

Essential #4

Provide for large wet year flows from Lake Okeechobee to the Everglades

The Problem

Historically, water from Lake Okeechobee spilled out into this vast wetland, which then flowed into the areas known today as the Water Conservation Areas. The primary reason for diverting the water from Lake Okeechobee to the St. Lucie and Caloosahatchee estuaries was to create the Everglades Agricultural Area (EAA). If the connection between the Lake and the Everglades is ever to be re-established to relieve the need for discharges to the estuaries, water from Lake Okeechobee must be passed through the EAA.

- **How much water from Lake Okeechobee can be sent southward?**
- **What will it take to clean up the polluted Lake water before it reaches the Everglades?**
- **What is the best way to convey the water from the Lake to the Everglades?**

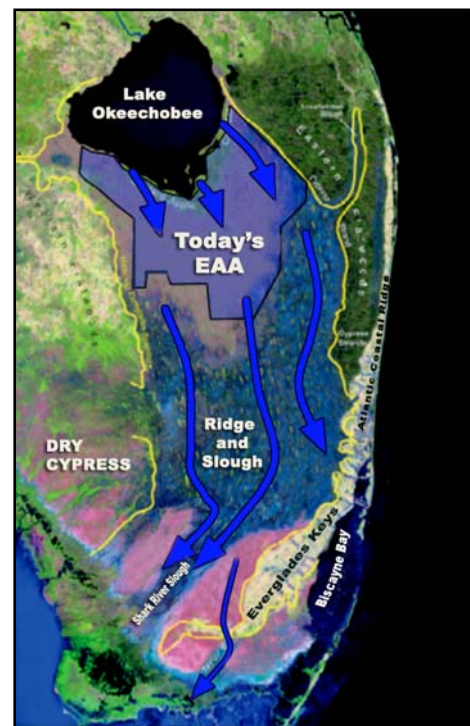
The Solution

By employing the same modeling simulations that agencies use to examine those three key questions, Foundation scientists have determined that the amount of water that can be sent to the Everglades depends upon how much of the barriers to sheetflow are removed (Essential #6).

CERP only plans to partially remove the barriers and will send very little water from the Lake to the Everglades during wet years. CERP relies heavily on a system of Aquifer Storage and Recovery (ASR) wells to store the water underground instead of having it flow through the Everglades.

However, if the recommendations in Essential #6 are implemented, an estimated 1.25 million acre-ft of water could be moved from the Lake through the Everglades during wet years. This would decrease the need for ASR well and other storage by up to 40 percent.

Unfortunately this water is excessively high in nutrients, with phosphorus concentrations in Lake Okeechobee that are currently more than 15 times higher than suitable for the Everglades. And because Lake Okeechobee has amassed some 200 million cubic meters of polluted mud that covers roughly half the Lake's bottom, it is predicted that pollution levels in the Lake will remain above the phosphorus goal for decades after inflow water quality goals are met.



Historically water flowed generally in a southerly direction from Lake Okeechobee to Florida Bay unimpeded by the canals and dikes currently present.

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The Solution continued...

Water from the Lake will need treatment to remove pollutants before sending to the Everglades-- and treating this water to acceptable levels of nutrients will require doubling the current number of Stormwater Treatment Areas (STAs) by using an additional 45,000 acres.

How best to convey the water, depends on perspective. From a strictly engineering viewpoint, “best” is a canal, which has no ecological value but is efficient at moving water. From an ecological perspective, “best” is a full recovery of the pre-drainage wetland function, both hydrologic and ecologic. The Everglades Foundation is committed to finding a cost-effective solution, one that considers system-wide environmental benefits.

Providing for large wet year flows from Lake Okeechobee to the Everglades will require:

- The construction of an additional 45,000 acres of additional STAs in the EAA.
- The removal of the barriers to flow including canals, levees, and other water management structures in Water Conservation Area 3A (Essential #6). This will accommodate the movement of up to 1.2 million acre-ft from Lake Okeechobee into the Everglades during wet years, and cutting the total storage need by up to 40 percent.
- The construction of a cost-effective conveyance system that improves ecological function while moving large water volumes during wet years.
- Developing a means to remove or treat Lake Okeechobee's mud center to accelerate water quality improvements and reduce cleansing demands on other water quality features.



Alligator tracks wander across the exposed mud in Lake Okeechobee during the drought of 2007

Essentials #3, #4, #5

*Construct the requisite storage and flow
to restore the Everglades, the estuaries, and Lake Okeechobee*

The Background

When the southern reaches of the Hoover Dike were completed around Lake Okeechobee in 1933, the Everglades lost most of its water supply. Without water from Lake Okeechobee's watershed, the Everglades became much drier, causing reduced productivity in Florida Bay as well as in the Gulf Coast estuaries.

Water that historically flowed south was directed to the east coast by the St. Lucie River and the west coast by the Caloosahatchee River. This caused the coastal estuaries to bear the brunt of huge amounts of damaging fresh water releases from Lake Okeechobee.

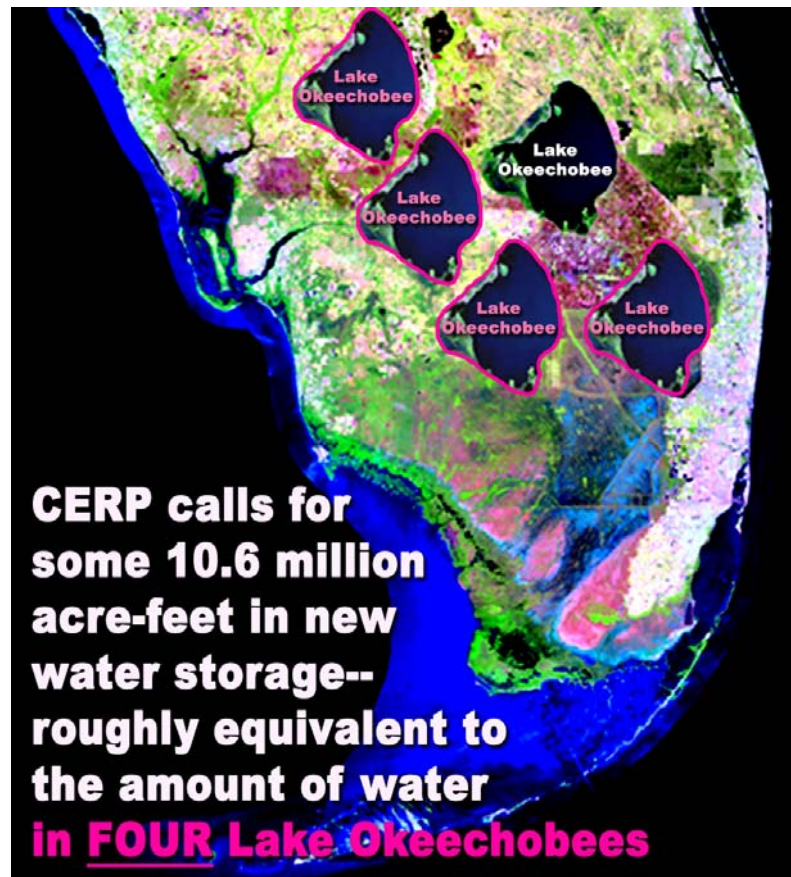
Decades of relentless drainage of the Everglades marshes coupled with lowered Lake Okeechobee water levels has decreased the amount of space available to store water--the amount of water the natural systems need to get them through the dry season, and through times when rainy season does not bring its usual bounty. As a consequence of not being able to save water, the remnant Everglades ecosystem is very susceptible to floods and droughts.

If the Everglades is to survive, the storage that was inherent in the vast spatial extent of its natural wetlands must be recovered. This need to store additional water is of paramount importance to the Comprehensive Everglades Restoration Plan (CERP).

CERP calls for huge increases in storage--some 10.6 million acre-feet in new storage which is roughly equivalent to the amount of water in four Lake Okeechobees.

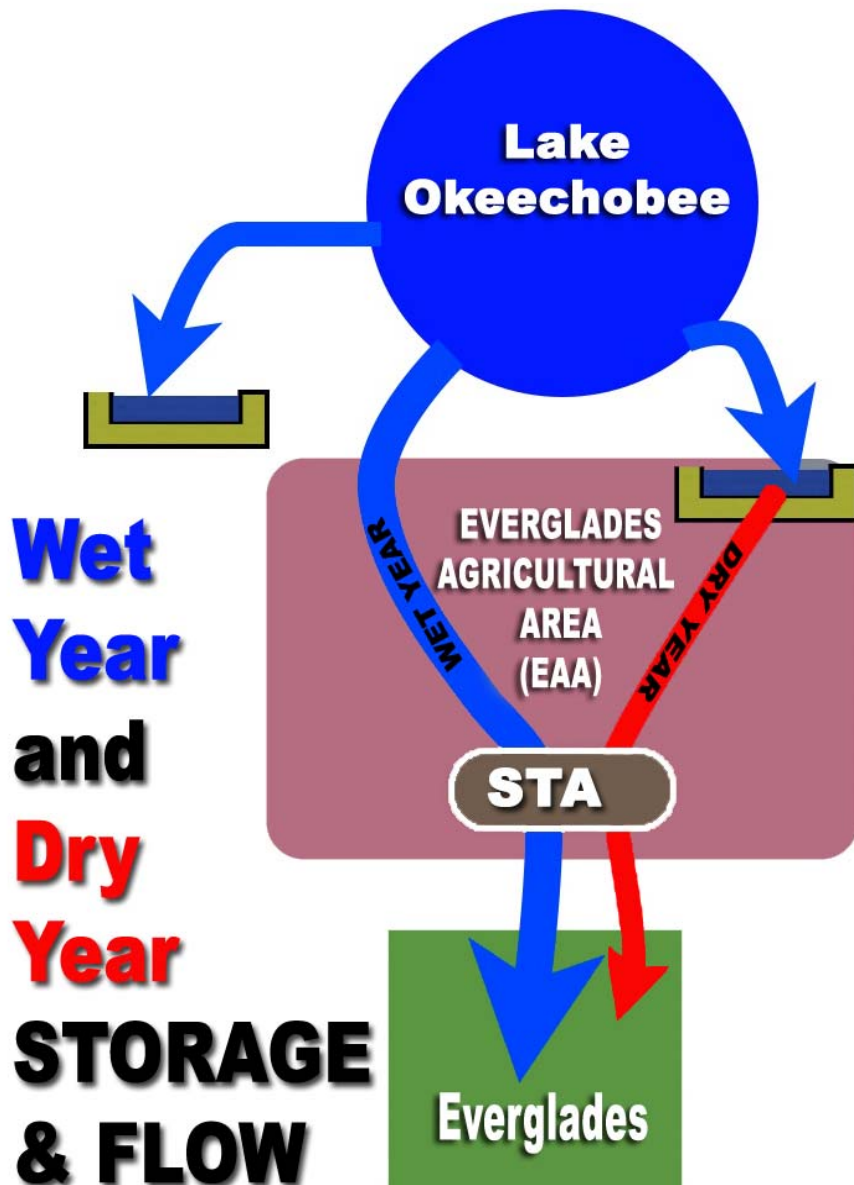
The fate of CERP relies on the plan's ability to provide this storage. Yet the 2000 plan suggested that 90 percent of this new storage could be provided by Aquifer Storage and Recovery (ASR) wells. Beyond the ASRs, CERP also planned to store another 3 percent of the water necessary in "reclaimed" rock mines.

Today both technologies are recognized as extremely risky and of highly uncertain feasibility. Long-promised ASR contingency plans have not been delivered by the State and federal partner agencies; Essentials #3, #4, and #5 propose just such a contingency plan.



Essentials #3, #4, #5

Construct the requisite storage and flow to restore the Everglades, the estuaries, and Lake Okeechobee



The Key Concept

The concepts of storage and flow are linked.

During wet years, THREE ACTIONS must occur:

First, store sufficient water in a surface reservoir to supply the Everglades with enough water during droughts. (Essential #3)

Second, after treating the water to remove pollutants, send as much water from Lake Okeechobee as possible to the Everglades. (Essential #4)

And finally, construct enough additional storage to prevent damaging discharges to the estuaries, and use this water for drought supplies to the Lake and for other water needs. This is the operational strategy that minimizes storage need, but restores the estuaries and the Everglades. (Essential #5)