

Statement of Work for Phase 2 FDEM Watershed Planning Grant

Scope of Work:

For Phase 2, FDEM will coordinate with Sub-recipients to produce a Watershed Master Plan (WMP) for credit under the Community Rating System (CRS). In Phase 1, a pilot project was completed that consisted of research, the creation of a framework and guidance documents that ensure a consistent statewide approach to WMP development.

Sub-recipients under the Watershed Planning Initiative will use the Phase 1 guidance materials to produce a Watershed Master Plan for credit under CRS. Phase 1 materials can be found at: <https://www.floridadisaster.org/dem/mitigation/watershed-planning-initiative> or <https://www.fau.edu/engineering/research/cwr3/clearinghouse/>. The Sub-recipient will finalize the process by receiving approval from ISO/CRS that the created WMP is sufficient to receive credits under CRS 452.b. Tasks necessary to the completion of a Phase 2 include:

Task 1 – Creation of preliminary scope of work, initial flood modeling & submission of draft WMP to CRS officials for approval. The flood modeling should consider evaluations of the watershed's runoff response from design storms under current and predicted future conditions and assessments of the impacts of sea level rise and climate change. Preliminary modeling should include 10-, 25- & 100-year storm events. This initial scope of work and WMP draft should include preliminary modeling of the 10-, 25- and 100-year storm events, an inventory of the ground characteristics and data availability, existing regulations and plans in place, a description of vulnerable areas or areas of interest, a list of potential solutions, and a brief description of future actions plans.

Task 2 – Submit final WMP & CRS approval. After receiving feedback and approval on the sub-recipient's scope of work and flood modeling submission in Task 1 from FDEM and CRS officials, the sub-recipient will finalize the flood modeling process and complete their WMP. At a minimum, the modeling and WMP must include 10, 25 & 100 year storm events—or model sea level rise—to receive credit through CRS element 452.b. The sub-recipient will update their CRS plan and submit the updated prospective point total to CRS to receive points for element 452.b. The sub-recipient will submit the updated CRS plan to CRS for approval at the same time as they submit their final WMP to CRS for approval. If revisions are necessary. The subrecipient will correct and re-submit for CRS approval.

FDEM's grant process includes the previously stated Task 1 and Task 2. Task 1 for the subrecipient grant includes the following sub-Tasks 1-6 which will be performed by FAU under subcontract.

Task 1- Background Information Gathering

Task 2- Policy Documentation for HUCS

Task 3- Risk Models for HUCS)

Task 4- Identifying Critical Areas/Solutions in HUCS

Task 5- Action Plan

Task 6 - Submit for Staff Review

Task 7 - Submit to NFIP for Review

Task 8 – Update CRS submission

Task 9 - Commission Approval

Task 10 – Progress reports to FDEM

Interim documentation will be provided for submission for initial commentary at the 75% stage of Tasks 1 to 5. FAU will complete Tasks 1-5 based on feedback from NFIP reviewers as a part of Subrecipient Task 2 in the FDEM RFP and provide support for sub-Tasks 7 to 9 which are a part of the Task 2 in the FDEM guidance. Each work task is outlined in the following paragraphs.

Task 1 - Background Information

Watershed Master Plans (WMPs), as conceived by the National Flood Insurance Program (NFIP) Community Rating System (CRS) program, provide an outline for communities to reduce local flood risk. According to the CRS Coordinator's Manual 2021 Addendum (FEMA, 2021), "the objective of watershed master planning is to provide communities within a watershed with a tool they can use to make decisions that will reduce flooding from development on a watershed-wide basis." Successful watershed master plans (WMPs) consist of the following activities (Association of State Floodplain Managers, 2020):

1. Evaluation of the watershed's runoff response from specific design storms under current and predicted future conditions
2. Assessment of the impacts of sea level rise and climate change
3. Identification of wetlands and other natural areas throughout the watershed
4. Protection of natural channels
5. Implementation of regulatory standards for new development such that peak flows and volumes are sufficiently controlled
6. Specific mitigation recommendations to ensure that communities are resilient in the future
7. A dedicated funding source to implement the mitigation strategies recommended by the plan

The process begins by first characterizing the watershed. A balanced approach is needed to obtain watershed-related information with the relevant precision. For example, groundwater is relevant when the ground and surface waters are directly connected, and the soil may lack capacity for infiltration storage. Geology, hydrogeology, land use, canals and other water bodies, and historical changes to the surface may be relevant to create the watershed description. A summary of the local communities involved in each HUC will be developed. Topographic features, uplands, wetlands, and shorelines will be delineated along with current flood maps. Other requirements are growth projections and mitigation strategies at the various scales (watershed, regional, and local) to limit increasing flood risk. FAU will collect the necessary data to be able to generate the mapping products needed for watershed master planning activities.

DELIVERABLE: Chapters 1 and 2 of the Watershed plan

Task 2 - Policy Documentation for HUCs

A Watershed Master Plan should be cognizant of applicable regulatory guidelines, ordinances, and public policies that relate to water management within the study area. It is important that the WMP identify the control actions, management practices, and regulations as well as the agencies that have authority and jurisdiction, as applicable to the study area. These will include regulatory standards for new development such that peak flows and volumes are sufficiently controlled and regulations that prohibit development,

alteration, and modification of existing natural channels are in place. The universe of existing regulations includes federal, state, tribal, regional, and local rules. FAU with assistance from the communities in the study area will identify the necessary documents including the Local Mitigation Strategy (LMS) plan and previous CRS credit reviews, as well as minimum flows and levels and flow volumes, as applicable.

DELIVERABLE: Chapter 3 of the Watershed plan

Task 3 - Risk Models for HUCS

Modeling and assessment of vulnerability focused on the combination of a high water table, low soil storage, heavy rains, flat topography, and impervious conditions that can lead to localized nuisance flooding events. Modeling at the screening level is needed to identify areas of the watershed that are at risk. FAU will use a screening tool to identify regions with elevated risk of inundation based on multiple collected datasets and hydrological modeling. The screening tool utilizes topographic data from various sources, water table elevations, tidal information for coastal areas obtained from the NOAA Current & Tides website, soil maps obtained from the USDA, and other key datasets. **Error! Reference source not found.**1 shows how the GIS layers interface in the tool, and how they are combined for spatial analysis. The model chosen for this screening tool is Cascade 2001, which is a multi-basin hydrologic/hydraulic routing model developed by the South Florida Water Management District. The model permits the investigator to analyze different storm events and flooding scenarios. The following data layers collected during Task 1 activities are processed to develop the input files for Cascade 2001.

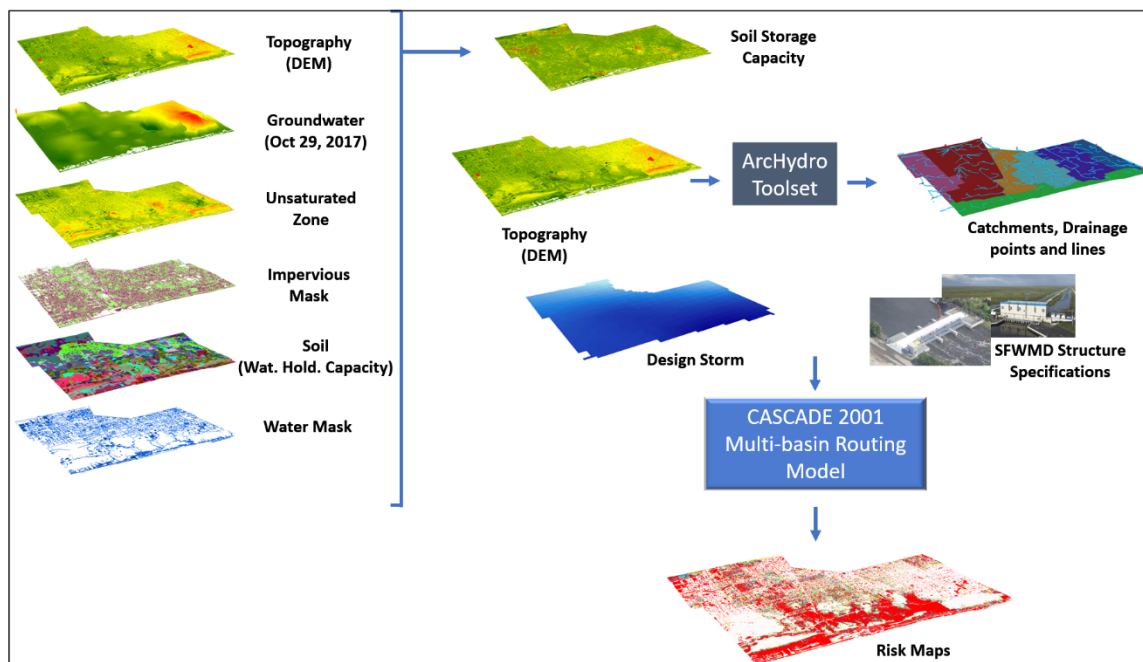


Figure 2.1. Screening tool methodology for creating flood risk maps

FAU will conduct map development activities that address the required design storms including 5-, 10-, 25- and 100-year floods, plus the 3-day, 25-year storm event, with 1, 2, 3, 4 and 5 ft of sea level rise and king tides, as applicable. At a minimum, the modeling and WMP must include 10-, 25- & 100-year storm events—or model sea level rise—to receive credit through CRS element 452.b. Note that understanding build-out and the impacts build-out has on drainage are factors that must be considered in modeling which must come from the underlying local communities. This is the watershed master planning assessment.

DELIVERABLE: Chapter 4 of the Watershed plan with all applicable modeling scenarios for the HUC and relationship to involved HUCs; drilldown to community issue modeling

Task 4- Identifying Critical Areas/Solutions in the HUCs

Once areas at risk have been identified in the watershed master planning assessment, Task 4 is designed to identify potential mitigation measures to improve community resilience and flood protection. The process starts with narrowing down the feasible engineering alternatives using threshold criteria and quantifiable selection criteria that include measures of effectiveness, cost, and added benefit to the community. At the center of these planning efforts should also exist the provision for an adequate drainage system, designed to accommodate an increased volume of water and/or increased peak flows. Current capital plans, stormwater master plans, capital projects etc. will be identified. Local governments have these documents which will be secured in Task 2.

For this document, 35 solutions referred to as the “Periodic Table” menu of green and grey infrastructure technologies (**Error! Reference source not found.**2.2) will be referenced as applicable. Improvements like pump stations, changing weir elevations, larger pipes and coastal sea walls are major hardening efforts that can be modeled in Cascade 2001.

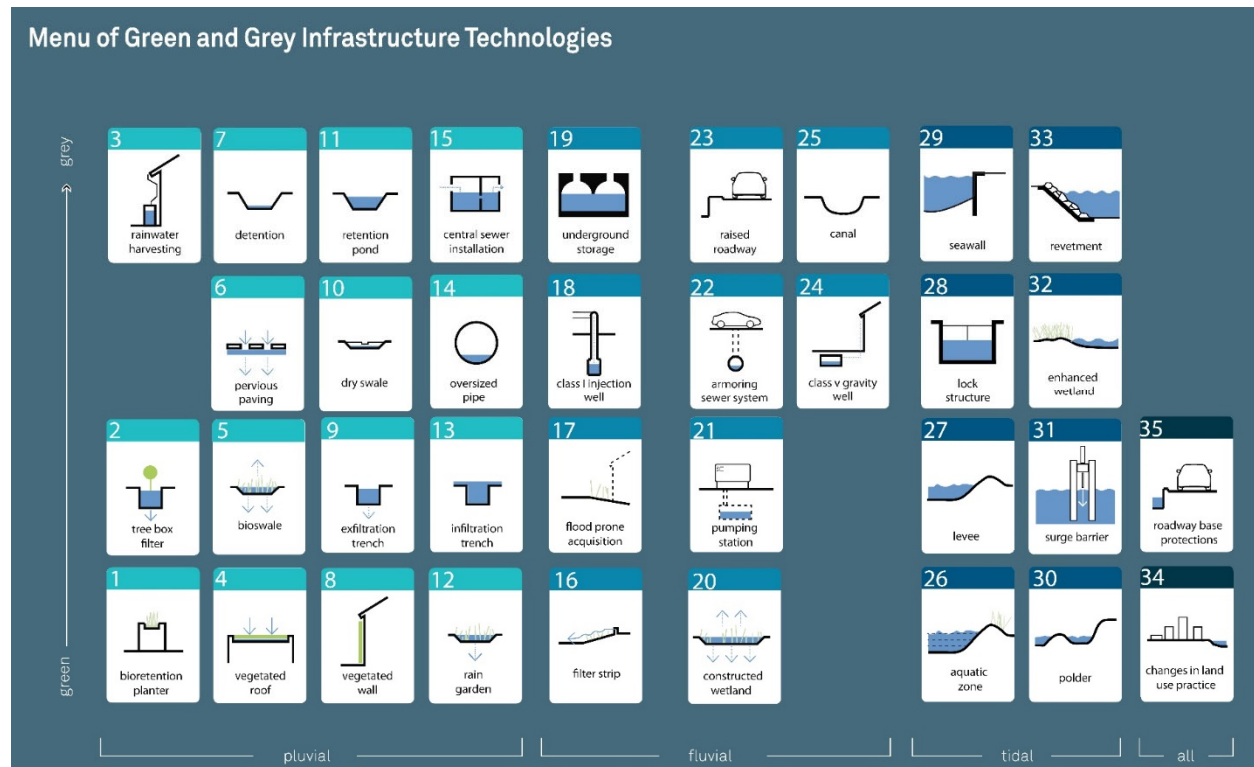


Figure 2.2. “Periodic table” menu of green and grey infrastructure technology options. The menu is organized to address various flooding types, from *pluvial* (rainfall and runoff mitigation in upland areas), *fluvial* (runoff, high ground water, and surface water management in low-lying flood prone areas), *tidal* (flooding associated with storm surge, high ground water, and tidally influenced), and *all* (applies across the spectrum).

DELIVERABLE: Update and completion of Chapter 4 and Chapter 5 of the Watershed plan with applicable modeling scenarios for the HUC

Task 5- Action Plan

The key components of the implementation phase are: 1) the implementation team, 2) information/education, 3) capital improvement projects, 4) maintenance, 5) monitoring, and 6) evaluation and adjustments. A watershed implementation team made up of key stakeholder partners from the planning team, particularly those whose responsibilities include making sure tasks are being implemented, reviewing monitoring data, ensuring technical assistance in the design and installation of management measures, finding new funding sources, and communicating results to the public.

DELIVERABLE: Chapter 6 of the Watershed plan – this should complete the planning document

Task 6 – Submit Draft Plan to Staff for Review

FAU will submit the draft WMP to staff for review and comments. Feedback will be addressed in a timely fashion, prior to Task 7.

DELIVERABLE: Delivery and receipt of comments from staff of the planning document

Task 7 – Submit Draft plan to FDEM and NFIP Staff for Review

FAU will support the subrecipient’s submission of the draft plan to staff at NFIP for review and comments. Feedback will be addressed in a timely manner so that Task 8 can be pursued. Note FAU has no control over the length of time that NFIP staff and FDEM staff require to review the draft WMP documents.

DELIVERABLE: Chapter 6 of the Watershed plan – this should complete the planning document

Task 8 – Update CRS submission

FAU will support the subrecipient’s submission of revised CRS plan to staff at NFIP for review and comments. Feedback will be addressed in a timely manner so that Task 9 can be pursued. Note FAU has no control over the length of time that NFIP staff and FDEM staff require to review the draft WMP documents.

DELIVERABLE: n/a

Task 9 – Commission approval

FAU will support the subrecipient’s submission of the draft WMP to its governing board for approval. If the subrecipient desires FAU faculty presence, this will be coordinated with FAU.

DELIVERABLE: n/a

