

**The Florida Senate**  
**BILL ANALYSIS AND FISCAL IMPACT STATEMENT**

(This document is based on the provisions contained in the legislation as of the latest date listed below.)

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Prepared By: The Professional Staff of the Appropriations Committee on Agriculture, Environment, and General Government

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BILL: SB 1170

INTRODUCER: Senators Calatayud and Garcia

SUBJECT: Flooding and Sea Level Rise Vulnerability Studies

DATE: April 11, 2023

REVISED: \_\_\_\_\_

	ANALYST	STAFF DIRECTOR	REFERENCE	ACTION
1.	<u>Barriero</u>	<u>Rogers</u>	<u>EN</u>	<u>Favorable</u>
2.	<u>Reagan</u>	<u>Betta</u>	<u>AEG</u>	<u>Favorable</u>
3.	_____	_____	<u>FP</u>	_____

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**I. Summary:**

SB 1170 amends the Resilient Florida Program to authorize the Department of Environmental Protection (DEP) to provide grants to counties or municipalities for feasibility studies and the cost of permitting for innovative measures that reduce the impact of flooding and sea level rise and focus on nature-based solutions. The bill authorizes water management districts, in support of local government adaptation planning, to receive grants under the Resilient Florida Grant Program for the purpose of supporting the Florida Flood Hub for Applied Research and Innovation and the DEP for data creation and collection, modeling, and the implementation of statewide standards.

The bill substantially expands the geographical area where a sea level impact projection (SLIP) study is required and changes the types of structures that this requirement applies to. Currently, a SLIP study must be conducted before beginning construction of a new coastal structure within the coastal building zone. The bill amends this requirement by providing that, beginning July 1, 2024, a SLIP study must be conducted before beginning construction of a “potentially at-risk structure or infrastructure” in an area at risk due to sea level rise, regardless of whether it is within the coastal building zone.

The bill directs the DEP to update its SLIP study rules to provide for the changes required under this bill. In addition to the requirements for the existing rule, the revised rules must include a requirement that state-financed constructors assess the risk of flooding, inundation, and wave action damage to potentially at-risk structures or infrastructure and provide a list of flood mitigation strategies for consideration as part of the structure or infrastructure’s design.

The DEP will incur indeterminate costs to develop rules regarding when a state-financed constructor must conduct a SLIP study. These costs can be handled within existing resources.

The effective date of the bill is July 1, 2023.

## II. Present Situation:

### Flooding and Sea Level Rise

Given Florida's flat topography<sup>1</sup> and extreme rainfall events, flooding has been an issue throughout the state's history.<sup>2</sup> The effects of climate change—including sea level rise, increased storm intensity, and increased frequency and severity of extreme rainfall events—have increased flooding in inland and coastal areas.<sup>3</sup>

Sea level rise is a direct effect of climate change, resulting from a combination of thermal expansion of warming ocean waters and the addition of water mass into the ocean, largely associated with the loss of ice from glaciers and ice sheets.<sup>4</sup> The global mean sea level has risen about eight to nine inches since 1880, and the rate of rise is accelerating: 0.06 inches per year throughout most of the twentieth century, 0.14 inches per year from 2006–2015, and 0.24 inches per year from 2018–2019.<sup>5</sup> In 2021, global sea levels set a new record high—3.8 inches above 1993 levels.<sup>6</sup>

The latest projections from the National Oceanic and Atmospheric Administration (NOAA) estimate that an average of two feet sea level rise can be expected over the next 50 years.<sup>7</sup> All coastal areas of Florida will be affected under this scenario.<sup>8</sup> Miami-Dade and Monroe Counties, including the Florida Keys, are projected to be most impacted.<sup>9</sup> Even under a more conservative scenario of one-foot sea level rise, three of Monroe County's four medical facilities, 65 percent of Monroe's schools, and 71 percent of emergency shelters will be below sea level.<sup>10</sup> More than 81 miles of roadway from Miami-Dade through Palm Beach County would also be below sea level under the one-foot sea level rise scenario.<sup>11</sup>

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<sup>1</sup> The Florida coastline has an average elevation of approximately 15 to 20 feet above mean sea level (MSL) with barrier islands typically at elevation zero to five feet above MSL. The southern portion of the state (south of Lake Okeechobee) is typically lower than 15 feet MSL. U.S. Army Corps of Engineers, *South Atlantic Coastal Study: Florida Appendix*, 3-26 (2022), available at

[https://www.sad.usace.army.mil/Portals/60/siteimages/SACS/SACS\\_FL\\_Appendix\\_508\\_20220812.pdf?ver=XGRM8v-69\\_bdLAFPXEmlOg%3d%3d](https://www.sad.usace.army.mil/Portals/60/siteimages/SACS/SACS_FL_Appendix_508_20220812.pdf?ver=XGRM8v-69_bdLAFPXEmlOg%3d%3d).

<sup>2</sup> Florida Office of Economic and Demographic Research (EDR), *Annual Assessment of Flooding and Sea Level Rise*, 2 (2023), available at [http://edr.state.fl.us/Content/natural-resources/2023\\_AnnualAssessmentFloodingandSeaLevelRise\\_Chapter6.pdf](http://edr.state.fl.us/Content/natural-resources/2023_AnnualAssessmentFloodingandSeaLevelRise_Chapter6.pdf).

<sup>3</sup> National Aeronautics and Space Administration (NASA), *The Effects of Climate Change*, <https://climate.nasa.gov/effects/> (last visited Mar. 6, 2023).

<sup>4</sup> National Oceanic and Atmospheric Administration (NOAA) et al., *Global and Regional Sea Level Rise Scenarios for the U.S.*, (2022) available at <https://oceanservice.noaa.gov/hazards/sealevelrise/sealevelrise-tech-report.html>;

<sup>5</sup> NOAA, *Climate Change: Global Sea Level*, <https://www.climate.gov/news-features/understanding-climate/climate-change-global-sea-level> (last visited Mar. 6, 2023).

<sup>6</sup> *Id.*

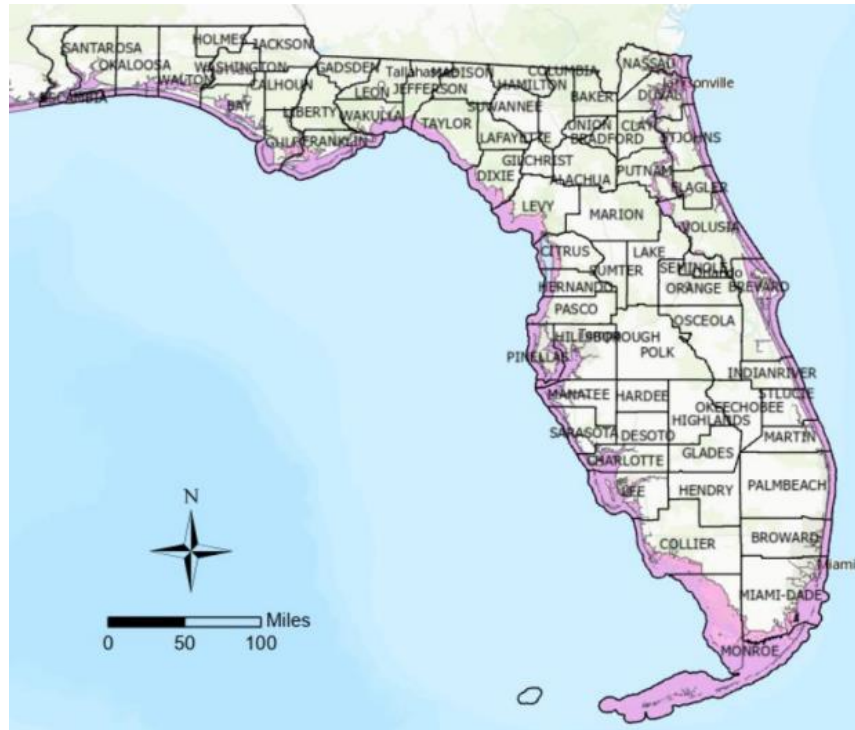
<sup>7</sup> EDR, *Annual Assessment of Flooding and Sea Level Rise* at 20; NOAA, *Global and Regional Sea Level Rise Scenarios for the U.S.*, (2022) available at <https://oceanservice.noaa.gov/hazards/sealevelrise/sealevelrise-tech-report.html>;

<sup>8</sup> EDR, *Annual Assessment of Flooding and Sea Level Rise* at 21.

<sup>9</sup> *Id.* at 21.

<sup>10</sup> *Id.* at 38.

<sup>11</sup> *Id.* at 39.



*Projection of 2 ft. Sea Level Rise<sup>12</sup>*

Over five million structures are estimated to be affected by flooding under a two-foot sea level rise scenario. The estimated value of these at-risk properties exceeds \$576 billion.<sup>13</sup>

Analyses of medical facilities, schools, and fire stations located in the two-foot sea level rise impact area indicate that the actual number of structures that may be completely or partially inundated are few.<sup>14</sup> However, in low-lying areas, and especially on barrier islands, the submergence of the connecting routes to residential areas may greatly impact the continued use and occupation of these structures. In these cases, some neighborhoods may be disconnected from the services that this type of infrastructure provides. In addition, infrastructure on the barrier islands may be cut off from the mainland.<sup>15</sup>

Due to its porous geology, economic and property value, and the potential impact of various flooding hazards, southeast Florida is the area most at risk from sea level rise.<sup>16</sup> The effects of sea level rise are already apparent in this region and pose a threat to lives, livelihoods, economies, and the environment.<sup>17</sup> Physical impacts of sea level rise include coastal inundation and erosion, increased frequency of flooding in vulnerable coastal and inland areas due to

<sup>12</sup> *Id.* at 21.

<sup>13</sup> *Id.* at 24, 25.

<sup>14</sup> *Id.* at 27. For example, accessibility to 53 medical facilities in the coastal areas of Florida may be disrupted; eight school buildings may be partially or completely inundated; and at least seven fire stations in the coastal areas from Jacksonville to Apalachicola may be partially or completely inundated. *Id.* at 31.

<sup>15</sup> *Id.*

<sup>16</sup> EDR, *Annual Assessment of Flooding and Sea Level Rise* at 2.

<sup>17</sup> Sea Level Rise Ad Hoc Work Group, Southeast Florida Regional Climate Change Compact (SFRCCC), *Unified Sea Level Rise Projection: Southeast Florida*, 5 (2019), available at [https://southeastfloridaclimatecompact.org/wp-content/uploads/2020/04/Sea-Level-Rise-Projection-Guidance-Report\\_FINAL\\_02212020.pdf](https://southeastfloridaclimatecompact.org/wp-content/uploads/2020/04/Sea-Level-Rise-Projection-Guidance-Report_FINAL_02212020.pdf).

impairment of the region’s largely gravity-driven stormwater infrastructure system, reduced soil infiltration capacity, and saltwater intrusion of drinking-water supply. Moreover, the impacts of surge from tropical storms or hurricanes are exacerbated by sea level rise. Increased pollution and contamination from flooding degrades natural resources critical to the region’s economy. Sea level rise can also result in displacement, decrease in property values and tax base, increases in insurance costs, loss of services, and impairment of infrastructure such as roads and septic systems.<sup>18</sup>

### Sea Level Rise Projections

Entities from the international to the local level use scientific data and modeling to create projections of future sea level rise for planning and decision-making. The NOAA operates tide gauges along the nation’s coasts and satellites that measure changes in sea level. In 2017 and 2022, the NOAA published sea level rise projections for the U.S.<sup>19</sup> The NOAA’s projections include observation-based extrapolations and five scenarios ranging from “low” to “high.”<sup>20</sup> Interactive maps have been developed to depict local conditions under each NOAA scenario.<sup>21</sup>

### Resilience and Nature-Based Solutions

Resilience is the ability of a community to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions.<sup>22</sup> Resilience planning includes preparing for hazard events, risk mitigation, and post-event recovery and should be proactive, continuous, and integrated into other community goals and plans.<sup>23</sup>

Nature-based solutions (NBSs) are an important part of resilience planning. NBSs use natural features and processes to combat climate change, reduce flood risks, improve water quality, protect coastal property, restore and protect wetlands, and stabilize shorelines.<sup>24</sup> Examples of NBSs include:

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<sup>18</sup> Sea Level Rise Ad Hoc Work Group, Southeast Florida Regional Climate Change Compact (SFRCCC), *Unified Sea Level Rise Projection: Southeast Florida*, 5 (2019), available at [https://southeastfloridaclimatecompact.org/wp-content/uploads/2020/04/Sea-Level-Rise-Projection-Guidance-Report\\_FINAL\\_02212020.pdf](https://southeastfloridaclimatecompact.org/wp-content/uploads/2020/04/Sea-Level-Rise-Projection-Guidance-Report_FINAL_02212020.pdf).

<sup>19</sup> NOAA, *Global and Regional Sea Level Rise Scenarios for the United States*, (2017), available at [https://tidesandcurrents.noaa.gov/publications/techrpt83\\_Global\\_and\\_Regional\\_SLR\\_Scenarios\\_for\\_the\\_US\\_final.pdf](https://tidesandcurrents.noaa.gov/publications/techrpt83_Global_and_Regional_SLR_Scenarios_for_the_US_final.pdf);

NOAA, *Global and Regional Sea Level Rise Scenarios for the United States*, (2022), available at <https://aambpublicoceanservice.blob.core.windows.net/oceanserviceprod/hazards/sealevelrise/noaa-nos-techrpt01-global-regional-SLR-scenarios-US.pdf>.

<sup>20</sup> NOAA, *Global and Regional Sea Level Rise Scenarios for the United States*, 15 (2022). The 2017 projections also included an “extreme” scenario, which has been removed from the 2022 report. See NOAA, *Global and Regional Sea Level Rise Scenarios for the United States*, 23 (2017).

<sup>21</sup> University of Florida, *Florida Sea Level Scenario Sketch Planning Tool*, <https://sls.geoplan.ufl.edu/viewer/> (last visited Mar. 9, 2023).

<sup>22</sup> Federal Emergency Management Agency (FEMA), *National Risk Index: Community Resilience*, <https://hazards.fema.gov/nri/community-resilience> (last visited Mar. 8, 2023).

<sup>23</sup> National Institute of Standards and Technology, U.S. Dep’t of Commerce, *Community Resilience Planning Guide for Buildings and Infrastructure Systems*, 1 (2016), available at <https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.1190v1.pdf>.

<sup>24</sup> FEMA, *FEMA Resources for Climate Resilience*, 5 (2021), available at [https://www.fema.gov/sites/default/files/documents/fema\\_resources-climate-resilience.pdf](https://www.fema.gov/sites/default/files/documents/fema_resources-climate-resilience.pdf).

- Living shorelines, which stabilize a shore by combining living components, such as plants, with structural elements, such as rock or sand. Living shorelines can slow waves, reduce erosion, and protect coastal property.
- Oyster reefs. Oysters are often referred to as “ecosystem engineers” because of their tendency to attach to hard surfaces and create large reefs made of thousands of individuals. In addition to offering shelter and food to coastal species, oyster reefs buffer coasts from waves and filter surrounding waters.
- Dunes, which often have dune grasses or other vegetation and serve as a barrier between the water’s edge and inland areas.<sup>25</sup>

### Statewide Resilience Programs

The Florida Legislature has established several statewide resilience programs, including the Resilient Florida Grant Program, the Comprehensive Statewide Flood Vulnerability and Sea Level Rise Data Set, and the Statewide Flooding and Sea Level Rise Resilience Plan.

The Resilient Florida Grant Program provides grants to counties or municipalities for community resilience planning, including vulnerability assessments, plan development, and projects to adapt critical assets.<sup>26</sup> In the programs first two years, 263 implementation projects have been awarded a total of nearly \$954 million.<sup>27</sup> Vulnerability assessments funded through this program must encompass the entire county or municipality; use the most recent publicly available Digital Elevation Model and dynamic modeling techniques, if available; and analyze the vulnerability of and risks to critical assets,<sup>28</sup> including regionally significant assets.<sup>29</sup> In addition, vulnerability assessments must include, where applicable:

- Peril of flood comprehensive plan amendments that address the requirements of s. 163.3178(2)(f), F.S.,<sup>30</sup> if the county or municipality is subject to, but has not complied with, such requirements;
- The depth of tidal flooding, current and future storm surge flooding, rainfall-induced flooding (including for a 100-year and 500-year storm), and compound flooding or the combination of tidal, storm surge, and rainfall-induced flooding; and
- The following scenarios and standards:

<sup>25</sup> FEMA, *Types of Nature-Based Solutions*, <https://www.fema.gov/emergency-managers/risk-management/nature-based-solutions/types> (last visited Mar. 8, 2023).

<sup>26</sup> Section 380.093(2)(a), F.S. “Critical asset” is defined to include broad lists of assets relating to transportation, critical infrastructure, emergency facilities, natural resources, and historical and cultural resources.

<sup>27</sup> This figure includes \$270 million of state funding for the Statewide Flooding and Sea Level Resilience Plan. DEP, *Presentation to the Florida Senate Committee on Environment and Natural Resources* (Feb. 23, 2023), available at [https://www.flsenate.gov/Committees/Show/SSHR/MeetingPacket/5700/10150\\_MeetingPacket\\_5700\\_2.23.23.pdf](https://www.flsenate.gov/Committees/Show/SSHR/MeetingPacket/5700/10150_MeetingPacket_5700_2.23.23.pdf).

<sup>28</sup> Critical assets include transportation assets and evacuation routes (airports, bridges, bus terminals, major roadways, etc.), critical infrastructure (wastewater and stormwater treatment facilities, drinking water facilities, solid and hazardous waste facilities, etc.), critical community and emergency facilities (schools, correctional facilities, fire stations, hospitals, etc.), and natural, cultural, and historical resources (conservation lands, parks, shorelines, wetlands, etc.). Section 380.093(2)(a), F.S.

<sup>29</sup> Section 380.093(3)(c), F.S. Regionally significant assets are critical assets that support the needs of communities spanning multiple geopolitical jurisdictions. Section 380.093(2)(d), F.S.

<sup>30</sup> This section provides that, in communities abutting the Gulf of Mexico or Atlantic Ocean or other coastal areas defined by statute, a local government’s comprehensive plan must include a coastal management element. Sections 163.3178(2) and 163.3177(6)(g), F.S. This element must contain a redevelopment component that outlines the principles that must be used to eliminate inappropriate and unsafe development in the coastal areas when opportunities arise. Section 163.3178(2)(f), F.S.

- All analyses in the North American Vertical Datum of 1988;<sup>31</sup>
- At least two local sea level rise scenarios, which must include the 2017 NOAA intermediate-low and intermediate-high sea level rise projections;
- At least two planning horizons that include planning horizons for the years 2040 and 2070; and
- Local sea level data that has been interpolated between the two closest NOAA tide gauges.<sup>32</sup>

The Comprehensive Statewide Flood Vulnerability and Sea Level Rise Data Set and Assessment will provide information necessary to determine the risks to inland and coastal communities.<sup>33</sup> By July 1, 2023, the DEP must develop a data set providing statewide sea level rise projections and information necessary to determine the risks of flooding and sea level rise to inland and coastal communities. By July 1, 2024, the DEP must develop a statewide assessment (using the statewide data set) identifying vulnerable infrastructure, geographic areas, and communities. The statewide assessment must include an inventory of critical assets and be updated every five years.<sup>34</sup>

The Statewide Flooding and Sea Level Rise Resilience Plan consists of ranked projects that address risks of flooding and sea level rise to coastal and inland communities.<sup>35</sup> Examples of projects include construction of living shorelines, seawalls, and pump stations, elevation projects, and infrastructure hardening.<sup>36</sup> Counties, municipalities, water management districts, regional water supply authorities, and other entities may submit to the DEP an annual list of proposed projects. Each project must have a minimum 50 percent cost share, unless the project assists or is within a financially disadvantaged community.<sup>37</sup> The DEP ranks the projects using a four-tier scoring system.<sup>38</sup> The DEP has adopted rules to implement s. 380.093, F.S., relating to the Statewide Flooding and Sea Level Rise Resilience Plan and project submittal requirements. These rules can be found in Chapter 62S-8 of the Florida Administrative Code.<sup>39</sup> In December

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<sup>31</sup> A vertical datum is a surface of zero elevation to which heights of various points are referenced. Traditionally, vertical datums have used classical survey methods to measure height differences (i.e. geodetic leveling) to best fit the surface of the earth. The current vertical datum for the contiguous United States and Alaska is the North American Vertical Datum of 1988. NOAA, *National Geodetic Survey: Vertical Datums*,

<https://www.ngs.noaa.gov/datums/vertical/#:~:text=TABLE%20%3A%20Current%20Vertical%20Datums%20for%20Unit ed%20States,%20%202002-present%20%20%20%20more%20rows%20> (last visited Mar. 9, 2023).

<sup>32</sup> Section 380.093(3)(d)

<sup>33</sup> Section 380.093(4), F.S.; DEP, *Resilient Florida Program – Statewide Assessment*, <https://floridadep.gov/rcp/resilient-florida-program/content/resilient-florida-program-statewide-assessment> (last visited Mar. 9, 2023).

<sup>34</sup> *Id.* See also DEP, *Resilient Florida Program – Statewide Assessment*, <https://floridadep.gov/rcp/resilient-florida-program/content/resilient-florida-program-statewide-assessment> (last visited Mar. 7, 2023).

<sup>35</sup> Section 380.093(5), F.S.

<sup>36</sup> DEP, *2022-2023 Statewide Flooding and Sea Level Rise Resilience Plan*, available at [https://floridadep.gov/sites/default/files/FY22.23%20Statewide%20Flooding%20and%20Sea%20Level%20Rise%20Resilience%20Plan\\_0.pdf](https://floridadep.gov/sites/default/files/FY22.23%20Statewide%20Flooding%20and%20Sea%20Level%20Rise%20Resilience%20Plan_0.pdf).

<sup>37</sup> Section 380.093(5)(e), F.S. A financially disadvantaged small community is a municipality with a population of 10,000 or fewer, or a county with a population of 50,000 or fewer, where the per capita annual income is less than the state's per capita annual income. *Id.*

<sup>38</sup> Section 380.093(5)(h), F.S.

<sup>39</sup> Fla. Admin. Code Chapter 62S-8, available at [https://floridadep.gov/sites/default/files/Final%20Rule%20Language\\_0.pdf](https://floridadep.gov/sites/default/files/Final%20Rule%20Language_0.pdf).

2022, the DEP submitted the Fiscal Year 23-24 Statewide Flooding and Sea Level Rise Resilience Plan totaling nearly \$408 million over the next three years.<sup>40</sup>

The DEP may also provide funding for regional resilience entities to assist local governments with planning for the resilience needs of communities and coordinating intergovernmental solutions to mitigate adverse impacts of flooding and sea level rise.<sup>41</sup> To date, \$4 million has been appropriated to regional resilience entities.<sup>42</sup>

In 2022, the Statewide Office of Resilience was created within the Executive Office of the Governor for the purpose of reviewing all flood resilience and mitigation activities in the state and coordinating flood resilience and mitigation efforts with federal, state, and local governmental entities and other stakeholders. The office's Chief Resilience Officer and the DEP worked together to provide the Governor and Legislature with a report on flood resilience and mitigation efforts across Florida. The report includes:

- A list of local governments that are required to comply with the requirements of s. 163.3178(2)(f), F.S.,<sup>43</sup> but are not in compliance, as reported by the Department of Economic Opportunity;
- A list of local governments that have completed vulnerability assessments in compliance with the requirements of the Resilient Florida grant program in s. 380.093(3), F.S.;<sup>44</sup>
- An overview of the geographic distribution of entities with funded projects in the Statewide Flooding and Sea Level Rise Resilience Plan,<sup>45</sup> and
- A statewide inventory of basin-level flooding assessments and other related basin-level planning efforts self-reported by water management districts or special districts authorized to submit projects pursuant to s. 380.093(5), F.S.<sup>46</sup>

### **Florida Flood Hub for Applied Research and Innovation**

The Florida Flood Hub for Applied Research and Innovation was established within the University of South Florida College of Marine Science to coordinate efforts between the

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<sup>40</sup> DEP and Florida Statewide Office of Resilience, *2022 Flood Resilience and Mitigation Efforts Across Florida*, 9, available at [https://floridadep.gov/sites/default/files/2022%20Flood%20Resilience%20and%20Mitigation%20Efforts%20Report%20Only\\_0.pdf](https://floridadep.gov/sites/default/files/2022%20Flood%20Resilience%20and%20Mitigation%20Efforts%20Report%20Only_0.pdf)

<sup>41</sup> Section 380.093(6), F.S.

<sup>42</sup> DEP, *Presentation to the Florida Senate Committee on Environment and Natural Resources*, 18 (Feb. 23, 2023), available at [https://www.flsenate.gov/Committees/Show/SSHR/MeetingPacket/5700/10150\\_MeetingPacket\\_5700\\_2.23.23.pdf](https://www.flsenate.gov/Committees/Show/SSHR/MeetingPacket/5700/10150_MeetingPacket_5700_2.23.23.pdf).

<sup>43</sup> Section 163.3178(2)(f), F.S., requires local coastal governments to include a redevelopment component within their comprehensive plans' coastal management element, which outlines the principles that must be used to eliminate inappropriate and unsafe development in the coastal areas when opportunities arise. *See* DEP and Florida Statewide Office of Resilience, *2022 Flood Resilience and Mitigation Efforts Across Florida*, 2, available at [https://floridadep.gov/sites/default/files/2022%20Flood%20Resilience%20and%20Mitigation%20Efforts%20Report%20Only\\_0.pdf](https://floridadep.gov/sites/default/files/2022%20Flood%20Resilience%20and%20Mitigation%20Efforts%20Report%20Only_0.pdf); Letter from Department of Economic Opportunity to DEP, 1-2 (Nov. 9, 2022), available at [https://floridadep.gov/DEO\\_PoF\\_Letter2022](https://floridadep.gov/DEO_PoF_Letter2022).

<sup>44</sup> DEP and Florida Statewide Office of Resilience, *2022 Flood Resilience and Mitigation Efforts Across Florida*, 3, available at [https://floridadep.gov/sites/default/files/2022%20Flood%20Resilience%20and%20Mitigation%20Efforts%20Report%20Only\\_0.pdf](https://floridadep.gov/sites/default/files/2022%20Flood%20Resilience%20and%20Mitigation%20Efforts%20Report%20Only_0.pdf)

<sup>45</sup> *Id.* at 7-9.

<sup>46</sup> *Id.* at 10-12.

academic and research institutions of the state.<sup>47</sup> The Florida Flood Hub is tasked with, among other things, organizing existing data needs for a comprehensive statewide flood vulnerability and sea level rise analysis and performing gap analyses to determine data needs; developing statewide open source hydrologic models for physically based flood frequency estimation and real-time forecasting of flood; establishing community-based programs to improve flood monitoring and prediction along major waterways; and providing tidal and storm surge flooding data to counties and municipalities for vulnerability assessments.<sup>48</sup>

### **Sea Level Impact Projection (SLIP) Studies**

SLIP studies analyze the potential impact of sea level rise and other coastal hazards on state-funded coastal construction projects.<sup>49</sup> These studies are critical to understanding the safety and economic impacts of sea level rise and coastal flooding.<sup>50</sup>

State-financed constructors<sup>51</sup> must conduct a SLIP study before commencing construction of a new coastal structure within the coastal building zone.<sup>52</sup> Coastal structures include major structures and uninhabitable major structures:

- 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.<sup>53</sup>
- Uninhabitable 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.

SLIP studies are only required within the coastal building zone. The coastal building zone includes:

- The land area from the seasonal high-water line landward to a line 1,500 feet landward from the coastal construction control line (CCCL) as established pursuant to s. 161.053, F.S., 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 and shown on flood insurance rate maps;
- On coastal barrier islands, it includes the land area from the seasonal high-water line to a line 5,000 feet landward from the CCCL or the entire island, whichever is less; and
- All land area in the Florida Keys located within Monroe County.<sup>54</sup>

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<sup>47</sup> Section 380.0933(1), F.S.

<sup>48</sup> Section 380.0933(2) and (3), F.S.

<sup>49</sup> DEP, *Slip Studies*, <https://floridadep-slip.org/AboutSLIPStudies.aspx> (last visited Mar. 6, 2023).

<sup>50</sup> *Id.*

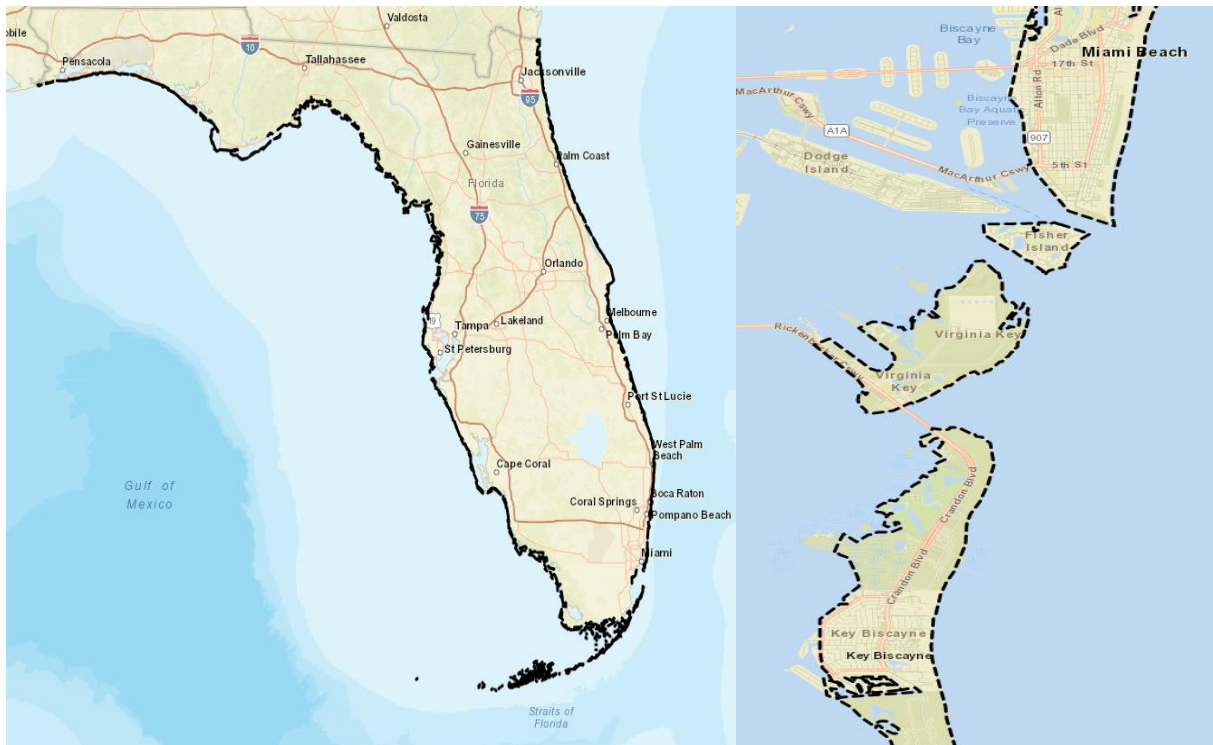
<sup>51</sup> “State-financed constructor” is defined as a public entity that commissions or manages a construction project using funds appropriated from the state. Section 161.551(1)(d), F.S.

<sup>52</sup> Section 161.551, F.S.; Fla. Admin. Code R. 62S-7.011(1).

<sup>53</sup> Section 161.54(6)(a), F.S.

<sup>54</sup> Fla. Admin. Code R. 62S-7.010; section 161.54(1), F.S.





*Coastal Building Zone for Florida and parts of Miami-Dade County<sup>55</sup>*

At a minimum, a SLIP study must include:<sup>56</sup>

- A systematic, interdisciplinary, and scientifically accepted approach in the natural sciences and construction design in conducting the study;
- Alternatives for the coastal structure’s design and siting, including discussion of how such alternatives would affect the potential public safety and environmental impacts assessed in the study, as well as the risks and costs associated with maintaining, repairing, and constructing the coastal structure; and
- An assessment of the flooding, inundation, and wave action damage risks relating to the coastal structure over its expected life or 50 years, whichever is less. This assessment must:
  - Take into account potential sea-level rise and increased storm risk during the expected life of the coastal structure or 50 years, whichever is less;
  - Provide scientific and engineering evidence of the risk to the coastal structure and methods used to mitigate, adapt to, or reduce this risk;
  - Use available scientific research and generally accepted industry practices;
  - Provide the mean average annual chance of substantial flood damage over the expected life of the coastal structure or 50 years, whichever is less; and
  - Analyze potential public safety and environmental impacts resulting from damage to the coastal structure including, but not limited to, leakage of pollutants, electrocution and explosion hazards, and hazards resulting from floating or flying structural debris.<sup>57</sup>

<sup>55</sup> DEP, *SLIP Tool*, <https://floridadep-slip.org/Map.aspx> (last visited Mar. 9, 2023).

<sup>56</sup> Section 161.551(3), F.S.

<sup>57</sup> Section 161.551(3), F.S.

“Substantial flood damage” as used in this section 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.<sup>58</sup>

The SLIP study must be submitted to the DEP and published on the DEP’s website before construction can commence.<sup>59</sup> If a state-financed constructor begins construction of a coastal structure without first submitting a SLIP study, the DEP is authorized to institute a civil action for injunctive relief to cease further construction of the coastal structure and recovery of all or a portion of state funds expended on the coastal structure.<sup>60</sup> The DEP is required to maintain a copy of all SLIP studies on its website for ten years.<sup>61</sup>

The DEP has adopted Chapter 62S-7 of the Florida Administrative Code, which implements s. 161.551, F.S., and provides for the requirements for state-financed constructors, SLIP study standards, and the implementation and enforcement of SLIP study requirements. These rules went into effect July 1, 2022. In addition, the DEP created a SLIP Study Tool that provides an interactive map with information on coastal flooding spatial data and details on current SLIP studies.<sup>62</sup>

### III. Effect of Proposed Changes:

**Section 1** authorizes the Department of Environmental Protection (DEP) to provide Resilient Florida Program grants to counties or municipalities for feasibility studies and the cost of permitting for innovative measures that reduce the impact of flooding and sea level rise and focus on nature-based solutions. The bill provides that the water management districts are eligible to receive grants under the Resilient Florida Program for the purpose of supporting the Florida Flood Hub for Applied Research and Innovation and the DEP through data creation and collection, modeling, and the implementation of statewide standards.

**Section 2** substantially revises the existing sea level impact projection (SLIP) study requirements under s. 161.551, F.S. The bill redesignates the statute from s. 161.551, F.S., in the chapter of law dealing with beach and shore preservation to s. 380.0937, F.S., in the chapter of law addressing land and water management.

The bill substantially expands the geographical area where SLIP studies are required and changes the types of structures that this requirement applies to. Currently, a SLIP study must be conducted before a state-financed constructor begins construction of a new coastal structure within the coastal building zone. The bill amends this requirement by providing that, beginning July 1, 2024, a SLIP study must be conducted before a state-financed constructor begins construction of a certain critical assets (called “potentially at-risk structure or infrastructure”) in an “area at risk due to sea level rise.”

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<sup>58</sup> Section 161.551(1)(e), F.S.

<sup>59</sup> Section 161.551(6)(a), F.S.

<sup>60</sup> Section 161.551(4), F.S.

<sup>61</sup> Section 161.551(6)(a), F.S.

<sup>62</sup> DEP, *SLIP Studies*, <https://floridadep-slip.org/AboutSLIPStudies.aspx> (last visited Mar. 8, 2023); DEP, *SLIP Map*, <https://floridadep-slip.org/Map.aspx> (last visited Mar. 8, 2023).

The bill defines “area at risk due to sea level rise” as any location 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 under s. 380.093(3)(d)3.b., F.S.<sup>63</sup> For the purposes of this definition, the threshold for tidal flooding is two feet above the mean higher high water.<sup>64</sup> The bill defines “potentially at-risk structure or infrastructure” to mean certain types of critical assets when those assets are within an area at risk due to sea level rise. The types of critical assets for which a slip study would be required include:

- Transportation assets and evacuation routes, including airports, bridges, bus terminals, ports, major roadways, marinas, rail facilities, and railroad bridges;
- Critical infrastructure, including wastewater treatment facilities and lift stations, stormwater treatment facilities and pump stations, drinking water facilities, water utility conveyance systems, electric production and supply facilities, solid and hazardous waste facilities, military installations, communications facilities, and disaster debris management sites;
- Critical community and emergency facilities, including schools, colleges, universities, community centers, correctional facilities, disaster recovery centers, emergency medical service facilities, emergency operation centers, fire stations, health care facilities, hospitals, law enforcement facilities, local government facilities, logistical staging areas, affordable public housing, risk shelter inventory, and state government facilities; and
- Historical or cultural assets.

The bill will require the DEP to update its SLIP rules. The bill retains existing rule requirements with the following changes. The bill:

- Replaces the phrase “mean average annual change of substantial flood damage” with “estimated probability of significant flood damage” in the context of the assessment; and
- Adds a requirement that the state-financed constructor provide a list of flood mitigation strategies evaluated as part of the design of the potentially at-risk structure or infrastructure and identify appropriate flood mitigation strategies for consideration as part of the potentially at-risk structure or infrastructure design.

The bill revises the definition of “substantial flood damage” to “significant flood damage.” The bill adds the term erosion as a type of damage covered in the definition and clarifies that the damage can result from a “discrete or compound natural hazard event” rather than a single event. Under the bill, the damage must exceed:

- Twenty-five percent of the “replacement cost” (existing law uses market value) of the potentially at-risk structure or infrastructure at the time of the event; or
- A defined threshold established by the DEP, in coordination with the Department of Transportation and the water management districts, for a potentially at-risk structure or infrastructure for which replacement cost is not an appropriate metric, such as roadways. The threshold must be established by July 1, 2024.

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<sup>63</sup> This section requires vulnerability assessments to provide at least two local sea level rise scenarios, which must include the 2017 National Oceanic and Atmospheric Administration (NOAA) intermediate-low and intermediate-high sea level rise projections. Section 380.093(3)(d)3.b., F.S.

<sup>64</sup> Higher high water means the higher of the two high waters of a tidal day where the tide is of the semidiurnal or mixed type. NOAA, *NOAA Shoreline: Glossary*, <https://shoreline.noaa.gov/glossary.html#partg> (last visited Mar. 9, 2023). An area has a semidiurnal tidal cycle if it experiences two high and two low tides of approximately equal size every lunar day. Many areas on the eastern coast of North America experience these tidal cycles. NOAA, *Tides and Water Levels*, [https://oceanservice.noaa.gov/education/tutorial\\_tides/tides07\\_cycles.html](https://oceanservice.noaa.gov/education/tutorial_tides/tides07_cycles.html) (last visited Mar. 9, 2023).

**Section 3** provides an effective date of July 1, 2023.

**IV. Constitutional Issues:**

A. Municipality/County Mandates Restrictions:

None.

B. Public Records/Open Meetings Issues:

None.

C. Trust Funds Restrictions:

None.

D. State Tax or Fee Increases:

None.

E. Other Constitutional Issues:

None.

**V. Fiscal Impact Statement:**

A. Tax/Fee Issues:

None.

B. Private Sector Impact:

None.

C. Government Sector Impact:

The Department of Environmental Protection may incur costs to develop rules regarding when a state-financed constructor must conduct a sea level impact projection (SLIP) study. These costs can be handled within existing resources. State-financed constructors may also incur costs to conduct additional SLIP studies.

**VI. Technical Deficiencies:**

None.

**VII. Related Issues:**

None.

**VIII. Statutes Affected:**

This bill substantially amends section 380.093 of the Florida Statutes.

This bill repeals section 161.551 of the Florida Statutes and replaces it with a new section 380.0937 of the Florida Statutes.

**IX. Additional Information:****A. Committee Substitute – Statement of Changes:**

(Summarizing differences between the Committee Substitute and the prior version of the bill.)

None.

**B. Amendments:**

None.

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This Senate Bill Analysis does not reflect the intent or official position of the bill's introducer or the Florida Senate.

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