

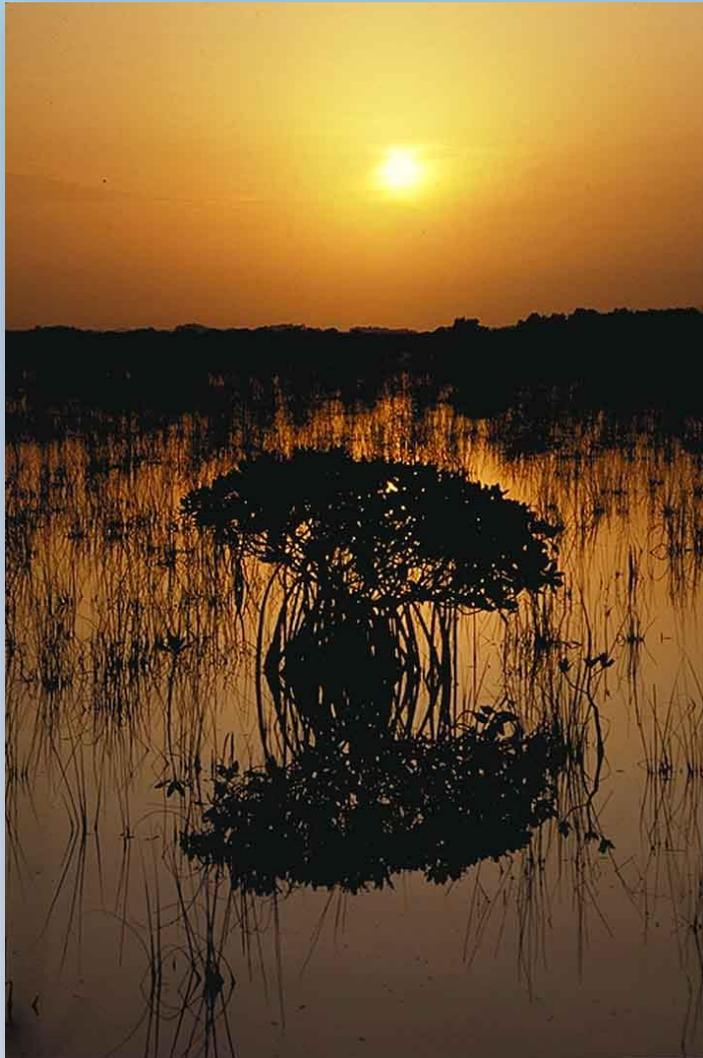
# RECOMMENDATIONS FOR EVERGLADES RESTORATION UNDER A FUTURE CLIMATE SCENARIO

SPONSORED BY UNITED STATES GEOLOGICAL SURVEY, FLORIDA SEA GRANT  
AND THE CENTER FOR ENVIRONMENTAL STUDIES AT FLORIDA ATLANTIC UNIVERSITY

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Florida Atlantic University ♦ Boca Raton, Florida

## MEETING SUMMARY



## APRIL 2014 MEETING STRUCTURE

*Recommendations for Everglades Restoration Under a Future Climate Change Scenario* convened eighty-four participants from academia, local, state and federal agencies, as well as public and private organizations. During the two-day technical meeting, seven interdisciplinary groups of experts addressed the question: **How can we effectively enhance restoration efforts throughout the Everglades watershed through an adaptive management process that incorporates current scientific knowledge of climate-related impacts?** The teams recommended actions to address current and future potential impacts such as increased temperature, changes in evapotranspiration and rainfall parameters for restoration efforts. The steering committee asked the groups to focus on 'no regrets strategies,' defined as strategies which remain cost-effective under a range of future climate scenarios and take into consideration other policy objectives. We also identified information gaps and prioritized future research needs.

The program and discussions were divided among seven working groups:

1. Water Management Response to Hydrology and Sea Level Rise
2. Managing Water Quality and Quantity in the Northern Everglades
3. Managing the Everglades by Influencing Biogeochemical Processes
4. Shifts and Challenges to Vegetative Communities
5. Managing Wildlife for Sustainability in a Changing Climate
6. Management Framework for Landscape Systems
7. Management Considerations for Coastal Systems

## GENERAL CONSENSUS

To successfully manage restoration projects in the Everglades, the impact of current and future predicted changes (in temperature and evaporation, rainfall and rainfall intensity, and sea level rise with salt water intrusion) must be taken into account. The overall conceptual knowledge we have collected about current and future impacts should now be augmented with specific data. Monitoring these changes is a priority.



The group emphasized and concluded that:

- While Everglades restoration focuses on the natural environment, the growing and changing human environment, both urban and rural, is closely interlinked, especially in the context of water supply and water management;
- Water storage will become even more critical in the future and the potential for increased capacity should be examined;
- While water storage is important, water conservation in agriculture and in urban environments is a vital medium- and long-term objective;
- Restoring water flow through the system, which is the critical goal of restoration in the Everglades, is even more important in the context of climate change;

## GENERAL CONSENSUS (continued)

- Increased water flow can reduce the impact of salt water intrusion, and increase the degree of peat formation, also reducing salt water intrusion;
- Maintaining and increasing peat formation is a vital component of a healthy Everglades system and should be given priority in all management initiatives;



- Appropriate adaptation efforts and areas most vulnerable to the impacts of changing conditions in both natural and urban areas need to be identified;
- Informed decision-making demands detailed data on potential changes in the amount, distribution and intensity of precipitation under future climate scenarios;
- The current cooperation on organizational issues between implementing agencies (as exemplified by the makeup of the meeting) is evident, but communication gaps were identified, including between counties and state and federal agencies; and
- The active presence of managers from several key agencies highlighted the need for ongoing communication with and education for the public, water managers and other decision makers.

## RECOMMENDED MANAGEMENT STRATEGIES

Despite some uncertainties of magnitude and timing, based on the conclusions above, we recommend a number of management strategies that can safely be implemented as 'no-regrets measures.'

- Conduct a vulnerability analysis of Southern Florida and the Everglades similar to the US Army Corps of Engineers' study for the areas that would be most impacted by the next Super Storm Sandy.
- Improve our modeling of rainfall and evapotranspiration under future climate scenarios and the potential impact on the local hydrological cycle and thus water supply and management.
- Review and revise water management schedules and MFLs (minimum flows and levels).
- Encourage FDEP and local governments to engage in land acquisition to connect corridors for migration using FWC's existing state Wildlife Action Plan and Land Conservation Cooperatives (LCC) Work.
- Improve communication gaps, including between counties and state and federal agencies.
- Continue to involve managers from key agencies to maintain communication with and education for the public, water managers and other decision makers.
- Incorporate opportunities to increase water storage in existing and future Everglades projects.

## **BACKGROUND: TECHNICAL MEETING SERIES 2010-2013**

Florida Atlantic University's Center for Environmental Studies (CES) and the U. S. Geological Survey (USGS) with support from Florida Sea Grant have developed and implemented a series of technical meetings to address the significant climate and sea level rise changes that will have major implications for regional restoration projects throughout the Everglades watershed.



The series of meetings, held over the past three years under the guidance of an inter-agency steering committee, included an event held in March 2012, *Hydrology of the Everglades in the Context of Climate Change*, which focused on the technical issues of downscaling and subsequent hydrological forecasting. During the meeting, the group realized a more interdisciplinary and South Florida-focused approach was a logical next step.

As preparation, a webinar and follow up discussions were held in August 2012 for key Florida ecologists on the process and findings of the hydrology workshop. The steering committee, which included six federal agencies, water management representatives and five universities, concluded that a scientifically based scenario approach would focus attention on a discrete set of hypothetical ecological conditions.

*Predicting Ecological Changes in the FL Everglades in a Future Climate Scenario*, a technical meeting held in February 2013, brought together scientists and resource managers to implement this scenario-based approach. The steering committee selected a set of climate change and sea level rise scenarios to run using the South Florida Water Management Model (SFWMM), the regional-scale, hydrologic model for the region. Based on outputs from the model run, Everglades ecologists identified how hydrologic changes associated with possible future climate change regimes might influence Everglades ecology. Participants reached general agreement on two main points: 1) The basic principle of Everglades Restoration, “getting the water right” by restoring as much as possible of the original hydrologic system, is even more important in the face of sea level rise and other climate changes, and 2) Adaptive management is critical in order to maximize management efficacy in the face of complexity, uncertain timing and magnitude of climate change.

At a decision makers meeting held in Naples in January 2014, managers and scientists highlighted a series of issues to be addressed. These discussions provided a framework for the April Technical Meeting, which included the following strategies: 1) define the key issues, 2) understand our present degree of knowledge, 3) recommend adaptive strategies, 4) design plans to address issues, and 5) identify major knowledge gaps.

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[http://www.ces.fau.edu/climate\\_change/everglades-recommendations-2014/](http://www.ces.fau.edu/climate_change/everglades-recommendations-2014/)