographic challenges – Much of this area is low-lying, with topographic ridges to the south, east, and west, which creates a "bowl" where stormwater collects and creates flooding. Based on a review of available historical aerial imagery from 1952, the lowest lying areas where flooding now occurs were historically wetlands and natural floodplain where inundation would be expected.
- Figure 89 shows the Florida Shores North problem area boundaries overlayed on the 1952 aerials.
- Increases in impervious area within Florida Shores – Based on a review of historical imagery, Florida Shores was originally developed in the late 1950s. In the more than 60 years since, the area has progressively been built out to its current conditions with impervious homes, paved roadways, driveways, etc. The Florida Shores stormwater system was not designed to handle the full-buildout condition that exists today. Figure 90 shows how impervious conditions have changed over time based on historical and current aerial imagery.
- Loss of surface storage in Florida Shores – Surface storage has continually been reduced in Florida Shores as new homes are constructed. Typically, when new homes are constructed on empty lots, owners bring in fill to build their homes up higher and effectively reduce the surface storage for stormwater management.

Figure 88 18th Street Canal Hydraulic Grade Lines

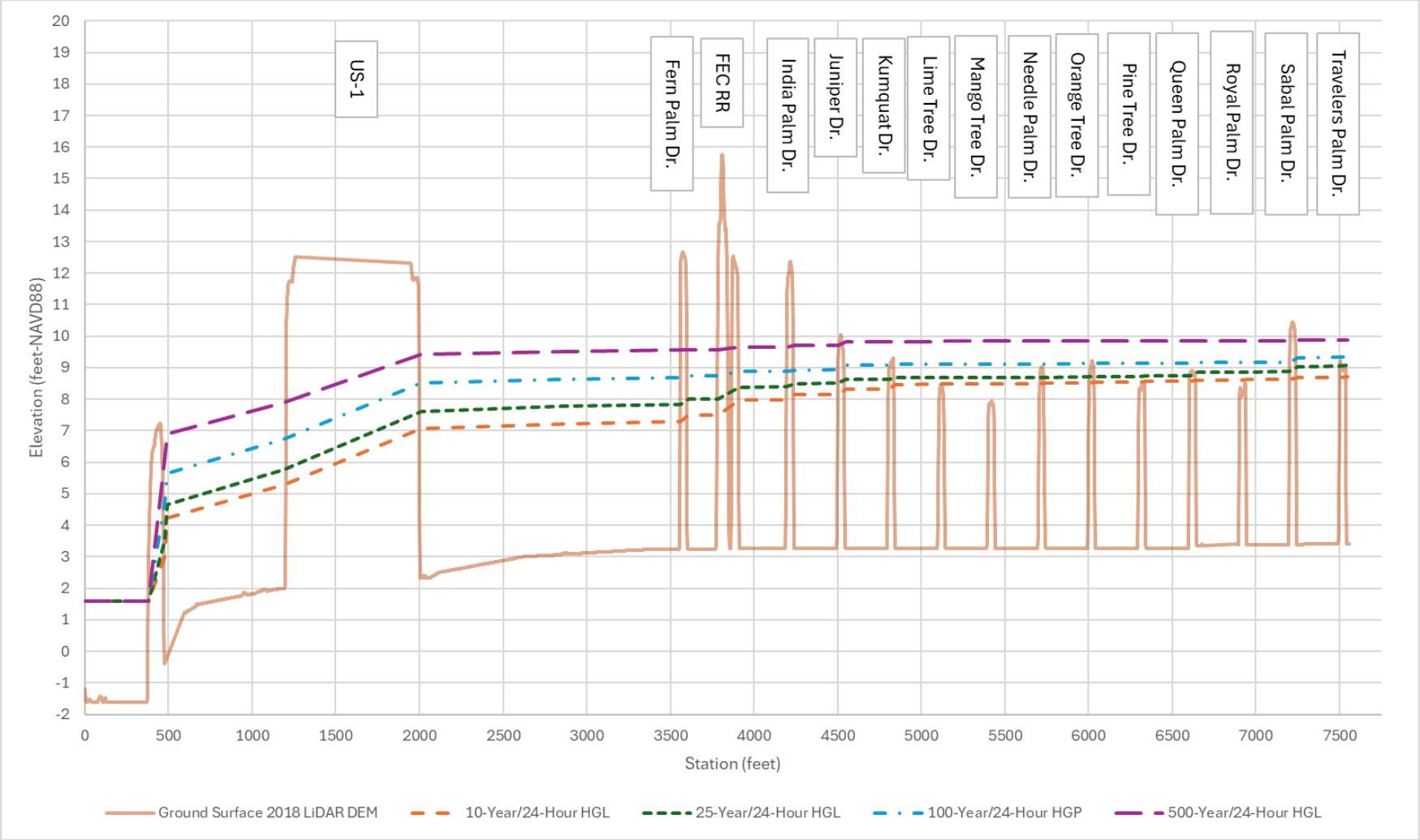


Table 31 18th Street Canal Cross-Culvert Hydraulic Summary

Roadway Crossing	Pipe Shape	Pipe Count	Pipe Rise (in)	Pipe Span (in)	Upstream Invert Elevation (ft-NAVD88)	Downstream Invert Elevation (ft-NAVD88)	Pipe Material	Upstream Peak Stage (ft-NAVD88)			
								10-Year/ 24-Hour	25-Year/ 24-Hour	100-Year/ 24-Hour	500-Year/ 24-Hour
South Riverside Drive	Rectangular	2	60	72	-2.18	-2.18	Concrete	2.99	3.48	4.69	6.08
US-1	Rectangular	1	108	108	-0.06	0.46	Concrete	7.06	7.61	8.51	9.41
Fern Palm Drive	Circular	2	72	72	0.52	0.36	Concrete	7.5	8	8.74	9.58
FEC	Circular	2	66	66	1.75	1.28	Concrete	7.78	8.22	8.82	9.61
Hibiscus Drive	Circular	2	72	72	1.66	1.32	Concrete	7.98	8.38	8.88	9.65
India Palm Drive	Horizontal Ellipse	2	58	91	1.56	1.35	Concrete	8.14	8.5	8.92	9.7
Juniper Drive	Horizontal Ellipse	2	58	91	1.62	1.47	Concrete	8.31	8.63	9.08	9.82
Kumquat Drive	Horizontal Ellipse	2	58	91	-0.64	-0.69	Concrete	8.47	8.68	9.1	9.83
Lime Tree Drive	Circular	2	72	72	0.15	-0.13	Concrete	8.49	8.69	9.11	9.84
Mango Tree Drive	Horizontal Ellipse	2	58	91	0.6	0.2	Concrete	8.5	8.69	9.12	9.84
Needle Palm Drive	Circular	2	72	72	-0.25	-0.29	Concrete	8.52	8.7	9.12	9.84
Orange Tree Drive	Circular	2	60	60	1.42	1.46	Concrete	8.55	8.71	9.13	9.84
Pine Tree Drive	Horizontal Ellipse	2	58	91	1.83	1.78	Concrete	8.58	8.74	9.15	9.85
Queen Palm Drive	Horizontal Ellipse	2	58	91	1.99	1.84	Concrete	8.61	8.85	9.16	9.86
Royal Palm Drive	Horizontal Ellipse	2	58	91	2.17	1.92	Concrete	8.62	8.87	9.16	9.86
Sabal Palm Drive	Horizontal Ellipse	2	58	91	2.16	1.97	Concrete	8.69	9.04	9.31	9.87
Travelers Palm Drive	Horizontal Ellipse	1	58	91	2.17	2.15	Concrete	8.72	9.07	9.35	9.87

Figure 89 Florida Shores North of Indian River Boulevard 1952 Aerials

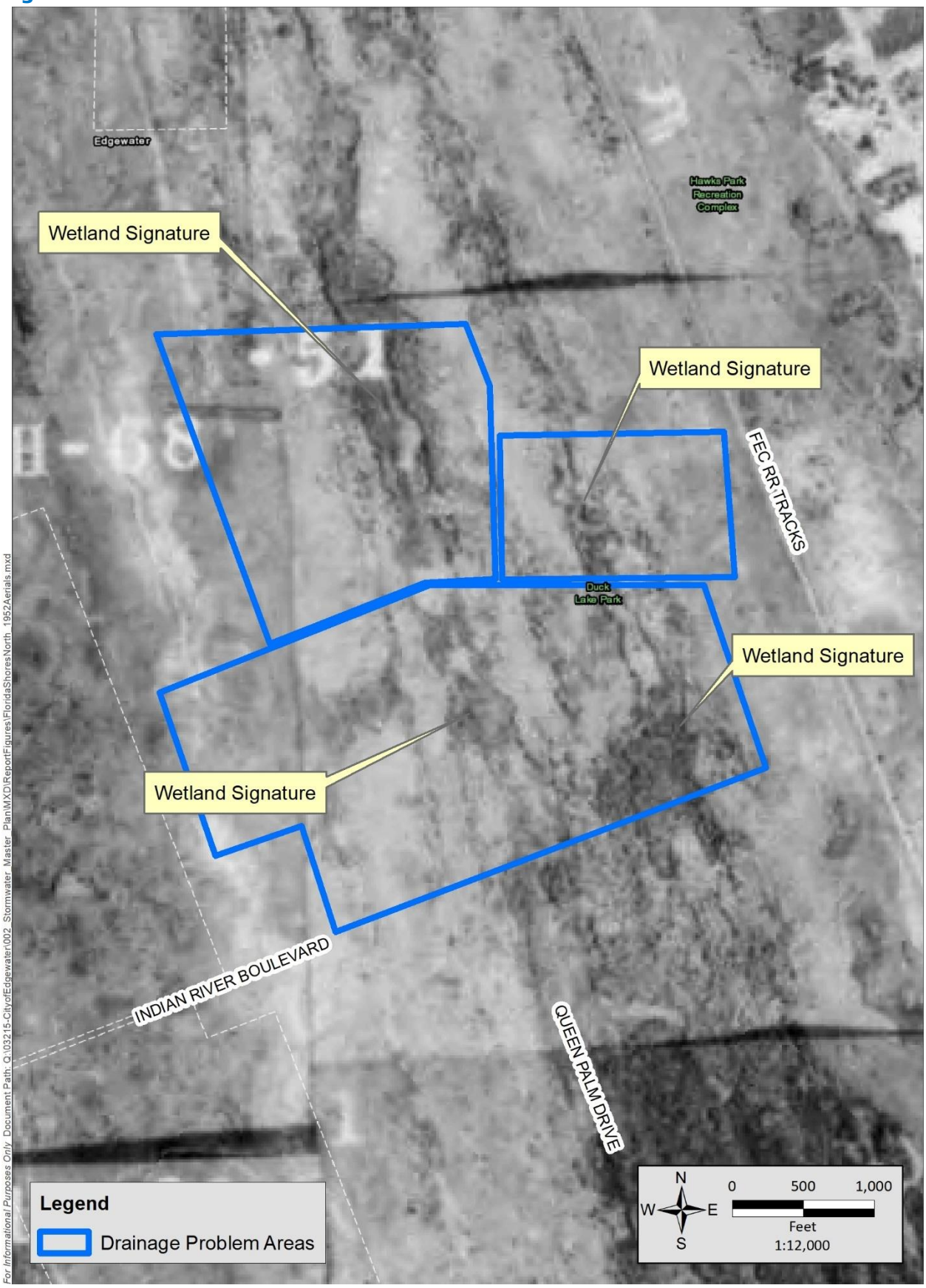
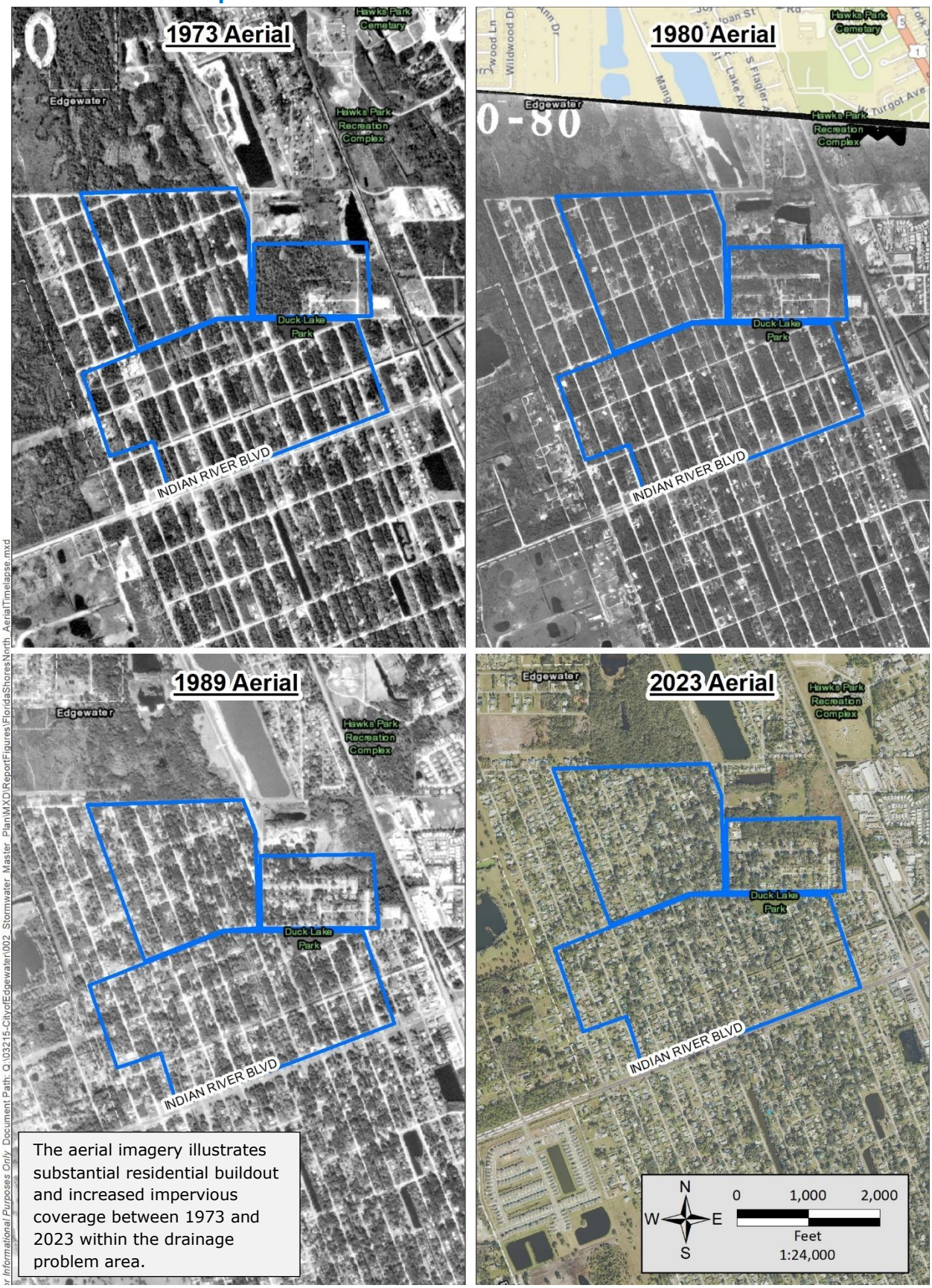


Figure 90 Florida Shores North of Indian River Boulevard Historic Aerial Timelapse



6.6.3 Florida Shores West Side

This group includes drainage problem areas 1019 and 1020, which are in Florida Shores south of Indian River Boulevard and west of Willow Oak Drive and drain to the Silver Palm Canal through the T1, T2, T3, T4, T5, and T6 Canals. Problem area 1020 includes the T1, T2, T3, T4, and T5 Canals, which drain approximately 226 acres of medium-density residential area, with an average CN of 64 and an average impervious area percentage of 34 percent. Problem area 1019 includes the T6 Canal, which drains approximately 117 acres of medium-density residential area, with an average CN of 63 and average impervious area percentage of 32 percent. Parts of these problem areas also drain directly to the Silver Palm Canal, which drains approximately 164 acres of medium-density residential area in Florida Shores, with an average CN of 65 and average impervious area percentage of 31 percent. In total, the canals drain approximately 510 acres with an average CN of 64 and an average imperious percentage of 32 percent. The landscape in these basins predominantly slopes east to west, with a topographic ridge that runs north-south along the west side of the problem areas. The lowest points in the 1019 problem area are along Vista Palm Drive, Woodland Drive, and Yulee Tree Drive south of 30th Street, with centerline of roadway elevations between 8 and 9 feet NAVD88. The lowest points in the 1020 problem area are along Tamarind Drive, Unity Tree Drive, and Vista Palm Drive between 24th Street and 28th Street, with centerline of roadway elevations between 7.5- and 8.5-ft-NAVD88. Figure 91 shows the drainage basins for each of the canals overlaid on the LiDAR DEM.

Runoff from these areas collects in the T1, T2, T3, T4, T5, and T6 Canals and flows west into the Silver Palm Canal, which ultimately discharges into the Turnbull Hammock through an existing ditch between 29th and 30th Street or through an existing 48-inch pipe at 35th Street. Before discharging into the Silver Palm Canal, runoff must pass through several cross-culverts of varying sizes where the ditches intersect roadways. Six culvert crossings of between 30- and 36-inches in diameter are along the Silver Palm Canal.

Figure 92Figure 92 shows the model predicted 100-year 24-hour inundation extents, and Figure 93 shows the 25-year 24-hour inundation extents for the Florida Shores West drainage problem areas with node peak stages labeled along the Canals. Figure 94 shows the building, residential yard, and roadway FPLOS deficiencies identified in this area. As shown in the figures, significant flooding occurs in these problem areas with the worst flooding occurring along Yulee Tree Drive, Woodland Drive, and Vista Palm Drive south of 30th Street and along Vista Palm Drive, Unity Tree Drive, and Tamarind Drive north of 30th Street. Compared to the other Florida Shores problem areas, this area contains significantly fewer instances of predicted building flooding. Jones Edmunds used the inundation mapping results, modeled peak stages, and DEM to estimate the cumulative volume of stormwater on the ground surface outside existing stormwater ponds at the peak stages during the 100-year/24-hour and 25-year/24-hour design storm events. This is representative of the volume of flooding on the surface if all the model nodes peaked at the same time step in the model. This slightly conservative assumption is close to reality given the observed relatively-flat landscape and stagnation of flood waters. Table 32 summarizes the results, which represent a rough approximation of the surface storage deficit in this area. For the 100-year storm event, approximately 73 acre-feet of stormwater runoff are stored on the surface outside the existing stormwater ponds and ditches. This is equivalent to approximately 15 acres of stormwater pond with 5 feet of storage depth or the volume of approximately 35 Olympic-sized swimming pools.

Figure 91 Drainage Basin Delineation and Existing Topography – Florida Shores West Side

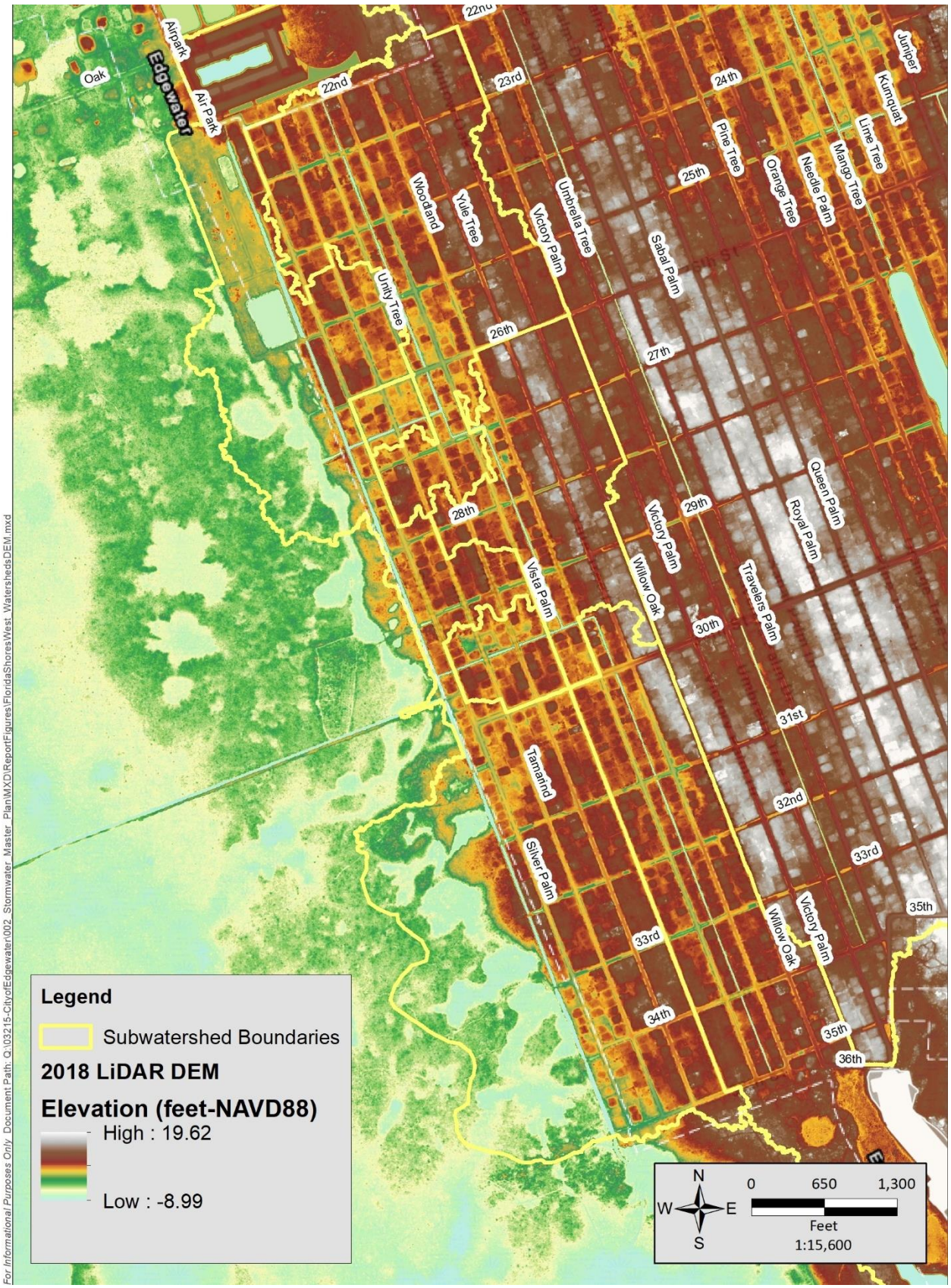


Figure 92 100-Year Existing Conditions Flooding – Florida Shores West Side



Figure 93 25-Year Existing Conditions Flooding – Florida Shores West Side



Figure 94 Building, Yard, and Roadway Flooding Results (FPLOS) – Florida Shores West Side

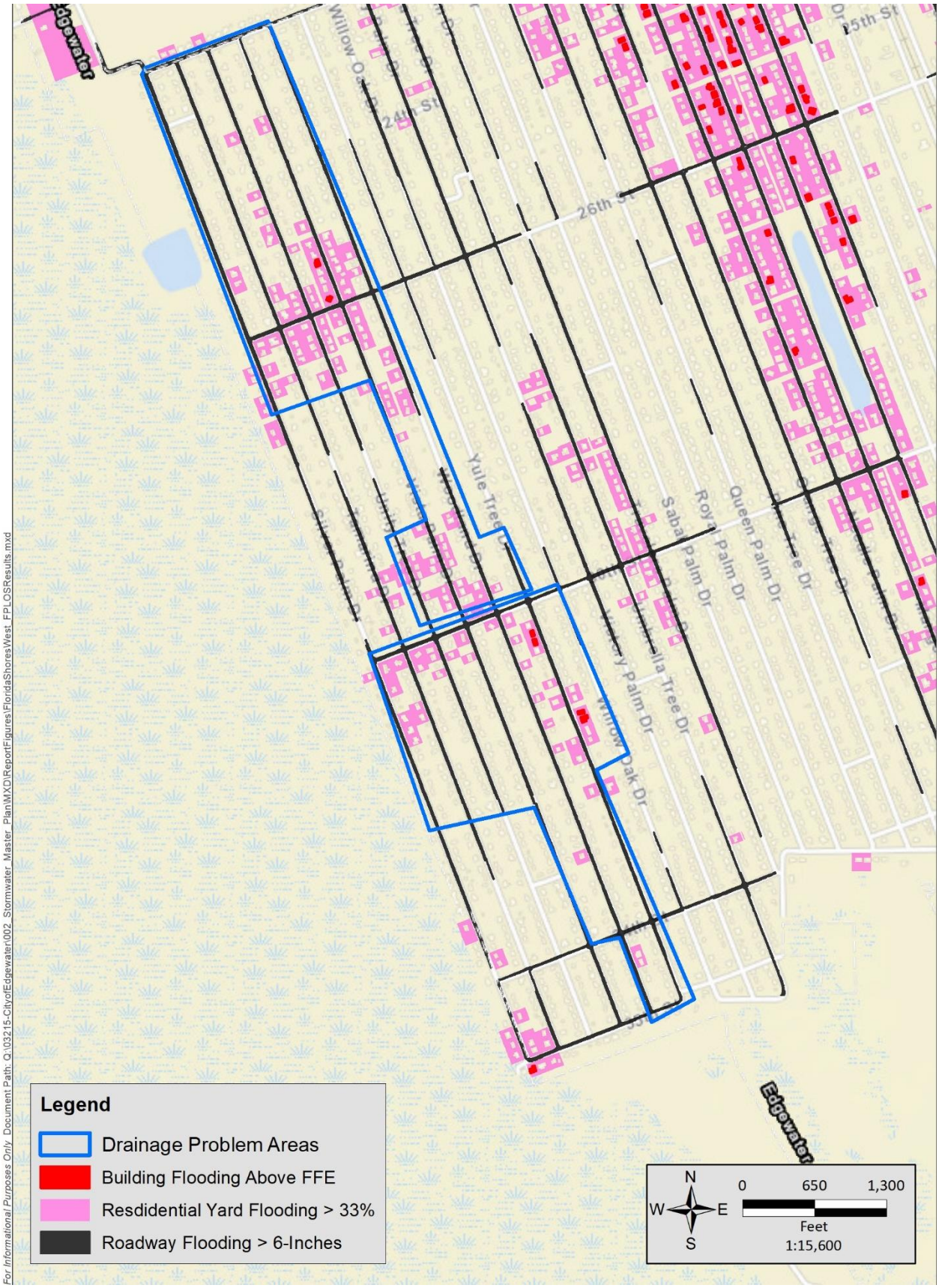


Table 32 Estimated Surface Flooding Volumes in the Florida Shores West Problem Areas

Storm Event	Surface Flooding Volume (acre-feet)
25-Year/24-Hour	38
100-Year/24-Hour	73

The modeled predicted flooding in this area is extensive but corresponds well with the flooding that residents have experienced in recent storm events. The flooding in this area can be attributed to several factors including:

- Limited stormwater pond storage capacity – Engineers typically budget approximately 15–20 percent of a proposed new development site for stormwater ponds. The basin that drains to this area is approximately 510 acres, which means that approximately 77–102 acres of planned stormwater would be required if developed today. Approximately 6.5 acres of stormwater ponds are in this area, with all the ponds being shallow dry-retention areas designed for water quality treatment and offering minimal storage capacity. This area has a significant deficiency in stormwater storage capacity, which is approximated in Table 32 for the 25-year and 100-year/24-hour events.
- Limited hydraulic conveyance capacity – The hydraulic capacities of the primary drainage canals and cross-culverts in this area and along the Silver Palm Canal to the Turnbull Hammock are undersized for the stormwater runoff produced from this drainage area. These conveyance systems were primarily constructed in the 1950s and 1960s before modern stormwater regulations and planning requirements. The primary drainage ditches were designed to dewater these low-lying areas rather than provide stormwater protection. Figure 95 shows the hydraulic grade line along the Silver Palm/T1/T3 Canals, and Figure 96 shows the hydraulic grade line along the Silver Palm/T2/T6 Canals for the 10-, 25-, 100-, and 500-year/24-hour storm events. As shown in the figures, there is significant head loss along the Silver Palm Canal between 30th Street and 25th Street and significant head loss along the T2 Canal between Woodland Drive and the Silver Palm Canal. Table 33 and Table 34 summarize the hydraulic conditions at each of the cross-culvert locations along the canals.
- Topographic challenges – Much of this area is low-lying with north-south topographic ridges, which creates a "bowl" where stormwater collects and creates flooding. Based on a review of available historical aerial imagery from 1952, the lowest-lying areas where flooding now occurs were historically wetlands and natural floodplain where inundation would be expected. Figure 97 shows the Florida Shores West Side problem area boundaries overlayed on the 1952 aerials.
- Increases in impervious area within Florida Shores – Based on a review of historical imagery, Florida Shores was originally developed in the late 1950s. In the more than 60 years since, the area has progressively been built out to its current conditions with impervious homes, paved roadways, driveways, etc. The Florida Shores stormwater system was not designed to handle the full build-out condition that exists today. Figure 98 shows how impervious conditions have changed over time based on historical and current aerial imagery.
- Loss of surface storage in Florida Shores – Surface storage has continually been reduced in Florida Shores as new homes are constructed. Typically, when new homes are constructed on empty lots, owners bring in fill to build their homes up higher and effectively reduce the surface storage for stormwater management.

Figure 95 Hydraulic Grade Lines Along the Silver Palm, T1, and T3 Canals

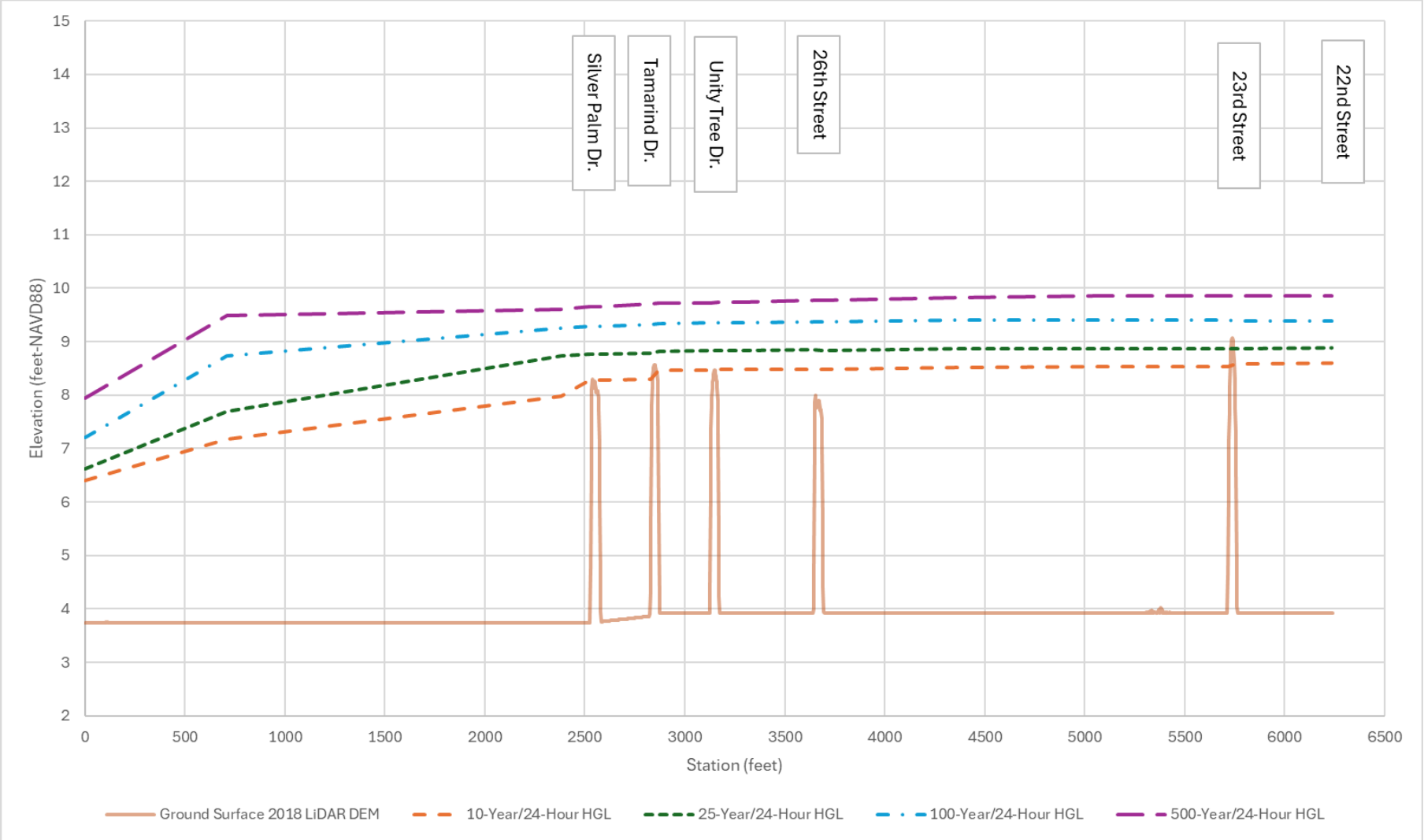


Figure 96 Hydraulic Grade Lines Along the Silver Palm, T2, and T6 Canals

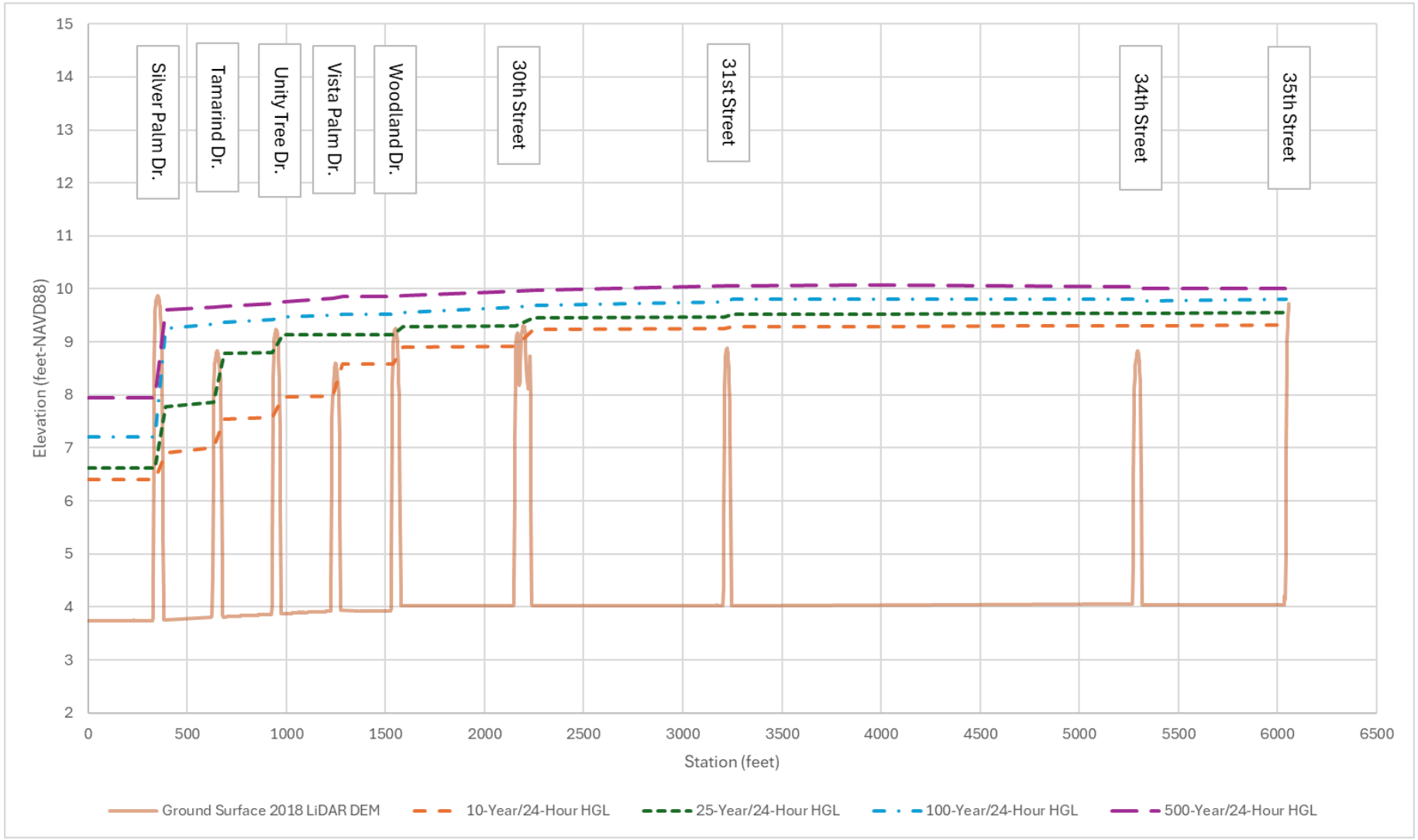


Table 33 Silver Palm, T1, and T3 Canals Cross-Culvert Hydraulic Summary

Roadway Crossing	Pipe Shape	Pipe Count	Pipe Rise (in)	Pipe Span (in)	Upstream Invert Elevation (ft-NAVD88)	Downstream Invert Elevation (ft-NAVD88)	Pipe Length (ft)	Pipe Material	Upstream Peak Stage (ft-NAVD88)			
									10-Year/ 24-Hour	25-Year/ 24-Hour	100-Year/ 24-Hour	500-Year/ 24-Hour
Silver Palm Drive	Circular	2	48	48	1.6	1.88	41	Concrete	8.28	8.77	9.29	9.66
Tamarind Drive	Circular	2	48	48	1.93	2	40	Concrete	8.46	8.82	9.33	9.72
Unity Tree Drive	Circular	2	42	42	1.73	1.99	41	Concrete	8.48	8.84	9.36	9.74
26th Street	Circular	2	36	36	3.35	3.38	40	Concrete	8.49	8.84	9.37	9.78
23rd Street	Circular	1	48	48	3.23	2.92	35	Corrugated Metal	8.59	8.87	9.39	9.85

Table 34 Silver Palm, T2, and T6 Canals Cross-Culvert Hydraulic Summary

Roadway Crossing	Pipe Shape	Pipe Count	Pipe Rise (in)	Pipe Span (in)	Upstream Invert Elevation (ft-NAVD88)	Downstream Invert Elevation (ft-NAVD88)	Pipe Length (ft)	Pipe Material	Upstream Peak Stage (ft-NAVD88)			
									10-Year/ 24-Hour	25-Year/ 24-Hour	100-Year/ 24-Hour	500-Year/ 24-Hour
Silver Palm Drive	Circular	2	48	48	1.6	1.88	41	Concrete	8.28	8.77	9.29	9.66
Tamarind Drive	Circular	2	48	48	1.93	2	40	Concrete	8.46	8.82	9.33	9.72
Unity Tree Drive	Circular	2	42	42	1.73	1.99	41	Concrete	8.48	8.84	9.36	9.74
Vista Palm Drive	Circular	2	36	36	2.42	2.44	38	Concrete	8.5	8.87	9.37	9.75
Woodland Drive	Circular	2	36	36	2.87	2.66	44	Concrete	8.9	9.28	9.56	9.87
30th Street	Circular	2	36	36	2.62	2.5	78	Concrete	9.24	9.45	9.69	9.98
31st Street	Circular	1	48	48	3.62	3.07	34	Corrugated Metal	9.28	9.52	9.8	10.06
34th Street	Circular	1	24	24	4.04	4.22	42	Concrete	9.31	9.54	9.78	10

Figure 97 Florida Shores West Side 1952 Aerials

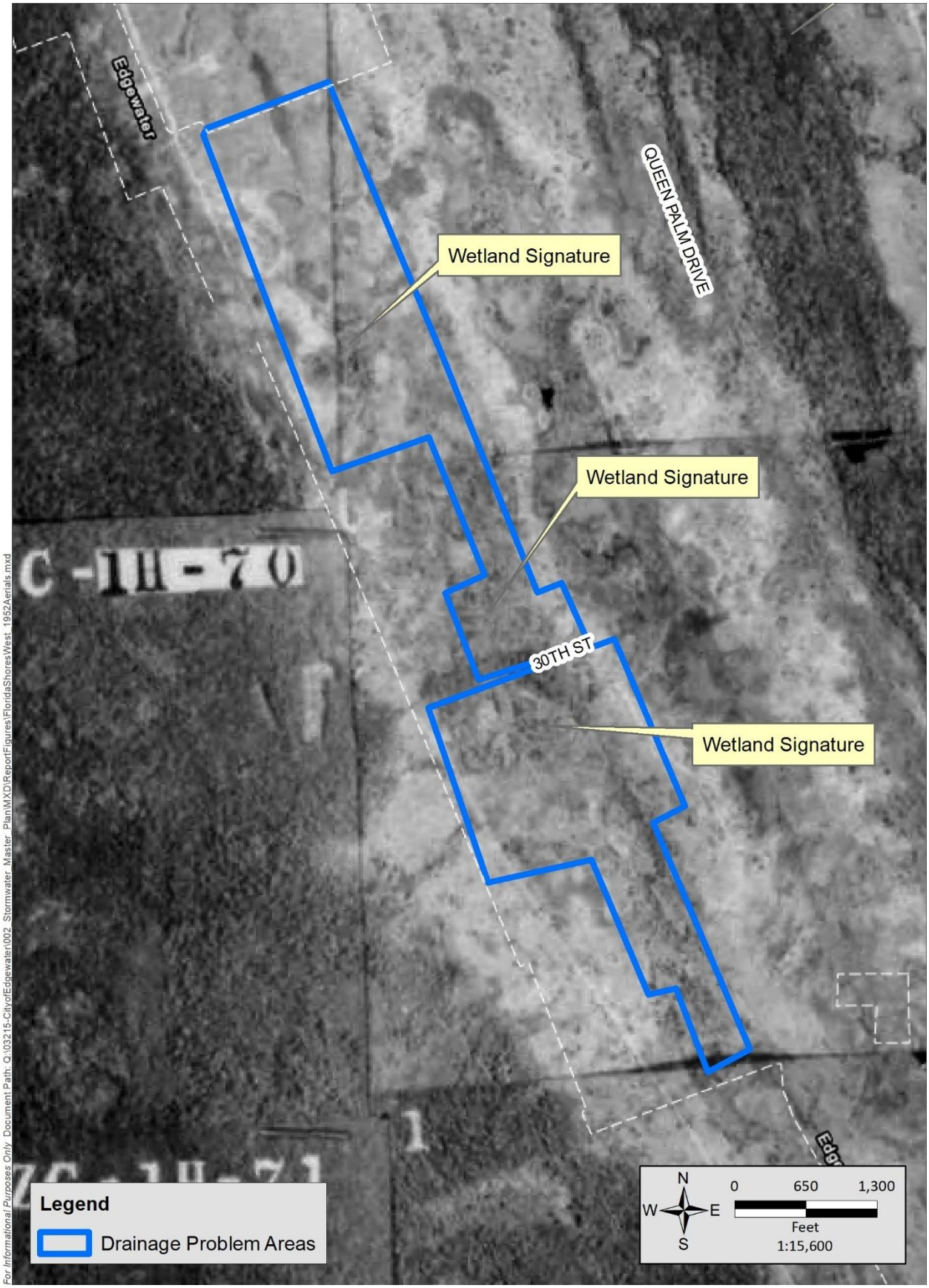
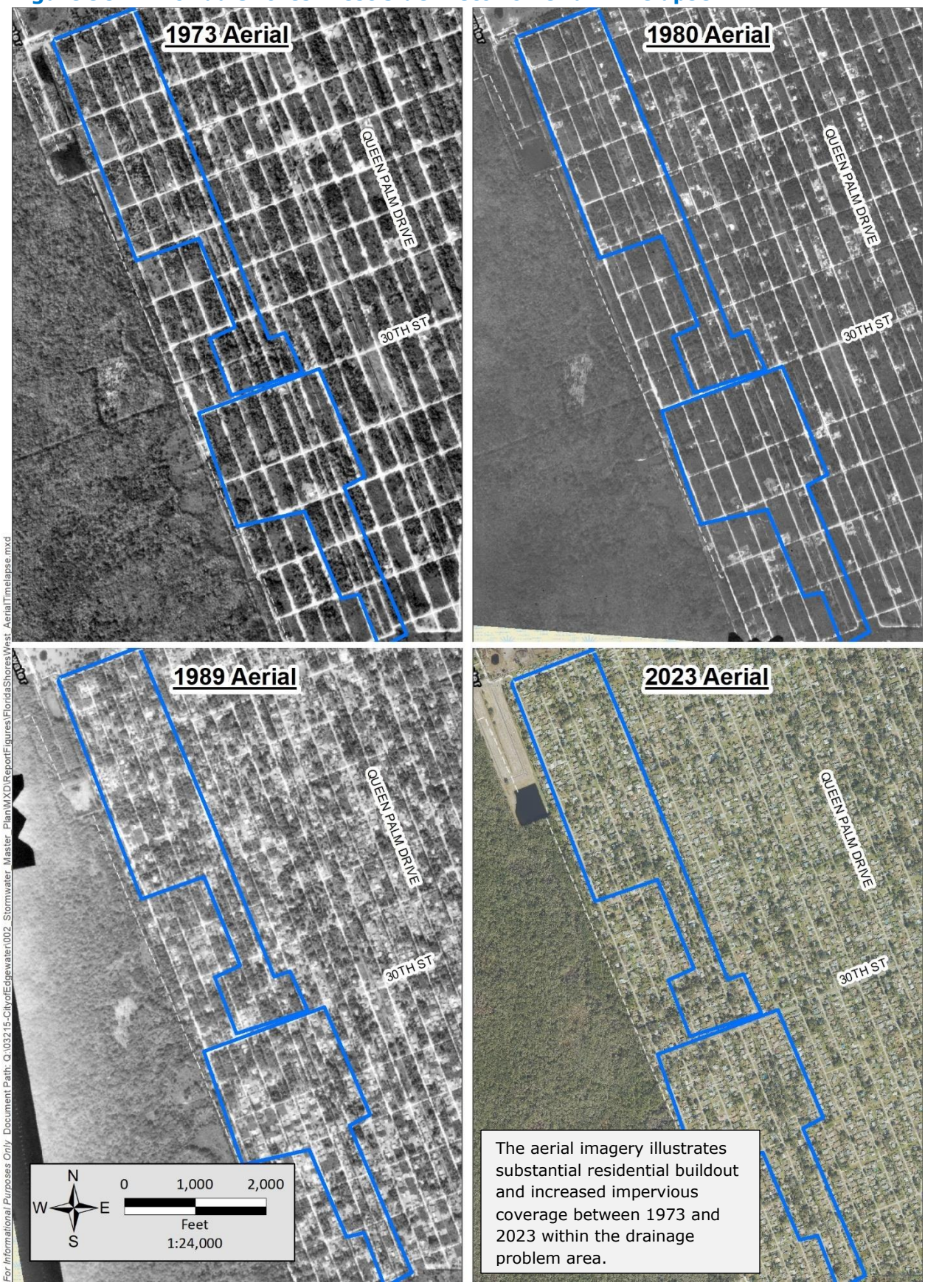


Figure 98 Florida Shores West Side Historic Aerial Timelapse

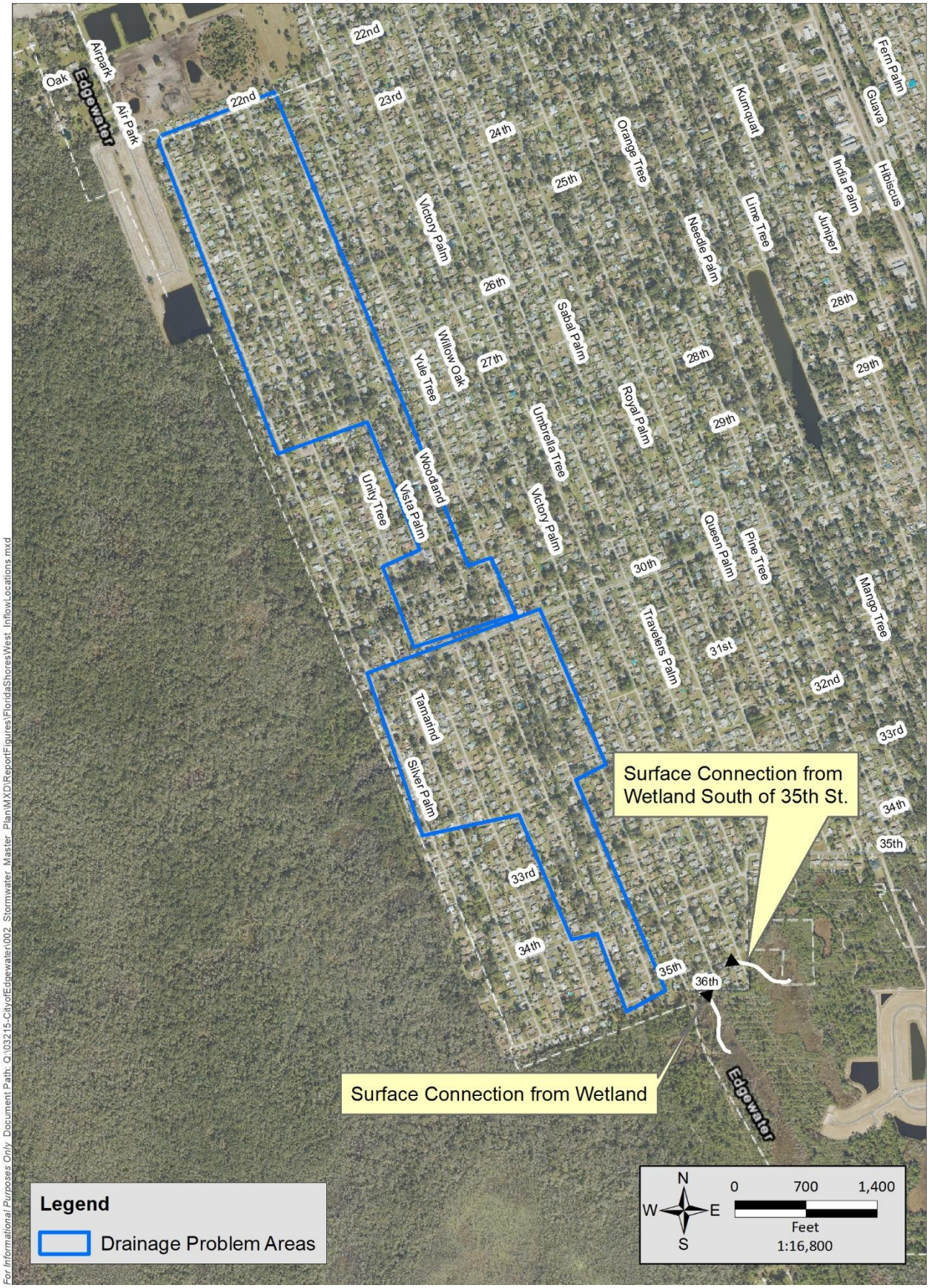


Like the Florida Shores South of Indian River Boulevard problem areas, some of the discussions related to flooding in this part of Florida Shores have centered around offsite flows coming into the Shores from south of 35th and 36th Streets and the impact it has on flooding in the area. Based on the model results and observed conditions, some inflow occurs from the wetland areas south of 35th and 36th Streets. Figure 99 shows the locations where this occurs. Jones Edmunds used the StormWise model to determine how sensitive flood stages in Florida Shores West are to the inflow from south of 35th and 36th Streets. Jones Edmunds ran the StormWise model for two scenarios and compared the peak stages.

- Wetlands south of 35th and 36th Streets full – This scenario assumes the wetlands south of 35th and 36th Street are full at the beginning of the model simulations, which is the worst-case scenario for impacts to Florida Shores. Rainfall in the wetlands would immediately be able to discharge north into Florida Shores without being attenuated by storage in the wetlands.
- Hydraulic connections from south of 35th and 36th Streets turned off – This scenario assumes that the overland weir and pipe connections from south of 35th and 36th Streets do not exist, and water is not able to flow into Florida Shores from the south. This effectively eliminates any impact that the offsite flow from the south would have.

We then compared the node peak stage results from the two scenarios to determine the worst-case scenario impact that the inflow from south of 35th and 36th Streets has on stages in this area. The maximum peak stage difference between the two model scenarios occurred at the nodes that receive the flow directly from the wetlands along 35th and 36th Streets. The maximum changes in peak stage were 0.09 foot for the 10-year event, 0.06 foot for the 25-year event, 0.07 foot for the 100-year event, and 0.14 foot for the 500-year event. These increases were isolated to a small area at the very south end of Florida Shores. The average difference for the rest of the nodes that had impacts were 0.02 foot for the 10-year event, 0.02 foot for the 25-year event, 0.01 foot for the 100-year event, and 0.01 foot for the 500-year event. These results indicate that the inflow from south of 35th and 36th Streets have very little impacts on flood stages in the Florida Shores West problem areas.

Figure 99 Inflow Locations for Florida Shores West Side



6.6.4 EDGEWATER ACRES

This group includes drainage problem areas 1004 and 1021, which are north of 12th Street between Mango Tree Drive and the FEC railroad tracks and drain north through the G5 Canal. The problem area drains approximately 161 acres of medium-density residential area with an average CN of 76 and average impervious area percentage of 29 percent. The landscape predominantly slopes east to west and south to north. Flagler Avenue runs along a topographic ridge in the middle of problem areas, the FEC railroad tracks create a ridge on the east and Mango Tree Drive creates a ridge on the west. The lowest areas east of Flagler Avenue are along Adele Street, Ann Street, and Ocean Avenue with roadway elevations as low as 7.0–7.5-ft-NAVD88. The lowest area west of Flagler Avenue is the at the City's wastewater treatment plant (WWTP), which has surface elevations of 6.0–7.5 feet NAVD88. There is also a large stormwater pond east of Mango Tree Drive and south of the WWTP. Figure 100 shows the G5 Canal drainage basin for this area overlaid on the LiDAR DEM.

Stormwater runoff east of Flagler Avenue primarily drains through an unnamed ditch along the west side of the FEC railroad tracks and discharges into the stormwater pond. Runoff west of Flagler Avenue and south of Joyce Street also drains into the stormwater pond through a network of stormwater inlets and pipe connections and/or sheetflow. The primary outfall for this area is through the G5 Canal, which drains north to Park Avenue and discharges under Park Avenue through two 36-inch cross-culverts and continues north to the G6 Canal. The G6 Canal then discharges into the G10 Canal under an old railroad track crossing through five 36-inch corrugated-metal culverts.

Figure 101 shows the model-predicted 100-year 24-hour inundation extents, and Figure 102 shows the 25-year 24-hour inundation extents for the Edgewater Acres drainage problem areas with node peak stages labeled. Figure 103 shows the building, residential yard, and roadway FPLOS deficiencies identified in this area. As shown in the figures, significant flooding occurs in these problem areas with the worst flooding occurring east of Flagler Avenue and near the WWTP.

Figure 100 Drainage Basin Delineation and Existing Topography – Edgewater Acres

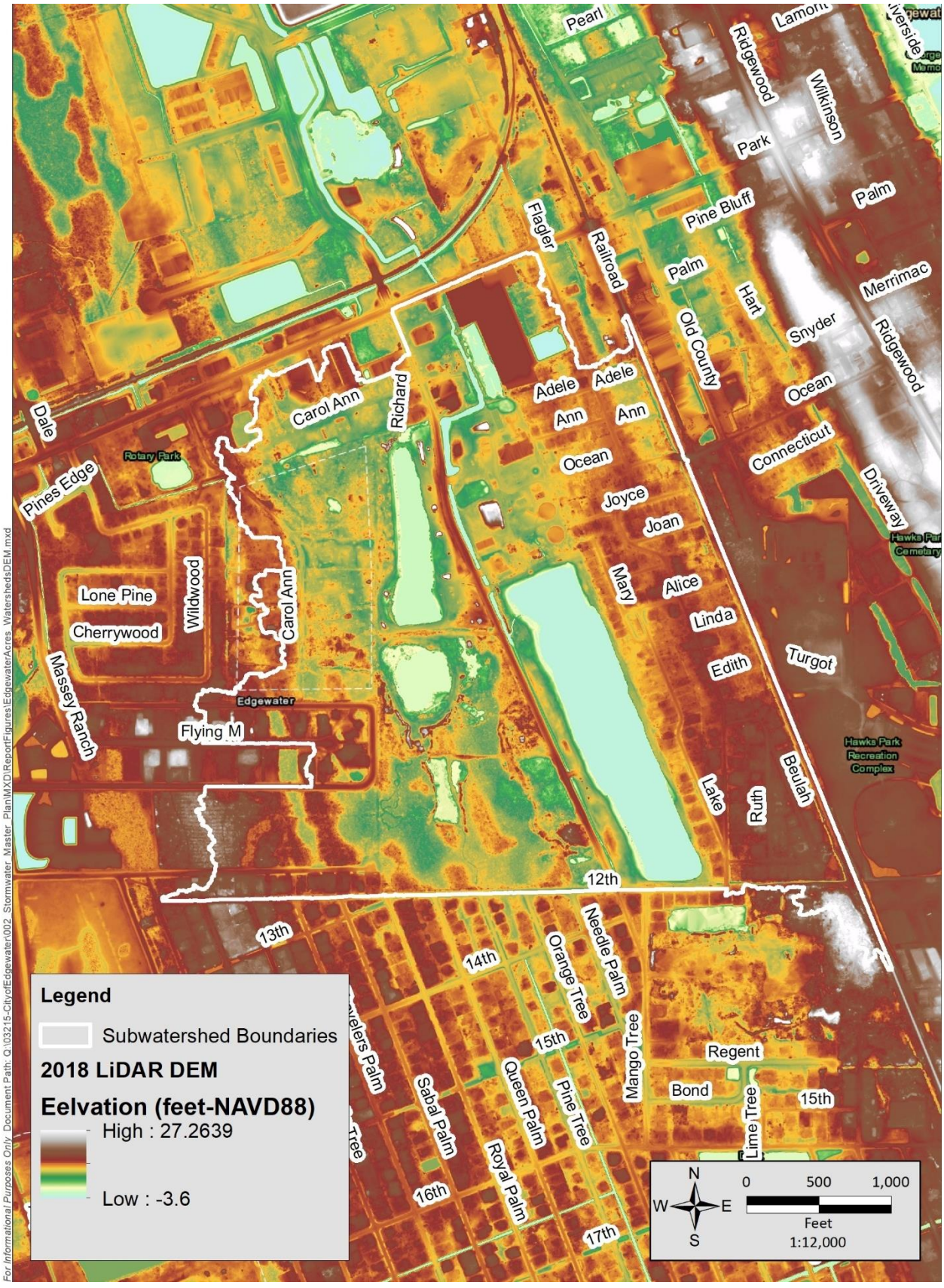


Figure 101 100-Year Existing Conditions Flooding – Edgewater Acres

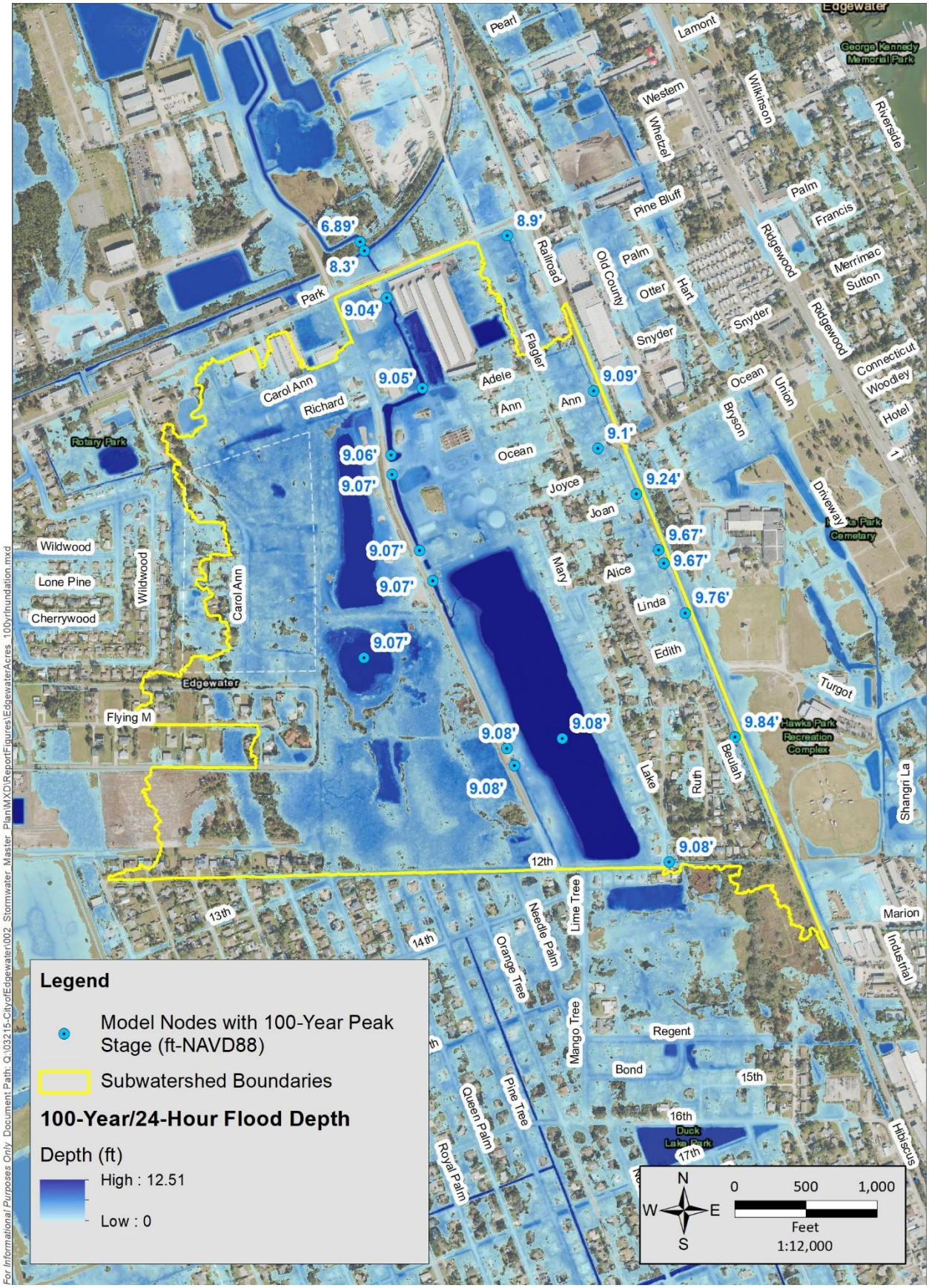


Figure 102 25-Year Existing Conditions Flooding – Edgewater Acres

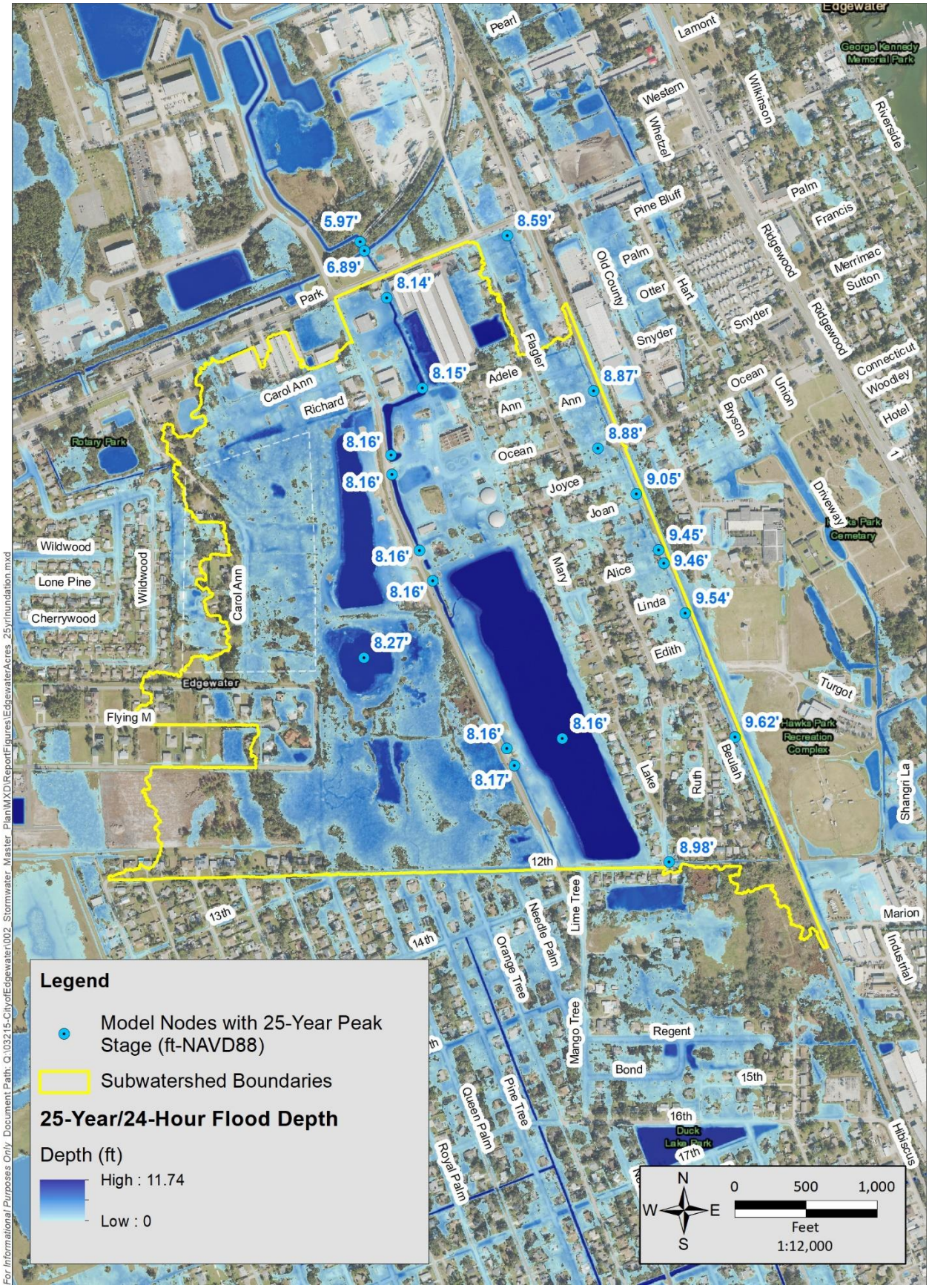
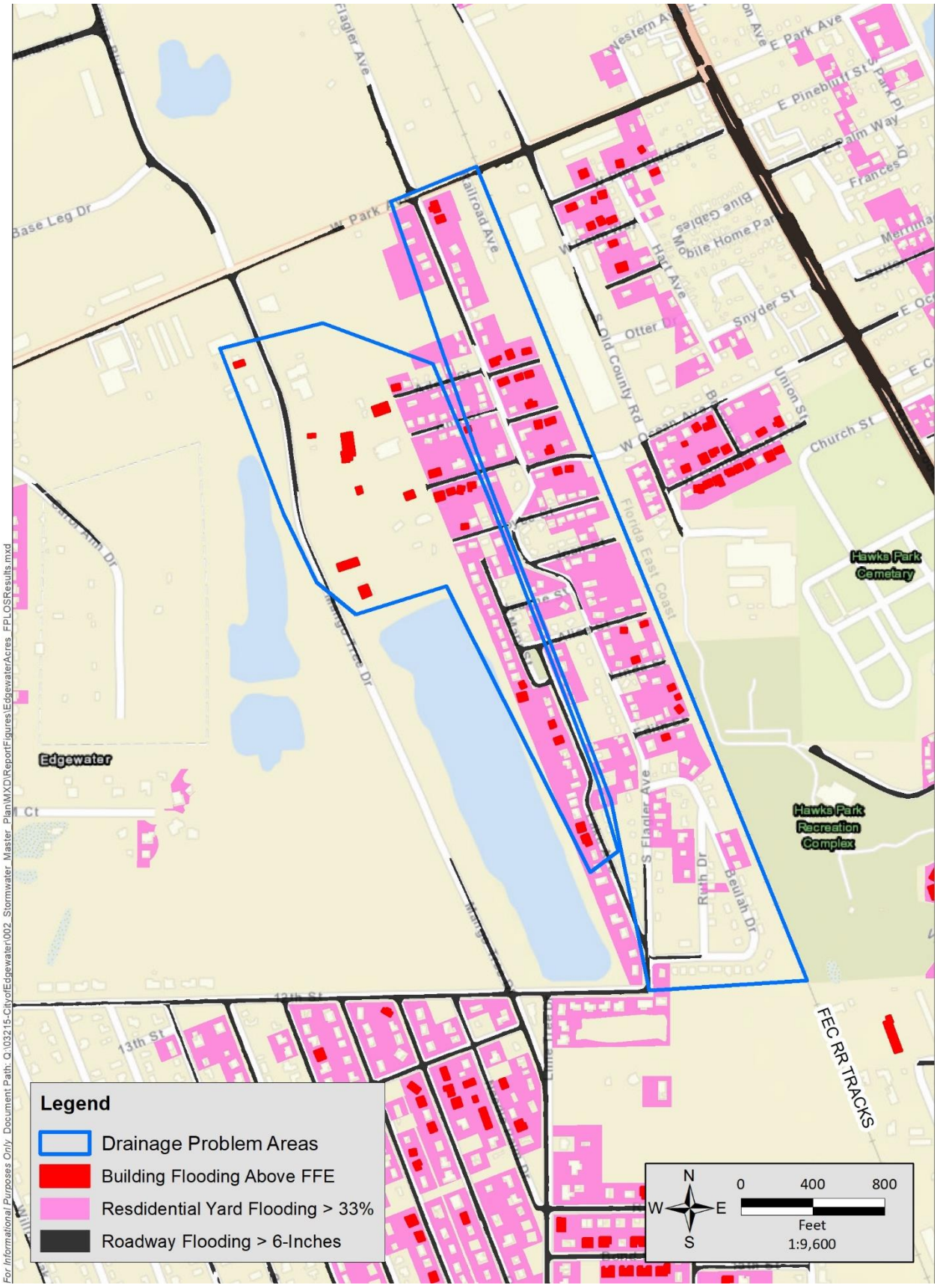


Figure 103 Building, Yard, and Roadway Flooding Results (FPLOS) – Edgewater Acres



The modeled predicted flooding in this area is extensive but corresponds well with the flooding that residents and the City have experienced in recent storm events. The flooding in this area can be attributed to several factors including:

- Limited hydraulic conveyance capacity – The hydraulic capacities of the primary drainage canals and cross-culverts are undersized for the stormwater runoff produced from this drainage area. Figure 104 shows the hydraulic grade line along the G3, G10, G6, and G5 Canals for the 10-, 25-, 100-, and 500-year/24-hour storm events. As shown in the figures, significant headloss occurs at the double 36-inch culvert crossing under Park Avenue and at the 36-inch culverts under the old railroad tracks in the G6 Canal north of Park Avenue. Table 35 summarizes the hydraulic conditions at each of the cross-culvert locations along the canals.
- Topographic challenges – Much of this area is low-lying with north-south topographic ridges, which creates a "bowl" where stormwater collects and creates flooding. Based on a review of available historical aerial imagery from 1952, the lowest-lying areas where flooding now occurs were historically wetlands and natural floodplain where inundation would be expected.
- Figure 105 shows the Edgewater Acres problem area boundaries overlayed on the 1952 aerials. This is particularly challenging in the low-lying areas along Adele Street, Ann Street, Ocean Avenue, and at the City's WWTP.
- Offsite flow from south of 12th Street – Based on the StormWise model results, the Edgewater Acres drainage problem accepts a significant amount of flow from Florida Shores and the areas south of 12th Street. The model results show that this area accepts a combined peak flow rate from south of 12th Street of approximately 730 cfs for the 100-year storm event and 256 cfs for the 25-year event.

Figure 104 Hydraulic Grade Lines for the G3, G10, G6, and G5 Canals

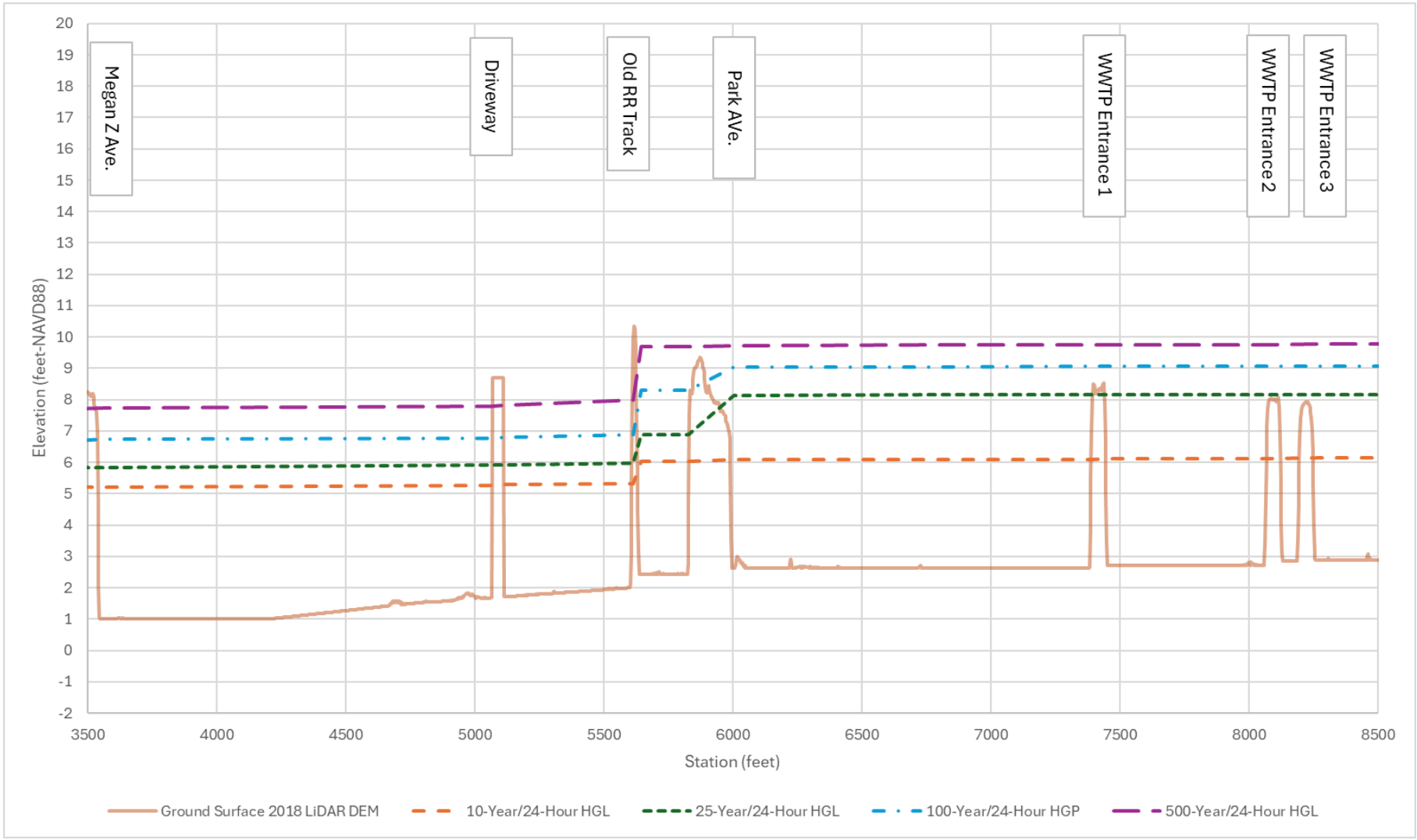


Table 35 G3, G10, G6, and G5 Canals Cross-Culvert Hydraulic Summary

Roadway Crossing	Pipe Shape	Pipe Count	Pipe Rise (in)	Pipe Span (in)	Upstream Invert Elevation (ft-NAVD88)	Downstream Invert Elevation (ft-NAVD88)	Pipe Length (ft)	Pipe Material	Upstream Peak Stage (ft-NAVD88)			
									10-Year/ 24-Hour	25-Year/ 24-Hour	100-Year/ 24-Hour	500-Year/ 24-Hour
Megan Z Avenue	Conspan	1	-9999	-9999	-0.3	-0.3	112	Concrete	5.21	5.84	6.75	7.74
Driveway	Conspan	1	-9999	-9999	0.8	0.8	40	Concrete	5.29	5.92	6.8	7.83
Old RR Track	Circular	4	36	36	4.2	3.93	26	Corrugated Metal	6.04	6.89	8.3	9.69
Old RR Track	Circular	1	36	36	1.92	2.09	29	Corrugated Metal	6.04	6.89	8.3	9.69
Park Avenue	Circular	2	36	36	2.14	1.71	162	Concrete	6.09	8.14	9.04	9.72
WWTP Entrance No. 1	Circular	2	36	36	0.77	0.7	64	Concrete	6.11	8.16	9.07	9.76
WWTP Entrance No. 2	Circular	1	36	36	2.24	1.87	56	Corrugated Metal	6.16	8.16	9.07	9.77
WWTP Entrance No. 3	Circular	1	24	24	3.21	3.34	45	Corrugated Metal	6.69	8.17	9.08	9.78

Figure 105 Edgewater Acres 1952 Aerials



6.6.5 G2 AND G11 CANALS

This group includes drainage problem areas 1001, 1002, and 1015, which are between the FEC railroad tracks and US-1 south of 10th Street and drain north to the Gabordy Canal through the G2 Canal. Problem area 1001 includes G2 Canal between 10th Street and Park Avenue, which drains approximately 140 acres of medium-density residential and commercial and services area with an average CN of 68 and an average impervious area percentage of 35 percent. Problem area 1002 includes G2 Canal between Park Avenue and the Edgewater New Smyrna Cemetery, which drains approximately 170 acres of medium-density residential, commercial and services, institutional, and park area with an average CN of 56 and an average impervious area percentage of 36 percent. Problem area 1015 includes the Shangri La Village subdivision, which has a drainage area of approximately 18 acres with a CN of 60 and impervious percentage of 29 percent. In total, the G2 Canal drains approximately 300 acres with an average CN of 61 and an average imperious percentage of 36 percent. The landscape in these basins predominantly slopes south to north with US-1 creating a topographic ridge to the east and the FEC railroad tracks creating a topographic ridge to the west. The lowest points in these problem areas are at the north end along Palmetto Street and Canal Road with roadway elevations between 2.5 and 4 feet NAVD88. Figure 106 shows the drainage basin for the G2 canal overlaid on the LiDAR DEM.

Stormwater runoff from the area north of Park Avenue primarily drains to the G2 Canal through sheetflow and/or shallow ditches/swales. The G2 Canal has several cross-culverts in this area where roadways and/or developments intersect the Canal. Runoff from the area south of Park Avenue and north of Connecticut Avenue drains toward Park Avenue through two collection systems, one along Hart Avenue and the other between Hart Avenue and South Old County Road. Both systems ultimately discharge into the G2 Canal north of Park Avenue. Runoff from the area south of Connecticut drains to the G2 Canal through piped collection systems, stormwater ponds, and/or sheetflow. The G2 Canal in this area flows north into the Hart Avenue collection system through a 36-inch culvert at Connecticut Avenue. Ultimately the G2 Canal discharges north into the G1 Canal box culverts under 10th Street, which flows into ML.

Figure 107 shows the model predicted 100-year 24-hour inundation extents, and Figure 108 shows the 25-year 24-hour inundation extents for the G2-G11 drainage problem areas with node peak stages labeled. Figure 109 shows the building, residential yard, and roadway FPLOS deficiencies identified in this area. As shown in the figures, significant flooding occurs in these problem areas with the worst flooding occurring south of Park Avenue between Hart Avenue and South Old County Road, along Cheeta Drive, and along the G2 Canal between Oak Ridge Avenue and 10th Street.

Figure 106 Drainage Basin Delineation and Existing Topography – G2 and G11 Canals

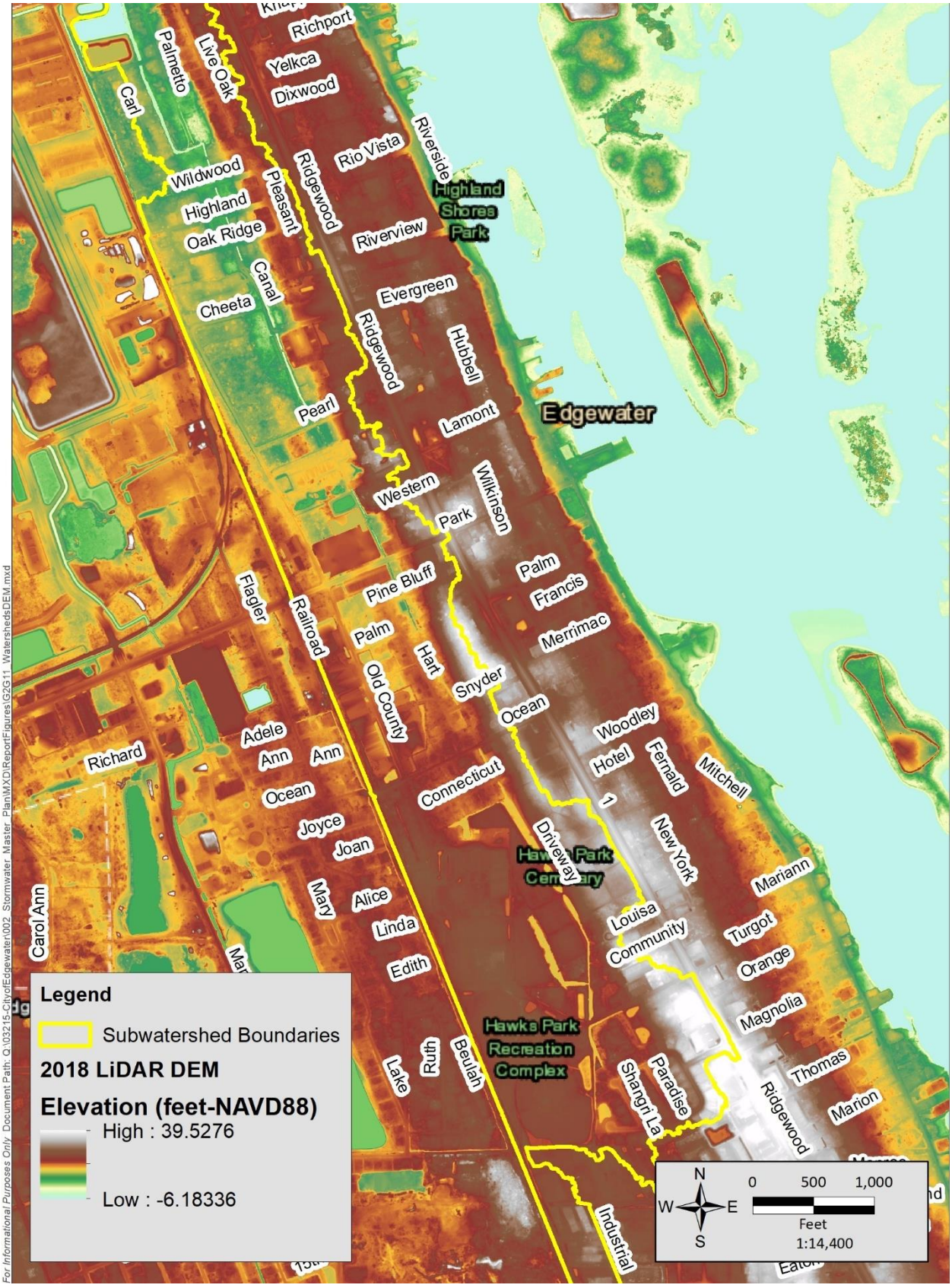


Figure 107 100-Year Existing Conditions Flooding – G2 and G11 Canals

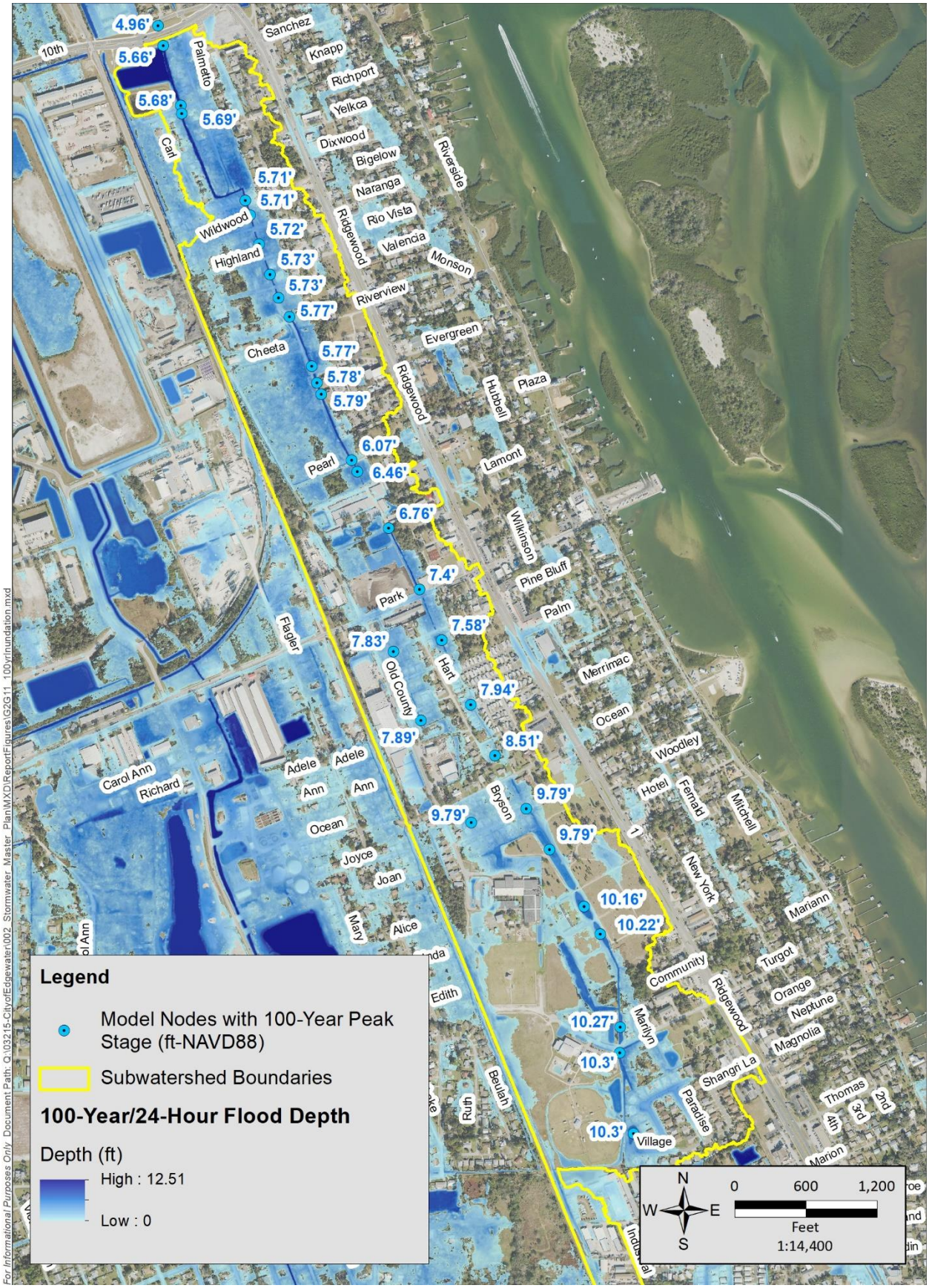


Figure 108 25-Year Existing Conditions Flooding – G2 and G11 Canals

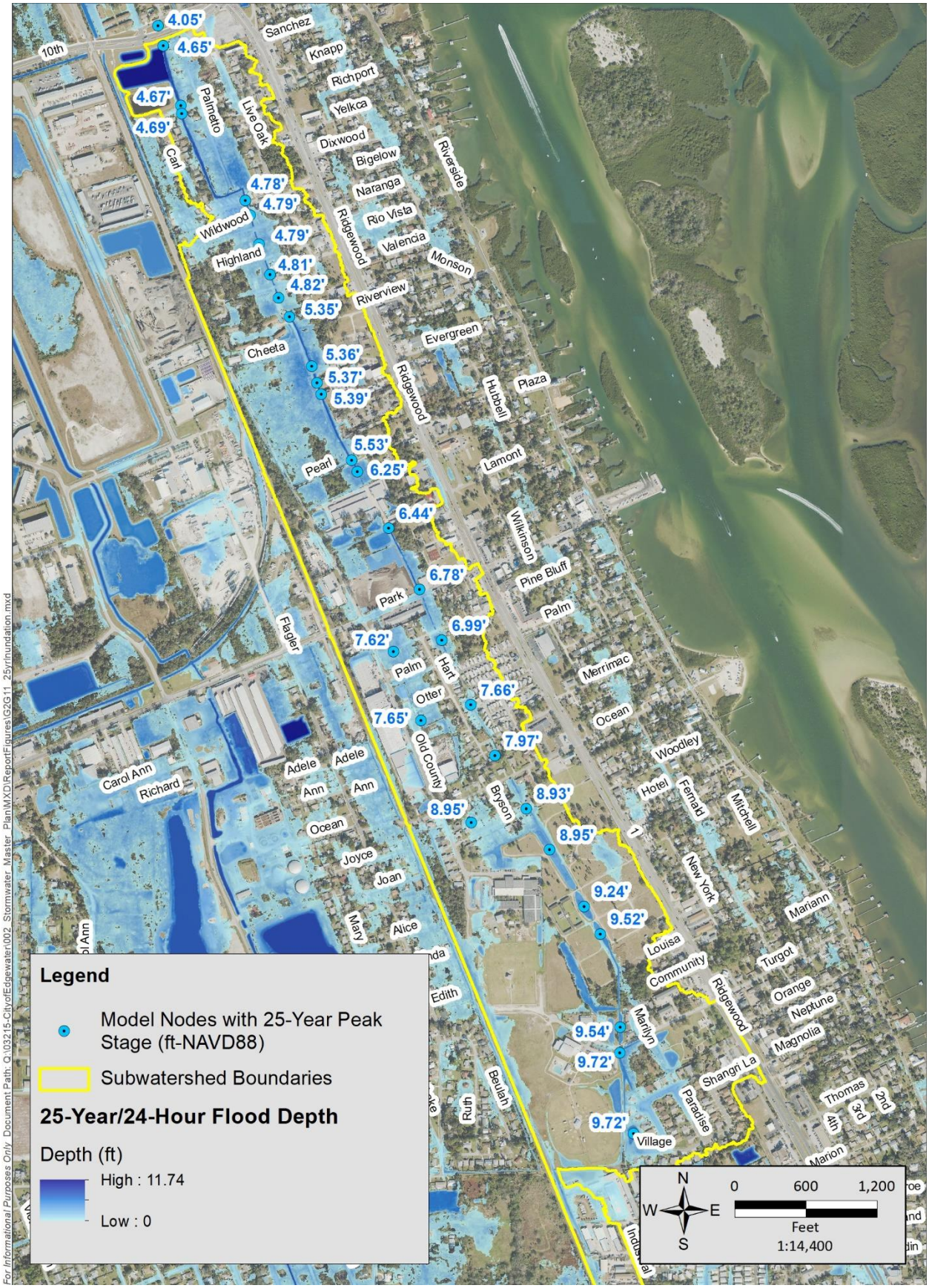
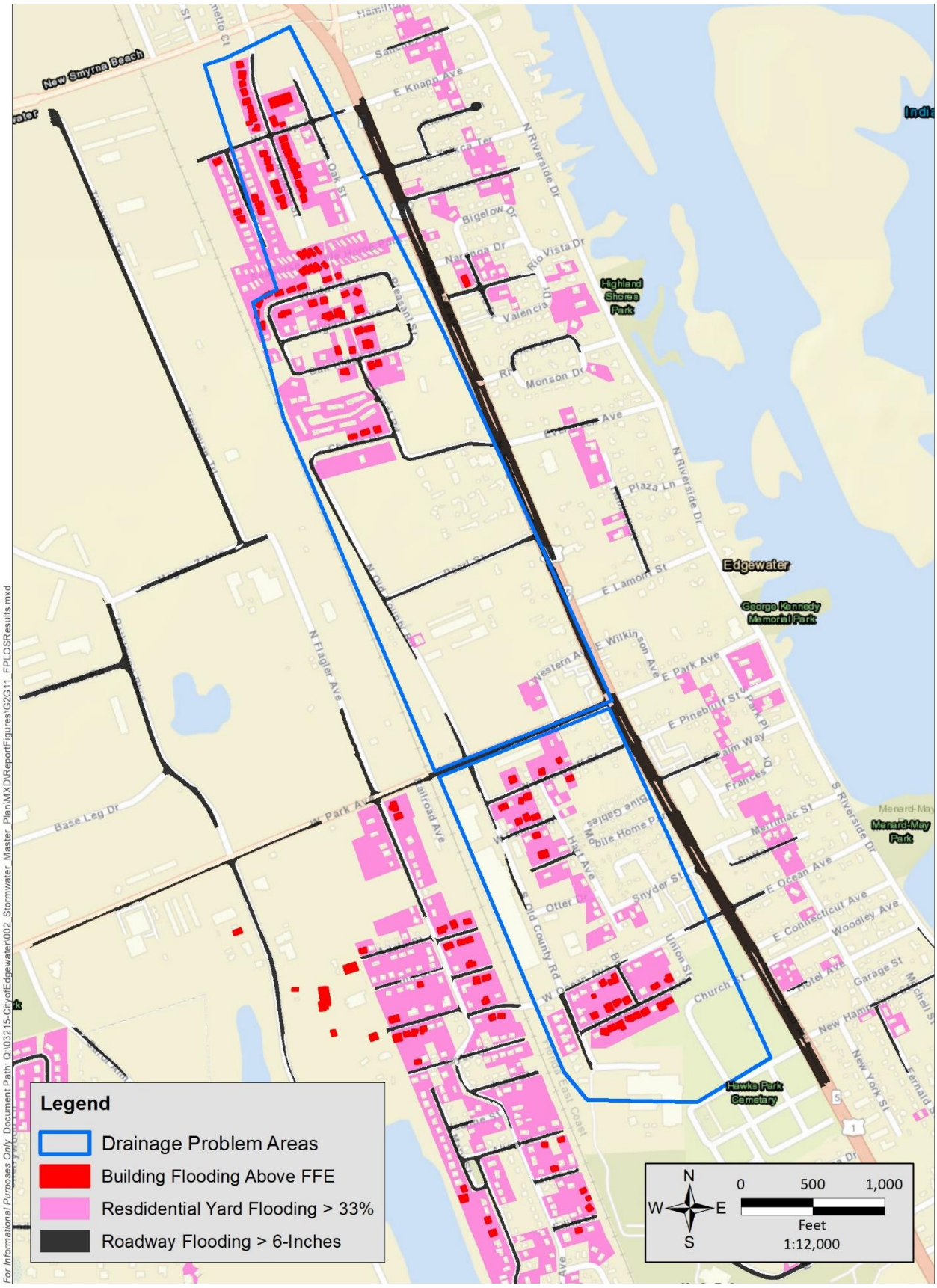


Figure 109 Building, Yard, and Roadway Flooding Results (FPLOS) – G2 and G11 Canals



The modeled predicted flooding in this area is extensive but aligns well with the flooding that residents and the City have experienced in recent storm events. The flooding in this area can be attributed to several factors including:

- Limited hydraulic conveyance capacity – The hydraulic capacities of the primary drainage canals and culverts are undersized for the stormwater runoff produced from this drainage area. Figure 110 shows the hydraulic grade line along the G2 and G1 Canals to ML for the 10-, 25-, 100-, and 500-year/24-hour storm events. As shown in the figures, significant headlosses occur between ML and the downstream end of the G2 Canal, between the north end of Pearl Street and Park Avenue, and between Park Avenue and Connecticut Avenue. Table 36 summarizes the hydraulic conditions at each of the cross-culvert locations along the canals.
- Topographic challenges – Much of this area is low-lying with north-south topographic ridges, which creates a "bowl" where stormwater collects and creates flooding. Based on a review of available historical aerial imagery from 1952, the lowest-lying areas where flooding occurs now were historically wetlands and natural floodplain where inundation would be expected.
- Figure 111 shows the G2 G11 problem areas overlayed on the 1952 aerials. This is particularly challenging in the low-lying areas along Palmetto Street, Canal Road, and the area east and west of Hart Avenue.
- Tidal Influence/Flooding – This area is directly connected to ML, which is tidally influenced and can experience elevated stages during tropical events, Nor'easters, and king tides. Tidal flooding is particularly a problem from the area between 10th Street and Pearl Street due to low surface elevations, with some areas below 2.5 ft-NAVD88. Additionally, elevated tidal stages can reduce surface storage during compound flooding events and can cause adverse tailwater conditions that limit the conveyance capacity of the G2 Canal and other stormwater collection systems.

Figure 110 Hydraulic Grade Lines for the G2 and G11 Canals

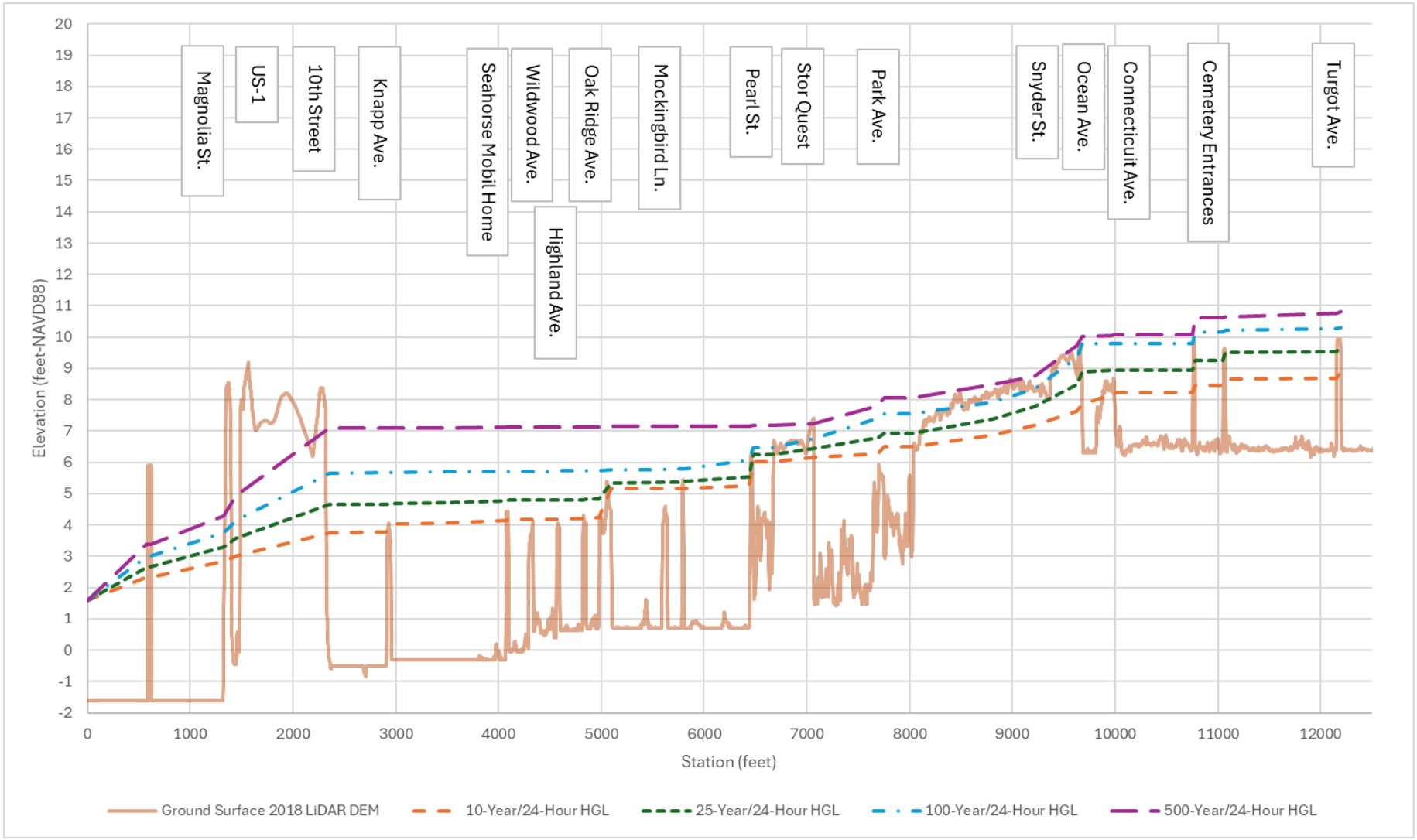


Table 36 G2 and G11 Canals Cross-Culvert Hydraulic Summary

Roadway Crossing	Pipe Count	Pipe Shape	Pipe Rise (in)	Pipe Span (in)	Upstream Invert Elevation (ft-NAVD88)	Downstream Invert Elevation (ft-NAVD88)	Pipe Length (ft)	Pipe Material	Upstream Peak Stage (ft-NAVD88)			
									10-Year/ 24-Hour	25-Year/ 24-Hour	100-Year/ 24-Hour	500-Year / 24-Hour
North Riverside Drive	1	Bridge	-9999	-9999	-1.6	-1.6	30	Natural Bottom	2.34	2.66	3	3.39
Magnolia Street	2	Rectangular	72	120	-4.27	-4.17	80	Concrete	3.02	3.57	4.16	4.94
US-1	2	Rectangular	84	120	-2.87	-2.97	124	Concrete	3.24	3.85	4.56	5.56
10th Street Pipe 1	2	Rectangular	84	120	-2.42	-2.89	407	Concrete	3.33	3.97	4.82	5.97
10th Street Pipe 2	2	Rectangular	84	120	-2.19	-2.42	163	Concrete	3.39	4.05	4.96	6.18
10th Street Pipe 3	2	Circular	42	42	-0.43	-0.44	144	Concrete	3.74	4.65	5.66	7.09
West Knapp Avenue	2	Circular	42	42	-1.65	-1.33	41	Concrete	4.02	4.69	5.69	7.11
Seahorse Mobile Home	1	Circular	42	42	-1.08	-0.99	27	Concrete	4.17	4.79	5.71	7.12
Wildwood Avenue	2	Circular	30	30	0.03	-0.42	45	Concrete	4.18	4.79	5.72	7.12
Highland Avenue	2	Circular	30	30	-0.65	-0.62	33	Concrete	4.2	4.81	5.73	7.13
Oak Ridge Avenue	2	Circular	30	30	-0.04	-0.08	33	Concrete	4.22	4.82	5.73	7.13
Canal Road Driveway	1	Circular	36	36	0.22	0.2	119	Concrete	5.16	5.35	5.77	7.14
Mockingbird Lane	2	Circular	24	24	-0.09	-0.19	51	Corrugated Metal	5.17	5.37	5.78	7.15
Driveway Culvert	1	Circular	36	36	-1.84	-2.09	21	HDPE	5.18	5.39	5.79	7.15
Pearl Street	1	Circular	30	30	1.02	0.64	31	Concrete	6.03	6.25	6.46	7.18
StorQuest	2	Circular	36	36	0.45	0.3	406	Concrete	6.15	6.44	6.76	7.24

Roadway Crossing	Pipe Count	Pipe Shape	Pipe Rise (in)	Pipe Span (in)	Upstream Invert Elevation (ft-NAVD88)	Downstream Invert Elevation (ft-NAVD88)	Pipe Length (ft)	Pipe Material	Upstream Peak Stage (ft-NAVD88)			
									10-Year/ 24-Hour	25-Year/ 24-Hour	100-Year/ 24-Hour	500-Year / 24-Hour
West Park Avenue	2	Circular	24	24	1.84	1.81	57	Concrete	6.51	6.94	7.56	8.07
Hart Avenue Pipe 1	1	Circular	42	42	2.4	1.69	775	Concrete	6.87	7.39	7.93	8.48
Hart Avenue Pipe 2	1	Circular	36	36	3.28	2.67	398	Concrete	7.17	7.78	8.36	8.73
Hart Avenue Pipe 3	1	Circular	36	36	3.5	3.28	141	Concrete	7.34	7.97	8.51	8.82
Hart Avenue Pipe 4	1	Circular	36	36	3.9	3.5	277	Concrete	7.64	8.5	9.35	9.74
West Ocean Avenue	1	Circular	36	36	3.93	3.9	46	Concrete	7.86	8.88	9.78	10.03
Connecticut Avenue Pipe 1	1	Circular	36	36	4.35	3.93	282	Concrete	8.15	8.93	9.79	10.06
Connecticut Avenue Pipe 2	1	Circular	36	36	4.4	4.35	34	Concrete	8.24	8.95	9.79	10.07
Cemetery Entrance 1	1	Horizontal Ellipse	27	36	3.41	3.43	21	Corrugated Metal	8.45	9.24	10.16	10.61
Cemetery Entrance 2	1	Horizontal Ellipse	27	36	3.55	3.42	22	Corrugated Metal	8.67	9.52	10.22	10.65
Turgot Avenue	1	Horizontal Ellipse	24	38	4.26	3.78	40	Concrete	8.88	9.72	10.3	10.82

Figure 111 G2 and G11 Canals 1952 Aerials



6.6.6 PELICAN WEST

This area includes the Pelican Cove Subdivision, which is north of 22nd Street on the east side of the FEC railroad tracks and drains south to the E5 Canal. Pelican Cove is an approximately 45-acre medium-density residential development with an average CN of 44 and an average impervious area percentage of 47 percent. The landscape in Pelican Cove predominantly slopes north to south, with lower elevations toward the center of the subdivision. The lowest points in Pelican Cove are along the west side of Sea Gull Court and along Falcon Avenue near Egret Court and Sea Hawk Court, with roadway elevations between 10- and 11-ft-NAVD88. Figure 112 shows the drainage basin for Pelican West overlaid on the LiDAR DEM.

Stormwater runoff from Pelican Cove drains to the E5 Canal through a stormwater collection system of shallow roadside swales, inlets, and underground pipes. The collection system pipes discharge into the E5 Canal through two 24-inch pipes, one at the southeast corner of Sandpiper Court and the other at the southwest corner of Sea Gull Court. The E5 Canal drains west and discharges into the E3 Canal. The E3 Canal drains north toward Indian River Boulevard and discharges into the 18th Street Canal through two 54-inch culverts at Indian River Boulevard.

Figure 113 shows the model predicted 100-year 24-hour inundation extents, and Figure 114 shows the 25-year 24-hour inundation extents for the Pelican West drainage problem area with node peak stages labeled. Figure 115 shows the building, residential yard, and roadway FPLOS deficiencies identified in this area. As shown in the figures, significant flooding occurs in Pelican Cove in the 100-year 24-hour event, with the worst flooding occurring on Sea Gull Court, Falcon Avenue, and Sea Hawk Court.

The flooding in this area can be attributed to following factors:

- Limited hydraulic conveyance capacity – The hydraulic capacities of the primary drainage canals and culverts are undersized for the stormwater runoff produced from this drainage area. Figure 116 shows the hydraulic grade line along the E3 and E5 Canals from the 18th Street Canal to Pelican Cove for the 10-, 25-, 100-, and 500-year/24-hour storm events. As shown in the figures, significant head loss occurs in the system between the 18th Street Canal and 20th Street that contributes to the flooding in Pelican Cove. Table 37 summarizes the hydraulic conditions at each of the cross-culvert locations along the canals.
- Topographic challenges – The Pelican Cove Subdivision is low-lying relative to the surrounding residential areas in the E3 and E5 Canal basins. The subdivision appears to have been constructed in natural low spot for this area. Based on a review of available historical aerial imagery from 1952, the subdivision appears to be in historical wetlands where inundation would be expected.
- Figure 117 shows the current parcel boundaries overlayed on the 1952 aerials.

Figure 112 Drainage Basin Delineation and Existing Topography – Pelican West

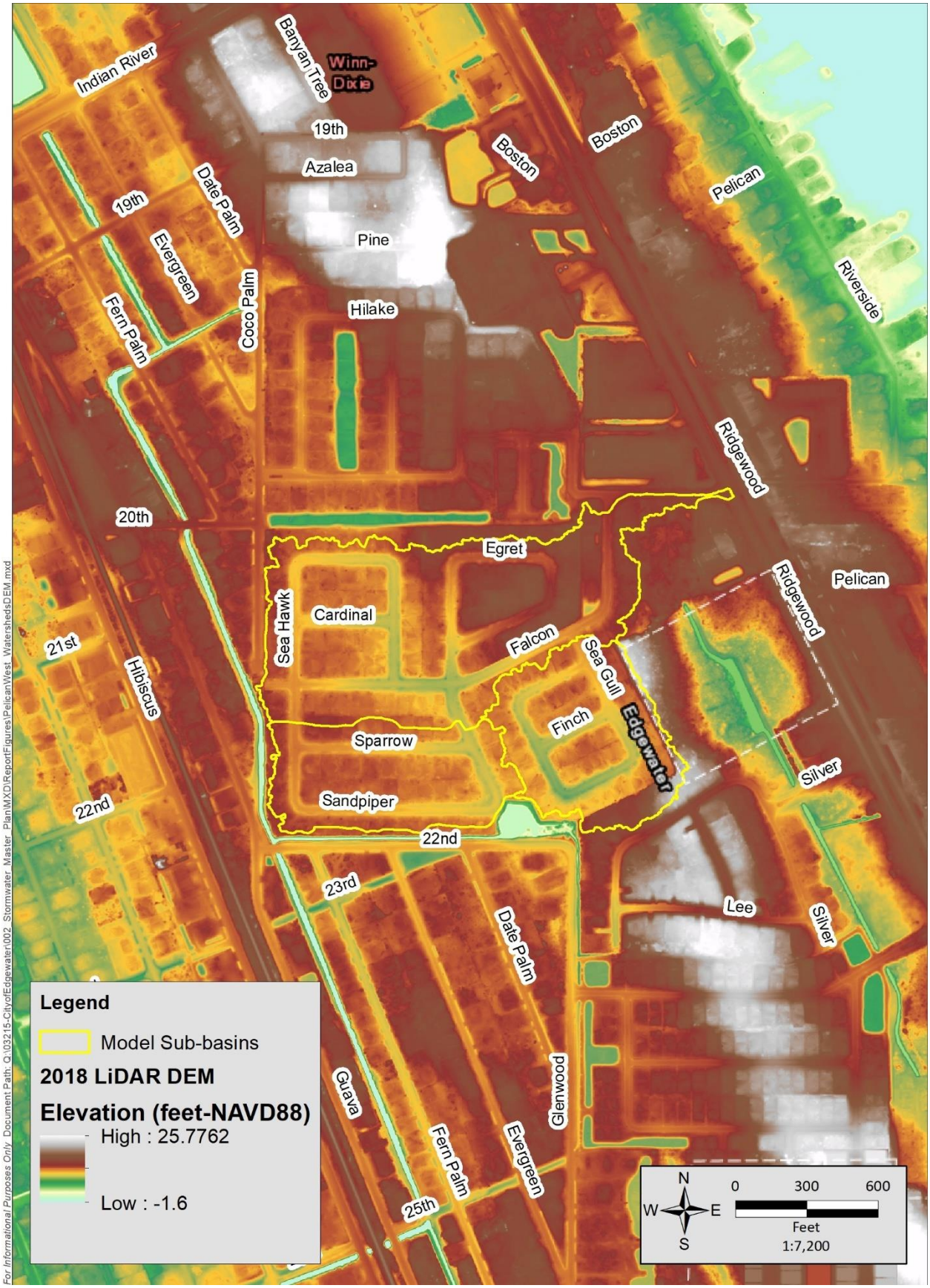


Figure 113 100-Year Existing Conditions Flooding – Pelican West



Figure 114 25-Year Existing Conditions Flooding – Pelican West



Figure 115 Building, Yard, and Roadway Flooding Results (FPLOS) – Pelican West

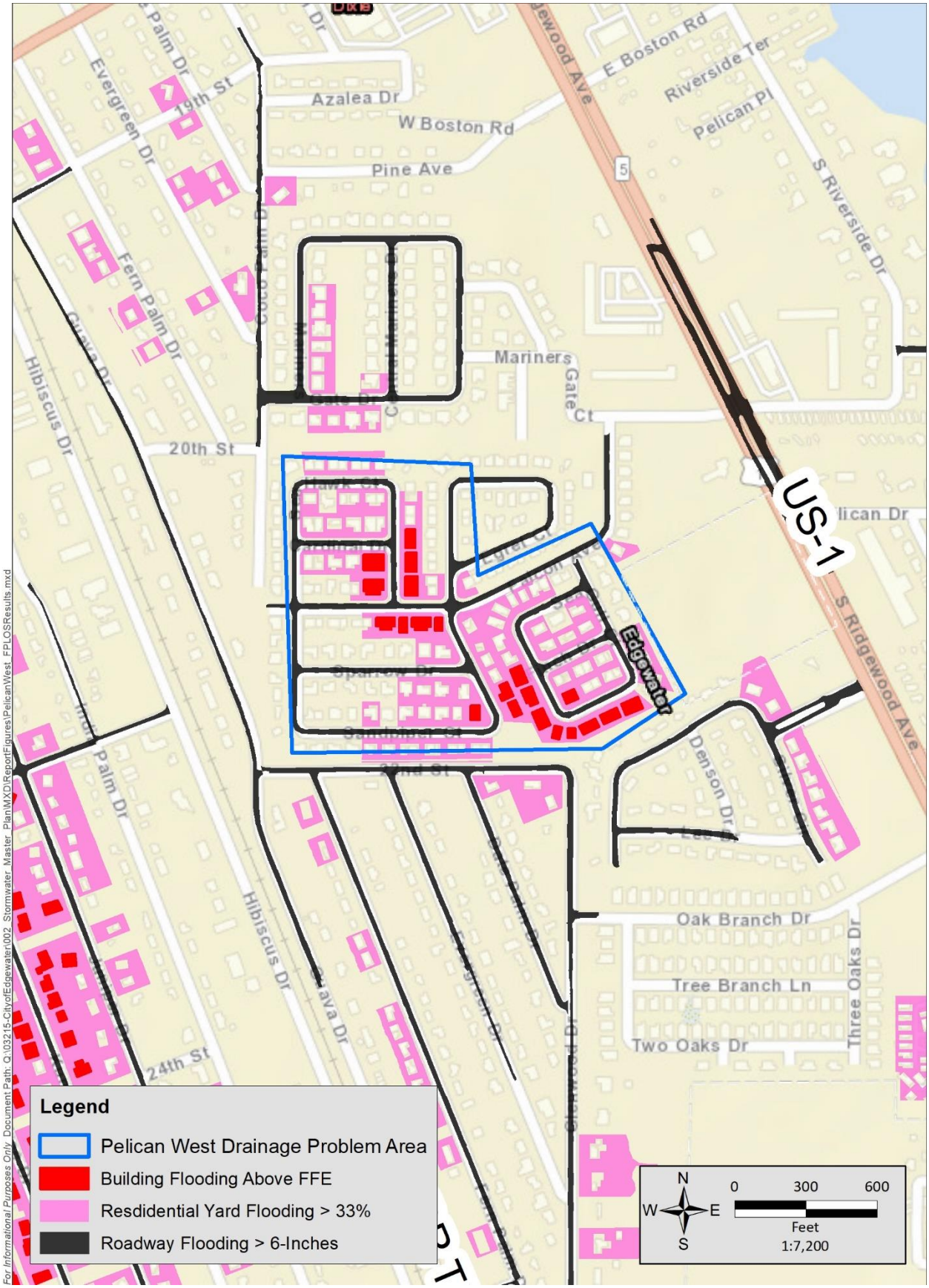


Figure 116 Hydraulic Grade Lines for the E3 and E5 Canals

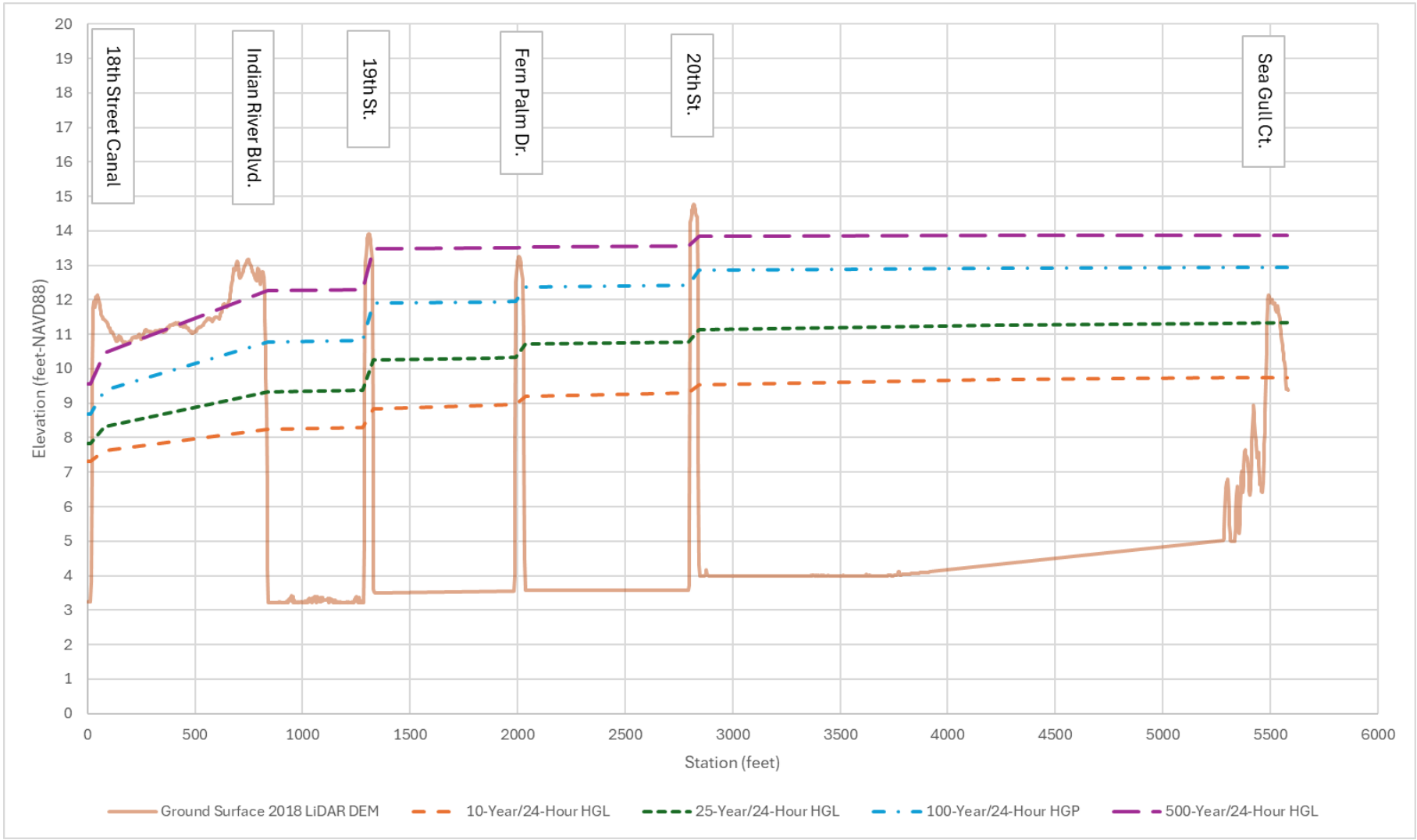


Table 37 E3 and E5 Canals Cross-Culvert Hydraulic Summary

Roadway Crossing	Pipe Shape	Pipe Count	Pipe Rise (in)	Pipe Span (in)	Upstream Invert Elevation (ft-NAVD88)	Downstream Invert Elevation (ft-NAVD88)	Pipe Length (ft)	Pipe Material	Upstream Peak Stage (ft-NAVD88)			
									10-Year/ 24-Hour	25-Year/ 24-Hour	100-Year/ 24-Hour	500-Year/ 24-Hour
Indian River Boulevard Pipe 1	Circular	2	54	54	1.91	1.9	44	Concrete	7.68	8.38	9.36	10.57
Indian River Boulevard Pipe 2	Circular	2	54	54	1.98	1.92	749	Concrete	8.25	9.34	10.78	12.28
19th Street	Horizontal Ellipse	2	34	53	2.22	2.3	38	Concrete	8.85	10.25	11.91	13.49
Fern Palm Drive	Circular	2	54	54	2.32	2.72	39	Concrete	9.2	10.71	12.38	13.54
20th Street	Circular	2	54	54	3	3.06	41	Concrete	9.53	11.13	12.85	13.85
Sea Gull Court	Horizontal Ellipse	1	14	23	9.59	9.13	65	Concrete	10.35	12.4	12.97	13.87

Figure 117 Pelican West 1952 Aerials



7 SURFACE WATER RESOURCE ASSESSMENT

This Section addresses the scope of work outlined in Tasks 7.1 and 7.2 to evaluate the status and trends of the most recent available water quality data as well as assess potential impairments for each Water Body Identification Number (WBID) within the City's portion of the St. Johns River Watershed.

The City has implemented a comprehensive Watershed management program to address water quantity, water quality, and natural systems protection and restoration within its Watersheds. The City also participates in two regulatory water quality improvement programs: the ML Reasonable Assurance Plan (RAP) and the North Indian River Lagoon (NIRL) BMAP. Both programs aim to restore water quality in their respective waterbodies by making improvements upstream within the contributing Watersheds.

The City is within VC and the SJRWMD area of responsibility. The City includes both urban and rural ecosystems that drain to the St. Johns River, ML, and NIRL, and the Halifax River (Figure 118).

As a stakeholder in the development of the ML RAP, the City made a commitment to improve water quality in the lagoon. Since its adoption, the lagoon has experienced seagrass recovery and gained compliance with nitrogen and chlorophyll a criteria.

Turnbull Creek has been placed on the study list for failure to comply with the dissolved oxygen criteria, but a causative pollutant has not been identified. Turnbull Bay is impaired for chlorophyll a, iron and fecal indicator bacteria.

Within these boundaries are many geographic "basin" or "sub-segment" delineations used for sampling and reporting of various data sources. These include Watershed basins and sub-basins, FDEP WBIDs, and ambient water quality sub-segment boundaries. The City Boundary intersects eight WBIDs including (Figure 119):

- Central ML.
- Little Cow Creek.
- North ML.
- Samsula Canal.
- Spruce Creek Swamp.
- Turnbull Bay.
- Turnbull Creek.
- Various unnamed ditches.

Figure 118 City of Edgewater Watershed

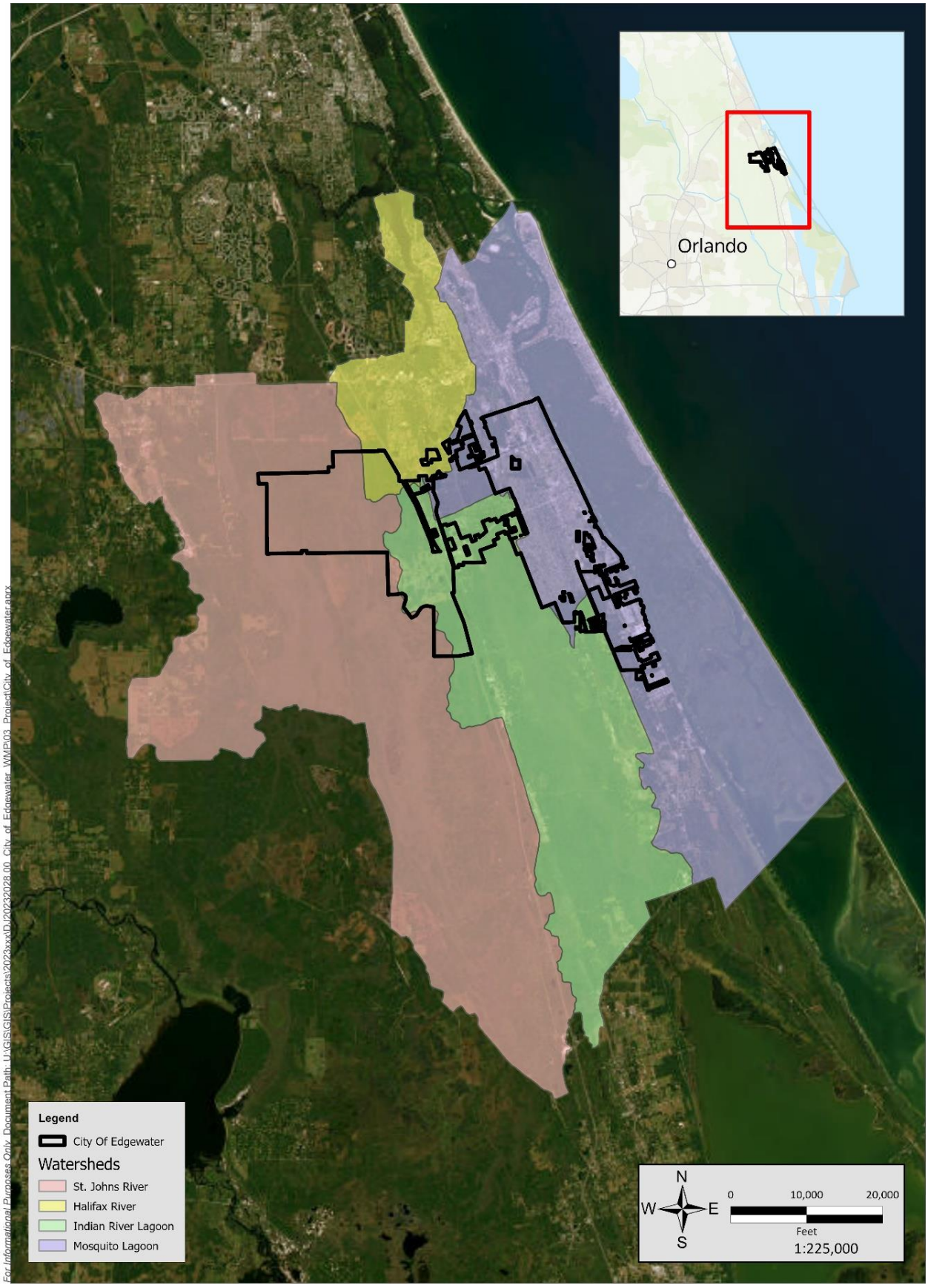
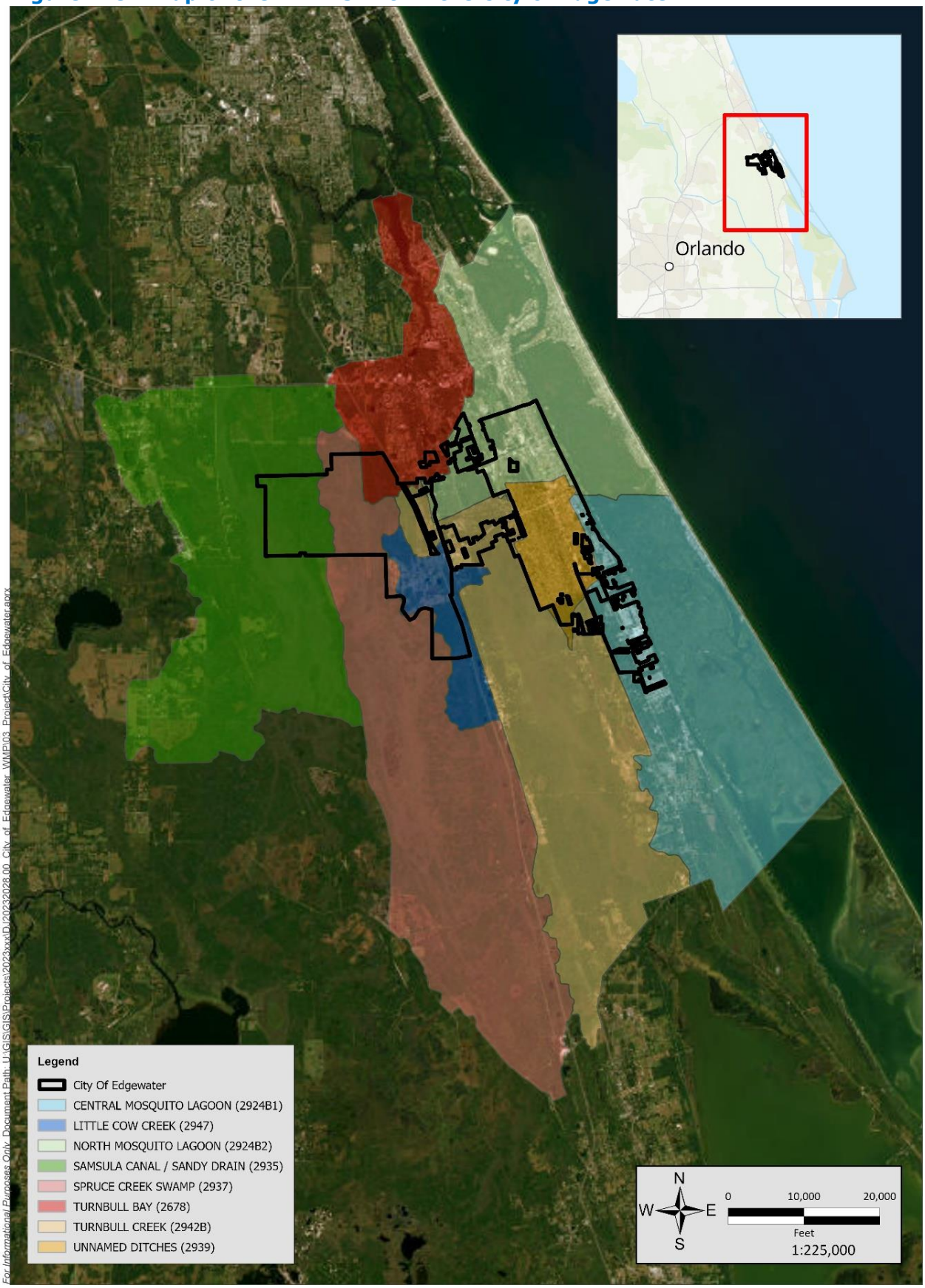


Figure 119 Map of the WBIDS within the City of Edgewater



7.1 WATER QUALITY DATA

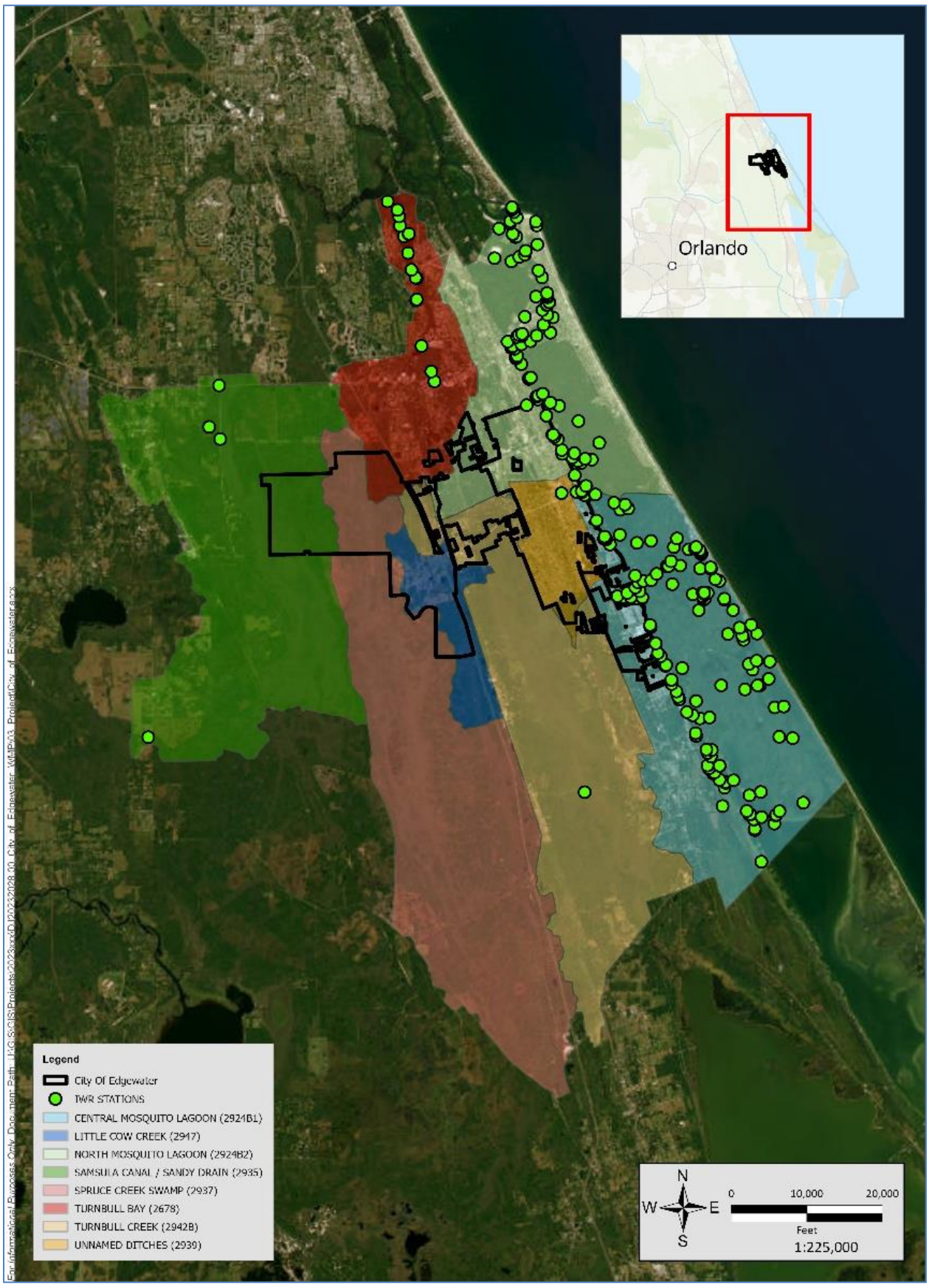
The following Subsections summarize the water quality data compiled for this project from FDEP's Impaired Waters Rule (IWR) database and FDEP's Watershed Information Network (WIN) database.

7.1.1 COMPILED DATA

The assessment of Florida waterbodies and water segments relative to applicable water quality standards and designated uses relies on the FDEP-maintained IWR database. Run 65 of the IWR database was queried for relevant water quality parameters collected from stations within the City's portion of the St. Johns River Watershed boundary. However, this database does not include the most recent year of data from 2024. Therefore, the IWR database was supplemented using data directly from FDEP WIN database for ambient water quality monitoring data. (We expect these data will be uploaded to the IWR database.)

The primary parameters include nutrients, chlorophyll *a*, *in situ* parameters (dissolved oxygen, salinity, temperature) and fecal indicator bacteria. Figure 120 shows the stations from which data were obtained. Most of the available data were not collected within the City's limits but in the receiving waters of ML, Turnbull Creek, and Turnbull Bay.

Figure 120 Water Quality Monitoring Locations Compiled



7.2 TEMPORAL/SPATIAL TRENDS ANALYSES

Appendix A summarizes the compiled water quality data included in the database at the station level grouped by WBID. Appendix B summarizes the compiled water quality data included in the database as scatter plots of monthly means within the WBID boundary. These scatter plots have an automated x-axis (date range) to reflect the data available for a given parameter.

7.2.1 TRENDS ANALYSIS

One of the major goals of the City's Watershed Management Plan is the protection and restoration of water quality in the receiving water bodies. A critical element of the SWMP's development is an understanding of the spatial and temporal variation in the water quality of the pertinent waterbodies. Trend analyses on the receiving waterbodies and waterbodies within the City were conducted. Time series trend analyses for water quality data collected in the City were unsuccessful due to insufficient data. Where data were sufficient, tests were performed using the Seasonal Kendall Tau (SKT) test for trend based on monthly data at the station level. Appendix C provides a detailed description of the SKT test used for this analysis.

To satisfy the specific objectives of this task, trend analyses were conducted on water quality at the WBID level for WBIDs with sufficient data available. These trend analyses identify the water bodies that are experiencing trends in the various water quality parameters monitored including:

- Total nitrogen (TN)
- Total phosphorus (TP)
- Dissolved orthophosphate
- Chlorophyll *a*
- Ammonia
- Salinity
- pH
- Dissolved oxygen

Monthly averages for each of the parameters were used for the analysis. The period of record analyzed varied by data availability in each WBID but generally encapsulated 2010 to 2023, inclusive. Trend analyses were conducted for the following receiving waters: North ML, Central ML, and NIRL. Other WBIDs that intersected the City's boundary lacked sufficient data for trend analyses.

Appendix D provides detailed output from the trend tests. Table 38 presents a summary of the statistically significant trends in water quality at the WBID spatial scale. The table presents the following fields:

- Basin – water body name.
- Trend – grouping as either improving or degrading water body.
- Parameter – water quality parameter.
- Count – number of samples.
- P-Value – probability that the slope in the data is greater than 0.
- Slope – computed slope in the data over time.

Results in green represent an improving trend in concentrations, and those in red represent degrading trends in water quality concentrations. Only the trend tests that were statistically significant are shown in the table; Appendix E provides the remaining results.

Table 38 Significant Water Quality Trends Associated with the City between 2010–2023

Basin	Parameter	Count	p	Slope	Trend	Magnitude	Trend Symbol
North ML (2924B2)	Salinity	156	0	-0.528	Decreasing	Small	↓
Dissolved Oxygen	Saturation	155	0.001	-0.705	Decreasing	Small	↓
Central ML (2924B1)	pH	156	0.011	-0.007	Decreasing	Small	↓
	Nitrate + Nitrite	158	0	0.001	Increasing	Large	↑
	Ortho Phosphorus	149	0	0.001	Increasing	Large	↑
	Total Phosphorus	160	0	0.003	Increasing	Large	↑
	Temperature	156	0.048	0.1	Increasing	Small	↑
	Chlorophyll a	160	0.048	-0.084	Decreasing	Small	↓
	Salinity	156	0.022	-0.443	Decreasing	Small	↓
	Dissolved Oxygen Saturation	155	0.032	0.609	Increasing	Small	↑
	Total Phosphorus	157	0	0.002	Increasing	Small	↑
IRL (2963F3)	Salinity	162	0.003	-1.108	Decreasing	Small	↓
	Dissolved Oxygen Saturation	160	0	1.158	Increasing	Small	↑
	Nitrate + Nitrite	153	0.007	0.001	Increasing	Large	↑
	Ortho Phosphorus	138	0.002	0.001	Increasing	Large	↑
	Temperature	162	0.022	0.099	Increasing	Small	↑

7.3 Regulatory Review

Several WBIDs that intersect the City's boundary are currently listed as impaired following the most recent evaluation completed by FDEP.

7.3.1 Existing Waterbody Impairments

7.3.1.1 ML

Although ML (WBID: 2924B1 and 2924B2) is designated as impaired for Fecal Coliform (Shellfish Harvesting), Iron, and Nutrients (Chlorophyll-a, Total Phosphorous), the

waterbody's nutrient impairment is covered under the IWR Assessment Category 4b (reasonable assurance). This is due to the Secretarial Adoption of the MLRAP submitted by VC and Stakeholder Group, which includes the City.

The MLRAP appears to be having some positive influence on the North and Central ML segments. MLRAP projects have been implemented since 2022. From 2020 through 2024, the North ML has met the criteria (shaded green) for TN and chlorophyll a each year (Table 39). In fact, based on communications with Kevin O'Donnell, FDEP Program Administrator for the Water Quality Evaluation and TMDL Program that oversees the MLRAP, the North ML (WBID 2924B2) is expected to be moved to Category 2b (not impaired) for total nitrogen as part of the 2024–2026 Biennial Assessment. In the Central ML segment, TN also met the criterion while chlorophyll -a only passed the last two years. Values for TP continue to not meet the criteria.

Table 39 Annual Geometric Means for ML Segments

Segment	Year	TN* (mg/L)	TP* (mg/L)	Chlorophyll a* (µg/L)
North ML	2020	0.48	0.058	3.6
	2021	0.40	0.058	3.3
	2022	0.47	0.057	3.9
	2023	0.35	0.064	2.3
	2024	0.45	0.070	2.4
Central ML	2020	0.65	0.056	4.8
	2021	0.61	0.057	5.1
	2022	0.60	0.056	5.4
	2023	0.37	0.055	2.7
	2024	0.44	0.046	2.5

Notes: *Concentrations expressed as an annual geometric mean. Cells shaded red indicate that the water body did not meet water quality criteria.

The improvements in water quality have possibly helped improve the seagrass coverage reported in the *ML Reasonable Assurance Plan 2024 Annual Report* (Jones Edmunds, 2025). Modest gains were reported in both the North and Central ML Segments.

7.3.1.2 Other Waterbodies

Additionally, various unnamed ditches within WBID 2939 are impaired due to nutrients (TP, chlorophyll a), which have annual geometric means that exceed the required threshold and have thus placed it under Category 4d- Study list. Turnbull Creek (Freshwater Segment WBID: 2942B) has an impairment for dissolved oxygen classified under the IR Assessment category 4d- Study list due to a lack of data for this parameter and since no causative pollutant has been identified.

A statewide BMAP is in place for the NIRL, which is a receiving body of the City's Watershed (FDEP 2025). The BMAP's 2025 update calls for a 1,959 lb/yr reduction in TN and 297 lb/yr reduction in TP for the City of Edgewater.

7.3.2 EXISTING TMDLS

Although no TMDLs currently exist within the City Watershed boundaries, two TMDLs exist just north of the City. Spruce Creek (WBID 2674 and 2674A) has an approved TMDL for Fecal Coliform (Shellfish Harvesting), dissolved oxygen, and TP.

7.4 POLLUTANT LOADING ESTIMATION

We estimated the pollutant loadings for the City using two methods to comply with the FDEP NIRL BMAP and the MLRAP. For the BMAP, loading data were compiled from the Spatial Watershed Iterative Model (SWIL) 3.0 model and tabulated by source (direct runoff or baseflow), basin, and subbasin. For the portion of the City contributing to ML, we relied on the Spatially Integrated Model for Pollutant Load Estimation (SIMPLE) developed and recently updated for the RAP.

7.4.1 SWIL

The SWIL model was originally developed in 2012 by Applied Ecology, Inc. as an alternative to the Pollution Load Screening Model and Hydrologic Simulation Program FORTRAN Model originally developed for determining the IRL TMDL. Since 2012, the SWIL model has undergone several upgrades, and the current version is 3.0 (Applied Ecology, 2019). The model extends from the City in the north to the Merritt Island National Wildlife Refuge in the south (Figure 121). The loading estimates derived from the model are mainly driven by precipitation, land use, and soils. Pollutant load reduction from stormwater best management practices are accounted for where present.

The data used for this project were provided as two static current conditions GIS feature classes made up of 50x50 meter grid cells. Each grid cell is assigned the average estimated volume and TN and TP load over the period of record, which is 2004–2017. One feature class contains the raw loading estimates while the other contains area normalized loading estimates.

The stormwater basins and subbasins were developed as part of this Study (Figure 122). To estimate the pollutant loads for the City, the SWIL 50mx50m grid was overlaid on the City's subbasin layer.

Using the GIS UNION function, a new feature was created from the intersection of the stormwater basin and SWIL layers that includes the attributes from both features. As shown in Figure 123, the direct runoff (DRO) rates are expressed in pounds per acre per year (lb/acre/year) and the areas are reported in square feet. These data were exported from GIS for further processing where the areas (square feet) were converted to acres and multiplied by the loading rate to get an annual load for each grid cell/subbasin combo. These individual cells are then summed by subbasin, which is then summed by basin to report the estimated load at both spatial scales.

Figure 121 SWIL Model Extent in the City

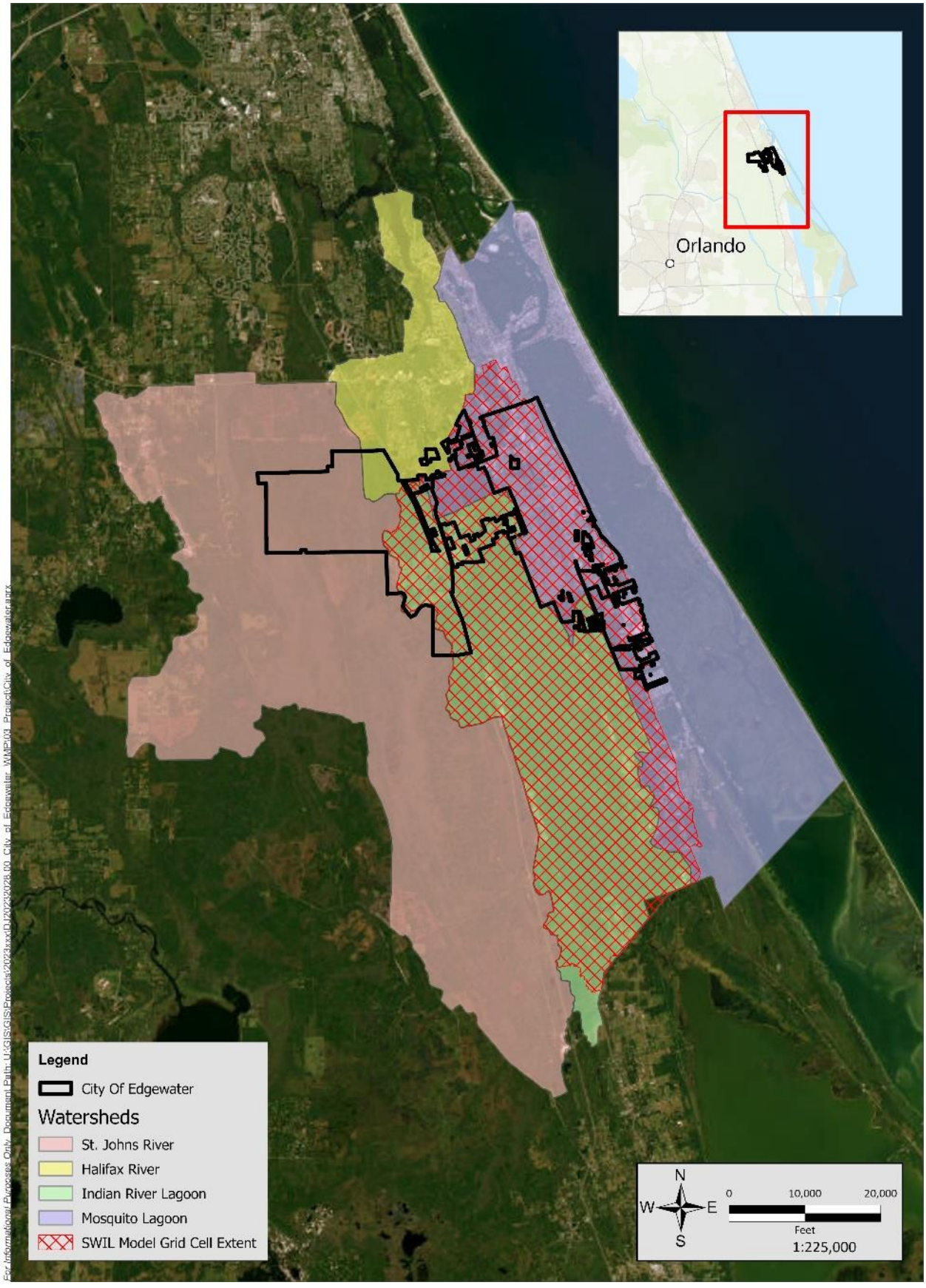


Figure 122 Map of the City Stormwater Basins

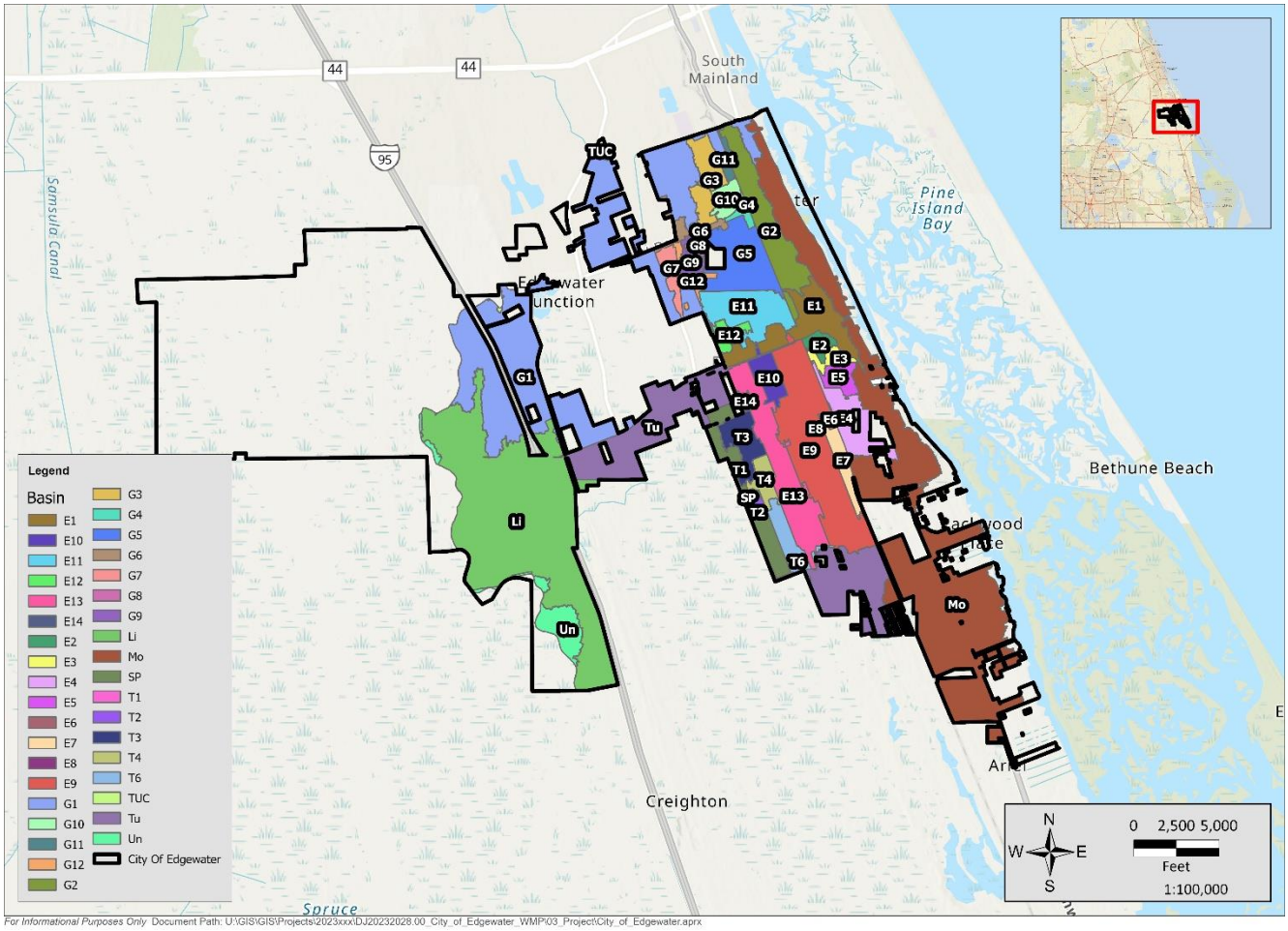
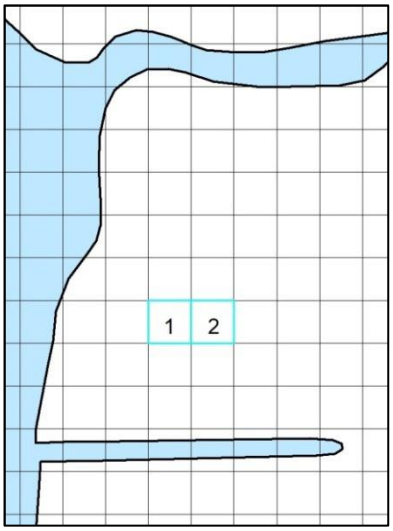
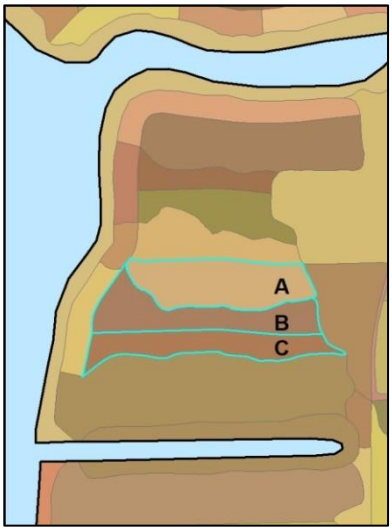


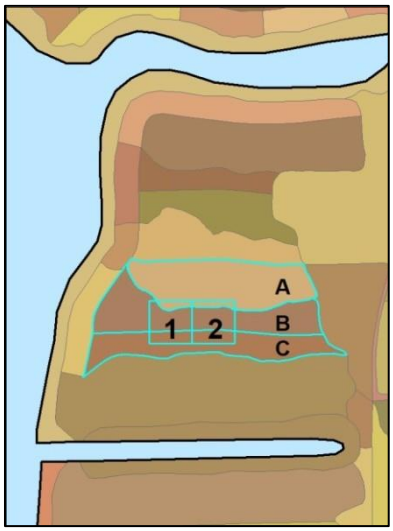
Figure 123 Example of the Union Function





GRID	DRO TN	DRO TP	DRO Volume
1	3.791978	0.608609	920.134924
2	3.791978	0.608609	920.134924

SUBBASIN	Area
A	114208
B	103864
C	87539



GRID	DRO TN	DRO TP	DRO Volume	SUBBASIN	Subbasin Area	Union Area
1	3.791978	0.608609	920.134924	A	114,208	3,592
1	3.791978	0.608609	920.134924	B	103,864	15,399
1	3.791978	0.608609	920.134924	C	87,539	7,916
2	3.791978	0.608609	920.134924	A	114,208	3,834
2	3.791978	0.608609	920.134924	B	103,864	14,660
2	3.791978	0.608609	920.134924	C	87,539	8,414

7.4.1.1 SWIL Results

The results from loadings analyses can be reported two ways with different units: lb/yr and lb/acre/yr. Loads reported in pounds per year are important to understand the amount of a pollutant entering a waterbody from a specific area. These loads can be directly related to the loading allocations in the NIRL BMAP, also reported in lb/yr. The issue with this reporting unit is its inability to make real direct comparisons between basins with similar land use categories because at that point, the load is only dependent on the size of the basin.

To directly compare the loads generated by different basins, the loads must be normalized by basin area. In this case, the loads are reported in lb/acre/yr. This method allows for the identification of "hot spots" or areas of relatively higher loads than others that could benefit from additional management action.

The loads are also presented by source (baseflow, DRO, total [baseflow + DRO]) and by constituent. The ranges on the figures are relative only to the source and constituent. Care must be taken when comparing the results between sources. Having identified a basin as high for baseflow TN and low for DRO TN does not eliminate the basin from management actions.

The results from the above analysis were exported as tables for incorporating back into the GIS for display and Table 40 summarizes further analysis. Appendix F provides tables of loads by basin. Baseflow loading makes up a larger proportion (> 40 percent) of the total load than seen in other parts of the state. These proportionately higher baseflow loads may increase the cost effectiveness of baseflow load-reducing BMPs.

Table 40 Summary of TN and TP Annual Loadings from DRO and Baseflow for the City

Parameter	DRO (lb/year)	Baseflow (lb/year)	Total (lb/year)
TN	42,452	29,231	71,683
TP	5,472	4,025	9,497

To demonstrate the distribution of the loads by Stormwater Basins, the estimated loads for TN and TP were mapped by basin (Figure 124 through Figure 129). The estimated loads are tabulated in Table B1 in Appendix F. Highest loadings can be attributed to built-out conditions east of US1 along ML. Other high loading areas include the infill areas between I-95 and US-1 with increased residential, commercial, and industrial land uses.

Figure 124 SWIL Annual DRO TN Load

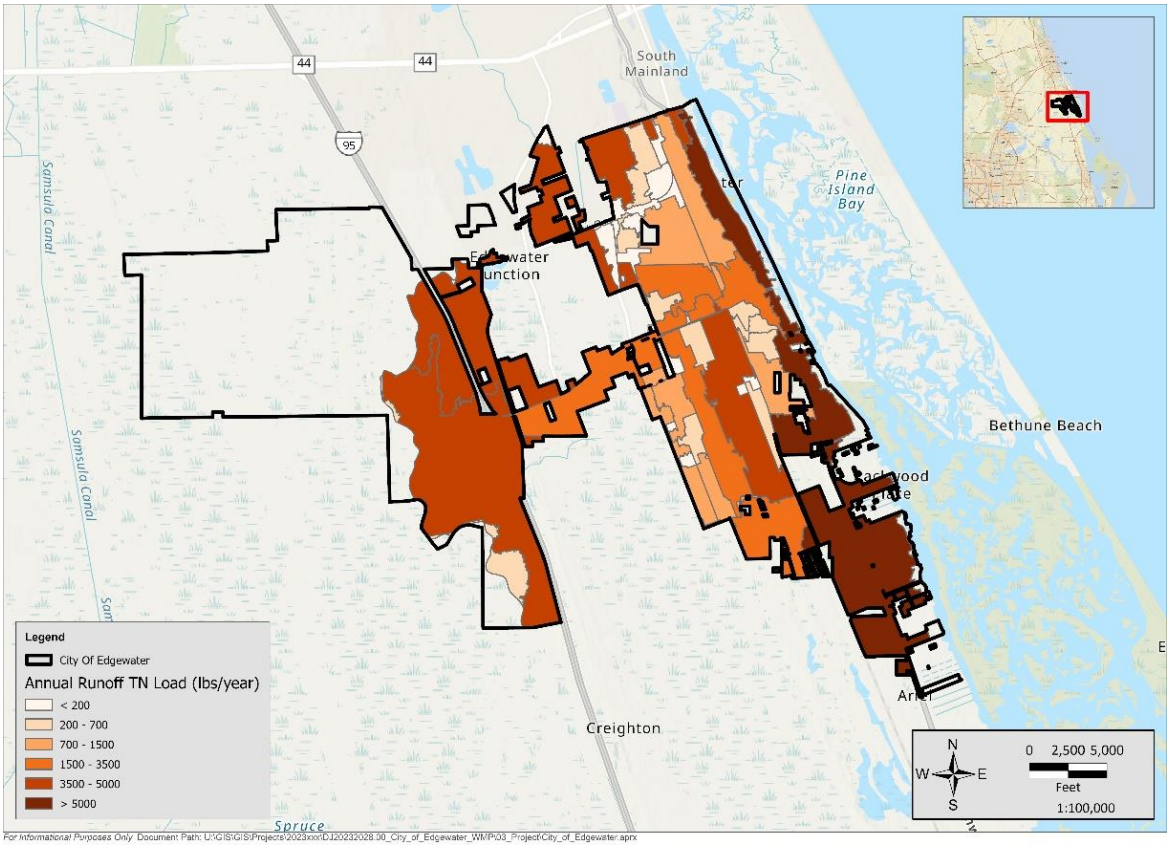


Figure 125 SWIL Annual Baseflow TN Load

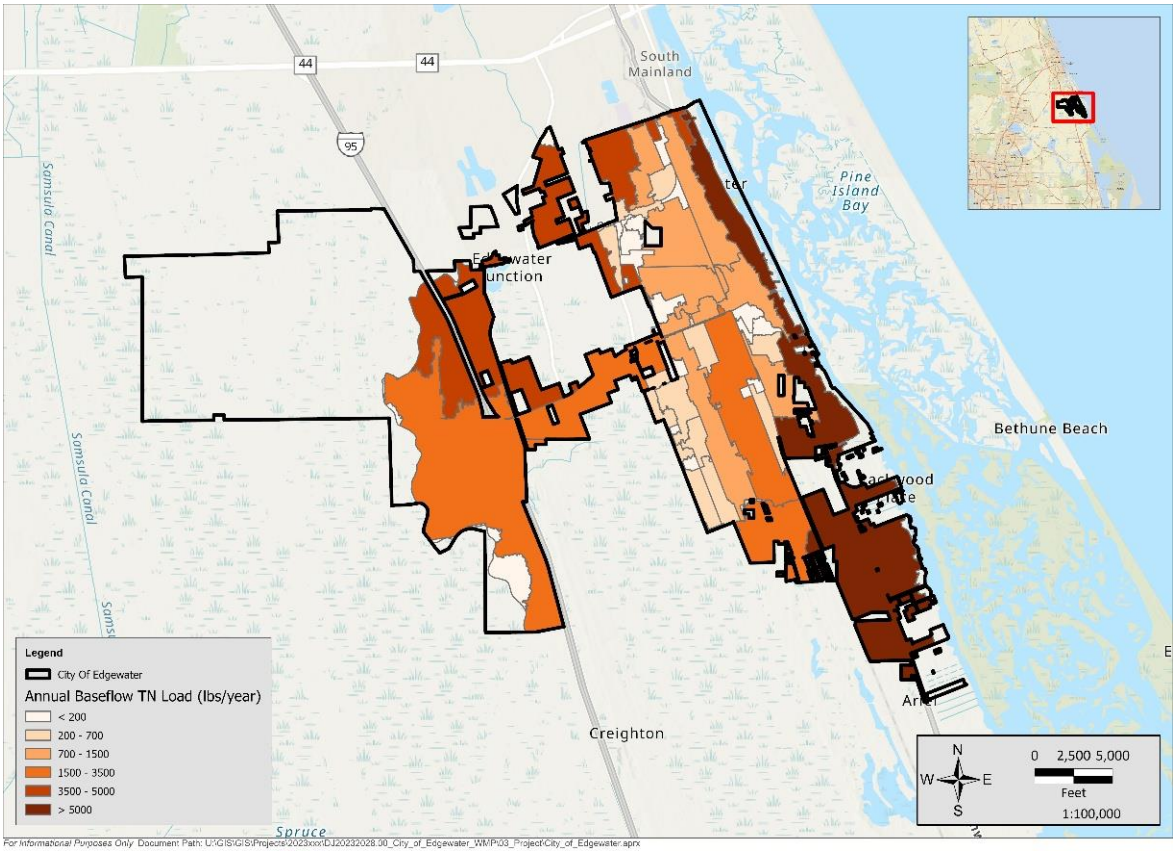


Figure 126 SWIL Annual DRO TP Load

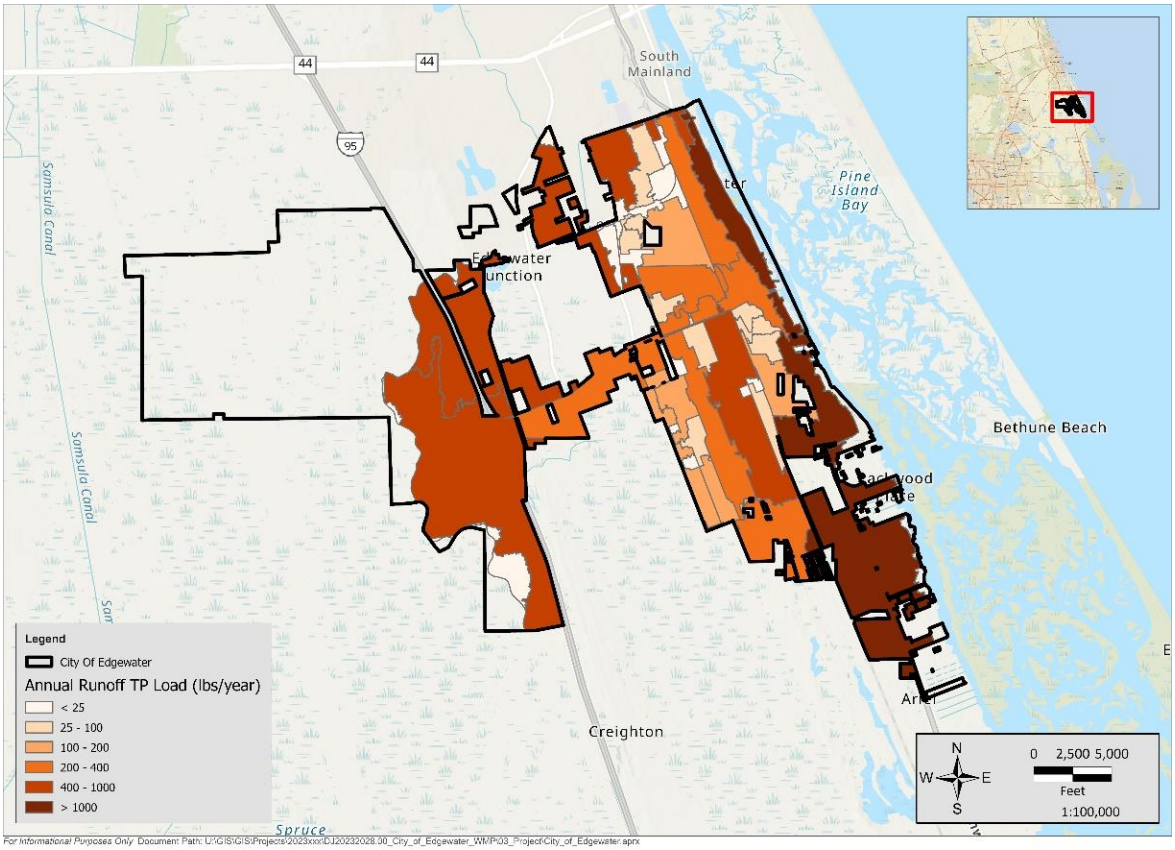


Figure 127 SWIL Annual Baseflow TP Load

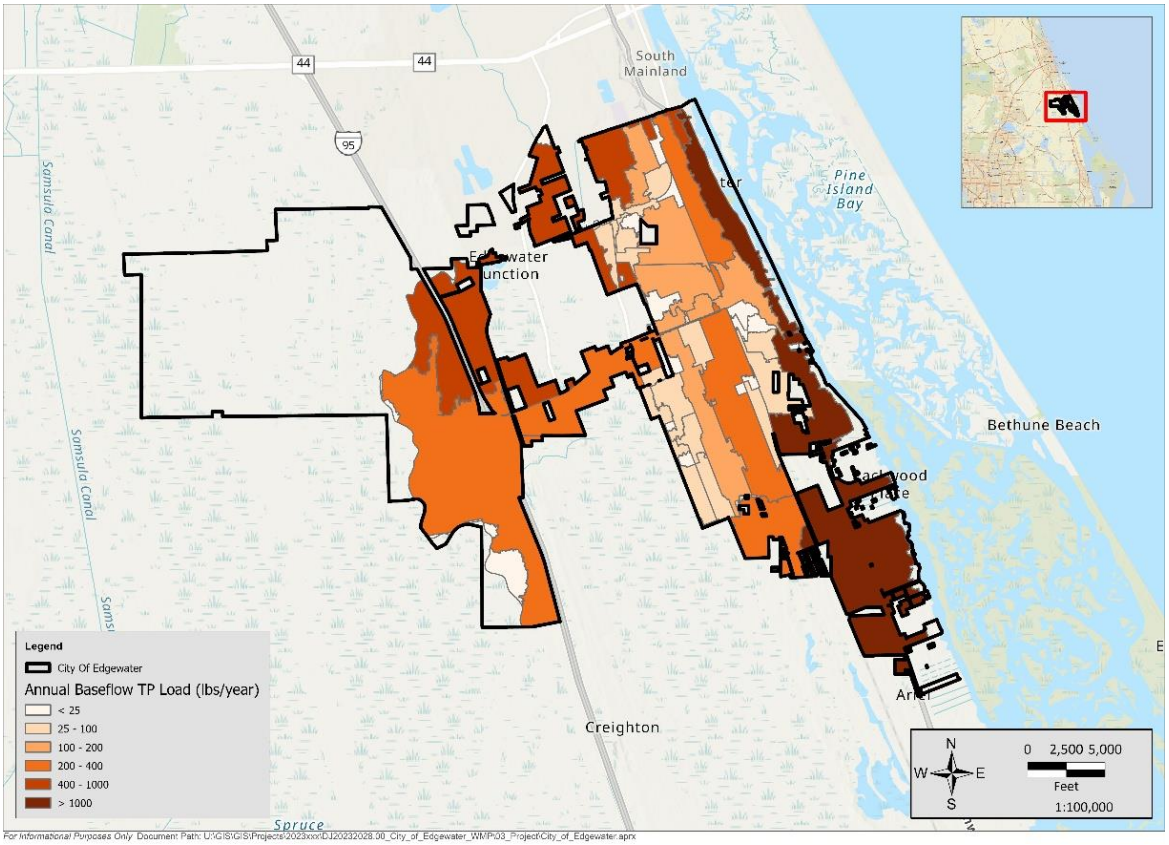


Figure 128 SWIL Annual Total TN Load

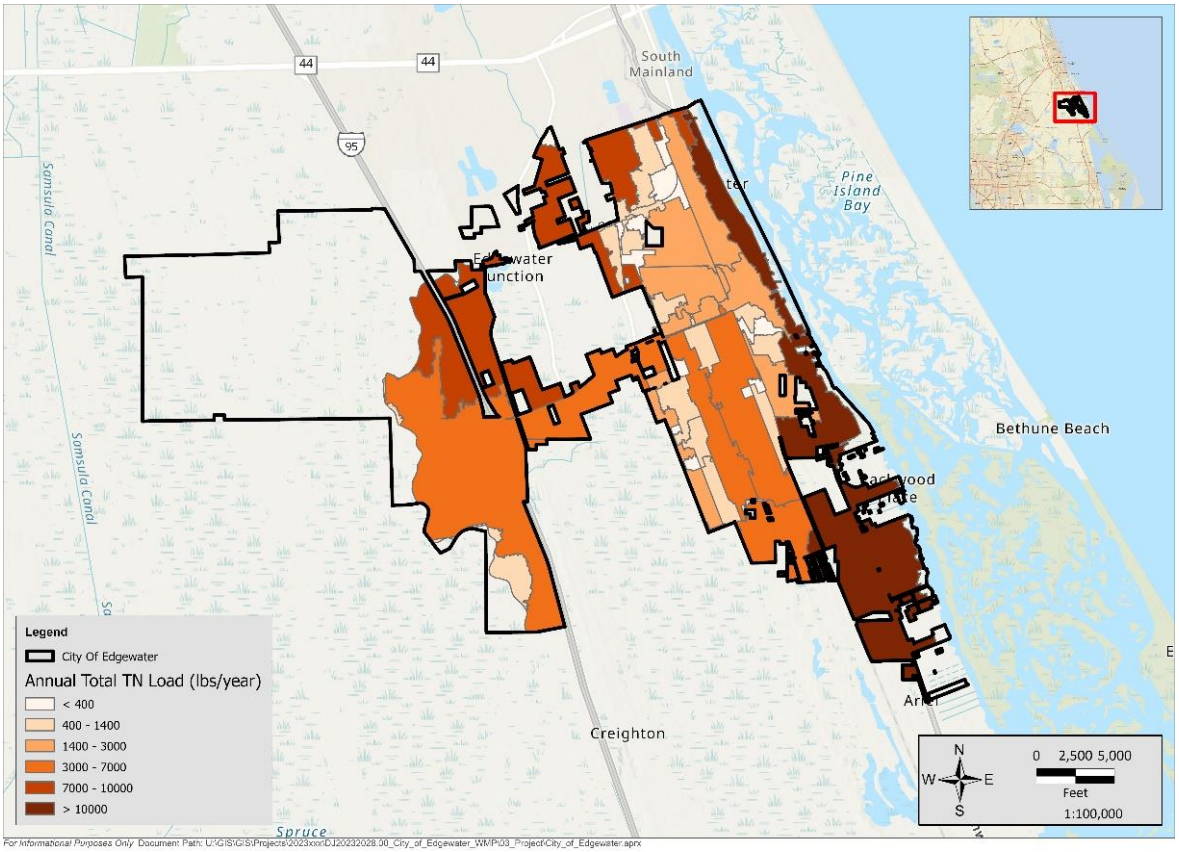
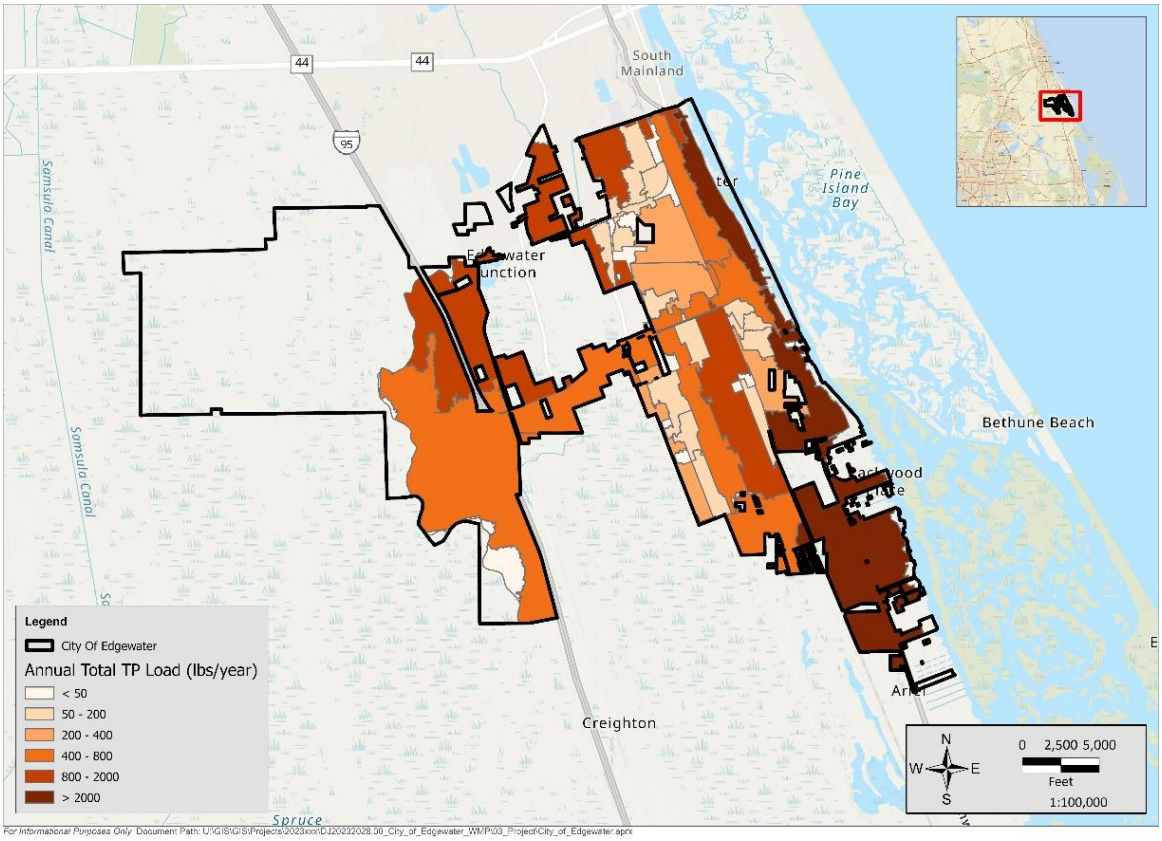


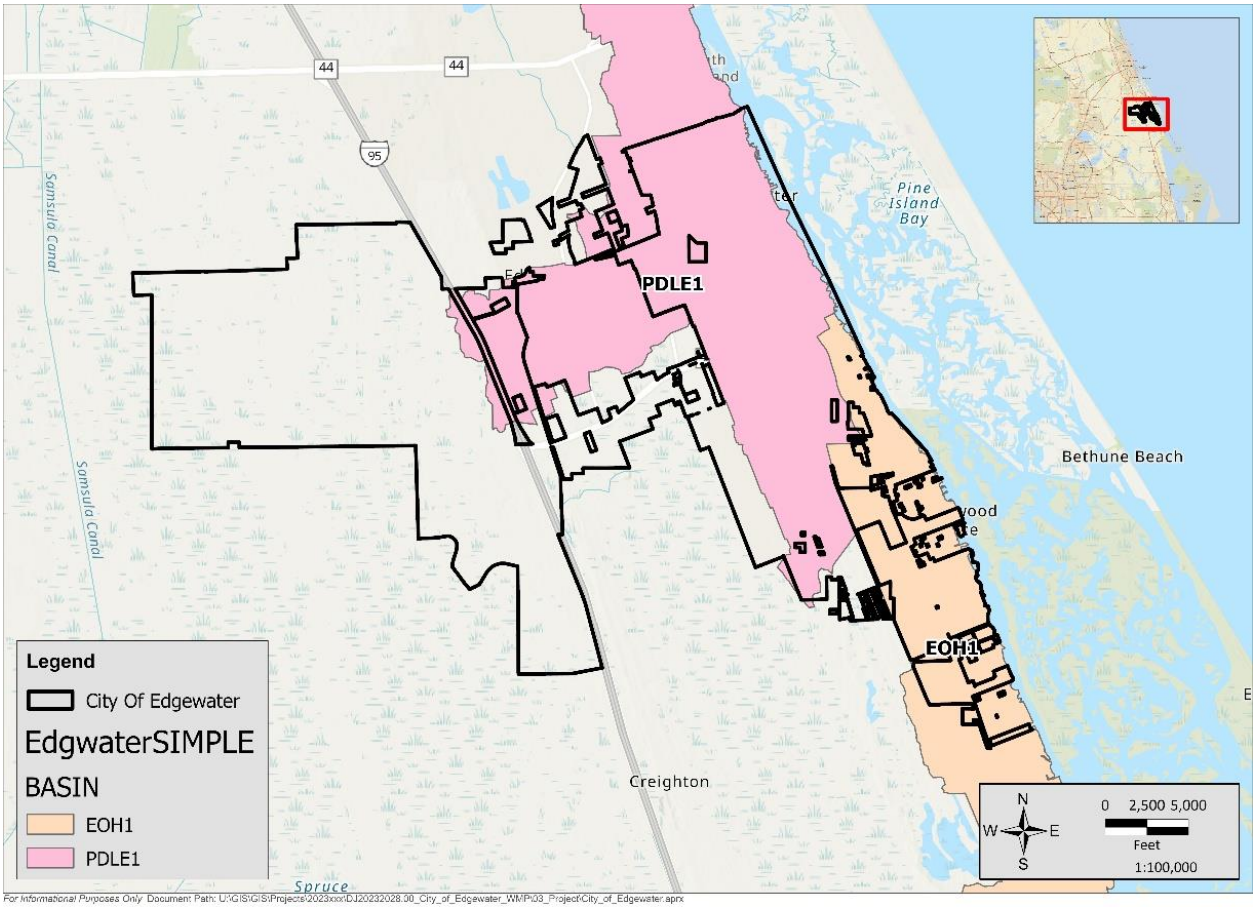
Figure 129 SWIL Annual Total TP Load



7.4.2 SIMPLE

The ML SIMPLE model was created during the development of the MLRAP spanning between 2015 and 2024 and was recently updated through 2024 (Jones Edmunds, 2025). This model includes loadings from DRO, baseflow, septic systems and point sources. Atmospheric deposition directly to the lagoon segments was calculated outside of the SIMPLE routine. Two of the 11 basins included in the model are associated with the City (Figure 130). These include basins PDLE1 and EOH1.

Figure 130 SIMPLE Model Basins in the City



Due to the specific input needed to estimate the pollutant loads, it was difficult to attribute the loads specifically to the City. Presented below in Figure 131 and Figure 132 are the monthly loading values for the two basins that include loadings from the City. Obvious outliers are seen in the two spikes caused by Hurricanes Ian and Milton. Despite increases in rainfall, loads generally decreased in the later years of the time-series. These could be partially attributed to MLRAP project implementation since 2022.

Figure 131 Time-Series Plot of Monthly TN Loading

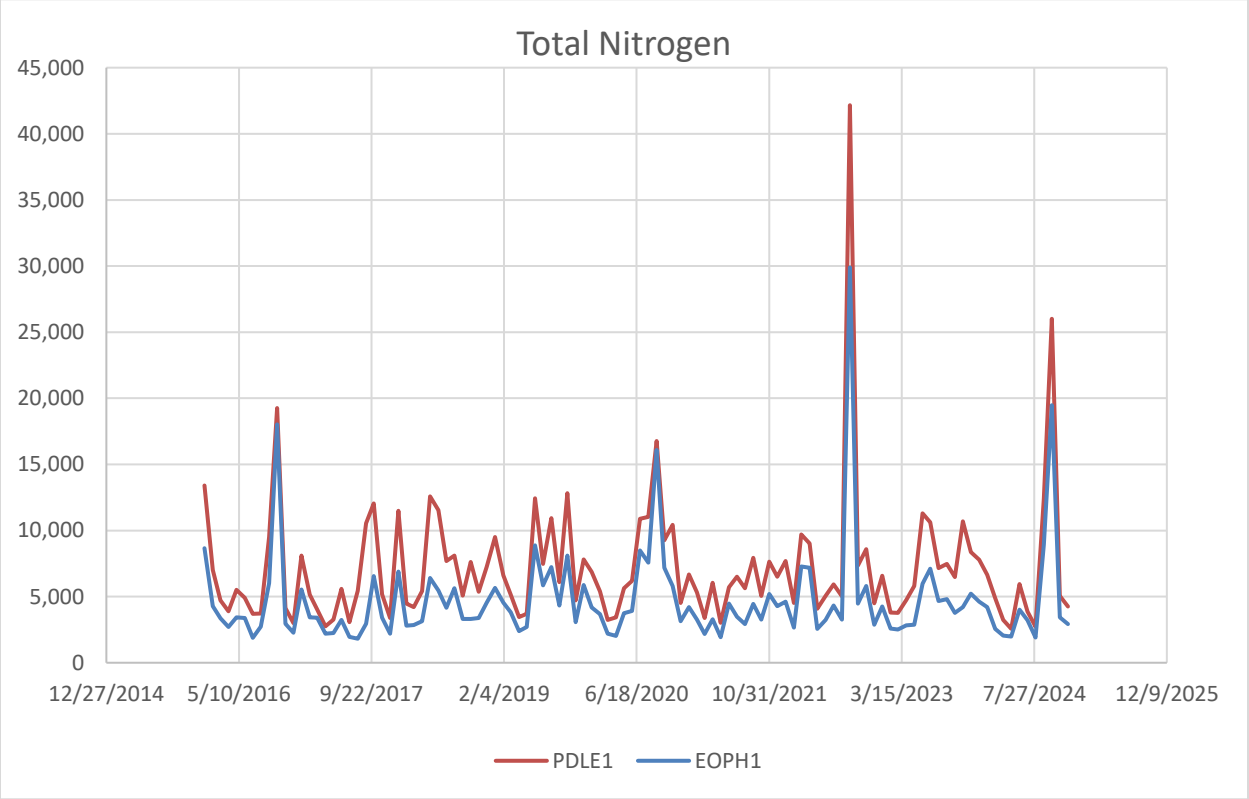
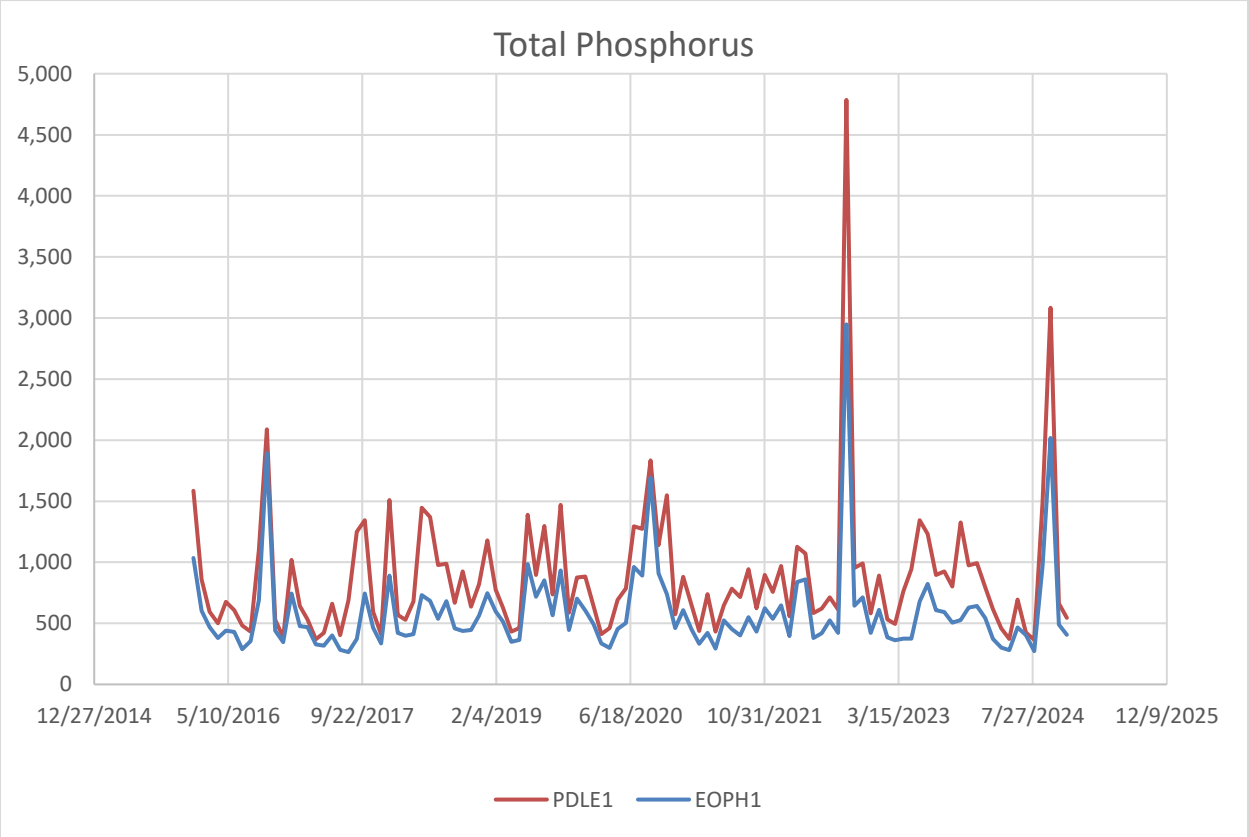


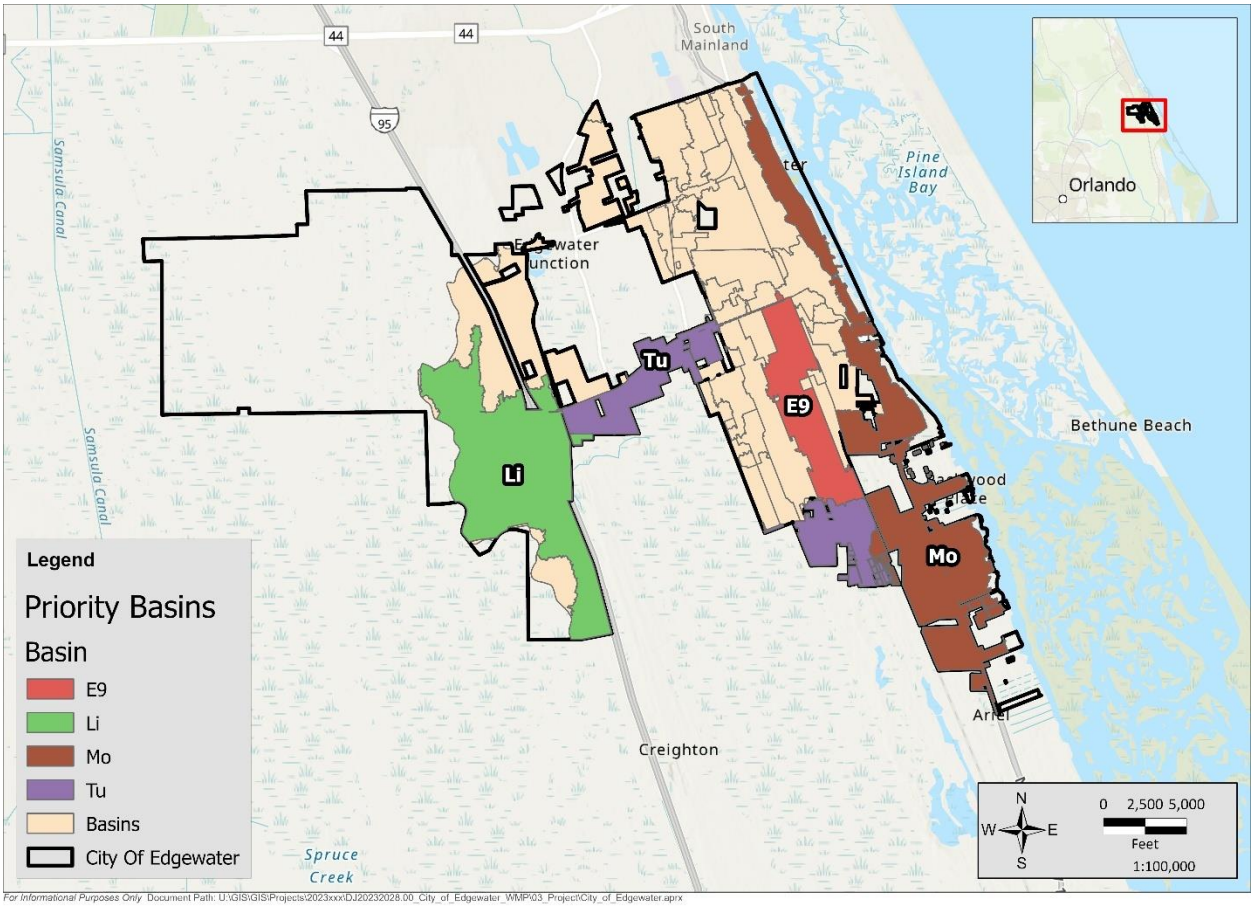
Figure 132 Time-Series Plot of Monthly TP Loading



7.5 Water Quality Priority Areas for Capital Projects

Given the status of the receiving waters and the regulatory commitments of the NIRL BMAP and the MLRAP, priority should be given to those contributing areas for project identification. Since TN and TP loads are generally proportional, higher TN loads are usually accompanied by higher TP loads. Figure 124 through Figure 129 show that the area with the highest normalized runoff and baseflow TN and TP loadings is Basin MO, which drains to ML, as shown in Figure 133. Basin E9, also discharges to ML would also rank higher. Within NIRL basins, Basin LI has the highest contributing area, followed by Basin TU.

Figure 133 Priority Basins for Water Quality Capital Projects



7.6 SWRA Conclusions

- Limited water quality data are collected within the City. The City chose to develop a targeted water quality monitoring program to identify areas in need of retrofits.
- Though no trends in TN concentrations are indicated, the two ML segments are meeting the appropriate nitrogen criteria. This could be due to the implementation of MLRAP projects.
- NO2+NO3 is decreasing in North ML.
- Chlorophyll-a concentrations in North ML are meeting their criteria and have during the last 2 years in the Central ML segment. This coincides with a decreasing trend in

chlorophyll-a concentrations within that segment. Further work is needed in the IRL to bring South ML into compliance due to the connection between the IRL and ML through the Haulover Canal.

- Trends in water quality indicate that TP continues to load the City's receiving waters at rates at or above those before the adoption of the ML RAP. That is evident in the increasing phosphorus trends in all three segments tested.
- Marked improvements have been made to ML since the adoption of the RAP. Annual geometric means of TN and chlorophyll-a have been meeting criteria. TP is still not meeting its criteria.
- ML has seen a recovery in seagrass coverage in the central and south segments since the losses seen in 2021.
- Based the 2025 NIRL BMAP update, the City has been assigned a load reduction of 1,959 lb/year of TN and 297 lb/year of TP. Projects submitted to FDEP to date account for 162 lb/year reduction in TN (8.3 percent) and 22 lb/year reduction in TP (7.4 percent) based on educational efforts. The goal is to achieve the allocated load reductions by 2035.
- Turnbull Creek (Freshwater Segment WBID: 2942B) is impaired for dissolved oxygen but is classified as Category 4d – Study list due to a lack of data for this parameter and since no causative pollutant has been identified.
- Output from the SIMPLE model indicates slight load reductions in recent years, excluding the months with hurricanes. This could be indicative of reductions from ML RAP project implementation.
- Based on the load estimates from SWIL and the regulatory commitments to the ML RAP and the NIRL BMAP, the following basins were identified as candidates for water quality improvement projects: MO, E9, LI, and TU.

8 IMPROVEMENT ALTERNATIVES AND 30-YEAR STORMWATER CAPITAL IMPROVEMENT PLAN

As discussed in Section 6, Jones Edmunds identified numerous problem areas across the City. Mead & Hunt conducted an Alternatives Analysis to identify flood control projects for the City. These proposed improvement alternatives were specifically designed and located to benefit 15 of the most heavily impacted areas.

Mead & Hunt considered flooding severity along with project feasibility when developing alternatives. Up to three alternatives were developed for each problem area, in accordance with the project scope. Scenarios across the City were evaluated to develop the best alternatives, with the most successful chosen and further developed for report inclusion.

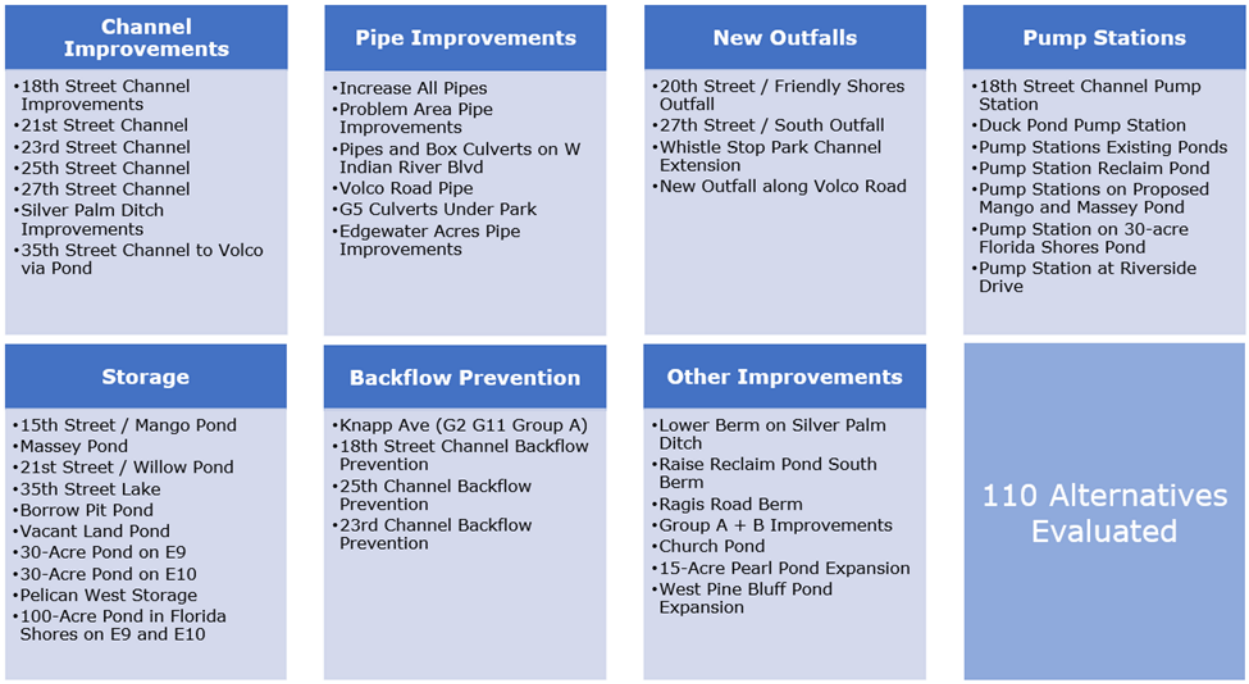
Not every project should be viewed as independent, and the order in which they are constructed is important. Conveyance improvements can allow water to drain more quickly from a basin, potentially creating flooding issues elsewhere, unless adequate storage or a pump station has been constructed to handle additional volume. All storage projects that include the construction of new ponds and pump station projects can be considered independent projects. Conveyance projects that improve culvert or channel flow should be evaluated independently before moving forward as a standalone project.

8.1 ALTERNATIVE EVALUATION

Over 110 alternatives were evaluated during the development of this SWMP. Given the magnitude of the City's challenges, large-scale alternatives were conceptualized where possible to achieve meaningful improvements during the larger design storm events. Although several smaller and more economical projects may not offer significant improvements during large storms, they are beneficial during smaller events.

Figure 134 shows an overview of the analyzed alternatives grouped into seven categories.

Figure 134 Conceptualized Alternatives



8.1.1 Alternative Feasibility

Alternatives presented in this Section were developed through a structured screening process that combined results from hydrologic and hydraulic modelling with professional engineering judgement and practical constraints inherent to the City's layout and topography. The purpose of this process was to identify and develop alternatives that are feasible, constructable, and hydraulically effective.

When evaluating alternatives across a city, a variety of factors must be considered. These include engineering considerations that can be quantified in hydrologic and hydraulic modelling, and they also include equally important factors that are more difficult to analyze numerically. These include project feasibility, citizen feedback, impacts to existing utilities, impacts to existing infrastructure, and spatial limitations within a largely built-out environment.

Rather than relying on a purely numerical scoring system that can overlook the nuances of stakeholder considerations, our screening process applied fundamental drainage engineering principles to determine whether a proposed alternative could reasonably achieve meaningful flood-reduction benefits without creating adverse impacts elsewhere in the system. Alternatives that did not meet this basic feasibility criteria were not carried forward for detailed modeling or inclusion in the CIP.

8.1.1.1 Storage Feasibility

Alternatives based on the storage of stormwater were screened based on their physical proximity and hydraulic connection to the flooding problem areas they were intended to address. In Edgewater's predominantly flat terrain, water tends to accumulate in localized topographic "bowls" and storage must be within or immediately adjacent to these areas to intercept runoff during storm events.

Storage alternatives too far from a problem area or lacking a clear hydraulic pathway to reach the storage during storm events were considered ineffective and removed from further consideration.

8.1.1.2 Conveyance Feasibility

Conveyance-based alternatives, including pipes, culverts, or canals, were evaluated to confirm that sufficient hydraulic head exists to drive flow in the intended direction. If a conveyance project is not paired with appropriate storage or lacks sufficient hydraulic head, it may redistribute flooding or increase downstream stages. Conveyance alternatives were screened for downstream impacts and interactions with the broader drainage system.

Where conveyance improvements were found to be dependent on downstream storage or outfall improvements to function effectively, they were either paired with companion projects or deferred to later implantation phases where companion projects had been previously constructed.

8.1.2 Channel Improvements

Improving or expanding existing stormwater drainage channels presents strategic benefits and notable implementation challenges. Channel improvements can reduce localized flooding, improve public safety, and support long-term drainage performance.

- Benefits
    - Improved Conveyance: New or widened channels can accommodate higher flow volumes.
    - Maintenance: Improved channel geometry and access can facilitate routine maintenance, sediment removal, and vegetation management.
    - Public Safety: Regrading channels for more stable side slopes reduces risks of erosion and bank failure.
- Challenges
    - Limited Right-of-Way (ROW): Many existing channels are constrained by adjacent development, making widening or re-grading difficult without property acquisition or easements.
    - Utility Conflicts: Buried and overhead utilities parallel or cross existing channels, requiring costly relocations or design workarounds.
    - Downstream Constraints: Increased conveyance can exacerbate downstream flooding if not paired with an appropriate companion project that creates additional storage. Simply put, improperly implemented conveyance improvements can transfer flooding downstream rather than eliminate it. In many cases, downstream culverts, outfalls, or receiving waters cannot be expanded, limiting the effectiveness of upstream improvements and requiring careful hydraulic consideration.
    - Construction Limitations: High groundwater tables, soft soils, and limited access in developed areas complicate construction staging.

8.1.3 Pipe Improvements

Upgrading or expanding existing stormwater pipe systems is a critical strategy for mitigating flooding, particularly where urbanization has outpaced legacy infrastructure. These

improvements can provide system-wide benefits but also present significant logistical and engineering challenges.

- Benefits
    - Improved Conveyance: New or expanded pipes can accommodate higher flow volumes.
    - Legacy Constraints: Many older systems were designed with undersized culverts or non-standard materials. Modernizing these configurations improves hydraulic performance and long-term reliability.
    - Drainage Planning: Replacing or realigning pipe networks provides opportunities to construct drainage systems in areas without cohesive stormwater infrastructure, such as older neighborhoods.
    - Improved Connectivity and Redundancy: Strategic pipe improvements can enhance system interconnectivity, allowing for better flow routing.
- Challenges
    - Conflicts with Existing Infrastructure: Replacing pipes beneath major roadways often requires extensive coordination that significantly increases cost and complexity.
    - Downstream Constraints: As with channel improvements, upsizing upstream pipes may overwhelm downstream components. Upsizing pipes may not resolve flooding issues if downstream outfalls remain undersized and capacity-limited.
    - Construction Limitations: Existing utilities, shallow cover, and flat topography can restrict the available space for deeper or larger pipes, requiring alternative design solutions.

8.1.4 New Outfalls

As discussed previously, runoff from most developments around the City are channeled through two main outfalls to the river or west toward Turnbull Hammock. The goal of a new outfall is to create an alternative way for water to travel toward either ultimate outfall via gravity and allow the few existing and surcharged outfalls to function more effectively.

- Benefits
    - Improve Drainage Efficiency: A new outfall would provide an additional direct discharge path for stormwater and reduce the dependency on limited existing infrastructure.
    - Improved Connectivity and Redundancy: An interconnected drainage system can offer more control of runoff routing and provide necessary redundancy if downstream infrastructure fails or becomes unusable.
    - Long-Term Effectiveness: Once established, a gravity outfall is a passive system that typically requires lower life cycle costs than active systems.
- Challenges
    - Complexity: The permitting and construction phases involve considerable complexity, often resulting in extended and unpredictable permitting timelines.

- Tidal Constraints: As some of the City's flooding issues can be attributed to high tide events with significant backflow along the outfalls, considering tide gates/backflow prevention devices as part of a new outfall alternative is necessary.
- Topography: The topography around Florida Shores includes a high ridge along the east side that would be difficult to overcome to reach the ultimate outfall at the river.
- Construction Limitations: Land acquisition requirements, restricted ROWs, and utility conflicts add to project complexity.

8.1.5 Pump Stations

The City's stormwater system does not have any permanent pump stations. Constructing stormwater pump stations offers benefits where gravity systems alone are insufficient to manage runoff, especially during high tide or extreme rainfall events.

- Benefits
  - Active Drainage: Pump stations allow the movement of water from areas where gravity flow is limited by flat topography or tidal backflow.
  - Tidal Resilience: Pump station improvements are commonly paired with tide gates/backflow prevention devices so that the pumps can maintain system discharge capacity when outfalls are tide locked.
  - Storage Augmentation: In heavily urbanized areas where creating or expanding storage ponds is not practical, being able to draw down an existing pond can create temporary additional storage that may help attenuate some flows in the early parts of a storm event.
  - Integration: Modern pump stations designed with variable-speed drives, telemetry, and remote monitoring allow for adaptive operation based on rainfall intensity, tide levels, or emergency conditions.
- Challenges
  - Complexity: The complex system of pump station equipment, intake structures, FMs, and outfall structures requires continuous power and maintenance. With pump stations, the introduction of mechanical dependence means that flood risk becomes tied to system reliability. Designs should carefully analyze resiliency, constructability, operability, and redundancy.
  - Outfall: The location and structure of the outfall structure can pose challenging design and permitting constraints related to environmental and noise concerns.
  - High Capital and Lifecycle Costs: Significant up-front investment and long-term costs for operations, maintenance, and equipment replacement are necessary.

8.1.6 Storage

As mentioned, the lack of central storage throughout many existing residential areas around the City is one of the primary drivers for flooding. Creating new stormwater ponds or expanding and improving the connectivity of existing ponds is particularly difficult in built-up neighborhoods.

- Benefits
  - Significant Flood Risk Reduction: Storage ponds hold water that would otherwise be stored and retained within the residential drainage basins. Coupled with stormwater

pump stations to augment the amount of storage and drainage improvements to convey runoff to the pond, a stormwater pond can accommodate a fixed volume of runoff that might otherwise be stored throughout a developed area.
    - Long-Term Effectiveness: Once established, a stormwater pond becomes a passive system component that requires fewer life cycle costs than other active systems.
    - Water Quality: Wet detention ponds are highly effective in removing nutrients from stormwater via sedimentation of particles and pollutant uptake via vegetation.
    - Opportunity for Community Area: When designed appropriately, a stormwater pond can become a permanent water feature offering opportunities for recreation or education.

- Challenges:

    - Location: For storage to effectively solve flooding, it must be in the lower elevations of a basin or where flows can be redirected from a problem area to the new storage. Most of the City's flooding happens where homes were built in lower elevations, with little to no land readily available to create new storage ponds where they are most needed.
    - Property Acquisition: Voluntary property acquisition programs aimed at assembling clusters of properties that may be converted into storage ponds in the future must be implemented.
    - Conflicts with Existing Infrastructure: Projects involving large excavations as is required to create new storage would involve extensive coordination to relocate the existing utilities.

8.1.7 Backflow Prevention

Also known as tide gates or flood gates, backflow prevention stops water from traveling backward along a conduit. Tidal backflow prevention systems are effective in mitigating tidal backups within drainage infrastructure; however, they may also limit the system's drainage capacity during rainfall events. Although these systems perform well in preventing flooding caused by non-rainfall tidal occurrences, such as king tides, the use of tide gates can impede the system's ability to discharge water efficiently when rain coincides with high tides. Consequently, backflow prevention devices must be paired with additional capacity enhancements, such as pump stations or storage ponds, to ensure optimal drainage performance under varying conditions.

- Benefits

    - Prevention of Tidal Backflow: This is the primary reason for including backflow prevention strategies as a project alternative.
    - Adaptability: Several methods prevent tidal flows from backing up. More passive system examples include duckbill valves and tide gates, where active systems include movable weirs or sluice gates that can be synced with the operation of stormwater pump stations.

- Challenges

    - Hydraulic Restriction: Some devices can impede outflow, even during low tide, reducing system efficiency. Restricting tidal exchange can have ecological impacts that may trigger regulatory concerns.

- Maintenance: Debris, sediment, or vegetation can damage gates or foul, so continuous inspection and maintenance are essential.
- Construction Limitations: The options available for backflow prevention devices are more limited due to the large size of the stormwater outfall channels.

8.1.8 Other Improvements

Several proposed alternatives were considered that did not belong to any of the categories outlined above. Many of the improvements listed are of a limited scale and would not yield measurable results if included in the stormwater model.

- Green Infrastructure/Low Impact Development (LID)
- Large-scale improvements to Help Improve System Performance
- Stormwater Reuse and Harvesting
- Floodplain Restoration
- Property-Level Adaptation
- Land Use and Zoning Strategies
- Nature-Based Solutions

8.2 Proposed Alternatives

Figure 135 shows the process for developing and evaluating alternatives.

Figure 135 Alternative Development Process



Preliminary design is the initial stage of alternative development. During this phase, projects are incorporated into the model at a simpler scale to determine a concept's overall effectiveness. A new pipe, pump, or outfall might be evaluated, but specifics involving the project site or route are not yet included. For this SWMP, these "big picture" models incorporated ideas from City officials, citizen comments, and staff from Jones Edmunds and Mead & Hunt. Some of these alternatives were more successful than others. Section 8.3 discusses the less successful alternatives that nonetheless provided valuable insight.

Conceptual design is when the most successful preliminary alternatives are further explored. During this stage, different variations of each alternative are tested and connections to adjacent canals, ponds, or outfalls may be added. Pipe and pump sizing may be varied and tested. Ultimately, the goal is to refine and improve upon the alternative.

Detailed analysis is the third stage when detailed individual models are prepared for each of the most successful and impactful individual alternatives. Project specifics are fine tuned to the greatest extent possible.

Final phasing is the last stage during which projects are grouped into Phase 1, 2, 3, or 4. Section 8.4 provides more details on project phasing.

The subsequent sections summarize each proposed improvement alternative and provide a figure displaying a project schematic and tabular results showing how each improvement

alternative impacts key problem areas. Several alternatives provided benefits to numerous problem areas during modeling. Accordingly, the projects are grouped according to project area, and the tabular results from several problem areas illustrate how projects may have widespread benefits.

8.2.1 Florida Shores South of Indian River Boulevard (1000, 1006, 1009)

This area includes neighborhoods in Florida Shores that drain into three main canals: E9, E10, and E13. Together, these canals handle runoff from about 1,300 acres of mostly residential land with only 36 acres dedicated to stormwater storage within five existing ponds and some dispersed dry retention areas.

8.2.1.1 Pump Stations on Existing Ponds

This scenario involves installing three 50-cfs pump stations on existing ponds within the Florida Shores neighborhood and using a shared FM to discharge to the Indian River North. The first pump station is proposed at the existing pond between Mango Tree Drive and Lime Tree Drive, north of 22nd Street. This pump station will use a 36-inch FM, manifolding with the FM at the second pump station.

The second 50-cfs pump station is proposed at the pond between Lime Tree Drive and Kumquat Drive, north of 23rd Street. This pump station will use a 36-inch FM, manifolding with the FM at the third pump station.

The third 50-cfs pump station is proposed at the pond between Queen Palm Drive and Pine Tree Drive, north of 22nd Street. At the third pump, the FM will upsize to 54 inches, sending stormwater south of Friendly Shores with an outfall into the Indian River North.

Table 41 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. This project is proposed for construction during Phase 1.

Table 41 Inundation Reduction Results – Pump Stations on Existing Ponds

	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	43	94	370	324	46
G2 and G11	33	33	0	105	105	0
Florida Shores – North of 442	7	7	0	56	40	16
Edgewater Acres – WWTP	12	12	0	37	36	1
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	20	1
Total	**189**	**95**	**94**	**595**	**531**	**64**

Table 42 shows the Engineer's Opinion of Probable Construction Costs (EOPCC) for this scenario. Figure 136 shows the proposed project layout. The FM layout shown in the figure generally follows the existing ROW, but further refinement of the FM route will be required during project design.

Table 42 EOPCC Summary – Pump Stations on Existing Ponds

Pump Station and FM					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	36-inch FM	2,000	2,900	LF	5,800,000
2	54-inch FM	3,500	5,800	LF	20,300,000
3	Pump Station < 50 cfs	3,000,000	3	EA	9,000,000
				Construction Costs Subtotal	35,100,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
4	Mobilization and General Conditions	10	35,100,000	LS	3,510,000
5	Erosion and Sediment Control	5	35,100,000	LS	1,755,000
6	Restoration	6	35,100,000	LS	2,106,000
7	Dewatering	3	35,100,000	LS	1,053,000
8	Maintenance of Traffic	3	35,100,000	LS	1,053,000
9	Engineering Design and CA Oversight Costs	15	35,100,000	LS	5,265,000
10	Construction Engineering Inspection Costs	4	35,100,000	LS	1,404,000
11	Project Contingency Costs	30	35,100,000	LS	10,530,000
				General Conditions Subtotal	26,676,000
				Total	**61,776,000**

Figure 136 Pump Stations on Existing Pond



8.2.1.2 Volco Road Improvements

Volco Road passes through an area characterized by natural ridges running north and south with long wetlands in the depressions between. A relatively complex interaction of overland flow connections is between these wetlands, with the east wetlands flowing to the north and the west wetlands flowing to the south. Water collects in the area south of 35th Street and east of Travelers Palm Drive, stagnating there for extended periods without an outfall to the south.

In this proposed scenario, approximately 115 LF of dual 36-inch reinforced concrete pipe (RCP) is installed under Volco Road, restoring historical drainage patterns and allowing this area to drain between storm events. Although this project provides limited benefits to overall flooding in Florida Shores South when considered in isolation, it is included in Phase 1 due to ongoing concerns from City staff and residents regarding water accumulation in this area. Documentation indicates that during significant storm events, water flows from this location into the south part of Florida Shores. Facilitating proper drainage in this area helps reduce this risk.

Table 43 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. This project is proposed for construction during Phase 1.

Table 43 Inundation Reduction Results – Volco Road Improvements

	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	135	2	370	370	0
G2 and G11	33	33	0	105	105	0
Florida Shores – North of 442	7	7	0	56	56	0
Edgewater Acres – WWTP	12	12	0	37	37	0
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	21	0
Total	**189**	**187**	**2**	**595**	**595**	**0**

Table 44 EOPCC Summary – Volco Road Improvement

Storm Pipe					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	36-inch RCP	300	230	LF	69,000
2	End Treatment for dual 36-inch RCP	10,000	2	EA	20,000
				Construction Costs Subtotal	89,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
3	Mobilization and General Conditions	10	89,000	LS	9,000
4	Erosion and Sediment Control	5	89,000	LS	4,000
5	Restoration	4	89,000	LS	4,000
6	Dewatering	4	89,000	LS	4,000
7	Maintenance of Traffic	4	89,000	LS	4,000
8	Project Contingency Costs	30	89,000	LS	27,000
				General Conditions Subtotal	52,000
				Total	**141,000**

Table 44 shows the EOPCC for this scenario. Figure 137 shows the proposed project layout.

Figure 137 Volco Road Improvements



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8.2.1.3 30-Acre Pond (E9)

Additional storage is the most effective and reliable attenuation method, but proximity to the affected area is key. If the proposed storage is adjacent to the impacted area, runoff can be efficiently directed into the storage. This is especially true in a large and flat neighborhood like Florida Shores, which is surrounded by topographic ridges, creating a "bowl" where water collects and causes flooding. The relatively flat topography within the "bowl" means that flooding across the neighborhood often happens simultaneously. In this scenario, limited time likely prevents directing water to off-site storage.

Consequently, this project proposes the voluntary acquisition of approximately 90 parcels in east-central Florida Shores, an area particularly impacted by recent flooding. We propose that up to 30 acres of pond storage will be excavated on these parcels. The exact shape and configuration of the proposed pond can vary; however, it is most effective in the approximate area between West Indian River Boulevard to the north, 25th Street to the south, Juniper Drive to the east, and Royal Palm Drive to the west.

This pond is intended to integrate with the existing ponds and pump stations created during the Phase 1 project: Pump Stations on Existing Ponds. This will allow the pond to be drawn down in preparation for large events, allowing for even greater storage when needed.

Table 45 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. This project is proposed for construction during Phase 2.

Table 45 Inundation Reduction Results 30-Acre Pond (E9)

	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	18	119	30	221	149
G2 and G11	33	33	0	105	105	0
Florida Shores – North of 442	7	4	3	56	34	22
Edgewater Acres – WWTP	12	12	0	37	35	2
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	19	2
Total	**189**	**67**	**122**	**595**	**420**	**175**

Table 46 shows the EOPCC for this scenario. Figure 138 shows the proposed project layout.

Table 46 EOPCC Summary – 30-Acre Pond (E9)

Pond Excavation					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	Demolition	2,500,000	1	LS	2,500,000
2	Utility Relocation	3,000,000	1	LS	3,000,000
3	Pond Excavation	15	467000	CY	7,005,000
			Construction Costs Subtotal		12,505,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
4	Mobilization and General Conditions	10	12,505,000	LS	1,251,000
5	Erosion and Sediment Control	5	12,505,000	LS	625,000
6	Restoration	6	12,505,000	LS	750,000
7	Dewatering	10	12,505,000	LS	1,251,000
8	Maintenance of Traffic	3	12,505,000	LS	375,000
9	Engineering Design and CA Oversight Costs	15	12,505,000	LS	1,876,000
10	Construction Engineering Inspection Costs	4	12,505,000	LS	500,000
11	Project Contingency Costs	30	12,505,000	LS	3,752,000
			General Conditions Subtotal		10,380,000
				Total	**22,885,000**

Figure 138 30-Acre Pond (E9)



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8.2.1.4 21st Street Pond to E9 Canal

This scenario involves constructing an 11-acre pond on the vacant lot at the west end of 21st Street easement, establishing a connection to the E9 Canal through the voluntary acquisition of a property on the west side of Willow Oak Drive, and expanding and extending the existing E14 Canal to reach from Willow Oak Drive to the pond between Mango Tree Drive and Lime Tree Drive. Proposed 8-feet-by-4-feet box culverts will be installed under roadway crossings. These improvements will provide additional stormwater storage and facilitate stormwater conveyance out of Florida Shores.

Table 47 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. This project is proposed for construction during Phase 2.

Table 47 Inundation Reduction Results – 21st Street Pond to E9 Canal

	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	108	29	370	352	18
G2 and G11	33	33	0	105	105	0
Florida Shores – North of 442	7	7	0	56	54	2
Edgewater Acres – WWTP	12	12	0	37	36	1
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	21	0
Total	**189**	**160**	**29**	**595**	**574**	**21**

Table 48 shows the EOPCC for this scenario. Figure 139 shows the proposed project layout.

Table 48 EOPCC Summary – 21st Street Pond to E9 Canal

Pond Excavation					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	Pond Excavation	15	167,000	CY	2,505,000
Canals					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
2	Canal Excavation	34	6,200	CY	211,000
3	8-foot-by-4-foot Box Culvert	2,500	390	LF	975,000
4	End Treatment for 8-foot-by-4-foot Box Culvert	50,000	22	EA	1,100,000
5	Driveway Removal and Reconstruction	15	8,000	SF	120,000
			Construction Costs Subtotal		4,911,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
6	Mobilization and General Conditions	10	4,911,000	LS	491,000
7	Erosion and Sediment Control	5	4,911,000	LS	246,000
8	Restoration	6	4,911,000	LS	295,000
9	Dewatering	7	4,911,000	LS	344,000
10	Maintenance of Traffic	3	4,911,000	LS	147,000
11	Engineering Design and CA Oversight Costs	15	4,911,000	LS	737,000
12	Construction Engineering Inspection Costs	4	4,911,000	LS	196,000
13	Project Contingency Costs	30	4,911,000	LS	1,473,000
			General Conditions Subtotal		3,929,000
				Total	**8,840,000**

Figure 139 21st Street Pond to E9



8.2.1.5 Box Culvert – Indian River Boulevard

This scenario upsizes three culverts beneath West Indian River Boulevard. We propose replacing the existing culverts with 8-feet-by-5-feet box culverts to facilitate flow through the E9, E10, and E13 Canals away from the Florida Shores neighborhood. This project must be implemented after the construction of drainage improvements in Florida Shores north of the SR-442 area, as increasing conveyance without additional storage can potentially create negative downstream impacts, effectively moving problems from one area to another.

Table 49 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. The results show the possible negative impacts of this scenario as a standalone project. Although a net positive number of properties may be removed from the floodplain, many homes could be newly affected. This project is proposed for construction during Phase 3.

Table 49 Inundation Reduction Results – Box Culvert – Indian River Boulevard

	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	73	64	370	320	50
G2 and G11	33	33	0	105	105	0
Florida Shores – North of 442	7	15	-8	56	87	-31
Edgewater Acres – WWTP	12	18	-6	37	43	-6
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	21	0
Total	**189**	**139**	**50**	**595**	**582**	**13**

Table 50 shows the EOPCC for this scenario. Figure 140 shows the proposed project layout.

Table 50 EOPCC Summary – Box Culvert Upsizing – Indian River Boulevard

Storm Structure						
Item #	Length	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	420	8-foot-x-5-foot Box Culvert	2,500	420	LF	1,050,000
2	6	End Treatment for 8-foot-x-5-foot Box Culvert	50,000	6	EA	300,000
					Construction Costs Subtotal	1,350,000
General Conditions						
Item #		Description	Unit Cost (%)	Quantity	Unit	Cost ($)
3		Mobilization and General Conditions	10	1,350,000	LS	135,000
4		Erosion and Sediment Control	5	1,350,000	LS	68,000
5		Restoration	6	1,350,000	LS	81,000
6		Dewatering	3	1,350,000	LS	41,000
7		Maintenance of Traffic	3	1,350,000	LS	41,000
8		Engineering Design and Construction Administration Oversight	15	1,350,000	LS	203,000
9		Construction Engineering Inspection Costs	4	1,350,000	LS	54,000
10		Project Contingency Costs	30	1,350,000	LS	405,000
					General Conditions Subtotal	1,028,000
					TOTAL	**2,378,000**

Figure 140 Box Culvert – Indian River Boulevard



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8.2.1.6 Friendly Shores Outfall to E9 Canal

This scenario builds on the Pelican West Storage and Friendly Shores Outfall projects as described in Section 8.2.6.1. After excavating additional storage and establishing a new outfall, this project proposes a connection west to the E9 Canal. We propose installing 8-foot-by-5-foot box culverts or an equivalent number of round culverts below roadway crossings and installing a culvert below the FEC-owned railway.

The benefit of establishing an additional connection into central Florida Shores is two-fold; primarily, it helps central Florida Shores drain more directly and efficiently into the IRL. Secondly, by diverting a portion of water to an alternative pathway, the remaining areas draining to existing canals and outfalls can drain more efficiently, as this infrastructure will be less stressed and overloaded.

This project is proposed for construction during Phase 3.

Table 51 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events.

Table 51 Inundation Reduction Results – Friendly Shores Outfall to E9 Canal

	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	33	104	370	275	95
G2 and G11	33	33	0	105	105	0
Florida Shores – North of 442	7	7	0	56	34	22
Edgewater Acres – WWTP	12	12	0	37	35	2
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	0	21
Total	**189**	**85**	**104**	**595**	**455**	**140**

Table 52 shows the EOPCC for this scenario. Figure 141 shows the proposed project layout.

Table 52 EOPCC Summary – Friendly Shores Outfall to E9 Canal

Canal					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	Channel Excavation	34	2,400	CY	82,000
Storm Pipe					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
2	8-feet-by-4-feet Box Culvert	3,000	140	LF	420,000
3	60-inch RCP–Jack and Bore	5,500	300	LF	1,650,000
4	End Treatment for 8-feet-by-4-feet Box Culvert	50,000	8	EA	400,000
5	End Treatment for 60-inch RCP	65,000	2	EA	130,000
				Construction Costs Subtotal	2,682,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
6	Mobilization and General Conditions	10	2,682,000	LS	268,000
7	Erosion and Sediment Control	5	2,682,000	LS	134,000
8	Restoration	6	2,682,000	LS	161,000
9	Dewatering	7	2,682,000	LS	188,000
10	Maintenance of Traffic	3	2,682,000	LS	80,000
11	Engineering Design and CA Oversight Costs	15	2,682,000	LS	402,000
12	Construction Engineering Inspection Costs	4	2,682,000	LS	107,000
13	Project Contingency Costs	30	2,682,000	LS	805,000
				General Conditions Subtotal	2,145,000
				Total	**4,827,000**

Figure 141 Friendly Shores Outfall to E9 Canal



8.2.1.7 Florida Shores 100-Acre Pond to E9 and E10 Canals

The most effective and reliable attenuation method is creating additional storage. When creating additional storage to alleviate flooding, proximity to the affected area is key. If the proposed storage is adjacent to the impacted area, runoff can be efficiently directed into the storage. This is especially true in a large and flat neighborhood like Florida Shores, which is surrounded by topographic ridges, creating a "bowl" where water collects, causing flooding. The relatively flat topography within the "bowl" means that flooding across the neighborhood often happens simultaneously. In this scenario, limited time likely prevents directing water to off-site storage.

This scenario builds on the 30-Acre Pond project in Phase 2 and proposes the voluntary acquisition of approximately 190 additional parcels for a total of approximately 280 acquired parcels of which a 100-acre pond will be excavated. The exact shape and configuration of the proposed pond can vary; however, it is most effective in the approximate area between West Indian River Boulevard to the north, 30th Street to the south, Juniper Drive to the east, and Royal Palm Drive to the west.

This large pond is intended to provide relief during relatively extreme future events that are expected to bring large storms and higher tailwater elevations in the IRL. This pond is intended to be integrated with the existing ponds and pump stations created during the Phase 1 Project: Pump Stations on Existing Ponds. This will allow the pond to be drawn down in advance of large events and will allow for an outfall into the IRL, even when prohibitively high tailwater conditions prevent drainage via the canals.

Table 53 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. This project is proposed for construction during Phase 4.

Table 53 Inundation Reduction Results – Florida Shores 100-Acre Pond to E9 and E10 Canals

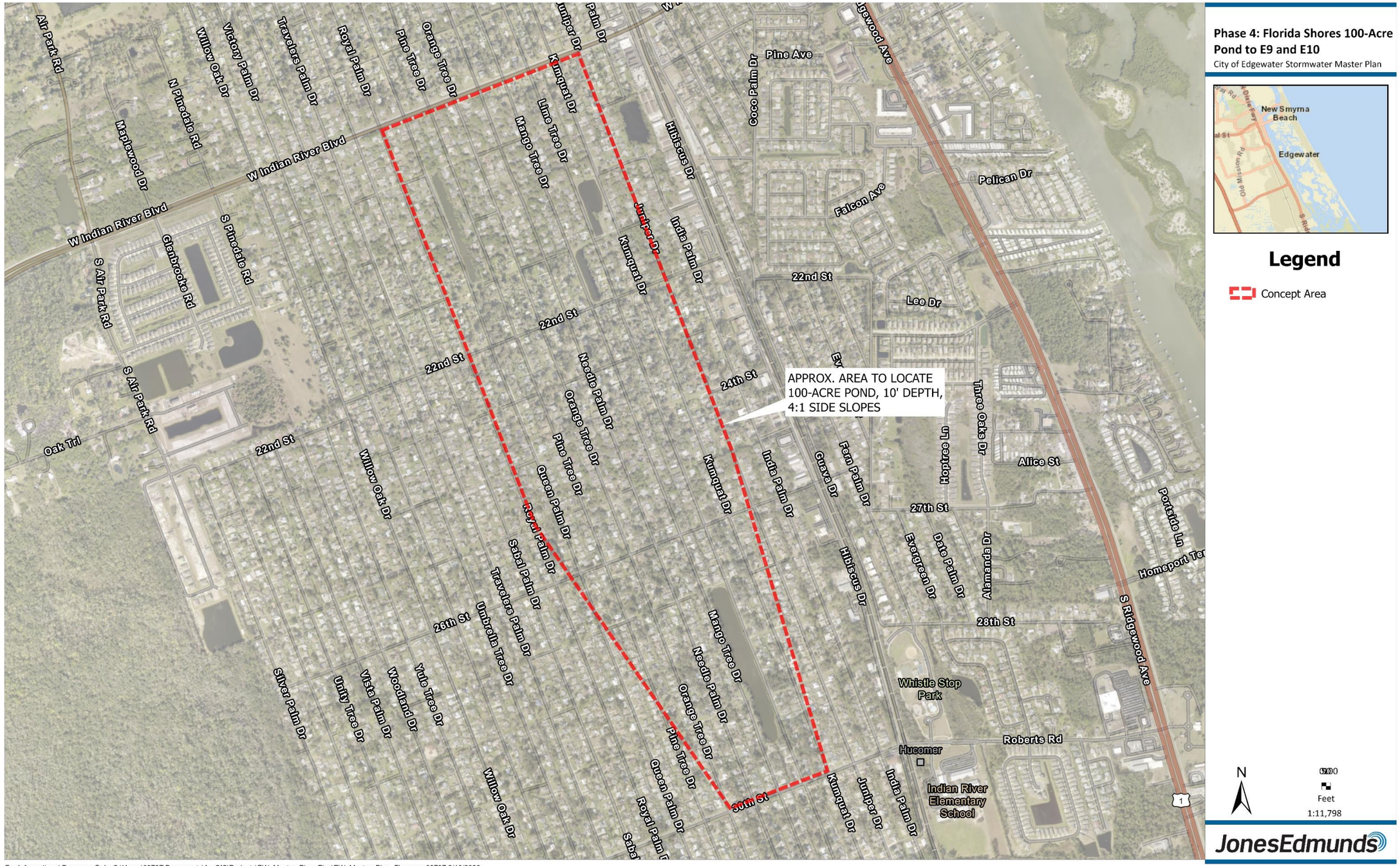
	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	7	130	370	24	346
G2 and G11	33	33	0	105	105	0
Florida Shores – North of 442	7	4	3	56	19	37
Edgewater Acres – WWTP	12	12	0	37	28	9
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	19	2
Total	**189**	**56**	**133**	**595**	**201**	**394**

Table 54 shows the EOPCC for this scenario. Figure 142 shows the proposed project layout.

Table 54 EOPCC Summary – Florida Shores 100-Acre Pond to E9 and E10 Canals

Ponds					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	Demolition	6,000,000	1	LS	6,000,000
2	Utility Relocation	5,000,000	1	LS	5,000,000
3	Pond Excavation	15	1,120,000	CY	16,800,000
			Construction Costs Subtotal		27,800,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
4	Mobilization and General Conditions	10	27,800,000	LS	2,780,000
5	Erosion and Sediment Control	5	27,800,000	LS	1,390,000
6	Restoration	10	27,800,000	LS	2,780,000
7	Dewatering	10	27,800,000	LS	2,780,000
8	Maintenance of Traffic	3	27,800,000	LS	834,000
9	Engineering Design and CA Oversight Costs	15	27,800,000	LS	4,170,000
10	Construction Engineering Inspection Costs	4	27,800,000	LS	1,112,000
11	Project Contingency Costs	30	27,800,000	LS	8,340,000
			General Conditions Subtotal		24,186,000
				Total	**51,986,000**

Figure 142 Florida Shores 100-Acre Pond to E9 and E10 Canals



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8.2.2 Florida Shores North of Indian River Boulevard (1003, 1010, 1013)

This area includes neighborhoods in Florida Shores north of State Road 442 that drain into the E1 Canal through the E11 and E12 Canals. Together, these canals handle runoff from about 420 acres of mostly residential land with only 7 acres dedicated to stormwater storage with a single pond and some dispersed dry retention areas.

8.2.2.1 Duck Pond Pump Station

This scenario involves installing one 50-cfs pump station on an existing pond in the north Florida Shores neighborhood. The pond is northeast of the intersection of Needle Tree Palm Drive and 17th Street. From here, the pump station would send stormwater from the pond to an outfall at the east end of Virginia Street to the Indian River North through a 36-inch FM. This scenario also includes collection system pipe and inlet improvements north of the Duck Lake pond to more efficiently convey runoff to the pond.

Table 55 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. This project is proposed for construction during Phase 1.

Table 55 Inundation Reduction Results – Duck Pond Pump Station

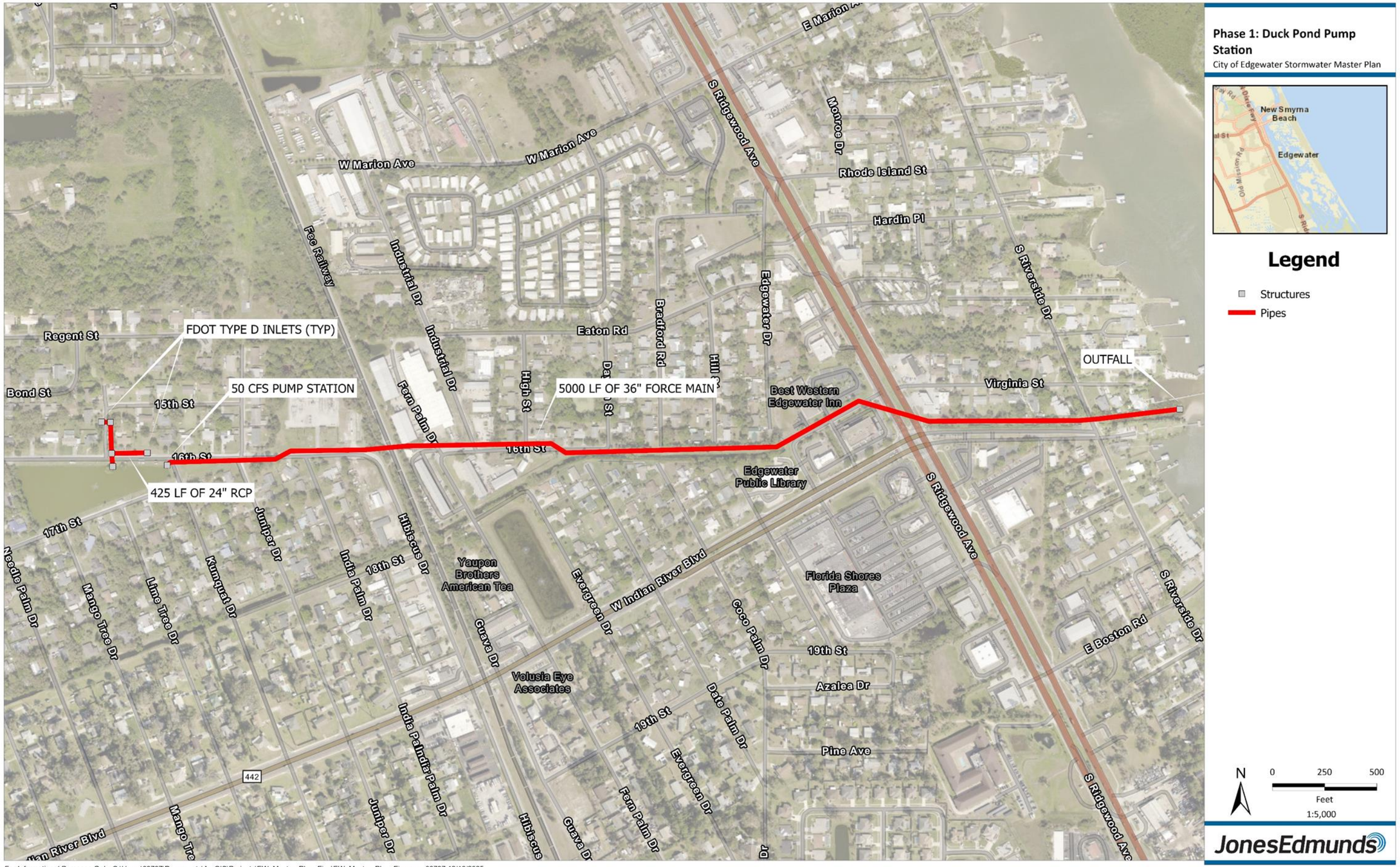
	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	132	5	370	370	0
G2 and G11	33	33	0	105	105	0
Florida Shores – North of 442	7	6	1	56	50	6
Edgewater Acres – WWTP	12	12	0	37	36	1
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	21	0
Total	**189**	**183**	**6**	**595**	**588**	**7**

Table 56 shows the EOPCC for this scenario. Figure 143 shows the proposed project layout.

Table 56 EOPCC Summary – Duck Pond Pump Station

Storm Pipe					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	24-inch RCP	300	430	LF	129,000
2	FDOT Type E-Inlets	8,000	5	EA	40,000
Pump Station and FM					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
3	36-inch FM	2,000	5000	LF	10,000,000
4	Pump Station < 50 cfs	3,000,000	1	EA	3,000,000
			Construction Costs Subtotal		13,169,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
5	Mobilization and General Conditions	10	13,169,000	LS	1,317,000
6	Erosion and Sediment Control	5	13,169,000	LS	658,000
7	Restoration	6	13,169,000	LS	790,000
8	Dewatering	3	13,169,000	LS	395,000
9	Maintenance of Traffic	3	13,169,000	LS	395,000
10	Engineering Design and CA Oversight Costs	15	13,169,000	LS	1,975,000
11	Construction Engineering Inspection Costs	4	13,169,000	LS	527,000
12	Project Contingency Costs	30	13,169,000	LS	3,951,000
			General Conditions Subtotal		10,008,000
				Total	**23,177,000**

Figure 143 Duck Pond Pump Station



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8.2.2.2 18th Street Canal Improvements

This scenario expands the 18th Street Canal to a bottom width of 30 feet from Travelers Palm Drive to the canal outfall at East Indian River Boulevard and installs dual 10-foot-by-5-foot box culverts at each road crossing. The length of the expanded canal will be stabilized to prevent future erosion, and the dual box culverts where the canal outfalls at the Indian River North will include backflow prevention devices/tide gates.

Table 57shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. This project is proposed for construction during Phase 1.

Table 57 Inundation Reduction Results – 18th Street Canal Improvements

	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	127	10	370	365	5
G2 and G11	33	33	0	105	105	0
Florida Shores – North of 442	7	6	1	56	40	16
Edgewater Acres – WWTP	12	12	0	37	36	1
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	21	0
Total	**189**	**178**	**11**	**595**	**574**	**22**

Table 58 shows the EOPCC for this scenario. Figure 144 shows the proposed project layout.

Table 58 EOPCC Summary – 18th Street Canal Improvements

Canals					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	Canal Excavation	34	39,000	CY	1,326,000
2	Canal Stabilization	125	5,500	LF	687,500
Storm Pipe					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
3	10-feet-by-5-feet Box Culvert	3,500	1,100	LF	3,850,000
4	End Treatment for 10-foot-by-5-foot Box Culvert	55,000	56	EA	3,080,000
5	60-inch RCP – Jack & Bore	5,500	675	LF	3,712,500
6	Backflow Prevention Device	1,250,000	2	EA	2,500,000
				Construction Costs Subtotal	15,156,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
7	Mobilization and General Conditions	10	15,156,000	LS	1,516,000
8	Erosion and Sediment Control	5	15,156,000	LS	758,000
9	Restoration	6	15,156,000	LS	909,000
10	Dewatering	7	1,326,000	LS	93,000
11	Maintenance of Traffic	3	15,156,000	LS	455,000
12	Engineering Design and CA Oversight Costs	15	15,156,000	LS	2,273,000
13	Construction Engineering Inspection Costs	4	15,156,000	LS	606,000
14	Project Contingency Costs	30	15,156,000	LS	4,547,000
				General Conditions Subtotal	11,157,000
				TOTAL	**26,313,000**

Figure 144 18th Street Canal Improvements



8.2.2.3 Massey Pond to E11 Canal

This scenario expands the existing pond at Massey Ranch Airport into a 45-acre stormwater storage pond as well as the existing channel that runs east along 15th Street to the E11 channel. An 8-foot-by-5-foot box culvert will be installed at each road crossing, and each driveway will be relocated where the channel expansion intersects with residential driveways.

Table 59shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. This project is proposed for construction during Phase 2.

Table 59 Inundation Reduction Results – Massey Pond to E11 Canal

	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	131	6	370	367	3
G2 and G11	33	33	0	105	105	0
Florida Shores – North of 442	7	6	1	56	39	17
Edgewater Acres – WWTP	12	12	0	37	36	1
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	21	0
Total	**189**	**182**	**7**	**595**	**574**	**21**

Table 60 shows the EOPCC for this scenario. Figure 145 shows the proposed project layout.

Table 60 EOPCC Summary – Massey Pond to E11 Channel

Pond Excavation					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	Pond Excavation	15	428,000	CY	6,420,000
Canals					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
2	Canal Excavation	34	3,300	CY	112,000
Storm Pipe					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
3	8-foot-by-5-foot Box Culvert	2,500	280	LF	700,000
4	End Treatment for 8-foot-by-5-foot Box Culvert	50,000	16	EA	800,000
5	Driveway Removal and Reconstruction	15	9,000	SF	135,000
			Construction Costs Subtotal		8,167,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
6	Mobilization and General Conditions	10	8,167,000	LS	817,000
7	Erosion and Sediment Control	5	8,167,000	LS	408,000
8	Restoration	6	8,167,000	LS	490,000
9	Dewatering	7	6,532,000	LS	457,000
10	Maintenance of Traffic	3	8,167,000	LS	245,000
11	Engineering Design and CA Oversight Costs	15	8,167,000	LS	1,225,000
12	Construction Engineering Inspection Costs	4	8,167,000	LS	327,000
13	Project Contingency Costs	30	8,167,000	LS	2,450,000
			General Conditions Subtotal		6,419,000
				Total	**14,586,000**

Figure 145 Massey Pond to E11 Channel



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8.2.2.4 Mango Pond to E11 Canal

This scenario constructs a new 10-acre stormwater pond northeast of the intersection of Mango Tree Drive and Regent Street and expands the existing channel that runs west along 15th Street to the E11 channel. An 8-foot-by-5-foot box culvert will be installed at each road crossing, and each driveway will be relocated where the channel expansion intersects with residential driveways.

Table 61 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. This project is proposed for construction during Phase 3.

Table 61 Inundation Reduction Results – Mango Pond to E11 Canal

	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	129	8	370	366	4
G2 and G11	33	33	0	105	105	0
Florida Shores – North of 442	7	3	4	56	51	5
Edgewater Acres – WWTP	12	12	0	37	36	1
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	21	0
Total	**189**	**177**	**12**	**595**	**585**	**10**

Table 62 shows the EOPCC for this scenario. Figure 146 shows the proposed project layout.

Table 62 EOPCC Summary – Mango Pond to E11 Canal

Pond Excavation					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	Pond Excavation	15	167,000	CY	2,505,000
Canals					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
2	Channel Excavation	34	740	CY	25,000
Storm Pipe					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
3	48-inch RCP	325	100	LF	33,000
4	8-foot-by-5-foot Box Culvert	2,500	80	LF	200,000
5	End Treatment for 48-inch RCP	13,500	2	EA	27,000
6	End Treatment for 8-foot-by-5-foot Box Culvert	50,000	2	EA	100,000
7	Driveway Removal and Reconstruction	15	1,000	SF	15,000
				Construction Costs Subtotal	2,905,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
8	Mobilization and General Conditions	10	2,905,000	LS	291,000
9	Erosion and Sediment Control	5	2,905,000	LS	145,000
10	Restoration	6	2,905,000	LS	174,000
11	Dewatering	7	2,530,000	LS	177,000
12	Maintenance of Traffic	3	2,905,000	LS	87,000
13	Engineering Design and CA Oversight Costs	15	2,905,000	LS	436,000
14	Construction Engineering Inspection Costs	4	2,905,000	LS	116,000
15	Project Contingency Costs	30	2,905,000	LS	872,000
				General Conditions Subtotal	2,298,000
				Total	**5,203,000**

Figure 146 Mango Pond to E11 Canal



8.2.2.5 Pump Stations (Mango and Massey)

This scenario involves installing two 50-cfs pump stations in the proposed ponds in the north portion of the Florida Shores neighborhood. The expansion of Massey Pond from Section 8.2.2.3 and the creation of the new Mango Pond from Section 8.2.2.4 need to be completed before the construction of these pump stations.

The first pump station is proposed in Massey Pond, which will be expanded during Phase 2. Stormwater flows would be sent through a proposed 36-inch FM either across 16th Street or along the 15th Street ROW toward Mango Tree Drive where it would join the FM from the other proposed pump station. The FM would then manifold into a 54-inch pipe before continuing toward its ultimate outfall on the Indian River North.

The second pump station is proposed in the future pond that will be constructed during Phase 3 on the vacant property at the intersection of Mango Tree Drive and Regent Street. This pump station would send stormwater across a 36-inch FM south along Mango Tree Drive until manifolding into the 54-inch pipe where it would join the FM from the proposed Massey Pond pump station.

Together, the two pump stations would pump water via the 54-inch FM along the channel on 16th street, crossing under North Ridgewood Avenue before discharging to the ultimate outfall to the Indian River North at the east end of Virginia Street.

Table 63 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. This project is proposed for construction during Phase 4.

Table 63 Inundation Reduction Results – Pump Stations (Mango and Massey)

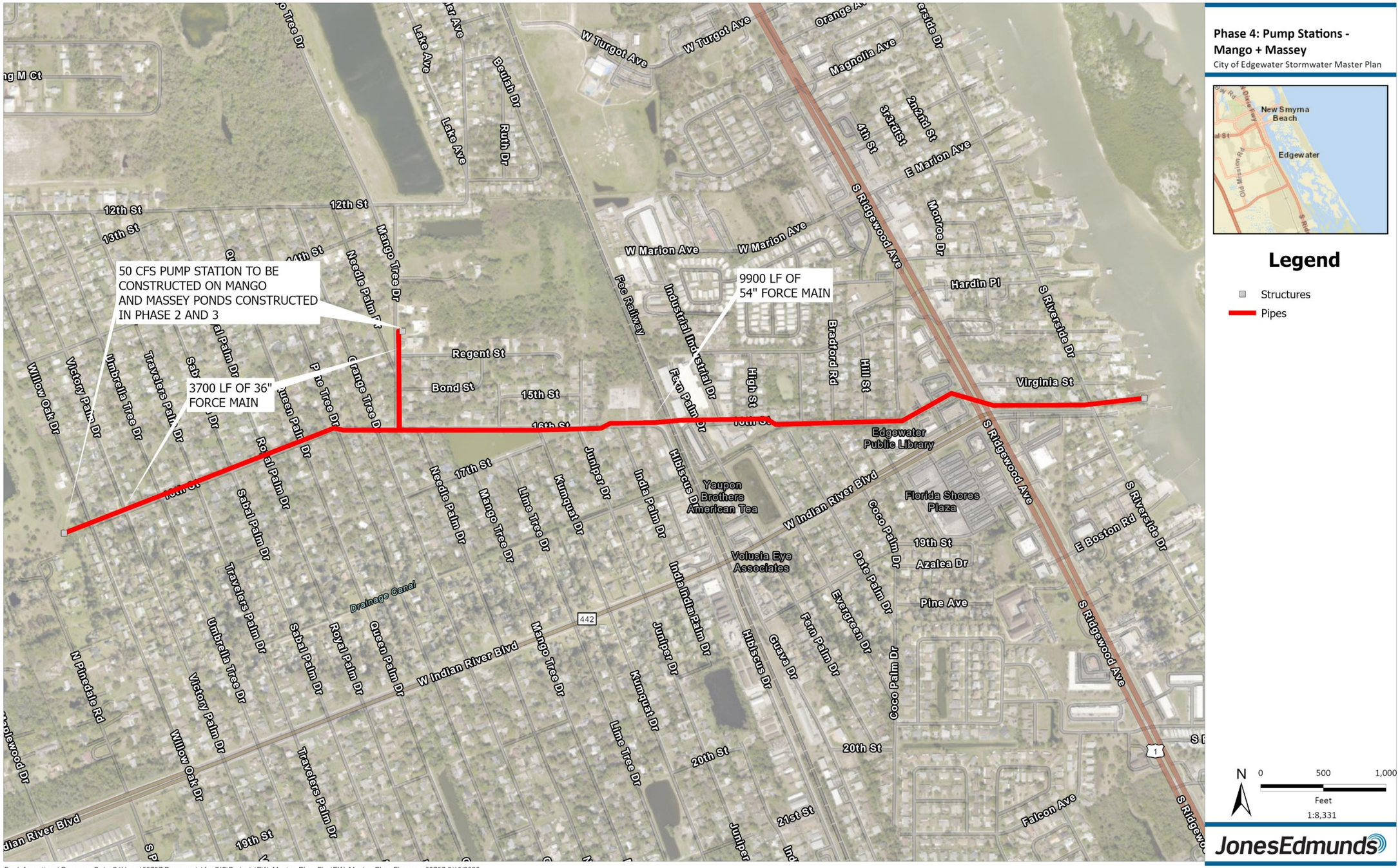
	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	124	13	370	365	5
G2 and G11	33	33	0	105	105	0
Florida Shores – North of 442	7	1	6	56	27	29
Edgewater Acres – WWTP	12	12	0	37	29	8
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	21	0
Total	**189**	**170**	**19**	**595**	**553**	**42**

Table 64 shows the EOPCC for this scenario. Figure 147 shows the proposed project layout.

Table 64 EOPCC Summary – Pump Stations (Mango and Massey)

Pump Station and FM					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	36-inch FM	2,000	3,700	LF	7,400,000
2	54-inch FM	3,500	9,900	LF	34,650,000
3	Pump Station < 50 cfs	3,000,000	2	EA	6,000,000
				Construction Costs Subtotal	48,050,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
4	Mobilization and General Conditions	10	48,050,000	LS	4,805,000
5	Erosion and Sediment Control	2	48,050,000	LS	961,000
6	Restoration	3	48,050,000	LS	1,442,000
7	Dewatering	1	48,050,000	LS	481,000
8	Maintenance of Traffic	3	48,050,000	LS	1,442,000
9	Engineering Design and CA Oversight Costs	10	48,050,000	LS	4,805,000
10	Construction Engineering Inspection Costs	4	48,050,000	LS	1,922,000
11	Project Contingency Costs	30	48,050,000	LS	14,415,000
				General Conditions Subtotal	30,273,000
				Total	**78,323,000**

Figure 147 Pump Stations (Mango and Massey)



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8.2.3 Florida Shores West Side (1019, 1020, 1022)

This area includes neighborhoods on the west of Florida Shores south of Indian River Boulevard and drains to the Silver Palm Canal through the T1, T2, T3, T4, T5, and T6 Canals that drain to the Turnbull Hammock through the Silver Palm Canal, which runs along the west of Florida Shores. These canals convey runoff from approximately 510 acres of mostly residential land with only 6.5 acres of stormwater ponds that function as shallow dry-detention areas not designed for flooding prevention.

8.2.3.1 27th Street Channel to E9 Canal

This scenario involves expanding the existing channel that runs east along 27th Street to the E9 channel. An 8-foot-by-5-foot box culvert will be installed at each road crossing, and each driveway will be relocated where the channel expansion intersects with residential driveways.

Table 65 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. This project is proposed for construction during Phase 1.

Table 65 Inundation Reduction Results – 27th Street Channel to E9 Canal

	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	116	21	370	360	10
G2 and G11	33	33	0	105	105	0
Florida Shores – North of 442	7	7	0	56	54	2
Edgewater Acres – WWTP	12	12	0	37	36	1
Florida Shores – West Side of 442	0	0	0	6	4	2
Pelican West	0	0	0	21	21	0
Total	**189**	**168**	**21**	**595**	**581**	**15**

Table 66 shows the EOPCC for this scenario. Figure 148 shows the proposed project layout.

Table 66 EOPCC Summary – 27th Street Channel to E9 Canal

Canals					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	Canal Excavation	34	6,200	CY	211,000
Storm Pipe					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
2	8-foot-by-4-foot Box Culvert	2,500	510	LF	1,275,000
3	End Treatment for 8-foot-by-4-foot Box Culvert	50,000	34	EA	1,700,000
4	Driveway Removal and Reconstruction	15	13,000	SF	195,000
			Construction Costs Subtotal		3,381,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
5	Mobilization and General Conditions	10	3,381,000	LS	338,000
6	Erosion and Sediment Control	5	3,381,000	LS	169,000
7	Restoration	6	3,381,000	LS	203,000
8	Dewatering	10	3,381,000	LS	338,000
9	Maintenance of Traffic	3	3,381,000	LS	101,000
10	Engineering Design and CA Oversight Costs	15	3,381,000	LS	507,000
11	Construction Engineering Inspection Costs	4	3,381,000	LS	135,000
12	Project Contingency Costs	30	3,381,000	LS	1,014,000
			General Conditions Subtotal		2,805,000
				Total	**6,186,000**

Figure 148 27th Street Channel to E9 Canal



8.2.3.2 Silver Palm Ditch Improvements

This scenario involves removing two 30-inch culverts, three 36-inch culverts, and one 48-inch culvert from the Silver Palm Ditch, which runs along the west edge of the Florida Shores neighborhood. These culverts create a constriction in the system and removing them will allow the west Florida Shores area to drain to Turnbull Hammock more effectively.

Table 67 shows that no expected structures are being removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. However, removing these culverts will increase conveyance and make the channel easier to maintain. This project is proposed for construction during Phase 1.

Table 67 Inundation Reduction Results – Silver Palm Ditch Improvements

	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	137	0	370	370	0
G2 and G11	33	33	0	105	105	0
Florida Shores – North of 442	7	7	0	56	56	0
Edgewater Acres – WWTP	12	12	0	37	37	0
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	21	0
Total	**189**	**189**	**0**	**595**	**595**	**0**

Table 68 shows the EOPCC for this scenario. Figure 148 shows the proposed project layout.

Table 68 EOPCC Summary – Silver Palm Ditch Improvements

Canals					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	Demolition	15,000	1	LS	15,000
2	Canal Excavation	34	250	CY	9,000
3	Canal Stabilization	125	200	LF	25,000
			Construction Costs Subtotal		49,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
4	Mobilization and General Conditions	10	49,000	LS	5,000
5	Erosion and Sediment Control	5	49,000	LS	2,000
6	Restoration	6	49,000	LS	3,000
7	Dewatering	3	49,000	LS	1,000
8	Maintenance of Traffic	3	49,000	LS	1,000
9	Project Contingency Costs	30	49,000	LS	15,000
			General Conditions Subtotal		27,000
				Total	**76,000**

Figure 149 Silver Palm Ditch Improvements



8.2.3.3 25th Street Canal to E9 Canal

This scenario involves expanding the existing channel that runs east along 25th Street to the E9 channel. An 8-foot-by-5-foot box culvert will be installed at each road crossing, and each driveway will be relocated where the channel expansion intersects with residential driveways.

Table 69 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. This project is proposed for construction during Phase 2.

Table 69 Inundation Reduction Results – 25th Street Canal to E9 Canal

	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	114	23	370	360	10
G2 and G11	33	33	0	105	105	0
Florida Shores – North of 442	7	7	0	56	52	4
Edgewater Acres – WWTP	12	12	0	37	36	1
Florida Shores – West Side of 442	0	0	0	6	5	1
Pelican West	0	0	0	21	21	0
Total	**189**	**166**	**23**	**595**	**580**	**16**

Table 70 shows the EOPCC for this scenario. Figure 150 shows the proposed project layout.

Table 70 EOPCC Summary – 25th Street Canal to E9 Canal

Canals					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	Canal Excavation	34	6,400	CY	218,000
Storm Pipe					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
2	8-foot-by-4-foot Box Culverts	2,500	630	LF	1,575,000
3	End Treatment for 8-foot-by-4-foot Box Culvert	50,000	36	EA	1,800,000
4	Driveway Removal and Reconstruction	15	16,000	SF	240,000
			Construction Costs Subtotal		3,833,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
5	Mobilization and General Conditions	10	3,833,000	LS	383,000
6	Erosion and Sediment Control	5	3,833,000	LS	192,000
7	Restoration	6	3,833,000	LS	230,000
8	Dewatering	7	3,833,000	LS	268,000
9	Maintenance of Traffic	3	3,833,000	LS	115,000
10	Engineering Design and CA Oversight Costs	15	3,833,000	LS	575,000
11	Construction Engineering Inspection Costs	4	3,833,000	LS	153,000
12	Project Contingency Costs	30	3,833,000	LS	1,150,000
			General Conditions Subtotal		3,066,000
				Total	**6,899,000**

Figure 150 25th Street Canal to E9 Canal



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8.2.3.4 23rd Street Channel to E9 Canal

This scenario involves expanding the existing channel that runs east along 23rd Street to the E9 channel. An 8-foot-by-5-foot box culvert will be installed at each road crossing, and each driveway will be relocated where the channel expansion intersects with residential driveways.

Table 71 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. This project is proposed for construction during Phase 3.

Table 71 Inundation Reduction Results – 23rd Street Channel to E9 Canal

	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	114	23	370	355	15
G2 and G11	33	33	0	105	105	0
Florida Shores – North of 442	7	7	0	56	52	4
Edgewater Acres – WWTP	12	12	0	37	36	1
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	21	0
Total	**189**	**166**	**23**	**595**	**575**	**20**

Table 72 shows the EOPCC for this scenario. Figure 151 shows the proposed project layout.

Table 72 EOPCC Summary – 23rd Street Channel to E9 Canal

Canals					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	Canal Excavation	34	6,200	CY	211,000
Storm Pipe					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
2	8-foot-by-5-foot Box Culvert	2,500	560	LF	1,400,000
3	End Treatment for 8-foot-by-5-foot Box Culvert	50,000	34	EA	1,700,000
4	Driveway Removal and Reconstruction	15	26,000	SF	390,000
			Construction Costs Subtotal		3,701,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
5	Mobilization and General Conditions	10	3,701,000	LS	370,000
6	Erosion and Sediment Control	5	3,701,000	LS	185,000
7	Restoration	6	3,701,000	LS	222,000
8	Dewatering	7	211,000	LS	15,000
9	Maintenance of Traffic	3	3,701,000	LS	111,000
10	Engineering Design and CA Oversight Costs	15	3,701,000	LS	555,000
11	Construction Engineering Inspection Costs	4	3,701,000	LS	148,000
12	Project Contingency Costs	30	3,701,000	LS	1,110,000
			General Conditions Subtotal		2,716,000
				Total	**6,417,000**

Figure 151 23rd Street Channel to E9 Canal



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8.2.4 EDGEWATER ACRES (1004, 1021)

This area includes the neighborhood north of 12th Street between Mango Tree Drive and the FEC railroad tracks east of the WWTP. All flows drain through the G5 Canal, which drains through the large reuse pond before continuing north under Park Avenue and into the Gabordy Canal system. The G5 Canal in this area drains approximately 161 acres of medium-density residential land. The 23-acre reuse pond is used for reuse augmentation and was not designed for stormwater storage.

8.2.4.1 Reuse Pond Pump Station

This scenario involves installing a 50-cfs pump station at the existing wastewater reuse pond at the intersection of Mango Tree Drive and 12th Street. The pump station would send stormwater from the pond to an outfall at the east end of Virginia Street to the Indian River North through a 36-inch FM. This scenario includes pumping the existing pond down before storm events to maximize stormwater storage during the event.

Table 73 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. We propose that this project be constructed during Phase 1.

Table 73 Inundation Reduction Results – Reuse Pond Pump Station

	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	137	0	370	370	0
G2 and G11	33	33	0	105	105	0
Florida Shores – North of 442	7	7	0	56	39	17
Edgewater Acres – WWTP	12	12	0	37	36	1
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	21	0
Total	**189**	**189**	**0**	**595**	**577**	**18**

Table 74 shows the EOPCC for this scenario. Figure 152 shows the proposed project layout.

Table 74 EOPCC Summary – Reuse Pond Pump Station

Pump Station & FM					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	36-inch FM	2,000	4,700	LF	9,400,000
2	Pump Station < 50 cfs	3,000,000	1	EA	3,000,000
				Construction Costs Subtotal	12,400,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
3	Mobilization and General Conditions	10	12,400,000	LS	1,240,000
4	Erosion and Sediment Control	5	12,400,000	LS	620,000
5	Restoration	6	12,400,000	LS	744,000
6	Dewatering	3	12,400,000	LS	372,000
7	Maintenance of Traffic	3	12,400,000	LS	372,000
8	Engineering Design and CA Oversight Costs	15	12,400,000	LS	1,860,000
9	Construction Engineering Inspection Costs	4	12,400,000	LS	496,000
10	Project Contingency Costs	30	12,400,000	LS	3,720,000
				General Conditions Subtotal	9,424,000
				Total	**21,824,000**

Figure 152 Reuse Pond Pump Station



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8.2.4.2 Edgewater Acres Pipe Improvements

This scenario involves multiple drainage improvements to pipes in the Edgewater Acres neighborhood between the WWTP and FEC. The existing drainage system in the neighborhood consists of the G5 Canal, which surrounds the neighborhood going south along the FEC railroad to 12th Street where it turns west to discharge into the large reuse pond before continuing down the G5 Canal to the Gabordy Canal. The proposed improvements include upsizing most of the existing pipes to 24 or 36 inches and creating new connections to the reuse pond to direct flows into the pond without having to go around the whole neighborhood through the existing channel.

Table 75 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. We propose that this project be constructed during Phase 1.

Table 75 Inundation Reduction Results – Edgewater Acres Pipe Improvements

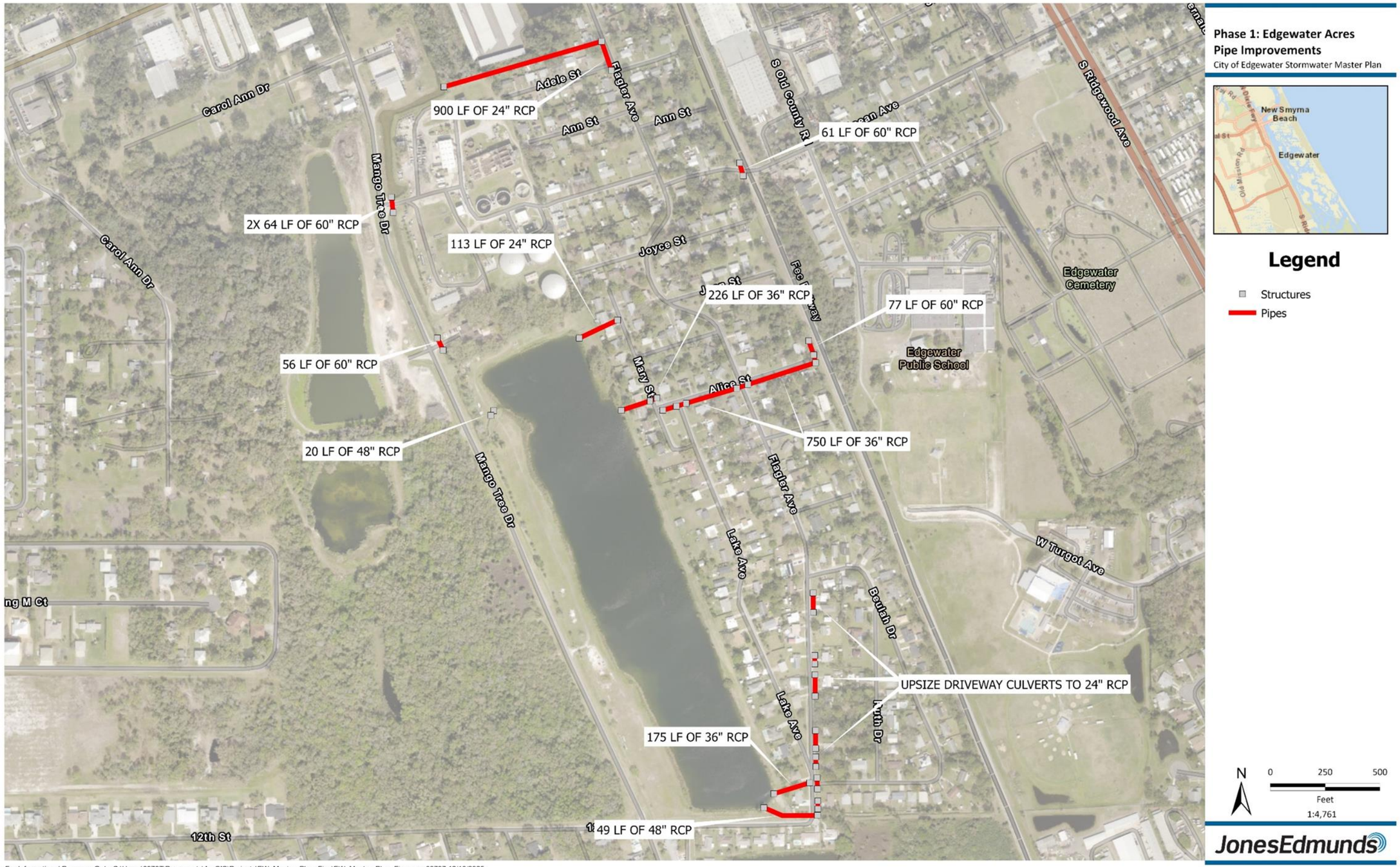
	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	137	0	370	370	0
G2 and G11	33	33	0	105	105	0
Florida Shores – North of 442	7	7	0	56	56	0
Edgewater Acres – WWTP	12	12	0	37	36	1
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	21	0
Total	**189**	**189**	**-1**	**595**	**594**	**1**

Table 76 shows the EOPCC for this scenario. Figure 153 shows the proposed project layout.

Table 76 EOPCC Summary – Edgewater Acres Pipe Improvements

Storm Pipe					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	Demolition	40,000	1	LS	40,000
2	24-inch RCP	200	1,560	LF	312,000
3	36-inch RCP	300	1,150	LF	345,000
4	48-inch RCP	325	70	LF	22,750
5	60-inch RCP	400	330	LF	132,000
6	End Treatment for 24-inch RCP	7,000	14	EA	98,000
7	End Treatment for 36-inch RCP	10,000	4	EA	40,000
8	End Treatment for 48-inch RCP	13,500	3	EA	40,500
9	End Treatment for 60-inch RCP	20,000	8	EA	160,000
10	FDOT Type E-Inlets	8,000	11	EA	88,000
				Construction Costs Subtotal	1,278,250
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
11	Mobilization and General Conditions	10	1,278,250	LS	128,000
12	Erosion and Sediment Control	5	1,278,250	LS	64,000
13	Restoration	6	1,278,250	LS	77,000
14	Dewatering	3	1,278,250	LS	38,000
15	Maintenance of Traffic	3	1,278,250	LS	38,000
16	Engineering Design and CA Oversight Costs	25	1,278,250	LS	320,000
17	Construction Engineering Inspection Costs	4	1,278,250	LS	51,000
18	Project Contingency Costs	30	1,278,250	LS	383,000
				General Conditions Subtotal	1,099,000
				TOTAL	**2,377,250**

Figure 153 Edgewater Acres Pipe Improvements



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8.2.4.3 G5 Culverts Under Park Avenue

This scenario involves constructing an 8-foot-by-5-foot box culvert across Park Avenue to facilitate flow through the E5 Canal as it intersects Park Avenue. The project also involves removing the existing culverts under the FEC railroad ROW north of Park Avenue. Both culvert locations create significant hydraulic constrictions in the system. This project should be constructed after the pump station at the reuse pond to prevent potential adverse impacts downstream.

Table 77 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. We propose that this project be constructed during Phase 2.

Table 77 Inundation Reduction Results G5 Culverts Under Park Avenue

	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	137	0	370	370	0
G2 and G11	33	34	-1	105	107	-2
Florida Shores – North of 442	7	7	0	56	38	18
Edgewater Acres – WWTP	12	12	0	37	35	2
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	21	0
Total	**189**	**190**	**-1**	**595**	**577**	**18**

Table 78 shows the EOPCC for this scenario. Figure 154 shows the proposed project layout.

Table 78 EOPCC Summary – G5 Culverts under Park Avenue

Storm Pipe					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	Demolition of Culverts under RR ROW	50,000	1	LS	50,000
2	10-foot-by-5-foot Box Culvert	2,500	165	LF	413,000
3	End Treatment for 10-foot-by-5-foot Box Culvert	50,000	2	EA	100,000
				Construction Costs Subtotal	563,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
4	Mobilization and General Conditions	10	563,000	LS	56,000
5	Erosion and Sediment Control	5	563,000	LS	28,000
6	Restoration	6	563,000	LS	34,000
7	Dewatering	3	563,000	LS	17,000
8	Maintenance of Traffic	3	563,000	LS	17,000
9	Engineering Design and CA Oversight Costs	15	563,000	LS	84,000
10	Construction Engineering Inspection Costs	4	563,000	LS	23,000
11	Project Contingency Costs	30	563,000	LS	169,000
				General Conditions Subtotal	428,000
				Total	**991,000**

Note: RR = Railroad

Figure 154 G5 Culverts under Park Avenue



8.2.5 G2 AND G11 CANALS (1001, 1002, 1015)

This area includes neighborhoods between the FEC railroad tracks and US-1 south of 10th Street that drain north to the Gabordy Canal through the G2 and G11 Canals. Together these canals handle runoff from approximately 330 acres of a mixture of land uses including medium-density residential, commercial, and service areas.

8.2.5.1 G2 and G11 Group A and Group B Improvements

This scenario includes the alternatives developed during the G2-G11 Canal Improvement Project. For grant funding purposes, the G2–G11 Canal Improvement project was split into two projects, referred to in this SWMP as Group A and Group B. Both projects are underway. Group A began construction January 2025, and Group B design and plan development are underway. Components of each project include:

- Group A
    - Knapp Avenue Improvements
    - Wildwood Avenue Pond and Pipe Improvements
    - Highland Avenue Pipe Improvements
    - Oak Ridge Avenue Pipe Improvements
    - Canal Road Pond and Pipe Improvements
    - Pearl Street Pond
    - Edgewater Storage Bypass on Pearl Street and Old County Road
- Group B
    - Mockingbird Lane – Evergreen Avenue Pump Station and FM
    - Pearl Street Pond
    - Parktowne Pond Redirect
    - Pine Bluff Pump Station and FM
    - Seahorse Mobile Home Park Culvert Improvement
    - Turgot Avenue Pond

The watersheds of the G2 and G11 Canals were significantly impacted by Hurricane Irma in 2017, Hurricanes Ian and Nicole in 2022, and Hurricane Milton in 2024. This project will provide expanded storage to contain runoff from large storm events and mitigate the impacts of tidal backflow into the system.

Table 79 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. As it is already underway, this project is part of Phase 1.

Table 79 Inundation Reduction Results – G2 and G11 Group A and Group B Improvements

	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	137	0	370	370	0
G2 and G11	33	21	12	105	90	15
Florida Shores – North of 442	7	7	0	56	56	0
Edgewater Acres – WWTP	12	12	0	37	37	0
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	21	0
Total	**189**	**177**	**12**	**595**	**580**	**15**

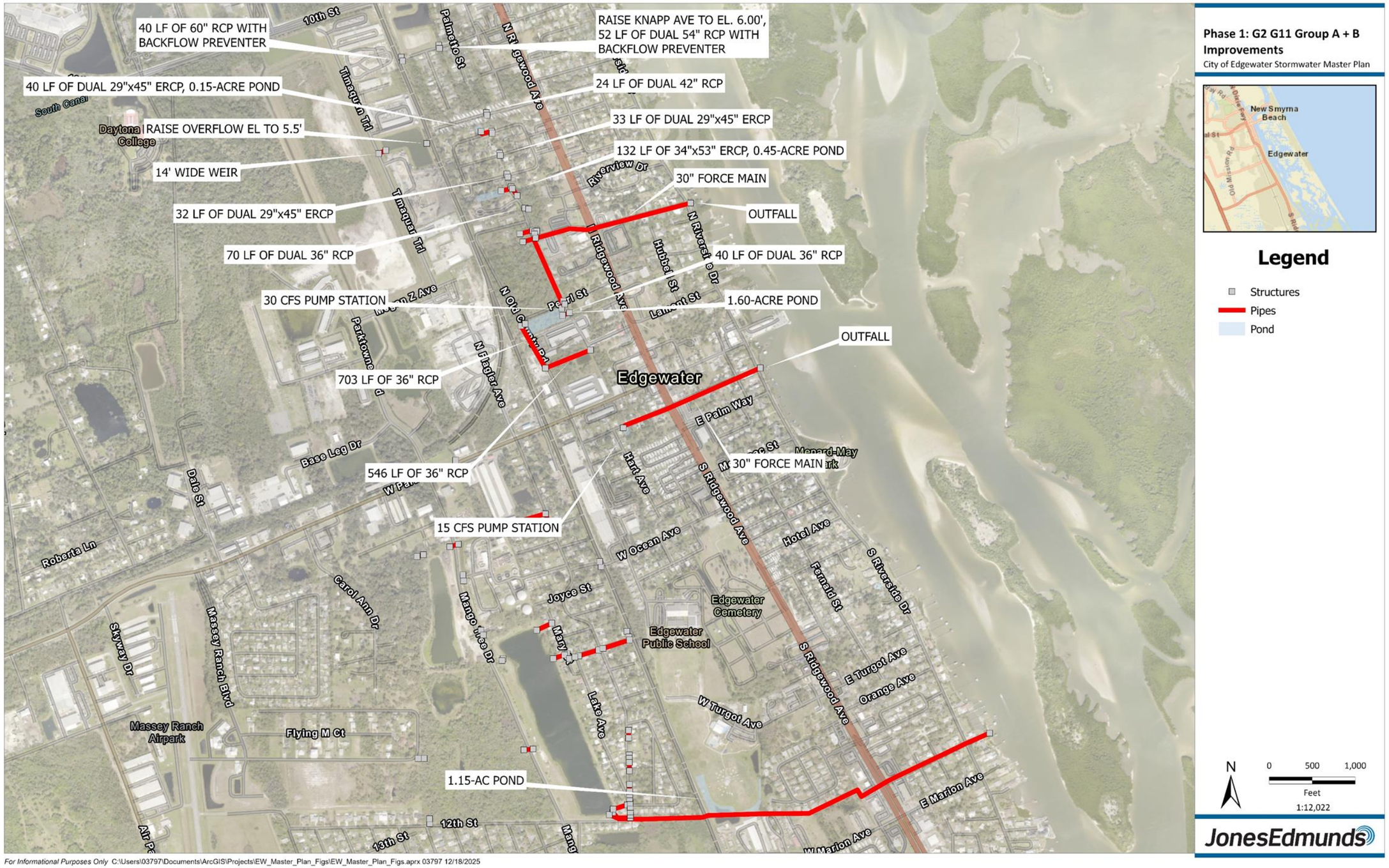
Table 80 shows the EOPCC for this scenario. Figure 155 shows the proposed project layout.

Table 80 G2 and G11 Canal Group A and B Improvements

Pond Excavation					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	Pond Excavation	15	49,000	CY	735,000
Storm Pipe					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
2	36-inch RCP	300	1,400	LF	420,000
3	42-inch RCP	310	30	LF	9,300
4	54-inch RCP	350	50	LF	17,500
5	60-inch RCP	400	40	LF	16,000
6	29-inch-by-45-inch RCP	5,000	110	LF	550,000
7	34-inch-by-53-inch ERCP	6,500	130	LF	845,000
8	36-inch Straight Concrete Endwall	10,000	8	EA	80,000
9	42-inch Straight Concrete Endwall	16,500	2	EA	33,000
10	54-inch Straight Concrete Endwall	18,000	2	EA	36,000
11	60-inch Straight Concrete Endwall	20,000	2	EA	40,000
Pump Station and FM					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
12	30-inch FM	150	4,600	LF	690,000
13	Pump Station < 50 cfs	2,500,000	2	EA	5,000,000
			Construction Costs Subtotal		8,471,800
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
14	Mobilization and General Conditions	10	8,471,800	LS	847,000
15	Erosion and Sediment Control	5	8,471,800	LS	424,000
16	Restoration	6	8,471,800	LS	508,000
17	Dewatering	7	735,000	LS	51,000
18	Maintenance of Traffic	3	8,471,800	LS	254,000
19	Engineering Design and CA Oversight Costs	15	8,471,800	LS	1,271,000
20	Construction Engineering Inspection Costs	4	8,471,800	LS	339,000
21	Project Contingency Costs	10	8,471,800	LS	847,000
			General Conditions Subtotal		4,541,000
				Total	**13,012,800**

Note: ERCP = Elliptical Reinforced Concrete Pipe.

Figure 155 G2 and G11 Canal Group A and Group B Improvements



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8.2.5.2 Church Pond

This scenario involves constructing a 1-acre stormwater pond on the vacant lot north of the intersection of Canal Road and Mockingbird Lane. The proposed pond would have an intake and discharge adjacent to the G2 Canal and would provide additional stormwater storage for the surrounding communities. This project incorporates the G2/G11 Canal Improvements Group A and B, which are currently under construction.

Table 81 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. We propose that this project be constructed during Phase 2.

Table 81 Inundation Reduction Results – Church Pond

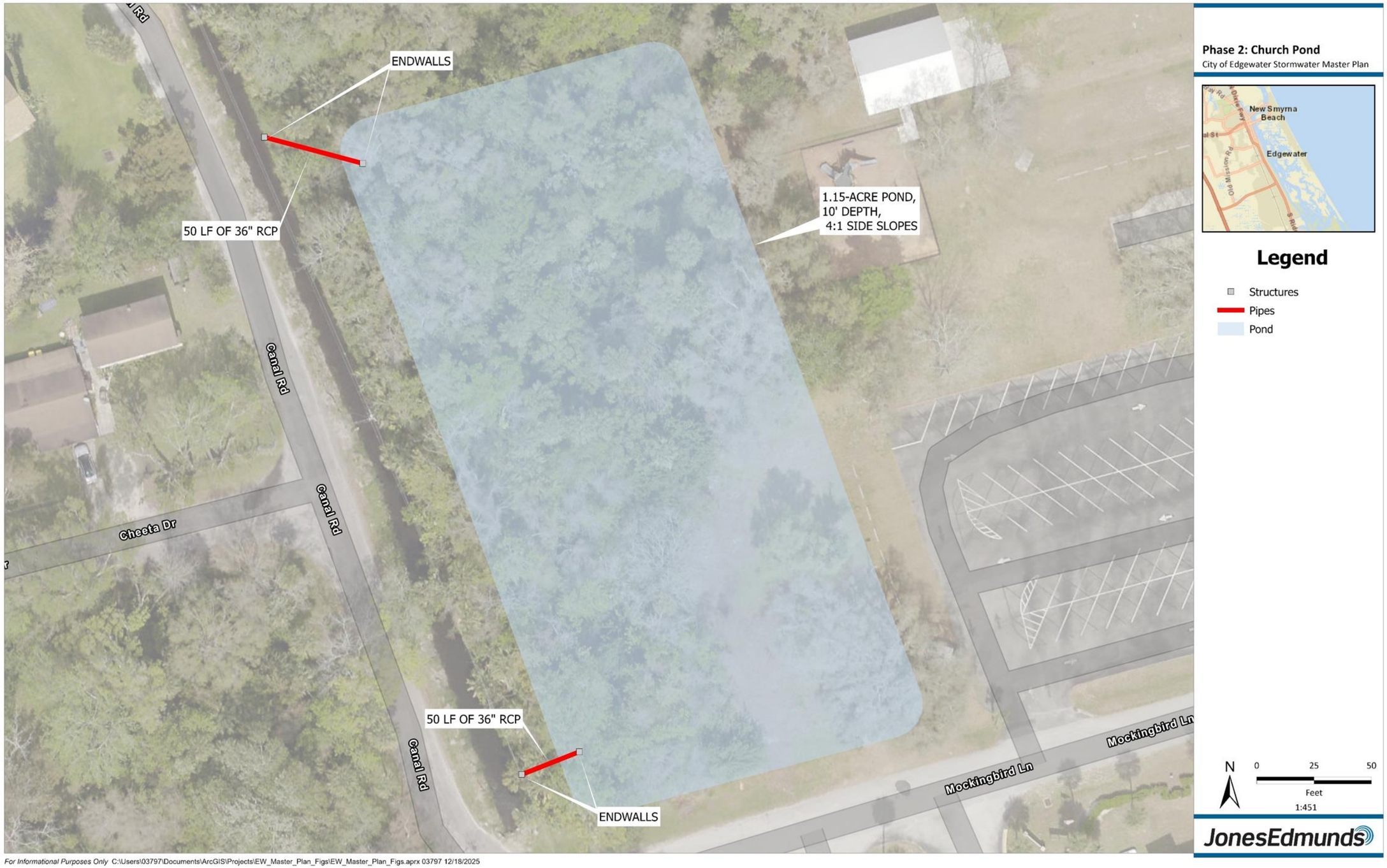
	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	138	-1	370	370	0
G2 and G11	33	21	12	105	87	18
Florida Shores – North of 442	7	7	0	56	56	0
Edgewater Acres – WWTP	12	12	0	37	37	0
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	21	0
Total	**189**	**178**	**11**	**595**	**577**	**18**

Table 82 shows the EOPCC for this scenario. Figure 156 shows the proposed project layout.

Table 82 EOPCC Summary – Church Pond

Pond Excavation					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	Pond Excavation	15	15,400	CY	231,000
Storm Pipe					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
2	36-inch RCP	300	100	LF	30,000
3	End Treatment for 36-inch RCP	10,000	4	EA	40,000
			Construction Costs Subtotal		301,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
4	Mobilization and General Conditions	10	301,000	LS	30,000
5	Erosion and Sediment Control	5	301,000	LS	15,000
6	Restoration	6	301,000	LS	18,000
7	Dewatering	7	231,000	LS	16,000
8	Maintenance of Traffic	3	301,000	LS	9,000
9	Engineering Design and CA Oversight Costs	15	301,000	LS	45,000
10	Construction Engineering Inspection Costs	4	301,000	LS	12,000
11	Project Contingency Costs	30	301,000	LS	90,000
			General Conditions Subtotal		235,000
				Total	**536,000**

Figure 156 Church Pond



8.2.5.3 15-Acre Pond at Pearl Street

This scenario involves expanding the Pearl Street pond that is being constructed as part of the Group B projects from Section 8.2.5.1 into a larger, 15-acre pond using the vacant property north of Pearl Street. The current pond and pump station design includes a 1.6-acre pond built on the vacant lot south of Pearl Street with a 30-cfs pump station that discharges to the Indian River North via a proposed FM running north along the G2 Canal before turning east on Mockingbird Lane under North Ridgewood Avenue to a new outfall on Evergreen Avenue. This project incorporates the G2/G11 Canal Improvements Group A and B, which are currently under construction.

The proposed expansion would merge the Group B pond and the vacant lot north of Pearl Street for a total pond area of approximately 15 acres. The proposed influent pipe from the Group B projects would remain, and a new overflow structure and outfall pipe would be constructed on the north end of the new pond around Mockingbird Lane.

Table 83 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. We propose that this project be constructed during Phase 3.

Table 83 Inundation Reduction Results 15-Acre Pond at Pearl Street

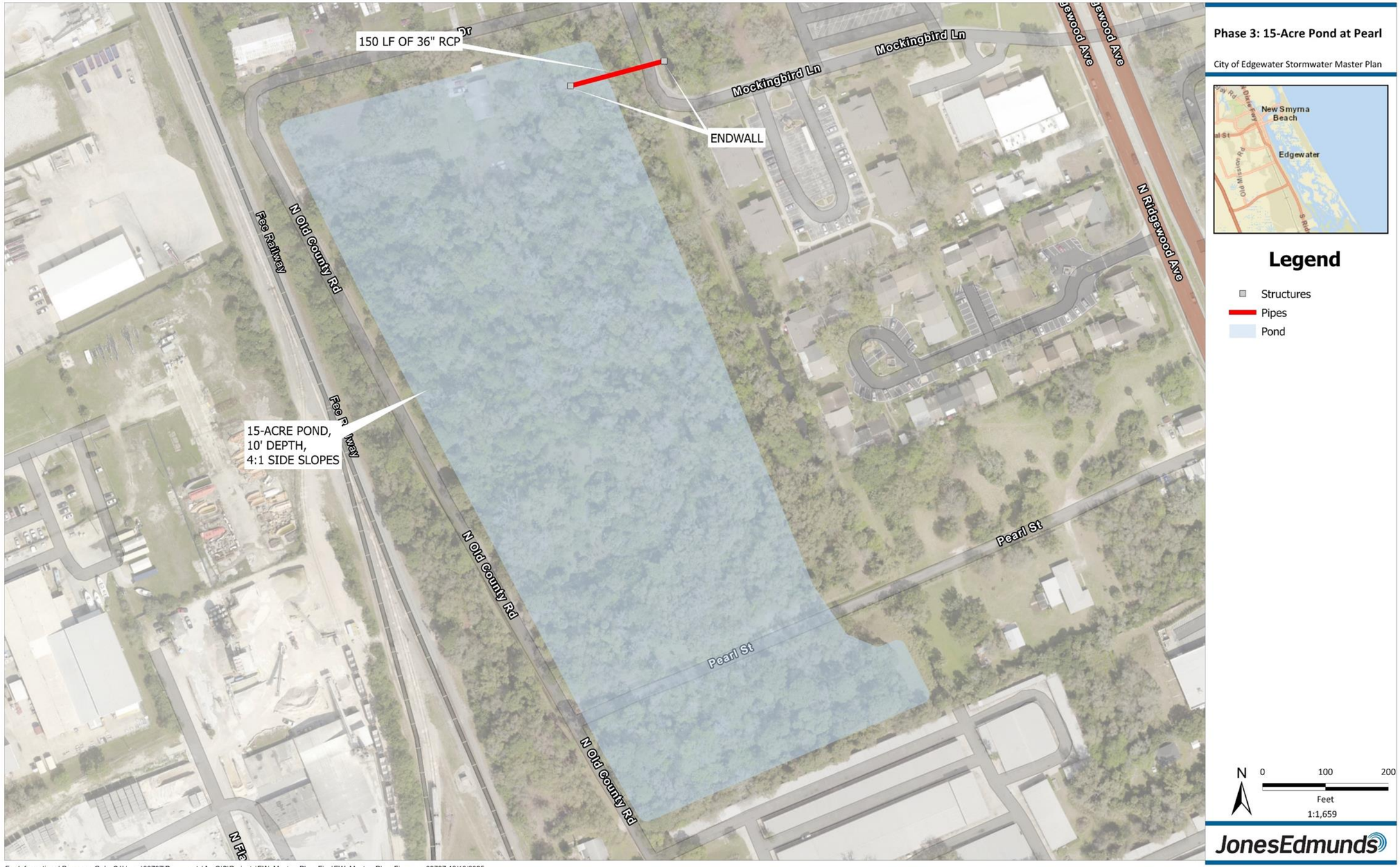
	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	137	0	370	370	0
G2 and G11	33	16	17	105	54	51
Florida Shores – North of 442	7	7	0	56	56	0
Edgewater Acres – WWTP	12	12	0	37	37	0
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	21	0
Total	**189**	**172**	**17**	**595**	**544**	**51**

Table 84 shows the EOPCC for this scenario. Figure 157 shows the proposed project layout.

Table 84 EOPCC Summary – 15-Acre-Pond at Pearl Street

Ponds					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	Pond Excavation	15	152,000	CY	2,280,000
Storm Pipe					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
2	36-inch RCP	300	150	LF	45,000
3	End Treatment for 36-inch RCP	10,000	2	EA	20,000
			Construction Costs Subtotal		2,345,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
4	Mobilization and General Conditions	10	2,345,000	LS	235,000
5	Erosion and Sediment Control	5	2,345,000	LS	117,000
6	Restoration	6	2,345,000	LS	141,000
7	Dewatering	7	2,280,000	LS	160,000
8	Maintenance of Traffic	3	2,345,000	LS	70,000
9	Engineering Design and CA Oversight Costs	15	2,345,000	LS	352,000
10	Construction Engineering Inspection Costs	4	2,345,000	LS	94,000
11	Project Contingency Costs	30	2,345,000	LS	704,000
			General Conditions Subtotal		1,873,000
				Total	**4,218,000**

Figure 157 15-Acre Pond at Pearl Street



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8.2.6 PELICAN WEST (1023)

This area includes the Pelican Cove Subdivision, which is north of 22nd Street east of the FEC railroad tracks and drains south to the E5 Canal. This area is approximately 45 acres of medium-density residential land with approximately 0.6 acre dedicated to stormwater storage.

8.2.6.1 Pelican West Storage

This scenario involves the voluntary acquisition of the vacant property east of Pelican Cove West between the neighborhood and US-1. The proposed improvement also expands the existing small pond on the property to approximately 9.5 acres and connects it to the E5 Canal with a 48-inch pipe. This project will provide additional storage for runoff from Pelican Cove and reduce localized flooding in the Pelican West neighborhood. This project will also reduce the volume of runoff that is conveyed to the 18th Street Canal and benefit other areas that drain there.

Table 85 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. We propose that this project be constructed during Phase 1.

Table 85 Inundation Reduction Results – Pelican West Storage

	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	124	13	370	366	4
G2 and G11	33	33	0	105	105	0
Florida Shores – North of 442	7	7	0	56	56	0
Edgewater Acres – WWTP	12	12	0	37	37	0
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	4	17
Total	**189**	**176**	**13**	**595**	**574**	**21**

Table 86 shows the EOPCC for this scenario. Figure 158 shows the proposed project layout.

Table 86 EOPCC Summary – Pelican West Storage

Pond Excavation					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
1	Pond Excavation	15	153,300	CY	2,300,000
Storm Pipe					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
2	48-inch RCP	325	510	CY	166,000
3	48-inch Straight Concrete Endwall	13,500	2	EA	27,000
			Construction Costs Subtotal		2,466,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
4	Mobilization and General Conditions	10	2,466,000	LS	247,000
5	Erosion and Sediment Control	5	2,466,000	LS	123,000
6	Restoration	6	2,466,000	LS	148,000
7	Dewatering	7	2,466,000	LS	173,000
8	Maintenance of Traffic	3	2,466,000	LS	74,000
9	Engineering Design and CA Oversight Costs	15	2,466,000	LS	370,000
10	Construction Engineering Inspection Costs	4	2,466,000	LS	99,000
11	Project Contingency Costs	30	2,466,000	LS	740,000
			General Conditions Subtotal		1,974,000
				Total	**4,440,000**

Figure 158 Pelican West Storage



8.2.6.2 Friendly Shores Outfall to Pelican West – Storage

This scenario builds on the Pelican West Storage alternative and proposes constructing a new outfall to the Indian River North. Section 6.5 of this report notes that the E1 Canal, or 18th Street Canal, is the main conveyance serving most of the Florida Shores neighborhood and is significantly undersized to serve the runoff from this area. We analyzed several alternatives for a new outfall from Florida Shores considering some noteworthy challenges:

- The areas east of Florida Shores and on the coastal neighborhoods are very built out with little available land to create a new outfall.
- A new outfall would need to cross the FEC railroad and South Ridgewood Avenue, posing significant permitting challenges for the design of any large conduit.
- An important ridge between the FEC railroad and South Ridgewood Avenue would require extensive excavation to construct any large conveyance across.

The most sensible route from the alternative analysis involves using the existing E4 and E5 channels, connecting across the proposed pond from the Pelican West Storage project, and using a vacant City-owned property just south of the Friendly Shores mobile home community and east of South Ridgewood Avenue to create a new outfall. The new outfall from the Pelican West Storage pond would need a large box culvert of at least 8-foot-by-4-foot across South Ridgewood Avenue, and the vacant lot would have to be converted into a new channel as shown in Figure 159.

The proposed outfall will primarily provide improvements in and around the Pelican West Neighborhood but will provide some improvements in Florida Shores neighborhood by diverting some of the current flow across the E6 channel on 25th Street, across the FEC railroad, and north along the E4 channel that runs between Guava Drive and Fern Palm Drive. This outfall would decrease the flow in the E5 channel that flows north to the E1 channel, creating more capacity for the E1 channel to handle the flow from Florida Shores.

Table 87 shows the expected number of structures that may be removed from the floodplain according to an inundation analysis of the 25-year and 100-year/24-hour design storm events. We propose that this project be constructed during Phase 2.

Table 87 Inundation Reduction Results – Friendly Shores Outfall to Pelican West – Storage

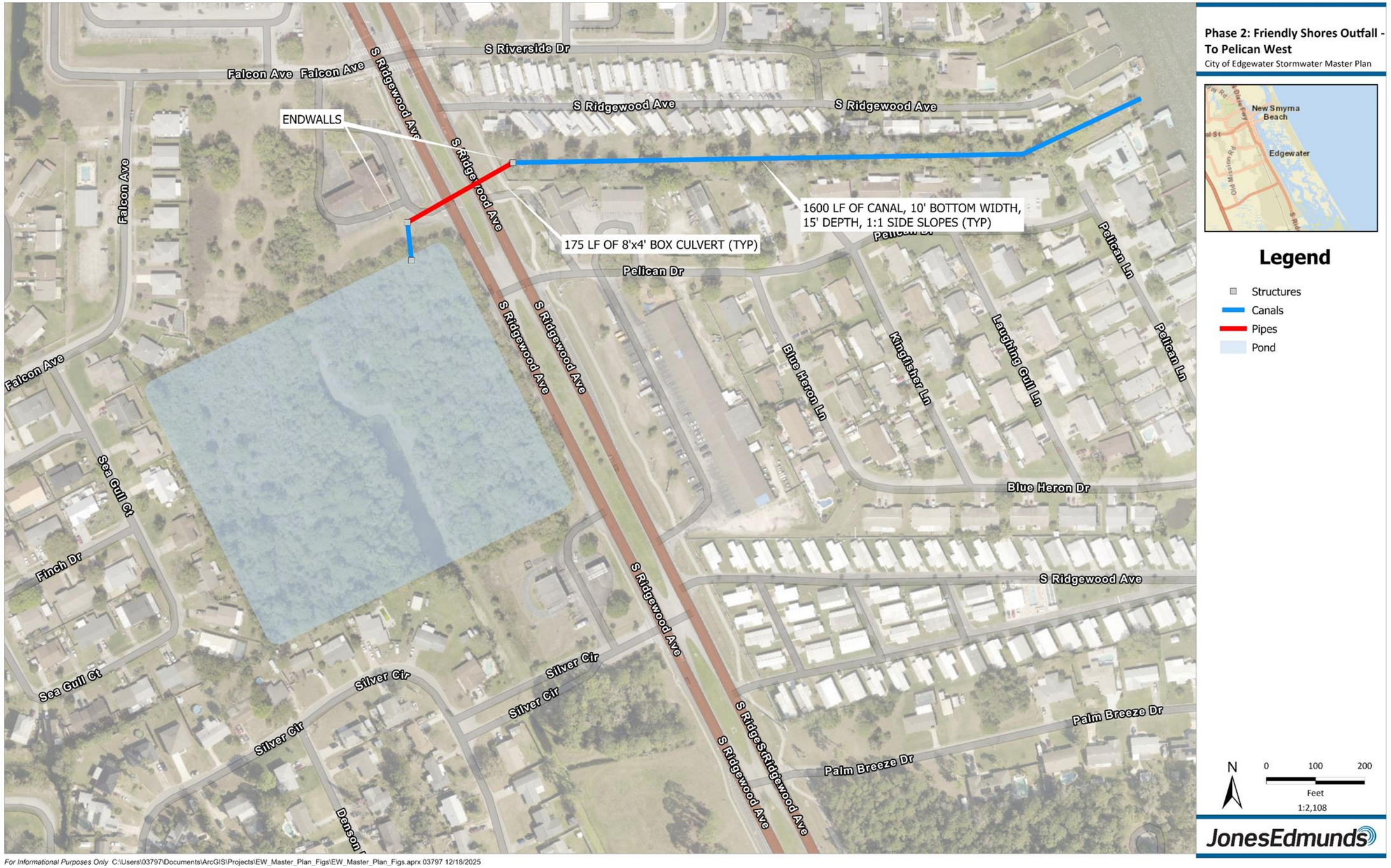
	25-Year 24-Hour			100-Year 24-Hour		
	Inundated Pre	Inundated Post	Reduced	Inundated Pre	Inundated Post	Reduced
Florida Shores – South of 442	137	111	26	370	357	13
G2 and G11	33	33	0	105	105	0
Florida Shores – North of 442	7	7	0	56	46	10
Edgewater Acres – WWTP	12	12	0	37	36	1
Florida Shores – West Side of 442	0	0	0	6	6	0
Pelican West	0	0	0	21	0	21
Total	189	163	26	595	550	45

Table 88 shows the EOPCC for this scenario. Figure 159 shows the proposed project layout.

Table 88 EOPCC Summary – Friendly Shores Outfall to Pelican West – Storage

Canals					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
2	Canal Excavation	34	1,600	CY	54,000
Storm Pipe					
Item #	Description	Unit Cost ($)	Quantity	Unit	Cost ($)
3	8-foot-by-4-foot Box Culvert	2,500	175	LF	438,000
4	End Treatment for 8-foot-by-4-foot Box Culvert	50,000	2	EA	100,000
				Construction Costs Subtotal	592,000
General Conditions					
Item #	Description	Unit Cost (%)	Quantity	Unit	Cost ($)
5	Mobilization and General Conditions	10	592,000	LS	59,000
6	Erosion and Sediment Control	5	592,000	LS	30,000
7	Restoration	6	592,000	LS	36,000
8	Dewatering	7	54,000	LS	4,000
9	Maintenance of Traffic	3	592,000	LS	18,000
10	Engineering Design and CA Oversight Costs	15	592,000	LS	89,000
11	Construction Engineering Inspection Costs	4	592,000	LS	24,000
12	Project Contingency Costs	30	592,000	LS	178,000
				General Conditions Subtotal	438,000
				Total	**1,030,000**

Figure 159 Friendly Shores Outfall to Pelican West – Storage



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8.2.7 PERMITTING REQUIREMENTS

The recommended projects may require multiple permits before starting construction. The following lists potentially required permits and agency coordination:

- United States Army Corps of Engineers (USACE) Section 404 Dredge and Fill Permit – A Section 404 Dredge and Fill Permit will be required for any work conducted in Waters of the State, including federally regulated wetlands.
- SJRWMD ERP – An ERP may be required if the project impacts wetlands, could potentially impact water quality in the receiving waterbody, or could potentially create adverse offsite impacts by changing hydrologic or hydraulic conditions.
- FDOT Utility Permit – Utilities installation or adjustment within FDOT ROWs will require obtaining a utility permit from FDOT. This includes constructing stormwater FMs.
- FDOT Drainage Connection Permit – Drainage improvement projects within or adjacent to an FDOT ROW will be required to obtain an FDOT Drainage Connection Permit.
- FEC Utility Crossing License Permit – Projects within or adjacent to an FEC ROW will be required to obtain a Utility Crossing License Permit.
- VC – Any work within a ROW of a County-maintained road will need a VC-issued Use Permit.
- Federal Aviation Authority (FAA) – Projects adjacent to airplane facilities may require coordination with the FAA.

Table 89 summarizes the expected permitting requirement for each of the proposed alternatives.

Table 89 Summary of Expected Permitting Requirements for the Proposed Alternatives

Proposed Alternative	Permits Required						
	USACE 404	SJRWMD ERP	FDOT Utility	FDOT Drainage	FEC Utility	VC Use	FAA Coordination
Pump Stations on Existing Ponds	x	x	x		x		
Volco Road Improvements	x	x				x	
G2/G11 Group A and Group B	x	x	x		x	x	
Duck Pond Pump Station	x	x	x		x		
18th Street Canal Improvements	x	x		x	x		
Reuse Pond Pump Station	x	x	x		x		
Edgewater Acres Pipe Improvements	x	x					
27th Street Channel to E9 Canal	x	x					
Silver Palm Ditch Improvements	x	x					
Pelican West Storage		x					
30-Acre Pond (E9)	x	x					
21st Street Pond to E9 Canal	x	x					
Church Pond	x	x					
Massey Pond to E11 Canal	x	x					x
G5 Culverts Under Park Avenue		x					
25th Street Canal to E9 Canal	x	x					
Friendly Shores Outfall to Pelican West – Storage	x	x	x				
Box Culvert Indian River Boulevard		x		x			
Friendly Shores Outfall to E9 Canal	x	x			x		
15-Acre Pond at Pearl Street	x	x			x		
Mango Pond to E11 Canal	x	x					
23rd Street Channel to E9 Canal	x	x					
Florida Shores 100-acre Pond to E9 and E10 Canals	x	x					
Pond Pump Stations (Mango and Massey)		x	x		x		x

8.3 EVALUATED BUT UNSELECTED ALTERNATIVES

Various parties in the City have proposed flood improvement project ideas in recent years. Mead & Hunt evaluated a wide range of ideas from different sources, incorporating each into the City StormWise model. Some concepts and ideas showed potential, but others were less successful. This section summarizes these less successful concepts and ideas that are not recommended for implementation. These projects either showed limited benefits in the model or posed challenges in terms of cost or construction feasibility. Despite this, they provided valuable insight and direction in creating more successful alternatives.

We offer a summary and brief analysis for each concept, explaining the challenges of each project and how this information may have provided useful insight into the City's stormwater infrastructure. This information will help inform future discussion and answer questions regarding flood improvements in the City.

8.3.1 18TH STREET CANAL OUTFALL

The 18th Street Canal discharges into Indian River North and is the only outfall for the canal system in east Florida Shores. Before entering the Indian River North, flow passes through two 5-foot-by-6-foot box culverts under Riverside Drive. In the past, these box culverts have been observed flowing full. Consequently, they have been proposed as a chokepoint in the system.

A model scenario was prepared in which the culverts under Riverside Drive were completely removed and replaced with an open channel. In this scenario, a portion of South Riverside Drive is vacated and removed, and the 18th Street Canal continues from US-1 to the Indian River North as an open canal. This is a relatively ambitious and unrealistic hypothetical scenario. In reality, some sort of replacement culvert would likely be installed under Riverside Drive. However, any potential benefit from opening the 18th Street outfall would be the greatest in this case.

Table 90 shows a selection of peak stages and peak flows during the 100-year, 24-hour design storm event. The locations start at the 18th Street outfall and move progressively upstream. The results show that removing the culvert at Riverside Drive brings down stages near the canal outfall. However, benefits become less pronounced when moving upstream, especially in the E9 Canal where benefits are negligible when comparing stages and flows in Florida Shores.

Table 90 18th Street Canal Peak Stages and Flows

Location Upstream		Existing Conditions	Proposed Conditions – Riverside Culvert Removed, Channel Constructed
E1 Outfall	Peak Stage Peak Flow	5.65 ft 460.53 cfs	4.90 ft 493.86 cfs
E1 Canal and US-1	Peak Stage Peak Flow	7.80 ft 406.92 cfs	7.34 ft 438.40 cfs
18th Street Canal and Hibiscus Drive	Peak Stage Peak Flow	8.88 ft 208.08 cfs	8.82 ft 214.96 cfs
E9 Canal and 442	Peak Stage Peak Flow	10.49 ft 162.61 cfs	10.49 ft 163.12 cfs
E9 Canal and Lime Tree Drive	Peak Stage Peak Flow	10.54 cfs 85.34 cfs	10.54 ft 85.84 cfs

The 18th Street Canal outfall is only a small part of a system with many hydraulic losses. Pipes and canals are undersized and flow is restricted throughout the system. In general, upsizing and upgrading the last component in a system does not provide system-wide benefits that help reduce flooding in the problem areas, particularly Florida Shores. More successful projects create storage close to the problem areas or open new outfalls, either through canals or new pump stations.

8.3.2 18TH STREET CANAL AT US-1

This scenario sought to model an even more aggressive hypothetical outfall modification. As previously noted, before flow enters the Indian River North it passes through two 5-foot-by-6-foot box culverts under Riverside Drive that flow full in large events. During these same large events, observers have noted that the next upstream culvert flows half full. This structure is a 9-foot-by-9-foot box culvert crossing US-1 and passing under CVS and Jiffy Lube.

A model scenario was prepared in which the culverts beneath both Riverside Drive and US-1 were removed and replaced with a channel. Removing US-1 is not feasible, but if upgrading this outfall could benefit the problem areas it should be observed in this extreme example.

Table 91 shows a selection of peak stages and peak flows during the 100-year/24-hour design storm event. The locations start at the 18th Street Canal outfall and move progressively upstream. As summarized in the previous section, these results show diminished benefits when moving upstream. By the time results are compared in the problem areas and specifically Florida Shores, improvements can be viewed as negligible or absent.

In certain situations, variations in flow depths between sequential culverts may indicate that one is undersized. However, in this instance, the observed differences are attributed to the distinct elevations of the structures. The culvert beneath Riverside Drive has an invert elevation of -2.18 ft-NAVD88 and a maximum depth of 5 feet, whereas the culvert below US-1 features an invert elevation of 0.46 foot-NAVD88 and a maximum depth of 9 feet. As the top of the structure under US-1 is approximately 6.64 feet higher than that of the

structure beneath Riverside Drive, both culverts are unlikely to experience full flow simultaneously.

Table 91 18th Street Canal at US-1 Peak Stages and Flows

Location Upstream		Existing Conditions	Proposed Conditions – Riverside Culvert, CVS and Jiffy Lube Removed, Channel Constructed
E1 Outfall	Peak Stage Peak Flow	5.65 ft 460.53 cfs	3.28 ft 699.56 cfs
E1 Canal and South Ridgewood Avenue	Peak Stage Peak Flow	7.80 ft 406.92 cfs	3.52 ft 642.76 cfs
18th Street Canal and Hibiscus Drive	Peak Stage Peak Flow	8.88 ft 208.08 cfs	7.72 ft 274.16 cfs
E9 Canal and SR-442	Peak Stage Peak Flow	10.49 ft 162.61 cfs	10.47 ft 167.137 cfs
E9 Canal and Lime Tree Drive	Peak Stage Peak Flow	10.54 cfs 85.34 cfs	10.52 ft 85.84 cfs

8.3.3 Whistle Stop Park Channel Improvements

Whistle Stop Park is on the southeast edge of Florida Shores, bounded by 28th Street to the north and Roberts Road to the south. The E4 Canal begins at the north end of the park, and the C1 Canal begins at the south. On the east side of the park is a common area owned by the Meadow Lake Homeowners Association that contains several ponds and depressional storage areas. No pipe or channel in this area connects the E4 and C1 Canals. One hypothesis proposed that establishing a connection could allow runoff to drain south along the C1 Canal, taking water away from the problem areas.

A model scenario was prepared in which a channelized connection is established between the C1 and E4 Canals. The proposed channel had a depth of 5 feet, a bottom width of 10 feet, and 2:1 side slopes. It passed through the common area owned by Meadow Lake Homeowners Association and connected to existing storage in the basin. The proposed channel was connected to the existing canals through dual 48-inch culverts beneath both 28th Street and Roberts Road.

The model indicated that the proposed channel had minimal benefit during large storms and in smaller storms could make flooding worse, likely because Whistle Stop Park is on a relatively high parcel and this area represents a local drainage divide. From this point, the E4 Canal flows north and the C1 Canal flows south. When an additional connection is added to this point, flows split and proceed north and south as they currently do. Further, adding additional storage to a high point would provide limited benefit, as runoff would be unable to reach it. Additionally, the E4 canal is approximately 5.35 feet lower than the C1 Canal. The C1 Canal would need to be much deeper and wider to get the E4 Canal to reverse direction and flow south. Lowering the invert of the C1 Canal would lose positive drainage to the south and back up flow at the north end of the canal.

This scenario illustrates the importance of selecting appropriate project sites. Storage provides no benefit if runoff cannot reach it, and additional connectivity provides no benefit

if flow will not pass through it. In general, storage should be constructed in local low points, and connectivity should be added in places with sufficient head to drive flow.

8.3.4 Lower Berm on Silver Palm Ditch

Stormwater in the City and specifically Florida Shores discharges through one of two pathways, either east into the Indian River North or west into the Turnbull Hammock, flowing south into the IRL. At the west side of Florida Shores, water collects in the Silver Palm Ditch, where it enters the Hammock either through a channel near 30th Street, or at the southmost end of Florida Shores near 35th Street. Presently, the banks of the Silver Palm Ditch are higher than adjacent homes, likely an artifact from when the ditch was initially excavated. This acts as a berm, separating backyards of homes in Florida Shores from the Hammock.

One hypothesis is that lowering the west banks of this ditch could allow water to exit Florida Shores more efficiently. Instead of exiting through two small outfalls, water could sheet flow from the Silver Palm ditch into Turnbull Hamock. The ground generally drops several feet heading west from Florida Shores into the Hammock, meaning that sufficient head might be present to drive water out of Florida Shores. Additionally, peak stages during the 100-year storm are lower in the Hammock than in adjacent areas in Florida Shores in the existing conditions stormwater model, meaning that water is unlikely to backflow into the neighborhood.

To evaluate this hypothesis, several model scenarios were prepared in which the cross section of this berm was lowered by approximately 2 feet. One scenario modeled lowering independently, and the other two analyzed lowering the berm in conjunction with establishing connections across to the E9 Canal. When analyzed independently, lowering the berm had very little impact. Better results were observed when combined with connections across to the E9 Canal. However, these improvements are almost entirely attributable to the additional connectivity, which was observed to be more effective when the berm was left unmodified.

From a constructability standpoint, lowering the berm would also be difficult to implement due to accurate grading being difficult, and implementing the work would disturb many properties for little to no benefit. As a result, we do not recommend pursuing this project.

8.3.5 35th Street Lake

Historically, drainage issues have generally occurred around 35th Street at the south end of Florida Shores. This area contains natural ridges running north and south with long wetlands in the depressions between. A relatively complex interaction of overland flow exists between these wetlands, with the east wetlands flowing north and the west wetlands flowing south. Water collects in the area south of 35th Street and east of Travelers Palm Drive, stagnating there for extended periods without an outfall to the south. During large storm events, water flows from this area into Florida Shores.

The City installed a stone weir on the south side of 35th Street between Pine Tree Drive and Orange Tree Drive to allow this area to drain with the expectation that water could gradually pass through the void space of the stone, enter the Florida Shores stormwater management system, and gradually drain between storm events.

Instead of managing this flooded area with berms, one hypothesis involves constructing a storage pond in this area for safer and more effective stormwater retention. Water in a pond could be stored at a comparatively lower elevation with the goal of reducing peak stages during storm events and reducing flow into Florida Shores.

A model scenario was prepared in which an approximately 23-acre pond is constructed south of 35th Street and east of Travelers Palm Drive. Several different configurations were evaluated. The pond was modelled as a standalone improvement, with channelized connections to the E9 and E13 Canals and piped connections reaching south across Volco Road.

Ultimately, these improvements showed little to no benefit, often worsening flooding in nearby problem areas in Florida Shores, likely attributable to several factors. Primarily, the elevation of this area is relatively high and directing water into the pond is difficult, as the top elevation would be higher than many nearby problem areas. Additionally, a pond constructed at a comparatively high elevation presents a possibility for backflow to occur into lower-lying properties. Secondly, the pond is not close to a problem area and is even farther from an outfall to the Indian River North, which makes it difficult for the pond to provide effective relief to the problem areas or remove water from Florida Shores.

8.4 Project Phases

A phasing approach was used to maximize each proposed project's benefits. Projects were divided into four phases according to the order of implementation, with Phase 1 projects occurring first and Phase 4 projects occurring last.

8.4.1 Phase 1 (2026–2034)

Projects were selected for inclusion in Phase 1 for several reasons. They do not require property acquisitions and can be started in a more immediate timeframe. Additionally, their effectiveness does not depend on other projects and results indicate they will not cause negative impacts elsewhere in the City. Further, they may already be under planning or construction, as is the case with the G2–G11 Group A and B projects, or the City has previously expressed interest in the project, such as with the Silver Palm Ditch Improvements. These projects allow for future improvements to maximize benefits to their associated problem areas. Figure 160 shows the locations of Phase 1 projects. Table 92 summarizes the proposed Phase 1 projects by problem area.

Table 93 summarizes the LOS delivered by the Phase 1 projects. Service levels are indicated by the number of buildings with reduced flood risk during the 25-year and 100-year/24-hour design storm events. Phase 1 demonstrates considerable effectiveness in mitigating flood risk for the 25-year/24-hour design-storm event, reducing building flood risk for 69 percent of structures within the identified problem areas.

Appendix G contains inundation maps by problem area, presenting data for both 25-year and 100-year/24-hour design storm events.

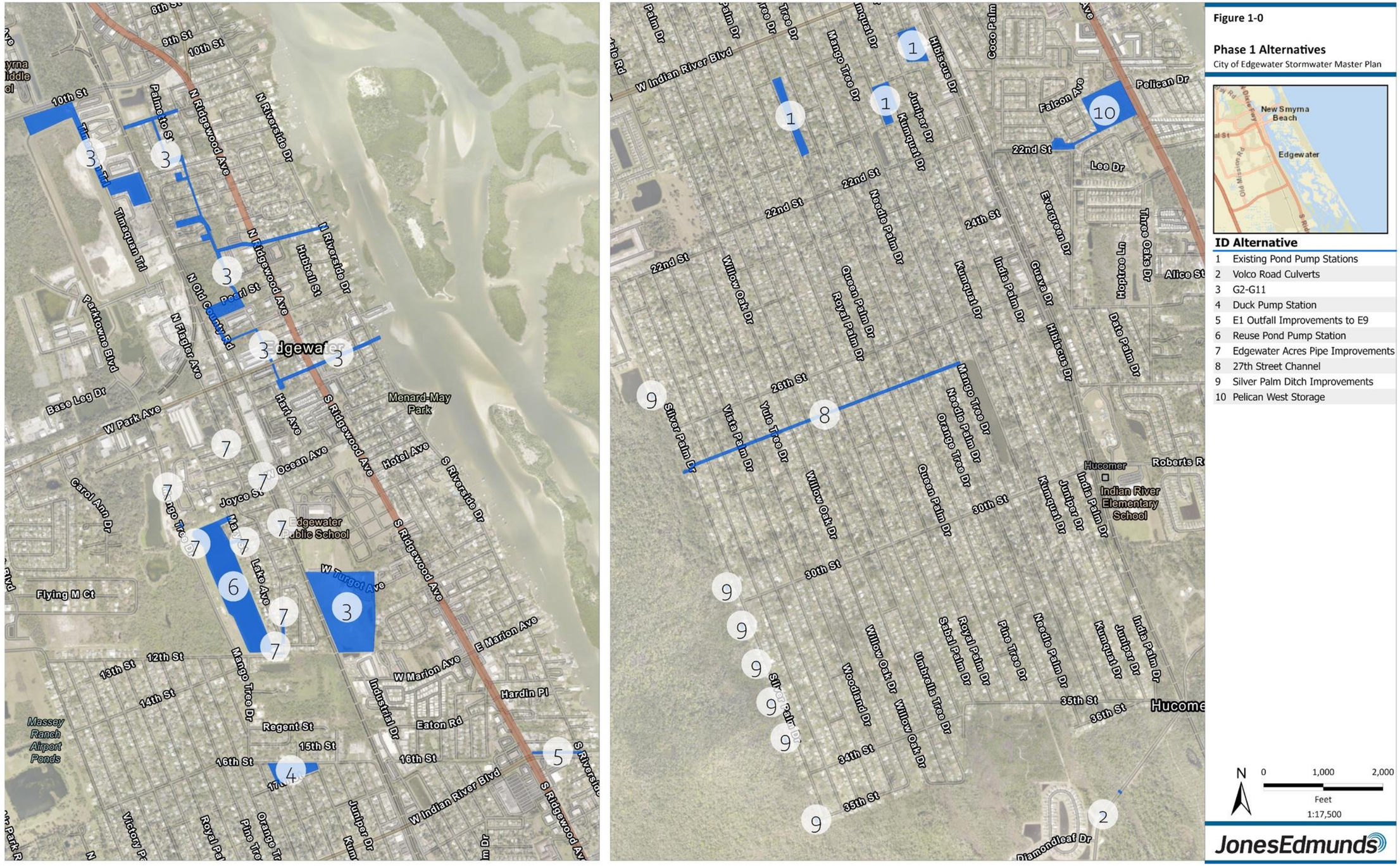
Table 92 Phase 1 (2026–2034) Projects

Problem Region	Problem Areas	Phase 1 Projects
Florida Shores South of Indian River Boulevard	1000, 1006, 1009	Pump Stations on Existing Ponds Volco Road Improvements
Florida Shores North of Indian River Boulevard	1003, 1010, 1013	Duck Pond Pump Station 18th Street Canal Improvements
Florida Shores West Side	1019, 1020, 1022	27th Street Channel to E9 Silver Palm Ditch improvements
Edgewater Acres	1004, 1021	Reuse Pond Pump Station Edgewater Acres Pipe Improvements
G2 and G11 Canals	1001, 1002, 1015	Group A and Group B
Pelican Cove West	1023	Pelican West Storage

Table 93 Phase 1 (2026–2034) Flooding above Building FFE

Problem Region	25-Year/24-Hour Event			100-Year/24-Hour Event		
	Existing	After Phase 1	Buildings Improved	Existing	After Phase 1	Buildings Improved
Florida Shores South of Indian River Boulevard	137	24	113	370	278	292
Florida Shores North of Indian River Boulevard	7	3	4	38	21	17
Florida Shores West Side	0	0	0	6	5	1
Edgewater Acres	12	10	2	35	15	20
G2 and G11 Canals	33	23	10	107	94	13
Pelican Cove West	0	0	0	21	20	1
Total Buildings	**189**	**60**	**129**	**577**	**433**	**144**

Figure 160 Phase 1 Projects



8.4.2 PHASE 2 (2035–2044)

The Phase 2 projects in Figure 161 and Table 94 are recommended for implementation after the completion of Phase 1 projects. They build on Phase 1 projects and rely on them to avoid downstream impacts. These projects require property acquisitions and will pose greater permitting challenges, requiring coordination with agencies like FDOT, FEC, and USACE. These projects also lay the foundation for Phase 3 and 4 projects.

Table 95 summarizes the LOS delivered by the Phase 2 projects. Service levels are indicated by the number of buildings with reduced flood risk during 25-year and 100-year/24-hour design storm events. Phase 2 demonstrates considerable effectiveness in mitigating flood risk for the 100-year/24-hour design storm, reducing building flood risk for 72 percent of structures within the identified problem areas.

Appendix G contains inundation maps by problem area, presenting data for both 25-year and 100-year/24-hour design storm events.

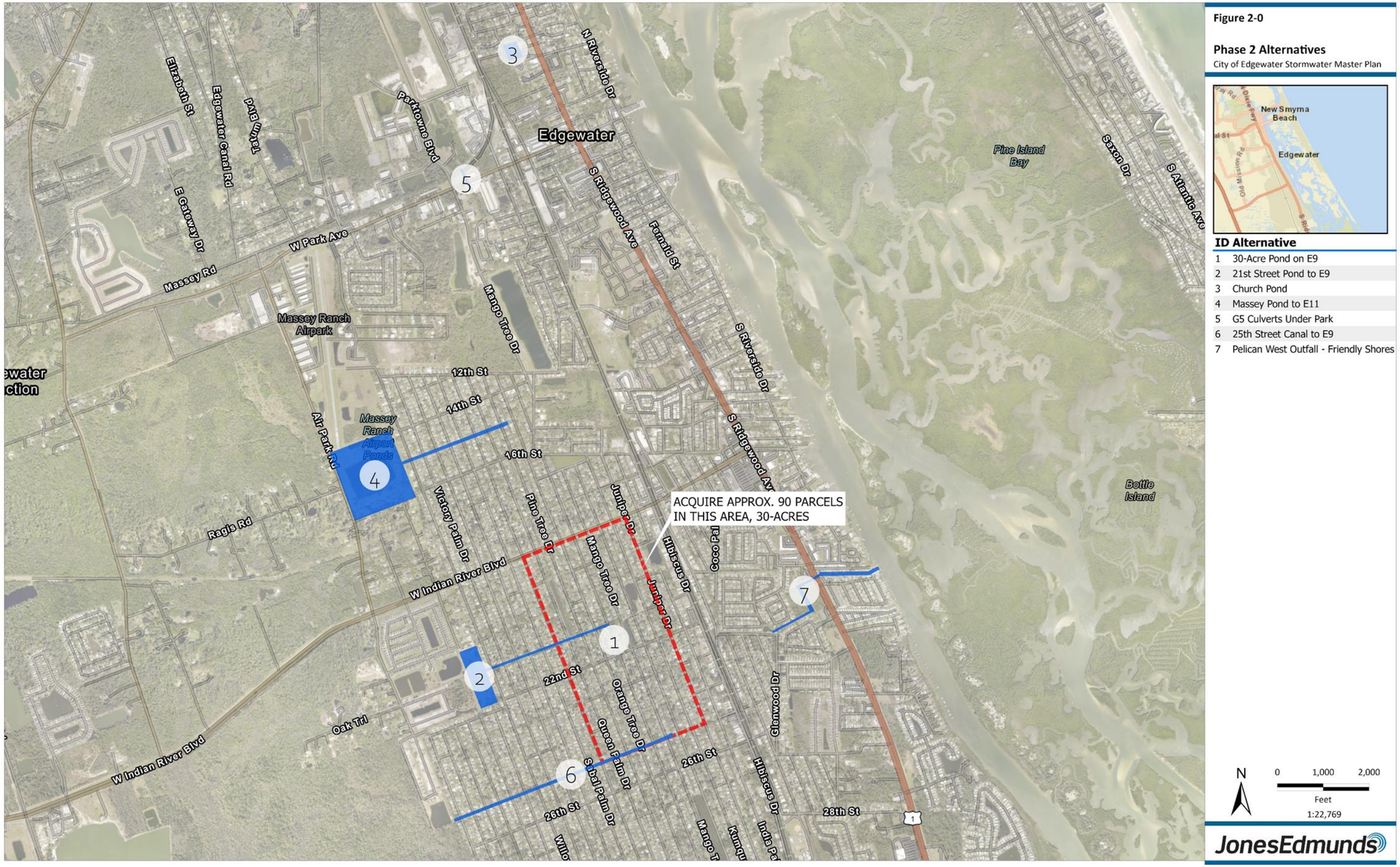
Table 94 Phase 2 (2035–2044) Projects

Problem Region	Problem Areas	Phase 2 Projects
Florida Shores South of Indian River Boulevard	1000, 1006, 1009	30-Acre Pond (E9) 21st Street Pond to E9 Canal
Florida Shores North of Indian River Boulevard	1003, 1010, 1013	Massey Pond to E11 Canal
Florida Shores West Side	1019, 1020, 1022	25th Street Canal to E9
Edgewater Acres	1004, 1021	G5 Culverts under Park Avenue
G2 and G11 Canals	1001, 1002, 1015	Church Pond
Pelican Cove West	1023	Pelican West Storage Friendly Shores Outfall to Pelican West – Storage

Table 95 Phase 2 (2035–2044) Flooding above Building FFE

Problem Region	25-Year/24-Hour Event			100-Year/24-Hour Event		
	Existing	After Phase 2	Buildings Improved	Existing	After Phase 2	Buildings Improved
Florida Shores South of Indian River Boulevard	137	4	133	370	47	323
Florida Shores North of Indian River Boulevard	7	1	6	38	7	31
Florida Shores West Side	0	0	0	6	4	2
Edgewater Acres	12	10	2	35	15	20
G2 and G11 Canals	33	23	10	107	93	14
Pelican Cove West	0	0	0	21	6	15
Total Buildings	**189**	**38**	**151**	**577**	**172**	**405**

Figure 161 Phase 2 Projects



8.4.3 PHASE 3 (2045–2049)

The Phase 3 projects in Figure 162 and Table 96 are recommended for implementation after the completion of Phase 1 and 2 projects, as they require these improvements to avoid downstream impacts. Phase 3 projects seek to provide additional storage and conveyance improvements to supplement previously constructed projects. These projects also lay the foundation for Phase 4 projects.

Table 97 summarizes the LOS delivered by the Phase 3 projects. Service levels are indicated by the number of buildings with reduced flood risk during the 25-year and 100-year/ 24-hour design storm, events. Phase 3 demonstrates considerable effectiveness in mitigating flood risk for the 100-year/24-hour design storm, reducing building flood risk for 82 percent of structures within the identified problem areas.

Appendix G contains inundation maps by problem area, presenting data for both 25-year and 100-year/24-hour design storm events.

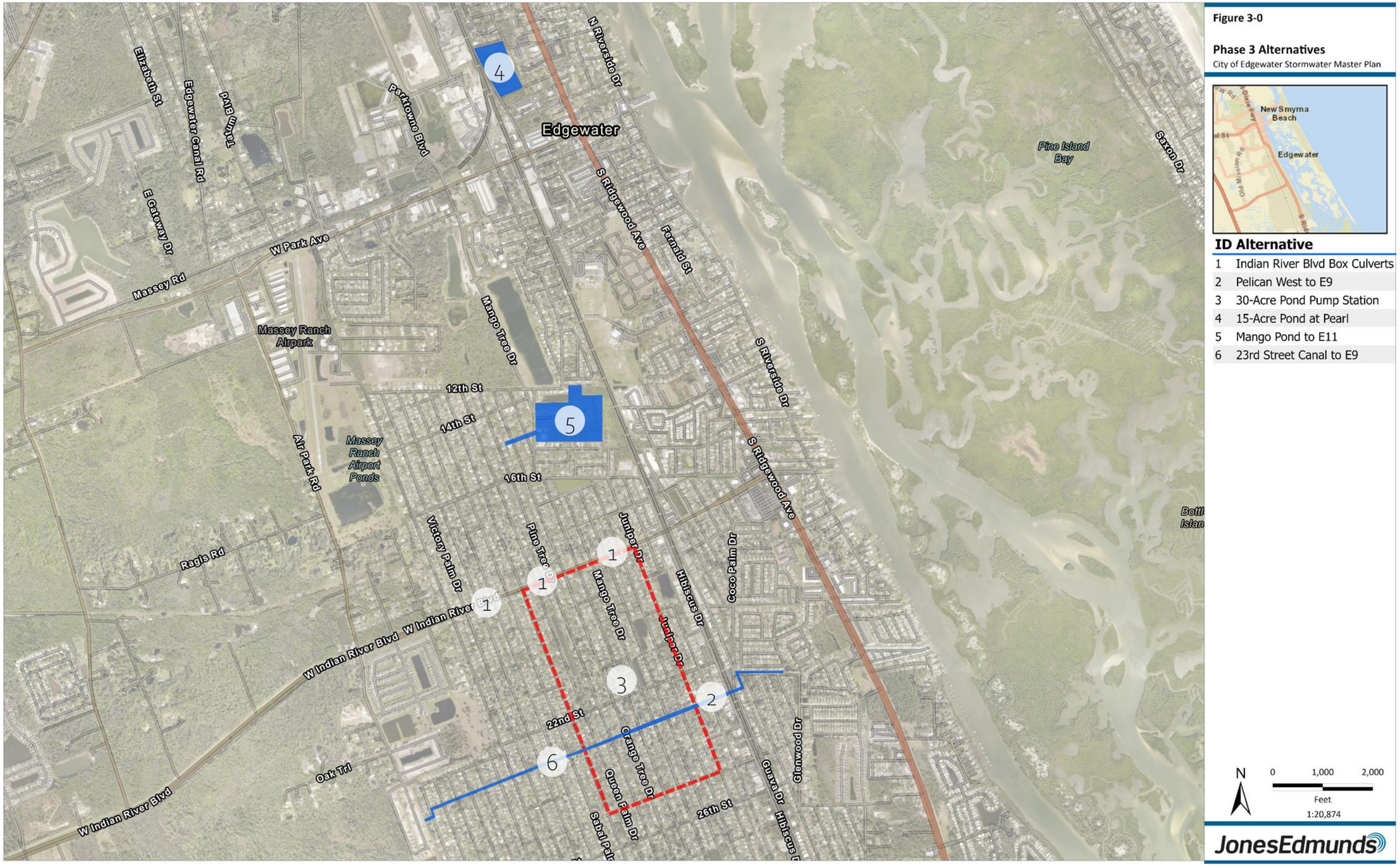
Table 96 Phase 3 (2045–2049) Projects

Problem Region	Problem Areas	Phase 3 Projects
Florida Shores South of Indian River Boulevard	1000, 1006, 1009	Box Culverts at Indian River Boulevard Friendly Shores Outfall to E9 Canal
Florida Shores North of Indian River Boulevard	1003, 1010, 1013	Mango Pond to E11 Canal
Florida Shores West Side	1019, 1020, 1022	23rd Street Canal to E9
Edgewater Acres	1004, 1021	
G2 and G11 Canals	1001, 1002, 1015	15-Acre Pond at Pearl Street
Pelican Cove West	1023	

Table 97 Phase 3 (2045–2049) Flooding above Building FFE

Problem Region	25-Year/24-Hour Event			100-Year/24-Hour Event		
	Existing	After Phase 3	Buildings Improved	Existing	After Phase 3	Buildings Improved
Florida Shores South of Indian River Boulevard	137	2	135	370	36	334
Florida Shores North of Indian River Boulevard	7	0	7	38	3	35
Florida Shores West Side	0	0	0	6	3	3
Edgewater Acres	12	9	3	35	15	20
G2 and G11 Canals	33	14	19	107	52	55
Pelican Cove West	0	0	0	21	2	19
Total Buildings	**189**	**25**	**164**	**577**	**111**	**466**

Figure 162 Phase 3 Projects



8.4.4 PHASE 4 (2050–2055)

The Phase 4 projects in Figure 163 and Table 98 are proposed as long-term conceptual improvements due to their large scale and requirement of large voluntary property acquisitions. Given the difficulty of these projects, the precise location of several included projects will vary. These projects are intended to address flooding associated with predicted SLR.

These projects are the final steps in maximizing flood control. They depend on the implementation of projects in the previous phases for maximized benefits.

Table 99 summarizes the LOS delivered by the Phase 4 projects. Service levels are indicated by the number of buildings with reduced flood risk during 25-year and 100-year/24-hour design storm events. Phase 4 demonstrates considerable effectiveness in mitigating flood risk for the 100-year/24-hour design storm event, reducing building flood risk for 86 percent of structures within the identified problem areas. In addition, Phase 4 projects provide the same LOS while accounting for potential future SLR.

Appendix G contains inundation maps by problem area, presenting data for both 25-year and 100-year/24-hour design storm events.

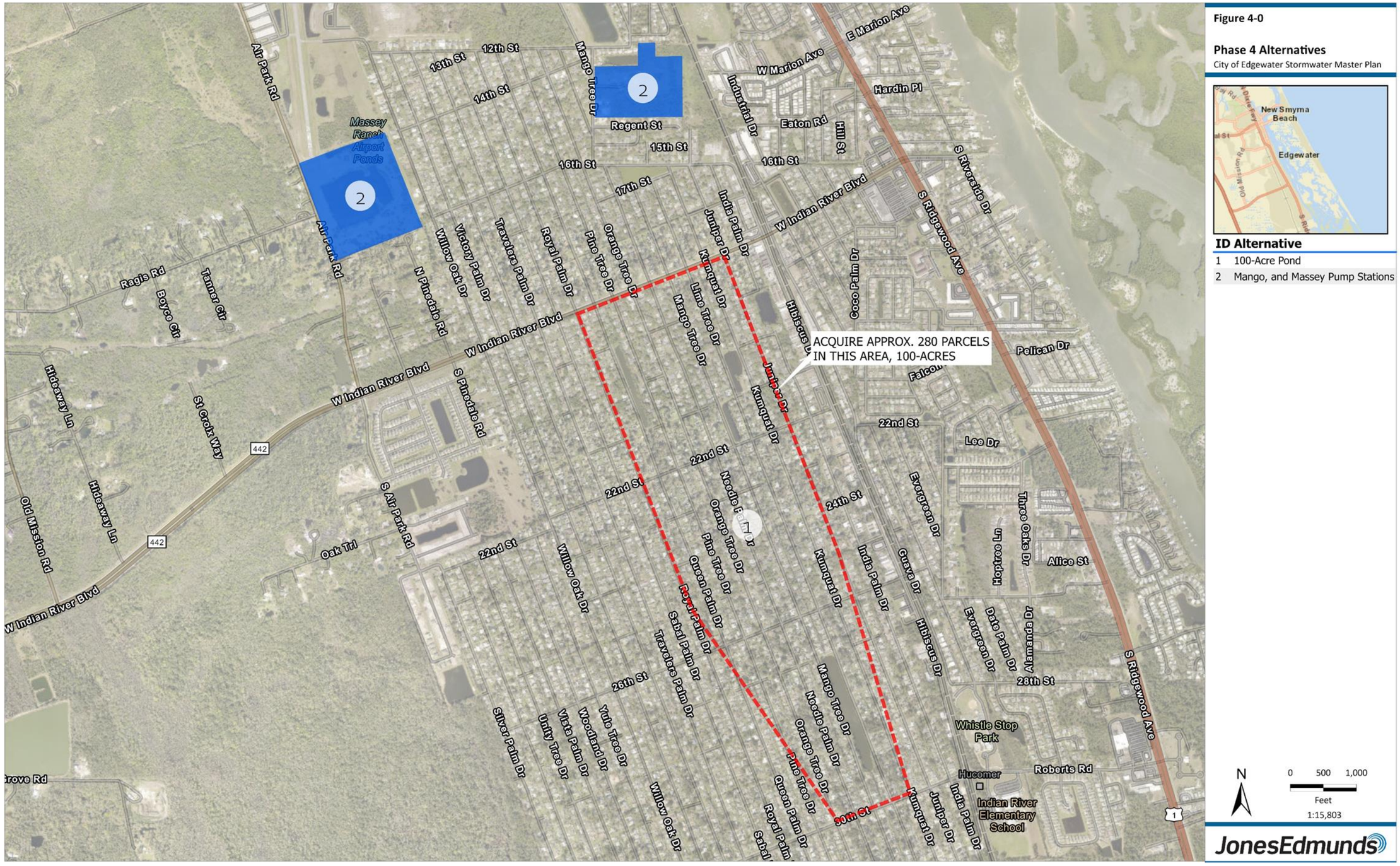
Table 98 Phase 4 (2050–2054) Projects

Problem Region	Problem Areas	Phase 4 Projects
Florida Shores South of Indian River Boulevard	1000, 1006, 1009	Florida Shores 100-Acre Pond to E9 and E10
Florida Shores North of Indian River Boulevard	1003, 1010, 1013	Pump Stations at Mango and Massey Ponds
Florida Shores West Side	1019, 1020, 1022	
Edgewater Acres	1004, 1021	
G2 and G11 Canals	1001, 1002, 1015	
Pelican Cove West	1023	

Table 99 Phase 4 (2050–2054) Flooding above Building FFE

Problem Region	25-Year/24-Hour Event			100-Year/24-Hour Event		
	Existing	After Phase 4	Buildings Improved	Existing	After Phase 4	Buildings Improved
Florida Shores South of Indian River Boulevard	137	2	135	370	14	356
Florida Shores North of Indian River Boulevard	7	0	7	38	2	36
Florida Shores West Side	0	0	0	6	3	3
Edgewater Acres	12	9	3	35	15	20
G2 and G11 Canals	33	14	19	107	52	55
Pelican Cove West	0	0	0	21	2	19
Total Buildings	**189**	**25**	**164**	**577**	**88**	**489**

Figure 163 Phase 4 Projects



8.5 CAPITAL IMPROVEMENT PLAN

The CIP outlines a 30-year schedule for executing four distinct project phases along with the respective cost estimates. The figures in Table 100 are based on current dollar values, and future planning should account for inflationary considerations. Further, the provided costs do not encompass land acquisition expenses, as specific parcels for most projects are unidentified.

8.5.1 PHASE 1 TIMELINE (2026–2034)

As outlined earlier in this chapter, the Phase 1 projects comprise initiatives that can advance independently without property acquisition. Table 100 presents a detailed timeline for completing these proposed Phase 1 projects, including itemized costs for each initiative and the total Phase expenditure. The selection process for Phase 1 projects was conducted with a strategic emphasis on addressing immediate opportunities, such as improvements to Volco Road and the Silver Palm Ditch. Further, Phase 1 includes ongoing enhancements to the G2/G11 Canals.

8.5.2 PHASE 2 TIMELINE (2035–2044)

The selected Phase 2 projects will expand on the progress made during Phase 1. These initiatives have been ranked in order of importance and are scheduled for implementation over the ten-year span from 2035 to 2044. Table 101 outlines the proposed timeline and estimated costs for carrying out Phase 2.

8.5.3 PHASE 3 TIMELINE (2045–2049)

Phase 3 projects expand on those completed in Phase 2, focusing mainly on conveyance upgrades that enhance the system's efficiency in directing runoff. These efforts depend on the storage capacity established during Phases 1 and 2 to avoid inadvertently increasing flooding risks downstream. Table 102 provides an overview of the suggested schedule and estimated expenses associated with implementing Phase 3.

8.5.4 PHASE 4 TIMELINE (2050–2055)

Phase 4 is designed to improve future resilience and prepare the city for possible SLR as well as shifts in rainfall patterns and intensity. Table 103 outlines the proposed timeline along with estimated costs for carrying out Phase 4.

Table 100 Phase 1 Project Timeline

Project Name	Completion Year	Cost	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Volco Road Improvements	2026	$141,000	$141,000									
G2 and G11 Canal Improvements – Group A*	2026	$4,000,000	$4,000,000									
G2 and G11 Canal Improvements – Group B*	2027	$9,000,000		$9,000,000								
Silver Palm Ditch Improvement	2027	$76,000		$76,000								
Pump Stations on Existing Ponds	2029	$61,800,000				$61,800,000						
Duck Pond Pump Station	2030	$23,200,000					$23,200,000					
27th Street Canal to E9	2032	$6,200,000							$6,200,000			
18th Street Canal Improvements	2033	$26,300,000								$26,300,000		
Reuse Pond Pump Station	2034	$21,800,000									$21,800,000	
Total Cost		**$152,517,000**	**$4,141,000**	**$9,076,000**	**$0**	**$61,800,000**	**$23,200,000**	**$0**	**$6,200,000**	**$26,300,000**	**$21,800,000**	**$0**

Note: *G2/G11 Canal Improvement Cost is not included in the Total Capital Cost since these projects are currently underway.

Table 101 Phase 2 Project Timeline

Project Name	Completion Year	Cost	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
G5 Culverts at Park Avenue	2036	$990,000		$990,000								
Church Pond	2037	$540,000			$540,000							
30-Acre Pond in Florida Shores South	2038	$22,900,000				$22,900,000						
Edgewater Acre Pipe Improvements	2039	$2,400,000					$2,400,000					
Massey Pond to E11 Canal	2040	$14,600,000						$14,600,000				
25th Street Canal to E9	2041	$6,900,000							$6,900,000			
21st Street Pond to E9	2042	$8,800,000								$8,800,000		
Pelican West Storage	2043	$4,400,000									$4,400,000	
Friendly Shores Outfall to Pelican West – Storage	2044	$1,000,000										$1,000,000
Total Cost		**$62,530,000**	**$0**	**$990,000**	**$540,000**	**$22,900,000**	**$2,400,000**	**$14,600,000**	**$6,900,000**	**$8,800,000**	**$4,400,000**	**$1,000,000**

Table 102 Phase 3 Project Timeline

Project Name	Completion Year	Cost	2045	2046	2047	2048	2049
Box Culverts – Indian River Boulevard	2045	$2,400,000	$2,400,000				
Friendly Shores Outfall – to E9	2046	$4,800,000		$4,800,000			
Mango Pond to E11 Canal	2047	$5,200,000			$5,200,000		
23rd Street Canal to E9	2048	$6,400,000				$6,400,000	
15-Acre Pond at Pearl	2049	$4,200,000					$4,200,000
Total Cost		**$23,000,000**	**$2,400,000**	**$4,800,000**	**$5,200,000**	**$6,400,000**	**$4,200,000**

Table 103 Phase 4 Project Timeline

Project Name	Completion Year	Cost	2050	2051	2052	2053	2054
Pump Stations (Mango and Massey)	2050	$78,300,000	$78,300,000				
100-Acre Pond in Florida Shores South	2054	$52,000,000					$52,000,000
Total Cost		**$130,000,000**	**$78,000,000**	**$0**	**$0**	**$0**	**$52,000,000**

8.6 Future Resiliency Planning

The proposed alternatives identified in this SWMP involve future resiliency planning for the City. This section identifies key challenges to consider when identifying stormwater system performance and infrastructure needs across different planning horizons. Based on available studies, this future resiliency analysis focuses on SLR as the most predictable factor, while also acknowledging the uncertainty associated with changes in rainfall intensity and frequency.

8.6.1 SLR Considerations

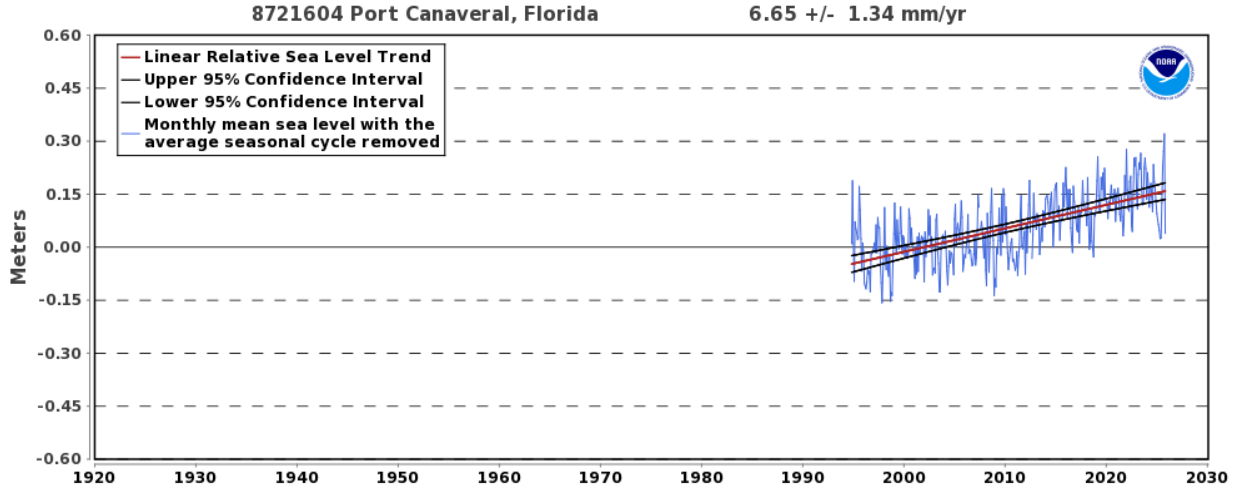
The main components of the City's stormwater system depend on hydraulic gravity head to convey water to the ultimate outfall or receiving water, typically using the available energy from gravity to drive water through the conveyance system to the outfalls to infiltrate the groundwater through impervious areas, dry retention areas, or exfiltration systems.

SLR poses a growing threat to the City's stormwater infrastructure by elevating outfall water levels, increasing tidal backflow, and raising groundwater elevations, which ultimately reduce the gravity-driven capacity of the system. NOAA documented in the *2022 Sea Level Rise Technical Report* that rising coastal water levels caused by ocean warming and regional dynamics is a well-documented trend along the east coast of Florida.

8.6.2 Historical Trends

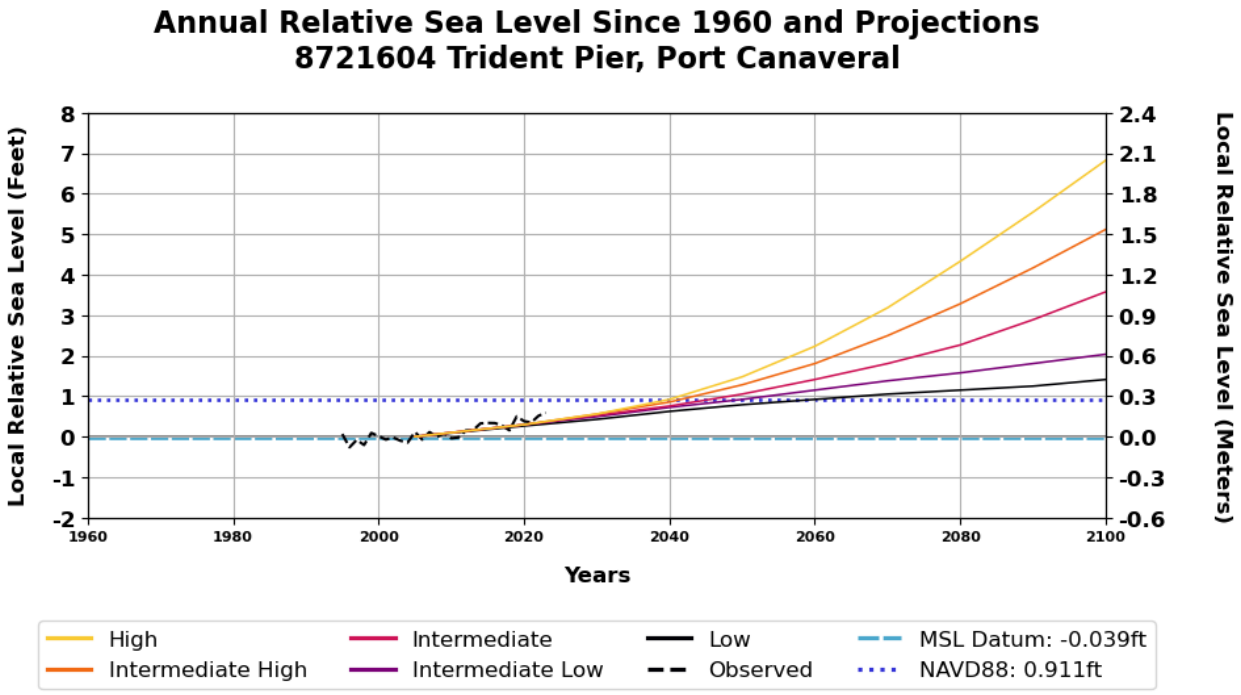
Observed tide gauge data shows that the sea level has risen for decades. Figure 164 shows a steady upward trend using local tide measurements obtained from the Port Canaveral tide station.

Figure 164 NOAA SLR Projections



NOAA projects that average sea level will rise 10–12 inches over the next 30 years, which is nearly equal to the rise measured over the last 100 years. Figure 165 shows the full suite of NOAA scenario estimates (low, intermediate low, intermediate, intermediate high, and high) projected for the Port Canaveral tidal gauge.

Figure 165 Annual Sea Level Predictions (NOAA)



The intermediate scenario estimate is frequently recommended for general planning because it represents a median estimate that balances near-term confidence with reasonable assumptions about future atmospheric conditions. The intermediate projection was chosen for this analysis because it supports resilient planning while acknowledging inherent uncertainties. Table 104 shows the projected SLR according to the intermediate projection. The 2070 prediction is the maximum SLR studied for this report, which shows a rise of approximately 1.855 feet from the current tidal levels.

Table 104 SLR NOAA Estimates

Phase	Timeline	NOAA SLR Year Estimate	Rise (ft)	Resulting Expected High Tide Elevation (ft)
Phase 1	2025–2035	Existing (MHHW)	0	1.6
Phase 1+2	2035–2045	2035	0.705	2.305
Phase 1+2+3	2045–2050	2040	0.820	2.42
Phase 1+2+3+4	2050–2055	2070	1.855	3.455

The existing conditions model used a static high tide prediction of 1.6 feet as a boundary condition at the outfall nodes on the river. The predicted SLR in Table 104 (Column 4) was added to the existing conditions high tide level, and the resulting value was used as the new

static high tide boundary condition in the model (Column 5). For example, the 2070 rise prediction of 1.855 feet would correspond with a boundary condition set to 3.455 feet.

8.6.3 Resiliency Strategies

The projects in the four proposed phases developed from the Alternative Analysis can generally be grouped into the following categories:

- Conveyance Improvements
- Additional Storage
- Pump Stations
- New Outfalls
- Backflow Prevention

All categories except pump stations rely on gravity as the main driving force to convey water across the Watershed either to an outfall or a storage area. However, as discussed in Section 8.6.1, SLR limits the City's ability to rely solely on gravity to convey water away from the City. Therefore, the most important strategies to consider when planning for resilience to SLR include:

- Pumped systems that can overcome the hydraulic disadvantage.
- Backflow prevention to prevent tidal backflows.
- Additional storage upstream of backflow prevention that can receive runoff and reduce surface level flooding.

Other methods often considered to prevent or reduce the impact from tidal flooding include sea walls, elevating roadways, or elevating structures. However, these methods were not considered for this SWMP because they generally only provide localized improvements adjacent to the water bodies.

8.6.4 State Resiliency Grant Requirements

Under Florida Statute Section 380.093 (the Resilient Florida Program), entities applying for Resilient Florida grant funding must include SLR in their vulnerability assessments. For assessments initiated after July 1, 2024, the statute requires using at least the 2022 NOAA intermediate-low and intermediate SLR scenarios across two planning horizons (e.g., to 2040/2070) as a minimum in the analysis. Table 104 summarizes the SLR scenario analysis for the 2040 and 2070 planning horizons.

The City's most recent vulnerability assessment was conducted using the East Central Florida Regional Planning Council (ECFRPC) SLR predictions and a static approach to identifying tidal flooding using a recent DEM. This "bathtub"-style SLR analysis raises water surfaces uniformly across the landscape without simulating the hydraulics and rainfall interaction that affects system performance. This vulnerability assessment can be further refined using the modeling efforts from this SWMP and would ensure that the most accurate vulnerability estimates are presented to FDEP to best position the City to receive Program funding.

8.6.5 Results from SLR Analysis

The SLR analysis results show that the proposed alternatives can effectively combat the effects of elevated sea levels without major losses in effectiveness. Table 105 summarizes the building inundation modeling results under existing tidal conditions (1.6 feet-NAVD) across the four

phases and four storm events (2-, 10-, 25-, and 100-year). The table reports the number of buildings expected to flood in each scenario. These data include the following building counts:

- Expected to be inundated above the estimated FFE.
- Within the modeled inundation extent but not expected to be inundated above the FFE.
- Not expected to be inundated.

Each progressive phase shows improvements where fewer buildings are shown as inundated above the FFE across all storm events.

Table 105 Building Inundation Analysis for Existing Tide Conditions

	Existing			
	2-Year/ 24-Hour	10-Year/ 24Hour	25-Year/ 24-Hour	100-Year/ 24-Hour
Flooding Above FFE	7	56	198	657
Flooding Below FFE, Touches Building Footprint	387	1,084	1,594	2,123
No Building Flooding	11,499	10,753	10,101	9,113
	Phase 1			
Flooding Above FFE	5	15	65	471
Flooding Below FFE, Touches Building Footprint	336	762	1,303	2,019
No Building Flooding	11,552	11,116	10,525	9,403
	Phase 2			
Flooding Above FFE	5	16	45	210
Flooding Below FFE, Touches Building Footprint	308	642	1,013	1,841
No Building Flooding	11,580	11,235	10,835	9,842
	Phase 3			
Flooding Above FFE	5	14	35	149
Flooding Below FFE, Touches Building Footprint	288	598	925	1,748
No Building Flooding	11,600	11,281	10,933	9,996
	Phase 4			
Flooding Above FFE	5	14	34	125
Flooding Below FFE, Touches Building Footprint	285	588	911	1,569
No Building Flooding	11,603	11,291	10,948	10,199

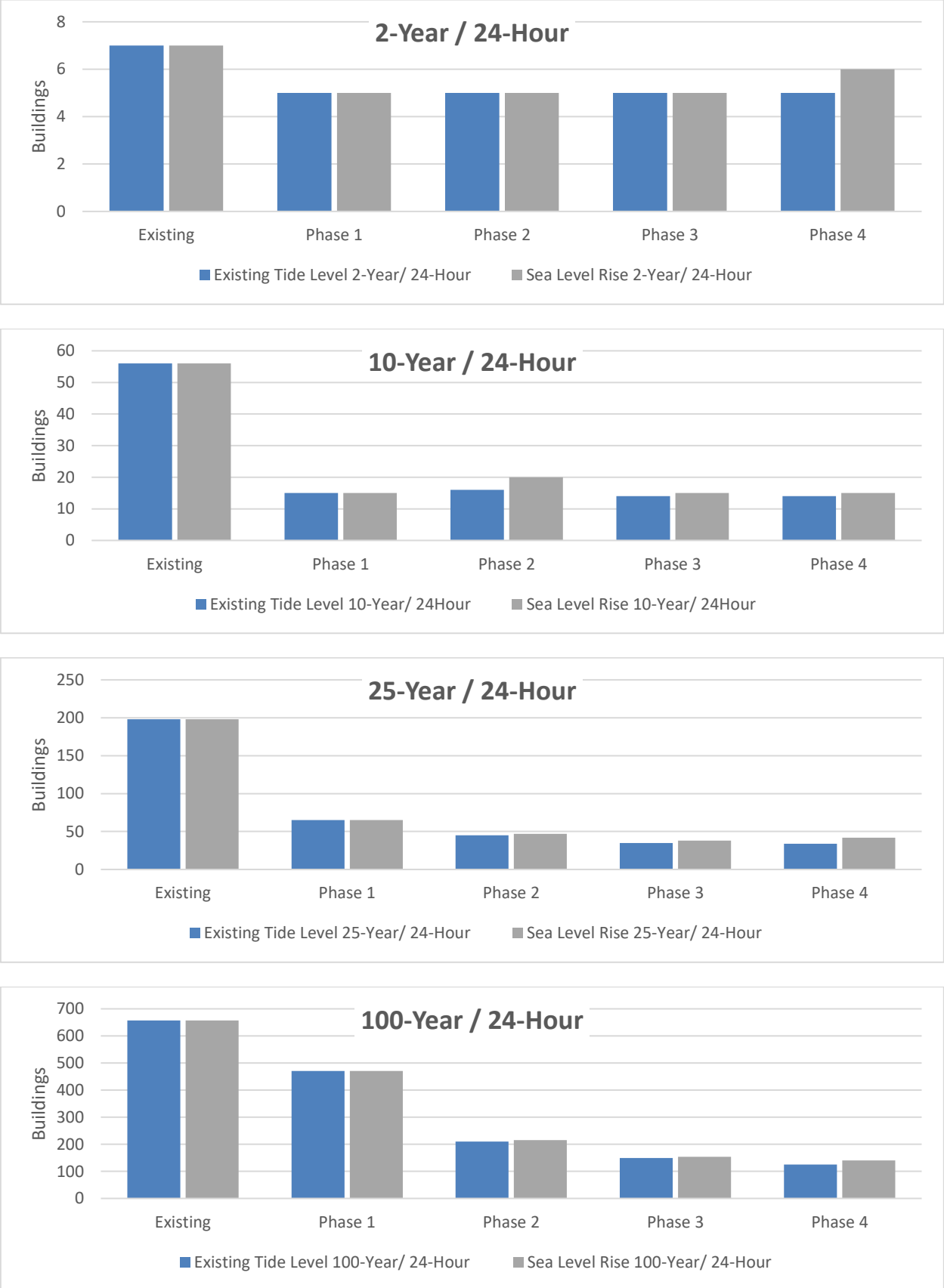
Table 106 summarizes the building inundation analysis for the different storm events for each of the four phases for the SLR conditions. The results show the updated count of expected building inundation for each phase alternative coupled with the progressive predicted SLR.

Table 106 Building Inundation Analysis for SLR Tide Conditions

	Existing Conditions (SLR+0.0 ft)			
	2-Year/ 24-Hour	10-Year/ 24-Hour	25-Year/ 24-Hour	100-Year/ 24-Hour
Flooding Above FFE	7	56	198	657
Flooding Below FFE, Touches Building Footprint	387	1,084	1,594	2,123
No Building Flooding	11,499	10,753	10,101	9,113
	Phase 1 (SLR+0.0 ft)			
Flooding Above FFE	5	15	65	471
Flooding Below FFE, Touches Building Footprint	336	762	1,303	2,019
No Building Flooding	11,552	11,116	10,525	9,403
	Phase 2 (SLR+0.71 ft)			
Flooding Above FFE	5	20	47	215
Flooding Below FFE, Touches Building Footprint	318	645	1,021	1,844
No Building Flooding	11,570	11,228	10,825	9,834
	Phase 3 (SLR+0.82 ft)			
Flooding Above FFE	5	15	38	154
Flooding Below FFE, Touches Building Footprint	294	607	927	1,761
No Building Flooding	11,594	11,271	10,928	9,978
	Phase 4 (SLR+1.86 ft)			
Flooding Above FFE	6	15	42	140
Flooding Below FFE, Touches Building Footprint	314	610	946	1,736
No Building Flooding	11,573	11,268	10,905	10,017

As expected, the number of buildings either within the inundation footprint or inundated above the FFE increases as the sea level increases. However, Figure 166 shows that across all storm events and increased sea level conditions, the phased group of projects proposed in this SWMP maintains approximately the same LOS without major degradation of inundation protection despite the increased boundary condition caused by SLR.

Figure 166 Building Inundation above FFE for Existing Sea Level versus SLR Conditions



8.6.6 Precipitation Considerations

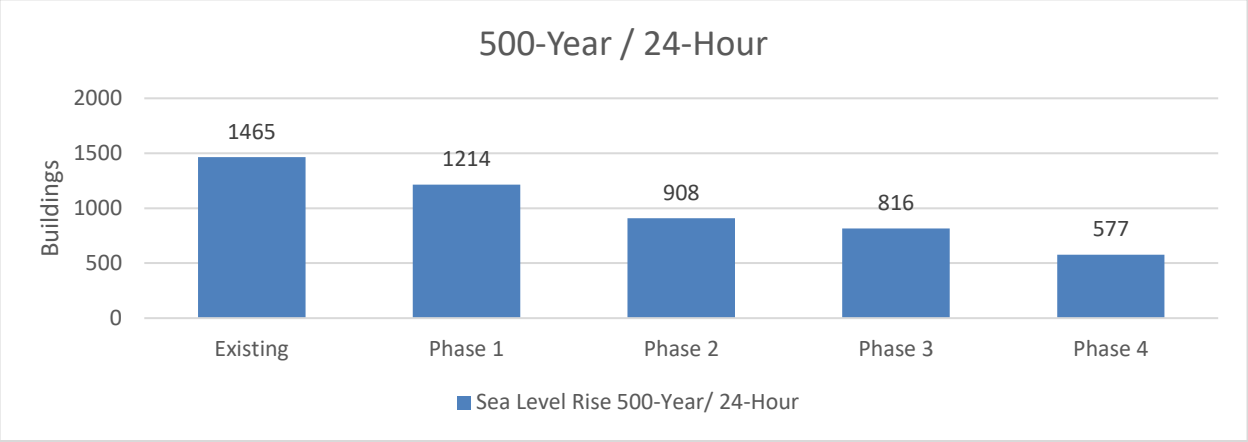
Although Florida's overall annual average rainfall of 52–54 inches has remained somewhat constant, recent trends show changes as extreme precipitation events are expected to become more frequent and intense. A study by the South Florida Water Management District (SFWMD) found that the frequency of intense storm events increased after 1980 with recent major rainfall events indicating that the trend in more intense storms continues to increase. A 2021 assessment by Broward County of future conditions showed a predicted rainfall increase of 13 percent for a 100-year storm event.

Recent extreme rainfall events that have affected the City have been discussed throughout this SWMP, including the September 2024 storm event and Hurricane Milton. Other recent notable storm events that caused issues throughout the City include Hurricane Ian and a large storm event in October 2025 during an especially high spring tide, also known as a king tide.

Predicting the future rainfall trends is outside the scope of this SWMP because no established method exists for inclusion in the stormwater model. However, the most extreme rainfall distribution studied (such as the 500-year/24-hour storm) can provide insight into the extent that major increases in rainfall amounts would affect the LOS provided by the proposed alternatives. The amount of rainfall for a 500-year storm event is 18.2 inches, which is approximately 39 percent more than the 13.2 inches of a 100-year storm event. This modeled increase in rainfall is well above the expected 13 percent increase in the 100-year storm previously mentioned, so the analysis results provide an extreme scenario of rainfall increase.

Figure 168 shows the number of buildings expected to be inundated above the FFE for the 500-year 24-hour storm event, without taking SLR into account. The number of buildings inundated would be more than double the current expected flooding in the analysis of the 100-year storm.

Figure 167 Building Inundation Above FFE for 500-Year Storm Event



A recent trend toward shorter, more intense storms than what many legacy stormwater systems were designed to handle has occurred. A stormwater system will perform differently when subjected to a rainfall event of a similar depth but shorter duration, usually resulting in higher peak flows that test the limits of capacity of existing infrastructure.

8.6.7 SWMP AS A LIVING DOCUMENT

This SWMP is intended to function as a living document that evolves alongside the community and should be revisited and refined to ensure continued relevance and effectiveness. Future updates to this master planning effort will be needed to adapt to regulatory changes or changes to environmental conditions.

The stormwater model is a dynamic tool that can be updated with revised topography, infrastructure improvements, and/or development patterns to evaluate system performance under various stressors. The model can also be updated as new data become available, such as updated SLR projections or new rainfall intensity curves. By maintaining and periodically recalibrating the model, the City can make informed, data-driven decisions that enhance long-term flood resilience.

9 OPERATION AND MAINTENANCE (O&M) REVIEW AND CONDITION ASSESSMENT CRITERIA

The City's Stormwater Division, part of the City's Environmental Services Department, is responsible for operating and maintaining the City's stormwater system. The City's stormwater system includes approximately:

- 25 miles of primary drainage ditches/canals.
- 30 miles of stormwater pipe.
- 1,300 inlets, catch basins, pond control structures, and manholes.
- 300 stormwater ponds.
- 150 miles of swales and driveway culverts.
- 1,800 pipe end treatments.

The Stormwater Division includes 13 personnel, 11 of which are dedicated full-time to stormwater maintenance and two part-time personnel who split time between stormwater and other divisions. The Stormwater Division personnel include:

- 1 Public Works Division Manager (Part-time).
- 1 Superintendent (Part-time).
- 1 Team leader.
- 2 Canal maintenance specialists.
- 1 Certified spray tech/heavy equipment operator.
- 2 Heavy equipment operators.
- 3 Equipment operators.
- 2 Maintenance workers.

Jones Edmunds reviewed the City's existing drainage O&M program and developed recommendations for improvement. Jones Edmunds met with and interviewed City staff to determine how the system is currently maintained and operated, and we collected and reviewed existing documentation and/or tracking developed by the City for its O&M program. The City's GIS data were used to characterize the stormwater system and determine locations included in the plan. Jones Edmunds reviewed the GIS data and made updates where gaps existed. This Section summarizes the City's existing O&M program and identifies opportunities/recommendations for improvements for the following:

- Inspection/maintenance frequency by drainage system component type.
- Inspection/maintenance activities by drainage system component type.
- Inspection/maintenance tracking systems.
- Drainage O&M budgets and personnel.

Jones Edmunds also developed recommended scoring system templates for assessing the condition of the City's stormwater infrastructure. The City can use these templates to complete condition assessments and identify/prioritize locations where system maintenance and/or rehabilitation is needed. The maintenance plan, budget, and approach outlined in this report are intended for recurrent maintenance activities and do not account for specific locations where the system has failed and significant repairs are needed. The City should

identify locations where the system failed during their routine inspection/maintenance activities and determine if City maintenance crews can make the necessary repairs or if a larger scale capital improvement project is needed.

9.1 Inspection Schedule and Activities

The City does not have a formalized plan for performing regular inspections of the stormwater system. Currently, inlets and pipe ends are inspected before and after storm events for blockages, and crews will inspect system components while performing ditch, pond, and other maintenance activities. Inspection of the entire system should be performed regularly to identify where the system needs to be maintained to avoid system failures. This section provides a recommended inspection schedule and summarizes the American Society of Civil Engineers (ASCE) recommendations for inspection activities.

9.1.1 Inspection Schedule

A one-size-fits-all inspection schedule for stormwater systems is not possible. Inspection schedules can vary based on different factors—drainage feature type, sediment/debris loading, permit requirements, etc. Inspection requirements and recommendations have been provided by permitting agencies and ASCE that can serve as a starting place for developing a maintenance schedule based on industry standards. If necessary, the schedule should be adjusted over time to meet the unique needs of the City's system.

According to the SJRWMD *Environmental Resource Permit (ERP) Applicant's Handbook*, Volume 1, all permitted stormwater managements systems, dams, impoundments, reservoirs, or appurtenant works must be operated and maintained in perpetuity. The O&M should be in accordance with the design plans, calculations, and other specifications submitted with an application, approved by the agency, and incorporated as a condition into any permit issued. Maintenance requirements, if provided, are stipulated on a case-by-case basis and documented as conditions in the permit. SJRWMD does not require wholesale inspections of permitted systems on a regular schedule. Jones Edmunds reviewed all the ERP permits on the SJRWMD permitting website for which the City was listed as an owner. Jones Edmunds reviewed the permit conditions for each of the permits to determine the permitted inspection requirements from the District. Table 107 summarizes the inspection conditions for each of the City's stormwater permits with inspection criteria called out in the permit's general conditions. In general, all City-owned stormwater systems have conditions requiring inspection every 2 years with findings reported. Some ponds have additional conditions that are unique to the permitted systems.

Table 107 SJRWMD Permitted Inspection Requirements for City Stormwater Systems

Permit Name	SJRWMD Permit Number	Referenced Permit Conditions	Permitted Maintenance Conditions
Turgot Pond	56870-5	15	The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The O&M entity must maintain a record of each required inspection, including the date of the inspection, the name, address, and telephone number of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 14 days the entity shall submit an Exceptions Report to the District, on form number 40C42.900(6), Exceptions Report for Stormwater Management Systems Out of Compliance.
Suntrail Path City of Edgewater	215492-5	21	The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The O&M entity must maintain a record of each required inspection, including the date of the inspection, the name and contact information of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 30 days the entity shall submit a report electronically or in writing to the District using Form 62-330.311(1), "Operation and Maintenance Inspection Certification," describing the remedial actions taken to resolve the failure or deviation.
Hawk's Park Pickleball Facility	56872-4	21	The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The operation and maintenance entity must maintain a record of each required inspection, including the date of the inspection, the name and contact information of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 30 days the entity shall submit a report electronically or in writing to the District using Form 62-330.311(1), "Operation and Maintenance Inspection Certification," describing the remedial actions taken to resolve the failure or deviation.

Permit Name	SJRWMD Permit Number	Referenced Permit Conditions	Permitted Maintenance Conditions
City of Edgewater Public Works	146603-3	23, 27	Condition 23: The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The operation and maintenance entity must maintain a record of each required inspection, including the date of the inspection, the name and contact information of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 30 days the entity shall submit a report electronically or in writing to the District using Form 62-330.311(1), "Operation and Maintenance Inspection Certification," describing the remedial actions taken to resolve the failure or deviation. Condition 27: A maintenance program shall be implemented in accordance with Exhibit C of the Draft CE received February 3, 2025, for the preserved wetland and upland areas on a regular basis to ensure those areas meet the integrity and viability of the success criteria as permitted, including ensuring that the mitigation site is maintained in perpetuity free from invasive exotic species such that they comprise less than 5-percent areal coverage of plants on the Florida Exotic Pest Plant Council's list of Florida's most invasive species within the mitigation area. In addition, the permittee shall manage the conservation areas such that exotic/nuisance plant species do not dominate any one section of those areas.
Travelers Umbrella – Unity Canals Stabilization Project	186057-3	16, 22	Condition 16: The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other uplands in a manner that does not require a permit under Chapter 62-330, FAC, or cause violations of state water quality standards. Condition 22: The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The O&M entity must maintain a record of each required inspection, including the date of the inspection, the name and contact information of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 30 days the entity shall submit a report electronically or in writing to the District using Form 62-330.311(1), "Operation and Maintenance Inspection Certification," describing the remedial actions taken to resolve the failure or deviation.

Permit Name	SJRWMD Permit Number	Referenced Permit Conditions	Permitted Maintenance Conditions
Hart Avenue Drainage Improvements	111927-3	16, 20	Condition 16: The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other uplands in a manner that does not require a permit under Chapter 62-330, FAC, or cause violations of state water quality standards. Condition 20: The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The O&M entity must maintain a record of each required inspection, including the date of the inspection, the name and contact information of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 30 days the entity shall submit a report electronically or in writing to the District using Form 62-330.311(1), "Operation and Maintenance Inspection Certification," describing the remedial actions taken to resolve the failure or deviation.
Hart Avenue Drainage Improvements	111927-2	16, 22	Condition 16: The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other uplands in a manner that does not require a permit under Chapter 62-330, FAC, or cause violations of state water quality standards. Condition 22: The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The O&M entity must maintain a record of each required inspection, including the date of the inspection, the name and contact information of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 30 days the entity shall submit a report electronically or in writing to the District using Form 62-330.311(1), "Operation and Maintenance Inspection Certification," describing the remedial actions taken to resolve the failure or deviation.

Permit Name	SJRWMD Permit Number	Referenced Permit Conditions	Permitted Maintenance Conditions
Whistle Stop Park Improvements	77023-6	16, 22	Condition 16: The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other uplands in a manner that does not require a permit under Chapter 62-330, FAC, or cause violations of state water quality standards. Condition 22: The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The operation and maintenance entity must maintain a record of each required inspection, including the date of the inspection, the name and contact information of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 30 days the entity shall submit a report electronically or in writing to the District using Form 62-330.311(1), "Operation and Maintenance Inspection Certification," describing the remedial actions taken to resolve the failure or deviation.
Indian River Boulevard West Expansion	148731-1	16, 22	Condition 16: The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other uplands in a manner that does not require a permit under Chapter 62-330, FAC, or cause violations of state water quality standards. Condition 22: The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The O&M entity must maintain a record of each required inspection, including the date of the inspection, the name and contact information of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 30 days the entity shall submit a report electronically or in writing to the District using Form 62-330.311(1), "Operation and Maintenance Inspection Certification," describing the remedial actions taken to resolve the failure or deviation.

Permit Name	SJRWMD Permit Number	Referenced Permit Conditions	Permitted Maintenance Conditions
Dale Avenue to 10th Street Trail	65341-2	16, 23	Condition 16: The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other uplands in a manner that does not require a permit under Chapter 62-330, FAC, or cause violations of state water quality standards. Condition 23: Wetlands 1 and 2 must be monitored and maintained in accordance with the wetland management plan received by the District on November 28, 2016.
Whistlestop Park Driveway Interconnect	77023-5	16, 24	Condition 16: The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other uplands in a manner that does not require a permit under Chapter 62-330, FAC, or cause violations of state water quality standards. Condition 24: The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The O&M entity must maintain a record of each required inspection, including the date of the inspection, the name and contact information of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 30 days the entity shall submit a report electronically or in writing to the District using Form 62-330.311(1), "Operation and Maintenance Inspection Certification," describing the remedial actions taken to resolve the failure or deviation.

Permit Name	SJRWMD Permit Number	Referenced Permit Conditions	Permitted Maintenance Conditions
Rotary Park	107941-2	16, 23	Condition 16: The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other uplands in a manner that does not require a permit under Chapter 62-330, FAC, or cause violations of state water quality standards. Condition 23: The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The O&M entity must maintain a record of each required inspection, including the date of the inspection, the name and contact information of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 30 days the entity shall submit a report electronically or in writing to the District using Form 62-330.311(1), "Operation and Maintenance Inspection Certification," describing the remedial actions taken to resolve the failure or deviation.
30th Street Sidewalk (Silver Palm Drive to India Palm Drive)	127785-1	24	The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The O&M entity must maintain a record of each required inspection, including the date of the inspection, the name, address, and telephone number of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 14 days the entity shall submit an Exceptions Report to the District, on form number 40C-42.900(6), Exceptions Report for Stormwater Management Systems Out of Compliance.

Permit Name	SJRWMD Permit Number	Referenced Permit Conditions	Permitted Maintenance Conditions
City of Edgewater Fire Station #55	124946-1	22	The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The O&M entity must maintain a record of each required inspection, including the date of the inspection, the name, address, and telephone number of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 14 days the entity shall submit an Exceptions Report to the District, on form number 40C-42.900(6), Exceptions Report for Stormwater Management Systems Out of Compliance.
Eastern Shores Stormwater Improvements	119532-1	25	The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The O&M entity must maintain a record of each required inspection, including the date of the inspection, the name, address, and telephone number of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 14 days the entity shall submit an Exceptions Report to the District, on form number 40C-42.900(6), Exceptions Report for Stormwater Management Systems Out of Compliance.
Edgewater Water Supply Wells #17, #18, #19, and #20	119156-1	25	The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The O&M entity must maintain a record of each required inspection, including the date of the inspection, the name, address, and telephone number of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 14 days the entity shall submit an Exceptions Report to the District, on form number 40C-42.900(6), Exceptions Report for Stormwater Management Systems Out of Compliance.

Permit Name	SJRWMD Permit Number	Referenced Permit Conditions	Permitted Maintenance Conditions
City of Edgewater Kennedy Park Improvements	84804-2	22	The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The O&M entity must maintain a record of each required inspection, including the date of the inspection, the name, address, and telephone number of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 14 days the entity shall submit an Exceptions Report to the District, on form number 40C-42.900(6), Exceptions Report for Stormwater Management Systems Out of Compliance.
City of Edgewater Rotary Club	107941-1	22	The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The operation and maintenance entity must maintain a record of each required inspection, including the date of the inspection, the name, address, and telephone number of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 14 days the entity shall submit an Exceptions Report to the District, on form number 40C-42.900(6), Exceptions Report for Stormwater Management Systems Out of Compliance.
Edgewater Animal Hospital	105463-1	24	The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The operation and maintenance entity must maintain a record of each required inspection, including the date of the inspection, the name, address, and telephone number of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 14 days the entity shall submit an Exceptions Report to the District, on form number 40C-42.900(6), Exceptions Report for Stormwater Management Systems Out of Compliance.

Permit Name	SJRWMD Permit Number	Referenced Permit Conditions	Permitted Maintenance Conditions
Massey Parcel Roadway Drainage and Utility Development	65055-6	25	The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The O&M entity must maintain a record of each required inspection, including the date of the inspection, the name, address, and telephone number of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 14 days the entity shall submit an Exceptions Report to the District, on form number 40C-42.900(6), Exceptions Report for Stormwater Management Systems Out of Compliance.
ParkTowne Industrial Center – Phase 1 Drainage and Utility Improvements	65055-5	26	The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The O&M entity must maintain a record of each required inspection, including the date of the inspection, the name, address, and telephone number of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 14 days the entity shall submit an Exceptions Report to the District, on form number 40C-42.900(6), Exceptions Report for Stormwater Management Systems Out of Compliance.
ParkTowne Industrial Center – Phase 1 Drainage and Utility Improvements	65055-3	25	The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The O&M entity must maintain a record of each required inspection, including the date of the inspection, the name, address, and telephone number of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 14 days the entity shall submit an Exceptions Report to the District, on form number 40C-42.900(6), Exceptions Report for Stormwater Management Systems Out of Compliance.

Permit Name	SJRWMD Permit Number	Referenced Permit Conditions	Permitted Maintenance Conditions
Hawks Park, Phase 2	90528-1	25	The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The O&M entity must maintain a record of each required inspection, including the date of the inspection, the name, address, and telephone number of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 14 days the entity shall submit an Exceptions Report to the District, on form number 40C-42.900(6), Exceptions Report for Stormwater Management Systems Out of Compliance.
ParkTowne Industrial Center	65055-2	25	The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The O&M entity must maintain a record of each required inspection, including the date of the inspection, the name, address, and telephone number of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 14 days the entity shall submit an Exceptions Report to the District, on form number 40C-42.900(6), Exceptions Report for Stormwater Management Systems Out of Compliance.
Edgewater Parking Area	83991-1	22	The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The O&M entity must maintain a record of each required inspection, including the date of the inspection, the name, address, and telephone number of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 14 days the entity shall submit an Exceptions Report to the District, on form number 40C-42.900(6), Exceptions Report for Stormwater Management Systems Out of Compliance.

Permit Name	SJRWMD Permit Number	Referenced Permit Conditions	Permitted Maintenance Conditions
Edgewater Gymnasium Complex Phase 2	56870-3	23	The O&M entity shall inspect the stormwater or surface water management system once within 2 years after the completion of construction and every 2 years thereafter to determine if the system is functioning as designed and permitted. The O&M entity must maintain a record of each required inspection, including the date of the inspection, the name, address, and telephone number of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by SJRWMD during normal business hours. If at any time the system is not functioning as designed and permitted, then within 14 days the entity shall submit an Exceptions Report to the District, on form number 40C-42.900(6), Exceptions Report for Stormwater Management Systems Out of Compliance.
Pelican Place (Pave existing dirt road)	67600-1	20	The O&M entity shall submit inspection reports to the District 2 years after the operation phase permit becomes effective and every 2 years thereafter on District From EN-46. The inspection form must be signed and sealed by an appropriate registered professional.
Edgewater Gymnasium Complex Phase 1	56870-2	23	The O&M entity shall submit inspection reports to the District 2 years after the operation phase permit becomes effective and every 2 years thereafter on District From EN-46. The inspection form must be signed and sealed by an appropriate registered professional.
Dale Street Extension	65341-1	23	The O&M entity shall submit inspection reports to the District 2 years after the operation phase permit becomes effective and every 2 years thereafter on District From EN-46. The inspection form must be signed and sealed by an appropriate registered professional.
Whistlestop Park Skateboard Facility	77023-3	22	The O&M entity shall submit inspection reports to the District 2 years after the operation phase permit becomes effective and every 2 years thereafter on District From EN-46. The inspection form must be signed and sealed by an appropriate registered professional.
Edgewater Gymnasium Complex Phase 1	56870-1	23	The O&M entity shall submit inspection reports to the District 2 years after the operation phase permit becomes effective and every 2 years thereafter on District From EN-46. The inspection form must be signed and sealed by an appropriate registered professional.
Edgewater Library Parking Lot Expansion	77422-2	4	The O&M entity shall submit inspection reports to the District 2 years after the operation phase permit becomes effective and every 2 years thereafter on District From EN-46. The inspection form must be signed and sealed by an appropriate registered professional.

Permit Name	SJRWMD Permit Number	Referenced Permit Conditions	Permitted Maintenance Conditions
Florida Shores Roadway Improvement Project	22969-2	20	A registered Professional Engineer (PE) or his or her designee must be on-site to verify that the filtration system is constructed according to the permitted plans. This PE must submit a signed and sealed inspection report to the District using form number EN-42 within 30 days of completion of the filter system. An annual inspection of the filter system must be made by a PE or his or her designee in the month of May. A signed and sealed inspection report must be submitted to the District by the inspecting PE within 30 days of the inspection date. If the filtration system is not functioning as designed and permitted, maintenance must be performed immediately and reported in the annual inspection report. If maintenance measures are insufficient to enable the system to meet the design and performance standards in Chapter 40C-42, the permittee must obtain District approval of an alternate design. For the remaining systems (retention/swales), the permittee shall submit inspection reports to the District two years after the operation phase permit becomes effective and every two years thereafter on District From EN-46. The inspection form must be signed and sealed by an appropriate registered professional.
Whistlestop Park Interconnect	77023-2	3	The O&M entity shall submit inspection reports to the District 2 years after the operation phase permit becomes effective and every 2 years thereafter on District From EN-46. The inspection form must be signed and sealed by an appropriate registered professional.
Florida Shores CIP	22969-1	12	A registered Professional Engineer (PE) or his or her designee must be on-site to verify that the filtration system is constructed according to the permitted plans. This PE must submit a signed and sealed inspection report to the District using form number EN-42 within 30 days of completion of the filter system. An annual inspection of the filter system must be made by a PE or his or her designee in the month of May. A signed and sealed inspection report must be submitted to the District by the inspecting PE within 30 days of the inspection date. If the filtration system is not functioning as designed and permitted, maintenance must be performed immediately and reported in the annual inspection report. If maintenance measures are insufficient to enable the system to meet the design and performance standards in Chapter 40C-42, the permittee must obtain District approval of an alternate design.

The City also maintains a Municipal Separate Storm Sewer System (MS4) permit through the FDEP NPDES. Under the MS4 permit, FDEP requires permittees to perform and document regular inspections of their stormwater systems. The inspection frequencies and activities vary by "Structural Control" type (i.e., pond, ditch, pipe, inlet, etc.).

ASCE published recommendations for stormwater inspection frequencies in its publication *Standard Guidelines for the Operation and Maintenance of Urban Stormwater Systems (ASCE/EWRI 47-05)*. Inspection frequencies vary by system component type, similar to the MS4 requirements.

Jones Edmunds developed a recommended inspection schedule for the City based on permit requirements, ASCE recommendations, understanding of the City's system and maintenance challenges, and feedback from City staff. Table 108 summarizes the recommended inspection schedule for the City and the recommended inspection schedules from FDEP and ASCE.

Table 108 Summary of Inspection Schedules

System Component	MS4 Permit Required	ASCE Recommended Schedule		Recommended Schedule for the City	
		Spot Check	Full Inspection	Spot Check	Full Inspection
Ditches/Waterways	10 Years	3 Years	6 Years	Annually	3 Years
Ditches/Waterways Subject to Heavy Debris Loads	10 Years	Following Large Storm Events	Annually	Following Large Storm Events	Annually
Retention/Detention Ponds	3 Years	Annually	6 Years	Annually	2 Years
Critical Cross-Drains	10 Years	Following Large Storm Events	6 Years	Following Large Storm Events	6 Years
Large-Diameter Collection System Culverts	10 Years	3 Years	6 Years	3 Years	6 Years
Small-Diameter Collection System Culverts	10 Years	3 Years	6 Years	3 Years	6 Years
Pipes Subject to Heavy Debris Loads	10 Years	Annually	6 Years	Following Large Storm Events	6 Years
Inlets and Catch Basins	10 Years	Annually	3 Years	Annually	3 Years
Inlet and Catch Basins Subject to Heavy Debris Loads	10 Years	Annually	3 Years	Following Large Storm Events	3 Years
Manholes	10 Years	Before Paving or Resurfacing	6 Years	Before and After Repaving Activities	6 Years

System Component	MS4 Permit Required	ASCE Recommended Schedule		Recommended Schedule for the City	
		Spot Check	Full Inspection	Spot Check	Full Inspection
Major Outfalls	Annually	3 Years	6 Years	Annually	6 Years
Baffle Boxes	10 Years	Annually	3 Years	Following Large Storm Events	3 Years
Swales and Driveway Culverts	N/A	N/A	N/A	2 Years	5 Years

9.1.2 Asset Condition Rating Methodology

FDEP and ASCE also provide recommendations for inspection activities (i.e., maintenance problems that should be checked for during inspections). Table 109 summarizes the FDEP- and ASCE-recommended inspection activities by system component. They also recommend that inspection records are kept as points of reference to determine the rate and severity of deterioration. Jones Edmunds developed recommended scoring templates for each system component type to assess the condition of the city's stormwater infrastructure. These templates can be used by the City to complete condition assessments and identify/prioritize locations where system maintenance and/or rehabilitation is needed. The City should consider developing a standardized procedure and forms for completing and documenting inspections based on these criteria.

The scoring templates include a list of inspection items for each system component, a description of each inspection item, a weighting factor for each inspection item (0-1), and scoring guidance for each inspection item for assigning the inspection score. Each inspection item is assigned an inspection score from 0 to 5 based on the condition of the inspected asset. The inspection score is then multiplied by the weighting factor for each inspection item, and the weighted scores are summed. The sum of the weighted scores is divided by 5 and then multiplied by 100 to determine the total score from 0 to 100. The total score is then used to determine the relative priority and need for maintenance action. Table 110 through Table 117 summarize the inspection scoring templates for:

- Cross-culverts.
- Swales and driveway culverts.
- Ditches and waterways.
- Wet detention ponds.
- Dry retention ponds.
- Inlets, catch basins, and manholes.
- Closed conduit stormwater collection pipes.
- Pipe outfalls.

Table 109 Recommended Inspection Activities

System Component	MS4 Recommended Activities	ASCE Recommended Activities	
		Spot Check	Full Inspection
Ditches/Waterways	▪ Inspect for damage that would prevent proper flow conditions and operation. ▪ Inspect and monitor sediment accumulation to prevent loss of storage volume and adverse impacts on flow and operation. ▪ Inspect and monitor litter/debris accumulations to prevent loss of storage volume and adverse impacts on flow and operation. ▪ Inspect vegetation on bottom and side slopes of conveyances to ensure that it is healthy, maintaining coverage, and that no erosion is occurring within the conveyance system.	▪ Inspect the channel from street crossings or other points of access. ▪ Annually spot check channels subject to heavy sediment loads that cause invert wear. ▪ Spot check channels carrying large debris loads annually at debris-deposit locations if needed.	▪ Inspect the invert and channel walls for wear and cracking. ▪ Look for scouring or undermining of channel walls or inverts. ▪ Investigate any channel settlement. ▪ Include channel fencing in inspection, if any.
Retention/Detention Ponds	▪ Inspect the system for storage volume recovery within permitted time. ▪ Inspect and monitor sediment accumulation in the system or inflow/outflow points to prevent loss of storage volume or clogging of the filter system of the inflow/outflow pipes. For wet detention, determine if accumulations exceed 20 percent of the permitted storage volume. ▪ Inspect inflow and outflow structures, trash racks, and other components for signs of undercutting or piping, settling, or damage, and for accumulation of debris and trash that would cause clogging and adversely impact operation of the system. ▪ Inspect the system for potential mosquito breeding areas such as cattails or other invasive vegetation. ▪ Inspect vegetation on side slopes to ensure it is healthy and maintaining coverage, and that no erosion is occurring.	▪ Spot check for problems that could decrease capacity.	▪ Observe and note any sinkholes, cracks, or ruptures. ▪ Note evidence of seepage, including piping, embankment sloughing, or the presence of detrimental vegetation. ▪ Examine if sediment deposit is significant enough for removal. ▪ All valves, controls, venting, and cathodic protection systems should be examined. ▪ Check overflow drains to ensure that flows are directed away from the structure to prevent under cutting.
Closed Conduits	▪ Inspect pipes and culverts for structural deficiencies or damage that would prevent proper flow conditions and operation. ▪ Inspect pipes and culverts to monitor sediment accumulation to prevent loss of storage volume and adverse impacts on flow and operations. ▪ Inspect and monitor litter/debris accumulations to prevent loss of storage volume and adverse impacts on flow and operation. ▪ Inspection of pipes and culverts can be done through a variety of methods, such as visual observation during normal operating conditions, TVing, mirroring, or other appropriate methods.	▪ Inspect conduit from a manhole or inlet. ▪ If problems are spotted, a more extensive inspection may be needed. ▪ Annually inspect conduits subject to extensive invert if needed. ▪ Annually spot check conduits subject to heavy debris flow.	▪ Inspect the invert for wear. ▪ Inspect the integrity of the joints. ▪ Look for sediment deposits. ▪ Inspect the structural integrity of the conduit. ▪ Inspect conduits too small for walking in by towing an inspector on a dolly or through video inspection, if needed.
Inlets and Catch Basins	▪ Inspect for damage that would prevent proper flow conditions and operation. ▪ Inspect and monitor sediment accumulation to prevent loss of storage volume and adverse impacts on flow and operation. ▪ Inspect and monitor litter/debris accumulations to prevent loss of storage volume and adverse impacts on flow and operation.	▪ Spot-check annually to determine if cleaning is necessary.	▪ Perform inspection and/or inspection-cleanout.
Manholes	▪ Inspect for damage that would prevent proper flow conditions and operation. ▪ Inspect and monitor sediment accumulation to prevent loss of storage volume and adverse impacts on flow and operation. ▪ Inspect and monitor litter/debris accumulations to prevent loss of storage volume and adverse impacts on flow and operation.	▪ Inspect for damage from floating debris discharging from laterals. ▪ Check manhole covers to make sure they have not been paved over. ▪ Verify that well-constructed manhole shafts are in working order.	▪ Inspect for damage from floating debris discharging from laterals. ▪ Check manhole covers to make sure they have not been paved over. ▪ Verify that well-constructed manhole shafts are in working order.
Major Outfalls	▪ Inspect outfalls to ensure that they are not clogged with litter, debris, or sediment and they are flowing properly. ▪ Inspect for damaged headwalls, seepage around pipe, erosion of bank around outfall, erosion or sedimentation at discharge point, and damaged or clogged riprap.	▪ Inspect conduit from a manhole or inlet/outlet. ▪ If problems are spotted, a more extensive inspection may be needed. ▪ Annually inspect conduits subject to extensive invert wear if needed. ▪ Annually spot-check conduits subject to heavy debris flow if needed.	▪ Completely inspect submerged outlets (same as other closed conduits) and frequently inspect these in cases of heavy marine growth. ▪ Inspect and repair or replace as necessary riprap, gabions, or other fabricated slope-control products.

Table 110 Inspection Scoring Template for Cross-Culverts

Inspection Item	Description / What to Evaluate	Weight	Scoring Guidance (0–5)
Inlet Obstruction/ Debris	Assess for vegetation, trash, or debris blocking flow at the culvert entrance.	0.2	0 = Clear; 1 = minor debris <10% blocked; 2 = 10–25% blocked; 3 = 25–50%; 4 = >50%; 5 = fully blocked or stagnant water upstream
Sediment Accumulation (Barrel and Inlet)	Check for sediment or silt reducing culvert flow area.	0.2	0 = <5% filled; 1 = 5–10%; 2 = 11–20%; 3 = 21–30%; 4 = 31–50%; 5 = >50% or barrel mostly plugged
Structural Integrity (Barrel)	Inspect for corrosion, cracks, deformation, or joint separation.	0.2	0 = intact; 1 = minor surface rust; 2 = visible corrosion; 3 = deformation <5% or small cracks; 4 = >5% deformation, open joints; 5 = collapse or large separation
Inlet/Outlet Headwall and Wingwalls Condition	Evaluate concrete, masonry, or end treatment for cracks, displacement, or undermining.	0.15	0 = sound; 2 = minor cracks/spalling; 3 = noticeable cracks, slight displacement; 4 = undermined or displaced wall; 5 = failed or missing
Erosion/Scour at Inlet or Outlet Ditch	Check for scouring, undermining, or headcutting of the ditch banks or apron area.	0.1	0 = none; 1 = minor rills; 2 = small scour hole <6 in; 3 = undercutting; 4 = severe scour >1 ft; 5 = bank failure or pipe end exposure
Alignment/ Grade Consistency	Verify that culvert alignment matches ditch inverts and allows proper flow transition.	0.1	0 = aligned; 2 = minor offset; 3 = noticeable misalignment causing ponding; 4 = significant slope mismatch; 5 = water bypassing or overtopping road
Safety/Access	Evaluate for accessibility, exposed ends, traffic hazards, or standing water at the road shoulder.	0.05	0 = safe, accessible; 2 = minor hazard; 3 = restricted access; 4 = unsafe roadside; 5 = immediate public hazard or collapse risk

Table 111 Inspection Scoring Template for Swales and Driveway Culverts

Inspection Item	Description / What to Evaluate	Weight	Scoring Guidance (0–5)
Obstruction/ Debris	Evaluate for trash, grass clippings, leaves, or litter restricting flow in swale or culvert entrance.	0.2	0 = Clear; 1 = minor debris <10% area blocked; 2 = partial debris (10–25%); 3 = moderate (25–50%); 4 = severe (>50%); 5 = fully blocked or stagnant water present
Sediment Accumulation/ Siltation	Look for soil/sand buildup in flow path or inside culvert barrel.	0.2	0 = <5% of cross-section filled; 1 = 5–10%; 2 = 11–20%; 3 = 21–30%; 4 = 31–50%; 5 = >50% filled or flow bypassing
Vegetation Condition (Swale)	Evaluate grass health, invasive growth, or flow restriction by overgrown vegetation.	0.15	0 = well-vegetated, dense turf; 1 = sparse but stable; 2 = patchy cover, minor erosion; 3 = dense weeds; 4 = excessive vegetation (>50% flow area blocked); 5 = bare/eroding or completely overgrown
Erosion/Scour	Check for rills, bare soil, or undercutting at driveway culverts and swale transitions.	0.15	0 = none; 1 = minor rills <1” deep; 2 = small bare areas; 3 = noticeable undercutting; 4 = severe erosion compromising structure; 5 = structural failure or safety hazard
Culvert Condition (Barrel/Ends)	Assess for rust, joint separation, end damage, or deformation.	0.15	0 = intact, sound; 1 = minor surface rust; 2 = visible corrosion, small dent; 3 = joint gap <1”; 4 = deformation >5%, severe rust; 5 = collapse, separation, or complete blockage
Driveway Transition/ Inlet Alignment	Evaluate if culvert inverts match swale grade and if water bypasses or ponds.	0.1	0 = aligned, consistent grade; 2 = minor offset causing ponding <1”; 3 = moderate misalignment; 4 = flow diversion; 5 = water bypasses driveway or causes flooding
Access/Safety/ Public Hazard	Note traffic hazards, steep slopes, exposed ends, or other safety issues.	0.05	0 = safe and accessible; 2 = minor hazard (slippery slope); 4 = difficult access or trip hazard; 5 = exposed pipe or unsafe roadside drop-off

Table 112 Inspection Scoring Template for Ditches and Waterways

Inspection Item	Description / What to Evaluate	Weight	Scoring Guidance (0–5)
Flow Obstruction/ Debris	Evaluate presence of trash, tree limbs, large debris, or blockages that restrict flow in the ditch channel.	0.2	0 = Clear; 1 = minor debris (<10% area blocked); 2 = moderate debris (10–25%); 3 = 25–50%; 4 = >50%; 5 = fully blocked or stagnant water
Sediment Accumulation	Assess buildup of sediment, silt, or deposits reducing channel depth or hydraulic capacity.	0.2	0 = <5% of channel depth lost; 1 = 5–10%; 2 = 11–20%; 3 = 21–30%; 4 = 31–50%; 5 = >50% (major sedimentation restricting conveyance)
Erosion/Bank Stability	Check for sloughing, undercutting, or sidewall collapse along channel banks.	0.2	0 = stable banks; 1 = minor rills; 2 = localized bare spots; 3 = undercutting or vertical scarps; 4 = bank failure along sections; 5 = widespread erosion or road/structure risk
Vegetation Condition	Evaluate vegetation type, density, and potential flow restriction or invasive coverage.	0.15	0 = healthy turf or native coverage; 1 = sparse but stable; 2 = moderate weeds or patchy cover; 3 = thick vegetation reducing flow; 4 = dense vegetation blocking >50%; 5 = excessive vegetation or total blockage
Channel Geometry/ Cross-Section Integrity	Determine if the ditch has maintained its original trapezoidal or designed cross-section.	0.1	0 = consistent shape; 2 = minor siltation or slumping; 3 = noticeable distortion; 4 = over-widened or slumped; 5 = lost design shape or filled in
Outfall/ Structure Interface (pipes, headwalls, weirs)	Check conditions where pipes, headwalls, or other structures enter/exit the ditch.	0.1	0 = intact and stable; 2 = minor scouring or undermining; 3 = separated joints or cracks; 4 = undermined or partially collapsed; 5 = failed interface or exposed utility
Access/Public Safety	Evaluate maintenance access, slope stability, and any public safety hazards.	0.05	0 = safe, accessible; 2 = limited access or mild hazard; 3 = restricted access or slope >3:1; 4 = unsafe or encroached area; 5 = immediate safety risk (steep drop, exposed structure)

Table 113 Inspection Scoring Template for Wet Detention Ponds

Inspection Item	Description / What to Evaluate	Weight	Scoring Guidance (0–5)
Sediment Accumulation /Storage Volume Loss	Evaluate sediment buildup within the permanent pool and littoral zone that reduces pond storage or water quality volume.	0.25	0 = <5% of design storage lost; 1 = 5–10%; 2 = 11–20%; 3 = 21–30%; 4 = 31–50%; 5 = >50% storage loss (dredging required)
Inflow/ Outflow Structure Condition	Inspect for damage, clogging, corrosion, or structural deterioration of culverts, risers, and control orifices.	0.2	0 = clear and functional; 1 = minor debris; 2 = moderate blockage or surface rust; 3 = >25% blocked; 4 = corrosion, joint failure; 5 = inoperable or collapsed
Embankment/ Slope Stability	Assess side slopes for erosion, bare spots, or undercutting.	0.15	0 = stable with full grass cover; 1 = minor bare spots; 2 = small rills or isolated erosion; 3 = noticeable erosion; 4 = significant erosion or slumping; 5 = failure or breach risk
Vegetation and Littoral Zone Condition	Evaluate health of aquatic vegetation and control of invasives.	0.15	0 = balanced native vegetation; 1 = minor overgrowth; 2 = sparse or invasive species <25%; 3 = moderate invasives 25–50%; 4 = dominant invasives >50%; 5 = complete overgrowth
Trash, Debris, and Floating Material	Check pond surface and banks for litter, algae mats, or excessive organic debris.	0.1	0 = clean; 1 = few floating items; 2 = light debris along edges; 3 = visible buildup on >25% of shoreline; 4 = widespread litter or algal mats; 5 = severe accumulation or odor
Outlet Control /Discharge Function	Verify outlet structure, weir, or orifice operation and tailwater condition.	0.1	0 = functional; 1 = slight obstruction; 2 = partially submerged; 3 = flow restricted; 4 = structure obstructed or submerged; 5 = inoperable, causing pond overtopping
Safety, Access, and Aesthetics	Assess fence, signage, access gates, and public safety hazards (drop-offs, steep slopes).	0.05	0 = safe, fenced, accessible; 2 = minor vegetation blocking access; 3 = limited access or missing signage; 4 = unsafe slope or damaged fence; 5 = serious hazard (open drop, missing fence section)

Table 114 Inspection Scoring Template for Dry Retention Ponds

Inspection Item	Description / What to Evaluate	Weight	Scoring Guidance (0–5)
Sediment Accumulation /Storage Volume Loss	Evaluate how much of the design storage volume or infiltration area is lost due to sediment buildup.	0.25	0 = <5% volume loss; 1 = 5–10%; 2 = 11–20%; 3 = 21–30%; 4 = 31–50%; 5 = >50% filled or water ponds for >48 hrs.
Infiltration Function/ Standing Water Duration	Check how long water remains after rainfall; assess infiltration performance and ponding issues.	0.2	0 = drains within 24 hrs.; 1 = drains in 24–36 hrs.; 2 = 36–48 hrs.; 3 = >48 hrs.; 4 = ponded >72 hrs.; 5 = standing water or nonfunctioning
Erosion/ Slopes and Bottom Condition	Examine basin side slopes and bottom for erosion, rutting, or channelization of flow paths.	0.15	0 = stable with grass cover; 1 = minor bare spots; 2 = localized erosion <2 in deep; 3 = small gullies or bare bottom; 4 = severe erosion or slope slumping; 5 = major washouts or structure undermining
Vegetation Coverage/ Condition	Evaluate vegetation establishment, mowing, and invasive species presence.	0.15	0 = uniform grass cover; 1 = minor thin spots; 2 = patchy grass or weeds <25%; 3 = moderate weeds/invasives 25–50%; 4 = dominant invasives or unmaintained; 5 = bare soil or heavy thatch impeding infiltration
Trash, Debris, and Obstructions	Look for litter, yard waste, or blockages in inflow swales and pond floor.	0.1	0 = clean; 1 = light litter; 2 = scattered debris <25%; 3 = localized piles or inflow blockage; 4 = widespread trash; 5 = flow path obstructed or causing ponding
Inflow/ Outfall Structure Condition	Inspect pipe aprons, flared ends, and swales for damage, clogging, or misalignment.	0.1	0 = clear and stable; 1 = small debris; 2 = partial blockage or sediment; 3 = >25% obstructed; 4 = undermined or joint separation; 5 = failed or detached structure
Access/ Public Safety	Evaluate fencing, signage, access roads, and potential public hazards.	0.05	0 = safe and accessible; 2 = minor vegetation blocking access; 3 = restricted access; 4 = unsafe slopes or missing signage; 5 = exposed drop or open access hazard

Table 115 Inspection Scoring Template for Inlets, Catch Basins, and Manholes

Inspection Item	Description / What to Evaluate	Weight	Scoring Guidance (0–5)
Sediment Accumulation/Sump Condition	Check sump depth or accumulated material in basin or manhole invert.	0.25	0 = <10% sump full; 1 = 10–20%; 2 = 21–30%; 3 = 31–50%; 4 = 51–75%; 5 = >75% full or restricting flow
Debris/Grate Blockage (Surface Inlets)	Inspect grate, curb opening, or hood for leaves, litter, or debris blocking inflow.	0.2	0 = clear; 1 = small debris; 2 = <25% blocked; 3 = 25–50%; 4 = >50%; 5 = fully blocked / ponding observed
Structural Condition (Walls, Frames, Lids, Joints)	Inspect for cracks, displacement, spalling, or corrosion of concrete, brick, or frame.	0.2	0 = sound; 1 = minor surface wear; 2 = small cracks/spalls; 3 = moderate cracking or displaced frame; 4 = large cracks, leaning structure; 5 = structural failure, missing lid, collapse risk
Invert/Flow Condition	Check base flow, invert erosion, and flow channel alignment through structure.	0.1	0 = smooth and aligned; 1 = minor sediment; 2 = partial sediment or invert wear <10%; 3 = flow restriction or invert corrosion; 4 = severe wear or undermined invert; 5 = blocked or flow diversion
Inflow/ Outflow Pipe Connection Integrity	Check pipe joints and connections for leakage, misalignment, or gaps.	0.1	0 = tight and intact; 1 = minor leakage; 2 = small gaps; 3 = separated joints; 4 = visible infiltration/exfiltration; 5 = major separation or collapse
Accessibility/ Safety	Evaluate traffic safety, lid accessibility, cover seating, and public hazards.	0.1	0 = safe and flush; 1 = minor offset; 2 = slight trip hazard; 3 = damaged grate or difficult access; 4 = unsafe offset or missing bolts; 5 = open or missing cover — immediate hazard
Evidence of Illicit Discharge or Contamination	Observe for odors, discoloration, or unusual flow indicating cross-connections or pollutants.	0.05	0 = none; 1 = minor odor; 2 = slight discoloration; 3 = recurring sheen or discharge; 4 = confirmed contamination; 5 = illicit connection or hazardous waste detected

Table 116 Inspection Scoring Template for Closed Conduit Stormwater Collection Pipes

Inspection Item	Description / What to Evaluate	Weight	Scoring Guidance (0–5)
Structural Integrity (Cracks, Deformation, Joint Separation)	Evaluate barrel condition via CCTV or field inspection for cracks, corrosion, deformation, displaced joints, or collapse.	0.25	0 = intact; 1 = hairline cracks, no leakage; 2 = minor cracks or corrosion; 3 = visible joint gaps or mild deformation (<5%); 4 = moderate deformation or cracked barrel; 5 = major deformation, collapse, or separation
Sediment Accumulation/Flow Restriction	Observe sediment depth or deposits reducing flow area.	0.2	0 = <5% full; 1 = 5–10%; 2 = 11–20%; 3 = 21–30%; 4 = 31–50%; 5 = >50% blocked
Debris/ Obstructions (Roots, Trash, Vegetation, etc.)	Check for roots, grease, trash, or other obstructions restricting flow or causing surcharging.	0.15	0 = clear; 1 = small debris; 2 = light obstruction <10%; 3 = partial blockage (10–25%); 4 = severe obstruction (25–50%); 5 = full blockage or flow diversion
Invert Wear/ Corrosion/ Abrasion	Inspect invert for corrosion, metal loss, or concrete abrasion, especially near outfalls or under tidal influence.	0.15	0 = none; 1 = light corrosion; 2 = 5–10% wear; 3 = 10–25% loss or pitting; 4 = >25% loss or visible rebar; 5 = structural failure or holes in barrel
Joint Integrity/Leakage	Look for groundwater infiltration, exfiltration, or misaligned joints observed via CCTV or flow patterns.	0.1	0 = tight, sealed joints; 1 = small weep; 2 = damp joints; 3 = active infiltration; 4 = multiple leaks; 5 = severe infiltration/exfiltration or soil loss around pipe
Alignment/ Grade Consistency	Evaluate alignment between manholes and culverts; look for sags, offsets, or ponding within pipe.	0.1	0 = consistent slope and alignment; 1 = minor deviation; 2 = small sag causing minor standing water; 3 = noticeable sag or offset joint; 4 = severe offset restricting flow; 5 = alignment failure, bypass, or collapse
Accessibility/ Safety/ Inspection Feasibility	Determine if structure is accessible for cleaning, TV, or repair; note confined space or traffic hazards.	0.05	0 = fully accessible; 1 = minor access restriction; 2 = difficult access (e.g., deep structure); 3 = confined or traffic hazard; 4 = unsafe for entry; 5 = inaccessible or sealed line with unknown condition

Note: CCTV = Closed Circuit Television.

Table 117 Inspection Scoring Template for Pipe Outfalls

Inspection Item	Description / What to Evaluate	Weight	Scoring Guidance (0–5)
Outlet Structure/ Headwall Condition	Inspect headwall, end treatment, and surrounding concrete or masonry for cracks, displacement, or undermining.	0.25	0 = sound; 1 = minor surface wear; 2 = small cracks/spalls; 3 = moderate cracks or displacement; 4 = undermined section or partial failure; 5 = failed or collapsed headwall
Outlet Obstruction/ Debris	Assess for blockage by trash, vegetation, or sediment restricting discharge flow.	0.2	0 = clear; 1 = minor debris <10%; 2 = partial blockage 10–25%; 3 = 25–50%; 4 = >50% blocked; 5 = fully blocked or stagnant tailwater
Bank/ Channel Erosion or Scour	Evaluate erosion, sloughing, or undermining downstream or adjacent to outfall.	0.15	0 = stable; 1 = minor rills; 2 = localized scour <6 in; 3 = undercutting or riprap displacement; 4 = severe scour >1 ft; 5 = active erosion threatening infrastructure
Energy Dissipation/ Apron/ Riprap Condition	Inspect riprap, gabion, or apron for displacement, voids, or settlement.	0.1	0 = intact; 1 = minor stone movement; 2 = 10–25% loss; 3 = 25–50% loss or voids; 4 = >50% displaced or missing; 5 = total failure or exposed subgrade
Sediment Accumulation at Outlet	Observe sediment or backwater buildup affecting hydraulic discharge.	0.1	0 = <5% restricted; 1 = 5–10%; 2 = 11–20%; 3 = 21–30%; 4 = 31–50%; 5 = >50% filled or outlet buried
Tidal/ Tailwater Backflow Condition	Check for evidence of tidal influence, standing water, or non-functional backflow devices (flap gates, tideflex valves).	0.1	0 = drains freely; 1 = slight tailwater; 2 = minor tidal wetting; 3 = backflow during high tide; 4 = standing tailwater after tide; 5 = flap gate failure or constant submergence
Access/ Safety/Public Exposure	Evaluate physical access for maintenance and public safety hazards (steep banks, open drop-offs).	0.1	0 = accessible, safe; 1 = minor vegetation barrier; 2 = difficult access; 3 = unsafe slope or confined area; 4 = steep drop or proximity to pedestrian area; 5 = immediate public hazard or fall risk

9.2 Summary of Current Maintenance Activities and Recommended Scheduled Maintenance Activities

Stormwater maintenance is a continuous process that must be performed to keep the system clean and operating as intended. Certain maintenance activities are recurrent and should be scheduled at regular intervals. This section summarizes the City's current maintenance activities and provides recommendations for additional activities the City should implement for each of the primary system components.

9.2.1 Primary Drainage Ditches and Waterways

Ditches and waterways are the primary drainage conveyance features for most of the City. They are the discharge point for various piped collection systems across the City, and they convey significant amounts of stormwater runoff to ultimate discharge points (i.e., ML, Turnbull Hammock, etc.). The City's Stormwater Division provides maintenance for approximately 25 miles of ditches and waterways, shown in Figure 168. Currently, the City's Stormwater Division completes the following maintenance activities for the primary drainage ditches and waterways:

- Bank mowing, completed for each ditch one or two times per year.
- Removal of debris and sediment, completed for each ditch one or two times per year.
- Bank stabilization/re-building, completed as needed.
- Ditch recontouring and riprapping, completed as needed.
- Limited ditch spraying, completed as needed and where crews have access.

Based on discussions with City Stormwater Division staff, field observations, knowledge of maintenance activities that other local communities similar to Edgewater perform, and ASCE/FDEP recommendations, Jones Edmunds made the following observations and recommendations related to ditch maintenance activities and frequencies:

- The City's ditch mowing and sediment removal frequencies should be sufficient to keep the system in good operating condition. The current maintenance frequency exceeds the inspection frequencies recommended by ASCE/FDEP for ditches and waterways. The City has expressed a desire to clean and maintain each of the ditches at least twice per year.
- As shown in Figure 169, many of the City's drainage ditches have very steep banks (side slope steeper than 2:1 horizontal to vertical) with sandy soils that are susceptible to erosion and cave-ins. This can cause ditch extents to widen over time, which can create property losses on parcels adjacent to the ditches. Removing vegetation along ditch banks can exacerbate this issue because the root systems help protect and stabilize the banks. The City's maintenance staff should maintain as much vegetation on the ditch banks as possible without impeding the flow in the ditches. The City may want to evaluate options for constructed stabilization alternatives for the sections of ditch that are most susceptible to erosion. This could include gabions, block walls, geoweb mats, etc.

Figure 168 City-Maintained Drainage Ditches and Waterways

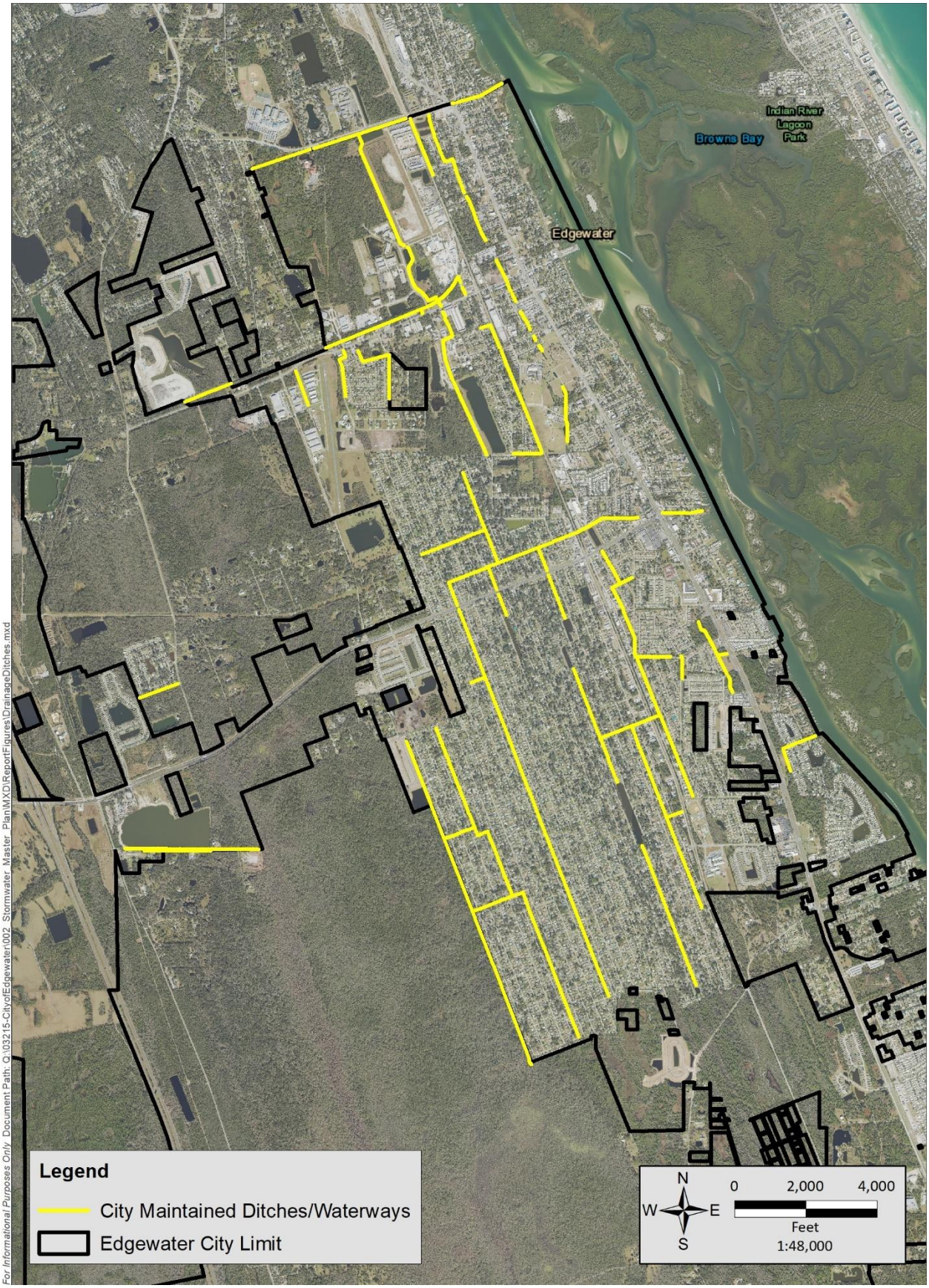


Figure 169 Example of a City Ditch with Steep Eroding Banks



9.2.2 Dry Retention Ponds

The City currently owns and maintains approximately 300 dry retention ponds covering approximately 30 acres, most of which are small ponds in Florida Shores constructed to provide water quality treatment when the Florida Shores roads were paved. Figure 170 shows the dry retention pond locations. The City currently performs the following recurrent maintenance activities at these ponds:

- Mowing of side banks and pond bottoms approximately 4 to 6 times per year for each retention pond.
- Removal of built-up muck at the bottom of ponds and placement of sand as needed.

Based on discussions with City Stormwater Division staff, field observations, knowledge of maintenance activities that other local communities similar to Edgewater perform, and ASCE/FDEP recommendations, Jones Edmunds made the following observations and recommendations related to dry retention pond maintenance activities and frequencies:

- The City's dry retention mowing and sediment removal frequencies should be sufficient to keep the system in good operating condition.
- The dry retention ponds in Florida Shores that have outfall structures discharging into the City's ditches were designed with underdrain systems to recover the pond volume following storm events. These systems are now 25–30 years old and likely do not function as originally designed, which can cause the ponds to hold water longer than intended. The City should inspect the underdrain systems to determine if they are

functioning. The permitted design plans show multiple cleanout ports at each pond with an underdrain. The City should locate these clean out ports and perform maintenance where possible to restore function to the underdrains. If maintenance is not possible or sufficient, the City should consider reconstructing the underdrain systems or permitting modifications to the pond outfall structures to improve pond recovery times.

9.2.3 Wet Detention Ponds

The City currently owns and maintains approximately 30 wet detention ponds covering approximately 90 acres. Figure 171 shows the wet detention pond locations. The City performs the following recurrent maintenance activities at these ponds:

- Mowing of side banks approximately 1 to 2 times per year for each pond.
- Mowing pond top of banks approximately 12 times per year.
- Bank stabilization/re-building as needed.
- Pond spraying approximately 3 to 4 times per year for each pond. Spraying for the pond on Queen Palm Drive and the pond at Fern Palm and SR442 is subcontracted. Spraying for the remainder of the ponds is performed by City crews.

Based on discussions with City Stormwater Division staff, field observations, knowledge of maintenance activities that other local communities similar to Edgewater perform, and ASCE/FDEP recommendations, Jones Edmunds made the following observations and recommendations related to wet detention pond maintenance activities and frequencies:

- The City should plan and budget for pond sediment removal. Ponds typically need to have sediment removed every 30 to 40 years, or when the pond volume is reduced by more than 20 percent. This work will likely not be performed by City staff and will need to be contracted. The City should monitor sediment depths during annual inspections. The City may expect to perform this maintenance at least once every 30 to 40 years.

Figure 170 Dry Retention Pond Locations

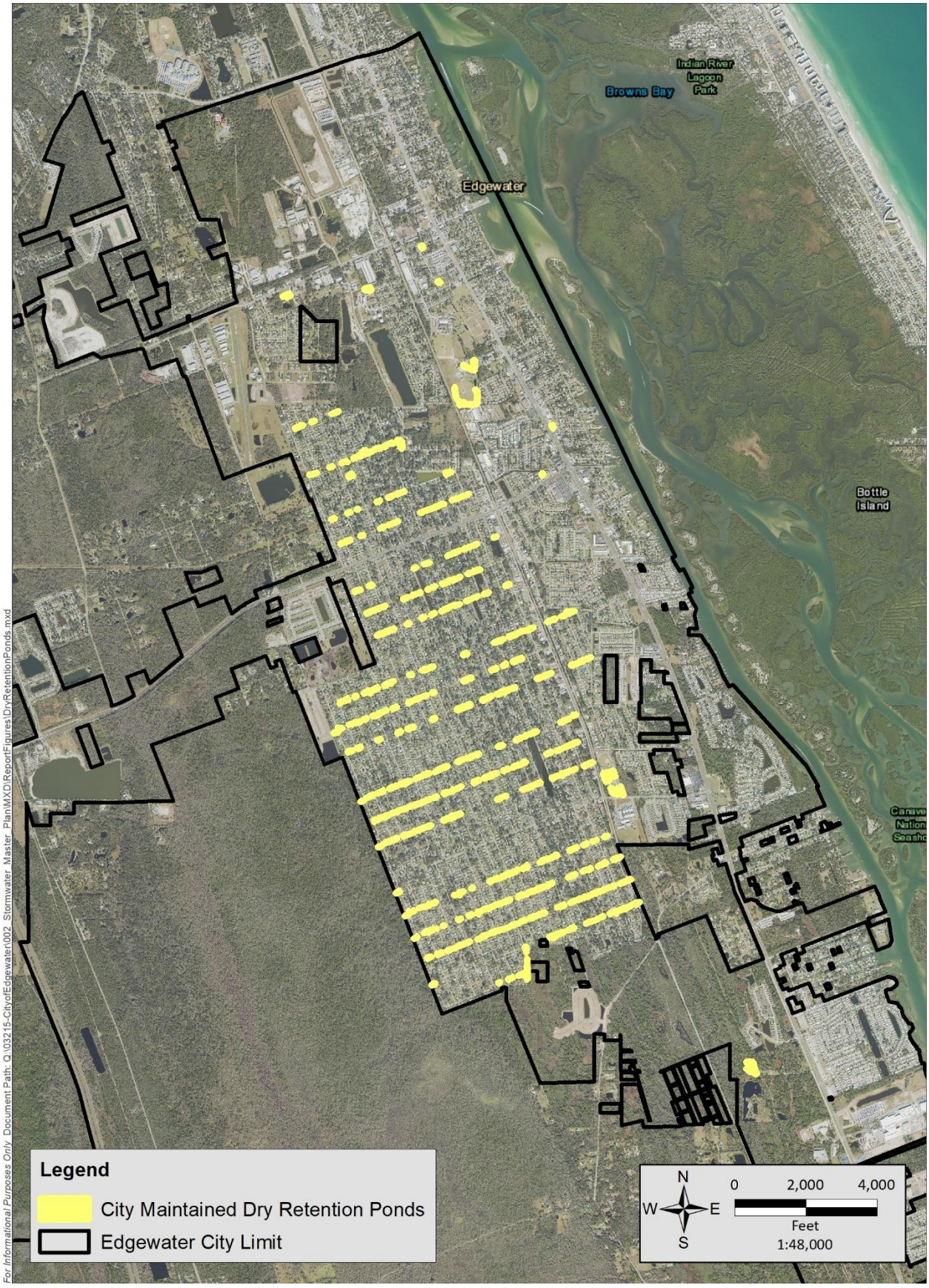
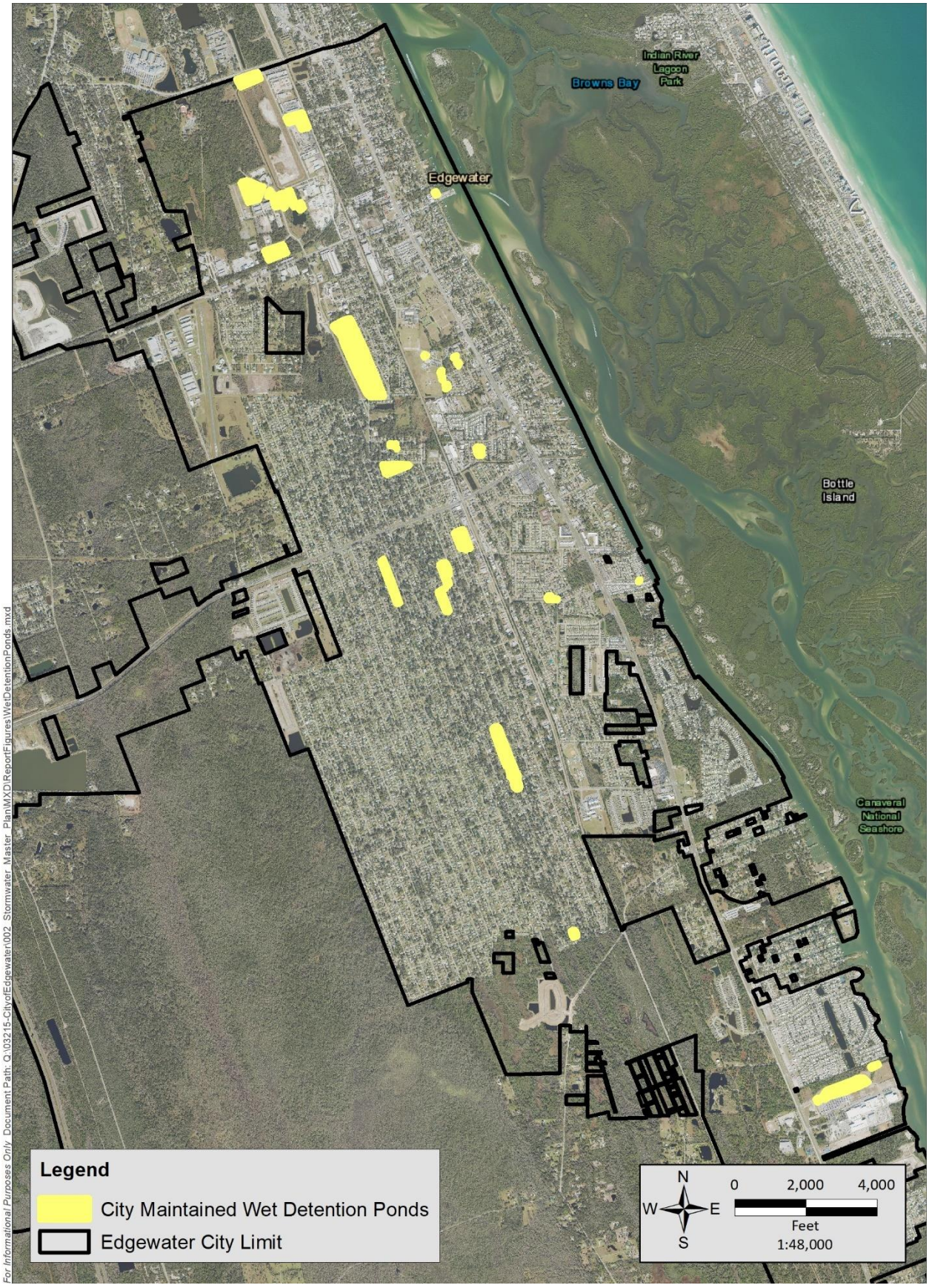


Figure 171 Wet Detention Pond Locations



9.2.4 MAJOR CROSS-CULVERTS

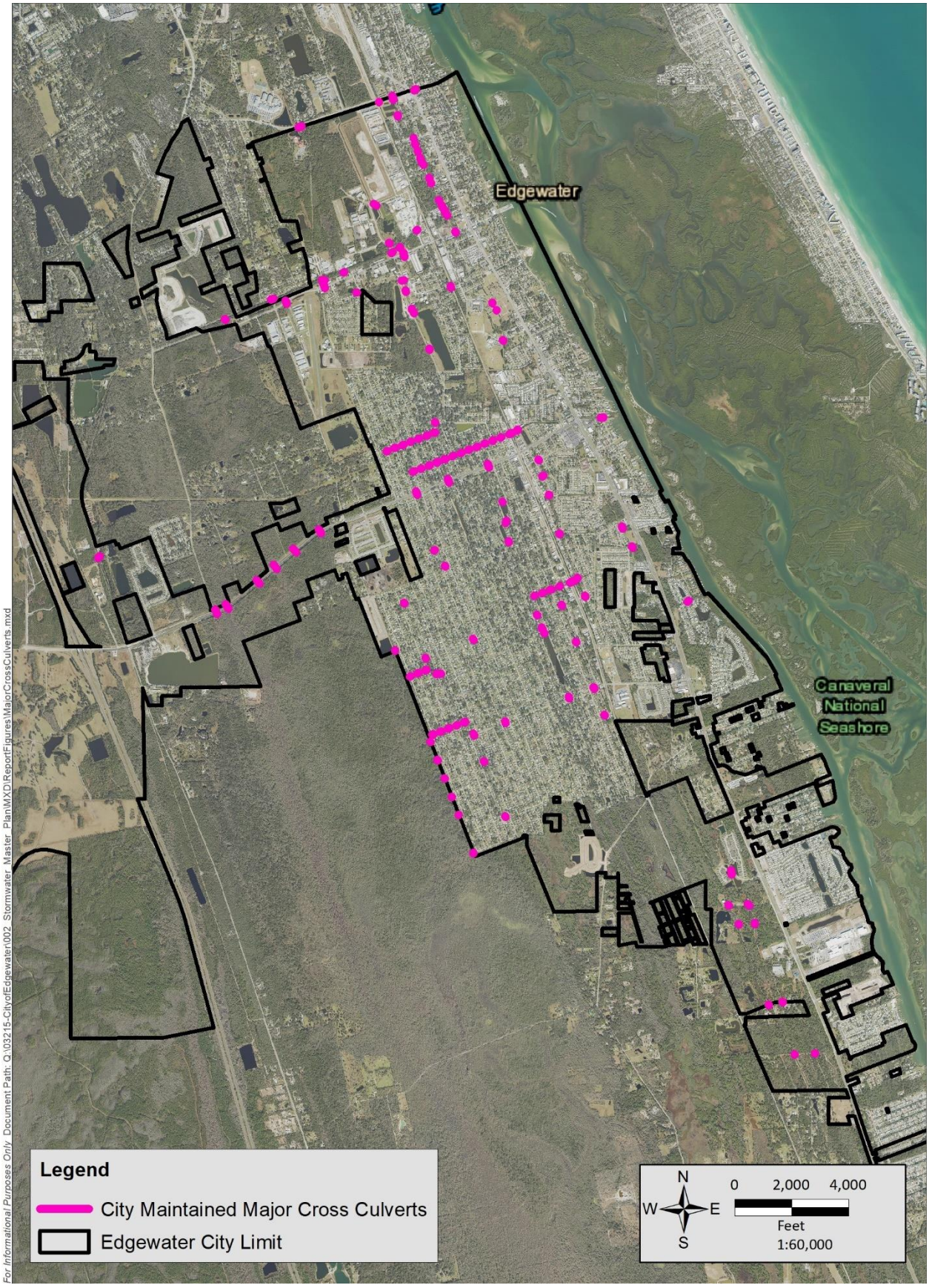
Figure 172 shows that the City currently owns and maintains approximately 9,900 linear feet (LF) of large-diameter pipes and box culverts where the City's major conveyance ditches and waterways intersect roadways. These major cross-culverts are critical to the function of the City's stormwater system because they are in primary flow ways and are in lower-lying areas that can be more flood-prone. Additionally, these cross-culverts are subject to higher sediment loads because they serve as outfalls for piped collection systems that drain urbanized areas without providing treatment to remove suspended solids. The City performs the following recurrent maintenance activities at these cross-culvert:

- The City uses a string trimmer to clear vegetation at the cross-culverts approximately six times per year.
- Removal of sediment and debris at the culvert ends occurs when the upstream and downstream ditches are mowed/cleaned, which occurs one to two times per year.
- The City should inspect and clean the major cross-culvert end treatments as needed following large storm events.

Based on discussions with City Stormwater Division staff, field observations, knowledge of maintenance activities that other local communities similar to Edgewater perform, and ASCE/FDEP recommendations, Jones Edmunds made the following observations and recommendations related to major cross-culvert maintenance activities and frequencies:

- The City's cross-culvert string trimming and pipe end cleaning frequencies should be sufficient to keep the system in good operating condition.
- The City should plan to remove sediment, clean, and inspect the entire length of major cross-culverts regularly. The City may expect to perform this maintenance at least once every 5 to 7 years for non-self-cleaning culverts. The City should monitor sediment depths annually to determine when cleaning is required. Required cleaning intervals will vary by location based on sediment loads and velocities in the upstream and downstream ditches. The City does not currently have the capability to perform this maintenance; it will have to be subcontracted.

Figure 172 Major Cross-Culvert Locations



9.2.5 Pipe End Treatments

The City currently owns and maintains approximately 1,600 pipe end treatments not associated with the major culvert-crossings discussed in Section 9.2.4. Figure 173 shows the pipe end treatment locations. The City performs the following recurrent maintenance activities at these ponds:

- The City uses a string trimmer to clear vegetation at the cross-culverts approximately six times per year.
- Removal of sediment and debris at the culvert ends occurs at least one time per year or more frequently if needed.
- The City inspects and cleans pipe end treatments as needed following large storm events.

Based on discussions with City Stormwater Division staff, field observations, knowledge of maintenance activities that other local communities similar to Edgewater perform, and ASCE/FDEP recommendations, Jones Edmunds made the following observations and recommendations related to pipe end treatment maintenance activities and frequencies:

- The City's end treatment string trimming and cleaning frequencies should be sufficient to keep the system in good operating condition.
- The City should plan to perform miscellaneous point repairs for pipe end treatments where failures have occurred. In most cases, the City could perform this maintenance but currently does not have crew availability to do so. This maintenance will likely have to be subcontracted out.

9.2.6 Collection System and Smaller Diameter Cross-Culvert Pipes

Figure 174 shows that the City owns and maintains approximately 30 miles of stormwater collection system and smaller diameter stormwater pipes. The City currently does not perform scheduled recurrent maintenance on these pipes. Maintenance of the pipe system is triggered by calls from residents or if crews notice pipes issues while performing ditch or pipe end treatment maintenance. We recommend that the City implement the following improvements/additions to the recurrent maintenance of stormwater collection system and smaller diameter cross-culvert pipes:

- Cleaning/jetting collection system and small diameter cross-culvert pipes by City maintenance crews with the Vac-Con truck. The City may expect to perform this maintenance at least once every 6 years, cleaning approximately 5 miles of drainage pipe per year. The City's Stormwater Division does not have a Vac-Con truck and is renting one as necessary. The City's Wastewater Division is purchasing a new Vac-Con truck and the Stormwater Division will receive the Wastewater Division's old truck.
- Cleaning and CCTV inspecting the collection system and small diameter cross-culvert pipes with a length greater than 75 linear feet once every 6 years. This corresponds with the ASCE recommendation to perform a complete inspection of closed conduits once every 6 years. We assumed that pipes less than 75 linear feet could be visually inspected by City crews at the pipe ends.

Figure 173 Pipe End Treatments

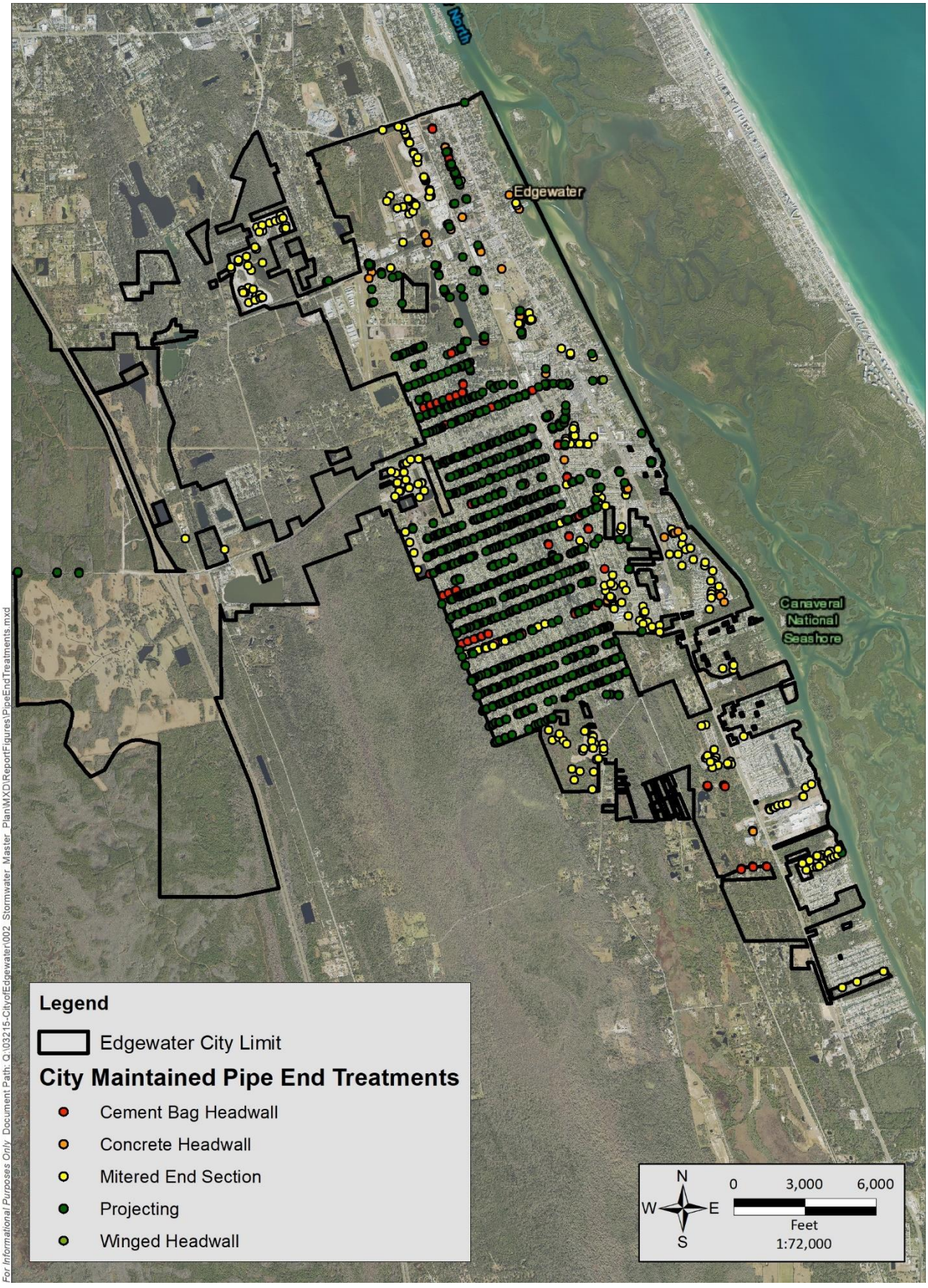
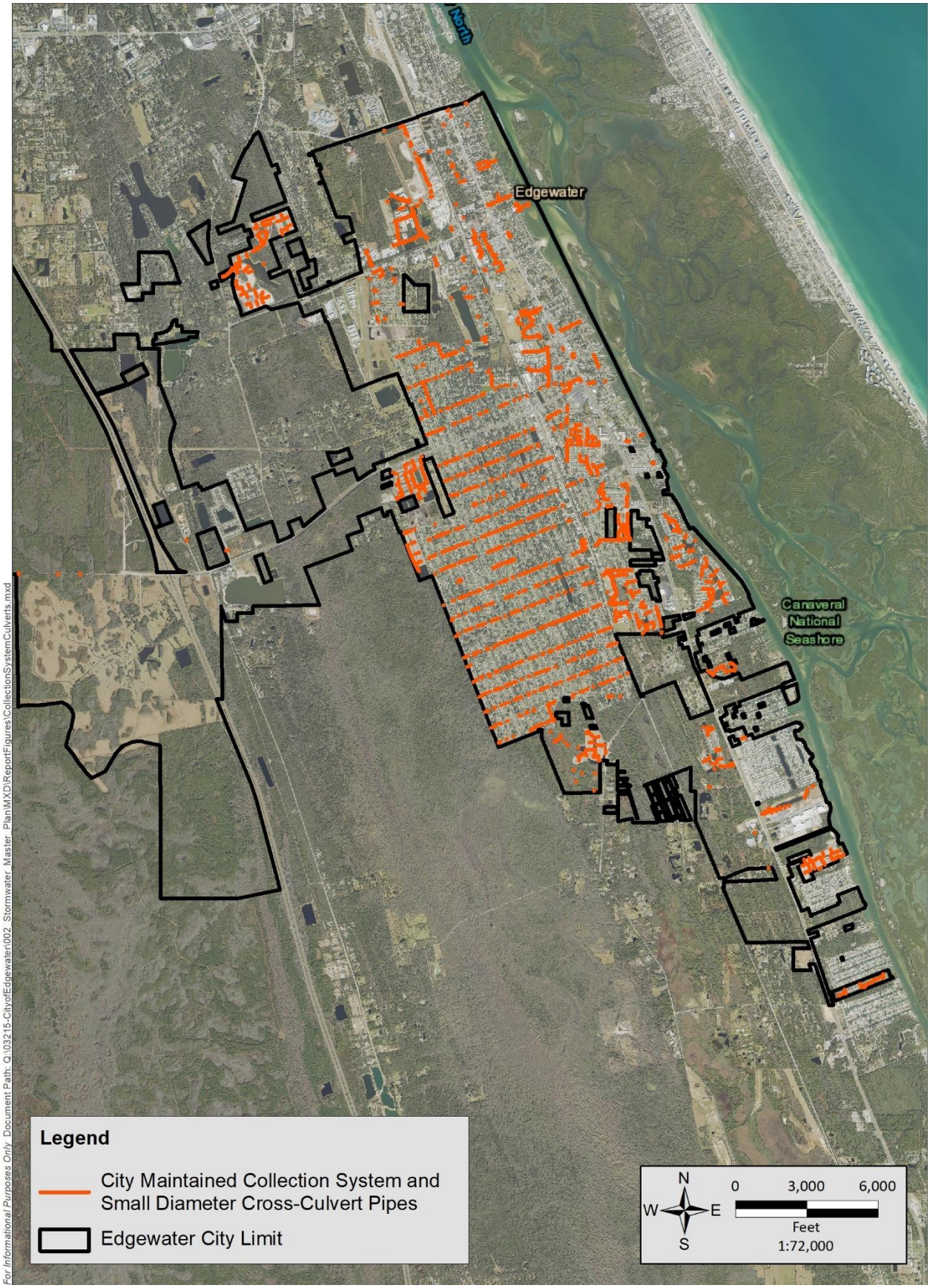


Figure 174 Collection System and Smaller Diameter Cross-Culvert Pipes



9.2.7 Collection System Structures

The City owns and maintains approximately 1,300 inlet structures, manholes, catch basins, baffle boxes, pond outfall structures, curb inlets, etc. (Figure 175). The City performs the following recurrent maintenance activities at these structures:

- Following large storm events, the City inspects and cleans collection system structures as needed. Based on rainfall data collected by SJRWMD, on average, the City experiences 13 days per year with greater than 1-inch of rainfall. The City should expect to perform this maintenance approximately 12–13 times per year.

Based on discussions with City Stormwater Division staff, field observations, knowledge of maintenance activities that other local communities similar to Edgewater perform, and ASCE/FDEP recommendations, Jones Edmunds has the following observations and recommendations related to collection system structure maintenance activities and frequencies:

- Inspect the City's baffle boxes every other month and clean out if needed.
- Inspect and clean out the City's pond outfall structures at least once a year.
- Based on the recommended pipe cleaning schedule proposed in Section 9.2.6, we assume that the structures will be cleaned out at least every 3 years when the City's crews jet and clean the pipes.

9.2.8 Roadside Swales and Driveway Culverts

The City contains approximately 155 miles of roadside swales and driveway culverts, most of which are in Florida Shores and convey stormwater runoff from paved roads and residential parcels to stormwater retention ponds and outfall ditches (Figure 176). Recently, the City has not performed recurrent planned maintenance on roadside swales and driveway culverts, and maintenance has resulted from resident requests as resource availability allowed. The City has recently begun dedicating resources to digging out roadside swales and cleaning driveway culverts to improve performance. The roadside swales and driveway culverts are part of the secondary drainage collection system and should be considered a lower-priority maintenance item compared to the primary ditches and culvert conveyances. In most cases, when these systems are not properly maintained, water stages up over driveways or spills into roadways and can still continue downhill toward the stormwater ponds and/or primary ditches without causing significant flooding. We recommend that the City implement the following improvements/additions to the recurrent maintenance of roadside swales and driveway culverts:

- Clean and grade roadside swales and driveway culverts once every 5 years. This would involve cleaning approximately 31 miles of swales and culverts per year.

Figure 175 Collection System Structures

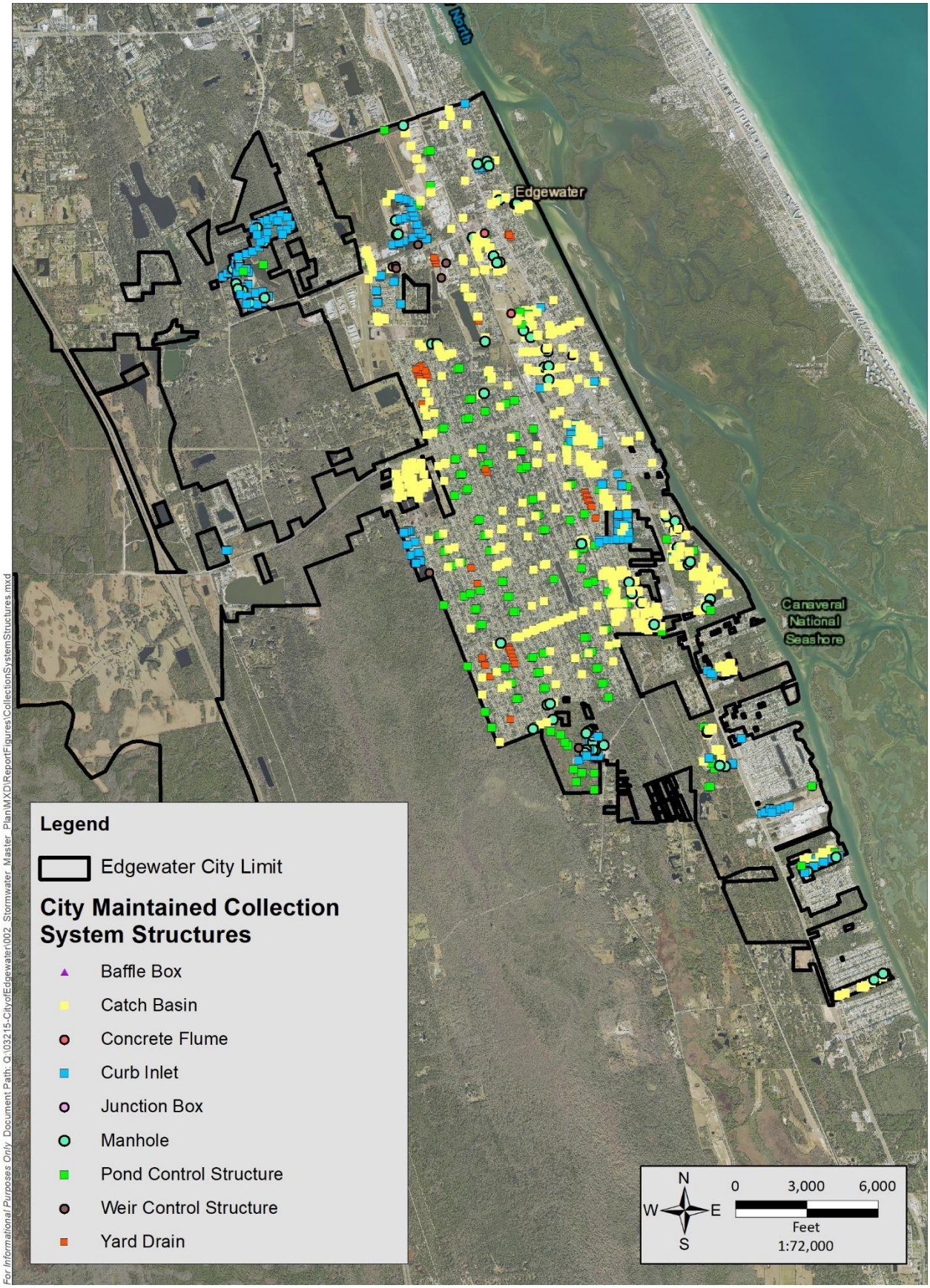
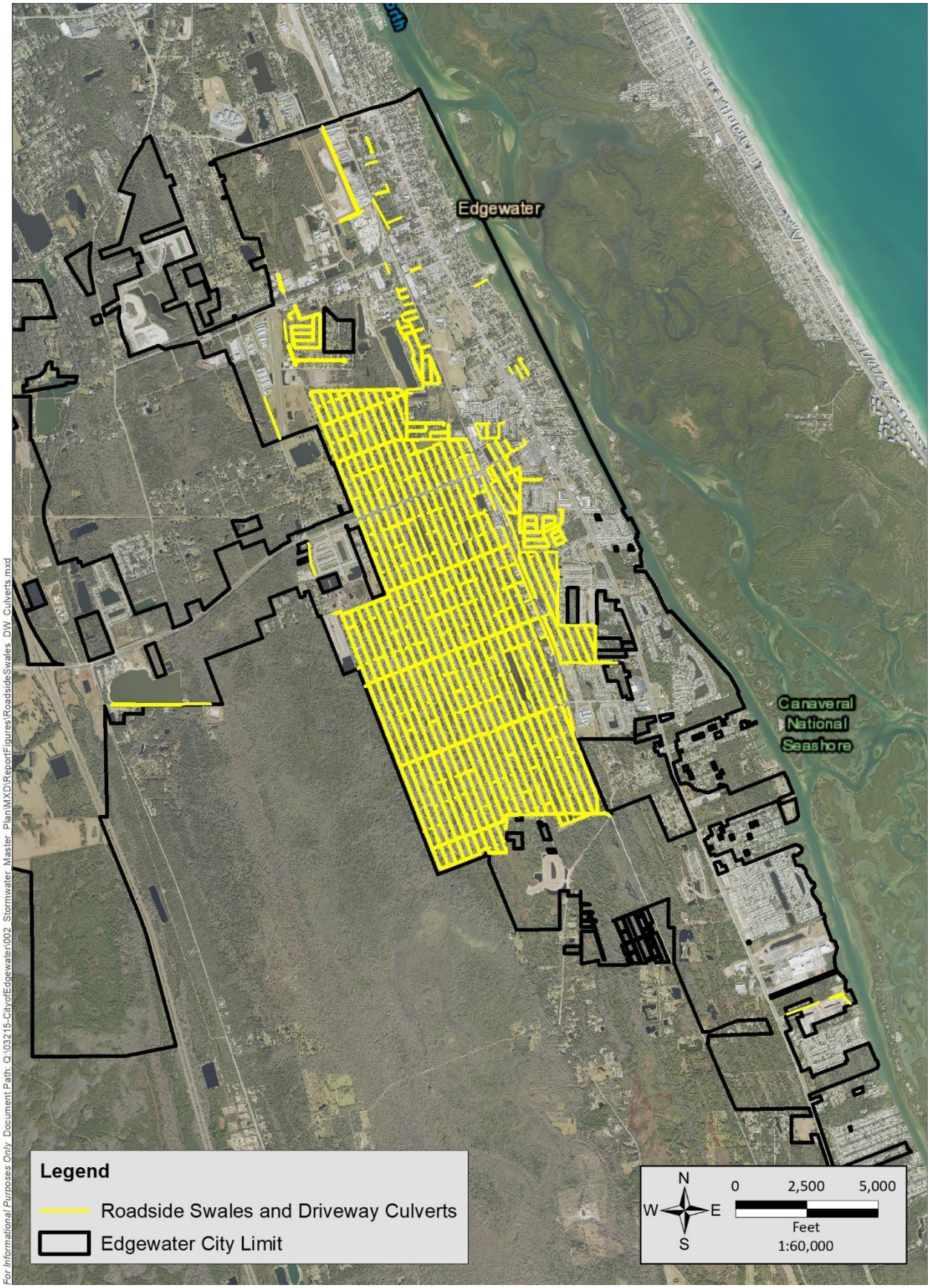


Figure 176 Roadside Swales and Driveway Culverts



9.3 Annual Maintenance Budget and Crew Hours Estimate

Jones Edmunds developed an estimated yearly budget to inspect and maintain the City's stormwater system. The budget includes costs for scheduled recurrent maintenance as well as allowances for small unscheduled point repairs when the system experiences localized damage. We developed a budget estimate for each system component included in Section 9.2 based on the potential required maintenance frequencies in Section 9.2, information provided by the City about current operation/personnel costs and efficiencies, unit costs from previous contracted maintenance activities, knowledge of the City's stormwater system, unit costs from industry sources, and professional judgment. This Section documents the methods and assumptions used to develop the budgets for each system component. All costs are in 2025 dollars; the City may apply an inflation factor for future years as construction and labor costs continue to increase.

9.3.1 Primary Ditches and Waterways

Jones Edmunds made the following assumptions and considerations to develop the estimated yearly budget and labor hours for maintaining the City's ditches and waterways:

- The City's Stormwater Division performs all ditch maintenance in-house.
- The City's hourly operating cost for a crew member is $48/hour including benefits, calculated from the City's Fiscal Year (FY) 2026 Stormwater Services budget. To determine this number, Stormwater Division personnel related expenses were totaled and divided by the number of full-time equivalent employees (FTEs) in the Stormwater Division.
- The City maintains 25 miles of ditch.
- Ditch maintenance will occur in each ditch section 2 times per year.
- Ditch maintenance and mowing occur simultaneously and can be performed by 1 operator.
- One Florida Shores block of ditch, or approximately 0.14 mile, can be maintained in 2 days.
- The City performs approximately 25 ditch repairs per year.
- Ditch repairs are performed by a two-person crew and require 40 hours on average to complete.

Table 118 summarizes the yearly ditch/waterway maintenance cost and labor hours estimates.

Table 118 Estimated Yearly Ditch/Waterway Maintenance Cost and Labor Hours

Maintenance Activity	Total Maintained Length (miles)	Yearly Maintained Length (miles)	Labor Hours	Estimated Cost ($)
Ditch Mowing and Maintenance	25	50	5,714	277,012
Maintenance Activity	**Number of Repairs per Year**	**2-Person Crew Hours to Perform a Repair**	**Labor Hours**	**Estimated Cost ($)**
Ditch Repairs	25	40	2,000	96,954
Totals	NA	NA	7,714	373,966

9.3.2 Dry Retention Ponds

Jones Edmunds made the following assumptions and considerations to develop the estimated yearly budget and labor hours for maintaining the City's dry retention ponds:

- The City's Stormwater Division performs all dry retention pond maintenance in-house.
- The City's hourly operating cost for a crew member is $48/hour including benefits, calculated from the City's FY 2026 Stormwater Services budget. To determine this number, Stormwater Division personnel-related expenses were totaled and divided by the number of FTEs in the Stormwater Division.
- The City maintains a total of 300 dry retention ponds.
- The City mows each retention pond once every 2 months.
- Retention pond mowing is performed by one operator.
- On average, eight retention ponds can be mowed in an 8-hour day.
- On average, the City de-mucks and sands 10 retention ponds per year, assuming this maintenance is required once every 30 years.
- De-mucking and sanding retention ponds are completed by a two-person crew and takes approximately 4 days on average to complete.

Table 119 summarizes the yearly dry retention pond maintenance cost and labor hours estimates.

Table 119 Estimated Yearly Dry Retention Maintenance Labor Cost and Labor Hours

Maintenance Activity	Ponds Maintained per Year	Ponds Maintained Per Day	Labor Hours	Estimated Cost ($)
Pond Mowing	1,800	8	1,800	87,259
Maintenance Activity	Ponds Maintained per Year	2-Person Crew Hours to Perform Repair	Labor Hours	Cost
De-Muck and Sand	10	32	640	31,025
Totals	NA	NA	2,440	118,284

9.3.3 Wet Detention Ponds

Jones Edmunds made the following assumptions and considerations to develop the estimated yearly budget and labor hours for maintaining the City's wet detention ponds:

- The City's Stormwater Division performs all wet detention pond maintenance in-house, except for the spraying of two ponds.
- The City's hourly operating cost for a crew member is $48/hour including benefits, calculated from the City's FY 2026 Stormwater Services budget. To determine this number, Stormwater Division personnel-related expenses were totaled and divided by the number of FTEs in the Stormwater Division.
- The City maintains approximately 30 wet detention ponds that cover approximately 90 acres.

- The City mows/maintains an approximately 20-foot buffer around each detention pond, covering a total area of approximately 20 acres. Half of this area is considered side bank, and the other half is considered top of bank.
- The City maintains the pond side banks for each detention pond twice a year.
- The City maintains the pond top of banks for each detention 12 times a year
- Detention pond side bank maintenance is performed by one operator who can maintain an acre in approximately 4 hours.
- Detention pond top of bank maintenance is performed by one operator who can maintain an acre in approximately 2 hours.
- The mobilization and demobilization time for mowing a pond is 30 minutes.
- On average, the City needs to de-muck 3 acres of detention pond per year, assuming this maintenance is required at each pond once every 40 years. Pond de-mucking will be subcontracted, and the estimated cost of de-mucking was assumed to be $60 per cubic yard with 10 percent added to cover mobilization, dewatering, and other associated costs. On average, 2 feet of sediment will be removed.
- City-conducted pond spraying occurs at each pond four times per year. A two-person City crew can spray two ponds per day on average.

Table 120 summarizes the yearly wet detention pond maintenance cost and labor hours estimates.

Table 120 Estimated Yearly Wet Detention Maintenance Cost and Labor Hours

Maintenance Activity	Acres Mowed per Year	Hours to Mow 1 Acre	Labor Hours with mob/demob per Year	Estimated Cost ($)
Top of Bank Mowing	120	2	420	20,360
Side Bank Mowing	20	4	110	5,332
Maintenance Activity	Ponds Sprayed per Year	Ponds Sprayed per Day by 2-Person Crew	Labor Hours per year	Cost
Pond Spraying	112	2	956	$46,344
Totals	NA	NA	1,486	72,037
Maintenance Activity	Acres Maintained per Year	Estimated Yearly Sediment Removal (CY)	De-Muck Cost ($/CY)	Estimated Cost ($)
Pond De-mucking	2.25	7,260	66	479,160
Pond Spraying	NA	NA	NA	10,000
Totals	NA	NA	NA	489,160

9.3.4 Major Cross-Culverts

Jones Edmunds made the following assumptions and considerations to develop the estimated yearly budget and labor hours for maintaining the City's major cross-culverts:

- The City's hourly operating cost for a crew member is $48/hour including benefits, calculated from the City's FY 2026 Stormwater Services budget. To determine this

number, Stormwater Division personnel-related expenses were totaled and divided by the number of FTEs in the Stormwater Division.

- The City maintains 166 major cross-culverts, 161 round/elliptical culverts and 5 box culverts or con-spans.
- Cleaning and removal of sediment for the entire length of major cross-culverts occurs once every 6 years and is subcontracted. Cleaning will be needed at half of the culvert crossings assuming that half of the culverts are self-cleaning and will not require maintenance.
- Contracted cross-drain maintenance costs $10,000 per box culvert/con-span and $5,000 per round culvert. A 10-percent markup was added for mobilization and maintenance of traffic cost.
- Sediment is removed from culvert ends when the upstream and downstream ditches are cleaned. This maintenance time and cost is accounted for in Section 9.3.1.
- Culvert ends are string-trimmed every other month. This maintenance time and cost is accounted for in Section 9.3.5.

Table 121 summarizes the yearly major cross-culvert maintenance cost.

Table 121 Estimated Yearly Major Cross-Culvert Maintenance Cost

Cross-Drain Shape	Number of Culverts	Cleanings per Year	Cost per Cleaning ($)	Yearly Cleaning Cost ($)
Round	161	13.4	$5,500	73,792
Box Culvert/Con-Spans	5	0.4	$11,000	4,583
Totals				78,375

9.3.5 Pipe End Treatments

Jones Edmunds made the following assumptions and considerations to develop the estimated yearly budget and labor hours for maintaining the City's pipe end treatments:

- The City's Stormwater Division performs all pipe end treatment maintenance in-house.
- The City's hourly operating cost for a crew member is $48/hour including benefits, calculated from the City's FY 2026 Stormwater Services budget. To determine this number, Stormwater Division personnel-related expenses were totaled and divided by the number of FTEs in the Stormwater Division.
- The City maintains approximately 1,800 pipe end treatments.
- Culvert ends are string-trimmed every other month. This maintenance is completed by one operator and takes 15 minutes per pipe end.
- Pipe ends are de-silted and exposed once a year for 50-percent of the pipe end treatments. This maintenance is completed by one operator and takes 30 minutes per pipe end.
- City crews clean 15 percent of the end treatments before, during, or after significant rainfall events. End treatment cleaning takes 30 minutes per pipe end on average and is completed by one operator.
- Significant rainfall events are defined as events where more than 1 inch of rainfall occurs in a day. Based on SJRWMD rainfall gauge data, this occurs 13 times per year on average.

- On average, the City will complete $25,000 per year in point repairs to end treatments. Larger replacement projects will be completed as CIP projects.

Table 122 summarizes the yearly major cross-culvert maintenance cost and labor hours estimates.

Table 122 Estimated Yearly Pipe End Treatment Maintenance Cost and Labor Hours

Maintenance Activity	End Treatment Count	Cleanings per Year	Labor Hours per Year	Yearly Cost ($)
Pre-/Post-Storm Cleaning	1,813	3,535	1,768	85,692
Point Repairs	N/A	N/A	N/A	25,000
End Treatment Mowing/ Weed Whacking	1,813	10,878	2,720	131,834
De-Silt and Expose Ends	1,813	907	453	21,972
Total Cost			4,940	264,497

9.3.6 Collection System and Smaller Diameter Cross-Culvert Pipes

Jones Edmunds made the following assumptions and considerations to develop the estimated yearly labor budget and hours for maintaining the City's collection system and smaller diameter cross-culvert pipes:

- The City's Stormwater Division performs all collection system and smaller diameter cross-culvert pipe maintenance in-house.
- The City maintains approximately 28,000 linear feet of collection system and smaller diameter cross-culvert pipes.
- The City's hourly operating cost for a crew member is $48/hour including benefits, calculated from the City's FY 2026 Stormwater Services budget. To determine this number, Stormwater Division personnel-related expenses were totaled and divided by the number of FTEs in the Stormwater Division.
- Pipes are jet cleaned by City crews once every 6 years. This maintenance is performed by a two-person crew that can clean 500 linear feet of pipe per day on average. We assumed that 50 percent of pipes require jet cleaning and the other 50 percent are self-cleaning and do not require cleaning.
- Pipes are cleaned and CCTV'd by the City once every 6 years. Pipes with a total length less than 75 linear feet do not require CCTV'ing. We assumed that 50 percent of pipes require jet cleaning and the other 50 percent are self-cleaning and do not require cleaning before CCTV'ing.
- On average, the City will complete $50,000 per year in point repairs to these pipes. Larger replacement and pipelining projects will be completed as CIP projects.

Table 123 summarizes the yearly collection system and smaller diameter cross-culvert maintenance cost and labor hours estimates.

Table 123 Estimated Yearly Collection System and Smaller Diameter Cross-Culvert Pipe Maintenance Cost and Labor Hours

Maintenance Activity	Total Pipe Length (feet)	Yearly Length Cleaned (feet)	City Labor Hours per Year	Yearly Cost ($)
Pipe Cleaning	159,797	26,633	852	41,315
Maintenance Activity	Total Pipe Length (feet)	Yearly Inspected Length (feet)	City Labor Hours per Year	Yearly Cost ($)
CCTV Inspection	159,797	21,917	234	11,333
Point Repairs	N/A	N/A	N/A	50,000
Total Cost			1,086	102,643

9.3.7 Collection System Structures

Jones Edmunds made the following assumptions and considerations to develop the estimated yearly budget and labor hours for maintaining the City's collection system structures:

- The City's Stormwater Division performs all collection system structure maintenance in house.
- The City's hourly operating cost for a crew member is $48/hour including benefits, calculated from the City's FY 2026 Stormwater Services budget. To determine this number, Stormwater Division personnel-related expenses were totaled and divided by the number of FTEs in the Stormwater Division.
- The City maintains 1,300 collection system structures.
- City crews clean 15 percent of the collection system structures before, during, or after significant rainfall events. Structure cleaning takes 30 minutes per structure on average and is completed by one operator.
- Significant rainfall events are defined as events where more than 1 inch of rainfall occurs in a day. Based on SJRWMD rainfall gauge data, this occurs 13 times per year on average.
- Baffle boxes are cleaned four times a year and take approximately 4 hours to maintain.
- On average, the City will complete $50,000 per year in point repairs to these structures. Larger replacements will be completed as CIP projects.

Table 124 summarizes the yearly collection system and smaller diameter cross-culvert maintenance cost and labor hours estimates.

Table 124 Estimated Yearly Collection System Structure Maintenance Cost and Labor Hours

Maintenance Activity	Structure Count	Cleanings per Year	City Labor Hours per Year	Yearly Cost ($)
Pre-/Post-Storm Cleaning	1,300	2,399	1,410	68,333
Point Repairs	N/A	N/A	N/A	50,000
Total Cost				118,333

9.3.8 Roadside Swales and Driveway Culverts

Jones Edmunds made the following assumptions and considerations to develop the estimated yearly labor budget and hours for maintaining the City's roadside swale and driveway culverts:

- The City's Stormwater Division performs all roadside swale and driveway culvert maintenance in-house.
- The City's hourly operating cost for a crew member is $48/hour including benefits, calculated from the City's FY 2026 Stormwater Services budget. To determine this number, Stormwater Division personnel-related expenses were totaled and divided by the number of FTEs in the Stormwater Division.
- The City maintains approximately 154 miles of roadside swale and/or driveway culverts.
- Roadside swale and driveway culvert maintenance is performed once every 5 years, which means that approximately 31 miles are maintained each year.
- A two-person crew can maintain roadside swales on both sides of the street for approximately 400 feet in an 8-hour day. This is equivalent to approximately 0.15 miles per day.
- A two-person crew can maintain the driveway culverts on both sides of the street for approximately 400 feet in an 8-hour day. This is equivalent to approximately 0.15 miles per day.

Table 125 summarizes the yearly roadside swale and driveway culvert maintenance cost and labor hours estimates.

Table 125 Estimated Yearly Roadside Swale and Driveway Culvert Maintenance Cost and Labor Hours

Maintenance Activity	Total Length (miles)	Yearly Length Cleaned (miles)	City Labor Hours per Year	Yearly Cost ($)
Swales	154	31	3,252	157,671
Driveway Culverts	154	31	3,252	157,671
Total			6,505	315,342

9.4 O&M Funding Strategy and Program Sustainability

Based on the maintenance budget and labor hours estimates documented in Sections 9.3.1 through 9.3.8, the total estimated maintenance budget for the City to implement the recommended plan is approximately $3,740,000. Table 126 summarizes the total budget and includes operating expenses and debt service, estimated from the City's FY 2026 stormwater budget. The estimated total City stormwater maintenance labor hours required for implementing this plan is 31,977 hours. This assumes that the crew has an efficiency of 80 percent, accounting for downtime from holidays, vacations, sick/injury leave, equipment issues, responding to specific resident requests, repairing system failures, etc. Table 127 breaks down the labor hours needed by maintenance activity type. Assuming that approximately 2,100 hours of time are available each year per FTE, this equates to a need for 15.2 FTEs, which would require that the City hire four additional full-time stormwater maintenance staff. The labor hour estimates and budget do not include time/money for

completing stormwater inspections, capital expenditures, or increased operating expenses from adding four FTEs.

Based on the City's FY 2026 stormwater budget, the City's stormwater utility currently generates approximately $2,700,000. Implementing the proposed maintenance plan is not sustainable under current funding levels and would require the City to increase funding for the stormwater budget.

Table 126 Summary of Total Estimated Maintenance Budget

System Component	In-House Maintenance Cost ($)	Contracted Maintenance Cost ($)	Total Cost ($)
Primary Ditches/Waterways	373,966	—	373,966
Dry Retention Ponds	118,284	—	118,284
Wet Detention Ponds	72,037	489,160	561,197
Major Cross-Culverts	—	78,375	78,375
Pipe End Treatments	239,498	25,000	264,498
Collection System and Smaller Diameter Cross-Culverts	52,648	50,000	102,648
Collection System Structures	68,333	50,000	118,333
Roadside Swales and Driveway Culverts	315,341	—	315,341
Subtotal	1,240,107	692,535	1,932,642
Adjustment for 80-percent Crew Efficiency	1,550,134	692,535	2,242,669
Operating Expenses	1,200,000	—	1,200,000
Debt Service	300,000	—	300,000
Total			$3,742,669

Table 127 Summary of Estimated City Labor Hours by System Component

System Component	Stormwater Labor Hours Needed
Primary Ditches/Waterways	7,714
Dry Retention Ponds	2,440
Wet Detention Ponds	1,486
Major Cross-Culverts	—
Pipe End Treatments	4,940
Collection System and Smaller Diameter Cross-Culverts	1,086
Collection System Structures	1,410
Roadside Swales and Driveway Culverts	6,505
Total Labor Hours Needed	25,581
Labor Hours Needed at 80-percent Efficiency	31,977
FTEs Needed	15.2

9.5 Post-Storm Inspection and Emergency Response Procedures

Following major storm events, the City must evaluate the performance and condition of the stormwater management system to identify potential damage, operational issues, or maintenance needs. Post-storm inspections help ensure that stormwater infrastructure continues to function as intended and that any issues that could increase the risk of flooding or system failure are promptly addressed. In addition, post-storm evaluations provide valuable information that can be used to improve maintenance practices and inform future capital improvement planning.

9.5.1 Post-Storm Inspection Procedures

Post-storm inspections are typically initiated following significant rainfall events, tropical systems, or when widespread flooding or drainage concerns are reported by residents or City staff. Inspections are generally conducted as soon as conditions are safe, with priority given to areas known to experience flooding or areas containing critical stormwater infrastructure, such as the 18th Street ditch/culvert system and other primary outfall ditch systems.

Inspections focus on evaluating the condition and functionality of key stormwater system components, including stormwater inlets, culverts, pipes, open channels, outfalls, and stormwater ponds. During these inspections, City staff look for conditions that impact system performance, including debris accumulation, sediment buildup, erosion, structural damage, or blockages that could reduce conveyance capacity. Attention should be given to major conveyance systems, roadway crossings, outfall structures, and locations with a history of drainage complaints or flooding.

The City should document field observations through inspection forms, maintenance work orders, photographs, and GIS records where possible. This would allow the City to track recurring problem areas and prioritize future maintenance or repair activities.

9.5.2 Emergency Response Procedures

When storm-related issues are identified that pose an immediate risk to public safety or significantly impair stormwater system performance, the City initiates emergency response actions prior to storm events, if time permits, to inspect the stormwater system, make sure major drainage systems are clear of blockages, draw down storage areas where possible, and place temporary pumps as-needed. Emergency response is also needed following major storm events to restore system functionality as quickly as possible. Emergency response activities are typically coordinated through the City's Public Works Department and may involve coordination with other City departments, emergency management personnel, or external agencies as needed.

Emergency response actions may include removing debris from clogged inlets and culverts, clearing obstructions within drainage channels, repairing damaged stormwater structures, installing temporary erosion control measures, or deploying temporary pumping operations where necessary (i.e., Duck Lake). In cases where stormwater infrastructure damage results in roadway flooding or hazardous conditions, traffic control measures or temporary road closures may be implemented until conditions are stabilized.

If repairs exceed the capacity of available City resources, emergency contractors may need to be mobilized to perform necessary work.

9.5.3 Repair Prioritization

Following post-storm inspections, identified issues are prioritized based on the potential risk to public safety, the severity of system impairment, and the likelihood of continued flooding or infrastructure damage. Issues that result in active flooding, structural failure of stormwater infrastructure, or significant blockage of major conveyance systems are addressed with the highest priority. Moderate issues that reduce system efficiency but do not immediately impact public safety are scheduled for repair as resources allow, whereas minor maintenance issues may be incorporated into routine maintenance activities.

9.5.4 Documentation and Refinement

Information collected during post-storm inspections is used to support ongoing stormwater system management and planning efforts. Documented issues may result in follow-up maintenance activities, targeted inspections, or recommendations for capital improvement projects. In addition, post-storm observations can help identify recurring flooding locations, undersized infrastructure, or maintenance deficiencies that may warrant further evaluation as part of the City's capital improvement planning efforts.

By maintaining a structured approach to post-storm inspections and emergency response, the City can improve the resilience and reliability of its stormwater management system while proactively addressing potential drainage issues.

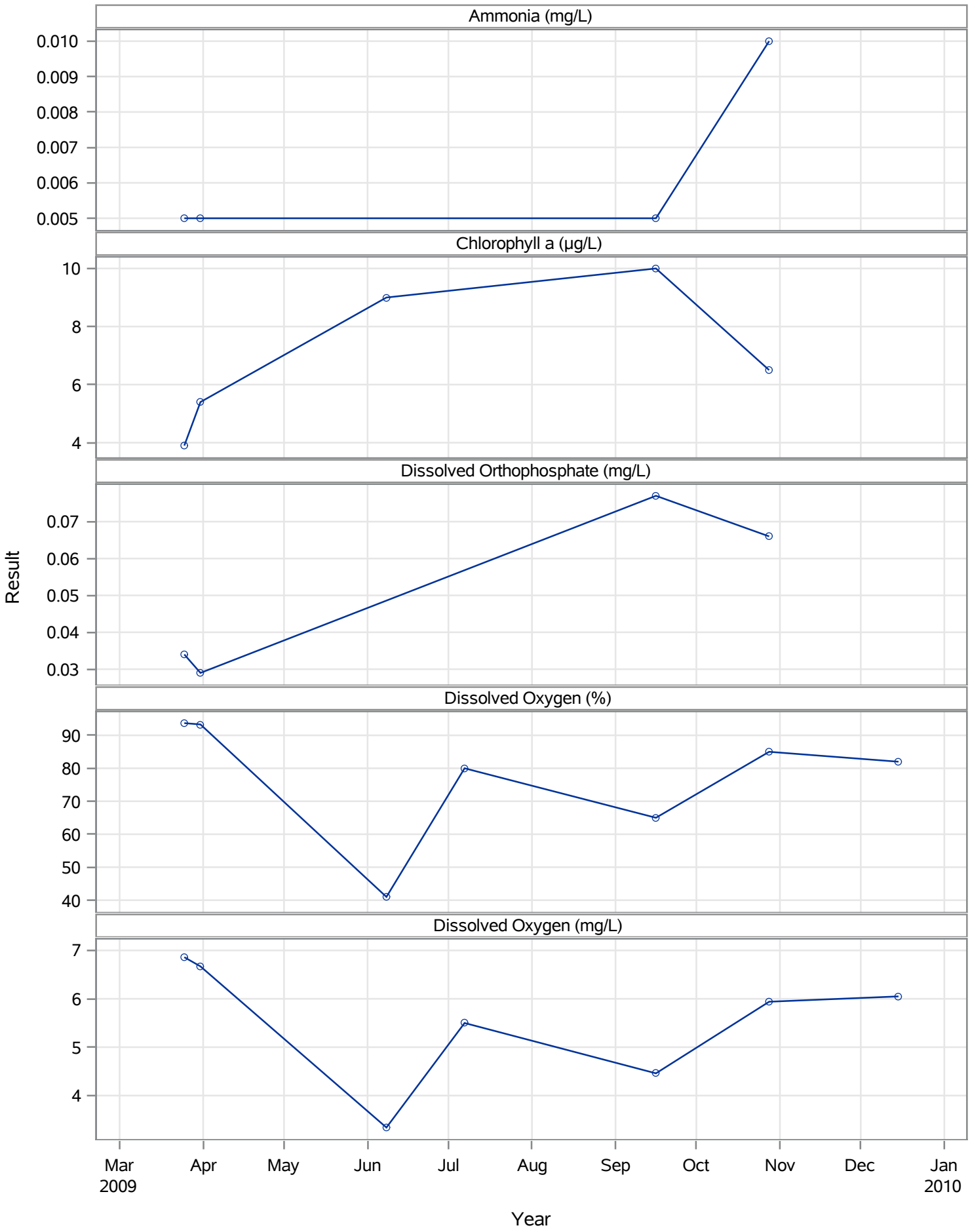
9.6 Maintenance Plan Implementation

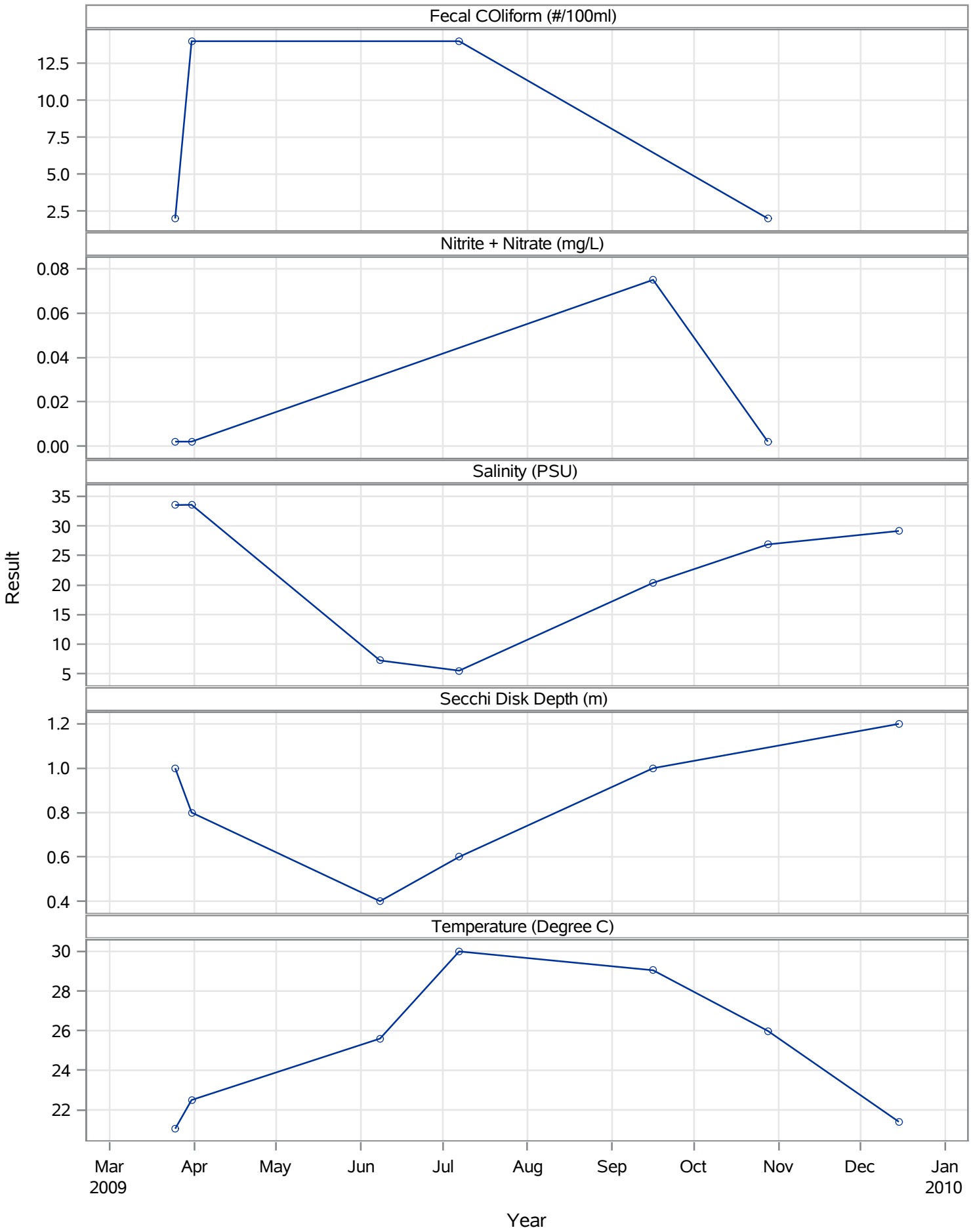
Jones Edmunds recommends that the City develop a stormwater inspection and maintenance tracking system to implement the proposed plan. The City is currently working to implement a Citywide asset management software (AMS) that includes modules for stormwater management. AMS is used by municipalities across Florida to manage assets (streets, water, sewer, stormwater, fleets, etc.). AMS is a customizable software used for scheduling and tracking the inspection/maintenance of municipal assets and tracking costs. Some AMS brands can be integrated with GIS asset data layers, such as the City's stormwater asset data and data developed for the SWMP. This makes tracking, reporting, and executing maintenance activities easier because each asset has an associated physical location that can be viewed and queried on in a map within AMS. Jones Edmunds recommends working with the selected AMS implementation team to incorporate the proposed inspection and maintenance plan into the City's workflow.

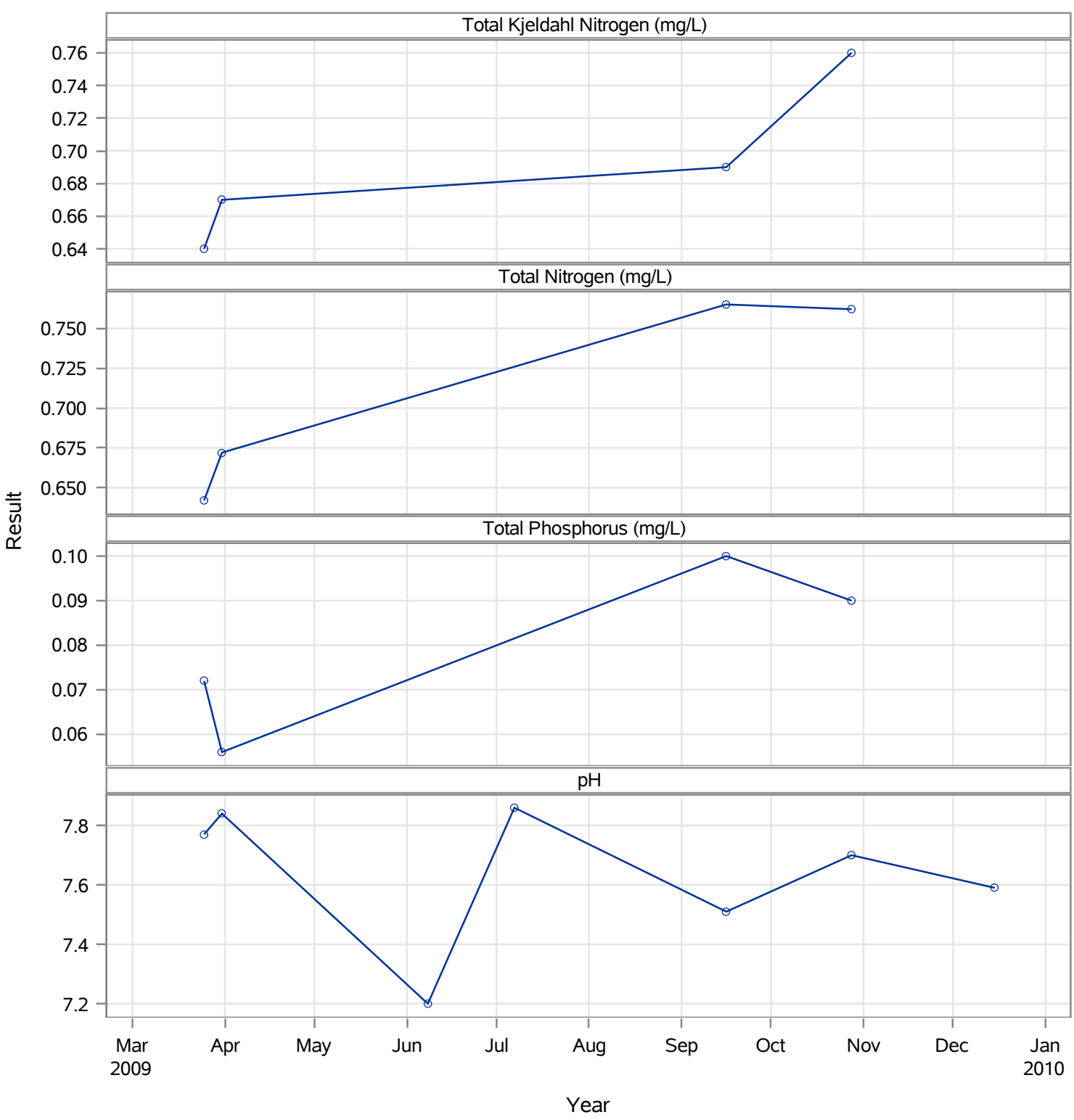
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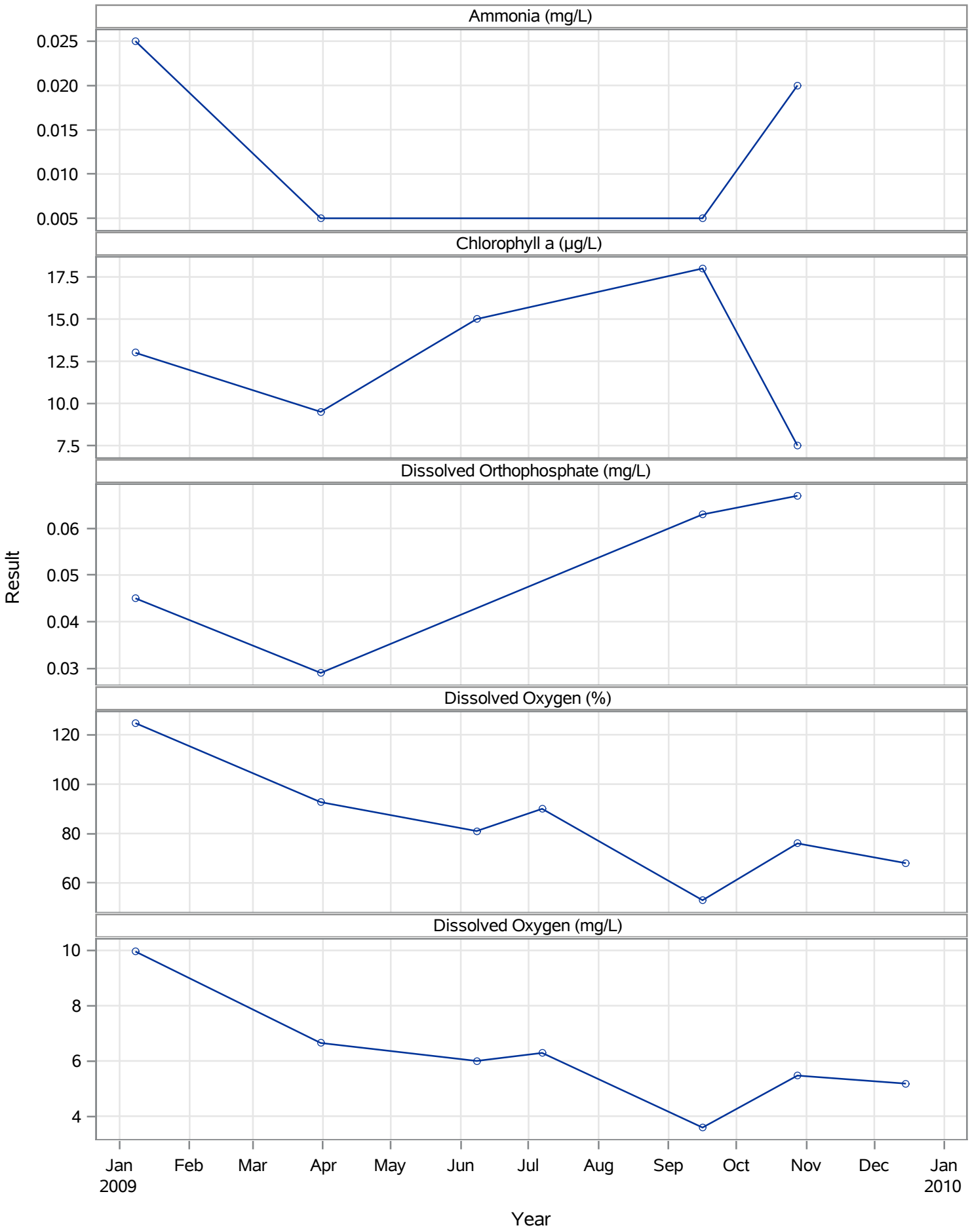
Florida Department of Environmental Protection. *North Indian River Lagoon BMAP 2025*. 2025. Florida Department of Environmental Protection, https://floridadep.gov/sites/default/files/2025%20North%20Indian%20River%20Lagoon%20BMAP.pdf. Accessed 13 Feb. 2026.

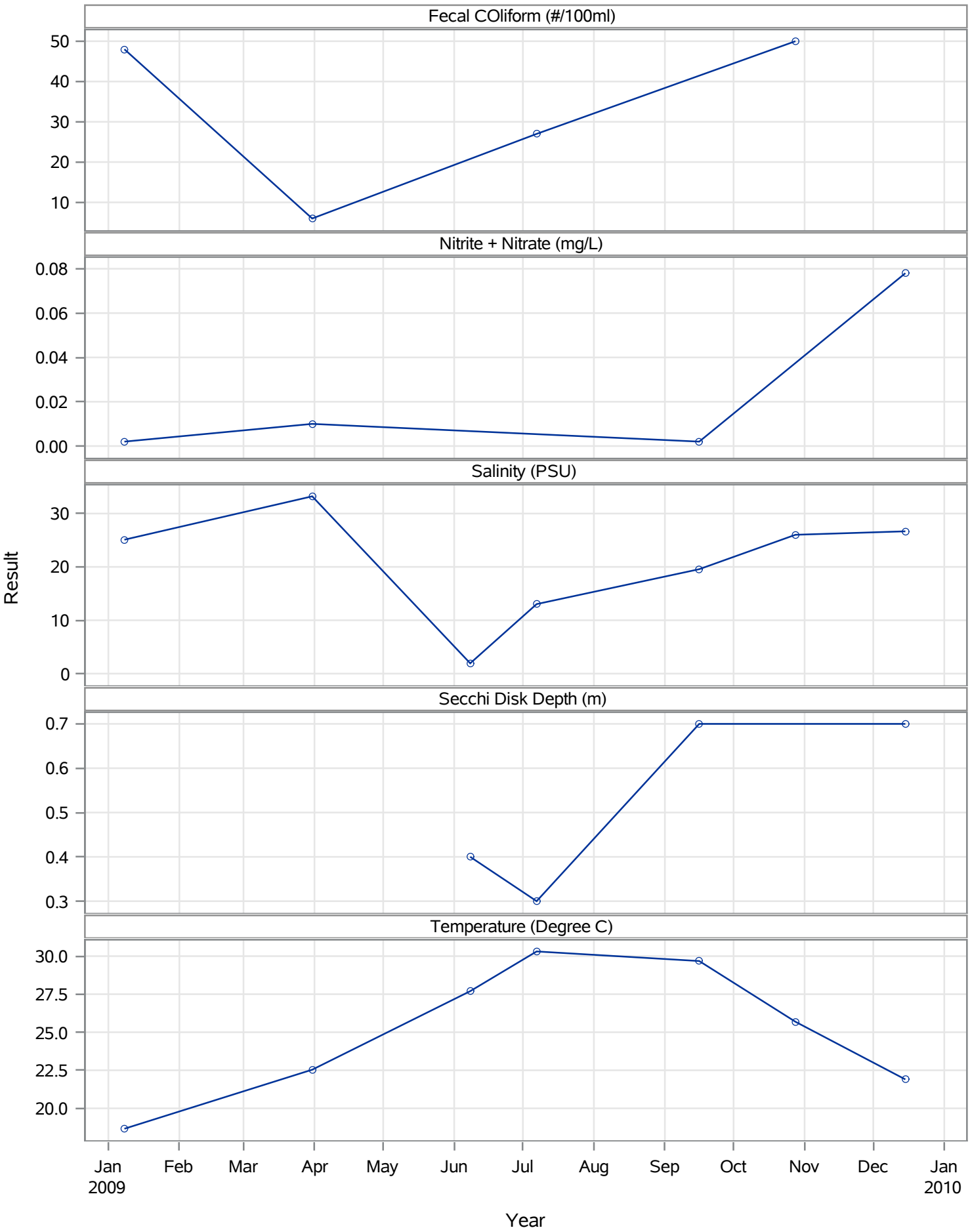
Appendix A
Station Water Quality Data Time-Series Plots

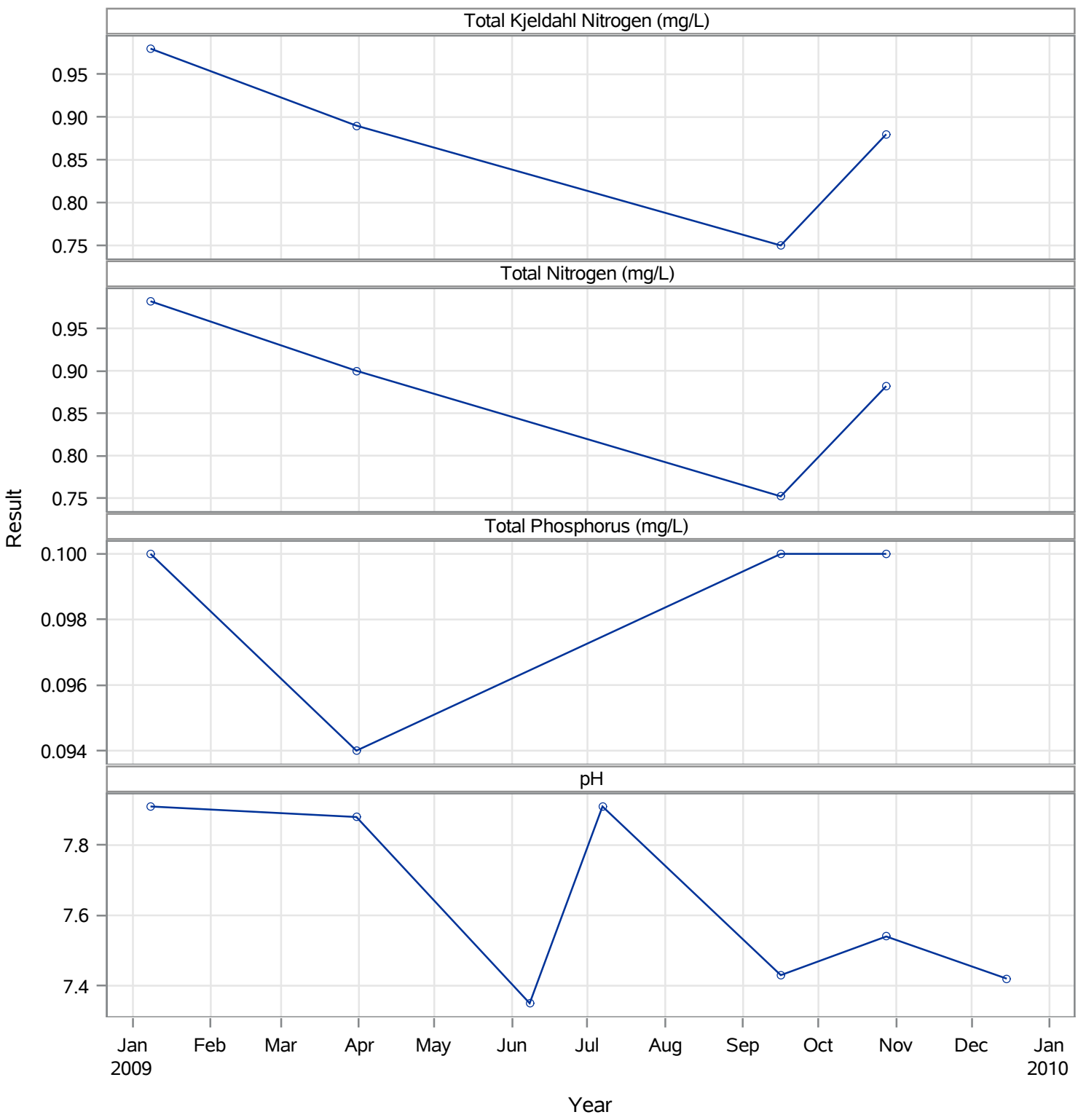

WBID=2678 Site=21FLA 27010613
Ammonia (mg/L)
0.010
0.009
0.008
0.007
0.006
0.005
Chlorophyll a (µg/L)
10
8
6
4
Dissolved Orthophosphate (mg/L)
0.07
0.06
0.05
0.04
0.03
Dissolved Oxygen (%)
90
80
70
60
50
40
Dissolved Oxygen (mg/L)
7
6
5
4
Result
Mar
2009
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
2010
Year

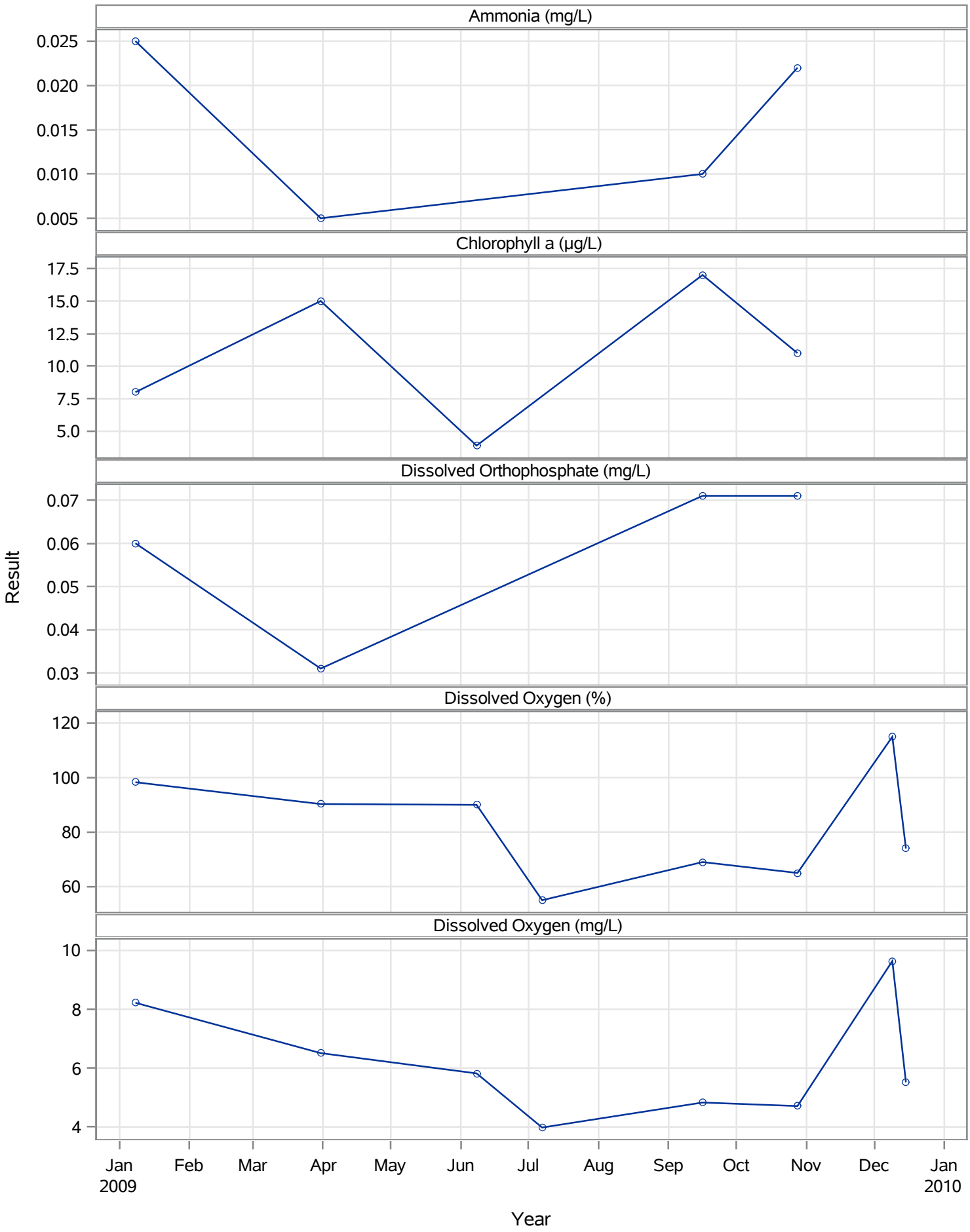

WBID=2678 Site=21FLA 27010613
Fecal COliform (#/100ml)
12.5
10.0
7.5
5.0
2.5
Nitrite + Nitrate (mg/L)
0.08
0.06
0.04
0.02
0.00
Salinity (PSU)
35
30
25
20
15
10
5
Secchi Disk Depth (m)
1.2
1.0
0.8
0.6
0.4
Temperature (Degree C)
30
28
26
24
22
Result
Mar
2009
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
2010
Year

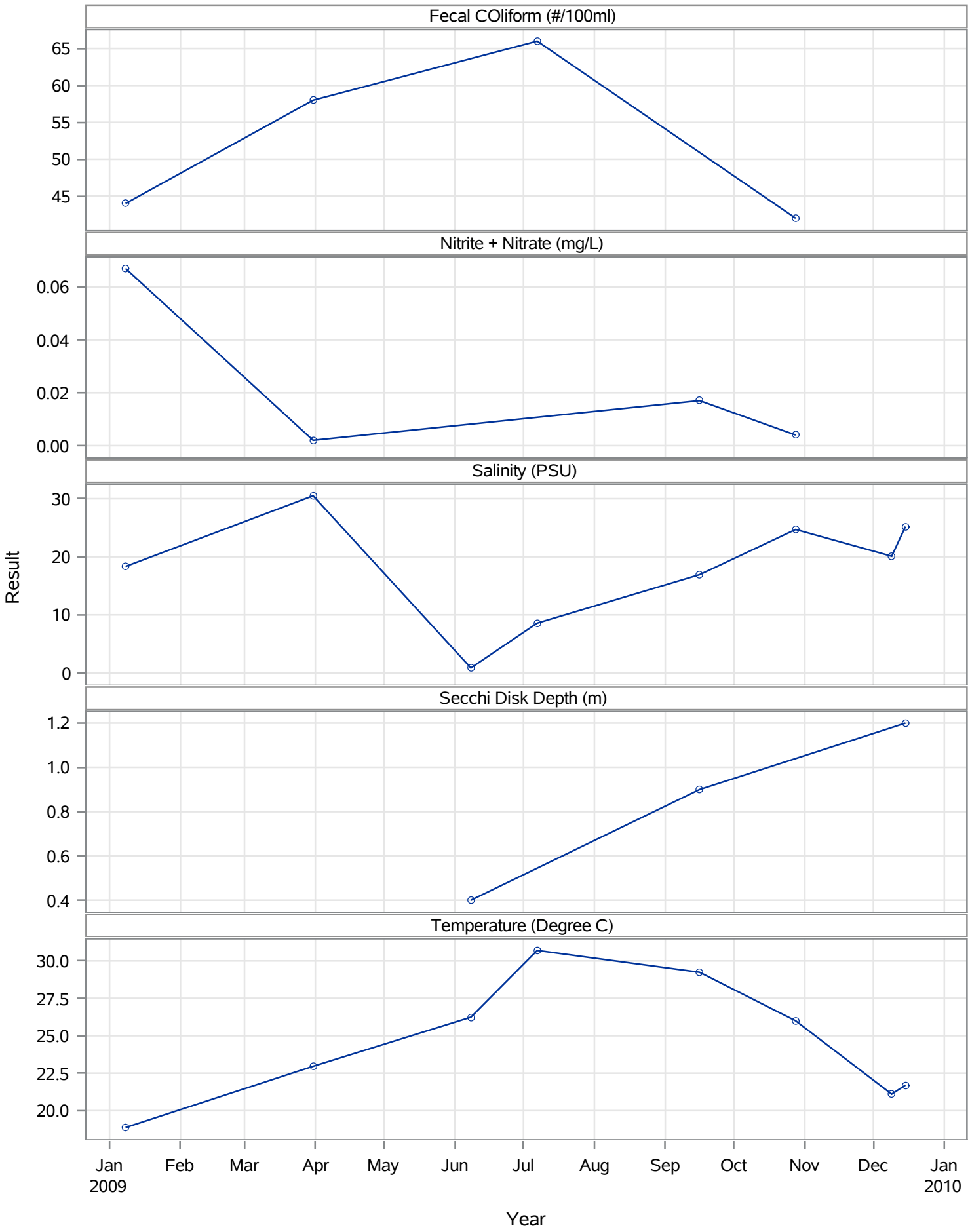

WBID=2678 Site=21FLA 27010613
Total Kjeldahl Nitrogen (mg/L)
0.76
0.74
0.72
0.70
0.68
0.66
0.64
Total Nitrogen (mg/L)
0.750
0.725
0.700
0.675
0.650
Total Phosphorus (mg/L)
0.10
0.09
0.08
0.07
0.06
pH
7.8
7.6
7.4
7.2
Result
Mar
2009
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
2010
Year

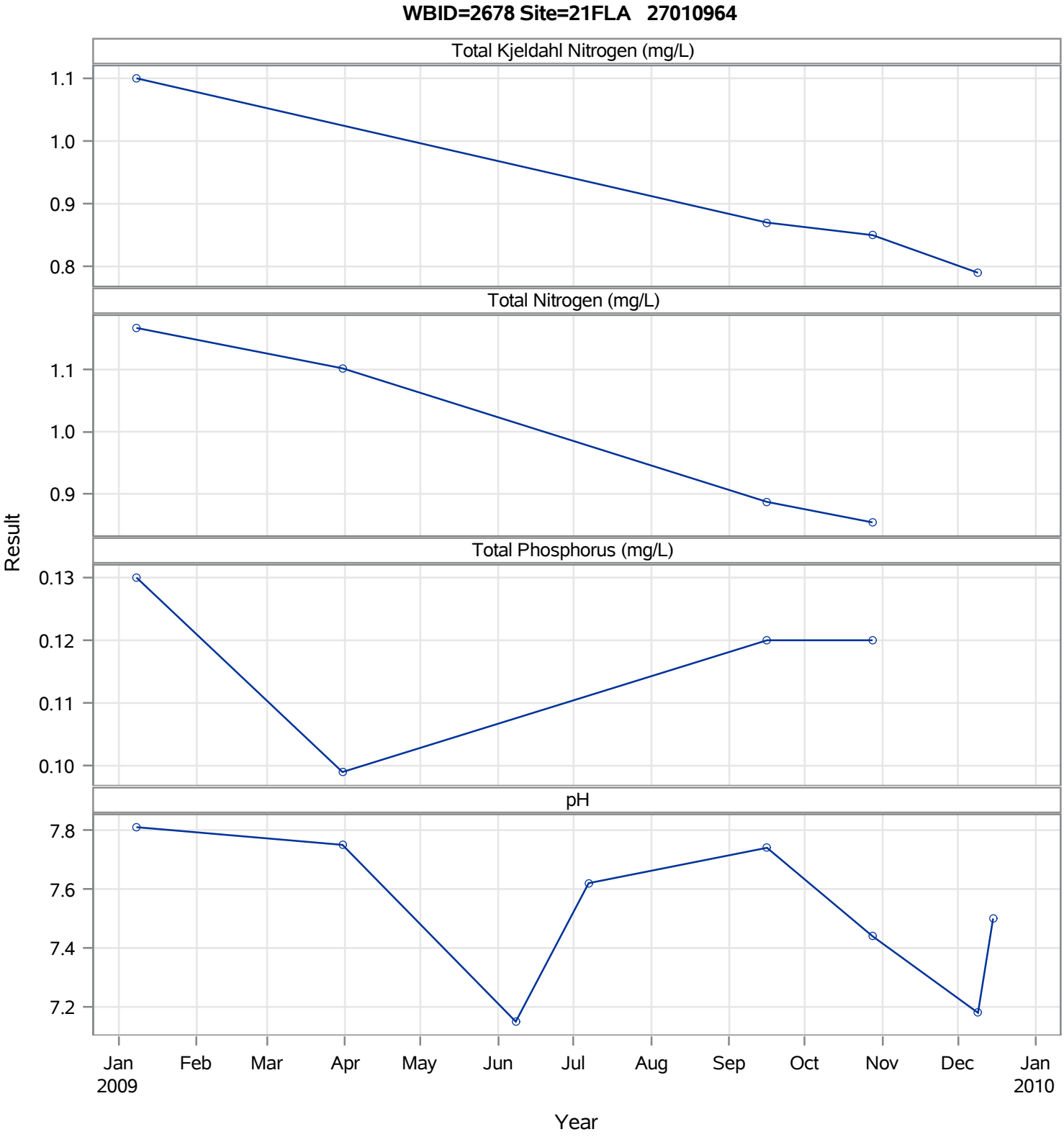

WBID=2678 Site=21FLA 27010963
Ammonia (mg/L)
0.025
0.020
0.015
0.010
0.005
Chlorophyll a (µg/L)
17.5
15.0
12.5
10.0
7.5
Dissolved Orthophosphate (mg/L)
0.06
0.05
0.04
0.03
Result
Dissolved Oxygen (%)
120
100
80
60
Dissolved Oxygen (mg/L)
10
8
6
4
Jan 2009
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan 2010
Year

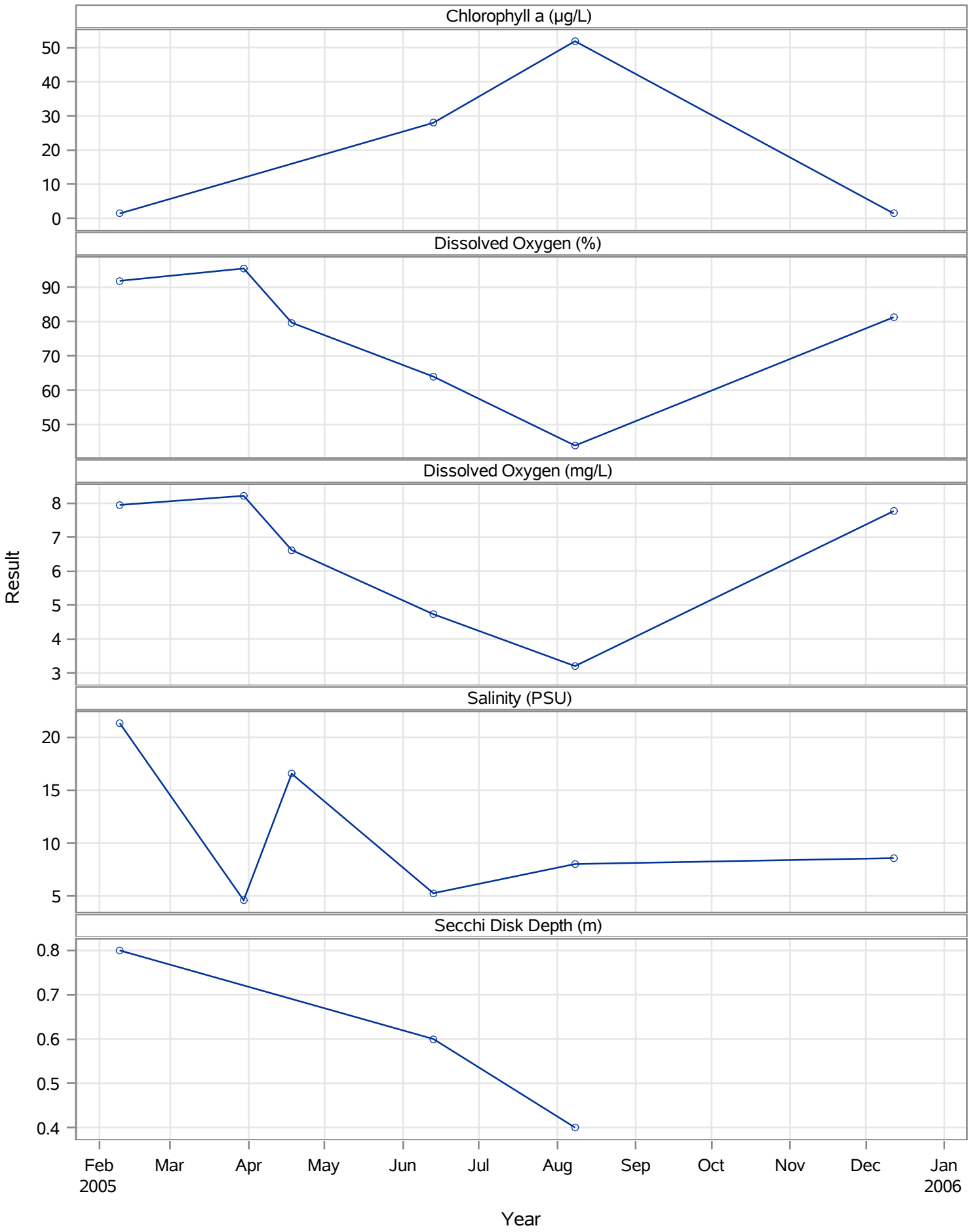

WBID=2678 Site=21FLA 27010963
Fecal COliform (#/100ml)
50
40
30
20
10
Nitrite + Nitrate (mg/L)
0.08
0.06
0.04
0.02
0.00
Salinity (PSU)
30
20
10
0
Secchi Disk Depth (m)
0.7
0.6
0.5
0.4
0.3
Temperature (Degree C)
30.0
27.5
25.0
22.5
20.0
Result
Jan
2009
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
2010
Year

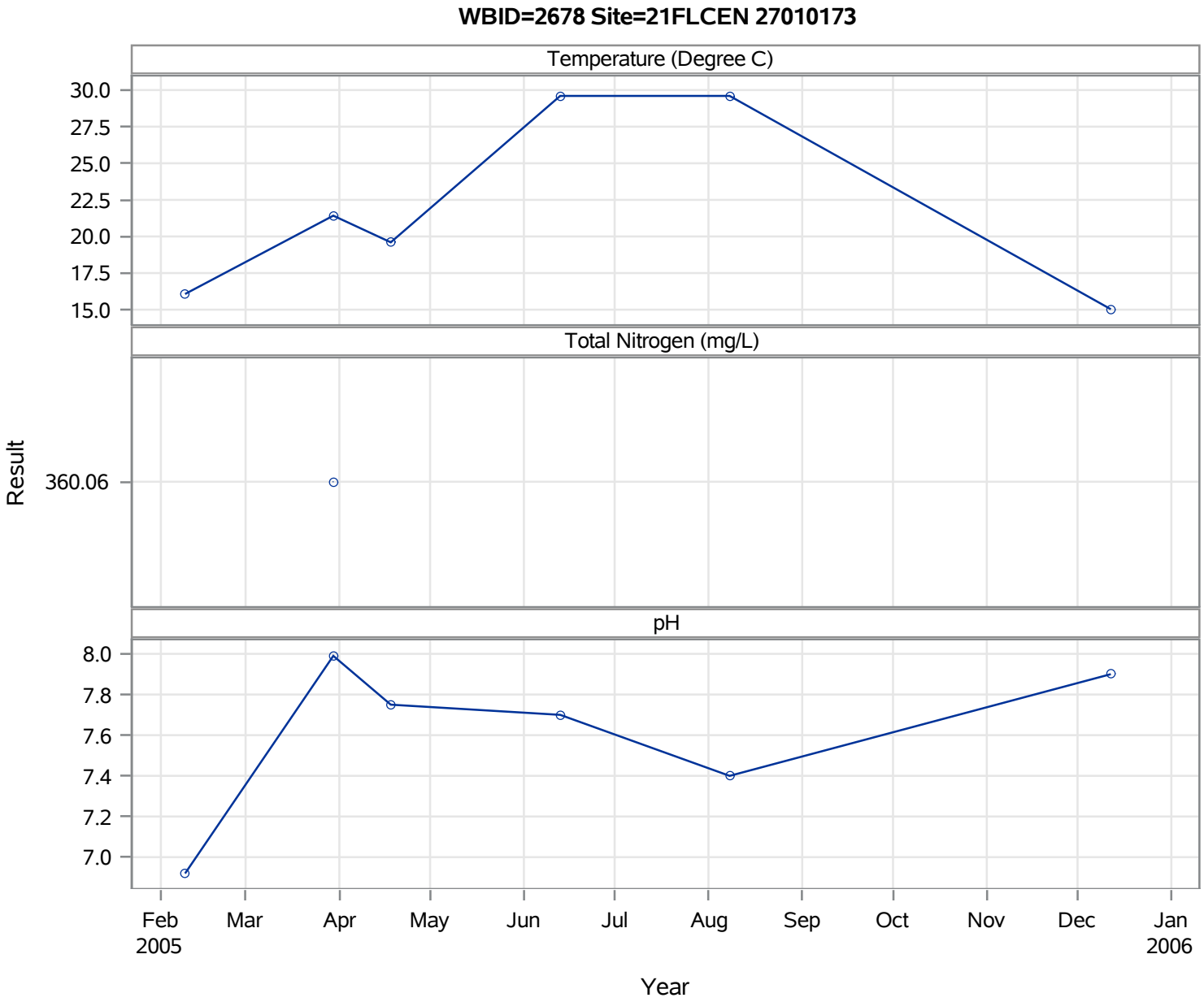

WBID=2678 Site=21FLA 27010963
Total Kjeldahl Nitrogen (mg/L)
0.95
0.90
0.85
0.80
0.75
Total Nitrogen (mg/L)
0.95
0.90
0.85
0.80
0.75
Result
Total Phosphorus (mg/L)
0.100
0.098
0.096
0.094
pH
7.8
7.6
7.4
Jan
2009
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
2010
Year

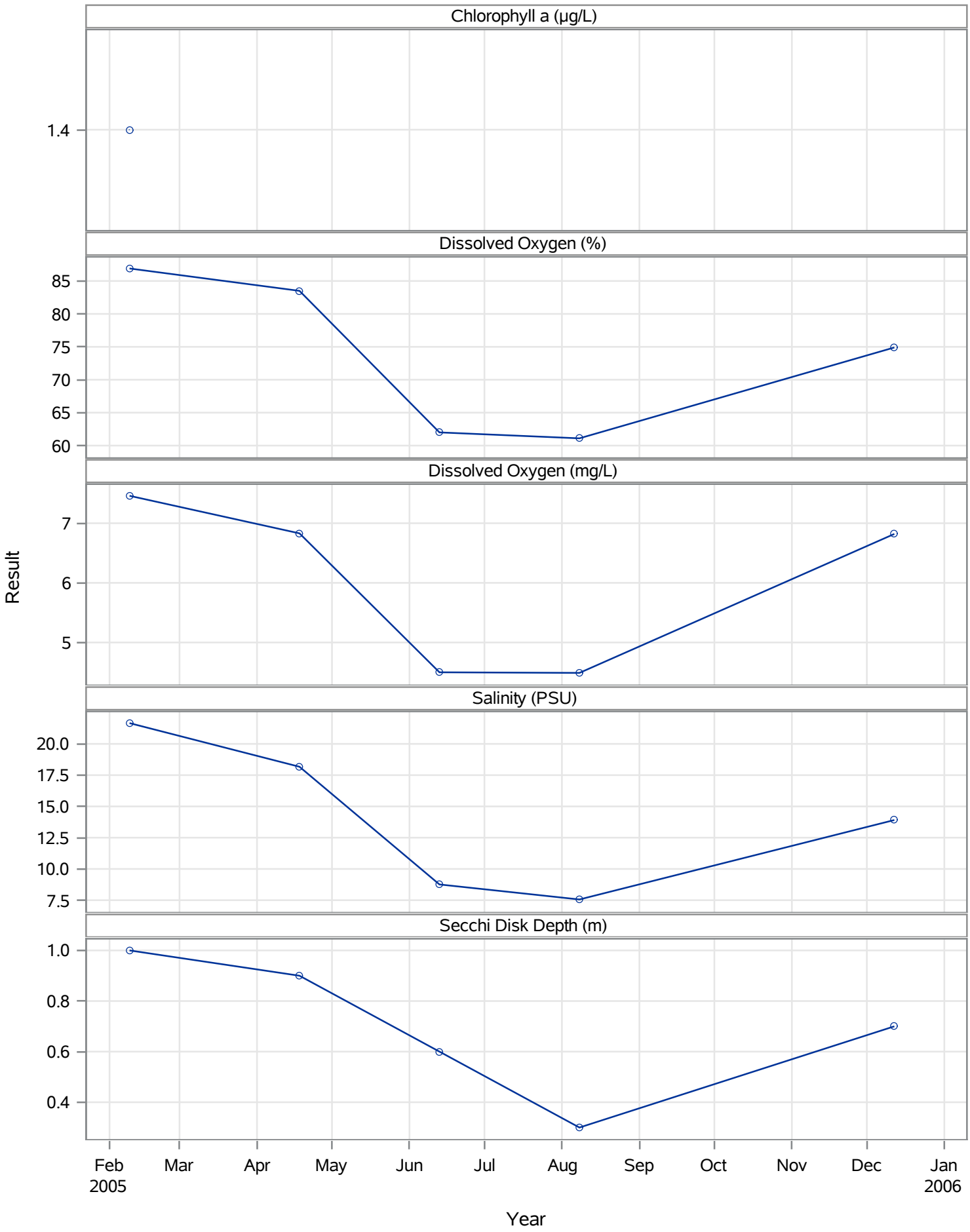

WBID=2678 Site=21FLA 27010964
Ammonia (mg/L)
0.025
0.020
0.015
0.010
0.005
Chlorophyll a (µg/L)
17.5
15.0
12.5
10.0
7.5
5.0
Dissolved Orthophosphate (mg/L)
0.07
0.06
0.05
0.04
0.03
Dissolved Oxygen (%)
120
100
80
60
Dissolved Oxygen (mg/L)
10
8
6
4
Result
Jan 2009
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan 2010
Year

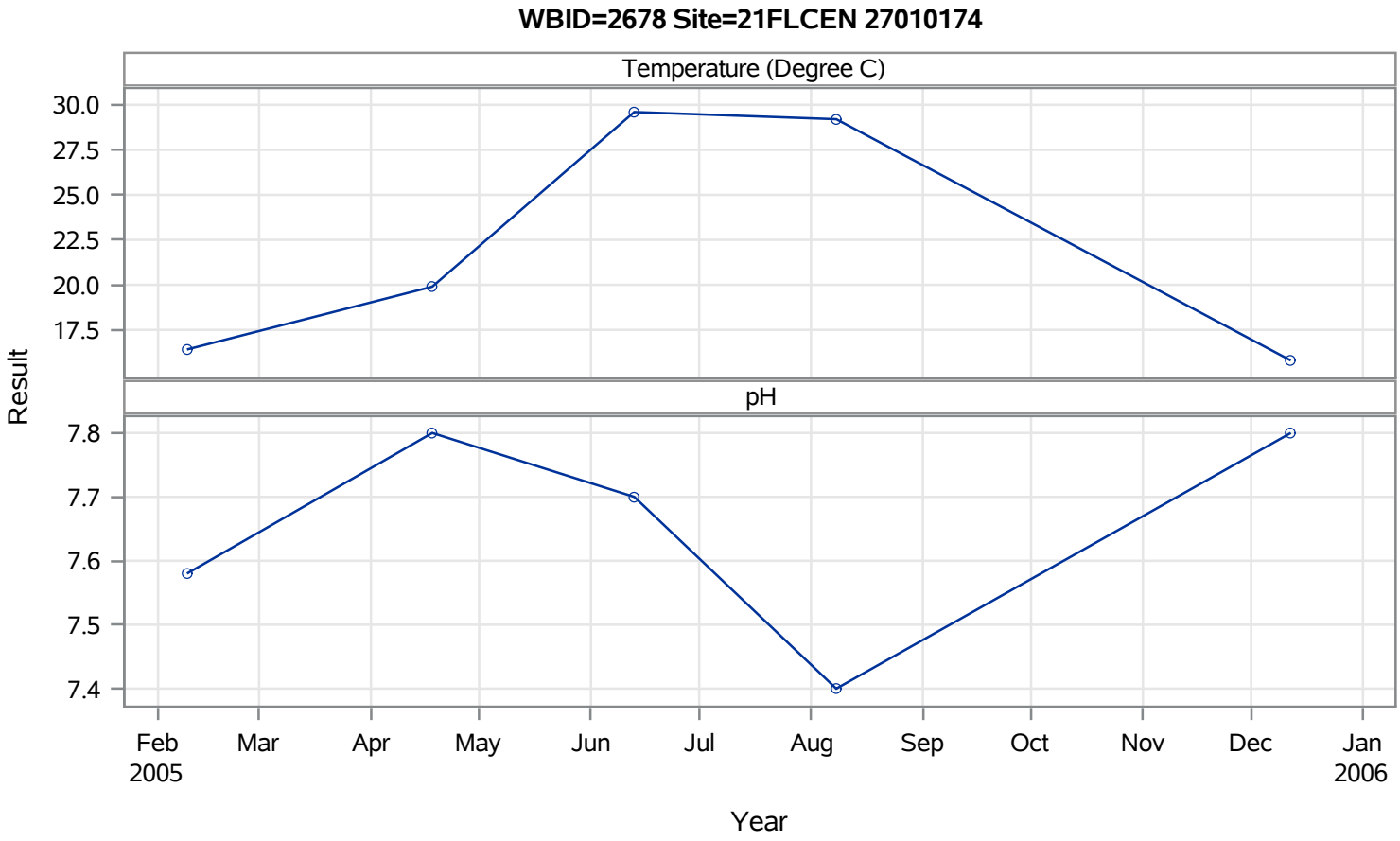

WBID=2678 Site=21FLA 27010964
Fecal COliform (#/100ml)
65
60
55
50
45
Nitrite + Nitrate (mg/L)
0.06
0.04
0.02
0.00
Salinity (PSU)
30
20
10
0
Secchi Disk Depth (m)
1.2
1.0
0.8
0.6
0.4
Temperature (Degree C)
30.0
27.5
25.0
22.5
20.0
Result
Jan
2009
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
2010
Year

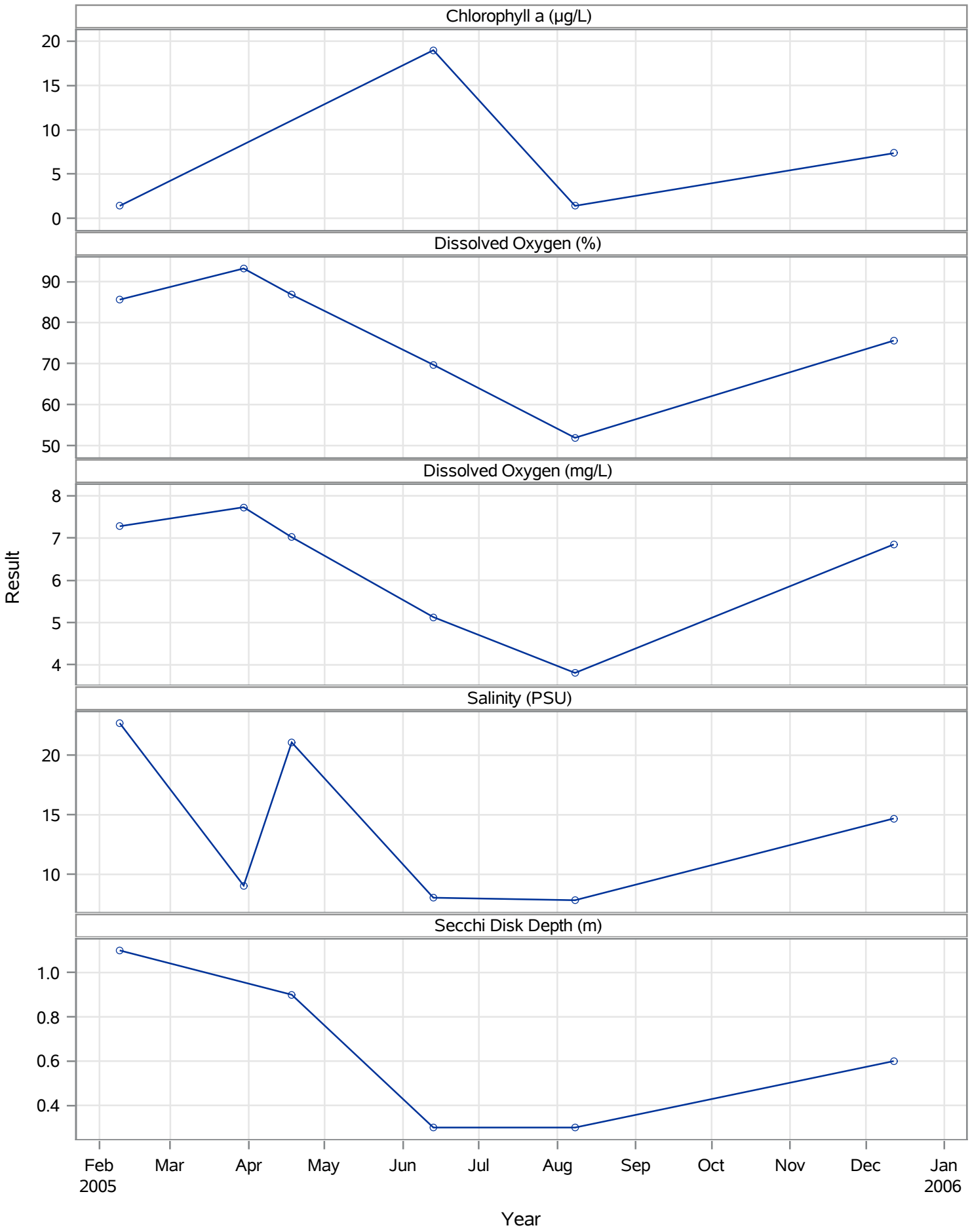

WBID=2678 Site=21FLA 27010964
Total Kjeldahl Nitrogen (mg/L)
1.1
1.0
0.9
0.8
Total Nitrogen (mg/L)
1.1
1.0
0.9
Total Phosphorus (mg/L)
0.13
0.12
0.11
0.10
pH
7.8
7.6
7.4
7.2
Result
Jan
2009
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
2010
Year

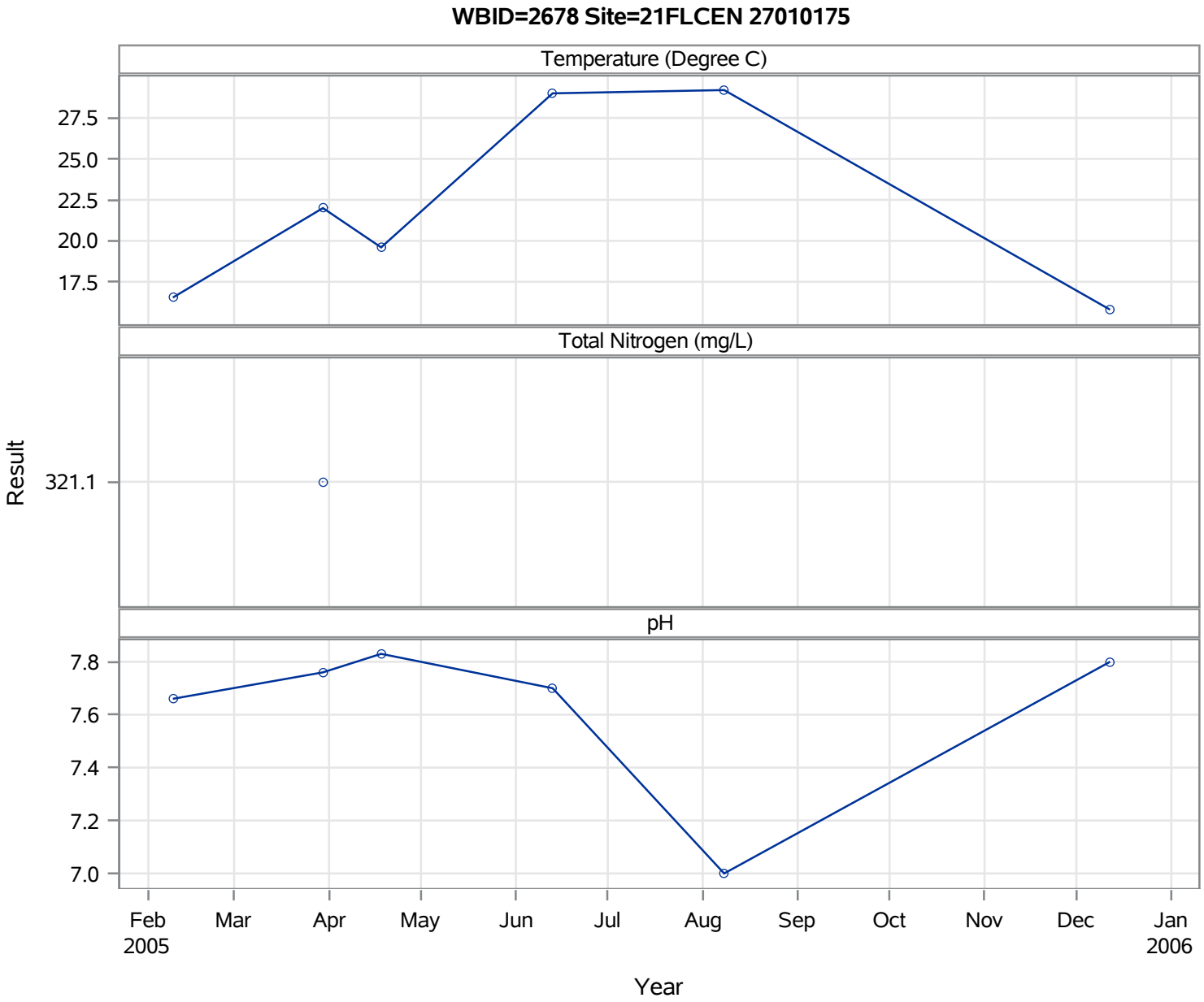

WBID=2678 Site=21FLCEN 27010173
Chlorophyll a (µg/L)
50
40
30
20
10
0
Dissolved Oxygen (%)
90
80
70
60
50
Dissolved Oxygen (mg/L)
8
7
6
5
4
3
Result
Salinity (PSU)
20
15
10
5
Secchi Disk Depth (m)
0.8
0.7
0.6
0.5
0.4
Feb
2005
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
2006
Year

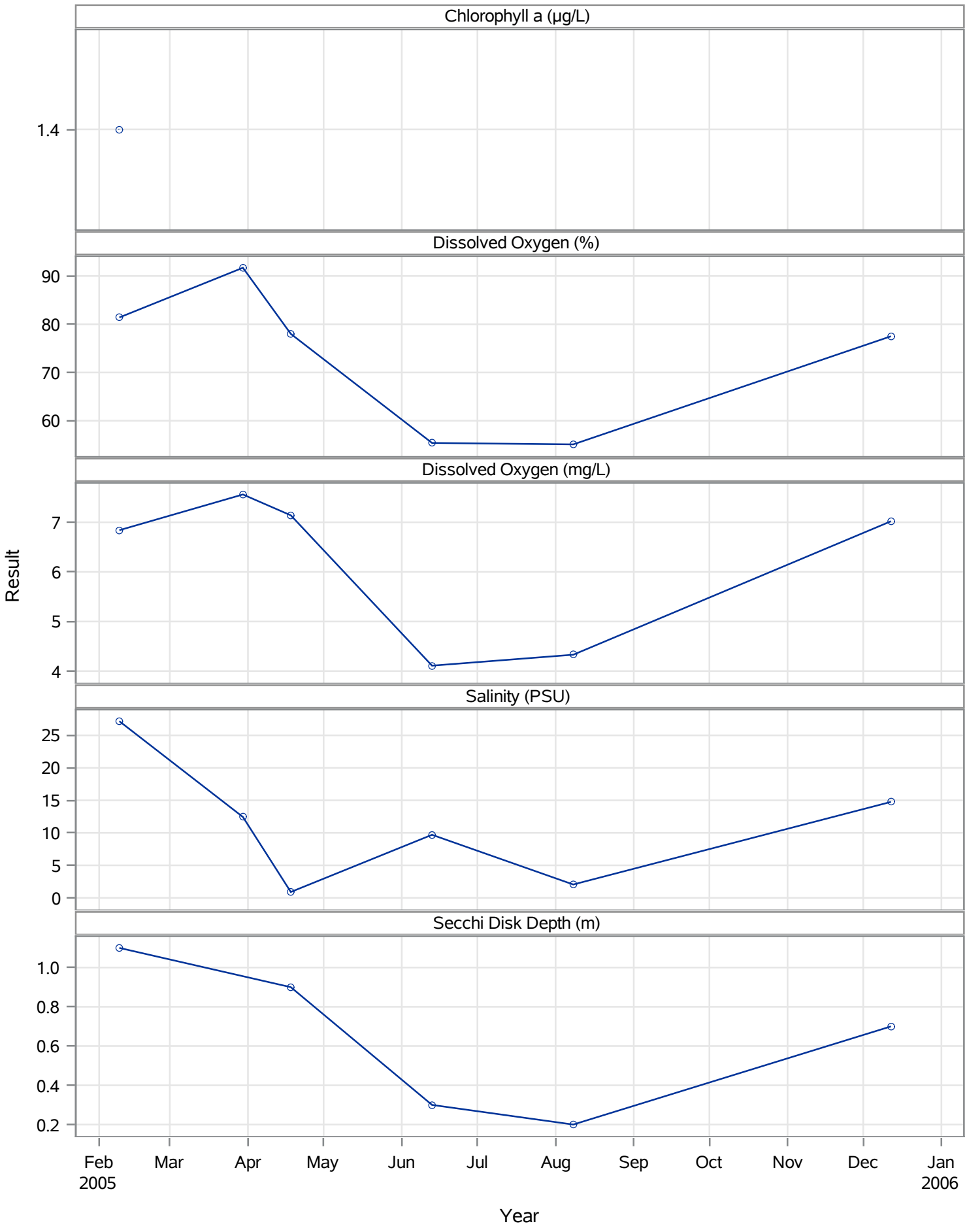

WBID=2678 Site=21FLCEN 27010173
Temperature (Degree C)
30.0
27.5
25.0
22.5
20.0
17.5
15.0
Total Nitrogen (mg/L)
360.06
pH
8.0
7.8
7.6
7.4
7.2
7.0
Result
Feb
2005
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
2006
Year

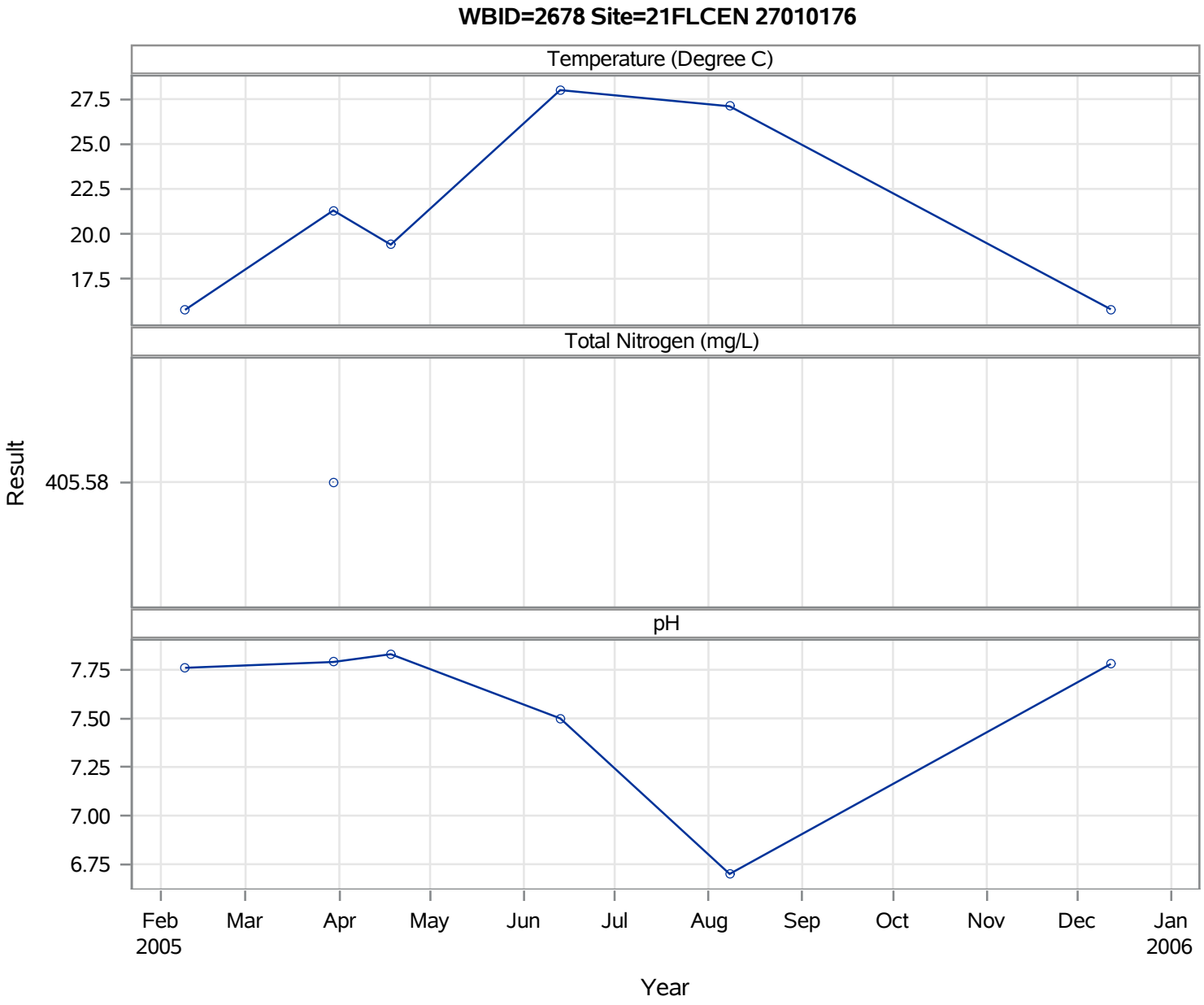

WBID=2678 Site=21FLCEN 27010174
Chlorophyll a (µg/L)
1.4
Dissolved Oxygen (%)
85
80
75
70
65
60
Dissolved Oxygen (mg/L)
7
6
5
Result
Salinity (PSU)
20.0
17.5
15.0
12.5
10.0
7.5
Secchi Disk Depth (m)
1.0
0.8
0.6
0.4
Feb 2005
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan 2006
Year

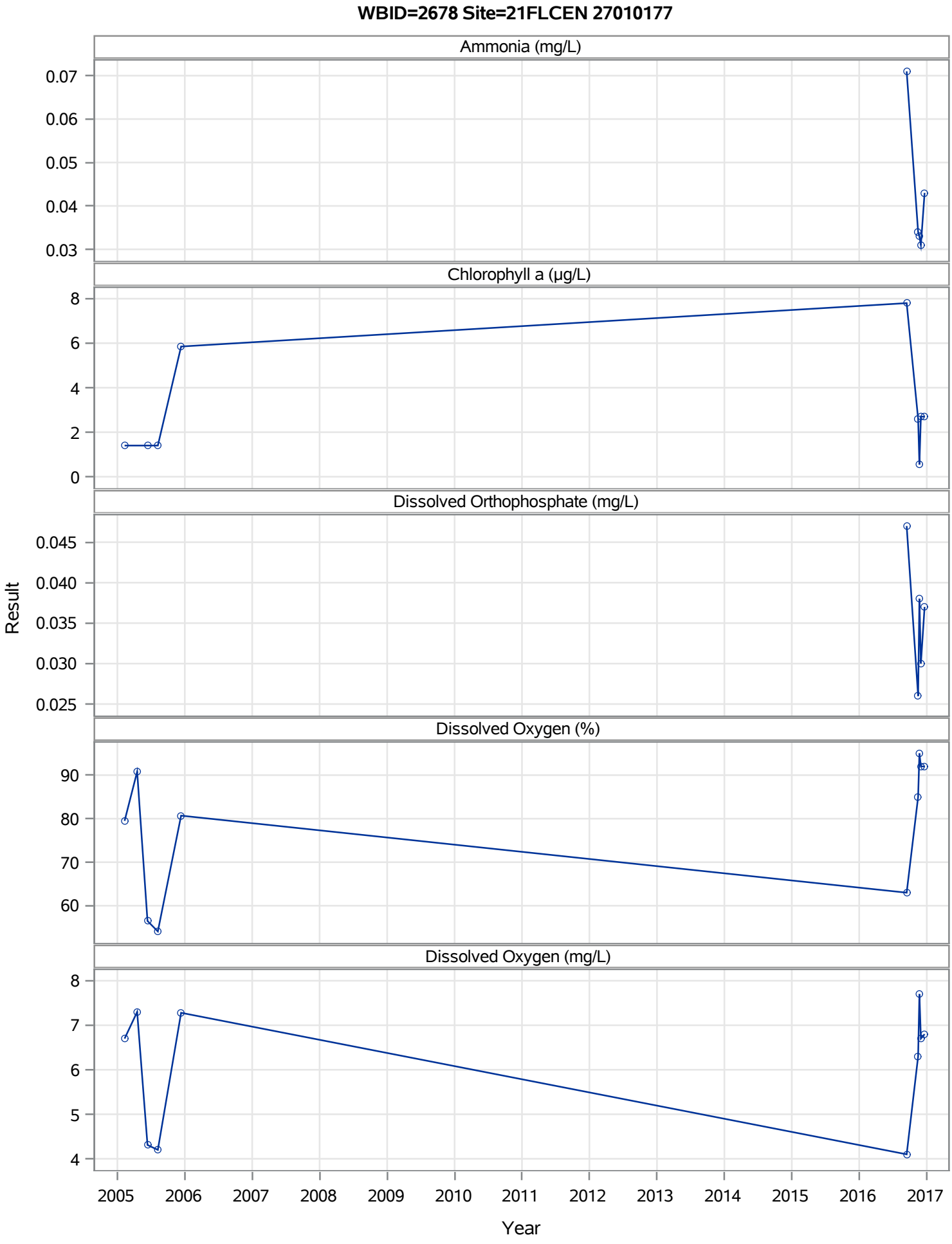

WBID=2678 Site=21FLCEN 27010174
Temperature (Degree C)
30.0
27.5
25.0
22.5
20.0
17.5
pH
7.8
7.7
7.6
7.5
7.4
Result
Feb
2005
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
2006
Year

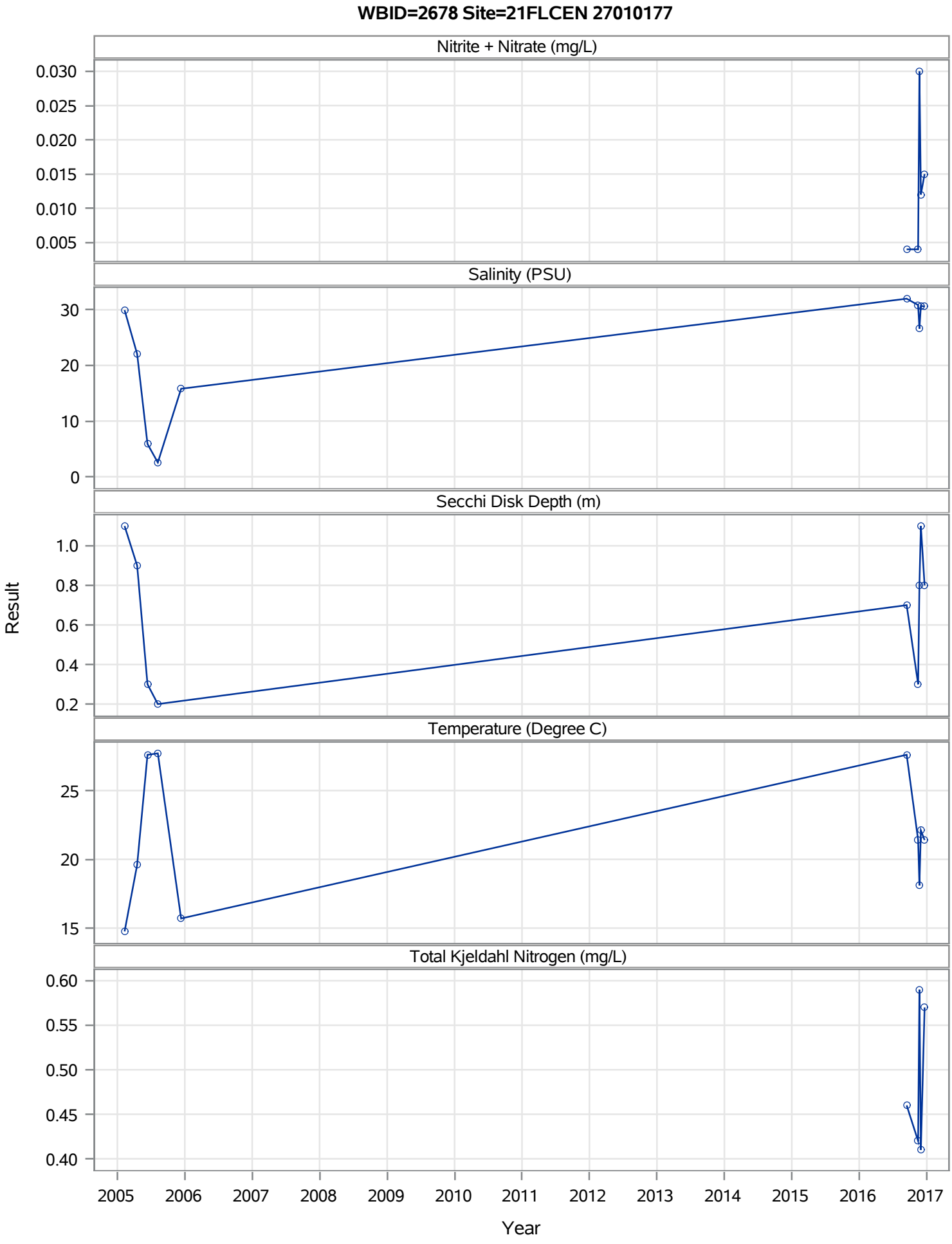

WBID=2678 Site=21FLCEN 27010175
Chlorophyll a (µg/L)
20
15
10
5
0
Dissolved Oxygen (%)
90
80
70
60
50
Dissolved Oxygen (mg/L)
8
7
6
5
4
Result
Salinity (PSU)
20
15
10
Secchi Disk Depth (m)
1.0
0.8
0.6
0.4
Feb
2005
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
2006
Year

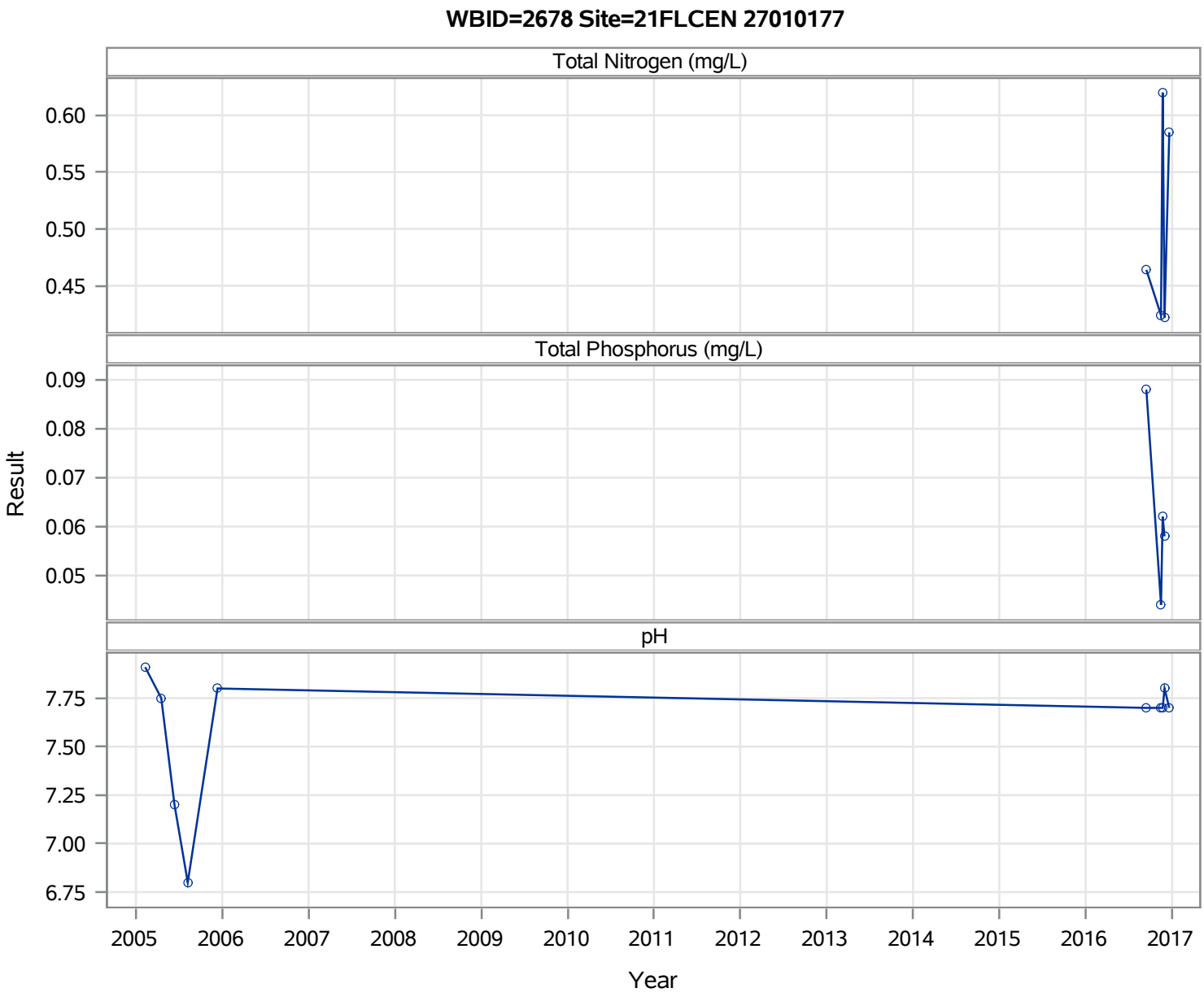

WBID=2678 Site=21FLCEN 27010175
Temperature (Degree C)
27.5
25.0
22.5
20.0
17.5
Total Nitrogen (mg/L)
321.1
pH
7.8
7.6
7.4
7.2
7.0
Result
Feb
2005
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
2006
Year

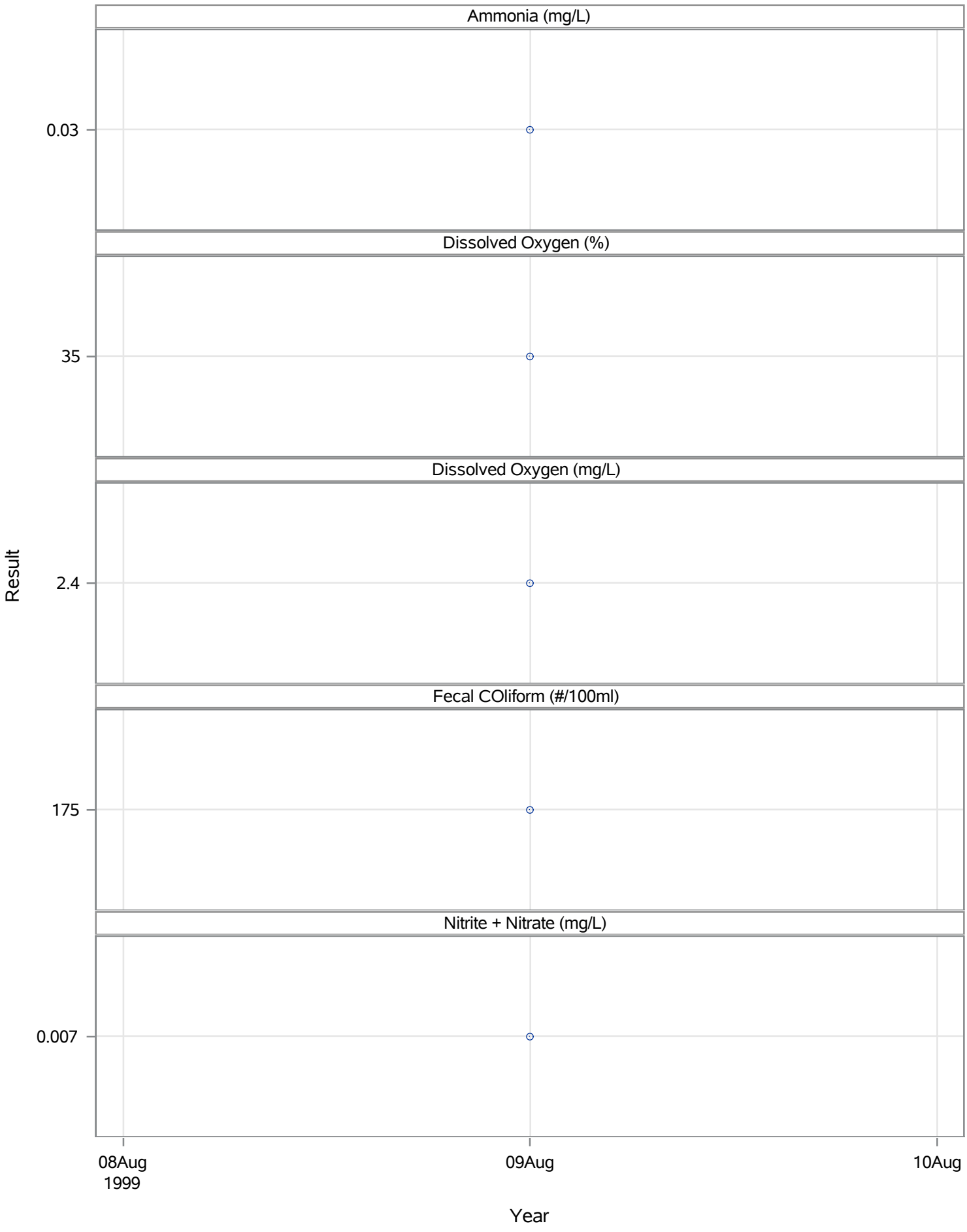

WBID=2678 Site=21FLCEN 27010176
Chlorophyll a (µg/L)
1.4
Dissolved Oxygen (%)
90
80
70
60
Dissolved Oxygen (mg/L)
7
6
5
4
Salinity (PSU)
25
20
15
10
5
0
Secchi Disk Depth (m)
1.0
0.8
0.6
0.4
0.2
Result
Feb
2005
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
2006
Year

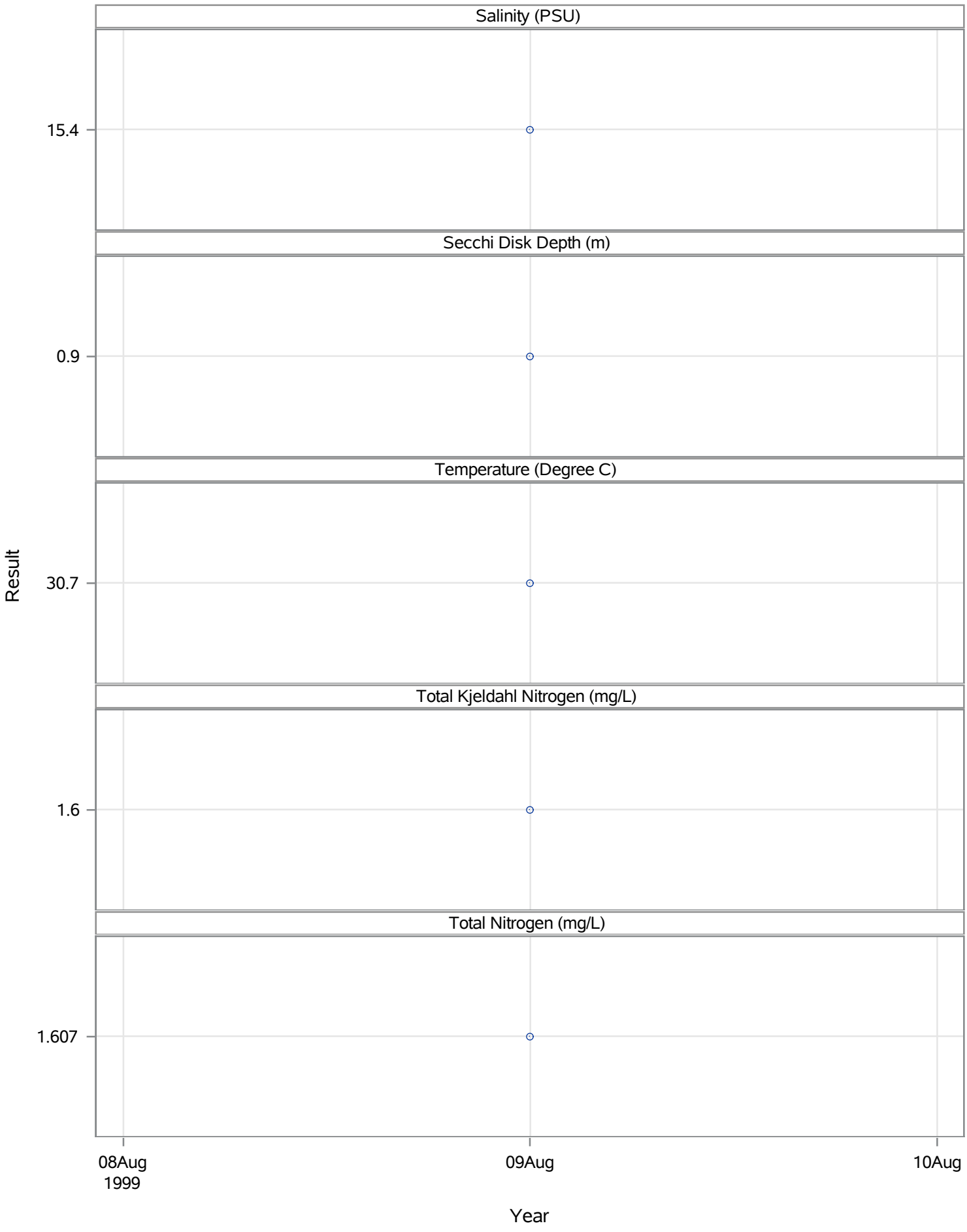

WBID=2678 Site=21FLCEN 27010176
Temperature (Degree C)
27.5
25.0
22.5
20.0
17.5
Total Nitrogen (mg/L)
405.58
pH
7.75
7.50
7.25
7.00
6.75
Result
Feb
2005
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
2006
Year

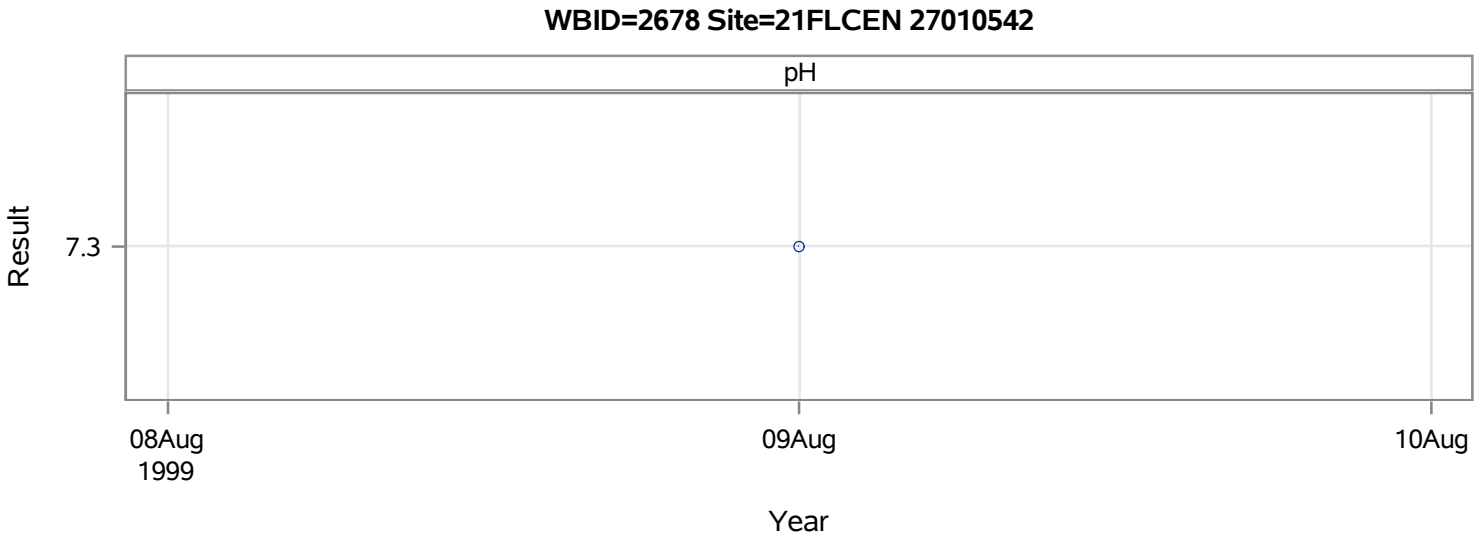

WBID=2678 Site=21FLCEN 27010177
Ammonia (mg/L)
0.07
0.06
0.05
0.04
0.03
Chlorophyll a (µg/L)
8
6
4
2
0
Dissolved Orthophosphate (mg/L)
0.045
0.040
0.035
0.030
0.025
Result
Dissolved Oxygen (%)
90
80
70
60
Dissolved Oxygen (mg/L)
8
7
6
5
4
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
Year

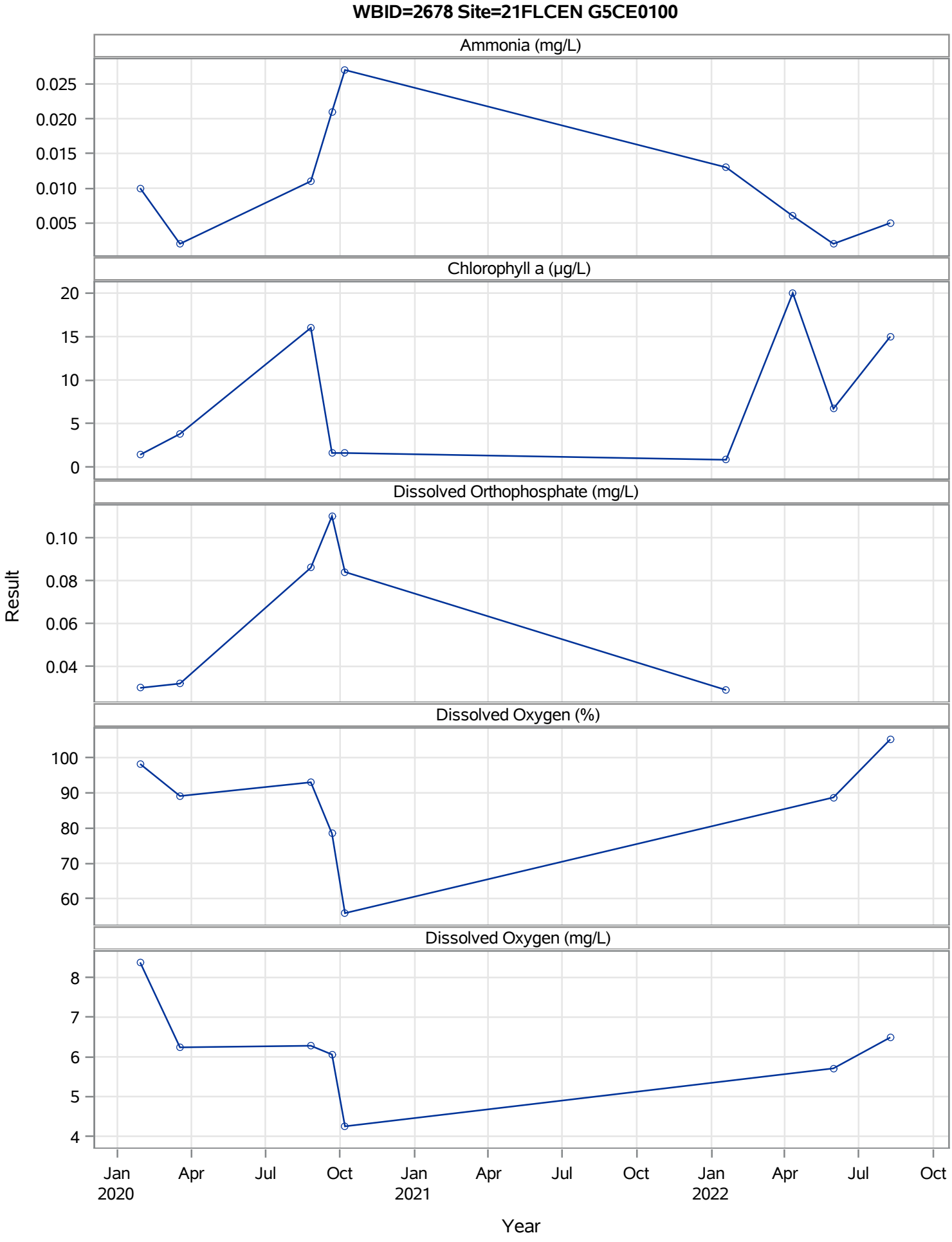

WBID=2678 Site=21FLCEN 27010177
Nitrite + Nitrate (mg/L)
0.030
0.025
0.020
0.015
0.010
0.005
Salinity (PSU)
30
20
10
0
Secchi Disk Depth (m)
1.0
0.8
0.6
0.4
0.2
Temperature (Degree C)
25
20
15
Total Kjeldahl Nitrogen (mg/L)
0.60
0.55
0.50
0.45
0.40
Result
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
Year

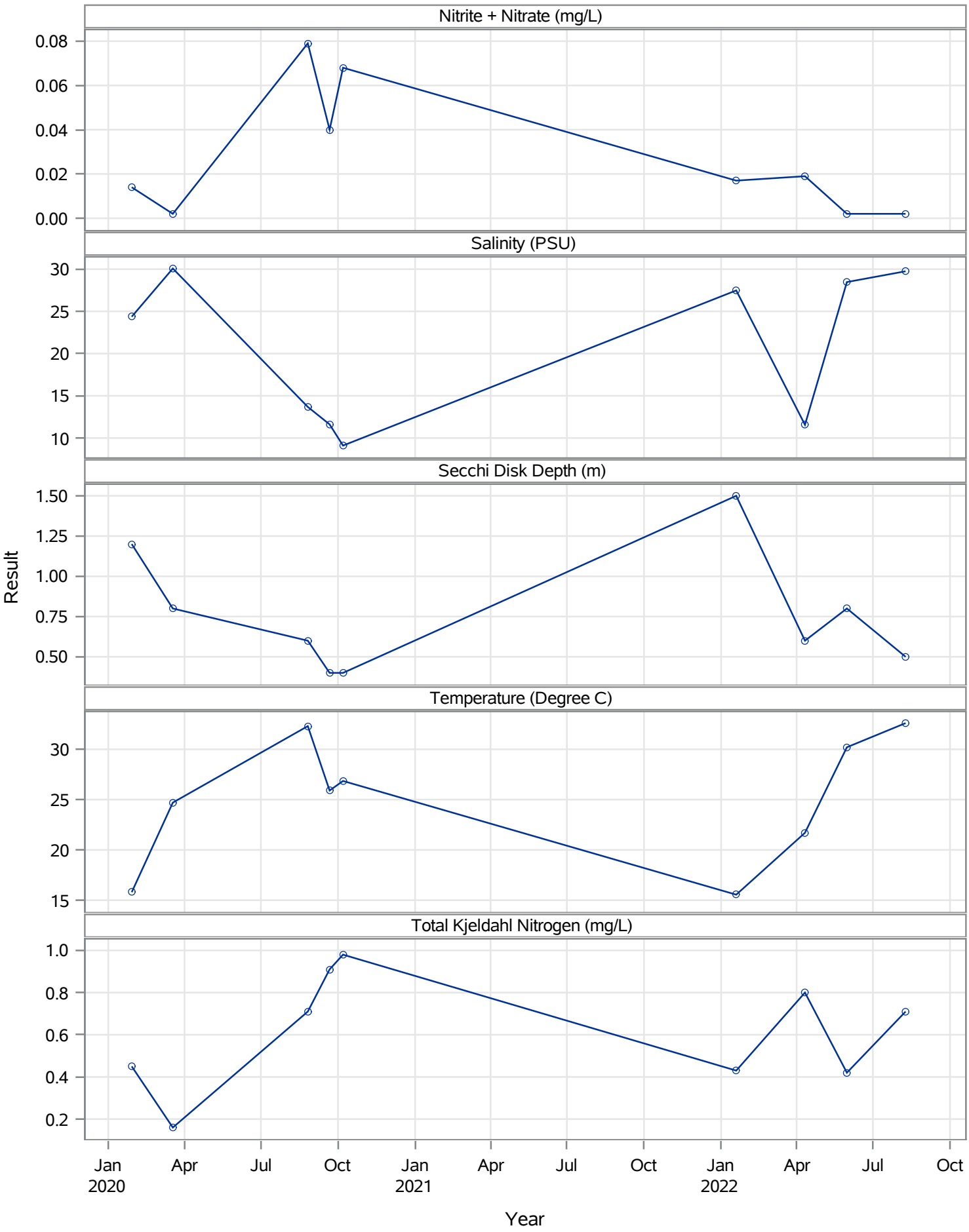

WBID=2678 Site=21FLCEN 27010177
Total Nitrogen (mg/L)
0.60
0.55
0.50
0.45
Total Phosphorus (mg/L)
0.09
0.08
0.07
0.06
0.05
Result
pH
7.75
7.50
7.25
7.00
6.75
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
Year

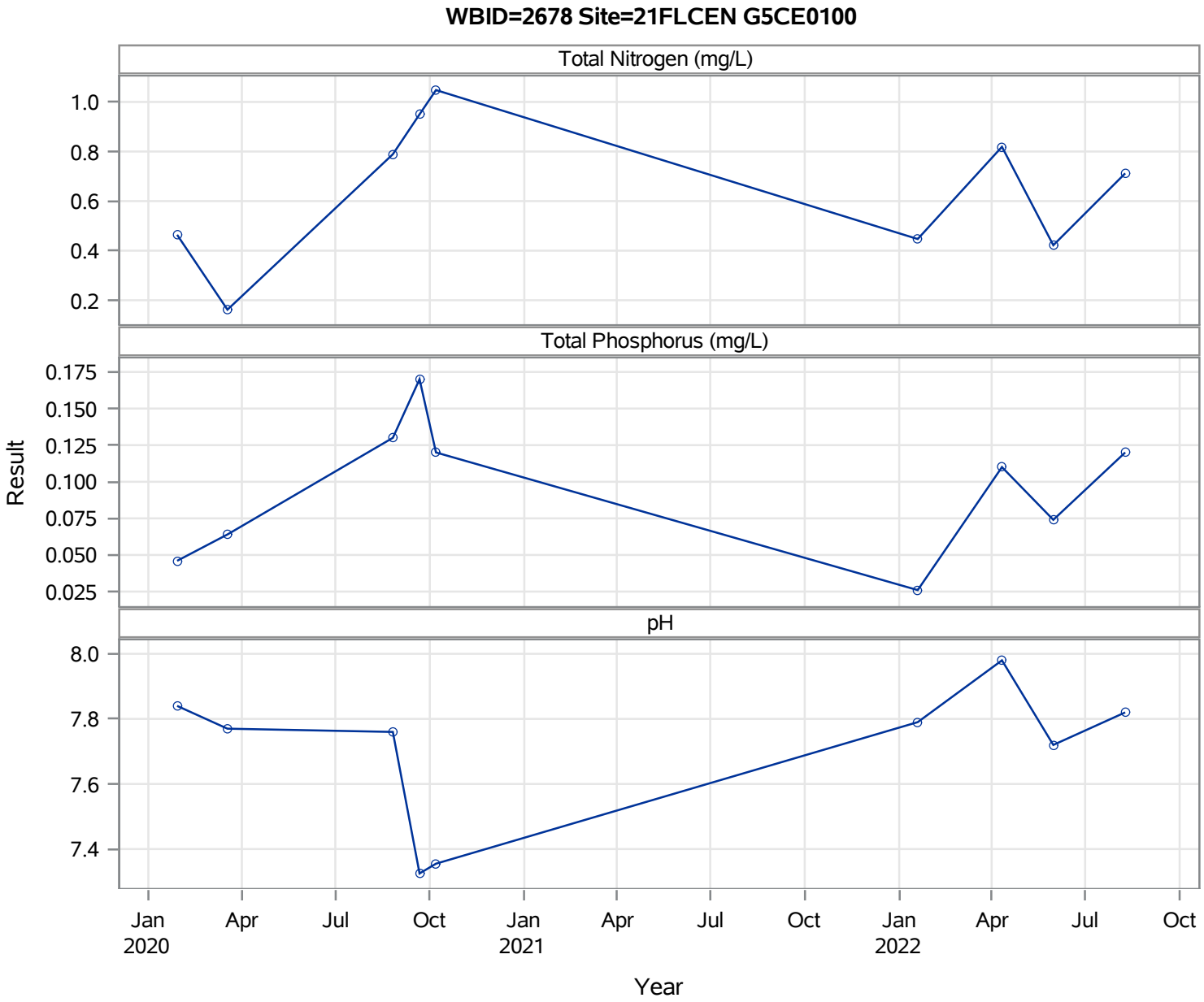

WBID=2678 Site=21FLCEN 27010542
Ammonia (mg/L)
0.03
Dissolved Oxygen (%)
35
Dissolved Oxygen (mg/L)
2.4
Fecal COliform (#/100ml)
175
Nitrite + Nitrate (mg/L)
0.007
Result
08Aug
1999
09Aug
10Aug
Year

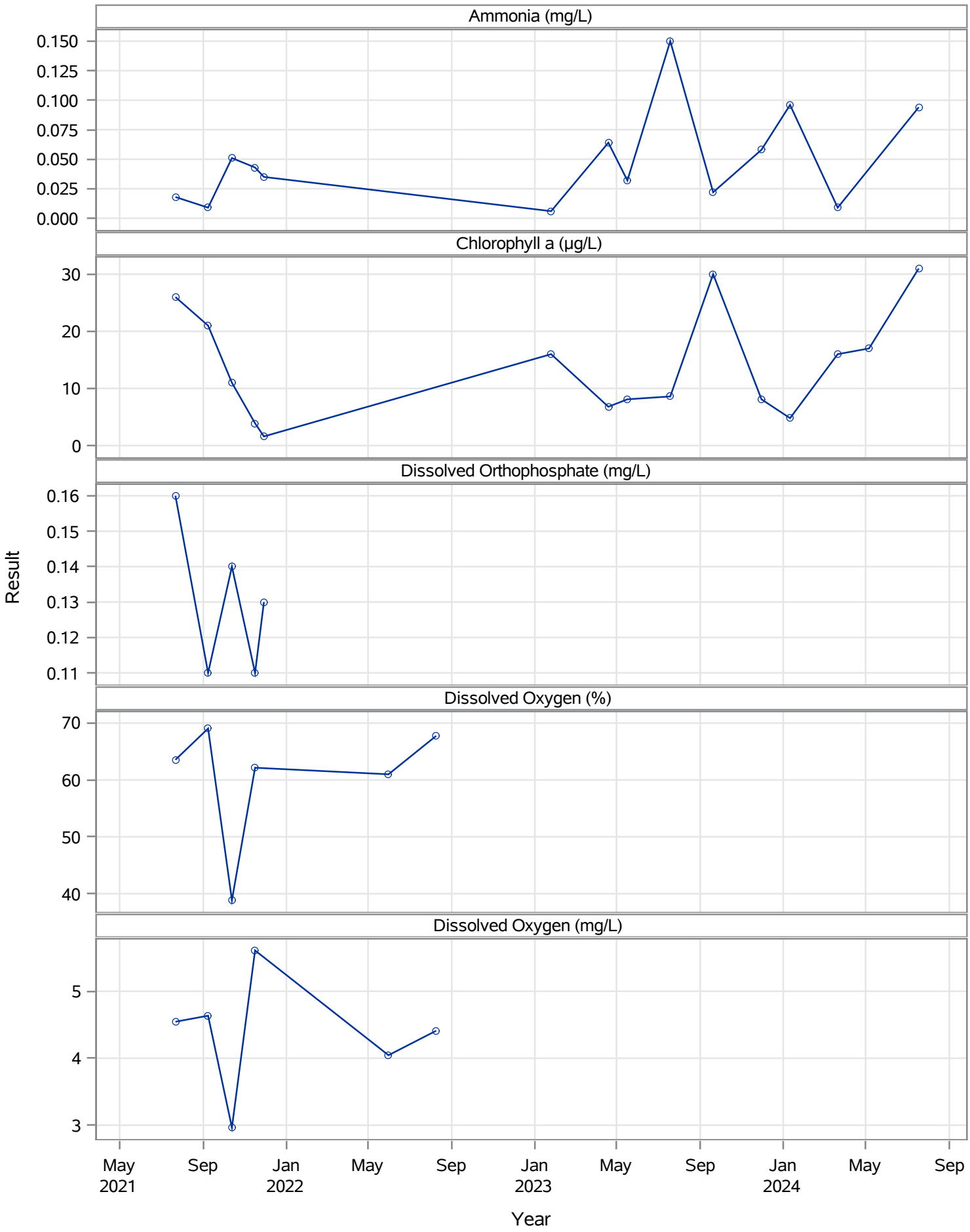

WBID=2678 Site=21FLCEN 27010542
Salinity (PSU)
15.4
Secchi Disk Depth (m)
0.9
Temperature (Degree C)
30.7
Total Kjeldahl Nitrogen (mg/L)
1.6
Total Nitrogen (mg/L)
1.607
Result
08Aug
1999
09Aug
10Aug
Year

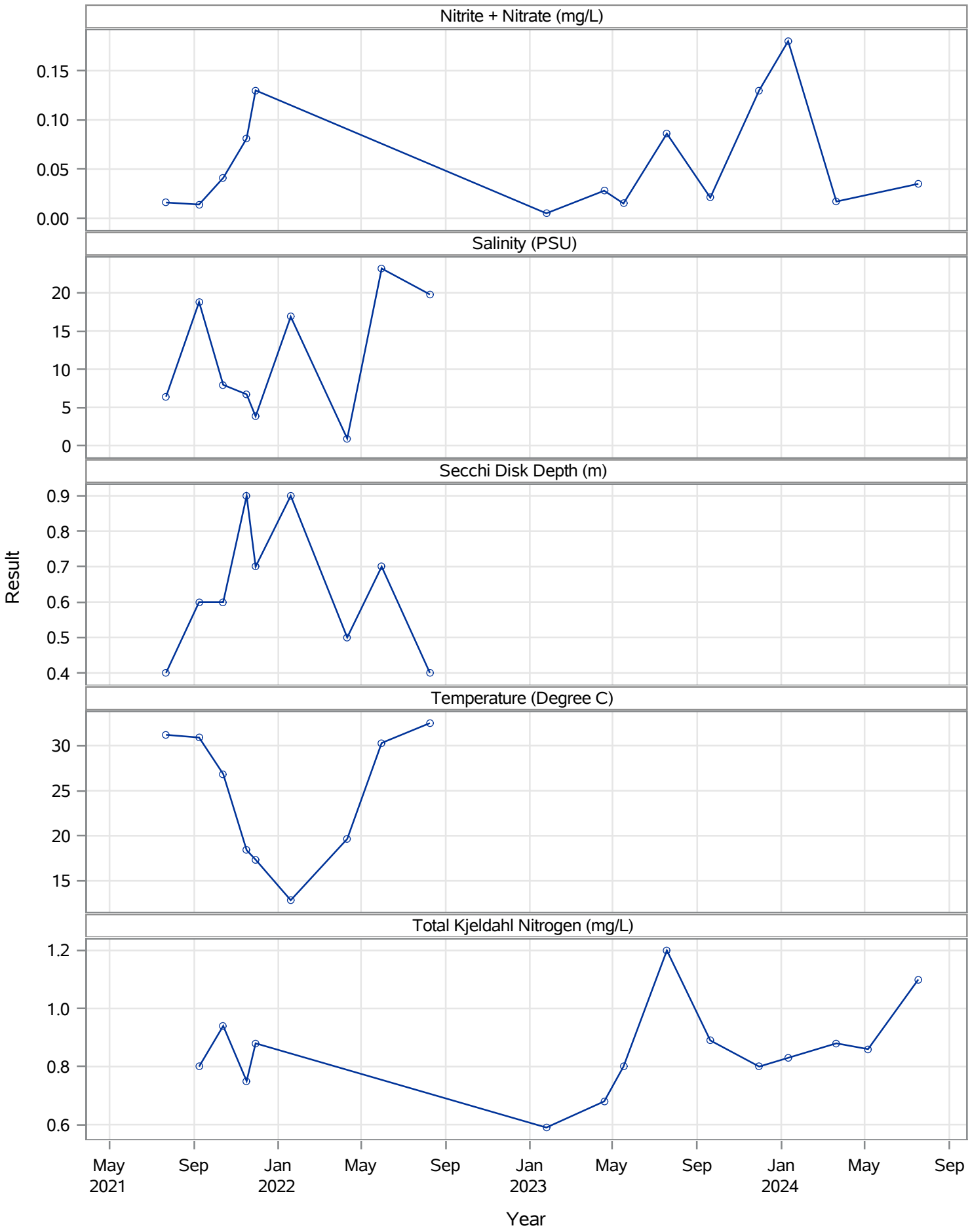

WBID=2678 Site=21FLCEN 27010542
pH
Result
7.3
08Aug
1999
09Aug
10Aug
Year

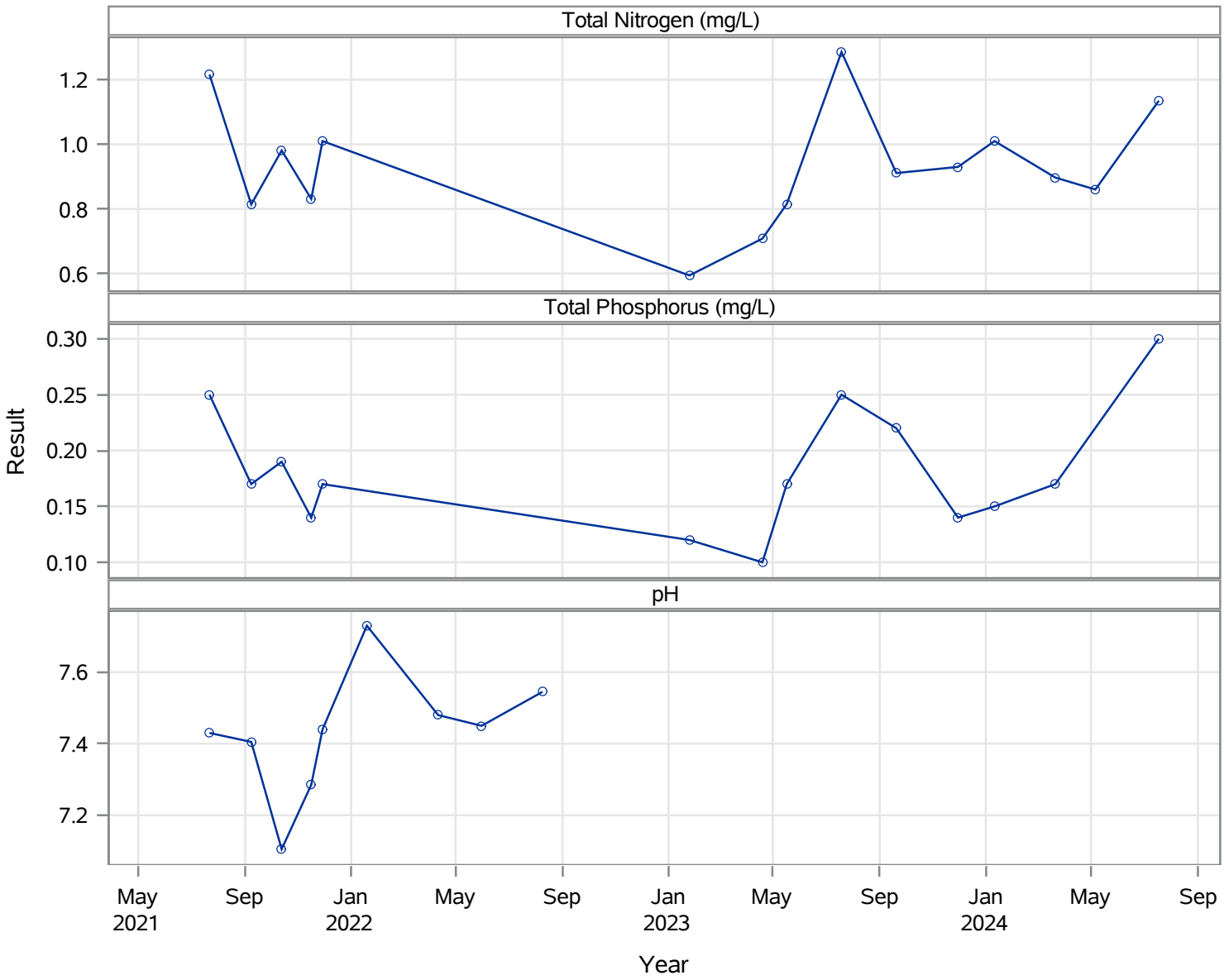

WBID=2678 Site=21FLCEN G5CE0100
Ammonia (mg/L)
0.025
0.020
0.015
0.010
0.005
Chlorophyll a (µg/L)
20
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.10
0.08
0.06
0.04
Dissolved Oxygen (%)
100
90
80
70
60
Dissolved Oxygen (mg/L)
8
7
6
5
4
Result
Jan
2020
Apr
Jul
Oct
Jan
2021
Apr
Jul
Oct
Jan
2022
Apr
Jul
Oct
Year

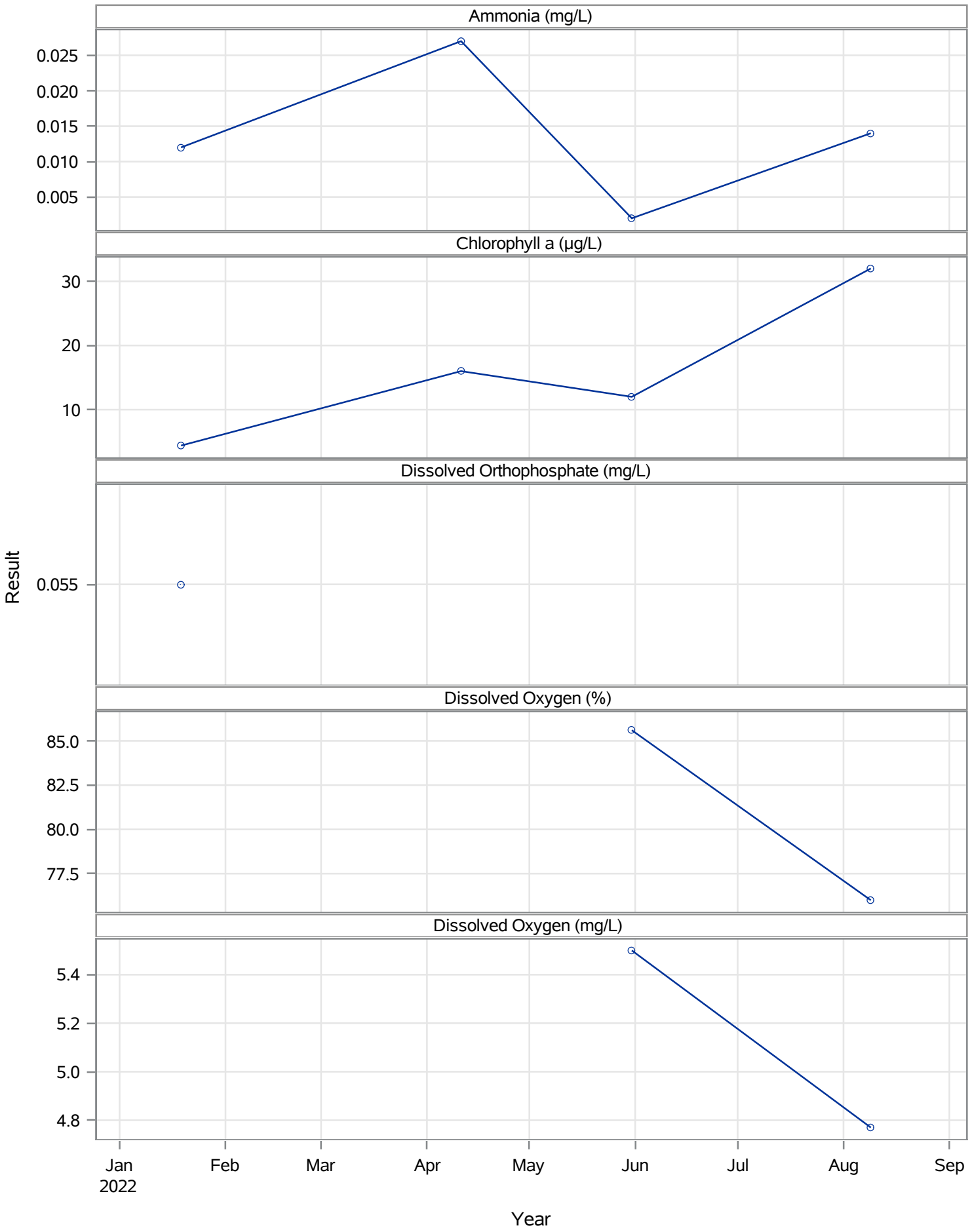

WBID=2678 Site=21FLCEN G5CE0100
Nitrite + Nitrate (mg/L)
0.08
0.06
0.04
0.02
0.00
Salinity (PSU)
30
25
20
15
10
Secchi Disk Depth (m)
1.50
1.25
1.00
0.75
0.50
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
1.0
0.8
0.6
0.4
0.2
Result
Jan
2020
Apr
Jul
Oct
Jan
2021
Apr
Jul
Oct
Jan
2022
Apr
Jul
Oct
Year

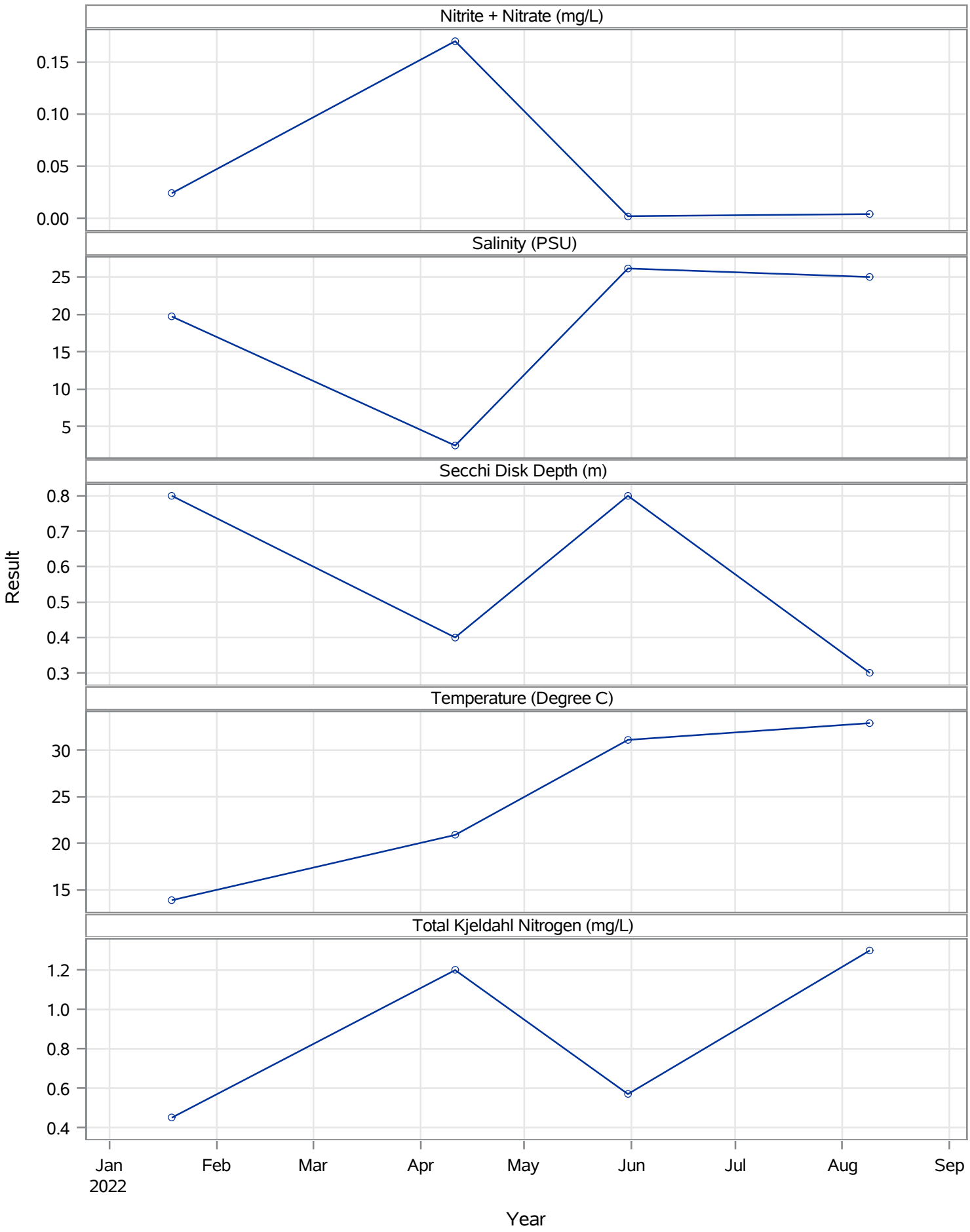

WBID=2678 Site=21FLCEN G5CE0100
Total Nitrogen (mg/L)
1.0
0.8
0.6
0.4
0.2
Total Phosphorus (mg/L)
0.175
0.150
0.125
0.100
0.075
0.050
0.025
pH
8.0
7.8
7.6
7.4
Result
Jan
2020
Apr
Jul
Oct
Jan
2021
Apr
Jul
Oct
Jan
2022
Apr
Jul
Oct
Year

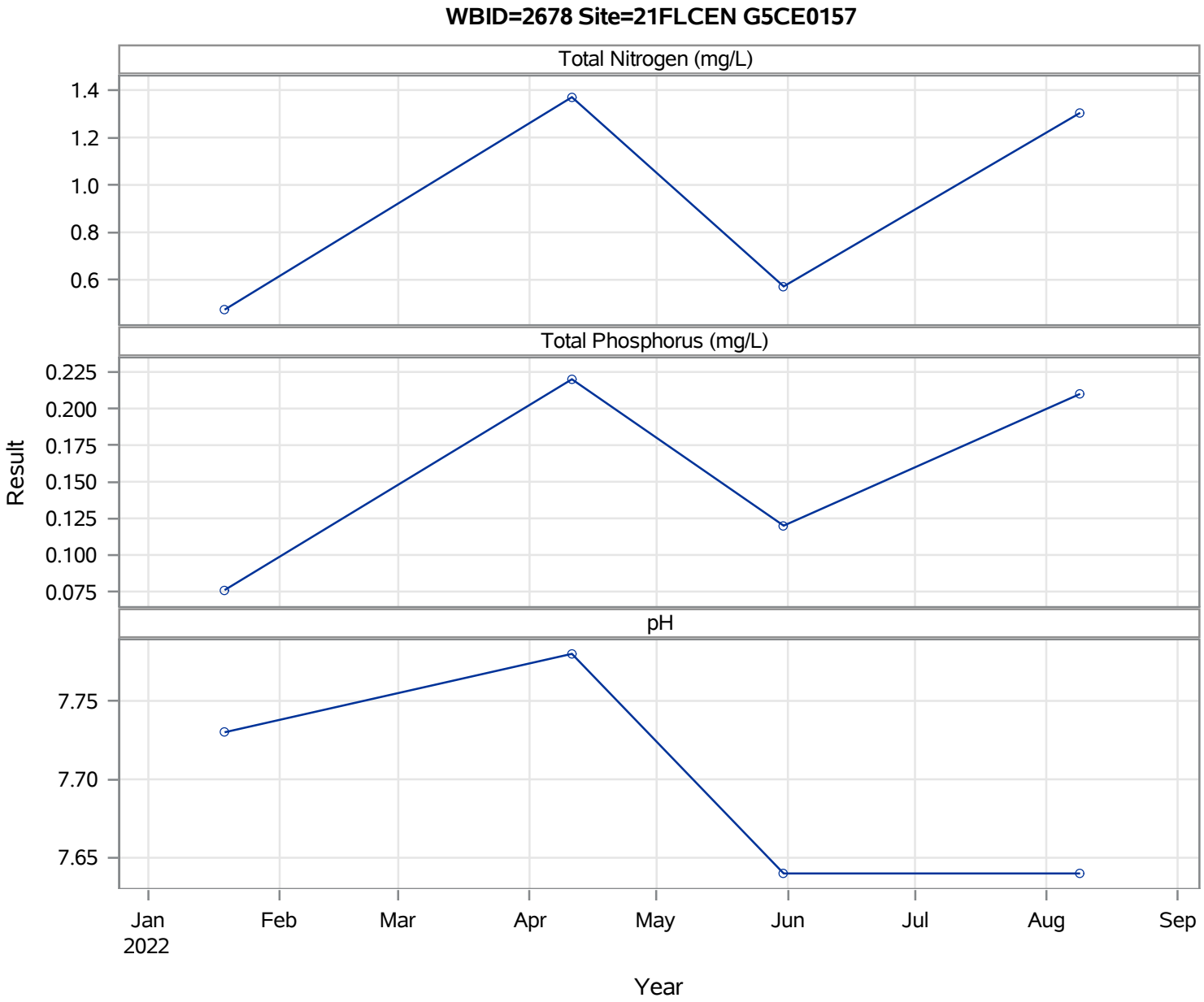

WBID=2678 Site=21FLCEN G5CE0130
Ammonia (mg/L)
0.150
0.125
0.100
0.075
0.050
0.025
0.000
Chlorophyll a (µg/L)
30
20
10
0
Dissolved Orthophosphate (mg/L)
0.16
0.15
0.14
0.13
0.12
0.11
Dissolved Oxygen (%)
70
60
50
40
Dissolved Oxygen (mg/L)
5
4
3
Result
May 2021
Sep
Jan 2022
May
Sep
Jan 2023
May
Sep
Jan 2024
May
Sep
Year

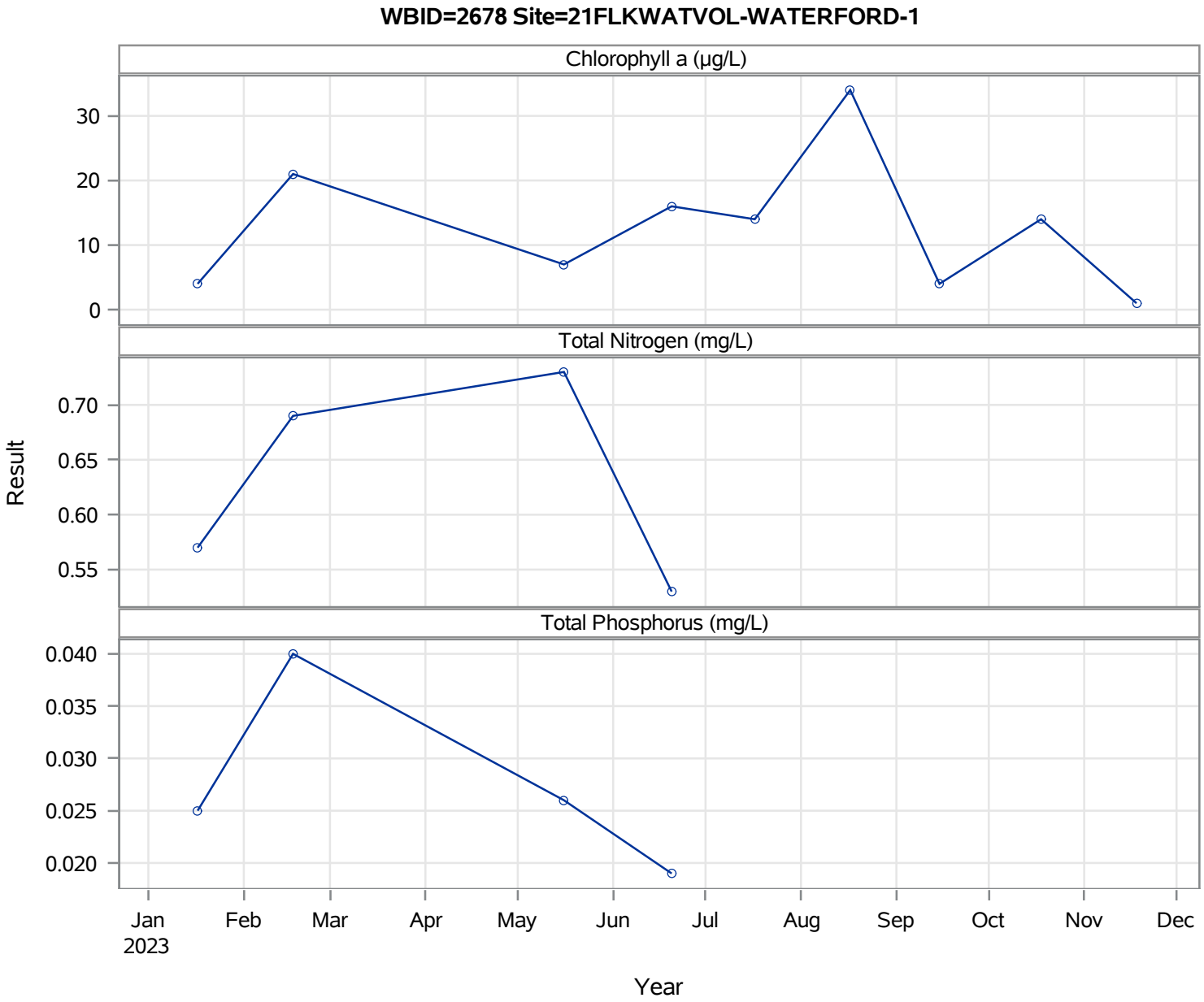

WBID=2678 Site=21FLCEN G5CE0130
Nitrite + Nitrate (mg/L)
0.15
0.10
0.05
0.00
Salinity (PSU)
20
15
10
5
0
Secchi Disk Depth (m)
0.9
0.8
0.7
0.6
0.5
0.4
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
1.2
1.0
0.8
0.6
Result
May 2021
Sep
Jan 2022
May
Sep
Jan 2023
May
Sep
Jan 2024
May
Sep
Year

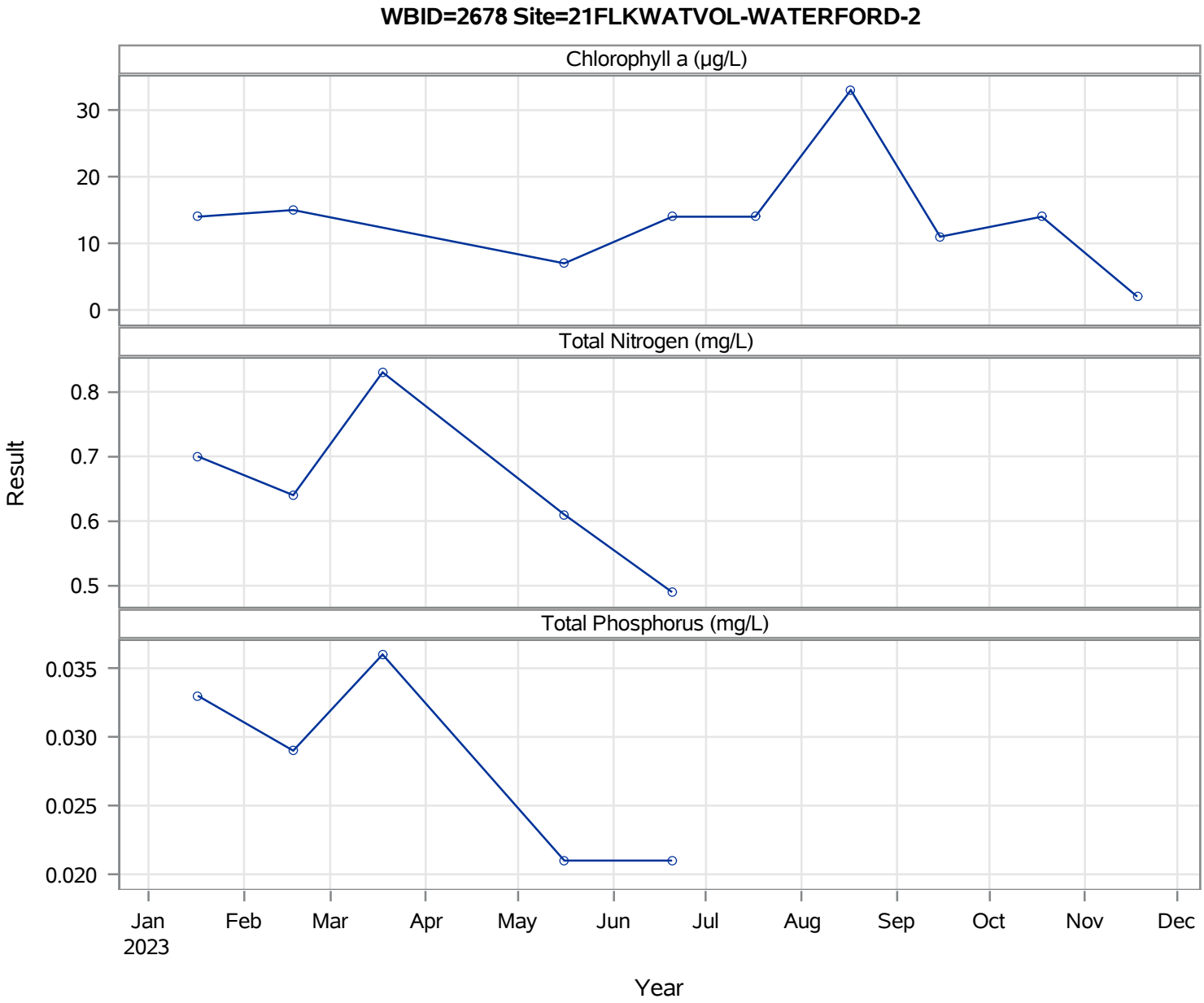

WBID=2678 Site=21FLCEN G5CE0130
Total Nitrogen (mg/L)
1.2
1.0
0.8
0.6
Total Phosphorus (mg/L)
0.30
0.25
0.20
0.15
0.10
pH
7.6
7.4
7.2
Result
May 2021
Sep
Jan 2022
May
Sep
Jan 2023
May
Sep
Jan 2024
May
Sep
Year

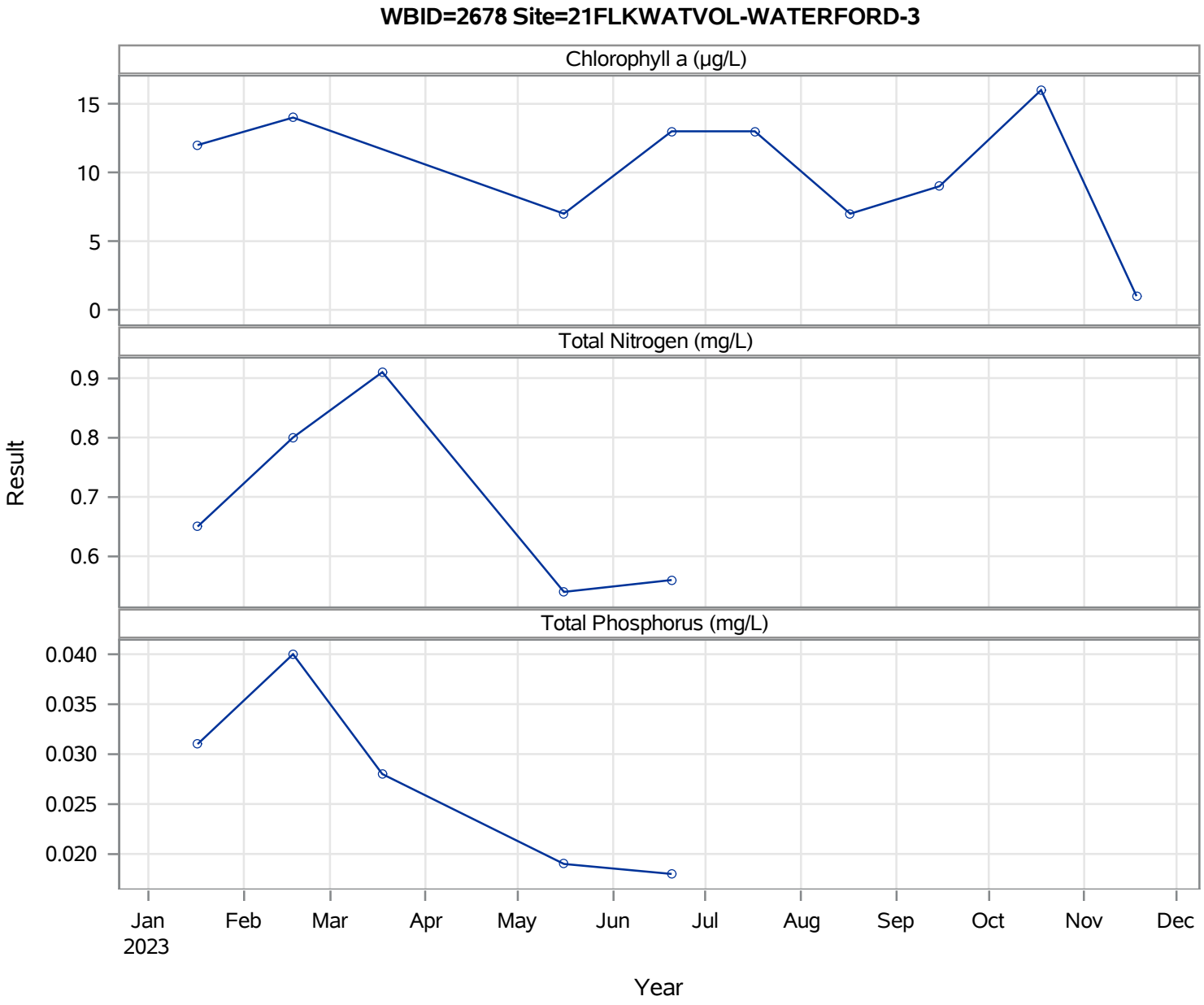

WBID=2678 Site=21FLCEN G5CE0157
Ammonia (mg/L)
0.025
0.020
0.015
0.010
0.005
Chlorophyll a (µg/L)
30
20
10
Dissolved Orthophosphate (mg/L)
0.055
Dissolved Oxygen (%)
85.0
82.5
80.0
77.5
Dissolved Oxygen (mg/L)
5.4
5.2
5.0
4.8
Result
Jan
2022
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Year

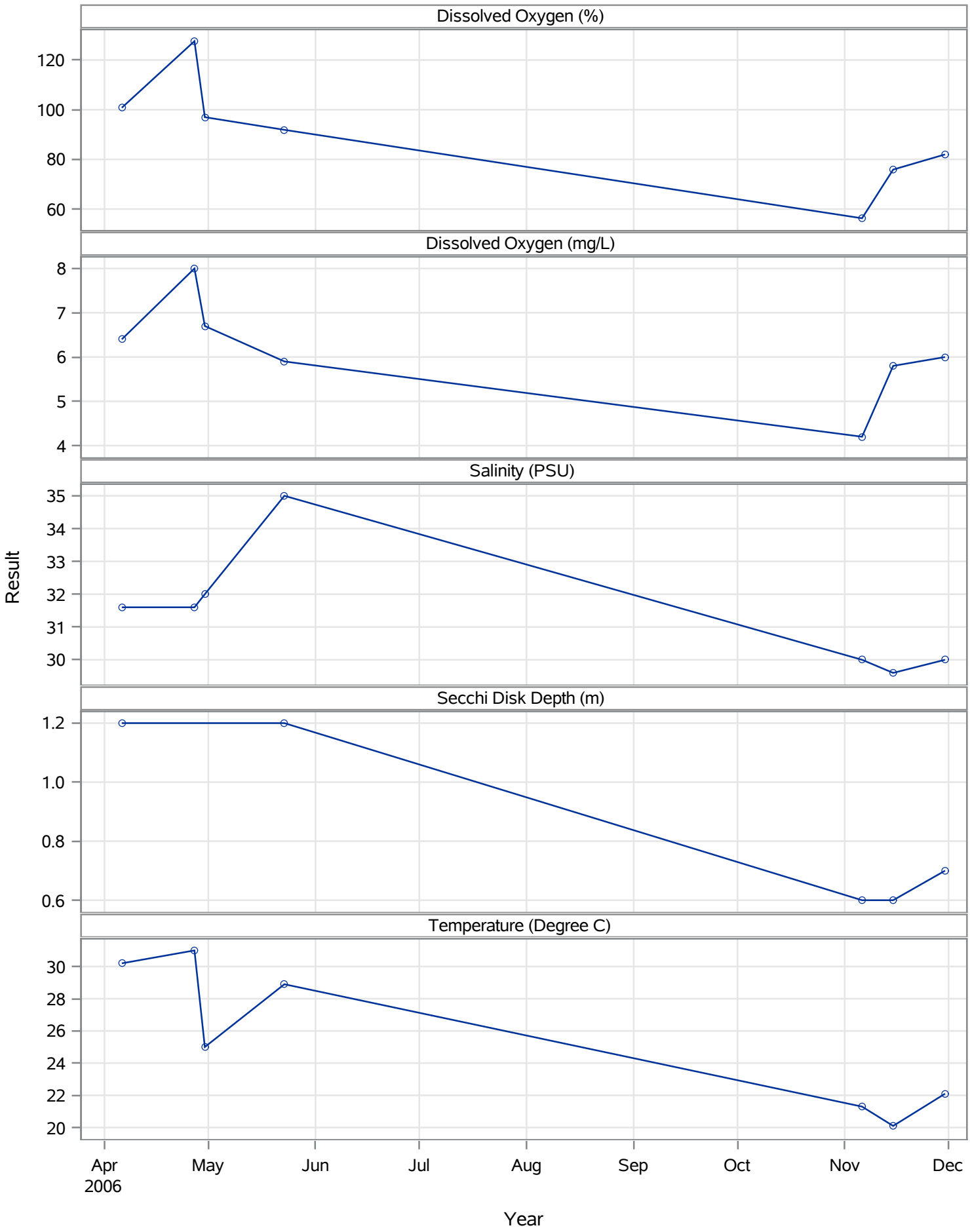

WBID=2678 Site=21FLCEN G5CE0157
Nitrite + Nitrate (mg/L)
0.15
0.10
0.05
0.00
Salinity (PSU)
25
20
15
10
5
Secchi Disk Depth (m)
0.8
0.7
0.6
0.5
0.4
0.3
Result
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
1.2
1.0
0.8
0.6
0.4
Jan
2022
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Year

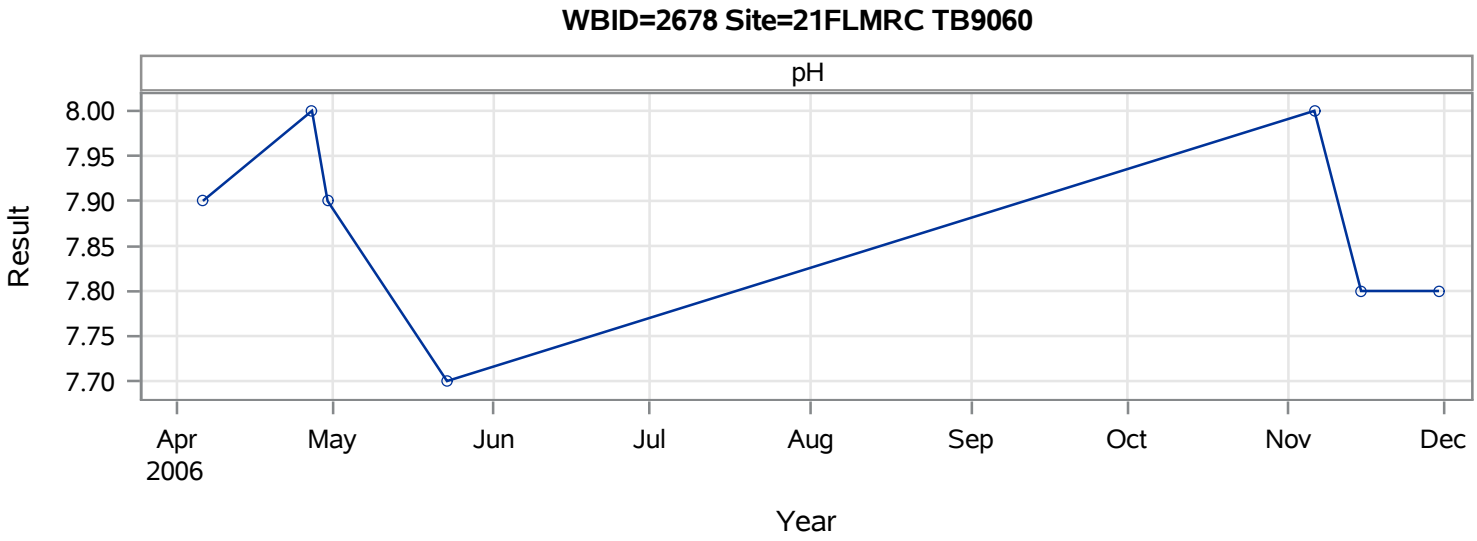

WBID=2678 Site=21FLCEN G5CE0157
Total Nitrogen (mg/L)
1.4
1.2
1.0
0.8
0.6
Total Phosphorus (mg/L)
0.225
0.200
0.175
0.150
0.125
0.100
0.075
Result
pH
7.75
7.70
7.65
Jan
2022
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Year

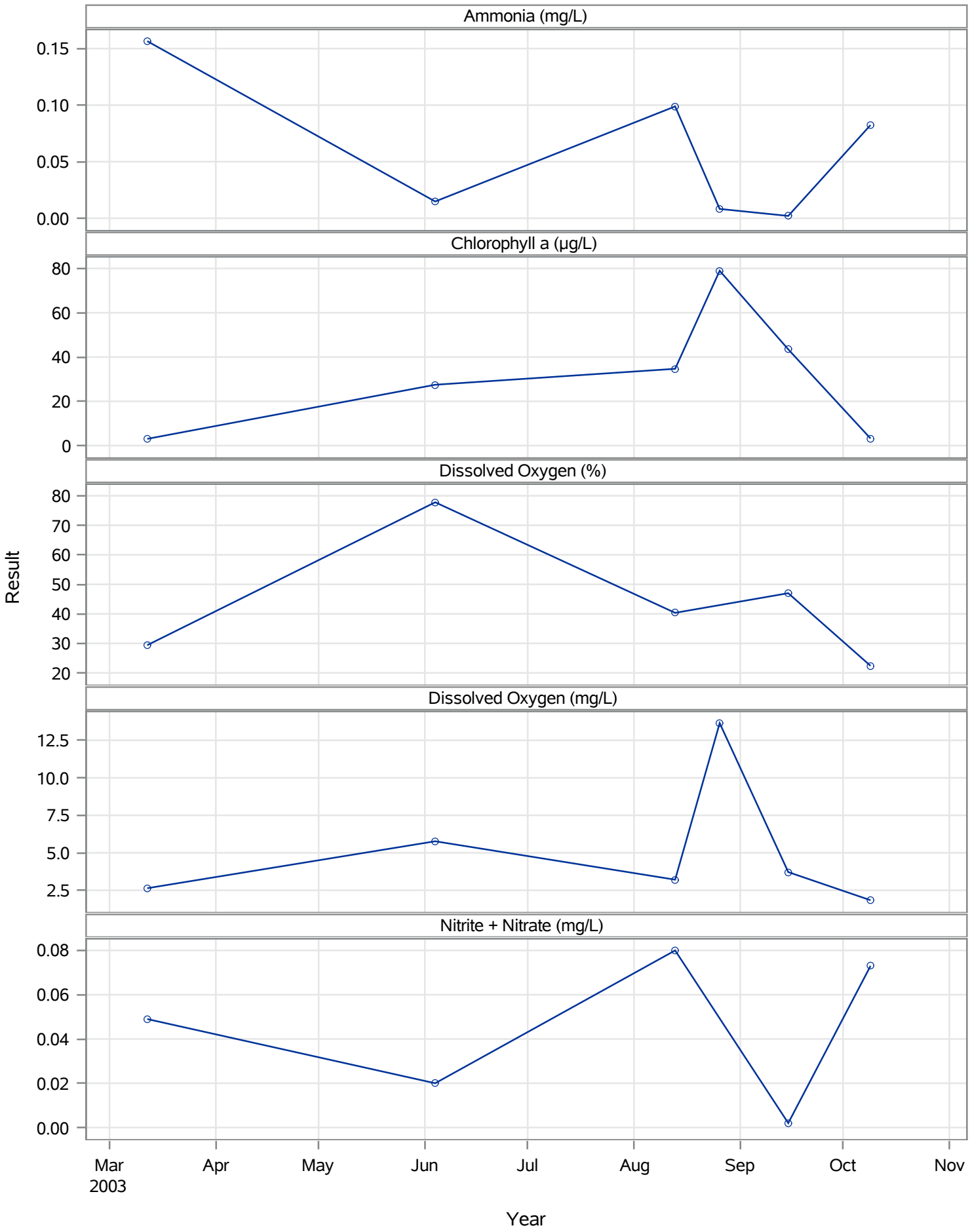

WBID=2678 Site=21FLKWATVOL-WATERFORD-1
Chlorophyll a (µg/L)
30
20
10
0
Total Nitrogen (mg/L)
0.70
0.65
0.60
0.55
Total Phosphorus (mg/L)
0.040
0.035
0.030
0.025
0.020
Result
Jan
2023
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Year

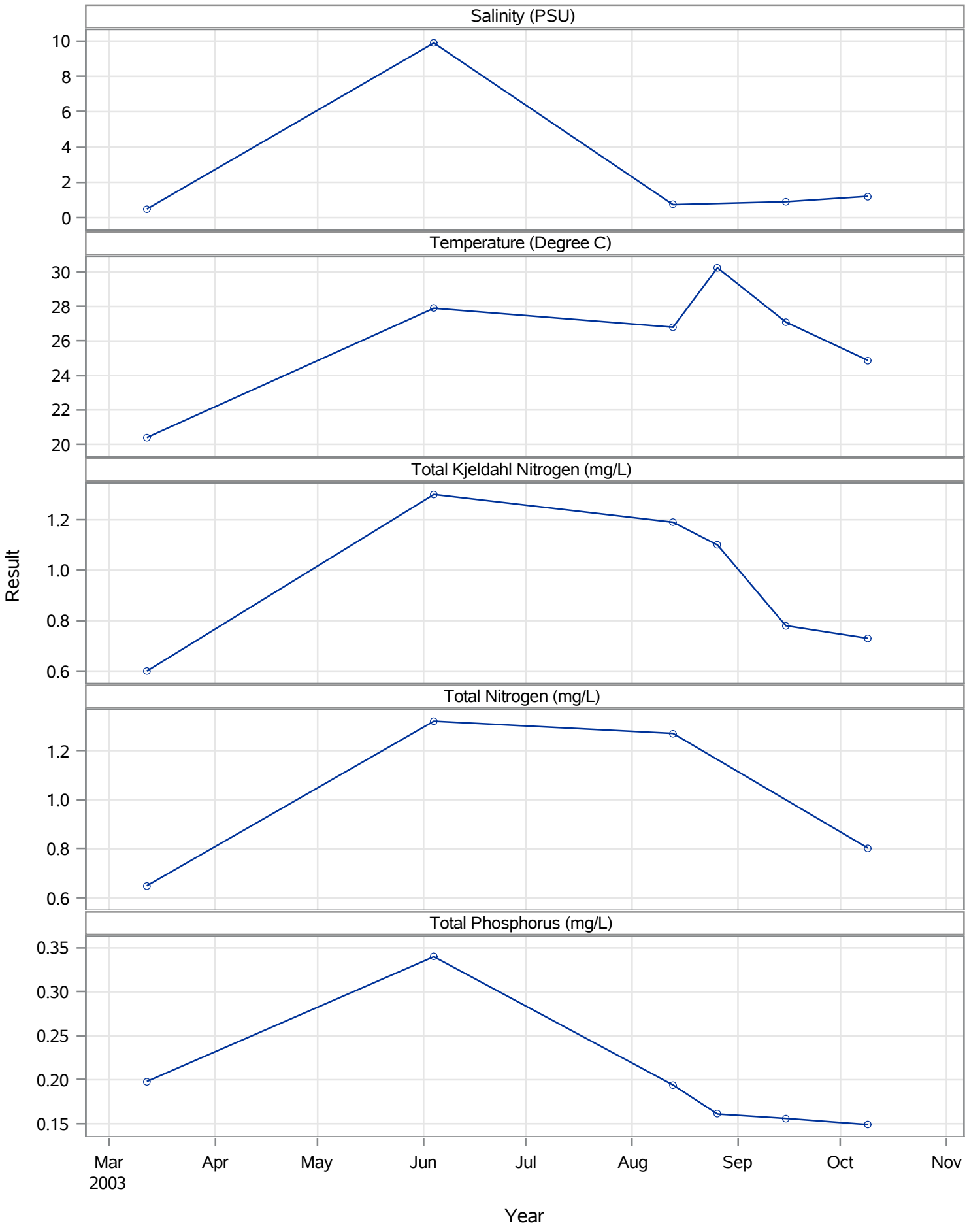

WBID=2678 Site=21FLKWATVOL-WATERFORD-2
Chlorophyll a (µg/L)
30
20
10
0
Total Nitrogen (mg/L)
0.8
0.7
0.6
0.5
Total Phosphorus (mg/L)
0.035
0.030
0.025
0.020
Result
Jan
2023
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Year

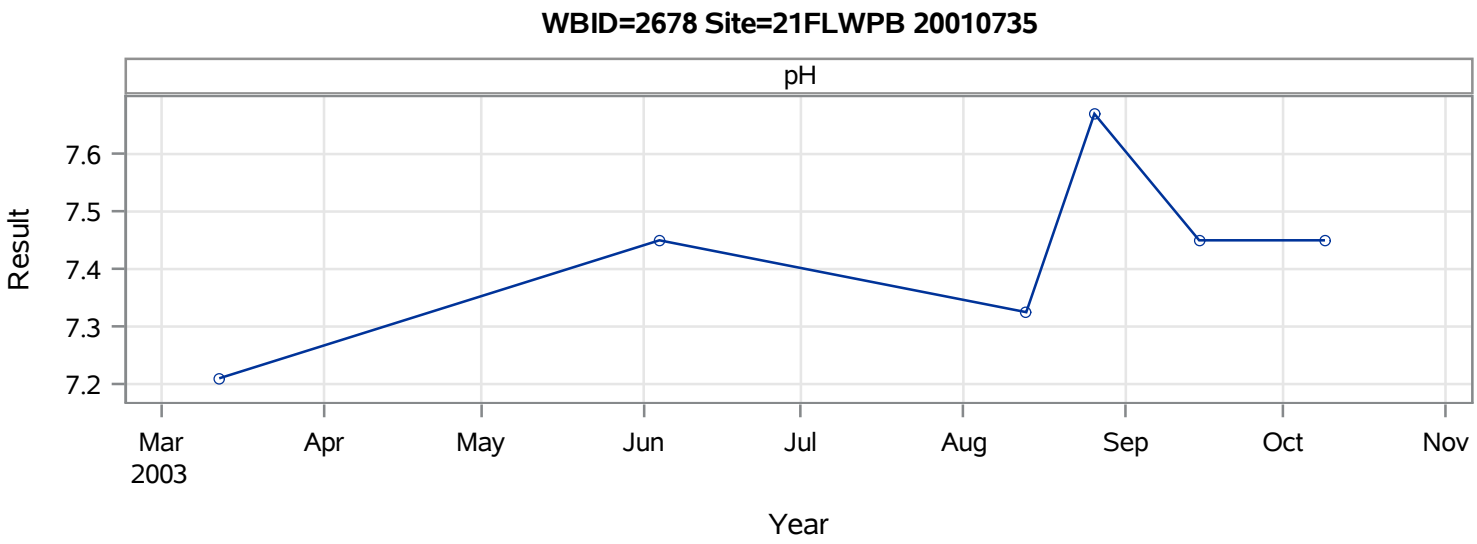

WBID=2678 Site=21FLKWATVOL-WATERFORD-3
Chlorophyll a (µg/L)
15
10
5
0
Total Nitrogen (mg/L)
0.9
0.8
0.7
0.6
Total Phosphorus (mg/L)
0.040
0.035
0.030
0.025
0.020
Result
Jan
2023
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Year

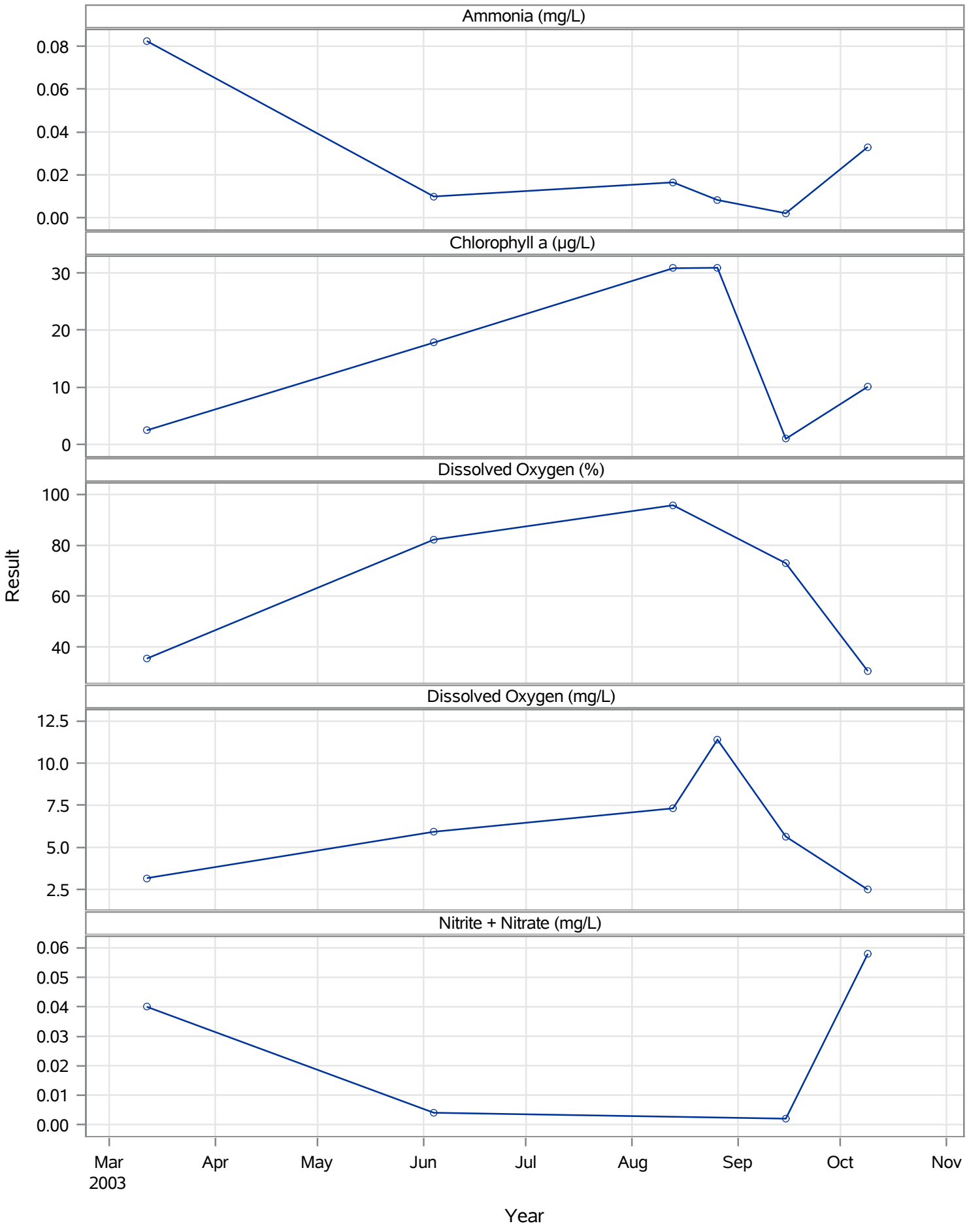

WBID=2678 Site=21FLMRC TB9060
Dissolved Oxygen (%)
120
100
80
60
Dissolved Oxygen (mg/L)
8
7
6
5
4
Salinity (PSU)
35
34
33
32
31
30
Secchi Disk Depth (m)
1.2
1.0
0.8
0.6
Temperature (Degree C)
30
28
26
24
22
20
Result
Apr
2006
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Year

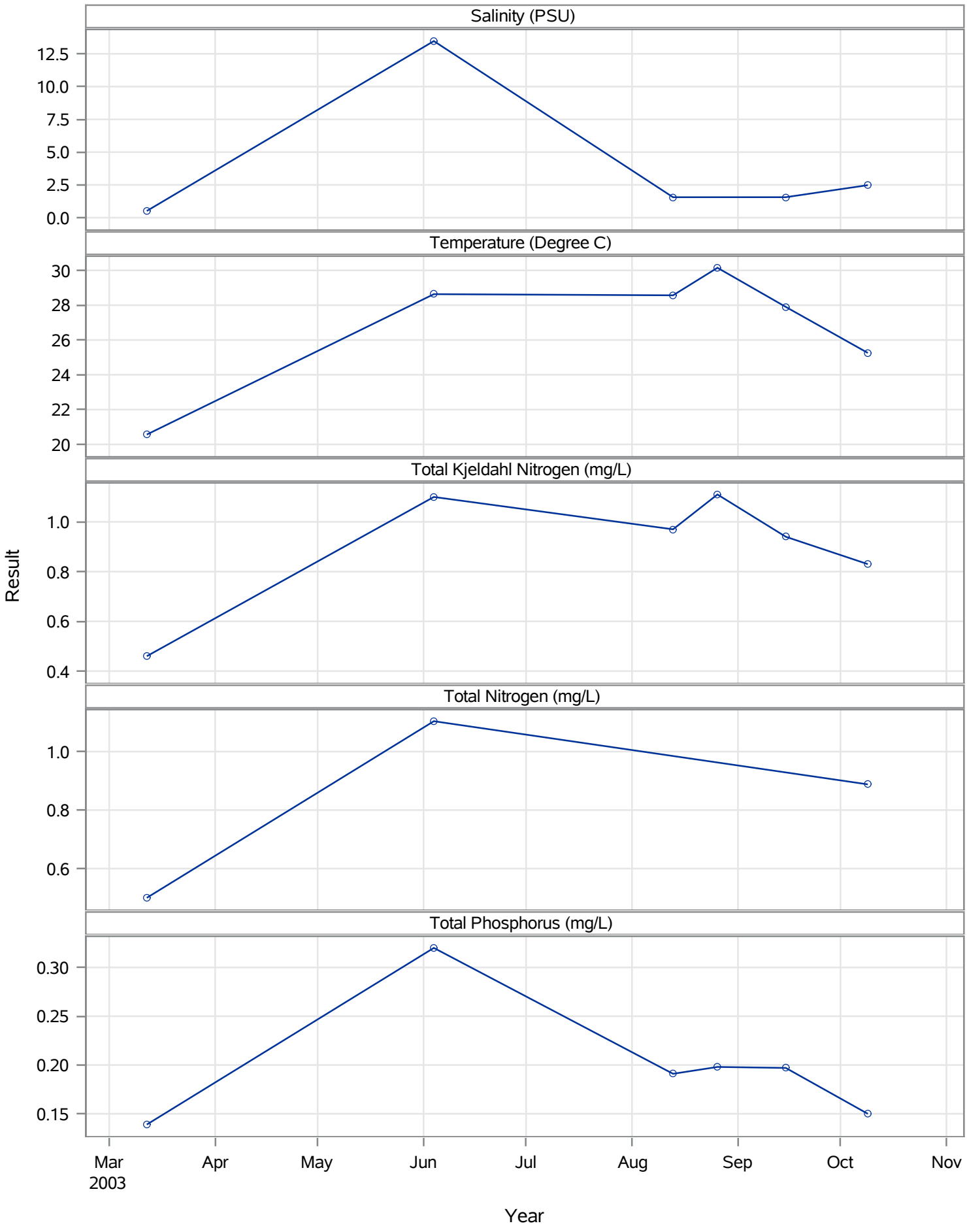

WBID=2678 Site=21FLMRC TB9060
pH
Result
8.00
7.95
7.90
7.85
7.80
7.75
7.70
Apr
2006
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Year

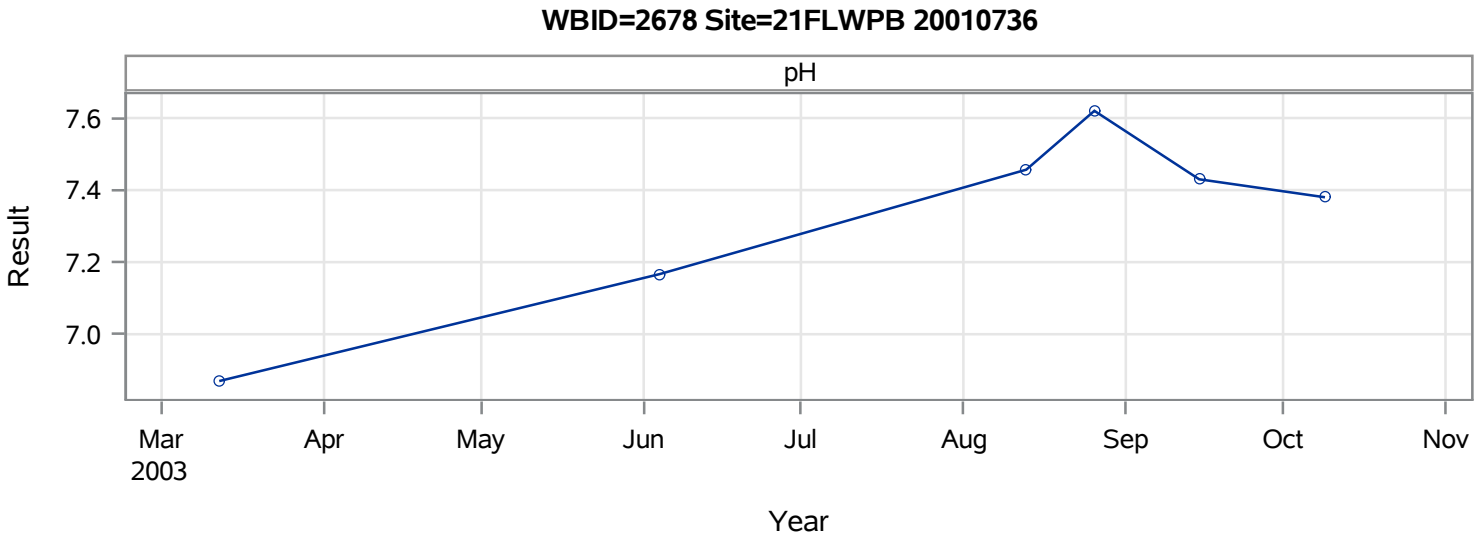

WBID=2678 Site=21FLWPB 20010735
Ammonia (mg/L)
0.15
0.10
0.05
0.00
Chlorophyll a (µg/L)
80
60
40
20
0
Dissolved Oxygen (%)
80
70
60
50
40
30
20
Dissolved Oxygen (mg/L)
12.5
10.0
7.5
5.0
2.5
Nitrite + Nitrate (mg/L)
0.08
0.06
0.04
0.02
0.00
Result
Mar
2003
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Year

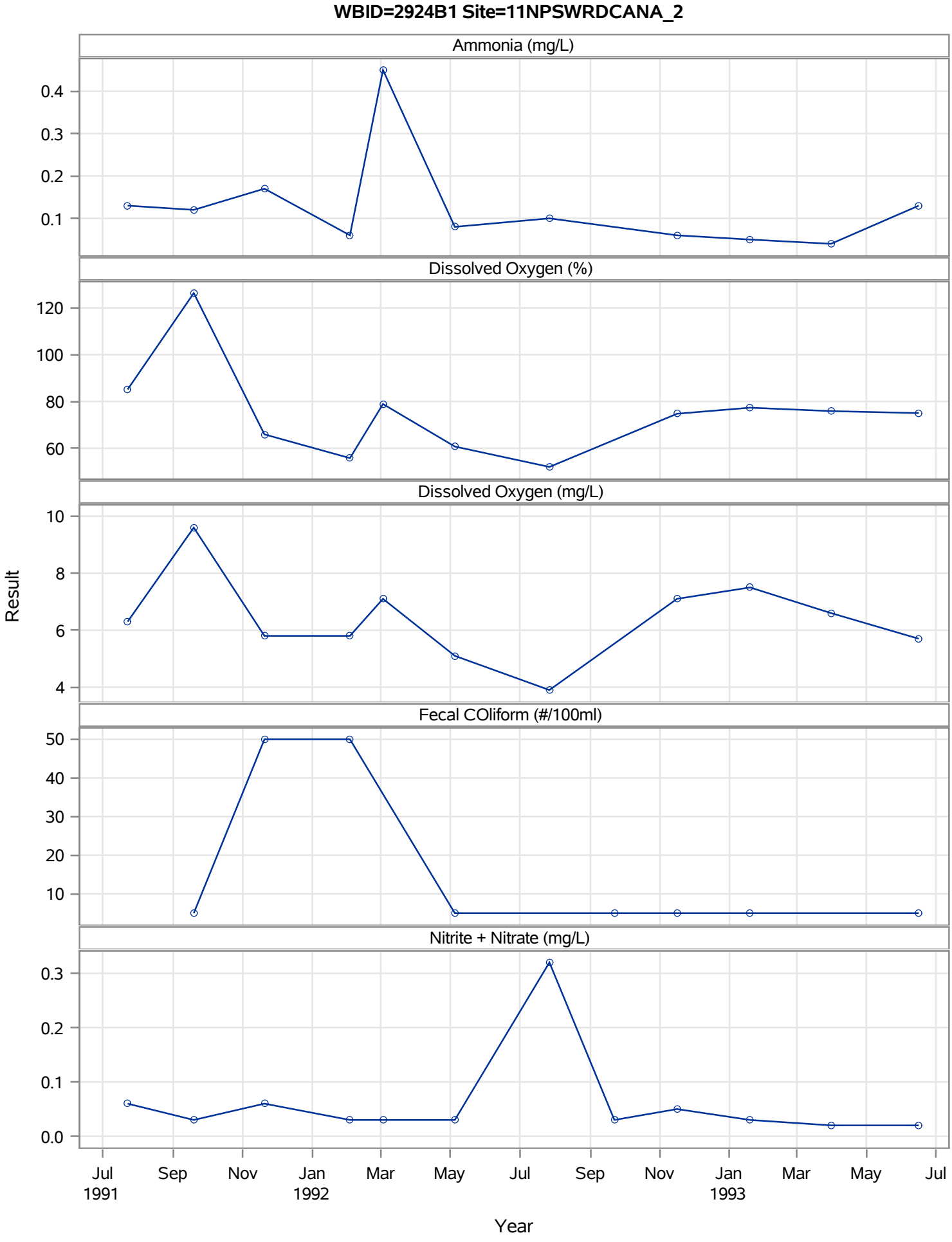

WBID=2678 Site=21FLWPB 20010735
Salinity (PSU)
10
8
6
4
2
0
Temperature (Degree C)
30
28
26
24
22
20
Total Kjeldahl Nitrogen (mg/L)
1.2
1.0
0.8
0.6
Total Nitrogen (mg/L)
1.2
1.0
0.8
0.6
Total Phosphorus (mg/L)
0.35
0.30
0.25
0.20
0.15
Result
Mar
2003
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Year

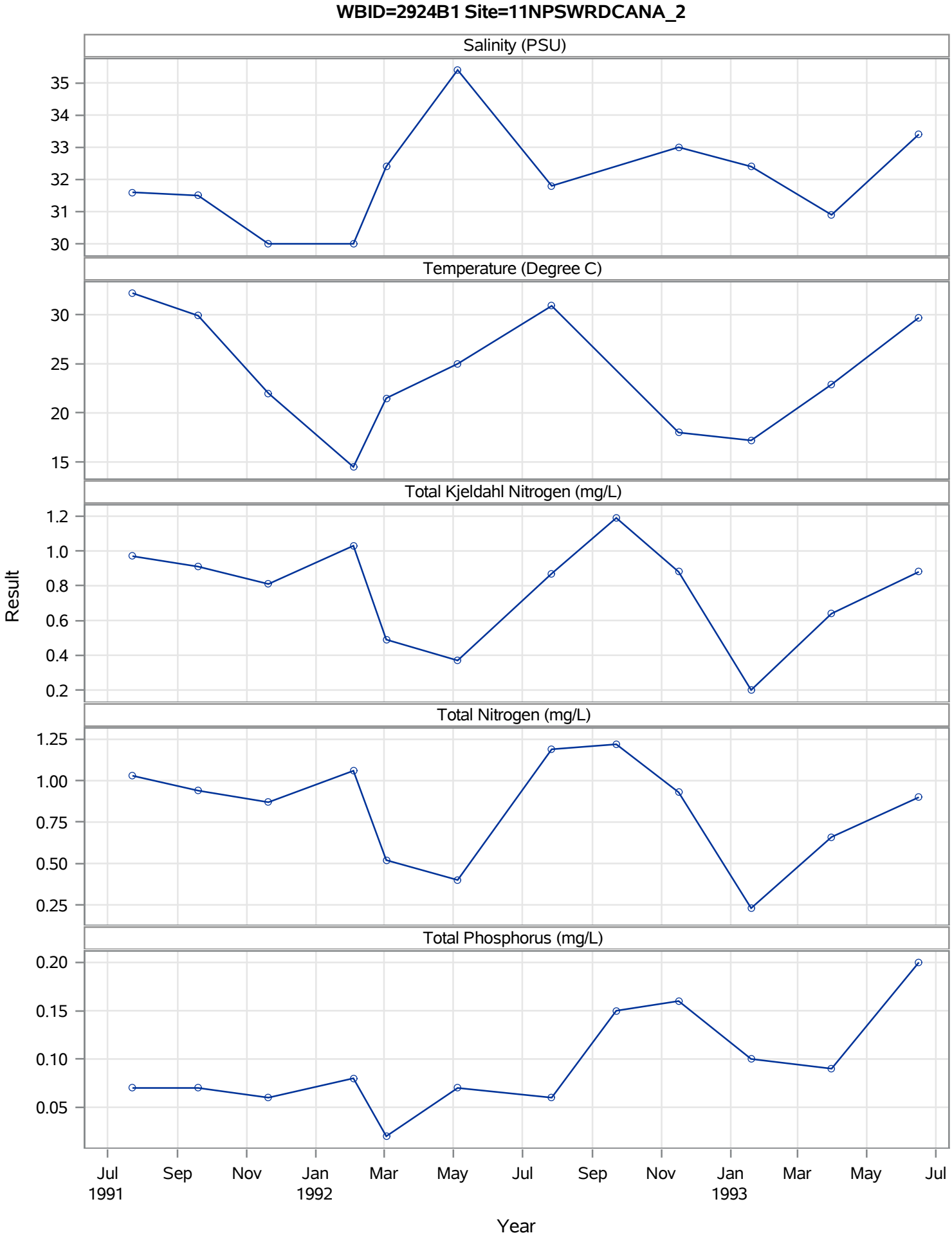

WBID=2678 Site=21FLWPB 20010735
pH
Result
7.6
7.5
7.4
7.3
7.2
Mar
2003
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Year

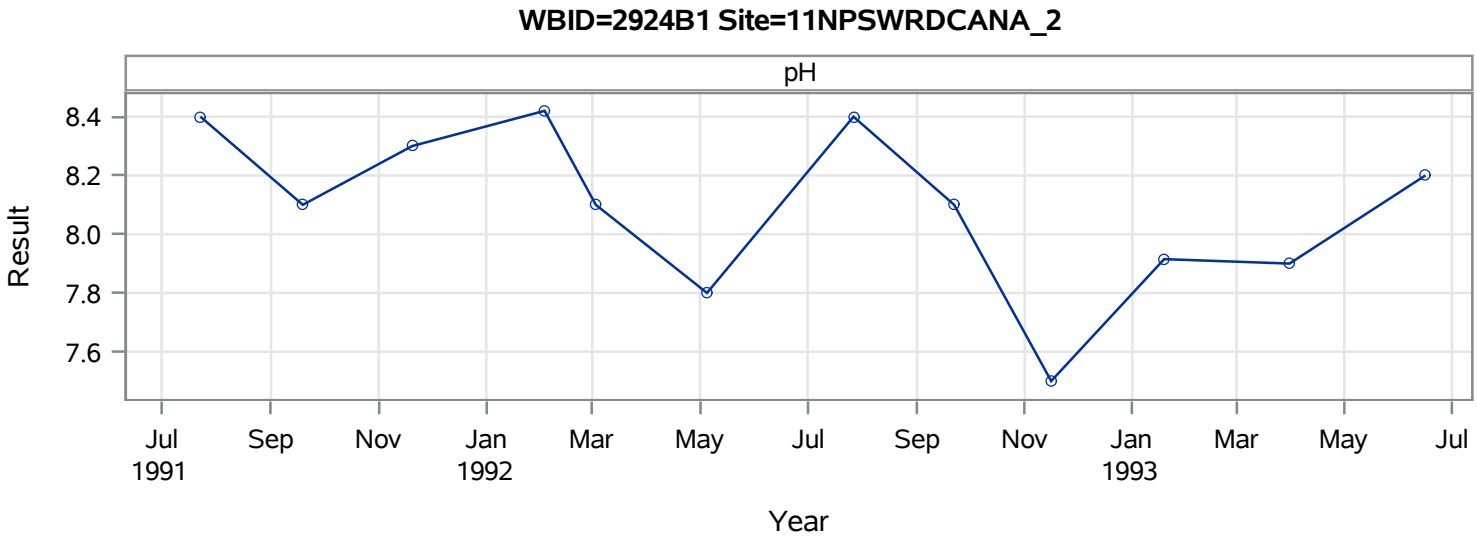

WBID=2678 Site=21FLWPB 20010736
Ammonia (mg/L)
0.08
0.06
0.04
0.02
0.00
Chlorophyll a (µg/L)
30
20
10
0
Dissolved Oxygen (%)
100
80
60
40
Dissolved Oxygen (mg/L)
12.5
10.0
7.5
5.0
2.5
Nitrite + Nitrate (mg/L)
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Result
Mar
2003
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Year

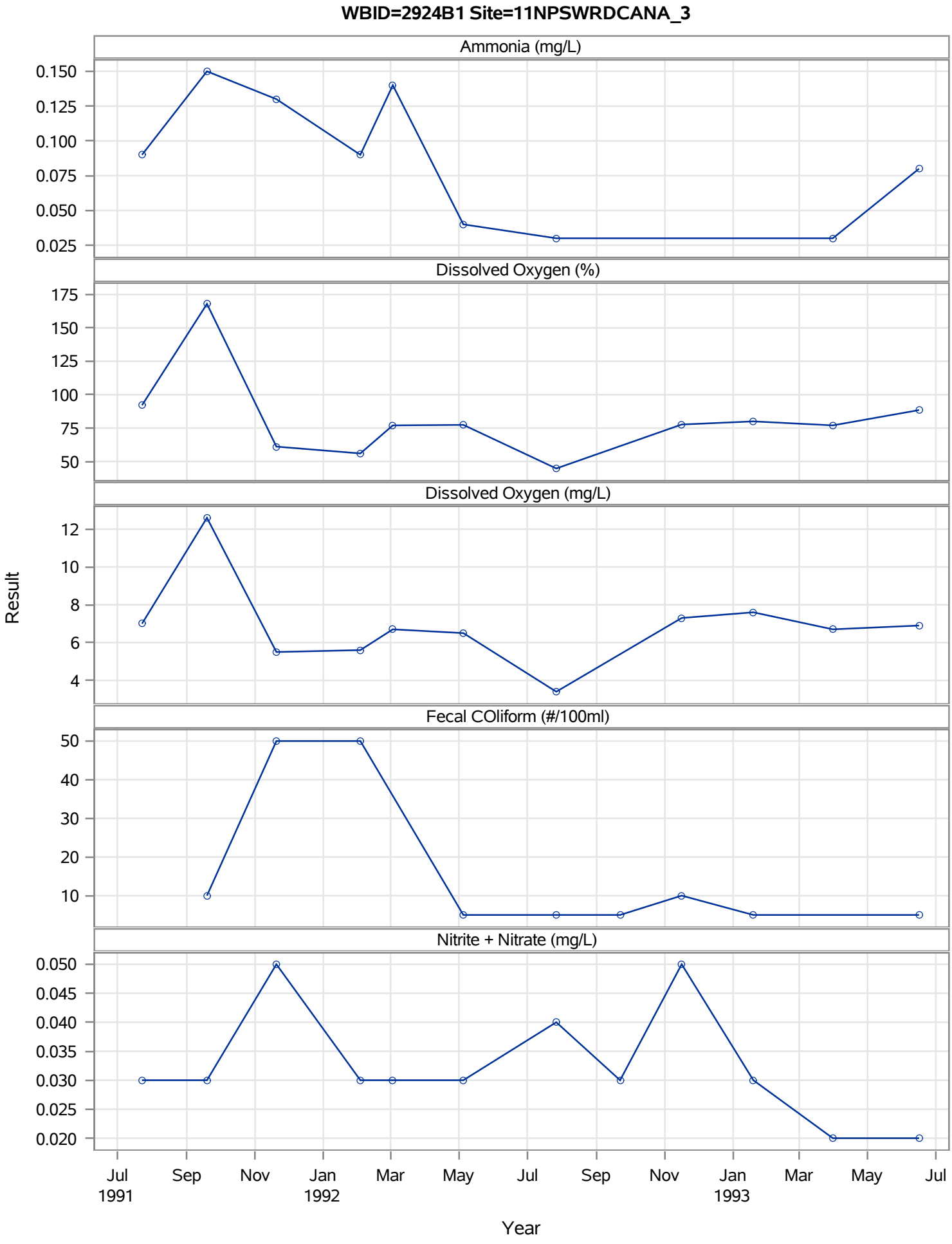

WBID=2678 Site=21FLWPB 20010736
Salinity (PSU)
12.5
10.0
7.5
5.0
2.5
0.0
Temperature (Degree C)
30
28
26
24
22
20
Total Kjeldahl Nitrogen (mg/L)
1.0
0.8
0.6
0.4
Total Nitrogen (mg/L)
1.0
0.8
0.6
Total Phosphorus (mg/L)
0.30
0.25
0.20
0.15
Result
Mar
2003
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Year

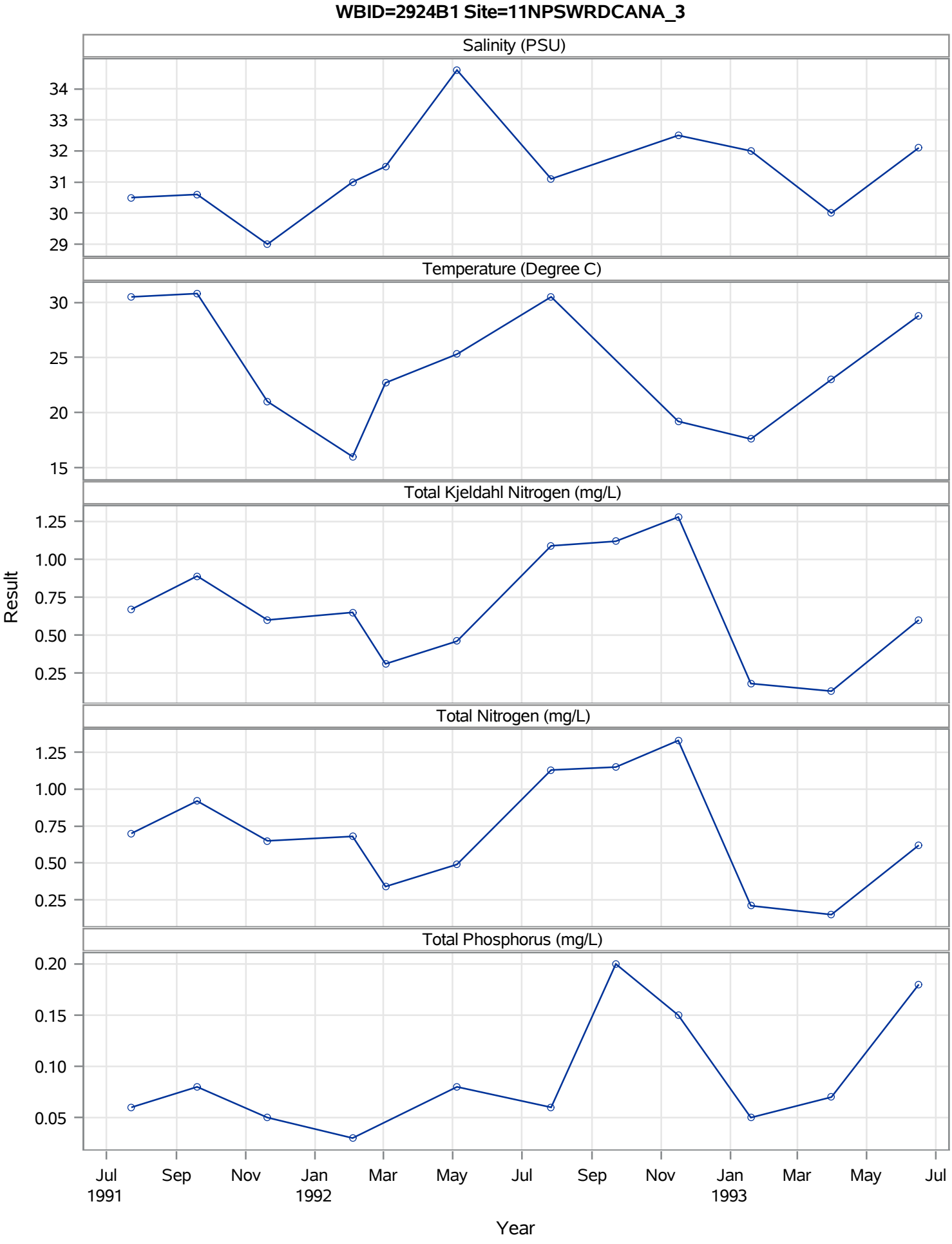

WBID=2678 Site=21FLWPB 20010736
pH
Result
7.6
7.4
7.2
7.0
Mar
2003
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Year

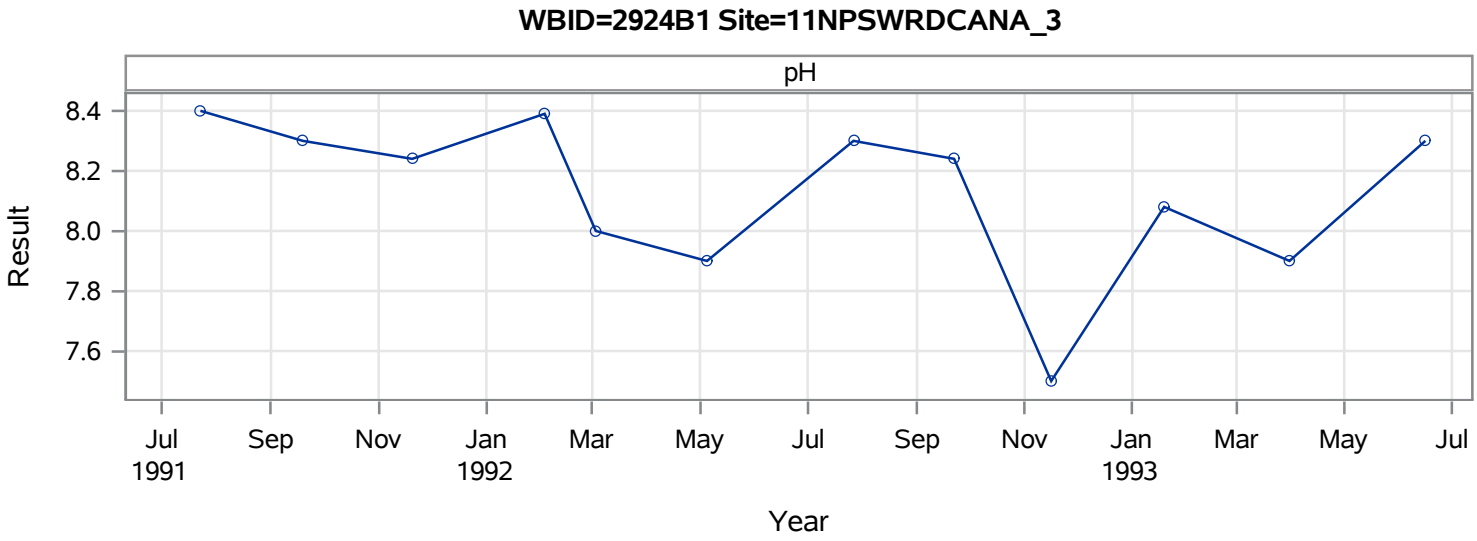

WBID=2924B1 Site=11NPSWRDCANA_2
Ammonia (mg/L)
0.4
0.3
0.2
0.1
Dissolved Oxygen (%)
120
100
80
60
Dissolved Oxygen (mg/L)
10
8
6
4
Fecal COliform (#/100ml)
50
40
30
20
10
Nitrite + Nitrate (mg/L)
0.3
0.2
0.1
0.0
Result
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

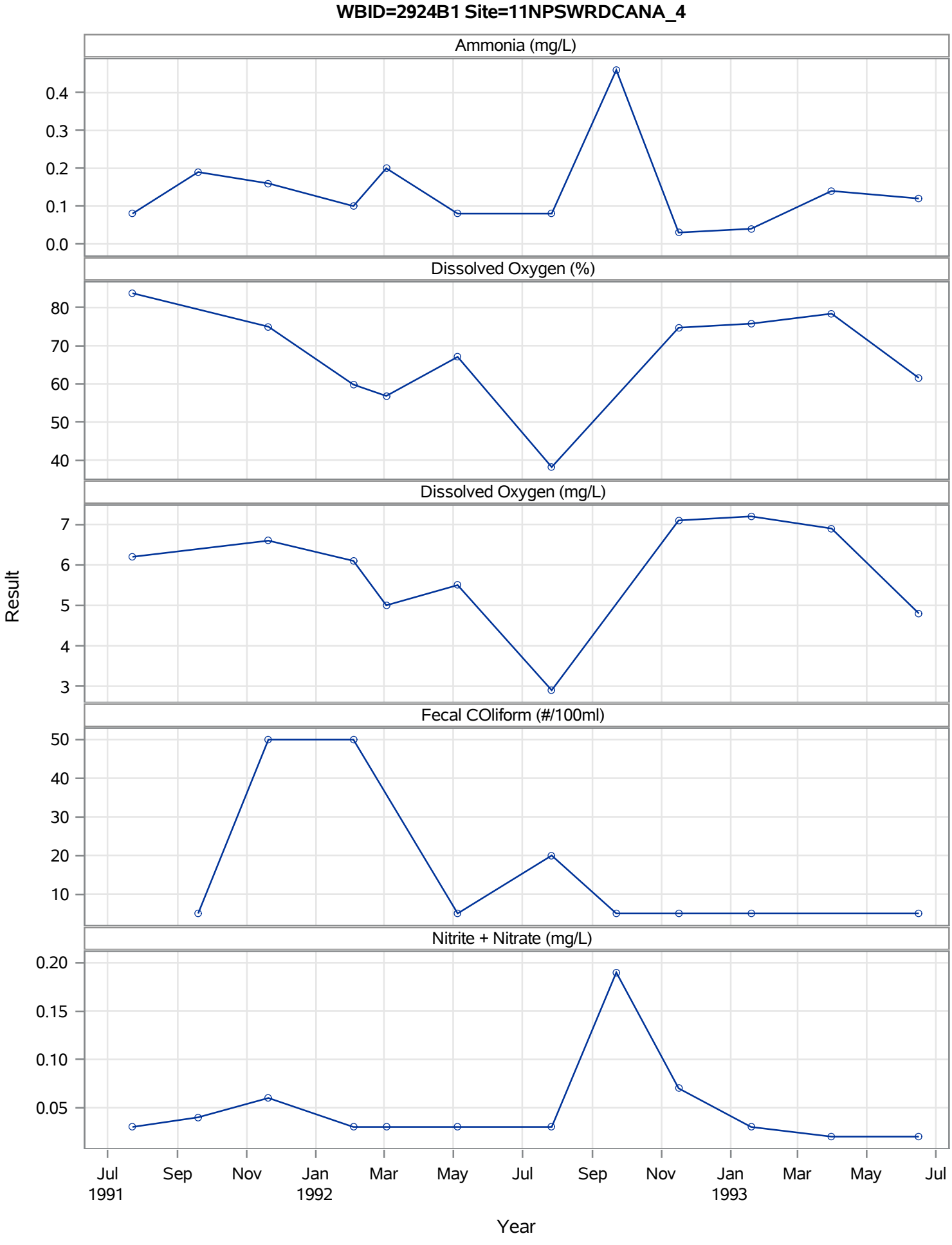

WBID=2924B1 Site=11NPSWRDCANA_2
Salinity (PSU)
35
34
33
32
31
30
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
1.2
1.0
0.8
0.6
0.4
0.2
Total Nitrogen (mg/L)
1.25
1.00
0.75
0.50
0.25
Total Phosphorus (mg/L)
0.20
0.15
0.10
0.05
Result
Jul 1991
Sep
Nov
Jan 1992
Mar
May
Jul
Sep
Nov
Jan 1993
Mar
May
Jul
Year

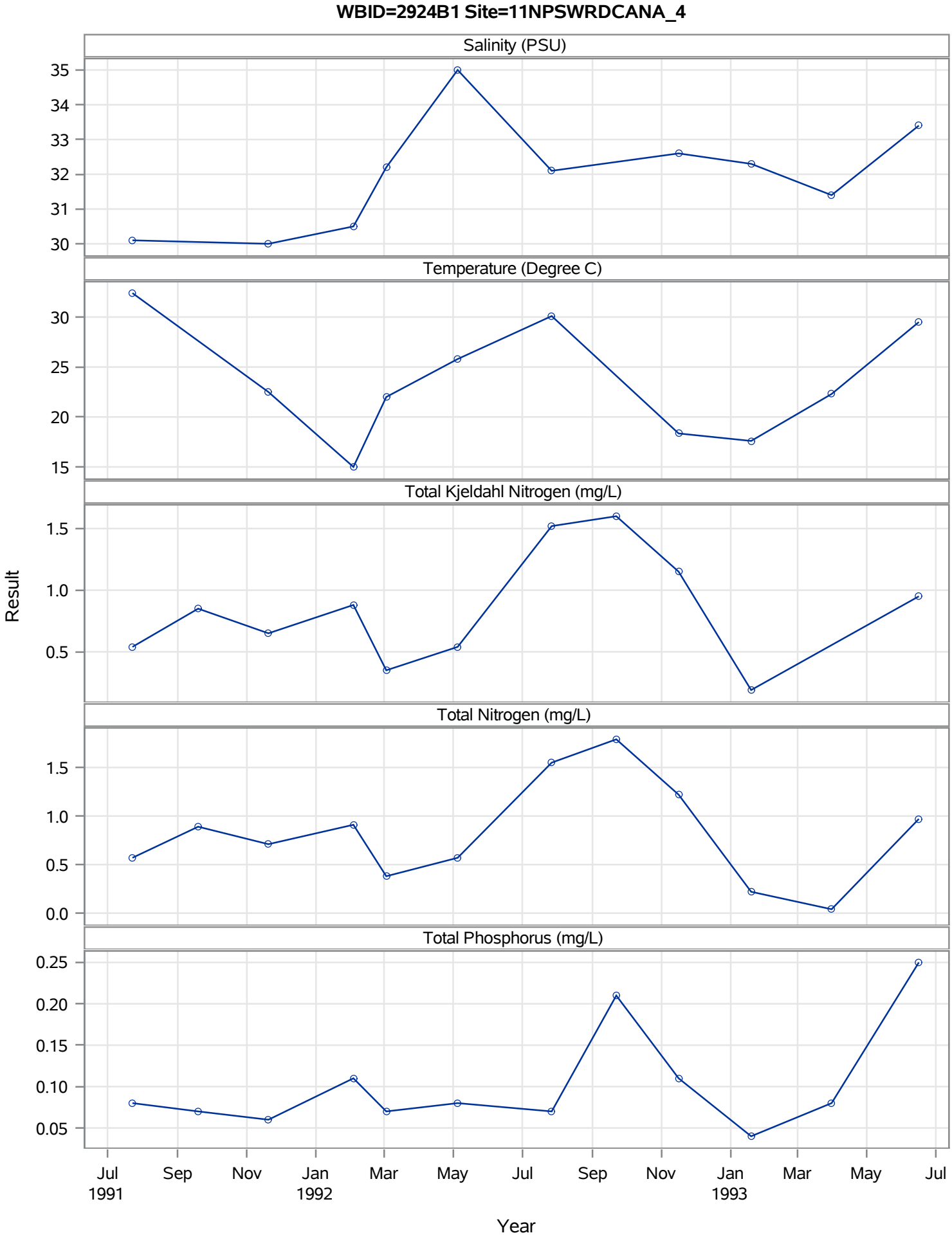

WBID=2924B1 Site=11NPSWRDCANA_2
pH
Result
8.4
8.2
8.0
7.8
7.6
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

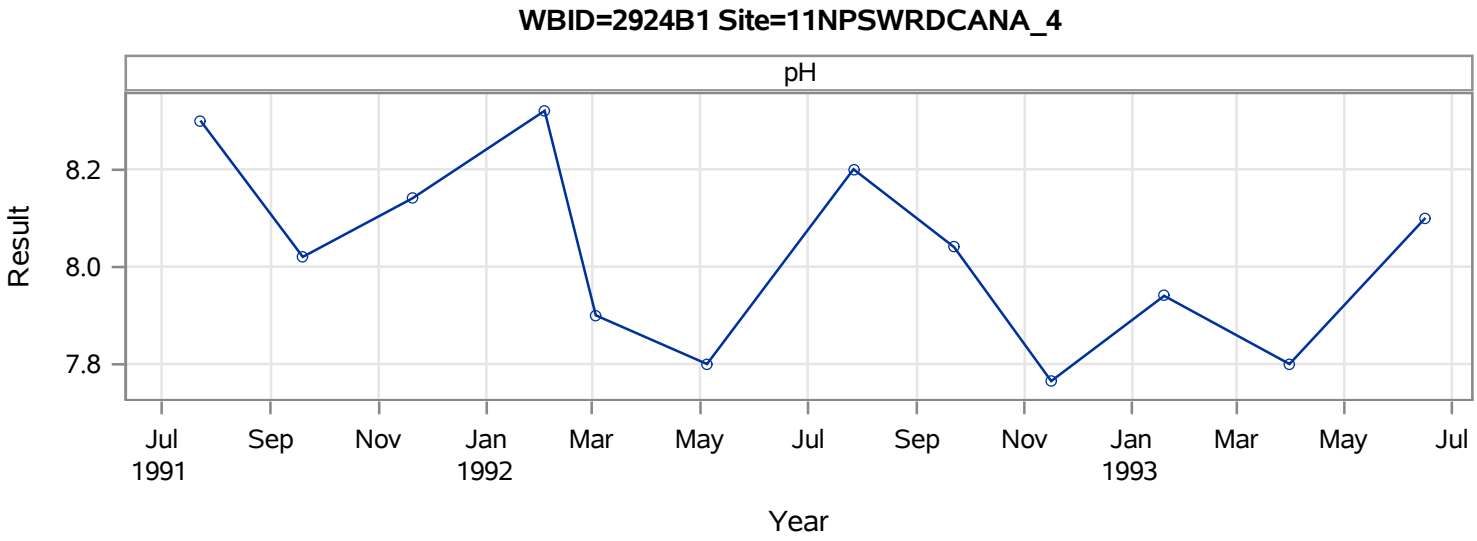

WBID=2924B1 Site=11NPSWRDCANA_3
Ammonia (mg/L)
0.150
0.125
0.100
0.075
0.050
0.025
Dissolved Oxygen (%)
175
150
125
100
75
50
Dissolved Oxygen (mg/L)
12
10
8
6
4
Fecal COliform (#/100ml)
50
40
30
20
10
Nitrite + Nitrate (mg/L)
0.050
0.045
0.040
0.035
0.030
0.025
0.020
Result
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

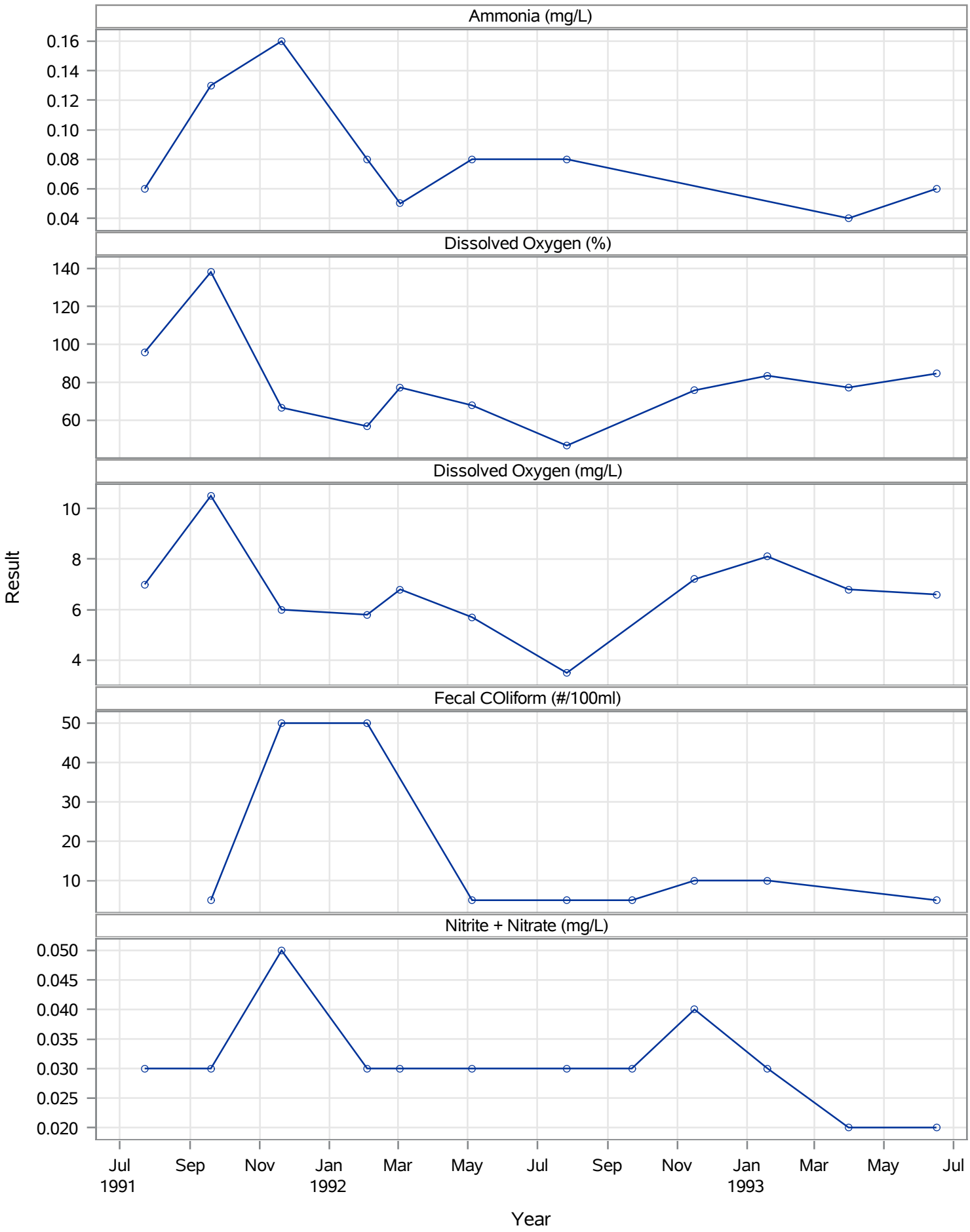

WBID=2924B1 Site=11NPSWRDCANA_3
Salinity (PSU)
34
33
32
31
30
29
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
1.25
1.00
0.75
0.50
0.25
Total Nitrogen (mg/L)
1.25
1.00
0.75
0.50
0.25
Total Phosphorus (mg/L)
0.20
0.15
0.10
0.05
Result
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

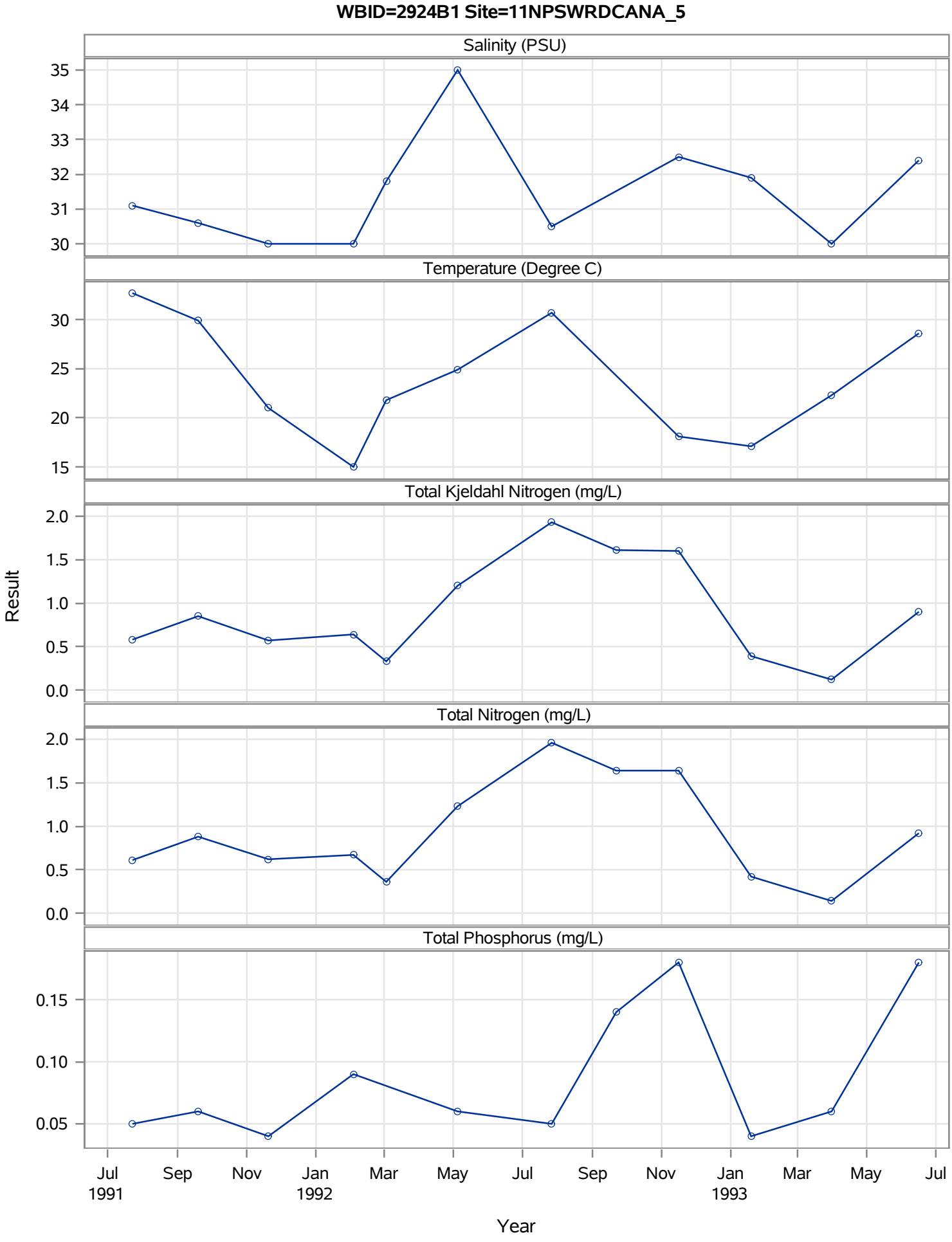

WBID=2924B1 Site=11NPSWRDCANA_3
pH
Result
8.4
8.2
8.0
7.8
7.6
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

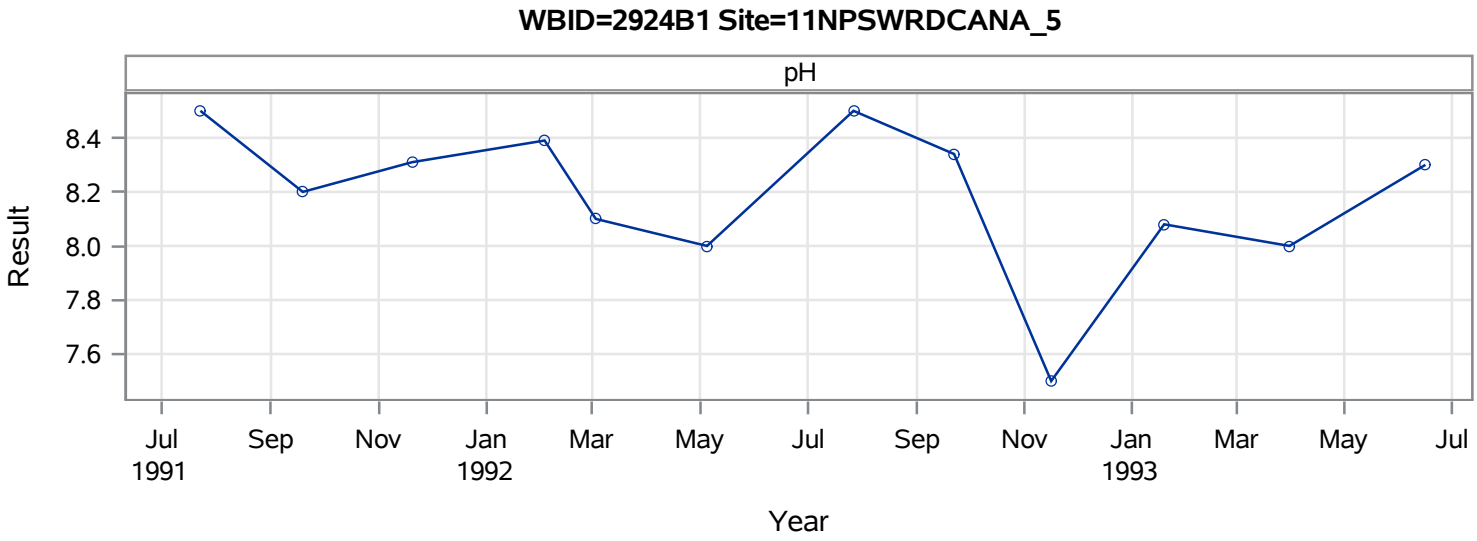

WBID=2924B1 Site=11NPSWRDCANA_4
Ammonia (mg/L)
0.4
0.3
0.2
0.1
0.0
Dissolved Oxygen (%)
80
70
60
50
40
Dissolved Oxygen (mg/L)
7
6
5
4
3
Fecal COliform (#/100ml)
50
40
30
20
10
Nitrite + Nitrate (mg/L)
0.20
0.15
0.10
0.05
Result
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

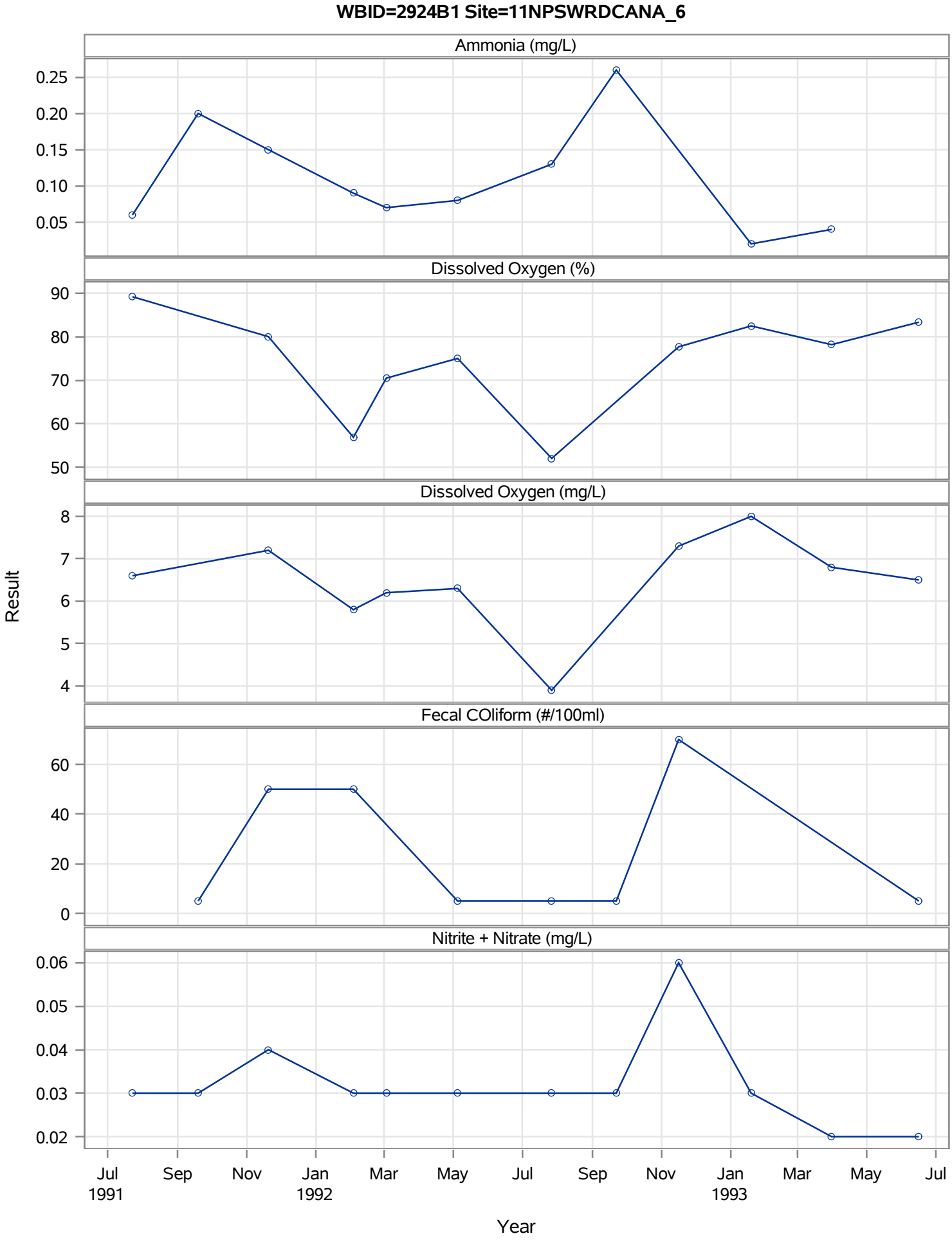

WBID=2924B1 Site=11NPSWRDCANA_4
Salinity (PSU)
35
34
33
32
31
30
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
1.5
1.0
0.5
Total Nitrogen (mg/L)
1.5
1.0
0.5
0.0
Total Phosphorus (mg/L)
0.25
0.20
0.15
0.10
0.05
Result
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

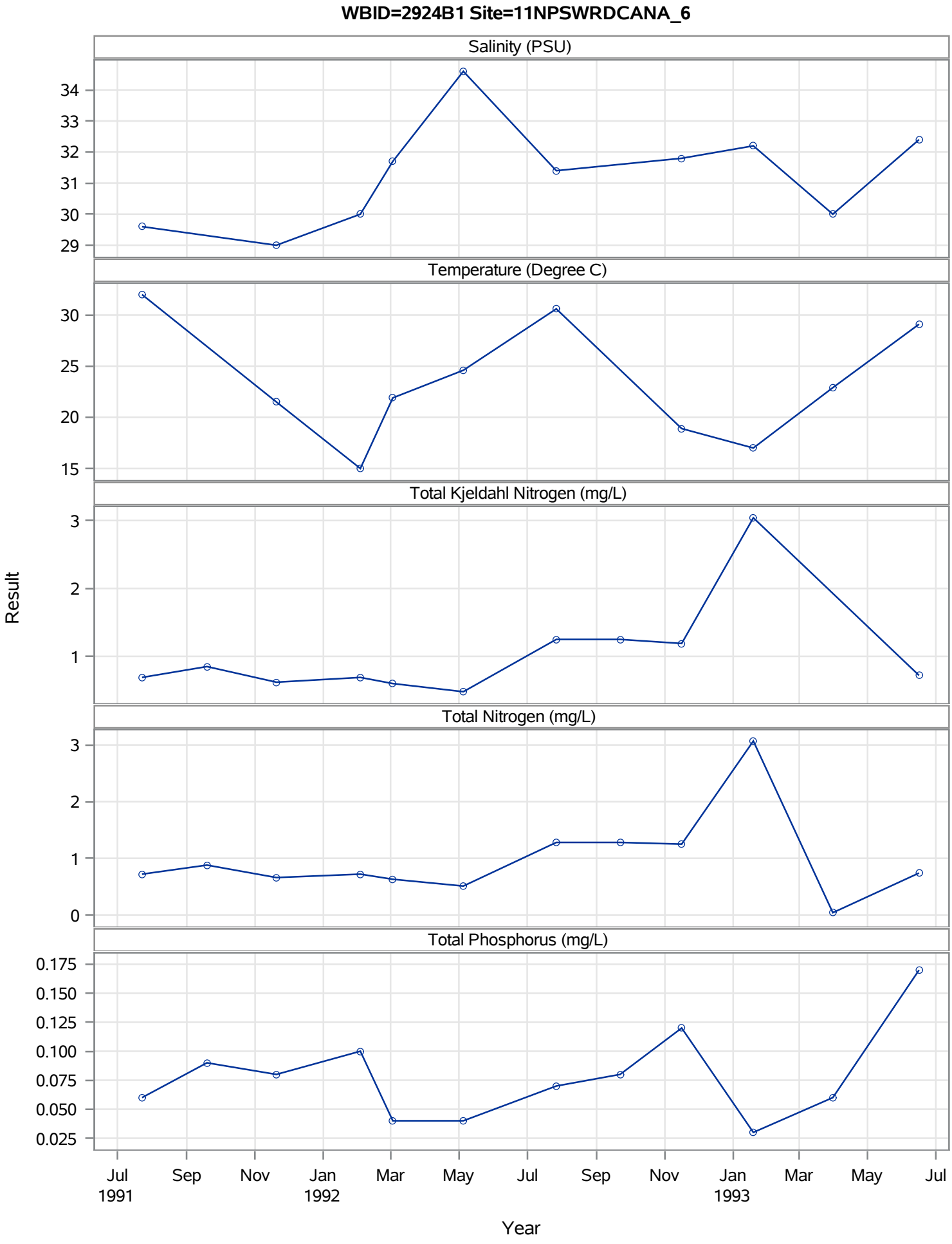

WBID=2924B1 Site=11NPSWRDCANA_4
pH
Result
8.2
8.0
7.8
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

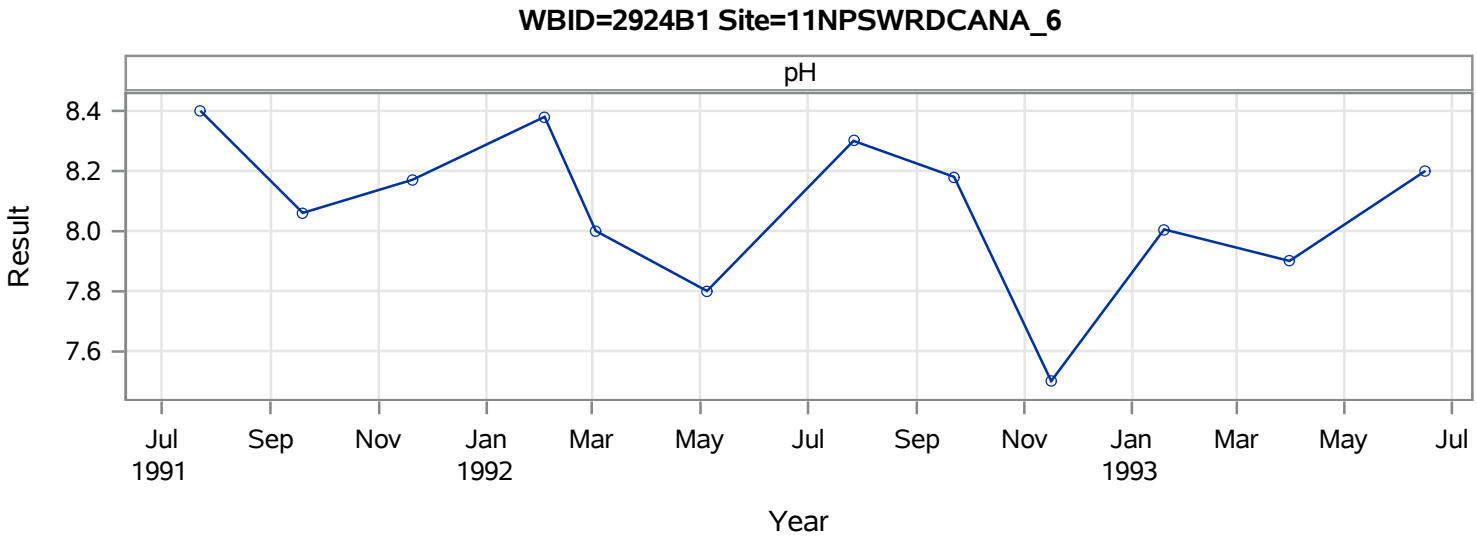

WBID=2924B1 Site=11NPSWRDCANA_5
Ammonia (mg/L)
0.16
0.14
0.12
0.10
0.08
0.06
0.04
Dissolved Oxygen (%)
140
120
100
80
60
Dissolved Oxygen (mg/L)
10
8
6
4
Fecal COliform (#/100ml)
50
40
30
20
10
Nitrite + Nitrate (mg/L)
0.050
0.045
0.040
0.035
0.030
0.025
0.020
Result
Jul 1991
Sep
Nov
Jan 1992
Mar
May
Jul
Sep
Nov
Jan 1993
Mar
May
Jul
Year

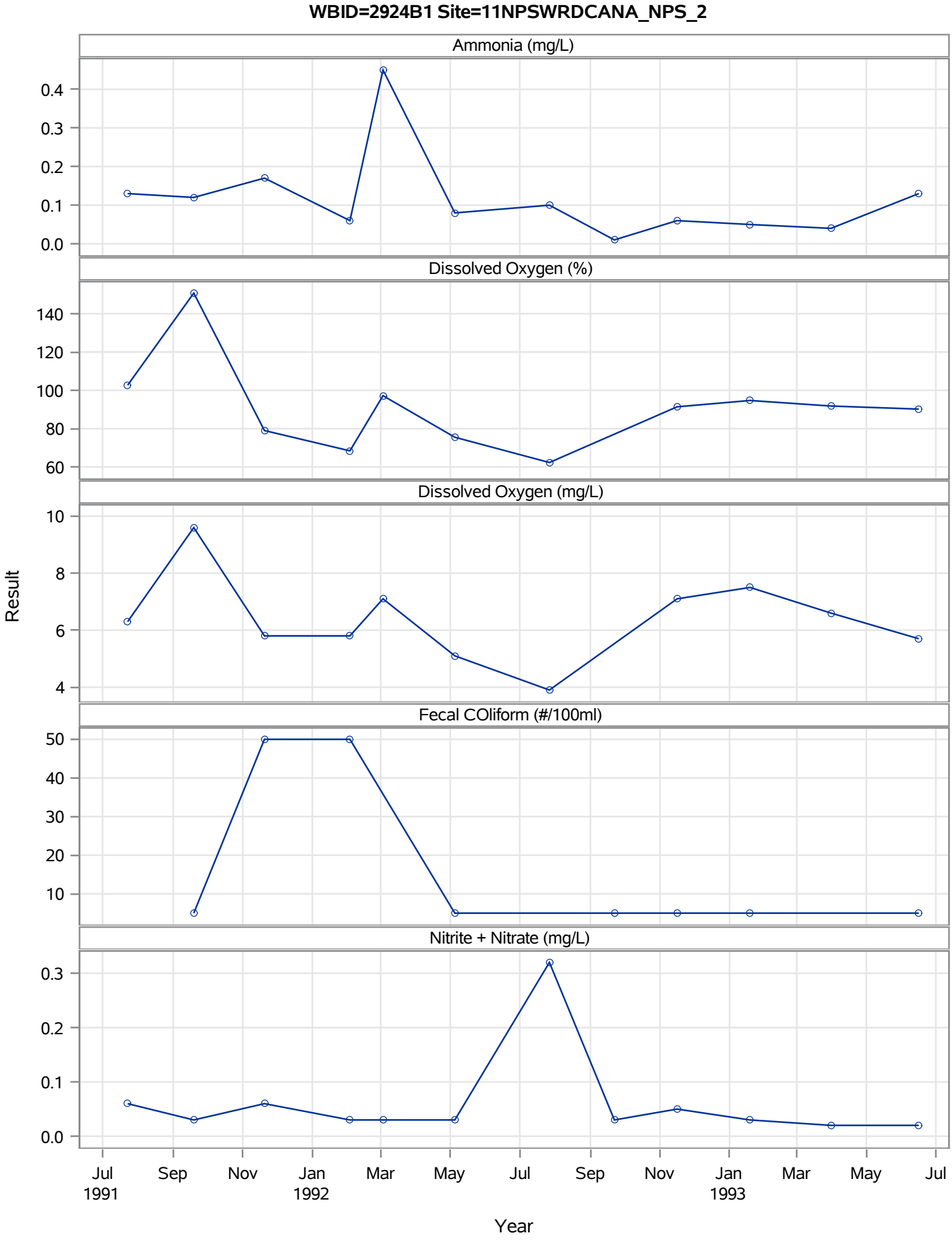

WBID=2924B1 Site=11NPSWRDCANA_5
Salinity (PSU)
35
34
33
32
31
30
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Total Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Total Phosphorus (mg/L)
0.15
0.10
0.05
Result
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

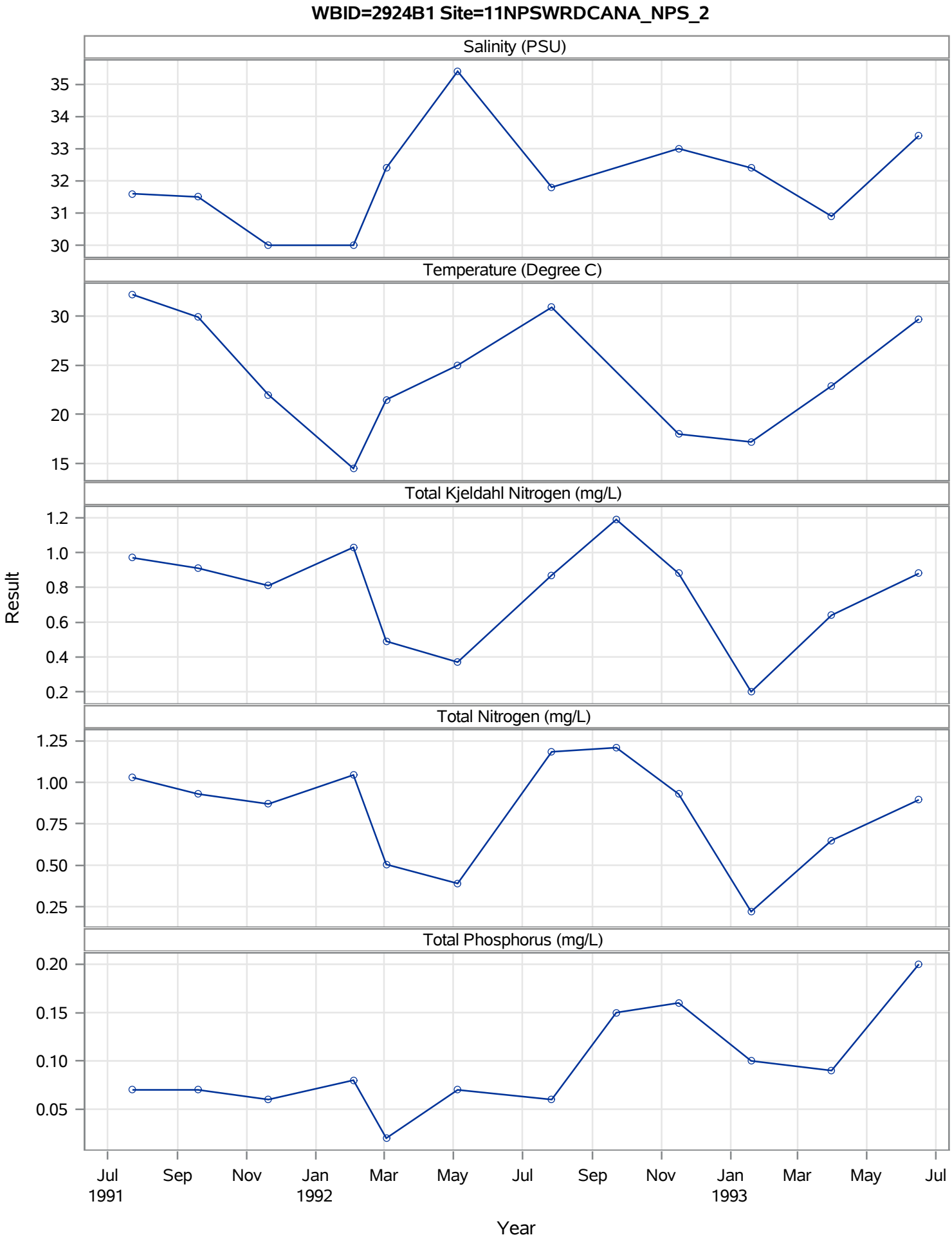

WBID=2924B1 Site=11NPSWRDCANA_5
pH
Result
8.4
8.2
8.0
7.8
7.6
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

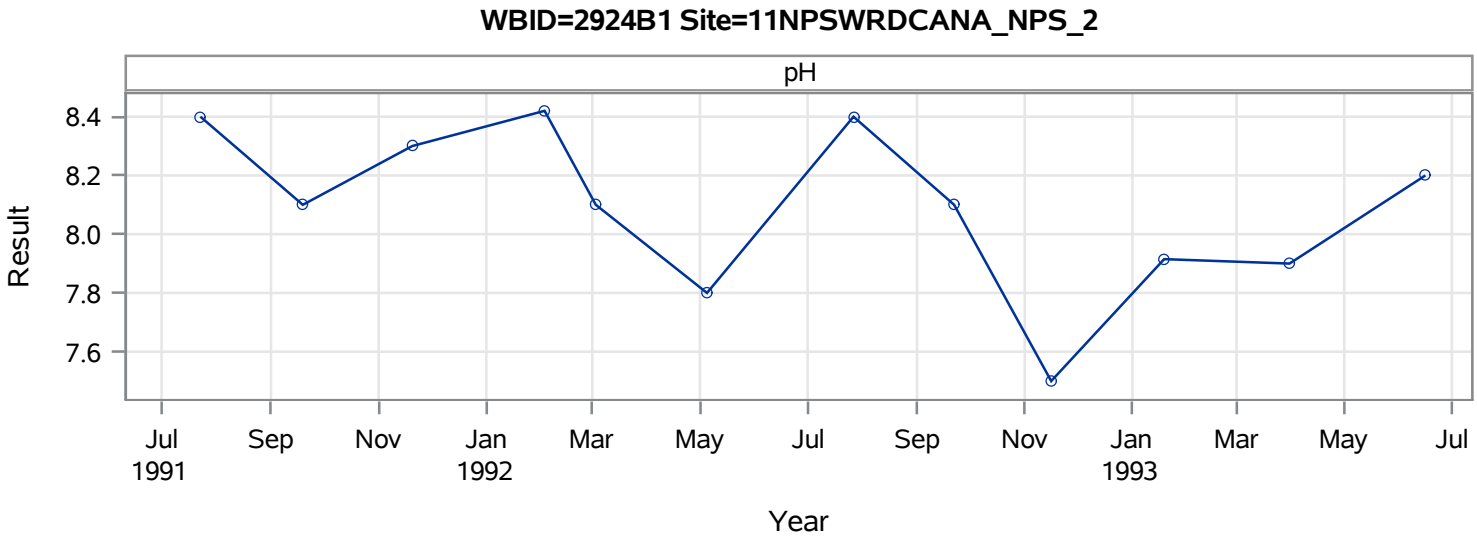

WBID=2924B1 Site=11NPSWRDCANA_6
Ammonia (mg/L)
0.25
0.20
0.15
0.10
0.05
Dissolved Oxygen (%)
90
80
70
60
50
Dissolved Oxygen (mg/L)
8
7
6
5
4
Fecal COliform (#/100ml)
60
40
20
0
Nitrite + Nitrate (mg/L)
0.06
0.05
0.04
0.03
0.02
Result
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

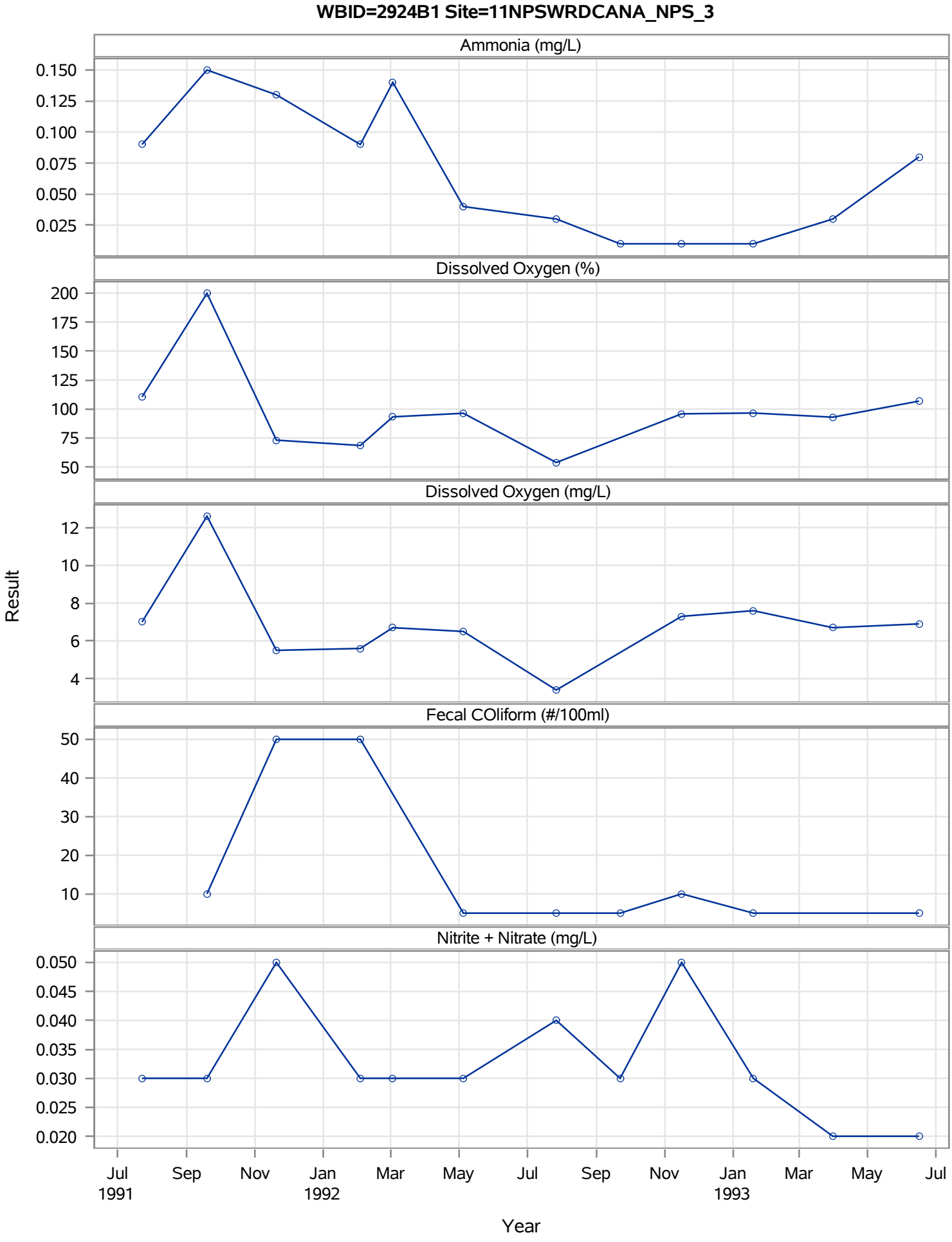

WBID=2924B1 Site=11NPSWRDCANA_6
Salinity (PSU)
34
33
32
31
30
29
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
3
2
1
Total Nitrogen (mg/L)
3
2
1
0
Total Phosphorus (mg/L)
0.175
0.150
0.125
0.100
0.075
0.050
0.025
Result
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

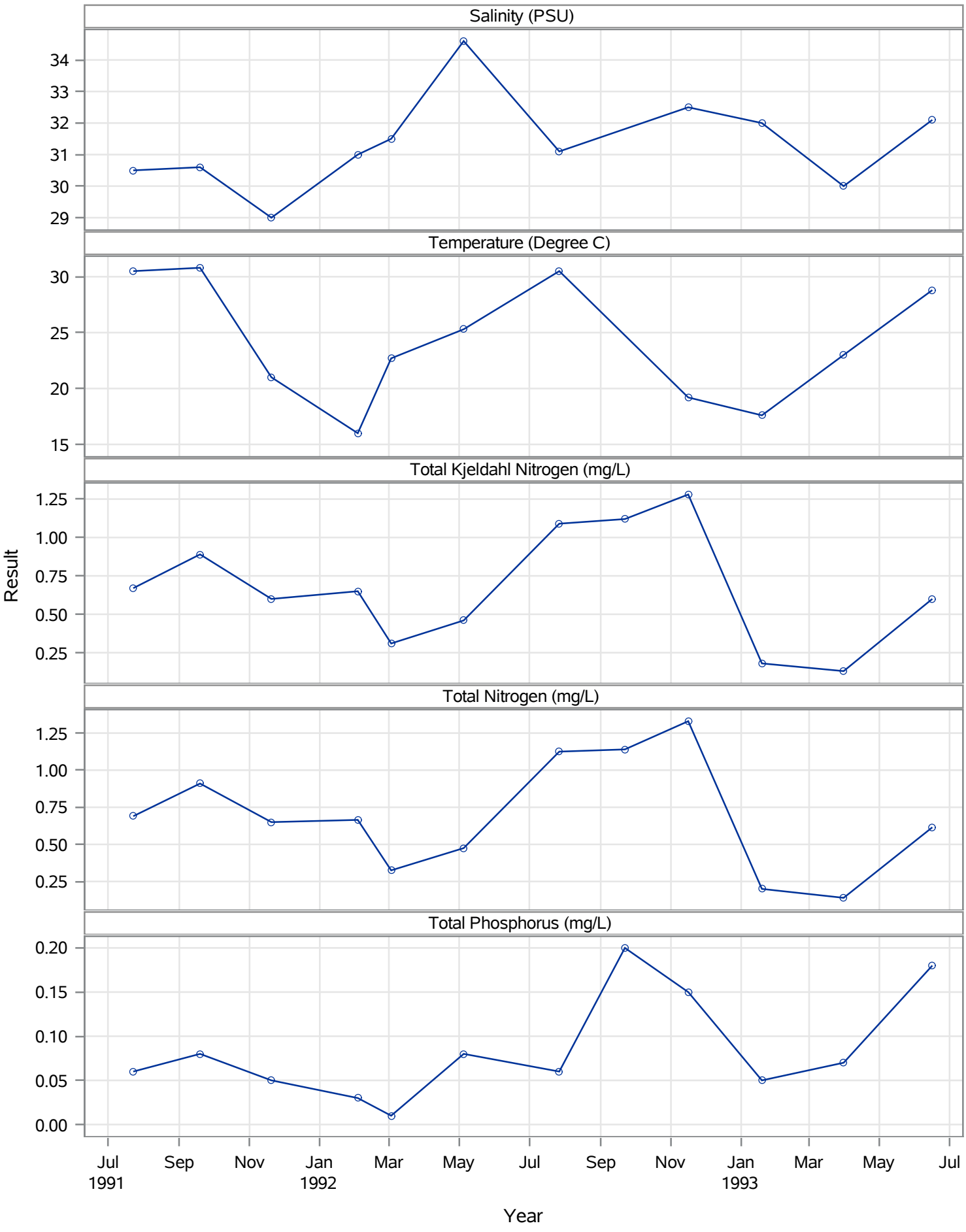

WBID=2924B1 Site=11NPSWRDCANA_6
pH
Result
8.4
8.2
8.0
7.8
7.6
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

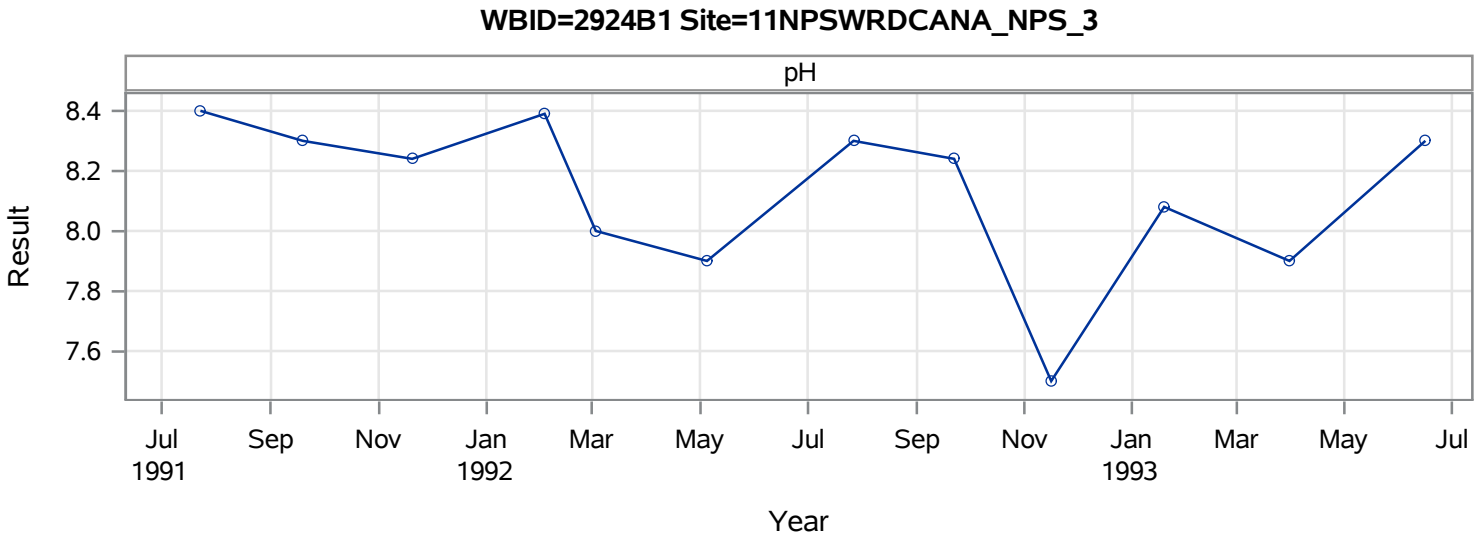

WBID=2924B1 Site=11NPSWRDCANA_NPS_2
Ammonia (mg/L)
0.4
0.3
0.2
0.1
0.0
Dissolved Oxygen (%)
140
120
100
80
60
Dissolved Oxygen (mg/L)
10
8
6
4
Fecal COliform (#/100ml)
50
40
30
20
10
Nitrite + Nitrate (mg/L)
0.3
0.2
0.1
0.0
Result
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

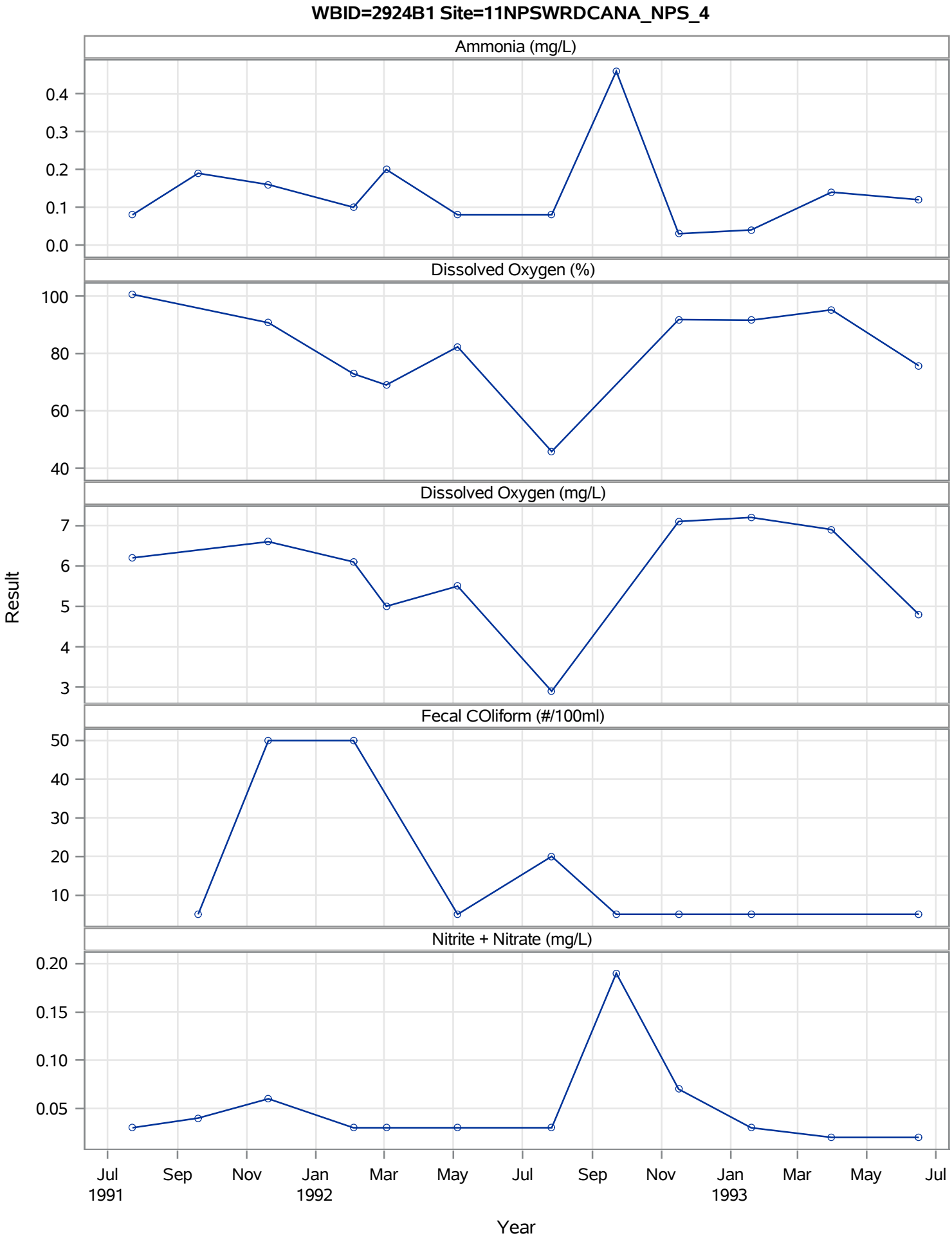

WBID=2924B1 Site=11NPSWRDCANA_NPS_2
Salinity (PSU)
35
34
33
32
31
30
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
1.2
1.0
0.8
0.6
0.4
0.2
Total Nitrogen (mg/L)
1.25
1.00
0.75
0.50
0.25
Total Phosphorus (mg/L)
0.20
0.15
0.10
0.05
Result
Jul 1991
Sep
Nov
Jan 1992
Mar
May
Jul
Sep
Nov
Jan 1993
Mar
May
Jul
Year

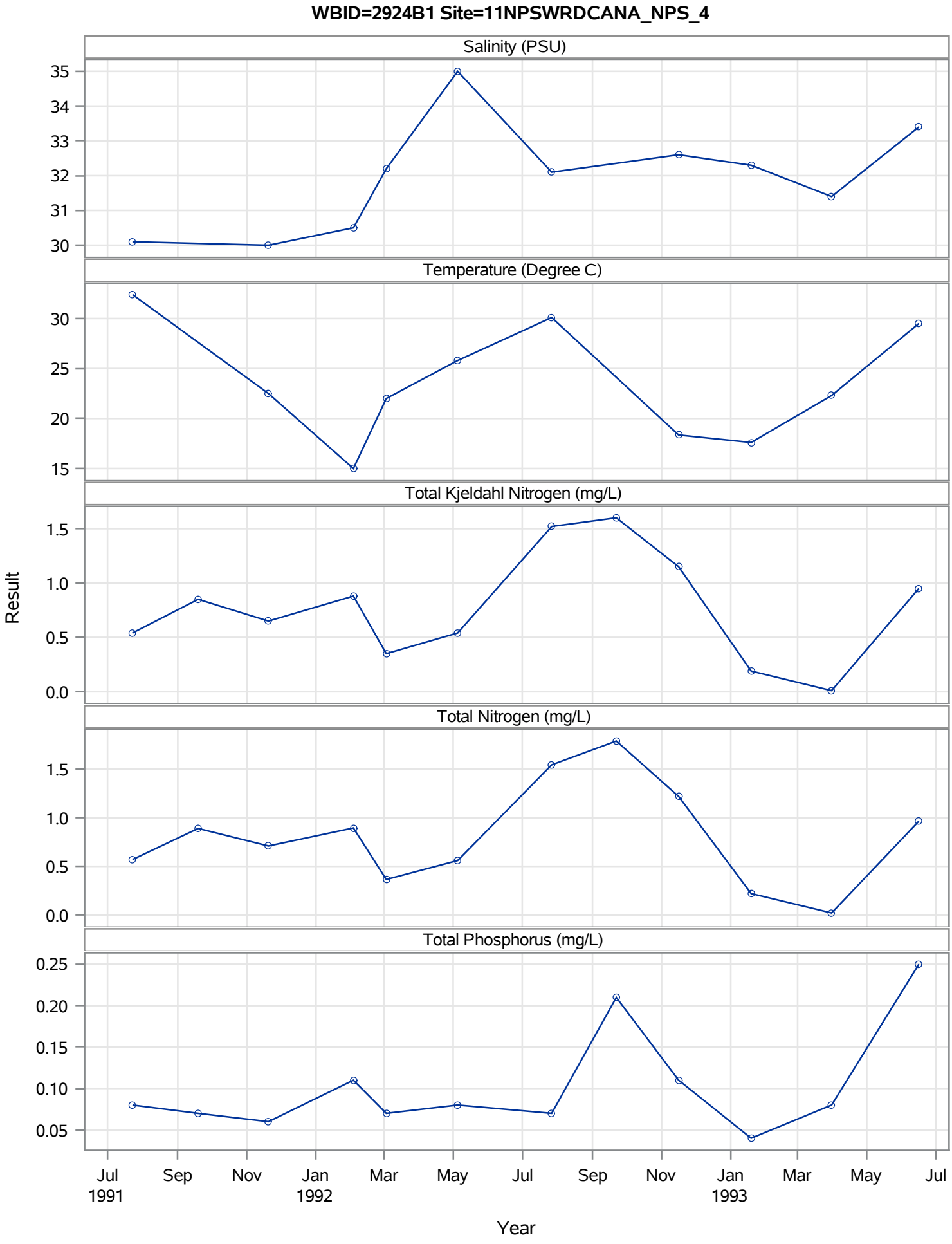

WBID=2924B1 Site=11NPSWRDCANA_NPS_2
pH
Result
8.4
8.2
8.0
7.8
7.6
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

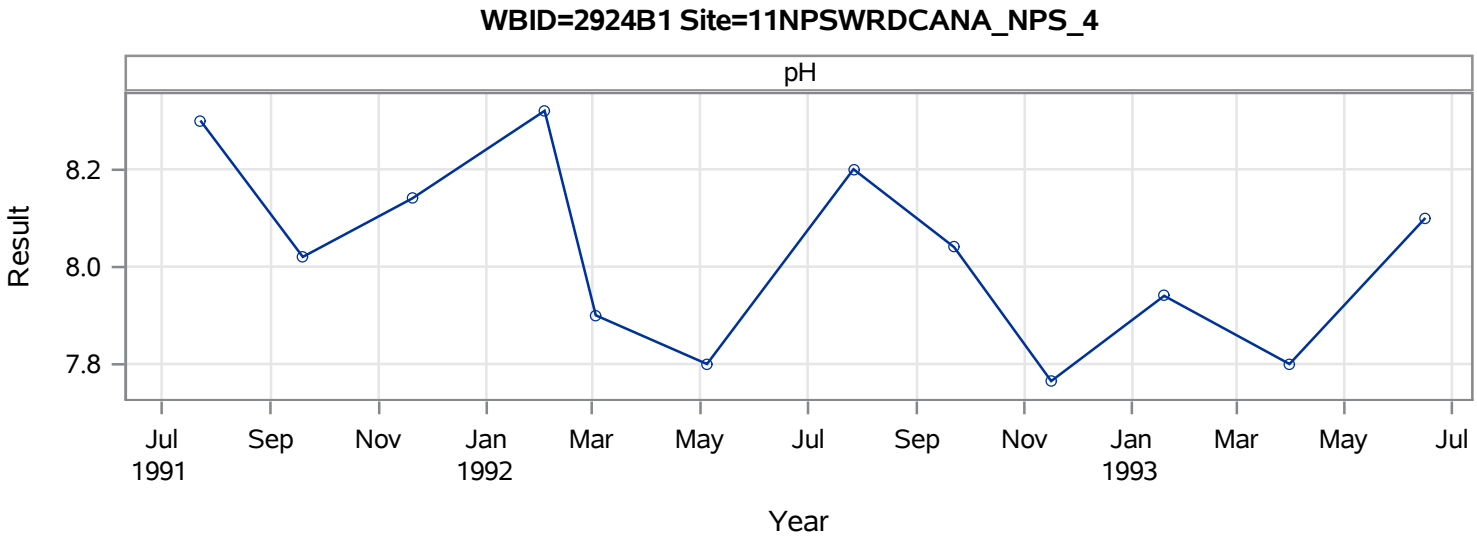

WBID=2924B1 Site=11NPSWRDCANA_NPS_3
Ammonia (mg/L)
0.150
0.125
0.100
0.075
0.050
0.025
Dissolved Oxygen (%)
200
175
150
125
100
75
50
Dissolved Oxygen (mg/L)
12
10
8
6
4
Fecal COliform (#/100ml)
50
40
30
20
10
Nitrite + Nitrate (mg/L)
0.050
0.045
0.040
0.035
0.030
0.025
0.020
Result
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

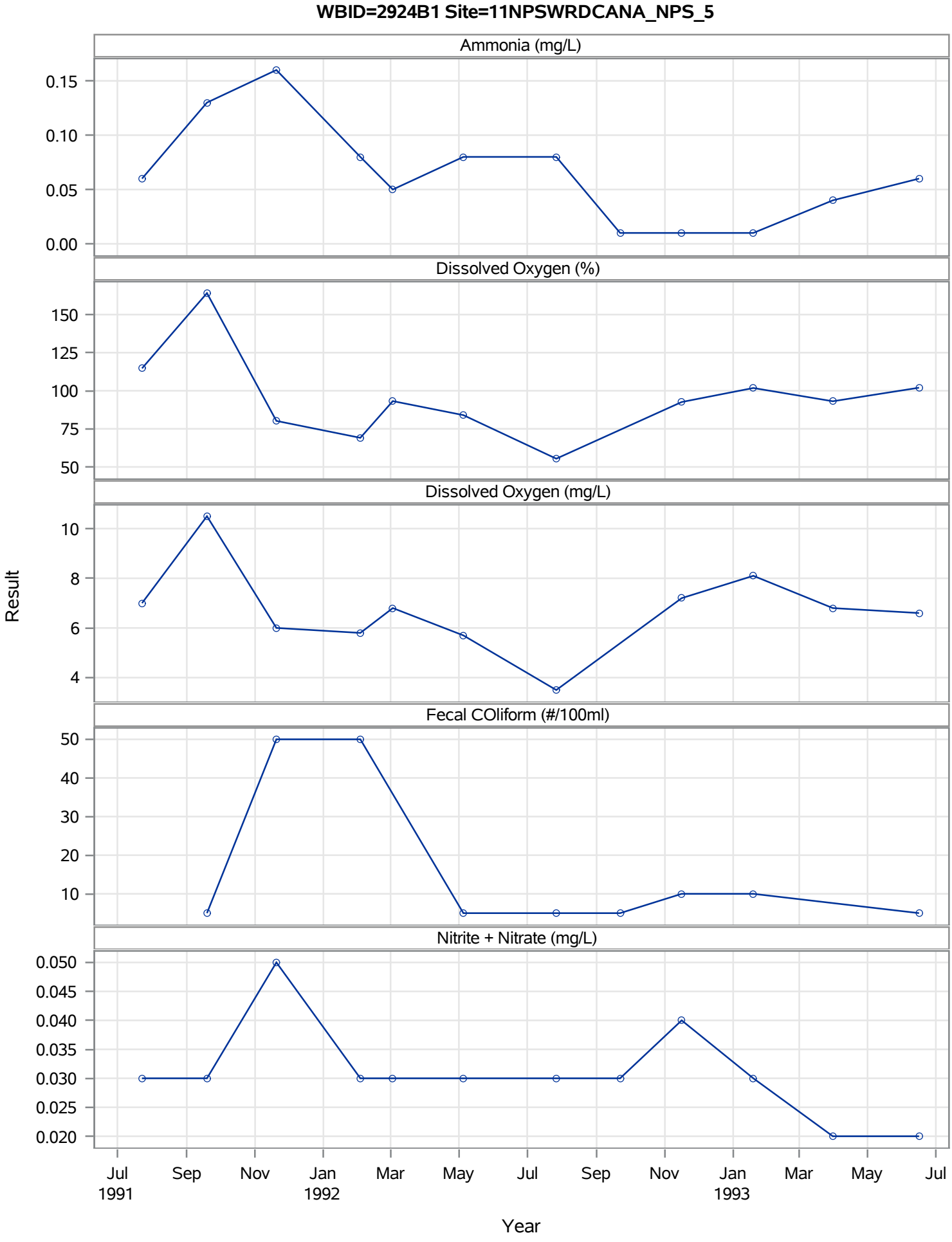

WBID=2924B1 Site=11NPSWRDCANA_NPS_3
Salinity (PSU)
34
33
32
31
30
29
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
1.25
1.00
0.75
0.50
0.25
Total Nitrogen (mg/L)
1.25
1.00
0.75
0.50
0.25
Total Phosphorus (mg/L)
0.20
0.15
0.10
0.05
0.00
Result
Jul 1991
Sep
Nov
Jan 1992
Mar
May
Jul
Sep
Nov
Jan 1993
Mar
May
Jul
Year

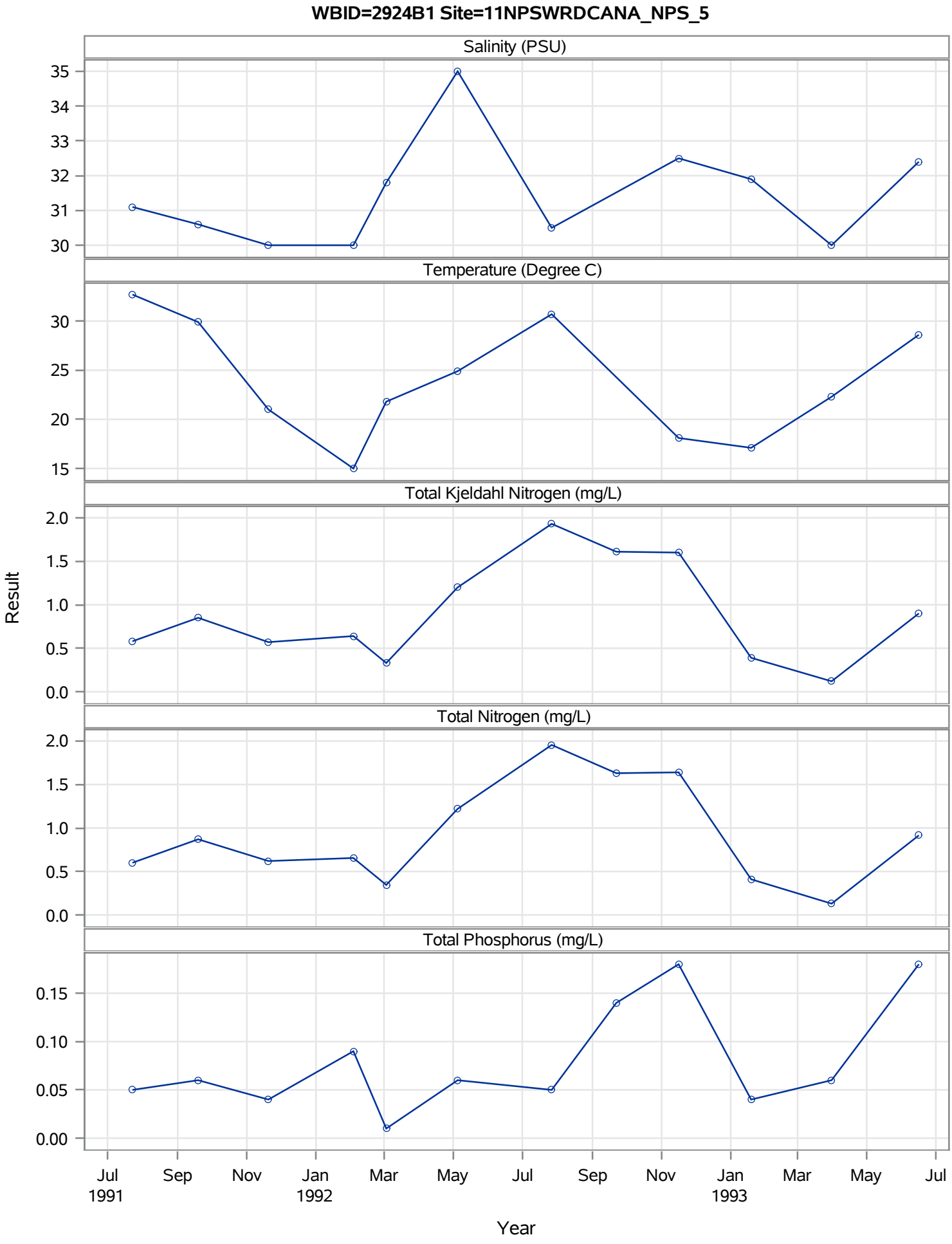

WBID=2924B1 Site=11NPSWRDCANA_NPS_3
pH
Result
8.4
8.2
8.0
7.8
7.6
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

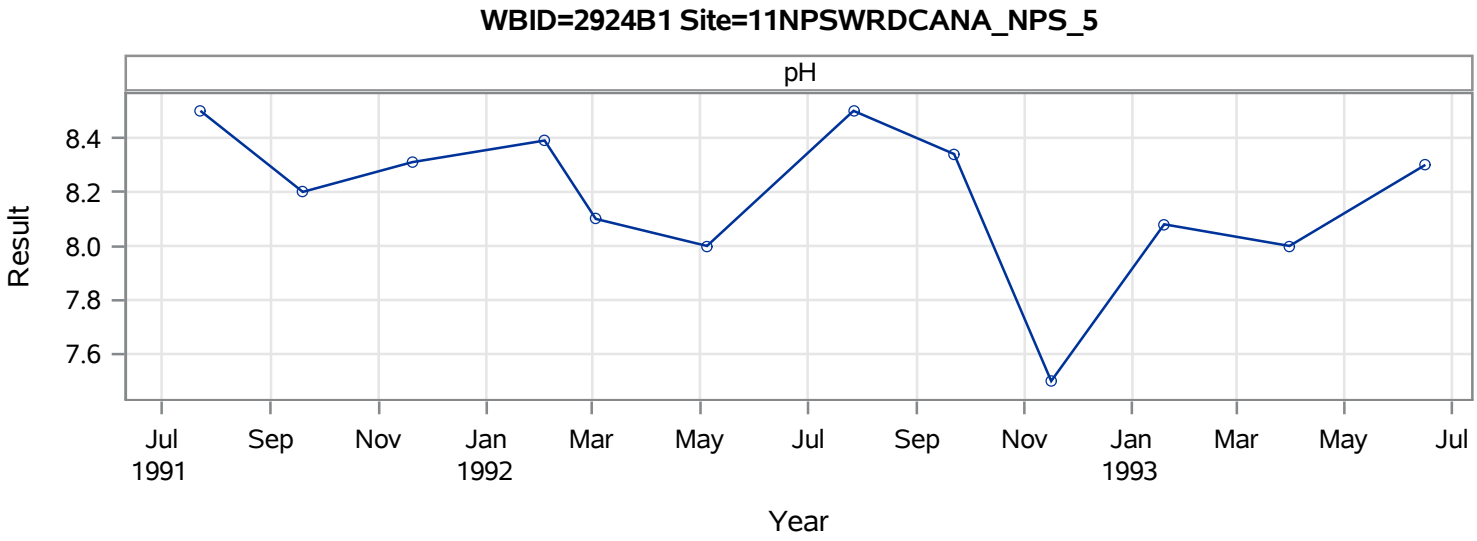

WBID=2924B1 Site=11NPSWRDCANA_NPS_4
Ammonia (mg/L)
0.4
0.3
0.2
0.1
0.0
Dissolved Oxygen (%)
100
80
60
40
Dissolved Oxygen (mg/L)
7
6
5
4
3
Fecal COliform (#/100ml)
50
40
30
20
10
Nitrite + Nitrate (mg/L)
0.20
0.15
0.10
0.05
Result
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

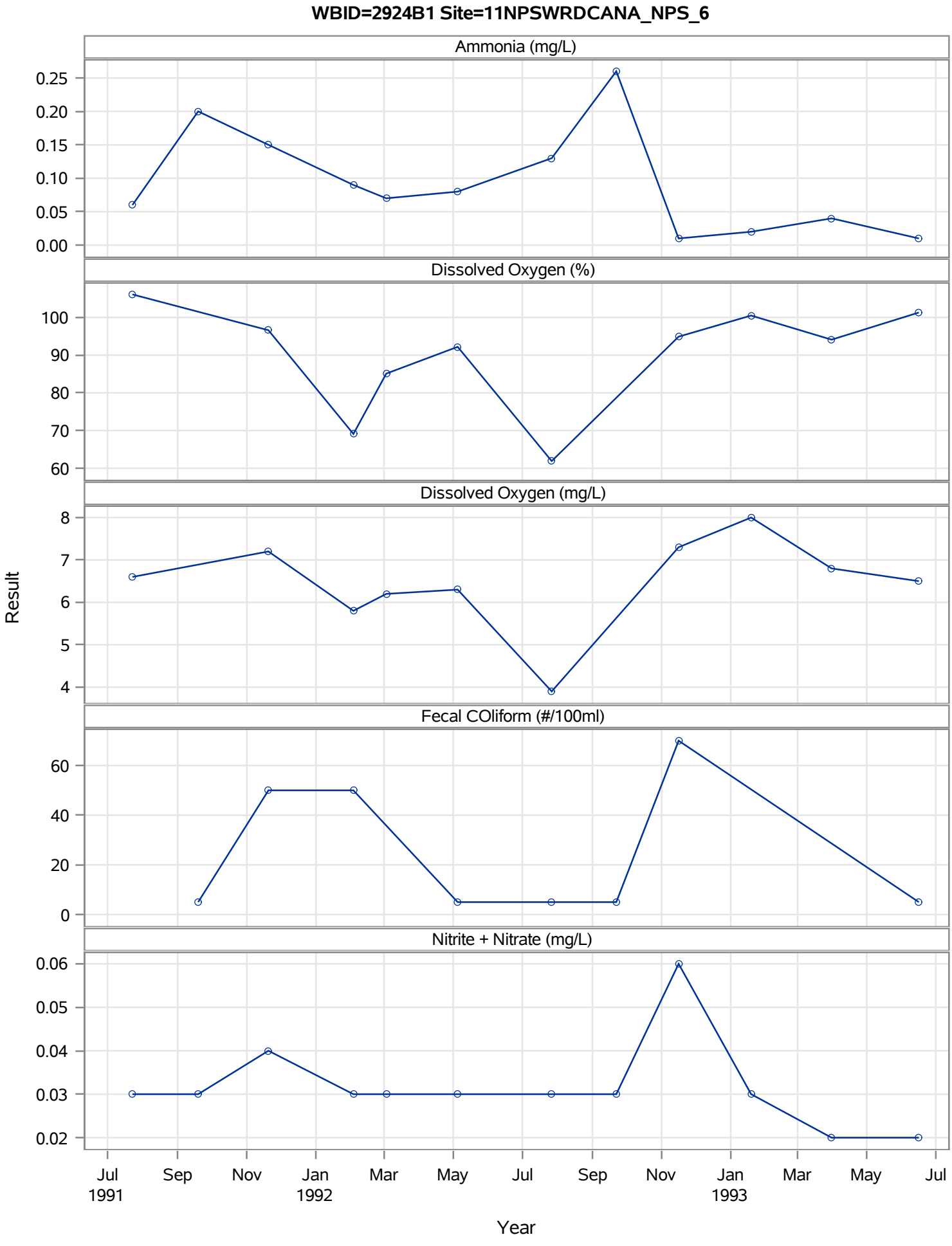

WBID=2924B1 Site=11NPSWRDCANA_NPS_4
Salinity (PSU)
35
34
33
32
31
30
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
1.5
1.0
0.5
0.0
Total Nitrogen (mg/L)
1.5
1.0
0.5
0.0
Total Phosphorus (mg/L)
0.25
0.20
0.15
0.10
0.05
Result
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

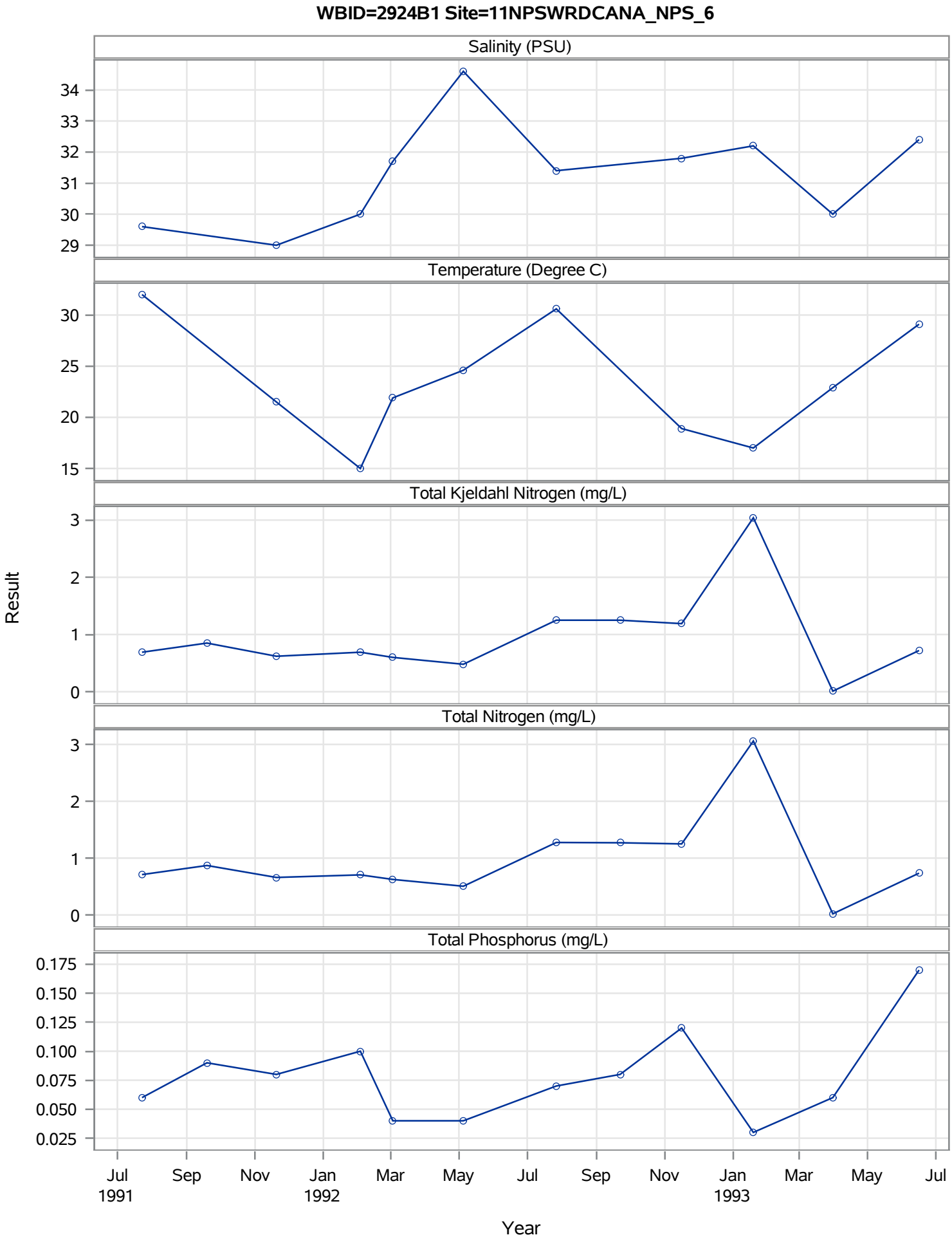

WBID=2924B1 Site=11NPSWRDCANA_NPS_4
pH
Result
8.2
8.0
7.8
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

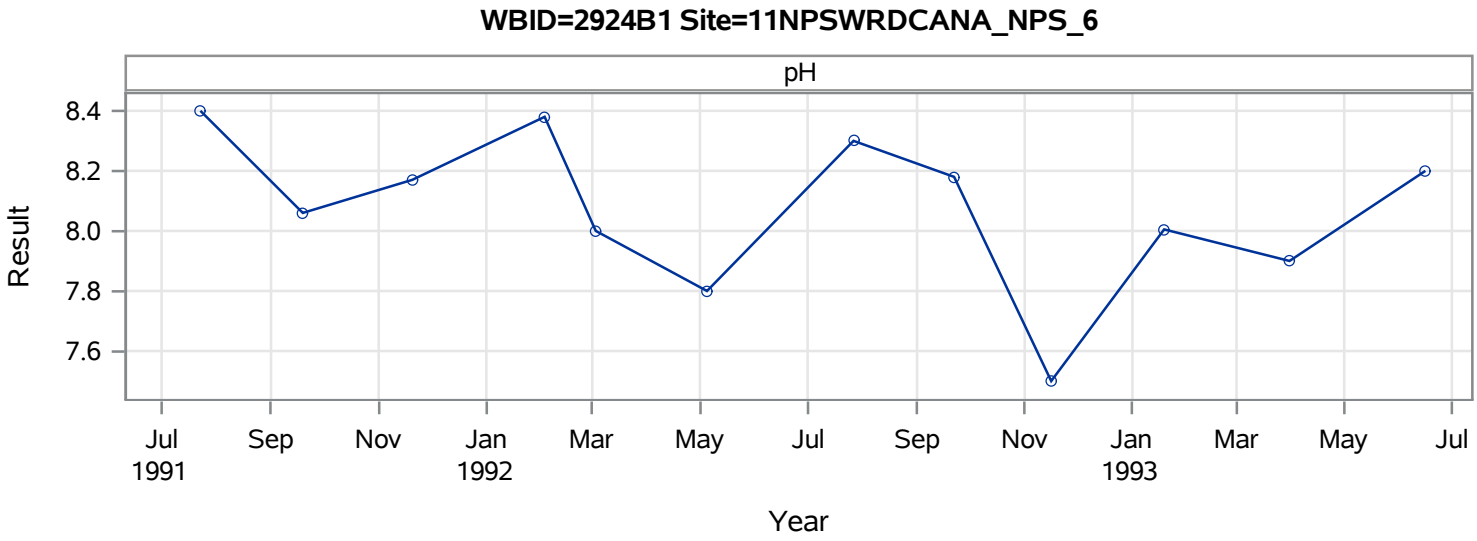

WBID=2924B1 Site=11NPSWRDCANA_NPS_5
Ammonia (mg/L)
0.15
0.10
0.05
0.00
Dissolved Oxygen (%)
150
125
100
75
50
Dissolved Oxygen (mg/L)
10
8
6
4
Fecal COliform (#/100ml)
50
40
30
20
10
Nitrite + Nitrate (mg/L)
0.050
0.045
0.040
0.035
0.030
0.025
0.020
Result
Jul 1991
Sep
Nov
Jan 1992
Mar
May
Jul
Sep
Nov
Jan 1993
Mar
May
Jul
Year

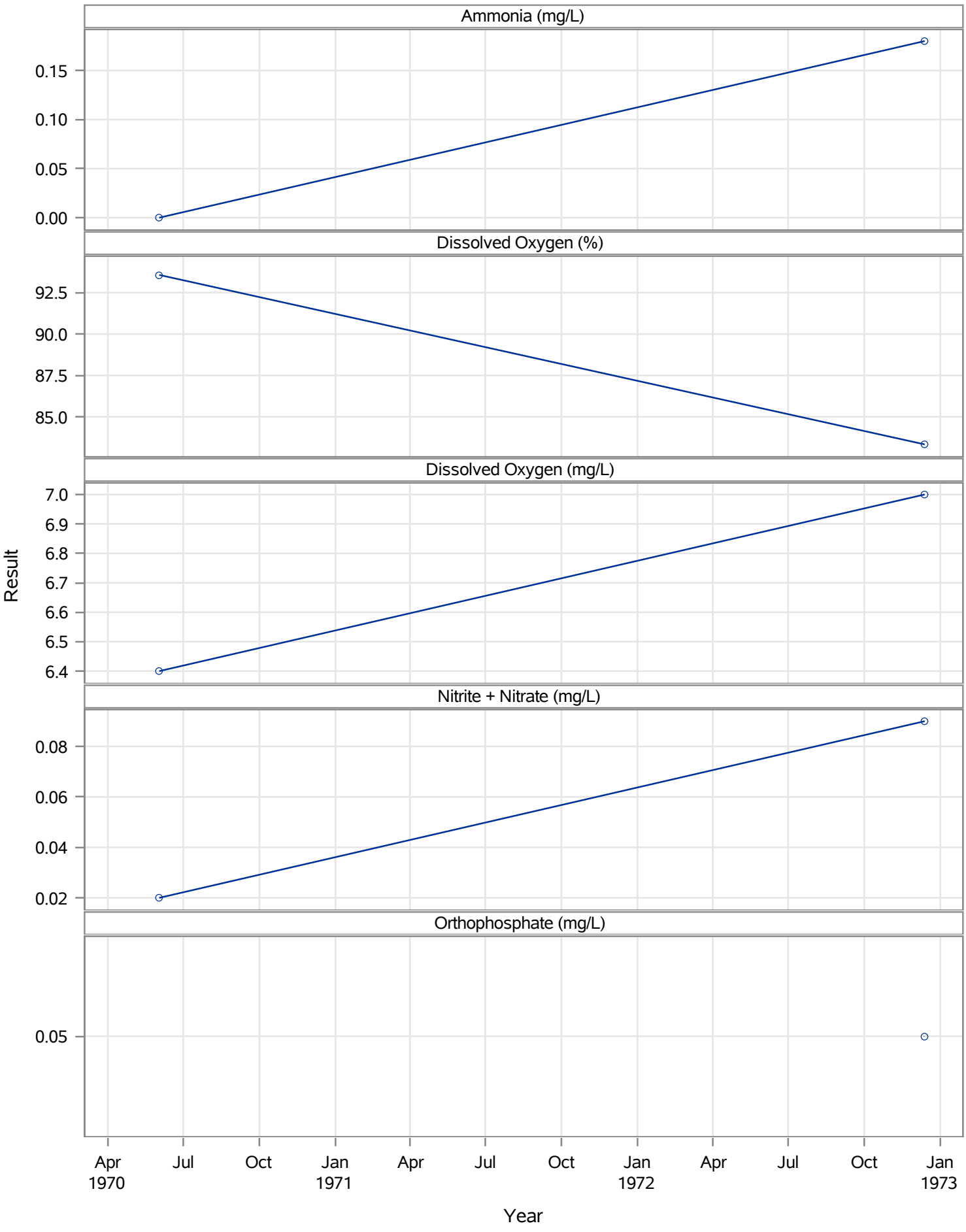

WBID=2924B1 Site=11NPSWRDCANA_NPS_5
Salinity (PSU)
35
34
33
32
31
30
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Total Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Total Phosphorus (mg/L)
0.15
0.10
0.05
0.00
Result
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

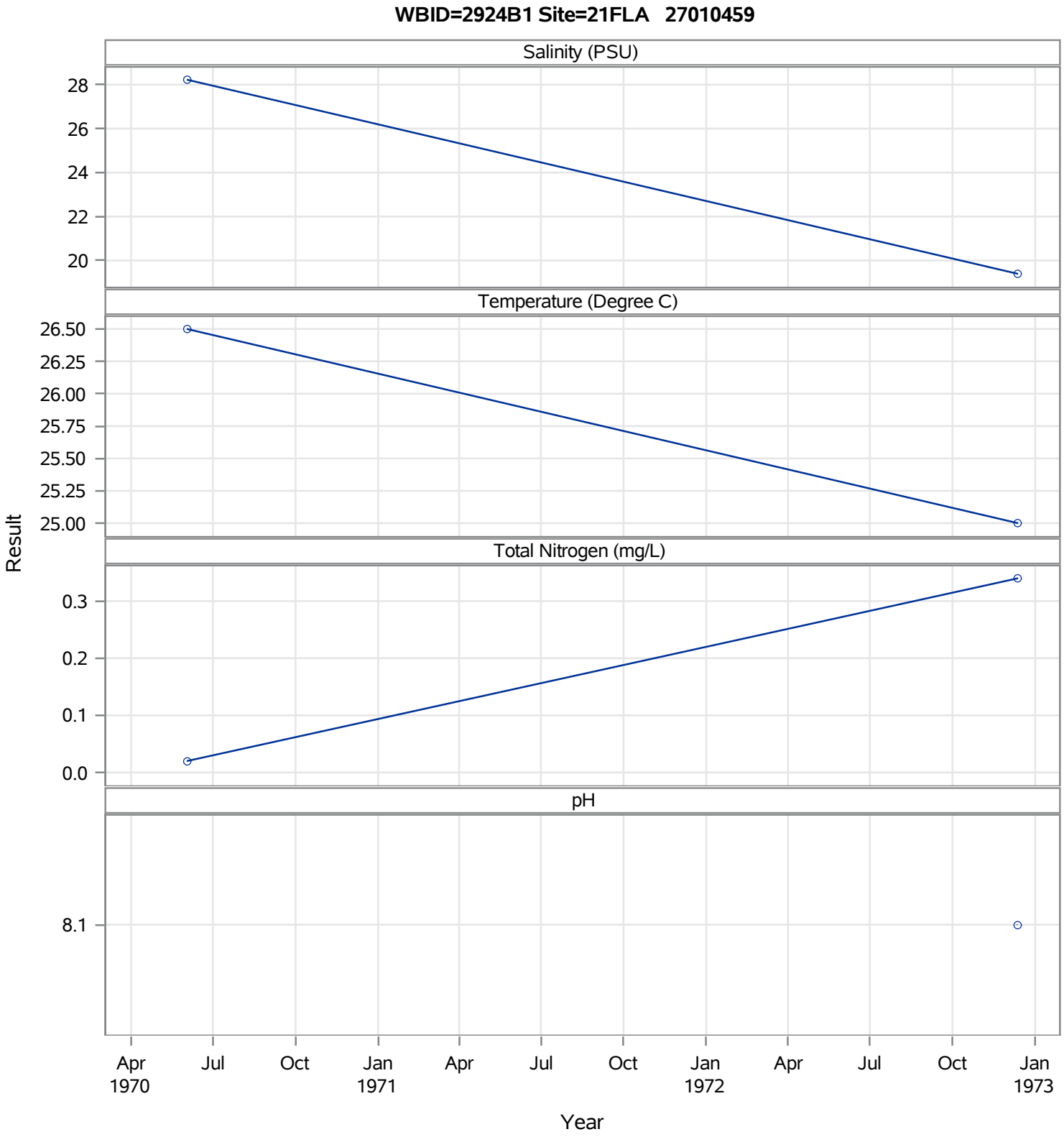

WBID=2924B1 Site=11NPSWRDCANA_NPS_5
pH
Result
8.4
8.2
8.0
7.8
7.6
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

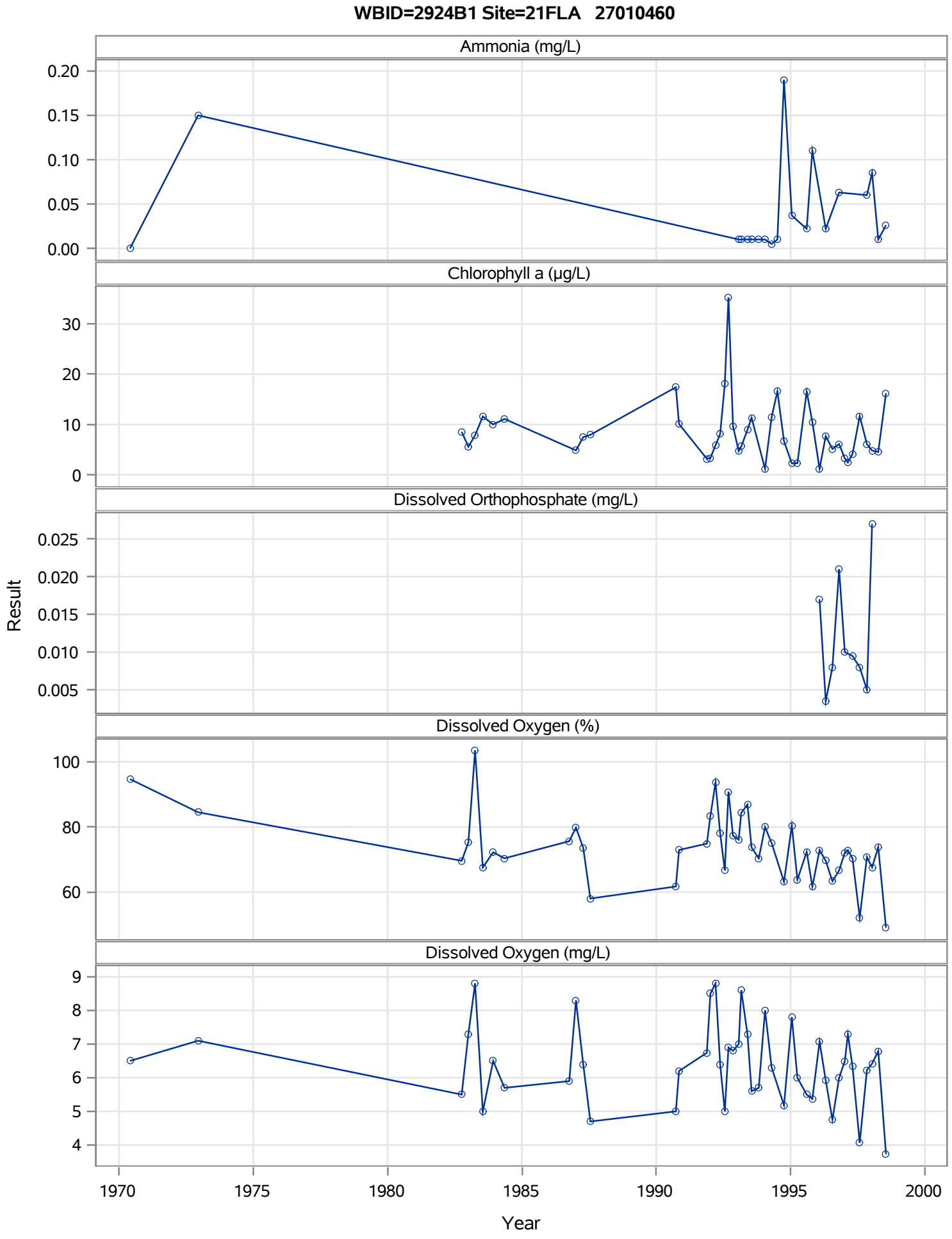

WBID=2924B1 Site=11NPSWRDCANA_NPS_6
Ammonia (mg/L)
0.25
0.20
0.15
0.10
0.05
0.00
Dissolved Oxygen (%)
100
90
80
70
60
Dissolved Oxygen (mg/L)
8
7
6
5
4
Fecal COliform (#/100ml)
60
40
20
0
Nitrite + Nitrate (mg/L)
0.06
0.05
0.04
0.03
0.02
Result
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

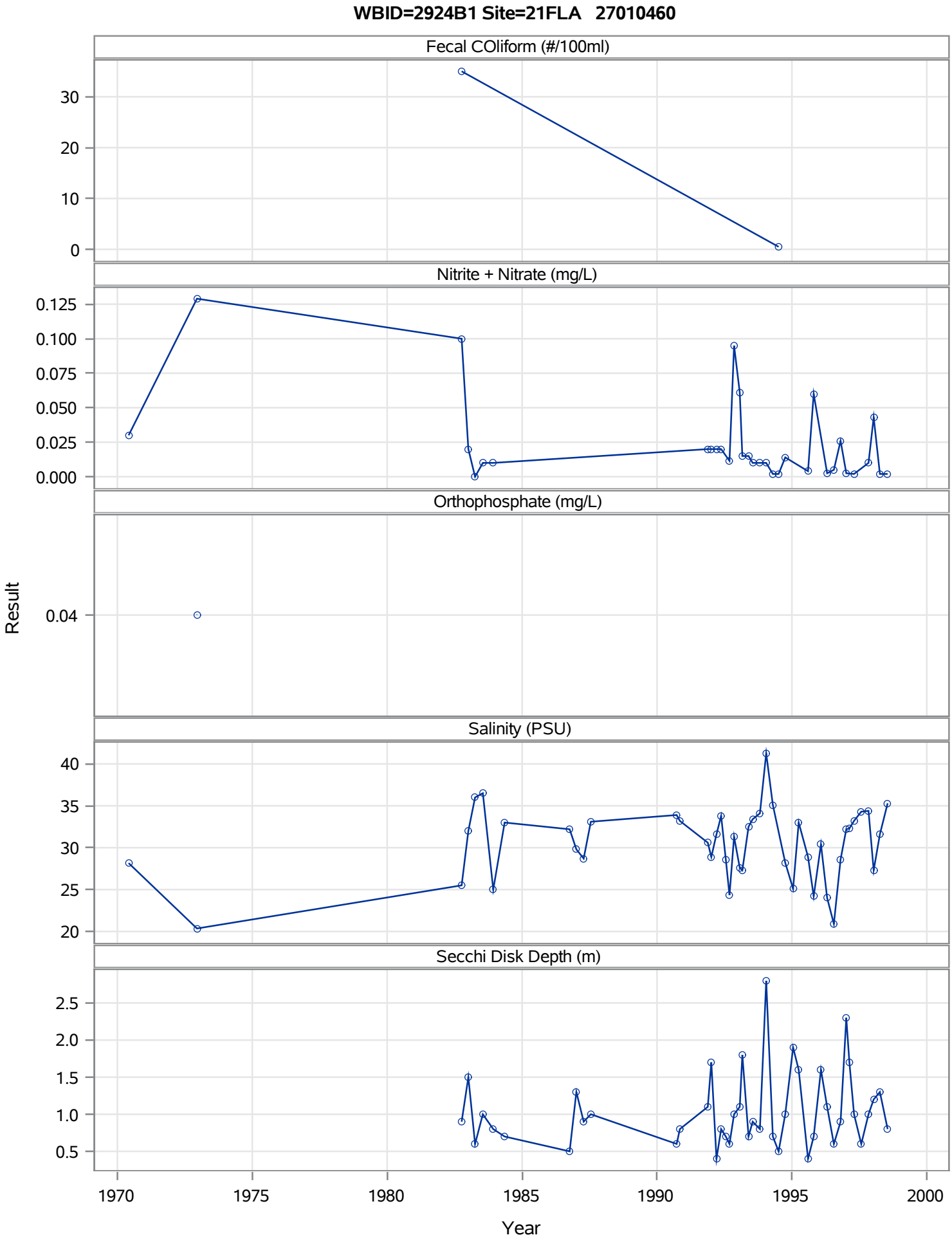

WBID=2924B1 Site=11NPSWRDCANA_NPS_6
Salinity (PSU)
34
33
32
31
30
29
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
3
2
1
0
Total Nitrogen (mg/L)
3
2
1
0
Total Phosphorus (mg/L)
0.175
0.150
0.125
0.100
0.075
0.050
0.025
Result
Jul 1991
Sep
Nov
Jan 1992
Mar
May
Jul
Sep
Nov
Jan 1993
Mar
May
Jul
Year

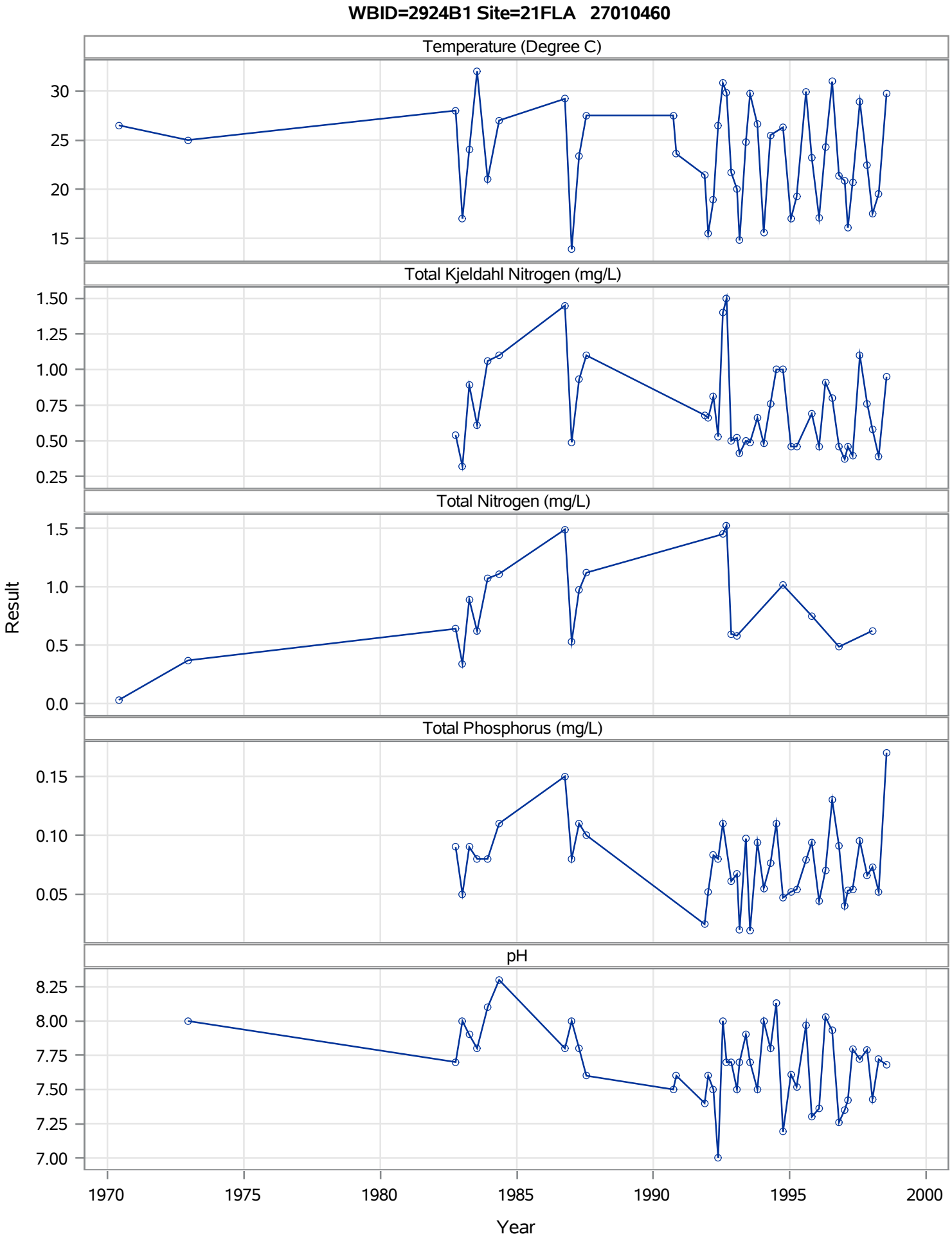

WBID=2924B1 Site=11NPSWRDCANA_NPS_6
pH
Result
8.4
8.2
8.0
7.8
7.6
Jul
1991
Sep
Nov
Jan
1992
Mar
May
Jul
Sep
Nov
Jan
1993
Mar
May
Jul
Year

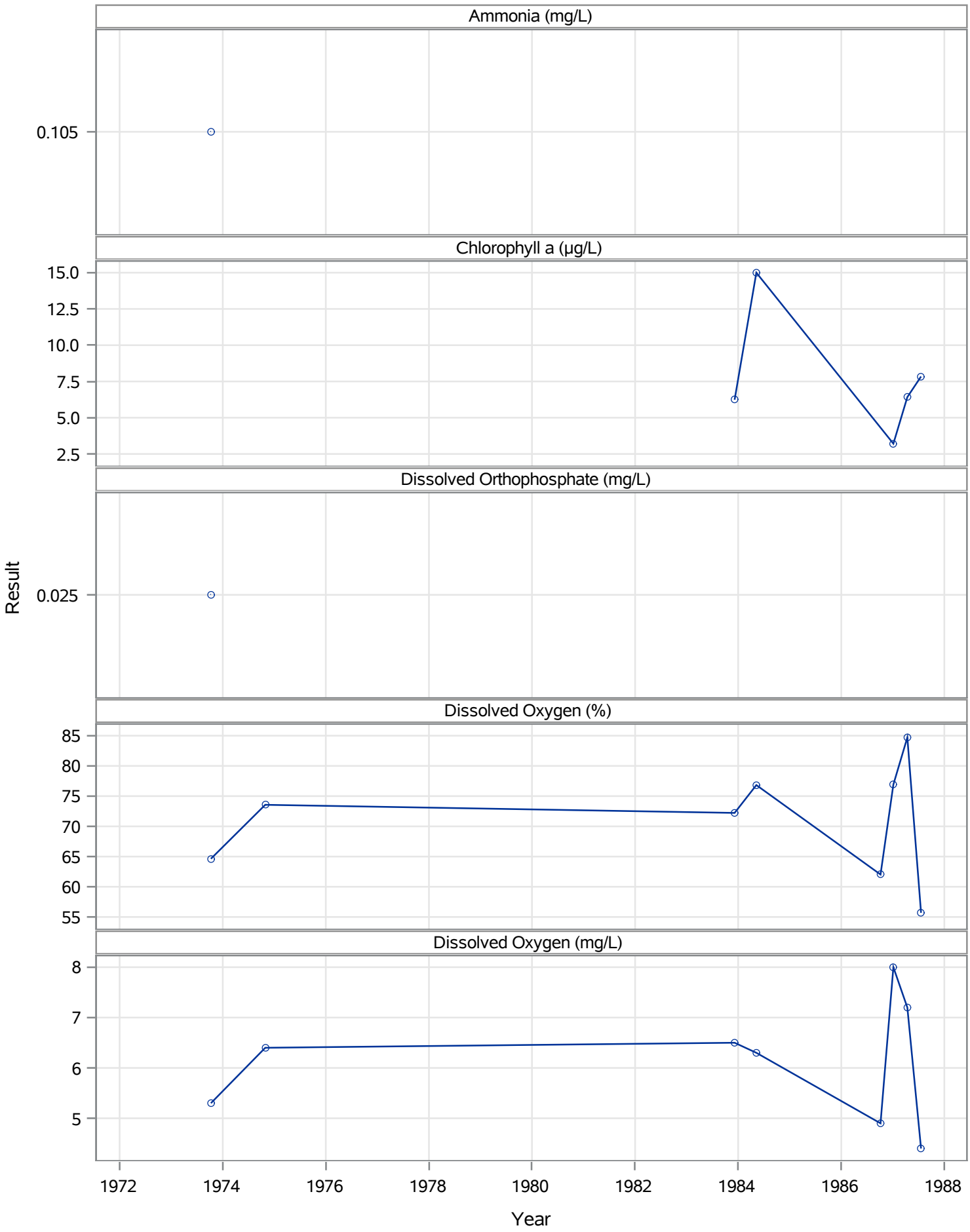

WBID=2924B1 Site=21FLA 27010459
Ammonia (mg/L)
0.15
0.10
0.05
0.00
Dissolved Oxygen (%)
92.5
90.0
87.5
85.0
Dissolved Oxygen (mg/L)
7.0
6.9
6.8
6.7
6.6
6.5
6.4
Nitrite + Nitrate (mg/L)
0.08
0.06
0.04
0.02
Orthophosphate (mg/L)
0.05
Result
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

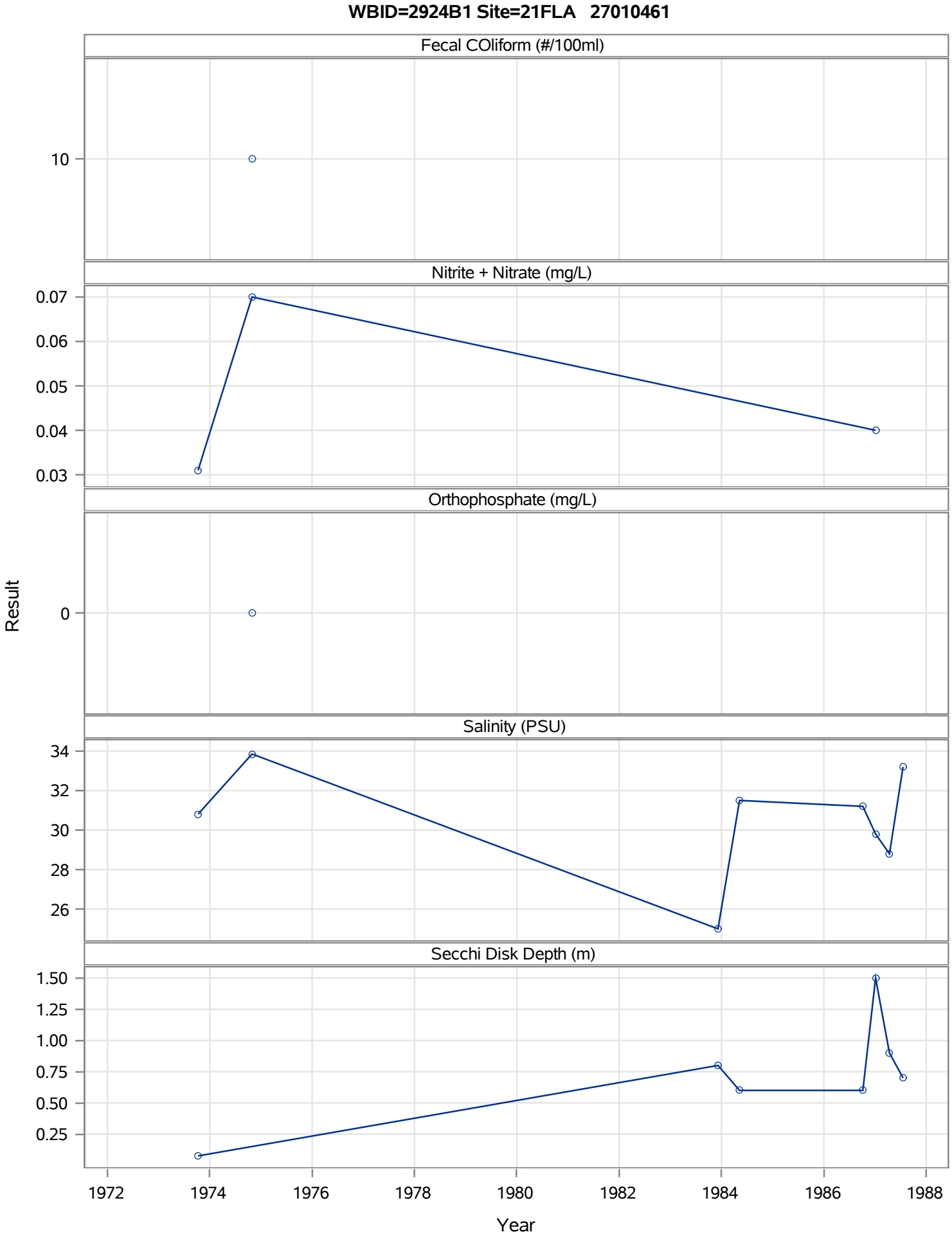

WBID=2924B1 Site=21FLA 27010459
Salinity (PSU)
28
26
24
22
20
Temperature (Degree C)
26.50
26.25
26.00
25.75
25.50
25.25
25.00
Total Nitrogen (mg/L)
0.3
0.2
0.1
0.0
pH
8.1
Result
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

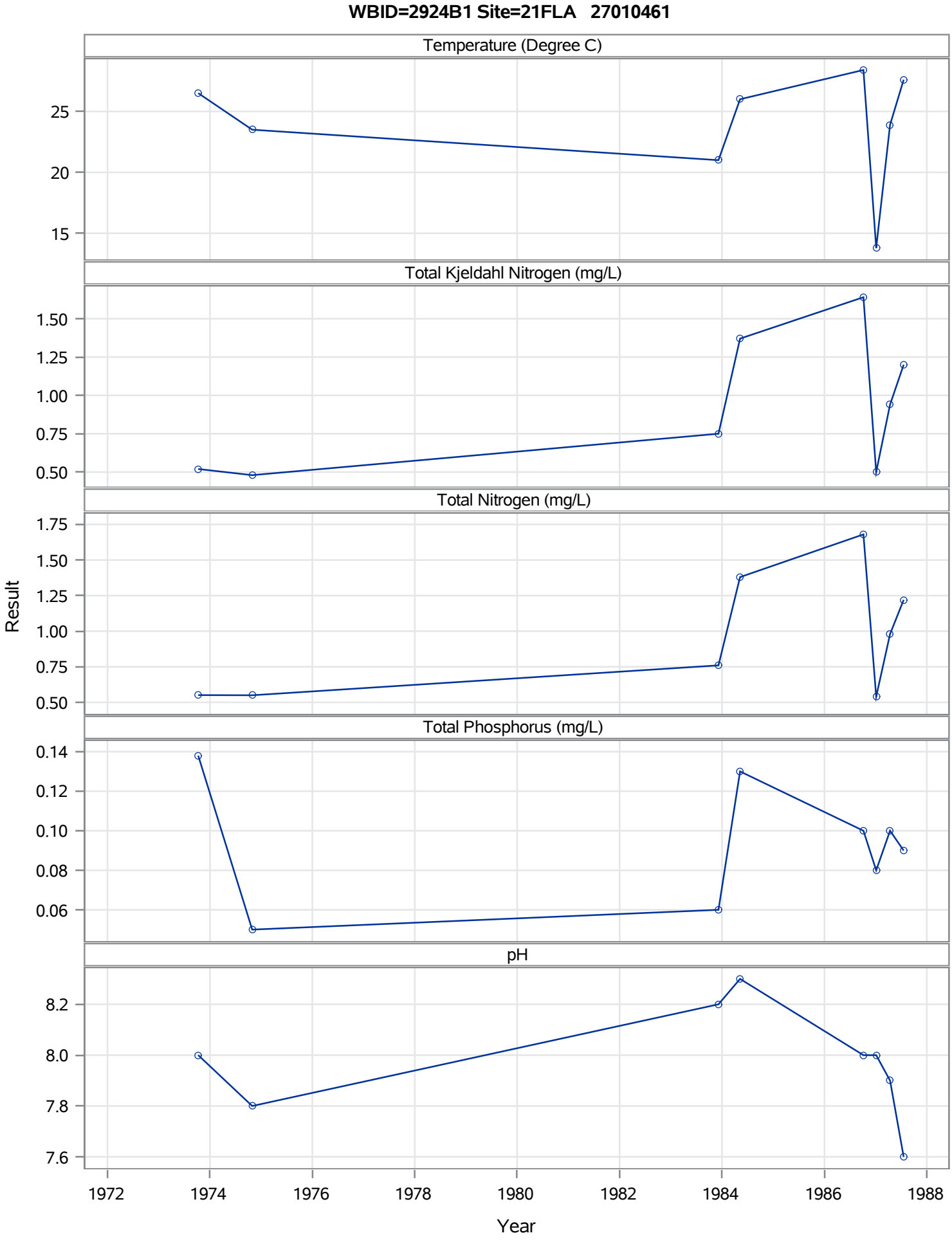

WBID=2924B1 Site=21FLA 27010460
Ammonia (mg/L)
0.20
0.15
0.10
0.05
0.00
Chlorophyll a (µg/L)
30
20
10
0
Dissolved Orthophosphate (mg/L)
0.025
0.020
0.015
0.010
0.005
Dissolved Oxygen (%)
100
80
60
Dissolved Oxygen (mg/L)
9
8
7
6
5
4
Result
1970
1975
1980
1985
1990
1995
2000
Year

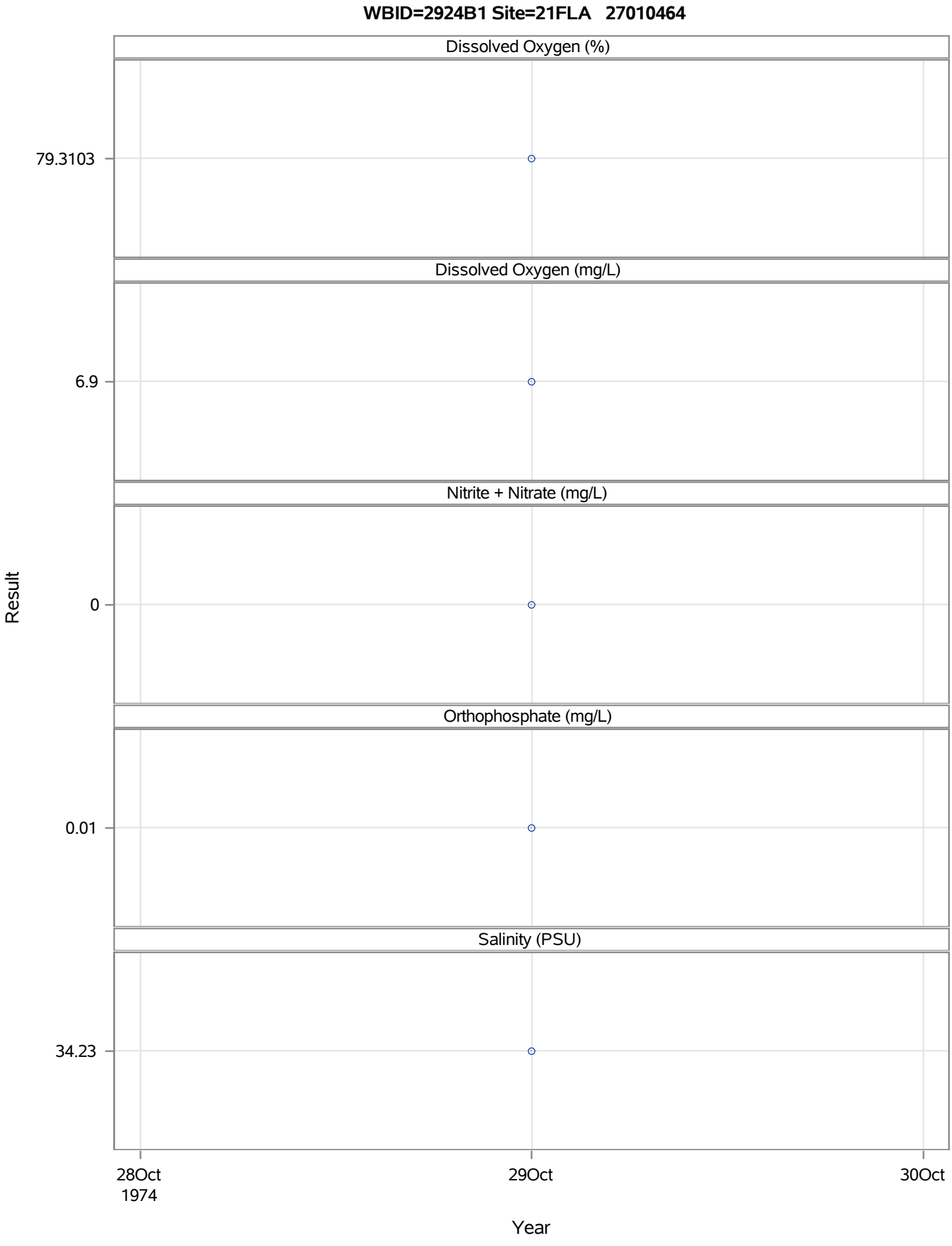

WBID=2924B1 Site=21FLA 27010460
Fecal COliform (#/100ml)
30
20
10
0
Nitrite + Nitrate (mg/L)
0.125
0.100
0.075
0.050
0.025
0.000
Orthophosphate (mg/L)
0.04
Result
Salinity (PSU)
40
35
30
25
20
Secchi Disk Depth (m)
2.5
2.0
1.5
1.0
0.5
1970
1975
1980
1985
1990
1995
2000
Year

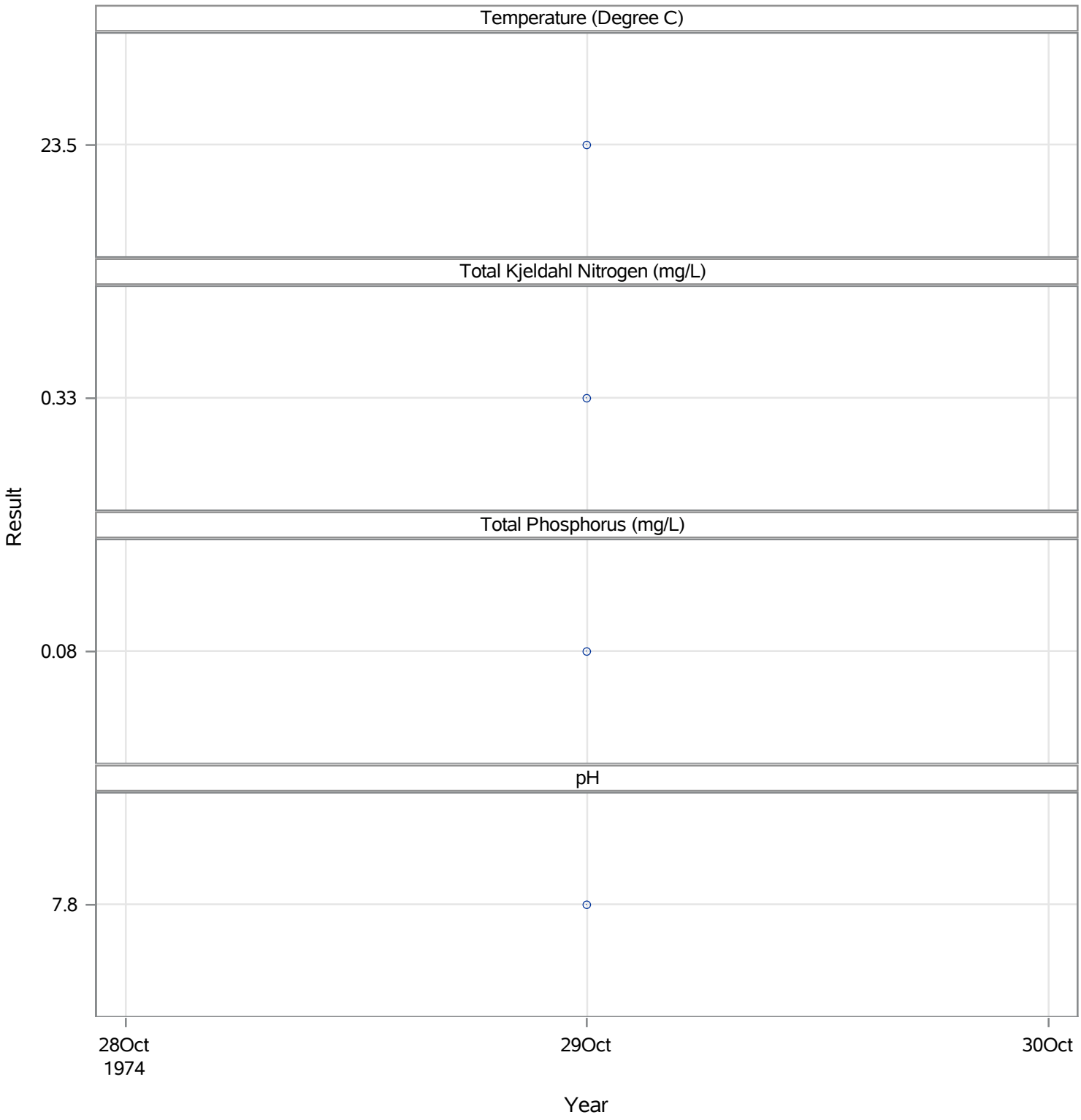

WBID=2924B1 Site=21FLA 27010460
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
1.50
1.25
1.00
0.75
0.50
0.25
Total Nitrogen (mg/L)
1.5
1.0
0.5
0.0
Result
Total Phosphorus (mg/L)
0.15
0.10
0.05
pH
8.25
8.00
7.75
7.50
7.25
7.00
1970
1975
1980
1985
1990
1995
2000
Year

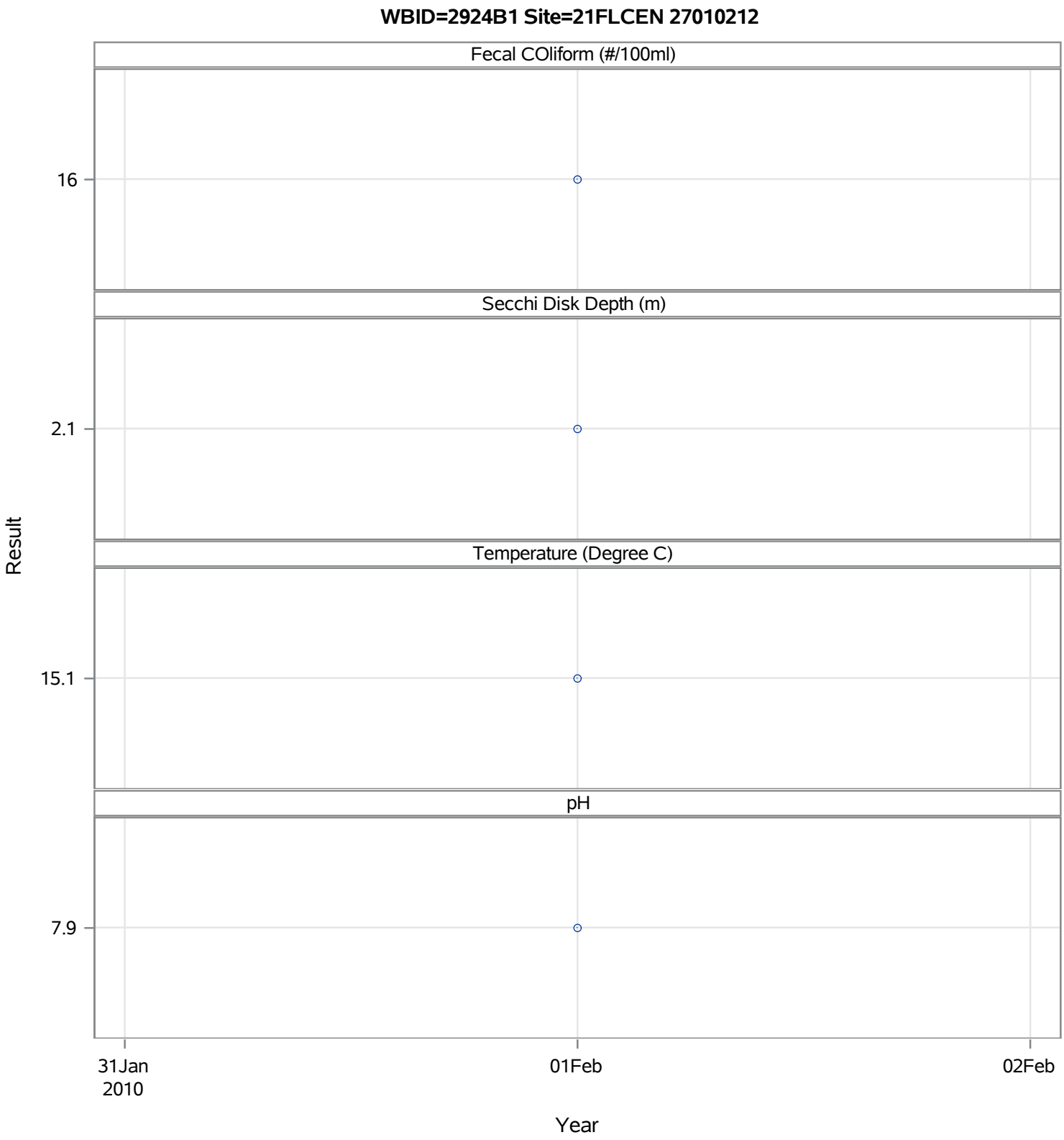

WBID=2924B1 Site=21FLA 27010461
Ammonia (mg/L)
0.105
Chlorophyll a (µg/L)
15.0
12.5
10.0
7.5
5.0
2.5
Dissolved Orthophosphate (mg/L)
0.025
Dissolved Oxygen (%)
85
80
75
70
65
60
55
Dissolved Oxygen (mg/L)
8
7
6
5
Result
1972
1974
1976
1978
1980
1982
1984
1986
1988
Year

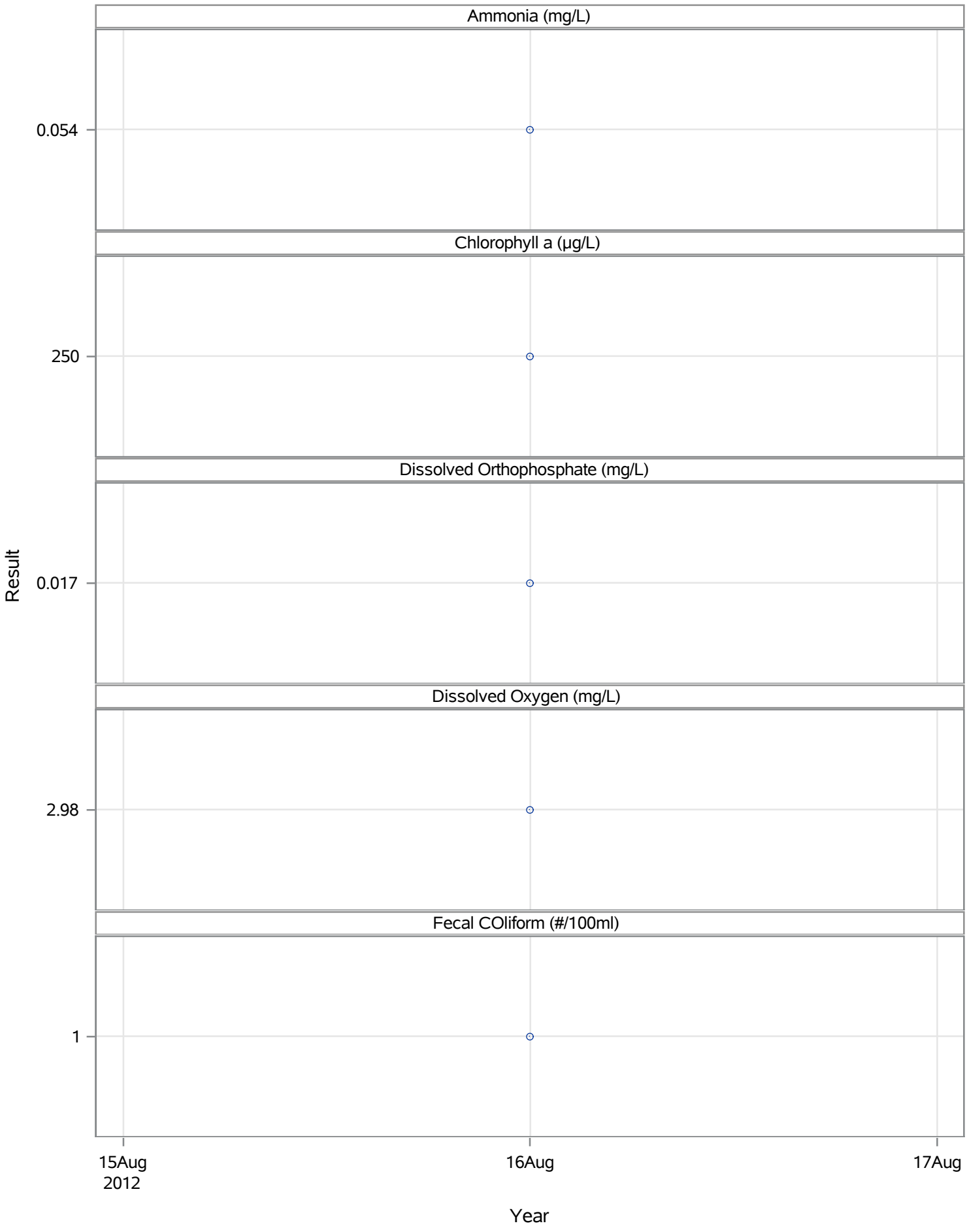

WBID=2924B1 Site=21FLA 27010461
Fecal COliform (#/100ml)
10
Nitrite + Nitrate (mg/L)
0.07
0.06
0.05
0.04
0.03
Orthophosphate (mg/L)
0
Salinity (PSU)
34
32
30
28
26
Secchi Disk Depth (m)
1.50
1.25
1.00
0.75
0.50
0.25
Result
1972
1974
1976
1978
1980
1982
1984
1986
1988
Year

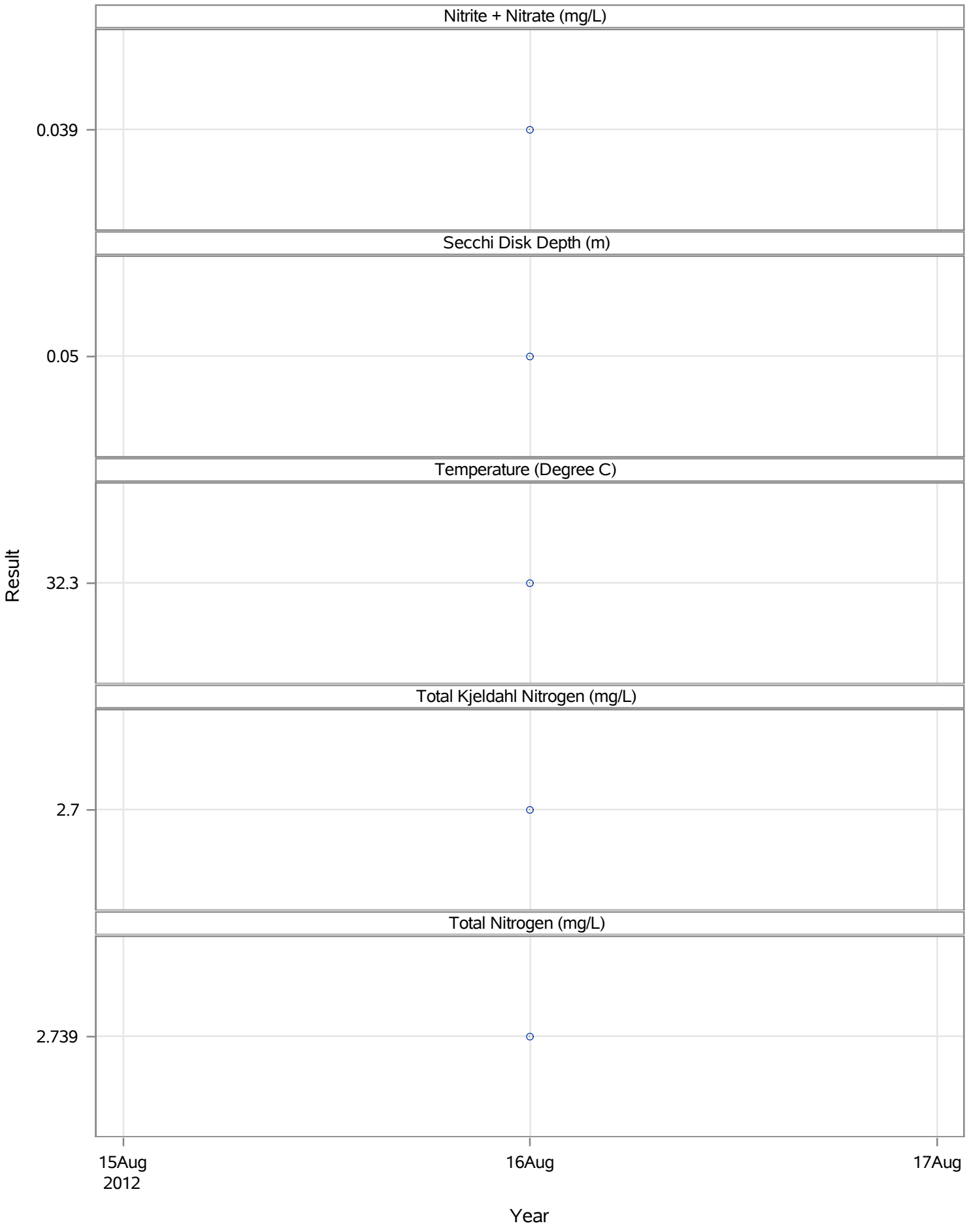

WBID=2924B1 Site=21FLA 27010461
Temperature (Degree C)
25
20
15
Total Kjeldahl Nitrogen (mg/L)
1.50
1.25
1.00
0.75
0.50
Total Nitrogen (mg/L)
1.75
1.50
1.25
1.00
0.75
0.50
Result
Total Phosphorus (mg/L)
0.14
0.12
0.10
0.08
0.06
pH
8.2
8.0
7.8
7.6
1972
1974
1976
1978
1980
1982
1984
1986
1988
Year

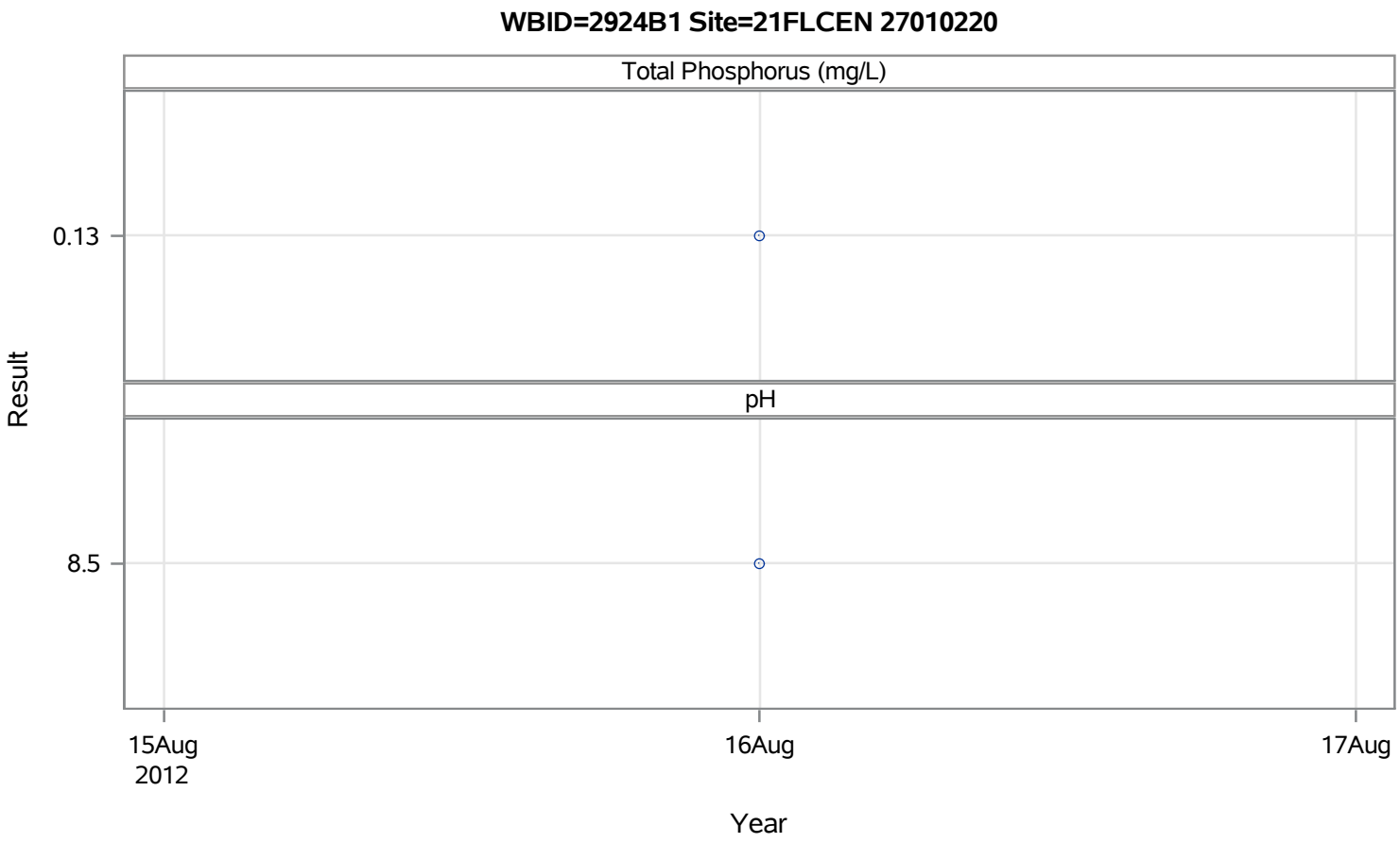

WBID=2924B1 Site=21FLA 27010464
Dissolved Oxygen (%)
79.3103
Dissolved Oxygen (mg/L)
6.9
Nitrite + Nitrate (mg/L)
0
Orthophosphate (mg/L)
0.01
Salinity (PSU)
34.23
Result
28Oct
1974
29Oct
30Oct
Year

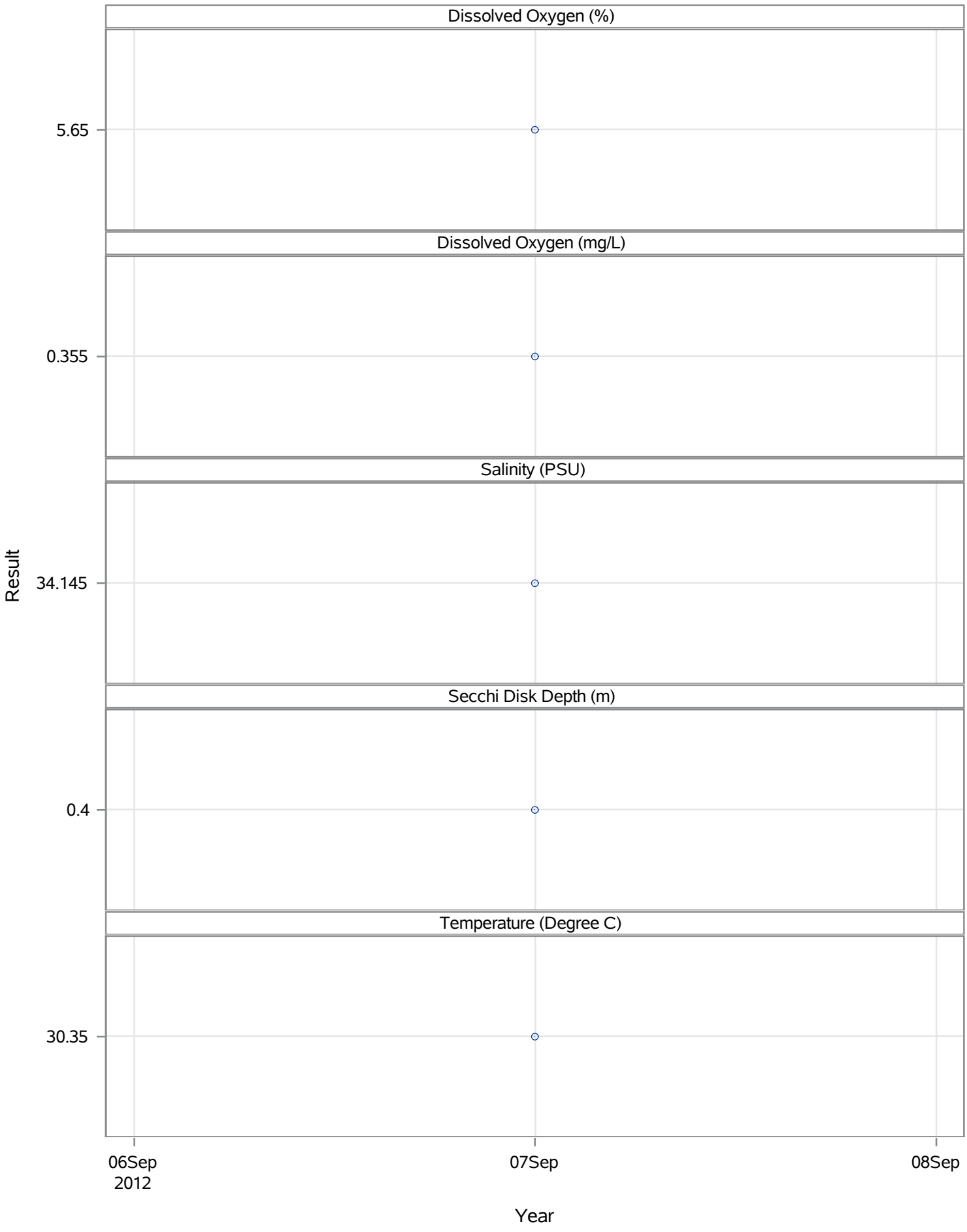

WBID=2924B1 Site=21FLA 27010464
Temperature (Degree C)
23.5
Total Kjeldahl Nitrogen (mg/L)
0.33
Total Phosphorus (mg/L)
0.08
pH
7.8
Result
28Oct
1974
29Oct
30Oct
Year

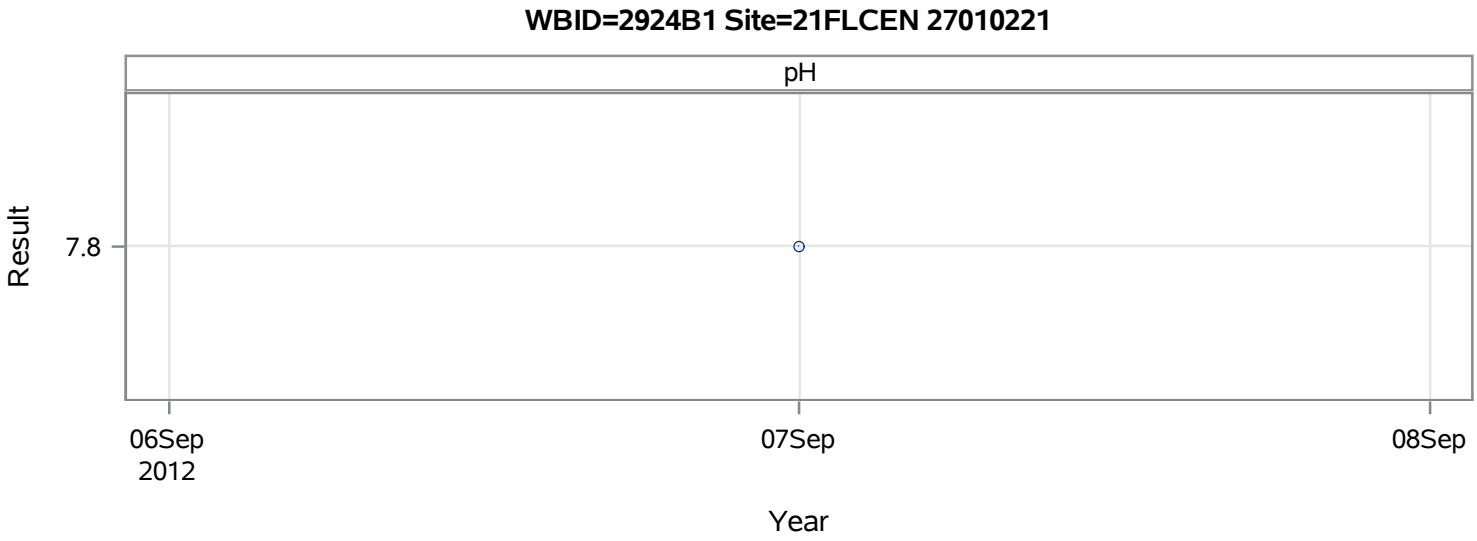

WBID=2924B1 Site=21FLCEN 27010212
Fecal COliform (#/100ml)
16
Secchi Disk Depth (m)
2.1
Temperature (Degree C)
15.1
pH
7.9
Result
31Jan
2010
01Feb
02Feb
Year

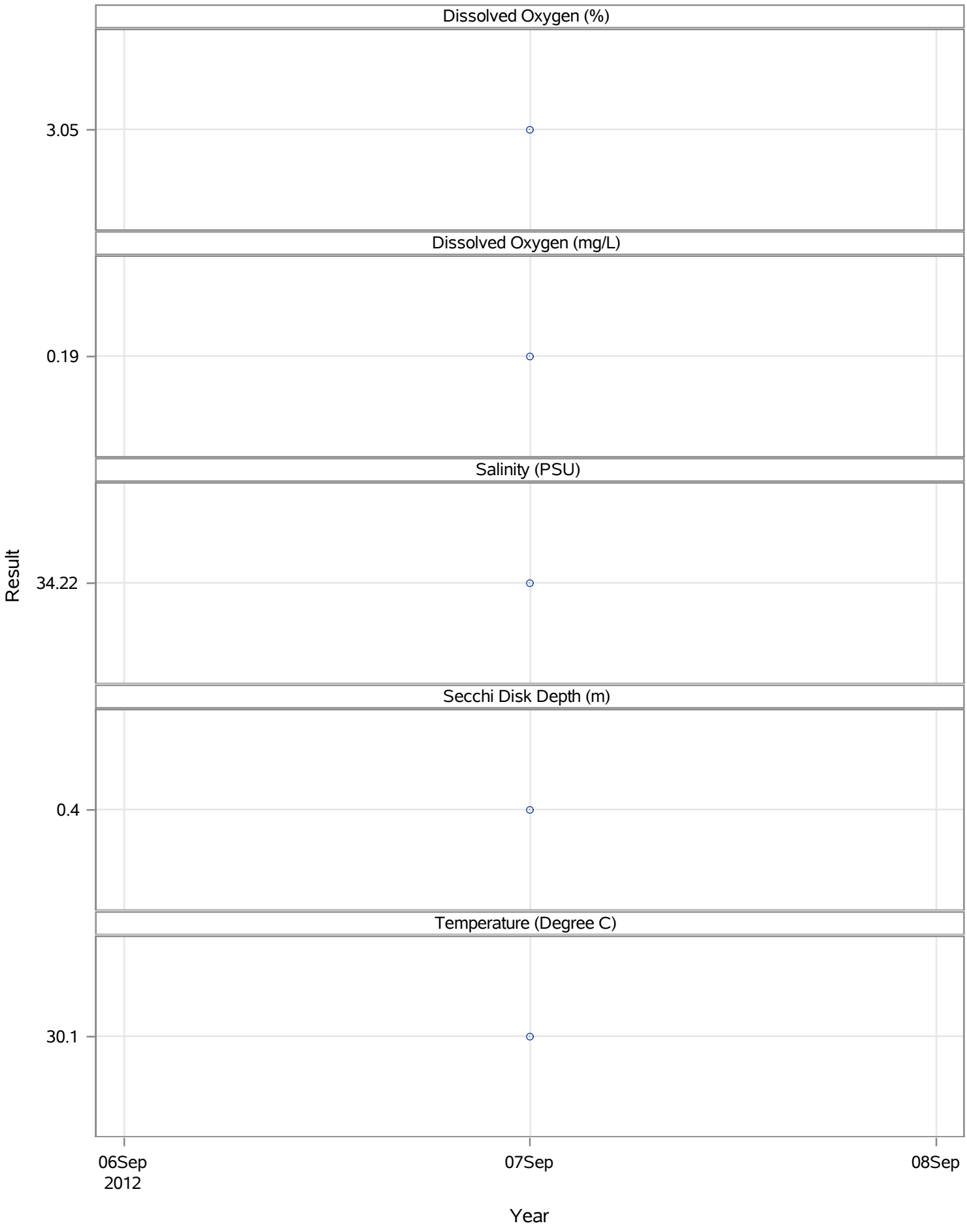

WBID=2924B1 Site=21FLCEN 27010220
Ammonia (mg/L)
0.054
Chlorophyll a (µg/L)
250
Dissolved Orthophosphate (mg/L)
0.017
Dissolved Oxygen (mg/L)
2.98
Fecal COliform (#/100ml)
1
Result
15Aug
2012
16Aug
17Aug
Year

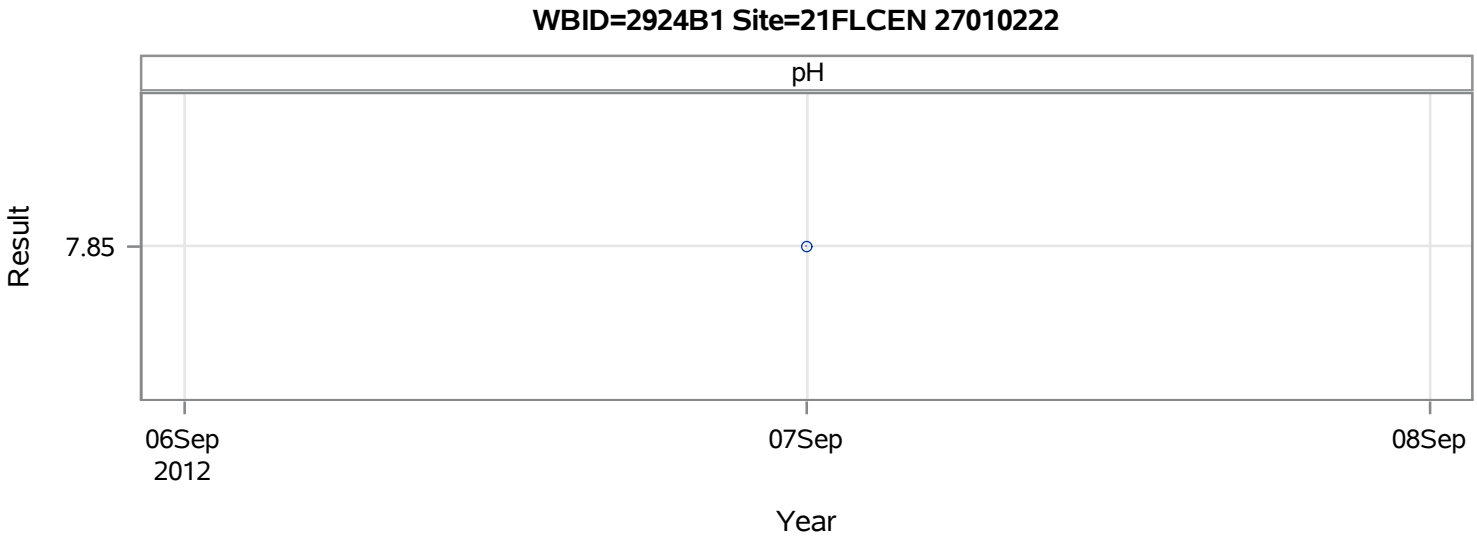

WBID=2924B1 Site=21FLCEN 27010220
Nitrite + Nitrate (mg/L)
0.039
Secchi Disk Depth (m)
0.05
Temperature (Degree C)
32.3
Total Kjeldahl Nitrogen (mg/L)
2.7
Total Nitrogen (mg/L)
2.739
Result
15Aug
2012
16Aug
17Aug
Year

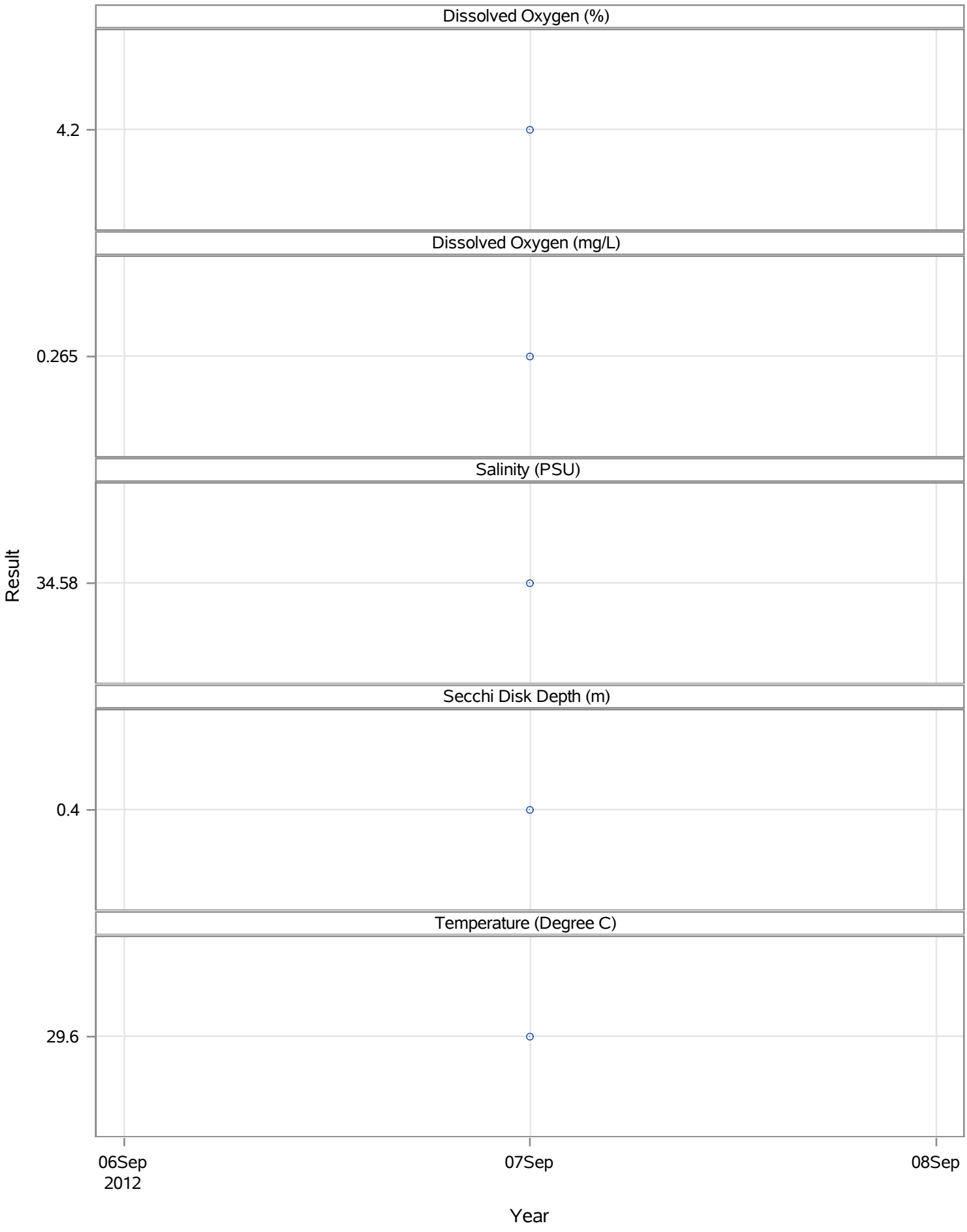

WBID=2924B1 Site=21FLCEN 27010220
Total Phosphorus (mg/L)
0.13
pH
8.5
Result
15Aug
2012
16Aug
17Aug
Year

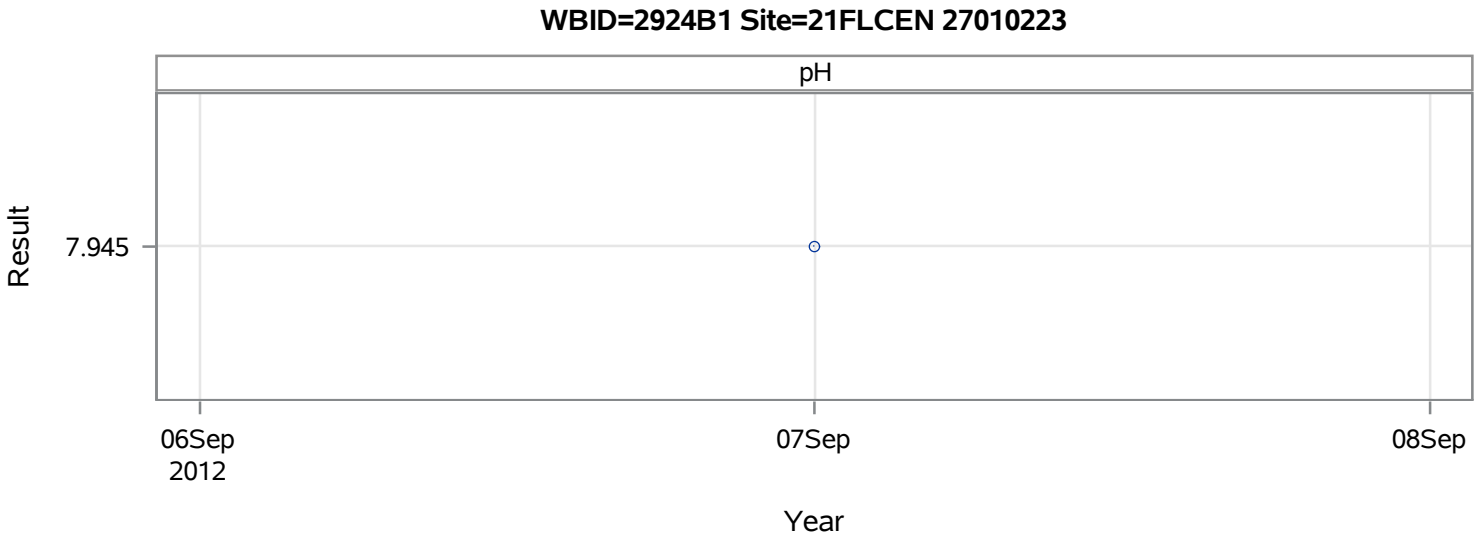

WBID=2924B1 Site=21FLCEN 27010221
Dissolved Oxygen (%)
5.65
Dissolved Oxygen (mg/L)
0.355
Salinity (PSU)
34.145
Secchi Disk Depth (m)
0.4
Temperature (Degree C)
30.35
Result
06Sep
2012
07Sep
08Sep
Year

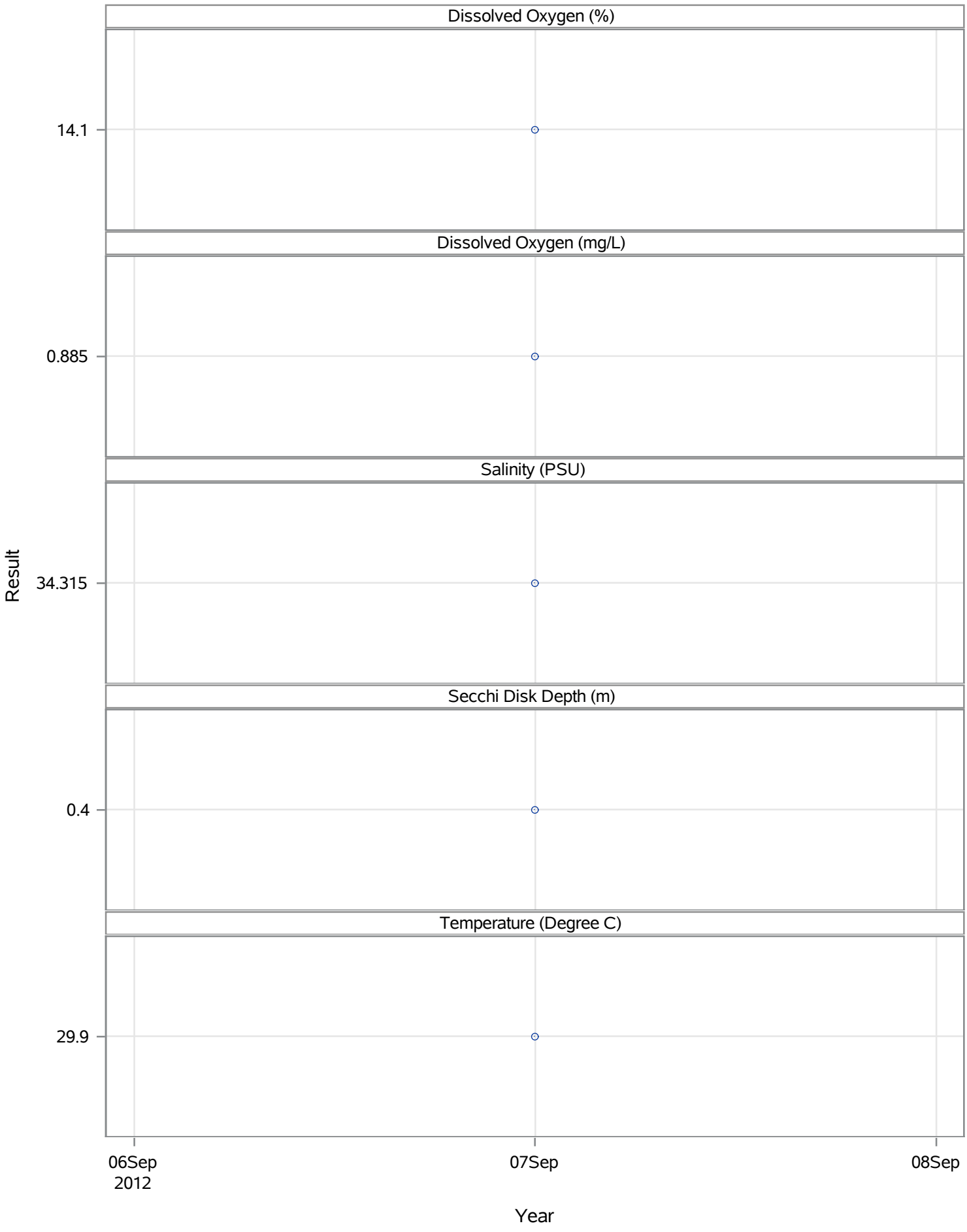

WBID=2924B1 Site=21FLCEN 27010221
pH
Result
7.8
06Sep
2012
07Sep
08Sep
Year

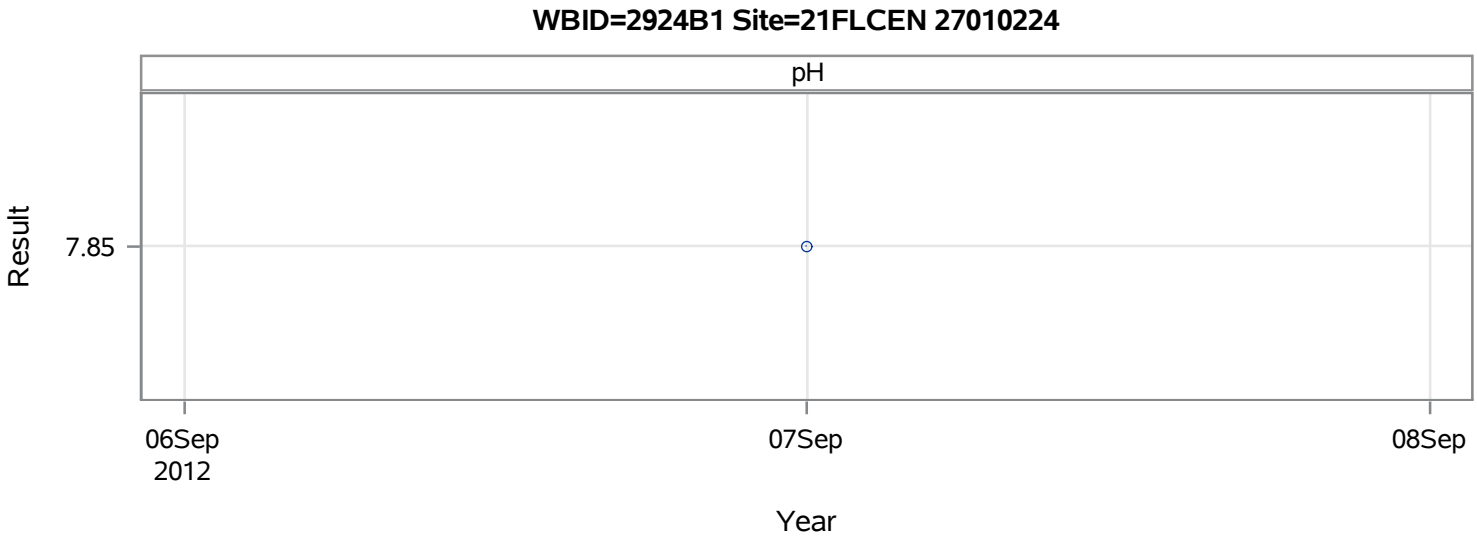

WBID=2924B1 Site=21FLCEN 27010222
Dissolved Oxygen (%)
3.05
Dissolved Oxygen (mg/L)
0.19
Salinity (PSU)
34.22
Secchi Disk Depth (m)
0.4
Temperature (Degree C)
30.1
Result
06Sep
2012
07Sep
08Sep
Year

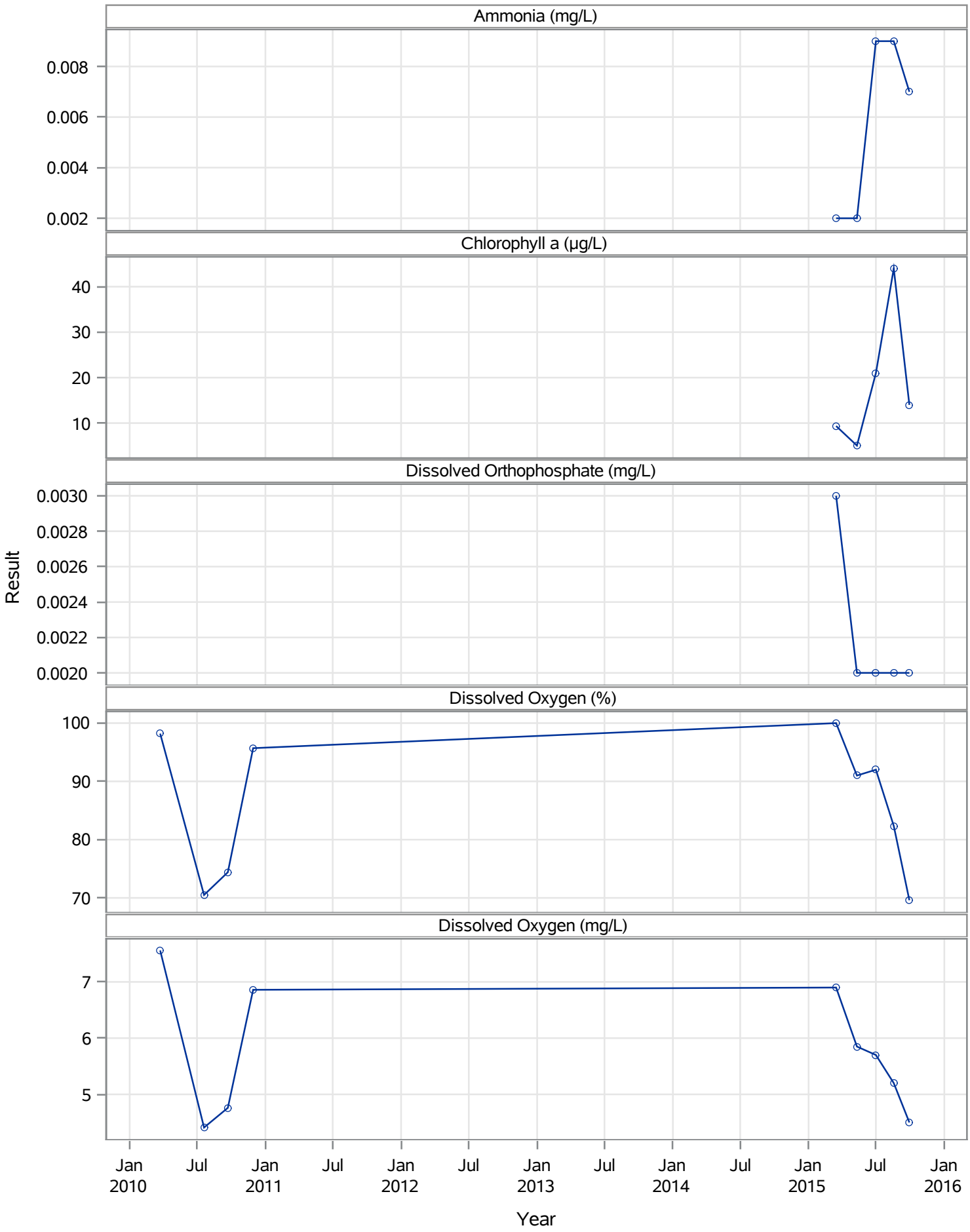

WBID=2924B1 Site=21FLCEN 27010222
pH
Result
7.85
06Sep
2012
07Sep
08Sep
Year

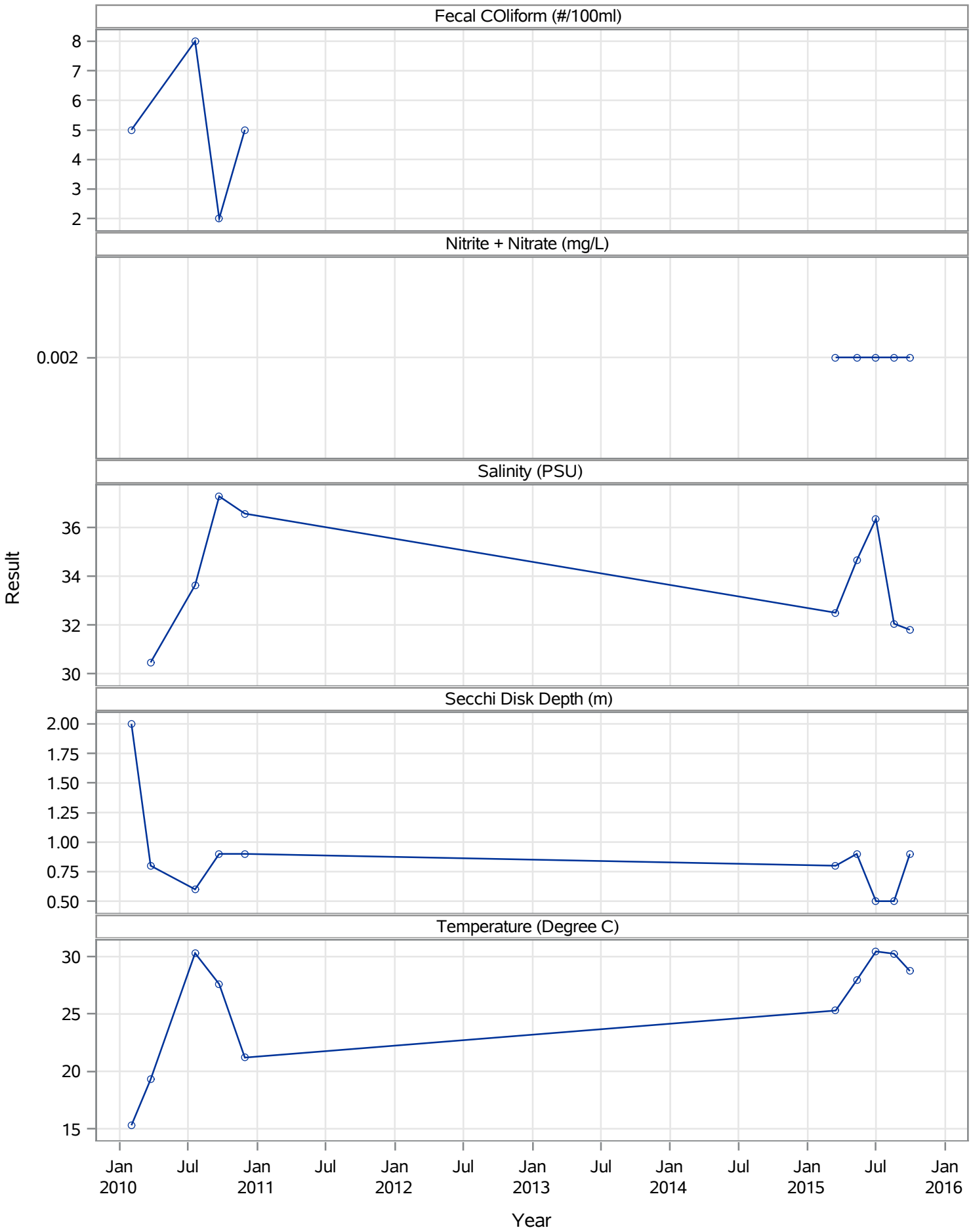

WBID=2924B1 Site=21FLCEN 27010223
Dissolved Oxygen (%)
4.2
Dissolved Oxygen (mg/L)
0.265
Salinity (PSU)
34.58
Secchi Disk Depth (m)
0.4
Temperature (Degree C)
29.6
Result
06Sep
2012
07Sep
08Sep
Year

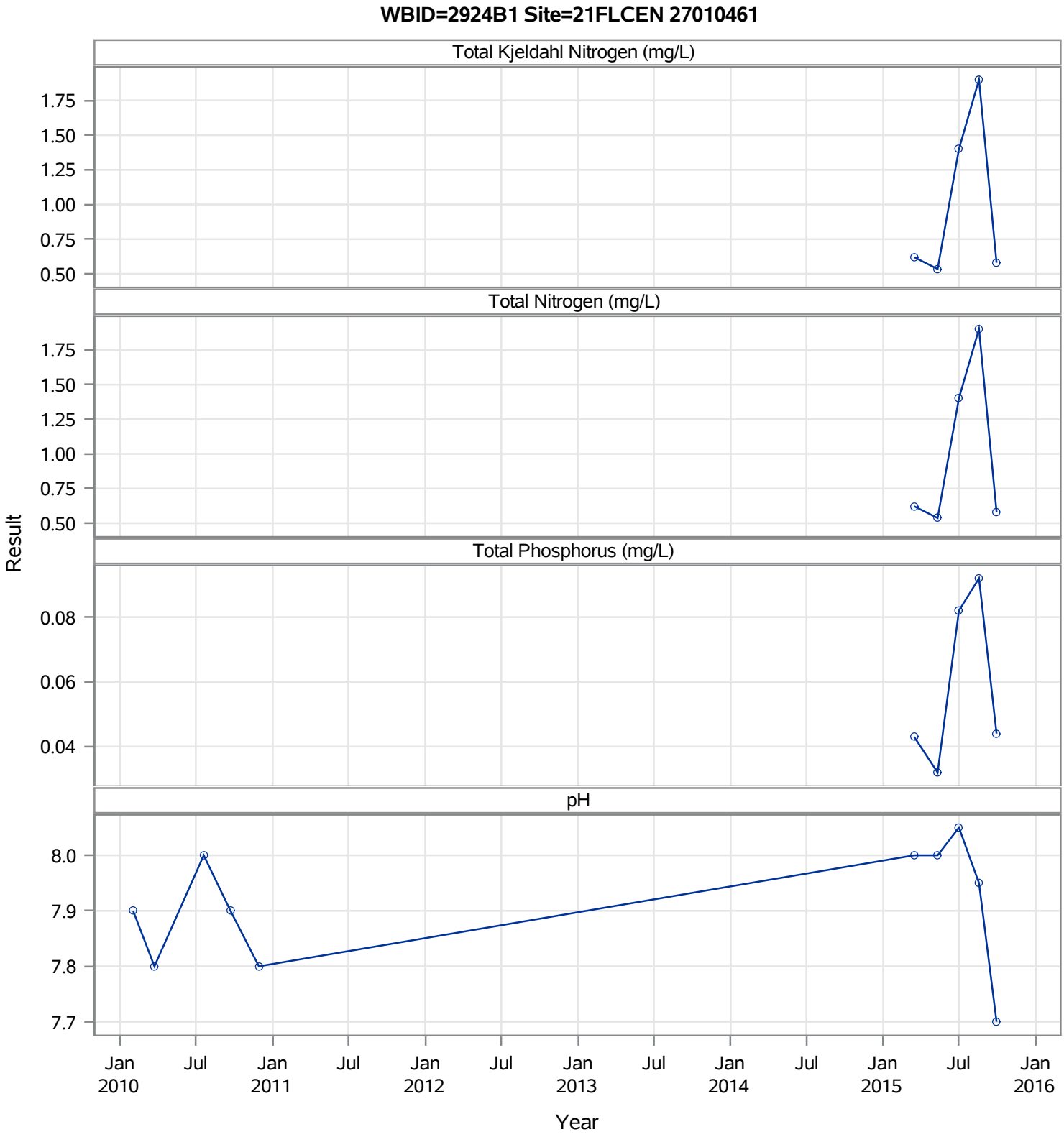

WBID=2924B1 Site=21FLCEN 27010223
pH
Result
7.945
06Sep
2012
07Sep
08Sep
Year

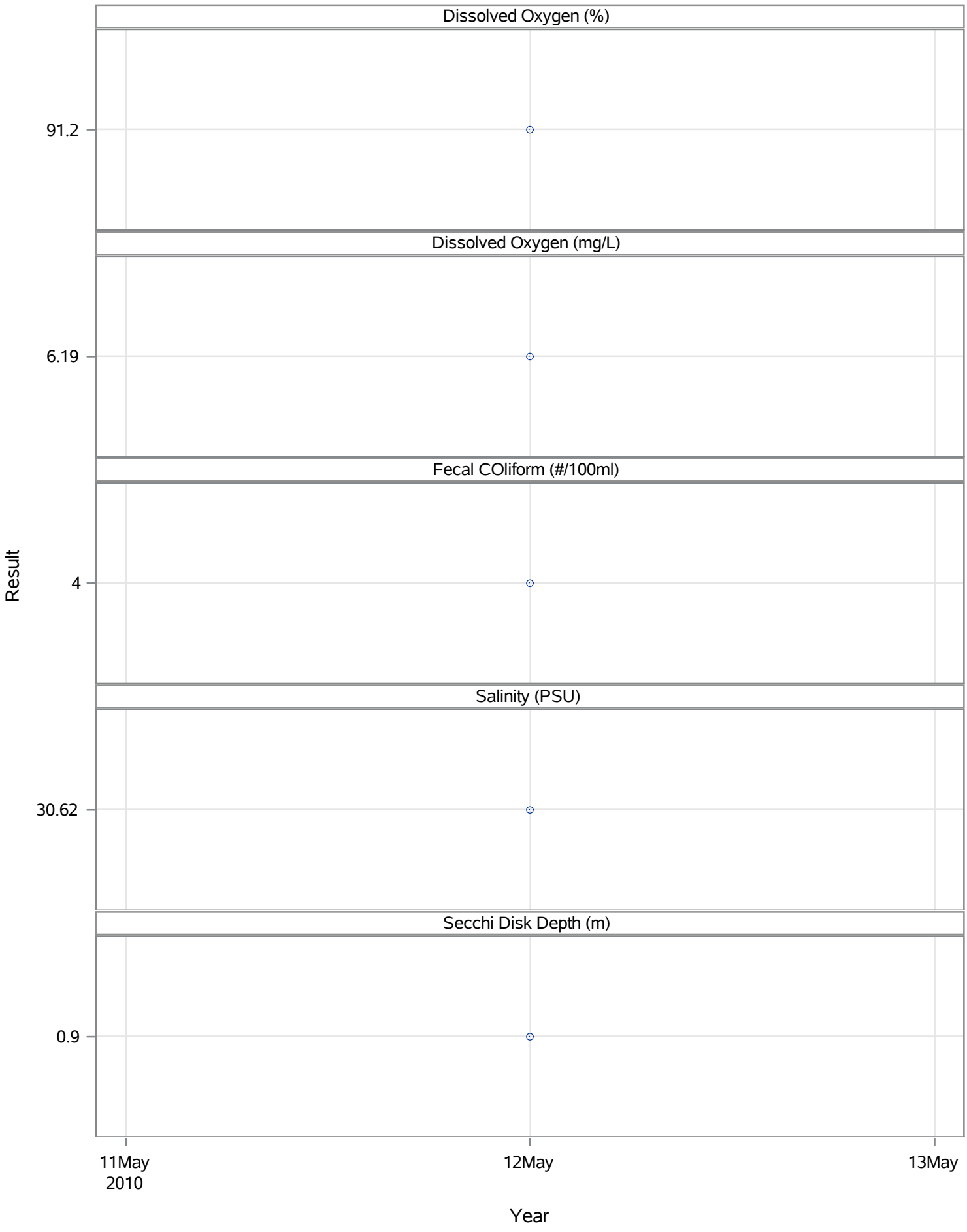

WBID=2924B1 Site=21FLCEN 27010224
Dissolved Oxygen (%)
14.1
Dissolved Oxygen (mg/L)
0.885
Salinity (PSU)
34.315
Secchi Disk Depth (m)
0.4
Temperature (Degree C)
29.9
Result
06Sep
2012
07Sep
08Sep
Year

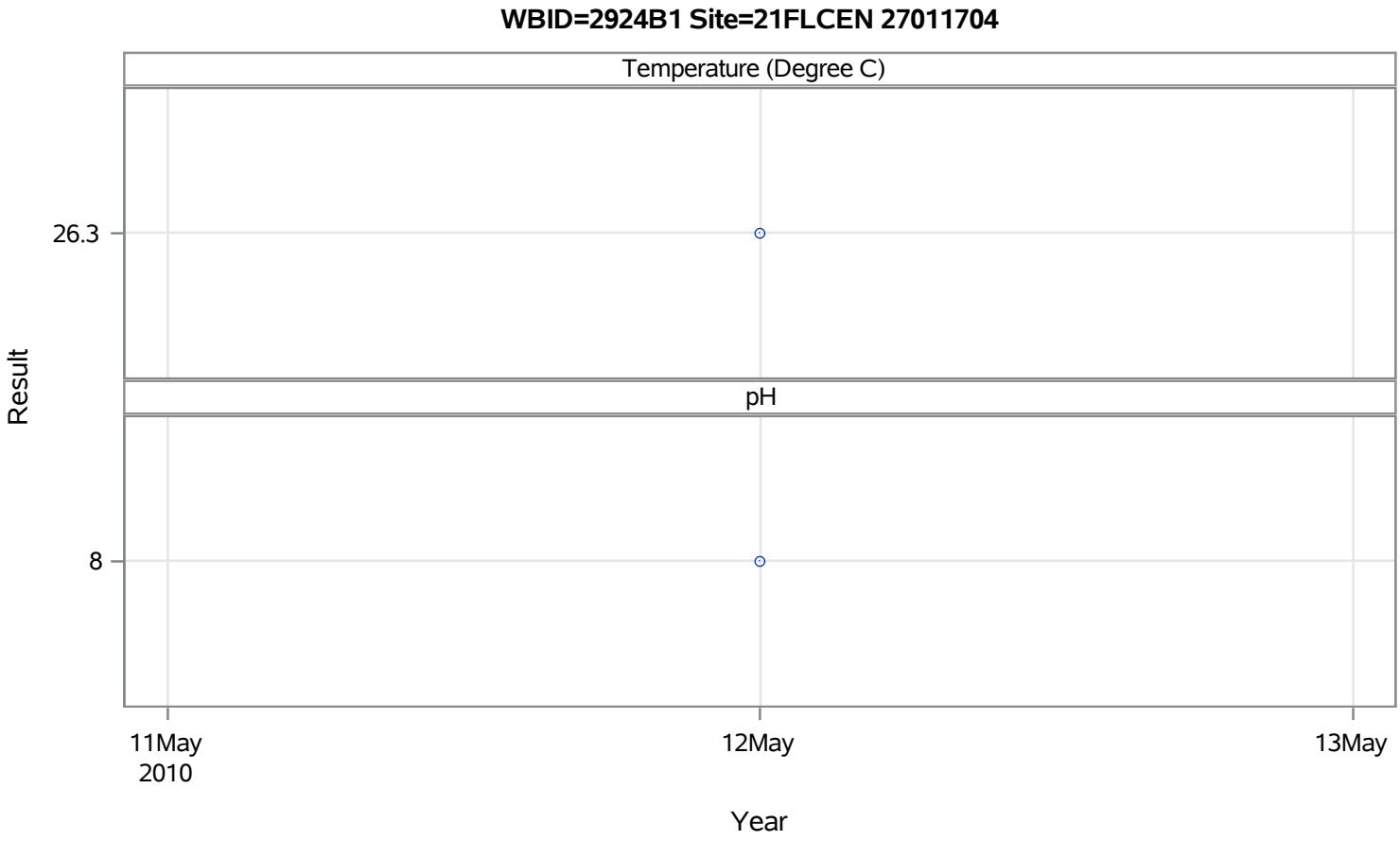

WBID=2924B1 Site=21FLCEN 27010224
pH
Result
7.85
06Sep
2012
07Sep
08Sep
Year

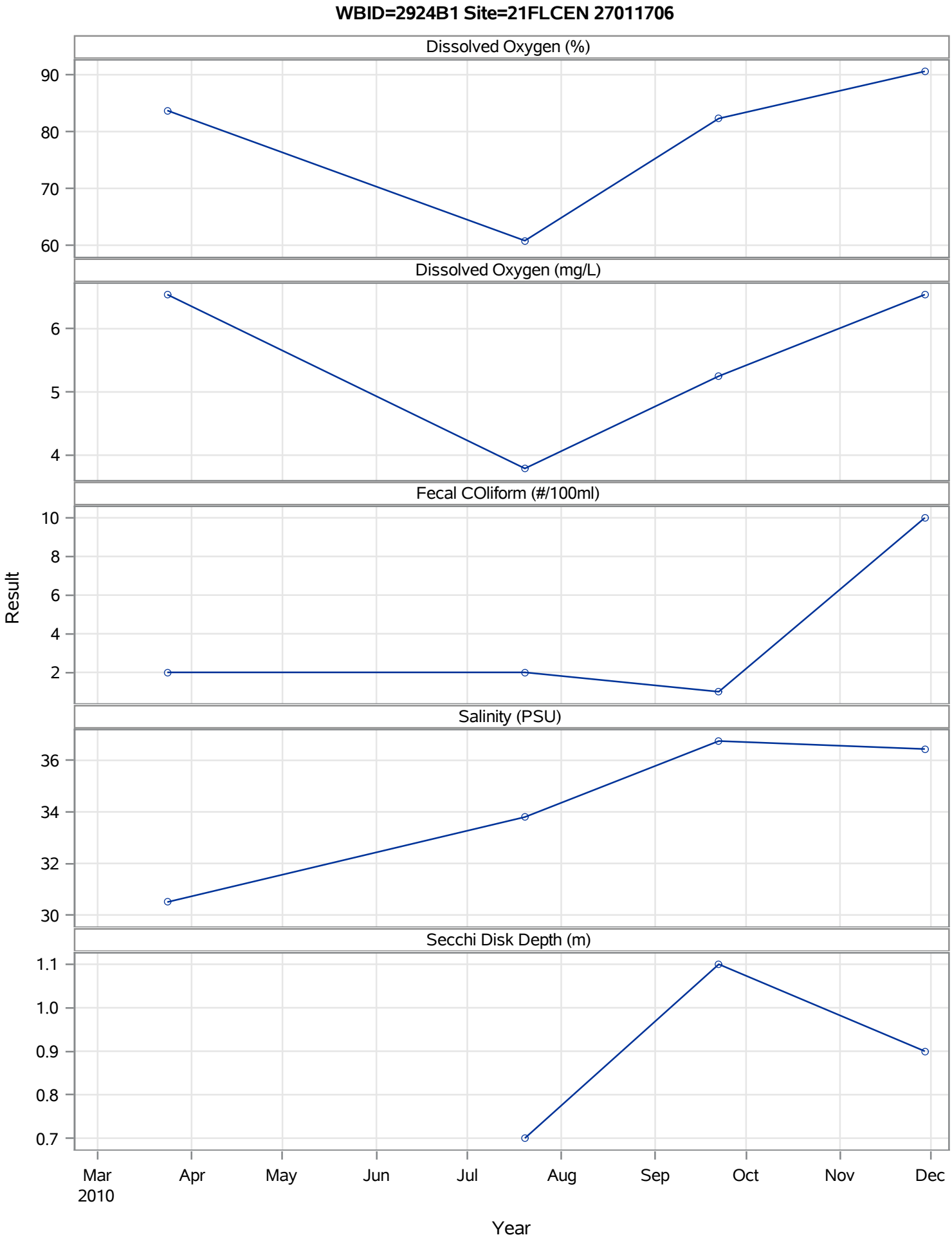

WBID=2924B1 Site=21FLCEN 27010461
Ammonia (mg/L)
0.008
0.006
0.004
0.002
Chlorophyll a (µg/L)
40
30
20
10
Dissolved Orthophosphate (mg/L)
0.0030
0.0028
0.0026
0.0024
0.0022
0.0020
Result
Dissolved Oxygen (%)
100
90
80
70
Dissolved Oxygen (mg/L)
7
6
5
Jan 2010
Jul
Jan 2011
Jul
Jan 2012
Jul
Jan 2013
Jul
Jan 2014
Jul
Jan 2015
Jul
Jan 2016
Year

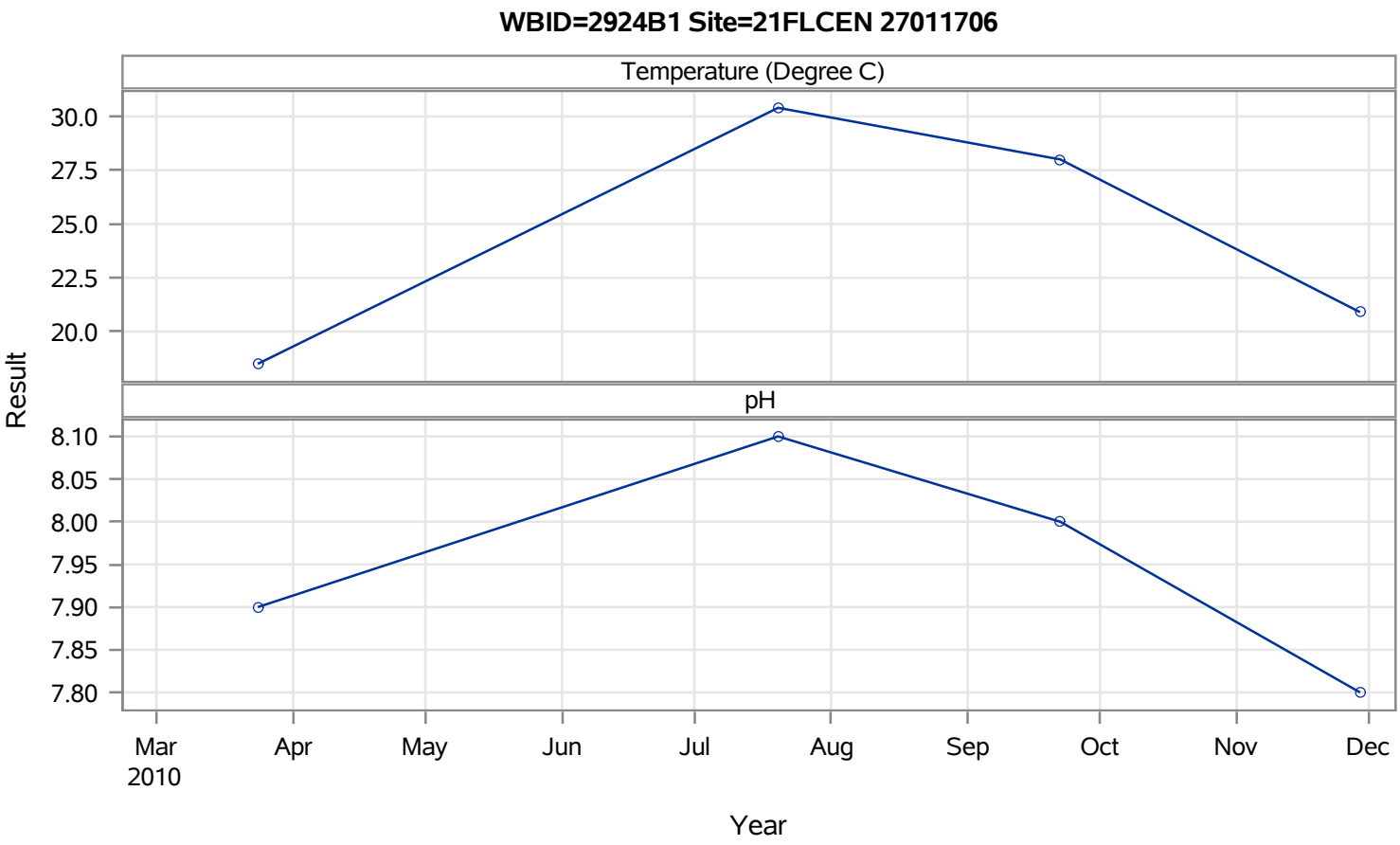

WBID=2924B1 Site=21FLCEN 27010461
Fecal COliform (#/100ml)
8
7
6
5
4
3
2
Nitrite + Nitrate (mg/L)
0.002
Salinity (PSU)
36
34
32
30
Secchi Disk Depth (m)
2.00
1.75
1.50
1.25
1.00
0.75
0.50
Temperature (Degree C)
30
25
20
15
Result
Jan 2010
Jul
Jan 2011
Jul
Jan 2012
Jul
Jan 2013
Jul
Jan 2014
Jul
Jan 2015
Jul
Jan 2016
Year

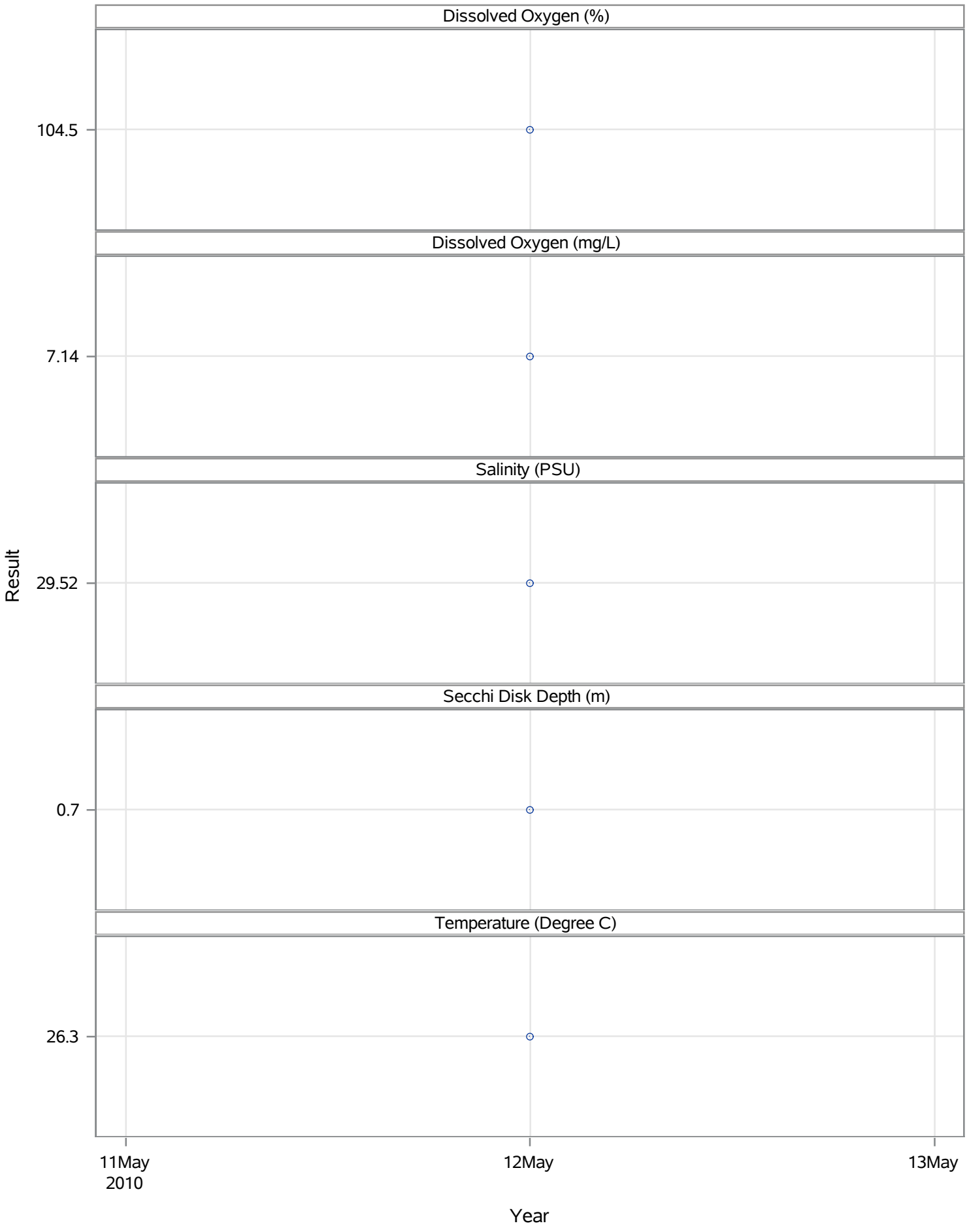

WBID=2924B1 Site=21FLCEN 27010461
Total Kjeldahl Nitrogen (mg/L)
1.75
1.50
1.25
1.00
0.75
0.50
Total Nitrogen (mg/L)
1.75
1.50
1.25
1.00
0.75
0.50
Total Phosphorus (mg/L)
0.08
0.06
0.04
pH
8.0
7.9
7.8
7.7
Result
Jan 2010
Jul
Jan 2011
Jul
Jan 2012
Jul
Jan 2013
Jul
Jan 2014
Jul
Jan 2015
Jul
Jan 2016
Year

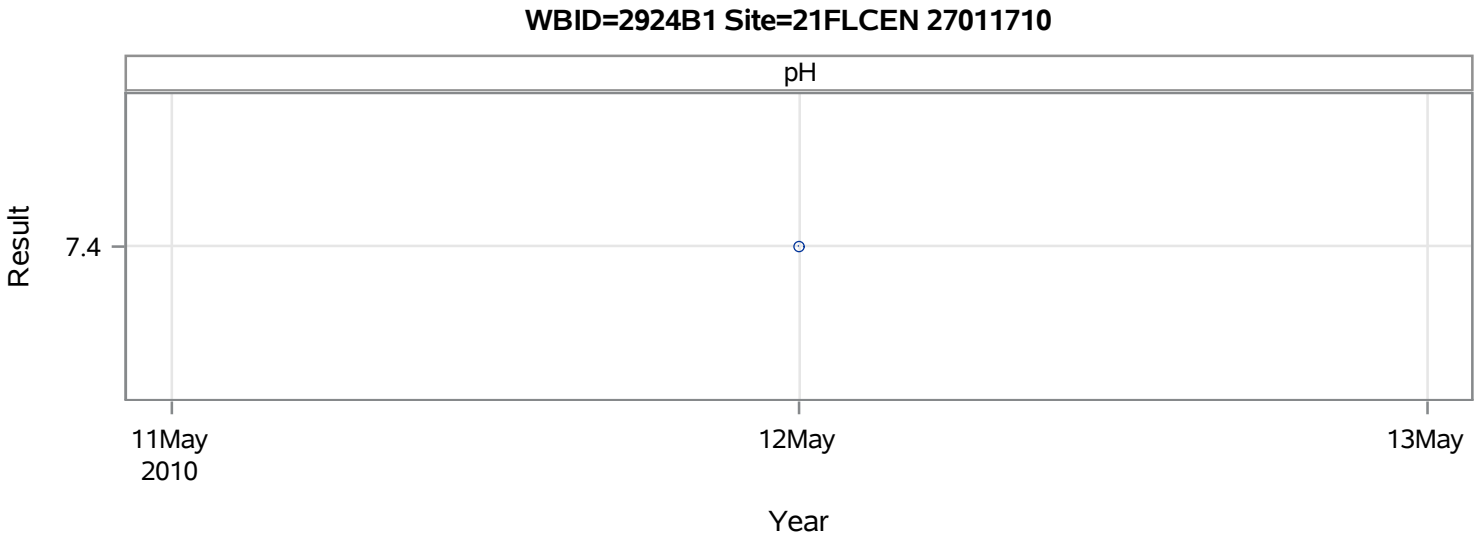

WBID=2924B1 Site=21FLCEN 27011704
Dissolved Oxygen (%)
91.2
Dissolved Oxygen (mg/L)
6.19
Fecal COliform (#/100ml)
4
Salinity (PSU)
30.62
Secchi Disk Depth (m)
0.9
Result
11May
2010
12May
13May
Year

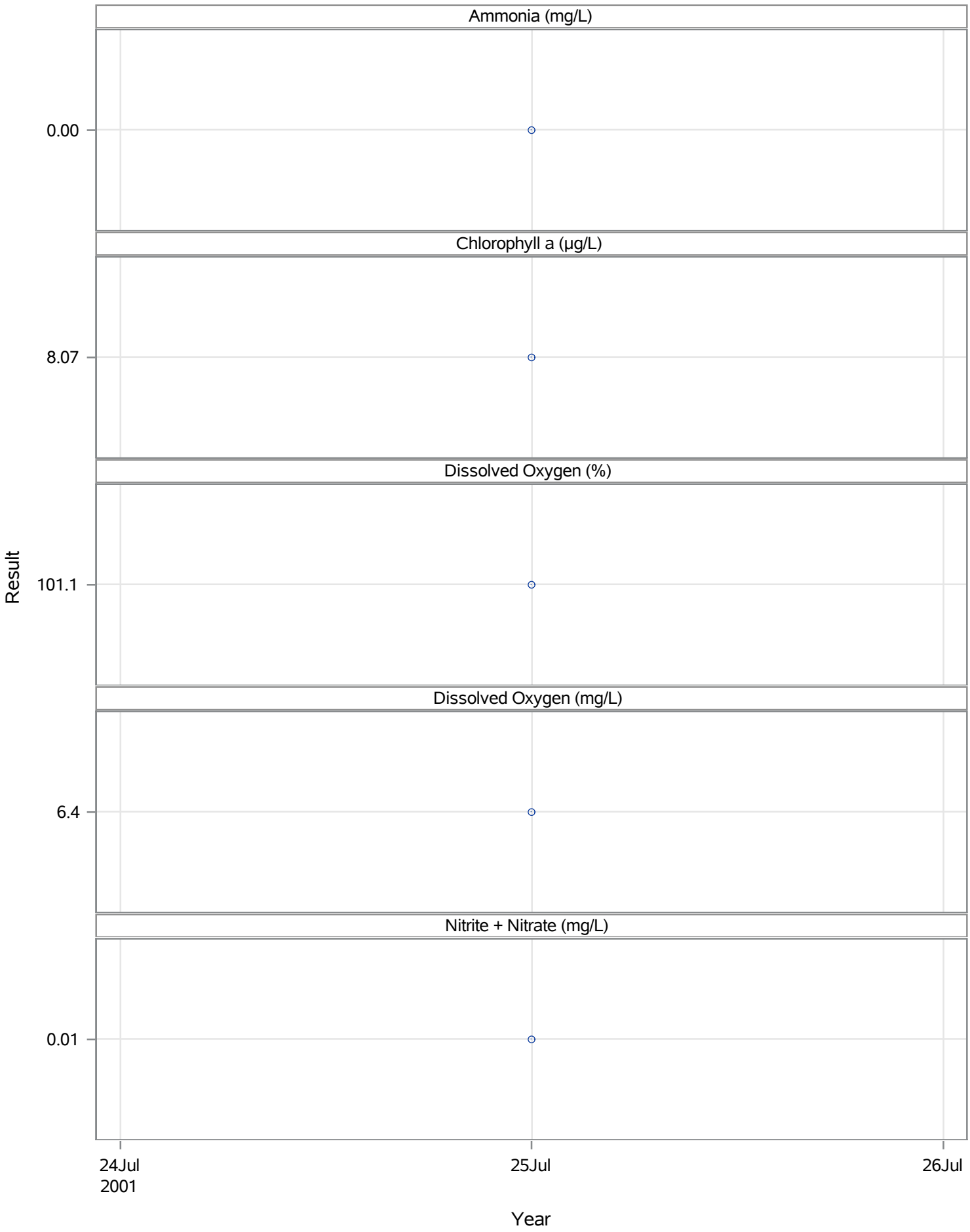

WBID=2924B1 Site=21FLCEN 27011704
Temperature (Degree C)
26.3
pH
8
Result
11May
2010
12May
13May
Year

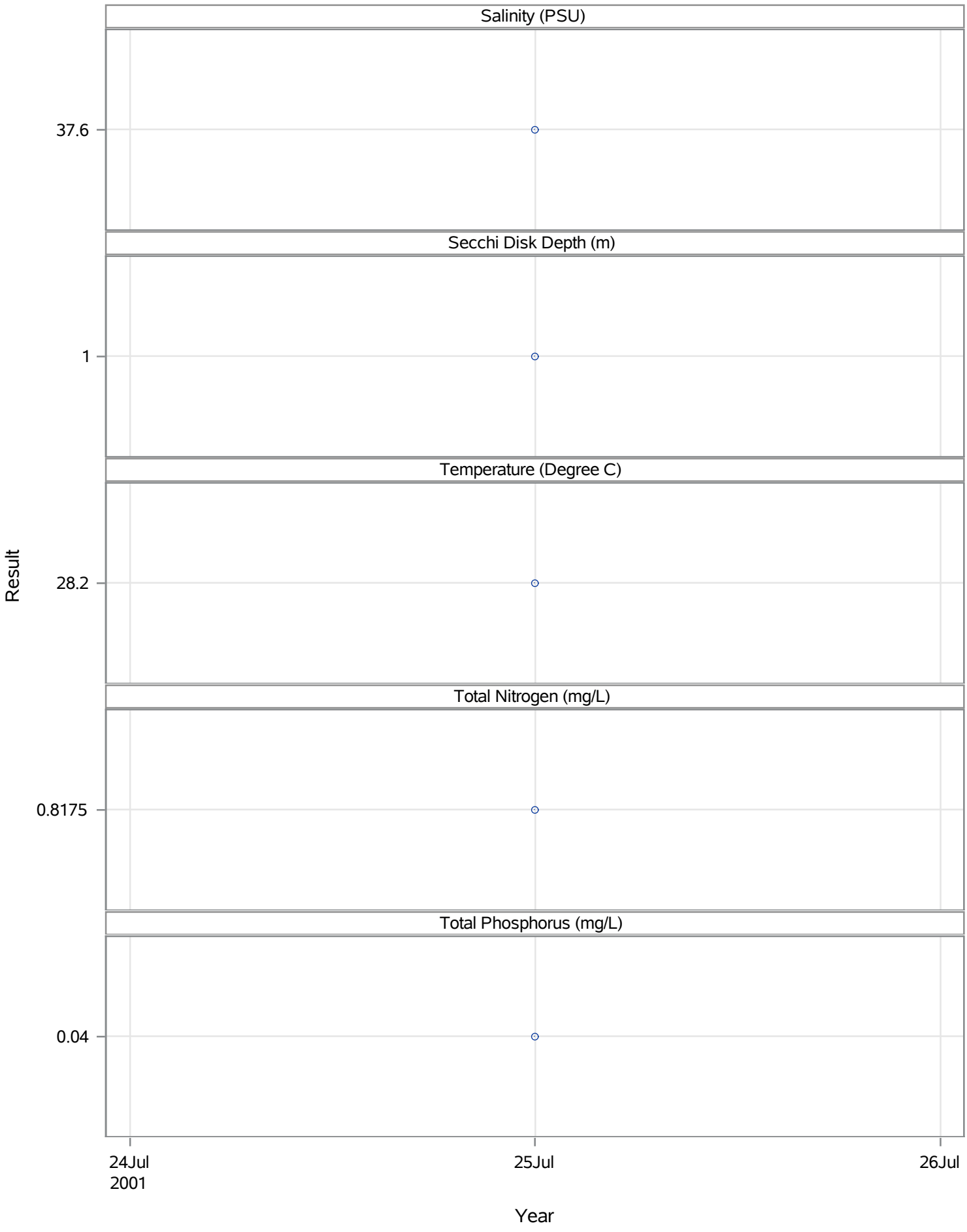

WBID=2924B1 Site=21FLCEN 27011706
Dissolved Oxygen (%)
90
80
70
60
Dissolved Oxygen (mg/L)
6
5
4
Fecal COliform (#/100ml)
10
8
6
4
2
Salinity (PSU)
36
34
32
30
Secchi Disk Depth (m)
1.1
1.0
0.9
0.8
0.7
Result
Mar
2010
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Year

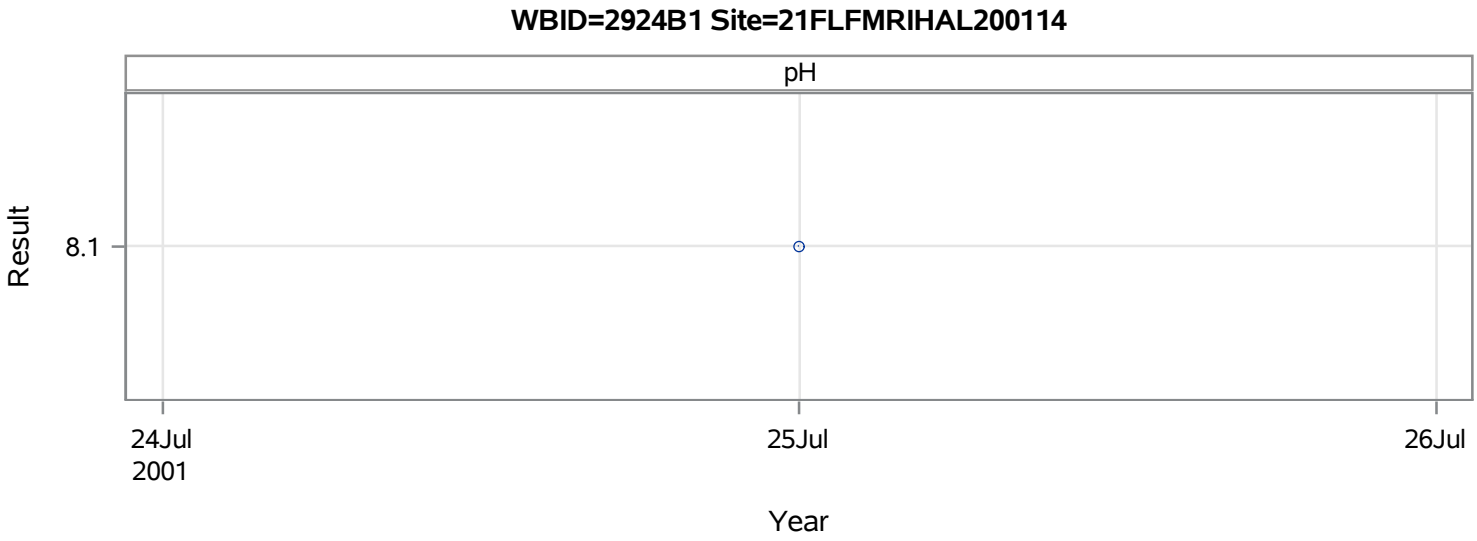

WBID=2924B1 Site=21FLCEN 27011706
Temperature (Degree C)
30.0
27.5
25.0
22.5
20.0
pH
8.10
8.05
8.00
7.95
7.90
7.85
7.80
Result
Mar
2010
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Year

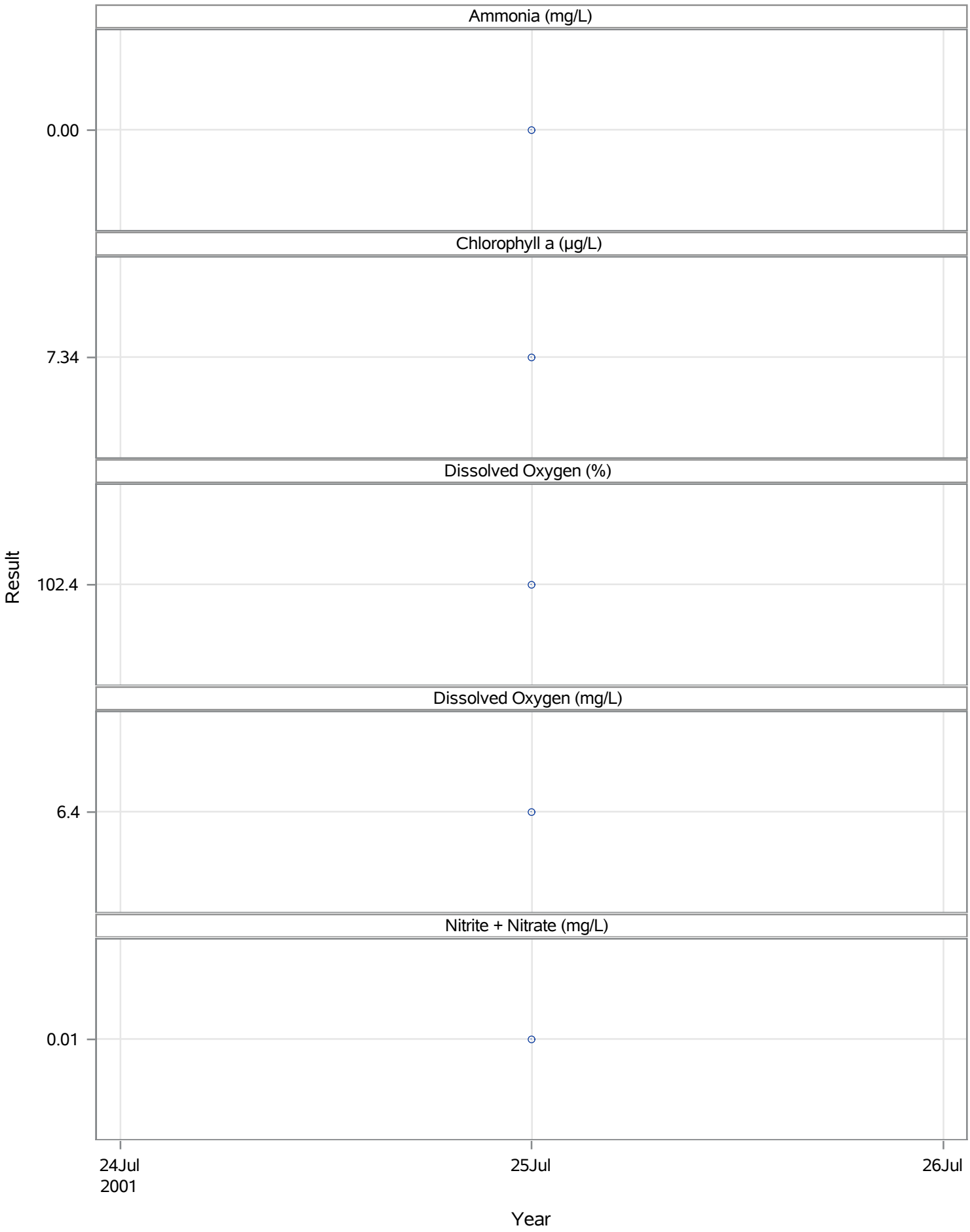

WBID=2924B1 Site=21FLCEN 27011710
Dissolved Oxygen (%)
104.5
Dissolved Oxygen (mg/L)
7.14
Salinity (PSU)
29.52
Secchi Disk Depth (m)
0.7
Temperature (Degree C)
26.3
Result
11May
2010
12May
13May
Year

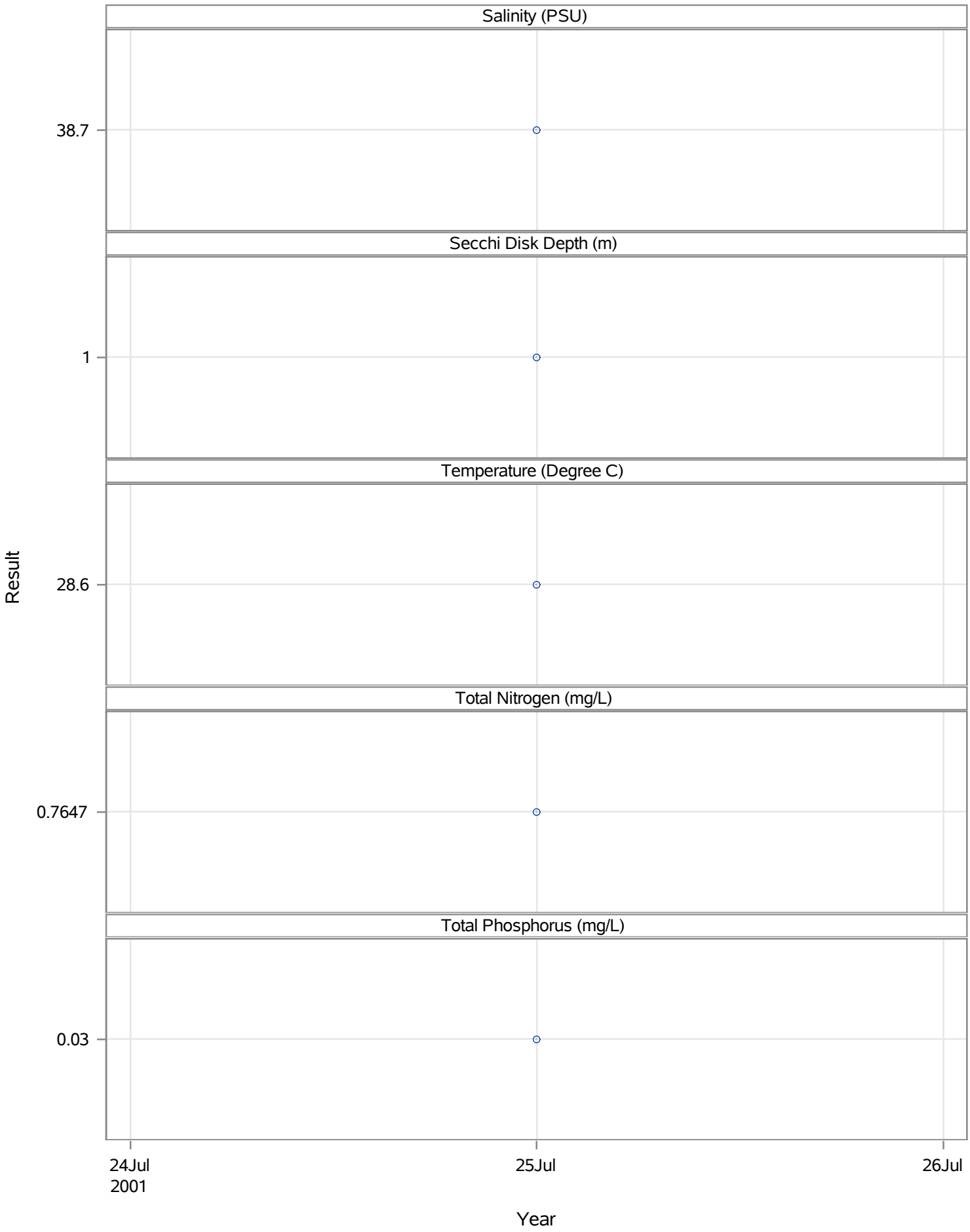

WBID=2924B1 Site=21FLCEN 27011710
pH
Result
7.4
11May
2010
12May
13May
Year

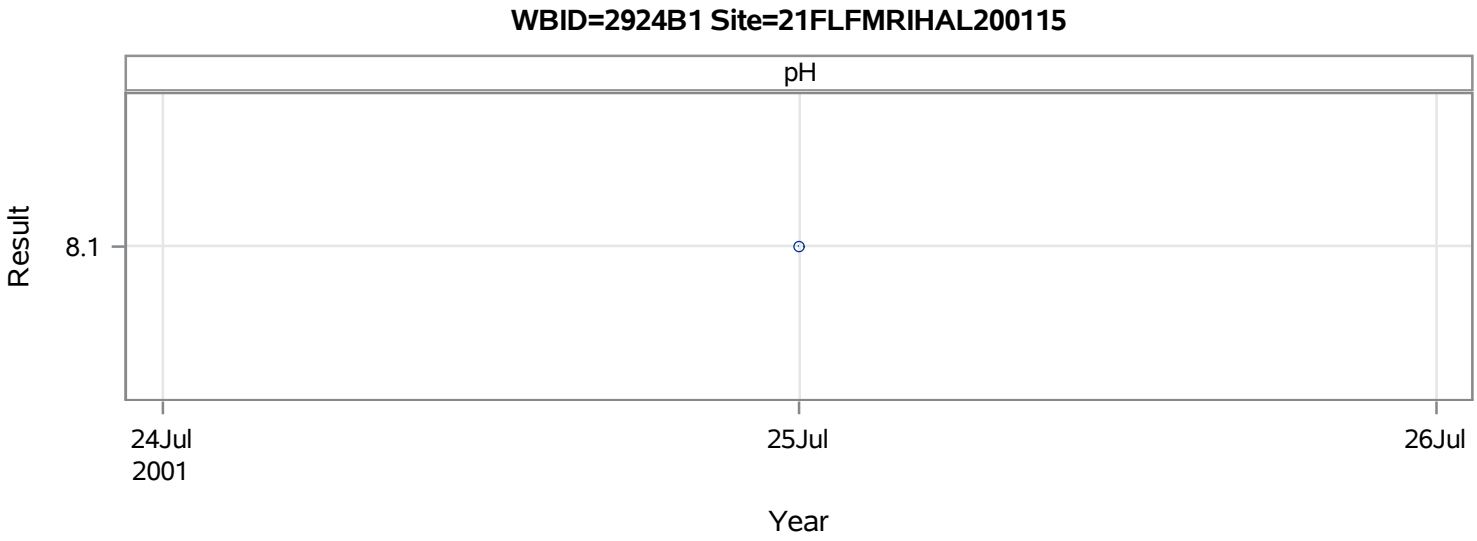

WBID=2924B1 Site=21FLFMRIHAL200114
Ammonia (mg/L)
0.00
Chlorophyll a (µg/L)
8.07
Dissolved Oxygen (%)
101.1
Dissolved Oxygen (mg/L)
6.4
Nitrite + Nitrate (mg/L)
0.01
Result
24Jul
2001
25Jul
26Jul
Year

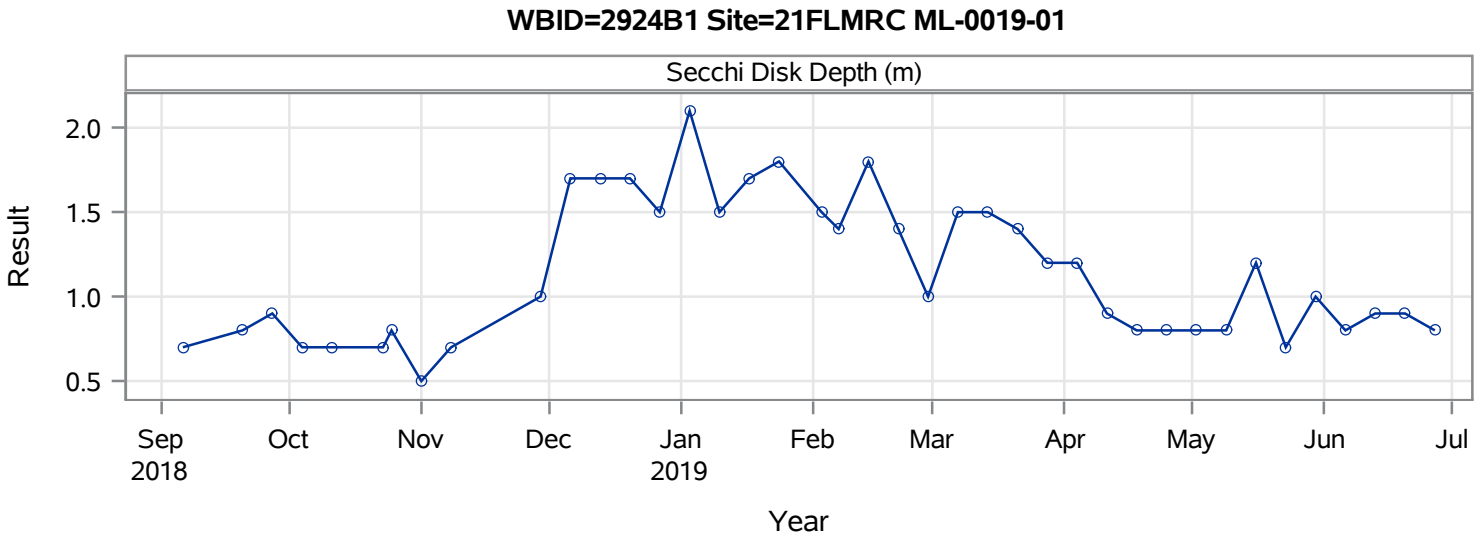

WBID=2924B1 Site=21FLFMRIHAL200114
Salinity (PSU)
37.6
Secchi Disk Depth (m)
1
Temperature (Degree C)
28.2
Total Nitrogen (mg/L)
0.8175
Total Phosphorus (mg/L)
0.04
Result
24Jul
2001
25Jul
26Jul
Year

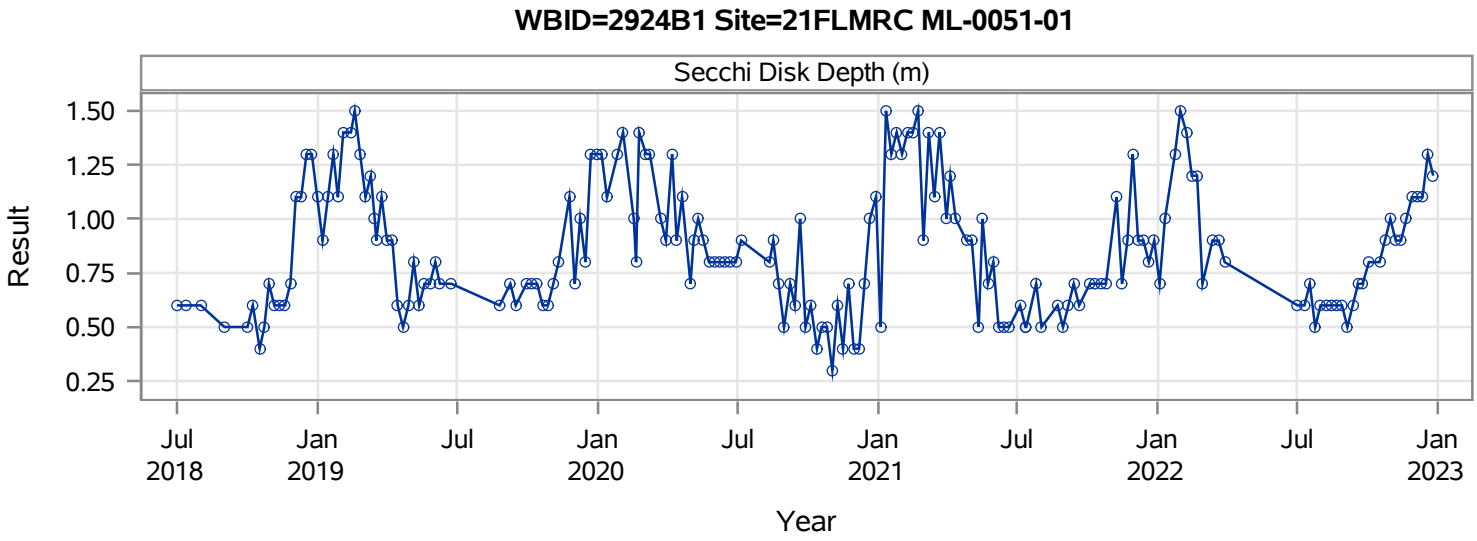

WBID=2924B1 Site=21FLFMRIHAL200114
pH
Result
8.1
24Jul
2001
25Jul
26Jul
Year

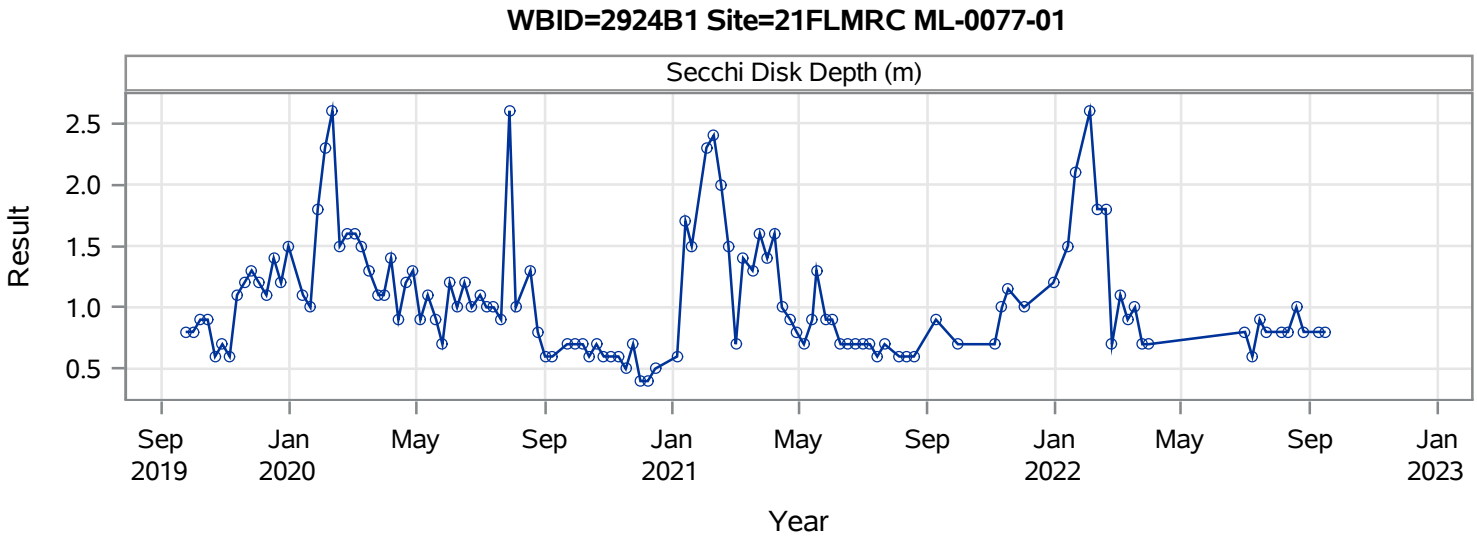

WBID=2924B1 Site=21FLFMRIHAL200115
Ammonia (mg/L)
0.00
Chlorophyll a (µg/L)
7.34
Dissolved Oxygen (%)
102.4
Dissolved Oxygen (mg/L)
6.4
Nitrite + Nitrate (mg/L)
0.01
Result
24Jul
2001
25Jul
26Jul
Year

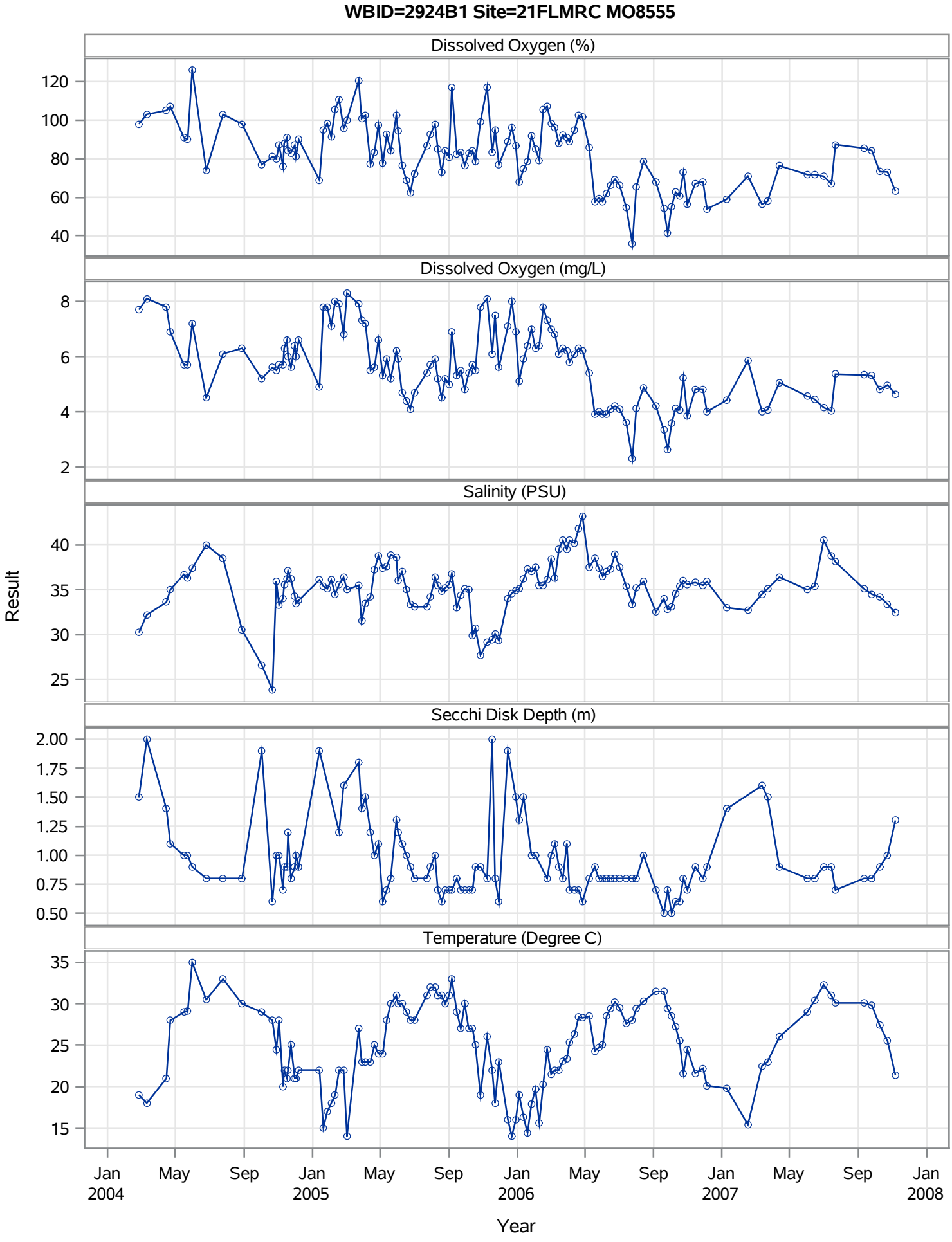

WBID=2924B1 Site=21FLFMRIHAL200115
Salinity (PSU)
38.7
Secchi Disk Depth (m)
1
Temperature (Degree C)
28.6
Total Nitrogen (mg/L)
0.7647
Total Phosphorus (mg/L)
0.03
Result
24Jul
2001
25Jul
26Jul
Year

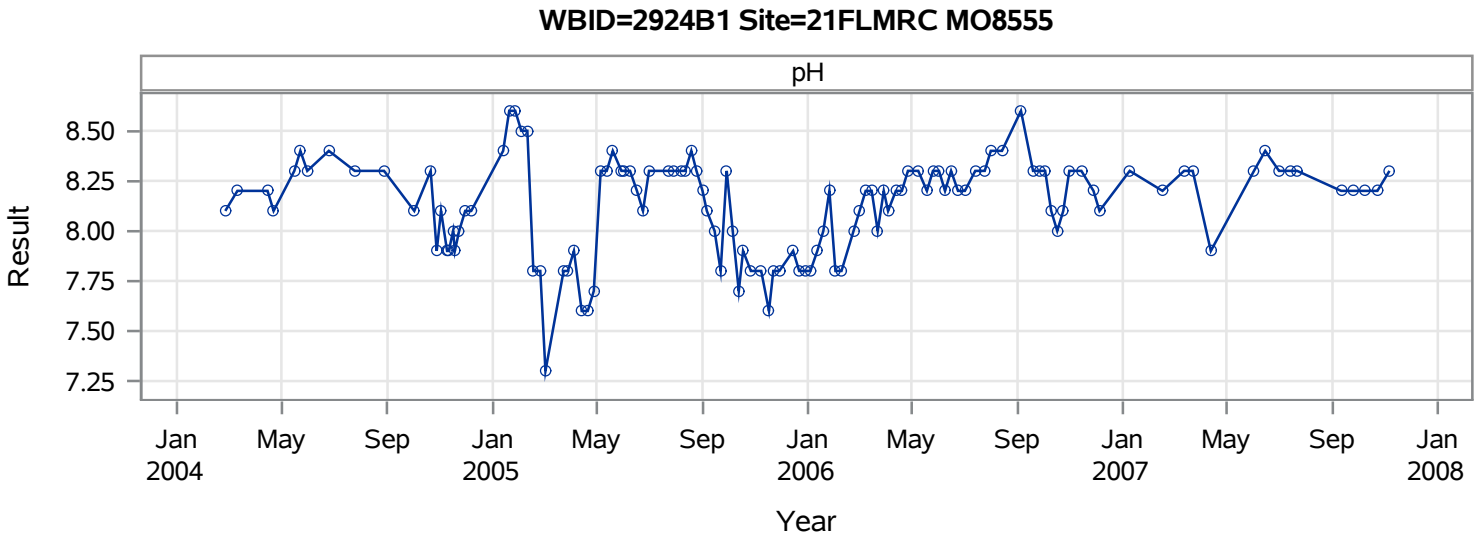

WBID=2924B1 Site=21FLFMRIHAL200115
pH
Result
8.1
24Jul
2001
25Jul
26Jul
Year

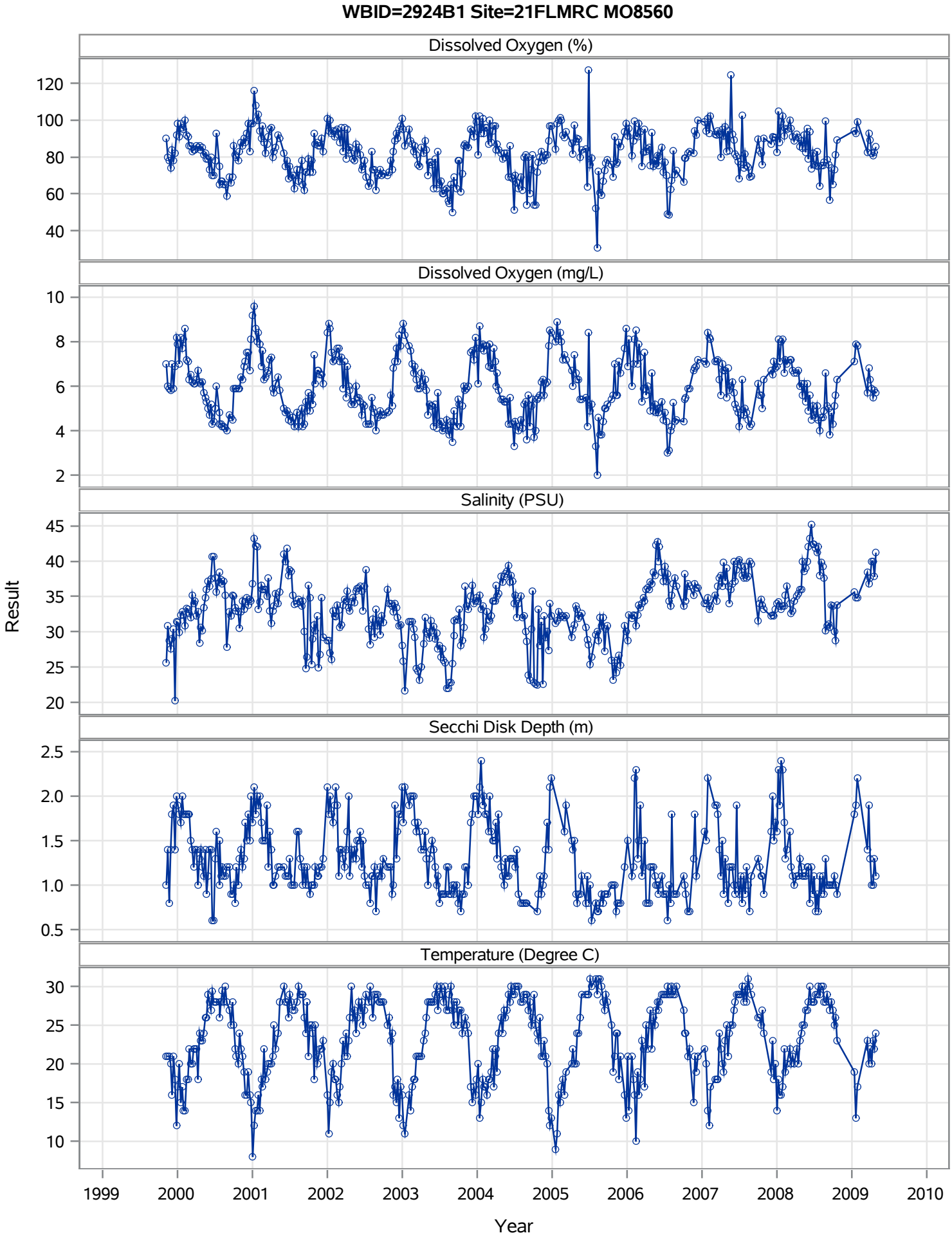

WBID=2924B1 Site=21FLMRC ML-0019-01
Secchi Disk Depth (m)
Result
2.0
1.5
1.0
0.5
Sep
2018
Oct
Nov
Dec
Jan
2019
Feb
Mar
Apr
May
Jun
Jul
Year

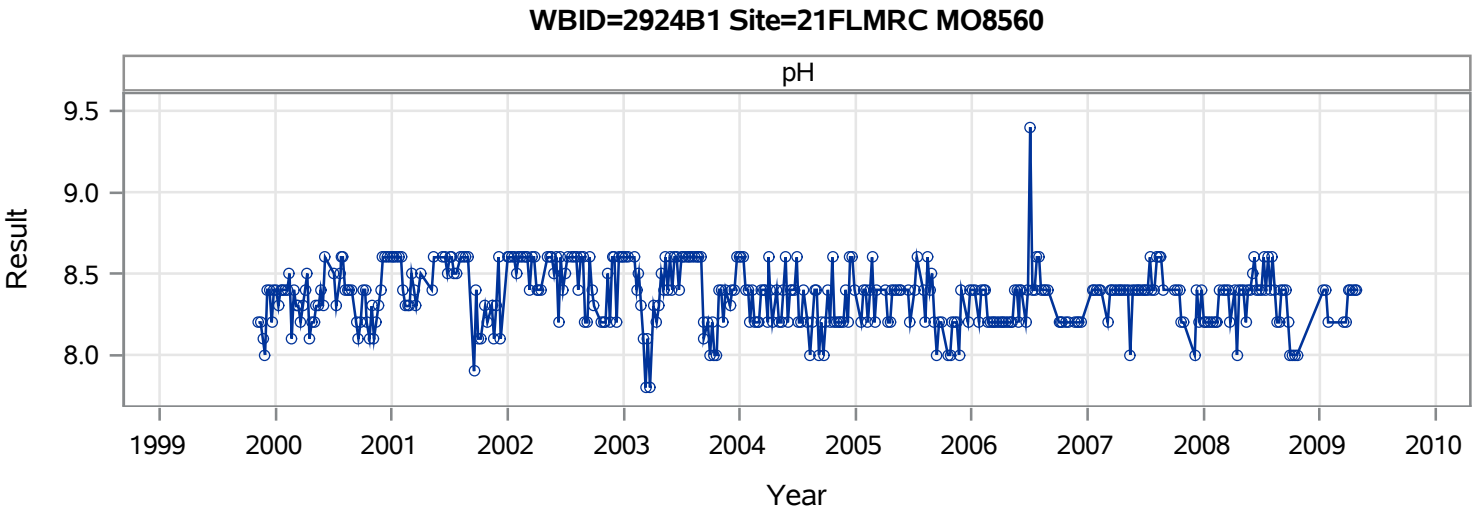

WBID=2924B1 Site=21FLMRC ML-0051-01
Secchi Disk Depth (m)
Result
1.50
1.25
1.00
0.75
0.50
0.25
Jul 2018
Jan 2019
Jul
Jan 2020
Jul
Jan 2021
Jul
Jan 2022
Jul
Jan 2023
Year

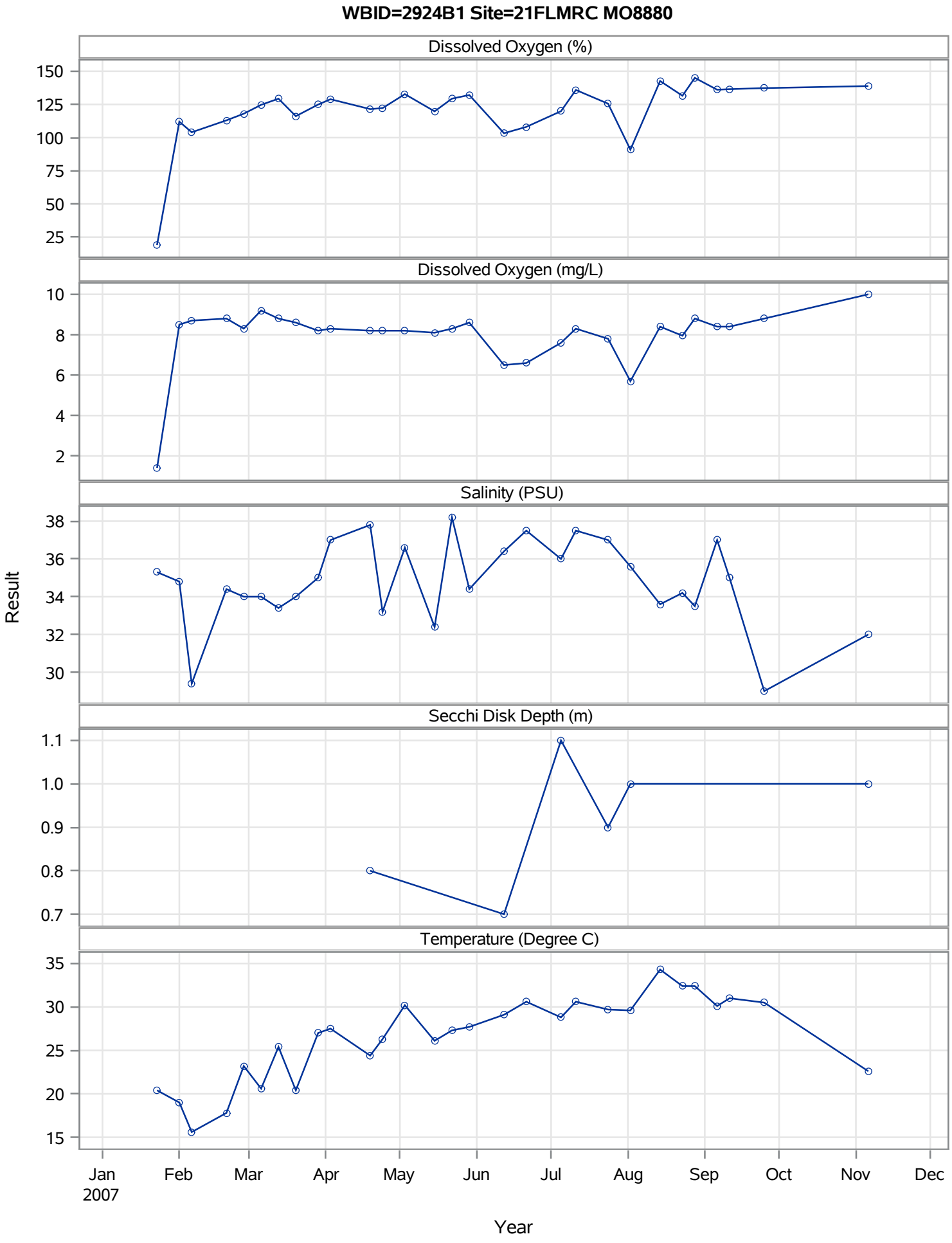

WBID=2924B1 Site=21FLMRC ML-0077-01
Secchi Disk Depth (m)
Result
2.5
2.0
1.5
1.0
0.5
Sep
2019
Jan
2020
May
Sep
Jan
2021
May
Sep
Jan
2022
May
Sep
Jan
2023
Year

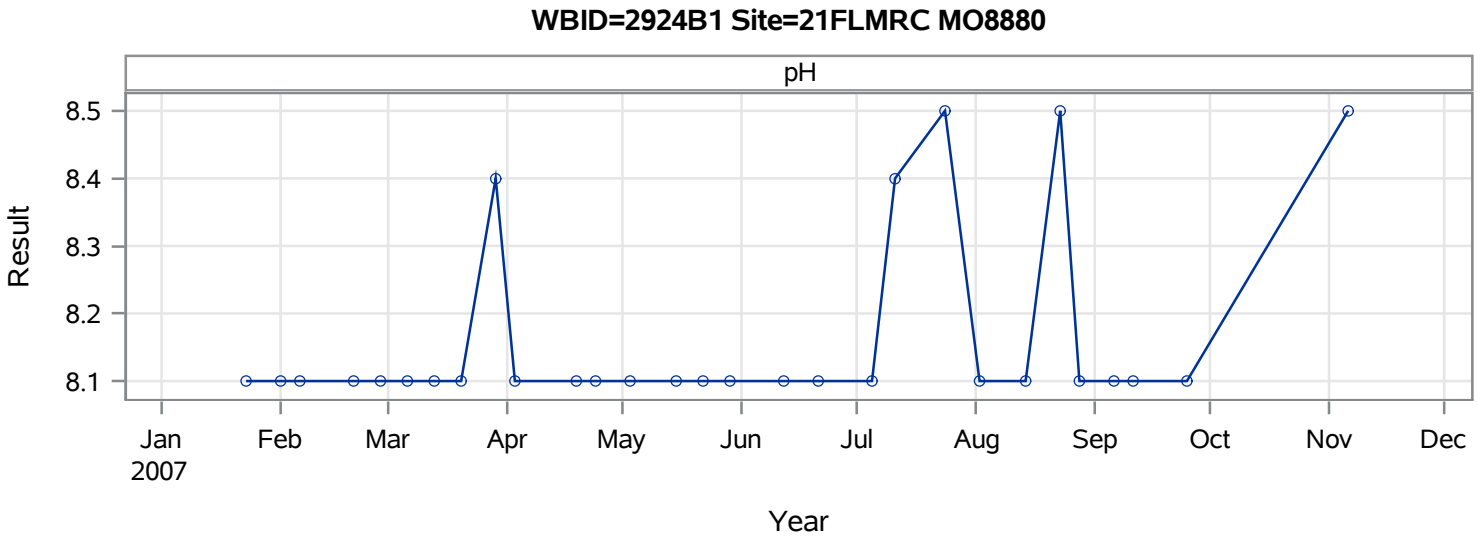

WBID=2924B1 Site=21FLMRC MO8555
Dissolved Oxygen (%)
120
100
80
60
40
Dissolved Oxygen (mg/L)
8
6
4
2
Salinity (PSU)
40
35
30
25
Secchi Disk Depth (m)
2.00
1.75
1.50
1.25
1.00
0.75
0.50
Temperature (Degree C)
35
30
25
20
15
Result
Jan 2004
May
Sep
Jan 2005
May
Sep
Jan 2006
May
Sep
Jan 2007
May
Sep
Jan 2008
Year

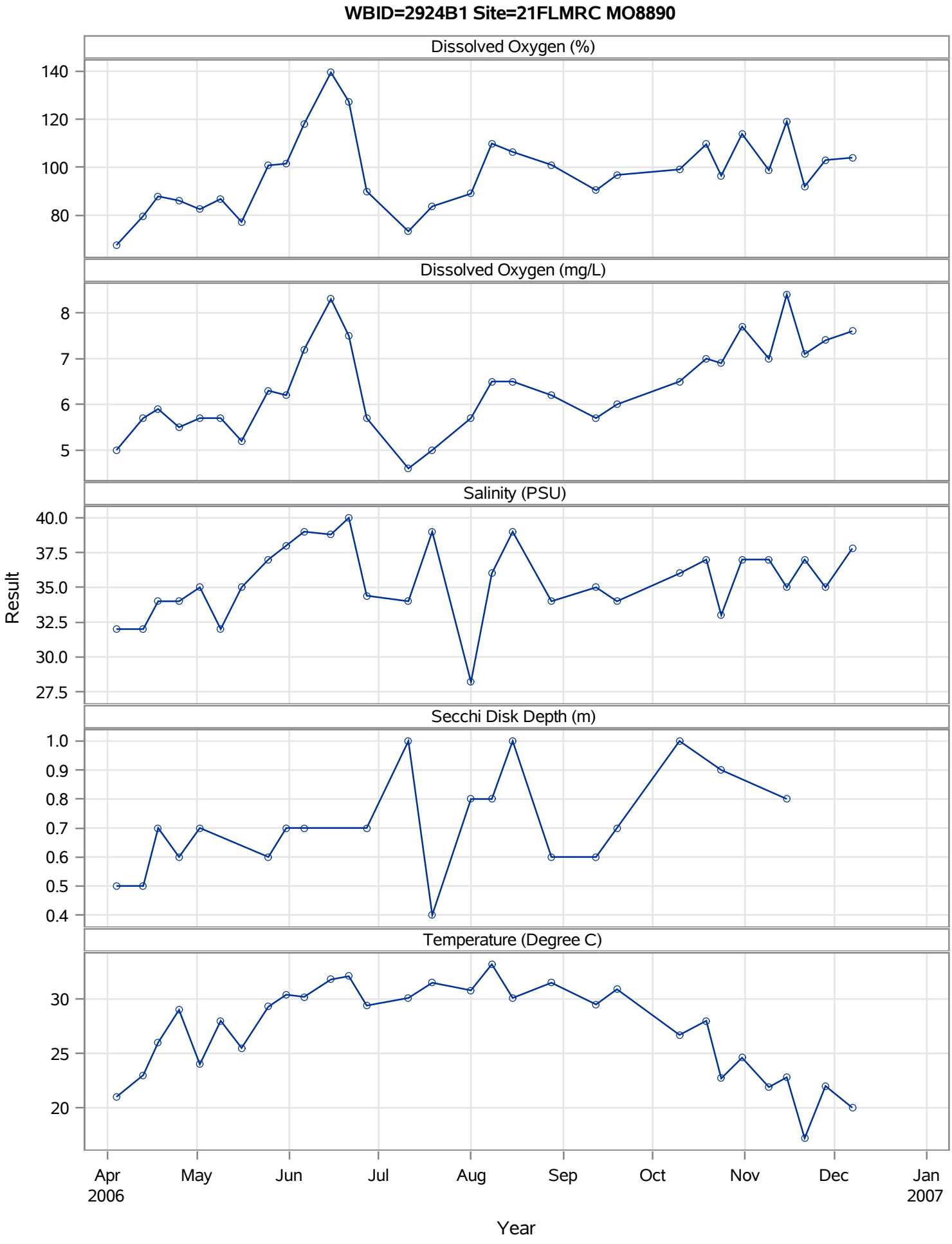

WBID=2924B1 Site=21FLMRC MO8555
pH
Result
8.50
8.25
8.00
7.75
7.50
7.25
Jan
2004
May
Sep
Jan
2005
May
Sep
Jan
2006
May
Sep
Jan
2007
May
Sep
Jan
2008
Year

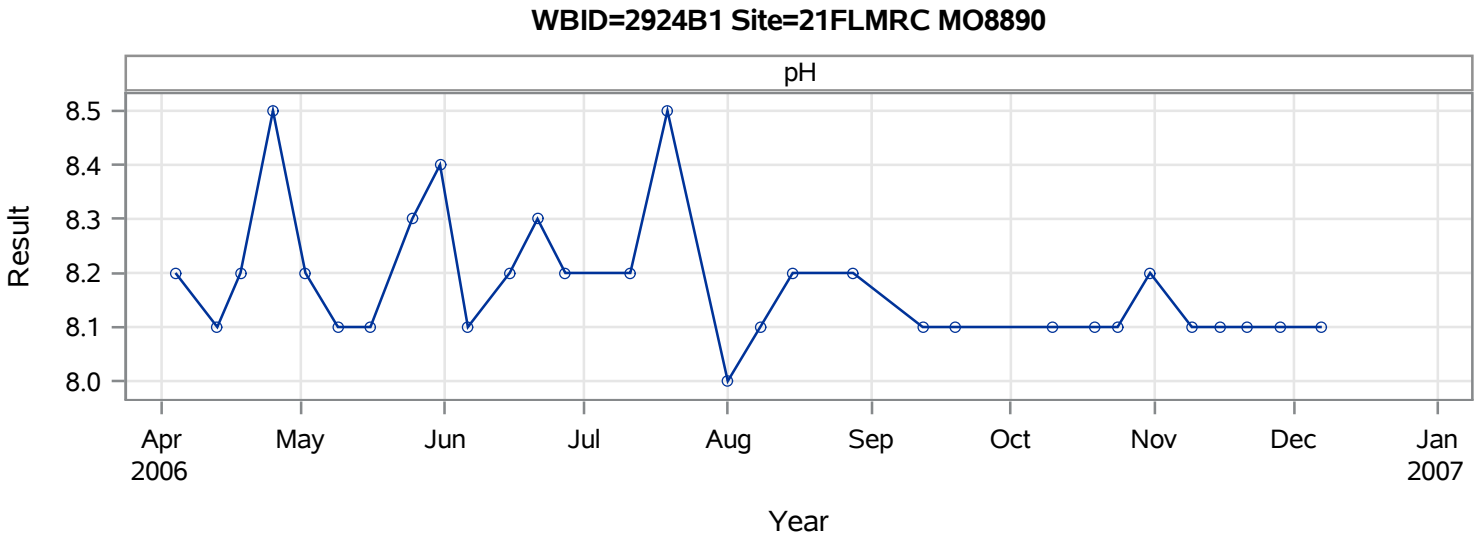

WBID=2924B1 Site=21FLMRC MO8560
Dissolved Oxygen (%)
120
100
80
60
40
Dissolved Oxygen (mg/L)
10
8
6
4
2
Salinity (PSU)
45
40
35
30
25
20
Secchi Disk Depth (m)
2.5
2.0
1.5
1.0
0.5
Temperature (Degree C)
30
25
20
15
10
Result
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year

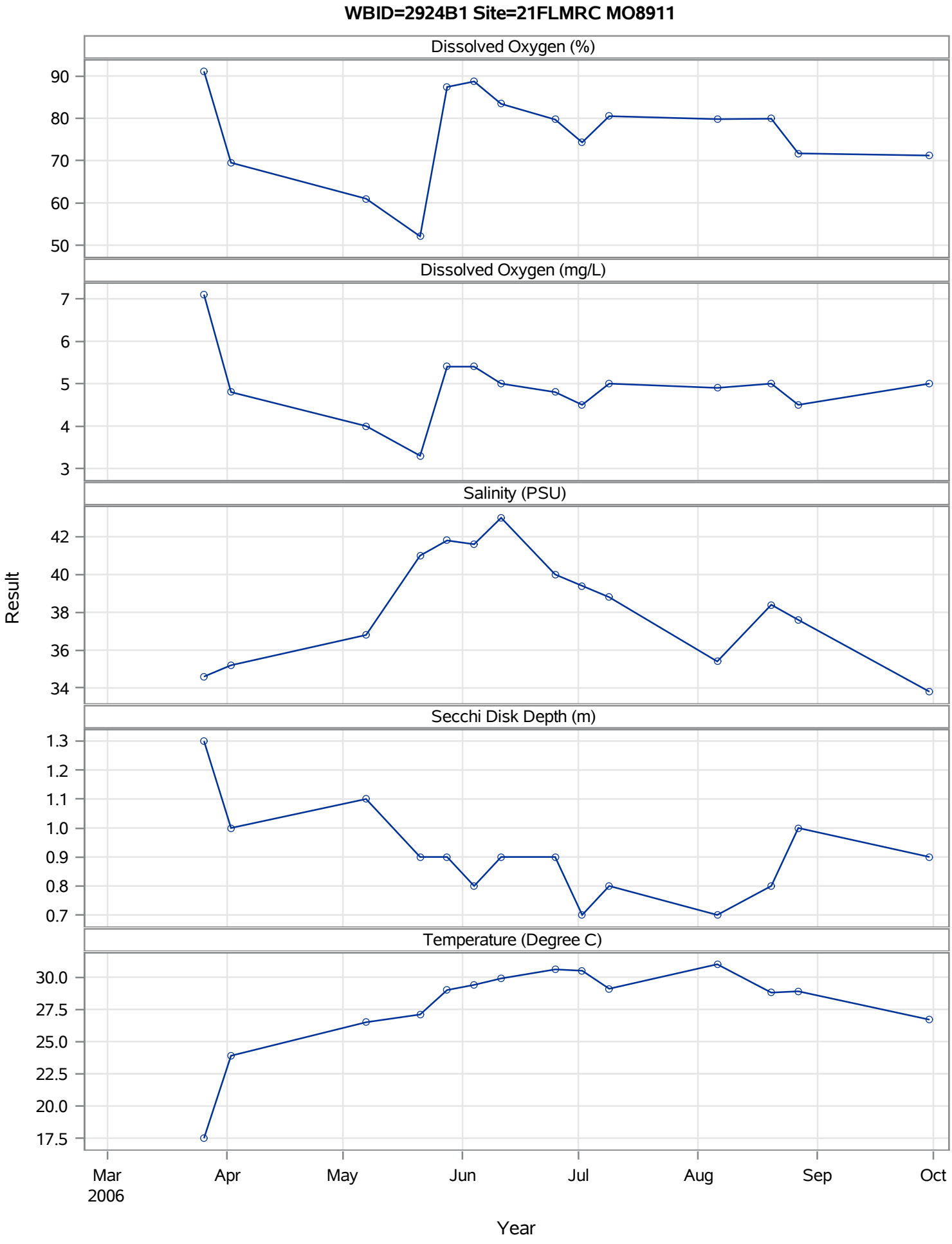

WBID=2924B1 Site=21FLMRC MO8560
pH
Result
9.5
9.0
8.5
8.0
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year

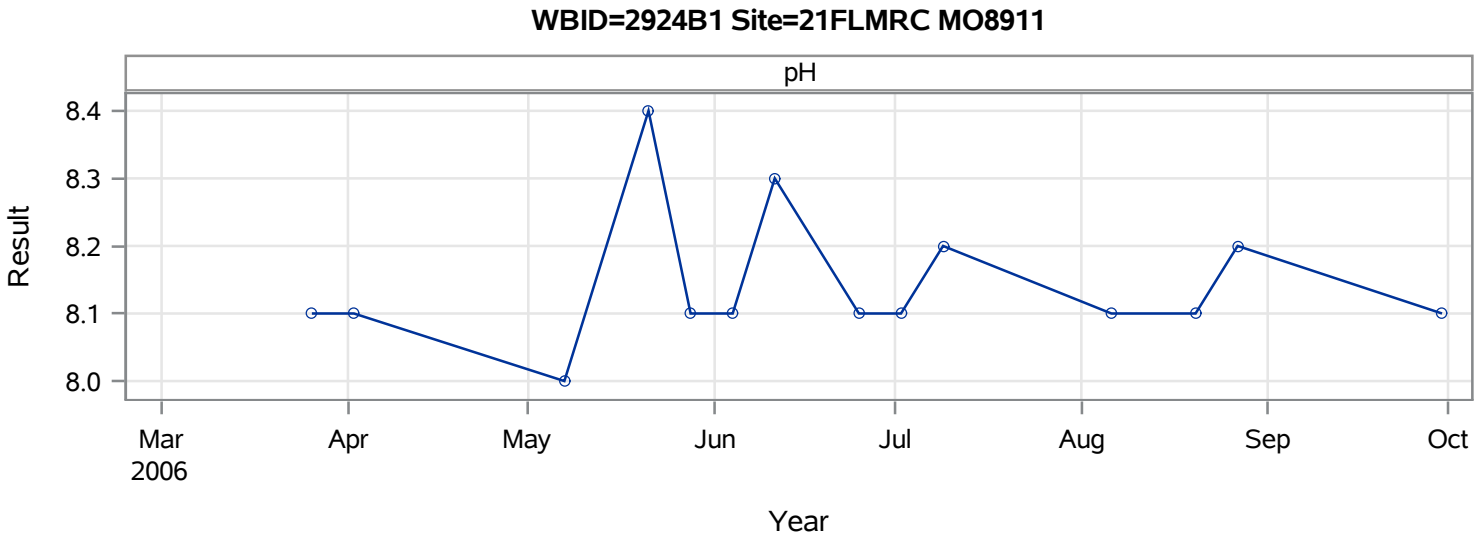

WBID=2924B1 Site=21FLMRC MO8880
Dissolved Oxygen (%)
150
125
100
75
50
25
Dissolved Oxygen (mg/L)
10
8
6
4
2
Salinity (PSU)
38
36
34
32
30
Secchi Disk Depth (m)
1.1
1.0
0.9
0.8
0.7
Temperature (Degree C)
35
30
25
20
15
Result
Jan
2007
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Year

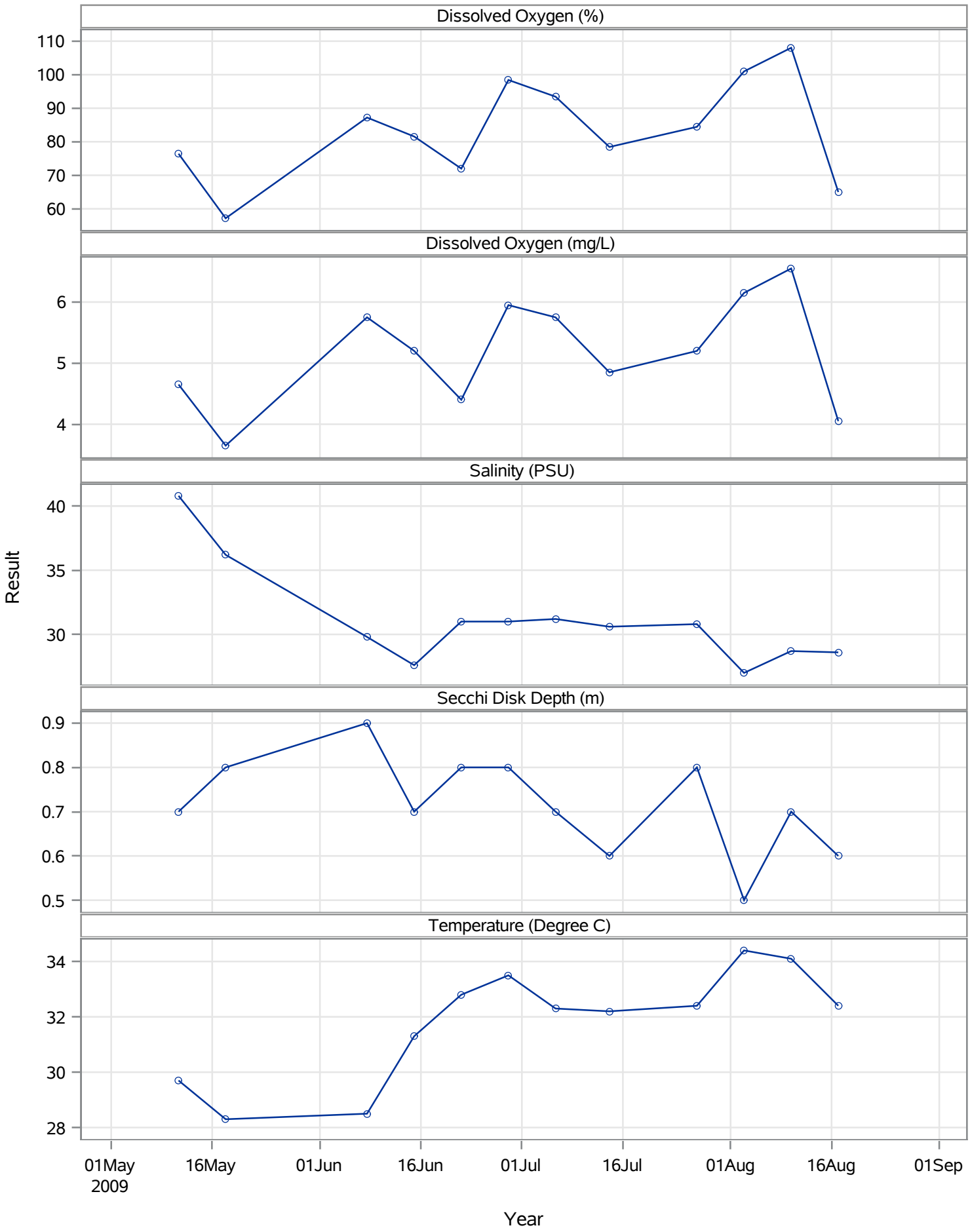

WBID=2924B1 Site=21FLMRC MO8880
pH
Result
8.5
8.4
8.3
8.2
8.1
Jan
2007
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Year

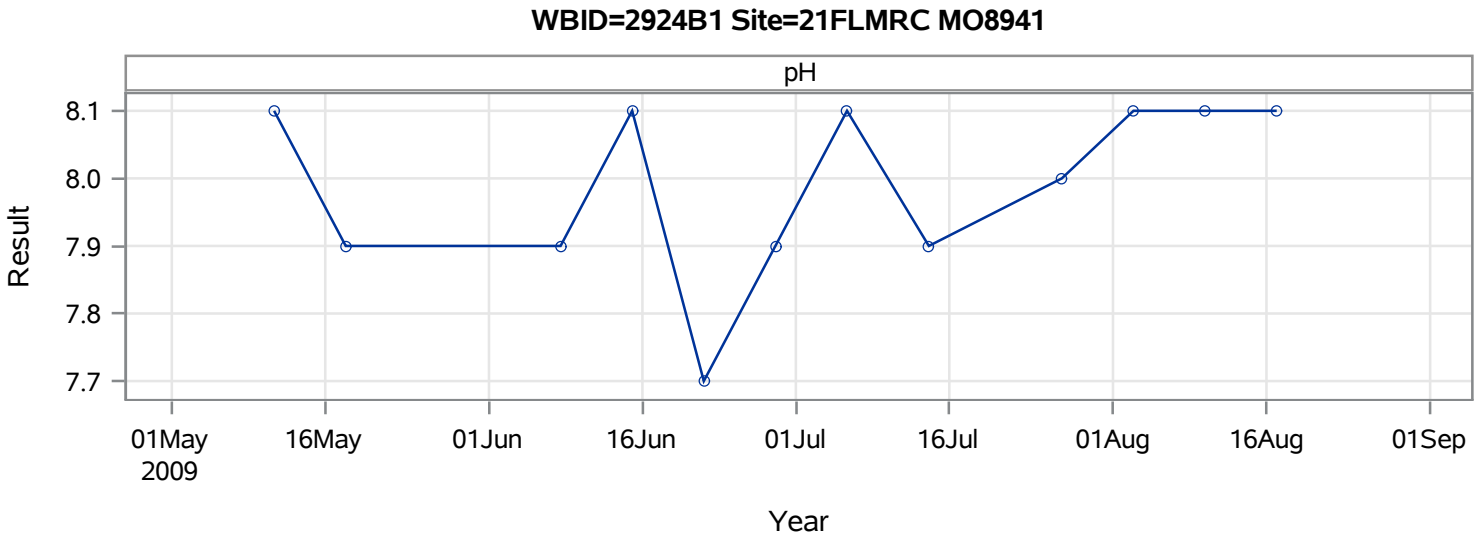

WBID=2924B1 Site=21FLMRC MO8890
Dissolved Oxygen (%)
140
120
100
80
Dissolved Oxygen (mg/L)
8
7
6
5
Salinity (PSU)
40.0
37.5
35.0
32.5
30.0
27.5
Secchi Disk Depth (m)
1.0
0.9
0.8
0.7
0.6
0.5
0.4
Temperature (Degree C)
30
25
20
Result
Apr
2006
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
2007
Year

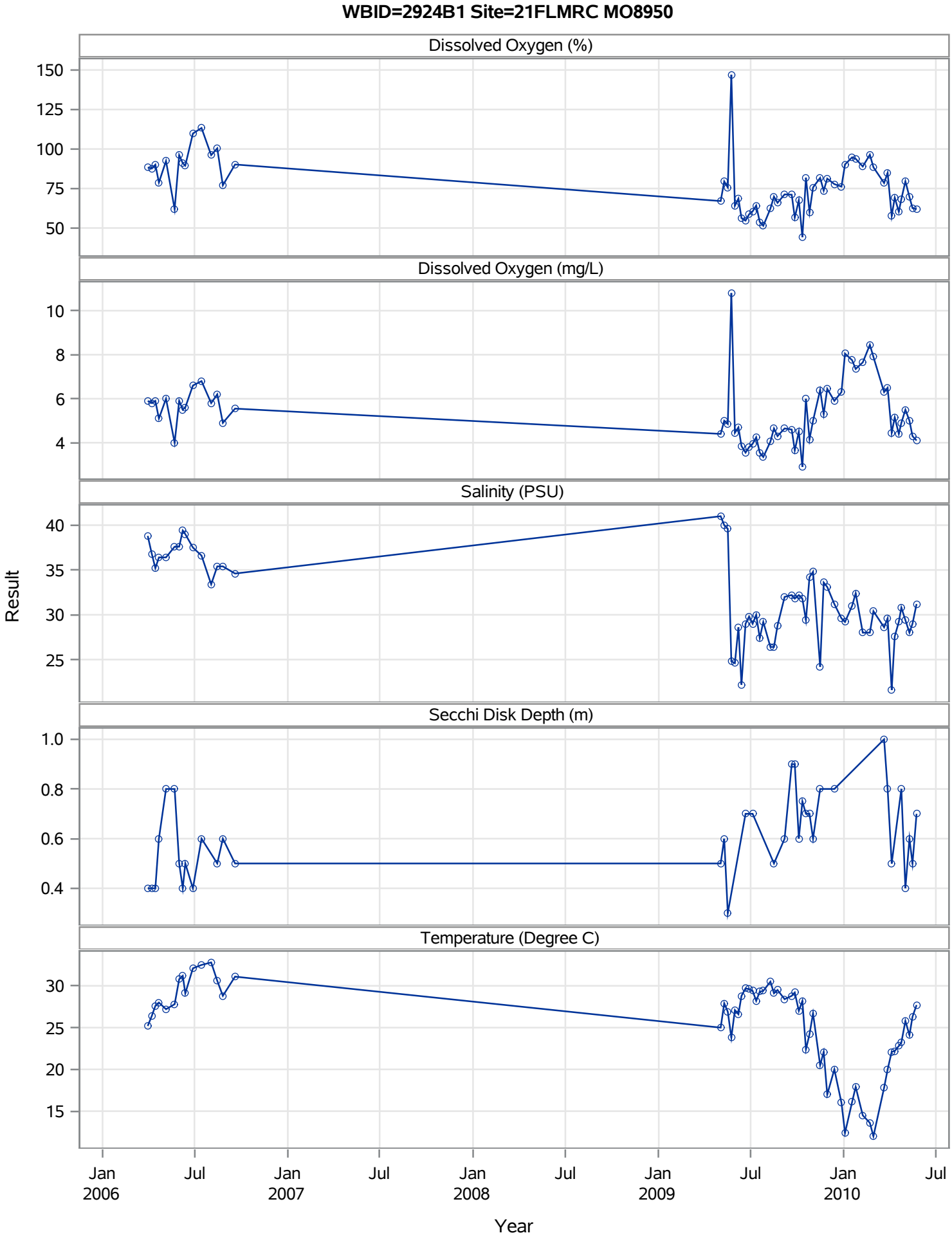

WBID=2924B1 Site=21FLMRC MO8890
pH
Result
8.5
8.4
8.3
8.2
8.1
8.0
Apr
2006
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
2007
Year

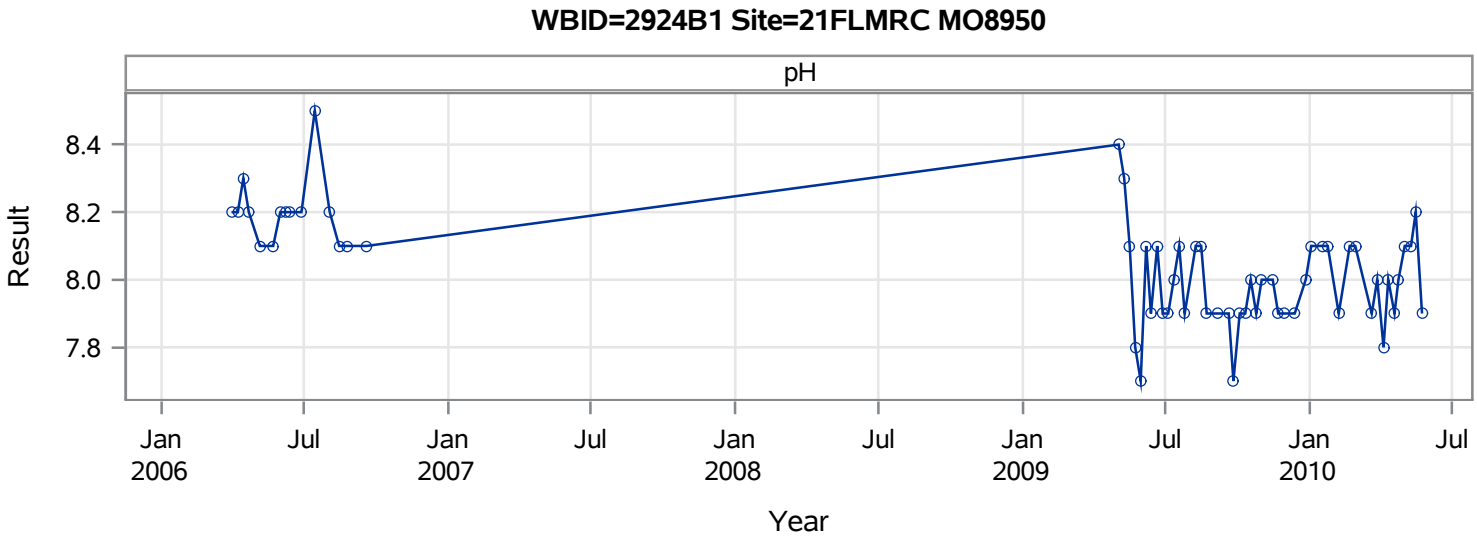

WBID=2924B1 Site=21FLMRC MO8911
Dissolved Oxygen (%)
90
80
70
60
50
Dissolved Oxygen (mg/L)
7
6
5
4
3
Salinity (PSU)
42
40
38
36
34
Secchi Disk Depth (m)
1.3
1.2
1.1
1.0
0.9
0.8
0.7
Temperature (Degree C)
30.0
27.5
25.0
22.5
20.0
17.5
Result
Mar
2006
Apr
May
Jun
Jul
Aug
Sep
Oct
Year

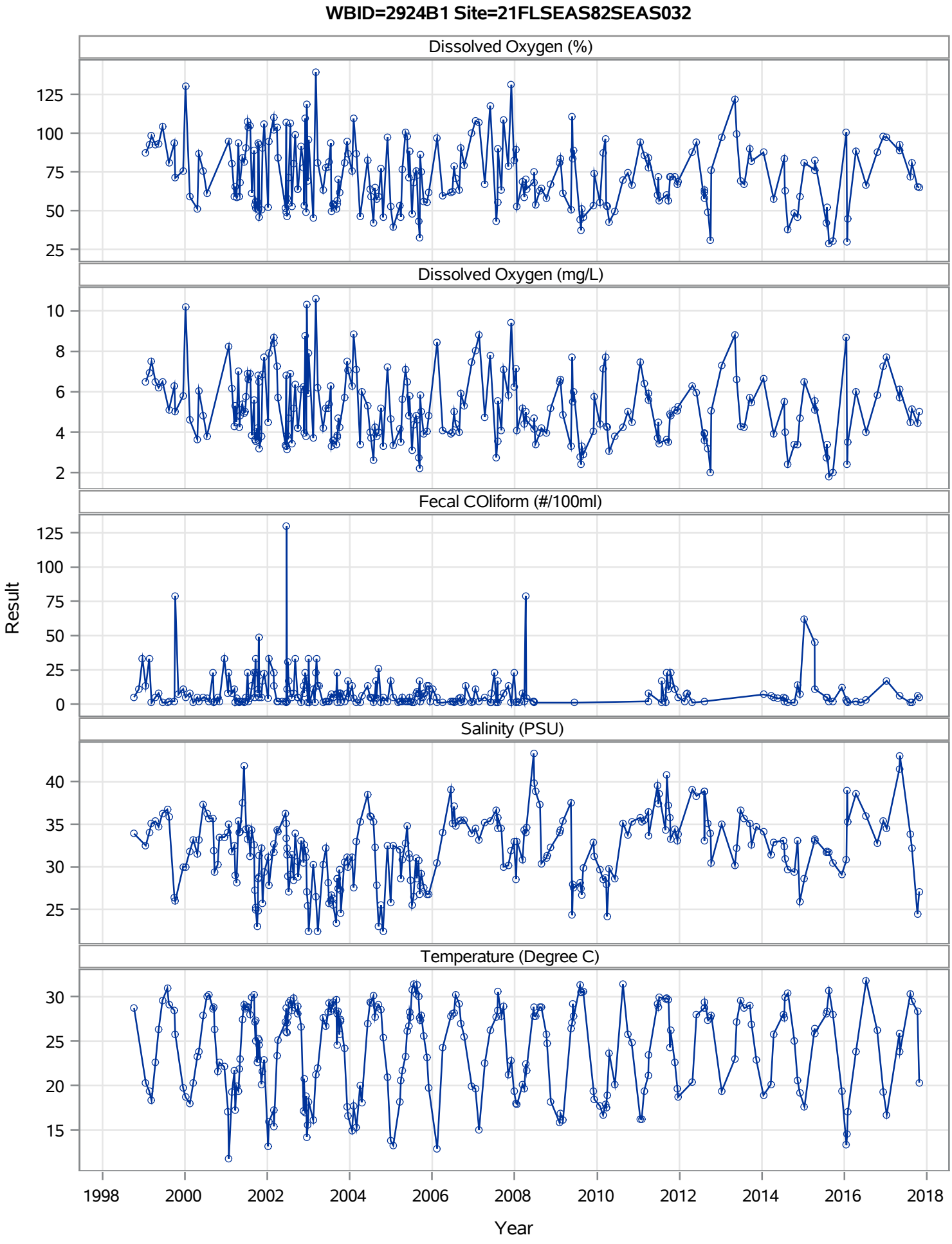

WBID=2924B1 Site=21FLMRC MO8911
pH
Result
8.4
8.3
8.2
8.1
8.0
Mar
2006
Apr
May
Jun
Jul
Aug
Sep
Oct
Year

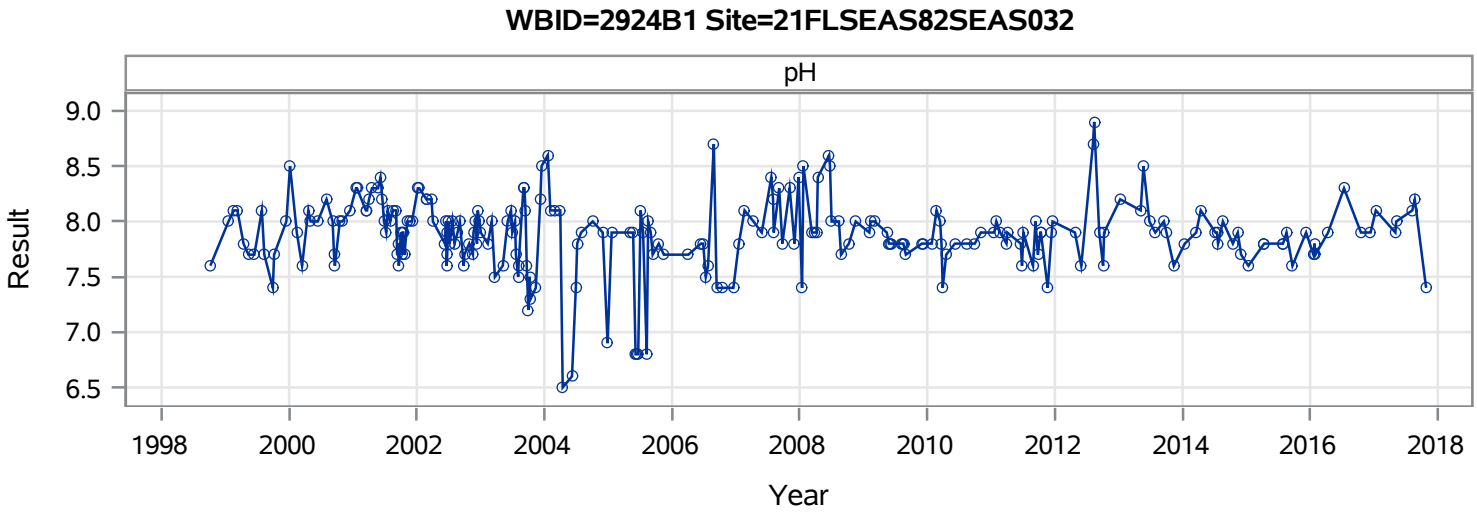

WBID=2924B1 Site=21FLMRC MO8941
Dissolved Oxygen (%)
110
100
90
80
70
60
Dissolved Oxygen (mg/L)
6
5
4
Salinity (PSU)
40
35
30
Secchi Disk Depth (m)
0.9
0.8
0.7
0.6
0.5
Temperature (Degree C)
34
32
30
28
Result
01May
2009
16May
01Jun
16Jun
01Jul
16Jul
01Aug
16Aug
01Sep
Year

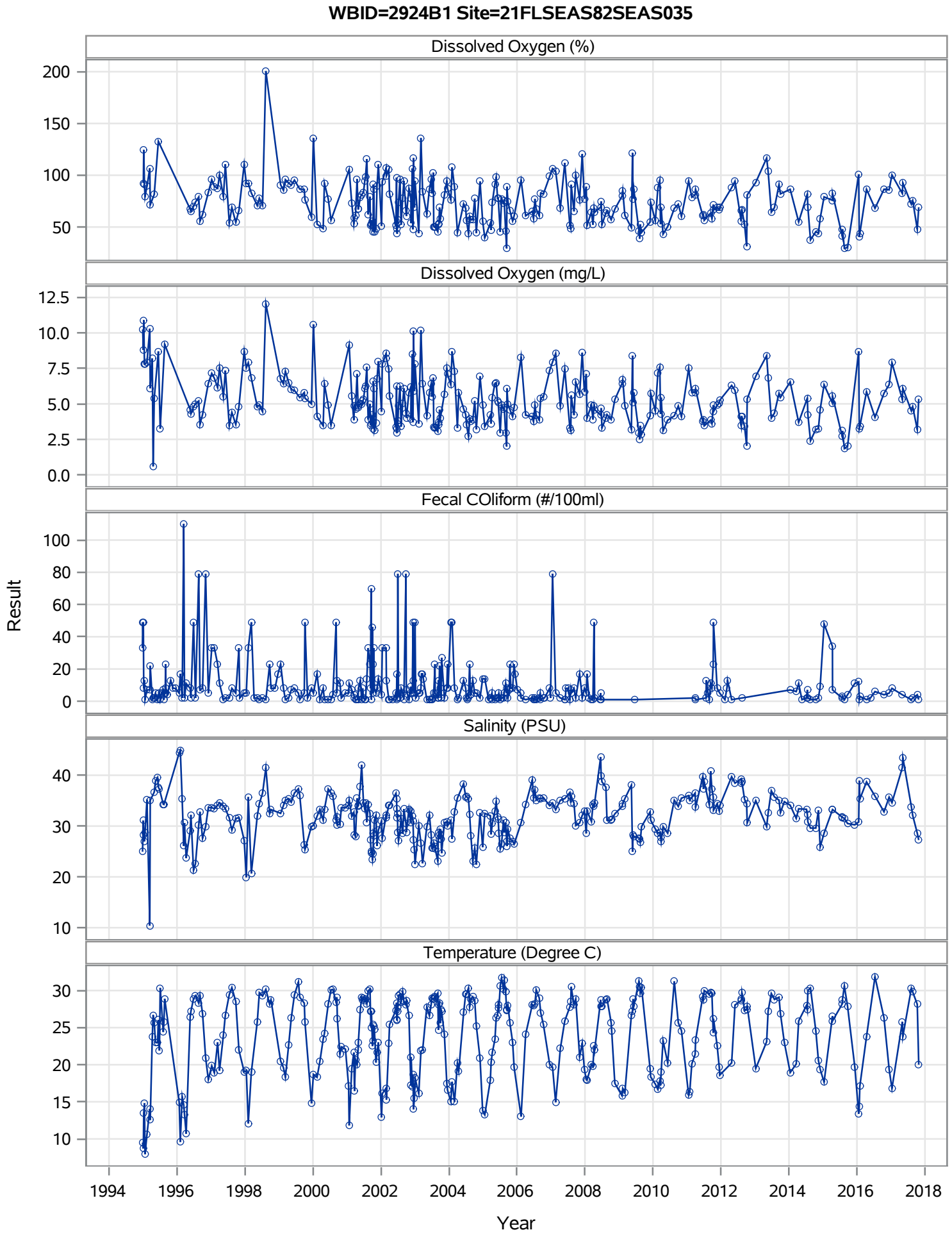

WBID=2924B1 Site=21FLMRC MO8941
pH
Result
8.1
8.0
7.9
7.8
7.7
01May
2009
16May
01Jun
16Jun
01Jul
16Jul
01Aug
16Aug
01Sep
Year

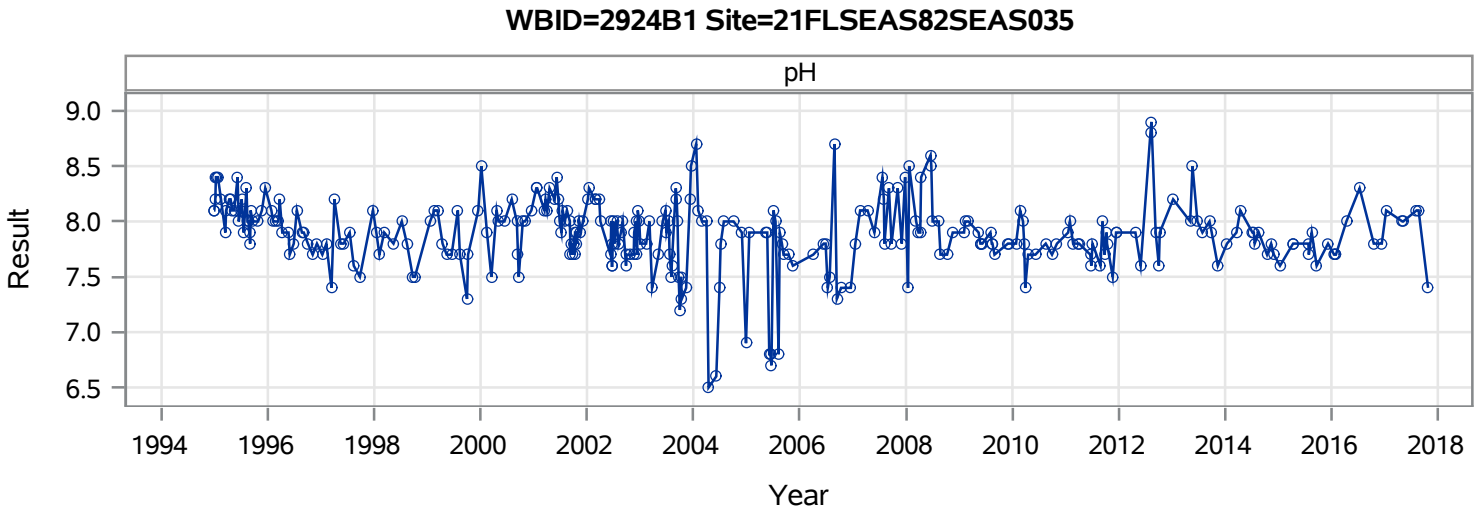

WBID=2924B1 Site=21FLMRC MO8950
Dissolved Oxygen (%)
150
125
100
75
50
Dissolved Oxygen (mg/L)
10
8
6
4
Salinity (PSU)
40
35
30
25
Secchi Disk Depth (m)
1.0
0.8
0.6
0.4
Temperature (Degree C)
30
25
20
15
Result
Jan 2006
Jul
Jan 2007
Jul
Jan 2008
Jul
Jan 2009
Jul
Jan 2010
Jul
Year

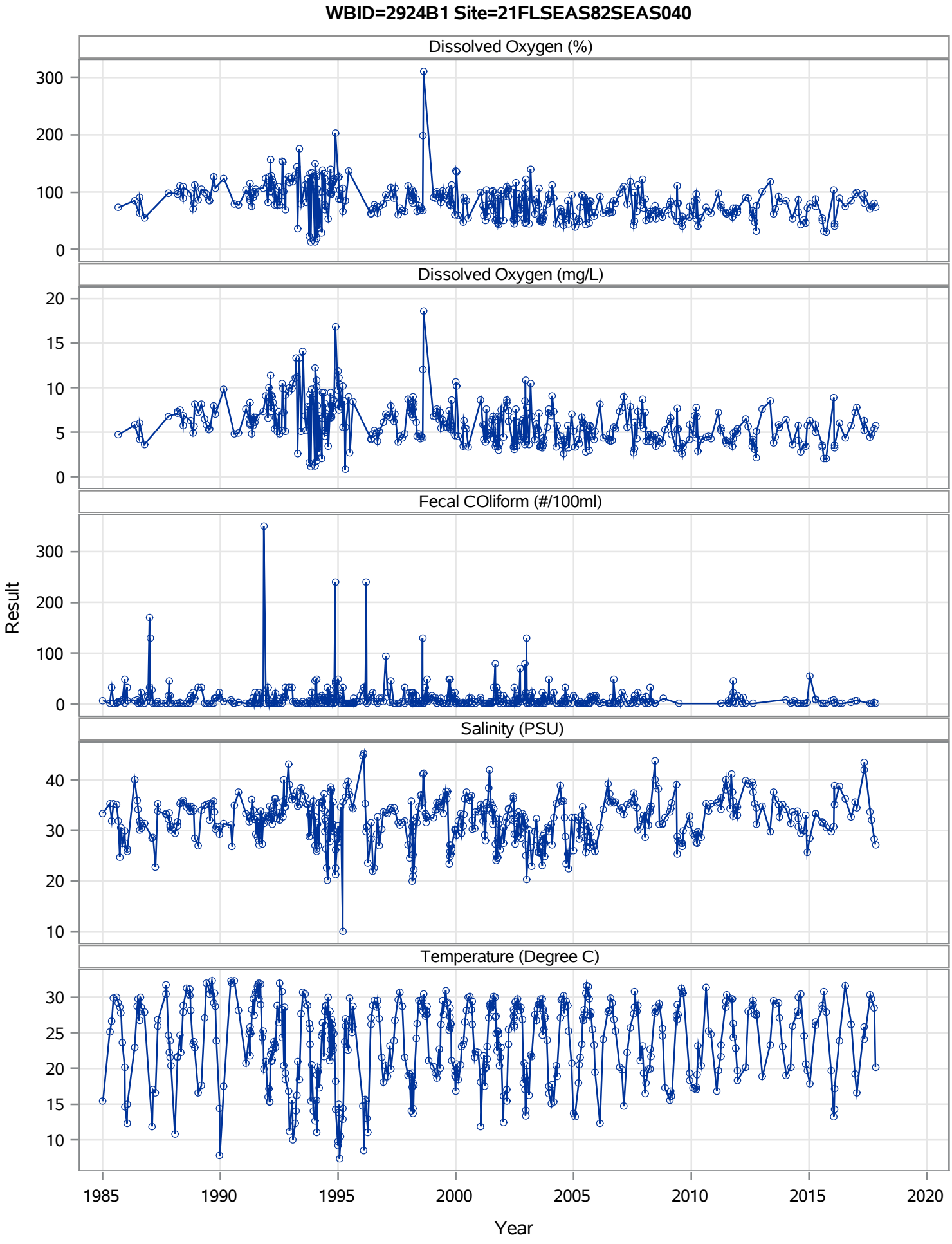

WBID=2924B1 Site=21FLMRC MO8950
pH
Result
8.4
8.2
8.0
7.8
Jan
2006
Jul
Jan
2007
Jul
Jan
2008
Jul
Jan
2009
Jul
Jan
2010
Jul
Year

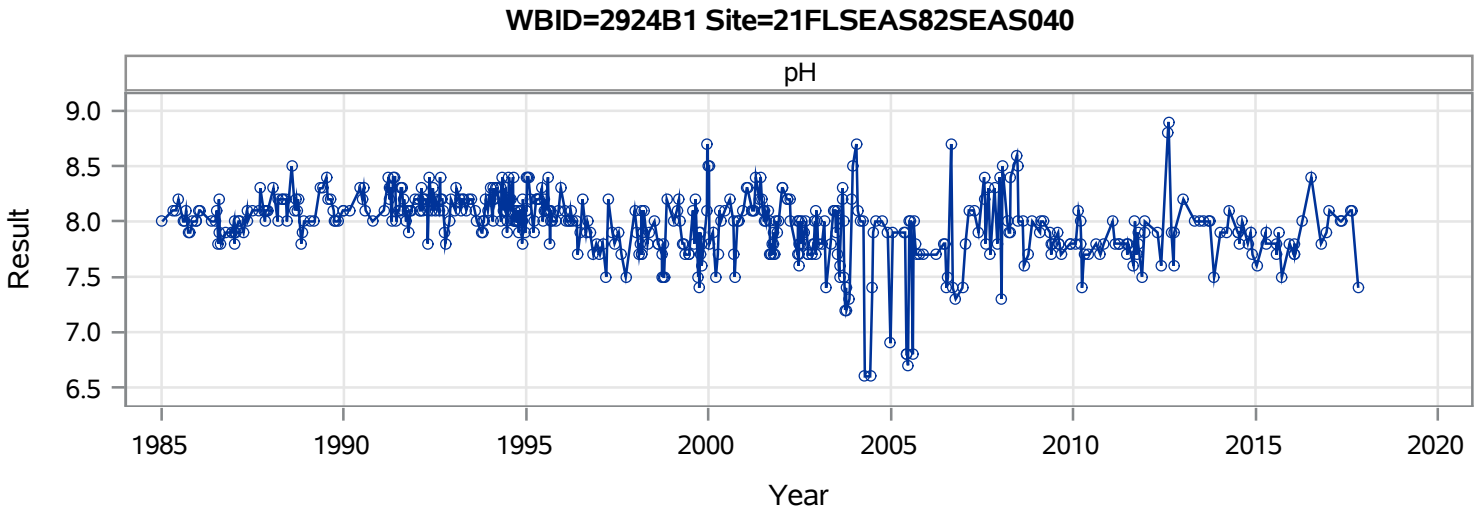

WBID=2924B1 Site=21FLSEAS82SEAS032
Dissolved Oxygen (%)
125
100
75
50
25
Dissolved Oxygen (mg/L)
10
8
6
4
2
Fecal COliform (#/100ml)
125
100
75
50
25
0
Salinity (PSU)
40
35
30
25
Temperature (Degree C)
30
25
20
15
Result
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

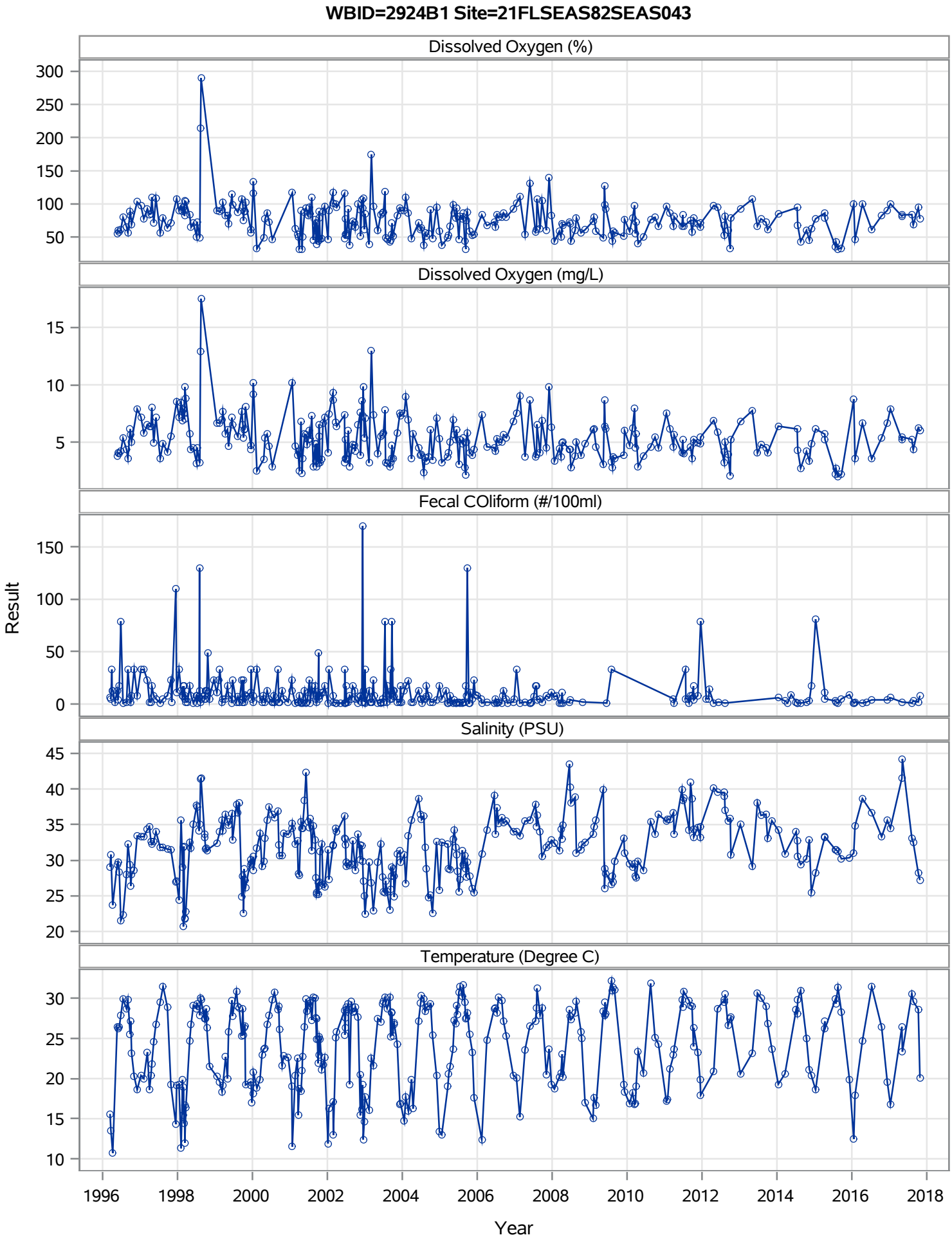

WBID=2924B1 Site=21FLSEAS82SEAS032
pH
Result
9.0
8.5
8.0
7.5
7.0
6.5
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

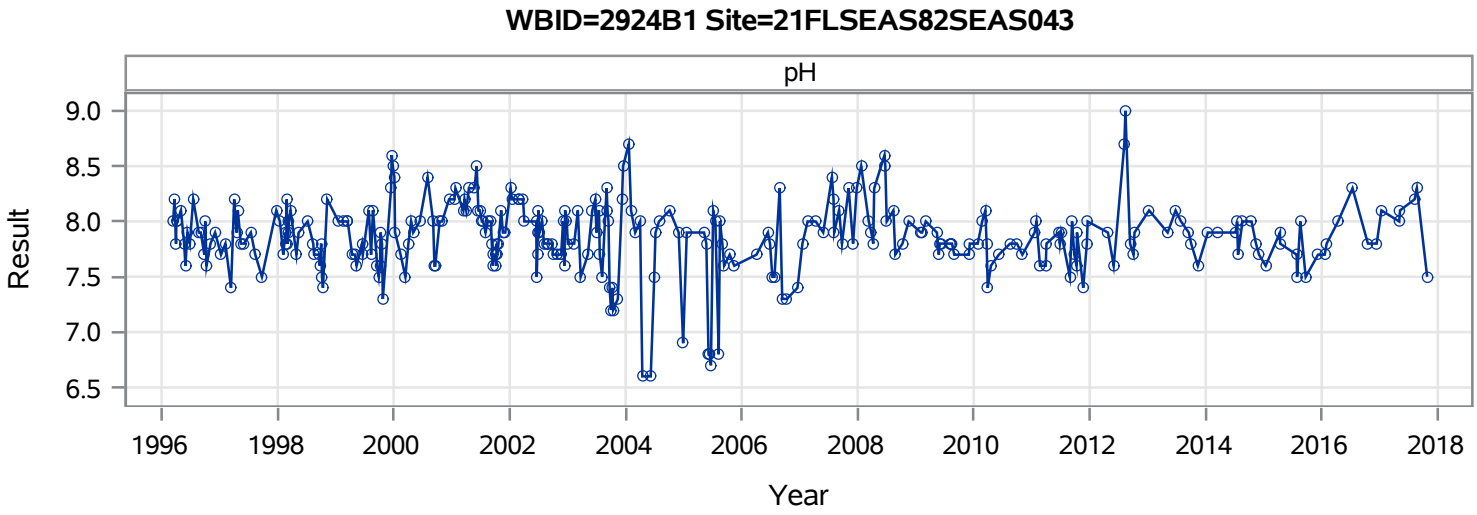

WBID=2924B1 Site=21FLSEAS82SEAS035
Dissolved Oxygen (%)
200
150
100
50
Dissolved Oxygen (mg/L)
12.5
10.0
7.5
5.0
2.5
0.0
Fecal COliform (#/100ml)
100
80
60
40
20
0
Salinity (PSU)
40
30
20
10
Temperature (Degree C)
30
25
20
15
10
Result
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

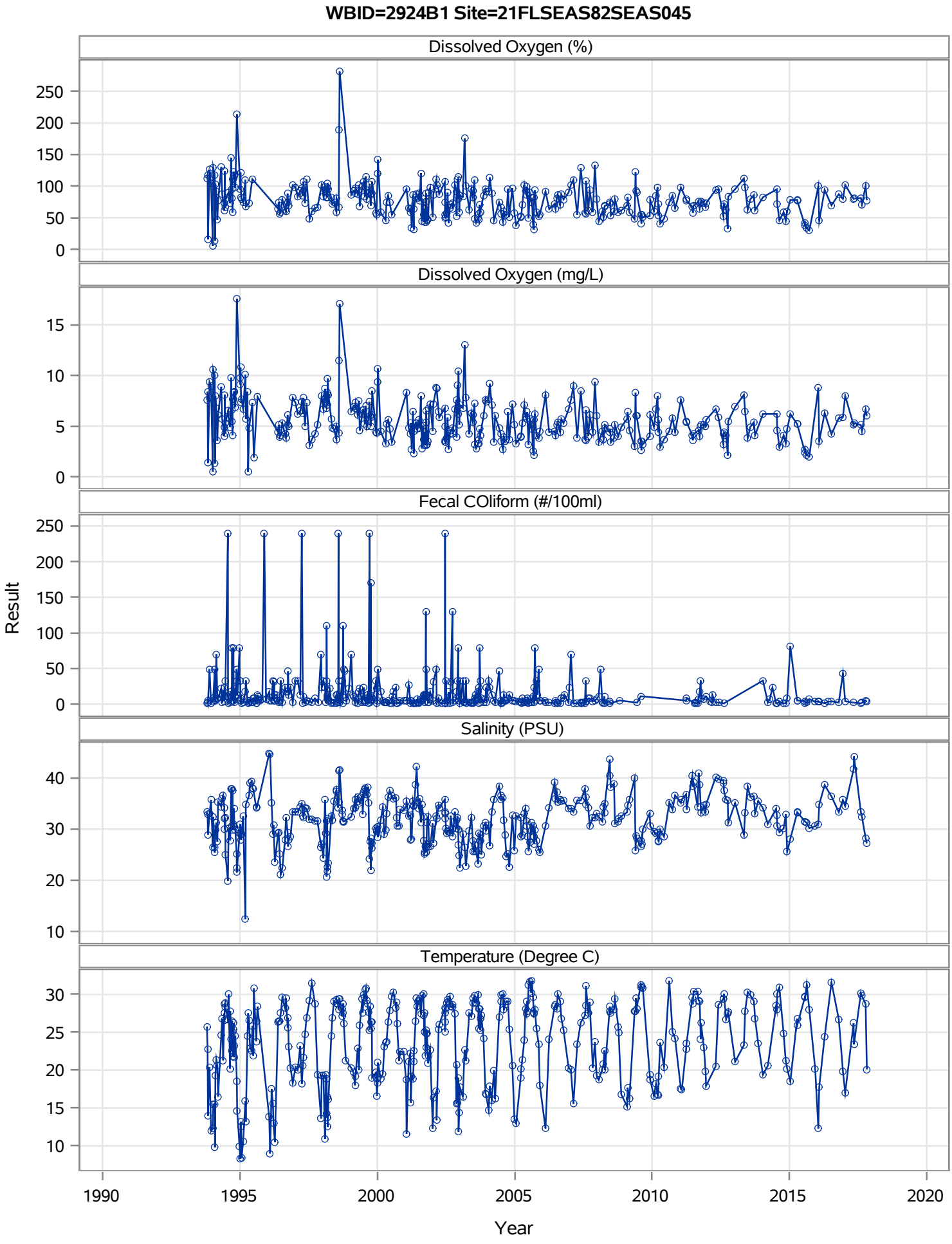

WBID=2924B1 Site=21FLSEAS82SEAS035
pH
Result
9.0
8.5
8.0
7.5
7.0
6.5
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

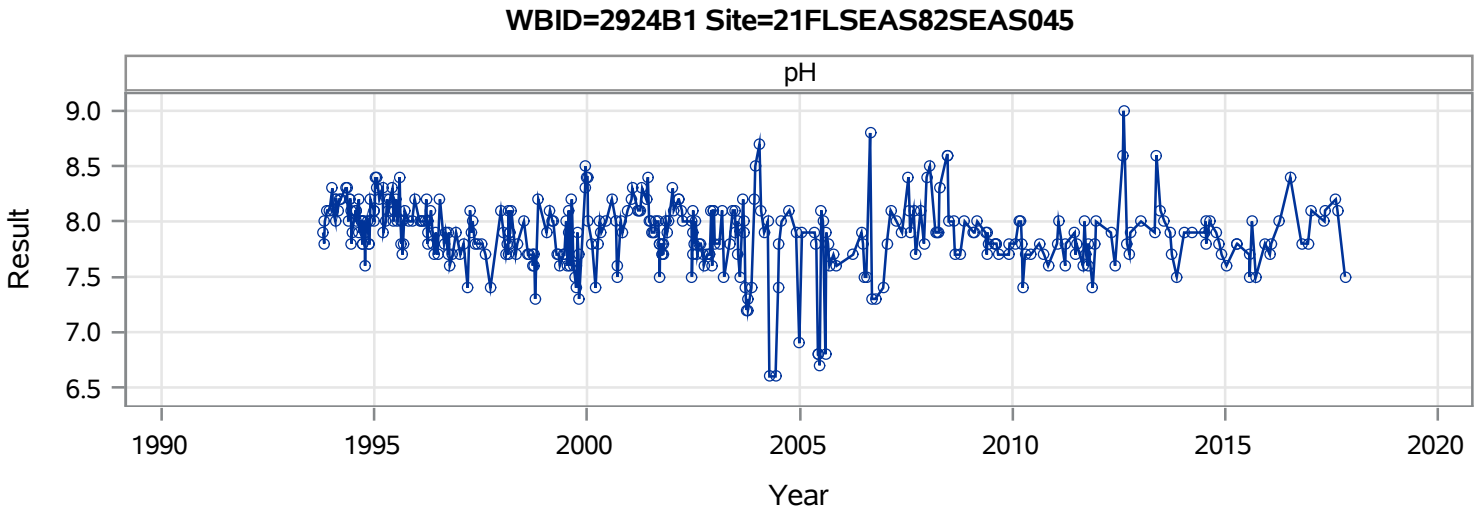

WBID=2924B1 Site=21FLSEAS82SEAS040
Dissolved Oxygen (%)
300
200
100
0
Dissolved Oxygen (mg/L)
20
15
10
5
0
Fecal COliform (#/100ml)
300
200
100
0
Result
Salinity (PSU)
40
30
20
10
Temperature (Degree C)
30
25
20
15
10
1985
1990
1995
2000
2005
2010
2015
2020
Year

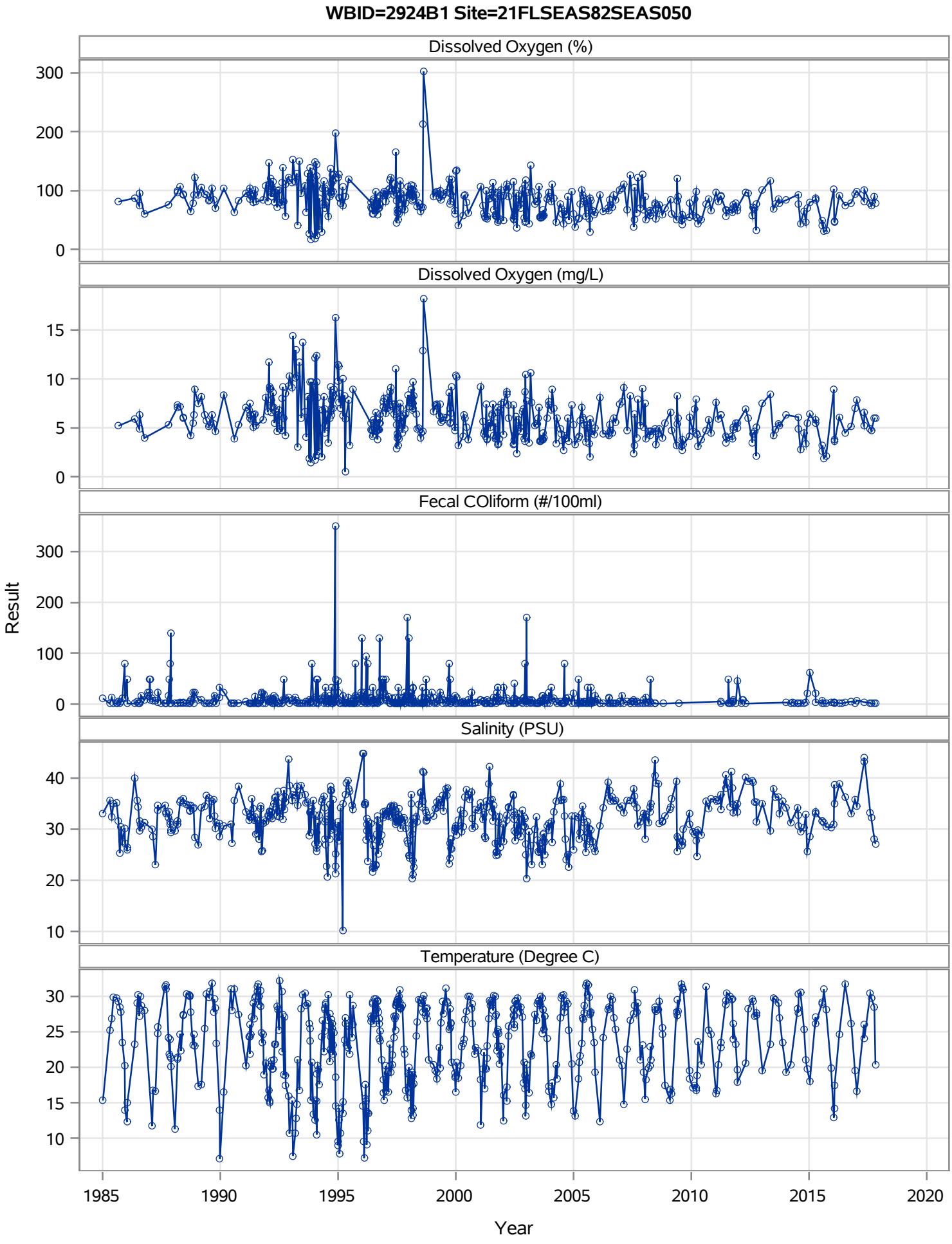

WBID=2924B1 Site=21FLSEAS82SEAS040
pH
Result
9.0
8.5
8.0
7.5
7.0
6.5
1985
1990
1995
2000
2005
2010
2015
2020
Year

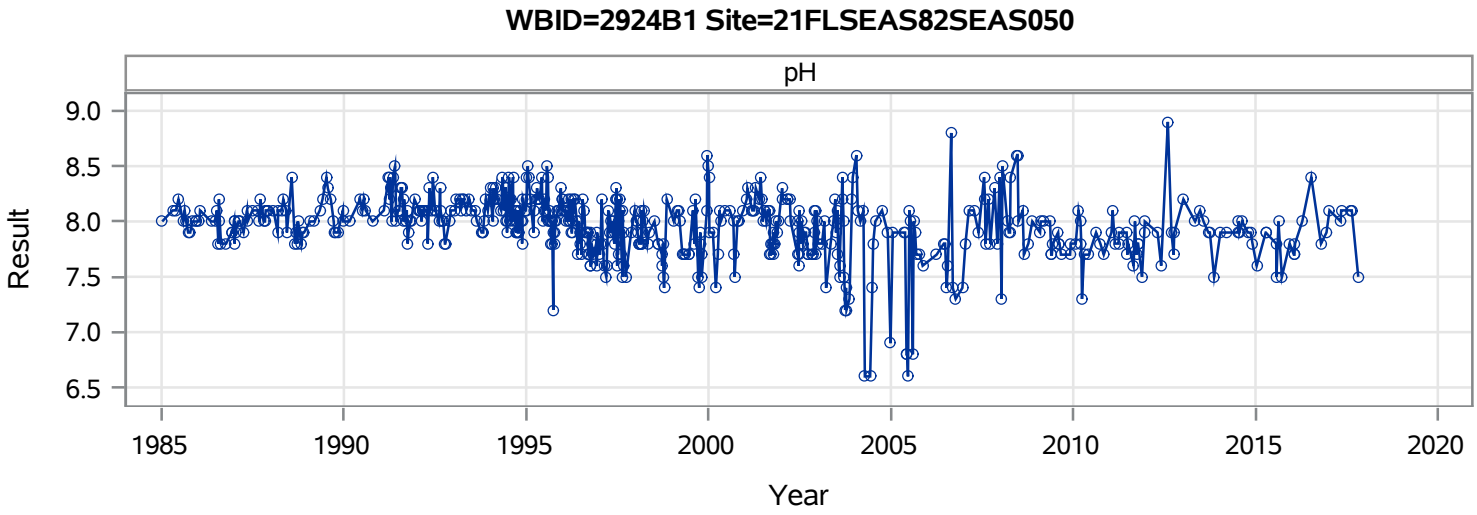

WBID=2924B1 Site=21FLSEAS82SEAS043
Dissolved Oxygen (%)
300
250
200
150
100
50
Dissolved Oxygen (mg/L)
15
10
5
Fecal COliform (#/100ml)
150
100
50
0
Result
Salinity (PSU)
45
40
35
30
25
20
Temperature (Degree C)
30
25
20
15
10
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

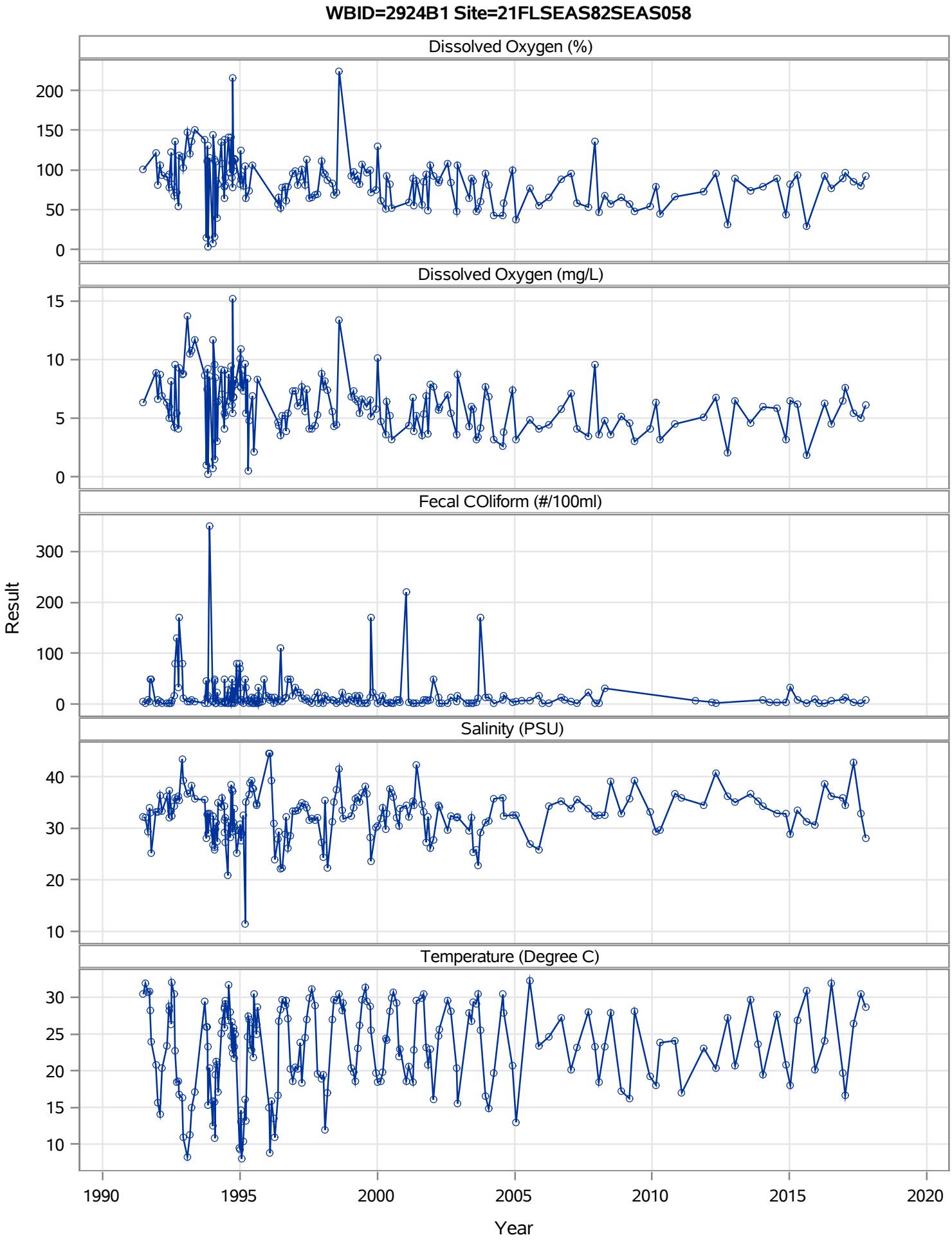

WBID=2924B1 Site=21FLSEAS82SEAS043
pH
Result
9.0
8.5
8.0
7.5
7.0
6.5
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

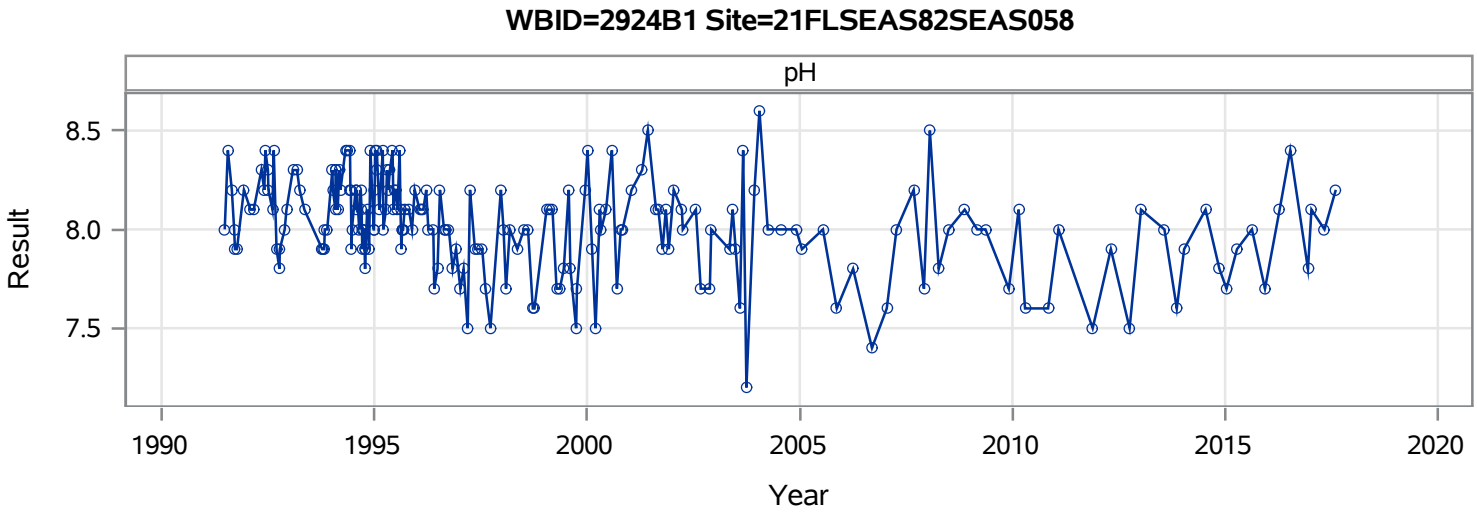

WBID=2924B1 Site=21FLSEAS82SEAS045
Dissolved Oxygen (%)
250
200
150
100
50
0
Dissolved Oxygen (mg/L)
15
10
5
0
Fecal COliform (#/100ml)
250
200
150
100
50
0
Salinity (PSU)
40
30
20
10
Temperature (Degree C)
30
25
20
15
10
Result
1990
1995
2000
2005
2010
2015
2020
Year

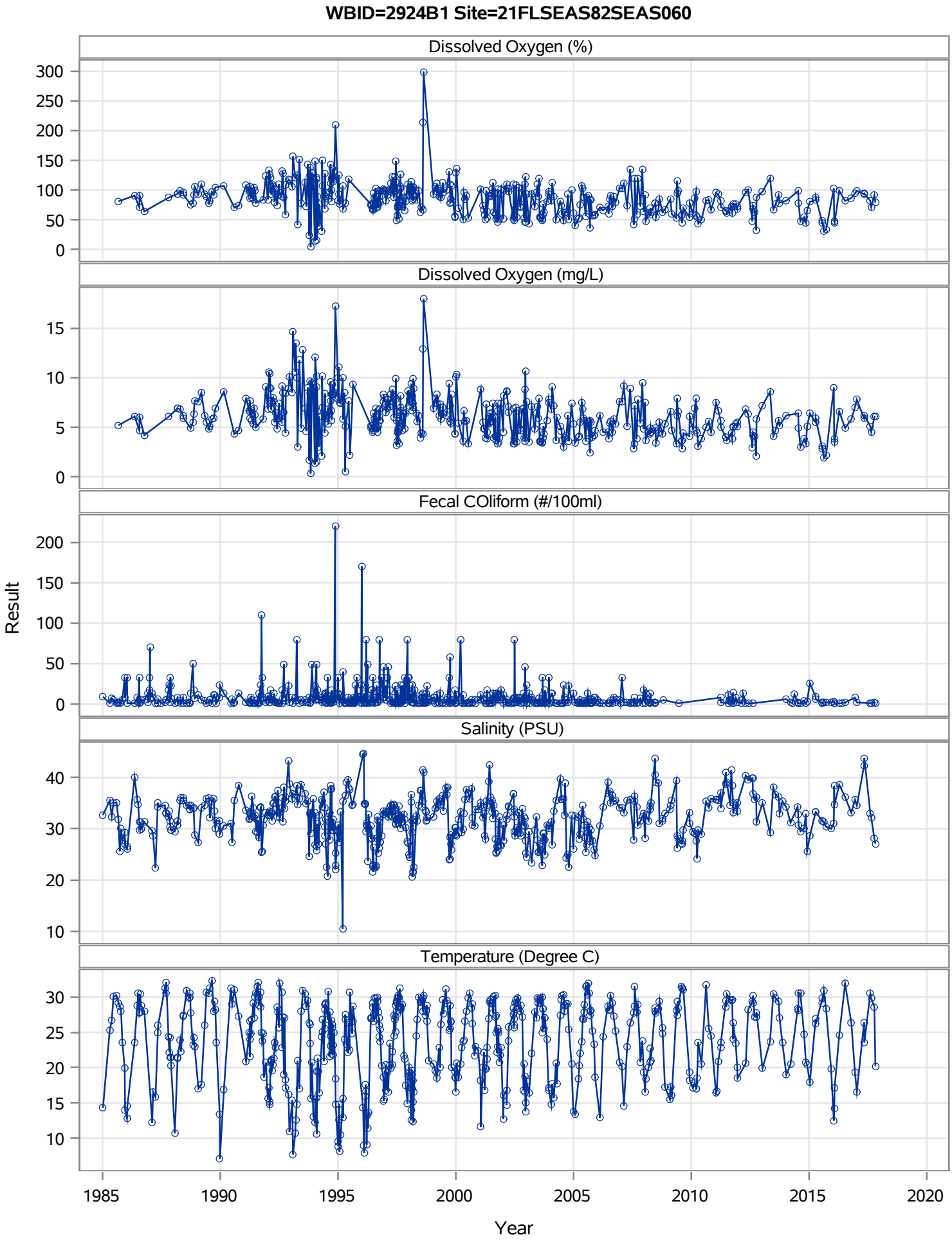

WBID=2924B1 Site=21FLSEAS82SEAS045
pH
Result
9.0
8.5
8.0
7.5
7.0
6.5
1990
1995
2000
2005
2010
2015
2020
Year

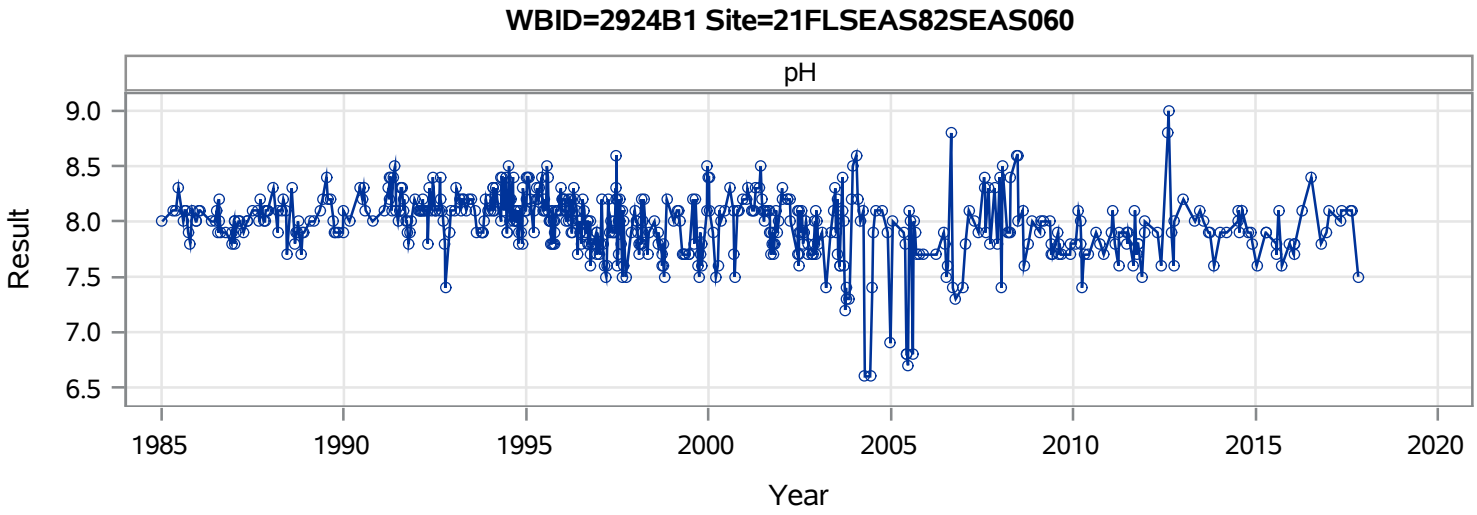

WBID=2924B1 Site=21FLSEAS82SEAS050
Dissolved Oxygen (%)
300
200
100
0
Dissolved Oxygen (mg/L)
15
10
5
0
Fecal COliform (#/100ml)
300
200
100
0
Result
Salinity (PSU)
40
30
20
10
Temperature (Degree C)
30
25
20
15
10
1985
1990
1995
2000
2005
2010
2015
2020
Year

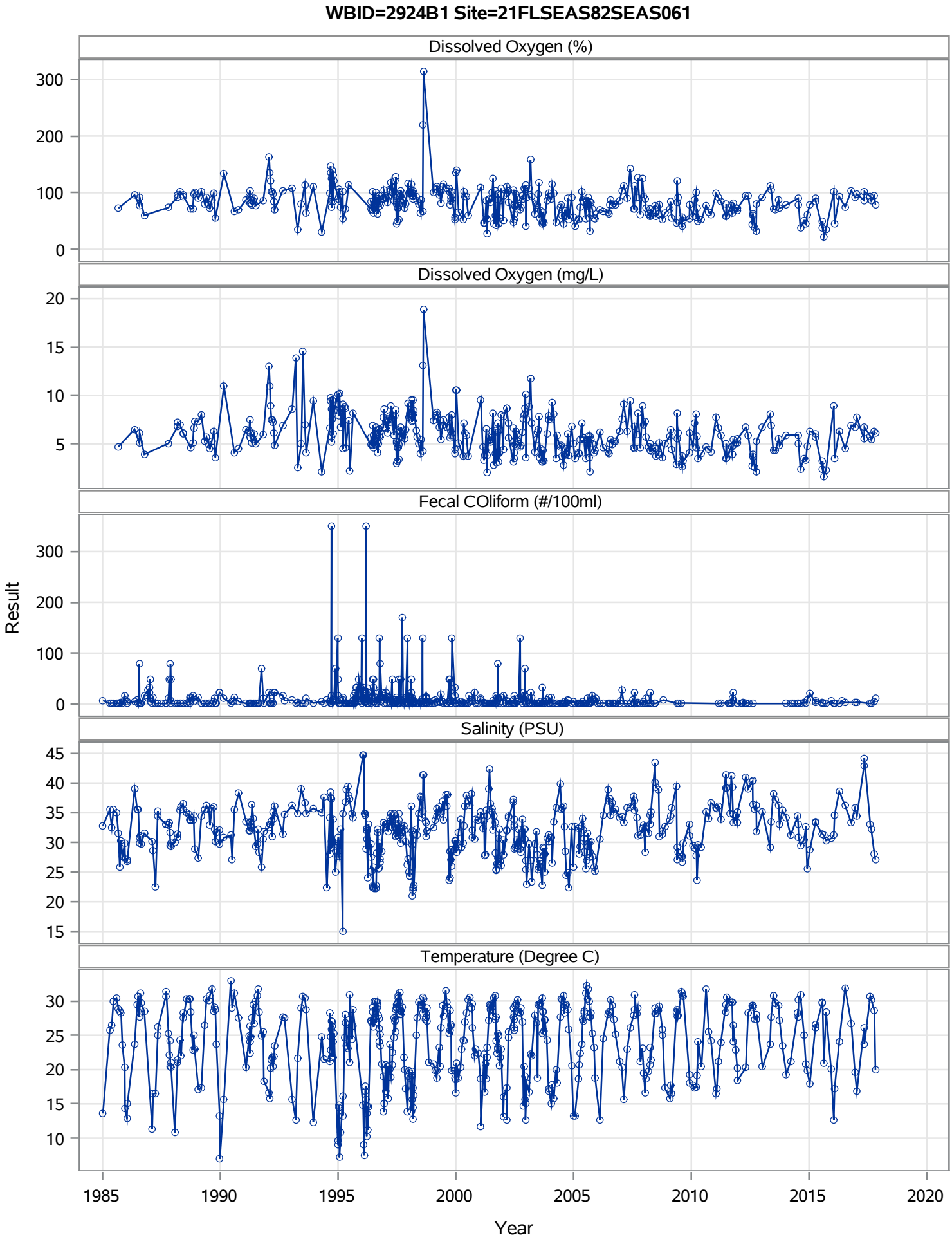

WBID=2924B1 Site=21FLSEAS82SEAS050
pH
Result
9.0
8.5
8.0
7.5
7.0
6.5
1985
1990
1995
2000
2005
2010
2015
2020
Year

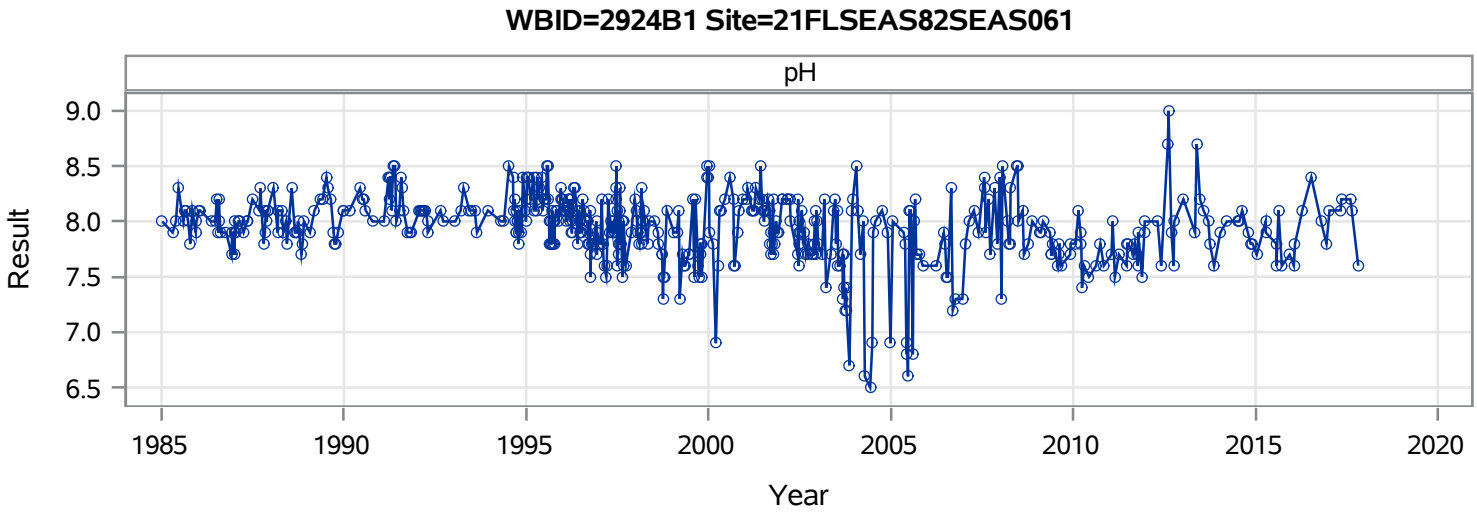

WBID=2924B1 Site=21FLSEAS82SEAS058
Dissolved Oxygen (%)
Dissolved Oxygen (mg/L)
Fecal COliform (#/100ml)
Salinity (PSU)
Temperature (Degree C)
Result
Year
1990
1995
2000
2005
2010
2015
2020

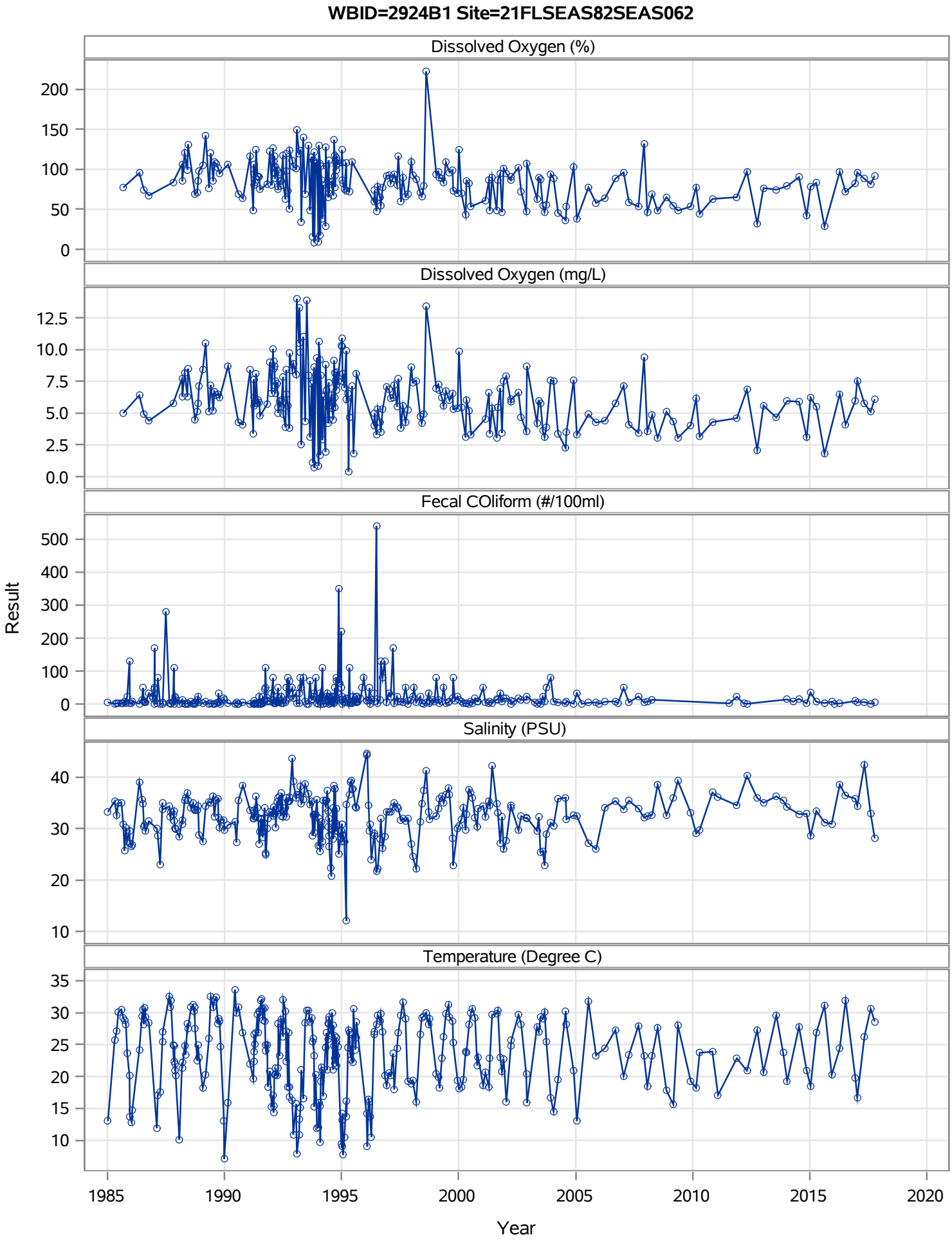

WBID=2924B1 Site=21FLSEAS82SEAS058
pH
Result
8.5
8.0
7.5
1990
1995
2000
2005
2010
2015
2020
Year

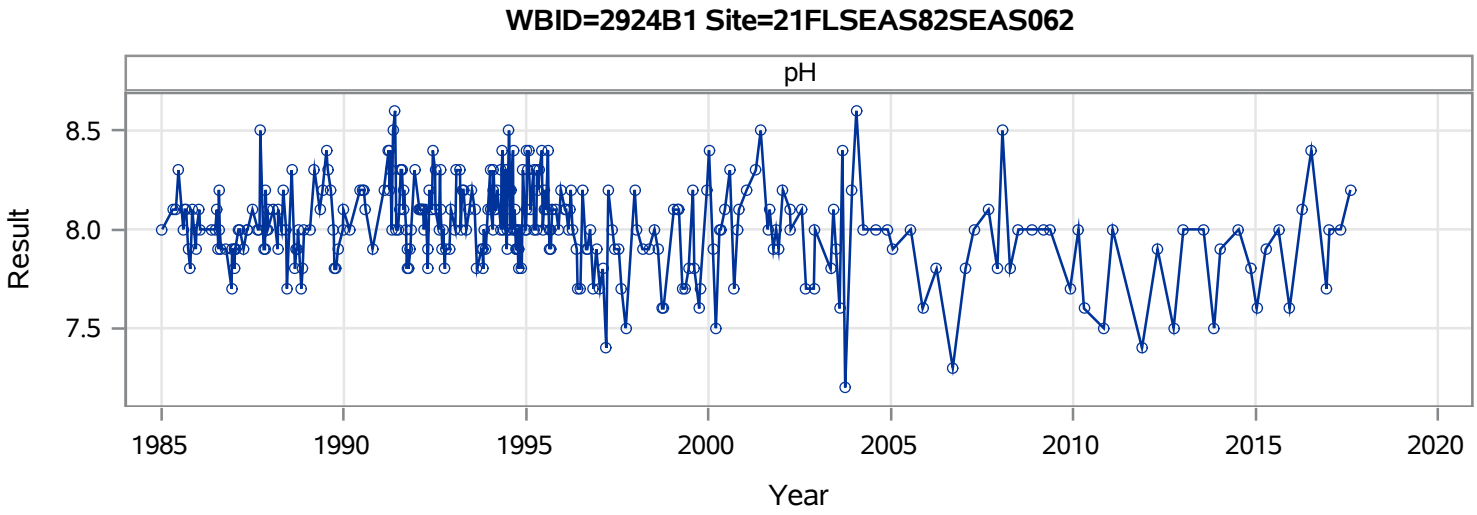

WBID=2924B1 Site=21FLSEAS82SEAS060
Dissolved Oxygen (%)
300
250
200
150
100
50
0
Dissolved Oxygen (mg/L)
15
10
5
0
Fecal COliform (#/100ml)
200
150
100
50
0
Salinity (PSU)
40
30
20
10
Temperature (Degree C)
30
25
20
15
10
Result
1985
1990
1995
2000
2005
2010
2015
2020
Year

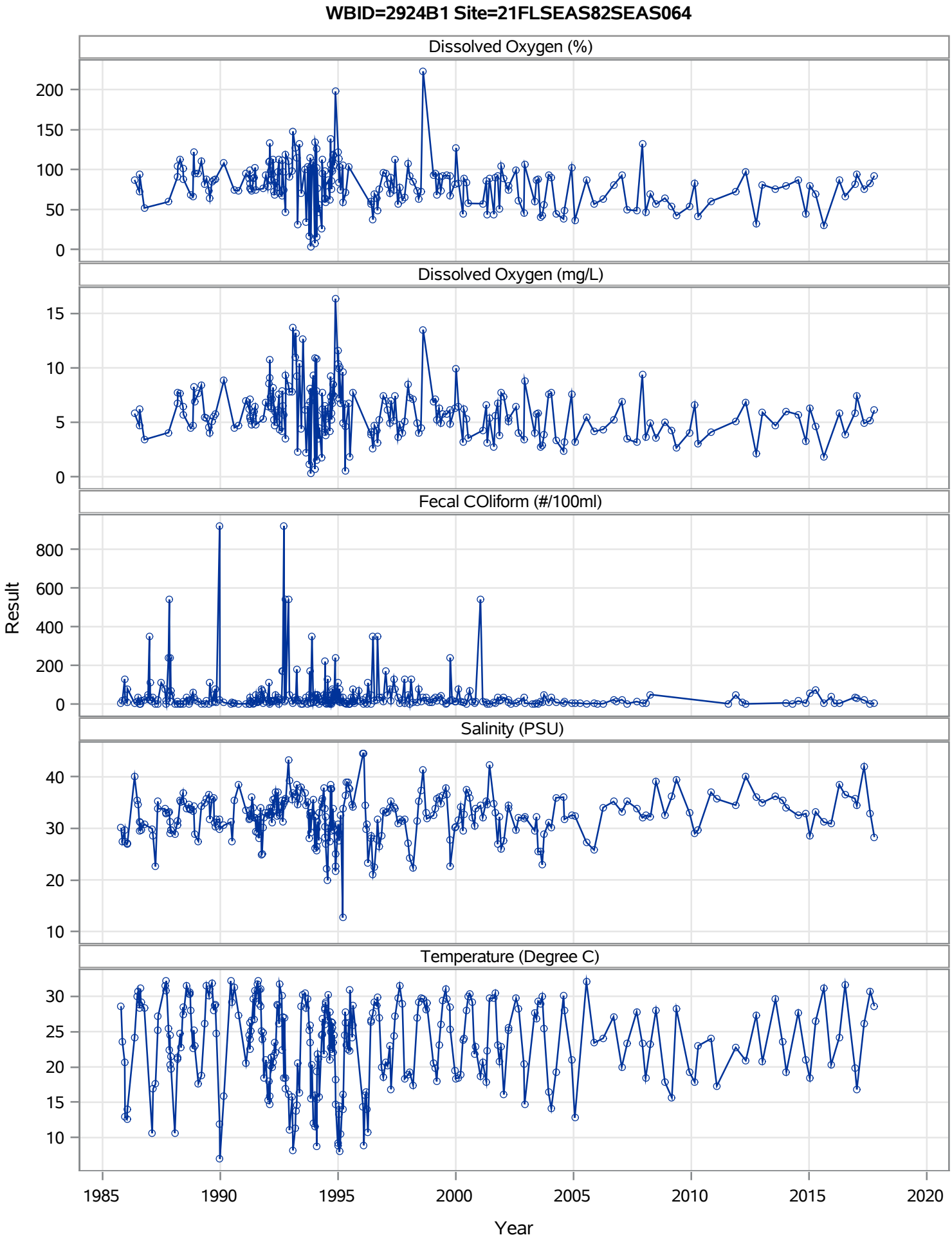

WBID=2924B1 Site=21FLSEAS82SEAS060
pH
Result
9.0
8.5
8.0
7.5
7.0
6.5
1985
1990
1995
2000
2005
2010
2015
2020
Year

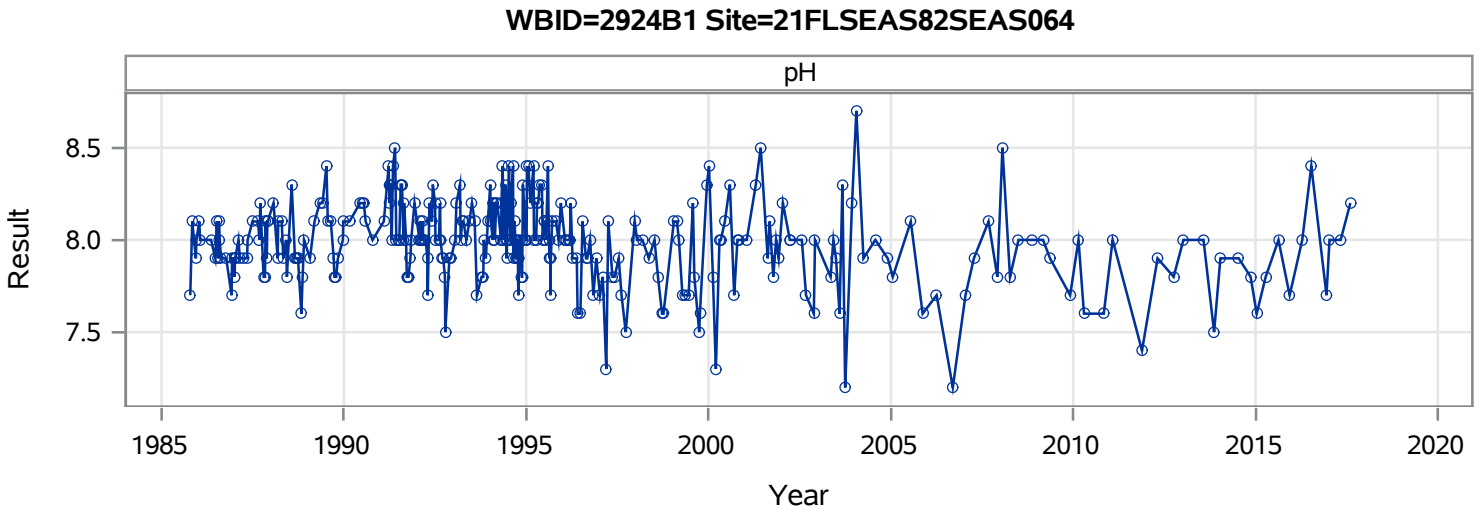

WBID=2924B1 Site=21FLSEAS82SEAS061
Dissolved Oxygen (%)
300
200
100
0
Dissolved Oxygen (mg/L)
20
15
10
5
Fecal COliform (#/100ml)
300
200
100
0
Result
Salinity (PSU)
45
40
35
30
25
20
15
Temperature (Degree C)
30
25
20
15
10
1985
1990
1995
2000
2005
2010
2015
2020
Year

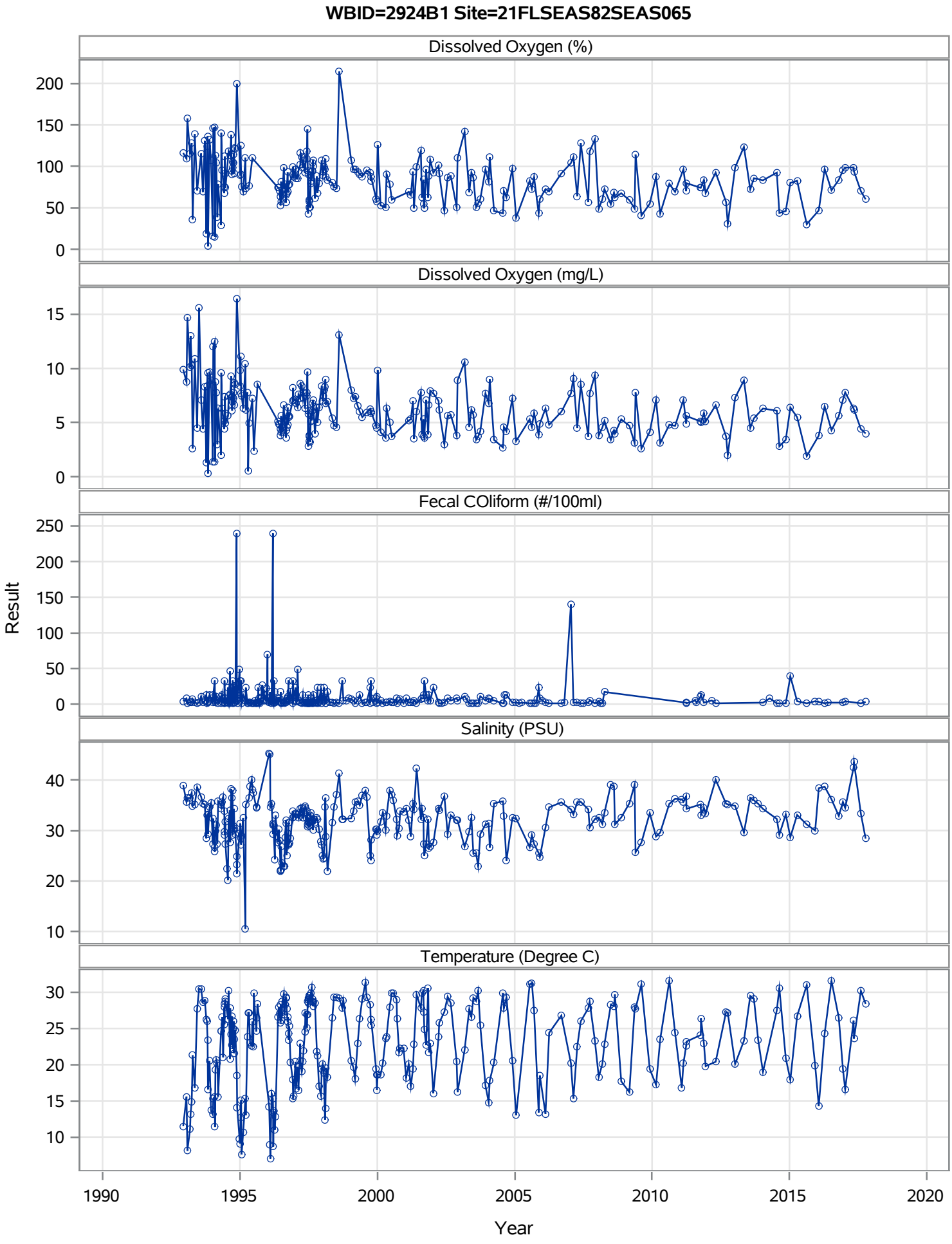

WBID=2924B1 Site=21FLSEAS82SEAS061
pH
Result
9.0
8.5
8.0
7.5
7.0
6.5
1985
1990
1995
2000
2005
2010
2015
2020
Year

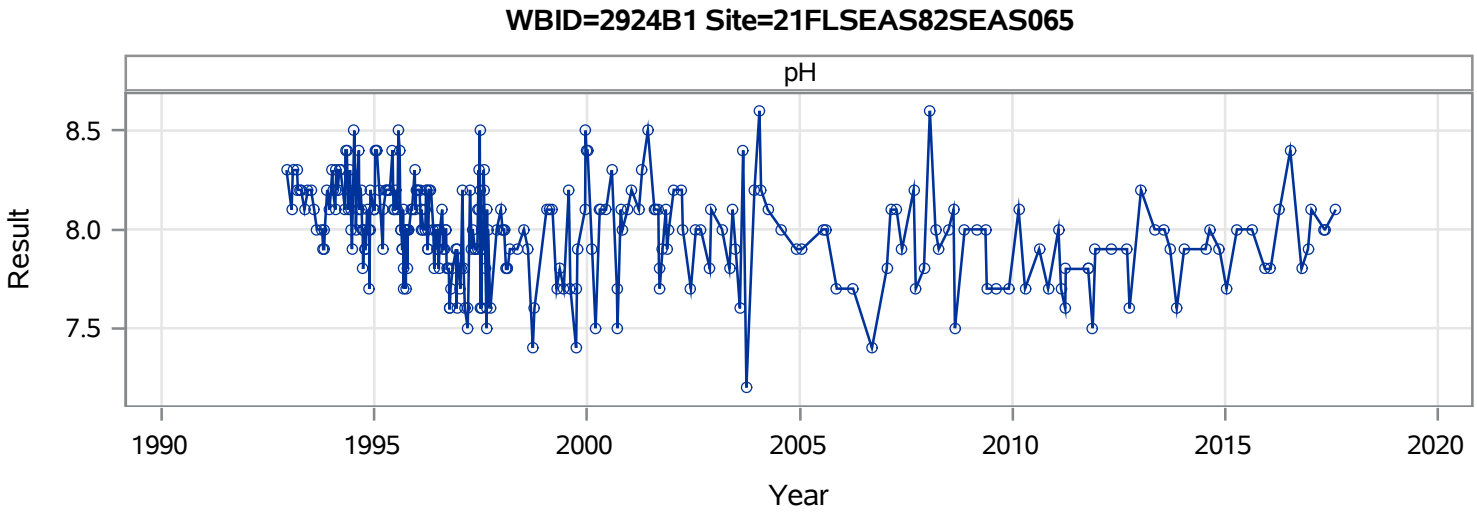

WBID=2924B1 Site=21FLSEAS82SEAS062
Dissolved Oxygen (%)
200
150
100
50
0
Dissolved Oxygen (mg/L)
12.5
10.0
7.5
5.0
2.5
0.0
Fecal COliform (#/100ml)
500
400
300
200
100
0
Salinity (PSU)
40
30
20
10
Temperature (Degree C)
35
30
25
20
15
10
Result
1985
1990
1995
2000
2005
2010
2015
2020
Year

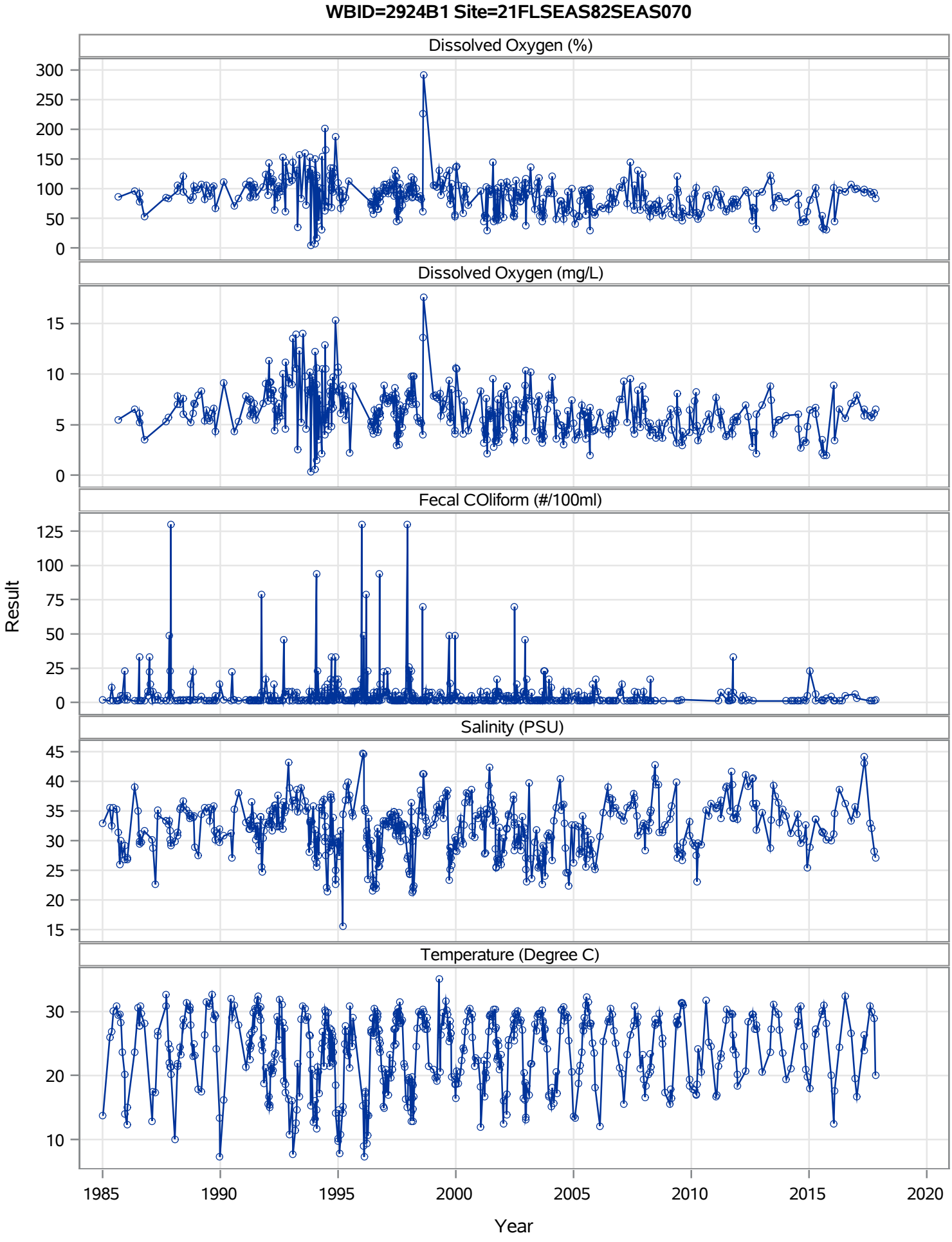

WBID=2924B1 Site=21FLSEAS82SEAS062
pH
Result
8.5
8.0
7.5
1985
1990
1995
2000
2005
2010
2015
2020
Year

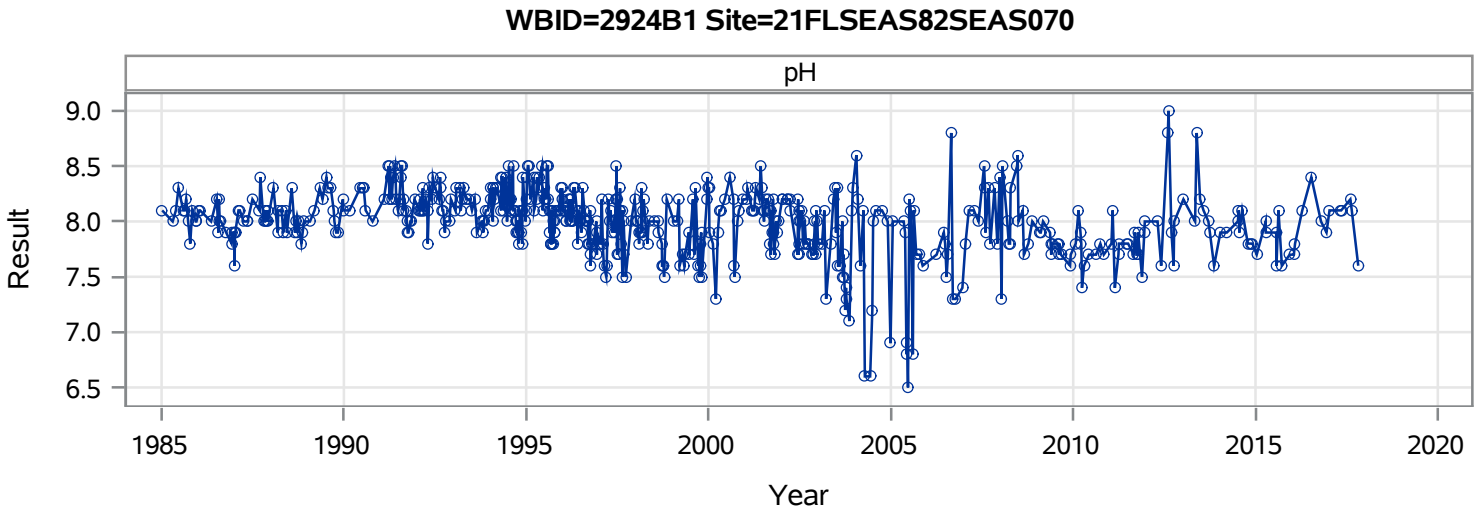

WBID=2924B1 Site=21FLSEAS82SEAS064
Dissolved Oxygen (%)
200
150
100
50
0
Dissolved Oxygen (mg/L)
15
10
5
0
Fecal COliform (#/100ml)
800
600
400
200
0
Result
Salinity (PSU)
40
30
20
10
Temperature (Degree C)
30
25
20
15
10
1985
1990
1995
2000
2005
2010
2015
2020
Year

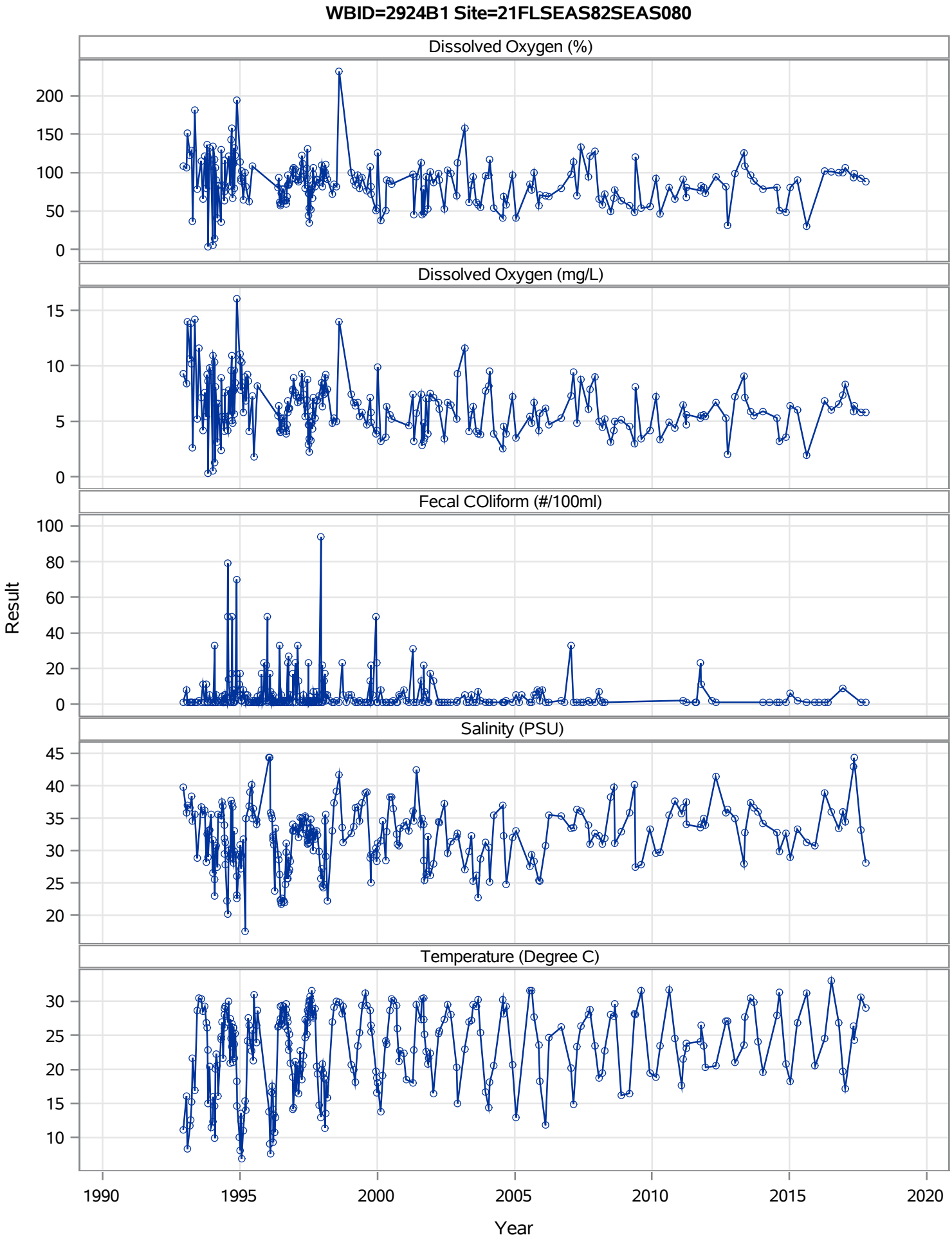

WBID=2924B1 Site=21FLSEAS82SEAS064
pH
Result
8.5
8.0
7.5
1985
1990
1995
2000
2005
2010
2015
2020
Year

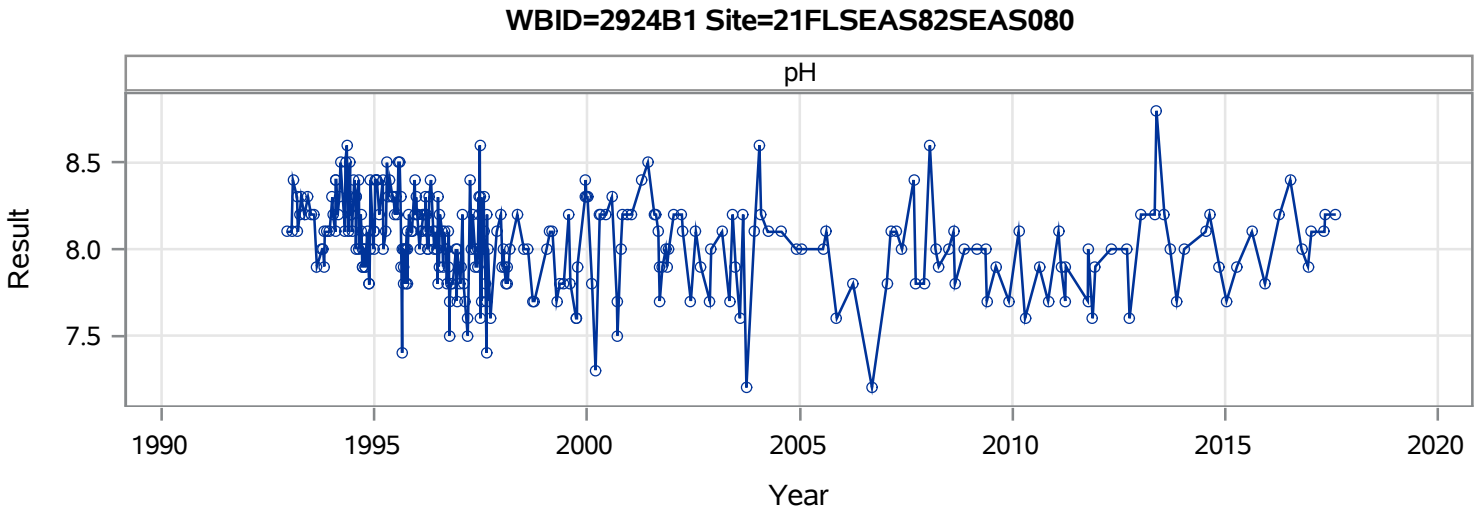

WBID=2924B1 Site=21FLSEAS82SEAS065
Dissolved Oxygen (%)
Dissolved Oxygen (mg/L)
Fecal COliform (#/100ml)
Salinity (PSU)
Temperature (Degree C)
Result
Year
1990
1995
2000
2005
2010
2015
2020

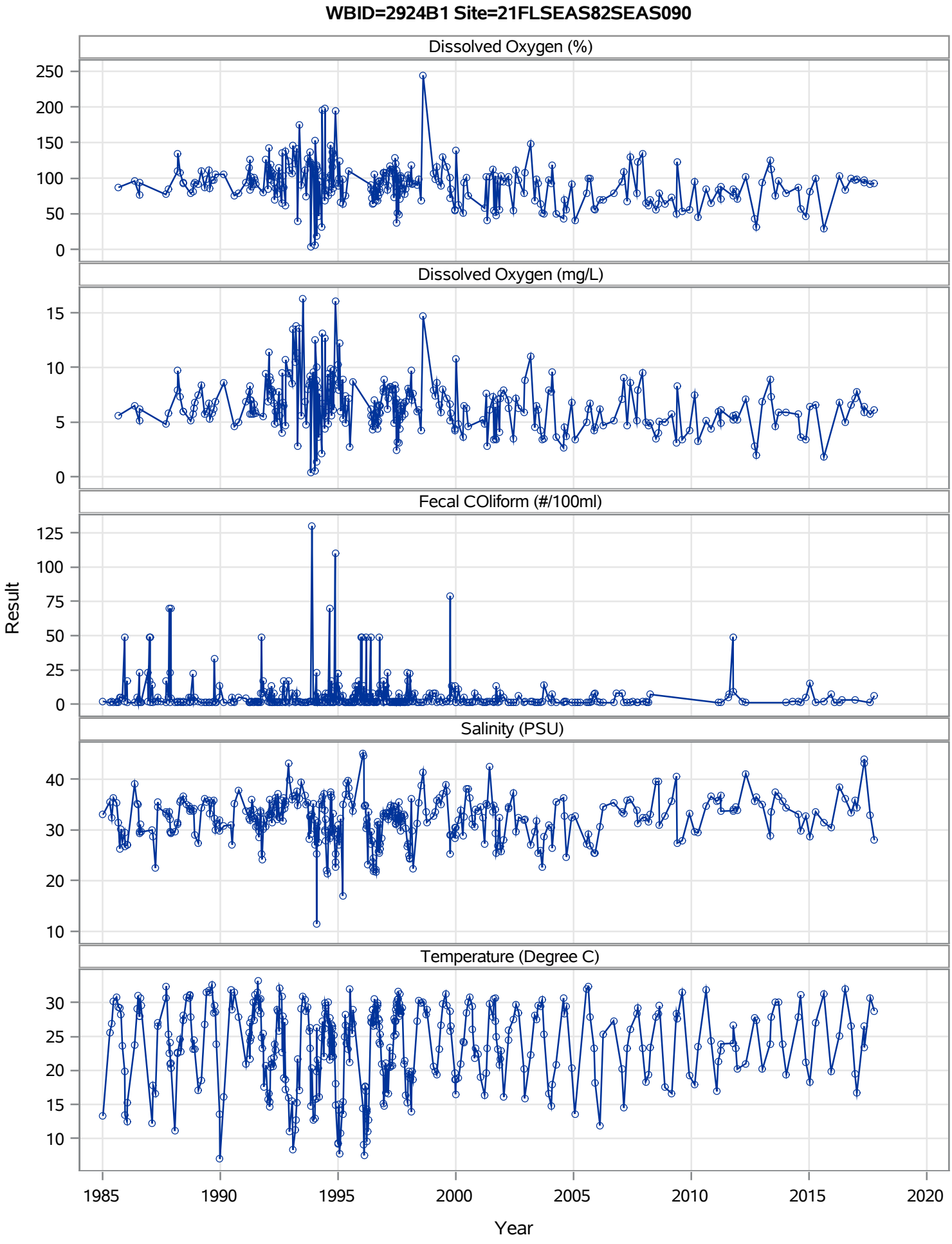

WBID=2924B1 Site=21FLSEAS82SEAS065
pH
Result
8.5
8.0
7.5
1990
1995
2000
2005
2010
2015
2020
Year

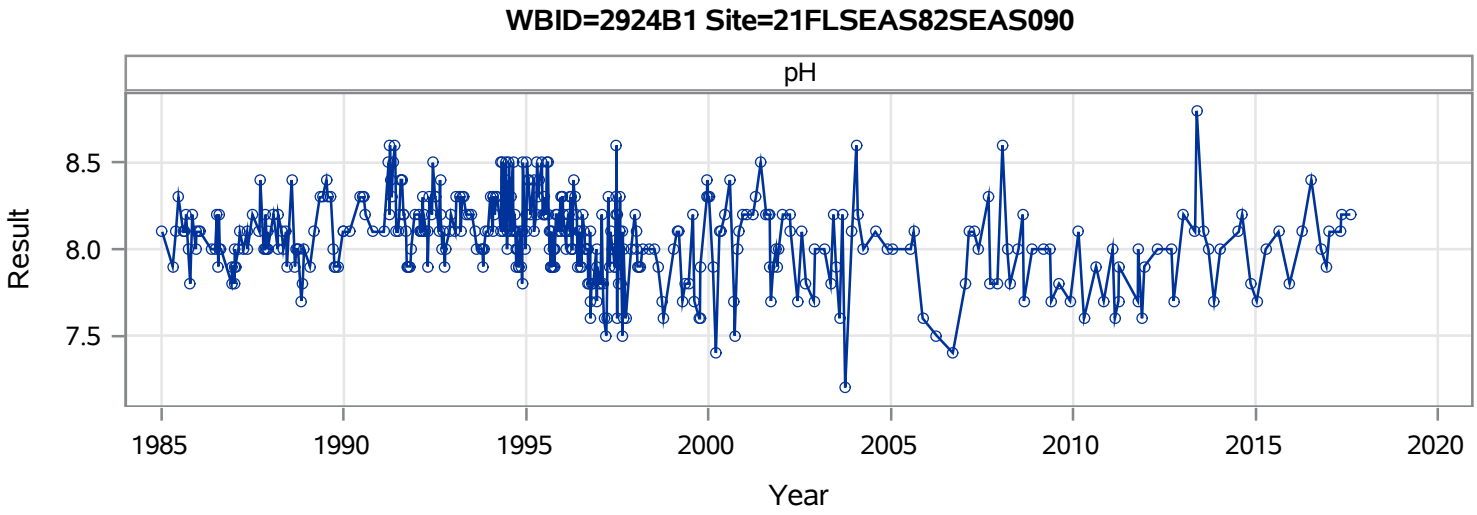

WBID=2924B1 Site=21FLSEAS82SEAS070
Dissolved Oxygen (%)
300
250
200
150
100
50
0
Dissolved Oxygen (mg/L)
15
10
5
0
Fecal COliform (#/100ml)
125
100
75
50
25
0
Salinity (PSU)
45
40
35
30
25
20
15
Temperature (Degree C)
30
20
10
Result
1985
1990
1995
2000
2005
2010
2015
2020
Year

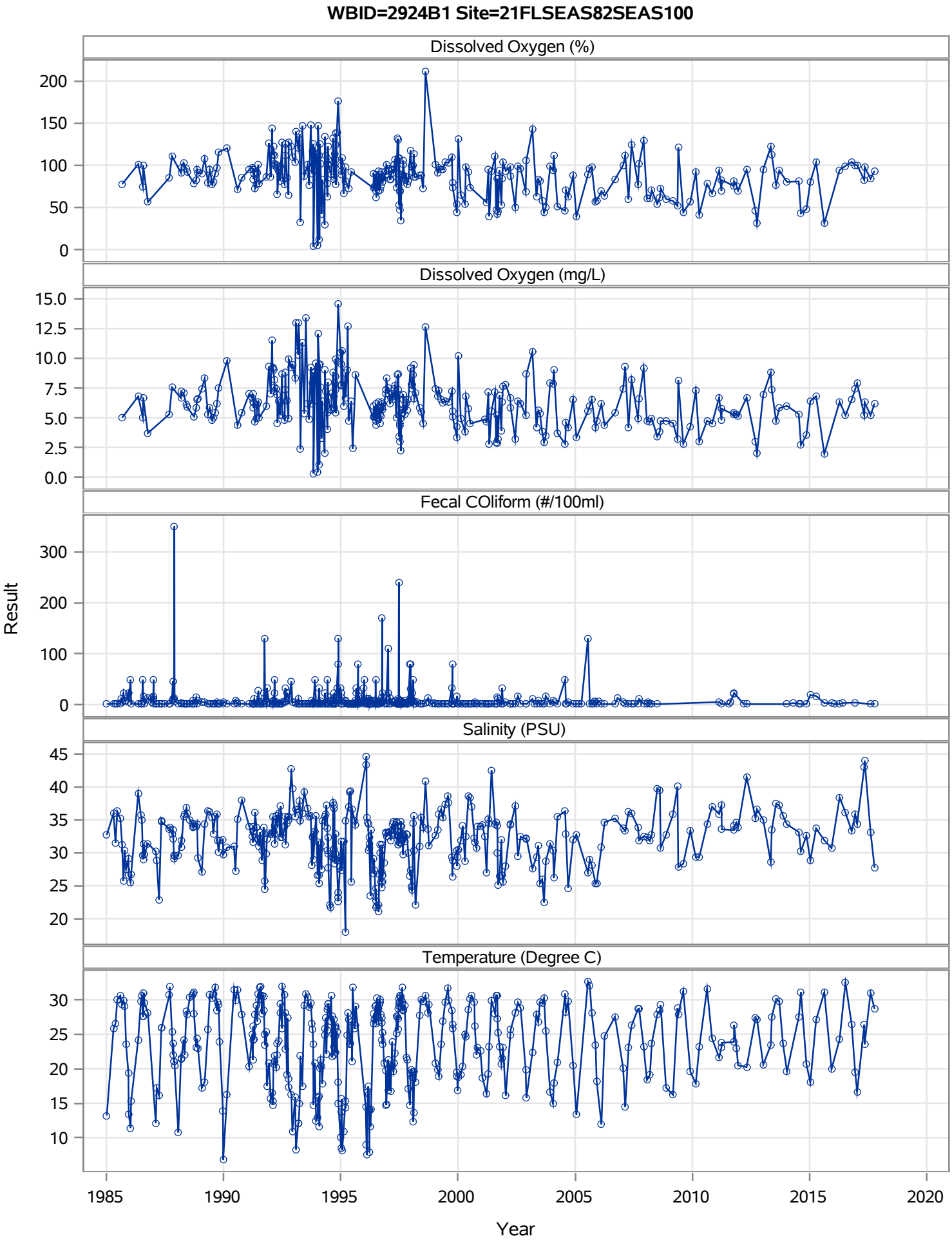

WBID=2924B1 Site=21FLSEAS82SEAS070
pH
Result
9.0
8.5
8.0
7.5
7.0
6.5
1985
1990
1995
2000
2005
2010
2015
2020
Year

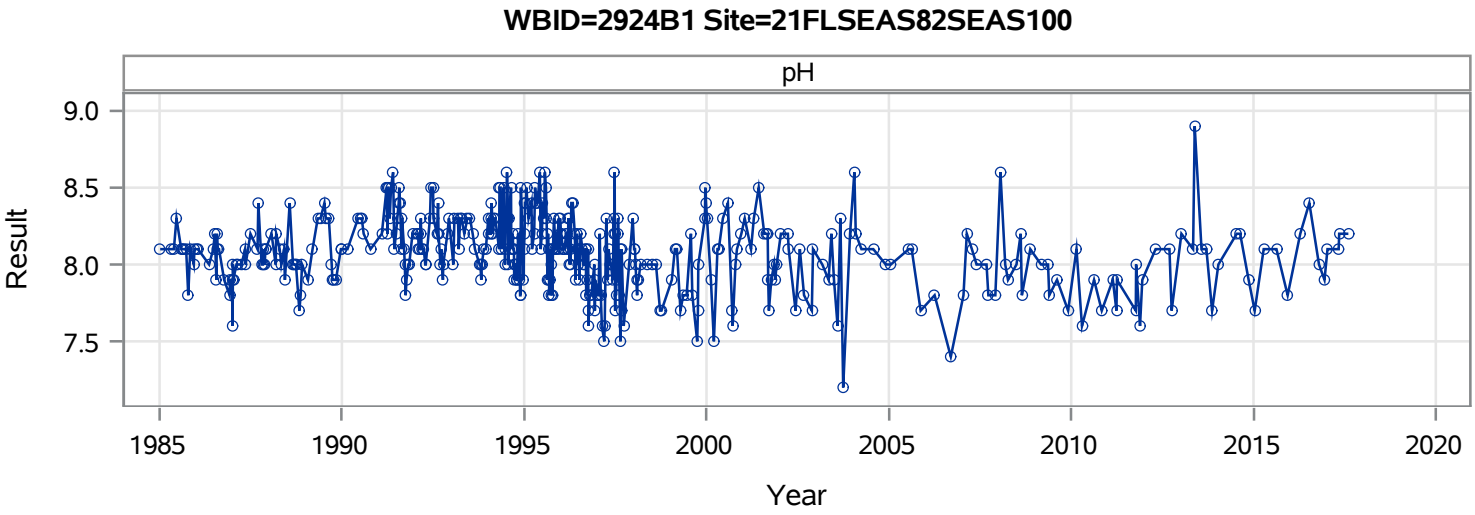

WBID=2924B1 Site=21FLSEAS82SEAS080
Dissolved Oxygen (%)
200
150
100
50
0
Dissolved Oxygen (mg/L)
15
10
5
0
Fecal COliform (#/100ml)
100
80
60
40
20
0
Salinity (PSU)
45
40
35
30
25
20
Temperature (Degree C)
30
25
20
15
10
Result
1990
1995
2000
2005
2010
2015
2020
Year

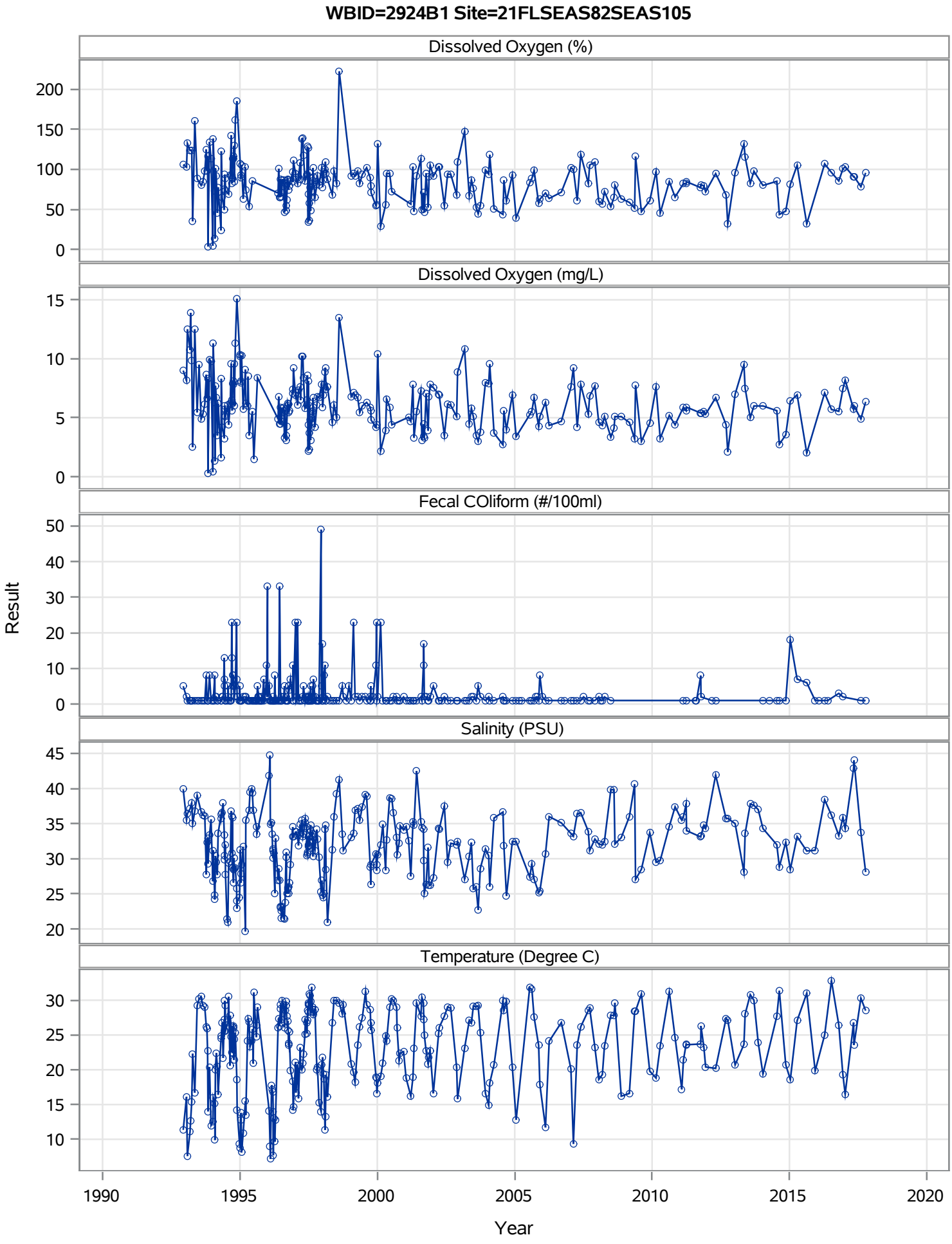

WBID=2924B1 Site=21FLSEAS82SEAS080
pH
Result
8.5
8.0
7.5
1990
1995
2000
2005
2010
2015
2020
Year

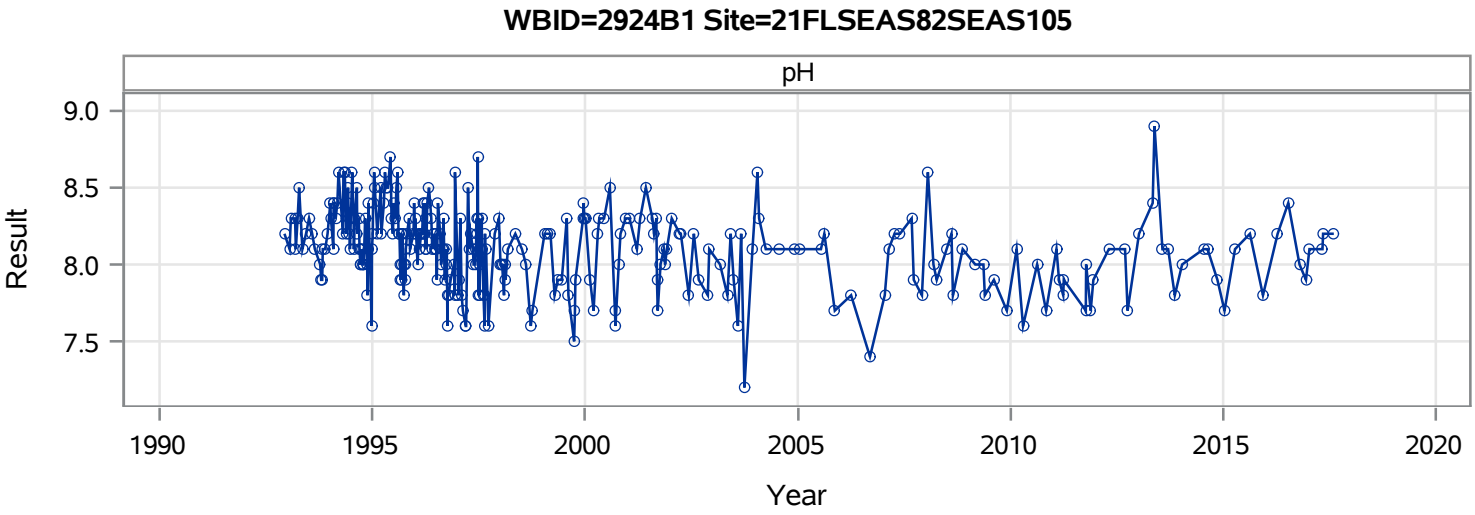

WBID=2924B1 Site=21FLSEAS82SEAS090
Dissolved Oxygen (%)
250
200
150
100
50
0
Dissolved Oxygen (mg/L)
15
10
5
0
Fecal COliform (#/100ml)
125
100
75
50
25
0
Salinity (PSU)
40
30
20
10
Temperature (Degree C)
30
25
20
15
10
Result
1985
1990
1995
2000
2005
2010
2015
2020
Year

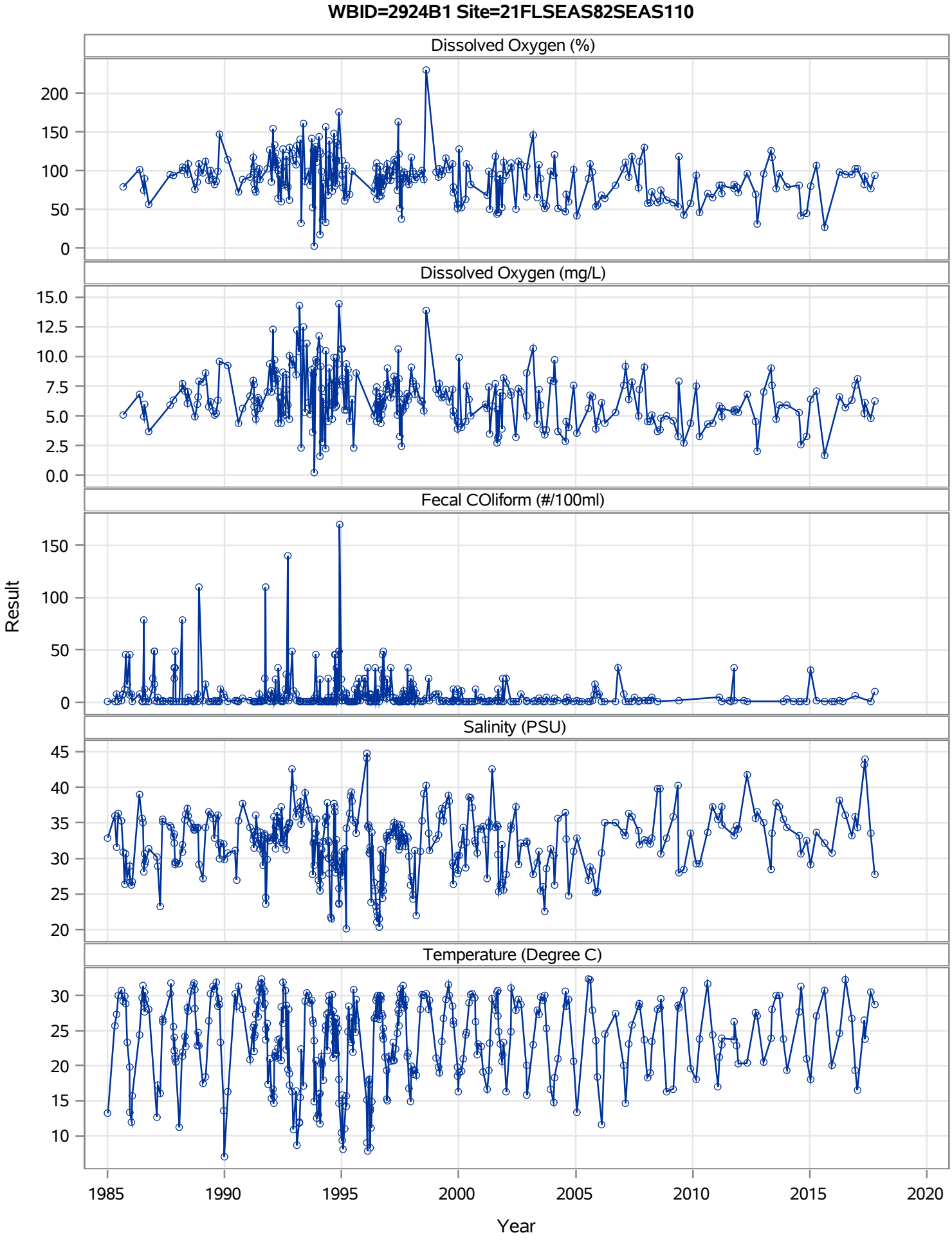

WBID=2924B1 Site=21FLSEAS82SEAS090
pH
Result
8.5
8.0
7.5
1985
1990
1995
2000
2005
2010
2015
2020
Year

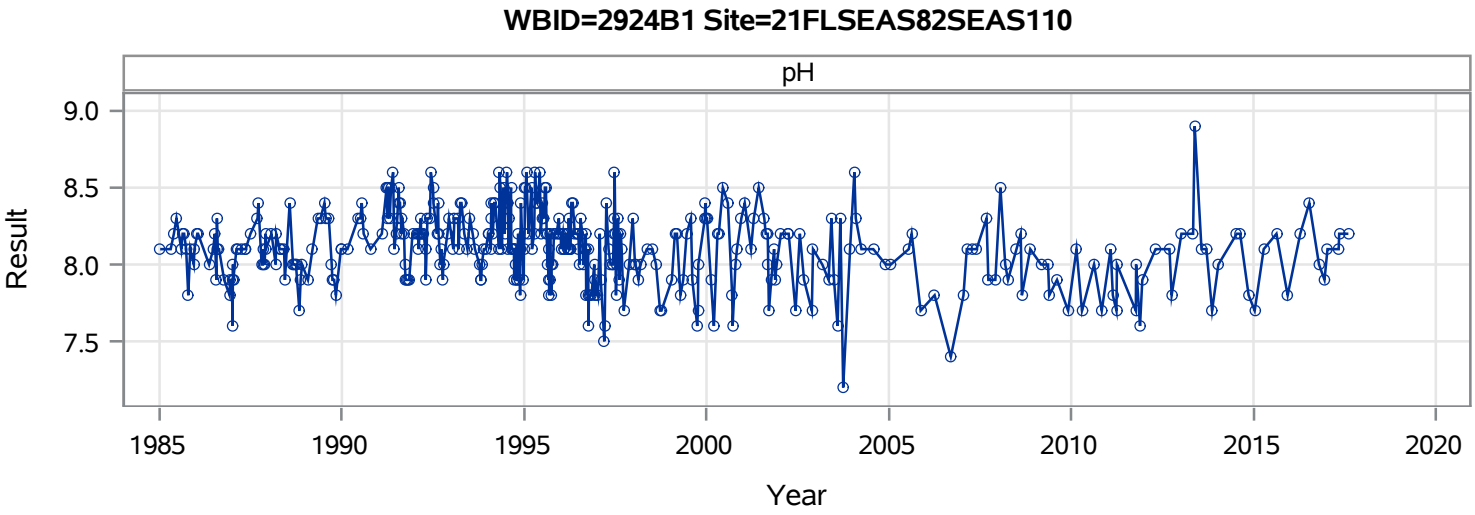

WBID=2924B1 Site=21FLSEAS82SEAS100
Dissolved Oxygen (%)
200
150
100
50
0
Dissolved Oxygen (mg/L)
15.0
12.5
10.0
7.5
5.0
2.5
0.0
Fecal COliform (#/100ml)
300
200
100
0
Salinity (PSU)
45
40
35
30
25
20
Temperature (Degree C)
30
25
20
15
10
Result
1985
1990
1995
2000
2005
2010
2015
2020
Year

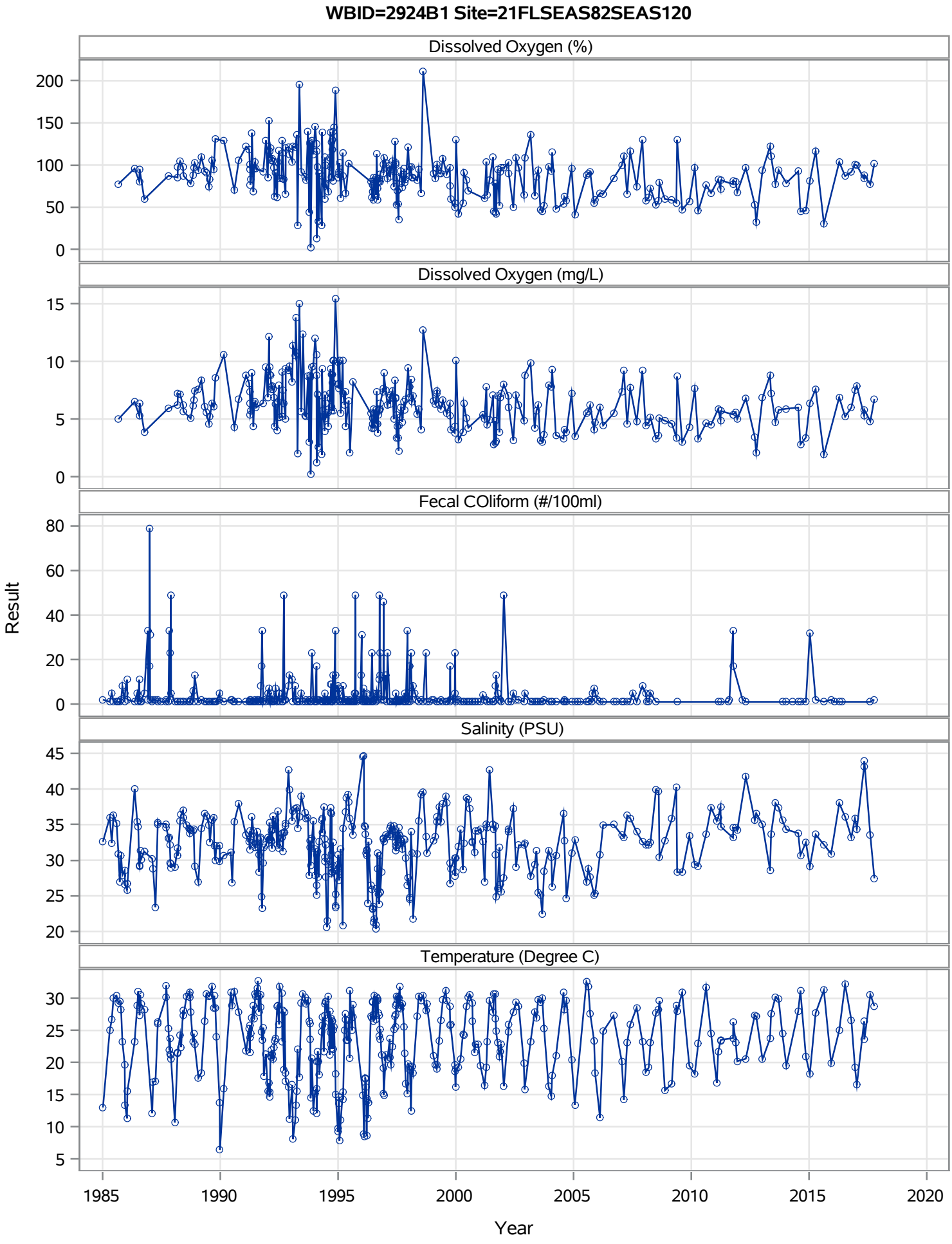

WBID=2924B1 Site=21FLSEAS82SEAS100
pH
Result
9.0
8.5
8.0
7.5
1985
1990
1995
2000
2005
2010
2015
2020
Year

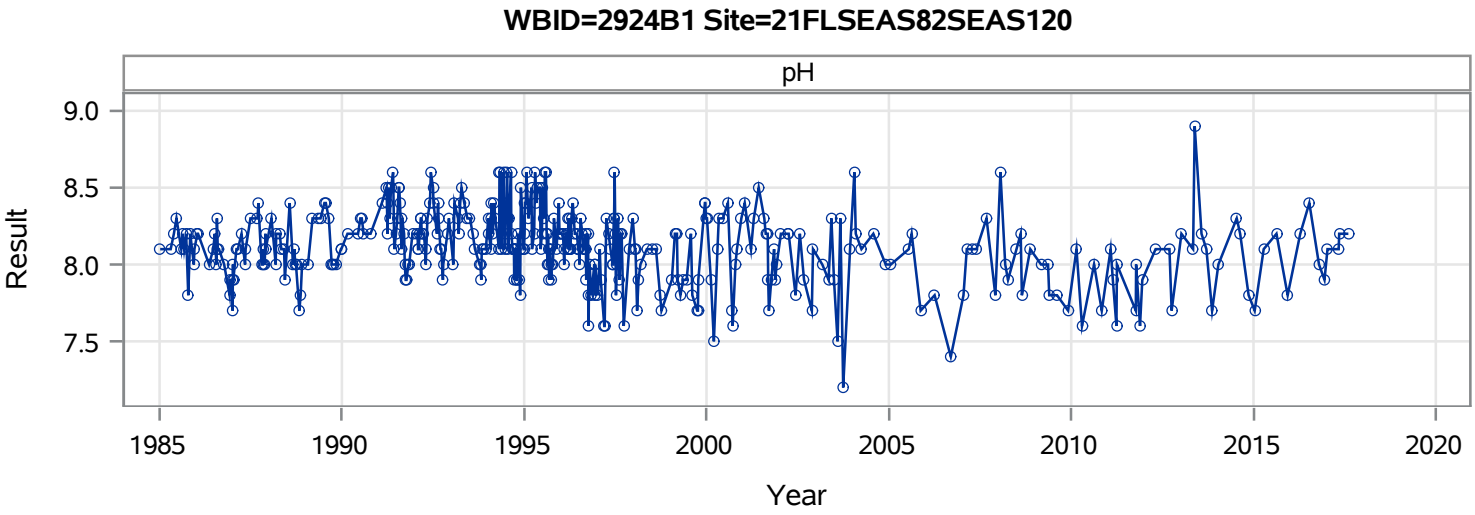

WBID=2924B1 Site=21FLSEAS82SEAS105
Dissolved Oxygen (%)
200
150
100
50
0
Dissolved Oxygen (mg/L)
15
10
5
0
Fecal COliform (#/100ml)
50
40
30
20
10
0
Salinity (PSU)
45
40
35
30
25
20
Temperature (Degree C)
30
25
20
15
10
Result
1990
1995
2000
2005
2010
2015
2020
Year

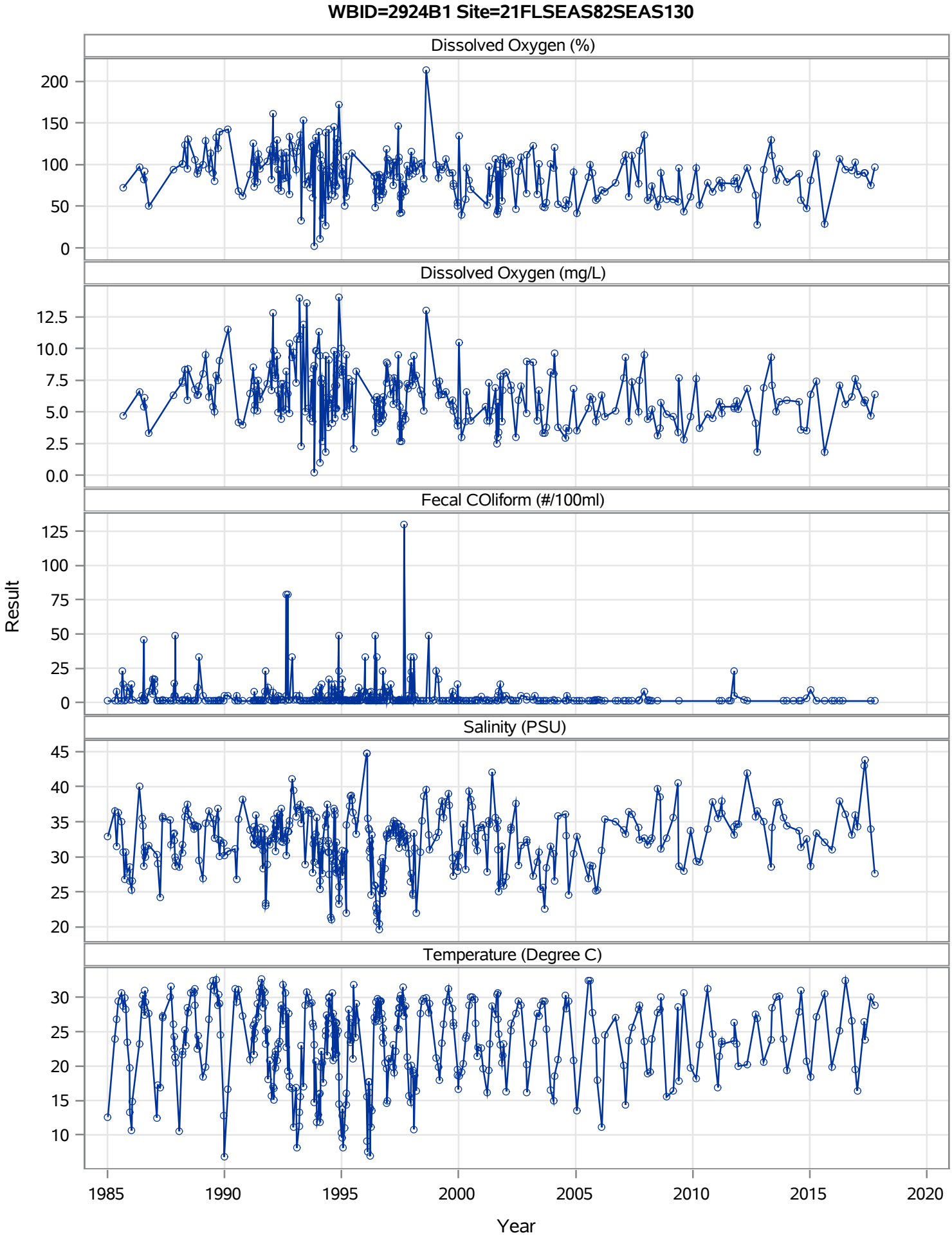

WBID=2924B1 Site=21FLSEAS82SEAS105
pH
Result
9.0
8.5
8.0
7.5
1990
1995
2000
2005
2010
2015
2020
Year

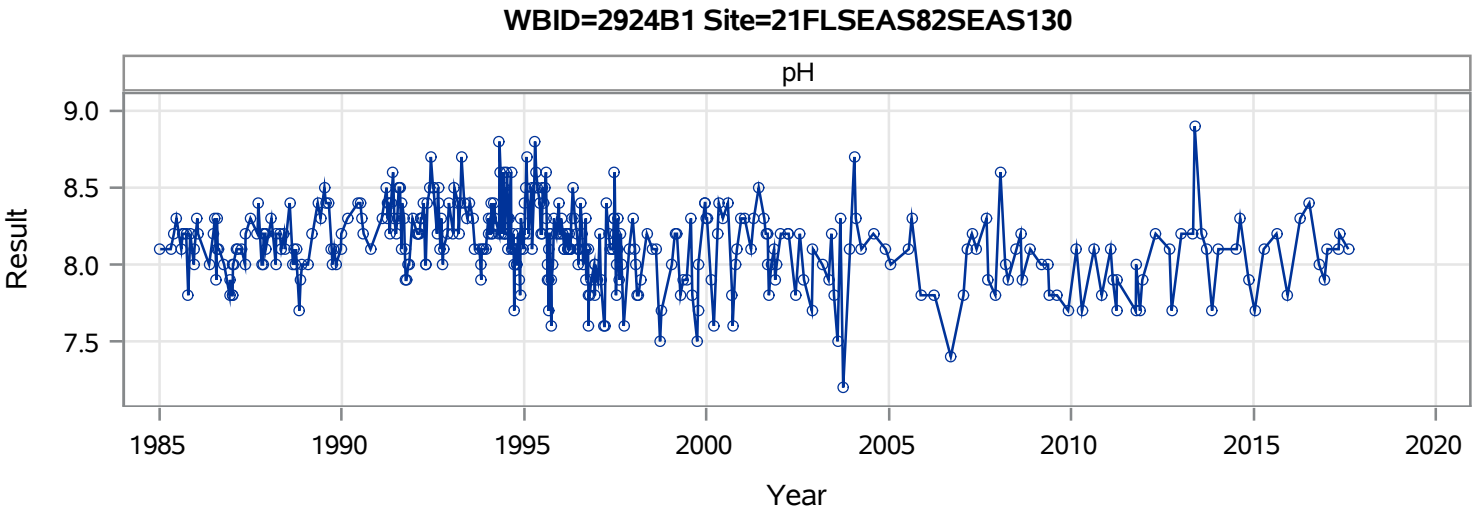

WBID=2924B1 Site=21FLSEAS82SEAS110
Dissolved Oxygen (%)
200
150
100
50
0
Dissolved Oxygen (mg/L)
15.0
12.5
10.0
7.5
5.0
2.5
0.0
Fecal COliform (#/100ml)
150
100
50
0
Salinity (PSU)
45
40
35
30
25
20
Temperature (Degree C)
30
25
20
15
10
Result
1985
1990
1995
2000
2005
2010
2015
2020
Year

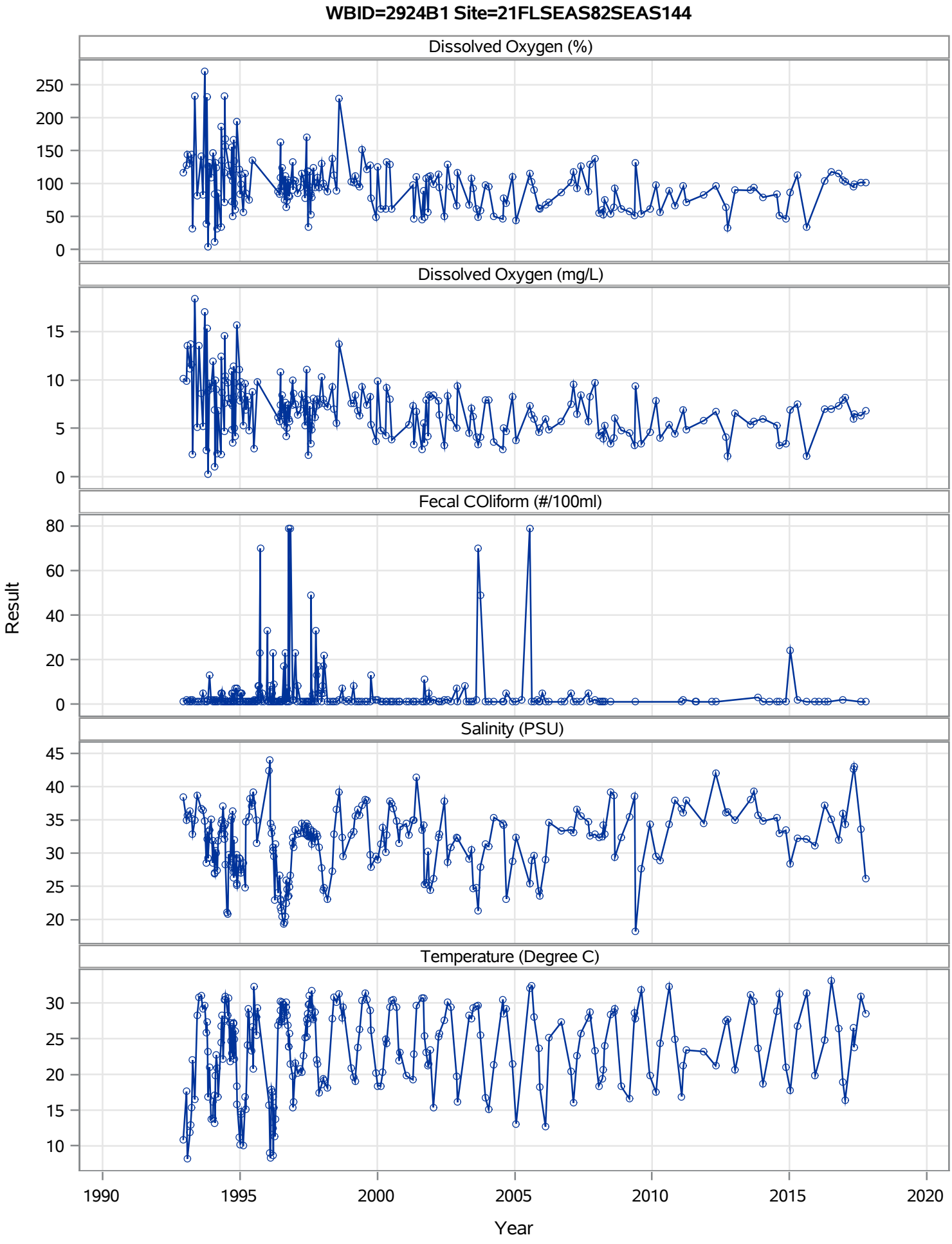

WBID=2924B1 Site=21FLSEAS82SEAS110
pH
Result
9.0
8.5
8.0
7.5
1985
1990
1995
2000
2005
2010
2015
2020
Year

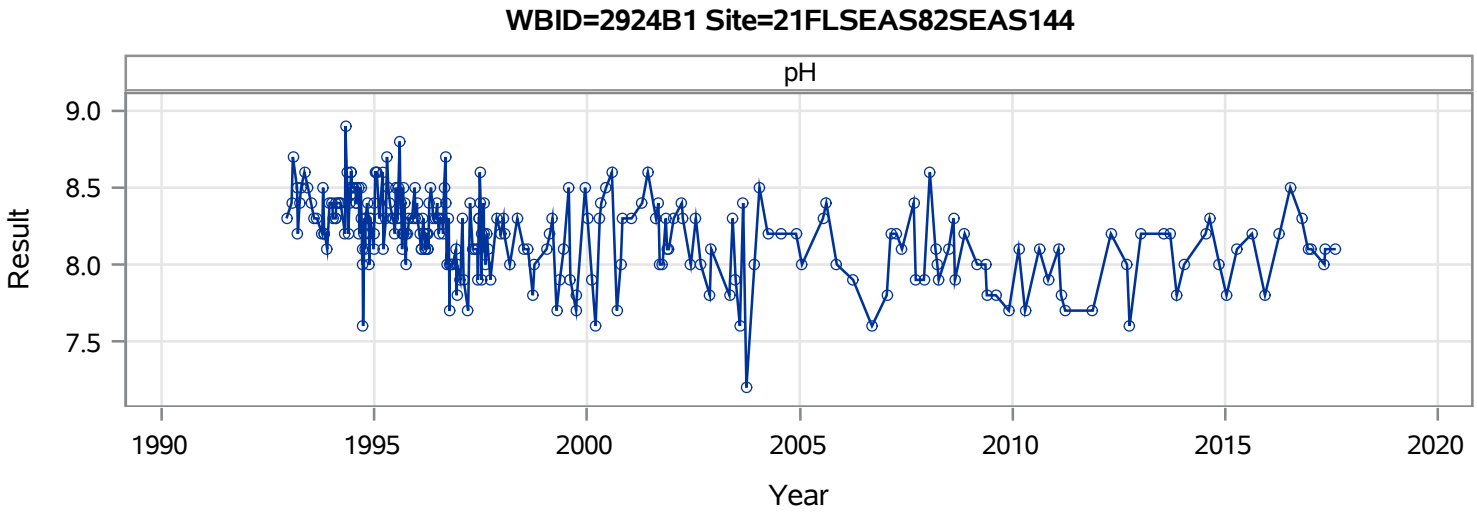

WBID=2924B1 Site=21FLSEAS82SEAS120
Dissolved Oxygen (%)
200
150
100
50
0
Dissolved Oxygen (mg/L)
15
10
5
0
Fecal COliform (#/100ml)
80
60
40
20
0
Salinity (PSU)
45
40
35
30
25
20
Temperature (Degree C)
30
25
20
15
10
5
Result
1985
1990
1995
2000
2005
2010
2015
2020
Year

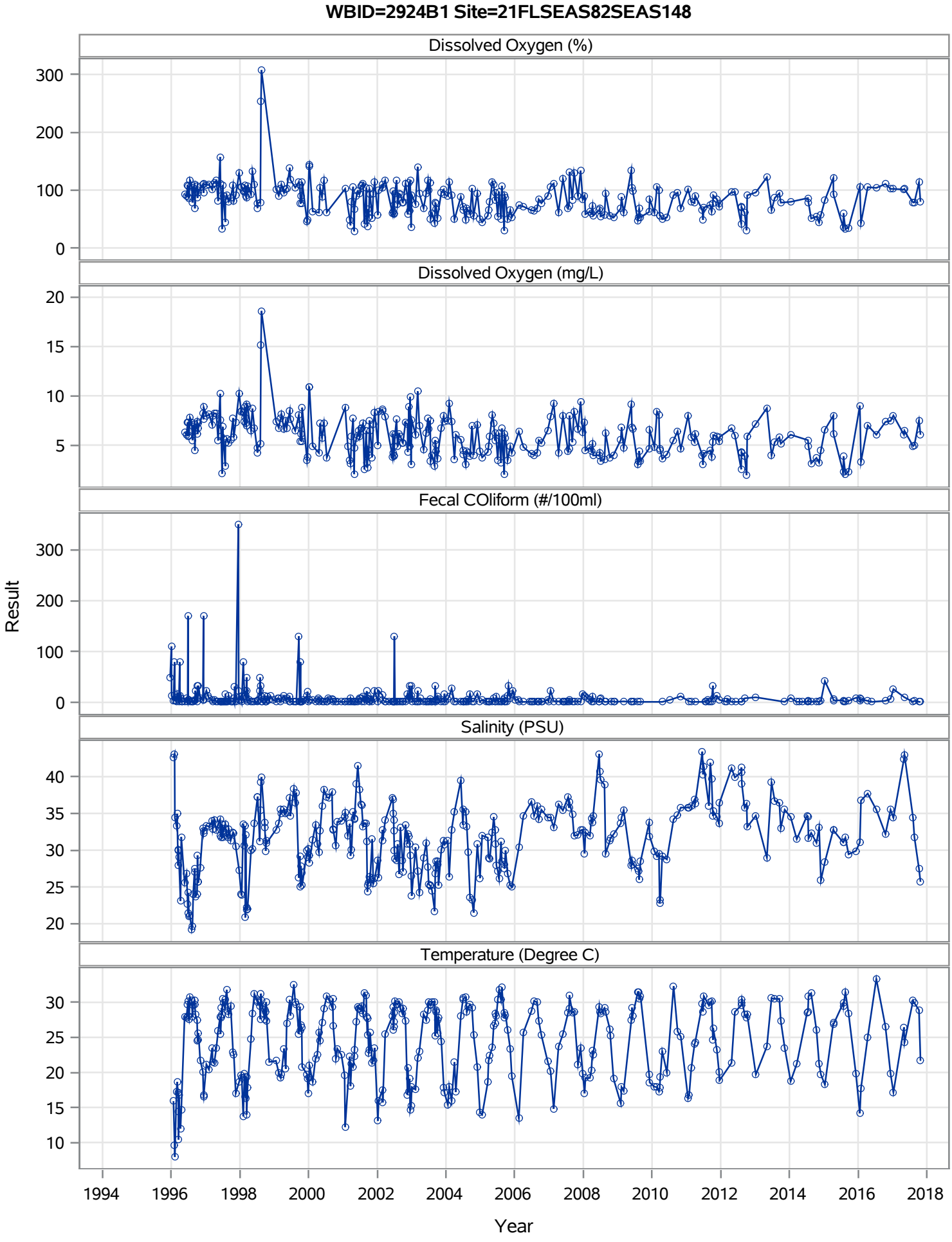

WBID=2924B1 Site=21FLSEAS82SEAS120
pH
Result
9.0
8.5
8.0
7.5
1985
1990
1995
2000
2005
2010
2015
2020
Year

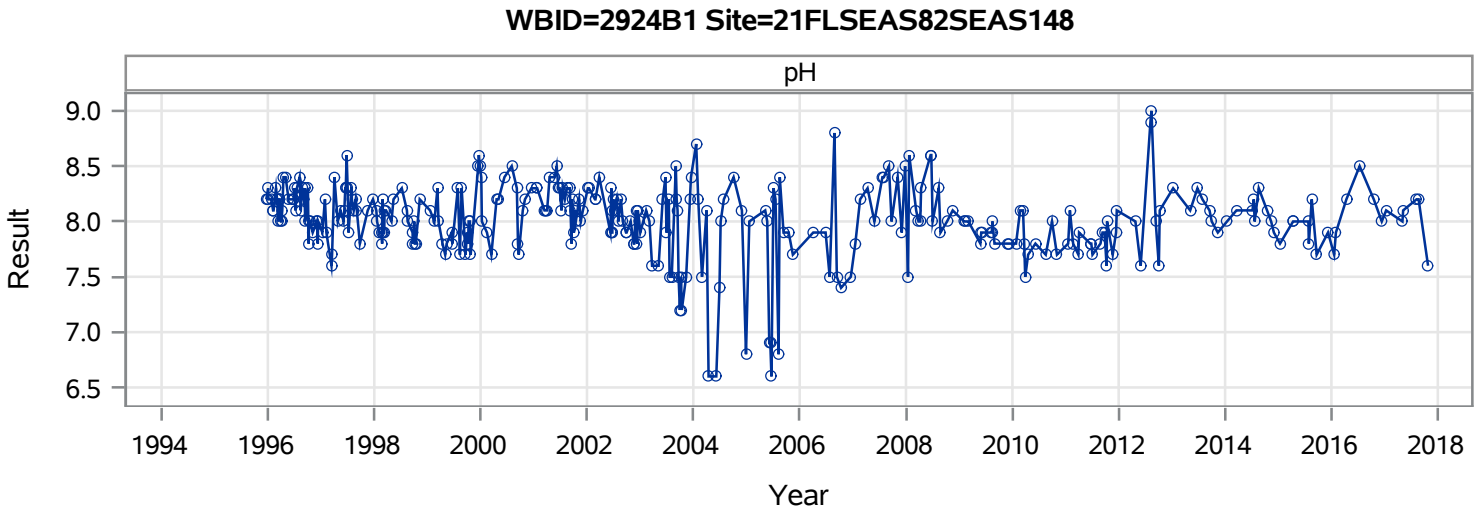

WBID=2924B1 Site=21FLSEAS82SEAS130
Dissolved Oxygen (%)
200
150
100
50
0
Dissolved Oxygen (mg/L)
12.5
10.0
7.5
5.0
2.5
0.0
Fecal COliform (#/100ml)
125
100
75
50
25
0
Salinity (PSU)
45
40
35
30
25
20
Temperature (Degree C)
30
25
20
15
10
Result
1985
1990
1995
2000
2005
2010
2015
2020
Year

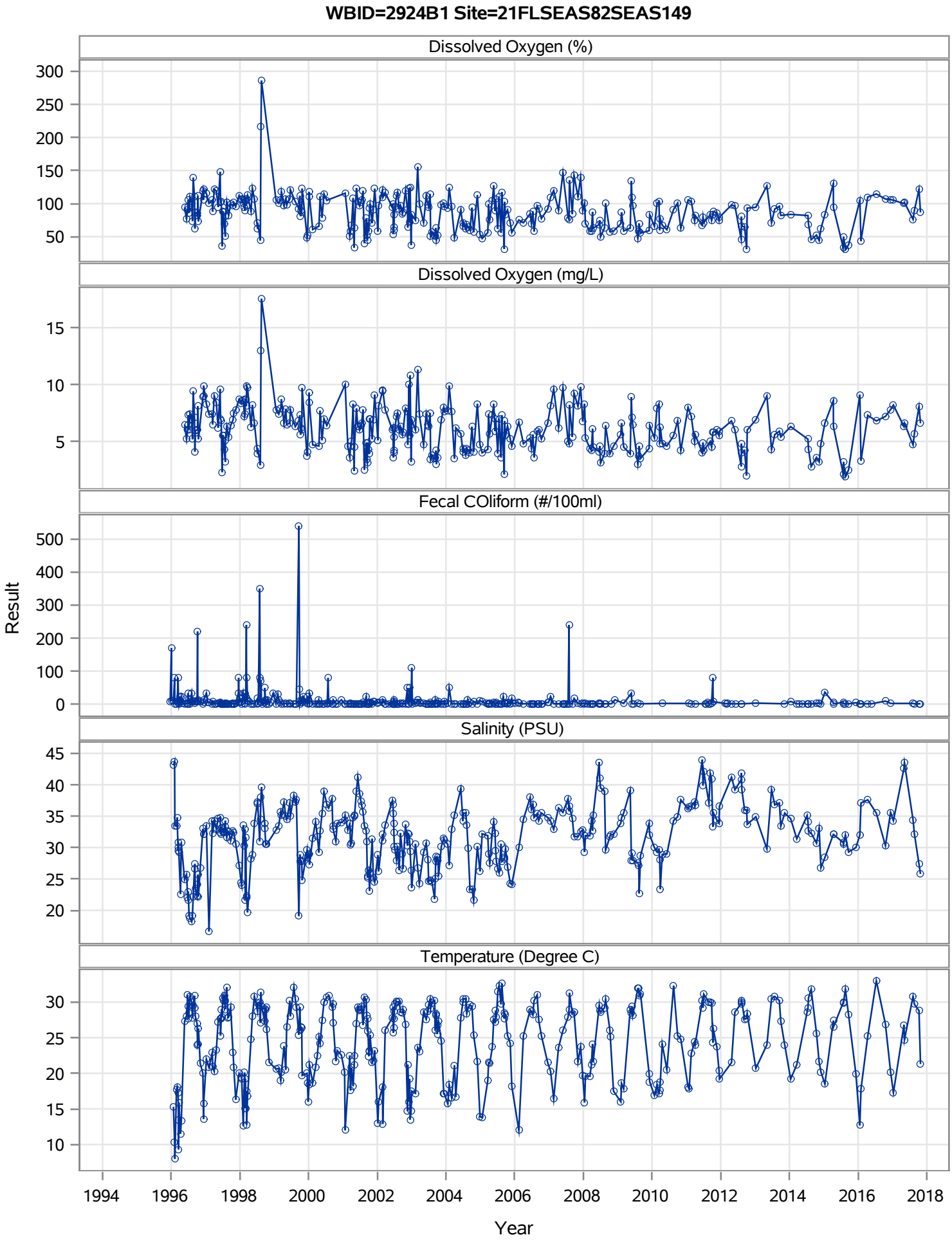

WBID=2924B1 Site=21FLSEAS82SEAS130
pH
Result
9.0
8.5
8.0
7.5
1985
1990
1995
2000
2005
2010
2015
2020
Year

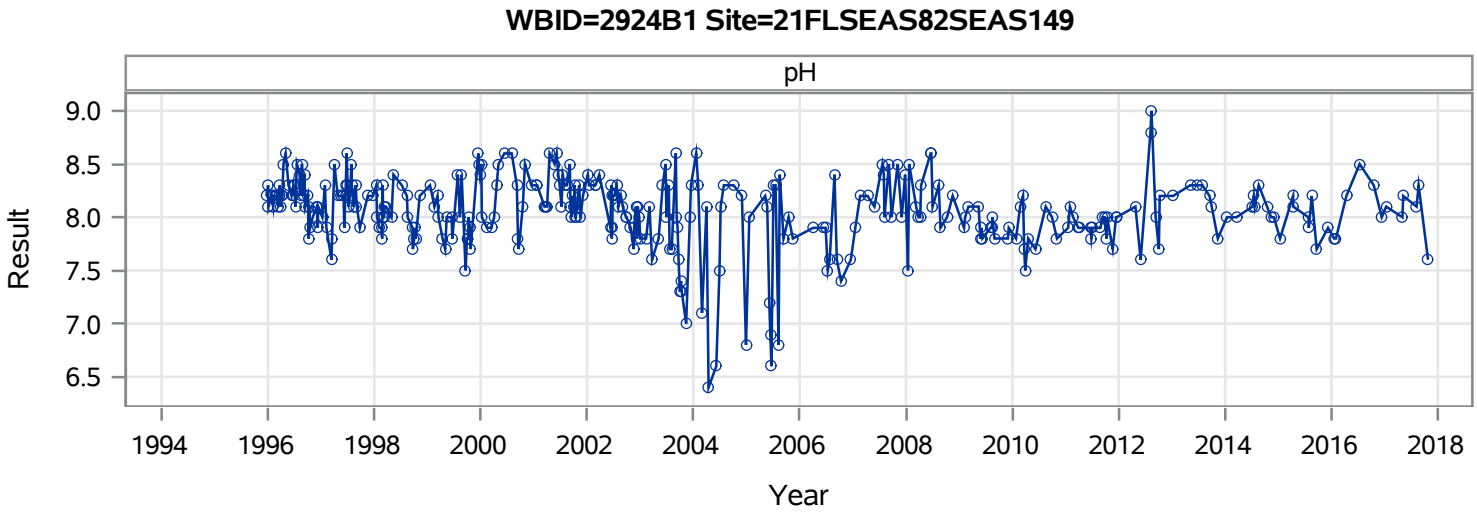

WBID=2924B1 Site=21FLSEAS82SEAS144
Dissolved Oxygen (%)
250
200
150
100
50
0
Dissolved Oxygen (mg/L)
15
10
5
0
Fecal COliform (#/100ml)
80
60
40
20
0
Salinity (PSU)
45
40
35
30
25
20
Temperature (Degree C)
30
25
20
15
10
Result
1990
1995
2000
2005
2010
2015
2020
Year

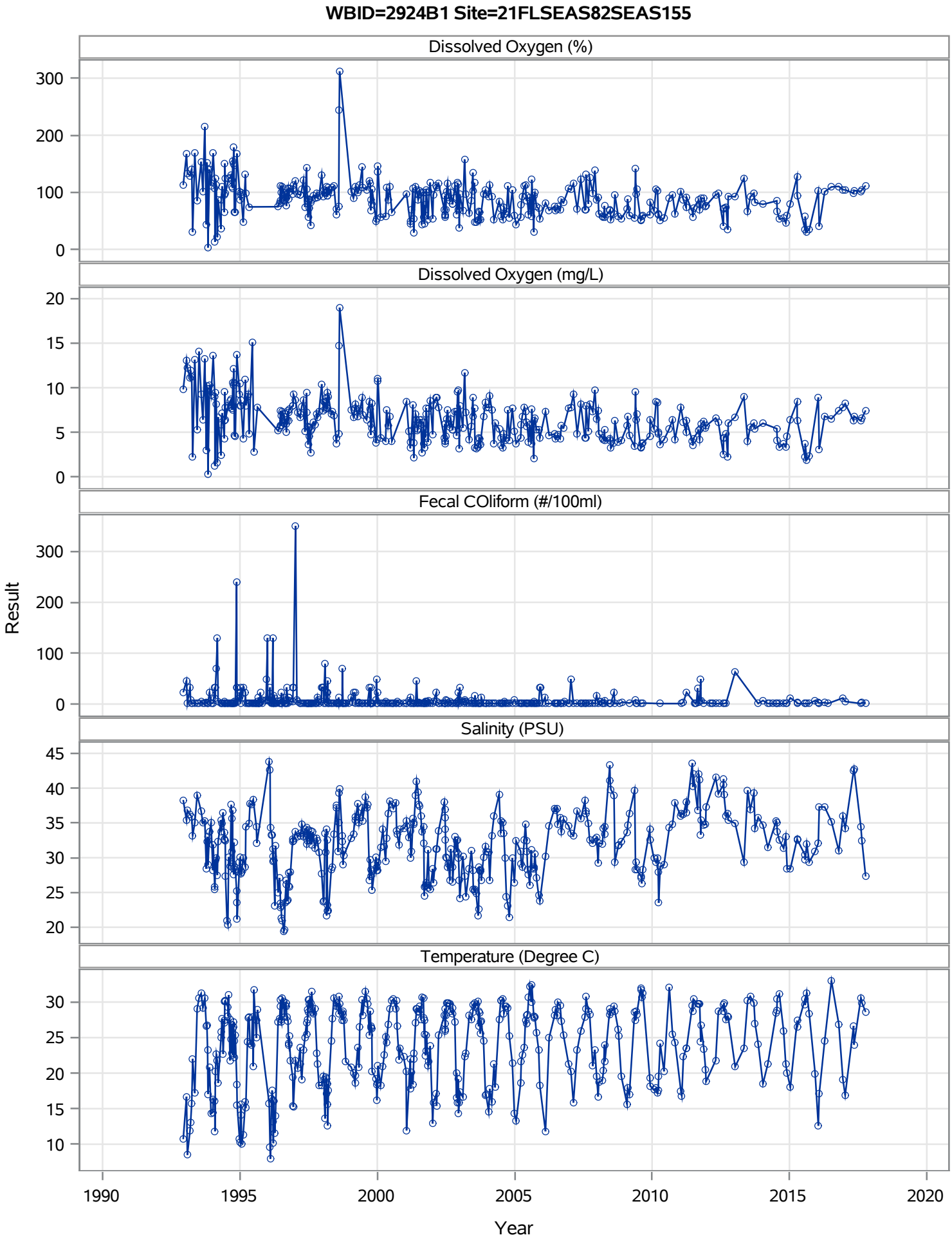

WBID=2924B1 Site=21FLSEAS82SEAS144
pH
Result
9.0
8.5
8.0
7.5
1990
1995
2000
2005
2010
2015
2020
Year

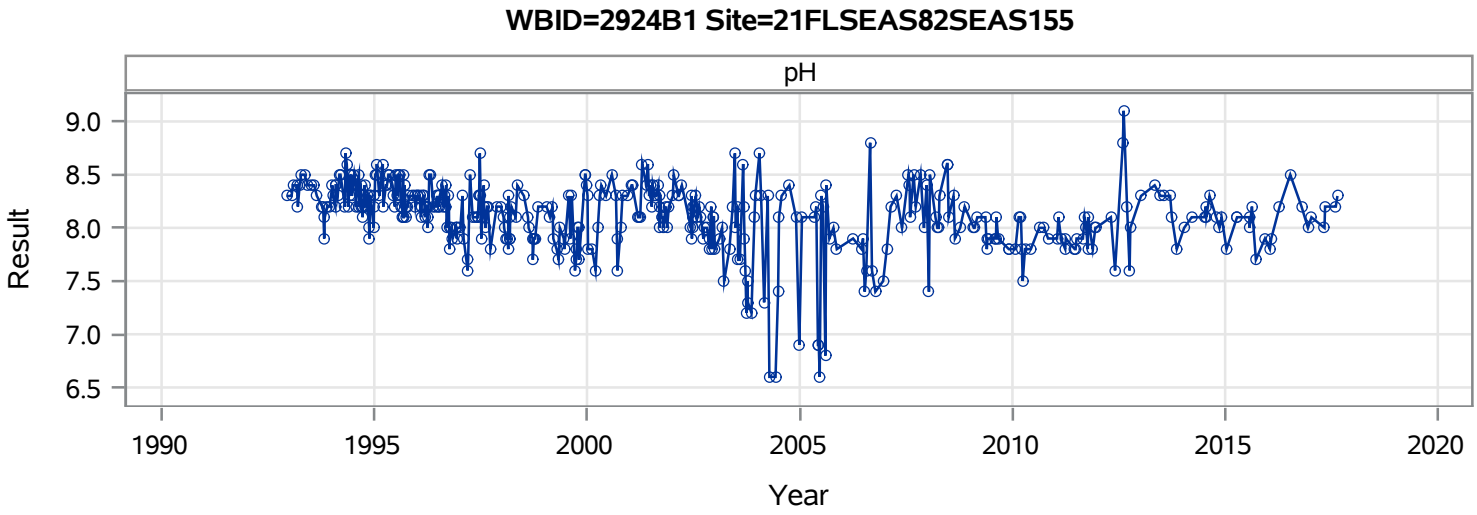

WBID=2924B1 Site=21FLSEAS82SEAS148
Dissolved Oxygen (%)
300
200
100
0
Dissolved Oxygen (mg/L)
20
15
10
5
Fecal COliform (#/100ml)
300
200
100
0
Result
Salinity (PSU)
40
35
30
25
20
Temperature (Degree C)
30
25
20
15
10
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

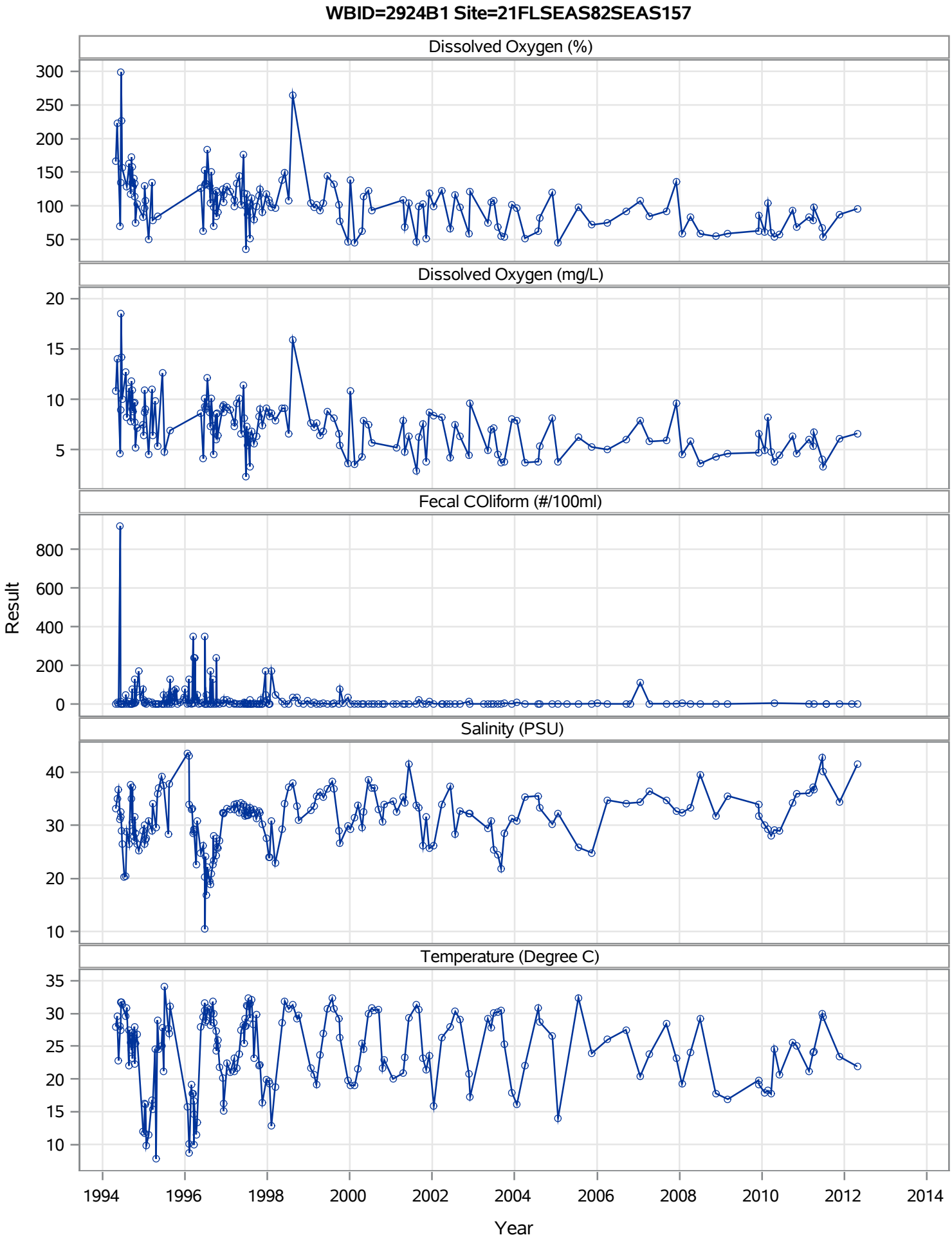

WBID=2924B1 Site=21FLSEAS82SEAS148
pH
Result
9.0
8.5
8.0
7.5
7.0
6.5
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

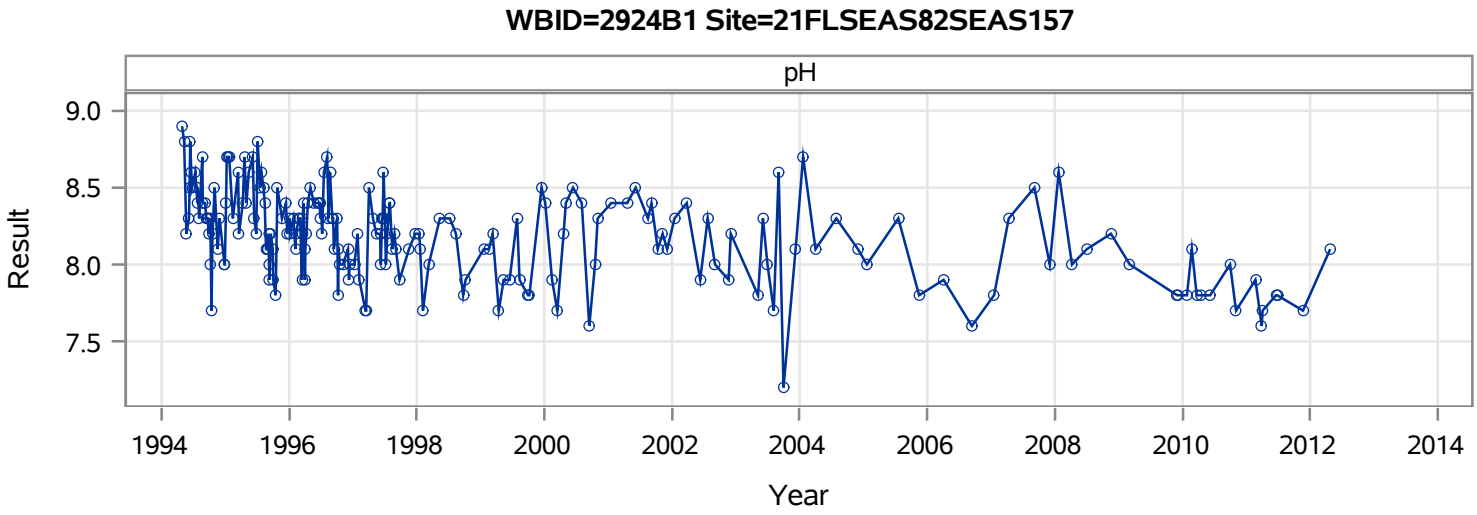

WBID=2924B1 Site=21FLSEAS82SEAS149
Dissolved Oxygen (%)
300
250
200
150
100
50
Dissolved Oxygen (mg/L)
15
10
5
Fecal COliform (#/100ml)
500
400
300
200
100
0
Result
Salinity (PSU)
45
40
35
30
25
20
Temperature (Degree C)
30
25
20
15
10
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

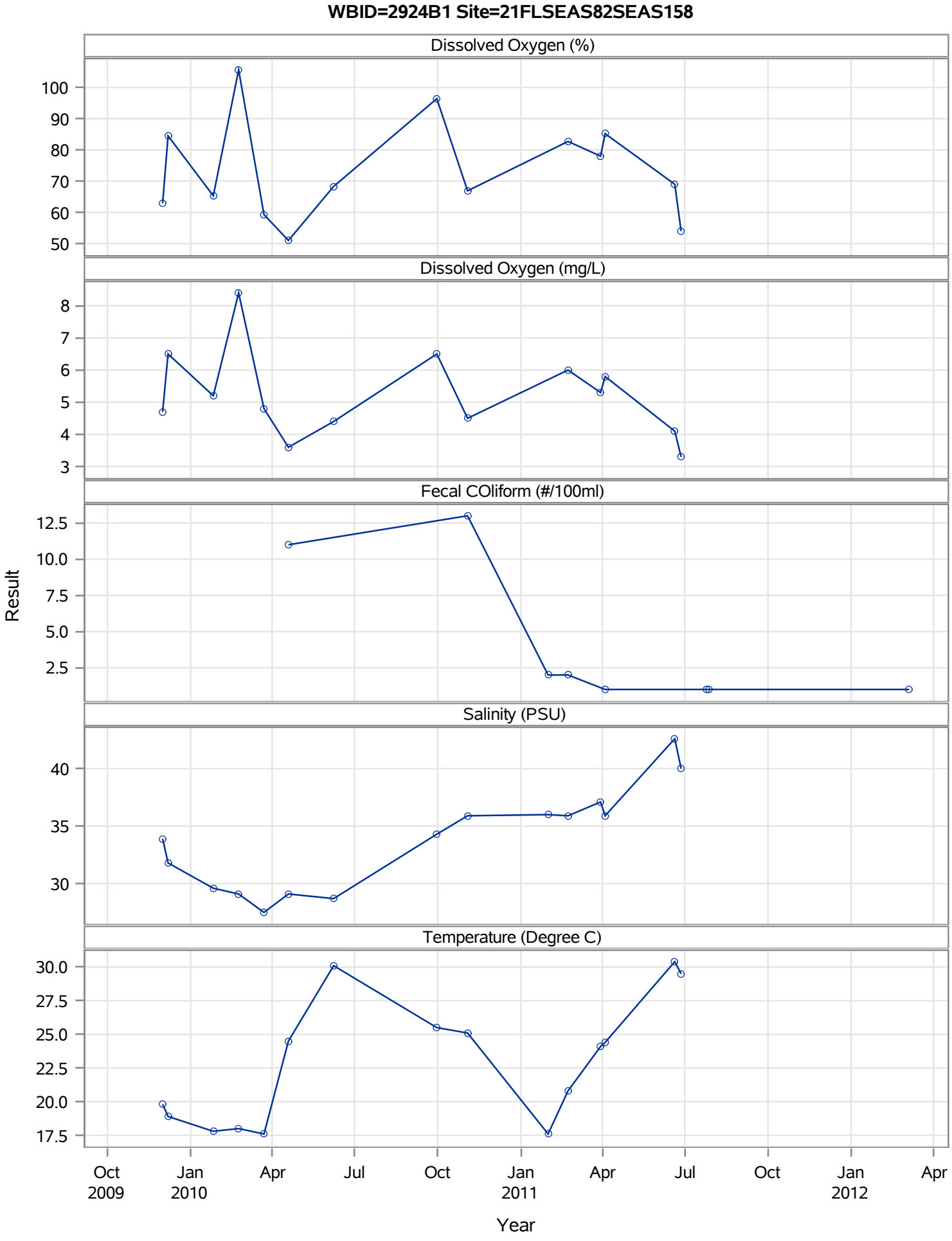

WBID=2924B1 Site=21FLSEAS82SEAS149
pH
Result
9.0
8.5
8.0
7.5
7.0
6.5
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

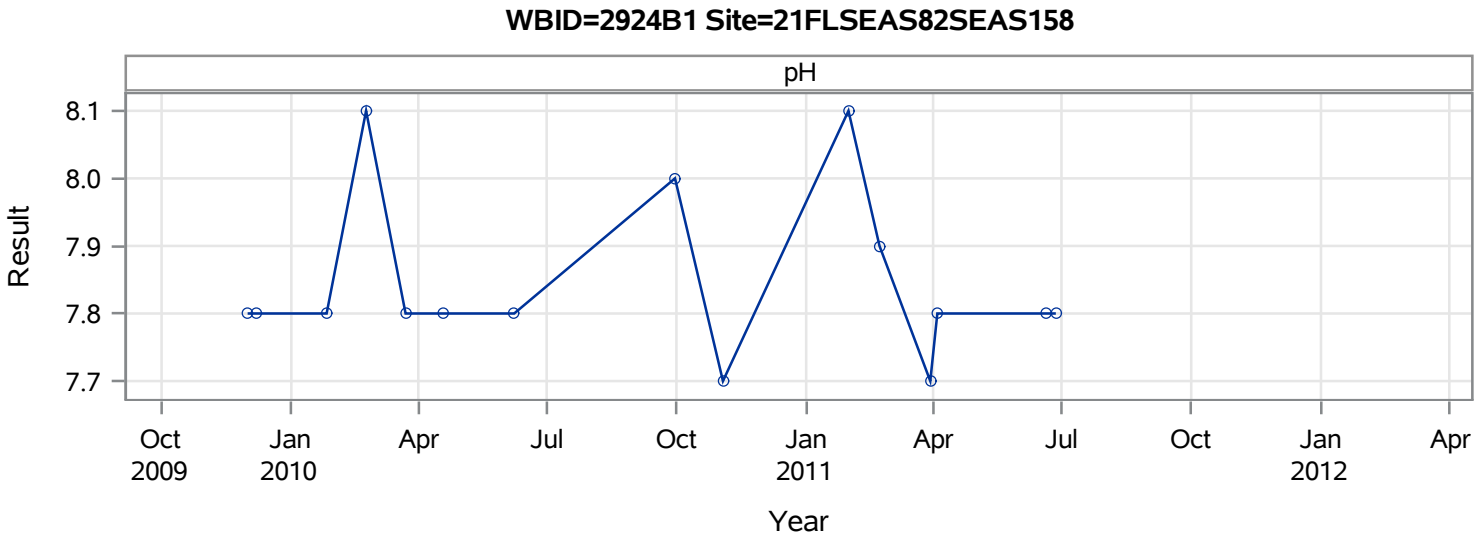

WBID=2924B1 Site=21FLSEAS82SEAS155
Dissolved Oxygen (%)
300
200
100
0
Dissolved Oxygen (mg/L)
20
15
10
5
0
Fecal COliform (#/100ml)
300
200
100
0
Result
Salinity (PSU)
45
40
35
30
25
20
Temperature (Degree C)
30
25
20
15
10
1990
1995
2000
2005
2010
2015
2020
Year

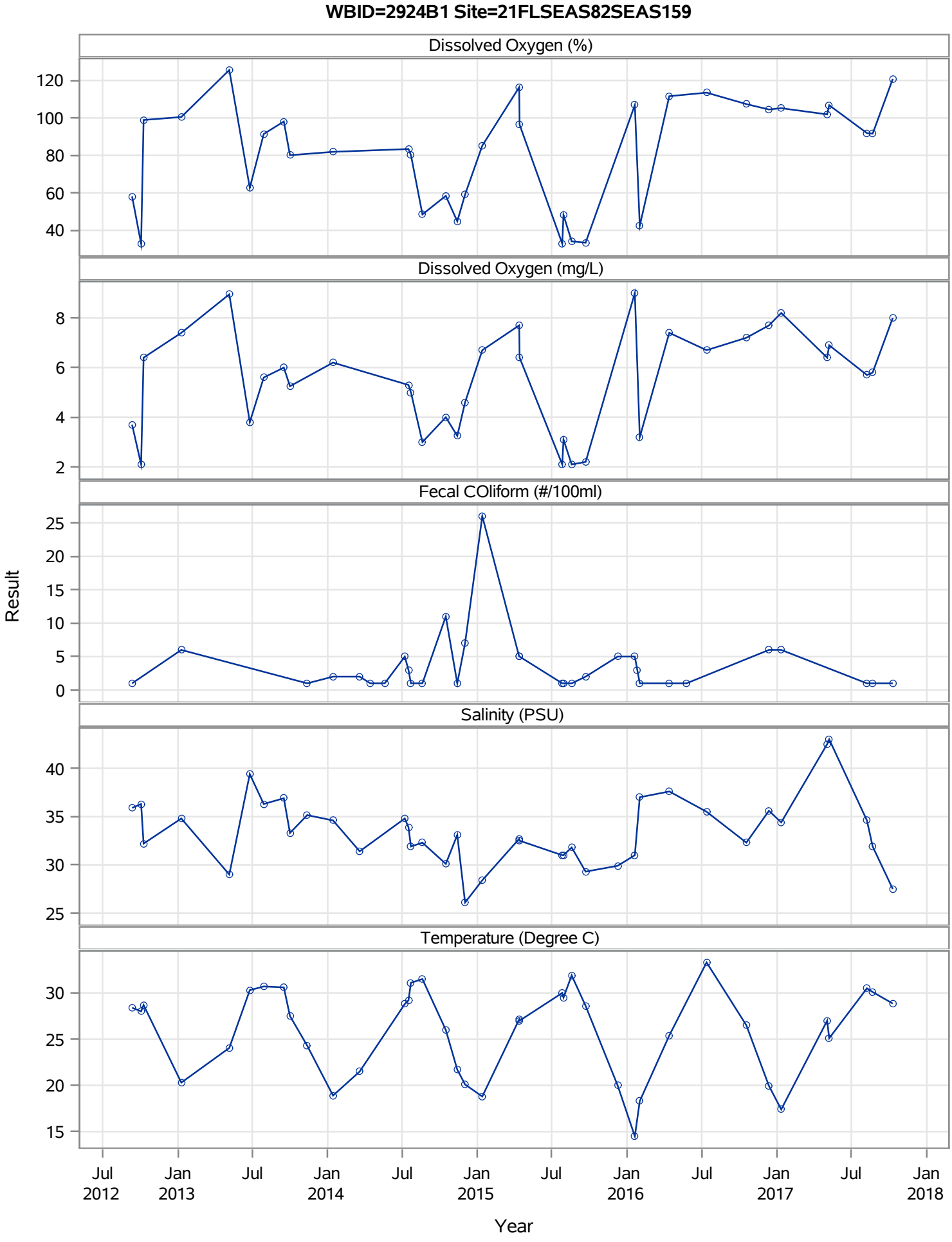

WBID=2924B1 Site=21FLSEAS82SEAS155
pH
Result
9.0
8.5
8.0
7.5
7.0
6.5
1990
1995
2000
2005
2010
2015
2020
Year

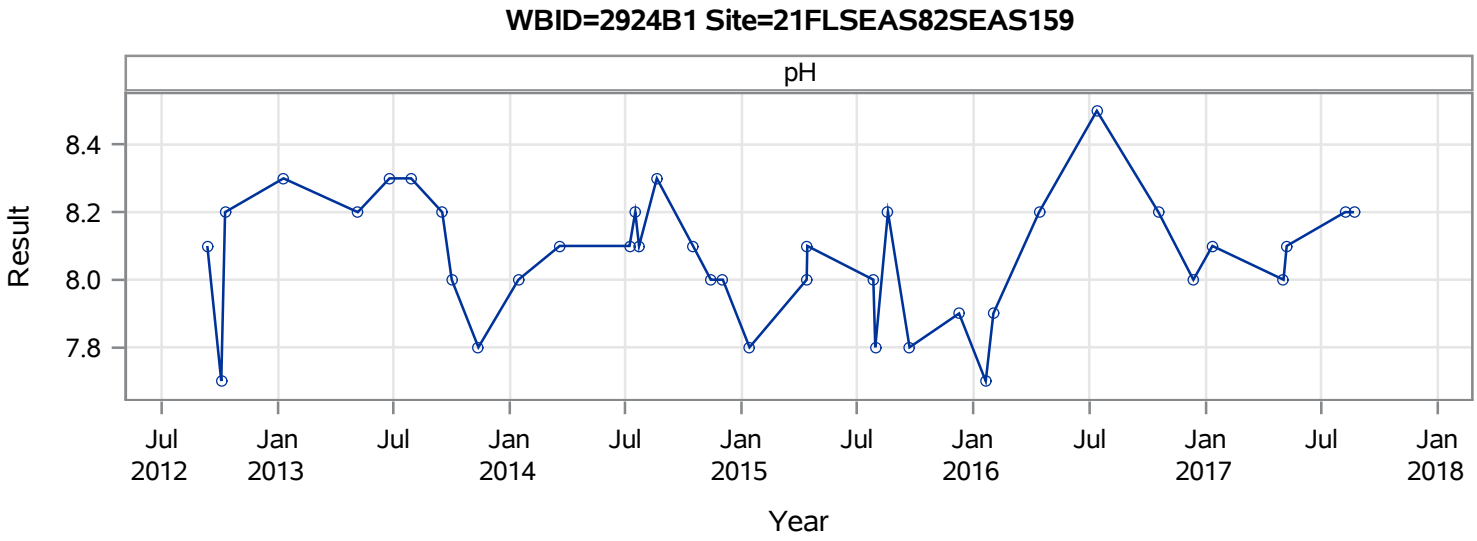

WBID=2924B1 Site=21FLSEAS82SEAS157
Dissolved Oxygen (%)
300
250
200
150
100
50
Dissolved Oxygen (mg/L)
20
15
10
5
Fecal COliform (#/100ml)
800
600
400
200
0
Result
Salinity (PSU)
40
30
20
10
Temperature (Degree C)
35
30
25
20
15
10
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
Year

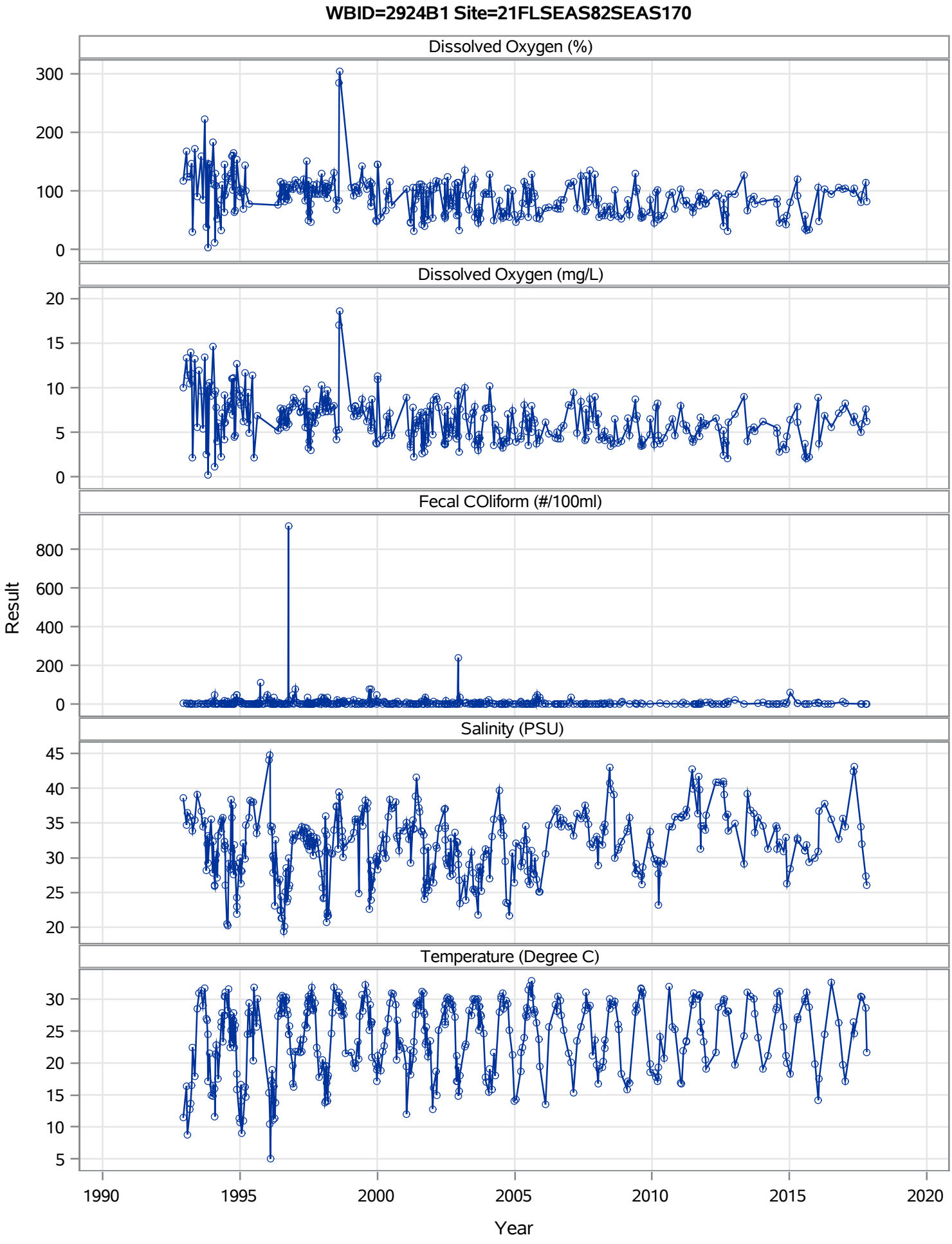

WBID=2924B1 Site=21FLSEAS82SEAS157
pH
Result
9.0
8.5
8.0
7.5
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
Year

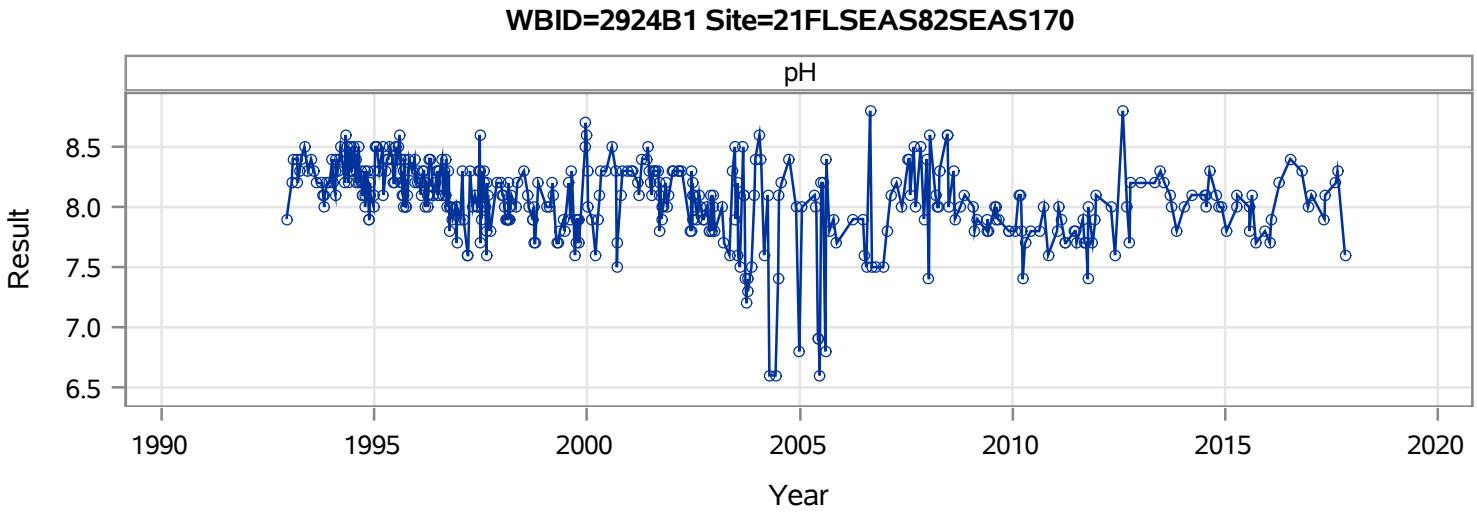

WBID=2924B1 Site=21FLSEAS82SEAS158
Dissolved Oxygen (%)
100
90
80
70
60
50
Dissolved Oxygen (mg/L)
8
7
6
5
4
3
Fecal COliform (#/100ml)
12.5
10.0
7.5
5.0
2.5
Salinity (PSU)
40
35
30
Temperature (Degree C)
30.0
27.5
25.0
22.5
20.0
17.5
Result
Oct
2009
Jan
2010
Apr
Jul
Oct
Jan
2011
Apr
Jul
Oct
Jan
2012
Apr
Year

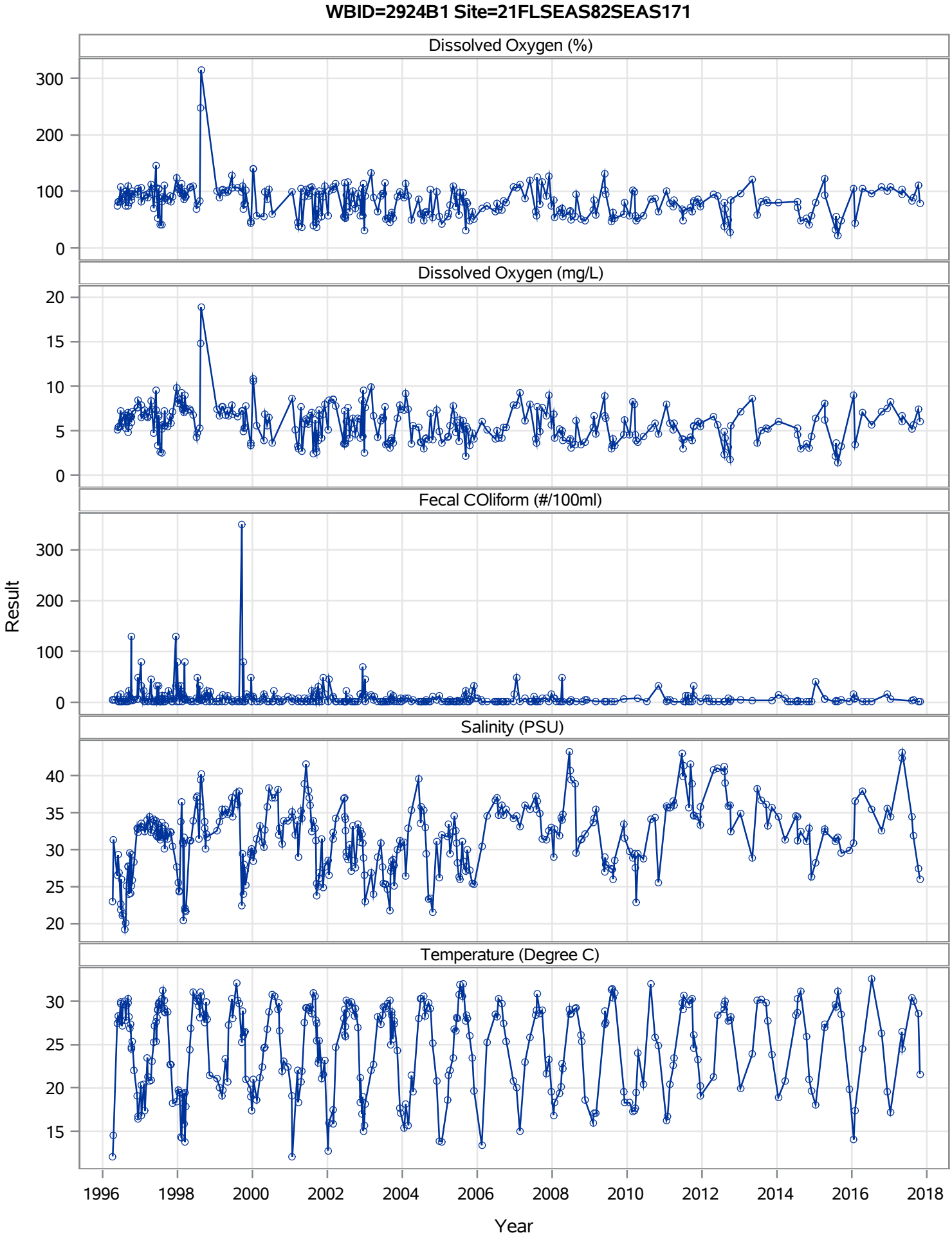

WBID=2924B1 Site=21FLSEAS82SEAS158
pH
Result
8.1
8.0
7.9
7.8
7.7
Oct
2009
Jan
2010
Apr
Jul
Oct
Jan
2011
Apr
Jul
Oct
Jan
2012
Apr
Year

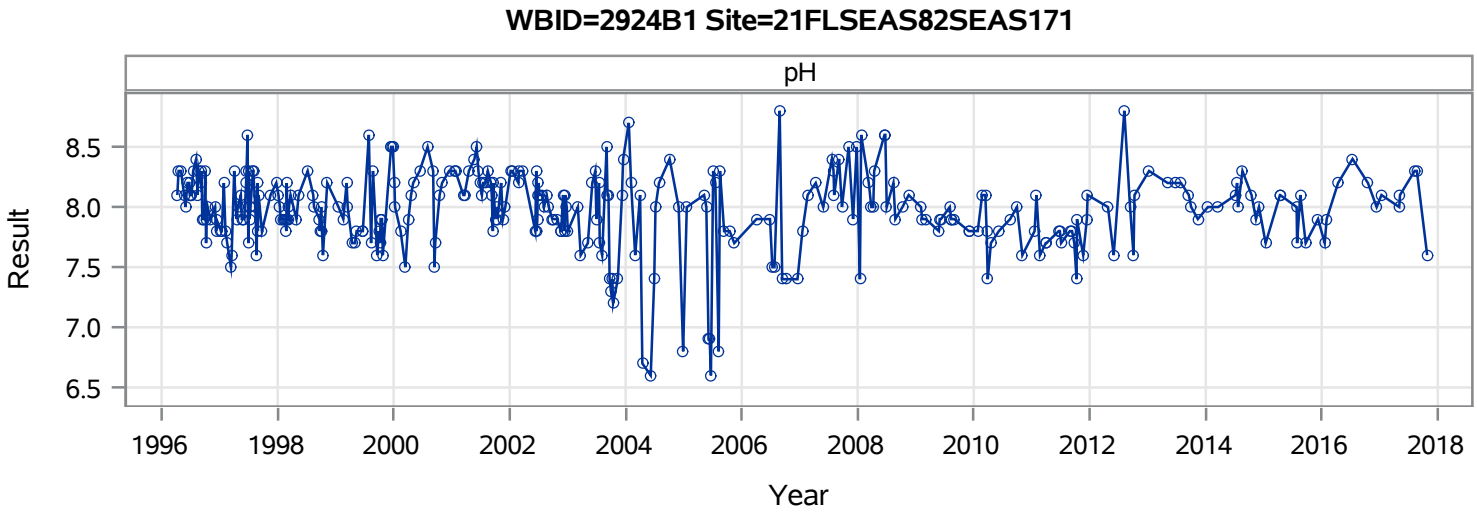

WBID=2924B1 Site=21FLSEAS82SEAS159
Dissolved Oxygen (%)
120
100
80
60
40
Dissolved Oxygen (mg/L)
8
6
4
2
Fecal COliform (#/100ml)
25
20
15
10
5
0
Salinity (PSU)
40
35
30
25
Temperature (Degree C)
30
25
20
15
Result
Jul 2012
Jan 2013
Jul
Jan 2014
Jul
Jan 2015
Jul
Jan 2016
Jul
Jan 2017
Jul
Jan 2018
Year

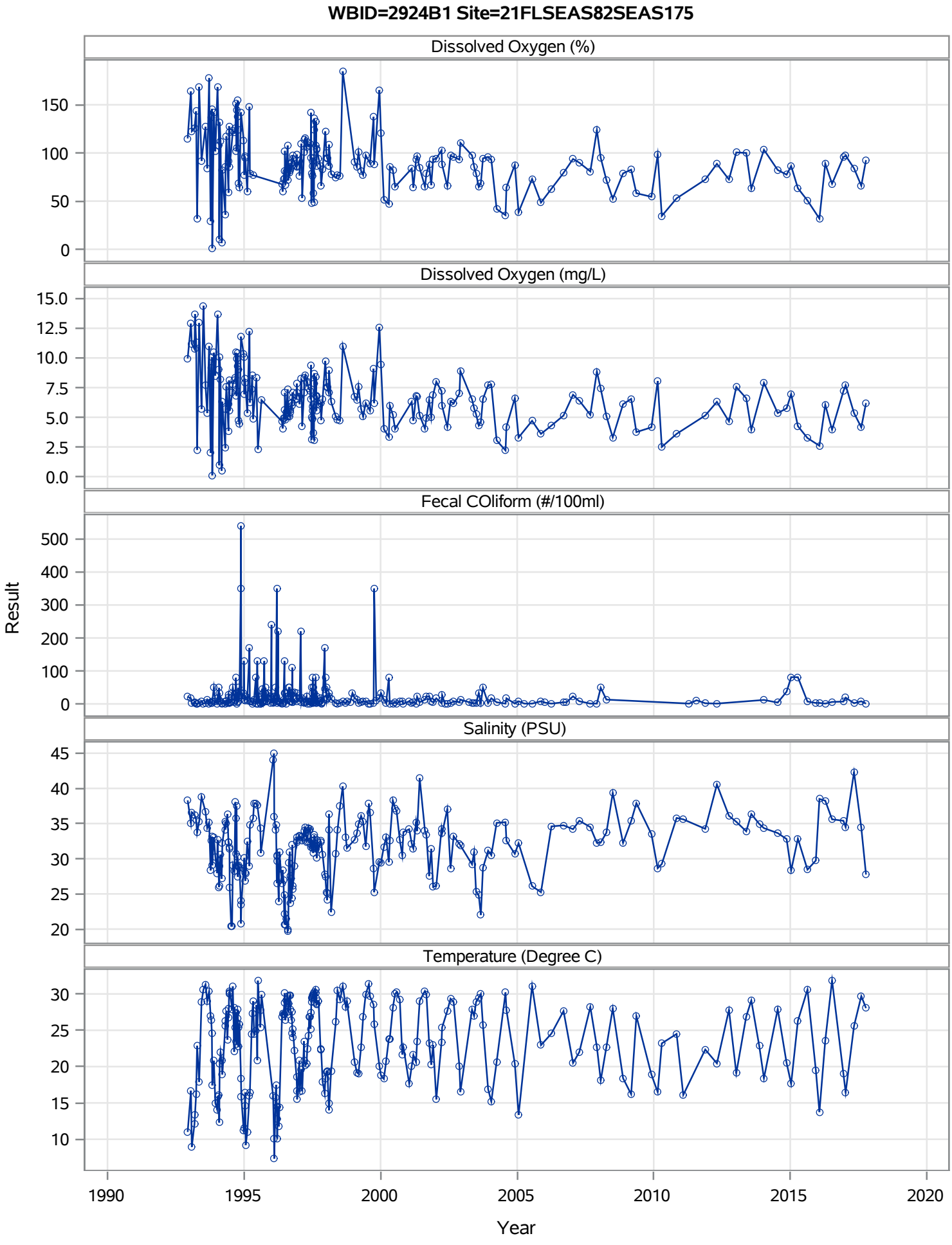

WBID=2924B1 Site=21FLSEAS82SEAS159
pH
Result
8.4
8.2
8.0
7.8
Jul 2012
Jan 2013
Jul
Jan 2014
Jul
Jan 2015
Jul
Jan 2016
Jul
Jan 2017
Jul
Jan 2018
Year

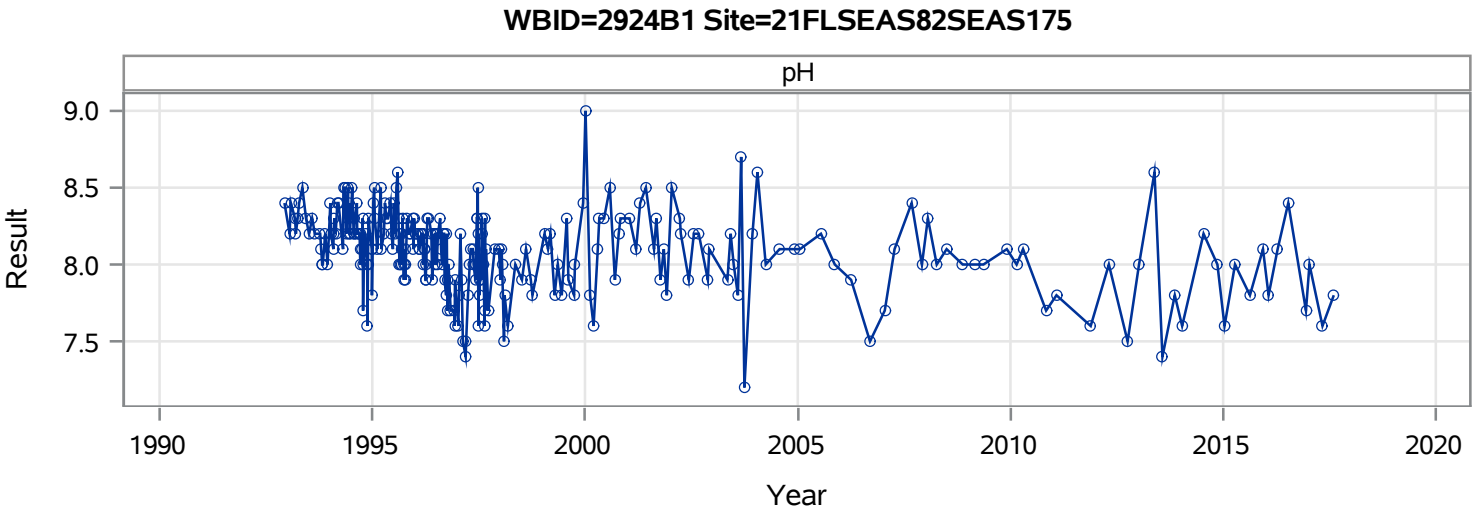

WBID=2924B1 Site=21FLSEAS82SEAS170
Dissolved Oxygen (%)
300
200
100
0
Dissolved Oxygen (mg/L)
20
15
10
5
0
Fecal COliform (#/100ml)
800
600
400
200
0
Salinity (PSU)
45
40
35
30
25
20
Temperature (Degree C)
30
25
20
15
10
5
Result
1990
1995
2000
2005
2010
2015
2020
Year

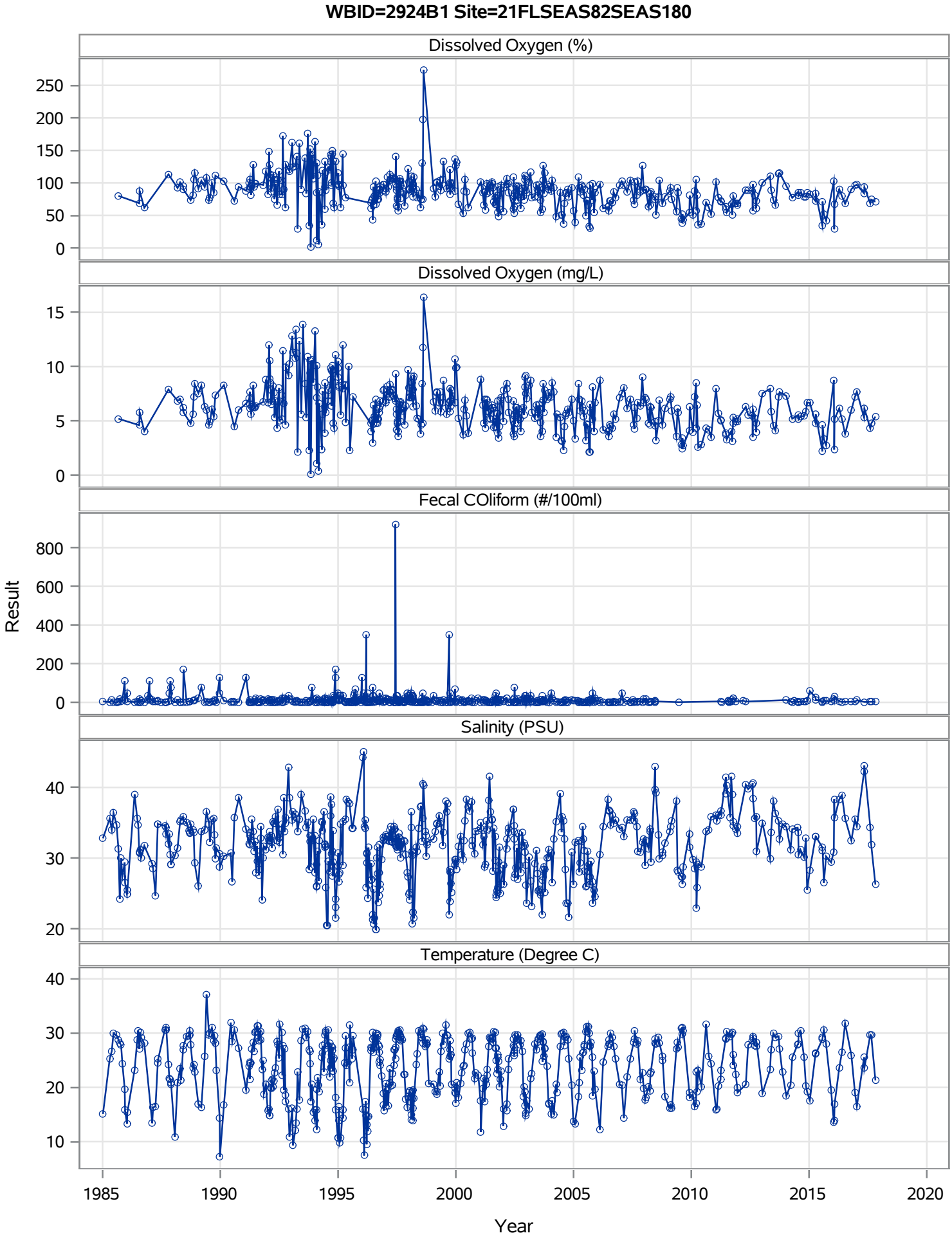

WBID=2924B1 Site=21FLSEAS82SEAS170
pH
Result
8.5
8.0
7.5
7.0
6.5
1990
1995
2000
2005
2010
2015
2020
Year

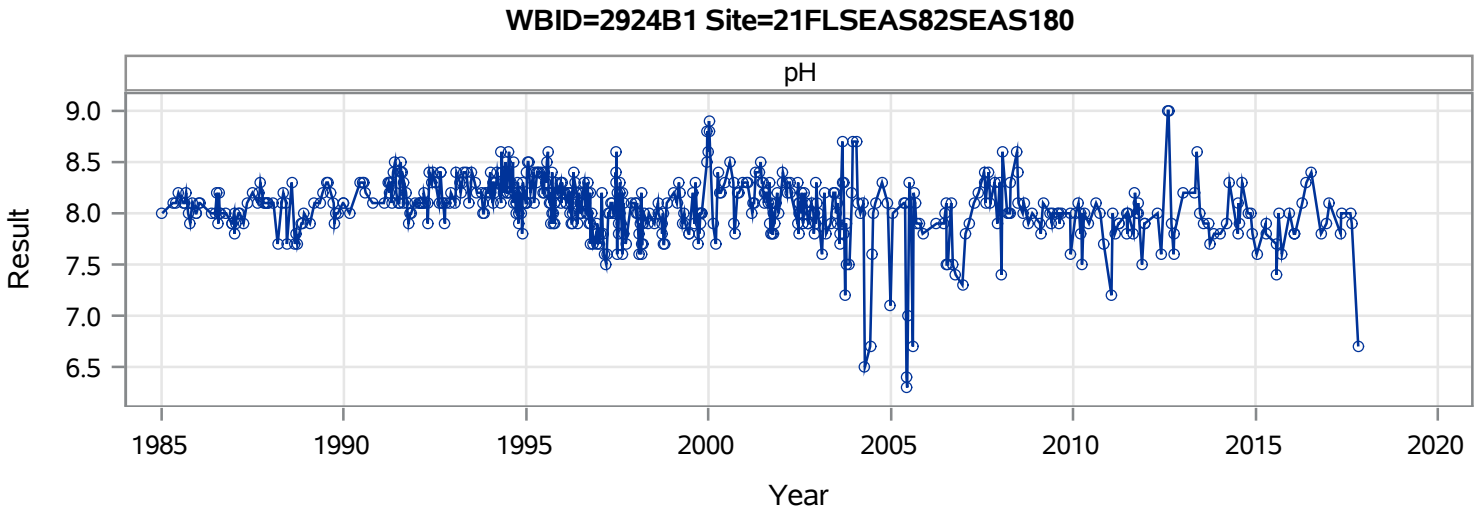

WBID=2924B1 Site=21FLSEAS82SEAS171
Dissolved Oxygen (%)
300
200
100
0
Dissolved Oxygen (mg/L)
20
15
10
5
0
Fecal COliform (#/100ml)
300
200
100
0
Result
Salinity (PSU)
40
35
30
25
20
Temperature (Degree C)
30
25
20
15
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

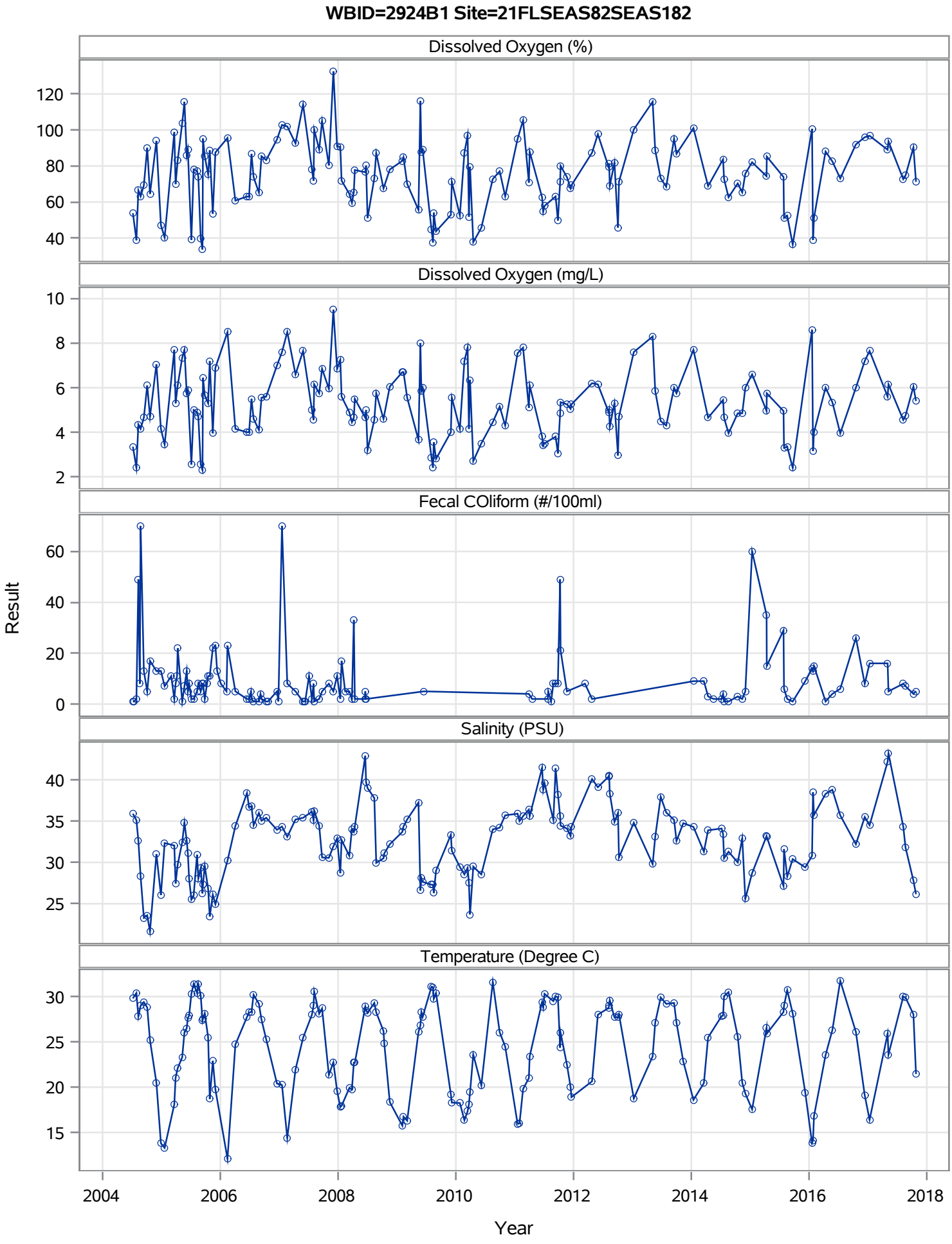

WBID=2924B1 Site=21FLSEAS82SEAS171
pH
Result
8.5
8.0
7.5
7.0
6.5
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

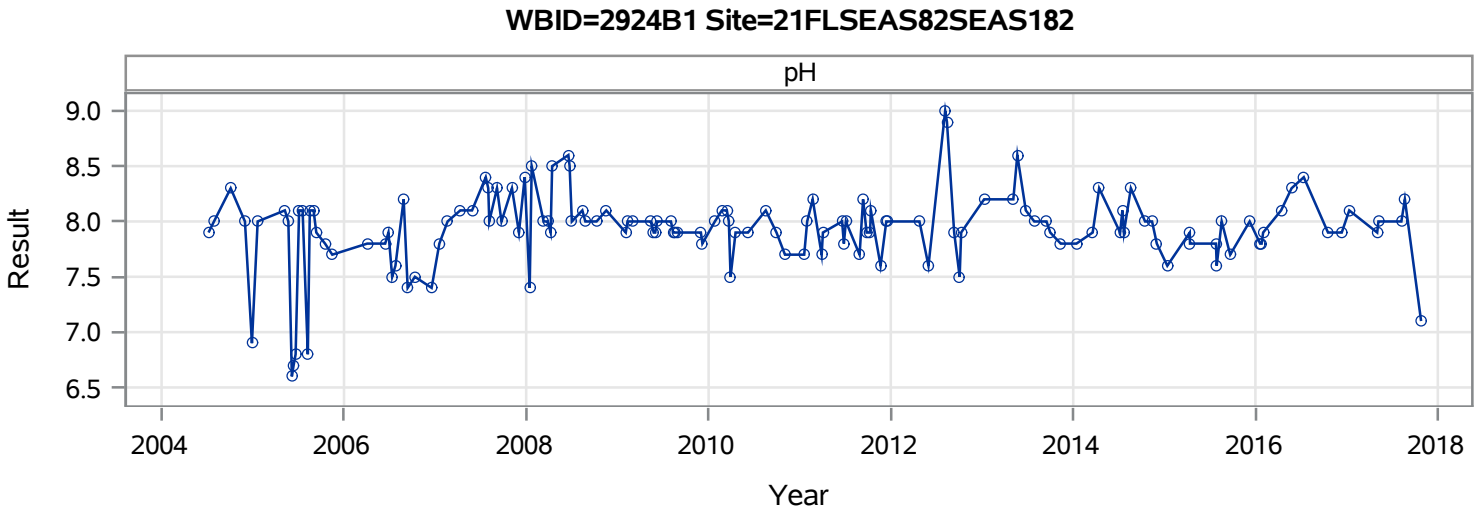

WBID=2924B1 Site=21FLSEAS82SEAS175
Dissolved Oxygen (%)
150
100
50
0
Dissolved Oxygen (mg/L)
15.0
12.5
10.0
7.5
5.0
2.5
0.0
Fecal COliform (#/100ml)
500
400
300
200
100
0
Salinity (PSU)
45
40
35
30
25
20
Temperature (Degree C)
30
25
20
15
10
Result
1990
1995
2000
2005
2010
2015
2020
Year

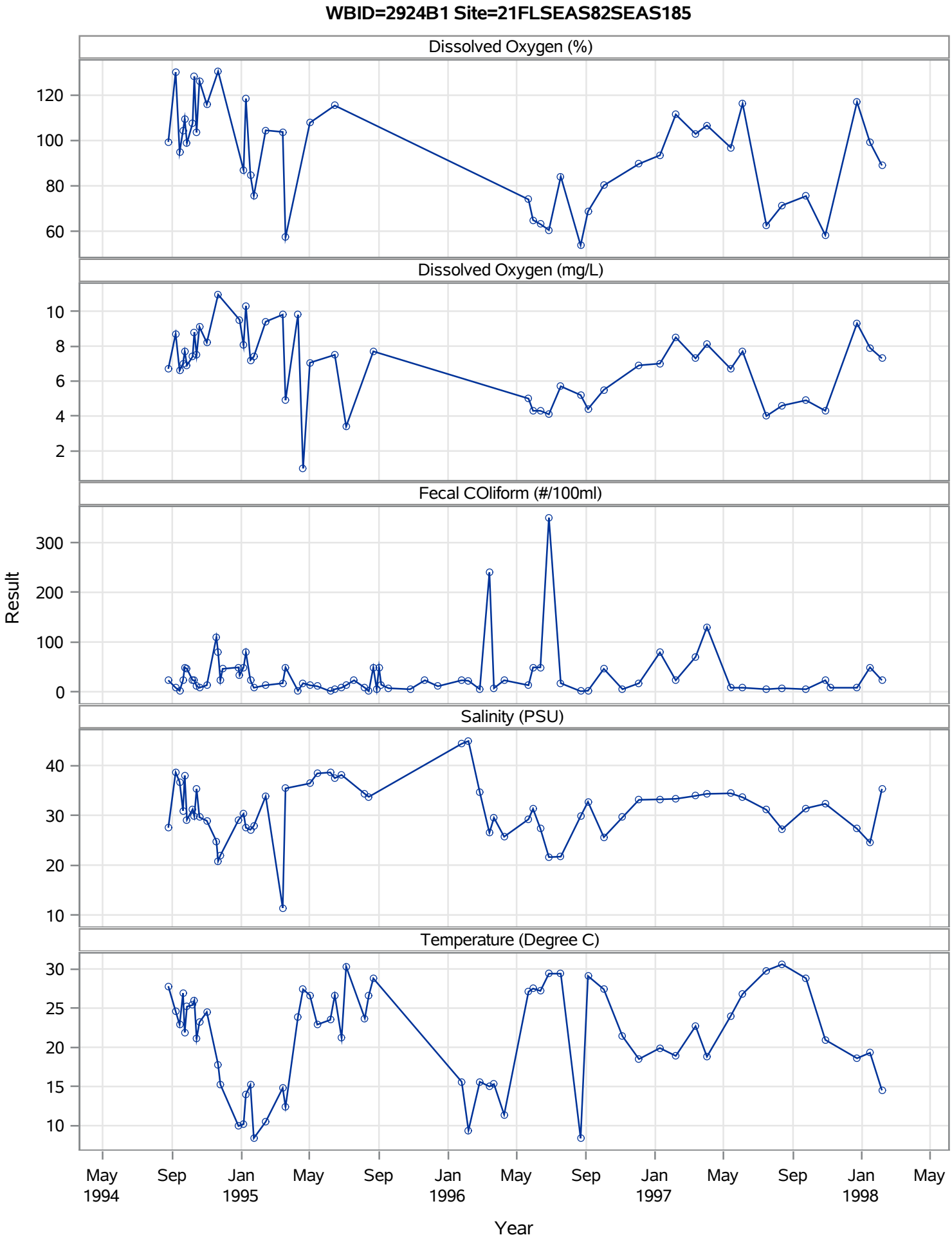

WBID=2924B1 Site=21FLSEAS82SEAS175
pH
Result
9.0
8.5
8.0
7.5
1990
1995
2000
2005
2010
2015
2020
Year

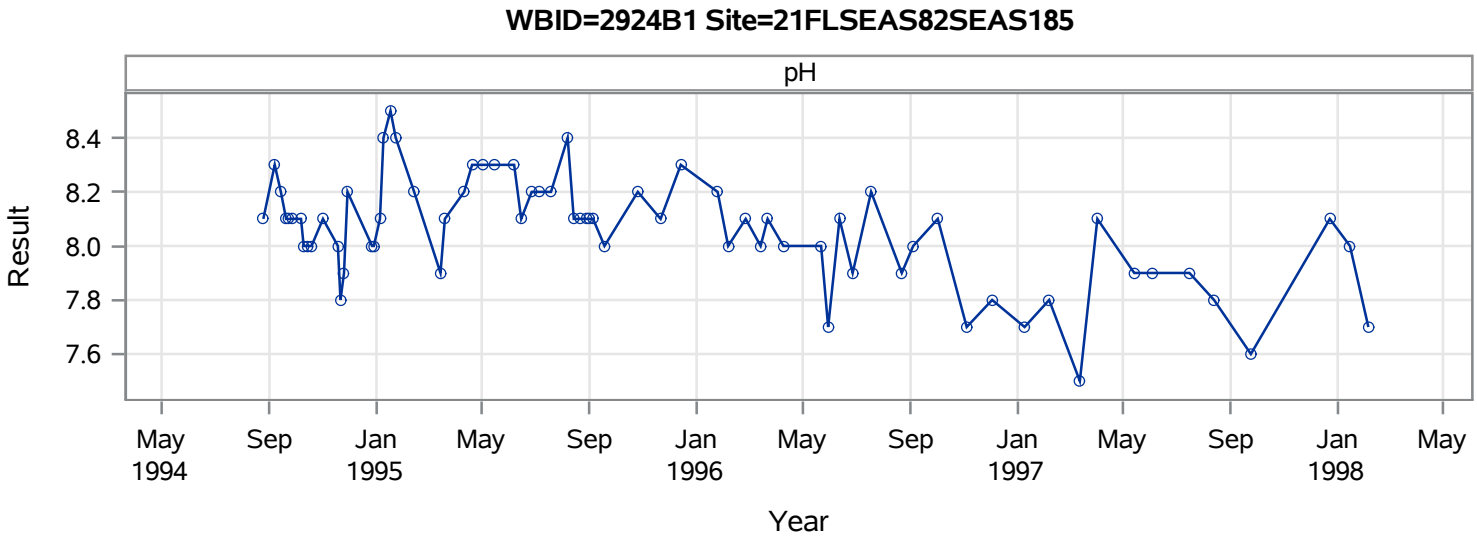

WBID=2924B1 Site=21FLSEAS82SEAS180
Dissolved Oxygen (%)
250
200
150
100
50
0
Dissolved Oxygen (mg/L)
15
10
5
0
Fecal COliform (#/100ml)
800
600
400
200
0
Result
Salinity (PSU)
40
30
20
Temperature (Degree C)
40
30
20
10
1985
1990
1995
2000
2005
2010
2015
2020
Year

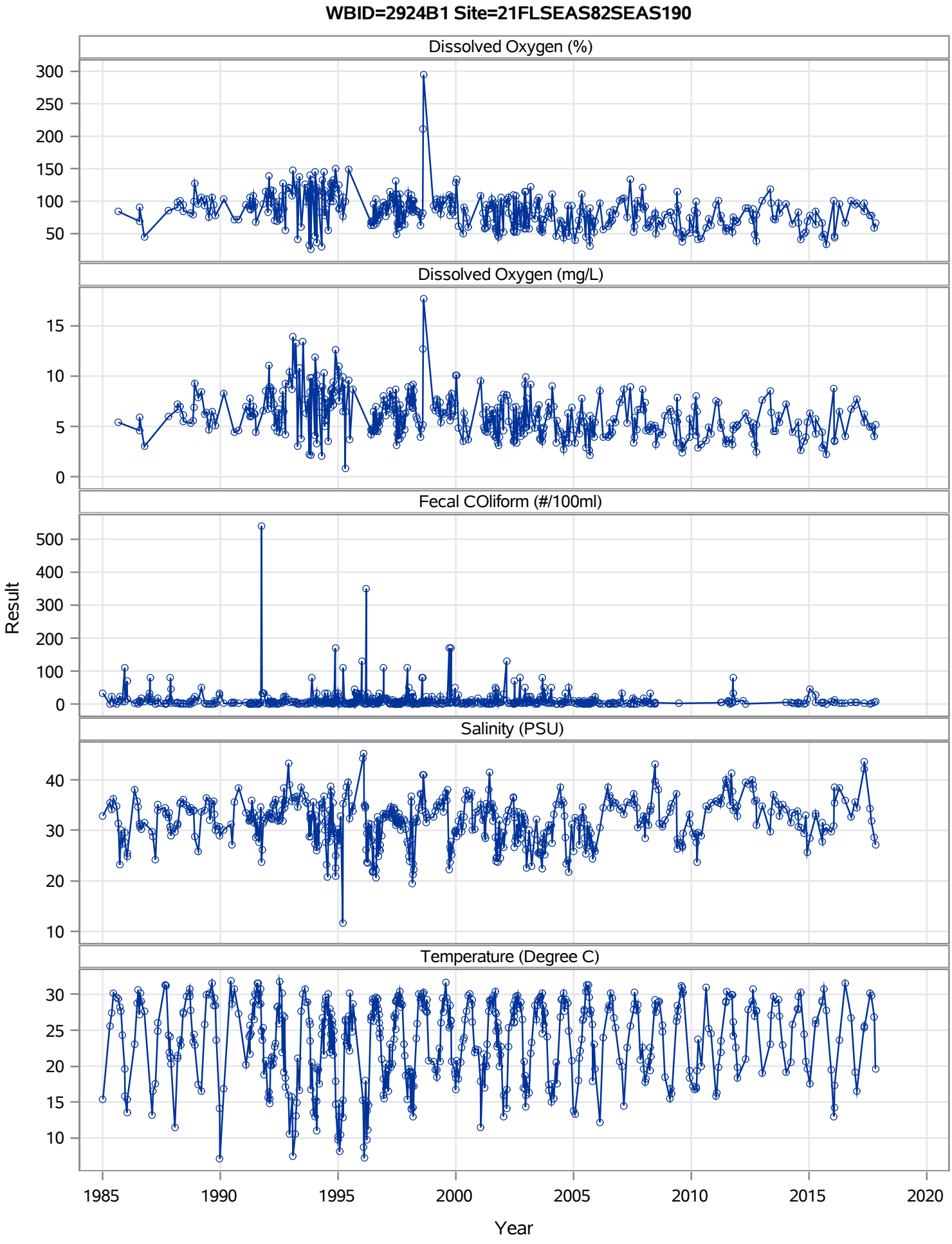

WBID=2924B1 Site=21FLSEAS82SEAS180
pH
Result
9.0
8.5
8.0
7.5
7.0
6.5
1985
1990
1995
2000
2005
2010
2015
2020
Year

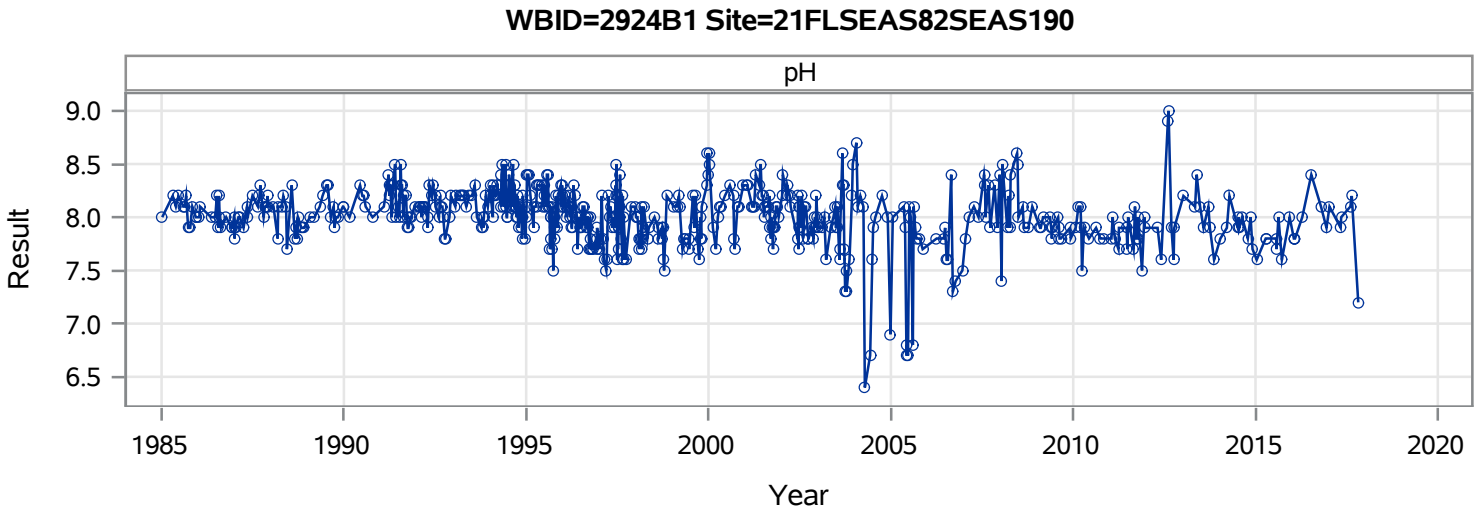

WBID=2924B1 Site=21FLSEAS82SEAS182
Dissolved Oxygen (%)
120
100
80
60
40
Dissolved Oxygen (mg/L)
10
8
6
4
2
Fecal COliform (#/100ml)
60
40
20
0
Salinity (PSU)
40
35
30
25
Temperature (Degree C)
30
25
20
15
Result
2004
2006
2008
2010
2012
2014
2016
2018
Year

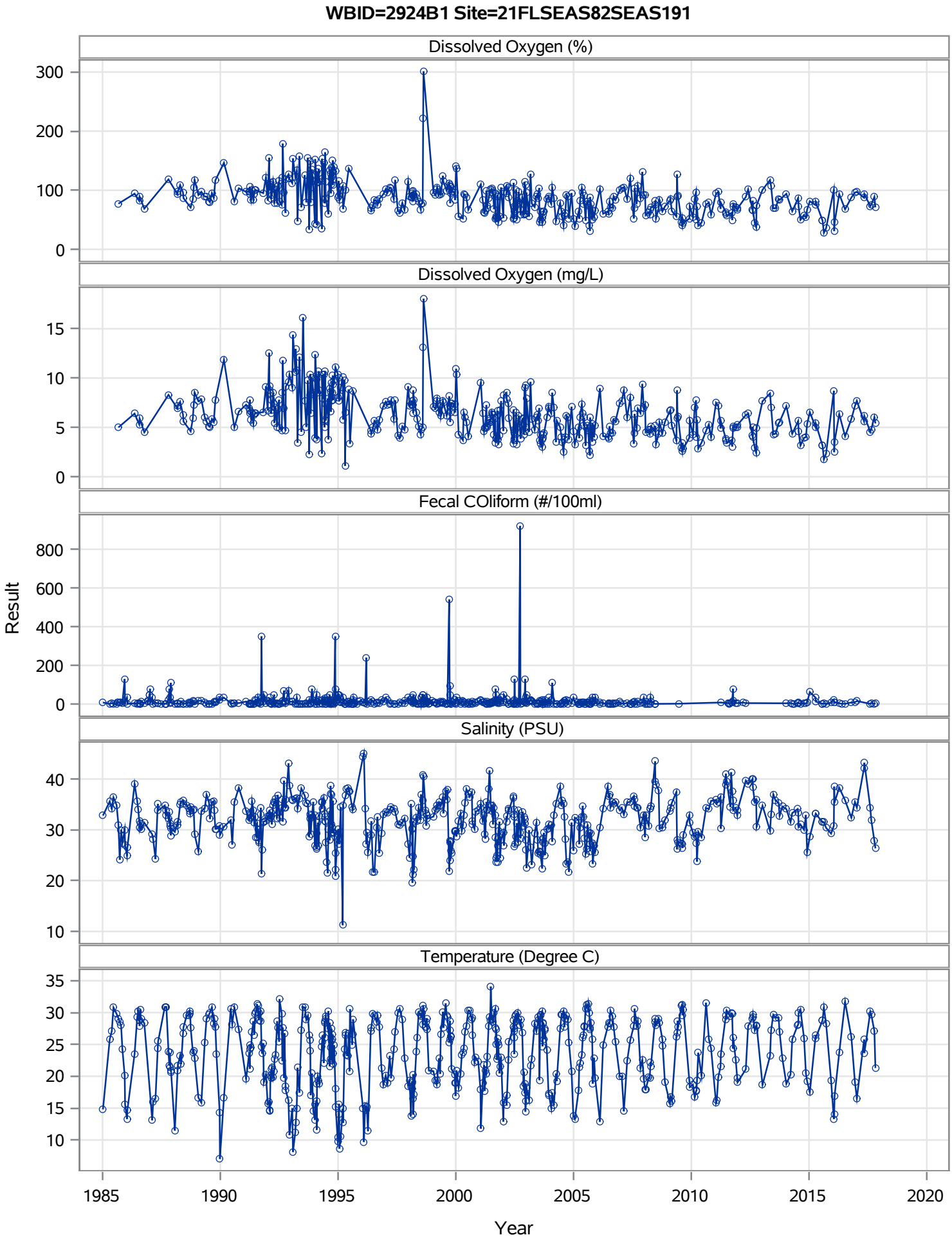

WBID=2924B1 Site=21FLSEAS82SEAS182
pH
Result
9.0
8.5
8.0
7.5
7.0
6.5
2004
2006
2008
2010
2012
2014
2016
2018
Year

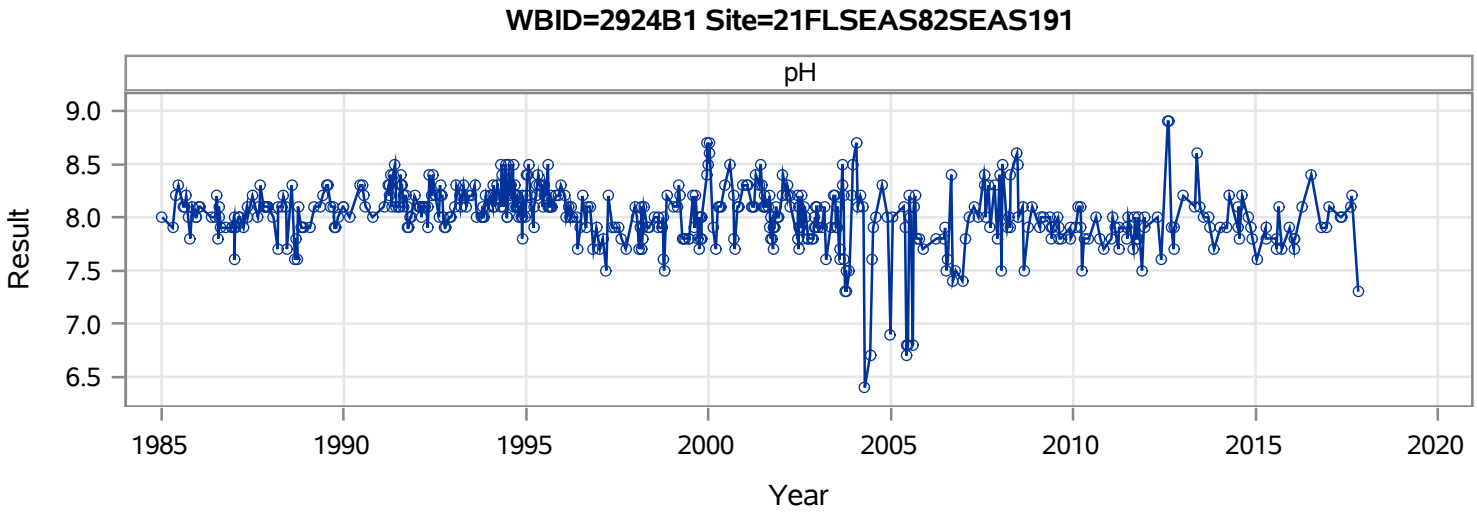

WBID=2924B1 Site=21FLSEAS82SEAS185
Dissolved Oxygen (%)
120
100
80
60
Dissolved Oxygen (mg/L)
10
8
6
4
2
Fecal COliform (#/100ml)
300
200
100
0
Salinity (PSU)
40
30
20
10
Temperature (Degree C)
30
25
20
15
10
Result
May 1994
Sep
Jan 1995
May
Sep
Jan 1996
May
Sep
Jan 1997
May
Sep
Jan 1998
May
Year

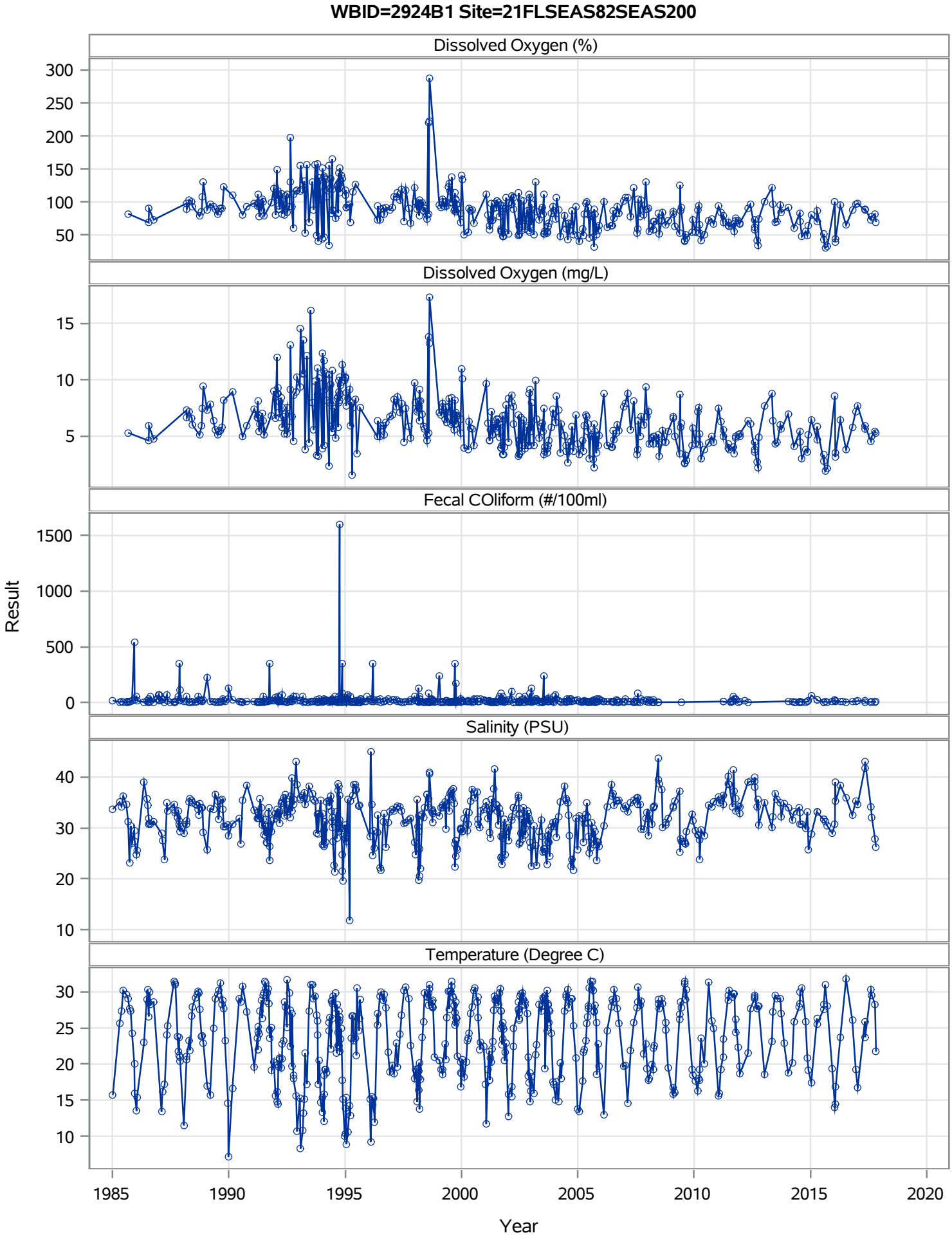

WBID=2924B1 Site=21FLSEAS82SEAS185
pH
Result
8.4
8.2
8.0
7.8
7.6
May
1994
Sep
Jan
1995
May
Sep
Jan
1996
May
Sep
Jan
1997
May
Sep
Jan
1998
May
Year

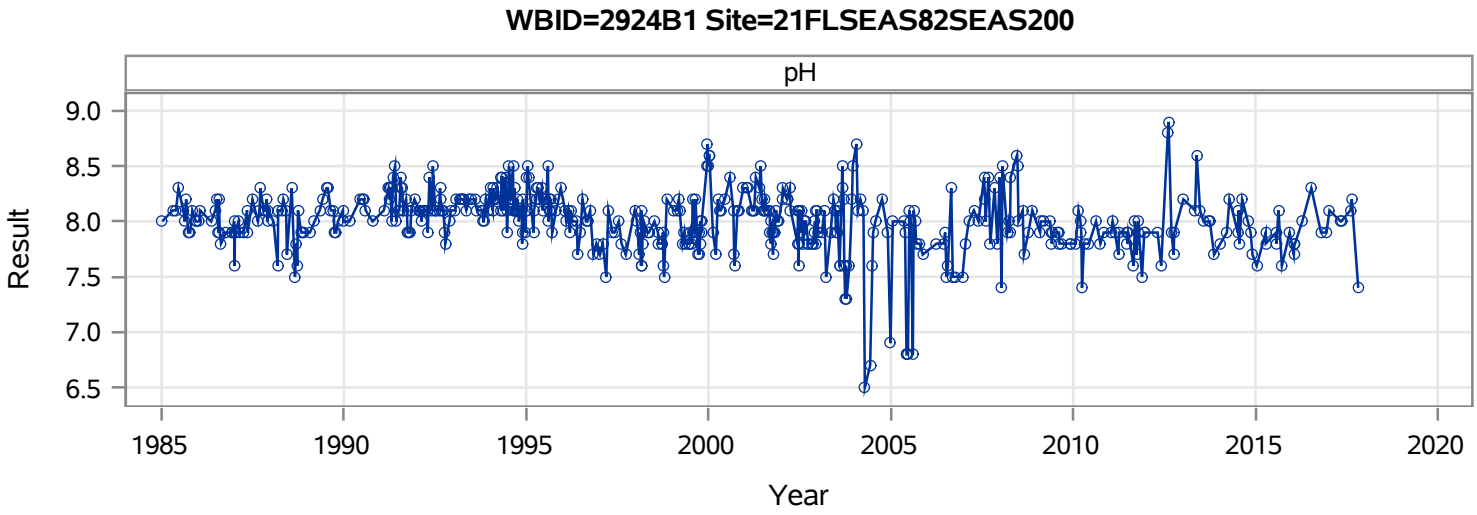

WBID=2924B1 Site=21FLSEAS82SEAS190
Dissolved Oxygen (%)
300
250
200
150
100
50
Dissolved Oxygen (mg/L)
15
10
5
0
Fecal COliform (#/100ml)
500
400
300
200
100
0
Salinity (PSU)
40
30
20
10
Temperature (Degree C)
30
25
20
15
10
Result
1985
1990
1995
2000
2005
2010
2015
2020
Year

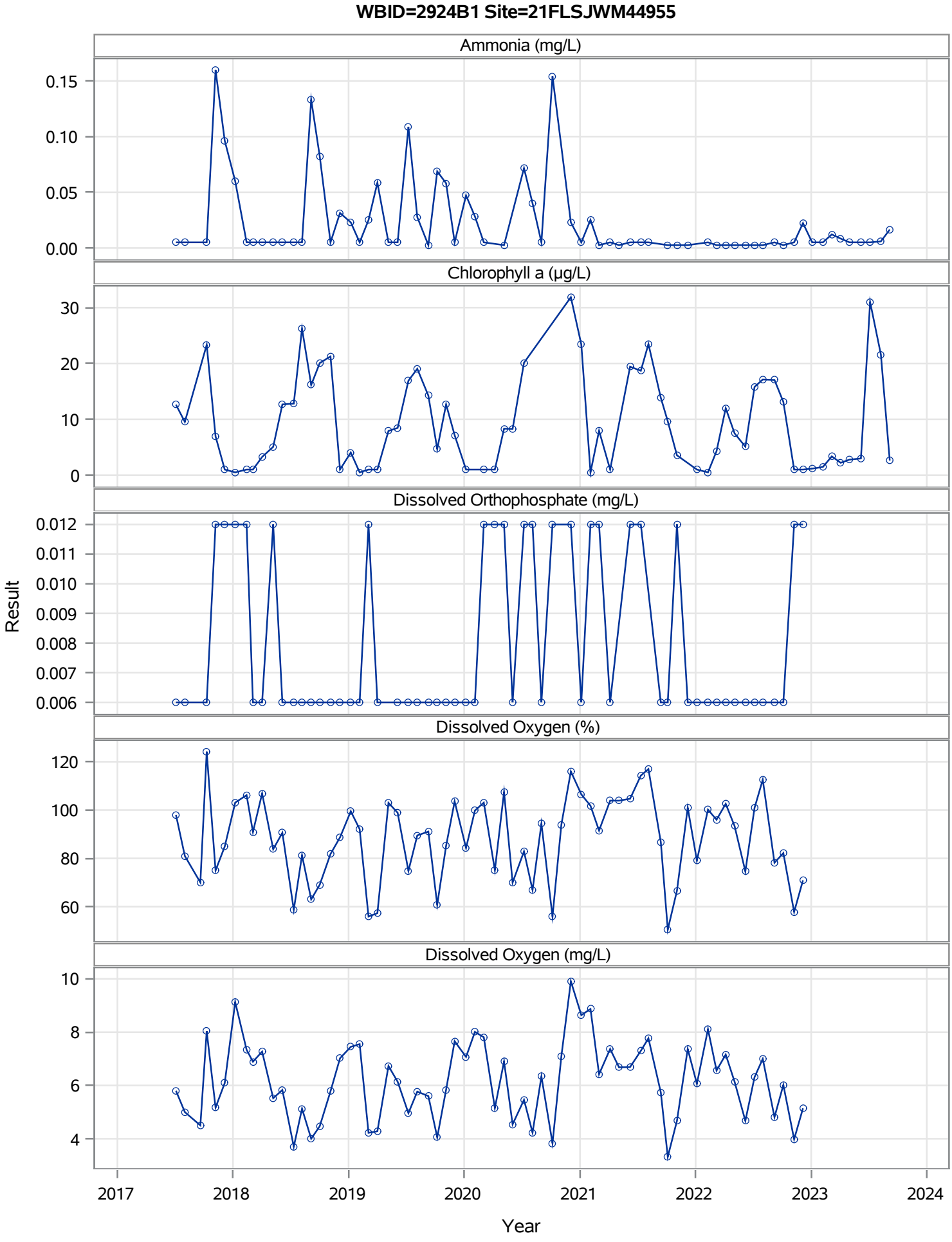

WBID=2924B1 Site=21FLSEAS82SEAS190
pH
Result
9.0
8.5
8.0
7.5
7.0
6.5
1985
1990
1995
2000
2005
2010
2015
2020
Year

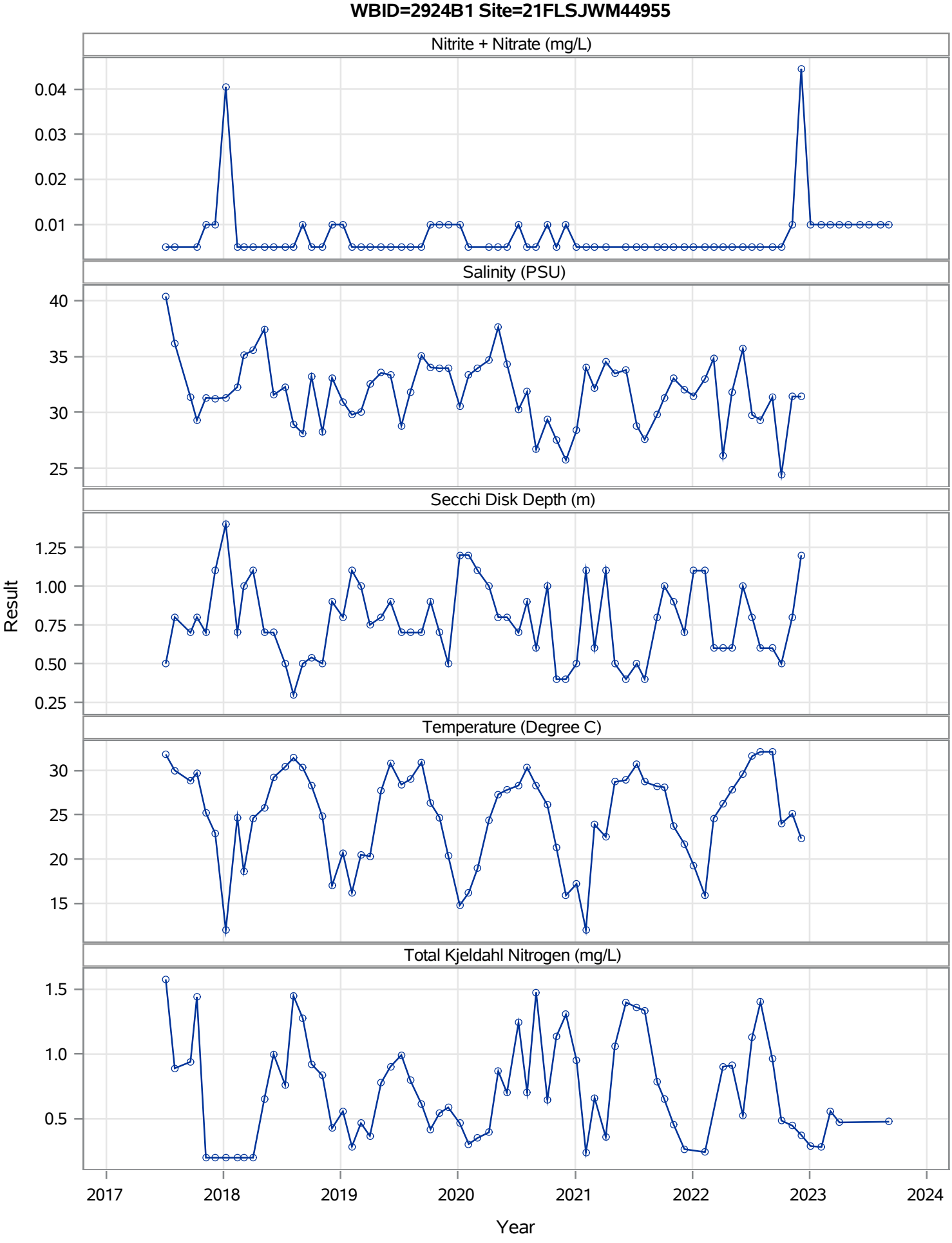

WBID=2924B1 Site=21FLSEAS82SEAS191
Dissolved Oxygen (%)
300
200
100
0
Dissolved Oxygen (mg/L)
15
10
5
0
Fecal COliform (#/100ml)
800
600
400
200
0
Salinity (PSU)
40
30
20
10
Temperature (Degree C)
35
30
25
20
15
10
Result
1985
1990
1995
2000
2005
2010
2015
2020
Year

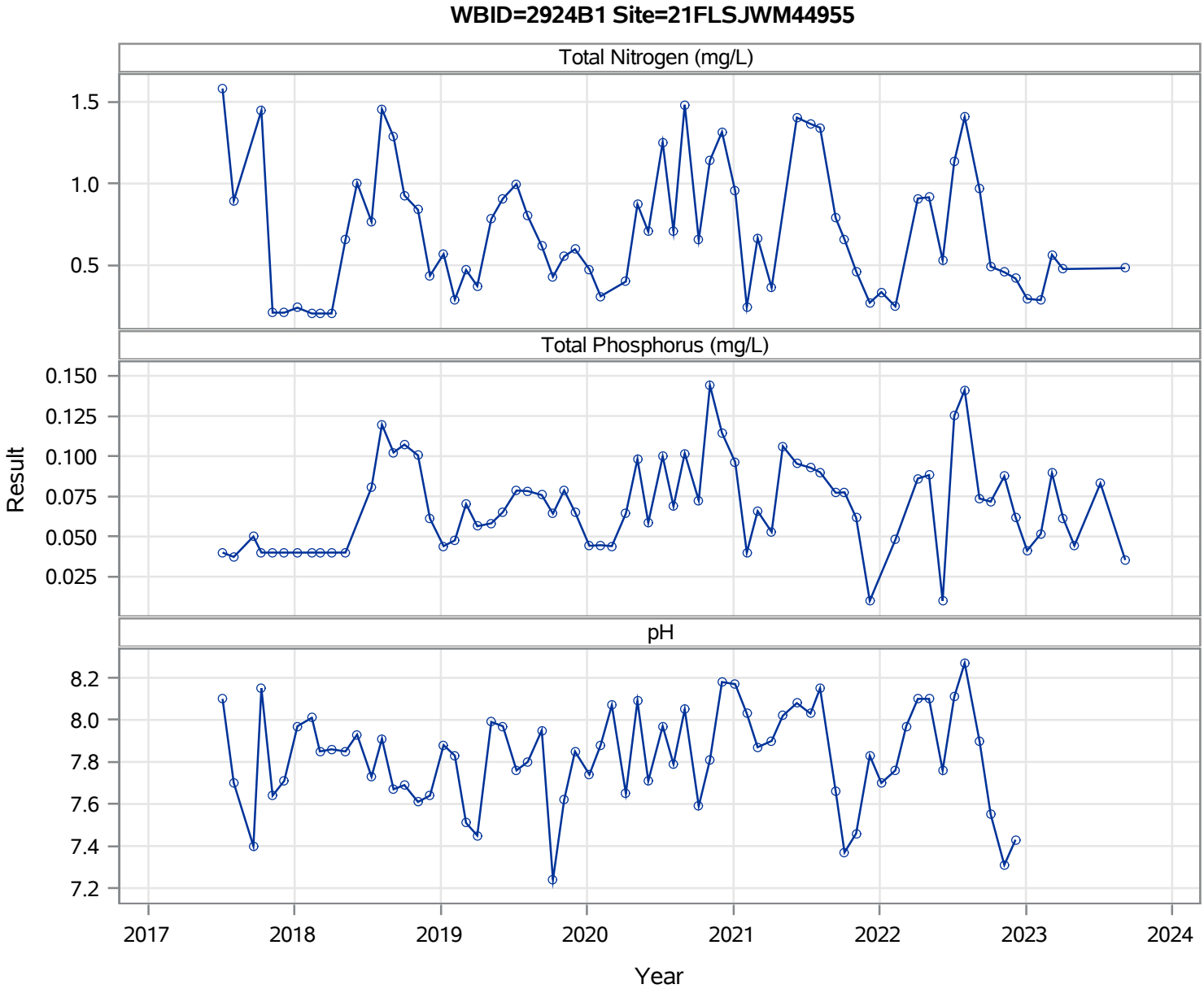

WBID=2924B1 Site=21FLSEAS82SEAS191
pH
Result
9.0
8.5
8.0
7.5
7.0
6.5
1985
1990
1995
2000
2005
2010
2015
2020
Year

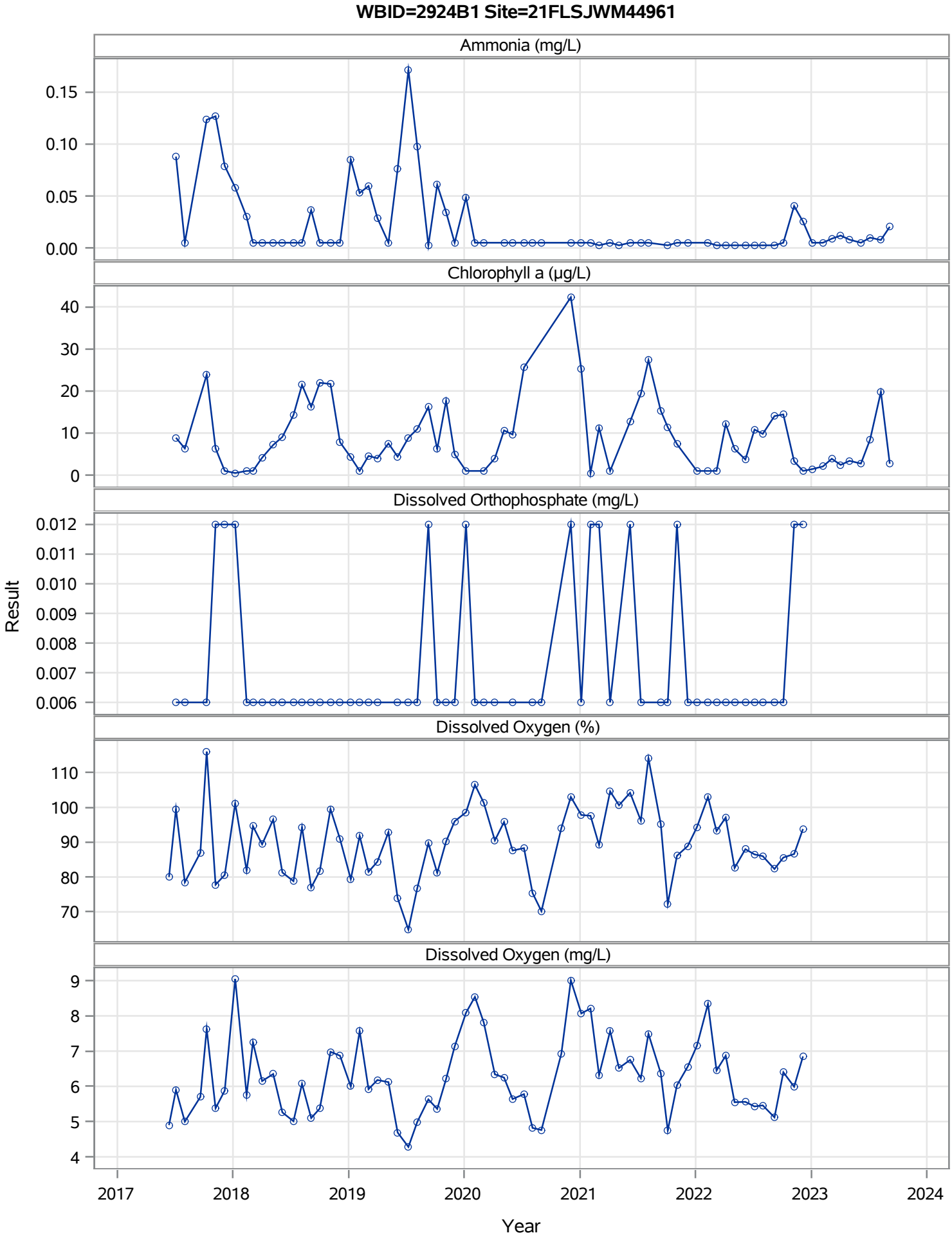

WBID=2924B1 Site=21FLSEAS82SEAS200
Dissolved Oxygen (%)
300
250
200
150
100
50
Dissolved Oxygen (mg/L)
15
10
5
Fecal COliform (#/100ml)
1500
1000
500
0
Salinity (PSU)
40
30
20
10
Temperature (Degree C)
30
25
20
15
10
Result
1985
1990
1995
2000
2005
2010
2015
2020
Year

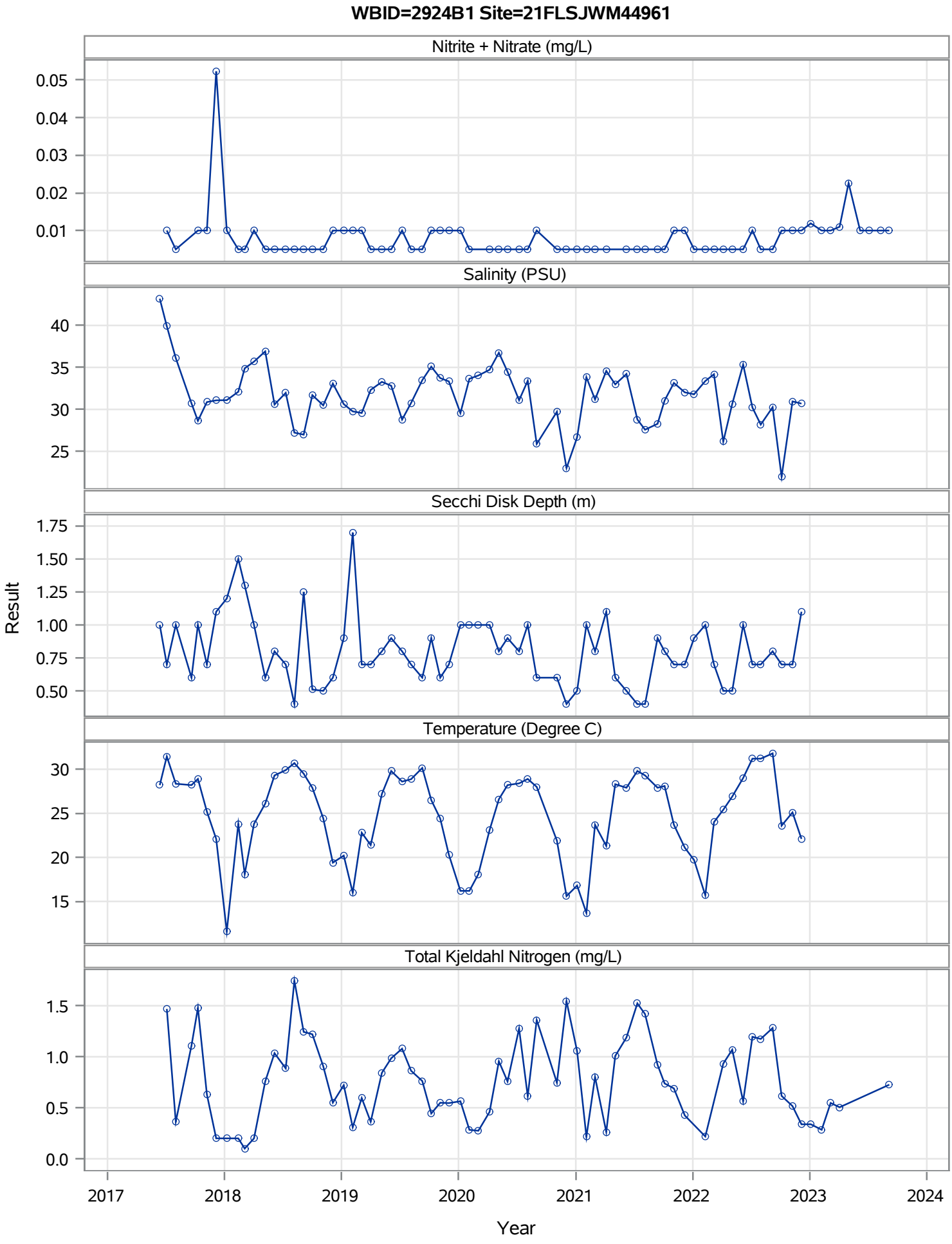

WBID=2924B1 Site=21FLSEAS82SEAS200
pH
Result
9.0
8.5
8.0
7.5
7.0
6.5
1985
1990
1995
2000
2005
2010
2015
2020
Year

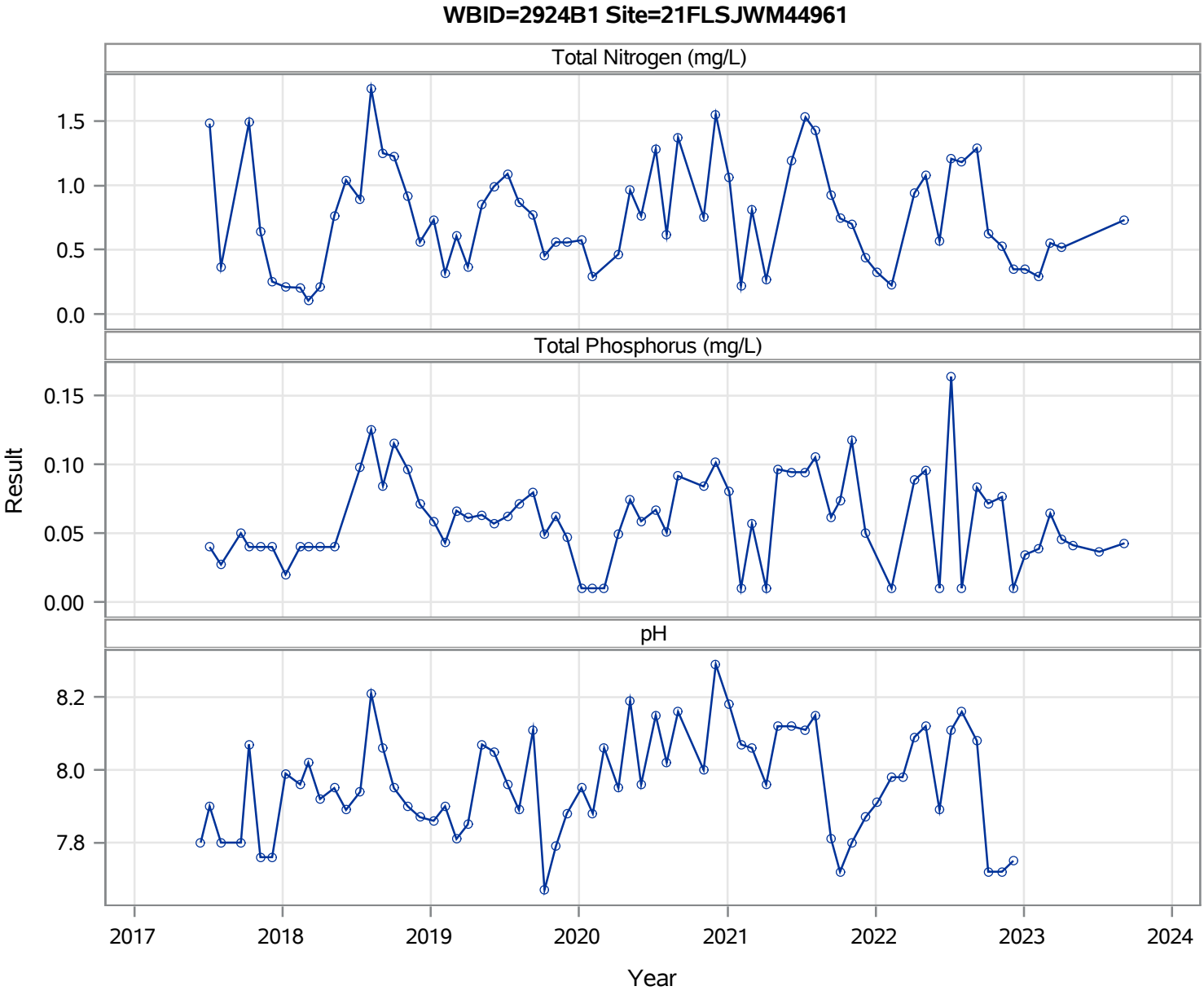

WBID=2924B1 Site=21FLSJWM44955
Ammonia (mg/L)
0.15
0.10
0.05
0.00
Chlorophyll a (µg/L)
30
20
10
0
Dissolved Orthophosphate (mg/L)
0.012
0.011
0.010
0.009
0.008
0.007
0.006
Result
Dissolved Oxygen (%)
120
100
80
60
Dissolved Oxygen (mg/L)
10
8
6
4
2017
2018
2019
2020
2021
2022
2023
2024
Year

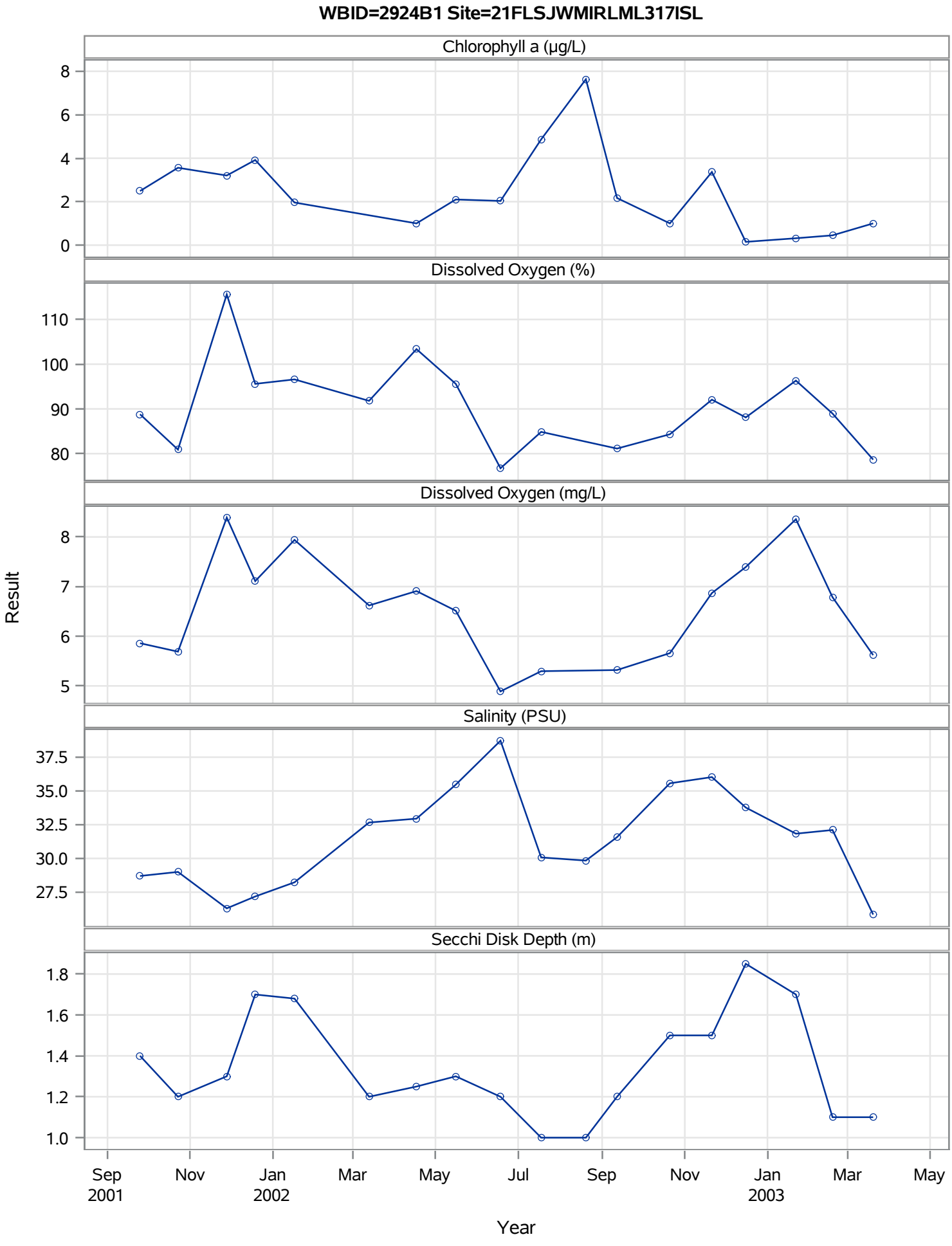

WBID=2924B1 Site=21FLSJWM44955
Nitrite + Nitrate (mg/L)
0.04
0.03
0.02
0.01
Salinity (PSU)
40
35
30
25
Secchi Disk Depth (m)
1.25
1.00
0.75
0.50
0.25
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
1.5
1.0
0.5
Result
2017
2018
2019
2020
2021
2022
2023
2024
Year

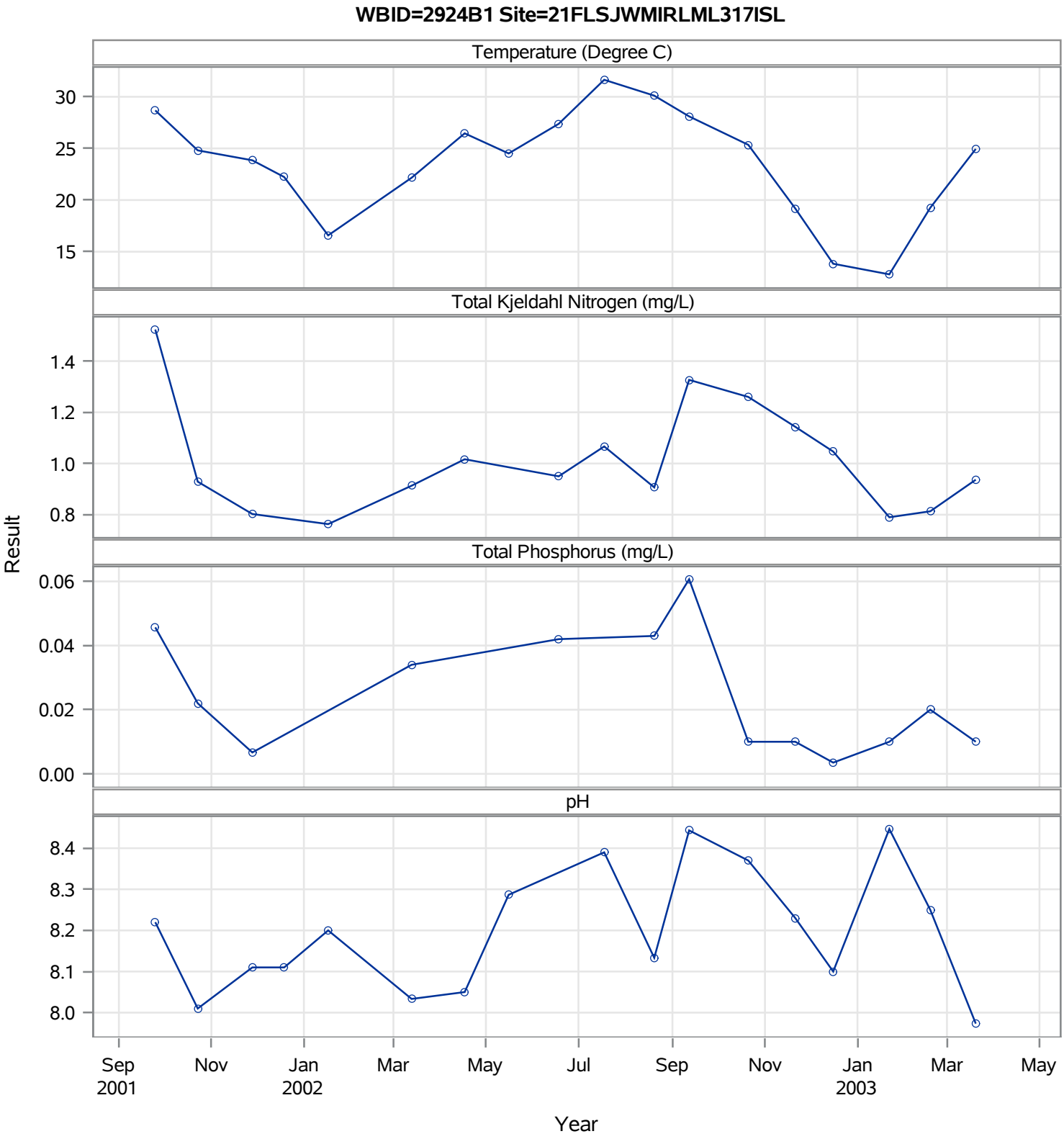

WBID=2924B1 Site=21FLSJWM44955
Total Nitrogen (mg/L)
1.5
1.0
0.5
Total Phosphorus (mg/L)
0.150
0.125
0.100
0.075
0.050
0.025
Result
pH
8.2
8.0
7.8
7.6
7.4
7.2
2017
2018
2019
2020
2021
2022
2023
2024
Year

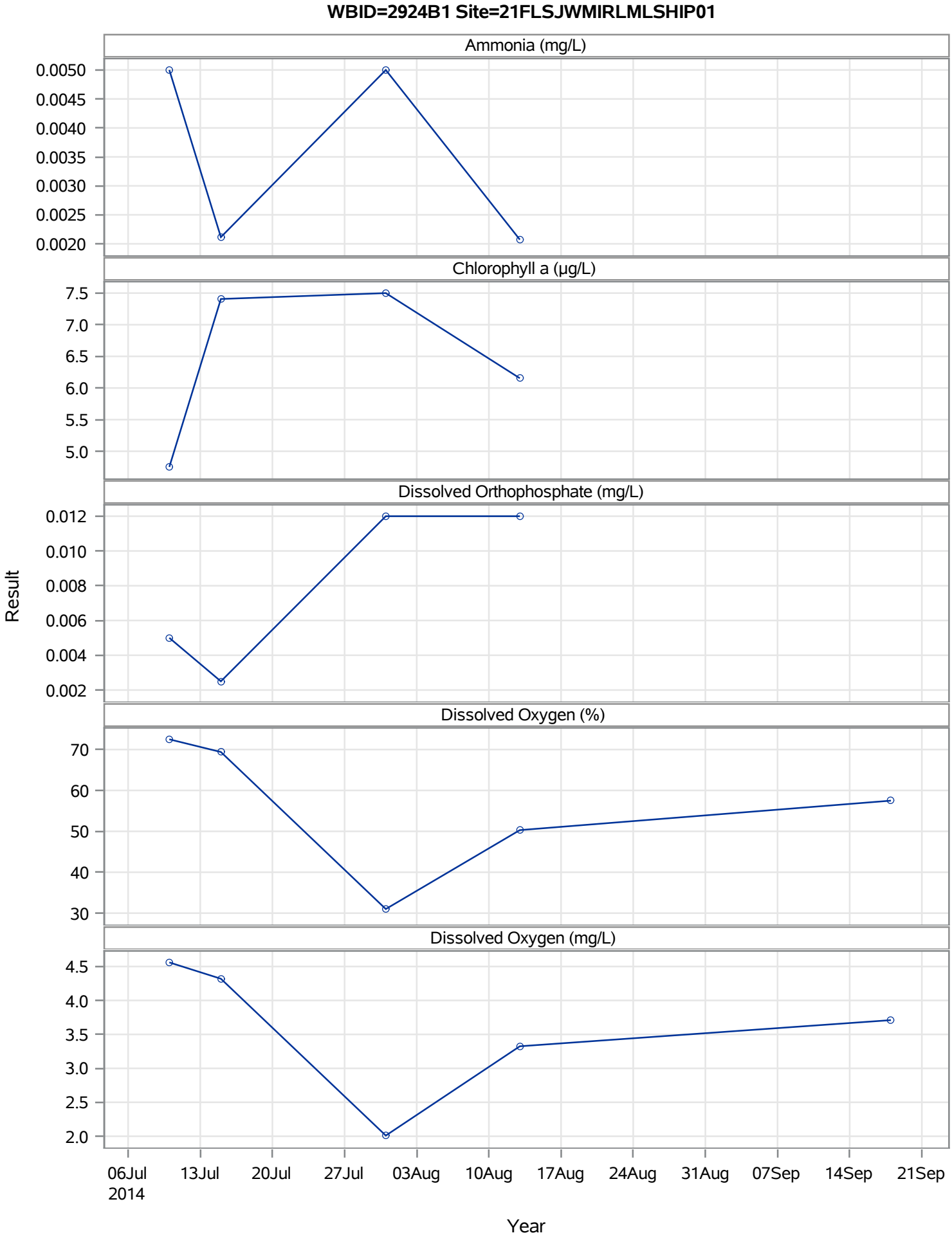

WBID=2924B1 Site=21FLSJWM44961
Ammonia (mg/L)
0.15
0.10
0.05
0.00
Chlorophyll a (µg/L)
40
30
20
10
0
Dissolved Orthophosphate (mg/L)
0.012
0.011
0.010
0.009
0.008
0.007
0.006
Result
Dissolved Oxygen (%)
110
100
90
80
70
Dissolved Oxygen (mg/L)
9
8
7
6
5
4
2017
2018
2019
2020
2021
2022
2023
2024
Year

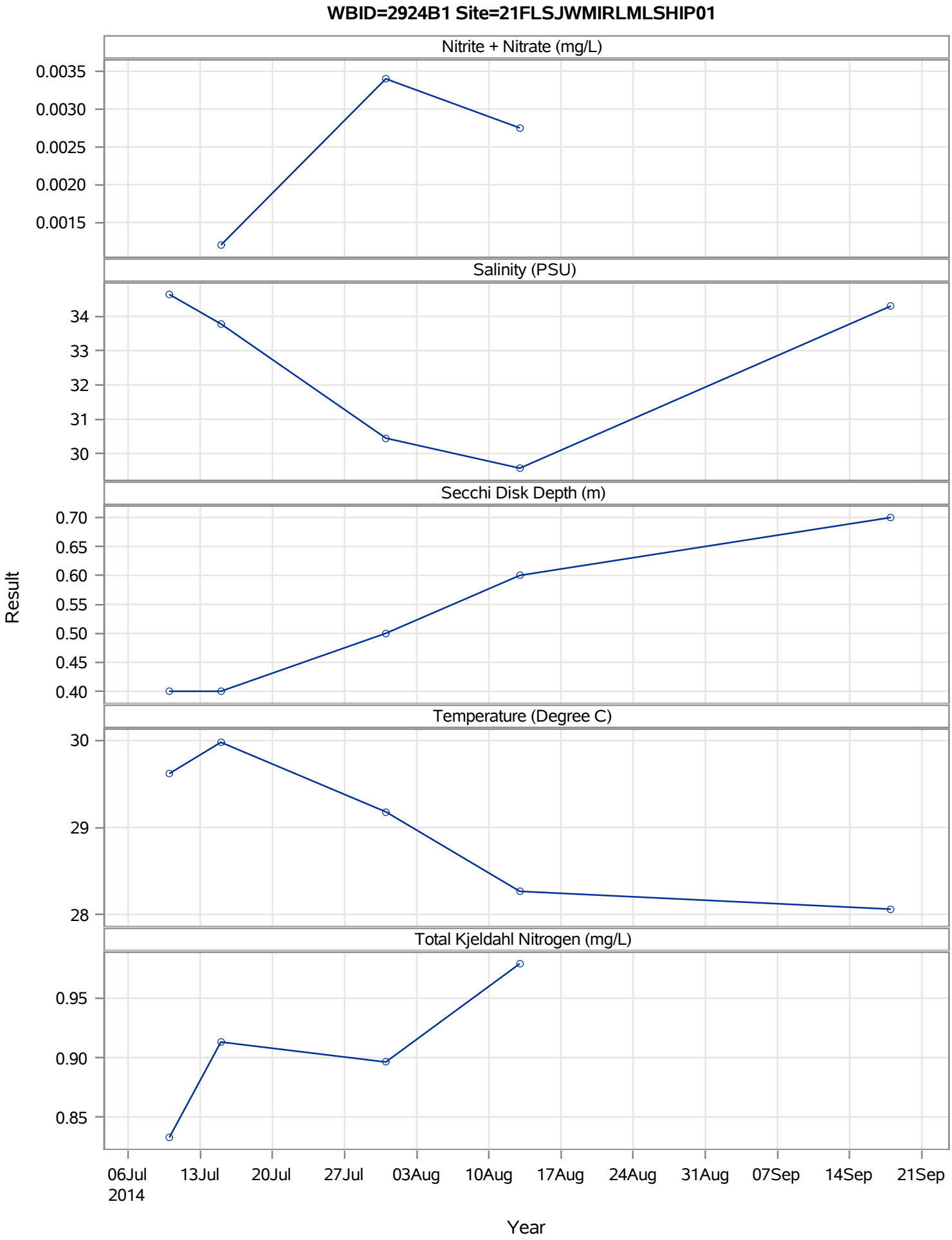

WBID=2924B1 Site=21FLSJWM44961
Nitrite + Nitrate (mg/L)
0.05
0.04
0.03
0.02
0.01
Salinity (PSU)
40
35
30
25
Secchi Disk Depth (m)
1.75
1.50
1.25
1.00
0.75
0.50
Result
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
1.5
1.0
0.5
0.0
2017
2018
2019
2020
2021
2022
2023
2024
Year

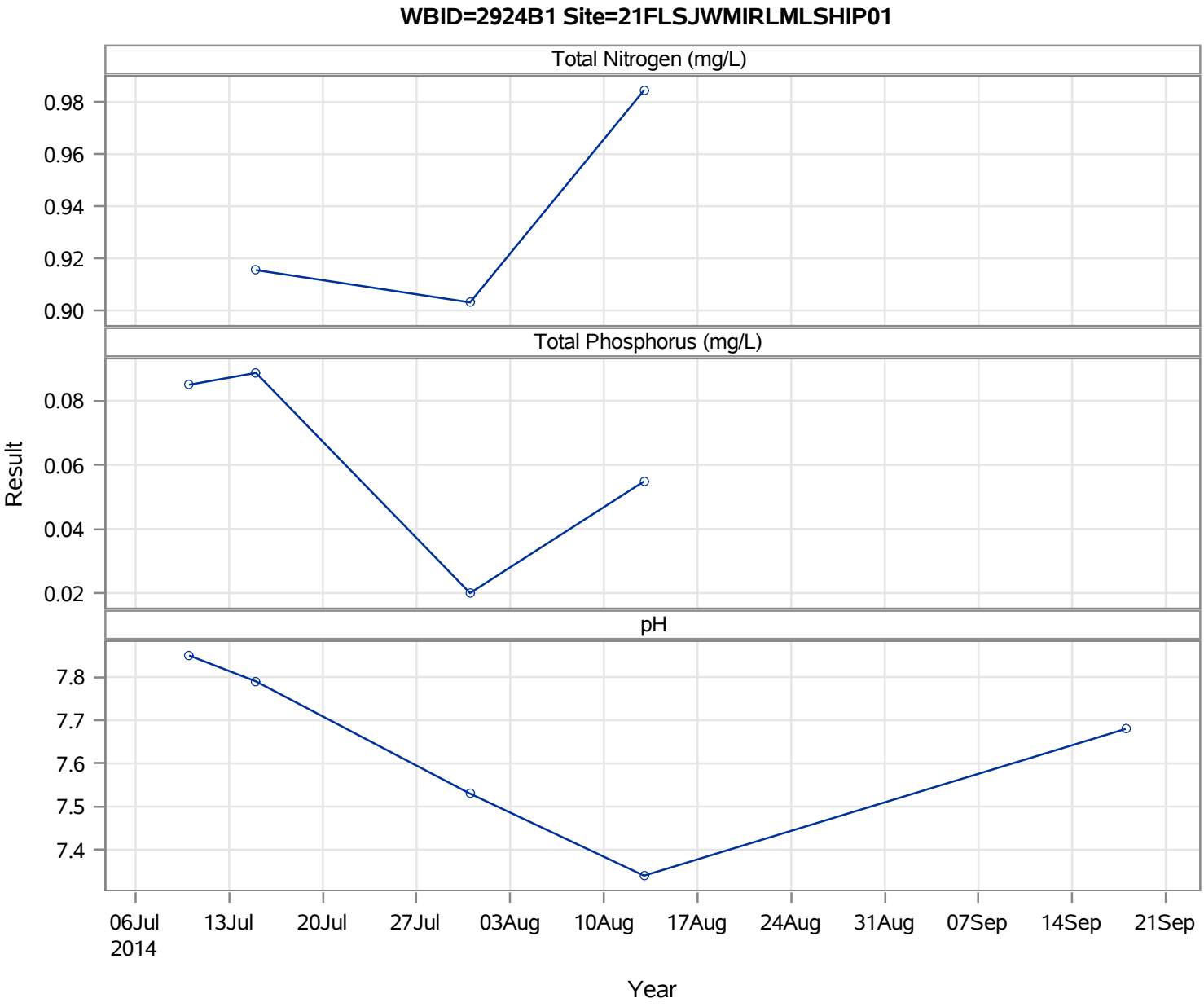

WBID=2924B1 Site=21FLSJWM44961
Total Nitrogen (mg/L)
1.5
1.0
0.5
0.0
Total Phosphorus (mg/L)
0.15
0.10
0.05
0.00
pH
8.2
8.0
7.8
Result
2017
2018
2019
2020
2021
2022
2023
2024
Year

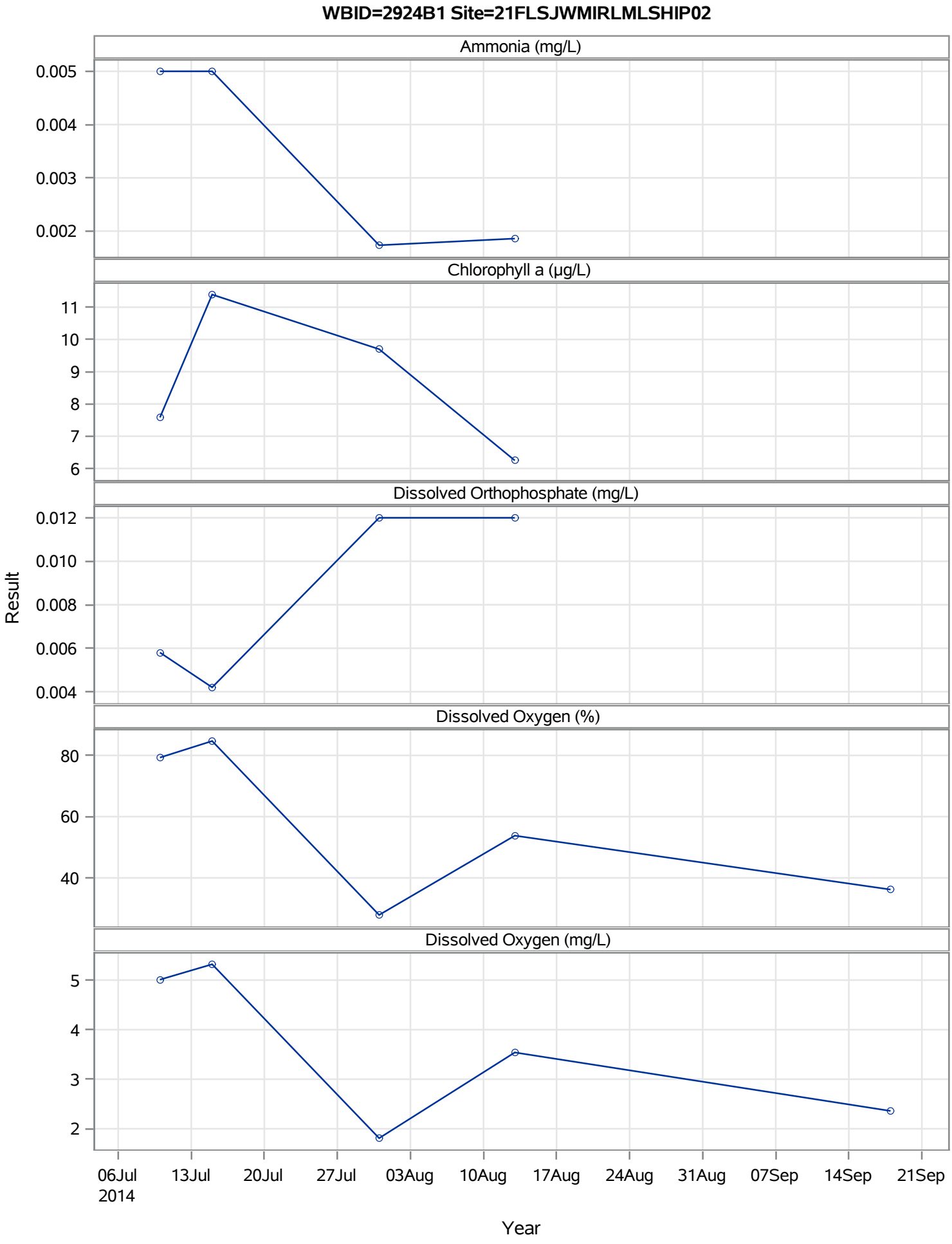

WBID=2924B1 Site=21FLSJWMIRLML317ISL
Chlorophyll a (µg/L)
Dissolved Oxygen (%)
Dissolved Oxygen (mg/L)
Salinity (PSU)
Secchi Disk Depth (m)
Result
Year
Sep 2001
Nov
Jan 2002
Mar
May
Jul
Sep
Nov
Jan 2003
Mar
May

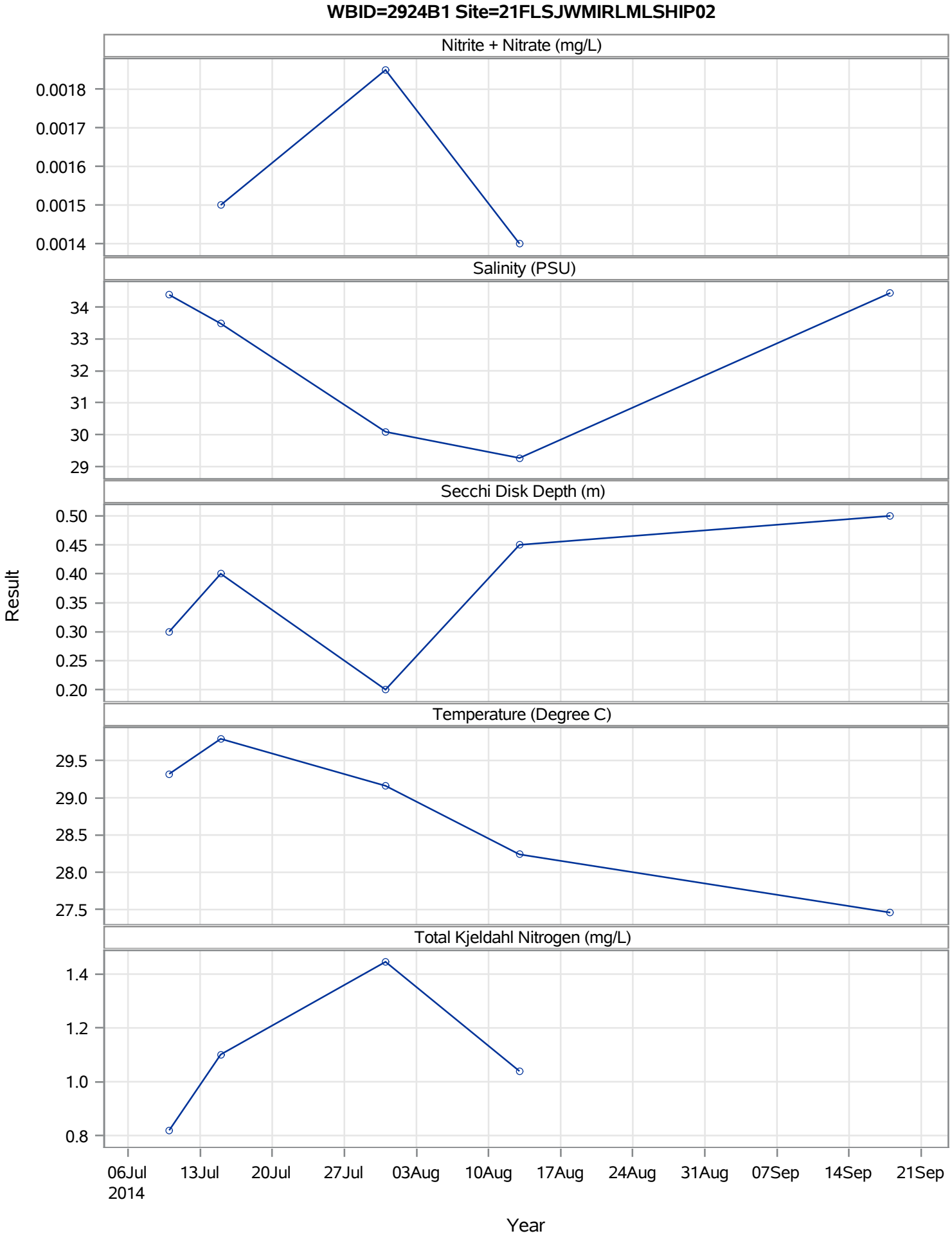

WBID=2924B1 Site=21FLSJWMIRLML317ISL
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
1.4
1.2
1.0
0.8
Total Phosphorus (mg/L)
0.06
0.04
0.02
0.00
pH
8.4
8.3
8.2
8.1
8.0
Result
Sep
2001
Nov
Jan
2002
Mar
May
Jul
Sep
Nov
Jan
2003
Mar
May
Year

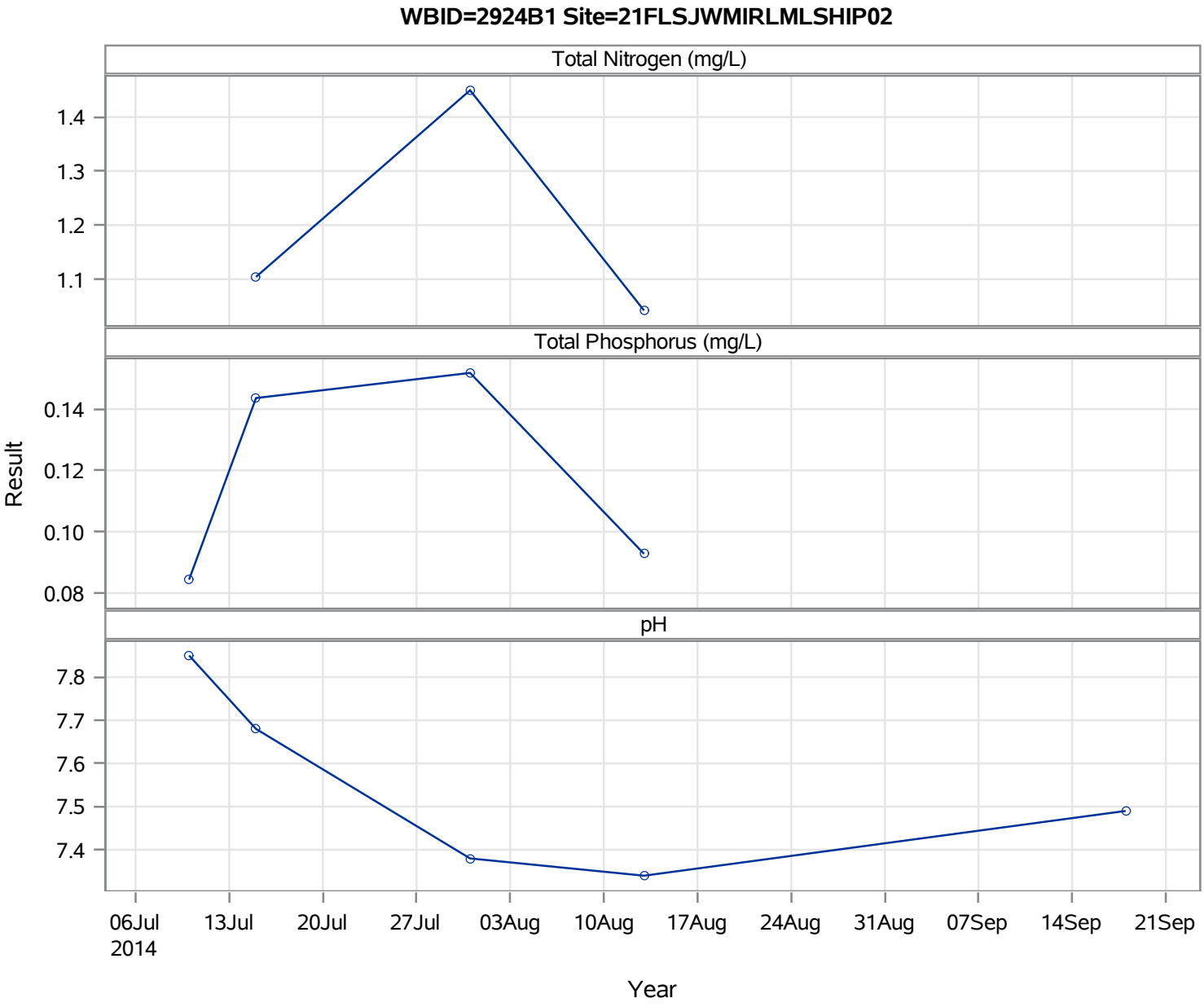

WBID=2924B1 Site=21FLSJWMIRLMLSHIP01
Ammonia (mg/L)
0.0050
0.0045
0.0040
0.0035
0.0030
0.0025
0.0020
Chlorophyll a (µg/L)
7.5
7.0
6.5
6.0
5.5
5.0
Dissolved Orthophosphate (mg/L)
0.012
0.010
0.008
0.006
0.004
0.002
Dissolved Oxygen (%)
70
60
50
40
30
Dissolved Oxygen (mg/L)
4.5
4.0
3.5
3.0
2.5
2.0
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

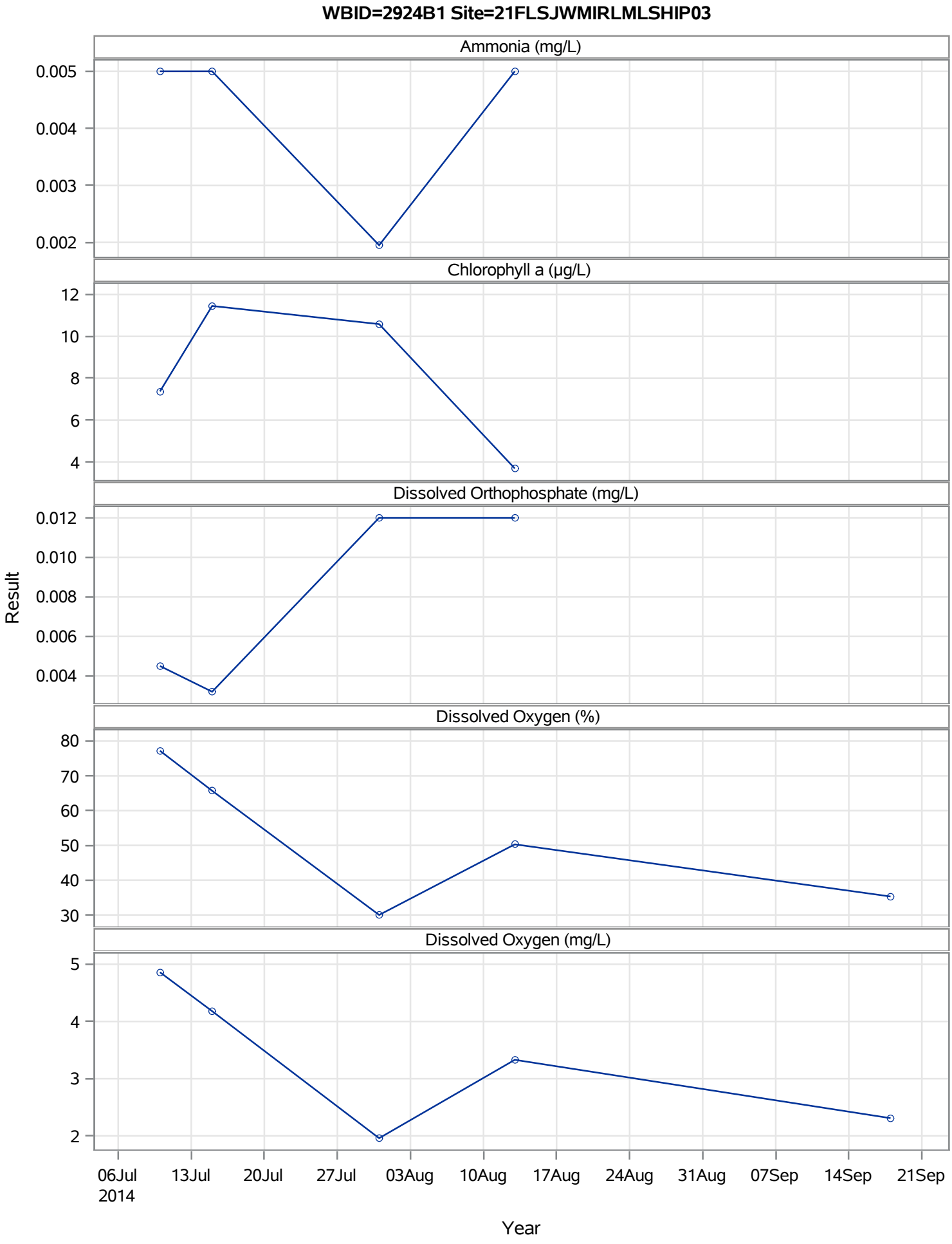

WBID=2924B1 Site=21FLSJWMIRLMLSHIP01
Nitrite + Nitrate (mg/L)
0.0035
0.0030
0.0025
0.0020
0.0015
Salinity (PSU)
34
33
32
31
30
Secchi Disk Depth (m)
0.70
0.65
0.60
0.55
0.50
0.45
0.40
Temperature (Degree C)
30
29
28
Total Kjeldahl Nitrogen (mg/L)
0.95
0.90
0.85
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

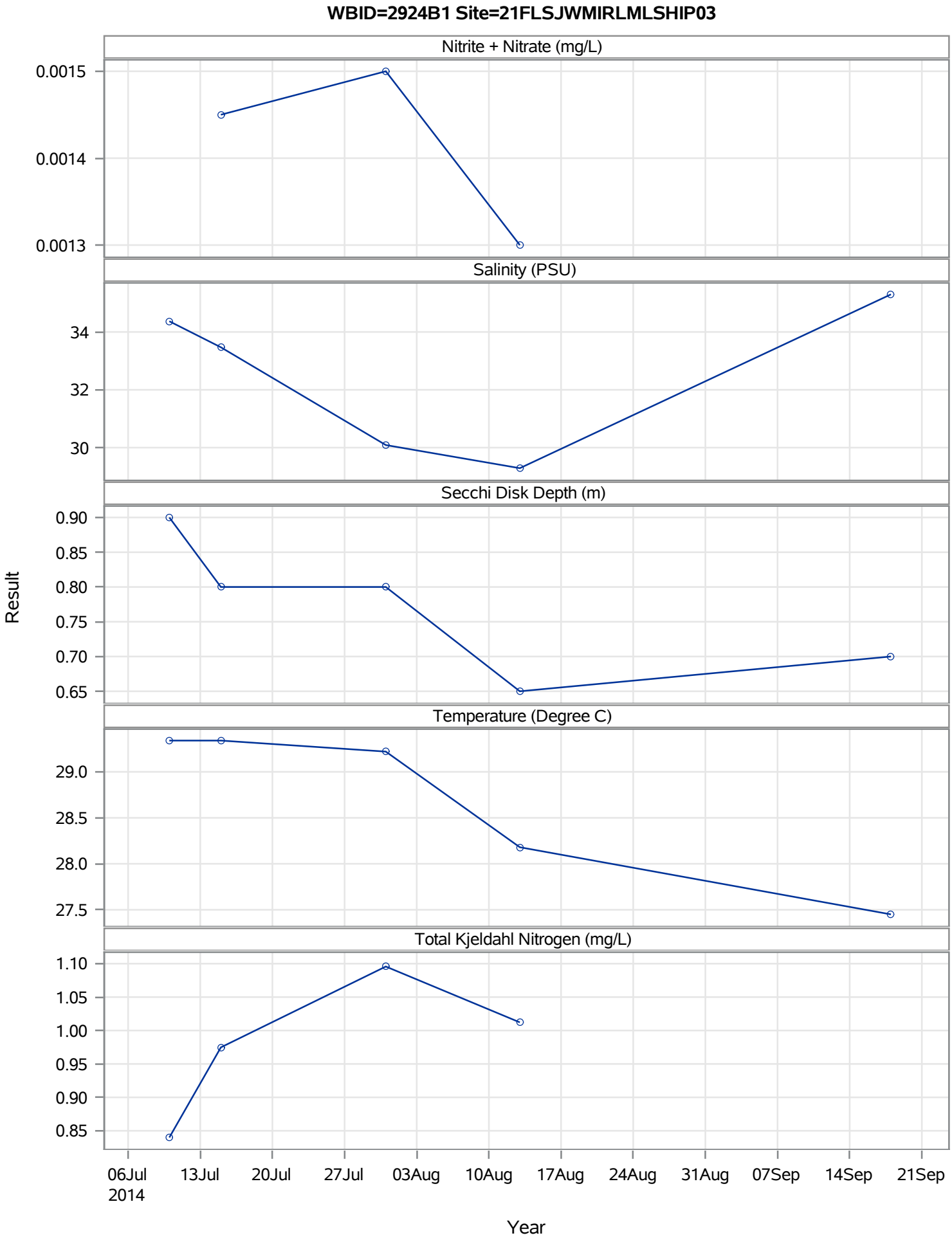

WBID=2924B1 Site=21FLSJWMIRLMLSHIP01
Total Nitrogen (mg/L)
0.98
0.96
0.94
0.92
0.90
Total Phosphorus (mg/L)
0.08
0.06
0.04
0.02
pH
7.8
7.7
7.6
7.5
7.4
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

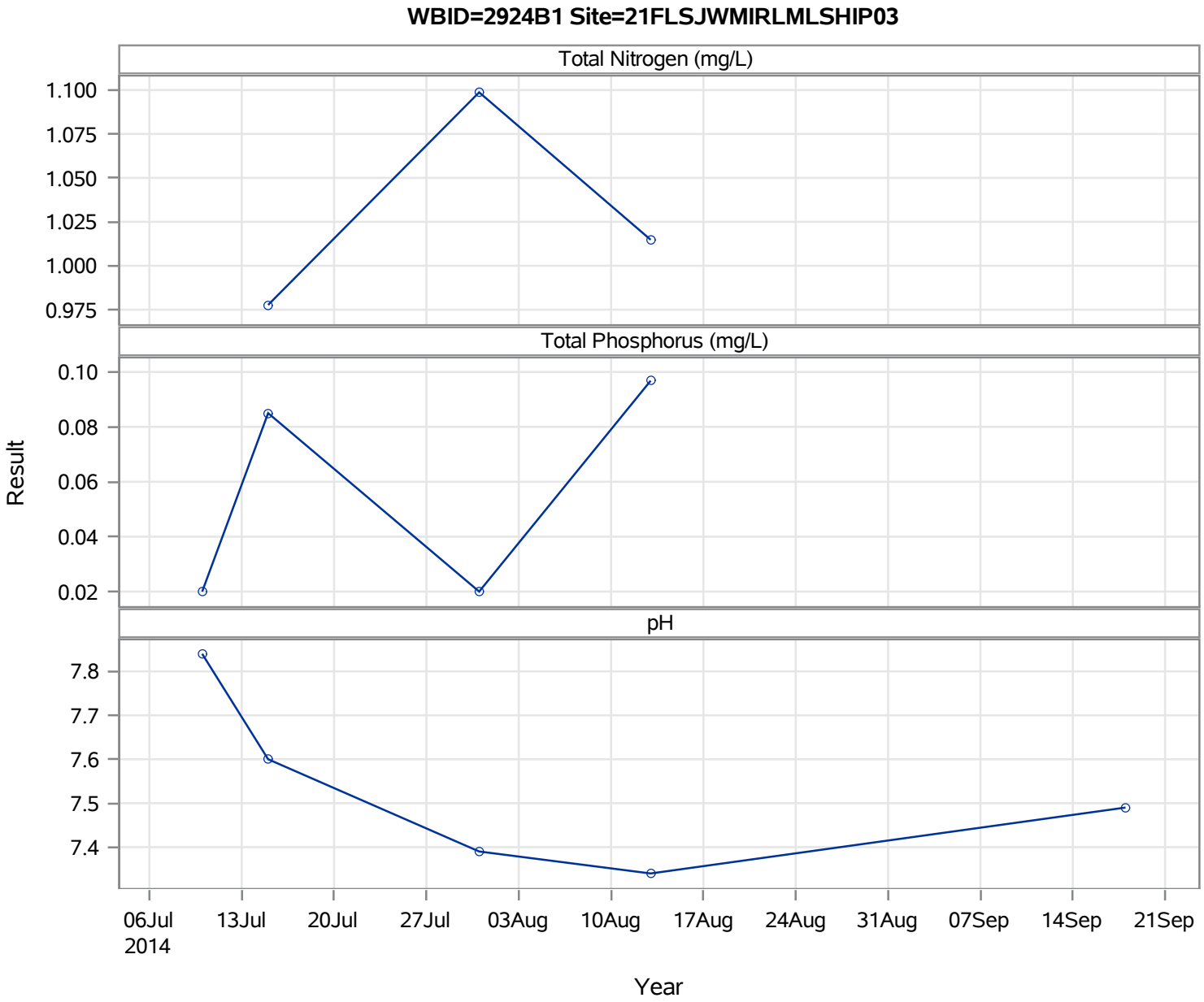

WBID=2924B1 Site=21FLSJWMIRLMLSHIP02
Ammonia (mg/L)
0.005
0.004
0.003
0.002
Chlorophyll a (µg/L)
11
10
9
8
7
6
Dissolved Orthophosphate (mg/L)
0.012
0.010
0.008
0.006
0.004
Dissolved Oxygen (%)
80
60
40
Dissolved Oxygen (mg/L)
5
4
3
2
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

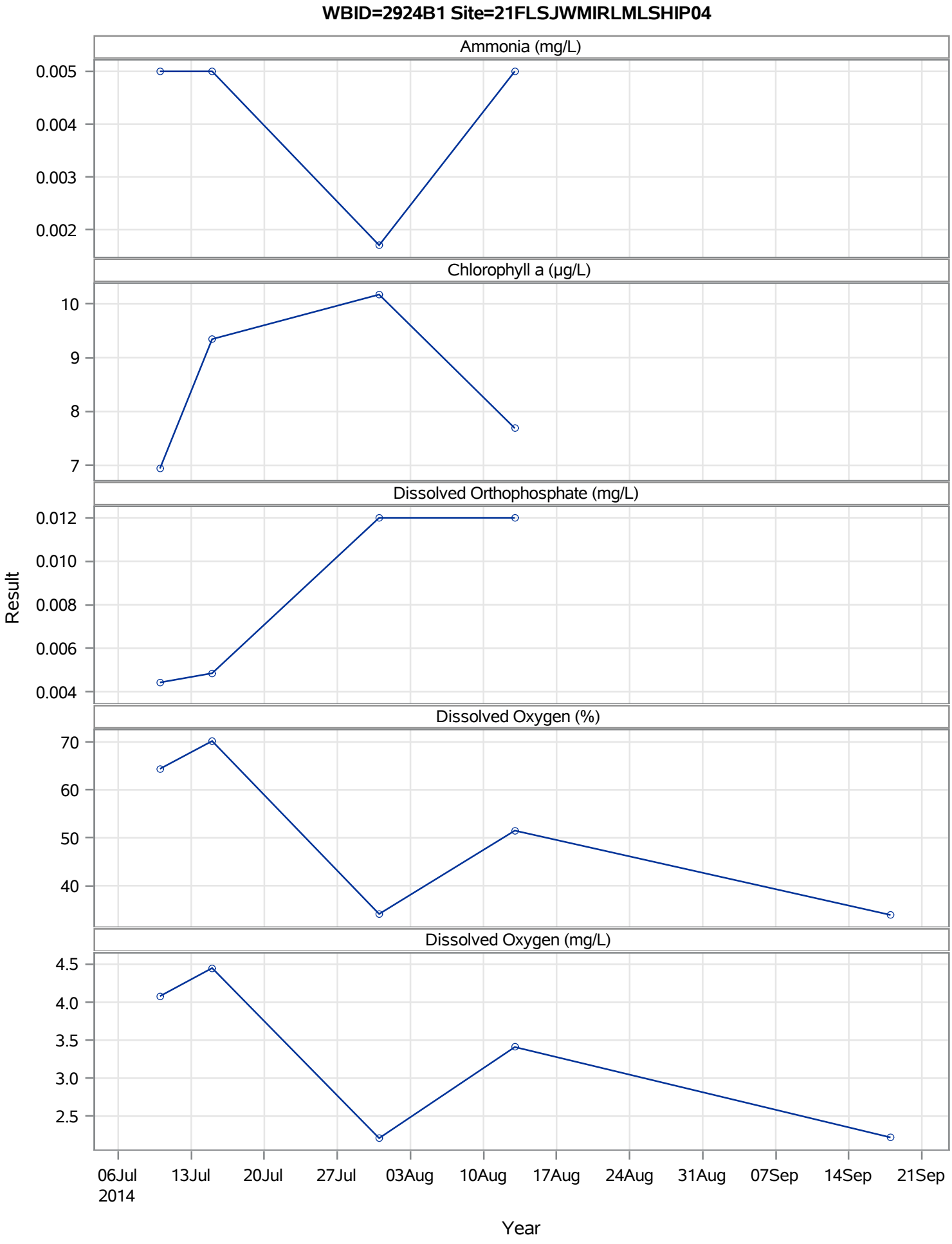

WBID=2924B1 Site=21FLSJWMIRLMLSHIP02
Nitrite + Nitrate (mg/L)
0.0018
0.0017
0.0016
0.0015
0.0014
Salinity (PSU)
34
33
32
31
30
29
Secchi Disk Depth (m)
0.50
0.45
0.40
0.35
0.30
0.25
0.20
Temperature (Degree C)
29.5
29.0
28.5
28.0
27.5
Total Kjeldahl Nitrogen (mg/L)
1.4
1.2
1.0
0.8
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

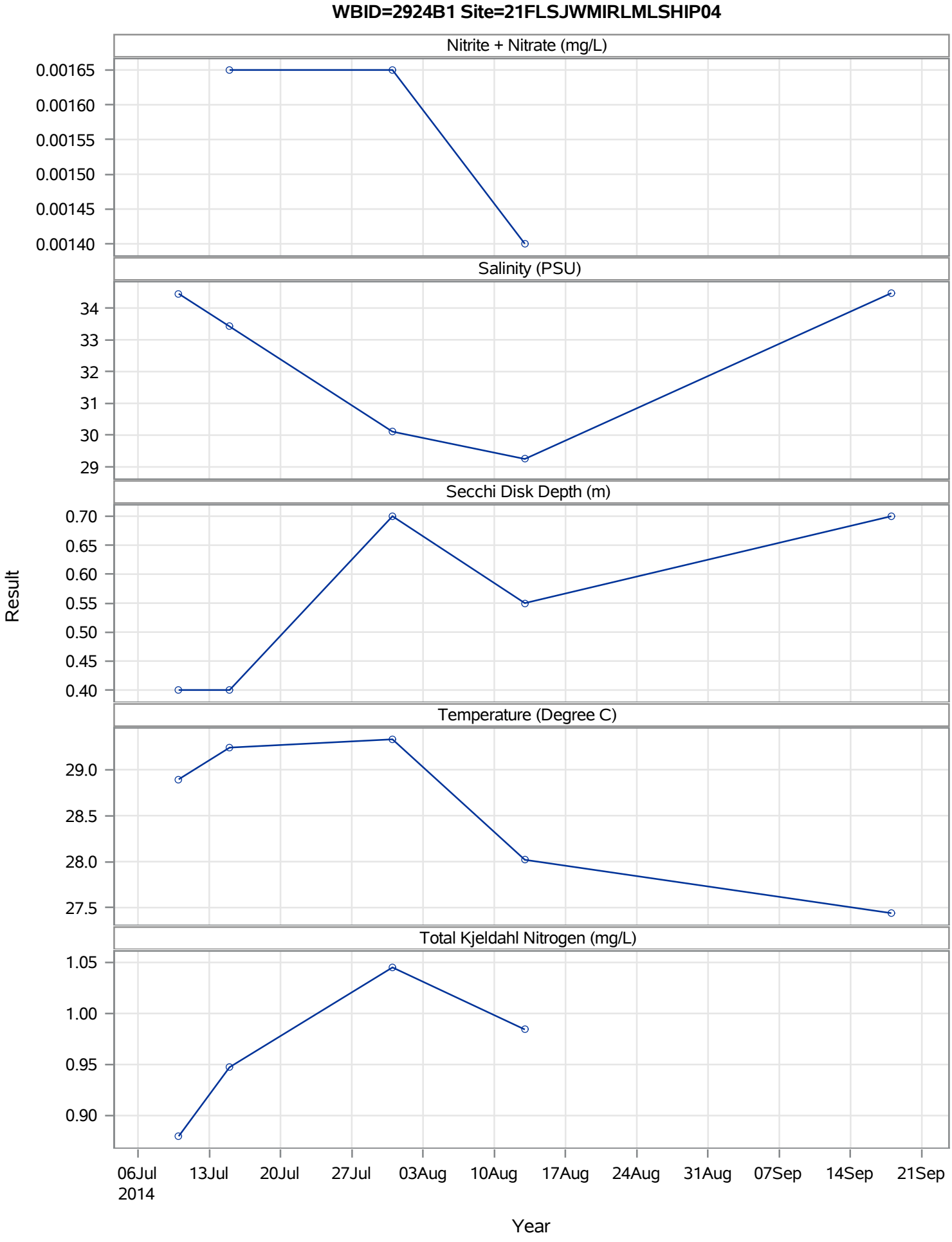

WBID=2924B1 Site=21FLSJWMIRLMLSHIP02
Total Nitrogen (mg/L)
1.4
1.3
1.2
1.1
Total Phosphorus (mg/L)
0.14
0.12
0.10
0.08
pH
7.8
7.7
7.6
7.5
7.4
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

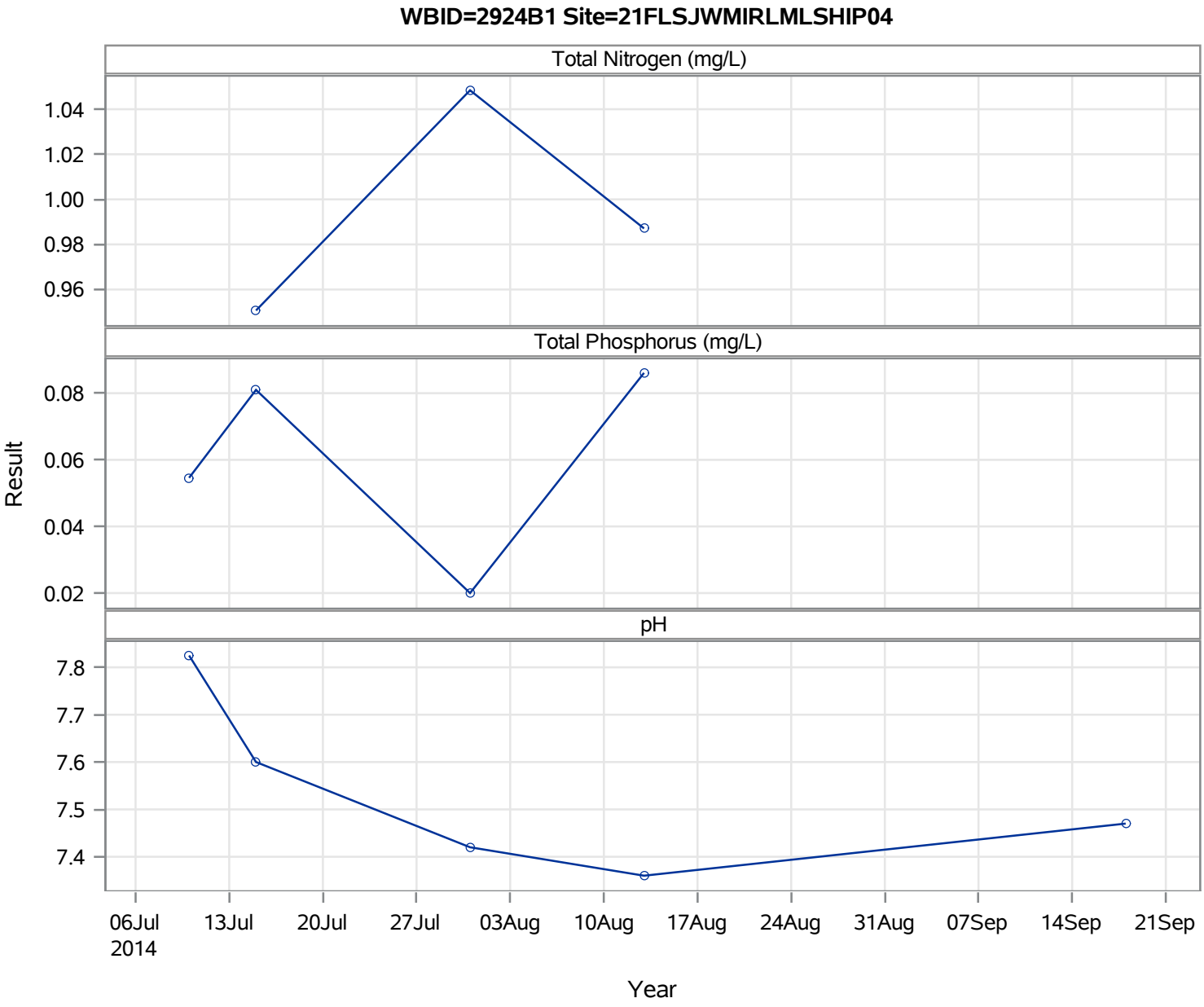

WBID=2924B1 Site=21FLSJWMIRLMLSHIP03
Ammonia (mg/L)
0.005
0.004
0.003
0.002
Chlorophyll a (µg/L)
12
10
8
6
4
Dissolved Orthophosphate (mg/L)
0.012
0.010
0.008
0.006
0.004
Dissolved Oxygen (%)
80
70
60
50
40
30
Dissolved Oxygen (mg/L)
5
4
3
2
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

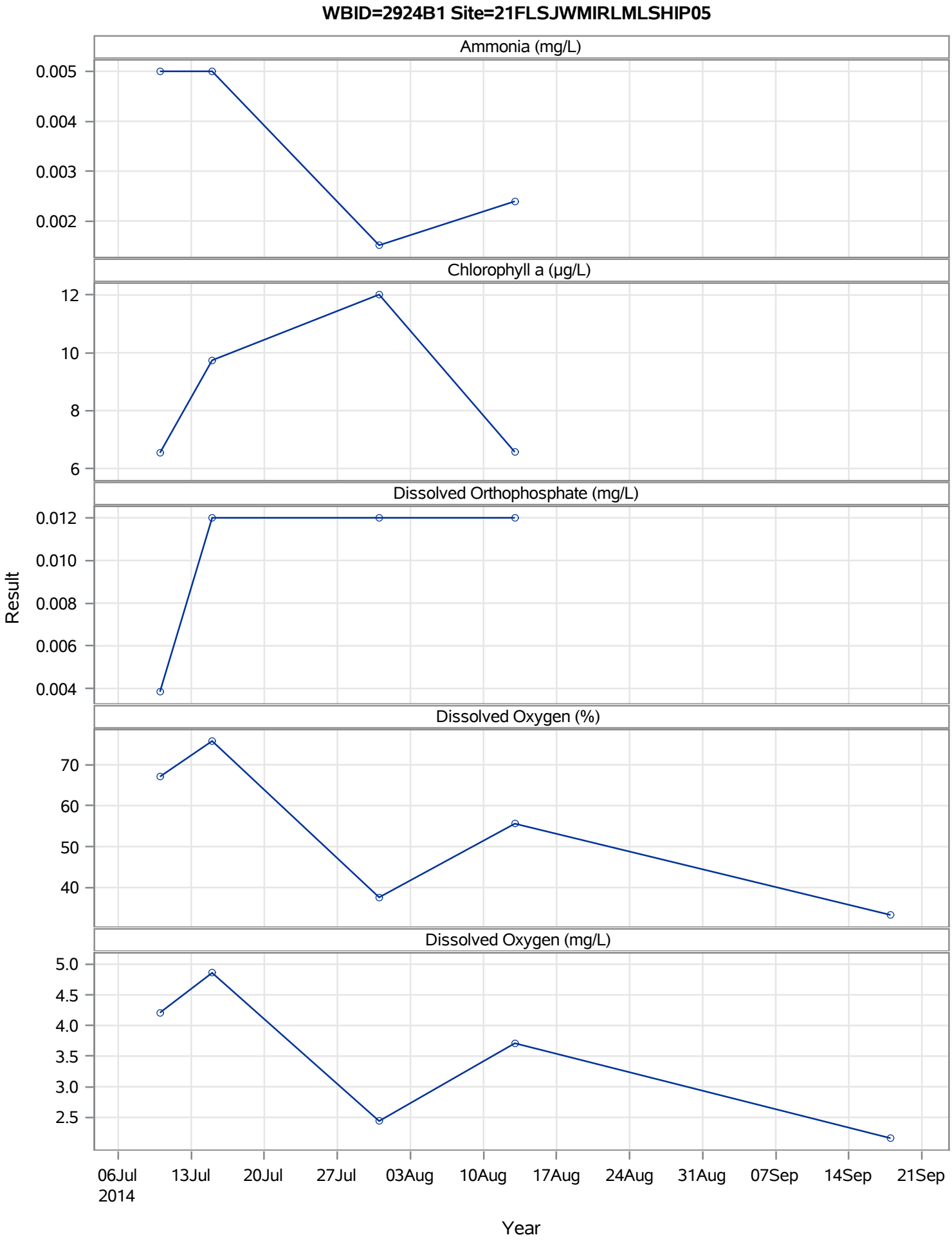

WBID=2924B1 Site=21FLSJWMIRLMLSHIP03
Nitrite + Nitrate (mg/L)
0.0015
0.0014
0.0013
Salinity (PSU)
34
32
30
Secchi Disk Depth (m)
0.90
0.85
0.80
0.75
0.70
0.65
Temperature (Degree C)
29.0
28.5
28.0
27.5
Total Kjeldahl Nitrogen (mg/L)
1.10
1.05
1.00
0.95
0.90
0.85
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

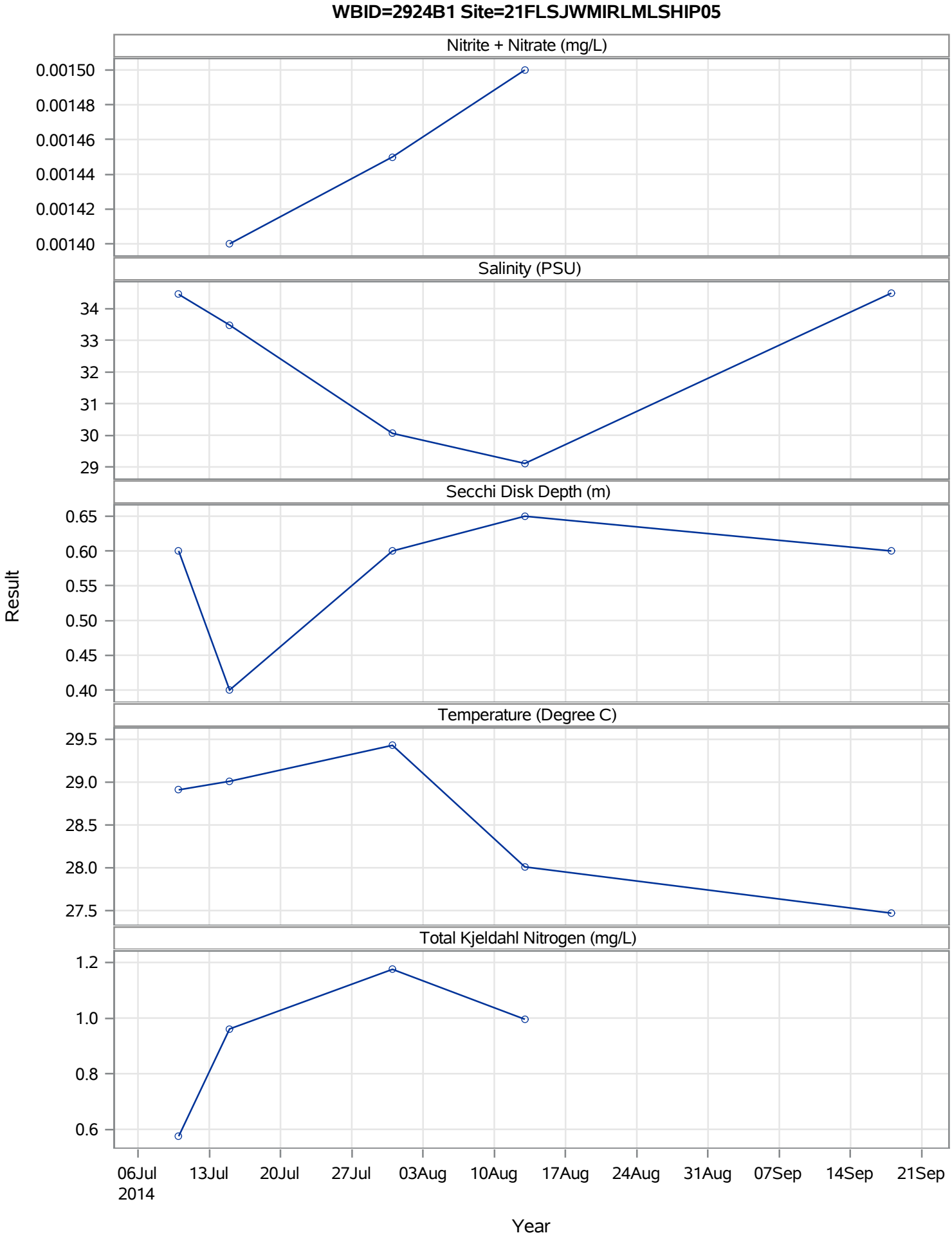

WBID=2924B1 Site=21FLSJWMIRLMLSHIP03
Total Nitrogen (mg/L)
1.100
1.075
1.050
1.025
1.000
0.975
Total Phosphorus (mg/L)
0.10
0.08
0.06
0.04
0.02
pH
7.8
7.7
7.6
7.5
7.4
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

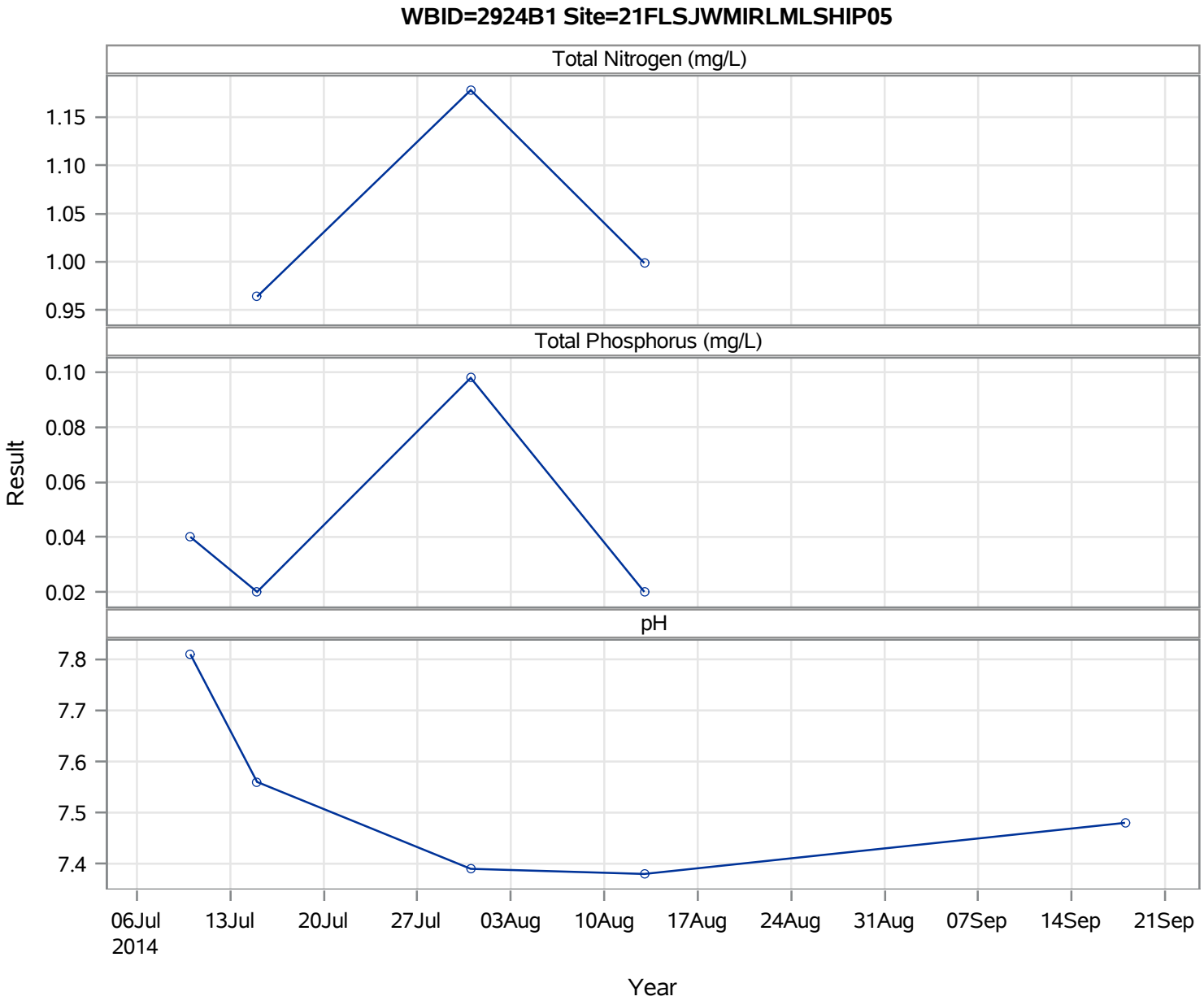

WBID=2924B1 Site=21FLSJWMIRLMLSHIP04
Ammonia (mg/L)
0.005
0.004
0.003
0.002
Chlorophyll a (µg/L)
10
9
8
7
Dissolved Orthophosphate (mg/L)
0.012
0.010
0.008
0.006
0.004
Result
Dissolved Oxygen (%)
70
60
50
40
Dissolved Oxygen (mg/L)
4.5
4.0
3.5
3.0
2.5
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

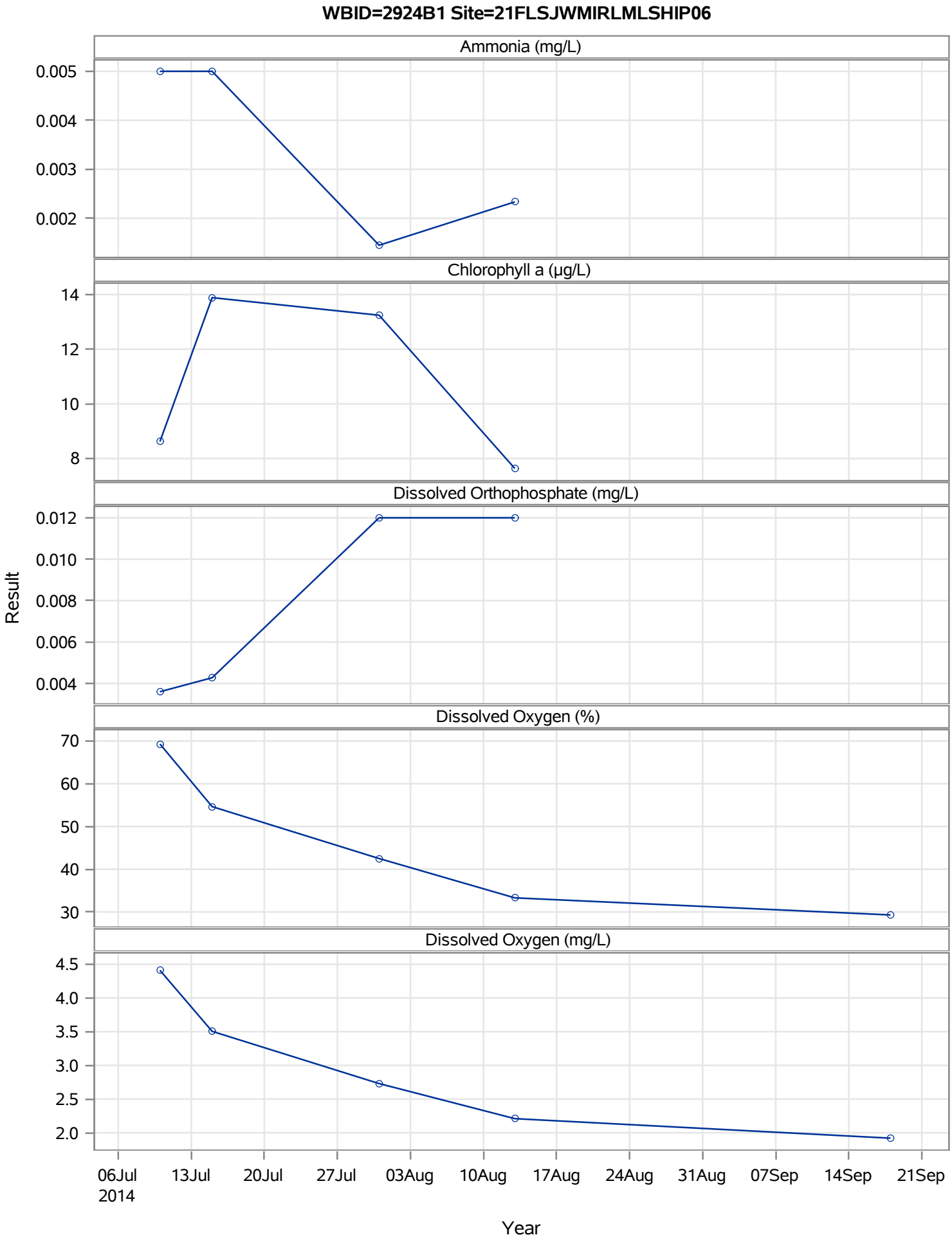

WBID=2924B1 Site=21FLSJWMIRLMLSHIP04
Nitrite + Nitrate (mg/L)
0.00165
0.00160
0.00155
0.00150
0.00145
0.00140
Salinity (PSU)
34
33
32
31
30
29
Secchi Disk Depth (m)
0.70
0.65
0.60
0.55
0.50
0.45
0.40
Temperature (Degree C)
29.0
28.5
28.0
27.5
Total Kjeldahl Nitrogen (mg/L)
1.05
1.00
0.95
0.90
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

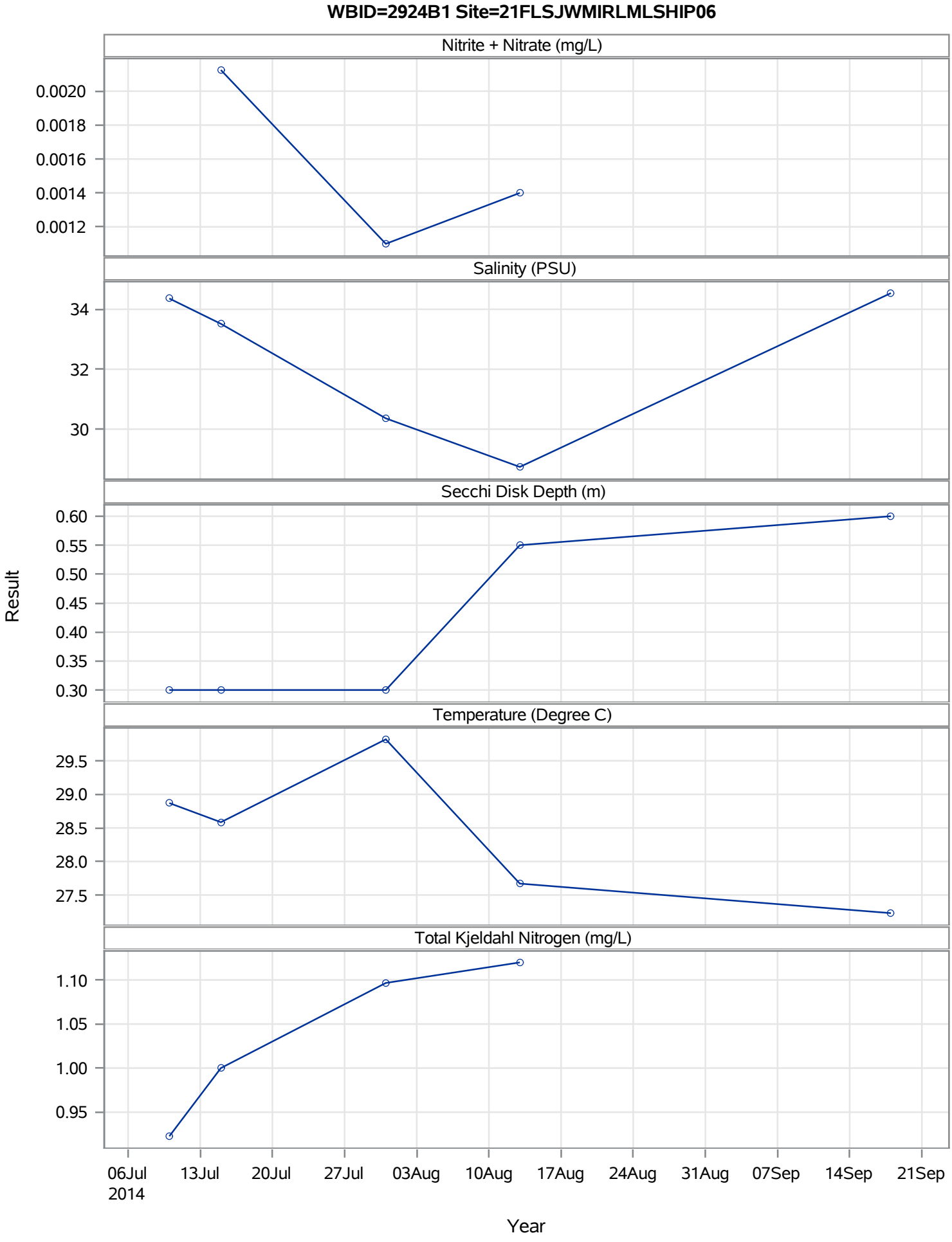

WBID=2924B1 Site=21FLSJWMIRLMLSHIP04
Total Nitrogen (mg/L)
1.04
1.02
1.00
0.98
0.96
Total Phosphorus (mg/L)
0.08
0.06
0.04
0.02
pH
7.8
7.7
7.6
7.5
7.4
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

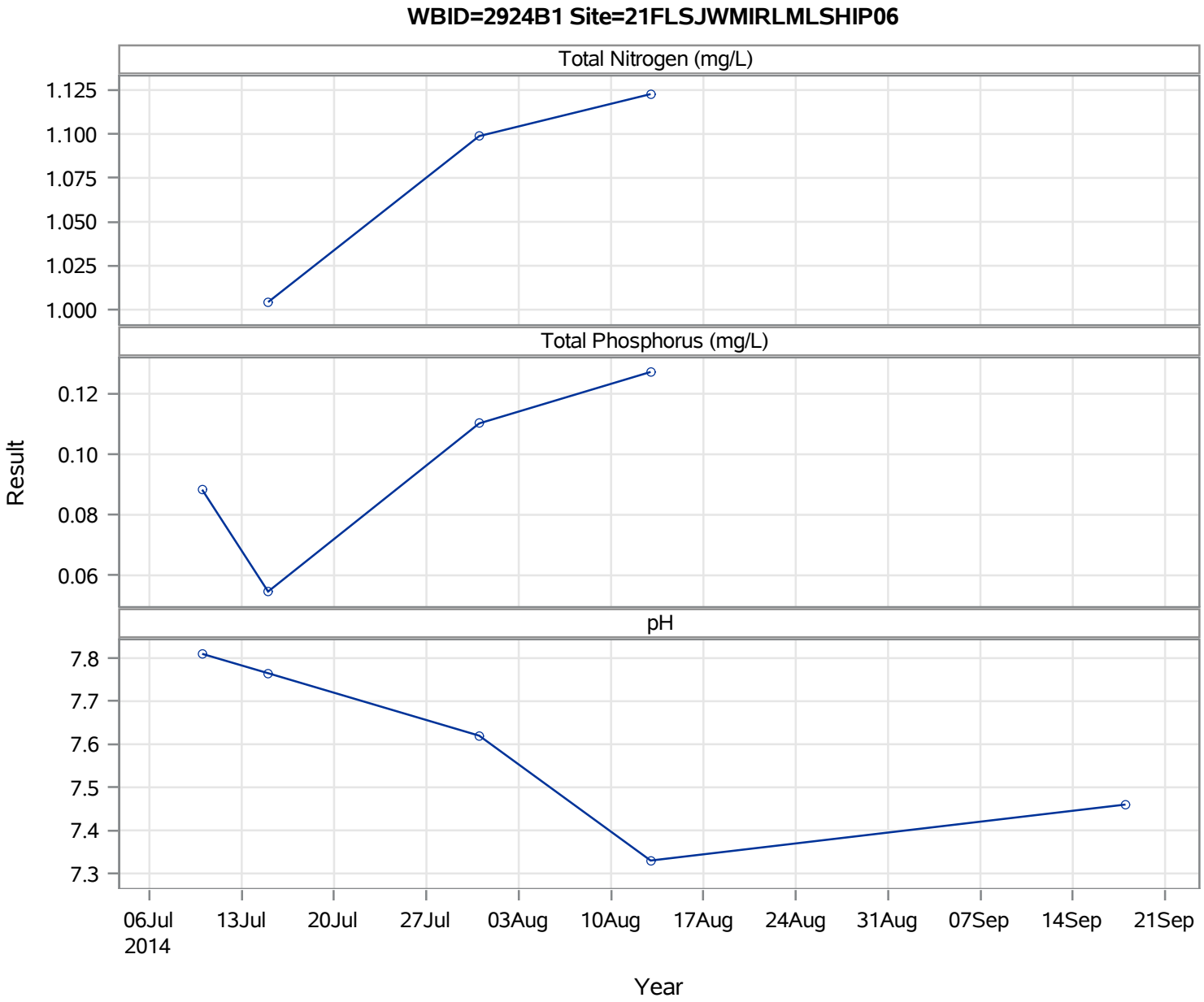

WBID=2924B1 Site=21FLSJWMIRLMLSHIP05
Ammonia (mg/L)
0.005
0.004
0.003
0.002
Chlorophyll a (µg/L)
12
10
8
6
Dissolved Orthophosphate (mg/L)
0.012
0.010
0.008
0.006
0.004
Result
Dissolved Oxygen (%)
70
60
50
40
Dissolved Oxygen (mg/L)
5.0
4.5
4.0
3.5
3.0
2.5
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

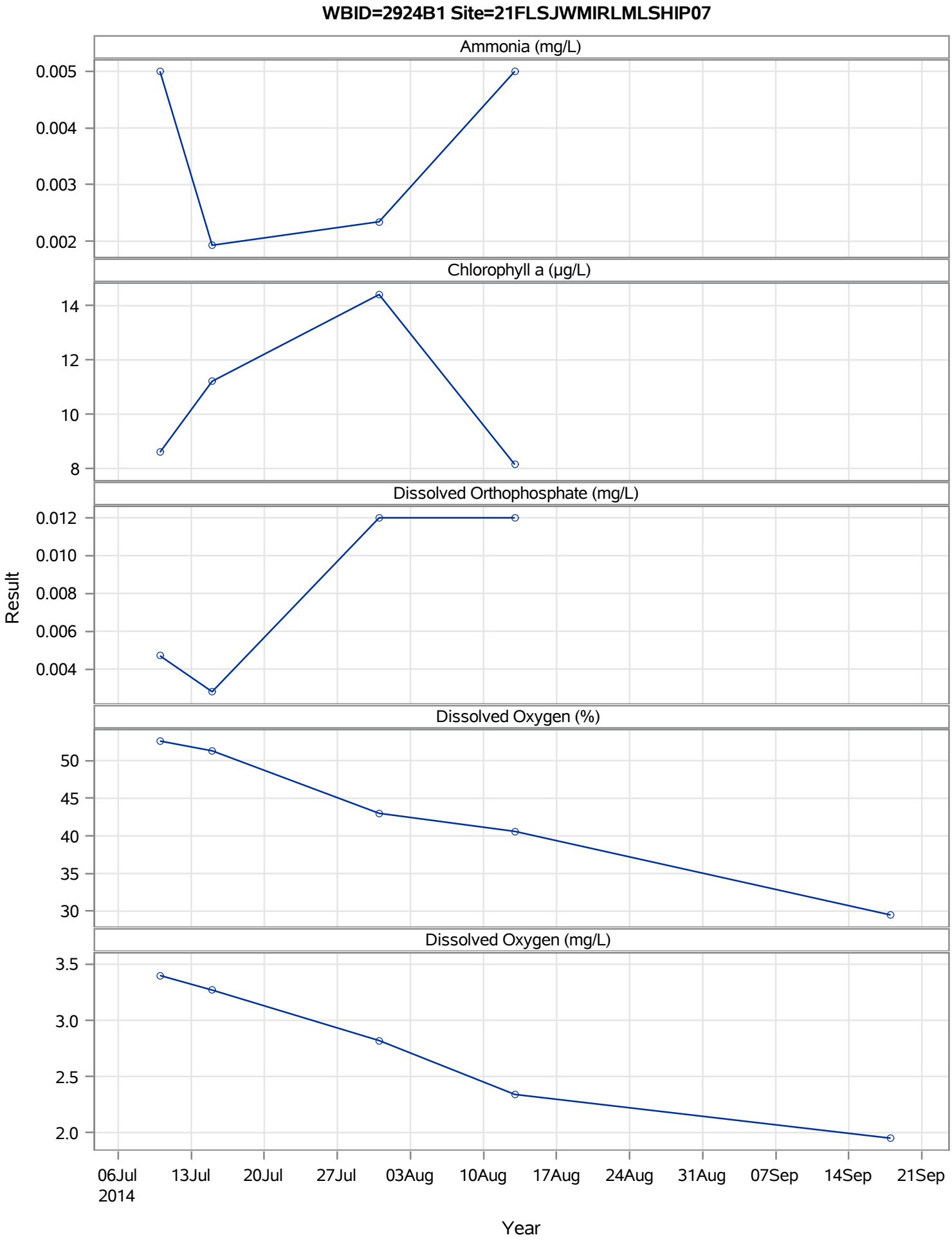

WBID=2924B1 Site=21FLSJWMIRLMLSHIP05
Nitrite + Nitrate (mg/L)
0.00150
0.00148
0.00146
0.00144
0.00142
0.00140
Salinity (PSU)
34
33
32
31
30
29
Secchi Disk Depth (m)
0.65
0.60
0.55
0.50
0.45
0.40
Temperature (Degree C)
29.5
29.0
28.5
28.0
27.5
Total Kjeldahl Nitrogen (mg/L)
1.2
1.0
0.8
0.6
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

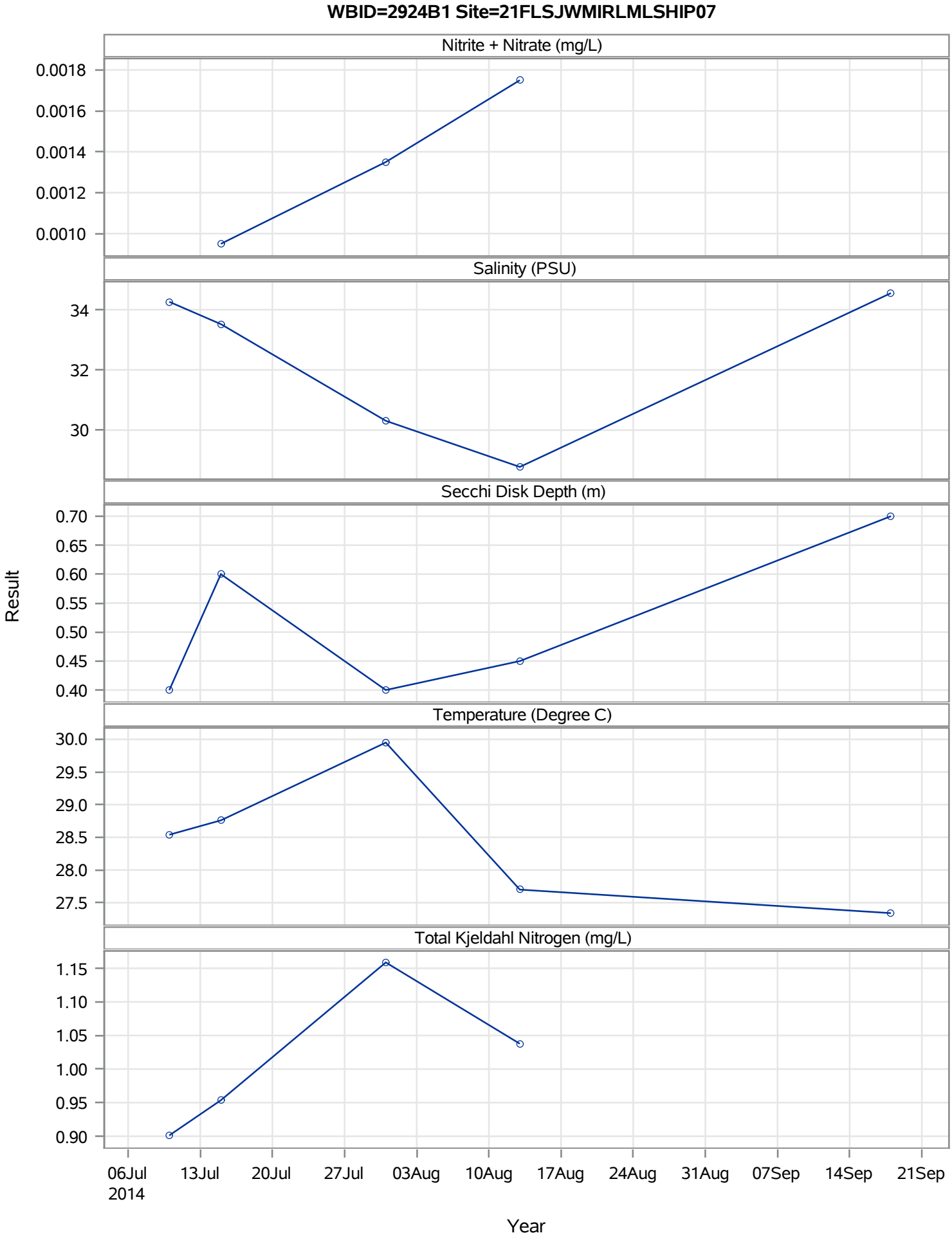

WBID=2924B1 Site=21FLSJWMIRLMLSHIP05
Total Nitrogen (mg/L)
1.15
1.10
1.05
1.00
0.95
Total Phosphorus (mg/L)
0.10
0.08
0.06
0.04
0.02
pH
7.8
7.7
7.6
7.5
7.4
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

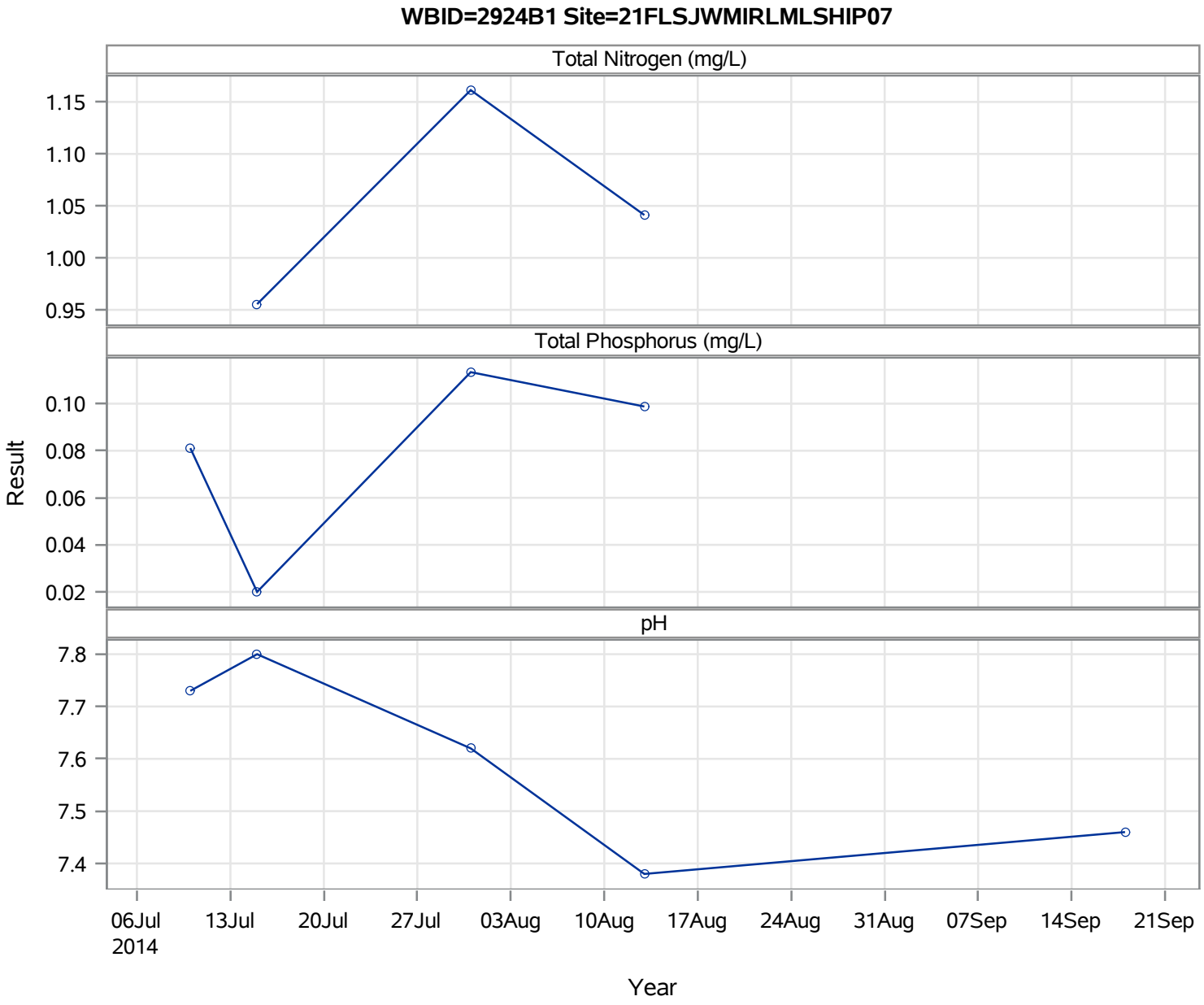

WBID=2924B1 Site=21FLSJWMIRLMLSHIP06
Ammonia (mg/L)
0.005
0.004
0.003
0.002
Chlorophyll a (µg/L)
14
12
10
8
Dissolved Orthophosphate (mg/L)
0.012
0.010
0.008
0.006
0.004
Dissolved Oxygen (%)
70
60
50
40
30
Dissolved Oxygen (mg/L)
4.5
4.0
3.5
3.0
2.5
2.0
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

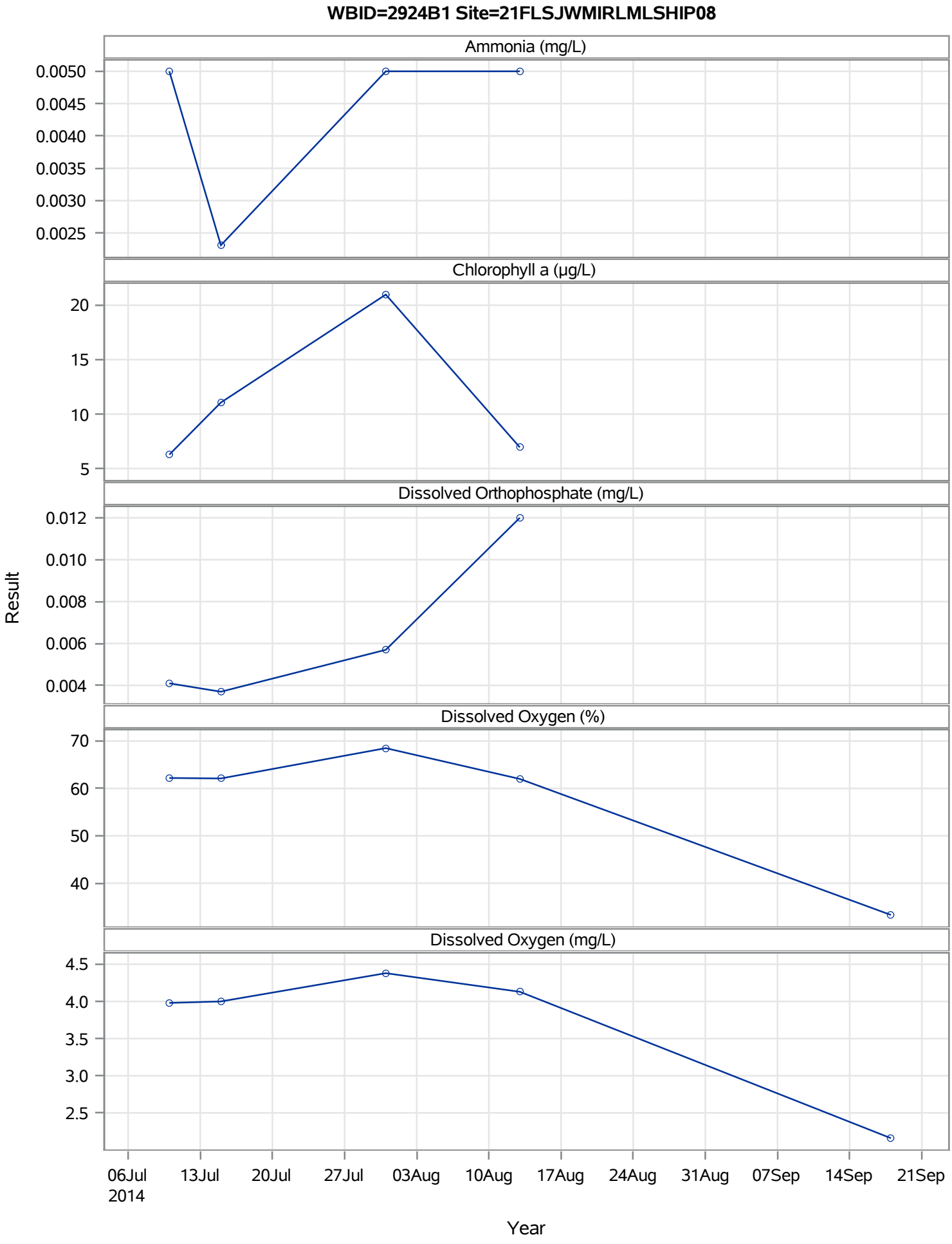

WBID=2924B1 Site=21FLSJWMIRLMLSHIP06
Nitrite + Nitrate (mg/L)
0.0020
0.0018
0.0016
0.0014
0.0012
Salinity (PSU)
34
32
30
Secchi Disk Depth (m)
0.60
0.55
0.50
0.45
0.40
0.35
0.30
Temperature (Degree C)
29.5
29.0
28.5
28.0
27.5
Total Kjeldahl Nitrogen (mg/L)
1.10
1.05
1.00
0.95
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

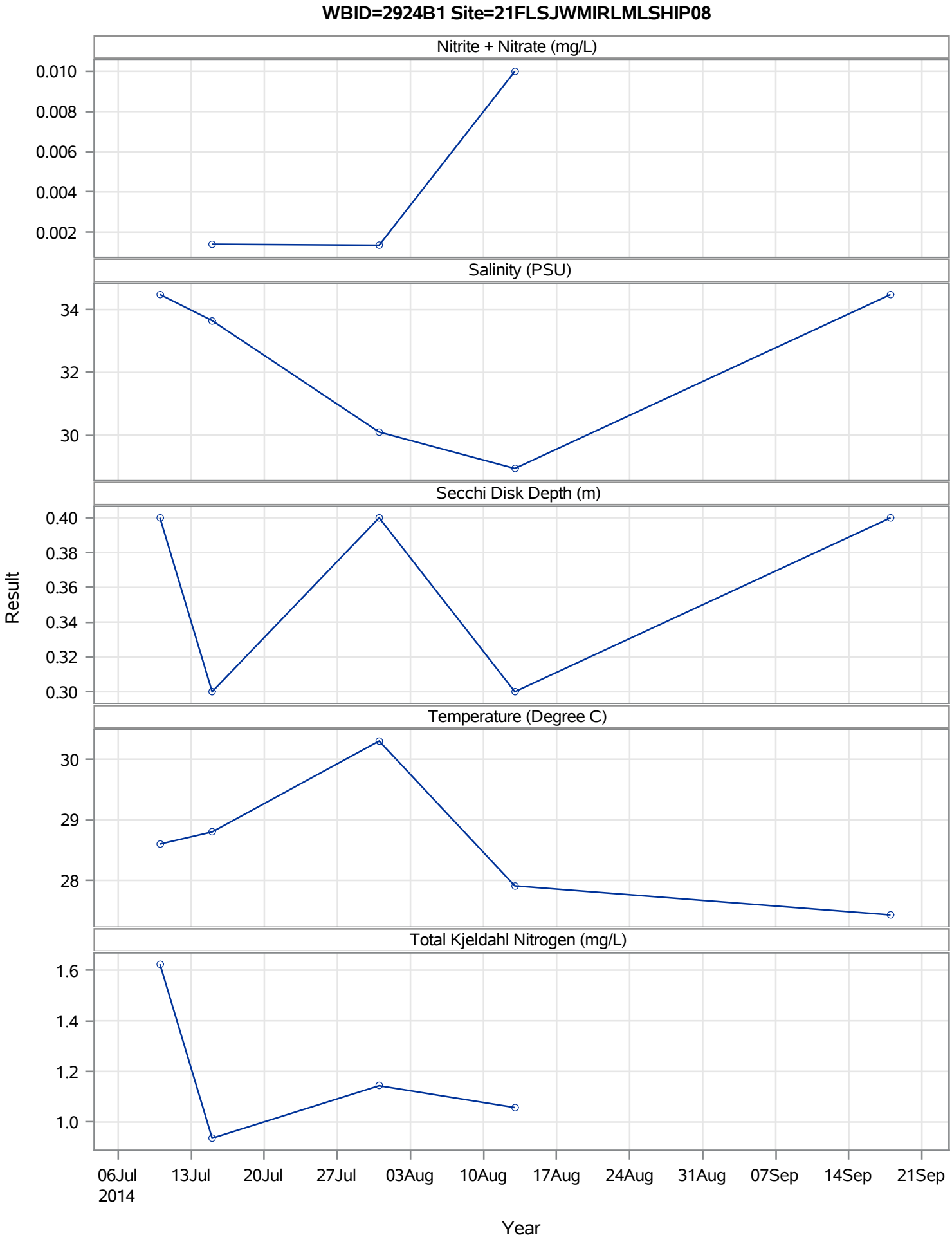

WBID=2924B1 Site=21FLSJWMIRLMLSHIP06
Total Nitrogen (mg/L)
1.125
1.100
1.075
1.050
1.025
1.000
Total Phosphorus (mg/L)
0.12
0.10
0.08
0.06
pH
7.8
7.7
7.6
7.5
7.4
7.3
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

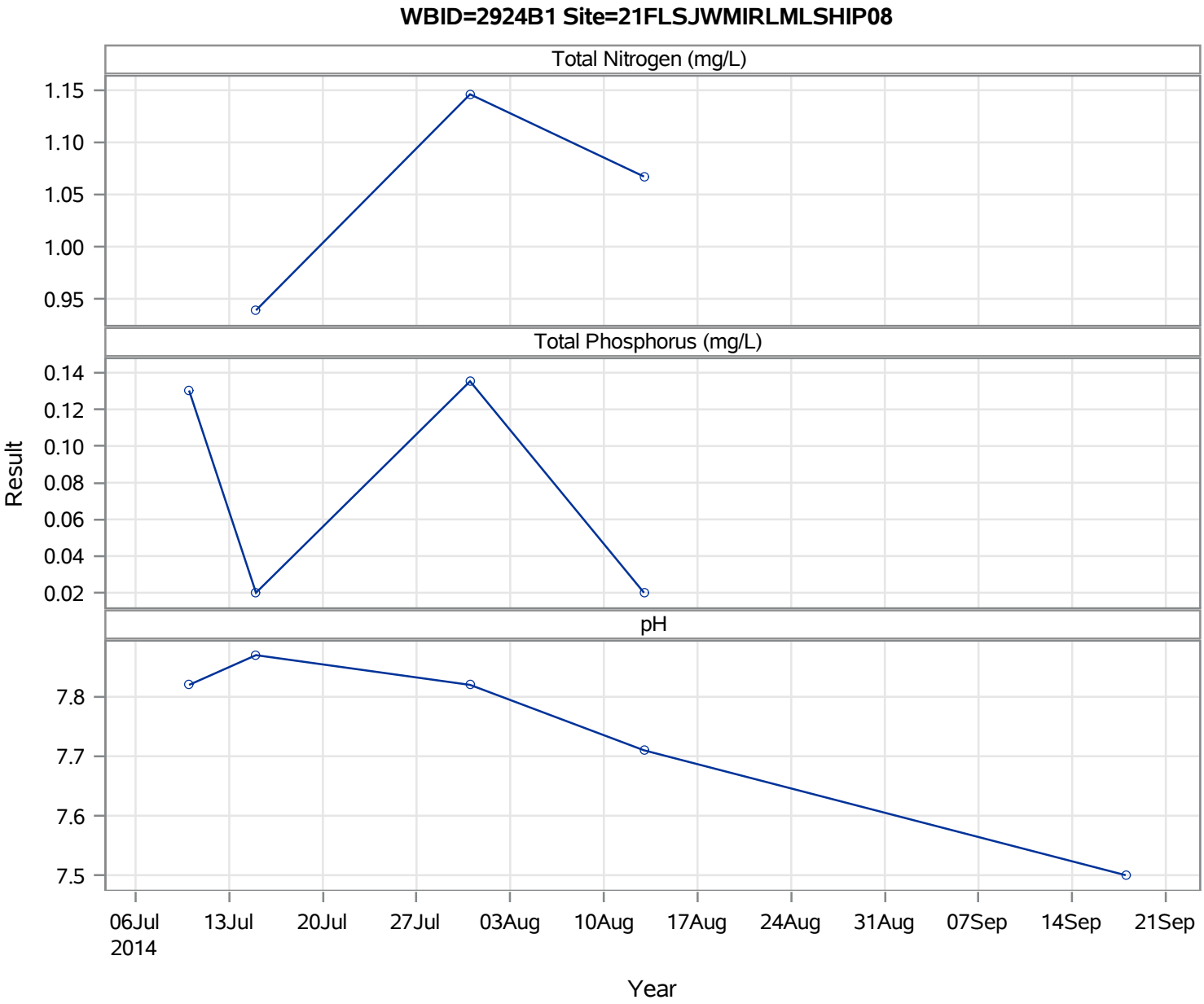

WBID=2924B1 Site=21FLSJWMIRLMLSHIP07
Ammonia (mg/L)
0.005
0.004
0.003
0.002
Chlorophyll a (µg/L)
14
12
10
8
Dissolved Orthophosphate (mg/L)
0.012
0.010
0.008
0.006
0.004
Dissolved Oxygen (%)
50
45
40
35
30
Dissolved Oxygen (mg/L)
3.5
3.0
2.5
2.0
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

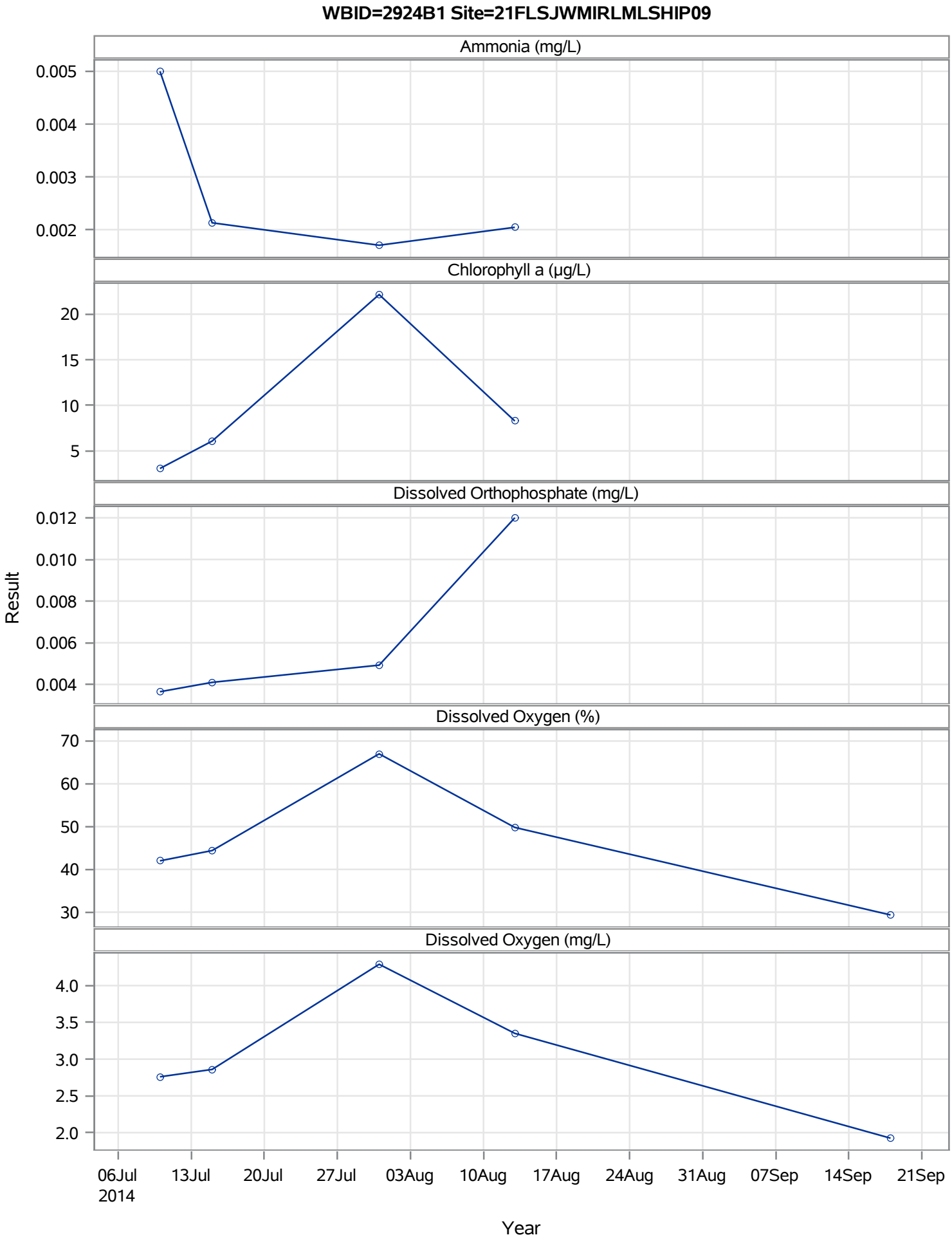

WBID=2924B1 Site=21FLSJWMIRLMLSHIP07
Nitrite + Nitrate (mg/L)
0.0018
0.0016
0.0014
0.0012
0.0010
Salinity (PSU)
34
32
30
Secchi Disk Depth (m)
0.70
0.65
0.60
0.55
0.50
0.45
0.40
Temperature (Degree C)
30.0
29.5
29.0
28.5
28.0
27.5
Total Kjeldahl Nitrogen (mg/L)
1.15
1.10
1.05
1.00
0.95
0.90
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

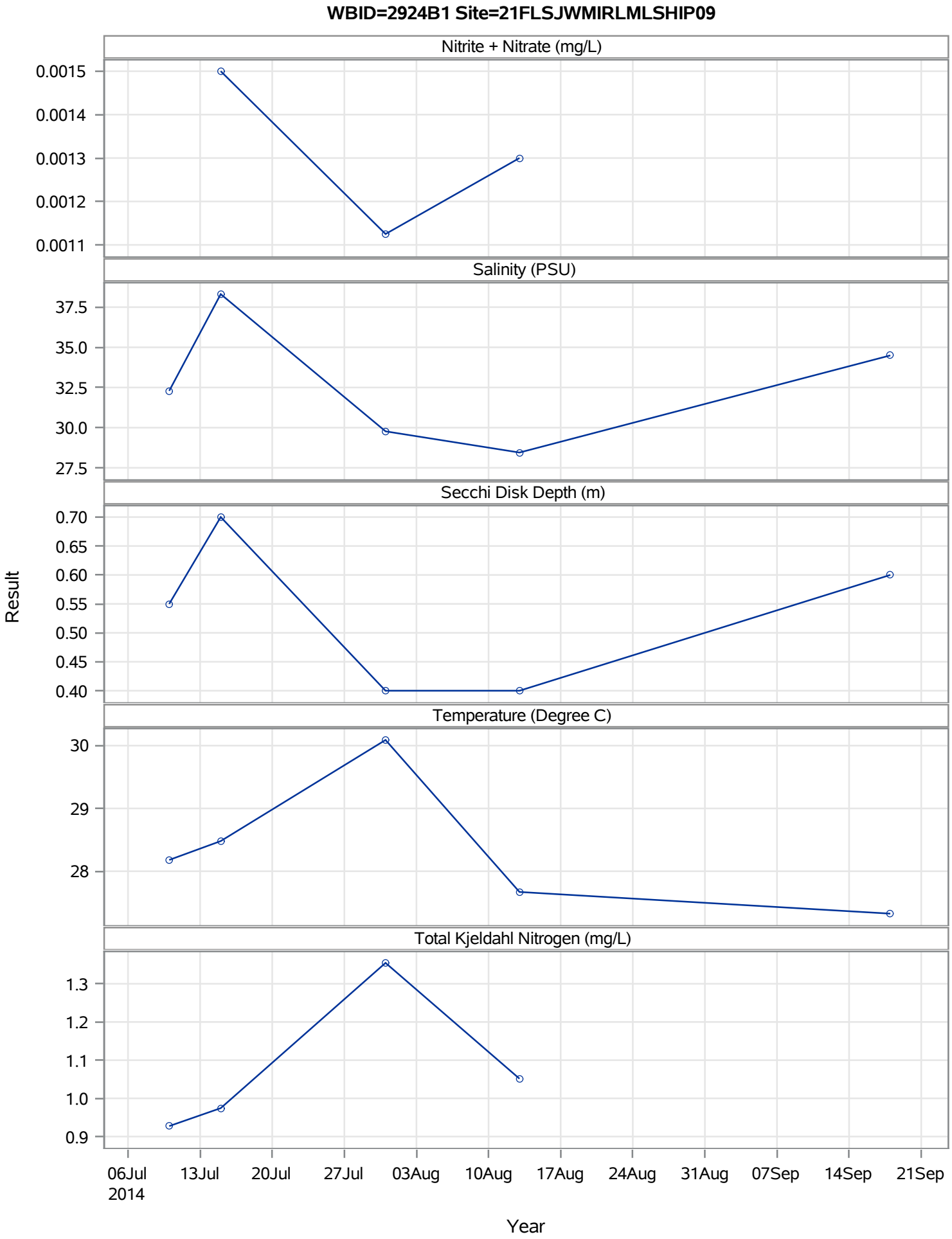

WBID=2924B1 Site=21FLSJWMIRLMLSHIP07
Total Nitrogen (mg/L)
1.15
1.10
1.05
1.00
0.95
Total Phosphorus (mg/L)
0.10
0.08
0.06
0.04
0.02
pH
7.8
7.7
7.6
7.5
7.4
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

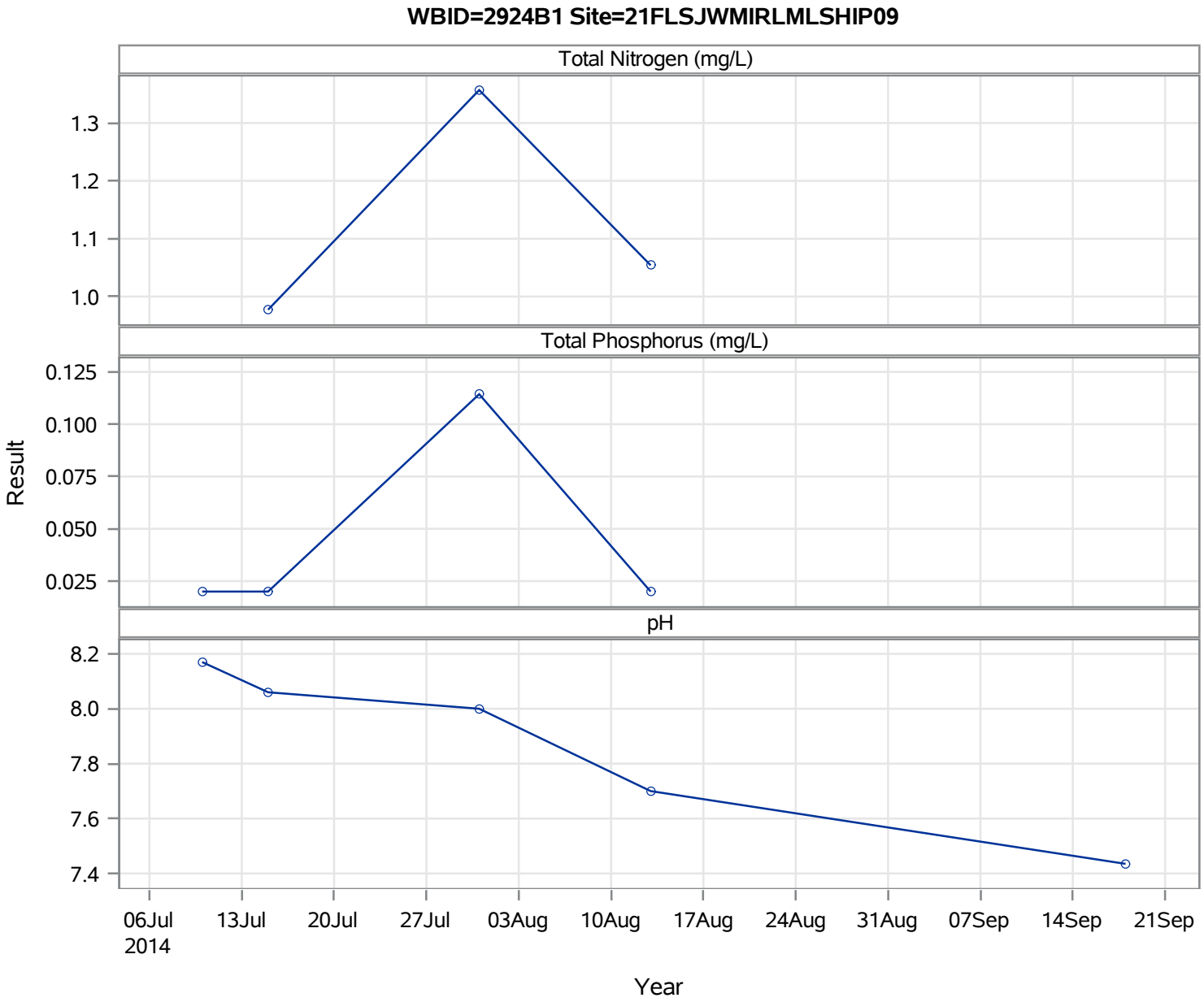

WBID=2924B1 Site=21FLSJWMIRLMLSHIP08
Ammonia (mg/L)
0.0050
0.0045
0.0040
0.0035
0.0030
0.0025
Chlorophyll a (µg/L)
20
15
10
5
Dissolved Orthophosphate (mg/L)
0.012
0.010
0.008
0.006
0.004
Result
Dissolved Oxygen (%)
70
60
50
40
Dissolved Oxygen (mg/L)
4.5
4.0
3.5
3.0
2.5
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

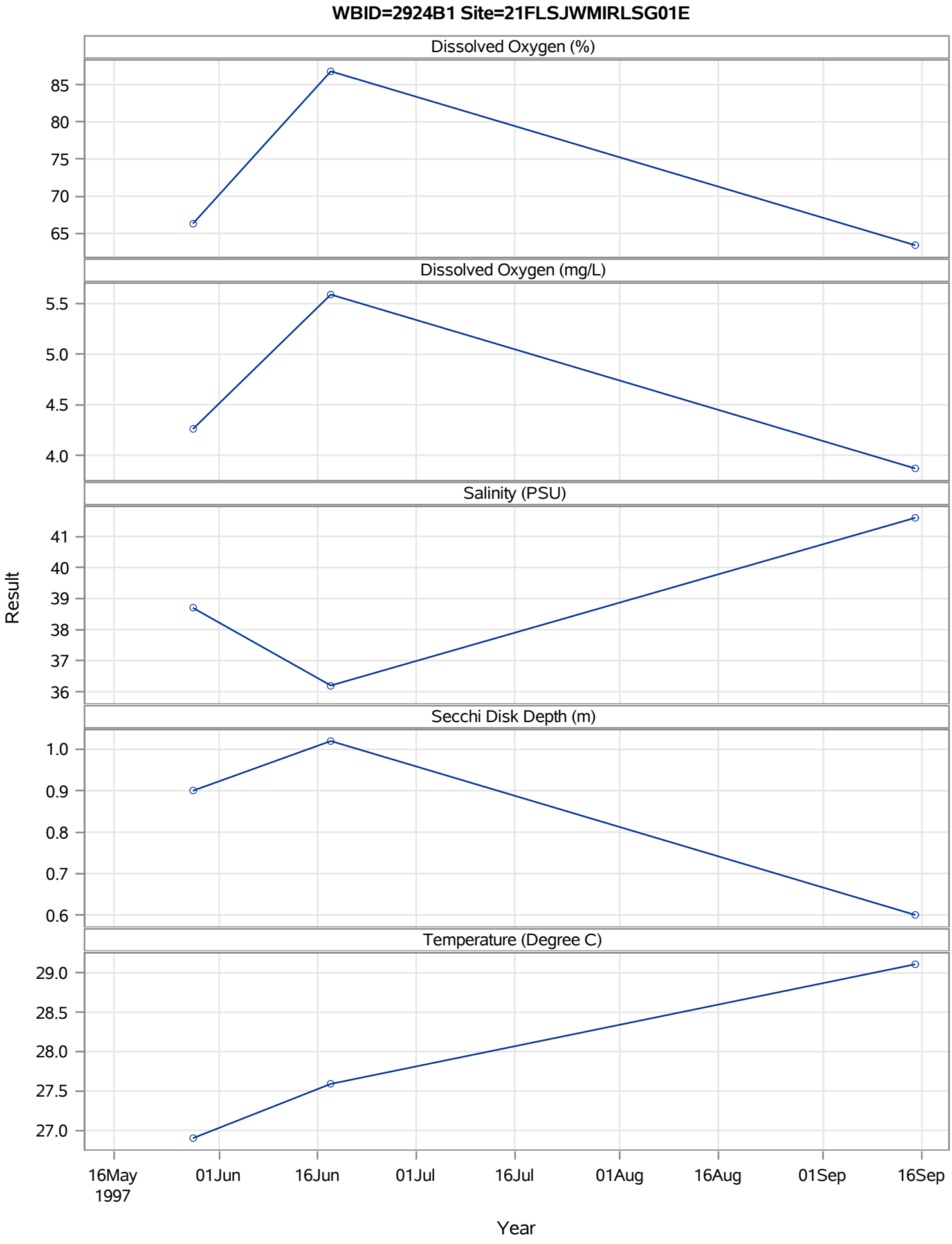

WBID=2924B1 Site=21FLSJWMIRLMLSHIP08
Nitrite + Nitrate (mg/L)
0.010
0.008
0.006
0.004
0.002
Salinity (PSU)
34
32
30
Secchi Disk Depth (m)
0.40
0.38
0.36
0.34
0.32
0.30
Temperature (Degree C)
30
29
28
Total Kjeldahl Nitrogen (mg/L)
1.6
1.4
1.2
1.0
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

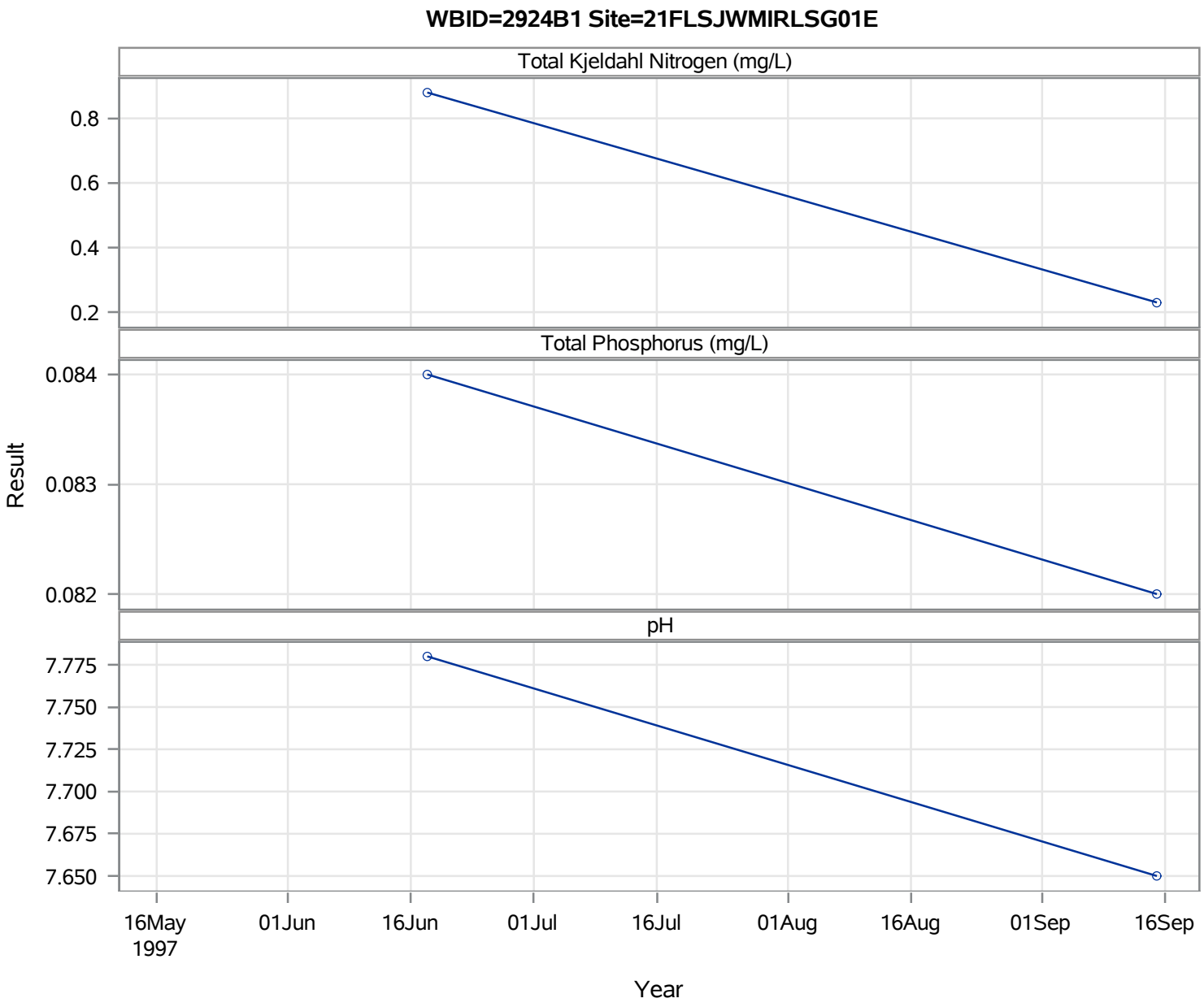

WBID=2924B1 Site=21FLSJWMIRLMLSHIP08
Total Nitrogen (mg/L)
1.15
1.10
1.05
1.00
0.95
Total Phosphorus (mg/L)
0.14
0.12
0.10
0.08
0.06
0.04
0.02
Result
pH
7.8
7.7
7.6
7.5
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

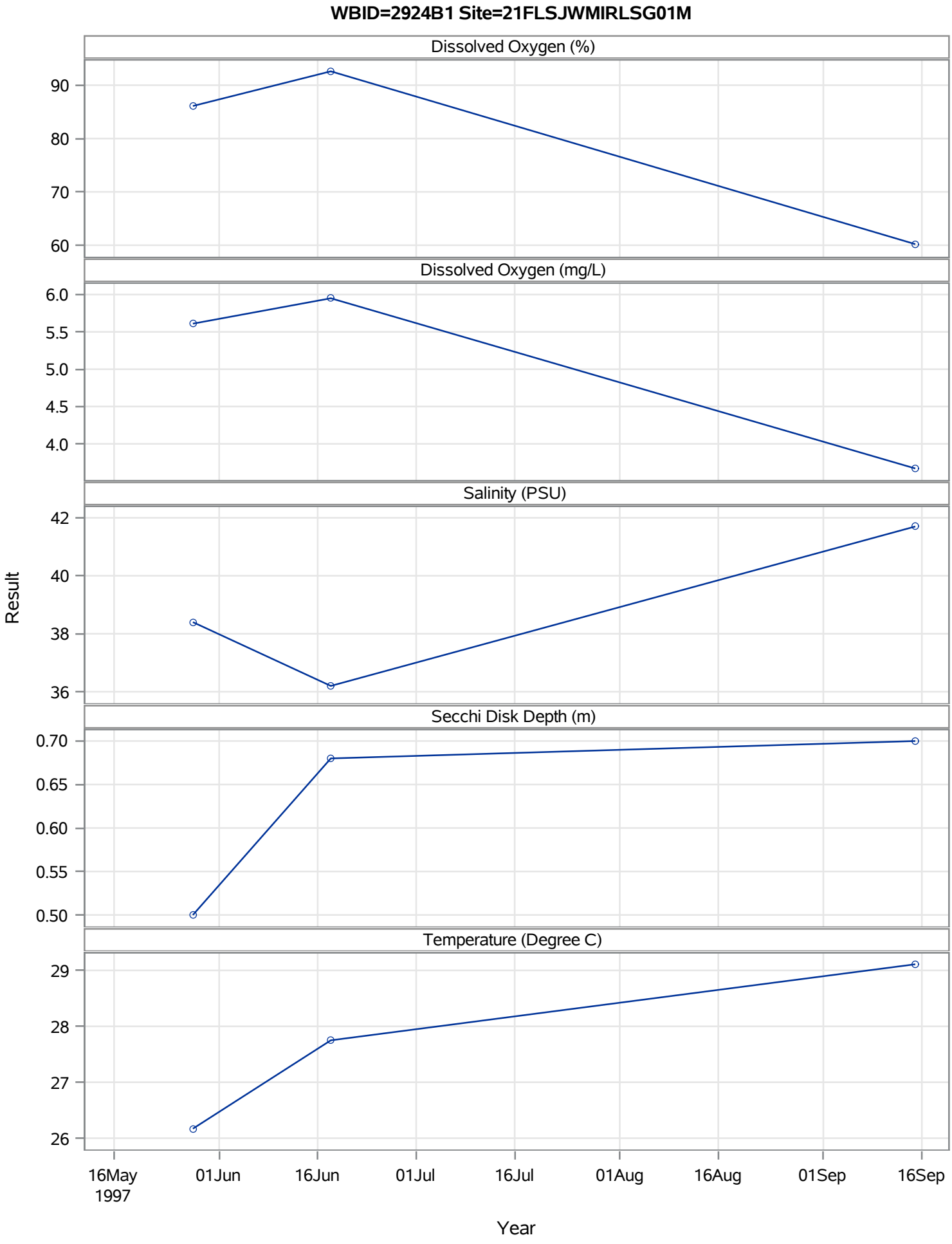

WBID=2924B1 Site=21FLSJWMIRLMLSHIP09
Ammonia (mg/L)
0.005
0.004
0.003
0.002
Chlorophyll a (µg/L)
20
15
10
5
Dissolved Orthophosphate (mg/L)
0.012
0.010
0.008
0.006
0.004
Dissolved Oxygen (%)
70
60
50
40
30
Dissolved Oxygen (mg/L)
4.0
3.5
3.0
2.5
2.0
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

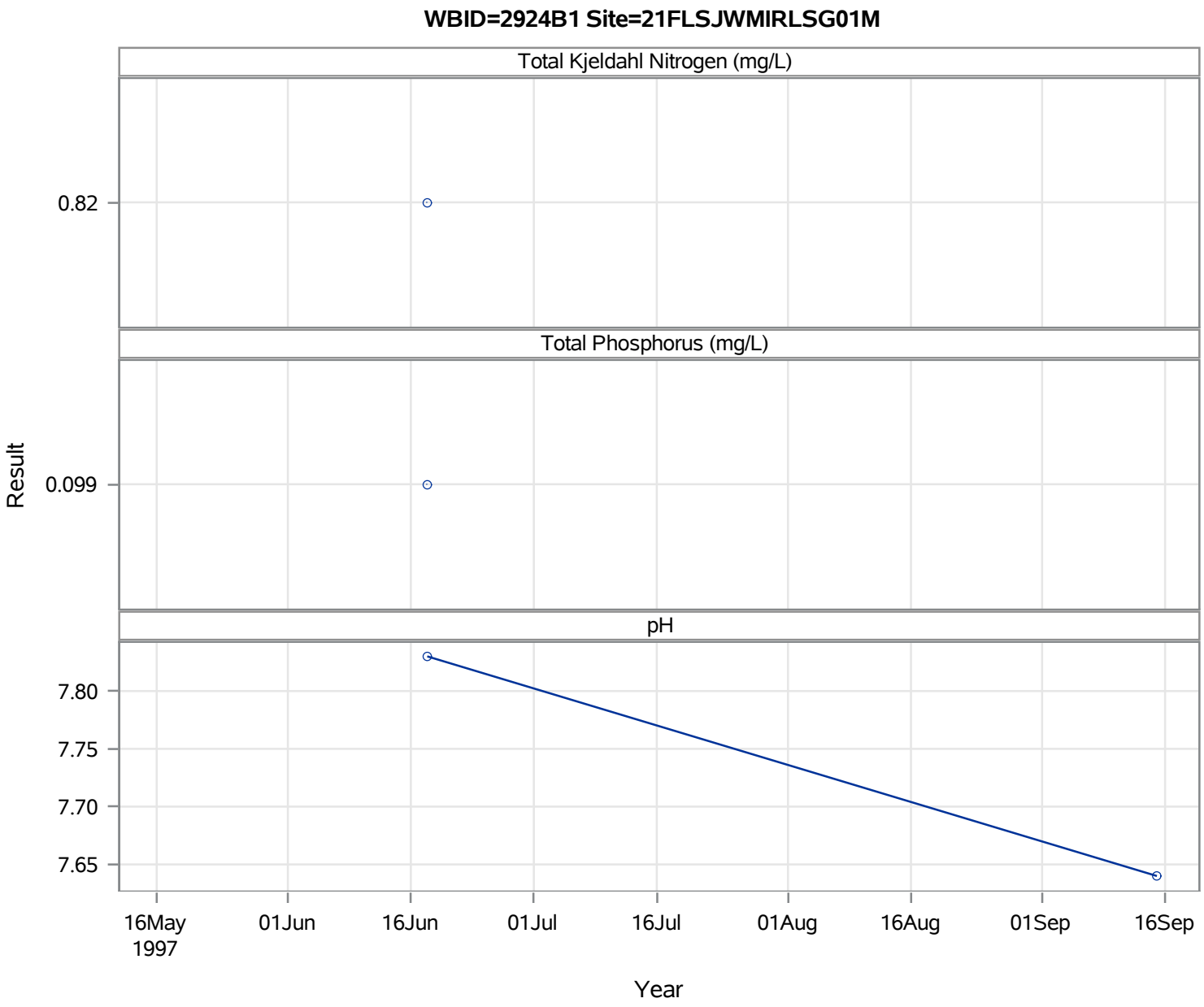

WBID=2924B1 Site=21FLSJWMIRLMLSHIP09
Nitrite + Nitrate (mg/L)
0.0015
0.0014
0.0013
0.0012
0.0011
Salinity (PSU)
37.5
35.0
32.5
30.0
27.5
Secchi Disk Depth (m)
0.70
0.65
0.60
0.55
0.50
0.45
0.40
Temperature (Degree C)
30
29
28
Total Kjeldahl Nitrogen (mg/L)
1.3
1.2
1.1
1.0
0.9
Result
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

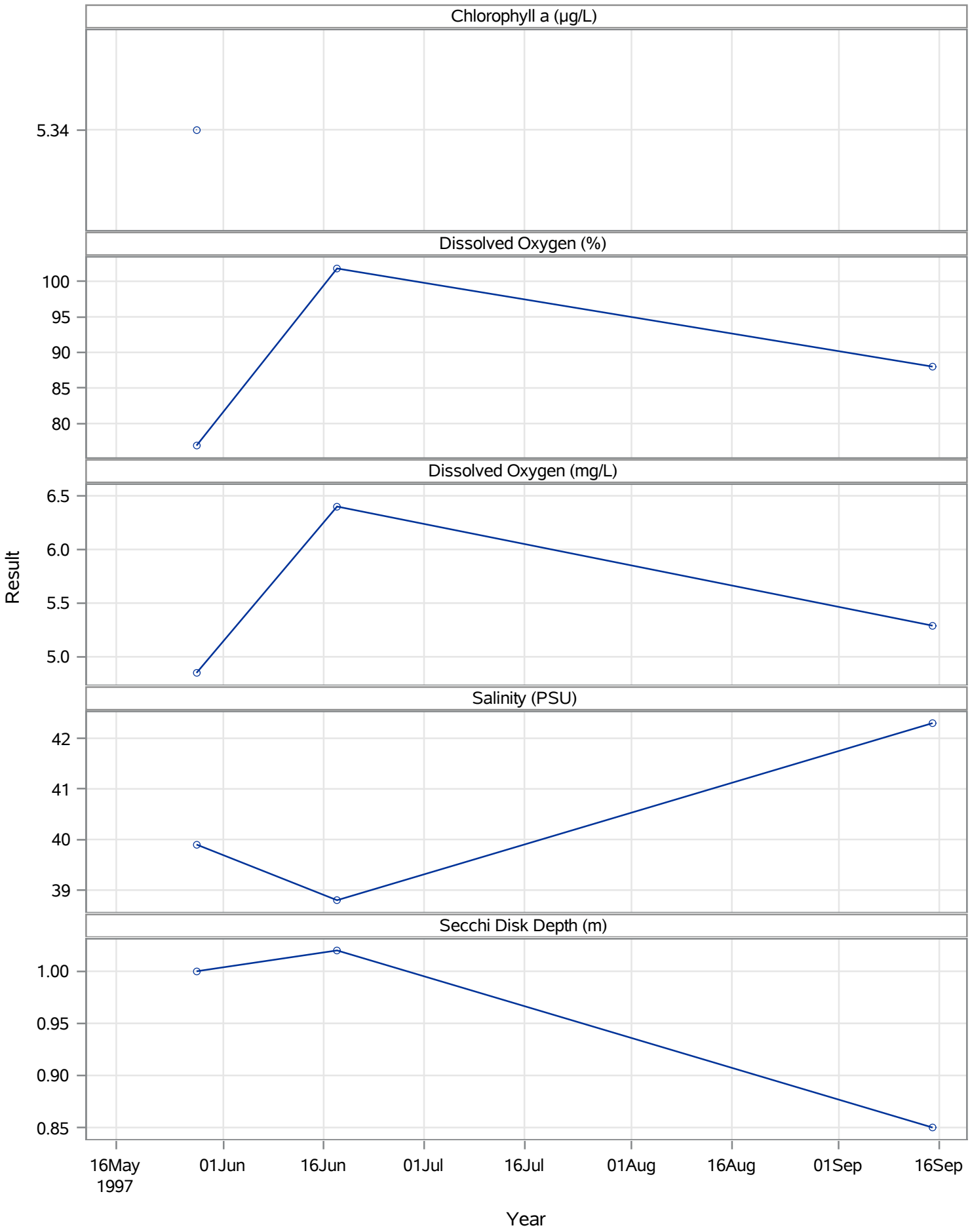

WBID=2924B1 Site=21FLSJWMIRLMLSHIP09
Total Nitrogen (mg/L)
1.3
1.2
1.1
1.0
Total Phosphorus (mg/L)
0.125
0.100
0.075
0.050
0.025
Result
pH
8.2
8.0
7.8
7.6
7.4
06Jul
2014
13Jul
20Jul
27Jul
03Aug
10Aug
17Aug
24Aug
31Aug
07Sep
14Sep
21Sep
Year

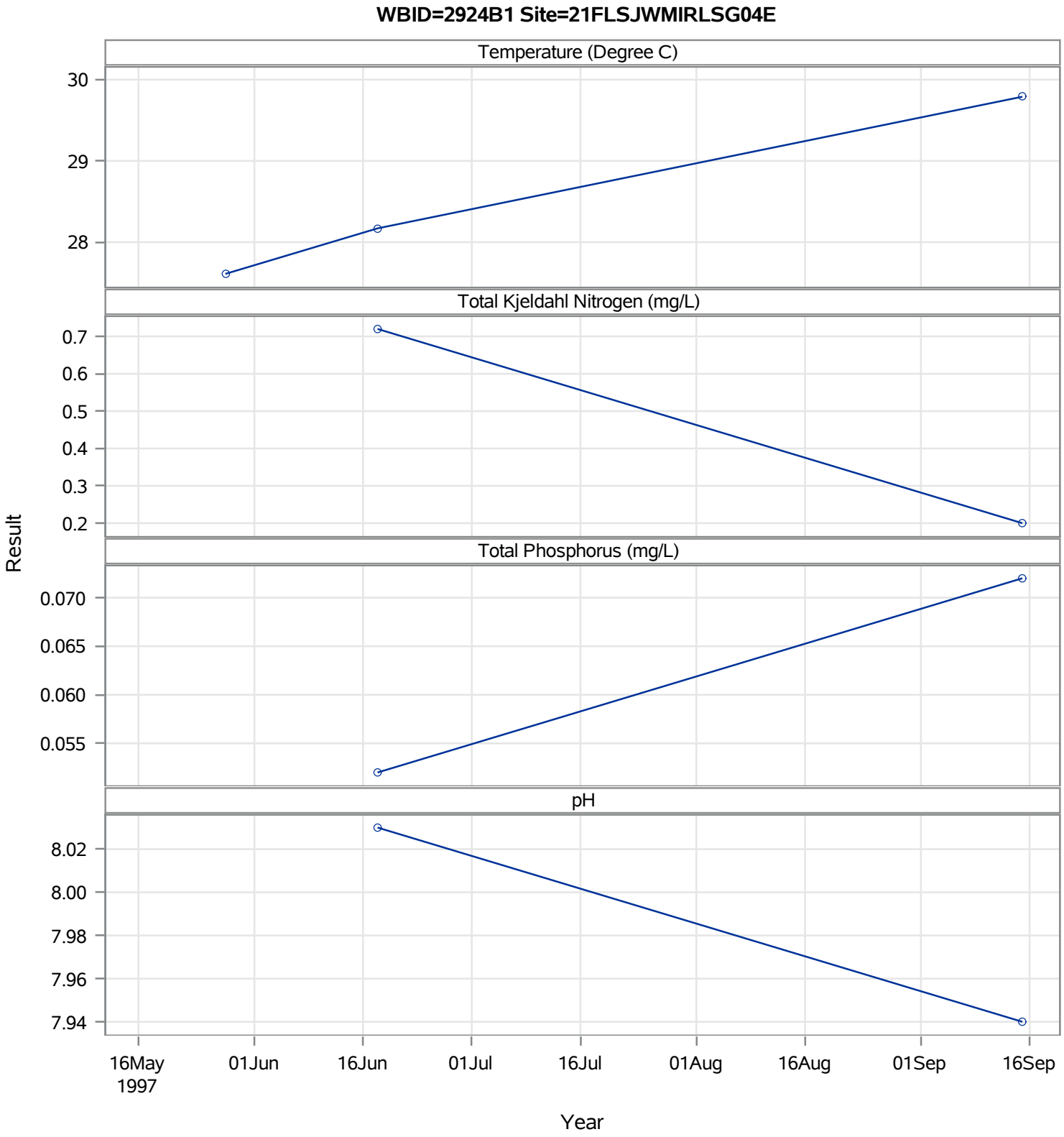

WBID=2924B1 Site=21FLSJWMIRLSG01E
Dissolved Oxygen (%)
85
80
75
70
65
Dissolved Oxygen (mg/L)
5.5
5.0
4.5
4.0
Salinity (PSU)
41
40
39
38
37
36
Secchi Disk Depth (m)
1.0
0.9
0.8
0.7
0.6
Temperature (Degree C)
29.0
28.5
28.0
27.5
27.0
Result
16May
1997
01Jun
16Jun
01Jul
16Jul
01Aug
16Aug
01Sep
16Sep
Year

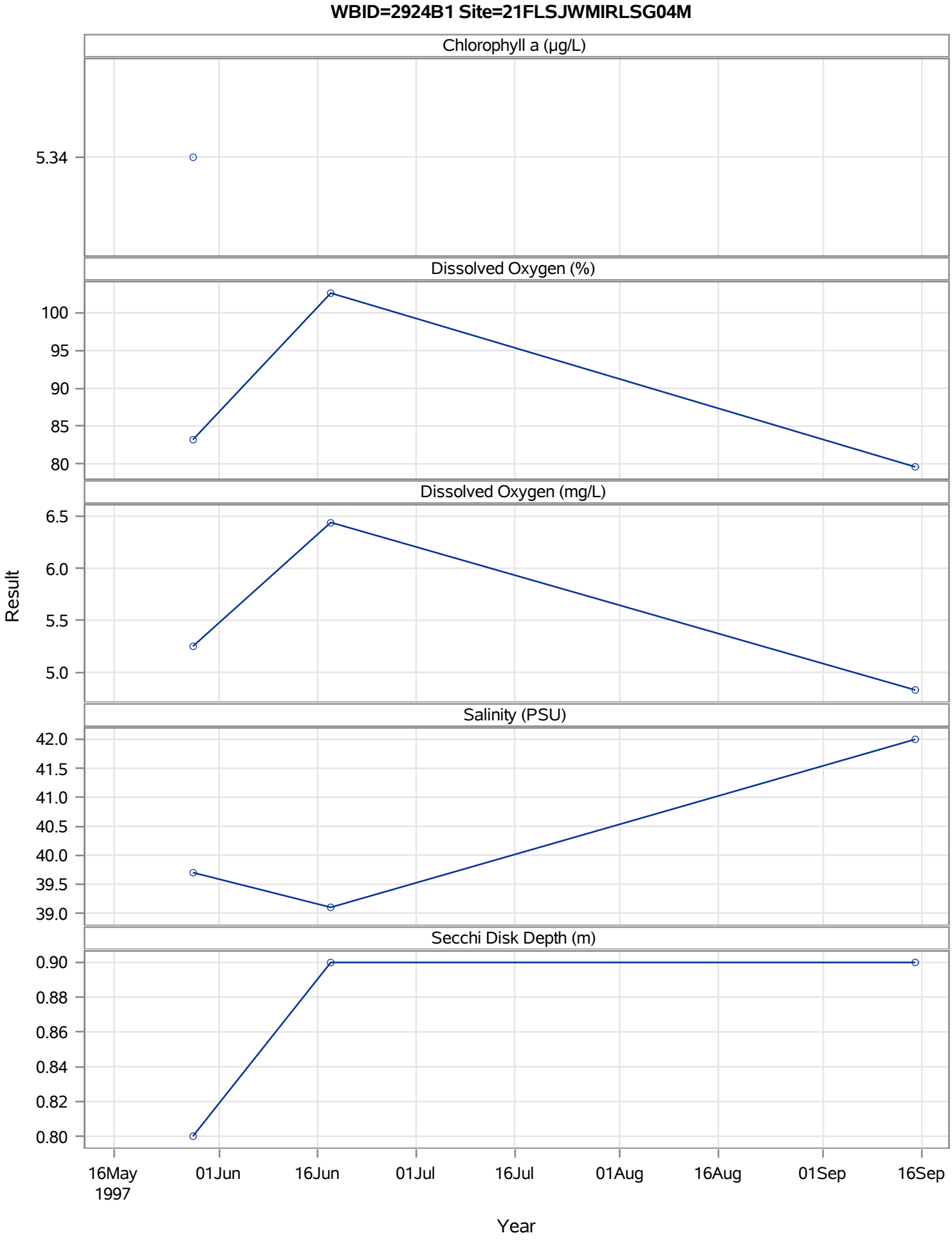

WBID=2924B1 Site=21FLSJWMIRLSG01E
Total Kjeldahl Nitrogen (mg/L)
0.8
0.6
0.4
0.2
Total Phosphorus (mg/L)
0.084
0.083
0.082
pH
7.775
7.750
7.725
7.700
7.675
7.650
Result
16May
1997
01Jun
16Jun
01Jul
16Jul
01Aug
16Aug
01Sep
16Sep
Year

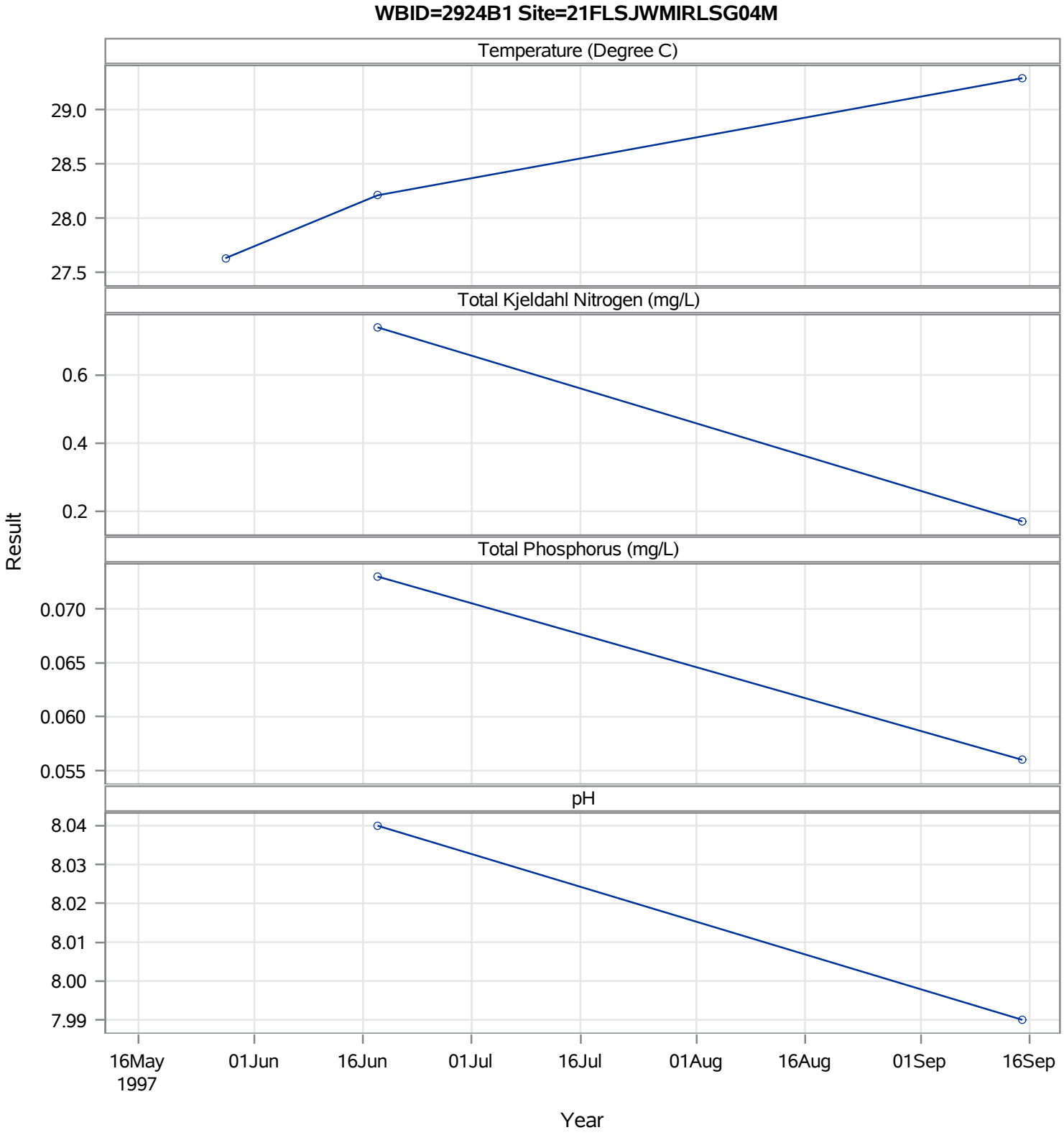

WBID=2924B1 Site=21FLSJWMIRLSG01M
Dissolved Oxygen (%)
90
80
70
60
Dissolved Oxygen (mg/L)
6.0
5.5
5.0
4.5
4.0
Salinity (PSU)
42
40
38
36
Secchi Disk Depth (m)
0.70
0.65
0.60
0.55
0.50
Temperature (Degree C)
29
28
27
26
Result
16May
1997
01Jun
16Jun
01Jul
16Jul
01Aug
16Aug
01Sep
16Sep
Year

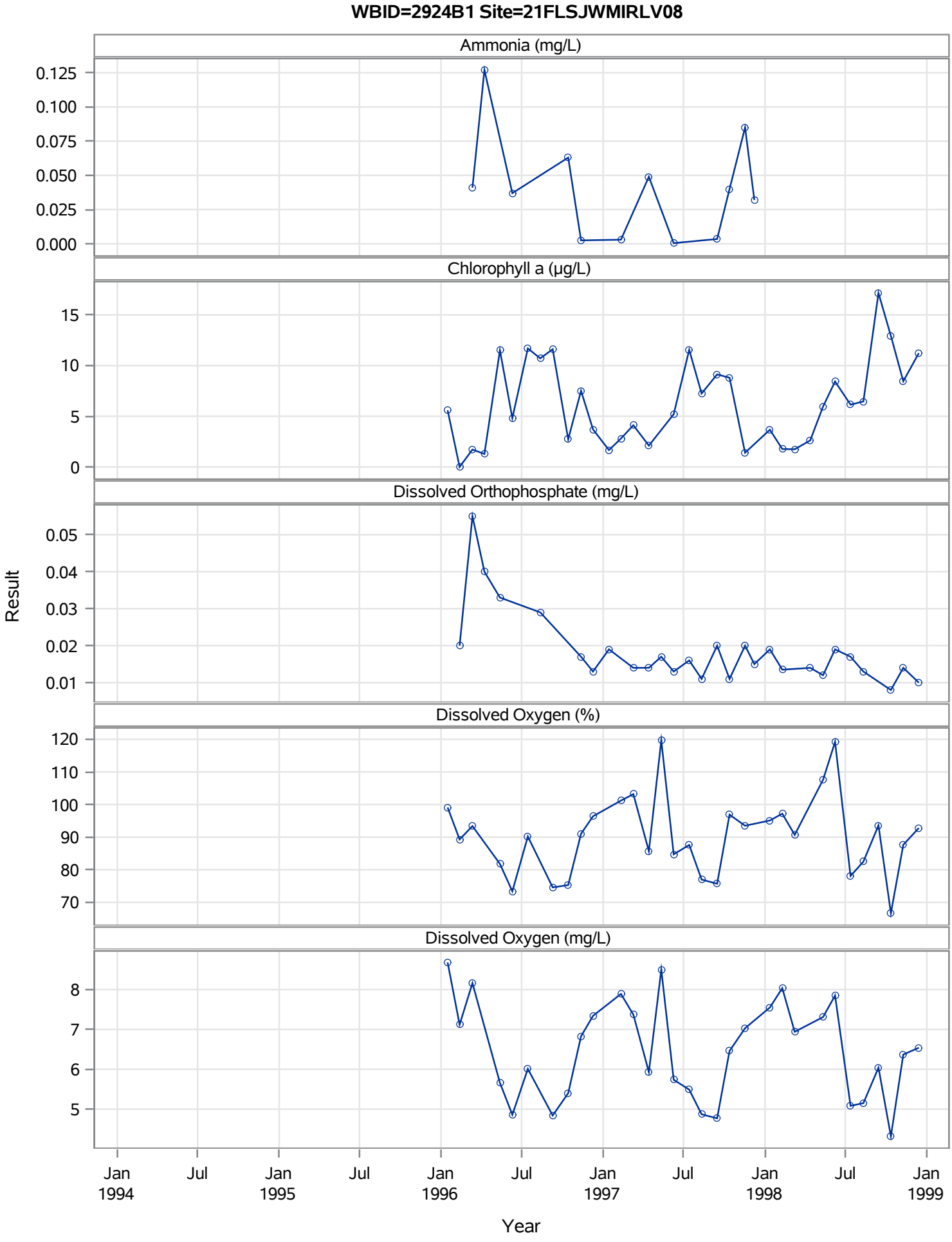

WBID=2924B1 Site=21FLSJWMIRLSG01M
Total Kjeldahl Nitrogen (mg/L)
0.82
Total Phosphorus (mg/L)
0.099
pH
7.80
7.75
7.70
7.65
Result
16May
1997
01Jun
16Jun
01Jul
16Jul
01Aug
16Aug
01Sep
16Sep
Year

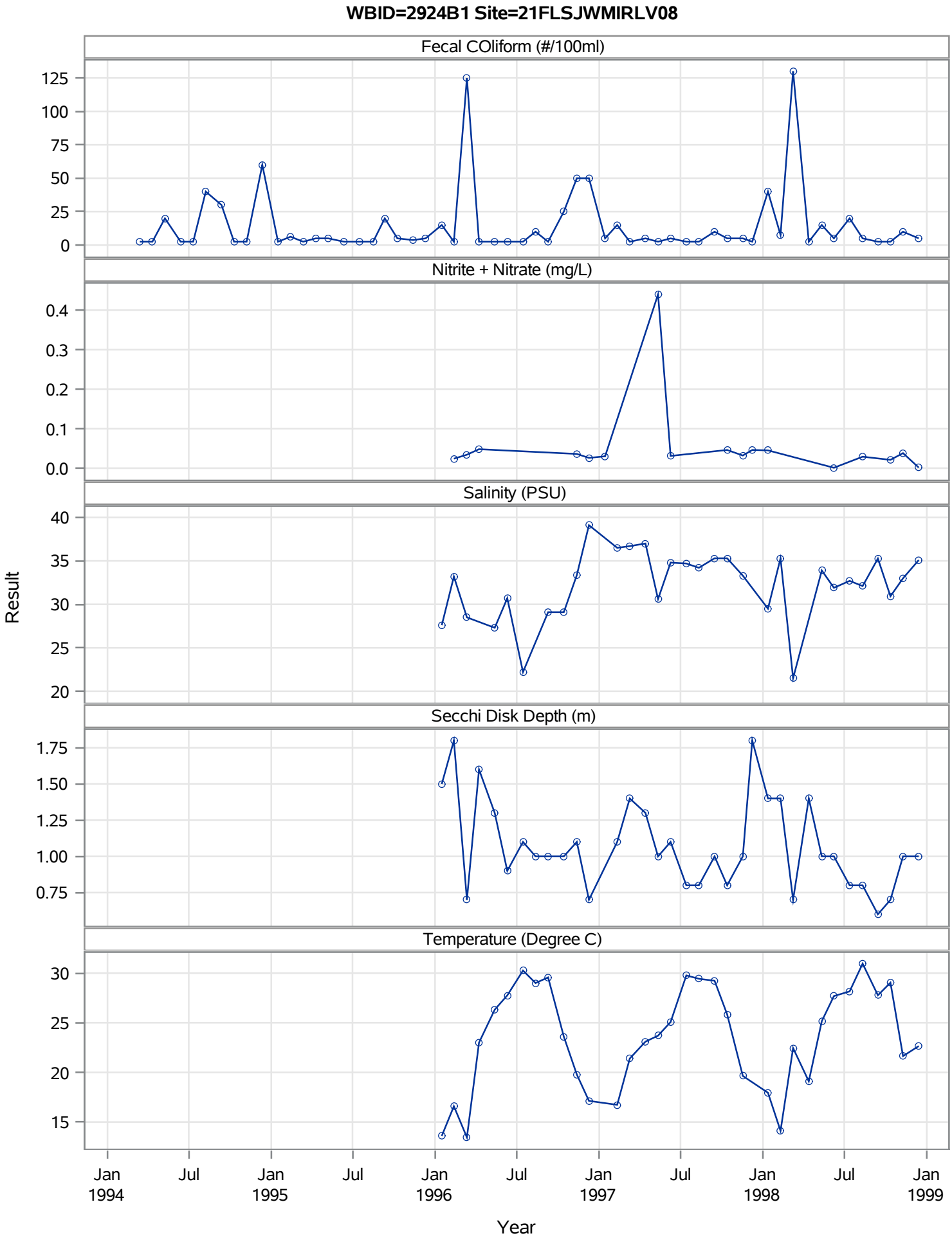

WBID=2924B1 Site=21FLSJWMIRLSG04E
Chlorophyll a (µg/L)
5.34
Dissolved Oxygen (%)
100
95
90
85
80
Dissolved Oxygen (mg/L)
6.5
6.0
5.5
5.0
Salinity (PSU)
42
41
40
39
Secchi Disk Depth (m)
1.00
0.95
0.90
0.85
Result
16May
1997
01Jun
16Jun
01Jul
16Jul
01Aug
16Aug
01Sep
16Sep
Year

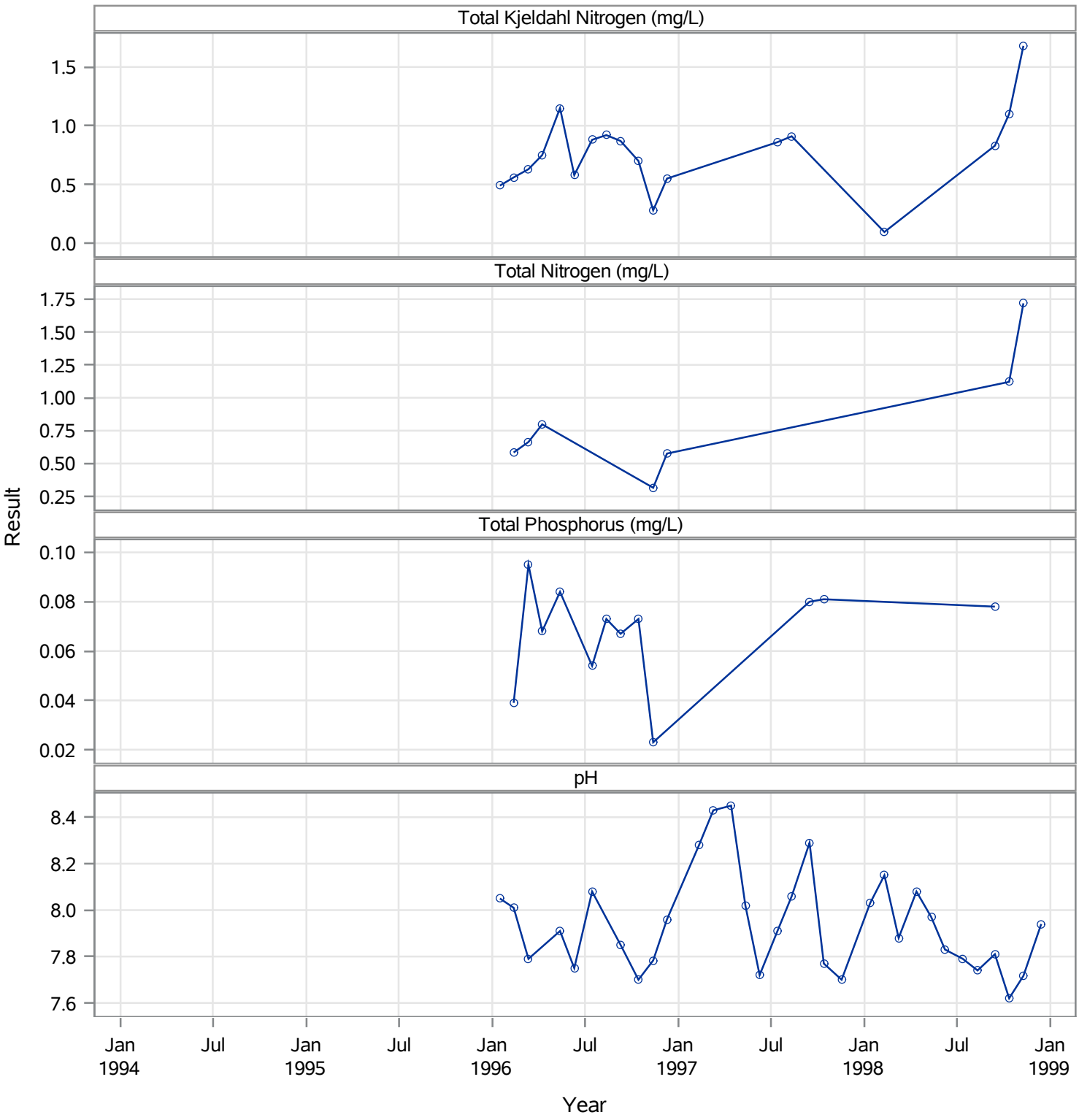

WBID=2924B1 Site=21FLSJWMIRLSG04E
Temperature (Degree C)
30
29
28
Total Kjeldahl Nitrogen (mg/L)
0.7
0.6
0.5
0.4
0.3
0.2
Total Phosphorus (mg/L)
0.070
0.065
0.060
0.055
pH
8.02
8.00
7.98
7.96
7.94
Result
16May
1997
01Jun
16Jun
01Jul
16Jul
01Aug
16Aug
01Sep
16Sep
Year

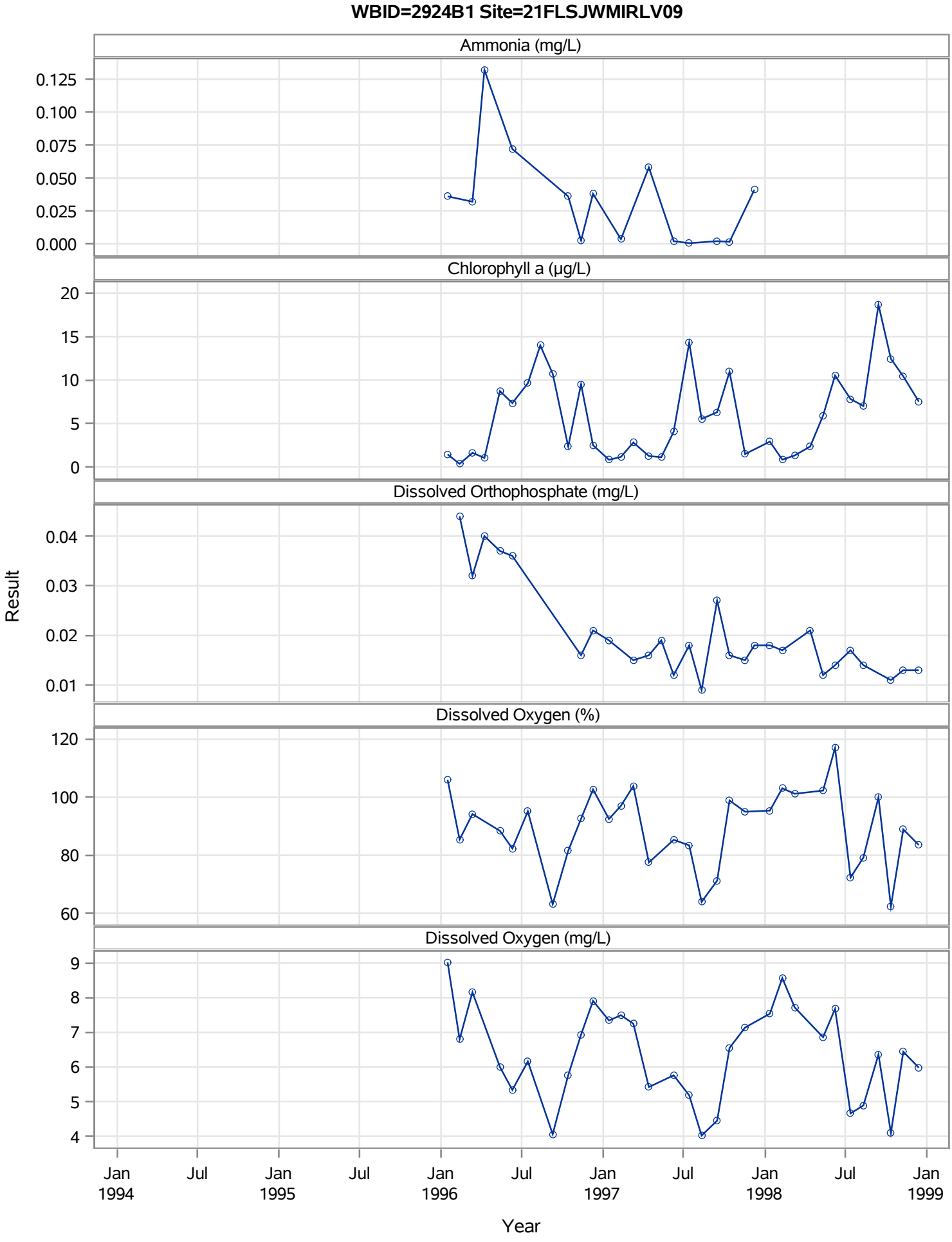

WBID=2924B1 Site=21FLSJWMIRLSG04M
Chlorophyll a (µg/L)
5.34
Dissolved Oxygen (%)
100
95
90
85
80
Dissolved Oxygen (mg/L)
6.5
6.0
5.5
5.0
Result
Salinity (PSU)
42.0
41.5
41.0
40.5
40.0
39.5
39.0
Secchi Disk Depth (m)
0.90
0.88
0.86
0.84
0.82
0.80
16May
1997
01Jun
16Jun
01Jul
16Jul
01Aug
16Aug
01Sep
16Sep
Year

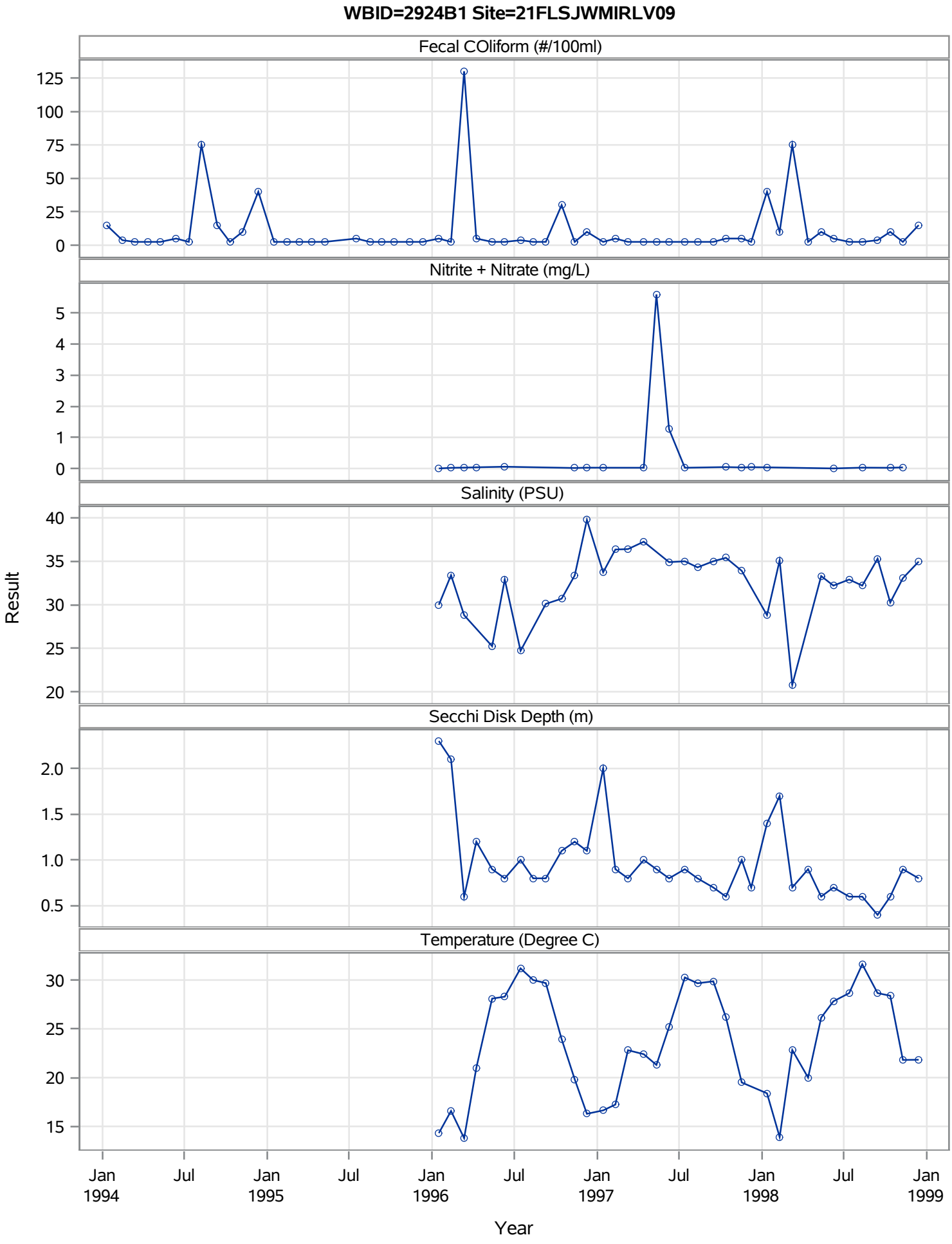

WBID=2924B1 Site=21FLSJWMIRLSG04M
Temperature (Degree C)
29.0
28.5
28.0
27.5
Total Kjeldahl Nitrogen (mg/L)
0.6
0.4
0.2
Total Phosphorus (mg/L)
0.070
0.065
0.060
0.055
pH
8.04
8.03
8.02
8.01
8.00
7.99
Result
16May
1997
01Jun
16Jun
01Jul
16Jul
01Aug
16Aug
01Sep
16Sep
Year

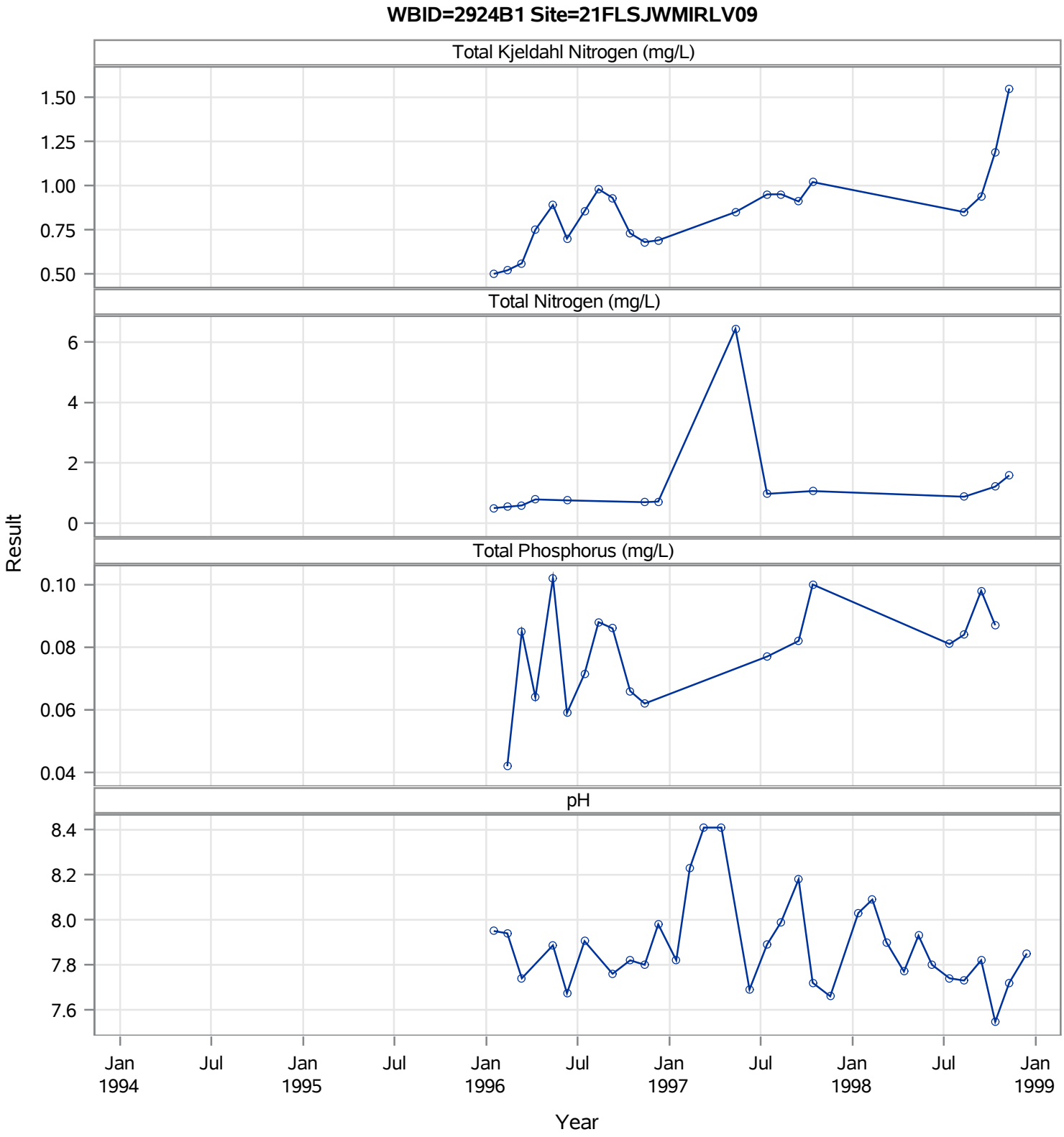

WBID=2924B1 Site=21FLSJWMIRLV08
Ammonia (mg/L)
0.125
0.100
0.075
0.050
0.025
0.000
Chlorophyll a (µg/L)
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.05
0.04
0.03
0.02
0.01
Dissolved Oxygen (%)
120
110
100
90
80
70
Dissolved Oxygen (mg/L)
8
7
6
5
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

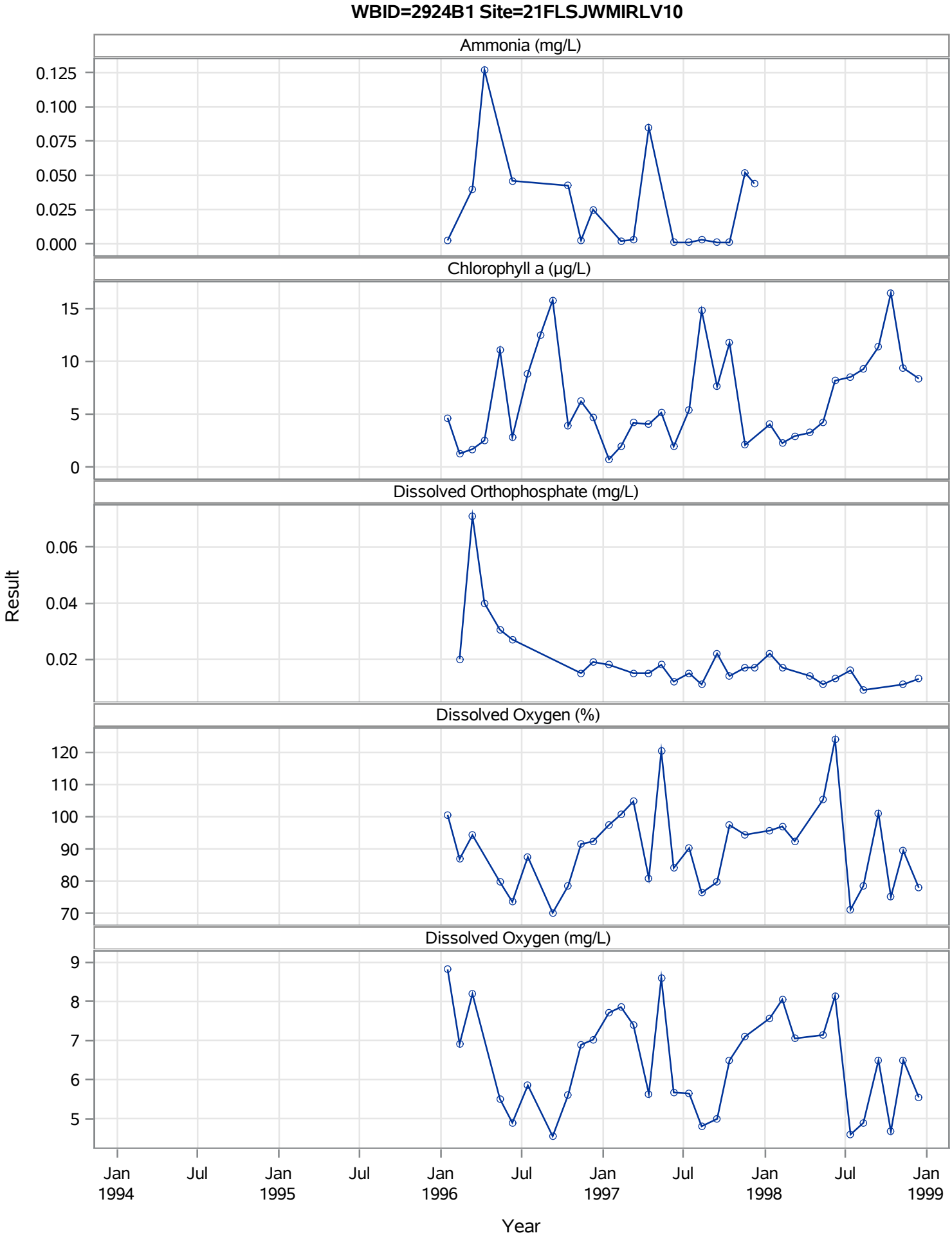

WBID=2924B1 Site=21FLSJWMIRLV08
Fecal COliform (#/100ml)
125
100
75
50
25
0
Nitrite + Nitrate (mg/L)
0.4
0.3
0.2
0.1
0.0
Salinity (PSU)
40
35
30
25
20
Secchi Disk Depth (m)
1.75
1.50
1.25
1.00
0.75
Temperature (Degree C)
30
25
20
15
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

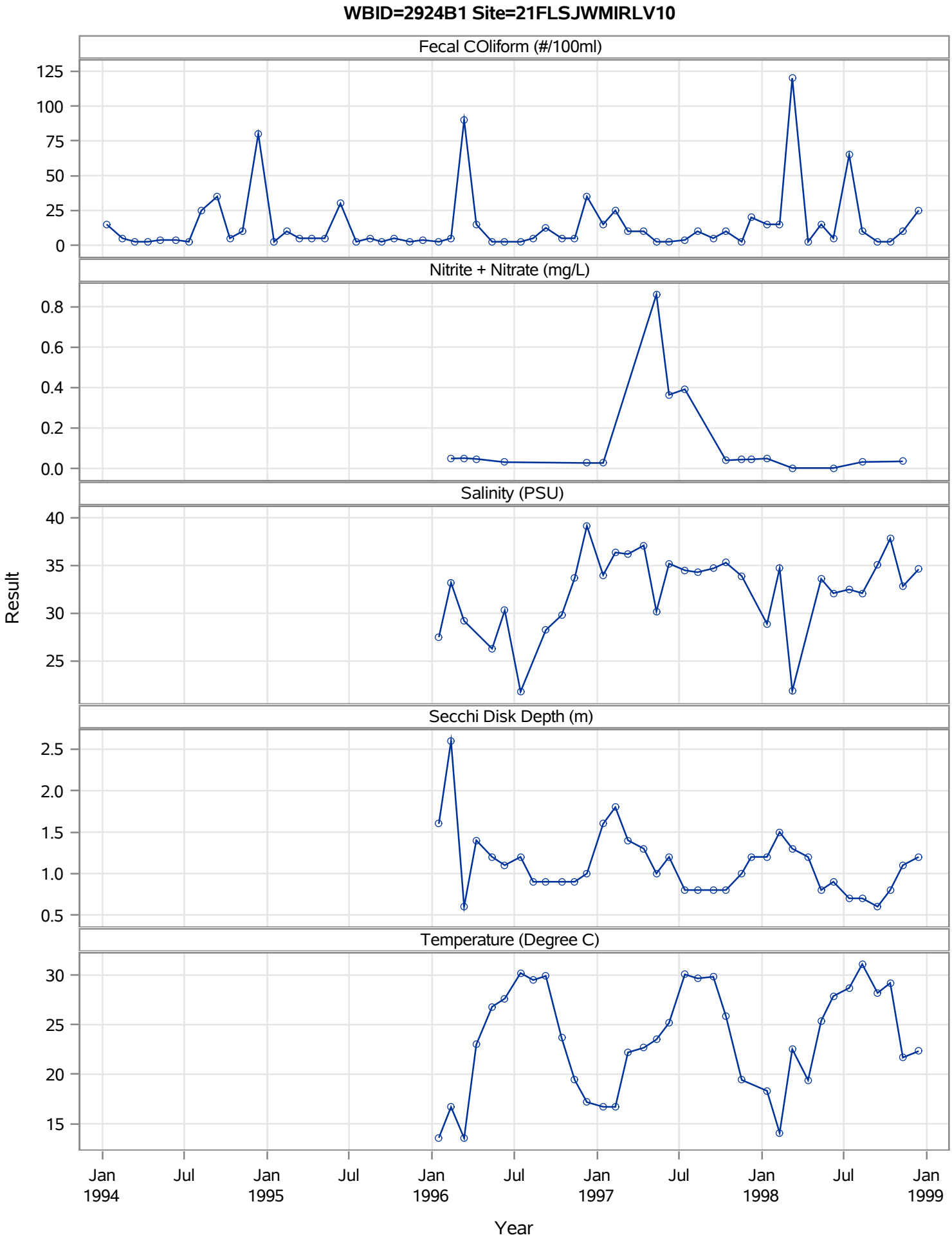

WBID=2924B1 Site=21FLSJWMIRLV08
Total Kjeldahl Nitrogen (mg/L)
1.5
1.0
0.5
0.0
Total Nitrogen (mg/L)
1.75
1.50
1.25
1.00
0.75
0.50
0.25
Total Phosphorus (mg/L)
0.10
0.08
0.06
0.04
0.02
pH
8.4
8.2
8.0
7.8
7.6
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

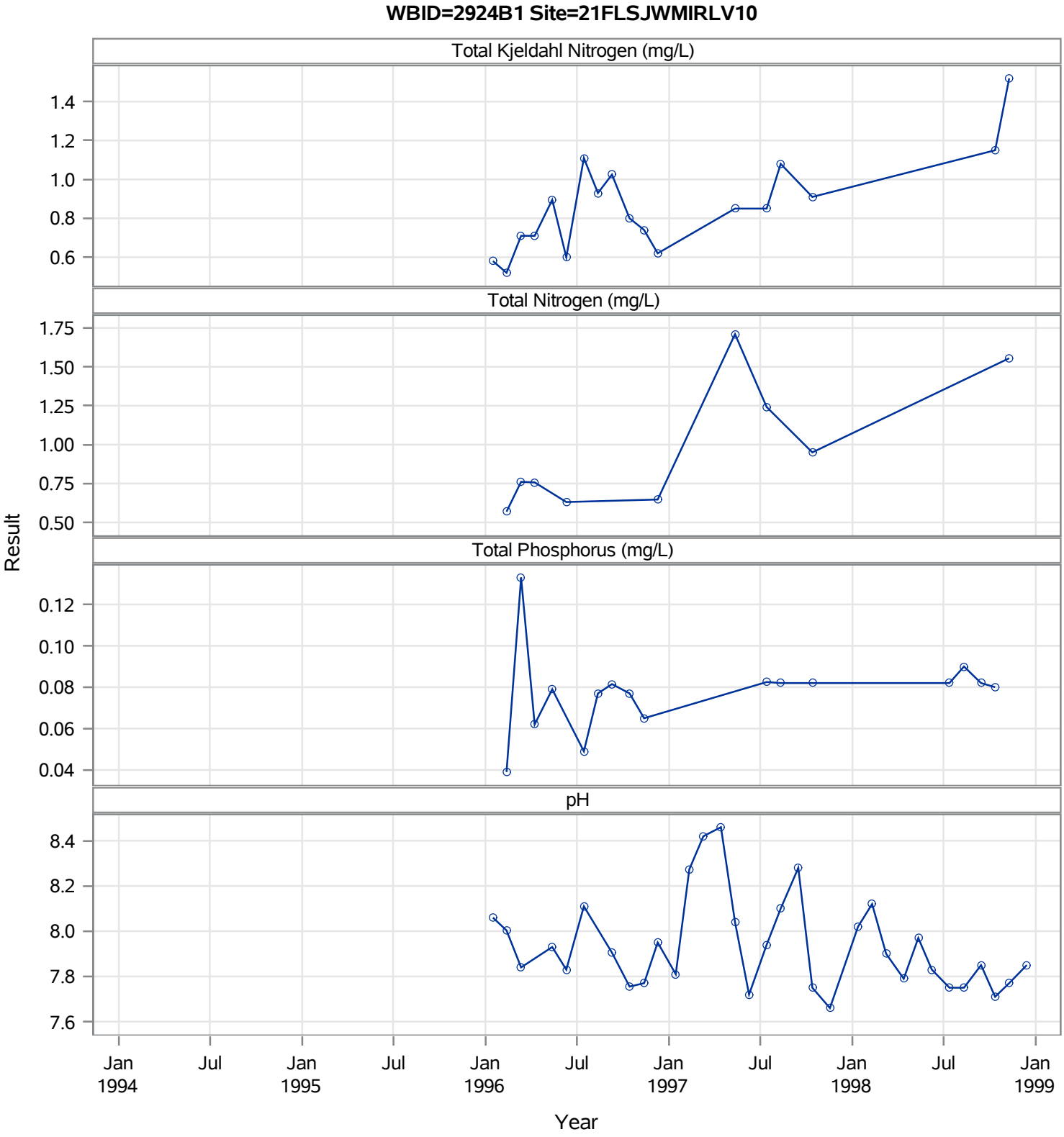

WBID=2924B1 Site=21FLSJWMIRLV09
Ammonia (mg/L)
0.125
0.100
0.075
0.050
0.025
0.000
Chlorophyll a (µg/L)
20
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.04
0.03
0.02
0.01
Dissolved Oxygen (%)
120
100
80
60
Dissolved Oxygen (mg/L)
9
8
7
6
5
4
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

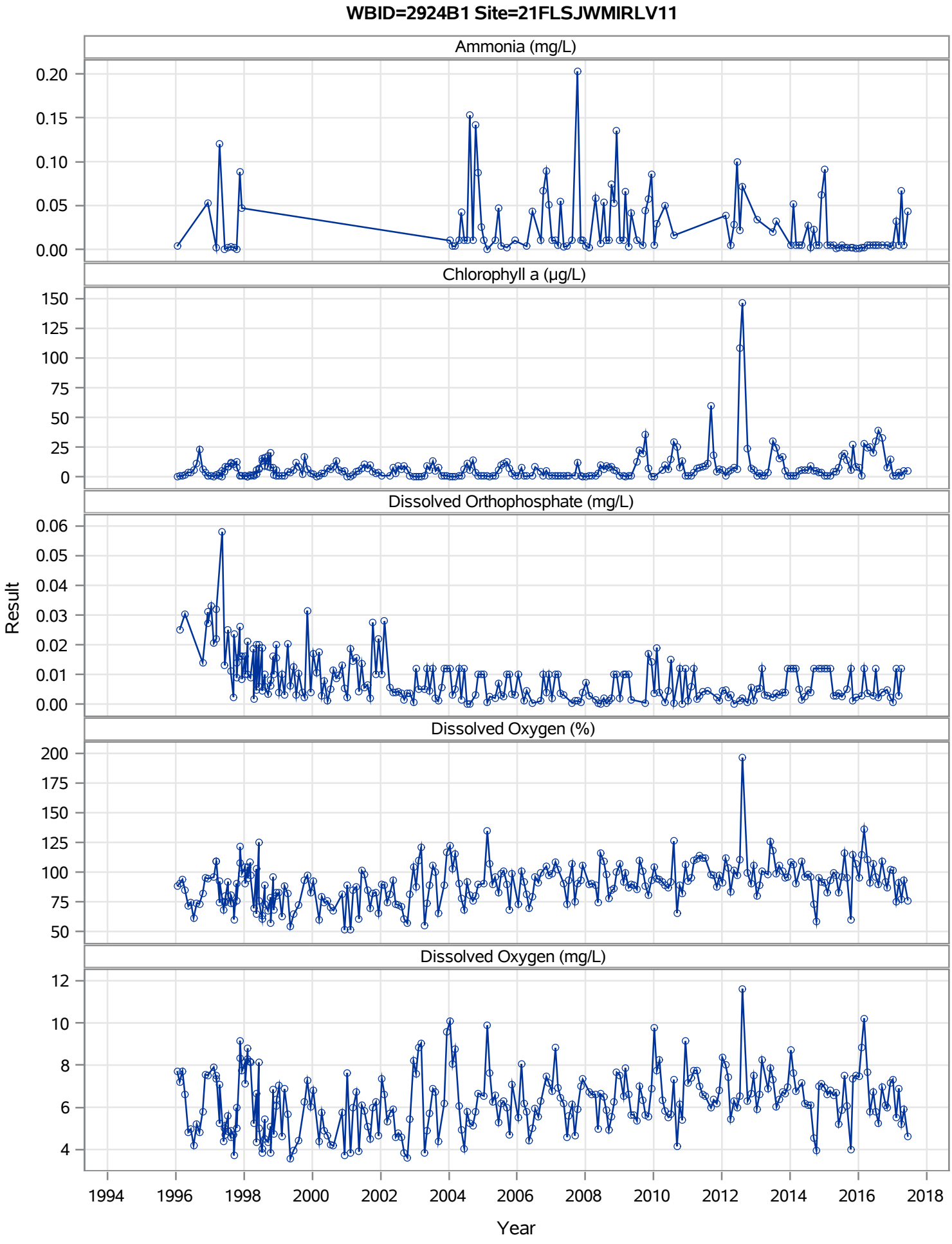

WBID=2924B1 Site=21FLSJWMIRLV09
Fecal COliform (#/100ml)
125
100
75
50
25
0
Nitrite + Nitrate (mg/L)
5
4
3
2
1
0
Salinity (PSU)
40
35
30
25
20
Secchi Disk Depth (m)
2.0
1.5
1.0
0.5
Temperature (Degree C)
30
25
20
15
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

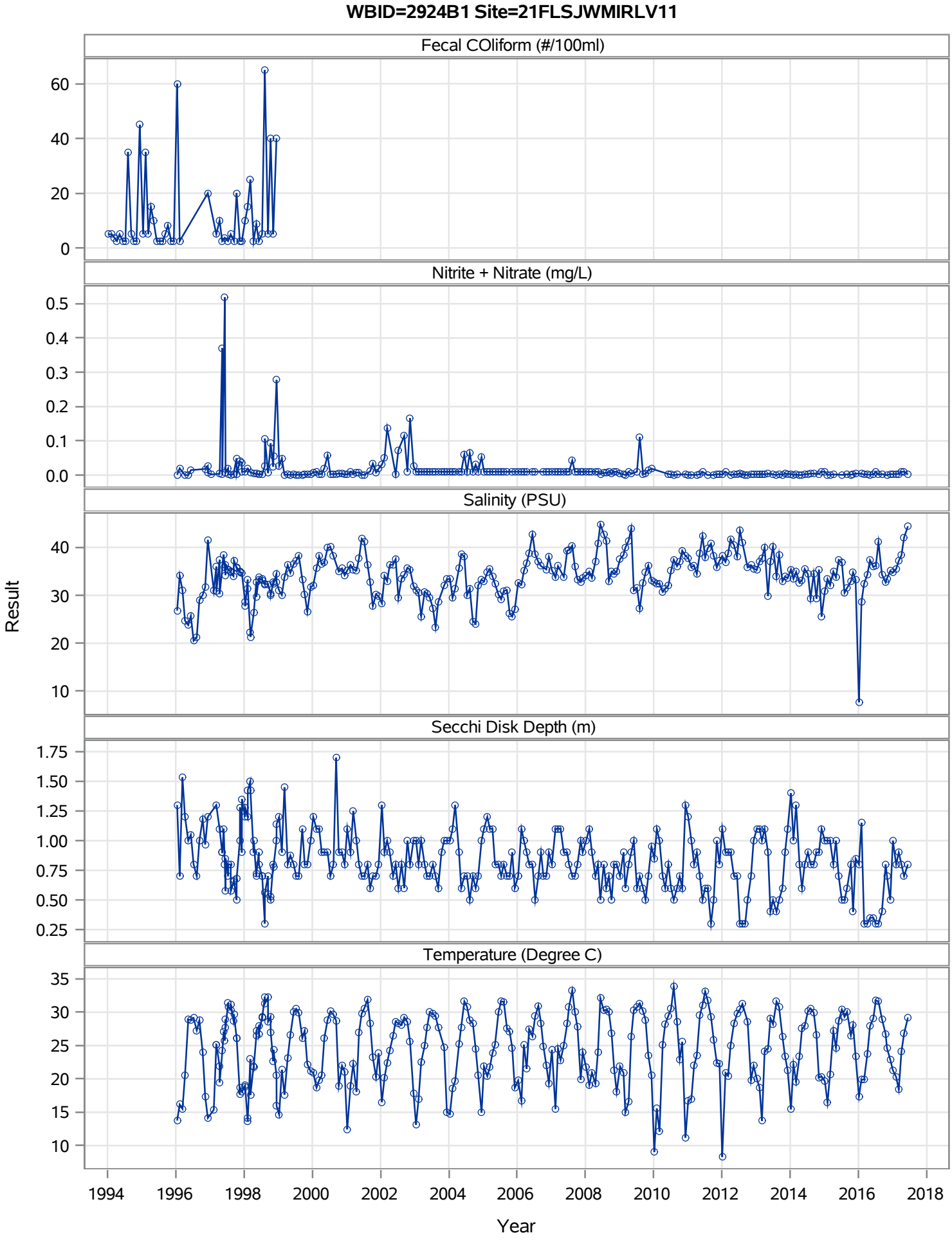

WBID=2924B1 Site=21FLSJWMIRLV09
Total Kjeldahl Nitrogen (mg/L)
1.50
1.25
1.00
0.75
0.50
Total Nitrogen (mg/L)
6
4
2
0
Total Phosphorus (mg/L)
0.10
0.08
0.06
0.04
pH
8.4
8.2
8.0
7.8
7.6
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

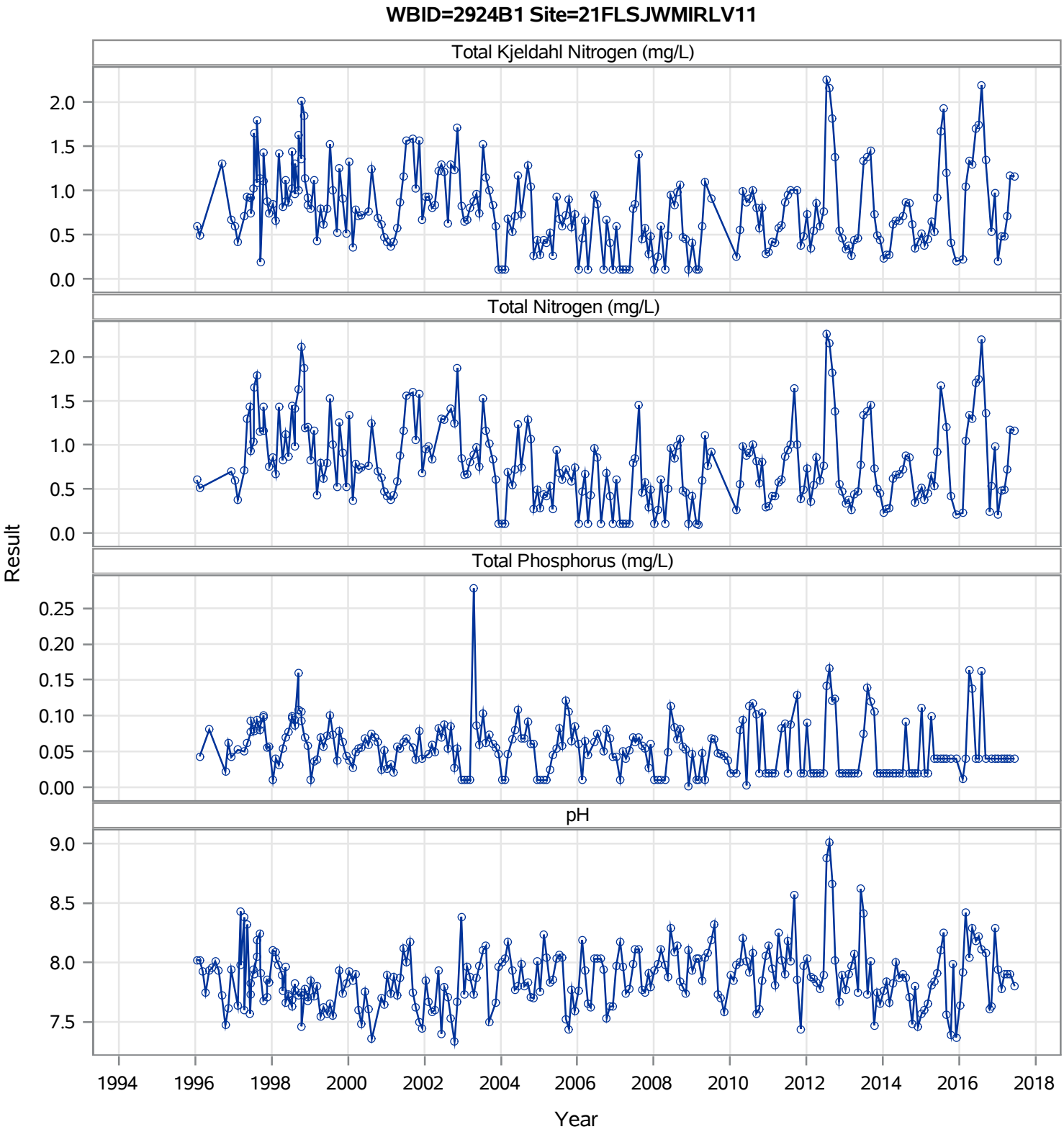

WBID=2924B1 Site=21FLSJWMIRLV10
Ammonia (mg/L)
0.125
0.100
0.075
0.050
0.025
0.000
Chlorophyll a (µg/L)
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.06
0.04
0.02
Dissolved Oxygen (%)
120
110
100
90
80
70
Dissolved Oxygen (mg/L)
9
8
7
6
5
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

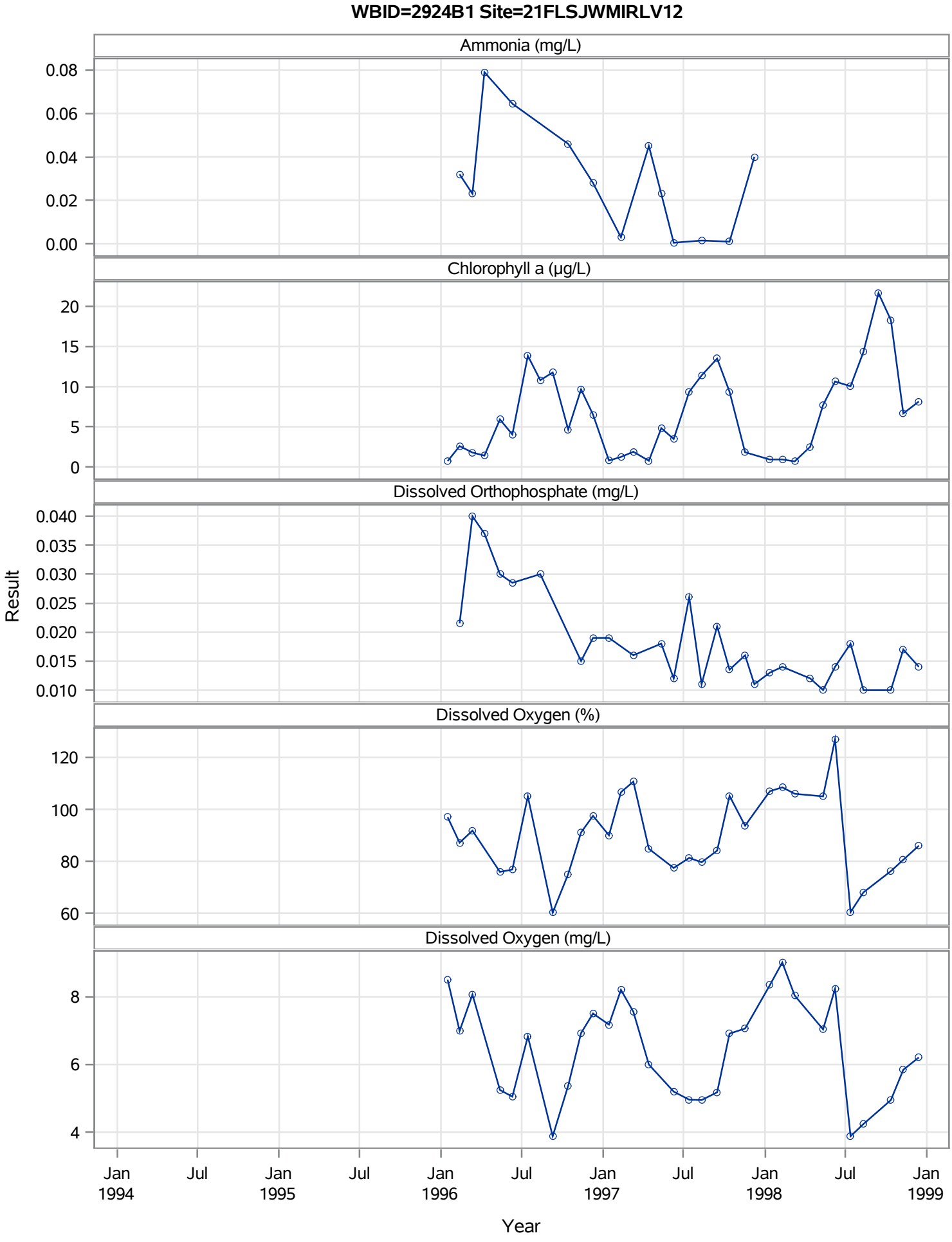

WBID=2924B1 Site=21FLSJWMIRLV10
Fecal COliform (#/100ml)
125
100
75
50
25
0
Nitrite + Nitrate (mg/L)
0.8
0.6
0.4
0.2
0.0
Salinity (PSU)
40
35
30
25
Secchi Disk Depth (m)
2.5
2.0
1.5
1.0
0.5
Temperature (Degree C)
30
25
20
15
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

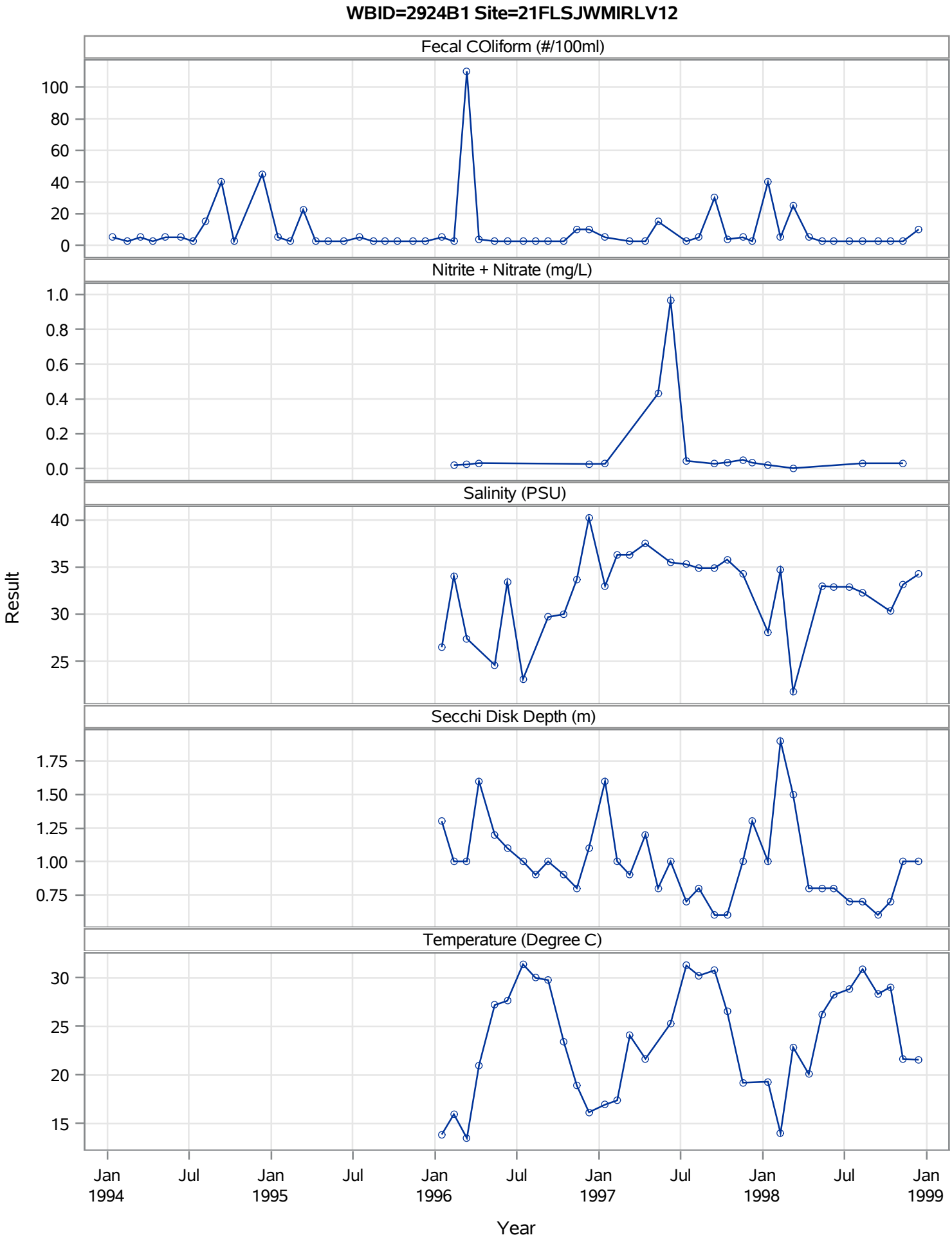

WBID=2924B1 Site=21FLSJWMIRLV10
Total Kjeldahl Nitrogen (mg/L)
1.4
1.2
1.0
0.8
0.6
Total Nitrogen (mg/L)
1.75
1.50
1.25
1.00
0.75
0.50
Total Phosphorus (mg/L)
0.12
0.10
0.08
0.06
0.04
pH
8.4
8.2
8.0
7.8
7.6
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

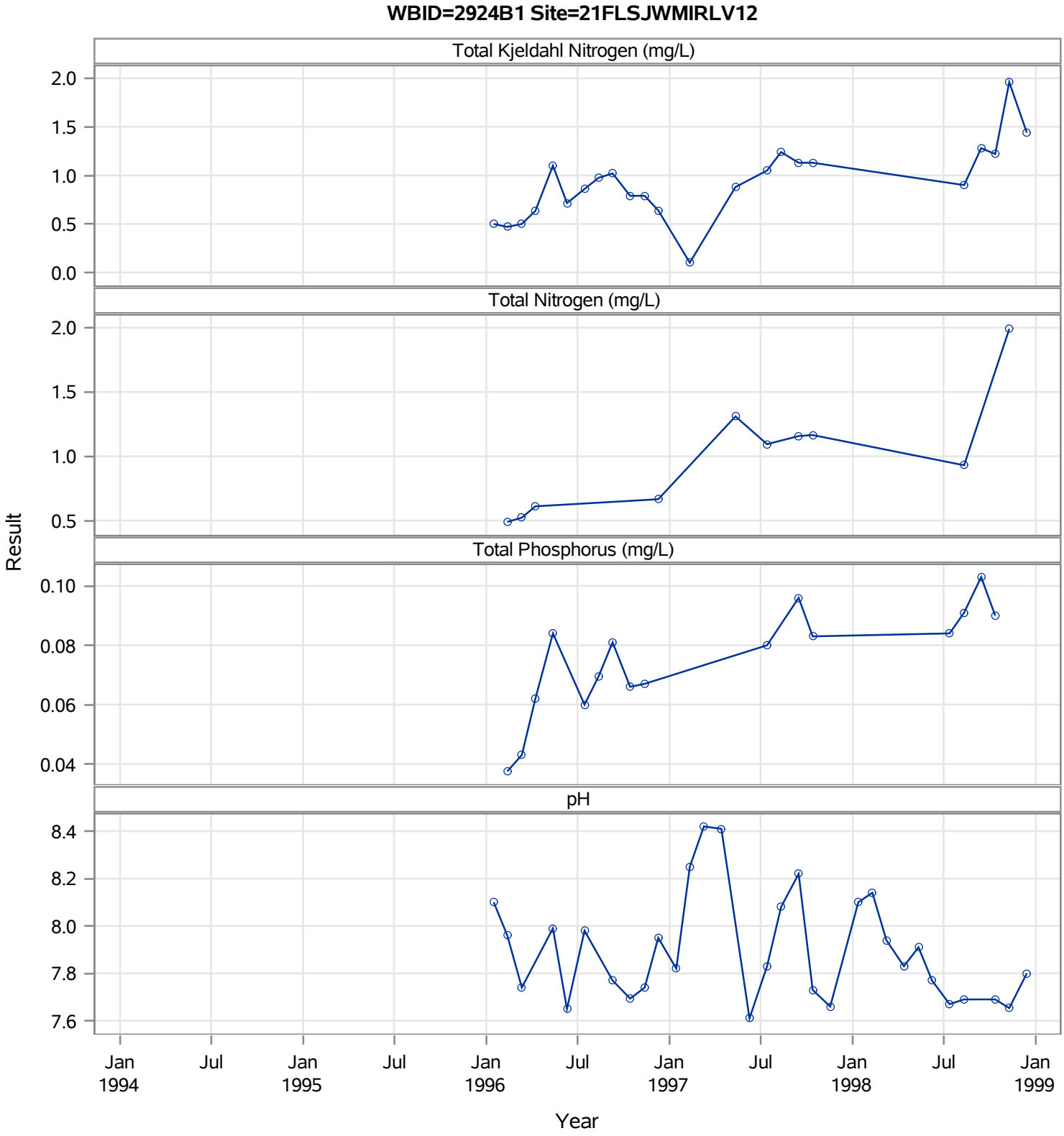

WBID=2924B1 Site=21FLSJWMIRLV11
Ammonia (mg/L)
0.20
0.15
0.10
0.05
0.00
Chlorophyll a (µg/L)
150
125
100
75
50
25
0
Dissolved Orthophosphate (mg/L)
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Dissolved Oxygen (%)
200
175
150
125
100
75
50
Dissolved Oxygen (mg/L)
12
10
8
6
4
Result
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

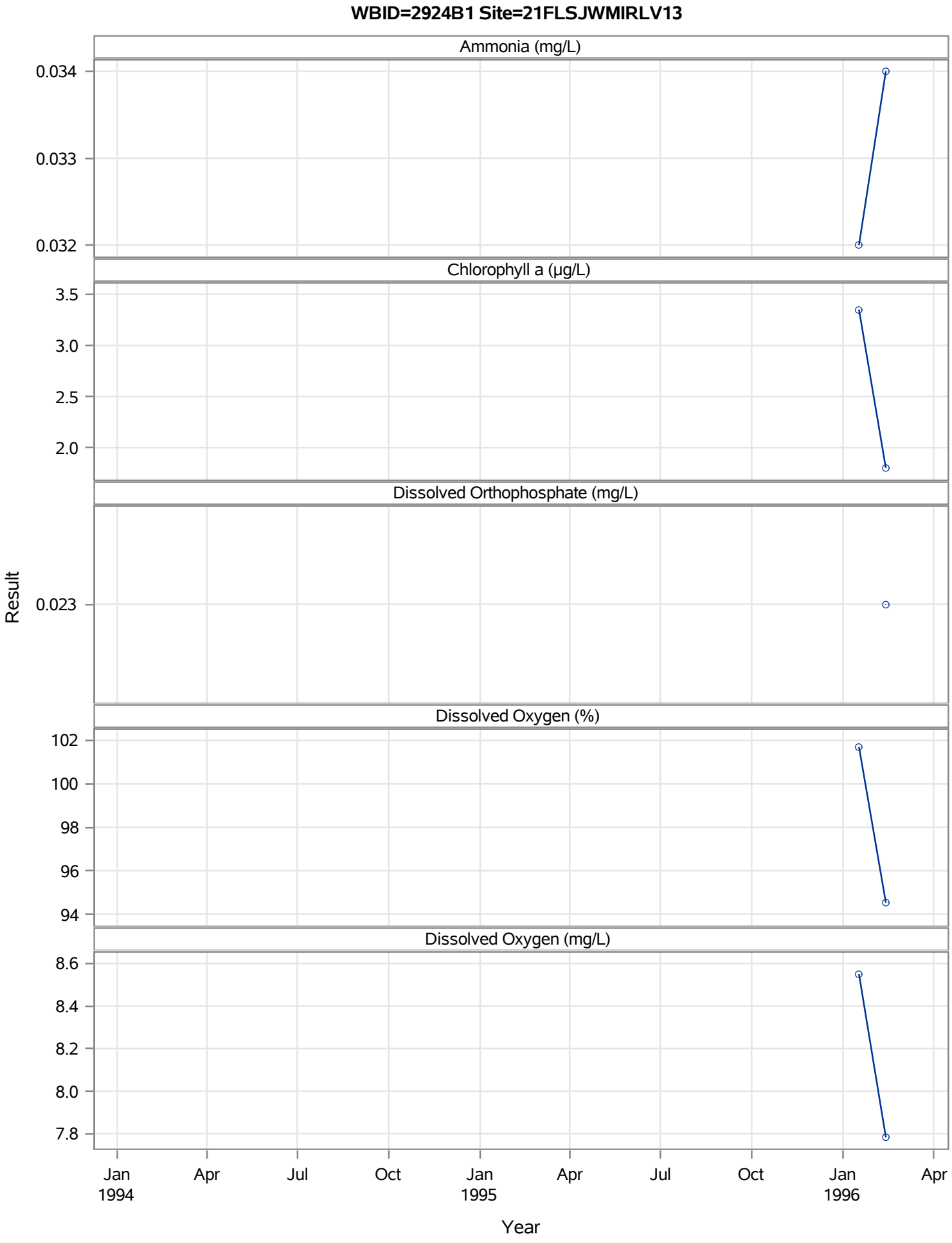

WBID=2924B1 Site=21FLSJWMIRLV11
Fecal COliform (#/100ml)
Nitrite + Nitrate (mg/L)
Salinity (PSU)
Secchi Disk Depth (m)
Temperature (Degree C)
Result
Year
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018

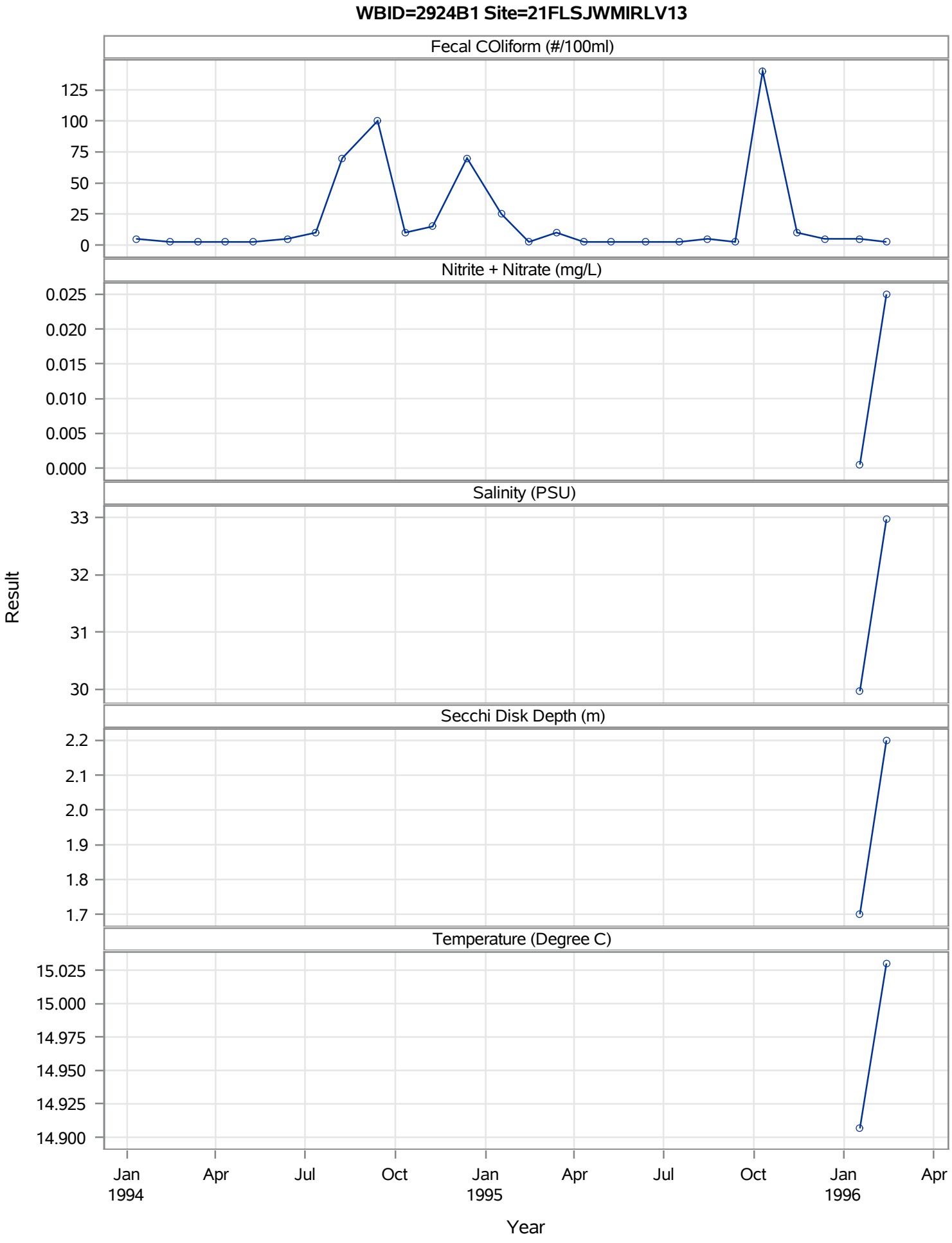

WBID=2924B1 Site=21FLSJWMIRLV11
Total Kjeldahl Nitrogen (mg/L)
Total Nitrogen (mg/L)
Total Phosphorus (mg/L)
pH
Result
Year
0.0
0.5
1.0
1.5
2.0
0.00
0.05
0.10
0.15
0.20
0.25
7.5
8.0
8.5
9.0
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018

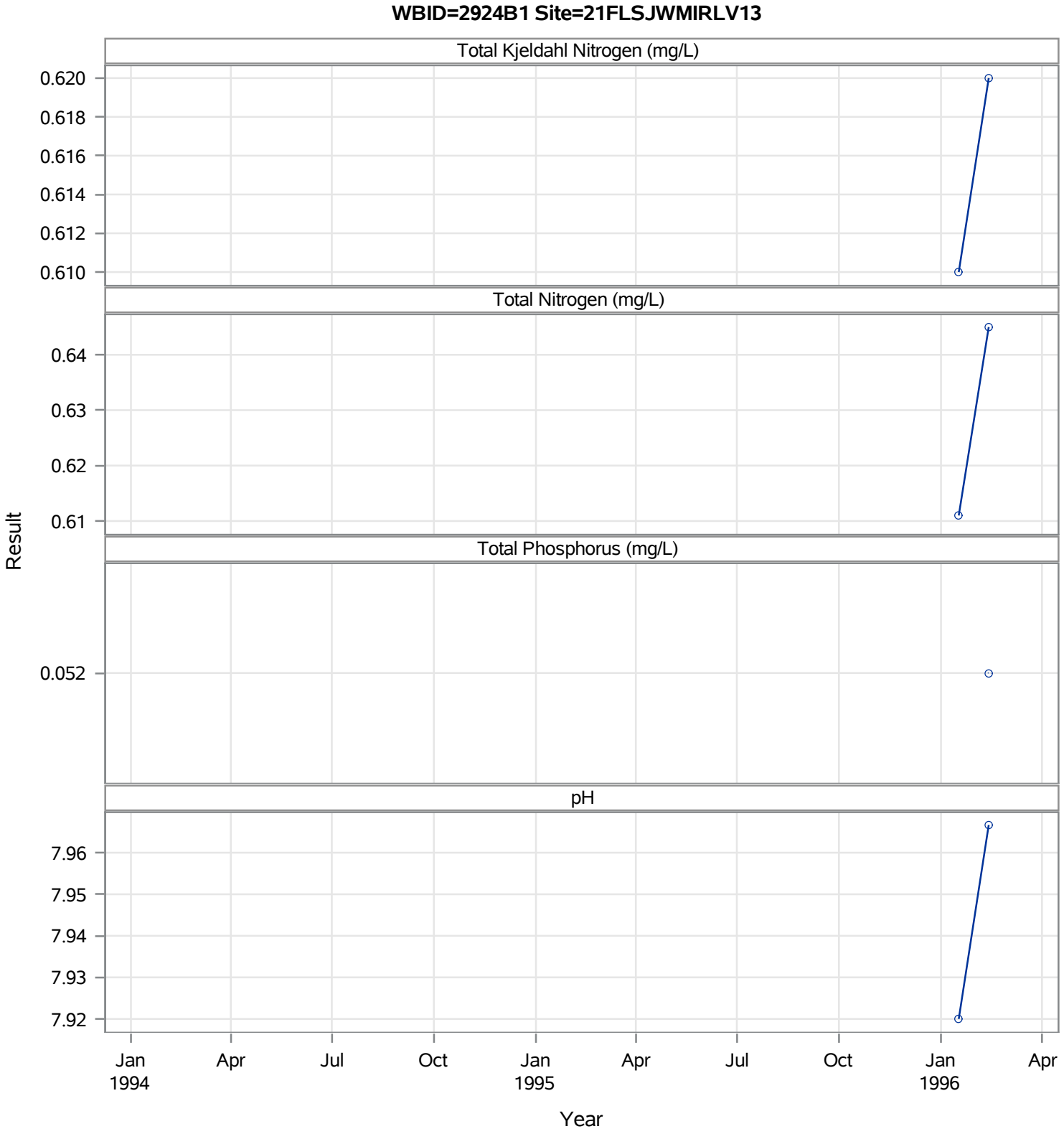

WBID=2924B1 Site=21FLSJWMIRLV12
Ammonia (mg/L)
0.08
0.06
0.04
0.02
0.00
Chlorophyll a (µg/L)
20
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.040
0.035
0.030
0.025
0.020
0.015
0.010
Dissolved Oxygen (%)
120
100
80
60
Dissolved Oxygen (mg/L)
8
6
4
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

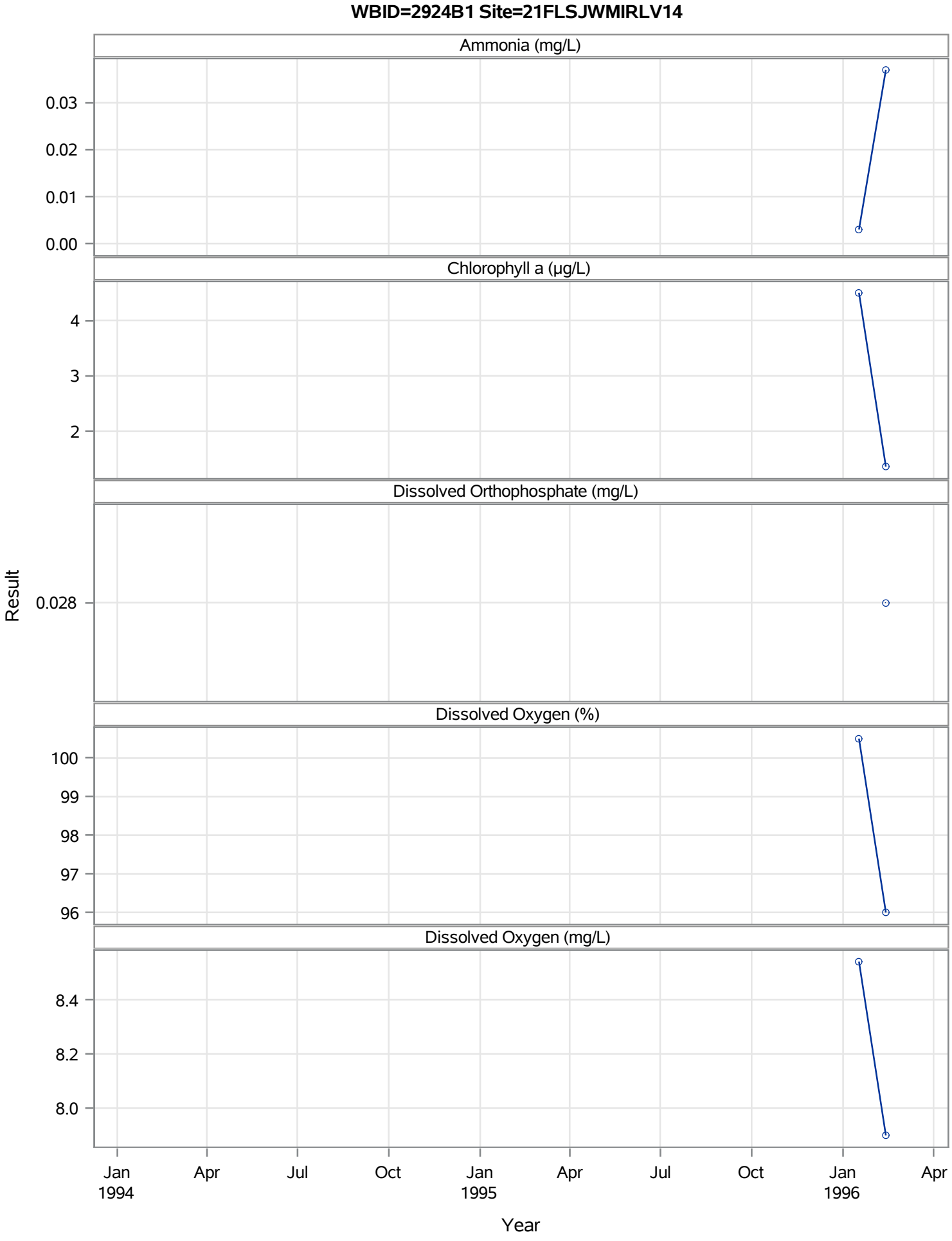

WBID=2924B1 Site=21FLSJWMIRLV12
Fecal COliform (#/100ml)
100
80
60
40
20
0
Nitrite + Nitrate (mg/L)
1.0
0.8
0.6
0.4
0.2
0.0
Salinity (PSU)
40
35
30
25
Secchi Disk Depth (m)
1.75
1.50
1.25
1.00
0.75
Temperature (Degree C)
30
25
20
15
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

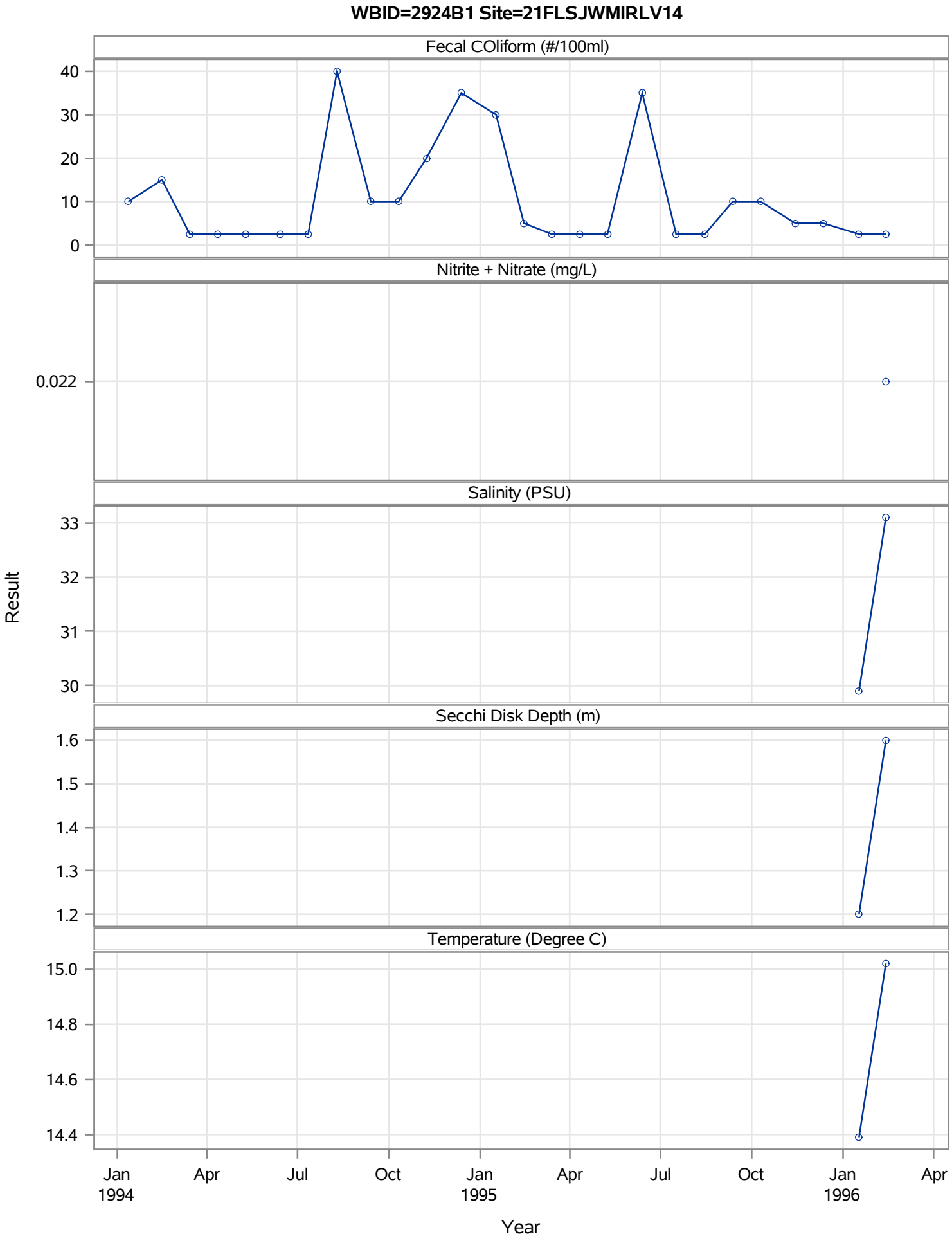

WBID=2924B1 Site=21FLSJWMIRLV12
Total Kjeldahl Nitrogen (mg/L)
Total Nitrogen (mg/L)
Total Phosphorus (mg/L)
pH
Result
2.0
1.5
1.0
0.5
0.0
0.10
0.08
0.06
0.04
8.4
8.2
8.0
7.8
7.6
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

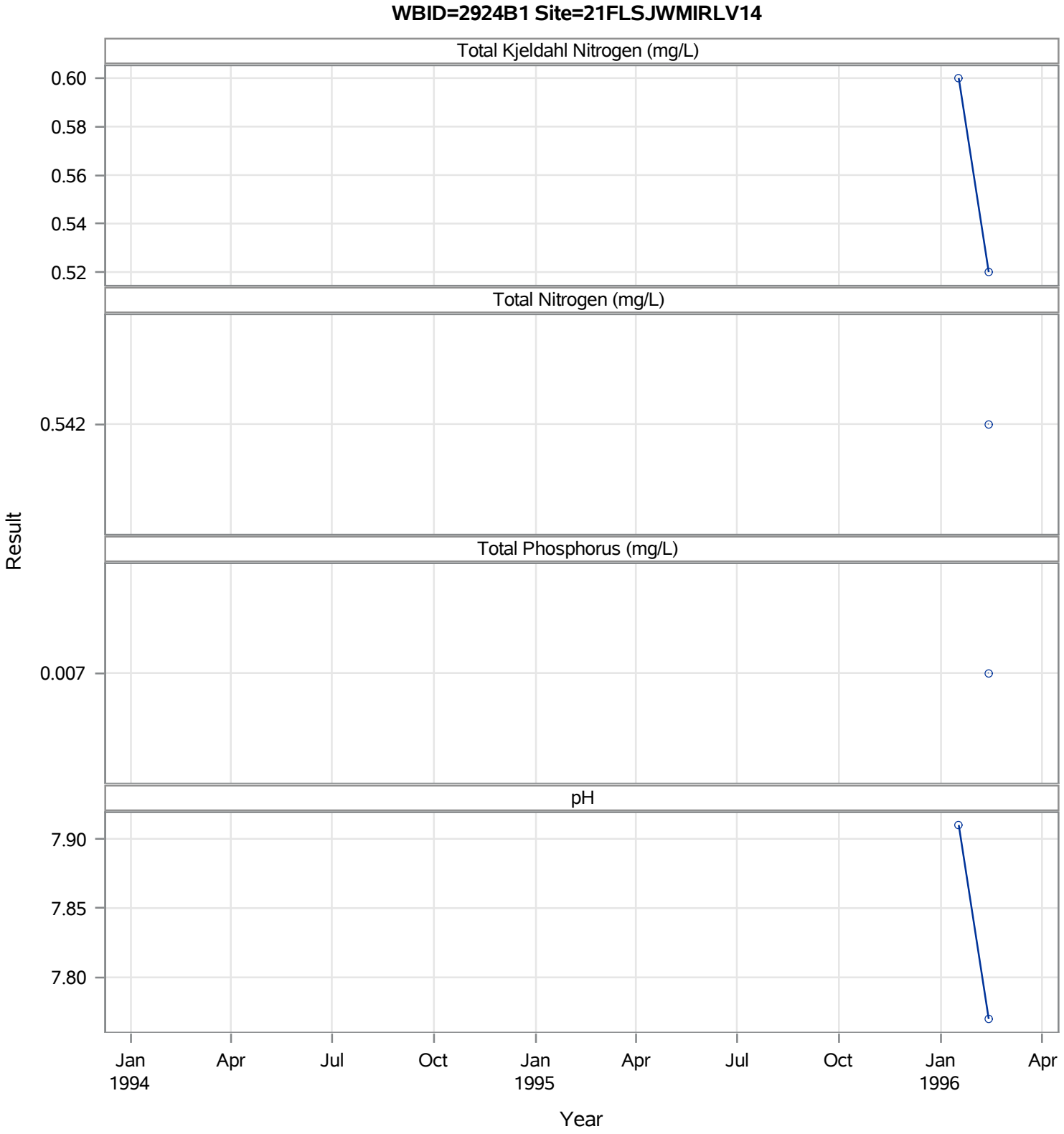

WBID=2924B1 Site=21FLSJWMIRLV13
Ammonia (mg/L)
0.034
0.033
0.032
Chlorophyll a (µg/L)
3.5
3.0
2.5
2.0
Dissolved Orthophosphate (mg/L)
0.023
Dissolved Oxygen (%)
102
100
98
96
94
Dissolved Oxygen (mg/L)
8.6
8.4
8.2
8.0
7.8
Result
Jan 1994
Apr
Jul
Oct
Jan 1995
Apr
Jul
Oct
Jan 1996
Apr
Year

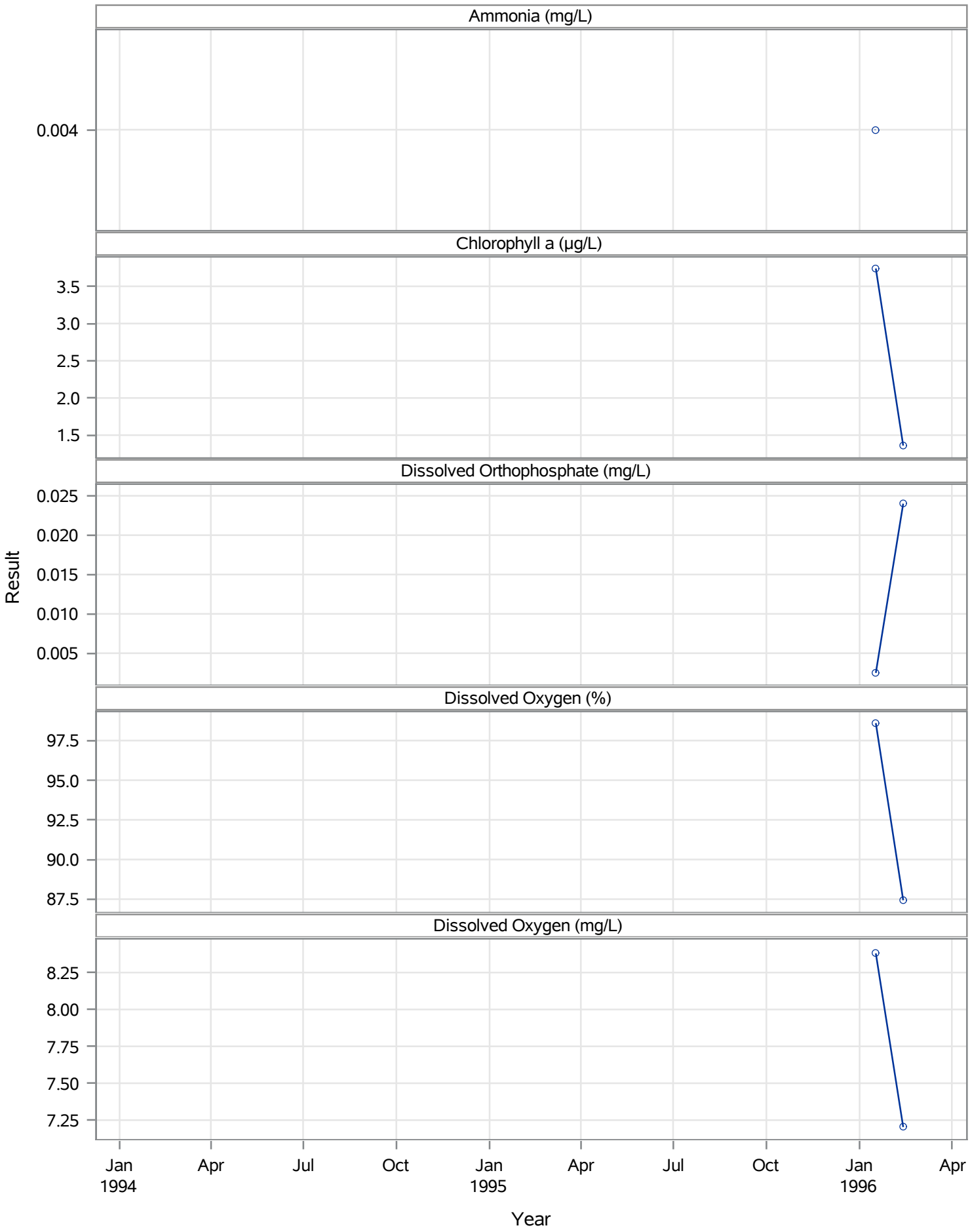

WBID=2924B1 Site=21FLSJWMIRLV13
Fecal COliform (#/100ml)
125
100
75
50
25
0
Nitrite + Nitrate (mg/L)
0.025
0.020
0.015
0.010
0.005
0.000
Salinity (PSU)
33
32
31
30
Secchi Disk Depth (m)
2.2
2.1
2.0
1.9
1.8
1.7
Temperature (Degree C)
15.025
15.000
14.975
14.950
14.925
14.900
Result
Jan
1994
Apr
Jul
Oct
Jan
1995
Apr
Jul
Oct
Jan
1996
Apr
Year

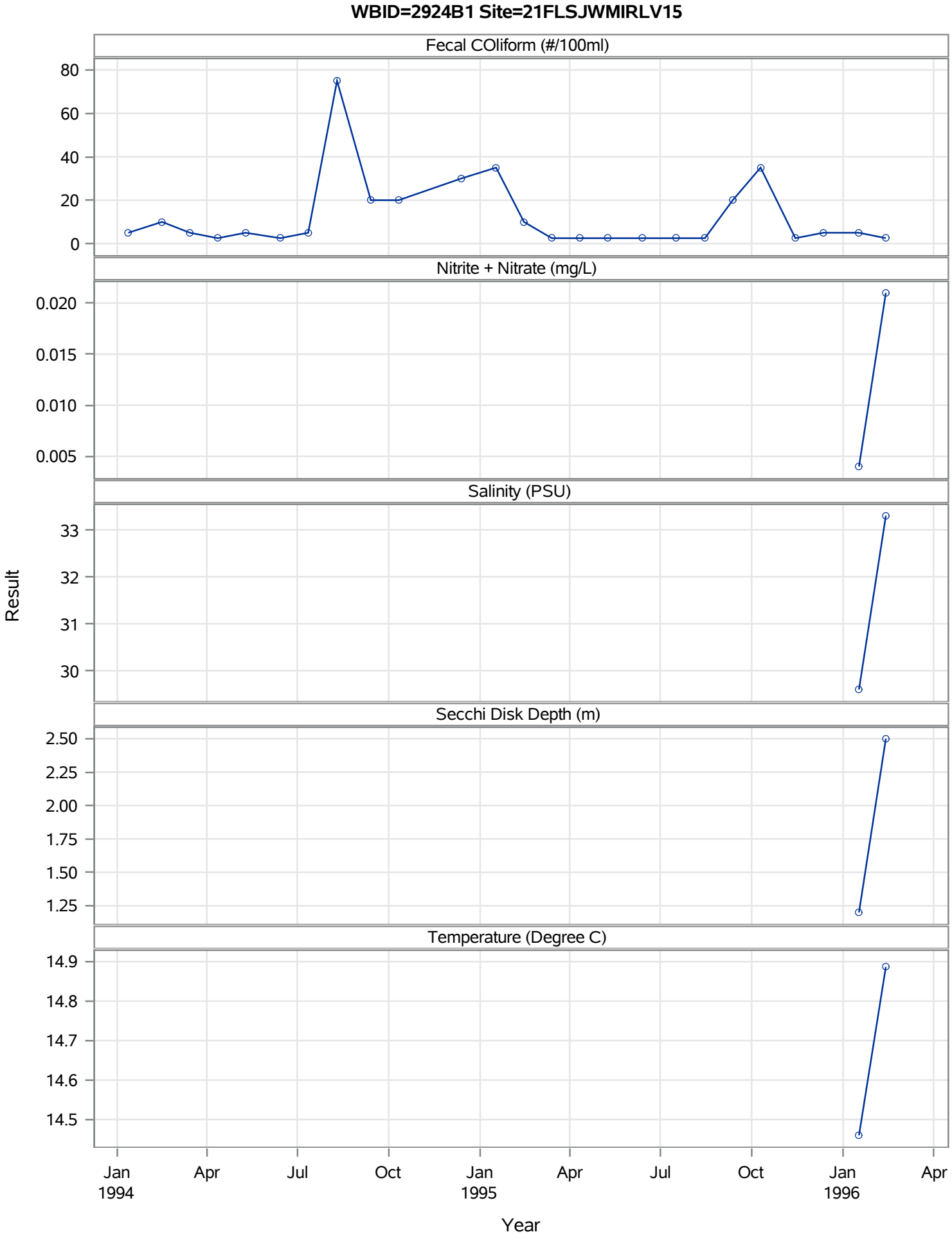

WBID=2924B1 Site=21FLSJWMIRLV13
Total Kjeldahl Nitrogen (mg/L)
0.620
0.618
0.616
0.614
0.612
0.610
Total Nitrogen (mg/L)
0.64
0.63
0.62
0.61
Total Phosphorus (mg/L)
0.052
pH
7.96
7.95
7.94
7.93
7.92
Result
Jan
1994
Apr
Jul
Oct
Jan
1995
Apr
Jul
Oct
Jan
1996
Apr
Year

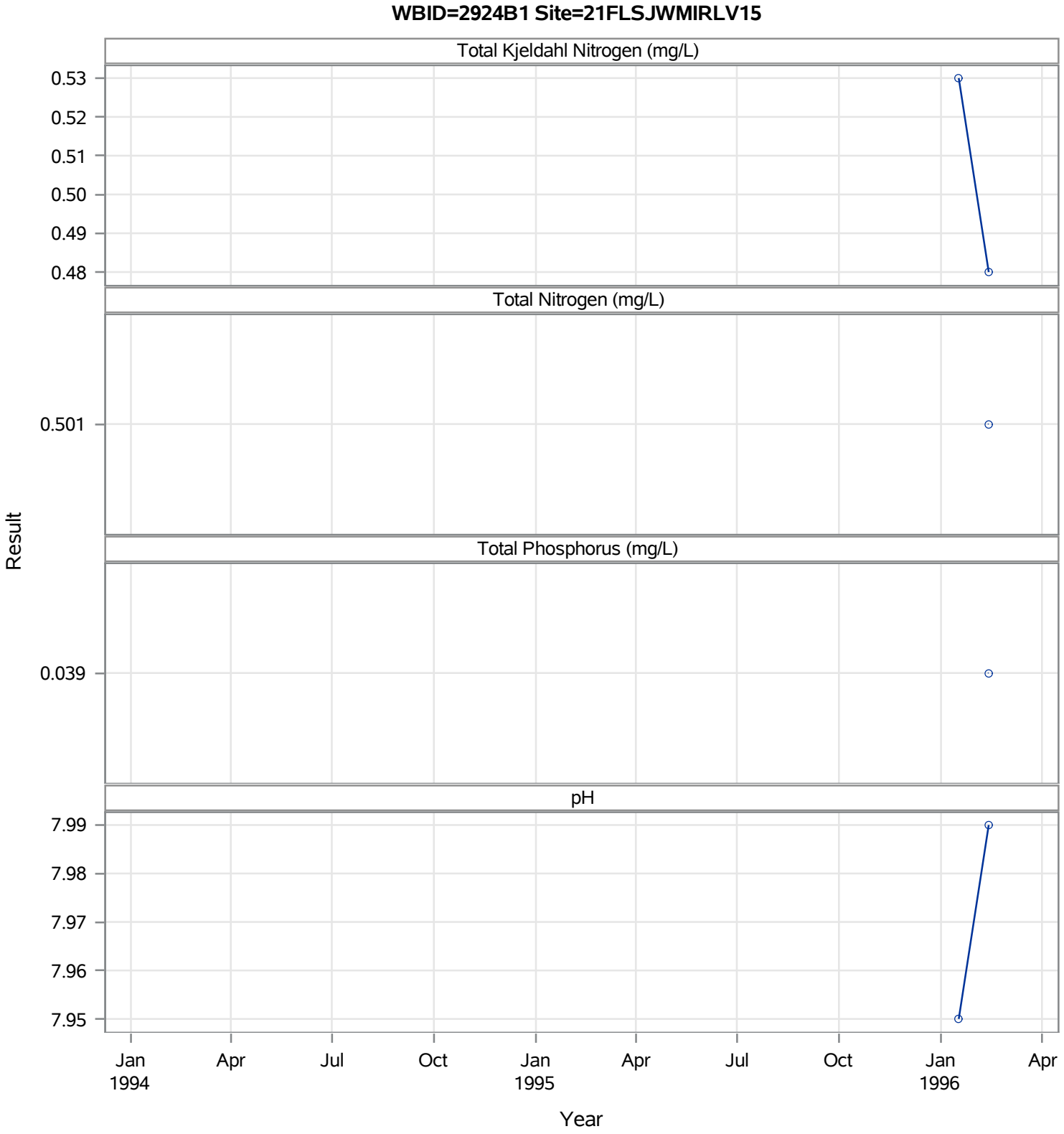

WBID=2924B1 Site=21FLSJWMIRLV14
Ammonia (mg/L)
0.03
0.02
0.01
0.00
Chlorophyll a (µg/L)
4
3
2
Dissolved Orthophosphate (mg/L)
0.028
Dissolved Oxygen (%)
100
99
98
97
96
Dissolved Oxygen (mg/L)
8.4
8.2
8.0
Result
Jan
1994
Apr
Jul
Oct
Jan
1995
Apr
Jul
Oct
Jan
1996
Apr
Year

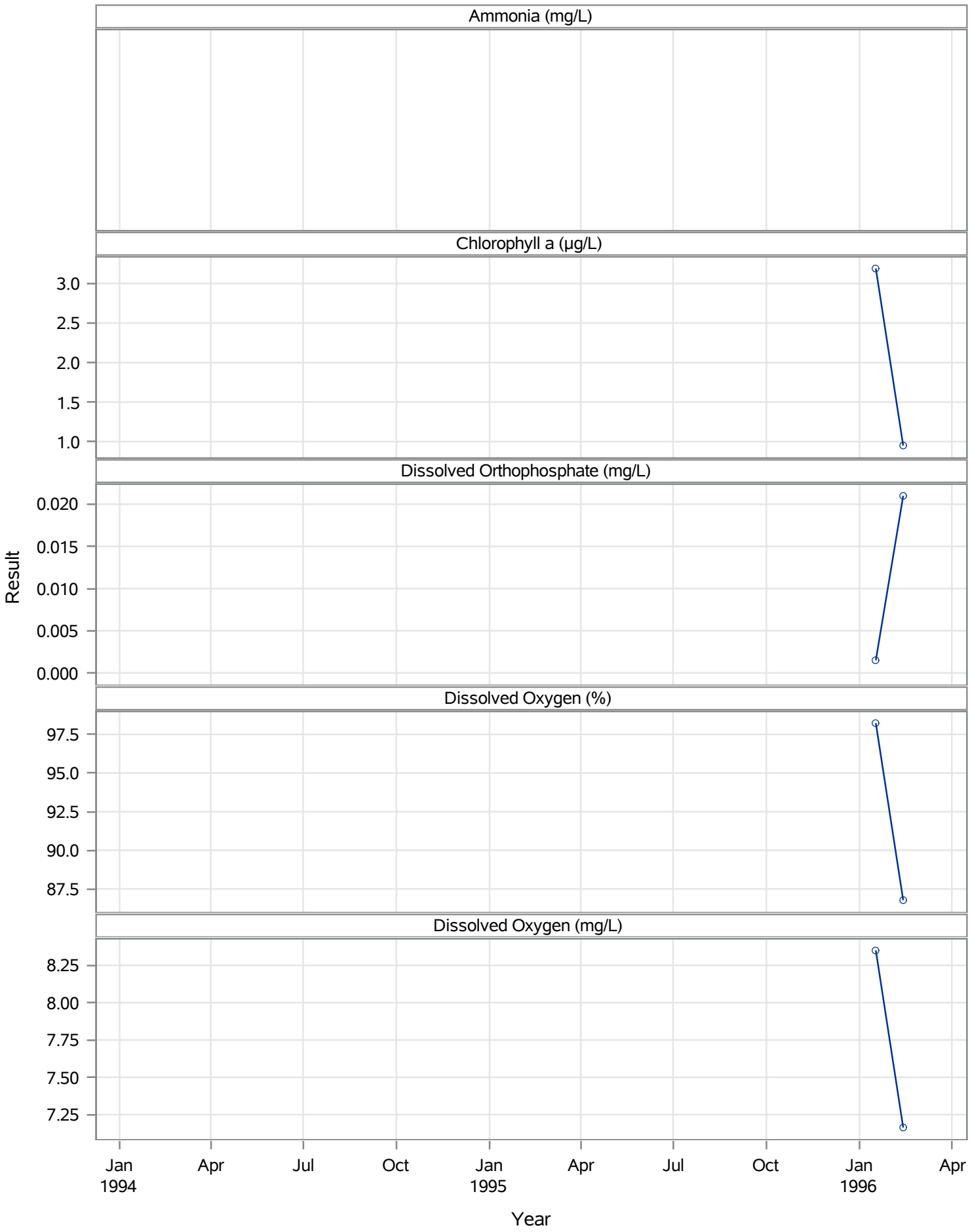

WBID=2924B1 Site=21FLSJWMIRLV14
Fecal COliform (#/100ml)
40
30
20
10
0
Nitrite + Nitrate (mg/L)
0.022
Salinity (PSU)
33
32
31
30
Secchi Disk Depth (m)
1.6
1.5
1.4
1.3
1.2
Temperature (Degree C)
15.0
14.8
14.6
14.4
Result
Jan
1994
Apr
Jul
Oct
Jan
1995
Apr
Jul
Oct
Jan
1996
Apr
Year

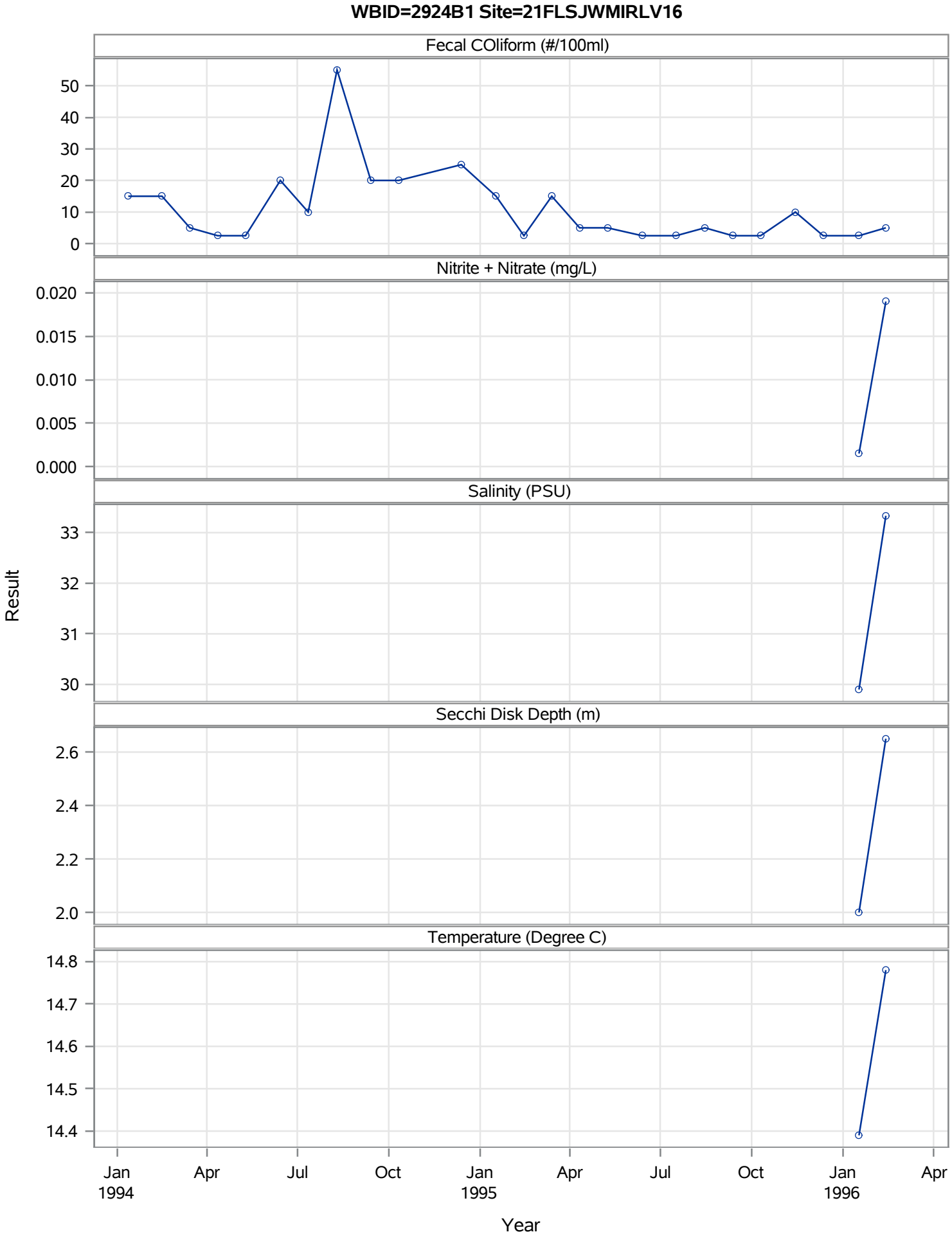

WBID=2924B1 Site=21FLSJWMIRLV14
Total Kjeldahl Nitrogen (mg/L)
0.60
0.58
0.56
0.54
0.52
Total Nitrogen (mg/L)
0.542
Total Phosphorus (mg/L)
0.007
pH
7.90
7.85
7.80
Result
Jan
1994
Apr
Jul
Oct
Jan
1995
Apr
Jul
Oct
Jan
1996
Apr
Year

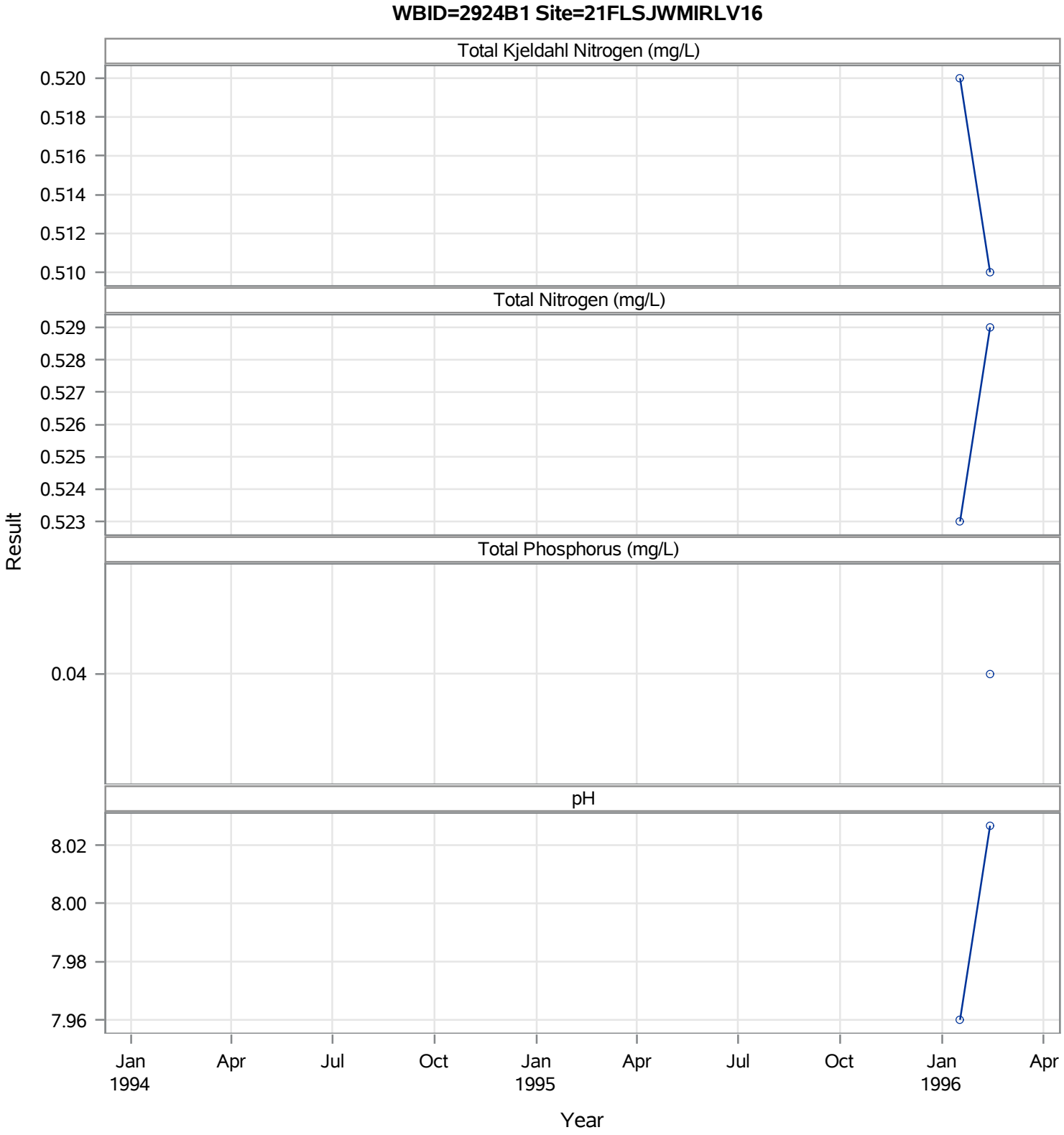

WBID=2924B1 Site=21FLSJWMIRLV15
Ammonia (mg/L)
0.004
Chlorophyll a (µg/L)
3.5
3.0
2.5
2.0
1.5
Dissolved Orthophosphate (mg/L)
0.025
0.020
0.015
0.010
0.005
Result
Dissolved Oxygen (%)
97.5
95.0
92.5
90.0
87.5
Dissolved Oxygen (mg/L)
8.25
8.00
7.75
7.50
7.25
Jan 1994
Apr
Jul
Oct
Jan 1995
Apr
Jul
Oct
Jan 1996
Apr
Year

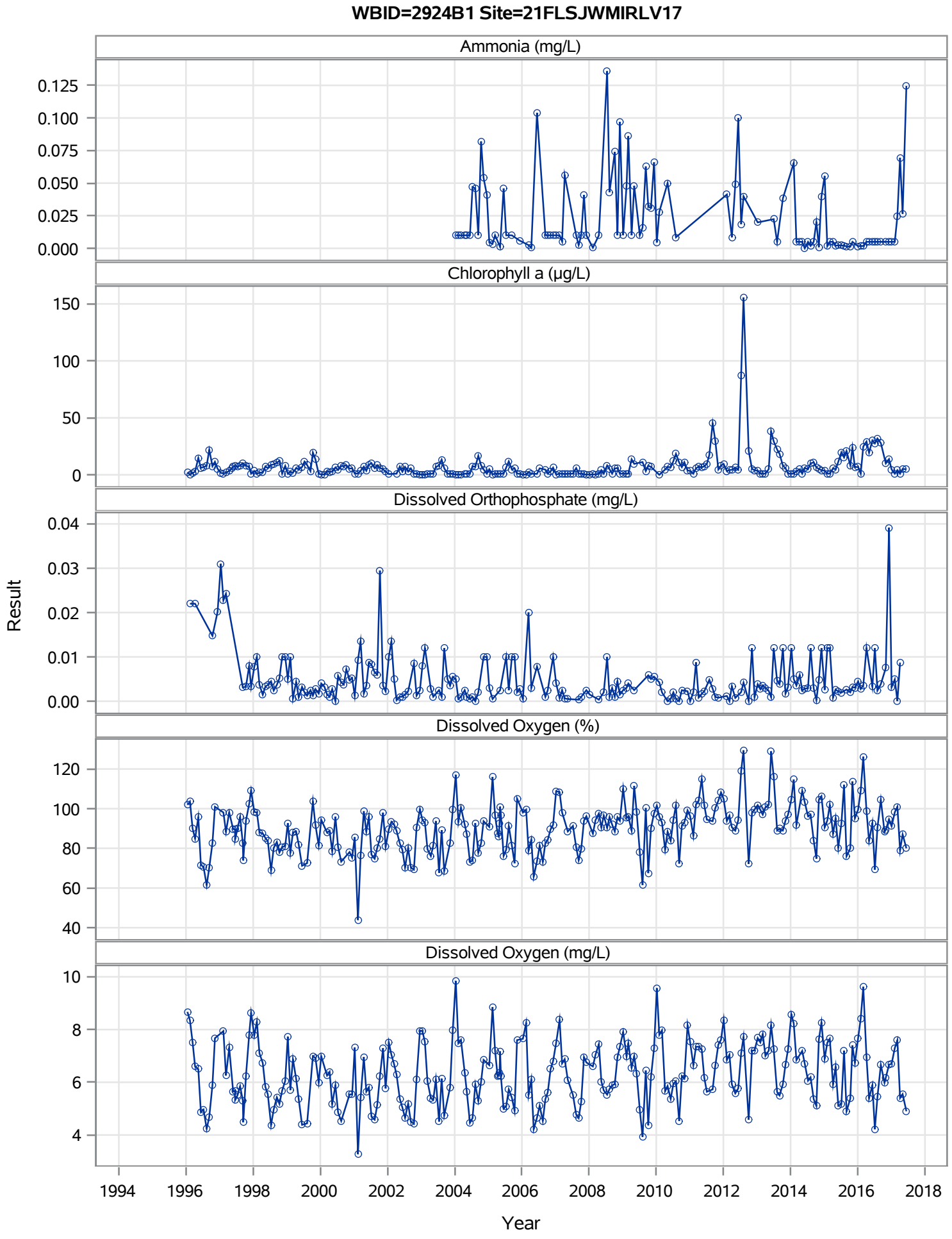

WBID=2924B1 Site=21FLSJWMIRLV15
Fecal COliform (#/100ml)
80
60
40
20
0
Nitrite + Nitrate (mg/L)
0.020
0.015
0.010
0.005
Salinity (PSU)
33
32
31
30
Secchi Disk Depth (m)
2.50
2.25
2.00
1.75
1.50
1.25
Temperature (Degree C)
14.9
14.8
14.7
14.6
14.5
Result
Jan
1994
Apr
Jul
Oct
Jan
1995
Apr
Jul
Oct
Jan
1996
Apr
Year

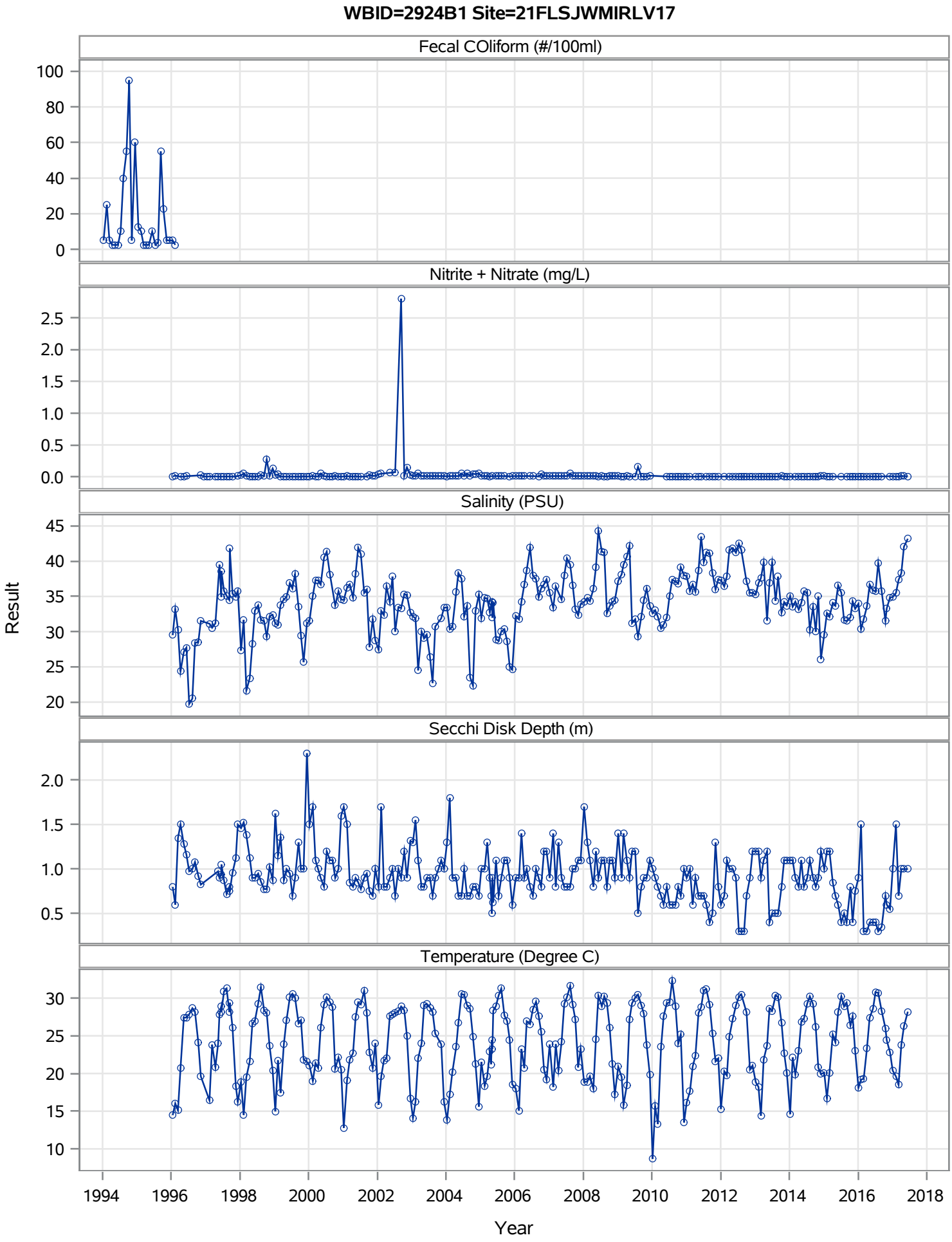

WBID=2924B1 Site=21FLSJWMIRLV15
Total Kjeldahl Nitrogen (mg/L)
0.53
0.52
0.51
0.50
0.49
0.48
Total Nitrogen (mg/L)
0.501
Total Phosphorus (mg/L)
0.039
pH
7.99
7.98
7.97
7.96
7.95
Result
Jan
1994
Apr
Jul
Oct
Jan
1995
Apr
Jul
Oct
Jan
1996
Apr
Year

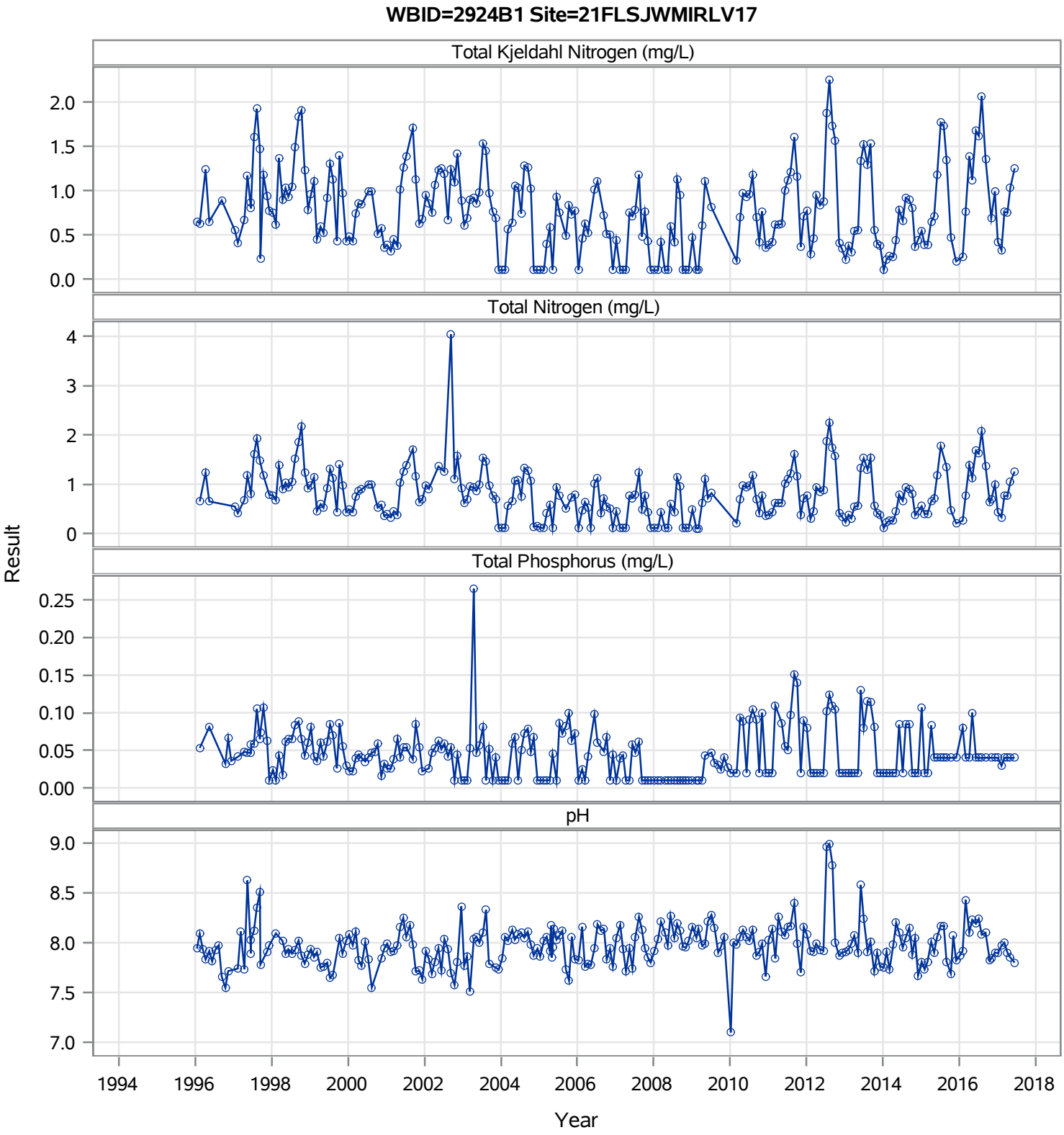

WBID=2924B1 Site=21FLSJWMIRLV16
Ammonia (mg/L)
Chlorophyll a (µg/L)
3.0
2.5
2.0
1.5
1.0
Dissolved Orthophosphate (mg/L)
0.020
0.015
0.010
0.005
0.000
Result
Dissolved Oxygen (%)
97.5
95.0
92.5
90.0
87.5
Dissolved Oxygen (mg/L)
8.25
8.00
7.75
7.50
7.25
Jan
1994
Apr
Jul
Oct
Jan
1995
Apr
Jul
Oct
Jan
1996
Apr
Year

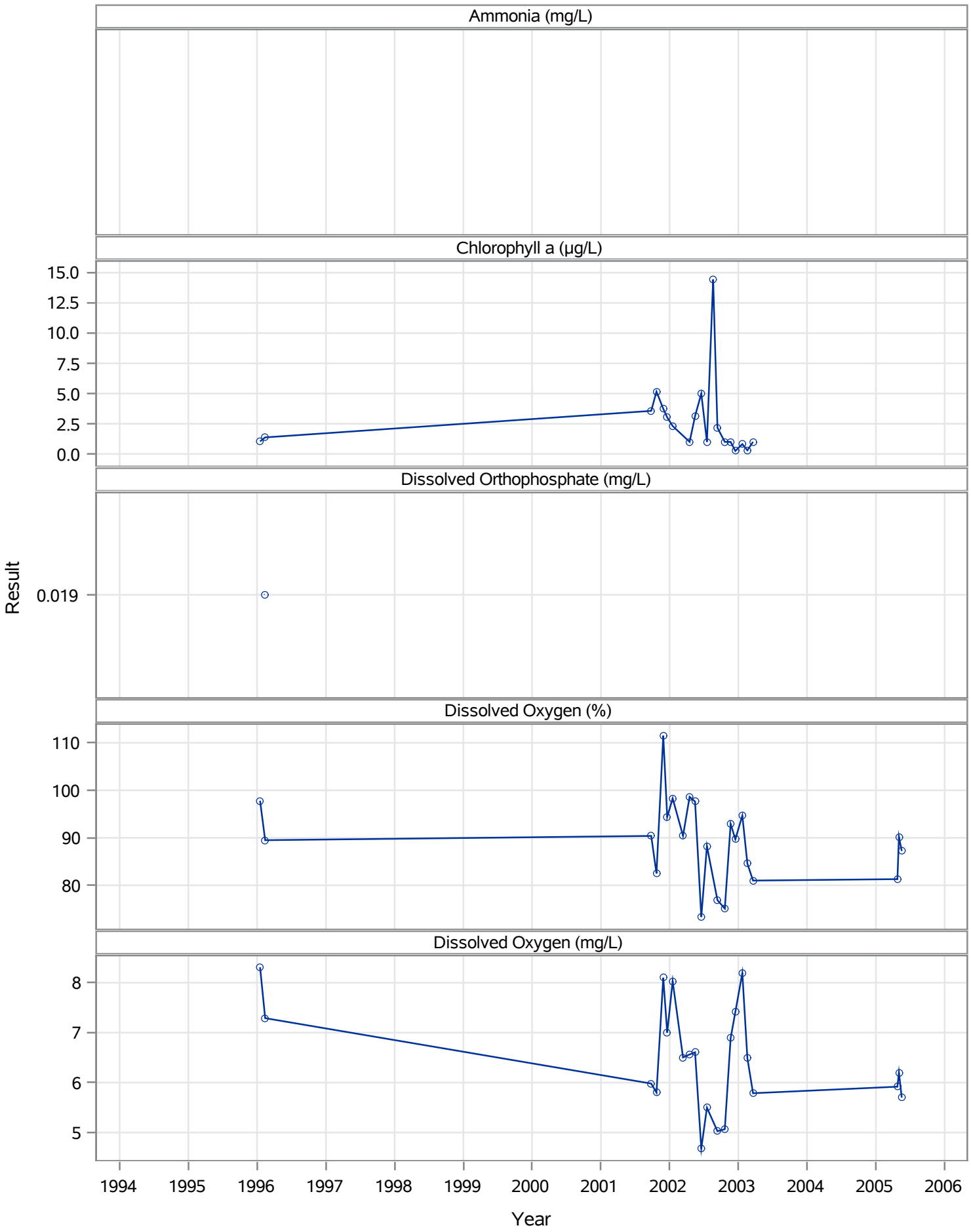

WBID=2924B1 Site=21FLSJWMIRLV16
Fecal COliform (#/100ml)
50
40
30
20
10
0
Nitrite + Nitrate (mg/L)
0.020
0.015
0.010
0.005
0.000
Salinity (PSU)
33
32
31
30
Secchi Disk Depth (m)
2.6
2.4
2.2
2.0
Temperature (Degree C)
14.8
14.7
14.6
14.5
14.4
Result
Jan
1994
Apr
Jul
Oct
Jan
1995
Apr
Jul
Oct
Jan
1996
Apr
Year

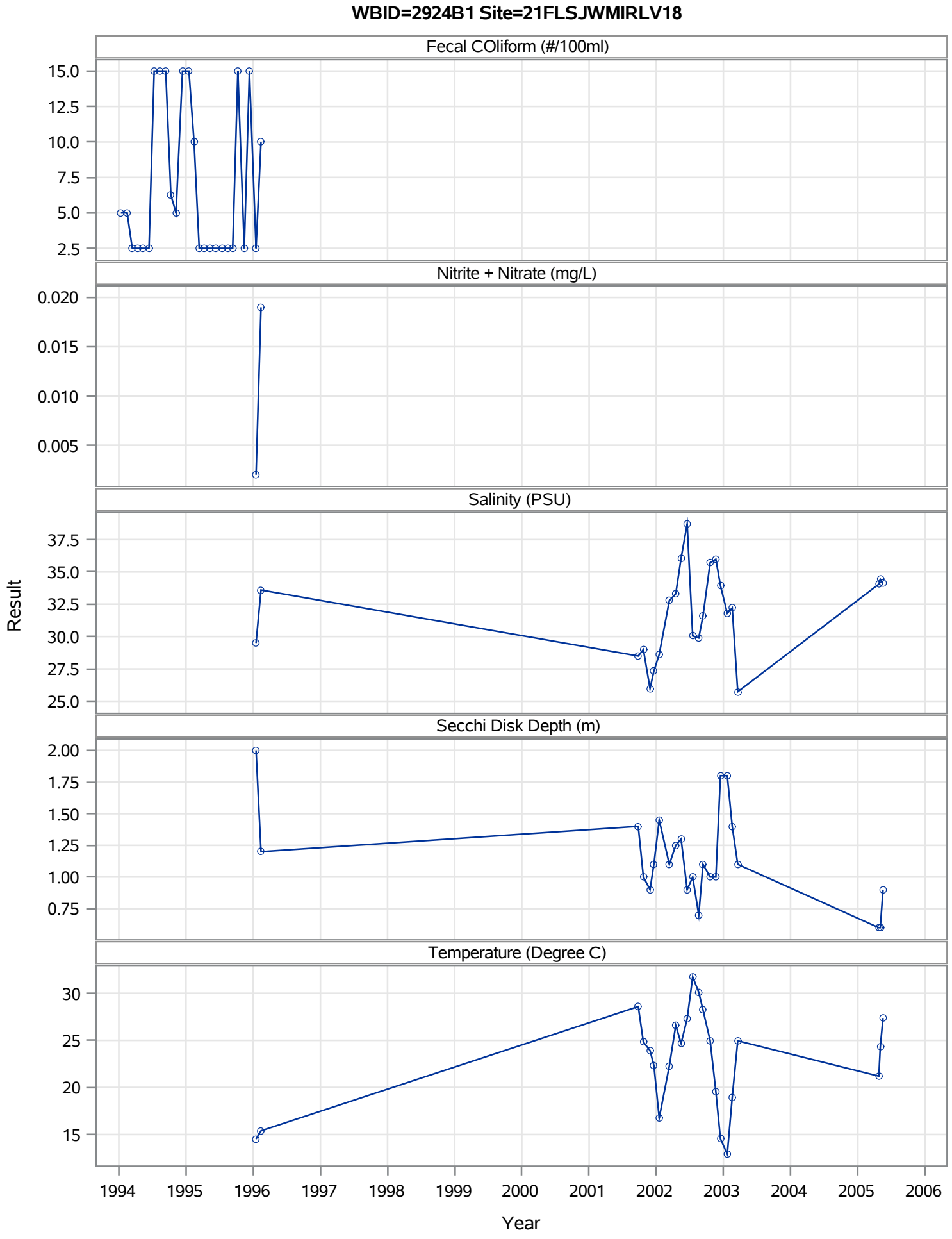

WBID=2924B1 Site=21FLSJWMIRLV16
Total Kjeldahl Nitrogen (mg/L)
0.520
0.518
0.516
0.514
0.512
0.510
Total Nitrogen (mg/L)
0.529
0.528
0.527
0.526
0.525
0.524
0.523
Result
Total Phosphorus (mg/L)
0.04
pH
8.02
8.00
7.98
7.96
Jan 1994
Apr
Jul
Oct
Jan 1995
Apr
Jul
Oct
Jan 1996
Apr
Year

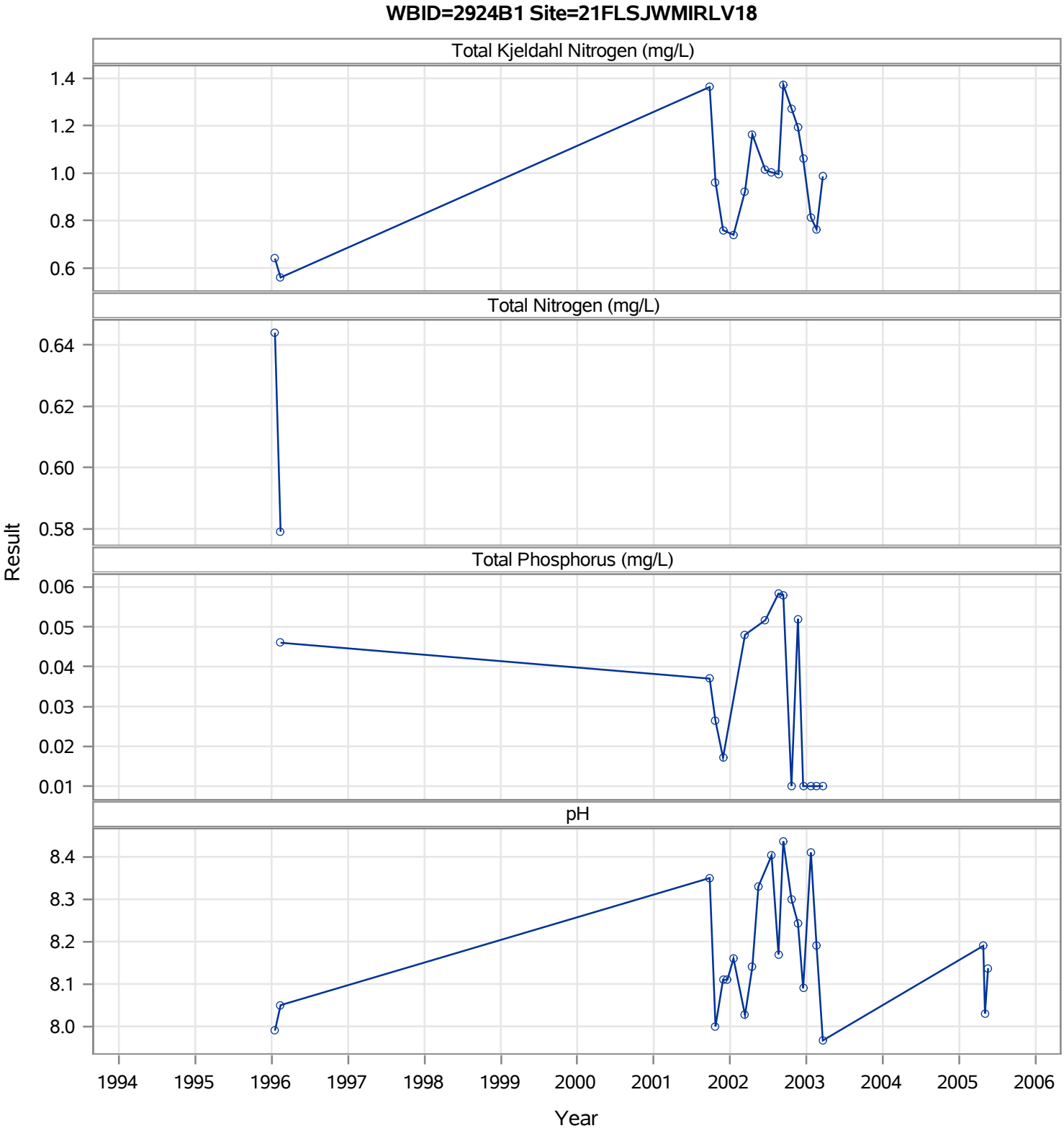

WBID=2924B1 Site=21FLSJWMIRLV17
Ammonia (mg/L)
0.125
0.100
0.075
0.050
0.025
0.000
Chlorophyll a (µg/L)
150
100
50
0
Dissolved Orthophosphate (mg/L)
0.04
0.03
0.02
0.01
0.00
Dissolved Oxygen (%)
120
100
80
60
40
Dissolved Oxygen (mg/L)
10
8
6
4
Result
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

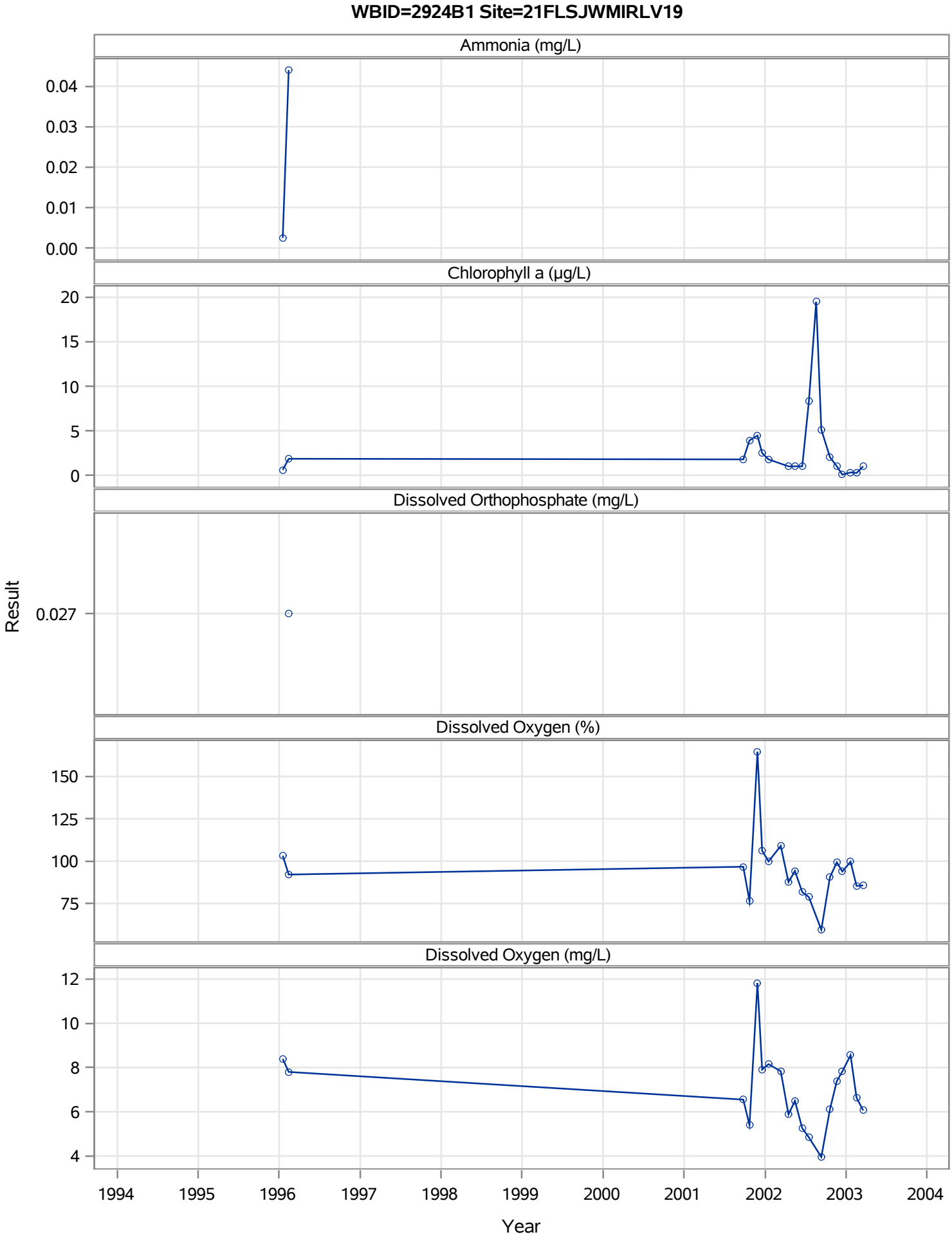

WBID=2924B1 Site=21FLSJWMIRLV17
Fecal COliform (#/100ml)
100
80
60
40
20
0
Nitrite + Nitrate (mg/L)
2.5
2.0
1.5
1.0
0.5
0.0
Salinity (PSU)
45
40
35
30
25
20
Secchi Disk Depth (m)
2.0
1.5
1.0
0.5
Temperature (Degree C)
30
25
20
15
10
Result
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

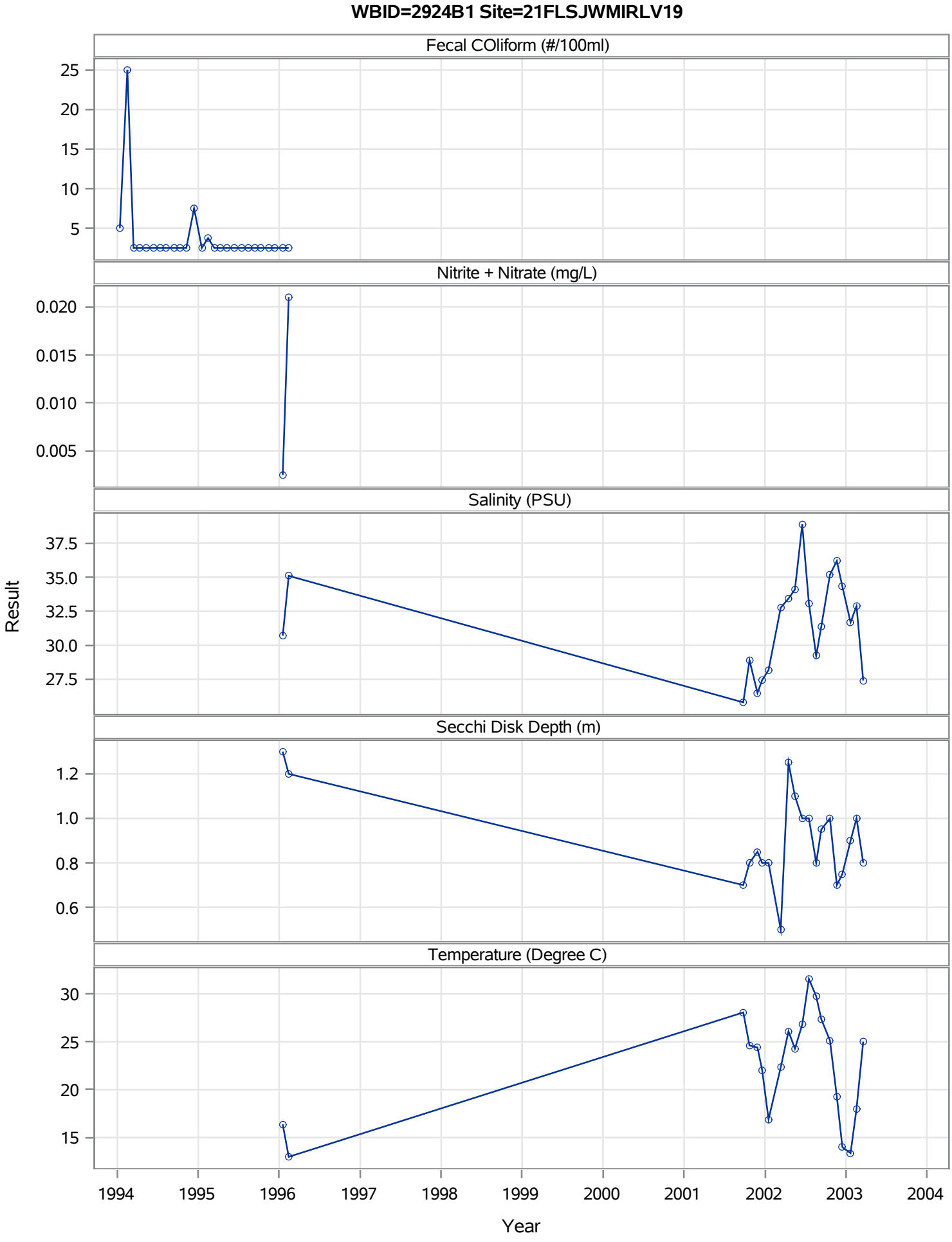

WBID=2924B1 Site=21FLSJWMIRLV17
Total Kjeldahl Nitrogen (mg/L)
Total Nitrogen (mg/L)
Total Phosphorus (mg/L)
pH
Result
Year
0.0
0.5
1.0
1.5
2.0
0
1
2
3
4
0.00
0.05
0.10
0.15
0.20
0.25
7.0
7.5
8.0
8.5
9.0
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018

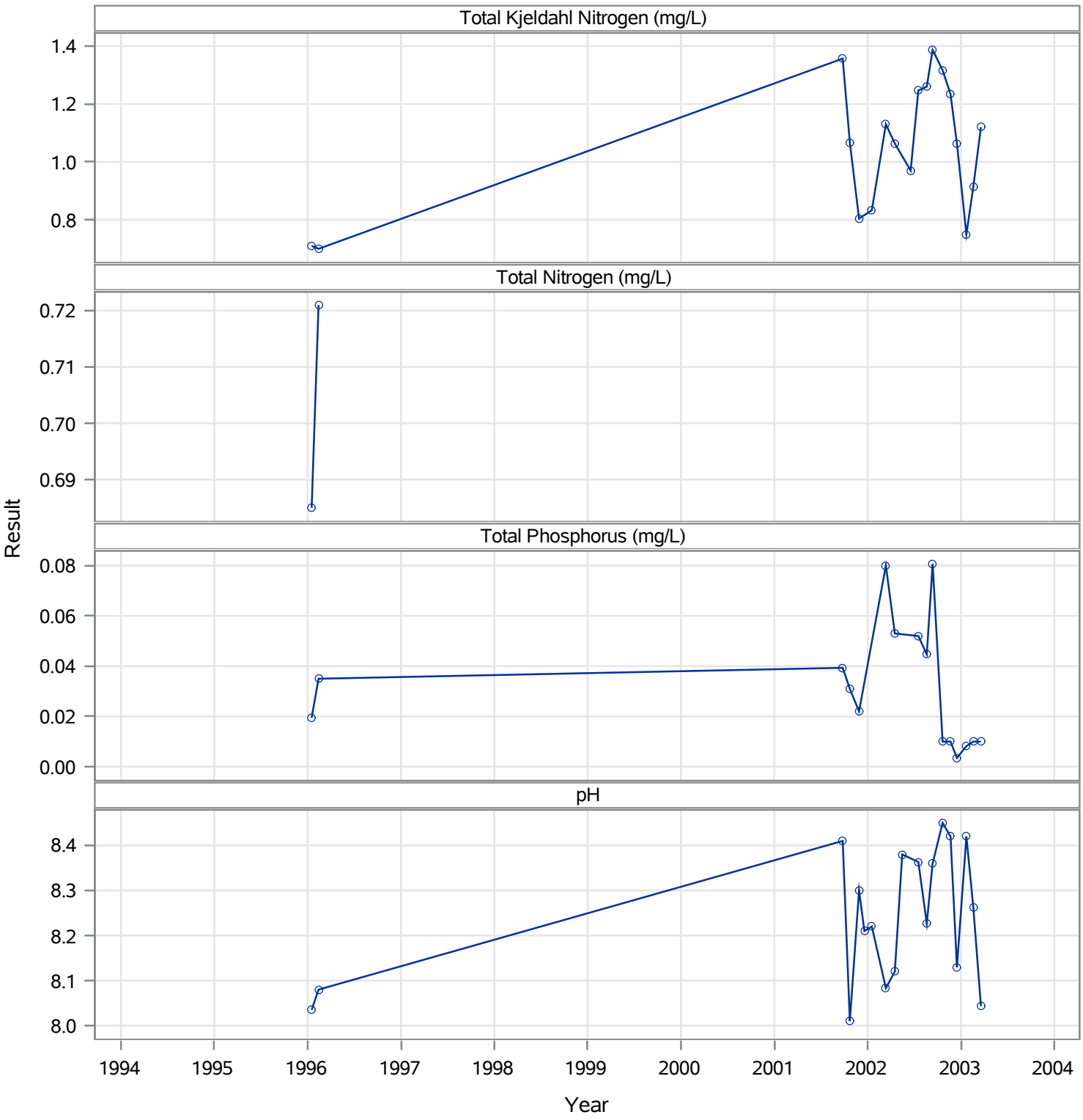

WBID=2924B1 Site=21FLSJWMIRLV18
Ammonia (mg/L)
Chlorophyll a (µg/L)
15.0
12.5
10.0
7.5
5.0
2.5
0.0
Dissolved Orthophosphate (mg/L)
0.019
Dissolved Oxygen (%)
110
100
90
80
Dissolved Oxygen (mg/L)
8
7
6
5
Result
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Year

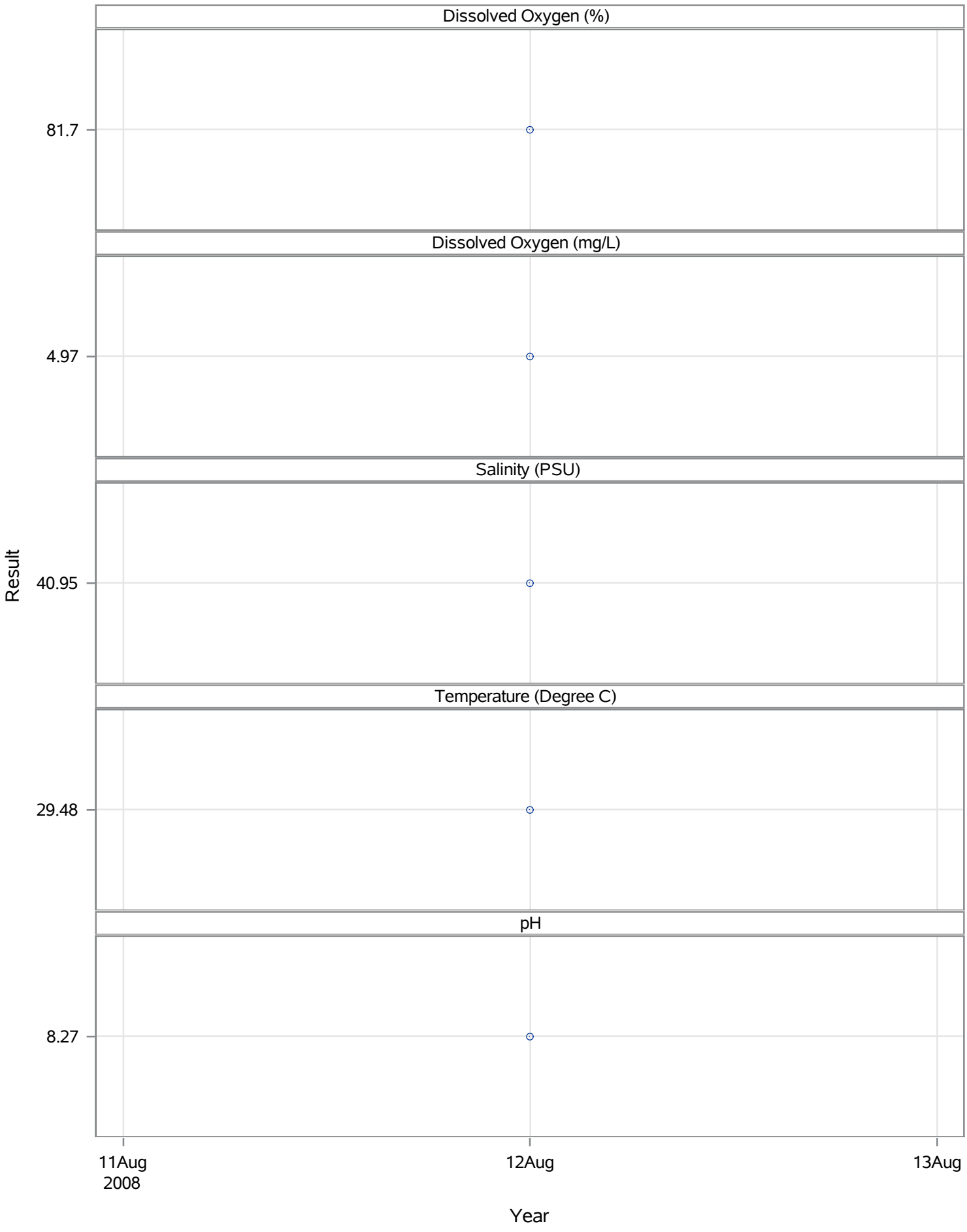

WBID=2924B1 Site=21FLSJWMIRLV18
Fecal COliform (#/100ml)
15.0
12.5
10.0
7.5
5.0
2.5
Nitrite + Nitrate (mg/L)
0.020
0.015
0.010
0.005
Salinity (PSU)
37.5
35.0
32.5
30.0
27.5
25.0
Secchi Disk Depth (m)
2.00
1.75
1.50
1.25
1.00
0.75
Temperature (Degree C)
30
25
20
15
Result
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Year

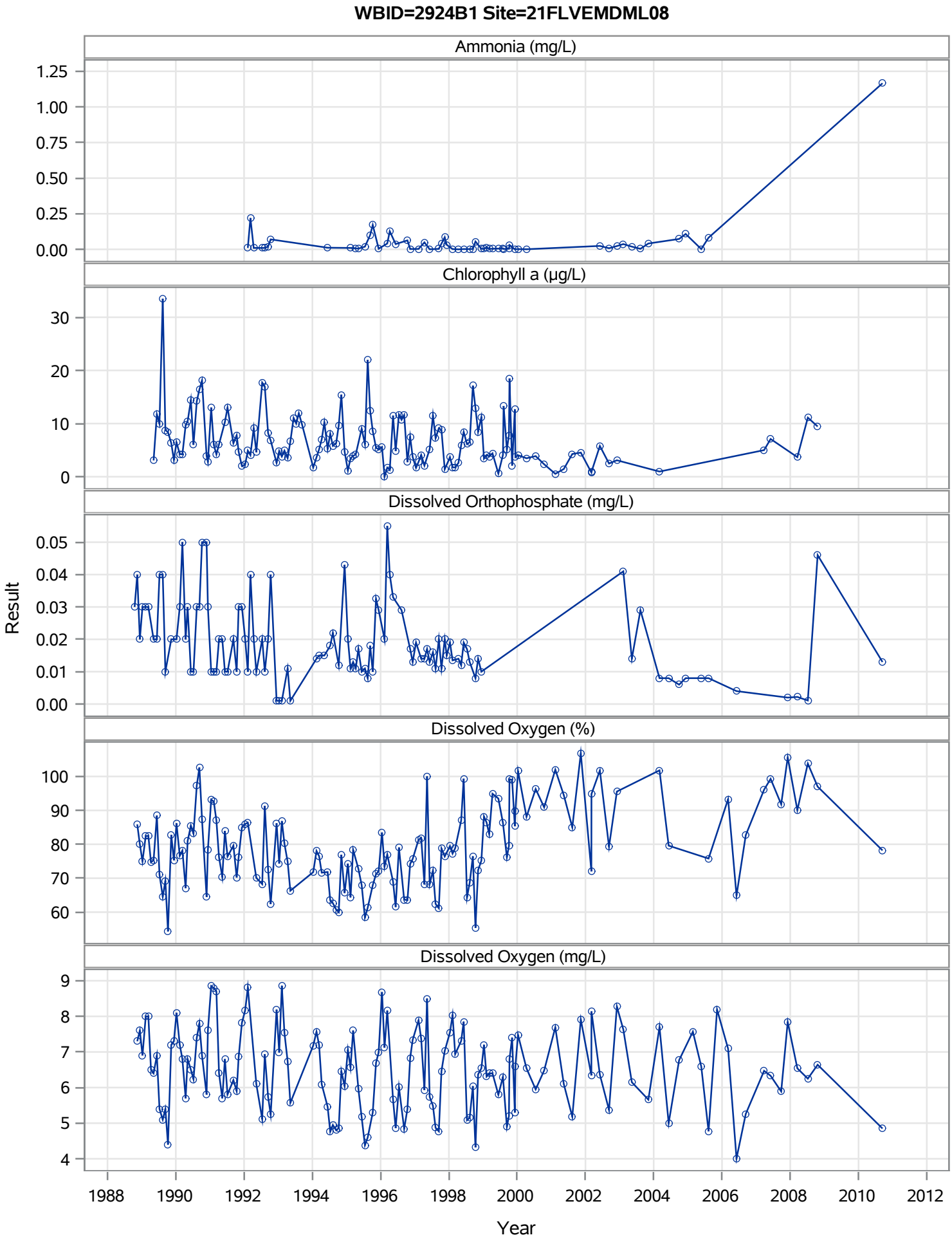

WBID=2924B1 Site=21FLSJWMIRLV18
Total Kjeldahl Nitrogen (mg/L)
1.4
1.2
1.0
0.8
0.6
Total Nitrogen (mg/L)
0.64
0.62
0.60
0.58
Total Phosphorus (mg/L)
0.06
0.05
0.04
0.03
0.02
0.01
pH
8.4
8.3
8.2
8.1
8.0
Result
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Year

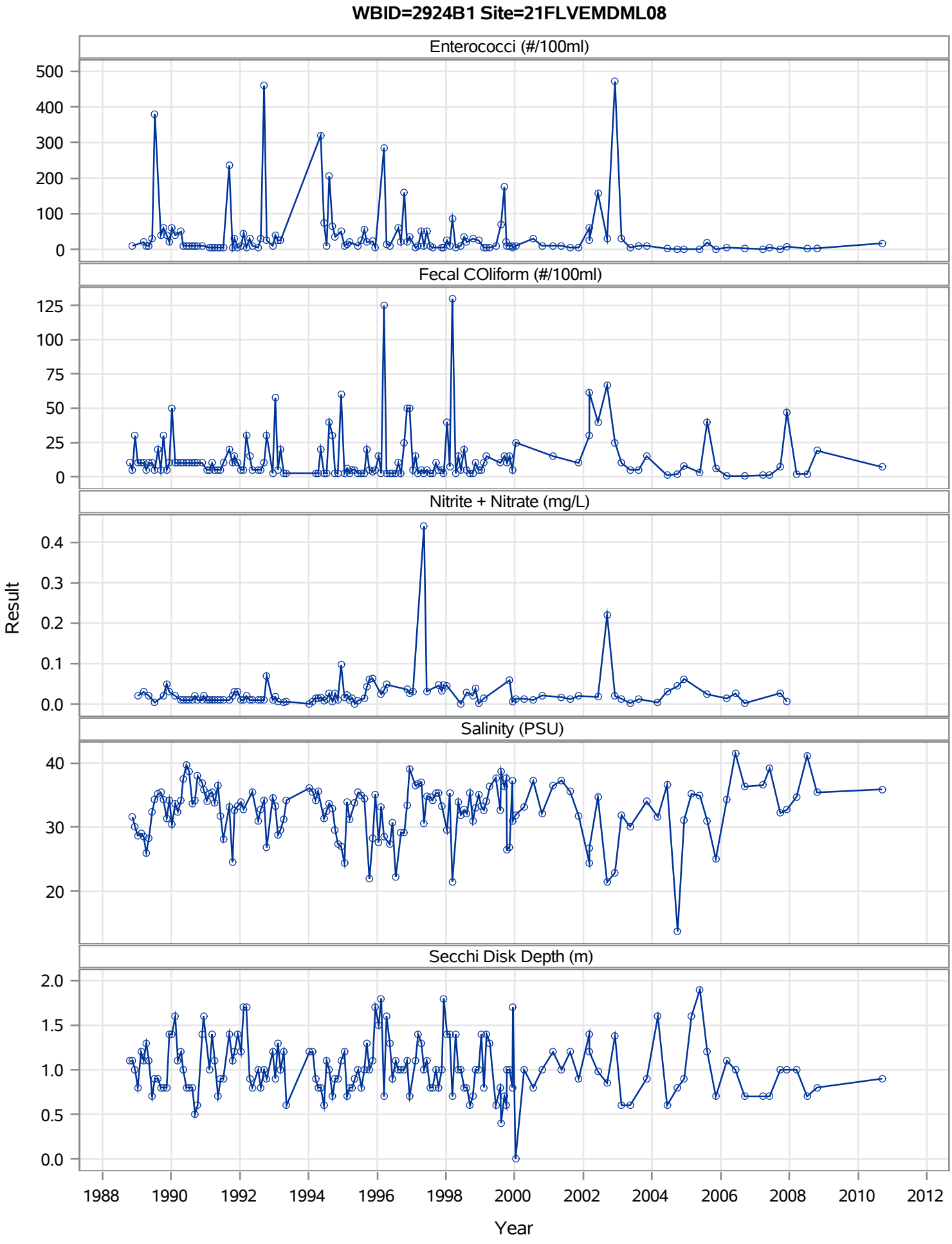

WBID=2924B1 Site=21FLSJWMIRLV19
Ammonia (mg/L)
0.04
0.03
0.02
0.01
0.00
Chlorophyll a (µg/L)
20
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.027
Dissolved Oxygen (%)
150
125
100
75
Dissolved Oxygen (mg/L)
12
10
8
6
4
Result
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
Year

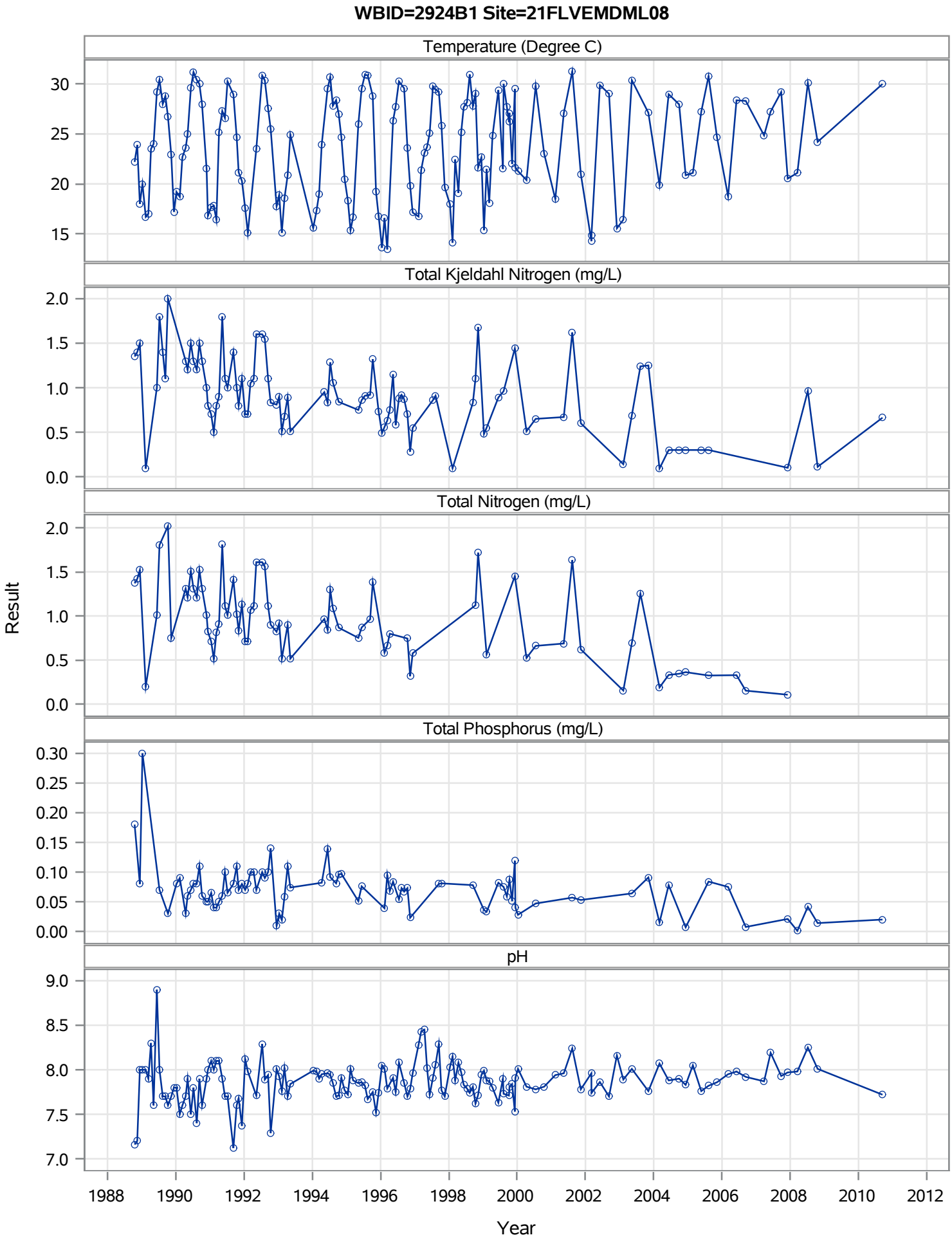

WBID=2924B1 Site=21FLSJWMIRLV19
Fecal COliform (#/100ml)
25
20
15
10
5
Nitrite + Nitrate (mg/L)
0.020
0.015
0.010
0.005
Salinity (PSU)
37.5
35.0
32.5
30.0
27.5
Secchi Disk Depth (m)
1.2
1.0
0.8
0.6
Temperature (Degree C)
30
25
20
15
Result
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
Year

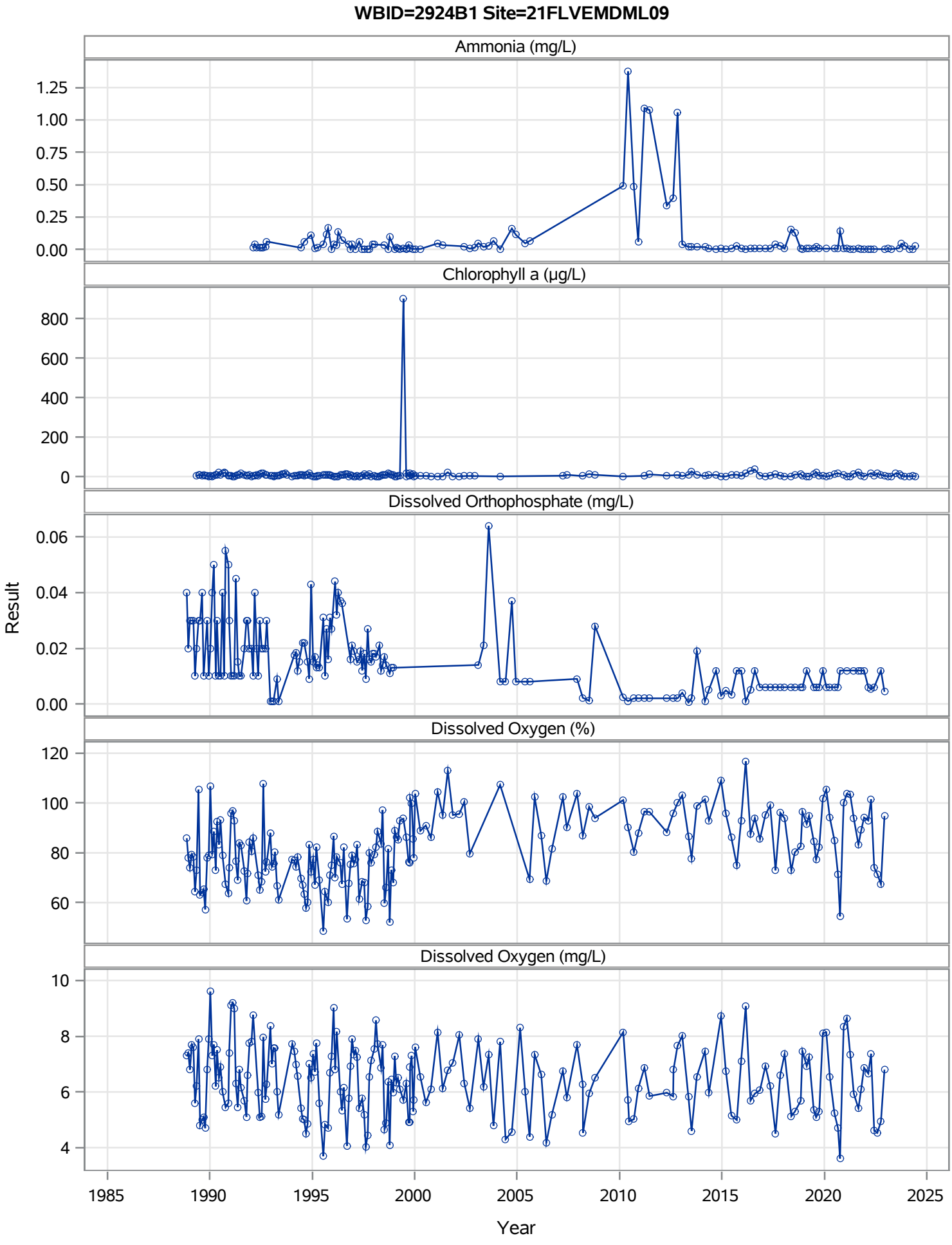

WBID=2924B1 Site=21FLSJWMIRLV19
Total Kjeldahl Nitrogen (mg/L)
1.4
1.2
1.0
0.8
Total Nitrogen (mg/L)
0.72
0.71
0.70
0.69
Total Phosphorus (mg/L)
0.08
0.06
0.04
0.02
0.00
pH
8.4
8.3
8.2
8.1
8.0
Result
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
Year

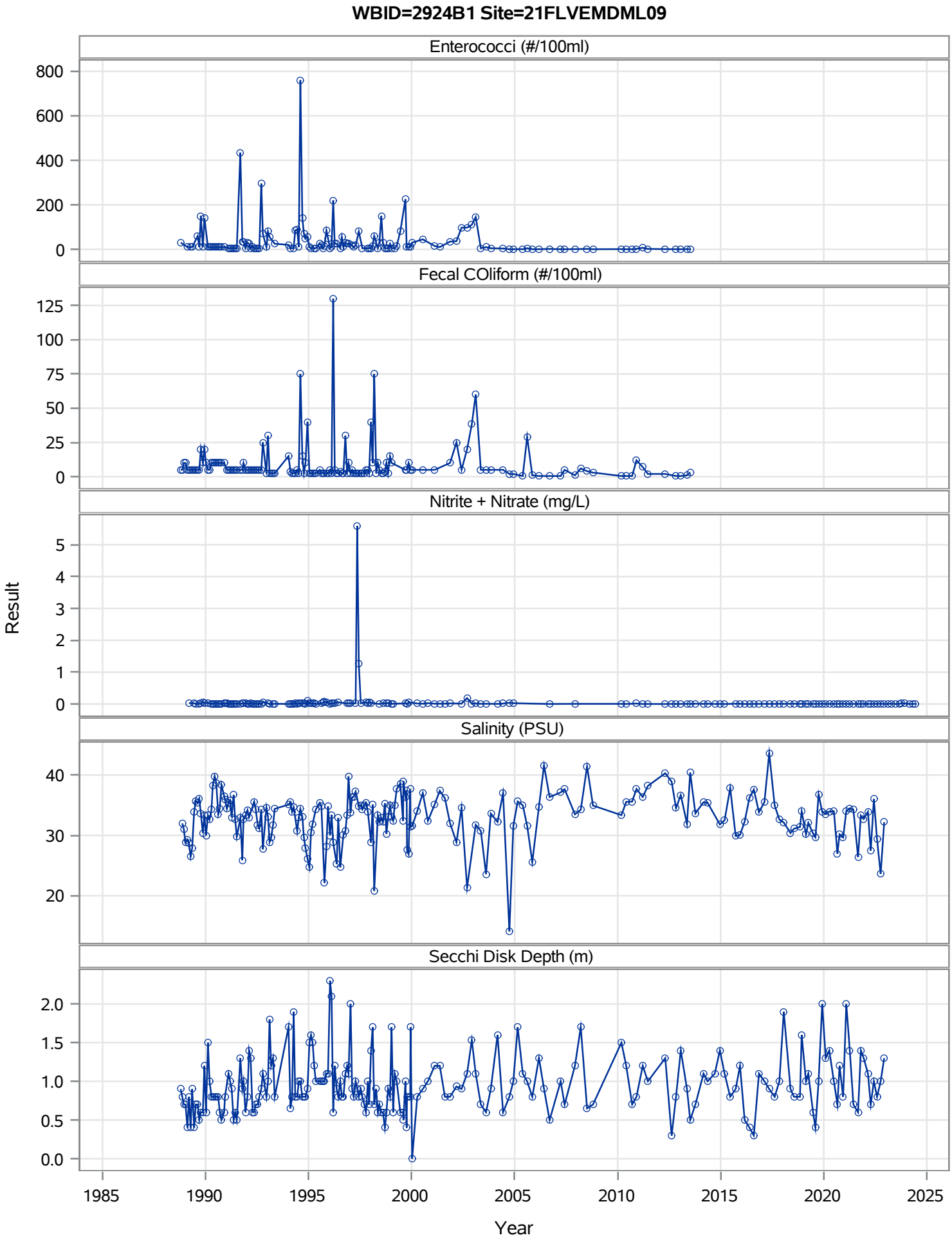

WBID=2924B1 Site=21FLSJWMMOSG17
Dissolved Oxygen (%)
81.7
Dissolved Oxygen (mg/L)
4.97
Salinity (PSU)
40.95
Temperature (Degree C)
29.48
pH
8.27
Result
11Aug
2008
12Aug
13Aug
Year

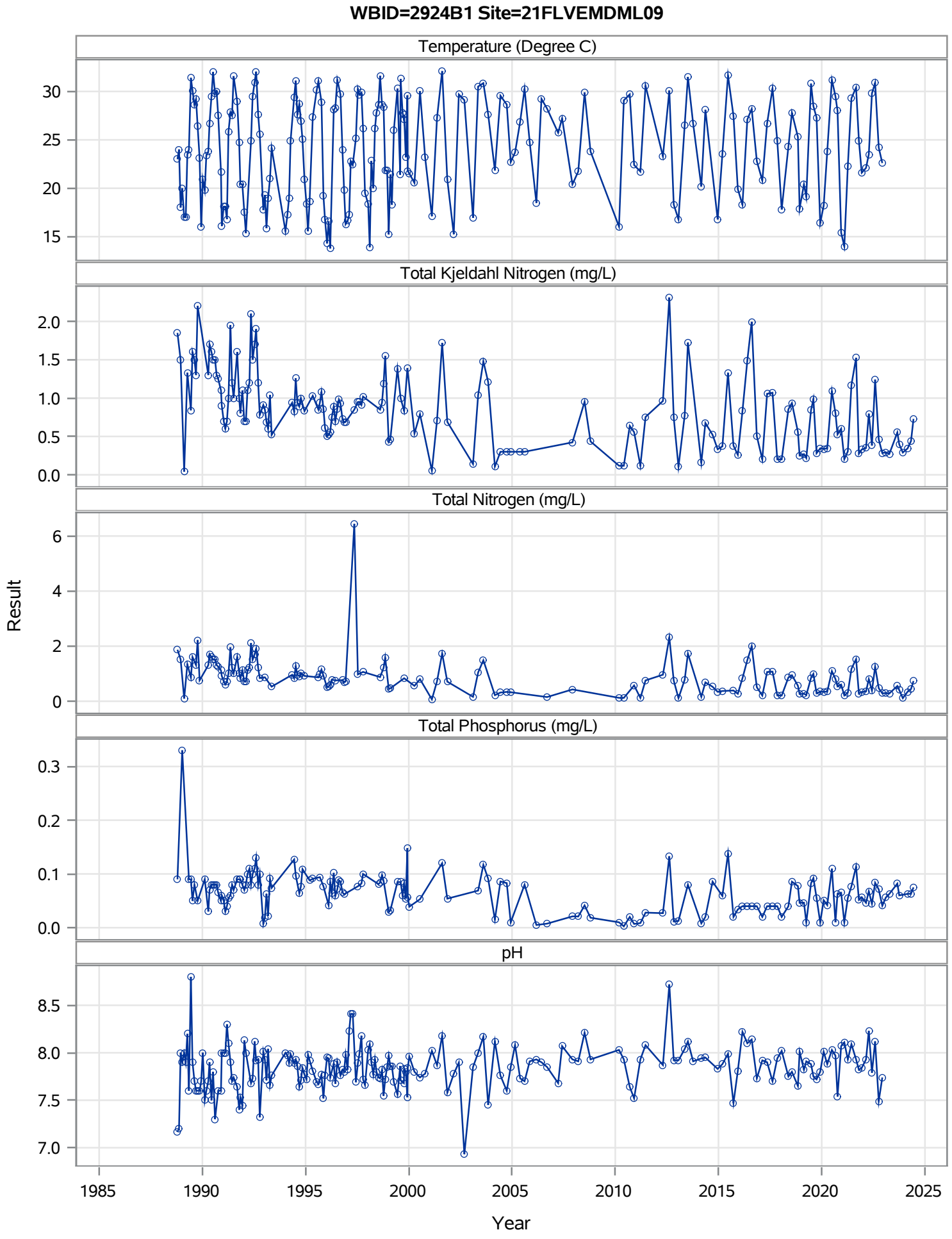

WBID=2924B1 Site=21FLVEMDML08
Ammonia (mg/L)
1.25
1.00
0.75
0.50
0.25
0.00
Chlorophyll a (µg/L)
30
20
10
0
Dissolved Orthophosphate (mg/L)
0.05
0.04
0.03
0.02
0.01
0.00
Result
Dissolved Oxygen (%)
100
90
80
70
60
Dissolved Oxygen (mg/L)
9
8
7
6
5
4
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Year

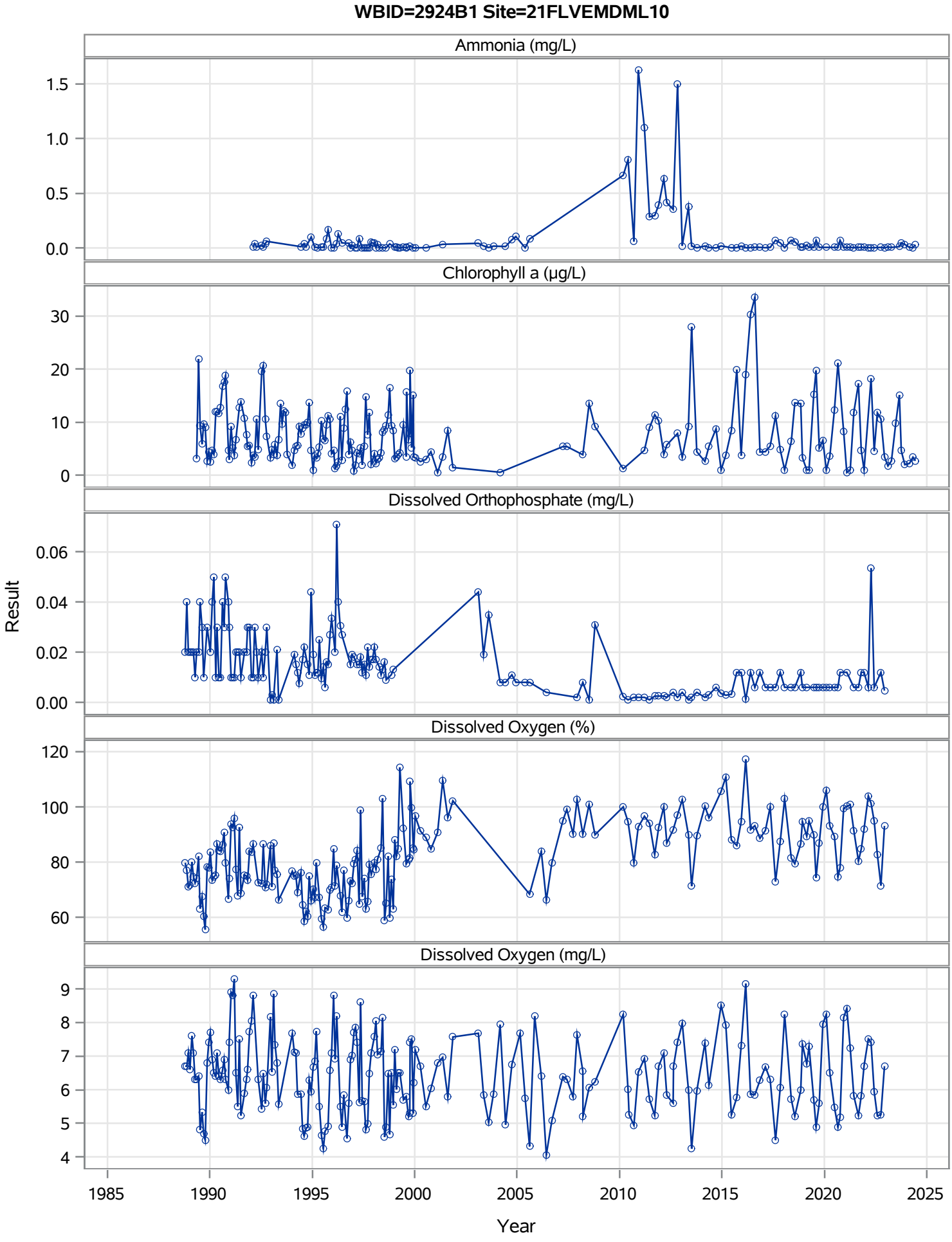

WBID=2924B1 Site=21FLVEMDML08
Enterococci (#/100ml)
500
400
300
200
100
0
Fecal COliform (#/100ml)
125
100
75
50
25
0
Nitrite + Nitrate (mg/L)
0.4
0.3
0.2
0.1
0.0
Result
Salinity (PSU)
40
30
20
Secchi Disk Depth (m)
2.0
1.5
1.0
0.5
0.0
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Year

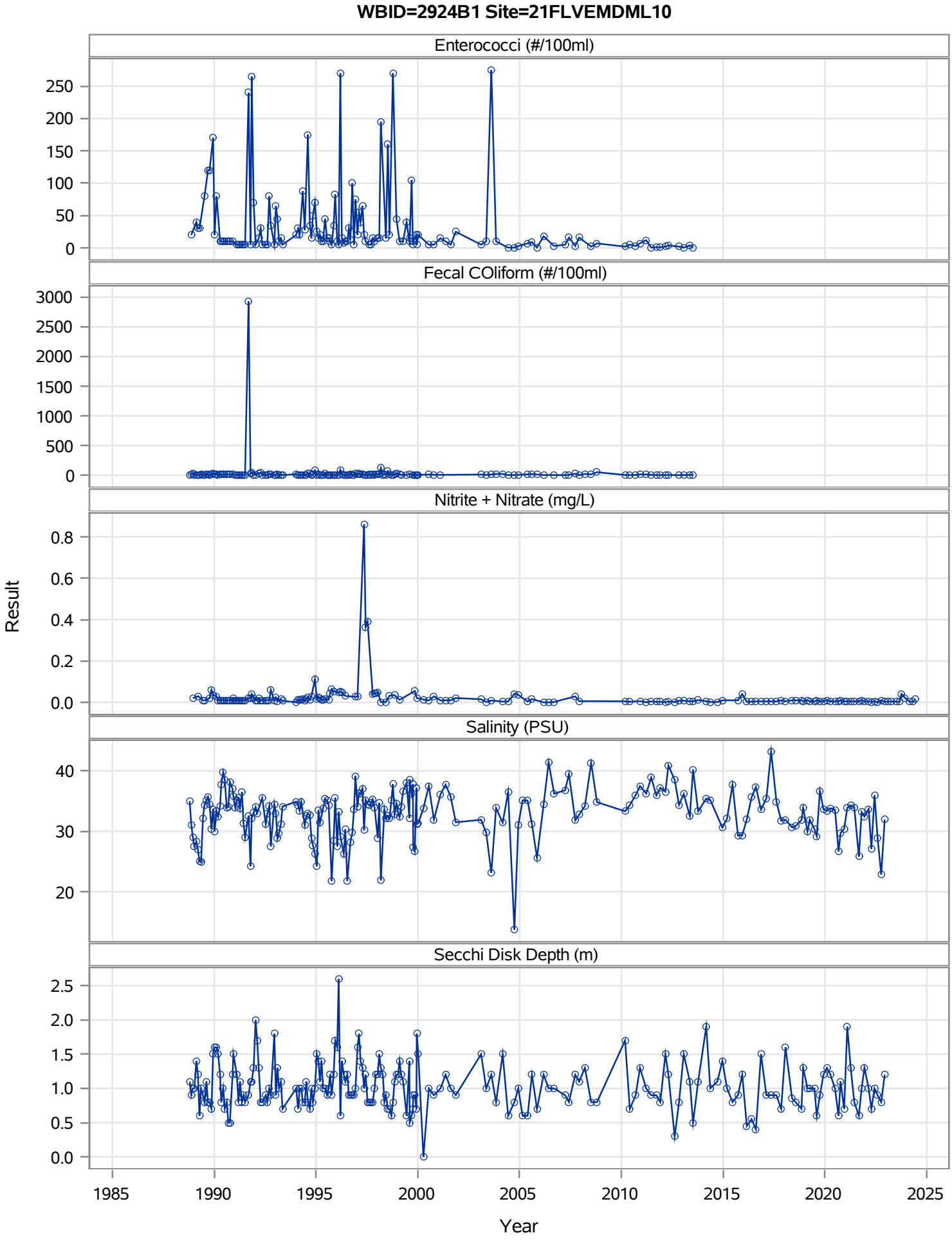

WBID=2924B1 Site=21FLVEMDML08
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Total Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Result
Total Phosphorus (mg/L)
0.30
0.25
0.20
0.15
0.10
0.05
0.00
pH
9.0
8.5
8.0
7.5
7.0
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Year

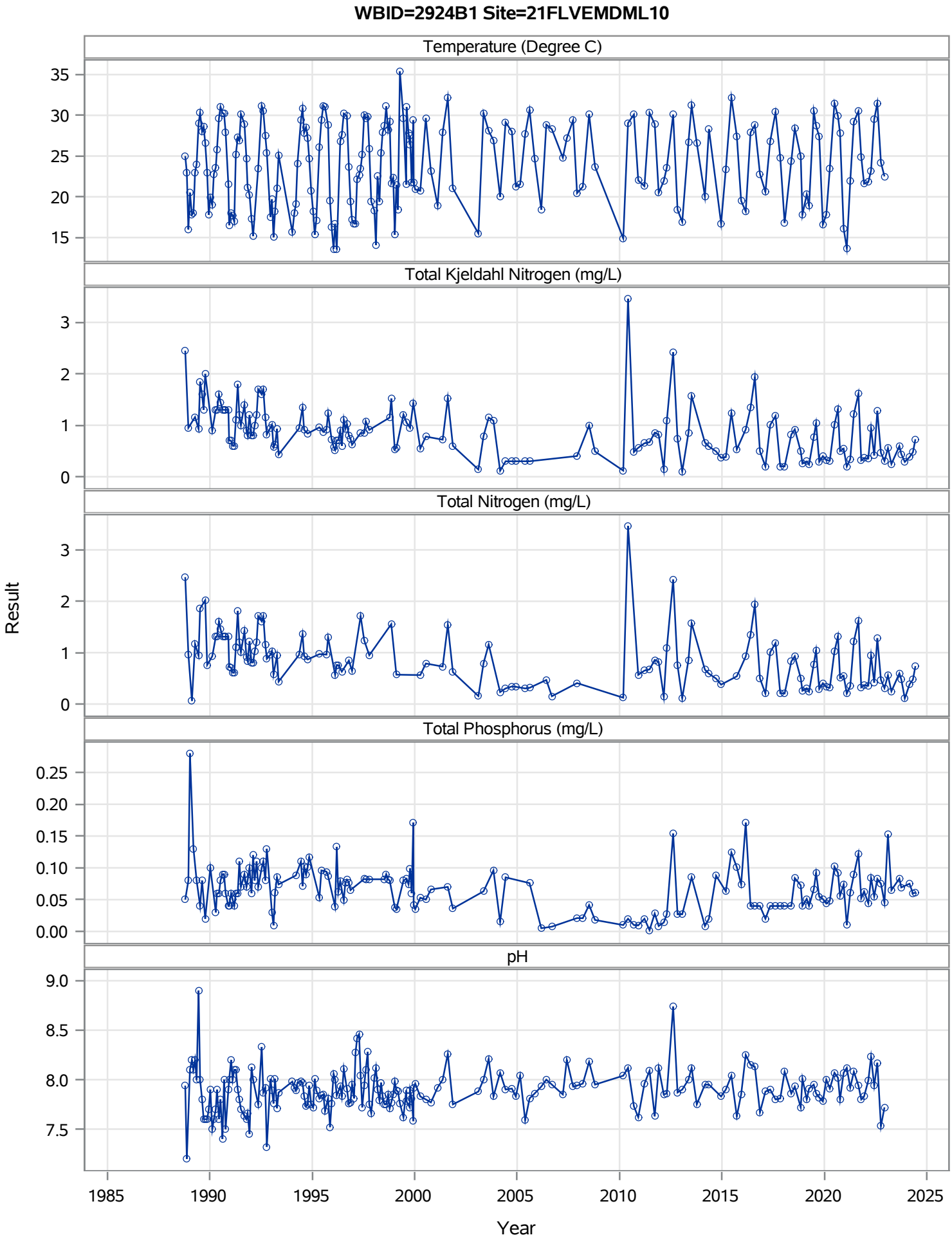

WBID=2924B1 Site=21FLVEMDML09
Ammonia (mg/L)
1.25
1.00
0.75
0.50
0.25
0.00
Chlorophyll a (µg/L)
800
600
400
200
0
Dissolved Orthophosphate (mg/L)
0.06
0.04
0.02
0.00
Result
Dissolved Oxygen (%)
120
100
80
60
Dissolved Oxygen (mg/L)
10
8
6
4
1985
1990
1995
2000
2005
2010
2015
2020
2025
Year

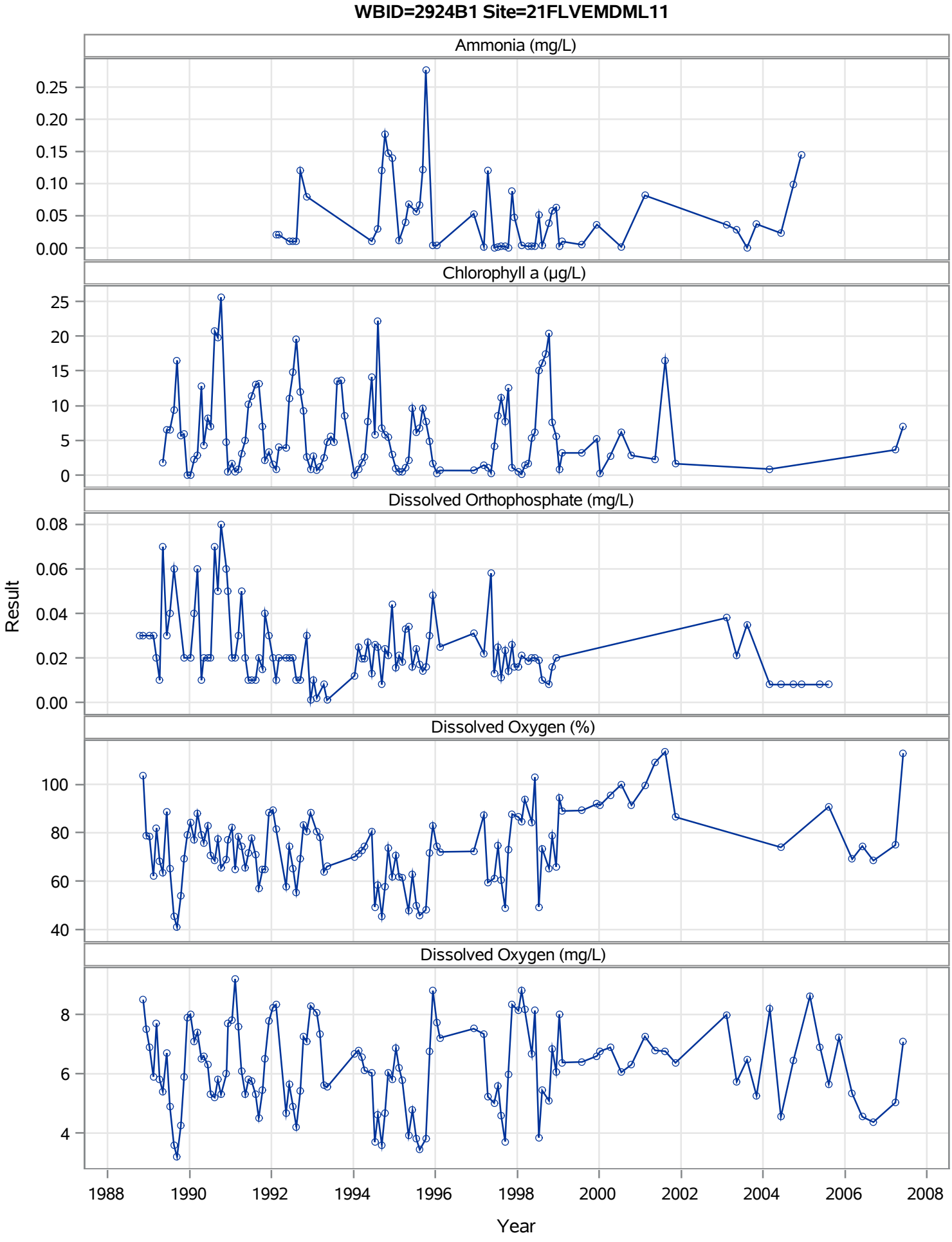

WBID=2924B1 Site=21FLVEMDML09
Enterococci (#/100ml)
800
600
400
200
0
Fecal COliform (#/100ml)
125
100
75
50
25
0
Nitrite + Nitrate (mg/L)
5
4
3
2
1
0
Result
Salinity (PSU)
40
30
20
Secchi Disk Depth (m)
2.0
1.5
1.0
0.5
0.0
1985
1990
1995
2000
2005
2010
2015
2020
2025
Year

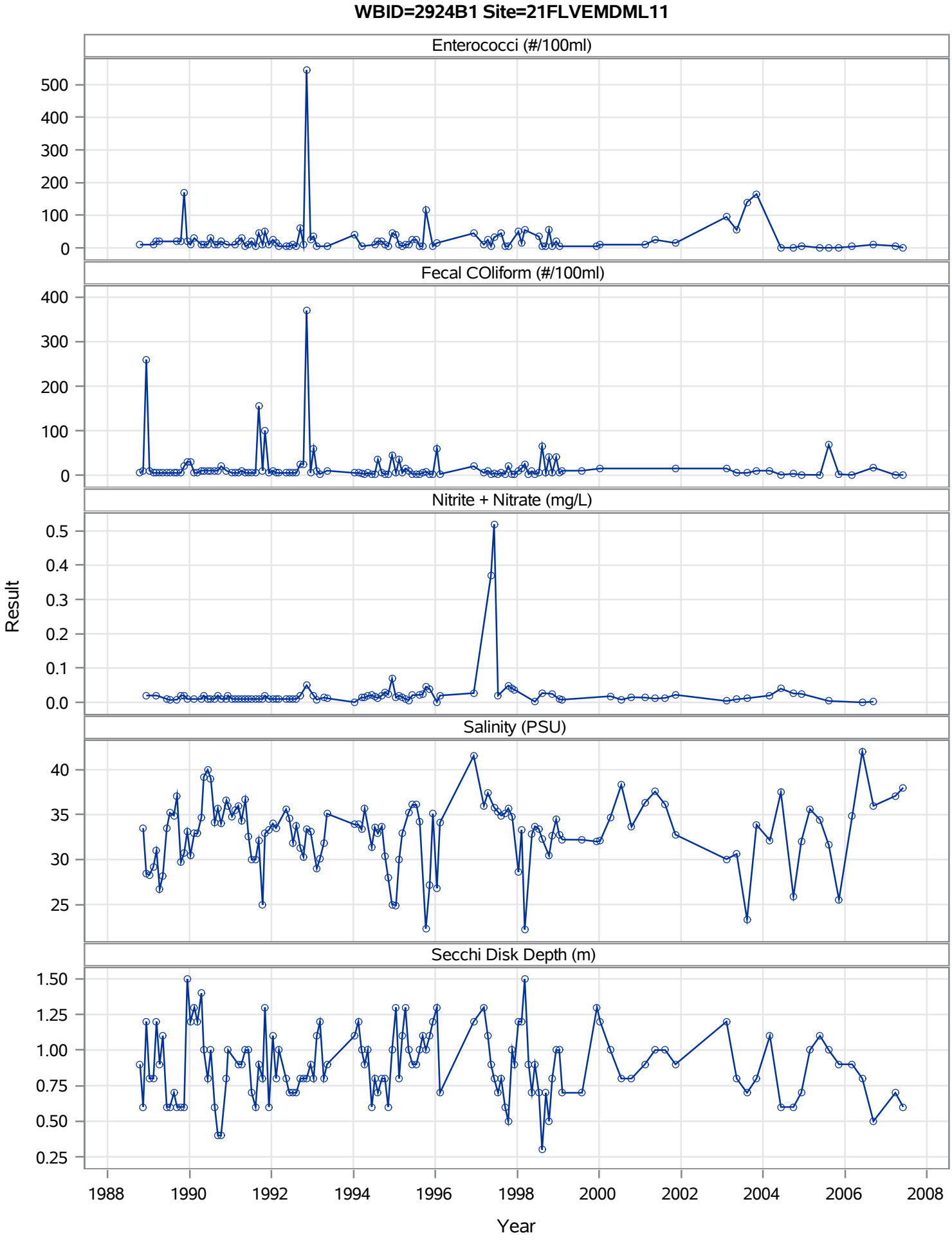

WBID=2924B1 Site=21FLVEMDML09
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Total Nitrogen (mg/L)
6
4
2
0
Result
Total Phosphorus (mg/L)
0.3
0.2
0.1
0.0
pH
8.5
8.0
7.5
7.0
1985
1990
1995
2000
2005
2010
2015
2020
2025
Year

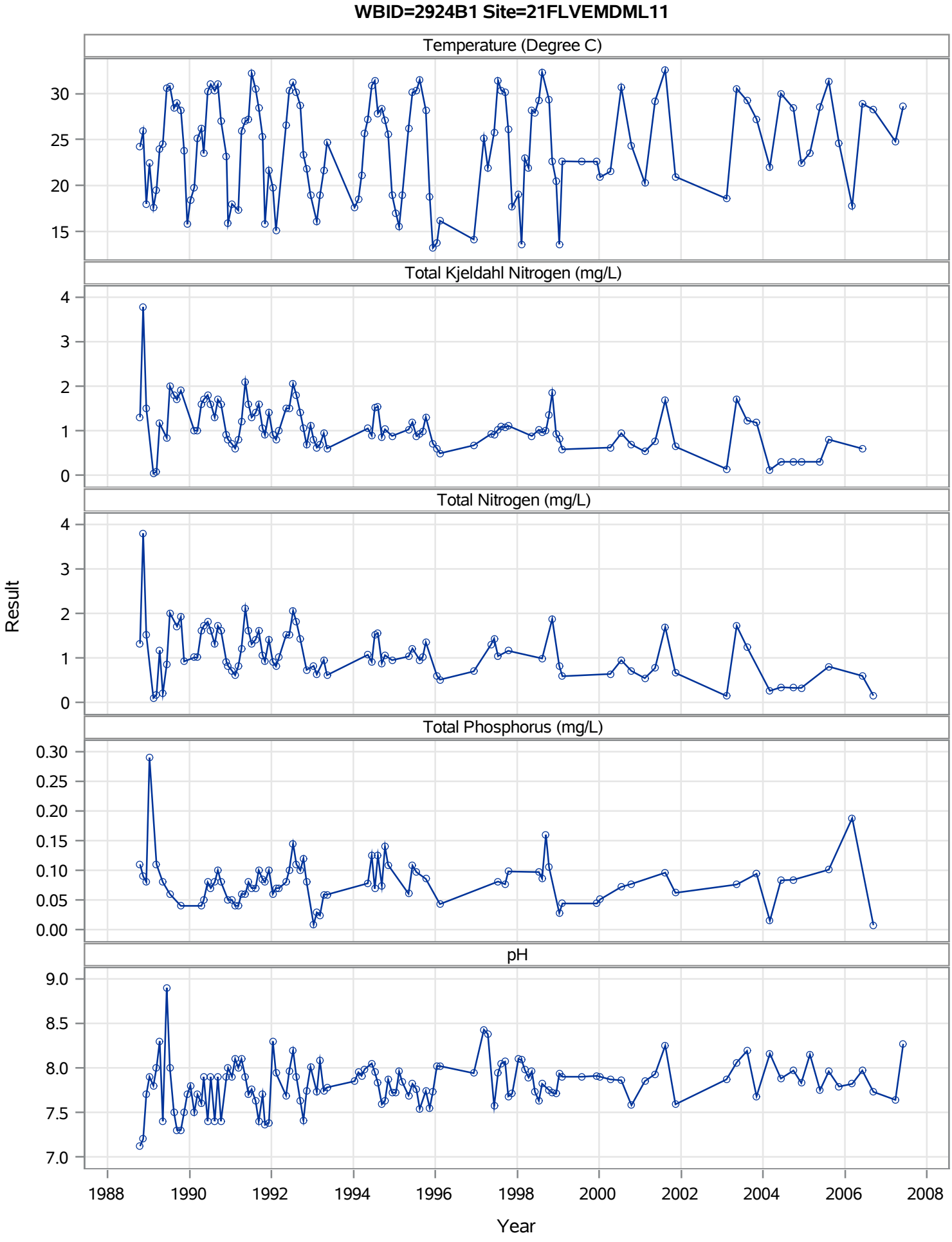

WBID=2924B1 Site=21FLVEMDML10
Ammonia (mg/L)
1.5
1.0
0.5
0.0
Chlorophyll a (µg/L)
30
20
10
0
Dissolved Orthophosphate (mg/L)
0.06
0.04
0.02
0.00
Result
Dissolved Oxygen (%)
120
100
80
60
Dissolved Oxygen (mg/L)
9
8
7
6
5
4
1985
1990
1995
2000
2005
2010
2015
2020
2025
Year

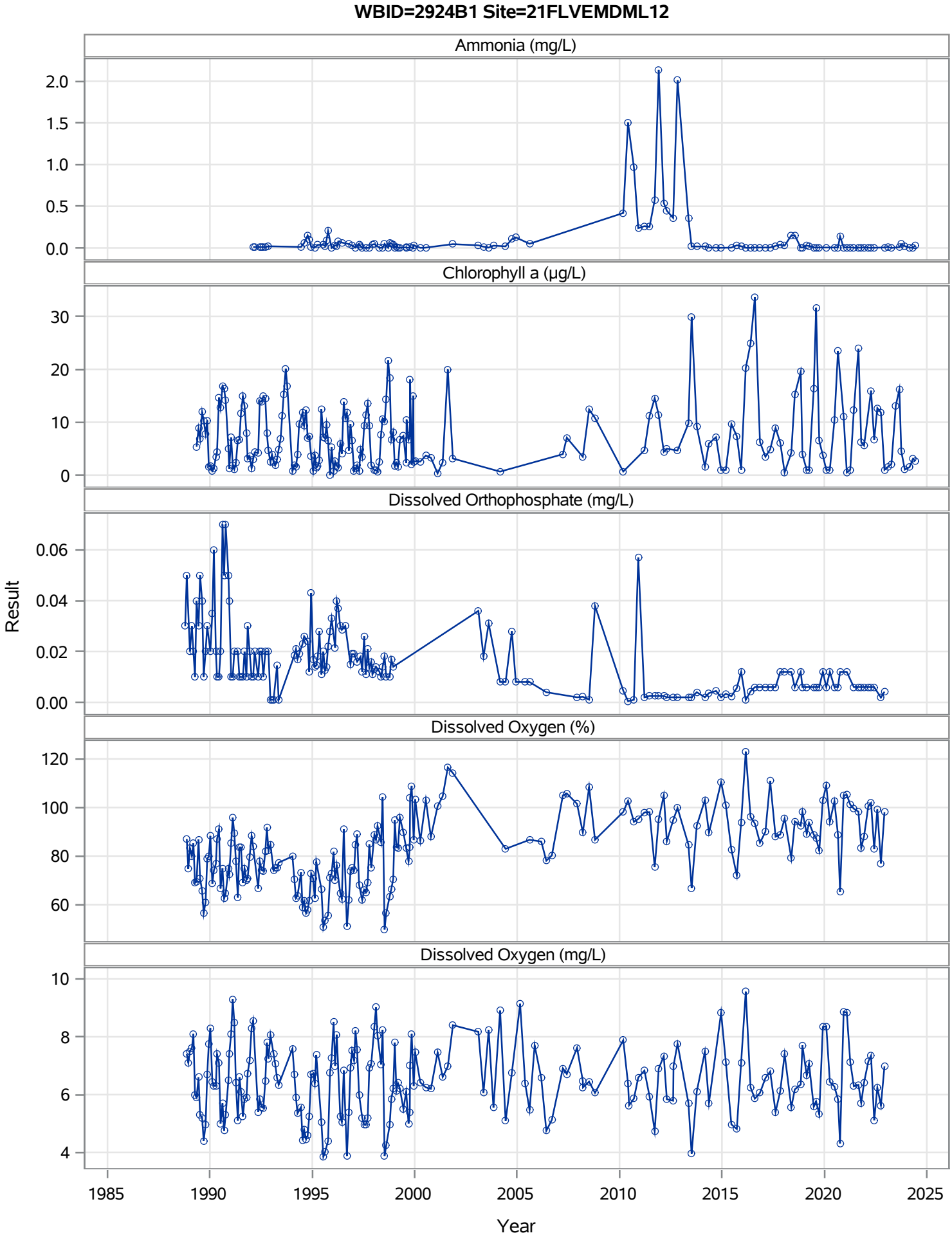

WBID=2924B1 Site=21FLVEMDML10
Enterococci (#/100ml)
250
200
150
100
50
0
Fecal COliform (#/100ml)
3000
2500
2000
1500
1000
500
0
Nitrite + Nitrate (mg/L)
0.8
0.6
0.4
0.2
0.0
Result
Salinity (PSU)
40
30
20
Secchi Disk Depth (m)
2.5
2.0
1.5
1.0
0.5
0.0
1985
1990
1995
2000
2005
2010
2015
2020
2025
Year

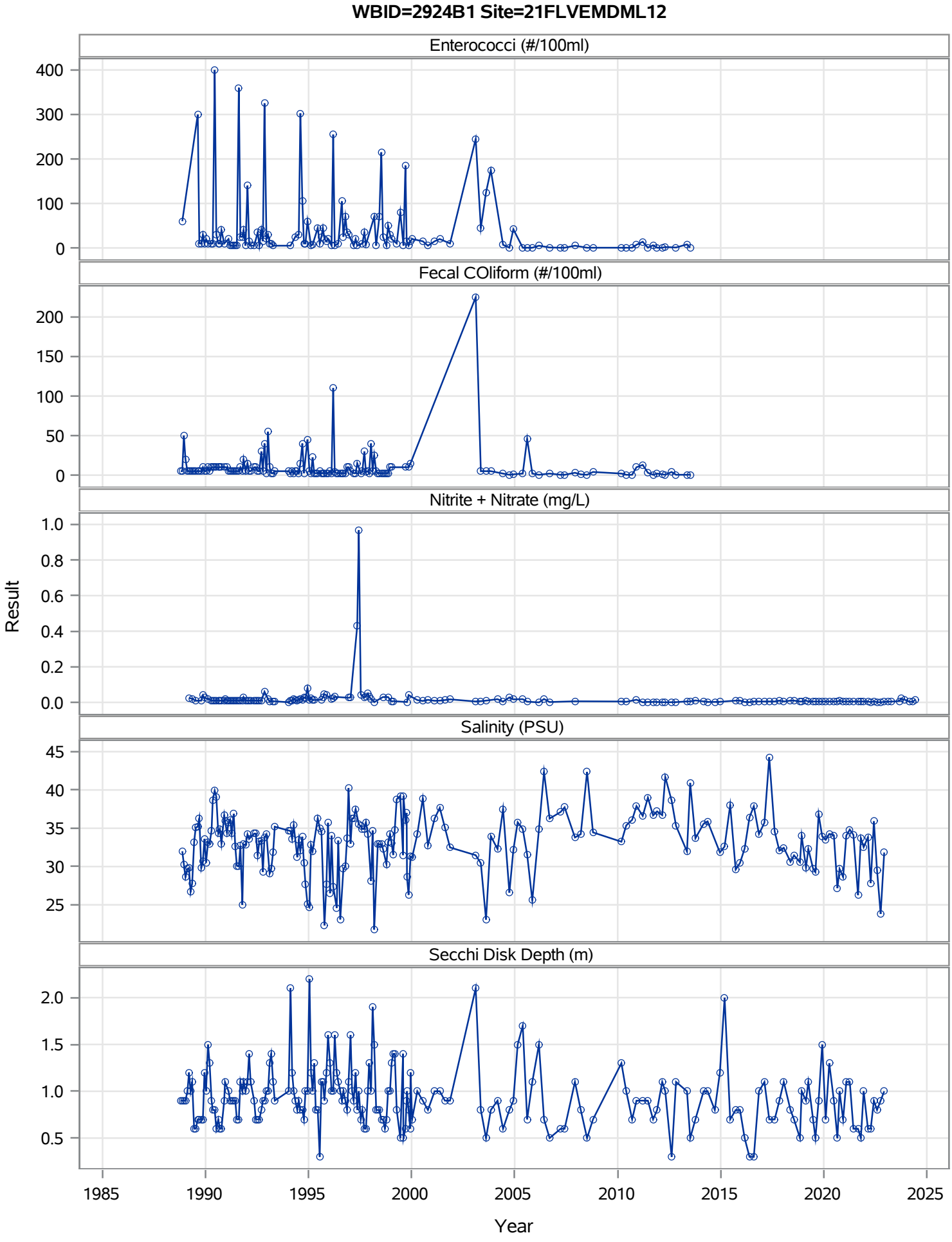

WBID=2924B1 Site=21FLVEMDML10
Temperature (Degree C)
35
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
3
2
1
0
Total Nitrogen (mg/L)
3
2
1
0
Result
Total Phosphorus (mg/L)
0.25
0.20
0.15
0.10
0.05
0.00
pH
9.0
8.5
8.0
7.5
1985
1990
1995
2000
2005
2010
2015
2020
2025
Year

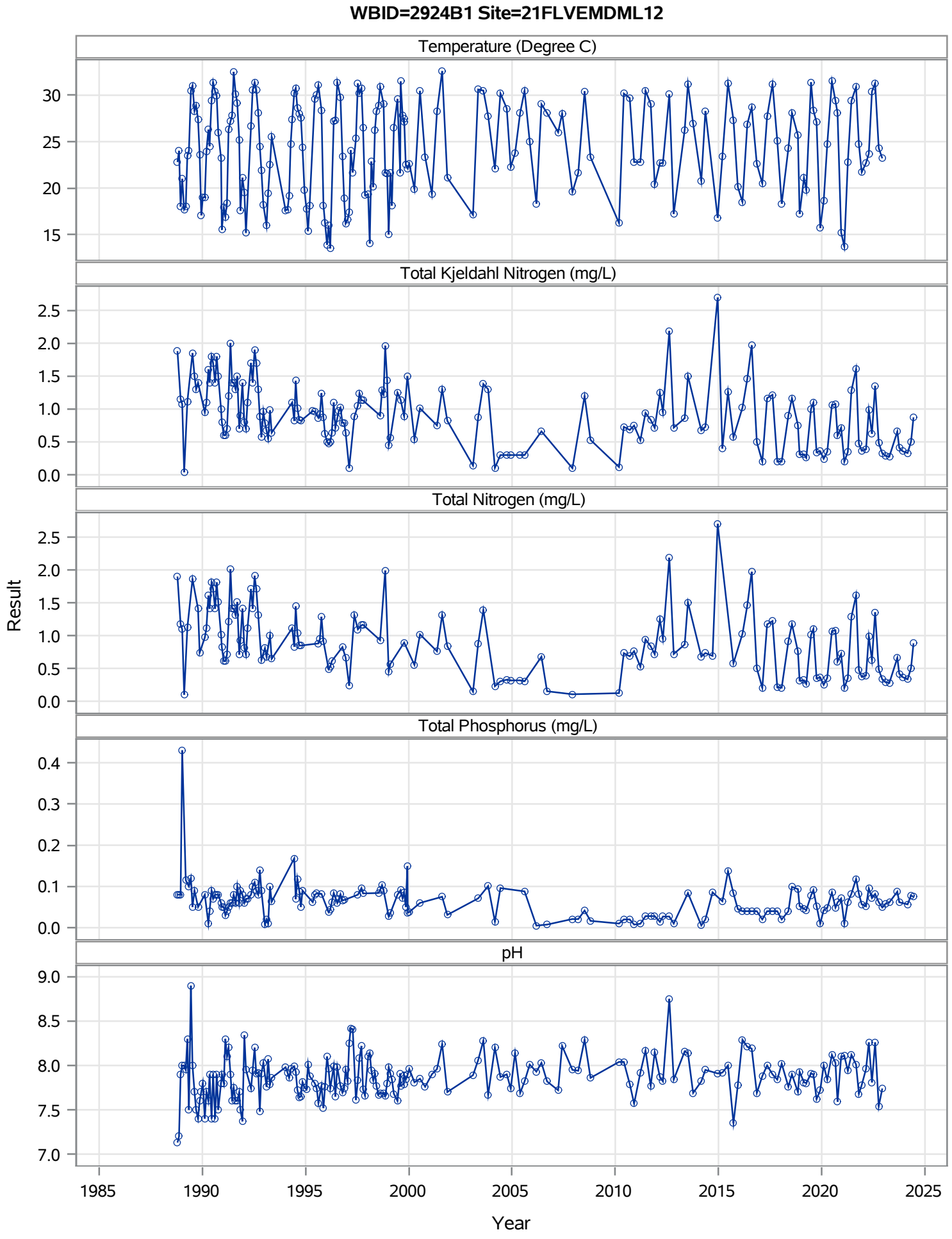

WBID=2924B1 Site=21FLVEMDML11
Ammonia (mg/L)
0.25
0.20
0.15
0.10
0.05
0.00
Chlorophyll a (µg/L)
25
20
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.08
0.06
0.04
0.02
0.00
Result
Dissolved Oxygen (%)
100
80
60
40
Dissolved Oxygen (mg/L)
8
6
4
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
Year

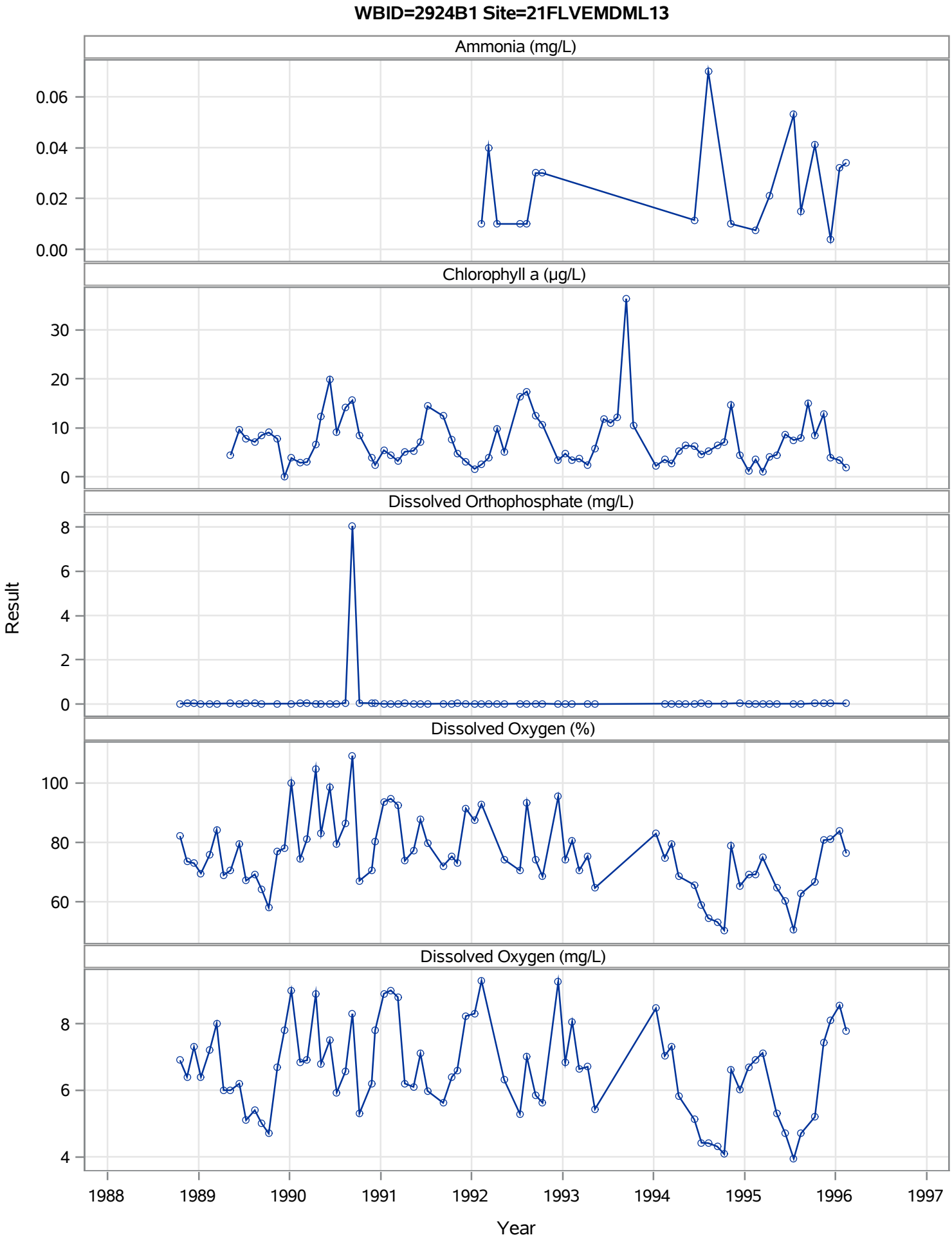

WBID=2924B1 Site=21FLVEMDML11
Enterococci (#/100ml)
500
400
300
200
100
0
Fecal COliform (#/100ml)
400
300
200
100
0
Nitrite + Nitrate (mg/L)
0.5
0.4
0.3
0.2
0.1
0.0
Result
Salinity (PSU)
40
35
30
25
Secchi Disk Depth (m)
1.50
1.25
1.00
0.75
0.50
0.25
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
Year

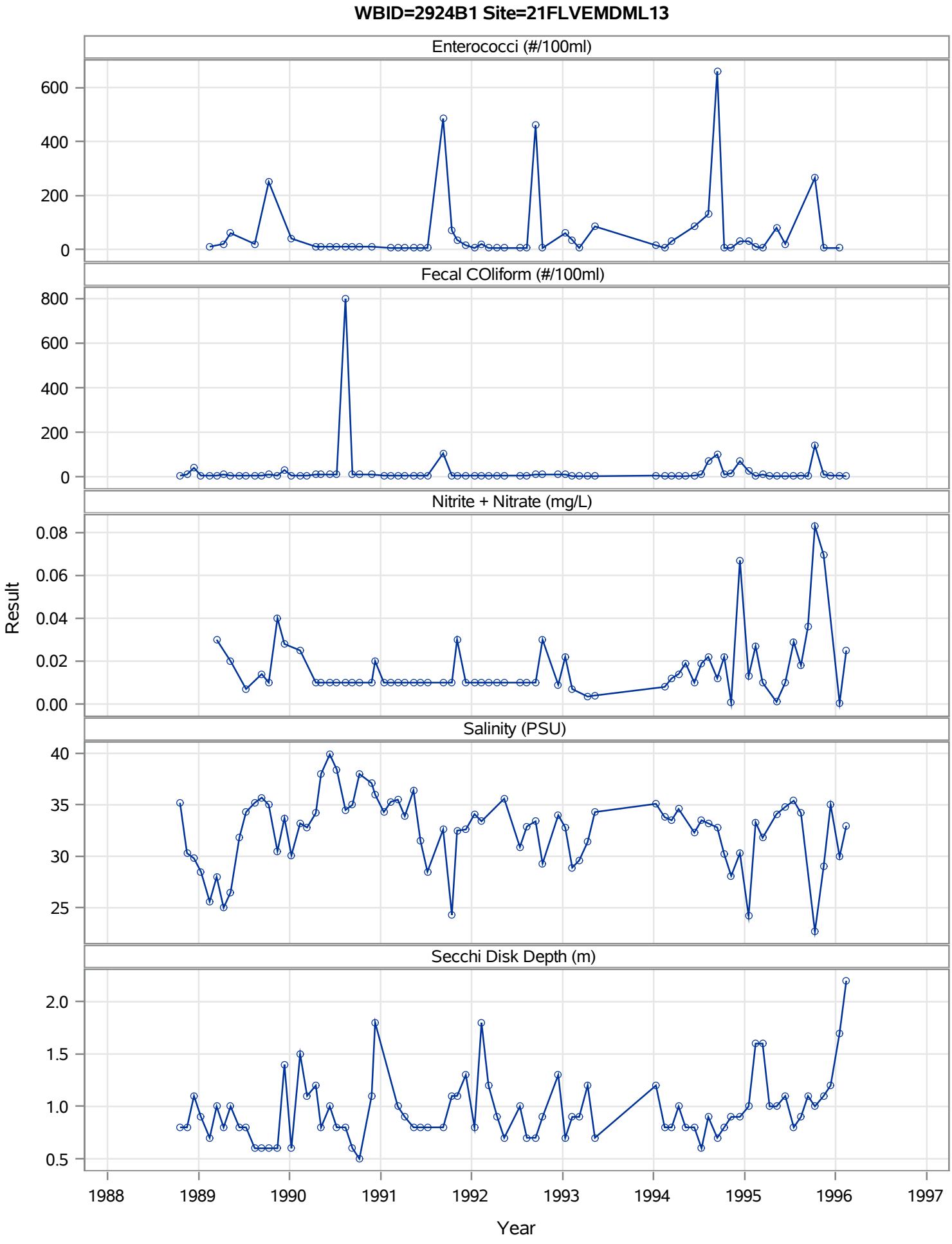

WBID=2924B1 Site=21FLVEMDML11
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
4
3
2
1
0
Total Nitrogen (mg/L)
4
3
2
1
0
Result
Total Phosphorus (mg/L)
0.30
0.25
0.20
0.15
0.10
0.05
0.00
pH
9.0
8.5
8.0
7.5
7.0
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
Year

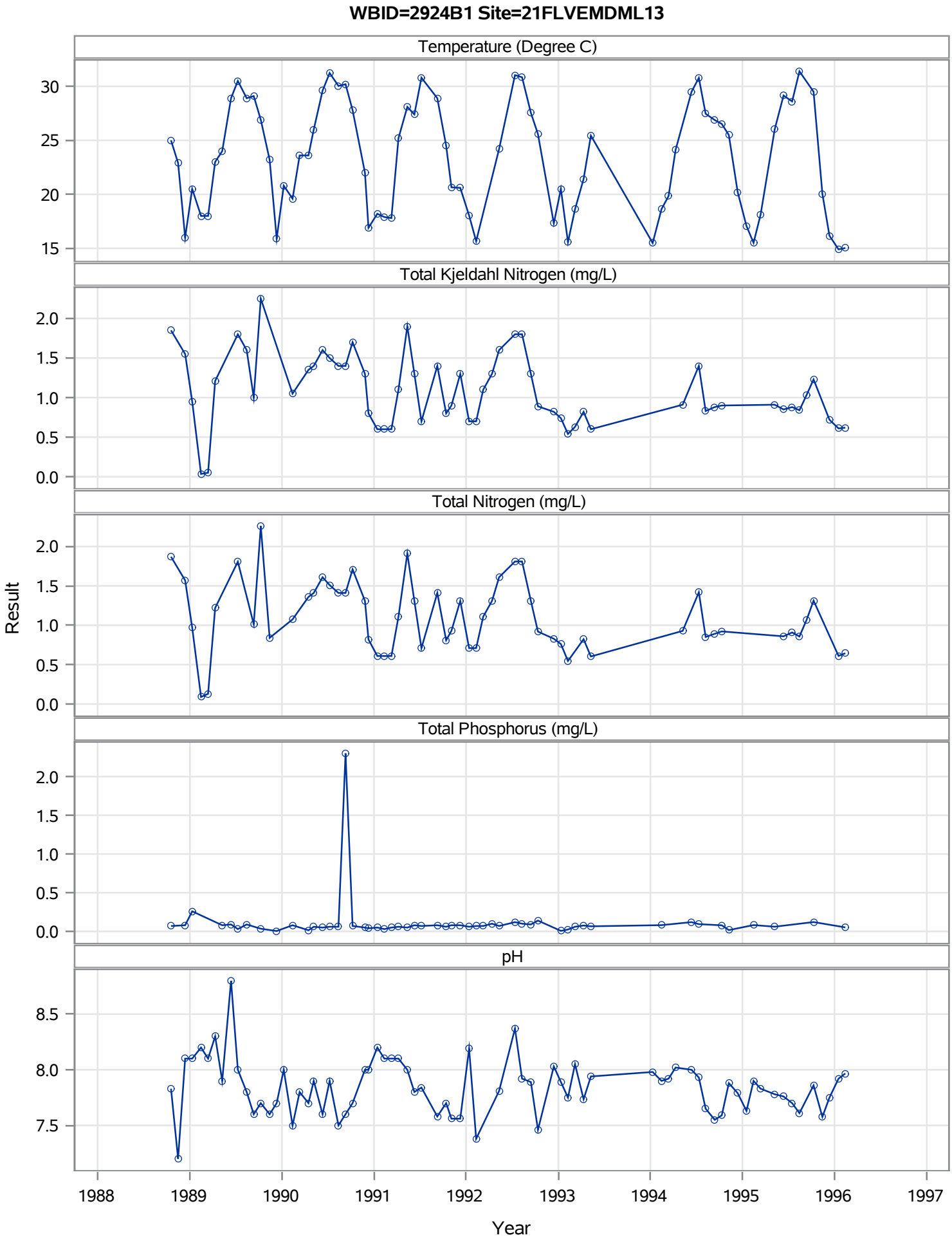

WBID=2924B1 Site=21FLVEMDML12
Ammonia (mg/L)
2.0
1.5
1.0
0.5
0.0
Chlorophyll a (µg/L)
30
20
10
0
Dissolved Orthophosphate (mg/L)
0.06
0.04
0.02
0.00
Dissolved Oxygen (%)
120
100
80
60
Dissolved Oxygen (mg/L)
10
8
6
4
Result
1985
1990
1995
2000
2005
2010
2015
2020
2025
Year

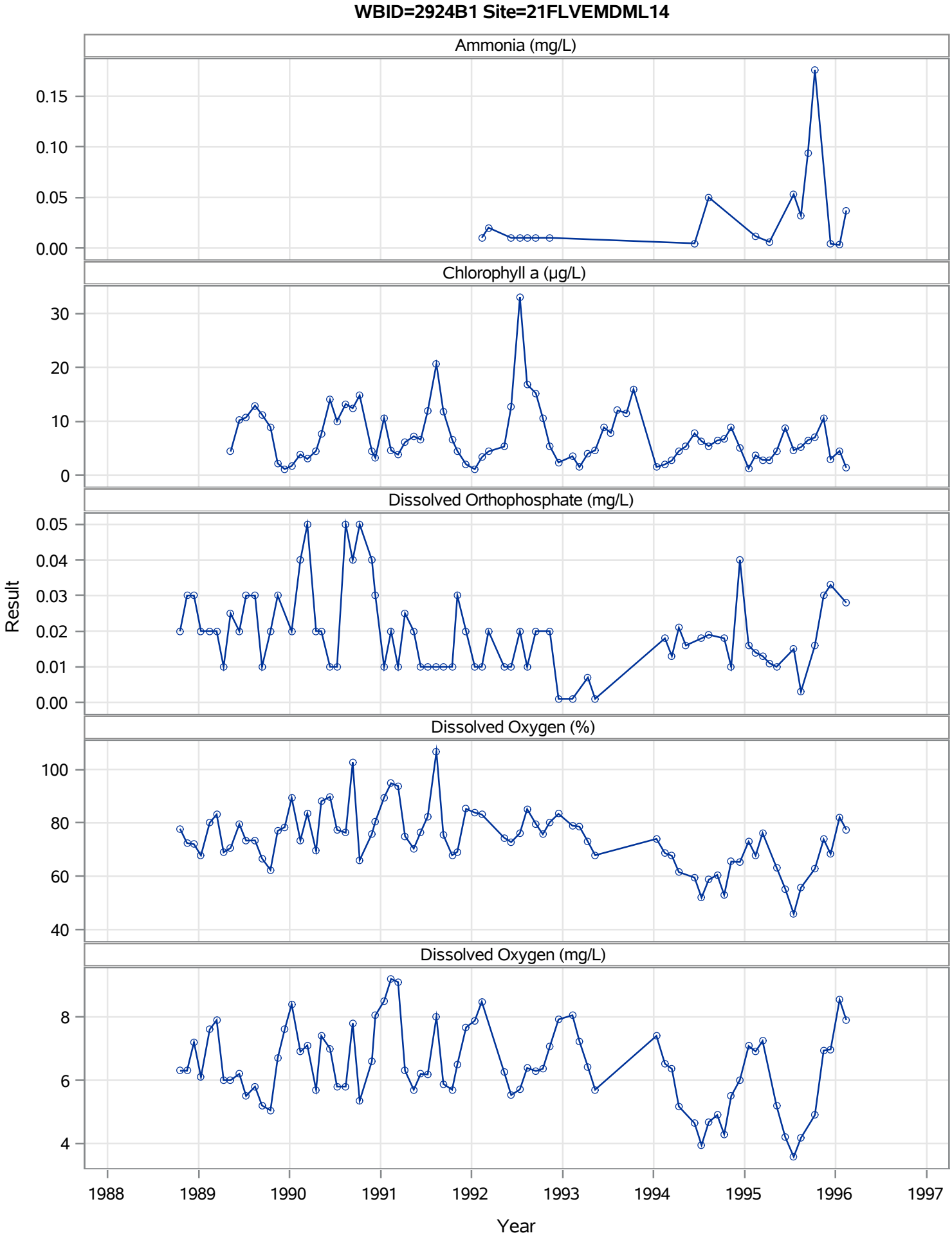

WBID=2924B1 Site=21FLVEMDML12
Enterococci (#/100ml)
400
300
200
100
0
Fecal COliform (#/100ml)
200
150
100
50
0
Nitrite + Nitrate (mg/L)
1.0
0.8
0.6
0.4
0.2
0.0
Salinity (PSU)
45
40
35
30
25
Secchi Disk Depth (m)
2.0
1.5
1.0
0.5
Result
1985
1990
1995
2000
2005
2010
2015
2020
2025
Year

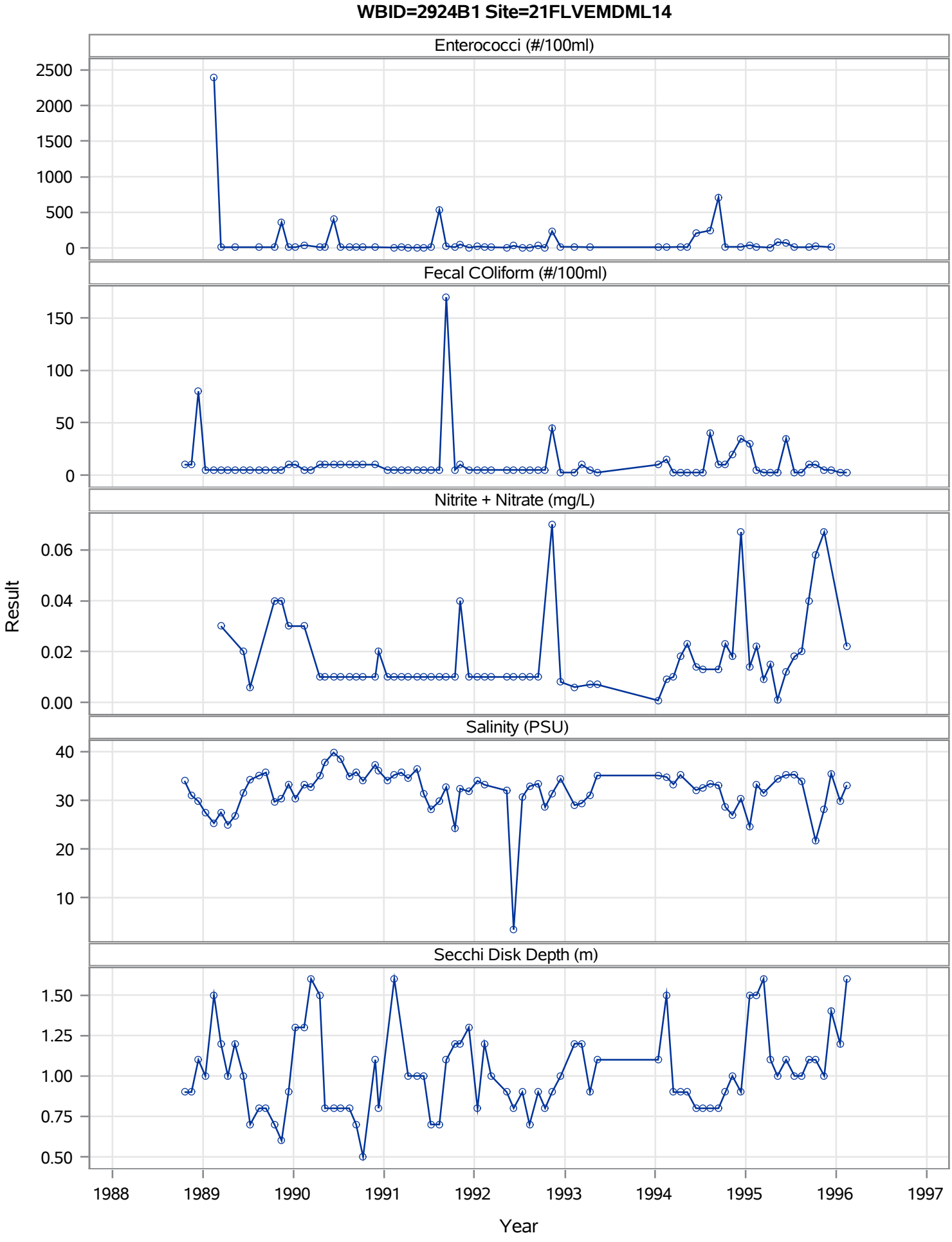

WBID=2924B1 Site=21FLVEMDML12
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
2.5
2.0
1.5
1.0
0.5
0.0
Total Nitrogen (mg/L)
2.5
2.0
1.5
1.0
0.5
0.0
Result
Total Phosphorus (mg/L)
0.4
0.3
0.2
0.1
0.0
pH
9.0
8.5
8.0
7.5
7.0
1985
1990
1995
2000
2005
2010
2015
2020
2025
Year

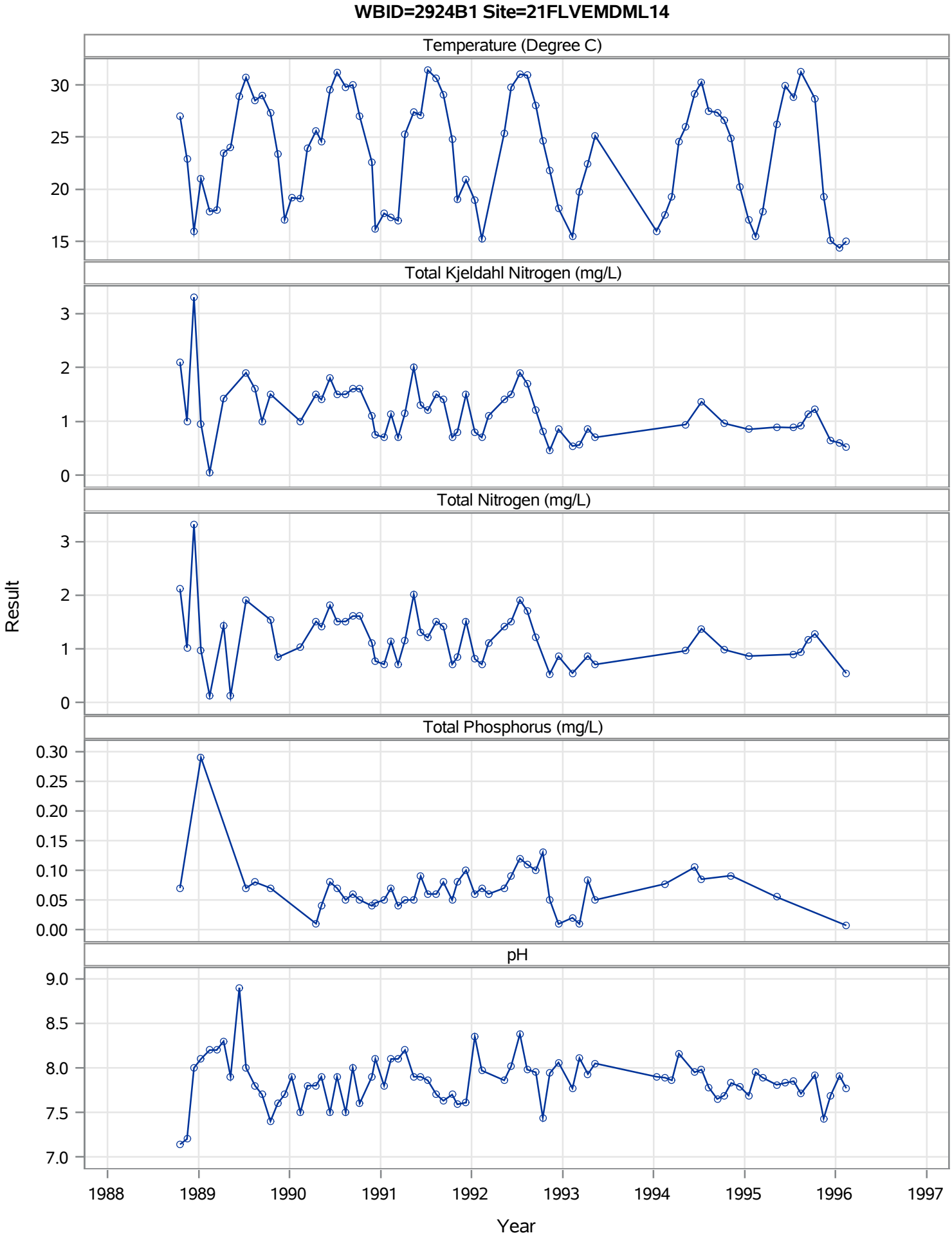

WBID=2924B1 Site=21FLVEMDML13
Ammonia (mg/L)
0.06
0.04
0.02
0.00
Chlorophyll a (µg/L)
30
20
10
0
Dissolved Orthophosphate (mg/L)
8
6
4
2
0
Dissolved Oxygen (%)
100
80
60
Dissolved Oxygen (mg/L)
8
6
4
Result
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

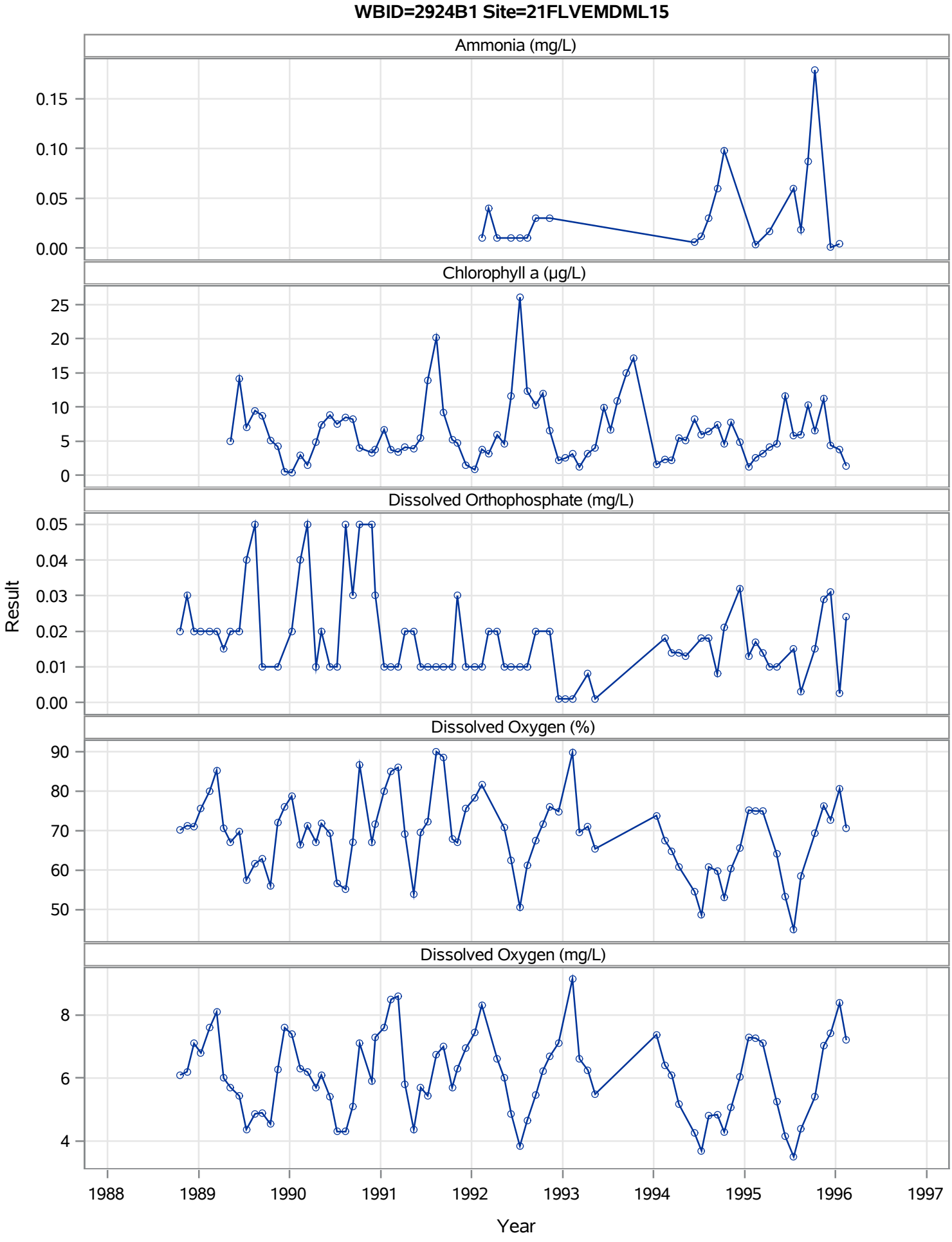

WBID=2924B1 Site=21FLVEMDML13
Enterococci (#/100ml)
600
400
200
0
Fecal COliform (#/100ml)
800
600
400
200
0
Nitrite + Nitrate (mg/L)
0.08
0.06
0.04
0.02
0.00
Salinity (PSU)
40
35
30
25
Secchi Disk Depth (m)
2.0
1.5
1.0
0.5
Result
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

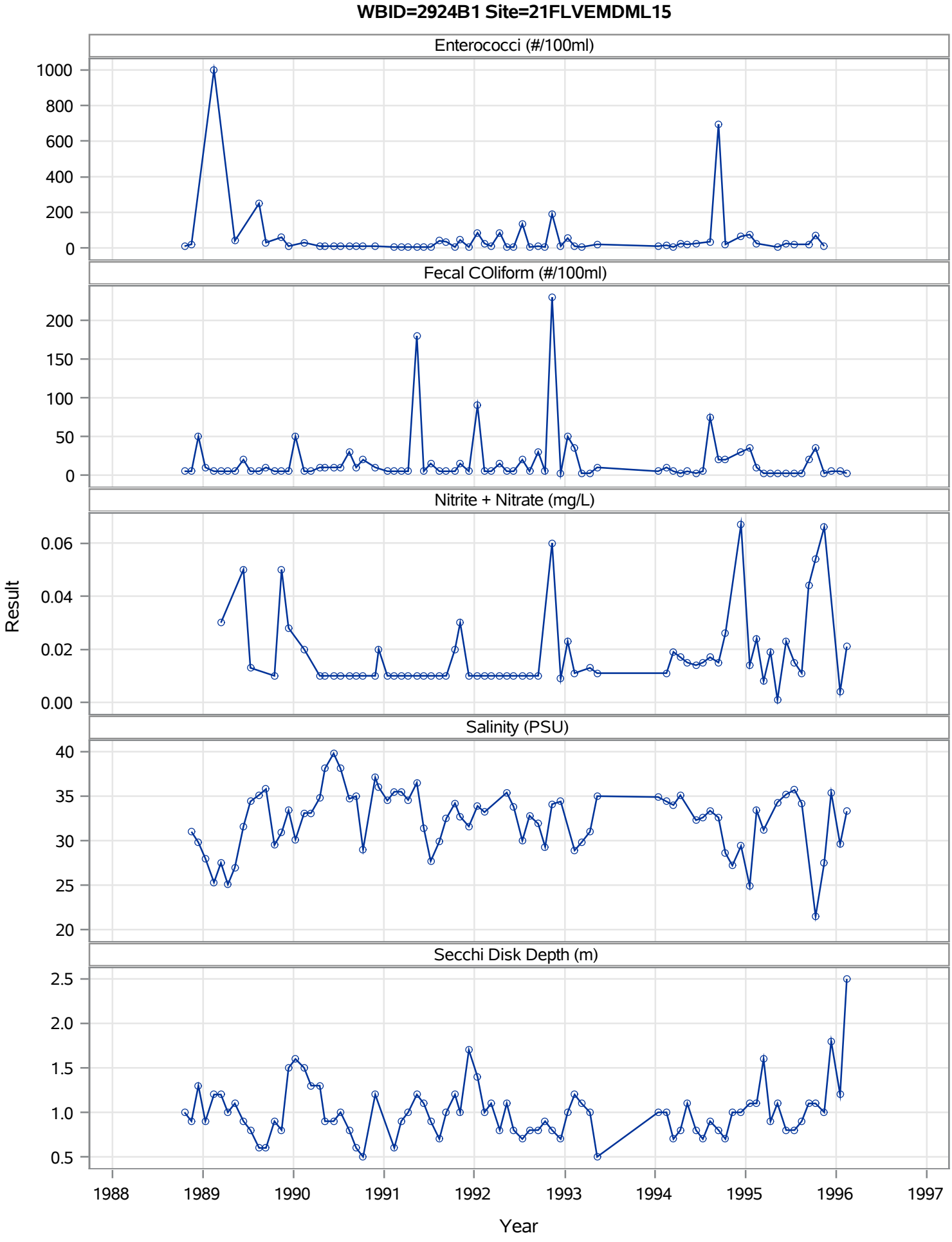

WBID=2924B1 Site=21FLVEMDML13
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Total Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Result
Total Phosphorus (mg/L)
2.0
1.5
1.0
0.5
0.0
pH
8.5
8.0
7.5
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

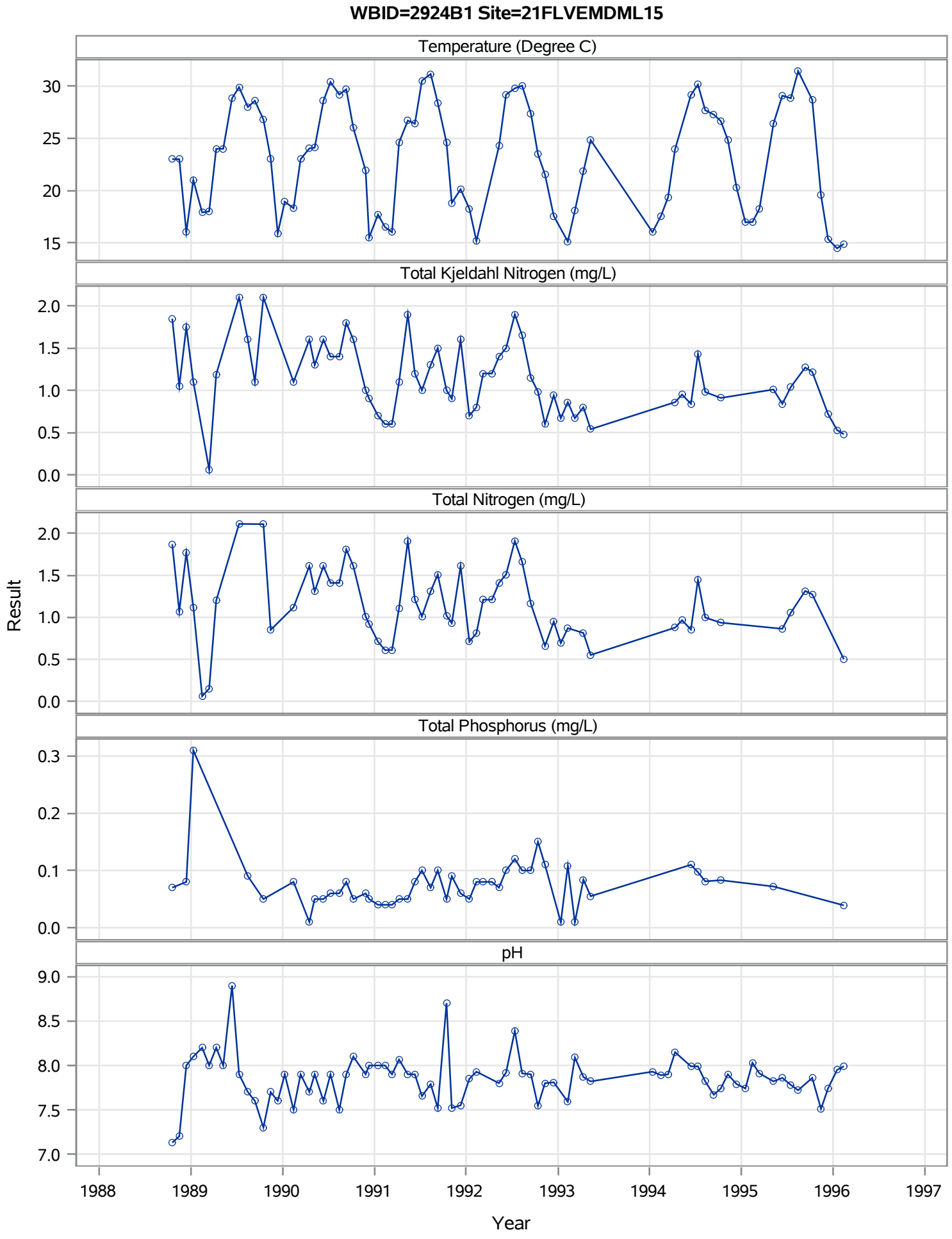

WBID=2924B1 Site=21FLVEMDML14
Ammonia (mg/L)
0.15
0.10
0.05
0.00
Chlorophyll a (µg/L)
30
20
10
0
Dissolved Orthophosphate (mg/L)
0.05
0.04
0.03
0.02
0.01
0.00
Dissolved Oxygen (%)
100
80
60
40
Dissolved Oxygen (mg/L)
8
6
4
Result
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

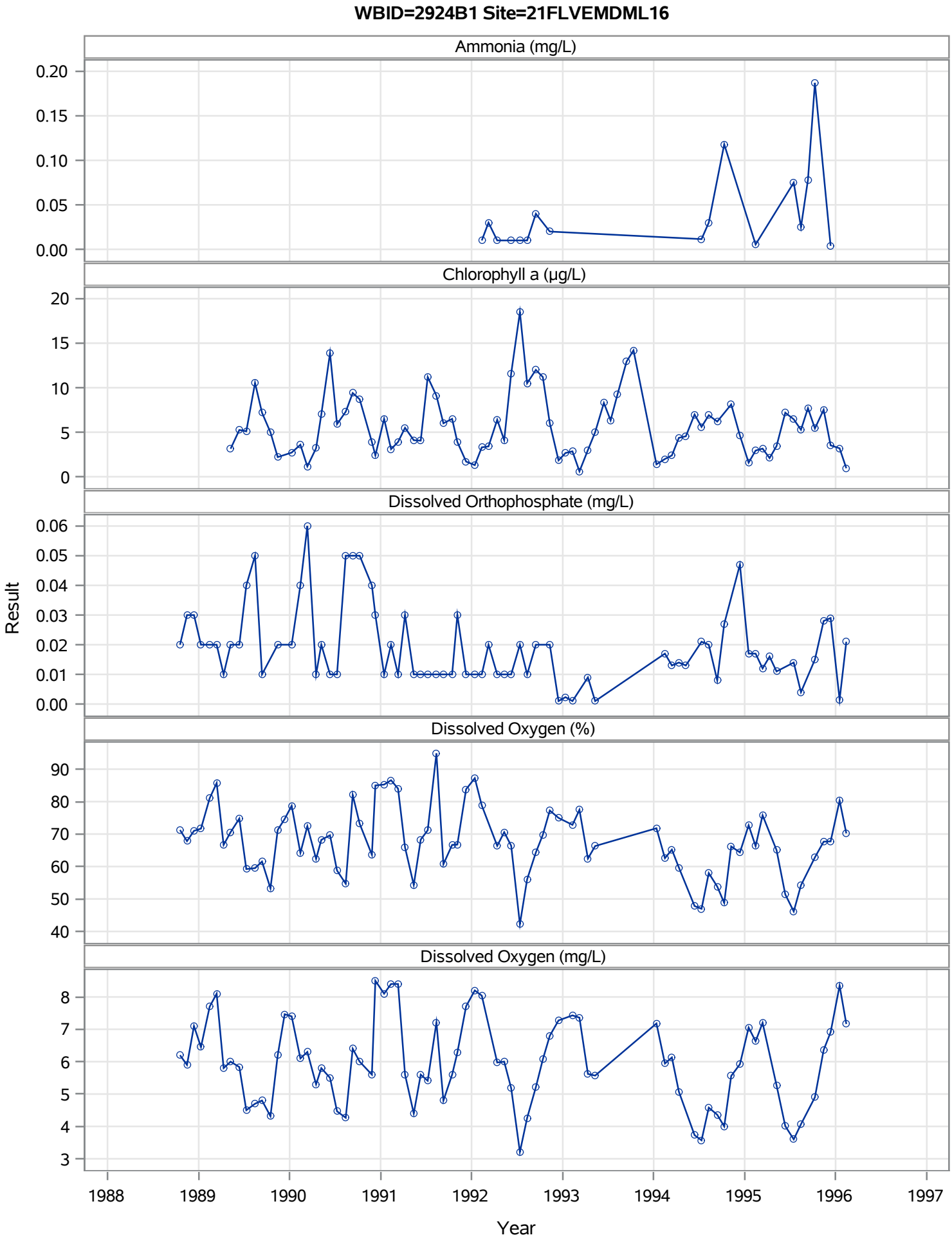

WBID=2924B1 Site=21FLVEMDML14
Enterococci (#/100ml)
2500
2000
1500
1000
500
0
Fecal COliform (#/100ml)
150
100
50
0
Nitrite + Nitrate (mg/L)
0.06
0.04
0.02
0.00
Salinity (PSU)
40
30
20
10
Secchi Disk Depth (m)
1.50
1.25
1.00
0.75
0.50
Result
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

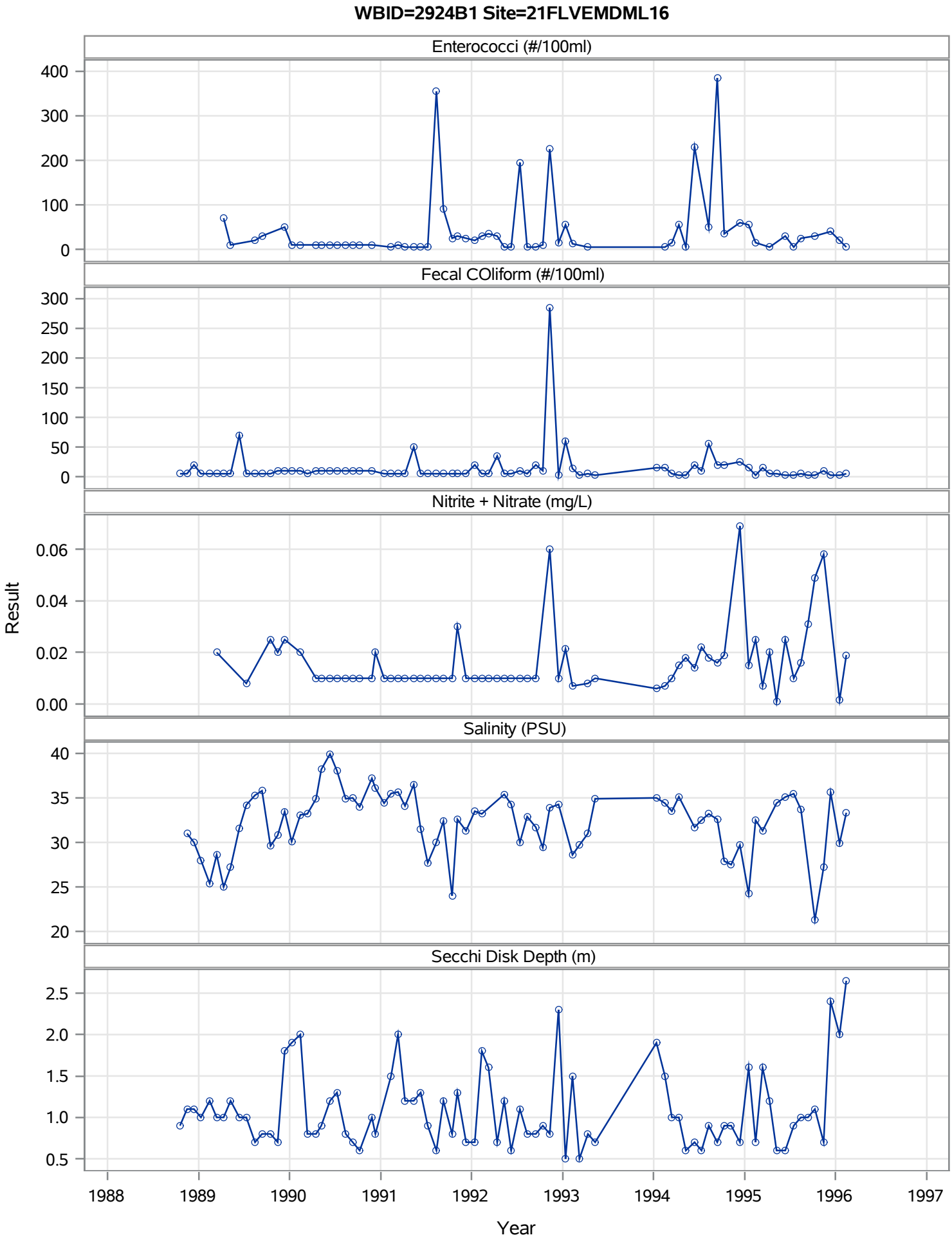

WBID=2924B1 Site=21FLVEMDML14
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
3
2
1
0
Total Nitrogen (mg/L)
3
2
1
0
Result
Total Phosphorus (mg/L)
0.30
0.25
0.20
0.15
0.10
0.05
0.00
pH
9.0
8.5
8.0
7.5
7.0
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

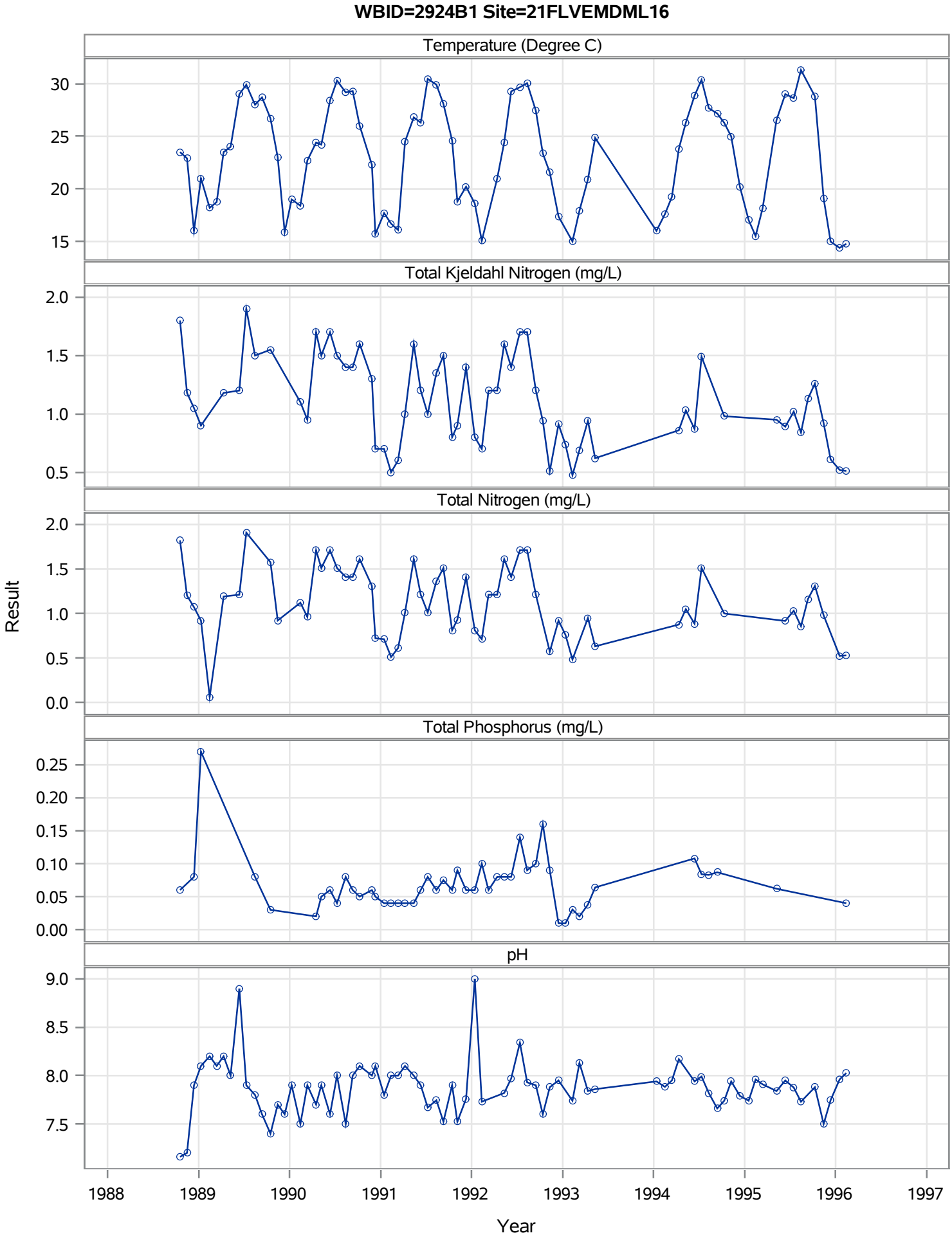

WBID=2924B1 Site=21FLVEMDML15
Ammonia (mg/L)
0.15
0.10
0.05
0.00
Chlorophyll a (µg/L)
25
20
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.05
0.04
0.03
0.02
0.01
0.00
Dissolved Oxygen (%)
90
80
70
60
50
Dissolved Oxygen (mg/L)
8
6
4
Result
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

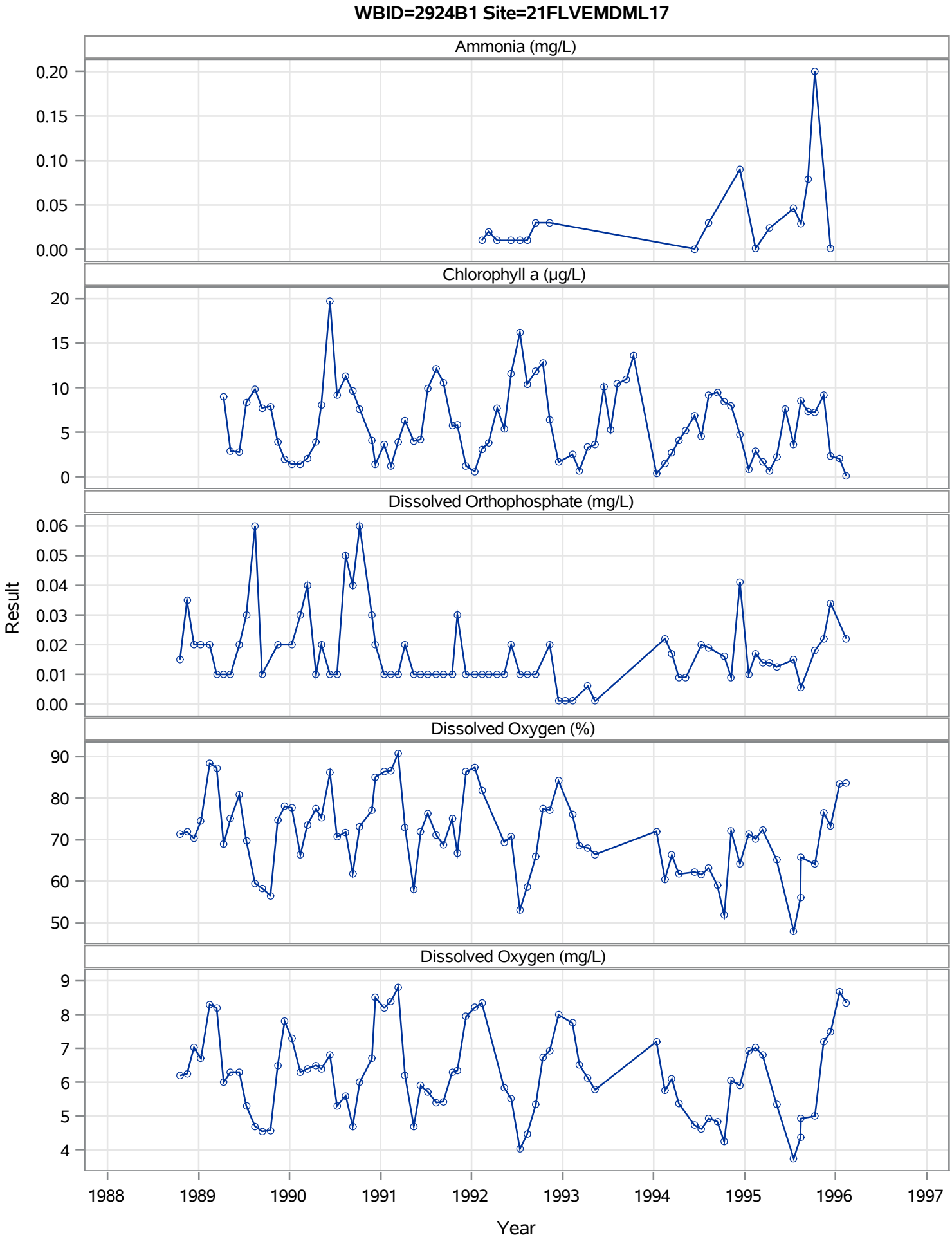

WBID=2924B1 Site=21FLVEMDML15
Enterococci (#/100ml)
1000
800
600
400
200
0
Fecal COliform (#/100ml)
200
150
100
50
0
Nitrite + Nitrate (mg/L)
0.06
0.04
0.02
0.00
Salinity (PSU)
40
35
30
25
20
Secchi Disk Depth (m)
2.5
2.0
1.5
1.0
0.5
Result
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

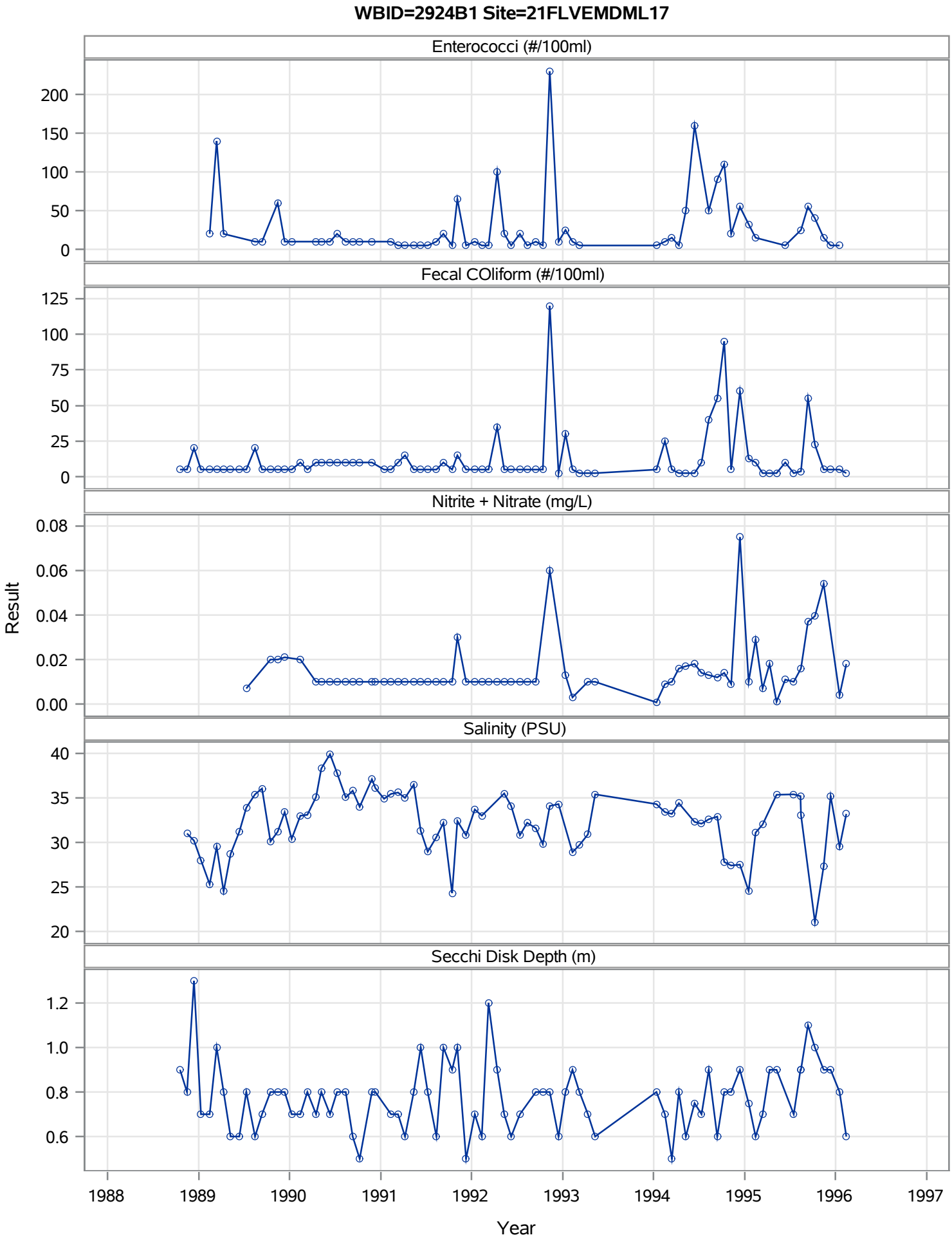

WBID=2924B1 Site=21FLVEMDML15
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Total Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Result
Total Phosphorus (mg/L)
0.3
0.2
0.1
0.0
pH
9.0
8.5
8.0
7.5
7.0
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

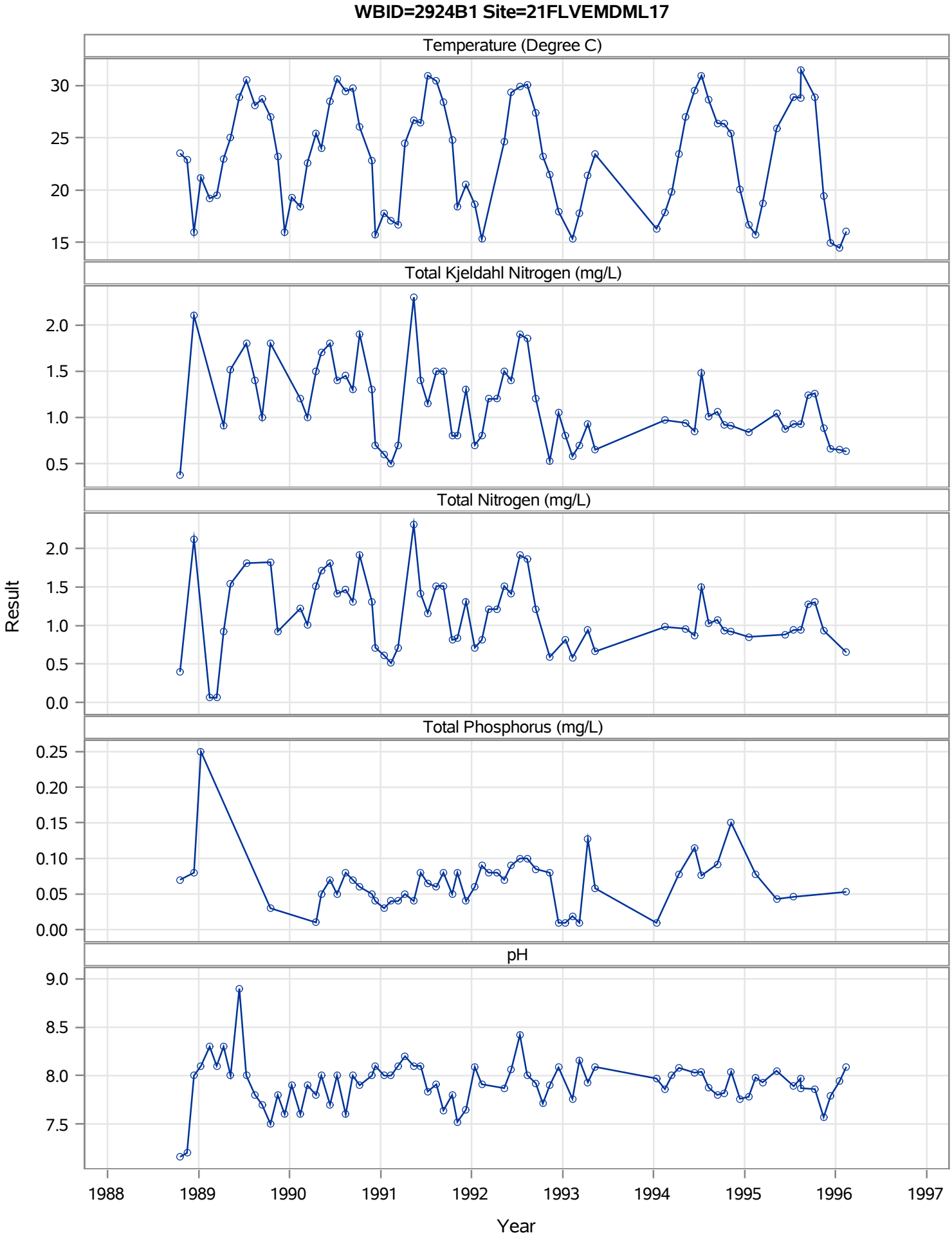

WBID=2924B1 Site=21FLVEMDML16
Ammonia (mg/L)
0.20
0.15
0.10
0.05
0.00
Chlorophyll a (µg/L)
20
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Dissolved Oxygen (%)
90
80
70
60
50
40
Dissolved Oxygen (mg/L)
8
7
6
5
4
3
Result
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

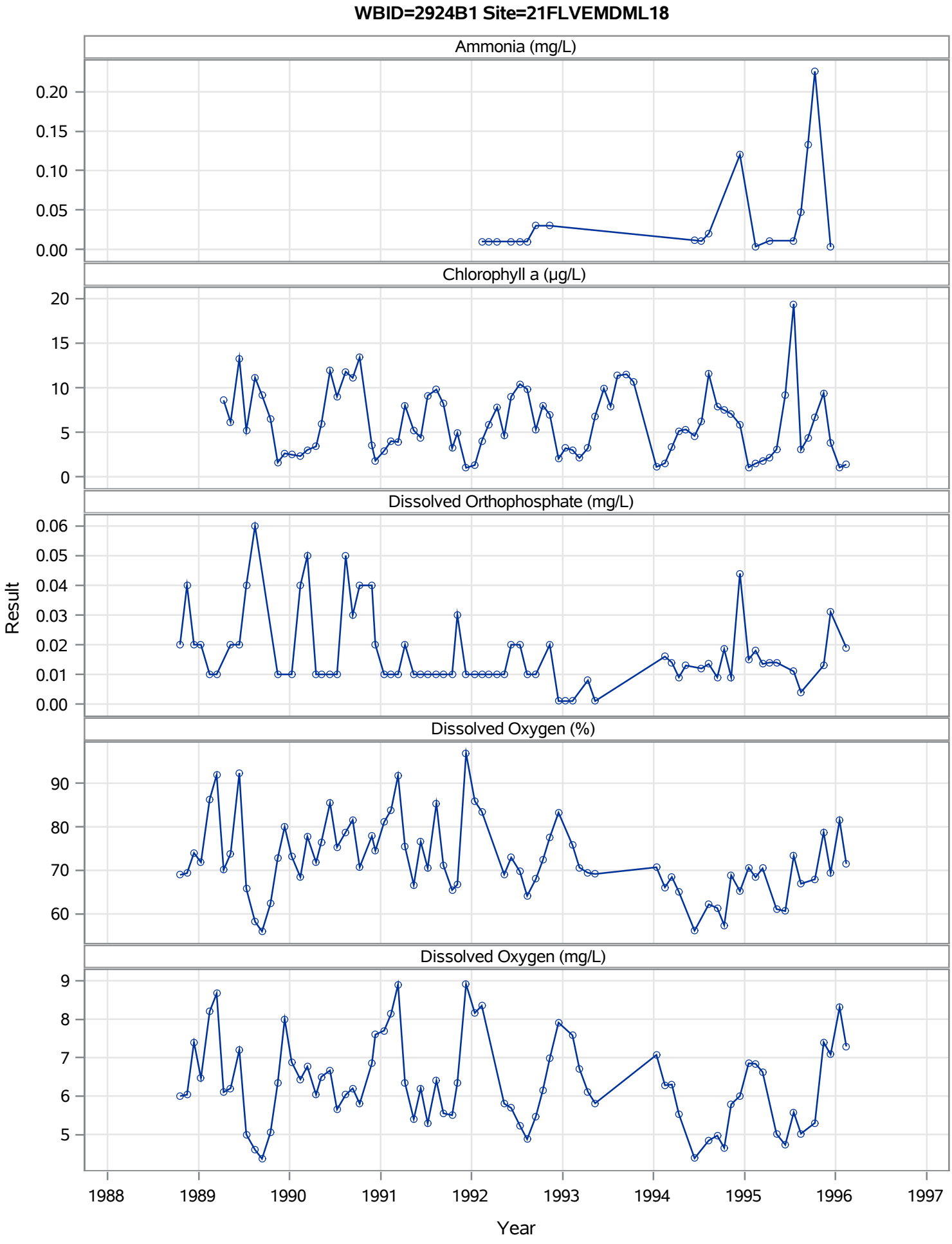

WBID=2924B1 Site=21FLVEMDML16
Enterococci (#/100ml)
400
300
200
100
0
Fecal COliform (#/100ml)
300
250
200
150
100
50
0
Nitrite + Nitrate (mg/L)
0.06
0.04
0.02
0.00
Salinity (PSU)
40
35
30
25
20
Secchi Disk Depth (m)
2.5
2.0
1.5
1.0
0.5
Result
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

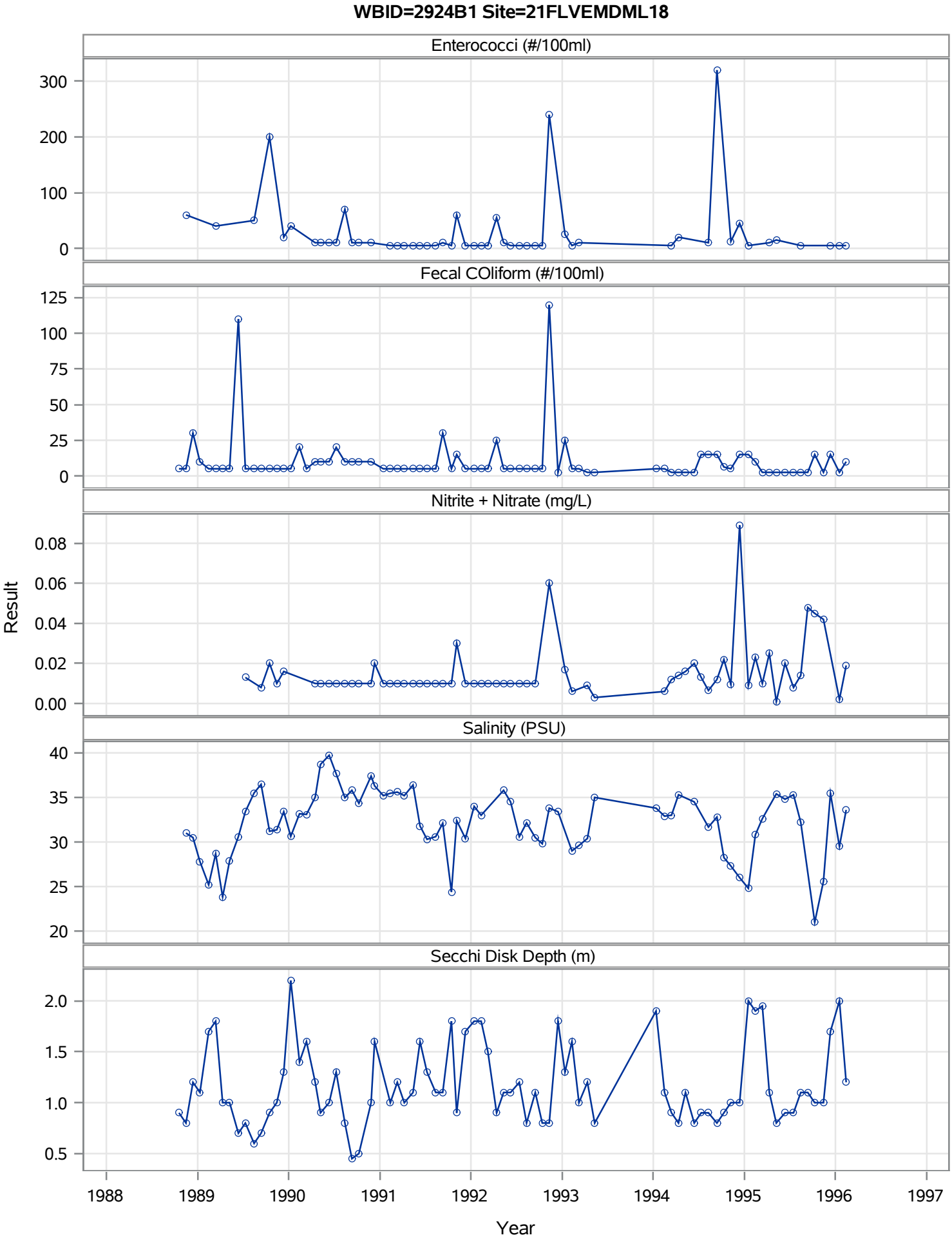

WBID=2924B1 Site=21FLVEMDML16
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
2.0
1.5
1.0
0.5
Total Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Result
Total Phosphorus (mg/L)
0.25
0.20
0.15
0.10
0.05
0.00
pH
9.0
8.5
8.0
7.5
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

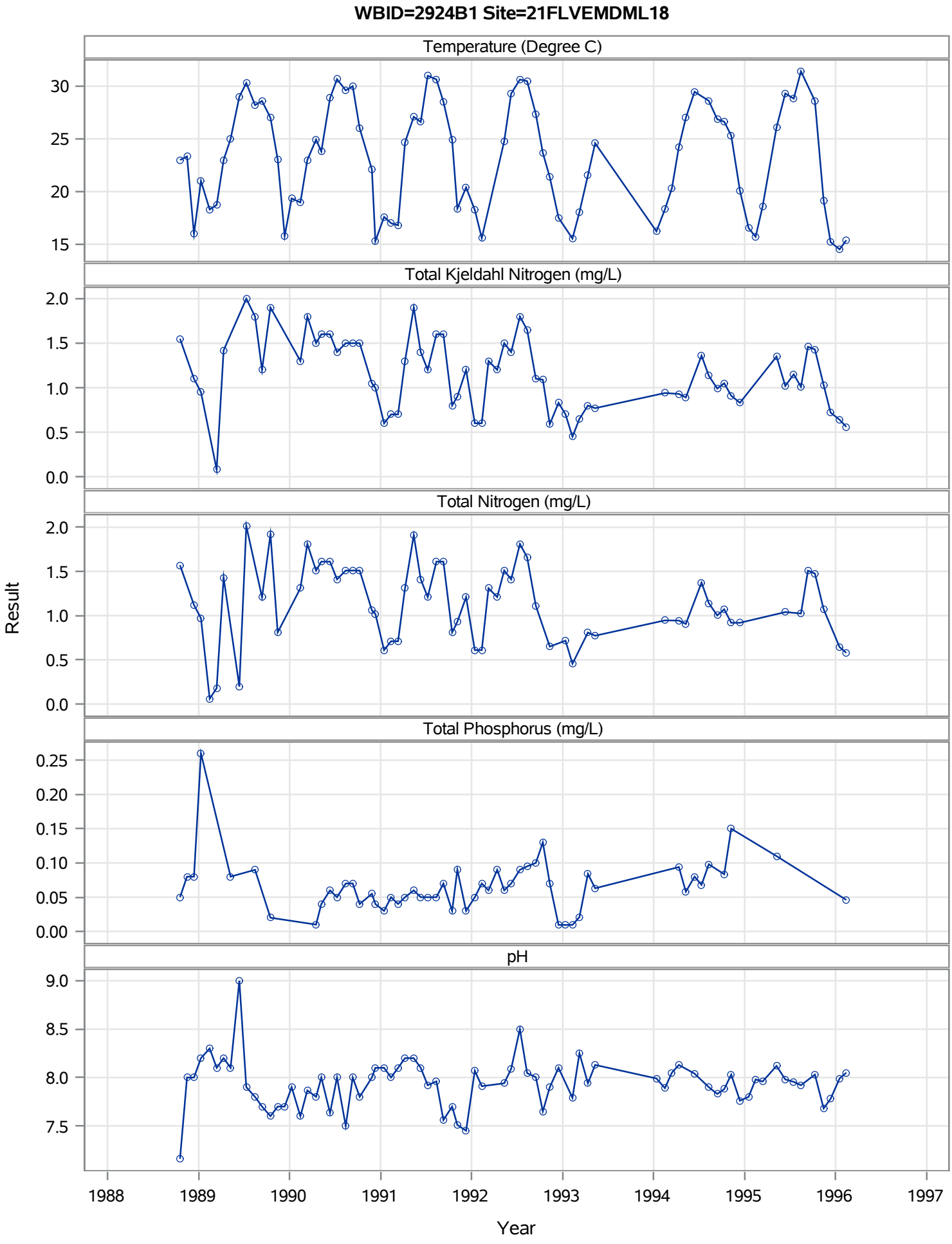

WBID=2924B1 Site=21FLVEMDML17
Ammonia (mg/L)
0.20
0.15
0.10
0.05
0.00
Chlorophyll a (µg/L)
20
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Dissolved Oxygen (%)
90
80
70
60
50
Dissolved Oxygen (mg/L)
9
8
7
6
5
4
Result
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

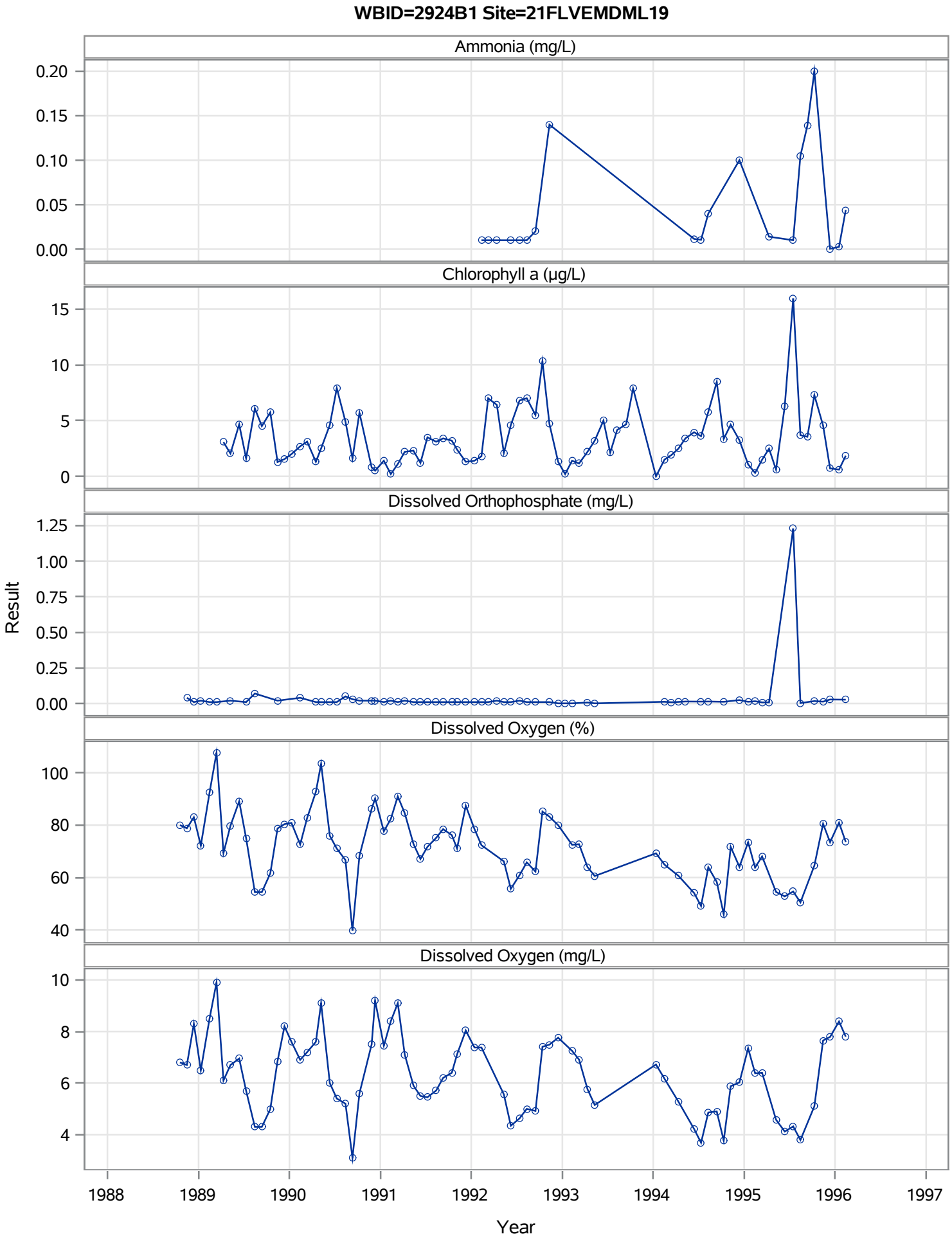

WBID=2924B1 Site=21FLVEMDML17
Enterococci (#/100ml)
200
150
100
50
0
Fecal COliform (#/100ml)
125
100
75
50
25
0
Nitrite + Nitrate (mg/L)
0.08
0.06
0.04
0.02
0.00
Salinity (PSU)
40
35
30
25
20
Secchi Disk Depth (m)
1.2
1.0
0.8
0.6
Result
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

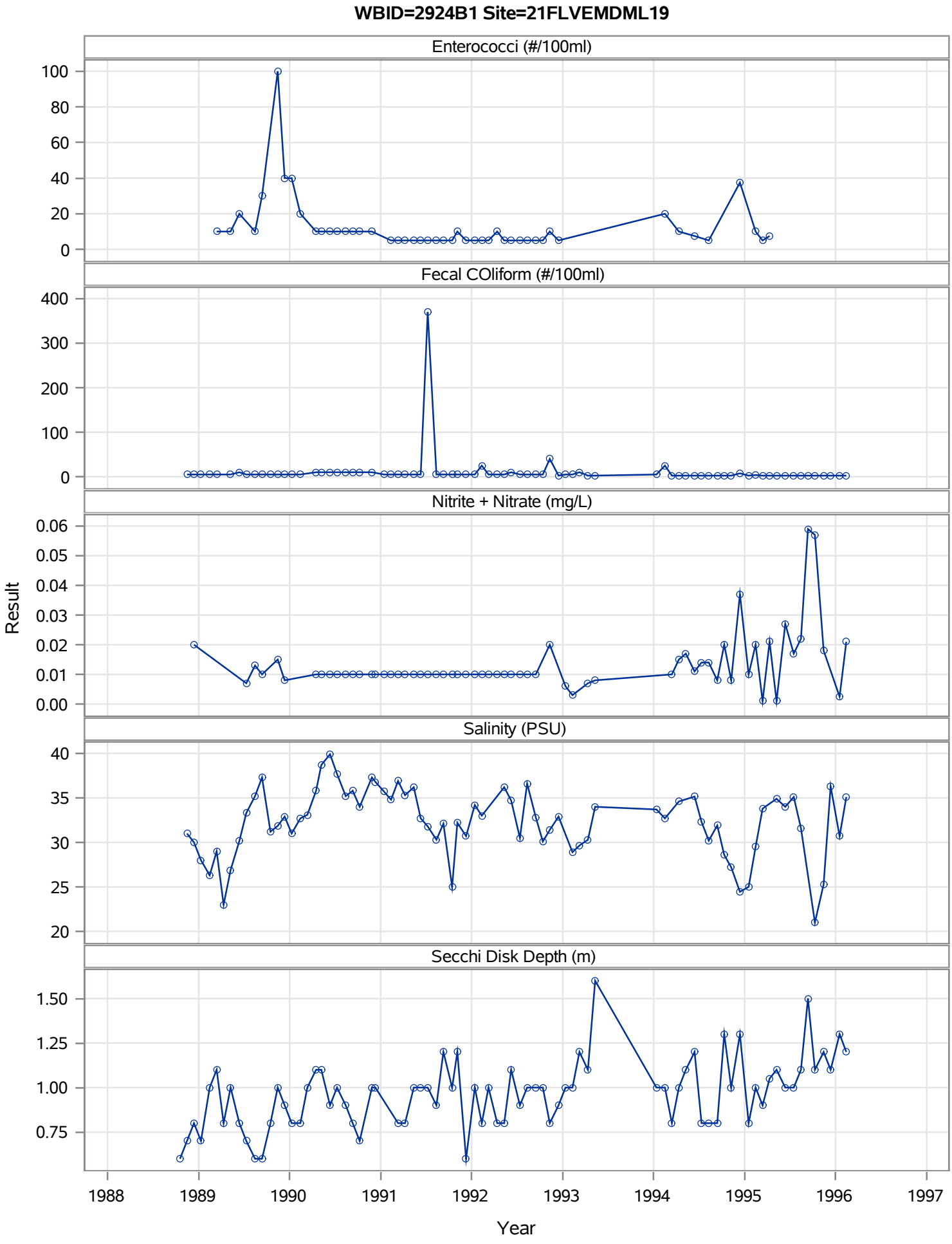

WBID=2924B1 Site=21FLVEMDML17
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
2.0
1.5
1.0
0.5
Total Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Result
Total Phosphorus (mg/L)
0.25
0.20
0.15
0.10
0.05
0.00
pH
9.0
8.5
8.0
7.5
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

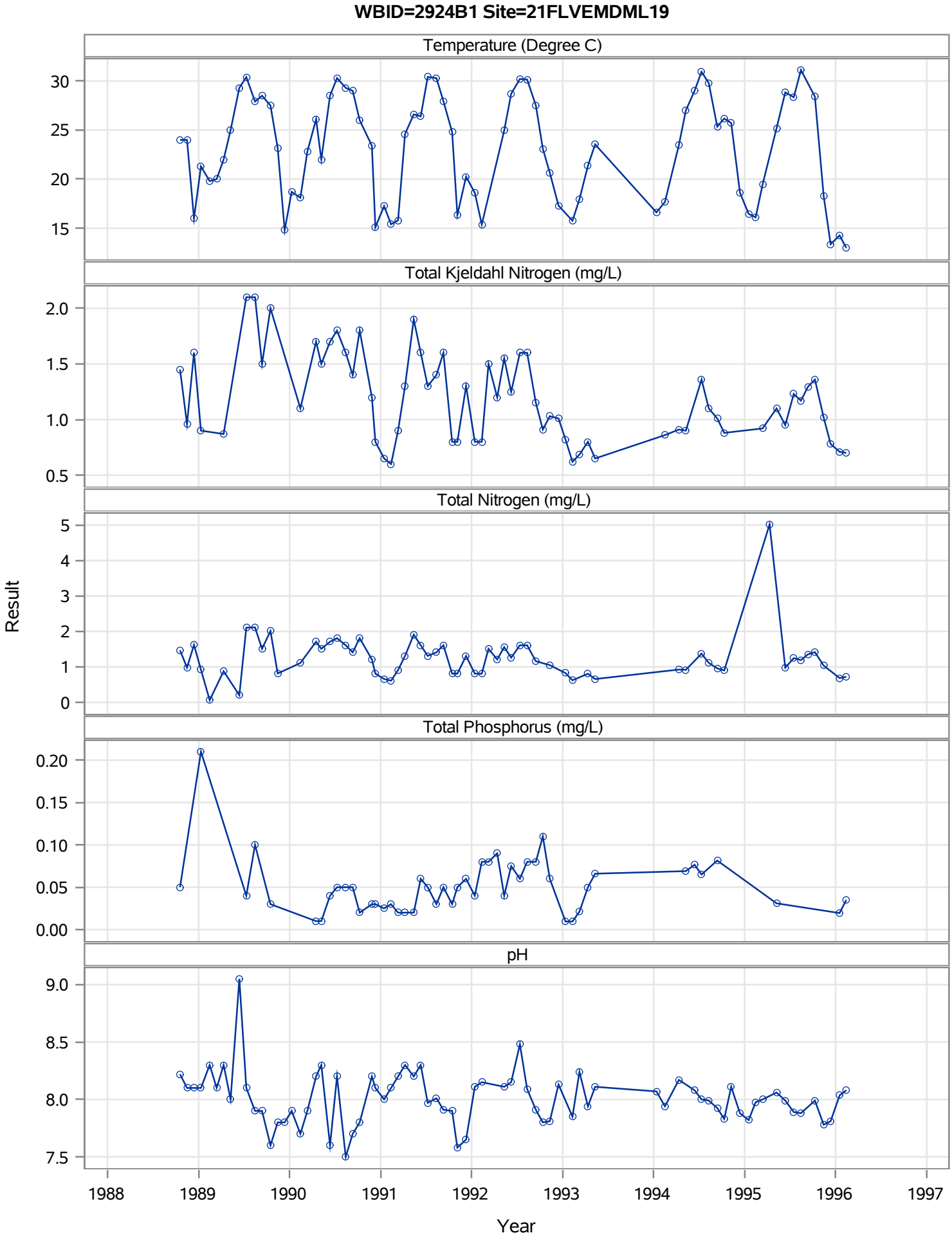

WBID=2924B1 Site=21FLVEMDML18
Ammonia (mg/L)
0.20
0.15
0.10
0.05
0.00
Chlorophyll a (µg/L)
20
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Result
Dissolved Oxygen (%)
90
80
70
60
Dissolved Oxygen (mg/L)
9
8
7
6
5
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

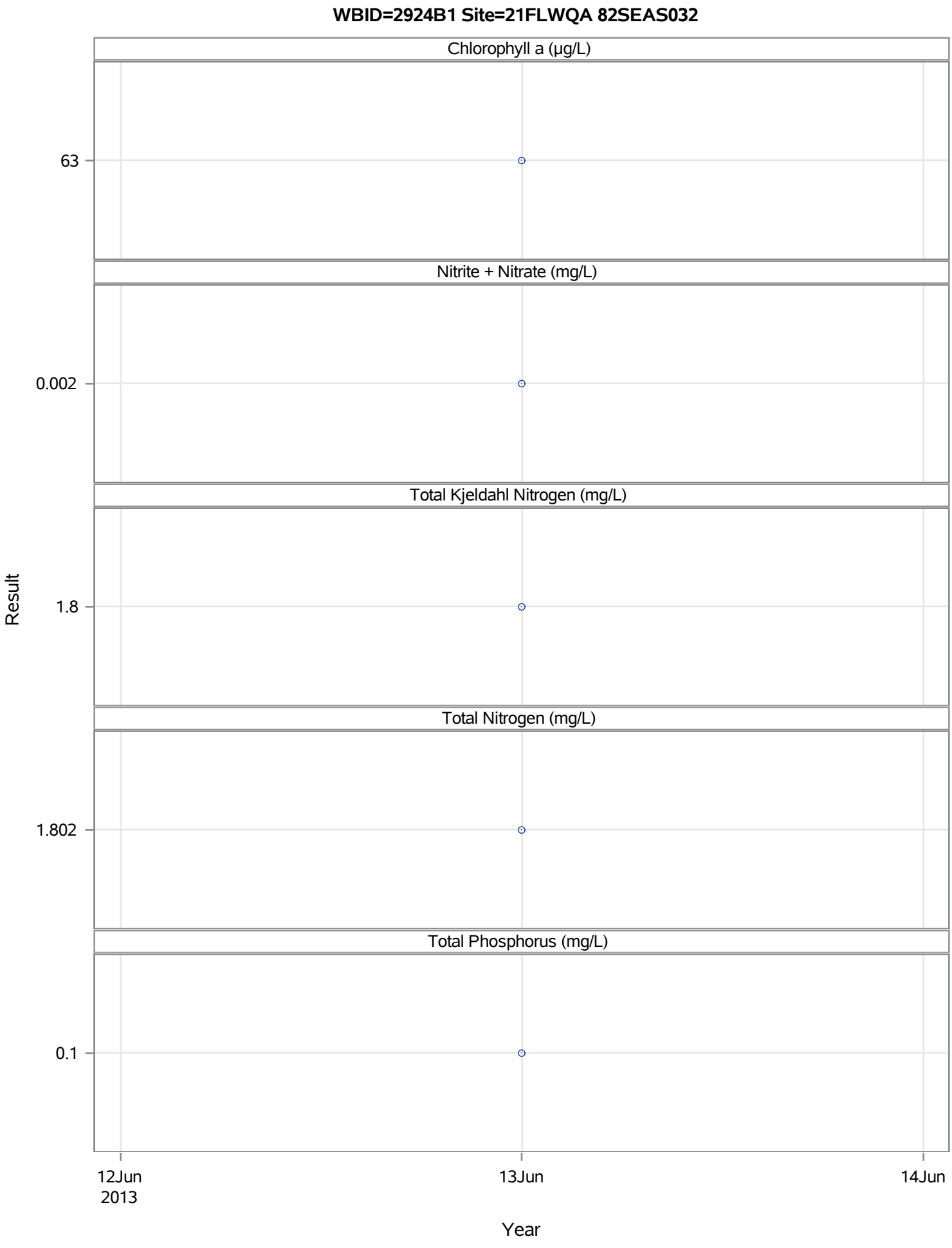

WBID=2924B1 Site=21FLVEMDML18
Enterococci (#/100ml)
300
200
100
0
Fecal COliform (#/100ml)
125
100
75
50
25
0
Nitrite + Nitrate (mg/L)
0.08
0.06
0.04
0.02
0.00
Result
Salinity (PSU)
40
35
30
25
20
Secchi Disk Depth (m)
2.0
1.5
1.0
0.5
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

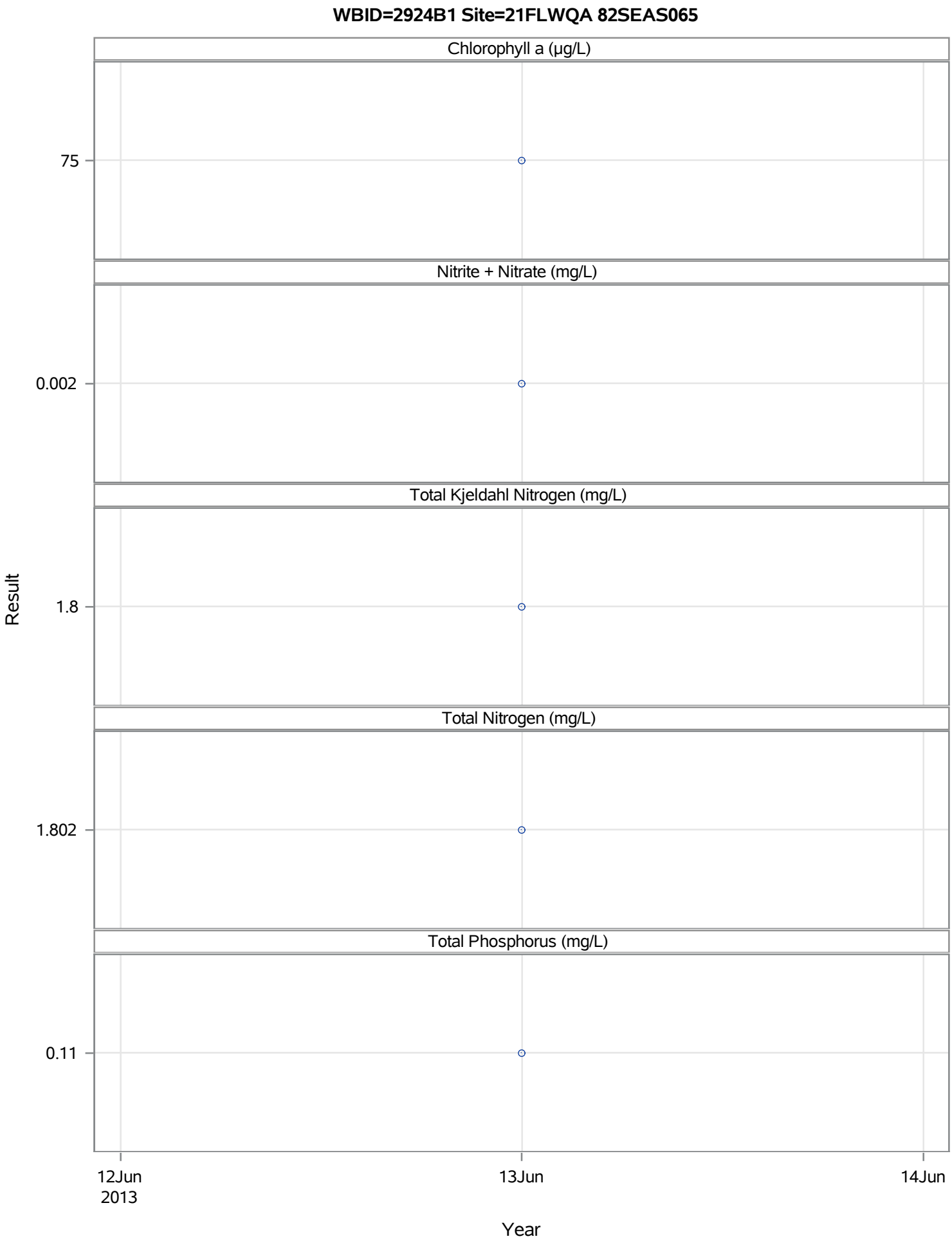

WBID=2924B1 Site=21FLVEMDML18
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Total Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Result
Total Phosphorus (mg/L)
0.25
0.20
0.15
0.10
0.05
0.00
pH
9.0
8.5
8.0
7.5
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

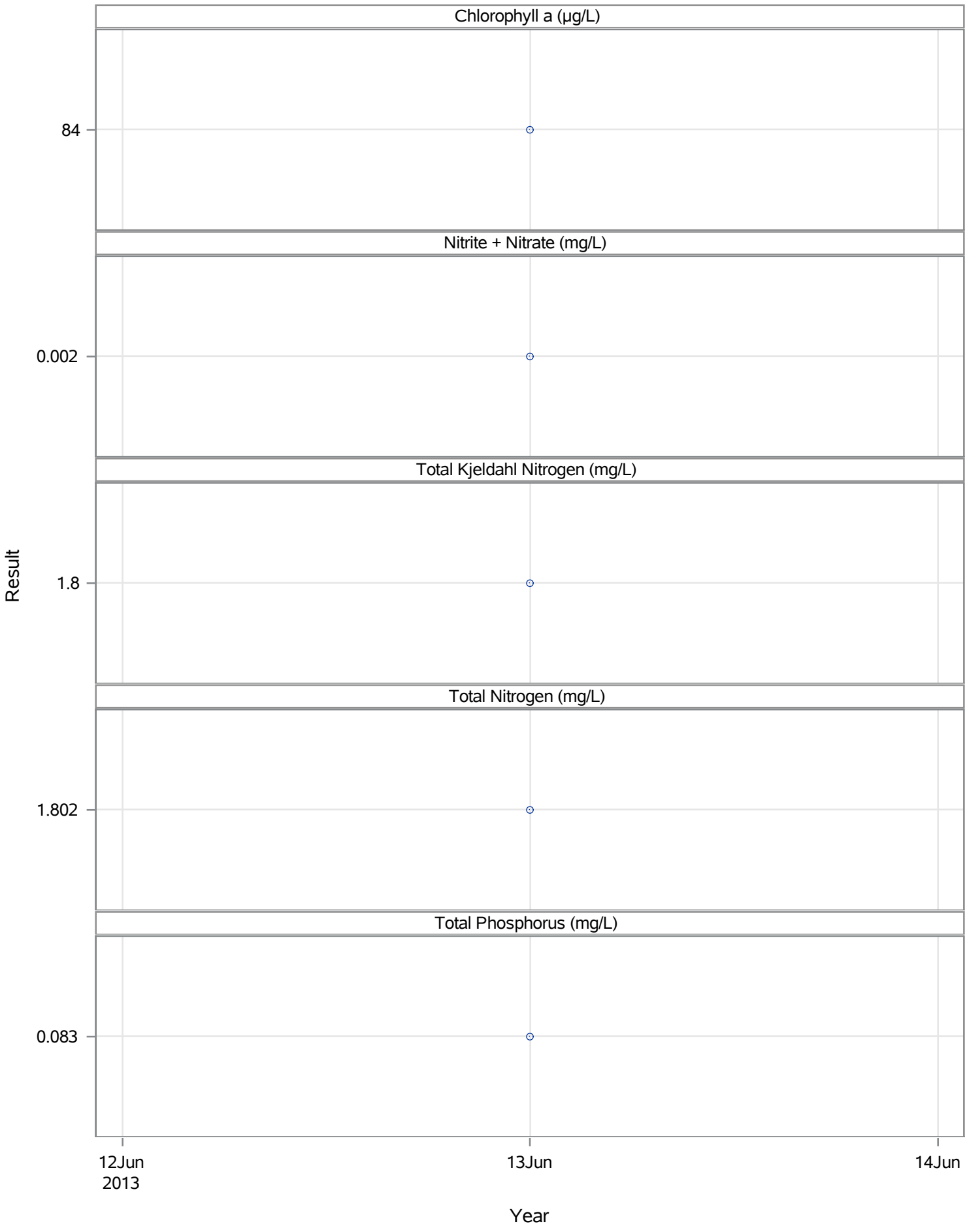

WBID=2924B1 Site=21FLVEMDML19
Ammonia (mg/L)
0.20
0.15
0.10
0.05
0.00
Chlorophyll a (µg/L)
15
10
5
0
Dissolved Orthophosphate (mg/L)
1.25
1.00
0.75
0.50
0.25
0.00
Result
Dissolved Oxygen (%)
100
80
60
40
Dissolved Oxygen (mg/L)
10
8
6
4
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

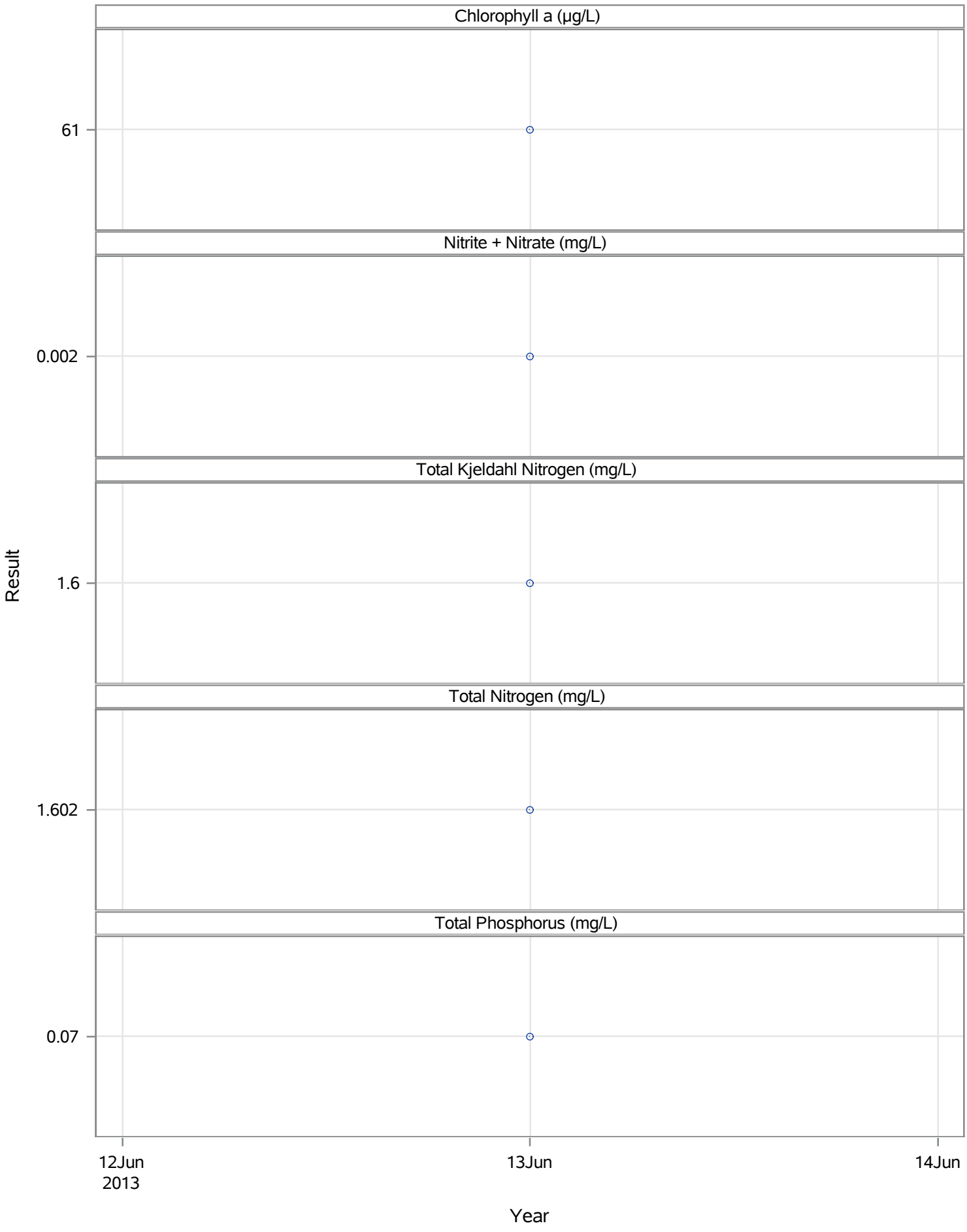

WBID=2924B1 Site=21FLVEMDML19
Enterococci (#/100ml)
100
80
60
40
20
0
Fecal COliform (#/100ml)
400
300
200
100
0
Nitrite + Nitrate (mg/L)
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Salinity (PSU)
40
35
30
25
20
Secchi Disk Depth (m)
1.50
1.25
1.00
0.75
Result
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

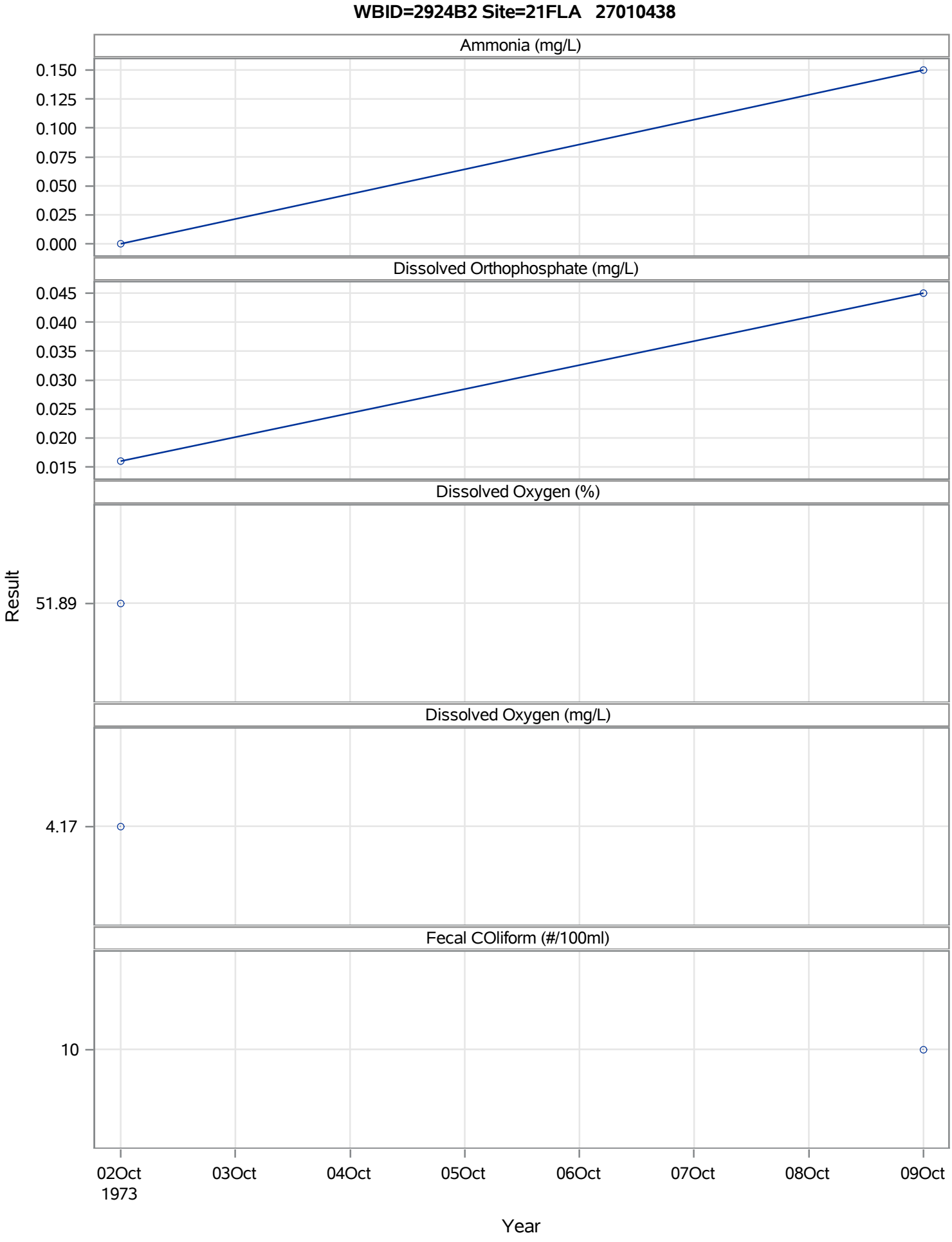

WBID=2924B1 Site=21FLVEMDML19
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
2.0
1.5
1.0
0.5
Total Nitrogen (mg/L)
5
4
3
2
1
0
Result
Total Phosphorus (mg/L)
0.20
0.15
0.10
0.05
0.00
pH
9.0
8.5
8.0
7.5
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
Year

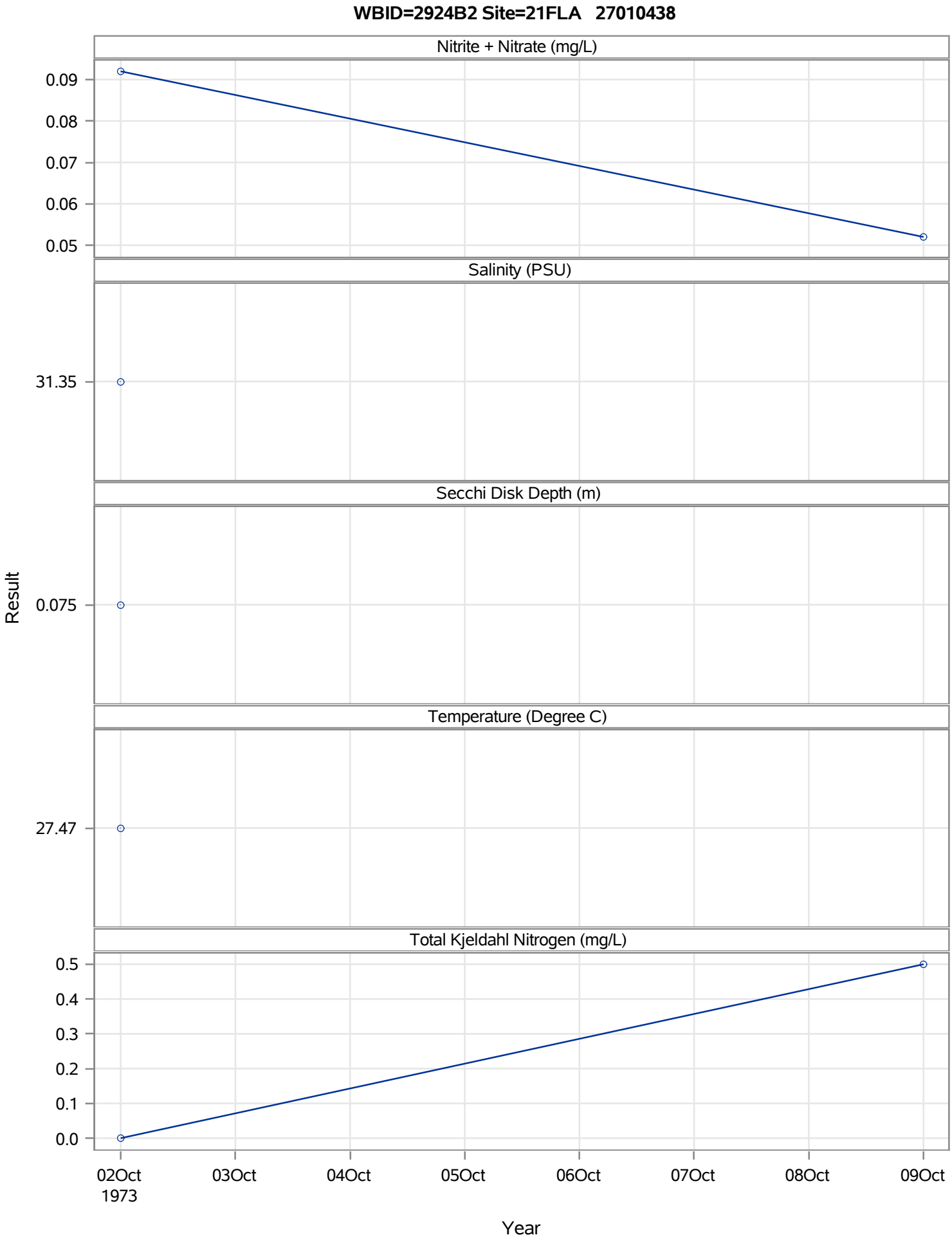

WBID=2924B1 Site=21FLWQA 82SEAS032
Chlorophyll a (µg/L)
63
Nitrite + Nitrate (mg/L)
0.002
Total Kjeldahl Nitrogen (mg/L)
1.8
Total Nitrogen (mg/L)
1.802
Total Phosphorus (mg/L)
0.1
Result
12Jun
2013
13Jun
14Jun
Year

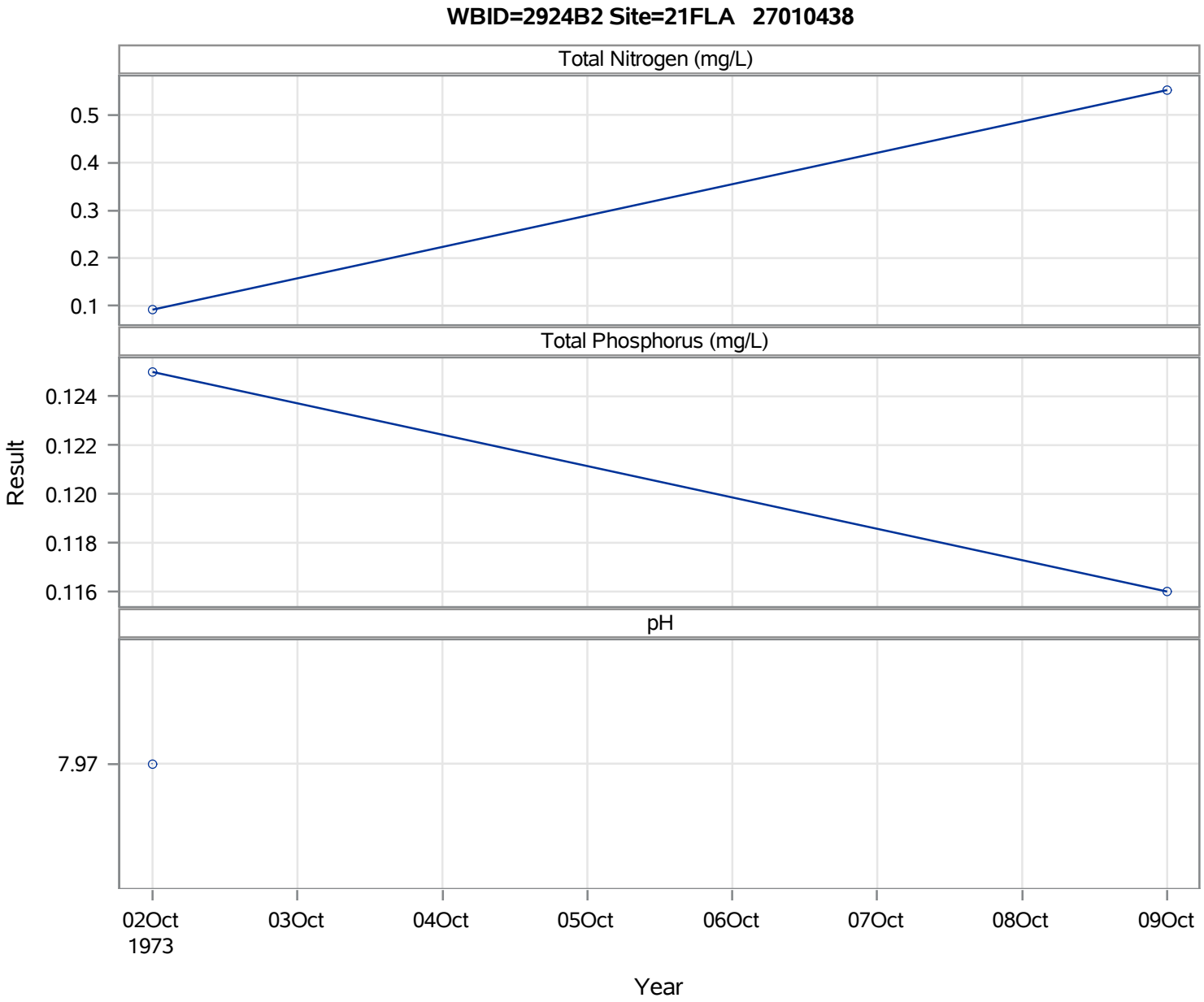

WBID=2924B1 Site=21FLWQA 82SEAS065
Chlorophyll a (µg/L)
75
Nitrite + Nitrate (mg/L)
0.002
Total Kjeldahl Nitrogen (mg/L)
1.8
Total Nitrogen (mg/L)
1.802
Total Phosphorus (mg/L)
0.11
Result
12Jun
2013
13Jun
14Jun
Year

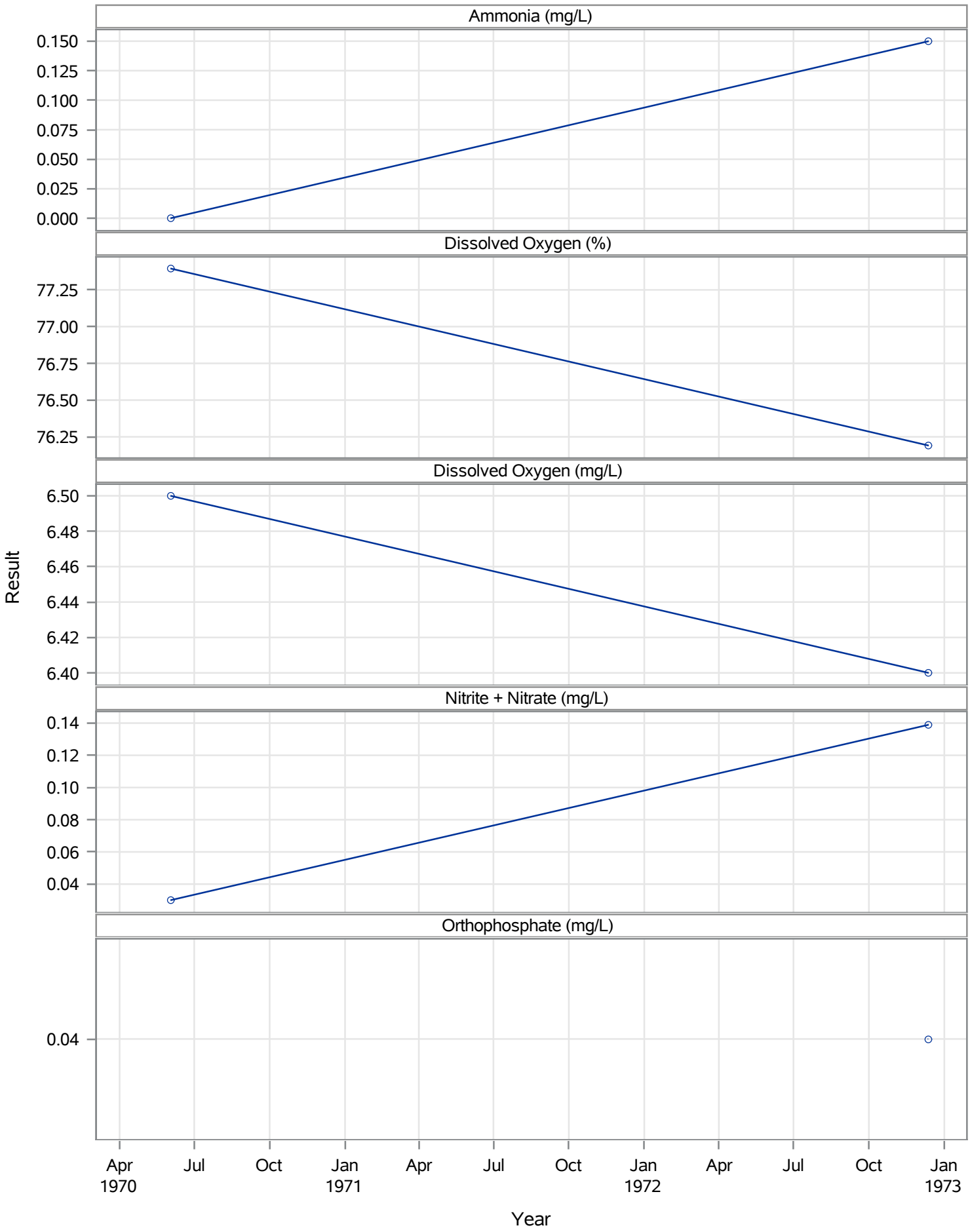

WBID=2924B1 Site=21FLWQA 82SEAS105
Chlorophyll a (µg/L)
84
Nitrite + Nitrate (mg/L)
0.002
Total Kjeldahl Nitrogen (mg/L)
1.8
Total Nitrogen (mg/L)
1.802
Total Phosphorus (mg/L)
0.083
Result
12Jun
2013
13Jun
14Jun
Year

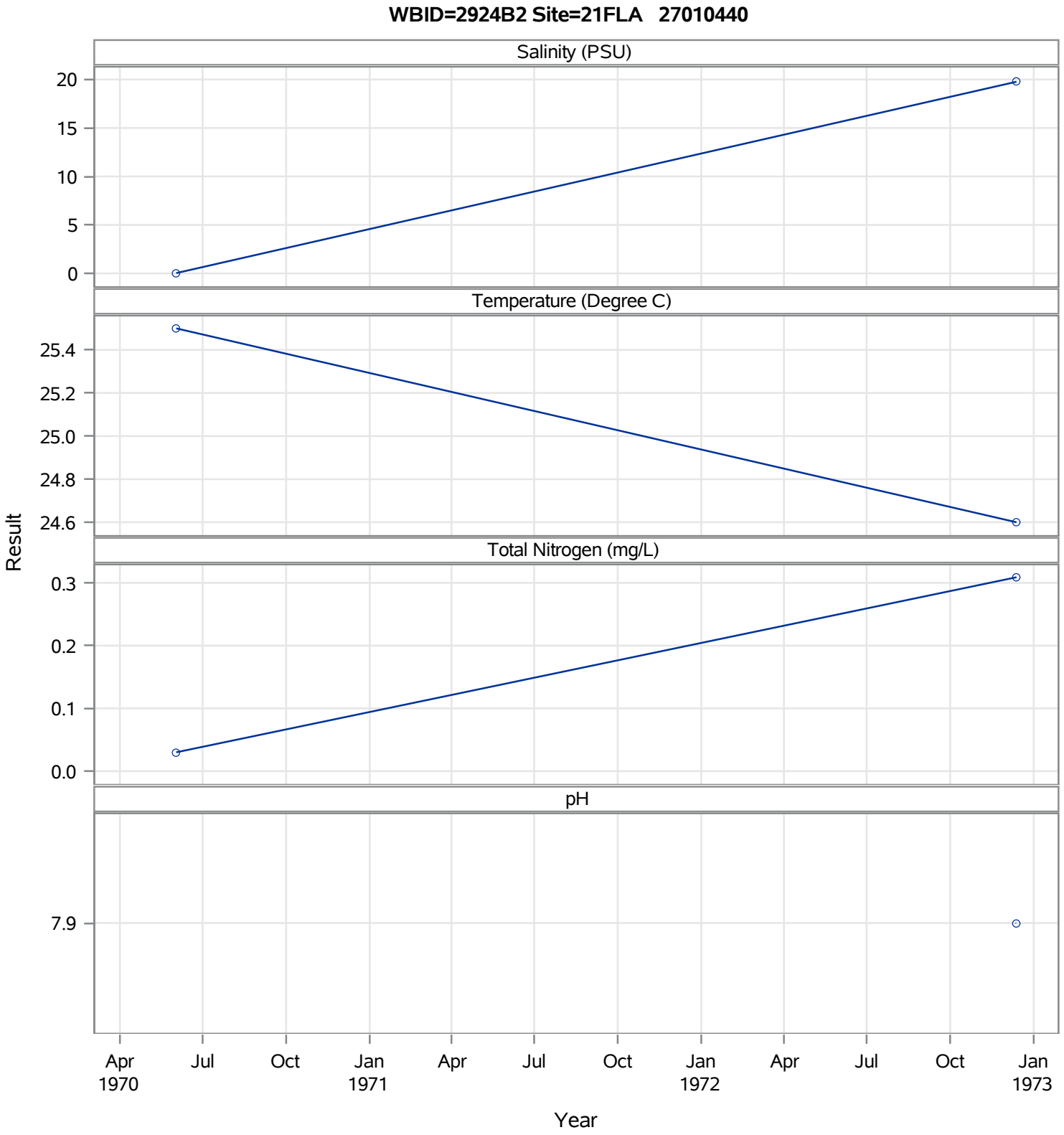

WBID=2924B1 Site=21FLWQA 82SEAS180
Chlorophyll a (µg/L)
61
Nitrite + Nitrate (mg/L)
0.002
Total Kjeldahl Nitrogen (mg/L)
1.6
Total Nitrogen (mg/L)
1.602
Total Phosphorus (mg/L)
0.07
Result
12Jun
2013
13Jun
14Jun
Year

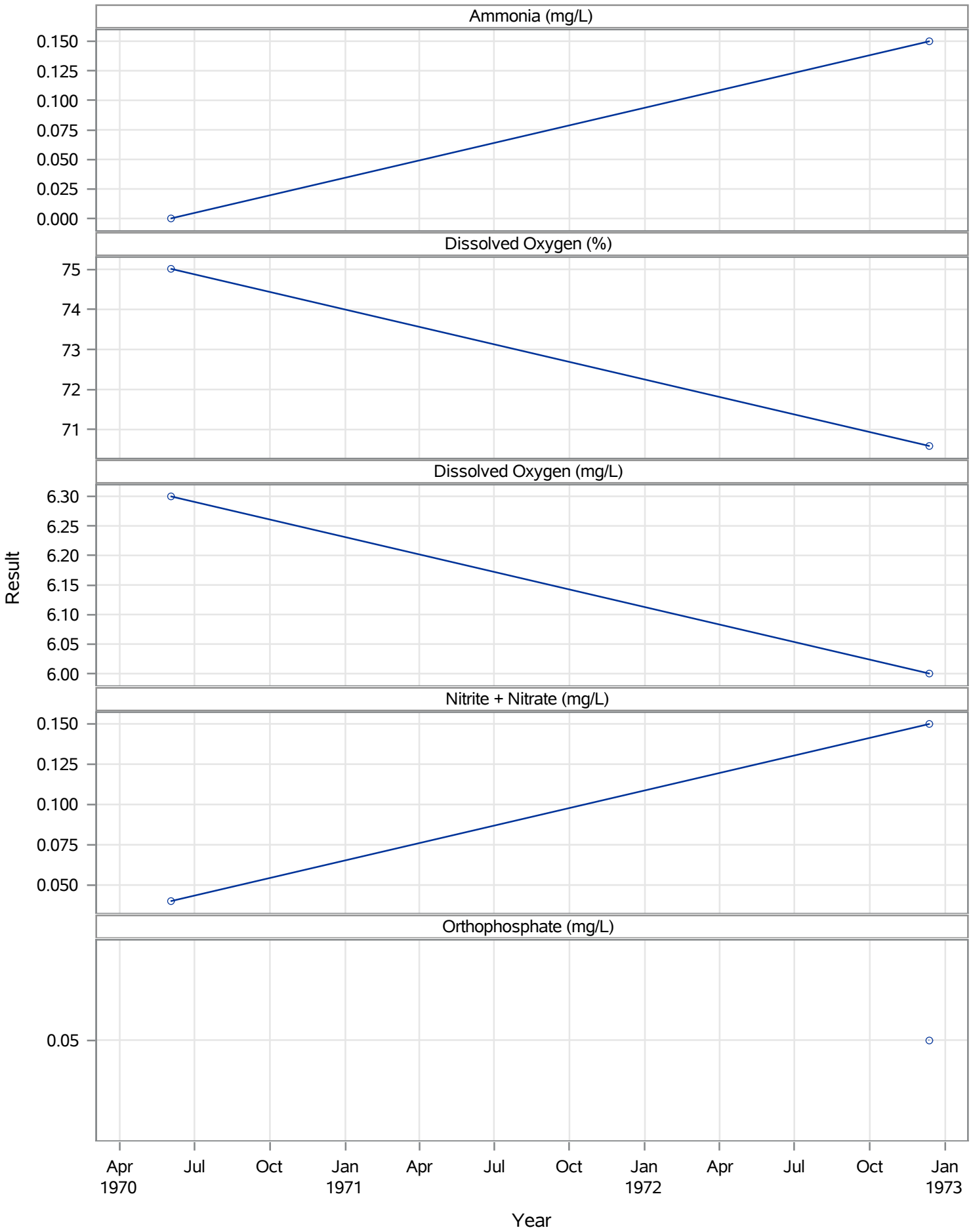

WBID=2924B2 Site=21FLA 27010438
Ammonia (mg/L)
0.150
0.125
0.100
0.075
0.050
0.025
0.000
Dissolved Orthophosphate (mg/L)
0.045
0.040
0.035
0.030
0.025
0.020
0.015
Dissolved Oxygen (%)
51.89
Dissolved Oxygen (mg/L)
4.17
Fecal COliform (#/100ml)
10
Result
02Oct
1973
03Oct
04Oct
05Oct
06Oct
07Oct
08Oct
09Oct
Year

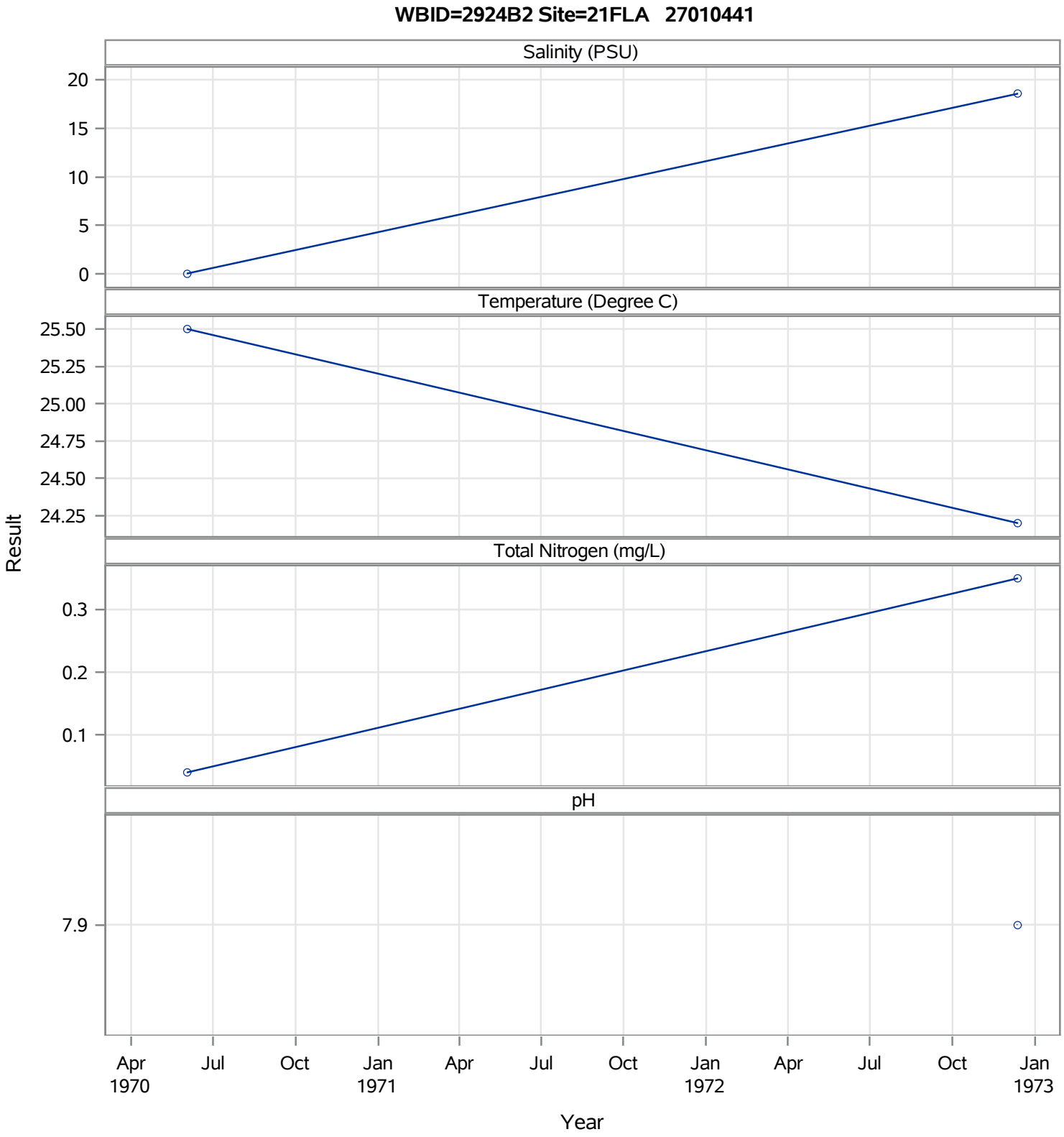

WBID=2924B2 Site=21FLA 27010438
Nitrite + Nitrate (mg/L)
0.09
0.08
0.07
0.06
0.05
Salinity (PSU)
31.35
Secchi Disk Depth (m)
0.075
Temperature (Degree C)
27.47
Total Kjeldahl Nitrogen (mg/L)
0.5
0.4
0.3
0.2
0.1
0.0
Result
02Oct
1973
03Oct
04Oct
05Oct
06Oct
07Oct
08Oct
09Oct
Year

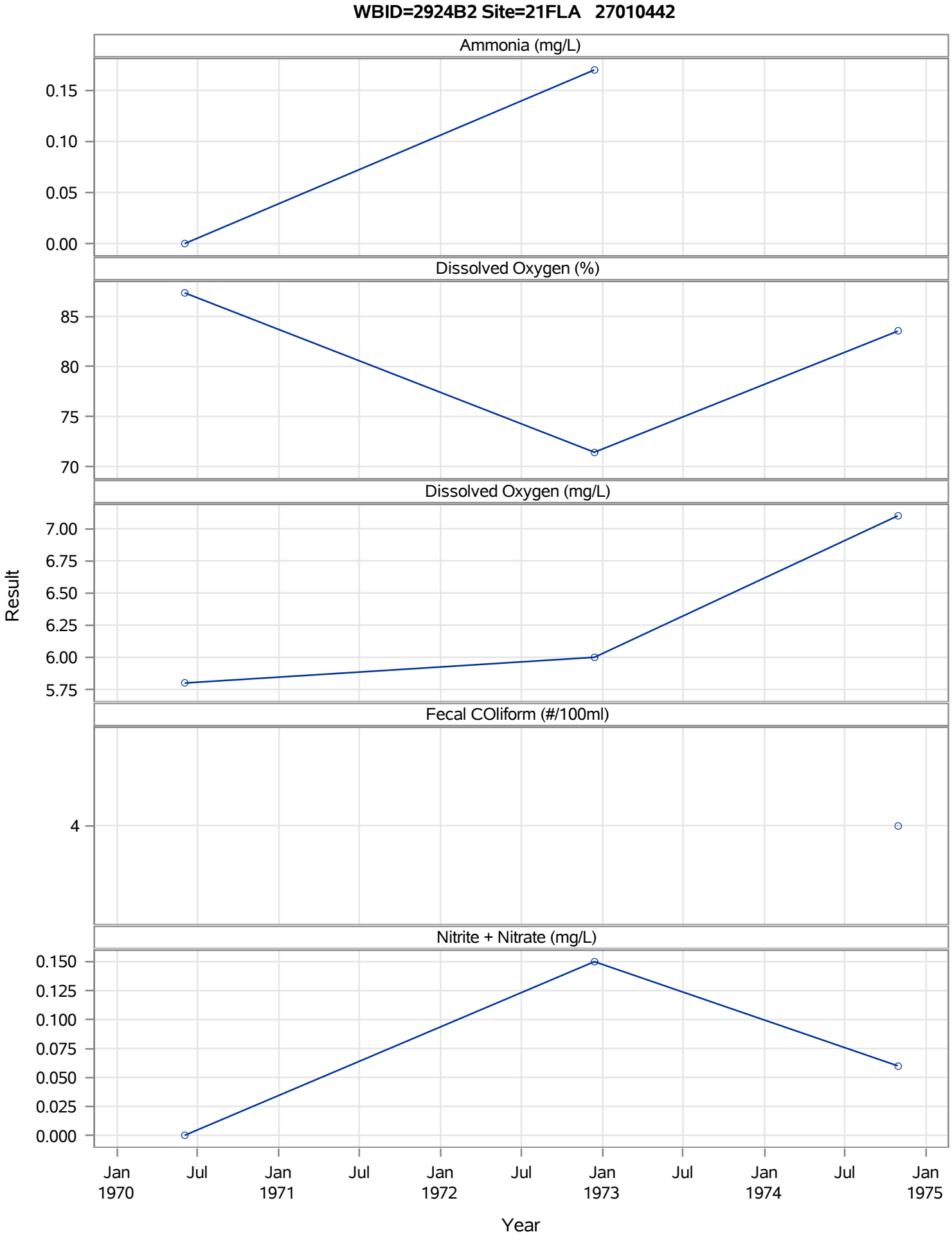

WBID=2924B2 Site=21FLA 27010438
Total Nitrogen (mg/L)
0.5
0.4
0.3
0.2
0.1
Total Phosphorus (mg/L)
0.124
0.122
0.120
0.118
0.116
pH
7.97
Result
02Oct
1973
03Oct
04Oct
05Oct
06Oct
07Oct
08Oct
09Oct
Year

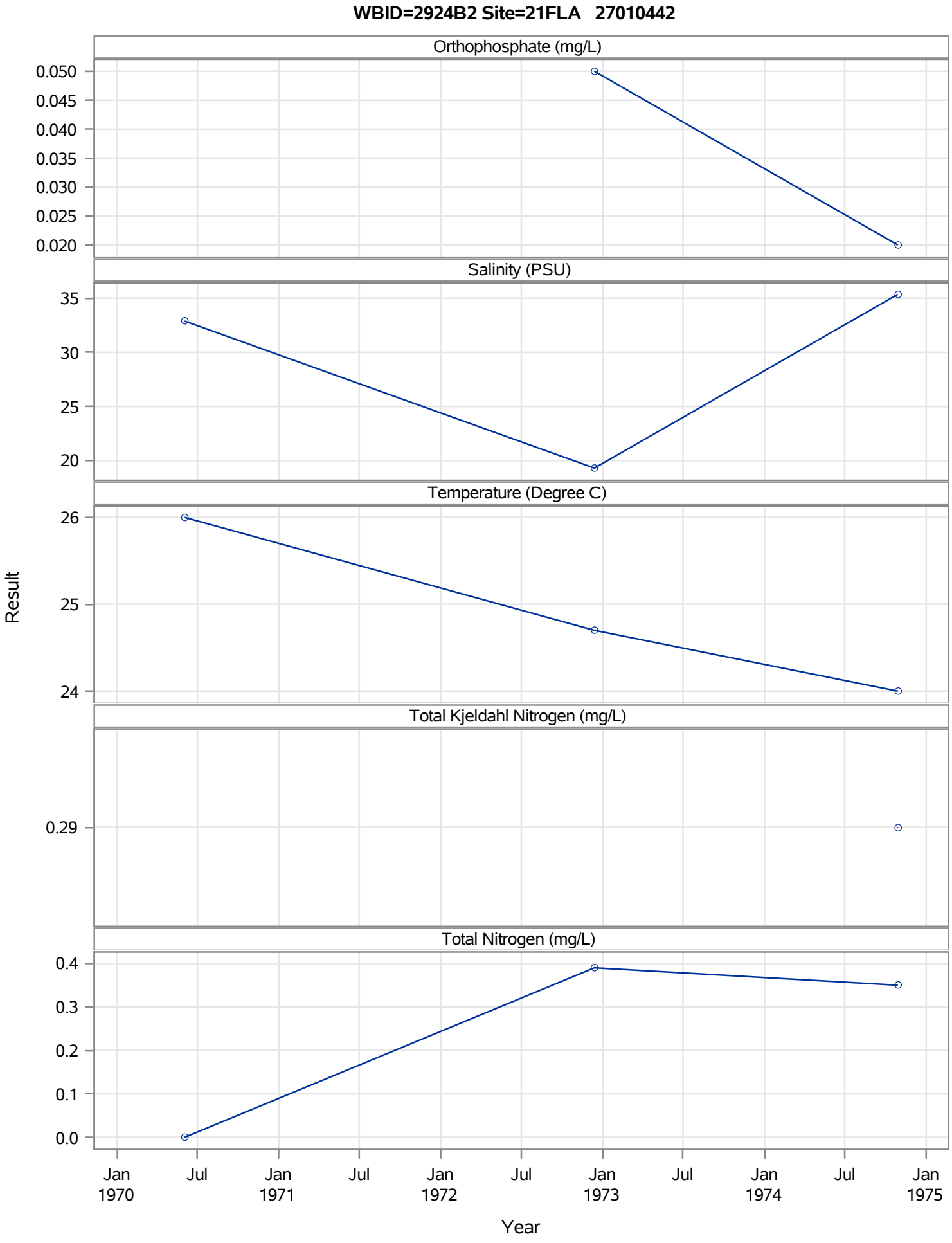

WBID=2924B2 Site=21FLA 27010440
Ammonia (mg/L)
0.150
0.125
0.100
0.075
0.050
0.025
0.000
Dissolved Oxygen (%)
77.25
77.00
76.75
76.50
76.25
Dissolved Oxygen (mg/L)
6.50
6.48
6.46
6.44
6.42
6.40
Nitrite + Nitrate (mg/L)
0.14
0.12
0.10
0.08
0.06
0.04
Orthophosphate (mg/L)
0.04
Result
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

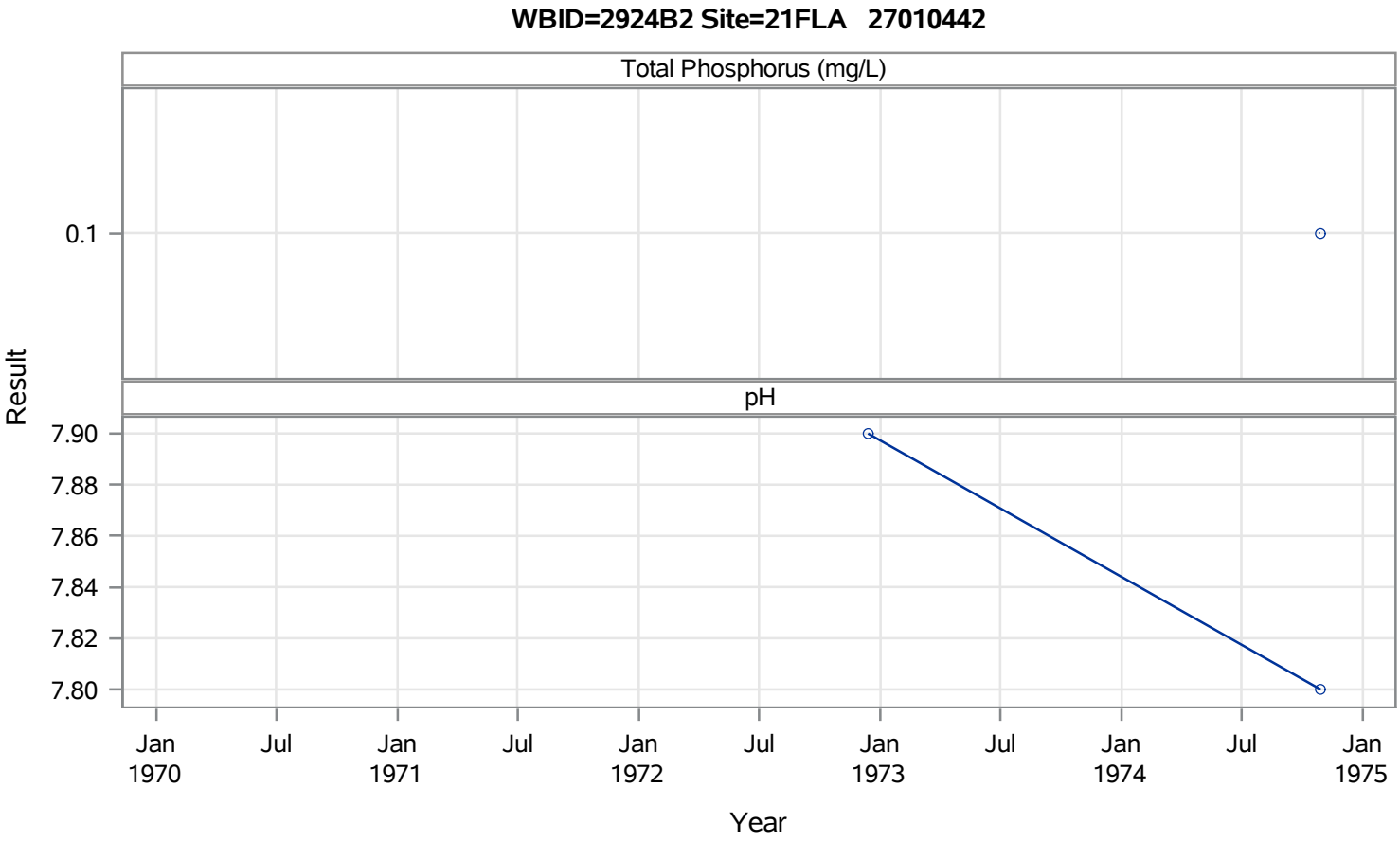

WBID=2924B2 Site=21FLA 27010440
Salinity (PSU)
20
15
10
5
0
Temperature (Degree C)
25.4
25.2
25.0
24.8
24.6
Total Nitrogen (mg/L)
0.3
0.2
0.1
0.0
pH
7.9
Result
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

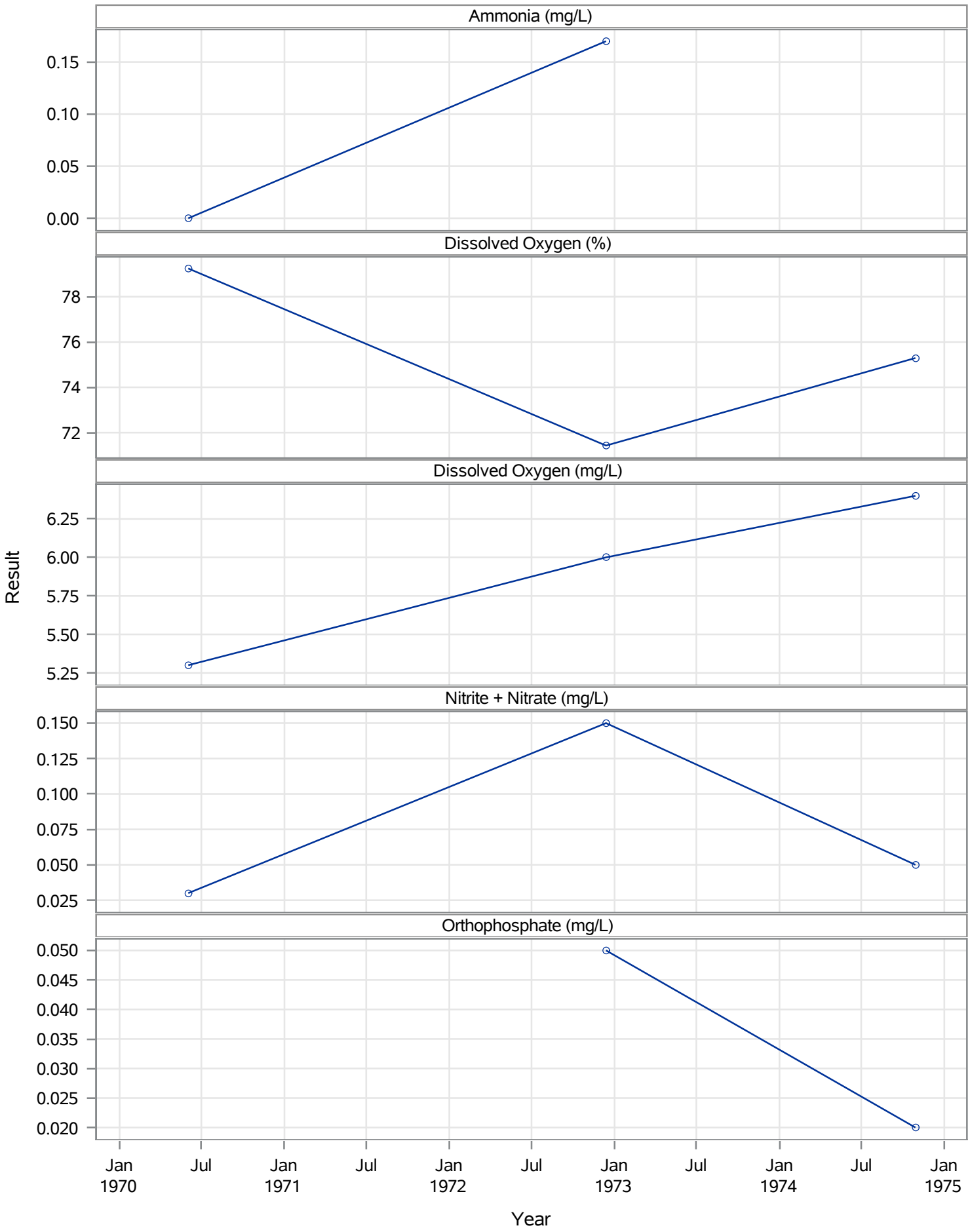

WBID=2924B2 Site=21FLA 27010441
Ammonia (mg/L)
0.150
0.125
0.100
0.075
0.050
0.025
0.000
Dissolved Oxygen (%)
75
74
73
72
71
Dissolved Oxygen (mg/L)
6.30
6.25
6.20
6.15
6.10
6.05
6.00
Nitrite + Nitrate (mg/L)
0.150
0.125
0.100
0.075
0.050
Orthophosphate (mg/L)
0.05
Result
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

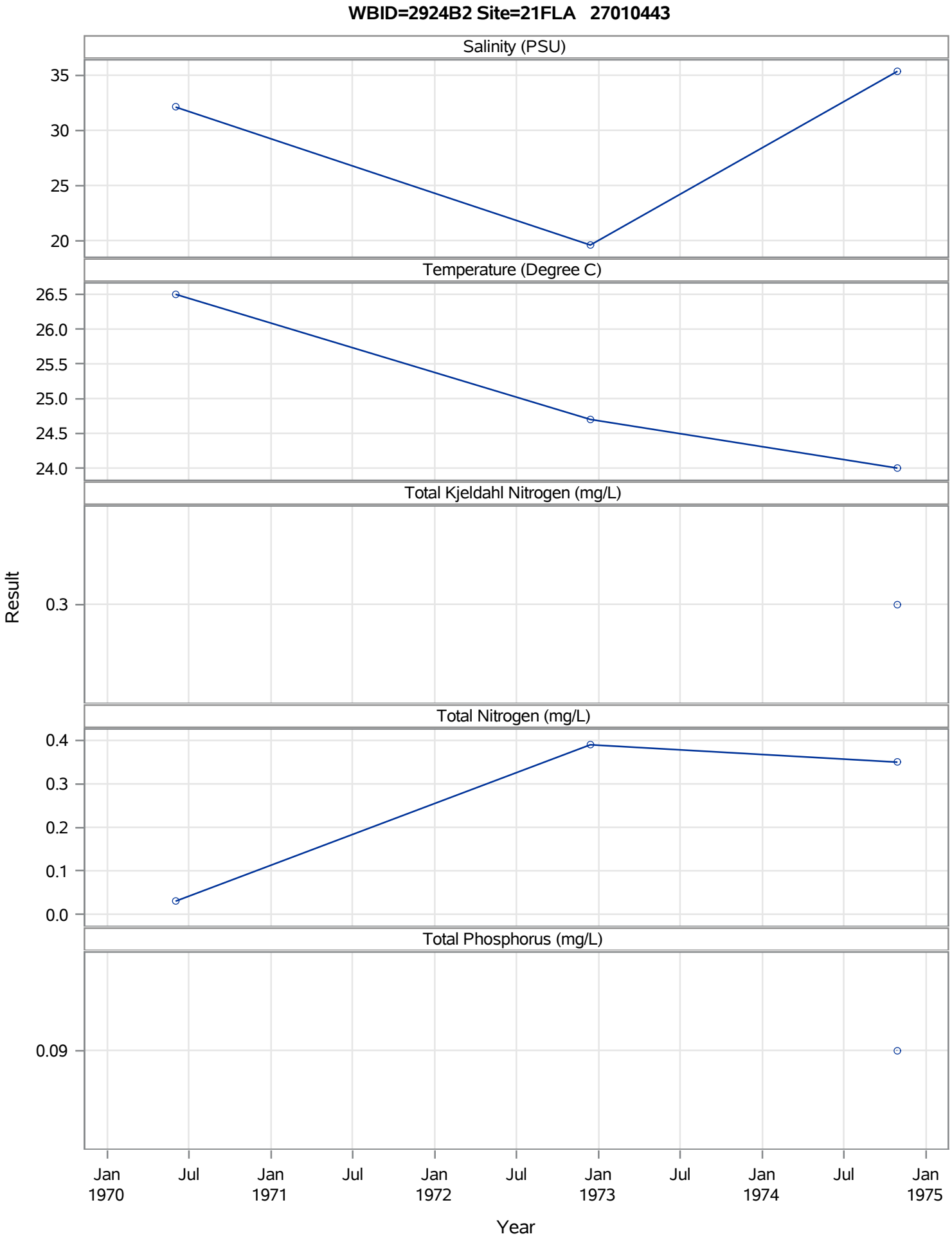

WBID=2924B2 Site=21FLA 27010441
Salinity (PSU)
20
15
10
5
0
Temperature (Degree C)
25.50
25.25
25.00
24.75
24.50
24.25
Total Nitrogen (mg/L)
0.3
0.2
0.1
pH
7.9
Result
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

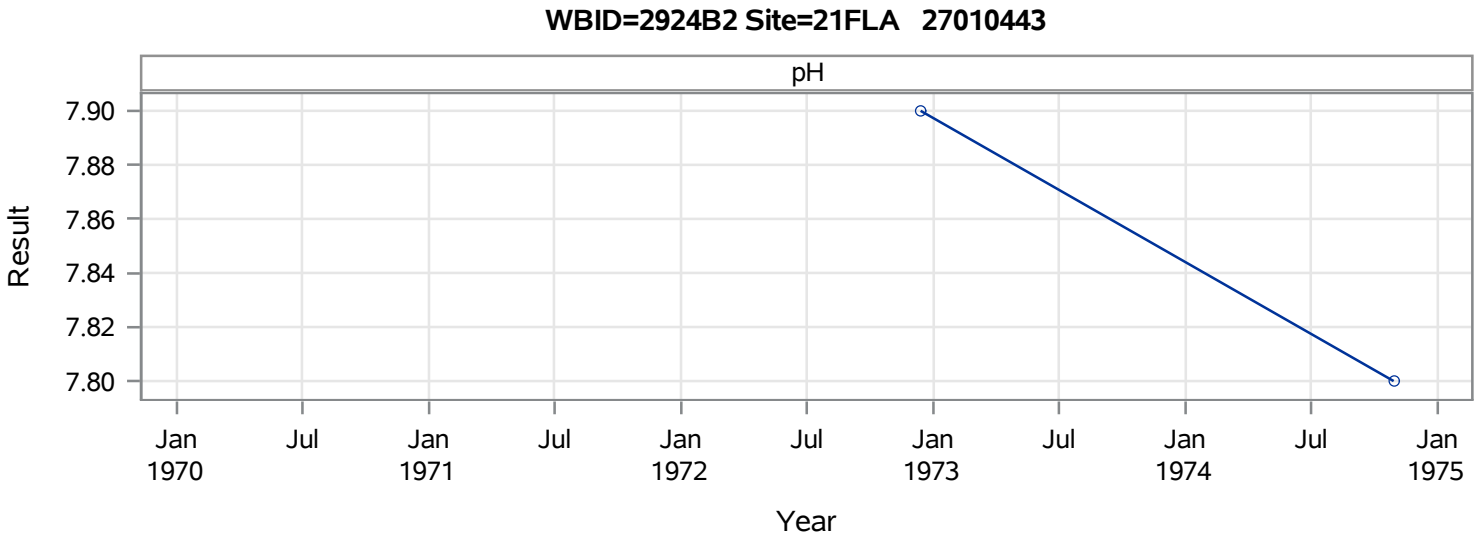

WBID=2924B2 Site=21FLA 27010442
Ammonia (mg/L)
0.15
0.10
0.05
0.00
Dissolved Oxygen (%)
85
80
75
70
Dissolved Oxygen (mg/L)
7.00
6.75
6.50
6.25
6.00
5.75
Result
Fecal COliform (#/100ml)
4
Nitrite + Nitrate (mg/L)
0.150
0.125
0.100
0.075
0.050
0.025
0.000
Jan 1970
Jul
Jan 1971
Jul
Jan 1972
Jul
Jan 1973
Jul
Jan 1974
Jul
Jan 1975
Year

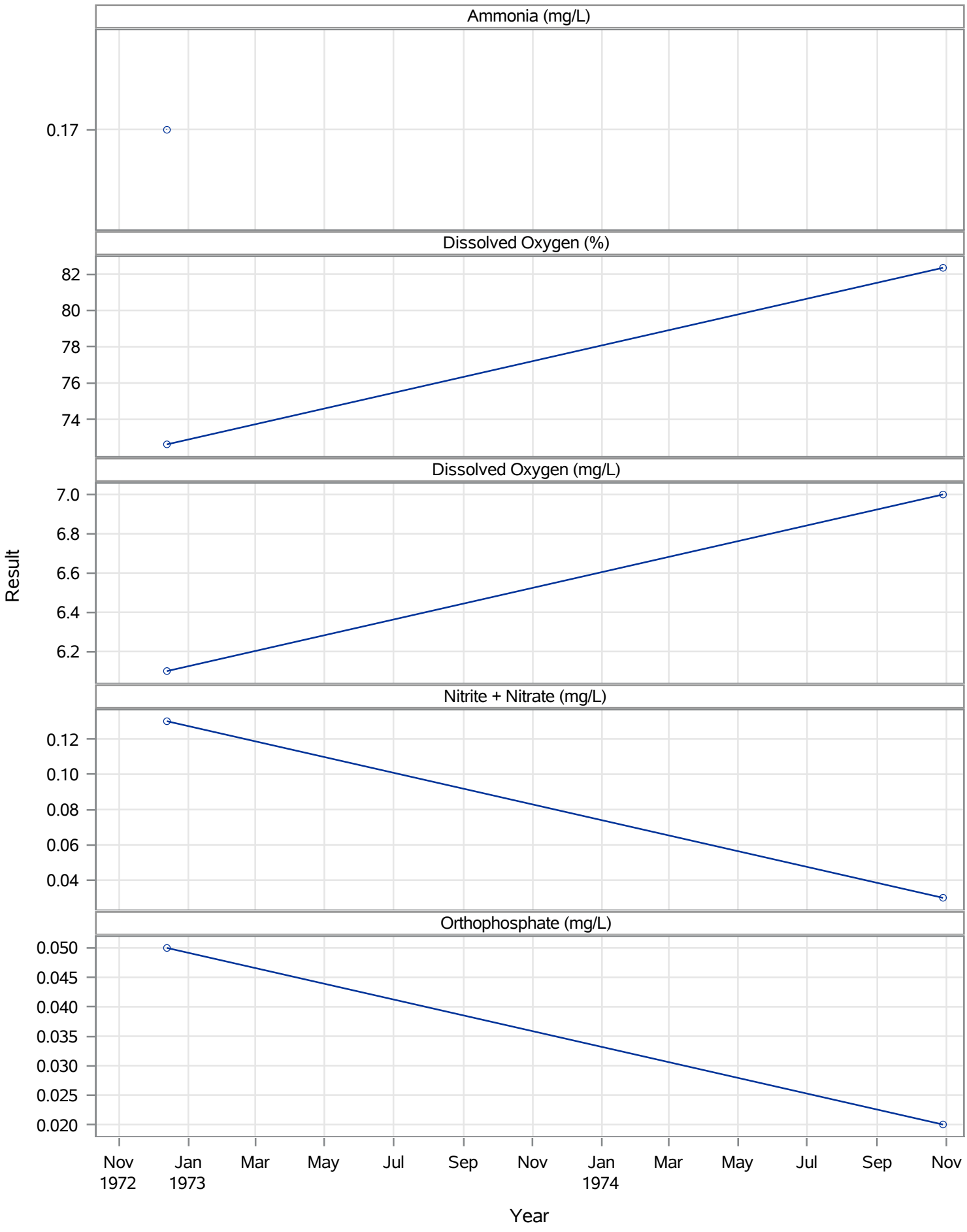

WBID=2924B2 Site=21FLA 27010442
Orthophosphate (mg/L)
0.050
0.045
0.040
0.035
0.030
0.025
0.020
Salinity (PSU)
35
30
25
20
Temperature (Degree C)
26
25
24
Total Kjeldahl Nitrogen (mg/L)
0.29
Total Nitrogen (mg/L)
0.4
0.3
0.2
0.1
0.0
Result
Jan 1970
Jul
Jan 1971
Jul
Jan 1972
Jul
Jan 1973
Jul
Jan 1974
Jul
Jan 1975
Year

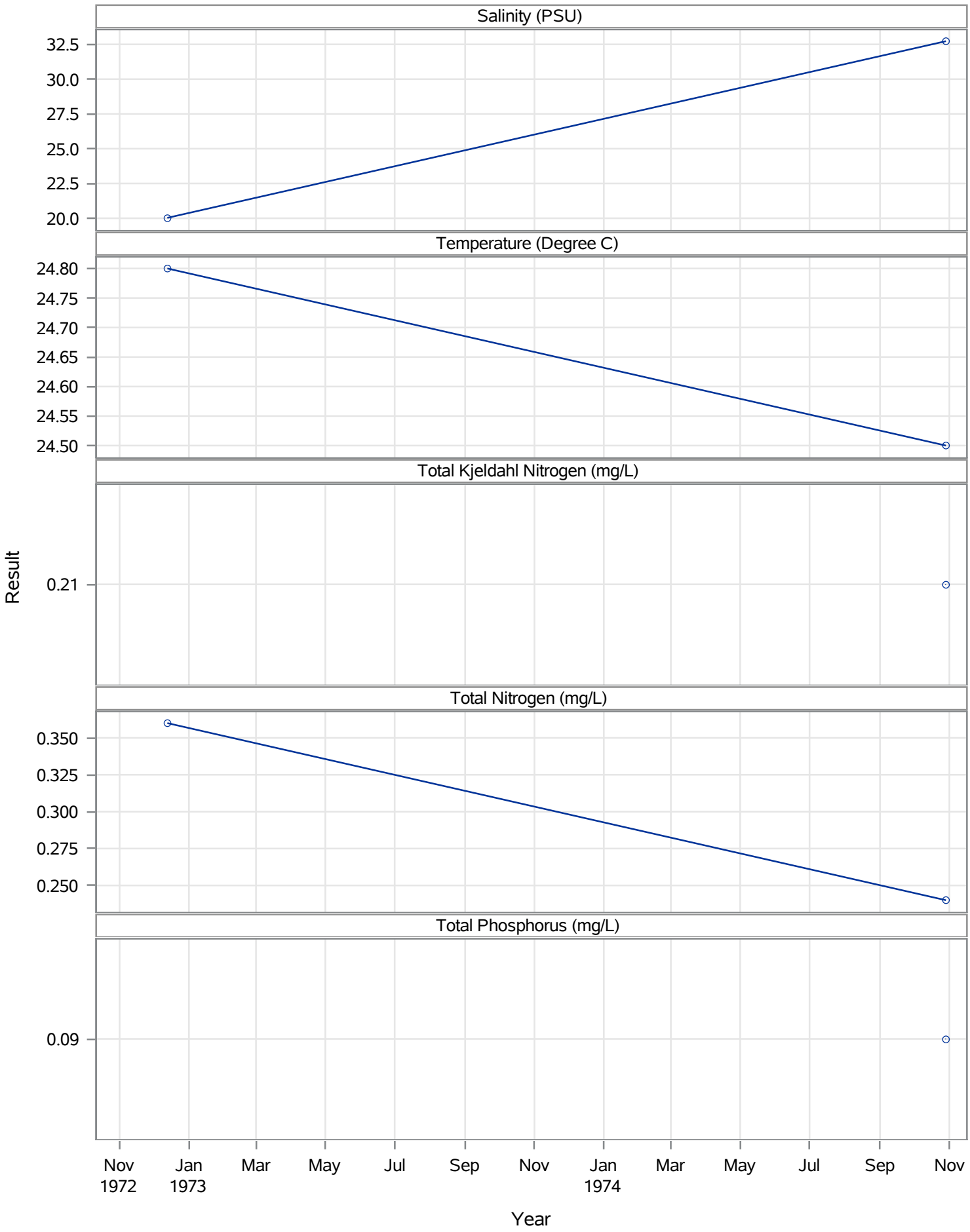

WBID=2924B2 Site=21FLA 27010442
Total Phosphorus (mg/L)
0.1
pH
7.90
7.88
7.86
7.84
7.82
7.80
Result
Jan 1970
Jul
Jan 1971
Jul
Jan 1972
Jul
Jan 1973
Jul
Jan 1974
Jul
Jan 1975
Year

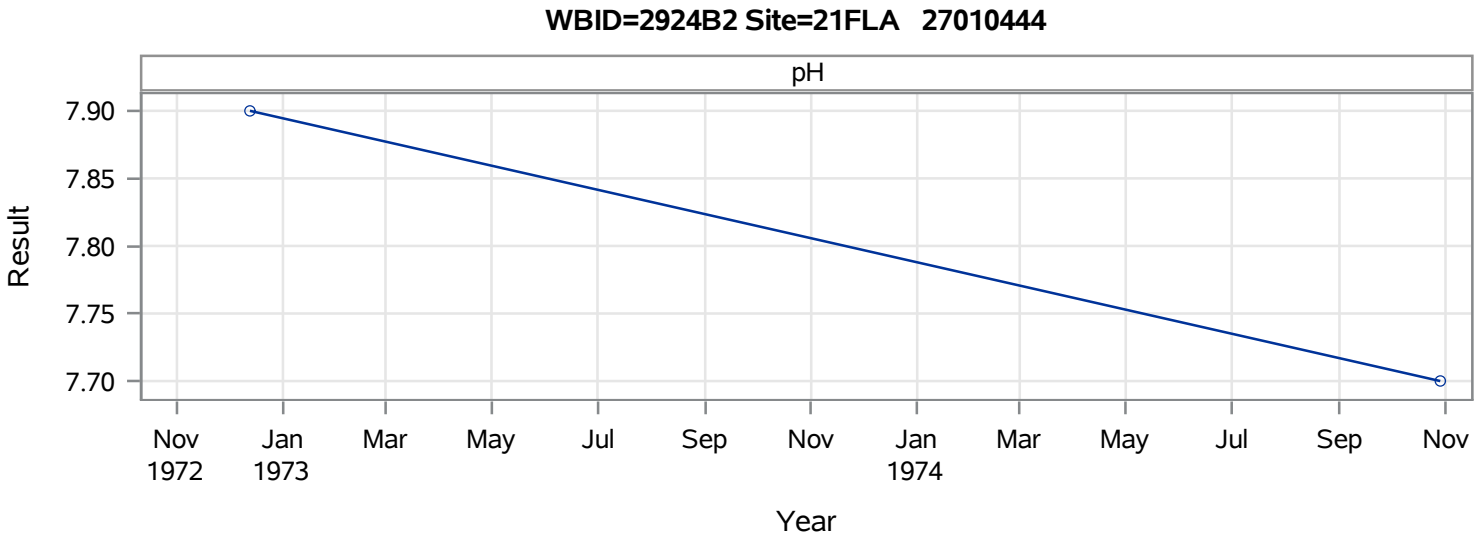

WBID=2924B2 Site=21FLA 27010443
Ammonia (mg/L)
0.15
0.10
0.05
0.00
Dissolved Oxygen (%)
78
76
74
72
Dissolved Oxygen (mg/L)
6.25
6.00
5.75
5.50
5.25
Nitrite + Nitrate (mg/L)
0.150
0.125
0.100
0.075
0.050
0.025
Orthophosphate (mg/L)
0.050
0.045
0.040
0.035
0.030
0.025
0.020
Result
Jan 1970
Jul
Jan 1971
Jul
Jan 1972
Jul
Jan 1973
Jul
Jan 1974
Jul
Jan 1975
Year

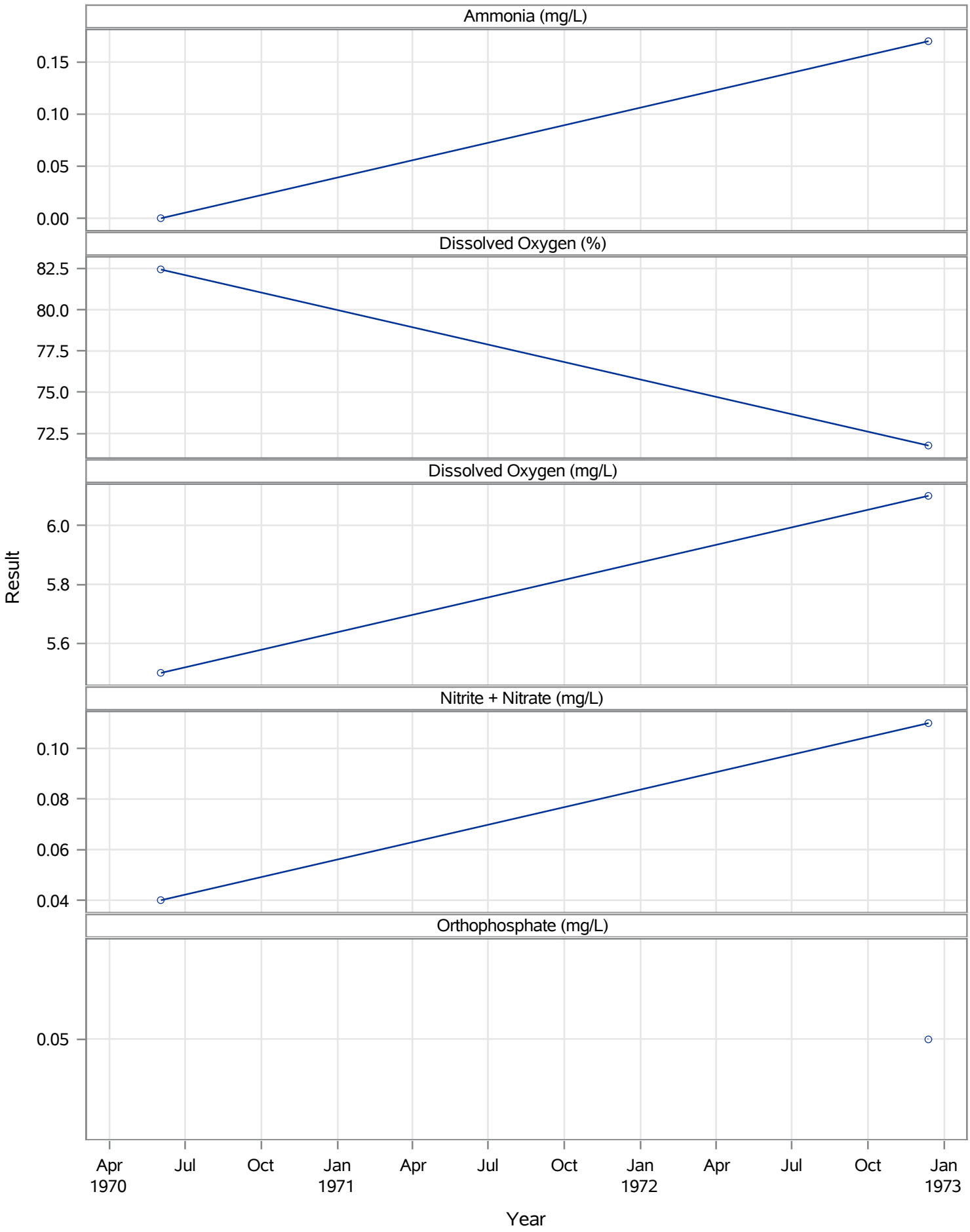

WBID=2924B2 Site=21FLA 27010443
Salinity (PSU)
35
30
25
20
Temperature (Degree C)
26.5
26.0
25.5
25.0
24.5
24.0
Total Kjeldahl Nitrogen (mg/L)
0.3
Total Nitrogen (mg/L)
0.4
0.3
0.2
0.1
0.0
Total Phosphorus (mg/L)
0.09
Result
Jan 1970
Jul
Jan 1971
Jul
Jan 1972
Jul
Jan 1973
Jul
Jan 1974
Jul
Jan 1975
Year

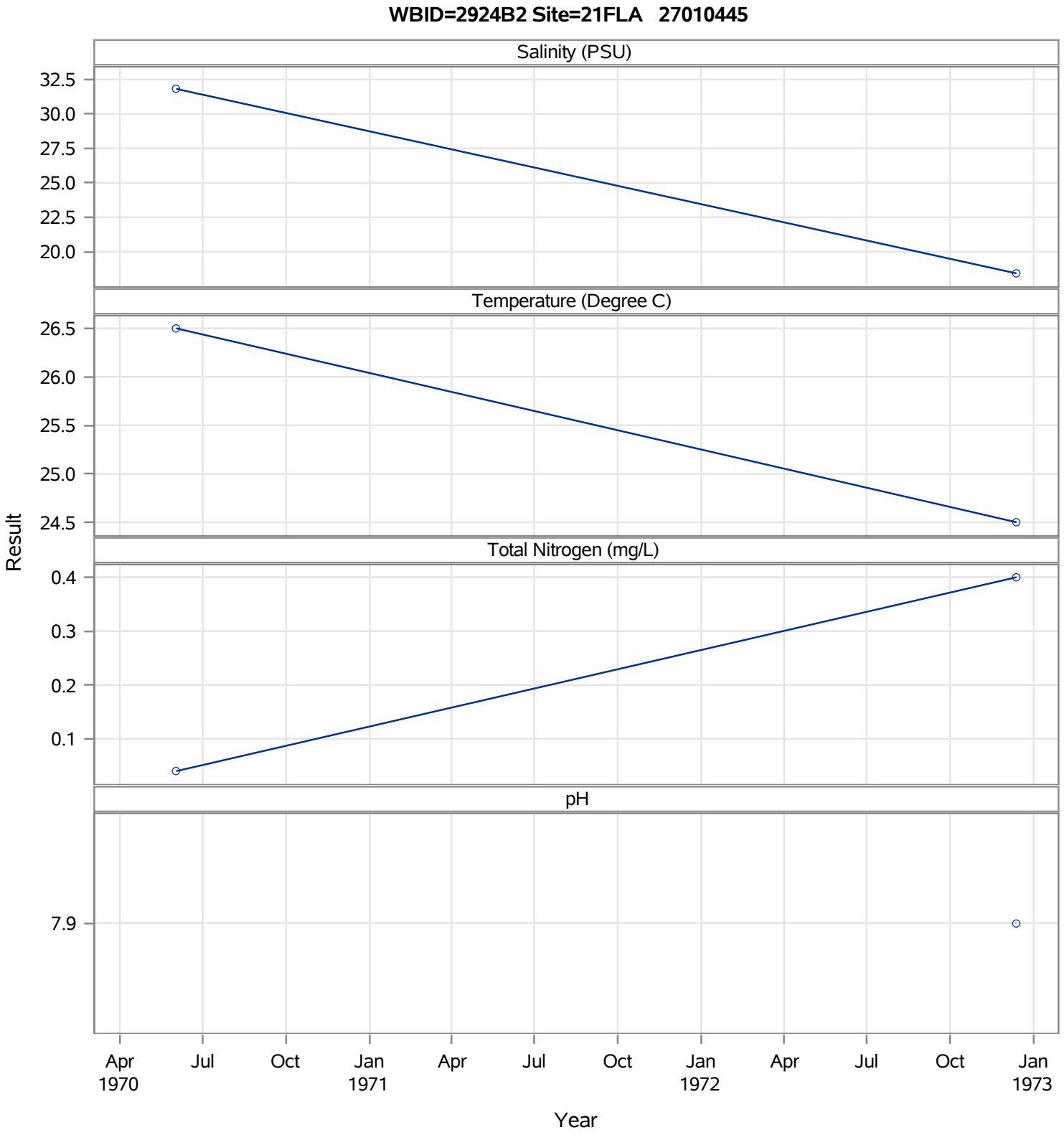

WBID=2924B2 Site=21FLA 27010443
pH
Result
7.90
7.88
7.86
7.84
7.82
7.80
Jan 1970
Jul
Jan 1971
Jul
Jan 1972
Jul
Jan 1973
Jul
Jan 1974
Jul
Jan 1975
Year

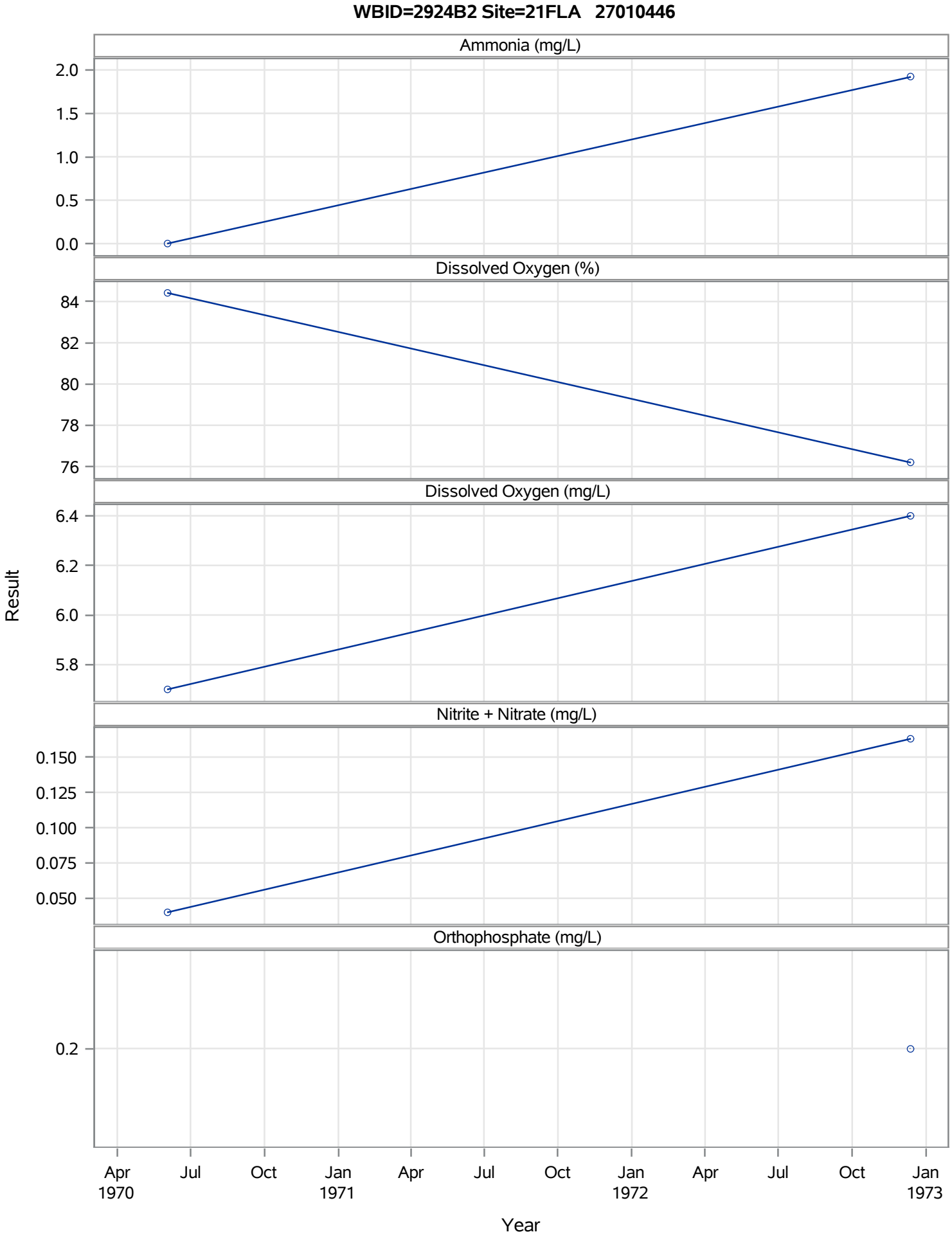

WBID=2924B2 Site=21FLA 27010444
Ammonia (mg/L)
0.17
Dissolved Oxygen (%)
82
80
78
76
74
Dissolved Oxygen (mg/L)
7.0
6.8
6.6
6.4
6.2
Nitrite + Nitrate (mg/L)
0.12
0.10
0.08
0.06
0.04
Orthophosphate (mg/L)
0.050
0.045
0.040
0.035
0.030
0.025
0.020
Result
Nov 1972
Jan 1973
Mar
May
Jul
Sep
Nov
Jan 1974
Mar
May
Jul
Sep
Nov
Year

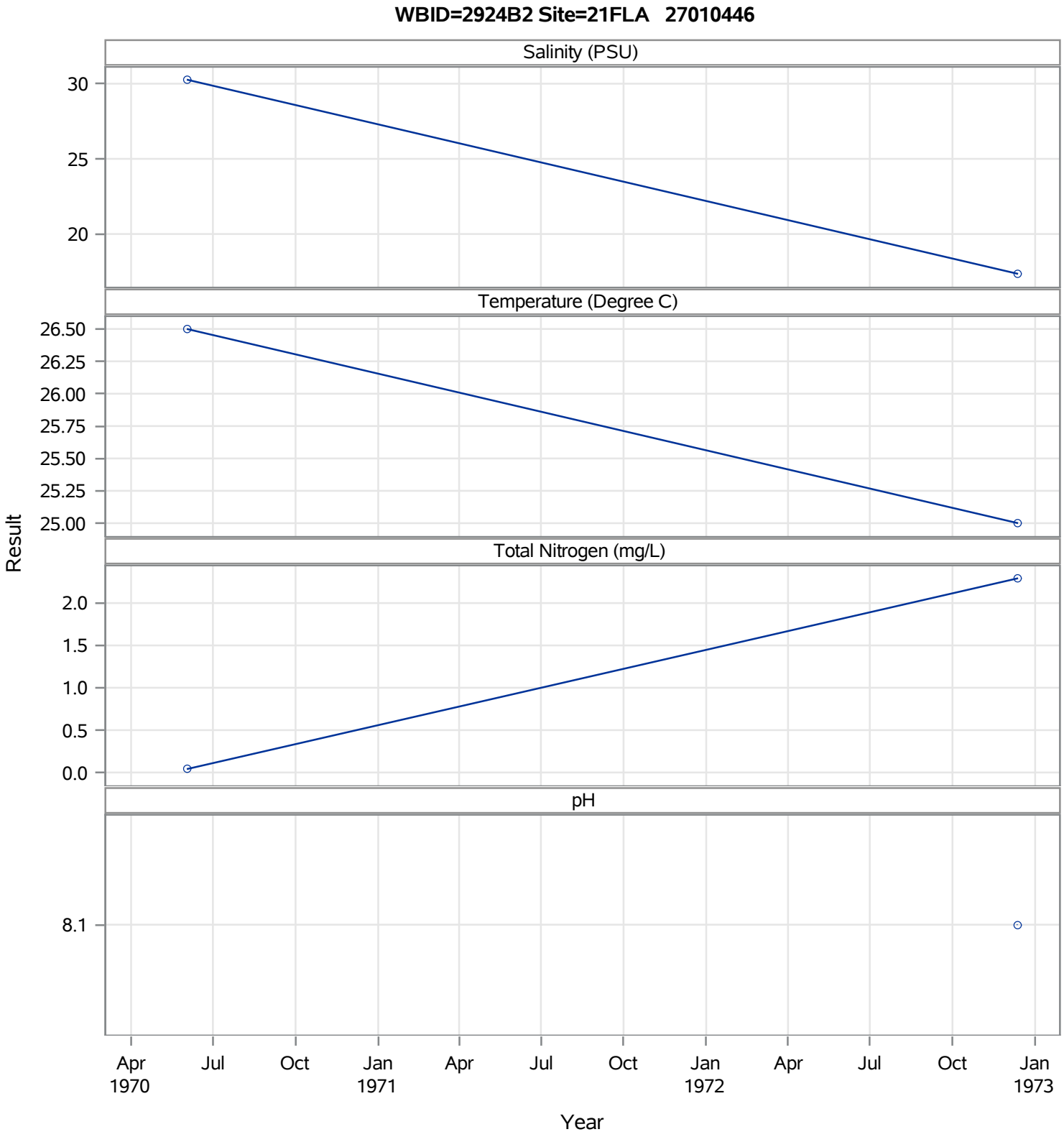

WBID=2924B2 Site=21FLA 27010444
Salinity (PSU)
32.5
30.0
27.5
25.0
22.5
20.0
Temperature (Degree C)
24.80
24.75
24.70
24.65
24.60
24.55
24.50
Total Kjeldahl Nitrogen (mg/L)
0.21
Total Nitrogen (mg/L)
0.350
0.325
0.300
0.275
0.250
Total Phosphorus (mg/L)
0.09
Result
Nov 1972
Jan 1973
Mar
May
Jul
Sep
Nov
Jan 1974
Mar
May
Jul
Sep
Nov
Year

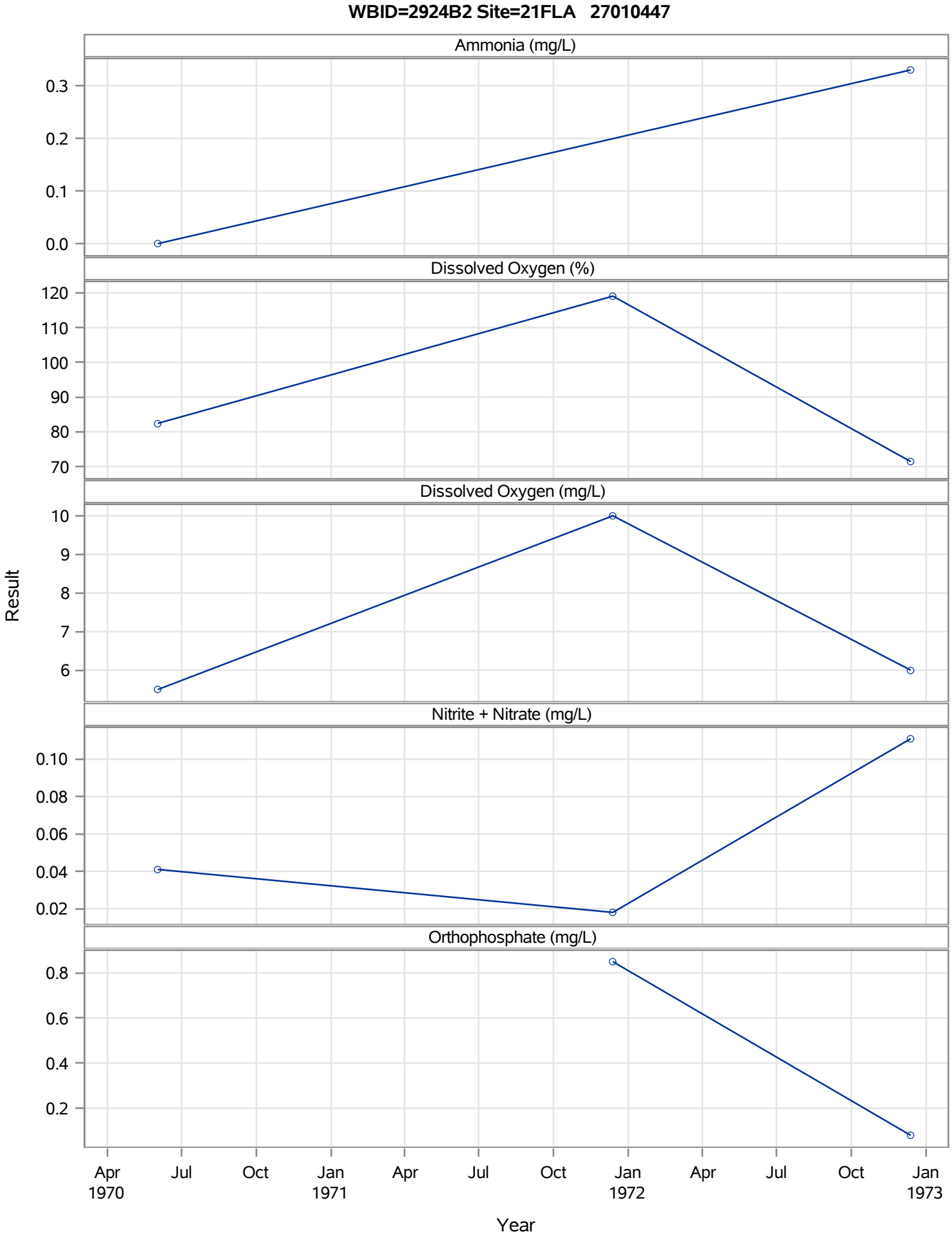

WBID=2924B2 Site=21FLA 27010444
pH
Result
7.90
7.85
7.80
7.75
7.70
Nov 1972
Jan 1973
Mar
May
Jul
Sep
Nov
Jan 1974
Mar
May
Jul
Sep
Nov
Year

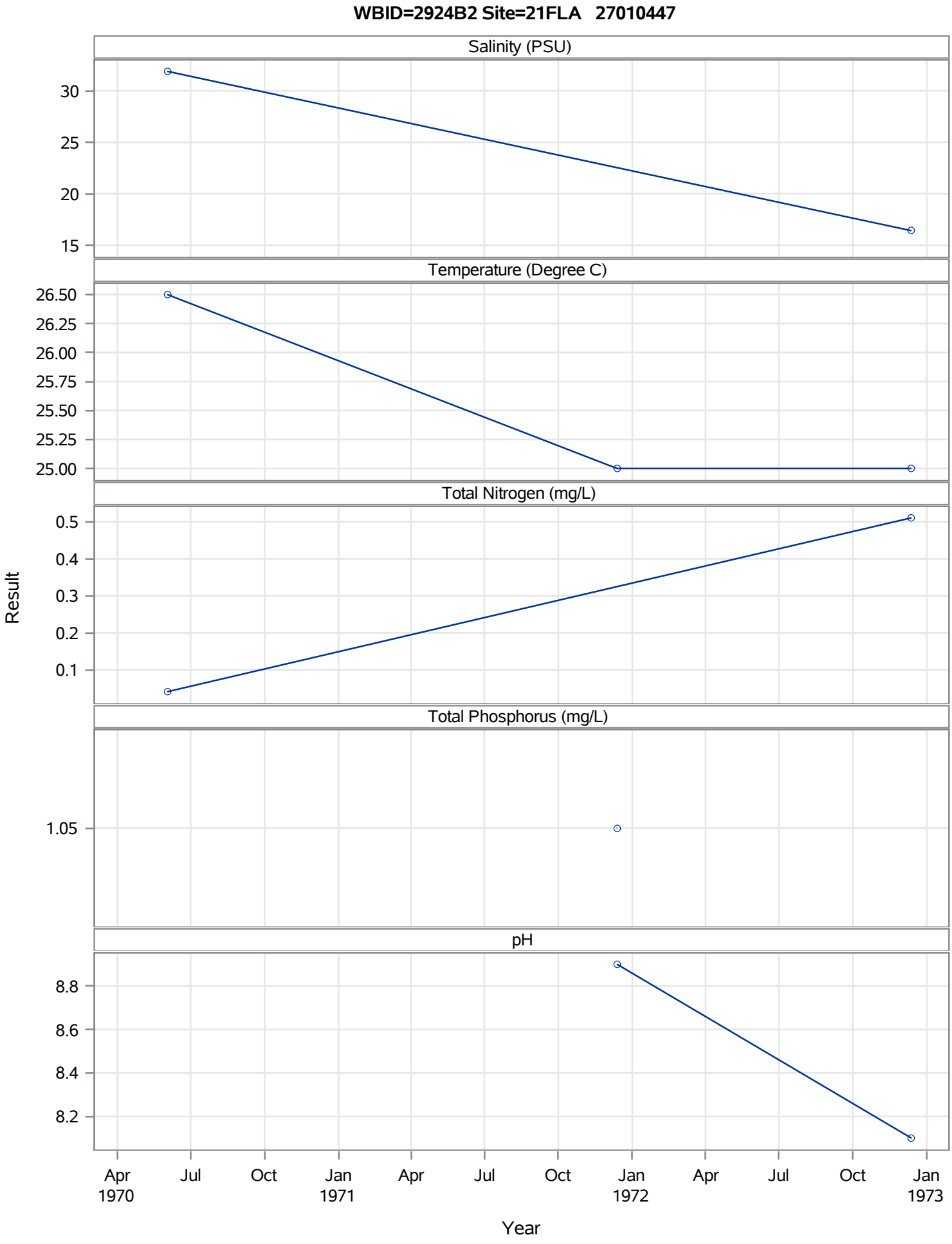

WBID=2924B2 Site=21FLA 27010445
Ammonia (mg/L)
0.15
0.10
0.05
0.00
Dissolved Oxygen (%)
82.5
80.0
77.5
75.0
72.5
Dissolved Oxygen (mg/L)
6.0
5.8
5.6
Nitrite + Nitrate (mg/L)
0.10
0.08
0.06
0.04
Orthophosphate (mg/L)
0.05
Result
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

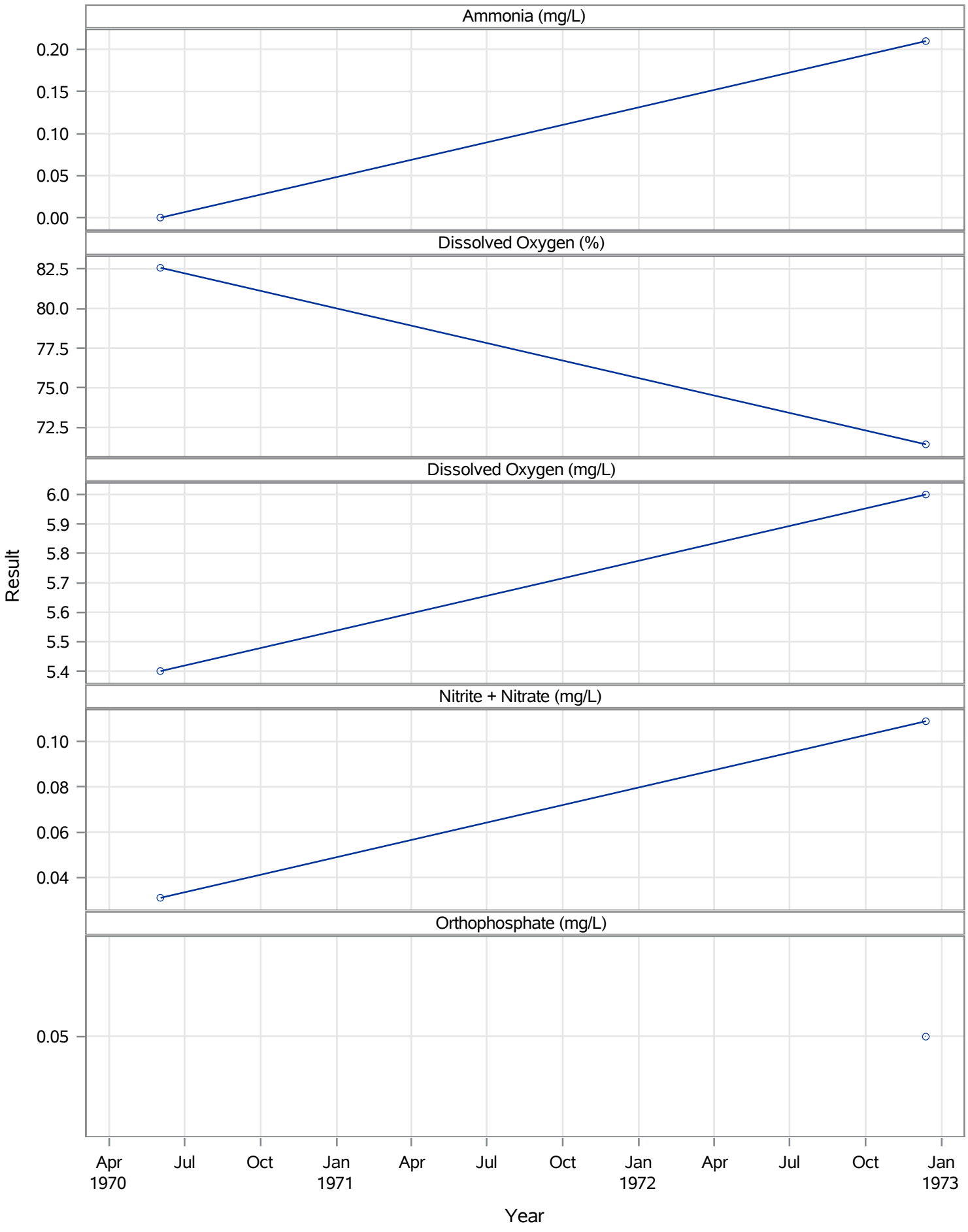

WBID=2924B2 Site=21FLA 27010445
Salinity (PSU)
32.5
30.0
27.5
25.0
22.5
20.0
Temperature (Degree C)
26.5
26.0
25.5
25.0
24.5
Result
Total Nitrogen (mg/L)
0.4
0.3
0.2
0.1
pH
7.9
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

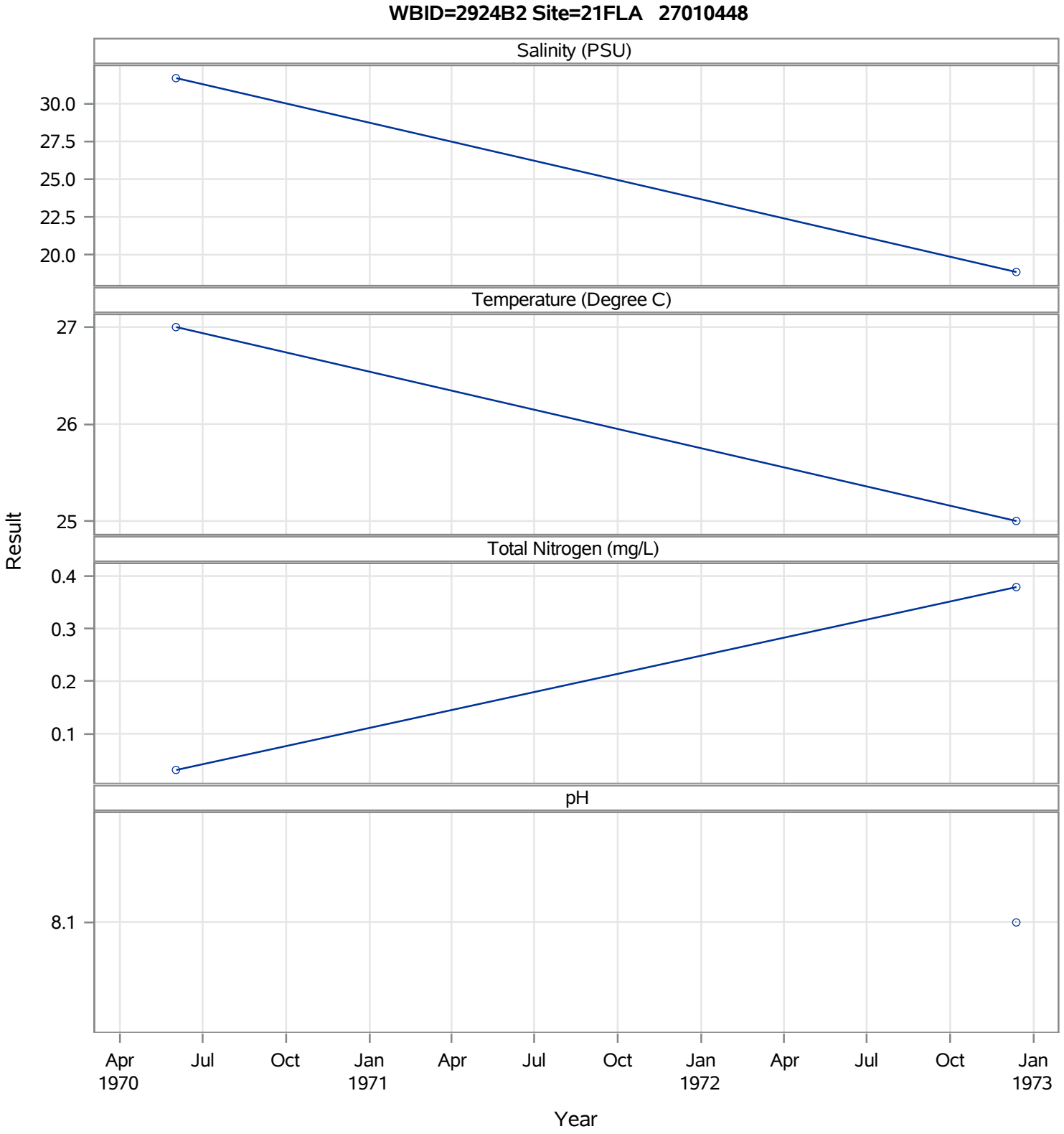

WBID=2924B2 Site=21FLA 27010446
Ammonia (mg/L)
2.0
1.5
1.0
0.5
0.0
Dissolved Oxygen (%)
84
82
80
78
76
Dissolved Oxygen (mg/L)
6.4
6.2
6.0
5.8
Nitrite + Nitrate (mg/L)
0.150
0.125
0.100
0.075
0.050
Orthophosphate (mg/L)
0.2
Result
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

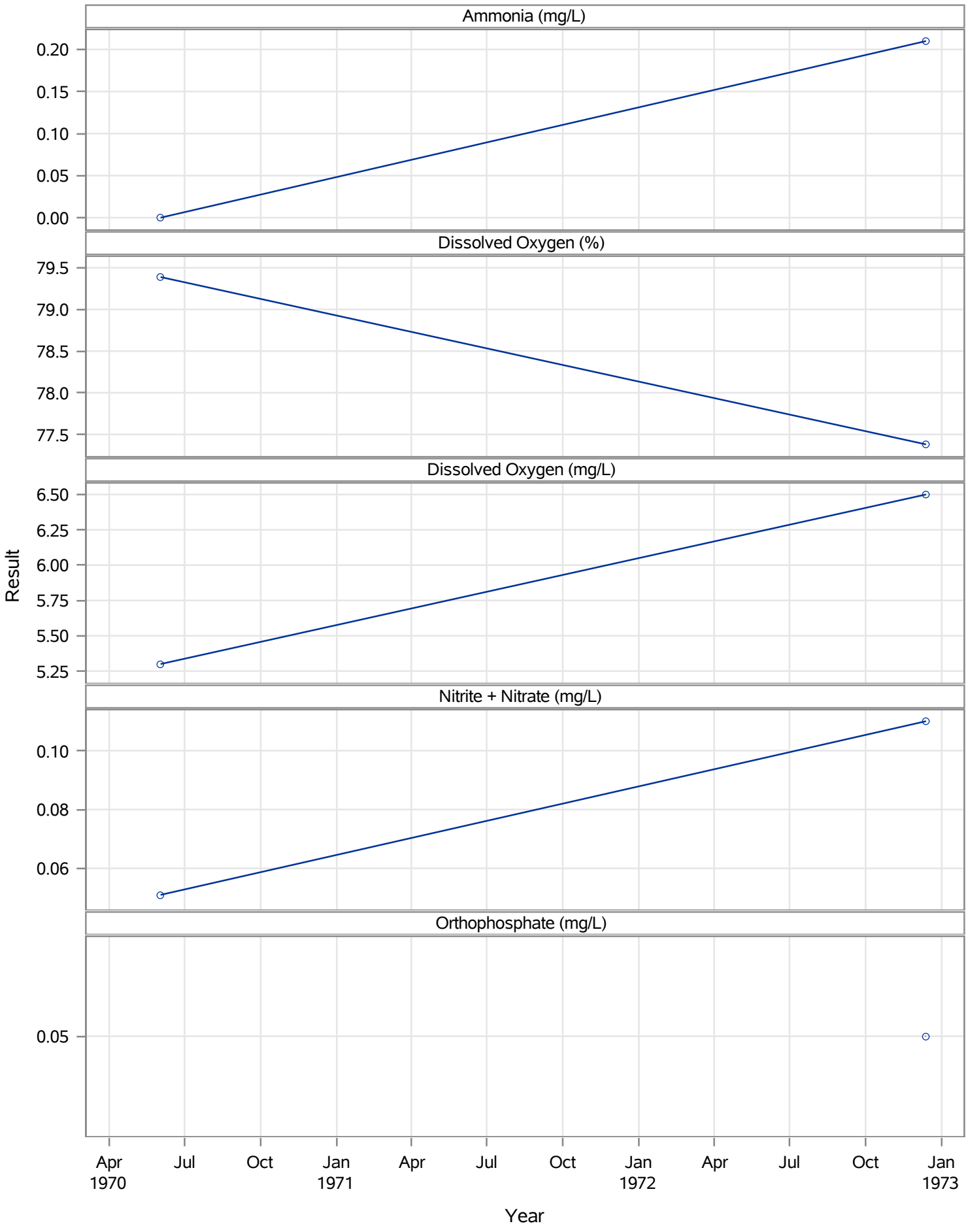

WBID=2924B2 Site=21FLA 27010446
Salinity (PSU)
30
25
20
Temperature (Degree C)
26.50
26.25
26.00
25.75
25.50
25.25
25.00
Result
Total Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
pH
8.1
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

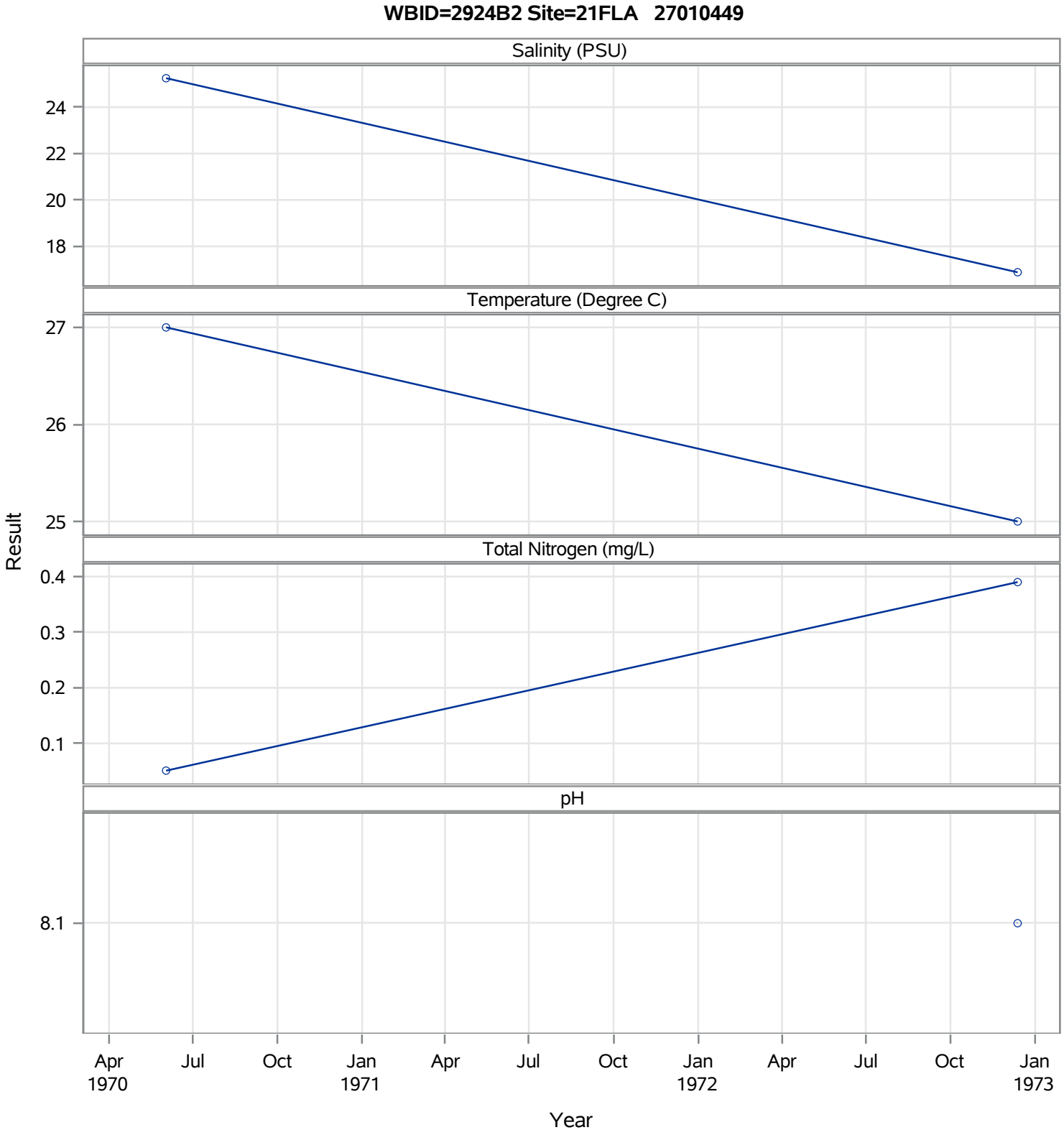

WBID=2924B2 Site=21FLA 27010447
Ammonia (mg/L)
0.3
0.2
0.1
0.0
Dissolved Oxygen (%)
120
110
100
90
80
70
Dissolved Oxygen (mg/L)
10
9
8
7
6
Nitrite + Nitrate (mg/L)
0.10
0.08
0.06
0.04
0.02
Orthophosphate (mg/L)
0.8
0.6
0.4
0.2
Result
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

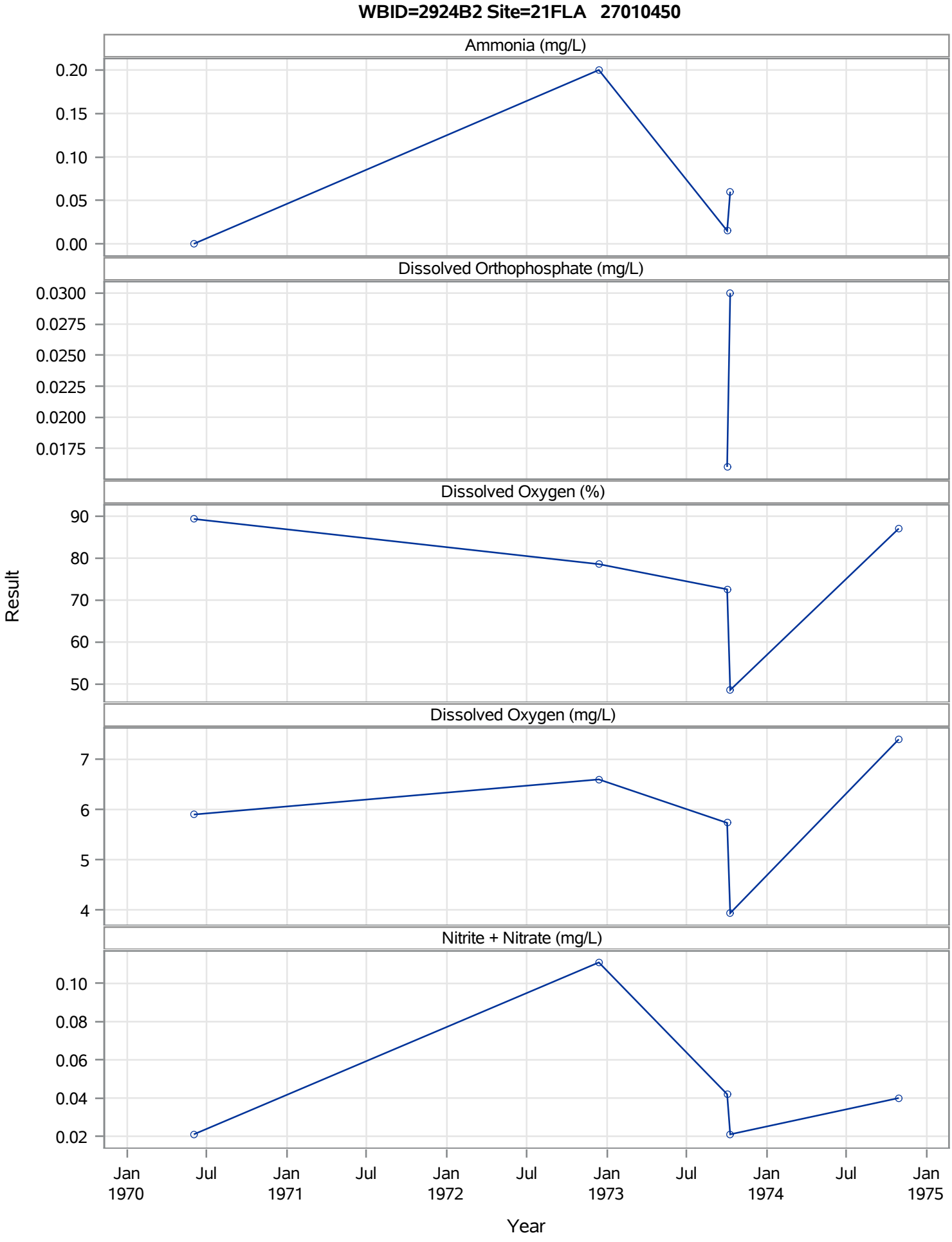

WBID=2924B2 Site=21FLA 27010447
Salinity (PSU)
30
25
20
15
Temperature (Degree C)
26.50
26.25
26.00
25.75
25.50
25.25
25.00
Total Nitrogen (mg/L)
0.5
0.4
0.3
0.2
0.1
Result
Total Phosphorus (mg/L)
1.05
pH
8.8
8.6
8.4
8.2
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

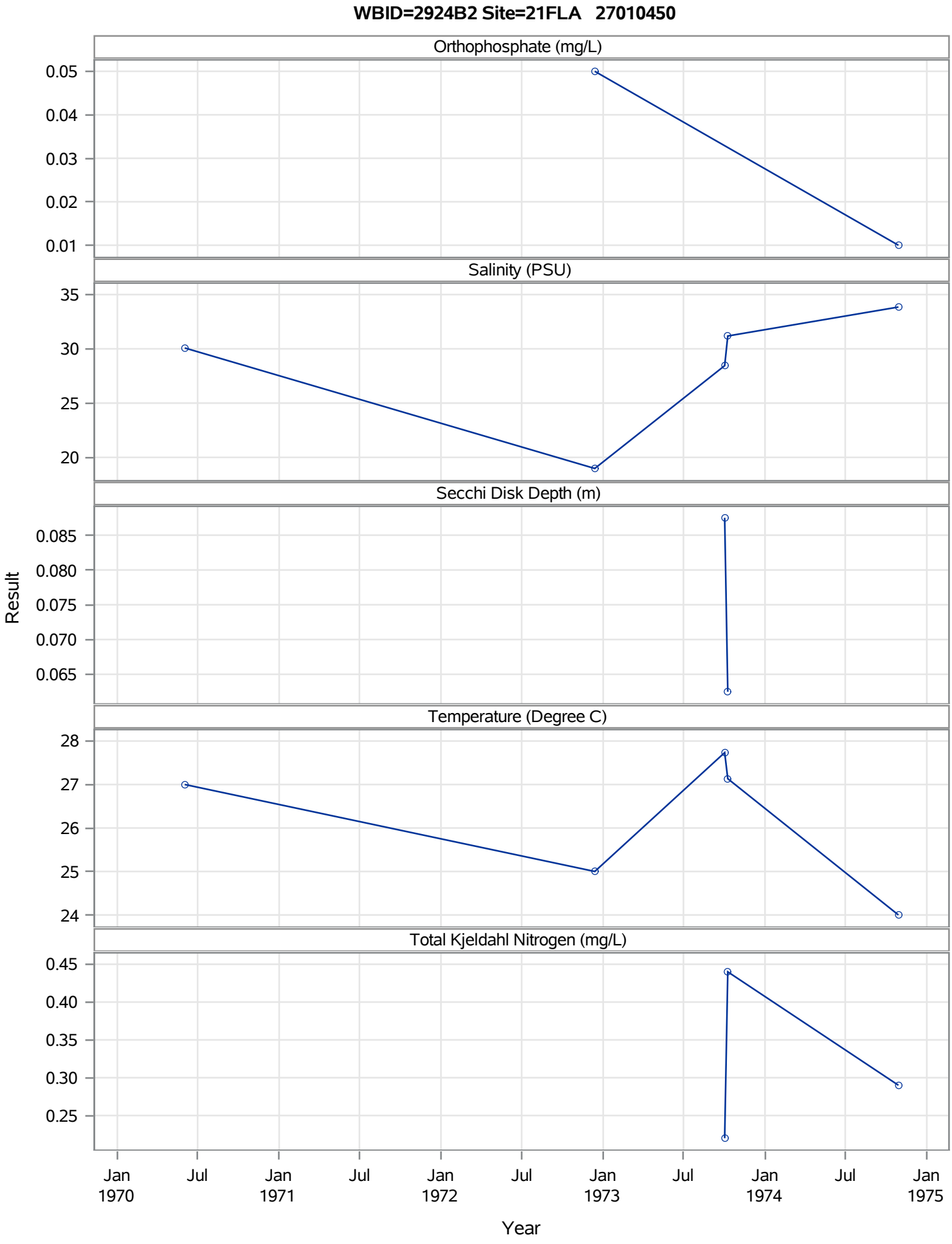

WBID=2924B2 Site=21FLA 27010448
Ammonia (mg/L)
0.20
0.15
0.10
0.05
0.00
Dissolved Oxygen (%)
82.5
80.0
77.5
75.0
72.5
Dissolved Oxygen (mg/L)
6.0
5.9
5.8
5.7
5.6
5.5
5.4
Result
Nitrite + Nitrate (mg/L)
0.10
0.08
0.06
0.04
Orthophosphate (mg/L)
0.05
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

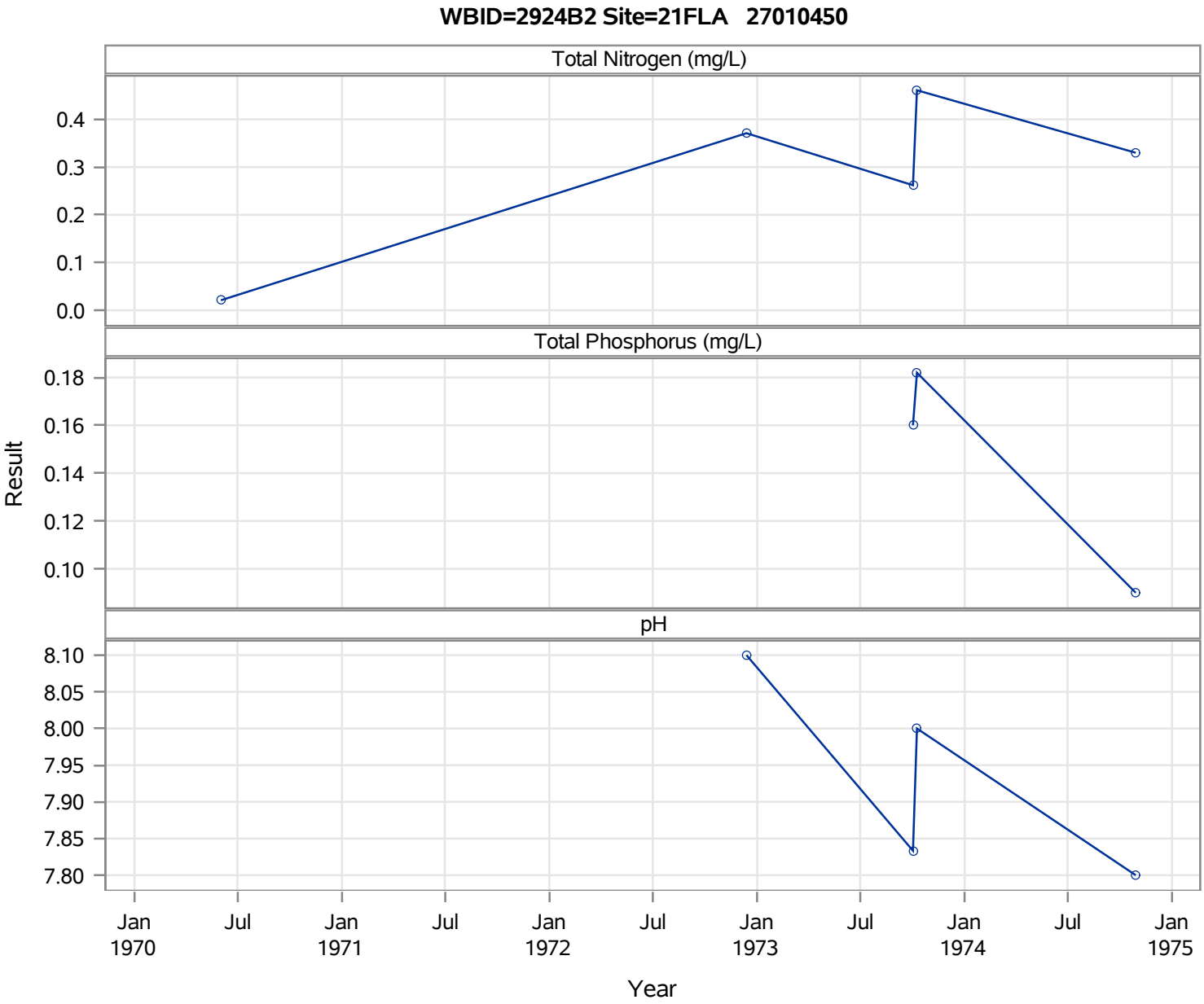

WBID=2924B2 Site=21FLA 27010448
Salinity (PSU)
30.0
27.5
25.0
22.5
20.0
Temperature (Degree C)
27
26
25
Total Nitrogen (mg/L)
0.4
0.3
0.2
0.1
pH
8.1
Result
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

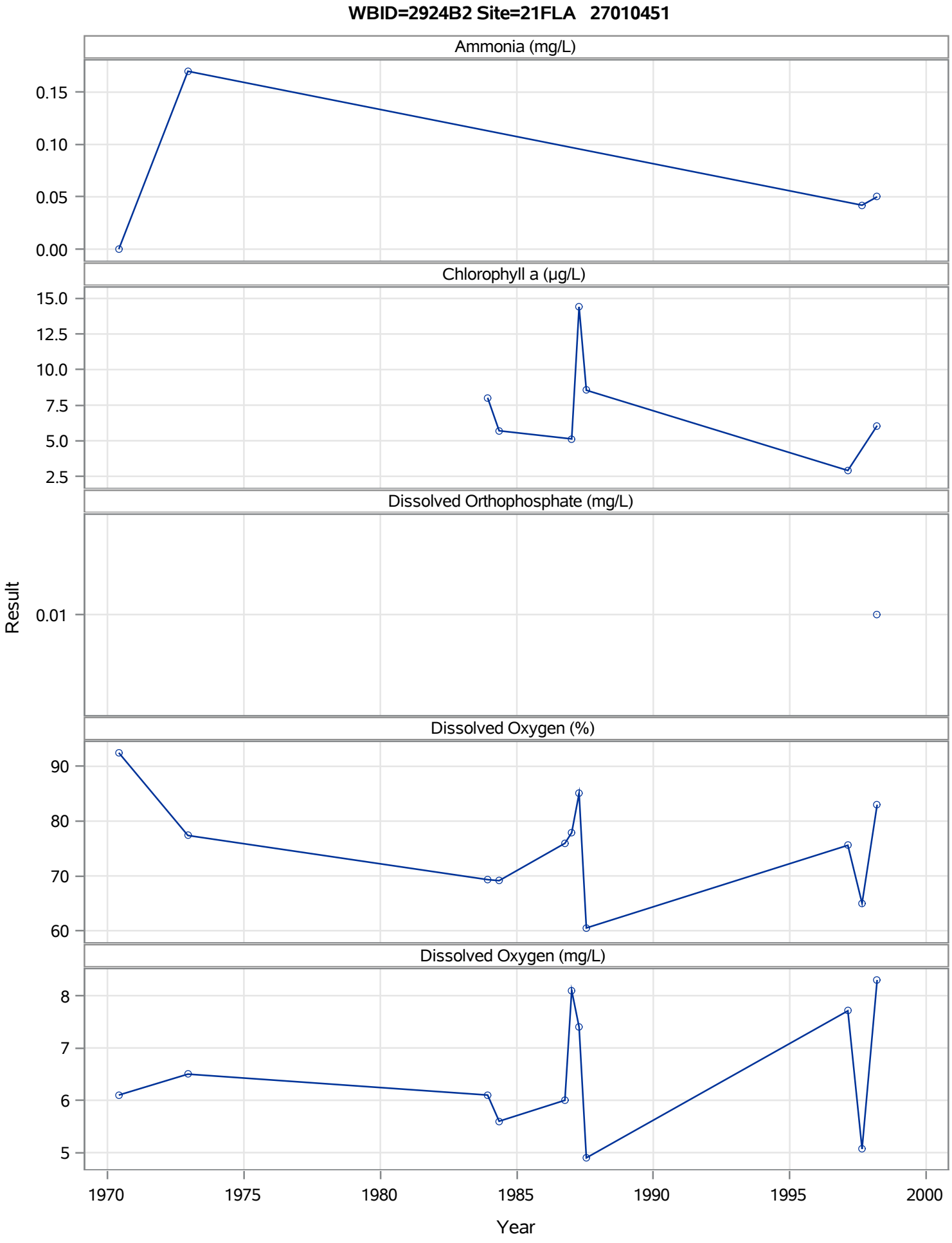

WBID=2924B2 Site=21FLA 27010449
Ammonia (mg/L)
0.20
0.15
0.10
0.05
0.00
Dissolved Oxygen (%)
79.5
79.0
78.5
78.0
77.5
Dissolved Oxygen (mg/L)
6.50
6.25
6.00
5.75
5.50
5.25
Nitrite + Nitrate (mg/L)
0.10
0.08
0.06
Orthophosphate (mg/L)
0.05
Result
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

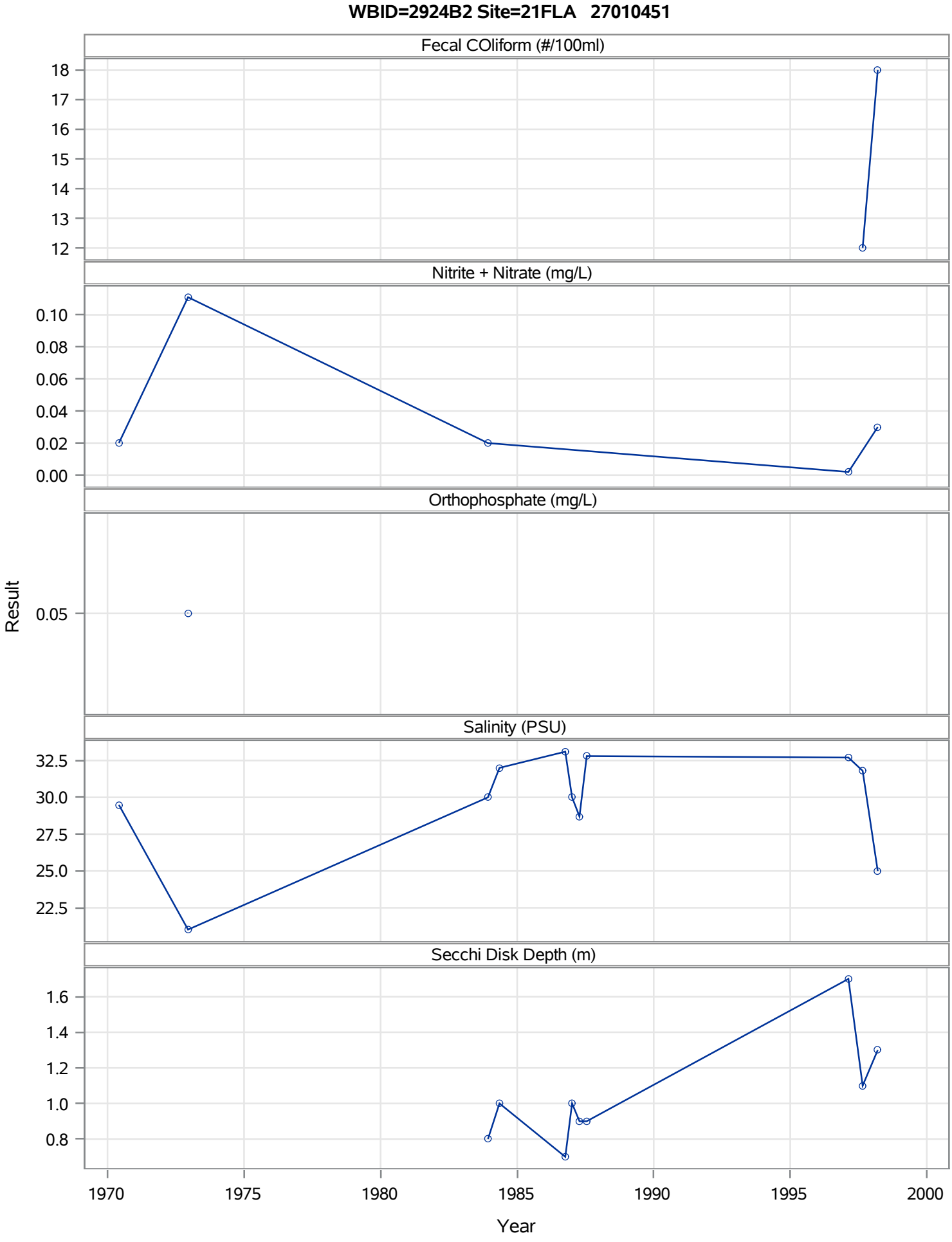

WBID=2924B2 Site=21FLA 27010449
Salinity (PSU)
24
22
20
18
Temperature (Degree C)
27
26
25
Result
Total Nitrogen (mg/L)
0.4
0.3
0.2
0.1
pH
8.1
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

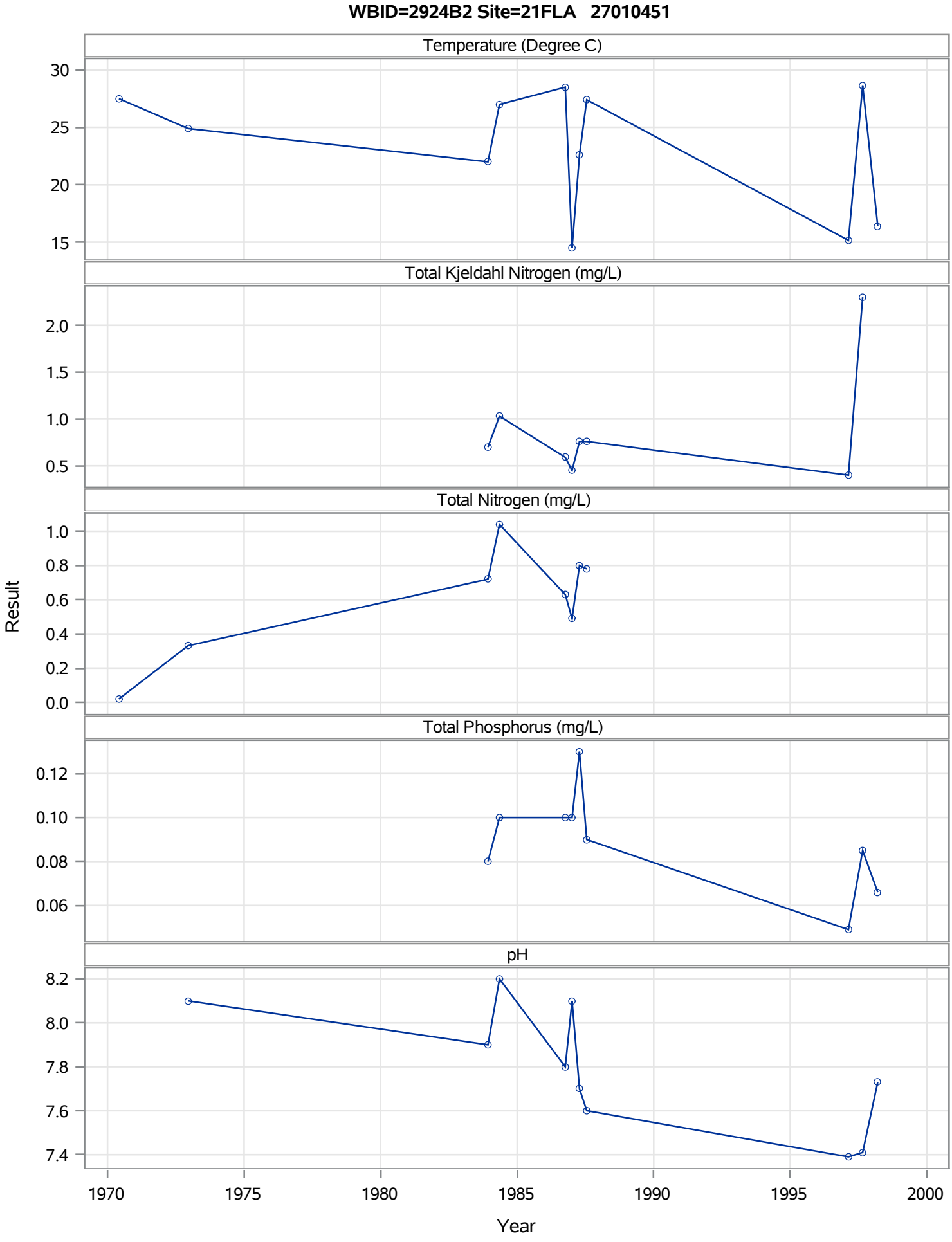

WBID=2924B2 Site=21FLA 27010450
Ammonia (mg/L)
0.20
0.15
0.10
0.05
0.00
Dissolved Orthophosphate (mg/L)
0.0300
0.0275
0.0250
0.0225
0.0200
0.0175
Dissolved Oxygen (%)
90
80
70
60
50
Dissolved Oxygen (mg/L)
7
6
5
4
Nitrite + Nitrate (mg/L)
0.10
0.08
0.06
0.04
0.02
Result
Jan 1970
Jul
Jan 1971
Jul
Jan 1972
Jul
Jan 1973
Jul
Jan 1974
Jul
Jan 1975
Year

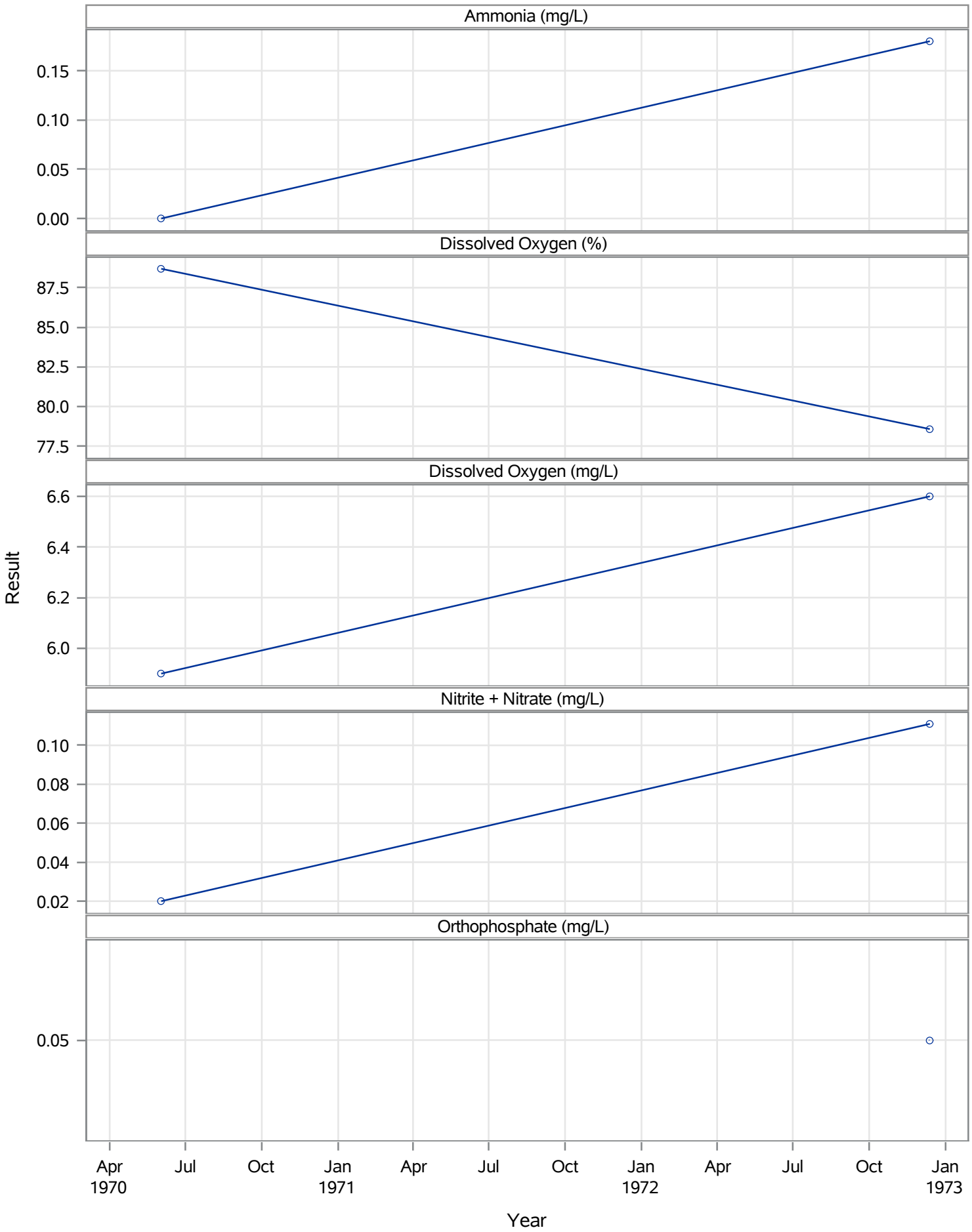

WBID=2924B2 Site=21FLA 27010450
Orthophosphate (mg/L)
0.05
0.04
0.03
0.02
0.01
Salinity (PSU)
35
30
25
20
Secchi Disk Depth (m)
0.085
0.080
0.075
0.070
0.065
Temperature (Degree C)
28
27
26
25
24
Total Kjeldahl Nitrogen (mg/L)
0.45
0.40
0.35
0.30
0.25
Result
Jan 1970
Jul
Jan 1971
Jul
Jan 1972
Jul
Jan 1973
Jul
Jan 1974
Jul
Jan 1975
Year

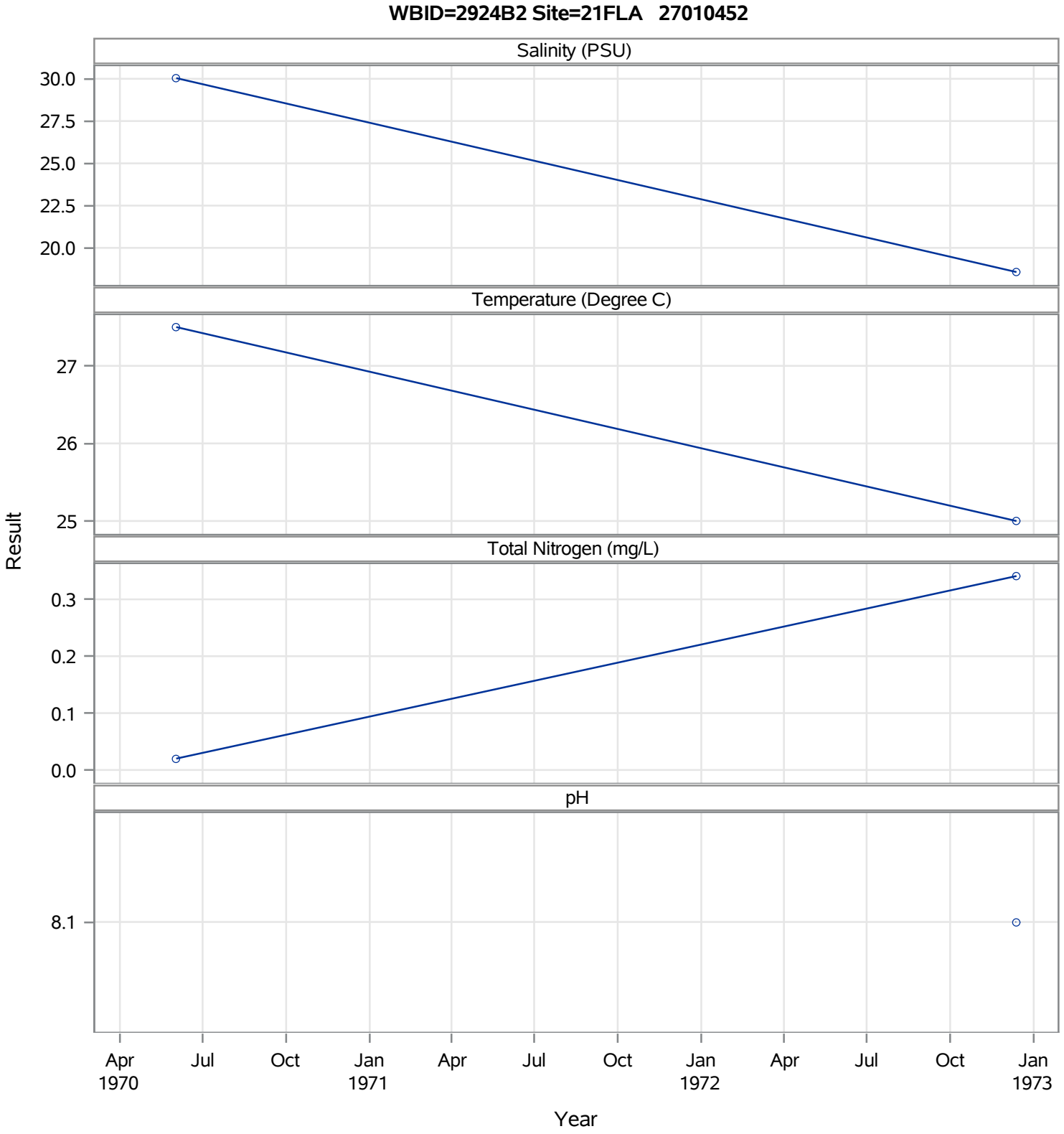

WBID=2924B2 Site=21FLA 27010450
Total Nitrogen (mg/L)
0.4
0.3
0.2
0.1
0.0
Total Phosphorus (mg/L)
0.18
0.16
0.14
0.12
0.10
pH
8.10
8.05
8.00
7.95
7.90
7.85
7.80
Result
Jan 1970
Jul
Jan 1971
Jul
Jan 1972
Jul
Jan 1973
Jul
Jan 1974
Jul
Jan 1975
Year

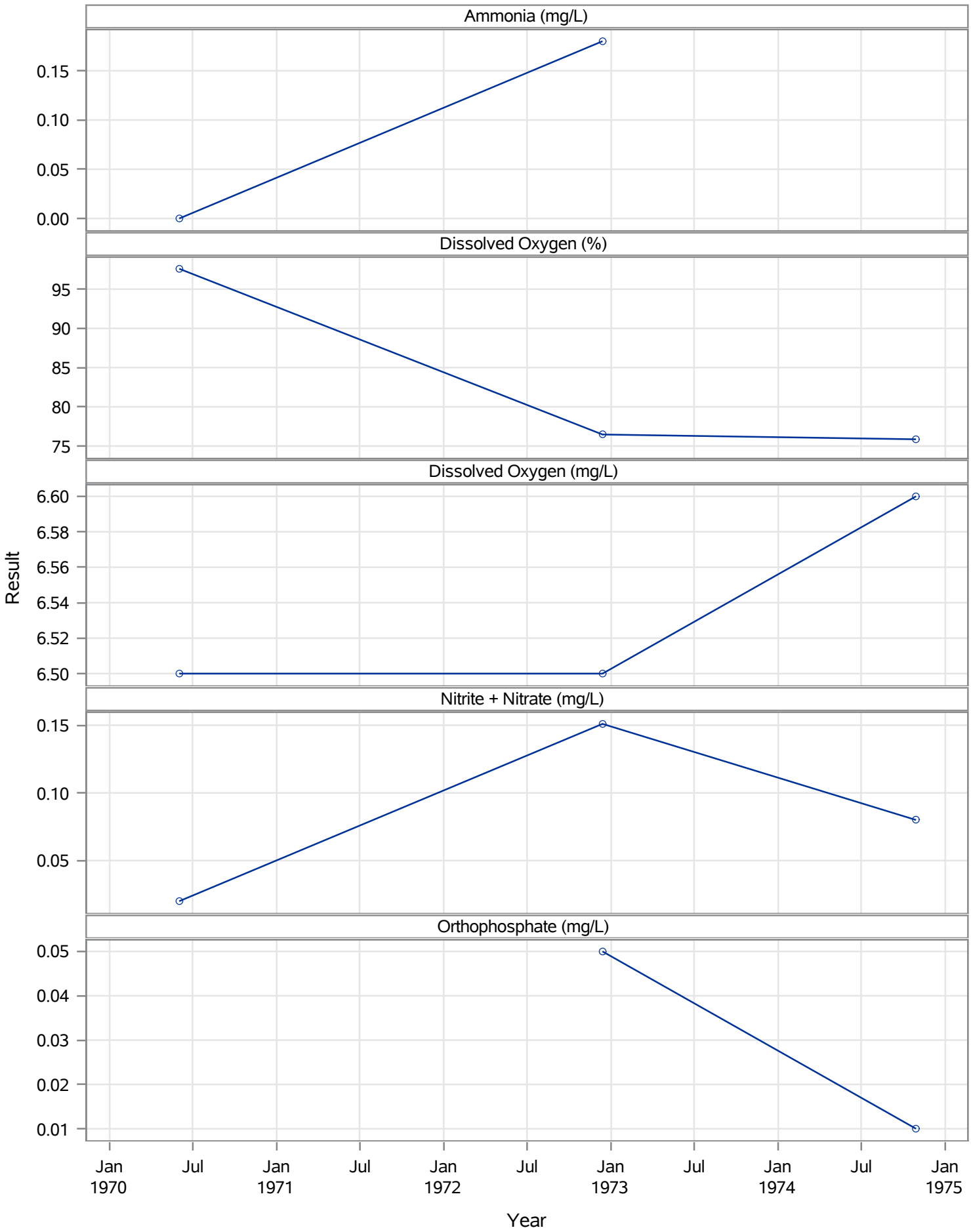

WBID=2924B2 Site=21FLA 27010451
Ammonia (mg/L)
0.15
0.10
0.05
0.00
Chlorophyll a (µg/L)
15.0
12.5
10.0
7.5
5.0
2.5
Dissolved Orthophosphate (mg/L)
0.01
Result
Dissolved Oxygen (%)
90
80
70
60
Dissolved Oxygen (mg/L)
8
7
6
5
1970
1975
1980
1985
1990
1995
2000
Year

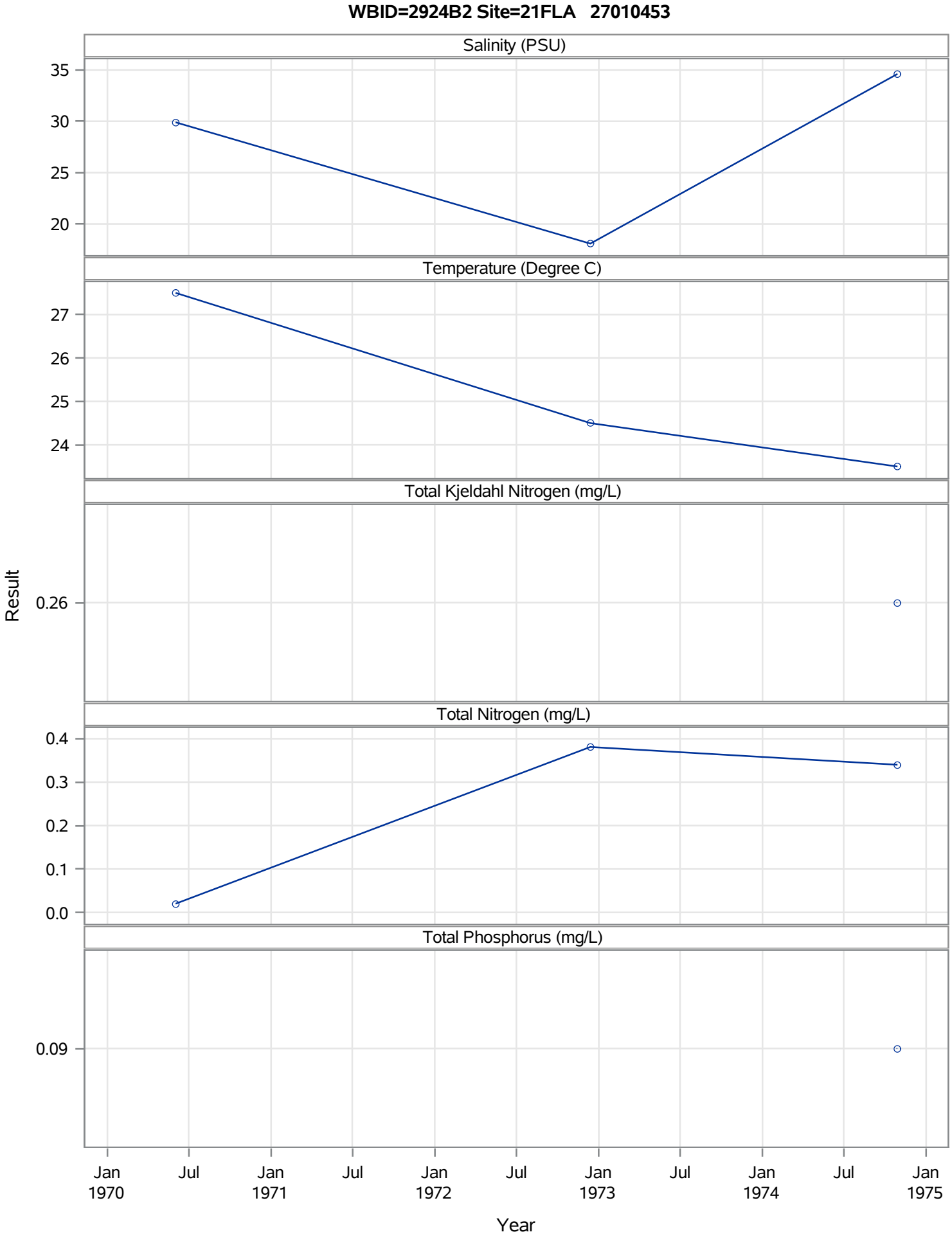

WBID=2924B2 Site=21FLA 27010451
Fecal COliform (#/100ml)
18
17
16
15
14
13
12
Nitrite + Nitrate (mg/L)
0.10
0.08
0.06
0.04
0.02
0.00
Orthophosphate (mg/L)
0.05
Result
Salinity (PSU)
32.5
30.0
27.5
25.0
22.5
Secchi Disk Depth (m)
1.6
1.4
1.2
1.0
0.8
1970
1975
1980
1985
1990
1995
2000
Year

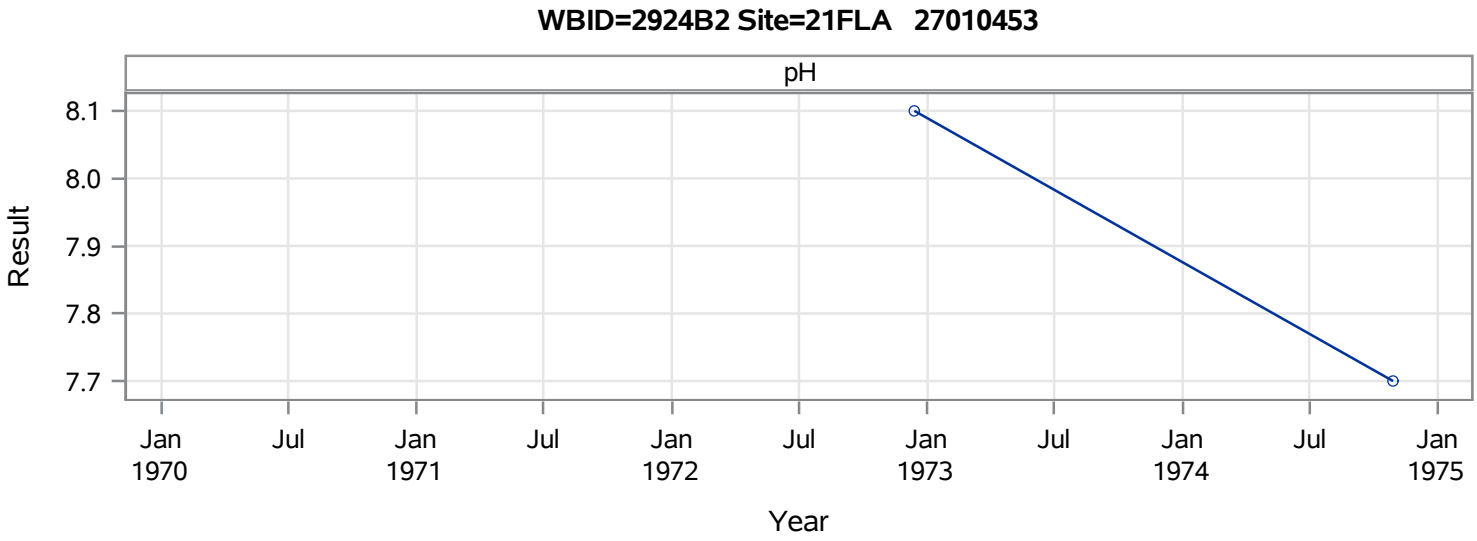

WBID=2924B2 Site=21FLA 27010451
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
2.0
1.5
1.0
0.5
Total Nitrogen (mg/L)
1.0
0.8
0.6
0.4
0.2
0.0
Total Phosphorus (mg/L)
0.12
0.10
0.08
0.06
pH
8.2
8.0
7.8
7.6
7.4
Result
1970
1975
1980
1985
1990
1995
2000
Year

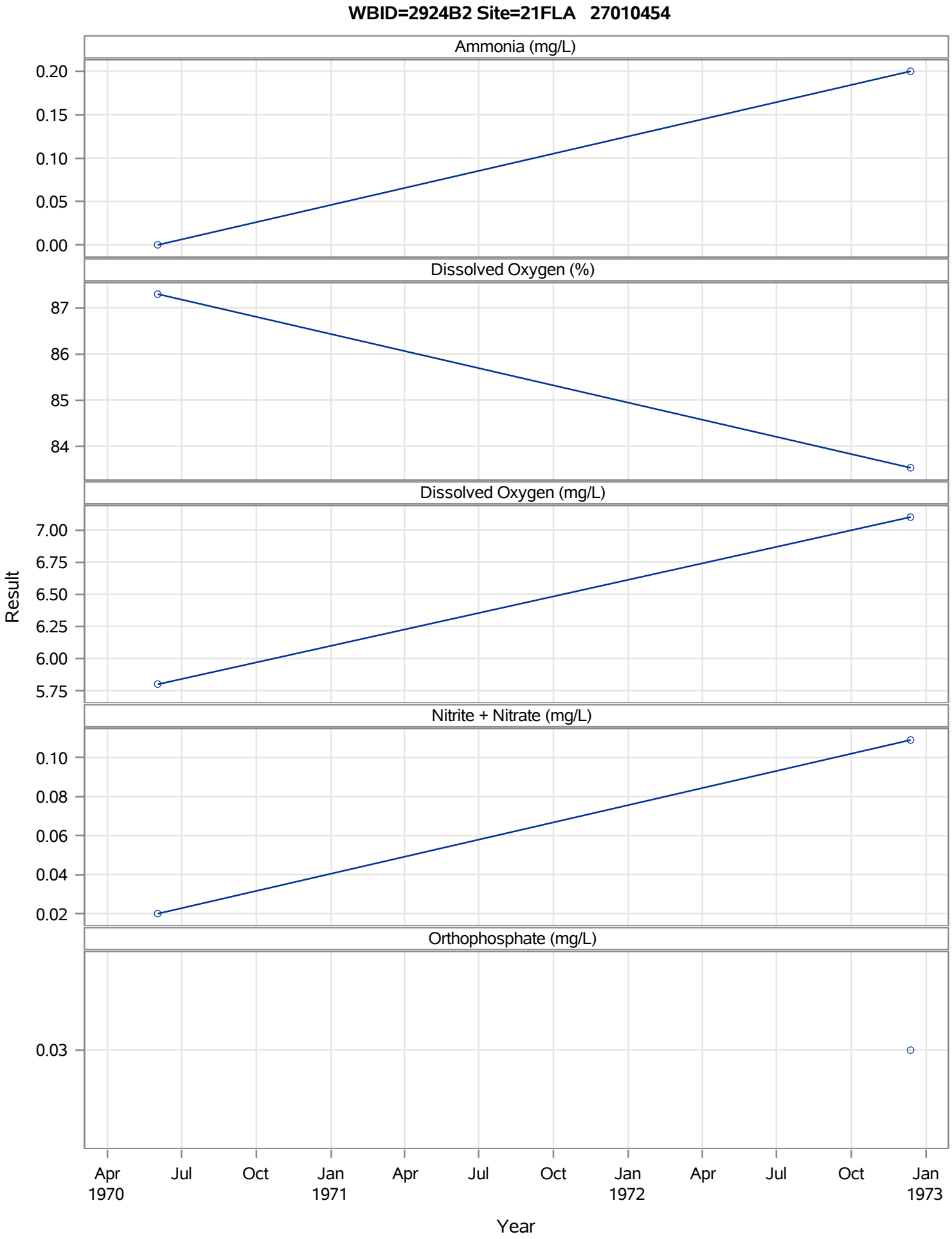

WBID=2924B2 Site=21FLA 27010452
Ammonia (mg/L)
0.15
0.10
0.05
0.00
Dissolved Oxygen (%)
87.5
85.0
82.5
80.0
77.5
Dissolved Oxygen (mg/L)
6.6
6.4
6.2
6.0
Nitrite + Nitrate (mg/L)
0.10
0.08
0.06
0.04
0.02
Orthophosphate (mg/L)
0.05
Result
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

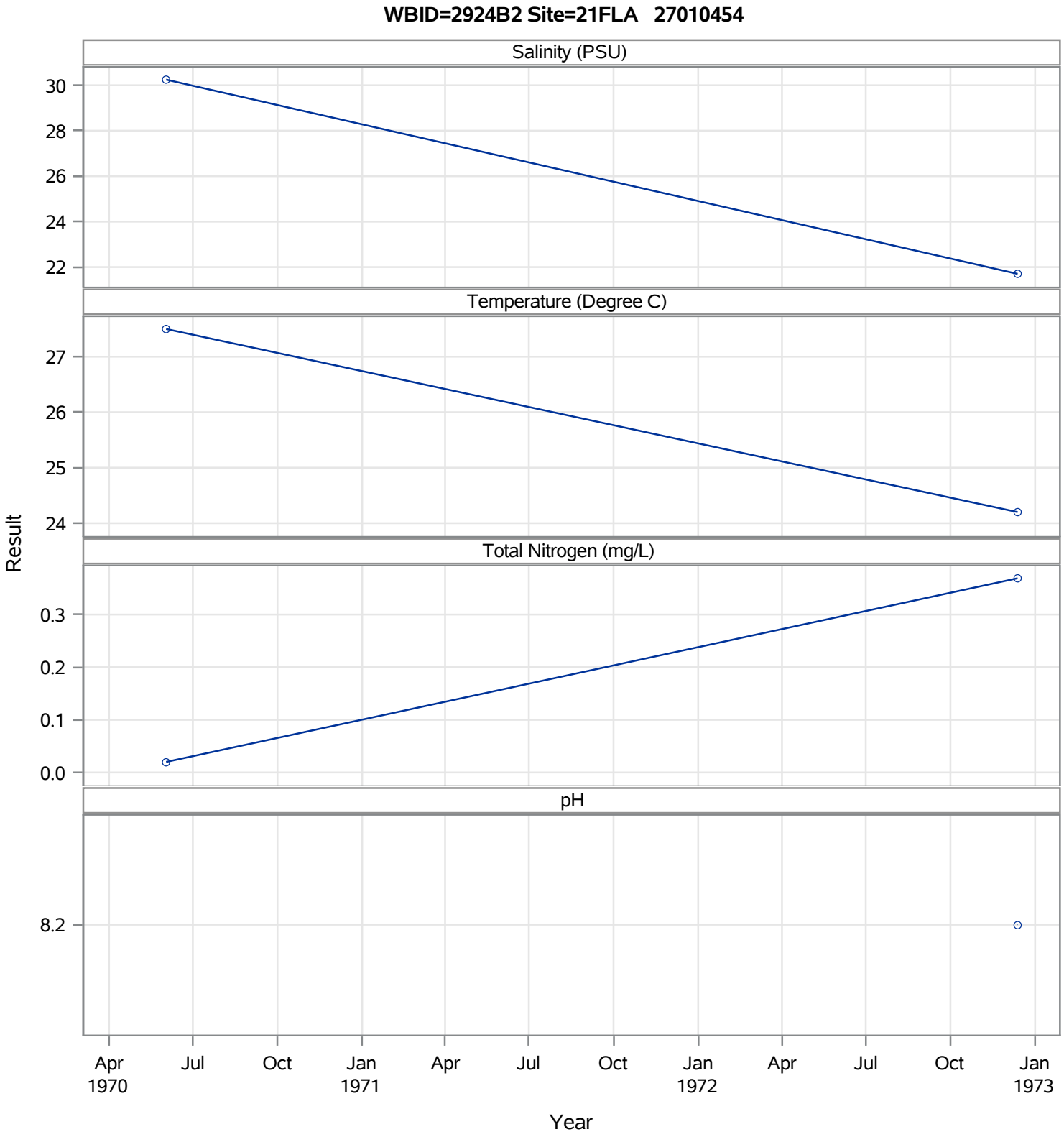

WBID=2924B2 Site=21FLA 27010452
Salinity (PSU)
30.0
27.5
25.0
22.5
20.0
Temperature (Degree C)
27
26
25
Total Nitrogen (mg/L)
0.3
0.2
0.1
0.0
pH
8.1
Result
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

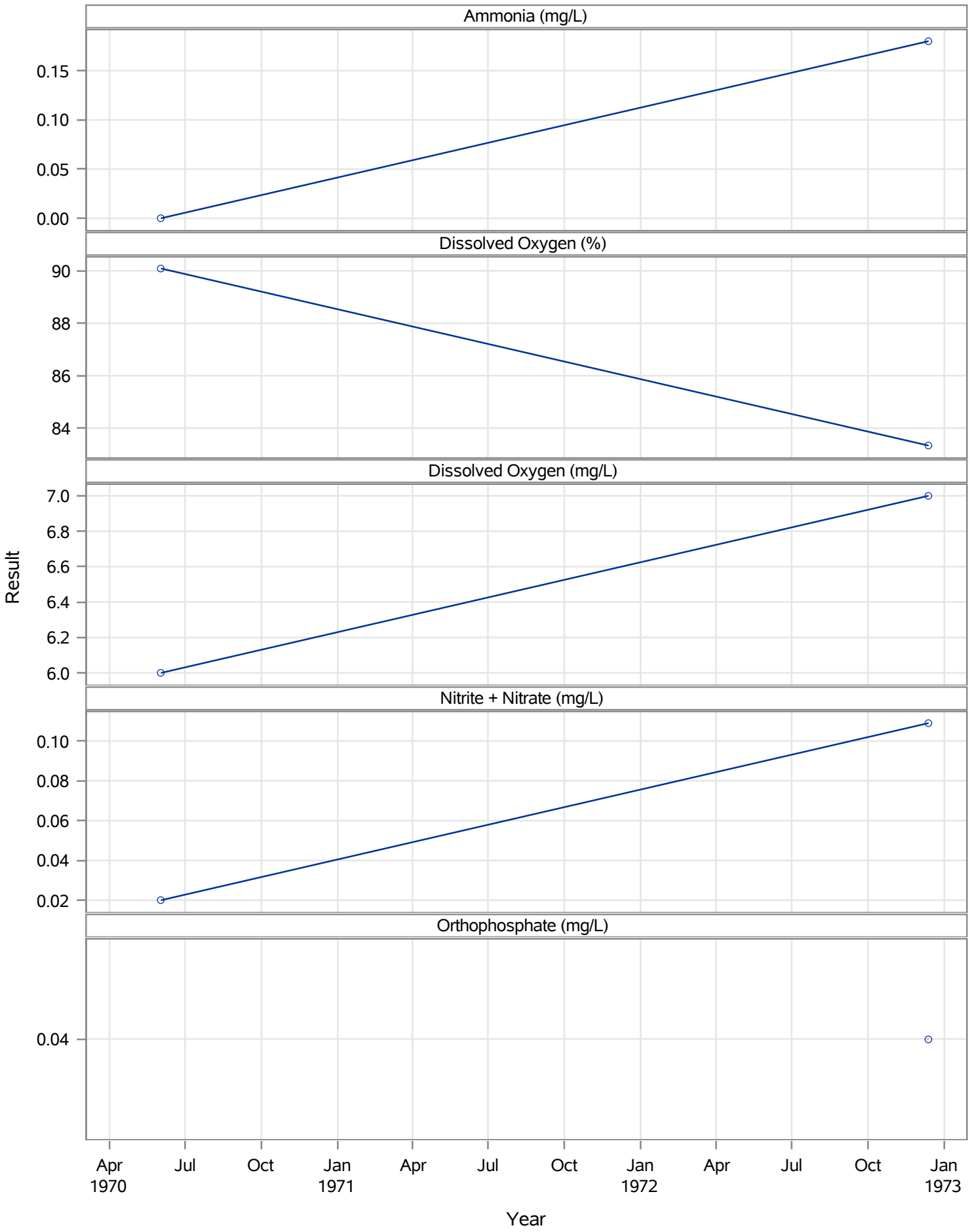

WBID=2924B2 Site=21FLA 27010453
Ammonia (mg/L)
0.15
0.10
0.05
0.00
Dissolved Oxygen (%)
95
90
85
80
75
Dissolved Oxygen (mg/L)
6.60
6.58
6.56
6.54
6.52
6.50
Result
Nitrite + Nitrate (mg/L)
0.15
0.10
0.05
Orthophosphate (mg/L)
0.05
0.04
0.03
0.02
0.01
Jan 1970
Jul
Jan 1971
Jul
Jan 1972
Jul
Jan 1973
Jul
Jan 1974
Jul
Jan 1975
Year

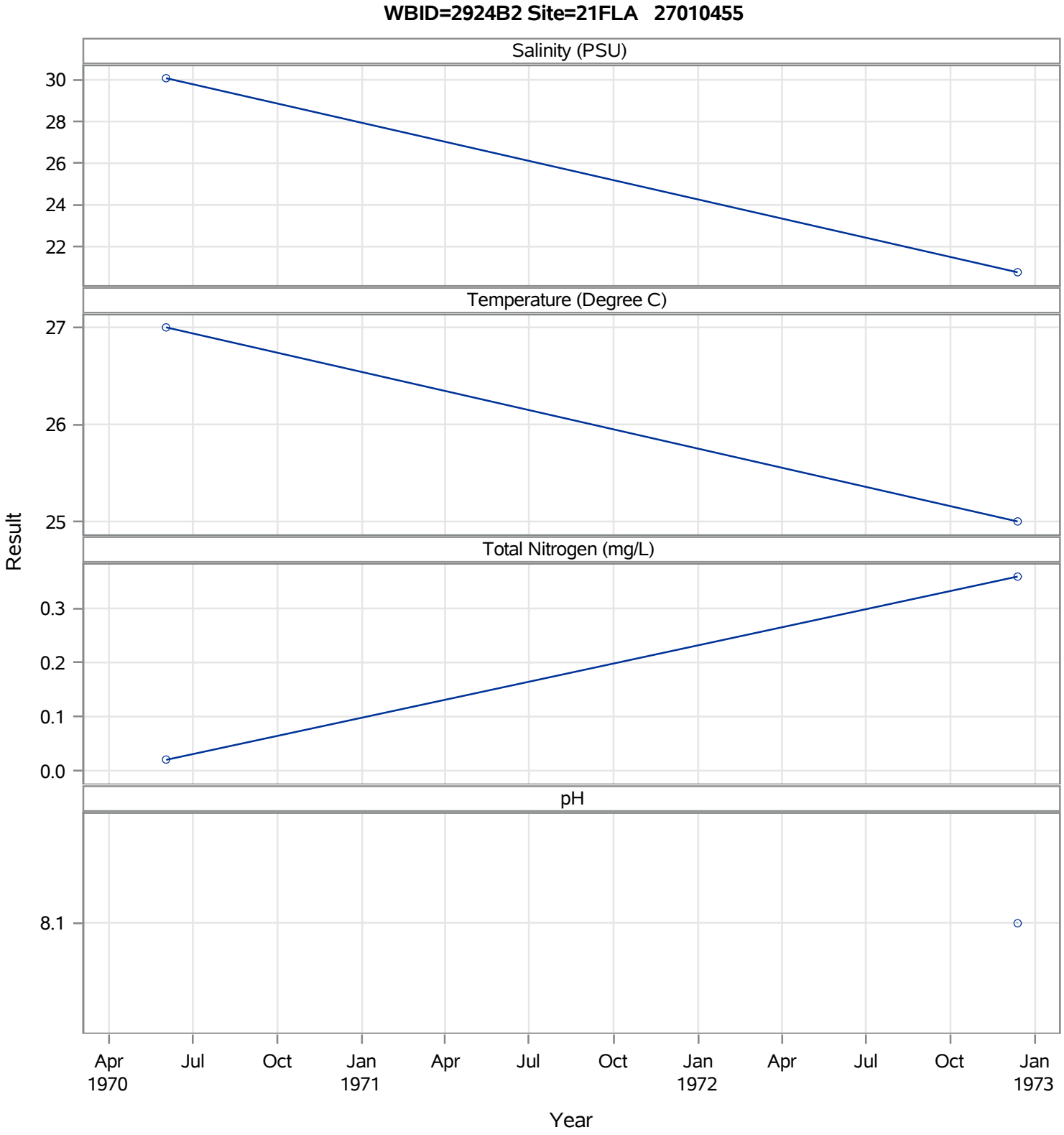

WBID=2924B2 Site=21FLA 27010453
Salinity (PSU)
35
30
25
20
Temperature (Degree C)
27
26
25
24
Total Kjeldahl Nitrogen (mg/L)
0.26
Total Nitrogen (mg/L)
0.4
0.3
0.2
0.1
0.0
Total Phosphorus (mg/L)
0.09
Result
Jan 1970
Jul
Jan 1971
Jul
Jan 1972
Jul
Jan 1973
Jul
Jan 1974
Jul
Jan 1975
Year

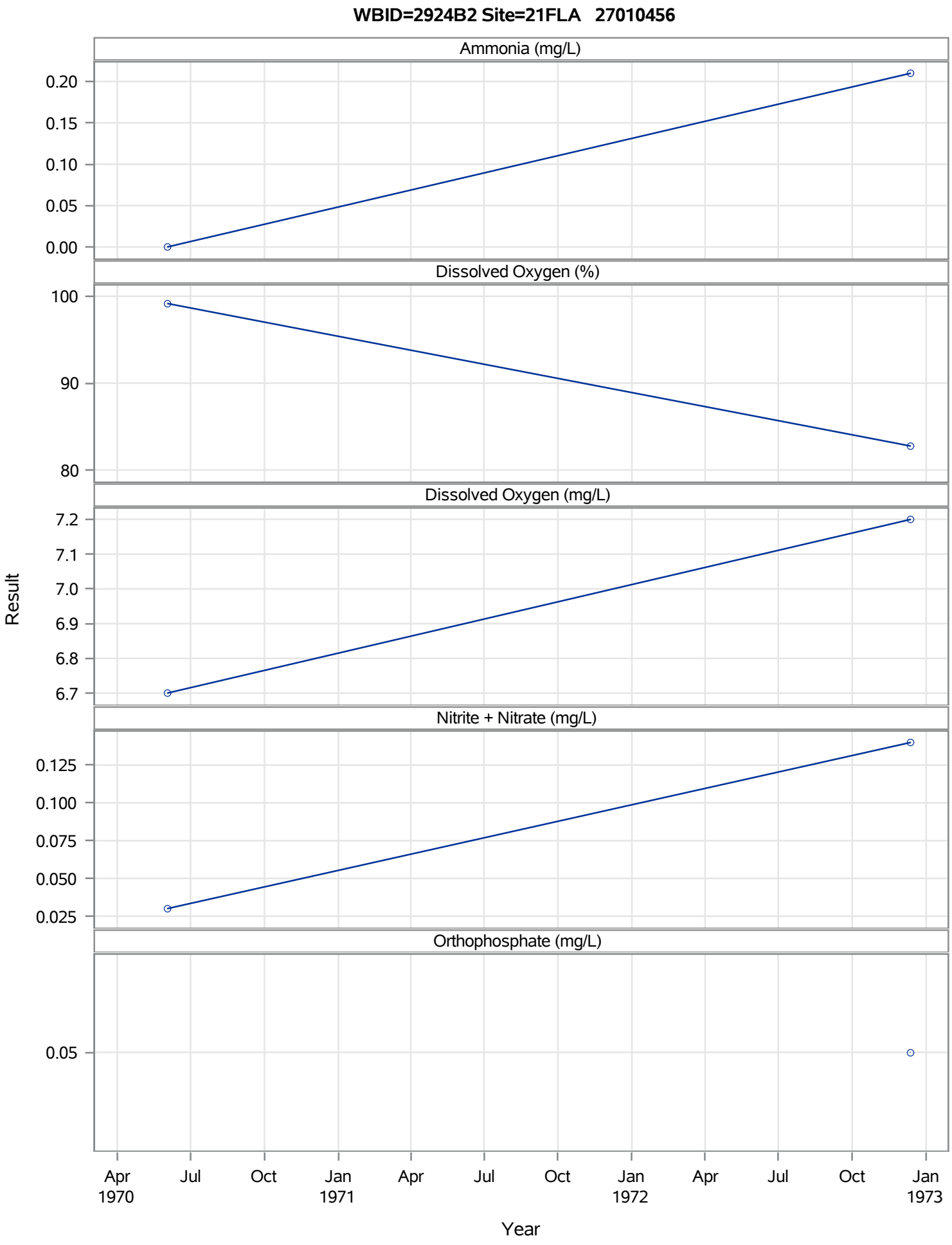

WBID=2924B2 Site=21FLA 27010453
pH
Result
8.1
8.0
7.9
7.8
7.7
Jan 1970
Jul
Jan 1971
Jul
Jan 1972
Jul
Jan 1973
Jul
Jan 1974
Jul
Jan 1975
Year

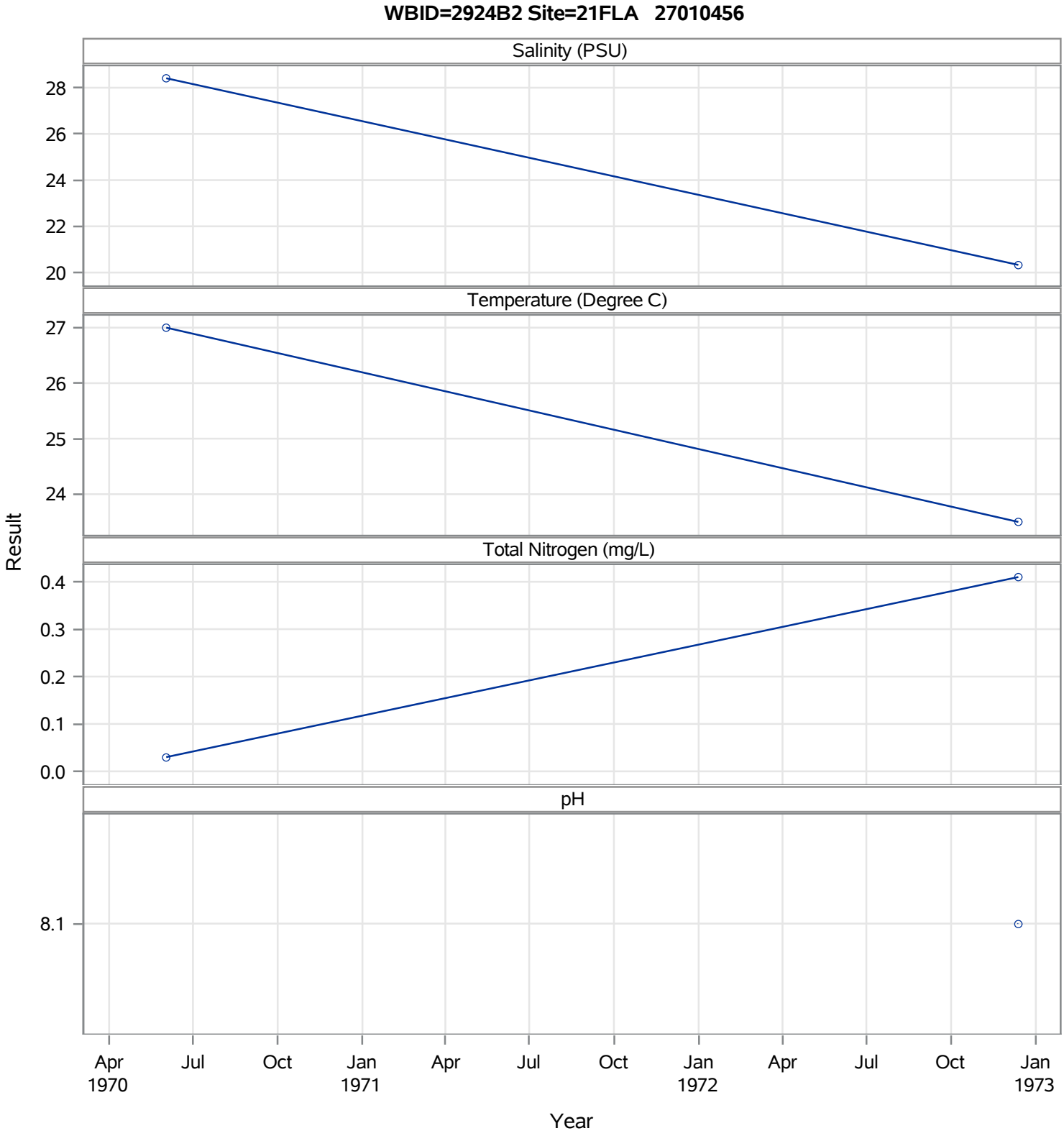

WBID=2924B2 Site=21FLA 27010454
Ammonia (mg/L)
0.20
0.15
0.10
0.05
0.00
Dissolved Oxygen (%)
87
86
85
84
Dissolved Oxygen (mg/L)
7.00
6.75
6.50
6.25
6.00
5.75
Nitrite + Nitrate (mg/L)
0.10
0.08
0.06
0.04
0.02
Orthophosphate (mg/L)
0.03
Result
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

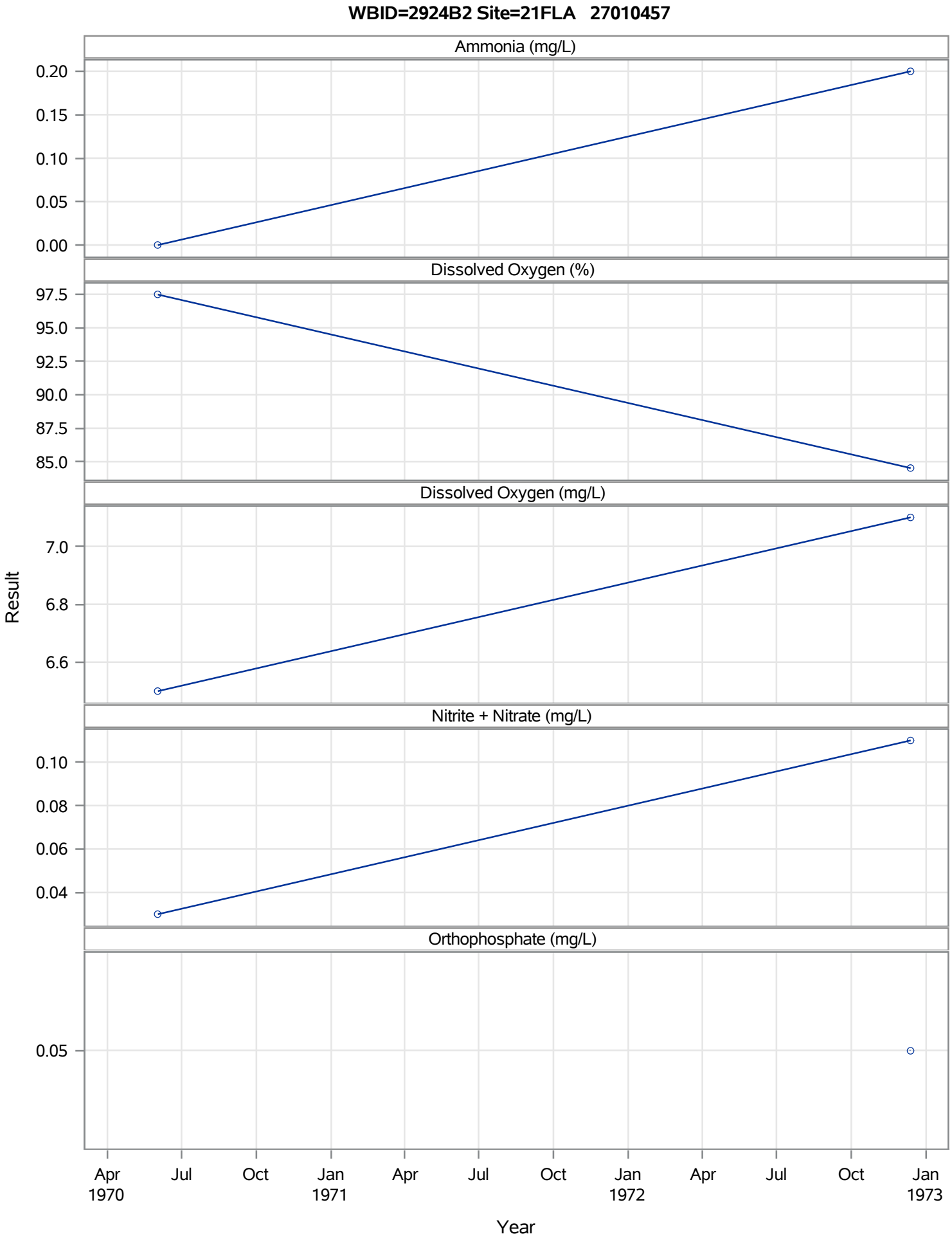

WBID=2924B2 Site=21FLA 27010454
Salinity (PSU)
30
28
26
24
22
Temperature (Degree C)
27
26
25
24
Total Nitrogen (mg/L)
0.3
0.2
0.1
0.0
pH
8.2
Result
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

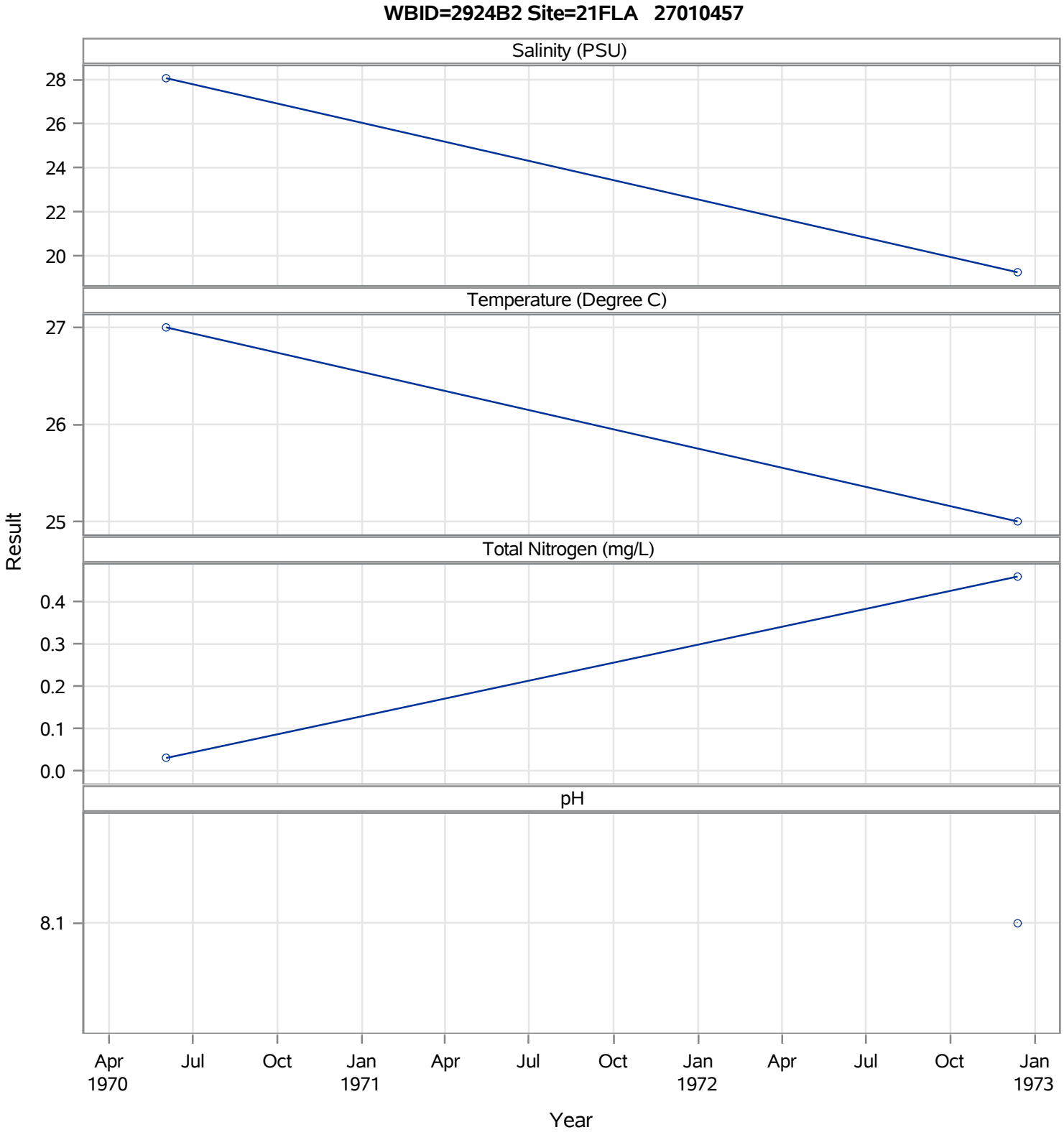

WBID=2924B2 Site=21FLA 27010455
Ammonia (mg/L)
0.15
0.10
0.05
0.00
Dissolved Oxygen (%)
90
88
86
84
Dissolved Oxygen (mg/L)
7.0
6.8
6.6
6.4
6.2
6.0
Nitrite + Nitrate (mg/L)
0.10
0.08
0.06
0.04
0.02
Orthophosphate (mg/L)
0.04
Result
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

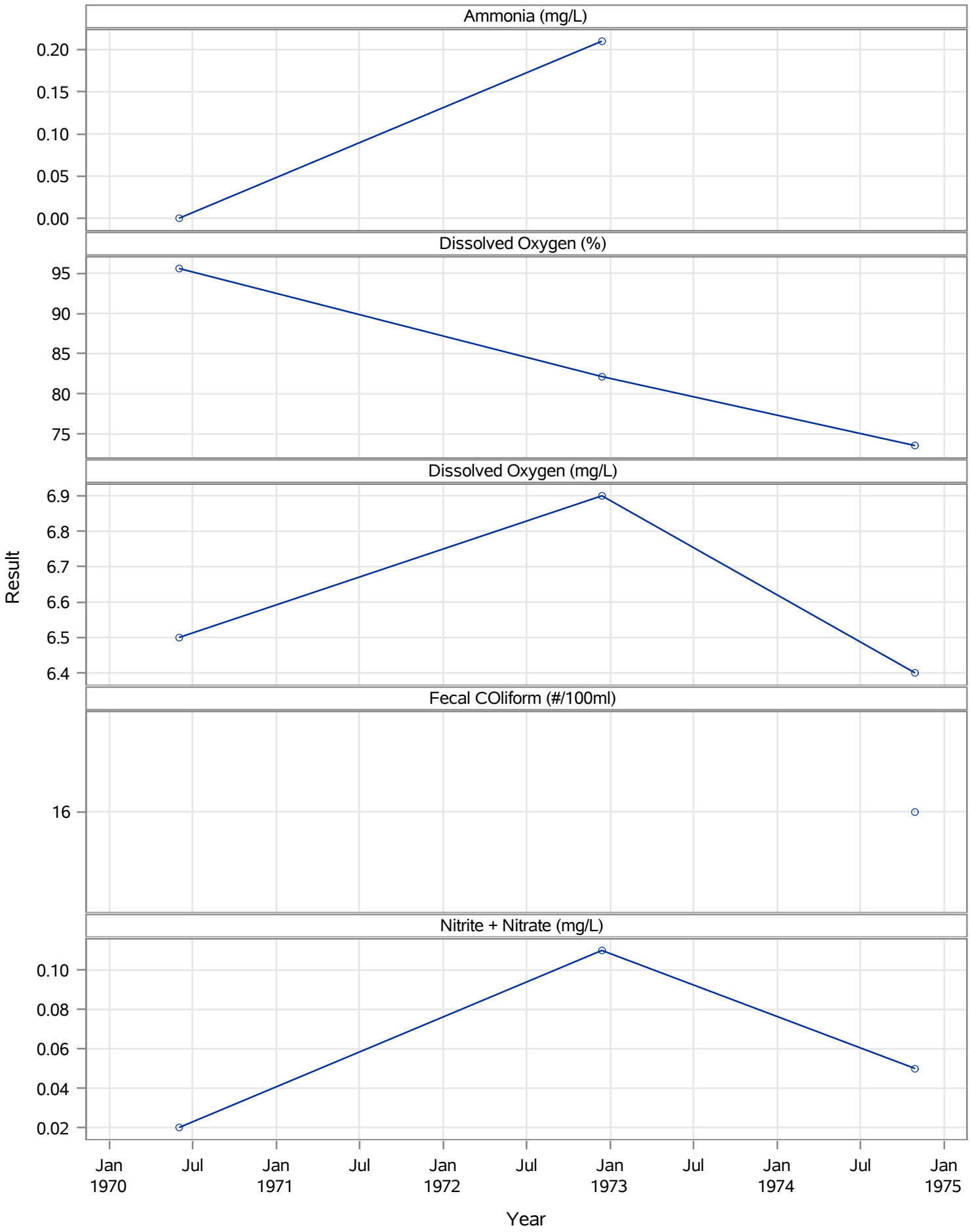

WBID=2924B2 Site=21FLA 27010455
Salinity (PSU)
30
28
26
24
22
Temperature (Degree C)
27
26
25
Result
Total Nitrogen (mg/L)
0.3
0.2
0.1
0.0
pH
8.1
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

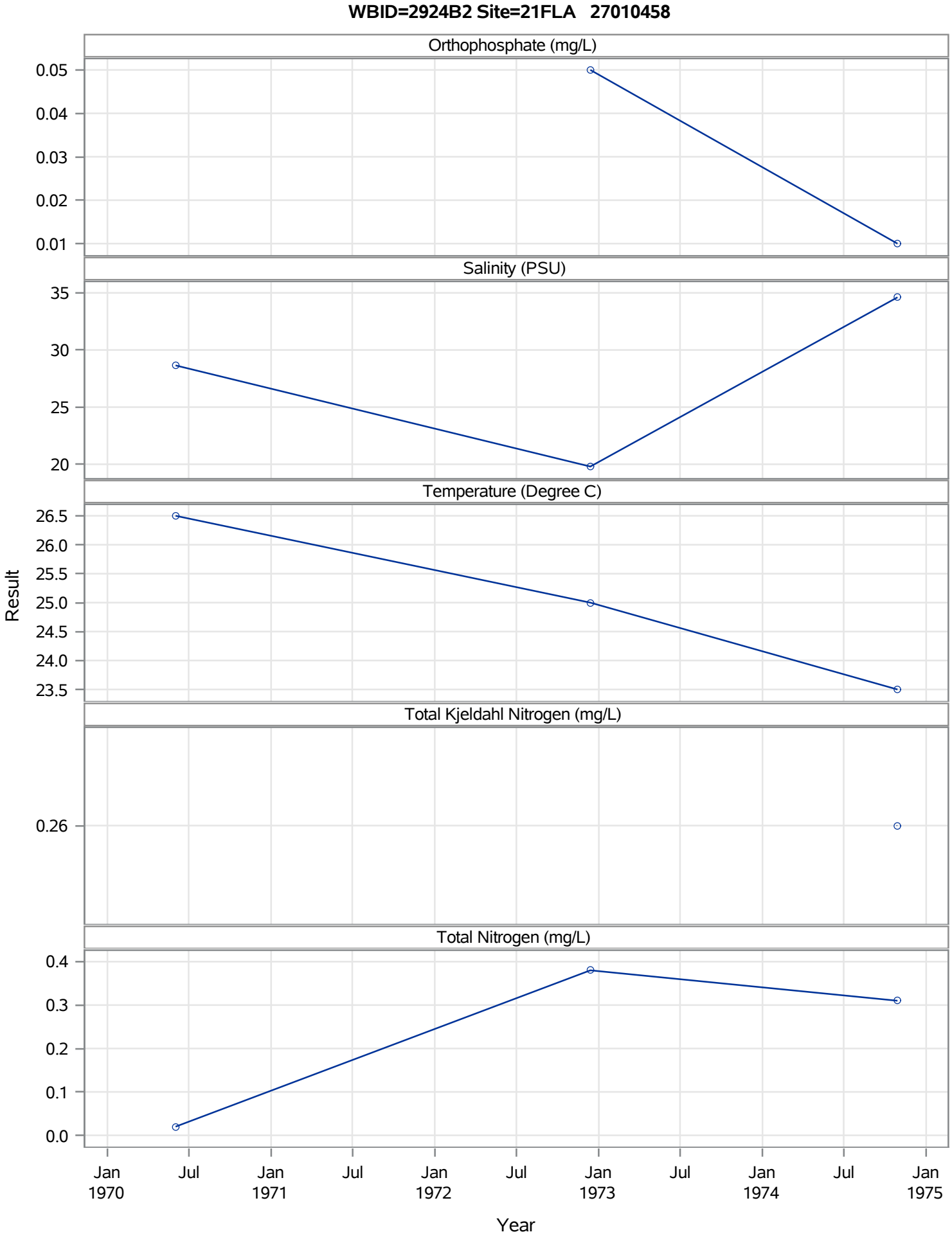

WBID=2924B2 Site=21FLA 27010456
Ammonia (mg/L)
0.20
0.15
0.10
0.05
0.00
Dissolved Oxygen (%)
100
90
80
Dissolved Oxygen (mg/L)
7.2
7.1
7.0
6.9
6.8
6.7
Nitrite + Nitrate (mg/L)
0.125
0.100
0.075
0.050
0.025
Orthophosphate (mg/L)
0.05
Result
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

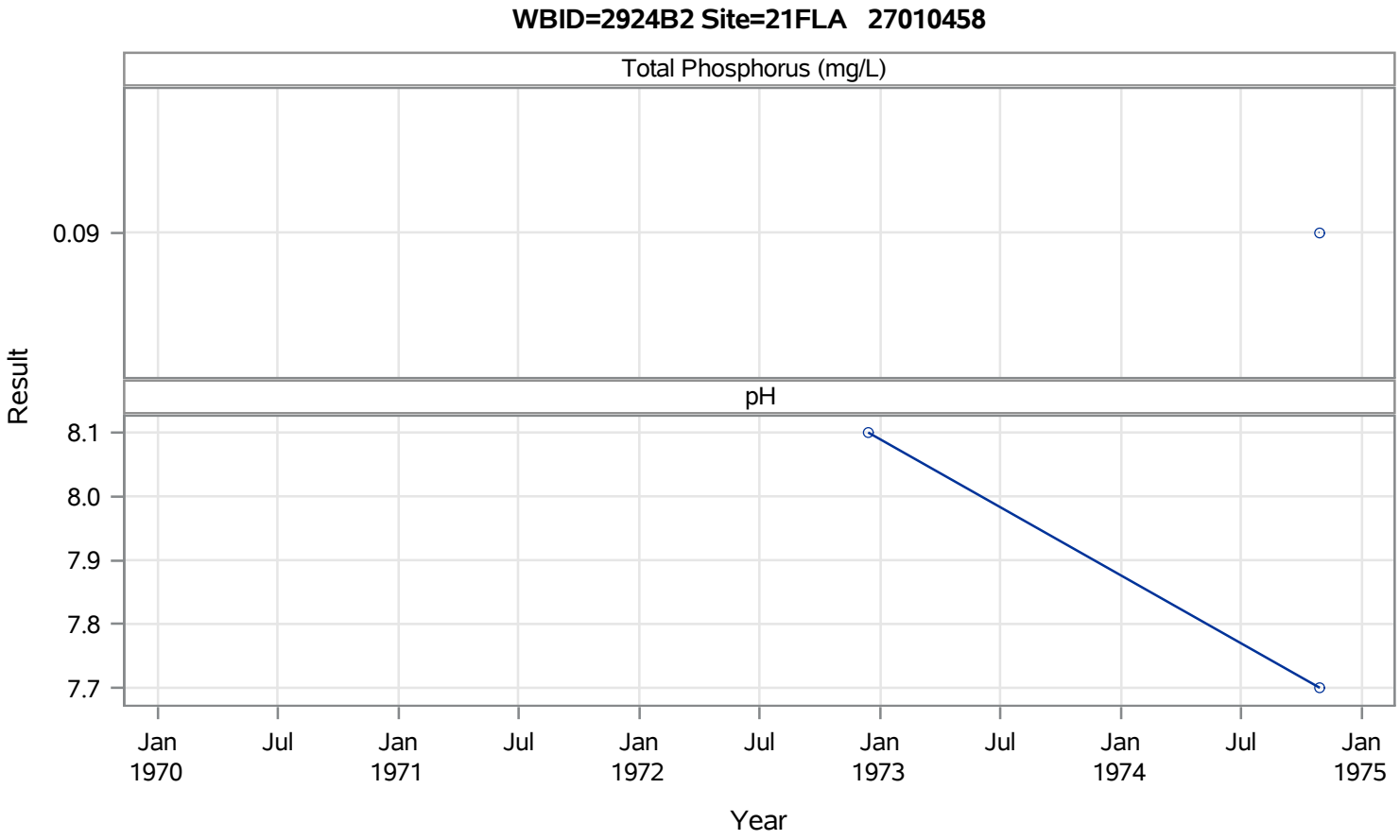

WBID=2924B2 Site=21FLA 27010456
Salinity (PSU)
28
26
24
22
20
Temperature (Degree C)
27
26
25
24
Total Nitrogen (mg/L)
0.4
0.3
0.2
0.1
0.0
pH
8.1
Result
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

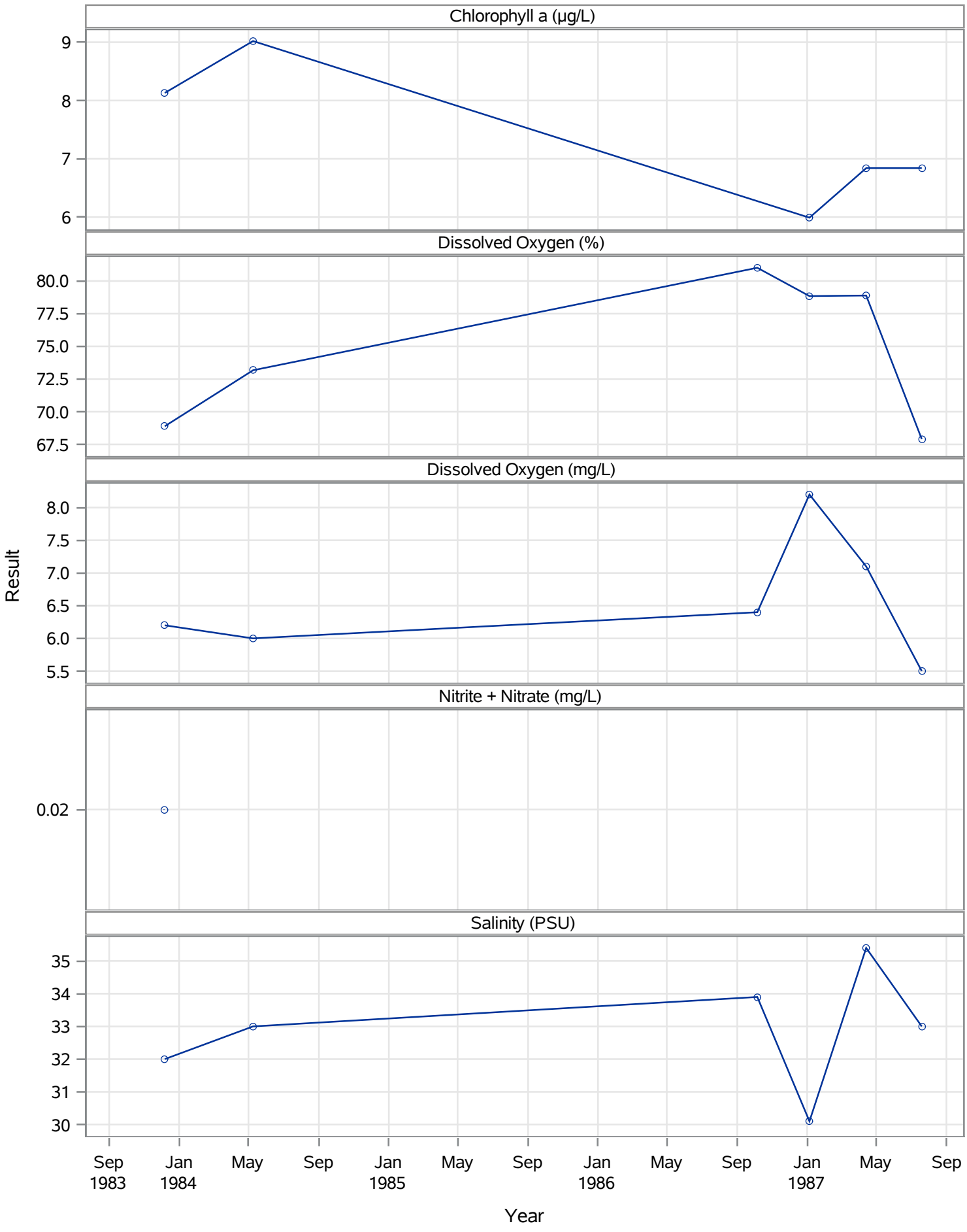

WBID=2924B2 Site=21FLA 27010457
Ammonia (mg/L)
0.20
0.15
0.10
0.05
0.00
Dissolved Oxygen (%)
97.5
95.0
92.5
90.0
87.5
85.0
Dissolved Oxygen (mg/L)
7.0
6.8
6.6
Nitrite + Nitrate (mg/L)
0.10
0.08
0.06
0.04
Orthophosphate (mg/L)
0.05
Result
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

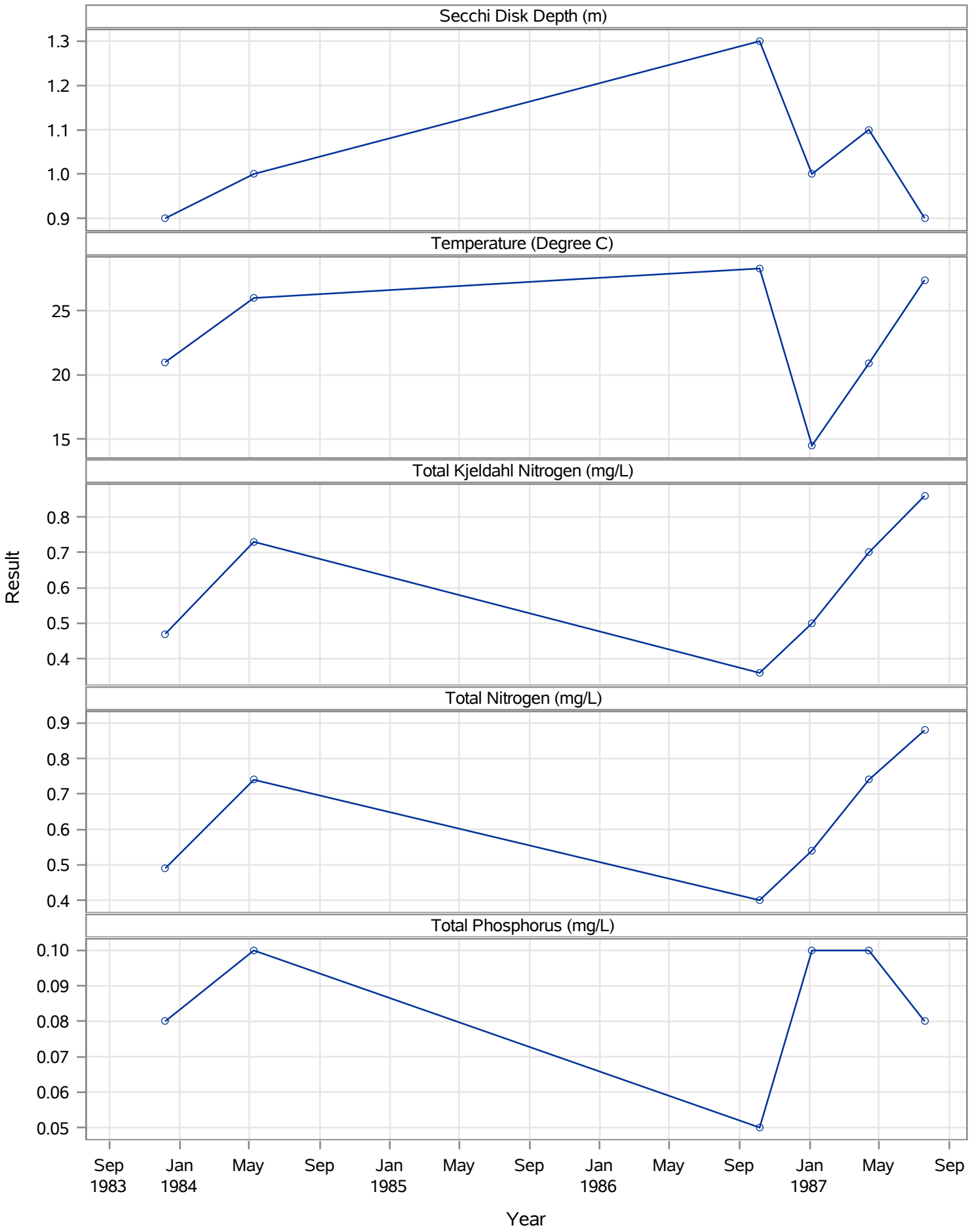

WBID=2924B2 Site=21FLA 27010457
Salinity (PSU)
28
26
24
22
20
Temperature (Degree C)
27
26
25
Total Nitrogen (mg/L)
0.4
0.3
0.2
0.1
0.0
pH
8.1
Result
Apr 1970
Jul
Oct
Jan 1971
Apr
Jul
Oct
Jan 1972
Apr
Jul
Oct
Jan 1973
Year

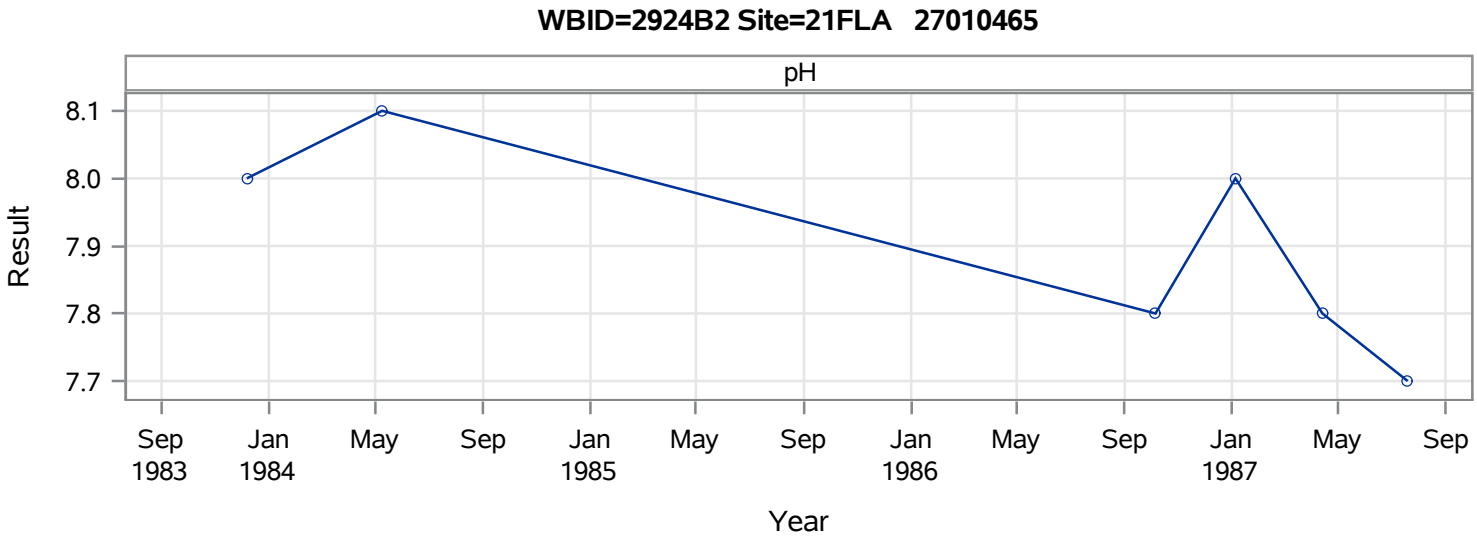

WBID=2924B2 Site=21FLA 27010458
Ammonia (mg/L)
0.20
0.15
0.10
0.05
0.00
Dissolved Oxygen (%)
95
90
85
80
75
Dissolved Oxygen (mg/L)
6.9
6.8
6.7
6.6
6.5
6.4
Result
Fecal COliform (#/100ml)
16
Nitrite + Nitrate (mg/L)
0.10
0.08
0.06
0.04
0.02
Jan 1970
Jul
Jan 1971
Jul
Jan 1972
Jul
Jan 1973
Jul
Jan 1974
Jul
Jan 1975
Year

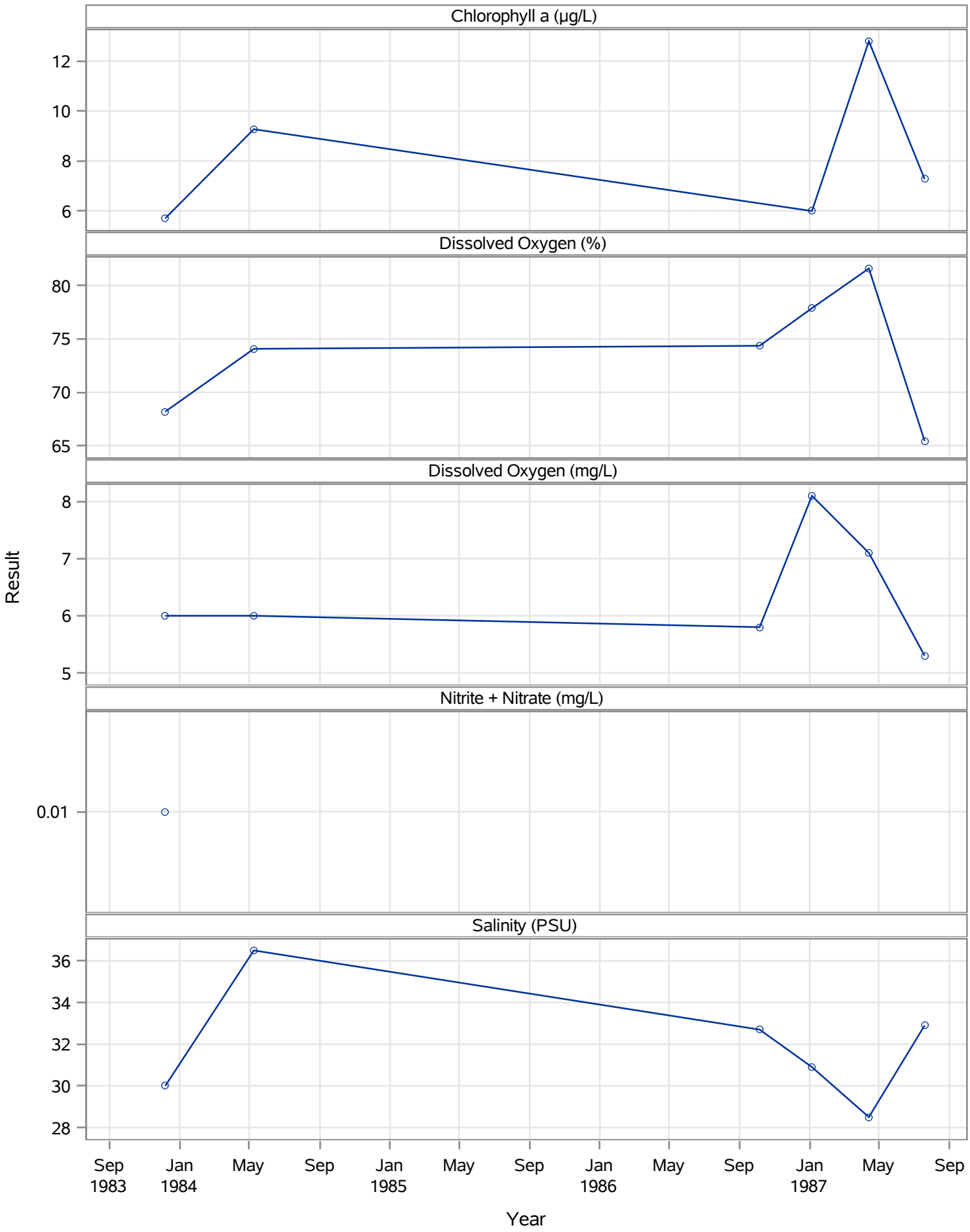

WBID=2924B2 Site=21FLA 27010458
Orthophosphate (mg/L)
0.05
0.04
0.03
0.02
0.01
Salinity (PSU)
35
30
25
20
Temperature (Degree C)
26.5
26.0
25.5
25.0
24.5
24.0
23.5
Result
Total Kjeldahl Nitrogen (mg/L)
0.26
Total Nitrogen (mg/L)
0.4
0.3
0.2
0.1
0.0
Jan 1970
Jul
Jan 1971
Jul
Jan 1972
Jul
Jan 1973
Jul
Jan 1974
Jul
Jan 1975
Year

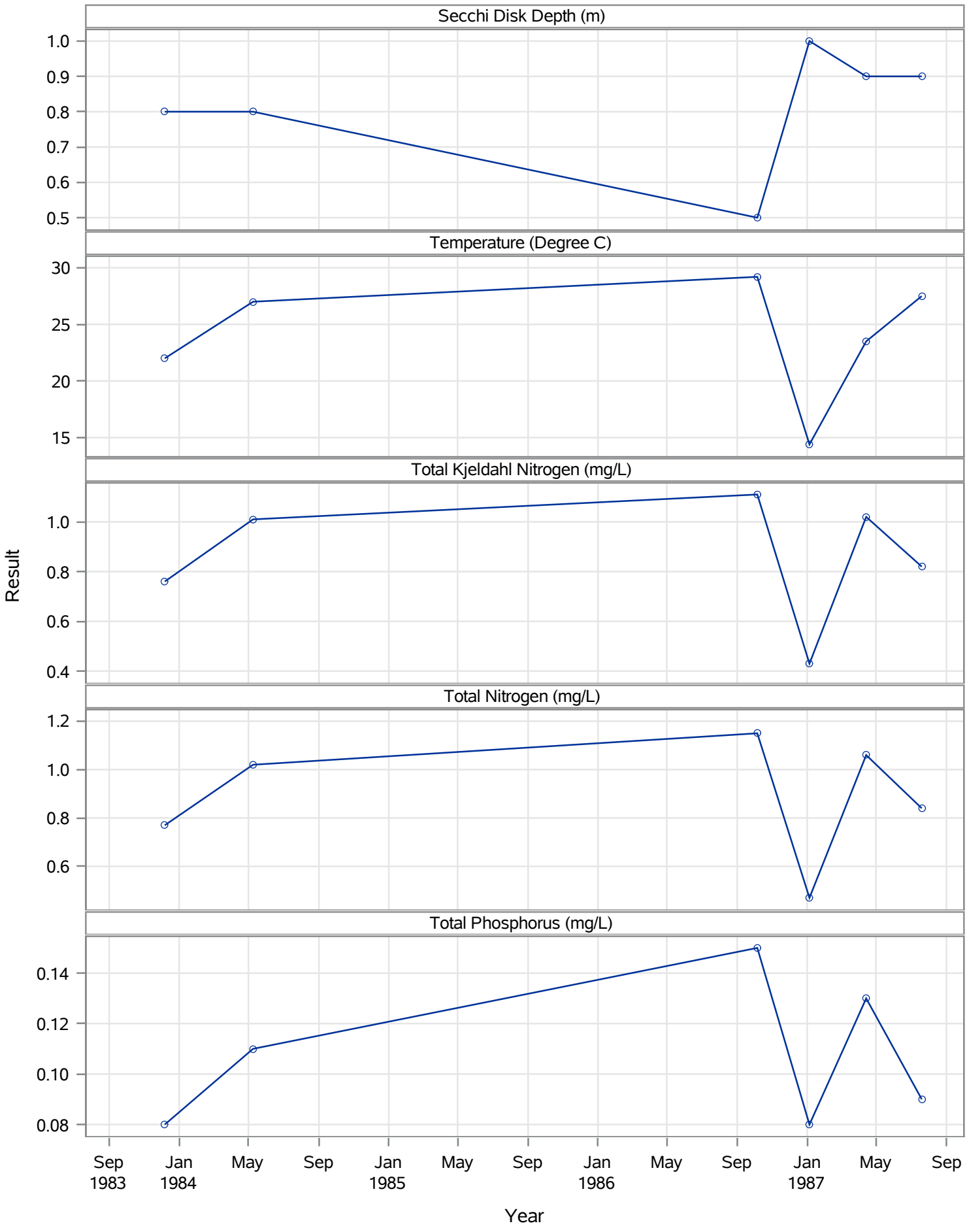

WBID=2924B2 Site=21FLA 27010458
Total Phosphorus (mg/L)
0.09
pH
8.1
8.0
7.9
7.8
7.7
Result
Jan 1970
Jul
Jan 1971
Jul
Jan 1972
Jul
Jan 1973
Jul
Jan 1974
Jul
Jan 1975
Year

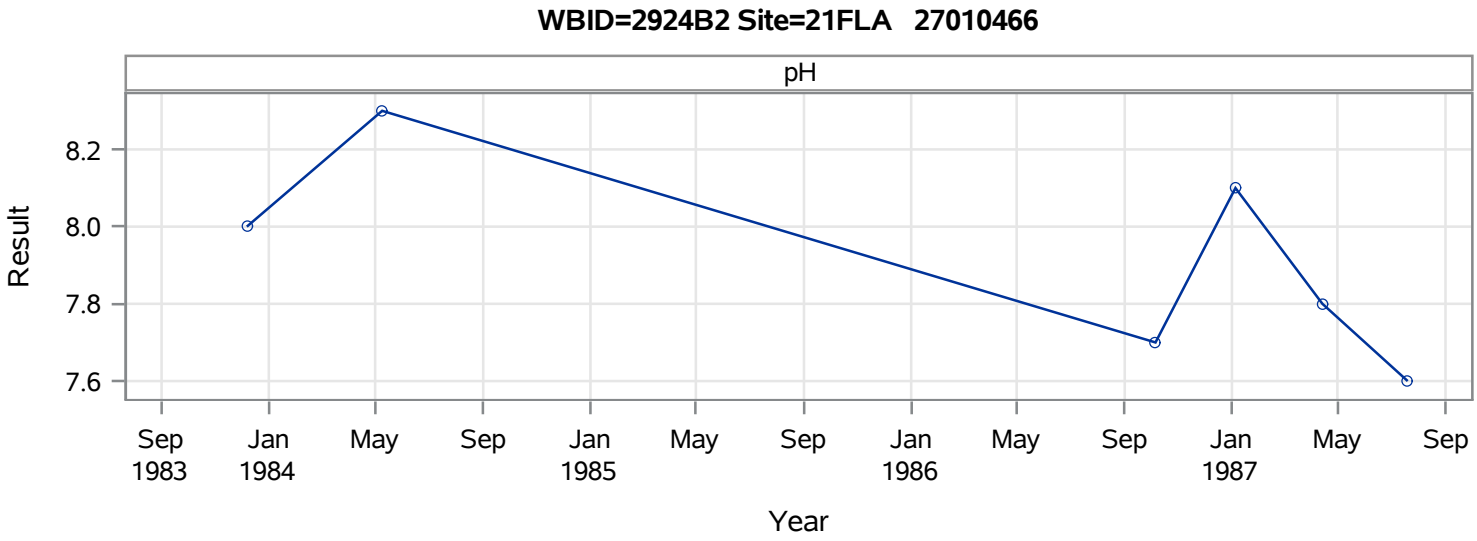

WBID=2924B2 Site=21FLA 27010465
Chlorophyll a (µg/L)
9
8
7
6
Dissolved Oxygen (%)
80.0
77.5
75.0
72.5
70.0
67.5
Dissolved Oxygen (mg/L)
8.0
7.5
7.0
6.5
6.0
5.5
Result
Nitrite + Nitrate (mg/L)
0.02
Salinity (PSU)
35
34
33
32
31
30
Sep 1983
Jan 1984
May
Sep
Jan 1985
May
Sep
Jan 1986
May
Sep
Jan 1987
May
Sep
Year

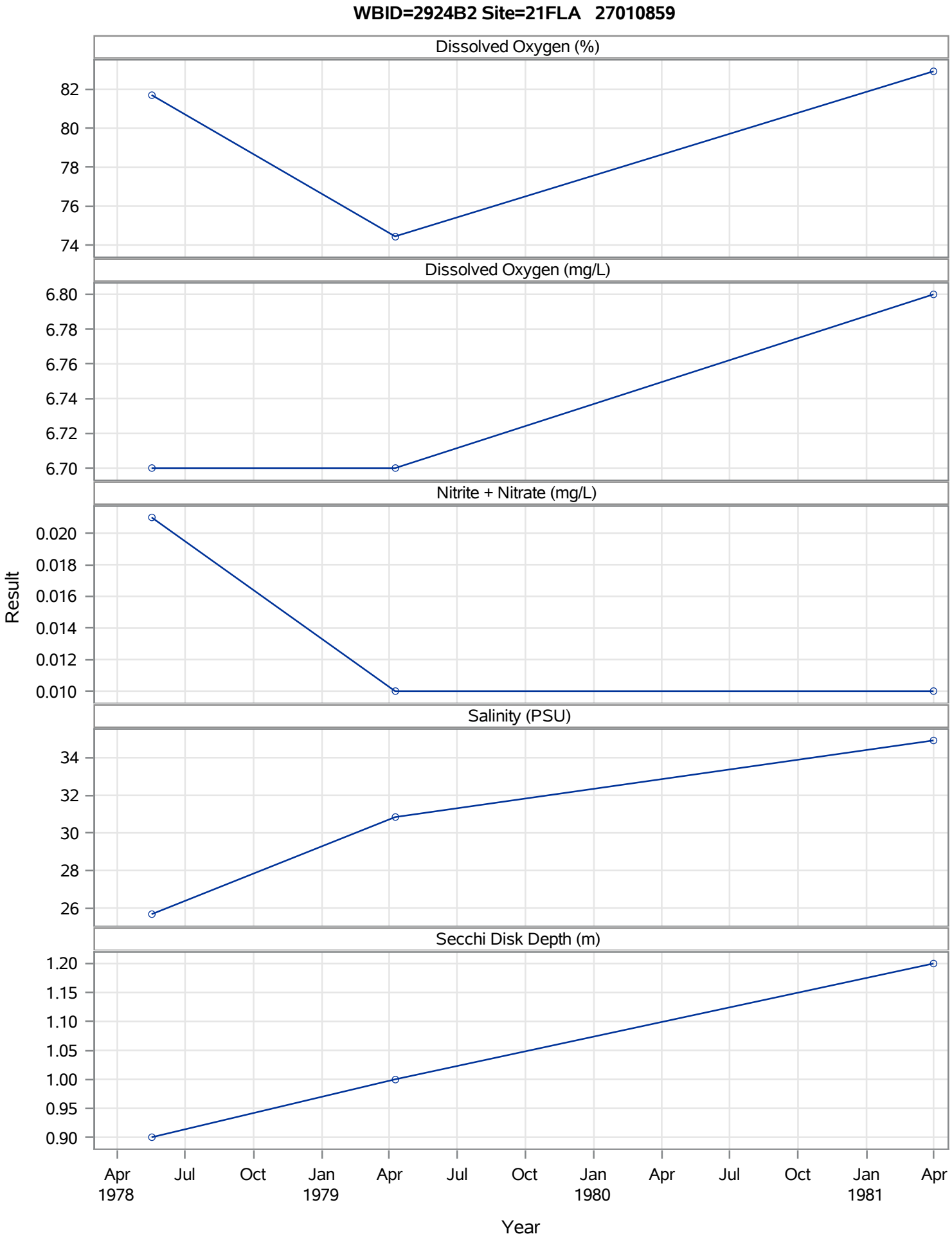

WBID=2924B2 Site=21FLA 27010465
Secchi Disk Depth (m)
1.3
1.2
1.1
1.0
0.9
Temperature (Degree C)
25
20
15
Total Kjeldahl Nitrogen (mg/L)
0.8
0.7
0.6
0.5
0.4
Total Nitrogen (mg/L)
0.9
0.8
0.7
0.6
0.5
0.4
Total Phosphorus (mg/L)
0.10
0.09
0.08
0.07
0.06
0.05
Result
Sep 1983
Jan 1984
May
Sep
Jan 1985
May
Sep
Jan 1986
May
Sep
Jan 1987
May
Sep
Year

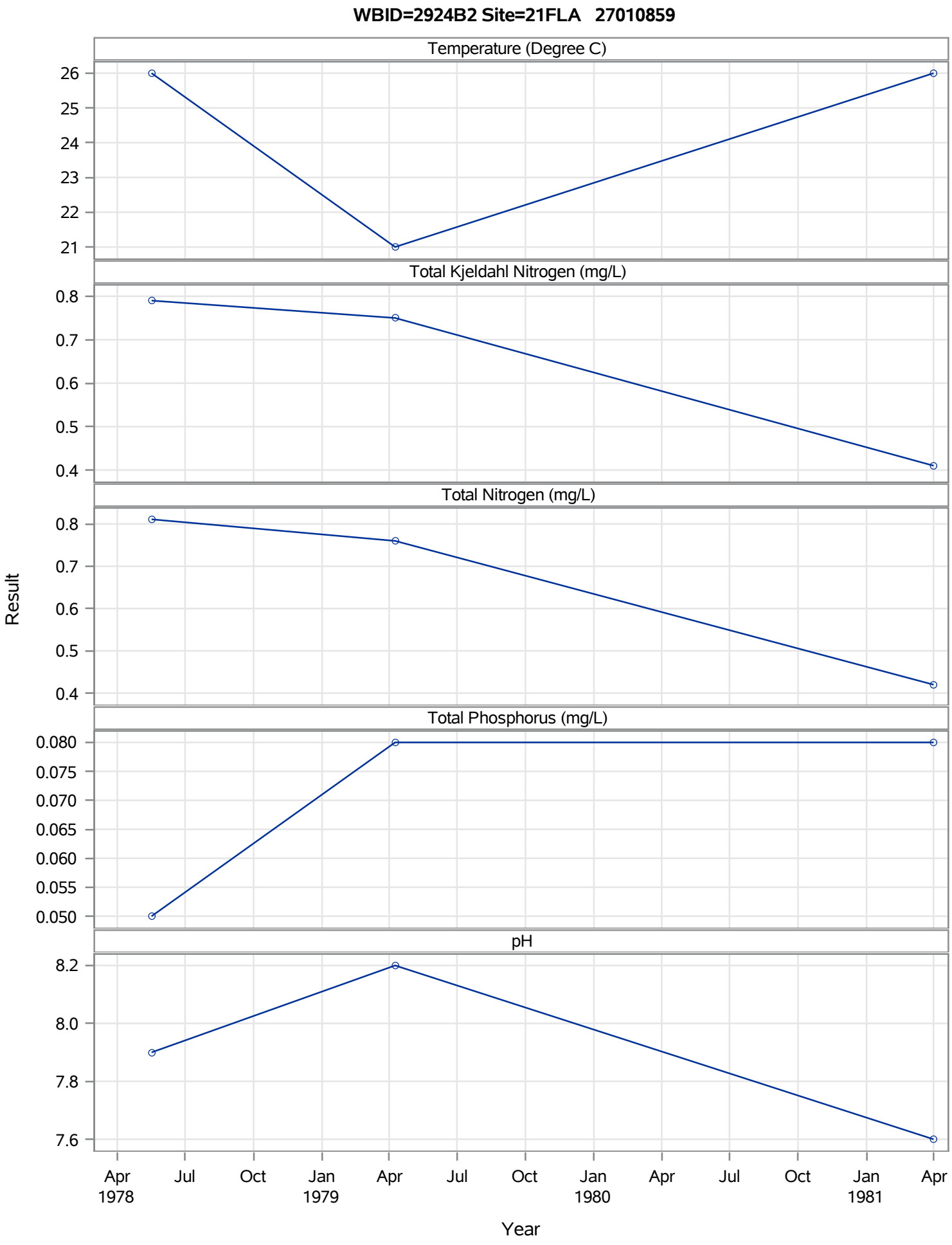

WBID=2924B2 Site=21FLA 27010465
pH
Result
8.1
8.0
7.9
7.8
7.7
Sep 1983
Jan 1984
May
Sep
Jan 1985
May
Sep
Jan 1986
May
Sep
Jan 1987
May
Sep
Year

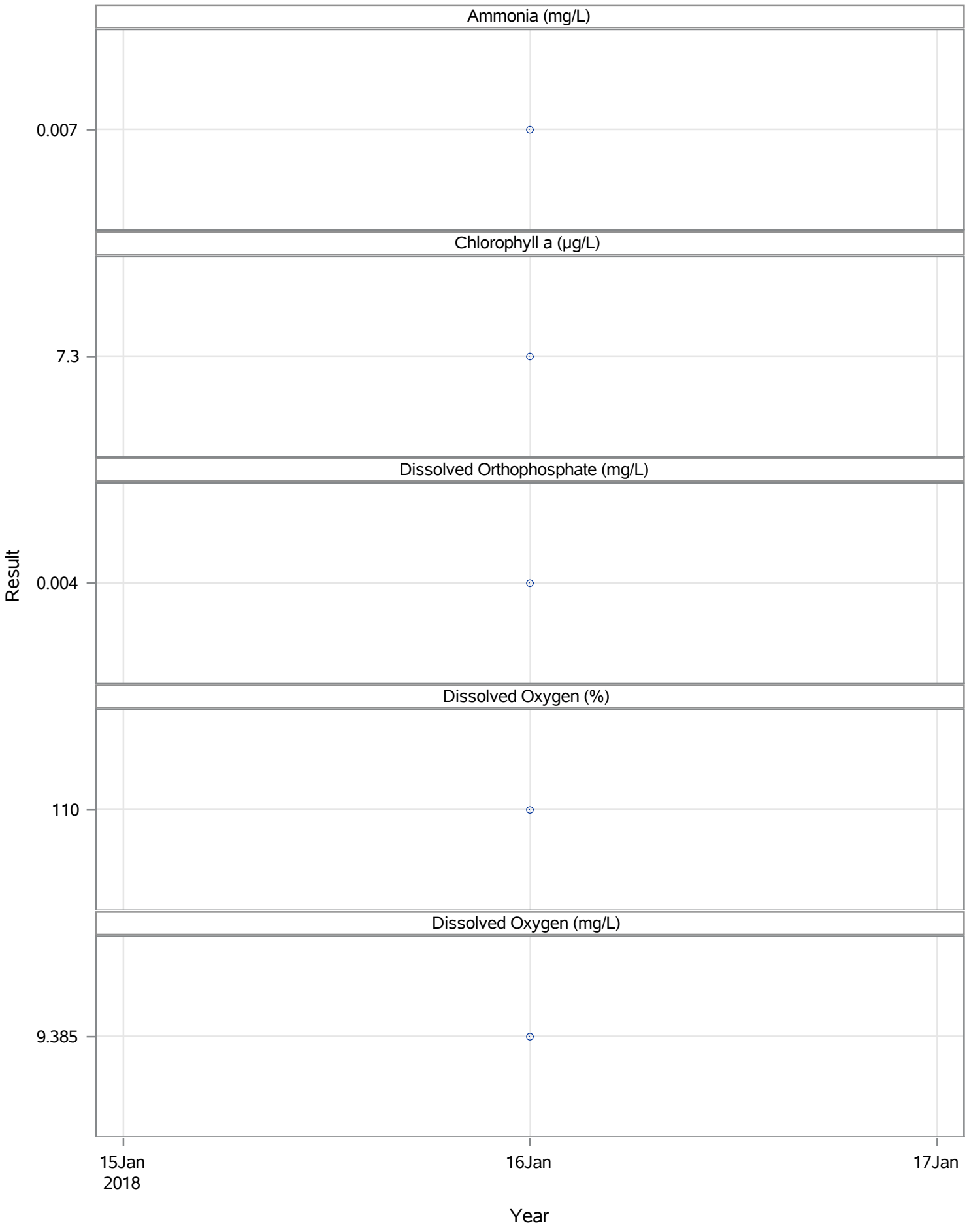

WBID=2924B2 Site=21FLA 27010466
Chlorophyll a (µg/L)
12
10
8
6
Dissolved Oxygen (%)
80
75
70
65
Dissolved Oxygen (mg/L)
8
7
6
5
Result
Nitrite + Nitrate (mg/L)
0.01
Salinity (PSU)
36
34
32
30
28
Sep 1983
Jan 1984
May
Sep
Jan 1985
May
Sep
Jan 1986
May
Sep
Jan 1987
May
Sep
Year

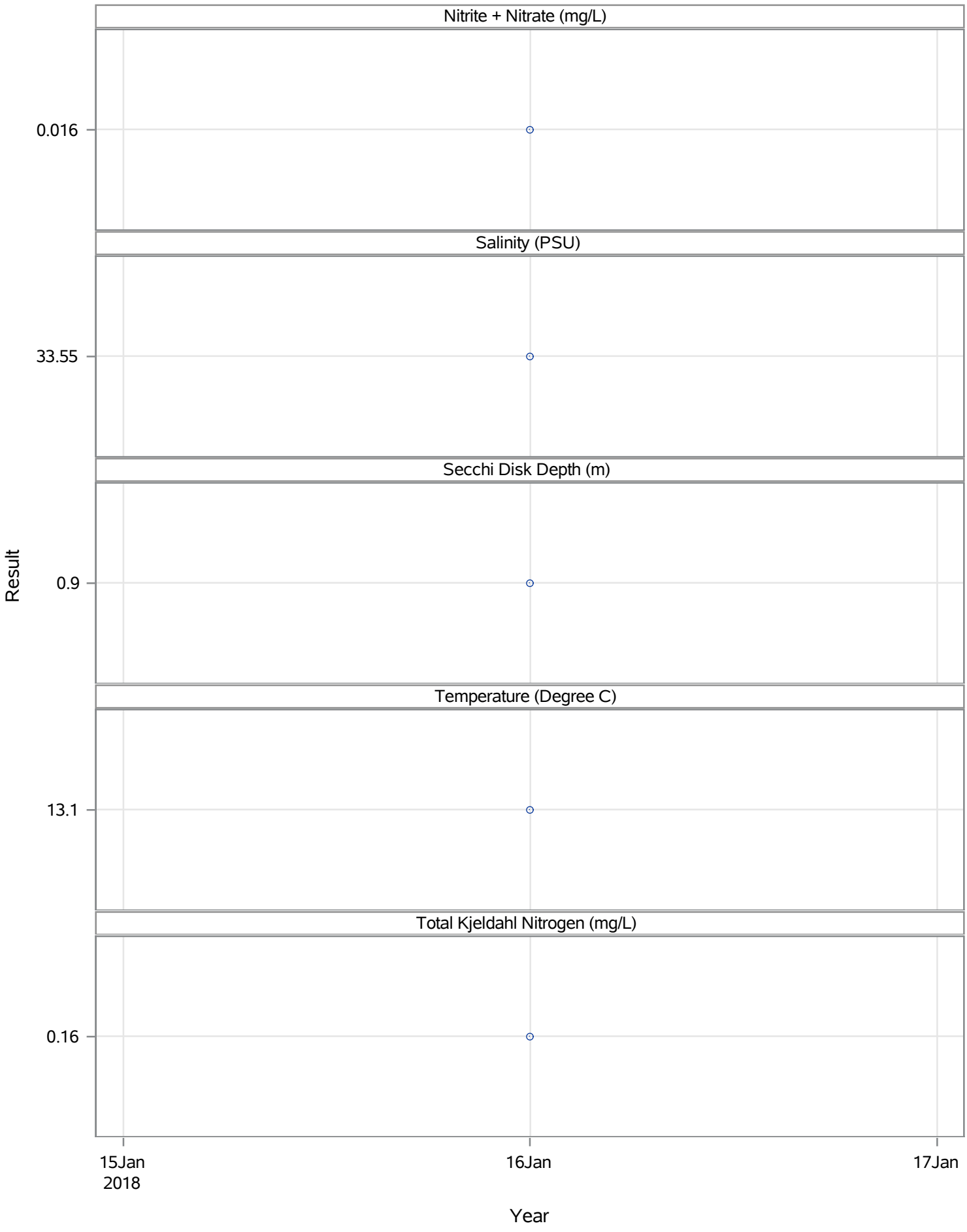

WBID=2924B2 Site=21FLA 27010466
Secchi Disk Depth (m)
1.0
0.9
0.8
0.7
0.6
0.5
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
1.0
0.8
0.6
0.4
Total Nitrogen (mg/L)
1.2
1.0
0.8
0.6
Total Phosphorus (mg/L)
0.14
0.12
0.10
0.08
Result
Sep 1983
Jan 1984
May
Sep
Jan 1985
May
Sep
Jan 1986
May
Sep
Jan 1987
May
Sep
Year

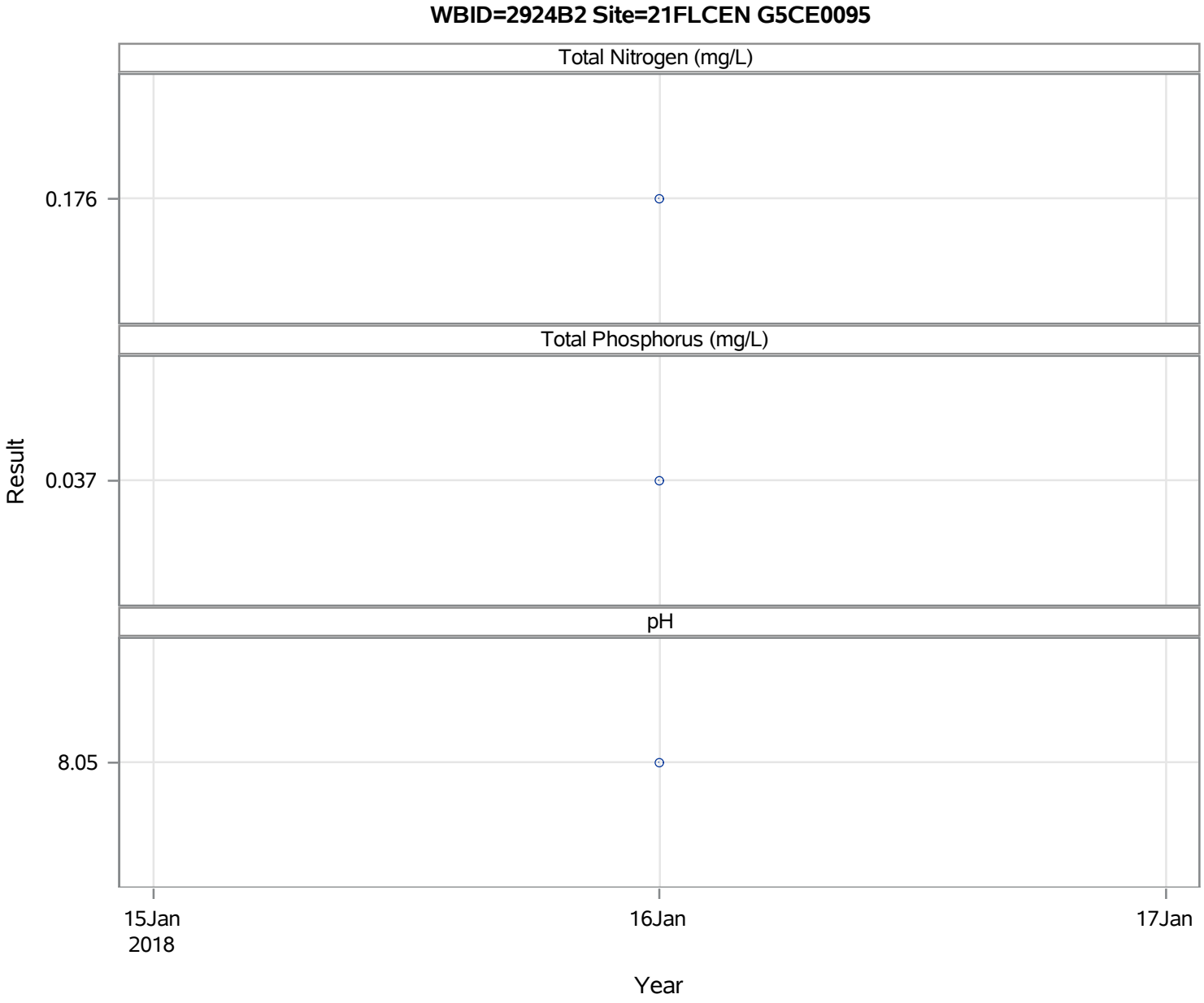

WBID=2924B2 Site=21FLA 27010466
pH
Result
8.2
8.0
7.8
7.6
Sep 1983
Jan 1984
May
Sep
Jan 1985
May
Sep
Jan 1986
May
Sep
Jan 1987
May
Sep
Year

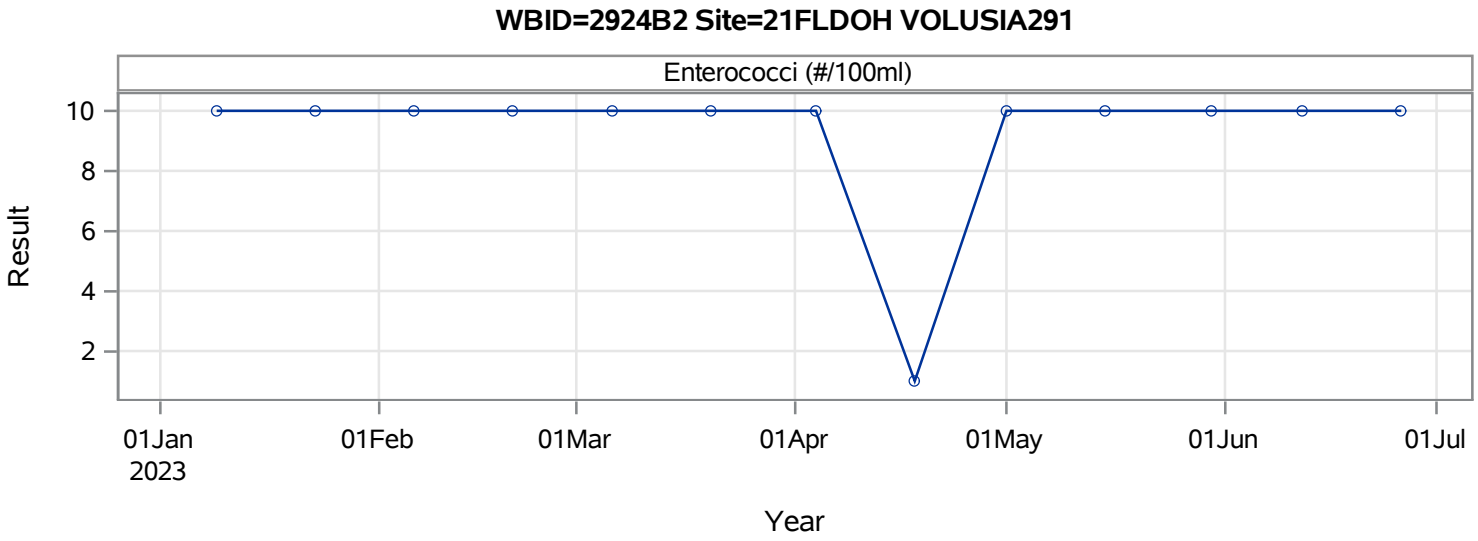

WBID=2924B2 Site=21FLA 27010859
Dissolved Oxygen (%)
82
80
78
76
74
Dissolved Oxygen (mg/L)
6.80
6.78
6.76
6.74
6.72
6.70
Nitrite + Nitrate (mg/L)
0.020
0.018
0.016
0.014
0.012
0.010
Result
Salinity (PSU)
34
32
30
28
26
Secchi Disk Depth (m)
1.20
1.15
1.10
1.05
1.00
0.95
0.90
Apr 1978
Jul
Oct
Jan 1979
Apr
Jul
Oct
Jan 1980
Apr
Jul
Oct
Jan 1981
Apr
Year

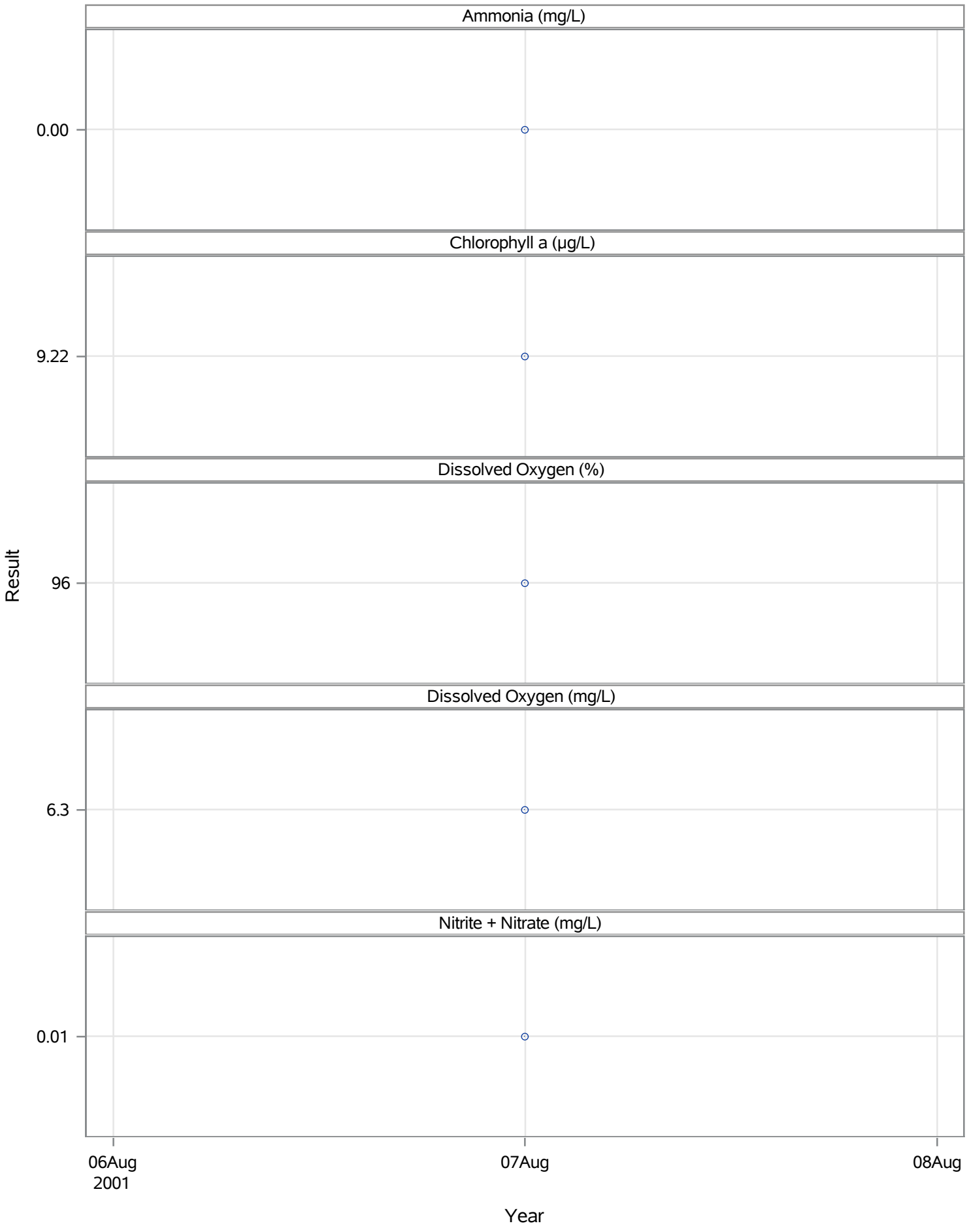

WBID=2924B2 Site=21FLA 27010859
Temperature (Degree C)
26
25
24
23
22
21
Total Kjeldahl Nitrogen (mg/L)
0.8
0.7
0.6
0.5
0.4
Total Nitrogen (mg/L)
0.8
0.7
0.6
0.5
0.4
Total Phosphorus (mg/L)
0.080
0.075
0.070
0.065
0.060
0.055
0.050
pH
8.2
8.0
7.8
7.6
Result
Apr 1978
Jul
Oct
Jan 1979
Apr
Jul
Oct
Jan 1980
Apr
Jul
Oct
Jan 1981
Apr
Year

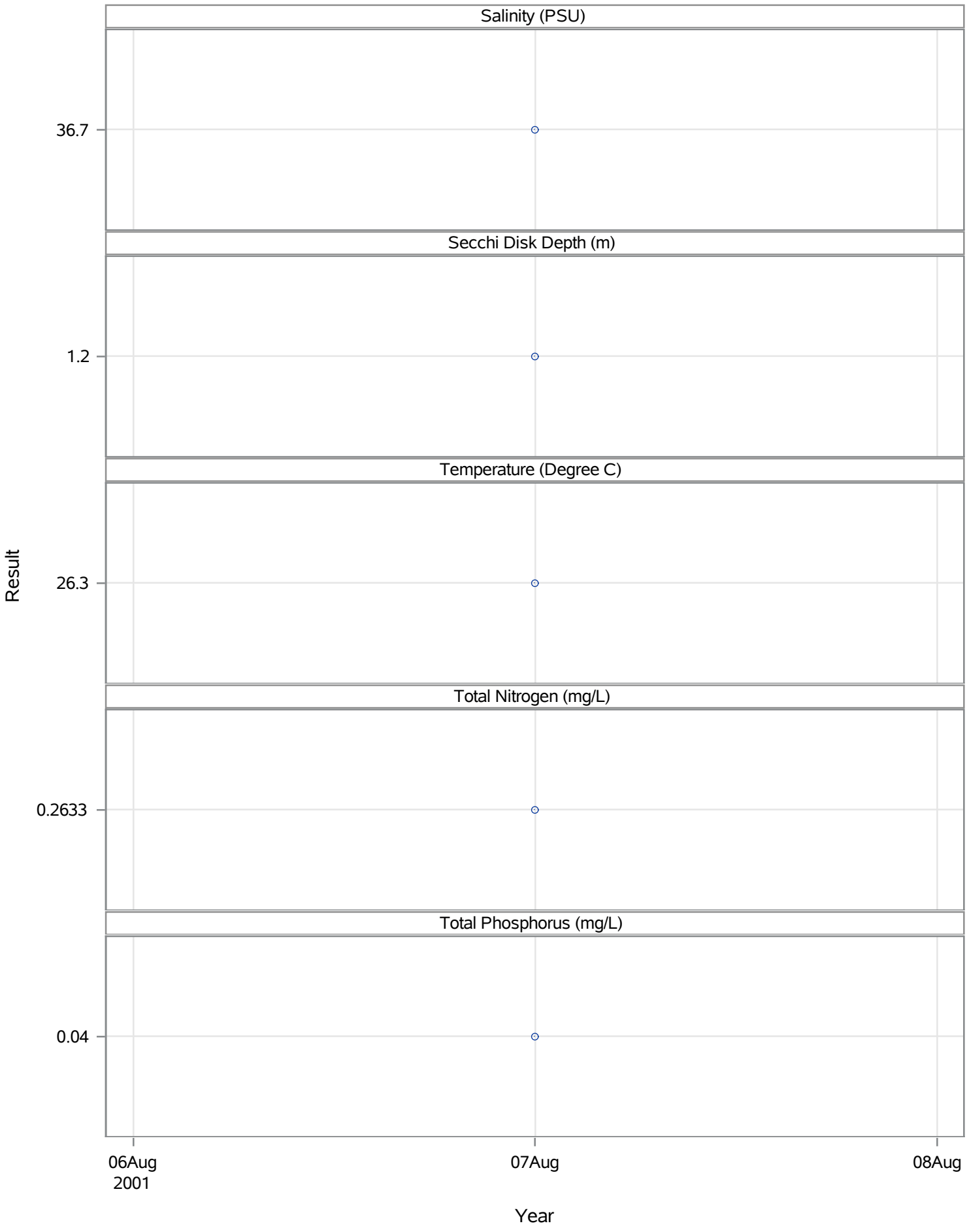

WBID=2924B2 Site=21FLCEN G5CE0095
Ammonia (mg/L)
0.007
Chlorophyll a (µg/L)
7.3
Dissolved Orthophosphate (mg/L)
0.004
Dissolved Oxygen (%)
110
Dissolved Oxygen (mg/L)
9.385
Result
15Jan
2018
16Jan
17Jan
Year

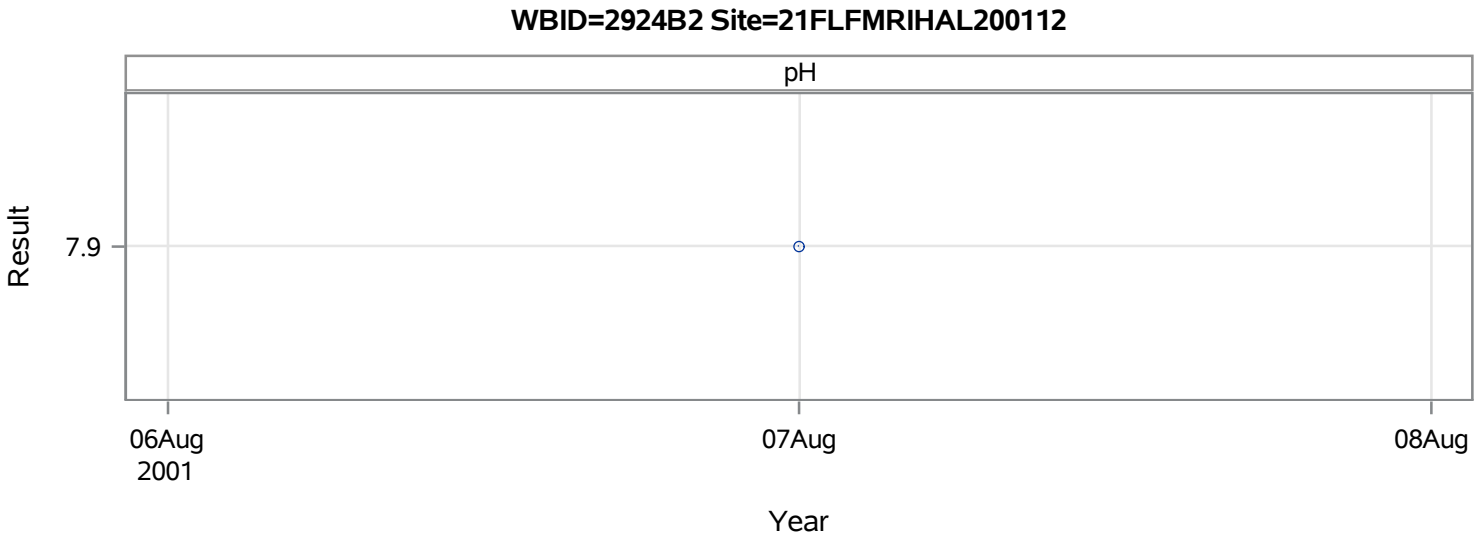

WBID=2924B2 Site=21FLCEN G5CE0095
Nitrite + Nitrate (mg/L)
0.016
Salinity (PSU)
33.55
Secchi Disk Depth (m)
0.9
Temperature (Degree C)
13.1
Total Kjeldahl Nitrogen (mg/L)
0.16
Result
15Jan
2018
16Jan
17Jan
Year

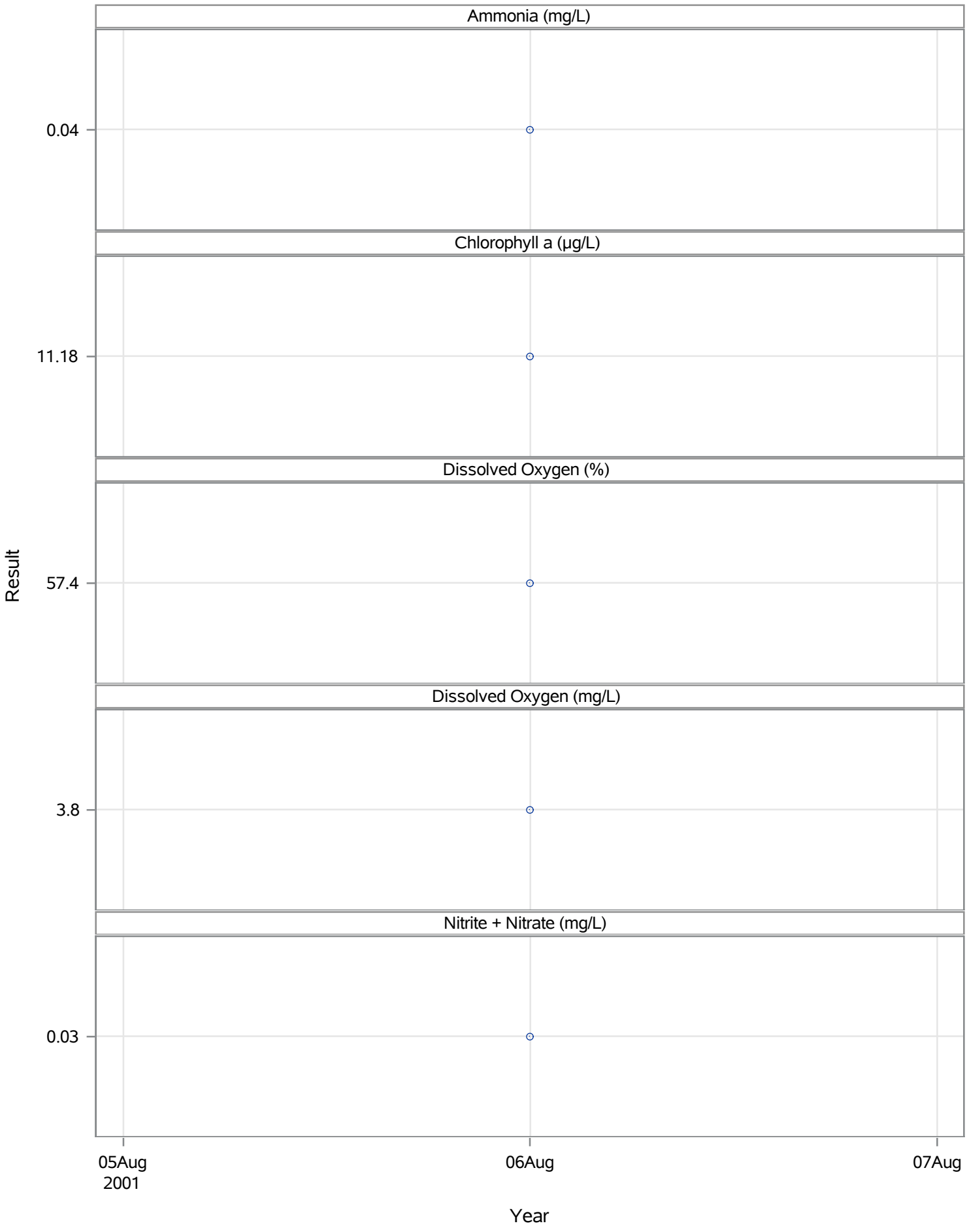

WBID=2924B2 Site=21FLCEN G5CE0095
Total Nitrogen (mg/L)
Total Phosphorus (mg/L)
pH
Result
0.176
0.037
8.05
15Jan
2018
16Jan
17Jan
Year

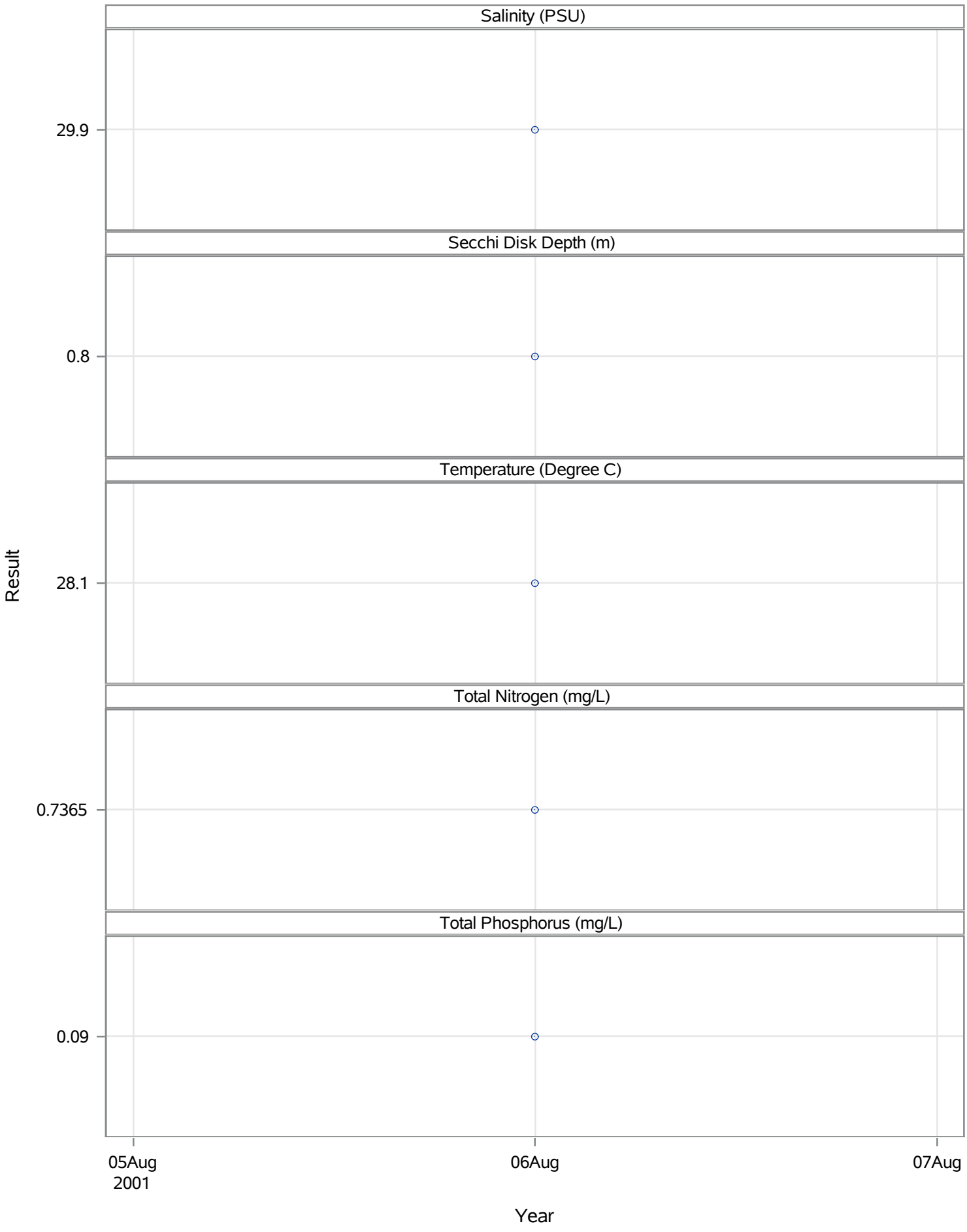

WBID=2924B2 Site=21FLDOH VOLUSIA291
Enterococci (#/100ml)
Result
10
8
6
4
2
01Jan
2023
01Feb
01Mar
01Apr
01May
01Jun
01Jul
Year

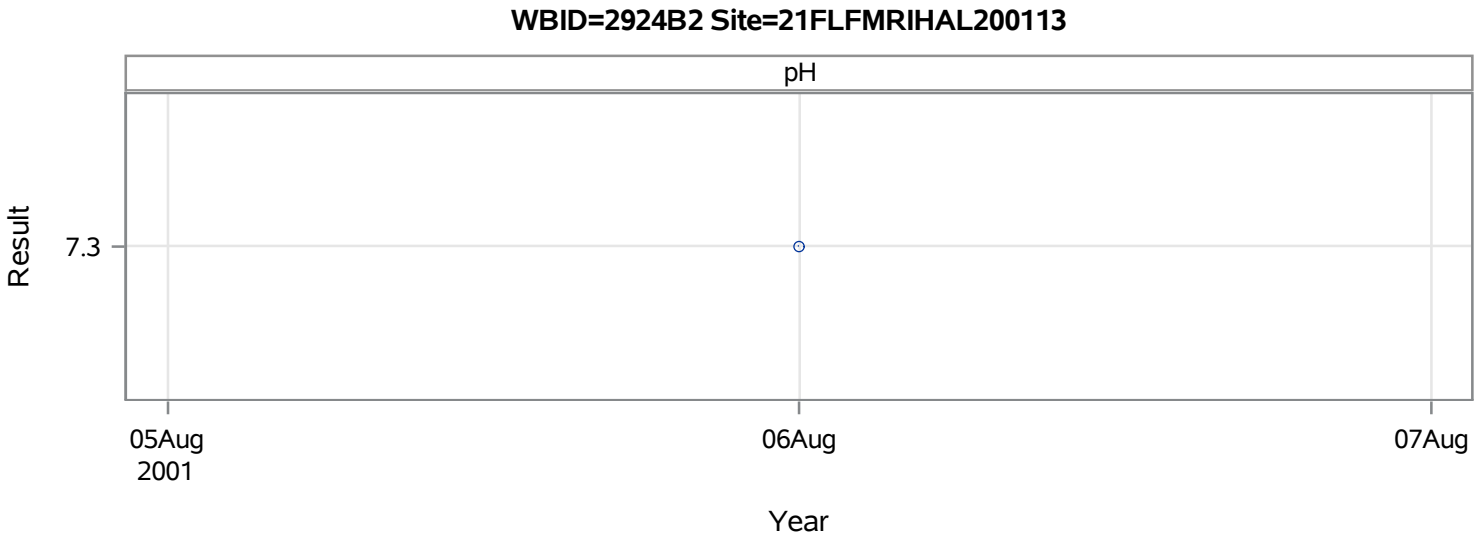

WBID=2924B2 Site=21FLFMRIHAL200112
Ammonia (mg/L)
0.00
Chlorophyll a (µg/L)
9.22
Dissolved Oxygen (%)
96
Dissolved Oxygen (mg/L)
6.3
Nitrite + Nitrate (mg/L)
0.01
Result
06Aug
2001
07Aug
08Aug
Year

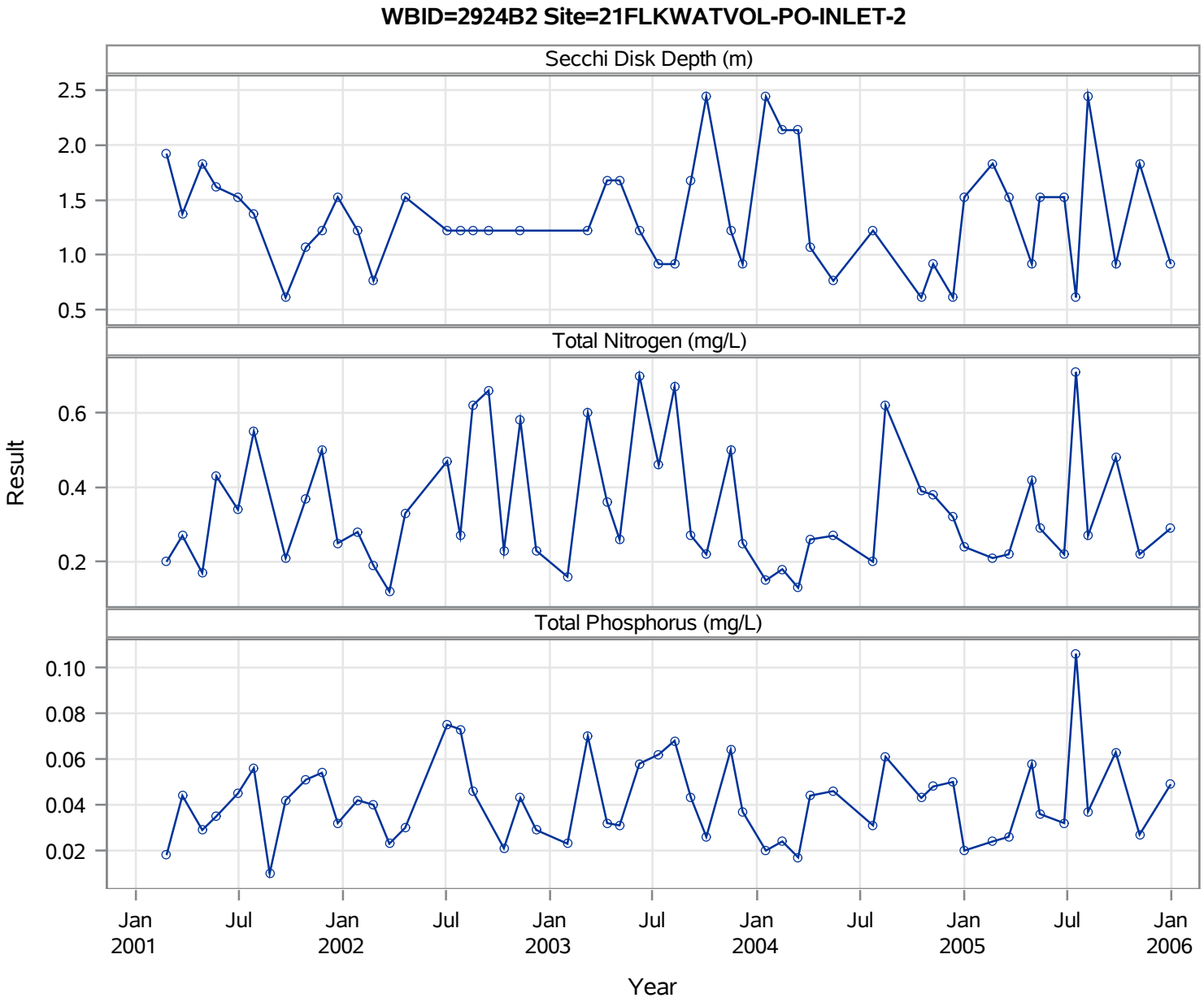

WBID=2924B2 Site=21FLFMRIHAL200112
Salinity (PSU)
36.7
Secchi Disk Depth (m)
1.2
Temperature (Degree C)
26.3
Total Nitrogen (mg/L)
0.2633
Total Phosphorus (mg/L)
0.04
Result
06Aug
2001
07Aug
08Aug
Year

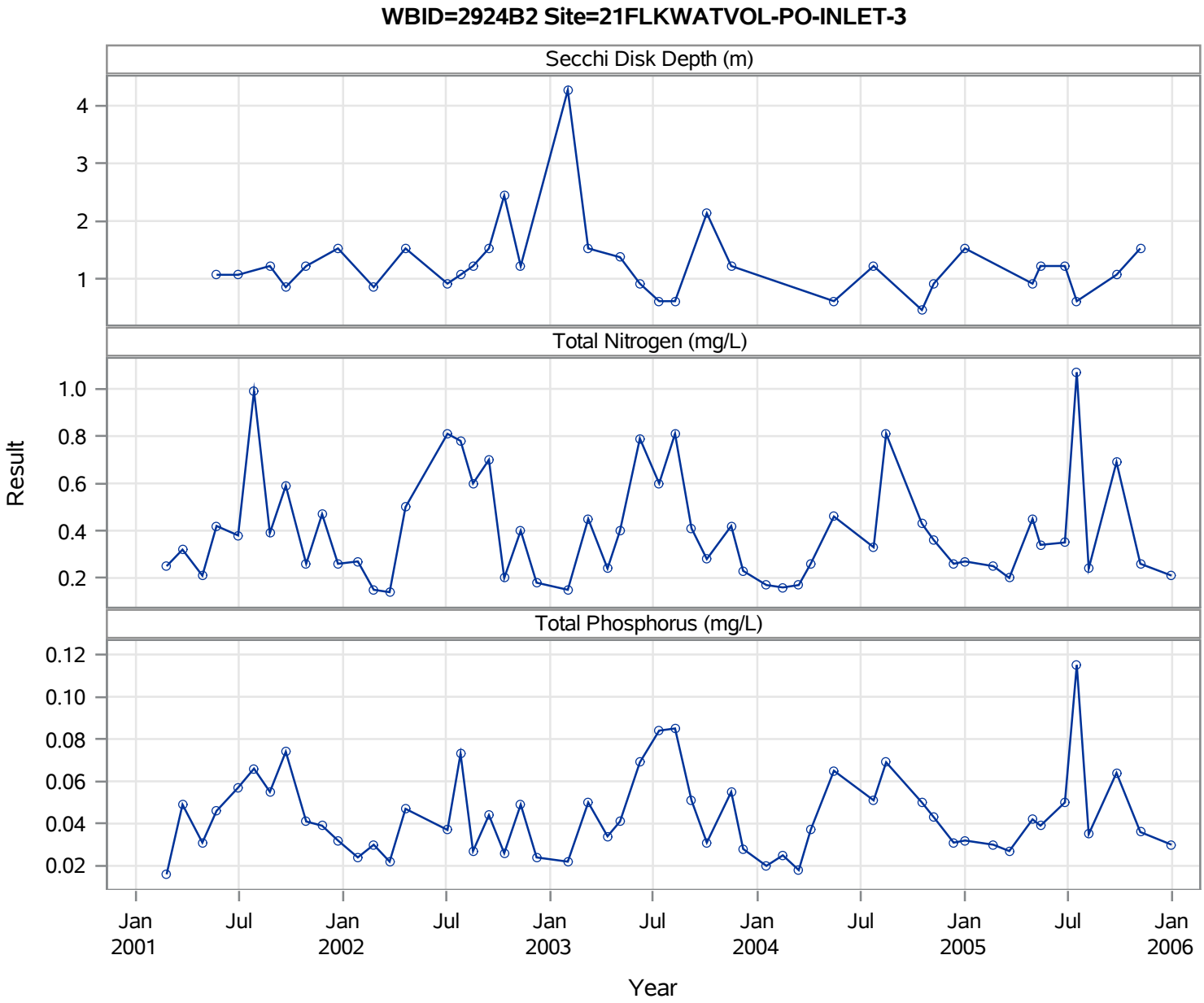

WBID=2924B2 Site=21FLFMRIHAL200112
pH
Result
7.9
06Aug
2001
07Aug
08Aug
Year

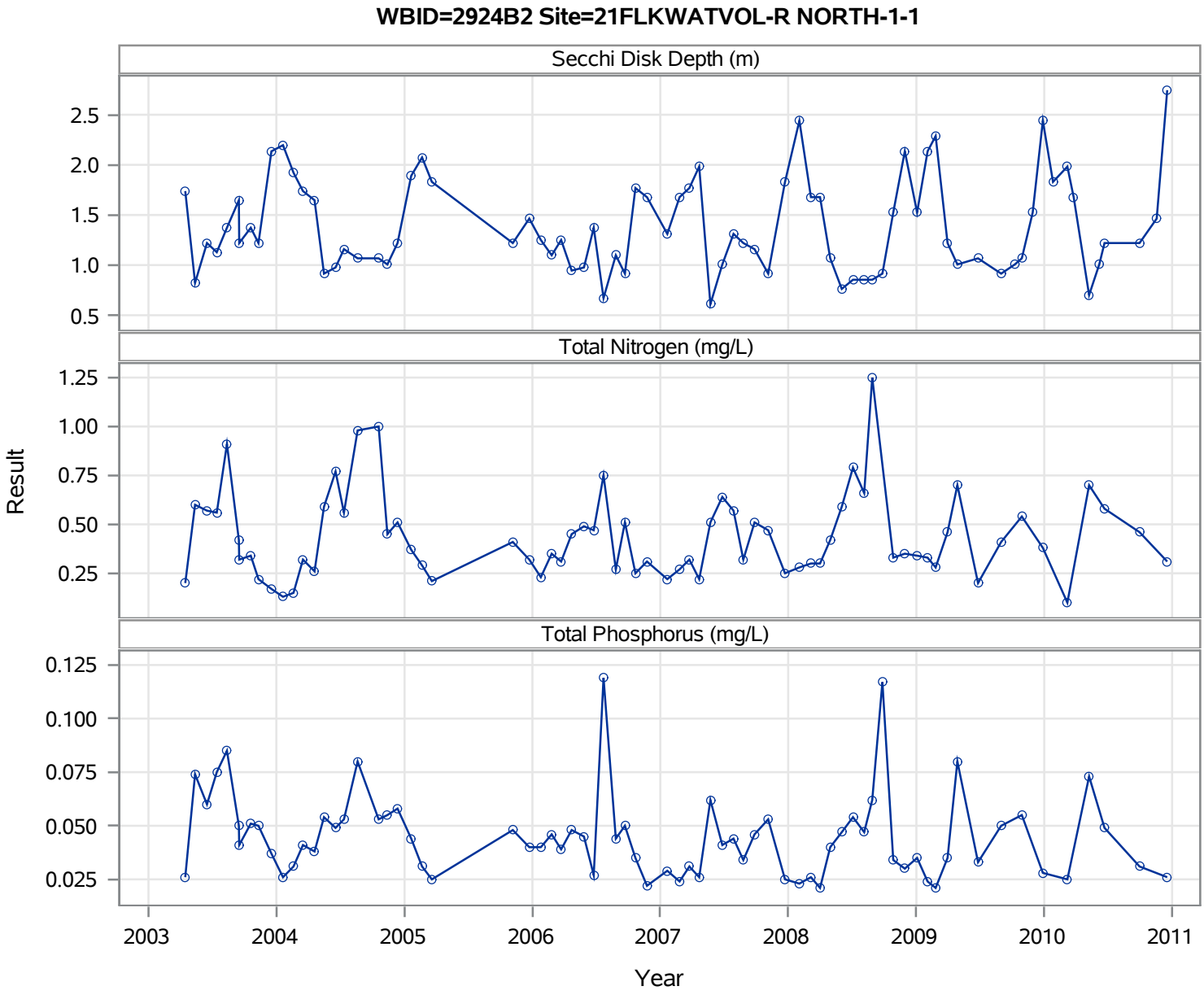

WBID=2924B2 Site=21FLFMRIHAL200113
Ammonia (mg/L)
0.04
Chlorophyll a (µg/L)
11.18
Dissolved Oxygen (%)
57.4
Dissolved Oxygen (mg/L)
3.8
Nitrite + Nitrate (mg/L)
0.03
Result
05Aug
2001
06Aug
07Aug
Year

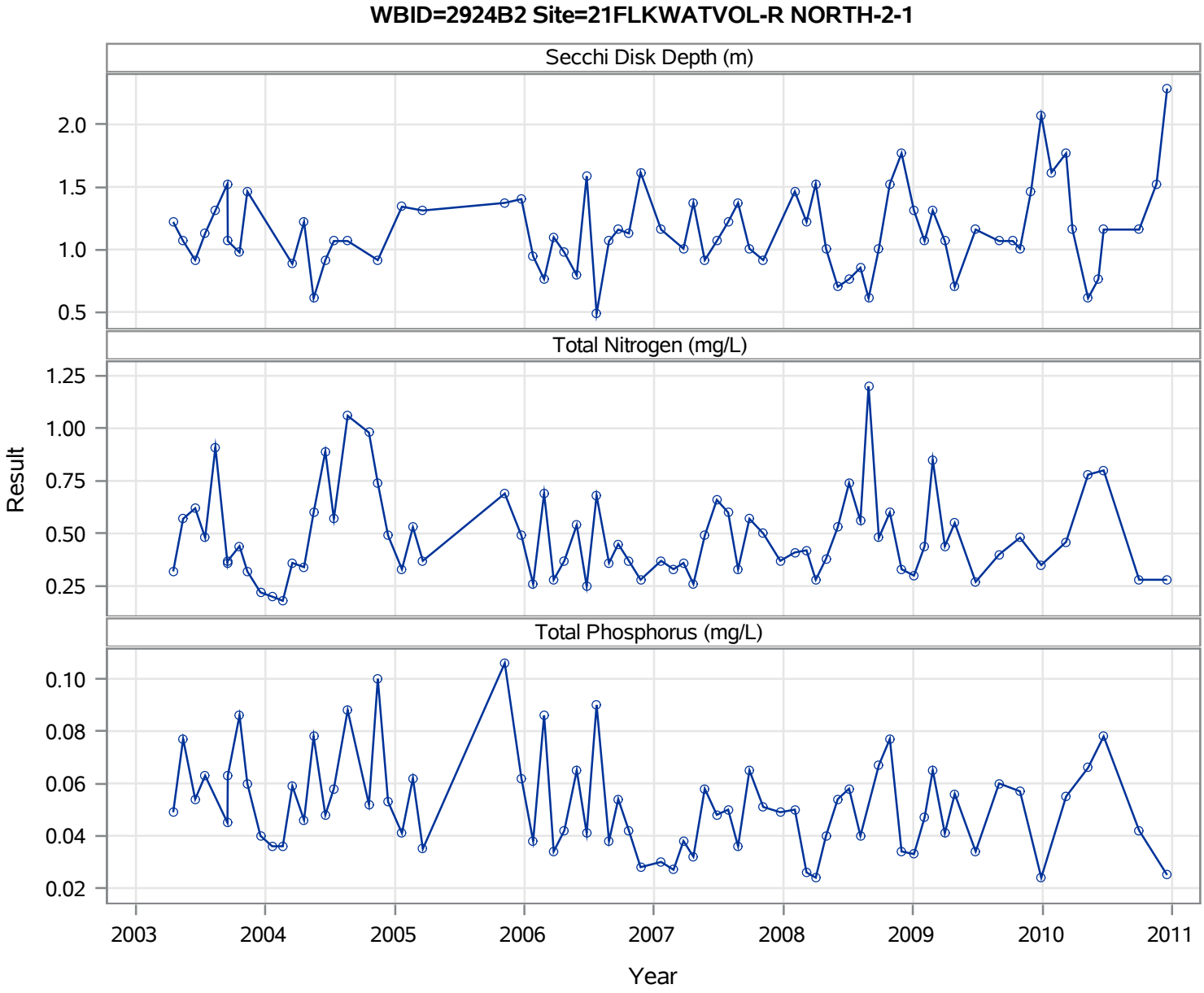

WBID=2924B2 Site=21FLFMRIHAL200113
Salinity (PSU)
29.9
Secchi Disk Depth (m)
0.8
Temperature (Degree C)
28.1
Total Nitrogen (mg/L)
0.7365
Total Phosphorus (mg/L)
0.09
Result
05Aug
2001
06Aug
07Aug
Year

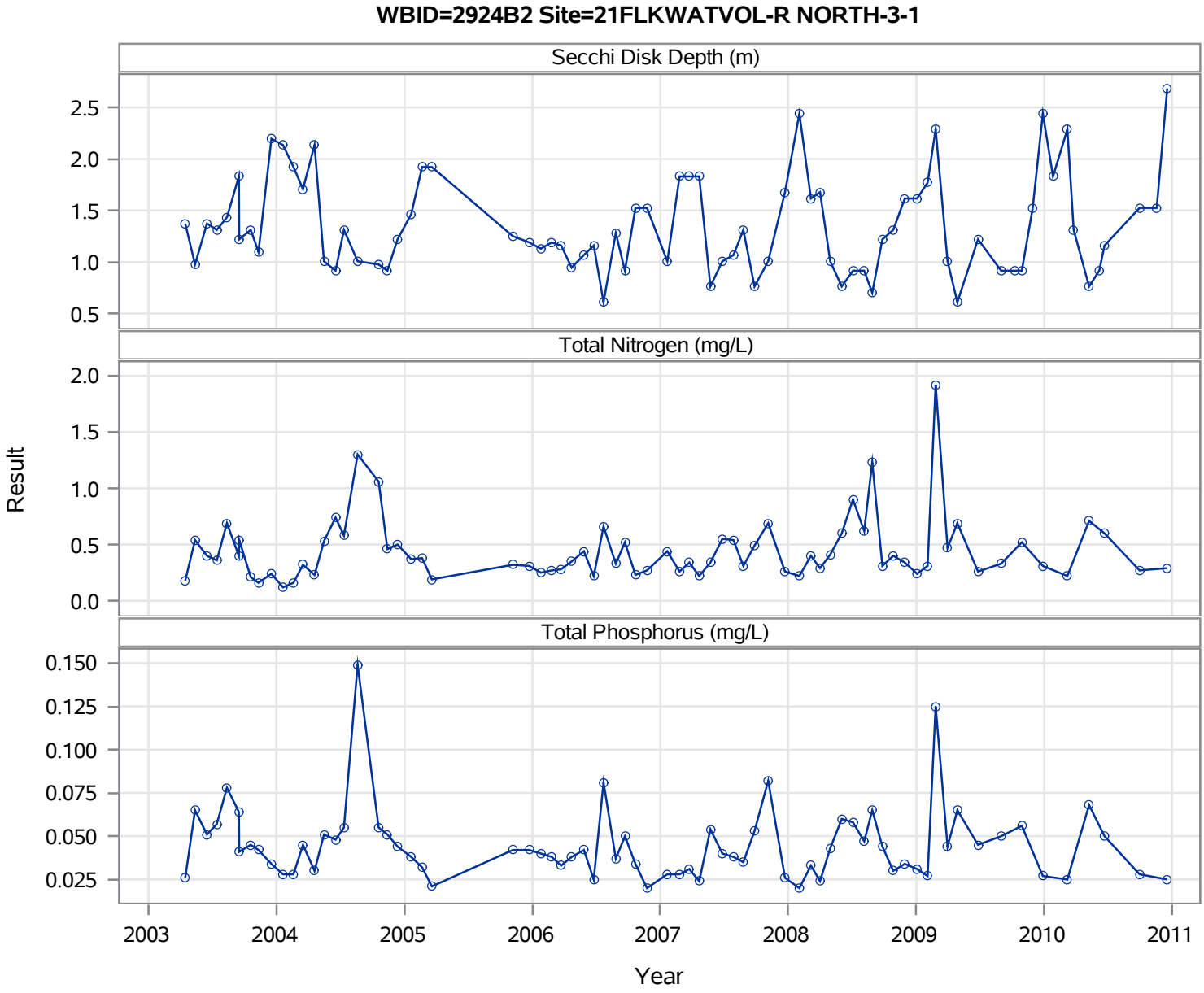

WBID=2924B2 Site=21FLFMRIHAL200113
pH
Result
7.3
05Aug
2001
06Aug
07Aug
Year

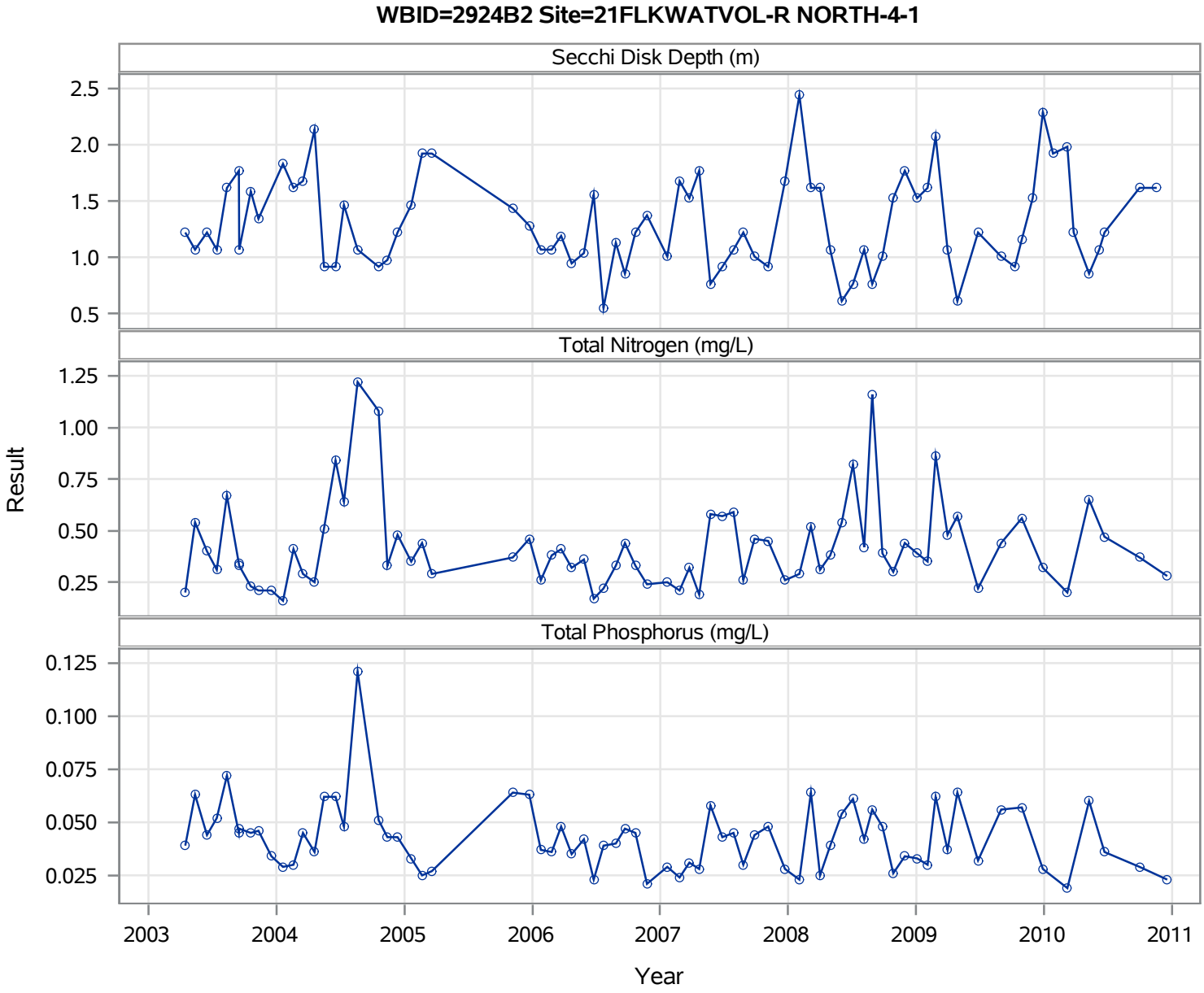

WBID=2924B2 Site=21FLKWATVOL-PO-INLET-2
Secchi Disk Depth (m)
2.5
2.0
1.5
1.0
0.5
Total Nitrogen (mg/L)
0.6
0.4
0.2
Total Phosphorus (mg/L)
0.10
0.08
0.06
0.04
0.02
Result
Jan 2001
Jul
Jan 2002
Jul
Jan 2003
Jul
Jan 2004
Jul
Jan 2005
Jul
Jan 2006
Year

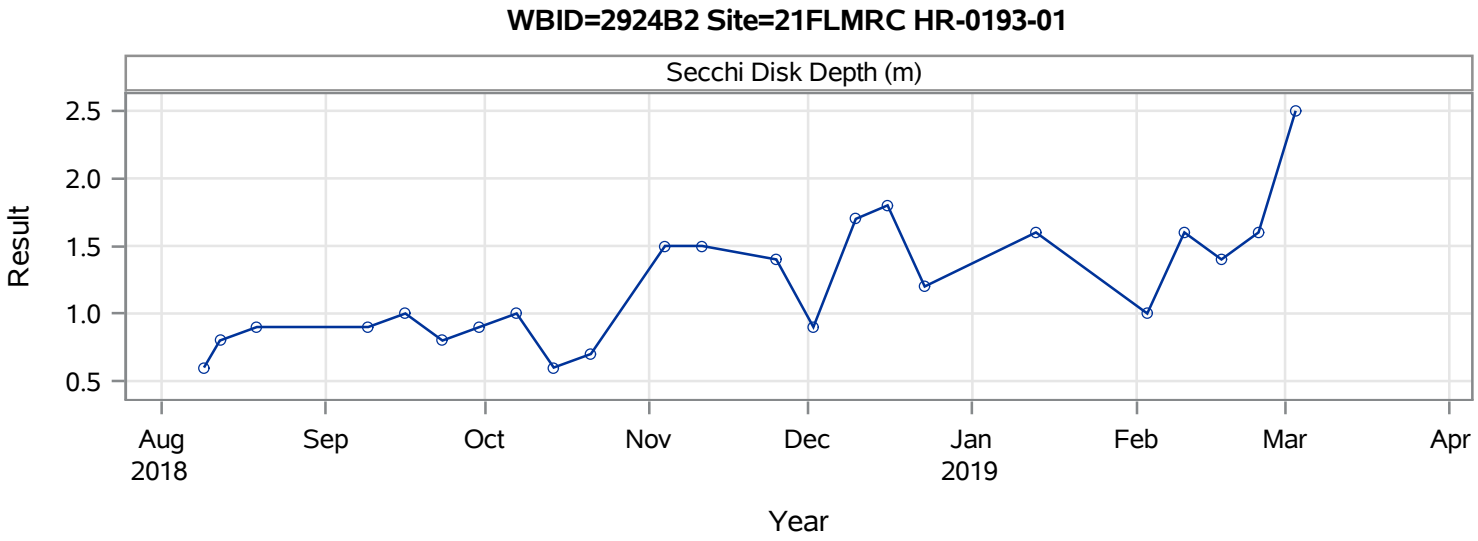

WBID=2924B2 Site=21FLKWATVOL-PO-INLET-3
Secchi Disk Depth (m)
Total Nitrogen (mg/L)
Total Phosphorus (mg/L)
Result
Year
Jan 2001
Jul
Jan 2002
Jul
Jan 2003
Jul
Jan 2004
Jul
Jan 2005
Jul
Jan 2006

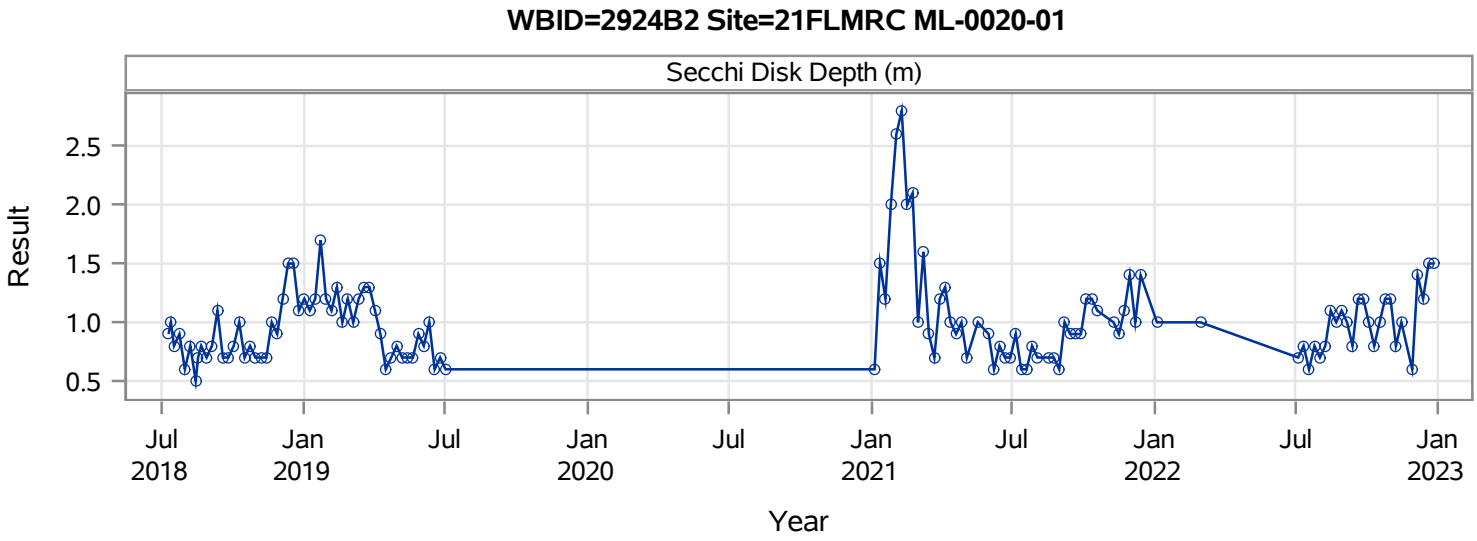

WBID=2924B2 Site=21FLKWATVOL-R NORTH-1-1
Secchi Disk Depth (m)
2.5
2.0
1.5
1.0
0.5
Total Nitrogen (mg/L)
1.25
1.00
0.75
0.50
0.25
Total Phosphorus (mg/L)
0.125
0.100
0.075
0.050
0.025
Result
2003
2004
2005
2006
2007
2008
2009
2010
2011
Year

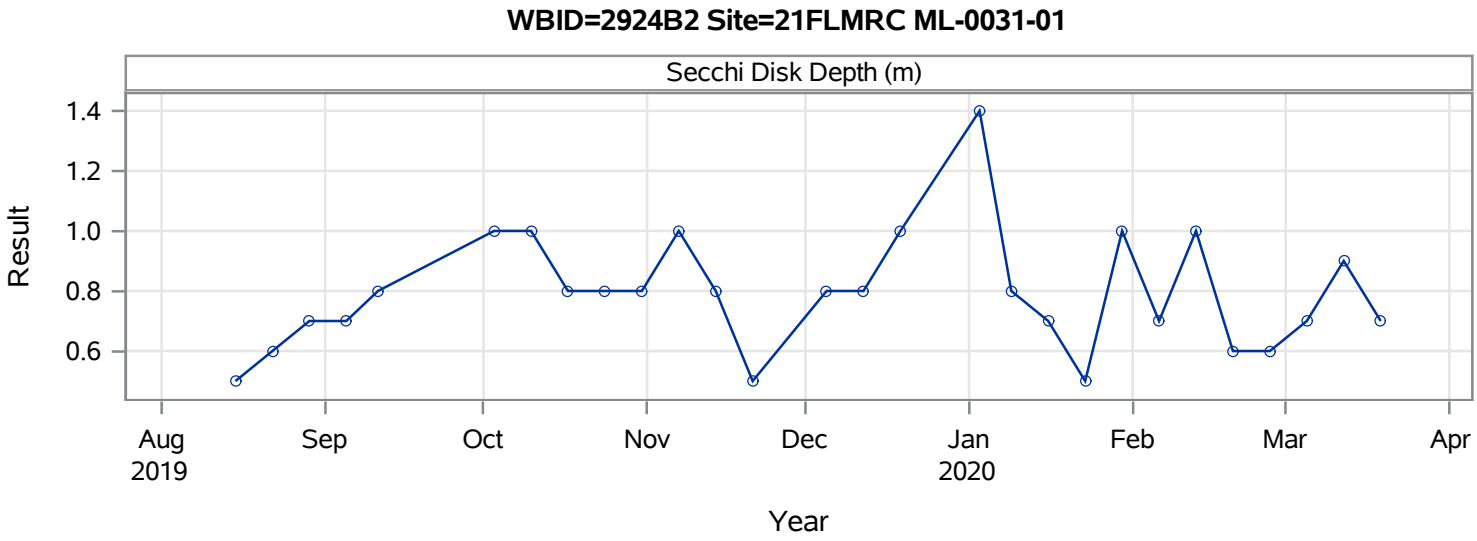

WBID=2924B2 Site=21FLKWATVOL-R NORTH-2-1
Secchi Disk Depth (m)
2.0
1.5
1.0
0.5
Total Nitrogen (mg/L)
1.25
1.00
0.75
0.50
0.25
Total Phosphorus (mg/L)
0.10
0.08
0.06
0.04
0.02
Result
2003
2004
2005
2006
2007
2008
2009
2010
2011
Year

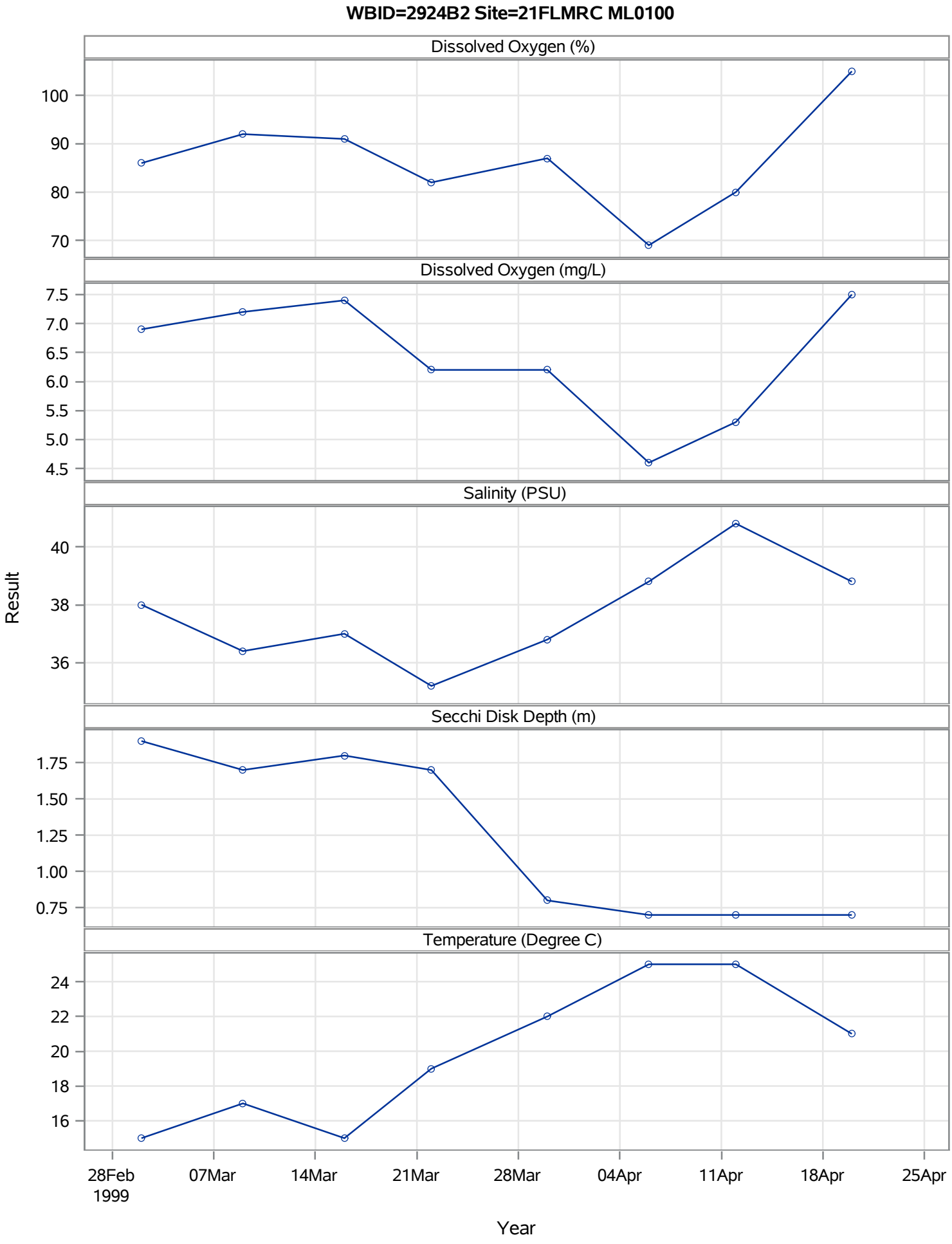

WBID=2924B2 Site=21FLKWATVOL-R NORTH-3-1
Secchi Disk Depth (m)
Total Nitrogen (mg/L)
Total Phosphorus (mg/L)
Result
2.5
2.0
1.5
1.0
0.5
0.0
0.150
0.125
0.100
0.075
0.050
0.025
2003
2004
2005
2006
2007
2008
2009
2010
2011
Year

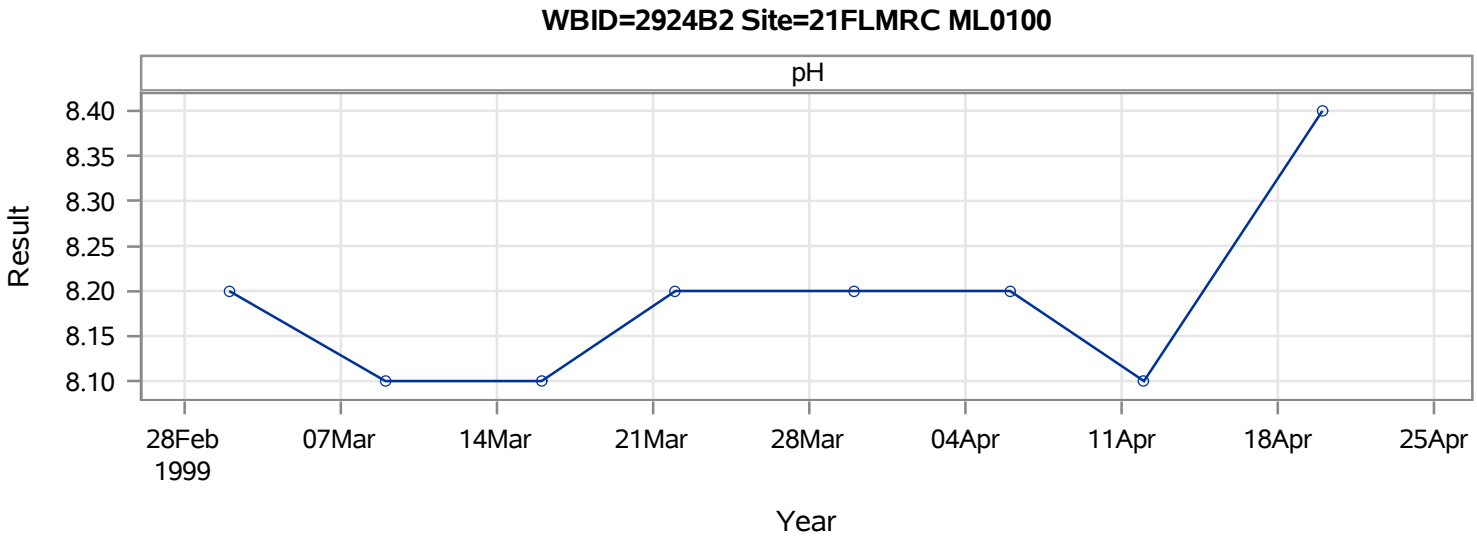

WBID=2924B2 Site=21FLKWATVOL-R NORTH-4-1
Secchi Disk Depth (m)
2.5
2.0
1.5
1.0
0.5
Total Nitrogen (mg/L)
1.25
1.00
0.75
0.50
0.25
Total Phosphorus (mg/L)
0.125
0.100
0.075
0.050
0.025
Result
2003
2004
2005
2006
2007
2008
2009
2010
2011
Year

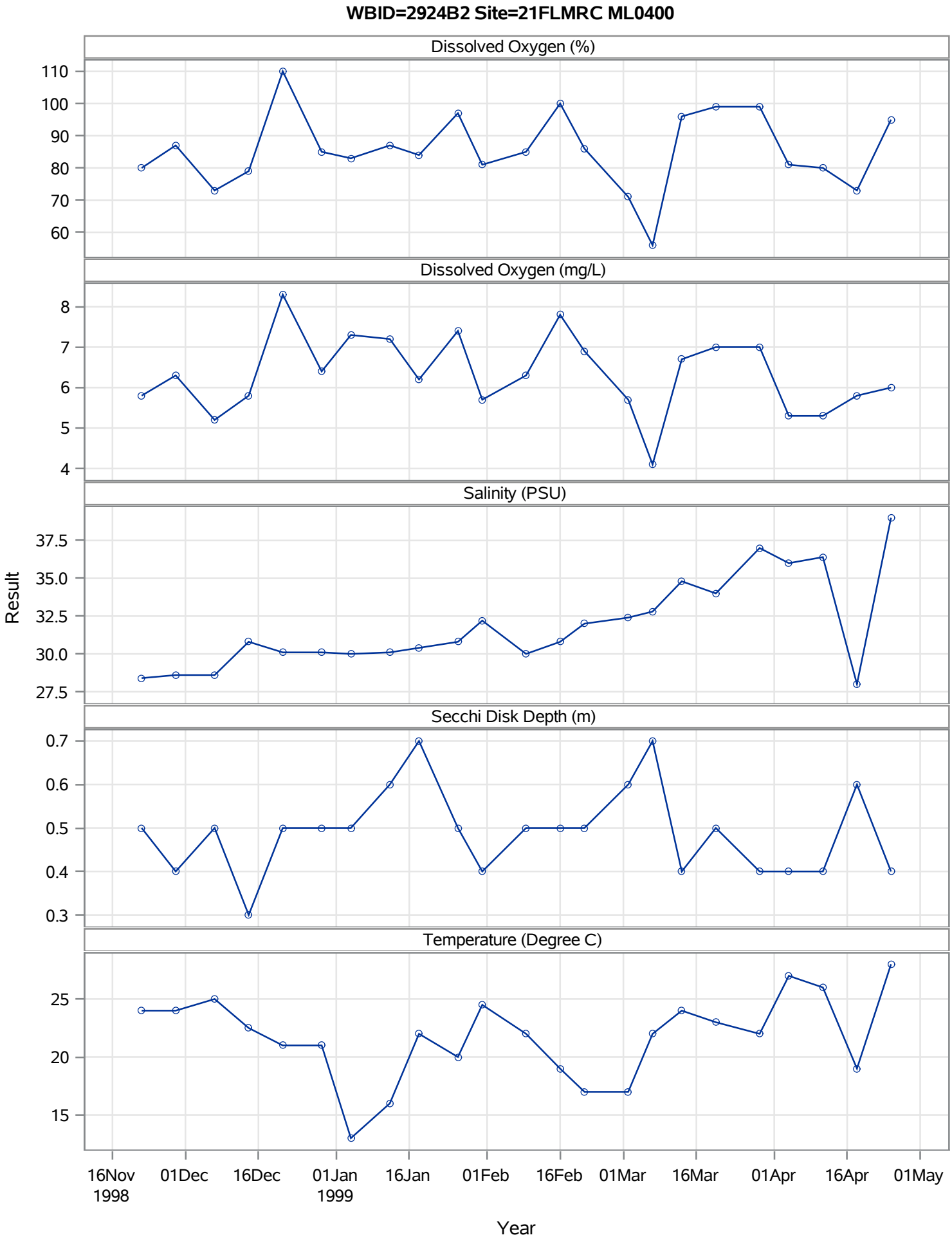

WBID=2924B2 Site=21FLMRC HR-0193-01
Secchi Disk Depth (m)
Result
2.5
2.0
1.5
1.0
0.5
Aug
2018
Sep
Oct
Nov
Dec
Jan
2019
Feb
Mar
Apr
Year

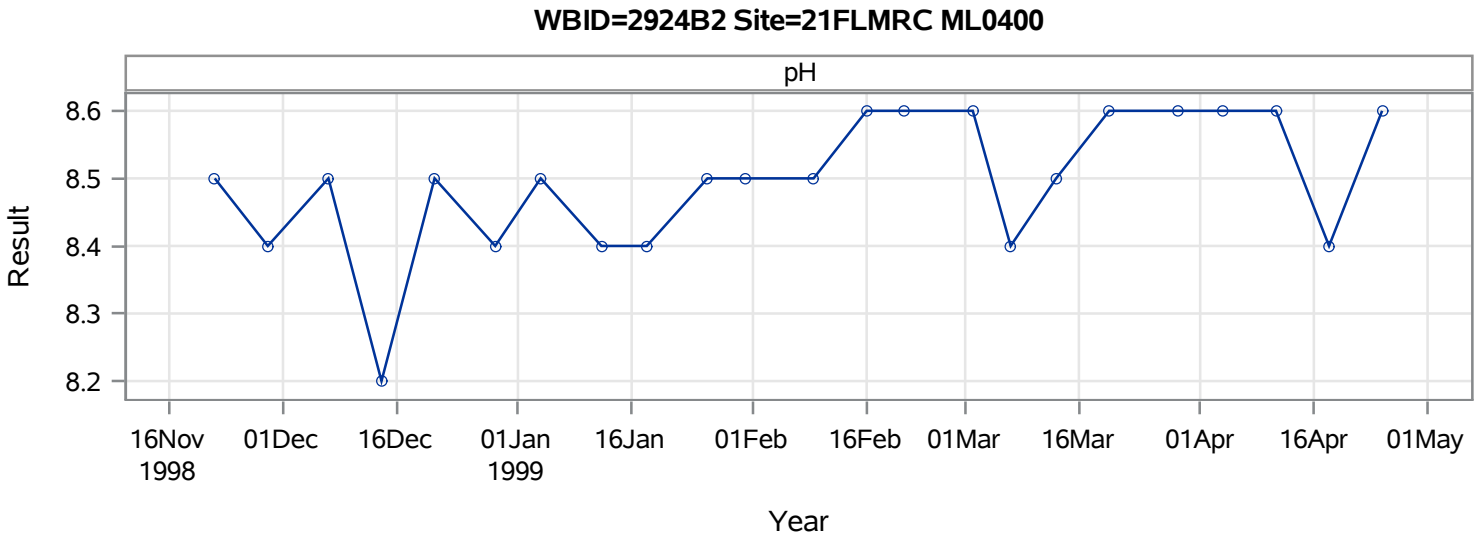

WBID=2924B2 Site=21FLMRC ML-0020-01
Secchi Disk Depth (m)
Result
2.5
2.0
1.5
1.0
0.5
Jul 2018
Jan 2019
Jul
Jan 2020
Jul
Jan 2021
Jul
Jan 2022
Jul
Jan 2023
Year

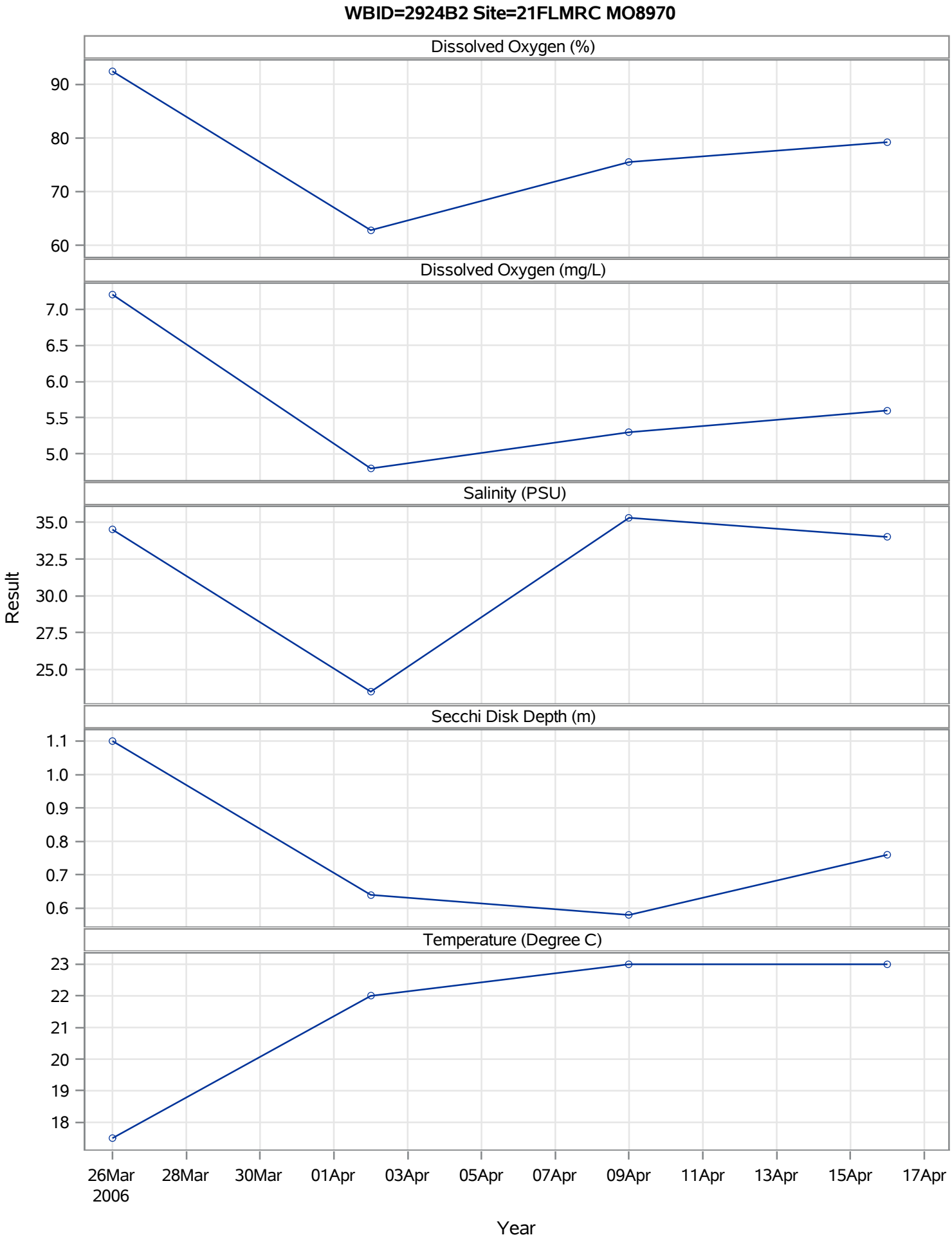

WBID=2924B2 Site=21FLMRC ML-0031-01
Secchi Disk Depth (m)
Result
1.4
1.2
1.0
0.8
0.6
Aug
2019
Sep
Oct
Nov
Dec
Jan
2020
Feb
Mar
Apr
Year

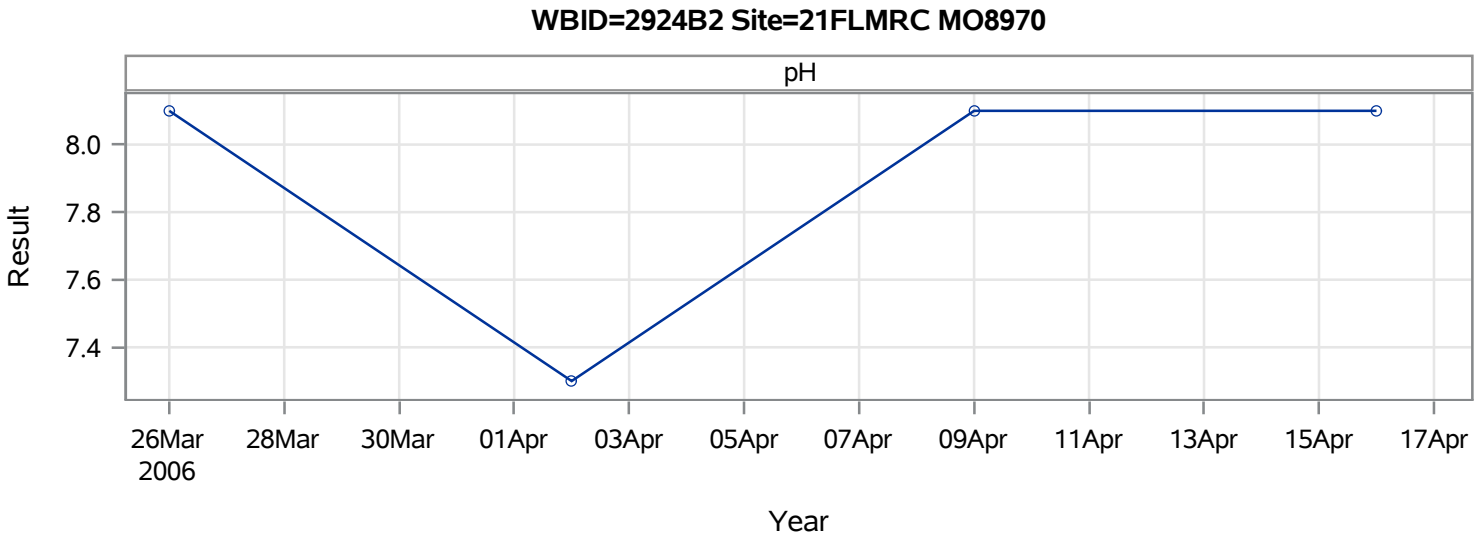

WBID=2924B2 Site=21FLMRC ML0100
Dissolved Oxygen (%)
100
90
80
70
Dissolved Oxygen (mg/L)
7.5
7.0
6.5
6.0
5.5
5.0
4.5
Salinity (PSU)
40
38
36
Secchi Disk Depth (m)
1.75
1.50
1.25
1.00
0.75
Temperature (Degree C)
24
22
20
18
16
Result
28Feb
1999
07Mar
14Mar
21Mar
28Mar
04Apr
11Apr
18Apr
25Apr
Year

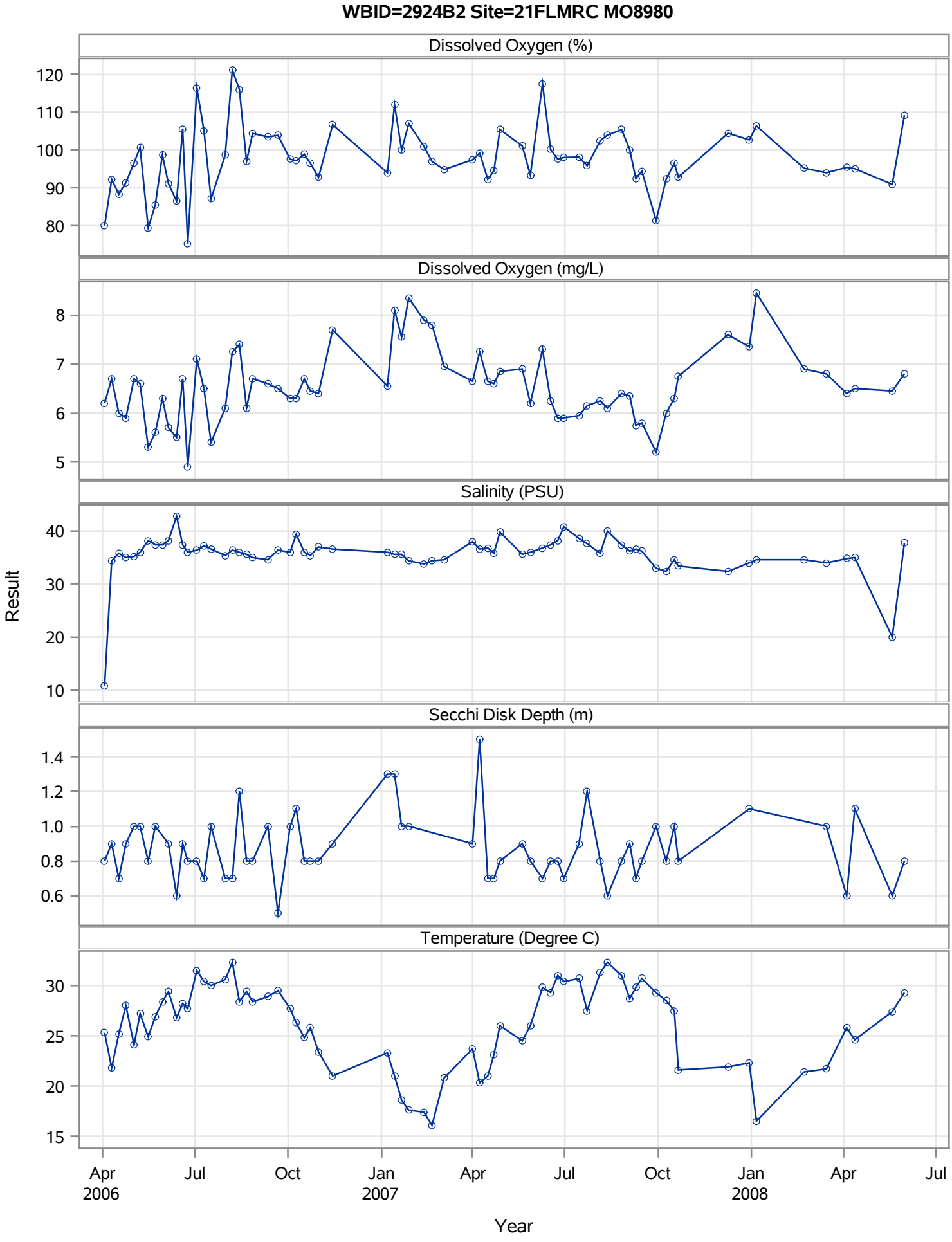

WBID=2924B2 Site=21FLMRC ML0100
pH
Result
8.40
8.35
8.30
8.25
8.20
8.15
8.10
28Feb
1999
07Mar
14Mar
21Mar
28Mar
04Apr
11Apr
18Apr
25Apr
Year

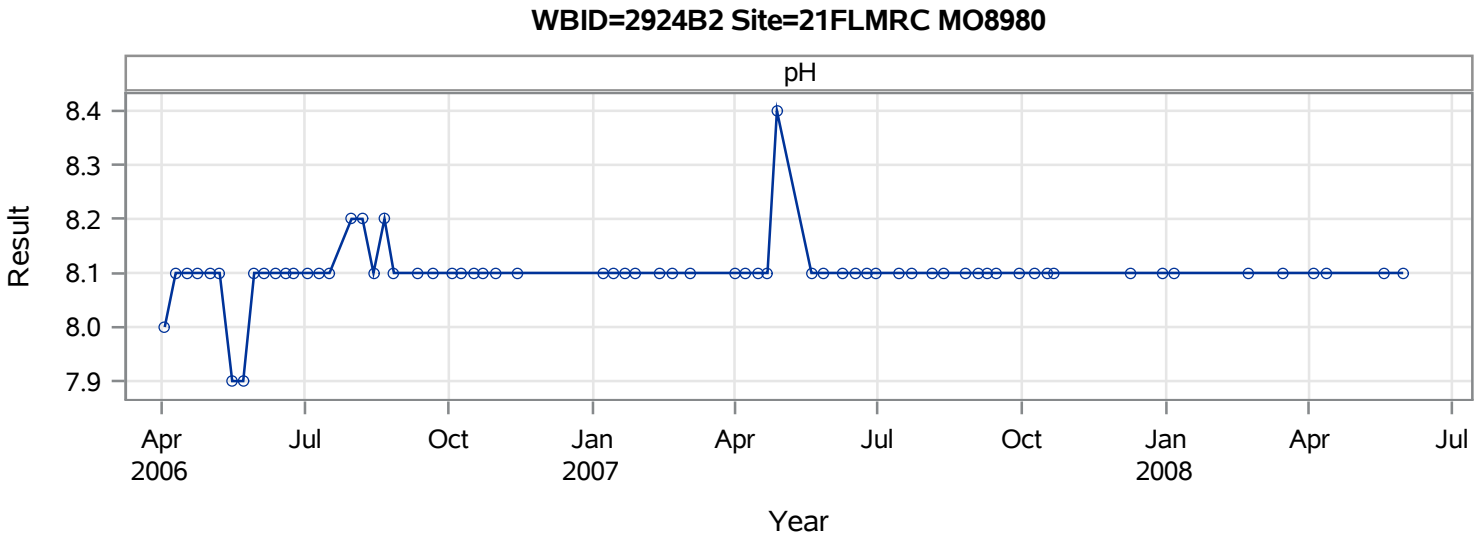

WBID=2924B2 Site=21FLMRC ML0400
Dissolved Oxygen (%)
110
100
90
80
70
60
Dissolved Oxygen (mg/L)
8
7
6
5
4
Salinity (PSU)
37.5
35.0
32.5
30.0
27.5
Secchi Disk Depth (m)
0.7
0.6
0.5
0.4
0.3
Temperature (Degree C)
25
20
15
Result
16Nov
1998
01Dec
16Dec
01Jan
1999
16Jan
01Feb
16Feb
01Mar
16Mar
01Apr
16Apr
01May
Year

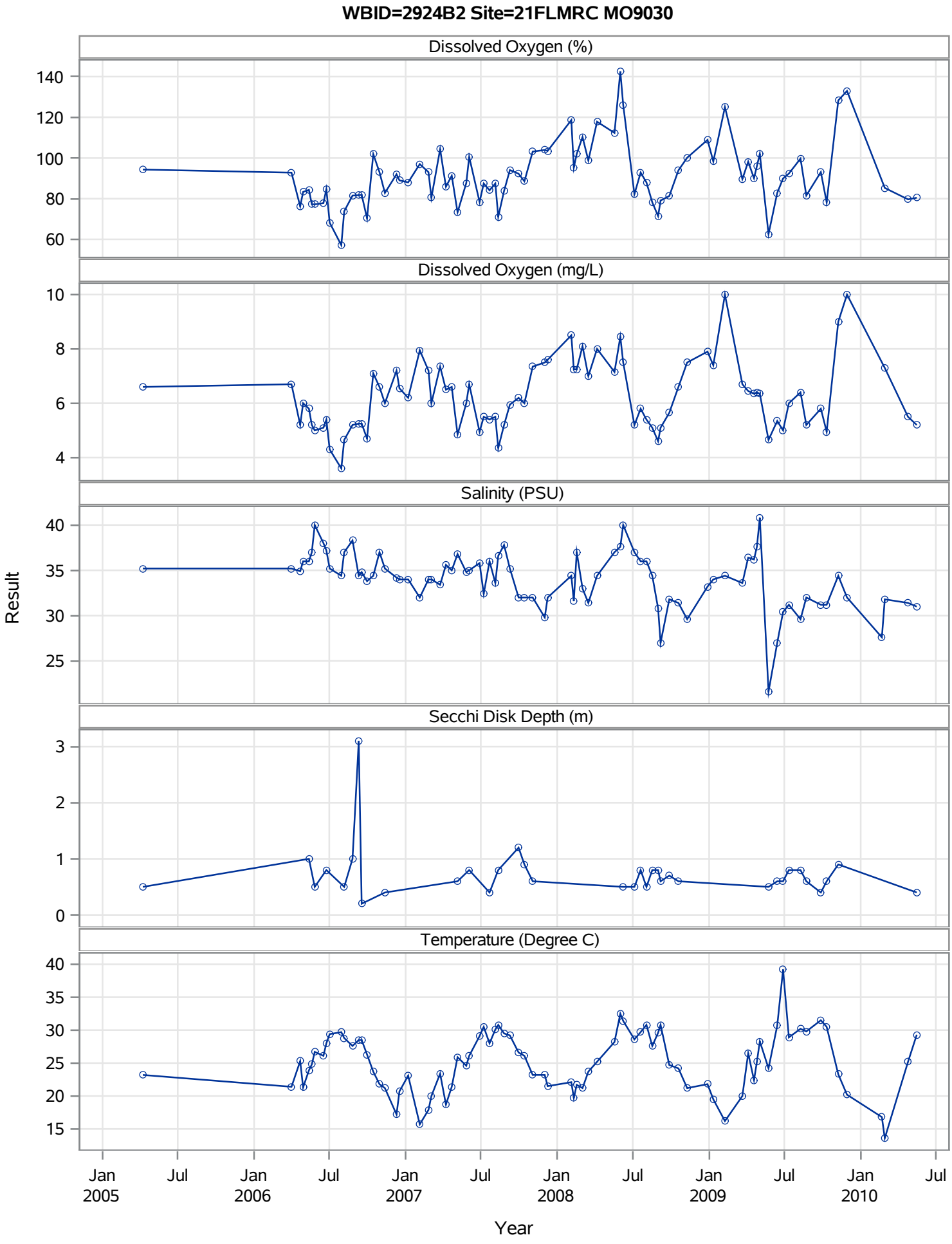

WBID=2924B2 Site=21FLMRC ML0400
pH
Result
8.6
8.5
8.4
8.3
8.2
16Nov
1998
01Dec
16Dec
01Jan
1999
16Jan
01Feb
16Feb
01Mar
16Mar
01Apr
16Apr
01May
Year

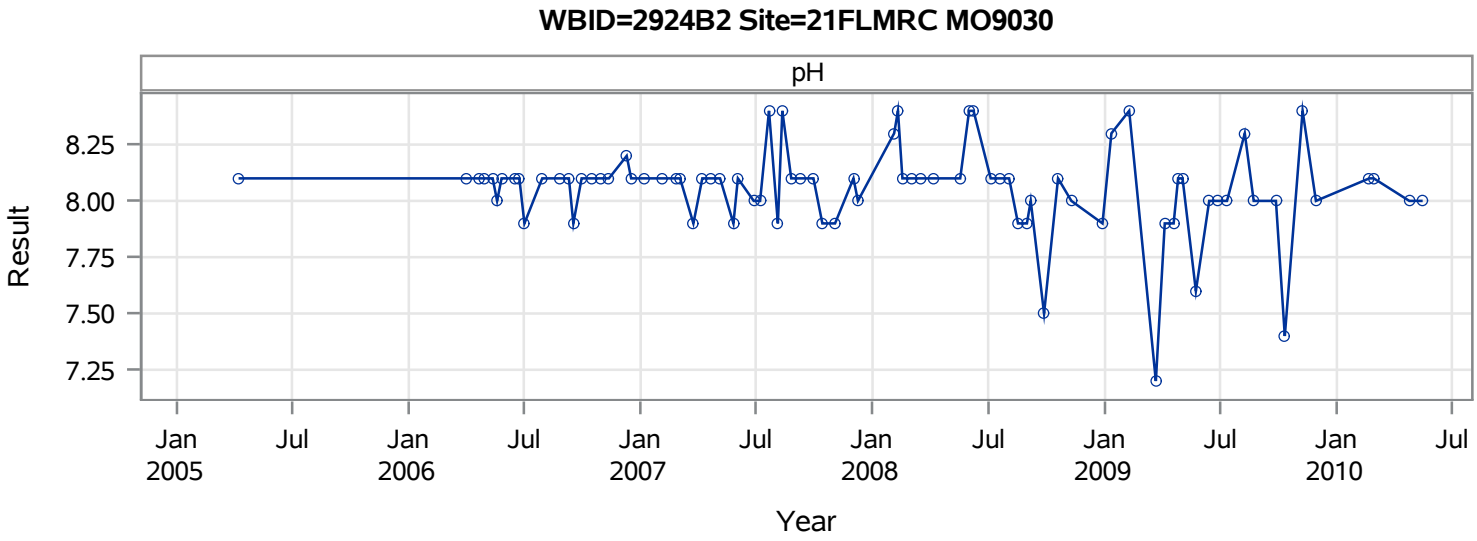

WBID=2924B2 Site=21FLMRC MO8970
Dissolved Oxygen (%)
90
80
70
60
Dissolved Oxygen (mg/L)
7.0
6.5
6.0
5.5
5.0
Salinity (PSU)
35.0
32.5
30.0
27.5
25.0
Secchi Disk Depth (m)
1.1
1.0
0.9
0.8
0.7
0.6
Temperature (Degree C)
23
22
21
20
19
18
Result
26Mar
2006
28Mar
30Mar
01Apr
03Apr
05Apr
07Apr
09Apr
11Apr
13Apr
15Apr
17Apr
Year

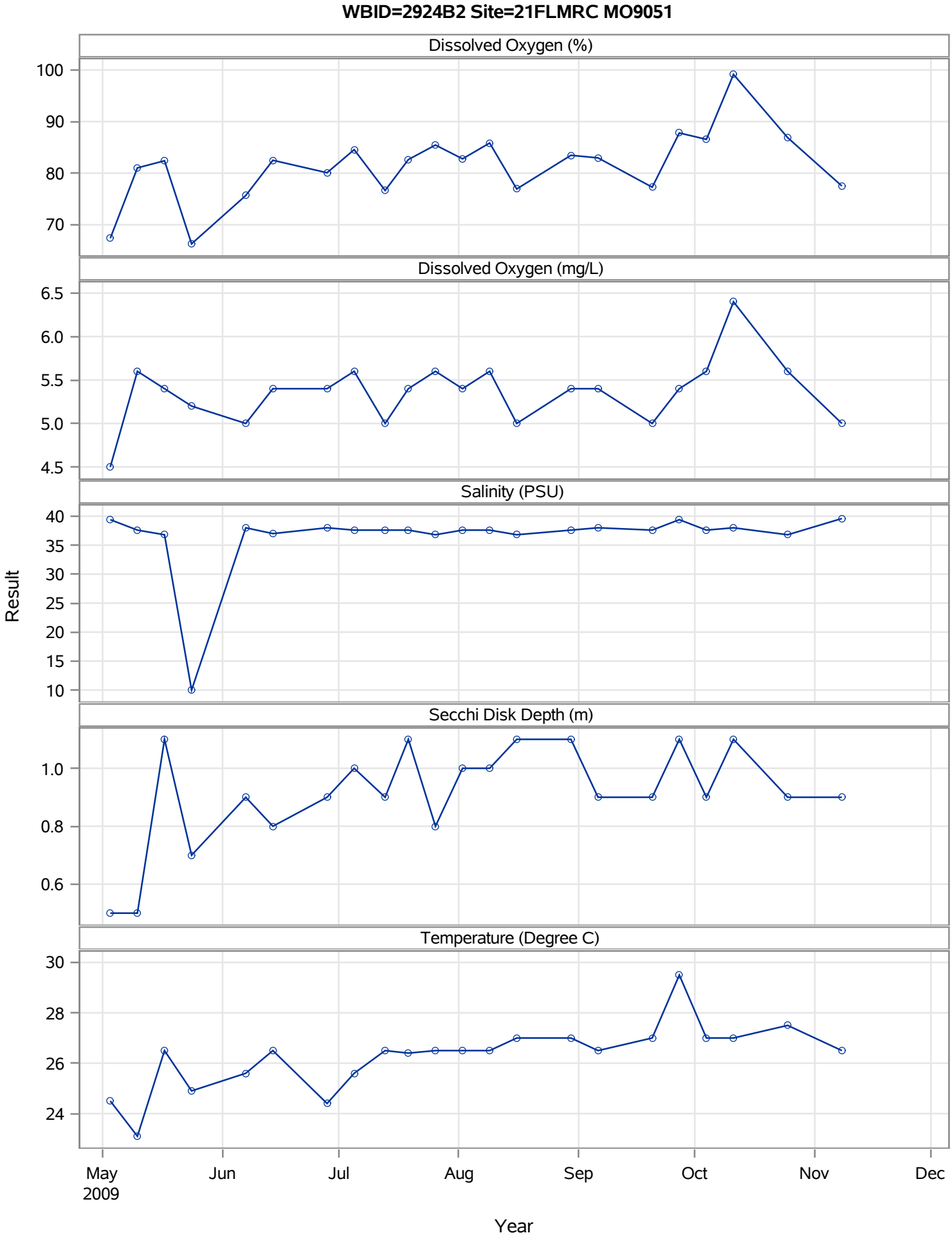

WBID=2924B2 Site=21FLMRC MO8970
pH
Result
8.0
7.8
7.6
7.4
26Mar
2006
28Mar
30Mar
01Apr
03Apr
05Apr
07Apr
09Apr
11Apr
13Apr
15Apr
17Apr
Year

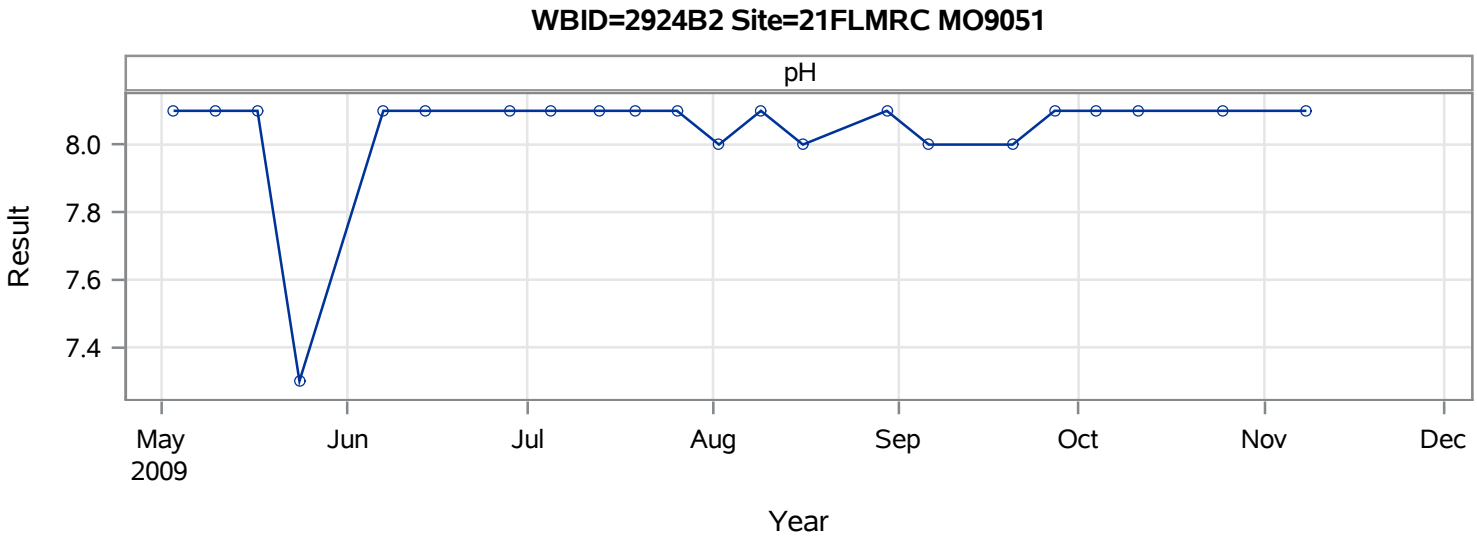

WBID=2924B2 Site=21FLMRC MO8980
Dissolved Oxygen (%)
120
110
100
90
80
Dissolved Oxygen (mg/L)
8
7
6
5
Salinity (PSU)
40
30
20
10
Secchi Disk Depth (m)
1.4
1.2
1.0
0.8
0.6
Temperature (Degree C)
30
25
20
15
Result
Apr
2006
Jul
Oct
Jan
2007
Apr
Jul
Oct
Jan
2008
Apr
Jul
Year

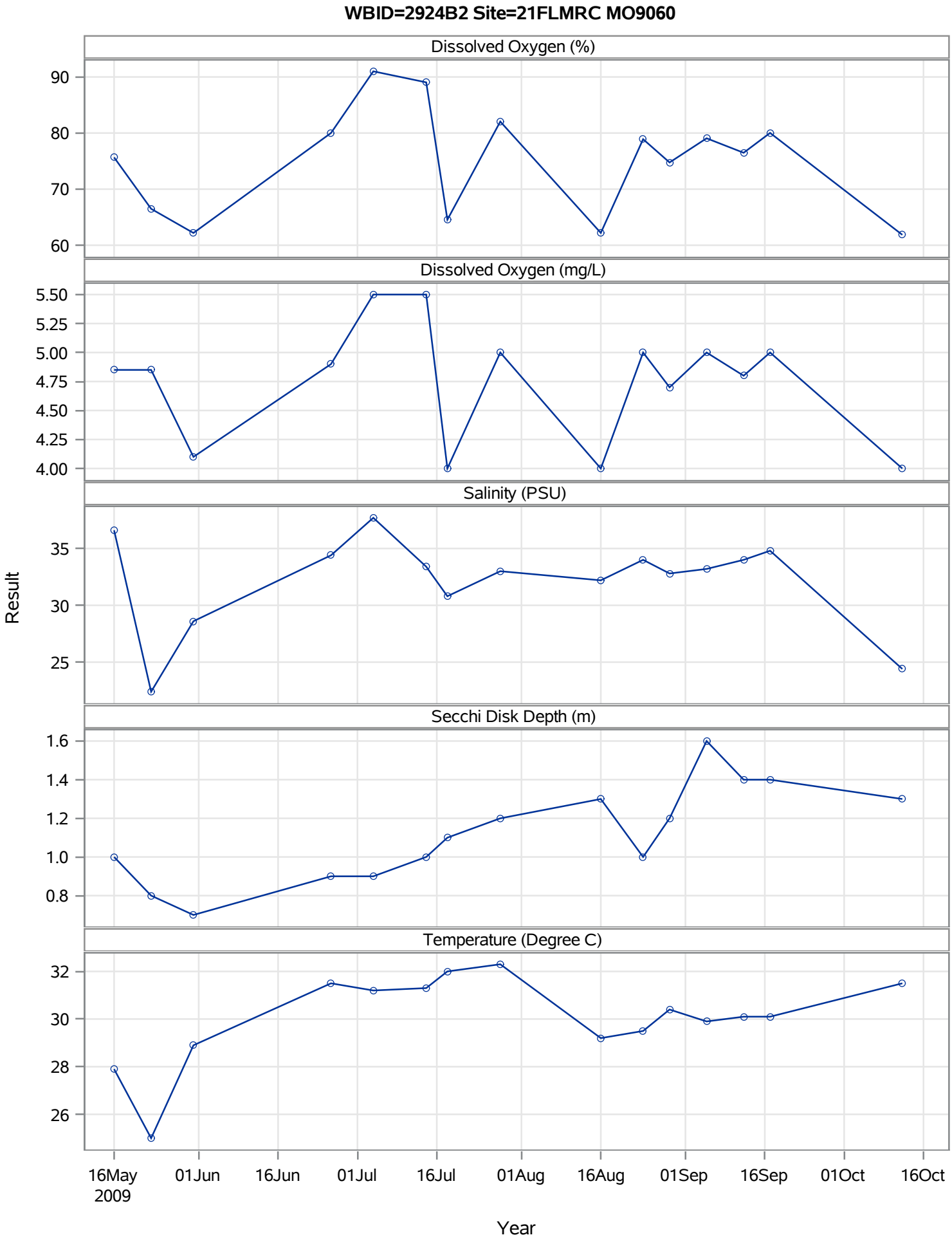

WBID=2924B2 Site=21FLMRC MO8980
pH
Result
8.4
8.3
8.2
8.1
8.0
7.9
Apr
2006
Jul
Oct
Jan
2007
Apr
Jul
Oct
Jan
2008
Apr
Jul
Year

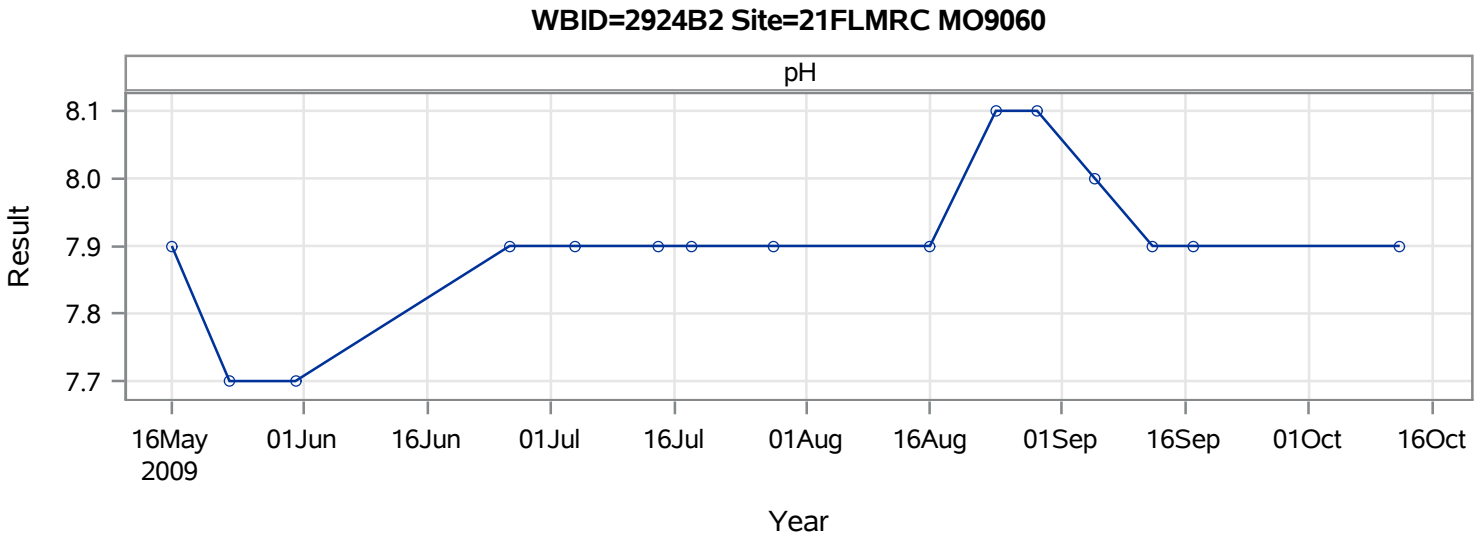

WBID=2924B2 Site=21FLMRC MO9030
Dissolved Oxygen (%)
140
120
100
80
60
Dissolved Oxygen (mg/L)
10
8
6
4
Salinity (PSU)
40
35
30
25
Secchi Disk Depth (m)
3
2
1
0
Temperature (Degree C)
40
35
30
25
20
15
Result
Jan 2005
Jul
Jan 2006
Jul
Jan 2007
Jul
Jan 2008
Jul
Jan 2009
Jul
Jan 2010
Jul
Year

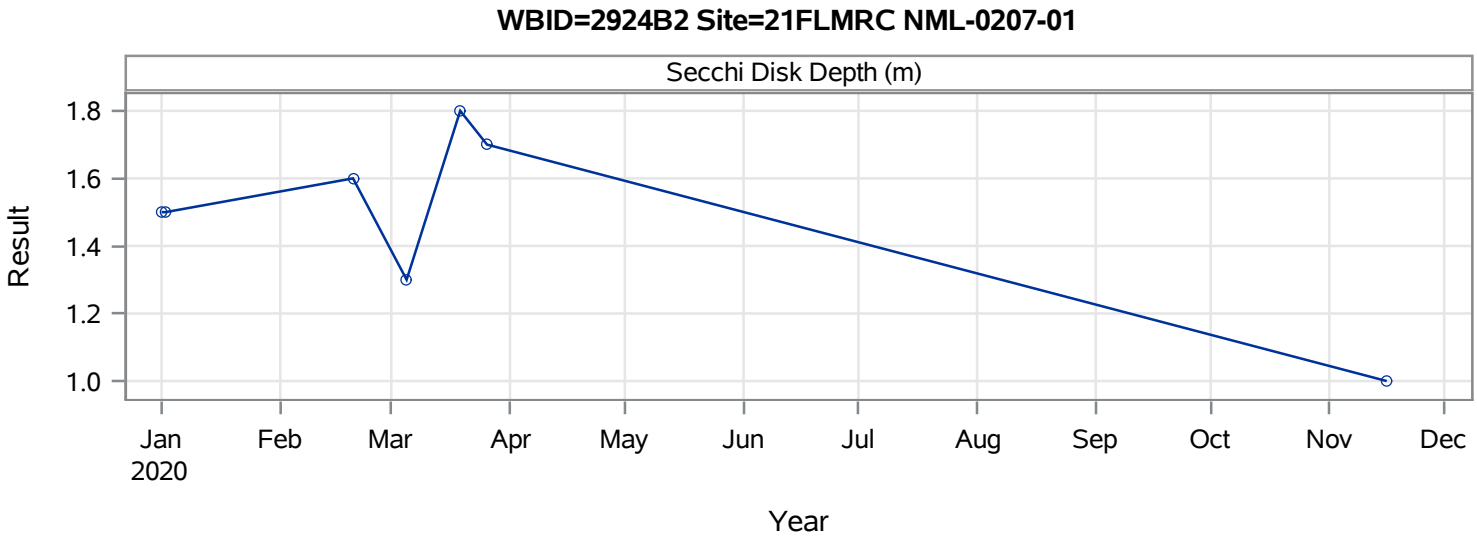

WBID=2924B2 Site=21FLMRC MO9030
pH
Result
8.25
8.00
7.75
7.50
7.25
Jan
2005
Jul
Jan
2006
Jul
Jan
2007
Jul
Jan
2008
Jul
Jan
2009
Jul
Jan
2010
Jul
Year

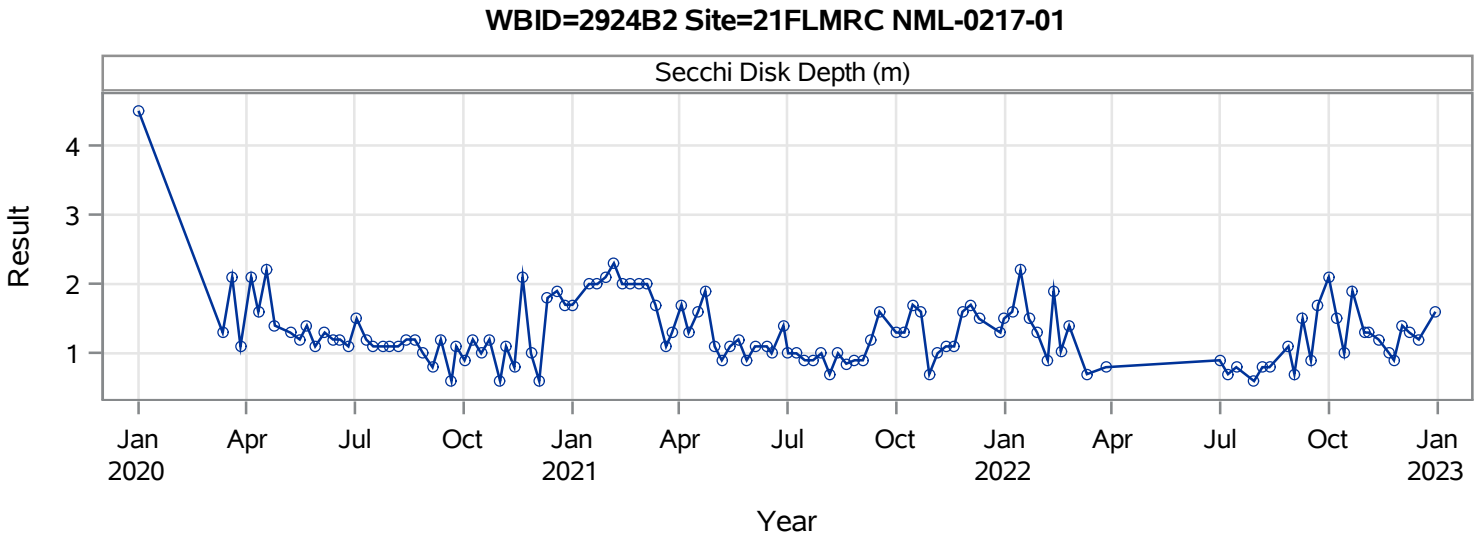

WBID=2924B2 Site=21FLMRC MO9051
Dissolved Oxygen (%)
100
90
80
70
Dissolved Oxygen (mg/L)
6.5
6.0
5.5
5.0
4.5
Salinity (PSU)
40
35
30
25
20
15
10
Secchi Disk Depth (m)
1.0
0.8
0.6
Temperature (Degree C)
30
28
26
24
Result
May
2009
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Year

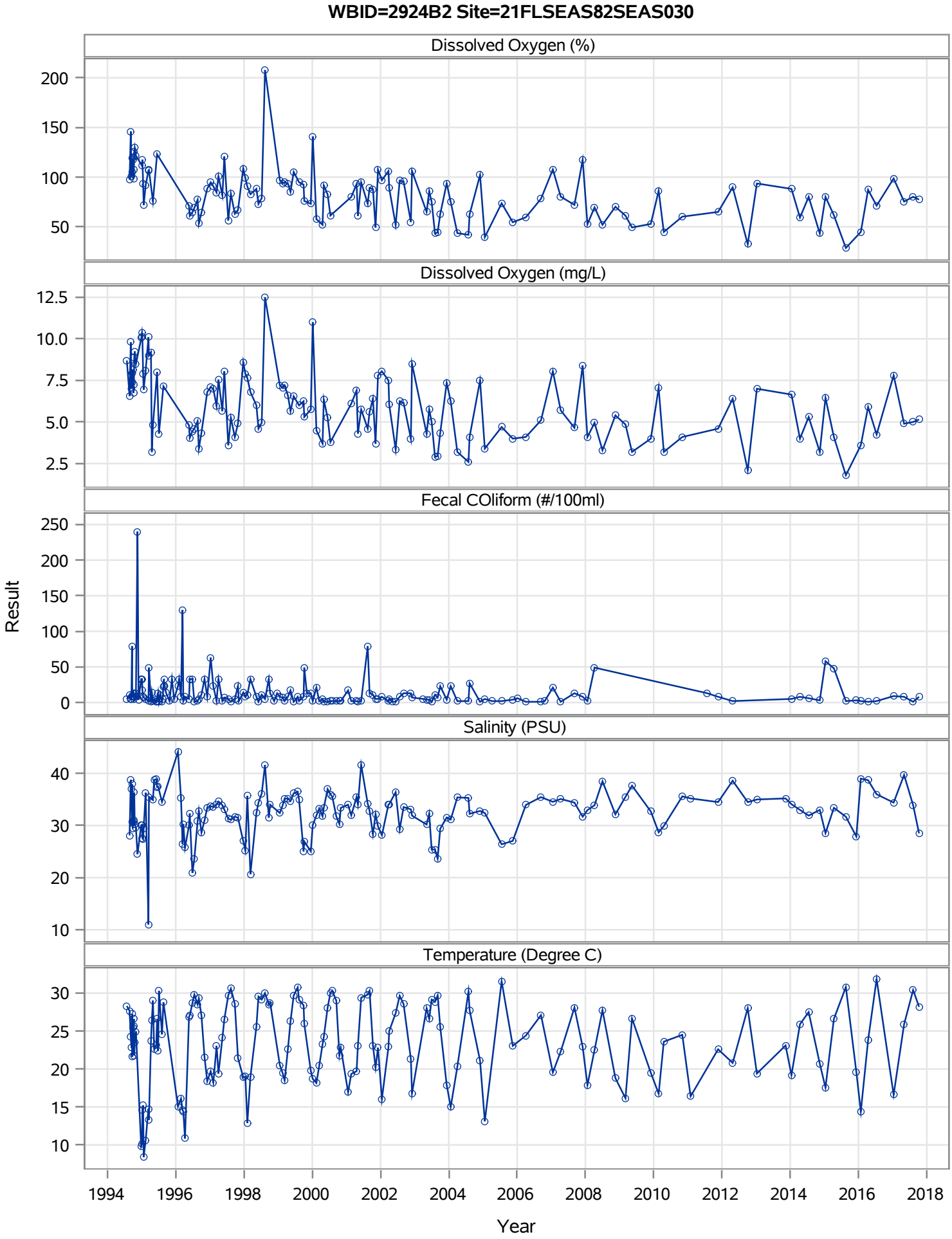

WBID=2924B2 Site=21FLMRC MO9051
pH
Result
8.0
7.8
7.6
7.4
May
2009
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Year

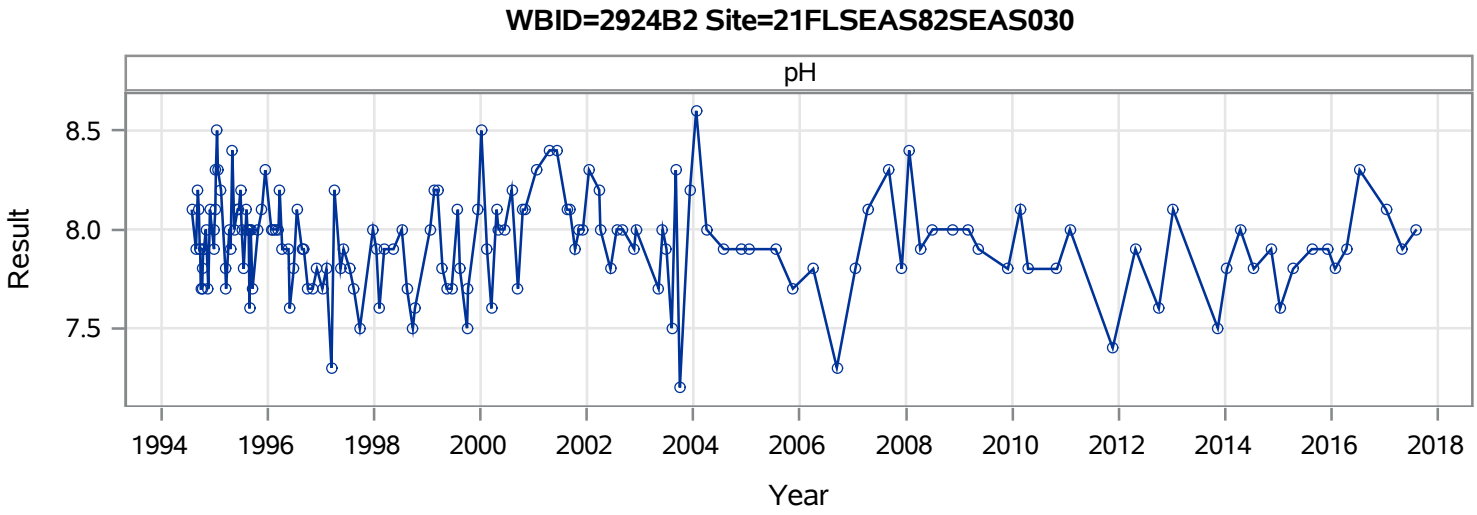

WBID=2924B2 Site=21FLMRC MO9060
Dissolved Oxygen (%)
90
80
70
60
Dissolved Oxygen (mg/L)
5.50
5.25
5.00
4.75
4.50
4.25
4.00
Salinity (PSU)
35
30
25
Secchi Disk Depth (m)
1.6
1.4
1.2
1.0
0.8
Temperature (Degree C)
32
30
28
26
Result
16May
2009
01Jun
16Jun
01Jul
16Jul
01Aug
16Aug
01Sep
16Sep
01Oct
16Oct
Year

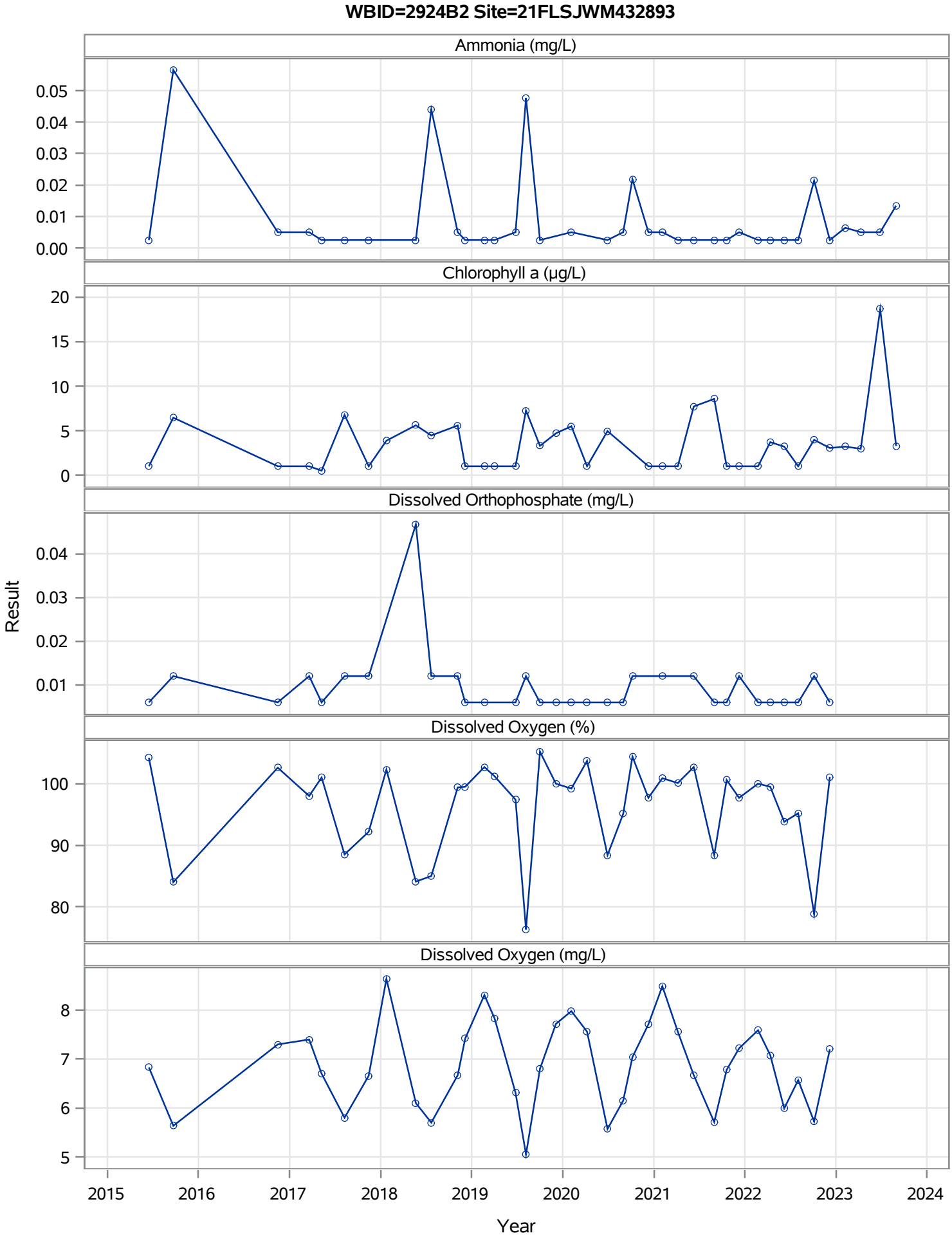

WBID=2924B2 Site=21FLMRC MO9060
pH
Result
8.1
8.0
7.9
7.8
7.7
16May
2009
01Jun
16Jun
01Jul
16Jul
01Aug
16Aug
01Sep
16Sep
01Oct
16Oct
Year

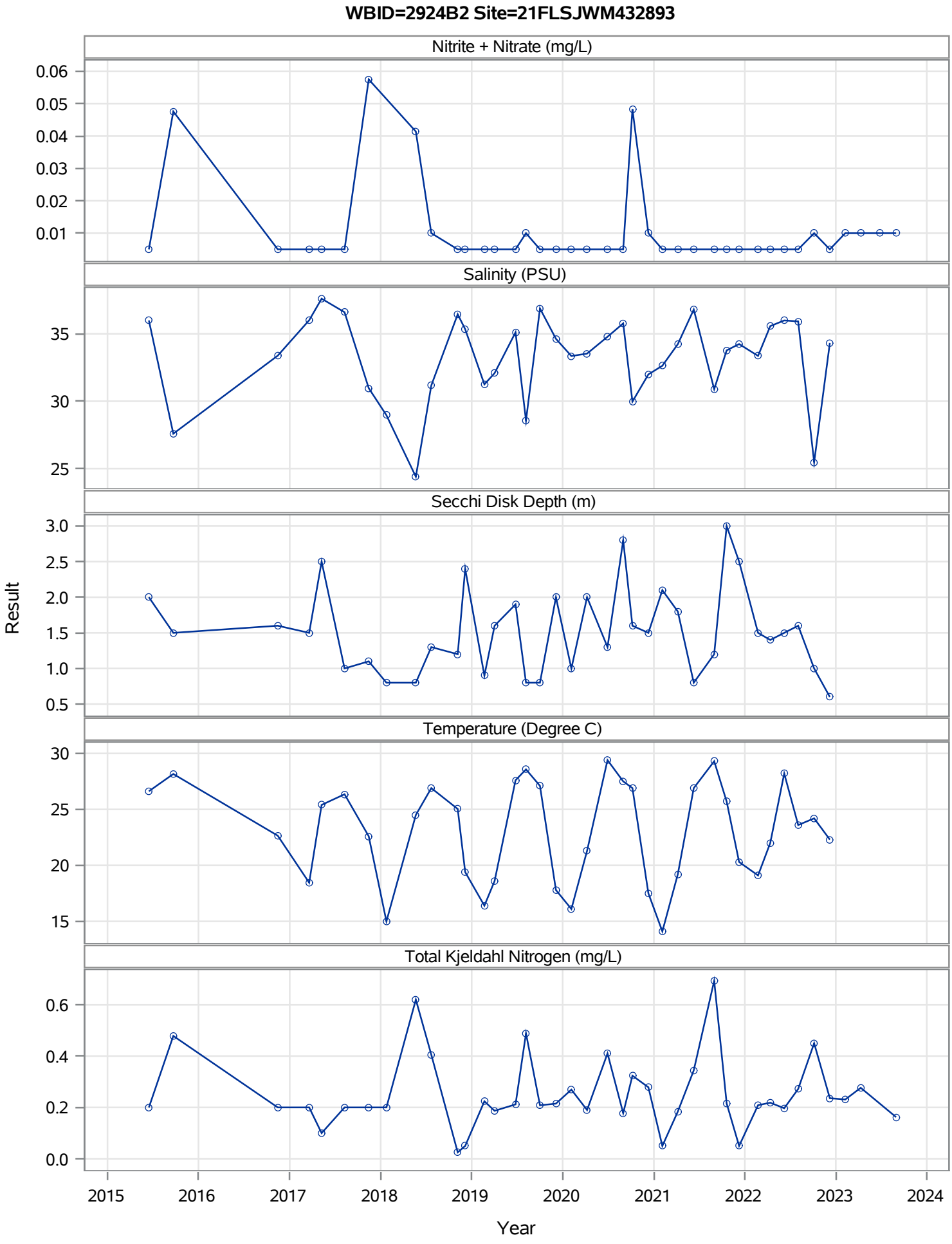

WBID=2924B2 Site=21FLMRC NML-0207-01
Secchi Disk Depth (m)
Result
1.8
1.6
1.4
1.2
1.0
Jan
2020
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Year

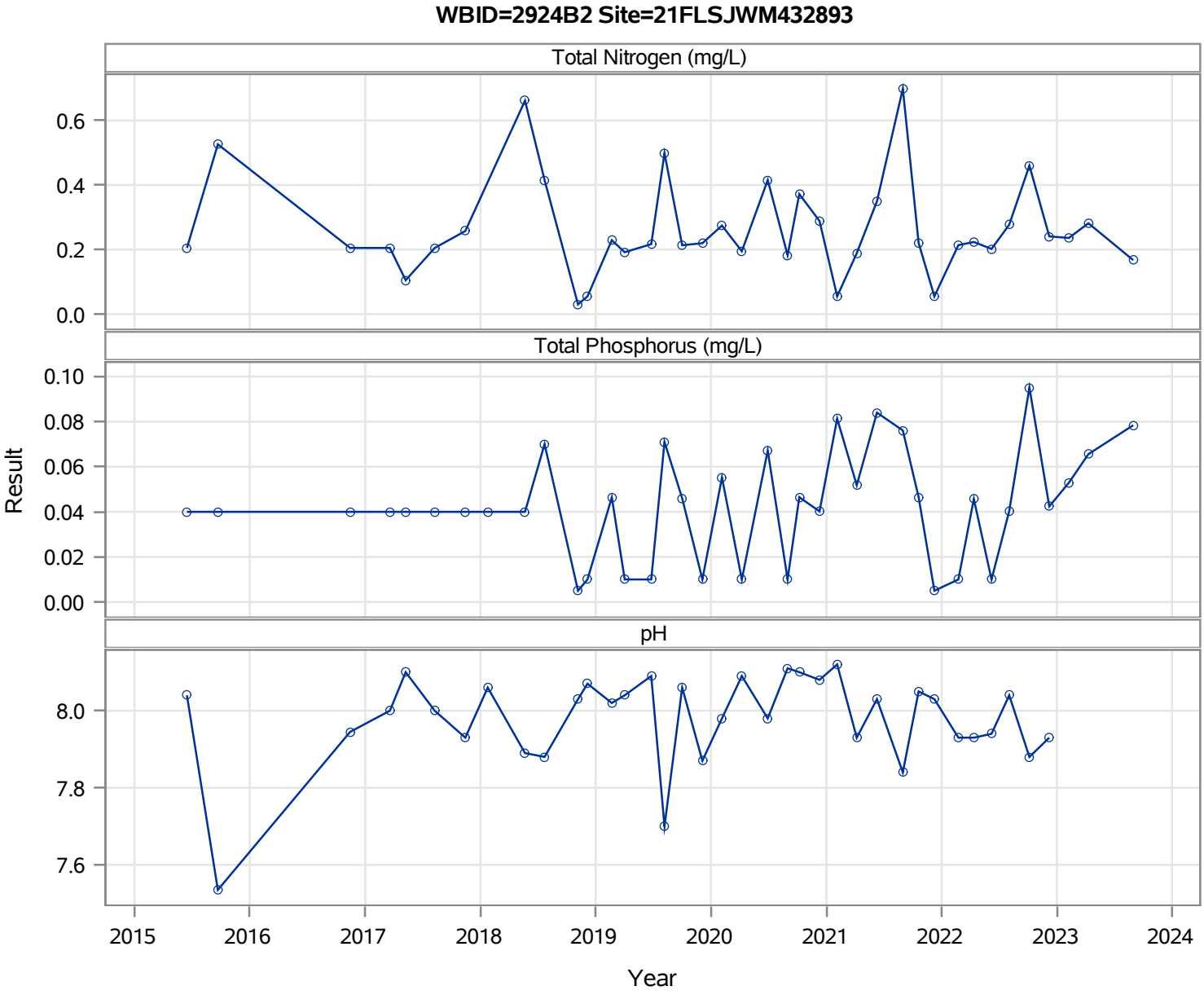

WBID=2924B2 Site=21FLMRC NML-0217-01
Secchi Disk Depth (m)
Result
4
3
2
1
Jan
2020
Apr
Jul
Oct
Jan
2021
Apr
Jul
Oct
Jan
2022
Apr
Jul
Oct
Jan
2023
Year

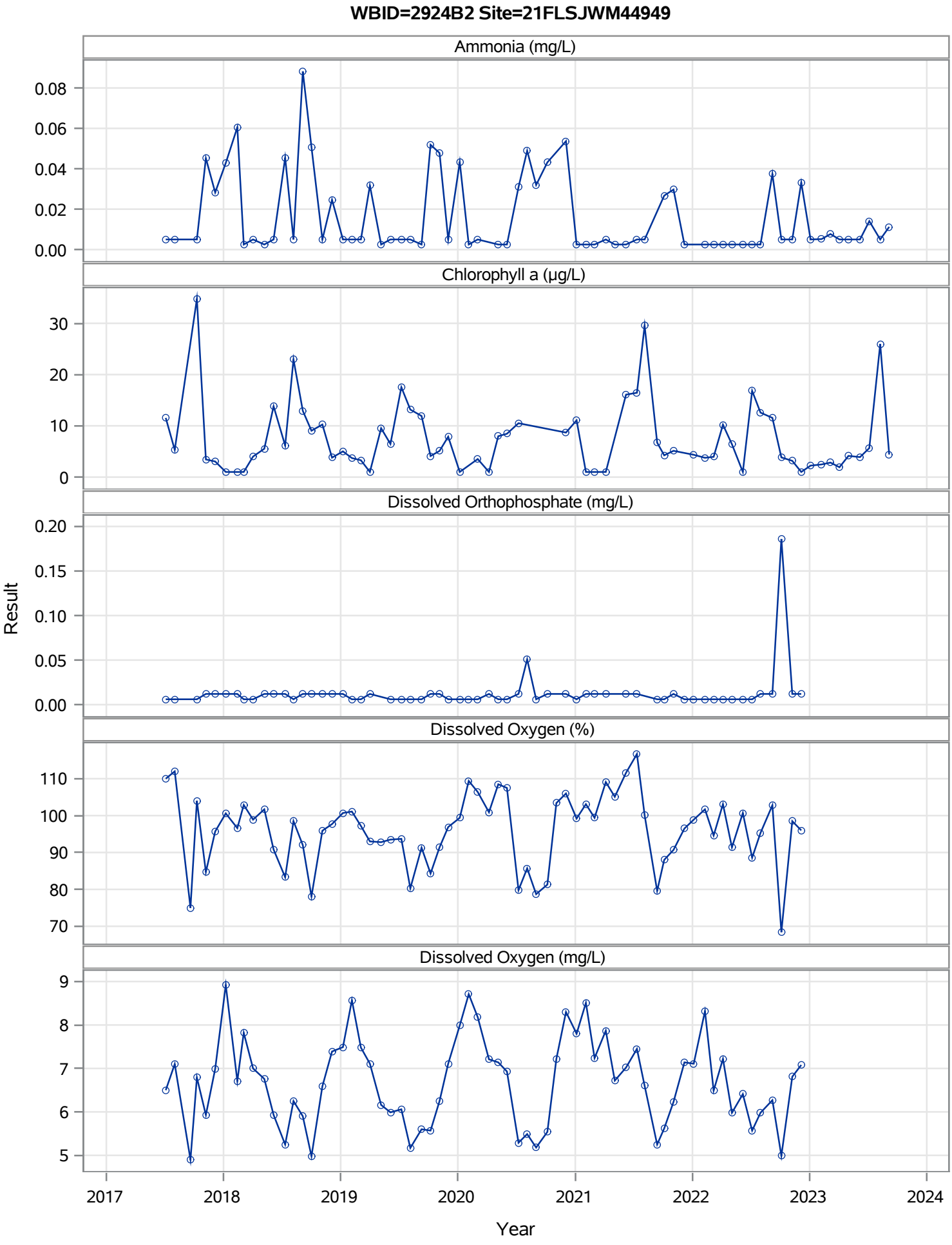

WBID=2924B2 Site=21FLSEAS82SEAS030
Dissolved Oxygen (%)
200
150
100
50
Dissolved Oxygen (mg/L)
12.5
10.0
7.5
5.0
2.5
Fecal COliform (#/100ml)
250
200
150
100
50
0
Salinity (PSU)
40
30
20
10
Temperature (Degree C)
30
25
20
15
10
Result
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

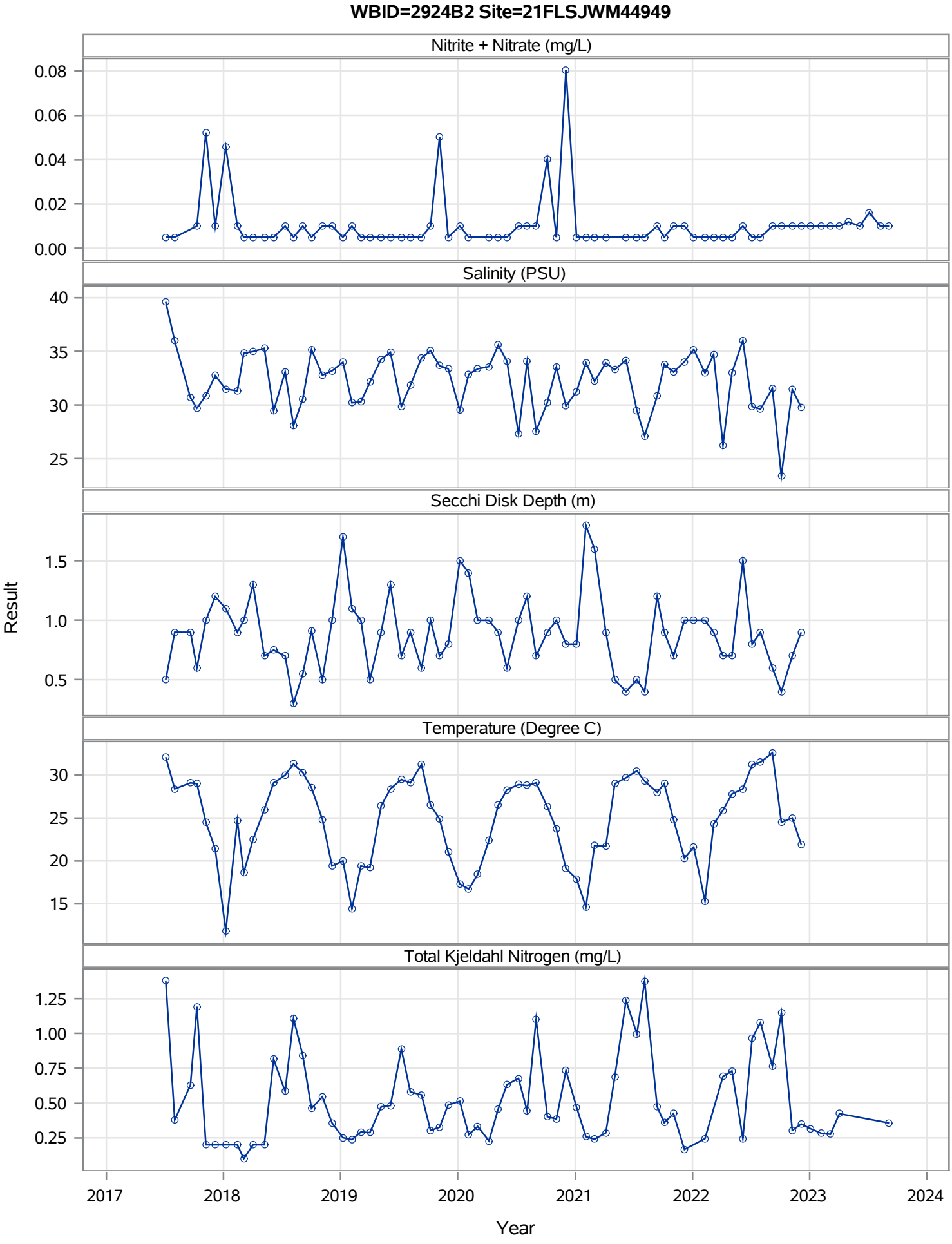

WBID=2924B2 Site=21FLSEAS82SEAS030
pH
Result
8.5
8.0
7.5
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

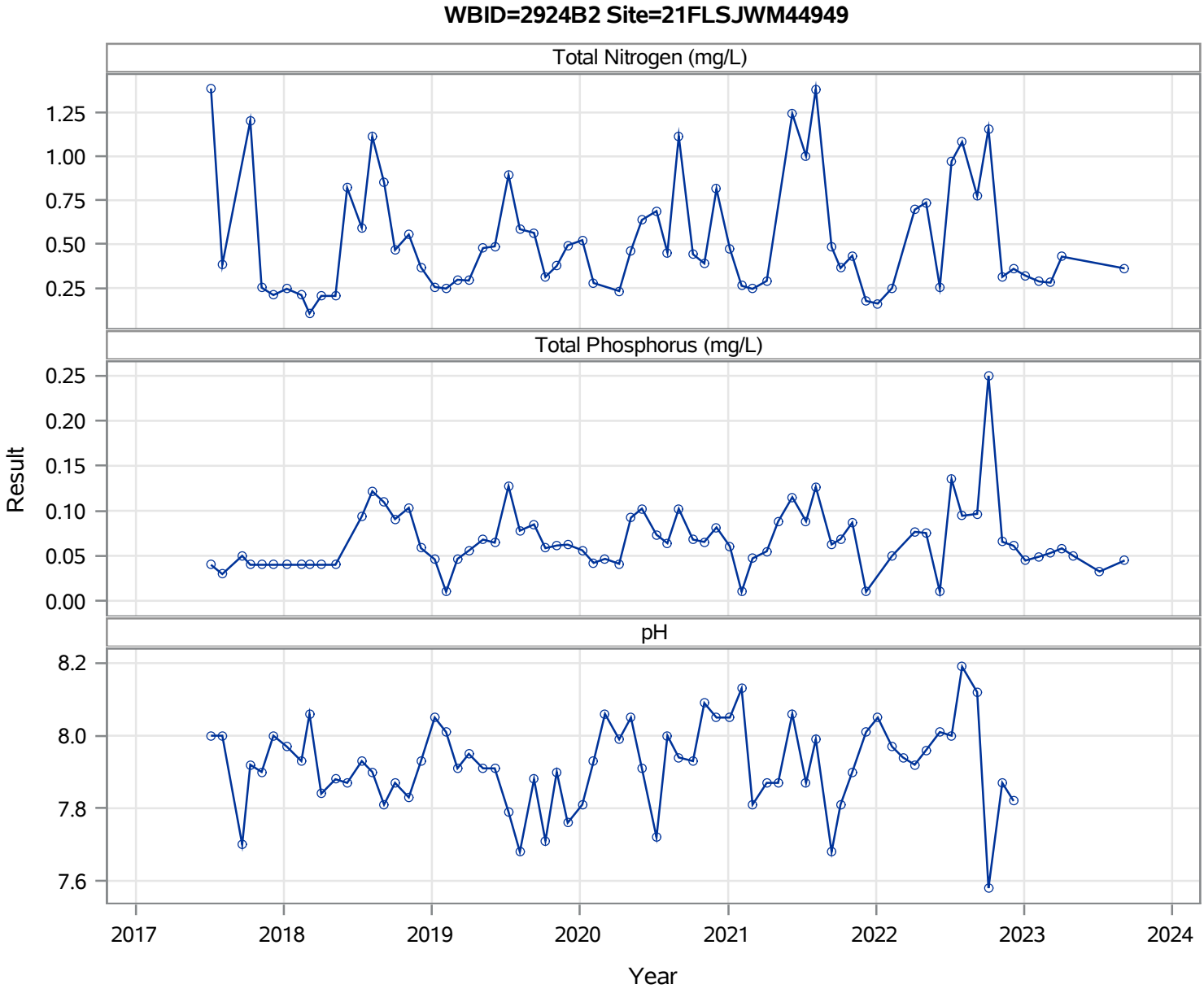

WBID=2924B2 Site=21FLSJWM432893
Ammonia (mg/L)
0.05
0.04
0.03
0.02
0.01
0.00
Chlorophyll a (µg/L)
20
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.04
0.03
0.02
0.01
Result
Dissolved Oxygen (%)
100
90
80
Dissolved Oxygen (mg/L)
8
7
6
5
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year

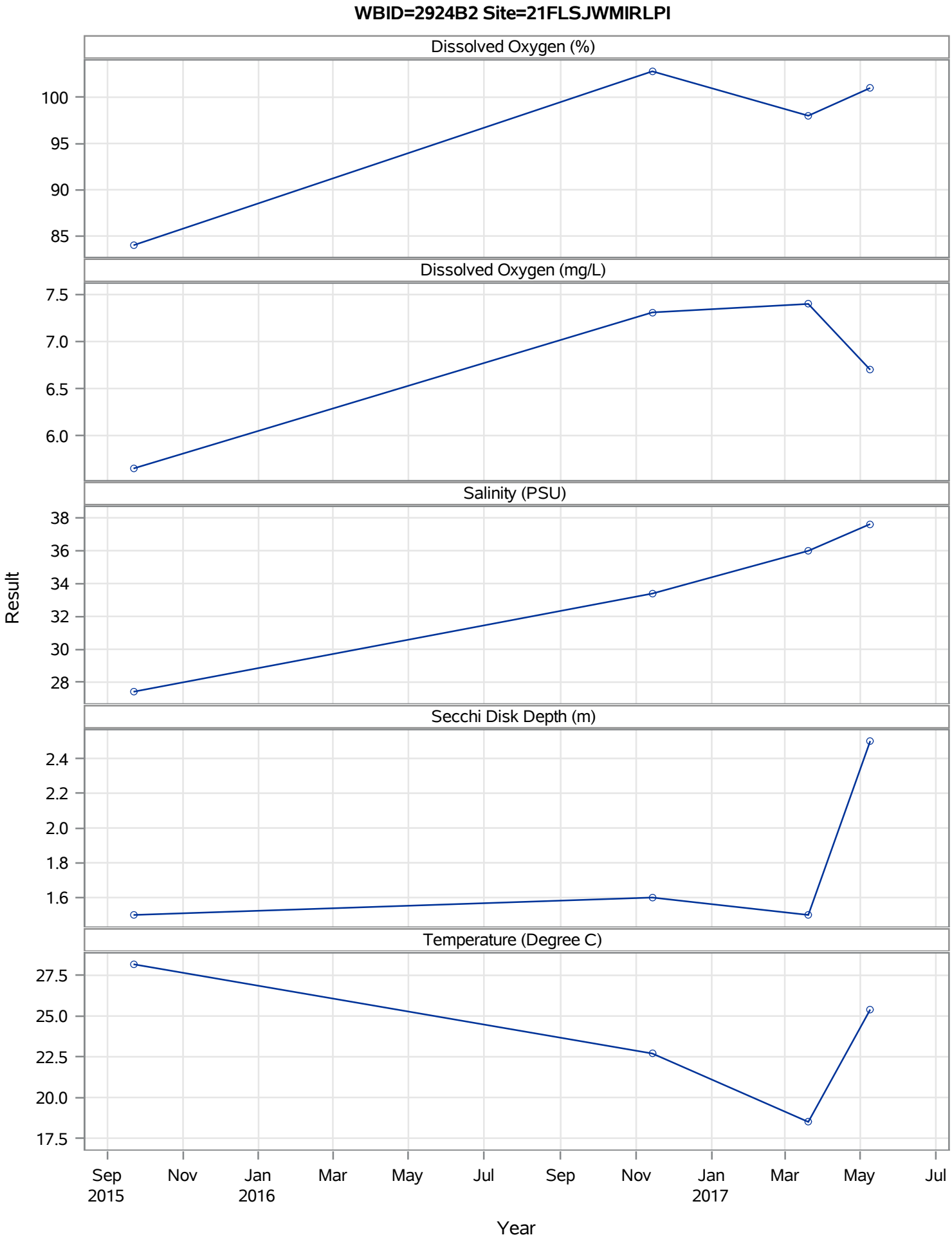

WBID=2924B2 Site=21FLSJWM432893
Nitrite + Nitrate (mg/L)
0.06
0.05
0.04
0.03
0.02
0.01
Salinity (PSU)
35
30
25
Secchi Disk Depth (m)
3.0
2.5
2.0
1.5
1.0
0.5
Result
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
0.6
0.4
0.2
0.0
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year

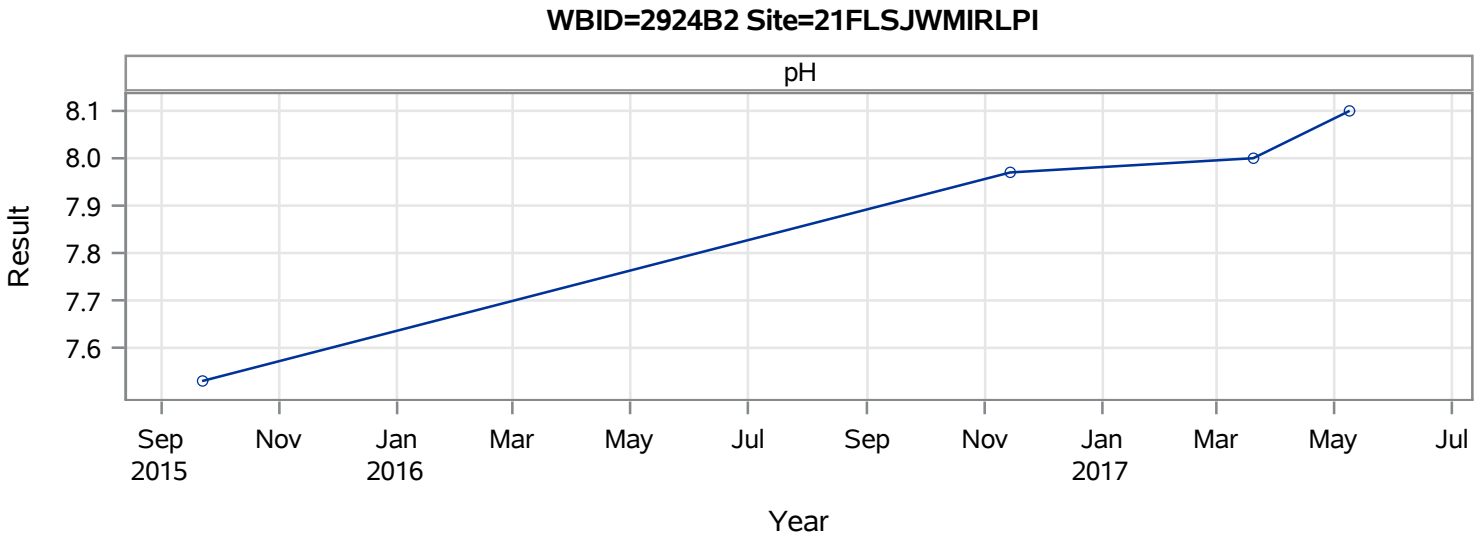

WBID=2924B2 Site=21FLSJWM432893
Total Nitrogen (mg/L)
0.6
0.4
0.2
0.0
Total Phosphorus (mg/L)
0.10
0.08
0.06
0.04
0.02
0.00
Result
pH
8.0
7.8
7.6
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year

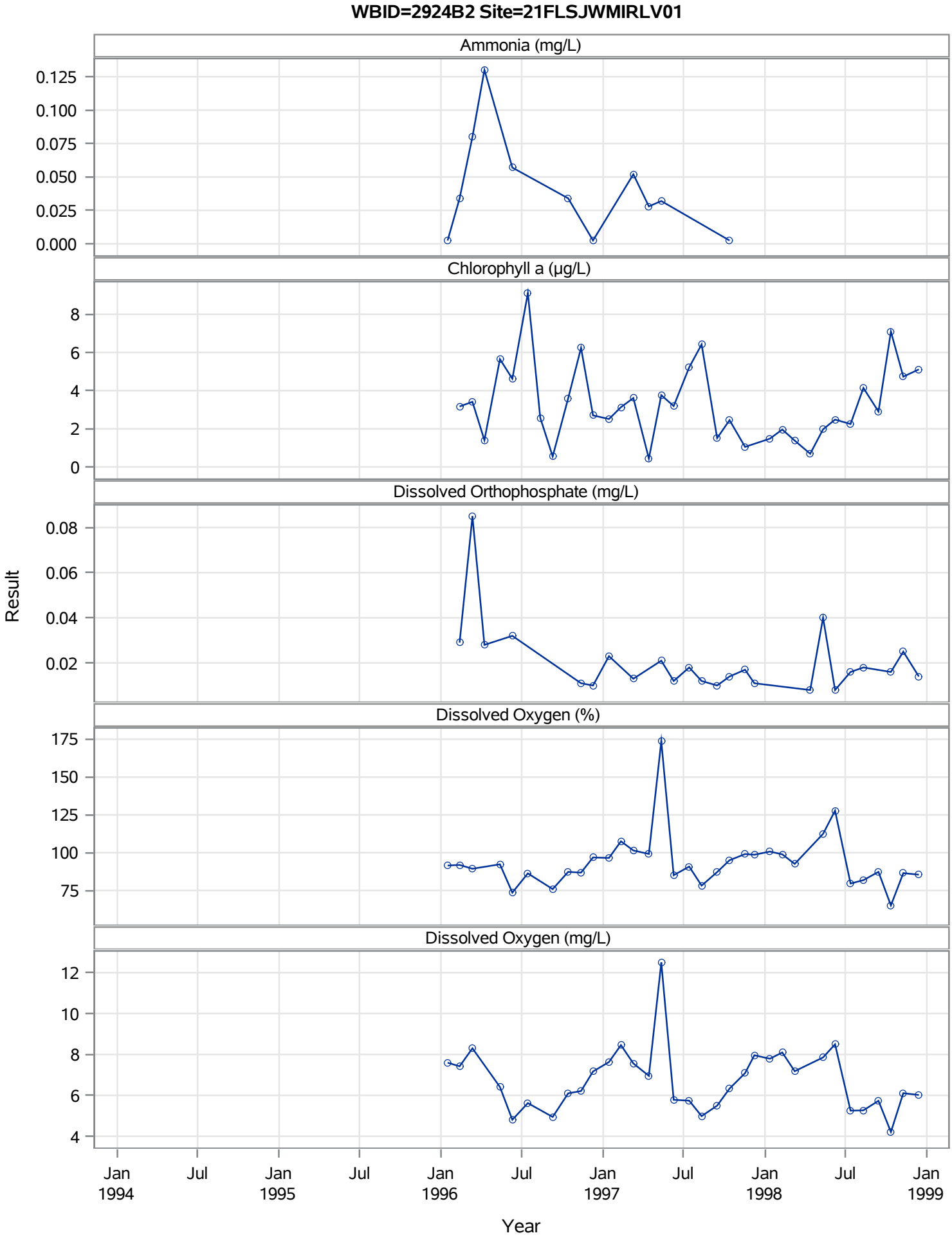

WBID=2924B2 Site=21FLSJWM44949
Ammonia (mg/L)
0.08
0.06
0.04
0.02
0.00
Chlorophyll a (µg/L)
30
20
10
0
Dissolved Orthophosphate (mg/L)
0.20
0.15
0.10
0.05
0.00
Dissolved Oxygen (%)
110
100
90
80
70
Dissolved Oxygen (mg/L)
9
8
7
6
5
Result
2017
2018
2019
2020
2021
2022
2023
2024
Year

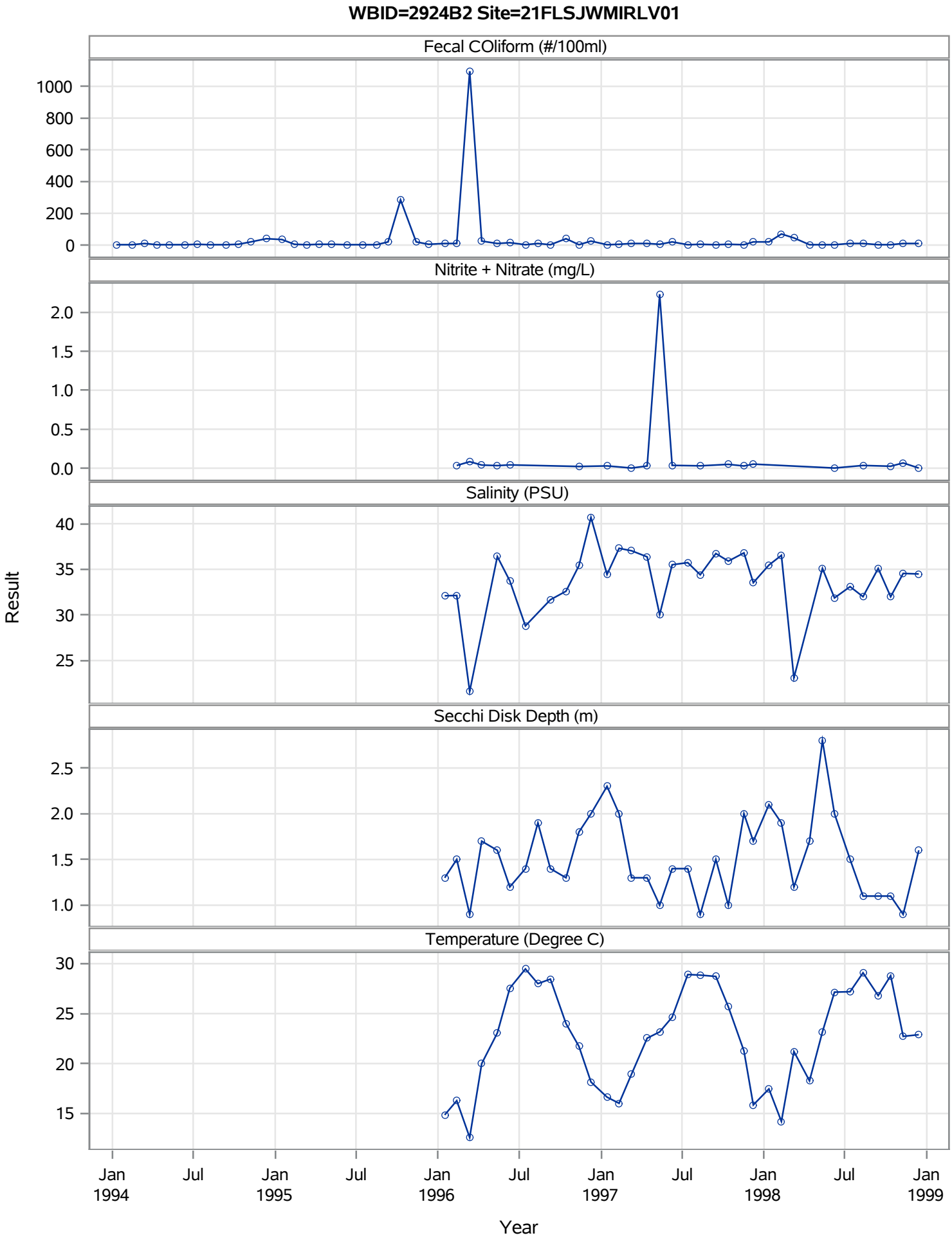

WBID=2924B2 Site=21FLSJWM44949
Nitrite + Nitrate (mg/L)
0.08
0.06
0.04
0.02
0.00
Salinity (PSU)
40
35
30
25
Secchi Disk Depth (m)
1.5
1.0
0.5
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
1.25
1.00
0.75
0.50
0.25
Result
2017
2018
2019
2020
2021
2022
2023
2024
Year

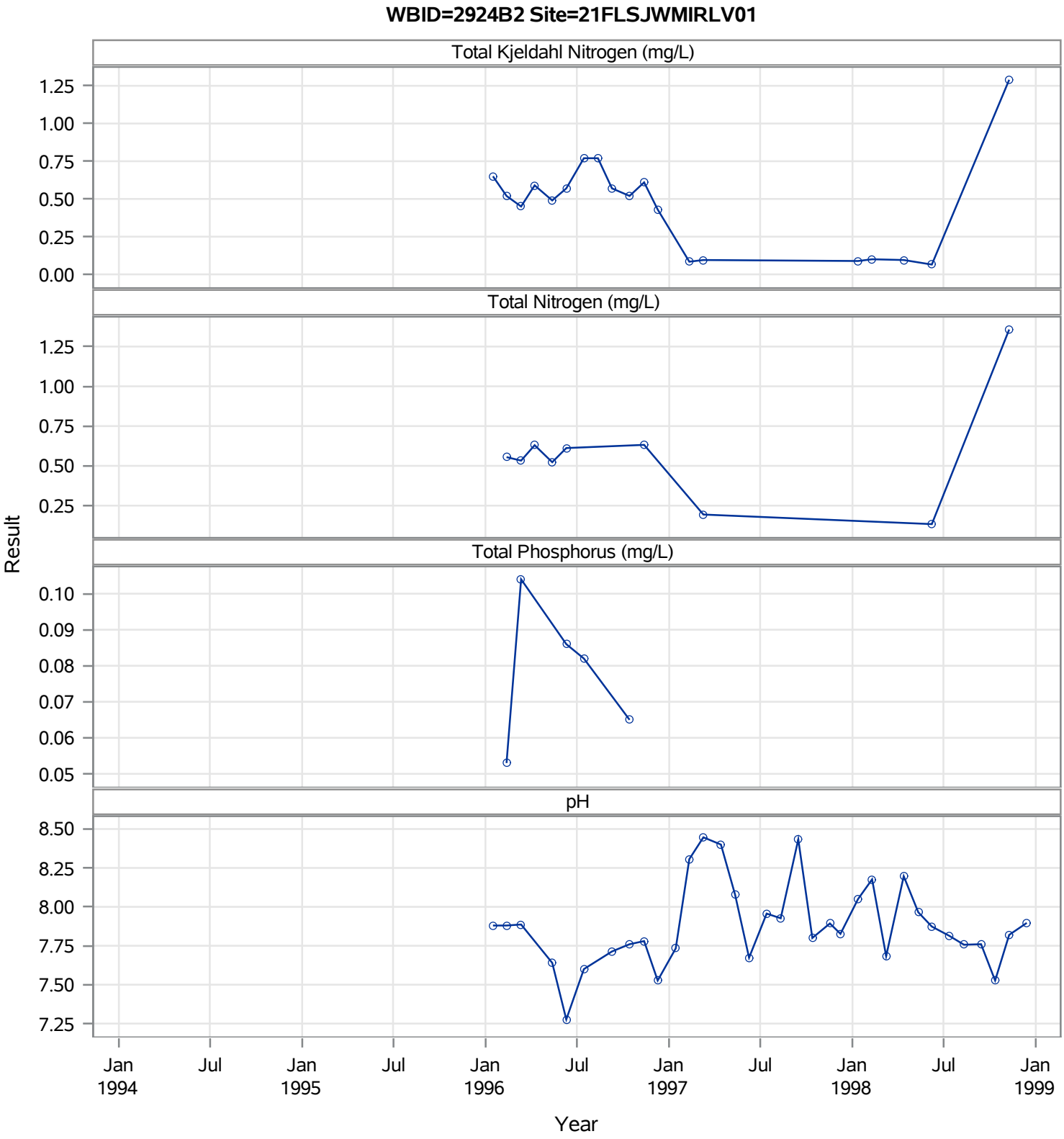

WBID=2924B2 Site=21FLSJWM44949
Total Nitrogen (mg/L)
1.25
1.00
0.75
0.50
0.25
Total Phosphorus (mg/L)
0.25
0.20
0.15
0.10
0.05
0.00
Result
pH
8.2
8.0
7.8
7.6
2017
2018
2019
2020
2021
2022
2023
2024
Year

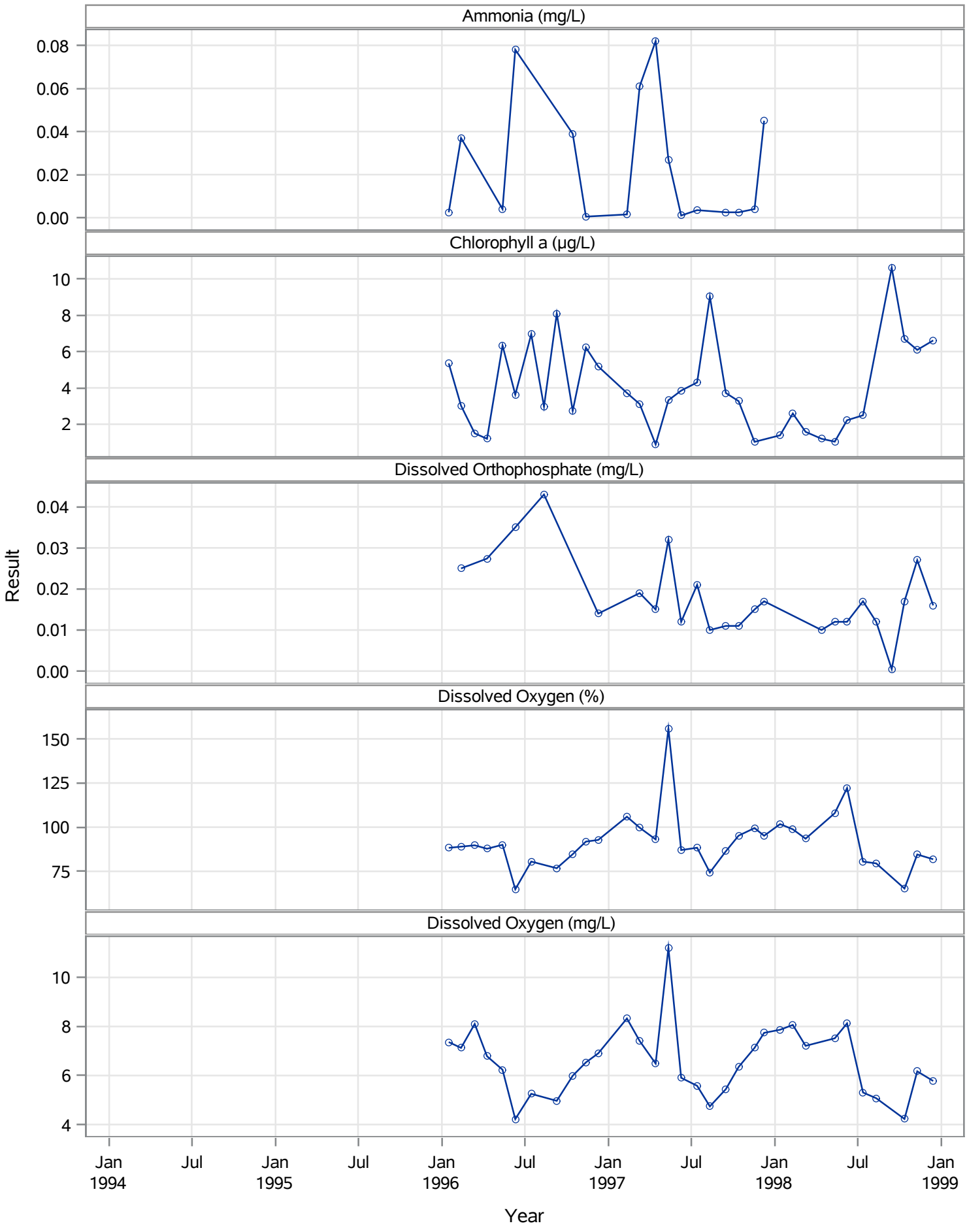

WBID=2924B2 Site=21FLSJWMIRLPI
Dissolved Oxygen (%)
100
95
90
85
Dissolved Oxygen (mg/L)
7.5
7.0
6.5
6.0
Salinity (PSU)
38
36
34
32
30
28
Secchi Disk Depth (m)
2.4
2.2
2.0
1.8
1.6
Temperature (Degree C)
27.5
25.0
22.5
20.0
17.5
Result
Sep
2015
Nov
Jan
2016
Mar
May
Jul
Sep
Nov
Jan
2017
Mar
May
Jul
Year

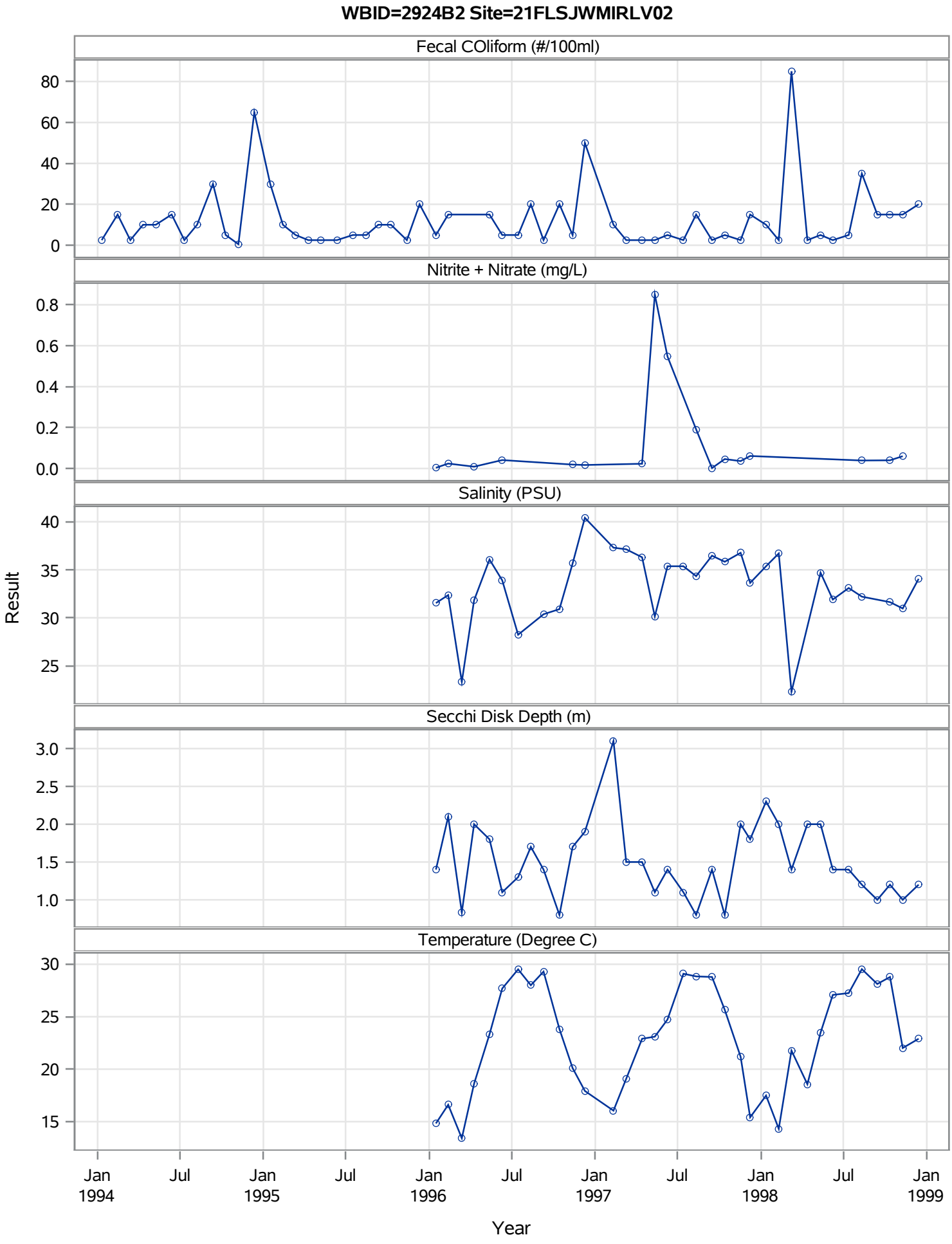

WBID=2924B2 Site=21FLSJWMIRLPI
pH
Result
8.1
8.0
7.9
7.8
7.7
7.6
Sep
2015
Nov
Jan
2016
Mar
May
Jul
Sep
Nov
Jan
2017
Mar
May
Jul
Year

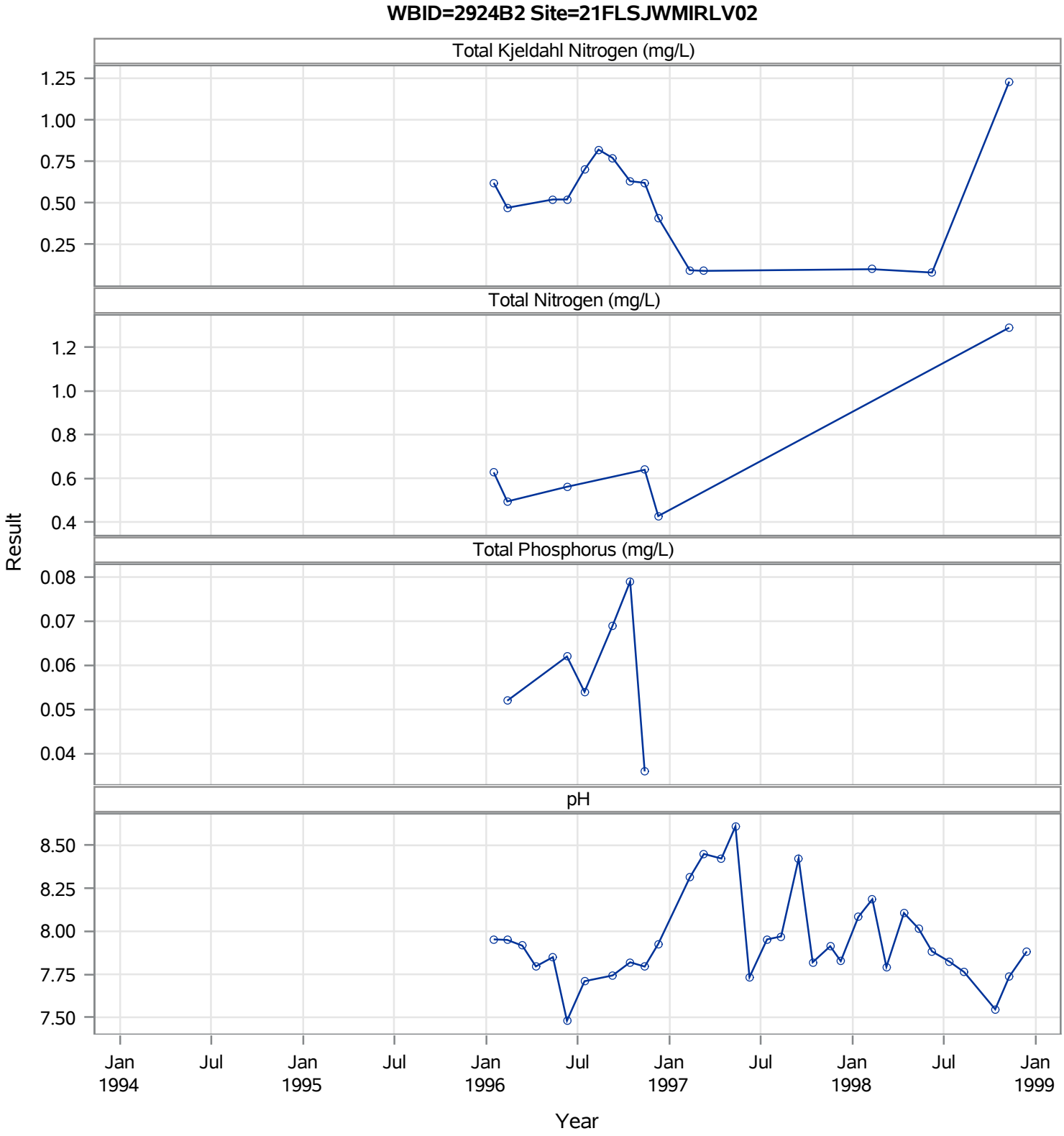

WBID=2924B2 Site=21FLSJWMIRLV01
Ammonia (mg/L)
0.125
0.100
0.075
0.050
0.025
0.000
Chlorophyll a (µg/L)
8
6
4
2
0
Dissolved Orthophosphate (mg/L)
0.08
0.06
0.04
0.02
Dissolved Oxygen (%)
175
150
125
100
75
Dissolved Oxygen (mg/L)
12
10
8
6
4
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

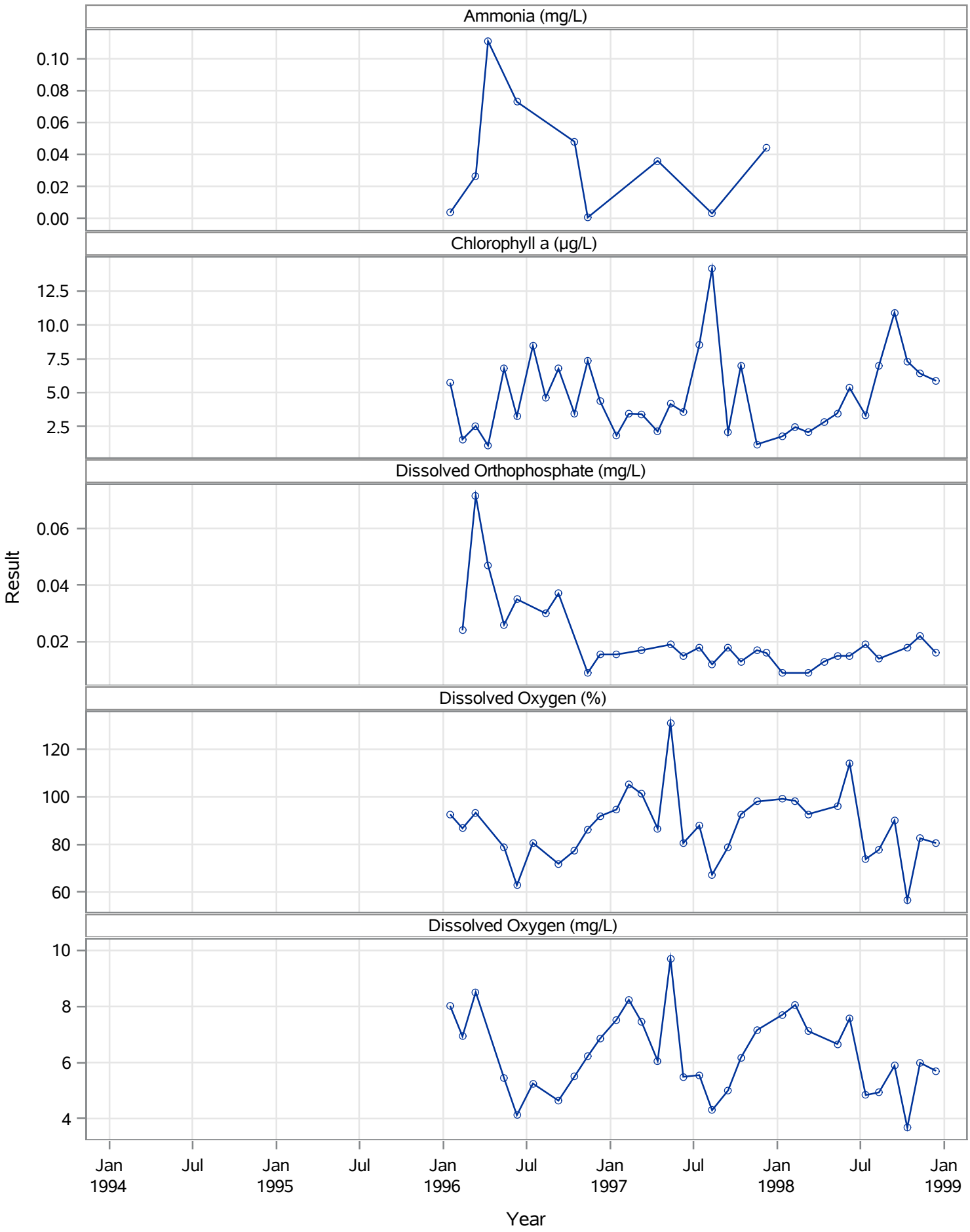

WBID=2924B2 Site=21FLSJWMIRLV01
Fecal COliform (#/100ml)
1000
800
600
400
200
0
Nitrite + Nitrate (mg/L)
2.0
1.5
1.0
0.5
0.0
Salinity (PSU)
40
35
30
25
Secchi Disk Depth (m)
2.5
2.0
1.5
1.0
Temperature (Degree C)
30
25
20
15
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

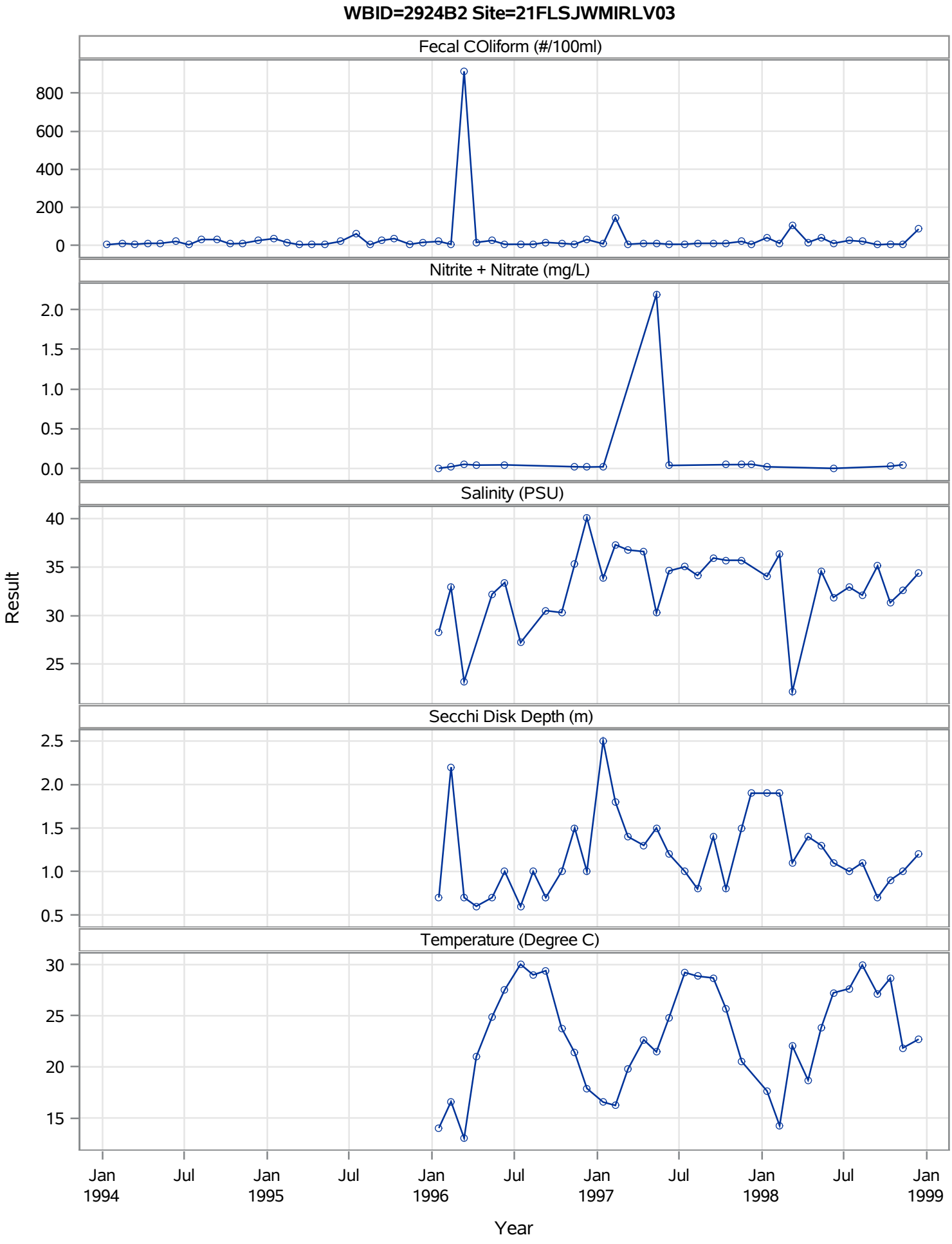

WBID=2924B2 Site=21FLSJWMIRLV01
Total Kjeldahl Nitrogen (mg/L)
1.25
1.00
0.75
0.50
0.25
0.00
Total Nitrogen (mg/L)
1.25
1.00
0.75
0.50
0.25
Total Phosphorus (mg/L)
0.10
0.09
0.08
0.07
0.06
0.05
pH
8.50
8.25
8.00
7.75
7.50
7.25
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

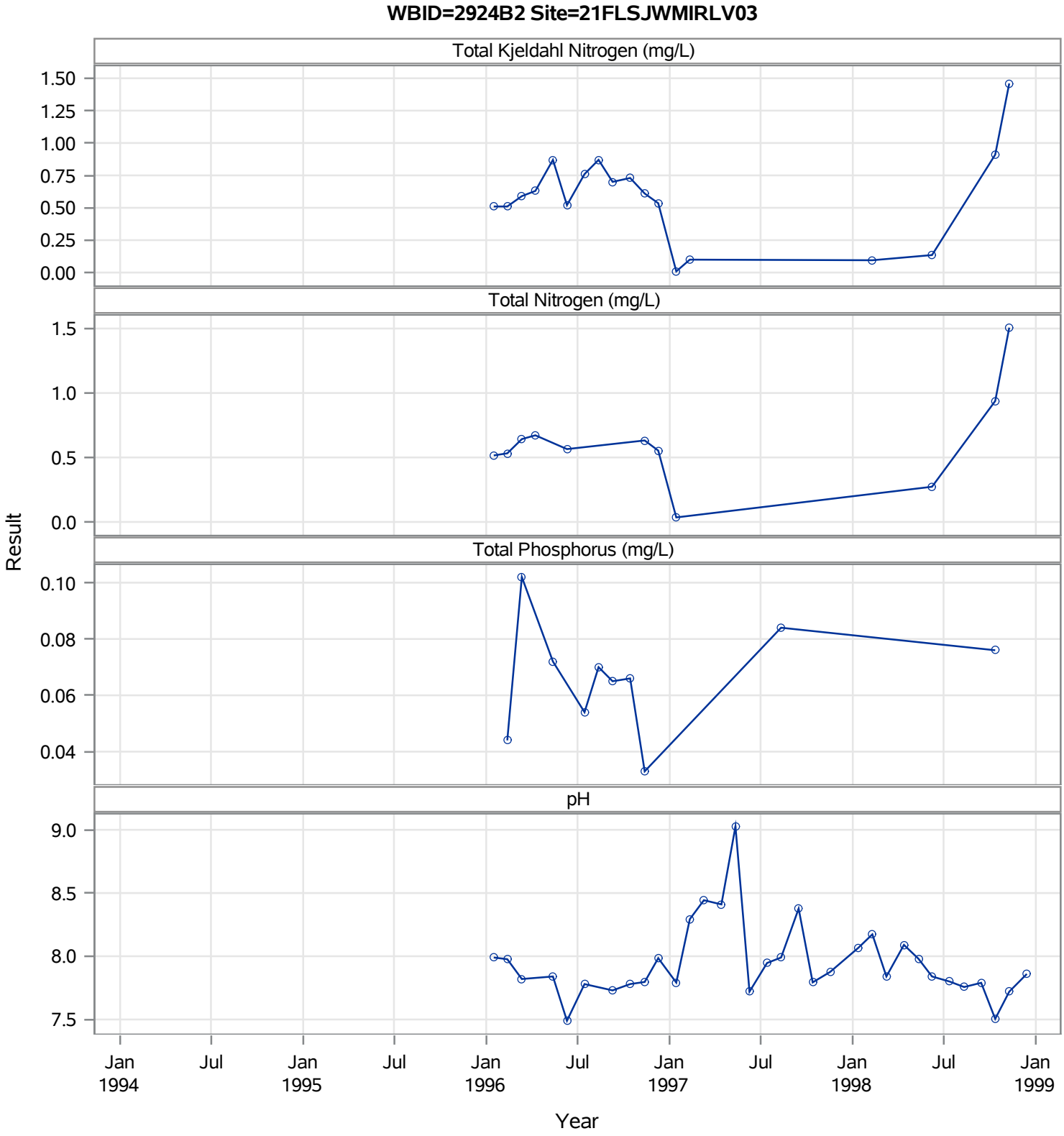

WBID=2924B2 Site=21FLSJWMIRLV02
Ammonia (mg/L)
0.08
0.06
0.04
0.02
0.00
Chlorophyll a (µg/L)
10
8
6
4
2
Dissolved Orthophosphate (mg/L)
0.04
0.03
0.02
0.01
0.00
Dissolved Oxygen (%)
150
125
100
75
Dissolved Oxygen (mg/L)
10
8
6
4
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

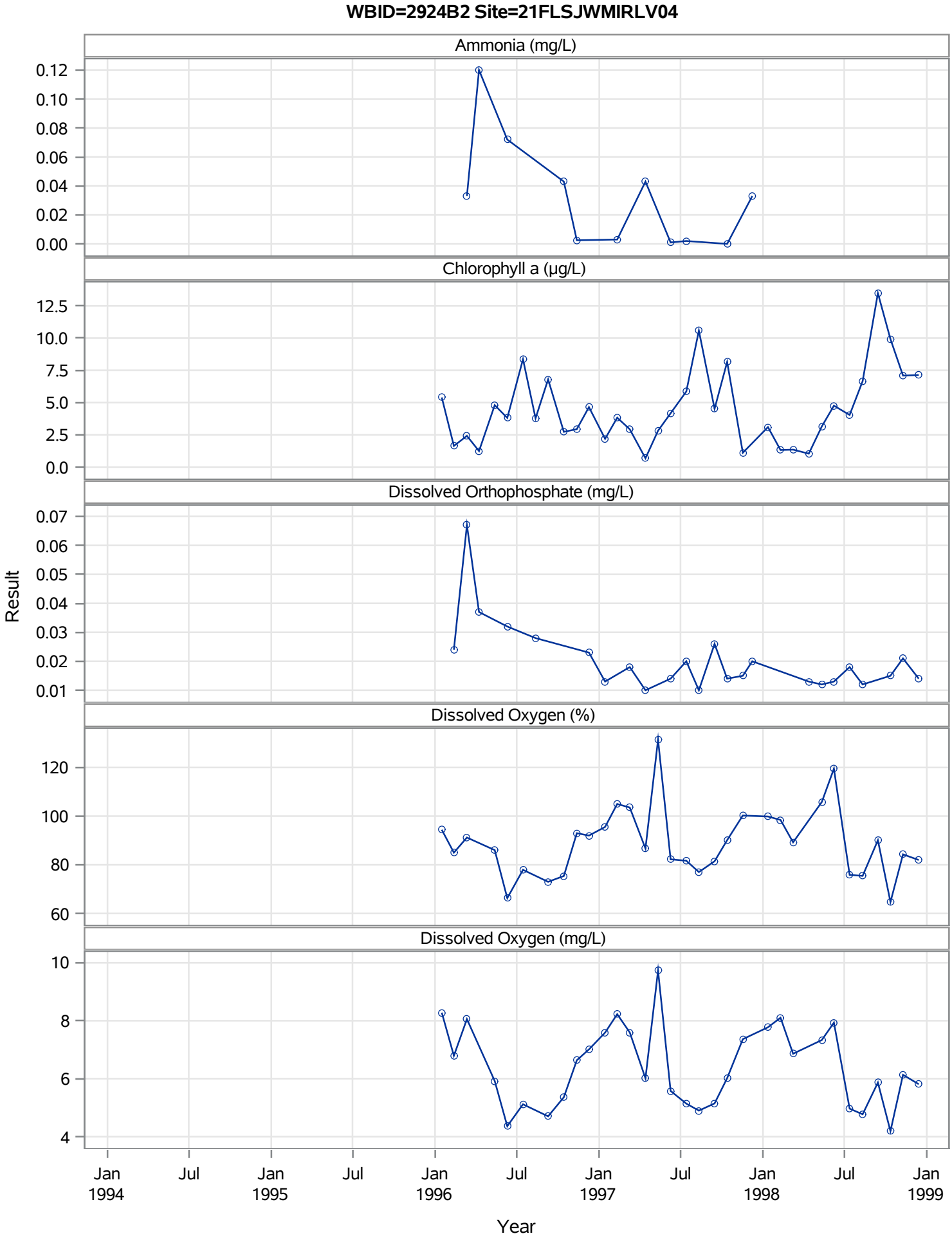

WBID=2924B2 Site=21FLSJWMIRLV02
Fecal COliform (#/100ml)
80
60
40
20
0
Nitrite + Nitrate (mg/L)
0.8
0.6
0.4
0.2
0.0
Salinity (PSU)
40
35
30
25
Secchi Disk Depth (m)
3.0
2.5
2.0
1.5
1.0
Temperature (Degree C)
30
25
20
15
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

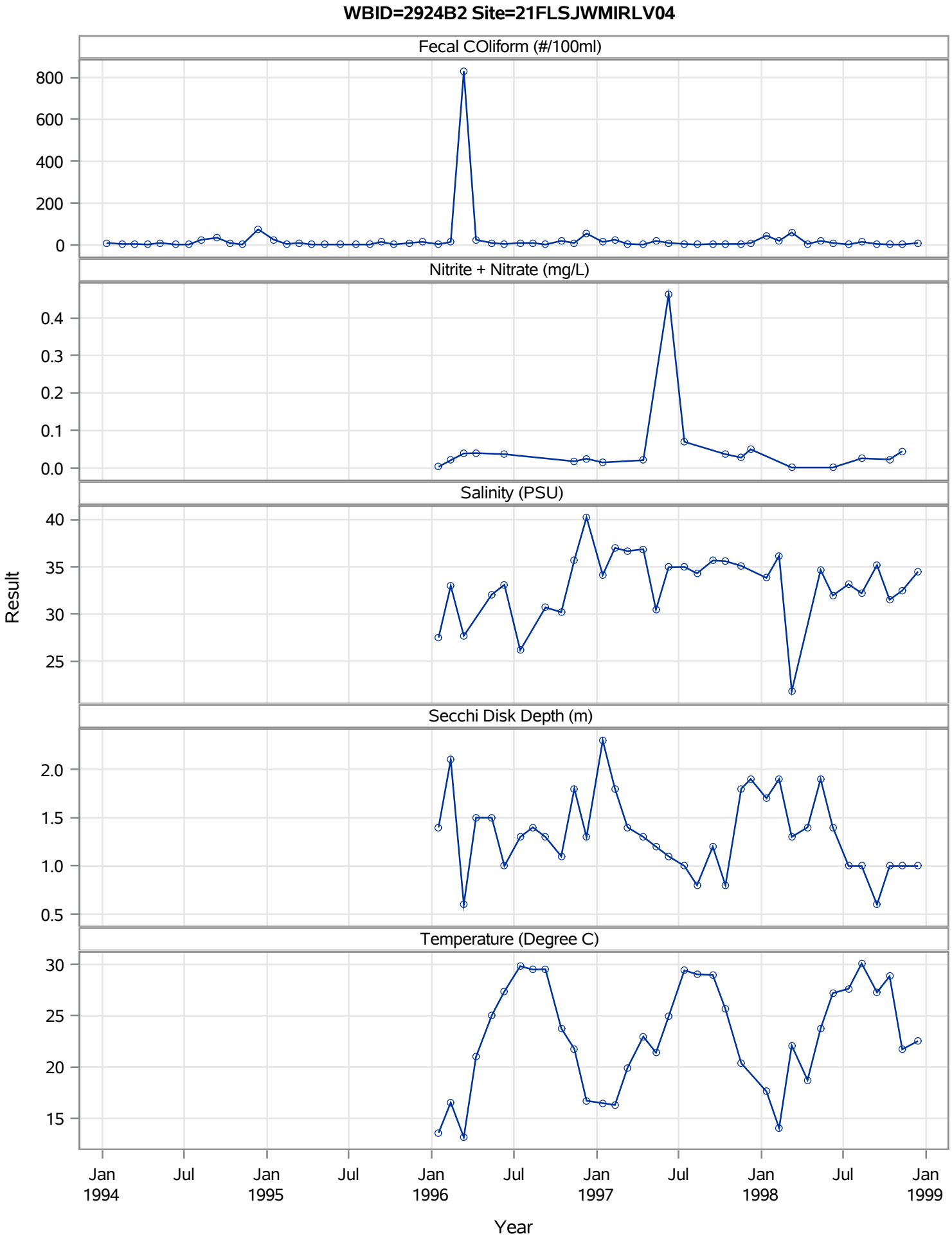

WBID=2924B2 Site=21FLSJWMIRLV02
Total Kjeldahl Nitrogen (mg/L)
1.25
1.00
0.75
0.50
0.25
Total Nitrogen (mg/L)
1.2
1.0
0.8
0.6
0.4
Total Phosphorus (mg/L)
0.08
0.07
0.06
0.05
0.04
pH
8.50
8.25
8.00
7.75
7.50
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

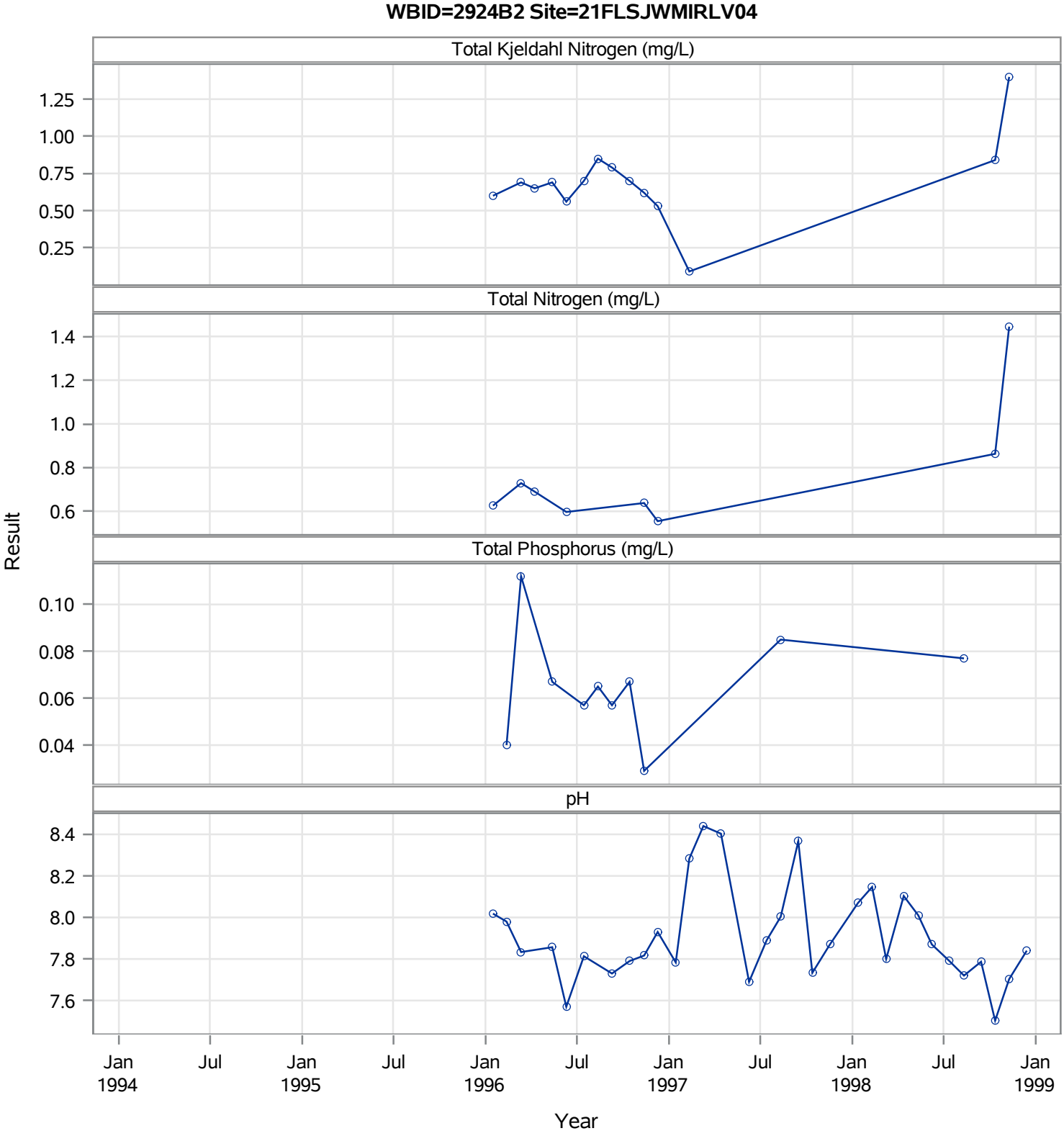

WBID=2924B2 Site=21FLSJWMIRLV03
Ammonia (mg/L)
0.10
0.08
0.06
0.04
0.02
0.00
Chlorophyll a (µg/L)
12.5
10.0
7.5
5.0
2.5
Dissolved Orthophosphate (mg/L)
0.06
0.04
0.02
Dissolved Oxygen (%)
120
100
80
60
Dissolved Oxygen (mg/L)
10
8
6
4
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

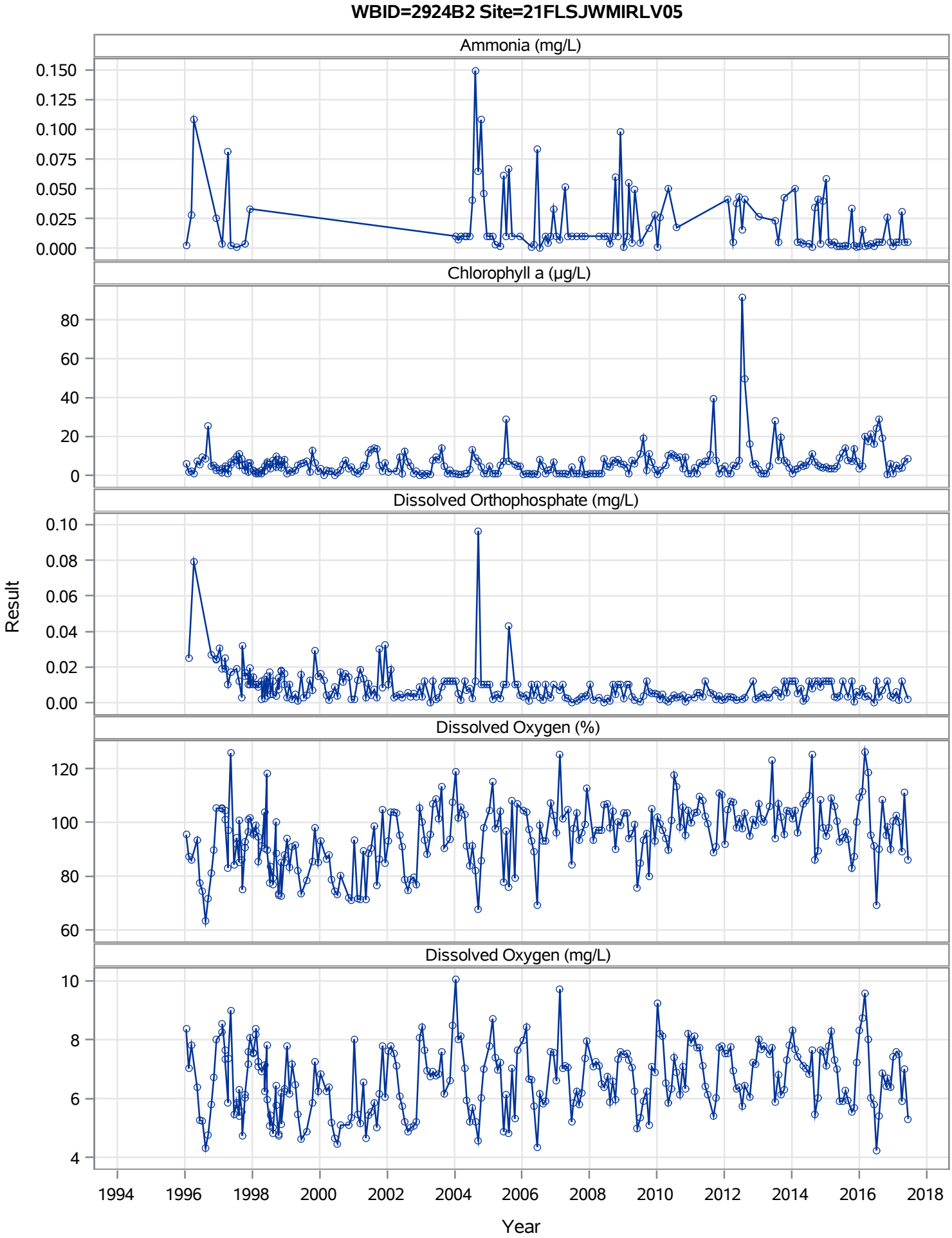

WBID=2924B2 Site=21FLSJWMIRLV03
Fecal COliform (#/100ml)
800
600
400
200
0
Nitrite + Nitrate (mg/L)
2.0
1.5
1.0
0.5
0.0
Salinity (PSU)
40
35
30
25
Secchi Disk Depth (m)
2.5
2.0
1.5
1.0
0.5
Temperature (Degree C)
30
25
20
15
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

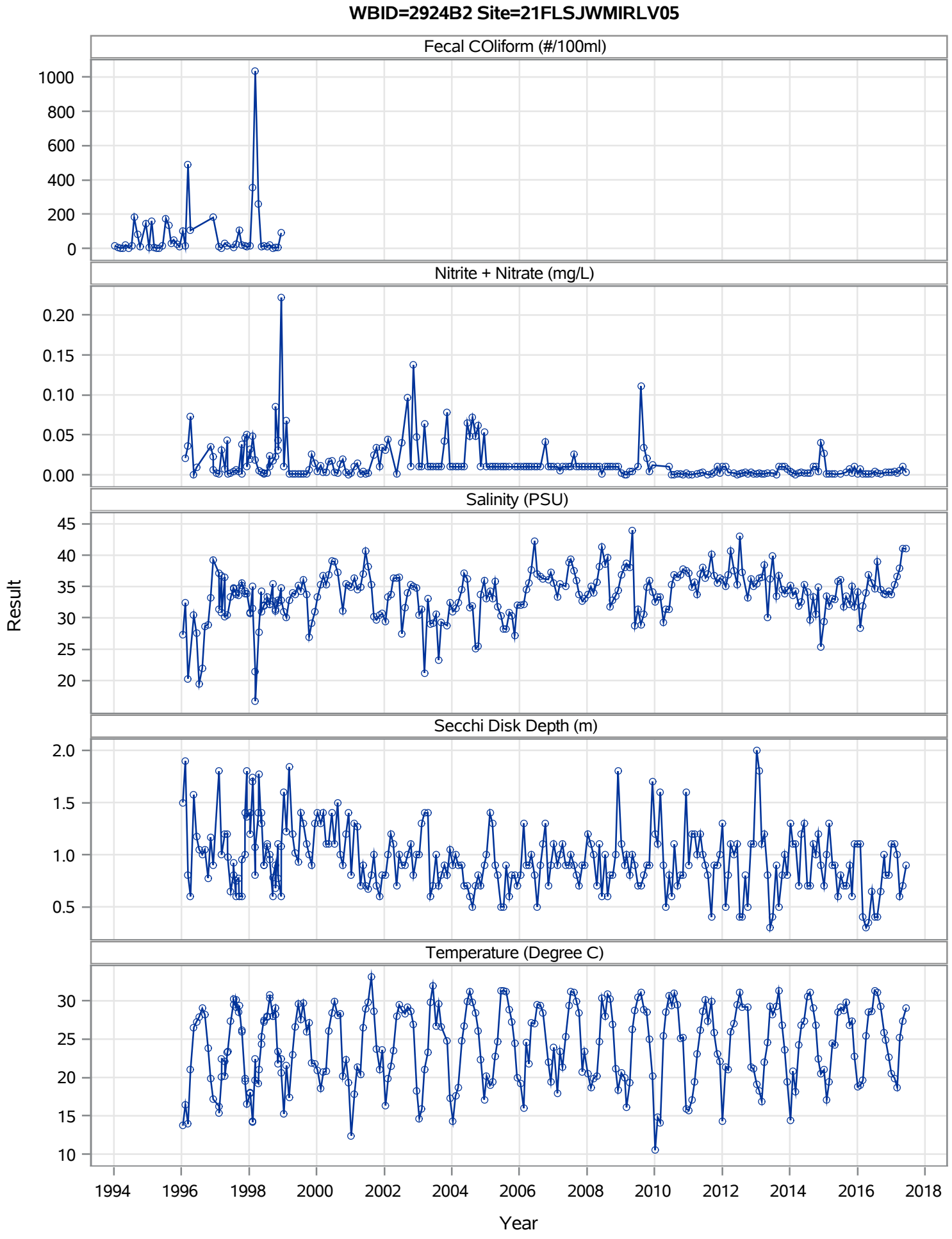

WBID=2924B2 Site=21FLSJWMIRLV03
Total Kjeldahl Nitrogen (mg/L)
1.50
1.25
1.00
0.75
0.50
0.25
0.00
Total Nitrogen (mg/L)
1.5
1.0
0.5
0.0
Total Phosphorus (mg/L)
0.10
0.08
0.06
0.04
pH
9.0
8.5
8.0
7.5
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

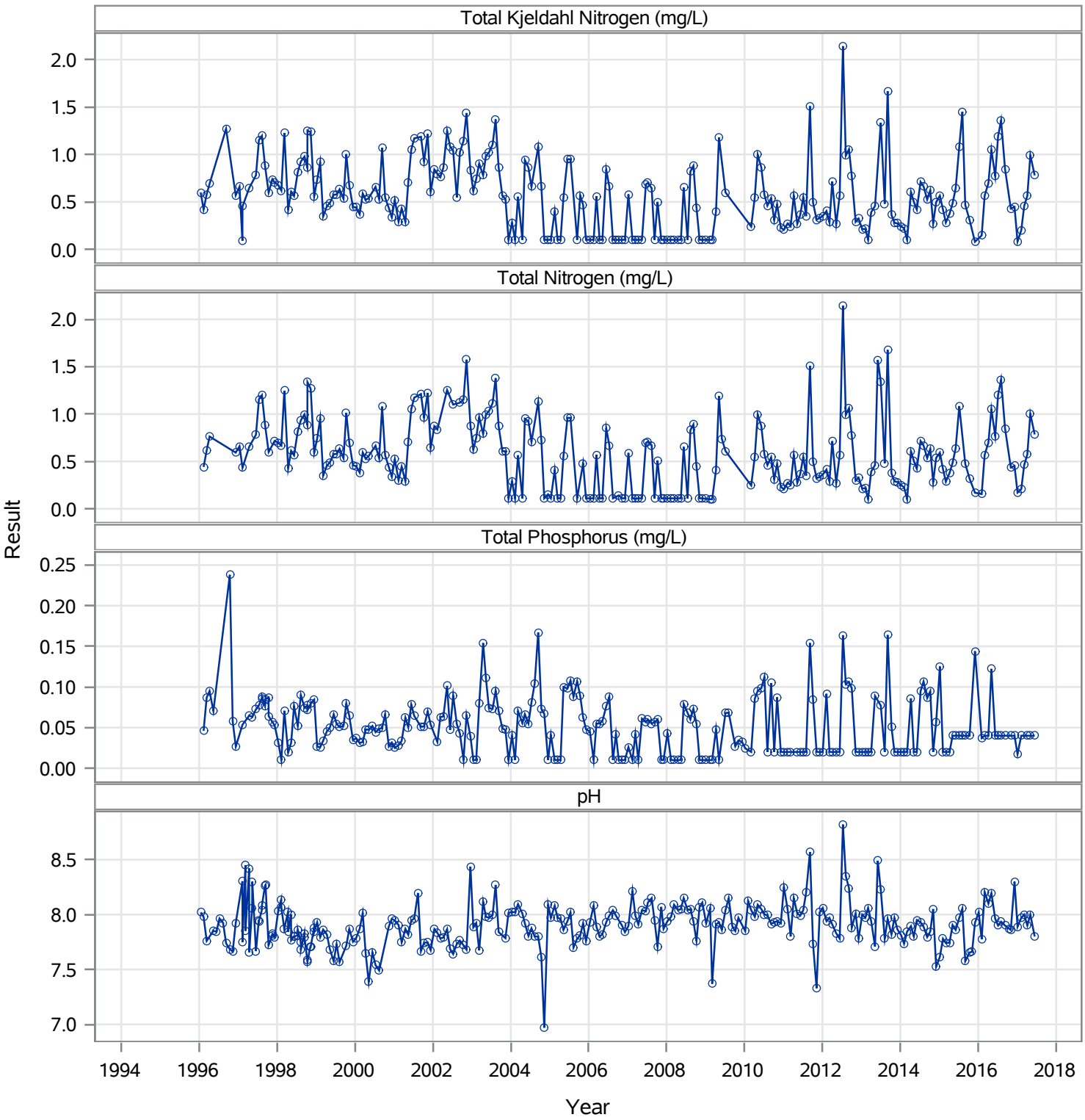

WBID=2924B2 Site=21FLSJWMIRLV04
Ammonia (mg/L)
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Chlorophyll a (µg/L)
12.5
10.0
7.5
5.0
2.5
0.0
Dissolved Orthophosphate (mg/L)
0.07
0.06
0.05
0.04
0.03
0.02
0.01
Result
Dissolved Oxygen (%)
120
100
80
60
Dissolved Oxygen (mg/L)
10
8
6
4
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

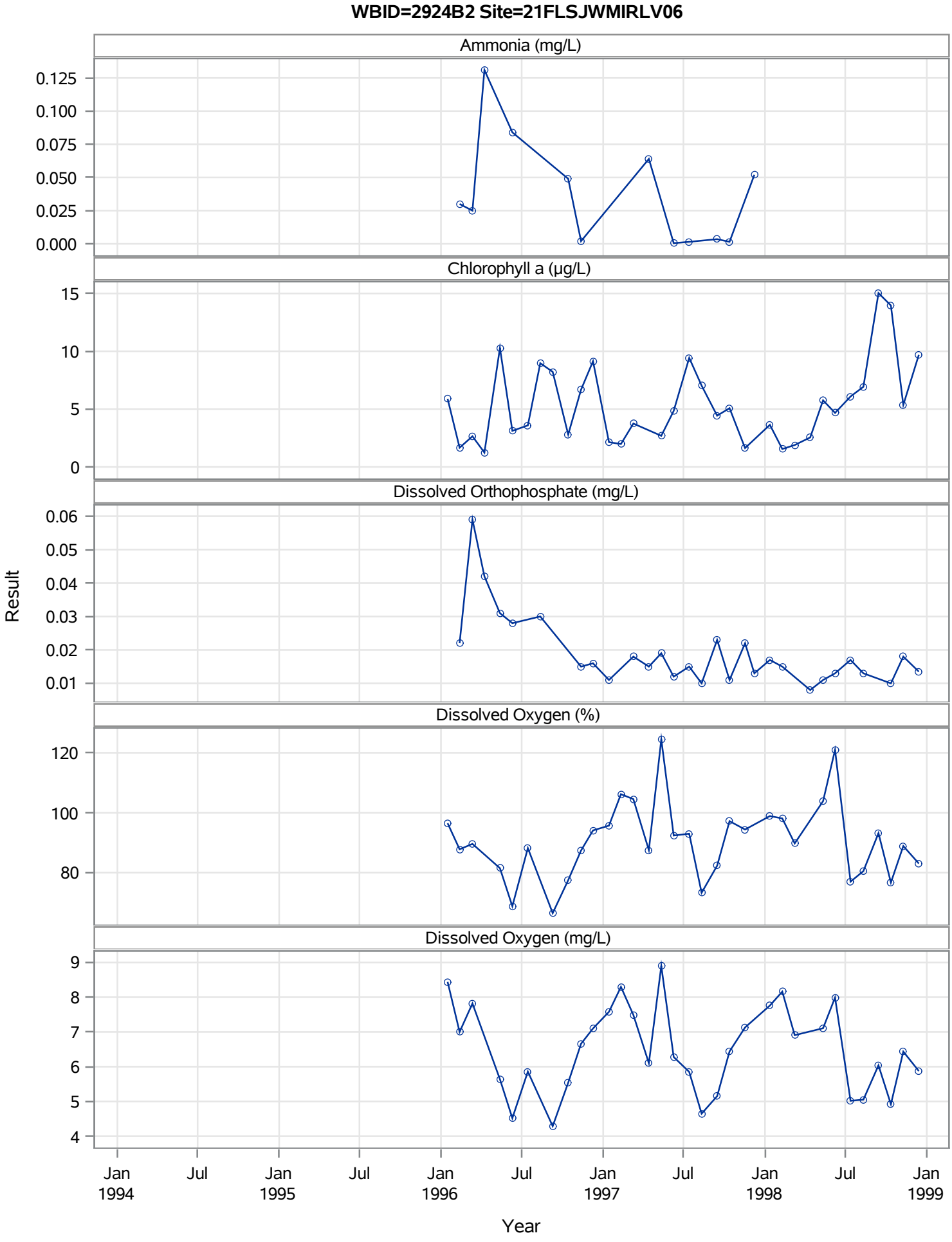

WBID=2924B2 Site=21FLSJWMIRLV04
Fecal COliform (#/100ml)
800
600
400
200
0
Nitrite + Nitrate (mg/L)
0.4
0.3
0.2
0.1
0.0
Salinity (PSU)
40
35
30
25
Secchi Disk Depth (m)
2.0
1.5
1.0
0.5
Temperature (Degree C)
30
25
20
15
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

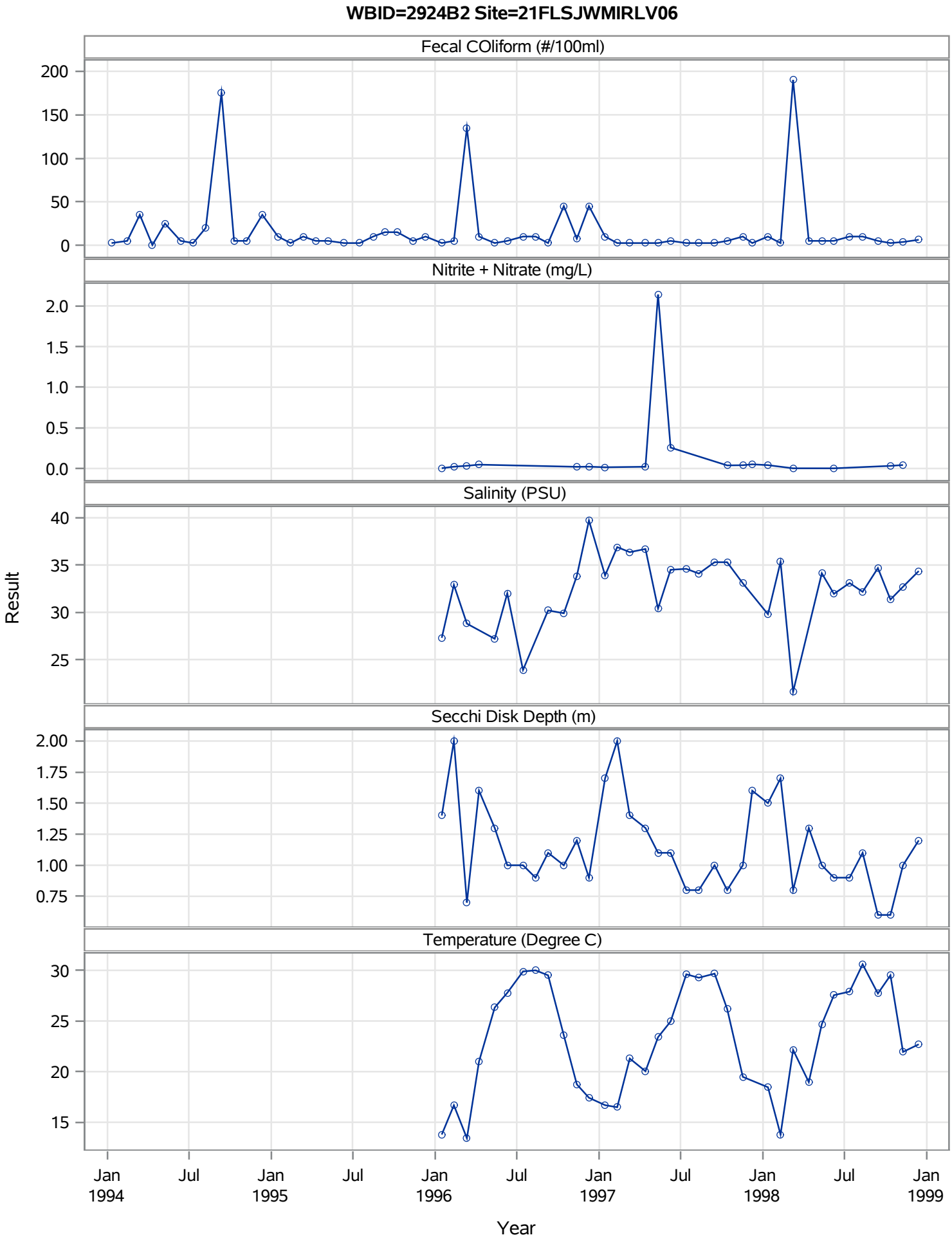

WBID=2924B2 Site=21FLSJWMIRLV04
Total Kjeldahl Nitrogen (mg/L)
1.25
1.00
0.75
0.50
0.25
Total Nitrogen (mg/L)
1.4
1.2
1.0
0.8
0.6
Total Phosphorus (mg/L)
0.10
0.08
0.06
0.04
pH
8.4
8.2
8.0
7.8
7.6
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

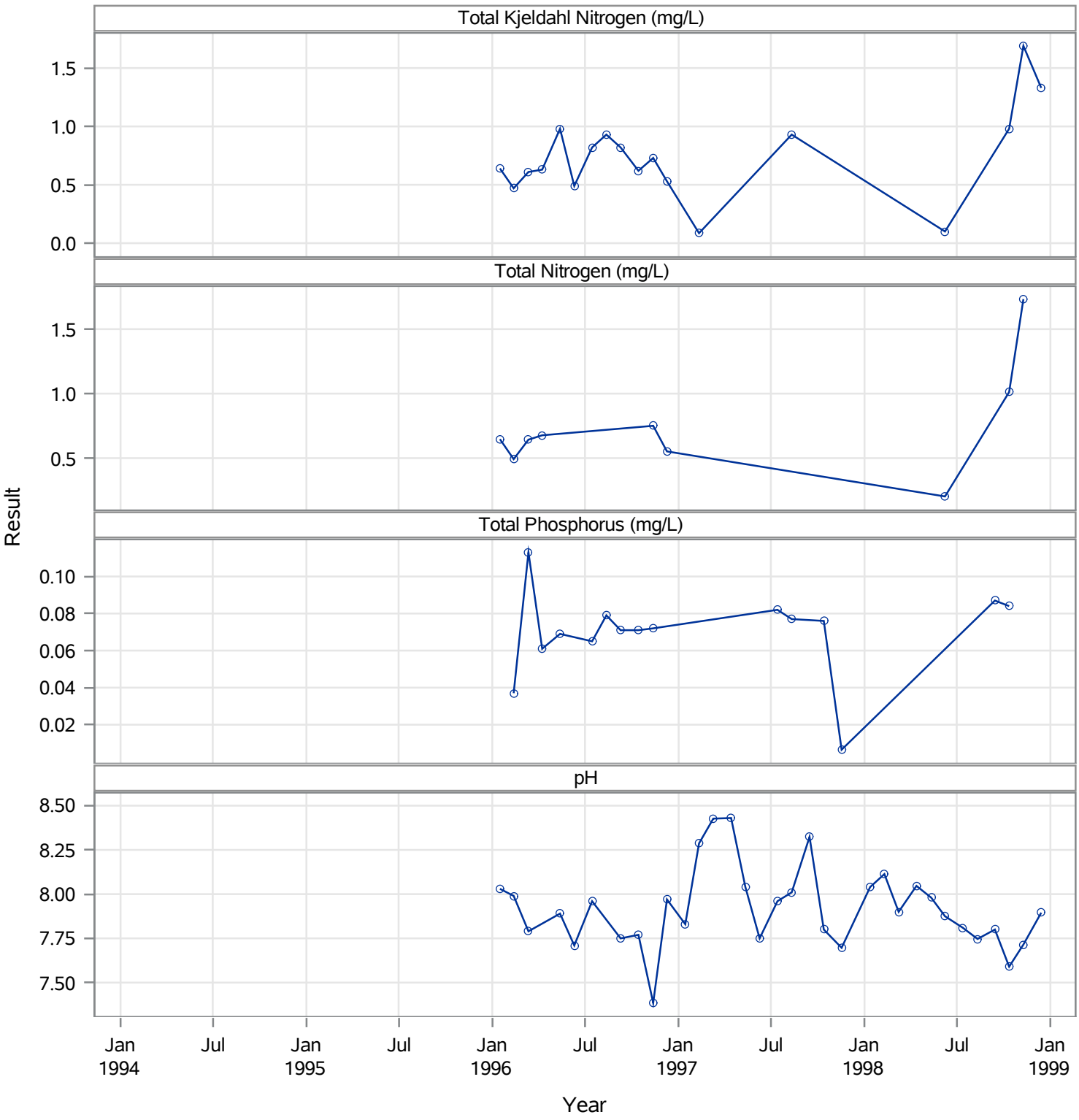

WBID=2924B2 Site=21FLSJWMIRLV05
Ammonia (mg/L)
0.150
0.125
0.100
0.075
0.050
0.025
0.000
Chlorophyll a (µg/L)
80
60
40
20
0
Dissolved Orthophosphate (mg/L)
0.10
0.08
0.06
0.04
0.02
0.00
Result
Dissolved Oxygen (%)
120
100
80
60
Dissolved Oxygen (mg/L)
10
8
6
4
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

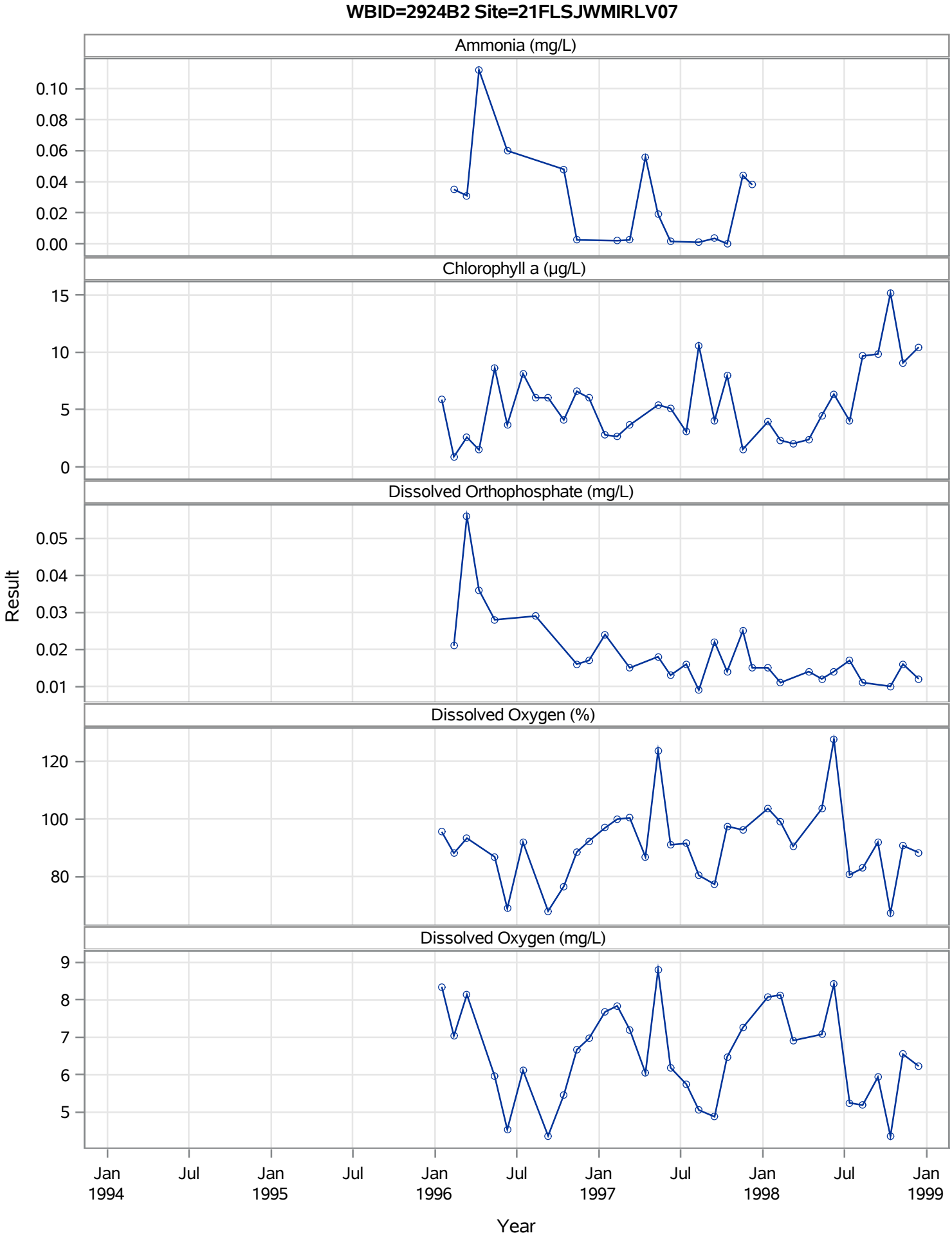

WBID=2924B2 Site=21FLSJWMIRLV05
Fecal COliform (#/100ml)
1000
800
600
400
200
0
Nitrite + Nitrate (mg/L)
0.20
0.15
0.10
0.05
0.00
Salinity (PSU)
45
40
35
30
25
20
Secchi Disk Depth (m)
2.0
1.5
1.0
0.5
Temperature (Degree C)
30
25
20
15
10
Result
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

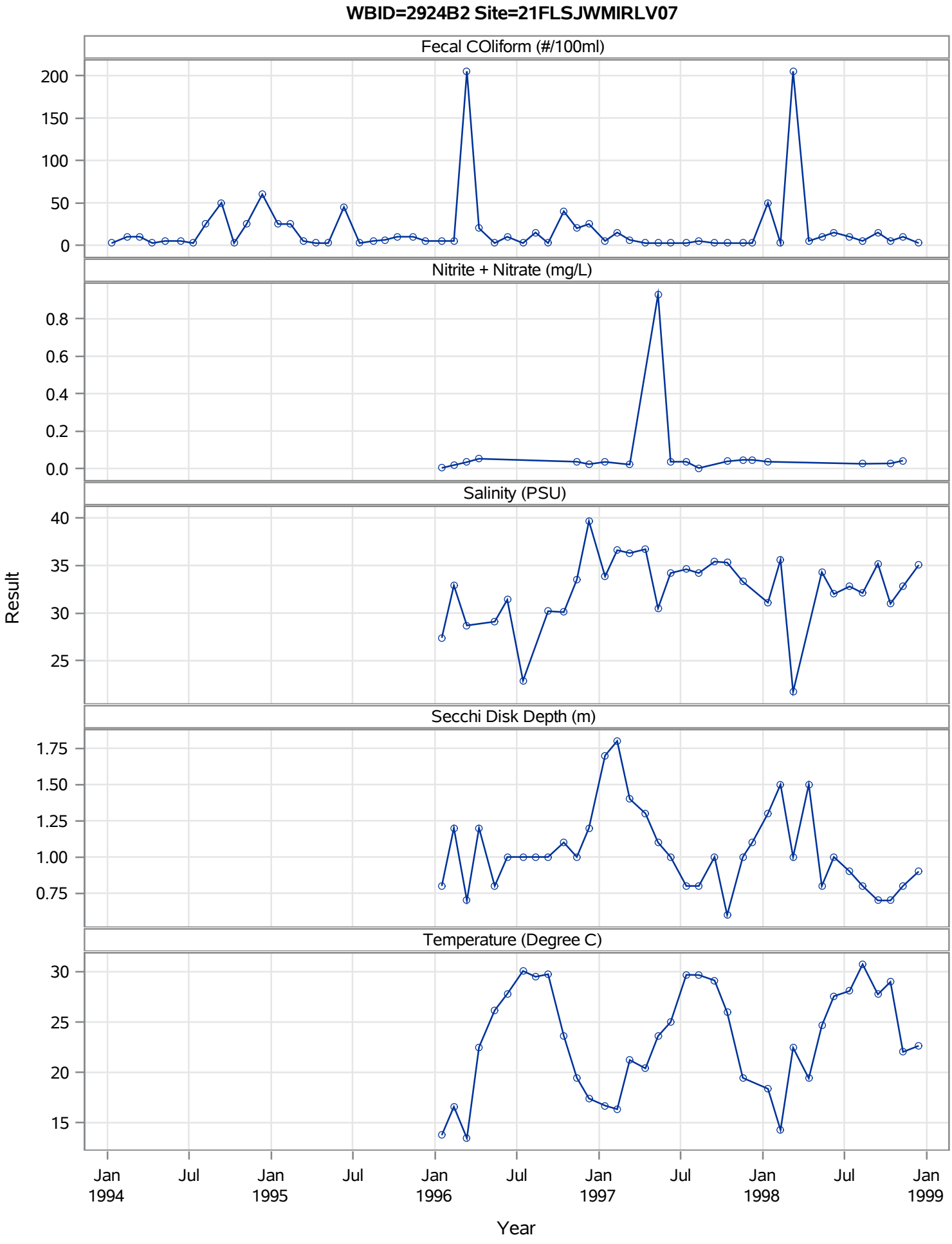

WBID=2924B2 Site=21FLSJWMIRLV05
Total Kjeldahl Nitrogen (mg/L)
Total Nitrogen (mg/L)
Total Phosphorus (mg/L)
pH
Result
Year
0.0
0.5
1.0
1.5
2.0
0.00
0.05
0.10
0.15
0.20
0.25
7.0
7.5
8.0
8.5
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018

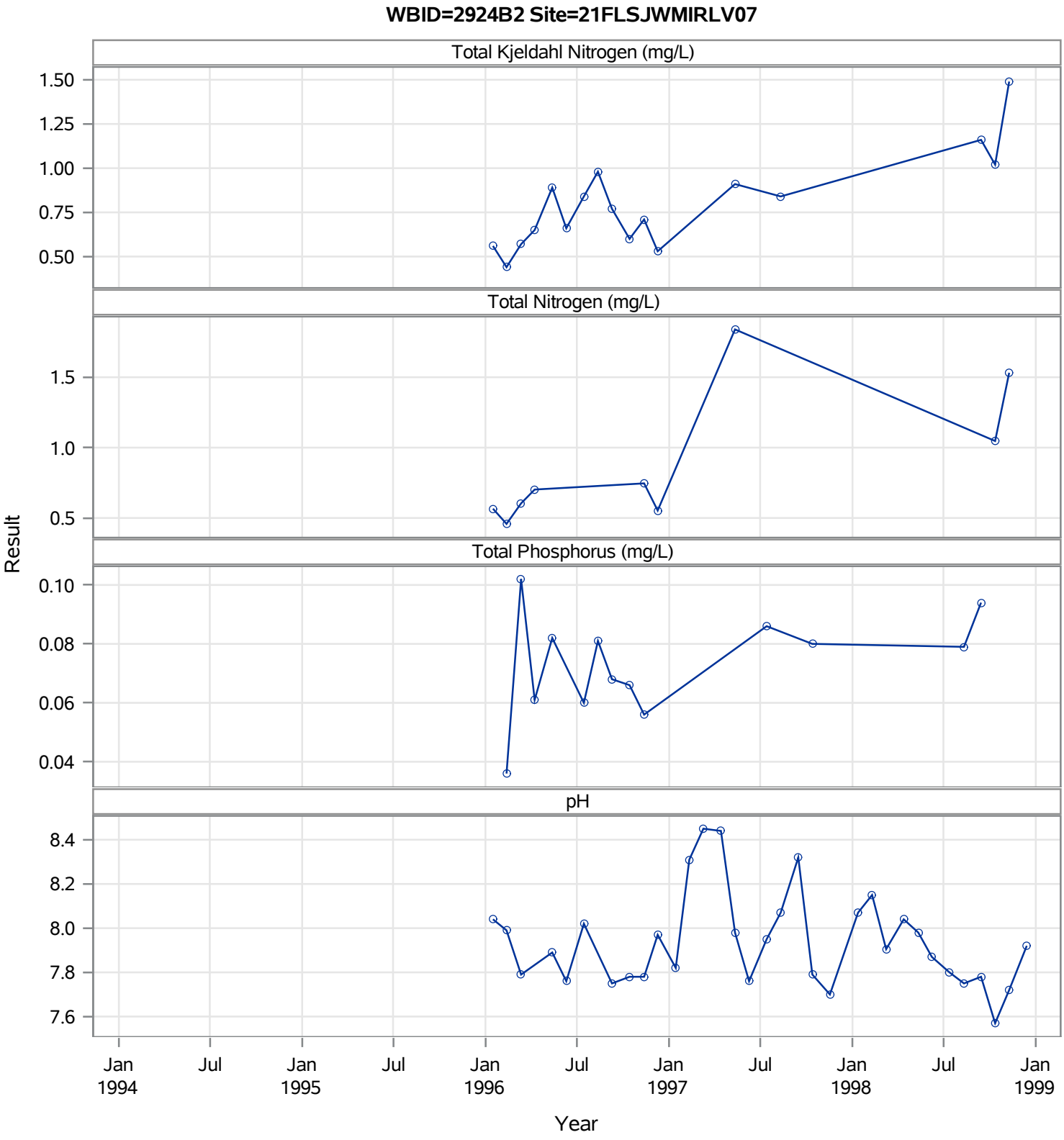

WBID=2924B2 Site=21FLSJWMIRLV06
Ammonia (mg/L)
0.125
0.100
0.075
0.050
0.025
0.000
Chlorophyll a (µg/L)
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.06
0.05
0.04
0.03
0.02
0.01
Dissolved Oxygen (%)
120
100
80
Dissolved Oxygen (mg/L)
9
8
7
6
5
4
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

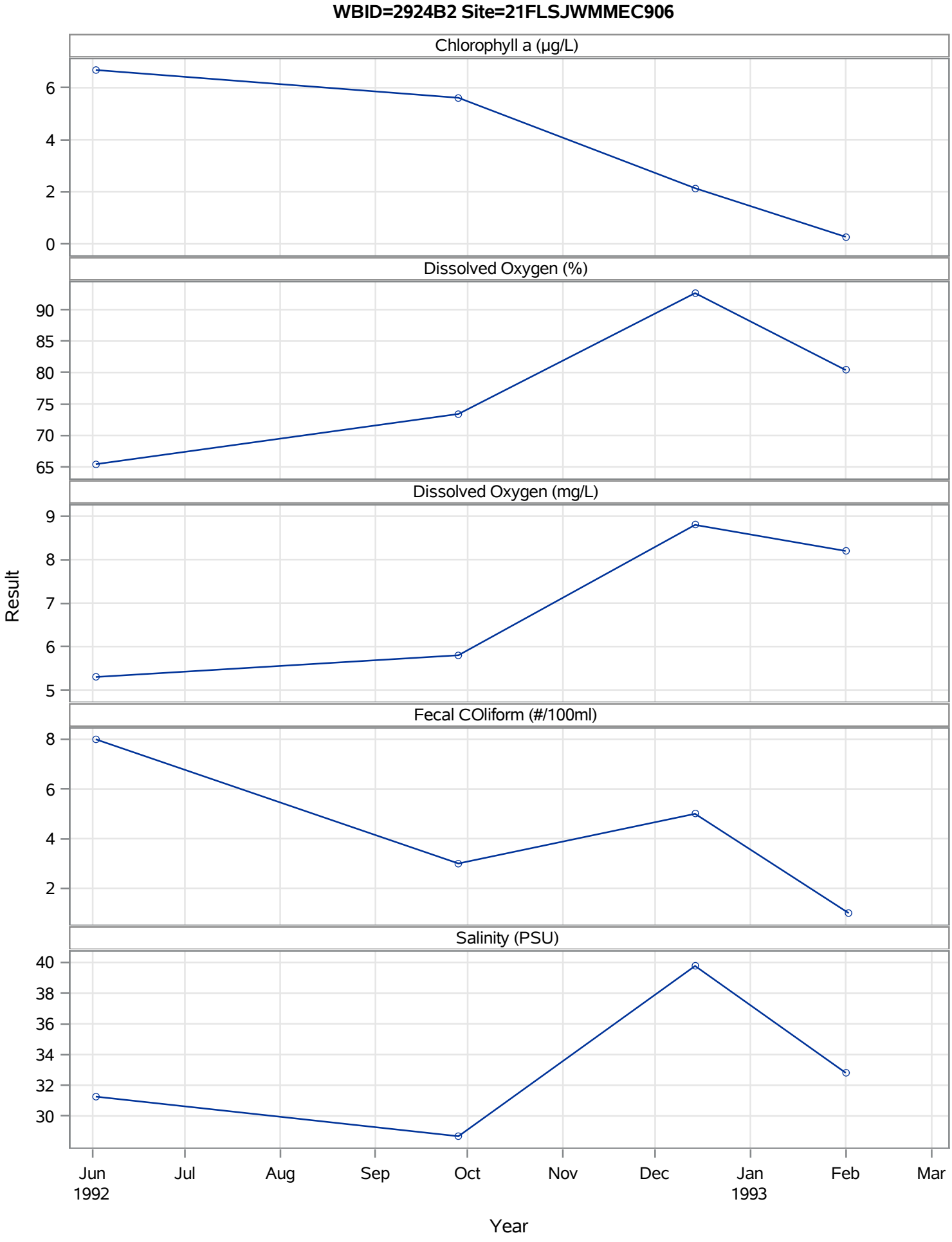

WBID=2924B2 Site=21FLSJWMIRLV06
Fecal COliform (#/100ml)
200
150
100
50
0
Nitrite + Nitrate (mg/L)
2.0
1.5
1.0
0.5
0.0
Salinity (PSU)
40
35
30
25
Secchi Disk Depth (m)
2.00
1.75
1.50
1.25
1.00
0.75
Temperature (Degree C)
30
25
20
15
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

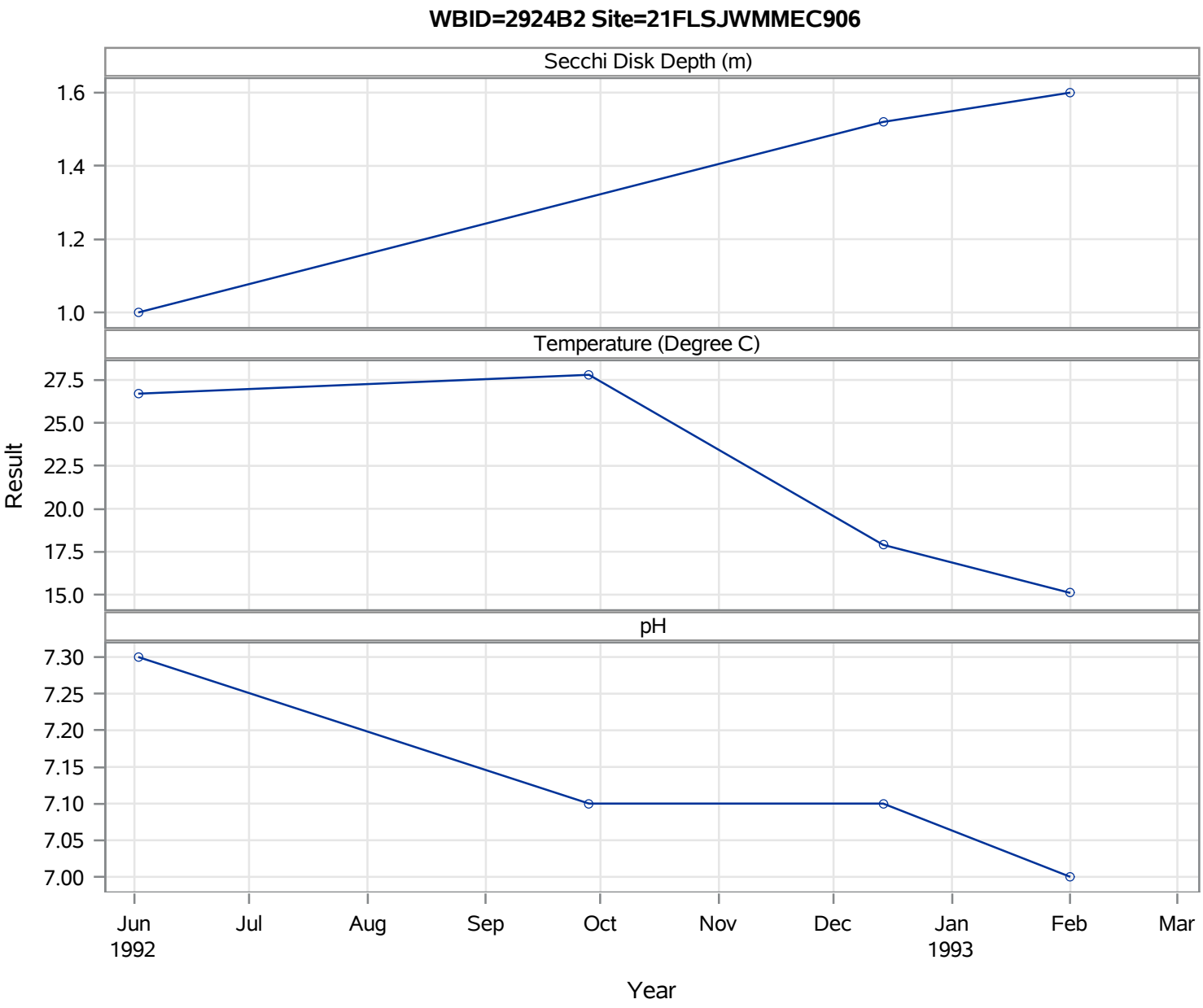

WBID=2924B2 Site=21FLSJWMIRLV06
Total Kjeldahl Nitrogen (mg/L)
1.5
1.0
0.5
0.0
Total Nitrogen (mg/L)
1.5
1.0
0.5
Total Phosphorus (mg/L)
0.10
0.08
0.06
0.04
0.02
pH
8.50
8.25
8.00
7.75
7.50
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

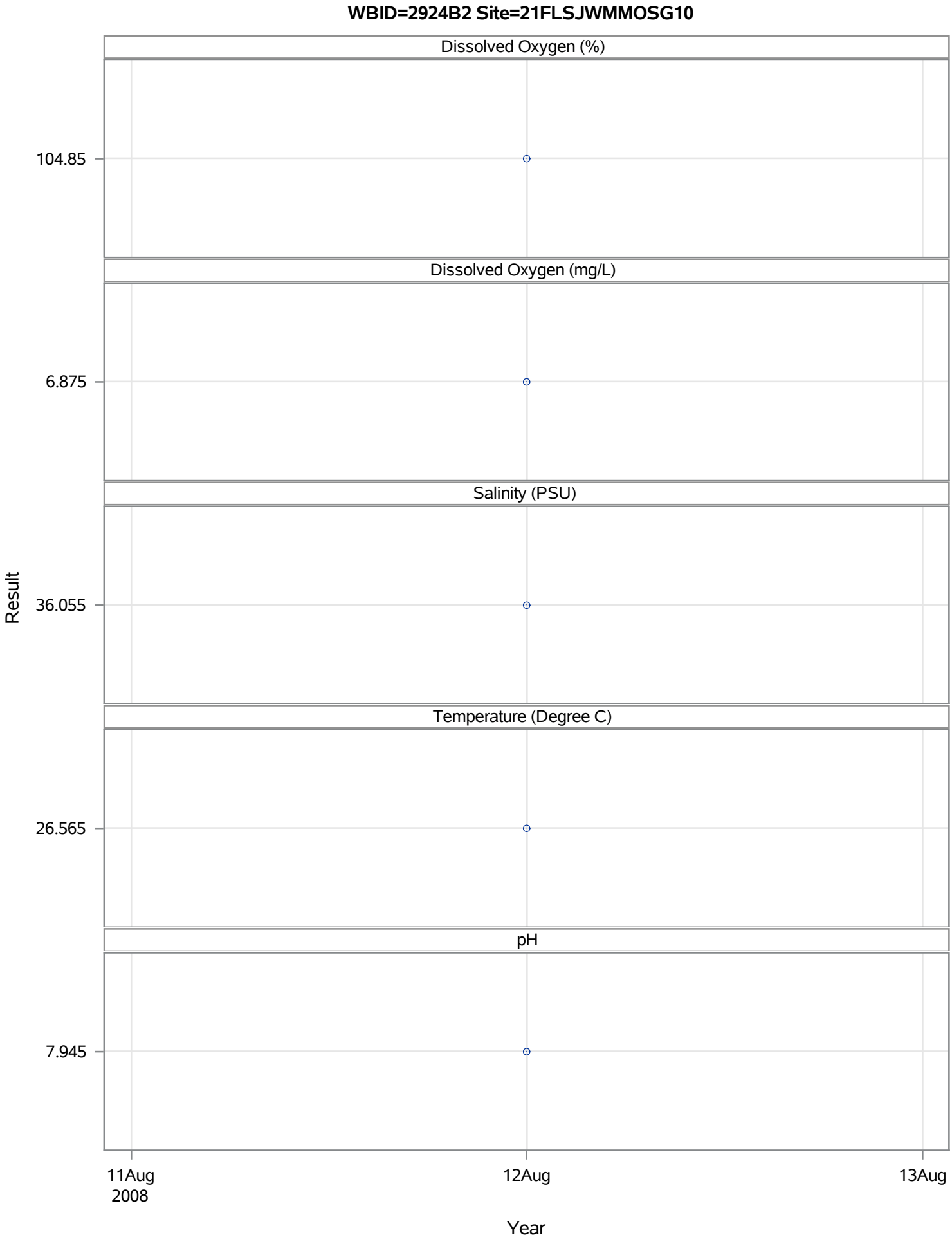

WBID=2924B2 Site=21FLSJWMIRLV07
Ammonia (mg/L)
0.10
0.08
0.06
0.04
0.02
0.00
Chlorophyll a (µg/L)
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.05
0.04
0.03
0.02
0.01
Dissolved Oxygen (%)
120
100
80
Dissolved Oxygen (mg/L)
9
8
7
6
5
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

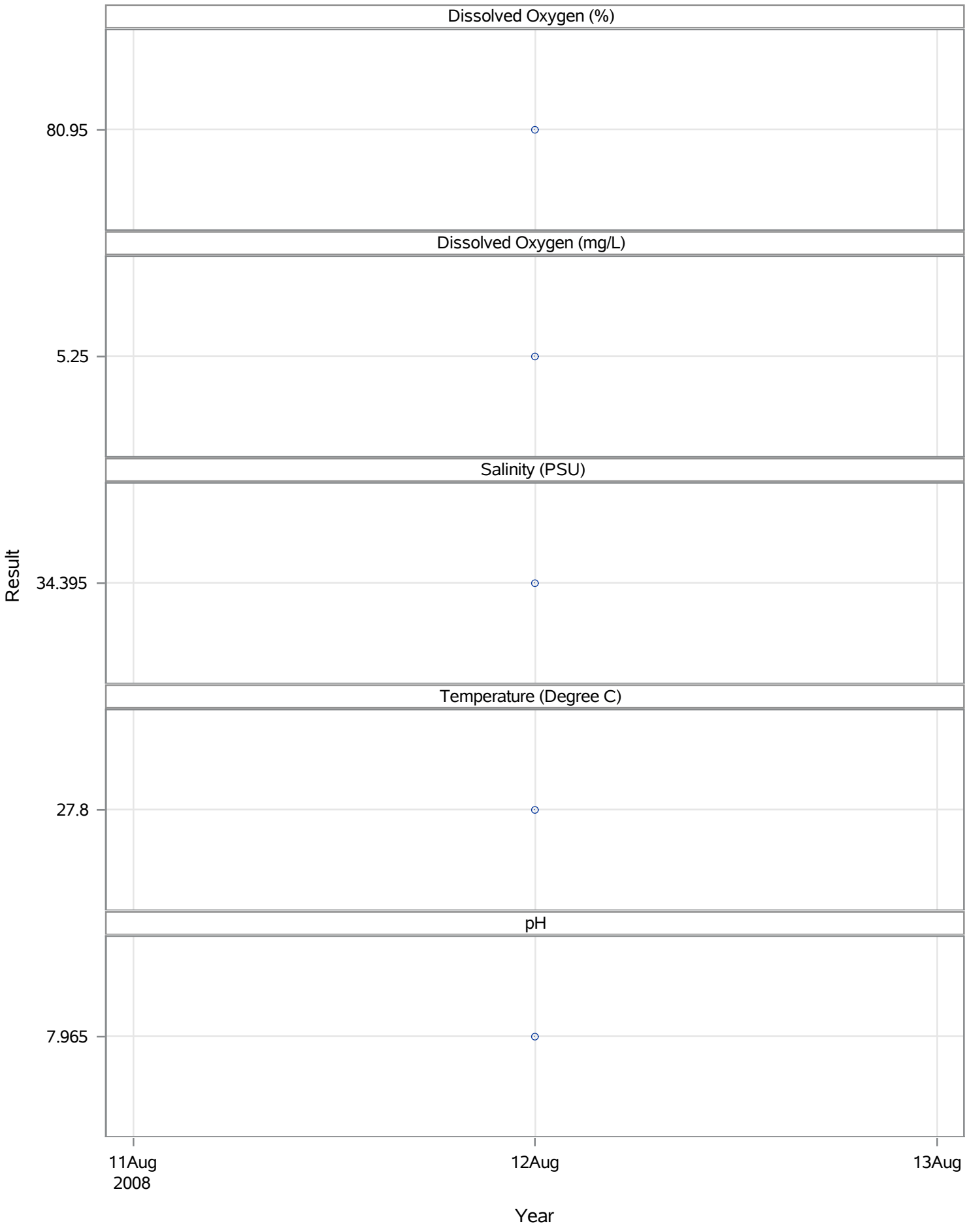

WBID=2924B2 Site=21FLSJWMIRLV07
Fecal COliform (#/100ml)
200
150
100
50
0
Nitrite + Nitrate (mg/L)
0.8
0.6
0.4
0.2
0.0
Salinity (PSU)
40
35
30
25
Secchi Disk Depth (m)
1.75
1.50
1.25
1.00
0.75
Temperature (Degree C)
30
25
20
15
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

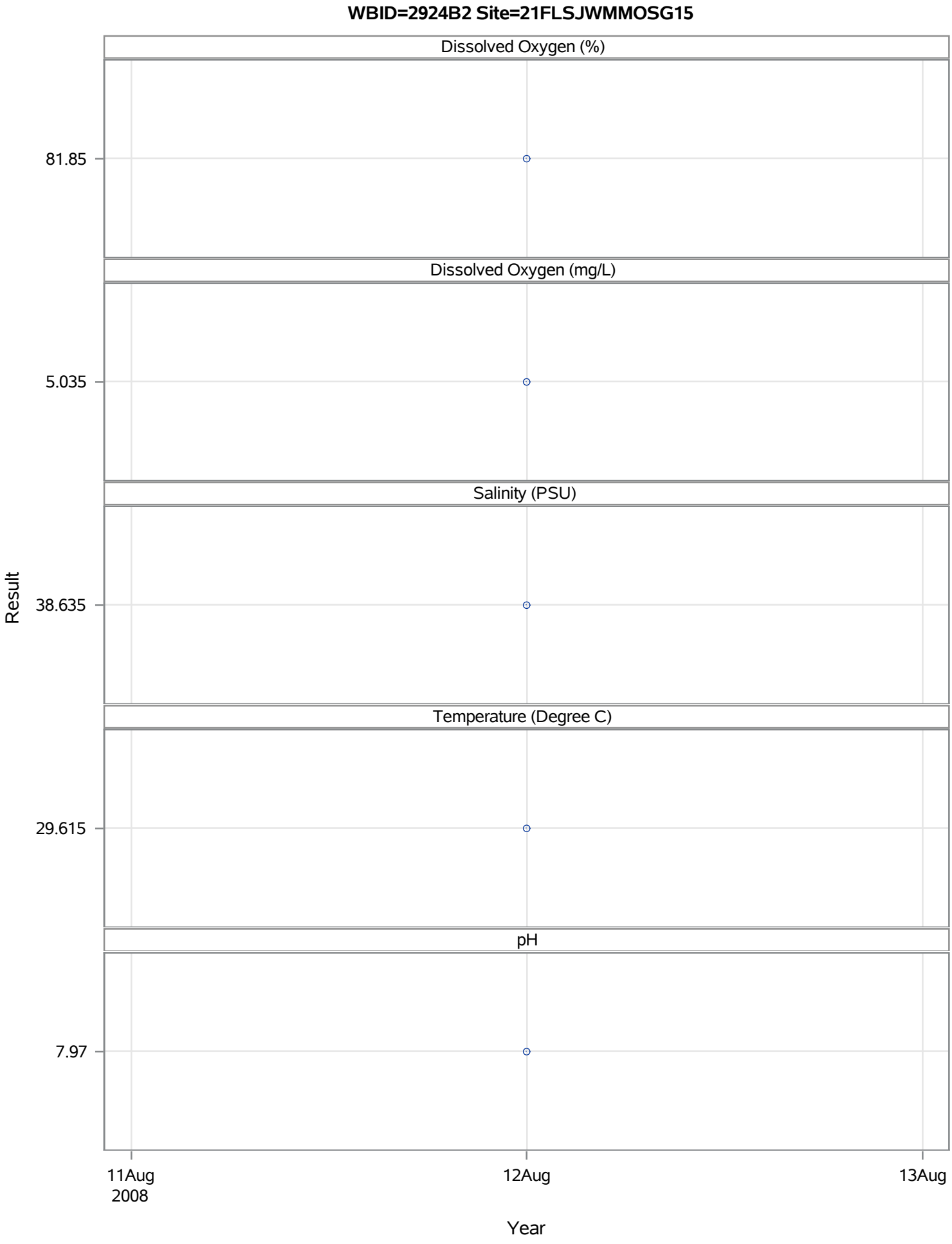

WBID=2924B2 Site=21FLSJWMIRLV07
Total Kjeldahl Nitrogen (mg/L)
1.50
1.25
1.00
0.75
0.50
Total Nitrogen (mg/L)
1.5
1.0
0.5
Total Phosphorus (mg/L)
0.10
0.08
0.06
0.04
pH
8.4
8.2
8.0
7.8
7.6
Result
Jan 1994
Jul
Jan 1995
Jul
Jan 1996
Jul
Jan 1997
Jul
Jan 1998
Jul
Jan 1999
Year

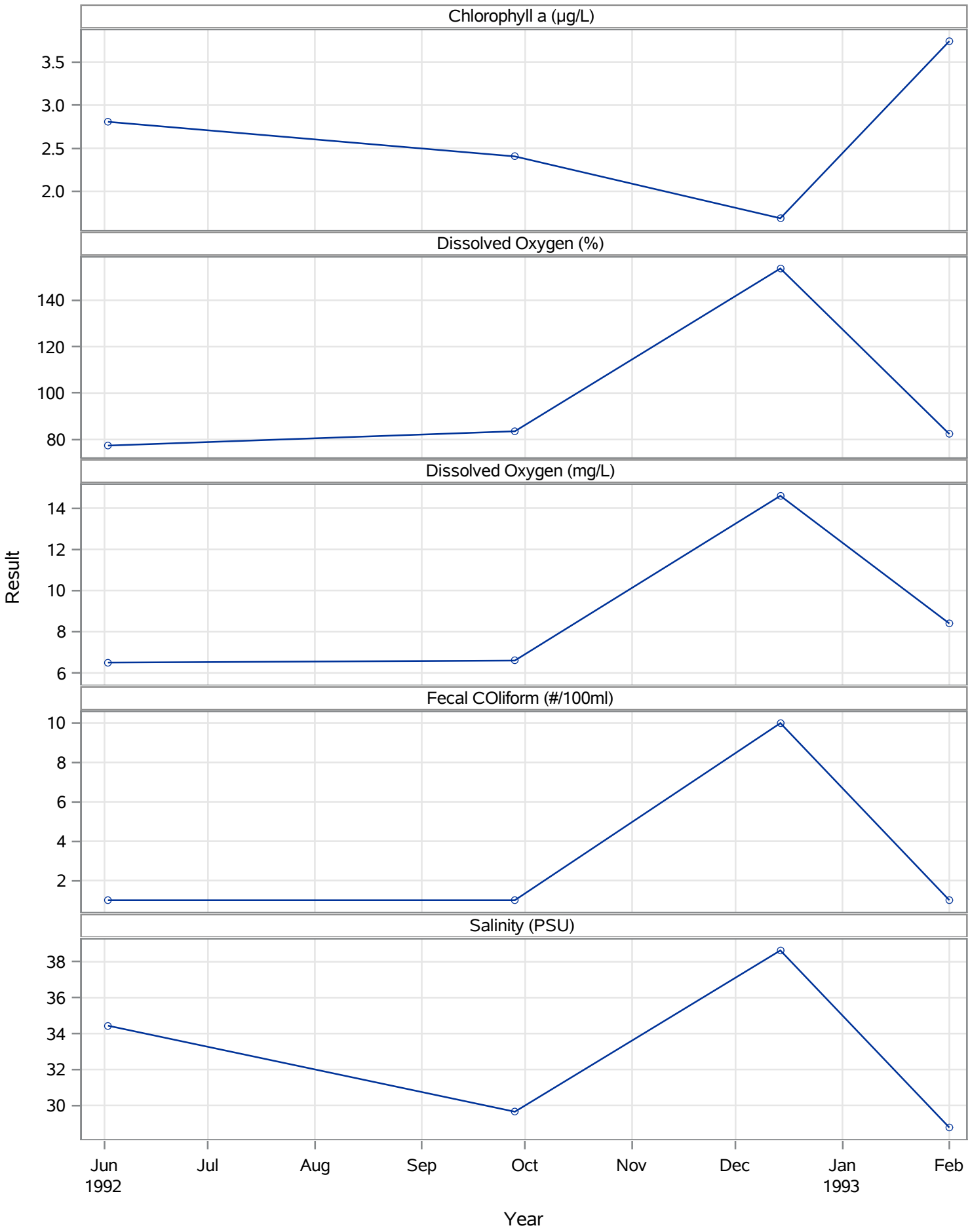

WBID=2924B2 Site=21FLSJWMMEC906
Chlorophyll a (µg/L)
Dissolved Oxygen (%)
Dissolved Oxygen (mg/L)
Fecal COliform (#/100ml)
Salinity (PSU)
Result
Year
Jun
1992
Jul
Aug
Sep
Oct
Nov
Dec
Jan
1993
Feb
Mar

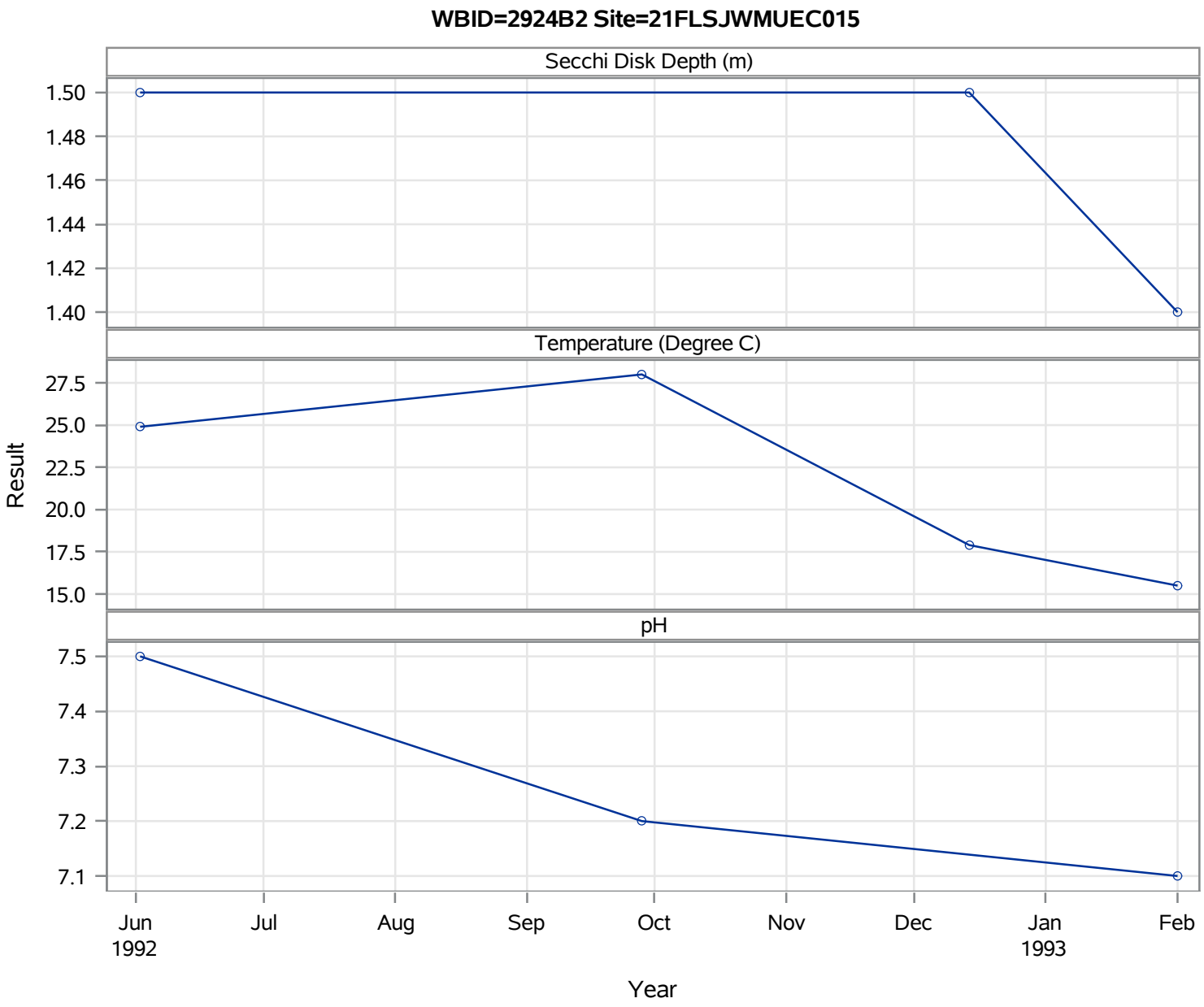

WBID=2924B2 Site=21FLSJWMMEC906
Secchi Disk Depth (m)
1.6
1.4
1.2
1.0
Temperature (Degree C)
27.5
25.0
22.5
20.0
17.5
15.0
pH
7.30
7.25
7.20
7.15
7.10
7.05
7.00
Result
Jun
1992
Jul
Aug
Sep
Oct
Nov
Dec
Jan
1993
Feb
Mar
Year

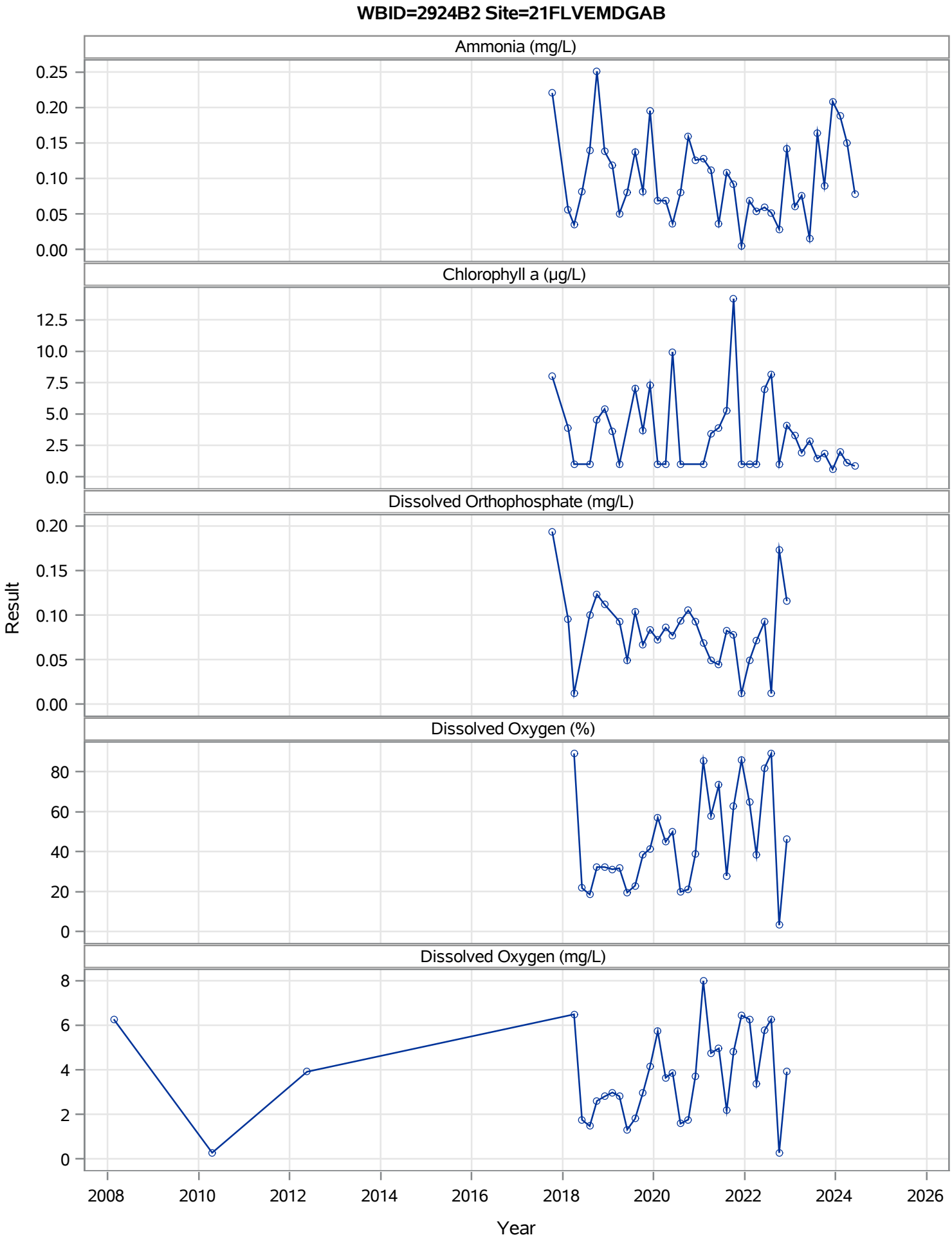

WBID=2924B2 Site=21FLSJWMMOSG10
Dissolved Oxygen (%)
104.85
Dissolved Oxygen (mg/L)
6.875
Salinity (PSU)
36.055
Temperature (Degree C)
26.565
pH
7.945
Result
11Aug
2008
12Aug
13Aug
Year

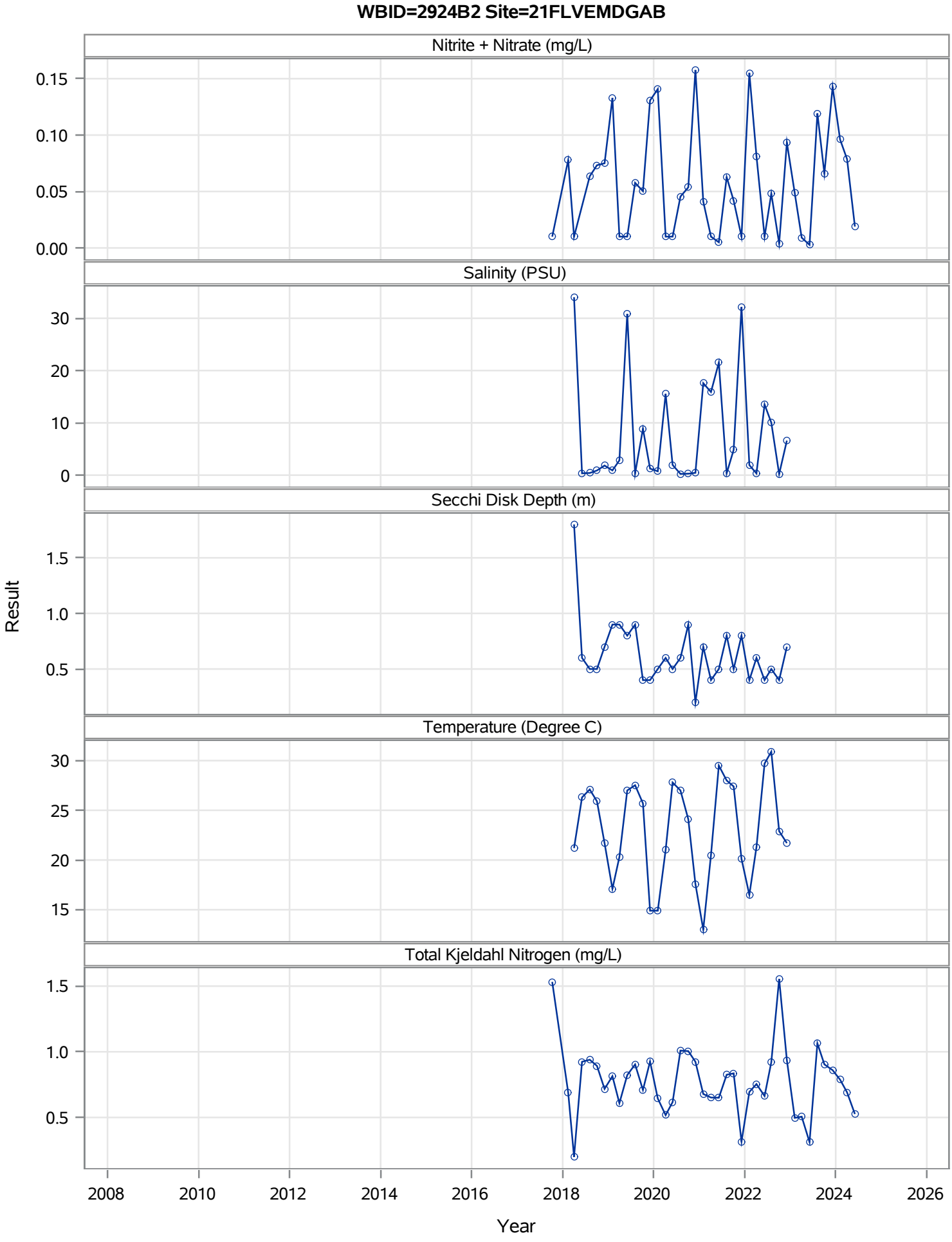

WBID=2924B2 Site=21FLSJWMMOSG11
Dissolved Oxygen (%)
80.95
Dissolved Oxygen (mg/L)
5.25
Salinity (PSU)
34.395
Temperature (Degree C)
27.8
pH
7.965
Result
11Aug
2008
12Aug
13Aug
Year

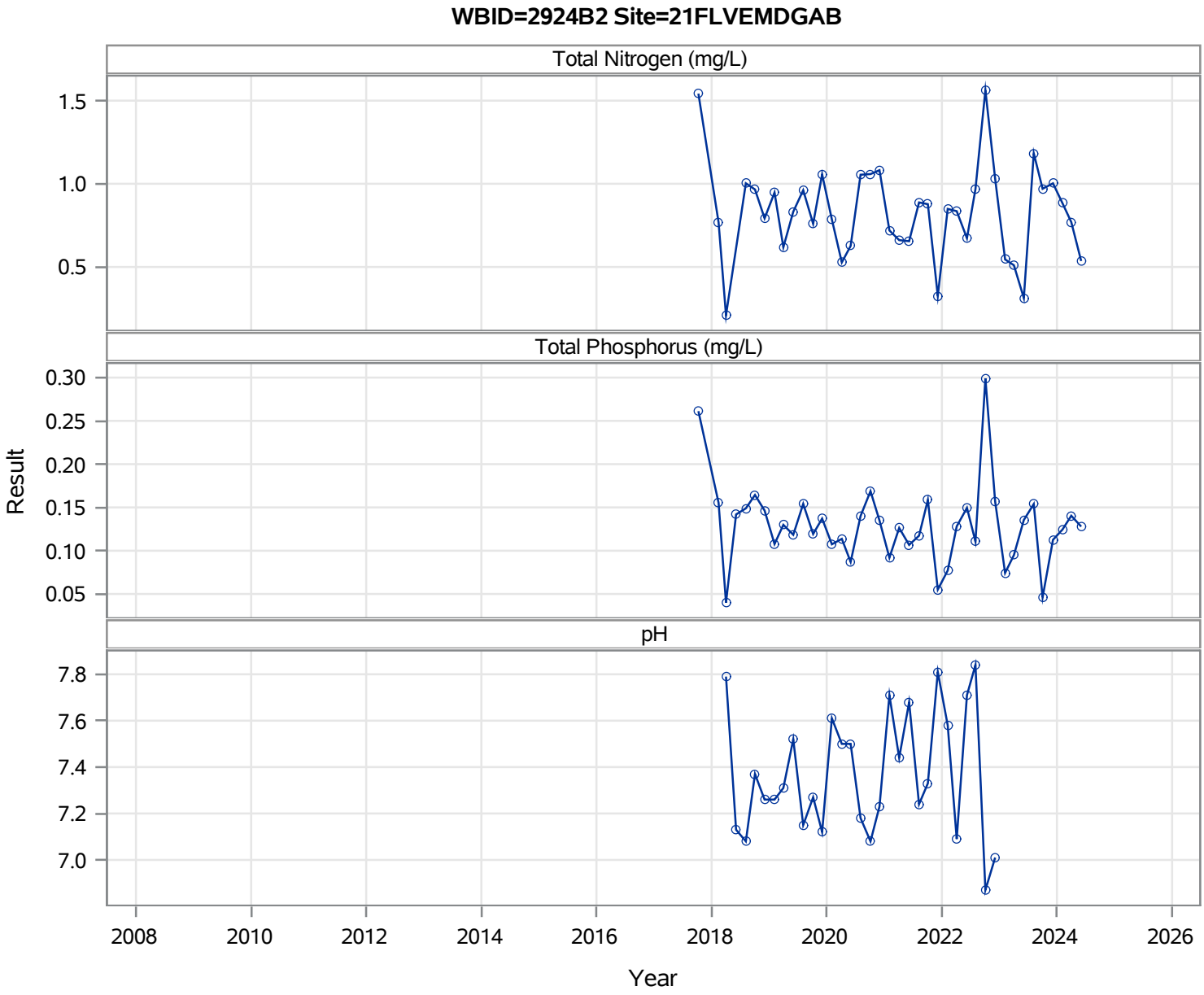

WBID=2924B2 Site=21FLSJWMMOSG15
Dissolved Oxygen (%)
81.85
Dissolved Oxygen (mg/L)
5.035
Salinity (PSU)
38.635
Temperature (Degree C)
29.615
pH
7.97
Result
11Aug
2008
12Aug
13Aug
Year

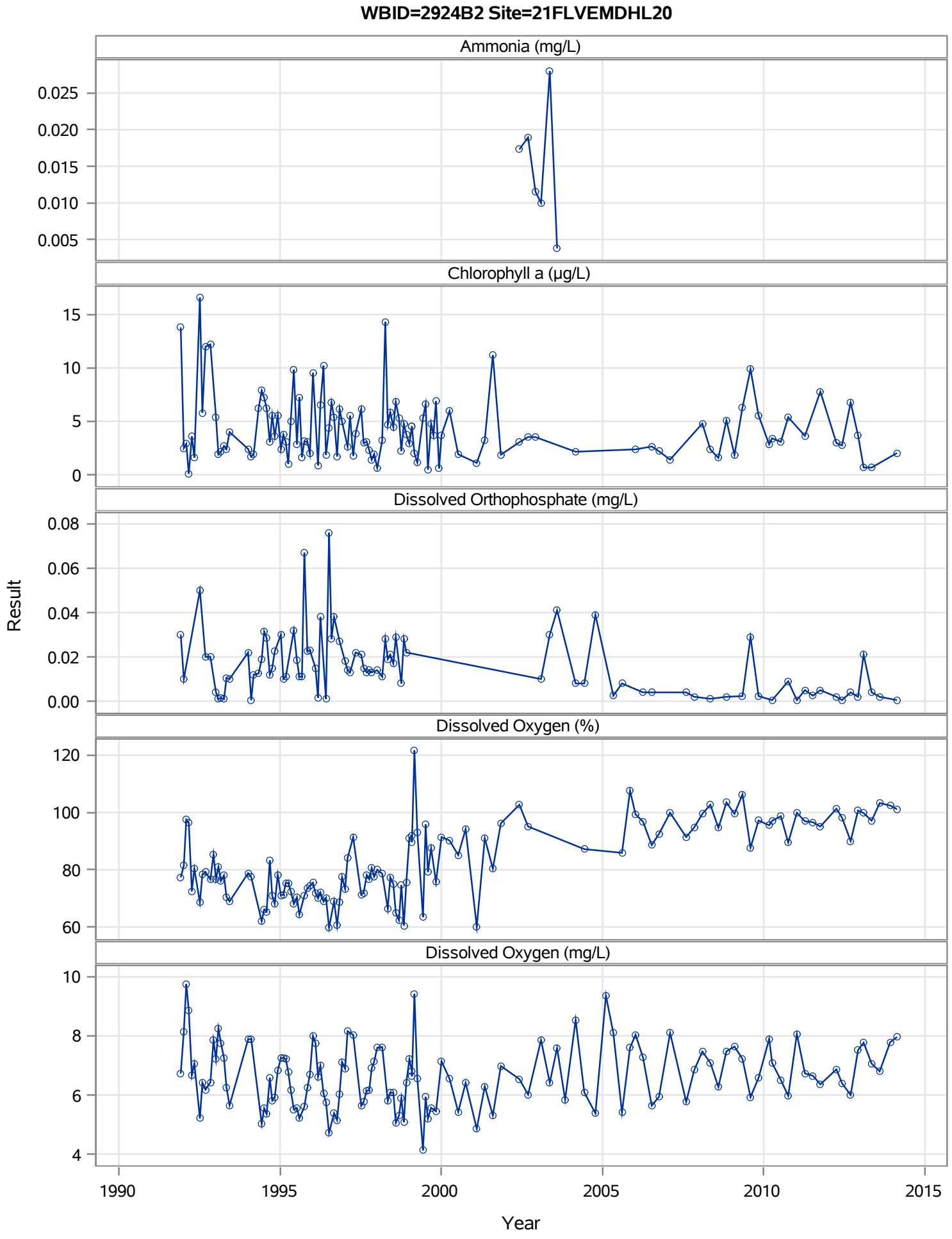

WBID=2924B2 Site=21FLSJWMUEC015
Chlorophyll a (µg/L)
3.5
3.0
2.5
2.0
Dissolved Oxygen (%)
140
120
100
80
Dissolved Oxygen (mg/L)
14
12
10
8
6
Result
Fecal COliform (#/100ml)
10
8
6
4
2
Salinity (PSU)
38
36
34
32
30
Jun
1992
Jul
Aug
Sep
Oct
Nov
Dec
Jan
1993
Feb
Year

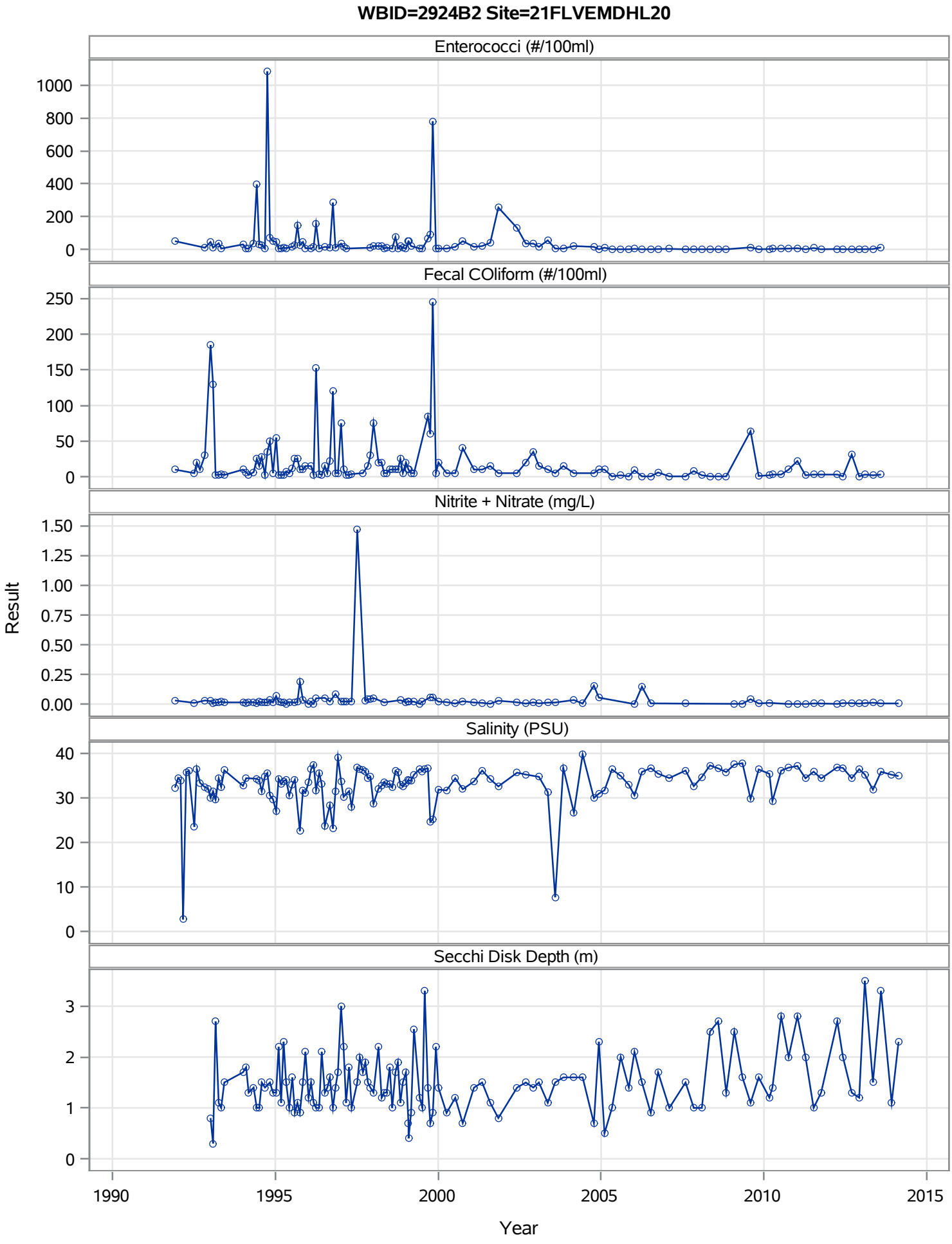

WBID=2924B2 Site=21FLSJWMUEC015
Secchi Disk Depth (m)
1.50
1.48
1.46
1.44
1.42
1.40
Temperature (Degree C)
27.5
25.0
22.5
20.0
17.5
15.0
pH
7.5
7.4
7.3
7.2
7.1
Result
Jun
1992
Jul
Aug
Sep
Oct
Nov
Dec
Jan
1993
Feb
Year

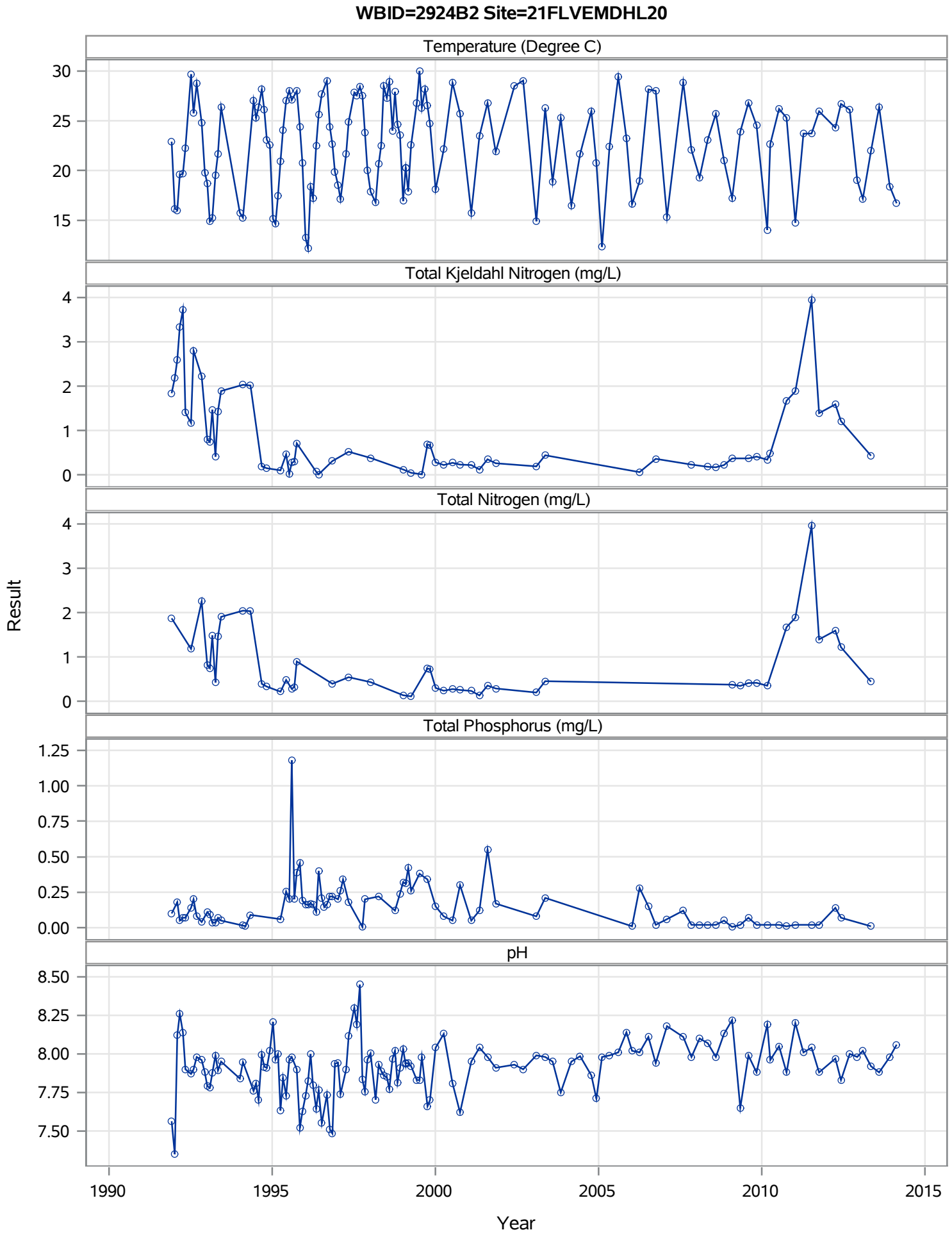

WBID=2924B2 Site=21FLVEMDGAB
Ammonia (mg/L)
0.25
0.20
0.15
0.10
0.05
0.00
Chlorophyll a (µg/L)
12.5
10.0
7.5
5.0
2.5
0.0
Dissolved Orthophosphate (mg/L)
0.20
0.15
0.10
0.05
0.00
Result
Dissolved Oxygen (%)
80
60
40
20
0
Dissolved Oxygen (mg/L)
8
6
4
2
0
2008
2010
2012
2014
2016
2018
2020
2022
2024
2026
Year

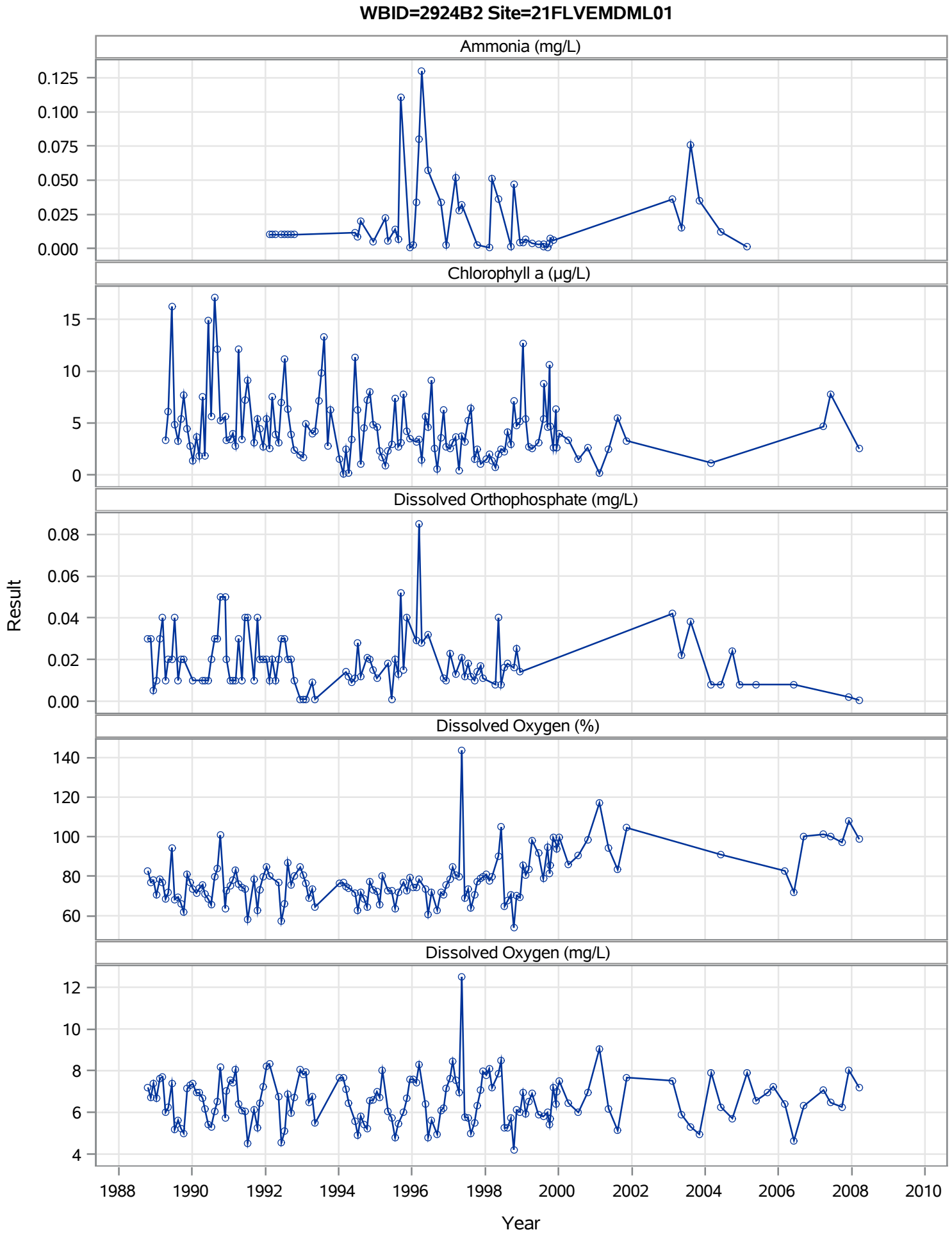

WBID=2924B2 Site=21FLVEMDGAB
Nitrite + Nitrate (mg/L)
0.15
0.10
0.05
0.00
Salinity (PSU)
30
20
10
0
Secchi Disk Depth (m)
1.5
1.0
0.5
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
1.5
1.0
0.5
Result
2008
2010
2012
2014
2016
2018
2020
2022
2024
2026
Year

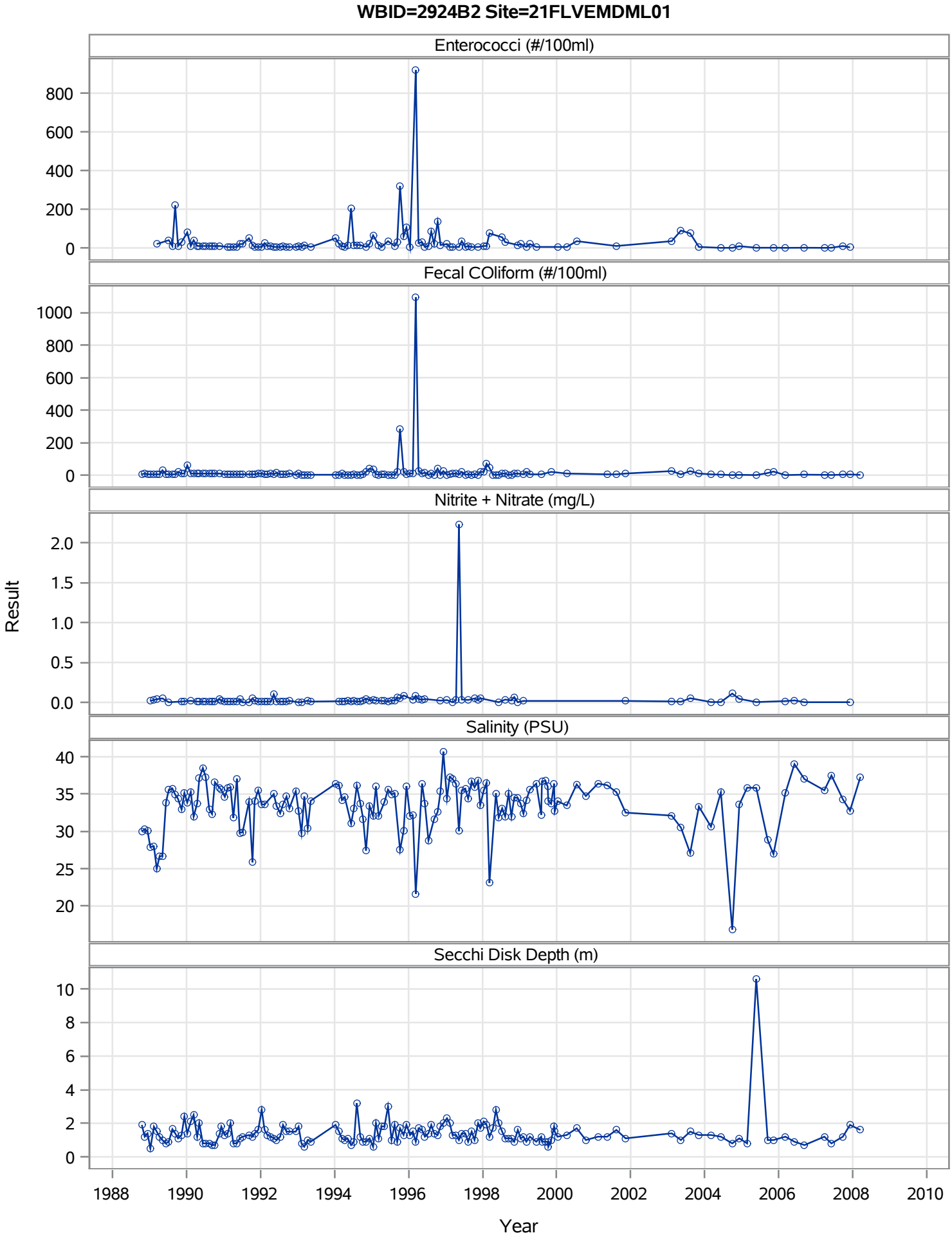

WBID=2924B2 Site=21FLVEMDGAB
Total Nitrogen (mg/L)
1.5
1.0
0.5
Total Phosphorus (mg/L)
0.30
0.25
0.20
0.15
0.10
0.05
pH
7.8
7.6
7.4
7.2
7.0
Result
2008
2010
2012
2014
2016
2018
2020
2022
2024
2026
Year

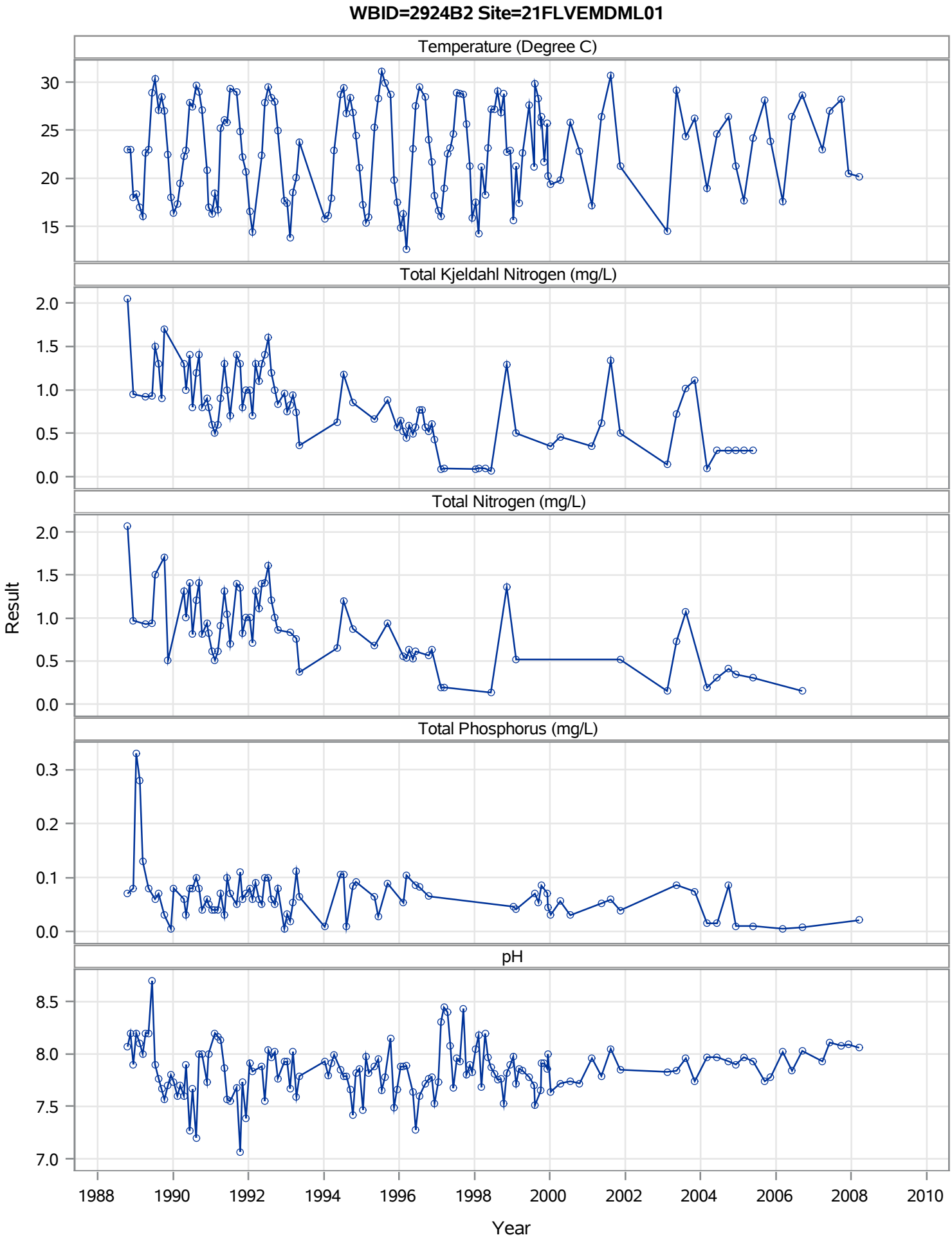

WBID=2924B2 Site=21FLVEMDHL20
Ammonia (mg/L)
0.025
0.020
0.015
0.010
0.005
Chlorophyll a (µg/L)
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.08
0.06
0.04
0.02
0.00
Result
Dissolved Oxygen (%)
120
100
80
60
Dissolved Oxygen (mg/L)
10
8
6
4
1990
1995
2000
2005
2010
2015
Year

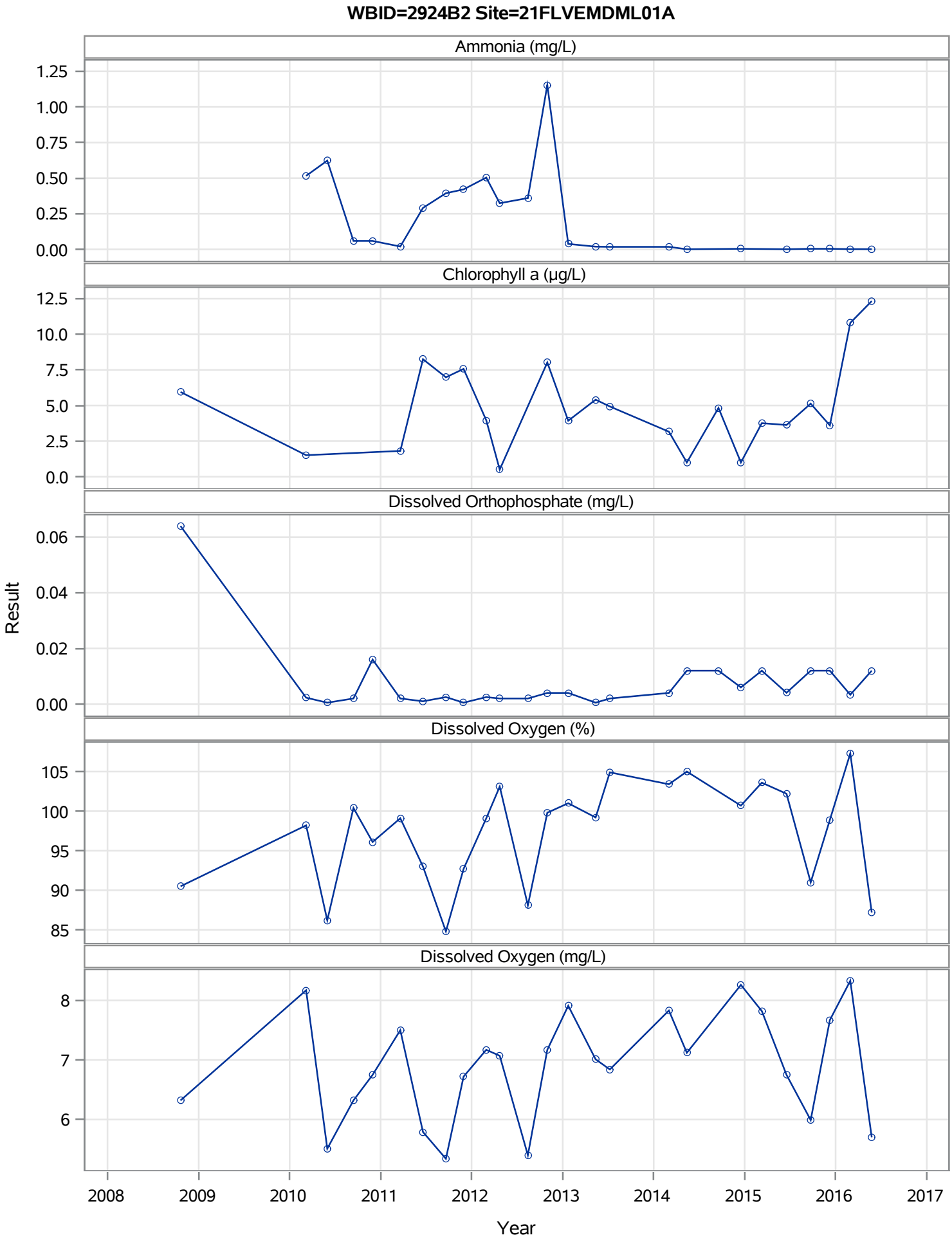

WBID=2924B2 Site=21FLVEMDHL20
Enterococci (#/100ml)
1000
800
600
400
200
0
Fecal COliform (#/100ml)
250
200
150
100
50
0
Nitrite + Nitrate (mg/L)
1.50
1.25
1.00
0.75
0.50
0.25
0.00
Result
Salinity (PSU)
40
30
20
10
0
Secchi Disk Depth (m)
3
2
1
0
1990
1995
2000
2005
2010
2015
Year

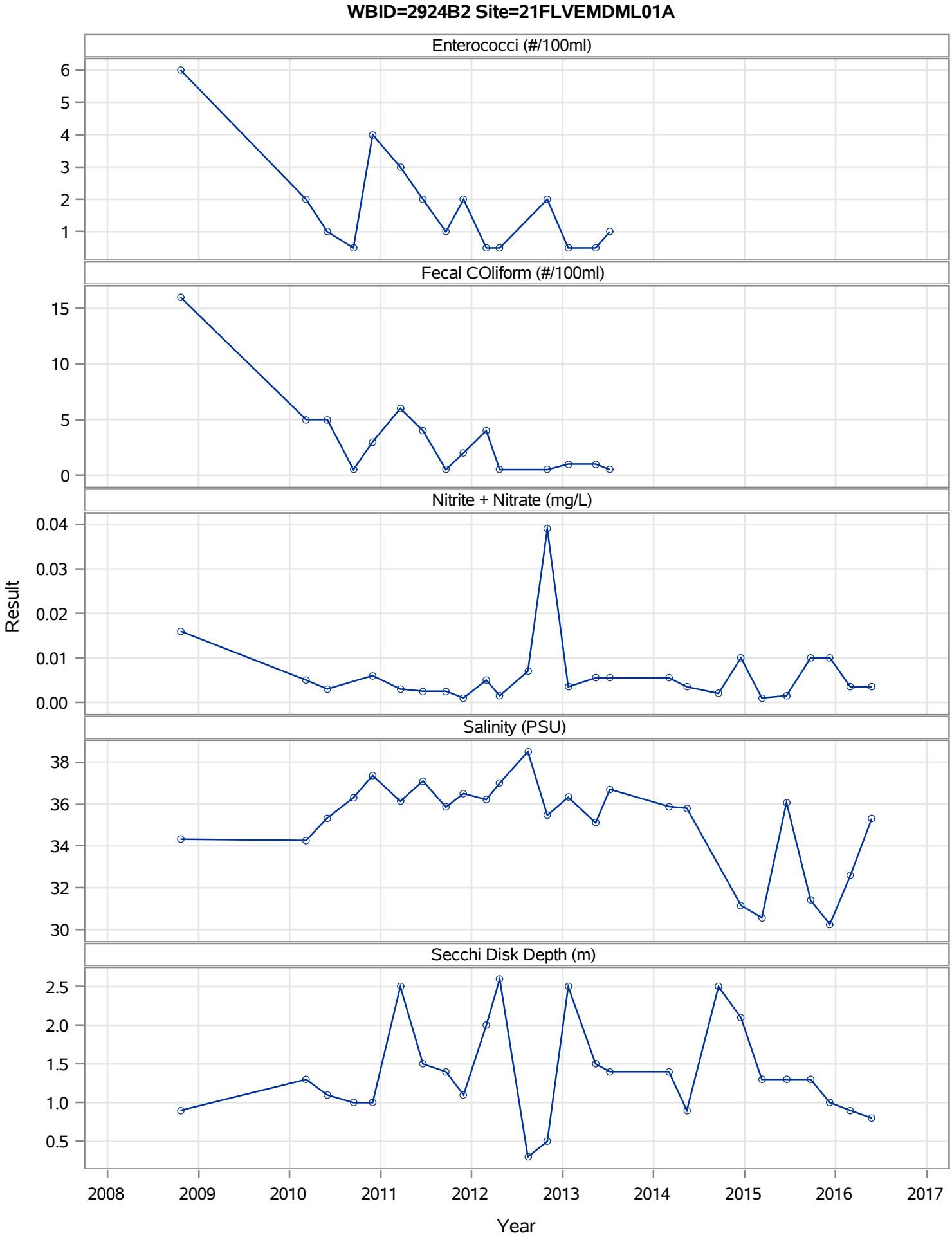

WBID=2924B2 Site=21FLVEMDHL20
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
4
3
2
1
0
Total Nitrogen (mg/L)
4
3
2
1
0
Result
Total Phosphorus (mg/L)
1.25
1.00
0.75
0.50
0.25
0.00
pH
8.50
8.25
8.00
7.75
7.50
1990
1995
2000
2005
2010
2015
Year

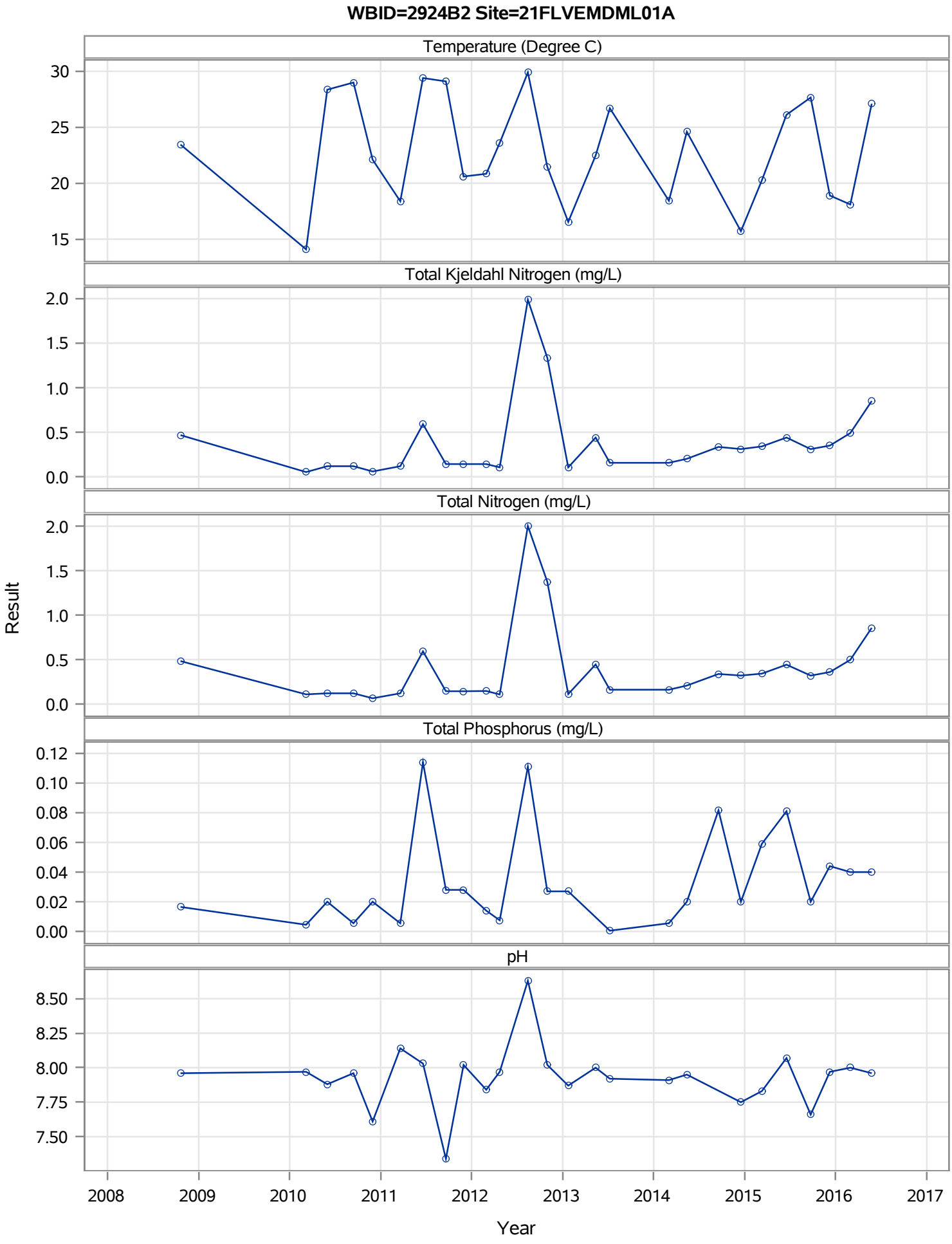

WBID=2924B2 Site=21FLVEMDML01
Ammonia (mg/L)
0.125
0.100
0.075
0.050
0.025
0.000
Chlorophyll a (µg/L)
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.08
0.06
0.04
0.02
0.00
Result
Dissolved Oxygen (%)
140
120
100
80
60
Dissolved Oxygen (mg/L)
12
10
8
6
4
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
Year

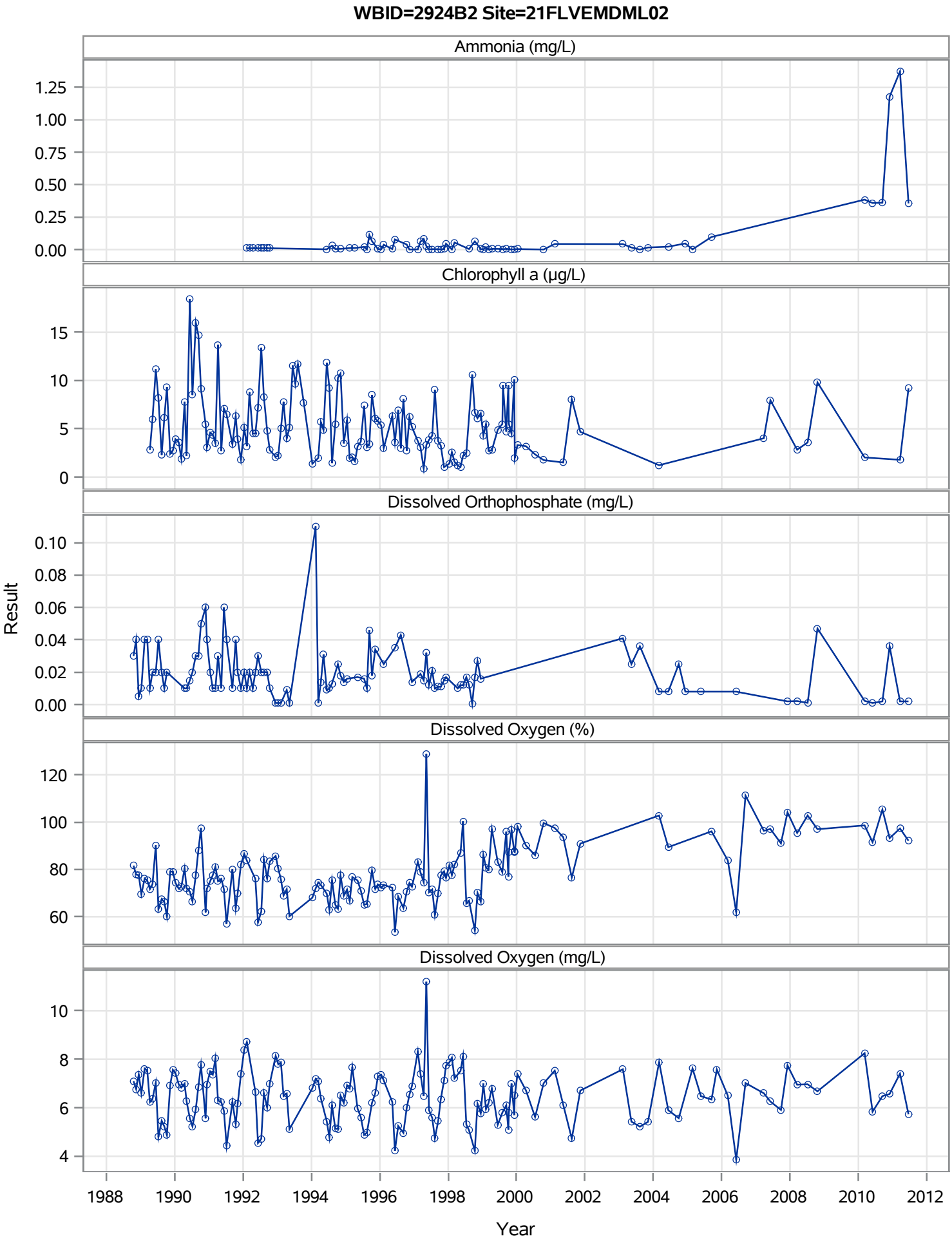

WBID=2924B2 Site=21FLVEMDML01
Enterococci (#/100ml)
800
600
400
200
0
Fecal COliform (#/100ml)
1000
800
600
400
200
0
Nitrite + Nitrate (mg/L)
2.0
1.5
1.0
0.5
0.0
Result
Salinity (PSU)
40
35
30
25
20
Secchi Disk Depth (m)
10
8
6
4
2
0
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
Year

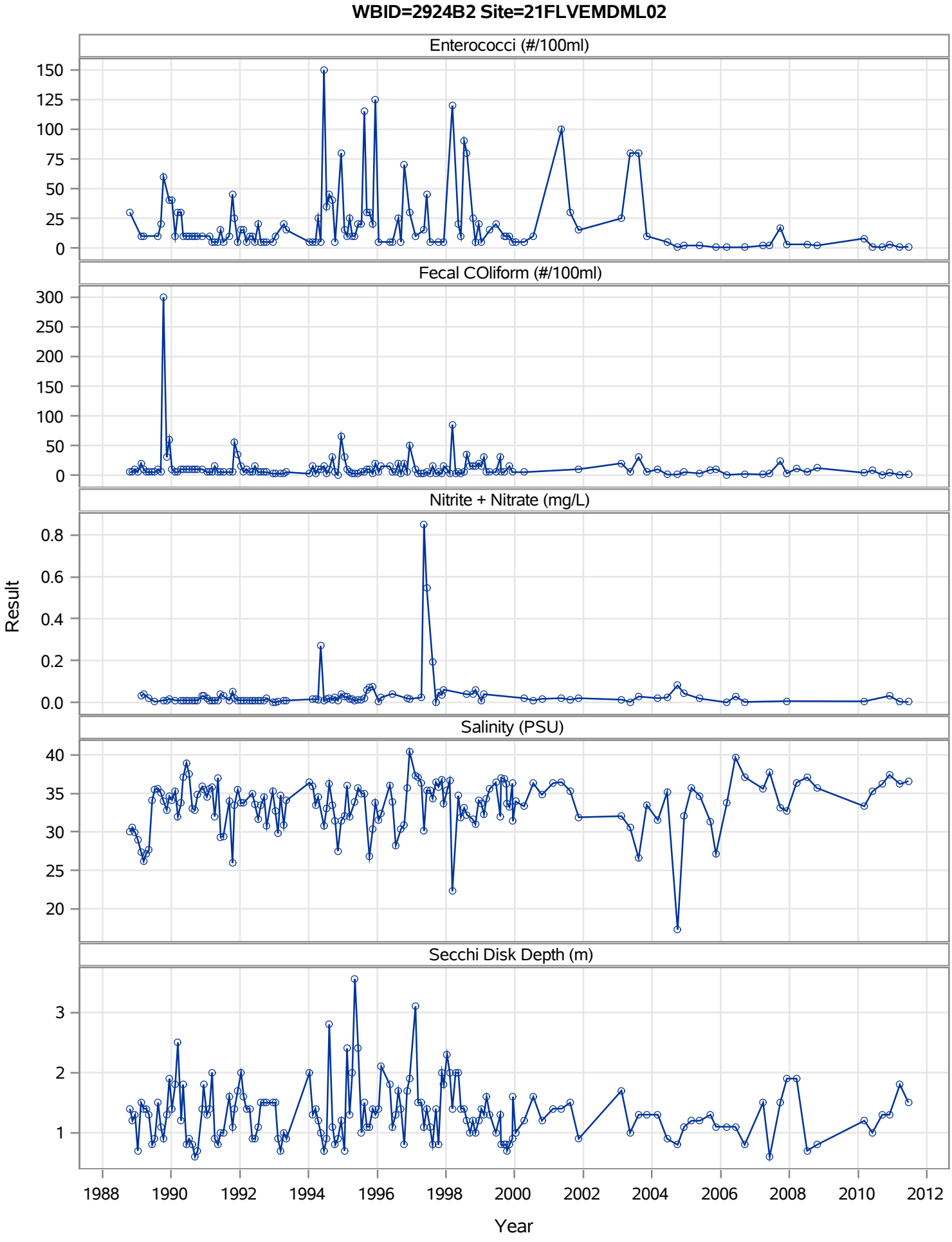

WBID=2924B2 Site=21FLVEMDML01
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Total Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Result
Total Phosphorus (mg/L)
0.3
0.2
0.1
0.0
pH
8.5
8.0
7.5
7.0
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
Year

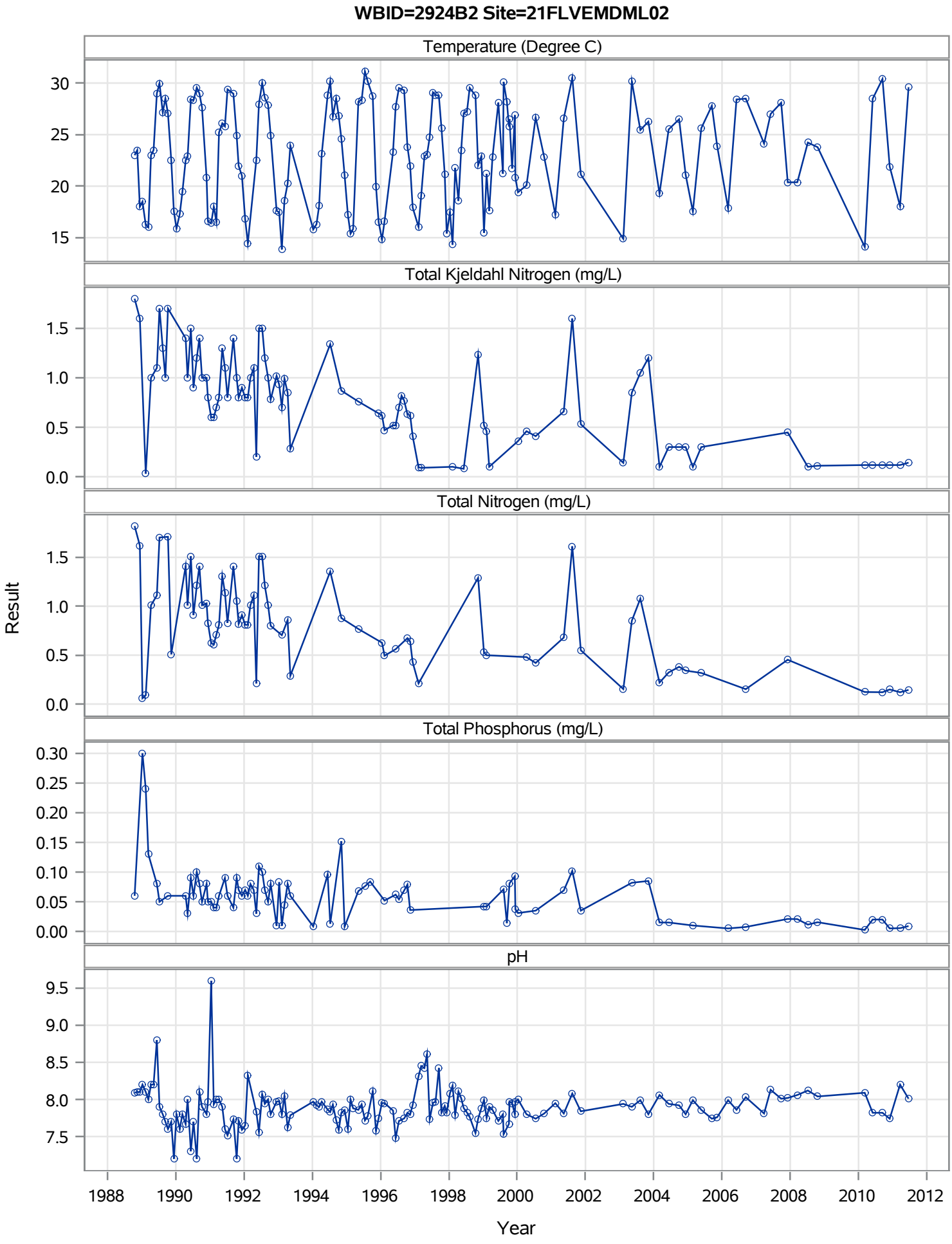

WBID=2924B2 Site=21FLVEMDML01A
Ammonia (mg/L)
1.25
1.00
0.75
0.50
0.25
0.00
Chlorophyll a (µg/L)
12.5
10.0
7.5
5.0
2.5
0.0
Dissolved Orthophosphate (mg/L)
0.06
0.04
0.02
0.00
Dissolved Oxygen (%)
105
100
95
90
85
Dissolved Oxygen (mg/L)
8
7
6
Result
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
Year

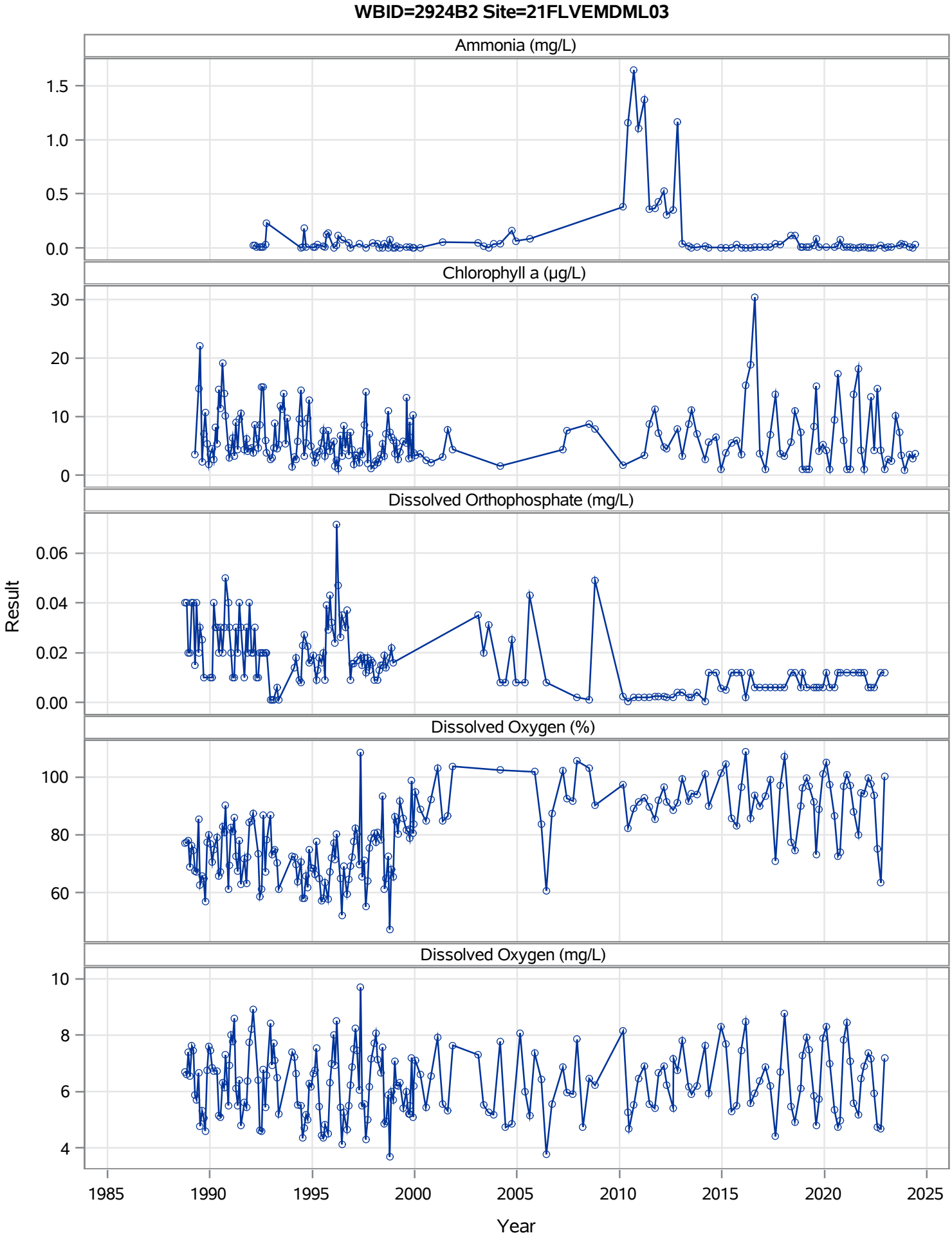

WBID=2924B2 Site=21FLVEMDML01A
Enterococci (#/100ml)
Fecal COliform (#/100ml)
Nitrite + Nitrate (mg/L)
Salinity (PSU)
Secchi Disk Depth (m)
Result
Year
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017

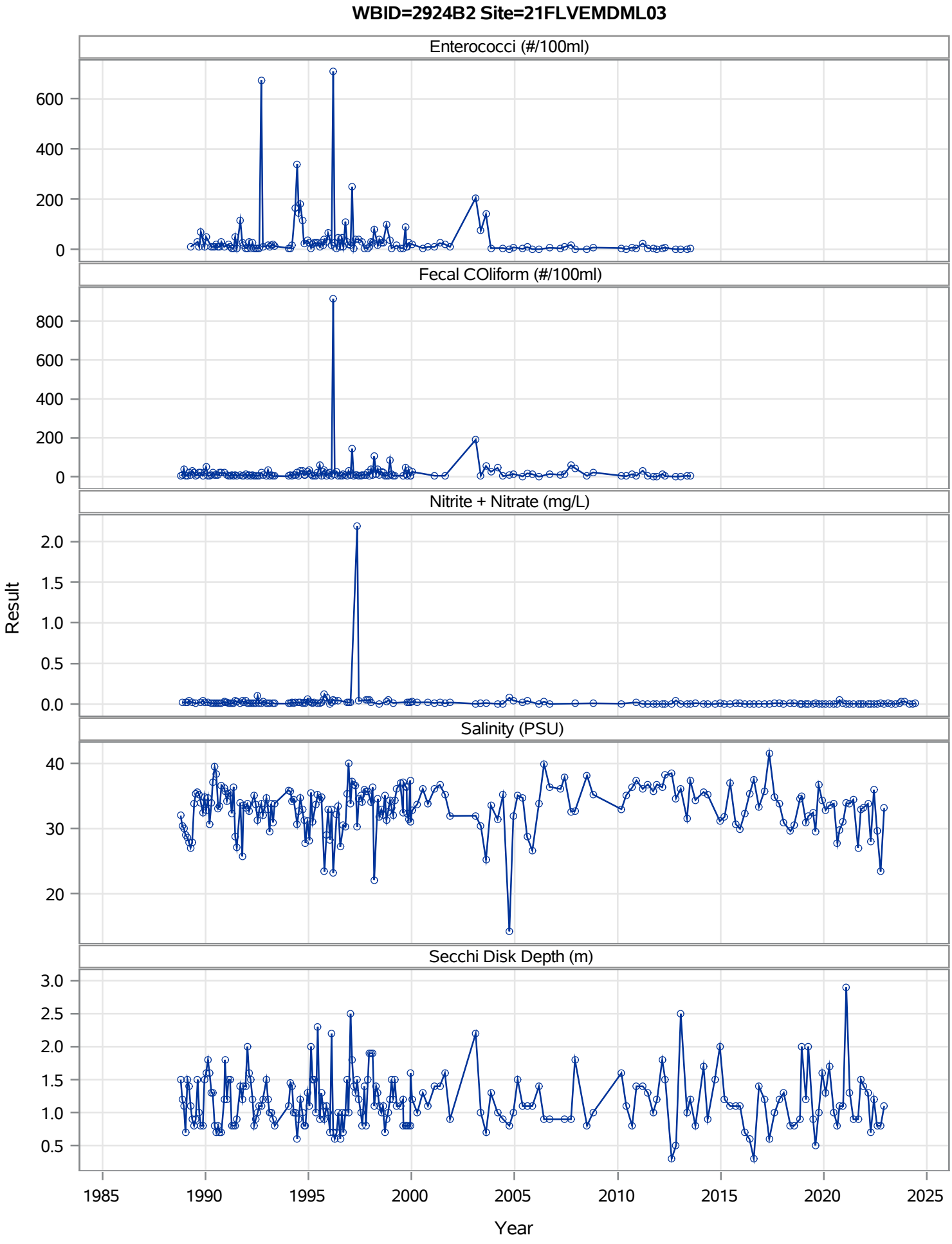

WBID=2924B2 Site=21FLVEMDML01A
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Total Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Result
Total Phosphorus (mg/L)
0.12
0.10
0.08
0.06
0.04
0.02
0.00
pH
8.50
8.25
8.00
7.75
7.50
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
Year

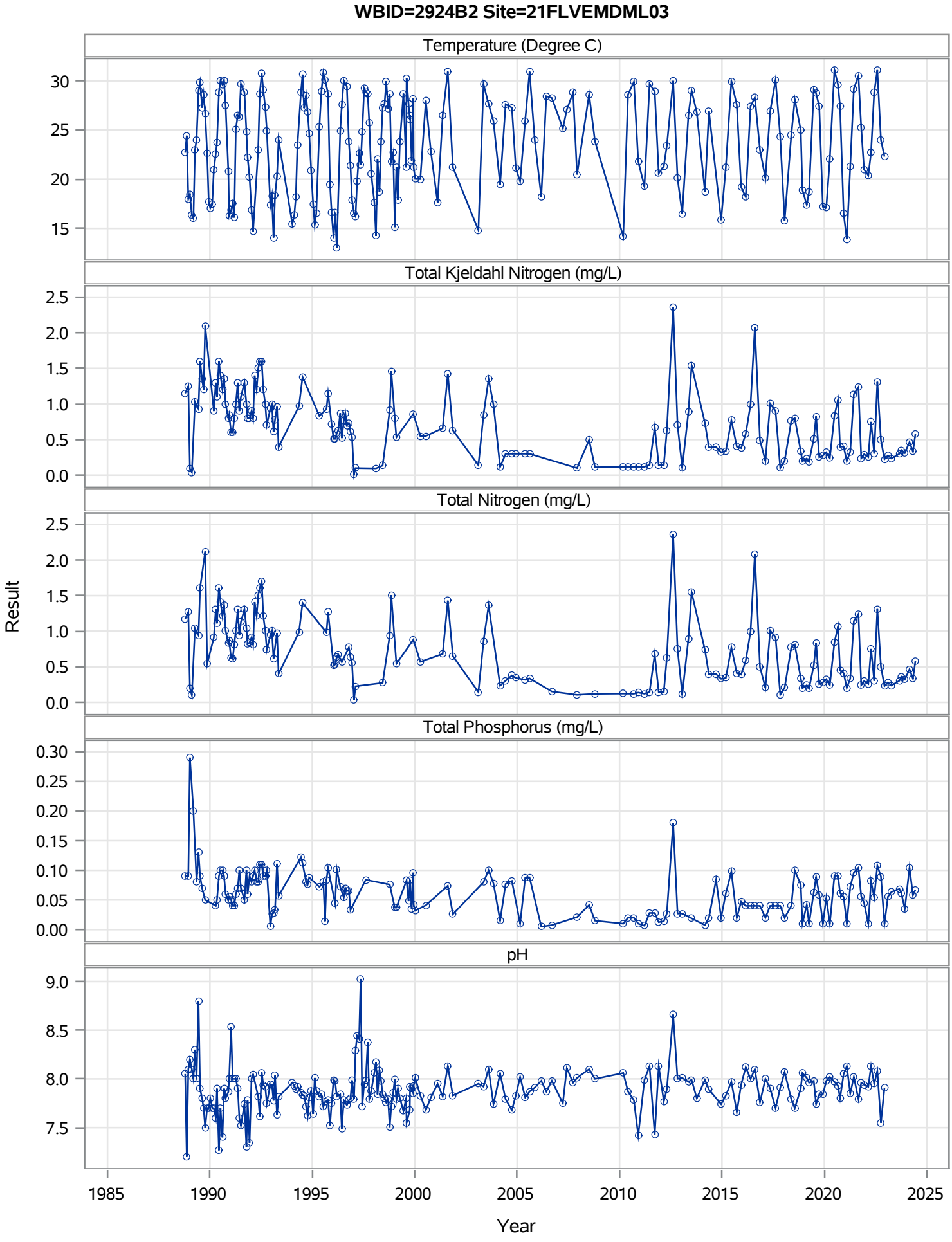

WBID=2924B2 Site=21FLVEMDML02
Ammonia (mg/L)
1.25
1.00
0.75
0.50
0.25
0.00
Chlorophyll a (µg/L)
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.10
0.08
0.06
0.04
0.02
0.00
Result
Dissolved Oxygen (%)
120
100
80
60
Dissolved Oxygen (mg/L)
10
8
6
4
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Year

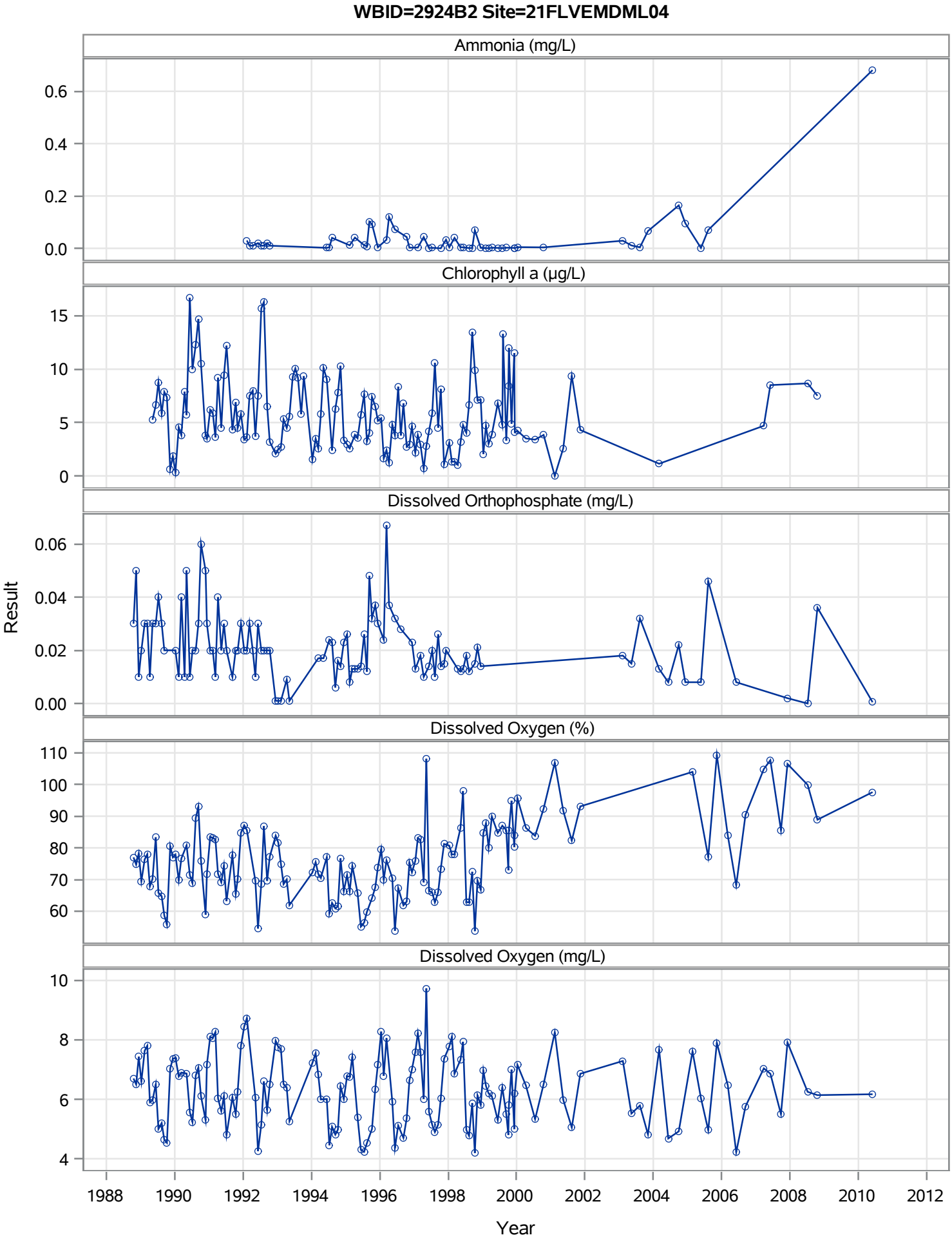

WBID=2924B2 Site=21FLVEMDML02
Enterococci (#/100ml)
150
125
100
75
50
25
0
Fecal COliform (#/100ml)
300
250
200
150
100
50
0
Nitrite + Nitrate (mg/L)
0.8
0.6
0.4
0.2
0.0
Result
Salinity (PSU)
40
35
30
25
20
Secchi Disk Depth (m)
3
2
1
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Year

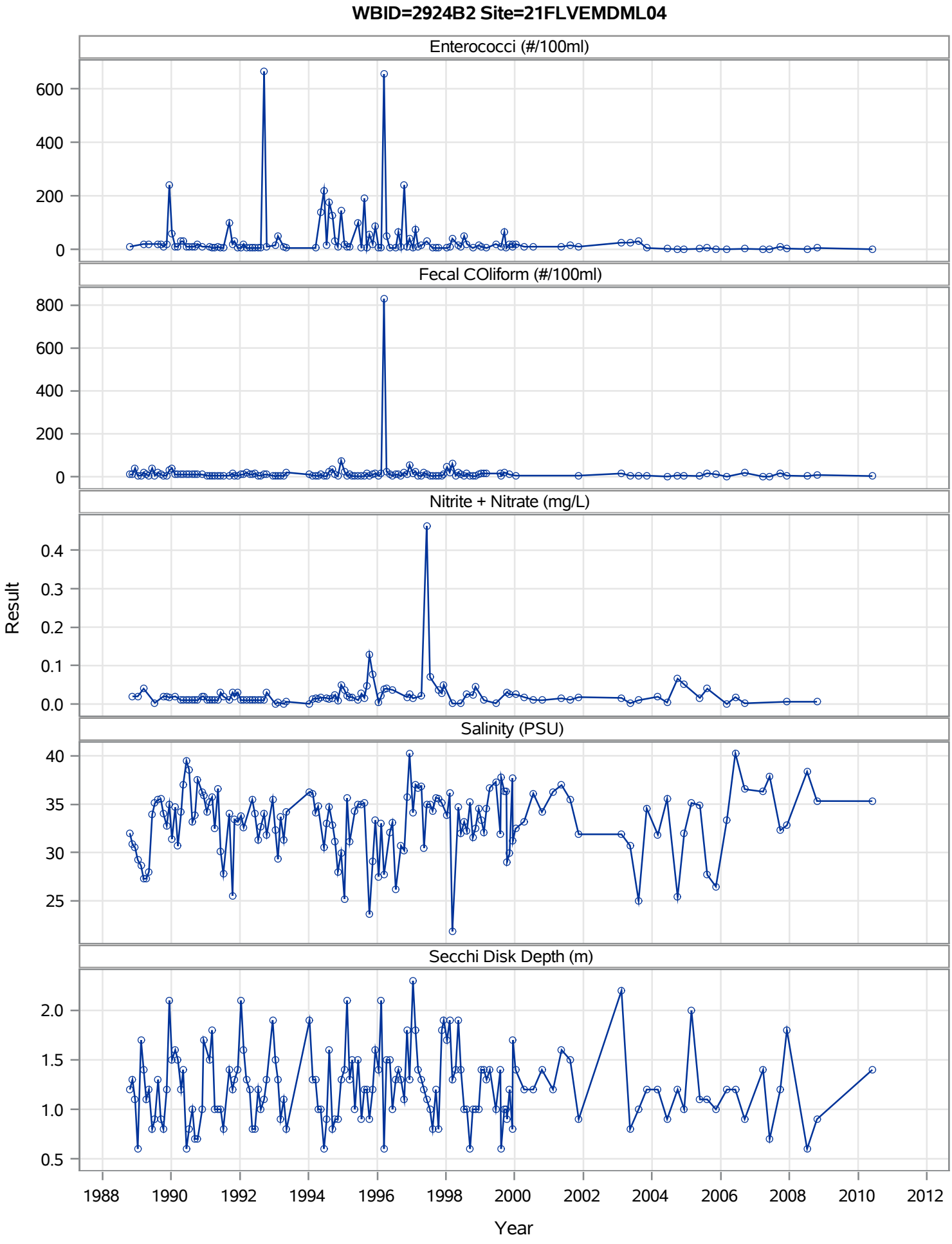

WBID=2924B2 Site=21FLVEMDML02
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
1.5
1.0
0.5
0.0
Total Nitrogen (mg/L)
1.5
1.0
0.5
0.0
Result
Total Phosphorus (mg/L)
0.30
0.25
0.20
0.15
0.10
0.05
0.00
pH
9.5
9.0
8.5
8.0
7.5
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Year

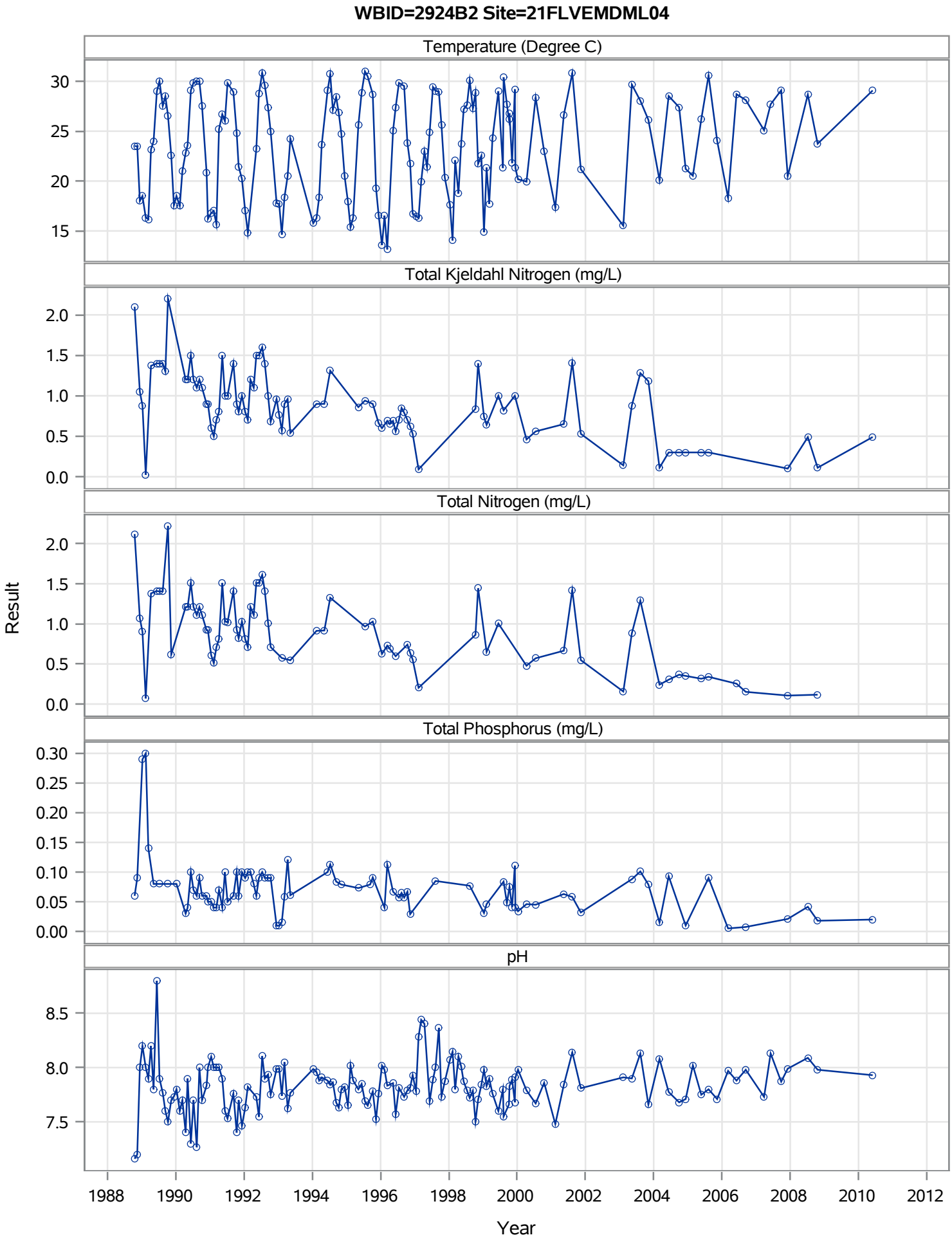

WBID=2924B2 Site=21FLVEMDML03
Ammonia (mg/L)
1.5
1.0
0.5
0.0
Chlorophyll a (µg/L)
30
20
10
0
Dissolved Orthophosphate (mg/L)
0.06
0.04
0.02
0.00
Result
Dissolved Oxygen (%)
100
80
60
Dissolved Oxygen (mg/L)
10
8
6
4
1985
1990
1995
2000
2005
2010
2015
2020
2025
Year

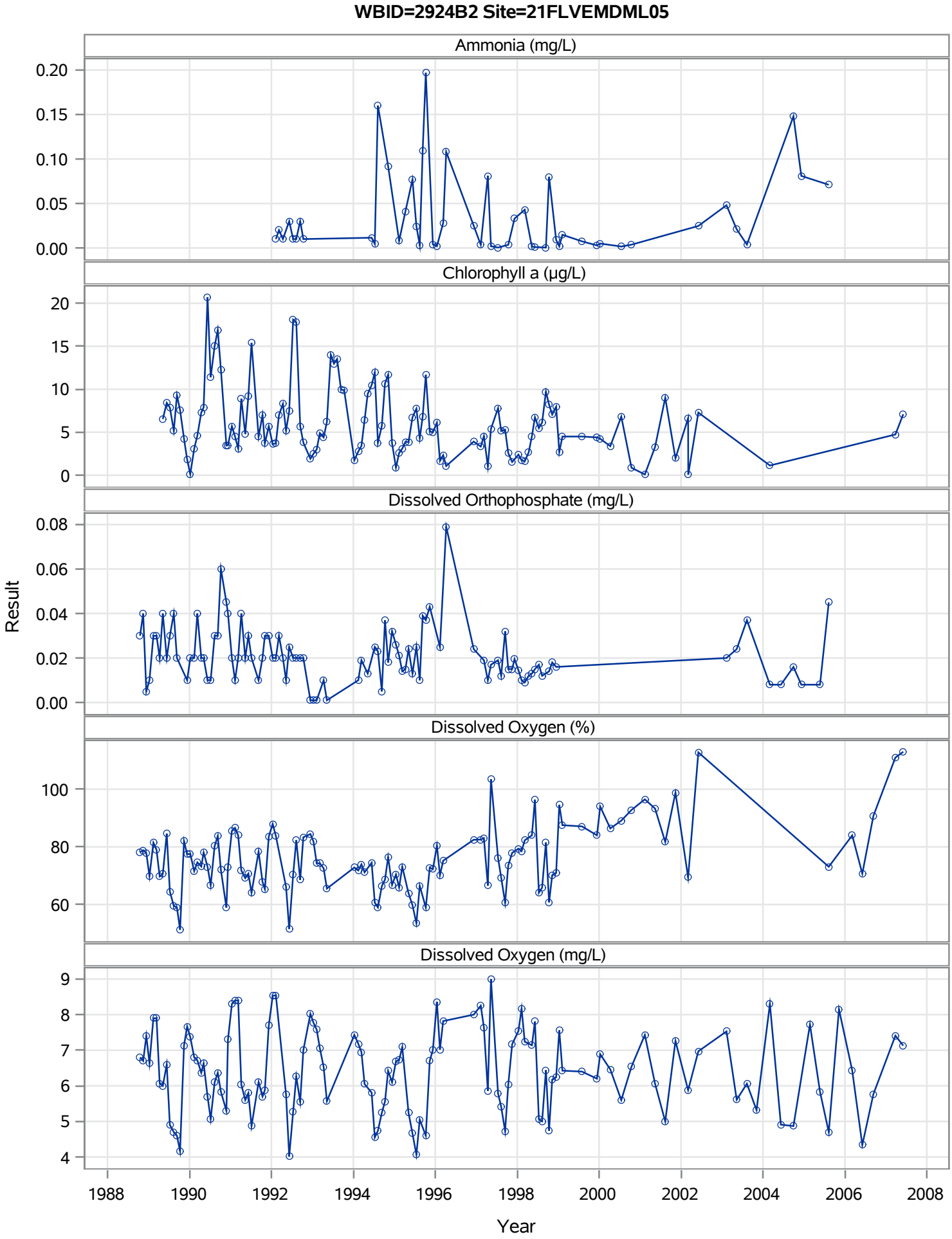

WBID=2924B2 Site=21FLVEMDML03
Enterococci (#/100ml)
600
400
200
0
Fecal COliform (#/100ml)
800
600
400
200
0
Nitrite + Nitrate (mg/L)
2.0
1.5
1.0
0.5
0.0
Result
Salinity (PSU)
40
30
20
Secchi Disk Depth (m)
3.0
2.5
2.0
1.5
1.0
0.5
1985
1990
1995
2000
2005
2010
2015
2020
2025
Year

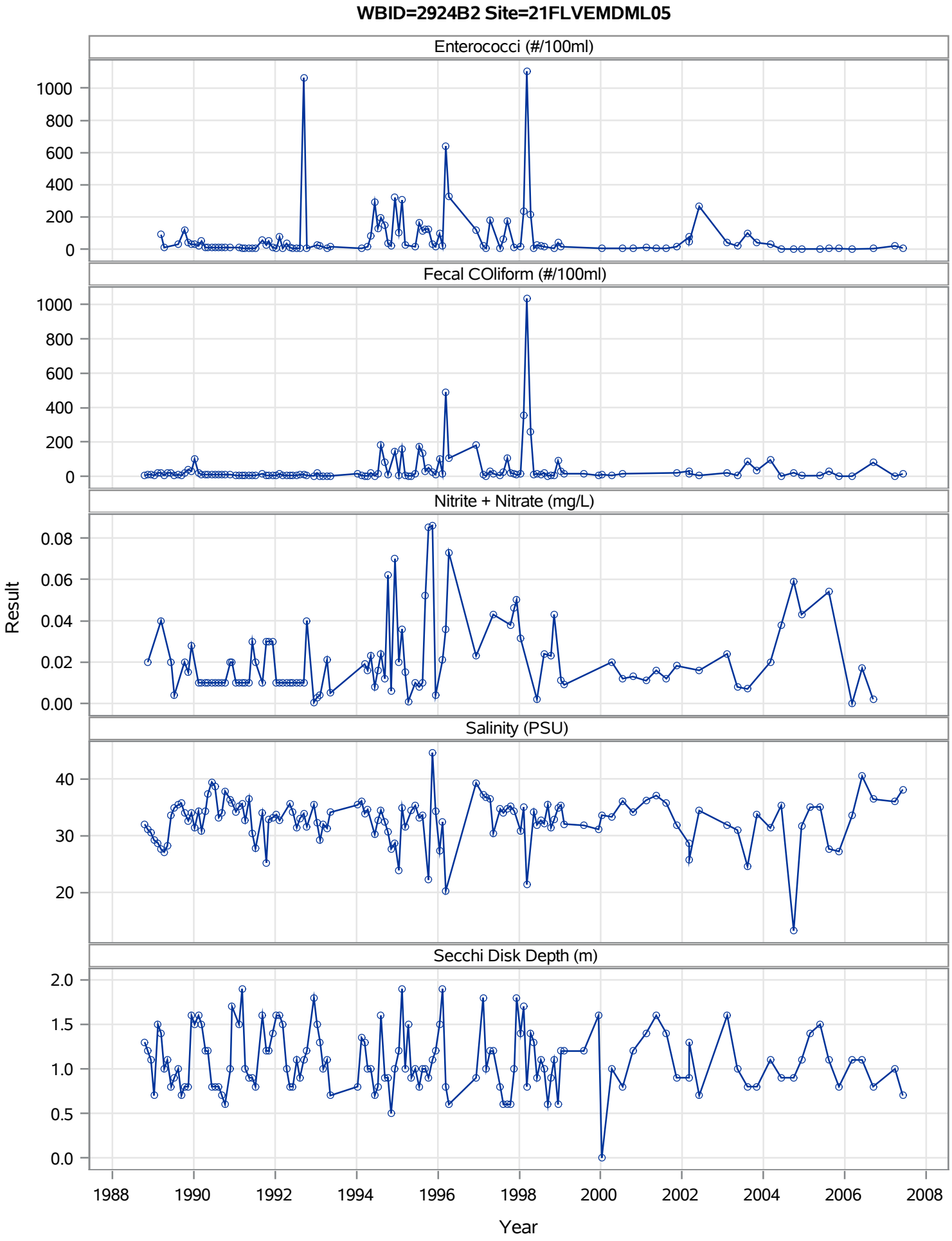

WBID=2924B2 Site=21FLVEMDML03
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
2.5
2.0
1.5
1.0
0.5
0.0
Total Nitrogen (mg/L)
2.5
2.0
1.5
1.0
0.5
0.0
Result
Total Phosphorus (mg/L)
0.30
0.25
0.20
0.15
0.10
0.05
0.00
pH
9.0
8.5
8.0
7.5
1985
1990
1995
2000
2005
2010
2015
2020
2025
Year

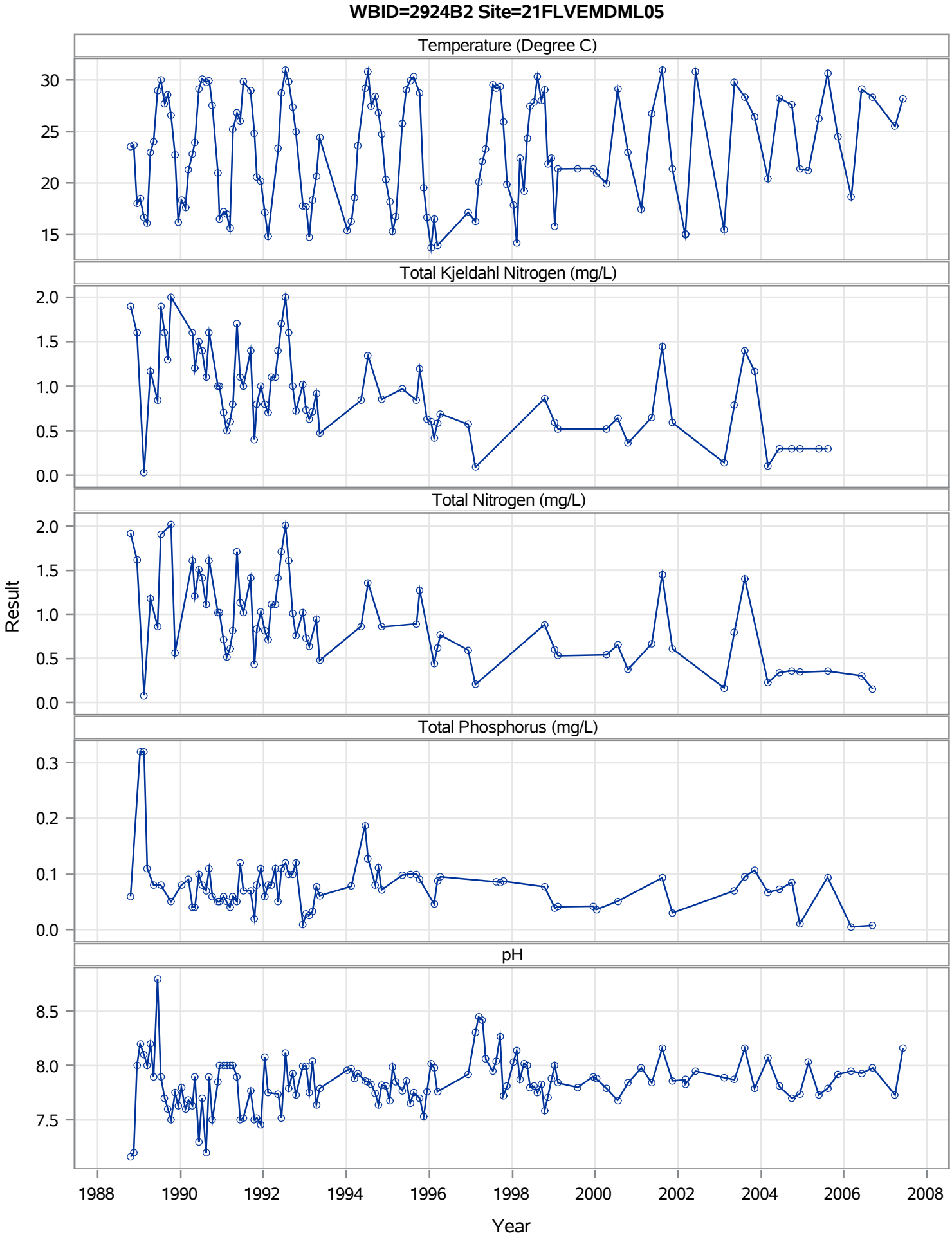

WBID=2924B2 Site=21FLVEMDML04
Ammonia (mg/L)
0.6
0.4
0.2
0.0
Chlorophyll a (µg/L)
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.06
0.04
0.02
0.00
Result
Dissolved Oxygen (%)
110
100
90
80
70
60
Dissolved Oxygen (mg/L)
10
8
6
4
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Year

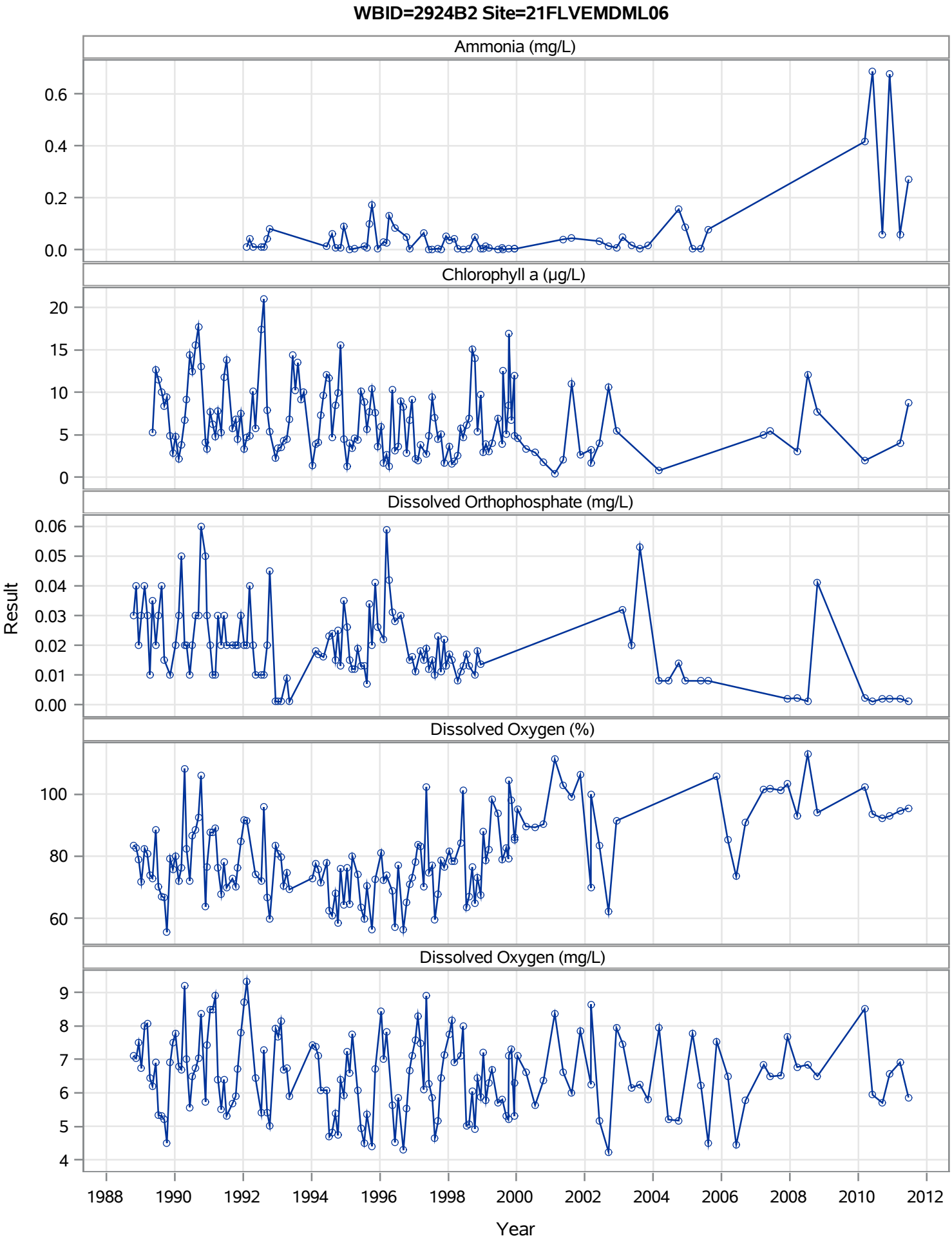

WBID=2924B2 Site=21FLVEMDML04
Enterococci (#/100ml)
600
400
200
0
Fecal COliform (#/100ml)
800
600
400
200
0
Nitrite + Nitrate (mg/L)
0.4
0.3
0.2
0.1
0.0
Result
Salinity (PSU)
40
35
30
25
Secchi Disk Depth (m)
2.0
1.5
1.0
0.5
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Year

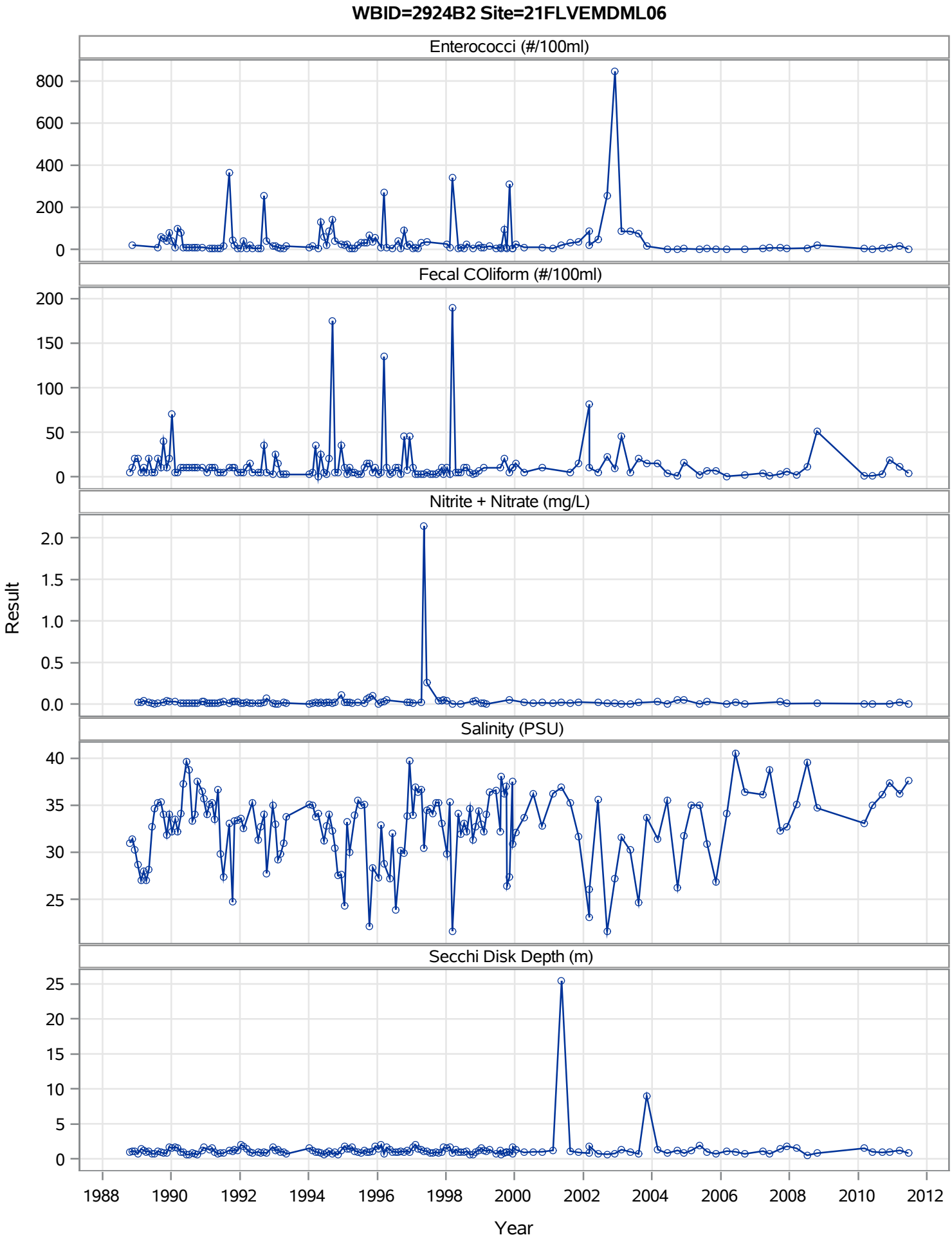

WBID=2924B2 Site=21FLVEMDML04
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Total Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Result
Total Phosphorus (mg/L)
0.30
0.25
0.20
0.15
0.10
0.05
0.00
pH
8.5
8.0
7.5
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Year

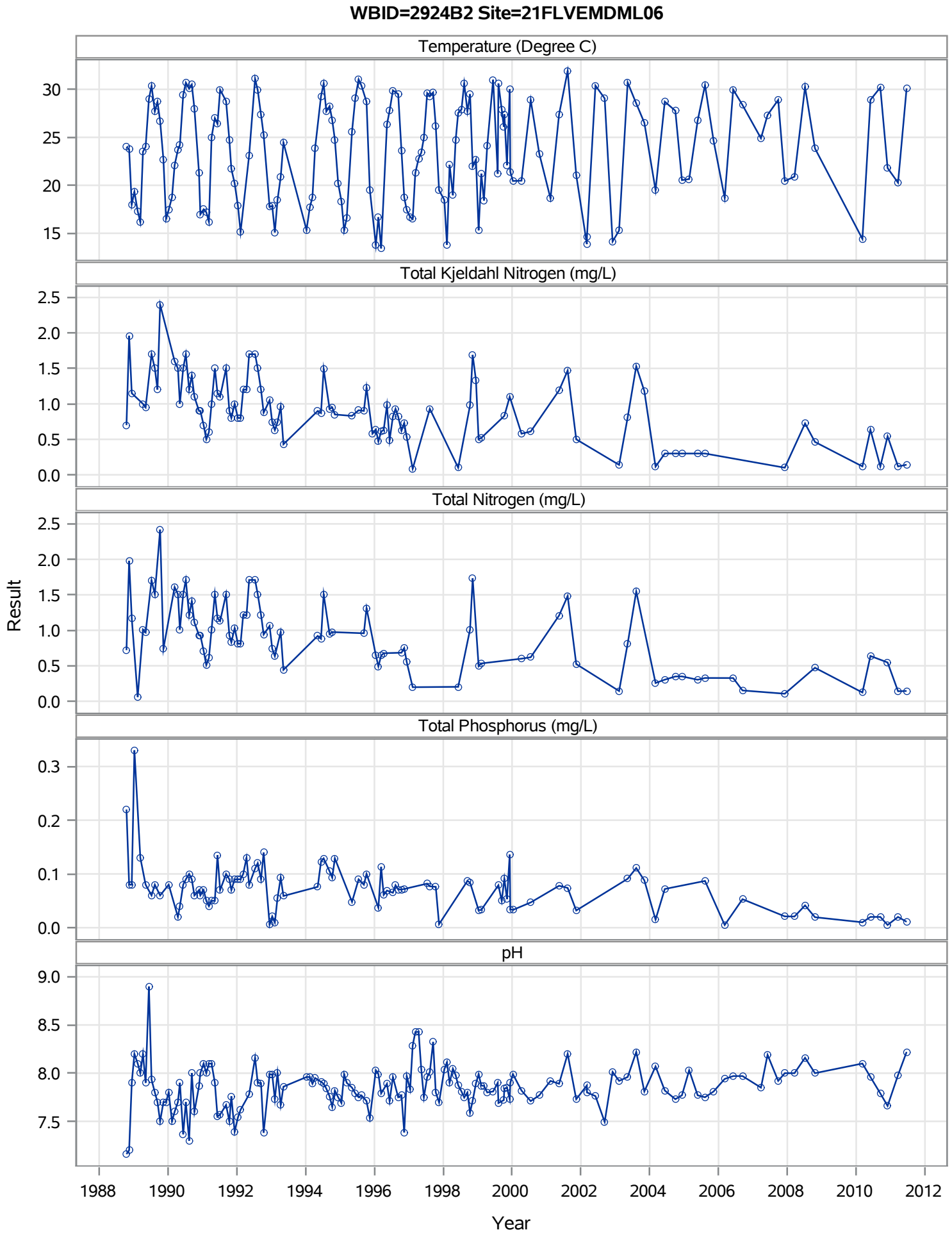

WBID=2924B2 Site=21FLVEMDML05
Ammonia (mg/L)
0.20
0.15
0.10
0.05
0.00
Chlorophyll a (µg/L)
20
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.08
0.06
0.04
0.02
0.00
Result
Dissolved Oxygen (%)
100
80
60
Dissolved Oxygen (mg/L)
9
8
7
6
5
4
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
Year

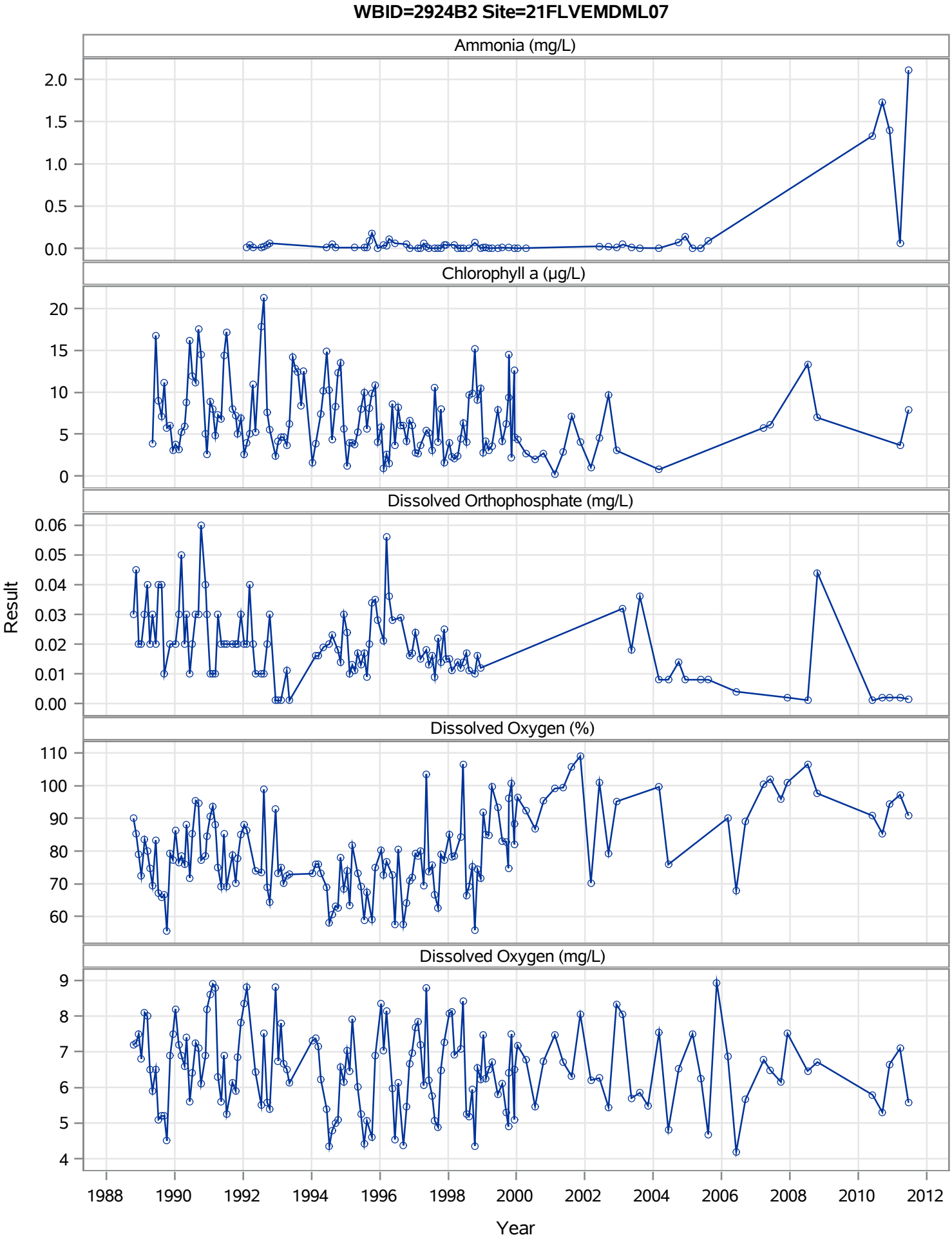

WBID=2924B2 Site=21FLVEMDML05
Enterococci (#/100ml)
1000
800
600
400
200
0
Fecal COliform (#/100ml)
1000
800
600
400
200
0
Nitrite + Nitrate (mg/L)
0.08
0.06
0.04
0.02
0.00
Result
Salinity (PSU)
40
30
20
Secchi Disk Depth (m)
2.0
1.5
1.0
0.5
0.0
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
Year

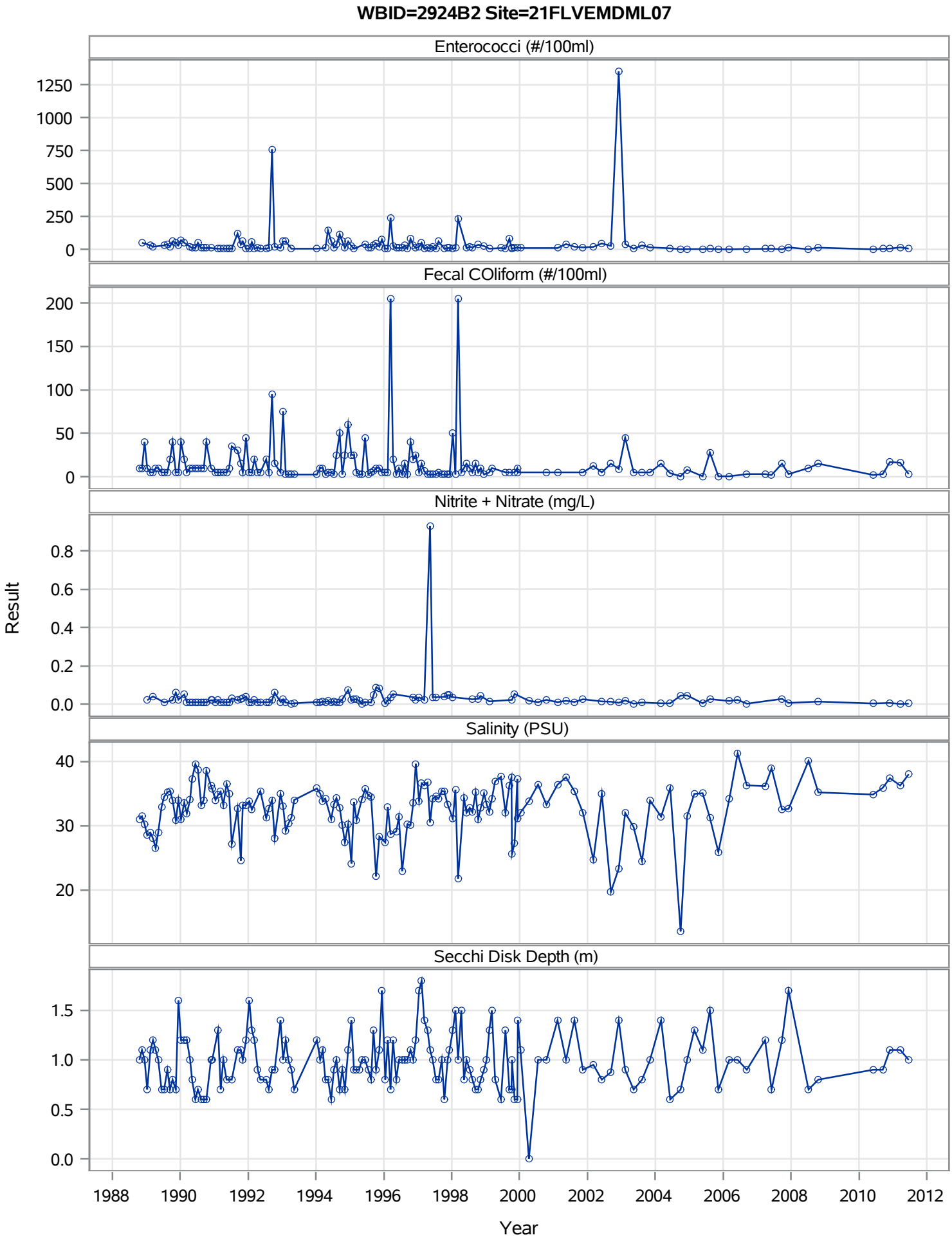

WBID=2924B2 Site=21FLVEMDML05
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Total Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Result
Total Phosphorus (mg/L)
0.3
0.2
0.1
0.0
pH
8.5
8.0
7.5
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
Year

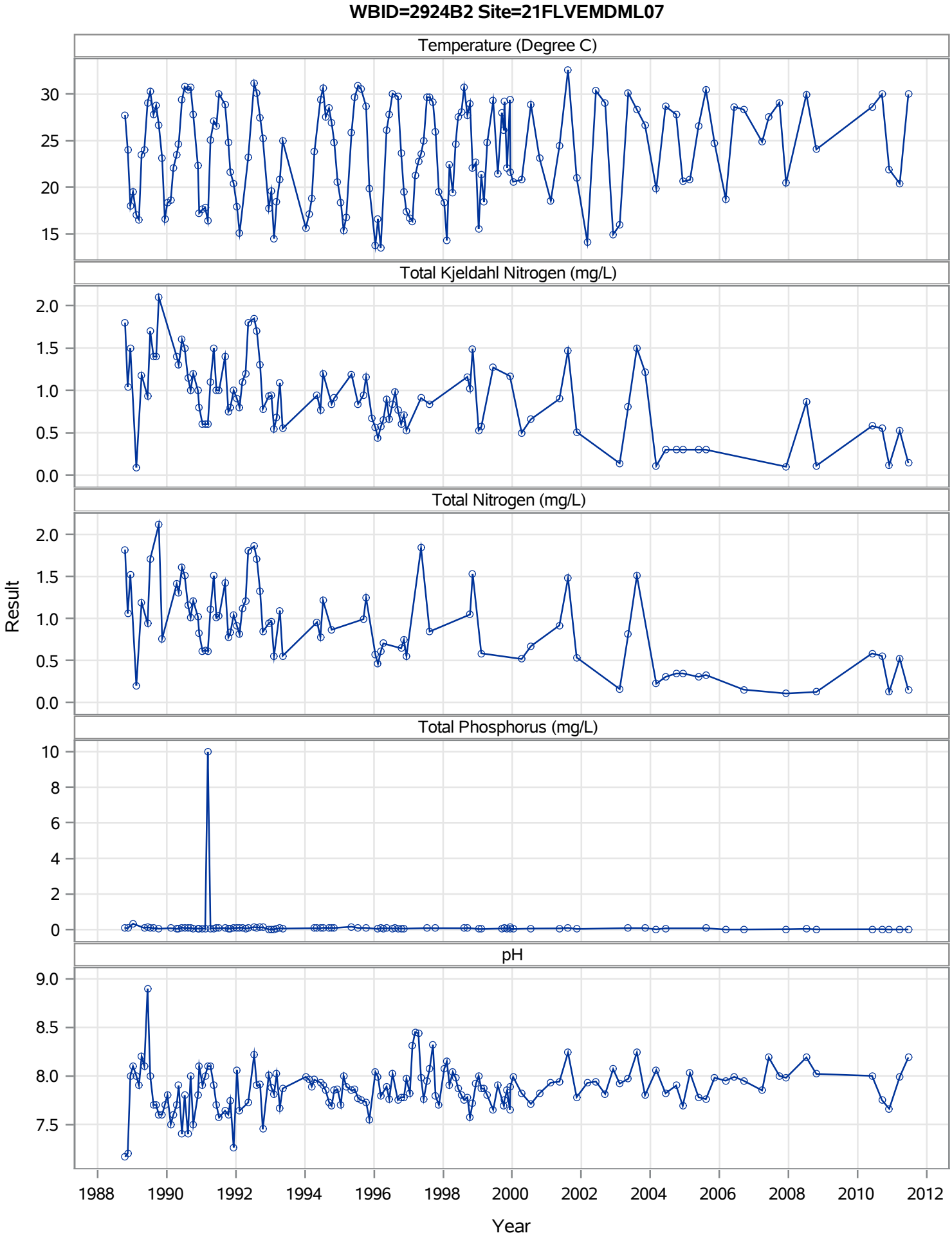

WBID=2924B2 Site=21FLVEMDML06
Ammonia (mg/L)
0.6
0.4
0.2
0.0
Chlorophyll a (µg/L)
20
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Result
Dissolved Oxygen (%)
100
80
60
Dissolved Oxygen (mg/L)
9
8
7
6
5
4
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Year

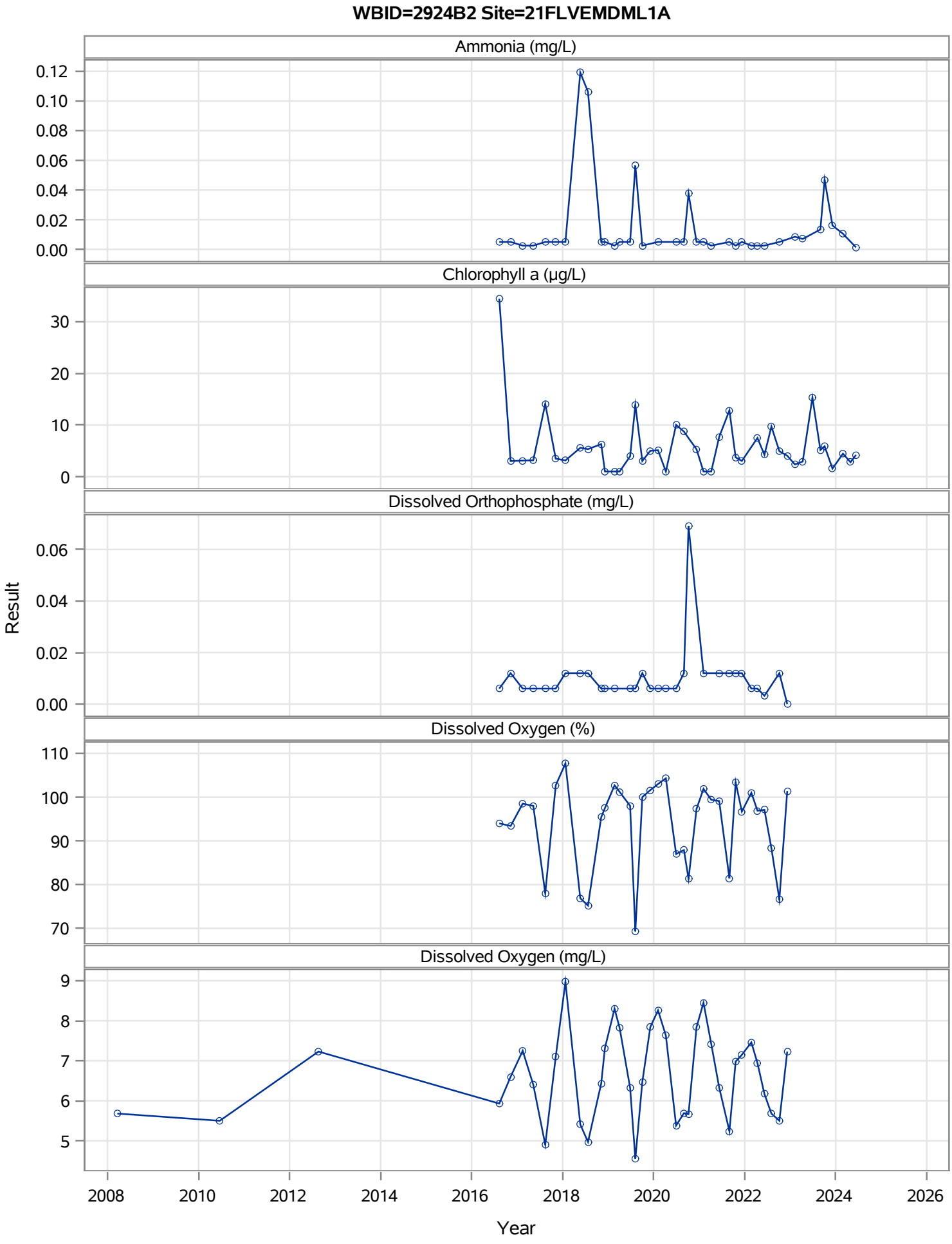

WBID=2924B2 Site=21FLVEMDML06
Enterococci (#/100ml)
800
600
400
200
0
Fecal COliform (#/100ml)
200
150
100
50
0
Nitrite + Nitrate (mg/L)
2.0
1.5
1.0
0.5
0.0
Salinity (PSU)
40
35
30
25
Secchi Disk Depth (m)
25
20
15
10
5
0
Result
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Year

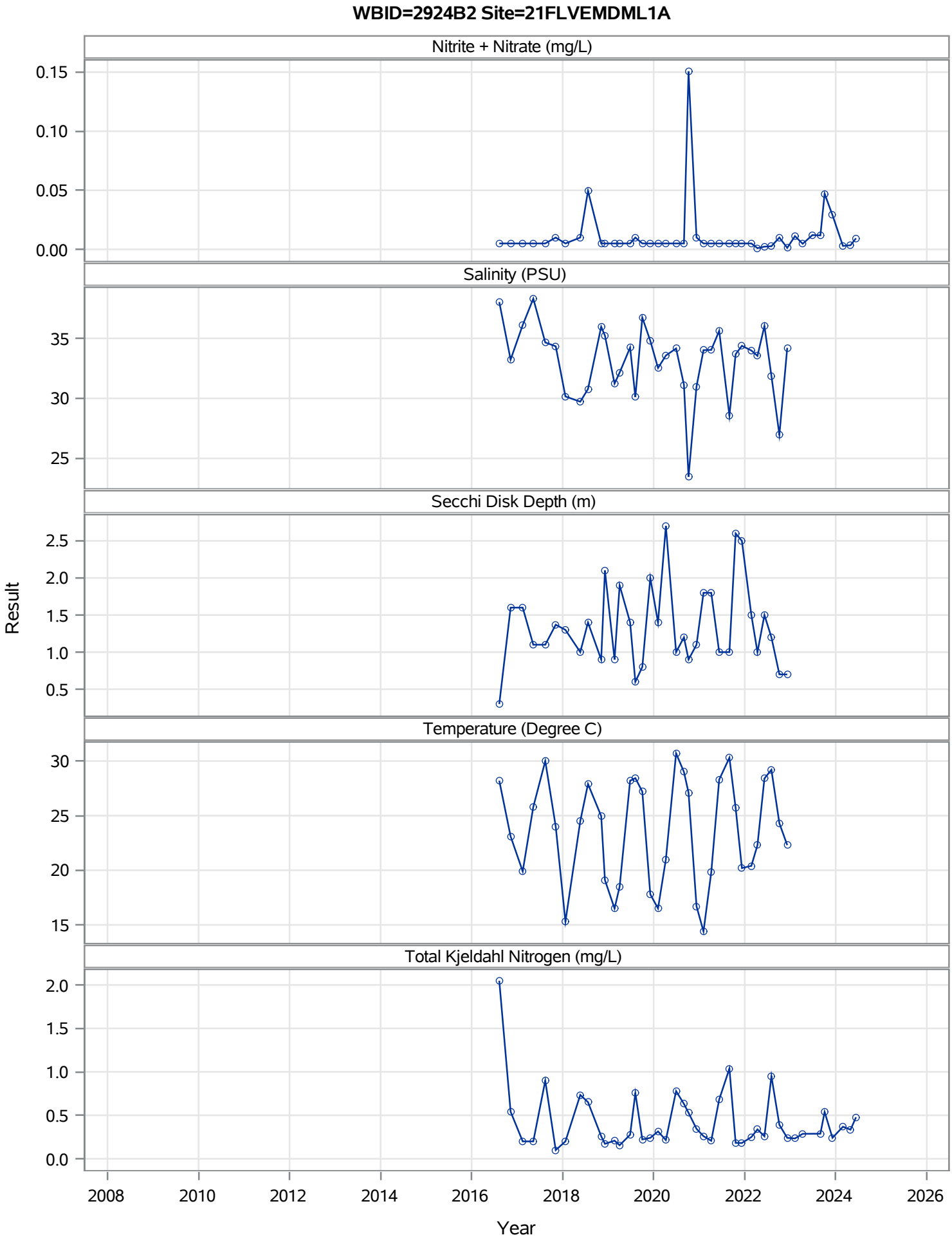

WBID=2924B2 Site=21FLVEMDML06
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
2.5
2.0
1.5
1.0
0.5
0.0
Total Nitrogen (mg/L)
2.5
2.0
1.5
1.0
0.5
0.0
Result
Total Phosphorus (mg/L)
0.3
0.2
0.1
0.0
pH
9.0
8.5
8.0
7.5
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Year

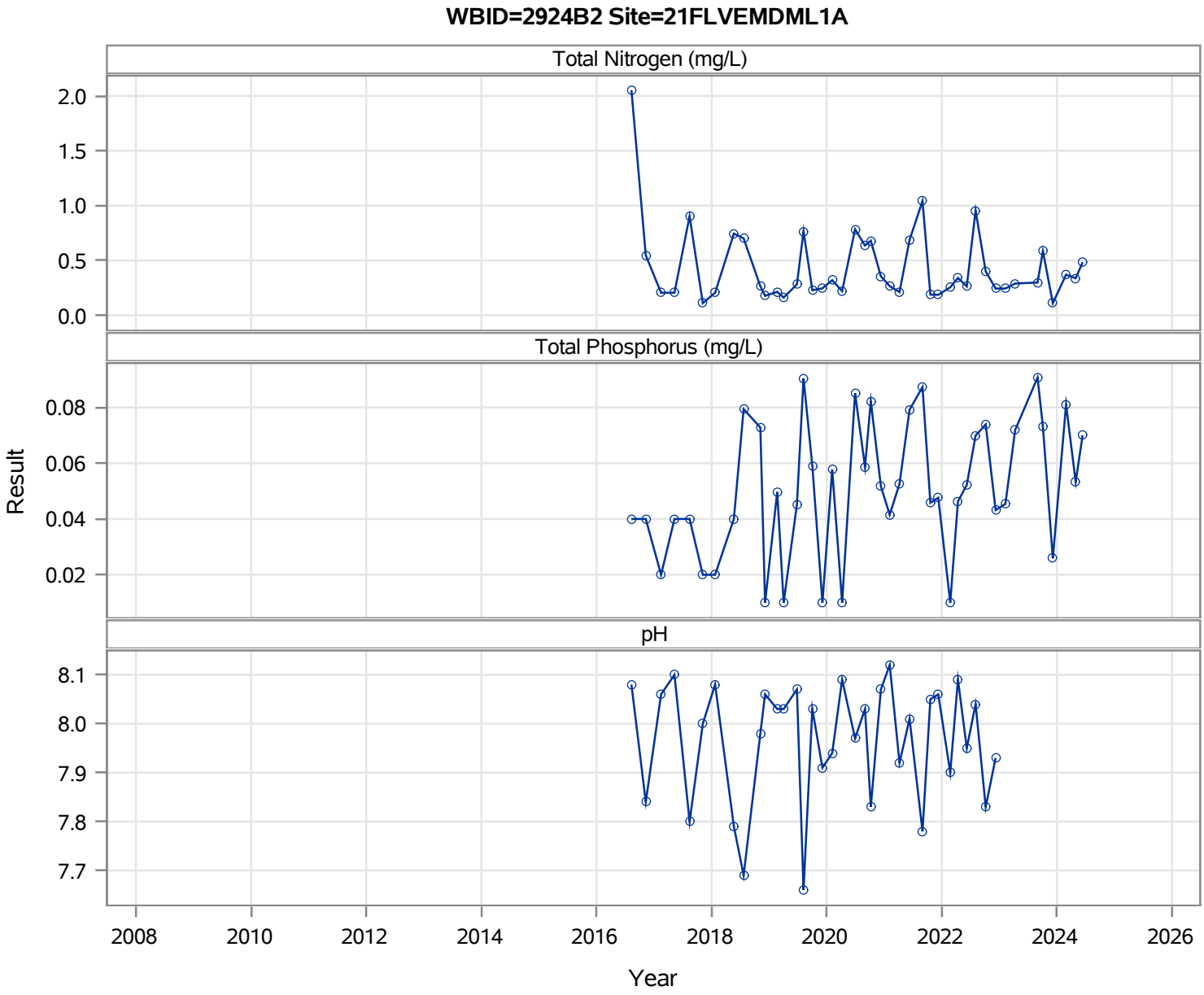

WBID=2924B2 Site=21FLVEMDML07
Ammonia (mg/L)
2.0
1.5
1.0
0.5
0.0
Chlorophyll a (µg/L)
20
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Result
Dissolved Oxygen (%)
110
100
90
80
70
60
Dissolved Oxygen (mg/L)
9
8
7
6
5
4
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Year

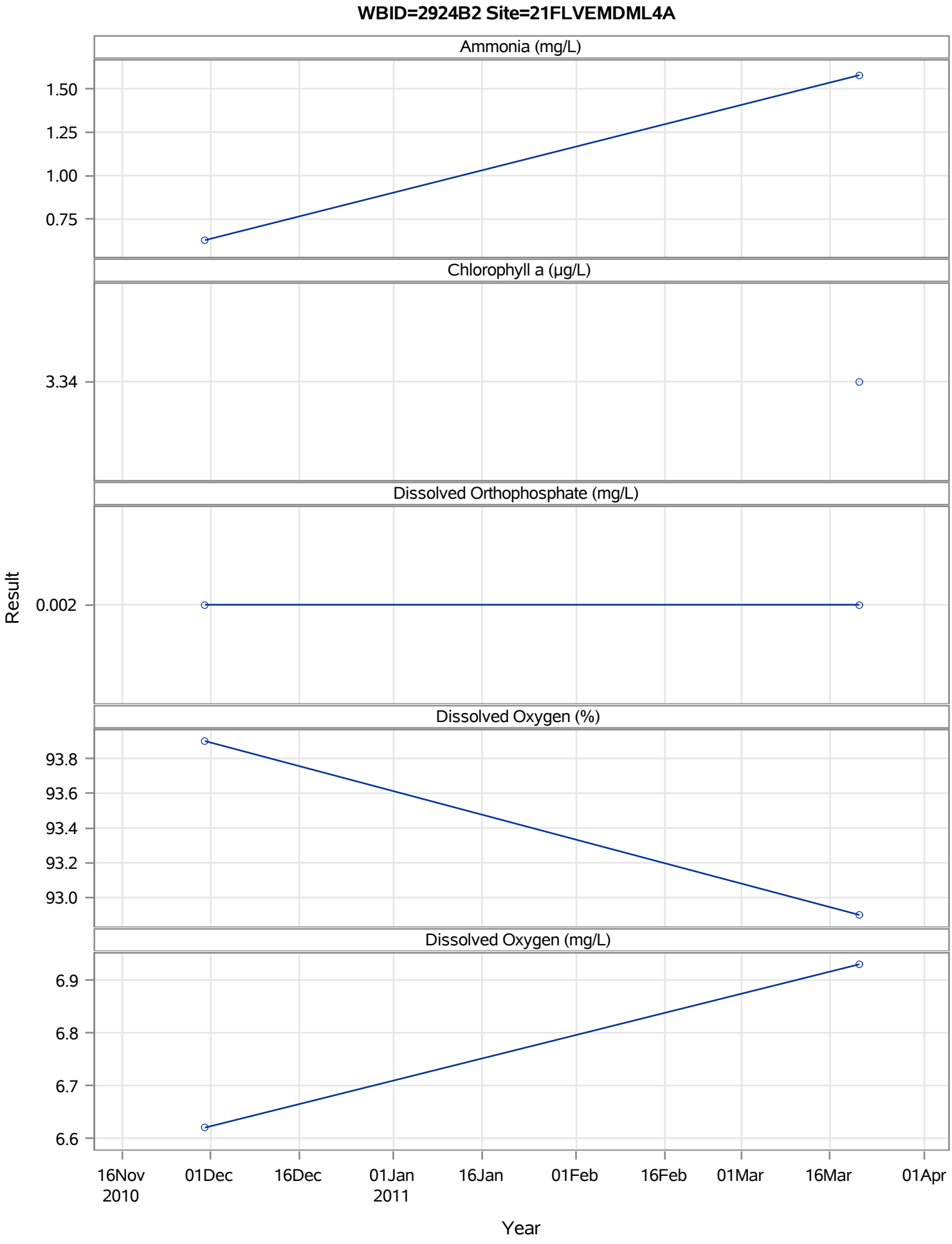

WBID=2924B2 Site=21FLVEMDML07
Enterococci (#/100ml)
1250
1000
750
500
250
0
Fecal COliform (#/100ml)
200
150
100
50
0
Nitrite + Nitrate (mg/L)
0.8
0.6
0.4
0.2
0.0
Result
Salinity (PSU)
40
30
20
Secchi Disk Depth (m)
1.5
1.0
0.5
0.0
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Year

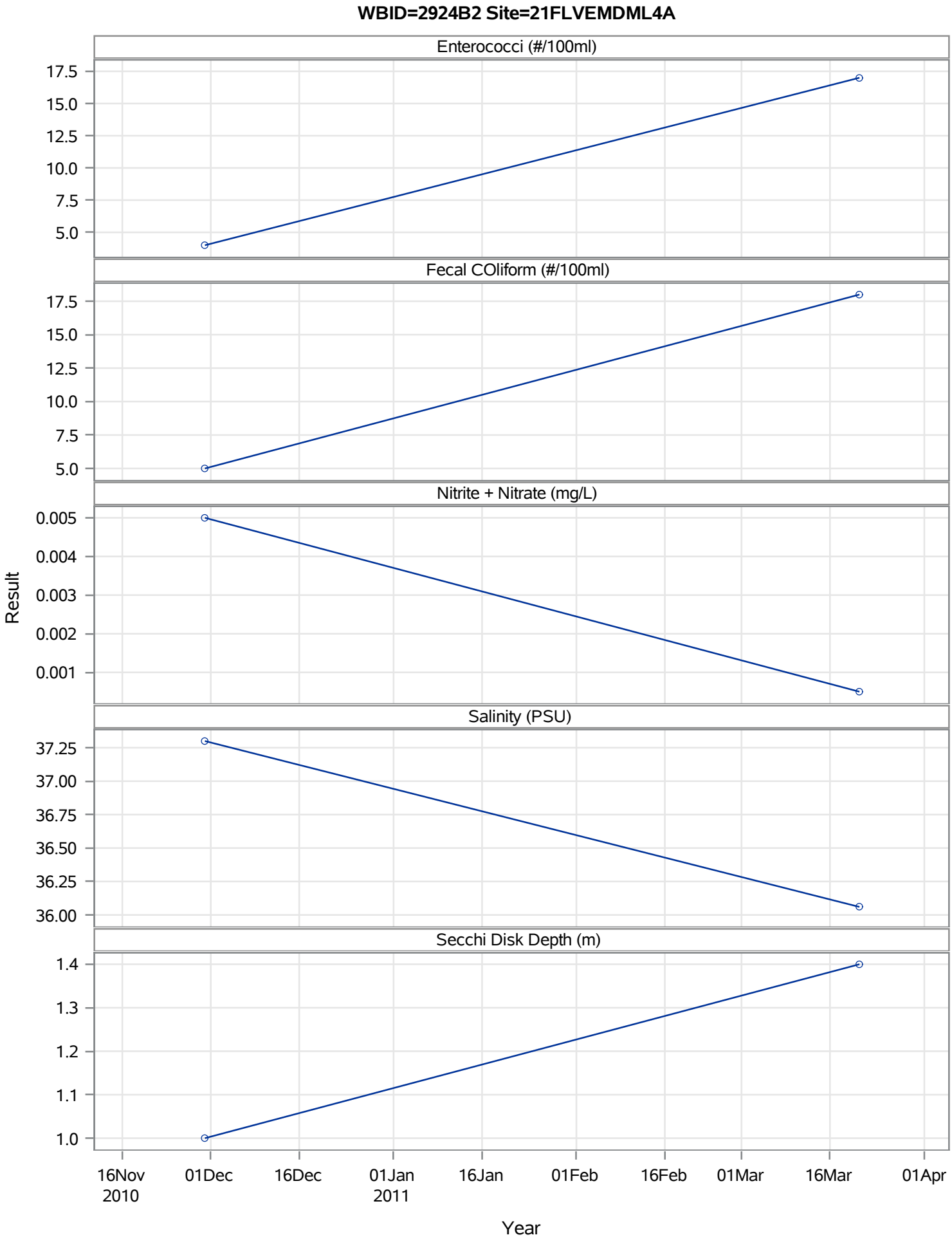

WBID=2924B2 Site=21FLVEMDML07
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Total Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Result
Total Phosphorus (mg/L)
10
8
6
4
2
0
pH
9.0
8.5
8.0
7.5
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Year

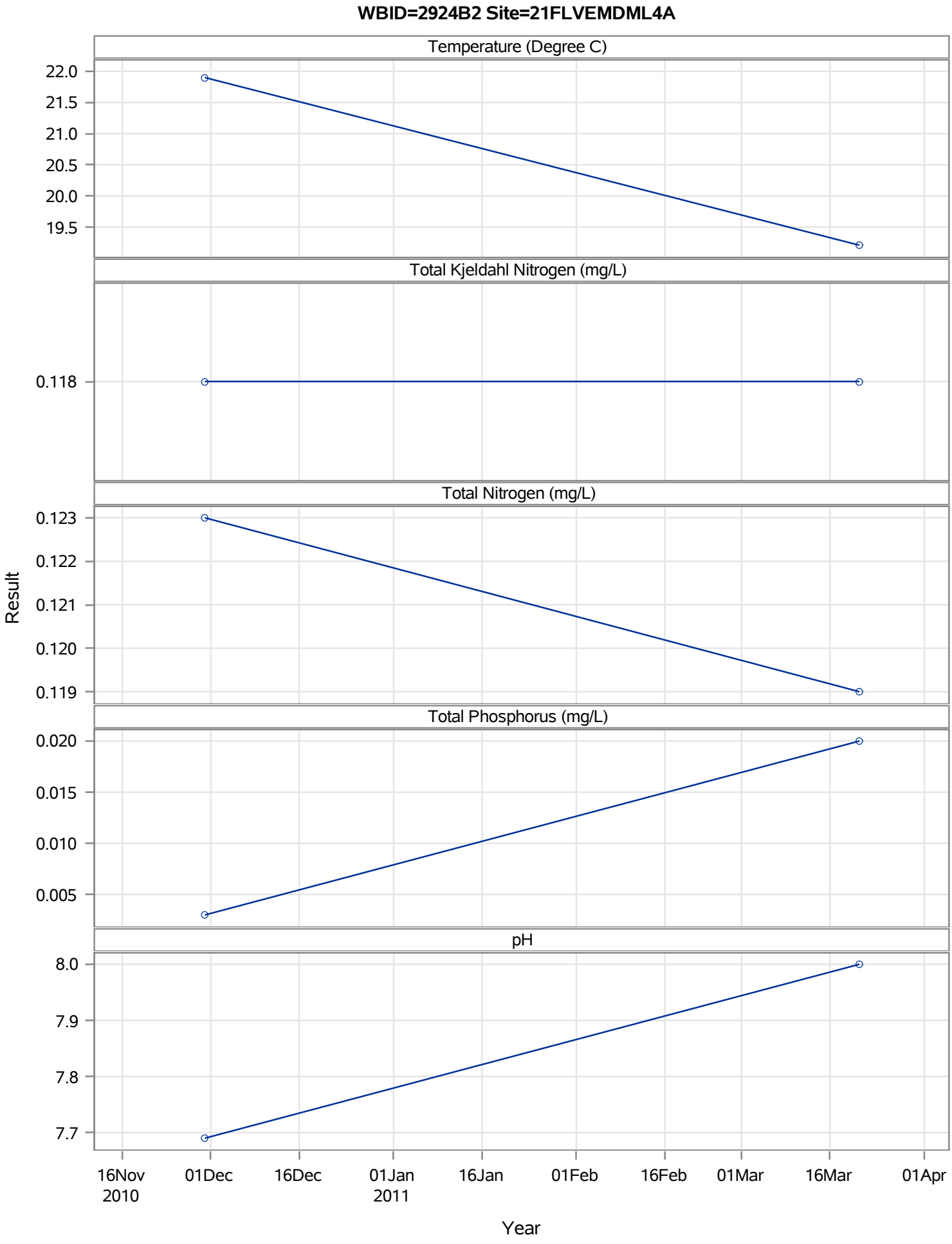

WBID=2924B2 Site=21FLVEMDML1A
Ammonia (mg/L)
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Chlorophyll a (µg/L)
30
20
10
0
Dissolved Orthophosphate (mg/L)
0.06
0.04
0.02
0.00
Dissolved Oxygen (%)
110
100
90
80
70
Dissolved Oxygen (mg/L)
9
8
7
6
5
Result
2008
2010
2012
2014
2016
2018
2020
2022
2024
2026
Year

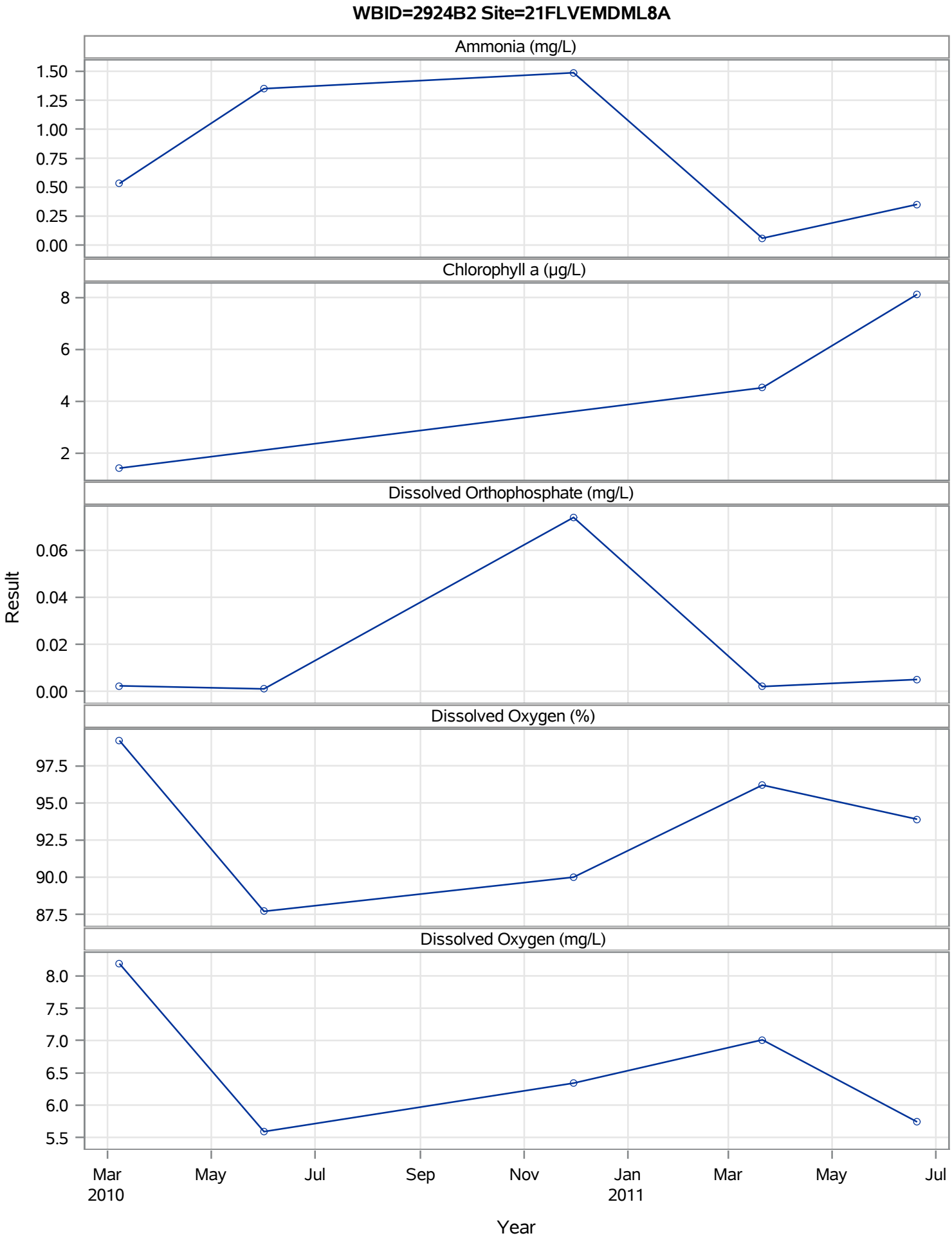

WBID=2924B2 Site=21FLVEMDML1A
Nitrite + Nitrate (mg/L)
0.15
0.10
0.05
0.00
Salinity (PSU)
35
30
25
Secchi Disk Depth (m)
2.5
2.0
1.5
1.0
0.5
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Result
2008
2010
2012
2014
2016
2018
2020
2022
2024
2026
Year

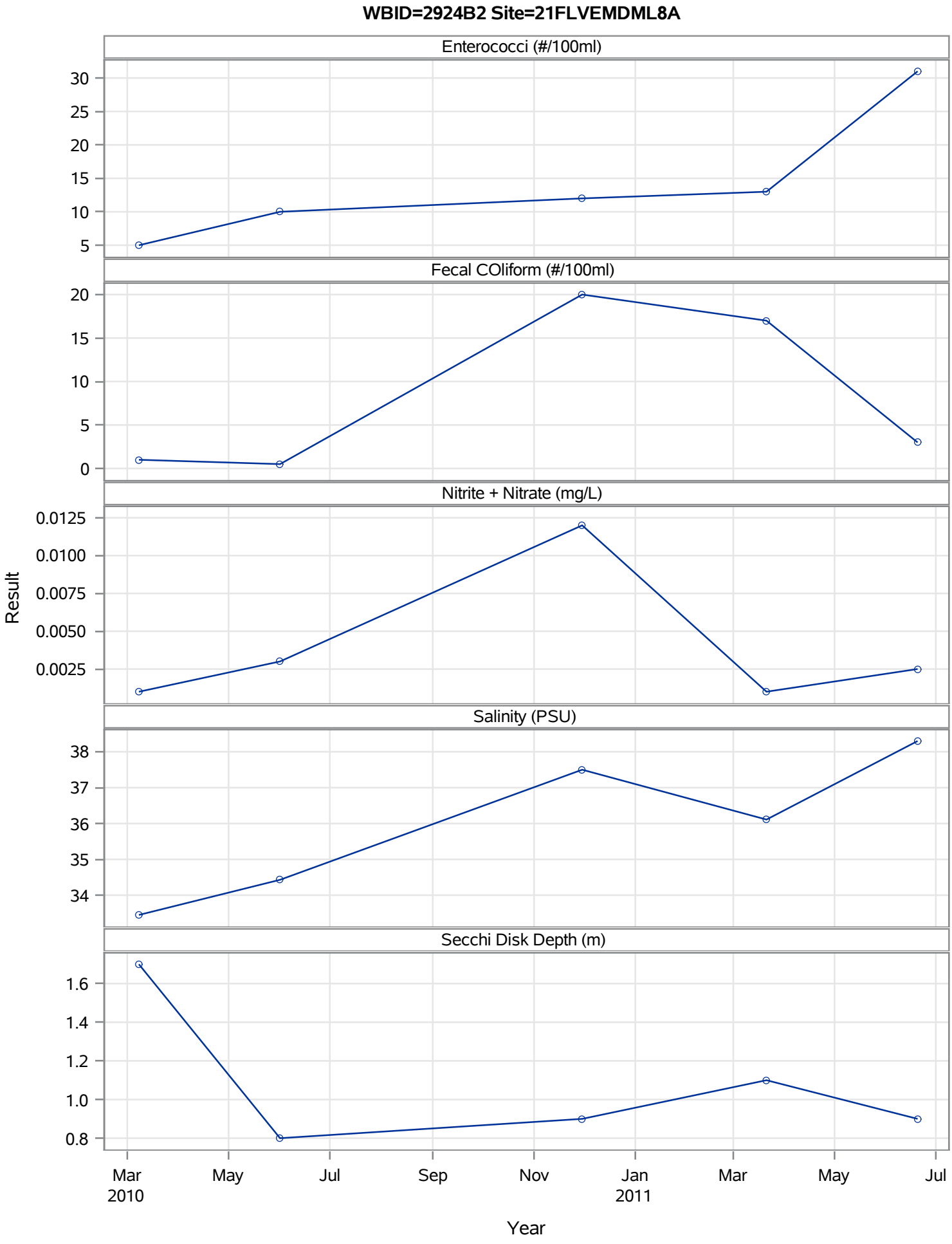

WBID=2924B2 Site=21FLVEMDML1A
Total Nitrogen (mg/L)
2.0
1.5
1.0
0.5
0.0
Total Phosphorus (mg/L)
0.08
0.06
0.04
0.02
pH
8.1
8.0
7.9
7.8
7.7
Result
2008
2010
2012
2014
2016
2018
2020
2022
2024
2026
Year

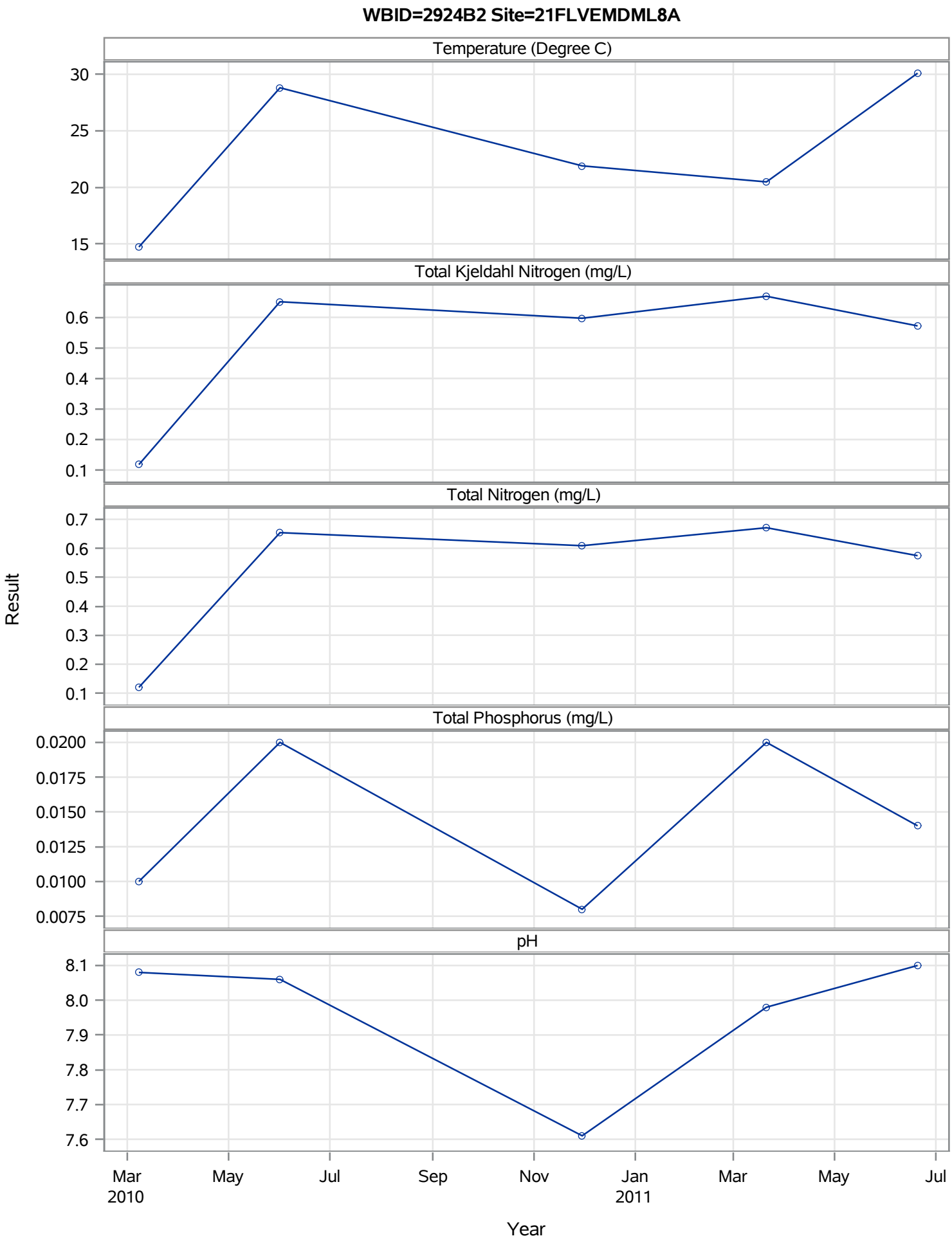

WBID=2924B2 Site=21FLVEMDML4A
Ammonia (mg/L)
1.50
1.25
1.00
0.75
Chlorophyll a (µg/L)
3.34
Dissolved Orthophosphate (mg/L)
0.002
Dissolved Oxygen (%)
93.8
93.6
93.4
93.2
93.0
Dissolved Oxygen (mg/L)
6.9
6.8
6.7
6.6
Result
16Nov
2010
01Dec
16Dec
01Jan
2011
16Jan
01Feb
16Feb
01Mar
16Mar
01Apr
Year

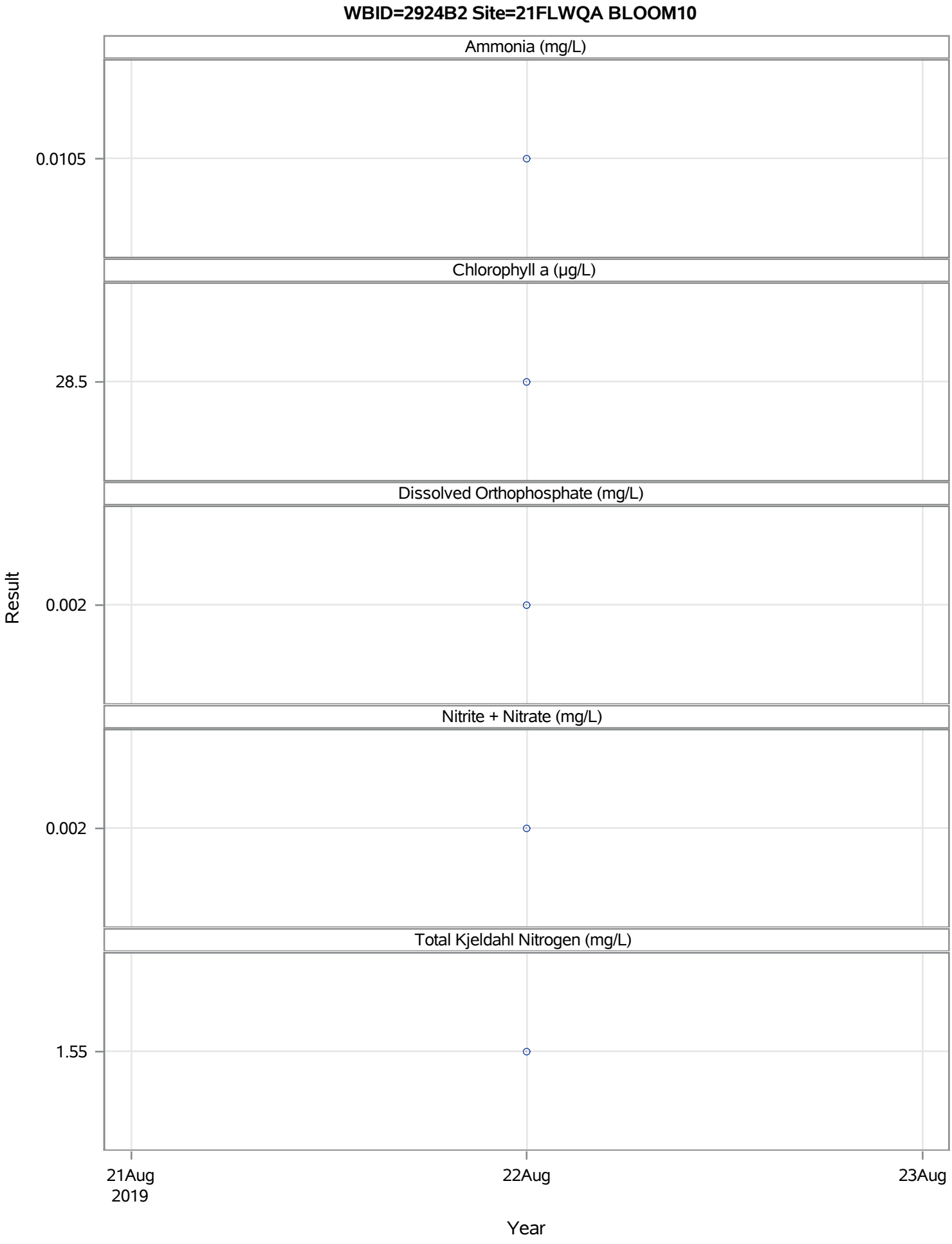

WBID=2924B2 Site=21FLVEMDML4A
Enterococci (#/100ml)
17.5
15.0
12.5
10.0
7.5
5.0
Fecal COliform (#/100ml)
17.5
15.0
12.5
10.0
7.5
5.0
Nitrite + Nitrate (mg/L)
0.005
0.004
0.003
0.002
0.001
Salinity (PSU)
37.25
37.00
36.75
36.50
36.25
36.00
Secchi Disk Depth (m)
1.4
1.3
1.2
1.1
1.0
Result
16Nov
2010
01Dec
16Dec
01Jan
2011
16Jan
01Feb
16Feb
01Mar
16Mar
01Apr
Year

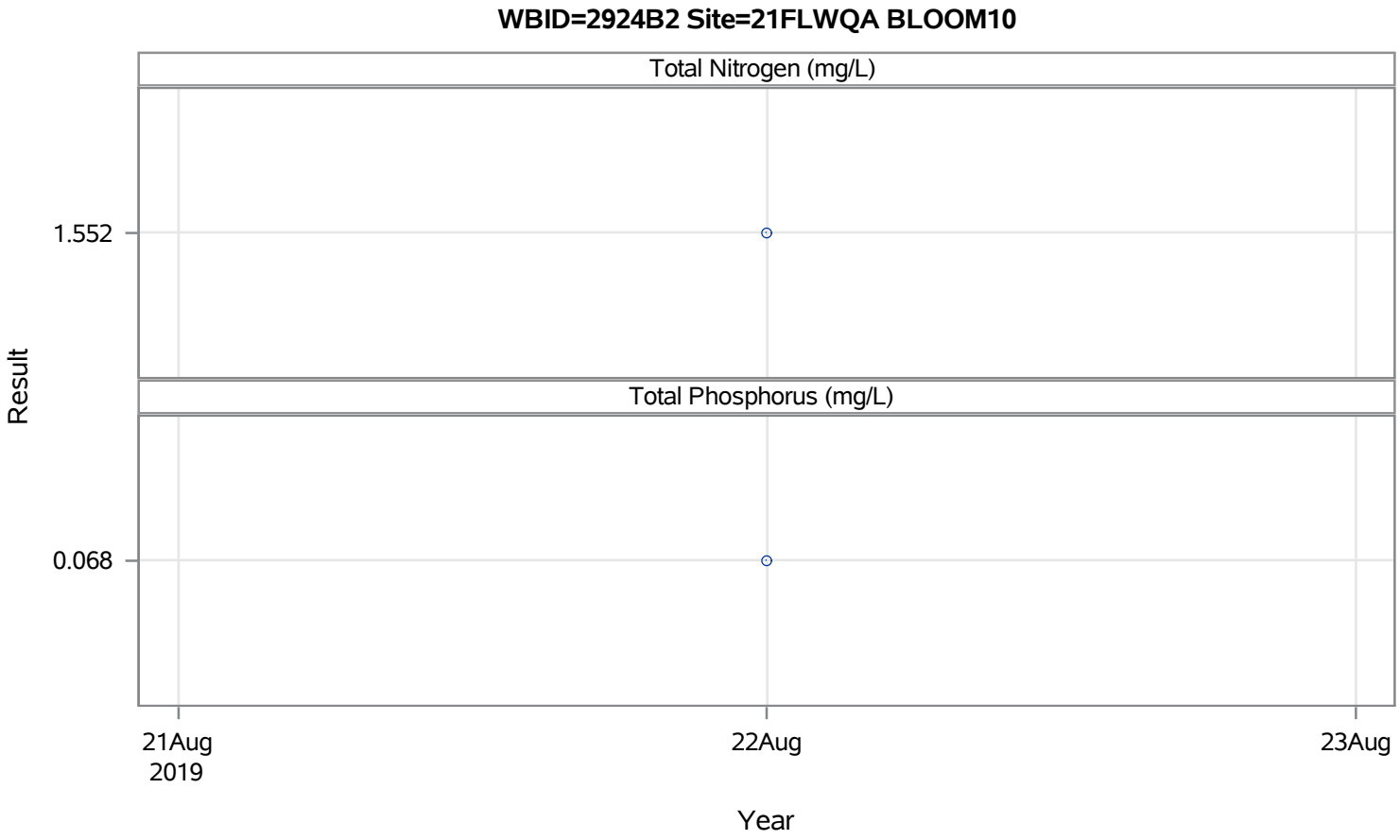

WBID=2924B2 Site=21FLVEMDML4A
Temperature (Degree C)
22.0
21.5
21.0
20.5
20.0
19.5
Total Kjeldahl Nitrogen (mg/L)
0.118
Total Nitrogen (mg/L)
0.123
0.122
0.121
0.120
0.119
Total Phosphorus (mg/L)
0.020
0.015
0.010
0.005
pH
8.0
7.9
7.8
7.7
Result
16Nov
2010
01Dec
16Dec
01Jan
2011
16Jan
01Feb
16Feb
01Mar
16Mar
01Apr
Year

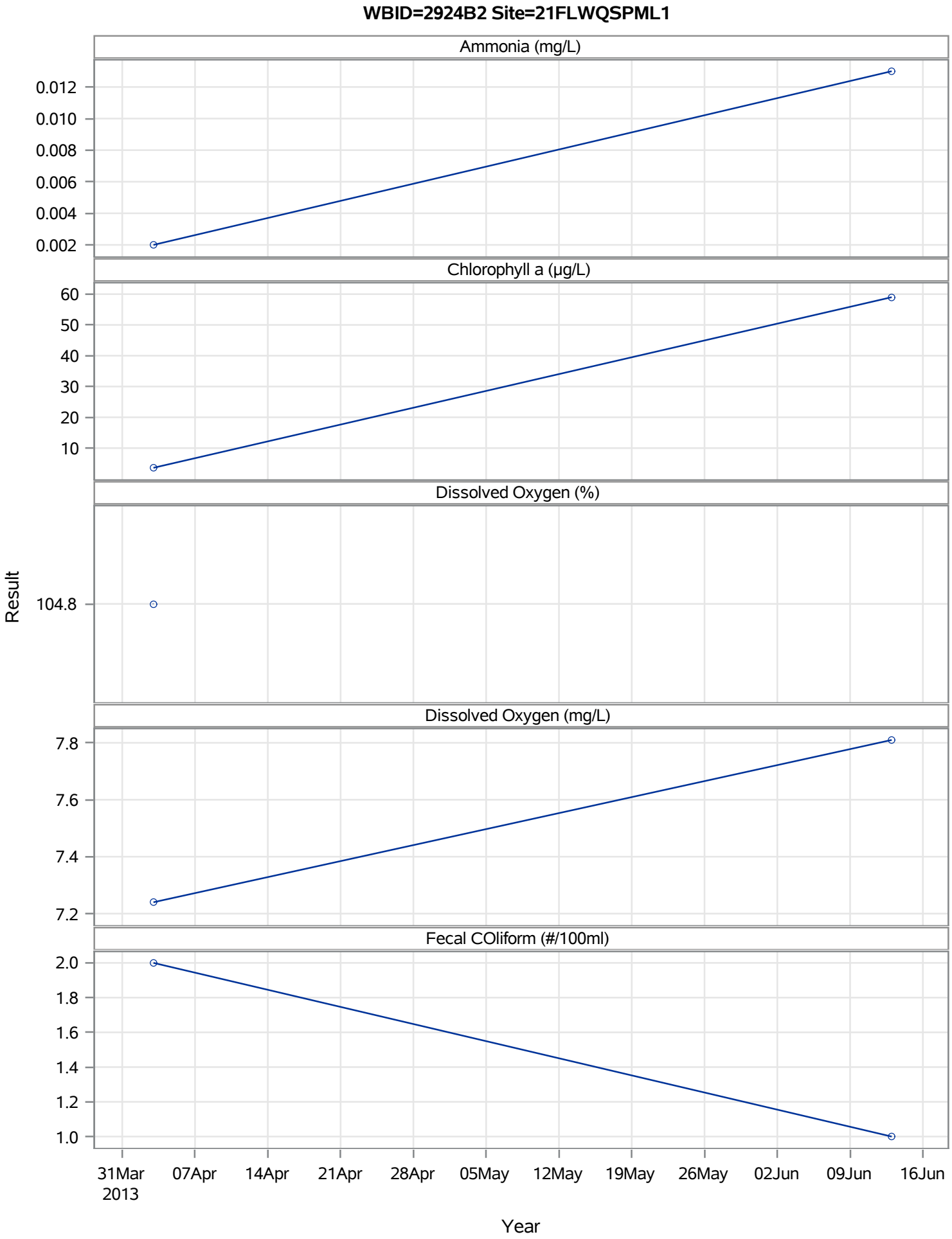

WBID=2924B2 Site=21FLVEMDML8A
Ammonia (mg/L)
1.50
1.25
1.00
0.75
0.50
0.25
0.00
Chlorophyll a (µg/L)
8
6
4
2
Dissolved Orthophosphate (mg/L)
0.06
0.04
0.02
0.00
Dissolved Oxygen (%)
97.5
95.0
92.5
90.0
87.5
Dissolved Oxygen (mg/L)
8.0
7.5
7.0
6.5
6.0
5.5
Result
Mar
2010
May
Jul
Sep
Nov
Jan
2011
Mar
May
Jul
Year

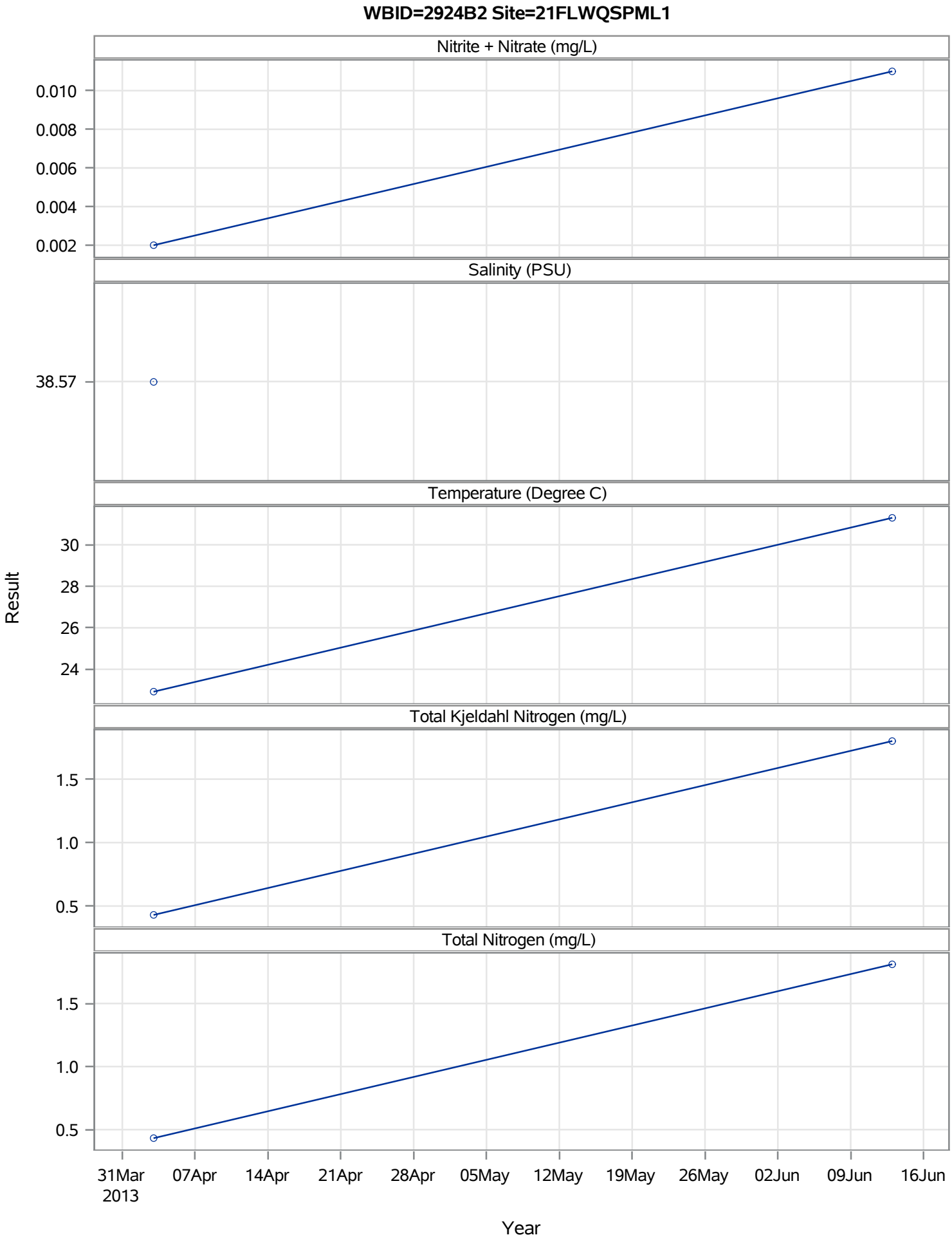

WBID=2924B2 Site=21FLVEMDML8A
Enterococci (#/100ml)
30
25
20
15
10
5
Fecal COliform (#/100ml)
20
15
10
5
0
Nitrite + Nitrate (mg/L)
0.0125
0.0100
0.0075
0.0050
0.0025
Result
Salinity (PSU)
38
37
36
35
34
Secchi Disk Depth (m)
1.6
1.4
1.2
1.0
0.8
Mar
2010
May
Jul
Sep
Nov
Jan
2011
Mar
May
Jul
Year

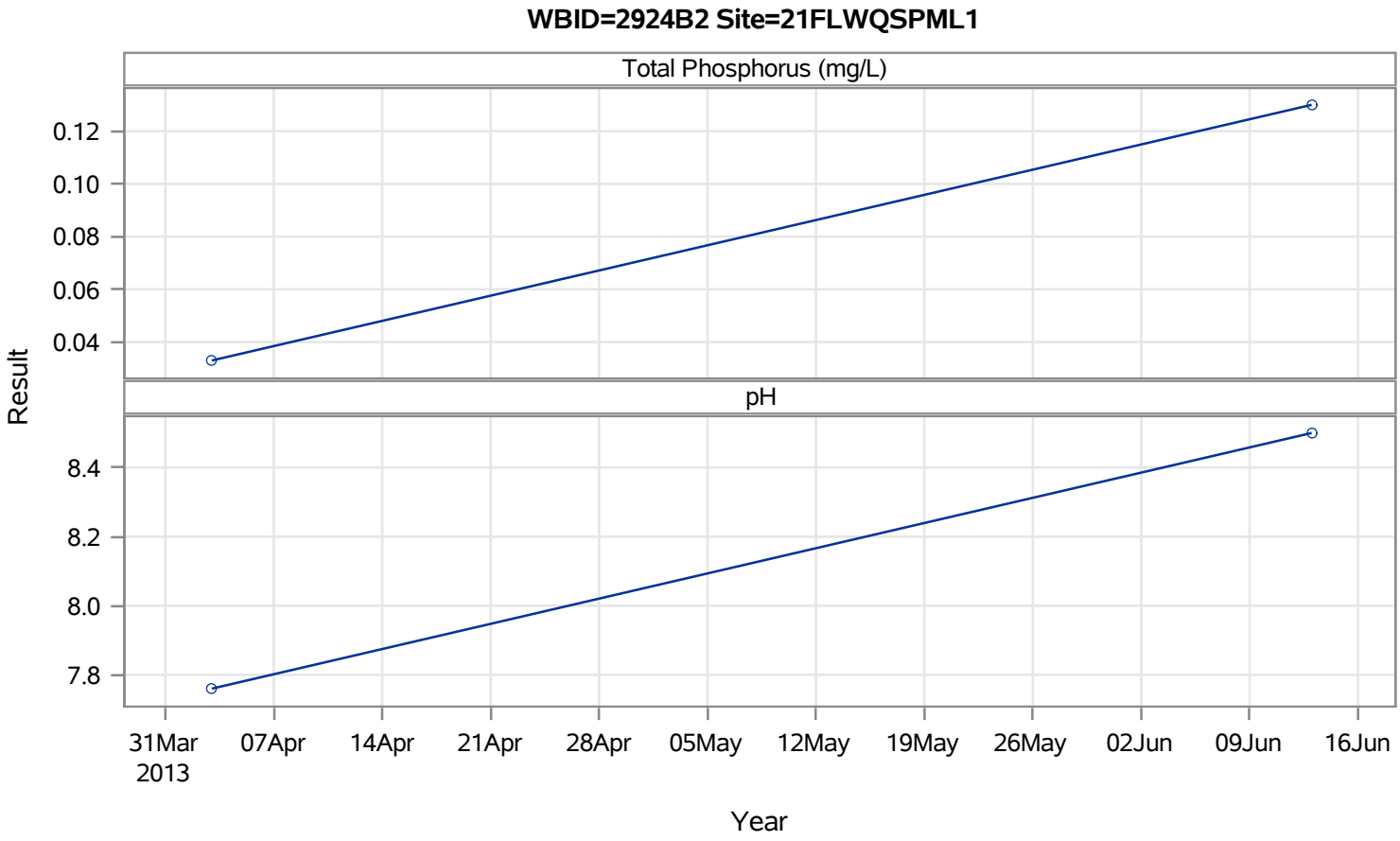

WBID=2924B2 Site=21FLVEMDML8A
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
0.6
0.5
0.4
0.3
0.2
0.1
Total Nitrogen (mg/L)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
Result
Total Phosphorus (mg/L)
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
pH
8.1
8.0
7.9
7.8
7.7
7.6
Mar
2010
May
Jul
Sep
Nov
Jan
2011
Mar
May
Jul
Year

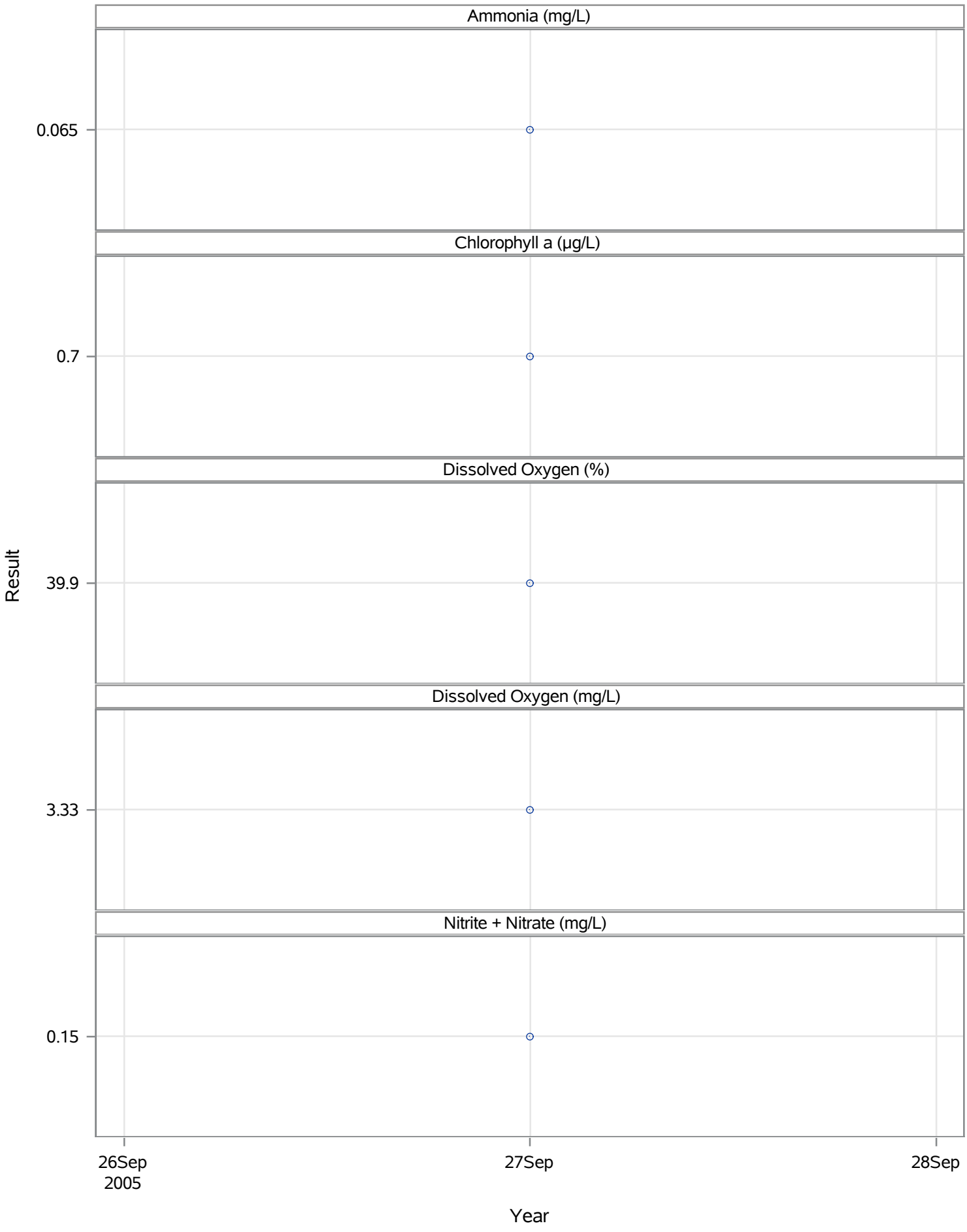

WBID=2924B2 Site=21FLWQA BLOOM10
Ammonia (mg/L)
Chlorophyll a (µg/L)
Dissolved Orthophosphate (mg/L)
Nitrite + Nitrate (mg/L)
Total Kjeldahl Nitrogen (mg/L)
Result
0.0105
28.5
0.002
0.002
1.55
21Aug
2019
22Aug
23Aug
Year

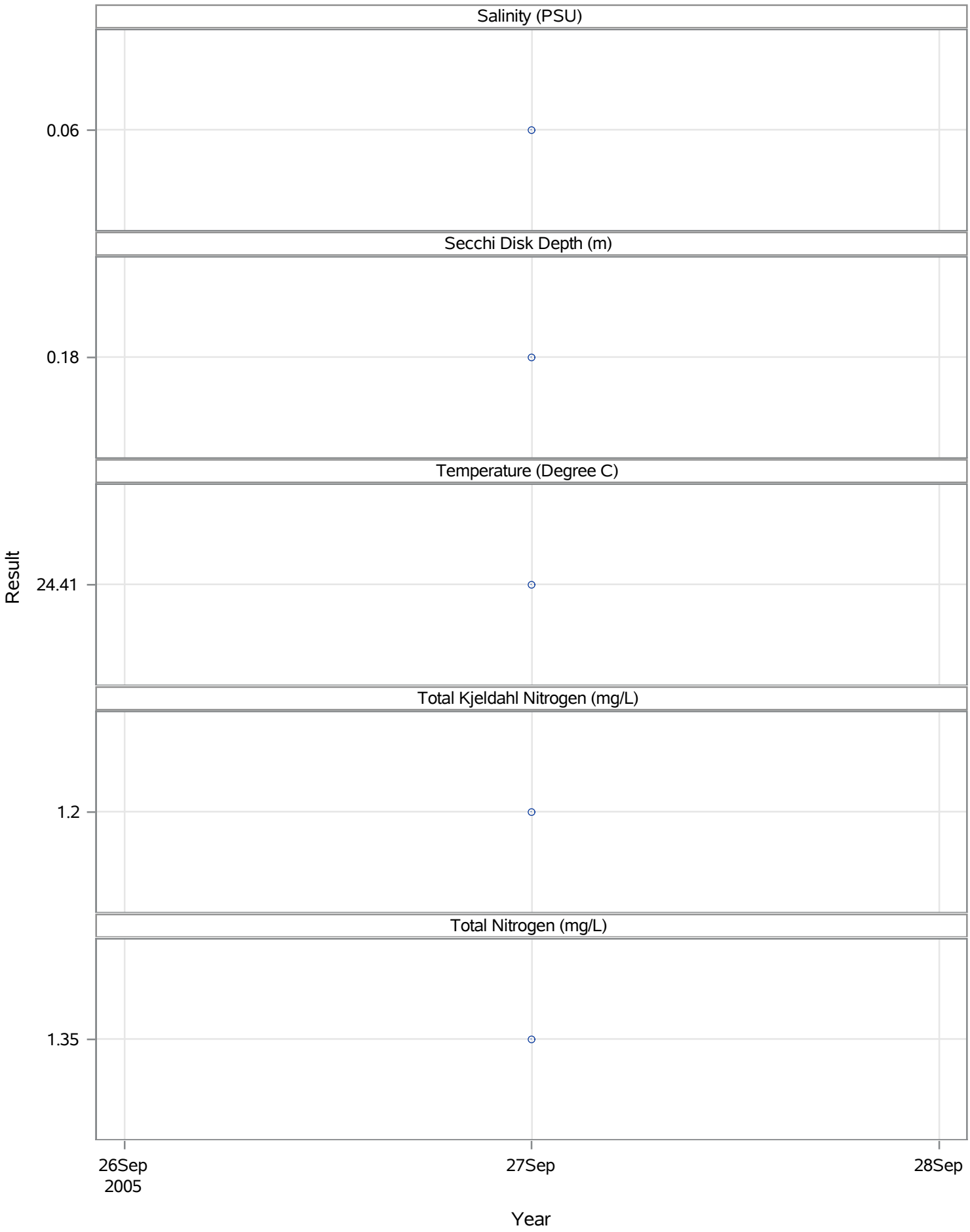

WBID=2924B2 Site=21FLWQA BLOOM10
Total Nitrogen (mg/L)
Total Phosphorus (mg/L)
1.552
0.068
Result
21Aug
2019
22Aug
23Aug
Year


WBID=2924B2 Site=21FLWQSPML1
Ammonia (mg/L)
0.012
0.010
0.008
0.006
0.004
0.002
Chlorophyll a (µg/L)
60
50
40
30
20
10
Dissolved Oxygen (%)
104.8
Dissolved Oxygen (mg/L)
7.8
7.6
7.4
7.2
Fecal COliform (#/100ml)
2.0
1.8
1.6
1.4
1.2
1.0
Result
31Mar
2013
07Apr
14Apr
21Apr
28Apr
05May
12May
19May
26May
02Jun
09Jun
16Jun
Year

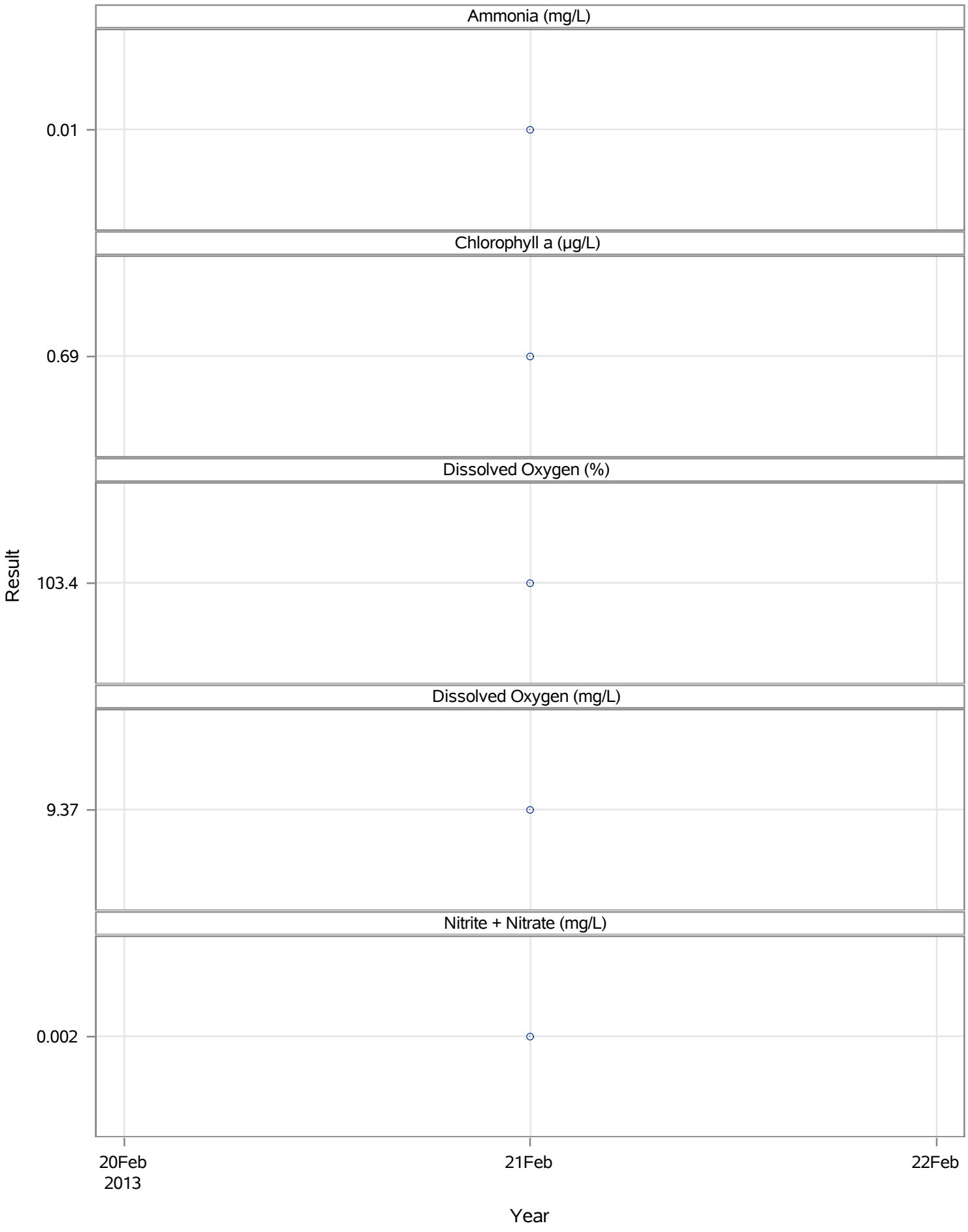

WBID=2924B2 Site=21FLWQSPML1
Nitrite + Nitrate (mg/L)
0.010
0.008
0.006
0.004
0.002
Salinity (PSU)
38.57
Temperature (Degree C)
30
28
26
24
Total Kjeldahl Nitrogen (mg/L)
1.5
1.0
0.5
Total Nitrogen (mg/L)
1.5
1.0
0.5
Result
31Mar
2013
07Apr
14Apr
21Apr
28Apr
05May
12May
19May
26May
02Jun
09Jun
16Jun
Year

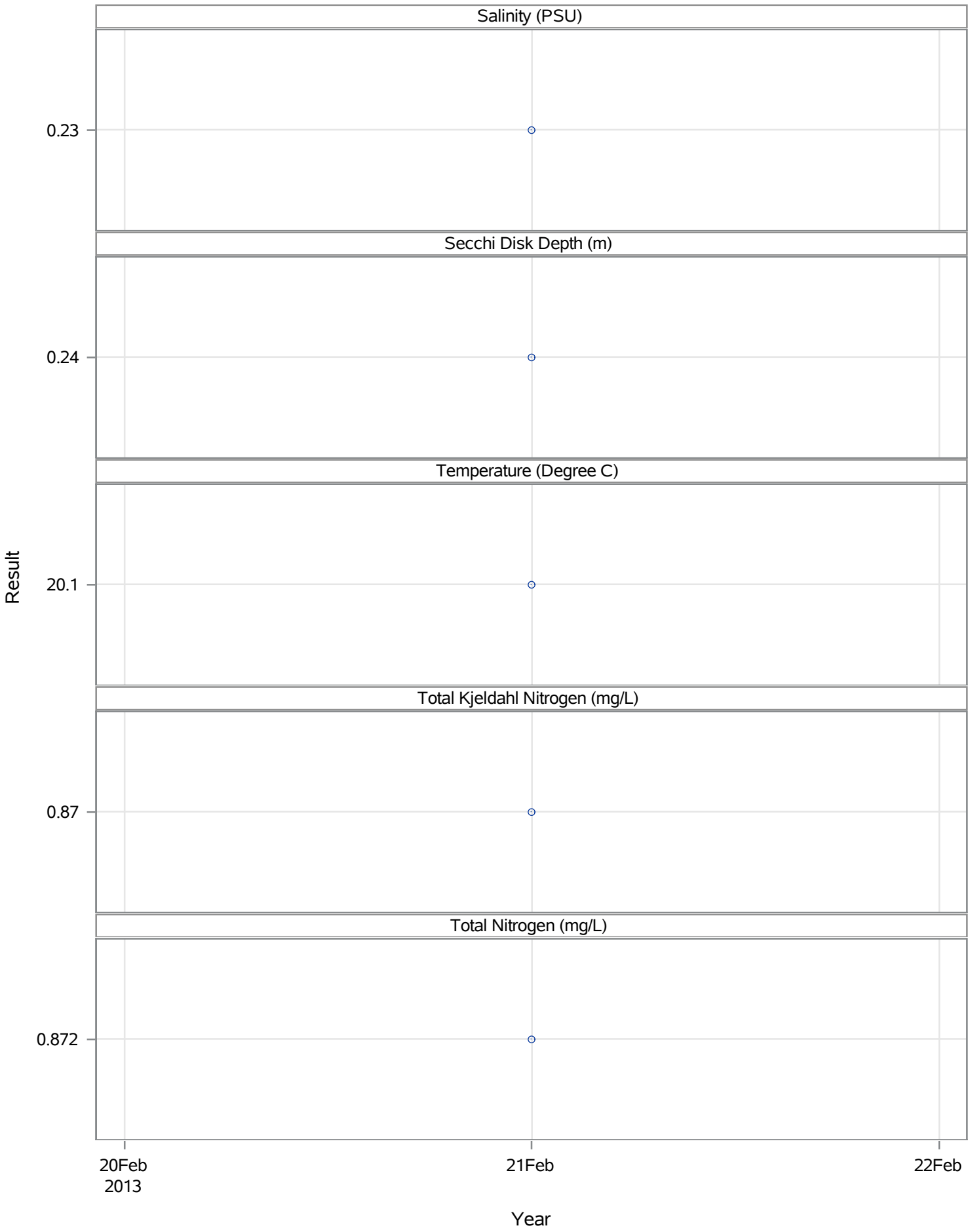

WBID=2924B2 Site=21FLWQSPML1
Total Phosphorus (mg/L)
0.12
0.10
0.08
0.06
0.04
pH
8.4
8.2
8.0
7.8
Result
31Mar
2013
07Apr
14Apr
21Apr
28Apr
05May
12May
19May
26May
02Jun
09Jun
16Jun
Year

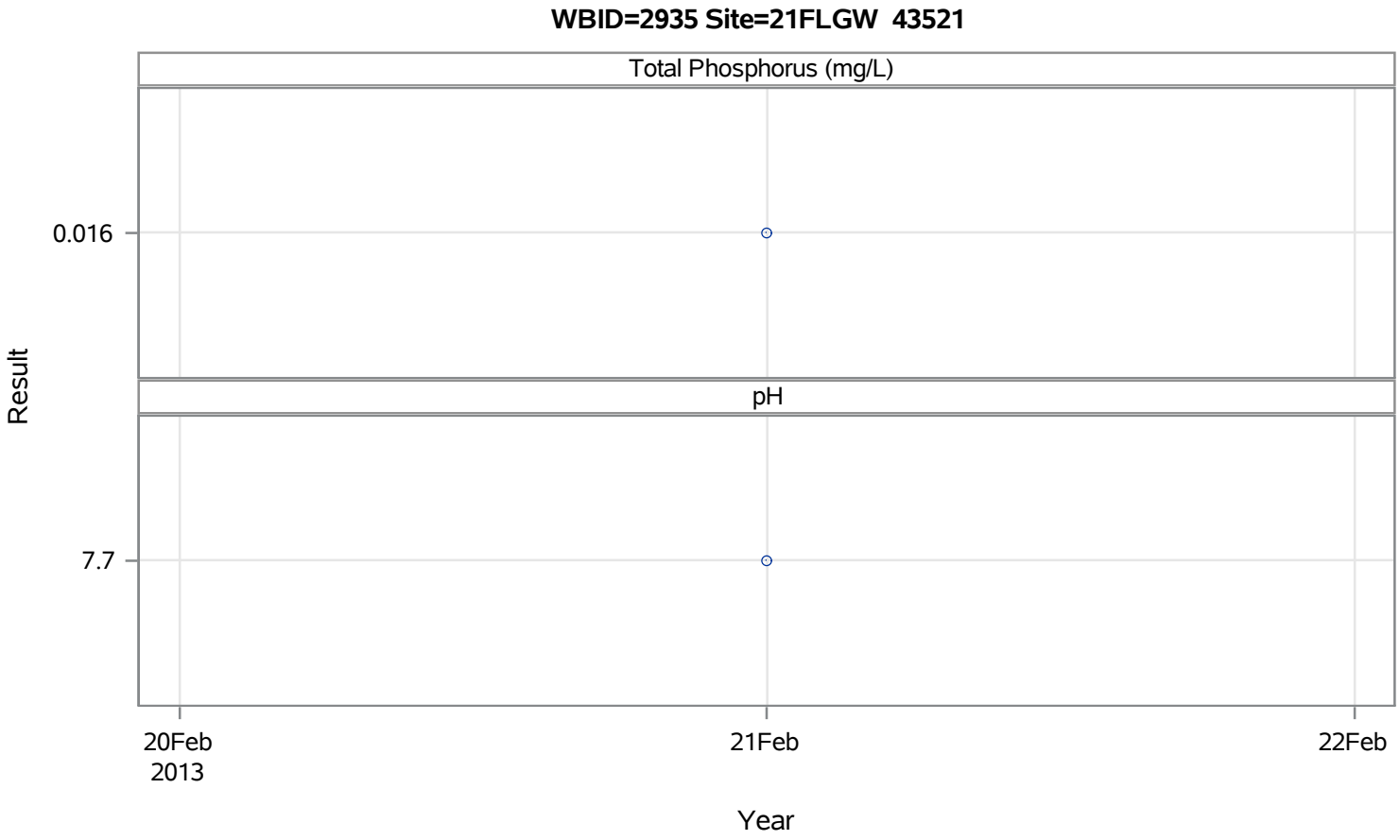

WBID=2935 Site=21FLGW 28283
Ammonia (mg/L)
0.065
Chlorophyll a (µg/L)
0.7
Dissolved Oxygen (%)
39.9
Dissolved Oxygen (mg/L)
3.33
Nitrite + Nitrate (mg/L)
0.15
Result
26Sep
2005
27Sep
28Sep
Year

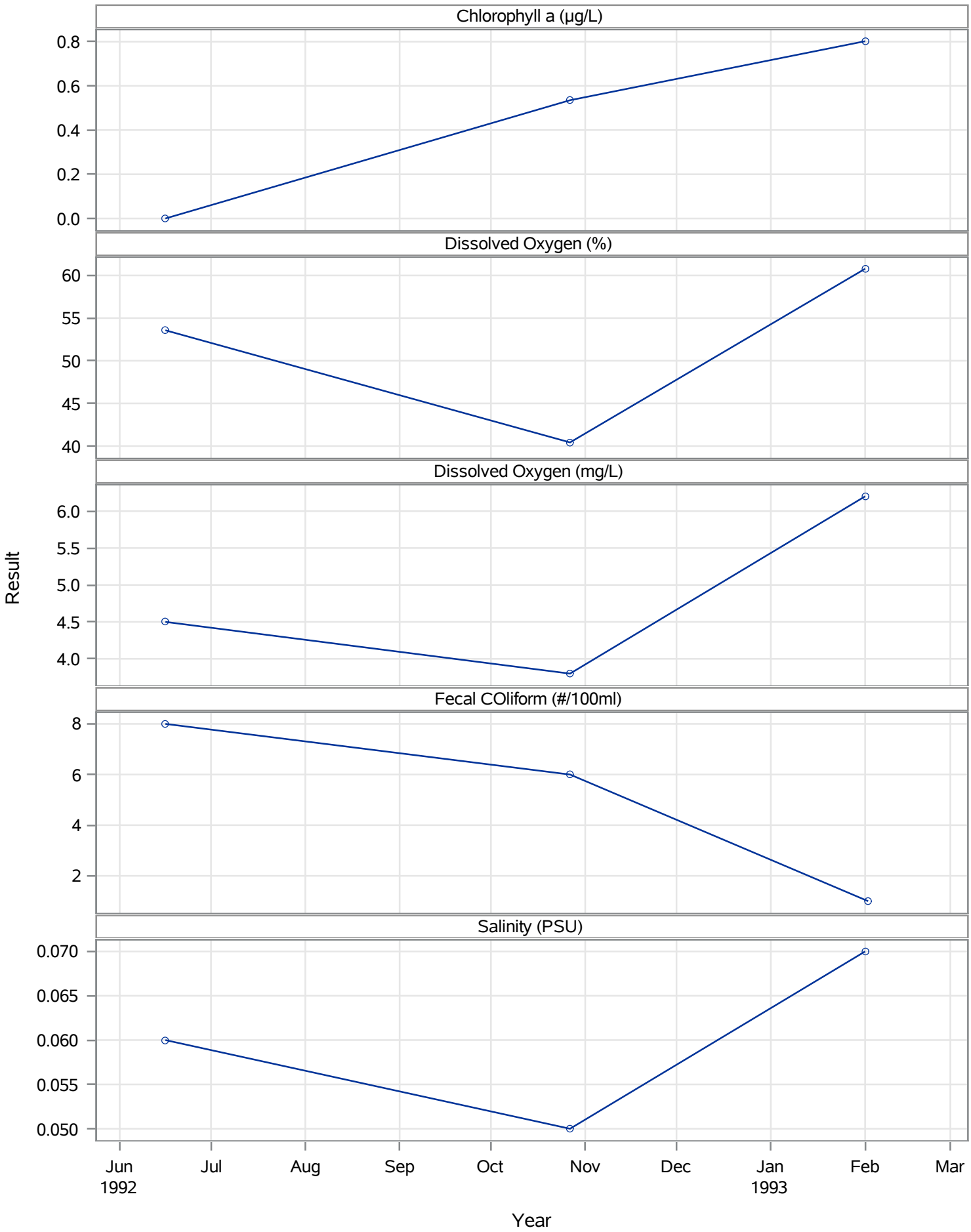

WBID=2935 Site=21FLGW 28283
Salinity (PSU)
0.06
Secchi Disk Depth (m)
0.18
Temperature (Degree C)
24.41
Total Kjeldahl Nitrogen (mg/L)
1.2
Total Nitrogen (mg/L)
1.35
Result
26Sep
2005
27Sep
28Sep
Year

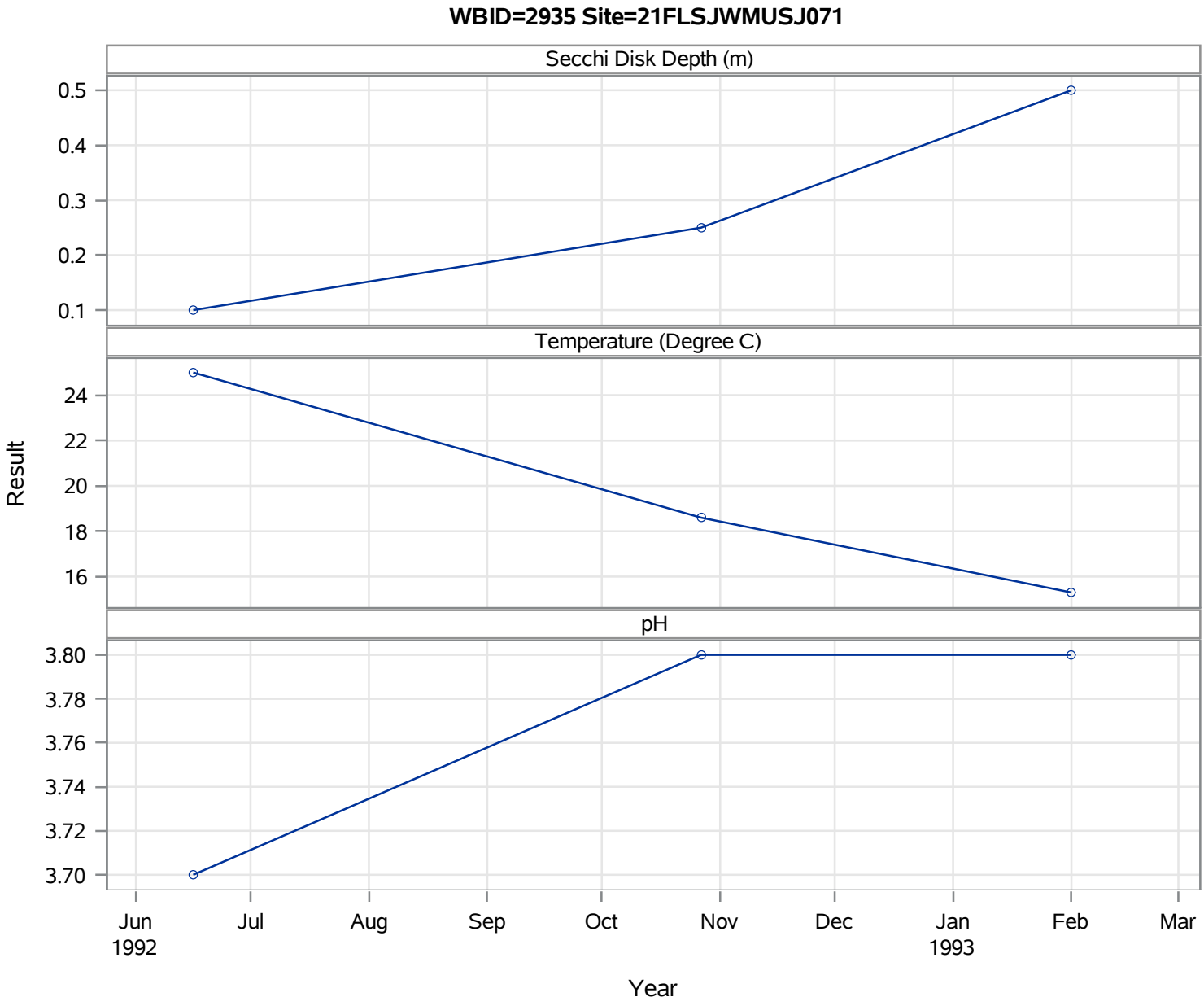

WBID=2935 Site=21FLGW 28283
Total Phosphorus (mg/L)
0.11
pH
6.1
Result
26Sep
2005
27Sep
28Sep
Year

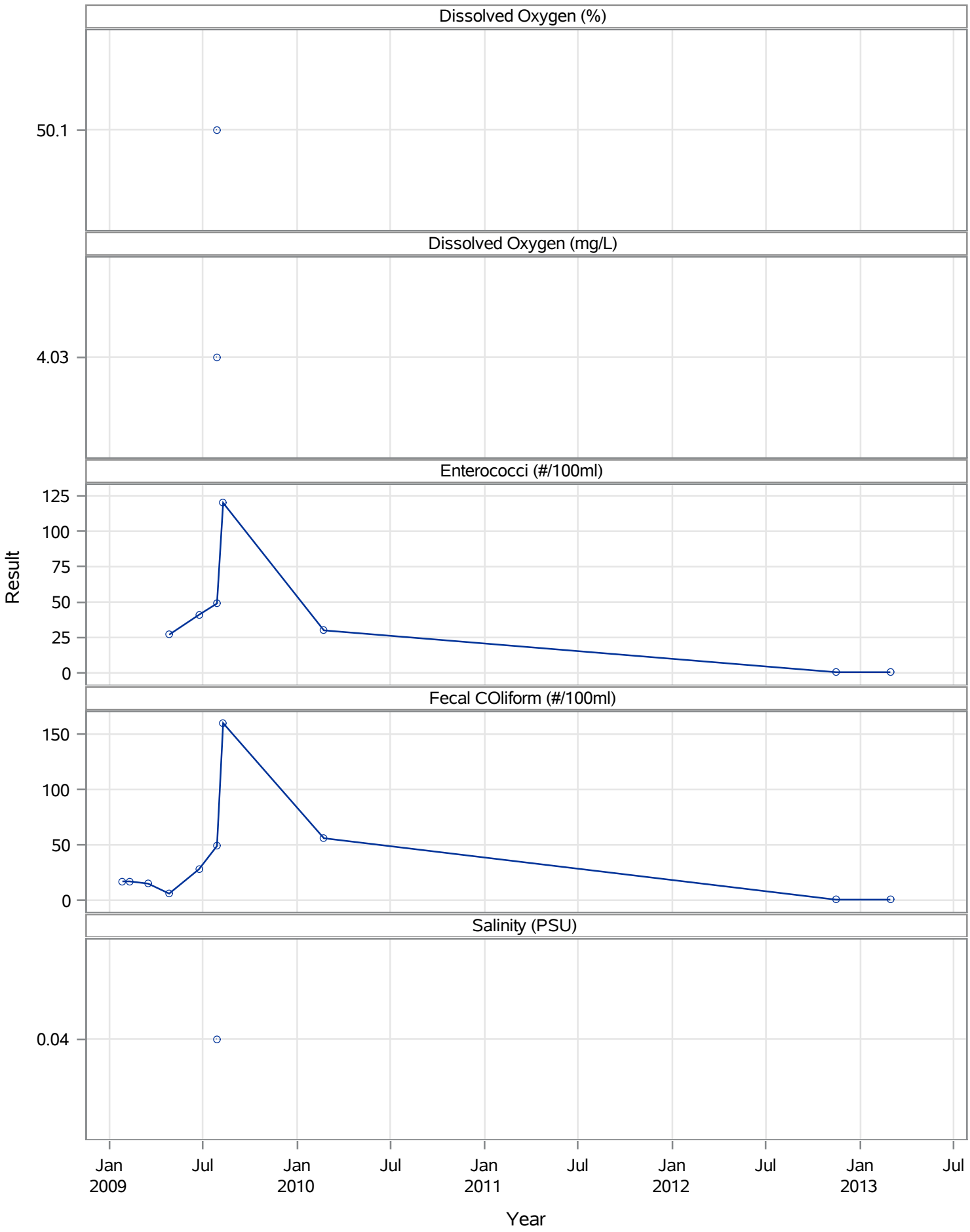

WBID=2935 Site=21FLGW 43521
Ammonia (mg/L)
0.01
Chlorophyll a (µg/L)
0.69
Dissolved Oxygen (%)
103.4
Dissolved Oxygen (mg/L)
9.37
Nitrite + Nitrate (mg/L)
0.002
Result
20Feb
2013
21Feb
22Feb
Year

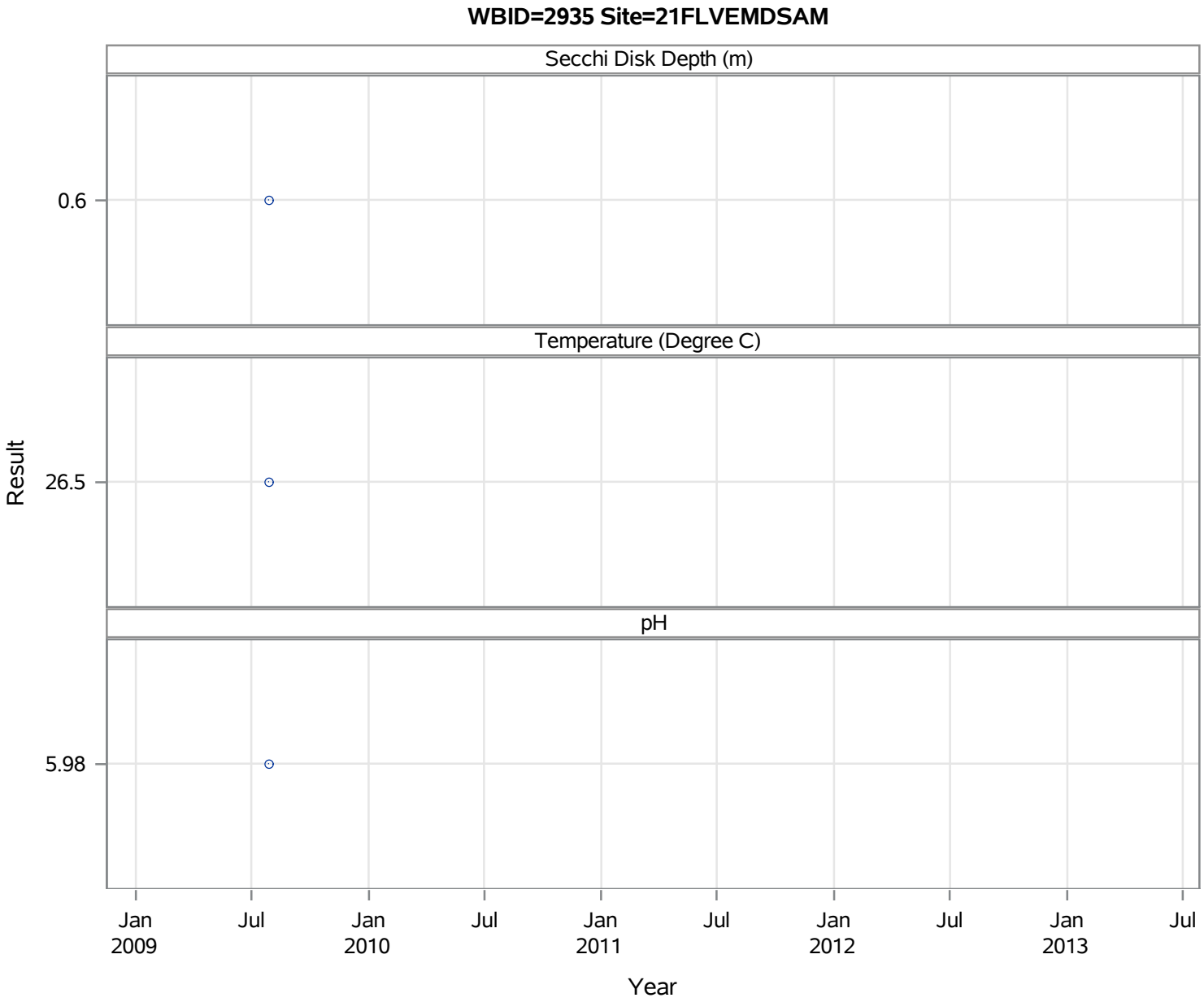

WBID=2935 Site=21FLGW 43521
Salinity (PSU)
0.23
Secchi Disk Depth (m)
0.24
Temperature (Degree C)
20.1
Total Kjeldahl Nitrogen (mg/L)
0.87
Total Nitrogen (mg/L)
0.872
Result
20Feb
2013
21Feb
22Feb
Year

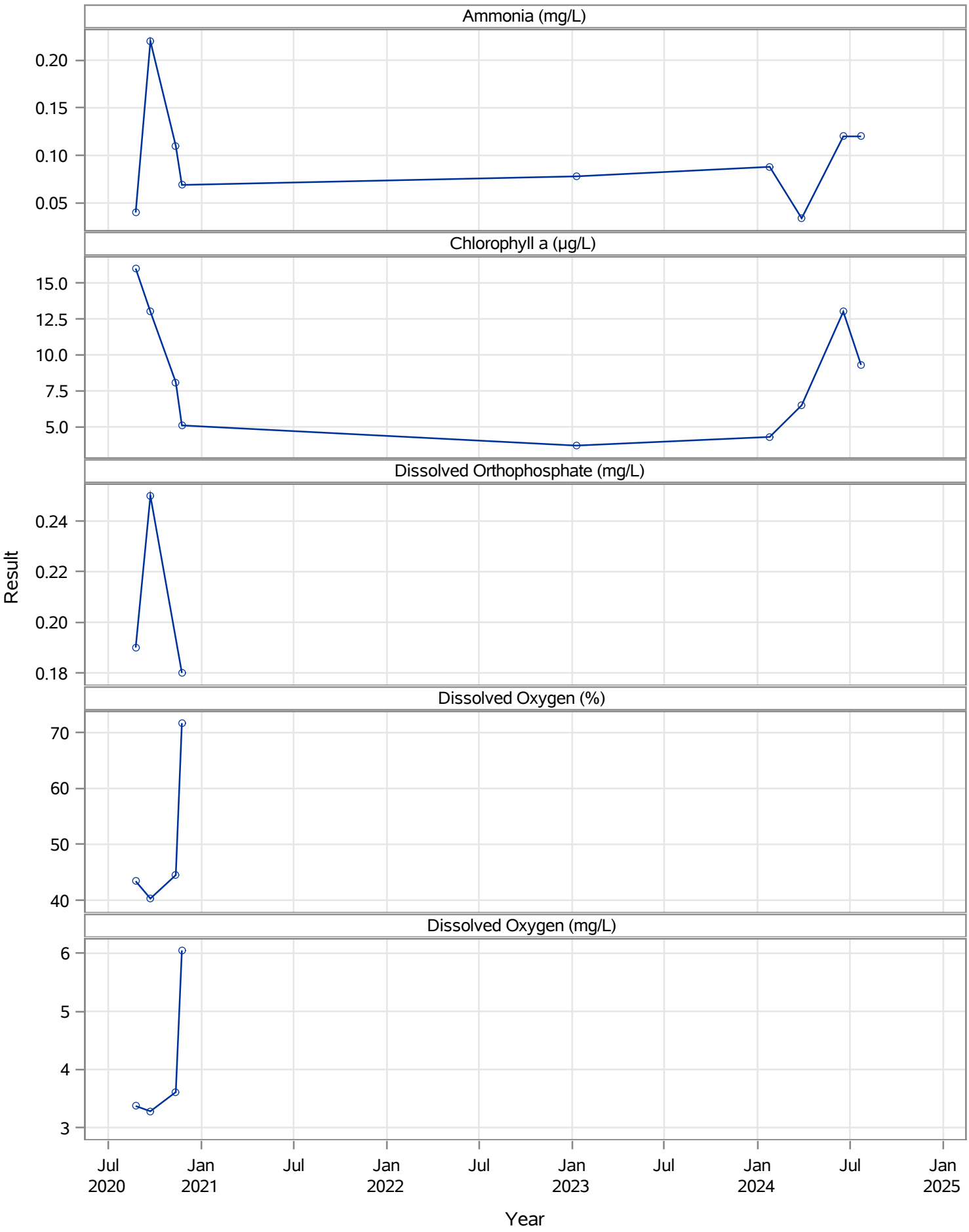

WBID=2935 Site=21FLGW 43521
Total Phosphorus (mg/L)
0.016
pH
7.7
Result
20Feb
2013
21Feb
22Feb
Year

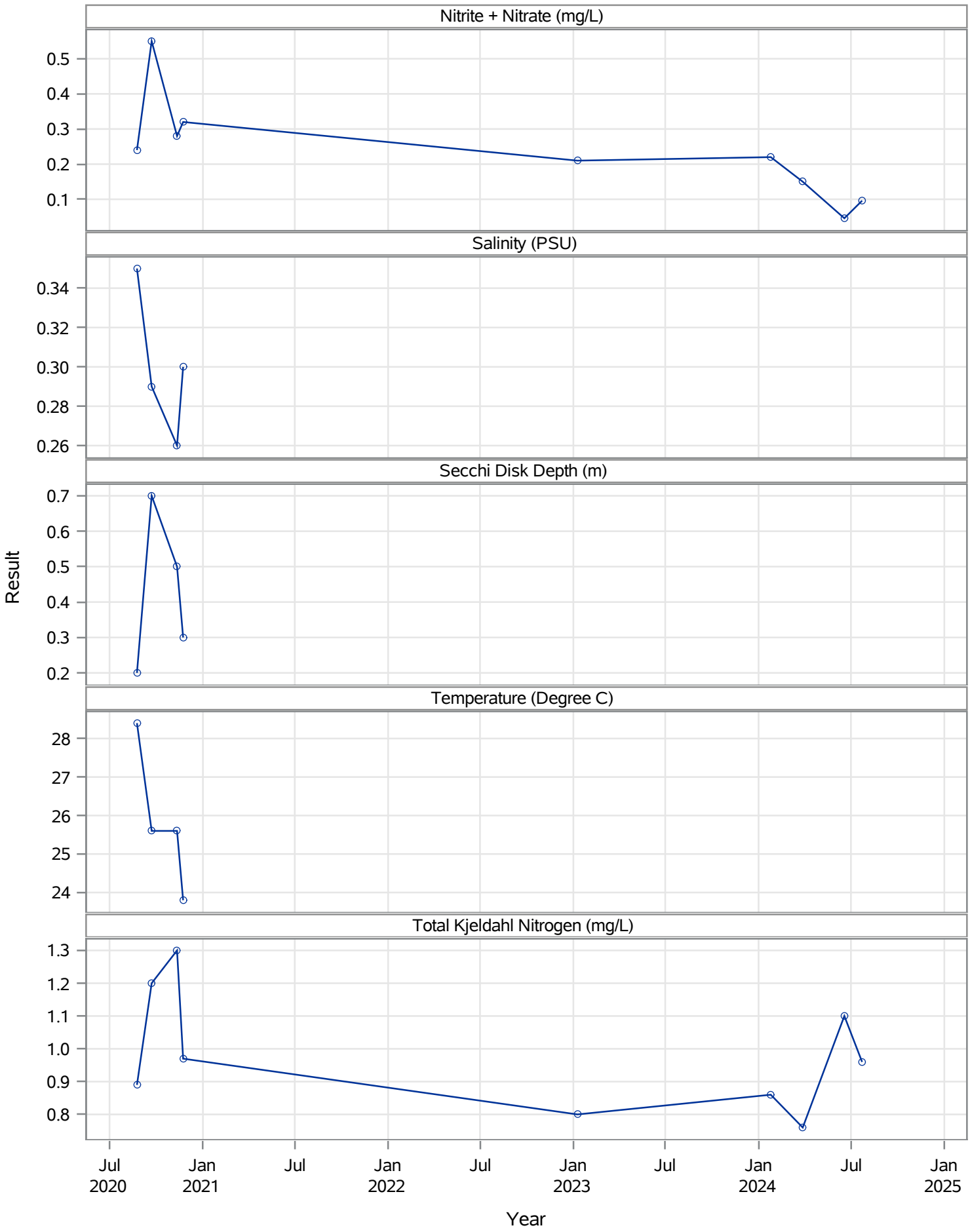

WBID=2935 Site=21FLSJWMUSJ071
Chlorophyll a (µg/L)
0.8
0.6
0.4
0.2
0.0
Dissolved Oxygen (%)
60
55
50
45
40
Dissolved Oxygen (mg/L)
6.0
5.5
5.0
4.5
4.0
Fecal COliform (#/100ml)
8
6
4
2
Salinity (PSU)
0.070
0.065
0.060
0.055
0.050
Result
Jun
1992
Jul
Aug
Sep
Oct
Nov
Dec
Jan
1993
Feb
Mar
Year

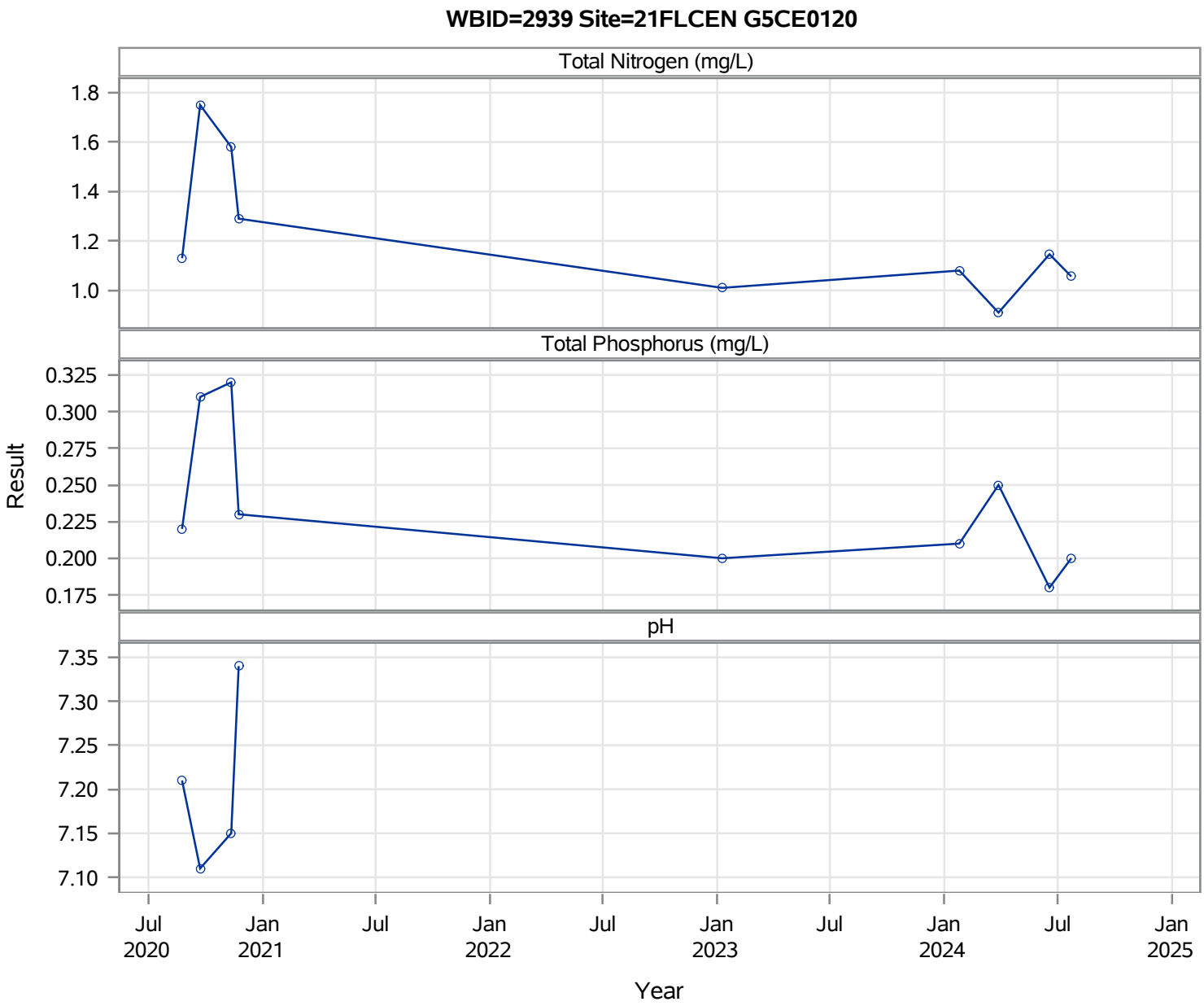

WBID=2935 Site=21FLSJWMUSJ071
Secchi Disk Depth (m)
0.5
0.4
0.3
0.2
0.1
Temperature (Degree C)
24
22
20
18
16
pH
3.80
3.78
3.76
3.74
3.72
3.70
Result
Jun
1992
Jul
Aug
Sep
Oct
Nov
Dec
Jan
1993
Feb
Mar
Year

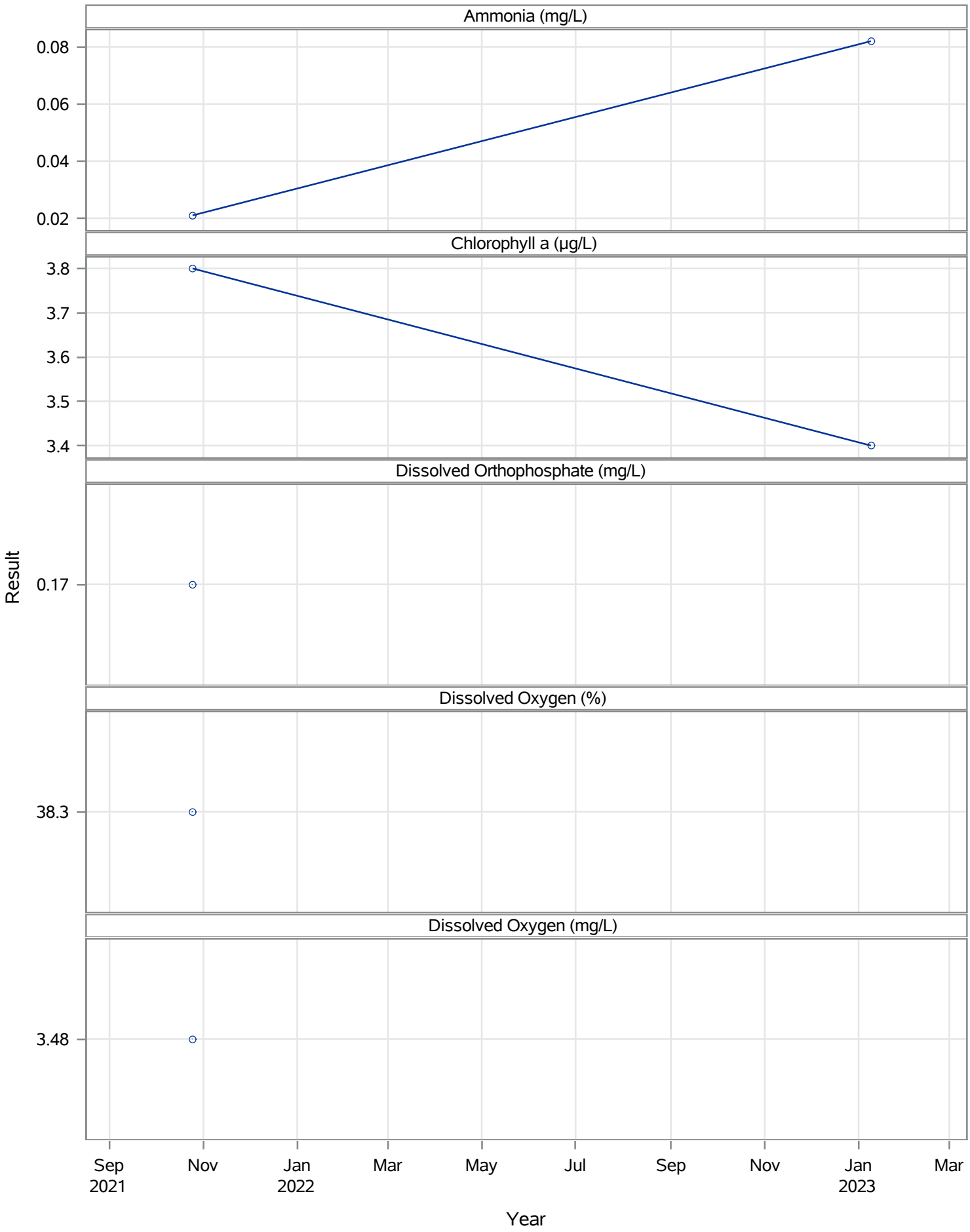

WBID=2935 Site=21FLVEMDSAM
Dissolved Oxygen (%)
50.1
Dissolved Oxygen (mg/L)
4.03
Enterococci (#/100ml)
125
100
75
50
25
0
Fecal COliform (#/100ml)
150
100
50
0
Salinity (PSU)
0.04
Result
Jan 2009
Jul
Jan 2010
Jul
Jan 2011
Jul
Jan 2012
Jul
Jan 2013
Jul
Year

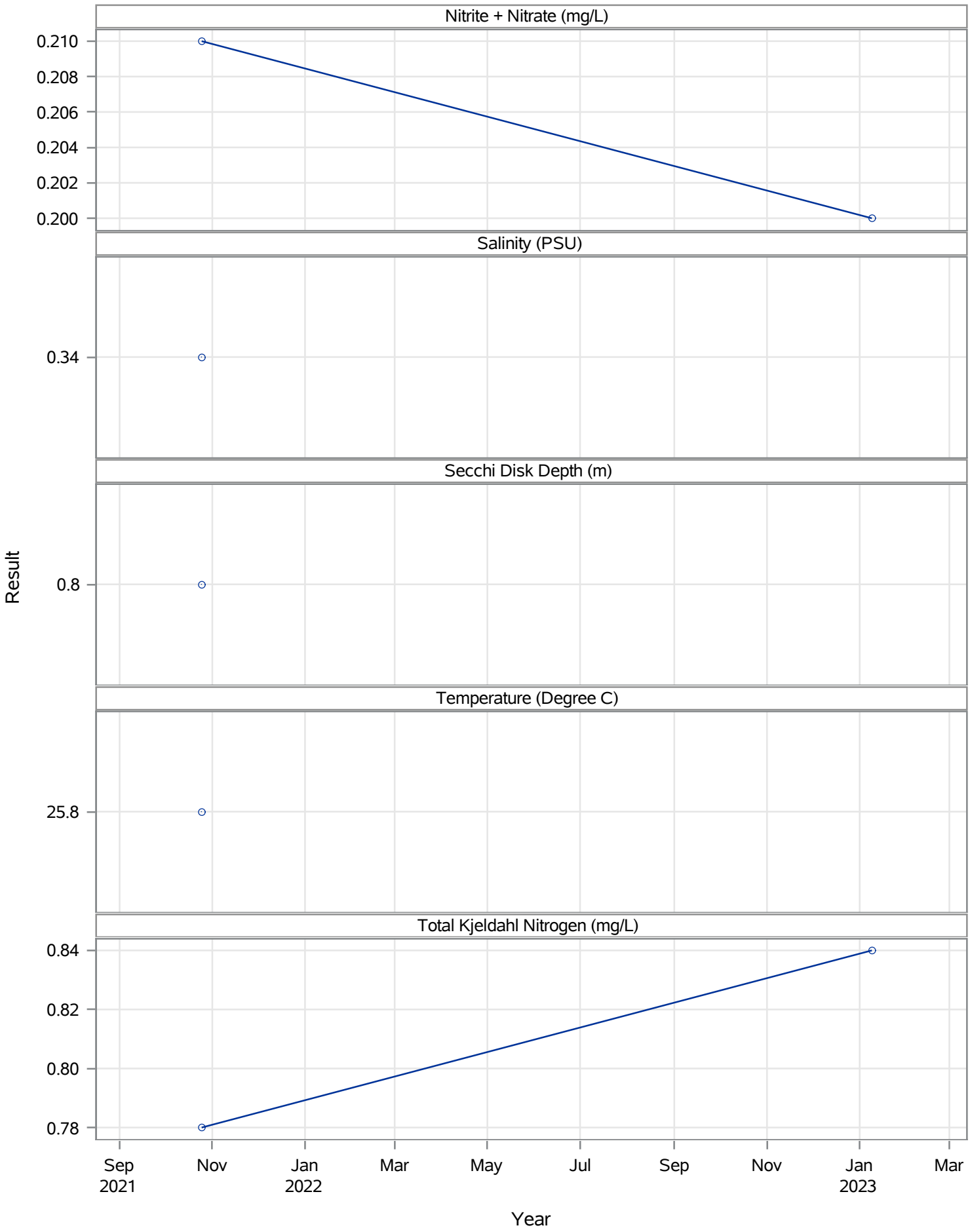

WBID=2935 Site=21FLVEMDSAM
Secchi Disk Depth (m)
Temperature (Degree C)
pH
Result
0.6
26.5
5.98
Jan
2009
Jul
Jan
2010
Jul
Jan
2011
Jul
Jan
2012
Jul
Jan
2013
Jul
Year

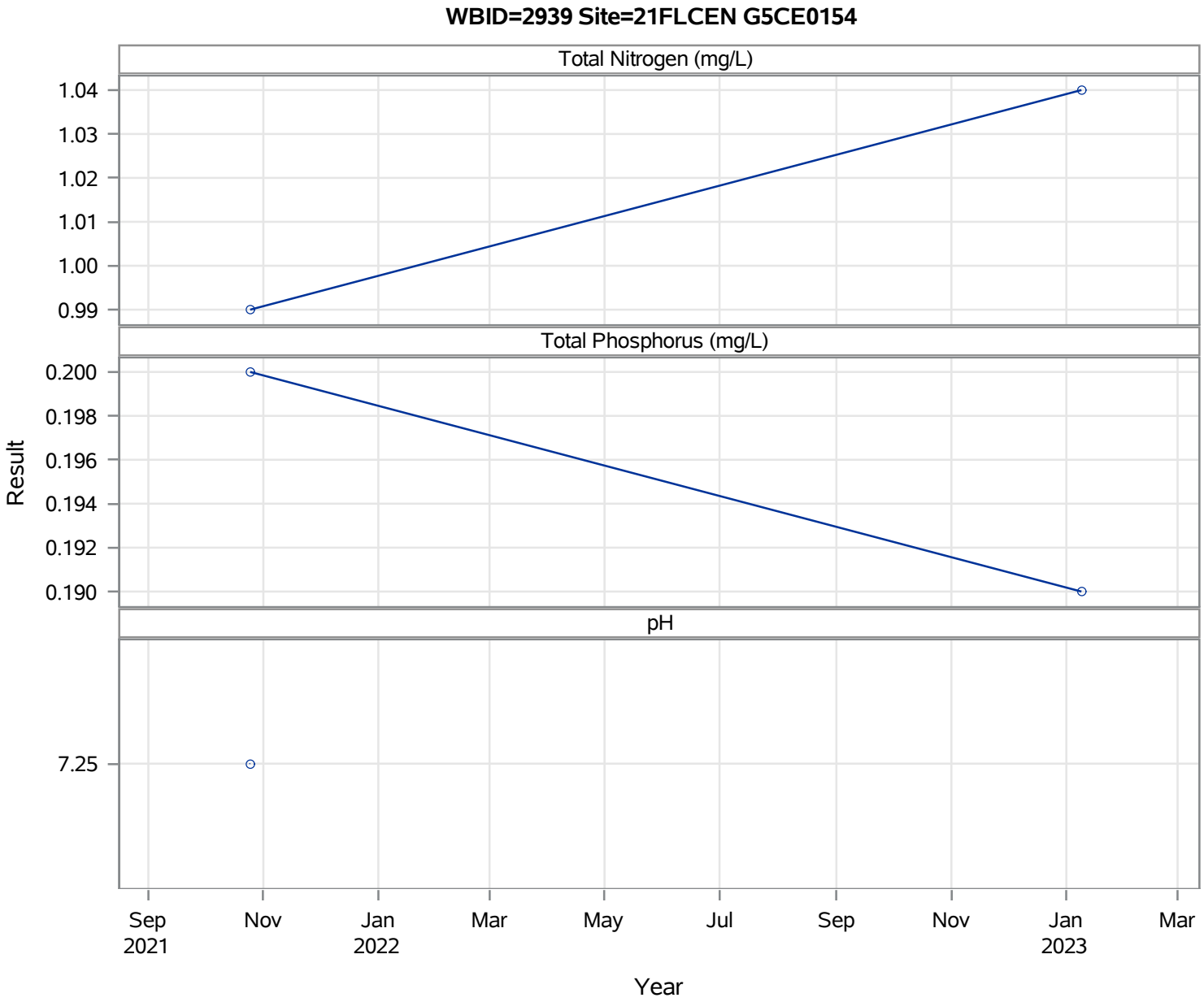

WBID=2939 Site=21FLCEN G5CE0120
Ammonia (mg/L)
0.20
0.15
0.10
0.05
Chlorophyll a (µg/L)
15.0
12.5
10.0
7.5
5.0
Dissolved Orthophosphate (mg/L)
0.24
0.22
0.20
0.18
Dissolved Oxygen (%)
70
60
50
40
Dissolved Oxygen (mg/L)
6
5
4
3
Result
Jul 2020
Jan 2021
Jul
Jan 2022
Jul
Jan 2023
Jul
Jan 2024
Jul
Jan 2025
Year

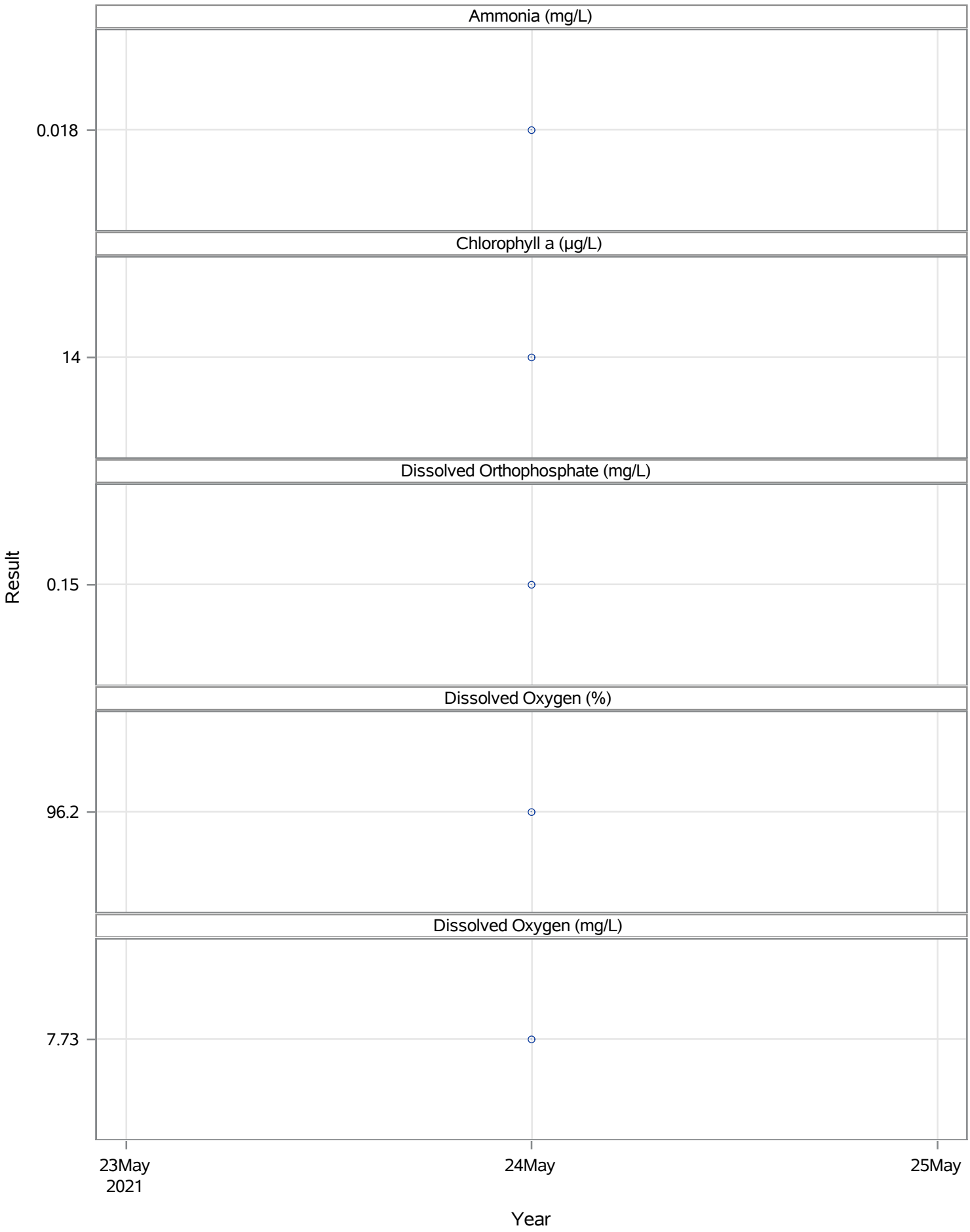

WBID=2939 Site=21FLCEN G5CE0120
Nitrite + Nitrate (mg/L)
0.5
0.4
0.3
0.2
0.1
Salinity (PSU)
0.34
0.32
0.30
0.28
0.26
Secchi Disk Depth (m)
0.7
0.6
0.5
0.4
0.3
0.2
Temperature (Degree C)
28
27
26
25
24
Total Kjeldahl Nitrogen (mg/L)
1.3
1.2
1.1
1.0
0.9
0.8
Result
Jul 2020
Jan 2021
Jul
Jan 2022
Jul
Jan 2023
Jul
Jan 2024
Jul
Jan 2025
Year

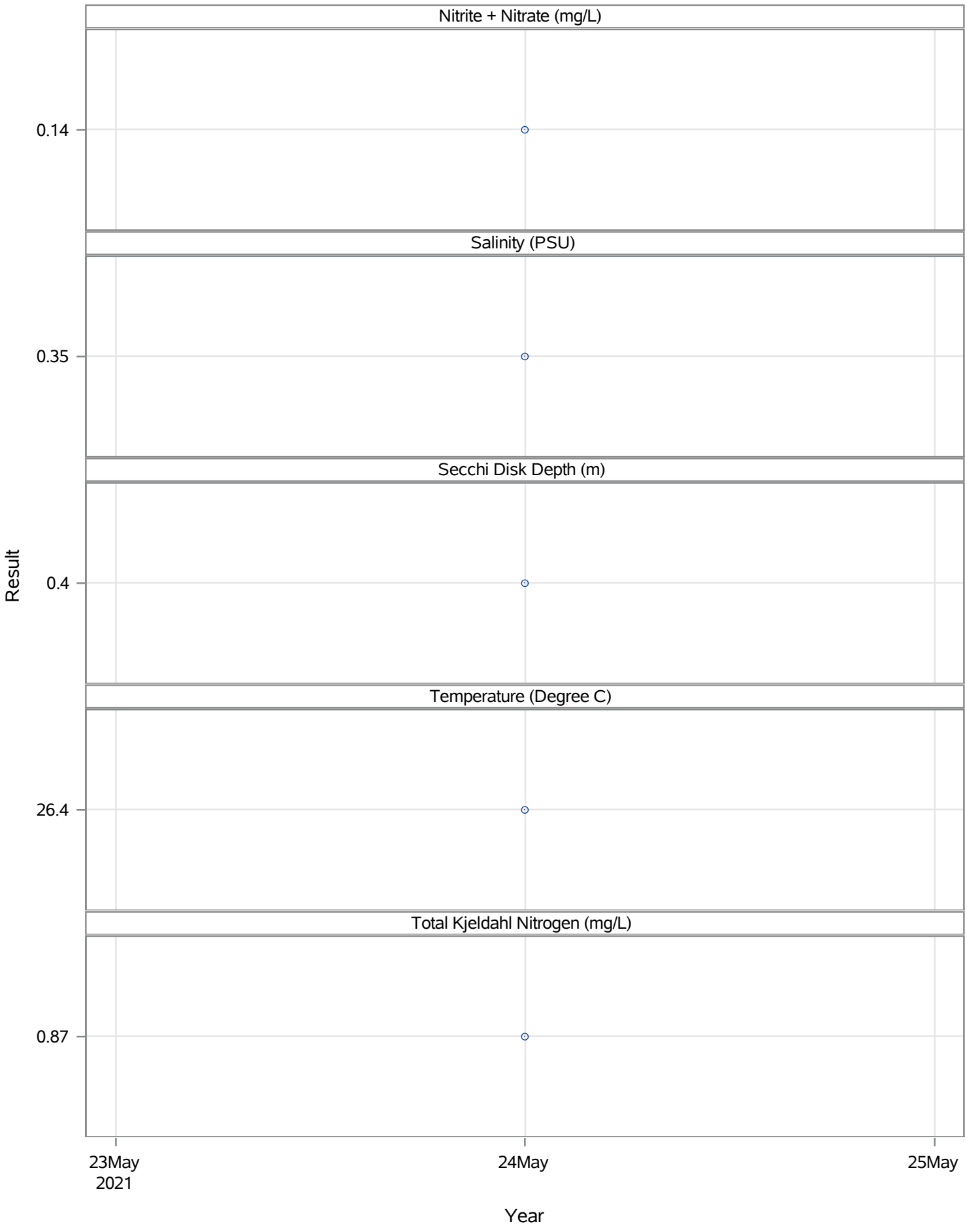

WBID=2939 Site=21FLCEN G5CE0120
Total Nitrogen (mg/L)
1.8
1.6
1.4
1.2
1.0
Total Phosphorus (mg/L)
0.325
0.300
0.275
0.250
0.225
0.200
0.175
Result
pH
7.35
7.30
7.25
7.20
7.15
7.10
Jul 2020
Jan 2021
Jul
Jan 2022
Jul
Jan 2023
Jul
Jan 2024
Jul
Jan 2025
Year

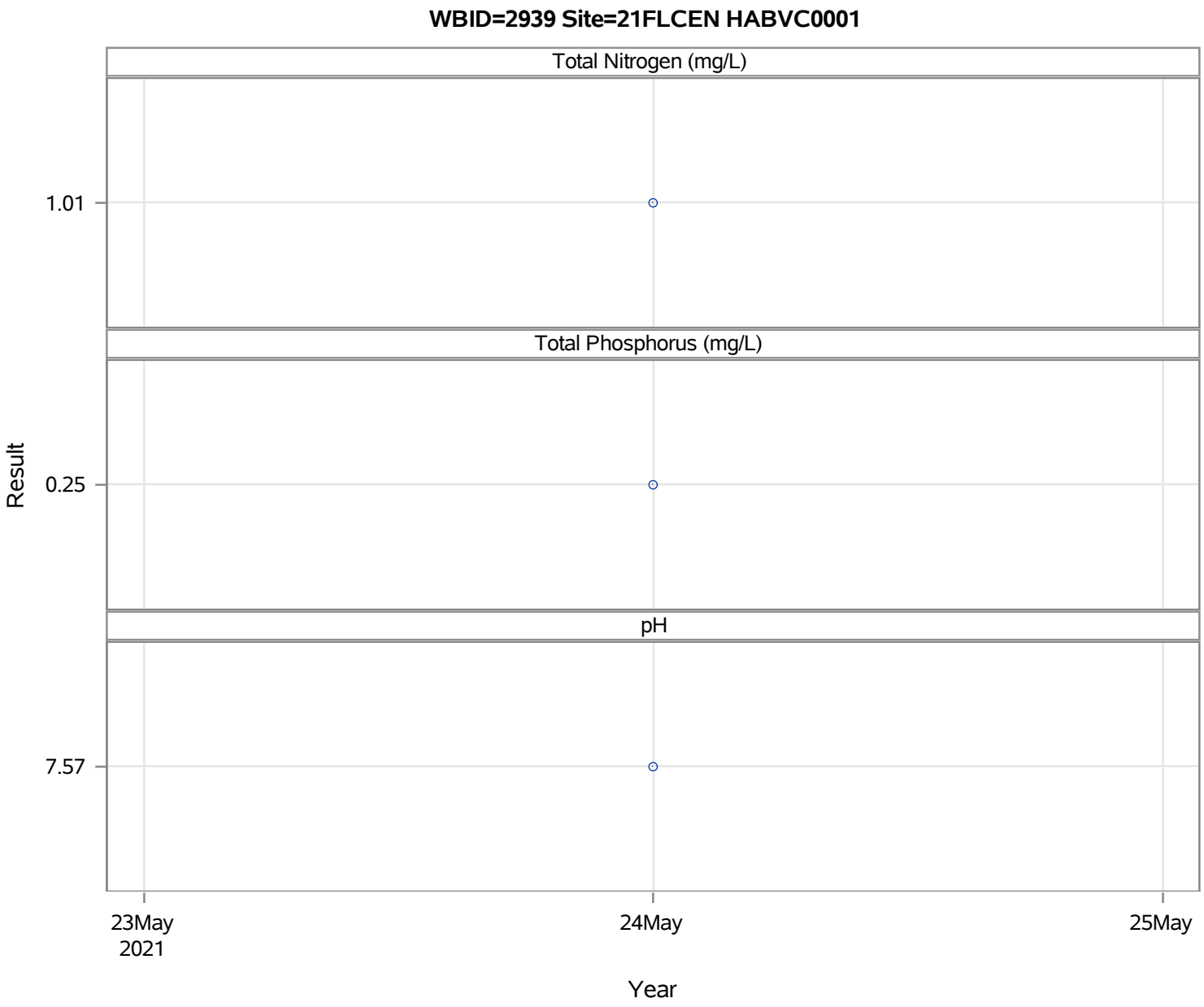

WBID=2939 Site=21FLCEN G5CE0154
Ammonia (mg/L)
0.08
0.06
0.04
0.02
Chlorophyll a (µg/L)
3.8
3.7
3.6
3.5
3.4
Dissolved Orthophosphate (mg/L)
0.17
Dissolved Oxygen (%)
38.3
Dissolved Oxygen (mg/L)
3.48
Result
Sep 2021
Nov
Jan 2022
Mar
May
Jul
Sep
Nov
Jan 2023
Mar
Year

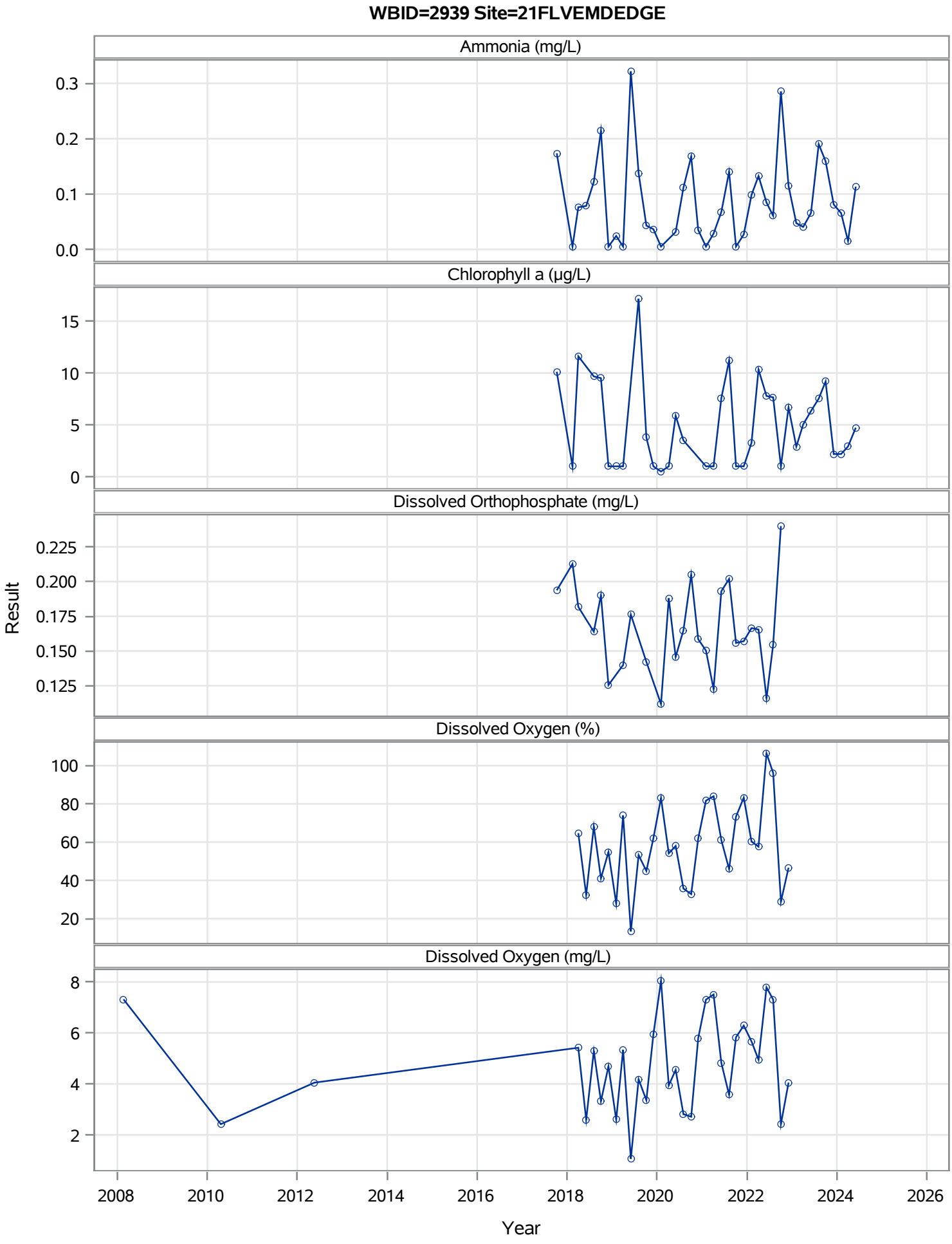

WBID=2939 Site=21FLCEN G5CE0154
Nitrite + Nitrate (mg/L)
0.210
0.208
0.206
0.204
0.202
0.200
Salinity (PSU)
0.34
Secchi Disk Depth (m)
0.8
Temperature (Degree C)
25.8
Total Kjeldahl Nitrogen (mg/L)
0.84
0.82
0.80
0.78
Result
Sep 2021
Nov
Jan 2022
Mar
May
Jul
Sep
Nov
Jan 2023
Mar
Year

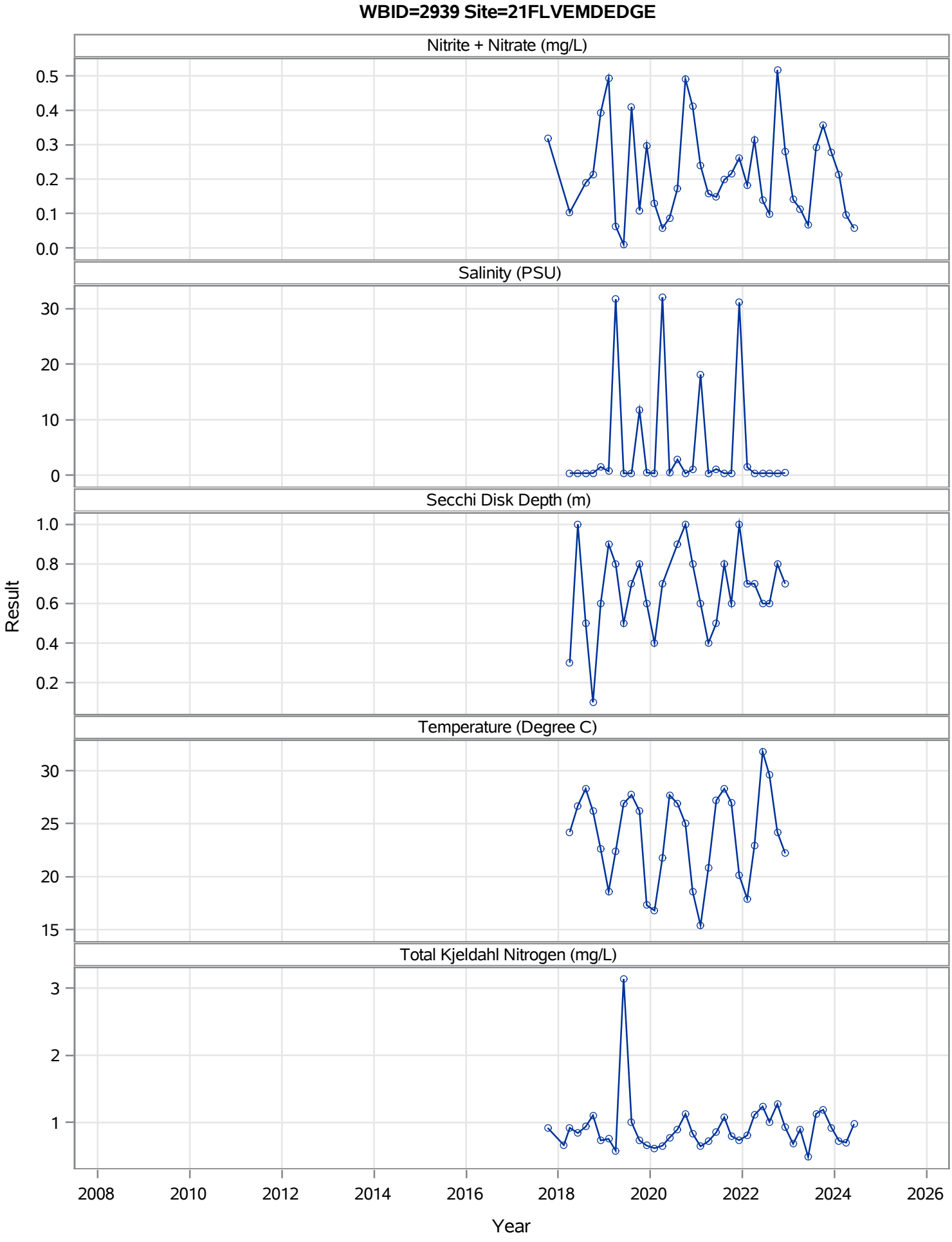

WBID=2939 Site=21FLCEN G5CE0154
Total Nitrogen (mg/L)
1.04
1.03
1.02
1.01
1.00
0.99
Total Phosphorus (mg/L)
0.200
0.198
0.196
0.194
0.192
0.190
pH
7.25
Result
Sep 2021
Nov
Jan 2022
Mar
May
Jul
Sep
Nov
Jan 2023
Mar
Year

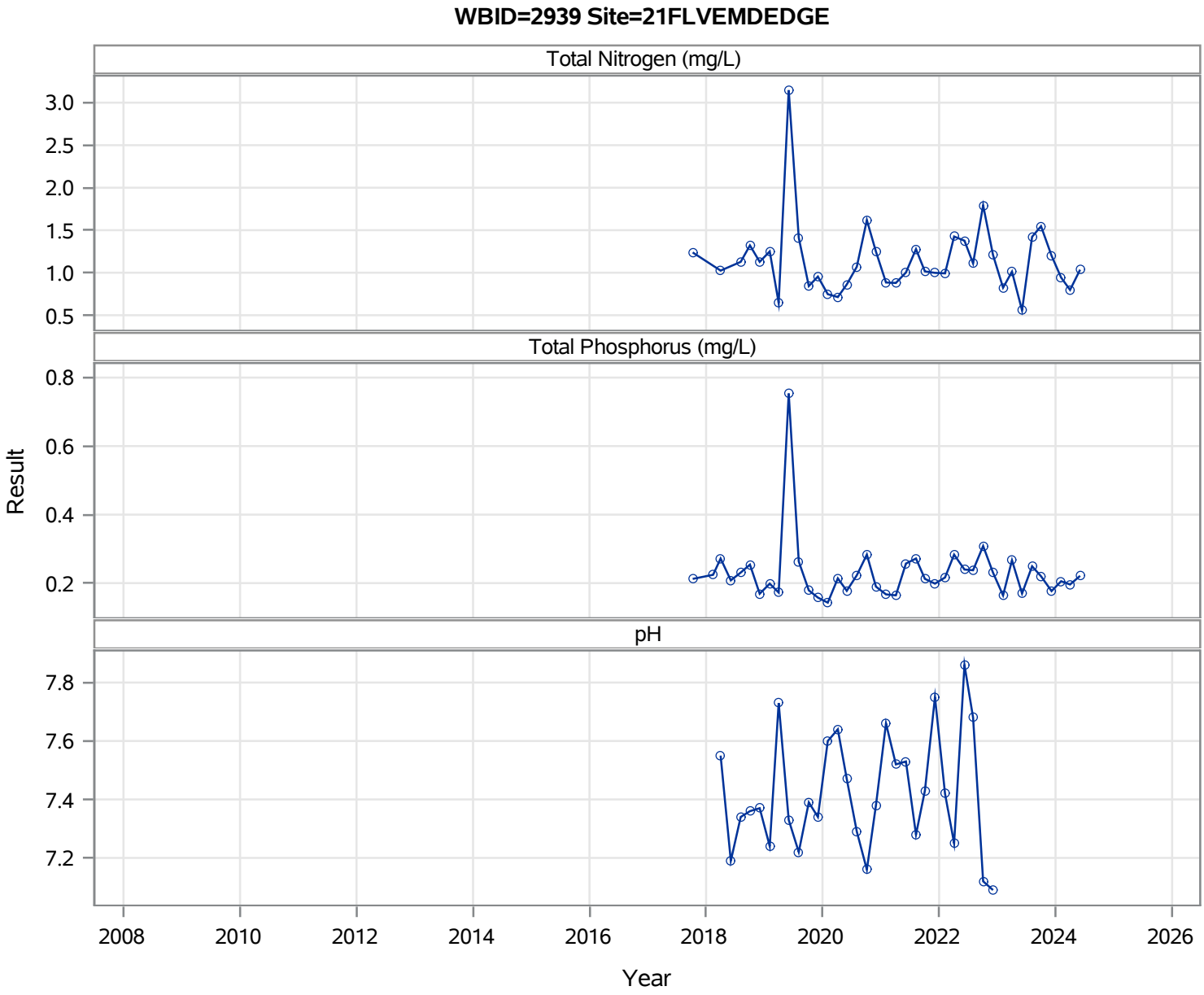

WBID=2939 Site=21FLCEN HABVC0001
Ammonia (mg/L)
0.018
Chlorophyll a (µg/L)
14
Dissolved Orthophosphate (mg/L)
0.15
Dissolved Oxygen (%)
96.2
Dissolved Oxygen (mg/L)
7.73
Result
23May
2021
24May
25May
Year

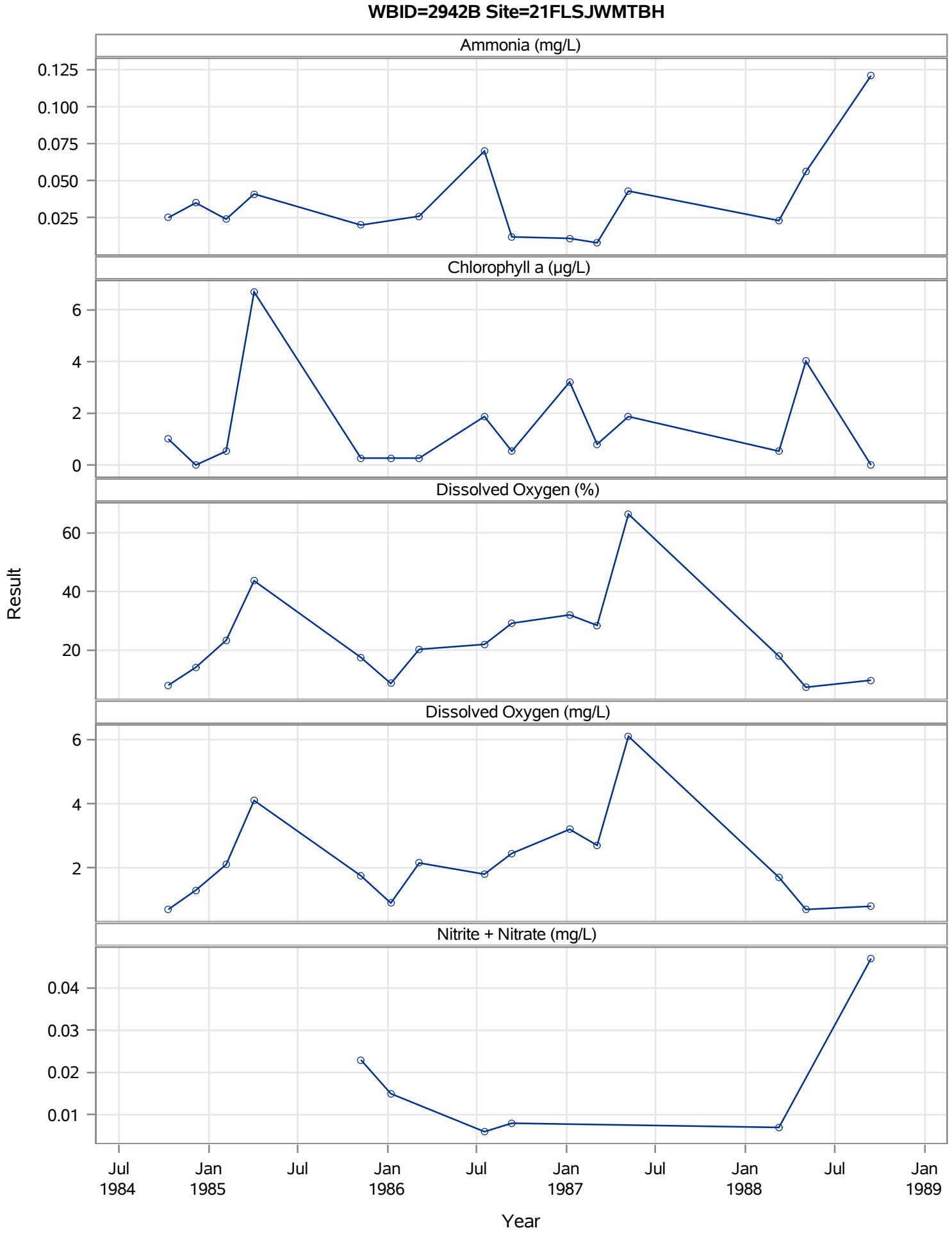

WBID=2939 Site=21FLCEN HABVC0001
Nitrite + Nitrate (mg/L)
0.14
Salinity (PSU)
0.35
Secchi Disk Depth (m)
0.4
Temperature (Degree C)
26.4
Total Kjeldahl Nitrogen (mg/L)
0.87
Result
23May
2021
24May
25May
Year

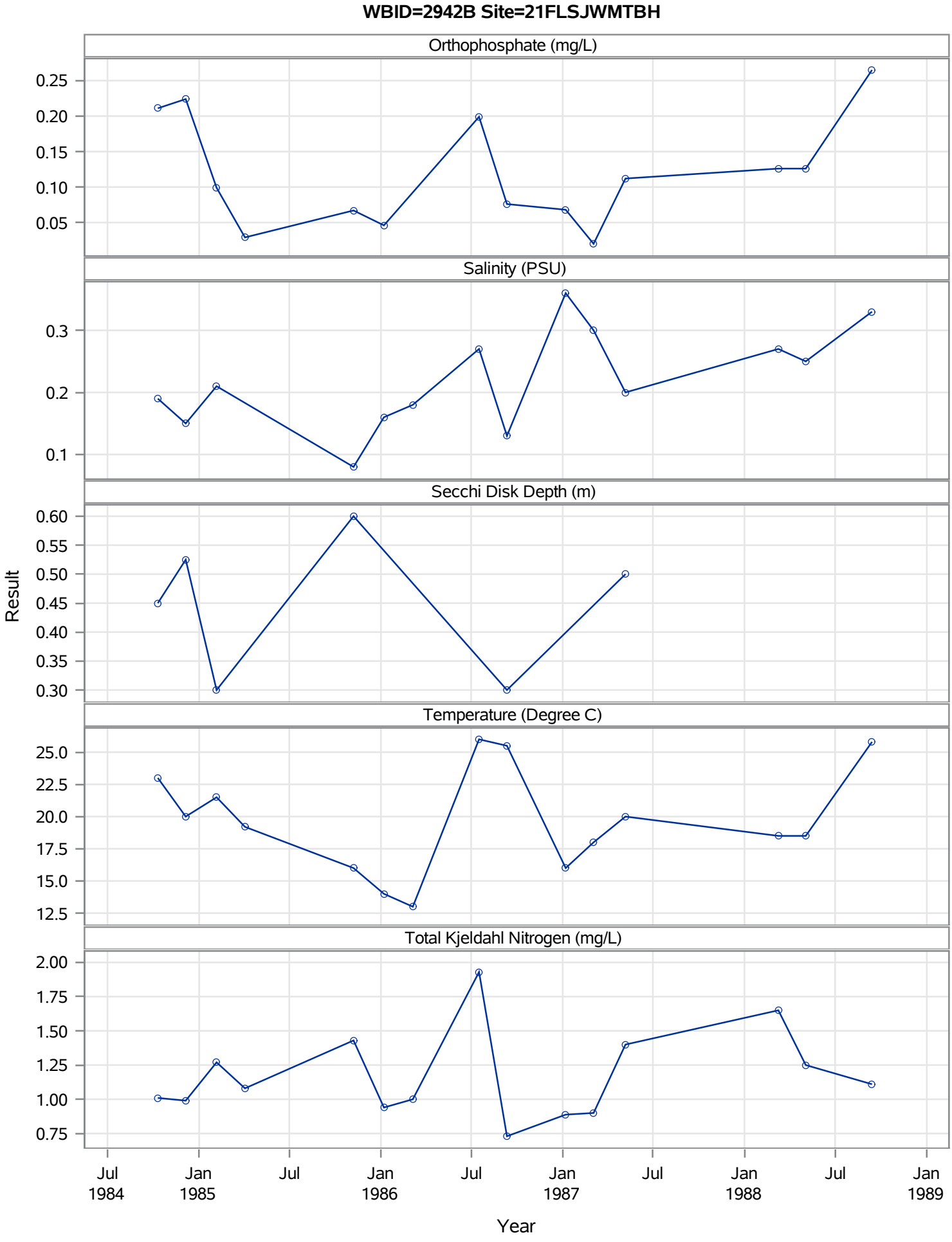

WBID=2939 Site=21FLCEN HABVC0001
Total Nitrogen (mg/L)
1.01
Total Phosphorus (mg/L)
0.25
pH
7.57
Result
23May
2021
24May
25May
Year

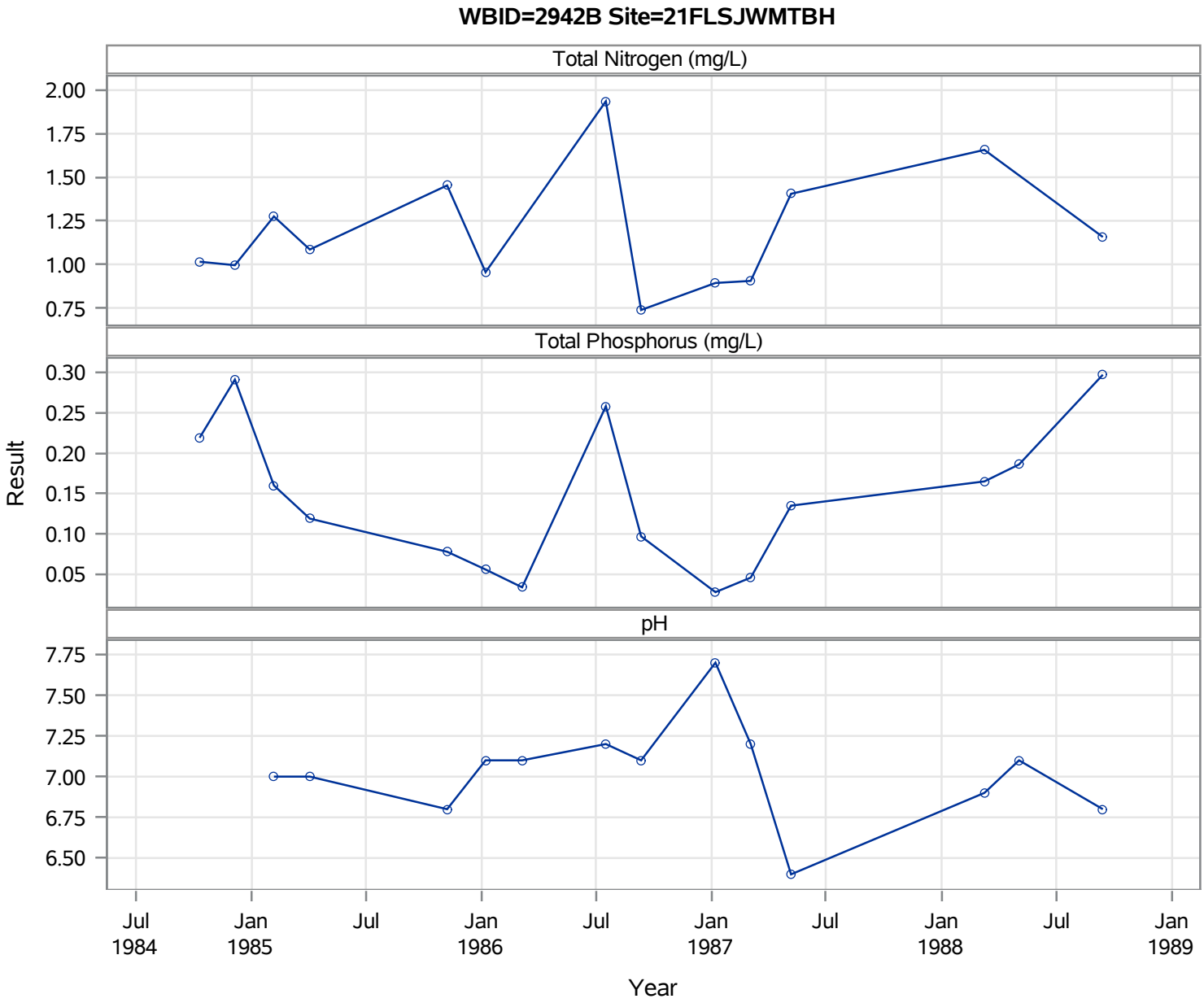

WBID=2939 Site=21FLVEMDEDGE
Ammonia (mg/L)
0.3
0.2
0.1
0.0
Chlorophyll a (µg/L)
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.225
0.200
0.175
0.150
0.125
Dissolved Oxygen (%)
100
80
60
40
20
Dissolved Oxygen (mg/L)
8
6
4
2
Result
2008
2010
2012
2014
2016
2018
2020
2022
2024
2026
Year

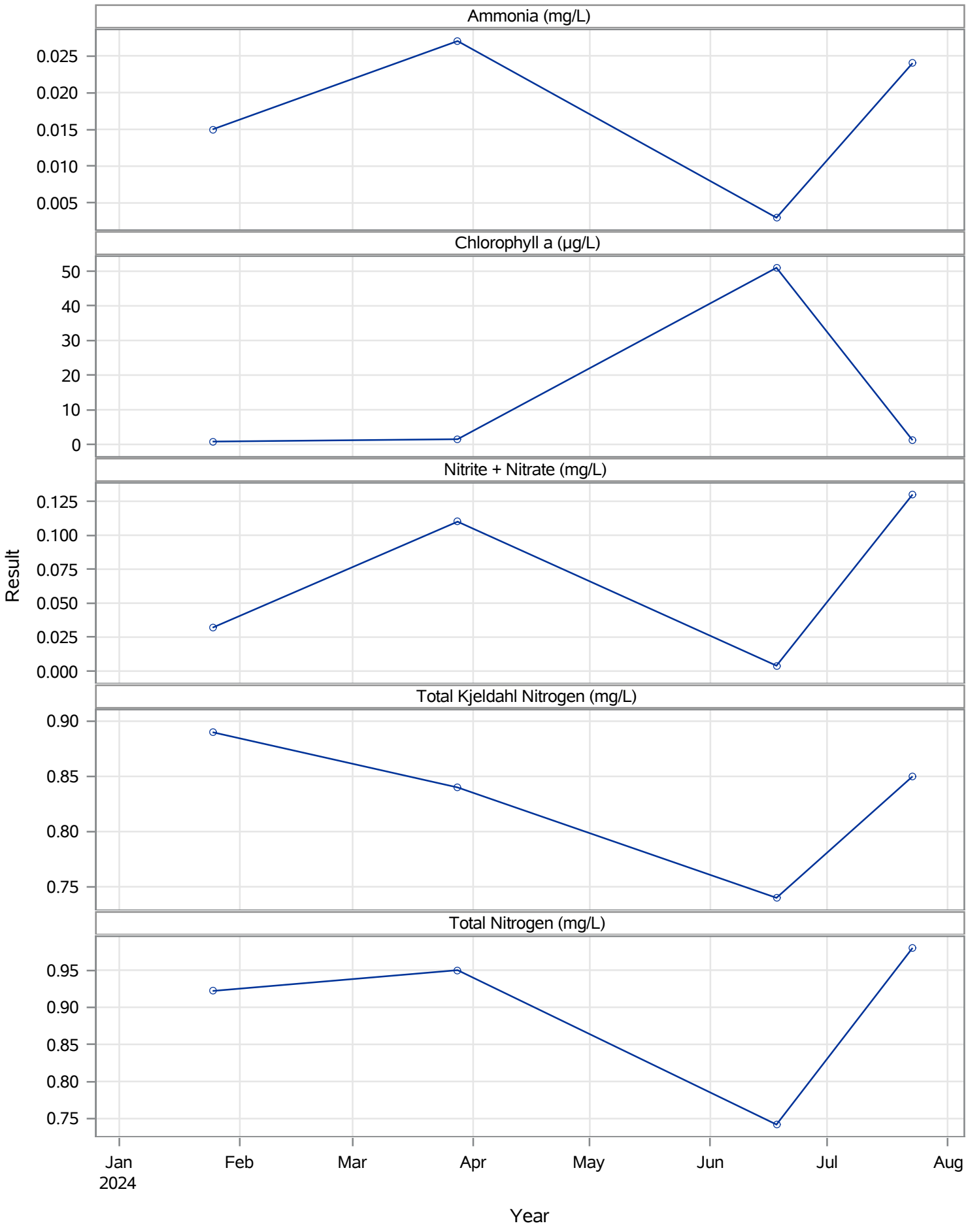

WBID=2939 Site=21FLVEMDEDGE
Nitrite + Nitrate (mg/L)
0.5
0.4
0.3
0.2
0.1
0.0
Salinity (PSU)
30
20
10
0
Secchi Disk Depth (m)
1.0
0.8
0.6
0.4
0.2
Result
Temperature (Degree C)
30
25
20
15
Total Kjeldahl Nitrogen (mg/L)
3
2
1
2008
2010
2012
2014
2016
2018
2020
2022
2024
2026
Year

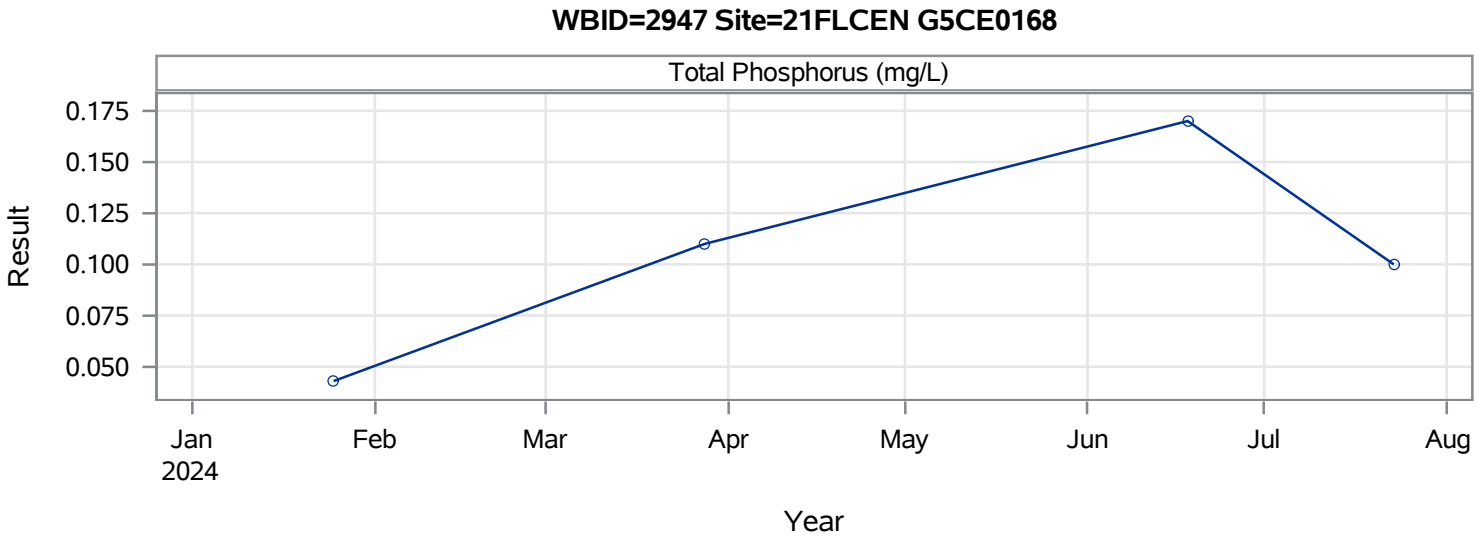

WBID=2939 Site=21FLVEMDEDGE
Total Nitrogen (mg/L)
3.0
2.5
2.0
1.5
1.0
0.5
Total Phosphorus (mg/L)
0.8
0.6
0.4
0.2
pH
7.8
7.6
7.4
7.2
Result
2008
2010
2012
2014
2016
2018
2020
2022
2024
2026
Year


WBID=2942B Site=21FLSJWMTBH
Ammonia (mg/L)
0.125
0.100
0.075
0.050
0.025
Chlorophyll a (µg/L)
6
4
2
0
Dissolved Oxygen (%)
60
40
20
Dissolved Oxygen (mg/L)
6
4
2
Nitrite + Nitrate (mg/L)
0.04
0.03
0.02
0.01
Result
Jul 1984
Jan 1985
Jul
Jan 1986
Jul
Jan 1987
Jul
Jan 1988
Jul
Jan 1989
Year


WBID=2942B Site=21FLSJWMTBH
Orthophosphate (mg/L)
0.25
0.20
0.15
0.10
0.05
Salinity (PSU)
0.3
0.2
0.1
Secchi Disk Depth (m)
0.60
0.55
0.50
0.45
0.40
0.35
0.30
Temperature (Degree C)
25.0
22.5
20.0
17.5
15.0
12.5
Total Kjeldahl Nitrogen (mg/L)
2.00
1.75
1.50
1.25
1.00
0.75
Result
Jul 1984
Jan 1985
Jul
Jan 1986
Jul
Jan 1987
Jul
Jan 1988
Jul
Jan 1989
Year

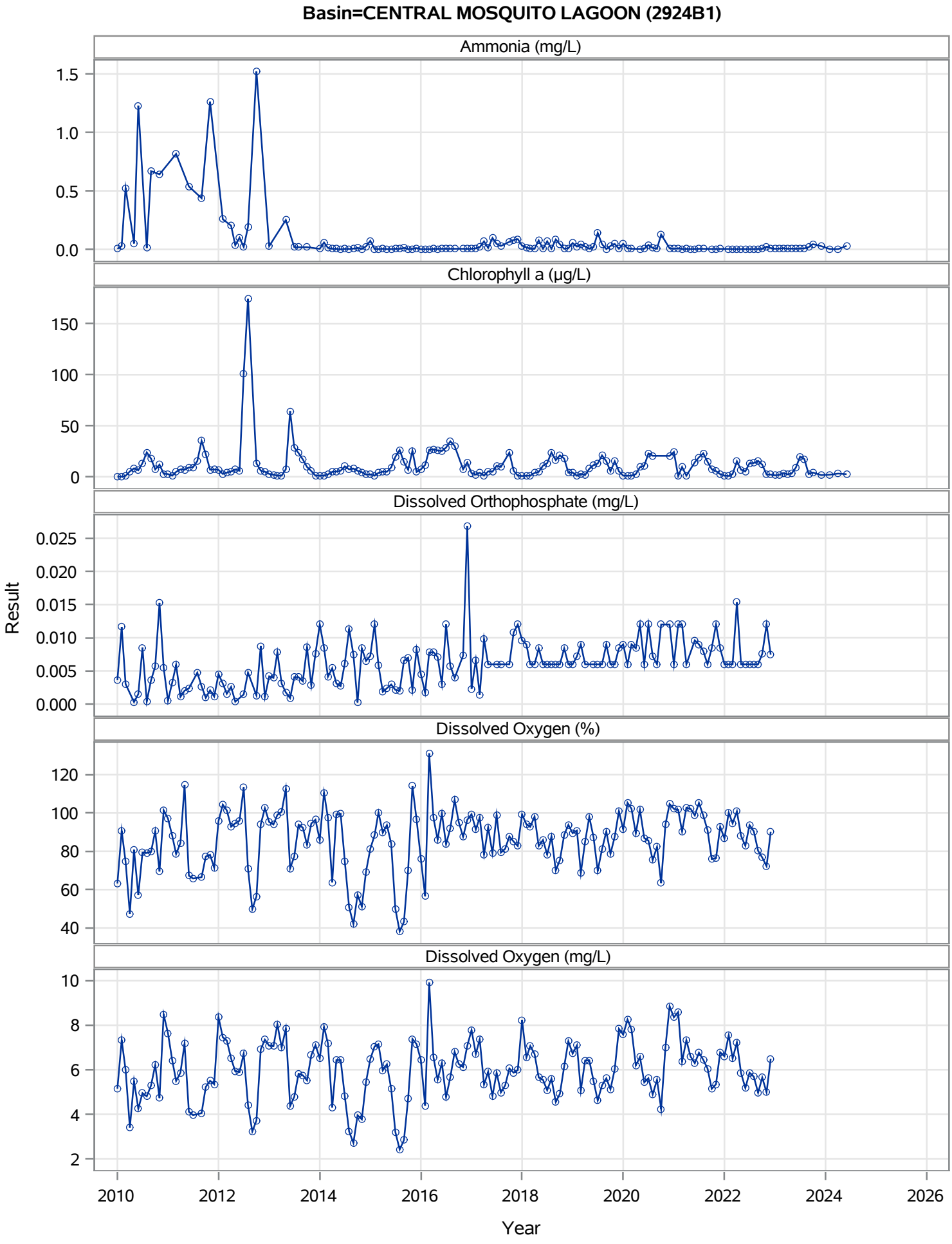

WBID=2942B Site=21FLSJWMTBH
Total Nitrogen (mg/L)
2.00
1.75
1.50
1.25
1.00
0.75
Total Phosphorus (mg/L)
0.30
0.25
0.20
0.15
0.10
0.05
pH
7.75
7.50
7.25
7.00
6.75
6.50
Result
Jul 1984
Jan 1985
Jul
Jan 1986
Jul
Jan 1987
Jul
Jan 1988
Jul
Jan 1989
Year

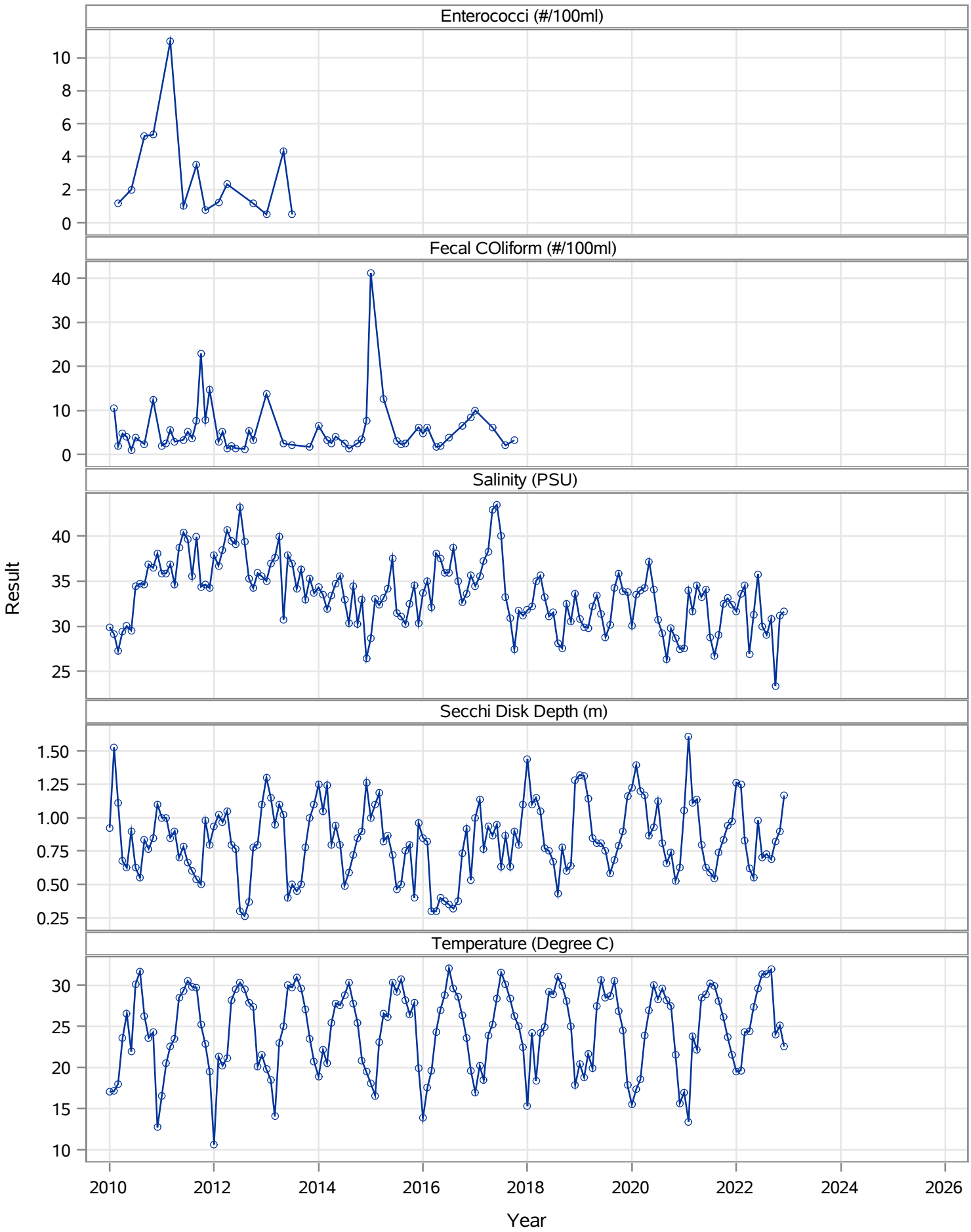

WBID=2947 Site=21FLCEN G5CE0168
Ammonia (mg/L)
0.025
0.020
0.015
0.010
0.005
Chlorophyll a (µg/L)
50
40
30
20
10
0
Nitrite + Nitrate (mg/L)
0.125
0.100
0.075
0.050
0.025
0.000
Total Kjeldahl Nitrogen (mg/L)
0.90
0.85
0.80
0.75
Total Nitrogen (mg/L)
0.95
0.90
0.85
0.80
0.75
Result
Jan
2024
Feb
Mar
Apr
May
Jun
Jul
Aug
Year

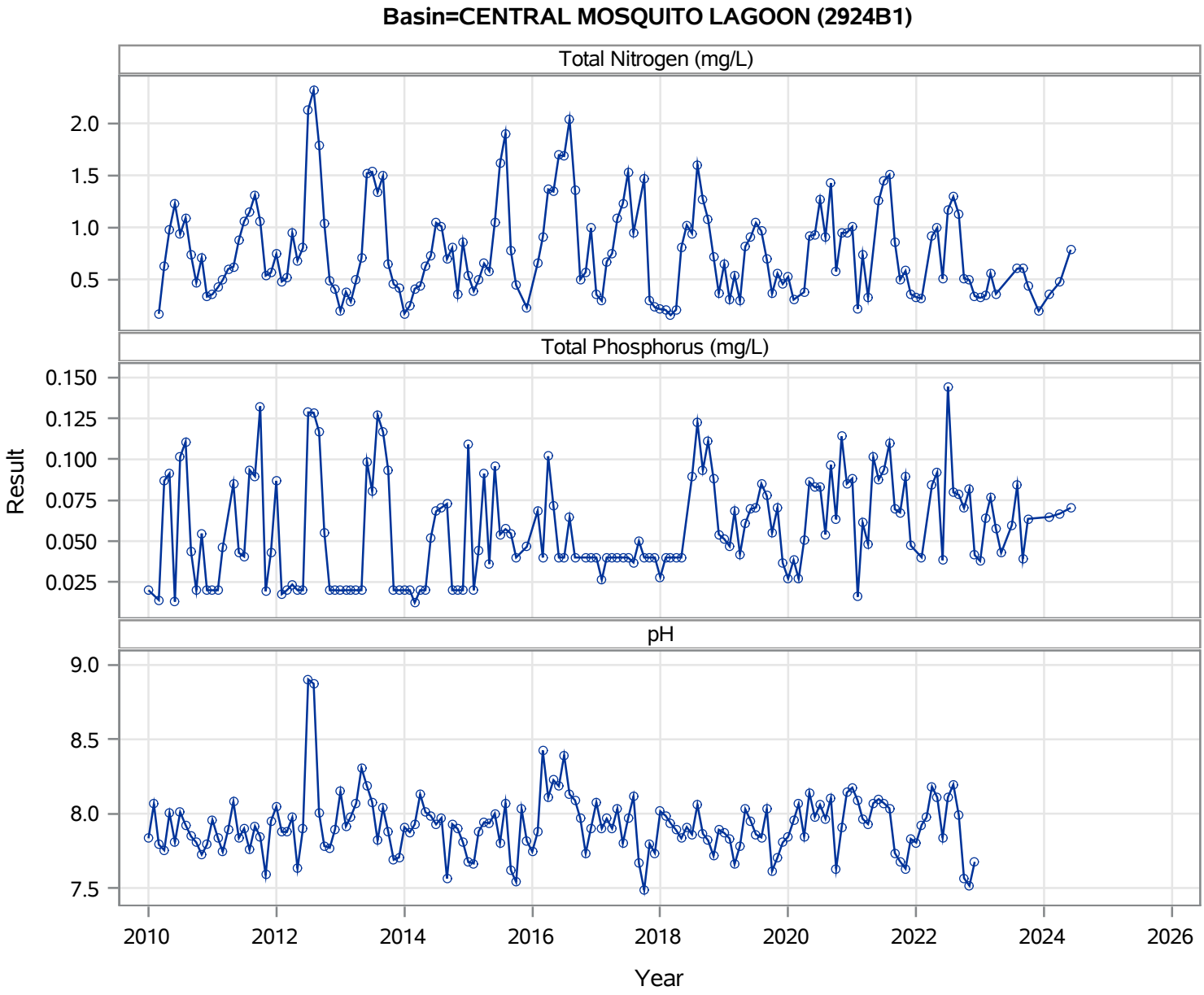

WBID=2947 Site=21FLCEN G5CE0168
Total Phosphorus (mg/L)
Result
0.175
0.150
0.125
0.100
0.075
0.050
Jan
2024
Feb
Mar
Apr
May
Jun
Jul
Aug
Year

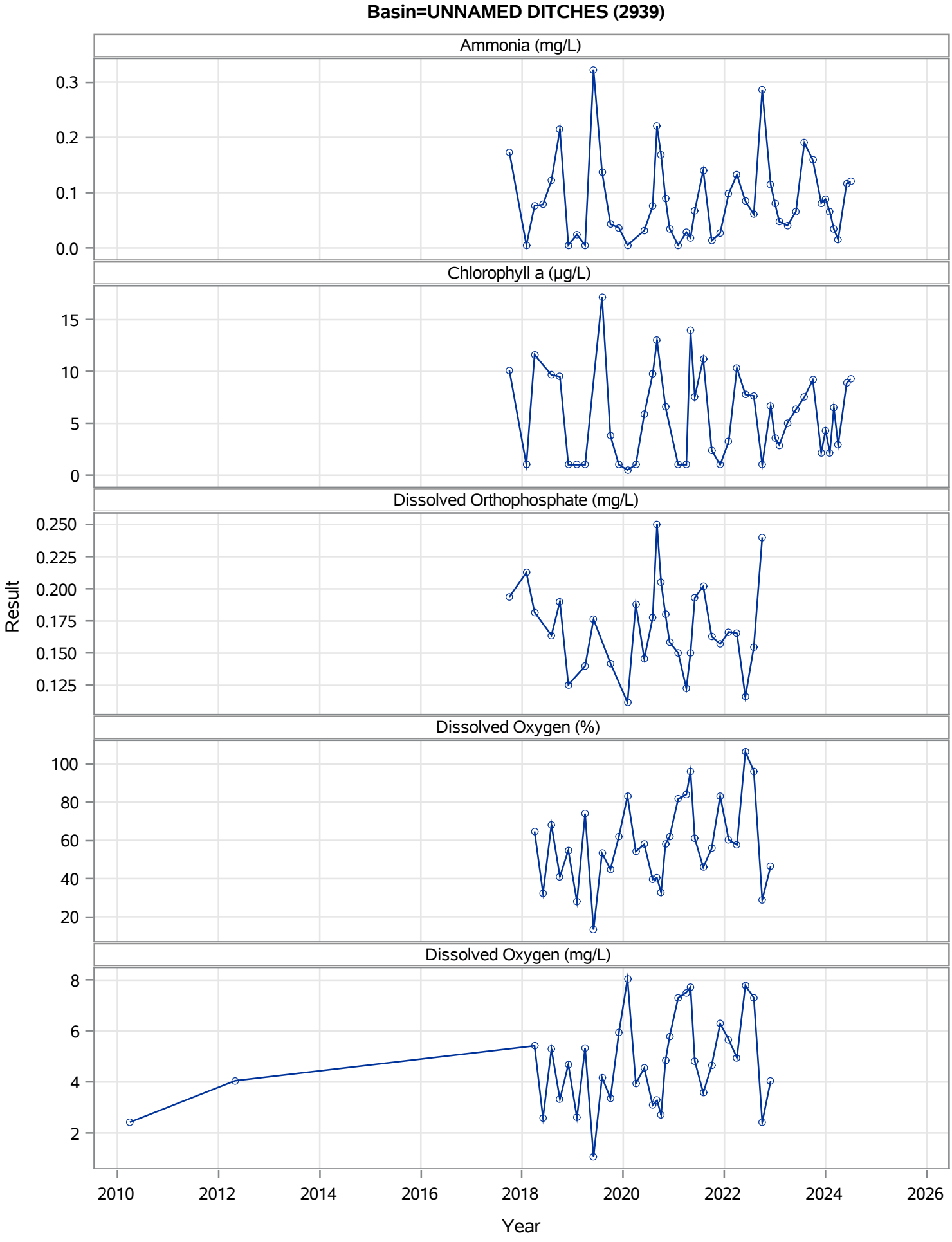
Appendix B

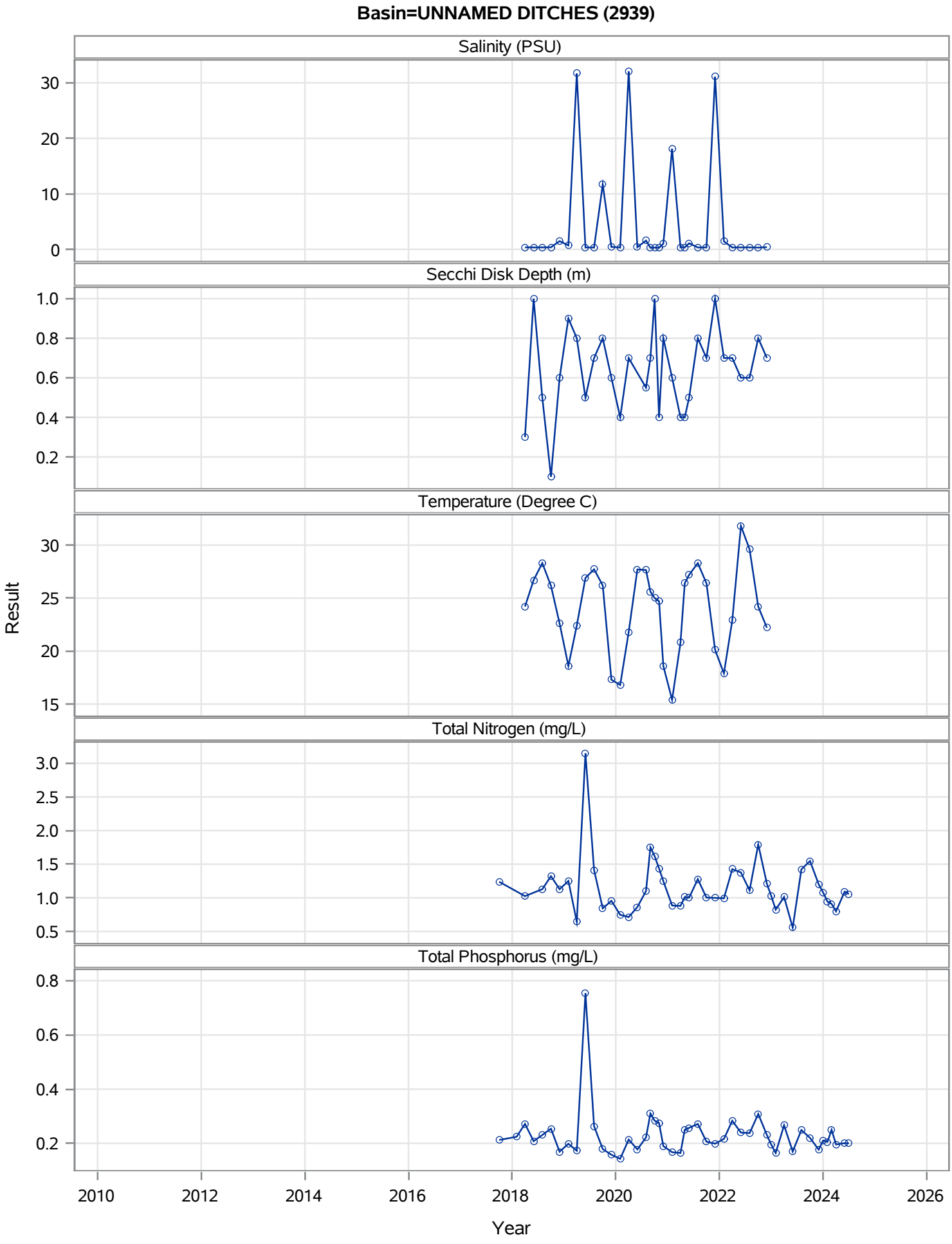
Water Quality Data Monthly Average Scatter Plots by WBID Boundary

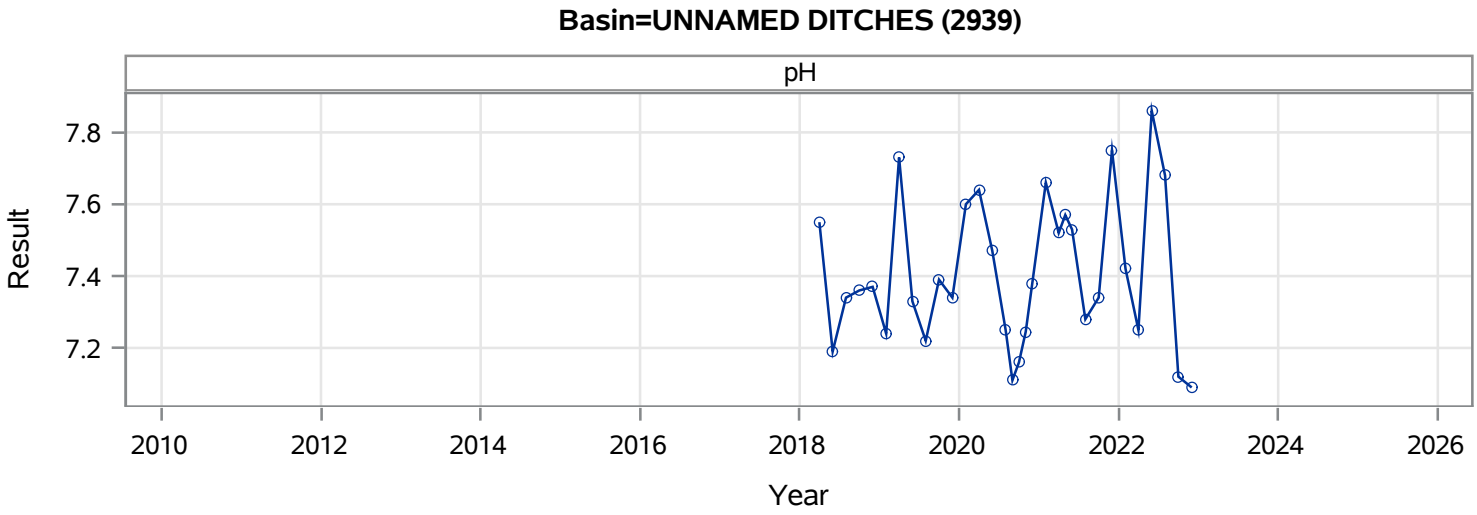

Basin=CENTRAL MOSQUITO LAGOON (2924B1)
Ammonia (mg/L)
1.5
1.0
0.5
0.0
Chlorophyll a (µg/L)
150
100
50
0
Dissolved Orthophosphate (mg/L)
0.025
0.020
0.015
0.010
0.005
0.000
Dissolved Oxygen (%)
120
100
80
60
40
Dissolved Oxygen (mg/L)
10
8
6
4
2
Result
2010
2012
2014
2016
2018
2020
2022
2024
2026
Year

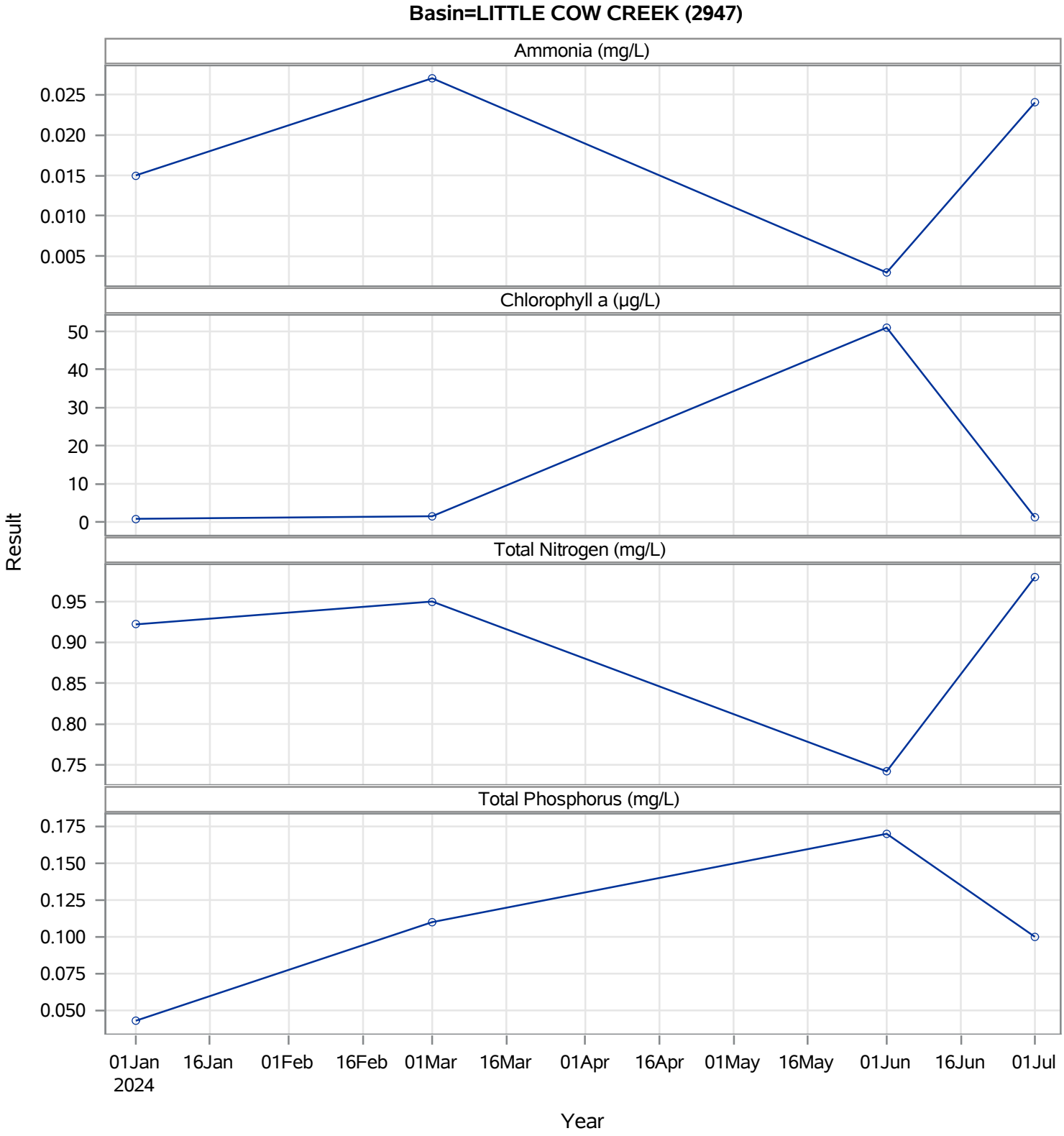

Basin=CENTRAL MOSQUITO LAGOON (2924B1)
Enterococci (#/100ml)
Fecal COliform (#/100ml)
Salinity (PSU)
Secchi Disk Depth (m)
Temperature (Degree C)
Result
Year
2010
2012
2014
2016
2018
2020
2022
2024
2026

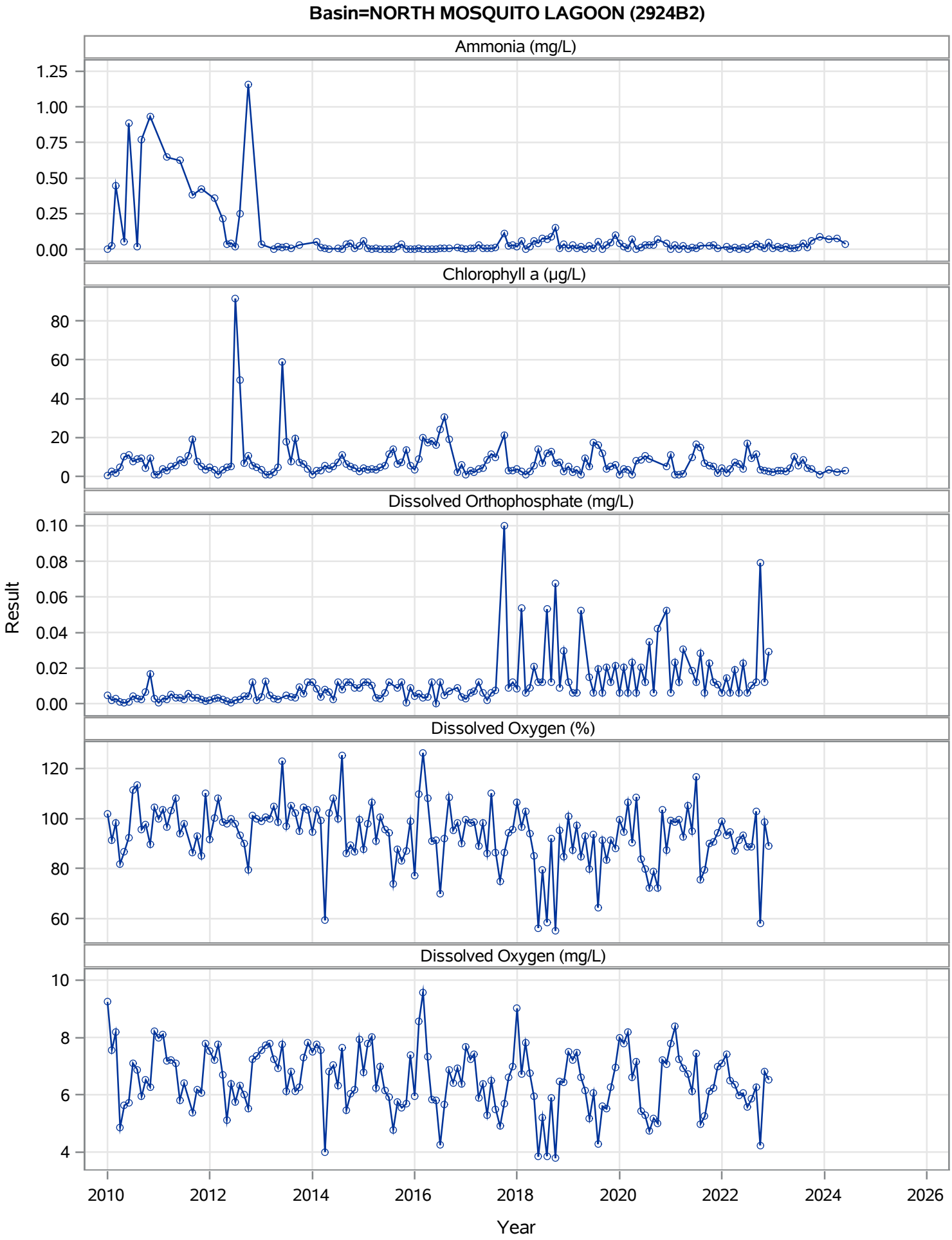

Basin=CENTRAL MOSQUITO LAGOON (2924B1)
Total Nitrogen (mg/L)
2.0
1.5
1.0
0.5
Total Phosphorus (mg/L)
0.150
0.125
0.100
0.075
0.050
0.025
Result
pH
9.0
8.5
8.0
7.5
2010
2012
2014
2016
2018
2020
2022
2024
2026
Year

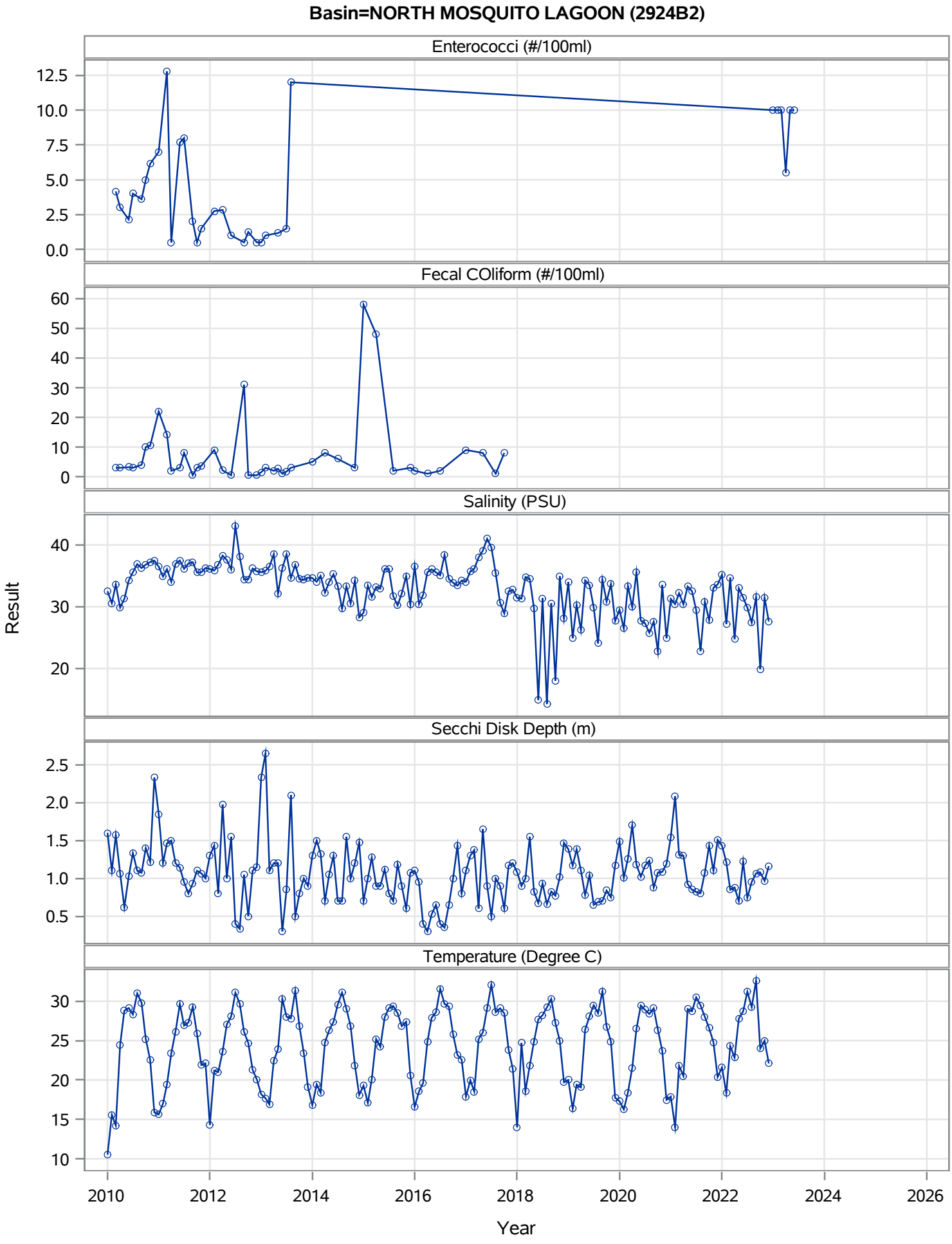

Basin=UNNAMED DITCHES (2939)
Ammonia (mg/L)
0.3
0.2
0.1
0.0
Chlorophyll a (µg/L)
15
10
5
0
Dissolved Orthophosphate (mg/L)
0.250
0.225
0.200
0.175
0.150
0.125
Dissolved Oxygen (%)
100
80
60
40
20
Dissolved Oxygen (mg/L)
8
6
4
2
Result
2010
2012
2014
2016
2018
2020
2022
2024
2026
Year

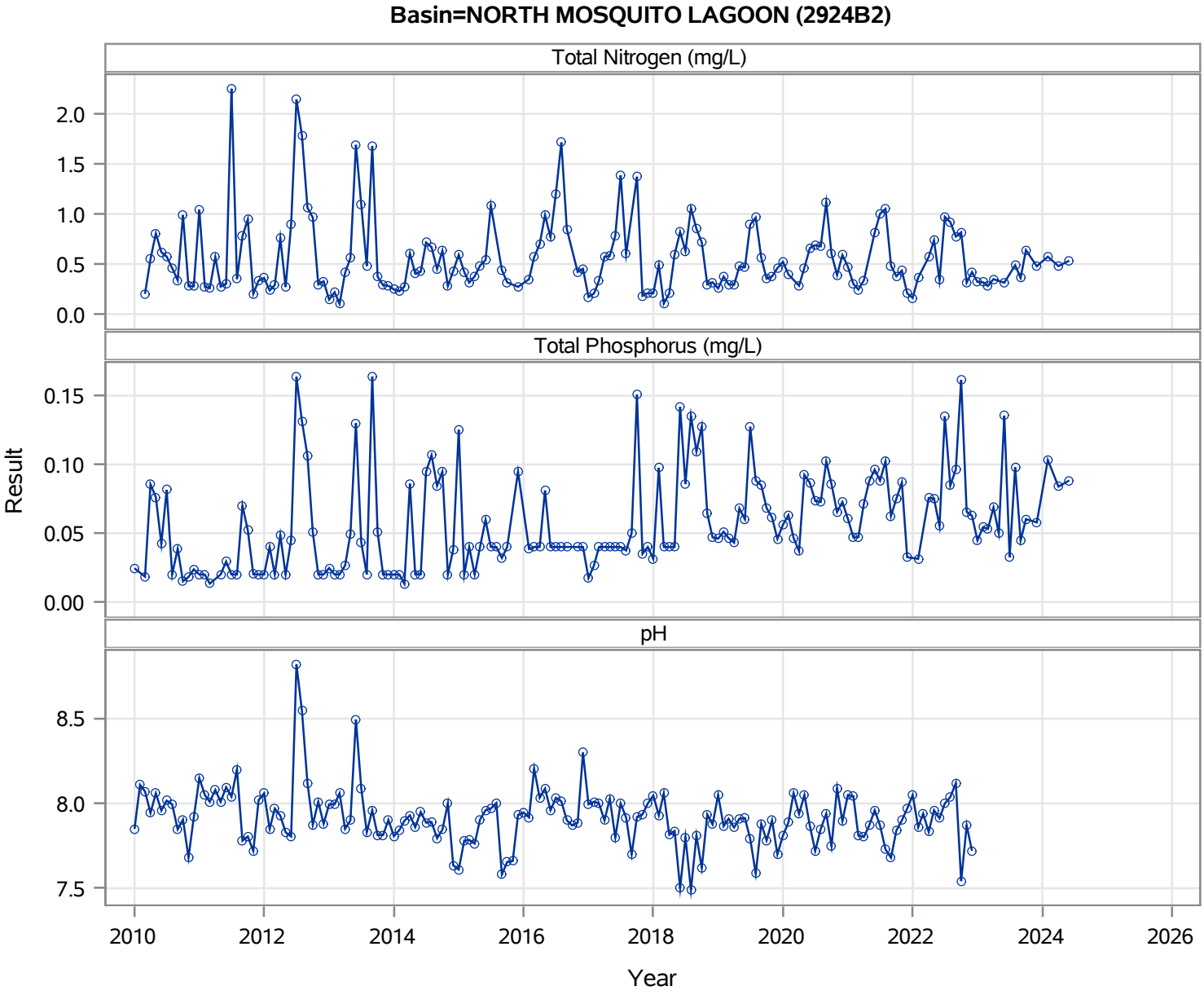

Basin=UNNAMED DITCHES (2939)
Salinity (PSU)
30
20
10
0
Secchi Disk Depth (m)
1.0
0.8
0.6
0.4
0.2
Temperature (Degree C)
30
25
20
15
Total Nitrogen (mg/L)
3.0
2.5
2.0
1.5
1.0
0.5
Total Phosphorus (mg/L)
0.8
0.6
0.4
0.2
Result
2010
2012
2014
2016
2018
2020
2022
2024
2026
Year

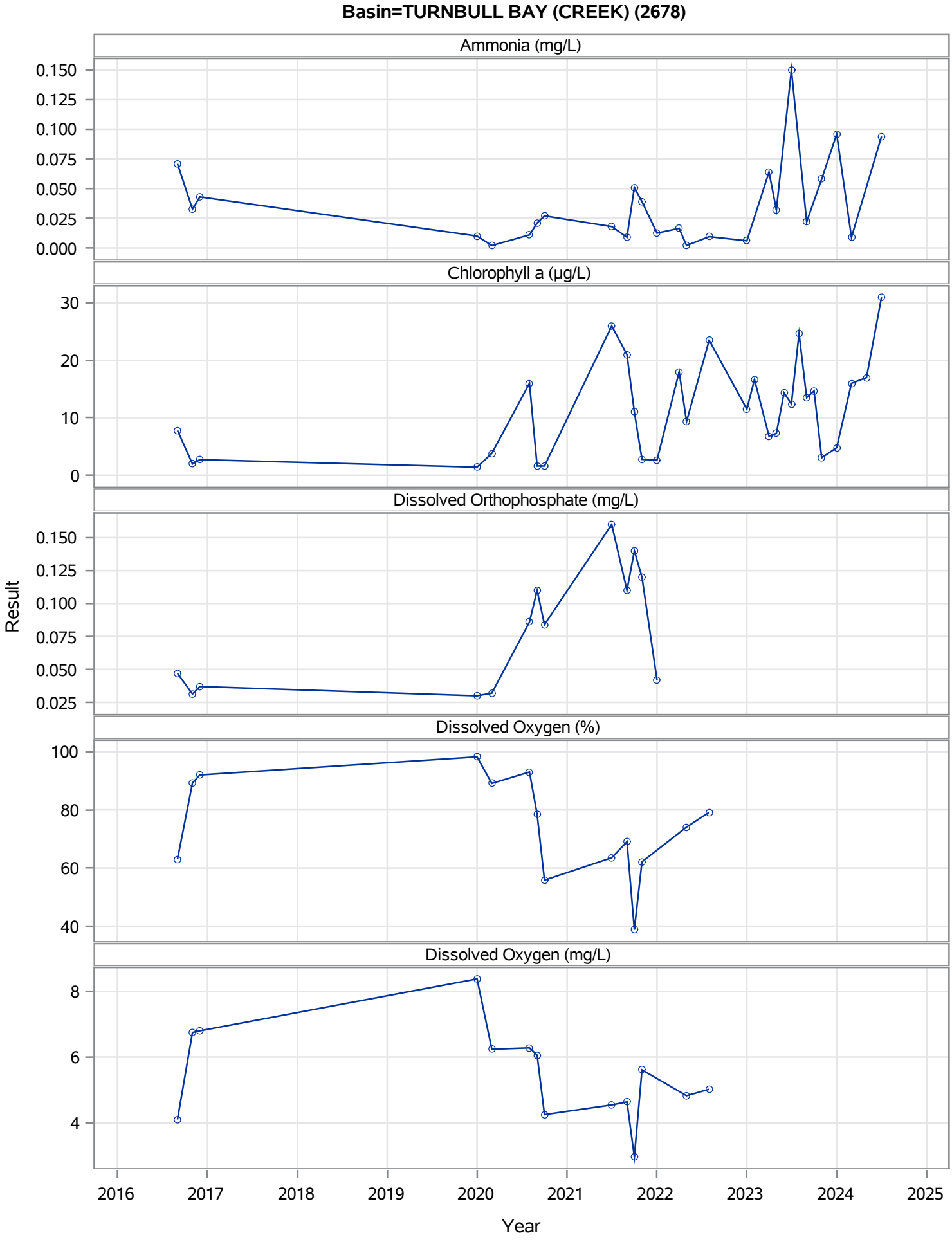

Basin=UNNAMED DITCHES (2939)
pH
Result
7.8
7.6
7.4
7.2
2010
2012
2014
2016
2018
2020
2022
2024
2026
Year

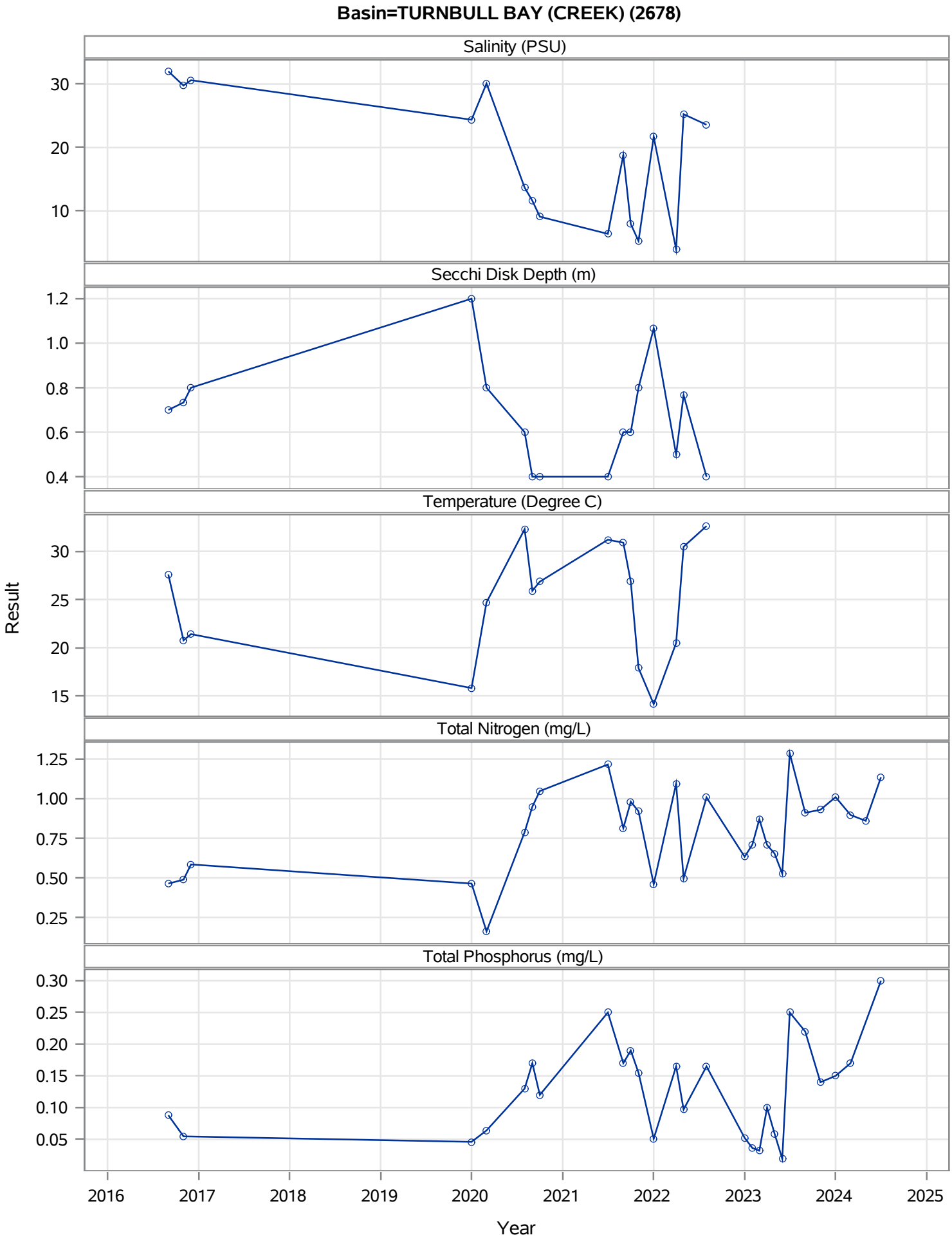

Basin=LITTLE COW CREEK (2947)
Ammonia (mg/L)
0.025
0.020
0.015
0.010
0.005
Chlorophyll a (µg/L)
50
40
30
20
10
0
Total Nitrogen (mg/L)
0.95
0.90
0.85
0.80
0.75
Total Phosphorus (mg/L)
0.175
0.150
0.125
0.100
0.075
0.050
Result
01Jan
2024
16Jan
01Feb
16Feb
01Mar
16Mar
01Apr
16Apr
01May
16May
01Jun
16Jun
01Jul
Year

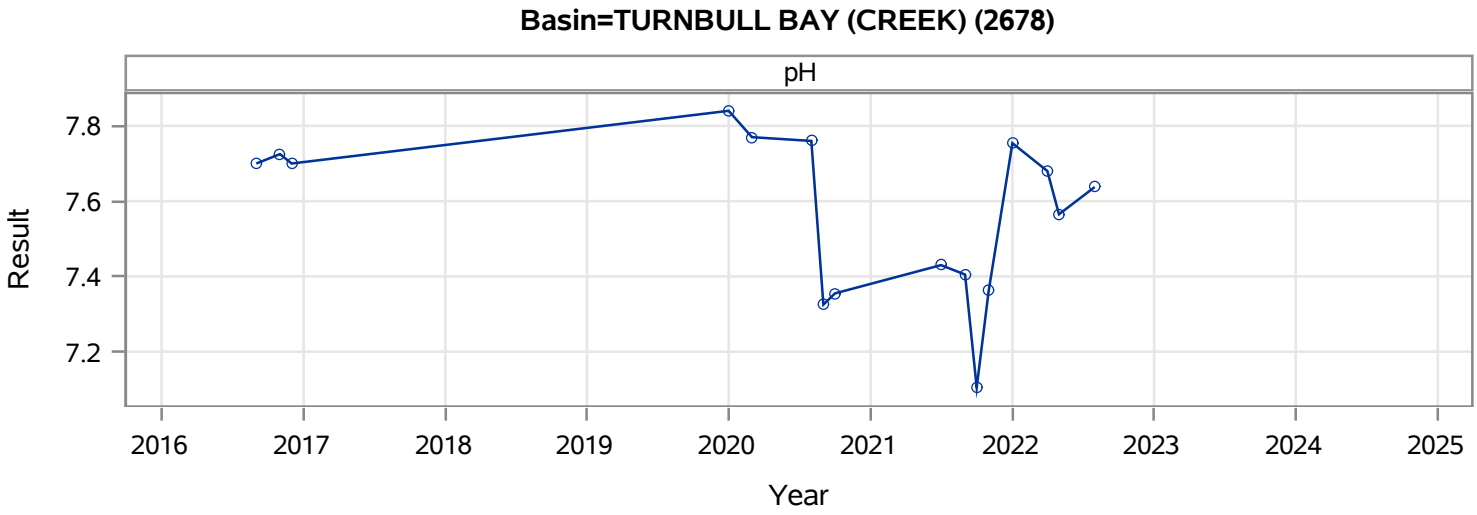

Basin=NORTH MOSQUITO LAGOON (2924B2)
Ammonia (mg/L)
1.25
1.00
0.75
0.50
0.25
0.00
Chlorophyll a (µg/L)
80
60
40
20
0
Dissolved Orthophosphate (mg/L)
0.10
0.08
0.06
0.04
0.02
0.00
Dissolved Oxygen (%)
120
100
80
60
Dissolved Oxygen (mg/L)
10
8
6
4
Result
2010
2012
2014
2016
2018
2020
2022
2024
2026
Year


Basin=NORTH MOSQUITO LAGOON (2924B2)
Enterococci (#/100ml)
Fecal COliform (#/100ml)
Salinity (PSU)
Secchi Disk Depth (m)
Temperature (Degree C)
Result
Year
2010
2012
2014
2016
2018
2020
2022
2024
2026


Basin=NORTH MOSQUITO LAGOON (2924B2)
Total Nitrogen (mg/L)
Total Phosphorus (mg/L)
pH
Result
Year
2.0
1.5
1.0
0.5
0.0
0.15
0.10
0.05
0.00
8.5
8.0
7.5
2010
2012
2014
2016
2018
2020
2022
2024
2026


Basin=TURNBULL BAY (CREEK) (2678)
Ammonia (mg/L)
0.150
0.125
0.100
0.075
0.050
0.025
0.000
Chlorophyll a (µg/L)
30
20
10
0
Dissolved Orthophosphate (mg/L)
0.150
0.125
0.100
0.075
0.050
0.025
Result
Dissolved Oxygen (%)
100
80
60
40
Dissolved Oxygen (mg/L)
8
6
4
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Year


Basin=TURNBULL BAY (CREEK) (2678)
Salinity (PSU)
30
20
10
Secchi Disk Depth (m)
1.2
1.0
0.8
0.6
0.4
Temperature (Degree C)
30
25
20
15
Total Nitrogen (mg/L)
1.25
1.00
0.75
0.50
0.25
Total Phosphorus (mg/L)
0.30
0.25
0.20
0.15
0.10
0.05
Result
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Year


Basin=TURNBULL BAY (CREEK) (2678)
pH
Result
7.8
7.6
7.4
7.2
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Year

Appendix C

Seasonal Kendall Tau Trend Test Methodology

Trend Analysis Steps

In the first step of each trend analysis, a time series plot of the raw data is prepared for the period of record. Figure B-1 displays a sample page of the actual output. This figure provides a valuable time-series of the trends in the data.

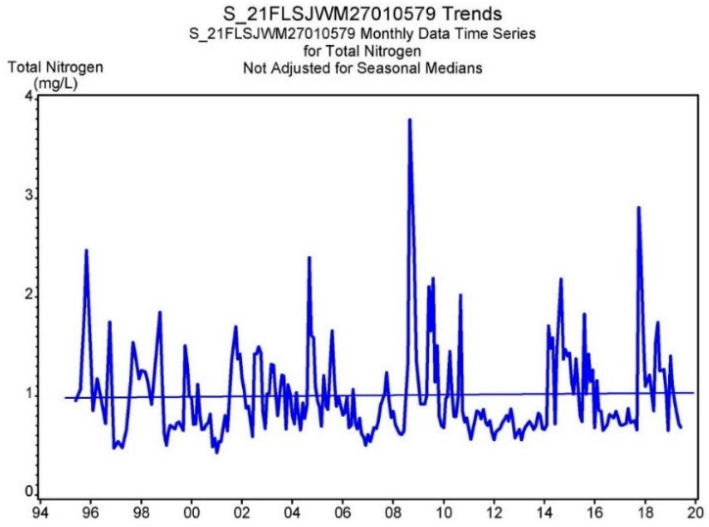


Figure B-1. Sample trend results output for step 1.

In the second step of the trend analysis, the time series data are averaged to monthly values, and a complete set of univariate statistics is calculated to present the seasonality of the data on a monthly intra-annual basis. Figure B-2 presents an example page from the results of the second step and provides a valuable overall view of the seasonality of the data. The annotated labels indicate the following features: 1 = the maximum value, 2= the minimum value, 3 = the median value, 4 = the lower 95% confidence limit of the median value, 5 = the mean value, 6 = the 75th percentile, 7 = the 25th percentile. If the confidence limits around the medians for any pair of months do not overlap, then the medians are considered to be significantly different at an alpha level of 0.05.

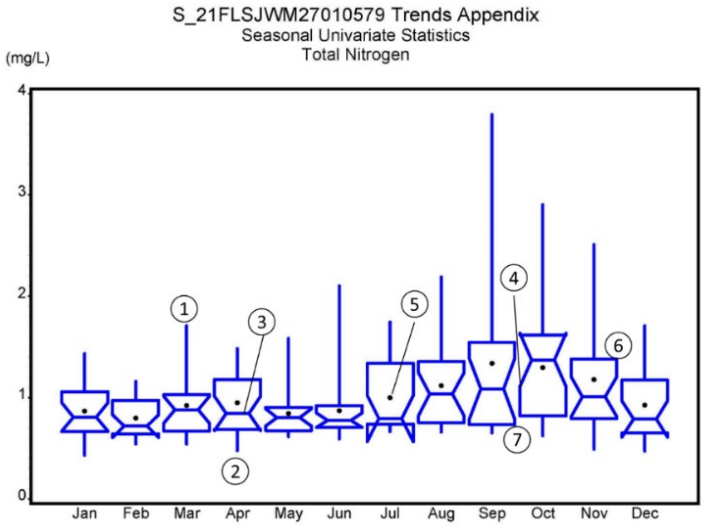


Figure B-2. Sample seasonal univariate results output for step 2 (annotated labels are circled and are not part of the actual outputs).

In the third step of the analysis, a correlation analysis is performed for each monthly value, the previous month's value, two months prior, etc., until correlation statistics have been calculated for all previous months up to 15 months prior. A table of these values is provided in the output (not shown).

In the fourth step of the analysis, a determination is made as to whether seasonality exists in the time series of data. An operationally defined and objective test to identify the presence of seasonality was applied.

A correlogram is provided as part of the output (example in Figure B-3). If a correlation value on this plot is statistically significant then it will lie beyond the confidence limits shown. If the data presented by the plot have seasonality, then one would expect the 6-month lag values to be negatively correlated and the 12-month lag values to be positively correlated.

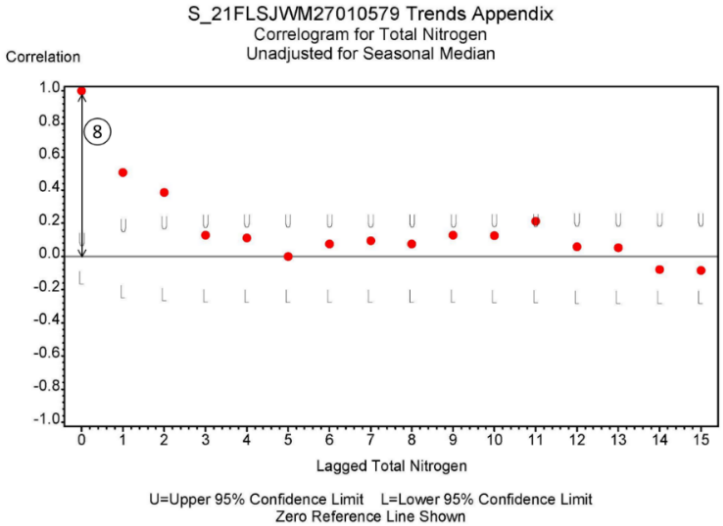


Figure B-3. Sample seasonality test information output for step 4.

The objective test measures the proportional distance between the zero line and the lower 95% confidence limit for the 6-month lag correlation, and the proportional distance between the zero reference line and the upper 95% confidence limit for the 12-month lag correlation (label 9). If the sum of these distances is greater than 1, or if distance 8 is greater than 1, then seasonality is determined to exist.

If the data are determined to be seasonal, then the data are adjusted for season by subtracting the median monthly value from each data point. The season-adjusted data are then applied to a Kendall Tau test. The Kendall Tau test determines the slope of the time series of data, and p-values for various data conditions. Tables of these values are provided in the results (examples not shown). However, in all cases summary trend tables are provided in the appendices showing the appropriate p-values, slopes, and significance results for each trend.

The next step is to test the data for autocorrelation in a similar fashion to that completed to identify seasonality. In the first phase of this analysis, the season-adjusted data are de-trended by removing the effects of the slope identified. A diagnostic figure is then provided of these data (Figure B-4).

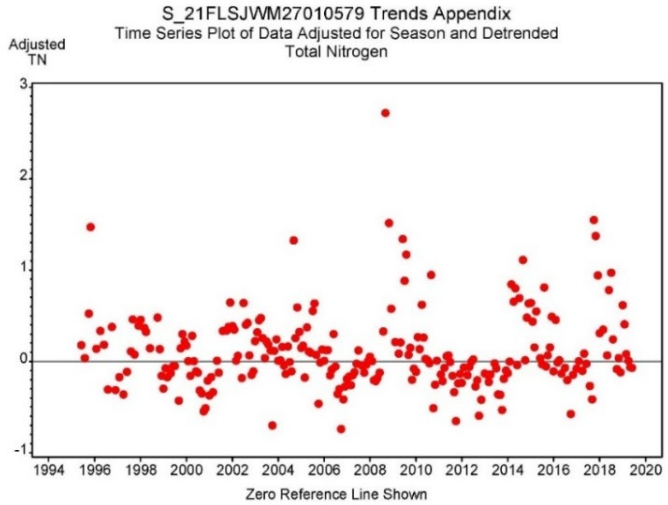


Figure B-4. Sample of the season adjusted and de-trended data.

In the next step of the analysis, the season-adjusted and de-trended data are prepared in the form of a correlogram to test for the presence of autocorrelation in the time series. Figure B-5 presents an example of this page of the detailed output. If both the 1-month lag (label 10) and the 2-month lag (label 11) are significantly correlated with the present values, then the data are identified as auto-correlated and an adjustment is made to the p-value.

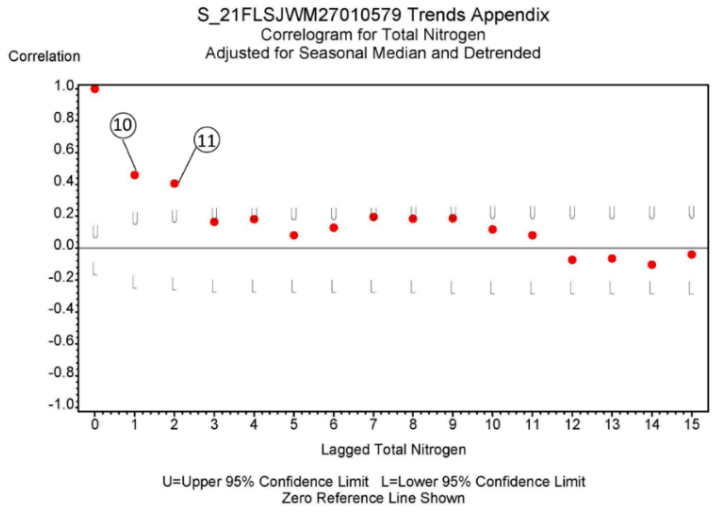


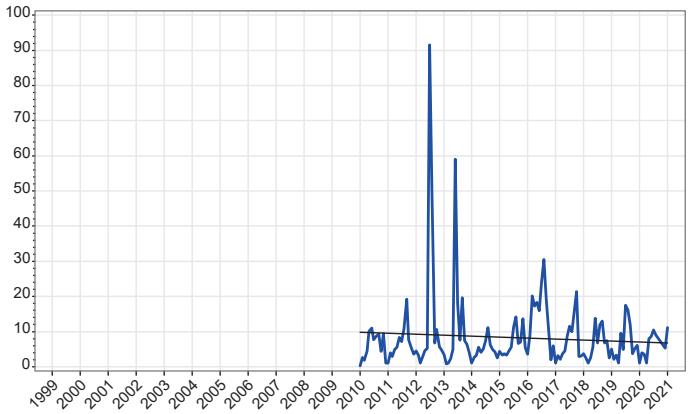
Figure B-5. Sample autocorrelation test figure.

In the final step of each trend analysis, the appropriate p-value (corrected for auto-correlation if necessary), significance assessment (based on alpha=0.05), slope, autocorrelation assessment (present/absent), and seasonality assessment (present/absent) of the trend analysis are compiled and tabulated in a summary table of trend test results. Trend tests were conducted at the station-level using the monthly average if more than one sample taken in a month at each station.

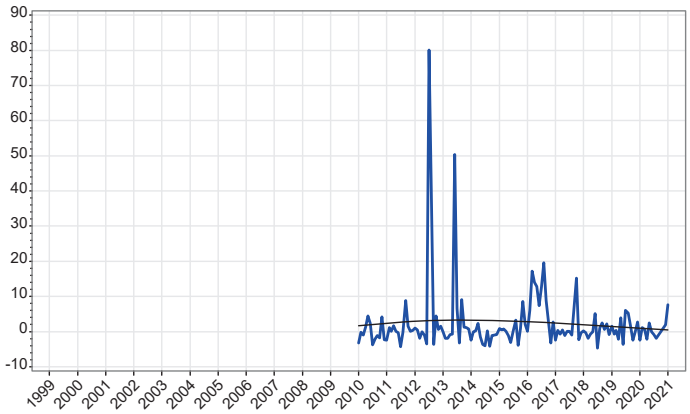
Appendix D

Detailed Output from the Seasonal Kendall Tau Trend Tests

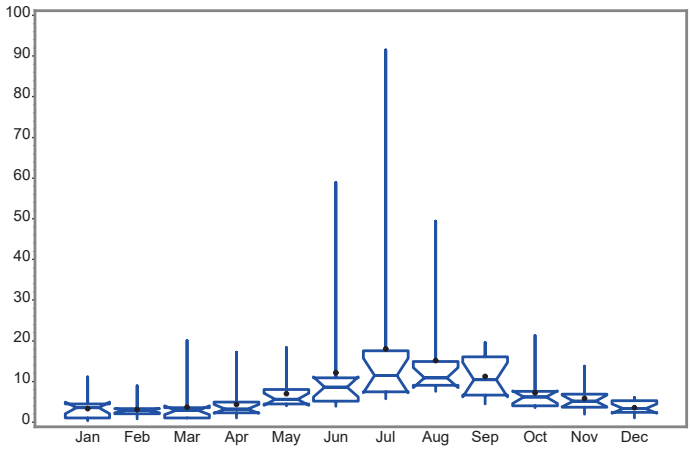
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
Chlorophyll a
Not Adjusted for Seasonal Medians



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
Chlorophyll a
Adjusted for Seasonal Medians



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Univariate Statistics
Chlorophyll a



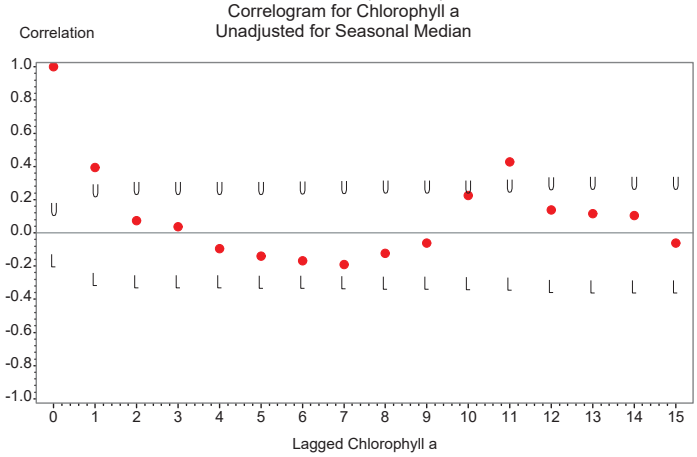
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Chlorophyll a
Unadjusted for Seasonal Medians

Lagged Chlorophyll a	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.393	0.134	0.267	-0.267
2	0.072	0.140	0.281	-0.281
3	0.038	0.141	0.281	-0.281
4	-0.096	0.141	0.281	-0.281
5	-0.139	0.141	0.282	-0.282
6	-0.168	0.142	0.284	-0.284
7	-0.191	0.143	0.286	-0.286
8	-0.123	0.145	0.289	-0.289
9	-0.062	0.145	0.290	-0.290
10	0.225	0.145	0.291	-0.291
11	0.426	0.147	0.295	-0.295
12	0.137	0.155	0.309	-0.309
13	0.115	0.155	0.311	-0.311

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Chlorophyll a
Unadjusted for Seasonal Medians

Lagged Chlorophyll a	Correlation	Standard Error	Upper Limit	Lower Limit
14	0.103	0.156	0.312	-0.312
15	-0.061	0.156	0.312	-0.312

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for Chlorophyll a
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

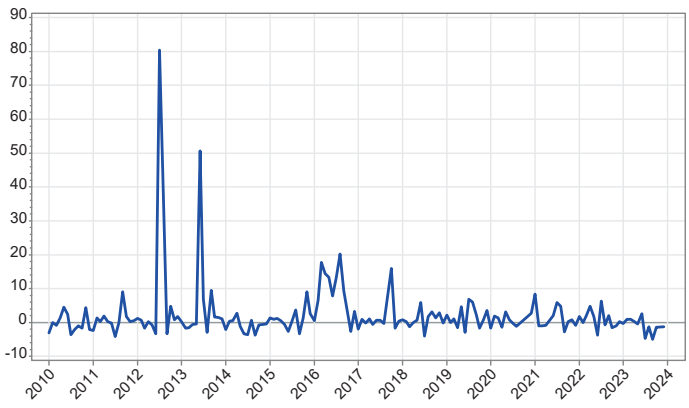
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Chlorophyll a
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.093	0.123	0.28	-0.069

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Chlorophyll a
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.093	0.123	0.28	-0.069

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Chlorophyll a



Zero Reference Line Shown

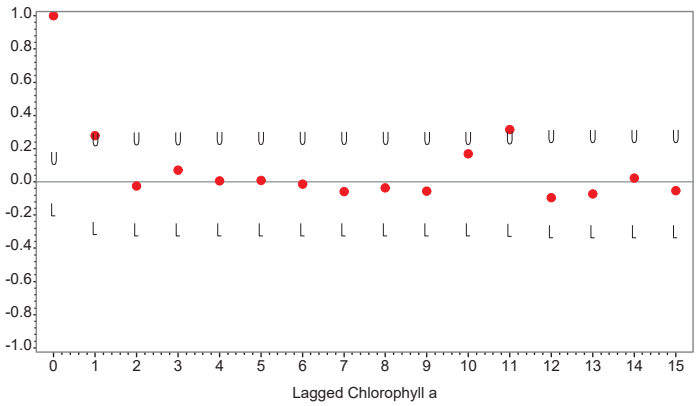
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Chlorophyll a
Adjusted for Seasonal Median and Detrended

Lagged Chlorophyll a	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.277	0.134	0.267	-0.267
2	-0.025	0.137	0.274	-0.274
3	0.070	0.137	0.274	-0.274
4	0.005	0.137	0.275	-0.275
5	0.008	0.137	0.275	-0.275
6	-0.013	0.137	0.275	-0.275
7	-0.059	0.137	0.275	-0.275
8	-0.037	0.137	0.275	-0.275
9	-0.057	0.137	0.275	-0.275
10	0.170	0.138	0.275	-0.275
11	0.316	0.139	0.278	-0.278
12	-0.096	0.143	0.286	-0.286
13	-0.073	0.143	0.287	-0.287

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Chlorophyll a
Adjusted for Seasonal Median and Detrended

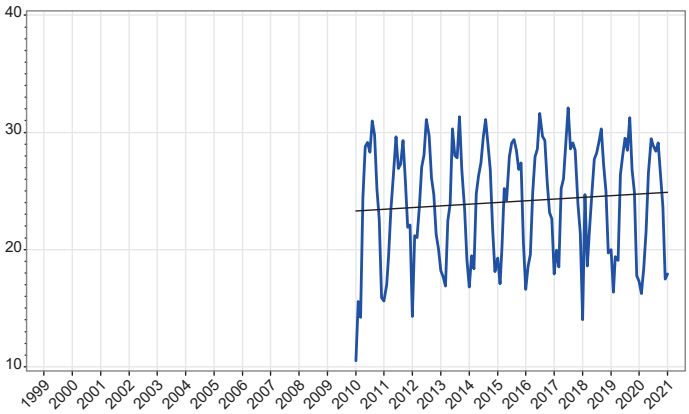
Lagged Chlorophyll a	Correlation	Standard Error	Upper Limit	Lower Limit
14	0.022	0.144	0.287	-0.287
15	-0.054	0.144	0.287	-0.287

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for Chlorophyll a
Correlation Adjusted for Seasonal Median and Detrended

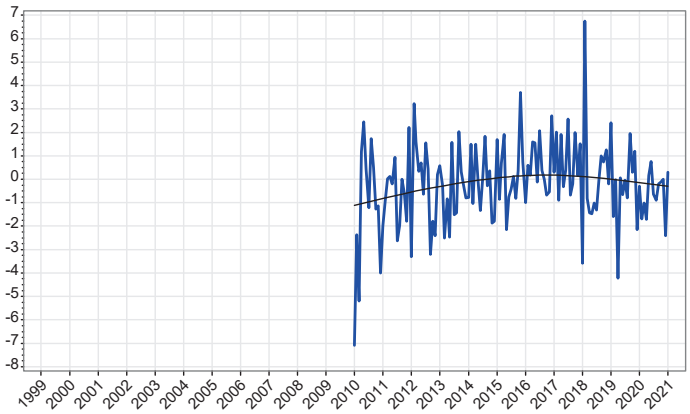


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

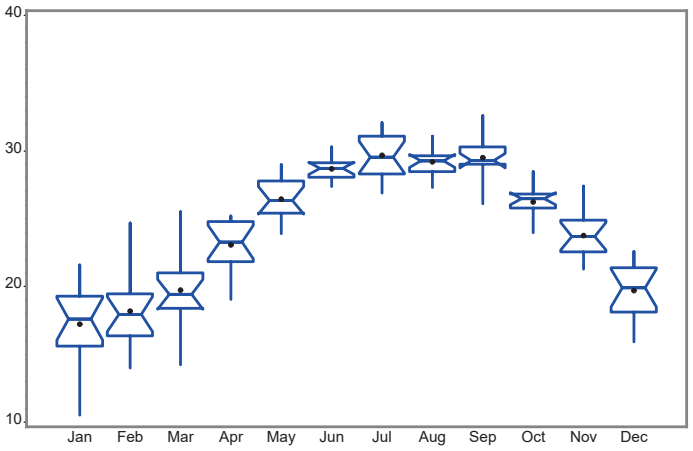
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
Temperature
Not Adjusted for Seasonal Medians



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
Temperature
Adjusted for Seasonal Medians



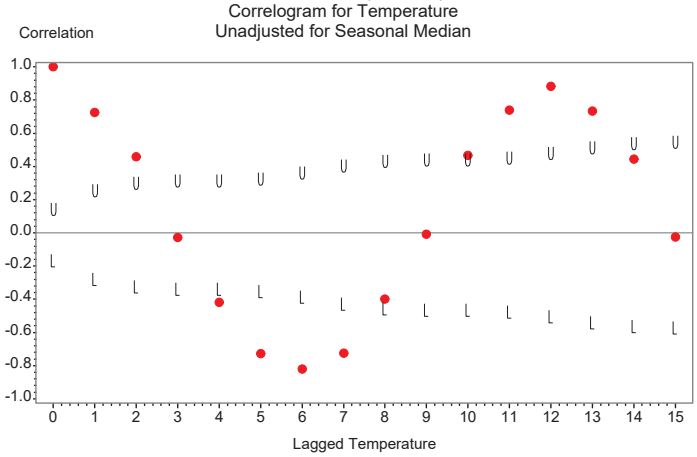
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Univariate Statistics
Temperature



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Temperature
Unadjusted for Seasonal Medians

Lagged Temperature	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.726	0.134	0.267	-0.267
2	0.457	0.155	0.311	-0.311
3	-0.029	0.163	0.326	-0.326
4	-0.419	0.163	0.326	-0.326
5	-0.727	0.169	0.339	-0.339
6	-0.820	0.187	0.374	-0.374
7	-0.726	0.207	0.415	-0.415
8	-0.398	0.222	0.444	-0.444
9	-0.008	0.226	0.452	-0.452
10	0.466	0.226	0.452	-0.452
11	0.740	0.232	0.464	-0.464
12	0.882	0.245	0.491	-0.491
13	0.734	0.264	0.527	-0.527
14	0.443	0.276	0.551	-0.551
15	-0.025	0.280	0.560	-0.560

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for Temperature
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

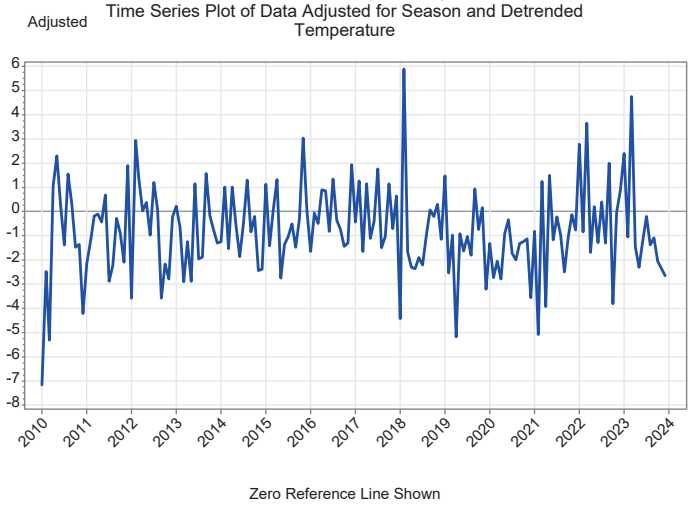
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Temperature
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.122	0.037	0.091	0.093

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Temperature
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.122	0.037	0.091	0.093

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Temperature

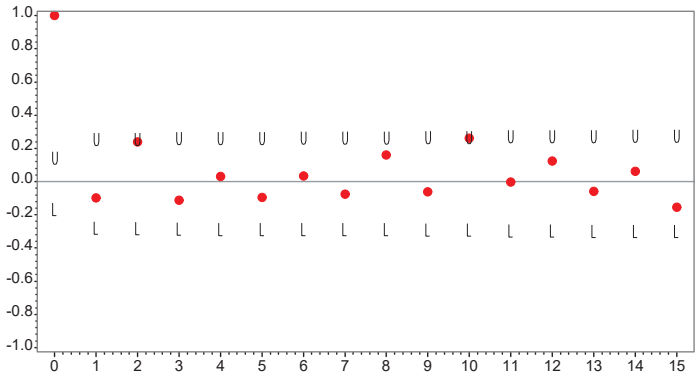


Zero Reference Line Shown

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Temperature
Adjusted for Seasonal Median and Detrended

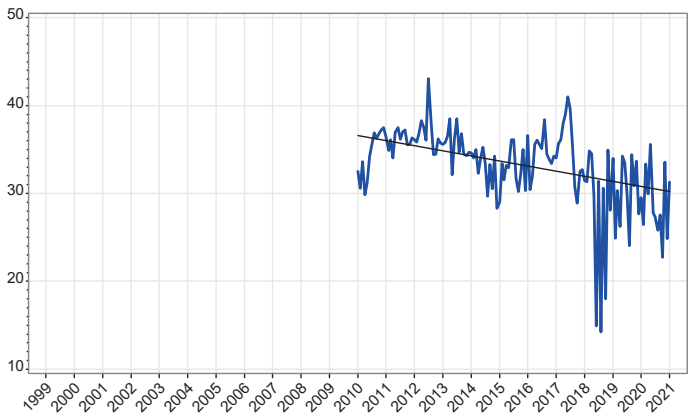
Lagged Temperature	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	-0.098	0.134	0.267	-0.267
2	0.240	0.134	0.268	-0.268
3	-0.111	0.137	0.273	-0.273
4	0.032	0.137	0.274	-0.274
5	-0.096	0.137	0.274	-0.274
6	0.033	0.138	0.275	-0.275
7	-0.076	0.138	0.275	-0.275
8	0.161	0.138	0.276	-0.276
9	-0.061	0.139	0.278	-0.278
10	0.261	0.139	0.278	-0.278
11	-0.003	0.142	0.284	-0.284
12	0.123	0.142	0.284	-0.284
13	-0.060	0.143	0.285	-0.285
14	0.061	0.143	0.286	-0.286
15	-0.154	0.143	0.286	-0.286

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for Temperature
Correlation Adjusted for Seasonal Median and Detrended

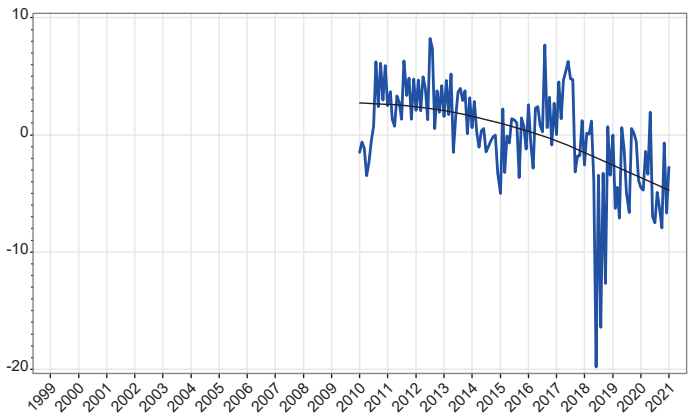


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

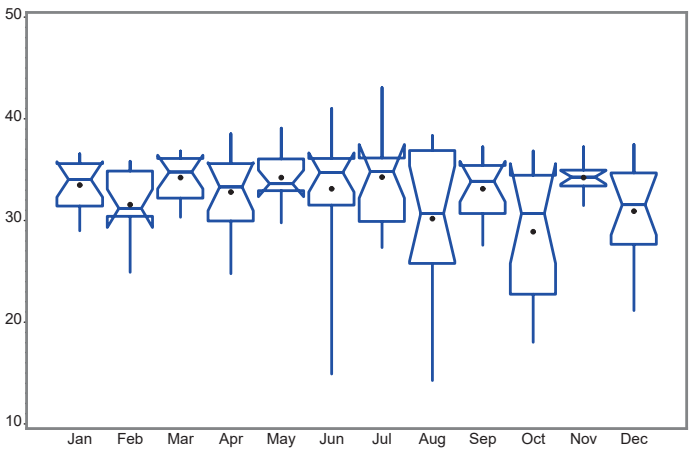
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
Salinity
Not Adjusted for Seasonal Medians



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
Salinity
Adjusted for Seasonal Medians



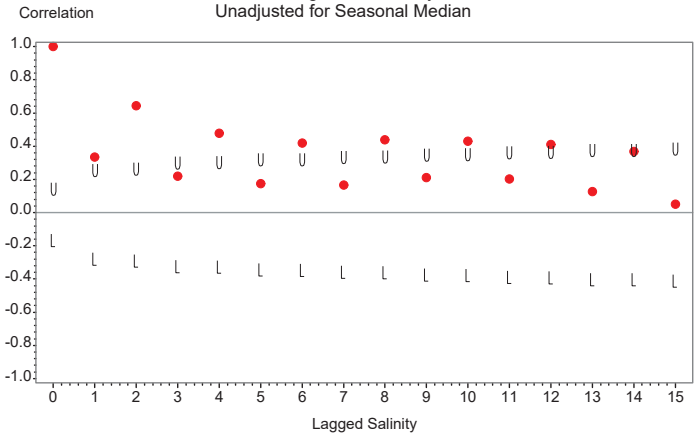
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Univariate Statistics
Salinity



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Salinity
Unadjusted for Seasonal Medians

Lagged Salinity	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.335	0.134	0.267	-0.267
2	0.644	0.139	0.277	-0.277
3	0.220	0.155	0.311	-0.311
4	0.478	0.157	0.314	-0.314
5	0.175	0.166	0.331	-0.331
6	0.420	0.167	0.333	-0.333
7	0.167	0.173	0.346	-0.346
8	0.438	0.174	0.348	-0.348
9	0.211	0.180	0.361	-0.361
10	0.430	0.182	0.364	-0.364
11	0.202	0.188	0.375	-0.375
12	0.411	0.189	0.378	-0.378
13	0.127	0.194	0.389	-0.389
14	0.367	0.195	0.389	-0.389
15	0.052	0.199	0.398	-0.398

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for Salinity
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

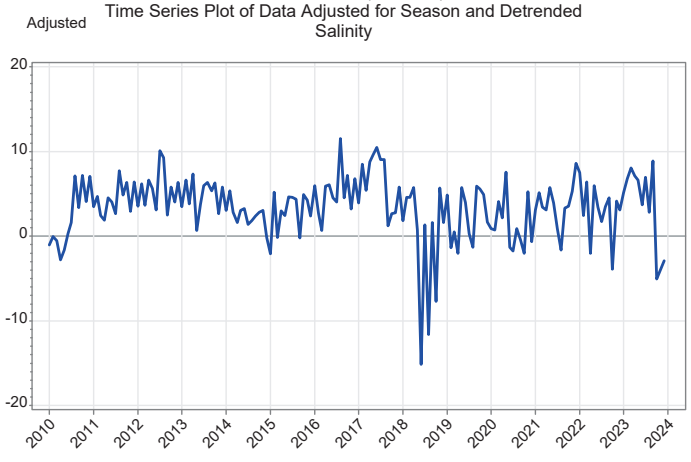
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Salinity
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.427	0	.004	-0.488

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Salinity
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.427	0	.004	-0.488

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Salinity

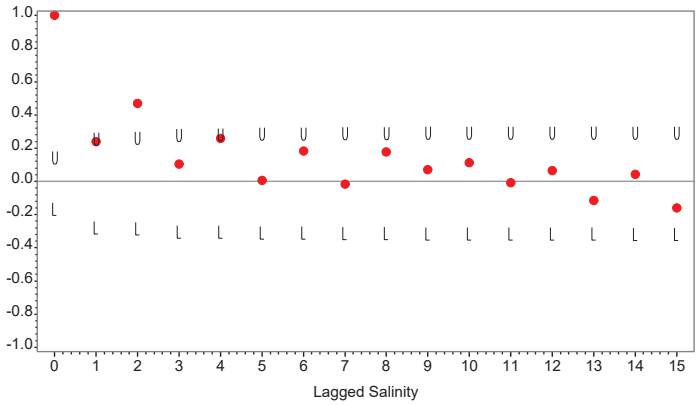


Zero Reference Line Shown

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Salinity
Adjusted for Seasonal Median and Detrended

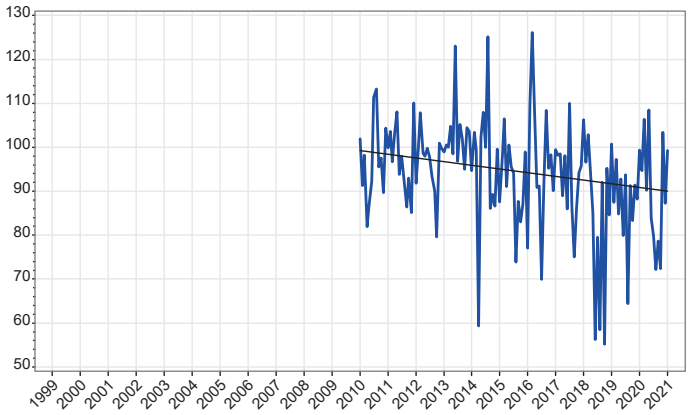
Lagged Salinity	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.238	0.134	0.267	-0.267
2	0.470	0.136	0.272	-0.272
3	0.105	0.145	0.291	-0.291
4	0.260	0.146	0.292	-0.292
5	0.006	0.149	0.297	-0.297
6	0.184	0.149	0.297	-0.297
7	-0.018	0.150	0.300	-0.300
8	0.178	0.150	0.300	-0.300
9	0.070	0.151	0.303	-0.303
10	0.113	0.151	0.303	-0.303
11	-0.007	0.152	0.304	-0.304
12	0.064	0.152	0.304	-0.304
13	-0.114	0.152	0.304	-0.304
14	0.042	0.153	0.305	-0.305
15	-0.160	0.153	0.305	-0.305

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for Salinity
Correlation Adjusted for Seasonal Median and Detrended

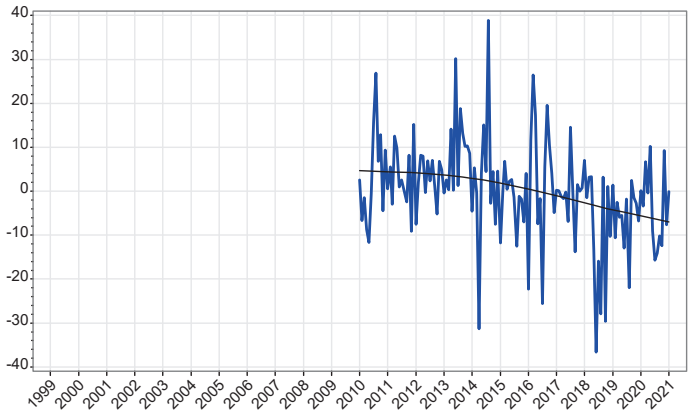


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

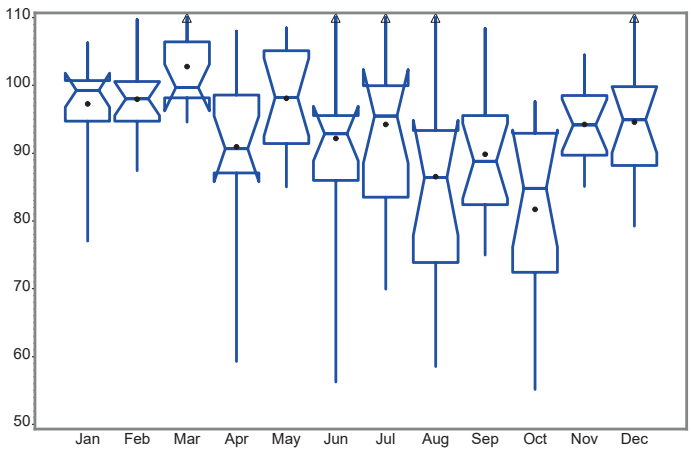
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
Dissolved Oxygen Saturation
Not Adjusted for Seasonal Medians



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
Dissolved Oxygen Saturation
Adjusted for Seasonal Medians



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Univariate Statistics
Dissolved Oxygen Saturation



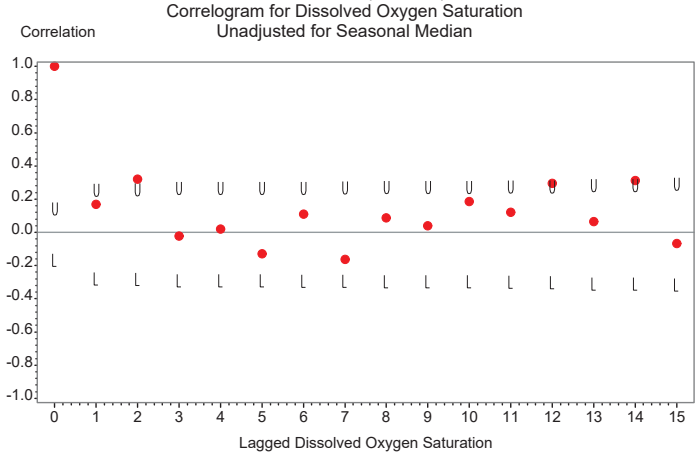
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Dissolved Oxygen Saturation
Unadjusted for Seasonal Medians

Lagged Dissolved Oxygen Saturation	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.170	0.134	0.267	-0.267
2	0.321	0.135	0.270	-0.270
3	-0.023	0.139	0.279	-0.279
4	0.021	0.139	0.279	-0.279
5	-0.128	0.139	0.279	-0.279
6	0.111	0.140	0.280	-0.280
7	-0.164	0.141	0.281	-0.281
8	0.086	0.142	0.284	-0.284
9	0.040	0.142	0.284	-0.284
10	0.187	0.142	0.284	-0.284
11	0.121	0.144	0.287	-0.287
12	0.294	0.144	0.288	-0.288
13	0.066	0.148	0.296	-0.296

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Dissolved Oxygen Saturation
Unadjusted for Seasonal Medians

Lagged Dissolved Oxygen Saturation	Correlation	Standard Error	Upper Limit	Lower Limit
14	0.313	0.148	0.296	-0.296
15	-0.067	0.152	0.304	-0.304

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for Dissolved Oxygen Saturation
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

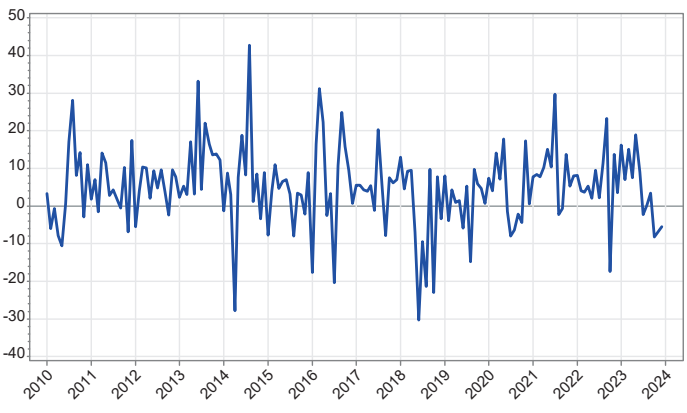
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Dissolved Oxygen Saturation
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.206	0	.007	-0.66

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Dissolved Oxygen Saturation
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.206	0	.007	-0.66

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Dissolved Oxygen Saturation



Zero Reference Line Shown

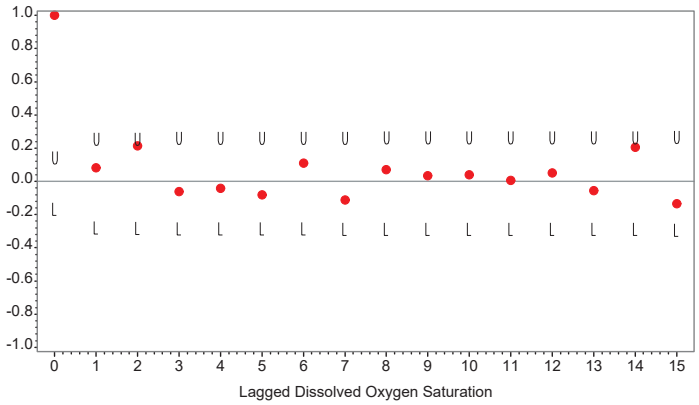
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Dissolved Oxygen Saturation
Adjusted for Seasonal Median and Detrended

Lagged Dissolved Oxygen Saturation	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.083	0.134	0.267	-0.267
2	0.215	0.134	0.268	-0.268
3	-0.063	0.136	0.272	-0.272
4	-0.043	0.136	0.272	-0.272
5	-0.081	0.136	0.272	-0.272
6	0.109	0.137	0.273	-0.273
7	-0.111	0.137	0.274	-0.274
8	0.071	0.138	0.275	-0.275
9	0.035	0.138	0.276	-0.276
10	0.040	0.138	0.276	-0.276
11	0.005	0.138	0.276	-0.276
12	0.052	0.138	0.276	-0.276
13	-0.055	0.138	0.276	-0.276

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Dissolved Oxygen Saturation
Adjusted for Seasonal Median and Detrended

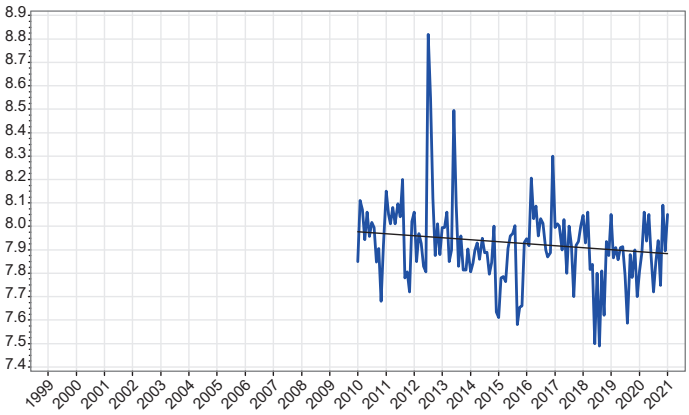
Lagged Dissolved Oxygen Saturation	Correlation	Standard Error	Upper Limit	Lower Limit
14	0.205	0.138	0.276	-0.276
15	-0.134	0.140	0.280	-0.280

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for Dissolved Oxygen Saturation
Correlation Adjusted for Seasonal Median and Detrended

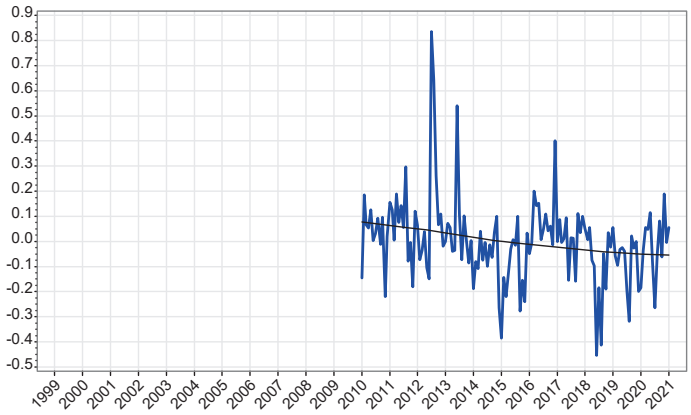


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

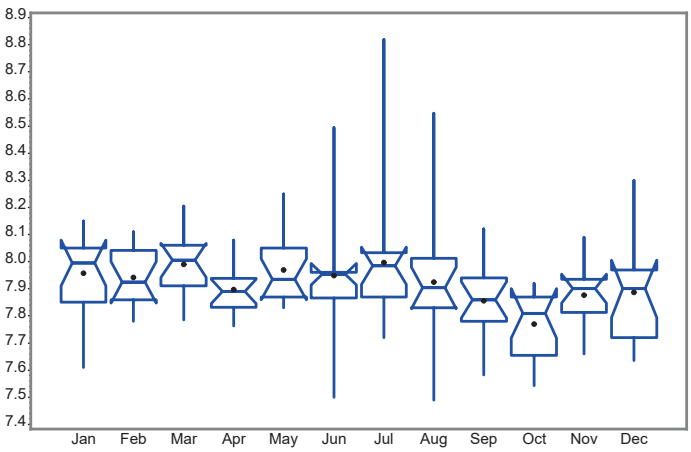
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
pH
(SU) Not Adjusted for Seasonal Medians



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
pH
Adjusted (SU) Adjusted for Seasonal Medians



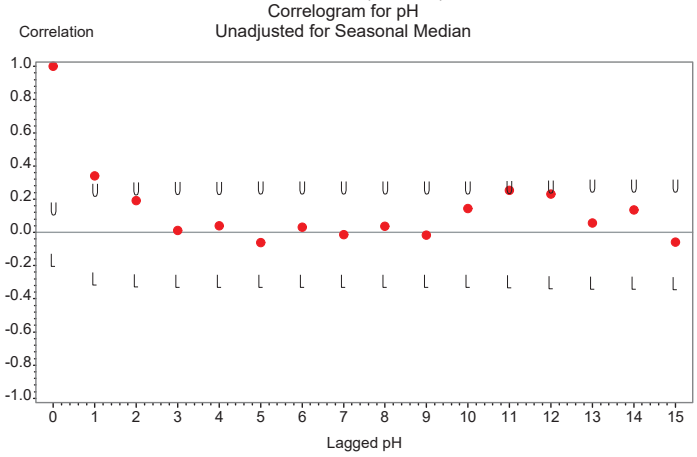
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Univariate Statistics
(SU) pH



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for pH
Unadjusted for Seasonal Medians

Lagged pH	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.340	0.134	0.267	-0.267
2	0.190	0.139	0.277	-0.277
3	0.012	0.140	0.280	-0.280
4	0.039	0.140	0.280	-0.280
5	-0.062	0.140	0.281	-0.281
6	0.030	0.140	0.281	-0.281
7	-0.013	0.140	0.281	-0.281
8	0.036	0.140	0.281	-0.281
9	-0.016	0.141	0.281	-0.281
10	0.143	0.141	0.281	-0.281
11	0.253	0.141	0.283	-0.283
12	0.231	0.144	0.288	-0.288
13	0.055	0.146	0.293	-0.293
14	0.135	0.146	0.293	-0.293
15	-0.058	0.147	0.294	-0.294

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for pH
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

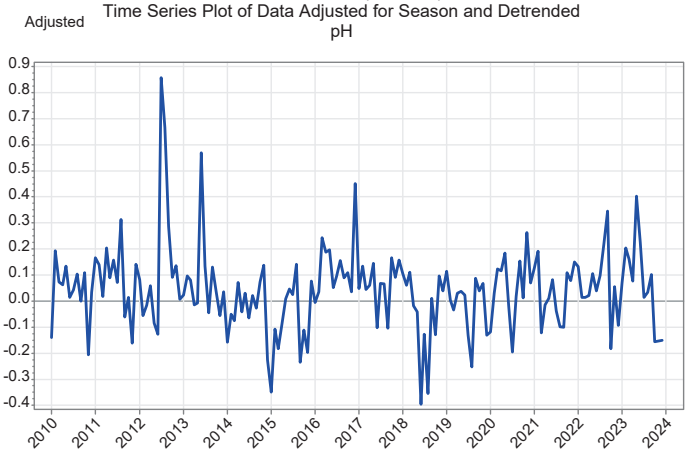
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
pH
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.127	0.03	0.114	-.006

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
pH
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.128	0.029	0.112	-.006

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
pH

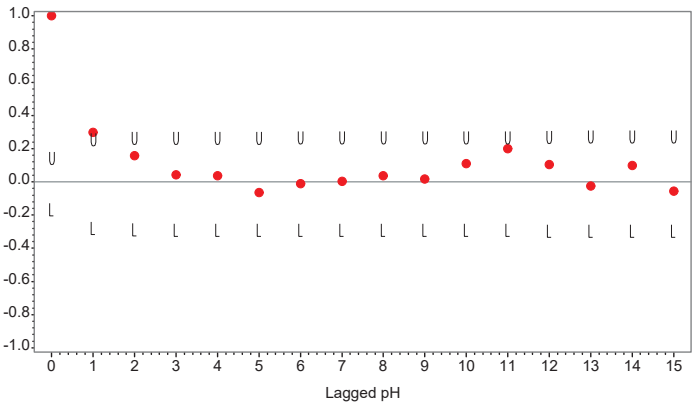


Zero Reference Line Shown

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for pH
Adjusted for Seasonal Median and Detrended

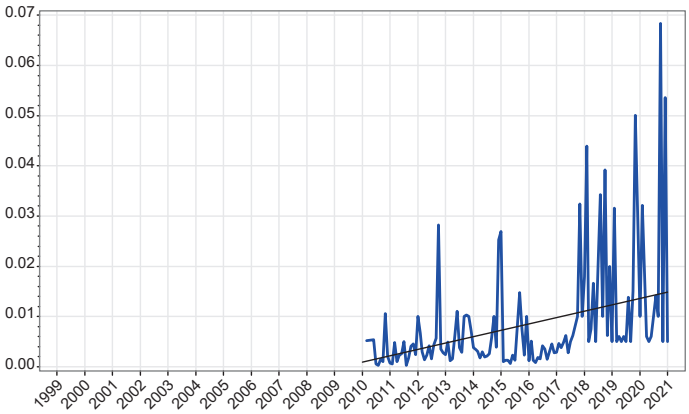
Lagged pH	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.297	0.134	0.267	-0.267
2	0.157	0.137	0.275	-0.275
3	0.042	0.139	0.277	-0.277
4	0.037	0.139	0.277	-0.277
5	-0.065	0.139	0.277	-0.277
6	-0.010	0.139	0.278	-0.278
7	0.002	0.139	0.278	-0.278
8	0.036	0.139	0.278	-0.278
9	0.017	0.139	0.278	-0.278
10	0.110	0.139	0.278	-0.278
11	0.200	0.139	0.279	-0.279
12	0.104	0.141	0.282	-0.282
13	-0.025	0.142	0.283	-0.283
14	0.099	0.142	0.283	-0.283
15	-0.056	0.142	0.284	-0.284

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for pH
Adjusted for Seasonal Median and Detrended

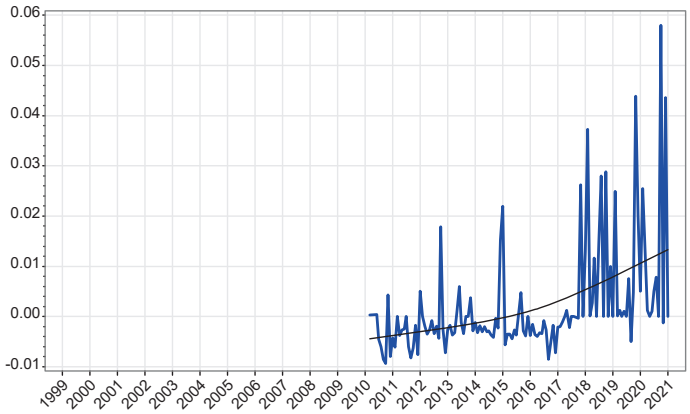


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

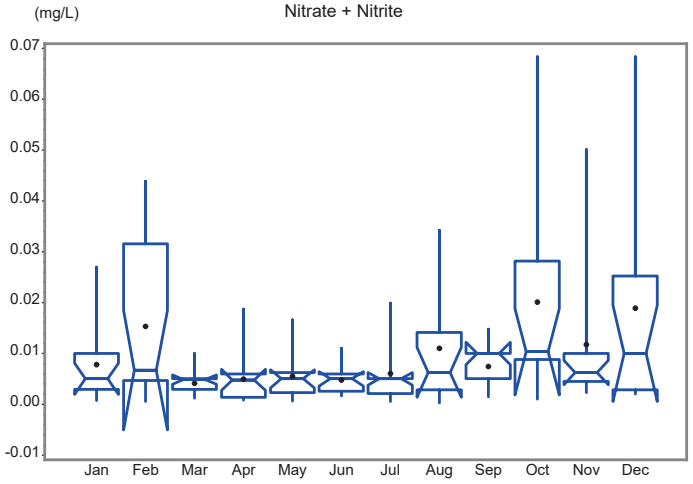
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
Nitrate + Nitrite
Not Adjusted for Seasonal Medians



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
Nitrate + Nitrite
Adjusted for Seasonal Medians



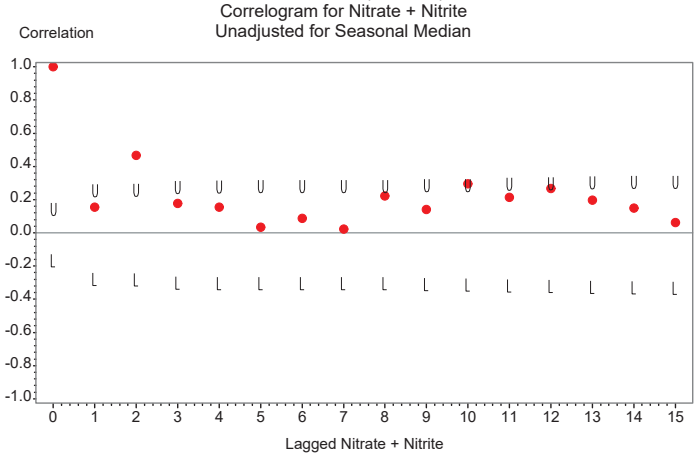
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Univariate Statistics
Nitrate + Nitrite



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Nitrate + Nitrite
Unadjusted for Seasonal Medians

Lagged Nitrate + Nitrite	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.156	0.134	0.267	-0.267
2	0.467	0.135	0.269	-0.269
3	0.176	0.144	0.288	-0.288
4	0.155	0.145	0.291	-0.291
5	0.034	0.146	0.293	-0.293
6	0.088	0.146	0.293	-0.293
7	0.023	0.147	0.293	-0.293
8	0.221	0.147	0.293	-0.293
9	0.141	0.149	0.297	-0.297
10	0.295	0.149	0.299	-0.299
11	0.215	0.153	0.306	-0.306
12	0.268	0.155	0.309	-0.309
13	0.196	0.157	0.315	-0.315
14	0.149	0.159	0.318	-0.318
15	0.062	0.160	0.319	-0.319

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for Nitrate + Nitrite
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

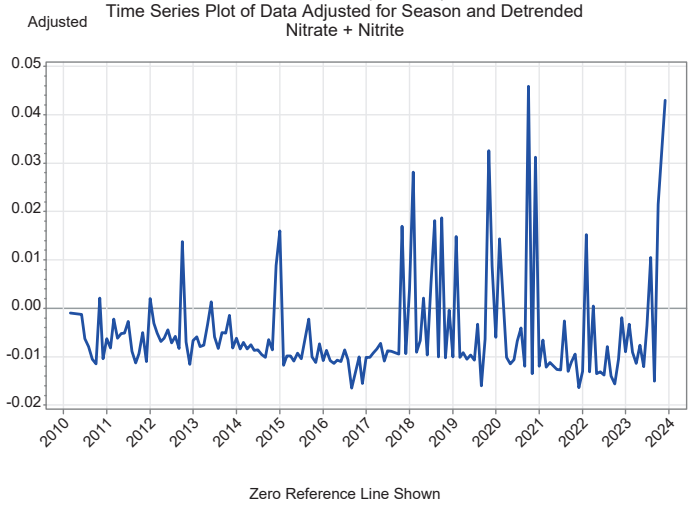
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Nitrate + Nitrite
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.438	0	.001	.001

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Nitrate + Nitrite
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.436	0	.002	.001

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Nitrate + Nitrite

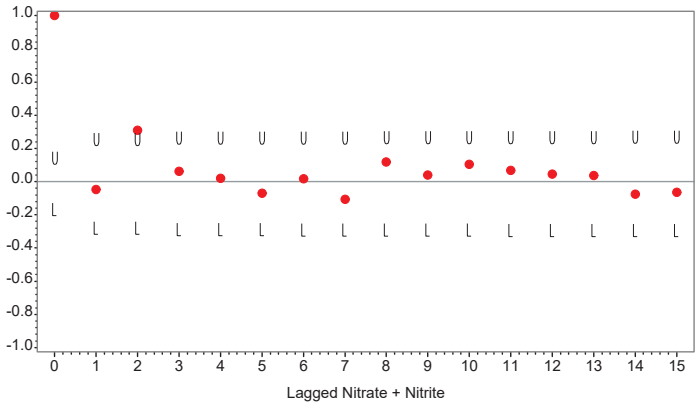


Zero Reference Line Shown

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Nitrate + Nitrite
Adjusted for Seasonal Median and Detrended

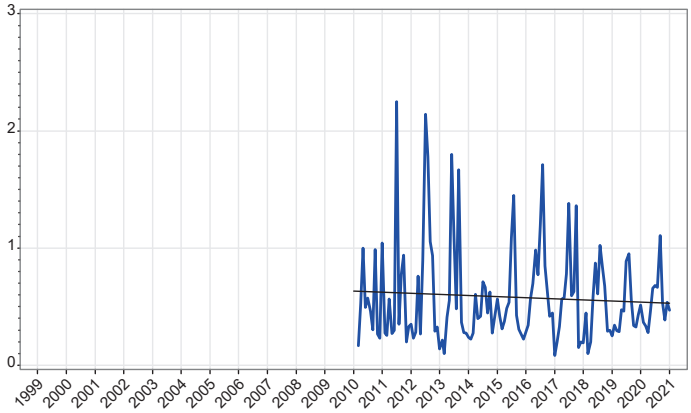
Lagged Nitrate + Nitrite	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	-0.048	0.134	0.267	-0.267
2	0.310	0.134	0.267	-0.267
3	0.062	0.138	0.276	-0.276
4	0.020	0.138	0.276	-0.276
5	-0.070	0.138	0.276	-0.276
6	0.017	0.138	0.277	-0.277
7	-0.106	0.138	0.277	-0.277
8	0.117	0.139	0.278	-0.278
9	0.040	0.139	0.279	-0.279
10	0.103	0.139	0.279	-0.279
11	0.068	0.140	0.280	-0.280
12	0.044	0.140	0.280	-0.280
13	0.036	0.140	0.280	-0.280
14	-0.076	0.140	0.281	-0.281
15	-0.065	0.141	0.281	-0.281

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for Nitrate + Nitrite
Adjusted for Seasonal Median and Detrended

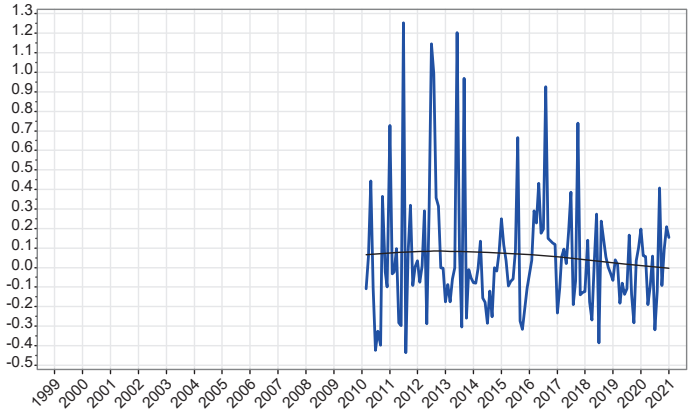


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

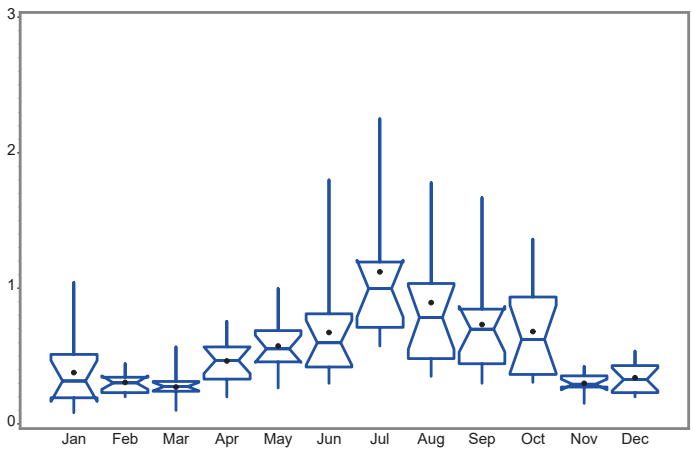
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
Total Kjeldahl Nitrogen
Not Adjusted for Seasonal Medians



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
Total Kjeldahl Nitrogen
Adjusted for Seasonal Medians



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Univariate Statistics
Total Kjeldahl Nitrogen



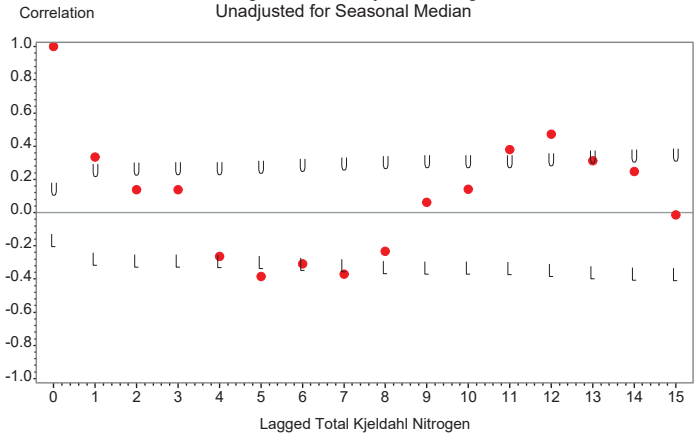
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Total Kjeldahl Nitrogen
Unadjusted for Seasonal Medians

Lagged Total Kjeldahl Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.335	0.134	0.267	-0.267
2	0.137	0.139	0.277	-0.277
3	0.137	0.139	0.279	-0.279
4	-0.265	0.140	0.280	-0.280
5	-0.384	0.143	0.286	-0.286
6	-0.308	0.149	0.298	-0.298
7	-0.372	0.153	0.306	-0.306
8	-0.234	0.158	0.316	-0.316
9	0.061	0.160	0.320	-0.320
10	0.142	0.160	0.321	-0.321
11	0.380	0.161	0.322	-0.322
12	0.473	0.166	0.333	-0.333
13	0.312	0.174	0.348	-0.348

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Total Kjeldahl Nitrogen
Unadjusted for Seasonal Medians

Lagged Total Kjeldahl Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
14	0.248	0.177	0.355	-0.355
15	-0.013	0.180	0.359	-0.359

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for Total Kjeldahl Nitrogen
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

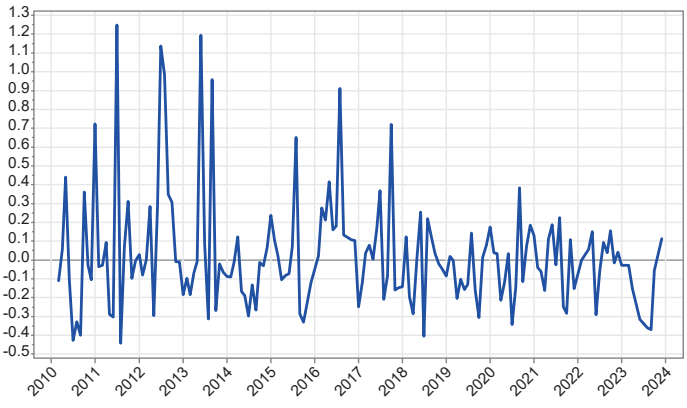
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Total Kjeldahl Nitrogen
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.025	0.693	0.707	.002

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Total Kjeldahl Nitrogen
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.024	0.706	0.718	.002

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Total Kjeldahl Nitrogen



Zero Reference Line Shown

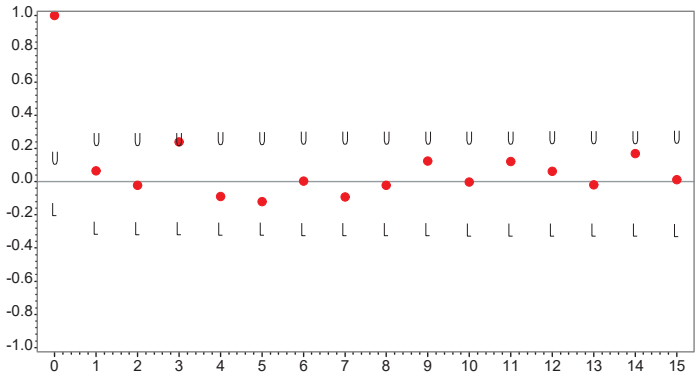
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Total Kjeldahl Nitrogen
Adjusted for Seasonal Median and Detrended

Lagged Total Kjeldahl Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.065	0.134	0.267	-0.267
2	-0.023	0.134	0.268	-0.268
3	0.239	0.134	0.268	-0.268
4	-0.089	0.136	0.273	-0.273
5	-0.122	0.137	0.273	-0.273
6	0.002	0.137	0.275	-0.275
7	-0.093	0.137	0.275	-0.275
8	-0.021	0.138	0.275	-0.275
9	0.125	0.138	0.275	-0.275
10	-0.002	0.138	0.277	-0.277
11	0.120	0.138	0.277	-0.277
12	0.062	0.139	0.278	-0.278
13	-0.020	0.139	0.278	-0.278

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Total Kjeldahl Nitrogen
Adjusted for Seasonal Median and Detrended

Lagged Total Kjeldahl Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
14	0.170	0.139	0.278	-0.278
15	0.011	0.140	0.281	-0.281

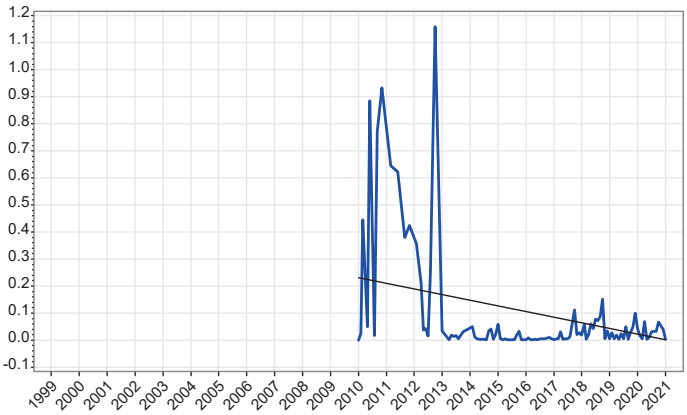
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for Total Kjeldahl Nitrogen
Correlation Adjusted for Seasonal Median and Detrended



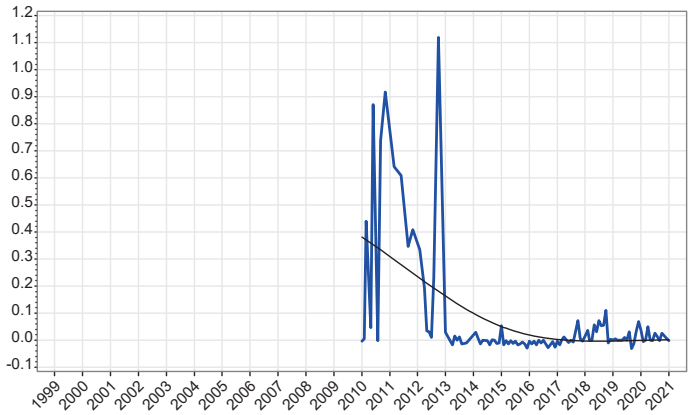
Lagged Total Kjeldahl Nitrogen

U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

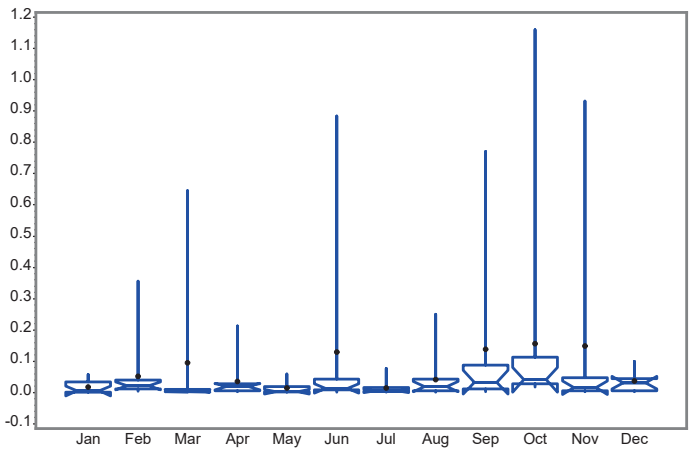
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
Ammonia
Not Adjusted for Seasonal Medians



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
Ammonia
Adjusted for Seasonal Medians



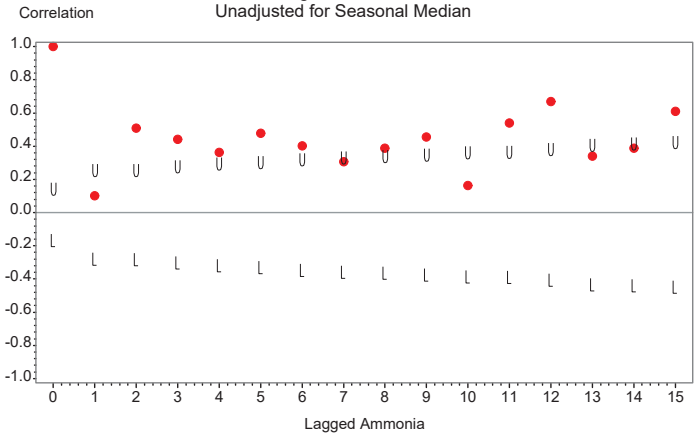
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Univariate Statistics
Ammonia



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Ammonia
Unadjusted for Seasonal Medians

Lagged Ammonia	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.102	0.134	0.267	-0.267
2	0.510	0.134	0.268	-0.268
3	0.441	0.145	0.290	-0.290
4	0.364	0.153	0.306	-0.306
5	0.479	0.158	0.316	-0.316
6	0.401	0.166	0.333	-0.333
7	0.307	0.172	0.344	-0.344
8	0.388	0.175	0.351	-0.351
9	0.456	0.180	0.361	-0.361
10	0.163	0.187	0.374	-0.374
11	0.540	0.188	0.376	-0.376
12	0.669	0.197	0.394	-0.394
13	0.341	0.210	0.420	-0.420
14	0.387	0.213	0.427	-0.427
15	0.609	0.217	0.435	-0.435

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for Ammonia
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

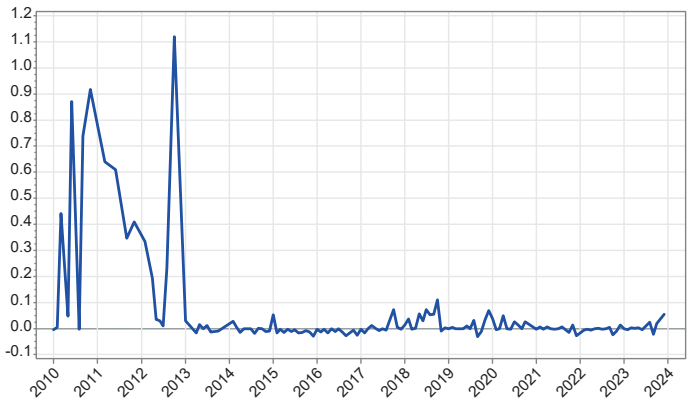
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Ammonia
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.063	0.345	0.638	0

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Ammonia
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.071	0.283	0.582	0

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Ammonia

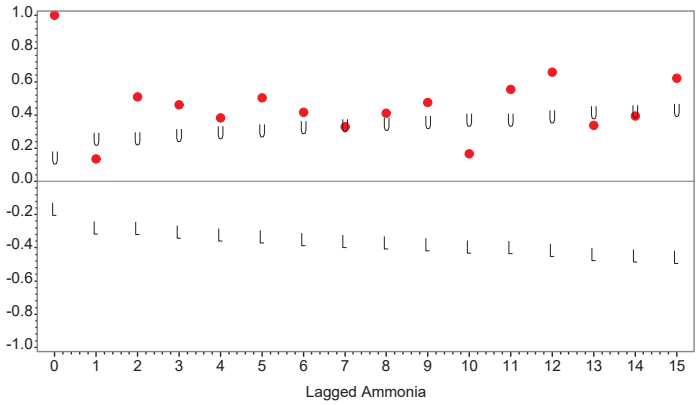


Zero Reference Line Shown

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Ammonia
Adjusted for Seasonal Median and Detrended

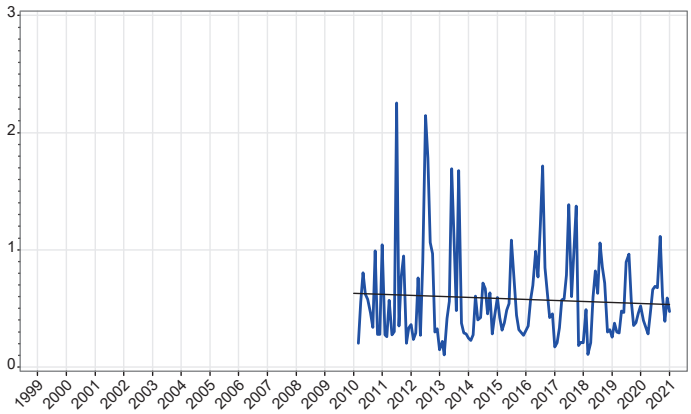
Lagged Ammonia	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.135	0.134	0.267	-0.267
2	0.509	0.134	0.269	-0.269
3	0.460	0.145	0.291	-0.291
4	0.383	0.154	0.308	-0.308
5	0.504	0.159	0.319	-0.319
6	0.416	0.169	0.337	-0.337
7	0.329	0.175	0.349	-0.349
8	0.409	0.178	0.357	-0.357
9	0.476	0.184	0.368	-0.368
10	0.166	0.191	0.382	-0.382
11	0.554	0.192	0.384	-0.384
12	0.659	0.201	0.402	-0.402
13	0.337	0.214	0.427	-0.427
14	0.393	0.217	0.434	-0.434
15	0.620	0.221	0.442	-0.442

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for Ammonia
Correlation Adjusted for Seasonal Median and Detrended

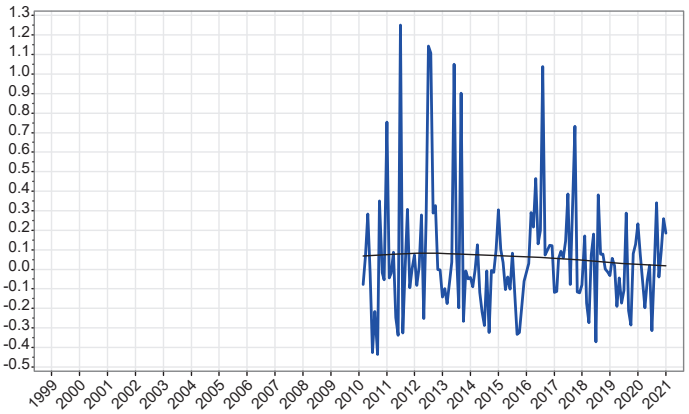


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

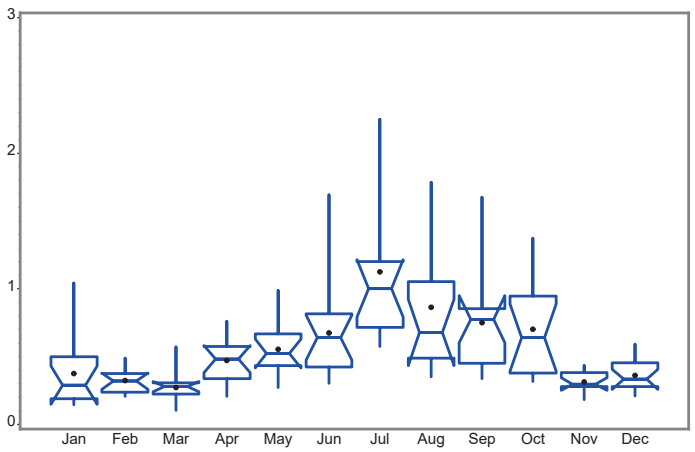
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
Total Nitrogen
Not Adjusted for Seasonal Medians



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
Total Nitrogen
Adjusted for Seasonal Medians



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Univariate Statistics
Total Nitrogen



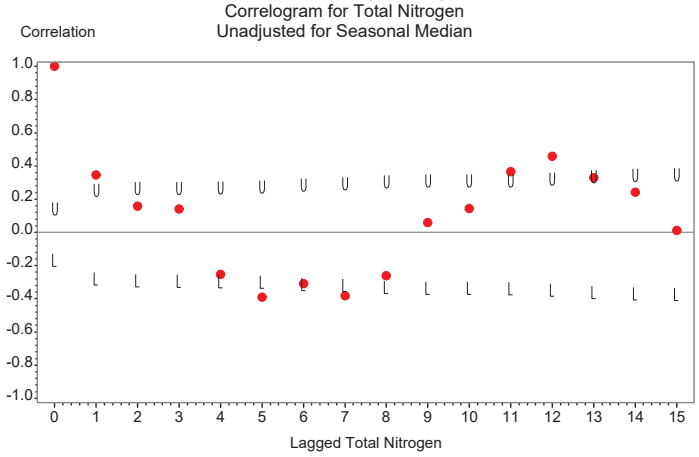
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Total Nitrogen
Unadjusted for Seasonal Medians

Lagged Total Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.345	0.134	0.267	-0.267
2	0.158	0.139	0.278	-0.278
3	0.142	0.140	0.280	-0.280
4	-0.253	0.141	0.282	-0.282
5	-0.390	0.143	0.287	-0.287
6	-0.310	0.150	0.299	-0.299
7	-0.382	0.153	0.307	-0.307
8	-0.262	0.159	0.318	-0.318
9	0.059	0.162	0.323	-0.323
10	0.144	0.162	0.323	-0.323
11	0.366	0.162	0.325	-0.325
12	0.457	0.167	0.334	-0.334
13	0.329	0.175	0.349	-0.349

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Total Nitrogen
Unadjusted for Seasonal Medians

Lagged Total Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
14	0.243	0.178	0.356	-0.356
15	0.011	0.180	0.360	-0.360

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for Total Nitrogen
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

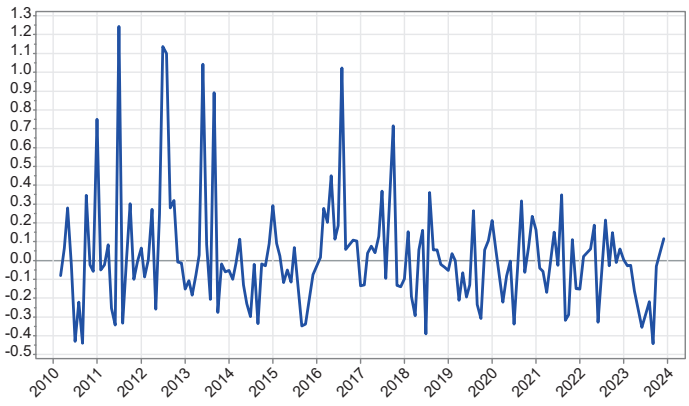
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Total Nitrogen
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.026	0.684	0.681	.001

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Total Nitrogen
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.027	0.671	0.668	.002

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Total Nitrogen



Zero Reference Line Shown

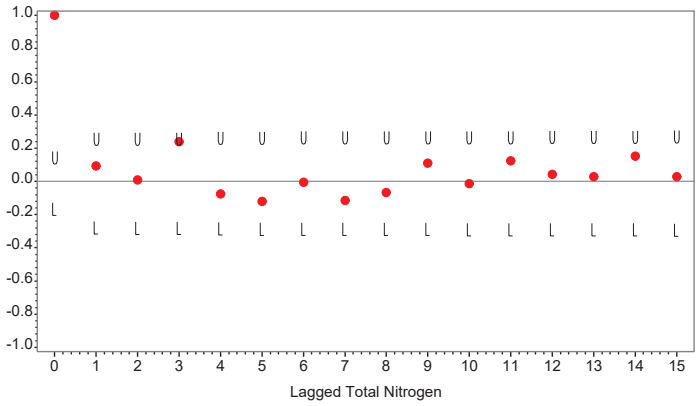
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Total Nitrogen
Adjusted for Seasonal Median and Detrended

Lagged Total Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.093	0.134	0.267	-0.267
2	0.008	0.134	0.268	-0.268
3	0.239	0.134	0.268	-0.268
4	-0.077	0.137	0.273	-0.273
5	-0.122	0.137	0.274	-0.274
6	-0.005	0.137	0.275	-0.275
7	-0.114	0.137	0.275	-0.275
8	-0.067	0.138	0.276	-0.276
9	0.110	0.138	0.276	-0.276
10	-0.015	0.139	0.277	-0.277
11	0.123	0.139	0.277	-0.277
12	0.041	0.139	0.279	-0.279
13	0.028	0.139	0.279	-0.279

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Total Nitrogen
Adjusted for Seasonal Median and Detrended

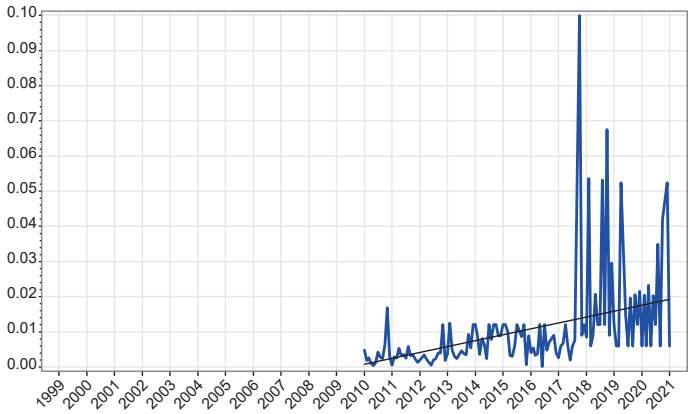
Lagged Total Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
14	0.152	0.139	0.279	-0.279
15	0.027	0.140	0.281	-0.281

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for Total Nitrogen
Correlation Adjusted for Seasonal Median and Detrended

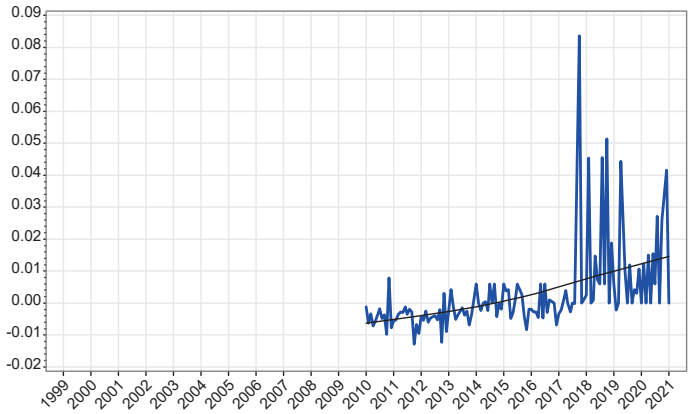


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

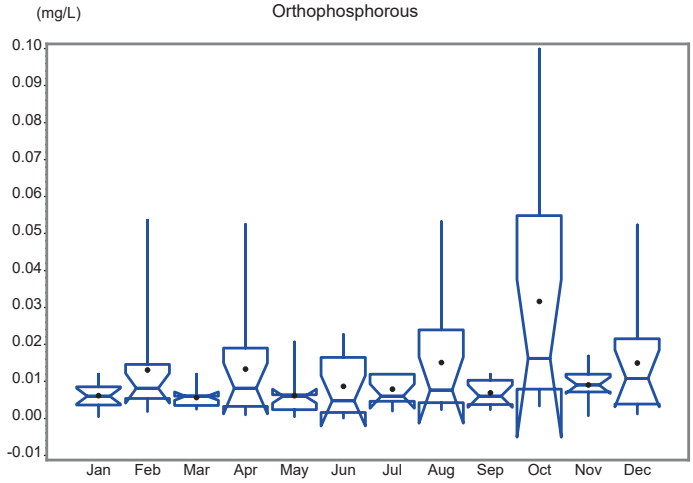
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
Orthophosphorous
Not Adjusted for Seasonal Medians



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
Orthophosphorous
Adjusted for Seasonal Medians



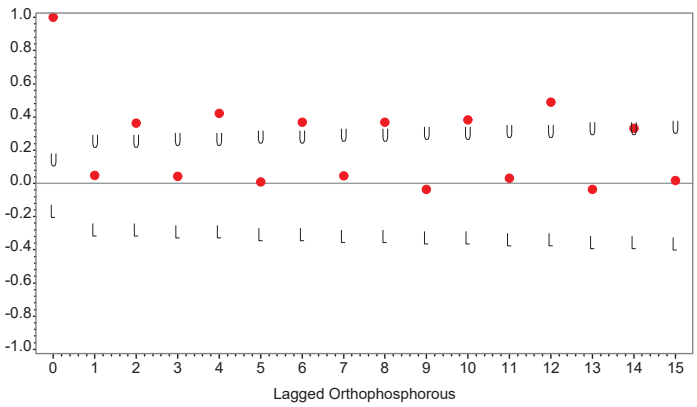
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Univariate Statistics
Orthophosphorous



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Orthophosphorous
Unadjusted for Seasonal Medians

Lagged Orthophosphorous	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.047	0.134	0.267	-0.267
2	0.362	0.134	0.267	-0.267
3	0.042	0.139	0.279	-0.279
4	0.423	0.140	0.279	-0.279
5	0.009	0.147	0.294	-0.294
6	0.369	0.147	0.294	-0.294
7	0.044	0.152	0.305	-0.305
8	0.367	0.152	0.305	-0.305
9	-0.036	0.158	0.315	-0.315
10	0.383	0.158	0.315	-0.315
11	0.032	0.163	0.326	-0.326
12	0.488	0.163	0.326	-0.326
13	-0.036	0.172	0.343	-0.343
14	0.331	0.172	0.343	-0.343
15	0.017	0.175	0.351	-0.351

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for Orthophosphorous
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

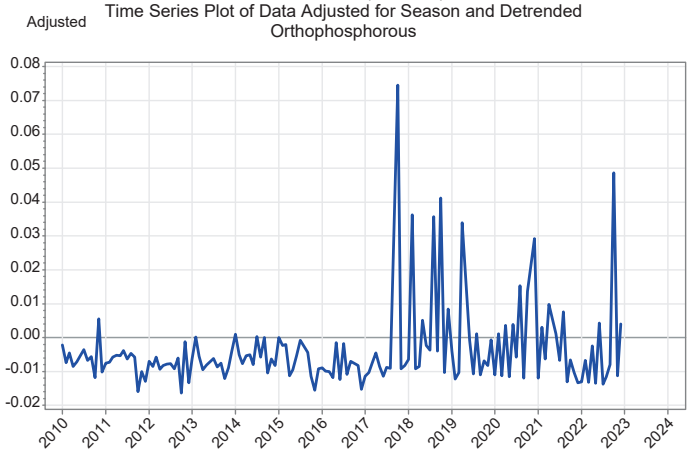
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Orthophosphorous
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.503	0	.001	.001

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Orthophosphorous
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.504	0	.001	.001

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Orthophosphorous

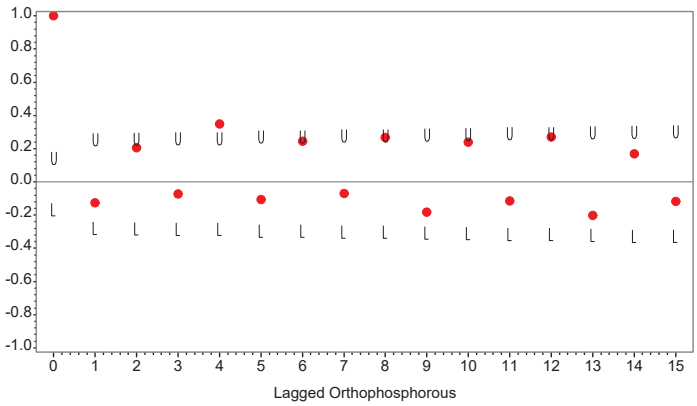


Zero Reference Line Shown

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Orthophosphorous
Adjusted for Seasonal Median and Detrended

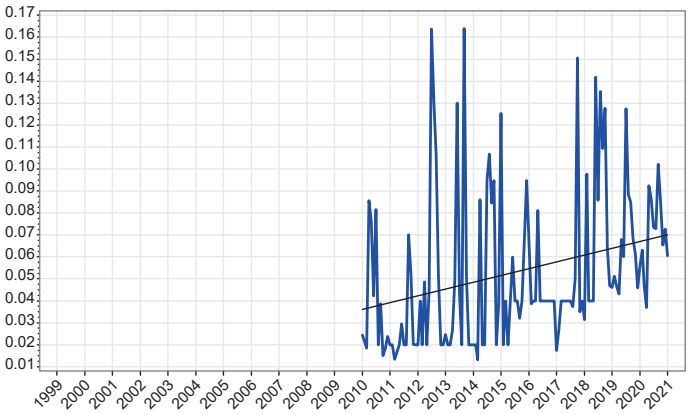
Lagged Orthophosphorous	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	-0.125	0.134	0.267	-0.267
2	0.205	0.134	0.269	-0.269
3	-0.074	0.136	0.272	-0.272
4	0.349	0.136	0.273	-0.273
5	-0.108	0.142	0.283	-0.283
6	0.246	0.142	0.284	-0.284
7	-0.071	0.145	0.289	-0.289
8	0.268	0.145	0.290	-0.290
9	-0.183	0.148	0.295	-0.295
10	0.240	0.149	0.298	-0.298
11	-0.116	0.151	0.303	-0.303
12	0.270	0.152	0.304	-0.304
13	-0.203	0.155	0.309	-0.309
14	0.169	0.156	0.313	-0.313
15	-0.117	0.157	0.315	-0.315

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for Orthophosphorous
Correlation Adjusted for Seasonal Median and Detrended

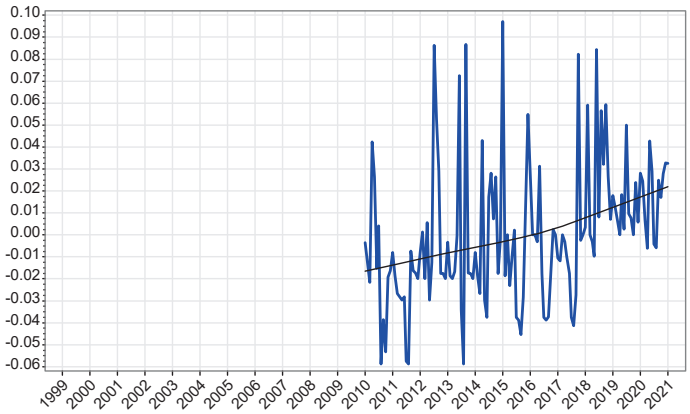


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

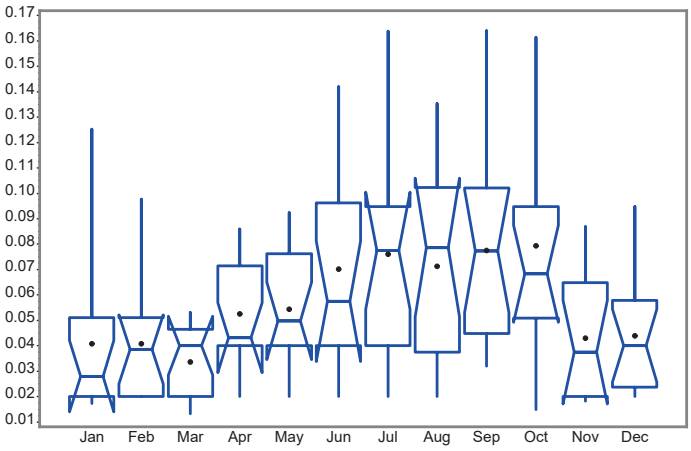
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
Total Phosphorous
Not Adjusted for Seasonal Medians



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Monthly Data Time Series
Total Phosphorous
Adjusted for Seasonal Medians



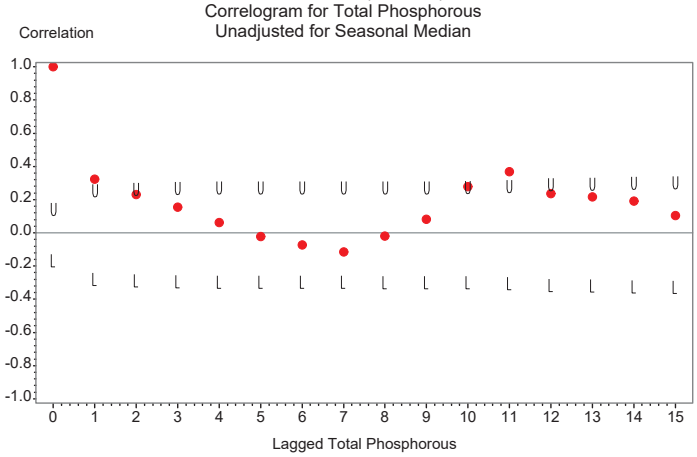
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Univariate Statistics
Total Phosphorous



NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Total Phosphorous
Unadjusted for Seasonal Medians

Lagged Total Phosphorous	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.324	0.134	0.267	-0.267
2	0.231	0.138	0.276	-0.276
3	0.155	0.141	0.281	-0.281
4	0.062	0.142	0.283	-0.283
5	-0.022	0.142	0.283	-0.283
6	-0.072	0.142	0.283	-0.283
7	-0.115	0.142	0.284	-0.284
8	-0.019	0.142	0.285	-0.285
9	0.082	0.142	0.285	-0.285
10	0.279	0.143	0.286	-0.286
11	0.367	0.146	0.292	-0.292
12	0.237	0.151	0.303	-0.303
13	0.216	0.154	0.307	-0.307
14	0.190	0.155	0.311	-0.311
15	0.105	0.157	0.314	-0.314

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for Total Phosphorous
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

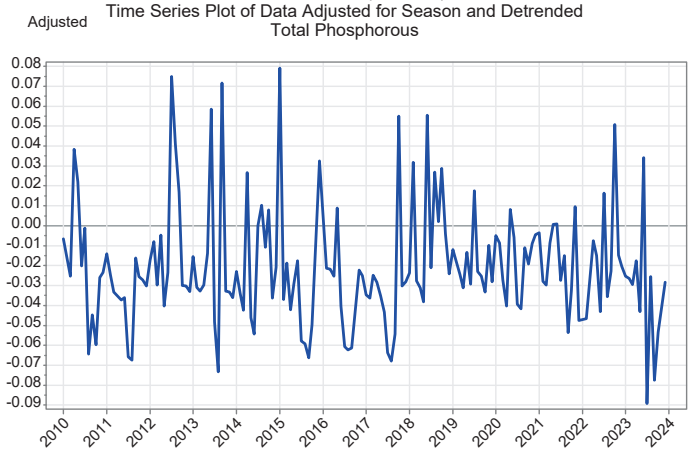
NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Total Phosphorous
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.366	0	.002	.003

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Total Phosphorous
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.366	0	.002	.003

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Total Phosphorous

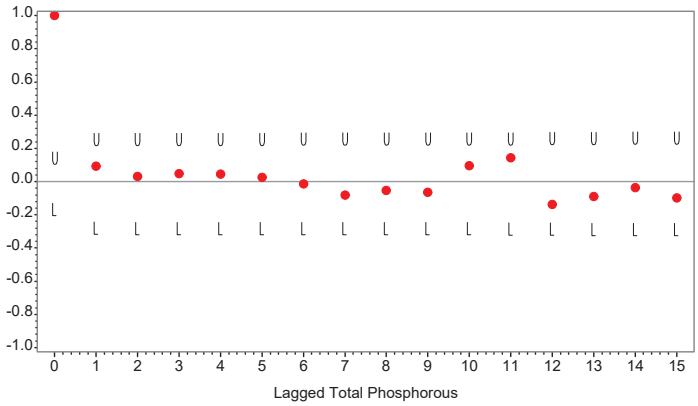


Zero Reference Line Shown

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Autocorrelation Statistics for Total Phosphorous
Adjusted for Seasonal Median and Detrended

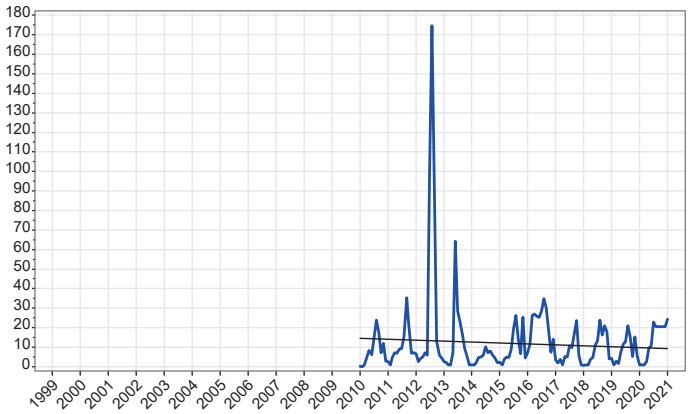
Lagged Total Phosphorous	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.093	0.134	0.267	-0.267
2	0.032	0.134	0.268	-0.268
3	0.047	0.134	0.268	-0.268
4	0.045	0.134	0.268	-0.268
5	0.026	0.134	0.268	-0.268
6	-0.014	0.134	0.269	-0.269
7	-0.081	0.134	0.269	-0.269
8	-0.054	0.135	0.269	-0.269
9	-0.065	0.135	0.269	-0.269
10	0.097	0.135	0.270	-0.270
11	0.144	0.135	0.271	-0.271
12	-0.137	0.136	0.272	-0.272
13	-0.090	0.137	0.274	-0.274
14	-0.035	0.137	0.275	-0.275
15	-0.098	0.137	0.275	-0.275

NORTH MOSQUITO LAGOON (2924B2) Trends Appendix
Correlogram for Total Phosphorous
Adjusted for Seasonal Median and Detrended

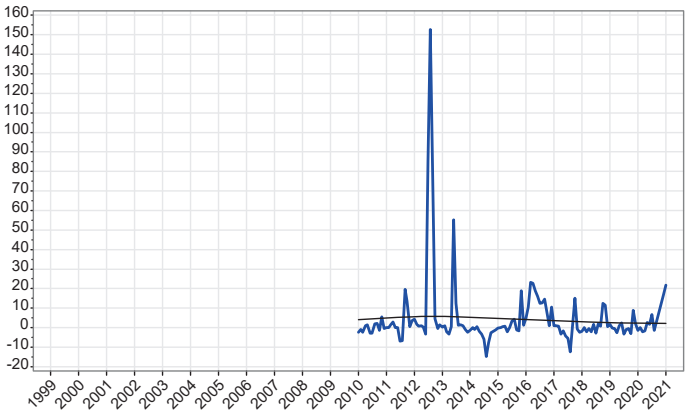


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

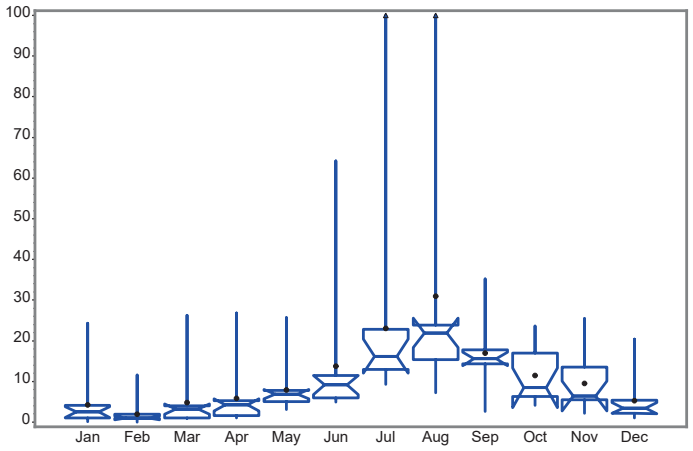
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Chlorophyll a
Not Adjusted for Seasonal Medians



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Chlorophyll a
Adjusted for Seasonal Medians



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Univariate Statistics
Chlorophyll a



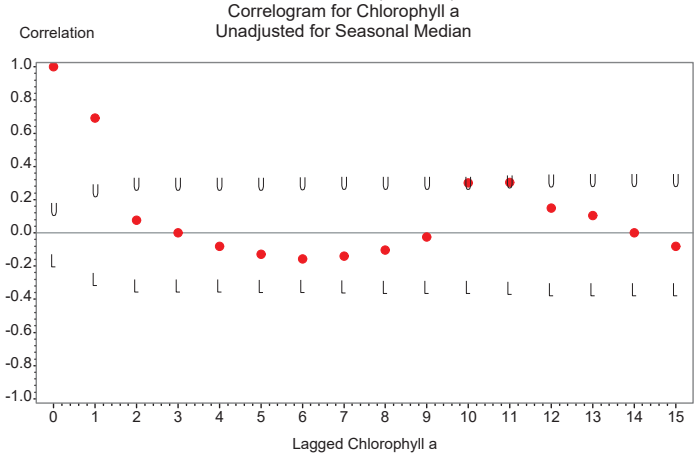
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Chlorophyll a
Unadjusted for Seasonal Medians

Lagged Chlorophyll a	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.692	0.134	0.267	-0.267
2	0.076	0.153	0.307	-0.307
3	-0.001	0.154	0.307	-0.307
4	-0.080	0.154	0.307	-0.307
5	-0.130	0.154	0.308	-0.308
6	-0.157	0.155	0.309	-0.309
7	-0.140	0.156	0.311	-0.311
8	-0.105	0.156	0.313	-0.313
9	-0.026	0.157	0.313	-0.313
10	0.300	0.157	0.313	-0.313
11	0.304	0.160	0.320	-0.320
12	0.150	0.164	0.327	-0.327
13	0.104	0.164	0.329	-0.329

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Chlorophyll a
Unadjusted for Seasonal Medians

Lagged Chlorophyll a	Correlation	Standard Error	Upper Limit	Lower Limit
14	0.000	0.165	0.329	-0.329
15	-0.081	0.165	0.329	-0.329

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Chlorophyll a
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

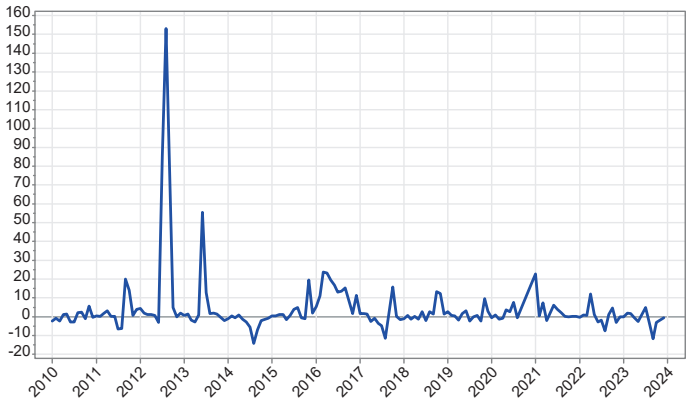
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Chlorophyll a
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.119	0.048	0.259	-0.084

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Chlorophyll a
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.119	0.048	0.259	-0.084

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Chlorophyll a



Zero Reference Line Shown

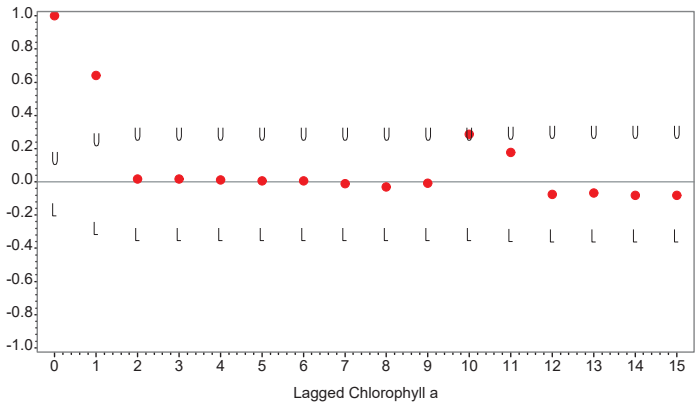
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Chlorophyll a
Adjusted for Seasonal Median and Detrended

Lagged Chlorophyll a	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.642	0.134	0.267	-0.267
2	0.016	0.151	0.302	-0.302
3	0.016	0.151	0.302	-0.302
4	0.012	0.151	0.302	-0.302
5	0.006	0.151	0.302	-0.302
6	0.005	0.151	0.302	-0.302
7	-0.011	0.151	0.302	-0.302
8	-0.030	0.151	0.302	-0.302
9	-0.008	0.151	0.302	-0.302
10	0.287	0.151	0.302	-0.302
11	0.177	0.154	0.308	-0.308
12	-0.075	0.155	0.311	-0.311
13	-0.066	0.156	0.311	-0.311

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Chlorophyll a
Adjusted for Seasonal Median and Detrended

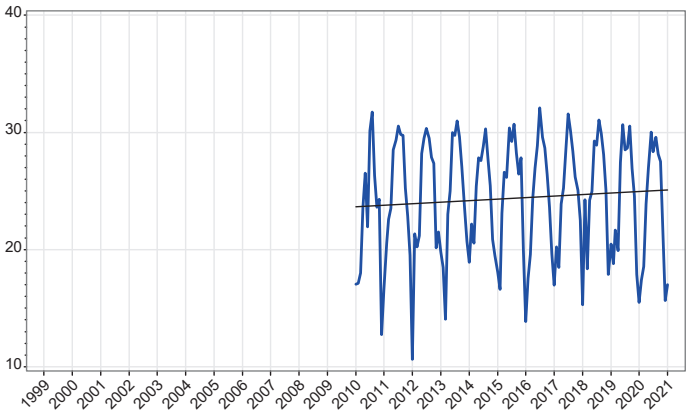
Lagged Chlorophyll a	Correlation	Standard Error	Upper Limit	Lower Limit
14	-0.082	0.156	0.311	-0.311
15	-0.082	0.156	0.312	-0.312

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Chlorophyll a
Correlation Adjusted for Seasonal Median and Detrended

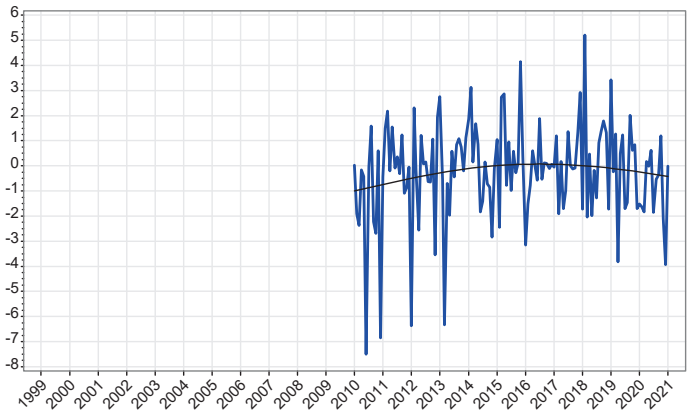


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

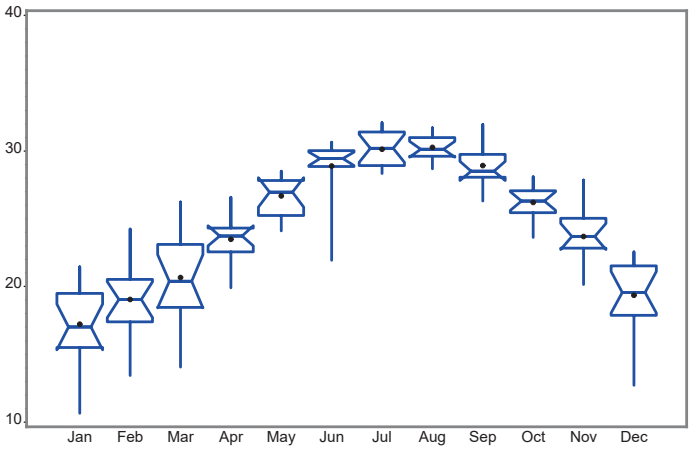
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Temperature
Not Adjusted for Seasonal Medians



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Temperature
Adjusted for Seasonal Medians



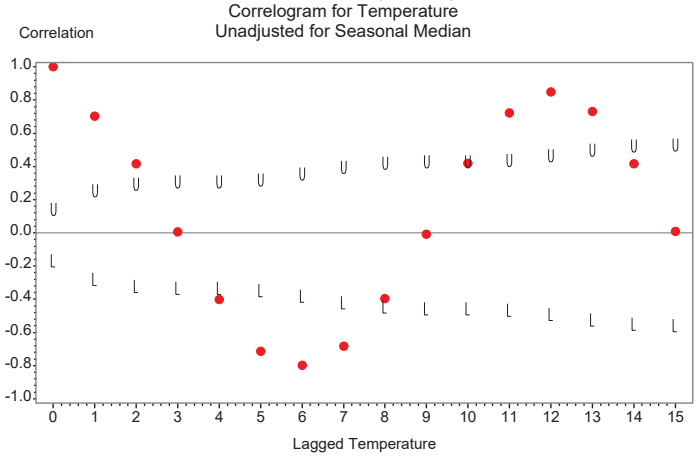
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Univariate Statistics
Temperature



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Temperature
Unadjusted for Seasonal Medians

Lagged Temperature	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.702	0.134	0.267	-0.267
2	0.416	0.154	0.308	-0.308
3	0.006	0.161	0.321	-0.321
4	-0.401	0.161	0.321	-0.321
5	-0.714	0.166	0.333	-0.333
6	-0.798	0.184	0.368	-0.368
7	-0.682	0.203	0.407	-0.407
8	-0.396	0.217	0.433	-0.433
9	-0.008	0.221	0.442	-0.442
10	0.419	0.221	0.442	-0.442
11	0.723	0.225	0.451	-0.451
12	0.849	0.239	0.478	-0.478
13	0.731	0.256	0.512	-0.512
14	0.415	0.268	0.537	-0.537
15	0.008	0.272	0.544	-0.544

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Temperature
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

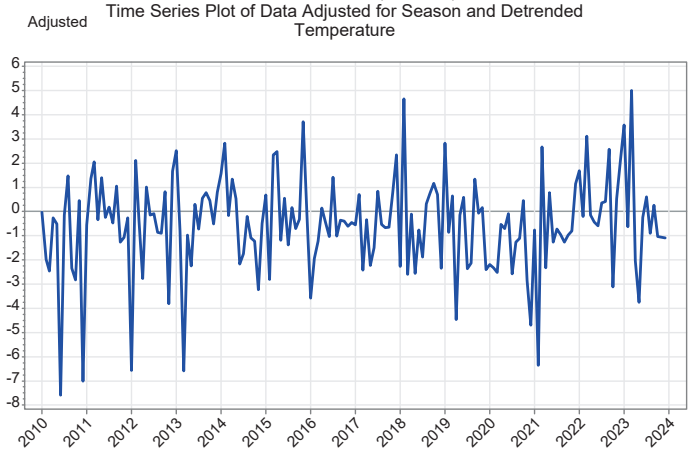
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Temperature
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.105	0.074	0.101	0.061

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Temperature
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.104	0.077	0.102	0.061

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Temperature

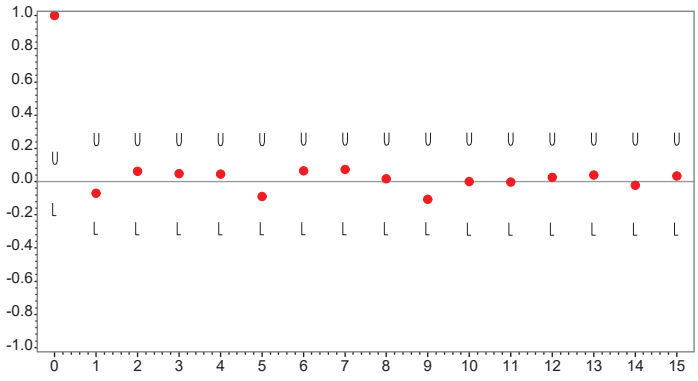


Zero Reference Line Shown

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Temperature
Adjusted for Seasonal Median and Detrended

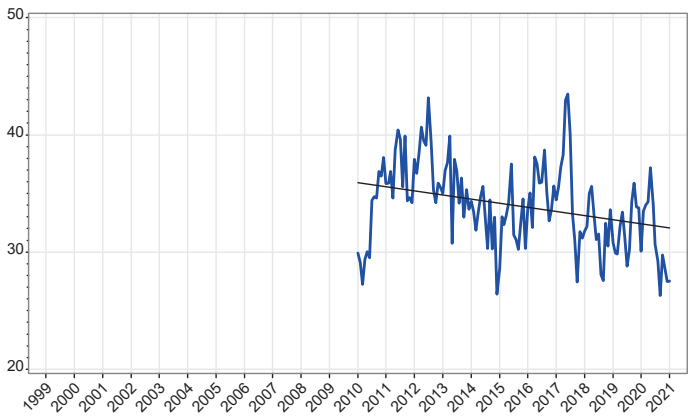
Lagged Temperature	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	-0.071	0.134	0.267	-0.267
2	0.062	0.134	0.268	-0.268
3	0.048	0.134	0.268	-0.268
4	0.046	0.134	0.268	-0.268
5	-0.090	0.134	0.268	-0.268
6	0.065	0.135	0.269	-0.269
7	0.072	0.135	0.270	-0.270
8	0.017	0.135	0.270	-0.270
9	-0.108	0.135	0.270	-0.270
10	0.001	0.136	0.271	-0.271
11	-0.002	0.136	0.271	-0.271
12	0.025	0.136	0.271	-0.271
13	0.040	0.136	0.271	-0.271
14	-0.021	0.136	0.271	-0.271
15	0.033	0.136	0.271	-0.271

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Temperature
Correlation Adjusted for Seasonal Median and Detrended

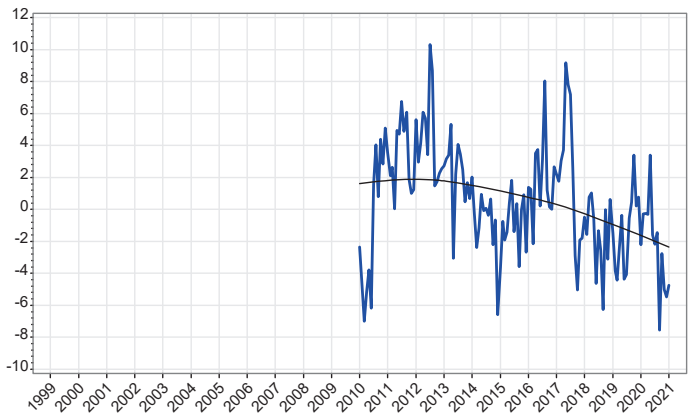


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

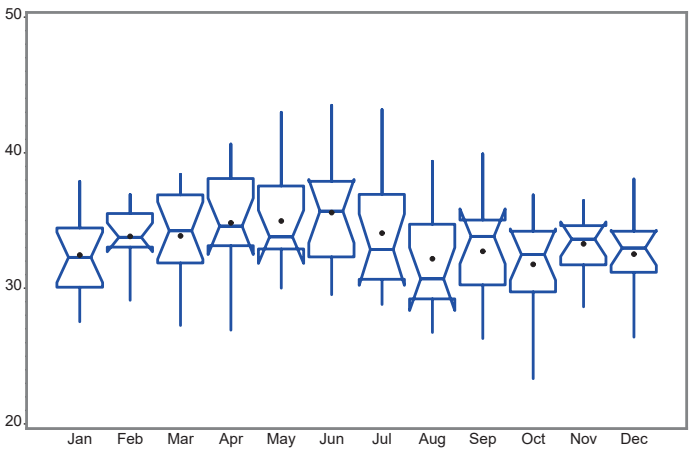
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Salinity
Not Adjusted for Seasonal Medians



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Salinity
Adjusted for Seasonal Medians



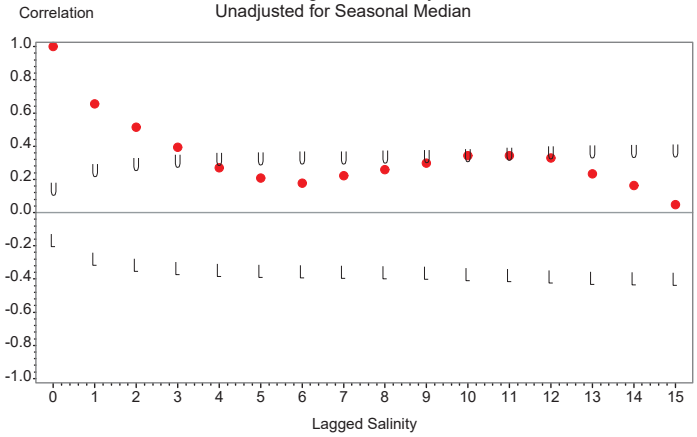
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Univariate Statistics
Salinity



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Salinity
Unadjusted for Seasonal Medians

Lagged Salinity	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.654	0.134	0.267	-0.267
2	0.513	0.151	0.303	-0.303
3	0.393	0.161	0.323	-0.323
4	0.269	0.167	0.334	-0.334
5	0.207	0.170	0.339	-0.339
6	0.177	0.171	0.342	-0.342
7	0.222	0.172	0.344	-0.344
8	0.258	0.174	0.348	-0.348
9	0.299	0.176	0.352	-0.352
10	0.344	0.179	0.358	-0.358
11	0.342	0.183	0.366	-0.366
12	0.329	0.187	0.374	-0.374
13	0.233	0.190	0.381	-0.381
14	0.162	0.192	0.384	-0.384
15	0.048	0.193	0.386	-0.386

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Salinity
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

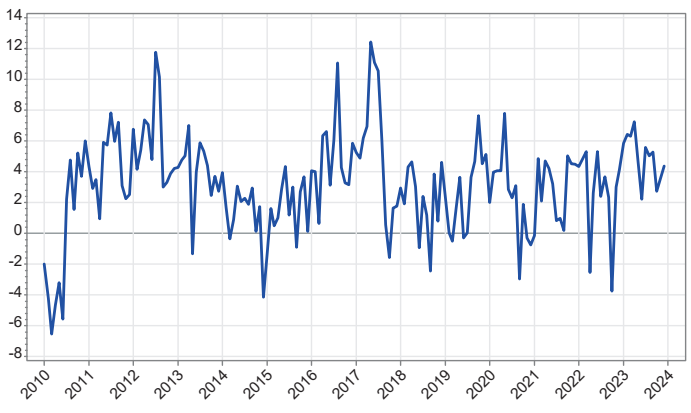
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Salinity
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.34	0	0.025	-0.383

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Salinity
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.34	0	0.025	-0.383

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Salinity

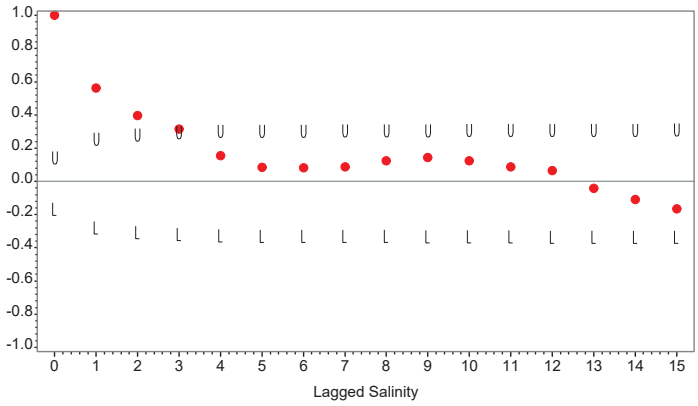


Zero Reference Line Shown

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Salinity
Adjusted for Seasonal Median and Detrended

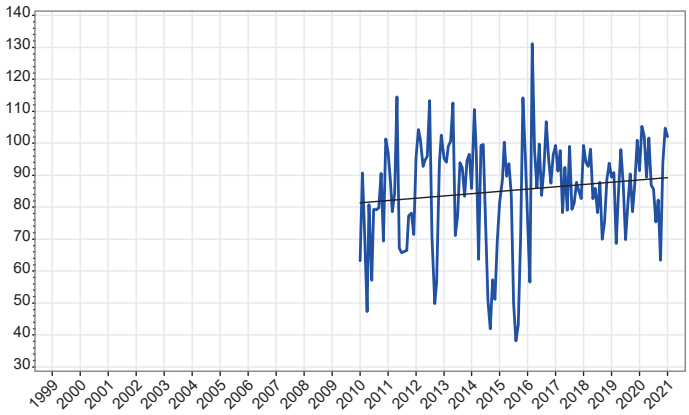
Lagged Salinity	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.562	0.134	0.267	-0.267
2	0.395	0.147	0.294	-0.294
3	0.315	0.153	0.306	-0.306
4	0.155	0.157	0.314	-0.314
5	0.085	0.158	0.316	-0.316
6	0.082	0.158	0.316	-0.316
7	0.088	0.158	0.317	-0.317
8	0.123	0.159	0.317	-0.317
9	0.144	0.159	0.319	-0.319
10	0.125	0.160	0.320	-0.320
11	0.086	0.161	0.321	-0.321
12	0.065	0.161	0.322	-0.322
13	-0.042	0.161	0.322	-0.322
14	-0.109	0.161	0.322	-0.322
15	-0.166	0.162	0.323	-0.323

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Salinity
Correlation Adjusted for Seasonal Median and Detrended

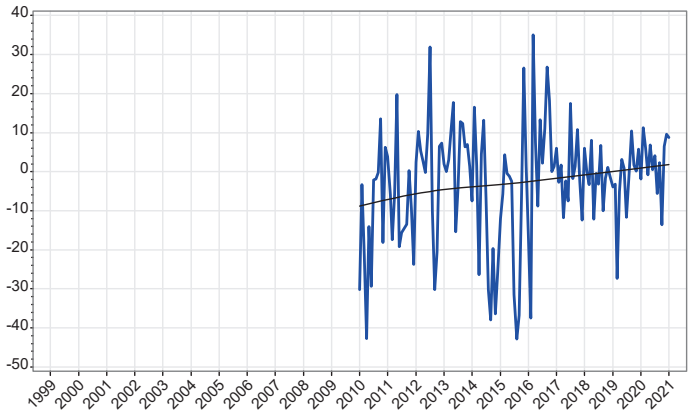


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

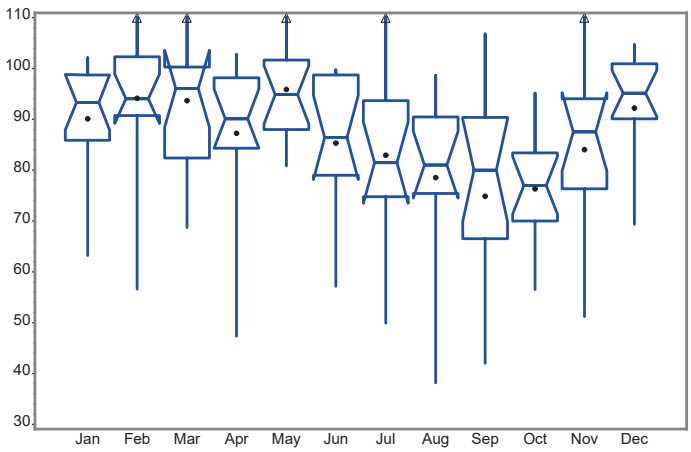
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Dissolved Oxygen Saturation
(%) Not Adjusted for Seasonal Medians



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Dissolved Oxygen Saturation
Adjusted (%) Adjusted for Seasonal Medians



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Univariate Statistics
Dissolved Oxygen Saturation
(%)



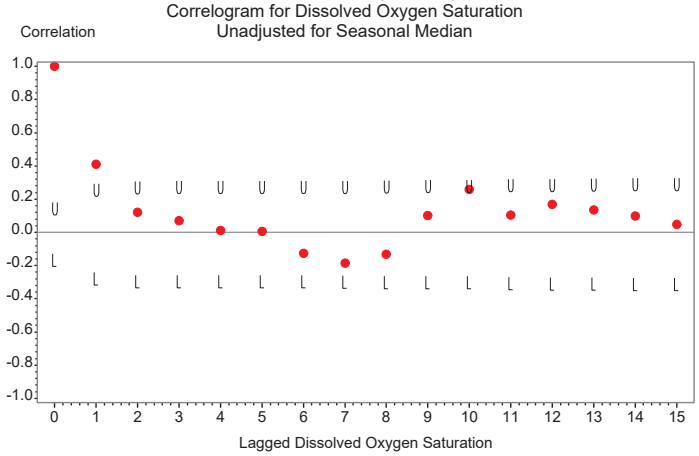
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Dissolved Oxygen Saturation
Unadjusted for Seasonal Medians

Lagged Dissolved Oxygen Saturation	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.409	0.134	0.267	-0.267
2	0.121	0.141	0.282	-0.282
3	0.069	0.142	0.283	-0.283
4	0.010	0.142	0.283	-0.283
5	0.005	0.142	0.283	-0.283
6	-0.126	0.142	0.283	-0.283
7	-0.184	0.142	0.285	-0.285
8	-0.133	0.144	0.288	-0.288
9	0.100	0.145	0.289	-0.289
10	0.258	0.145	0.290	-0.290
11	0.103	0.148	0.295	-0.295
12	0.169	0.148	0.296	-0.296
13	0.134	0.149	0.298	-0.298

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Dissolved Oxygen Saturation
Unadjusted for Seasonal Medians

Lagged Dissolved Oxygen Saturation	Correlation	Standard Error	Upper Limit	Lower Limit
14	0.098	0.150	0.300	-0.300
15	0.047	0.150	0.301	-0.301

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Dissolved Oxygen Saturation
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

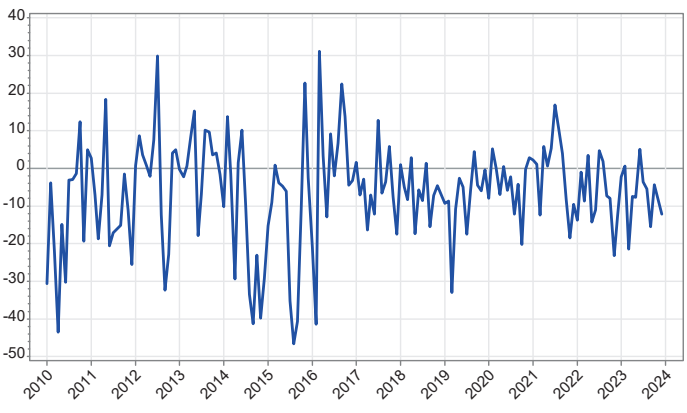
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Dissolved Oxygen Saturation
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.135	0.022	0.147	0.546

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Dissolved Oxygen Saturation
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.135	0.022	0.147	0.546

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Dissolved Oxygen Saturation



Zero Reference Line Shown

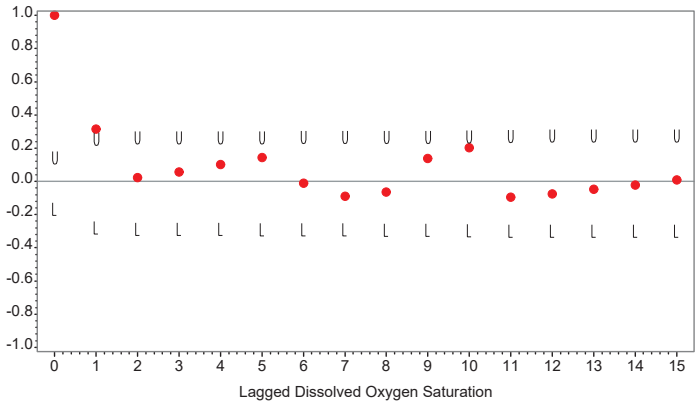
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Dissolved Oxygen Saturation
Adjusted for Seasonal Median and Detrended

Lagged Dissolved Oxygen Saturation	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.315	0.134	0.267	-0.267
2	0.022	0.138	0.276	-0.276
3	0.057	0.138	0.276	-0.276
4	0.102	0.138	0.276	-0.276
5	0.144	0.139	0.277	-0.277
6	-0.012	0.139	0.279	-0.279
7	-0.090	0.139	0.279	-0.279
8	-0.064	0.140	0.280	-0.280
9	0.137	0.140	0.280	-0.280
10	0.203	0.141	0.282	-0.282
11	-0.095	0.143	0.285	-0.285
12	-0.077	0.143	0.286	-0.286
13	-0.049	0.143	0.286	-0.286

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Dissolved Oxygen Saturation
Adjusted for Seasonal Median and Detrended

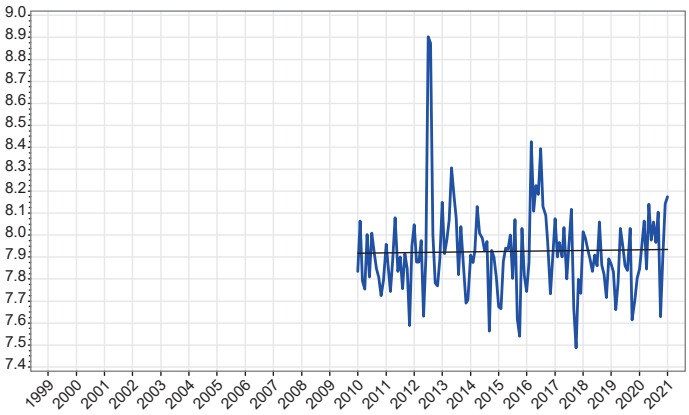
Lagged Dissolved Oxygen Saturation	Correlation	Standard Error	Upper Limit	Lower Limit
14	-0.021	0.143	0.287	-0.287
15	0.009	0.143	0.287	-0.287

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Dissolved Oxygen Saturation
Correlation Adjusted for Seasonal Median and Detrended

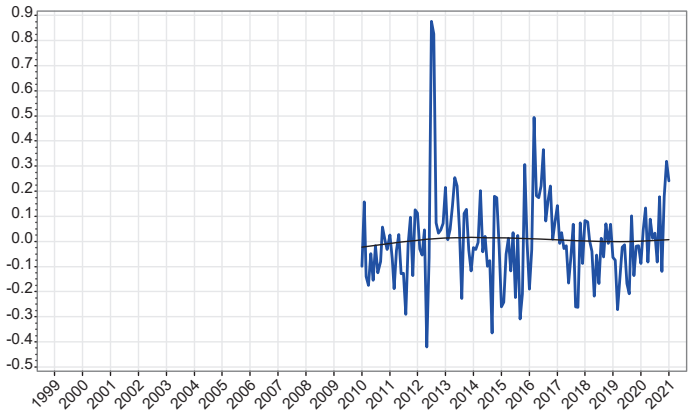


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

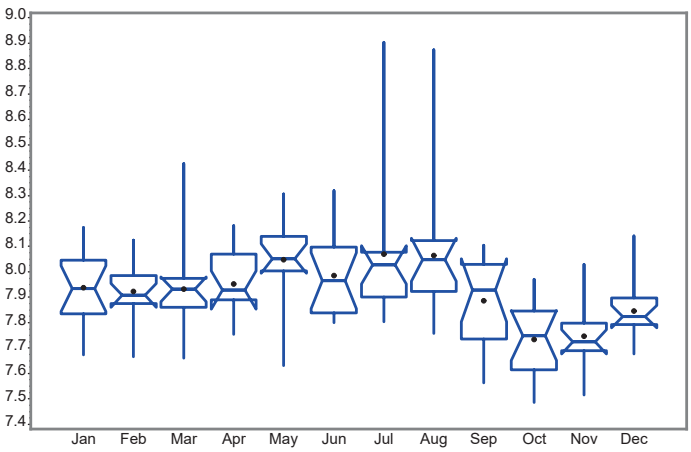
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
pH
(SU) Not Adjusted for Seasonal Medians



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
pH
Adjusted (SU) Adjusted for Seasonal Medians



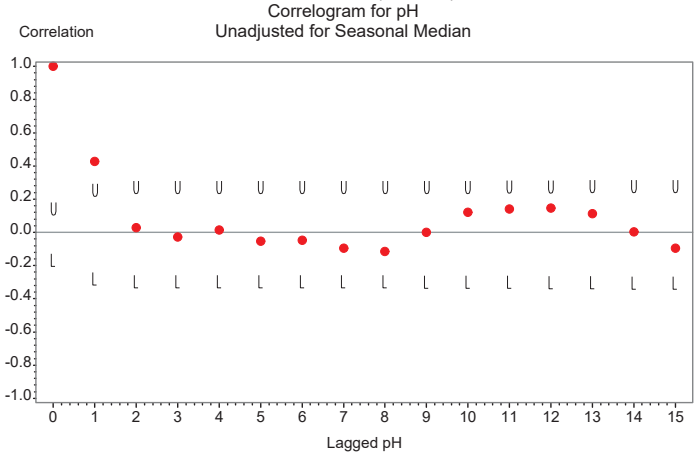
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Univariate Statistics
(SU) pH



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for pH
Unadjusted for Seasonal Medians

Lagged pH	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.426	0.134	0.267	-0.267
2	0.028	0.141	0.283	-0.283
3	-0.028	0.142	0.283	-0.283
4	0.013	0.142	0.283	-0.283
5	-0.053	0.142	0.283	-0.283
6	-0.049	0.142	0.283	-0.283
7	-0.095	0.142	0.284	-0.284
8	-0.116	0.142	0.284	-0.284
9	-0.001	0.143	0.285	-0.285
10	0.122	0.143	0.285	-0.285
11	0.141	0.143	0.287	-0.287
12	0.145	0.144	0.288	-0.288
13	0.113	0.145	0.290	-0.290
14	0.003	0.146	0.291	-0.291
15	-0.095	0.146	0.291	-0.291

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for pH
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

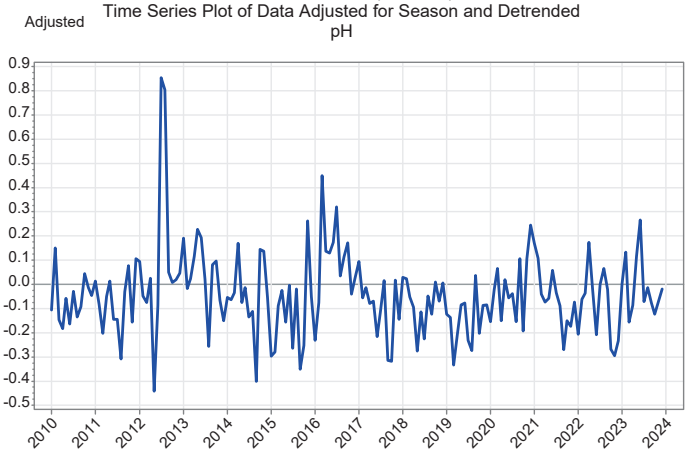
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
pH
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.109	0.062	0.202	.006

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
pH
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.108	0.065	0.206	.006

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
pH

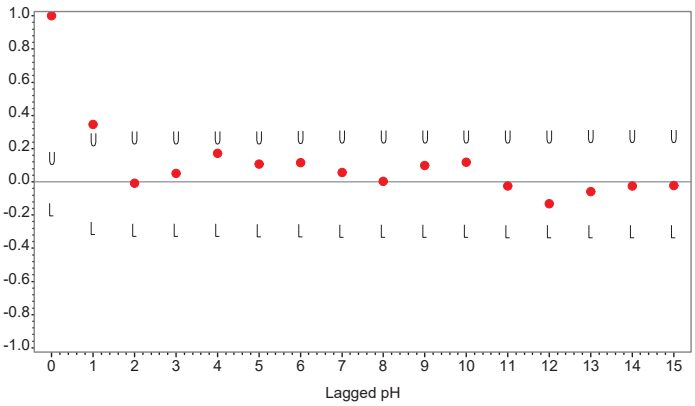


Zero Reference Line Shown

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for pH
Adjusted for Seasonal Median and Detrended

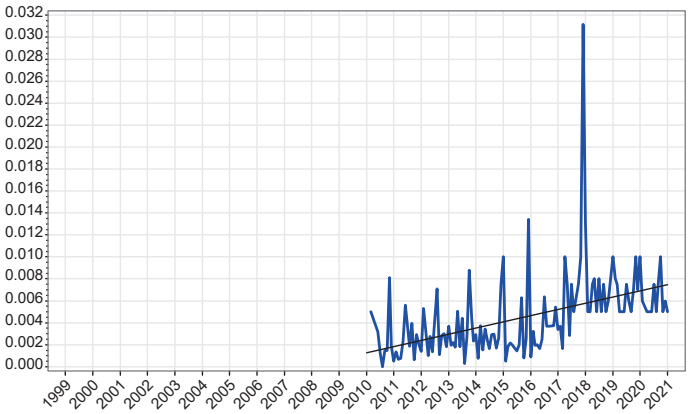
Lagged pH	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.345	0.134	0.267	-0.267
2	-0.009	0.139	0.278	-0.278
3	0.052	0.139	0.278	-0.278
4	0.172	0.139	0.278	-0.278
5	0.107	0.140	0.280	-0.280
6	0.115	0.141	0.281	-0.281
7	0.057	0.141	0.283	-0.283
8	0.004	0.141	0.283	-0.283
9	0.099	0.141	0.283	-0.283
10	0.118	0.142	0.284	-0.284
11	-0.026	0.142	0.285	-0.285
12	-0.131	0.142	0.285	-0.285
13	-0.058	0.143	0.286	-0.286
14	-0.026	0.143	0.287	-0.287
15	-0.023	0.143	0.287	-0.287

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for pH
Adjusted for Seasonal Median and Detrended

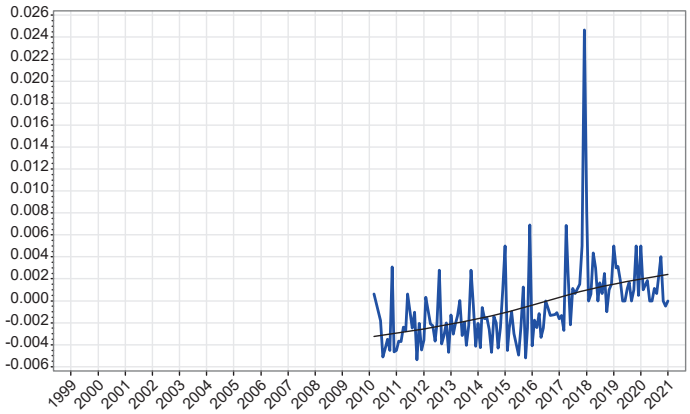


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

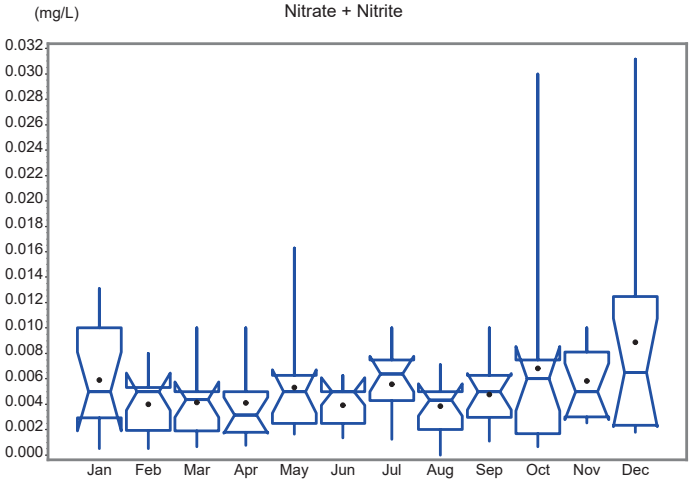
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Nitrate + Nitrite
Not Adjusted for Seasonal Medians



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Nitrate + Nitrite
Adjusted for Seasonal Medians



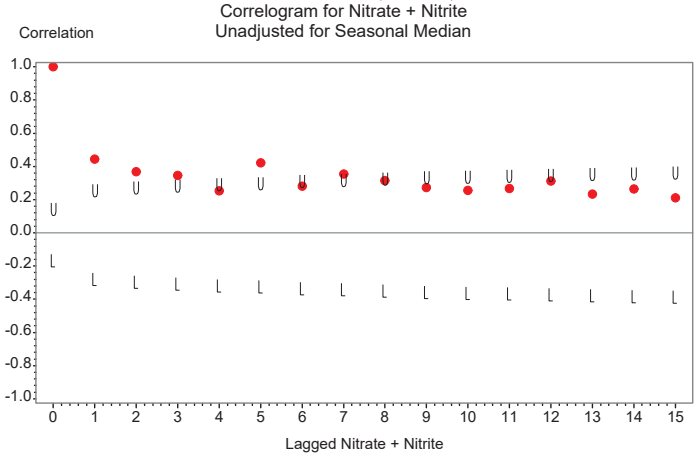
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Univariate Statistics
Nitrate + Nitrite



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Nitrate + Nitrite
Unadjusted for Seasonal Medians

Lagged Nitrate + Nitrite	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.443	0.134	0.267	-0.267
2	0.369	0.142	0.284	-0.284
3	0.347	0.148	0.295	-0.295
4	0.254	0.152	0.305	-0.305
5	0.421	0.155	0.310	-0.310
6	0.280	0.162	0.323	-0.323
7	0.354	0.165	0.329	-0.329
8	0.316	0.169	0.338	-0.338
9	0.274	0.172	0.345	-0.345
10	0.256	0.175	0.350	-0.350
11	0.266	0.177	0.354	-0.354
12	0.311	0.180	0.359	-0.359
13	0.232	0.183	0.366	-0.366
14	0.265	0.185	0.369	-0.369
15	0.212	0.187	0.374	-0.374

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Nitrate + Nitrite
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

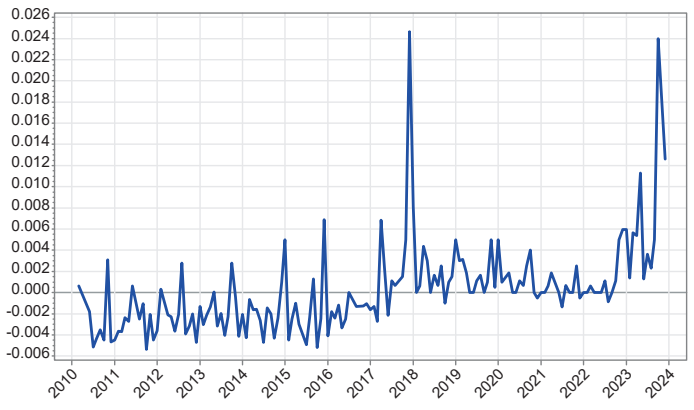
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Nitrate + Nitrite
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.493	0	.001	0

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Nitrate + Nitrite
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.489	0	.001	0

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Nitrate + Nitrite

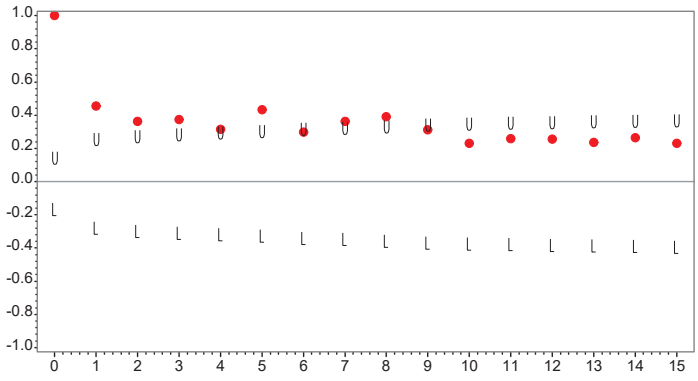


Zero Reference Line Shown

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Nitrate + Nitrite
Adjusted for Seasonal Median and Detrended

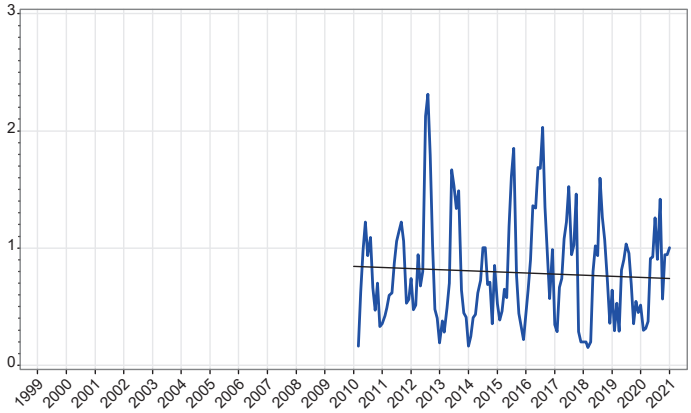
Lagged Nitrate + Nitrite	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.455	0.134	0.267	-0.267
2	0.362	0.143	0.285	-0.285
3	0.375	0.148	0.296	-0.296
4	0.315	0.153	0.307	-0.307
5	0.432	0.157	0.315	-0.315
6	0.298	0.164	0.328	-0.328
7	0.364	0.167	0.335	-0.335
8	0.392	0.172	0.344	-0.344
9	0.313	0.177	0.355	-0.355
10	0.231	0.181	0.361	-0.361
11	0.260	0.182	0.365	-0.365
12	0.257	0.184	0.369	-0.369
13	0.236	0.187	0.373	-0.373
14	0.265	0.188	0.377	-0.377
15	0.230	0.191	0.381	-0.381

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Nitrate + Nitrite
Adjusted for Seasonal Median and Detrended

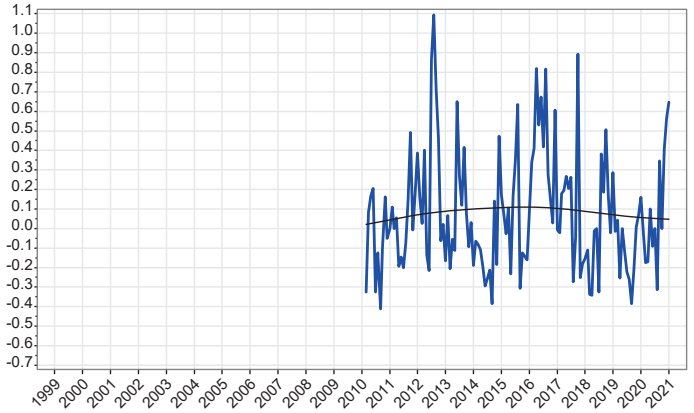


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

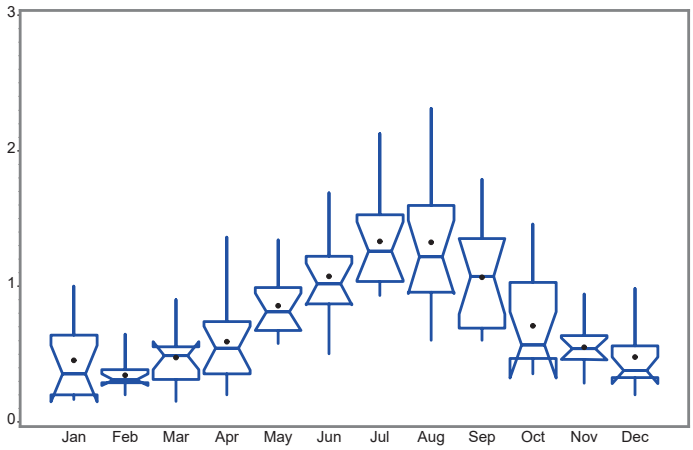
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Total Kjeldahl Nitrogen
Not Adjusted for Seasonal Medians



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Total Kjeldahl Nitrogen
Adjusted for Seasonal Medians



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Univariate Statistics
Total Kjeldahl Nitrogen



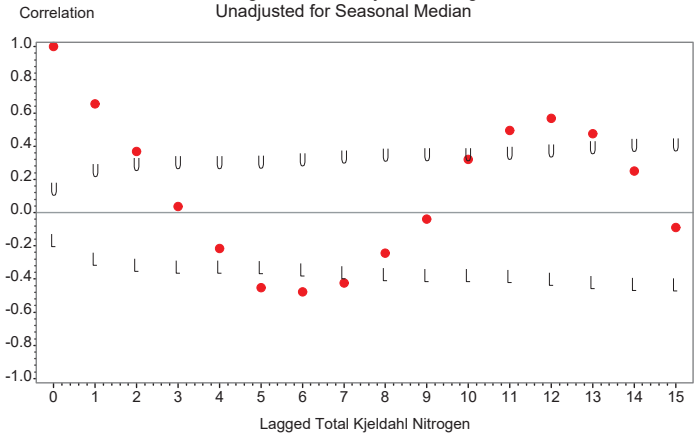
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Total Kjeldahl Nitrogen
Unadjusted for Seasonal Medians

Lagged Total Kjeldahl Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.656	0.134	0.267	-0.267
2	0.368	0.152	0.303	-0.303
3	0.038	0.157	0.314	-0.314
4	-0.217	0.157	0.314	-0.314
5	-0.452	0.159	0.317	-0.317
6	-0.477	0.166	0.332	-0.332
7	-0.425	0.174	0.348	-0.348
8	-0.243	0.180	0.360	-0.360
9	-0.038	0.182	0.364	-0.364
10	0.320	0.182	0.364	-0.364
11	0.494	0.185	0.371	-0.371
12	0.569	0.193	0.386	-0.386
13	0.475	0.203	0.406	-0.406

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Total Kjeldahl Nitrogen
Unadjusted for Seasonal Medians

Lagged Total Kjeldahl Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
14	0.249	0.209	0.419	-0.419
15	-0.091	0.211	0.422	-0.422

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Total Kjeldahl Nitrogen
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

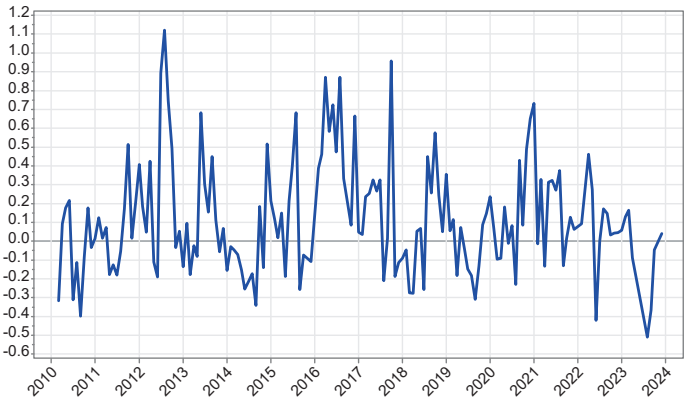
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Total Kjeldahl Nitrogen
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.063	0.306	0.526	-.007

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Total Kjeldahl Nitrogen
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.064	0.298	0.519	-.007

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Total Kjeldahl Nitrogen



Zero Reference Line Shown

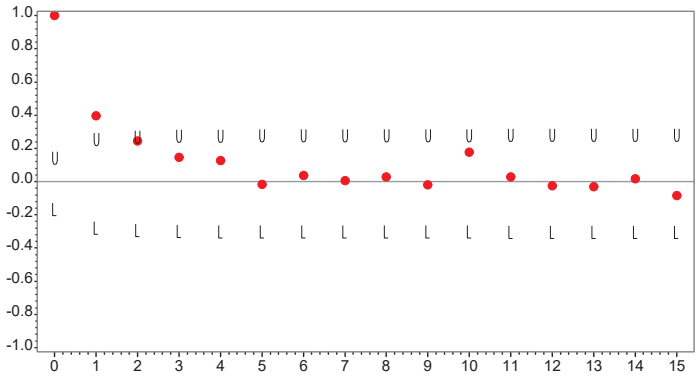
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Total Kjeldahl Nitrogen
Adjusted for Seasonal Median and Detrended

Lagged Total Kjeldahl Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.396	0.134	0.267	-0.267
2	0.244	0.140	0.281	-0.281
3	0.145	0.143	0.286	-0.286
4	0.126	0.144	0.288	-0.288
5	-0.016	0.144	0.289	-0.289
6	0.037	0.144	0.289	-0.289
7	0.007	0.145	0.289	-0.289
8	0.027	0.145	0.289	-0.289
9	-0.020	0.145	0.289	-0.289
10	0.177	0.145	0.289	-0.289
11	0.029	0.146	0.292	-0.292
12	-0.026	0.146	0.292	-0.292
13	-0.030	0.146	0.292	-0.292

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Total Kjeldahl Nitrogen
Adjusted for Seasonal Median and Detrended

Lagged Total Kjeldahl Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
14	0.016	0.146	0.292	-0.292
15	-0.084	0.146	0.292	-0.292

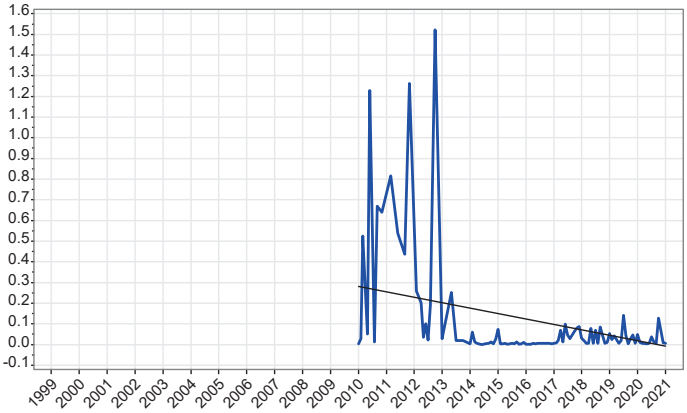
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Total Kjeldahl Nitrogen
Correlation Adjusted for Seasonal Median and Detrended



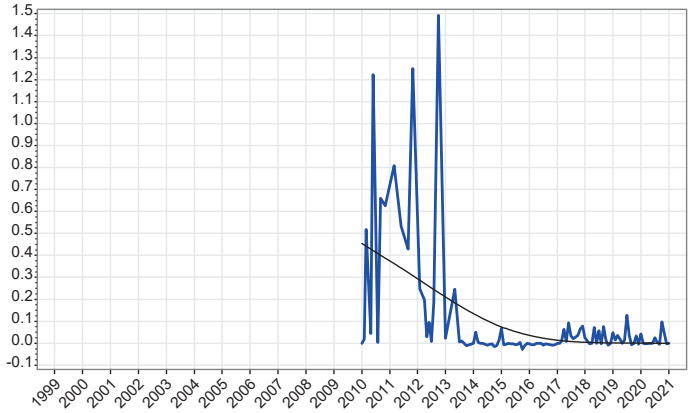
Lagged Total Kjeldahl Nitrogen

U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

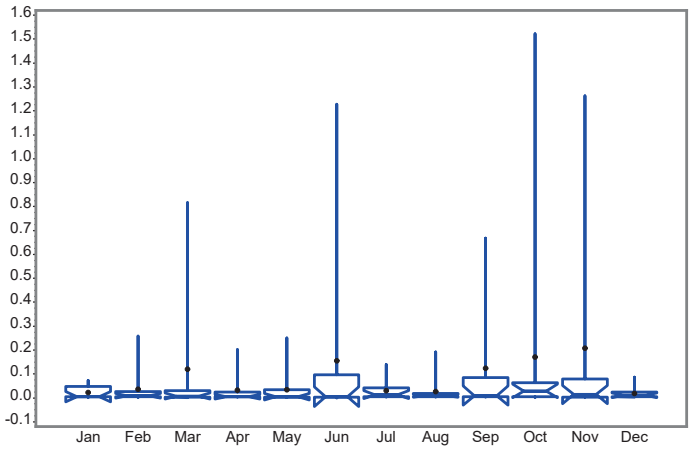
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Ammonia
Not Adjusted for Seasonal Medians



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Ammonia
Adjusted for Seasonal Medians



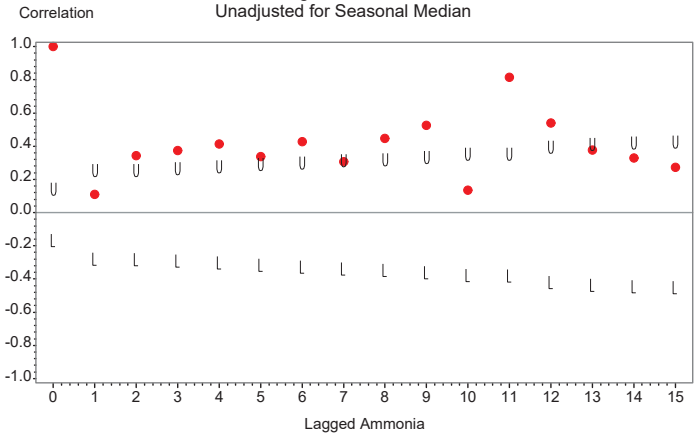
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Univariate Statistics
Ammonia



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Ammonia
Unadjusted for Seasonal Medians

Lagged Ammonia	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.111	0.134	0.267	-0.267
2	0.344	0.134	0.268	-0.268
3	0.373	0.139	0.279	-0.279
4	0.413	0.145	0.290	-0.290
5	0.336	0.152	0.304	-0.304
6	0.427	0.156	0.313	-0.313
7	0.307	0.163	0.326	-0.326
8	0.447	0.167	0.333	-0.333
9	0.525	0.174	0.347	-0.347
10	0.134	0.183	0.365	-0.365
11	0.815	0.183	0.367	-0.367
12	0.540	0.204	0.407	-0.407
13	0.378	0.212	0.424	-0.424
14	0.328	0.216	0.432	-0.432
15	0.274	0.219	0.438	-0.438

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Ammonia
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

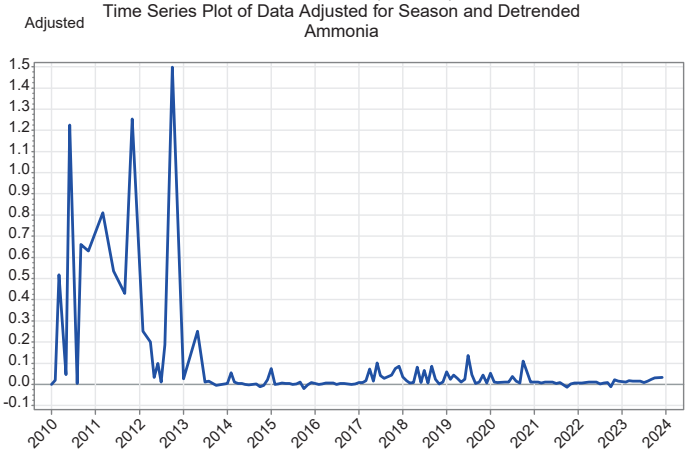
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Ammonia
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.213	.001	0.137	-.001

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Ammonia
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.215	.001	0.133	-.001

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Ammonia

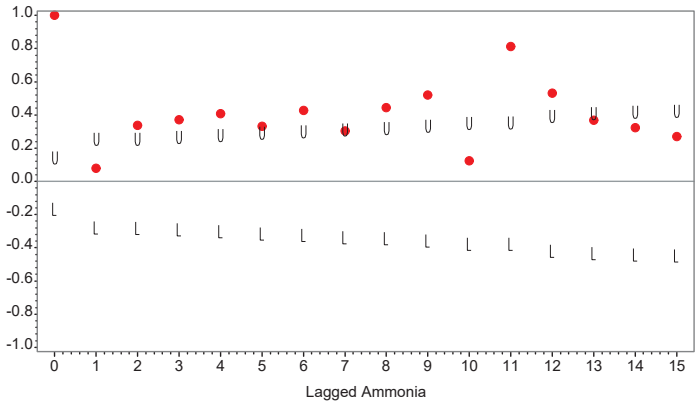


Zero Reference Line Shown

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Ammonia
Adjusted for Seasonal Median and Detrended

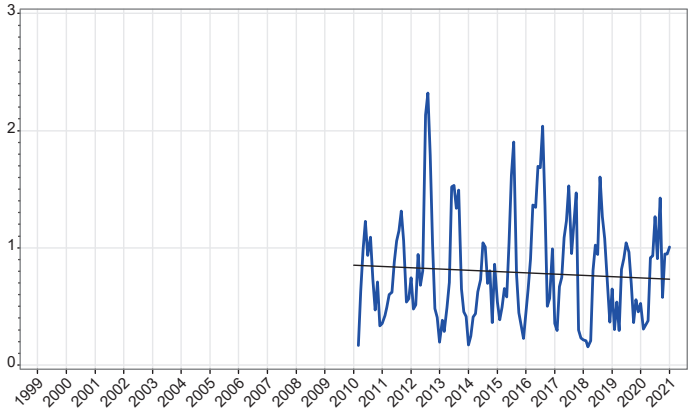
Lagged Ammonia	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.080	0.134	0.267	-0.267
2	0.336	0.134	0.268	-0.268
3	0.371	0.139	0.278	-0.278
4	0.408	0.145	0.289	-0.289
5	0.333	0.151	0.303	-0.303
6	0.427	0.156	0.311	-0.311
7	0.305	0.162	0.325	-0.325
8	0.444	0.166	0.332	-0.332
9	0.521	0.173	0.346	-0.346
10	0.125	0.182	0.364	-0.364
11	0.813	0.182	0.365	-0.365
12	0.530	0.203	0.406	-0.406
13	0.369	0.211	0.422	-0.422
14	0.324	0.215	0.429	-0.429
15	0.270	0.218	0.435	-0.435

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Ammonia
Correlation Adjusted for Seasonal Median and Detrended

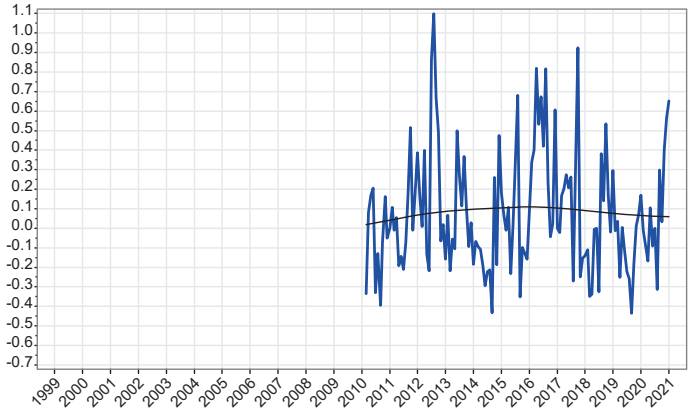


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

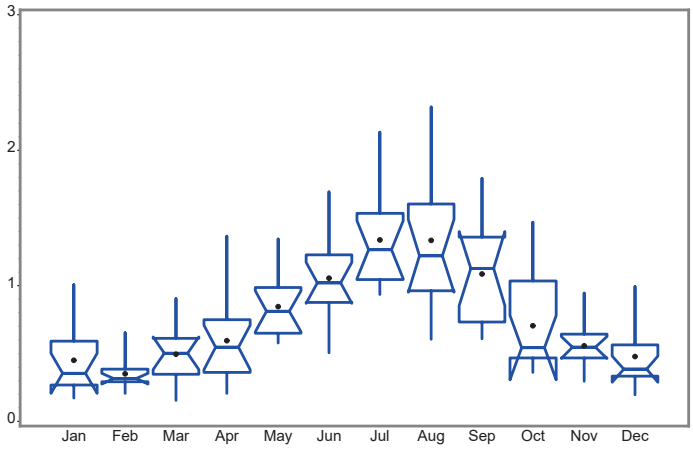
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Total Nitrogen
(mg/L) Not Adjusted for Seasonal Medians



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Total Nitrogen
Adjusted (mg/L) Adjusted for Seasonal Medians



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Univariate Statistics
(mg/L) Total Nitrogen



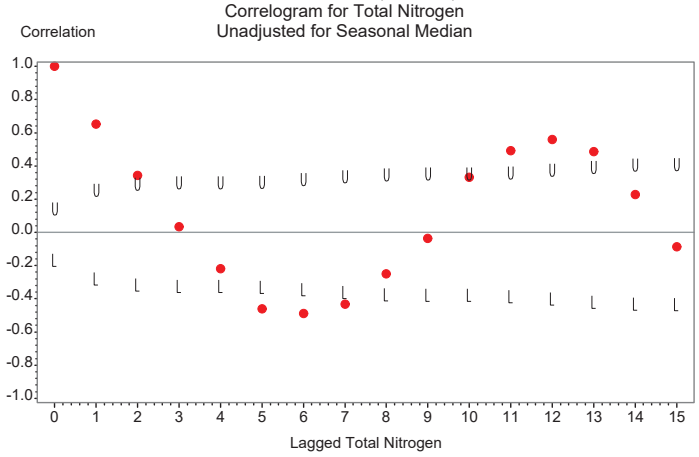
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Total Nitrogen
Unadjusted for Seasonal Medians

Lagged Total Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.651	0.134	0.267	-0.267
2	0.344	0.151	0.303	-0.303
3	0.033	0.156	0.312	-0.312
4	-0.219	0.156	0.312	-0.312
5	-0.461	0.158	0.316	-0.316
6	-0.488	0.166	0.331	-0.331
7	-0.433	0.174	0.348	-0.348
8	-0.249	0.180	0.361	-0.361
9	-0.035	0.182	0.365	-0.365
10	0.331	0.182	0.365	-0.365
11	0.491	0.186	0.372	-0.372
12	0.558	0.193	0.387	-0.387
13	0.487	0.203	0.406	-0.406

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Total Nitrogen
Unadjusted for Seasonal Medians

Lagged Total Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
14	0.228	0.210	0.419	-0.419
15	-0.086	0.211	0.422	-0.422

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Total Nitrogen
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

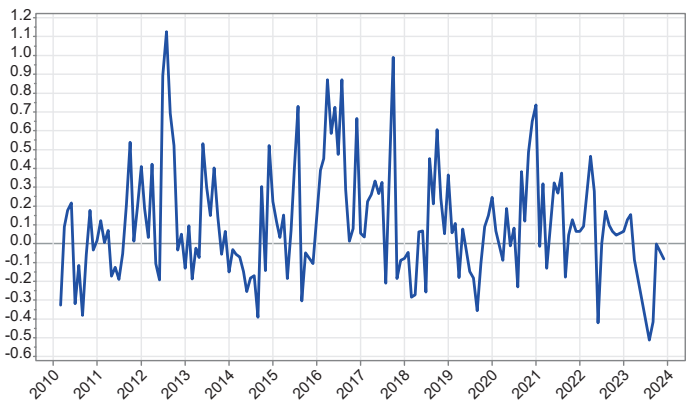
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Total Nitrogen
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.08	0.195	0.408	-.007

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Total Nitrogen
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.081	0.189	0.401	-.007

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Total Nitrogen



Zero Reference Line Shown

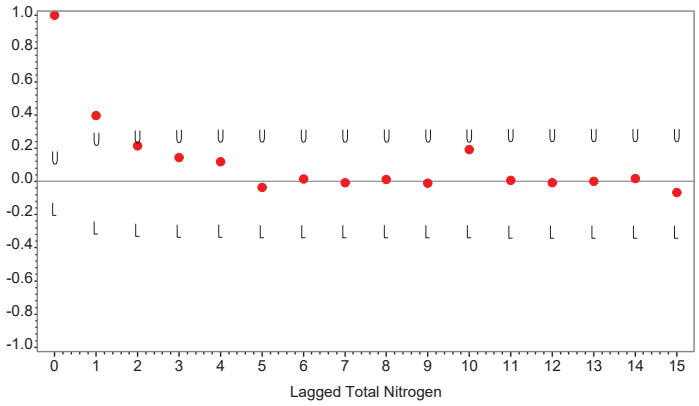
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Total Nitrogen
Adjusted for Seasonal Median and Detrended

Lagged Total Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.395	0.134	0.267	-0.267
2	0.215	0.140	0.281	-0.281
3	0.143	0.142	0.285	-0.285
4	0.117	0.143	0.286	-0.286
5	-0.036	0.144	0.288	-0.288
6	0.014	0.144	0.288	-0.288
7	-0.007	0.144	0.288	-0.288
8	0.011	0.144	0.288	-0.288
9	-0.010	0.144	0.288	-0.288
10	0.190	0.144	0.288	-0.288
11	0.005	0.145	0.291	-0.291
12	-0.009	0.145	0.291	-0.291
13	-0.001	0.145	0.291	-0.291

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Total Nitrogen
Adjusted for Seasonal Median and Detrended

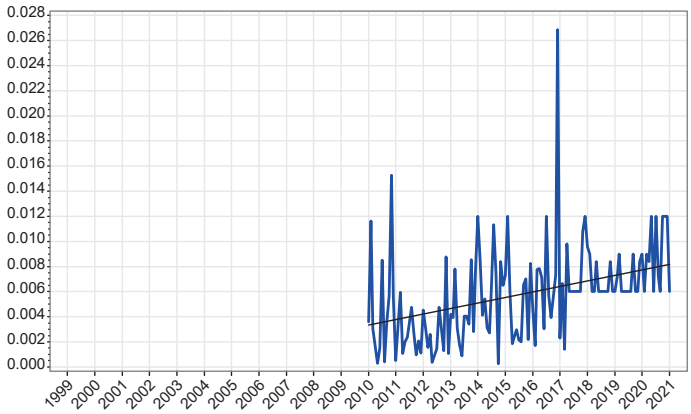
Lagged Total Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
14	0.018	0.145	0.291	-0.291
15	-0.067	0.145	0.291	-0.291

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Total Nitrogen
Correlation Adjusted for Seasonal Median and Detrended

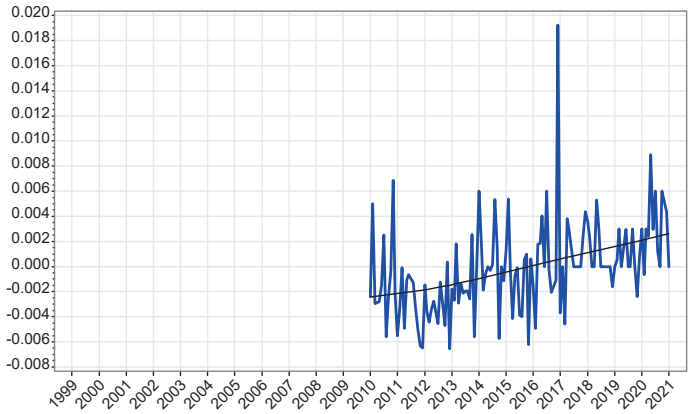


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

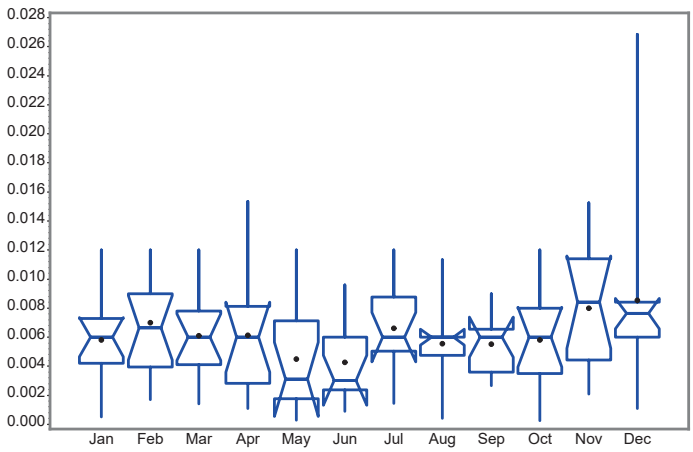
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Orthophosphorous
Not Adjusted for Seasonal Medians



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Orthophosphorous
Adjusted for Seasonal Medians



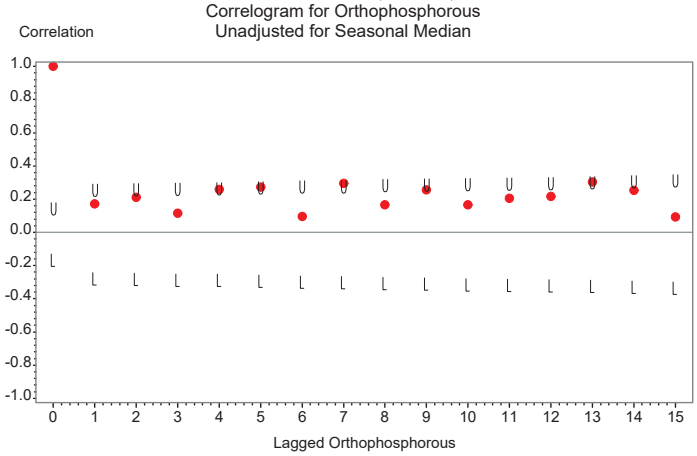
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Univariate Statistics
Orthophosphorous



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Orthophosphorous
Unadjusted for Seasonal Medians

Lagged Orthophosphorous	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.171	0.134	0.267	-0.267
2	0.210	0.135	0.270	-0.270
3	0.115	0.137	0.274	-0.274
4	0.258	0.137	0.275	-0.275
5	0.274	0.140	0.281	-0.281
6	0.097	0.143	0.287	-0.287
7	0.296	0.144	0.288	-0.288
8	0.167	0.147	0.295	-0.295
9	0.257	0.149	0.297	-0.297
10	0.167	0.151	0.302	-0.302
11	0.206	0.152	0.305	-0.305
12	0.216	0.154	0.308	-0.308
13	0.305	0.156	0.311	-0.311
14	0.253	0.159	0.318	-0.318
15	0.092	0.162	0.323	-0.323

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Orthophosphorous
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

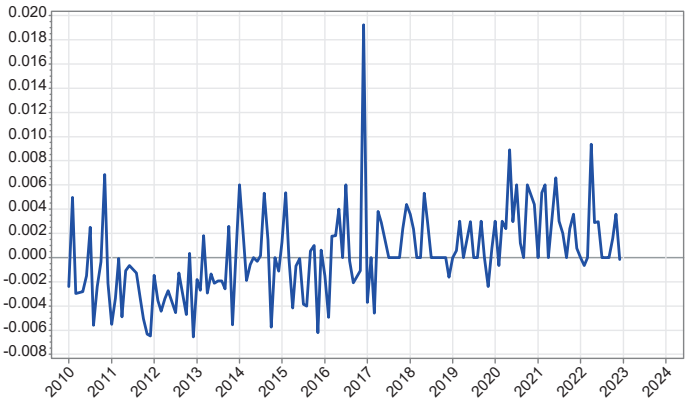
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Orthophosphorous
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.379	0	.002	0

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Orthophosphorous
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.385	0	.002	0

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Orthophosphorous

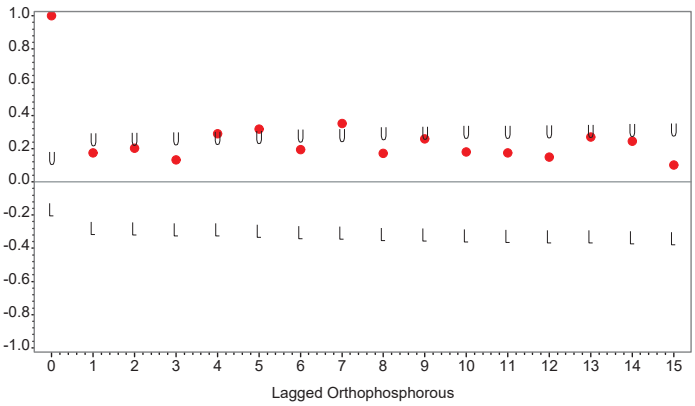


Zero Reference Line Shown

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Orthophosphorous
Adjusted for Seasonal Median and Detrended

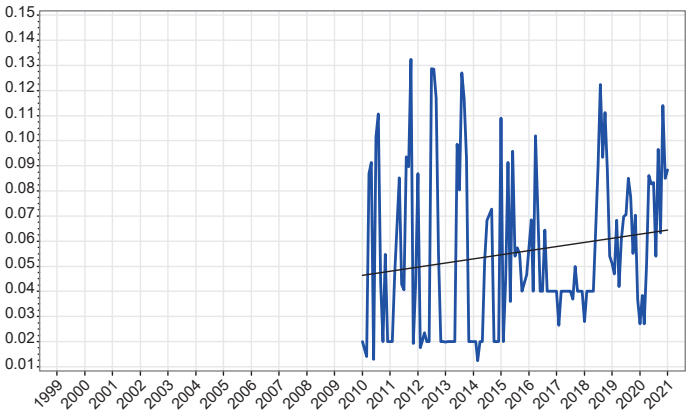
Lagged Orthophosphorous	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.174	0.134	0.267	-0.267
2	0.202	0.135	0.270	-0.270
3	0.133	0.137	0.274	-0.274
4	0.290	0.138	0.275	-0.275
5	0.318	0.141	0.282	-0.282
6	0.195	0.145	0.291	-0.291
7	0.350	0.147	0.294	-0.294
8	0.171	0.152	0.304	-0.304
9	0.258	0.153	0.306	-0.306
10	0.181	0.155	0.311	-0.311
11	0.174	0.157	0.313	-0.313
12	0.149	0.158	0.316	-0.316
13	0.270	0.159	0.317	-0.317
14	0.245	0.161	0.323	-0.323
15	0.102	0.164	0.327	-0.327

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Orthophosphorous
Correlation Adjusted for Seasonal Median and Detrended

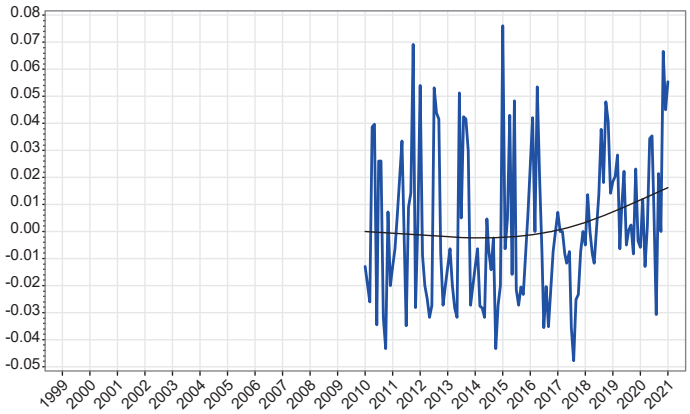


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

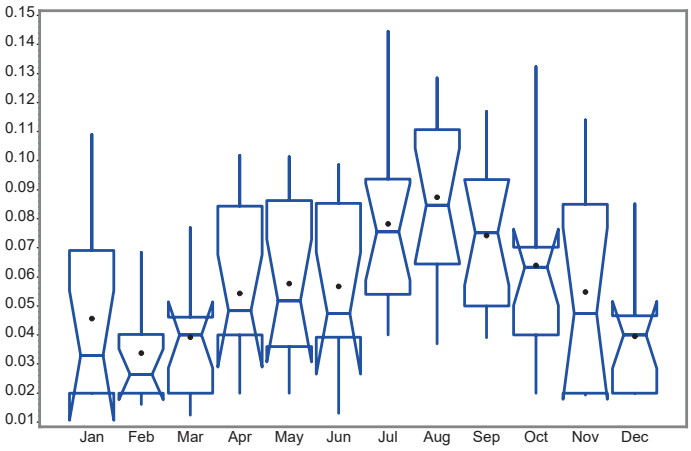
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Total Phosphorous
Not Adjusted for Seasonal Medians



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Total Phosphorous
Adjusted for Seasonal Medians



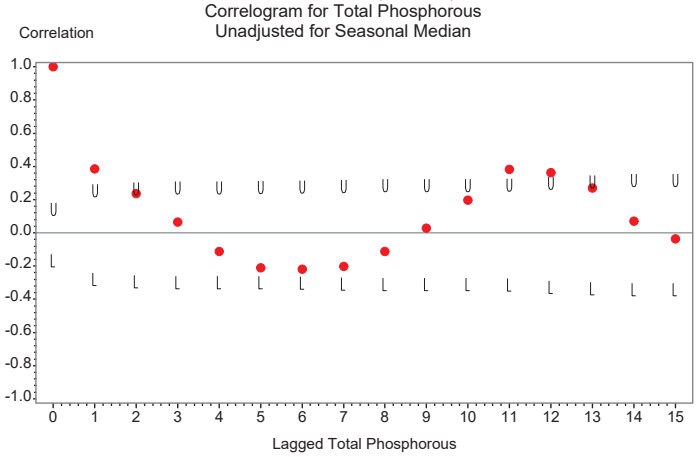
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Univariate Statistics
Total Phosphorous



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Total Phosphorous
Unadjusted for Seasonal Medians

Lagged Total Phosphorous	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.386	0.134	0.267	-0.267
2	0.236	0.140	0.280	-0.280
3	0.066	0.142	0.285	-0.285
4	-0.112	0.143	0.285	-0.285
5	-0.210	0.143	0.286	-0.286
6	-0.218	0.145	0.290	-0.290
7	-0.201	0.147	0.294	-0.294
8	-0.111	0.149	0.297	-0.297
9	0.028	0.149	0.298	-0.298
10	0.197	0.149	0.298	-0.298
11	0.382	0.151	0.301	-0.301
12	0.363	0.156	0.313	-0.313
13	0.270	0.161	0.322	-0.322
14	0.071	0.164	0.328	-0.328
15	-0.035	0.164	0.328	-0.328

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Total Phosphorous
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

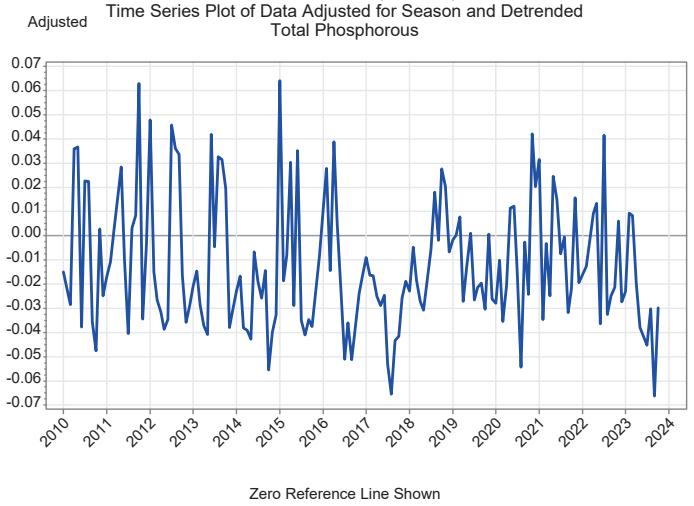
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Total Phosphorous
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.216	0	.009	.002

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Total Phosphorous
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.218	0	.008	.002

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Total Phosphorous

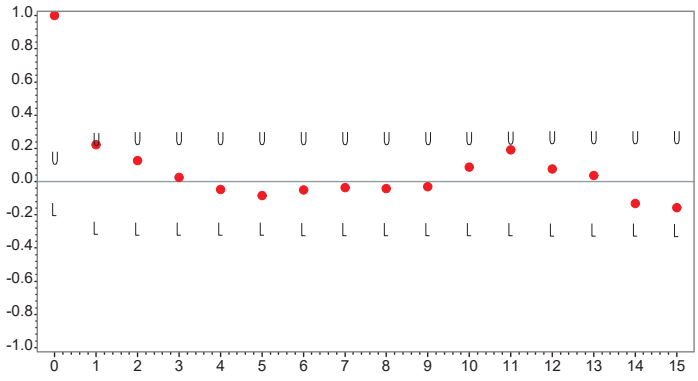


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CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Total Phosphorous
Adjusted for Seasonal Median and Detrended

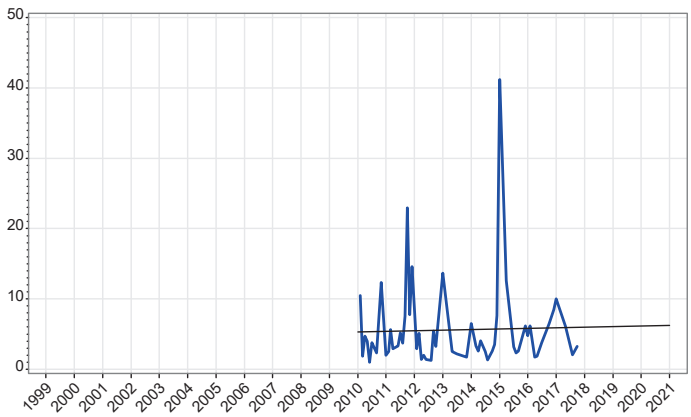
Lagged Total Phosphorous	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.221	0.134	0.267	-0.267
2	0.126	0.136	0.272	-0.272
3	0.025	0.136	0.273	-0.273
4	-0.047	0.137	0.273	-0.273
5	-0.084	0.137	0.273	-0.273
6	-0.050	0.137	0.274	-0.274
7	-0.036	0.137	0.274	-0.274
8	-0.043	0.137	0.274	-0.274
9	-0.032	0.137	0.274	-0.274
10	0.087	0.137	0.274	-0.274
11	0.191	0.138	0.275	-0.275
12	0.077	0.139	0.278	-0.278
13	0.037	0.139	0.279	-0.279
14	-0.132	0.139	0.279	-0.279
15	-0.156	0.140	0.280	-0.280

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Total Phosphorous
Adjusted for Seasonal Median and Detrended

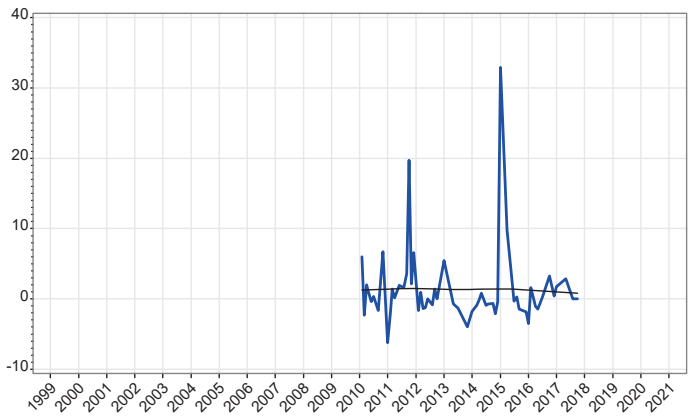


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

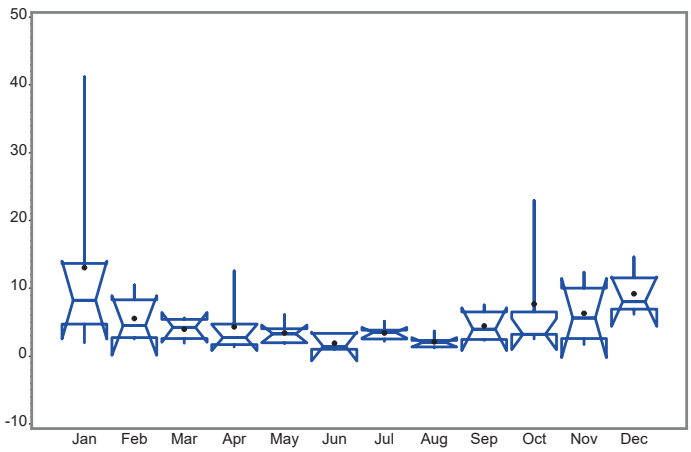
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Fecal Coliform
Not Adjusted for Seasonal Medians



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Monthly Data Time Series
Fecal Coliform
Adjusted for Seasonal Medians



CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Univariate Statistics
Fecal Coliform



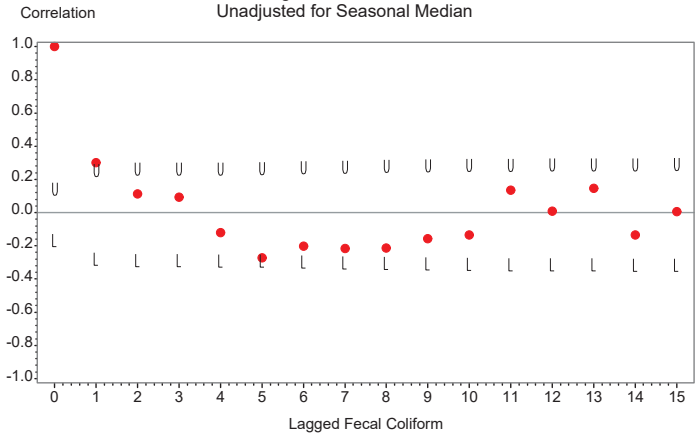
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Fecal Coliform
Unadjusted for Seasonal Medians

Lagged Fecal Coliform	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.301	0.134	0.267	-0.267
2	0.112	0.138	0.275	-0.275
3	0.094	0.138	0.276	-0.276
4	-0.120	0.139	0.277	-0.277
5	-0.271	0.139	0.278	-0.278
6	-0.201	0.142	0.284	-0.284
7	-0.215	0.144	0.288	-0.288
8	-0.213	0.146	0.292	-0.292
9	-0.156	0.148	0.295	-0.295
10	-0.134	0.149	0.297	-0.297
11	0.136	0.149	0.299	-0.299
12	0.008	0.150	0.300	-0.300
13	0.147	0.150	0.300	-0.300

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Fecal Coliform
Unadjusted for Seasonal Medians

Lagged Fecal Coliform	Correlation	Standard Error	Upper Limit	Lower Limit
14	-0.135	0.151	0.302	-0.302
15	0.007	0.152	0.303	-0.303

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Fecal Coliform
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

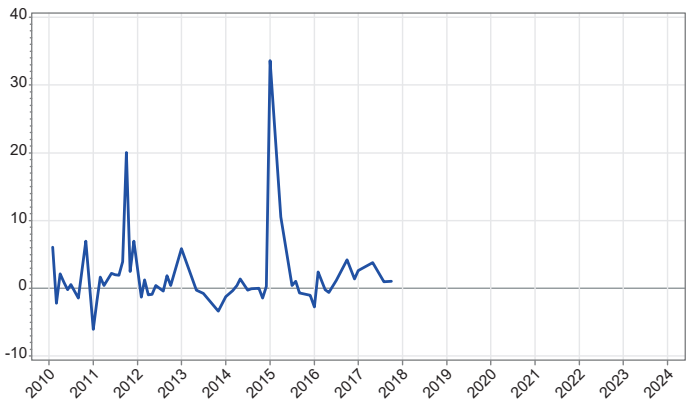
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Fecal Coliform
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.044	0.774	0.785	-0.111

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Fecal Coliform
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.044	0.774	0.785	-0.111

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Fecal Coliform



Zero Reference Line Shown

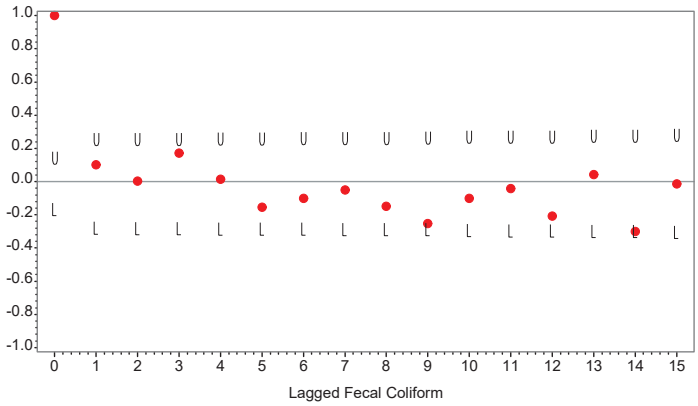
CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Fecal Coliform
Adjusted for Seasonal Median and Detrended

Lagged Fecal Coliform	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.100	0.134	0.267	-0.267
2	0.003	0.134	0.268	-0.268
3	0.172	0.134	0.268	-0.268
4	0.013	0.135	0.271	-0.271
5	-0.153	0.135	0.271	-0.271
6	-0.101	0.136	0.273	-0.273
7	-0.050	0.137	0.274	-0.274
8	-0.148	0.137	0.274	-0.274
9	-0.252	0.138	0.276	-0.276
10	-0.102	0.141	0.281	-0.281
11	-0.041	0.141	0.282	-0.282
12	-0.208	0.141	0.282	-0.282
13	0.043	0.143	0.286	-0.286

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Autocorrelation Statistics for Fecal Coliform
Adjusted for Seasonal Median and Detrended

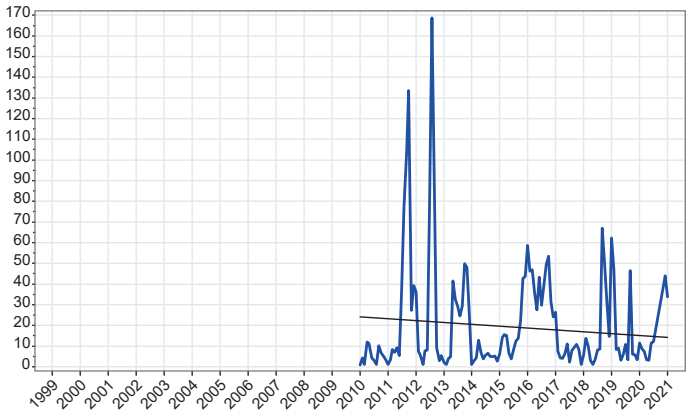
Lagged Fecal Coliform	Correlation	Standard Error	Upper Limit	Lower Limit
14	-0.300	0.143	0.286	-0.286
15	-0.013	0.147	0.293	-0.293

CENTRAL MOSQUITO LAGOON (2924B1) Trends Appendix
Correlogram for Fecal Coliform
Correlation Adjusted for Seasonal Median and Detrended

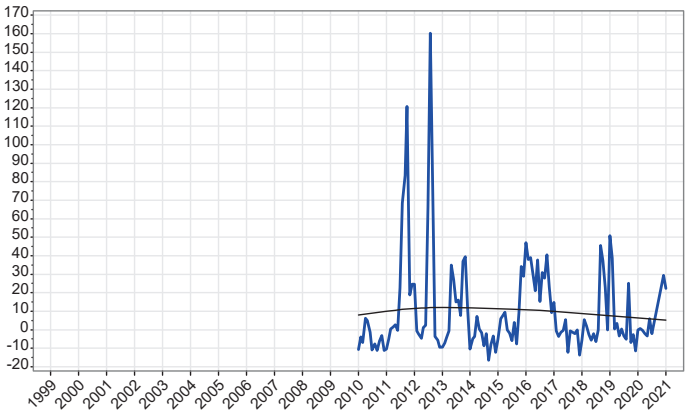


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

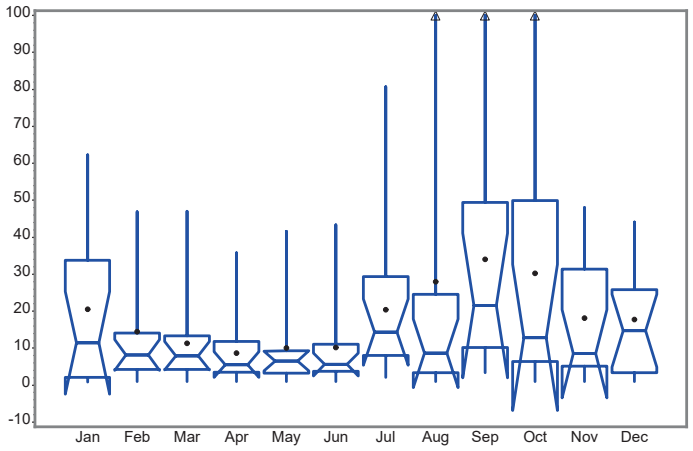
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
Chlorophyll a
Not Adjusted for Seasonal Medians



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
Chlorophyll a
Adjusted for Seasonal Medians



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Univariate Statistics
Chlorophyll a



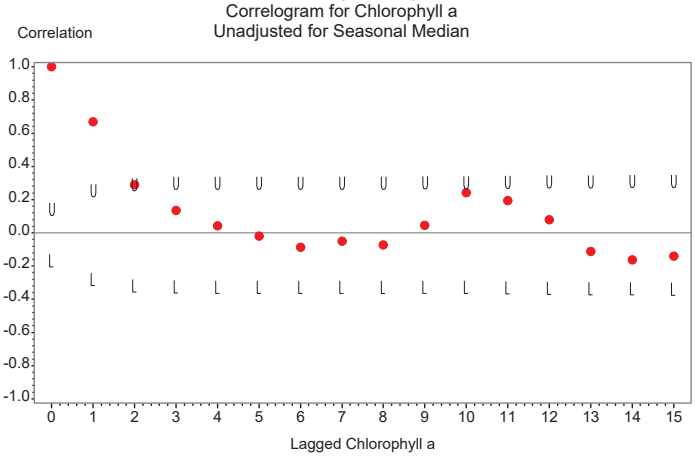
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Chlorophyll a
Unadjusted for Seasonal Medians

Lagged Chlorophyll a	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.670	0.134	0.267	-0.267
2	0.290	0.152	0.305	-0.305
3	0.134	0.156	0.311	-0.311
4	0.043	0.156	0.313	-0.313
5	-0.020	0.156	0.313	-0.313
6	-0.086	0.156	0.313	-0.313
7	-0.051	0.157	0.313	-0.313
8	-0.072	0.157	0.313	-0.313
9	0.046	0.157	0.314	-0.314
10	0.242	0.157	0.314	-0.314
11	0.193	0.159	0.318	-0.318
12	0.078	0.161	0.321	-0.321
13	-0.113	0.161	0.322	-0.322

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Chlorophyll a
Unadjusted for Seasonal Medians

Lagged Chlorophyll a	Correlation	Standard Error	Upper Limit	Lower Limit
14	-0.163	0.161	0.323	-0.323
15	-0.139	0.162	0.325	-0.325

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for Chlorophyll a
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

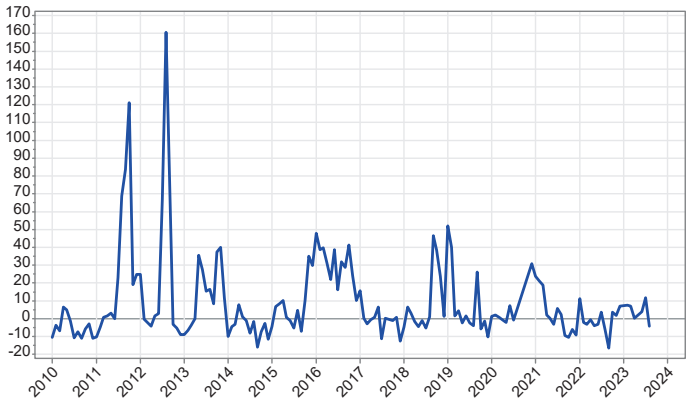
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Chlorophyll a
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.046	0.464	0.685	-0.114

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Chlorophyll a
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.044	0.475	0.692	-0.114

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Chlorophyll a



Zero Reference Line Shown

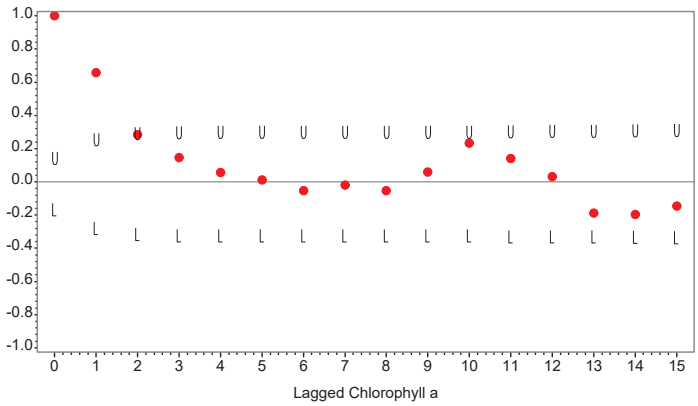
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Chlorophyll a
Adjusted for Seasonal Median and Detrended

Lagged Chlorophyll a	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.658	0.134	0.267	-0.267
2	0.284	0.152	0.303	-0.303
3	0.147	0.155	0.310	-0.310
4	0.056	0.156	0.311	-0.311
5	0.011	0.156	0.312	-0.312
6	-0.053	0.156	0.312	-0.312
7	-0.020	0.156	0.312	-0.312
8	-0.052	0.156	0.312	-0.312
9	0.058	0.156	0.312	-0.312
10	0.234	0.156	0.312	-0.312
11	0.142	0.158	0.316	-0.316
12	0.031	0.159	0.318	-0.318
13	-0.188	0.159	0.318	-0.318

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Chlorophyll a
Adjusted for Seasonal Median and Detrended

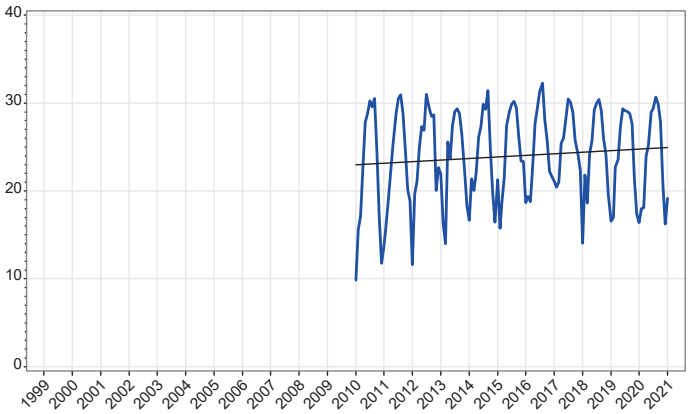
Lagged Chlorophyll a	Correlation	Standard Error	Upper Limit	Lower Limit
14	-0.196	0.160	0.321	-0.321
15	-0.146	0.162	0.323	-0.323

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for Chlorophyll a
Adjusted for Seasonal Median and Detrended

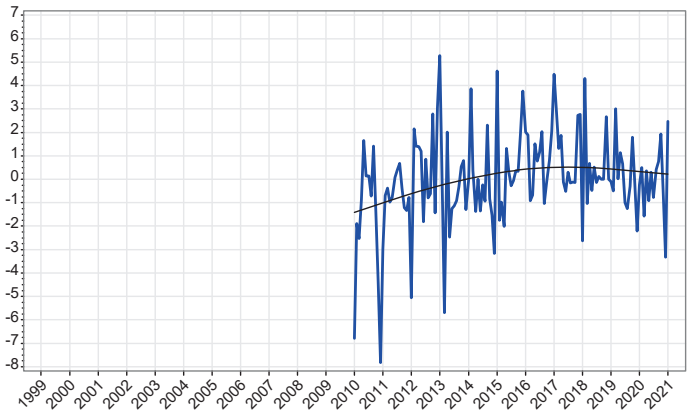


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

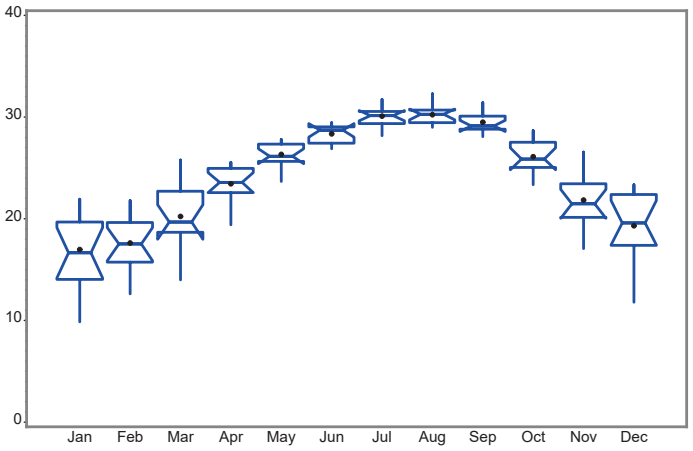
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
Temperature
Not Adjusted for Seasonal Medians



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
Temperature
Adjusted for Seasonal Medians



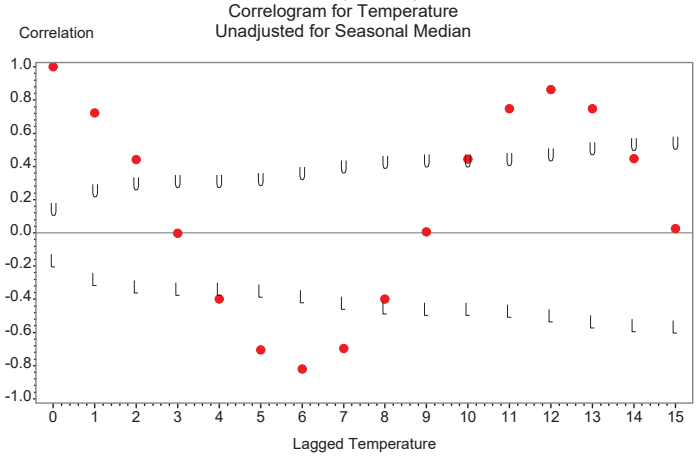
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Univariate Statistics
Temperature



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Temperature
Unadjusted for Seasonal Medians

Lagged Temperature	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.723	0.134	0.267	-0.267
2	0.442	0.155	0.310	-0.310
3	-0.002	0.163	0.325	-0.325
4	-0.399	0.163	0.325	-0.325
5	-0.706	0.168	0.336	-0.336
6	-0.819	0.185	0.370	-0.370
7	-0.696	0.205	0.411	-0.411
8	-0.398	0.219	0.438	-0.438
9	0.007	0.223	0.447	-0.447
10	0.445	0.223	0.447	-0.447
11	0.747	0.229	0.457	-0.457
12	0.863	0.243	0.485	-0.485
13	0.747	0.260	0.521	-0.521
14	0.446	0.273	0.545	-0.545
15	0.026	0.277	0.554	-0.554

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for Temperature
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

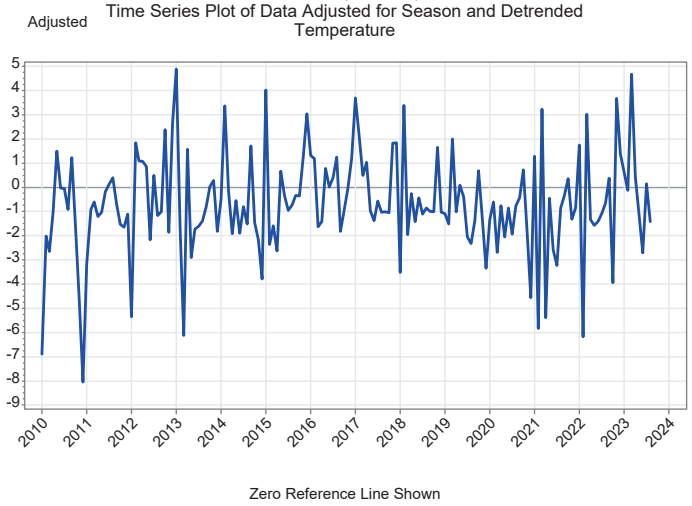
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Temperature
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.137	0.022	0.039	0.099

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Temperature
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.137	0.022	0.039	0.099

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Temperature

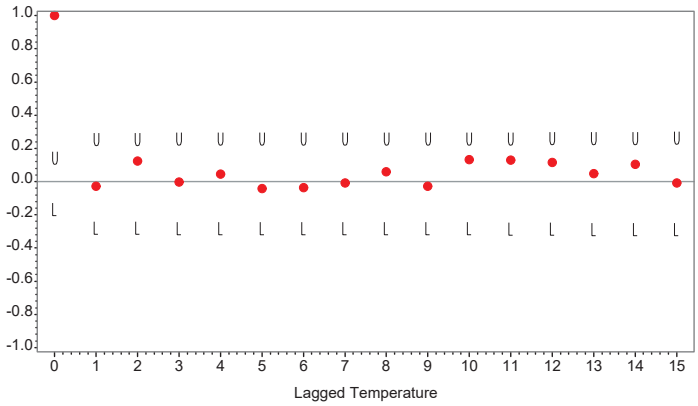


Zero Reference Line Shown

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Temperature
Adjusted for Seasonal Median and Detrended

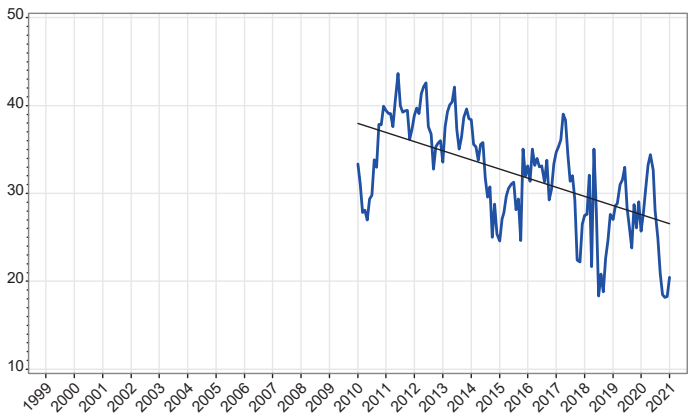
Lagged Temperature	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	-0.029	0.134	0.267	-0.267
2	0.125	0.134	0.267	-0.267
3	-0.004	0.134	0.269	-0.269
4	0.046	0.134	0.269	-0.269
5	-0.043	0.134	0.269	-0.269
6	-0.036	0.135	0.269	-0.269
7	-0.009	0.135	0.269	-0.269
8	0.058	0.135	0.269	-0.269
9	-0.027	0.135	0.269	-0.269
10	0.133	0.135	0.270	-0.270
11	0.130	0.136	0.271	-0.271
12	0.116	0.136	0.273	-0.273
13	0.048	0.137	0.274	-0.274
14	0.104	0.137	0.274	-0.274
15	-0.007	0.137	0.275	-0.275

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for Temperature
Correlation Adjusted for Seasonal Median and Detrended

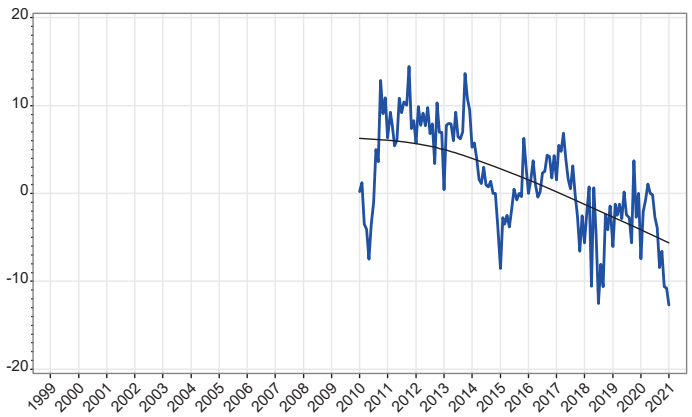


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

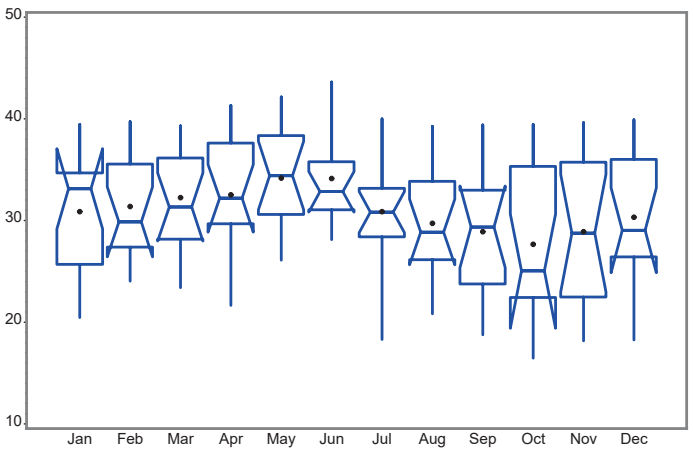
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
Salinity
Not Adjusted for Seasonal Medians



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
Salinity
Adjusted for Seasonal Medians



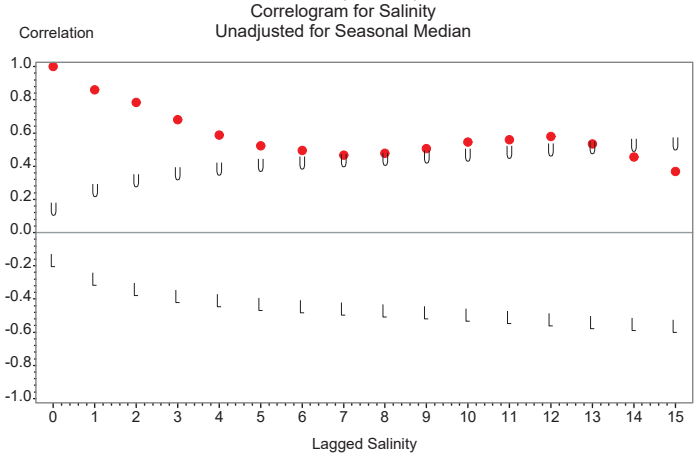
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Univariate Statistics
Salinity



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Salinity
Unadjusted for Seasonal Medians

Lagged Salinity	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.861	0.134	0.267	-0.267
2	0.783	0.163	0.327	-0.327
3	0.680	0.184	0.369	-0.369
4	0.587	0.199	0.397	-0.397
5	0.523	0.209	0.418	-0.418
6	0.494	0.216	0.433	-0.433
7	0.466	0.223	0.446	-0.446
8	0.477	0.229	0.457	-0.457
9	0.507	0.235	0.469	-0.469
10	0.546	0.241	0.482	-0.482
11	0.558	0.248	0.497	-0.497
12	0.579	0.256	0.511	-0.511
13	0.534	0.263	0.527	-0.527
14	0.456	0.270	0.539	-0.539
15	0.369	0.274	0.549	-0.549

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for Salinity
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

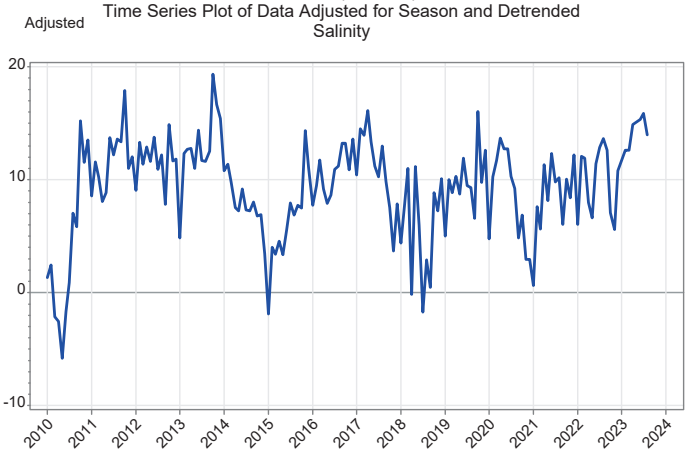
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Salinity
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.544	0	.003	-1.108

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Salinity
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.544	0	.003	-1.108

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Salinity

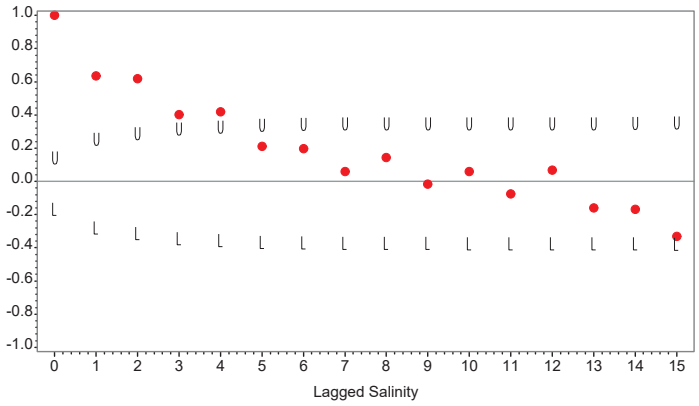


Zero Reference Line Shown

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Salinity
Adjusted for Seasonal Median and Detrended

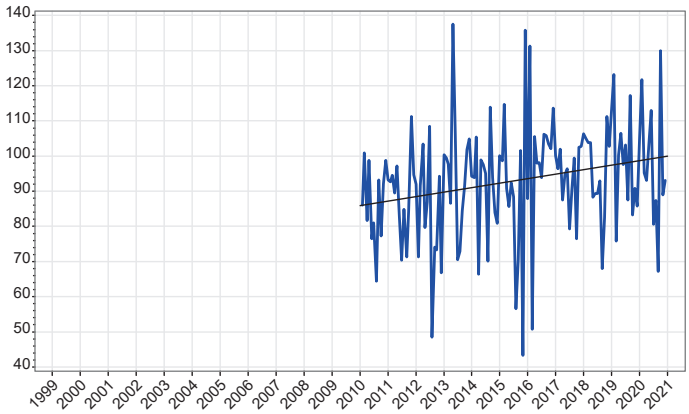
Lagged Salinity	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.635	0.134	0.267	-0.267
2	0.619	0.151	0.301	-0.301
3	0.402	0.165	0.330	-0.330
4	0.418	0.171	0.341	-0.341
5	0.210	0.177	0.353	-0.353
6	0.198	0.178	0.356	-0.356
7	0.058	0.179	0.359	-0.359
8	0.143	0.180	0.359	-0.359
9	-0.016	0.180	0.360	-0.360
10	0.059	0.180	0.361	-0.361
11	-0.077	0.180	0.361	-0.361
12	0.068	0.181	0.361	-0.361
13	-0.161	0.181	0.361	-0.361
14	-0.169	0.182	0.363	-0.363
15	-0.331	0.183	0.365	-0.365

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for Salinity
Correlation Adjusted for Seasonal Median and Detrended

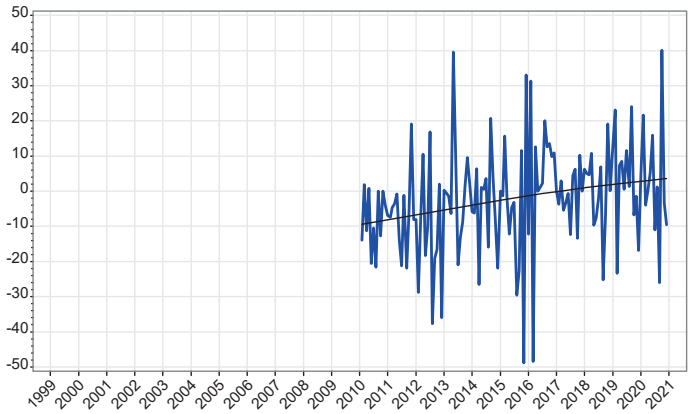


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

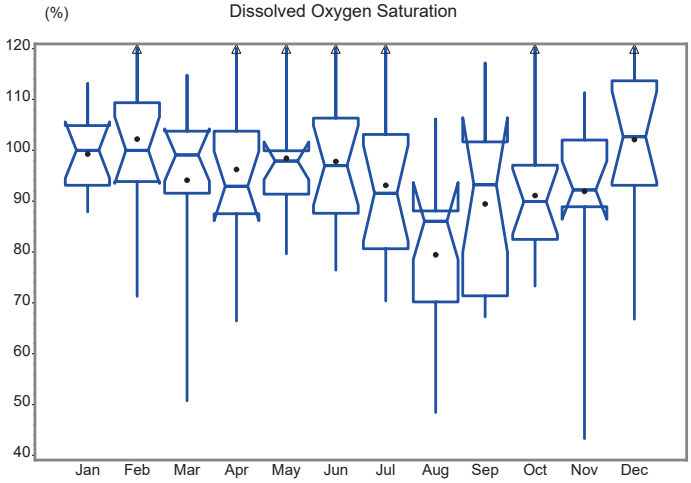
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
Dissolved Oxygen Saturation
Not Adjusted for Seasonal Medians



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
Dissolved Oxygen Saturation
Adjusted for Seasonal Medians



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Univariate Statistics
Dissolved Oxygen Saturation



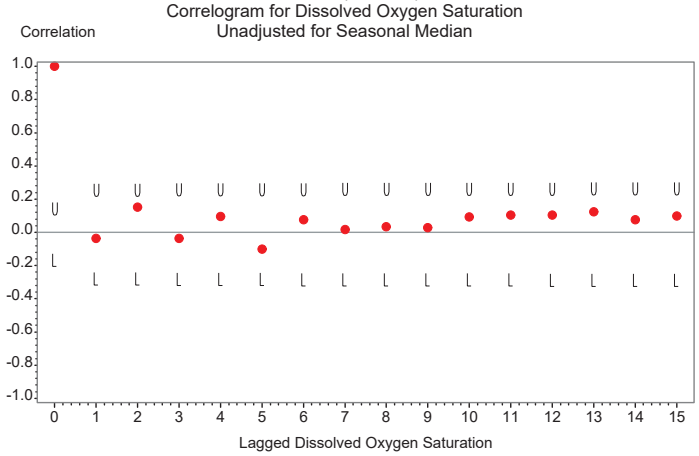
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Dissolved Oxygen Saturation
Unadjusted for Seasonal Medians

Lagged Dissolved Oxygen Saturation	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	-0.037	0.134	0.267	-0.267
2	0.151	0.134	0.267	-0.267
3	-0.037	0.135	0.269	-0.269
4	0.097	0.135	0.270	-0.270
5	-0.100	0.135	0.270	-0.270
6	0.075	0.136	0.271	-0.271
7	0.016	0.136	0.272	-0.272
8	0.033	0.136	0.272	-0.272
9	0.027	0.136	0.272	-0.272
10	0.093	0.136	0.272	-0.272
11	0.104	0.136	0.273	-0.273
12	0.104	0.137	0.274	-0.274
13	0.125	0.137	0.275	-0.275

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Dissolved Oxygen Saturation
Unadjusted for Seasonal Medians

Lagged Dissolved Oxygen Saturation	Correlation	Standard Error	Upper Limit	Lower Limit
14	0.075	0.138	0.276	-0.276
15	0.099	0.138	0.276	-0.276

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for Dissolved Oxygen Saturation
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

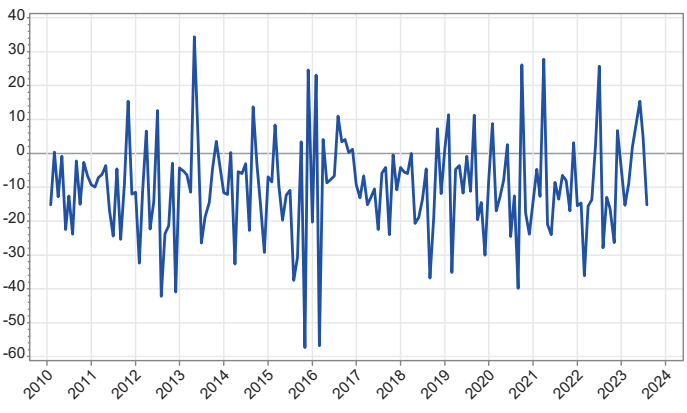
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Dissolved Oxygen Saturation
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.256	0	.003	1.158

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Dissolved Oxygen Saturation
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.256	0	.003	1.158

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Dissolved Oxygen Saturation



Zero Reference Line Shown

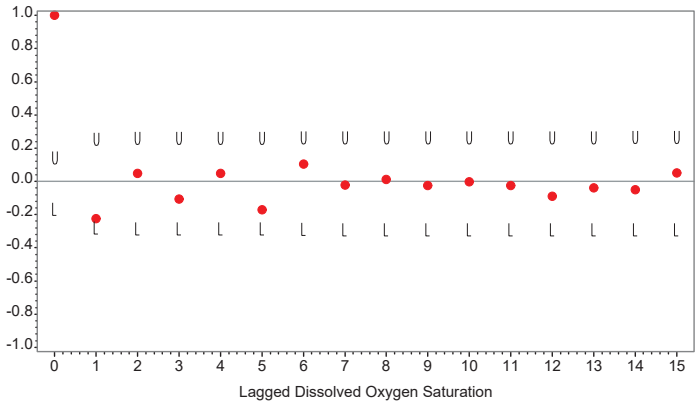
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Dissolved Oxygen Saturation
Adjusted for Seasonal Median and Detrended

Lagged Dissolved Oxygen Saturation	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	-0.225	0.134	0.267	-0.267
2	0.049	0.136	0.272	-0.272
3	-0.106	0.136	0.272	-0.272
4	0.047	0.136	0.273	-0.273
5	-0.170	0.137	0.273	-0.273
6	0.105	0.138	0.276	-0.276
7	-0.023	0.138	0.277	-0.277
8	0.011	0.138	0.277	-0.277
9	-0.026	0.138	0.277	-0.277
10	-0.003	0.138	0.277	-0.277
11	-0.024	0.138	0.277	-0.277
12	-0.089	0.138	0.277	-0.277
13	-0.038	0.139	0.277	-0.277

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Dissolved Oxygen Saturation
Adjusted for Seasonal Median and Detrended

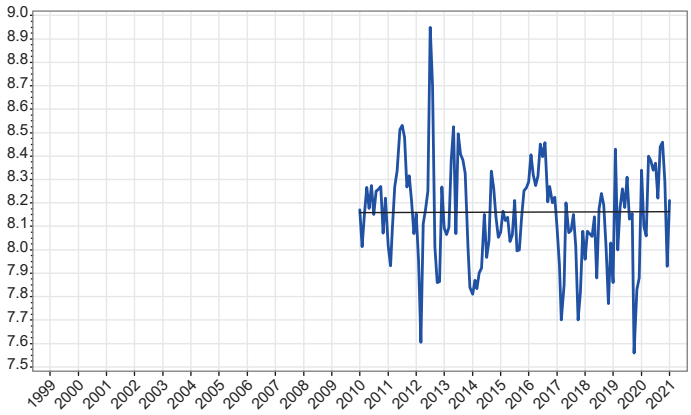
Lagged Dissolved Oxygen Saturation	Correlation	Standard Error	Upper Limit	Lower Limit
14	-0.051	0.139	0.278	-0.278
15	0.050	0.139	0.278	-0.278

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for Dissolved Oxygen Saturation
Correlation Adjusted for Seasonal Median and Detrended

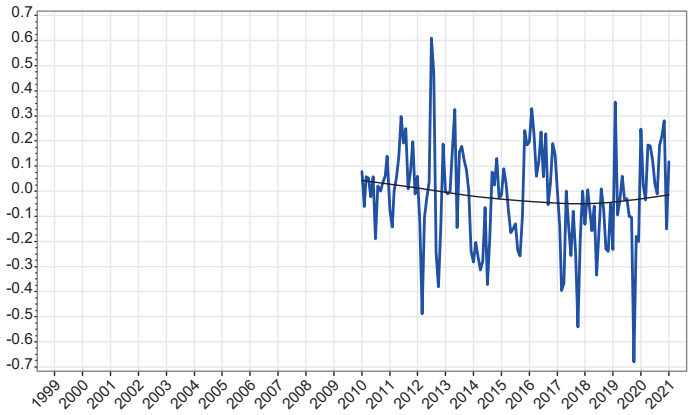


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

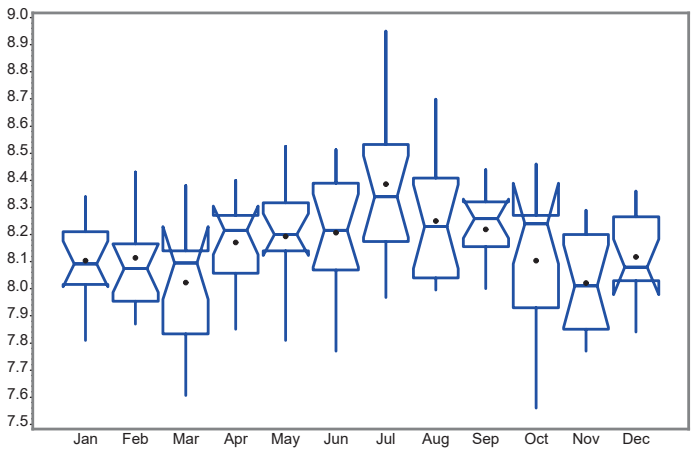
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
pH
(SU) Not Adjusted for Seasonal Medians



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
pH
Adjusted (SU) Adjusted for Seasonal Medians



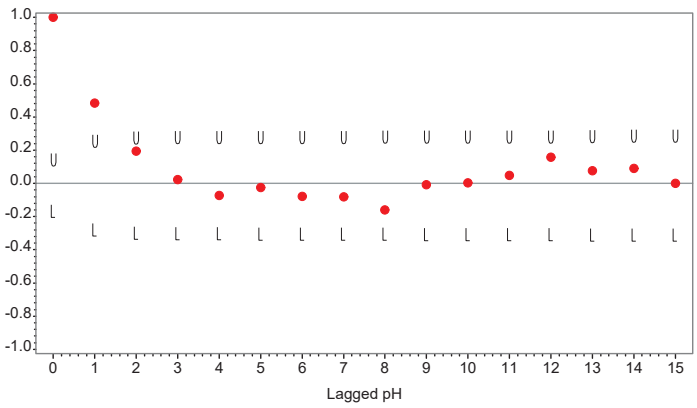
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Univariate Statistics
(SU) pH



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for pH
Unadjusted for Seasonal Medians

Lagged pH	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.483	0.134	0.267	-0.267
2	0.193	0.144	0.287	-0.287
3	0.024	0.145	0.290	-0.290
4	-0.072	0.145	0.290	-0.290
5	-0.024	0.145	0.291	-0.291
6	-0.079	0.145	0.291	-0.291
7	-0.080	0.146	0.291	-0.291
8	-0.159	0.146	0.292	-0.292
9	-0.009	0.147	0.294	-0.294
10	0.004	0.147	0.294	-0.294
11	0.049	0.147	0.294	-0.294
12	0.158	0.147	0.294	-0.294
13	0.077	0.148	0.296	-0.296
14	0.091	0.148	0.297	-0.297
15	-0.001	0.149	0.297	-0.297

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for pH
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

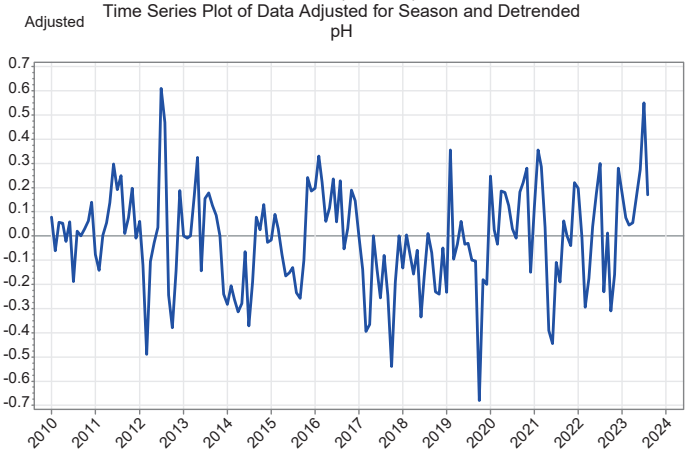
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
pH
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.01	0.88	0.924	0

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
pH
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
.009	0.893	0.933	0

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
pH

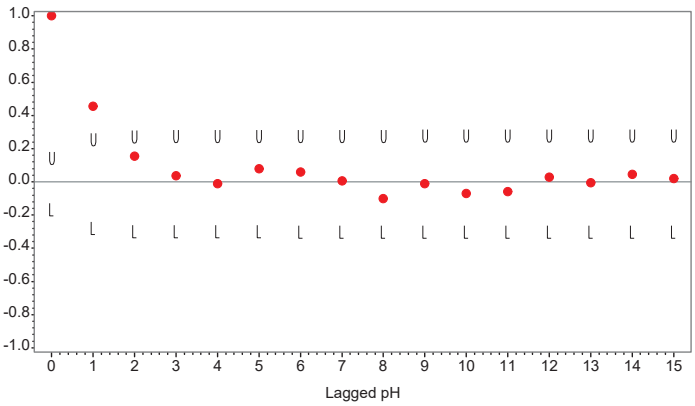


Zero Reference Line Shown

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for pH
Adjusted for Seasonal Median and Detrended

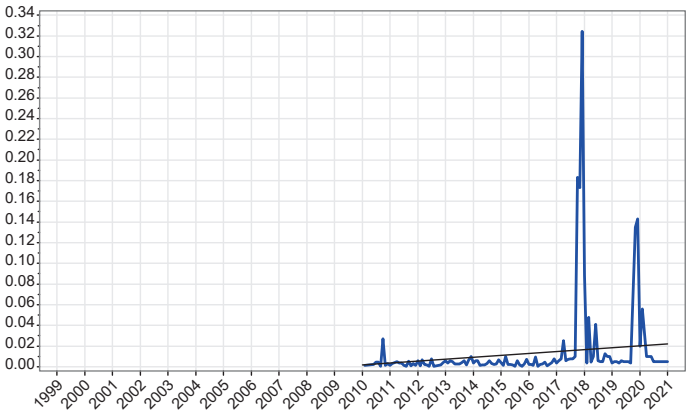
Lagged pH	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.456	0.134	0.267	-0.267
2	0.154	0.143	0.285	-0.285
3	0.038	0.144	0.287	-0.287
4	-0.012	0.144	0.287	-0.287
5	0.078	0.144	0.287	-0.287
6	0.060	0.144	0.288	-0.288
7	0.005	0.144	0.288	-0.288
8	-0.100	0.144	0.288	-0.288
9	-0.010	0.144	0.289	-0.289
10	-0.070	0.144	0.289	-0.289
11	-0.060	0.145	0.289	-0.289
12	0.029	0.145	0.290	-0.290
13	-0.006	0.145	0.290	-0.290
14	0.045	0.145	0.290	-0.290
15	0.021	0.145	0.290	-0.290

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for pH
Adjusted for Seasonal Median and Detrended

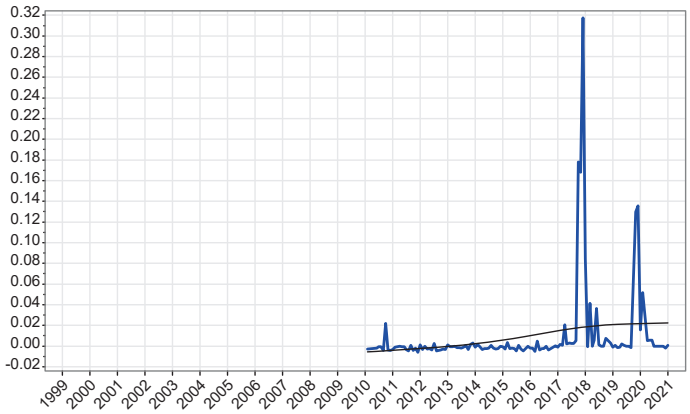


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

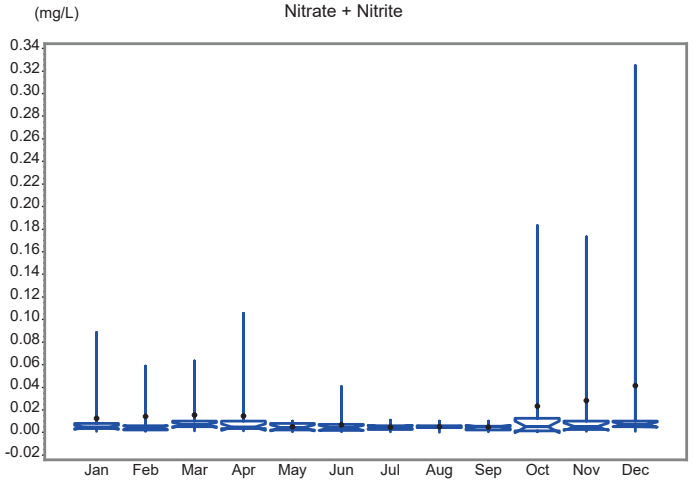
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
Nitrate + Nitrite
Not Adjusted for Seasonal Medians



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
Nitrate + Nitrite
Adjusted for Seasonal Medians



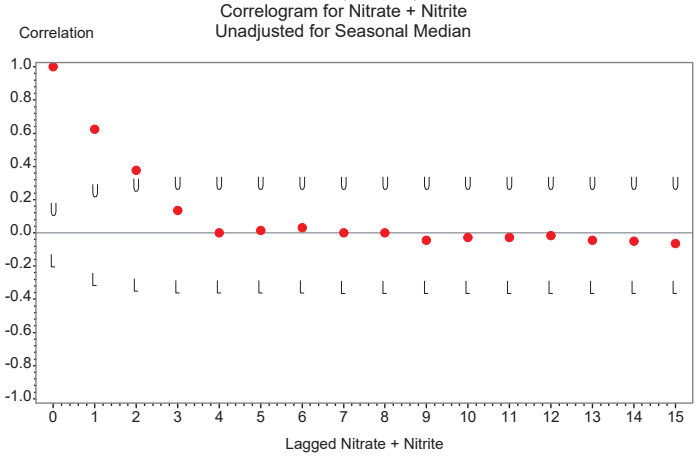
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Univariate Statistics
Nitrate + Nitrite



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Nitrate + Nitrite
Unadjusted for Seasonal Medians

Lagged Nitrate + Nitrite	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.624	0.134	0.267	-0.267
2	0.377	0.150	0.300	-0.300
3	0.135	0.156	0.311	-0.311
4	0.000	0.156	0.312	-0.312
5	0.014	0.156	0.312	-0.312
6	0.032	0.156	0.312	-0.312
7	-0.001	0.156	0.313	-0.313
8	0.000	0.156	0.313	-0.313
9	-0.044	0.156	0.313	-0.313
10	-0.028	0.156	0.313	-0.313
11	-0.028	0.156	0.313	-0.313
12	-0.017	0.156	0.313	-0.313
13	-0.046	0.156	0.313	-0.313
14	-0.051	0.156	0.313	-0.313
15	-0.065	0.157	0.313	-0.313

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for Nitrate + Nitrite
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

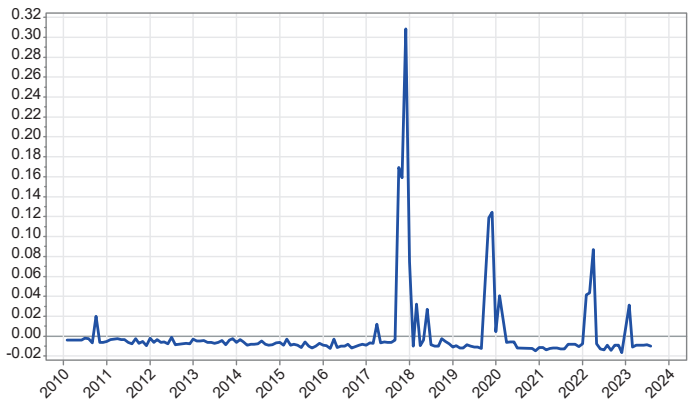
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Nitrate + Nitrite
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.376	0	.007	.001

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Nitrate + Nitrite
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.389	0	.005	.001

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Nitrate + Nitrite

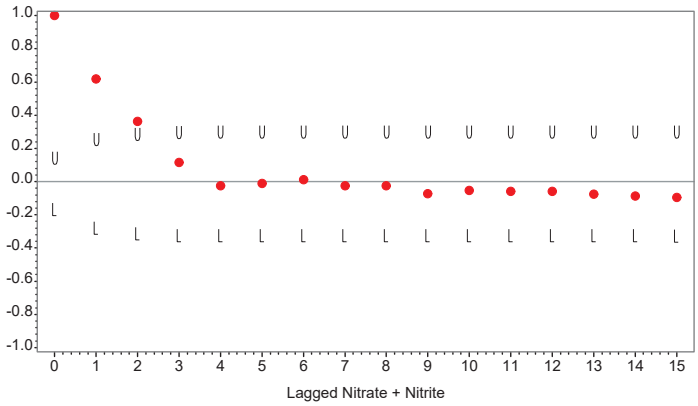


Zero Reference Line Shown

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Nitrate + Nitrite
Adjusted for Seasonal Median and Detrended

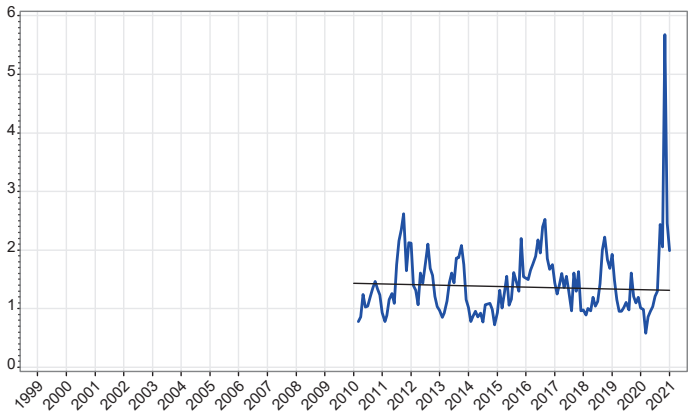
Lagged Nitrate + Nitrite	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.618	0.134	0.267	-0.267
2	0.363	0.150	0.299	-0.299
3	0.114	0.155	0.310	-0.310
4	-0.025	0.155	0.311	-0.311
5	-0.011	0.155	0.311	-0.311
6	0.010	0.155	0.311	-0.311
7	-0.026	0.155	0.311	-0.311
8	-0.026	0.155	0.311	-0.311
9	-0.072	0.155	0.311	-0.311
10	-0.054	0.156	0.311	-0.311
11	-0.059	0.156	0.311	-0.311
12	-0.058	0.156	0.312	-0.312
13	-0.077	0.156	0.312	-0.312
14	-0.088	0.156	0.312	-0.312
15	-0.096	0.157	0.313	-0.313

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for Nitrate + Nitrite
Adjusted for Seasonal Median and Detrended

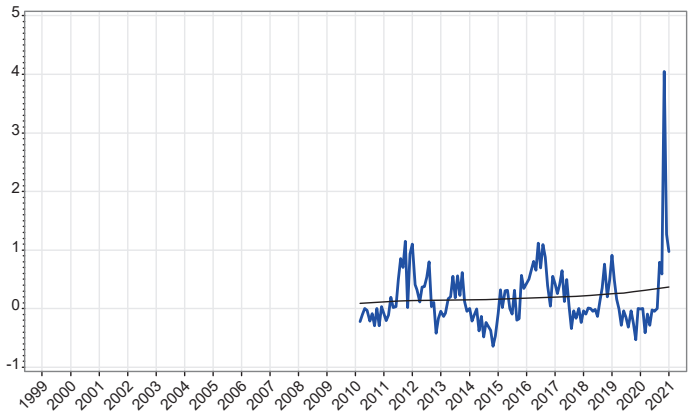


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

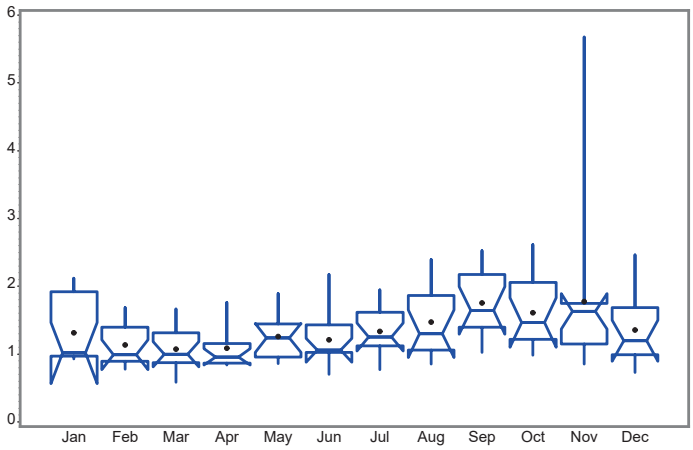
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
Total Kjeldahl Nitrogen
Not Adjusted for Seasonal Medians



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
Total Kjeldahl Nitrogen
Adjusted for Seasonal Medians



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Univariate Statistics
Total Kjeldahl Nitrogen



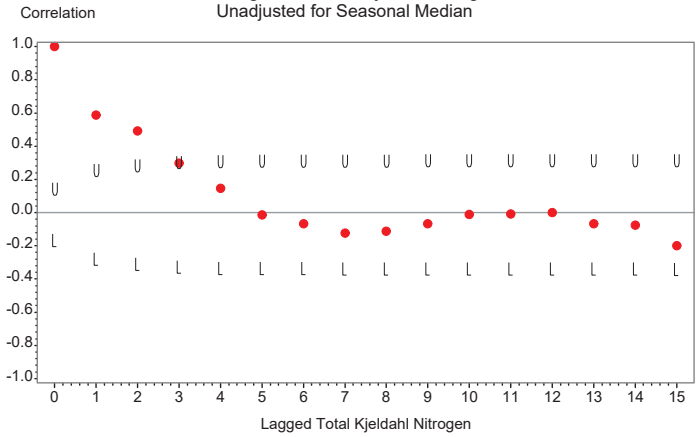
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Total Kjeldahl Nitrogen
Unadjusted for Seasonal Medians

Lagged Total Kjeldahl Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.588	0.134	0.267	-0.267
2	0.492	0.148	0.296	-0.296
3	0.297	0.158	0.315	-0.315
4	0.145	0.161	0.322	-0.322
5	-0.013	0.162	0.323	-0.323
6	-0.066	0.162	0.323	-0.323
7	-0.123	0.162	0.324	-0.324
8	-0.111	0.162	0.325	-0.325
9	-0.066	0.163	0.326	-0.326
10	-0.011	0.163	0.326	-0.326
11	-0.009	0.163	0.326	-0.326
12	0.000	0.163	0.326	-0.326
13	-0.068	0.163	0.326	-0.326

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Total Kjeldahl Nitrogen
Unadjusted for Seasonal Medians

Lagged Total Kjeldahl Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
14	-0.075	0.163	0.326	-0.326
15	-0.199	0.163	0.327	-0.327

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for Total Kjeldahl Nitrogen
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

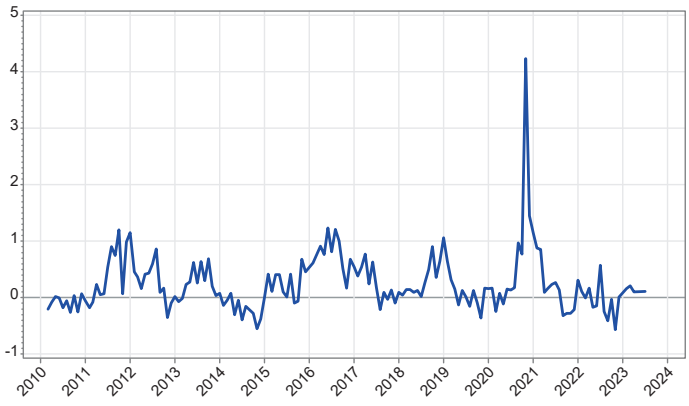
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Total Kjeldahl Nitrogen
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.111	0.071	0.387	-0.015

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Total Kjeldahl Nitrogen
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.111	0.071	0.387	-0.015

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Total Kjeldahl Nitrogen



Zero Reference Line Shown

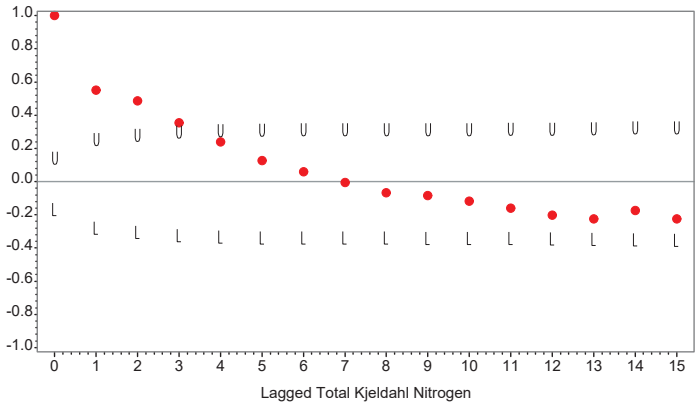
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Total Kjeldahl Nitrogen
Adjusted for Seasonal Median and Detrended

Lagged Total Kjeldahl Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.550	0.134	0.267	-0.267
2	0.485	0.146	0.293	-0.293
3	0.353	0.156	0.311	-0.311
4	0.238	0.160	0.321	-0.321
5	0.128	0.163	0.325	-0.325
6	0.058	0.163	0.326	-0.326
7	-0.005	0.163	0.326	-0.326
8	-0.066	0.163	0.326	-0.326
9	-0.084	0.163	0.327	-0.327
10	-0.119	0.164	0.327	-0.327
11	-0.161	0.164	0.328	-0.328
12	-0.202	0.165	0.330	-0.330
13	-0.224	0.167	0.333	-0.333

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Total Kjeldahl Nitrogen
Adjusted for Seasonal Median and Detrended

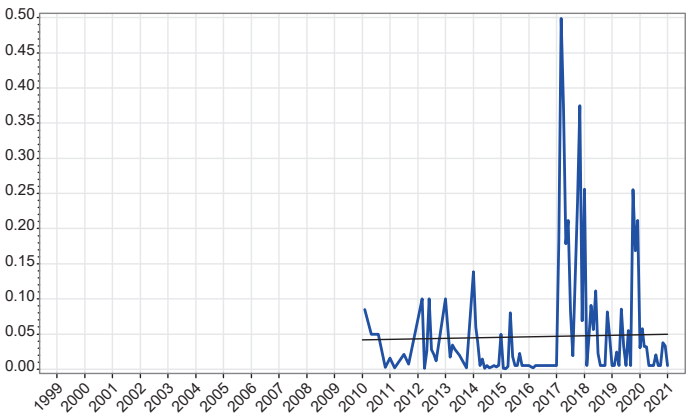
Lagged Total Kjeldahl Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
14	-0.173	0.168	0.337	-0.337
15	-0.225	0.169	0.339	-0.339

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for Total Kjeldahl Nitrogen
Correlation Adjusted for Seasonal Median and Detrended

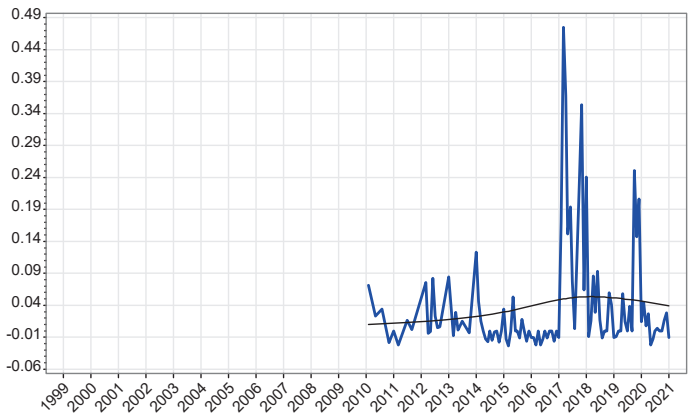


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

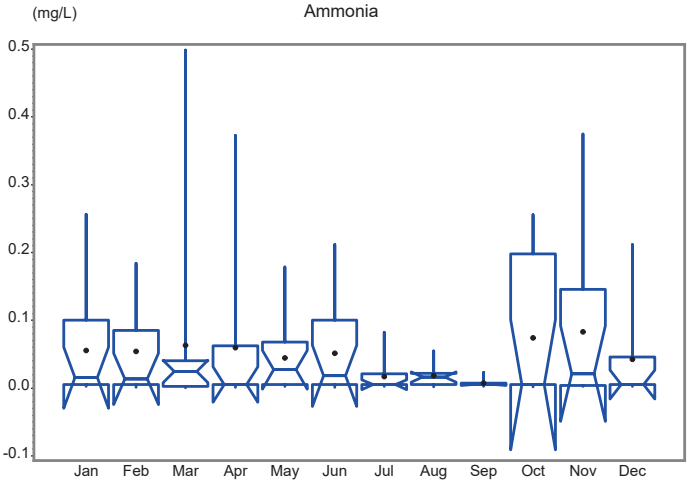
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
Ammonia
Not Adjusted for Seasonal Medians



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
Ammonia
Adjusted for Seasonal Medians



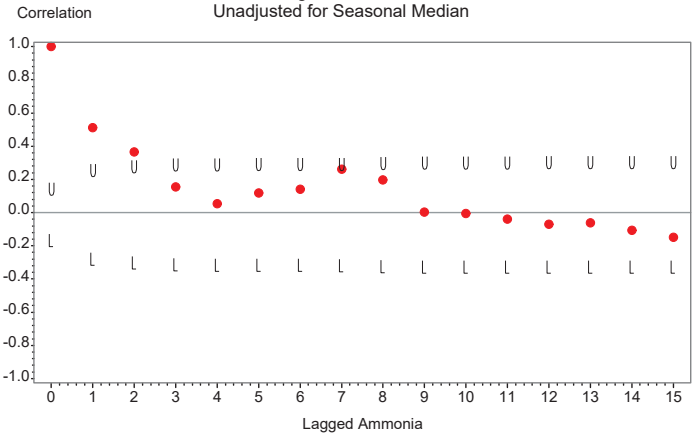
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Univariate Statistics
Ammonia



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Ammonia
Unadjusted for Seasonal Medians

Lagged Ammonia	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.511	0.134	0.267	-0.267
2	0.365	0.145	0.290	-0.290
3	0.155	0.150	0.300	-0.300
4	0.054	0.151	0.302	-0.302
5	0.117	0.151	0.303	-0.303
6	0.142	0.152	0.304	-0.304
7	0.261	0.153	0.305	-0.305
8	0.197	0.155	0.310	-0.310
9	0.004	0.157	0.313	-0.313
10	-0.006	0.157	0.313	-0.313
11	-0.039	0.157	0.313	-0.313
12	-0.070	0.157	0.314	-0.314
13	-0.061	0.157	0.314	-0.314
14	-0.106	0.157	0.314	-0.314
15	-0.150	0.158	0.315	-0.315

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for Ammonia
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

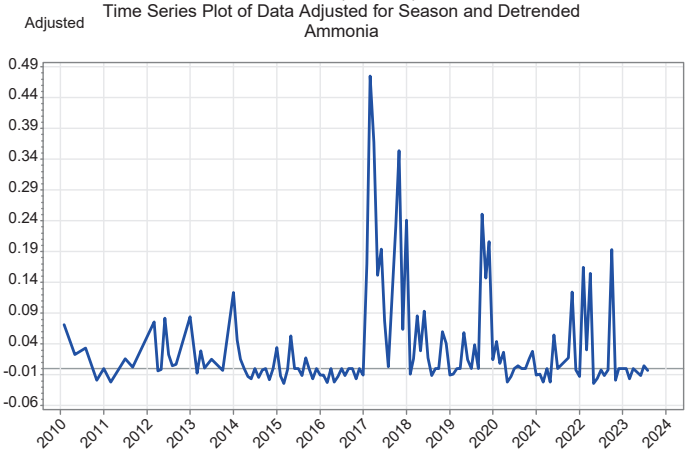
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Ammonia
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.032	0.638	0.772	0

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Ammonia
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.038	0.576	0.729	0

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Ammonia

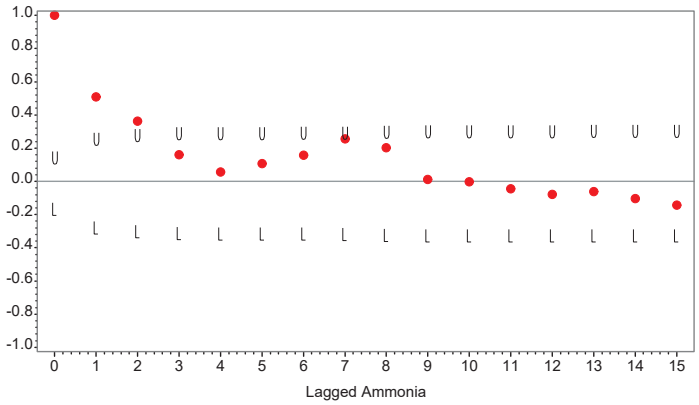


Zero Reference Line Shown

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Ammonia
Adjusted for Seasonal Median and Detrended

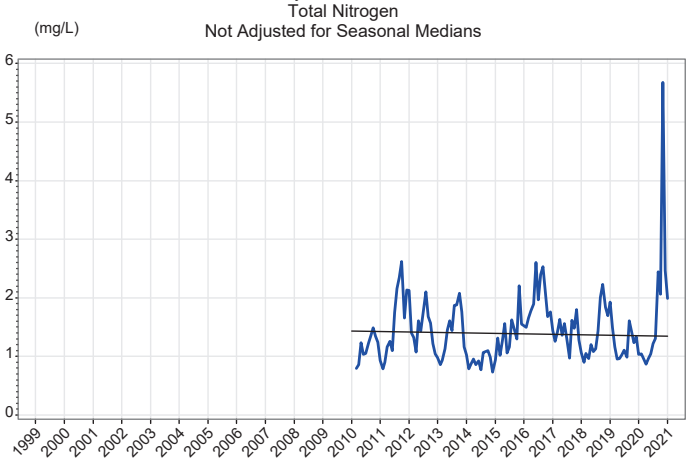
Lagged Ammonia	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.509	0.134	0.267	-0.267
2	0.362	0.145	0.289	-0.289
3	0.160	0.150	0.300	-0.300
4	0.056	0.151	0.302	-0.302
5	0.106	0.151	0.302	-0.302
6	0.157	0.152	0.303	-0.303
7	0.257	0.153	0.305	-0.305
8	0.203	0.155	0.310	-0.310
9	0.011	0.157	0.313	-0.313
10	-0.003	0.157	0.313	-0.313
11	-0.045	0.157	0.313	-0.313
12	-0.079	0.157	0.313	-0.313
13	-0.062	0.157	0.314	-0.314
14	-0.105	0.157	0.314	-0.314
15	-0.142	0.158	0.315	-0.315

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for Ammonia
Correlation Adjusted for Seasonal Median and Detrended

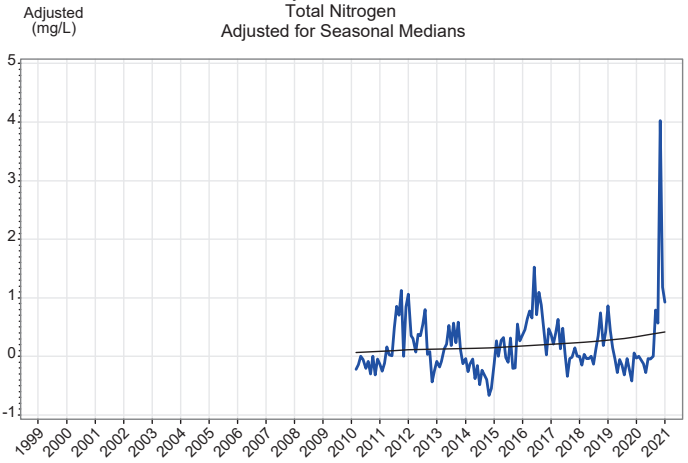


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

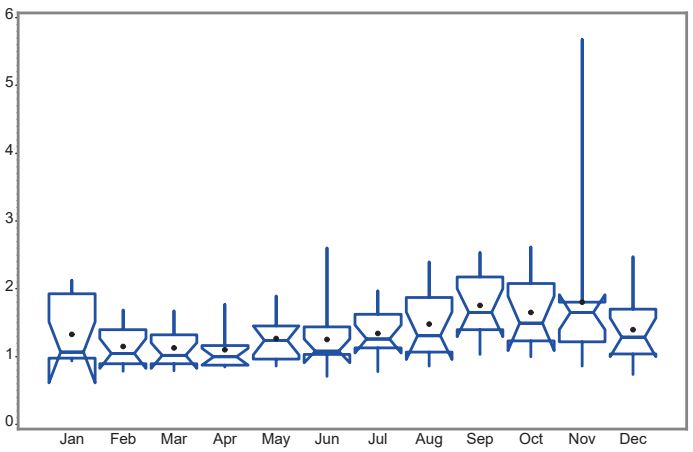
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
Total Nitrogen
Not Adjusted for Seasonal Medians



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
Total Nitrogen
Adjusted for Seasonal Medians



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Univariate Statistics
Total Nitrogen



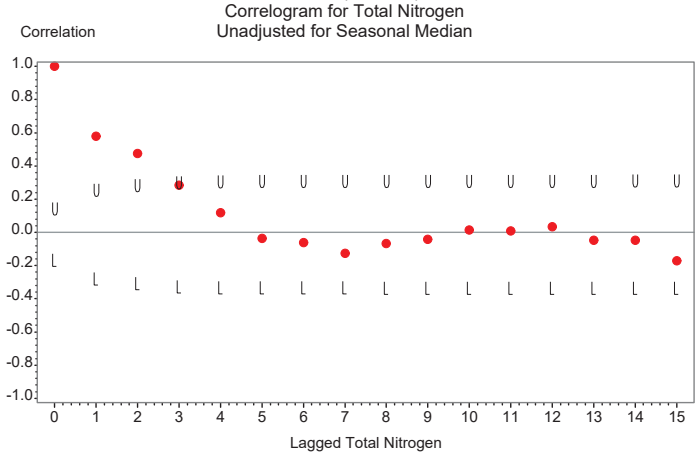
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Total Nitrogen
Unadjusted for Seasonal Medians

Lagged Total Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.578	0.134	0.267	-0.267
2	0.475	0.148	0.295	-0.295
3	0.285	0.157	0.313	-0.313
4	0.117	0.160	0.319	-0.319
5	-0.035	0.160	0.320	-0.320
6	-0.061	0.160	0.320	-0.320
7	-0.125	0.160	0.321	-0.321
8	-0.068	0.161	0.322	-0.322
9	-0.042	0.161	0.322	-0.322
10	0.014	0.161	0.322	-0.322
11	0.009	0.161	0.322	-0.322
12	0.034	0.161	0.322	-0.322
13	-0.047	0.161	0.322	-0.322

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Total Nitrogen
Unadjusted for Seasonal Medians

Lagged Total Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
14	-0.049	0.161	0.323	-0.323
15	-0.172	0.161	0.323	-0.323

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for Total Nitrogen
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

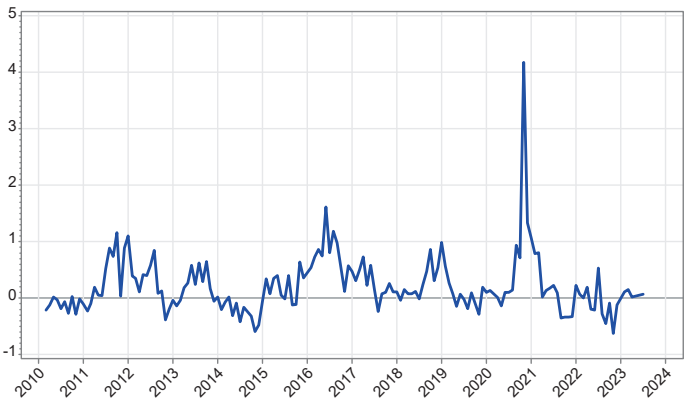
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Total Nitrogen
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.076	0.221	0.552	-0.012

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Total Nitrogen
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
-0.077	0.214	0.546	-0.012

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Total Nitrogen



Zero Reference Line Shown

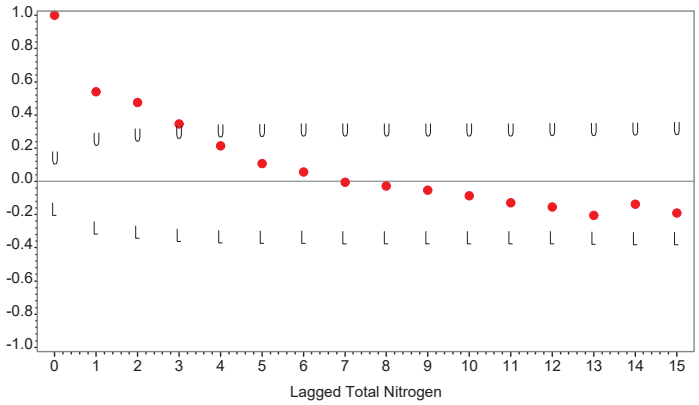
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Total Nitrogen
Adjusted for Seasonal Median and Detrended

Lagged Total Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.540	0.134	0.267	-0.267
2	0.476	0.146	0.292	-0.292
3	0.345	0.155	0.310	-0.310
4	0.215	0.160	0.319	-0.319
5	0.106	0.161	0.322	-0.322
6	0.055	0.162	0.323	-0.323
7	-0.005	0.162	0.324	-0.324
8	-0.027	0.162	0.324	-0.324
9	-0.053	0.162	0.324	-0.324
10	-0.086	0.162	0.324	-0.324
11	-0.129	0.162	0.324	-0.324
12	-0.155	0.163	0.326	-0.326
13	-0.206	0.164	0.327	-0.327

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Total Nitrogen
Adjusted for Seasonal Median and Detrended

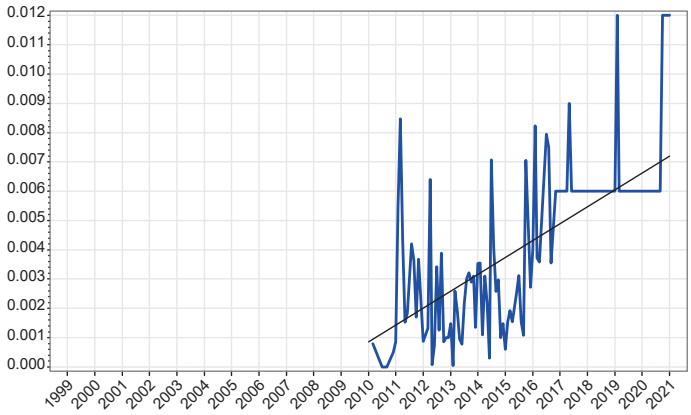
Lagged Total Nitrogen	Correlation	Standard Error	Upper Limit	Lower Limit
14	-0.138	0.165	0.330	-0.330
15	-0.191	0.166	0.332	-0.332

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for Total Nitrogen
Correlation Adjusted for Seasonal Median and Detrended

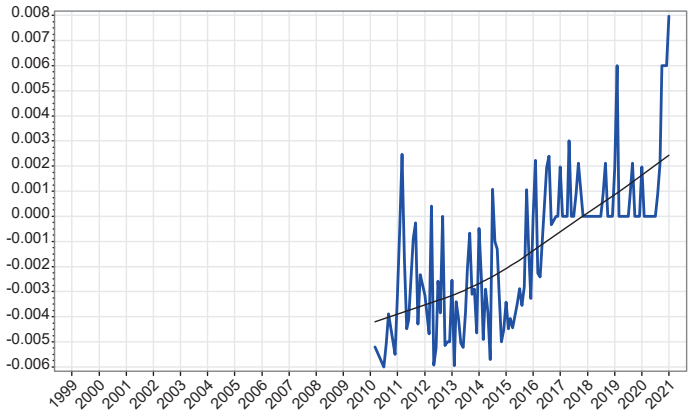


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

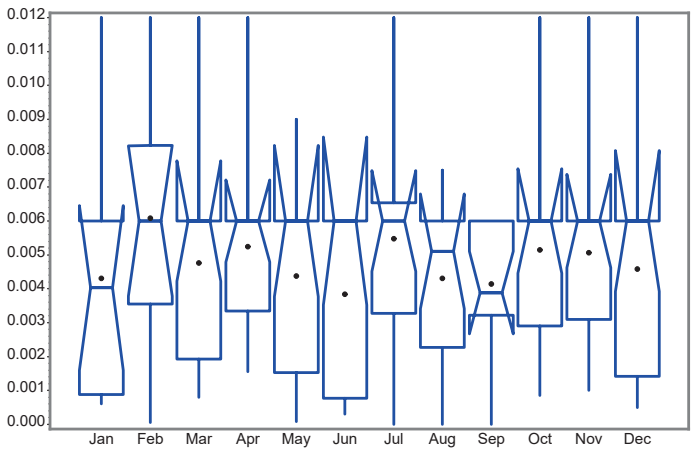
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
Orthophosphorous
Not Adjusted for Seasonal Medians



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
Orthophosphorous
Adjusted for Seasonal Medians



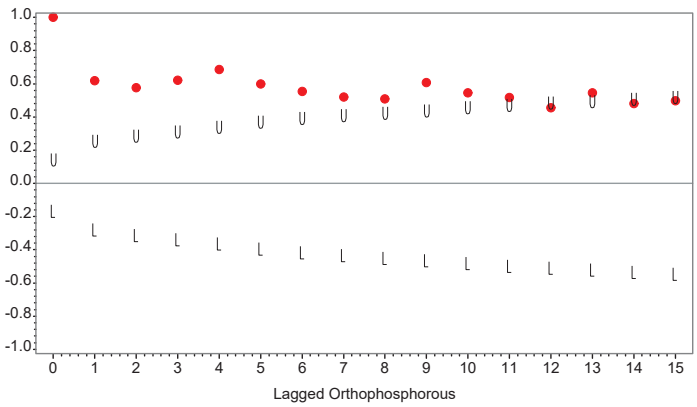
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Univariate Statistics
Orthophosphorous



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Orthophosphorous
Unadjusted for Seasonal Medians

Lagged Orthophosphorous	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.617	0.134	0.267	-0.267
2	0.577	0.150	0.299	-0.299
3	0.620	0.162	0.325	-0.325
4	0.685	0.176	0.352	-0.352
5	0.600	0.191	0.382	-0.382
6	0.554	0.202	0.404	-0.404
7	0.520	0.211	0.422	-0.422
8	0.508	0.218	0.437	-0.437
9	0.608	0.225	0.451	-0.451
10	0.546	0.235	0.470	-0.470
11	0.518	0.242	0.485	-0.485
12	0.454	0.249	0.498	-0.498
13	0.546	0.254	0.507	-0.507
14	0.480	0.261	0.521	-0.521
15	0.497	0.266	0.532	-0.532

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for Orthophosphorous
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

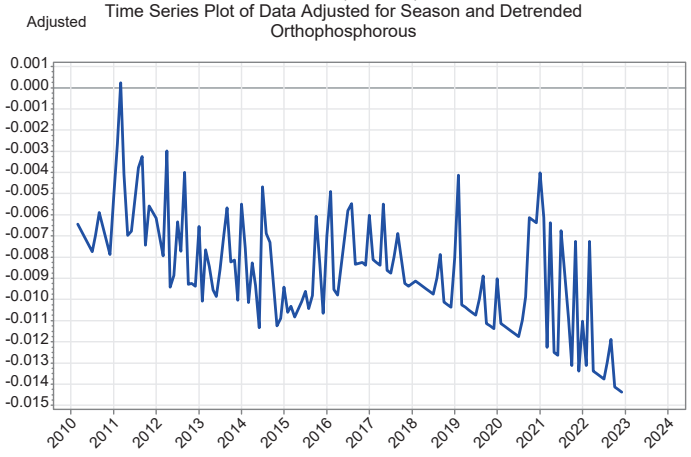
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Orthophosphorous
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.53	0	.002	.001

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Orthophosphorous
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.538	0	.002	.001

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Orthophosphorous

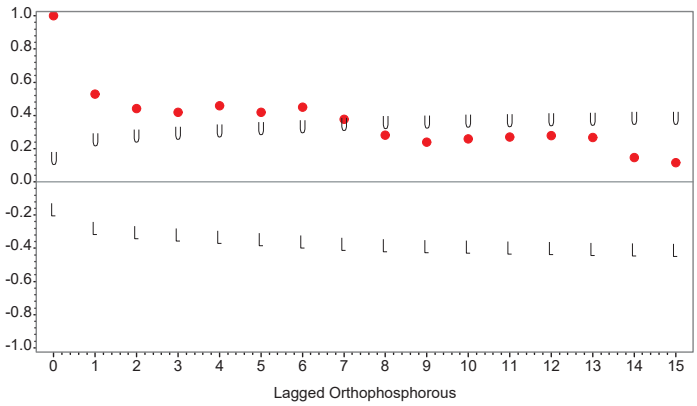


Zero Reference Line Shown

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Orthophosphorous
Adjusted for Seasonal Median and Detrended

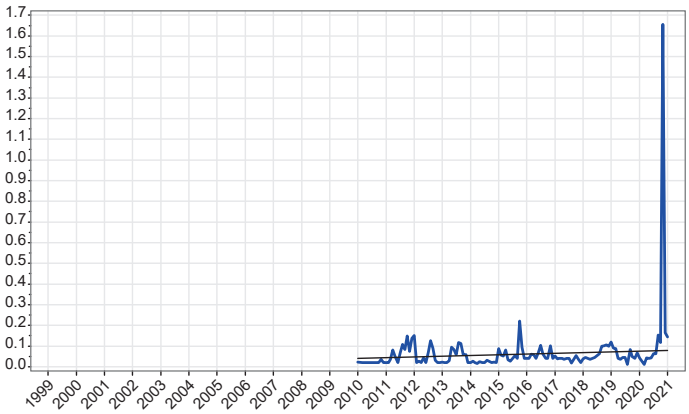
Lagged Orthophosphorous	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.529	0.134	0.267	-0.267
2	0.442	0.146	0.291	-0.291
3	0.419	0.153	0.307	-0.307
4	0.457	0.160	0.320	-0.320
5	0.418	0.168	0.335	-0.335
6	0.450	0.174	0.347	-0.347
7	0.378	0.181	0.361	-0.361
8	0.282	0.185	0.370	-0.370
9	0.240	0.188	0.375	-0.375
10	0.258	0.190	0.379	-0.379
11	0.269	0.192	0.383	-0.383
12	0.279	0.194	0.388	-0.388
13	0.266	0.196	0.392	-0.392
14	0.146	0.198	0.397	-0.397
15	0.114	0.199	0.398	-0.398

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for Orthophosphorous
Correlation Adjusted for Seasonal Median and Detrended

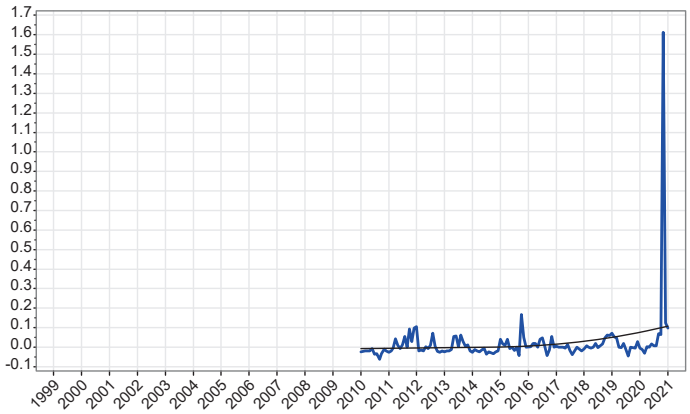


U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

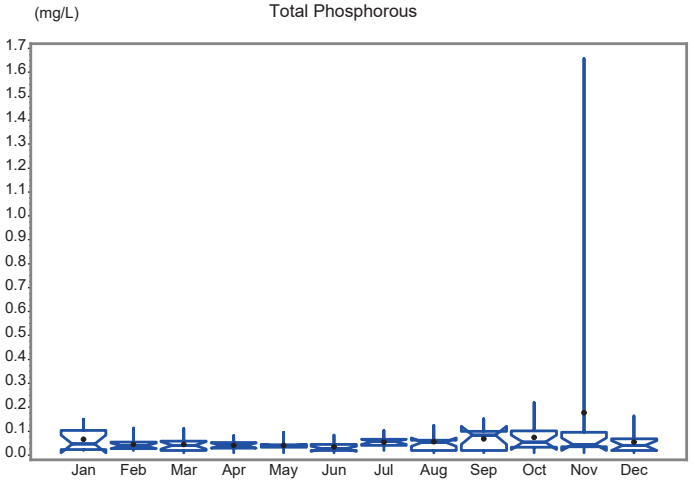
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
Total Phosphorous
Not Adjusted for Seasonal Medians



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Monthly Data Time Series
Total Phosphorous
Adjusted for Seasonal Medians



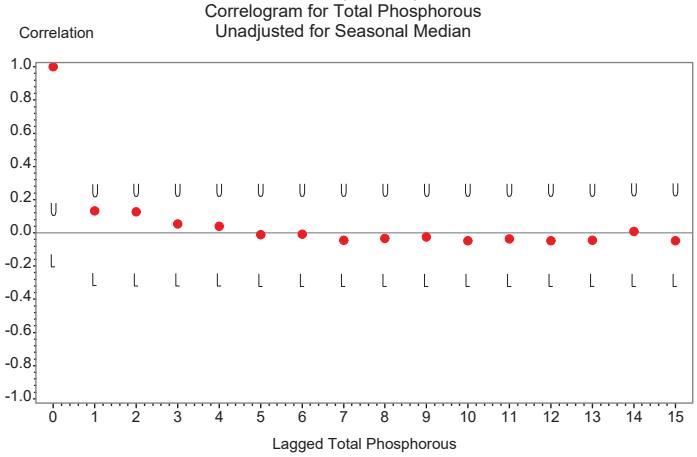
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Univariate Statistics
Total Phosphorous



INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Total Phosphorous
Unadjusted for Seasonal Medians

Lagged Total Phosphorous	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.131	0.134	0.267	-0.267
2	0.127	0.134	0.269	-0.269
3	0.054	0.135	0.270	-0.270
4	0.040	0.135	0.270	-0.270
5	-0.012	0.135	0.271	-0.271
6	-0.009	0.135	0.271	-0.271
7	-0.046	0.135	0.271	-0.271
8	-0.033	0.135	0.271	-0.271
9	-0.026	0.135	0.271	-0.271
10	-0.048	0.135	0.271	-0.271
11	-0.036	0.136	0.271	-0.271
12	-0.048	0.136	0.271	-0.271
13	-0.045	0.136	0.271	-0.271
14	0.008	0.136	0.272	-0.272
15	-0.049	0.136	0.272	-0.272

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for Total Phosphorous
Unadjusted for Seasonal Median



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

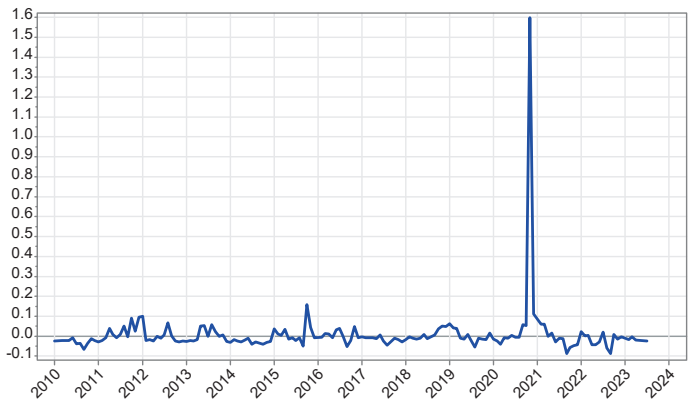
INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Total Phosphorous
Unadjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.115	0.059	0.241	.001

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Seasonal Kendall Tau Trend Test Statistics
Total Phosphorous
Adjusted for Seasonal Medians

Tau Statistic	P-Value Without Serial Correlation	P-Value With Serial Correlation	Slope Statistic
0.112	0.067	0.251	.001

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Time Series Plot of Data Adjusted for Season and Detrended
Total Phosphorous

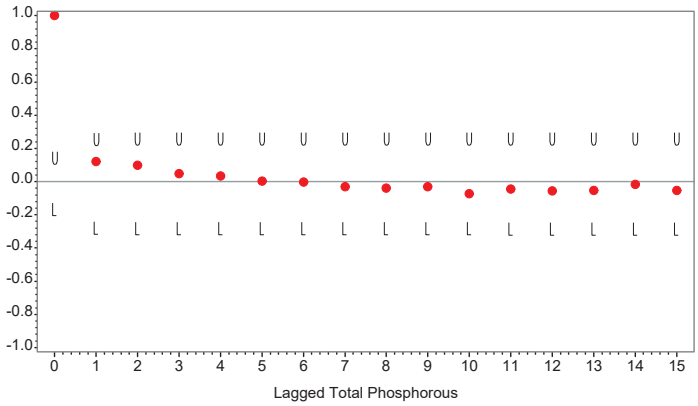


Zero Reference Line Shown

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Autocorrelation Statistics for Total Phosphorous
Adjusted for Seasonal Median and Detrended

Lagged Total Phosphorous	Correlation	Standard Error	Upper Limit	Lower Limit
0	1.000	0.077	0.154	-0.154
1	0.122	0.134	0.267	-0.267
2	0.099	0.134	0.269	-0.269
3	0.048	0.135	0.269	-0.269
4	0.034	0.135	0.270	-0.270
5	0.002	0.135	0.270	-0.270
6	-0.004	0.135	0.270	-0.270
7	-0.031	0.135	0.270	-0.270
8	-0.039	0.135	0.270	-0.270
9	-0.032	0.135	0.270	-0.270
10	-0.074	0.135	0.270	-0.270
11	-0.045	0.135	0.271	-0.271
12	-0.056	0.135	0.271	-0.271
13	-0.052	0.136	0.271	-0.271
14	-0.016	0.136	0.271	-0.271
15	-0.054	0.136	0.271	-0.271

INDIAN RIVER LAGOON (2963F3) Trends Appendix
Correlogram for Total Phosphorous
Adjusted for Seasonal Median and Detrended



U=Upper 95% Confidence Limit L=Lower 95% Confidence Limit
Zero Reference Line Shown

Appendix E

Tabulated Seasonal Kendall Tau Trend Test Results

Waterbody	Parameter	First	Last	Count	P-Value	Slope	Trend	Trend Magnitude
NORTH MOSQUITO LAGOON (2924B2)	Chlorophyll a	2010	2023	161	0.123	-0.069	No Trend	Small
NORTH MOSQUITO LAGOON (2924B2)	Ammonia	2010	2023	138	1	0	No Trend	Small
NORTH MOSQUITO LAGOON (2924B2)	Total Kjeldahl Nitrogen	2010	2023	158	0.706	0.002	No Trend	Small
NORTH MOSQUITO LAGOON (2924B2)	Total Nitrogen	2010	2023	155	0.671	0.002	No Trend	Small
NORTH MOSQUITO LAGOON (2924B2)	Salinity	2010	2023	167	0	-0.488	Decreasing	Small
NORTH MOSQUITO LAGOON (2924B2)	Dissolved Oxygen Saturation	2010	2023	166	0	-0.66	Decreasing	Small
NORTH MOSQUITO LAGOON (2924B2)	pH	2010	2023	167	0.029	-0.006	Decreasing	Small
NORTH MOSQUITO LAGOON (2924B2)	Nitrate + Nitrite	2010	2023	158	0	0.001	Increasing	Large
NORTH MOSQUITO LAGOON (2924B2)	Orthophosphorous	2010	2022	149	0	0.001	Increasing	Large
NORTH MOSQUITO LAGOON (2924B2)	Total Phosphorous	2010	2023	160	0	0.003	Increasing	Large
NORTH MOSQUITO LAGOON (2924B2)	Temperature	2010	2023	167	0.037	0.093	Increasing	Small
CENTRAL MOSQUITO LAGOON (2924B1)	Fecal Coliform	2010	2017	57	0.774	-0.111	No Trend	Small
CENTRAL MOSQUITO LAGOON (2924B1)	Nitrate + Nitrite	2010	2023	156	1	0	No Trend	Small
CENTRAL MOSQUITO LAGOON (2924B1)	pH	2010	2023	167	0.065	0.006	No Trend	Small
CENTRAL MOSQUITO LAGOON (2924B1)	Orthophosphorous	2010	2022	146	1	0	No Trend	Small
CENTRAL MOSQUITO LAGOON (2924B1)	Temperature	2010	2023	167	0.077	0.061	No Trend	Small
CENTRAL MOSQUITO LAGOON (2924B1)	Total Kjeldahl Nitrogen	2010	2023	157	0.298	-0.007	No Trend	Small
CENTRAL MOSQUITO LAGOON (2924B1)	Total Nitrogen	2010	2023	156	0.189	-0.007	No Trend	Small
CENTRAL MOSQUITO LAGOON (2924B1)	Ammonia	2010	2023	137	0.001	-0.001	Decreasing	Large
CENTRAL MOSQUITO LAGOON (2924B1)	Chlorophyll a	2010	2023	160	0.048	-0.084	Decreasing	Small
CENTRAL MOSQUITO LAGOON (2924B1)	Salinity	2010	2023	167	0.025	-0.383	Decreasing	Small
CENTRAL MOSQUITO LAGOON (2924B1)	Dissolved Oxygen Saturation	2010	2023	166	0.022	0.546	Increasing	Small
CENTRAL MOSQUITO LAGOON (2924B1)	Total Phosphorous	2010	2023	157	0	0.002	Increasing	Small
INDIAN RIVER LAGOON (2963F3)	Chlorophyll a	2010	2023	156	0.464	-0.114	No Trend	Small
INDIAN RIVER LAGOON (2963F3)	Ammonia	2010	2023	133	1	0	No Trend	Small
INDIAN RIVER LAGOON (2963F3)	pH	2010	2023	161	1	0	No Trend	Small
INDIAN RIVER LAGOON (2963F3)	Total Kjeldahl Nitrogen	2010	2023	156	0.387	-0.015	No Trend	Small
INDIAN RIVER LAGOON (2963F3)	Total Nitrogen	2010	2023	153	0.552	-0.012	No Trend	Small
INDIAN RIVER LAGOON (2963F3)	Total Phosphorous	2010	2023	155	0.059	0.001	No Trend	Small

Waterbody	Parameter	First	Last	Count	P-Value	Slope	Trend	Trend Magnitude
INDIAN RIVER LAGOON (2963F3)	Salinity	2010	2023	162	0.003	-1.108	Decreasing	Small
INDIAN RIVER LAGOON (2963F3)	Dissolved Oxygen Saturation	2010	2023	160	0	1.158	Increasing	Small
INDIAN RIVER LAGOON (2963F3)	Nitrate + Nitrite	2010	2023	153	0.007	0.001	Increasing	Large
INDIAN RIVER LAGOON (2963F3)	Orthophosphorous	2010	2022	138	0.002	0.001	Increasing	Large
INDIAN RIVER LAGOON (2963F3)	Temperature	2010	2023	162	0.022	0.099	Increasing	Small

Appendix F

SWIL Model Results by Basin

Table A1 Annual Hydrologic, TN and TP Loads by catchment for the City of Edgewater										
Location		Annual								
Basin	Area (Acres)	Volume (cf/year)			Total Nitrogen (lbs/year)			Total Phosphorus (lbs/year)		
		Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total
E1	290	506266	524403	1030669	1822	1024	2846	263	141	404
E2	44	81227	75835	157062	299	148	447	42	20	62
E3	49	79174	92490	171664	214	181	395	33	25	58
E4	204	319130	371290	690420	1101	725	1827	156	100	256
E5	65	78358	155972	234330	303	305	607	49	42	91
E6	15	28870	24781	53651	109	48	157	16	7	23
E7	86	122222	176638	298860	477	345	822	78	48	126
E8	9	17790	15529	33319	66	30	96	9	4	13
E9	669	1284744	1044059	2328803	4595	2040	6635	632	281	913
E10	91	187774	130215	317989	653	254	908	88	35	123
E11	256	483321	423323	906644	1745	827	2572	248	114	362
E12	56	110442	92205	202647	406	180	586	55	25	80
E13	396	793917	623724	1417641	2909	1219	4127	392	168	560
E14	21	37639	33645	71284	138	66	204	19	9	28
G1	1883	1499475	1825093	3324568	4177	3566	7743	446	491	937
G2	327	385246	765641	1150887	1422	1496	2918	222	206	428
G3	156	115599	376126	491725	264	735	998	38	101	140
G4	27	26581	66540	93121	89	130	219	12	18	30
G5	298	336070	637064	973133	1135	1245	2379	156	171	327
G6	67	52322	169179	221502	158	331	489	22	46	67
G7	67	28248	196180	224428	83	383	466	10	53	63
G8	31	54456	51418	105875	188	100	288	26	14	40
G9	50	73355	98611	171965	258	193	451	35	27	61
G10	66	51469	149301	200770	91	292	383	14	40	54

Table A1 Annual Hydrologic, TN and TP Loads by catchment for the City of Edgewater										
Location		Annual								
Basin	Area (Acres)	Volume (cf/year)			Total Nitrogen (lbs/year)			Total Phosphorus (lbs/year)		
		Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total
G11	32	30206	64935	95140	67	127	194	10	17	27
G12	50	30522	98812	129333	89	193	282	12	27	39
Li	1840	1542483	827788	2370271	4833	1617	6450	416	223	638
Mo	2124	2211608	4145484	6357092	7636	8099	15735	1215	1115	2331
SP	220	340360	320605	660965	1206	626	1832	156	86	242
T1	7	14988	10581	25569	55	21	76	7	3	10
T2	16	33840	25019	58859	124	49	173	17	7	23
T3	132	267643	203495	471138	984	398	1381	133	55	188
T4	71	143400	112045	255445	526	219	745	71	30	101
T6	111	214884	165106	379990	782	323	1105	104	44	148
Tu	1035	1006787	821334	1828121	3004	1605	4609	247	221	468
TUC	23	17670	11070	28740	50	22	72	4	3	7
Un	167	142694	36974	179669	394	72	466	19	10	29
G11	32	30206	64935	95140	67	127	194	10	17	27
G12	50	30522	98812	129333	89	193	282	12	27	39

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**		
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**
E1	B_E01_1000	7.59	12780	14501	27281	47	28	75	7	4	11
E1	B_E01_1010	8.90	12456	19566	32023	46	38	84	7	5	12
E1	B_E01_1020	1.34	1575	3312	4887	5	6	12	>1	>1	2
E1	B_E01_1030	17.67	38180	25783	63963	137	50	187	18	7	25
E1	B_E01_1040	3.27	2981	8905	11886	11	17	28	1	2	4
E1	B_E01_1050	1.27	813	3745	4558	3	7	10	>1	1	1
E1	B_E01_1060	2.04	2120	5397	7517	8	11	18	1	1	2
E1	B_E01_1070	2.96	5345	5356	10700	19	10	30	3	1	4
E1	B_E01_1080	3.39	4120	8163	12283	16	16	31	2	2	5
E1	B_E01_1090	1.87	2108	4757	6865	8	9	17	1	1	2
E1	B_E01_1100	0.99	522	2746	3268	2	5	7	>1	>1	>1
E1	B_E01_1110	1.52	2193	3333	5526	8	7	14	1	>1	2
E1	B_E01_1120	1.91	4058	2829	6887	15	6	20	2	>1	3
E1	B_E01_1130	2.40	4634	3787	8420	17	7	24	2	1	3
E1	B_E01_1140	2.89	5864	4511	10374	21	9	30	3	1	4
E1	B_E01_1150	0.59	880	1225	2105	3	2	5	>1	>1	>1
E1	B_E01_1160	5.32	9030	10086	19116	32	20	52	4	3	7
E1	B_E01_1170	8.00	12377	14497	26874	42	28	71	6	4	9
E1	B_E01_1180	2.41	2744	5821	8565	10	11	21	1	2	3
E1	B_E01_1190	9.25	14274	18814	33088	53	37	90	8	5	13
E1	B_E01_1200	9.94	17433	17193	34626	60	34	94	8	5	13
E1	B_E01_1210	2.25	3347	4742	8089	11	9	20	1	1	3
E1	B_E01_1220	2.43	4421	4378	8799	16	9	24	2	1	3
E1	B_E01_1230	5.35	10527	8617	19144	39	17	55	5	2	8

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
E1	B_E01_1240	4.28	4125	11581	15706	14	23	37	2	3	5	
E1	B_E01_1250	1.80	2491	4032	6523	10	8	18	2	1	3	
E1	B_E01_1260	6.87	10742	13983	24725	38	27	66	6	4	9	
E1	B_E01_1270	5.48	10043	8993	19036	37	18	54	5	2	7	
E1	B_E01_1280	1.66	3274	2690	5964	12	5	18	2	>1	3	
E1	B_E01_1290	1.80	2551	3894	6446	11	8	19	2	1	3	
E1	B_E01_1300	1.73	3745	2458	6203	14	5	18	2	>1	2	
E1	B_E01_1310	0.88	1546	1525	3071	5	3	8	>1	>1	1	
E1	B_E01_1320	2.90	4026	6318	10344	18	12	30	4	2	5	
E1	B_E01_1330	0.42	661	862	1523	2	2	4	>1	>1	>1	
E1	B_E01_1340	1.52	2508	2303	4812	8	5	12	1	>1	2	
E1	B_E01_1350	2.59	3200	6043	9243	15	12	27	3	2	5	
E1	B_E01_1360	7.27	10537	8943	19479	25	17	43	4	2	6	
E1	B_E01_1370	3.62	6889	6093	12981	25	12	37	3	2	5	
E1	B_E01_1380	1.25	1893	2538	4431	7	5	12	1	>1	2	
E1	B_E01_1390	1.76	2165	4125	6290	10	8	18	2	1	3	
E1	B_E01_1400	1.38	2349	2551	4900	6	5	11	>1	>1	1	
E1	B_E01_1410	1.73	1794	4369	6163	8	9	16	2	1	3	
E1	B_E01_1420	2.14	3245	3908	7152	10	8	17	1	1	2	
E1	B_E01_1430	6.98	11923	12653	24577	32	25	57	5	3	9	
E1	B_E01_1440	1.64	2537	3344	5881	9	7	15	1	>1	2	
E1	B_E01_1450	4.55	5794	10479	16273	27	20	47	6	3	9	
E1	B_E01_1460	5.69	6366	13634	20000	26	27	53	6	4	9	
E1	B_E01_1470	3.80	6895	6695	13589	21	13	35	3	2	5	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
E1	B_E01_1480	0.59	1215	928	2143	4	2	6	>1	>1	>1	
E1	B_E01_1490	2.24	3093	4872	7965	14	10	23	3	1	4	
E1	B_E01_1500	1.39	1717	3251	4968	8	6	14	2	>1	3	
E1	B_E01_1510	2.12	2480	5035	7515	10	10	20	2	1	3	
E1	B_E01_1520	0.16	393	196	589	1	>1	2	>1	>1	>1	
E1	B_E01_1530	2.90	5752	4763	10515	21	9	30	3	1	4	
E1	B_E01_1540	4.56	9327	7168	16495	34	14	48	4	2	6	
E1	B_E01_1550	2.24	1919	6169	8088	6	12	19	>1	2	3	
E1	B_E01_1560	1.54	3007	2538	5546	11	5	16	2	>1	2	
E1	B_E01_1570	0.41	668	800	1468	3	2	4	>1	>1	>1	
E1	B_E01_1580	3.79	8081	5551	13632	29	11	39	4	1	5	
E1	B_E01_1590	3.91	7300	6704	14003	27	13	40	4	2	6	
E1	B_E01_1600	3.65	7853	5286	13139	29	10	39	4	1	5	
E1	B_E01_1610	1.59	2697	2991	5688	10	6	16	1	>1	2	
E1	B_E01_1620	6.50	13176	10099	23274	48	20	68	6	3	9	
E1	B_E01_1630	1.63	3080	2778	5859	11	5	17	2	>1	2	
E1	B_E01_1640	4.89	10372	7206	17577	38	14	52	5	2	7	
E1	B_E01_1650	4.86	10398	6473	16871	36	13	49	5	2	7	
E1	B_E01_1660	4.91	10633	7012	17644	39	14	53	5	2	7	
E1	B_E01_1670	3.33	6665	5245	11910	25	10	35	3	1	5	
E1	B_E01_1680	4.88	10319	7238	17557	38	14	52	5	2	7	
E1	B_E01_1690	4.89	9370	8276	17646	34	16	51	5	2	7	
E1	B_E01_1700	1.41	2605	2441	5046	10	5	14	1	>1	2	
E1	B_E01_1710	1.12	2280	1751	4031	8	3	12	1	>1	2	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			Annual									
Basin	Subbasin	Area (Acres)	Volume (cf/year)			Total Nitrogen (lbs/year)			Total Phosphorus (lbs/year)			
			Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	
E1	B_E01_1720	4.87	10620	6864	17484	39	13	52	5	2	7	
E1	B_E01_1730	3.28	6811	4963	11775	25	10	35	3	1	5	
E1	B_E01_1740	4.84	10418	6988	17406	38	14	52	5	2	7	
E1	B_E01_1750	4.86	9945	7540	17485	36	15	51	5	2	7	
E1	B_E01_1760	2.90	5967	4477	10444	22	9	31	3	1	4	
E1	B_E01_1770	2.10	4141	3415	7556	15	7	22	2	>1	3	
E1	B_E01_1780	4.10	8591	6174	14765	31	12	43	4	2	6	
E1	B_E01_1790	1.52	2867	2584	5450	11	5	16	1	>1	2	
E1	B_E01_1800	5.65	11451	8871	20323	42	17	59	6	2	8	
E1	B_E01_1810	5.75	11662	9010	20672	43	18	60	6	2	8	
E1	B_E01_1820	1.67	3312	2669	5981	12	5	17	2	>1	2	
E2	B_E02_1000	4.64	7978	8686	16665	30	17	47	4	2	7	
E2	B_E02_1010	0.42	633	874	1507	3	2	4	>1	>1	>1	
E2	B_E02_1020	2.31	4177	4173	8350	16	8	24	2	1	3	
E2	B_E02_1030	3.27	6486	5250	11736	24	10	34	3	1	5	
E2	B_E02_1040	1.38	3202	1795	4997	12	4	15	2	>1	2	
E2	B_E02_1050	2.75	5534	4346	9880	20	8	29	3	1	4	
E2	B_E02_1060	1.17	1558	2624	4183	6	5	11	1	>1	2	
E2	B_E02_1070	1.81	3461	3044	6505	13	6	19	2	>1	3	
E2	B_E02_1080	0.71	849	1669	2518	4	3	7	>1	>1	1	
E2	B_E02_1090	1.40	3126	1922	5049	11	4	15	2	>1	2	
E2	B_E02_1100	1.75	3050	3224	6274	11	6	18	2	>1	2	
E2	B_E02_1110	1.31	2462	2250	4713	9	4	13	1	>1	2	
E2	B_E02_1120	5.16	8427	10033	18460	32	20	52	5	3	8	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
E2	B_E02_1130	11.96	24030	18850	42880	85	37	122	11	5	17	
E2	B_E02_1140	1.06	1786	2018	3804	7	4	11	>1	>1	1	
E2	B_E02_1150	2.67	4468	5075	9543	17	10	27	2	1	4	
E3	B_E03_1000	6.38	10091	12750	22841	40	25	65	7	3	10	
E3	B_E03_1010	1.51	1908	3492	5401	8	7	15	2	>1	3	
E3	B_E03_1020	2.62	5878	3564	9442	21	7	28	3	>1	4	
E3	B_E03_1030	5.71	8951	11468	20419	35	22	57	6	3	9	
E3	B_E03_1040	26.99	45911	45779	91691	89	89	179	13	12	25	
E3	B_E03_1050	2.87	3332	6959	10291	9	14	23	2	2	4	
E3	B_E03_1060	3.14	3102	8478	11580	11	17	28	1	2	4	
E4	B_E04_1000	7.37	12084	14605	26689	45	29	74	7	4	11	
E4	B_E04_1010	1.98	2614	4427	7041	11	9	19	2	1	3	
E4	B_E04_1020	6.08	11332	10420	21752	42	20	62	6	3	9	
E4	B_E04_1030	4.93	6435	11294	17729	25	22	47	4	3	7	
E4	B_E04_1040	3.69	6384	7046	13431	23	14	37	3	2	5	
E4	B_E04_1050	11.59	23297	17926	41223	84	35	119	11	5	16	
E4	B_E04_1060	8.38	17190	12713	29903	63	25	88	8	3	12	
E4	B_E04_1070	2.18	3373	4157	7530	12	8	21	2	1	3	
E4	B_E04_1080	5.30	8269	9881	18150	30	19	50	4	3	7	
E4	B_E04_1090	15.48	27873	24626	52499	59	48	107	10	7	17	
E4	B_E04_1100	4.87	9308	7528	16835	31	15	46	4	2	6	
E4	B_E04_1110	4.52	8428	7643	16071	30	15	45	4	2	6	
E4	B_E04_1120	4.98	10690	6372	17062	38	12	51	5	2	7	
E4	B_E04_1130	3.97	1599	9083	10682	6	18	24	>1	2	3	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**		
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**
E4	B_E04_1140	5.85	7311	10566	17877	27	21	47	3	3	6
E4	B_E04_1150	18.40	7016	42349	49366	26	83	109	3	11	14
E4	B_E04_1160	6.65	10036	12889	22925	38	25	63	6	3	9
E4	B_E04_1170	9.77	13605	20992	34597	53	41	94	9	6	14
E4	B_E04_1180	4.07	7829	6620	14449	29	13	42	4	2	6
E4	B_E04_1190	10.16	20652	15616	36269	76	31	106	10	4	15
E4	B_E04_1200	0.12	69	267	335	>1	>1	>1	>1	>1	>1
E4	B_E04_1210	5.68	11284	8950	20234	42	17	59	6	2	8
E4	B_E04_1220	4.23	7065	7534	14599	26	15	41	4	2	6
E4	B_E04_1230	3.68	8470	4702	13173	31	9	40	4	1	5
E4	B_E04_1240	2.98	6522	4129	10651	24	8	32	3	1	4
E4	B_E04_1260	2.60	2896	5098	7994	10	10	20	1	1	3
E4	B_E04_1270	0.82	1542	1338	2880	6	3	8	>1	>1	1
E4	B_E04_1280	0.01	13	26	39	>1	>1	>1	>1	>1	>1
E4	B_E04_1290	0.98	776	2663	3439	2	5	7	>1	>1	1
E4	B_E04_1300	5.55	10778	8223	19001	39	16	55	5	2	7
E4	B_E04_1310	1.56	2931	2553	5484	11	5	16	1	>1	2
E4	B_E04_1320	2.98	4550	5729	10279	17	11	29	3	2	4
E4	B_E04_1330	5.00	6839	9696	16535	25	19	44	3	3	6
E4	B_E04_1340	4.31	3530	9009	12539	12	18	29	1	2	4
E4	B_E04_1350	4.12	6116	7963	14079	23	16	38	4	2	6
E4	B_E04_1360	6.19	11419	10430	21848	36	20	57	5	3	8
E4	B_E04_1370	2.87	3927	6239	10167	12	12	25	2	2	4
E4	B_E04_1380	1.00	1736	1832	3568	3	4	7	>1	>1	>1

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			Annual									
Basin	Subbasin	Area (Acres)	Volume (cf/year)			Total Nitrogen (lbs/year)			Total Phosphorus (lbs/year)			
			Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	
E4	B_E04_1390	0.49	735	1007	1743	2	2	4	>1	>1	>1	
E4	B_E04_1400	2.24	3404	4417	7820	10	9	19	1	1	3	
E4	B_E04_1410	0.70	276	2070	2346	>1	4	5	>1	>1	>1	
E4	B_E04_1420	3.53	5568	6923	12491	14	14	27	2	2	4	
E4	B_E04_1430	1.99	3358	3739	7098	6	7	14	>1	1	2	
E5	B_E05_1000	9.90	6600	29484	36084	25	58	83	4	8	12	
E5	B_E05_1010	12.79	23035	22087	45122	83	43	126	11	6	17	
E5	B_E05_1020	10.51	16736	20735	37471	66	41	106	11	6	16	
E5	B_E05_1030	24.46	23805	64050	87855	94	125	220	16	17	33	
E5	B_E05_1040	5.01	5046	12873	17918	21	25	46	4	3	7	
E5	B_E05_1050	2.75	3136	6744	9880	14	13	27	3	2	5	
E6	B_E06_1000	2.42	4256	4376	8632	16	9	25	2	1	4	
E6	B_E06_1010	2.79	4797	5153	9951	19	10	29	3	1	4	
E6	B_E06_1020	4.01	8483	5925	14408	32	12	43	5	2	6	
E6	B_E06_1030	2.57	5651	3629	9280	21	7	28	3	>1	4	
E6	B_E06_1040	0.93	2230	1125	3356	8	2	10	1	>1	1	
E6	B_E06_1050	2.24	3452	4573	8025	14	9	23	2	1	4	
E7	B_E07_1000	5.07	8742	9320	18062	34	18	52	5	3	8	
E7	B_E07_1010	10.24	13966	21820	35786	54	43	96	9	6	15	
E7	B_E07_1020	6.21	10976	11214	22190	42	22	64	7	3	10	
E7	B_E07_1030	1.47	1980	3245	5225	8	6	15	2	>1	3	
E7	B_E07_1040	1.50	2788	2573	5361	10	5	15	1	>1	2	
E7	B_E07_1050	2.77	3585	5981	9566	15	12	27	3	2	5	
E7	B_E07_1060	1.47	1972	3244	5215	9	6	15	2	>1	3	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
E7	B_E07_1070	1.63	3043	2780	5823	11	5	17	2	>1	2	
E7	B_E07_1080	7.25	8488	16710	25197	34	33	67	6	4	11	
E7	B_E07_1090	1.46	2384	2794	5178	9	5	14	1	>1	2	
E7	B_E07_1100	9.77	14542	19926	34468	57	39	96	10	5	15	
E7	B_E07_1110	10.48	12184	22151	34334	48	43	91	8	6	14	
E7	B_E07_1120	6.95	11238	13207	24444	42	26	68	6	4	10	
E7	B_E07_1130	6.43	8004	14592	22596	32	29	60	5	4	9	
E7	B_E07_1140	1.72	2792	3288	6080	10	6	17	1	>1	2	
E7	B_E07_1150	2.39	3449	4991	8440	13	10	23	2	1	3	
E7	B_E07_1160	3.15	4565	6532	11097	18	13	31	3	2	5	
E7	B_E07_1170	3.84	3325	8722	12047	14	17	31	3	2	5	
E7	B_E07_1180	2.18	4202	3549	7750	15	7	22	2	>1	3	
E8	B_E08_1000	4.61	8164	8314	16478	30	16	47	4	2	6	
E8	B_E08_1010	4.70	9626	7215	16841	35	14	49	5	2	7	
E9	B_E09_1000	2.89	5482	4910	10391	20	10	30	3	1	4	
E9	B_E09_1010	2.66	5077	4455	9532	19	9	28	3	1	4	
E9	B_E09_1020	7.01	15253	9948	25200	56	19	75	8	3	10	
E9	B_E09_1030	0.93	1748	1585	3333	6	3	10	>1	>1	1	
E9	B_E09_1040	2.18	4435	3390	7825	16	7	23	2	>1	3	
E9	B_E09_1050	5.43	10952	8552	19504	40	17	57	5	2	8	
E9	B_E09_1060	1.37	3102	1832	4934	11	4	15	2	>1	2	
E9	B_E09_1070	3.65	7577	5376	12953	27	11	37	4	1	5	
E9	B_E09_1080	2.33	4711	3649	8360	17	7	24	2	>1	3	
E9	B_E09_1090	8.15	17844	11455	29298	65	22	88	9	3	12	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
E9	B_E09_1100	0.72	1563	1020	2583	6	2	8	>1	>1	1	
E9	B_E09_1110	1.87	3702	3068	6770	13	6	19	2	>1	3	
E9	B_E09_1120	1.35	2771	2073	4845	10	4	14	1	>1	2	
E9	B_E09_1130	2.06	4546	2885	7431	17	6	22	2	>1	3	
E9	B_E09_1140	7.99	18102	10653	28755	63	21	84	8	3	11	
E9	B_E09_1150	1.03	1940	1644	3584	7	3	10	>1	>1	1	
E9	B_E09_1160	7.86	14415	4257	18672	24	8	33	4	1	5	
E9	B_E09_1170	1.03	2010	1285	3295	6	3	9	>1	>1	1	
E9	B_E09_1180	0.66	1171	1175	2346	4	2	7	>1	>1	>1	
E9	B_E09_1190	1.20	2301	2005	4307	8	4	12	1	>1	2	
E9	B_E09_1200	5.90	12963	7551	20514	44	15	59	6	2	8	
E9	B_E09_1210	3.16	6012	5306	11317	22	10	33	3	1	4	
E9	B_E09_1220	2.36	3892	4479	8370	15	9	23	2	1	4	
E9	B_E09_1230	1.17	2267	1835	4101	8	4	12	1	>1	2	
E9	B_E09_1240	3.66	6013	1058	7071	7	2	9	1	>1	1	
E9	B_E09_1250	5.15	10026	8538	18564	36	17	53	5	2	7	
E9	B_E09_1260	8.79	17048	14148	31196	61	28	89	8	4	12	
E9	B_E09_1270	6.32	12589	9530	22119	44	19	62	6	3	9	
E9	B_E09_1280	7.71	14708	12971	27679	55	25	80	8	3	11	
E9	B_E09_1290	5.44	10801	8260	19061	38	16	54	5	2	7	
E9	B_E09_1300	4.64	9655	3401	13056	22	7	28	3	>1	4	
E9	B_E09_1310	8.69	14353	16828	31181	54	33	87	8	5	13	
E9	B_E09_1320	1.23	2469	1727	4196	8	3	11	1	>1	2	
E9	B_E09_1330	2.09	3649	3834	7482	14	7	21	2	1	3	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
E9	B_E09_1340	1.03	2079	1473	3551	7	3	10	>1	>1	1	
E9	B_E09_1350	2.50	5302	3687	8989	19	7	26	3	>1	4	
E9	B_E09_1360	0.87	1814	1309	3122	7	3	9	>1	>1	1	
E9	B_E09_1370	2.05	3648	3557	7205	13	7	20	2	>1	3	
E9	B_E09_1380	0.91	1798	1458	3256	7	3	9	>1	>1	1	
E9	B_E09_1390	6.93	13190	11653	24843	49	23	71	7	3	10	
E9	B_E09_1400	7.12	14350	11241	25591	53	22	75	7	3	10	
E9	B_E09_1410	2.58	4597	4655	9252	17	9	26	2	1	4	
E9	B_E09_1420	3.10	6570	4572	11143	24	9	33	3	1	4	
E9	B_E09_1430	9.82	15455	20059	35515	59	39	99	9	5	15	
E9	B_E09_1440	6.51	13650	9714	23364	50	19	69	7	3	9	
E9	B_E09_1450	1.11	1800	2176	3976	7	4	11	>1	>1	2	
E9	B_E09_1460	4.85	9668	7722	17389	36	15	51	5	2	7	
E9	B_E09_1470	6.84	12806	11665	24471	49	23	72	8	3	11	
E9	B_E09_1480	1.71	3383	2746	6129	12	5	18	2	>1	2	
E9	B_E09_1490	5.37	11575	7704	19279	42	15	57	6	2	8	
E9	B_E09_1500	3.36	5530	6451	11981	21	13	33	3	2	5	
E9	B_E09_1510	1.87	4016	2694	6710	15	5	20	2	>1	3	
E9	B_E09_1520	1.81	3178	3278	6456	12	6	18	2	>1	3	
E9	B_E09_1530	1.72	3411	2753	6165	13	5	18	2	>1	2	
E9	B_E09_1540	5.11	10107	8211	18318	37	16	53	5	2	7	
E9	B_E09_1550	2.79	4418	5521	9939	17	11	28	3	1	4	
E9	B_E09_1560	5.08	10591	7639	18230	39	15	54	5	2	7	
E9	B_E09_1570	2.00	3849	3319	7168	14	6	21	2	>1	3	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**		
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**
E9	B_E09_1580	4.53	9041	7185	16226	33	14	47	5	2	6
E9	B_E09_1590	7.05	14292	11008	25301	52	22	74	7	3	10
E9	B_E09_1600	9.07	12607	20020	32628	50	39	89	9	5	14
E9	B_E09_1610	1.31	2400	2260	4660	9	4	14	1	>1	2
E9	B_E09_1620	6.10	12081	9801	21882	44	19	64	6	3	9
E9	B_E09_1630	4.29	9099	6261	15360	33	12	46	5	2	6
E9	B_E09_1640	5.90	12553	8609	21162	46	17	63	6	2	8
E9	B_E09_1650	2.13	4390	3265	7655	16	6	22	2	>1	3
E9	B_E09_1660	0.90	1472	1738	3210	6	3	9	>1	>1	1
E9	B_E09_1670	0.66	1158	1183	2342	4	2	7	>1	>1	>1
E9	B_E09_1680	6.58	12978	10613	23591	48	21	68	6	3	9
E9	B_E09_1690	4.69	8640	8124	16764	32	16	48	4	2	7
E9	B_E09_1700	7.04	14055	11184	25239	52	22	73	7	3	10
E9	B_E09_1710	1.13	1996	2040	4036	7	4	11	1	>1	2
E9	B_E09_1720	4.00	7179	7064	14242	27	14	41	4	2	6
E9	B_E09_1730	6.59	13108	10459	23567	48	20	69	7	3	9
E9	B_E09_1740	5.34	10583	8544	19127	39	17	56	5	2	8
E9	B_E09_1750	5.22	10677	8040	18718	39	16	55	5	2	7
E9	B_E09_1760	2.71	5365	4345	9709	20	8	28	3	1	4
E9	B_E09_1770	3.97	7656	6555	14211	28	13	41	4	2	6
E9	B_E09_1780	5.40	10300	8823	19123	37	17	54	5	2	7
E9	B_E09_1790	1.17	2241	1911	4151	8	4	12	1	>1	2
E9	B_E09_1800	6.27	12862	9591	22453	47	19	66	6	3	9
E9	B_E09_1810	7.58	15099	11656	26755	54	23	77	7	3	10

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
E9	B_E09_1820	3.77	7702	5810	13512	28	11	40	4	2	5	
E9	B_E09_1830	0.50	1014	748	1762	4	1	5	>1	>1	>1	
E9	B_E09_1840	0.45	886	628	1514	3	1	4	>1	>1	>1	
E9	B_E09_1850	7.25	15101	10901	26002	55	21	76	7	3	10	
E9	B_E09_1860	7.37	15261	11184	26445	56	22	78	7	3	10	
E9	B_E09_1870	1.94	3677	3263	6940	14	6	20	2	>1	3	
E9	B_E09_1880	3.28	6794	4964	11757	25	10	35	3	1	5	
E9	B_E09_1890	2.56	5073	4002	9075	18	8	26	2	1	4	
E9	B_E09_1900	2.59	4898	4243	9141	18	8	26	2	1	4	
E9	B_E09_1910	5.96	12083	9234	21317	44	18	62	6	2	8	
E9	B_E09_1920	6.71	13510	10496	24006	49	21	70	7	3	9	
E9	B_E09_1930	4.35	8448	6135	14583	27	12	39	4	2	5	
E9	B_E09_1940	4.12	8445	6327	14772	31	12	43	4	2	6	
E9	B_E09_1950	5.48	10800	8794	19593	40	17	57	5	2	8	
E9	B_E09_1960	5.26	11140	7719	18860	41	15	56	5	2	7	
E9	B_E09_1970	1.48	3109	2190	5299	11	4	16	2	>1	2	
E9	B_E09_1980	16.37	24285	9128	33413	40	18	58	6	2	8	
E9	B_E09_1990	6.41	13039	8957	21995	44	17	61	6	2	8	
E9	B_E09_2000	3.94	7454	6608	14062	27	13	40	4	2	6	
E9	B_E09_2010	5.11	10050	7246	17296	33	14	47	5	2	7	
E9	B_E09_2020	4.17	8626	6312	14938	31	12	44	4	2	6	
E9	B_E09_2030	7.56	15751	11319	27069	57	22	80	8	3	11	
E9	B_E09_2040	9.62	19418	14968	34387	71	29	100	10	4	14	
E9	B_E09_2050	6.93	14744	10074	24818	54	20	73	7	3	10	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
E9	B_E09_2060	1.91	3951	2898	6849	14	6	20	2	>1	3	
E9	B_E09_2070	2.31	5053	3222	8276	18	6	25	2	>1	3	
E9	B_E09_2080	2.52	5179	3825	9004	19	7	26	3	1	4	
E9	B_E09_2090	2.96	5769	4807	10575	21	9	31	3	1	4	
E9	B_E09_2100	1.92	3753	3095	6847	14	6	20	2	>1	3	
E9	B_E09_2110	1.81	3599	2863	6462	13	6	19	2	>1	3	
E9	B_E09_2120	0.87	1550	1539	3090	6	3	9	>1	>1	1	
E9	B_E09_2130	2.33	4925	3424	8349	18	7	25	2	>1	3	
E9	B_E09_2140	1.93	3644	3221	6864	13	6	20	2	>1	3	
E9	B_E09_2150	1.86	2731	3837	6568	10	7	18	1	1	3	
E9	B_E09_2160	2.32	4778	3520	8299	17	7	24	2	>1	3	
E9	B_E09_2170	3.61	7374	5524	12898	27	11	38	4	1	5	
E9	B_E09_2180	3.91	7920	6063	13983	29	12	41	4	2	6	
E9	B_E09_2190	4.06	8545	5995	14539	31	12	43	4	2	6	
E9	B_E09_2200	5.11	9356	8826	18182	35	17	52	5	2	7	
E9	B_E09_2210	2.62	5194	4148	9343	19	8	27	3	1	4	
E9	B_E09_2220	1.81	3415	3045	6460	13	6	19	2	>1	3	
E9	B_E09_2230	6.99	13981	10956	24936	51	21	73	7	3	10	
E9	B_E09_2240	7.66	15301	12049	27350	56	24	80	8	3	11	
E9	B_E09_2250	4.87	9868	7525	17393	36	15	51	5	2	7	
E9	B_E09_2260	5.38	10954	8263	19217	40	16	56	5	2	8	
E9	B_E09_2270	8.80	18224	13240	31464	67	26	92	9	4	12	
E9	B_E09_2280	5.89	11514	9483	20997	42	19	61	6	3	8	
E9	B_E09_2290	5.44	11071	8345	19416	40	16	57	5	2	8	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
E9	B_E09_2300	2.50	4552	4340	8892	17	8	25	2	1	3	
E9	B_E09_2310	5.53	10535	9160	19695	39	18	57	5	2	8	
E9	B_E09_2320	6.66	13214	10524	23738	48	21	69	7	3	9	
E9	B_E09_2330	5.34	10763	8311	19075	39	16	56	5	2	8	
E9	B_E09_2340	4.01	7750	6539	14289	28	13	41	4	2	6	
E9	B_E09_2350	5.22	10860	7776	18636	40	15	55	5	2	7	
E9	B_E09_2360	4.12	8254	6415	14670	30	13	43	4	2	6	
E9	B_E09_2370	4.55	8383	7792	16175	31	15	46	4	2	6	
E9	B_E09_2380	1.18	2380	1821	4201	9	4	12	1	>1	2	
E9	B_E09_2390	6.37	10742	11841	22583	41	23	65	7	3	10	
E9	B_E09_2400	5.08	9955	8154	18110	37	16	52	5	2	7	
E9	B_E09_2410	5.90	10693	10276	20969	40	20	60	5	3	8	
E9	B_E09_2420	1.51	2964	2399	5363	11	5	16	1	>1	2	
E9	B_E09_2430	4.48	8836	7110	15947	32	14	46	4	2	6	
E9	B_E09_2440	3.29	2942	7387	10329	13	14	27	3	2	5	
E9	B_E09_2450	5.81	12051	8696	20747	44	17	61	6	2	8	
E9	B_E09_2460	0.92	1785	1502	3287	7	3	9	>1	>1	1	
E9	B_E09_2470	7.34	14628	11491	26120	54	22	76	7	3	10	
E9	B_E09_2480	6.06	12139	9440	21579	44	18	63	6	3	9	
E9	B_E09_2490	3.08	5644	5193	10837	21	10	31	3	1	4	
E9	B_E09_2500	1.30	1157	2860	4017	5	6	11	1	>1	2	
E9	B_E09_2510	1.61	2241	3407	5648	9	7	15	1	>1	2	
E9	B_E09_2520	3.20	6018	5224	11242	22	10	32	3	1	4	
E9	B_E09_2530	1.01	2029	1570	3600	7	3	10	1	>1	1	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			Annual									
Basin	Subbasin	Area (Acres)	Volume (cf/year)			Total Nitrogen (lbs/year)			Total Phosphorus (lbs/year)			
			Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	
E9	B_E09_2540	4.18	7794	7070	14864	29	14	43	4	2	6	
E9	B_E09_2550	3.70	7844	5343	13187	29	10	39	4	1	5	
E9	B_E09_2560	6.63	11165	12031	23196	43	24	66	7	3	10	
E9	B_E09_2570	1.41	2809	2216	5025	10	4	15	1	>1	2	
E9	B_E09_2580	1.76	2765	3447	6212	10	7	17	1	>1	2	
E9	B_E09_2590	5.54	1182	10463	11646	4	20	25	>1	3	4	
E9	B_E09_2600	12.19	17950	23079	41029	67	45	112	9	6	15	
E10	B_E10_1000	1.65	3167	2737	5904	12	5	17	2	>1	2	
E10	B_E10_1010	1.65	3336	2591	5928	12	5	17	2	>1	2	
E10	B_E10_1020	1.85	4255	2404	6658	15	5	20	2	>1	3	
E10	B_E10_1030	1.22	2082	2249	4330	8	4	12	1	>1	2	
E10	B_E10_1040	6.08	12473	9424	21897	46	18	64	6	3	9	
E10	B_E10_1050	2.47	4817	3979	8796	17	8	25	2	1	3	
E10	B_E10_1060	4.91	10567	6782	17349	37	13	51	5	2	7	
E10	B_E10_1070	7.80	16369	11681	28050	60	23	83	8	3	11	
E10	B_E10_1080	9.10	19495	13174	32669	72	26	97	10	4	13	
E10	B_E10_1090	7.87	15639	5216	20855	31	10	42	4	1	6	
E10	B_E10_1100	6.51	13066	10333	23399	48	20	68	7	3	9	
E10	B_E10_1110	2.91	5755	4680	10435	21	9	30	3	1	4	
E10	B_E10_1120	1.84	3625	2647	6272	12	5	17	2	>1	2	
E10	B_E10_1130	6.72	14043	8673	22716	46	17	63	6	2	9	
E10	B_E10_1140	4.60	9621	6906	16527	35	13	49	5	2	7	
E10	B_E10_1150	8.08	16843	12188	29031	62	24	86	8	3	12	
E10	B_E10_1160	5.42	10821	8551	19372	39	17	56	5	2	8	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			Annual									
Basin	Subbasin	Area (Acres)	Volume (cf/year)			Total Nitrogen (lbs/year)			Total Phosphorus (lbs/year)			
			Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	
E10	B_E10_1170	5.08	10279	7880	18159	37	15	53	5	2	7	
E10	B_E10_1180	1.56	3130	2487	5617	11	5	16	2	>1	2	
E10	B_E10_1190	1.08	2339	1544	3884	9	3	12	1	>1	2	
E10	B_E10_1200	2.82	6051	4090	10140	22	8	30	3	1	4	
E11	B_E11_1000	2.20	4058	3822	7879	15	7	23	2	1	3	
E11	B_E11_1010	4.49	9337	6795	16132	34	13	48	5	2	6	
E11	B_E11_1020	1.30	2431	2249	4680	9	4	13	1	>1	2	
E11	B_E11_1030	0.72	1286	1281	2567	5	3	7	>1	>1	>1	
E11	B_E11_1040	4.54	8701	7615	16316	32	15	47	4	2	6	
E11	B_E11_1050	1.56	2968	2555	5523	11	5	16	2	>1	2	
E11	B_E11_1060	6.17	13271	8933	22205	48	17	66	6	2	9	
E11	B_E11_1070	1.39	2812	2165	4977	10	4	15	1	>1	2	
E11	B_E11_1080	2.72	5473	4252	9725	20	8	29	3	1	4	
E11	B_E11_1090	3.86	8368	5500	13869	31	11	41	4	1	6	
E11	B_E11_1100	6.18	10129	2512	12641	16	5	21	2	>1	3	
E11	B_E11_1110	1.53	3188	2306	5494	12	5	17	2	>1	2	
E11	B_E11_1120	8.55	13309	17320	30629	57	34	91	12	5	17	
E11	B_E11_1130	4.13	5521	9221	14743	25	18	43	6	2	8	
E11	B_E11_1140	4.34	8165	7425	15590	31	15	46	5	2	7	
E11	B_E11_1150	5.85	12320	8623	20942	45	17	62	6	2	8	
E11	B_E11_1160	1.79	3362	3067	6429	12	6	18	2	>1	3	
E11	B_E11_1170	1.21	2245	2104	4349	9	4	13	2	>1	2	
E11	B_E11_1180	6.95	14453	10522	24975	53	21	73	7	3	10	
E11	B_E11_1190	1.91	3806	3039	6845	14	6	20	2	>1	3	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
E11	B_E11_1200	7.62	12564	14748	27312	50	29	79	9	4	13	
E11	B_E11_1210	5.81	11939	8945	20884	44	17	61	6	2	8	
E11	B_E11_1220	1.43	1287	3794	5081	5	7	12	>1	1	2	
E11	B_E11_1230	9.55	18163	16069	34233	67	31	98	9	4	13	
E11	B_E11_1240	6.76	13861	10387	24249	51	20	71	7	3	10	
E11	B_E11_1250	3.36	6177	5889	12066	23	12	34	3	2	5	
E11	B_E11_1260	6.66	12782	11029	23811	48	22	69	7	3	10	
E11	B_E11_1270	9.55	18850	15415	34264	69	30	99	9	4	13	
E11	B_E11_1280	7.24	16706	9197	25903	60	18	78	8	2	11	
E11	B_E11_1290	10.70	20151	18224	38375	74	36	110	10	5	15	
E11	B_E11_1300	13.92	12423	36888	49311	39	72	111	7	10	17	
E11	B_E11_1310	1.97	3759	3308	7067	14	6	20	2	>1	3	
E11	B_E11_1320	2.52	5413	3646	9059	20	7	27	3	>1	4	
E11	B_E11_1330	0.39	774	610	1384	3	1	4	>1	>1	>1	
E11	B_E11_1340	23.91	50499	35155	85654	166	69	235	22	9	31	
E11	B_E11_1350	2.93	6274	4255	10529	23	8	31	3	1	4	
E11	B_E11_1360	1.23	2339	2047	4386	9	4	13	1	>1	2	
E11	B_E11_1370	1.71	3012	2923	5935	11	6	17	1	>1	2	
E11	B_E11_1380	1.11	2063	1914	3977	8	4	11	1	>1	2	
E11	B_E11_1390	1.20	1857	2324	4181	7	5	11	>1	>1	2	
E11	B_E11_1400	2.04	3970	3248	7218	14	6	21	2	>1	3	
E11	B_E11_1410	3.95	7966	6139	14105	29	12	41	4	2	6	
E11	B_E11_1420	1.97	3241	3312	6554	11	6	18	1	>1	2	
E11	B_E11_1430	5.89	12266	8767	21032	45	17	62	6	2	8	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			Annual									
Basin	Subbasin	Area (Acres)	Volume (cf/year)			Total Nitrogen (lbs/year)			Total Phosphorus (lbs/year)			
			Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	
E11	B_E11_1440	7.69	14863	12717	27581	55	25	79	7	3	11	
E11	B_E11_1450	4.68	9415	7324	16739	34	14	49	5	2	7	
E11	B_E11_1460	5.42	10637	8826	19462	39	17	56	5	2	8	
E11	B_E11_1470	3.36	7176	4891	12067	26	10	36	3	1	5	
E11	B_E11_1480	6.15	12100	9953	22053	44	19	64	6	3	9	
E11	B_E11_1490	3.57	6952	5863	12815	26	11	37	3	2	5	
E11	B_E11_1500	0.80	899	1658	2556	4	3	7	>1	>1	>1	
E11	B_E11_1510	2.15	3386	3958	7343	13	8	20	2	1	3	
E11	B_E11_1520	5.02	10123	7889	18012	37	15	52	5	2	7	
E11	B_E11_1530	8.40	16152	13648	29800	59	27	86	8	4	12	
E11	B_E11_1540	1.51	3099	2312	5411	11	5	16	2	>1	2	
E11	B_E11_1550	2.71	4981	4747	9727	18	9	28	3	1	4	
E12	B_E12_1000	4.11	7725	6957	14682	29	14	42	4	2	6	
E12	B_E12_1010	3.58	7256	5564	12820	27	11	38	4	1	5	
E12	B_E12_1020	4.35	8753	6846	15599	32	13	46	4	2	6	
E12	B_E12_1030	3.92	8018	6080	14098	29	12	41	4	2	6	
E12	B_E12_1040	2.73	5282	4540	9821	19	9	28	3	1	4	
E12	B_E12_1050	3.26	6524	5208	11732	24	10	34	3	1	5	
E12	B_E12_1060	3.45	6444	5942	12386	24	12	35	3	2	5	
E12	B_E12_1070	3.46	6682	5720	12402	25	11	36	3	2	5	
E12	B_E12_1080	3.80	7186	6437	13623	26	13	39	4	2	5	
E12	B_E12_1090	5.08	10226	8025	18252	37	16	53	5	2	7	
E12	B_E12_1100	4.43	8491	7384	15876	31	14	46	4	2	6	
E12	B_E12_1110	2.83	5508	4644	10153	20	9	29	3	1	4	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
E12	B_E12_1120	5.73	11288	9295	20583	41	18	60	6	3	8	
E12	B_E12_1130	3.63	7510	5472	12981	27	11	38	4	1	5	
E12	B_E12_1140	2.14	3549	4091	7639	13	8	21	2	1	3	
E13	B_E13_1000	3.25	6546	5137	11684	24	10	34	3	1	5	
E13	B_E13_1010	6.26	12617	9907	22525	46	19	66	6	3	9	
E13	B_E13_1020	1.99	3873	3281	7155	14	6	21	2	>1	3	
E13	B_E13_1030	1.84	3508	3120	6628	13	6	19	2	>1	3	
E13	B_E13_1040	7.52	16199	10882	27081	59	21	80	8	3	11	
E13	B_E13_1050	7.35	14937	11525	26462	55	23	77	7	3	10	
E13	B_E13_1060	1.92	4175	2739	6914	15	5	21	2	>1	3	
E13	B_E13_1070	4.85	10910	6611	17521	40	13	52	5	2	7	
E13	B_E13_1080	0.86	1582	1498	3079	6	3	9	>1	>1	1	
E13	B_E13_1090	2.13	4319	3333	7653	16	7	22	2	>1	3	
E13	B_E13_1100	1.14	2023	2059	4082	8	4	12	1	>1	2	
E13	B_E13_1110	3.41	6103	6128	12231	23	12	35	3	2	5	
E13	B_E13_1120	3.83	7150	6612	13762	26	13	39	4	2	5	
E13	B_E13_1130	4.93	9947	7755	17701	37	15	52	5	2	7	
E13	B_E13_1140	3.26	6811	4886	11697	25	10	35	3	1	5	
E13	B_E13_1150	0.47	788	898	1686	3	2	5	>1	>1	>1	
E13	B_E13_1160	1.97	3616	3439	7056	13	7	20	2	>1	3	
E13	B_E13_1170	5.54	11154	8755	19909	41	17	58	6	2	8	
E13	B_E13_1180	5.54	12207	7724	19931	45	15	60	6	2	8	
E13	B_E13_1190	5.00	8380	9525	17906	31	19	50	4	3	7	
E13	B_E13_1200	0.80	1613	1266	2880	6	2	8	>1	>1	1	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
E13	B_E13_1210	0.79	1627	1224	2851	6	2	8	>1	>1	1	
E13	B_E13_1220	2.69	5865	3795	9660	21	7	29	3	1	4	
E13	B_E13_1230	3.56	7542	5296	12838	27	10	38	4	1	5	
E13	B_E13_1240	5.08	10129	8134	18263	37	16	53	5	2	7	
E13	B_E13_1250	1.54	3172	2360	5532	12	5	16	2	>1	2	
E13	B_E13_1260	3.68	7824	5436	13260	29	11	39	4	1	5	
E13	B_E13_1270	2.96	6709	3991	10700	24	8	32	3	1	4	
E13	B_E13_1280	0.86	1584	1502	3086	6	3	9	>1	>1	1	
E13	B_E13_1290	4.72	9134	7769	16903	34	15	49	5	2	7	
E13	B_E13_1300	3.75	7317	6150	13468	27	12	39	4	2	5	
E13	B_E13_1310	2.01	4047	3171	7218	15	6	21	2	>1	3	
E13	B_E13_1320	8.55	17255	13463	30718	63	26	89	9	4	12	
E13	B_E13_1330	1.93	4016	2935	6951	15	6	20	2	>1	3	
E13	B_E13_1340	5.08	10243	8001	18244	38	16	53	5	2	7	
E13	B_E13_1350	2.15	4099	3623	7722	15	7	22	2	>1	3	
E13	B_E13_1360	5.03	10979	7119	18098	40	14	54	5	2	7	
E13	B_E13_1370	6.58	13735	9924	23658	50	19	70	7	3	9	
E13	B_E13_1380	1.29	2454	2163	4617	9	4	13	1	>1	2	
E13	B_E13_1390	2.06	4019	3370	7389	15	7	21	2	>1	3	
E13	B_E13_1400	1.28	2540	2048	4588	9	4	13	1	>1	2	
E13	B_E13_1410	3.65	7300	5813	13113	27	11	38	4	2	5	
E13	B_E13_1420	3.64	7313	5738	13051	27	11	38	4	2	5	
E13	B_E13_1430	3.13	6279	4966	11245	23	10	33	3	1	4	
E13	B_E13_1440	1.37	2883	2039	4922	11	4	14	1	>1	2	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			Annual									
Basin	Subbasin	Area (Acres)	Volume (cf/year)			Total Nitrogen (lbs/year)			Total Phosphorus (lbs/year)			
			Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	
E13	B_E13_1450	0.45	813	780	1593	3	2	5	>1	>1	>1	
E13	B_E13_1460	2.05	3979	3353	7332	15	7	21	2	>1	3	
E13	B_E13_1470	1.77	3393	2954	6347	12	6	18	2	>1	2	
E13	B_E13_1480	1.48	2968	2351	5319	11	5	15	1	>1	2	
E13	B_E13_1490	1.55	2971	2590	5561	11	5	16	1	>1	2	
E13	B_E13_1500	2.04	4156	3153	7309	15	6	21	2	>1	3	
E13	B_E13_1510	2.66	5307	4238	9544	19	8	28	3	1	4	
E13	B_E13_1520	1.86	3777	2907	6684	14	6	20	2	>1	3	
E13	B_E13_1530	1.61	3073	2676	5749	11	5	17	2	>1	2	
E13	B_E13_1540	1.98	3833	3249	7082	14	6	20	2	>1	3	
E13	B_E13_1550	4.49	9301	6829	16130	34	13	47	5	2	6	
E13	B_E13_1560	5.94	11747	9520	21266	43	19	62	6	3	8	
E13	B_E13_1570	4.60	9457	7050	16508	35	14	48	5	2	7	
E13	B_E13_1580	2.04	4222	3103	7325	15	6	21	2	>1	3	
E13	B_E13_1590	4.60	8162	8256	16418	30	16	46	4	2	6	
E13	B_E13_1600	1.94	3678	3255	6933	14	6	20	2	>1	3	
E13	B_E13_1610	4.06	8333	6205	14539	30	12	43	4	2	6	
E13	B_E13_1620	5.57	11636	8348	19984	42	16	59	6	2	8	
E13	B_E13_1630	1.40	2614	2384	4997	10	5	14	1	>1	2	
E13	B_E13_1640	6.17	13120	8991	22111	48	18	65	6	2	9	
E13	B_E13_1650	1.44	2725	2438	5163	10	5	15	1	>1	2	
E13	B_E13_1660	2.30	4853	3397	8249	18	7	24	2	>1	3	
E13	B_E13_1670	8.73	17439	13793	31232	64	27	91	9	4	12	
E13	B_E13_1680	4.16	8279	6605	14884	30	13	43	4	2	6	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			Annual									
Basin	Subbasin	Area (Acres)	Volume (cf/year)			Total Nitrogen (lbs/year)			Total Phosphorus (lbs/year)			
			Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	
E13	B_E13_1690	1.26	2402	2096	4497	9	4	13	1	>1	2	
E13	B_E13_1700	9.63	18799	15629	34428	69	31	100	9	4	14	
E13	B_E13_1710	4.82	9529	7710	17240	35	15	50	5	2	7	
E13	B_E13_1720	4.96	10612	7155	17767	39	14	53	5	2	7	
E13	B_E13_1730	3.54	6697	5949	12646	25	12	36	3	2	5	
E13	B_E13_1740	3.93	7780	6278	14058	29	12	41	4	2	6	
E13	B_E13_1750	2.12	4228	3347	7575	15	7	22	2	>1	3	
E13	B_E13_1760	0.68	1170	1240	2410	4	2	7	>1	>1	>1	
E13	B_E13_1770	3.04	6265	4621	10886	23	9	32	3	1	4	
E13	B_E13_1780	3.22	6697	4831	11528	24	9	34	3	1	5	
E13	B_E13_1790	3.02	6401	4404	10805	23	9	32	3	1	4	
E13	B_E13_1800	3.98	7653	6553	14206	28	13	41	4	2	6	
E13	B_E13_1810	0.99	1908	1635	3542	7	3	10	>1	>1	1	
E13	B_E13_1820	6.28	11950	10448	22398	44	20	64	6	3	9	
E13	B_E13_1830	2.28	4376	3769	8145	16	7	23	2	1	3	
E13	B_E13_1840	1.07	1996	1826	3822	7	4	11	1	>1	1	
E13	B_E13_1850	5.64	11901	8293	20195	43	16	60	6	2	8	
E13	B_E13_1860	4.16	8272	6606	14878	30	13	43	4	2	6	
E13	B_E13_1870	10.14	20918	15341	36259	76	30	106	10	4	14	
E13	B_E13_1880	6.54	12935	10426	23361	47	20	68	6	3	9	
E13	B_E13_1890	0.81	1267	1613	2880	5	3	8	>1	>1	1	
E13	B_E13_1900	6.86	14448	10085	24533	53	20	72	7	3	10	
E13	B_E13_1910	2.88	5345	4912	10257	20	10	29	3	1	4	
E13	B_E13_1920	1.64	3096	2756	5852	11	5	17	2	>1	2	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
E13	B_E13_1930	7.06	14143	11083	25226	52	22	73	7	3	10	
E13	B_E13_1940	5.67	11742	8514	20256	43	17	59	6	2	8	
E13	B_E13_1950	6.95	13935	10886	24821	51	21	72	7	3	10	
E13	B_E13_1960	5.08	10340	7816	18156	38	15	53	5	2	7	
E13	B_E13_1970	1.99	3678	3421	7099	14	7	20	2	>1	3	
E13	B_E13_1980	2.92	5517	4886	10403	20	10	30	3	1	4	
E13	B_E13_1990	1.46	2861	2356	5217	11	5	15	1	>1	2	
E13	B_E13_2000	1.69	3360	2662	6022	12	5	18	2	>1	2	
E13	B_E13_2010	3.76	7644	5807	13451	28	11	39	4	2	5	
E13	B_E13_2020	6.28	12644	9773	22417	46	19	65	6	3	9	
E13	B_E13_2030	5.47	10740	8729	19469	39	17	56	5	2	8	
E13	B_E13_2040	7.18	14724	10922	25646	54	21	75	7	3	10	
E13	B_E13_2050	6.39	12257	10510	22767	45	21	66	6	3	9	
E13	B_E13_2060	4.32	8648	6755	15403	32	13	45	4	2	6	
E13	B_E13_2070	1.41	2197	2783	4979	8	5	14	1	>1	2	
E13	B_E13_2080	1.66	2679	2776	5455	10	5	15	1	>1	2	
E13	B_E13_2090	7.06	13801	10989	24790	50	21	72	7	3	10	
E14	B_E14_1000	2.57	5148	4101	9250	19	8	27	3	1	4	
E14	B_E14_1010	4.62	9207	7398	16605	34	14	48	5	2	7	
E14	B_E14_1020	0.76	1253	1471	2724	5	3	8	>1	>1	1	
E14	B_E14_1030	7.08	14124	11343	25466	52	22	74	7	3	10	
E14	B_E14_1040	5.54	7908	9332	17240	29	18	48	4	3	7	
G1	B_G01_1000	2.33	4943	3374	8317	18	7	25	2	>1	3	
G1	B_G01_1010	3.05	4014	6598	10612	16	13	29	3	2	4	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			Annual									
Basin	Subbasin	Area (Acres)	Volume (cf/year)			Total Nitrogen (lbs/year)			Total Phosphorus (lbs/year)			
			Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	
G1	B_G01_1020	4.44	8208	7656	15863	29	15	44	4	2	6	
G1	B_G01_1030	1.46	2198	2979	5177	8	6	14	1	>1	2	
G1	B_G01_1040	2.66	3164	6442	9606	12	13	24	2	2	3	
G1	B_G01_1050	1.90	4278	2528	6806	15	5	20	2	>1	3	
G1	B_G01_1060	1.42	2534	2517	5050	9	5	14	1	>1	2	
G1	B_G01_1070	0.23	411	413	823	2	>1	2	>1	>1	>1	
G1	B_G01_1080	16.82	27011	33103	60114	99	65	164	15	9	24	
G1	B_G01_1090	4.10	7869	6756	14625	29	13	42	4	2	6	
G1	B_G01_1100	2.62	2016	5799	7815	8	11	19	1	2	3	
G1	B_G01_1110	0.65	506	1550	2056	2	3	5	>1	>1	>1	
G1	B_G01_1130	5.92	11457	9738	21196	42	19	61	6	3	8	
G1	B_G01_1140	19.21	17918	49342	67260	43	96	140	6	13	19	
G1	B_G01_1160	4.38	4788	2021	6810	1	4	5	>1	>1	>1	
G1	B_G01_1220	9.97	4917	25566	30483	9	50	59	1	7	8	
G1	B_G01_1230	9.91	5206	29094	34300	13	57	69	2	8	10	
G1	B_G01_1240	37.44	21242	107811	129053	55	211	266	10	29	39	
G1	B_G01_1250	10.91	4108	33285	37394	7	65	72	>1	9	10	
G1	B_G01_1260	10.19	3744	31406	35150	6	61	67	>1	8	9	
G1	B_G01_1270	1.47	526	4533	5060	>1	9	10	>1	1	1	
G1	B_G01_1280	53.56	32631	113380	146011	99	222	321	10	31	40	
G1	B_G01_1290	8.59	3198	26347	29544	5	51	57	>1	7	8	
G1	B_G01_1300	4.98	1816	15390	17206	3	30	33	>1	4	4	
G1	B_G01_1320	7.40	2870	22649	25519	5	44	49	>1	6	7	
G1	B_G01_1330	3.43	1500	10341	11842	2	20	23	>1	3	3	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
G1	B_G01_1340	6.63	2542	20279	22821	4	40	44	>1	5	6	
G1	B_G01_1350	19.05	13700	36606	50305	40	72	112	4	10	14	
G1	B_G01_1360	6.59	3118	19614	22732	5	38	43	>1	5	6	
G1	B_G01_1390	19.19	9999	34163	44162	36	67	103	3	9	12	
G1	B_G01_1400	16.36	12480	31772	44252	38	62	100	4	9	12	
G1	B_G01_1450	11.61	7347	30170	37517	16	59	75	2	8	10	
G1	B_G01_1460	12.27	6084	33925	40009	18	66	84	2	9	11	
G1	B_G01_1470	8.48	4656	15116	19773	17	30	47	1	4	5	
G1	B_G01_1530	1.35	1562	2866	4428	7	6	12	1	>1	2	
G1	B_G01_1560	2.35	3645	2120	5765	12	4	17	2	>1	2	
G1	B_G01_1570	2.96	3795	4284	8079	15	8	23	3	1	4	
G1	B_G01_1580	33.98	38510	15605	54115	134	30	164	13	4	18	
G1	B_G01_1590	2.19	1074	5712	6786	4	11	15	>1	2	2	
G1	B_G01_1600	11.06	10913	2097	13010	37	4	41	3	>1	4	
G1	B_G01_1610	22.90	23434	21805	45239	75	43	117	7	6	13	
G1	B_G01_1620	23.64	24369	1089	25458	81	2	83	6	>1	6	
G1	B_G01_1630	6.27	6752	2721	9474	22	5	27	2	>1	3	
G1	B_G01_1640	16.69	18374	4006	22380	64	8	72	7	1	8	
G1	B_G01_1650	10.24	9801	12954	22755	30	25	55	3	3	6	
G1	B_G01_1670	0.64	1425	655	2079	5	1	6	>1	>1	>1	
G1	B_G01_1680	19.05	17901	1254	19155	59	2	61	4	>1	4	
G1	B_G01_1690	0.66	1173	706	1879	4	1	5	>1	>1	>1	
G1	B_G01_1700	8.87	4212	26358	30569	6	51	58	1	7	8	
G1	B_G01_1710	2.57	963	7043	8006	3	14	17	>1	2	2	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			Annual									
Basin	Subbasin	Area (Acres)	Volume (cf/year)			Total Nitrogen (lbs/year)			Total Phosphorus (lbs/year)			
			Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	
G1	B_G01_1720	21.57	17307	11661	28969	51	23	74	4	3	7	
G1	B_G01_1730	0.63	382	725	1107	>1	1	2	>1	>1	>1	
G1	B_G01_1740	7.96	2847	18227	21074	6	36	41	1	5	6	
G1	B_G01_1760	22.54	28821	17382	46203	95	34	129	10	5	14	
G1	B_G01_1770	14.95	7601	20624	28225	20	40	60	2	6	8	
G1	B_G01_1780	6.01	3431	7798	11229	9	15	24	>1	2	3	
G1	B_G01_1790	1.55	2988	1101	4089	10	2	13	1	>1	2	
G1	B_G01_1800	103.14	75668	30089	105757	197	59	255	8	8	16	
G1	B_G01_1810	6.50	5321	2114	7435	17	4	21	2	>1	2	
G1	B_G01_1820	7.89	5634	15284	20919	19	30	48	2	4	6	
G1	B_G01_1840	2.27	818	5433	6251	3	11	13	>1	1	2	
G1	B_G01_1850	13.72	12908	10147	23055	44	20	64	6	3	9	
G1	B_G01_1860	27.52	19609	30810	50419	66	60	126	4	8	12	
G1	B_G01_1870	35.62	24882	38387	63269	83	75	158	7	10	17	
G1	B_G01_1880	11.90	9013	21498	30511	25	42	67	3	6	9	
G1	B_G01_1890	11.46	7030	5643	12673	16	11	27	>1	2	2	
G1	B_G01_1900	1.94	1001	2591	3592	3	5	8	>1	>1	1	
G1	B_G01_1910	0.77	1230	1376	2606	5	3	7	>1	>1	1	
G1	B_G01_1920	3.83	2081	465	2546	5	>1	5	>1	>1	>1	
G1	B_G01_1950	4.17	3996	3336	7332	6	7	12	>1	>1	2	
G1	B_G01_1960	1.21	543	2542	3086	2	5	7	>1	>1	>1	
G1	B_G01_1970	2.60	1487	342	1829	3	>1	4	>1	>1	>1	
G1	B_G01_1980	1.89	1403	2090	3493	5	4	9	>1	>1	>1	
G1	B_G01_1990	2.15	2823	3298	6121	9	6	16	1	>1	2	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
G1	B_G01_2000	3.25	1931	3206	5137	8	6	14	>1	>1	1	
G1	B_G01_2020	1.87	1787	2363	4150	7	5	12	>1	>1	2	
G1	B_G01_2040	13.65	15023	7248	22271	47	14	61	5	2	7	
G1	B_G01_2070	9.96	9200	7616	16816	32	15	47	3	2	5	
G1	B_G01_2170	3.08	5617	4901	10518	21	10	30	3	1	4	
G1	B_G01_2180	1.04	1238	2124	3363	5	4	9	1	>1	2	
G1	B_G01_2190	0.18	188	1	189	>1	>1	>1	>1	>1	>1	
G1	B_G01_2200	3.91	5248	699	5947	18	1	19	2	>1	2	
G1	B_G01_2380	5.36	8511	10486	18997	37	20	57	8	3	11	
G1	B_G01_2430	10.11	18954	12040	30994	49	24	73	11	3	14	
G1	B_G01_2480	11.57	15046	9636	24681	44	19	63	6	3	9	
G1	B_G01_2500	9.25	2450	4769	7219	3	9	13	>1	1	1	
G1	B_G01_2520	7.20	3141	8186	11327	12	16	28	2	2	4	
G1	B_G01_2550	17.38	7459	5658	13117	3	11	14	>1	2	2	
G1	B_G01_2570	20.82	9219	8198	17417	4	16	20	>1	2	3	
G1	B_G01_2580	3.03	2404	347	2752	7	>1	8	>1	>1	>1	
G1	B_G01_2590	43.75	12932	22182	35114	42	43	85	3	6	9	
G1	B_G01_2600	11.65	8079	162	8241	2	>1	2	>1	>1	>1	
G1	B_G01_2620	2.59	2292	1426	3718	4	3	7	>1	>1	>1	
G1	B_G01_2630	14.65	16056	4432	20488	52	9	61	4	1	5	
G1	B_G01_2640	30.26	26791	2551	29342	76	5	81	3	>1	4	
G1	B_G01_2650	10.06	9223	7005	16228	16	14	30	2	2	4	
G1	B_G01_2660	43.93	31190	17008	48198	89	33	122	6	5	10	
G1	B_G01_2670	3.83	6474	5633	12106	13	11	24	2	2	3	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**		
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**
G1	B_G01_2680	47.34	41588	3933	45521	126	8	134	7	1	8
G1	B_G01_2690	2.83	3794	3115	6909	7	6	13	>1	>1	2
G1	B_G01_2700	10.81	11557	5571	17129	19	11	30	2	1	4
G1	B_G01_2710	9.54	2009	5819	7828	5	11	17	>1	2	2
G1	B_G01_2720	13.70	10181	5168	15349	29	10	39	2	1	3
G1	B_G01_2730	4.65	2837	1258	4095	9	2	11	>1	>1	>1
G1	B_G01_2740	5.87	10466	8411	18878	19	16	35	2	2	5
G1	B_G01_2750	13.41	11012	1739	12751	35	3	39	2	>1	3
G1	B_G01_2760	50.46	72776	67676	140451	103	132	235	18	18	36
G1	B_G01_2770	16.52	14039	6631	20670	43	13	56	3	2	5
G1	B_G01_2780	8.76	952	22282	23234	3	44	47	>1	6	6
G1	B_G01_2790	51.31	56374	29380	85754	144	57	202	16	8	24
G1	B_G01_2800	26.01	2643	65757	68400	8	128	137	>1	18	19
G1	B_G01_2810	0.98	661	1278	1939	1	2	4	>1	>1	>1
G1	B_G01_2820	21.67	18037	5101	23138	23	10	33	2	1	3
G1	B_G01_2830	18.70	15398	8606	24004	46	17	63	4	2	6
G1	B_G01_2840	15.98	10148	5716	15864	31	11	42	2	2	3
G1	B_G01_2850	14.63	6231	24350	30581	15	48	63	>1	7	8
G1	B_G01_2860	30.71	29998	3680	33678	81	7	89	4	>1	5
G1	B_G01_2870	53.92	48710	16280	64989	140	32	171	16	4	20
G1	B_G01_2890	10.46	9107	6594	15701	23	13	36	2	2	3
G1	B_G01_2900	29.97	16461	38905	55366	44	76	120	4	10	14
G1	B_G01_2910	54.32	48831	5586	54417	131	11	142	4	2	5
G1	B_G01_2920	28.49	24565	18618	43184	54	36	91	3	5	8

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**		
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**
G1	B_G01_2930	46.73	35931	16448	52379	105	32	137	20	4	25
G1	B_G01_2940	21.80	23204	4350	27554	67	8	75	3	1	4
G1	B_G01_2950	52.20	20549	57675	78224	62	113	175	16	16	31
G1	B_G01_2960	41.33	30910	16557	47467	92	32	124	17	4	22
G1	B_G01_2970	14.62	10023	9444	19467	29	18	48	8	3	10
G1	B_G01_2980	7.37	5473	4348	9820	16	8	25	4	1	5
G1	B_G01_2990	66.63	34687	60232	94920	107	118	225	22	16	38
G1	B_G01_3000	0.20	139	211	350	>1	>1	>1	>1	>1	>1
G2	B_G02_1000	10.34	13161	19478	32639	49	38	88	6	5	12
G2	B_G02_1010	4.80	7704	9595	17298	28	19	47	4	3	7
G2	B_G02_1020	16.31	25288	32402	57689	96	63	160	15	9	24
G2	B_G02_1030	6.12	10697	11071	21768	41	22	63	6	3	9
G2	B_G02_1040	5.31	9769	9118	18887	36	18	54	5	2	8
G2	B_G02_1050	6.31	11338	11205	22544	42	22	64	6	3	9
G2	B_G02_1060	4.41	6523	9131	15654	26	18	44	5	2	7
G2	B_G02_1070	1.22	1536	2793	4329	7	5	12	1	>1	2
G2	B_G02_1080	1.81	2932	3552	6484	12	7	19	2	>1	3
G2	B_G02_1090	1.43	1847	3211	5058	8	6	14	1	>1	2
G2	B_G02_1100	2.02	2400	4742	7142	11	9	20	2	1	4
G2	B_G02_1110	2.60	2805	6390	9195	11	12	24	2	2	4
G2	B_G02_1120	7.75	7457	19820	27277	31	39	70	6	5	12
G2	B_G02_1130	9.64	2597	30926	33524	9	60	69	2	8	10
G2	B_G02_1140	2.06	2163	5126	7289	10	10	20	2	1	4
G2	B_G02_1150	1.28	1020	3481	4501	4	7	11	>1	>1	2

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
G2	B_G02_1160	11.63	8013	32819	40832	34	64	98	7	9	16	
G2	B_G02_1170	4.47	2485	13230	15715	8	26	33	1	4	5	
G2	B_G02_1180	1.29	1937	2702	4639	7	5	12	>1	>1	2	
G2	B_G02_1190	2.89	5691	4726	10417	20	9	30	3	1	4	
G2	B_G02_1200	8.76	8674	23446	32120	31	46	77	4	6	10	
G2	B_G02_1210	2.61	2773	6553	9326	9	13	22	1	2	3	
G2	B_G02_1220	0.33	208	962	1169	>1	2	3	>1	>1	>1	
G2	B_G02_1230	0.84	476	2164	2640	2	4	6	>1	>1	>1	
G2	B_G02_1240	1.66	1521	4351	5872	5	9	14	>1	1	2	
G2	B_G02_1250	4.65	9732	6859	16591	35	13	49	5	2	7	
G2	B_G02_1260	1.39	1256	3823	5079	4	7	12	>1	1	2	
G2	B_G02_1270	3.95	7737	6310	14048	29	12	41	4	2	6	
G2	B_G02_1280	1.14	1256	2814	4071	4	5	10	>1	>1	1	
G2	B_G02_1290	6.13	12825	9124	21949	46	18	64	6	2	9	
G2	B_G02_1300	4.43	10101	5850	15951	36	11	48	5	2	6	
G2	B_G02_1310	1.35	2202	2607	4809	8	5	13	1	>1	2	
G2	B_G02_1320	1.91	3206	3623	6829	11	7	19	2	>1	3	
G2	B_G02_1330	2.89	3758	6559	10317	13	13	26	2	2	4	
G2	B_G02_1340	1.16	1980	2186	4165	7	4	11	1	>1	2	
G2	B_G02_1350	6.27	9715	12622	22337	41	25	65	8	3	11	
G2	B_G02_1360	0.76	1172	1571	2743	4	3	7	>1	>1	>1	
G2	B_G02_1370	1.22	2321	2074	4395	8	4	13	1	>1	2	
G2	B_G02_1380	1.84	4244	2403	6646	15	5	20	2	>1	3	
G2	B_G02_1390	1.35	2239	2587	4826	8	5	13	1	>1	2	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
G2	B_G02_1400	2.11	2707	4796	7503	12	9	22	3	1	4	
G2	B_G02_1410	2.04	3446	3899	7344	12	8	20	2	1	3	
G2	B_G02_1420	0.40	679	730	1409	3	1	4	>1	>1	>1	
G2	B_G02_1430	2.41	3630	4962	8591	15	10	25	3	1	4	
G2	B_G02_1440	1.51	3355	2038	5393	12	4	16	2	>1	2	
G2	B_G02_1450	0.37	709	609	1318	3	1	4	>1	>1	>1	
G2	B_G02_1460	6.37	13437	9427	22864	48	18	67	6	3	9	
G2	B_G02_1470	2.47	5894	2998	8892	21	6	27	3	>1	4	
G2	B_G02_1480	3.27	6814	4886	11700	25	10	35	3	1	5	
G2	B_G02_1490	0.20	401	314	715	1	>1	2	>1	>1	>1	
G2	B_G02_1500	0.80	1772	1113	2885	6	2	9	>1	>1	1	
G2	B_G02_1510	2.64	5065	4356	9421	18	9	27	2	1	4	
G2	B_G02_1520	3.50	7242	5316	12558	27	10	37	4	1	5	
G2	B_G02_1530	2.39	1909	6103	8012	7	12	19	1	2	3	
G2	B_G02_1540	1.52	2085	3315	5400	8	6	15	2	>1	2	
G2	B_G02_1550	1.49	1365	3840	5205	6	8	13	1	1	2	
G2	B_G02_1560	15.62	13008	41732	54739	46	82	127	6	11	17	
G2	B_G02_1570	1.61	814	4804	5618	3	9	12	>1	1	2	
G2	B_G02_1580	3.76	2014	11086	13100	7	22	28	>1	3	4	
G2	B_G02_1590	2.57	1249	7695	8944	4	15	19	>1	2	3	
G2	B_G02_1600	3.34	1741	9906	11647	6	19	25	>1	3	3	
G2	B_G02_1610	6.78	3350	20295	23646	11	40	51	1	5	7	
G2	B_G02_1620	11.12	9564	28815	38379	33	56	89	4	8	12	
G2	B_G02_1630	8.13	4374	23806	28180	13	47	60	2	6	8	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			Annual									
Basin	Subbasin	Area (Acres)	Volume (cf/year)			Total Nitrogen (lbs/year)			Total Phosphorus (lbs/year)			
			Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	
G2	B_G02_1640	6.19	3342	18230	21572	11	36	47	1	5	6	
G2	B_G02_1650	1.30	600	3920	4520	2	8	9	>1	1	1	
G2	B_G02_1660	1.21	479	3761	4240	>1	7	8	>1	1	1	
G2	B_G02_1670	2.40	1102	7256	8358	3	14	17	>1	2	2	
G2	B_G02_1680	3.10	4411	6570	10981	19	13	31	4	2	6	
G2	B_G02_1690	4.48	2163	13503	15666	5	26	31	>1	4	4	
G2	B_G02_1700	0.30	129	917	1046	>1	2	2	>1	>1	>1	
G2	B_G02_1710	4.11	4213	10324	14537	17	20	37	3	3	6	
G2	B_G02_1720	4.06	2818	10905	13722	10	21	31	2	3	5	
G2	B_G02_1730	4.41	3226	12233	15459	13	24	36	2	3	6	
G2	B_G02_1740	14.47	6972	43665	50638	14	85	100	2	12	14	
G2	B_G02_1750	17.61	21504	41552	63056	94	81	175	21	11	32	
G2	B_G02_1760	6.03	13146	8512	21658	47	17	63	6	2	9	
G2	B_G02_1770	0.88	596	2597	3194	2	5	7	>1	>1	1	
G2	B_G02_1780	1.64	1114	4745	5860	4	9	13	>1	1	2	
G2	B_G02_1790	1.39	1359	3574	4933	4	7	11	>1	>1	2	
G2	B_G02_1800	4.84	4339	12884	17222	13	25	38	2	3	6	
G2	B_G02_1810	3.38	2351	9647	11998	7	19	26	1	3	4	
G3	B_G03_1000	11.85	5838	34703	40540	14	68	82	3	9	12	
G3	B_G03_1010	7.27	4155	20721	24876	9	40	50	2	6	7	
G3	B_G03_1020	45.18	22375	135556	157931	58	265	323	10	36	47	
G3	B_G03_1030	8.65	6007	23753	29759	12	46	58	2	6	8	
G3	B_G03_1040	16.90	8985	49944	58929	24	98	121	4	13	18	
G3	B_G03_1050	8.47	8712	8127	16839	28	16	44	2	2	4	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
G3	B_G03_1060	30.40	34816	50769	85586	64	99	164	9	14	22	
G3	B_G03_1070	5.46	5293	8119	13412	17	16	33	1	2	4	
G3	B_G03_1080	3.69	2669	10220	12889	7	20	27	1	3	4	
G3	B_G03_1090	15.64	14229	27879	42108	25	54	79	4	7	11	
G3	B_G03_1100	2.97	2521	6335	8856	5	12	17	>1	2	2	
G4	B_G04_1000	3.83	3316	8869	12185	11	17	29	1	2	4	
G4	B_G04_1010	4.18	2667	11770	14437	8	23	31	1	3	4	
G4	B_G04_1020	0.66	336	1806	2141	>1	4	4	>1	>1	>1	
G4	B_G04_1030	9.47	6856	26351	33207	21	51	72	3	7	10	
G4	B_G04_1040	8.73	13406	17745	31151	48	35	83	7	5	11	
G5	B_G05_1000	6.96	4721	19211	23932	14	38	52	2	5	7	
G5	B_G05_1010	2.19	1581	5285	6866	5	10	15	>1	1	2	
G5	B_G05_1020	11.62	8079	32315	40394	25	63	88	4	9	12	
G5	B_G05_1030	3.10	5242	5786	11028	19	11	30	3	2	4	
G5	B_G05_1040	1.50	2880	2404	5284	10	5	15	1	>1	2	
G5	B_G05_1050	3.16	3355	7716	11071	12	15	27	2	2	4	
G5	B_G05_1060	5.85	8764	12191	20955	35	24	59	7	3	10	
G5	B_G05_1070	2.36	4948	3517	8465	18	7	25	2	>1	3	
G5	B_G05_1080	2.27	2263	5747	8010	7	11	19	1	2	3	
G5	B_G05_1090	8.91	10203	21127	31331	36	41	77	5	6	10	
G5	B_G05_1100	17.05	19144	37492	56636	79	73	152	17	10	27	
G5	B_G05_1110	2.58	5948	3296	9244	22	6	28	3	>1	4	
G5	B_G05_1120	7.07	14188	11075	25263	52	22	73	7	3	10	
G5	B_G05_1130	19.40	18024	23992	42016	26	47	72	3	6	10	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
G5	B_G05_1140	3.38	1803	9717	11520	6	19	25	>1	3	3	
G5	B_G05_1150	1.35	2861	1981	4842	10	4	14	1	>1	2	
G5	B_G05_1160	0.93	2120	1220	3341	8	2	10	1	>1	1	
G5	B_G05_1170	1.60	3445	2284	5729	13	4	17	2	>1	2	
G5	B_G05_1180	2.91	3251	6925	10176	15	14	28	3	2	5	
G5	B_G05_1190	1.10	2355	1593	3948	9	3	12	1	>1	2	
G5	B_G05_1200	1.85	3994	2624	6618	15	5	20	2	>1	3	
G5	B_G05_1210	1.44	2934	2210	5145	11	4	15	1	>1	2	
G5	B_G05_1220	0.48	409	975	1384	1	2	3	>1	>1	>1	
G5	B_G05_1230	6.72	13133	10366	23500	48	20	68	6	3	9	
G5	B_G05_1240	0.83	1994	977	2972	7	2	9	>1	>1	1	
G5	B_G05_1250	2.07	3934	3454	7387	15	7	21	2	>1	3	
G5	B_G05_1260	8.61	8222	9083	17306	7	18	25	>1	2	3	
G5	B_G05_1270	1.21	312	3992	4304	1	8	9	>1	1	1	
G5	B_G05_1280	10.04	6079	20076	26155	13	39	52	>1	5	6	
G5	B_G05_1290	2.43	1306	6296	7602	5	12	17	>1	2	2	
G5	B_G05_1300	4.25	9623	5618	15240	35	11	46	5	2	6	
G5	B_G05_1310	48.24	51152	117384	168535	178	229	407	22	32	54	
G5	B_G05_1320	1.59	1176	4485	5661	4	9	13	>1	1	2	
G5	B_G05_1330	8.45	17305	12632	29937	63	25	88	8	3	12	
G5	B_G05_1340	10.00	4905	30567	35472	17	60	77	2	8	10	
G5	B_G05_1350	5.98	3282	15733	19015	12	31	42	1	4	5	
G5	B_G05_1360	2.84	6602	3589	10191	24	7	31	3	>1	4	
G5	B_G05_1370	17.28	10087	43992	54079	32	86	118	3	12	15	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
G5	B_G05_1380	6.22	4312	17108	21420	14	33	48	2	5	6	
G5	B_G05_1390	8.60	4623	25122	29745	15	49	64	2	7	9	
G5	B_G05_1400	2.46	5175	3612	8787	19	7	26	3	>1	4	
G5	B_G05_1410	1.83	1005	4953	5958	4	10	13	>1	1	2	
G5	B_G05_1420	8.09	3891	16300	20192	11	32	43	>1	4	5	
G5	B_G05_1430	3.63	740	6906	7646	2	13	16	>1	2	2	
G5	B_G05_1440	1.86	1126	5115	6241	4	10	14	>1	1	2	
G5	B_G05_1450	1.70	3626	2468	6094	13	5	18	2	>1	2	
G5	B_G05_1460	1.06	1189	2414	3603	4	5	9	>1	>1	1	
G5	B_G05_1470	1.21	675	3132	3807	2	6	9	>1	>1	1	
G5	B_G05_1480	2.49	4863	4018	8881	18	8	26	2	1	4	
G5	B_G05_1490	2.36	4683	3756	8440	17	7	25	2	1	3	
G5	B_G05_1500	2.68	1851	7670	9520	7	15	22	>1	2	3	
G5	B_G05_1510	6.51	10356	12746	23102	37	25	62	5	3	8	
G5	B_G05_1520	1.05	2000	1736	3736	7	3	11	1	>1	1	
G5	B_G05_1530	7.10	14334	11076	25410	51	22	73	7	3	10	
G6	B_G06_1000	0.63	600	1037	1637	>1	2	3	>1	>1	>1	
G6	B_G06_1010	3.96	4723	9240	13963	16	18	34	2	2	5	
G6	B_G06_1020	9.73	7492	23983	31475	23	47	70	3	6	9	
G6	B_G06_1030	1.95	2543	4392	6935	9	9	17	1	1	2	
G6	B_G06_1040	3.30	2349	9772	12121	9	19	28	1	3	4	
G6	B_G06_1050	0.83	968	1950	2918	3	4	7	>1	>1	>1	
G6	B_G06_1060	3.36	1652	8643	10294	5	17	21	>1	2	3	
G6	B_G06_1070	2.73	2897	6288	9185	10	12	22	1	2	3	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
G6	B_G06_1080	10.19	2835	31813	34648	6	62	69	>1	9	9	
G6	B_G06_1090	4.20	1964	12596	14560	4	25	28	>1	3	4	
G6	B_G06_1100	3.92	3486	9004	12490	11	18	28	1	2	4	
G6	B_G06_1110	2.36	2083	5615	7698	7	11	18	1	2	3	
G6	B_G06_1120	6.83	6886	15397	22283	24	30	54	3	4	8	
G6	B_G06_1130	4.00	2174	10951	13125	6	21	28	>1	3	4	
G6	B_G06_1140	2.82	5152	3249	8401	12	6	18	2	>1	3	
G6	B_G06_1150	2.68	1761	7353	9114	5	14	20	1	2	3	
G6	B_G06_1160	3.99	2756	7897	10653	8	15	24	>1	2	3	
G7	B_G07_1000	4.50	1968	13620	15588	4	27	30	>1	4	4	
G7	B_G07_1020	1.59	642	4887	5529	2	10	12	>1	1	2	
G7	B_G07_1030	13.71	4985	42267	47251	15	83	97	2	11	13	
G7	B_G07_1040	3.63	1624	10966	12590	5	21	26	>1	3	4	
G7	B_G07_1060	4.28	2195	12655	14849	7	25	32	>1	3	4	
G7	B_G07_1070	7.09	3340	21418	24758	11	42	53	1	6	7	
G7	B_G07_1080	4.96	2633	14616	17249	8	29	36	>1	4	5	
G7	B_G07_1090	6.50	2850	19601	22451	5	38	43	>1	5	6	
G7	B_G07_1100	5.64	1640	16818	18458	5	33	38	>1	5	5	
G7	B_G07_1110	10.32	5150	30344	35494	17	59	76	2	8	10	
G7	B_G07_1120	4.49	1221	8990	10211	4	18	22	>1	2	3	
G8	B_G08_1000	4.52	6229	9171	15400	20	18	38	3	2	5	
G8	B_G08_1010	6.08	12601	9167	21768	46	18	64	6	2	9	
G8	B_G08_1020	2.83	4130	2977	7107	6	6	12	>1	>1	2	
G8	B_G08_1030	1.26	1218	3139	4357	4	6	10	>1	>1	1	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**		
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**
G8	B_G08_1040	8.90	19211	12673	31884	70	25	95	9	3	13
G8	B_G08_1050	7.16	11067	14292	25358	42	28	70	7	4	11
G9	B_G09_1000	6.01	8657	12686	21343	31	25	55	4	3	8
G9	B_G09_1010	2.15	4274	3347	7621	16	7	22	2	>1	3
G9	B_G09_1020	5.30	10667	8230	18897	39	16	55	5	2	8
G9	B_G09_1030	12.74	27421	18127	45548	100	35	136	13	5	18
G9	B_G09_1040	8.88	6272	22856	29128	20	45	64	3	6	9
G9	B_G09_1050	3.03	6211	4648	10859	23	9	32	3	1	4
G9	B_G09_1060	8.02	7379	19600	26979	26	38	65	3	5	9
G9	B_G09_1070	3.97	2474	9116	11590	4	18	22	>1	2	3
G10	B_G10_1000	5.34	6841	5213	12054	9	10	19	1	1	3
G10	B_G10_1010	3.85	3070	8847	11917	3	17	21	>1	2	3
G10	B_G10_1020	12.24	7046	29935	36981	8	58	66	1	8	9
G10	B_G10_1030	9.84	11343	11645	22988	12	23	34	1	3	5
G10	B_G10_1040	3.48	2058	9953	12011	5	19	24	>1	3	4
G10	B_G10_1050	3.11	3261	5924	9185	6	12	17	>1	2	2
G10	B_G10_1060	9.18	5577	26575	32152	15	52	66	3	7	10
G10	B_G10_1070	3.03	2692	7709	10401	8	15	23	1	2	3
G10	B_G10_1080	1.56	776	4694	5470	2	9	11	>1	1	2
G10	B_G10_1090	1.75	817	5309	6127	2	10	13	>1	1	2
G10	B_G10_1100	9.35	5825	24688	30514	17	48	65	2	7	9
G10	B_G10_1110	3.25	2163	8807	10970	6	17	23	>1	2	3
G11	B_G11_1000	4.27	4283	8162	12445	13	16	29	2	2	4
G11	B_G11_1010	5.83	8766	10593	19359	32	21	53	5	3	8

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
G11	B_G11_1020	17.11	14642	33187	47829	18	65	83	3	9	12	
G11	B_G11_1030	4.41	2514	12993	15507	4	25	29	>1	3	4	
G12	B_G12_1000	2.35	2213	3583	5797	4	7	11	>1	>1	2	
G12	B_G12_1010	6.34	6669	4260	10929	16	8	25	3	1	4	
G12	B_G12_1020	4.57	1519	12632	14151	5	25	30	>1	3	4	
G12	B_G12_1030	11.56	6515	33755	40270	20	66	86	3	9	12	
G12	B_G12_1040	12.40	5470	20912	26382	22	41	63	3	6	9	
G12	B_G12_1050	4.37	3970	6393	10363	13	12	26	1	2	3	
G12	B_G12_1060	6.17	1566	16886	18452	5	33	38	>1	5	5	
G12	B_G12_1070	2.04	2599	391	2990	2	>1	3	>1	>1	>1	
Li	B_LCC_1000	1.54	1563	83	1645	5	>1	5	>1	>1	>1	
Li	B_LCC_1010	13.93	21740	15351	37090	75	30	105	11	4	15	
Li	B_LCC_1020	9.72	17676	13874	31550	67	27	94	10	4	14	
Li	B_LCC_1040	39.18	35280	32170	67451	107	63	170	9	9	18	
Li	B_LCC_1050	61.61	45872	48674	94545	155	95	250	15	13	28	
Li	B_LCC_1060	31.87	18905	24343	43248	82	48	130	13	7	20	
Li	B_LCC_1080	43.09	35740	25323	61063	97	49	147	7	7	14	
Li	B_LCC_1090	20.28	20258	12902	33160	68	25	93	6	3	10	
Li	B_LCC_1100	22.44	20177	462	20639	29	>1	29	>1	>1	>1	
Li	B_LCC_1110	8.62	1500	28076	29576	5	55	60	>1	8	8	
Li	B_LCC_1120	12.93	12701	21678	34380	50	42	92	7	6	13	
Li	B_LCC_1130	1.02	1068	93	1161	3	>1	3	>1	>1	>1	
Li	B_LCC_1140	46.07	46846	120	46966	125	>1	126	2	>1	2	
Li	B_LCC_1150	11.69	14529	23603	38131	44	46	90	5	6	11	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**		
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**
Li	B_LCC_1160	8.02	7323	2580	9903	29	5	34	3	>1	4
Li	B_LCC_1170	25.67	16338	16650	32987	101	33	134	17	4	22
Li	B_LCC_1180	17.76	18518	1247	19765	50	2	52	2	>1	2
Li	B_LCC_1190	8.83	6869	11151	18020	20	22	42	2	3	5
Li	B_LCC_1200	30.56	16713	9457	26170	44	18	62	3	3	6
Li	B_LCC_1210	39.18	40251	42652	82903	112	83	195	6	11	17
Li	B_LCC_1220	10.67	11091	3368	14459	30	7	37	>1	>1	2
Li	B_LCC_1230	6.01	744	20195	20939	2	39	42	>1	5	6
Li	B_LCC_1240	2.97	1744	1894	3638	11	4	15	2	>1	2
Li	B_LCC_1250	27.81	26132	1343	27475	79	3	82	4	>1	4
Li	B_LCC_1260	16.41	16604	33	16637	50	>1	50	2	>1	2
Li	B_LCC_1270	15.83	14324	6574	20898	44	13	57	2	2	4
Li	B_LCC_1280	24.53	17045	11938	28983	87	23	110	13	3	16
Li	B_LCC_1290	68.39	65153	2939	68092	166	6	172	8	>1	9
Li	B_LCC_1300	38.05	38370	15	38385	107	>1	107	3	>1	3
Li	B_LCC_1320	1.38	807	771	1579	6	2	7	1	>1	1
Li	B_LCC_1330	8.28	8291	64	8355	22	>1	22	>1	>1	>1
Li	B_LCC_1340	37.50	5669	59616	65285	17	116	134	8	16	24
Li	B_LCC_1350	61.51	30670	23142	53812	91	45	137	10	6	16
Li	B_LCC_1360	37.55	26709	21420	48129	109	42	151	10	6	15
Li	B_LCC_1370	18.77	19309	48	19356	55	>1	55	2	>1	2
Li	B_LCC_1380	10.39	10680	21	10701	28	>1	28	>1	>1	>1
Li	B_LCC_1390	22.84	22292	2381	24673	69	5	73	3	>1	4
Li	B_LCC_1400	111.59	114550	21635	136185	348	42	390	19	6	25

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**		
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**
Li	B_LCC_1410	31.50	32240	1003	33243	92	2	94	3	>1	3
Li	B_LCC_1420	40.83	39366	5158	44524	135	10	145	10	1	12
Li	B_LCC_1430	20.56	20093	4808	24901	66	9	75	4	1	6
Li	B_LCC_1440	5.33	3639	1561	5201	16	3	19	2	>1	2
Li	B_LCC_1450	161.28	113353	48592	161945	355	95	450	30	13	43
Li	B_LCC_1460	4.24	2936	1013	3949	15	2	17	2	>1	3
Li	B_LCC_1470	16.09	16302	511	16813	47	>1	48	2	>1	2
Li	B_LCC_1480	101.31	105547	16258	121805	314	32	346	14	4	18
Li	B_LCC_1490	38.28	27161	10174	37335	90	20	110	8	3	11
Li	B_LCC_1500	2.63	937	1706	2643	3	3	6	>1	>1	>1
Li	B_LCC_1510	50.14	32942	18985	51927	125	37	162	16	5	21
Li	B_LCC_1520	9.30	5355	4319	9675	23	8	31	3	1	4
Li	B_LCC_1530	2.76	2745	159	2904	8	>1	8	>1	>1	>1
Li	B_LCC_1540	54.86	39524	45378	84902	113	89	202	20	12	32
Li	B_LCC_1550	2.06	587	1468	2055	2	3	5	>1	>1	>1
Li	B_LCC_1560	0.40	104	261	366	>1	>1	>1	>1	>1	>1
Li	B_LCC_1590	39.54	31963	14807	46770	98	29	127	17	4	21
Li	B_LCC_1600	11.95	4611	8017	12628	22	16	38	4	2	6
Li	B_LCC_1620	0.04	11	30	41	>1	>1	>1	>1	>1	>1
Li	B_LCC_1640	2.37	131	3022	3153	>1	6	6	>1	>1	1
Li	B_LCC_1660	44.07	36865	28866	65731	112	56	168	17	8	25
Li	B_LCC_1670	2.43	912	1731	2643	6	3	9	1	>1	2
Li	B_LCC_1680	70.54	49668	63212	112881	157	123	281	22	17	39
Li	B_LCC_1690	111.52	114875	416	115290	349	>1	349	16	>1	16

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
Li	B_LCC_1720	1.35	52	1435	1487	>1	3	3	>1	>1	>1	
Li	B_LCC_1730	0.22	150	159	308	>1	>1	1	>1	>1	>1	
Li	B_LCC_1740	4.23	3731	2302	6033	11	4	15	>1	>1	1	
Li	B_LCC_1760	35.63	26634	34551	61185	84	68	152	12	9	21	
Mo	B_MOL_1000	144.83	177648	329847	507495	819	644	1464	193	89	282	
Mo	B_MOL_1010	5.14	9103	9054	18156	35	18	53	6	2	8	
Mo	B_MOL_1020	9.54	7921	23528	31450	31	46	77	5	6	11	
Mo	B_MOL_1030	2.40	3058	4120	7179	11	8	19	1	1	3	
Mo	B_MOL_1040	9.09	5926	17653	23579	17	34	51	2	5	6	
Mo	B_MOL_1050	6.04	5961	15014	20974	24	29	54	4	4	8	
Mo	B_MOL_1060	4.29	5067	6949	12016	18	14	31	2	2	4	
Mo	B_MOL_1070	5.94	4180	10610	14790	13	21	34	1	3	4	
Mo	B_MOL_1080	16.00	12101	27616	39717	40	54	94	5	7	12	
Mo	B_MOL_1090	1.52	1936	3425	5361	7	7	14	1	>1	2	
Mo	B_MOL_1100	2.03	2923	4220	7143	12	8	20	2	1	3	
Mo	B_MOL_1110	3.83	4632	8800	13432	21	17	38	5	2	7	
Mo	B_MOL_1120	8.38	10197	19238	29434	47	38	84	11	5	16	
Mo	B_MOL_1130	7.57	1542	15053	16595	4	29	33	>1	4	5	
Mo	B_MOL_1140	51.24	102513	68100	170613	365	133	498	47	18	65	
Mo	B_MOL_1150	3.90	5462	8025	13487	19	16	34	3	2	5	
Mo	B_MOL_1160	2.04	2209	4923	7133	10	10	19	2	1	3	
Mo	B_MOL_1170	5.68	6596	13129	19725	24	26	50	4	4	8	
Mo	B_MOL_1180	4.63	497	8661	9157	2	17	19	>1	2	3	
Mo	B_MOL_1190	7.22	7073	16378	23451	25	32	57	4	4	8	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
Mo	B_MOL_1200	2.59	2650	6419	9069	7	13	19	1	2	3	
Mo	B_MOL_1210	2.39	2904	5453	8357	13	11	24	3	1	5	
Mo	B_MOL_1220	10.64	10872	23905	34777	34	47	81	7	6	13	
Mo	B_MOL_1240	5.92	297	11015	11312	>1	22	22	>1	3	3	
Mo	B_MOL_1250	2.07	2516	4646	7162	9	9	18	1	1	3	
Mo	B_MOL_1260	5.52	5257	14033	19291	12	27	39	3	4	6	
Mo	B_MOL_1270	21.32	11106	62256	73363	30	122	152	5	17	22	
Mo	B_MOL_1280	1.72	1404	4552	5956	4	9	13	>1	1	2	
Mo	B_MOL_1290	2.19	3346	3815	7161	8	7	16	1	1	2	
Mo	B_MOL_1300	3.00	2611	5248	7858	5	10	15	>1	1	2	
Mo	B_MOL_1310	17.35	22656	26992	49648	35	53	88	6	7	13	
Mo	B_MOL_1320	1.37	1574	3056	4630	5	6	11	>1	>1	1	
Mo	B_MOL_1330	7.52	4404	21541	25945	13	42	55	2	6	8	
Mo	B_MOL_1340	4.09	5681	7840	13521	19	15	35	3	2	5	
Mo	B_MOL_1350	1.69	1871	3699	5570	3	7	11	>1	>1	2	
Mo	B_MOL_1360	2.62	1717	5445	7162	3	11	14	>1	1	2	
Mo	B_MOL_1370	1.70	1392	4464	5856	4	9	13	>1	1	2	
Mo	B_MOL_1380	7.90	8883	14984	23867	33	29	62	5	4	9	
Mo	B_MOL_1390	1.75	847	5149	5997	2	10	12	>1	1	2	
Mo	B_MOL_1400	10.09	10552	22542	33094	26	44	70	4	6	10	
Mo	B_MOL_1410	8.61	5121	17069	22190	16	33	49	2	5	7	
Mo	B_MOL_1420	4.68	5680	9537	15218	15	19	33	2	3	5	
Mo	B_MOL_1430	10.16	9603	24963	34567	20	49	68	4	7	11	
Mo	B_MOL_1440	7.45	11952	13251	25203	23	26	49	3	4	7	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
Mo	B_MOL_1450	7.77	3432	23234	26665	11	45	57	1	6	8	
Mo	B_MOL_1460	20.21	11602	58169	69771	32	114	146	5	16	21	
Mo	B_MOL_1470	1.09	1308	2460	3769	4	5	9	>1	>1	1	
Mo	B_MOL_1480	11.00	5161	32570	37731	17	64	81	2	9	11	
Mo	B_MOL_1490	2.24	1074	6588	7663	4	13	16	>1	2	2	
Mo	B_MOL_1500	8.16	8253	19810	28063	22	39	61	4	5	9	
Mo	B_MOL_1510	10.60	8179	24051	32231	28	47	75	4	6	11	
Mo	B_MOL_1530	7.36	8996	16632	25628	35	32	67	8	4	12	
Mo	B_MOL_1540	1.17	2297	1845	4142	8	4	12	1	>1	2	
Mo	B_MOL_1550	4.88	1357	15526	16883	4	30	34	>1	4	5	
Mo	B_MOL_1560	1.94	486	6198	6684	1	12	14	>1	2	2	
Mo	B_MOL_1570	7.29	3629	21443	25072	10	42	51	2	6	7	
Mo	B_MOL_1580	12.44	10307	25203	35510	36	49	85	4	7	11	
Mo	B_MOL_1590	2.76	763	5040	5803	3	10	13	>1	1	2	
Mo	B_MOL_1600	3.17	2386	6649	9035	8	13	21	>1	2	3	
Mo	B_MOL_1610	6.60	2945	19702	22647	10	38	48	1	5	6	
Mo	B_MOL_1620	19.72	7328	38742	46069	18	76	93	2	10	13	
Mo	B_MOL_1630	9.73	4514	28942	33457	13	57	70	2	8	10	
Mo	B_MOL_1640	2.71	1363	8038	9401	5	16	20	>1	2	3	
Mo	B_MOL_1650	2.79	2181	7515	9696	7	15	22	>1	2	3	
Mo	B_MOL_1660	2.84	3591	5513	9103	12	11	23	2	1	3	
Mo	B_MOL_1670	1.57	275	5128	5403	>1	10	11	>1	1	1	
Mo	B_MOL_1690	9.05	11672	12873	24545	42	25	67	5	3	9	
Mo	B_MOL_1700	8.49	4628	24582	29210	14	48	62	2	7	9	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**		
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**
Mo	B_MOL_1710	6.57	12693	10048	22740	46	20	65	6	3	9
Mo	B_MOL_1720	1.94	1416	5337	6752	4	10	14	>1	1	2
Mo	B_MOL_1730	1.81	926	5277	6203	3	10	13	>1	1	2
Mo	B_MOL_1740	2.51	810	7680	8489	3	15	18	>1	2	2
Mo	B_MOL_1750	8.35	1340	26826	28166	4	52	57	>1	7	8
Mo	B_MOL_1760	4.74	4667	11659	16326	16	23	39	3	3	6
Mo	B_MOL_1770	4.50	649	8789	9438	2	17	19	>1	2	2
Mo	B_MOL_1780	2.43	1637	6102	7739	5	12	17	>1	2	2
Mo	B_MOL_1790	22.67	20307	50134	70441	74	98	172	12	13	26
Mo	B_MOL_1800	11.07	5822	32330	38152	17	63	80	3	9	11
Mo	B_MOL_1810	8.26	13788	15041	28829	51	29	81	7	4	11
Mo	B_MOL_1820	4.89	8150	8764	16914	14	17	31	2	2	4
Mo	B_MOL_1830	1.88	2273	4186	6459	7	8	16	1	1	2
Mo	B_MOL_1840	25.65	12428	27546	39974	40	54	94	3	7	10
Mo	B_MOL_1850	18.57	9701	53838	63538	32	105	137	4	14	18
Mo	B_MOL_1860	10.20	6908	25511	32418	16	50	66	2	7	9
Mo	B_MOL_1870	26.59	17271	51792	69063	55	101	156	4	14	18
Mo	B_MOL_1880	2.57	3020	5556	8576	11	11	22	2	1	4
Mo	B_MOL_1890	39.26	20674	45126	65800	67	88	155	5	12	17
Mo	B_MOL_1900	2.51	3047	4635	7682	12	9	21	2	1	3
Mo	B_MOL_1910	2.68	3706	4739	8445	13	9	22	2	1	3
Mo	B_MOL_1920	5.33	6098	10404	16502	26	20	46	5	3	8
Mo	B_MOL_1930	9.05	7930	13825	21755	26	27	53	3	4	7
Mo	B_MOL_1940	7.35	8379	16840	25218	29	33	62	4	5	9

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
Mo	B_MOL_1950	8.00	3950	19824	23774	10	39	49	2	5	7	
Mo	B_MOL_1960	2.46	2980	5298	8278	11	10	22	2	1	4	
Mo	B_MOL_1970	5.36	2648	6193	8840	7	12	20	>1	2	2	
Mo	B_MOL_1990	2.06	2112	4611	6723	8	9	17	2	1	3	
Mo	B_MOL_2000	1.41	523	3546	4069	2	7	9	>1	>1	1	
Mo	B_MOL_2010	7.48	7653	18581	26233	30	36	66	5	5	10	
Mo	B_MOL_2020	3.54	2372	4658	7030	8	9	17	>1	1	2	
Mo	B_MOL_2030	3.72	113	5058	5171	>1	10	10	>1	1	1	
Mo	B_MOL_2040	4.33	5629	7734	13364	21	15	36	3	2	5	
Mo	B_MOL_2050	9.54	6011	11791	17802	22	23	45	3	3	6	
Mo	B_MOL_2060	10.60	9536	4558	14095	28	9	37	1	1	2	
Mo	B_MOL_2070	13.74	4216	10042	14258	12	20	32	>1	3	3	
Mo	B_MOL_2080	1.39	1909	2721	4630	6	5	11	>1	>1	2	
Mo	B_MOL_2090	43.08	41396	96082	137478	130	188	318	18	26	44	
Mo	B_MOL_2100	38.48	19796	37233	57029	62	73	135	4	10	14	
Mo	B_MOL_2110	7.31	1639	23681	25320	5	46	51	>1	6	7	
Mo	B_MOL_2120	5.49	1896	6928	8823	5	14	19	>1	2	2	
Mo	B_MOL_2130	15.81	3735	14638	18373	12	29	41	>1	4	5	
Mo	B_MOL_2150	5.53	4957	974	5931	3	2	5	>1	>1	>1	
Mo	B_MOL_2160	3.71	4125	8953	13078	14	17	32	2	2	4	
Mo	B_MOL_2180	5.83	5592	10981	16573	19	21	40	3	3	6	
Mo	B_MOL_2200	13.12	11500	19891	31391	41	39	80	6	5	11	
Mo	B_MOL_2210	3.94	2485	3786	6271	6	7	13	>1	1	2	
Mo	B_MOL_2220	10.01	4851	5207	10058	14	10	24	>1	1	2	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**		
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**
Mo	B_MOL_2230	8.69	9980	18789	28768	35	37	71	4	5	10
Mo	B_MOL_2240	3.49	671	10779	11450	2	21	23	>1	3	3
Mo	B_MOL_2260	0.95	1539	928	2467	5	2	7	>1	>1	>1
Mo	B_MOL_2280	20.82	15814	24465	40278	52	48	100	5	7	11
Mo	B_MOL_2290	5.32	5548	9845	15393	20	19	39	3	3	6
Mo	B_MOL_2300	60.67	66193	125503	191696	154	245	399	36	34	70
Mo	B_MOL_2310	4.67	5619	10281	15900	26	20	46	6	3	9
Mo	B_MOL_2320	11.36	929	17084	18013	3	33	36	>1	5	5
Mo	B_MOL_2330	15.37	10090	43646	53736	29	85	115	4	12	16
Mo	B_MOL_2340	6.01	5415	6395	11810	19	12	31	2	2	4
Mo	B_MOL_2360	4.37	4564	11124	15689	18	22	40	3	3	6
Mo	B_MOL_2370	15.27	8542	14028	22570	28	27	55	2	4	6
Mo	B_MOL_2380	0.50	33	772	805	>1	2	2	>1	>1	>1
Mo	B_MOL_2390	16.24	20615	32320	52935	55	63	118	10	9	19
Mo	B_MOL_2400	3.68	1011	7183	8194	3	14	17	>1	2	2
Mo	B_MOL_2410	1.79	1338	5206	6544	5	10	15	>1	1	2
Mo	B_MOL_2420	21.50	11627	14014	25642	38	27	65	3	4	6
Mo	B_MOL_2430	2.12	1346	2932	4278	5	6	10	>1	>1	1
Mo	B_MOL_2440	2.90	3817	6445	10262	12	13	25	2	2	4
Mo	B_MOL_2450	5.30	6451	11663	18115	30	23	52	7	3	10
Mo	B_MOL_2460	7.37	4863	20878	25741	21	41	62	4	6	10
Mo	B_MOL_2480	11.60	15068	23703	38770	68	46	114	16	6	22
Mo	B_MOL_2490	2.72	3546	5267	8813	13	10	23	2	1	4
Mo	B_MOL_2500	6.46	7822	15019	22840	35	29	65	8	4	12

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
Mo	B_MOL_2510	13.62	20041	25843	45884	82	50	133	16	7	23	
Mo	B_MOL_2520	22.89	7948	44430	52378	28	87	115	2	12	14	
Mo	B_MOL_2530	11.65	19528	21843	41370	42	43	84	6	6	12	
Mo	B_MOL_2540	11.19	9884	26825	36710	25	52	77	6	7	13	
Mo	B_MOL_2560	3.04	2184	6787	8972	6	13	20	>1	2	3	
Mo	B_MOL_2570	10.29	2790	30614	33404	9	60	69	>1	8	9	
Mo	B_MOL_2580	1.02	1179	1807	2986	4	4	7	>1	>1	1	
Mo	B_MOL_2590	18.17	6541	21789	28330	26	43	69	2	6	8	
Mo	B_MOL_2600	1.60	2299	3366	5665	8	7	14	2	>1	3	
Mo	B_MOL_2610	6.89	7239	17170	24409	21	34	55	5	5	10	
Mo	B_MOL_2620	5.37	8049	10012	18061	23	20	43	3	3	6	
Mo	B_MOL_2630	4.83	5174	11828	17003	15	23	38	3	3	6	
Mo	B_MOL_2640	47.98	41325	64809	106134	151	127	278	17	17	35	
Mo	B_MOL_2650	5.18	1406	12537	13943	6	24	30	>1	3	4	
Mo	B_MOL_2660	35.05	14215	24933	39148	55	49	104	4	7	11	
Mo	B_MOL_2680	13.11	1832	42741	44573	6	83	90	>1	11	12	
Mo	B_MOL_2690	18.93	21957	34020	55977	44	66	110	10	9	19	
Mo	B_MOL_2700	1.23	1522	2589	4110	5	5	10	>1	>1	1	
Mo	B_MOL_2710	6.21	6486	15011	21497	17	29	47	3	4	7	
Mo	B_MOL_2730	7.98	7861	14509	22370	14	28	42	2	4	5	
Mo	B_MOL_2740	22.38	34707	40858	75565	68	80	148	10	11	21	
Mo	B_MOL_2750	2.81	1609	7726	9336	6	15	21	>1	2	3	
Mo	B_MOL_2760	3.67	3525	9266	12792	8	18	26	2	2	4	
Mo	B_MOL_2780	1.07	1081	2717	3798	3	5	8	>1	>1	1	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
Mo	B_MOL_2790	3.33	695	10491	11186	2	20	22	>1	3	3	
Mo	B_MOL_2820	6.34	8672	12781	21454	30	25	55	5	3	9	
Mo	B_MOL_2850	3.41	1700	8991	10691	6	18	23	>1	2	3	
Mo	B_MOL_2860	10.73	12982	21876	34857	28	43	71	7	6	12	
Mo	B_MOL_2870	6.05	5928	15114	21041	15	30	45	3	4	7	
Mo	B_MOL_2880	8.22	1726	26611	28337	6	52	58	>1	7	8	
Mo	B_MOL_2890	16.51	30164	25282	55447	113	49	162	17	7	24	
Mo	B_MOL_2900	2.34	2636	5648	8284	8	11	19	2	2	3	
Mo	B_MOL_2910	4.21	6643	8280	14923	25	16	41	4	2	6	
Mo	B_MOL_2930	4.42	4226	10946	15172	13	21	34	3	3	6	
Mo	B_MOL_2940	3.30	4254	7070	11324	16	14	30	2	2	4	
Mo	B_MOL_2960	1.18	1779	2433	4212	7	5	11	>1	>1	2	
Mo	B_MOL_2970	1.70	1723	4434	6157	6	9	15	>1	1	2	
Mo	B_MOL_2980	1.87	2848	3376	6225	11	7	18	2	>1	3	
Mo	B_MOL_3000	1.24	1424	2829	4253	5	6	10	>1	>1	2	
Mo	B_MOL_3020	3.70	4001	9085	13086	16	18	34	3	2	5	
Mo	B_MOL_3040	22.83	27662	52030	79692	116	102	218	24	14	38	
Mo	B_MOL_3050	11.95	15838	25149	40986	62	49	111	14	7	21	
Mo	B_MOL_3070	1.44	416	4608	5024	2	9	11	>1	1	2	
Mo	B_MOL_3090	9.16	16275	14049	30324	33	27	61	6	4	10	
Mo	B_MOL_3100	6.83	9923	14308	24231	38	28	66	6	4	10	
Mo	B_MOL_3150	13.78	23547	24454	48001	86	48	134	14	7	20	
Mo	B_MOL_3160	2.23	3043	4825	7869	11	9	20	2	1	3	
Mo	B_MOL_3190	20.12	31795	39264	71059	126	77	203	22	11	32	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
Mo	B_MOL_3220	16.30	21519	37029	58548	89	72	161	18	10	27	
Mo	B_MOL_3250	7.90	10512	17406	27918	43	34	77	8	5	13	
Mo	B_MOL_3260	3.40	5064	6945	12009	19	14	32	3	2	5	
Mo	B_MOL_3290	4.19	3017	12455	15472	11	24	35	2	3	5	
Mo	B_MOL_3300	6.59	9050	14735	23785	33	29	62	5	4	9	
Mo	B_MOL_3340	4.99	10555	7344	17899	39	14	53	5	2	7	
Mo	B_MOL_3360	6.83	14228	10281	24509	53	20	73	8	3	10	
Mo	B_MOL_3390	4.78	6058	10780	16838	26	21	47	5	3	8	
Mo	B_MOL_3400	1.78	1702	4847	6548	6	9	16	>1	1	2	
Mo	B_MOL_3410	5.26	9873	9011	18884	36	18	54	5	2	7	
Mo	B_MOL_3420	2.38	2807	5852	8658	11	11	23	2	2	4	
Mo	B_MOL_3460	10.83	19470	19146	38616	74	37	111	11	5	16	
Mo	B_MOL_3490	5.06	9753	8391	18144	37	16	53	5	2	8	
Mo	B_MOL_3500	9.21	16207	16682	32890	59	33	92	8	4	12	
Mo	B_MOL_3520	12.10	22144	20011	42155	80	39	119	11	5	16	
Mo	B_MOL_3530	5.12	8991	9322	18314	33	18	51	4	3	7	
Mo	B_MOL_3540	11.05	20148	19601	39749	73	38	111	10	5	15	
Mo	B_MOL_3560	23.22	36132	47418	83550	131	93	224	18	13	30	
Mo	B_MOL_3580	4.48	9467	6624	16090	35	13	48	5	2	6	
Mo	B_MOL_3590	2.08	3282	4109	7390	12	8	20	2	1	3	
Mo	B_MOL_3610	2.20	4223	3676	7899	16	7	23	2	>1	3	
Mo	B_MOL_3620	3.32	6799	5101	11900	25	10	35	4	1	5	
Mo	B_MOL_3640	2.52	5665	3388	9054	21	7	27	3	>1	4	
Mo	B_MOL_3650	1.78	2233	4049	6282	8	8	16	1	1	2	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
Mo	B_MOL_3660	9.53	16544	17725	34269	60	35	95	9	5	14	
Mo	B_MOL_3670	3.65	8052	5059	13111	29	10	39	4	1	5	
Mo	B_MOL_3680	3.31	5187	6590	11777	19	13	32	2	2	4	
Mo	B_MOL_3690	1.01	1968	1660	3628	7	3	10	>1	>1	1	
Mo	B_MOL_3700	6.71	7986	15673	23660	31	31	62	5	4	9	
Mo	B_MOL_3710	6.48	12681	10570	23251	47	21	67	6	3	9	
Mo	B_MOL_3730	4.76	7350	9355	16706	28	18	46	4	3	7	
Mo	B_MOL_3740	3.82	7137	6551	13688	27	13	40	4	2	6	
Mo	B_MOL_3750	0.74	1080	1553	2633	4	3	7	>1	>1	1	
Mo	B_MOL_3760	3.27	5202	6282	11484	19	12	32	3	2	4	
Mo	B_MOL_3770	0.81	1709	1207	2916	6	2	9	>1	>1	1	
Mo	B_MOL_3780	2.28	4319	3851	8170	16	8	24	2	1	3	
Mo	B_MOL_3790	7.52	12890	13908	26798	47	27	75	6	4	10	
Mo	B_MOL_3800	14.31	18466	32207	50673	66	63	129	9	9	18	
Mo	B_MOL_3820	2.28	4800	3365	8165	18	7	24	2	>1	3	
Mo	B_MOL_3830	1.94	2703	4122	6825	10	8	18	1	1	2	
Mo	B_MOL_3840	3.66	7196	5881	13077	26	11	38	4	2	5	
Mo	B_MOL_3850	3.01	2831	7474	10305	10	15	25	1	2	3	
Mo	B_MOL_3860	1.80	3145	3270	6415	12	6	18	2	>1	3	
Mo	B_MOL_3870	2.20	1624	5872	7496	6	11	17	>1	2	2	
Mo	B_MOL_3880	17.72	28631	34943	63574	109	68	177	17	9	27	
Mo	B_MOL_3890	1.06	915	2718	3633	3	5	9	>1	>1	1	
Mo	B_MOL_3900	3.66	7641	5470	13111	28	11	39	4	1	5	
Mo	B_MOL_3910	1.12	841	3081	3922	3	6	9	>1	>1	1	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
Mo	B_MOL_3920	0.86	793	2195	2988	3	4	7	>1	>1	1	
Mo	B_MOL_3930	1.49	467	4600	5067	2	9	11	>1	1	1	
Mo	B_MOL_3940	3.07	4689	6194	10883	17	12	29	2	2	4	
Mo	B_MOL_3950	9.06	12908	19170	32078	47	37	84	6	5	11	
Mo	B_MOL_3960	2.44	2893	5716	8610	10	11	22	1	2	3	
Mo	B_MOL_3970	2.71	5170	4528	9698	18	9	27	2	1	4	
Mo	B_MOL_3980	2.16	4234	3477	7710	15	7	22	2	>1	3	
Mo	B_MOL_3990	3.84	7378	6438	13817	26	13	39	3	2	5	
Mo	B_MOL_4000	6.22	6133	15520	21653	24	30	54	4	4	8	
Mo	B_MOL_4020	4.32	7525	7851	15376	28	15	43	4	2	6	
Mo	B_MOL_4030	5.45	9782	9624	19405	36	19	55	5	3	7	
Mo	B_MOL_4050	5.11	5661	12096	17758	21	24	44	3	3	6	
Mo	B_MOL_4060	3.04	6125	4827	10952	22	9	32	3	1	4	
Mo	B_MOL_4070	9.65	13298	21172	34470	47	41	89	7	6	12	
Mo	B_MOL_4080	4.30	3675	12041	15716	13	24	37	2	3	5	
Mo	B_MOL_4090	2.37	4120	4305	8425	15	8	24	2	1	3	
Mo	B_MOL_4100	2.27	2534	5183	7717	9	10	20	1	1	3	
Mo	B_MOL_4110	1.82	3847	2704	6551	14	5	19	2	>1	3	
Mo	B_MOL_4120	8.46	17954	12305	30259	66	24	90	9	3	12	
Mo	B_MOL_4140	3.21	5556	5680	11237	21	11	32	3	2	4	
Mo	B_MOL_4150	3.45	7386	4953	12339	27	10	37	4	1	5	
Mo	B_MOL_4170	0.78	1127	1550	2677	4	3	7	>1	>1	1	
Mo	B_MOL_4180	4.30	8393	6913	15306	31	14	44	4	2	6	
Mo	B_MOL_4190	1.96	3230	3610	6840	12	7	19	2	>1	3	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
Mo	B_MOL_4200	4.58	9356	7025	16381	34	14	48	5	2	6	
Mo	B_MOL_4220	0.74	1391	1242	2633	5	2	8	>1	>1	1	
Mo	B_MOL_4230	0.77	523	2168	2691	2	4	6	>1	>1	>1	
Mo	B_MOL_4240	0.91	1576	1655	3231	6	3	9	>1	>1	1	
Mo	B_MOL_4250	1.79	3195	3254	6449	12	6	18	2	>1	2	
Mo	B_MOL_4260	1.36	2103	2699	4802	8	5	13	1	>1	2	
Mo	B_MOL_4280	2.95	6338	4171	10509	23	8	31	3	1	4	
Mo	B_MOL_4290	1.00	1744	1798	3542	6	4	10	>1	>1	1	
Mo	B_MOL_4400	2.33	3550	2373	5923	3	5	7	>1	>1	1	
SP	B_SIP_1000	2.63	4991	4393	9384	18	9	27	3	1	4	
SP	B_SIP_1010	4.95	7542	5680	13222	27	11	38	3	2	5	
SP	B_SIP_1020	2.70	5463	4176	9639	20	8	28	3	1	4	
SP	B_SIP_1030	2.50	5033	3903	8936	18	8	26	2	1	4	
SP	B_SIP_1040	1.04	1814	1782	3596	7	3	10	>1	>1	1	
SP	B_SIP_1050	2.82	5940	4146	10086	22	8	30	3	1	4	
SP	B_SIP_1060	3.96	8271	5880	14151	30	11	42	4	2	6	
SP	B_SIP_1070	1.95	4039	2930	6969	15	6	20	2	>1	3	
SP	B_SIP_1080	1.36	2639	2208	4847	10	4	14	1	>1	2	
SP	B_SIP_1090	6.41	12561	10326	22887	46	20	66	6	3	9	
SP	B_SIP_1100	2.15	3905	3569	7475	14	7	21	2	>1	3	
SP	B_SIP_1110	5.99	12017	9380	21397	44	18	62	6	3	8	
SP	B_SIP_1130	7.66	14870	12484	27354	55	24	79	7	3	11	
SP	B_SIP_1140	1.76	2685	2500	5185	10	5	15	1	>1	2	
SP	B_SIP_1150	3.74	7659	5716	13375	28	11	39	4	2	5	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
SP	B_SIP_1160	1.10	1746	1994	3740	6	4	10	>1	>1	1	
SP	B_SIP_1170	2.12	4183	3372	7554	15	7	22	2	>1	3	
SP	B_SIP_1180	6.12	12170	9716	21885	45	19	64	6	3	9	
SP	B_SIP_1190	1.29	1871	1590	3462	6	3	9	>1	>1	1	
SP	B_SIP_1200	1.95	3589	3223	6811	13	6	19	2	>1	3	
SP	B_SIP_1210	2.47	5110	3741	8852	19	7	26	3	1	4	
SP	B_SIP_1220	4.26	8667	6591	15258	32	13	45	4	2	6	
SP	B_SIP_1240	6.89	13438	11183	24621	49	22	71	7	3	10	
SP	B_SIP_1250	11.51	22873	18259	41132	84	36	120	11	5	16	
SP	B_SIP_1260	2.52	3790	3157	6947	13	6	19	1	>1	2	
SP	B_SIP_1270	1.55	2853	2557	5410	10	5	15	1	>1	2	
SP	B_SIP_1280	2.99	6083	4617	10700	22	9	31	3	1	4	
SP	B_SIP_1290	1.95	4137	2841	6979	15	6	21	2	>1	3	
SP	B_SIP_1300	2.31	4045	3372	7417	15	7	21	2	>1	3	
SP	B_SIP_1310	1.16	2175	1958	4133	8	4	12	1	>1	2	
SP	B_SIP_1320	0.81	1438	1217	2655	5	2	8	>1	>1	1	
SP	B_SIP_1330	6.52	9520	8882	18402	33	17	51	4	2	7	
SP	B_SIP_1340	4.15	8374	6325	14699	31	12	43	4	2	6	
SP	B_SIP_1350	3.72	7492	5761	13253	28	11	39	4	2	5	
SP	B_SIP_1360	4.54	9880	6355	16234	36	12	49	5	2	7	
SP	B_SIP_1370	3.25	7040	4577	11617	26	9	35	3	1	5	
SP	B_SIP_1380	9.10	15074	15042	30116	55	29	85	7	4	12	
SP	B_SIP_1390	4.04	3852	3029	6881	12	6	18	>1	>1	2	
SP	B_SIP_1400	7.82	16638	11436	28074	61	22	83	8	3	11	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
SP	B_SIP_1410	7.94	17384	11086	28470	64	22	85	9	3	12	
SP	B_SIP_1420	1.17	2417	1786	4203	9	3	12	1	>1	2	
SP	B_SIP_1430	22.22	15021	21457	36478	35	42	77	2	6	8	
SP	B_SIP_1440	6.61	10212	7620	17832	30	15	45	4	2	6	
SP	B_SIP_1450	1.21	1926	2164	4089	7	4	11	>1	>1	2	
SP	B_SIP_1460	1.76	1894	3184	5078	7	6	13	>1	>1	2	
SP	B_SIP_1470	1.24	2073	1702	3775	8	3	11	>1	>1	1	
SP	B_SIP_1480	7.61	4183	13459	17642	16	26	43	2	4	5	
SP	B_SIP_1490	10.65	4056	16366	20422	10	32	42	>1	4	5	
SP	B_SIP_1500	2.20	713	4088	4801	2	8	10	>1	1	1	
SP	B_SIP_1510	2.94	1560	5032	6592	4	10	14	>1	1	2	
SP	B_SIP_1520	8.23	3455	12793	16249	10	25	35	>1	3	4	
T1	B_T01_1000	3.62	7565	5379	12944	28	11	38	4	1	5	
T1	B_T01_1010	3.53	7424	5202	12626	27	10	37	4	1	5	
T2	B_T02_1000	4.62	8864	7611	16475	33	15	48	4	2	7	
T2	B_T02_1010	5.88	12143	8893	21036	44	17	62	6	2	8	
T2	B_T02_1020	0.97	2242	1239	3481	8	2	11	1	>1	1	
T2	B_T02_1030	4.99	10590	7276	17867	39	14	53	5	2	7	
T3	B_T03_1000	0.87	1412	1661	3073	5	3	9	>1	>1	1	
T3	B_T03_1010	0.79	1533	1290	2823	6	3	8	>1	>1	1	
T3	B_T03_1020	3.63	7413	5543	12956	27	11	38	4	1	5	
T3	B_T03_1030	4.26	8238	6978	15215	31	14	44	4	2	6	
T3	B_T03_1040	2.63	5383	4065	9447	20	8	28	3	1	4	
T3	B_T03_1050	4.15	8722	6115	14838	32	12	44	4	2	6	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			Annual									
Basin	Subbasin	Area (Acres)	Volume (cf/year)			Total Nitrogen (lbs/year)			Total Phosphorus (lbs/year)			
			Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	
T3	B_T03_1060	4.62	8810	7708	16518	33	15	48	4	2	7	
T3	B_T03_1070	2.29	5054	3177	8231	18	6	25	2	>1	3	
T3	B_T03_1080	4.43	9324	6549	15873	34	13	47	5	2	6	
T3	B_T03_1090	7.10	14278	11174	25453	52	22	74	7	3	10	
T3	B_T03_1100	3.81	7909	5743	13652	29	11	40	4	2	5	
T3	B_T03_1110	6.90	12936	11777	24713	48	23	71	7	3	10	
T3	B_T03_1120	1.74	3544	2672	6216	13	5	18	2	>1	2	
T3	B_T03_1130	6.54	13478	10030	23508	49	20	69	7	3	9	
T3	B_T03_1140	4.55	9753	6584	16337	36	13	48	5	2	7	
T3	B_T03_1150	2.95	6339	4277	10616	23	8	32	3	1	4	
T3	B_T03_1160	2.99	6431	4293	10724	24	8	32	3	1	4	
T3	B_T03_1170	4.97	10464	7403	17867	38	14	53	5	2	7	
T3	B_T03_1180	1.92	3661	3209	6870	14	6	20	2	>1	3	
T3	B_T03_1190	3.00	6184	4589	10774	23	9	32	3	1	4	
T3	B_T03_1200	1.70	3417	2679	6096	13	5	18	2	>1	2	
T3	B_T03_1210	3.60	7094	5768	12862	26	11	37	4	2	5	
T3	B_T03_1220	1.22	2408	1964	4373	9	4	13	1	>1	2	
T3	B_T03_1230	1.90	3364	3161	6525	12	6	19	2	>1	3	
T3	B_T03_1240	7.83	16777	11337	28114	61	22	84	8	3	11	
T3	B_T03_1250	7.16	15370	10306	25676	56	20	77	8	3	10	
T3	B_T03_1260	0.53	998	897	1895	4	2	5	>1	>1	>1	
T3	B_T03_1270	6.92	13628	11160	24788	50	22	72	7	3	10	
T3	B_T03_1280	6.39	13208	9693	22901	48	19	67	7	3	9	
T3	B_T03_1290	6.03	13063	8639	21703	48	17	65	6	2	9	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
T3	B_T03_1300	1.06	2024	1782	3806	7	3	11	1	>1	2	
T3	B_T03_1310	2.25	4413	3639	8051	16	7	23	2	>1	3	
T3	B_T03_1320	6.10	12135	9800	21935	44	19	64	6	3	9	
T3	B_T03_1330	4.97	8878	7833	16711	33	15	48	4	2	7	
T6	B_T06_1000	3.99	7867	6404	14272	29	13	41	4	2	6	
T6	B_T06_1010	2.37	4977	3513	8490	18	7	25	2	>1	3	
T6	B_T06_1020	4.32	9167	6297	15463	34	12	46	5	2	6	
T6	B_T06_1030	1.92	3622	3188	6809	13	6	20	2	>1	3	
T6	B_T06_1040	2.64	5170	4240	9411	19	8	27	3	1	4	
T6	B_T06_1050	3.84	7193	6488	13681	27	13	39	4	2	5	
T6	B_T06_1060	9.24	19387	13668	33055	71	27	97	9	4	13	
T6	B_T06_1070	6.35	13121	9556	22677	48	19	67	6	3	9	
T6	B_T06_1080	2.41	5223	3394	8618	19	7	26	3	>1	3	
T6	B_T06_1090	2.10	4291	3183	7474	16	6	22	2	>1	3	
T6	B_T06_1100	2.48	4838	3998	8836	18	8	26	2	1	4	
T6	B_T06_1110	2.21	4764	3135	7899	17	6	24	2	>1	3	
T6	B_T06_1120	3.71	7735	5504	13239	28	11	39	4	1	5	
T6	B_T06_1130	5.58	11127	8757	19884	41	17	58	6	2	8	
T6	B_T06_1140	4.59	9754	6662	16416	36	13	49	5	2	7	
T6	B_T06_1150	1.55	3267	2261	5528	12	4	16	2	>1	2	
T6	B_T06_1160	1.90	3908	2860	6768	14	6	20	2	>1	3	
T6	B_T06_1170	3.44	7811	4492	12303	28	9	37	4	1	5	
T6	B_T06_1180	2.88	6358	3915	10273	23	8	31	3	1	4	
T6	B_T06_1190	2.90	5913	4412	10325	22	9	30	3	1	4	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			Annual									
Basin	Subbasin	Area (Acres)	Volume (cf/year)			Total Nitrogen (lbs/year)			Total Phosphorus (lbs/year)			
			Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	Direct Runoff	Baseflow	Total	
T6	B_T06_1200	2.48	5218	3654	8871	19	7	26	3	>1	4	
T6	B_T06_1210	2.39	4706	3809	8515	17	7	25	2	1	3	
T6	B_T06_1220	2.62	5237	4112	9350	19	8	27	3	1	4	
T6	B_T06_1230	5.30	11053	7822	18875	41	15	56	5	2	8	
T6	B_T06_1240	5.34	10810	8261	19071	40	16	56	5	2	8	
T6	B_T06_1250	7.67	9414	13116	22530	33	26	59	4	4	7	
T6	B_T06_1260	3.68	6726	6137	12864	25	12	37	3	2	5	
T6	B_T06_1270	8.35	13410	11305	24715	47	22	69	6	3	9	
T6	B_T06_1280	2.69	2817	961	3779	8	2	10	>1	>1	>1	
T4	B_T45_1000	6.87	13692	10831	24522	50	21	72	7	3	10	
T4	B_T45_1010	1.76	3531	2767	6298	13	5	18	2	>1	3	
T4	B_T45_1020	6.01	12167	9323	21490	45	18	63	6	3	9	
T4	B_T45_1030	1.20	2238	2024	4262	8	4	12	1	>1	2	
T4	B_T45_1040	6.93	13773	11035	24808	50	22	72	7	3	10	
T4	B_T45_1050	1.18	2093	2126	4220	8	4	12	1	>1	2	
T4	B_T45_1060	1.12	2219	1769	3989	8	3	12	1	>1	2	
T4	B_T45_1070	3.93	8287	5755	14041	30	11	42	4	2	6	
T4	B_T45_1080	4.03	7057	7322	14379	26	14	41	4	2	6	
T4	B_T45_1090	3.31	6652	5152	11804	25	10	35	3	1	5	
T4	B_T45_1100	5.59	11605	8444	20049	42	16	59	6	2	8	
T4	B_T45_1110	2.43	4865	3835	8700	18	7	25	2	1	3	
T4	B_T45_1120	2.36	4554	3901	8455	17	8	24	2	1	3	
T4	B_T45_1130	2.48	4760	4134	8894	18	8	26	2	1	3	
T4	B_T45_1140	7.42	15287	11340	26626	56	22	78	7	3	11	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
T4	B_T45_1150	8.14	16891	12314	29205	62	24	86	8	3	12	
T4	B_T45_1160	6.60	13729	9973	23702	50	19	70	7	3	9	
TUC	B_TUC_1400	20.59	16153	10155	26309	47	20	66	4	3	6	
TUC	B_TUC_1920	2.27	1516	914	2431	4	2	6	>1	>1	>1	
Tu	B_TUH_1390	4.54	4101	2261	6363	10	4	14	>1	>1	1	
Tu	B_TUH_1410	1.09	601	748	1349	2	1	4	>1	>1	>1	
Tu	B_TUH_1430	3.65	3747	219	3967	11	>1	12	>1	>1	>1	
Tu	B_TUH_1440	17.50	13389	5232	18621	37	10	47	1	1	3	
Tu	B_TUH_1450	3.36	3240	2457	5697	6	5	11	>1	>1	1	
Tu	B_TUH_1460	6.23	4420	7263	11683	14	14	28	2	2	4	
Tu	B_TUH_1480	17.26	11284	5678	16962	32	11	43	2	2	3	
Tu	B_TUH_1510	17.45	15907	2257	18165	50	4	54	3	>1	3	
Tu	B_TUH_1520	0.65	941	688	1629	2	1	3	>1	>1	>1	
Tu	B_TUH_1530	19.05	17637	1793	19430	53	4	57	3	>1	3	
Tu	B_TUH_1540	21.59	20037	2619	22657	52	5	57	1	>1	2	
Tu	B_TUH_1550	17.52	15709	2552	18261	44	5	49	1	>1	2	
Tu	B_TUH_1570	1.80	789	493	1282	2	>1	3	>1	>1	>1	
Tu	B_TUH_1580	1.79	1906	265	2170	4	>1	4	>1	>1	>1	
Tu	B_TUH_1590	13.85	9701	1461	11162	26	3	29	>1	>1	1	
Tu	B_TUH_1600	9.03	8233	4061	12295	21	8	29	2	1	3	
Tu	B_TUH_1610	0.54	314	57	371	>1	>1	>1	>1	>1	>1	
Tu	B_TUH_1630	16.45	16955	2492	19446	46	5	51	1	>1	2	
Tu	B_TUH_1640	3.17	2935	1269	4204	7	2	10	>1	>1	>1	
Tu	B_TUH_1660	2.42	2472	22	2494	6	>1	7	>1	>1	>1	

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**		
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**
Tu	B_TUH_1670	24.24	25182	6099	31281	69	12	81	2	2	3
Tu	B_TUH_1680	2.98	2454	1018	3472	7	2	9	>1	>1	>1
Tu	B_TUH_1700	0.72	867	945	1812	2	2	3	>1	>1	>1
Tu	B_TUH_1720	39.79	25502	30827	56329	77	60	137	4	8	12
Tu	B_TUH_1730	10.69	6658	5866	12524	18	11	29	>1	2	2
Tu	B_TUH_1740	25.56	13309	20840	34149	35	41	76	>1	6	6
Tu	B_TUH_1750	7.39	2134	8701	10835	7	17	24	>1	2	3
Tu	B_TUH_1760	29.56	29128	5664	34791	86	11	97	4	2	5
Tu	B_TUH_1780	15.77	6475	25346	31821	20	50	69	1	7	8
Tu	B_TUH_1790	31.71	27150	37695	64845	79	74	153	4	10	14
Tu	B_TUH_1800	2.89	1527	3200	4727	4	6	10	>1	>1	1
Tu	B_TUH_1810	30.50	27765	23358	51123	81	46	127	4	6	10
Tu	B_TUH_1820	4.62	1688	5506	7194	5	11	16	>1	1	2
Tu	B_TUH_1830	13.37	4774	21406	26181	16	42	58	2	6	7
Tu	B_TUH_1840	4.23	6780	6841	13621	25	13	38	3	2	5
Tu	B_TUH_1850	3.18	471	5550	6021	2	11	12	>1	1	2
Tu	B_TUH_1860	10.47	7097	15617	22714	19	31	50	>1	4	5
Tu	B_TUH_1870	3.06	662	7336	7998	2	14	16	>1	2	2
Tu	B_TUH_1880	3.09	662	6423	7085	2	13	14	>1	2	2
Tu	B_TUH_1920	11.85	19797	14681	34477	70	29	99	8	4	12
Tu	B_TUH_1930	118.63	121112	16206	137319	386	32	418	27	4	31
Tu	B_TUH_1940	65.97	55605	15181	70786	74	30	103	11	4	15
Tu	B_TUH_1950	2.69	1667	0	1667	>1	>1	>1	>1	>1	>1
Tu	B_TUH_1960	3.03	2621	6078	8700	5	12	16	>1	2	2

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**		
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**
Tu	B_TUH_1970	1.25	999	271	1270	>1	>1	>1	>1	>1	>1
Tu	B_TUH_1980	30.18	51358	24935	76293	174	49	223	21	7	27
Tu	B_TUH_1990	1.43	3029	1934	4964	11	4	15	1	>1	2
Tu	B_TUH_2000	163.89	195221	134074	329294	612	262	873	52	36	88
Tu	B_TUH_2010	14.87	14515	36664	51179	61	72	133	13	10	23
Tu	B_TUH_2020	54.36	32278	153648	185927	105	300	406	13	41	54
Tu	B_TUH_2030	8.46	10277	17969	28246	31	35	66	4	5	9
Tu	B_TUH_2040	2.17	1953	5123	7076	7	10	17	>1	1	2
Tu	B_TUH_2050	3.50	7840	4593	12433	28	9	37	4	1	5
Tu	B_TUH_2060	2.71	2240	6039	8279	7	12	19	>1	2	2
Tu	B_TUH_2070	2.16	2215	5045	7260	7	10	17	>1	1	2
Tu	B_TUH_2080	5.60	7776	11103	18879	25	22	47	3	3	6
Tu	B_TUH_2090	1.31	2058	2613	4671	8	5	13	1	>1	2
Tu	B_TUH_2100	1.50	1760	2189	3949	5	4	9	>1	>1	>1
Tu	B_TUH_2110	2.04	3060	4236	7296	12	8	20	2	1	3
Tu	B_TUH_2120	3.61	4314	4992	9306	11	10	21	>1	1	2
Tu	B_TUH_2130	1.63	2760	2422	5182	9	5	14	1	>1	2
Tu	B_TUH_2140	2.14	3225	4387	7612	12	9	21	2	1	3
Tu	B_TUH_2150	2.73	3778	3238	7016	12	6	18	1	>1	2
Tu	B_TUH_2160	3.11	5477	4561	10038	14	9	23	2	1	3
Tu	B_TUH_2170	0.68	1344	886	2230	5	2	6	>1	>1	>1
Tu	B_TUH_2180	2.31	3318	3005	6323	11	6	16	>1	>1	2
Tu	B_TUH_2190	27.49	32341	22712	55053	103	44	147	8	6	14
Tu	B_TUH_2200	6.53	14111	8693	22804	50	17	67	6	2	9

Table B1 Annual Hydrologic, TN and TP Loads by subbasin for the City of Edgewater												
Location			**Annual**									
Basin	**Subbasin**	**Area (Acres)**	**Volume (cf/year)**			**Total Nitrogen (lbs/year)**			**Total Phosphorus (lbs/year)**			
			Direct Runoff	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	**Direct Runoff**	**Baseflow**	**Total**	
Tu	B_TUH_2210	2.98	4730	3500	8230	14	7	21	1	>1	2	
Tu	B_TUH_2220	36.36	41815	11618	53434	128	23	151	10	3	13	
Tu	B_TUH_2240	1.61	2433	3301	5735	9	6	15	1	>1	2	
Tu	B_TUH_2300	3.64	5156	3311	8467	18	6	25	2	>1	3	
Un	B_UNS_1330	8.85	9113	48	9161	24	>1	24	>1	>1	>1	
Un	B_UNS_1350	56.70	43860	14393	58253	119	28	147	5	4	9	
Un	B_UNS_1370	45.58	43375	2012	45387	115	4	119	2	>1	3	
Un	B_UNS_1390	36.71	36282	1462	37744	107	3	110	5	>1	5	
Un	B_UNS_1430	4.73	1402	3401	4803	5	7	11	>1	>1	2	
Un	B_UNS_1500	0.05	49	34	84	>1	>1	>1	>1	>1	>1	
Un	B_UNS_1520	0.93	808	536	1343	2	1	4	>1	>1	>1	
Un	B_UNS_1530	2.11	2072	962	3035	6	2	8	>1	>1	>1	
Un	B_UNS_1540	7.64	5408	7302	12710	16	14	30	4	2	6	
Un	B_UNS_1550	0.95	192	1485	1677	>1	3	3	>1	>1	>1	
Un	B_UNS_1600	3.05	134	5338	5472	>1	10	11	>1	1	2	

Appendix G

25-Year and 100-Year Existing versus Proposed Inundation Maps for Capital Improvement Plan Phases

Phase 1 Inundation
25-Year, 24-Hour Event
South Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Areas
- Post Inundation
- Pre Inundation

N

0 1,000 2,000

Feet

1:15,409

JonesEdmunds

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Phase 1 Inundation
25-Year, 24-Hour Event
North Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 250 500

Feet

1:5,755

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Phase 1 Inundation
25-Year, 24-Hour Event
West Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 500 1,000

Feet

1:12,142

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Phase 1 Inundation
25-Year, 24-Hour Event
Edgewater Acres
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 250 500

Feet

1:6,161

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Phase 1 Inundation
25-Year, 24-Hour Event
G2 and G11 Canals
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

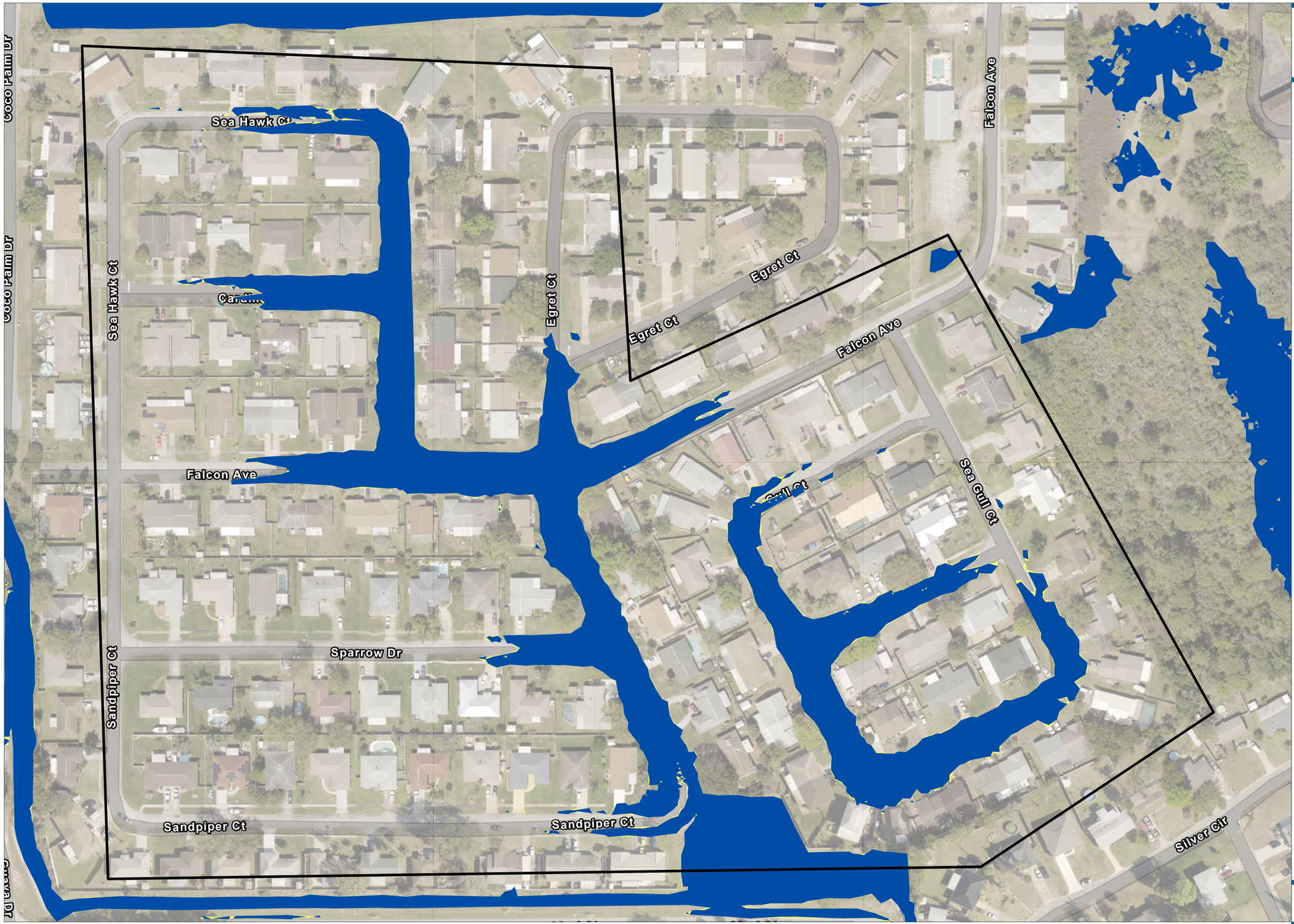
0 500 1,000

Feet

1:10,048

JonesEdmunds

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Phase 1 Inundation
25-Year, 24-Hour Event
Pelican West
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 75 150

Feet

1:1,680

JonesEdmunds

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Phase 1 Inundation
100-Year, 24-Hour Event
South Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 1,000 2,000

Feet

1:15,409

JonesEdmunds

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Phase 1 Inundation
100-Year, 24-Hour Event
North Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 250 500

Feet

1:5,755

JonesEdmunds

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Phase 1 Inundation
100-Year, 24-Hour Event
West Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 500 1,000

Feet

1:12,142

JonesEdmunds

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Phase 1 Inundation
100-Year, 24-Hour Event
Edgewater Acres
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 250 500

Feet

1:6,161

JonesEdmunds

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Phase 1 Inundation
100-Year, 24-Hour Event
G2 and G11 Canals
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

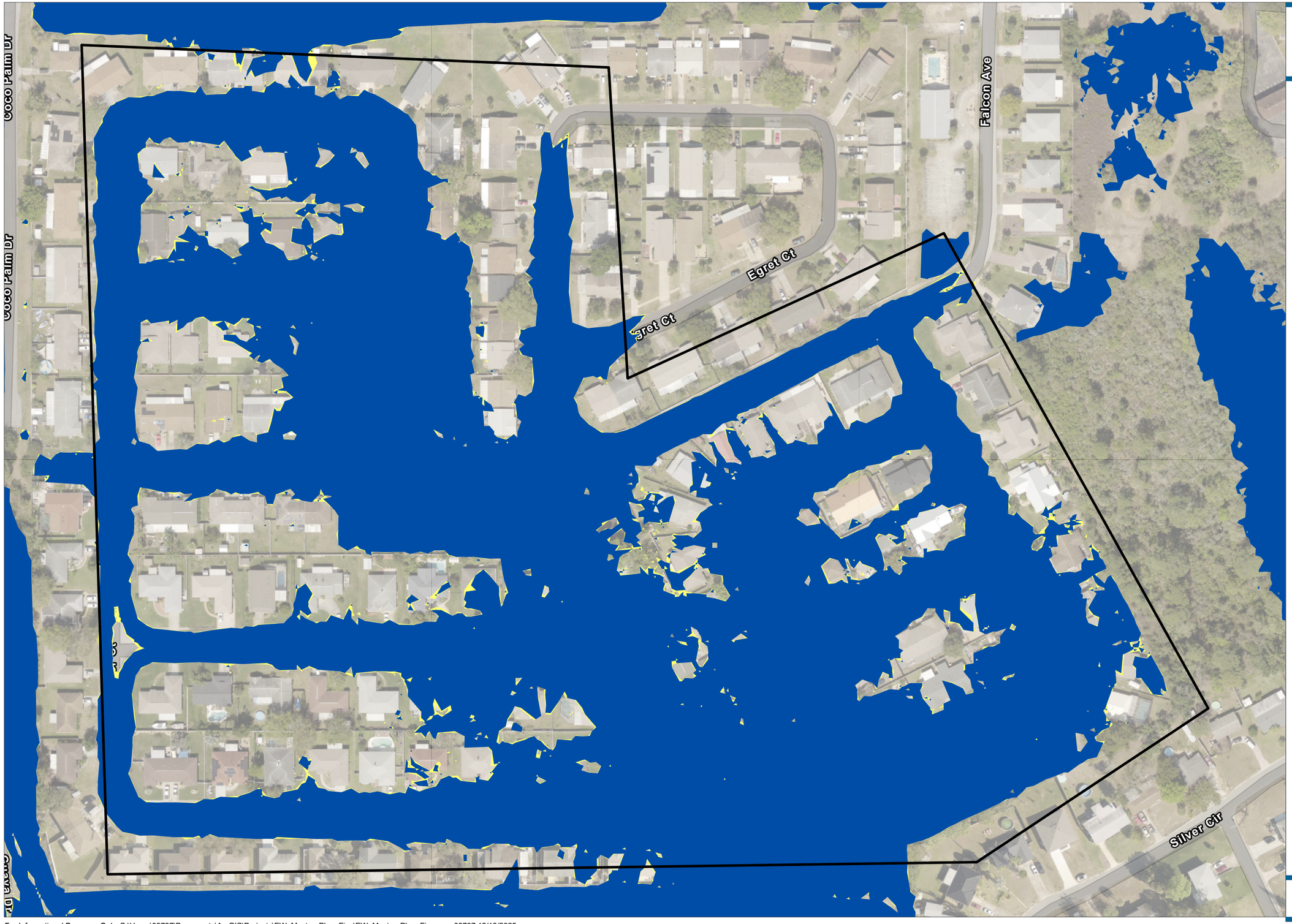
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JonesEdmunds

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Phase 1 Inundation
100-Year, 24-Hour Event
Pelican West
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 75 150

Feet

1:1,680

JonesEdmunds

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Phase 2 Inundation
25-Year, 24-Hour Event
South Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 1,000 2,000

Feet

1:15,409

JonesEdmunds

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Phase 2 Inundation
25-Year, 24-Hour Event
North Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 250 500

Feet

1:5,755

JonesEdmunds

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Phase 2 Inundation
25-Year, 24-Hour Event
West Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 500 1,000

Feet

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Phase 2 Inundation
25-Year, 24-Hour Event
Edgewater Acres
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 250 500

Feet

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JonesEdmunds

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Phase 2 Inundation
25-Year, 24-Hour Event
G2 and G11 Canals
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

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Feet

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Phase 2 Inundation
25-Year, 24-Hour Event
South Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

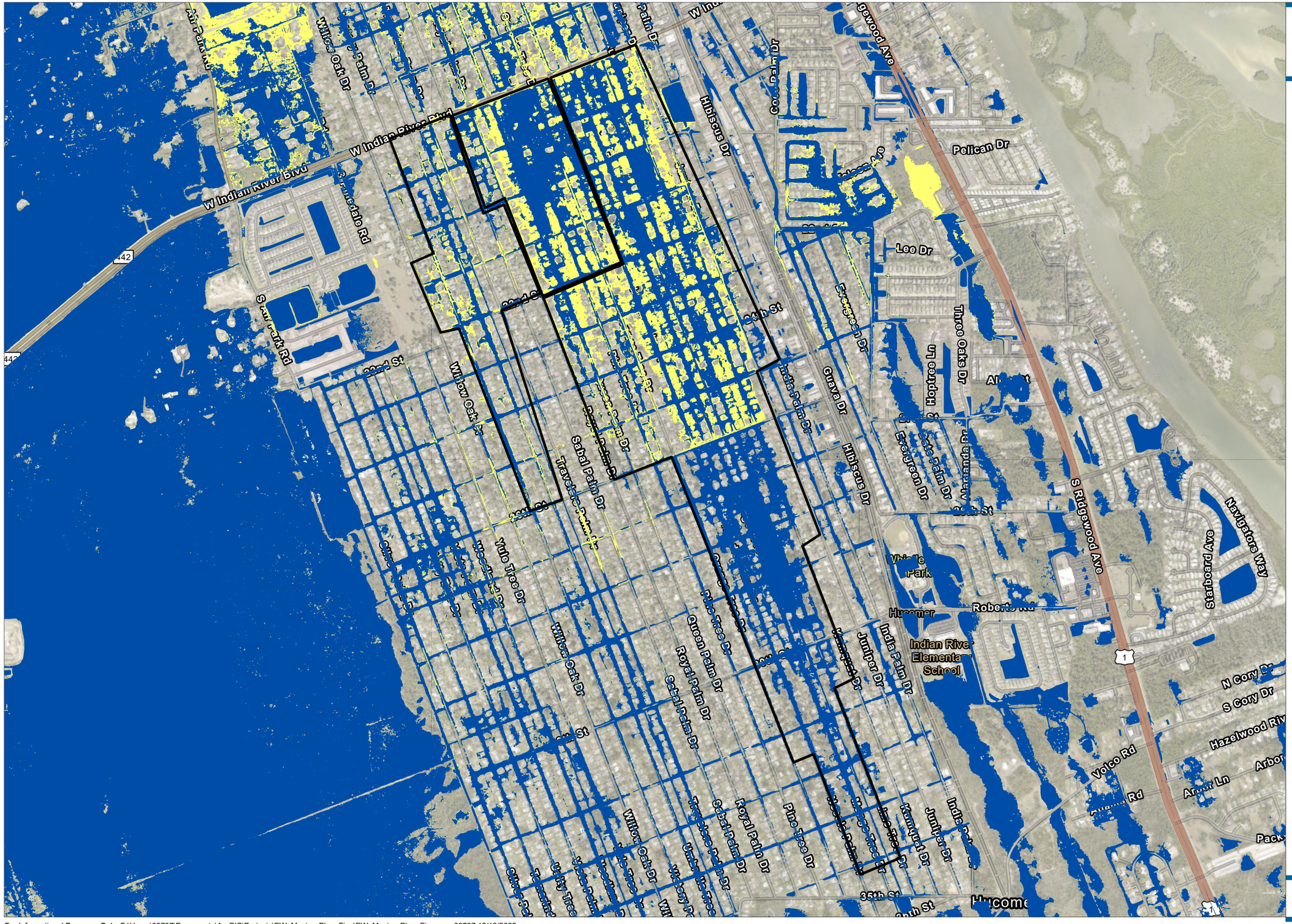
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Feet

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JonesEdmunds

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Phase 2 Inundation
100-Year, 24-Hour Event
North Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

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Feet

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Phase 2 Inundation
100-Year, 24-Hour Event
West Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

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Phase 2 Inundation
100-Year, 24-Hour Event
Edgewater Acres
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

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Phase 2 Inundation
100-Year, 24-Hour Event
G2 and G11 Canals
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

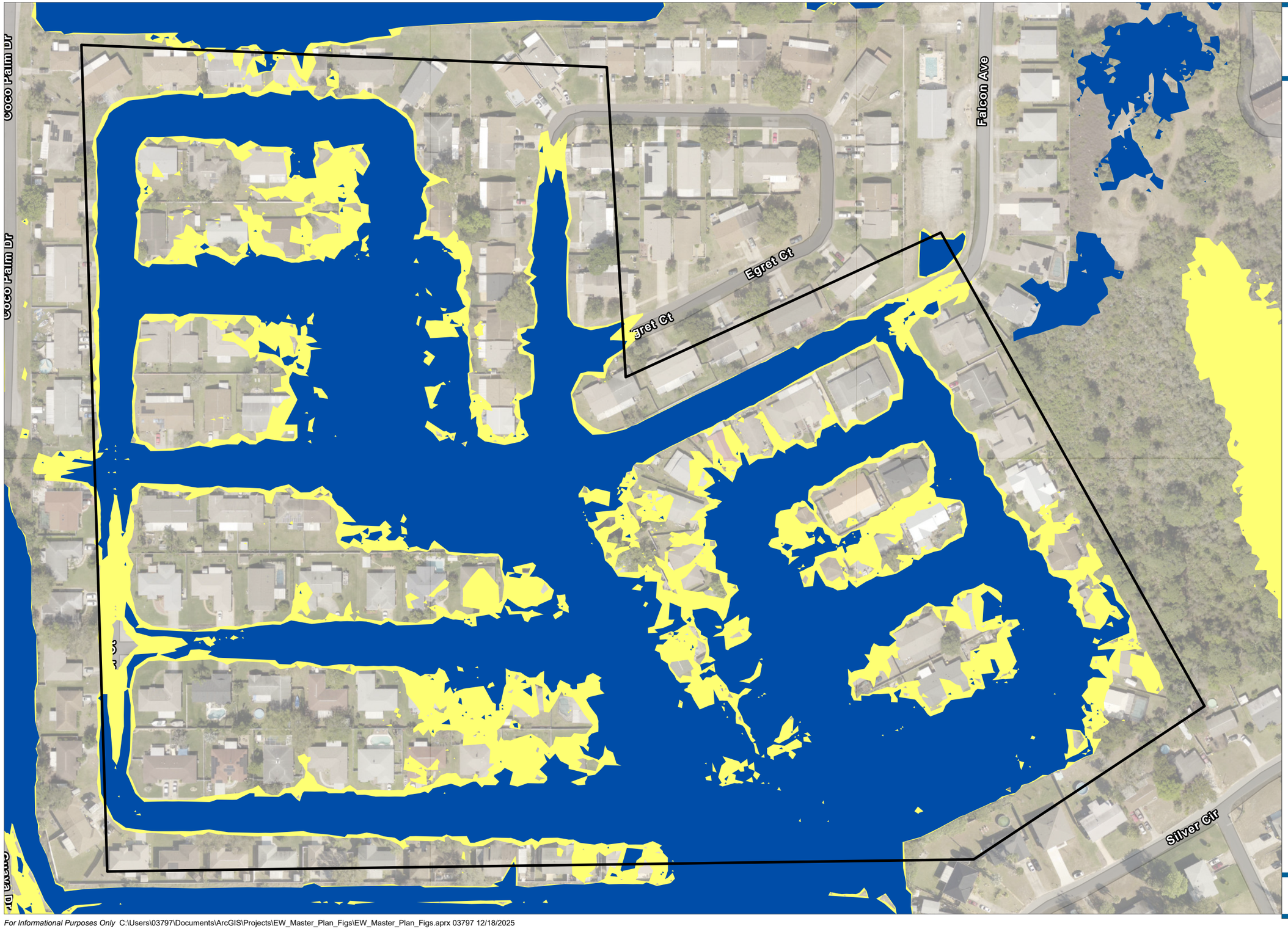
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Phase 2 Inundation
100-Year, 24-Hour Event
South Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 75 150

Feet

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Phase 3 Inundation
25-Year, 24-Hour Event
South Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 1,000 2,000

Feet

1:15,409

JonesEdmunds

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Phase 3 Inundation
25-Year, 24-Hour Event
North Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 250 500

Feet

1:5,755

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Phase 3 Inundation
25-Year, 24-Hour Event
West Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 500 1,000

Feet

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Phase 3 Inundation
25-Year, 24-Hour Event
Edgewater Acres
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 250 500

Feet

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JonesEdmunds

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Phase 3 Inundation
25-Year, 24-Hour Event
G2 and G11 Canals
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

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Feet

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Phase 3 Inundation
25-Year, 24-Hour Event
Pelican West
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

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Phase 3 Inundation
100-Year, 24-Hour Event
South Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

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Feet

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Phase 3 Inundation
100-Year, 24-Hour Event
North Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

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Phase 3 Inundation
100-Year, 24-Hour Event
West Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

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Phase 3 Inundation
100-Year, 24-Hour Event
Edgewater Acres
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

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Phase 3 Inundation
100-Year, 24-Hour Event
G2 and G11 Canals
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

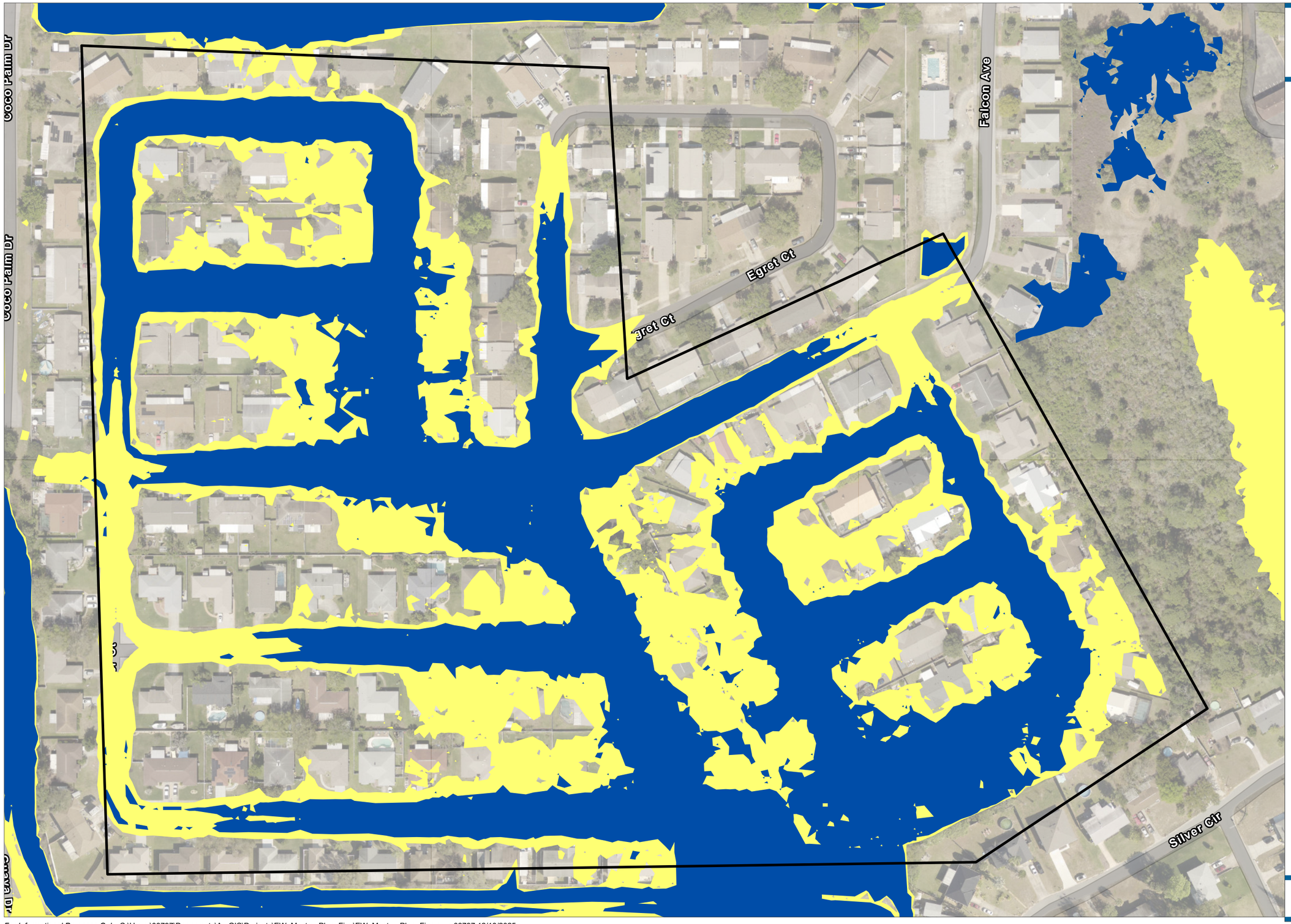
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Phase 3 Inundation
100-Year, 24-Hour Event
Pelican West
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 75 150

Feet

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JonesEdmunds

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Phase 4 Inundation
25-Year, 24-Hour Event
South Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 1,000 2,000

Feet

1:15,409

JonesEdmunds

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Phase 4 Inundation
25-Year, 24-Hour Event
North Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 250 500

Feet

1:5,755

JonesEdmunds

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Phase 4 Inundation
25-Year, 24-Hour Event
West Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 500 1,000

Feet

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JonesEdmunds

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Phase 4 Inundation
25-Year, 24-Hour Event
Edgewater Acres
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 250 500

Feet

1:6,161

JonesEdmunds

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Phase 4 Inundation
25-Year, 24-Hour Event
G2 and G11 Canals
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

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Feet

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Coco Palm Dr

Coco Palm Dr

Falcon Ave

Egret Ct

gret Ct

Silver Cir

Phase 4 Inundation
25-Year, 24-Hour Event
Pelican West
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

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Feet

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JonesEdmunds

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Phase 4 Inundation
100-Year, 24-Hour Event
South Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

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Feet

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JonesEdmunds

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Phase 4 Inundation
100-Year, 24-Hour Event
North Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

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Feet

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JonesEdmunds

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Phase 4 Inundation
100-Year, 24-Hour Event
West Florida Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

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Feet
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JonesEdmunds

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Phase 4 Inundation
100-Year, 24-Hour Event
Edgewater Acres
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

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Feet

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JonesEdmunds

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Phase 4 Inundation
100-Year, 24-Hour Event
G2 and G11 Canals
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

0 500 1,000

Feet

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JonesEdmunds

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Coco Palm Dr

Coco Palm Dr

Egret Ct

gret Ct

Falcon Ave

Silver Cir

Phase 4 Inundation
100-Year, 24-Hour Event
Pelican Shores
City of Edgewater Stormwater Master Plan



Legend

- Drainage Problem Area
- Post Inundation
- Pre Inundation

N

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