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Why You Should Care About Everglades Restoration

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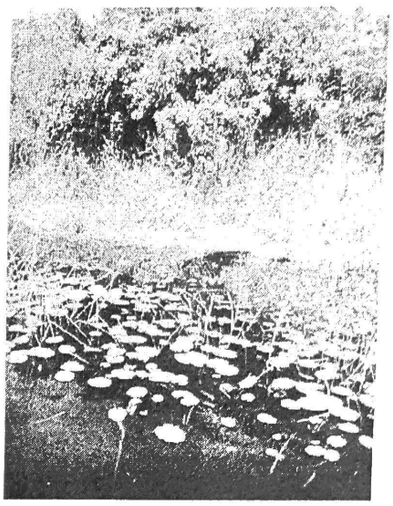
This week, the U.S House of Representatives passed a bill to move forward several Everglades restoration projects. According to Audubon Florida's Director of Everglades Policy Julie Hill-Gabriel, if the water resources bill becomes law, four Everglades restoration projects will be eligible for federal funding for the first time.



Okay, I get it. The only alligator you like is the one on your Lacoste polo shirt. Your favorite bird is either barbequed or fried. And you utterly despise mosquitos.

Why then, you ask, should you care about Everglades restoration?

Your water. The Everglades is the primary source of drinking water for more than 7 million Americans -- more than a third of Florida's population.

And the economy. The Everglades cornerstone of the regional economy, supporting the state's estimated $67 billion tourism industry, a $13 billion outdoor recreation economy, and $100 billion agriculture sector.

These sound like talking points, you say? Let's take a quick look at the history to understand how and why it matters.

Almost everywhere you go in South Florida used to be part of the Everglades. Miami International Airport? A wetland. South Beach? Mangroves. Weston? Well, take a look at what is just little west of there. When we talk about the "Greater Everglades," it refers to the ecosystem from the Kissimmee Chain of Lakes (close to Disney World), all the way south to Florida Bay by the Keys. Not just Everglades National Park in Miami Dade County.

Last century, conveniently after the invention of air conditioning and mosquito control, people started to settle in South Florida. After a few rainier than usual wet seasons and particularly nasty hurricanes in the 1940's, the Florida government asked the federal government for help to drain excess water off the landscape.

On this particular task, the federal government was quite effective. The project, known as the Central and South Florida Flood Control Project, transformed miles of wetlands into a regional water management system with thousands of miles of canals, thousands of levees and berms, dozens of pump stations and hundreds of water control structures and culverts. A gargantuan feat in human engineering.

The new water management system was so efficient that it drained too much water from the region -- water that otherwise would have gradually seeped into our aquifer to recharge public water supply and give life to the region's abundant ecosystems.

The severely altered ecosystem/man-made infrastructure remains today. During rainy periods, water is quickly flushed to tide. Approximately 1.7 billion gallons of water from the Everglades drains to the coasts each day. Conversely, this water is not available for use during dry periods.

This has some serious consequences for the region's ecosystem and economy. This summer, the St. Lucie and Caloosahatchee estuaries were hammered by large releases of water from Lake Okeechobee, leading to widespread devastation of these ecosystems. Prior to human alterations to the ecosystem, this water would have naturally flowed south. Sadly and ironically, in one or two years from now, the same estuaries may need water from Lake Okeechobee to help sustain their ecosystems during the dry season, likely at the same time agriculture and public water supply users will compete for water allocations.

Fortunately, at the turn of the new millennium, a new plan emerged. Encouraged by the unusual coalition of environmentalists, agricultural interests, and public water utilities, the Federal and State Governments embarked on a groundbreaking plan, known as the Comprehensive Everglades Restoration Plan (CERP), or just "Everglades restoration" for short. This effort is known as one of the largest ecosystem restoration projects in the world.

The plan sets forth more than 60 different projects to store water, clean water, and flow water through the system. It is projected to take several decades to complete. The plan aims to restore ecosystems, provide flood protection for residents, and ensure clean and abundant water supplies for South Florida's residents.

Thirteen years into the plan, we are slowly trudging along. There are a few Everglades restoration projects that are nearing completion. The Picayune Strand project, which restores wetlands on drained and on Florida's southwest region is nearly complete. This past March, the 1st mile of Tamiami Trail Bridge opened.

Where do we go from here? Finish projects. Get new ones authorized. And keep an eye toward adaptive management. No one said this was easy. Or cheap. Or that we would get it right all the time. But for our water, for our economy, and for our future, we must keep going.

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Managing Environmental Systems in the Florida Everglades

South Florida's vast Everglades ecosystem extends over 5,000,000 ha (12,400,000 acres). The region, which includes the Everglades and Biscayne Bay national parks and Big Cypress National Preserve, is home to many threatened and endangered bird, mammal, reptile, and plant species, including the Florida panther (*Puma concolor coryi*) and the Florida manatee (*Trichechus manatus latirostris*). The 400,000 ha (988,000 acre) subtropical wetland area for which the region is best known has been called a "river of grass" because a thin sheet of water flows constantly through it, allowing tall water-tolerant grasses to grow.

A hundred years of rapid human population growth, and the resulting need for water and farmland, have had a dramatic impact on the region. Flood control, dams, irrigation, and the need to provide fresh water to Floridians have led to a 30 percent decline in water flow through the Everglades. Much of the water that does flow through the region is polluted by phosphorus-rich fertilizer and waste from farms and other sources upstream. Cattails thrive on the input of phosphorus, choking out other native plants. The reduction in water flow and water quality is, by most accounts, destroying the Everglades. Can we save this natural system while still providing water to the people who need it?

The response of scientists and policy makers has been to treat the Everglades as a set of interacting systems and to manage the inputs and outputs of water and pollutants to those systems. The Comprehensive Everglades Restoration Plan of 2000 is a systems-based approach to the region's problems. It covers 16 counties and 46,600 km^2 (11,500,000 acres) of South Florida. The plan is based on three key steps: increasing water flow into the Everglades, reducing pollutants coming in, and developing strategies for dealing with future problems.

The first step—increasing water flow—will counteract some of the effects of decades of drainage by local communities. Its goal is to provide enough water to support the Everglades' aquatic and marsh organisms. The plan calls for restoring natural water flow as well as natural hydroperiods (seasonal increases and decreases in water flow). Its strategies include removal of over 390 km (240 miles) of inland levees, canals, and water control structures that have blocked this natural water movement.

Water conservation will also be a crucial part of reaching this goal. New water storage facilities and restored wetlands will capture and store water during rainy seasons for use during dry seasons, redirecting much of the 6.4 billion liters (1.7 billion gallons) of fresh water that currently flow to the ocean every day. About 80 percent of this fresh water will be redistributed back into the ecosystem via wetlands and aquifers. The remaining water will be used by cities and farms. The federal and state governments also hope to purchase nearby irrigated cropland and return it to a more natural state. In 2009, for example, the state of Florida purchased 29,000 ha (71,700 acres) of land from the United States Sugar Corporation, the first of a number of actions that will allow engineers to restore the natural flow of water from Lake Okeechobee into the Everglades. Florida is currently negotiating to purchase even more land from United States Sugar. In 2013, pilot projects for water storage in Lake Okeechobee were underway.

To achieve the second goal—reducing water pollution—local authorities will improve waste treatment facilities and place restrictions on the use of agricultural chemicals. Marshlands are particularly effective at absorbing nutrients and breaking down toxins. Landscape engineers have designed and built more than 21,000 ha (52,000 acres) of artificial marshes upstream of the Everglades to help clean water before it reaches Everglades National Park. Although not all of the region has seen water quality improvements, phosphorus concentrations in runoff from farms south of Lake Okeechobee are lower, meaning that fewer pollutants are reaching the Everglades.

The third goal—to plan for addressing future problems—requires an **adaptive management plan:**

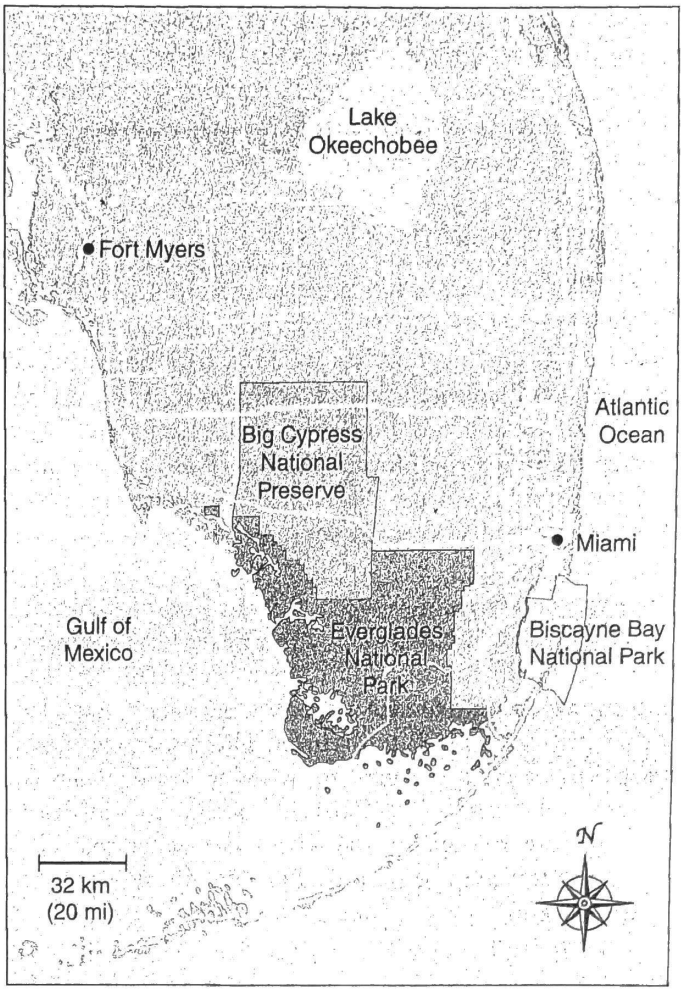
Adaptive management plan A plan that provides flexibility so that managers can modify it as changes occur.

River of grass. The subtropical wetland portion of the Florida Everglades has been described as a river of grass because of the tall water-tolerant grasses that cover its surface. *(Philip Lange/Shutterstock)*

a strategy that provides flexibility so that managers can modify it as future changes occur. Adaptive management is an answer to scientific uncertainty. In a highly complex system such as the Everglades, any changes, however well intentioned, may have unexpected consequences. Management strategies must adapt to the actual results of the restoration plan as they occur. In addition, an adaptive management plan can be changed to meet new challenges as they come. One such challenge is global warming. As the climate warms, glaciers melt and sea levels rise, so much of the Everglades could be inundated by seawater, which would destroy freshwater habitat. Adaptive management essentially means paying attention to what works and adjusting methods accordingly. The Everglades restoration plan will be adjusted along the way to take the results of ongoing observations into account, and it has put formal mechanisms in place to ensure that this will occur.

The Everglades plan has its critics. Some people are concerned that control of water flow and pollution will restrict the use of private property and affect economic development, possibly even harming the local economy. Yet other critics fear that the restoration project is underfunded or moving too slowly, and that current farming practices in the region are inconsistent with the goal of restoration.

In spite of its critics, the Everglades restoration plan is, historically speaking, a milestone project, not least because it is based on the concept that the environment is made up of interacting systems.



The Florida Everglades Ecosystem. This map shows the locations of Lake Okeechobee and the broader Everglades ecosystem, which includes Everglades and Biscayne Bay national parks and Big Cypress National Preserve.

Critical Thinking Questions

1. Why are the Florida Everglades environmentally significant?
2. How does your understanding of the Florida Everglades change when you think of the Everglades as a set of interacting systems?
3. What are some adaptive management strategies utilized in the Florida Everglades?

References

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chapter 2

REVIEW

Throughout this chapter, we have examined environmental systems. Earth is one large interconnected system. Components of the system follow basic principles of chemistry and biology. Energy is an important component of these systems. Energy conversions are frequently used in systems analysis. Natural systems change over space and time and humans are sometimes major actors in causing system change.