

2022

Flood Resilience and Mitigation Efforts Across Florida



**FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
&
FLORIDA STATEWIDE OFFICE OF RESILIENCE**



Flood Resilience and Mitigation Efforts Across Florida

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Introduction

On May 3, 2022, Governor DeSantis signed House Bill 7053 (2022), creating Chapter 2022-89, Laws of Florida. In compliance with Section 2, the Department of Environmental Protection (“department”), in consultation with the Chief Resilience Officer, prepared this report on flood resilience and mitigation efforts in Florida. The report contains the following elements:

1. A list of local governments that are required to comply with the requirements of s. 163.3178(2)(f), Florida Statute (F.S.), but are not in compliance, as reported by the Department of Economic Opportunity (DEO);
2. A list of local governments that have completed vulnerability assessments (VA) that comply with the requirements of s. 380.093(3), F.S.;
3. The geographic distribution of entities with funded projects in the Statewide Flooding and Sea Level Rise Resilience Plan (“Statewide Resilience Plan”); and
4. 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.

Local government compliance with s. 163.3178(2)(f), F.S.

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. As a component of this report, Chapter 2022-89, Section 2, Laws of Florida, requires that DEO provide a list of local governments that have not yet addressed the requirements, as of the date of this publication. Based on information provided by DEO in October, out of a total of 218 local governments subject to these “Peril of Flood” requirements, 49 (22%) have not yet addressed the requirements. Of those 49 local governments, DEO noted that one has submitted an adopted amendment, seven have submitted proposed amendments, and 25 have indicated an amendment will be prepared.

A copy of the letter from DEO listing the 49 local governments that have not yet addressed the requirements of s. 163.3178(2)(f), F.S., is available here:

https://floridadep.gov/DEO_PoF_Letter2022

Governments with Vulnerability Assessments (VA) that comply with s. 380.093, F.S.

The Vulnerability Assessment (“VA”) standards in s. 380.093(3), F.S., have been in effect since July 1, 2021, with minor updates effective July 1, 2022. The VA standards, in brief, require that an assessment encompass the entire county or municipality and all critical assets owned or maintained by the grant applicant. Additionally, the standards prescribe scenarios and standards that must be used in the VA, which includes two local sea level rise scenarios from the National Oceanic and Atmospheric Administration’s 2017 intermediate-low and intermediate-high sea level rise projections, and two planning horizons for the years 2040 and 2070, among other technical requirements that would evaluate flood depths for a given scenario. Since that time, significant effort has been made statewide to produce VAs in compliance with these standards (“comprehensive VA”). Although no comprehensive VAs have been submitted to the Department to date, the Resilient Florida Grant Program provided grant awards to local governments and regional resilience entities to complete VAs for 31 counties and 87 municipalities in its first year (figure 1). These VAs are expected to be completed within one to two years generally. The department received up to \$40 million in FY22-23 for grants to local governments for community resilience planning; applications were accepted from July 1st through September 1st and are currently being evaluated. The Department received a total of 192 new applications totaling over \$50 million and is finalizing the review for these grants. Once awards are made, an updated list of VAs currently in progress will be made available [here](#).

Communities that perform a comprehensive VA not funded by the department can submit a Vulnerability Assessment Compliance Checklist, which can be found in Appendix E of the [Standardized Vulnerability Assessment Scope of Work Guidance](#), to ensure eligibility for the Statewide Flooding and Sea Level Rise Resilience Plan.

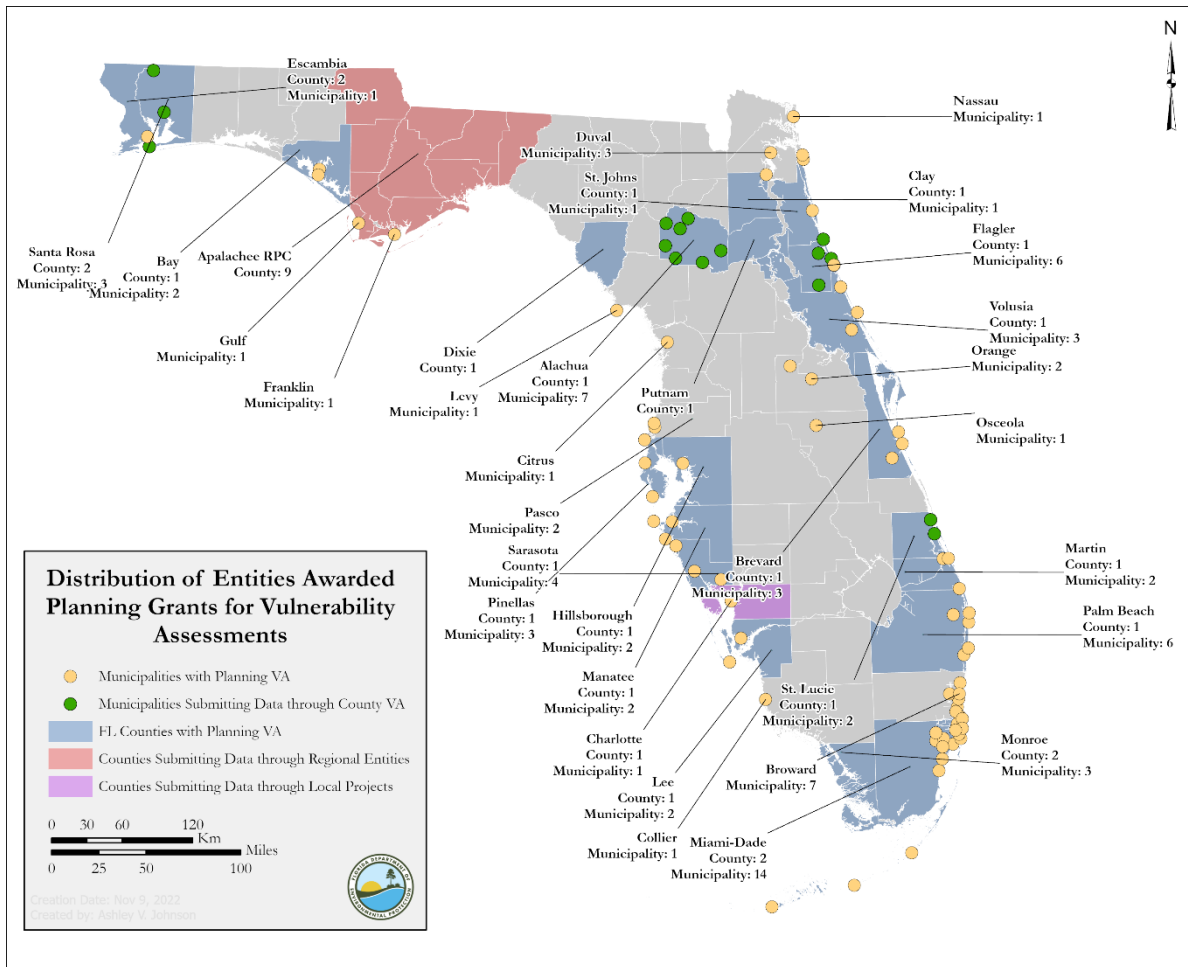


Figure 1. Figure showing all the counties and municipalities that were awarded an RF grant to complete a VA, and municipalities that will be submitting data through a county VA or local project.

VAs funded with FY21/22 funds or via another reported funding source:

- Alachua
- Alachua Co. (unincorporated)
- Anna Maria
- Apalachicola
- Apopka
- Archer
- Bal Harbour
- Bay Co. (unincorporated)
- Beverly Beach
- Biscayne Park
- Brevard Co. (unincorporated)
- Briny Breezes
- Bunnell
- Calhoun Co. (unincorporated via Apalachee Regional Planning Council (“ARPC”) project)
- Cape Coral
- Cedar Key
- Charlotte Co. (via local project)
- Clay Co. (unincorporated)
- Clearwater
- Crystal River
- Cutler Bay
- Dania Beach

- Delray Beach
- Dixie Co.
(unincorporated)
- Doral
- Edgewater
- Escambia Co.
(unincorporated)
- Fernandina Beach
- Flagler Beach
- Flagler Co.
(unincorporated)
- Fort Lauderdale
- Fort Pierce
- Franklin Co.
(unincorporated via
ARPC project)
- Gadsden Co.
(unincorporated via
ARPC project)
- Golden Beach
- Gulf Co.
(unincorporated via
ARPC project)
- Gulf Breeze
- Hallandale Beach
- Hawthorne
- High Springs
- Hillsborough (Port
Tampa Bay area)
- Hollywood
- Indialantic
- Islamorada
- Jackson Co.
(unincorporated via
ARPC project)
- Jacksonville (Duval
Co.)
- Jacksonville Beach
- Jay
- Jefferson Co.
(unincorporated via
ARPC project)
- Key West
- La Crosse
- Lauderhill
- Lee Co.
(unincorporated)
- Leon Co.
(unincorporated via
ARPC project)
- Liberty Co.
(unincorporated via
ARPC project)
- Longboat Key
- Lynn Haven
- Manatee Co.
(unincorporated)
- Marathon
- Marineland
- Martin Co.
(unincorporated)
- Medley
- Miami
- Miami Beach
- Miami Springs
- Miami-Dade Co.
(unincorporated)
- Micanopy
- Milton
- Monroe Co.
(unincorporated)
- Naples
- Neptune Beach
- New Port Richey
- Newberry
- North Bay
- North Miami
- North Miami Beach
- North Port
- Orange Park
- Ormond Beach
- Palm Bay
- Palm Beach
- Palm Beach Co.
(unincorporated)
- Palm Beach Shores
- Palm Coast
- Palmetto
- Panama City
- Pensacola
- Pinecrest
- Pinellas Co.
(unincorporated)
- Pompano Beach
- Ponce Inlet
- Port Richey
- Port St. Joe
- Punta Gorda
- Putnam Co.
(unincorporated)
- Sanibel
- Santa Rosa Co.
(unincorporated)
- Sarasota
- Sarasota Co.
(unincorporated)
- Satellite Beach
- Sewall's Point
- St. Augustine
- St. Cloud
- St. Johns Co.
(unincorporated)
- St. Lucie Co.
(unincorporated)
- St. Lucie Village
- St. Pete Beach
- Stuart
- Tampa
- Tarpon Springs
- Tequesta
- Venice
- Volusia Co.
(unincorporated)
- Wakulla Co.
(unincorporated via
ARPC project)
- West Miami
- West Palm Beach
- Wilton Manors
- Winter Park

Distribution of projects in Statewide Flooding and Sea Level Rise Resilience Plan and the Resilient Florida Grant Program

A total of 189 implementation projects were awarded in the program's first year totaling nearly \$675 million in grant awards (figure 2).

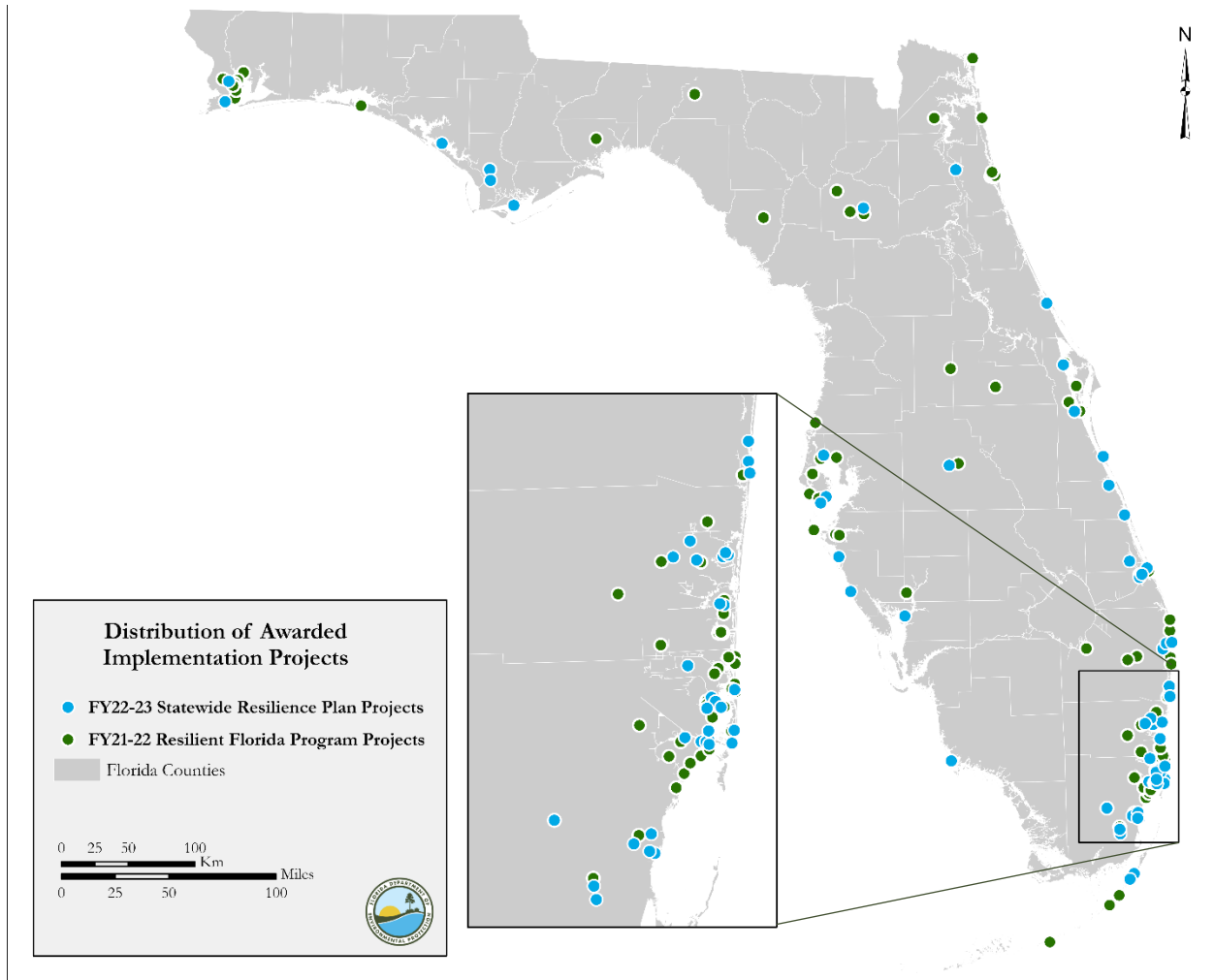


Figure 2. Figure showing all implementation projects where the FY22-23 Statewide Resilience Plan and Resilient Florida Grant Program projects were awarded by the program.

Of those projects, a total of 76 implementation projects were awarded as part of the FY22-23 Statewide Resilience Plan (figure 3). The distribution includes:

- 32 projects among 9 unique counties (42%)
- 38 projects among 23 unique municipalities (50%)
- 6 projects to one water management district (St. Johns River) (8%)

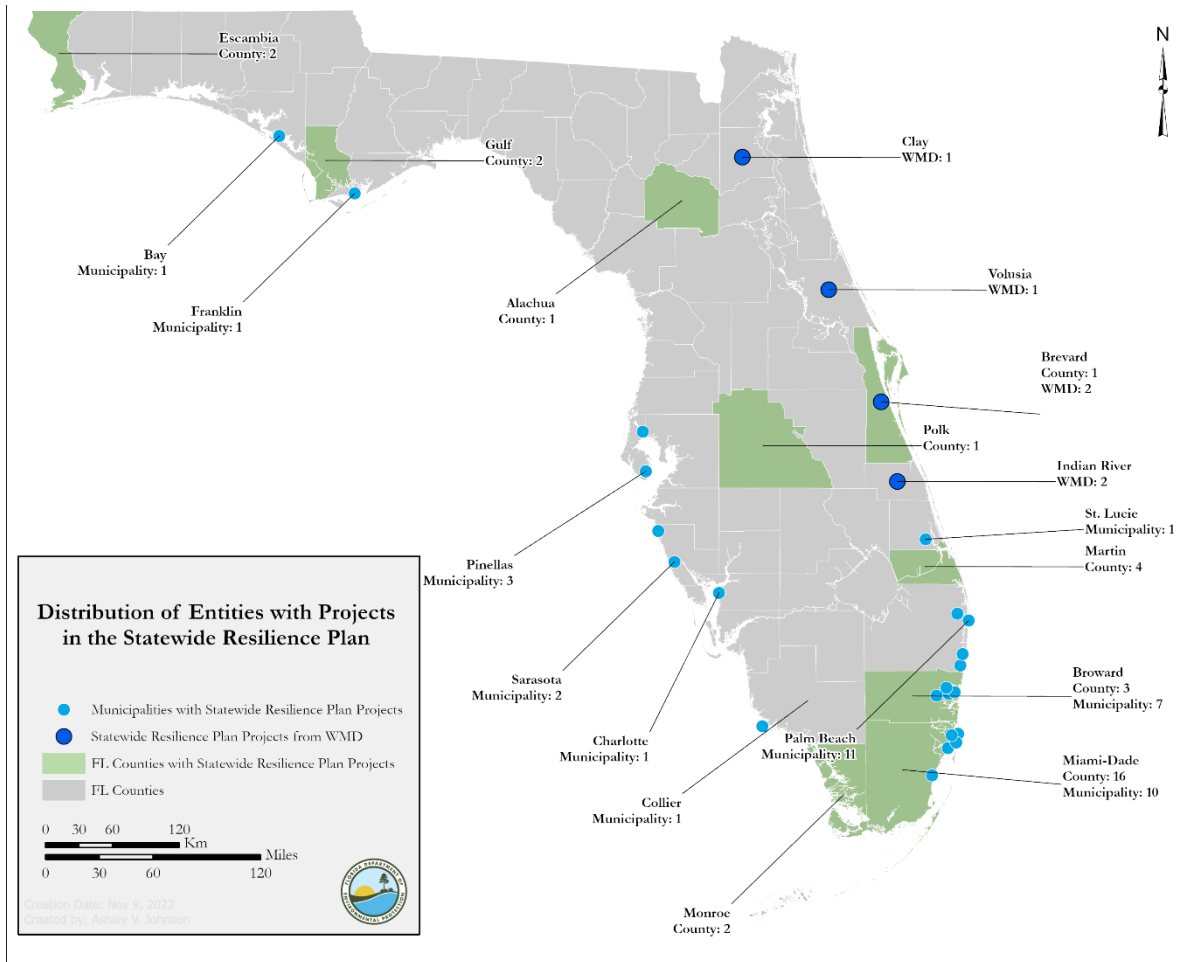


Figure 3. Figure showing all the counties, municipalities, and water management districts where the FY22-23 Statewide Resilience Plan projects were awarded by the program.

Additionally, a total of 113 implementation projects were awarded as part of the FY21-22 Resilient Florida Program Grants (figure 4). The distribution includes:

- o 47 projects among 18 unique counties (42%)
- o 66 projects among 43 unique municipalities (58%)

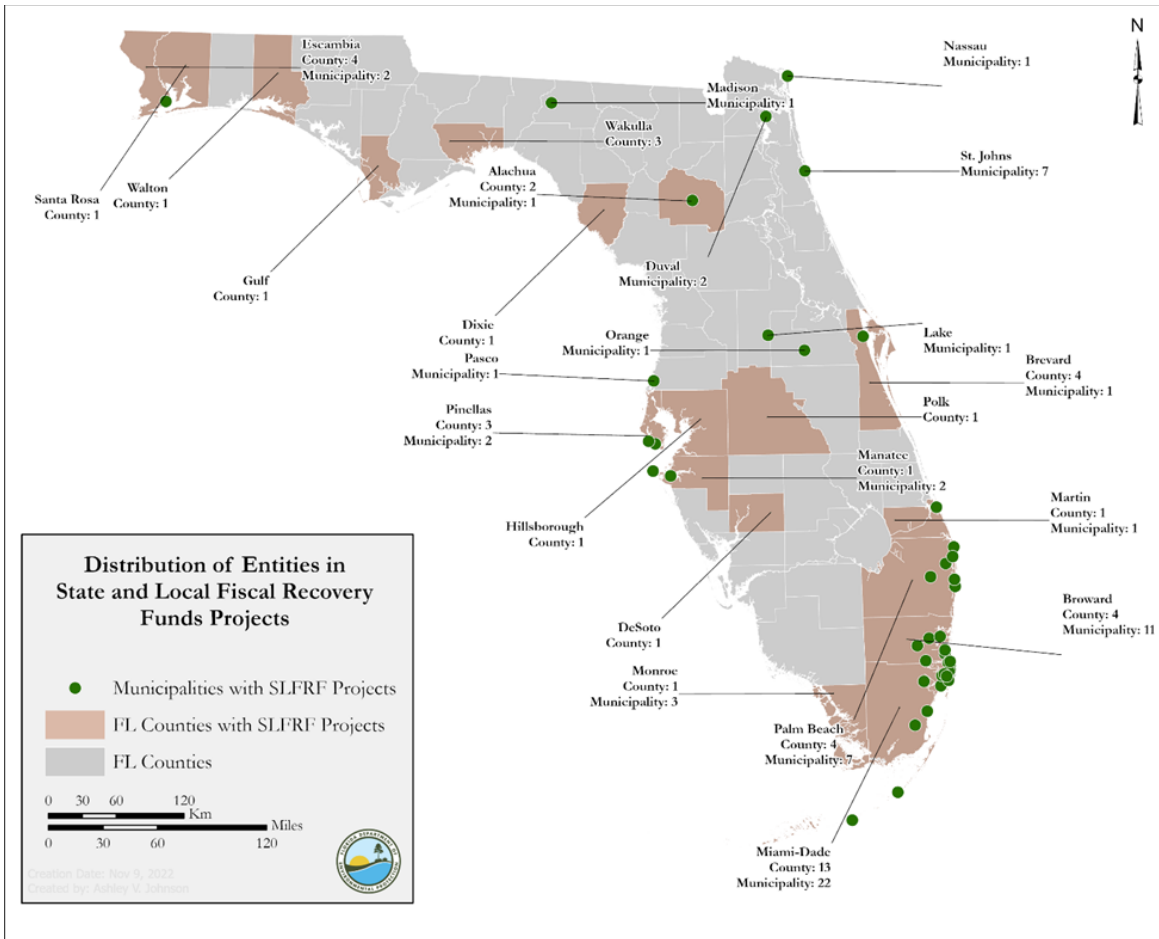


Figure 4. Figure showing all the counties and municipalities where the FY21-22 Resilient Florida Grant Program State and Local Fiscal Recovery Funds grants were awarded by the program.

On December 1, 2022, the Department submitted the FY 23-24 Statewide Flooding and Sea Level Rise Resilience Plan totaling nearly \$408 million over the next three years. The Department has also identified projects totaling \$86.5 million in grant awards using the balance of available FY21-22 Resilient Florida Grant Program State and Local Fiscal Recovery Funds.

Inventory of Basin-Level Flooding Assessments or planning efforts

Understanding and adapting to flooding challenges requires a regional perspective because water does not respect political or administrative boundaries. Therefore, conducting watershed or basin-level assessments represents a best practice for lowering flood risk. These assessments can be used to develop robust and reliable models to project how water enters a watershed (hydrologic data) and subsequently moves within and exits that watershed (hydraulic data). Detailed watershed or basin-level hydrologic and hydraulic (H&H) modeling is a critical tool for understanding flood risk now and under projected future conditions. H&H modeling is also necessary for developing low-risk flood mitigation and adaptation projects that achieve significant benefits without compromising existing upstream or downstream flood protection.

In gauging the maturity of watershed or basin-level planning across the state, DEP, in coordination with the Chief Resilience Officer, developed a survey that was sent to water management districts and 1,400 special purpose districts identified through DEO's "Community Planning and Development Special Districts" webpage to:

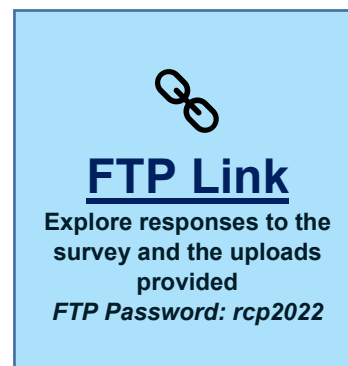
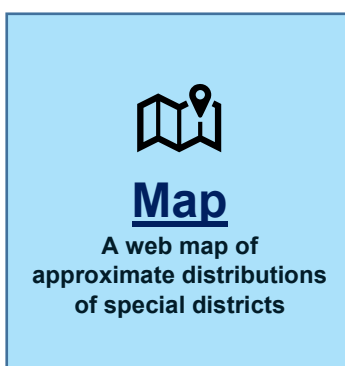
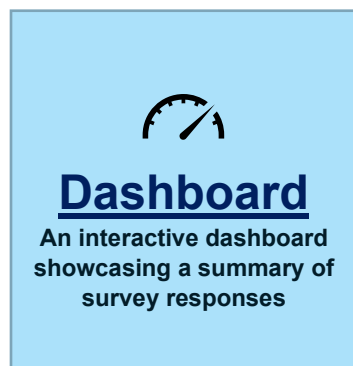
- Understand the state's starting point for implementing the assessment and modeling aspects of the Resilient Florida framework; and
- Identify the special districts eligible to develop and submit adaptation projects for inclusion in the Statewide Resilience Plan per s. 380.093(5), F.S.

A total of 639 special districts and each of the state's five water management districts responded (See Appendix A). In total, 54 respondents reported that they operate or maintain inlets & intercoastal waterways, potable water facilities, wastewater facilities, or airports or seaports. Among the respondents, only 7 special districts and 2 water management districts perform or provide funding to complete basin-level assessments within their administrative jurisdiction.

Information from survey respondents is provided on the following page through an interactive dashboard, map, and database. Summaries of the survey responses can be found in Appendix A and the complete questionnaire and responses can be found in Appendix B. The complete list of special districts identified from the DEO can be found [here](#).

Links for Basin-Level Assessment Response Dashboard, Map, and FTP Link

Hold CTRL + Click to follow links to the following resources:



Dashboard Link:

<https://floridadep.gov/RF/BasinSurveyDashboard>

Map Link:

<https://floridadep.gov/RF/BasinSurveyMap>

FTP Site Link:

<https://floridadep.gov/RF/BasinSurveyData>

FTP Password: rcp2022

These survey results suggest that prior to the enactment of s. 380.093, F.S., there were few existing efforts in Florida to comprehensively assess compound flood risk, incorporate it across state work, incentivize it in local decision-making, or embed it into statewide standards. As a result, most watershed or basin-level H&H studies or other flood models—if they even exist for a given locality—are either out of date, use incomplete data and assumptions, or do not include forward-looking data. Where modeling work is being conducted (e.g., at the Southwest Florida and South Florida water management districts), the potential use of different data sets and modeling standards could make comparisons inconsistent, hindering a holistic representation of both regional and statewide risk.

The Resilient Florida framework established in s. 380.093, F.S., is designed to help address this dearth of coordinated, forward-looking assessment and modeling to better

support infrastructure planning and implementation. The framework incentivizes planning, assessments, and adaptation project development through the provision of no-match state grants. Additionally, the establishment of the Florida Flood Hub for Applied Research and Innovation (Flood Hub) is a key part of the framework to help support the use of best-in-class flood modeling to provide a statewide picture of compound flood risk and to lower the technical burden on state and local governments to appropriately utilize best-in-class flood data and modeling to inform decision-making.

These survey results have also provided potential short-term pathways for action to better integrate special districts and water management districts into the Resilient Florida framework. For special districts, adaptation projects developed to address risks identified in watershed or basin-level assessments may also require additional analysis that meets the requirements of s. 380.093(3), F.S., including a demonstration that specific infrastructure is at-risk of flooding or sea level rise impacts under given scenarios and standards. DEP plans to initiate targeted outreach to special districts to encourage collaboration with local governments who receive Resilient Florida funding from DEP to develop statutorily-compliant VAs. Enhanced collaboration can ensure that special district owned infrastructure is included in local government VAs and therefore eligible for adaptation funding in future iterations of the Statewide Resilience Plan. Meanwhile for water management districts, additional focus on, and unified standards for, the development of watershed or basin-level flood assessments across all five districts could expedite progress towards meeting the essential goals of the Resilient Florida framework.

Appendix A: Summary of Responsive District Types by Special Purpose and Responsibilities

Breakdown of respondents by DEO Special Purpose

District Type	Count
Airports / Air Navigation Facilities	6
Airports / Air Navigation Facilities, Port Facilities	1
Beach and Shore Preservation	2
Beach Facilities, Inland Navigation and Waterways	1
Community Development	418
Community Development, Infrastructure Development	1
Community Redevelopment	73
County Development	4
County Water and Sewer	4
Downtown Development / Improvement	5
Drainage and/or Water Control	39
Drainage and/or Water Control, Municipal-Type Services, and Improvements	1
Drainage and/or Water Control, Road Maintenance	1
Economic Development	5
Infrastructure Development	7
Inland Navigation and Waterways	7
Inland Navigation and Waterways, Lake and Dam Maintenance	1
Inland Navigation and Waterways, Port Facilities	1
Municipal-Type Services and Improvements	2
Neighborhood Improvement - Local Gov.	2
Port Facilities	5
Regional Transportation	1
Regional Water	1
Soil and Water Conservation	23
Transportation Systems / Services	2
Utility Systems / Services	4
Water and/or Wastewater Systems	3
Water Management	5
Other	19

Summary of Responsibilities that would qualify an entity to submit projects for inclusion in the Statewide Resilience Plan

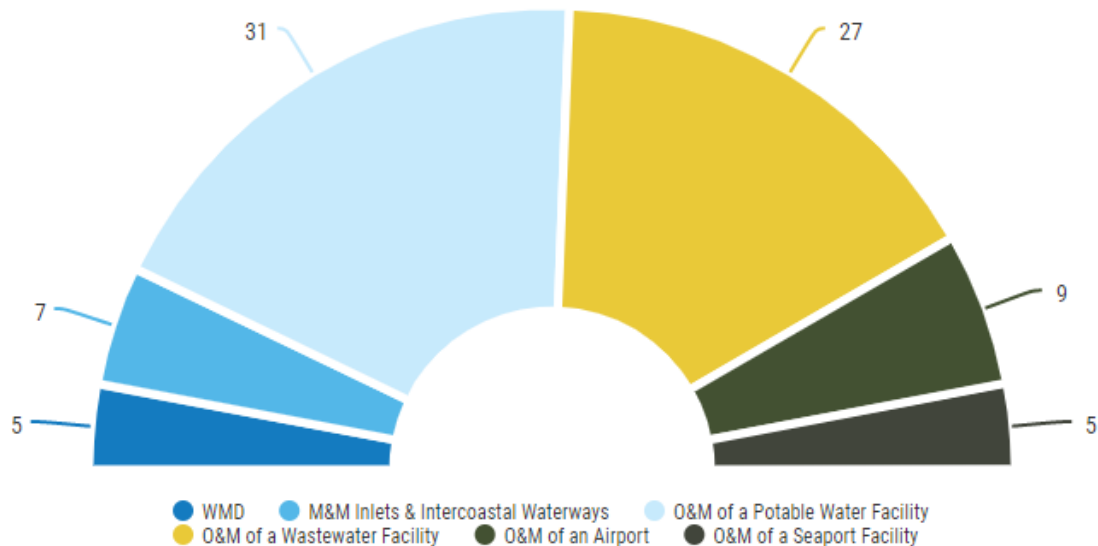
1. *Management and Maintenance of Inlets and Intracoastal Waterways*
2. *Operation and Maintenance of a Potable Water Facility*
3. *Operation and Maintenance of a Wastewater Facility*
4. *Operation and Maintenance of an Airport*
5. *Operation and Maintenance of a Seaport Facility*

Below are the varying selections from respondents reporting their appropriate special district responsibilities from the list above.

- **61** respondents reported having at least one of the listed responsibilities while **583** reported none applying.

Special District Responsibilities	Count
Management and maintenance of inlets and intracoastal waterways	7
Management and maintenance of inlets and intracoastal waterways, Operation and maintenance of a potable water facility, Operation, and maintenance of a wastewater facility	1
Management and maintenance of inlets and intracoastal waterways, Operation and maintenance of a potable water facility, Operation and maintenance of a wastewater facility, Operation and maintenance of an airport, Operation, and maintenance of a seaport facility	1
Operation and maintenance of an airport	8
Operation and maintenance of a potable water facility	6
Operation and maintenance of a potable water facility, Operation, and maintenance of a wastewater facility	24
Operation and maintenance of a potable water facility, Operation and maintenance of a wastewater facility, Operation, and maintenance of an airport	1
Operation and maintenance of a seaport facility	5
Operation and maintenance of a wastewater facility	2
WMD	3
WMD, none of these apply	1
WMD, Operation and maintenance of a potable water facility, Operation, and maintenance of a wastewater facility	1
WMD, Operation and maintenance of a potable water facility, Operation and maintenance of a wastewater facility, Operation, and maintenance of an airport	1
None of these apply	583

Breakdown of Respondents by Special District Responsibility



*M&M – Management & Maintenance *O&M - Operation & Maintenance

Figure 5. Donut chart of special district responsibilities breakdown, listed below

WMD (Water Management District)

1. Northwest Florida Water Management District
2. Suwannee River Water Management District
3. Coquina Water Control District
4. Southwest Florida Water Management District
5. South Florida Water Management District

Management and Maintenance of Inlets and Intracoastal Waterways

1. Isle of Palms Special District
2. Jupiter Inlet District
3. Harbor Bay Community Development District
4. Hillsboro Inlet District
5. West Coast Inland Navigation District
6. East Hendry County Drainage District
7. Sebastian Inlet Tax District

Operation and Maintenance of a Potable Water Facility

1. Barefoot Bay Water and Sewer District
2. City of Fort Meade
3. City of Margate Department of Environmental and Engineering Services
4. City of Brooksville
5. City of Oviedo
6. Clay County Utility Authority
7. St. Lucie County Water and Sewer District
8. St. Johns
9. City of Naples
10. Taylor Coastal Water and Sewer District
11. Bay Laurel Center Community Development District
12. Sun'n Lake of Sebring Improvement District
13. Alligator Point Water Resources District

14. Community Redevelopment Agency of the Town of Havana
15. Acme Improvement District
16. Northwest Florida Water Management District
17. Homosassa Special Water District
18. City of Maitland
19. Spring Lake Improvement District
20. Coral Springs Improvement District
21. Reedy Creek Improvement District
22. Suwannee Water and Sewer District
23. Village Center Community Development District
24. North Sumter County Utility Dependent District
25. Wildwood Utility Dependent District
26. Riverwood Community Development District
27. City of Blountstown
28. Emerald Coast Utilities Authority
29. Peace River-Manasota Regional Water Supply Authority
30. Babcock Ranch Community Independent Special District
31. City of Riviera Beach Utility Special District

Operation and Maintenance of a Wastewater Facility

1. Barefoot Bay Water and Sewer District
2. City of Fort Meade
3. City of Margate Department of Environmental and Engineering Services
4. City of Brooksville
5. City of Oviedo
6. Clay County Utility Authority
7. St. Lucie County Water and Sewer District
8. St. Johns
9. City of Naples
10. Taylor Coastal Water and Sewer District
11. Bay Laurel Center Community Development District
12. Sun'n Lake of Sebring Improvement District
13. Community Redevelopment Agency of the Town of Havana
14. Acme Improvement District
15. Poitras East Community Development District
16. Northwest Florida Water Management District
17. Spring Lake Improvement District
18. Coral Springs Improvement District
19. Reedy Creek Improvement District
20. Suwannee Water and Sewer District
21. Village Center Community Development District
22. North Sumter County Utility Dependent District
23. FDOT/SFRTA Miami/Hialeah Railyard (South Florida Water Management District)
24. Riverwood Community Development District
25. City of Blountstown
26. Emerald Coast Utilities Authority
27. Babcock Ranch Community Independent Special District

Operation and Maintenance of an Airport

1. St. Johns River Water Management District
2. Space Florida
3. Hillsborough County Aviation Authority
4. Lee County Port Authority
5. Sarasota-Manatee Airport Authority

6. Sebring Airport Authority
7. Gainesville-Alachua County Regional Airport Authority
8. Boca Raton Airport Authority
9. Bartow Municipal Airport Development Authority

Operation and Maintenance of a Seaport Facility

1. City of St. Cloud
2. Ocean Highway and Port Authority
3. Putnam County Port Authority
4. Citrus County Port Authority
5. Canaveral Port District

Appendix B: Questions & Responses to Basin-Level Assessment Form Survey

The 'Basin-Level Flooding Assessment' survey included the following questions, along with responses received.

Q1. Does the district currently conduct basin-level flooding assessments / watershed flood risk studies (i.e., modeling of flood risk at the watershed-level)?

Response: A total of **9** districts

District Name	District Type
City of Naples	
Acme Improvement District	Drainage and/or Water Control
Hillsborough County Aviation Authority	Airports / Air Navigation Facilities
Sarasota-Manatee Airport Authority	Airports / Air Navigation Facilities
Sebastian Inlet Tax District	Inland Navigation and Waterways
Coral Springs Improvement District	Drainage and/or Water Control
Reedy Creek Improvement District	Drainage and/or Water Control, Municipal-Type Services, and Improvements
Southwest Florida Water Management District	Water Management
South Florida Water Management District	Water Management

Q2. Does the district provide funding assistance to local partners to conduct similar flood studies in addition to, or in lieu of, district efforts?

Response: A total of **3** districts

District Name	District Type
Sebastian Inlet Tax District	Inland Navigation and Waterways
Babcock Ranch Community Independent Special District	Infrastructure Development
Southwest Florida Water Management District	Water Management

Q3. Do you have GIS files for your service area?

(a): A total of **5** districts that conduct basin-level assessments have GIS files.

District Name	District Type
Acme Improvement District	Drainage and/or Water Control
Hillsborough County Aviation Authority	Airports / Air Navigation Facilities
Reedy Creek Improvement District	Drainage and/or Water Control, Municipal-Type Services, and Improvements
Southwest Florida Water Management District	Water Management
South Florida Water Management District	Water Management

*Click the district name to access GIS files.

FTP Password: rcp2022

(b): A total of **1** district provides funding assistance to local partners to conduct similar flood studies and have GIS files.

District Name	District Type
Southwest Florida Water Management District	Water Management

(c): A total of **18** districts have GIS files but don't conduct basin-level assessments nor provide funding assistance to local partners to conduct similar flood studies.

District Name	District Type
City of Fort Meade	
City of Brooksville	
City of Oviedo	
Clay County Utility Authority	Utility Systems / Services
St. Lucie County Water and Sewer District	County Water and Sewer
St. Johns	
Sun'n Lake of Sebring Improvement District	Municipal-Type Services and Improvements
Community Redevelopment Agency of the Town of Havana	Community Redevelopment
Northwest Florida Water Management District	Water Management
East Hendry County Drainage District	Drainage and/or Water Control
City of Maitland	
Citrus County Port Authority	Port Facilities
Village Center Community Development District	Community Development
North Sumter County Utility Dependent District	
Wildwood Utility Dependent District	Utility Systems / Services
Emerald Coast Utilities Authority	Utility Systems / Services
Peace River-Manasota Regional Water Supply Authority	Regional Water
City of Riviera Beach Utility Special District	Utility Systems / Services

*Click the district name to access GIS files.

FTP Password: rcp2022

Q4. What guidelines are put into place to ensure technical consistency for the following types of data?

- Guidelines:**
1. Scale or boundary of watershed
 2. Spatial data
 3. Topographic data, including LiDAR and ground surveys
 4. Hydrologic features, including rainfall and soils
 5. Hydraulic features
 6. Floodplain delineation
 7. Future condition projections, including sea level rise, increased rainfall, compound flooding, and land use changes
 8. Floodplain analysis and H&H model development
 9. Flood protection level of service
 10. Access to critical assets

District Name	District Type	Conduct Basin-Level Assessments	Provide Funding Assistance	Have GIS Files	Guidelines in Place
Coral Springs Improvement District	Drainage and/or Water Control	Yes	No	No	Gee and Jensen (G&J) performed basin-wide flood modeling of proposed conditions for the 8 sq. mi. District in 1977 based on rainfall data, anticipated land use, and topographic surveys available at that time. Flood stage for the 10 and 100 year-5-day storm events were computed and design (permit) criteria established for construction within the district. An updated assessment of the drainage system's performance involving multi-basin flood routings (AdICPR) was completed ca. 2006. Requirements as to surface storage, below grade treatment and limits on impervious area reflected in the District's Permit Criteria Manual. New development and significant modifications to existing sites are required to comply with criteria resulting in roads and parking

					projected to be protected from the 10-year storm event and buildings protected from flooding during the 100-year event.
Acme Improvement District	Drainage and/or Water Control	Yes	No	Yes	1,2,3,f,5,6,8,9,10
Hillsborough County Aviation Authority	Airports / Air Navigation Facilities	Yes	No	Yes	We are working with our consultant team who is using regional spatial data and NOAA data to complete vulnerability assessments and resilience action plan work.
Sarasota-Manatee Airport Authority	Airports / Air Navigation Facilities	Yes	No	No	Technical Report for the Florida Statewide Airport Stormwater Study
Sebastian Inlet Tax District	Inland Navigation and Waterways	Yes	Yes	No	The district uses multiple licensed consultations for the collection and reporting of data specific to our projects. All topographic data is collected per monitoring protocols established by FDEP. We calibrate all our hydrologic models using real time wind, wave, and weather data that is collected by instrumentation immediately offshore the inlet and attached to our north jetty. Using the weather data imputed into our models, we are able to perform 3-day predication models.
Reedy Creek Improvement District	Drainage and/or Water Control, Municipal-Type Services, and Improvements	Yes	No	Yes	The RCID Land Development Regulations provide guidelines regarding the requested data. The Land Development Regulations indicate requirements for rainfall, soil and curve number considerations, sub-basin delineation, flood protection levels of service, etc. The RCID Master Drainage Model

						is a 1-dimensional H&H model, that provides the detailed hydraulic features including topographic data to establish floodplain elevations throughout the RCID Master Drainage System.
Babcock Ranch Community Independent Special District	Infrastructure Development	No	Yes	No		The current watersheds were modeled utilizing a combination of LiDAR and ground surveys. No efforts have been undertaken for any future condition projections as it relates to sea level rise, increased rainfall, compound flooding. Land Use projects for the year 2045 have been modeled utilizing present day rainfall intensity and patterns. No LOS has been completed to date for District assets in flood conditions.
Southwest Florida Water Management District	Water Management	Yes	Yes	Yes		<p>1. Scale or boundary of watershed is broken into planning units over the entire District. These are based on major drainage basins or contributing areas, for example, the Hillsborough River basin.</p> <p>2, 3, 4, 5, 6, 8, 9.</p> <p>Specifications are required per the Watershed Management Program's Guidelines & Specifications.</p> <p>7. Future conditions projections are not currently required as part of the program; however, many coastal plans include them based on the Tampa Bay forecasts.</p> <p>Have tried to include a copy of the Guidelines & Specifications for the Watershed Management Program, but they exceed the 10MB file size limitations. These can be provided along with Shapefile of basins and</p>

						status. Also, DSE utilized approved drainage analysis permitted with the SWFWMD and Haines City. Data in overall model was provided by SWFWMD based on existing study information.
South Florida Water Management District	Water Management	Yes	No	Yes		All the above are included and follow the FPLOS Program Guidelines. Program Description, phases, performance measures and progresses are summarized at: https://www.sfwmd.gov/our-work/flood-protection-level-service More details can be found at the final reports for each completed assessment (please contact us for copies of these reports). We will forward you final reports (they are larger than 10M). These are not guidance documents, but contains all the program requirements, and how they were addressed as part of the study.

Q5. Are the above technical guidelines incorporated into a guidance document?

Response: **4** out of the **9** districts with guidelines in place have a guidance document.

District Name	District Type	Guidelines into Document
Acme Improvement District	Drainage and/or Water Control	No
Babcock Ranch Community Independent Special District	Infrastructure Development	No
Coral Springs Improvement District	Drainage and/or Water Control	Yes
Hillsborough County Aviation Authority	Airports / Air Navigation Facilities	No

Reedy Creek Improvement District	Drainage and/or Water Control, Municipal-Type Services, and Improvements	Yes
Sarasota-Manatee Airport Authority	Airports / Air Navigation Facilities	No
Sebastian Inlet Tax District	Inland Navigation and Waterways	No
South Florida Water Management District	Water Management	Yes
Southwest Florida Water Management District	Water Management	Yes



Figure 6. Compilation of a select few special district guidance documents from those who provided them. From left to right: SFWMD, Coral Springs Improvement District, Reedy Creek Development District, & Peace River Manasota Regional Water Supply Authority

Q6. Are the flood assessments / risk studies based on hydrologic and hydraulic (H&H) modeling?

Response: Only **1** district (Hillsborough County Aviation Authority) responded **No** to basis on (H&H) modeling.

District Name	District Type	Assessment Based on H&H
Acme Improvement District	Drainage and/or Water Control	Yes
Babcock Ranch Community Independent Special District	Infrastructure Development	Yes
Coral Springs Improvement District	Drainage and/or Water Control	Yes

Hillsborough County Aviation Authority	Airports / Air Navigation Facilities	No
Reedy Creek Improvement District	Drainage and/or Water Control, Municipal-Type Services, and Improvements	Yes
Sarasota-Manatee Airport Authority	Airports / Air Navigation Facilities	Yes
Sebastian Inlet Tax District	Inland Navigation and Waterways	Yes
South Florida Water Management District	Water Management	Yes
Southwest Florida Water Management District	Water Management	Yes

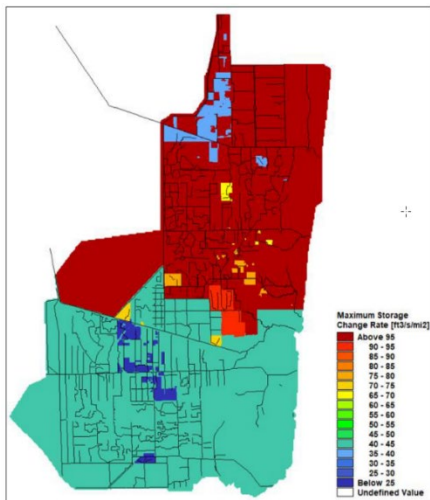


Figure 3.7-6: Maximum Storage Change Rate per SFWMD CSM Rating

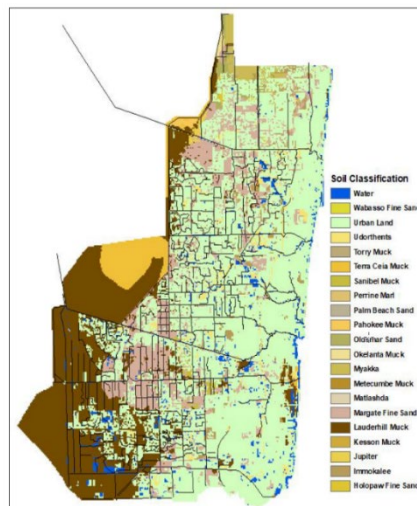


Figure 3.8-1: Map of Soils

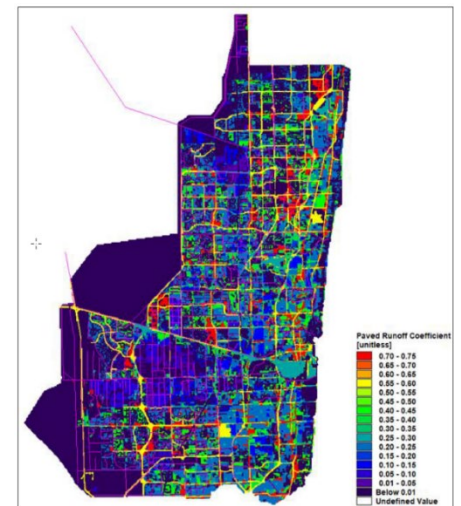


Figure 3.7-7: Map of Land Use Based Paved Runoff Coefficients

Figures 7, 8, & 9. Examples of H&H Modeling Analysis Pursuits in SFWMD numbered left to right.

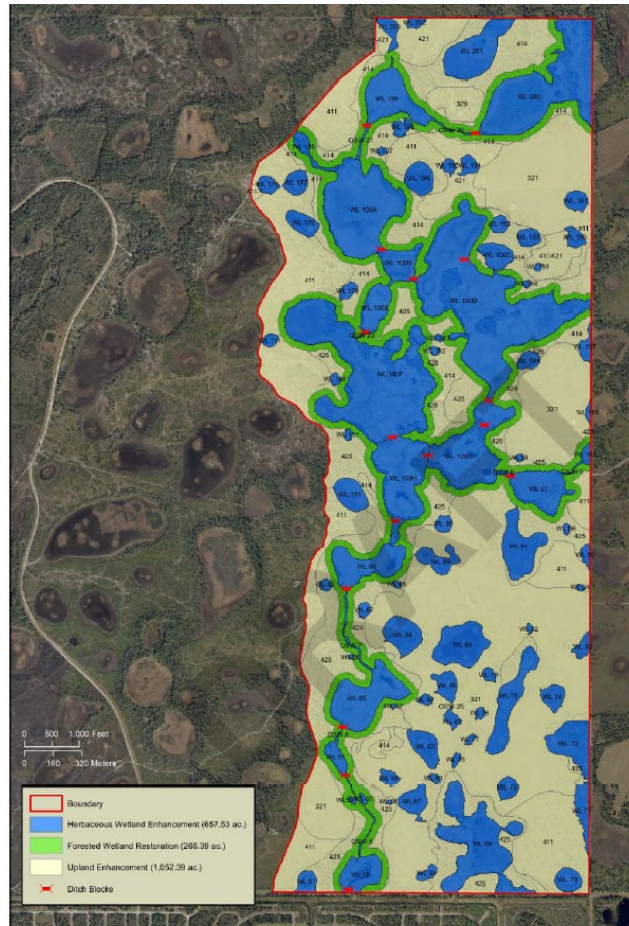
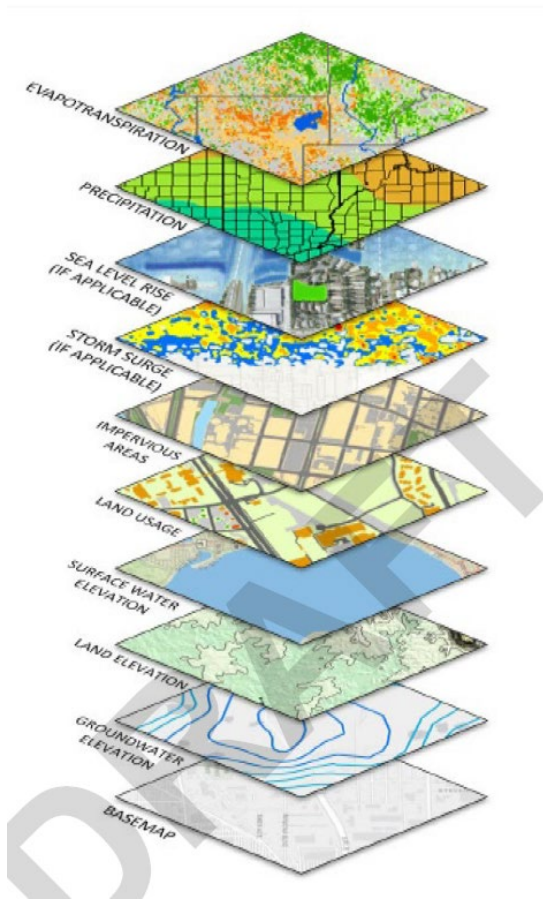


Figure 7-8 Hydrologic Restoration Concept

Figures 10 & 11. Examples of H&H Modeling Analysis Pursuits in Peace River Manasota Regional Water Supply Authority numbered left to right.

Q7. How are basins / watersheds prioritized for flood studies? Is there initial screening to prioritize where more granular modeling should be done?

Response: Only **1** district responded **No** (Sarasota-Manatee Airport Authority) with no reported level of initial prioritization screening.

District Name	District Type	Prioritization of Flood Studies
Acme Improvement District	Drainage and/or Water Control	Based on detailed hydrologic and hydraulic modeling
Babcock Ranch Community Independent Special District	Infrastructure Development	Based on historical performance of the stormwater system and new infrastructure updates.

Coral Springs Improvement District	Drainage and/or Water Control	The Coral Springs Improvement District benefits from fairly uniform grading and relatively consistent soil conditions. Both drainage basins were initially modeled in the 1970's and development requirements set forth in the established Permit Criteria Manual. Before parcels were approved for development from the existing vacant land/pasture/bean fields that comprised the district prior to 1977, CSID required demonstration of compliance with storage criteria and limits on impervious area.
Hillsborough County Aviation Authority	Airports / Air Navigation Facilities	We are mostly looking at storm surge inundation impacts to Tampa International Airport from Tampa Bay watershed.
Reedy Creek Improvement District	Drainage and/or Water Control, Municipal-Type Services, and Improvements	RCID has an existing model that covers our entire watershed of interest.
Sarasota-Manatee Airport Authority	Airports / Air Navigation Facilities	No
Sebastian Inlet Tax District	Inland Navigation and Waterways	Our consultants are currently identifying an expansion to the basin models to include stormwater runoff as tool to forecast flooding probabilities.
South Florida Water Management District	Water Management	<p>Pages 10 to 17 of the latest SFWMD Sea Level Rise and Flood Resiliency Plan summarize how basins and watersheds are being prioritized for flood studies, and how further studies/granular modeling/design recommendations are advanced: https://www.sfwmd.gov/sites/default/files/2022_SFWMD_SLRFRP_Final.pdf</p> <p>In addition, he have a comprehensive approach to rank project recommendations resulting from these slr/flood vulnerability assessments, described at pages 43-64 of the Plan referenced above.</p>
Southwest Florida Water Management District	Water Management	Watersheds are prioritized based on the degree of development/population changes, land use changes, flooding conditions, age of any previous studies, or lack of a working study in the watershed.

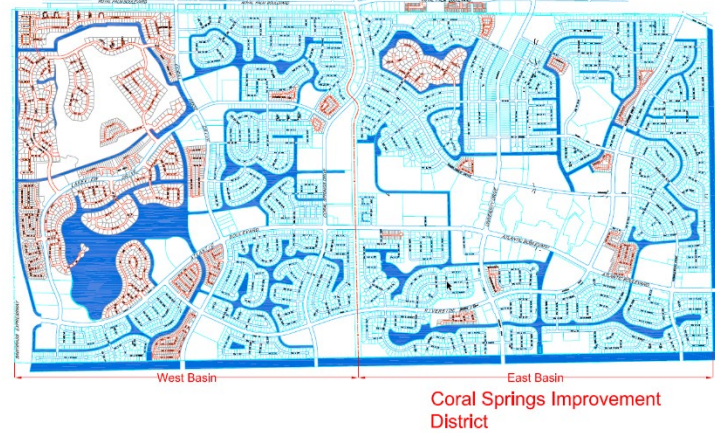
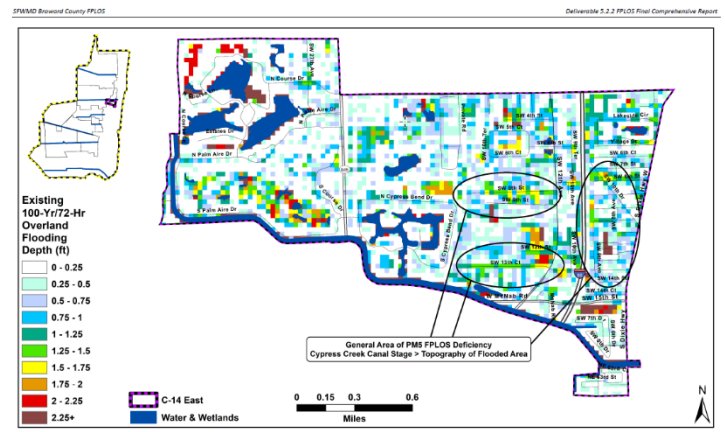
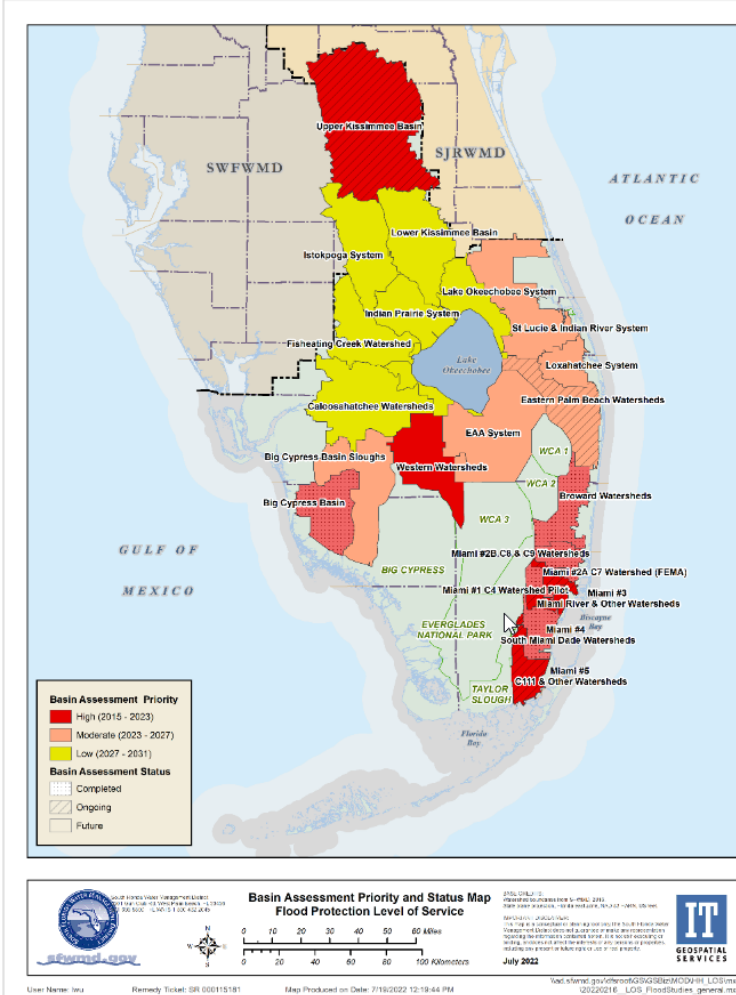


Figure 12. (Left image) Example of received basin / watershed prioritization outputs from SFWMD

Figure 13. (Top-right Image) Example of received basin / watershed prioritization outputs from SFWMD

Figure 14. (Bottom-right image) Example of received basin / watershed prioritization outputs from Coral Springs Improvement District

Q8. What processes (including peer or external review) are used to validate the results of the modeling?

District Name	District Type	Processes to Validate the Results of the Modeling
Acme Improvement District	Drainage and/or Water Control	External Review
Babcock Ranch Community Independent Special District	Infrastructure Development	The original modeling was approved by the SFWMD, all reviews on continued modeling efforts are required to meet the original guidelines set forth in the SFWMD approval. Thereby no sea level rise or incased intensity has been considered to date.

Coral Springs Improvement District	Drainage and/or Water Control	The storm water management modeling was reviewed by the South Florida Water Management District as part of the master storm water management permit application for the District. The modeling was subsequently reviewed and validated in 2006. Since 2006 no significant changes to the District have occurred.
Hillsborough County Aviation Authority	Airports / Air Navigation Facilities	Peer review through consultant team.
Reedy Creek Improvement District	Drainage and/or Water Control, Municipal-Type Services and Improvements	Peer review and verification via USGS monitoring.
Sarasota-Manatee Airport Authority	Airports / Air Navigation Facilities	Peer Review, review by SWFWMD and UF
Sebastian Inlet Tax District	Inland Navigation and Waterways	Collected and analyzed data is peer reviewed through publications and conference proceedings.
South Florida Water Management District	Water Management	Model results validation go through extensive peer technical review. The models developed by the Consultants are rigorously reviewed by internal four or five District experts and properly documented along with the Consultant responses. We also incorporate agency-wide Dr. Checks technical review process. We have technical teams from local governments sitting in each meeting and reviewing and validating model results and all assumptions made throughout all phases of the study. Partial results from our H&H Flood vulnerability assessments were also incorporated as part of the USACE South Atlantic Coastal Study. Finally, we recently performed a models crosswalk between County H&H model results (Miami Dade XPSWMN / Broward MIKE) and SFWMD / FPLOS model results (MIKE/HEC).
Southwest Florida Water Management District	Water Management	All Watershed Management Plans are required to go through an independent peer review by an outside consultant to verify and validate results. Before this occurs, all models are also reviewed in depth by District and cooperator staff.

Q9. 9. Is public outreach a component of the district's process for conducting flood assessments?

Response: **4** out of the **9** districts responded **Yes** to public outreach components.

District Name	District Type	Public Outreach	Public Outreach Description
Acme Improvement District	Drainage and/or Water Control	Yes	Flood control and stormwater management is included in our annual budget challenge online survey.
Babcock Ranch Community Independent Special District	Infrastructure Development	No	
Coral Springs Improvement District	Drainage and/or Water Control	No	
Hillsborough County Aviation Authority	Airports / Air Navigation Facilities	No	
Reedy Creek Improvement District	Drainage and/or Water Control, Municipal-Type Services, and Improvements	Yes	Meet regularly (at minimum quarterly) with stakeholders to address any questions and convey information as it develops.
Sarasota-Manatee Airport Authority	Airports / Air Navigation Facilities	No	
Sebastian Inlet Tax District	Inland Navigation and Waterways	No	
South Florida Water Management District	Water Management	Yes	The FPLOS Phase II Studies are heavily dependent on input from our local project partners. Public Workshops are conducted throughout the study (from scoping to final results). In addition, results from these assessments are integrated into the District Sea Level Rise and Flood Resiliency Plan annually. The document is open for public comments yearly, and we receive letters from 30+ organizations. Comments are incorporated into the final plan document, and responses to each individual commenter are provided.

Southwest Florida Water Management District	Water Management	Yes	All watershed modeling results must go through a public outreach where floodplain results are made available to the public. Affected property owners are notified individually and given opportunity to comment on results for a period of 45 days.
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Q10. Is the district a technical cooperative partner with FEMA?

Response: **3** out of the **9** districts are cooperative partners with FEMA.

District Name	District Technical Partner with FEMA	FEMA Standards Built into the Studies	Other Work to Flooding and Flood Risk
Acme Improvement District	No		No
Babcock Ranch Community Independent Special District	No		
Coral Springs Improvement District	No		CSID owns and maintains a system of canals and pump stations providing conveyance and flood storage. Additionally, CSID regulates development through a storm water management permitting process.
Hillsborough County Aviation Authority	Yes	Yes - FEMA building and stormwater design recommendations	
Reedy Creek Improvement District	No		Monitor water control structures and levees monthly, perform annual in-depth water control structure inspections and ongoing maintenance program for water control structures, culverts, and levees.

Sarasota-Manatee Airport Authority	No	No	
Sebastian Inlet Tax District	No	Yes, the Sebastian Inlet District also conducts frequent sediment bypassing projects downdrift of the inlet, thereby increasing resiliency along the areas of managed coastline.	
South Florida Water Management District	Yes	Models adopted as part of these studies are FEMA certified H&H models.	
Southwest Florida Water Management District	Yes	All studies follow the District's Guidelines and Specifications, which are based on FEMA requirements and standards.	No

Q11. Is there any additional context for your answers that you'd like to share?

Response: The **2** Water Management Districts (SFWMD & SWFWMD) provided additional context below.

District Name	District Type	Additional Context for Answers
Acme Improvement District	Drainage and/or Water Control	
Babcock Ranch Community Independent Special District	Infrastructure Development	No.
Coral Springs Improvement District	Drainage and/or Water Control	
Hillsborough County Aviation Authority	Airports / Air Navigation Facilities	
Reedy Creek Improvement District	Drainage and/or Water Control, Municipal-Type Services, and Improvements	N/A
Sarasota-Manatee Airport Authority	Airports / Air Navigation Facilities	No

Sebastian Inlet Tax District	Inland Navigation and Waterways	
South Florida Water Management District	Water Management	We will be happy to schedule an appointment to provide additional details, as needed.
Southwest Florida Water Management District	Water Management	The SWFWMD's Watershed Management Program has established modeling and floodplain requirements through its Guidelines and Specifications. These are based on FEMA requirements as well as local input. The program has over 100 completed studies that are utilized by our Regulatory Division as well as the public for watershed management decisions.