

# **SCOPE OF WORK**

## **For a Contract between the University of Florida Board of Trustees and the Florida Senate**

### Project Title:

Technical Review of Options to Move Water from Lake Okeechobee to the Everglades

### Principal Investigators:

Wendy Graham, Director, UF Water Institute (Project Leader)

Karl Havens, Director, Florida Sea Grant College Program

Thomas Frazer, Director, UF School of Natural Resources and Environment

K. Ramesh Reddy, Chair, UF/IFAS Department of Soil and Water Science

Mary Jane Angelo, Director, UF Environmental and Land Use Law Program

Peter Frederick, Research Professor, Wildlife Ecology and Conservation

### Project Period:

Start Date: Execution

End Date: March 1, 2015

## **Introduction**

The south Florida regional landscape has been engineered to provide flood protection and water supply for (1) a population that has grown to over 8 million residents and that contributes hundreds of billions of dollars annually to the Florida economy; and (2) a large and productive agricultural area south, east, north, and west of Lake Okeechobee. The regional hydrologic system, called the Central and Southern Florida (C&SF) Project, functions well in meeting its primary intended purposes, which were identified when the project was authorized in 1948.

Today it is recognized that this flood control and water delivery system that serves Florida's human population effectively also has caused considerable adverse impacts to the natural ecosystems of south Florida, including the St. Lucie Estuary, Caloosahatchee Estuary, Lake Okeechobee, and the Florida Everglades. Such impacts stem from large deviations in the quantity and quality of freshwater delivered to these systems relative to a pre-engineered time period. The main location for surface water storage in the C&SF system is Lake Okeechobee, which was designed with two large canals that now have the capacity to carry large volumes of water to the St. Lucie Estuary and the Caloosahatchee Estuary. Historically, no water flowed from the lake to the St. Lucie, and only a small amount of (much cleaner) water flowed to the Caloosahatchee. Currently, movement of water to the south is constrained by the capacity of much smaller canals, and by other factors including a need to prevent overtopping of levees in the Water Conservation Areas (a flood risk) and by legal limits for phosphorus loading to the Everglades. Water in Lake Okeechobee has become highly polluted with phosphorus and other nutrients from agricultural sources north of the lake. In spite of Best Management Practices (BMPs) implemented in the watersheds, high nutrient loads to the lake continue, in large part due to legacy nutrients accumulated in the system. The result of all of these factors is that when there is excessive rainfall in the northern basin and rapidly rising water levels in the lake, large discharges are made to the two estuaries. Large freshwater discharges reduce the salinity of the

estuaries, harming biota that are adapted to higher salinity conditions. They have also been associated with algal blooms fueled by the nutrient-rich water from Lake Okeechobee.

For decades, planning has been underway to develop solutions to these problems, and most notably, this resulted in a program called the Comprehensive Everglades Restoration Plan (CERP) that is being implemented by the US Army Corps of Engineers (USACE), its local partner the South Florida Water Management District (SFWMD), and the US Department of Interior (USDOI). Recently, these agencies have been focusing their efforts on a component of CERP, the Central Everglades Planning Project (CEPP), which was designed to expedite restoration in the Central Everglades.

Recently, after a particularly wet season in the region and large regulatory discharges to the estuaries, concerns arose about the timing of completing CERP, especially about the timing of construction and completion of projects that would reduce damaging estuary releases and increase the flow of clean water south to the Everglades. Stakeholders have questioned whether there are more immediate solutions especially to the problem of high discharges of poor quality freshwater to the estuaries. In response to the recommendations of the Florida Senate Select Committee on Indian River Lagoon and Lake Okeechobee Basin, the Florida Legislature recently appropriated \$232 million of funds to accelerate projects that are intended to take pressure off the estuaries and send clean water to the Everglades. The Florida Senate also recognized the value of an independent review of agency-adopted and other proposed plans to move even more water to the Everglades to: (1) ensure that existing evaluations of plans by the agencies are technically sound; and (2) possibly identify innovative, new approaches that have not previously been considered.

## Objectives

- (1) An interdisciplinary academic review team from the University of Florida Water Institute will review relevant reports and documents and interview scientists and engineers at the lead management agencies. The UF review team will also gather information from other agencies, organizations, and other individuals with expertise on issues related to reducing regulatory discharges from Lake Okeechobee to the estuaries and increasing the flow of water from the lake to the Everglades.
- (2) The UF review team will develop a report for the Florida Senate that provides a summary and an independent assessment of this regional water management issue. The final synthesis document will include the following sections:
  - A Historical Perspective of the Regional System – this section will be a concise overview of the pre-C&SF hydrology and water quality and how and why the C&SF system was constructed. This section of the report will include a discussion of the historic approach to manage water without considering the environmental needs for variation in hydrology, amount of water delivery or nutrient content of the water and nutrient loads.
  - The Current State of the System – this section will focus on how water is managed now and the current state of water quality in the context of the current legal and institutional environment.
  - Restoration Plans – this section will include an inventory and assessment of current and proposed restoration plans developed by the state and federal agencies, as well as

other plans proposed by stakeholders or identified by the review team. Examples of these plans include, dispersed water storage, Aquifer Storage and Recovery (ASR) wells, Stormwater Treatment Areas (STAs), the Central Everglades Planning Project (CEPP), Plan 6, and River of Grass planning process. Constraints to solving hydrologic, water quality, and habitat issues will be identified as well as potential solutions. Review of plans will include breakdown of legal and institutional constraints that may limit or impact the feasibility of particular plans. Evaluations will be conducted based on readily available information. No new data collection or modeling will be conducted. However, recommendations for additional data collection or modeling to further evaluate new restoration options may result from the analyses.

- Future Uncertainties – this section will consider uncertainties regarding rainfall, evapotranspiration, temperature, sea level rise, land use, population demographics, and legal and institutional framework that could affect the outcome of any restoration programs.
- Options – this section will identify policy and project options for improving water management and note advantages and disadvantages associated with each option.

The final report will include references to all sources of material used to develop assessments and evaluations.

## **Approach**

The UF review team will meet these objectives by thoroughly reviewing existing documents that have evaluated water storage, water quality, dispersal, and treatment options in the regional ecosystem by holding fact finding meetings to view presentations and ask questions of experts from the SFWMD, USACE, DOI, other agencies, and interested parties, and through closed review team meetings. The review of plans will consider an assessment of whether they meet their stated objectives, whether they may have unintended consequences, and what constraints exist to them achieving their desired outcomes.

The review activities will occur in fall 2014 and early winter 2015, with production of the final report in February 2015.

Support of relevant agencies to provide needed scientific information is critical for this project. The Florida Senate will make special requests of the agencies to support this activity in a timely manner.

## **Budget Narrative**

A total of \$250,000 will be paid to the University of Florida for a portion of the salaries of team members (including fringe benefits), travel costs of team members, and costs for production of the final report (editing, layout and printing).

This is a fixed cost project with one deliverable, a report to the Florida Senate with monthly status reports provided through conference calls with Senate staff. The final report will be provided on or before March 1, 2015.