

Everglades project - Tree Island Research

Mandate: The Everglades Forever Act (EFA), Comprehensive Everglades Restoration Plan (CERP) and Minimum Flows & Levels (MFLs)

Background:

Within the matrix of wetland types that makes up most of the greater Everglades are small topographical highs tree islands, which historically have provided suitable habitat for a wide variety of terrestrial plants and animals. Urban sprawl, agriculture, water management, and restoration projects have affected the biogeochemical processes, biodiversity, and cultural use of tree islands. Tree island health is considered to be one of the best indicators of the overall health of the Everglades ecosystem. Tree islands remain somewhat of a mystery. Tree island research is needed to improve water management practices and to execute restoration efforts within the Everglades ecosystem.

Management Issue:

Flood control and water management measures implemented by the Central and Southern Florida Project in the late 1940s altered historic water patterns in the Everglades National Park and the Water Conservation Areas (WCAs). One of the most sensitive indicators of problems caused by modified water management practices have been changes in the physical and biological character of tree islands. In the early 1960s, the number of tree islands in portions of WCA 2A and the northern and southern portions of WCA 3A declined significantly (Shortemeyer 1980). In WCA 2A and the southern section of WCA 3A, tree islands were lost because prolonged high-water levels caused the death of tree species on these islands. Most of the tree islands in WCA 2A lost their trees and shrubs between 1950 and 1970 because of prolonged high-water levels. Prolonged low-water levels in the northern section of WCA 3A resulted in tree island destruction because peat fires removed as much as 25 cm of their peat, and this resulted in water depths too great for shrub and tree recolonization when these former islands were flooded. Therefore, tree islands may provide the best and surest measure of the overall health of the Everglades. And, if so, the maintenance of healthy functioning tree islands should be a primary consideration for determining appropriate water flows and levels in the future for the Everglades

Project Objective:

The studies proposed in the Tree Island Research Work Plan is focused on fixed tree islands. The work plan is focused on fixed tree islands, because there is very little published information about them and their development. This island type also appears to be the most common in Water Conservation Areas 2A, 3A and 3B as well as Everglades National Park.

The Tree Island Research Work Plan is composed of four basic kinds of studies: (1) collection and synthesis of all available information on tree islands; (2) studies on the origin, geomorphological characteristics and vegetation; (3) studies of the development and persistence

of tree islands and their vegetation; and (4) studies of the creation and restoration of tree islands. Collectively, these studies will enable the development of realistic models of tree islands that can be used to assess their health, reconstruct lost tree islands, or mitigate for any tree islands lost to changes in the hydrology of the Everglades.

The overarching goal of these studies is to provide the information needed to develop water management plans that will preserve existing tree islands in the Everglades and to develop a strategy for restoring tree islands destroyed by high water or fire. The information collected will also be essential for developing models of tree island development and fate.

The proposed studies will be a cooperative effort involving personnel from the South Florida Water Management District, Florida Game and Freshwater Fish Commission, U.S. Geological Survey, and various universities.

Summary:

Assuming that tree islands are important and given their potential use as indicators of appropriate water management, it is imperative that a comprehensive research program be initiated to study this crucial component of the Everglades. All hypotheses for this research program are grounded in the belief that the health of tree islands is the best indicator of the overall condition of the Everglades. Tree islands are the first to suffer during droughts and are the least tolerant to above normal water levels. By monitoring the health of tree islands, it will be feasible to adjust the hydrology of the Everglades through adaptive management, and thus, to ensure their persistence and restoration. Data collected and models developed as part of this plan of work are directly applicable to the Florida Everglades Forever Act (EFA) of 1993 and mandated research on Minimum Flows and Levels (MFLs) and the Comprehensive Everglades Restoration Plan (CERP). The work proposed will also provide the information needed about how best to implement the hydrologic regimes for various sections of the Everglades proposed by the Natural System Model (NSM) so that any threats to tree islands are minimized.