Watershed Planning Initiative

Phase II Kickoff Webinar

Bureau of Mitigation
Florida Division of Emergency Management
9/22/2021

Watershed Planning Initiative

The Florida Division of Emergency Management's (FDEM) Bureau of Mitigation prioritizes flood risk management as an integral part of its mission. Florida is particularly vulnerable to tropical systems, storm surge, and other heavy rain events that contribute to flood risk. These combined conditions will result in increased flood risk exposure throughout the state. According to the Florida Demographic Forecast, growth and development are projected to increase and Florida can expect a net immigration of 375,000 people over the next six years.

Our Mission

Working together to ensure that Florida is prepared to respond to emergencies, recover from them, and mitigate against their impacts.

Contact Info

Florida Division of Emergency Management
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Tallahassee, Florida 32399-2100

Watershed Planning Initiative

Florida residents can protect themselves against flood exposure by purchasing flood insurance through the National Flood Insurance Program (NFIP).

- The NFIP underwrites the vast majority of flood insurance in the United States, insuring more than five million homes.
- The national average annual cost of flood insurance is approximately $700. Costs can be higher in areas with high flood risk exposure.
- To counteract this, NFIP communities can participate in the Community Rating System (CRS), which discounts flood insurance premiums to reflect the reduced flood risk resulting from a community's efforts.

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Watershed Planning Initiative

- The CRS scores NFIP communities by awarding credits for implementing higher floodplain management standards. Communities are graded along ten classes. A CRS Class 10 ranking provides no flood insurance discount and a Class 1 ranking provides a 45% discount on flood insurance premiums for policyholders within that jurisdiction.
- Importantly, CRS Class 5 communities—of which there are 42 currently in Florida—cannot progress to a CRS Class 4 ranking without the creation and adoption of a Watershed Master Plan.
- Due to this CRS Class barrier, the Watershed Planning Initiative was created to ensure Florida communities progress to better CRS Class rankings, which in turn would reduce flood insurance costs for Florida residents and enhance mitigation practices in communities vulnerable to flood risk exposure.

CRS Class	Credit Points	Premium Reduction	
		In SFHA	Outside SFHA
1	4500+	45%	10%
2	4000 - 4499	40%	10%
3	3500 - 3999	35%	10%
4	3000 - 3499	30%	10%
5	2500 - 2999	25%	10%
6	2000 - 2499	20%	10%
7	1500 - 1999	15%	5%
8	1000 - 1499	10%	5%
9	500 - 999	5%	5%
10	0 - 499	0%	0%

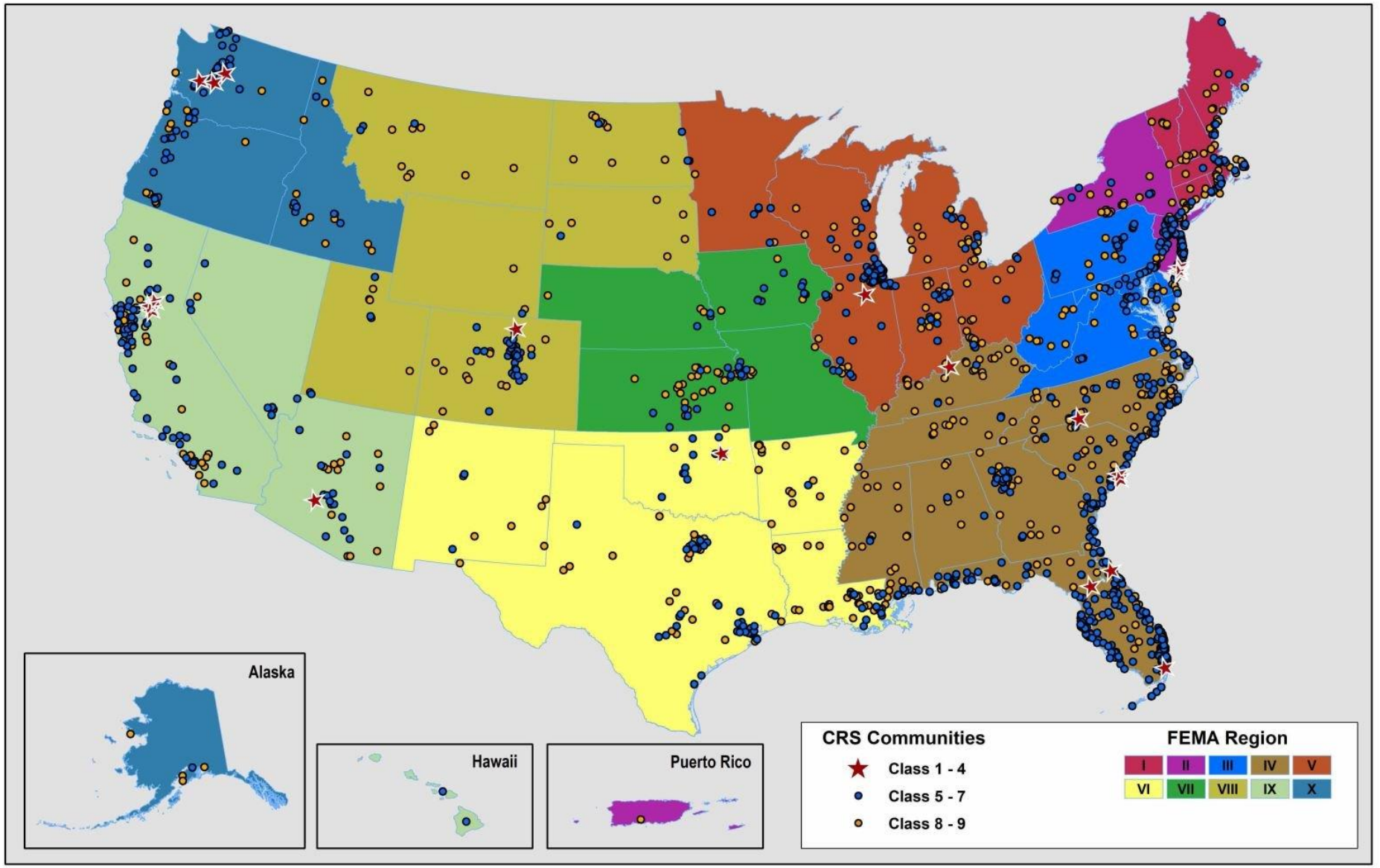
Preferred Risk Policies are not eligible for CRS premium discounts because they already have premiums lower than other policies. Preferred Risk Policies are only available in B, C and X zones for properties that are shown to have a minimal risk of flood damage.

Some minus-rated policies may not be eligible for CRS discounts.

Premium discounts are subject to change.

National Flood Insurance Program (NFIP)
Community Rating System (CRS)

October 2020



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NFIP/CRS

Watershed Planning Initiative

The project is funded through a $26.6 million grant under the Hazard Mitigation Grant Program (HMGP), as approved by FDEM and the Federal Emergency Management Agency (FEMA), with the purpose of creating standardized, cost-effective, and easily replicable Watershed Master Plans (WMP) throughout the state of Florida. According to NFIP (2019), there are 1.77 million flood insurance policies in Florida, and a 5% discount in communities with large concentrations of flood insurance policy holders would result in cumulative yearly savings far exceeding the cost of the grant award.

Watershed Master Plan for CRS

This process was designed specifically for the Watershed Master Plan component of CRS (452.b). The WMP element of CRS is described as follows:

- Your community can receive credits for implementing stormwater management regulations using a WMP.
- To qualify for credits under this element, your plan must model hydrologic behavior throughout the watershed, examine current and future conditions, and provide mitigation recommendations for reducing risk in the watershed.
- The modeling should consider the 100-year storm or evaluate sea level rise projections during multiple storm events.
- Considering a 100-year storm and/or sea level rise is a prerequisite for Class 4.
- You also get credit for evaluating future conditions, looking at more frequent and longer storms, evaluating sea level rise and climate change, or other factors.
- Your community must also adopt regulatory standards requiring stormwater management of runoff from a 10-year storm in addition to a 25-year flood event. Management of a 2-year storm is also recommended.
- Consult the January 2021 CRS Manual for a complete description of 452.b.

Watershed Master Plan for CRS

Element	Maximum Credits
WMP1 - If the watershed master plan meets all requirements (prerequisite for all of the following elements)	90
WMP2 - If the plan includes managing the runoff of all storms up to the 100 year storm	30
WMP3 - If the plan include providing onsite management of future stormwater, so that no new developments result in increases in peaks or volumes	55
WMP4 - If the plan includes managing runoff from all storms up to and including the 5 day event	35
WMP5 - If the plans identifies open space areas to be preserved for stormwater management purposes	30
WMP6 - If the plan recommends that protecting natural channels and your community adopts a corresponding ordinance	25
WMP7 - If the plan recommends channel improvement projects use natural approaches and your community adopts an ordinance stating this	25
WMP8 - If the plan identifies a funding source to implement the plan	25

The impact adjustment for this element involves dividing the area impacted by the watershed master plan by the area of the watershed.

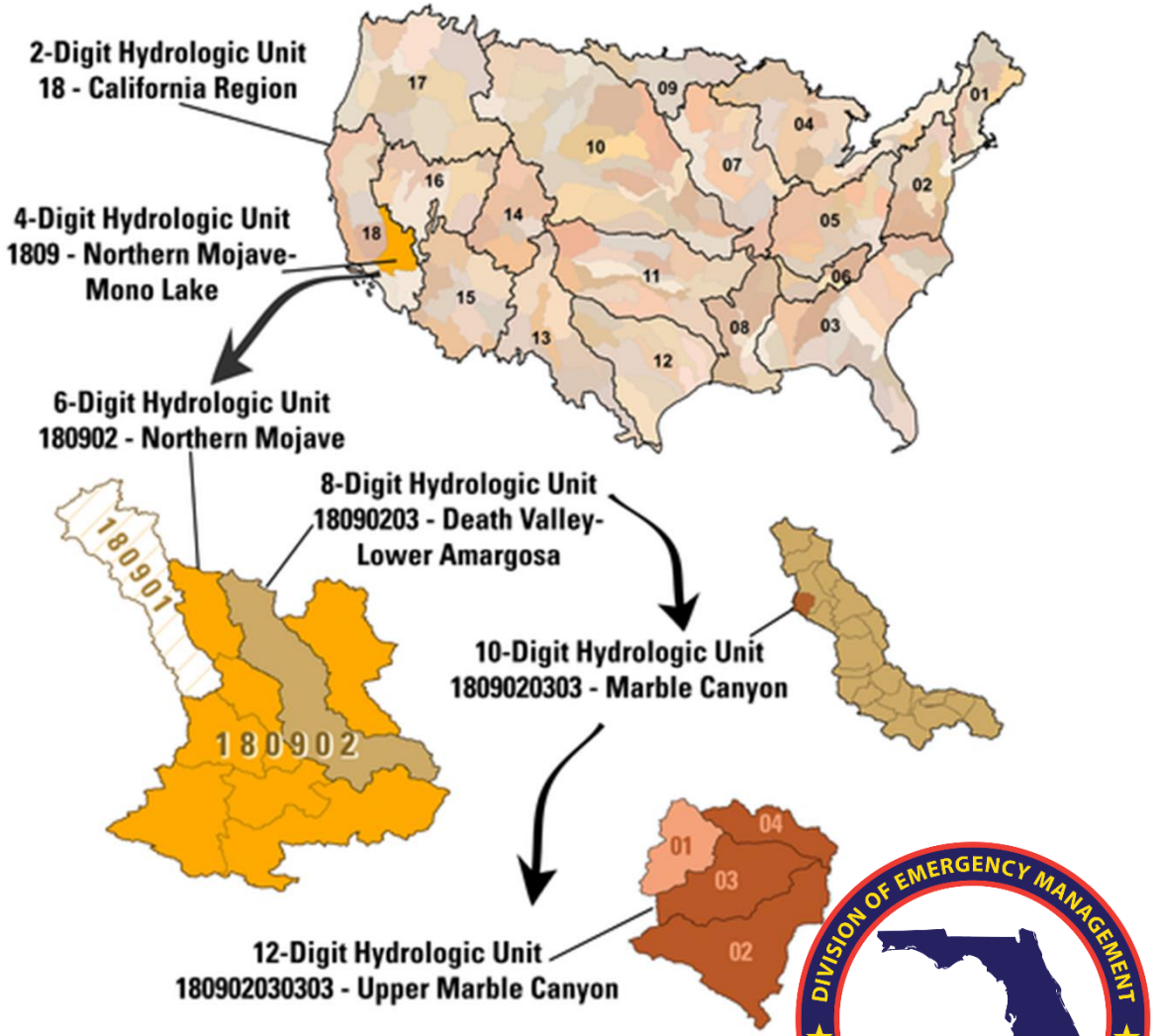
Phase 1 of the program was designed to, at minimum, satisfy the requirements of WMP 1 of the 452.b (WMP) element of CRS.

However, the documents and mapping methodologies developed in Phase 1 can produce WMPs that satisfy all elements of the 452.b element, depending on a community's natural characteristics, built environment, and overall flood mitigation goals.

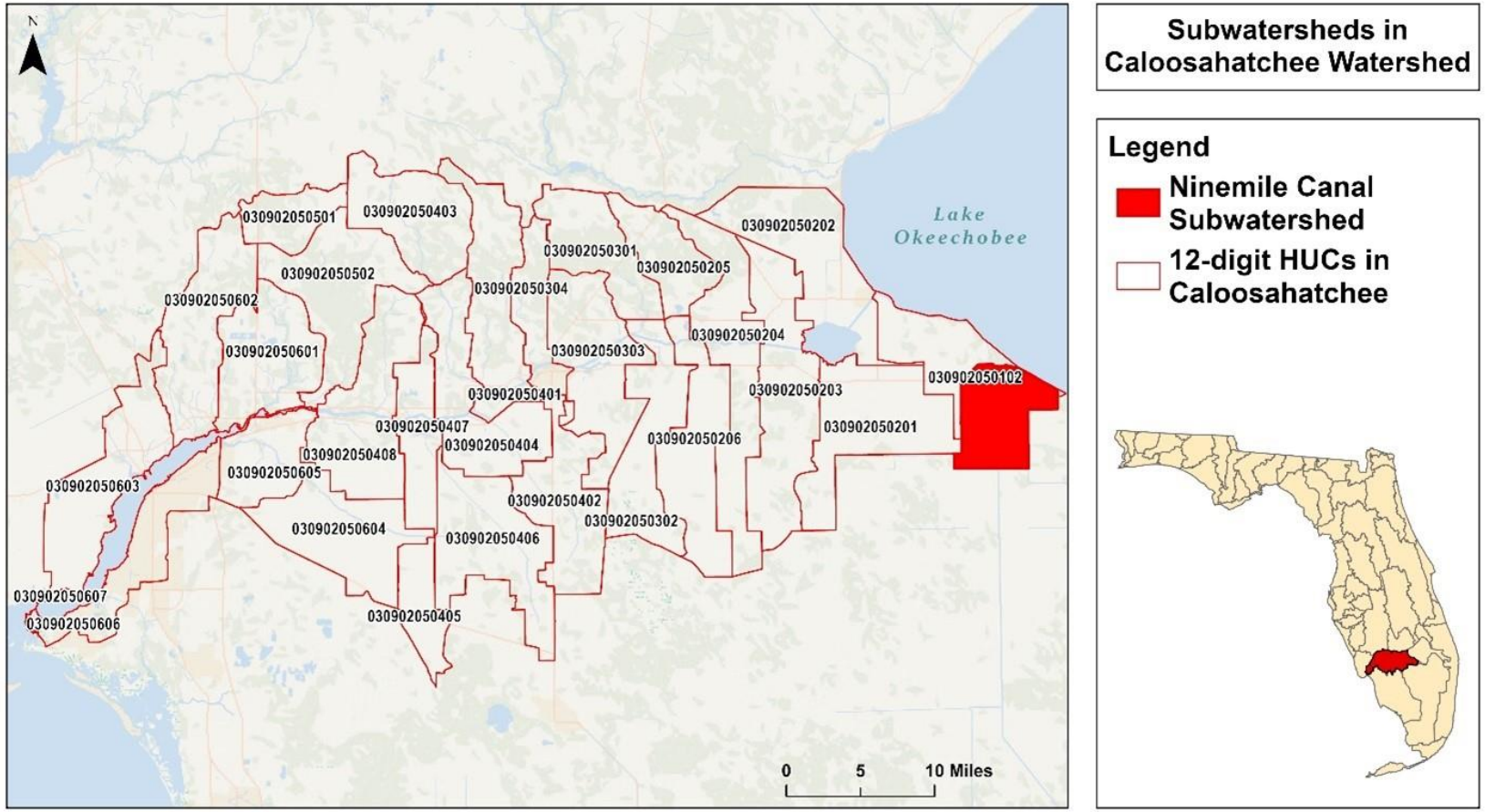
Watershed Master Plan – Scale

Although the plans are called Watershed Master Plans, it would be more appropriate to think of them as Sub Watershed Master Plans.

- Initially, it was thought that plans would be made at the 6 or 8-digit hydrological unit, making these documents more regional in scope.
- CRS officials clarified that what they are looking for is analysis at the 12-digit hydrological unit (also referred to as 6th level).
- A 12-digit hydrological unit varies in size from 15-65 sq miles.
- A government's WMP would involve all 12-digit sub watershed basins that lie within their jurisdiction.

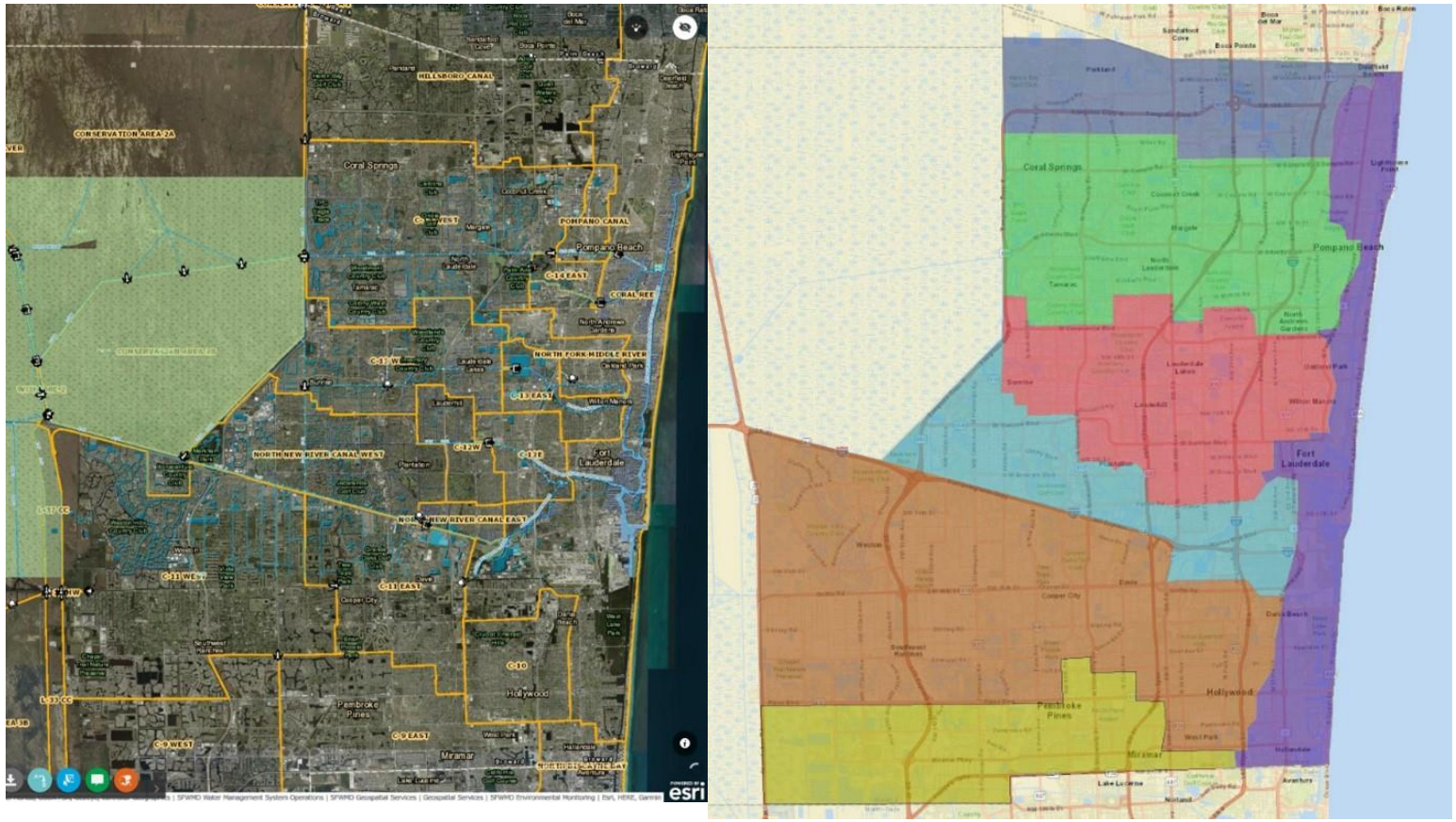


Watershed Master Plan – Scale



Location of the Caloosahatchee East/Clewiston (Ninemile Canal) HUC 030902050102 subwatershed in relation to the nearby subwatersheds, the greater Caloosahatchee watershed and the Everglades basin.

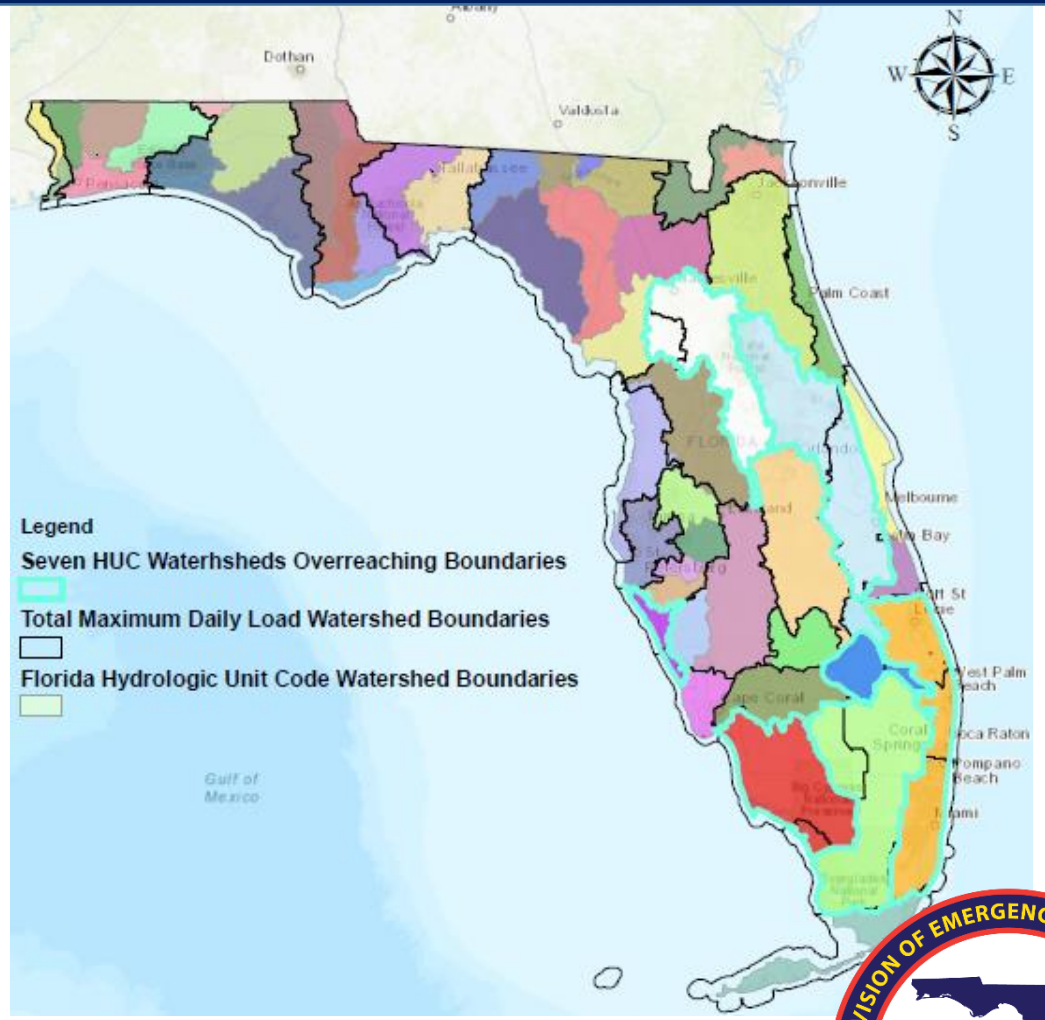
Watershed Master Plan – Scale



Watershed/USGS Subwatershed map of Broward County, FL (Rojas, 2020)

Phase 1 – Goals

From September 2019 – June 2021 FDEM conducted a pilot program—procuring the services of Florida Atlantic University (FAU) — that consisted of research, the creation of a framework and guidance documents for a consistent statewide approach to WMP development or updating, and the production of two complete WMPs to be used as an example for future WMPs developed by participating jurisdictions.



The 2020 HUC-TMDL boundary map

Phase 1 – Outcomes

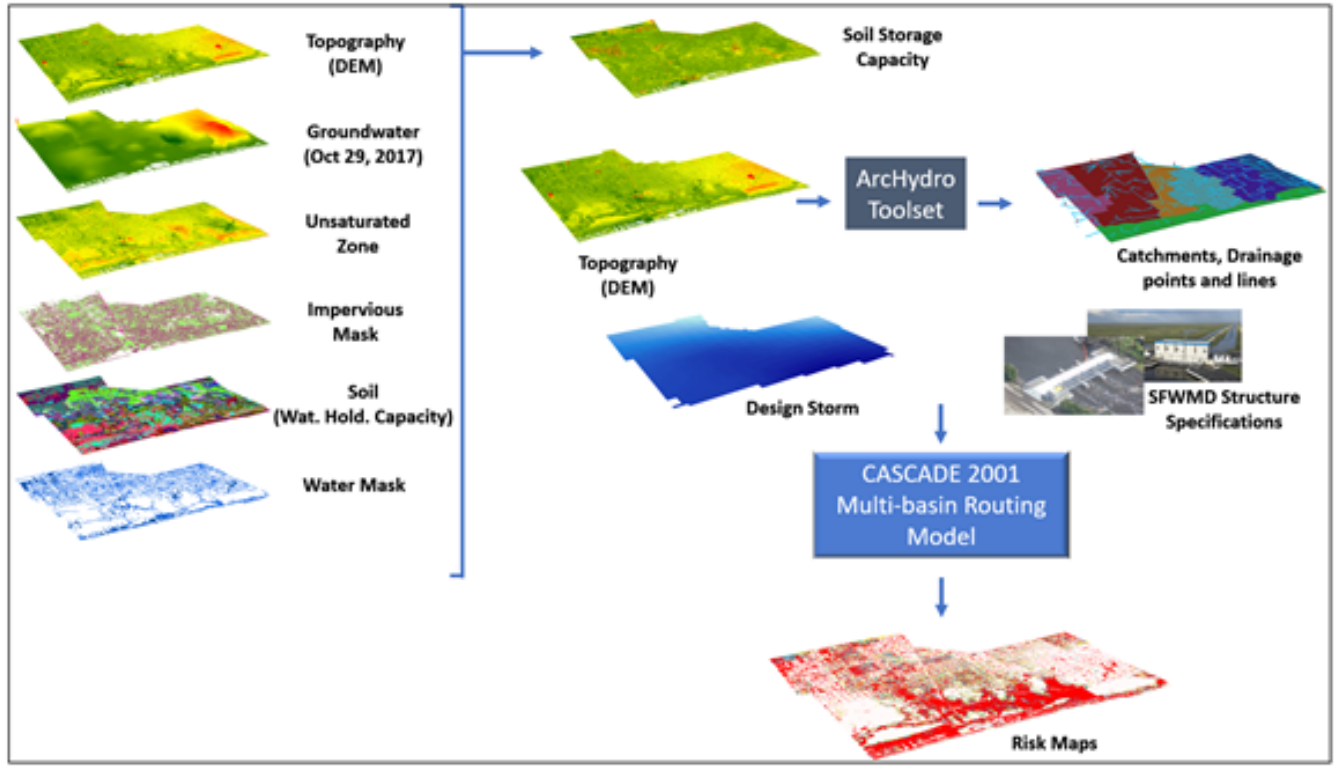
Task 1 of the program cataloged and analyzed all available data pertaining to WMP in Florida and identified data gaps within the available data. A report of FAU's findings was submitted to FDEM along with all available data.

Task 4 produced a WMP statewide catalog that included a list of watershed, flood, and floodplain management related documents produced by Florida communities and counties. This task also identified WMP best practices examples by cataloging the best examples of WMPs within the United States.

Name	Sources	Date Created or Date Range	Source Data Format
Rainfall	NOAA Atlas 14 Precipitation Frequency Estimates https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_gis.html	1840-2013	Raster image format (downloaded and processed)
Soil	USDA Soil SSURGO gSSURGO Database: https://sdmdataaccess.nrcs.usda.gov/	Released in 2019	Raster image format (downloaded and processed)
Landcover	USGS 30m resolution, derived from Landsat satellites https://www.mrlc.gov/data/nlcd-2016-land-cover-conus	Created for 2016	Raster image format (downloaded and processed)
Waterbodies	NHD24Area_dec07, and nhd24waterbody_dec17, both from National Hydrography Dataset created originally by USGS https://www.usgs.gov/core-science-systems/ngp/national-hydrography/national-hydrography-dataset	Created in 2007	Converted to binary raster image format (downloaded and processed)
Impervious Surface	USGS 30m resolution, derived from Landsat satellites https://www.mrlc.gov/data/nlcd-2016-land-cover-conus	Created for 2016	Converted to binary raster image format (downloaded and processed)
LiDAR Elevations	From USGS, NOAA, Counties and Cities of FL https://viewer.nationalmap.gov/basic/	2000-2019	Raster im (downl

Phase 1 – Outcomes

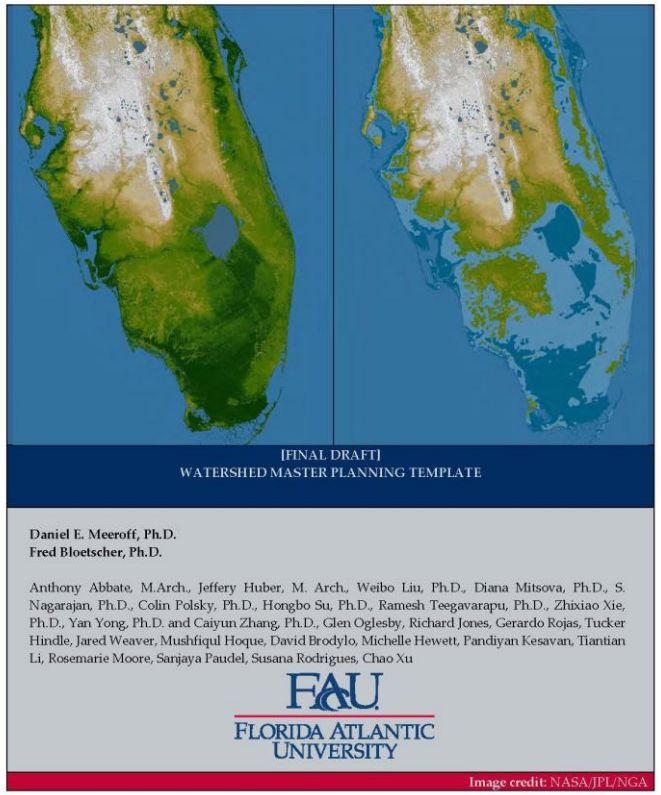
Task 2 provided a WMP development strategy that identified entities that may be responsible for WMP development. Task 2 also verified the flood modelling process (CASCADE) that will be used in Phase 2 of the program, and 10-year and 100-year preliminary flood maps were created for each of the 29 4-digit HUC basins in Florida. All data produced is available upon request.



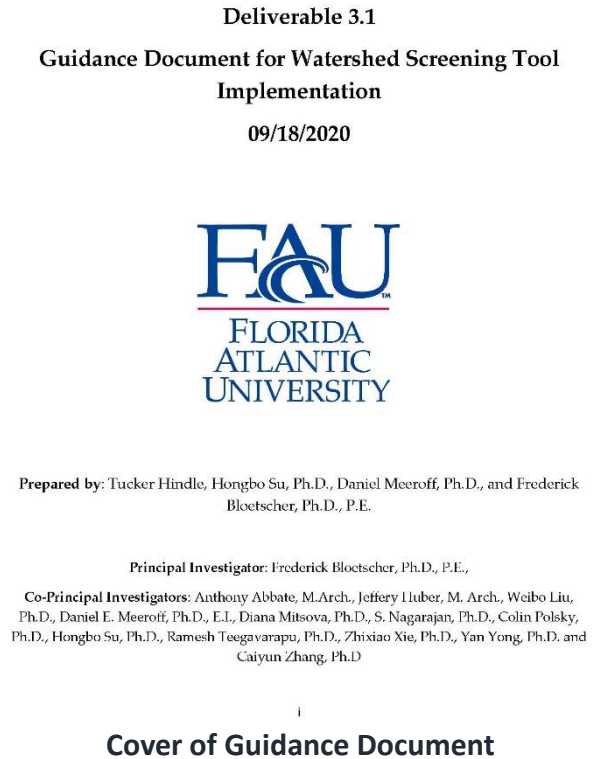
Screening tool methodology for creating flood risk discovery maps

Phase 1 – Outcomes

Task 3 produced an instructional manual for the CASCADE screening tool produced in Task 2 that outlined how to implement the screening tool methodology and flood risk scoring system for local communities, and produced a WMP template document that standardizes WMP documents statewide and streamlines the creation of WMP documents for communities.



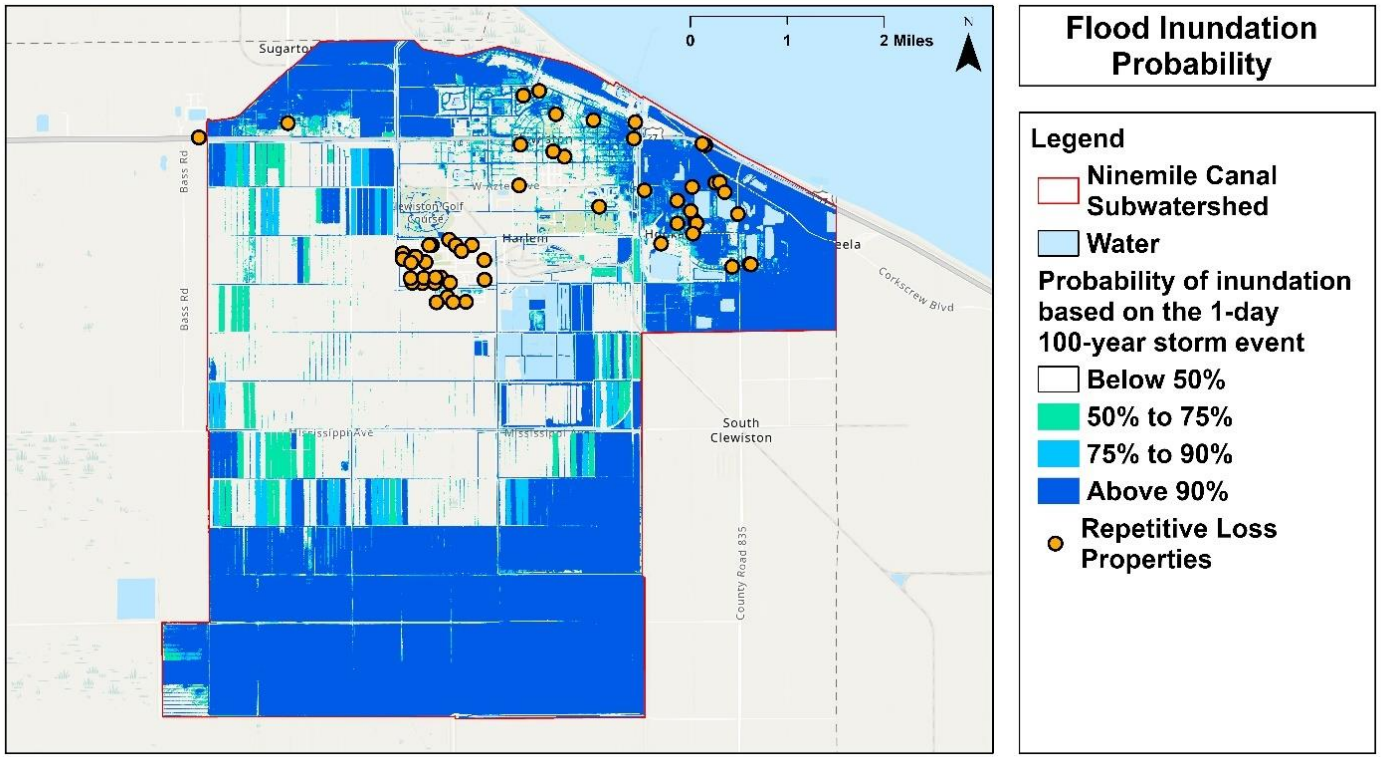
Cover of Watershed Master Plan Template



Cover of Guidance Document

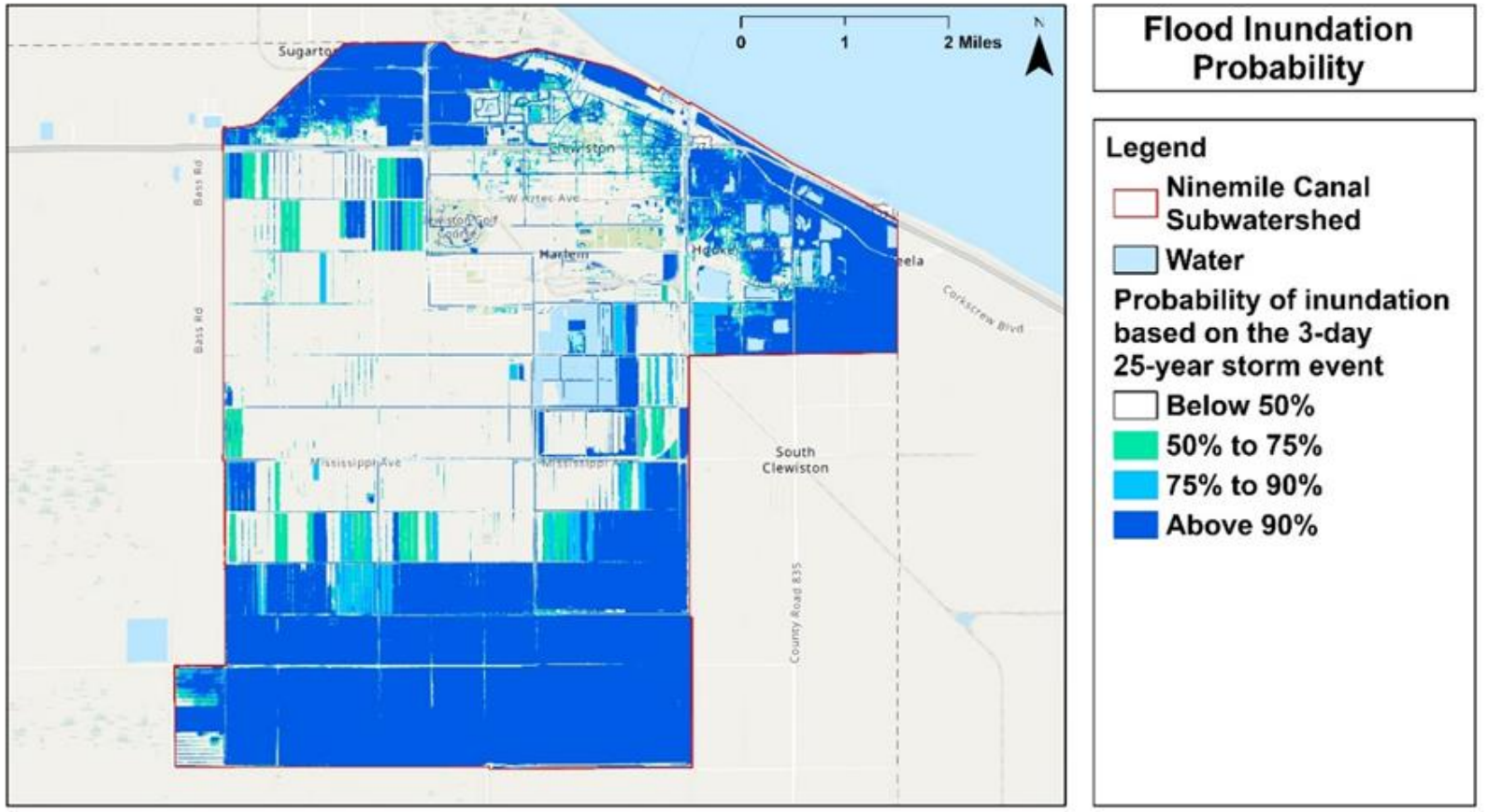
Phase 1 – Outcomes

Task 5 of the program used the WMP template to develop two WMPs; one for a selected coastal community and one for an inland community. These plans were reviewed by CRS officials in Florida, who reviewed their applicability to NFIP and CRS, and confirmed that the WMP plans would satisfy the Watershed Master Plan requirements for CRS. All documents produced in Phase 1 will be available online on FAU and FDEM's website, and all data produced in Phase 1 will be made publicly available.



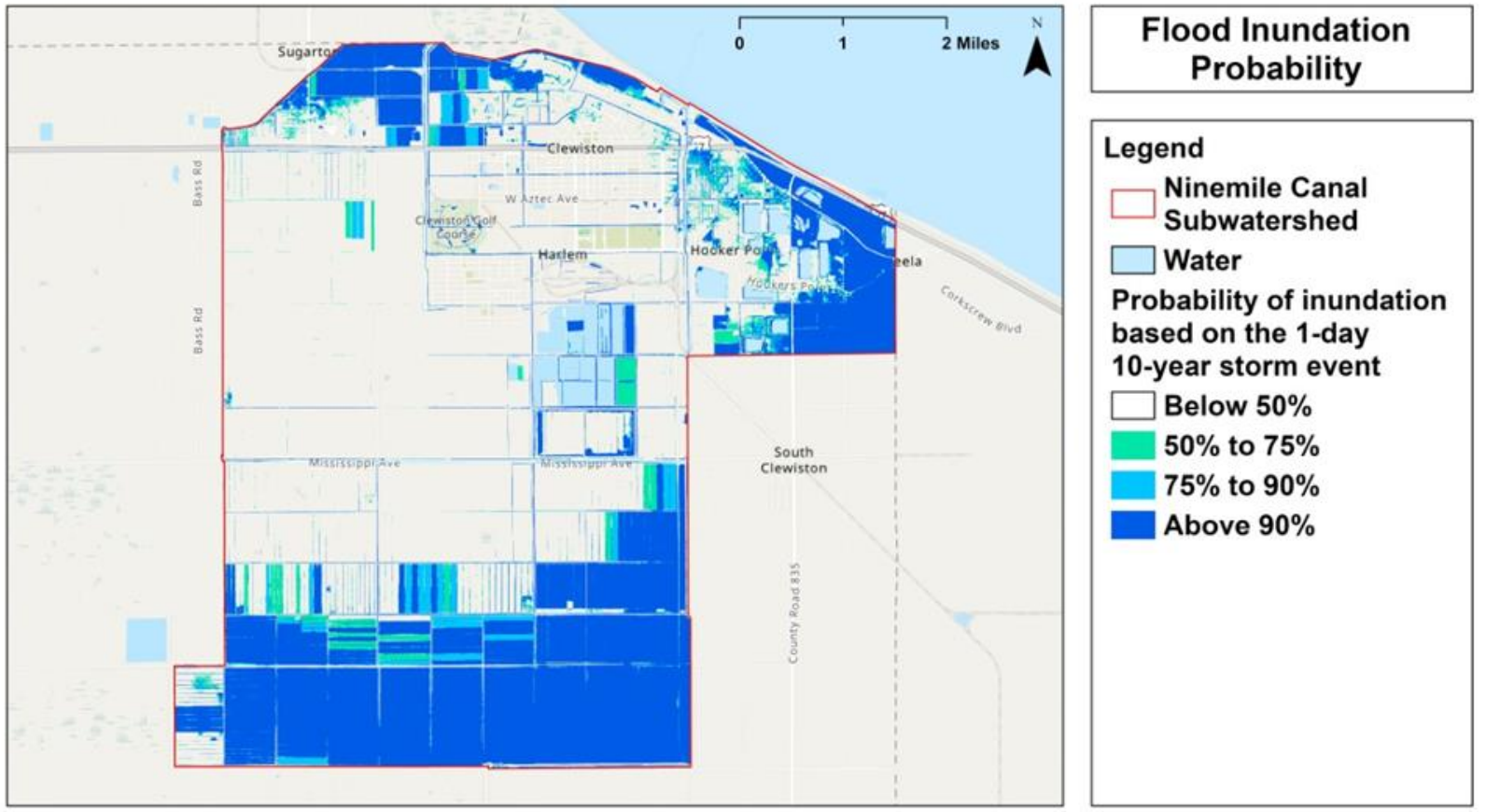
Probability of flood risk map for the study area for the 1-day, 100-year flood event, as processed by FAU.

Phase 1 – Outcomes



General locations of flood risk in the study area, based on the 3-day, 25-year storm, as processed by FAU.

Phase 1 – Outcomes



Flood risk map based on the 1-day, 10-year storm event for the study area, as processed by FAU

Watershed Master Planning Initiative

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CENTER FOR WATER RESILIENCY AND RISK REDUCTION
Florida Atlantic University

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THE FLORIDA DIVISION OF EMERGENCY MANAGEMENT

DIVISION OF EMERGENCY MANAGEMENT
FDEM
OFFICE OF THE GOVERNOR

Center for Water Resiliency and Risk Reduction

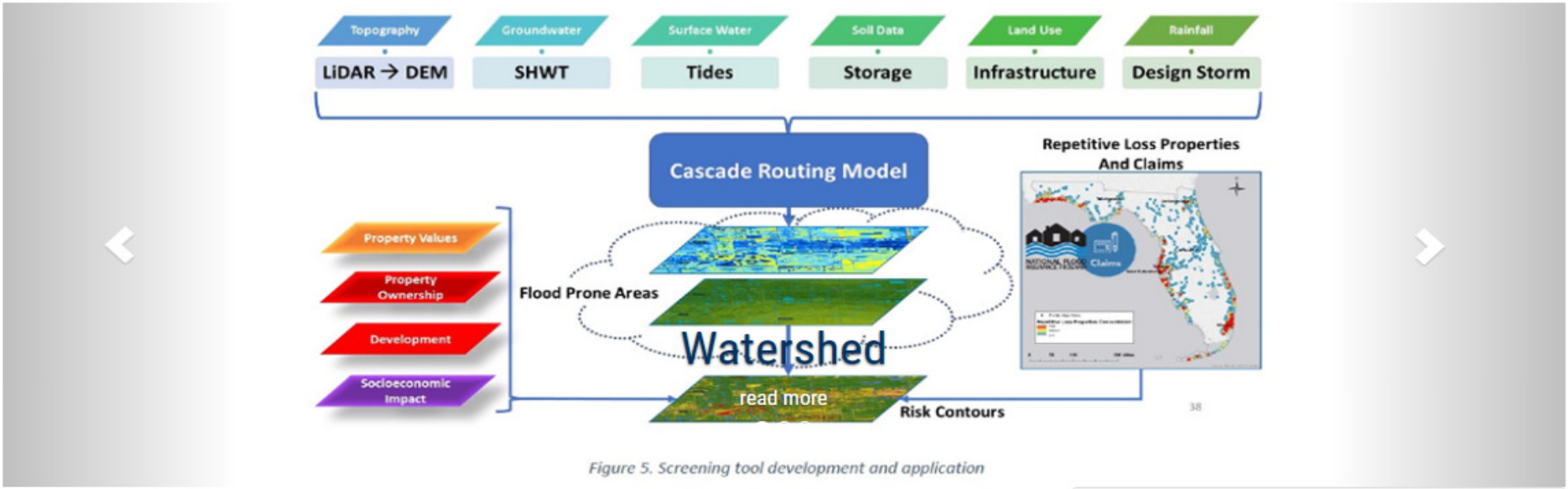


Figure 5. Screening tool development and application

The Center for Water Resiliency and Risk Reduction (CWR3) was established to help local communities develop mitigation strategies in response to the devastating effects of flooding on human safety and home properties. In addition to serving as a clearinghouse for watershed master planning tools and policies, the Center helps communities participate in the National Flood Insurance Program (NFIP) Community Rating System (CRS)... read more

EVENTS All Events

Peer Review Team Meeting - October 21, Via Zoom MORE INFO

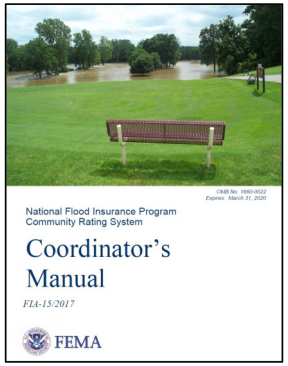
Phase I

- The Florida Division of Emergency Management (DEM)'s Bureau of Mitigation for Hazard Mitigation Grant Program (HMGP) DR-4337-004-P
- State goal is to lower Florida flood insurance premiums
  - Task 1: Catalog and Analyze Current Watershed Data Availability and Gaps
  - Task 2: Draft Watershed Master Plan (WMP) Development Strategy
  - Task 3: Watershed Master Plan Template Development
    - Production of two complete WMPs to be used as examples for future WMPs

In Phase 1, FAU CWR3 (with UNF and UCF) created a framework and guidance for a consistent statewide approach to WMP development

What is a Watershed Master Plan?

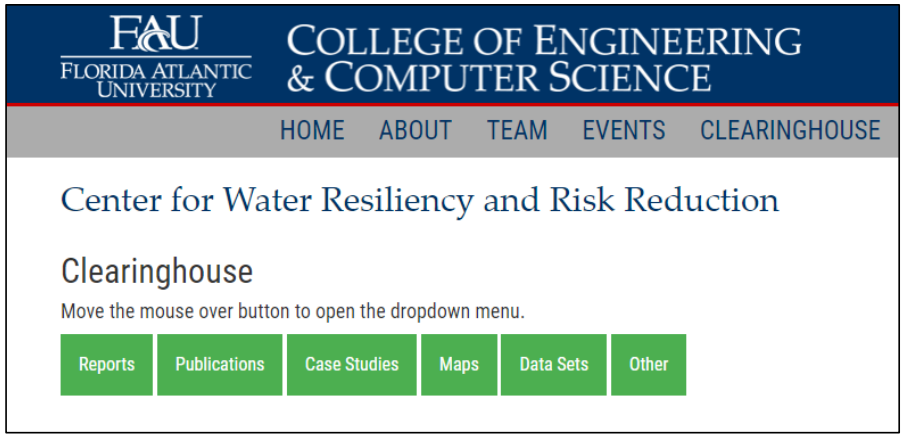
452b Requirements (315 points)



1	2	3	4	5	6	7	8
Evaluate future conditions, assess the impacts of sea level rise and climate change, stds, update >5 yr • 90 points	Evaluate watershed response from various design storms • 10, 25, 100 yr events • 30 points	Implement regulatory standards to control new development peak flows & volumes • 55 points	Manage runoff from all storms including the 5-d event • 35 points	Identify wetlands and other natural areas • 30 points	Protect natural channels • 25 points	Specific mitigation projects to ensure future resiliency (green infrastructure) • 25 points	Dedicated funding source to implement the mitigation strategies recommended by the plan • 25 points

FAU CWR3 obtained data to create a comprehensive statewide flood vulnerability and sea level rise analysis for all basins

- Topographic data
- Groundwater/surface water/tides/sea level rise
- Soils data
- Land use/land cover
- Precipitation records
- Open space/impervious areas/waterbodies/wetlands
- Locations of stormwater infrastructure
- Natural resources
- Demographics



FAU CWR3 performed a gap analysis to determine data needs

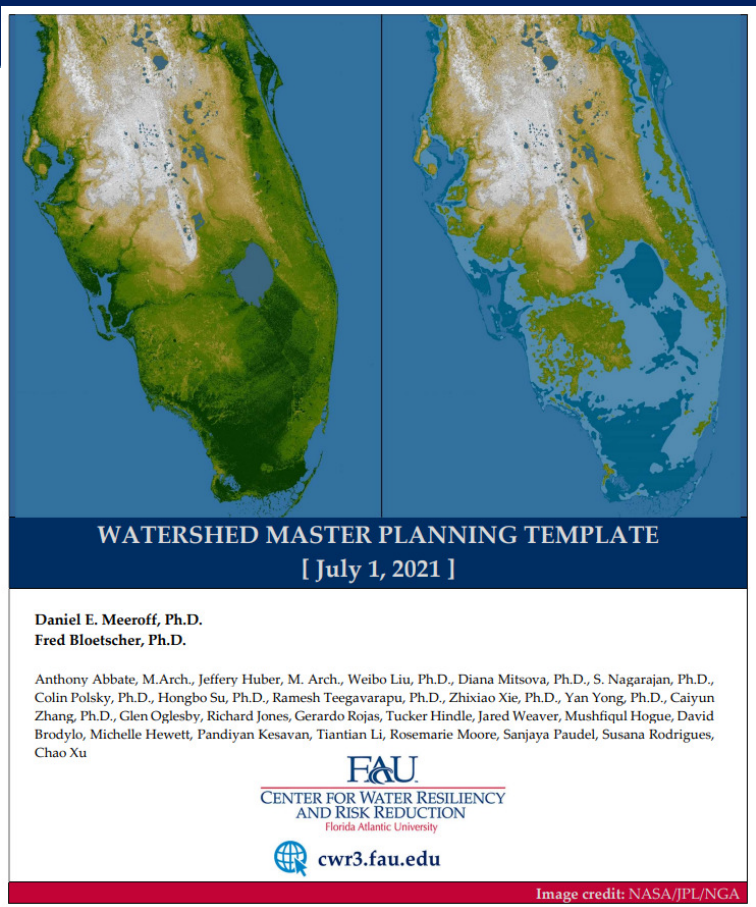
FAU CWR3 posted 4 TB of curated data sets on our clearinghouse website (cwr3.fau.edu)

FAU CWR3 developed a methodology for open source hydrologic modeling to estimate probability of inundation taking into account:

- King Tides
- Future land use changes
- Sea level rise
- Various design storms (2-yr, 5-yr, 25-yr, 100-yr, etc.)

FAU CWR3 developed a methodology for prioritizing implementation of mitigation strategies based on:

- Department of Revenue codes at the parcel level
- Tiered prioritization
- Potential economic damage
- Repetitive loss properties



- **Watershed Characterization**
  - Identify natural areas, wetlands, protect natural channels
- **Policy Framework**
  - Peak flows and volumes
- **Assessment of Vulnerable Areas**
  - Future land use
  - Sea level rise
  - King tides
  - 10 yr, 25 yr, and 100 yr design storms
  - Runoff from 5 d events
- **Inventory of Potential Solutions**
  - Green infrastructure
- **Action Plan**
  - Dedicated funding sources
  - Specific mitigation projects prioritization

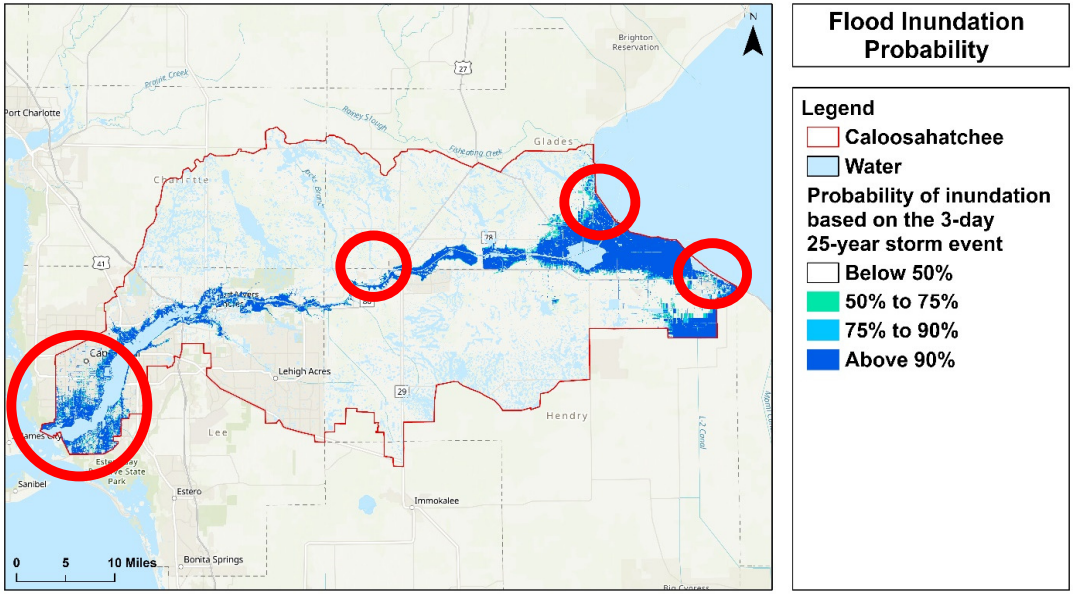
Policy Framework

- Existing regulations
  - Federal, state, regional, local
- Storm events
- Peak flows and volumes
- Minimum flows and levels
- Existing plans
- Dedicated funding sources
- Model ordinance

- Existing plans include:
  - Water quality management reports
  - Flood insurance studies
  - Floodplain management plans
  - Comprehensive plans
  - Unified land development regulations
  - MS4
  - Local mitigation strategies
  - Intergovernmental cooperative agreements
  - Stormwater pollution prevention plans
  - Post-disaster redevelopment plans
  - Climate adaption action plans
  - Stormwater management plans
  - Others

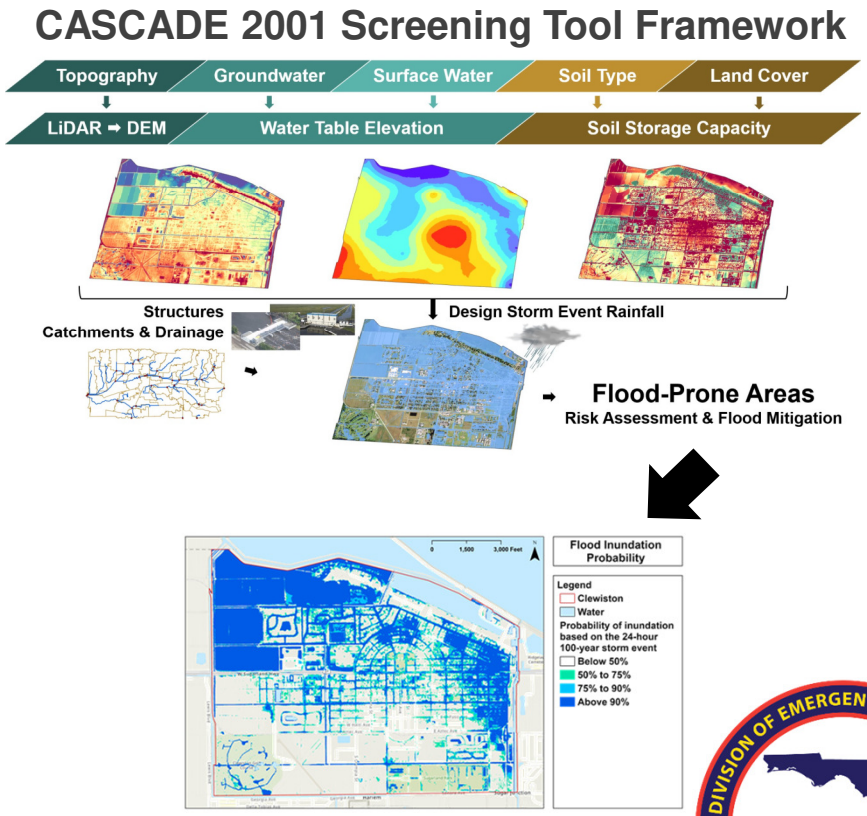
Assessment of Vulnerable Areas

- **Historical & Existing Challenges**
  - Existing Management Efforts
  - Critical Target Areas Identification
  - Potential Preservation Areas
- **Selection Process of Management Strategies**
  - Alternative Analysis
- **Future Challenges of Sea Level Rise and Climate Change**

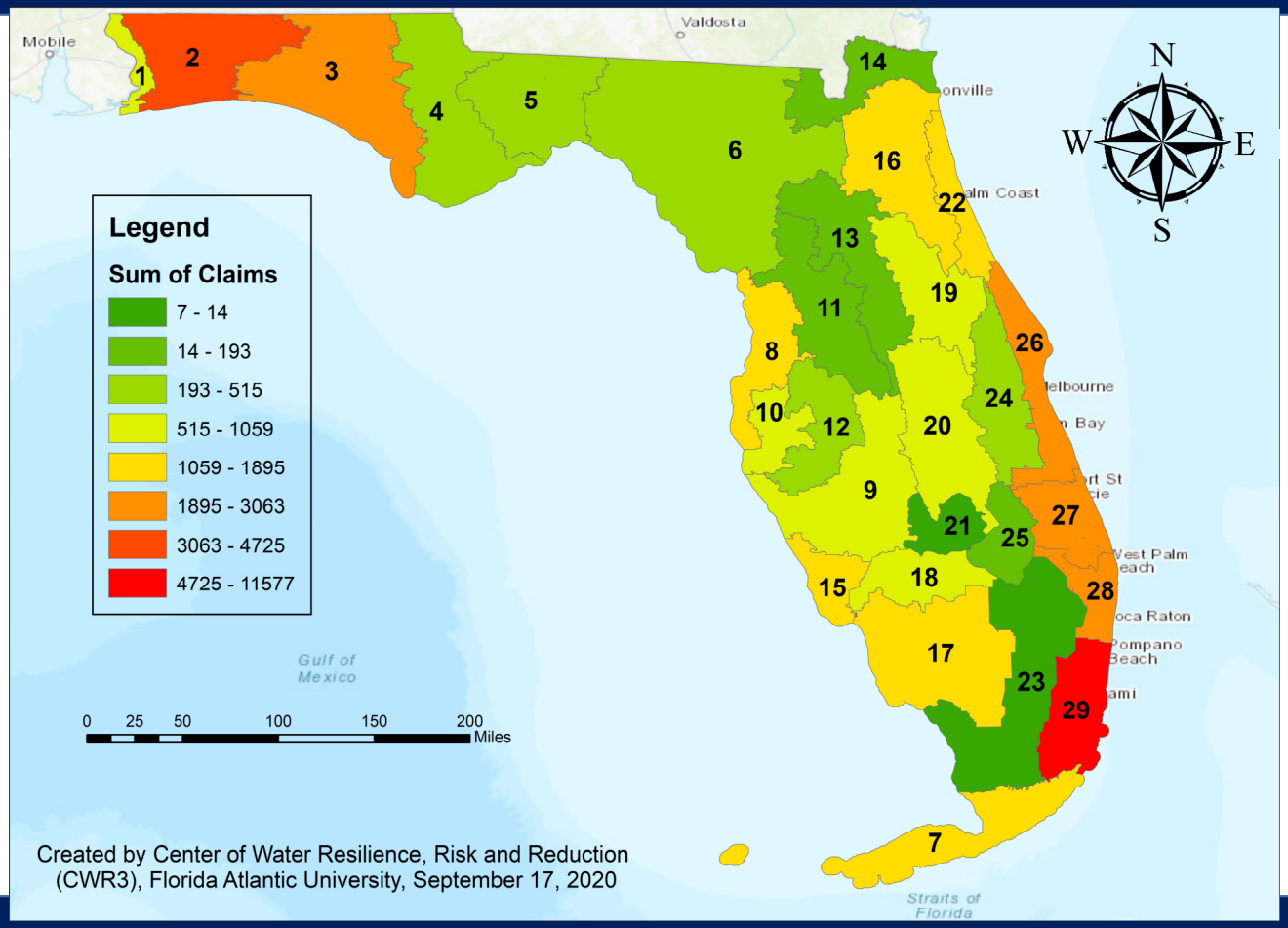


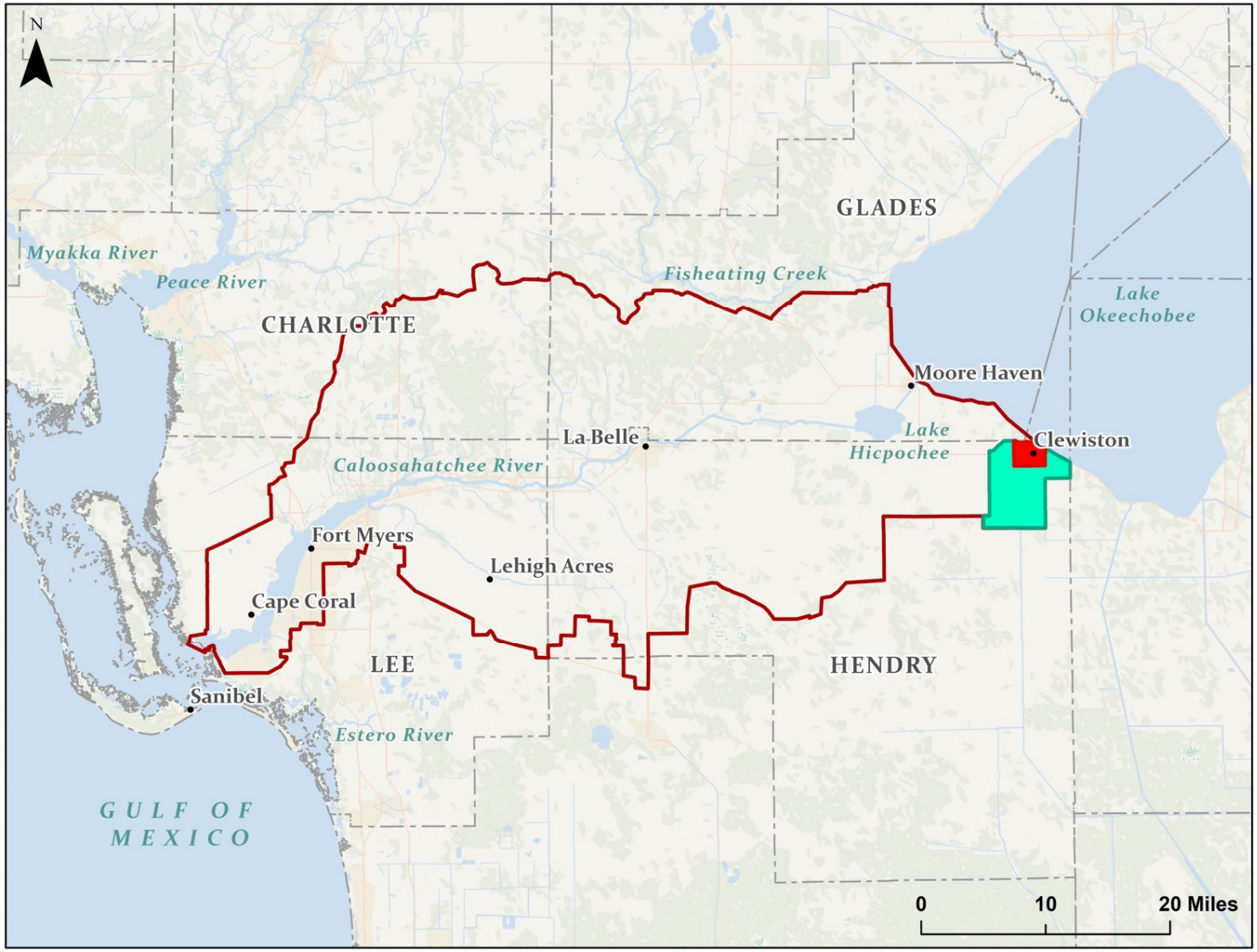
Modeling Approach

- **Flood Risk Screening Tool**
  - GIS-based approach to modeling based predicting how low-lying areas may be affected from
    1. Direct surface flooding
    2. Rising groundwater levels
    3. Inability to drain



Start With Watershed Boundaries



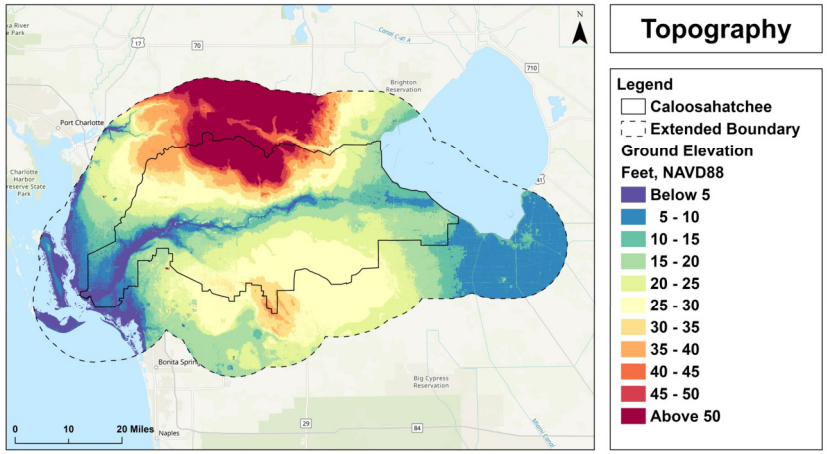


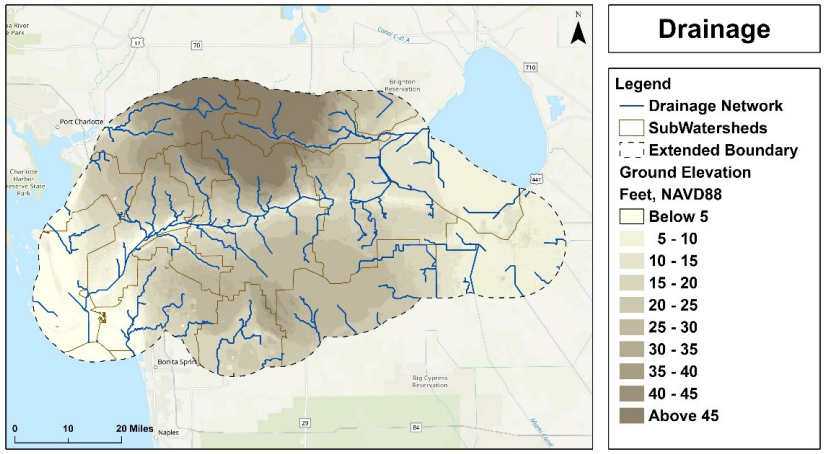
Study Area

Legend

- City of Clewiston, FL
- Ninemile Canal Subwatershed
- Caloosahatchee Watershed

Watershed Characterization

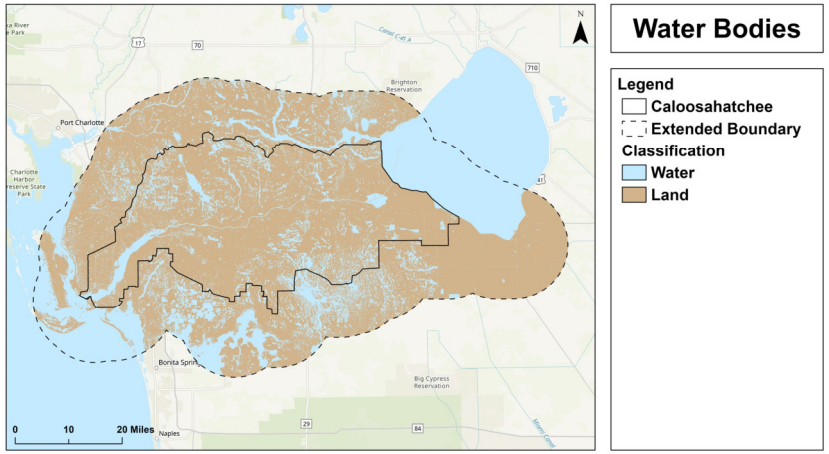


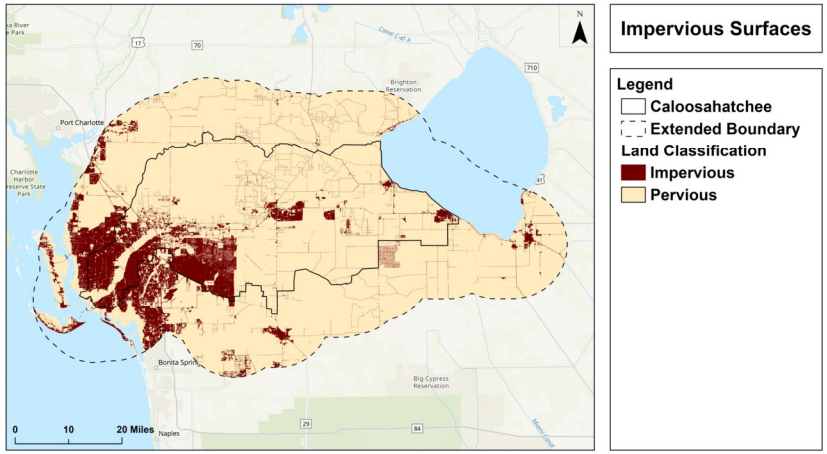


- **LiDAR-derived Digital Elevation Model**
  - USGS 3D Elevation Program
  - Horizontal: 3 meters
  - Vertical: 22 ~ 30 centimeters

- **Locate the Main Drainage Networks**
  - Locate inflows and outflows
  - Structures, catchments, drainage

Watershed Characterization





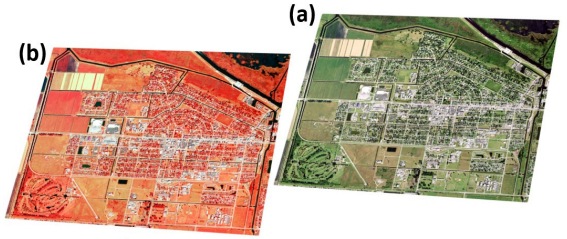
- **Locate Surface Water Features**
  - USGS National Hydrography Dataset
  - Includes isolated and disconnected waterbodies, wetlands, and frequently inundated lands
  - Horizontal: 10 meters

- **Locate Impervious Surfaces**
  - National Land Cover Database (2016)
  - Includes roads and urban areas
  - Horizontal: 30 meters

Impervious Surface Interpretation

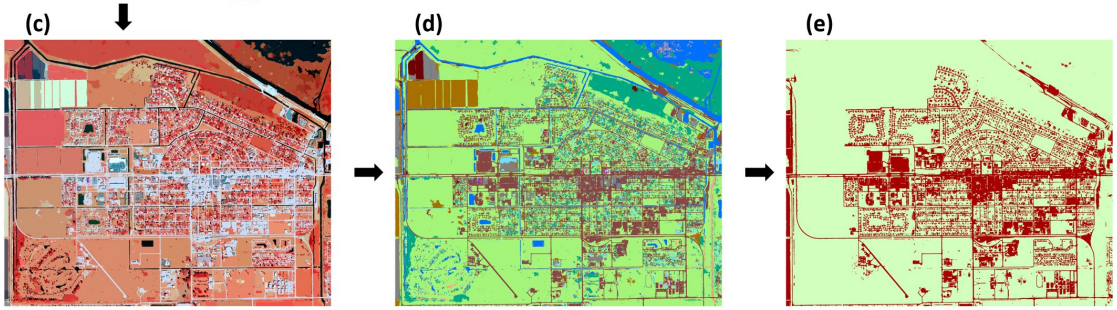
- National Land Cover Database's 30-m impervious layer of roads and urban areas has limitations at the subwatershed level
- So, we can utilize image classification of land cover as an alternative method using the method of Viswambharan (2020)

Classification of Impervious Surfaces



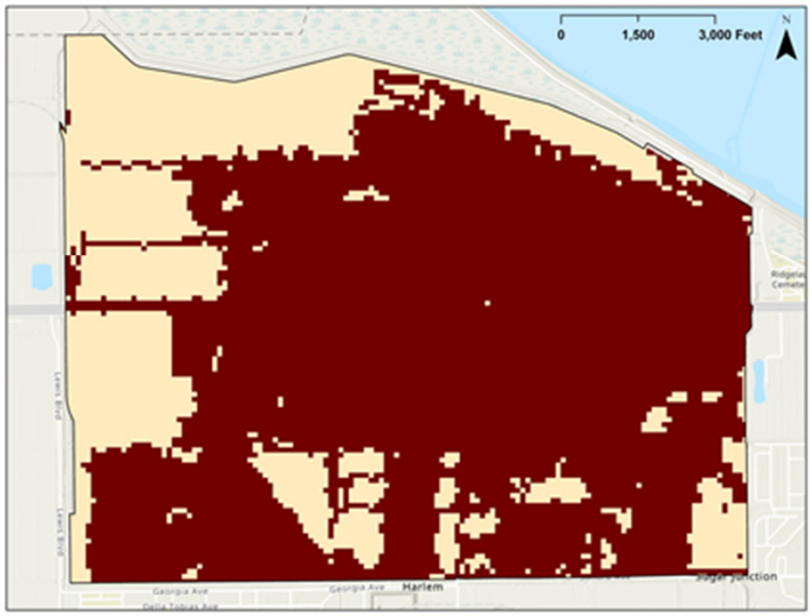
(a) USDA 2017 NAIP 4-band 8 Bit Imagery (1m Cell Size)
(b) Extract Spectral Bands
(c) Segment the Image
(d) Classify the Image
- Create Training Samples
- Train Classifier (Support Vector Machine)

(e) Reclassify as Pervious/Impervious



Land Use/Land Cover

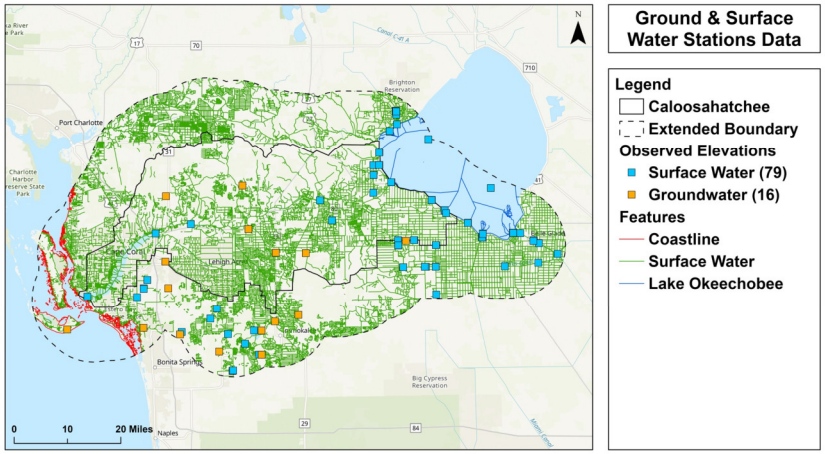
Comparison of 30-meter vs. 1-meter resolution impervious surfaces

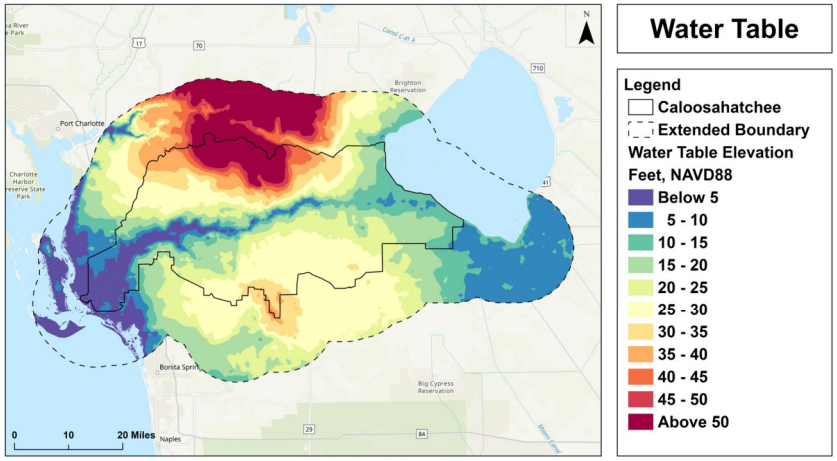


Land Classification

- Impervious
- Pervious

Groundwater Surface Development



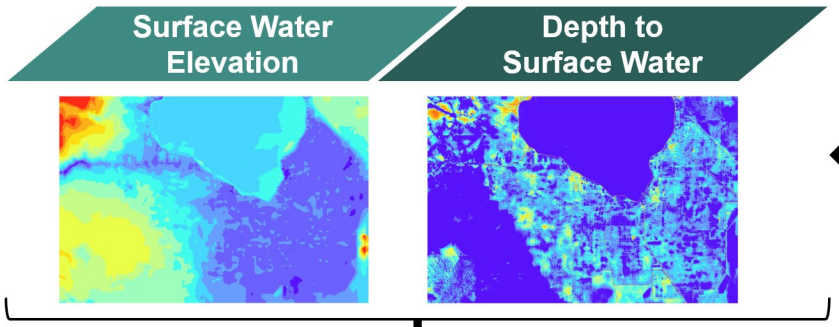


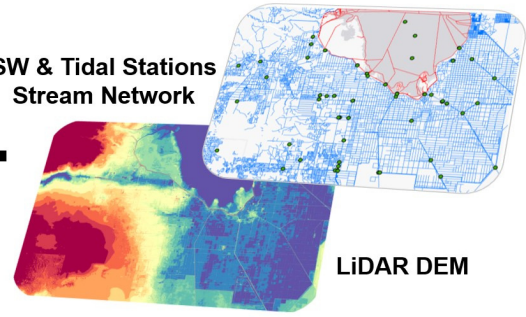
- **Station-Based Water Level Observations**
  - SFWMD's DBHYDRO database
  - 79 surface water, 16 groundwater, and 1 tidal stations in 99th percentile on 9/27/2013

- **Derive a 99th Percentile GW Surface**
  - Created using a multiple linear regression method from Zhang et al., 2020

Multiple Linear Regression Approach

- Collected station-based observation data
- Applied geostatistical interpolation methods from limited observations and LiDAR-derived DEM data
  - Ordinary kriging
  - Multiple linear regression (Zhang et al. 2020)



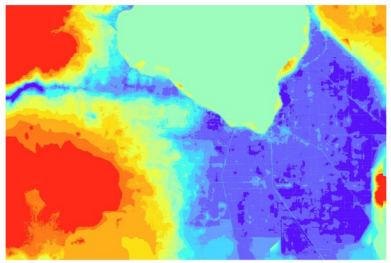


Multiple Linear Regression:

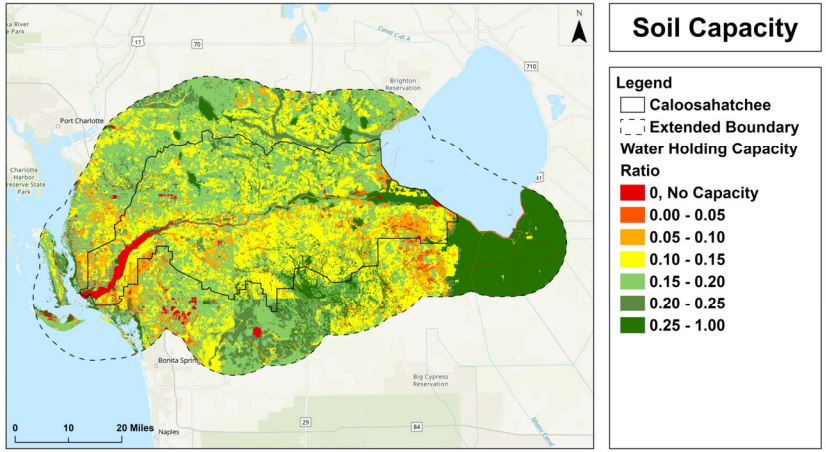
$$\text{Water Table Elevation} = \beta_1 \times \text{Surface Water Elevation} + \beta_2 \times \text{Depth to Surface Water} + \varepsilon$$

Station ID	Observed GW Elevation	Surface Water Elevation	Depth to Surface Water
C-1075	29.54 ft	26.98 ft	2.20 ft
HE-860	25.13 ft	23.55 ft	0.03 ft
HE-1069	18.24 ft	15.83 ft	2.39 ft
HE-1077	27.65 ft	26.57 ft	0.05 ft

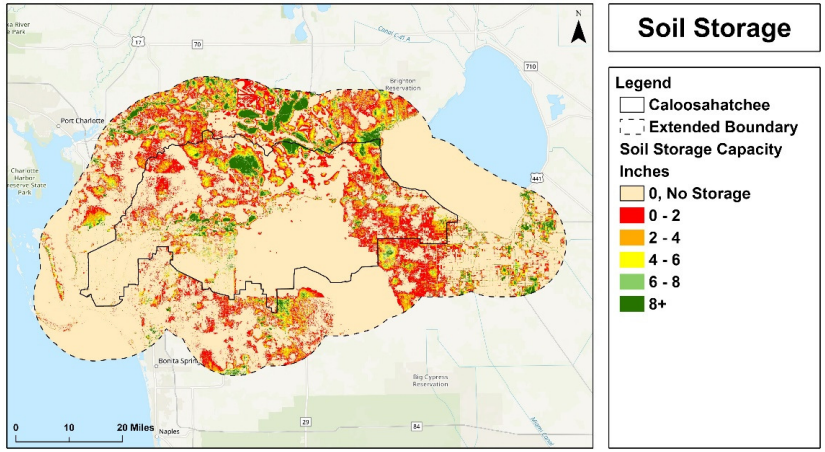
Water Table Elevation



Watershed Characterization

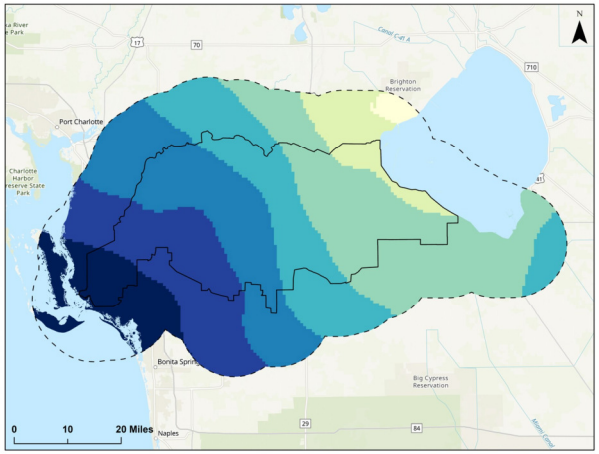


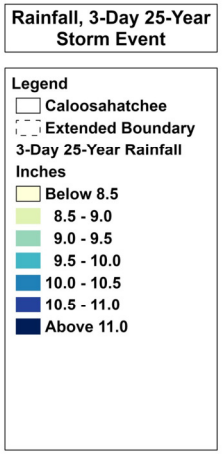
- **Soil Water Holding Capacity**
  - Computed by further processing of USDA's gridded SSURGO dataset
  - Horizontal: 10 meters

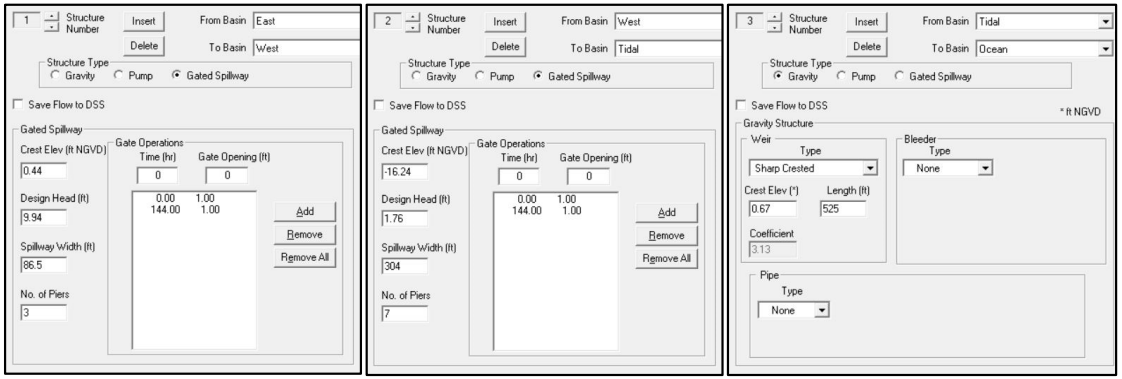


- **Zonal Average Soil Storage**
  - Combine the unsaturated depth, soil water holding capacity, impervious surfaces, and waterbodies

Screening Tool







- **Precipitation Records**
  - NOAA Atlas 14 dataset
  - Based on a design storm event (e.g., 3-day duration and 25-year return frequency)
  - Multiple design storm events are available

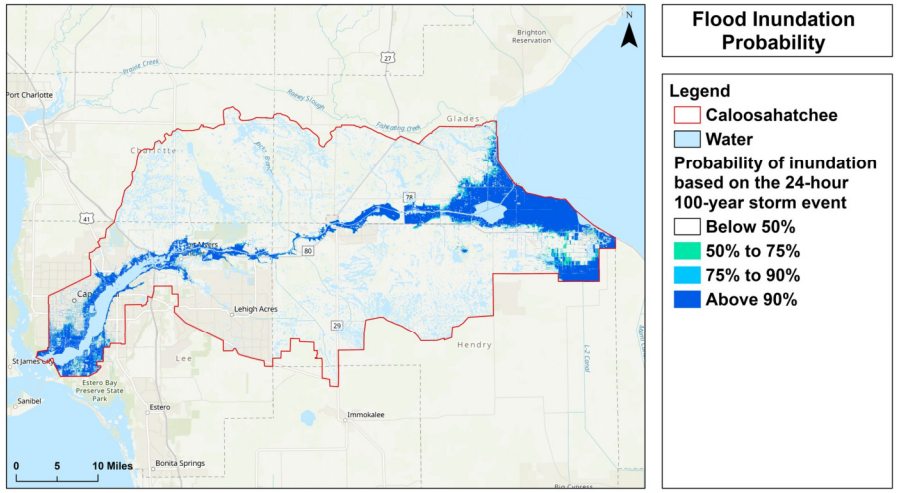
- **Model Inputs**
  - Structures, water levels, soil storage
  - Rainfall event
  - Etc.

Probabilistic Inundation Mapping

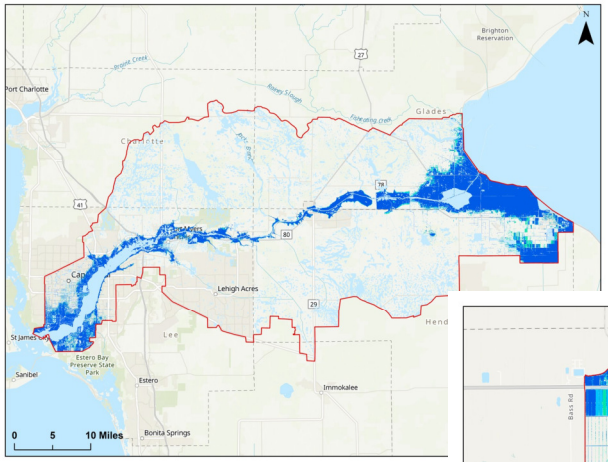
- **Spatiotemporal output of floodwater levels mapped to GIS:**
  - Probabilistic: reflects the degree of certainty in predictions and improves value of information

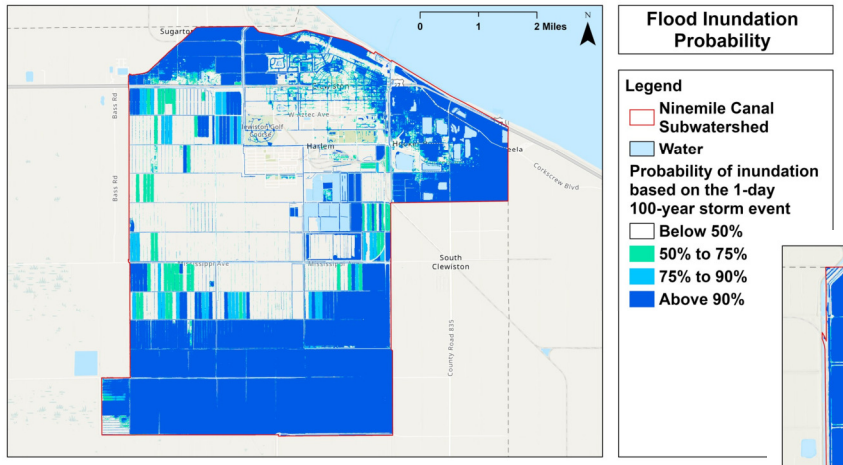
$$\text{Z-score} = \frac{\text{CASCADE Inundation} - \text{LiDAR DEM Elevation}}{0.46}$$

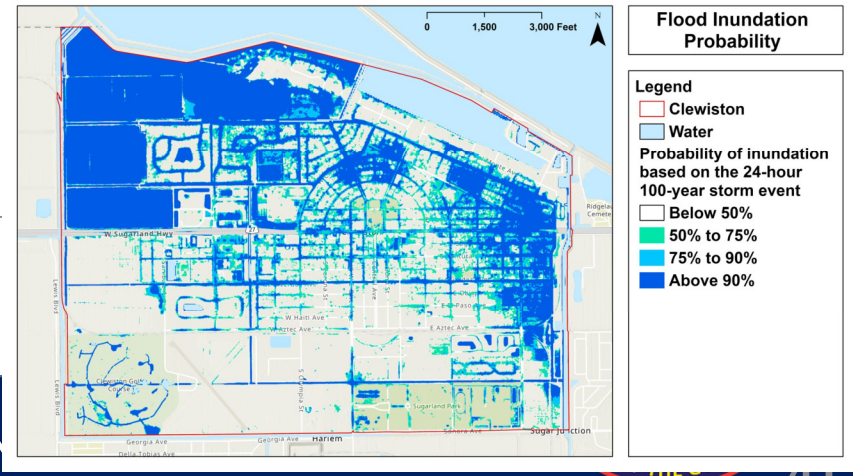
Risk of Flooding	Range of Z-scores	Color
Below 50%	< 0	
50% to 75%	0 to 0.675	
75% to 90%	0.675 to 1.282	
Above 90%	> 1.282	



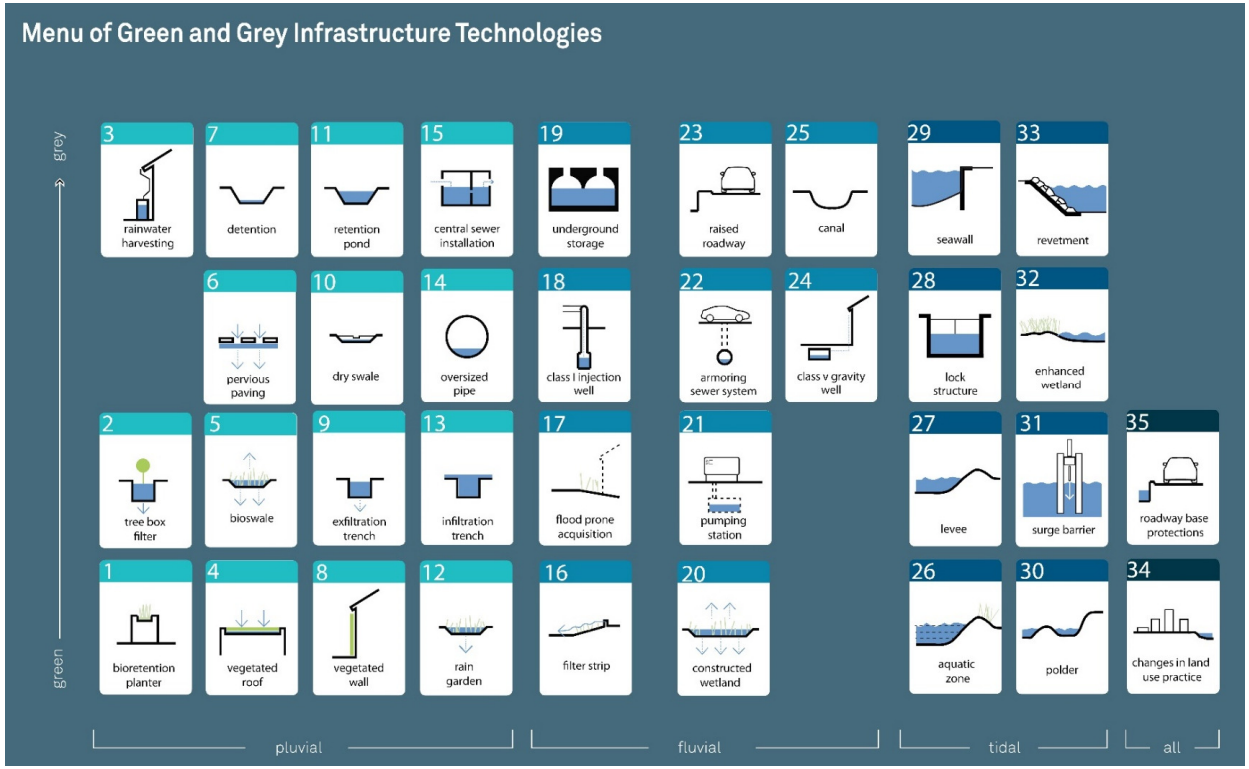
Drill-Down to the Local Level







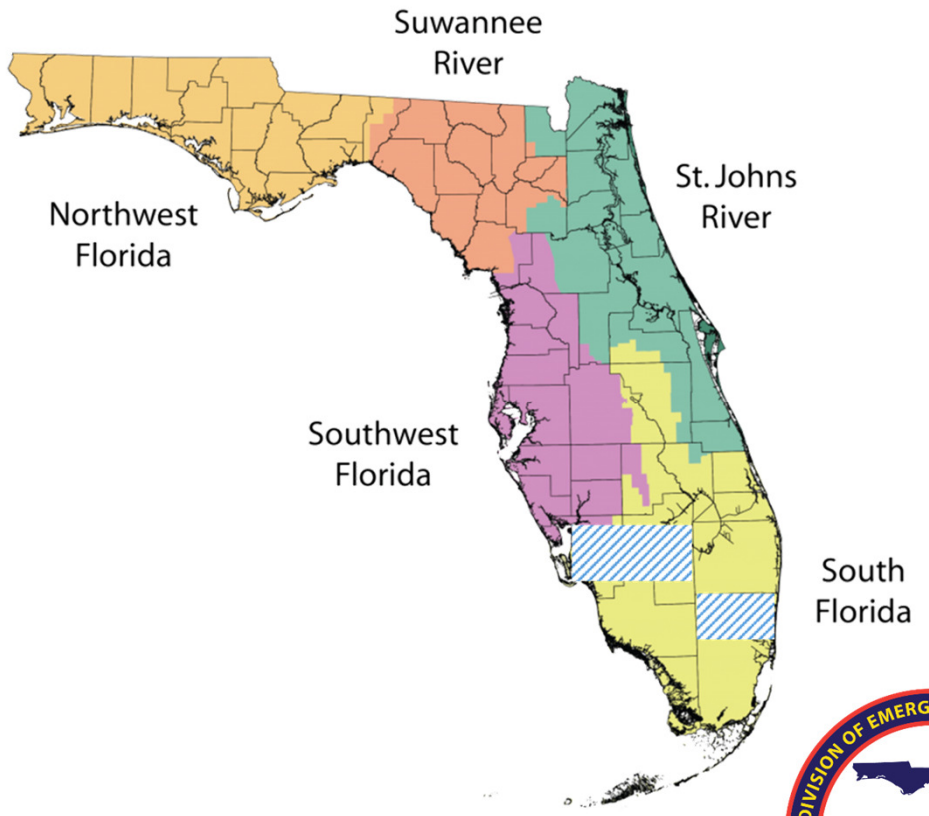
Inventory of Potential Solutions



- Toolbox with Design Guidelines
- Prioritization of Risk
- Capital Improvement & Financing Plan

Two Prototype WMPs (CRS452b)

- Ninemile Canal
  - HUC 12 digit: 030902050102
  - Clewiston
- South New River Canal-East
  - HUC 12 digit: 030902061205
  - Davie/Dania Beach



CWR3 Team

Civil, Environmental & Geomatics Engineering	Geosciences	Architecture & Urban Planning	Partners
• Bloetscher • Meeroff • Nagarajan • Su • Teegavarapu • Yong • 2 Ph.D. students • 4 MS students • 5 BS students	• Liu • Polsky • Xie • Zhang • 3 Ph.D. students • 2 OPS	• Abbate • Huber • Mitsova • 2 MS students • 2 BS students	• FDEM • WMDs • UCF • UNF

Timeline

Task	Start Time	Completion Date	Total Months
Catalog and Analyze Current Watershed Data	August 2019	February 2020	7
Assemble Stakeholder Group	April 2020	September 2020	6
Develop Screening Tool Methodology	August 2019	February 2020	7
Apply Screening Tool to All Florida Watersheds	October 2019	June 2020	9
Develop Prioritization Tools	November 2020	March 2021	5
Develop Guidance Document	February 2020	April 2020	3
Develop WMP Template	January 2020	December 2020	12
Develop WMP Prototypes	July 2020	October 2020	4
Report Review	January 2021	March 2021	3

FAU CWR3 Capabilities

Data Clearinghouse

- Curated datasets
- Watershed management planning tools and policies
- Outreach/public education materials
- Incentives to reduce future losses
- Web hosting for maps and datasets
- Mitigation strategies/Green infrastructure

Sophisticated modeling tools for assessing flood risk and providing green solutions for communities

FAU
CENTER FOR WATER RESILIENCY AND RISK REDUCTION
Florida Atlantic University

cwr3.fau.edu

Technical assistance for CRS activities

- Lowering premiums by increasing the number of insured and improving CRS scores
- Assisting governments to craft appropriate policies for mitigation/prevention
- Developing innovative flood management solutions
- Delivering Watershed Master Plans for communities

Phase 2

FEMA

If you don't have the proper staff or time,

FAU CWR3 is available to partner with you

to deliver a CRS creditable WMP in a timely fashion

CWR3@eng.fau.edu

FAU
CENTER FOR WATER RESILIENCY AND RISK REDUCTION
Florida Atlantic University

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thank
you

Phase 2 Rollout

With the Phase 1 process completed, FDEM will be moving forward with Phase 2 of the program

- For Phase 2, FDEM would request proposals from Florida communities for funding to produce a WMP.
- After FDEM enters into an agreement with an individual community to produce a WMP, FDEM would require participating communities to submit their completed WMP to CRS for approval, receive CRS points, and adopt the WMP as an annex to their LMS.
- Receiving CRS points is critical, as it results in increased ratings for their community and, subsequently, flood insurance premium discounts for community residents.

Phase 2 Rollout

Eligible Applicants:

- Local Governments or Communities
- County Governments
- Water Management Districts
- Intergovernmental Partnerships
  - Regional Planning Council
  - Regional Water Management Authority

An applicant must be participating in NFIP and not be on probation, suspended or withdrawn from the NFIP, and must be part of the CRS Program.

Phase 2 Rollout

Applicant Prioritization:

Applicants will be prioritized based on the criteria detailed below:

- Potential Flood Insurance Savings
  - See next slide for flood insurance savings calculation
- Flood Risk Exposure
  - Example: Specific Coastal communities may have a more immediate need for a WMP
- CRS Ranking of Communities
  - Priority will be given to communities with a CRS Rank of 5
- Other Local Community Conditions

Phase 2 Rollout

Potential Flood Insurance Savings – Methodology Breakdown Example – 2019

Community Name	County	Current CRS Class	Current CRS Discount	Policies	Class 4 - Total Savings/ Policy	Class 4 - Total Savings/ Community	Total Savings Between Class 5 & Class 4
Alachua County	Alachua	5	$ 172,921.00	1,543	$ 134.00	$ 206,106.00	$ 33,185.00
Bay County	Bay	5	$ 1,187,989.00	14,484	$ 96.00	$ 1,385,436.00	$ 197,447.00
Bonita Springs	Lee	5	$ 2,079,552.00	12,193	$ 204.00	$ 2,491,178.00	$ 411,626.00
Cape Coral	Lee	5	$ 7,273,190.00	33,487	$ 261.00	$ 8,726,221.00	$ 1,453,031.00
Charlotte County	Charlotte	5	$ 6,757,375.00	27,933	$ 290.00	$ 8,107,707.00	$ 1,350,332.00
Citrus County	Citrus	5	$ 1,262,612.00	4,442	$ 340.00	$ 1,511,932.00	$ 249,320.00
Collier County	Collier	5	$ 8,150,177.00	71,150	$ 136.00	$ 9,682,012.00	$ 1,531,835.00
Cutler Bay	Miami-Dade	5	$ 1,495,280.00	7,223	$ 248.00	$ 1,793,225.00	$ 297,945.00
Daytona Beach Shores	Volusia	5	$ 117,014.00	5,737	$ 20.00	$ 117,280.00	$ 266.00
Dunedin	Pinellas	5	$ 1,076,935.00	4,076	$ 317.00	$ 1,291,254.00	$ 214,319.00
Hernando County	Hernando	5	$ 884,399.00	3,674	$ 288.00	$ 1,058,289.00	$ 173,890.00

Phase 2 Rollout

Estimate of Funding Per Sub Applicant: $150,000 - $300,000

Federal Share: 75% Non-federal Share: 25%

- The funding amount was derived from Phase 1 activities. With the available data, template files, and guidance documents produced by FAU in Phase 1, the minimum cost to produce an individual plan for a small community was determined to be $150,000. For larger communities analyzing multiple sub watersheds, costs may be higher to complete a WMP.
- Funding will be determined after the State reviews all submitted Proposals.
- Currently there are approximately 120 Florida communities with a CRS Rank of 5 (42 as of October 2020) or a CRS Rank of 6 (79 as of October 2020).

Phase 2 Rollout

Estimate Individual Project Length: 12 – 18 months

Individual timelines for communities will vary, but all communities should be able to complete a Watershed Master Plan within 12 – 18 months, and the Period Of Performance for each sub applicant will last for 12 – 18 months.

Periods of Performance could vary depending on different approval processes:

- CRS Plan Amendment
- CRS Resubmission
- Compliance with LMS
- Coordination with Water Management Districts

Phase 2 – Proposals

Requirements for Proposals:

- **Applicant Information**
  - Title of Project
  - Organization
  - Applicant Type
  - County
  - Federal Tax I.D. Number
  - DUNS ID
  - FIPS Code
  - NFIP Community Identification Number
  - Point of Contact
  - Application Preparer
  - Authorized Applicant Agent
  - Verify LMS Compliance

Phase 2 – Proposals

Requirements for Proposals:

- **Project Description**
  - Type of Hazard that will be mitigated (flood)
  - Type of Project – Other – Watershed Master Plan
  - Number of persons protected by project – (**Fill in)**
  - List “total impacted area” to be protected by project
  - Level of protection and magnitude of event – 10, 25, and 100 year storm event
  - Select items project may impact – wetland, floodplain, water quality, coastal zone, etc.
  - Describe the existing problems of your community
  - Describe the types of protection the proposed project will provide
  - Scope of Work (what you plan to do) – Example: WMP 1 only or WMP1 –WMP 9
  - Describe any other on-going or proposed projects in the area

Phase 2 – Proposals

Requirements for Proposals:

- **Project Location**
  - Provide map of the area being modeled (area covered by sub watershed basins)
  - Provide a city or county scale map
  - Flood Insurance Rate Map of community

- **Budget/Costs**

Phase 2 – Proposals

Requirements for Proposals:

- **Grant Specific Information**
  - CRS Information
    - Current CRS rank
    - Number of CRS points to date by element
    - CRS renewal date
    - CRS site visit timeline
    - Potential CRS points gained from WMP development
  - Flood Insurance Information
    - Number of flood insurance policies within community
    - Average cost of flood insurance

Watershed Planning Initiative

Questions?