

Mead&Hunt

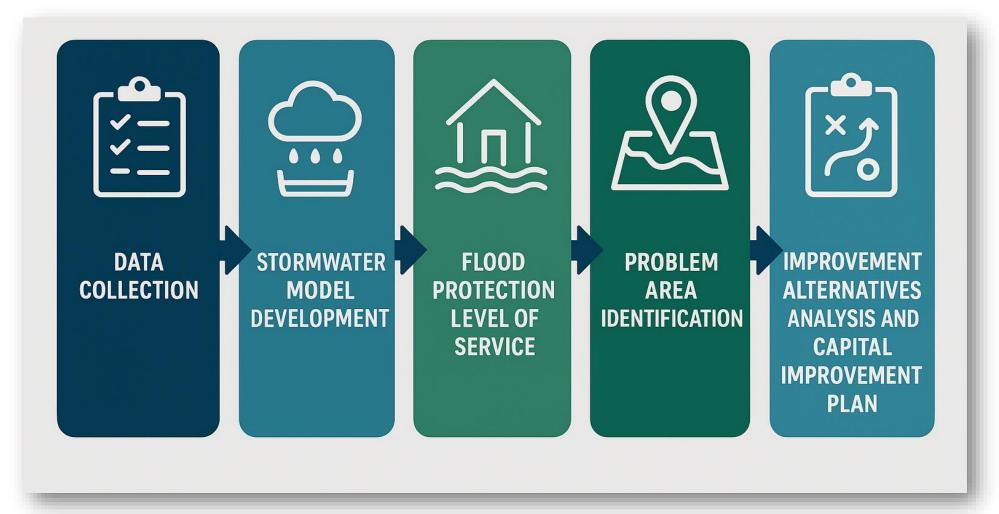


**JonesEdmunds** 

- Review Draft
   Stormwater Master
   Plan Findings and
   Recommendations
- Public Comment and Questions



### **Primary Project Tasks**





**Existing Stormwater Studies** and Models



2018 LiDAR Digital Elevation Model



GIS Stormwater Asset Inventories



**Existing Plan/As-built Data** 



2022 Landuse/Landcover Layer



Building Footprints and Impervious Layers



**NRCS Soils Data** 



**Aerial Imagery** 



**Parcel Data** 



Known Flooding Problem Areas



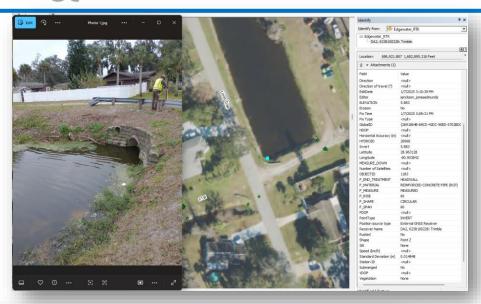
**FEMA Floodplains** 

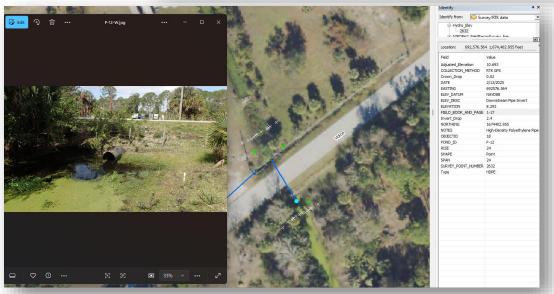


City's Comprehensive Plan

#### **Field Data Collection**

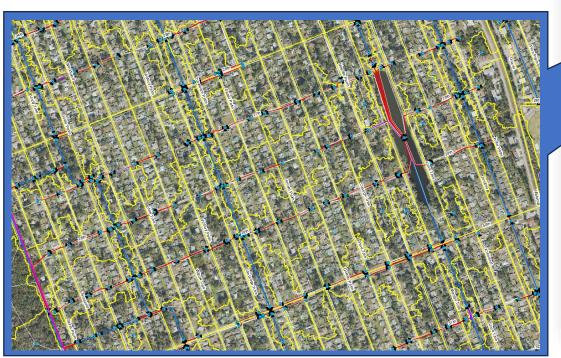
- Goal: Collect Data for Stormwater Model Development
- Collected Data at 1,135 Locations
  - Channel Cross-sections
  - Stormwater Collection Systems
  - Cross-Culverts
  - Pond Outfall Structures
- Data Collected Included
  - Invert Elevations
  - Size/shape
  - Material
  - Maintenance Condition
  - Photographs

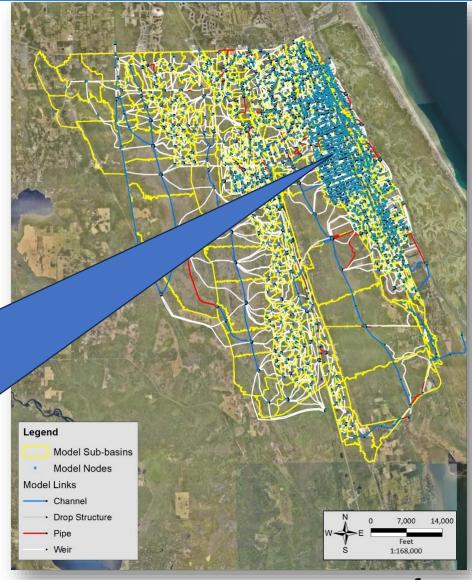




#### **Stormwater Model**

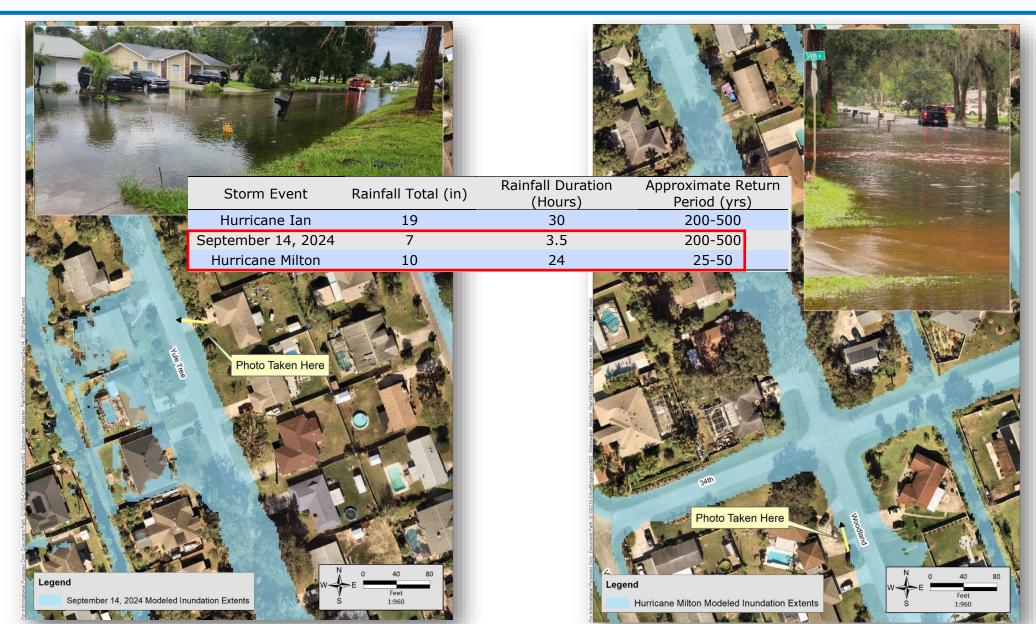
- Tool for:
  - Characterizing Existing Flooding
  - Testing and Developing Improvements
- Highly Detailed
- Extends Well Beyond the City's Limits





### **Stormwater Model: Verification**

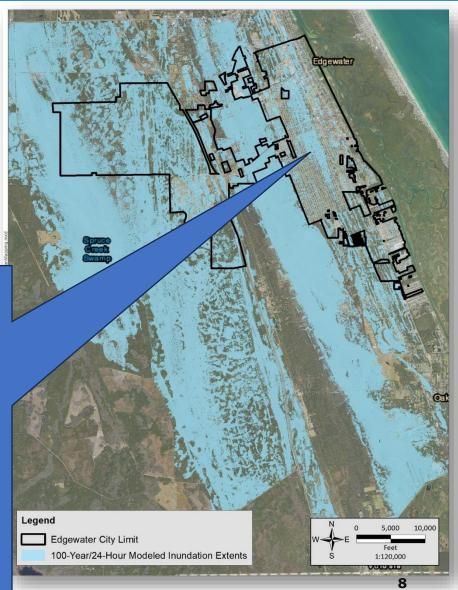
### **JonesEdmunds**



### **Stormwater Model**

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







- How well are you protecting from flooding under existing conditions?
- Where are the problems?
- Identified Structure, Residential Yard, and Roadway Flooding for each design event.

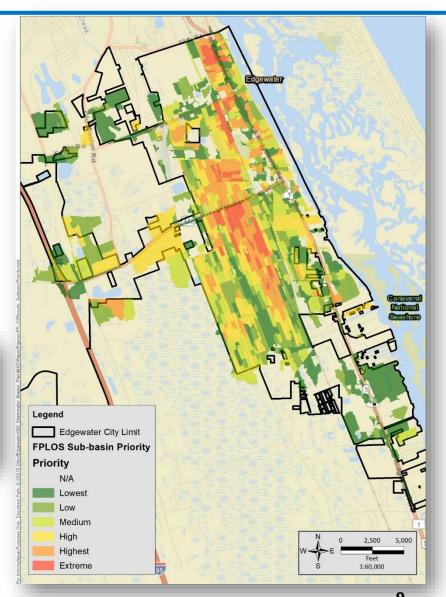
Policy 1.1.1: Stormwater Management System Level of Service Standards. The following Level of Service standards are hereby established for the City's stormwater management system.

Level A - No significant street flooding

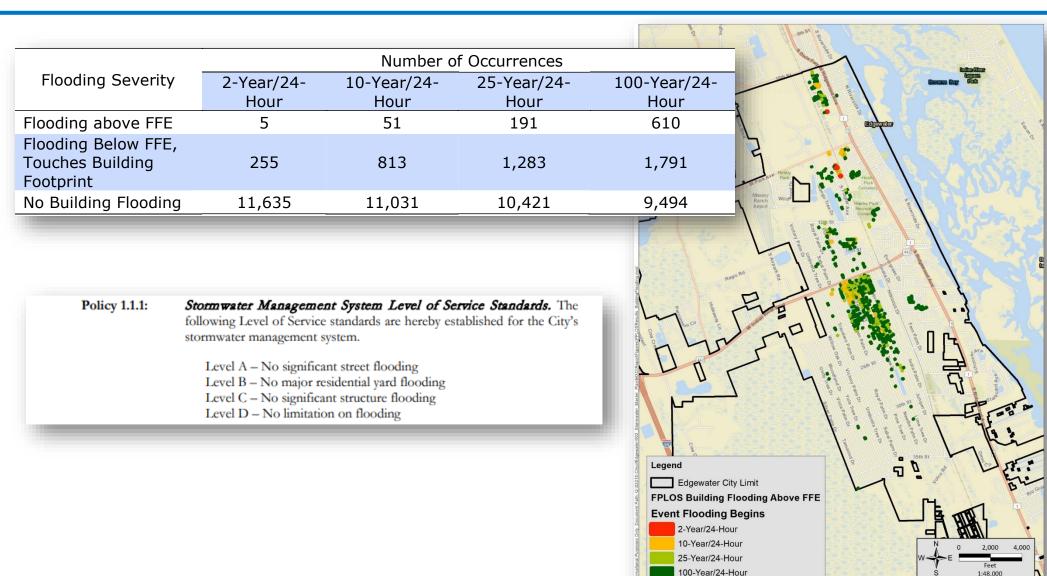
Level B - No major residential yard flooding

Level C - No significant structure flooding

Level D - No limitation on flooding









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	Number of Occurrences					
Flooding Severity	2-Year/24-	10-Year/24-	25-Year/24-	100-		
	Hour	Hour	Hour			
Yard Flooding 0-33%	1,832	2,766	2,930	2		
Yard Flooding 33-66%	215	576	794			
Yard Flooding 66-100%	42	367	769	1		
No Yard Flooding	7,966	6,349	5,562	4		

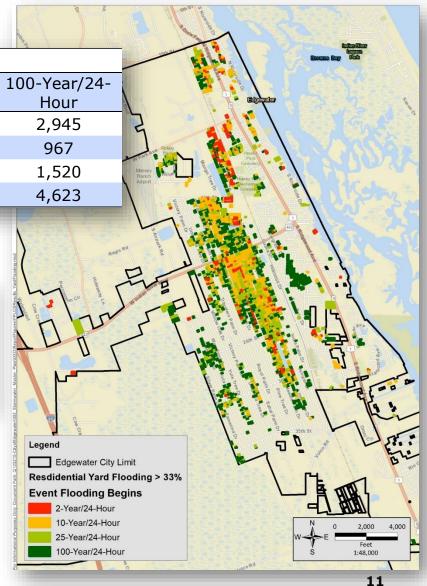
Policy 1.1.1: Stormwater Management System Level of Service Standards. The following Level of Service standards are hereby established for the City's stormwater management system.

Level A - No significant street flooding

Level B - No major residential yard flooding

Level C - No significant structure flooding

Level D - No limitation on flooding





			_			
	Number of Occurrences					
Flooding Severity	2-Year/24-	10-Year/24-	25-Year/24-	100		
	Hour	Hour	Hour			
Roadway Flooding Greater Than 6-inches	114	441	656			
Roadway Flooding Less Than 6-inches	385	617	629			
No Roadway Flooding	1,897	1,338	1,111			
				px		

**Stormwater Management System Level of Service Standards.** The following Level of Service standards are hereby established for the City's stormwater management system.

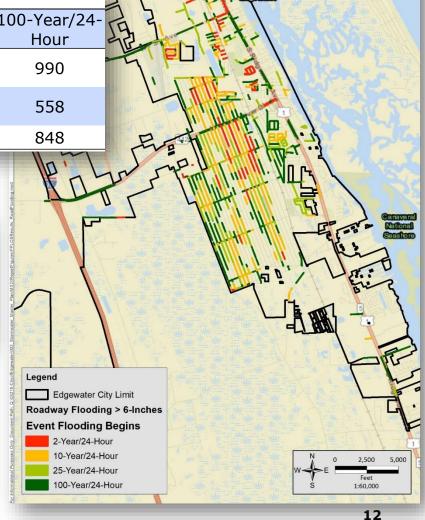
Level A - No significant street flooding

Level B - No major residential yard flooding

Level C - No significant structure flooding

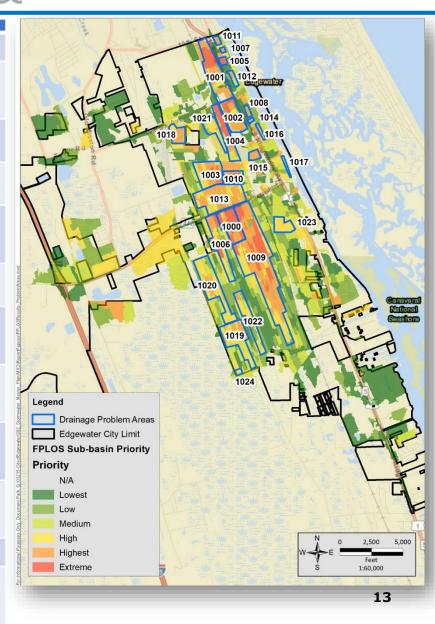
Level D - No limitation on flooding

Policy 1.1.1:



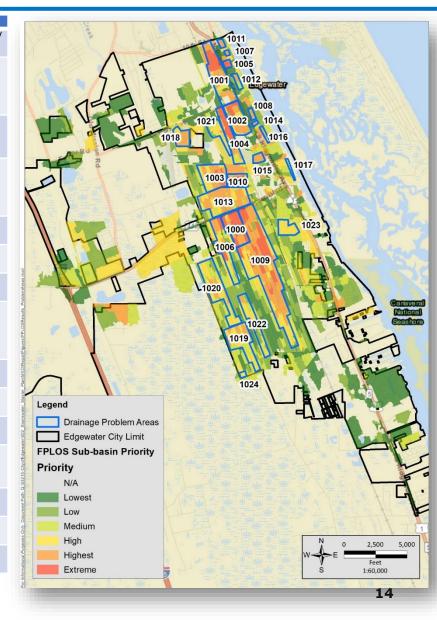
### **Problem Areas**

Problem				Number o	of Building w	ith Flooding	Above FFE
	Priority	Name	Location Description	2-Year/	10-Year/	25-Year/	100-Year
Area Id				24-Hour	24-Hour	24-Hour	24-Hour
1000	Tier 1	South Florida Shores: E10 Canal	South Florida Shores. E10 Canal basins between Indian River Boulevard (north), 22nd Street (south), Sabal Palm Drive (west), and Needle Palm Drive (east).	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).	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)	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).	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).	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).	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).	0	2	2	20
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).	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).	0	0	0	16
1015	Tier 2	Shangri La Village Subdivision	Shangri La Village Subdivision basin.	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).	0	0	0	4



### **Problem Areas**

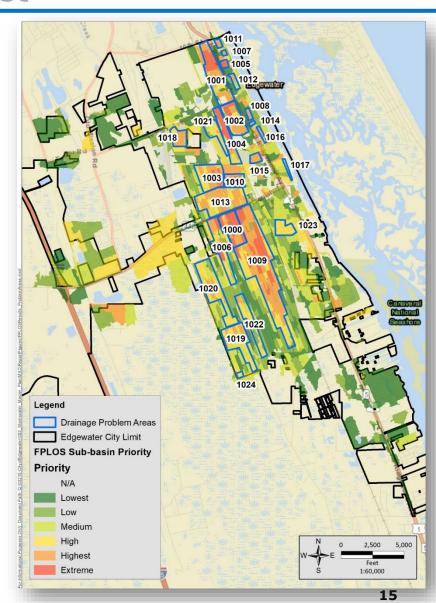
Deckler.				Number	of Building w	ith Flooding	Above FFE
Problem Area Id	Priority	Name	Location Description	2-Year/	10-Year/	25-Year/	100-Year/
Alealu				24-Hour	24-Hour	24-Hour	24-Hour
1020	Tier 2	South Florida Shores: T1, T2, T3, T4, and T5 Canals	South Florida Shores. T1, T2, T3, T4, and T5 Canal basins between 22nd Street (north), 30th Street (south), Silver Palm Drive (west), and Woodland Drive (east).	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).	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).	0	0	0	0
1023	Tier 2	Pelican Cove Subdivision	Pelican Cove Subdivision basins that drain into the E5 Canal.	0	0	0	21
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.	0	0	0	1
1007	Tier 3	Yelkca Terrace and Dixwood Avenue	Isolated depression between East Yelkca Terrace and Dixwood Avenue.	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).	0	0	0	0
1011	Tier 3	Sanchez Avenue and East Knapp Avenue	Isolated depressions between Hamilton Road (north) and Richport Lane (south).	0	0	0	0
1012	Tier 3	Evergreen Avenue	Isolated depression between Riverview Drive (north) and Plaza Lane (south).	0	0	0	0
1014	Tier 3	Hotel Street	Isolated depressions along Hotel Street between US-1 and Fernald Street.	0	0	0	0
1016	Tier 3	Fernald Street	Isolated depressions along Fernald Street between New Hampshire Street (north) and East Turgot Avenue (south).	0	0	0	0
1017	Tier 3	Riverside Drive	Riverside Drive between East Marion Avenue (north) and Virginia Street (south).	0	0	0	0
1018	Tier 3	Wildwood Subdivision	Wildwood Subdivision Basins.	0	0	0	0
1024	Tier 3	Silver Palm Drive and 35th Street	Intersection of Silver Palm Drive and 35th Street.	0	0	0	1





#### Grouped Tier 1 and Tier 2 Problem Areas

- Florida Shores South of Indian River Boulevard – Problem Areas 1000, 1009, 1006, and 1022
- Florida Shores North of Indian River Boulevard – Problem Areas 1003, 1010, and 1013
- Florida Shores West Problem Areas 1019 and 1020
- Edgewater Acres Problem Areas 1004 and 1021
- G2 and G11 Canals Problem Areas 1001, 1002, and 1015
- Pelican West Problem Area 1023



### **Florida Shores South**

## Mead& Jones Edmunds

Problem				Number	of Building w	ith Flooding	Above FFE
Area Id	Priority	Name	Location Description	2-Year/	10-Year/	25-Year/	100-Year/
Areara				24-Hour	24-Hour	24-Hour	24-Hour
1000	Tier 1	South Florida Shores: E10 Canal	South Florida Shores. E10 Canal basins between Indian River Boulevard (north), 22nd Street (south), Sabal Palm Drive (west), and Needle Palm Drive (east).	0	19	62	113
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).	0	3	74	254
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).	0	1	2	7
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).	0	0	0	0
			Total	0	23	138	374

Storm Event	Surface Flooding Volume				
Storiii Everit	(acre-feet)				
25-Year/24-Hour	228				
100-Year/24-Hour	403				
Equivalent to 100 acres					

with 4-feet of water or

~200 Olympic Swimming

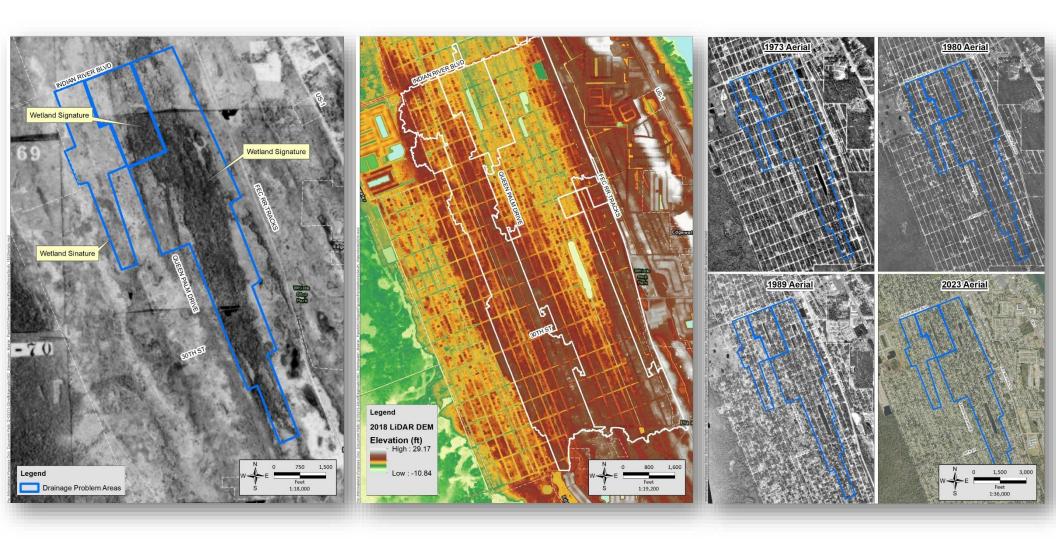
Pools

Model Nodes with 100-Year Peak Stage (ft-NAVD88) 100-Year/24-Hour Modeled Inundation Extents Subwatershed Boundaries

### **Flooding Drivers**



- Four recent storm events exceeding the 25–50-year return period storm.
- Florida Shores was developed in the 50's and 60's prior to modern stormwater regulations and design standards.
- Limited stormwater pond storage capacity Typically, 15-20% of newly developed area is reserved for stormwater ponds. Florida Shores South is ~1,300 acres, which would need 195-260 acres of ponds. Currently, there are ~36 acres of stormwater pond in Florida Shores South.
- Limited hydraulic capacity The drainage canals and pipes were originally intended to drain wetlands and provide mosquito control, not designed to handle 100-year flooding.
- Topographic challenges Worst flooding areas are in topographic low spots that were historically wetlands.
- Increasing impervious area as Florida Shores has experienced infill.
- Loss of surface storage as Florida Shores has experienced infill.



#### **Florida Shores North**

### Mead& Junt Jones Edmunds

Problem				Number	of Building w	ith Flooding	Above FFE
Area Id	Priority	Name	Location Description	2-Year/	10-Year/	25-Year/	100-Year/
Alealu				24-Hour	24-Hour	24-Hour	24-Hour
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).	0	2	5	20
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).	0	2	2	20
1013	Tier 1	North Florida Shores: E1, E11, and E12 Canals South of 16th Street	basins between 16th Street (north), Indian	0	0	0	16
			Total	0	4	7	56

Storm Event

Surface Flooding Volume (acre-feet)

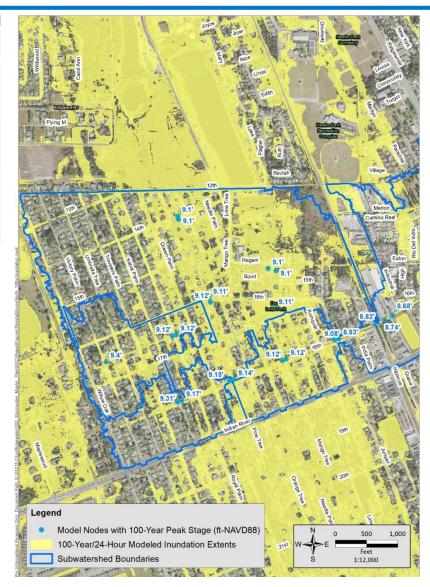
25-Year/24-Hour

/1

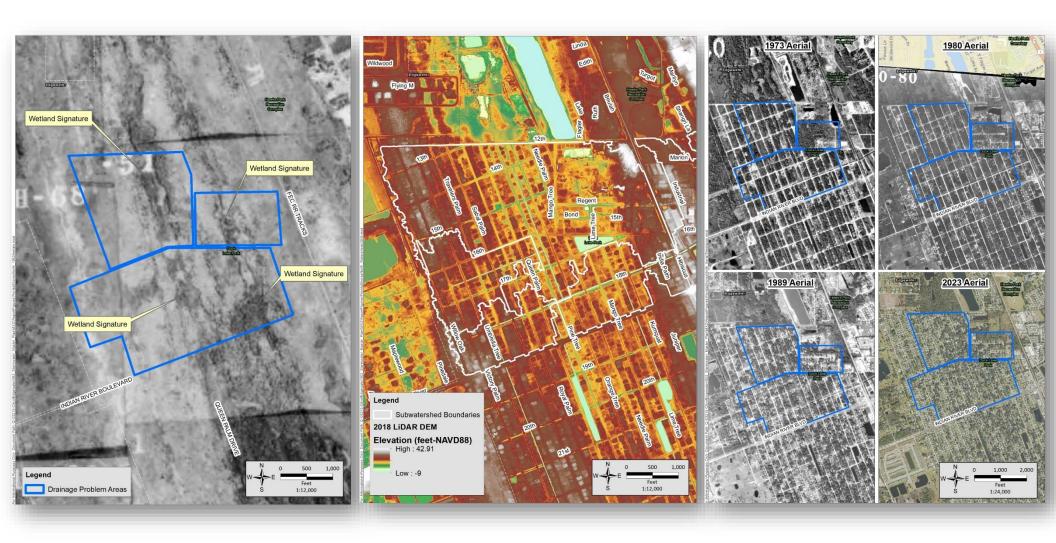
100-Year/24-Hour

132

Equivalent to 33 acres with 4-feet of water or ~65 Olympic Swimming Pools



- Four recent storm events exceeding the 25–50-year return period storm.
- Florida Shores was developed in the 50's and 60's prior to modern stormwater regulations and design standards.
- Limited stormwater pond storage capacity Typically, 15-20% of newly developed area is reserved for stormwater ponds. Florida Shores North is ~420 acres, which would need 63-84 acres of ponds. Currently, there are ~7 acres of stormwater pond in Florida Shores North.
- Limited hydraulic capacity The drainage canals and pipes were originally intended to drain wetlands and provide mosquito control, not designed to handle 100-year flooding.
- Topographic challenges Worst flooding areas are in topographic low spots that were historically wetlands.
- Increasing impervious area as Florida Shores has experienced infill.
- Loss of surface storage as Florida Shores has experienced infill.



### **Florida Shores West**

### Mead& Junt Jones Edmunds

Problem				Number o	Number of Building with Flooding Above FFE			
Area Id	Priority	Name	Location Description	2-Year/	10-Year/	25-Year/	100-Year/	
Alealu				24-Hour	24-Hour	24-Hour	24-Hour	
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).	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).	0	0	0	2	
			Total	0	0	0	6	

Storm Event

Surface Flooding Volume
(acre-feet)

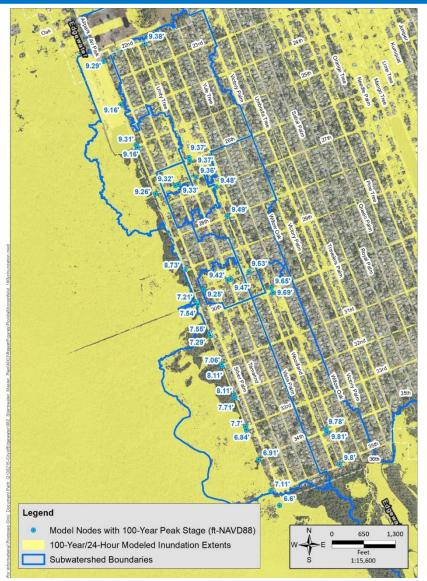
25-Year/24-Hour

38

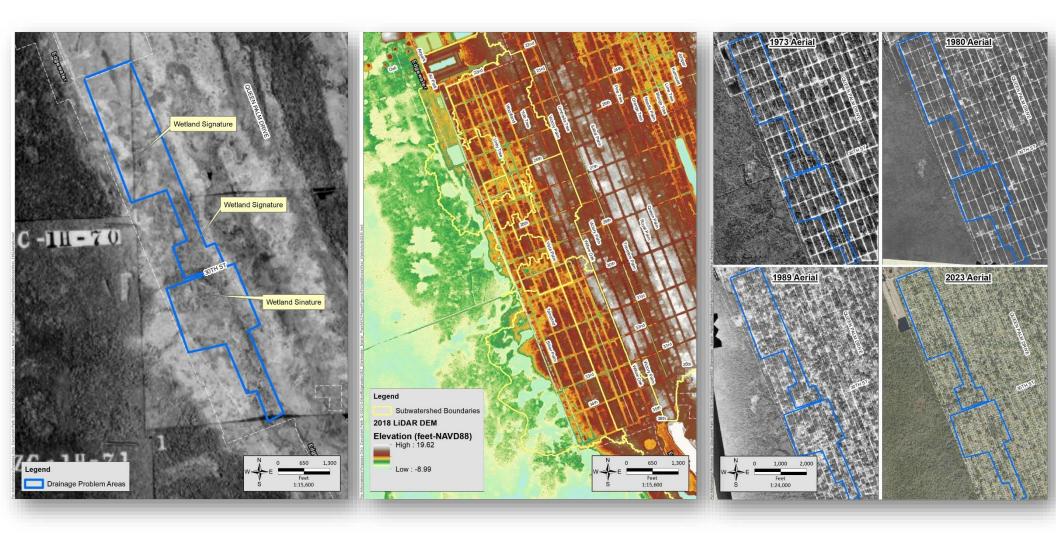
73

100-Year/24-Hour

Equivalent to 18 acres with 4-feet of water or ~35 Olympic Swimming Pools

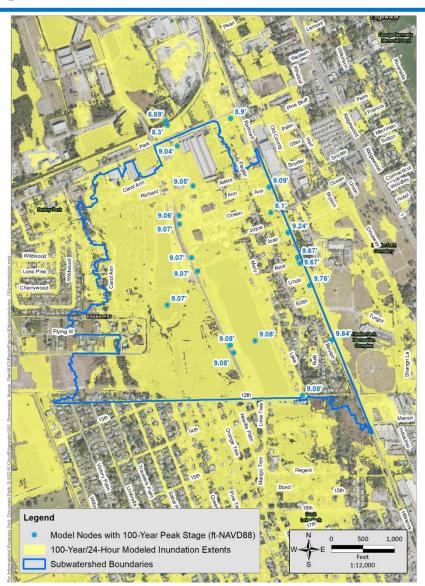


- Four recent storm events exceeding the 25–50-year return period storm.
- Florida Shores was developed in the 50's and 60's prior to modern stormwater regulations and design standards.
- Limited stormwater pond storage capacity Typically, 15-20% of newly developed area is reserved for stormwater ponds. Florida Shores West is ~510 acres, which would need 77-102 acres of ponds. Currently, there are ~6.5 acres of stormwater pond in Florida Shores West.
- Limited hydraulic capacity The drainage canals and pipes were originally intended to drain wetlands and provide mosquito control, not designed to handle 100-year flooding.
- Topographic challenges Worst flooding areas are in topographic low spots that were historically wetlands.
- Increasing impervious area as Florida Shores has experienced infill.
- Loss of surface storage as Florida Shores has experienced infill.



### **Edgewater Acres**

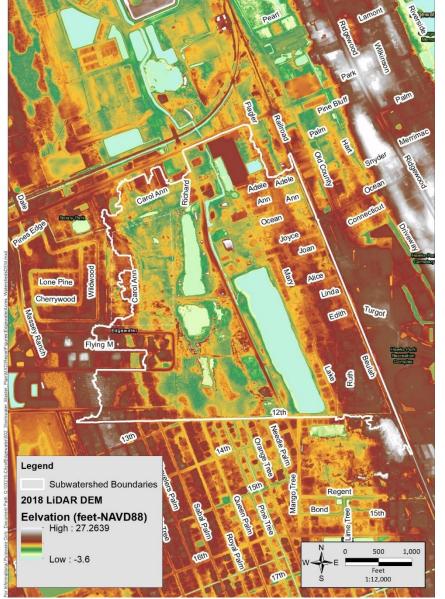
Problem				Number of Building with Flooding Above FFE				
	Area Id Priority Name	Name	Location Description	2-Year/	10-Year/	25-Year/	100-Year/	
Area Iu				24-Hour	24-Hour	24-Hour	24-Hour	
1004	Tier 1	Edgewater Acres East	Unnamed ditch basins between Park Avenue (north), Beulah Drive (south), railroad tracks (east), and Lake Avenue (west).	4	9	12	22	
1021	Tier 2	Edgewater Acres West	G5 Canal basins between Park Avenue (north), 12th Street (south), Mango Tree Drive (west), and Lake Avenue (east).	0	0	0	21	
			Total	4	9	12	43	



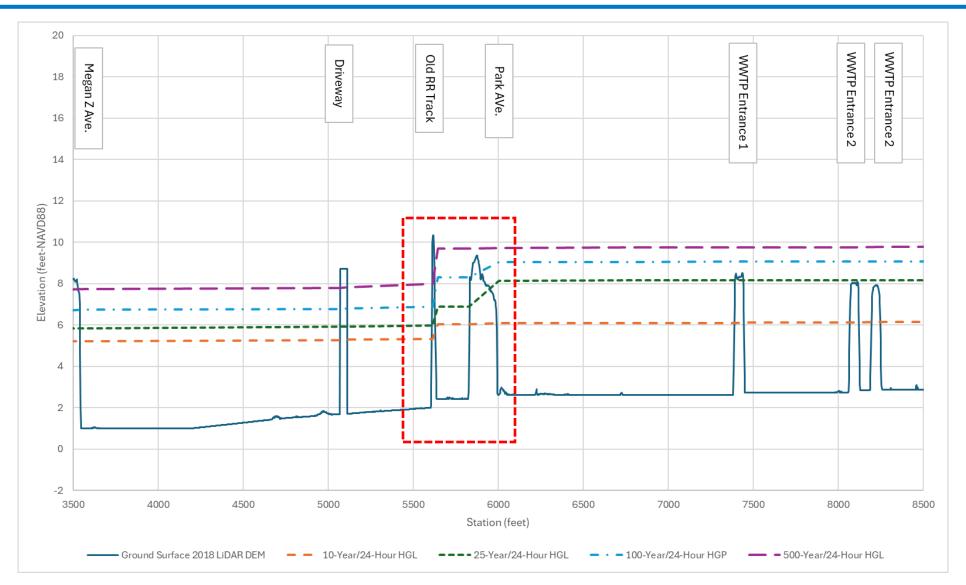
- Four recent storm events exceeding the 25–50-year return period storm.
- Area was developed in the 50's and 60's prior to modern stormwater regulations and design standards.
- Limited hydraulic capacity The drainage canals and pipes were originally intended to drain wetlands and provide mosquito control, not designed to handle 100-year flooding. Undersized culverts at Park Avenue and old railroad track crossing.
- Topographic challenges Worst flooding areas are in topographic low spots that were historically wetlands.
- Significant offsite flow from south of 12<sup>th</sup> Street 730 cubic-feetper-second in the 100-year/24-hour event.

### **Edgewater Acres**



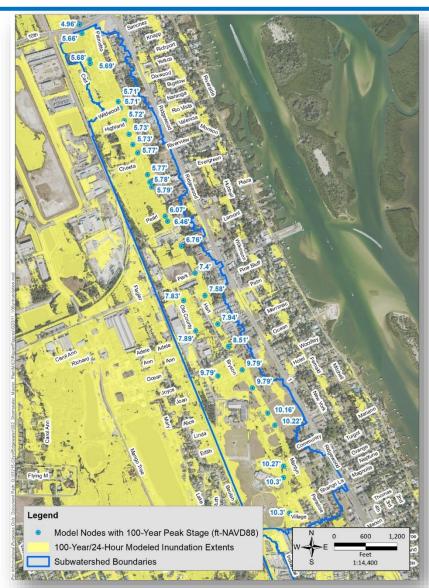


### **Edgewater Acres**



### **G2-G11 Canals**

Problem				Number o	Number of Building with Flooding Above FFE				
Area Id	Priority	Name	Location Description	2-Year/	10-Year/	25-Year/	100-Year/		
Alealu				24-Hour	24-Hour	24-Hour	24-Hour		
1001	Tier 1	G2 Canal North	G2 Canal basins between 10th Street (north), Park Avenue (south), railroad tracks (west), and US-1 (east).	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)	0	6	10	29		
1015	Tier 2	Shangri La Village Subdivision	Shangri La Village Subdivision basin.	0	0	0	8		
			Total	1	15	33	104		

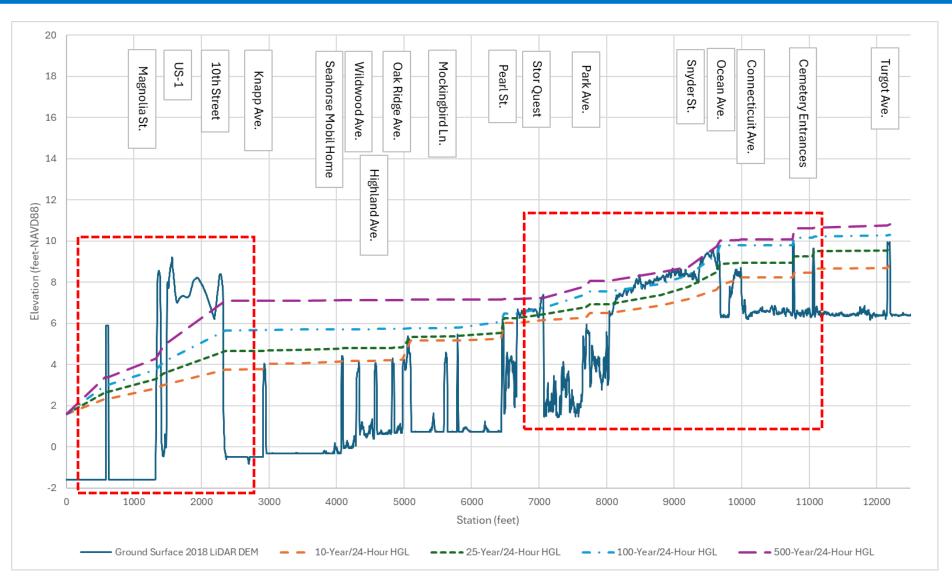


- Four recent storm events exceeding the 25–50-year return period storm.
- Area was developed in the 50's and 60's prior to modern stormwater regulations and design standards.
- Limited hydraulic capacity The drainage canals and pipes were originally intended to drain wetlands and provide mosquito control, not designed to handle 100-year flooding.
- Topographic challenges Worst flooding areas are in topographic low spots that were historically wetlands.
- Increasing impervious area as the area has experienced infill.
- Loss of surface storage as the area has experienced infill.

## Mead& Jones Edmunds

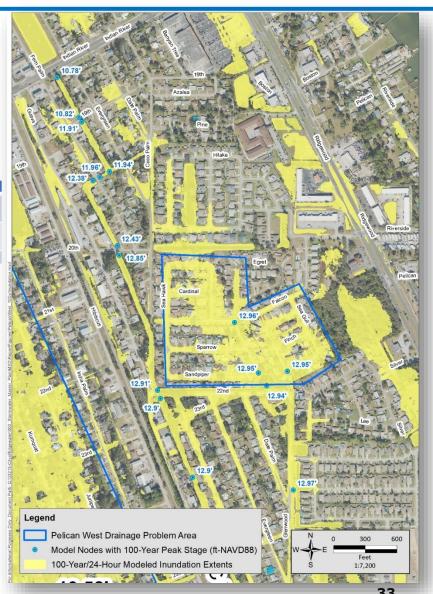




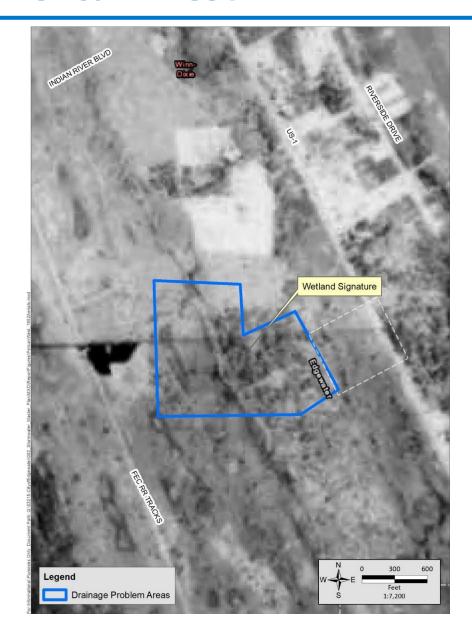


### **Pelican West**

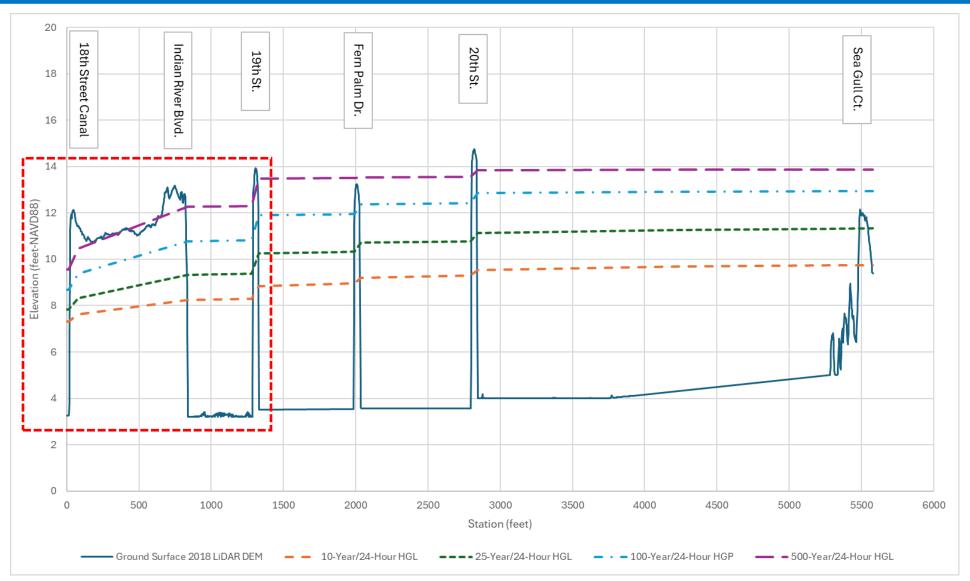
Problem Area Id	Priority	Name	Location Description	Number of 2-Year/ 24-Hour	of Building w 10-Year/ 24-Hour	ith Flooding 25-Year/ 24-Hour	Above FFE 100-Year/ 24-Hour
1023	Tier 2	Pelican Cove Subdivision	Pelican Cove Subdivision basins that drain into the E5 Canal.	0	0	0	21
		Subulvision	Total	0	0	0	21



- Four recent storm events exceeding the 25–50-year return period storm.
- Area was developed prior to modern stormwater regulations and design standards.
- Limited hydraulic capacity The drainage canals and pipes were originally intended to drain wetlands and provide mosquito control, not designed to handle 100-year flooding.
- Topographic challenges Worst flooding areas are in topographic low spots that were historically wetlands.







## PRELIMINARY DESIGN

# CONCEPTUAL DESIGN

### DETAILED ANALYSIS

## FINAL PHASING

- "Big picture" improvements
- Ideas from the City
- Ideas from citizen comments
- Ideas utilizing existing infrastructure

- Different alternatives for each concept
- Start modeling alternative groups
- Creating detailed models of the chosen alternatives
- Individual models
- Grouped alternatives into phases
- Detailed model including future conditions

### **Conceptual Design**



#### **Channel Improvements**

- •18th Street Channel Improvements
- •21st Street Channel
- •23rd Street Channel
- •25th Street Channel
- •27th Street Channel
- •Silver Palm Ditch Improvements
- •35th Street Channel to Volco via Pond

#### **Pipe Improvements**

- Increase All Pipes
- Problem Area Pipe Improvements
- Pipes and Box Culverts on W Indian River Blvd
- Volco Road Pipe
- •G5 Culverts Under Park
- Edgewater Acres Pipe Improvements

#### **New Outfalls**

- •20th Street / Friendly Shores
  Outfall
- •27th Street / South Outfall
- Whistle Stop Park Channel Extension
- New Outfall along Volco Road

#### **Pump Stations**

- •18th Street Channel Pump Station
- Duck Pond Pump Station
- Pump Stations on Existing Ponds
- Pump Station on Reclaim Pond
- Pump Stations on Proposed Mango and Massey Pond
- Pump Station on 30-acre Florida Shores Pond
- Pump Station at Riverside Drive

#### **Storage**

- •15th Street / Mango Pond
- Massey Pond
- •21st Street / Willow Pond
- •35th Street Lake
- Borrow Pit Pond
- Vacant Land Pond
- •30-Acre Pond on E9
- •30-Acre Pond on E10
- Pelican West Storage
- •100-Acre Pond in Florida Shores on E9 and E10

#### **Backflow Prevention**

- •Knapp Ave (G2 G11 Group A)
- •18th Street Channel Backflow Prevention
- 25th Channel Backflow Prevention
- •23rd Channel Backflow Prevention

#### **Other Improvements**

- •Lower Berm on Silver Palm Ditch
- •Raise Reclaim Pond South Berm
- •Ragis Road Berm
- •Group A + B Improvements
- Church Pond
- •15-Acre Pearl Pond Expansion
- •West Pine Bluff Pond Expansion

110 Alternatives
Evaluated

### **Detailed Design**



#### **Channel Improvements**

- Silver Palm Ditch Improvements
- 23rd Street Channel
- 25th Street Channel
- 27th Street Channel
- 18<sup>th</sup> Street Canal Improvements

#### **Pipe Improvements**

- Volco Pipe Improvements
- Box Culvert Indian River
   Blvd
- G5 Culverts Under Park Remove 5 Pipes
- Edgewater Acres Pipe Improvements

#### **New Outfalls**

- Friendly Shores Outfall -To Pelican West - Storage
- Friendly Shores Outfall -To E9

#### **Pump Stations**

- Pump Stations on Existing Ponds
- Pump Stations (Mango + Massey)
- Duck Pump Station
- Pump Station on E9 30acre pond
- Reuse Pond Pump
   Station Dewatered

#### **Storage**

- 30-Acre Pond (E9)
- Pelican West Storage
- 15-acre Pond at Pearl
- Church Pond
- Mango Pond to E11 Channel
- Massey Pond to E11 Channel
- Florida Shores 100-Acre Pond E9 E10
- 21st Street Pond to E9

#### **Backflow Prevention**

- Knapp Ave (G2 G11 Group A)
- 18th Street Channel Backflow Prevention
- 25th Channel Backflow Prevention
- 23rd Channel Backflow Prevention

#### **Other Improvements**

Group A + B
 Improvements

25 Alternatives
Developed

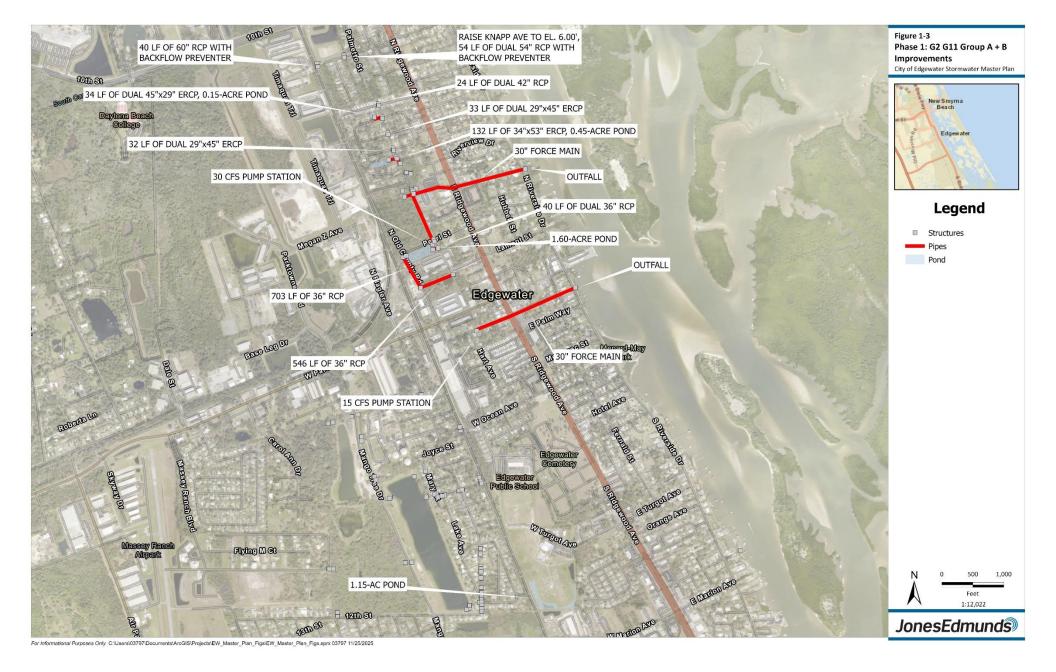


- Phase 1 project selection
  - Projects that can be built on existing vacant land
  - Projects that work independently of each other
  - Projects that the City has expressed interest in performing or are already under design and construction
  - Projects that do not require additional property acquisitions

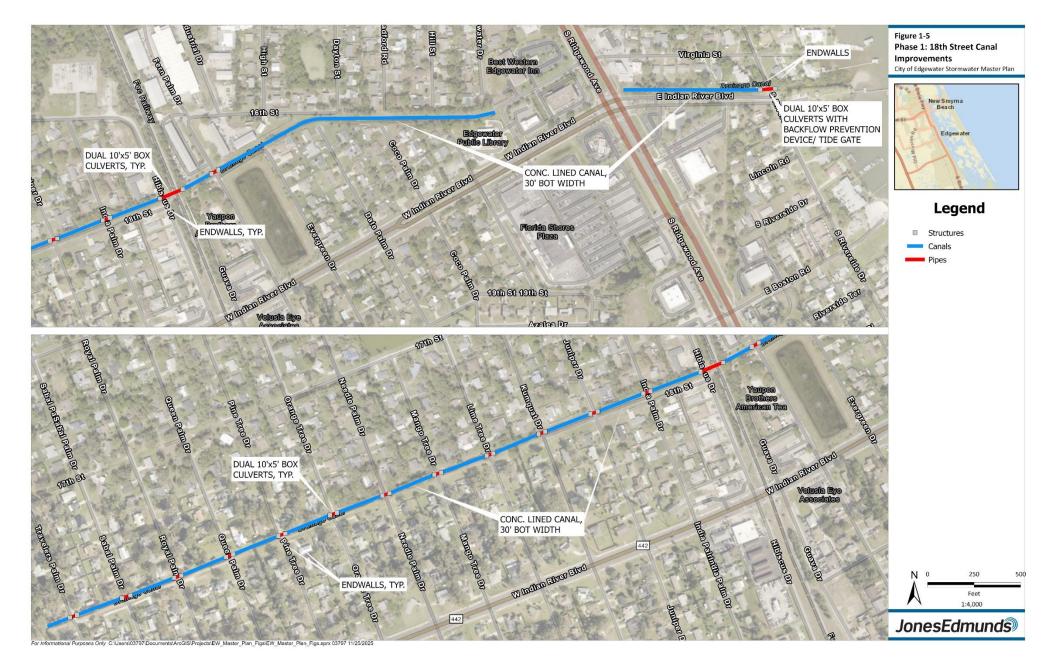
- Individual project
  - Pump Stations on Existing Ponds
  - Volco Road Culverts
  - G2 G11 Group A + B Improvements
  - Duck Pond Pump Station
  - 18<sup>th</sup> Street Canal Improvements
  - Reuse Pond Pump Station
  - Edgewater Acres Pipe Improvements
  - 27th Street Channel to E9
  - Silver Palm Ditch Improvements



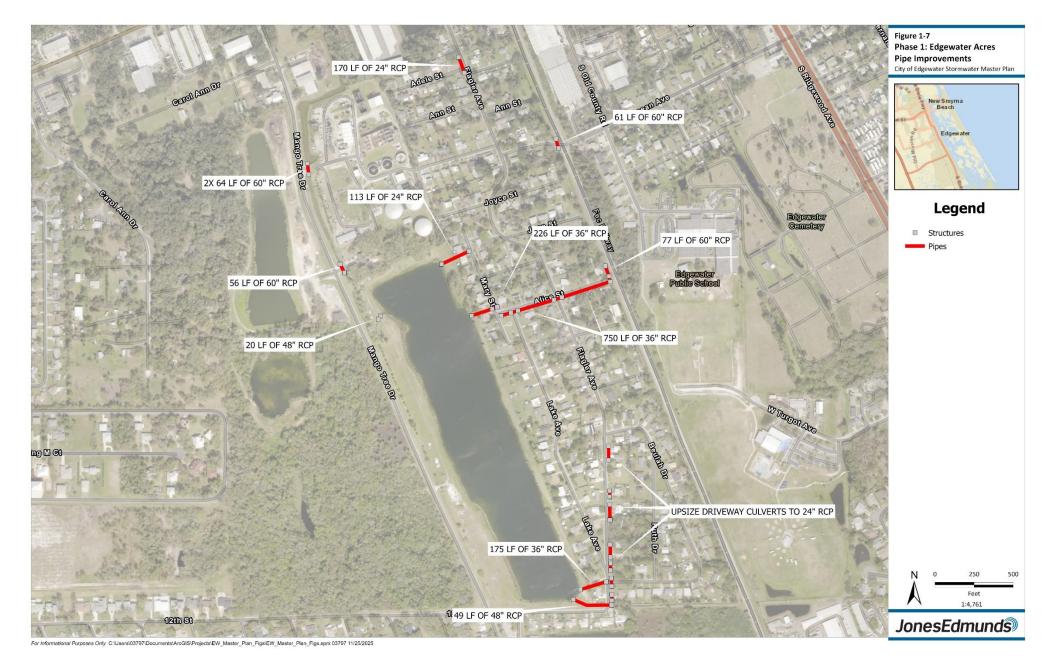








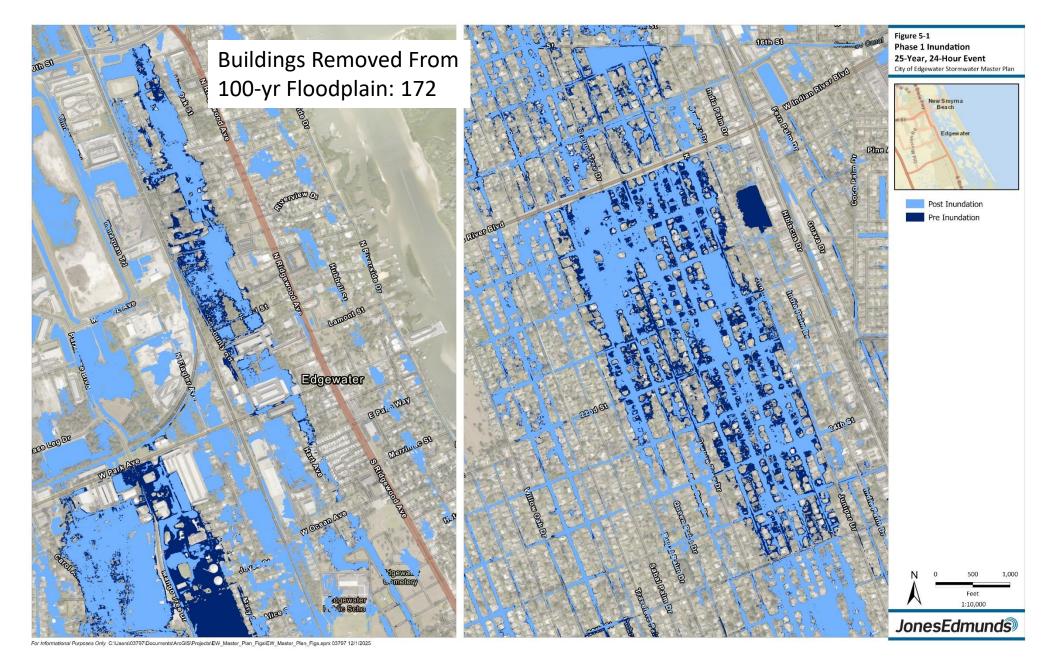




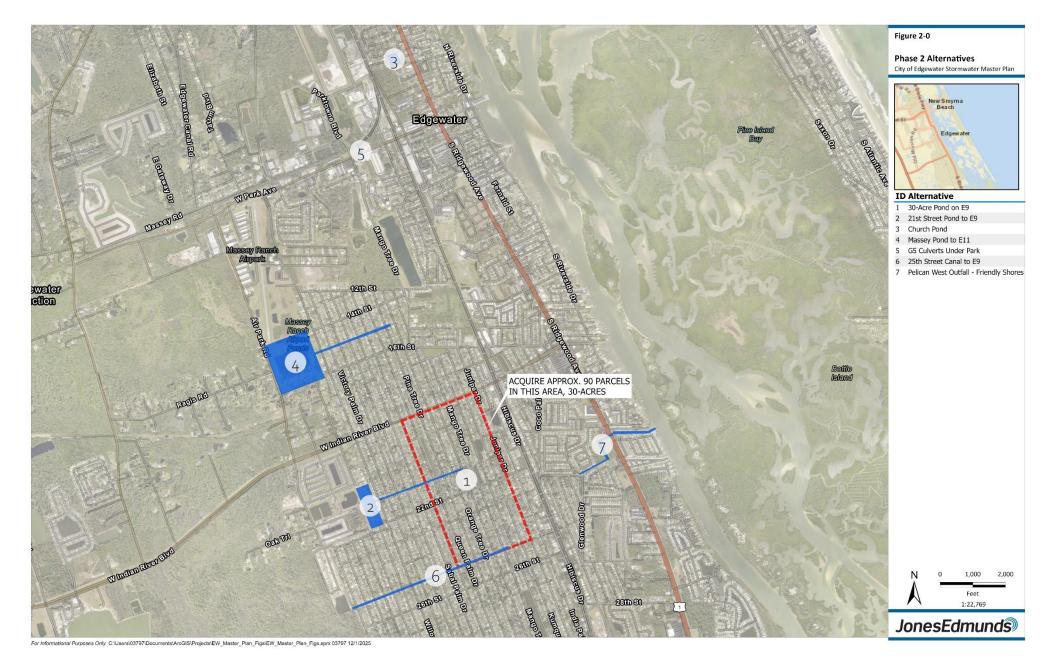


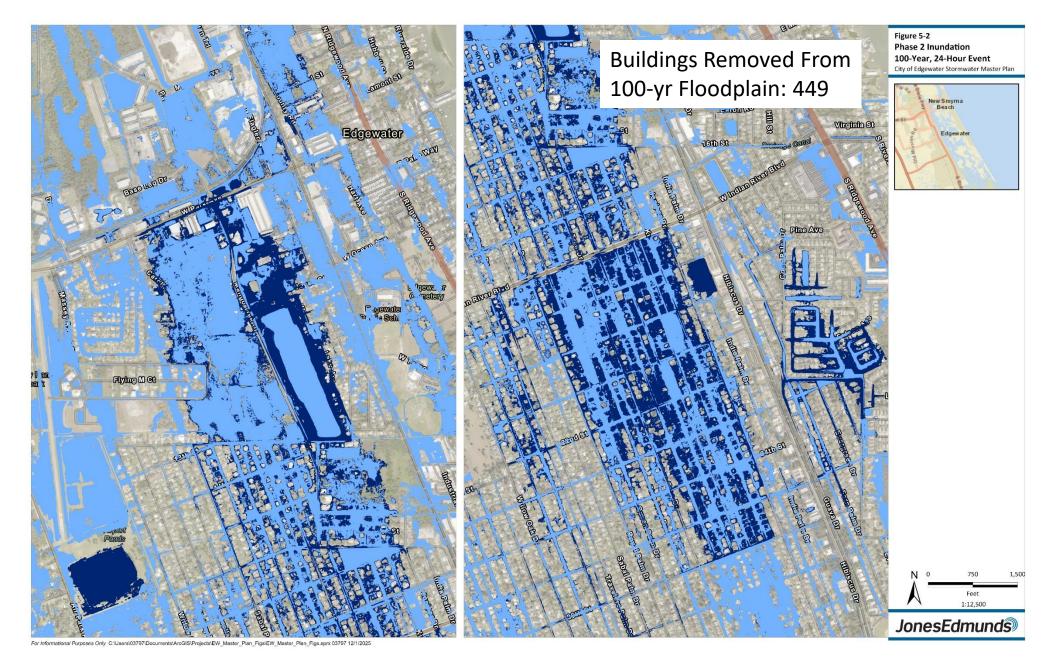






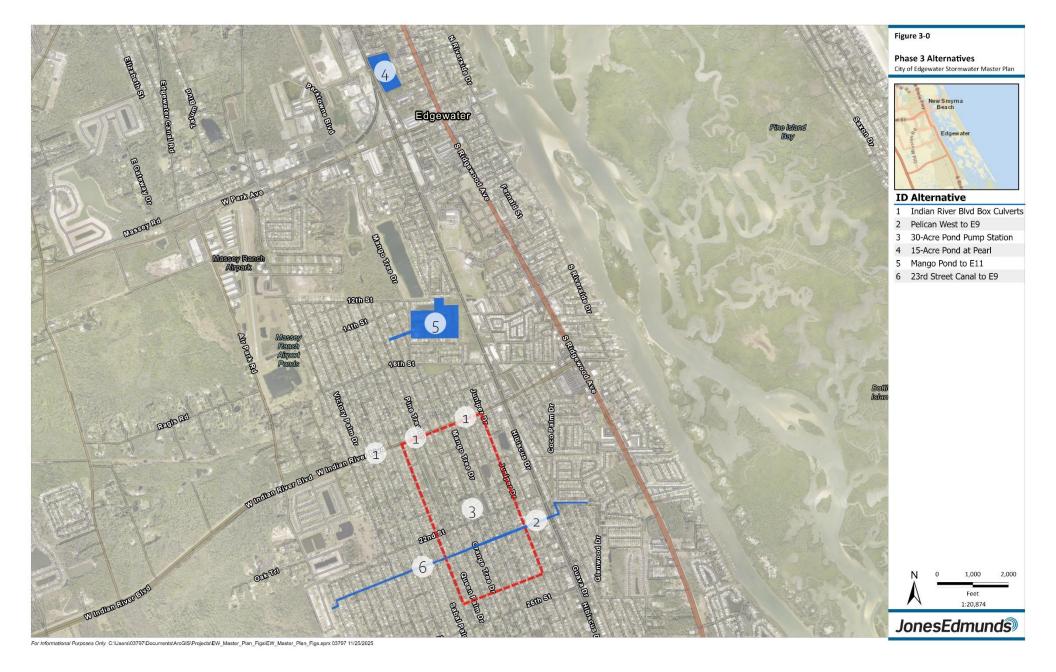
- Phase 2 project selection
  - Projects that require property acquisitions
  - Projects that require Phase 1 projects to avoid downstream impacts
  - Projects that will pose more permitting challenges
    - FDOT, FEC Railway, USACE
  - Projects that supplement projects from Phase 1
    - i.e. the E to W channels on 23rd, 25th, and 27th.
- Individual projects:
  - 30-Acre Pond (E9)
  - 21st Street Pond to E9
  - Church Pond
  - Massey Pond to E11 Channel
  - G5 Culverts Under Park Improvements
  - 25th Street Canal to E9
  - Friendly Shores Outfall To Pelican West Storage
  - Pelican West Storage

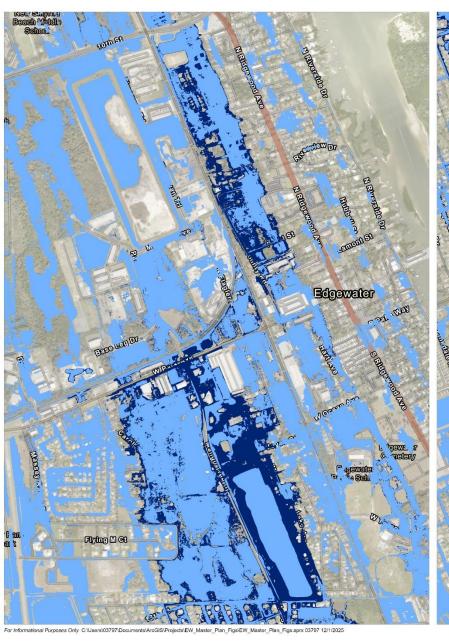


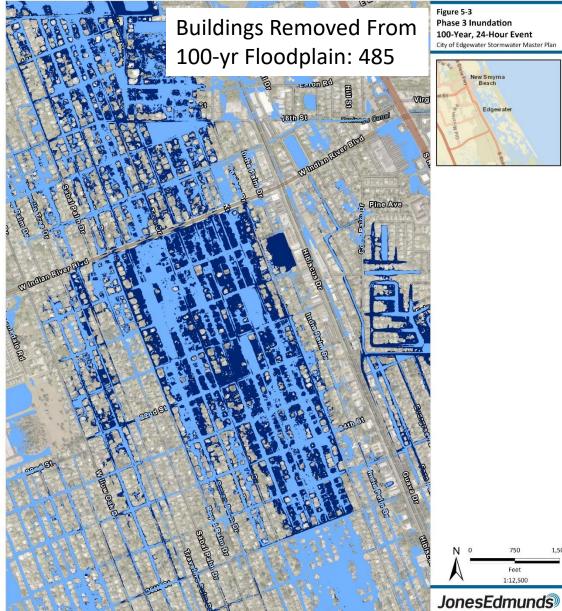




- Phase 3 project selection
  - Additional storage and conveyance improvements to supplement Phases 1 and 2
  - Projects that require Phases 1 and 2 projects to avoid downstream impacts
- Individual projects:
  - Box Culvert Indian River Blvd
  - Friendly Shores Outfall To E9
  - 15-acre Pond at Pearl
  - Mango Pond to E11 Channel
  - 23rd Street Channel to E9







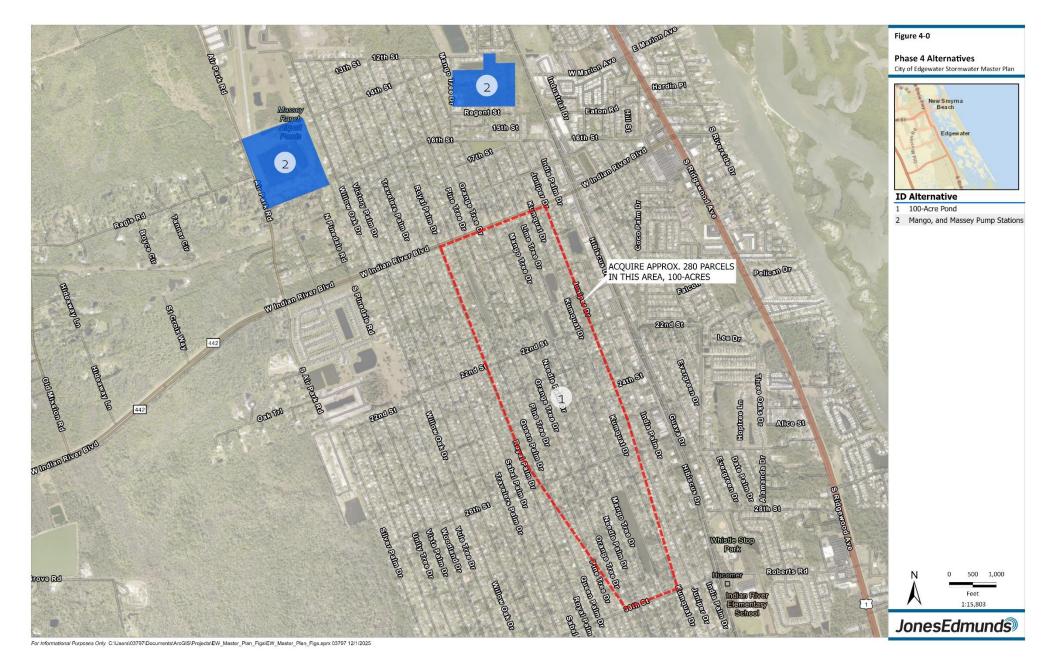
New Smyrna Beach

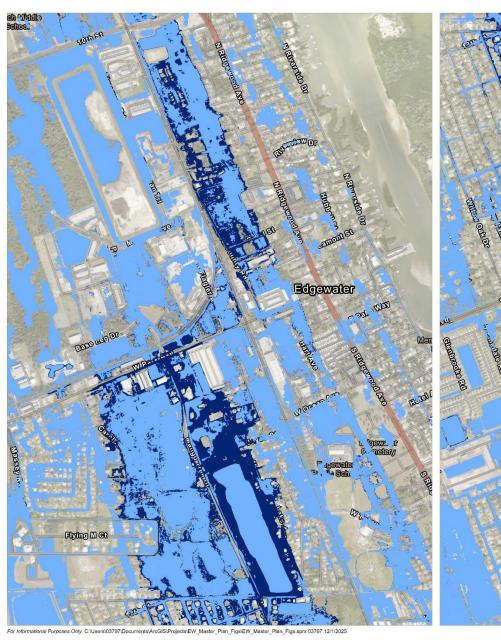
Edgewater

1:12,500



- Phase 4 project selection
  - Projects that require large amount of property acquisitions in Florida Shores
  - Projects are intended to address flooding associated with predicted sea level rise
- Individual projects:
  - Florida Shores 100-Acre Pond
  - Pump Stations (Mango + Massey)





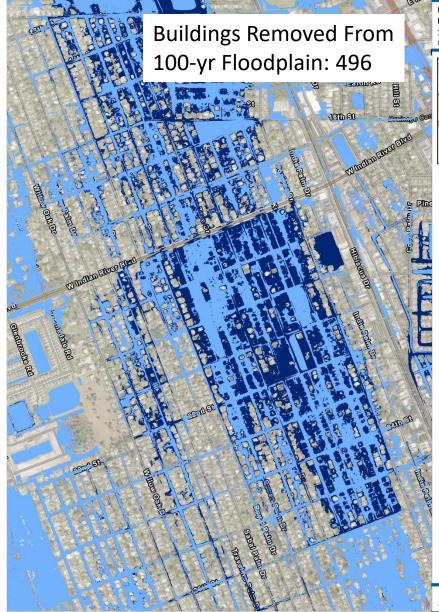


Figure 5-4
Phase 4 Inundation
100-Year, 24-Hour Event

City of Edgewater Stormwater Master Plan





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## **Summary of Costs**



ID	Phase 1	Phase 2	Phase 3	Phase 4
Florida Shores - South of 442 Problem Areas: 1000, 1009, 1006	- Pump Stations on Existing Ponds (\$30-40m)	- 30-Acre Pond on E9 (\$20m-25m)	- Box Culvert Indian River Blvd (\$2.5m-3.5m)	- Florida Shores 100-Acre Pond (\$40m-60m)
	- Volco Pipe (~\$90,000-110,000)	- 21st Street Pond to E9 (\$4m-5m)	- Friendly Shores Outfall - To E9 (\$4m-6m)	
G2 & G11 Problem Areas: 1001, 1002, 1015	- G2 G11 Group A Improvements (\$3m)	- Church Pond (\$500,000-600,000)	- 15-acre Pond at Pearl (\$2.5m-3.5m)	
	- G2 G11 Group B Improvements (\$6m-7m)			
Florida Shores - North of 442 Problem Areas: 1003, 1010, 1013	- Duck Pump Station (\$15m-25m)	- Massey Pond to E11 Channel (\$4m-5m)	- Mango Pond to E11 Channel (\$4m-5m)	- Mango + Massey Pump Stations (\$30m-40m)
	- E01 Outfall + Canal Improvements (\$10m-15m)			
Edgewater Acres - WWTP Problem Areas: 1004, 1021	- Reuse Pond Pump Station (\$20m-30m)	- G5 Culverts under Park Ave (\$500,000-1,000,000)		
	- Edgewater Acres Improvements (\$500,000-1,000,000)			
Florida Shores - West Side Problem Areas: 1019, 1020, 1022	- 27th Street Channel to E9 (\$7m-10m)	- 25th Street Canal to E9 (\$7m-10m)	- 23rd Street Channel to E9 (\$7m-10m)	
	- Silver Palm Ditch Improvements (\$200,000-250,000)			
Pelican West Problem Areas: 1023		- Friendly Shores Outfall (\$3.5m-4.5m)		
		- Pelican West Storage (\$3.5m-4.5m)		
TOTAL COST	- \$83m-121m	- \$43m-56m	- \$20m-28m	- \$70m-100m

Total Cost: \$216m - \$305m (Does not Include Property Acquisition Cost)



**Mead Hunt** 



**JonesEdmunds**