

Application

Resilient Florida – Planning Projects

1. Applicant and Project Information

If employee contact is not found, please click on the Contact Management tab at the top of the web page to add a new employee contact to the system. Please Note: your application will be lost unless you select the Save button prior to visting the Contact Management link. >

Applicant Account

Pinellas County

Applicant Grant Manager

Lisa Foster

Applicant Authorized Signee

Kelli Hammer Levy

Applicant Fiscal Agent

Meghan R Johnson

2. Project Information

Choose the project type you are submitting:

Available

Vulnerability assessment compliant with s. 380.093, F.S.

Update to Vulnerability Assessment for Statutory Compliance

Partial Vulnerability Assessment

Asset Inventory

Peril of Flood Comprehensive Plan Amendment

Chosen

Watershed Planning

* Project Title

Pinellas Brooker Creek Watershed Real-Time Flood Forecasting Early Warning System

This field is calculated.

Total Grant Funding Amount Requested

527,700.00

This field is calculated.

Total Grant Match Amount

0.00

List any municipalities directly served by the project and included in the scope of work. In the next step you will select the counties, if all municipalities are included that will be in the counties selected below, enter "all-inclusive."

List the City(ies)/ Town(s)/Village(s)

City of Oldsmar: The project area is the Brooker Creek watershed. While the focus area will be the Brooker Creek watershed (13 sqmi), the South Creek (4 sqmi), Lake Tarpon (15 sqmi), and NWS (143 sqmi) watersheds will also be incorporated. Areas within and downstream of the Brooker Creek watershed will benefit from this project.

Area Served

Select your county.

Available

Alachua

Baker

Bay

Bradford

Brevard

Chosen

Pinellas

Will the vulnerability assessment include any state managed lands such as National Estuarine Research Reserves (NERRs), State Parks or Aquatic Preserves (APs)?

No

Total Population

52,000

Percent of Population

100

3. Project Work Plan

Project Summary

This project will develop a real-time flood forecasting model and dashboard system that will serve as an early flood warning system and allow the County to predict flood levels impacting streets and structures in the Brooker Creek Watershed. The County and the City of Oldsmar (as well as the water management district) will have information for the 13 square mile watershed in advance of flooding to make better decisions. Information will be used to advance structure operations, notify/evacuate residents, flood proof utilities and/or mobilize pumps. The overarching purpose of the system is to minimize risk to lives (relocate/evacuate people at risk) and mitigate potential flood damages (e.g., prioritize sandbagging structures, protect lift stations and electrical facilities, relocate equipment and valuable property to higher elevations, move vehicles, etc.).

Project Description

The County has completed a Watershed Management Plan for the Brooker Creek Watershed (2024). Flooding is predicted based on specific design storm events. The modeling was developed for regulatory purposes and updating FEMA's Flood Insurance Rate Maps. The current models are limited by the initial water level conditions set up for the event-based modeling (including a specified rainfall amount and intensity watershed-wide). Flooding has been observed in recent years and does not align consistently with the plan, especially from a timing standpoint. Additionally, flooding appears to be progressively getting worse as storm frequencies and intensities increase.

A real-time flood forecasting (RTFF) technology powered by StormWise (Previously ICP4) has been developed to predict flood levels in advance of events by using watershed conditions and rainfall forecast to warn and alert stakeholders. The project will consist of combining existing hydrologic and hydraulic ICP4 models so a RTFF model and dashboard system can be developed for the system. The County will use the dashboard and rainfall projections to anticipate potential flooding conditions in advance, during and after storm events. The County will have better information for the 13 square mile watershed in advance to make better decisions on notifying and evacuating residents, closing roads, flood proof utilities and/or mobilizing pumps where warnings and/or alerts are indicated in the dashboard.

In addition, all StormWise and RTFF models can be adapted in the future for the following: evaluation of the impacts of future rainfall changes and other climatic parameters; expansion to include early flood warning for three other watersheds that will already be incorporated into this RTFF system (Lake Tarpon, South Creek, and NWS); and integration with a coastal RTFF system to account for compound flooding involving significant storm surge conditions.

4. Project Need and Benefit

Explain the demonstrated need, which the project addresses.

The Brooker Creek watershed within Pinellas County already experiences frequent flooding at numerous locations across its 13 square miles. There are many low-lying properties with significant encroachment into the flood conveyance areas in the developed areas of the watershed. Inflow from a very large watershed to the northeast contributes to the flooding problems. Residents experience flooding up to a week following a significant rainfall event. Recent flooding events include numerous extreme rainfall from fronts as well as more significant storms including Hurricane Debby (2024), a winter front and Hurricane Idalia (2023), Tropical Storms Fred and Elsa (2021), and Tropical Storm Eta (2020). More frequent and more intense storm events are anticipated which will require innovative and proactive approaches to mitigating flood risks and the potential consequences to county communities and infrastructure. This project will provide a unique and innovative tool that will continuously simulate real-time and forecasted flood depths and durations at critical assets across the entire Brooker Creek watershed days before a storm occurs. Automatically leveraging NOAA's real-time and forecasted precipitation and evapotranspiration data, it will continuously assess and forecast the flooding threats to critical assets. This real-time flood forecasting (RTFF) system will afford the County, the City of Oldsmar, and the water management district the unique ability to proactively mitigate the risks to property damage and threats to human welfare. Proactive measures may include closing roads, warning property owners/residents, strategically protecting critical assets, protecting electrical facilities or sanitary lift stations, drawing existing ponds down for additional storage, operating structures and pumps, all in advance of the threat. Having a clear picture in advance of the flood risks at a local street and structure scale will also allow the communities to position resources to recover more quickly. The RTFF system will include a user-friendly web-based interface that can easily be used to evaluate the threats and automated alerts will be issued to key individuals relieving the need to monitor the system before a threat. It will also include the ability for the users to easily evaluate the effects (positive and negative) of a series of "what-if" scenarios, for example: varying the predicted rainfall conditions. In the future, this can be adapted to include structure operation scenarios.

Explain how the proposed project fits into one or more of the Project Types.

The primary project type is watershed planning for this project. The model will be developed for the entire 13 square miles of the Brooker Creek Watershed. This study will provide better flood level information for decision makers from planning activities to emergency management responses.

If the project is a Vulnerability Assessment for Peril of Flood compliance or other, please describe how the project will meet the outlined requirements for a Vulnerability Assessment under s. 380.093, F.S.

The project significantly enhances existing watershed management plans and the previously completed countywide vulnerability assessment (VA) by transitioning from event-based modeling to continuous simulation that accounts for water level changes and future rainfall forecasts. The model will forecast the adverse impacts from flooding resulting from increases in frequency and duration of rainfall events by using real-time data and forecasted information.

If applicable, explain how the proposed project adapts critical assets to the effects of flooding and sea level rise as defined in s. 380.093, F.S.

This project will develop a model and dashboard for flood forecasting based on real-time watershed information. As the watershed information changes the model inputs change, the model performs the computations to better project the effects of flooding. Sea-level rise projections can be added to the model for future scenarios. The current watershed models developed throughout the County are event-based models and don't change the initial conditions for water levels and flow or rainfall intensity; however, this project enhances the existing watershed model to adapt to ongoing and future changes in the watershed. Furthermore, the critical assets from the previously completed countywide VA and the County's flood mitigation action plan (FMAP) will be leveraged to establish the risk point layers for continuous evaluation of the potential flood risks.

Discuss how the project is feasible and can be completed by the grant period deadline.

This project will use existing watershed models that will be updated with additional data. Having these existing watershed models completed already will allow the project to focus on the risk data points (critical assets) and real-time analysis rather than developing the watershed model. This project will be completed within the three-year grant period deadline. We estimate that this project will take approximately 24 months from project kickoff to completion. In addition, Pinellas County has successfully completed previous projects funded by Resilient Florida within their grant period.

Has the applicant entity(ies) performed a prior vulnerability assessment, separate from what is being proposed in this application?

Yes

Please list which entity(ies) have a prior vulnerability assessment.

Pinellas County has successfully completed their Sea Level Rise & Storm Surge Vulnerability Assessment. See attachment.

Would you be willing to share this previous work/data with DEP?

Yes

In order to access the rest of the application all required fields (indicated with an asterisk*) must be filled in and saved.

Name	Type
PinellasCounty_SeaLevelRiseandStormSurgeVulnerabilityAssessment-FINAL-FEB2022	PDF
PinellasCounty_Brooker_Creek_Map_Fig1	PDF

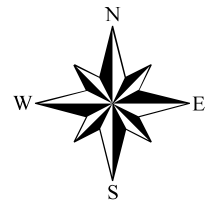
Application Tasks

Complete information about the Tasks

Tasks									
Task Number	Title	Work Performed By	Task Description	Goal	Time To Completion	Deliverable	Total Task Amount Requ...	Total Task Match Amount	
1	Set Context	Contractor only	A kickoff meeting will be held with the County (local municipality, water management district, and FDEP will be invited) to discuss the overall project scope, identify and obtain flooding documentation for calibration purposes, and ensure that the most current data sets are being utilized.	The objective this task is to strategically kick off the project.	1-6 months	Meeting agenda and sign-in sheets indicating location, date, and time of meeting	6000	0	
2	Data Collection or Study	Contractor only	Task 2.1: H&H Model Refinement: The existing Brooker Creek, South Creek, Lake Tarpon, and NWS watershed models will be merged together into one StormWise model and set up for Real Time Flood Forecasting. All model data including but not limited to nodes, links, cross sections, and basins will be migrated. Land use, soils, ground surface, NEXRAD grid, National Water Model (NWM) grid, crop coefficient zones for ET calculations, and the most recent aerial imagery will be prepared, imported, and pyramided for the final StormWise model. Task 2.2: Incorporate Critical Asset Flood Risk Points: Using the updated StormWise model, any points that are prone to flooding will be identified. Task 2.3: Development of Inland RTFF System: Adjustments to the H&H forecastable. Currently, the FloodWise RTFF technology uses forcing data (rainfall and evapotranspiration) from the National Water Model. A single medium range forecast will be conducted each day for a 3.5-day period in 1-hour increments. A user-friendly dashboard will be developed, and the alert system will be established. Task 2.4: RTFF System Testing and Calibration: Testing and verification of the RTFF system will be conducted. Task 2.5: Deployment of RTFF System: The RTFF System will be deployed by the end of year two. Task 2.6: Report Documentation: Draft and final reports will be prepared that document the model refinements, RTFF system development, critical asset data, calibration, and deployment as well as user information. Task 2.7: RTFF System Deployment & Maintenance: The FloodWise RTFF system will be deployed on the County consultant's server for a period of three years. This task includes all license fees associated with the RTFF system, computational costs and general O&M on the server including restarting simulations due to routine computer maintenance and downtime.	The goal of this task is to develop, calibrate, and deploy a robust countywide coupled inland-coastal real-time flood forecasting system.	2 years	Final report or study to include the process and methodology and any data gaps.	511700	0	
3	Stakeholder Coordination and Planning	Contractor only	The County's consultant will provide basic virtual training to County staff on the dashboard system. Access to the dashboard will be password protected.	The purpose of this task is to inform the County and other municipalities about the development and deployment of the RTFF system and train specific users on its use.	1-6 months	Presentation(s) from the meeting	10000	0	

Tasks Budget Category

Task Number	Budget Expense Amount	Match Amount
☐ 1	\$6,000.00	\$0.00
☐ 2	\$511,700.00	\$0.00
☐ 3	\$10,000.00	\$0.00



0 15,000



Feet

BROOKER CREEK

LAKE TARPON

NW5

SOUTH CREEK



**FULL VA UPLOADED IN PORTAL

PINELLAS COUNTY SEA LEVEL RISE AND STORM SURGE VULNERABILITY ASSESSMENT

FEBRUARY 2022

