





SEA LEVEL IMPACT PROJECTION (SLIP) STUDY INFORMATIONAL MEETING Chapter 62S-7, F.A.C.

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Office of Resilience and Coastal Protection/ Resilient Florida
Florida Department of Environmental Protection

Coast Smart Council Meeting | Nov. 29, 2023



BACKGROUND INFORMATION

SLIP STUDY INFORMATIONAL MEETING



FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION



Presentation Agenda

- Welcome & Introductions.
- Background Information.
- Overview of Chapter 62S-7, F.A.C.
- Questions.
- Adjournment.



BACKGROUND INFORMATION

About Sea Level Impact Projection (SLIP)

Sea level rise and coastal flooding are issues that are affecting an increasing number of Florida's coastal communities.

The "SLIP study rule" is an unprecedented step towards acknowledging and considering the impacts of sea level rise on coastal construction in Florida.

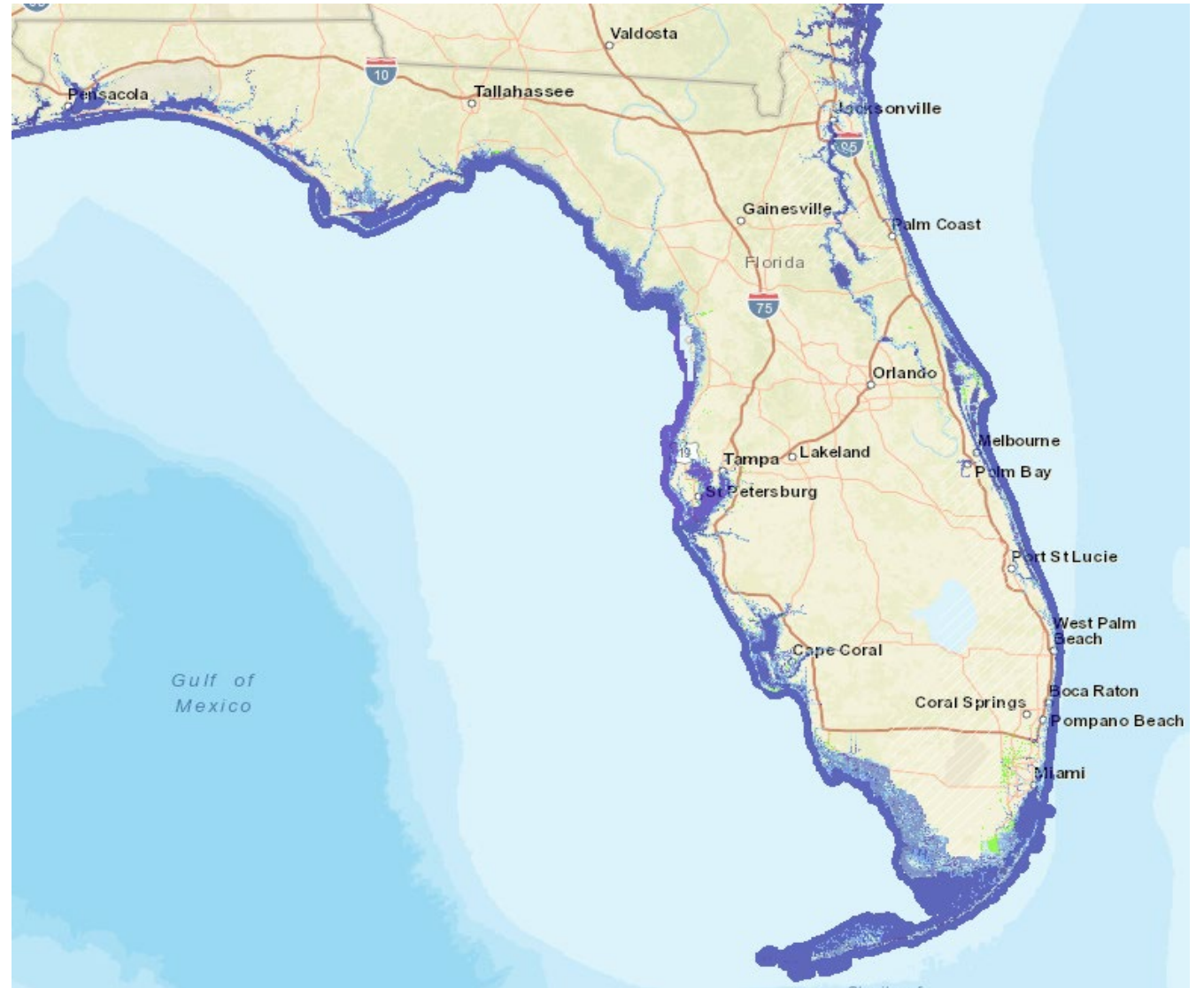
It is an example of the role that the Department of Environmental Protection plays in improving the resiliency of Florida's coastal region.

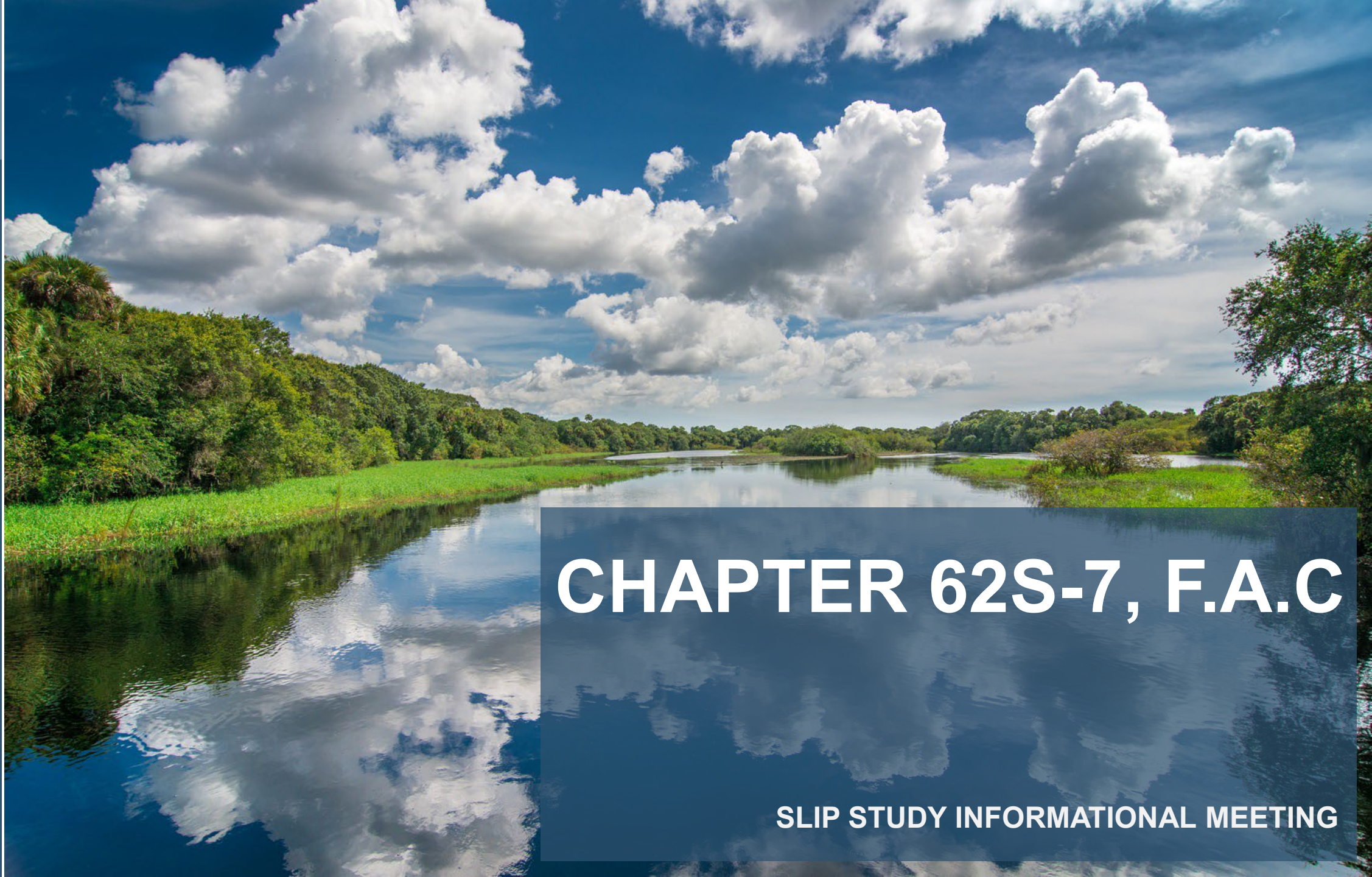




SEA LEVEL RISE PROJECTIONS

- Observations from around the state indicate that sea level has risen about a foot in the last 100 years; 5 inches just since 2000.
- By 2040, that number could increase by 3 to 11 additional inches for a total of 8 to 16 inches since 2000.
- By 2070, sea level could be 14-39 inches higher than in 2000.





CHAPTER 62S-7, F.A.C

SLIP STUDY INFORMATIONAL MEETING



OVERVIEW OF CHAPTER 62S-7, F.A.C.

- Signed by Governor DeSantis on June 29, 2020.
- Effective July 1, 2021, as Chapter 62S-7, F.A.C. with enforcement beginning on July 1, 2022; new legislative changes in effect July 1, 2024.
- Applies to the public financing of construction projects within areas at risk due to sea level rise.





CHAPTER 62S-7, F.A.C.

Who?

What?

Where?

When?

How?

State Financed Constructors:

- A public entity that commissions or manages a construction project using funds appropriated from the state.
- This includes all funds in the General Appropriations Act, including federal pass-through funds requiring appropriation of spending authority.
- Examples: line-item appropriations, FDOT new construction, state park facilities and projects prioritized in competitive grant programs.





CHAPTER 62S-7, F.A.C.

New Coastal Structures

Who?

What?

Where?

When?

How?

Major or non-habitable major structures, as defined in s. 161.54(6)(a) and (c), F.S.

- S. 161.551, (6)(a), F.S.: “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.
- S. 161.551 (6)(c), F.S.: “Non-habitable 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.
- **Projects that are rehabilitation or maintenance of existing structures, including related minor improvements, shall not be considered new.**



CHAPTER 62S-7, F.A.C.

Coastal Building Zone

Who?

What?

Where?

When?

How?

- a) “Area at risk due to sea level rise” – any location that is projected to be below the threshold for tidal flooding within the next 50 years by adding sea level rise using the highest of the sea level rise projections required by s.380.093(3)(d)3.b. For purposes of this paragraph, the threshold for tidal flooding is 2 feet above mean higher high water.
- b) 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, F.S., the land area seaward of the most landward velocity zone (V-zone) line as established by the Federal Emergency Management Agency (FEMA) and shown on flood insurance rate maps.
- c) On coastal barrier islands, it 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 barrier island, whichever is less.
- d) All land areas in the Florida Keys located within Monroe County shall be included in the coastal building zone.



CHAPTER 62S-7, F.A.C.

Coastal Building Zone:

Who?

What?

Where?

When?

How?





CHAPTER 62S-7, F.A.C.

Who?

What?

Where?

When?

How?

- The rule went into effect on July 1, 2021.
- Enforcement begins on July 1, 2022; with new legislative changes on July 1, 2024
- If the constructor meets the criteria to conduct a SLIP study on or after July 1, 2022, a SLIP study must be completed.
- Construction cannot commence until the SLIP study has been completed, submitted to the department and published on DEP's website for 30 days. Beginning July 1, 2024, the state-financed constructor is solely responsible for ensuring that the study submitted to the department for publication meets the requirements of subsection(3).
- All SLIP studies will remain on DEP's website for a minimum of 10 years. However, any portion of a study containing information that is exempt from s.119.07(1) and s.24(a), Art. I of the State Constitution must be redacted by the department before publication.



CHAPTER 62S-7, F.A.C.

Who?

State financed constructors have two options to chose from in order to comply with the rule:

What?

1. Users can choose to use DEP's web-based SLIP tool, which is user-friendly, timesaving and free.
2. Users can choose to conduct their own SLIP study, following the standards outlined in the rule.

Where?

Note – the standards are the same, whether option 1 or 2 is used.

When?

A systematic, interdisciplinary and scientifically accepted approach was used to develop the standards necessary to successfully complete a SLIP study.

How?



SLIP STUDY TOOL

<https://floridadep-slip.org/Default.aspx>

The screenshot shows the homepage of the SLIP Study Tool website. At the top is a dark blue navigation bar with the Florida Department of Environmental Protection logo on the left, the text "Florida Department of Environmental Protection" in the center, and links for "Home", "Learn", "Contact", and "SLIP Map" on the right. Below the navigation bar is a large banner image of a waterfront residential area with palm trees and houses. Overlaid on this image is a dark grey rounded rectangle containing the title "Sea Level Impact Projection Study Tool" and the subtitle "Determining risk for Florida coastline construction projects". Below the banner is a paragraph of text explaining the tool's purpose. At the bottom, there are three circular icons with corresponding text and "Continue" links for "SLIP Studies", "Section 161.551, F.S.", and "Adaptation".

Florida Department of Environmental Protection

Home Learn Contact SLIP Map

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 how to create a SLIP study report using this website and see published reports.
[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](#)



SLIP STUDY TOOL

8 INPUTS REQUIRED TO GENERATE THE REPORT

Florida Department of Environmental Protection

Home Learn Contact SLIP Map

*Denotes required values

*Project Name:
MC TEST

*County:
Martin County

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

*Construction type:
Bridge

Critical Elevation (ft NAVD88):
3.5

Construction Start Year:
2023

Expected Life (years):
40

Estimated Construction Cost (\$):
10

Create Report Cancel



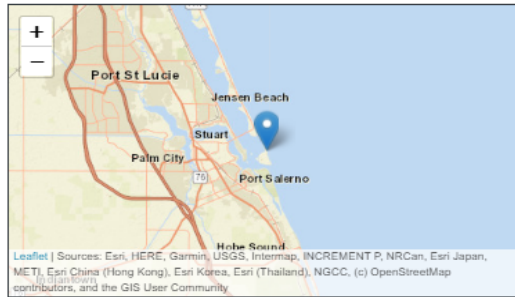
SLIP STUDY TOOL

REPORT CONTENT

Export/Print

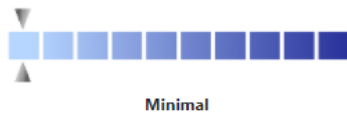
Sea Level Impact Projection (SLIP) Study Report

Project name	Bonsteel Park Driveway
County	Martin County
Coordinates	-80.16085 W, 27.18642 N
Project category	Horizontal
Construction type	Bridge
Construction start year	2022
Expected life (years)	20
Estimated Construction Cost (\$)	\$3,072,000
Critical elevation (ft NAVD88)	5.5
Organization	Florida DEP
Report Date	7/7/2021 2:04:47 PM



Results

Average Annual Chance of Substantial Flood Damage: 0.22%



Metric	Value
FEMA Flood Hazard Zone	AE
Base Flood Elevation (ft NAVD88)	5
Terrain Elevation (ft NAVD88)	2.54
10% Annual Chance (10 Year) Stillwater (ft NAVD88)	2.7
2% Annual Chance (50 Year) Stillwater (ft NAVD88)	3.9
1% Annual Chance (100 Year) Stillwater (ft NAVD88)	4.6
0.2% Annual Chance (500 Year) Stillwater (ft NAVD88)	4.6
Int-High Sea Level Rise (year 2040) (ft NAVD88)	0.22
Wind Zone (mph)	190

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.

	<p>Flood Barriers (Passive or Active)</p> <p>Barriers around a building system utility components to protect from flooding.</p>	<table border="1"> <tr> <td>Solution Timeline</td> <td>Intermediate</td> </tr> <tr> <td>Scale</td> <td>Micro</td> </tr> <tr> <td>Adaptation Infrastructure</td> <td>Gray</td> </tr> <tr> <td>Degree of Protection</td> <td>Medium</td> </tr> <tr> <td>Relative Cost (\$, \$\$, \$\$\$)</td> <td>\$\$</td> </tr> </table>	Solution Timeline	Intermediate	Scale	Micro	Adaptation Infrastructure	Gray	Degree of Protection	Medium	Relative Cost (\$, \$\$, \$\$\$)	\$\$
Solution Timeline	Intermediate											
Scale	Micro											
Adaptation Infrastructure	Gray											
Degree of Protection	Medium											
Relative Cost (\$, \$\$, \$\$\$)	\$\$											
	<p>Flood Damage-Resistant Materials</p> <p>The utilization of materials that provide partial protection to elements exposed to flood.</p>	<table border="1"> <tr> <td>Solution Timeline</td> <td>Intermediate</td> </tr> <tr> <td>Scale</td> <td>Micro</td> </tr> <tr> <td>Adaptation Infrastructure</td> <td>Gray</td> </tr> <tr> <td>Degree of Protection</td> <td>Medium</td> </tr> <tr> <td>Relative Cost (\$, \$\$, \$\$\$)</td> <td>\$\$</td> </tr> </table>	Solution Timeline	Intermediate	Scale	Micro	Adaptation Infrastructure	Gray	Degree of Protection	Medium	Relative Cost (\$, \$\$, \$\$\$)	\$\$
Solution Timeline	Intermediate											
Scale	Micro											
Adaptation Infrastructure	Gray											
Degree of Protection	Medium											
Relative Cost (\$, \$\$, \$\$\$)	\$\$											
	<p>Foundation Flood Vents</p> <p>Flood vents reduce structural damage from flooding. These permanent openings allow water to pass into or out of a building's exterior foundation walls.</p>	<table border="1"> <tr> <td>Solution Timeline</td> <td>Intermediate</td> </tr> <tr> <td>Scale</td> <td>Micro</td> </tr> <tr> <td>Adaptation Infrastructure</td> <td>Gray</td> </tr> <tr> <td>Degree of Protection</td> <td>Low</td> </tr> <tr> <td>Relative Cost (\$, \$\$, \$\$\$)</td> <td>\$\$</td> </tr> </table>	Solution Timeline	Intermediate	Scale	Micro	Adaptation Infrastructure	Gray	Degree of Protection	Low	Relative Cost (\$, \$\$, \$\$\$)	\$\$
Solution Timeline	Intermediate											
Scale	Micro											
Adaptation Infrastructure	Gray											
Degree of Protection	Low											
Relative Cost (\$, \$\$, \$\$\$)	\$\$											
	<p>Increase Plantings</p> <p>Using groundcover and shrubbery has a few benefits compared to unplanted surfaces. By reducing the velocity of the water on the surface, trees and shrubs improve the infiltration of the water. In addition, plants improve the infiltration rate of the soil. In short, planted surfaces improve the infiltration capacity of the surface and thereby reduce the chance of flooding.</p>	<table border="1"> <tr> <td>Solution Timeline</td> <td>Long Term</td> </tr> <tr> <td>Scale</td> <td>Macro</td> </tr> <tr> <td>Adaptation Infrastructure</td> <td>Green</td> </tr> <tr> <td>Degree of Protection</td> <td>Low</td> </tr> <tr> <td>Relative Cost (\$, \$\$, \$\$\$)</td> <td>\$</td> </tr> </table>	Solution Timeline	Long Term	Scale	Macro	Adaptation Infrastructure	Green	Degree of Protection	Low	Relative Cost (\$, \$\$, \$\$\$)	\$
Solution Timeline	Long Term											
Scale	Macro											
Adaptation Infrastructure	Green											
Degree of Protection	Low											
Relative Cost (\$, \$\$, \$\$\$)	\$											



SLIP STUDY TOOL

REPORT CONTENT

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.

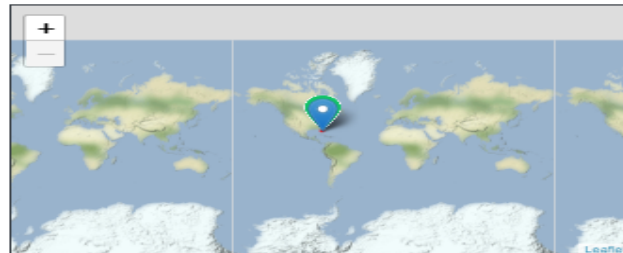
FEMA Flood Hazard Information

Flood Zone	AE
Zone subtype	COASTAL FLOODPLAIN
Static BFE (ft NAVD88)	5
Vertical Datum	NAVD88



The base flood elevation (BFE) is provided in NAVD88 for VE, AE, and AH special flood hazard zones.

Regional Sea Level Rise Scenarios



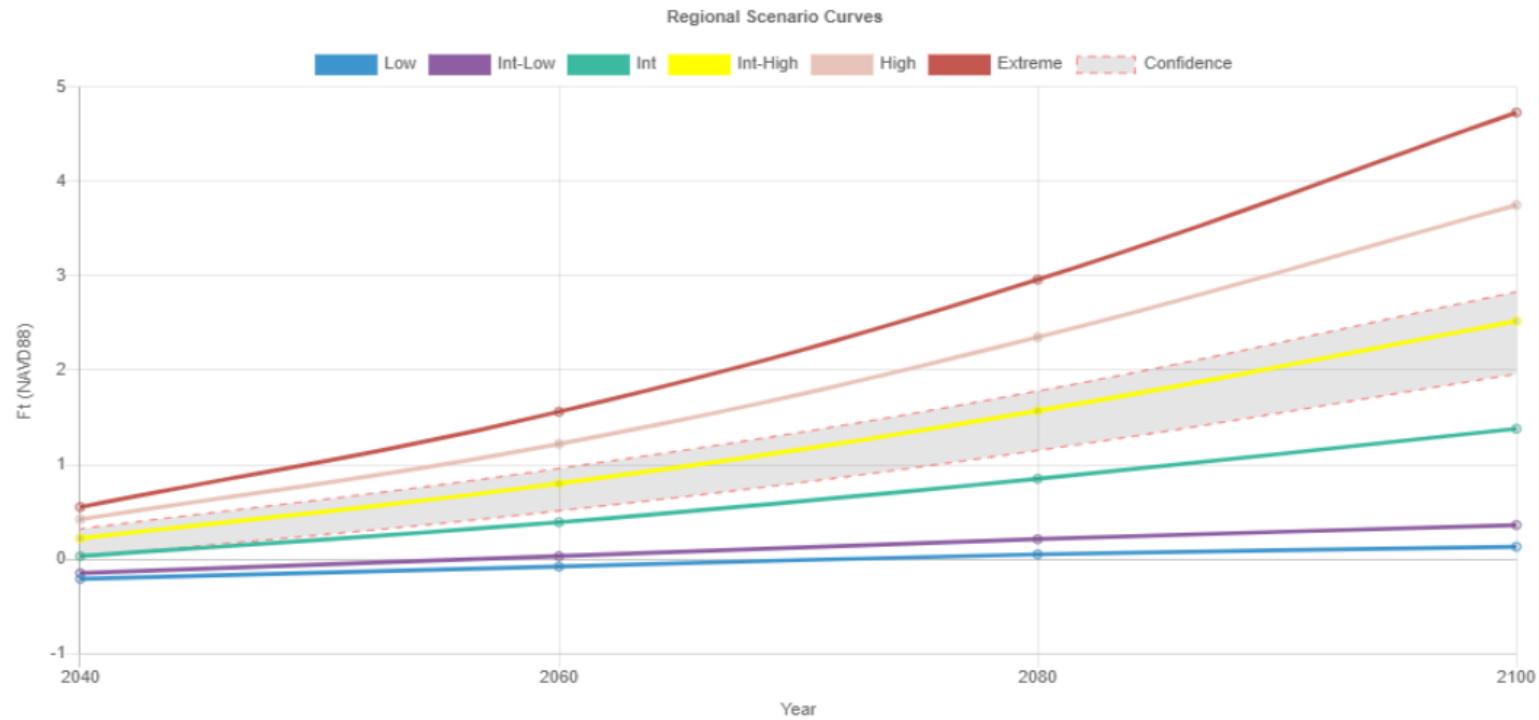
NOAA Regional Scenarios (ft NAVD88)

Scenario	2040	2060	2080	2100
Low	-0.21	-0.08	0.05	0.13
Intermediate Low	-0.15	0.03	0.21	0.36
Intermediate	0.03	0.39	0.85	1.38
Intermediate High	0.22	0.8	1.57	2.52
High	0.42	1.22	2.35	3.75
Extreme	0.55	1.56	2.96	undefined



SLIP STUDY TOOL

REPORT CONTENT



The five relative sea level rise (RSL) scenarios shown in this report are derived from NOAA Technical Report NOS CO-OPS 083 "Global and regional sea level rise scenarios for the United States" using the same methods as the USACE Sea Level Rise Calculator. These new scenarios were developed by the Sea Level Rise and Coastal Flood Hazard Scenarios and Tools Interagency Task Force, jointly convened by the U.S. Global Change Research Program (USGCRP) and the National Ocean Council as input to the USGCRP Sustained Assessment process and 4th National Climate Assessment. These RSL scenarios provide a revision to the (Parris et. al, 2012) global scenarios which were developed as input to the 3rd National Climate Assessment.

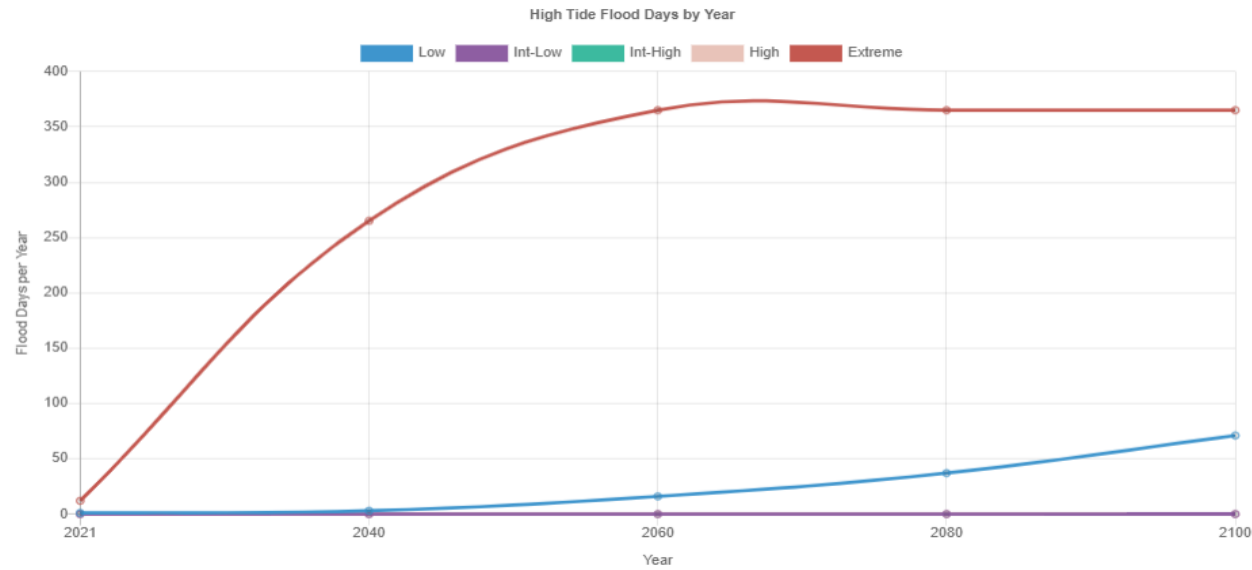
These RSL scenarios begin in year 2020 and take into account global mean sea level rise (GMSL), regional changes in ocean circulation, changes in Earth's gravity field due to ice melt redistribution, and local vertical land motion.



SLIP STUDY TOOL

REPORT CONTENT

NOAA High Tide Flooding Information



High Tide Flood Days by Year

Year	Low	Int-High	Extreme
2021	1	6	12
2040	3	85	265

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.

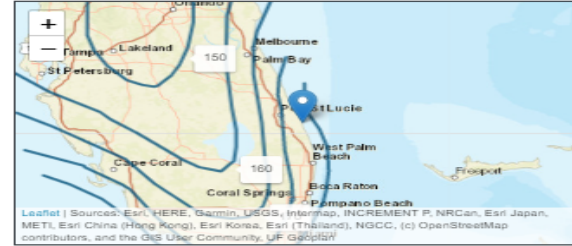


SLIP STUDY TOOL

REPORT CONTENT

Wind Zones

Metric	Value
Classification	C - Waterfront
Maximum Wind Speed	190

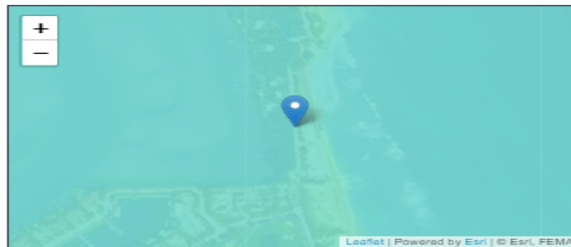


Exposure classification. Exposure is the term used to describe the area surrounding the building in question with regard to the ability of wind to blow directly on the structure without disruption from surrounding structures

B = Urban and suburban areas with many single-family or similar sized buildings within a distance of 1500 feet. All buildings not determined to be exposure C will be designed for Exposure B regardless of whether the structure is in the middle of a field or in the middle of a suburban setting

C = Waterfront. Also known as the open country exposure. Is used in the Florida Building Code as applicable only to Miami-Dade and Broward counties, the barrier islands, and land areas within 1500 ft of the coastline in the rest of the state.

Terrain



Metric	Value
Elevation (ft)	2.54
Vertical Datum	NAVD 88

This terrain elevation is derived from the latest compilation of terrain data from NOAA. This dataset contains the best publicly available terrain data in a 3m resolution.

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.



KEY CONSIDERATIONS

CHAPTER 62S-7, F.A.C.

The rule is informational rather than regulatory; however, there are consequences for failure to comply:

- Pursuit of injunctive relief to cease construction until the constructor comes into full compliance with the requirement.
- Recovery of all or a portion of the state funds expended on the construction activity.

Programs within your agency may be affected by this rule:

- Potentially update grant information language to reflect this.





THANK YOU

Eddy Bouza & Krista Shipley

Office of Resilience and Coastal Protection/
Resilient Florida
Florida Department of Environmental Protection

Contact Information:

Phone

Email