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quick facts on...

LILA

Physical Models for Everglades Restoration

APRIL 2008

The South Florida Water Management District *is a regional, governmental agency that oversees the water resources in the southern half of the state. It is the oldest and largest of the state's five water management districts.*

Our Mission *is to manage and protect water resources of the region by balancing and improving water quality, flood control, natural systems, and water supply.*

The Loxahatchee Impoundment Landscape Assessment (LILA) is a landscape-scale physical model developed by the South Florida Water Management District in collaboration with the U.S. Fish and Wildlife Service and the U.S. Army Corp of Engineers. LILA has been designed to provide researchers the ability to study the effects of water flow and water levels on various aspects of Everglades ecology (landscape features, wildlife, surface and ground water movement and quality) under controlled conditions. Returning the flow to the currently impounded Everglades Protection Area is one of the goals of the ecosystem restoration effort.

The collaborating agencies constructed the 80-acre model of the Everglades at the Arthur R. Marshall Loxahatchee National Wildlife Refuge in Boynton Beach, Florida, and is accessible to the public. Since 2003, this project has been helping scientists from around the world learn more about restoring the Everglades. Scientists and engineers use the project to test restoration techniques on a moderate scale before applying them to the large-scale Everglades ecosystem.

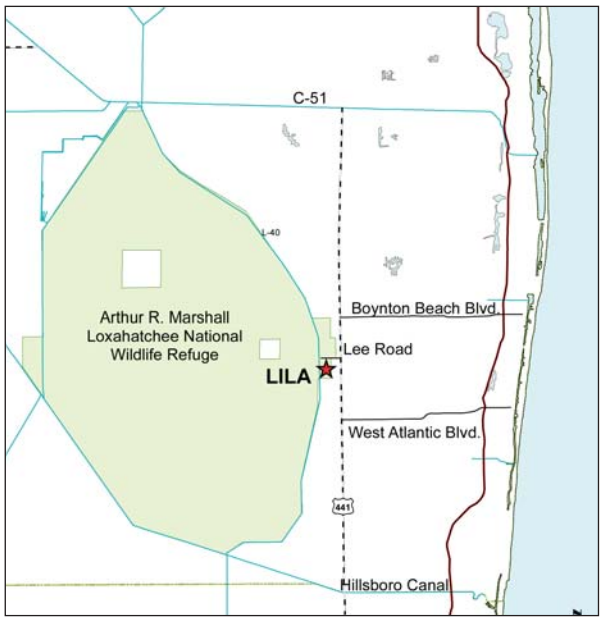
Aerial view of natural tree islands in the Everglades

The water levels at the site are continuously monitored by stage recorders. This information is available to the public through the SFWMD DBHydro web site: **http://my.sfwmd.gov/dbhydroplsql/show_dbkey_info.main_menu**

Flumes were installed in a LILA slough to allow researchers to examine the effects of flow on sediment movement.

Physical models are used in engineering and scientific research to provide insight on the response of some physical object to disturbance. Automobile and aircraft manufacturers build physical models prior to the construction of a prototype, to perform wind tunnel tests designed to examine the flow of air (wind resistance, drag, lift) on the form. In a similar way, scientists and engineers utilize scale models to provide insight into responses of components of the physical environment to perturbations on a landscape scale.

The four enclosed 20-acre marshes at LILA, called "macrocosms," make up a living laboratory. Each macrocosm contains tree islands, ridges and sloughs, three key habitats found in the natural system. Tree islands, the highest points in the marsh, support woody vegetation and are critical to the survival of both aquatic and terrestrial wildlife. Ridges are too wet for tree species and are dominated by sawgrass. Open water sloughs are at the lowest elevation and contain water lilies and other submerged aquatic plants that are critical for the survival of fish and other aquatic organisms. By providing different flows and depths using a system of culverts, canals and pumps, scientists can maintain specific conditions at LILA for their experimental designs in each macrocosm and study the effects of hydrology on erosion, accretion, vegetation and wildlife.



LILA (Loxahatchee Impoundment Landscape Assessment) at the Arthur R. Marshall Loxahatchee National Wildlife Refuge.

A LILA tree island (foreground) was planted with native trees to examine the impact of hydrology on tree survival and productivity, and the effects of tree density on ground water movement.

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