



Working Together to Create More Resilient Florida Communities

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FRCP, Tallahassee

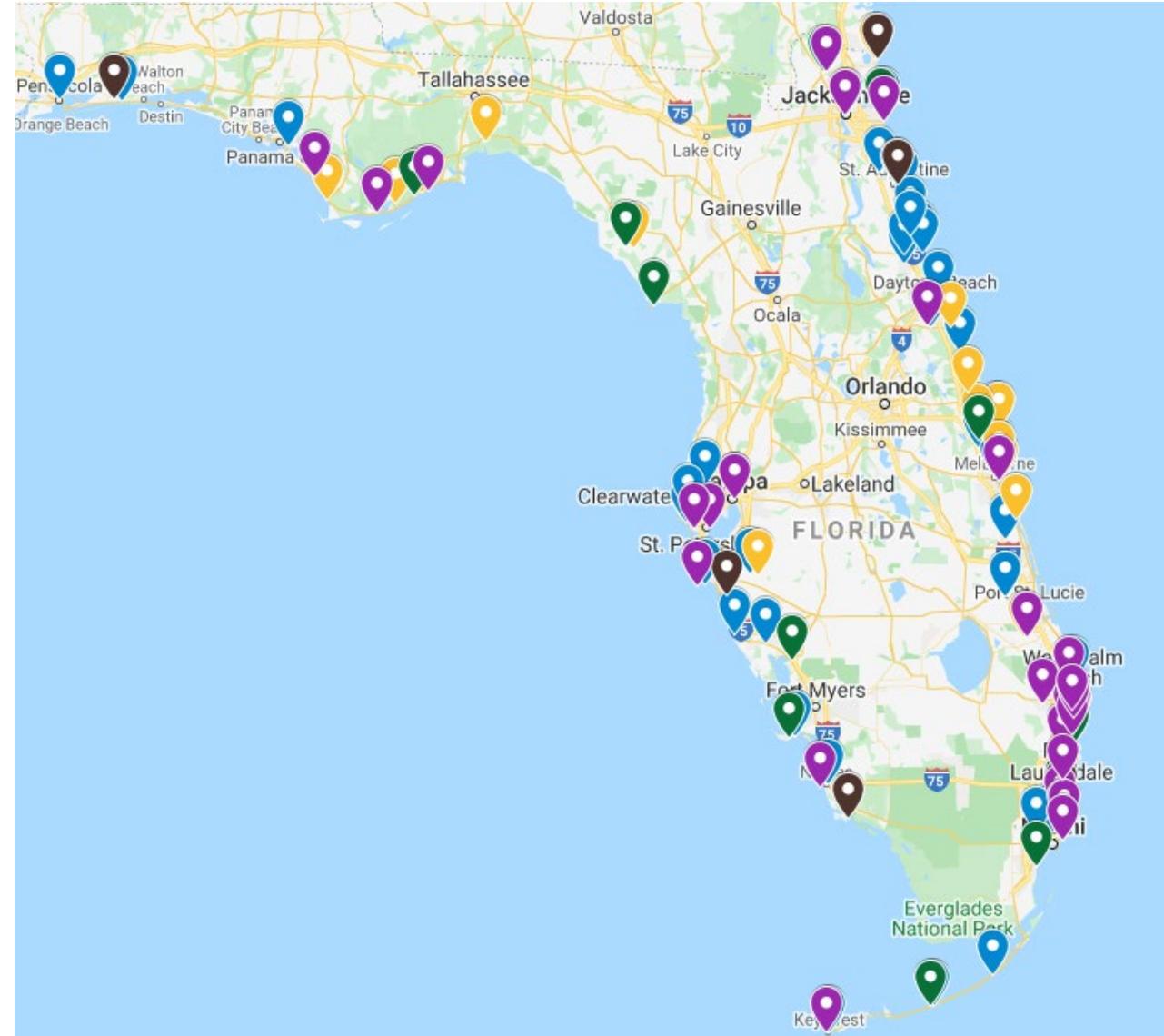
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Florida Resilient Coastlines Program

- **\$6.5 Million Allocated**
- **97 Total Awards**
 - *11 Implementation Projects*
 - *86 Planning Projects**
- **129 Cities and Counties**

*Planning Projects include Peril of Flood, Vulnerability Assessments, Adaptation Plans and Regional Coordination





Sea Level Impact Projection Studies

Section 161.551, F.S., Public Financing of Coastal Construction, and 62S-7, F.A.C.



161.551, F.S.

Sea Level Impact Projection Studies

An act relating to public financing of construction projects; creating s. 161.551, F.S.; defining terms; prohibiting state-financed constructors from commencing construction of certain structures in coastal areas after a specified date without first taking certain steps regarding a *sea level impact projection study*..



Slip Study Rule Timeline

June 29 2020	<ul style="list-style-type: none">• SB 178 signed by Governor DeSantis
October 2020	<ul style="list-style-type: none">• SLIP Study Requirements Development
November 2020	<ul style="list-style-type: none">• Notice of Rule Development• Stakeholder Roundtables
December 2020	<ul style="list-style-type: none">• SLIP Tool Web Application Mock-up
January 2021	<ul style="list-style-type: none">• Rule Development Workshop 1• Incorporation of Comments into Draft Rule Language
February 2021	<ul style="list-style-type: none">• Refinement of Draft Rule Language• Rule Development Workshop 2
March 2021	<ul style="list-style-type: none">• Comments due March 1• Finalize Rule Language
April 2021	<ul style="list-style-type: none">• Publish Notice of Proposed Rule• File JAPC Package• JAPC Comment Period
May 2021	<ul style="list-style-type: none">• Public Hearing if Requested• JAPC Comments due by May 20
June 2021	<ul style="list-style-type: none">• File with Department of State
July 2021	<ul style="list-style-type: none">• Rule Becomes Effective• Launch of SLIP Tool Web Application



161.551, F.S.

Sea Level Impact Projection Studies

Beginning 1 year after the date the rule developed by the department pursuant to subsection (3) is finalized and is otherwise in effect,

a state-financed constructor may not commence construction of a coastal structure without:

- (a) *Conducting a SLIP study* that meets the requirements established by the department;
- (b) *Submitting the study to the department*; and
- (c) *Receiving notification from the department that the study was received and that it has been published on the department's website pursuant to paragraph (6) (a) for at least 30 days*. The state-financed constructor is solely responsible for ensuring that the study submitted to the department for publication meets the requirements under subsection (3).



Definitions Included in the Statute

(a) "Coastal structure" means a *major structure or nonhabitable major structure* within the *coastal building zone*.

(b) "Public entity" means the state or any of its political subdivisions, or any municipality, county, agency, special district, authority, or other public body corporate of the state which is demonstrated to perform a public function or to serve a governmental purpose that could properly be performed or served by an appropriate governmental unit.

(c) "SLIP study" means a sea level impact projection study as established by the department pursuant to subsection (3).

"Major structure," "nonhabitable major structure," and "coastal building zone" are defined in the rule.



Definitions Included in the Statute

(d) "State-financed constructor" means a public entity that commissions or manages a construction project using funds appropriated from the state.

(e) "Substantial flood damage" means flood, inundation, or wave action damage resulting from a single event, such as a flood or tropical weather system, where such damage exceeds 25 percent of the market value of the coastal structure at the time of the event.



State Financed Constructor

161.551(b) “Public entity” means the state or any of its political subdivisions, or any municipality, county, agency, special district, authority, or other public body corporate of the state which is demonstrated to perform a public function or to serve a governmental purpose that could properly be performed or served by an appropriate governmental unit.

161.551(d) “State-financed constructor” means a public entity that commissions or manages a construction project using funds appropriated from the state.

Examples include all funds identified in the General Appropriations Act, including those federal pass-through funds requiring appropriation of spending authority:

- Line-item appropriations
- Legislative projects
- FDOT new construction
- Projects prioritized in competitive grant programs
- State Park facilities



Coastal Building Zone – Mainland

161.54(1) “Coastal building zone” means the land area from the seasonal high-water line landward to a line 1,500 feet landward from the coastal construction control line as established pursuant to s. [161.053](#),

...and, for those coastal areas fronting on the Gulf of Mexico, Atlantic Ocean, Florida Bay, or Straits of Florida and not included under s. [161.053](#), the land area seaward of the most landward velocity zone (V-zone) line as established by the Federal Emergency Management Agency and shown on flood insurance rate maps.



Coastal Building Zone - Barrier Island

161.55(4) APPLICATION TO COASTAL BARRIER ISLANDS.—All requirements of this part which are applicable to the coastal building zone shall also apply to coastal barrier islands. The coastal building zone on coastal barrier islands shall be the land area from the seasonal high-water line to a line 5,000 feet landward from the coastal construction control line established pursuant to s. [161.053](#), or the entire island, whichever is less....

For coastal barrier islands on which a coastal construction control line has not been established pursuant to s. [161.053](#), the coastal building zone shall be the land area seaward of the most landward velocity zone (V-zone) boundary line fronting upon the Gulf of Mexico, Atlantic Ocean, Florida Bay, or Straits of Florida. ...

All land area in the Florida Keys located within Monroe County shall be included in the coastal building zone.



Coastal Structure

161.551(a) “Coastal structure” means a major structure or nonhabitable major structure within the coastal building zone.

161.54(6)(a) “Major structure” means houses, mobile homes, apartment buildings, condominiums, motels, hotels, restaurants, towers, other types of residential, commercial, or public buildings, and other construction having the potential for substantial impact on coastal zones.

(b) “Minor structure” means pile-supported, elevated dune and beach walkover structures; beach access ramps and walkways; stairways; pile-supported, elevated viewing platforms, gazebos, and boardwalks; lifeguard support stands; public and private bathhouses; sidewalks, driveways, parking areas, shuffleboard courts, tennis courts, handball courts, racquetball courts, and other uncovered paved areas; earth retaining walls; and sand fences, privacy fences, ornamental walls, ornamental garden structures, aviaries, and other ornamental construction. It shall be a characteristic of minor structures that they are considered to be expendable under design wind, wave, and storm forces.

(c) “Nonhabitable major structure” means swimming pools; parking garages; pipelines; piers; canals, lakes, ditches, drainage structures, and other water retention structures; water and sewage treatment plants; electrical power plants, and all related structures or facilities, transmission lines, distribution lines, transformer pads, vaults, and substations; roads, bridges, streets, and highways; and underground storage tanks.

(d) “Coastal or shore protection structure” means shore-hardening structures, such as seawalls, bulkheads, revetments, rubble mound structures, groins, breakwaters, and aggregates of materials other than beach sand used for shoreline protection; beach and dune restoration; and other structures which are intended to prevent erosion or protect other structures from wave and hydrodynamic forces.



Horizontal/Vertical Construction

“Horizontal construction” means new construction of surface parking lots, highways, roads, streets, bridges, utilities, water supply projects, water plants, wastewater plants, water and wastewater distribution or conveyance facilities, wharves, docks, airport runways and taxiways, drainage projects, or related types of projects associated with civil engineering construction.

“Vertical construction” means the new construction of any building, structure or other improvement that is predominantly vertical, including, without limitation, a building, structure or improvement for the support, shelter and enclosure of persons, animals, chattels or movable property of any kind, and any improvement appurtenant thereto.



62S-7.011

Requirements of the State-Financed Constructor

- 1) A state-financed constructor, as defined in s. 161.551, F.S., must perform a SLIP study for construction of a new coastal structure, according to the standards defined in Chapter 62S-7.012, F.A.C. The department has developed a web-based tool for performing a SLIP study and submitting a SLIP study developed using this web-based tool shall fulfill the requirements of s. 161.55, F.S. A state financed constructor may also meet the requirements of s. 161.55, F.S., by submitting a SLIP study that meets the standards and criteria established in Chap. 62S-7.012, F.A.C.
- 2) The state-financed constructor must submit the SLIP study to the department for publication on the department website.



62S-7.011

Requirements of the State-Financed Constructor

- 3) The state-financed constructor may not commence construction until notified by DEP that:
 - a. the SLIP study was approved as meeting the requirements of s. 161.551, F.S. and
 - b. the 30-day publication period has finished.
- 4) DEP will send such notification via the web-based SLIP study tool or email.
- 5) All SLIP studies will be maintained on DEP's website for a minimum of 10 years.

1. A state-financed constructor choosing not to use the Department's web-based tool to conduct the SLIP study required under s. 161.551, F.S., shall do all of the following:
 - a) **Show the amount of sea level rise expected over 50 years or the expected life of the structure, whichever is less.**
 - i. Use NOAA 2017 Intermediate-High + any others desired
 - ii. Use interpolation method
 - iii. Use NAVD 88 for all elevations
 - iv. Figure in land subsidence
 - b) **Show the amount of flooding, inundation, and wave action damage risk expected over 50 years or the expected life of the structure, whichever is less.**
 - i. Use the FEMA storm surge water surface elevation for the 1% annual chance (100 year) flood event
 - ii. Add the FEMA 1% annual chance water surface elevation to the sea level rise scenario, and then compare to the project's critical elevations
 - iii. Use the USACE Depth-Damage Curves from the 2015 North Atlantic Coast Comprehensive Study to estimate the cost of future flood damage, for vertical construction only, by assessing the approximate flood depth within the structure, using the comparison of the critical elevations to the previously calculated 1% annual chance water surface elevation added to the local sea level rise scenarios.
 - c) **Show the risk to public safety and environmental impacts** by assigning a risk category per the Florida Building Code and providing the ultimate design wind speed.
 - d) **Provide alternatives for the project's design and siting**, which take into account the SLIP study analysis and aim to reduce future flood risk to the structure and the risks and costs associated with construction, maintenance and repair of the structure.





SLIP Studies

Section 161.551, F.S.

Adaptation

Sea Level Impact Projection Study Tool

Determining risk for Florida coastline construction projects

The purpose of the Sea Level Impact Projection (SLIP) Study Tool is to facilitate the conduction of SLIP studies for state-funded construction within the coastal building zone in accordance with Section 161.551, F.S.



SLIP Studies

Learn more about SLIP Studies and how to create a report using this website

[Continue](#)



Section 161.551, F.S.

Learn more about the Florida statute that mandates SLIP studies.

[Continue](#)



Adaptation

Learn about adaptation strategies for your construction projects.

[Continue](#)



Use the tools below to view base map and coastal flooding spatial data.

Sea Level Rise

SLIP Study Tool

Create Report

Coastal Layers

Sea Level Rise

NOAA Regional Scenarios

Flood Zones

Storm Surge Flood Depths

High Tide Flooding

Wind Zones

Terrain

Wildlife Index

None

Use the vertical slider to simulate water level rise, the resulting inundation footprint, and relative depth.

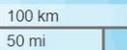
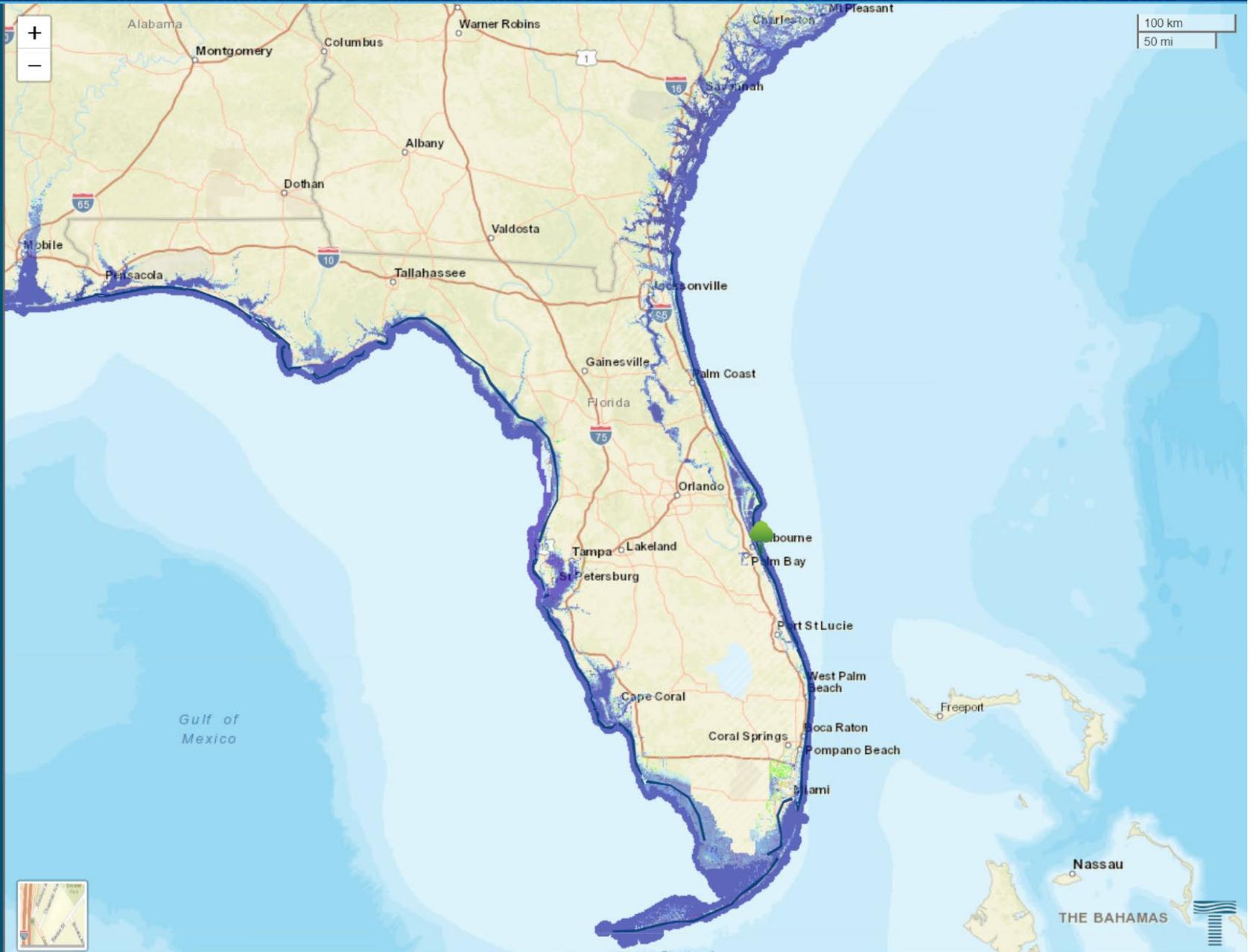
Water Depth

Low-lying inland areas prone to flood at selected sea level rise scenario

Water levels are relative to local Mean Higher High Water Datum. Areas that are hydrologically connected to the ocean are shown in shades of blue (darker blue = greater depth).



Water Level (feet)



Nassau THE BAHAMAS



Use the tools below to view base map and coastal flooding spatial data.

Coastal Layers

- Sea Level Rise (i)
- > NOAA Regional Scenarios (i)
- Flood Zones (i)
- Storm Surge Flood Depths (i)
- High Tide Flooding (i)
- Wind Zones (i)
- Terrain (i)
- Wildlife Index (i)
- None

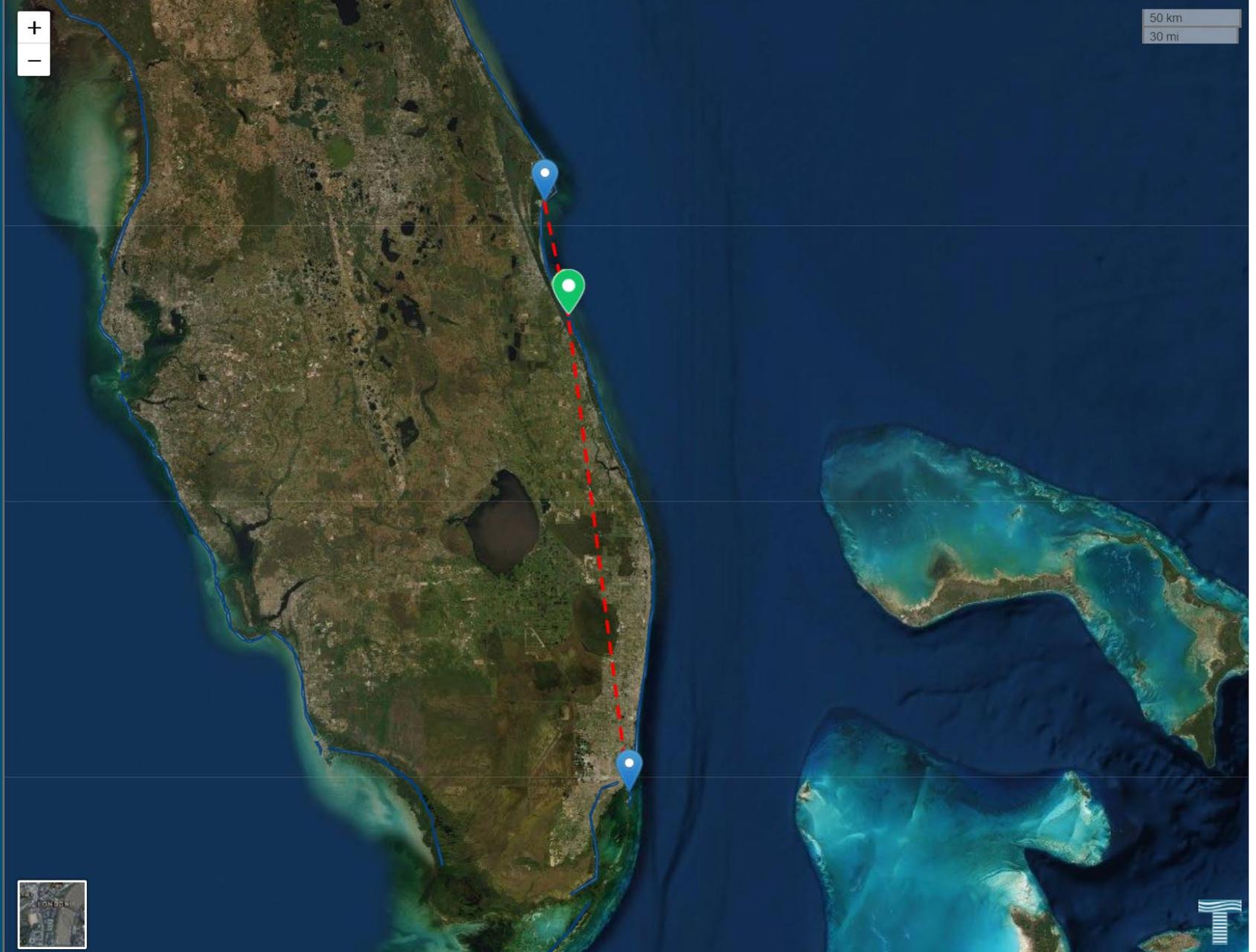
NOAA Regional Scenarios

Click a location on the map to see the interpolated regional sea level rise for the selected scenario. Elevations are in NAVD88 (ft).

Intermediate High ▾

Virginia Key, FL
Trident Pier, FL

2100	: 2.86 ft
2080	: 1.81 ft
2060	: 0.99 ft
2040	: 0.37 ft
2020	: -0.06 ft





Use the tools below to view base map and coastal flooding spatial data.

SLIP Study Tool

Create Report

Coastal Layers

- Sea Level Rise (i)
- NOAA Regional Scenarios (i)
- Flood Zones (i)
- Storm Surge Flood Depths (i)
- > High Tide Flooding (i)**
- Wind Zones (i)
- Terrain (i)
- Wildlife Index (i)
- None

High Tide Flooding

● Shallow Coastal Flooding

Annual occurrences of tidal flooding—exceeding local thresholds for minor impacts to infrastructure—have increased 5- to 10-fold since the 1960s in several U.S. coastal cities. The changes in high tide flooding over time are greatest where elevation is lower, local RSL rise is higher, or extreme variability is less.

In a sense, today's flood will become tomorrow's high tide, as sea level rise will cause flooding to occur more frequently and last for longer durations of time.

The red layer in the map represents areas currently subject to tidal flooding, often called "recurrent or nuisance flooding."





Use the tools below to view base map and coastal flooding spatial data.

SLIP Study Tool

Cancel Report

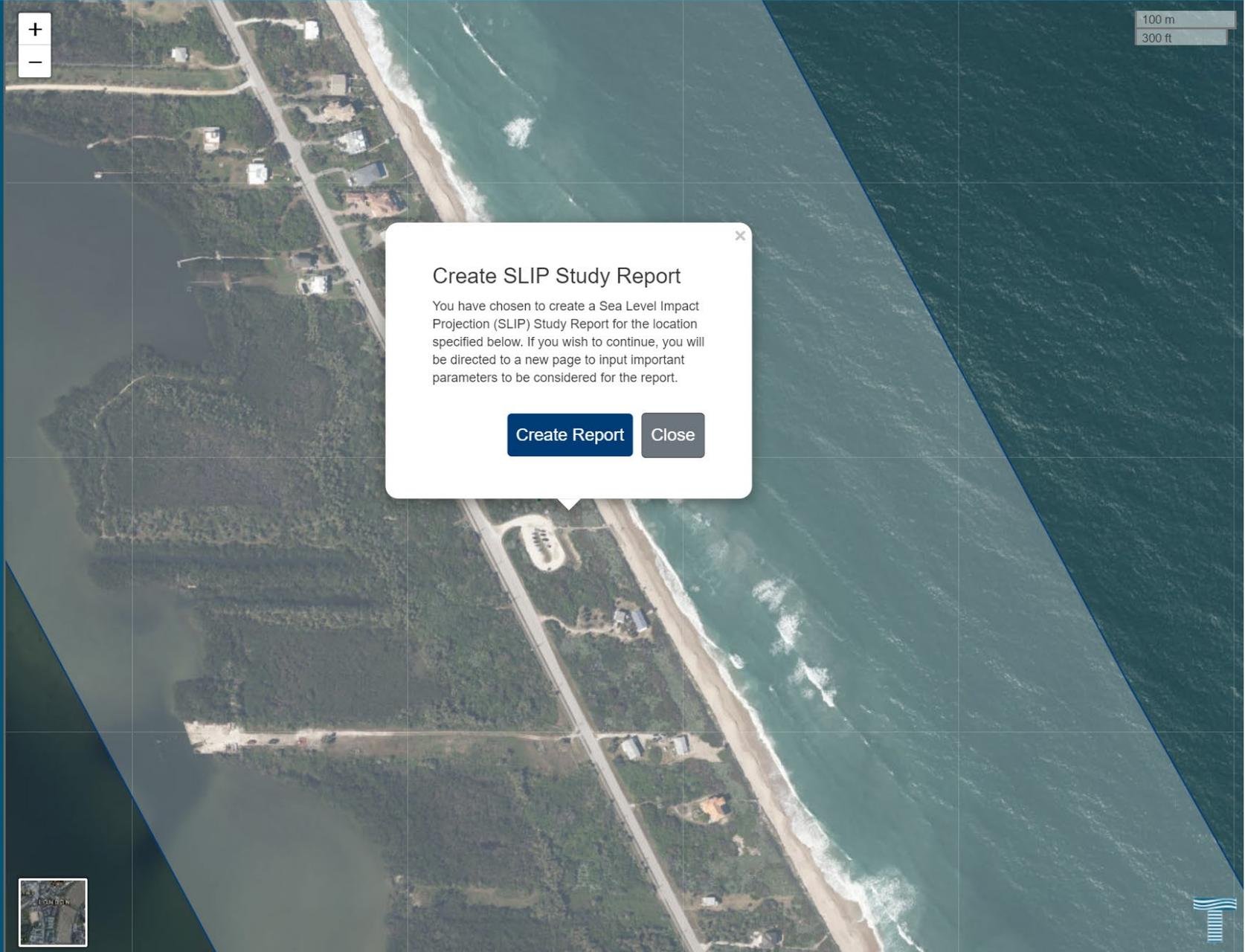
Coastal Layers

- > Sea Level Rise ⓘ
- NOAA Regional Scenarios ⓘ
- Flood Zones ⓘ
- Storm Surge Flood Depths ⓘ
- High Tide Flooding ⓘ
- Wind Zones ⓘ
- Terrain ⓘ
- Wildlife Index ⓘ
- None

Create Report

You have activated the "Create Report" tool. In order to create a new SLIP Study report use the map pane to the right to navigate to your project area. Click on the desired project area on the map and the "Create Report" form will pop up. Enter the required information and click "Create Report".

If you would like to cancel the "Create Report" process, click "Cancel Report" on the left side of this page.



100 m
300 ft

✕

Create SLIP Study Report

You have chosen to create a Sea Level Impact Projection (SLIP) Study Report for the location specified below. If you wish to continue, you will be directed to a new page to input important parameters to be considered for the report.

Create Report Close





Create SLIP Study Report

*Denotes required values

*Project Name:
Bonsteel Park Driveway

*Category:
Horizontal (road/bridge/parking lot, etc)

*Construction type:
Risk Category I

Critical Elevation (ft NAVD88):
1.3

*Construction Start Year:
2021

*Expected Life (years):
50

*Estimated Construction Cost (\$):
20000

Create Report

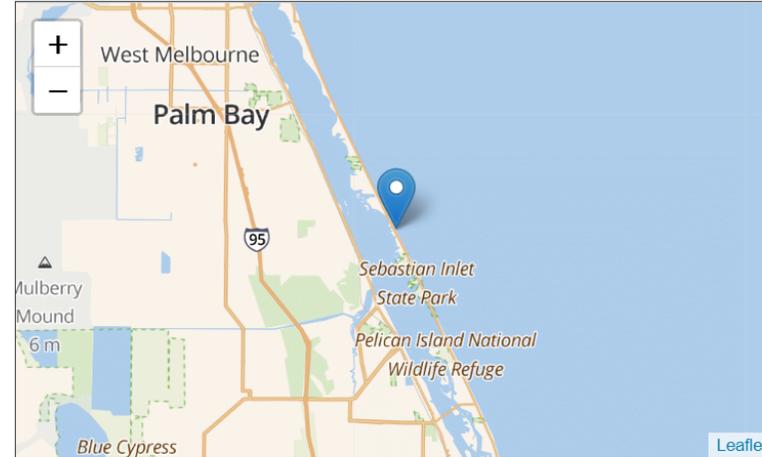
Cancel



Save Report

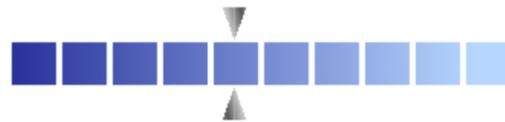
Sea Level Impact Projection (SLIP) Study Report (Demo version)

Project name	Bonsteel Park Platform
Coordinates	-80.47 W, 27.90 N
Project category	Horizontal
Construction type	Bridge
Construction start year	2021
Expected life (years)	40
Estimated Construction Cost (\$)	\$20,000
Critical elevation (ft NAVD88)	20.1
Organization	Taylor Engineering, Inc.
Report Date	5/4/2021, 10:07:14 AM



Results

Average Annual Chance of Flood Damage: **5%**



Metric	Value
FEMA Flood Hazard Zone	VE
Base Flood Elevation (ft NAVD88)	13
Int-High Sea Level Rise (year 2060) (ft NAVD88)	0.85
Wind Zone (mph)	180

The cumulative results of the SLIP Study were found to be moderate, meaning the selected location is moderately favorable when considering coastal hazards related to potential sea level impacts. More explanation will be forthcoming in future versions.



Potential Beneficial Adaptation Strategies

Based on the results of the SLIP Study, the following adaptation strategies may be beneficial to consider in the construction design. These are not recommendations, merely standard strategies used to mitigate risk.

Build on Partially Elevated Areas

Building on partially elevated areas reduces the flood risk locally.

Metric	Value
Solution Timeline	Long Term
Scale	Micro
Adaptation Infrastructure	Hybrid
Degree of Protection	Medium
Relative Cost (\$, \$\$, \$\$\$)	\$\$

Flood Barriers (Passive or Active)

Barriers around a building system utility components to protect from flooding.

Metric	Value
Solution Timeline	Intermediate
Scale	Micro
Adaptation Infrastructure	Gray
Degree of Protection	Medium
Relative Cost (\$, \$\$, \$\$\$)	\$\$



Potential Public Safety and Environmental Impacts

Based on the results of the SLIP Study, consider the following potential public safety and environmental impacts.

Flood Risk

When factoring in the flood zone, base flood elevation, terrain, and sea level rise trends for the project location, a moderate flood risk is present.

Wind Risk

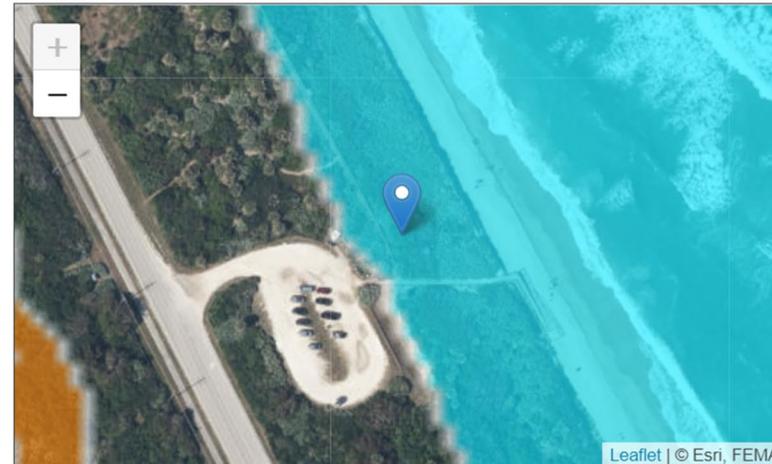
The project location was found to be located in an area of high wind risk with a C (waterfront) classification and potential wind speeds of 150 mph. There is potential risk from flying debris.

Explosion Risk

The high wind risk in this project location may contribute to a higher risk of explosion due to potential downed powerlines.

FEMA Flood Hazard Information

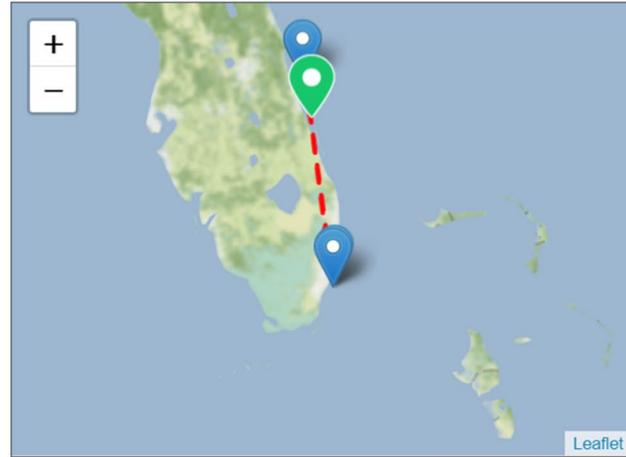
Flood Zone	VE
Zone subtype	COASTAL FLOODPLAIN
Static BFE (ft NAVD88)	13
Depth (ft NAVD88)	Not Applicable
Velocity	Not Applicable
Vertical Datum	NAVD88



The base flood elevation (BFE) is provided in NAVD88 for VE, AE, and AH special flood hazard zones. For AO special flood hazard zones though, FEMA does not calculate BFE. Instead, flood depth relative to the ground elevation is provided.



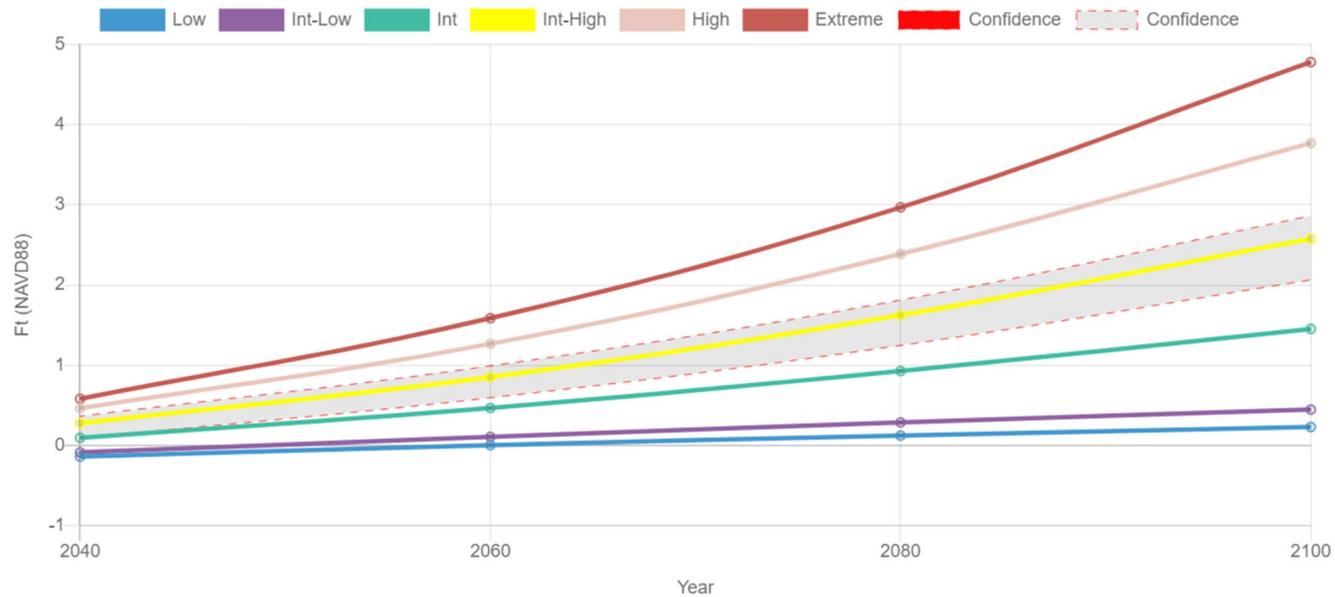
Regional Sea Level Rise Scenarios



NOAA Regional Scenarios (ft)

Scenario	2040	2060	2080	2100
Low	-0.14	0.01	0.12	0.23
Intermediate Low	-0.08	0.11	0.29	0.45
Intermediate	0.10	0.47	0.93	1.45
Intermediate High	0.28	0.85	1.63	2.58
High	0.46	1.27	2.39	3.77
Extreme	0.58	1.59	2.97	4.78

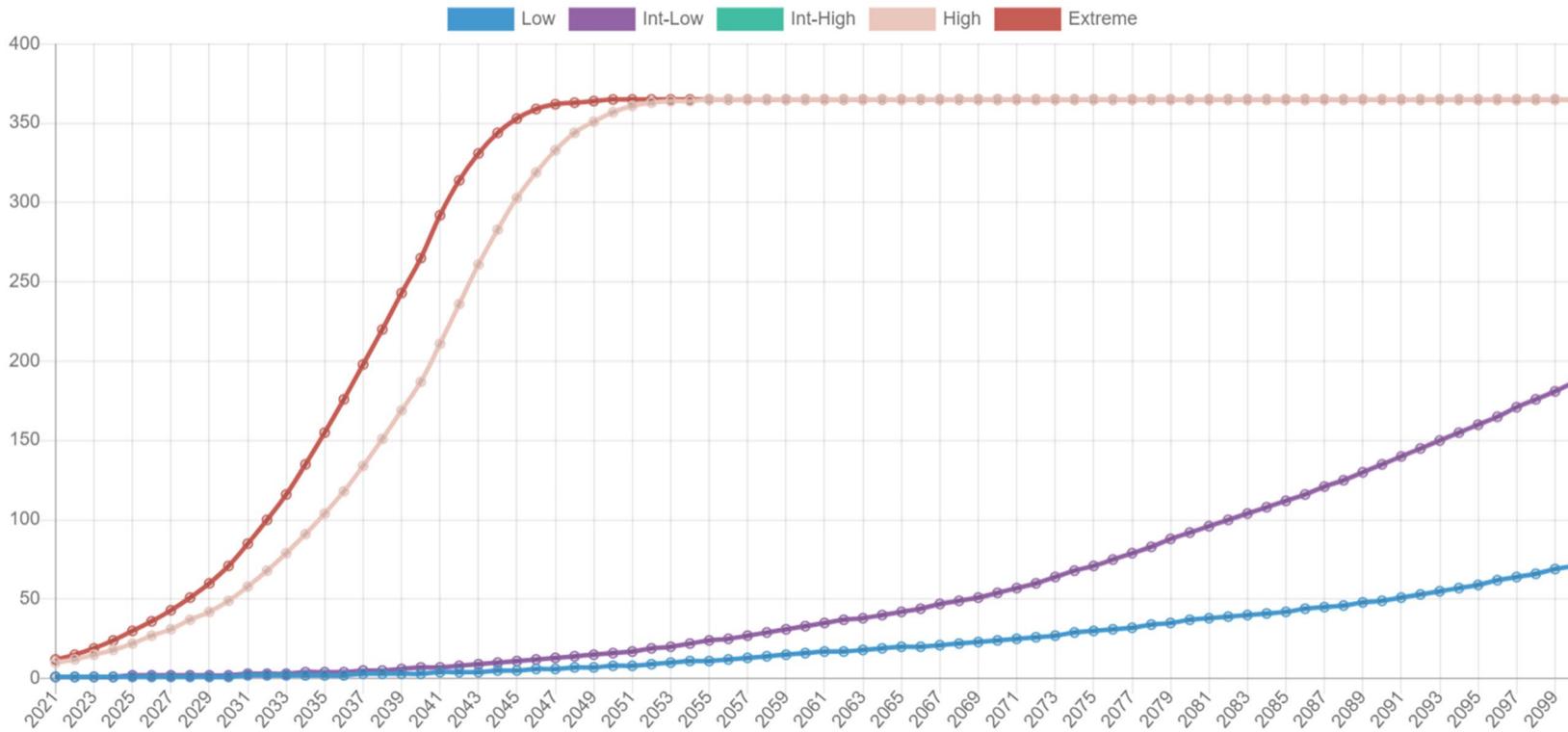
Regional Scenario Curves





NOAA High Tide Flooding Information

High Tide Flood Scenarios by Year - Tide Gauge 1

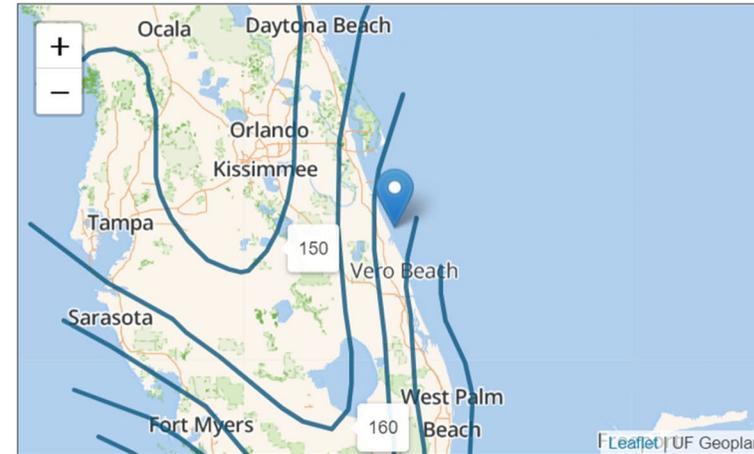


Year	Low	Int-Low	Int	Int-High	High	Extreme
2021	1	1	3	6	10	12
2040	3	7	30	85	187	265
2070	24	54	325	365	365	365

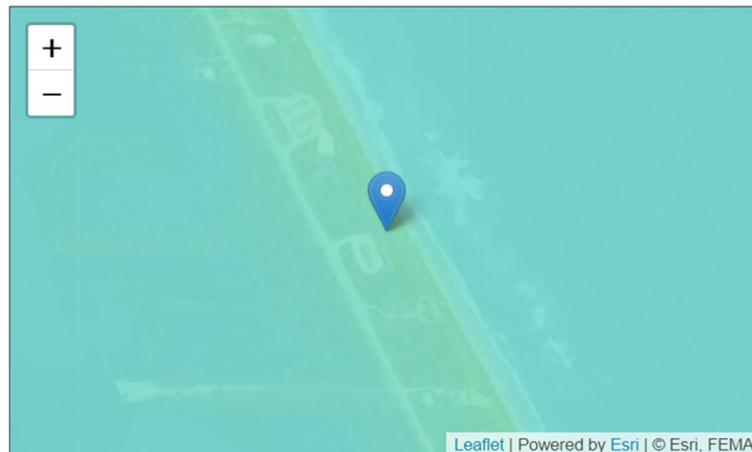


Wind Zones

Metric	Value
Classification	C - Waterfront
Maximum Wind Speed	180



Terrain



Metric	Value
Elevation (ft)	4.69
Vertical Datum	NAVD 88

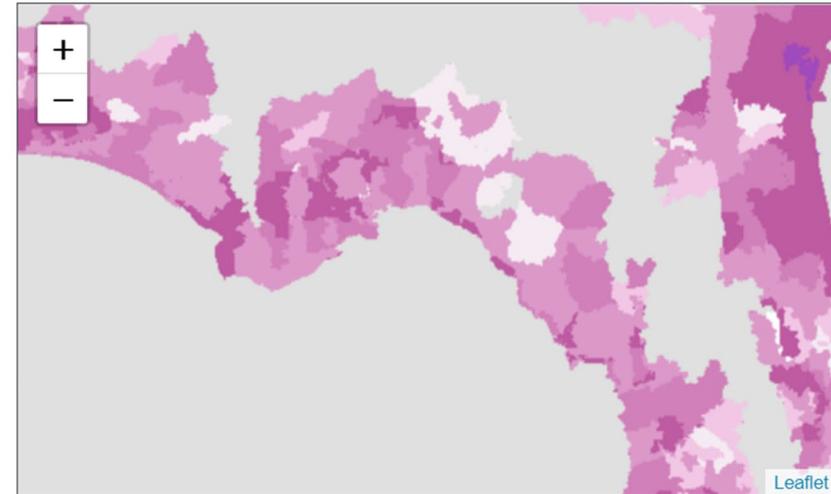


Wildlife Index

This location has a wildlife index of: **4**

A wildlife index of high value (scale of 1 - 6) represents watersheds where the most priority species and their habitats are present.

The National Fish and Wildlife Foundation (NFWF) used the following sources to create a comprehensive database of Aquatic and Terrestrial Indices: Nation Oceanographic and Atmospheric Administration (NOAA) Marine Fisheries Services, Audubon, BirdLife International, and NatureServe. NFWF compiled data from these sources to create an index of priority species and their habitats.



Design Alternatives

The selection of a construction project location involves a considerable number of factors, including but not limited to regulatory issues, engineering, and logical decisions. The SLIP Study Tool may be run multiple times with different project locations and critical elevations, to achieve a desired result. Please use the SLIP Map along with the Coastal Hazard layers to assist you in selecting the optimal location. Review this report and assess the risks which may be mitigated by changing the design parameters, then run the SLIP Study Tool again.



Project SLIP Study Reports

Below are the SLIP Study reports for this project:

Report	Report Date	Date Submitted	Publish Date	Action
View Report	3/29/2021 4:22:37 PM			Not Submitted
View Report	3/29/2021 3:27:40 PM			Not Submitted
View Report	3/29/2021 12:15:55 PM			Not Submitted
View Report	3/29/2021 10:42:54 AM	3/29/2021 1:52:31 PM	4/28/2021 1:52:31 PM	Unsubmit Report



Resilient Florida

Section 380.093, F.S.



Resilient Florida

	Resilient Florida Grant Program	Comprehensive Statewide Flood Vulnerability Data Set and Assessment		Statewide Flooding and Sea Level Rise Resilience Plan	Regional Resilience Entities	Florida Flood Hub
		Data Set	Assessment			
Activities	Provides funding for comprehensive plan amendments, Peril of Flood, vulnerability assessments, adaptation plans, and projects to adapt critical assets to the effects of flooding and sea level rise. Provides a methodology for completing vulnerability assessments.	Due July 1, 2022, this section provides for the collection and aggregation of data from vulnerability assessments that are existing, those completed from grant program, and to fill any gaps.	Due by July 1, 2023, this section provides for the incorporation of the data collected for the data set and other analyses into a statewide sea level rise vulnerability assessment.	By December 1, 2021, and each December 1 thereafter, a Statewide Flooding and Sea Level Rise Resilience Plan will be developed and submitted to the Governor and Legislature. The Plan will work on a 3-year rolling planning horizon and will consist of ranked projects that address the risks of flooding and sea level rise identified in the Statewide Flood and Sea Level Rise Vulnerability Assessment.	Provides funding to regional entities that are established by local governments to provide technical assistance on multijurisdictional projects.	Provides for the establishment of the Florida Flood Hub at USF's College of Marine Science. The Flood Hub will serve as the lead institution and will engage other institutions and partners to coordinate research and innovation around the flooding and sea level rise challenges facing the state.
Annual Funding	\$20,000,000			\$500,000,000	\$2,000,000	



Resilient Florida Grant Program

- Focused on planning
 - Comp plan amendments, especially compliance with the Peril of Flood statute
 - Vulnerability assessments
 - Adaptation/resilience plans
 - Projects to adapt critical assets

CONTEXT

- Assemble a steering committee
- Set guiding principles and motivations
- Establish planning area and describe geographic context
- Define public outreach approach and opportunities for community participation

ADAPTATION STRATEGIES

- Assess adaptive capacities
- Prioritize adaptation needs
- Identify adaptation strategies
- Integrate into existing plans

VULNERABILITY ASSESSMENT

- Conduct an exposure analysis
- Conduct a sensitivity analysis
- Assign focus areas

IMPLEMENTATION STRATEGIES

- Assess implementation capabilities
- Create a schedule of activities, actions, and actors
- Monitor and evaluate



Figure 1. Communities can follow this roadmap of steps to create an adaptation plan.



Consistent Vulnerability Assessments

- Will comprise the Statewide Vulnerability Assessment and be the basis for the Statewide Resilience Plan
- Encompass entire city or county and all critical assets*
- Use most recent publicly available DEM and generally accepted analysis and modeling
- Address Peril of Flood compliance if applicable
- Assess flooding using, at least, Intermediate Low and Intermediate High scenarios from NOAA 2017 for at least 2040 and 2070
 - Tidal flooding, including future high tide flooding
 - Current and future storm surge flooding
 - Rain-fall induced flooding to the extent practicable
 - Compound flooding



Statewide Flooding & Sea Level Rise Resilience Plan

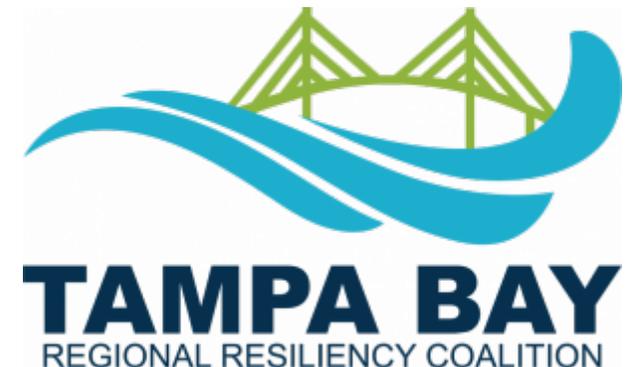
- 3-year rolling plan of projects taken from vulnerability assessments
- Year 1 Preliminary Plan uses already completed local vulnerability assessments
- Year 2 will update the Year 1 plan
- Year 3 and following will use projects identified in the Statewide Vulnerability Assessment
- Counties and municipalities, regional resilience entities (on behalf of a member), WMDs and flood control districts may submit projects to DEP starting 9/1/21.
- Minimum 50% cost share unless the applicant is a “financially disadvantaged small community”



Regional Resilience Entities

- Funding for regional resilience entities to assist communities and coordinate intergovernmental solutions
 - Technical assistance
 - Coordinate multijurisdictional vulnerability assessments
 - Develop project proposals to go into the Resilience Plan

SOUTHEAST FLORIDA
REGIONAL COMPACT
CLIMATE
CHANGE





Florida Flood Hub

- Designates the College of Marine Science at USF to serve as the lead institution to engage other academic and research institutions, private partners, and financial sponsors to coordinate efforts to support applied research and innovation to address the flooding and sea level rise challenges of the state.





Thank you!

**Contact Whitney Gray at 850-245-2098
or Whitney.Gray@FloridaDEP.gov**