



INDIAN RIVER SHORES **VULNERABILITY ASSESSMENT**

Presented By:





Introduction and Overview



Reasons for a Vulnerability Assessment



Scenarios Examined



Critical Assets Analyzed



Findings



Stakeholder input



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What is a Vulnerability Assessment



Introduction and Overview

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Assesses the extent to which a community is vulnerable to adverse impacts from flooding resulting from:

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3. Projected sea level rise.



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Such adverse impacts pose economic, social, environmental, and public health and safety challenges to the state. To most effectively address these challenges

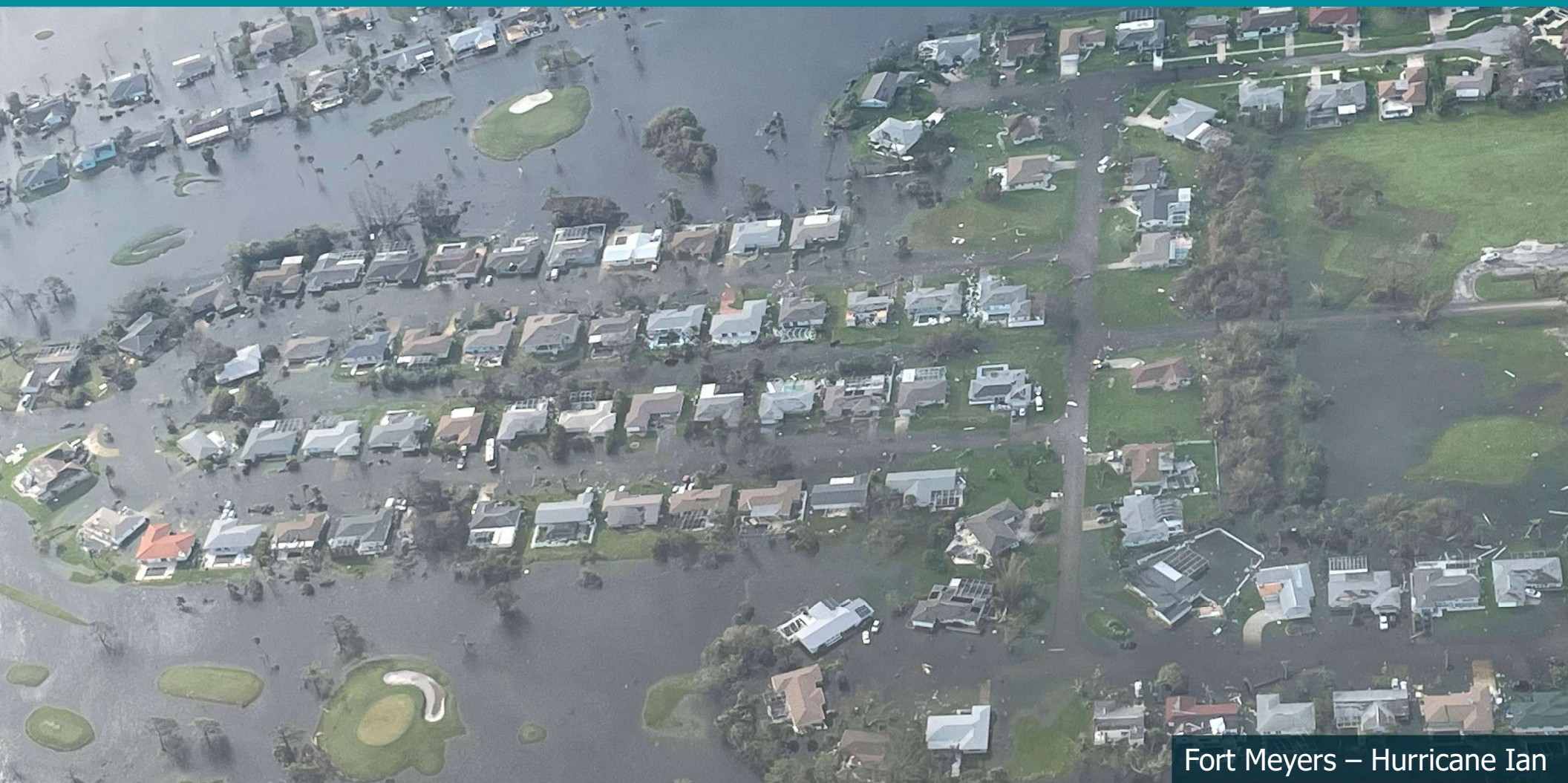


Introduction and Overview

At Risk vs. Resilient



Introduction and Overview



Fort Meyers – Hurricane Ian

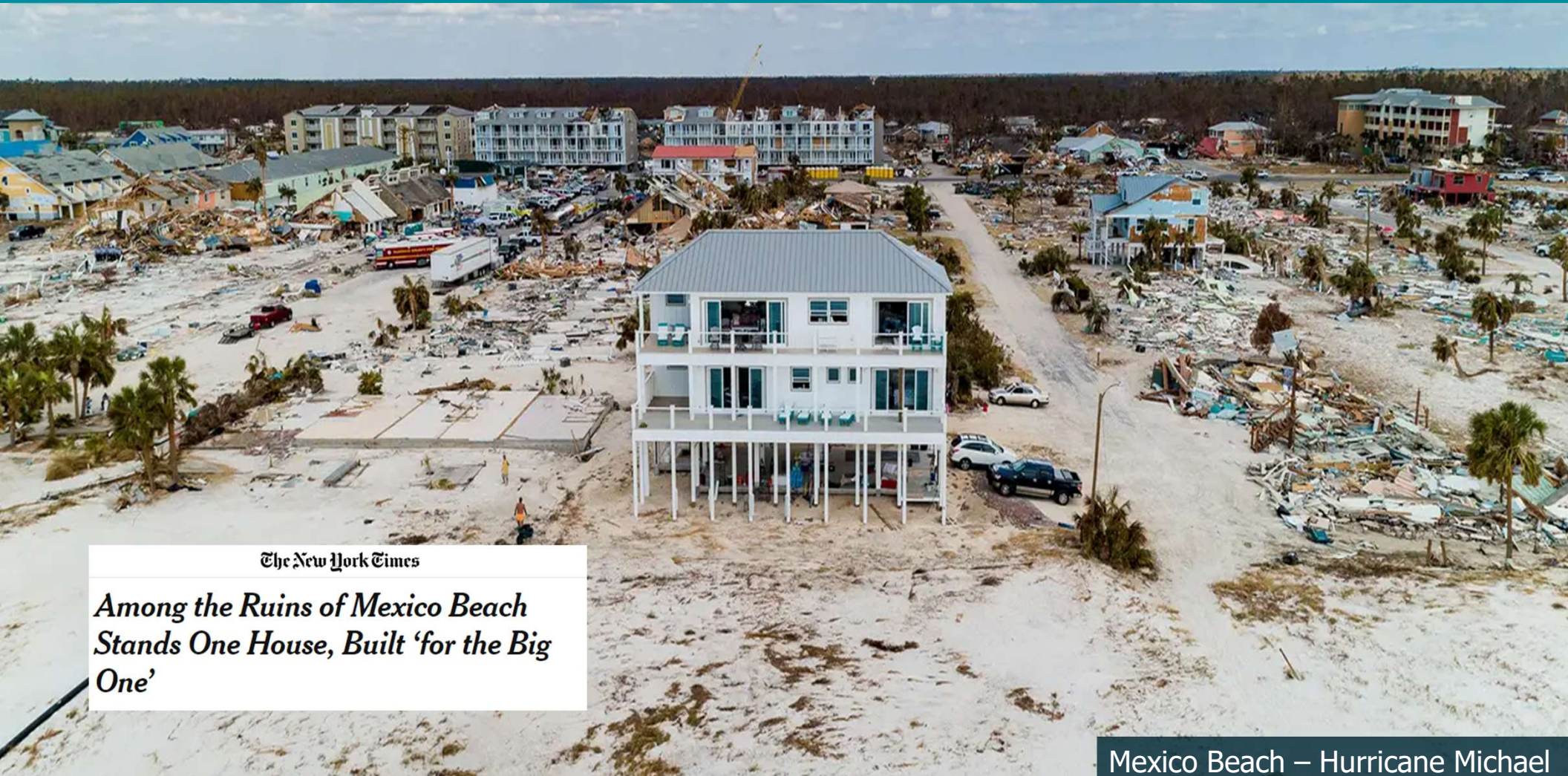
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Volusia County – Hurricane Nicole



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Resilient



Cape Coral – Hurricane Ian



Babcock Ranch – Lee County



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Why do a Vulnerability Assessment?

Florida Statute 380.093

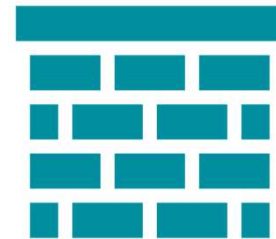
Funding Grants provided for:

- Resilience Planning and Data Collection
- Vulnerability Assessments
- Studies to reduce the impact of flooding and sea level rise

Questions for you to keep in mind



What Vulnerabilities does
Indian River Shores face?



What projects can you think of
that would make Indian River
Shores more resilient?



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Sea Level Rise



High Tide



100 Year Storm Event



Storm Surge



Scenarios Examined

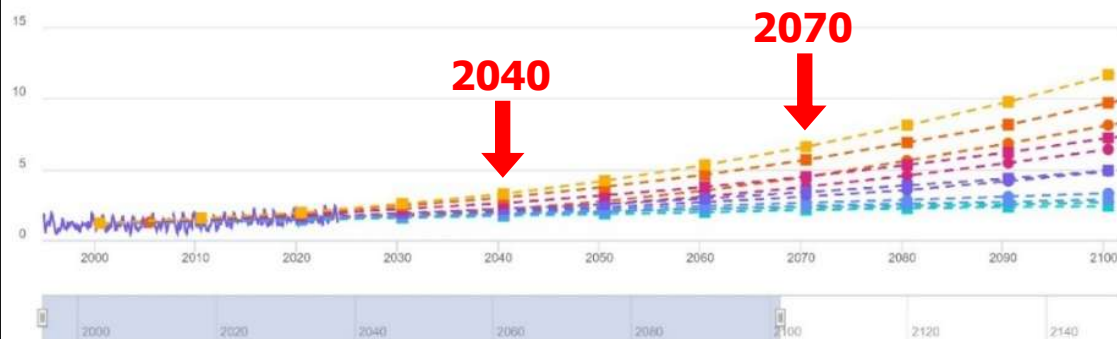


Sea Level Rise

Sea Level Data and Projections: Trident Pier, Port Canaveral, FL (8721604)

NOAA Tide Gauge

Feet above North American Vertical Datum of 1988
(1983-2001 epoch)



— MHHW - Monthly Value
— MHHW - NOAA et al. 2022 - Intermediate-Low
— MHHW - NOAA et al. 2022 - Intermediate
— MHHW - NOAA et al. 2022 - Intermediate-High
— MHHW - NOAA et al. 2022 - High
— MHHW - NOAA et al. 2017 - Low
— MHHW - NOAA et al. 2017 - Intermediate
— MHHW - NOAA et al. 2017 - Intermediate-High
— MHHW - NOAA et al. 2017 - High
— MHHW - NOAA et al. 2017 - Extreme

MSL record span: 1994 to 2024 (30 years)

Short record: The MSL record for this gauge spans fewer than forty years

NOAA et al. 2022 datum-to-start-year offset (est. SLC from 1992 to 2005): 0.168 ft.

NOAA et al. 2017 datum-to-start-year offset (est. SLC from 1992 to 2000): 0.093 ft.

Relative Sea Level Rise

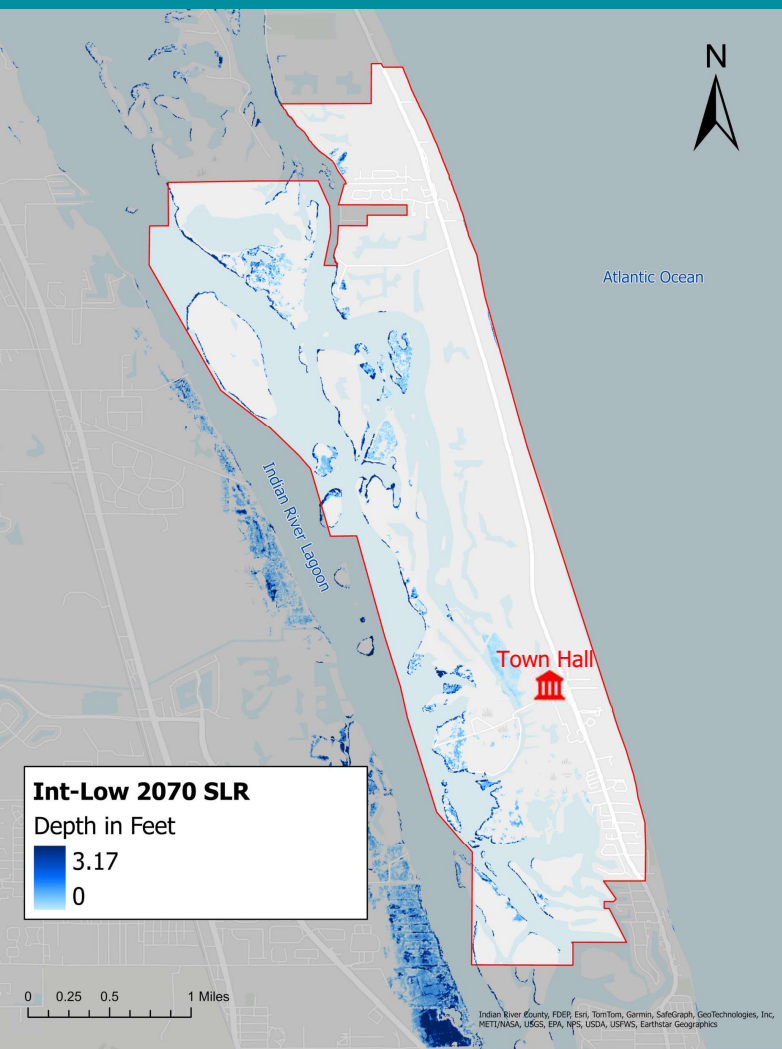
	Int-Low	Int-High
2040	0.76 ft	1.5 ft
2070	1.32 ft	3.37 ft



Scenarios Examined



Sea Level Rise

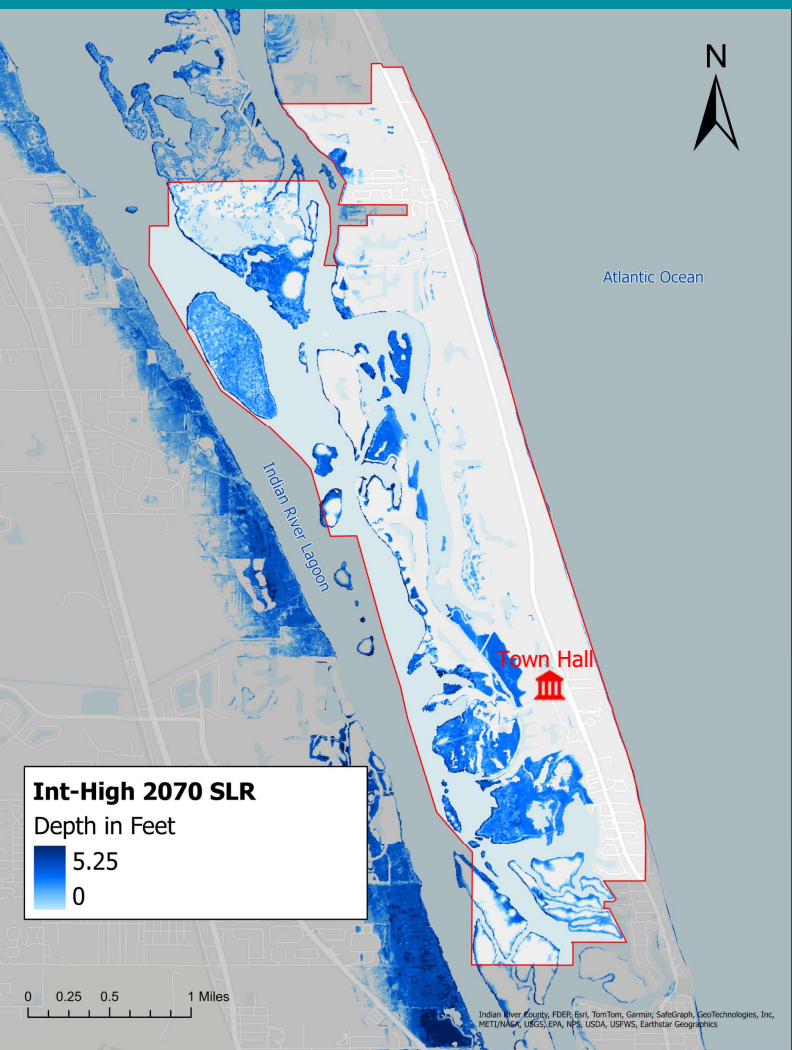


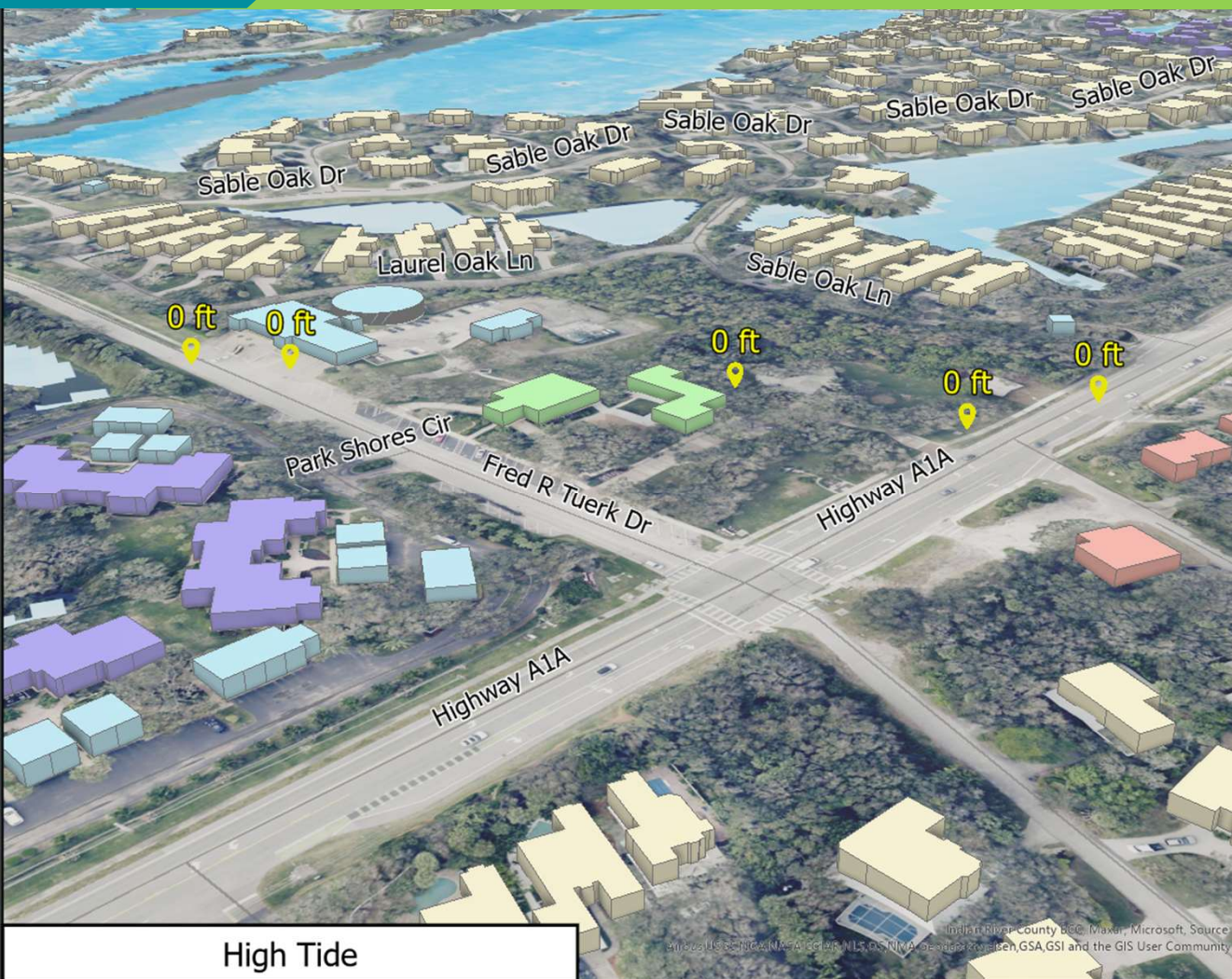


Scenarios Examined



Sea Level Rise



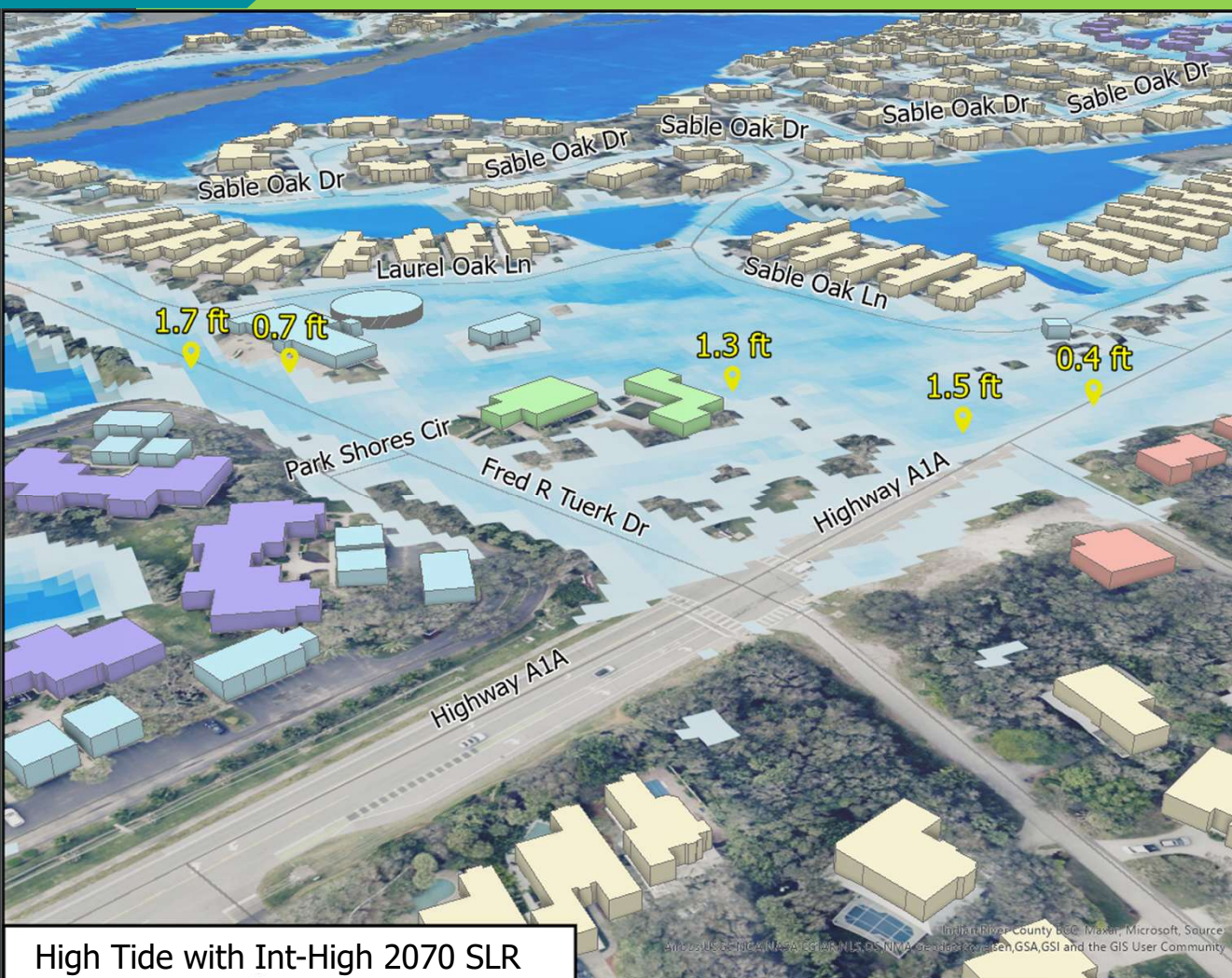
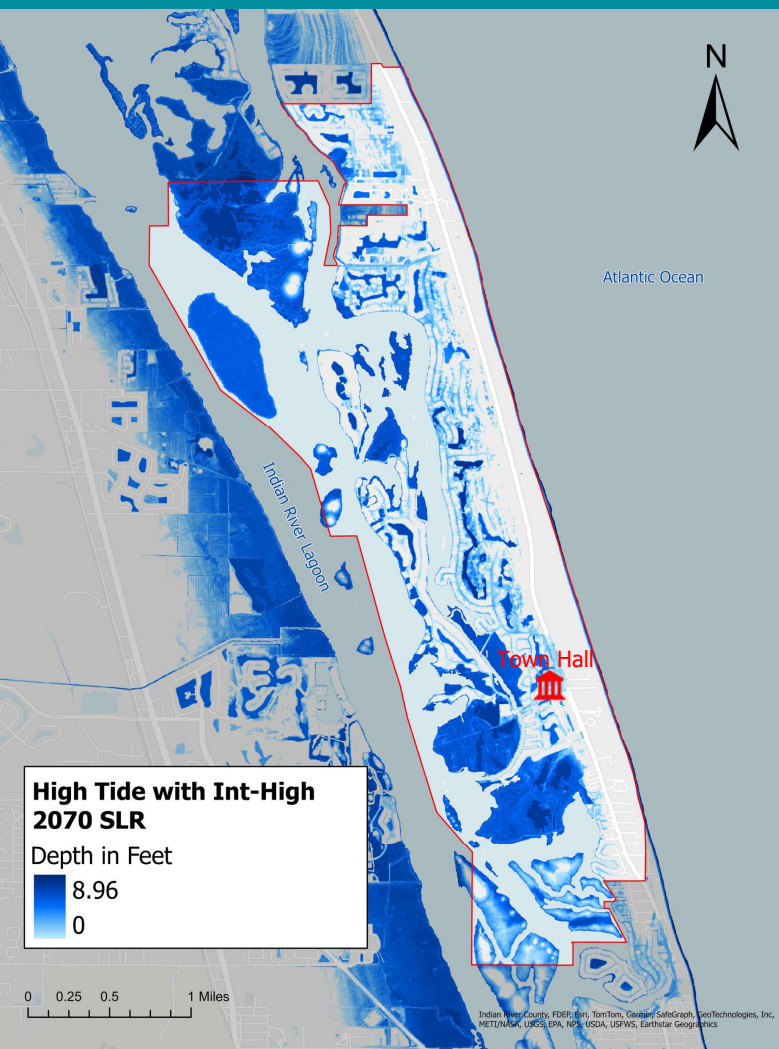


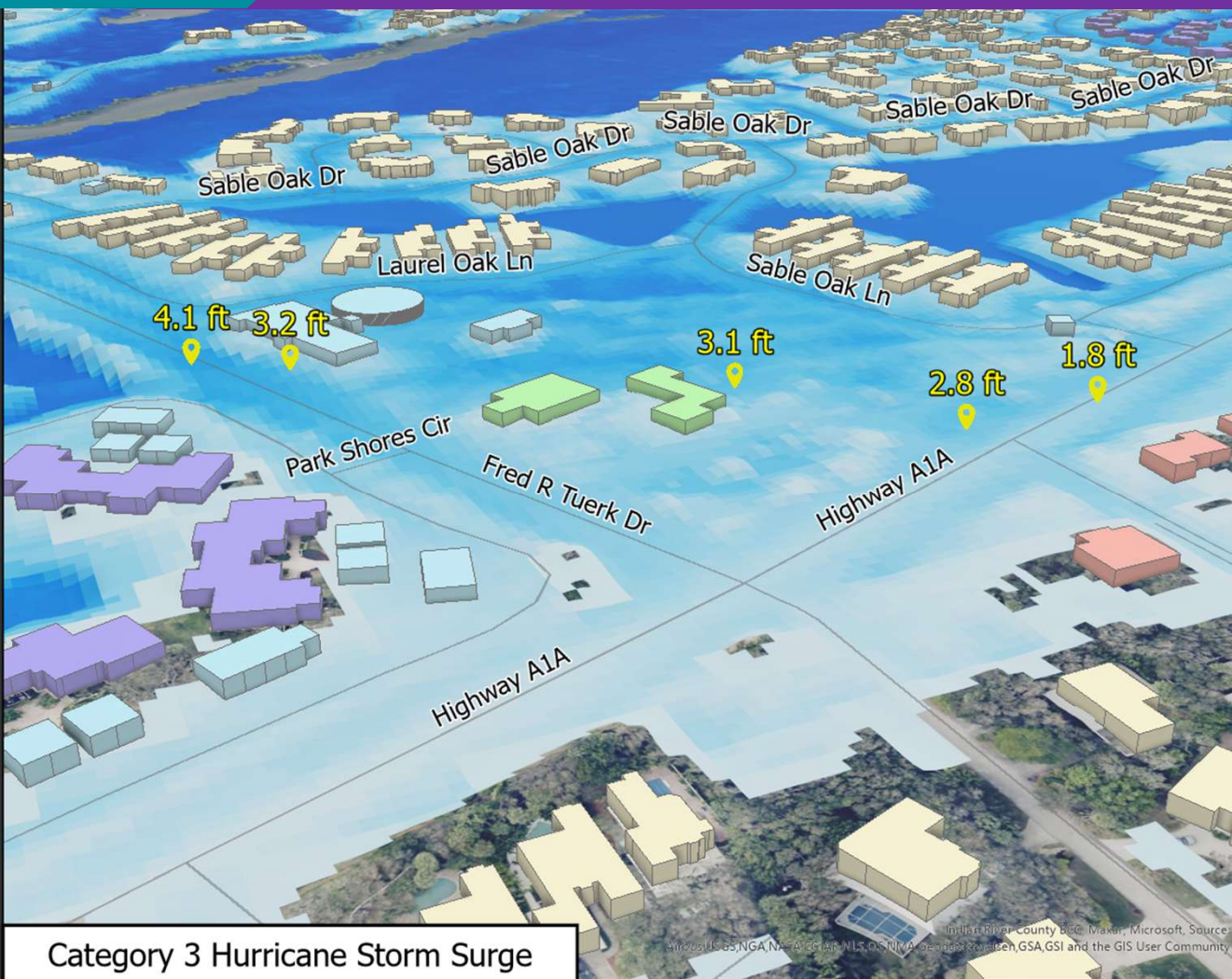


Scenarios Examined



High Tide





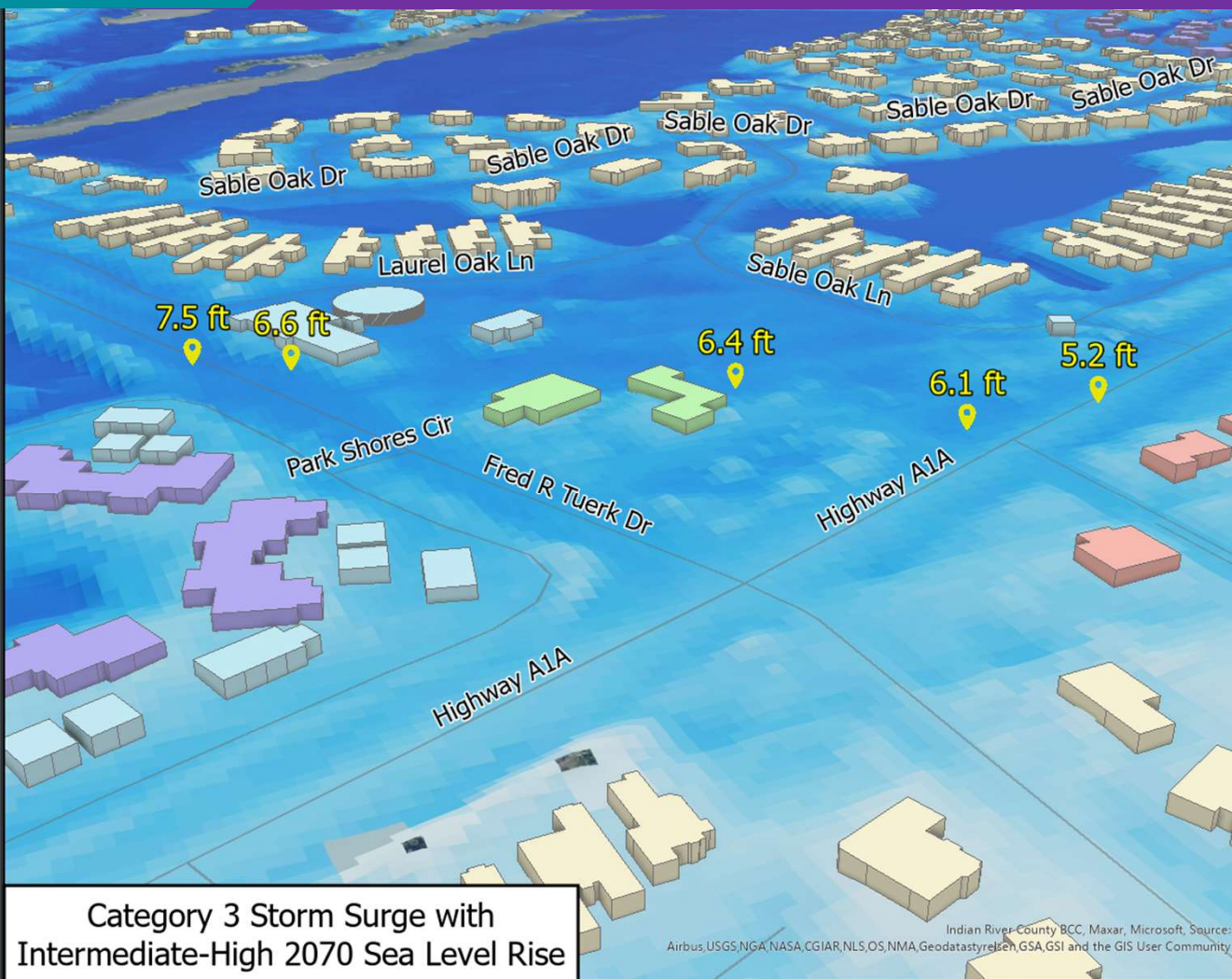
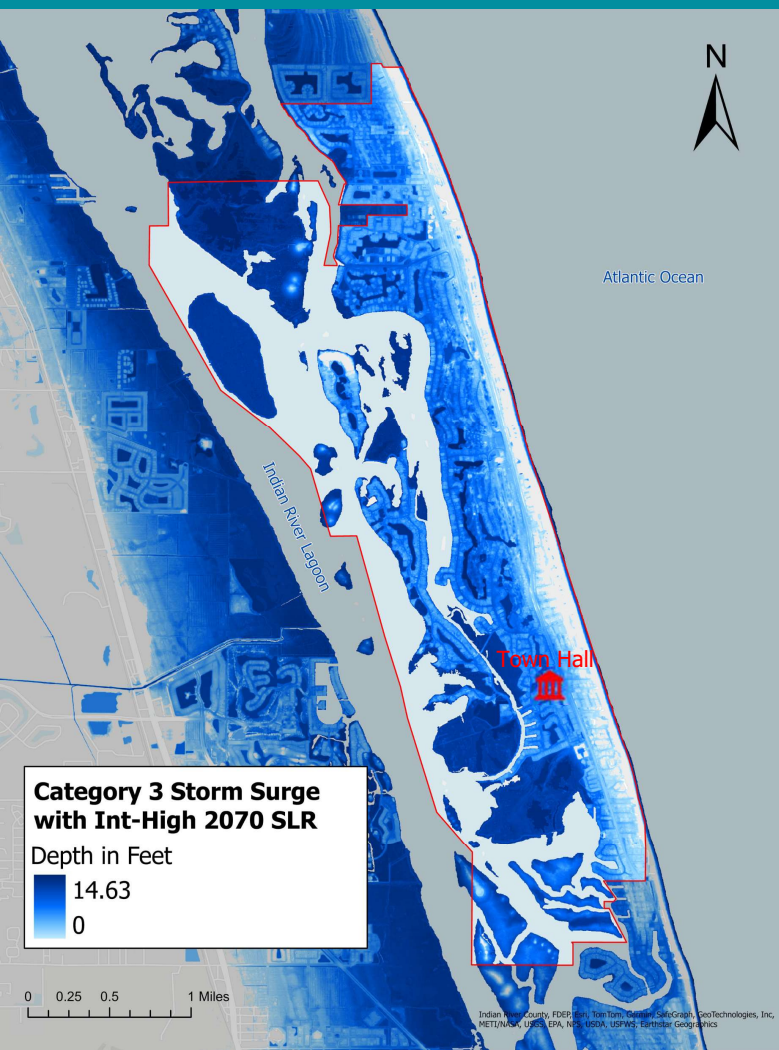
Category 3 Hurricane Storm Surge



Scenarios Examined



Storm Surge

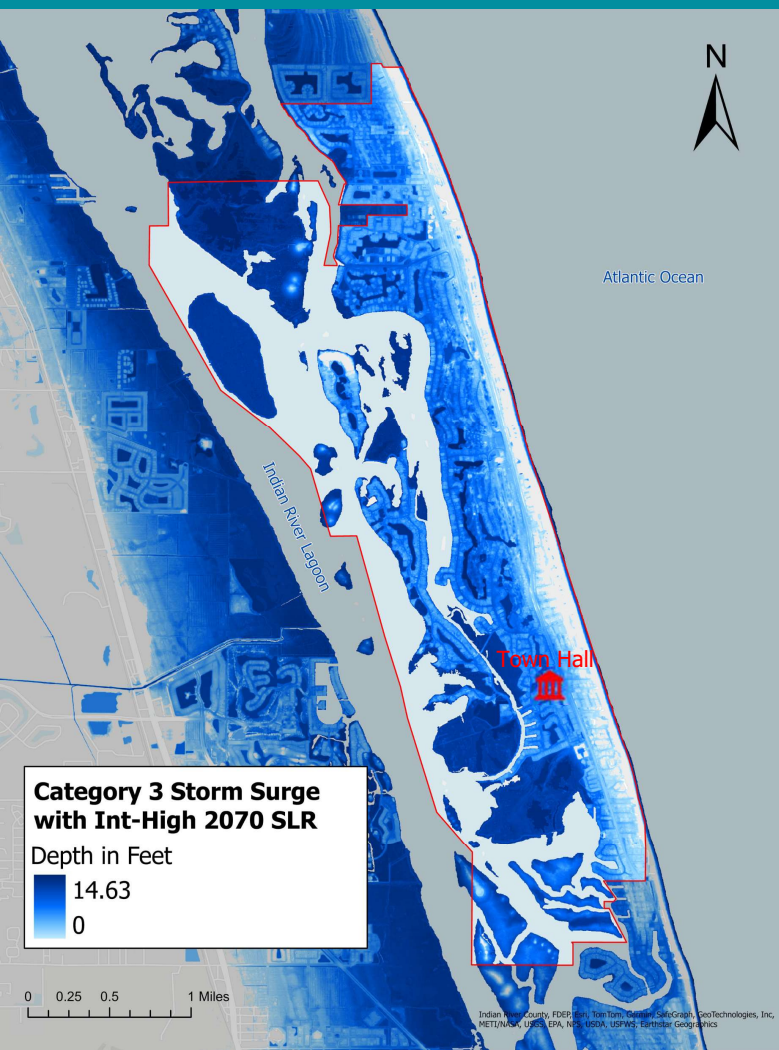




Scenarios Examined



Storm Surge

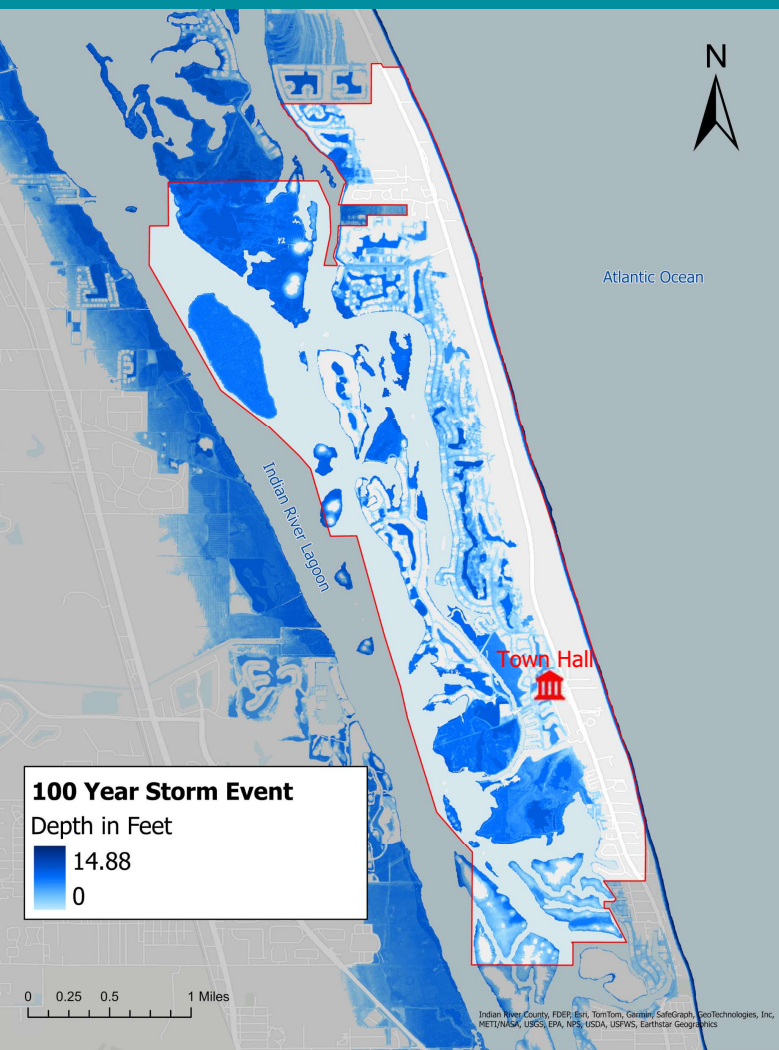




Scenarios Examined



100 Year Storm Event





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Critical Assets Analyzed

Critical and Regionally Significant Assets Detail List

Asset Class	Asset Type	Number of Assets	Asset Name	Address (if applicable)
Transportation and Evacuation Routes	Major Roadways	1	State Road A1A	N/A
Critical Infrastructure	Electric Production and Supply Facilities	1	Electric Facility	199 Fred R Tuerk Dr, Indian River Shores, FL 32963
	Wastewater Treatment Facilities and Lift Stations	44	Lift Stations	N/A
	Communications Facilities	1	Cell Tower	6001 Florida A1A, Indian River Shores, FL 32963
	Disaster Debris Management Site	1	FEMA Lot	Fred R Tuerk Dr, Indian River Shores, FL 32963
Critical Community and Emergency Facilities	Community Centers	1	Community Center	6001 Florida A1A, Indian River Shores, FL 32963
	Local Government Facilities	1	Town Hall	6001 Florida A1A, Indian River Shores, FL 32963
	Law Enforcement Facilities	1	Public Safety	6001 Florida A1A, Indian River Shores, FL 32963
	Fire Stations			
Natural, Cultural, and Historical Resource	Shorelines	2	Indian River Lagoon Shoreline	N/A
			Atlantic Ocean Shoreline	N/A
	Conservation Lands	2	Conservation Area	N/A
	Parks	2	Seagrape Trail Beach Access	Florida A1A, Indian River Shores, FL 32963
			Turtle Trail Beach Access	Florida A1A, Indian River Shores, FL 32963
	Wetlands	49	Wetlands	N/A



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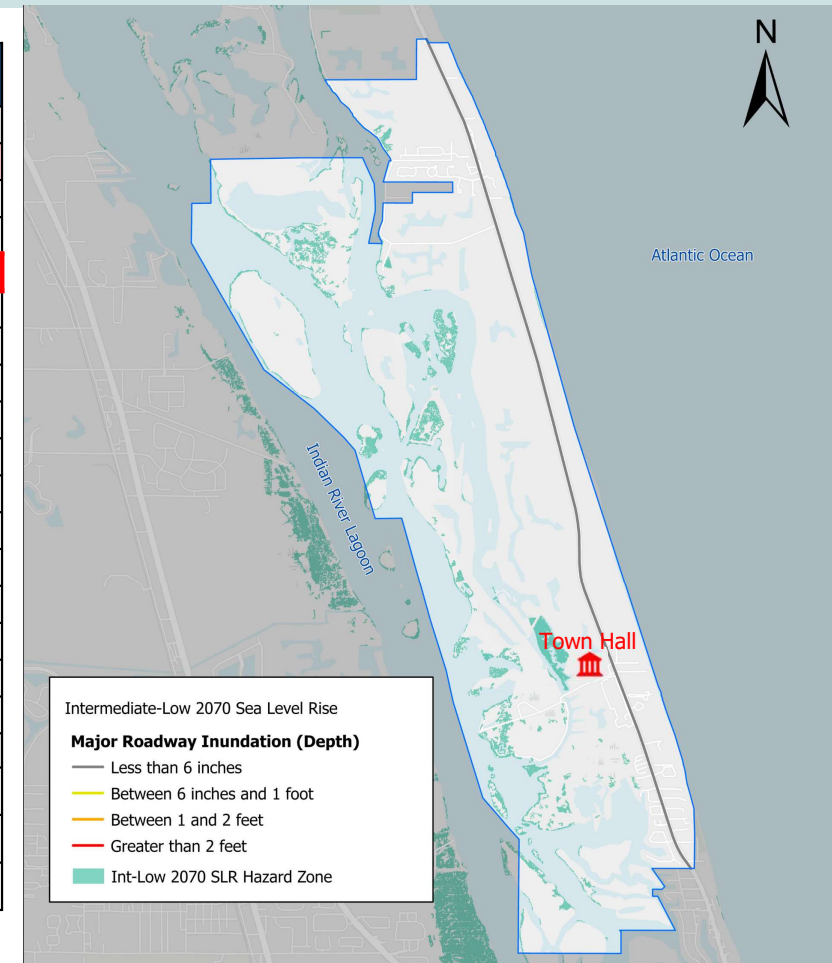
Stakeholder input

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Major Roadways

Table 7 – Major Roadway Impact by Hazard (Length in Feet)

Hazard Zone	State Road A1A					
	Low Risk		Medium Risk		High Risk	
IL2040	0	0%	0	0%	0	0%
IH2040	0	0%	0	0%	0	0%
IL2070	0	0%	0	0%	0	0%
IH2070	0	0%	0	0%	0	0%
High Tide	0	0%	0	0%	0	0%
HT + IL2040	0	0%	0	0%	0	0%
HT + IL2070	0	0%	0	0%	0	0%
HT + IH2040	0	0%	0	0%	0	0%
HT + IH2070	400	1%	0	0%	0	0%
Cat 3 SS	250	1%	1500	5%	400	1%
100 Year	0	0%	0	0%	0	0%
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Low Risk	Depth of flooding between 6 inches and 1 foot – drivable by few passenger vehicles (mostly SUV's)					
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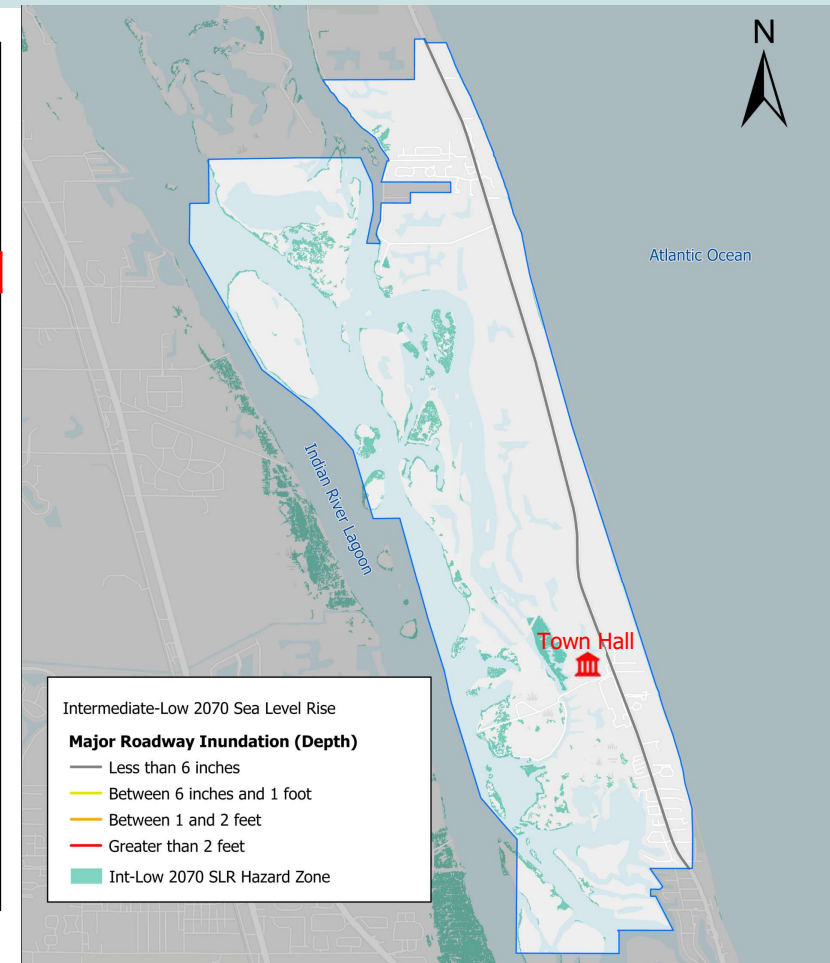
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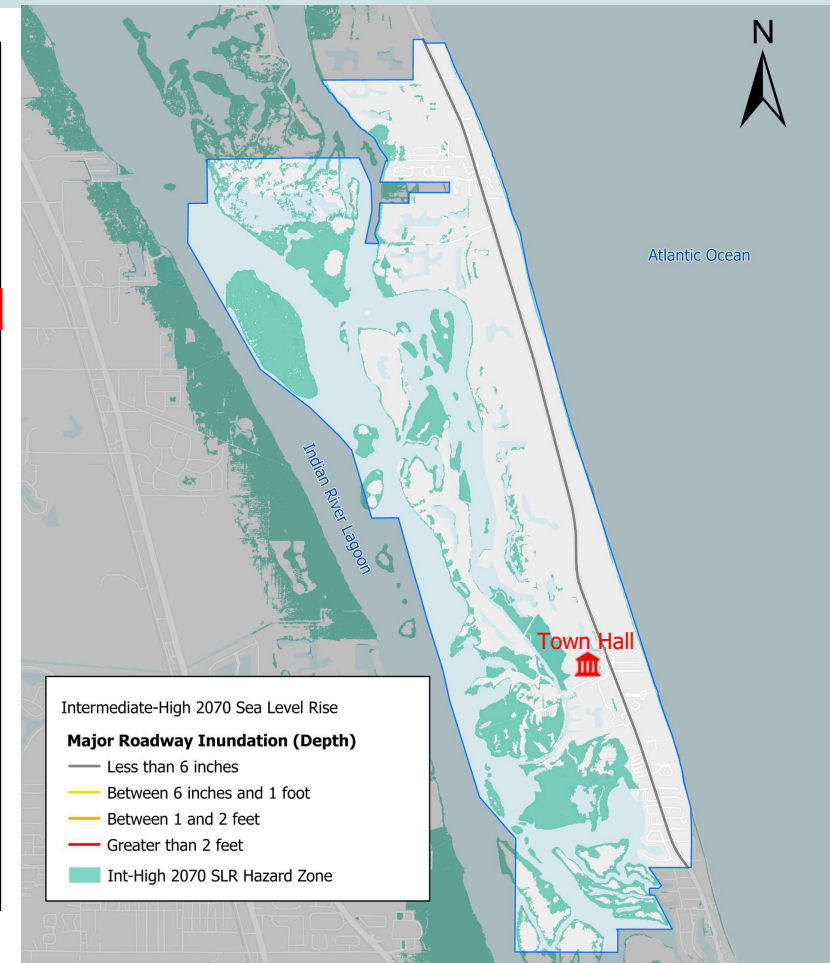


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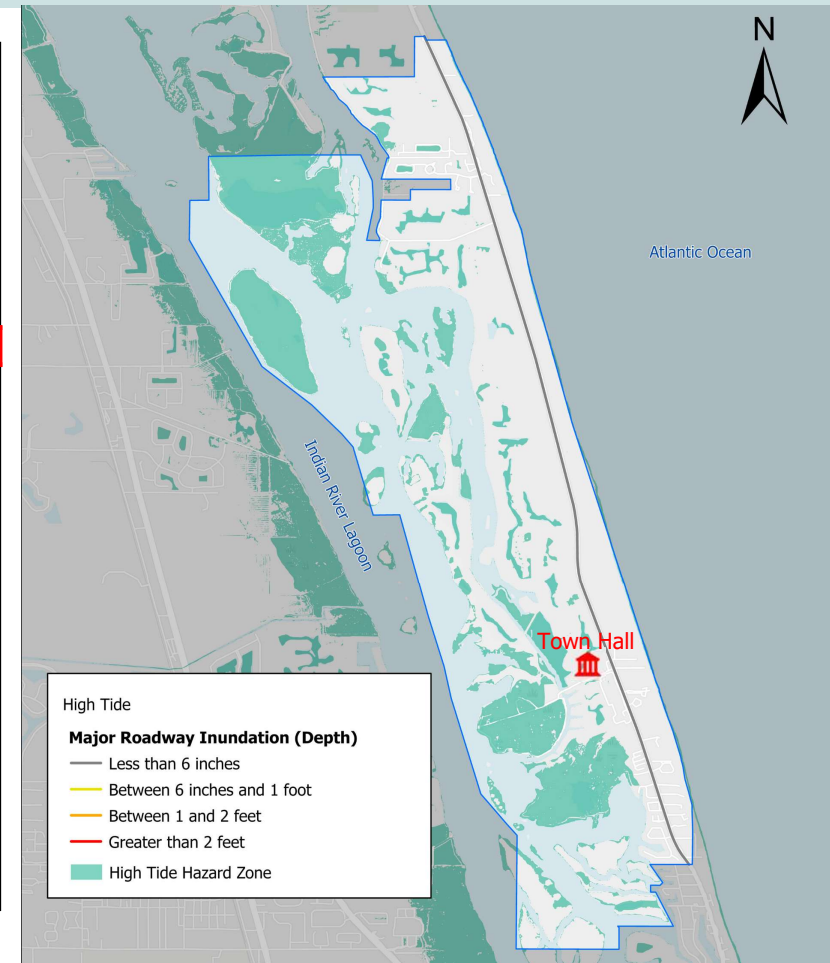
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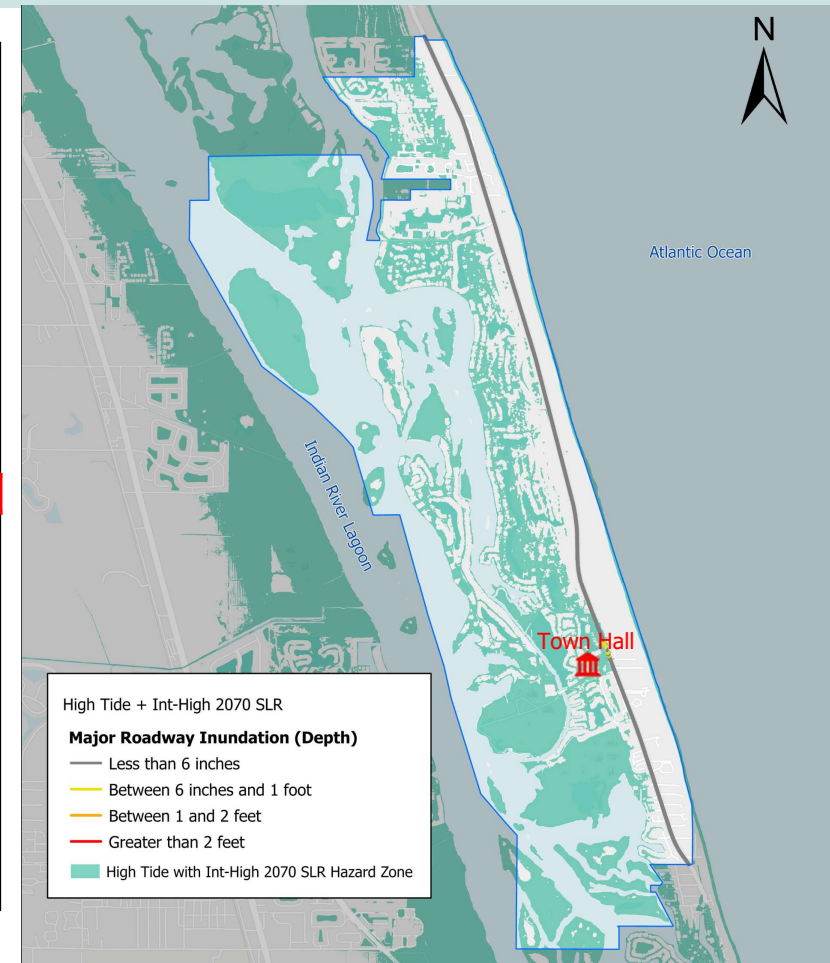
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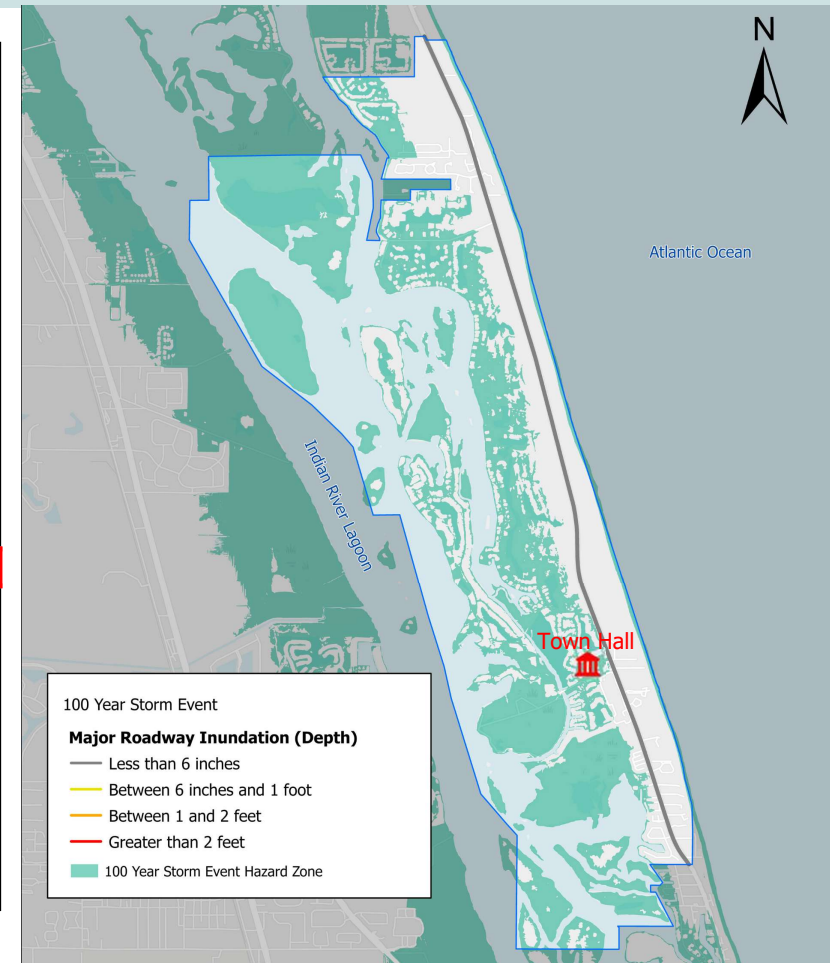
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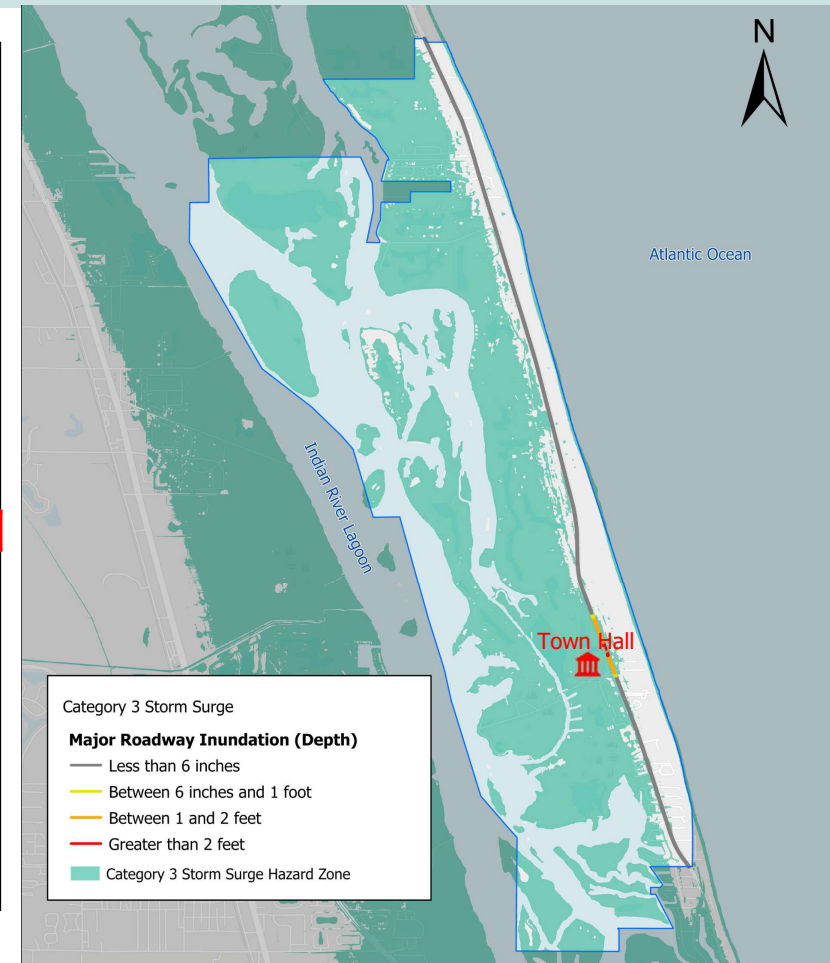
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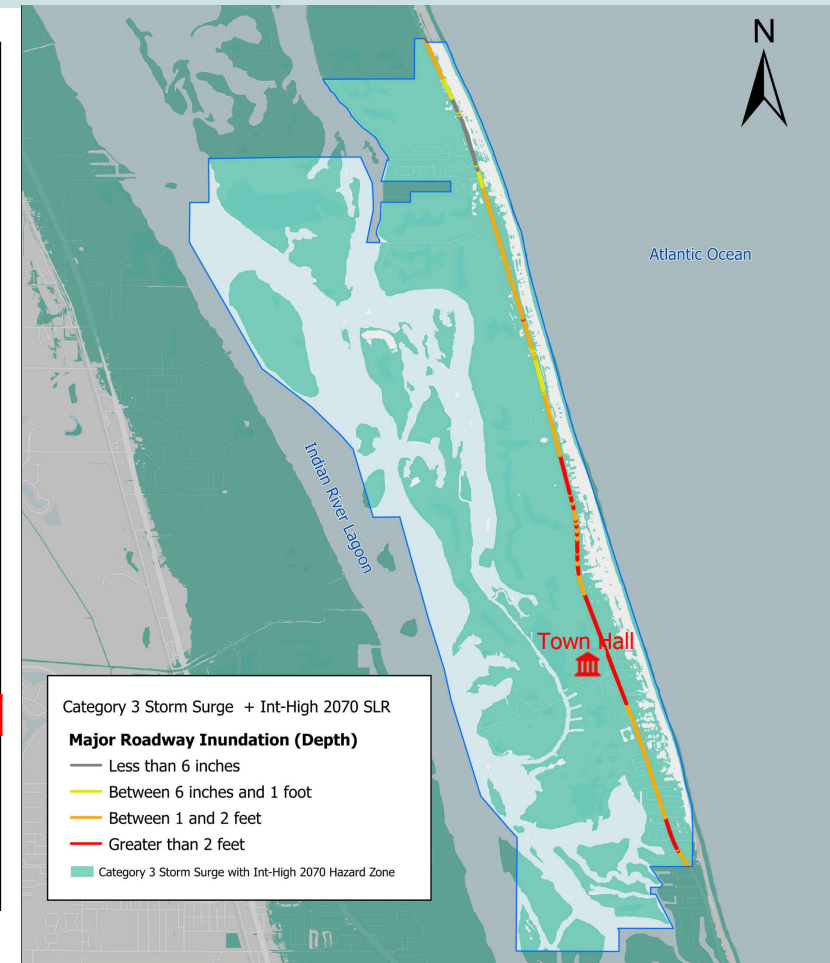
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SS + IH2040	0	0%	0	0%	0	0%
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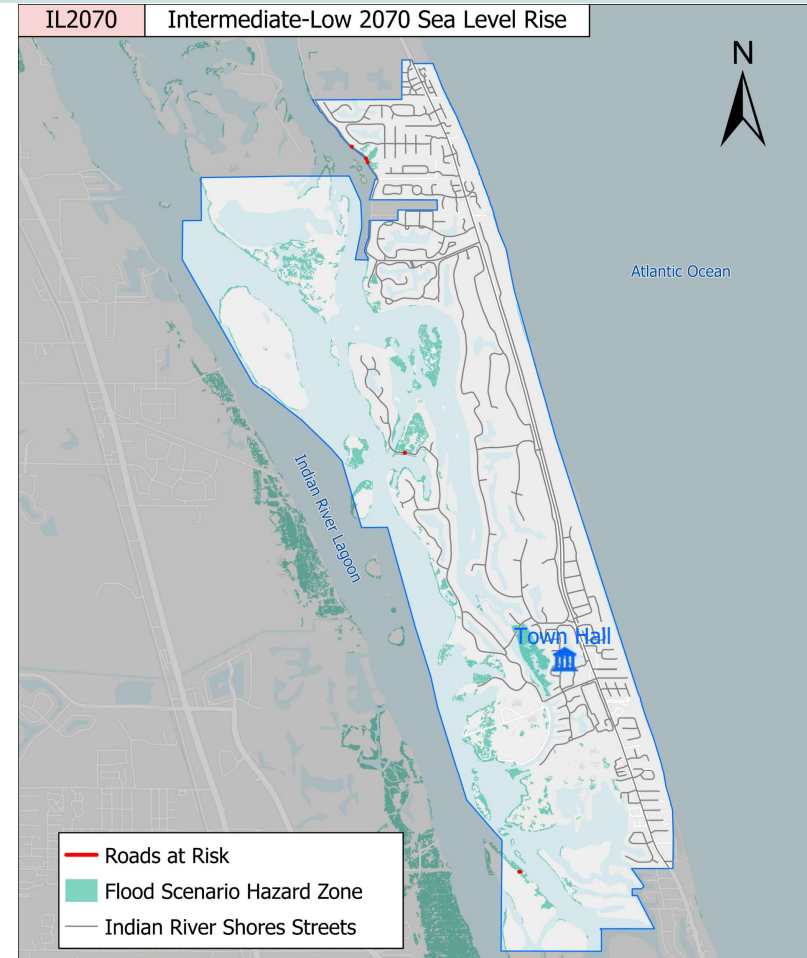
Streets

Table 8 - Projected Roadway Inundation by Hazard (Length in Feet)

Street Name	2017 NOAA Int-Low 2040	2017 NOAA Int-High 2040	2017 NOAA Int-Low 2070	2017 NOAA Int-High 2070	High Tide	High Tide + IL2040	High Tide + IL2070	High Tide + IH2040	High Tide + IH2070	Cat 3 Storm Surge	Flood Zone	Storm Surge + IL2040	Storm Surge + IL2070	Storm Surge + IH2040	Storm Surge + IH2070
46TH PL E	0	0	0	0	0	0	0	0	0	0	0	0	99	139	277
AMY ANN LN	0	0	0	0	0	0	0	0	415	517	393	542	551	561	561
ARROWHEAD TRAIL	0	0	0	0	0	0	0	0	240	319	0	319	319	319	319
BAY LEAF LN	0	0	0	0	0	0	0	0	0	0	0	56	152	152	152
BAYTREE DR	0	0	0	0	0	0	0	0	444	681	0	721	770	779	945
BAYWOOD DR	0	0	0	0	0	0	0	0	0	479	212	479	479	479	479
BEACH CLUB PL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
BEACH RD	0	0	0	0	0	0	0	0	0	0	0	155	850	988	4611
BEACHCOMBER LN	0	0	0	0	0	0	0	0	0	178	0	386	446	476	873
BEACHVIEW DR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39
BERMUDA BAY LN	0	0	0	0	0	0	0	0	38	297	0	646	935	952	1547

----- BREAK LINE -----

WATERWAY LN	0	0	0	0	0	0	0	0	403	422	404	422	422	422	422
WAXMYRTLE WAY	0	0	0	0	0	0	0	0	665	685	685	685	685	685	685
WEYBRIDGE CIR	0	0	0	0	0	0	0	0	827	1113	183	1113	1113	1113	1113
WHITE ORCHID WAY	0	0	0	0	0	0	0	0	0	108	0	214	224	224	224



Findings



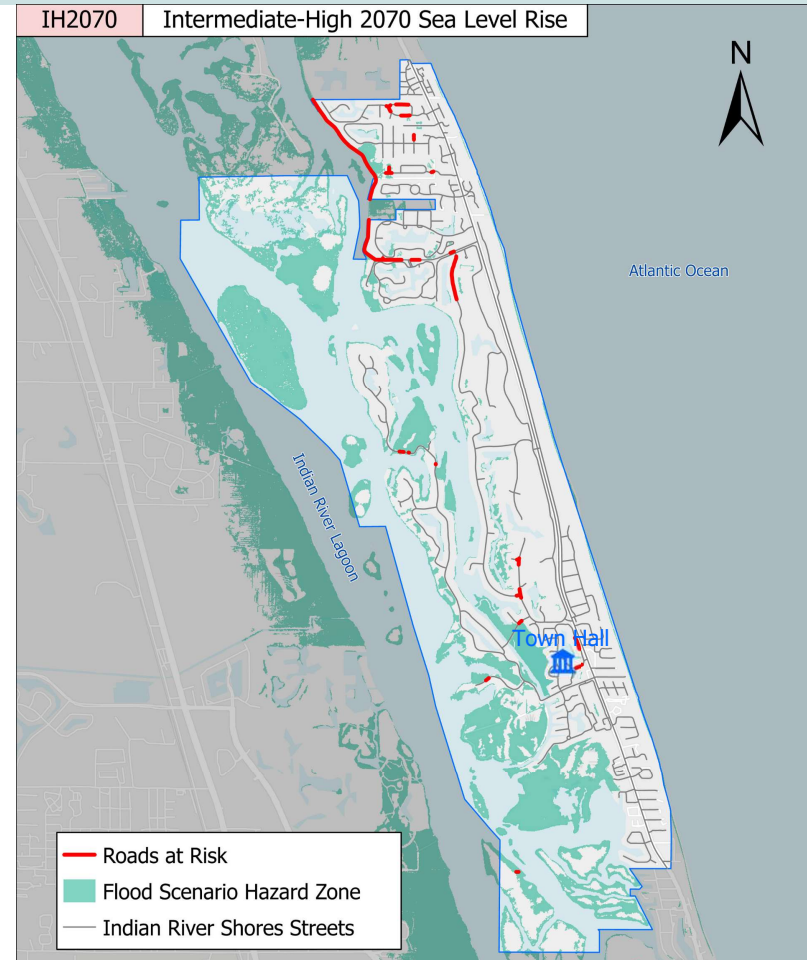
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46TH PL E	0	0	0	0	0	0	0	0	0	0	0	0	99	139	277	
AMY ANN LN	0	0	0	0	0	0	0	0	415	517	393	542	551	561	561	
ARROWHEAD TRAIL	0	0	0	0	0	0	0	0	240	319	0	319	319	319	319	
BAY LEAF LN	0	0	0	0	0	0	0	0	0	0	0	56	152	152	152	
BAYTREE DR	0	0	0	0	0	0	0	0	444	681	0	721	770	779	945	
BAYWOOD DR	0	0	0	0	0	0	0	0	0	479	212	479	479	479	479	
BEACH CLUB PL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55	
BEACH RD	0	0	0	0	0	0	0	0	0	0	0	155	850	988	4611	
BEACHCOMBER LN	0	0	0	0	0	0	0	0	0	178	0	386	446	476	873	
BEACHVIEW DR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39	
BERMUDA BAY LN	0	0	0	0	0	0	0	0	38	297	0	646	935	952	1547	

----- BREAK LINE -----

WATERWAY LN	0	0	0	0	0	0	0	0	403	422	404	422	422	422	422	
WAXMYRTLE WAY	0	0	0	0	0	0	0	0	665	685	685	685	685	685	685	
WEYBRIDGE CIR	0	0	0	0	0	0	0	0	827	1113	183	1113	1113	1113	1113	
WHITE ORCHID WAY	0	0	0	0	0	0	0	0	0	108	0	214	224	224	224	



Findings



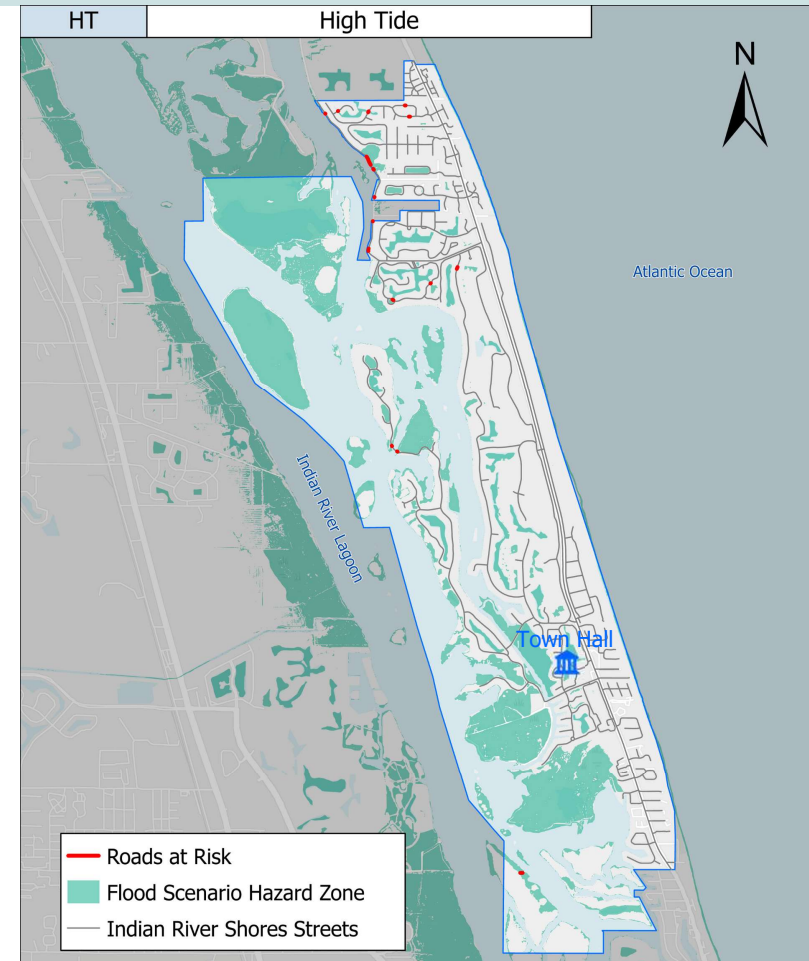
Streets

Table 8 - Projected Roadway Inundation by Hazard (Length in Feet)

Street Name	2017 Flood Hazard Zone 2000	2017 Flood Hazard Zone 5000	2017 Flood Hazard Zone 10000	2017 Flood Hazard Zone 15000	High Tide					Cat 3 Storm Surge	Storm Surge 1000	Storm Surge 2000	Storm Surge 3000	Storm Surge 4000	Storm Surge 5000
46TH PL E	0	0	0	0	0	0	0	0	0	0	0	99	139	277	
AMY ANN LN	0	0	0	0	0	0	0	0	415	517	393	542	551	561	561
ARROWHEAD TRAIL	0	0	0	0	0	0	0	0	240	319	0	319	319	319	319
BAY LEAF LN	0	0	0	0	0	0	0	0	0	0	0	56	152	152	152
BAYTREE DR	0	0	0	0	0	0	0	0	444	681	0	721	770	779	945
BAYWOOD DR	0	0	0	0	0	0	0	0	0	479	212	479	479	479	479
BEACH CLUB PL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
BEACH RD	0	0	0	0	0	0	0	0	0	0	0	155	850	988	4611
BEACHCOMBER LN	0	0	0	0	0	0	0	0	0	178	0	386	446	476	873
BEACHVIEW DR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39
BERMUDA BAY LN	0	0	0	0	0	0	0	0	38	297	0	646	935	952	1547

----- BREAK LINE -----

WATERWAY LN	0	0	0	0	0	0	0	0	403	422	404	422	422	422	422
WAXMYRTLE WAY	0	0	0	0	0	0	0	0	665	685	685	685	685	685	685
WEYBRIDGE CIR	0	0	0	0	0	0	0	0	827	1113	183	1113	1113	1113	1113
WHITE ORCHID WAY	0	0	0	0	0	0	0	0	0	108	0	214	224	224	224



Findings



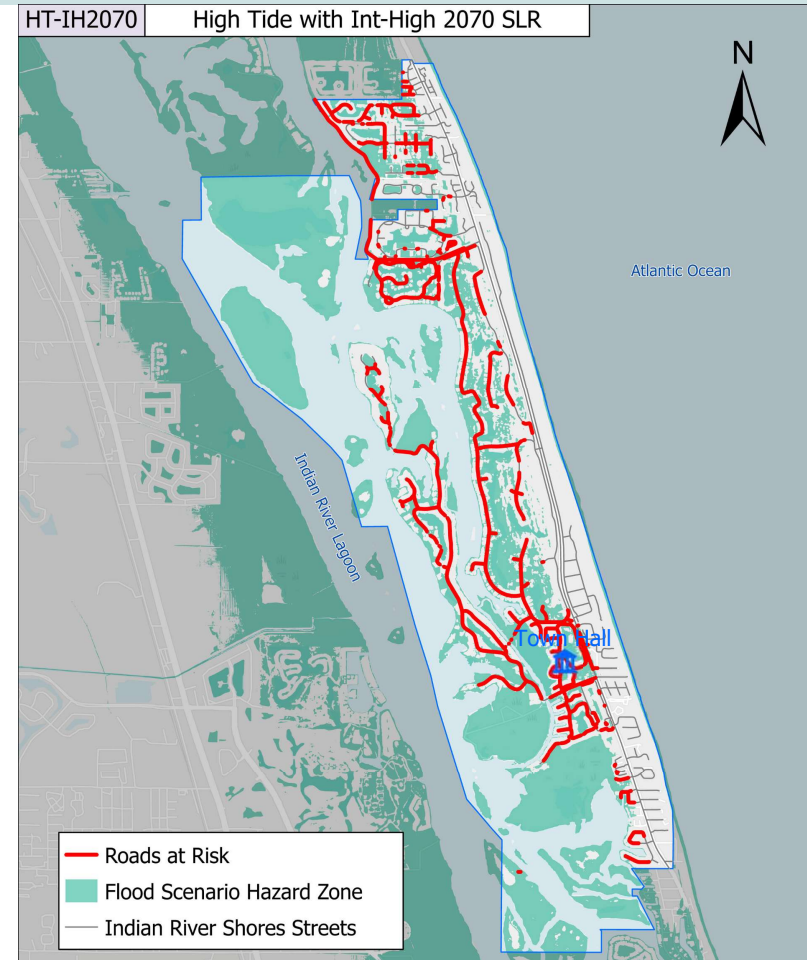
Streets

Table 8 - Projected Roadway Inundation by Hazard (Length in Feet)

Street Name	2017 Flood Hazard Zone 2000	2017 Flood Hazard Zone 2000	2017 Flood Hazard Zone 2000	2017 Flood Hazard Zone 2000	High Tide				High Tide + IH2070	Cat 3 Storm Surge	Storm Surge	Storm Surge + SLR	Storm Surge + SLR	Storm Surge + SLR	Storm Surge + SLR
46TH PL E	0	0	0	0	0	0	0	0	0	0	0	99	139	277	
AMY ANN LN	0	0	0	0	0	0	0	0	415	517	393	542	551	561	
ARROWHEAD TRAIL	0	0	0	0	0	0	0	0	240	319	0	319	319	319	
BAY LEAF LN	0	0	0	0	0	0	0	0	0	0	0	56	152	152	
BAYTREE DR	0	0	0	0	0	0	0	0	444	681	0	721	770	945	
BAYWOOD DR	0	0	0	0	0	0	0	0	0	479	212	479	479	479	
BEACH CLUB PL	0	0	0	0	0	0	0	0	0	0	0	0	0	55	
BEACH RD	0	0	0	0	0	0	0	0	0	0	0	155	850	988	
BEACHCOMBER LN	0	0	0	0	0	0	0	0	0	178	0	386	446	873	
BEACHVIEW DR	0	0	0	0	0	0	0	0	0	0	0	0	0	39	
BERMUDA BAY LN	0	0	0	0	0	0	0	0	38	297	0	646	935	1547	

----- BREAK LINE -----

WATERWAY LN	0	0	0	0	0	0	0	0	403	422	404	422	422	422
WAXMYRTLE WAY	0	0	0	0	0	0	0	0	665	685	685	685	685	685
WEYBRIDGE CIR	0	0	0	0	0	0	0	0	827	1113	183	1113	1113	1113
WHITE ORCHID WAY	0	0	0	0	0	0	0	0	0	108	0	214	224	224



Findings



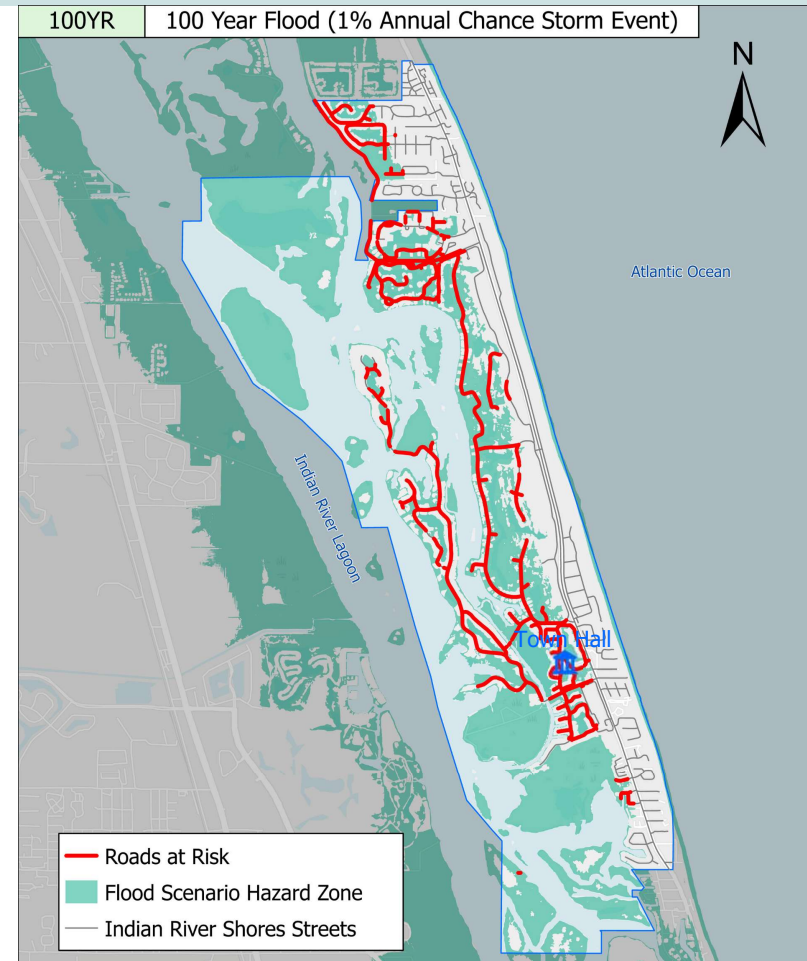
Streets

Table 8 - Projected Roadway Inundation by Hazard (Length in Feet)

Street Name	100 Year Flood (1% Annual Chance Storm Event)	100 Year Flood (1% Annual Chance Storm Event)	100 Year Flood (1% Annual Chance Storm Event)	100 Year Flood (1% Annual Chance Storm Event)	High Tide						Cat 3 Storm Surge	Flood Zone	Storm Surge (100Y)	Storm Surge (100Y)	Storm Surge (100Y)	Storm Surge (100Y)
46TH PL E	0	0	0	0	0	0	0	0	0	0	0	0	0	99	139	277
AMY ANN LN	0	0	0	0	0	0	0	0	0	415	517	393	542	551	561	561
ARROWHEAD TRAIL	0	0	0	0	0	0	0	0	0	240	319	0	319	319	319	319
BAY LEAF LN	0	0	0	0	0	0	0	0	0	0	0	0	56	152	152	152
BAYTREE DR	0	0	0	0	0	0	0	0	0	444	681	0	721	770	779	945
BAYWOOD DR	0	0	0	0	0	0	0	0	0	0	479	212	479	479	479	479
BEACH CLUB PL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
BEACH RD	0	0	0	0	0	0	0	0	0	0	0	0	155	850	988	4611
BEACHCOMBER LN	0	0	0	0	0	0	0	0	0	0	178	0	386	446	476	873
BEACHVIEW DR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39
BERMUDA BAY LN	0	0	0	0	0	0	0	0	0	38	297	0	646	935	952	1547

----- BREAK LINE -----

WATERWAY LN	0	0	0	0	0	0	0	0	403	422	404	422	422	422
WAXMYRTLE WAY	0	0	0	0	0	0	0	0	665	685	685	685	685	685
WEYBRIDGE CIR	0	0	0	0	0	0	0	0	827	1113	183	1113	1113	1113
WHITE ORCHID WAY	0	0	0	0	0	0	0	0	0	108	0	214	224	224



Findings



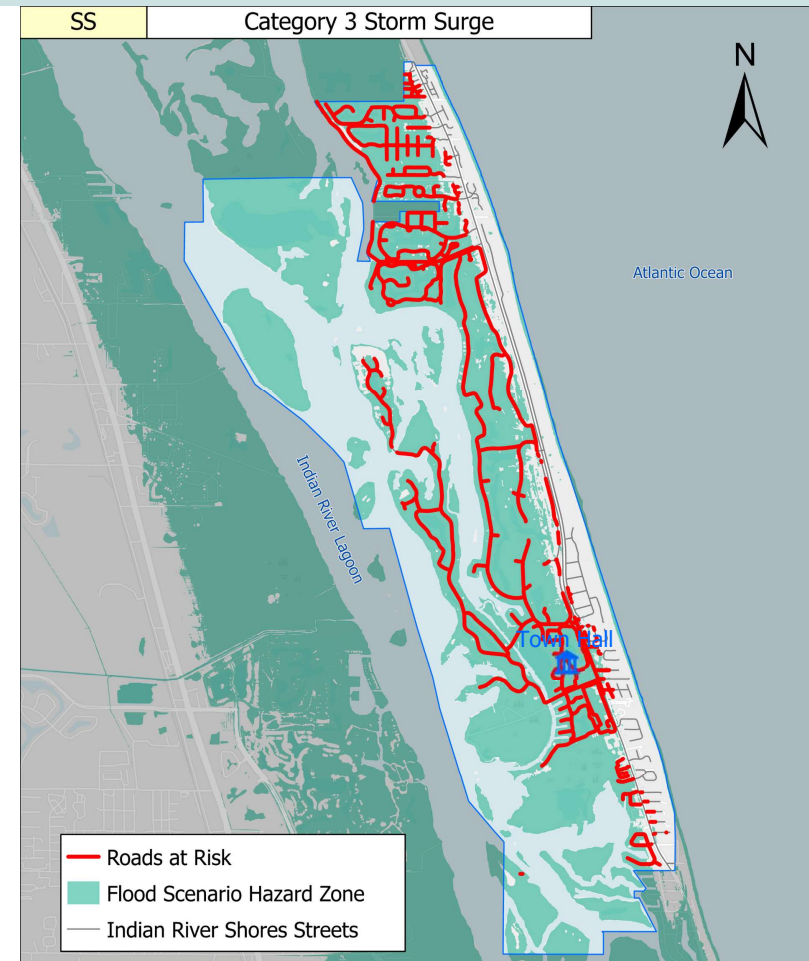
Streets

Table 8 - Projected Roadway Inundation by Hazard (Length in Feet)

Street Name	200 Year Flood Hazard Zone	500 Year Flood Hazard Zone	100 Year Flood Hazard Zone	200 Year Flood Hazard Zone	High Tide					Cat. 3 Storm Surge		200 Year Flood Hazard Zone	500 Year Flood Hazard Zone	100 Year Flood Hazard Zone	200 Year Flood Hazard Zone
46TH PL E	0	0	0	0	0	0	0	0	0	0	0	99	139	277	
AMY ANN LN	0	0	0	0	0	0	0	0	415	517	393	542	551	561	561
ARROWHEAD TRAIL	0	0	0	0	0	0	0	0	240	319	0	319	319	319	319
BAY LEAF LN	0	0	0	0	0	0	0	0	0	0	0	56	152	152	152
BAYTREE DR	0	0	0	0	0	0	0	0	444	681	0	721	770	779	945
BAYWOOD DR	0	0	0	0	0	0	0	0	0	479	212	479	479	479	479
BEACH CLUB PL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
BEACH RD	0	0	0	0	0	0	0	0	0	0	0	155	850	988	4611
BEACHCOMBER LN	0	0	0	0	0	0	0	0	0	178	0	386	446	476	873
BEACHVIEW DR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39
BERMUDA BAY LN	0	0	0	0	0	0	0	0	38	297	0	646	935	952	1547

----- BREAK LINE -----

WATERWAY LN	0	0	0	0	0	0	0	0	403	422	404	422	422	422
WAXMYRTLE WAY	0	0	0	0	0	0	0	0	665	685	685	685	685	685
WEYBRIDGE CIR	0	0	0	0	0	0	0	0	827	1113	183	1113	1113	1113
WHITE ORCHID WAY	0	0	0	0	0	0	0	0	0	108	0	214	224	224



Findings



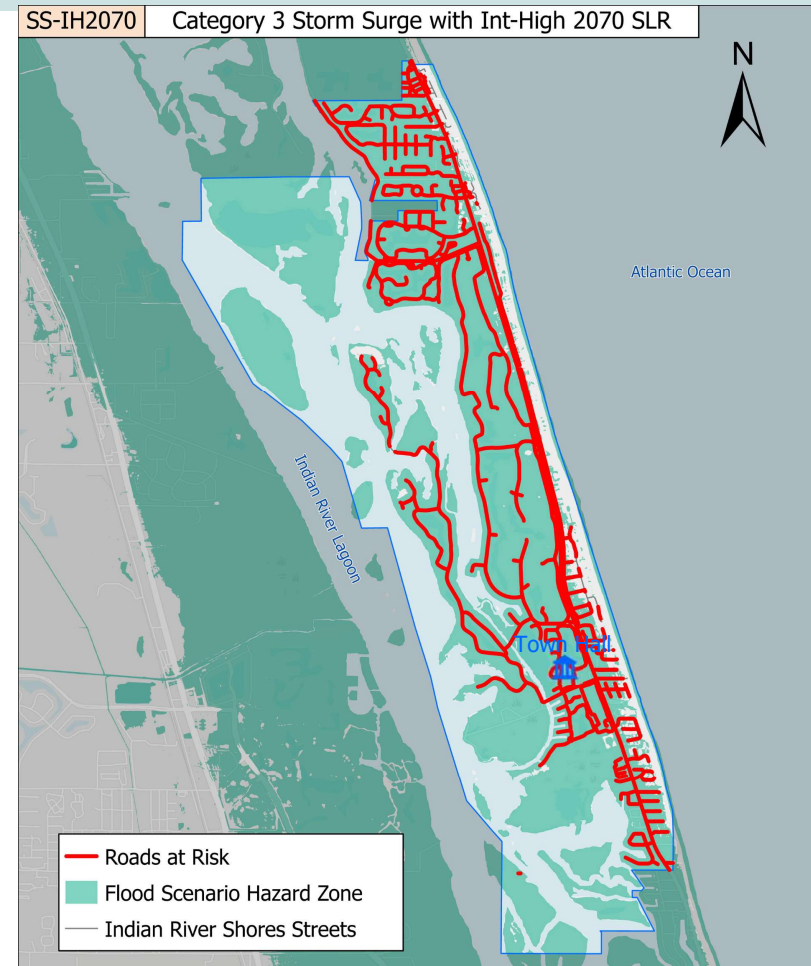
Streets

Table 8 - Projected Roadway Inundation by Hazard (Length in Feet)

Street Name	2017 Flood Hazard Zone 2000	2017 Flood Hazard Zone 2000	2017 Flood Hazard Zone 2000	2017 Flood Hazard Zone 2000	High Tide					Cat 3 Storm Surge	Storm Surge	Storm Surge + Int-High 2070 SLR	Storm Surge + Int-High 2070 SLR	Storm Surge + Int-High 2070 SLR
46TH PL E	0	0	0	0	0	0	0	0	0	0	0	99	139	277
AMY ANN LN	0	0	0	0	0	0	0	0	415	517	393	542	551	561
ARROWHEAD TRAIL	0	0	0	0	0	0	0	0	240	319	0	319	319	319
BAY LEAF LN	0	0	0	0	0	0	0	0	0	0	0	56	152	152
BAYTREE DR	0	0	0	0	0	0	0	0	444	681	0	721	770	945
BAYWOOD DR	0	0	0	0	0	0	0	0	0	479	212	479	479	479
BEACH CLUB PL	0	0	0	0	0	0	0	0	0	0	0	0	0	55
BEACH RD	0	0	0	0	0	0	0	0	0	0	0	155	850	988
BEACHCOMBER LN	0	0	0	0	0	0	0	0	0	178	0	386	446	873
BEACHVIEW DR	0	0	0	0	0	0	0	0	0	0	0	0	0	39
BERMUDA BAY LN	0	0	0	0	0	0	0	0	38	297	0	646	935	1547

----- BREAK LINE -----

WATERWAY LN	0	0	0	0	0	0	0	0	403	422	404	422	422	422	422
WAXMYRTLE WAY	0	0	0	0	0	0	0	0	665	685	685	685	685	685	685
WEYBRIDGE CIR	0	0	0	0	0	0	0	0	827	1113	183	1113	1113	1113	1113
WHITE ORCHID WAY	0	0	0	0	0	0	0	0	0	108	0	214	224	224	224





Findings



Property Impacts

Table 3 – Property Impacts

Hazard Zone	Acres in Zone	Acres %	Buildings in Zone	Buildings %	Parcels	Parcels %
Storm Surge + Int-High 2070	2628.4	88%	2126	90%	2292	97%
Storm Surge + Int-High 2040	2410.5	81%	1876	79%	2175	92%
Storm Surge + Int-Low 2070	2383.6	80%	1849	78%	2155	92%
Storm Surge + Int-Low 2040	2305.6	77%	1747	74%	2086	89%
All 100 Year Flood Zones	1488.1	50%	548	23%	1434	61%
Zone AE	1593.7	53%	722	30%	1302	55%
Zone VE	118.6	4%	35	1%	252	11%
Zone X	1270.7	43%	1999	84%	1990	85%
Storm Surge - Category 3	247.3	8%	1591	67%	1979	84%
High Tide + Int-High 2070	1483.9	50%	522	22%	1634	69%
High Tide + Int-High 2040	965.6	32%	36	2%	1103	47%
High Tide + Int-Low 2070	934.8	31%	31	1%	1044	44%
High Tide + Int-Low 2040	847.3	28%	15	1%	908	39%
High Tide	747.3	25%	2	0%	723	31%
2017 NOAA Int-High 2070	868.7	29%	40	2%	662	28%
2017 NOAA Int-Low 2070	22.1	1%	2	0%	173	7%
2017 NOAA Int-High 2040	44.2	1%	3	0%	194	8%
2017 NOAA Int-Low 2040	5.3	0%	0	0%	119	5%

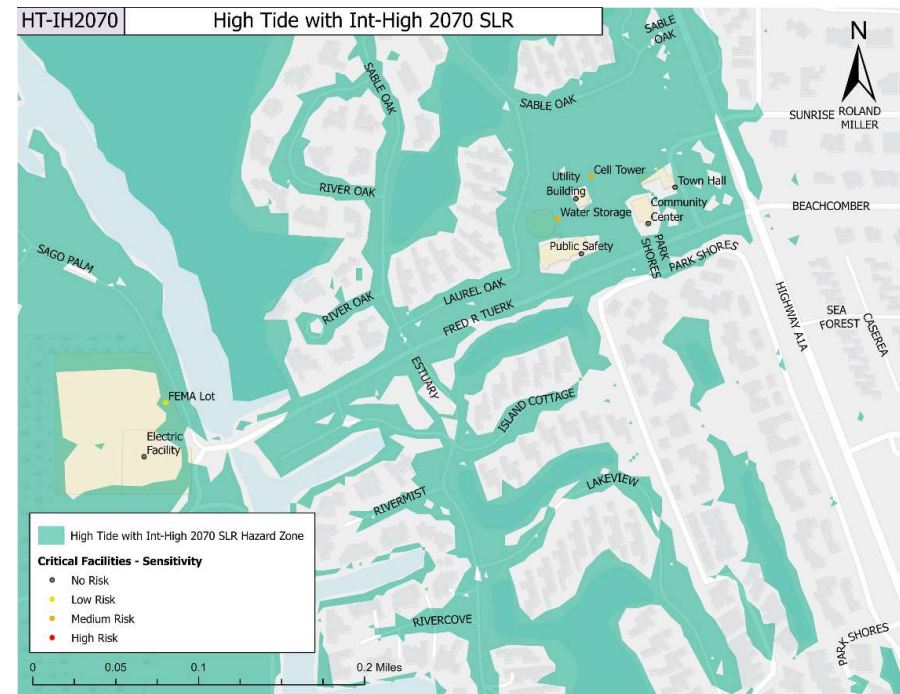
Findings



Impacts to Critical Facilities

Table 10 – Impacts to Critical Facilities (Depth in Feet)

Facility	2017 NOAA Int-Low 2040	2017 NOAA Int-High 2040	2017 NOAA Int-Low 2070	2017 NOAA Int-High 2070	High Tide	High Tide + IL2040	High Tide + IL2070	High Tide + IH2040	High Tide + IH2070	Cat 3 Storm Surge	Flood Zone	Storm Surge + IL2040	Storm Surge + IL2070	Storm Surge + IH2040	Storm Surge + IH2070
Public Safety	-	-	-	-	-	-	-	-	-	1.9	-	2.6	3.2	3.4	5.2
Community Center	-	-	-	-	-	-	-	-	-	0.6	-	1.3	1.9	2.1	3.9
Town Hall	-	-	-	-	-	-	-	-	-	1.4	-	2.2	2.8	2.9	4.8
Water Storage	-	-	-	-	-	-	-	-	1.4	3.8	1.4	4.5	5.1	5.3	7.1
Utility Building	-	-	-	-	-	-	-	-	-	1.5	-	2.3	2.8	3.0	4.9
EMS Cell Tower	-	-	-	-	-	-	-	-	1.1	3.3	0.9	4.0	4.6	4.8	6.6
Electrical Facility	-	-	-	-	-	-	-	-	-	1.5	-	2.3	2.8	3.0	4.9
FEMA Lot	-	-	-	-	-	-	-	-	0.7	3.5	1.2	4.3	4.8	5.0	6.9
Low Risk	Less than 1 feet of water, facility likely accessible and operational														
Medium Risk	Over 1 feet of water, possible impact to facility														
High Risk	Over 3 feet of water, impact to facility														



*Representative slide from sensitivity analysis maps



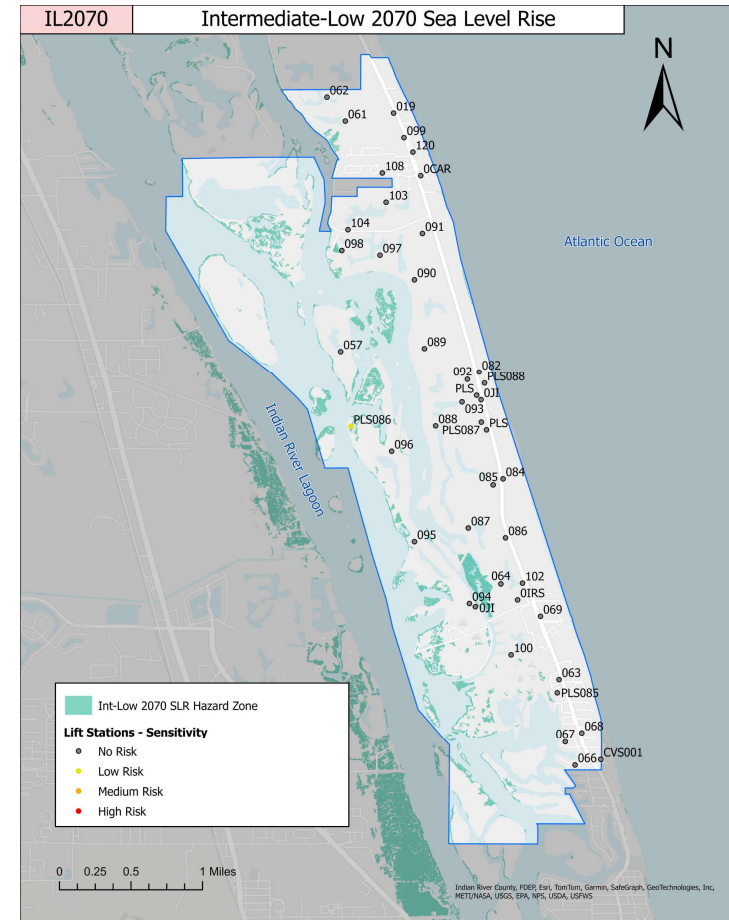
Findings



Impacts to Critical Infrastructure

Table 9 - Lift Stations Sensitivity (Depth in Feet)

Lift Station	Type	2017 NOAA Int-Low 2040	2017 NOAA Int-High 2040	2017 NOAA Int-Low 2070	2017 NOAA Int-High 2070	High Tide	High Tide + IL2040	High Tide + IL2070	High Tide + IH2040	High Tide + IH2070	Cat 3 Storm Surge	100 Year	Storm Surge + IL2040	Storm Surge + IL2070	Storm Surge + IH2040	Storm Surge + IH2070
019	Panel Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
019	Valve Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
019	Wet Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
057	Panel Box	-	-	-	-	-	-	-	-	-	3.2	0.4	4.0	4.5	4.7	6.6
057	Valve Box	-	-	-	-	-	-	-	-	-	3.2	0.6	4.0	4.5	4.7	6.6
057	Wet Well	-	-	-	-	-	-	-	-	0.2	3.2	0.6	4.0	4.5	4.7	6.6
061	Panel Box	-	-	-	-	-	-	-	-	0.5	3.6	1.7	4.3	4.9	5.1	6.9
061	Valve Box	-	-	-	-	-	-	-	-	0.6	3.8	2.0	4.6	5.2	5.3	7.2
061	Wet Well	-	-	-	-	-	-	-	-	0.5	3.7	1.8	4.4	5.0	5.2	7.0
062	Panel Box	-	-	-	-	-	-	-	-	0.1	4.0	1.9	4.7	5.3	5.5	7.3
BREAK LINE																
104	Valve Box	-	-	-	-	-	-	-	-	-	1.1	-	1.9	2.5	2.6	4.5
104	Wet Well	-	-	-	-	-	-	-	-	-	1.1	-	1.8	2.4	2.6	4.4
108	Wet Well	-	-	-	-	-	-	-	-	-	1.3	-	2.1	2.6	2.8	4.7
108	Valve Box	-	-	-	-	-	-	-	-	-	1.6	-	2.3	2.9	3.1	4.9
108	Panel Box	-	-	-	-	-	-	-	-	-	1.3	-	2.1	2.7	2.8	4.7
120	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8
CVS001	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3
PLS	Wet Well	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	2.0
PLS	LS	-	-	-	-	-	-	-	-	-	-	-	0.1	0.7	0.8	2.7
PLS085	LS	-	-	-	-	-	-	-	-	0.7	3.3	0.9	4.0	4.6	4.8	6.7
PLS086	LS	0.1	0.8	0.7	2.6	1.4	2.1	2.7	2.9	4.7	7.8	6.2	8.6	9.2	9.3	11.2
PLS087	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.8
PLS088	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Summary																
Low Risk		Less than 2 feet of water, equipment likely functional														
Medium Risk		Over 2 feet of water, impacts to equipment likely														
High Risk		Over 3 feet of water, major impact to equipment														





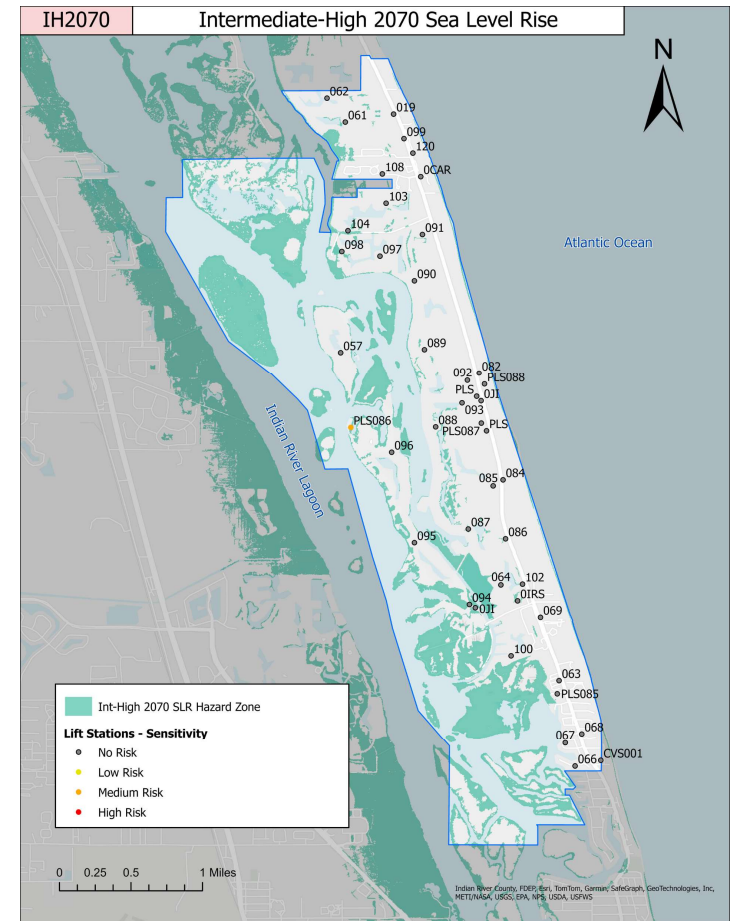
Findings



Impacts to Critical Infrastructure

Table 9 - Lift Stations Sensitivity (Depth in Feet)

Lift Station	Type	2017 NOAA Int-Low 2040	2017 NOAA Int-High 2040	2017 NOAA Int-Low 2070	2017 NOAA Int-High 2070	High Tide	High Tide + IL2040	High Tide + IL2070	High Tide + IH2040	High Tide + IH2070	Cat 3 Storm Surge	100 Year	Storm Surge + IL2040	Storm Surge + IL2070	Storm Surge + IH2040	Storm Surge + IH2070
019	Panel Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
019	Valve Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
019	Wet Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
057	Panel Box	-	-	-	-	-	-	-	-	-	1.2	0.2	2.0	2.0	2.2	2.2
057	Valve Box	-	-	-	-	-	-	-	-	-	1.2	0.2	2.0	2.0	2.2	2.2
057	Wet Well	-	-	-	-	-	-	-	-	0.2	1.2	0.2	2.0	2.0	2.2	2.2
061	Panel Box	-	-	-	-	-	-	-	-	-	1.2	0.2	2.0	2.0	2.2	2.2
061	Valve Box	-	-	-	-	-	-	-	-	0.2	1.2	0.2	2.0	2.0	2.2	2.2
061	Wet Well	-	-	-	-	-	-	-	-	0.2	1.2	0.2	2.0	2.0	2.2	2.2
062	Panel Box	-	-	-	-	-	-	-	-	0.2	1.2	0.2	2.0	2.0	2.2	2.2
BREAK LINE																
104	Valve Box	-	-	-	-	-	-	-	-	-	1.2	-	1.0	2.5	2.5	2.5
104	Wet Well	-	-	-	-	-	-	-	-	-	1.2	-	1.0	2.5	2.5	2.5
108	Wet Well	-	-	-	-	-	-	-	-	-	1.2	-	1.0	2.5	2.5	2.5
108	Valve Box	-	-	-	-	-	-	-	-	-	1.2	-	1.0	2.5	2.5	2.5
108	Panel Box	-	-	-	-	-	-	-	-	-	1.2	-	1.0	2.5	2.5	2.5
120	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0
CVS001	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0
PLS	Wet Well	-	-	-	-	-	-	-	-	-	-	-	0.2	1.0	2.0	-
PLS	LS	-	-	-	-	-	-	-	-	-	-	-	0.2	1.0	2.0	-
PLS085	LS	-	-	-	-	-	-	-	-	0.2	1.2	0.2	2.0	2.0	2.2	2.2
PLS086	LS	-	-	-	2.6	-	-	-	-	-	-	-	-	-	-	1.0
PLS087	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PLS088	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Legend																
Low Risk		Less than 2 feet of water, equipment likely functional														
Medium Risk		Over 2 feet of water, impacts to equipment likely														
High Risk		Over 3 feet of water, major impact to equipment														





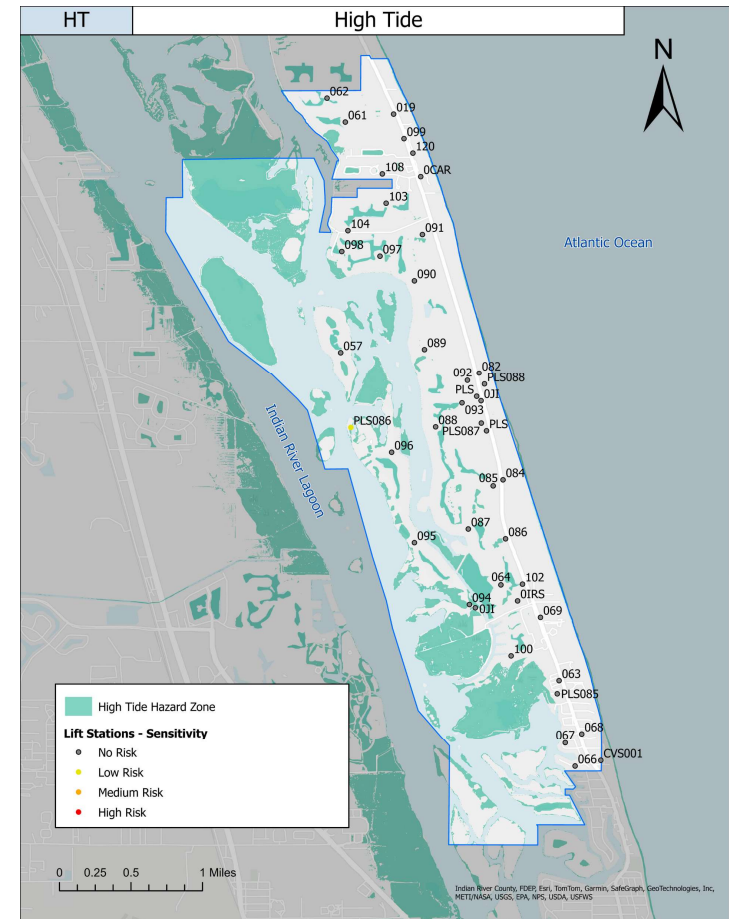
Findings



Impacts to Critical Infrastructure

Table 9 - Lift Stations Sensitivity (Depth in Feet)

Lift Station	Type	2017 NOAA Irib Low 2040	2017 NOAA Irib High 2040	2017 NOAA Irib Low 2070	2017 NOAA Irib High 2070	High Tide	High Tide + IL2040	High Tide + IL2070	High Tide + H42040	High Tide + H42070	Cat 3 Storm Surge	100 Year	Storm Surge + IL2040	Storm Surge + IL2070	Storm Surge + H42040	Storm Surge + H42070
019	Panel Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
019	Valve Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
019	Wet Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
057	Panel Box	-	-	-	-	-	-	-	-	-	0.2	0.2	0.2	0.2	0.2	0.2
057	Valve Box	-	-	-	-	-	-	-	-	-	0.2	0.2	0.2	0.2	0.2	0.2
057	Wet Well	-	-	-	-	-	-	-	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2
061	Panel Box	-	-	-	-	-	-	-	-	-	0.2	0.2	0.2	0.2	0.2	0.2
061	Valve Box	-	-	-	-	-	-	-	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2
061	Wet Well	-	-	-	-	-	-	-	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2
062	Panel Box	-	-	-	-	-	-	-	-	-	0.2	0.2	0.2	0.2	0.2	0.2
BREAK LINE																
104	Valve Box	-	-	-	-	-	-	-	-	-	1.4	-	1.4	2.5	2.5	2.5
104	Wet Well	-	-	-	-	-	-	-	-	-	1.4	-	1.4	2.5	2.5	2.5
108	Wet Well	-	-	-	-	-	-	-	-	-	1.4	-	1.4	2.5	2.5	2.5
108	Valve Box	-	-	-	-	-	-	-	-	-	1.4	-	1.4	2.5	2.5	2.5
108	Panel Box	-	-	-	-	-	-	-	-	-	1.4	-	1.4	2.5	2.5	2.5
120	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0
CVS001	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0
PLS	Wet Well	-	-	-	-	-	-	-	-	-	-	-	0.2	0.2	0.2	0.2
PLS	LS	-	-	-	-	-	-	-	-	-	-	-	0.2	0.2	0.2	0.2
PLS085	LS	-	-	-	-	-	-	-	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2
PLS086	LS	-	-	-	-	1.4	-	-	-	-	-	-	-	-	-	1.0
PLS087	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0
PLS088	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0
Legend																
Low Risk		Less than 2 feet of water, equipment likely functional														
Medium Risk		Over 2 feet of water, impacts to equipment likely														
High Risk		Over 3 feet of water, major impact to equipment														





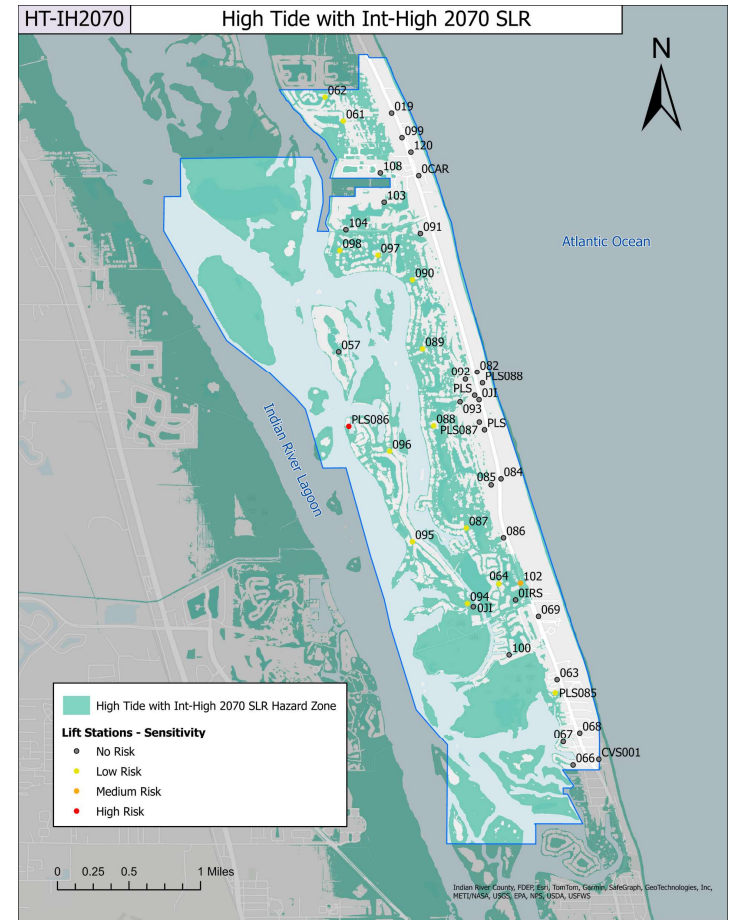
Findings



Impacts to Critical Infrastructure

Table 9 - Lift Stations Sensitivity (Depth in Feet)

Lift Station	Type	2017 NOAA Int. Low 2040	2017 NOAA Int. High 2040	2017 NOAA Int. Low 2070	2017 NOAA Int. High 2070	High Tide	High Tide + IL2040	High Tide + IL2070	High Tide + IH2040	High Tide + IH2070	Cat 3 Storm Surge	100 Year	Storm Surge + IL2040	Storm Surge + IL2070	Storm Surge + IH2040	Storm Surge + IH2070
019	Panel Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
019	Valve Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
019	Wet Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
057	Panel Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
057	Valve Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
057	Wet Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
061	Panel Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
061	Valve Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
061	Wet Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
062	Panel Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BREAK LINE																
104	Valve Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
104	Wet Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
108	Wet Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
108	Valve Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
108	Panel Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
120	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CVS001	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PLS	Wet Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PLS	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PLS085	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PLS086	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PLS087	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PLS088	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Legend																
Low Risk		Less than 2 feet of water, equipment likely functional														
Medium Risk		Over 2 feet of water, impacts to equipment likely														
High Risk		Over 3 feet of water, major impact to equipment														





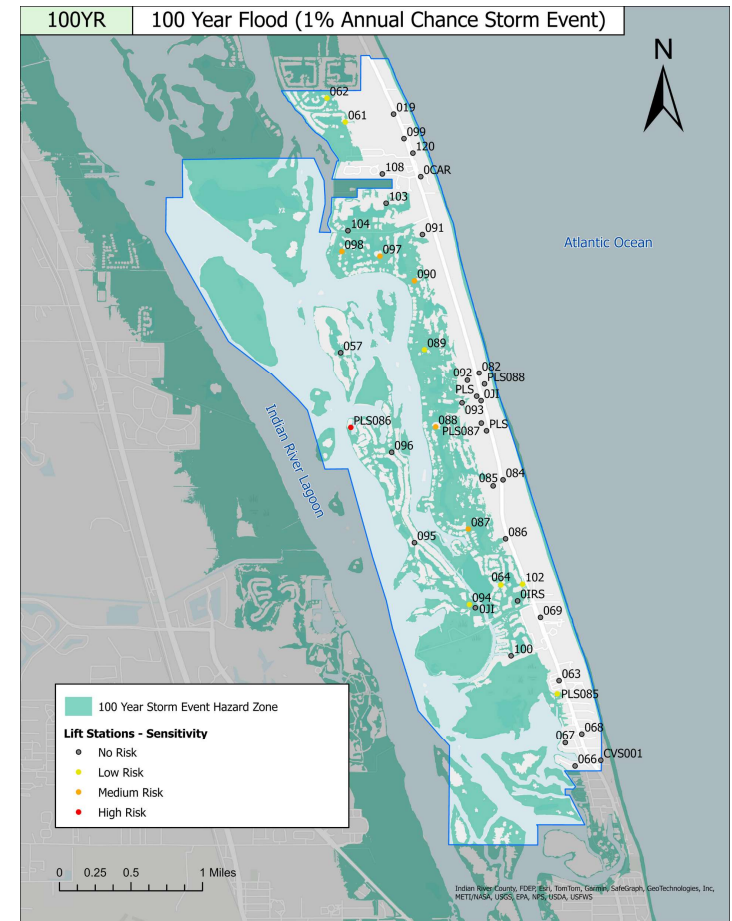
Findings



Impacts to Critical Infrastructure

Table 9 - Lift Stations Sensitivity (Depth in Feet)

Lift Station	Type	2017 NOAA Irib Low 2040	2017 NOAA Irib High 2040	2017 NOAA Irib Low 2070	2017 NOAA Irib High 2070	High Tide	High Tide + IL2040	High Tide + IL2070	High Tide + H42040	High Tide + H42070	Cat 3 Storm Surge	100 Year	Storm Surge + IL2040	Storm Surge + IL2070	Storm Surge + H42040	Storm Surge + H42070
019	Panel Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
019	Valve Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
019	Wet Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
057	Panel Box	-	-	-	-	-	-	-	-	-	-	0.4	0.4	0.4	0.4	0.4
057	Valve Box	-	-	-	-	-	-	-	-	-	-	0.6	0.6	0.6	0.6	0.6
057	Wet Well	-	-	-	-	-	-	-	-	-	-	0.6	0.6	0.6	0.6	0.6
061	Panel Box	-	-	-	-	-	-	-	-	-	-	1.7	1.7	1.7	1.7	1.7
061	Valve Box	-	-	-	-	-	-	-	-	-	-	2.0	2.0	2.0	2.0	2.0
061	Wet Well	-	-	-	-	-	-	-	-	-	-	1.8	1.8	1.8	1.8	1.8
062	Panel Box	-	-	-	-	-	-	-	-	-	-	1.9	1.9	1.9	1.9	1.9
-----BREAK LINE-----																
104	Valve Box	-	-	-	-	-	-	-	-	-	-	1.4	1.4	1.4	1.4	1.4
104	Wet Well	-	-	-	-	-	-	-	-	-	-	-	1.4	1.4	1.4	1.4
108	Wet Well	-	-	-	-	-	-	-	-	-	-	1.3	1.3	1.3	1.3	1.3
108	Valve Box	-	-	-	-	-	-	-	-	-	-	-	1.3	1.3	1.3	1.3
108	Panel Box	-	-	-	-	-	-	-	-	-	-	-	1.3	1.3	1.3	1.3
120	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0
CVS001	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0
PLS	Wet Well	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	2.0
PLS	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	2.0
PLS085	LS	-	-	-	-	-	-	-	-	-	-	0.9	0.9	0.9	0.9	0.9
PLS086	LS	-	-	-	-	-	-	-	-	-	-	6.2	6.2	6.2	6.2	6.2
PLS087	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0
PLS088	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0
-----BREAK LINE-----																
Low Risk		Less than 2 feet of water, equipment likely functional														
Medium Risk		Over 2 feet of water, impacts to equipment likely														
High Risk		Over 3 feet of water, major impact to equipment														



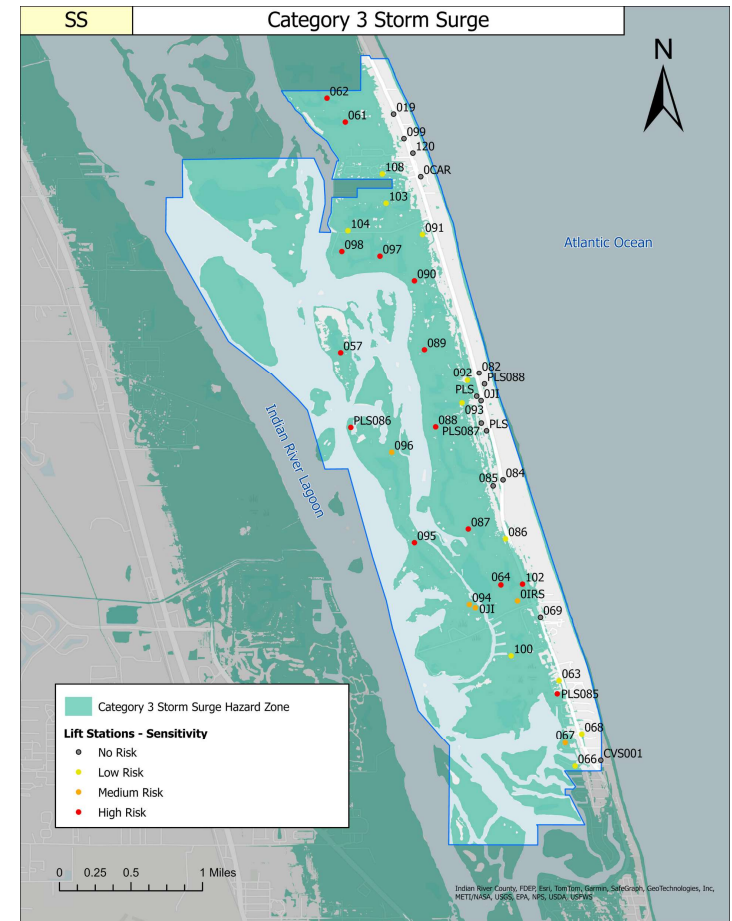
Findings



Impacts to Critical Infrastructure

Table 9 - Lift Stations Sensitivity (Depth in Feet)

Lift Station	Type	2017 NOAA IRL Low 2040	2017 NOAA IRL High 2040	2017 NOAA IRL Low 2070	2017 NOAA IRL High 2070	High Tide	High Tide + IL2040	High Tide + IL2070	High Tide + H42040	High Tide + H42070	Cat 3 Storm Surge	100 Year	Storm Surge + IL2040	Storm Surge + IL2070	Storm Surge + H42040	Storm Surge + H42070
019	Panel Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
019	Valve Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
019	Wet Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
057	Panel Box	-	-	-	-	-	-	-	-	-	3.2	0.7	2.0	2.0	2.0	2.0
057	Valve Box	-	-	-	-	-	-	-	-	-	3.2	0.7	2.0	2.0	2.0	2.0
057	Wet Well	-	-	-	-	-	-	-	-	0.2	3.2	0.7	2.0	2.0	2.0	2.0
061	Panel Box	-	-	-	-	-	-	-	-	-	3.6	-	-	-	-	-
061	Valve Box	-	-	-	-	-	-	-	-	-	3.8	2.0	2.0	2.0	2.0	2.0
061	Wet Well	-	-	-	-	-	-	-	-	0.3	3.7	0.7	-	-	-	-
062	Panel Box	-	-	-	-	-	-	-	-	-	4.0	0.7	2.0	2.0	2.0	2.0
BREAK LINE																
104	Valve Box	-	-	-	-	-	-	-	-	-	1.1	-	1.0	2.5	2.5	2.5
104	Wet Well	-	-	-	-	-	-	-	-	-	1.1	-	1.0	2.5	2.5	2.5
108	Wet Well	-	-	-	-	-	-	-	-	-	1.3	-	2.1	2.5	2.5	2.5
108	Valve Box	-	-	-	-	-	-	-	-	-	1.6	-	2.5	2.5	2.5	2.5
108	Panel Box	-	-	-	-	-	-	-	-	-	1.3	-	2.5	2.5	2.5	2.5
120	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9
CVS001	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9
PLS	Wet Well	-	-	-	-	-	-	-	-	-	-	-	-	0.9	2.0	-
PLS	LS	-	-	-	-	-	-	-	-	-	-	-	1.0	2.0	2.0	2.0
PLS085	LS	-	-	-	-	-	-	-	-	0.2	3.3	0.9	2.0	2.0	2.0	2.0
PLS086	LS	-	-	-	-	-	-	-	-	-	7.8	-	-	-	-	0.9
PLS087	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0
PLS088	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Risk Less than 2 feet of water, equipment likely functional																
Medium Risk Over 2 feet of water, impacts to equipment likely																
High Risk Over 3 feet of water, major impact to equipment																





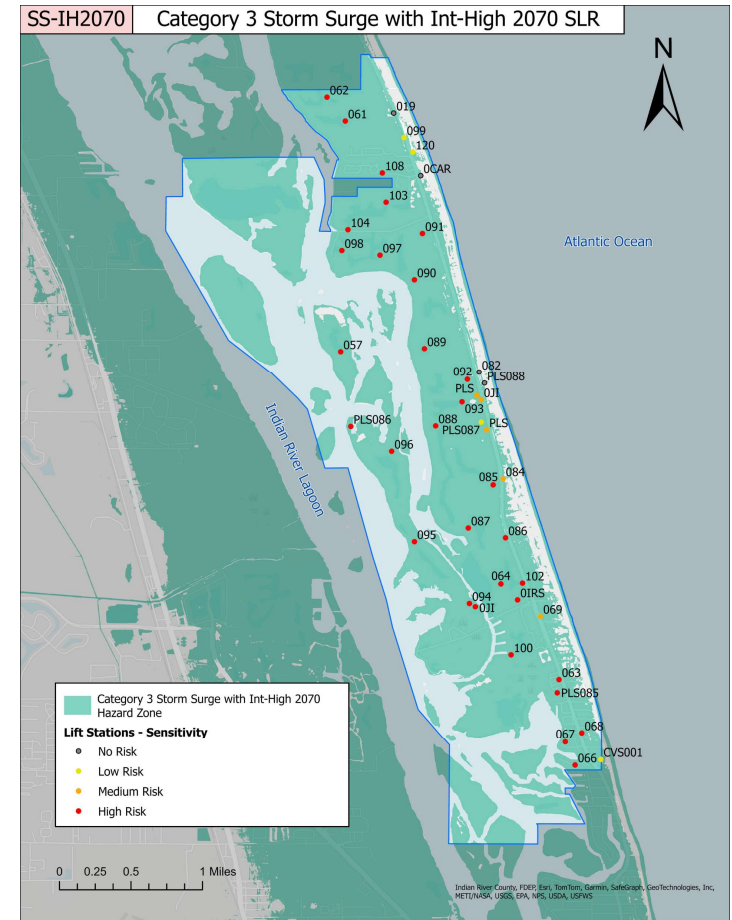
Findings



Impacts to Critical Infrastructure

Table 9 - Lift Stations Sensitivity (Depth in Feet)

Lift Station	Type	2017 NOAA Int-Low 2040	2017 NOAA Int-High 2040	2017 NOAA Int-Low 2070	2017 NOAA Int-High 2070	High Tide	High Tide + IL2040	High Tide + IL2070	High Tide + IH2040	High Tide + IH2070	Cat 3 Storm Surge	100 Year	Storm Surge + IL2040	Storm Surge + IL2070	Storm Surge + IH2040	Storm Surge + IH2070
019	Panel Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
019	Valve Box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
019	Wet Well	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
057	Panel Box	-	-	-	-	-	-	-	-	-	6.2	0.2	6.0	6.0	6.2	6.6
057	Valve Box	-	-	-	-	-	-	-	-	-	6.2	0.2	6.0	6.0	6.2	6.6
057	Wet Well	-	-	-	-	-	-	-	-	-	6.2	0.2	6.0	6.0	6.2	6.6
061	Panel Box	-	-	-	-	-	-	-	-	-	6.9	0.2	6.7	6.7	6.9	6.9
061	Valve Box	-	-	-	-	-	-	-	-	-	6.9	0.2	6.7	6.7	6.9	7.2
061	Wet Well	-	-	-	-	-	-	-	-	-	6.9	0.2	6.7	6.7	6.9	7.0
062	Panel Box	-	-	-	-	-	-	-	-	-	7.3	0.2	7.1	7.1	7.3	7.3
BREAK LINE																
104	Valve Box	-	-	-	-	-	-	-	-	-	4.4	-	4.0	4.0	4.4	4.5
104	Wet Well	-	-	-	-	-	-	-	-	-	4.4	-	4.0	4.0	4.4	4.4
108	Wet Well	-	-	-	-	-	-	-	-	-	4.3	-	3.9	3.9	4.3	4.7
108	Valve Box	-	-	-	-	-	-	-	-	-	4.3	-	3.9	3.9	4.3	4.9
108	Panel Box	-	-	-	-	-	-	-	-	-	4.3	-	3.9	3.9	4.3	4.7
120	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8
CVS001	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3
PLS	Wet Well	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	2.0
PLS	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	2.7
PLS085	LS	-	-	-	-	-	-	-	-	-	0.2	0.2	0.0	0.0	0.0	6.7
PLS086	LS	-	-	-	-	-	-	-	-	-	11.2	0.2	11.0	11.0	11.2	11.2
PLS087	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.8
PLS088	LS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Risk Summary																
Low Risk		Less than 2 feet of water, equipment likely functional														
Medium Risk		Over 2 feet of water, impacts to equipment likely														
High Risk		Over 3 feet of water, major impact to equipment														





Introduction and Overview



Reasons for a Vulnerability Assessment



Scenarios Examined



Critical Assets Analyzed



Findings



Stakeholder input



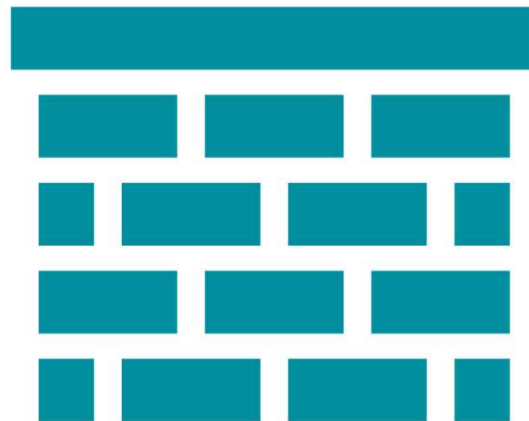
Stakeholder Input



What Vulnerabilities does Indian River
Shores face?



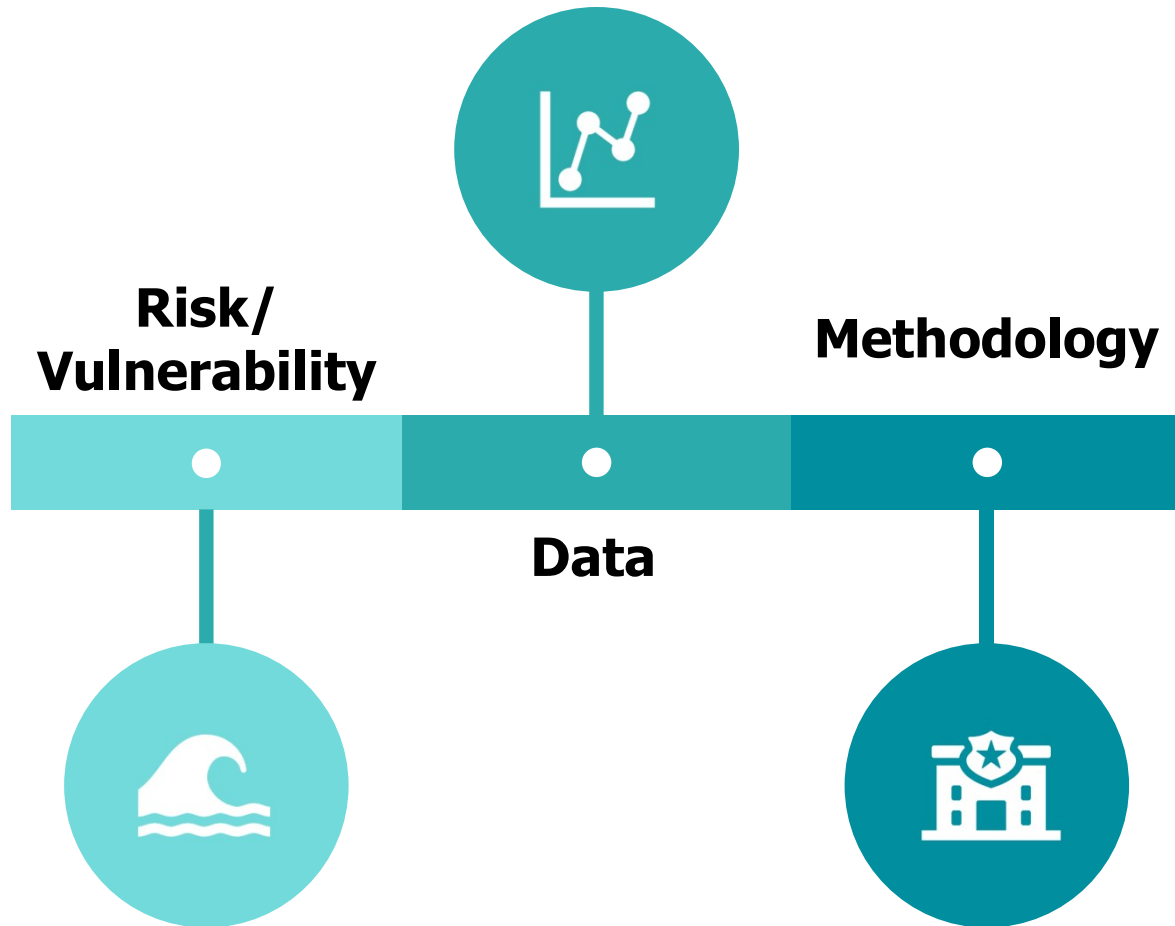
Stakeholder Input



What projects can you think of that would make Indian River Shores more resilient?

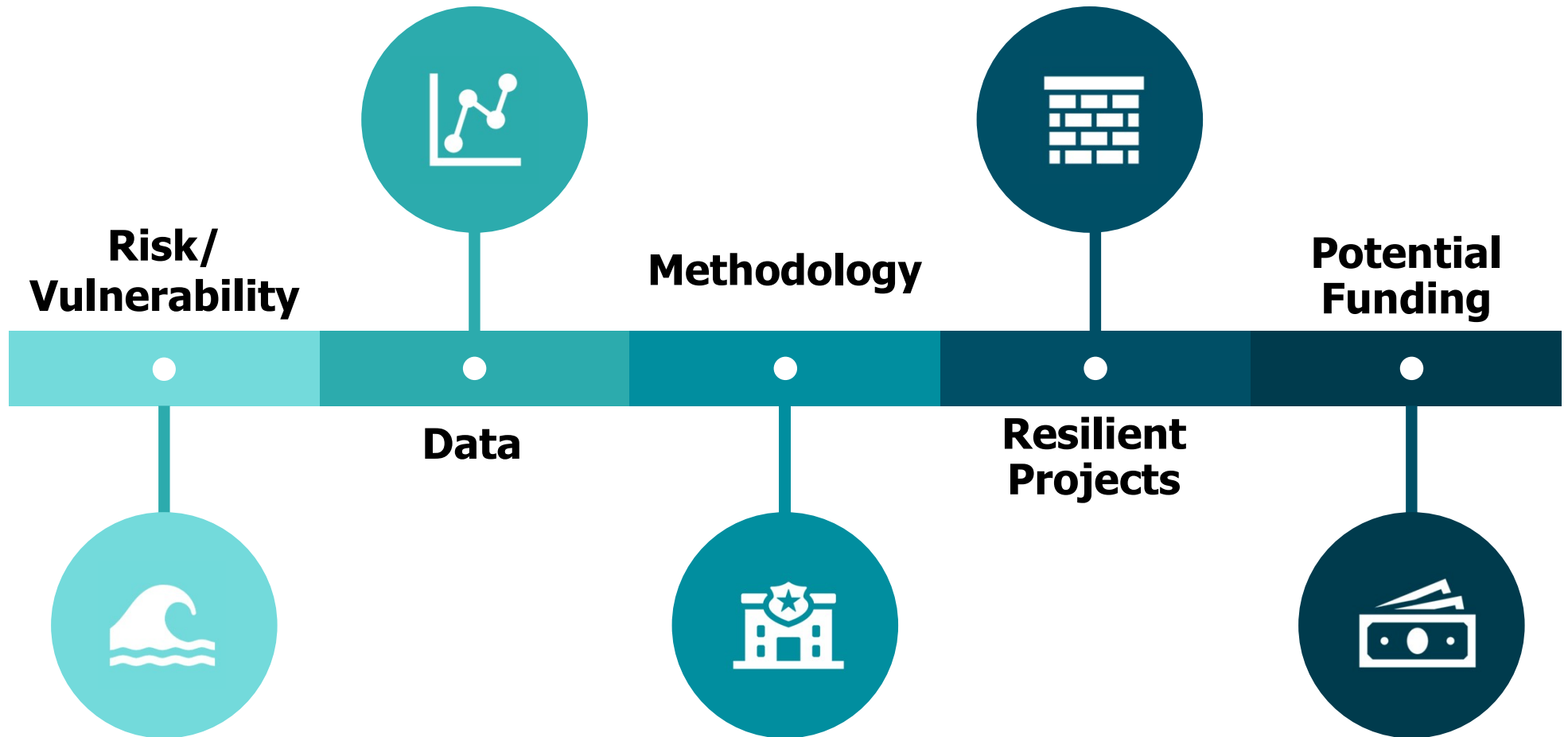


Stakeholder Input



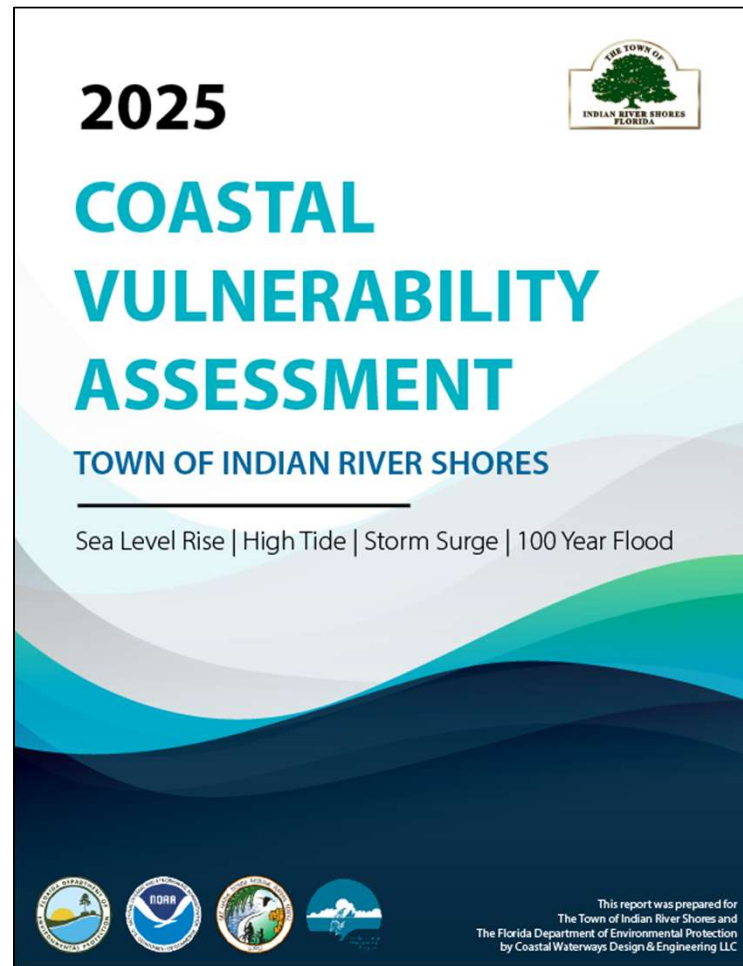


Stakeholder Input





Stakeholder Input





Stakeholder Input

Questions?