

**STATEMENT OF INTEREST
SOUTH FLORIDA-CARIBBEAN CESU
NUMBER W912HZ-17-SOI-0020
PROJECT TO BE INITIATED IN 2017**

**Project Title: Water Conservation Area 3 De-Compartmentalization
(DECOMP) and Sheetflow Enhancement Project - Physical Model,
Jacksonville District**

Responses to this Request for Statements of Interest will be used to identify potential investigators for a project to be funded by the U.S. Army Corps of Engineers (USACE) Jacksonville District, Ecosystem Branch in Jacksonville, FL. Approximately \$165,000 is expected to be available to support this project for one (1) year. Additional funding maybe available at a rate of \$175K/yr for up to 3 additional option years based on future R&D needs for a total of \$690K for the full project.

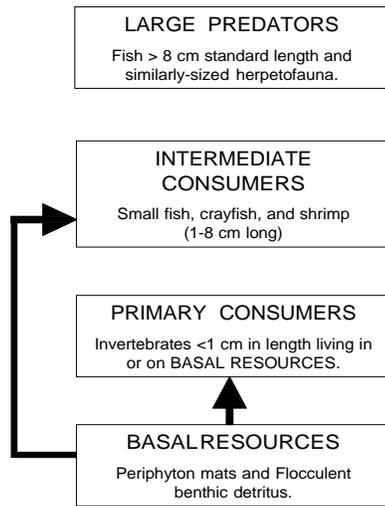
Background:

Restoration of the quantity, quality, timing, and distribution of water deliveries to Everglades marshes while maintaining drainage, flood control, water retention and supply, irrigation, and transportation is the primary goal of the Comprehensive Everglades Restoration Plan (CERP). A major challenge to accomplish this goal is presented by the miles of canals and levees that crisscross the ecosystem and that were put in place to accomplish the flood control, water retention and supply, and transportation of the current system. These barriers to unimpeded water flow are both the mechanism to obtain the benefits of human intervention in the ecosystem and major contributors to problems leading to the restoration program. DECOMP, the effort to de-compartmentalize the Everglades and regain large-scale unimpeded sheet flow of water, is a core effort of CERP. The DECOMP Physical Model (DPM) is a large-scale field study to address scientific, hydrologic, and water management issues related to two uncertainties in altering, and even removing, levees and canals in an effort to move ecological restoration forward. These key uncertainties are the ecological need to backfill canals and the ecological benefit of flow.

Brief Description of Anticipated Work:

Research activities shall evaluate the response of aquatic communities, and particularly fishes, to a landscape-scale manipulation of water flow accomplished by the DPM by levee breaching, introducing enhanced water flow velocities through the water control structure S-152, and altering canal depths adjacent to Everglades marshes. These manipulations have the potential to alter seasonal use of habitats by fish and alter population and community dynamics in the canal and adjacent marshes, with possible implications for ecosystem function. The changes have the potential to improve Everglades fisheries and alter the role of

top-down controls (see below figure) on ecosystem function by changing habitat connectivity and seasonal community dynamics.



Requirements of the research proposed are:

1. Document prey fish use of vegetation habitats in unaltered and filled canal habitats. Evaluate how changing vegetation in canal-fill areas is changing large-fish prey availability and seasonality.
2. Use sampling methods to document the large fish (>8cm standard length) communities in canal and fill-treatment habitats and evaluate change before and after fill treatments were implemented. Document relationships to changing vegetation structure in marsh-fill habitats.
3. In conjunction with large-fish sampling, use radio-transmitters to track Largemouth Bass and Florida Gar movements year-round to document canal and marsh use and use of canal fill-treatment areas. Evaluate if canal removal affects their movement area and dry-season habitat use.
4. Experimentally evaluate the impacts of seasonally elevated flow velocity on native Everglades aquatic communities.

Public Benefit:

These data will benefit the public through increased awareness of the effects of restoration efforts occurring within the Florida Everglades ecosystem. The data collected will inform future design efforts taking place within the Comprehensive Everglades Restoration Plan (CERP). By utilizing data garnered from pilot studies such as the DPM, planners and engineers will be able to effectively develop projects to create maximum benefit for the ecosystem and the public who enjoy the recreational benefits the Everglades provides to the residents and vacationers in the south Florida region.

Objectives:

The DECOMP Science Plan includes several working hypotheses related to the effects of canal backfilling on food-web dynamics. Those objectives have been updated based on work completed during the first years of the DPM study. Addressing these will provide a deeper understanding of canal-marsh interactions by way of animal ecology, with implications for both fisheries management and ecosystem management.

Objective 1- Test hypothesis that water flow and connectivity changes the dynamics and habitat use of prey-fish communities associated with backfill treatment areas. Habitat characteristics in the canal-fill areas have been changing since the time of construction. It is possible that these changes are altering the role of canals of habitats for fish by changing prey use and availability.

Objective 1.1- Document prey fish use of vegetation habitats in unaltered and filled canal habitats. Evaluate how changing vegetation in canal-fill areas is changing large-fish prey availability and seasonality.

Objective 2- Test hypothesis that canal fish communities associated with backfill treatment areas are unaffected by fill treatments. Habitat characteristics in the canal-fill areas have been changing since the time of construction. It is possible that these changes are altering their use by large fish such as sunfish, Lake Chubsuckers, Largemouth Bass, Bowfin, and Florida Gar.

Objective 2.1 – Use sampling methods to document the large fish (>8cm standard length) communities in canal and fill-treatment habitats and evaluate change before and after fill treatments were implemented. Document relationships to changing vegetation structure in marsh-fill habitats.

Objective 3- Test the hypothesis that Largemouth Bass and Florida Gar habitat use and movement are unaffected by canal fill treatments.

Largemouth Bass support an important recreational fishing industry in the Everglades north of Everglades National Park. Florida Gar are an important food species of the Native American communities living in the Everglades. Both species move between marsh and canal habitats routinely and may move long distances in the marsh during the wet season. An unknown portion of their populations return to canals in the dry season, probably tied to the severity of marsh drying.

Objective 3.1- In conjunction with large-fish sampling, use radio-transmitters to track Largemouth Bass and Florida Gar movements year-round to document canal

and marsh use and use of canal fill-treatment areas. Evaluate if canal removal affects their movement area and dry- season habitat use.

Objective 4- Test hypothesis that nutrient loading from elevated water flow has no effect on marsh aquatic food web function. DECOM PM work to date has document an impact of elevated water flow velocity on nutrient dynamics in periphyton mats. The impact on these changes to aquatic consumers is not known, though preliminary studies have documented changes in trophic state of mats affecting food quality and fatty acid composition of herbivorous fishes enclosed in the area. We need to know more about the long-term impacts of seasonal flows on nutrient dynamics and food-web ecology in affected areas.

Objective 4.1- Experimentally evaluate the impacts of seasonally elevated flow velocity on native Everglades aquatic communities.

Site Location:



Figure 1. Decom Physical Model site location in WCA3 in south Florida.

The Water Conservation Area 3 (WCA-3) Decompartmentalization and Sheetflow Enhancement (DECOMP) Physical Model (DPM) is a large-scale field test designed to answer uncertainties with depth, hydroperiod, sheetflow, and canal backfilling associated with the full-scale DECOMP project. The DPM is located in Miami-Dade County along the southern end of the L-67A and L-67C canals within Water Conservation Area 3 (WCA-3) in a region referred to as the “pocket”. The pocket is bounded to the northwest and the southeast by the L-67A and L-67C levee and canal systems respectively in Sections 3, 10 and 15, Township 53 South and Range 37 East.

The DPM includes installation and interim operations associated with the following features: ten controllable gated culverts within the L-67A Levee (S-152), degradation of 3,000 linear feet of the L- 67C levee and three, 1,000 ft backfill treatments in the L-67C canal (no backfill, partial backfill, and complete backfill). Scientific and water quality monitoring activities will be carried out to evaluate the uncertainties with depth, hydroperiod, sheetflow, and canal backfilling associated with the full-scale DECOMP project.

Vendor Requirements:

Vendor must be a non-federal partner of the South Florida-Caribbean CESU Unit willing to accept the negotiated CESU indirect cost rate of 17.5%. Successful applicants should have expert knowledge and work experience in Everglades ecosystem, particularly the water conservation areas and areas impacted by man-made flood control systems. The candidates should have prior experience with inventory and monitoring of fish and food web dynamics within these systems including mapping, data collection and statistical analysis. The candidates will also be required to submit three (3) quarterly status reports and one (1) annual report each year of the cooperative agreement.

Government Participation:

The Government will work cooperatively with the investigator to identify issues the protocol must address. The Government will not assist the awardee with field activities or data analysis review. The awardee will provide workspace and equipment as necessary.

Materials Requested for Statement of Interest/Qualifications:

Please provide the following via e-mail attachment to:
Deberay.R.Carmichael@usace.army.mil
(Maximum length: 2 pages, single-spaced 12 pt. font).

1. Name, Organization and Contact Information

2. Brief Statement of Qualifications (including):
 - a. Biographical Sketch,
 - b. Relevant past projects and clients with brief descriptions of these projects,
 - c. Staff, faculty or students available to work on this project and their areas of expertise,
 - d. Any brief description of capabilities to successfully complete the project you may wish to add (e.g. equipment, laboratory facilities, greenhouse facilities, field facilities, etc.).

Note: A proposed budget is NOT requested at this time.

Review of Statements Received: Based on a review of the Statements of Interest received, an investigator or investigators will be invited to prepare a full study proposal. Statements will be evaluated based on the investigator's specific experience and capabilities in areas related to the study requirements. Additionally, the evaluation method and selection criteria for research and development awards must be: (1) The Technical merits of the proposed research and development; and (2) Potential relationship of the proposed research and development to the Department of Defense missions.

Please send responses or direct questions to:

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Timeline for Review of Statements of Interest: Review of Statements of Interest will begin after the SOI has been posted on the CESU website for 10 working days.