

## Summary of Greater Everglades Restoration Workshop: 2. Hydrologic Modeling and Processes, May 7-8, 2002

### The Workshops

During April and May 2002, the United States Geological Survey (USGS) Greater Everglades Place Based Studies (PBS) held five information workshops in south Florida to discuss status of greater Everglades ecosystem research, and to solicit suggestions for additional studies from Everglades restoration partners. The Hydrologic Modeling and Related Processes Workshop was held at NOVA Southeastern University in Fort Lauderdale, May 7-8, 2002.

### Background

The greater Everglades restoration program is prescribing ecosystem-wide changes to some of the physical, hydrological, and chemical attributes

of the Everglades ecosystem. The ability to accurately understand the complex interactions between contaminants, nutrients, hydrology, and other processes and their effects on the landscape and habitat within the greater Everglades ecosystem, during the present, recent past, and prior to significant human alteration, is crucial for the success of greater Everglades ecosystem restoration and successful implementation of the Comprehensive Everglades Restoration Plan (CERP). Knowledge of these processes and their interactions produces better informed planning, project implementation, and land management decisions. Getting the water quantity, quality, distribution and timing right, as required by CERP, requires a complementary program of hydrologic research, monitoring, and modeling.

Many organizations and programs are dependent on scientific knowledge and more accurate hydrologic and ecologic models for restoring the greater Everglades ecosystem. These include federal, state, and local agencies, Native American tribal governments, as well as private organizations.

### Research Needs

Research needs, including those directly related to hydrologic modeling and processes, and those relevant to other research topics, were compiled during the workshop based on discussions among the represented organizations and individuals having interests and roles within greater Everglades restoration. For the purposes of this summary, these needs have been divided into 1) hydrological modeling and related research needs and 2) other needs discussed that are relevant to one of the other four workshop topics.

#### **Hydrologic Modeling Needs**

Enhance connectivity between SFWMM (South Florida Water Management Model) and Southern Inland and Coastal System (SICS) and Tides and Inflows in Mangroves of the Everglades (TIME) models.

Develop internet-accessible SICS and TIME model real-time animations.

Collect TIME equivalent data from outside of TIME model domain.

Develop additional salinity simulation capability to support Across Trophic Level System Simulation (ATLSS)



Measuring flow velocity in Taylor Slough wetlands to develop a simulation model. {Photo by Eric Swain, 1997.}

program for developing estuarine species models.

Expand boundaries of SICS and TIME models to the entire CERP project area including areas east of US 1.

Incorporate solute-transport and simple settling algorithms in regional models to assist in setting CERP water quality performance measures.

Model CERP implementation impacts on transport of nutrients within the Everglades.

Incorporate seepage effects associated with the eastern boundary of the Everglades within all applicable models.

Complete additional work to couple water quality and hydrologic monitoring data with SICS and TIME models.

Increase spatial resolution of surface water and groundwater elevation and salinity monitoring.

Improve discharge and recharge estimates associated with stormwater treatment areas.

Increase spatial extent of monitoring of flow structure in wetlands to assess flow impacts on landscapes and habitat, including tree islands.

Conduct additional studies on the hydraulic properties of the surficial aquifer system including the overlying peat and marl unit.

Collect additional information on Floridian Aquifer hydrogeology.

Develop additional models and model inputs for the southwest coast of Florida.

Develop stochastic methods for generating rainfall input data needed for applicable models.

Improve understanding of groundwater solute transport and upwelling (such as sulfates), and subsequent surface water mixing in central Everglades, particularly WCA-3A south of Alligator Alley.

Create probabilistic/stochastic approaches to better define trends and certainties within models.

Incorporate climate-change variables into model simulations.

## Research Needs Relevant to Other Workshops Topics

Complete USGS Aerial Height Finder (AHF) topographic survey in Everglades National Park, Loxahatchee, Big Cypress and Water Conservation Areas.

Map and delineate unique landscape features such as tree islands and hammocks using AHF system.

Establish NAVD88 control along the southwest Gulf coast in Everglades National Park.

Conduct bathymetric surveys of tidal rivers and creeks along the southwest coast of Florida.

Create a centralized ecosystem data repository system.

Gather reliable farm elevation/ topographic information at appropriate resolution.

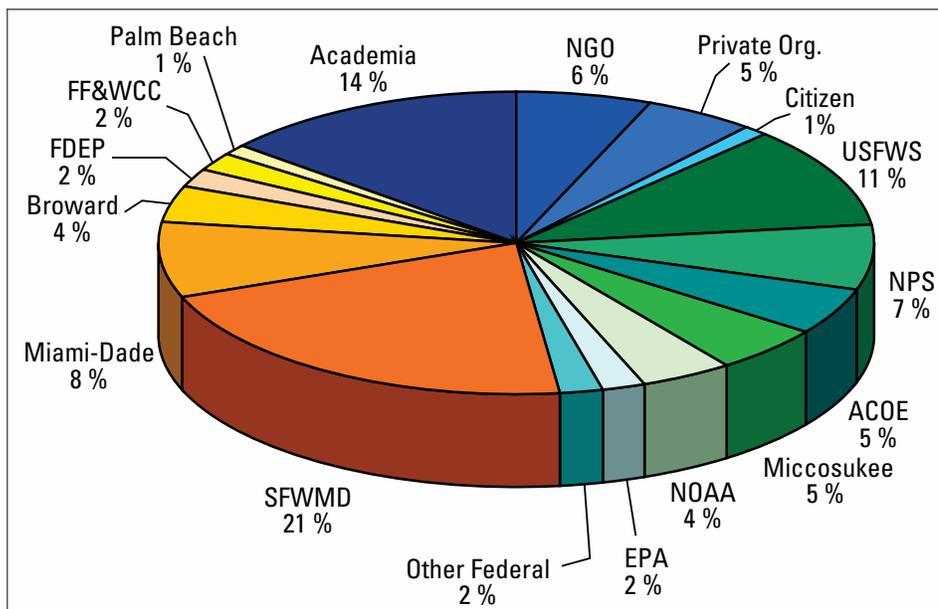
Use multi-agency collaboration to address data quality issues.

## For Further Information

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Participation by greater Everglades restoration partners during the 85-person Hydrologic Modeling Workshop (excluding USGS participants).