

THE PROBLEM

The Everglades of Yesterday were Defined by Water

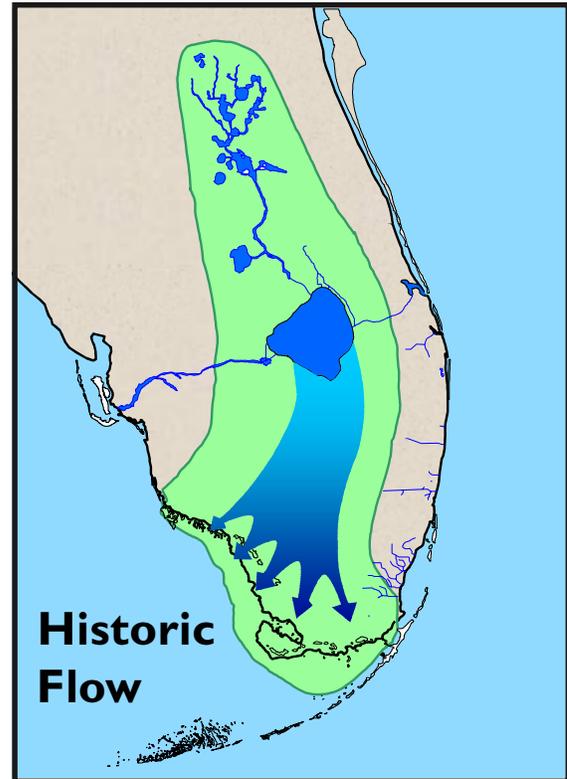
Why do we often talk about the Everglades of a hundred years ago? We need to understand how the Everglades functioned before they were drained and developed, beginning in the late 1800s. Of course, it's impossible to return the Everglades to that condition. But, understanding the form and function of the Everglades before they were significantly modified by people helps us better understand the current problems and possible solutions.

The landscape of the Everglades system was designed by nature to hold water. An eastern coastal ridge and a western inland ridge together formed a broad shallow valley sloping ever so slightly from north to south. South Florida has always been a naturally wet place, and the valley kept most rainfall within the Everglades.

Historically, rainwater from the Kissimmee Valley flowed south to Lake Okeechobee. The lake would periodically overflow its southern shoreline, and water would continue its slow journey through a 60-mile-wide shallow river flowing over the flat and level grasslands of the Everglades, eventually emptying into Florida Bay. Only a few small rivers flowed eastward through the coastal ridge. So, what made the Everglades unique?

We know that the three major characteristics that defined the historic Everglades - the "River of Grass" - were how the water flowed, the area's large size, and the variety of habitats.

Water connected the system, from top to bottom. The pace at which the sheet-like flow of water moved across the historic Everglades varied from months to years. Water that moved down the flat and level landscape flowed so slowly that, in effect, it was stored during one season for use in another. The Everglades' all-important long periods of natural flooding depended more on the ability to store water and its slow movement than on the immediate effects of rainfall. Because of the storage and slow flow in the natural



system, summer rains kept wetlands flooded and maintained fresh water flows to coastal estuaries well into the dry winter season. The enormous amount of storage made wetlands and estuaries less vulnerable to the rainfall that varies dramatically in time and place throughout south Florida.

The large area of the ecosystem provided a variety of wildlife habitats. In the mid-1800s, the wetlands of southern Florida covered an area of almost nine million acres. This was vast enough to support animals that had large feeding ranges or very special habitat needs. It produced an abundance of aquatic life, supported larger animals such as the Florida panther, and was big enough to repeatedly recover from the effects of hurricanes, fires, and other natural disturbances.

The Everglades' plants grew in a diverse mosaic of landscapes and seascapes. The Everglades were a complex system of plant life linked by water, and included expansive areas of sawgrass sloughs,

wet prairies, cypress swamps, mangrove swamps, and coastal lagoons and bays. This mosaic of habitat, in its vast area and with its unique water patterns, supported the continuing survival of animals under a wide range of seasonal and annual conditions.

Water is the key to restoration today. The current Everglades are only about half the size they were 100 years ago. While we cannot restore their historic size, we can restore many of the ways in which water was stored and flowed in the remaining area. Water — in the right place, at the right time, in the right quantity and quality — is a major necessary ingredient in the ecology that supports life in the Everglades.

Ecosystem Problems Center on Water

Some 50 years ago, when the people who lived in south Florida suffered through hurricanes and floods, droughts and fires, and when the region was expanding and growing, Congress authorized the Central and Southern Florida Project. This massive water management project was built to address flood protection and provide water to the people and agricultural lands. When the project was designed in the 1950s only about 500,000 people lived in the region, and it was estimated there might be two million by the year 2000. Today's population of about six million people is three times more than the project was designed to serve. This strains the ability of the built system to perform its intended functions. Also, until fairly recent times, we did not understand or appreciate as much about the natural environment as we do today, and the project has had unforeseen detrimental environmental effects.

Changes in water have caused many harmful changes in the natural environment. Over the past 100 years, excessive drainage of wetlands and changes in the natural variability of water flows have altered the Everglades wetland ecosystem on a regional scale.

Indicators of Ecosystem Problems

- 90-95% reduction in wading bird populations
- 68 plant and animal species are threatened or endangered
- 1.7 billion gallons of water per day on average lost through discharge to the ocean
- 1 million acres of the ecosystem under health advisories for mercury contamination
- Over 1.5 million acres infested with invasive, exotic plants
- Declining population levels of commercially and recreationally important fish species in the St. Lucie and Caloosahatchee estuaries and Biscayne and Florida bays
- Defoliation of seagrasses, fish kills and deformed fish within the St. Lucie estuary
- Continued reduction in number of birds initiating breeding in south Florida
- Repetitive water shortages and salt water intrusion

The remaining Everglades, and indeed the entire south Florida ecosystem, no longer exhibit the functions, richness, and area that historically defined the pre-drainage system. There have been substantial and irreversible reductions in the size of the ecosystem. Most of the negative changes in the ecosystem are a direct result of water management activities to control floods and provide for water supply. Today, discharges to the Everglades are often too much, or too little, and frequently at the wrong times of the year. An over abundance or scarcity of water affects plants and wildlife accustomed to the Everglades' historic range of water flows and levels. In addition, canals and highways that criss-cross the Everglades have interrupted its historic overland sheet flow.

Historically, most rainwater soaked into the ground in the region's vast wetlands. As south Florida developed, the canal system built over the past 100 years worked very effectively and drained water off the land too quickly. As a result, approximately **1.7 billion gallons of water per day** on average are discharged to the ocean and gulf. One conse-