

Summary of Greater Everglades Ecosystem Restoration Workshop: 1. Paleoecology and Ecosystem History, April 29, 2002

The Workshops

During April and May 2002, the United States Geological Survey's (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 greater Everglades restoration partners. The Paleoecology and Ecosystem History Workshop was held at NOVA Southeastern University in Fort Lauderdale, April 29, 2002.

Background

The greater Everglades restoration program is prescribing ecosystem-wide changes to some of the physical, hydrological, and chemical components of this ecosystem. The ability to accurately understand natural (prior to significant human alteration) conditions within the greater

Everglades ecosystem is crucial for success of greater Everglades ecosystem restoration and successful implementation of the Comprehensive Everglades Restoration Plan (CERP). Information on the historical and current natural system allows restoration planners to establish realistic baseline conditions, restoration goals, and performance measures; create predictive models; and monitor success of restoration efforts. Understanding past conditions and cycles of change also allows for better-informed planning, project implementation, and land management decisions.

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

What can ecosystem history studies tell us?

About the terrestrial Everglades . . .

Hydroperiod and water depth

- Pre-drainage conditions
- Natural spatial and temporal variability

Tree Islands

- Geologic and hydrologic requirements
- Historical patterns of change
- Longevity and stability
- Response to hydrologic changes

Ridge and Slough systems

Fire History and Water Depth

Water Quality

About the estuaries. . .

Salinity

- Historical range of salinity
- Natural seasonal variation
- Timing and delivery of freshwater

Water Quality

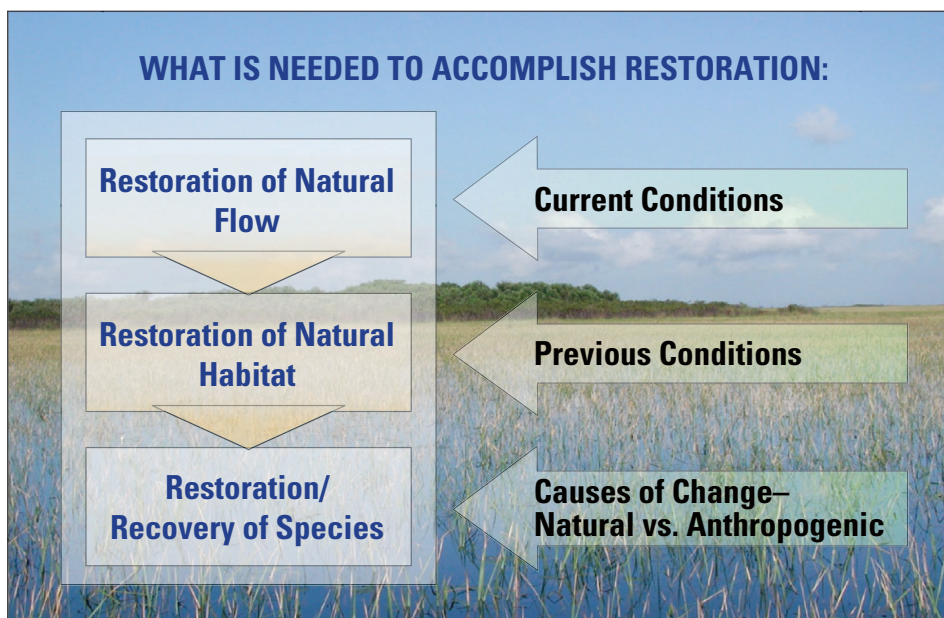
Seagrass

- Understanding the causes of die-offs
- Historical patterns of change

Biodiversity

Research Needs

Research needs, including those directly related to ecosystem history 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) paleoecology and ecosystem history and 2) other needs discussed that are relevant to one of the other four workshop topics.

Paleoecology-Ecosystem History

Expand paleoecological sediment analyses to include: Biscayne Bay; Card Sound; transects that include sawgrass ridges, sloughs, and tree islands; southwest coast of Florida; the eastern boundary of Everglades National Park and adjacent agricultural areas; and Estero Bay tributaries.

Compare current versus historical ecological aspects of: Biscayne Bay, Barnes and Card Sounds, marl prairies, location of ridge and slough landscape; freshwater inputs to Biscayne Bay; and Florida Bay nutrient inputs.

Determine historic trophic conditions within the Everglades.

Compare historical ecological conditions north and south of Tamiami Trail.

Determine impact on coral reefs due to changes in natural hydrology of the Everglades.

Determine the origin of long-term salinity variation in Florida Bay (e.g., climate, runoff, groundwater).

Present paleoecology data within the context of the Natural System Model (NSM) when applicable.

When presenting ecological models and their components, and paleoecological analyses of sediment cores, include associated levels of certainty.

Determine rates of sea level rise during the past several decades; use these data to forecast future rates, which can be incorporated into CERP implementation.

Document historical events and cyclic meteorological phenomena (e.g., hurricanes, el niño, la niña) and incorporate these within forecasting models.

Research Needs Relevant to Other Workshops Topics

Bathymetric data for southwest Florida and Biscayne Bay.

Create a Florida Bay circulation model/bathymetry for the year 2100 that considers sea level rise.

Model changes in precipitation that could occur due to CERP implementation.

Expand current ecological modeling efforts into southwest Florida.

Determine water levels and flows that allow both tree islands and the ridge and slough landscapes to exist.

Create estuarine/freshwater models for southwest Florida.

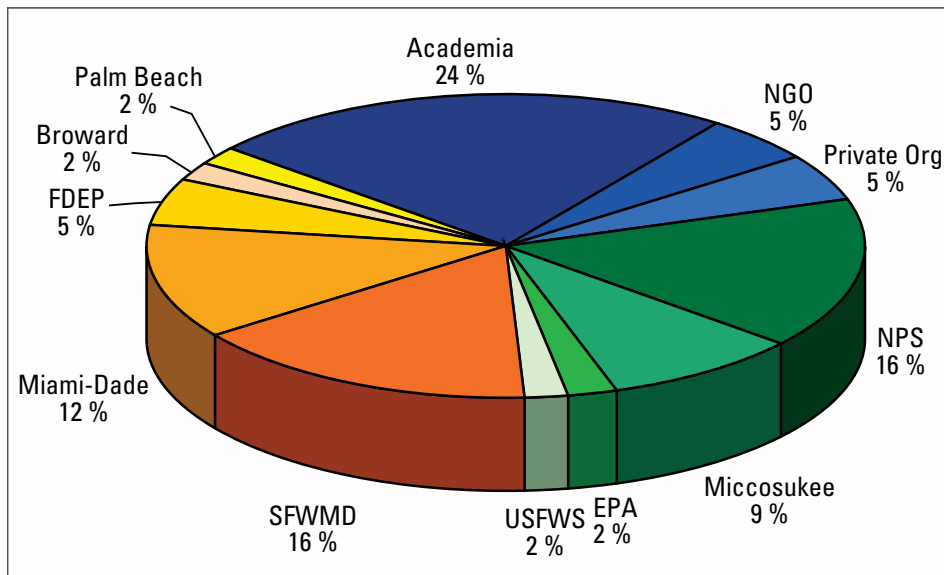
Determine the role of nutrients recycling versus introduced nutrients on coastal ecosystems.

For Further Information

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Participation by greater Everglades restoration partners during the 65-person Paleoecology and Ecosystem History Workshop (excluding USGS participants).