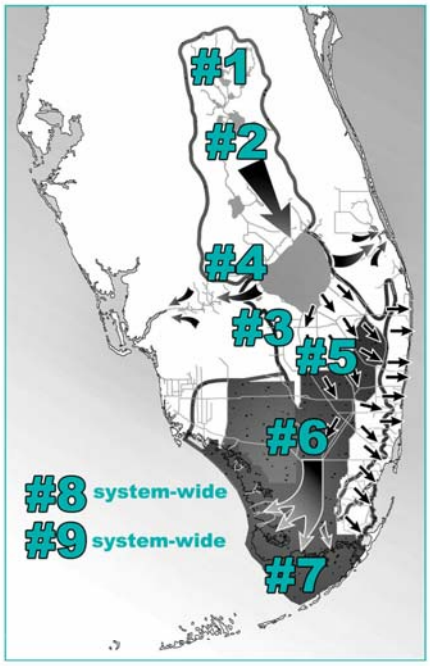


Both the Everglades Foundation's Environmental Advisory Council (EAC) and the Everglades Coalition have identified these nine restoration *"essential benchmarks"* that must be achieved if the Comprehensive Everglades Restoration Plan (CERP) is going to deliver benefits as it originally promised...

#1 Improve and protect water quality

#2 Restore the Kissimmee River

#3 Provide adequate water storage for the ecological needs of Everglades National Park and the Water Conservation Areas (WCAs)

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

#5 Provide additional water storage to protect the estuaries and Lake Okeechobee

#6 Restore historic sheet flow in the Everglades (*"Decompartmentalization"*)

#7 Restore the southern Everglades and Florida Bay

#8 Prevent development that undermines the Greater Everglades Ecosystem protection and restoration

#9 Restore the federal-state partnership

The Essentials for Everglades and Estuary Restoration

Seven years after the passage of the Water Resources Development Act of 2000 (WRDA 2000) approving the Comprehensive Everglades Restoration Plan (CERP), the Everglades ecosystem remains in deep trouble. The wetlands that define the fragile Everglades ecosystem have been joined in their distress by the estuaries on both coasts--badly damaged by the flood and drought cycle that overwhelms them with fresh water and later denies them of fresh water. Without the historic Everglades, there is no place to store the water that falls in high rainfall years. Because of this inadequacy, the modern flood control system of drainage canals discharge billions of gallons of precious fresh water into the Atlantic and Gulf.

The coastal estuaries, like the Everglades, are further damaged by our failure to address water quality issues--particularly north of Lake Okeechobee, and in the Lake itself. This failure has meant that water that can be stored by the existing system for distribution is loaded with nutrients--pollutants that neither the internal wetlands nor the estuaries can absorb without drastic changes to the health of native plants and animals.

In short, despite passage of WRDA 2000, and hundreds of millions spent thus far to implement the Everglades portion of it, little progress has been made on the ground in dealing with the problems of unacceptable water quality, blocked sheetflow, and inadequate storage.

Scientists in government and in the environmental community have been engaged for years in diagnosing these problems and determining science-based answers. For the past year the Everglades Foundation has been joined by a wide spectrum of national, state, and local environmental groups who have been testing and refining proposed solutions. These groups include:

Audubon
Audubon of Florida
Clean Water Action
Collier County Audubon
Conservancy of Southwest Florida
Defenders of Wildlife
Everglades Coalition
Everglades Foundation
Everglades Law Center
Everglades Trust
FL Oceanographic Society
Florida Wildlife Federation
National Parks Conservation Association
National Wildlife Federation
Natural Resources Defense Council
Rivers Coalition
Sanibel-Captiva Conservation Foundation
Sierra Club Foundation
Tropical Audubon Society
World Wildlife Fund

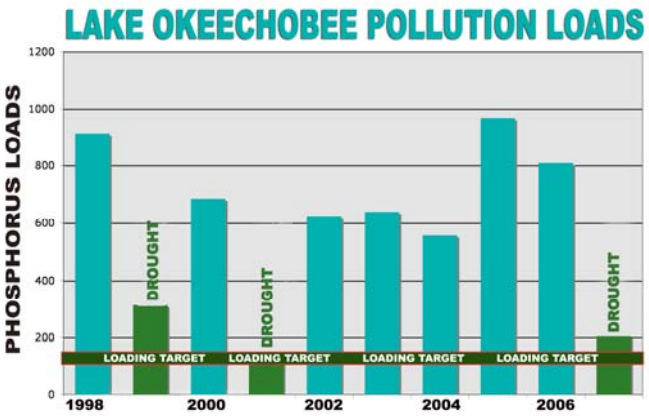
These partner organizations have met individually and together in plenary sessions throughout 2007 to complete **The Essentials of Everglades Restoration--*the steps that MUST be taken if the Everglades and estuaries are to be restored and conserved…***

Essential #1

Improve and protect water quality

The Problem

Polluted agricultural runoff and stormwater from expanding urban areas is unraveling the fabric of the Greater Everglades ecosystem. The natural functions of the Everglades that make it the most biologically diverse ecosystem in North America involve large amounts of water that is naturally low in nutrients and driven by abundant sunshine and rainfall. Nutrient-laden runoff disrupts nutrient cycles and causes dramatic imbalances in Everglades native flora and fauna.



The most serious water quality problem facing the greater Everglades and the coastal estuaries is the pollution of Lake Okeechobee. Nutrient loads far exceed state-mandated levels and "choke" the Lake with nutrients. These nutrients remain in the Lake for decades, causing algae blooms and other indicators of profound imbalances. Phosphorus levels in Lake water now exceed 150 parts per billion, about 3.5 times recommended levels.

These kinds of pollution levels are not only deadly to the Lake, the Lake's polluted water is also discharged south into the southern Everglades—as well as to the Atlantic estuaries by way of the St. Lucie River, and to the Gulf of Mexico estuaries by way of the Caloosahatchee. At all three discharge points, the Lake's polluted water is linked to serious degradation of these ecologically productive and economically valuable systems.

The pollution in the Lake has been an issue since the late 1970s. The 1973 state legislature authorized the *Special Project to Prevent the Eutrophication of Lake Okeechobee*. The project's 1976 *Final Report* made extensive recommendations to limit nutrient pollution into the Lake. Other than the Kissimmee River Project, most of the *Final Report's* recommendations were never implemented. In 1983, the South Florida Management District attempted to deal with pollution levels in the Lake by sending much of the polluted water to the Everglades--triggering almost two decades of litigation. More than $1.8 billion has been invested in clean-up, but the toll on the Everglades has been incalculable.

Recent scientific data indicates the damaged areas of the Everglades continue to expand. More than 25 percent of the remaining Everglades has been damaged by excessive nutrient pollution— a 40 percent increase in just 10 years. Clearly, improvements are needed in the treatment of this nutrient-laden runoff prior to introducing it into the Everglades.

Essential #1

Improve and protect water quality

The Solution

The water quality problems facing Lake Okeechobee are daunting. The aggressive strategy to address this long-neglected problem involves the following actions:

- **Implement the proposed Best Management Practices (BMPs) in the Lake Okeechobee watershed, including the upper Kissimmee Chain of Lakes.** BMPs are types of structures and techniques that farmers or developers use to reduce on-site pollution. *The Lake Okeechobee and Estuary Recovery Plan* suggests some excellent BMPs that should be realistically implemented. This BMP program also needs to be expanded to include innovative ways to decrease phosphorus use, decrease its mobility, and improve recovery of already-applied fertilizer.

- **Purchase land and construct additional Stormwater Treatment Areas (STAs) in the Everglades Agricultural Area (EAA); and strengthen special Best Management Practices (BMPs) in the EAA.** The evidence is abundantly clear that additional water treatment areas are necessary to remove the pollution from runoff water leaving the Everglades Agricultural Area. An additional 45,000 acres of STAs will be needed to treat the expected flows from the Lake to the Everglades *(Essential #4)* The BMP Program in the EAA is 15 years old and is in urgent need of refinement and strengthening. Monitoring the BMP performance suggests several of the most successful BMPs, now voluntary, should be mandatory.

Stormwater Treatment Areas (STA) are manmade marshes designed to remove phosphorus and other pollutants from the water column. The Essentials document that almost double the acreage proposed in CERP will be needed for STAs in order to treat all of the water.

- **Begin the construction of STAs in the Lake Okeechobee Basin.** Constructing water treatment areas north of the Lake is more complex than in the EAA. Still, if we infer from the experience of the existing treatment areas in the EAA, it is reasonable to predict more than 100,000 acres of STAs could be needed. The South Florida Water Management District should begin addressing this reality by identifying locations, purchasing lands, and constructing feasible STAs--beginning with the STA features identified in the *Lake Okeechobee Watershed Project.*

- **Develop a long-range plan that will achieve the targets required in the Lake Okeechobee Recovery Act of 2000.** The Northern Everglades Act of 2007 once again calls for the South Florida Water Management District to spell out the action steps the State will be taking to meet specific target goals to reduce water pollution. The State is developing a plan, but a clear roadmap for getting to the pollution goals will be necessary if pollution goals will actually be met.

Essential #1

Improve and protect water quality

The Solution continued…

- **Invest in new technologies and studies to address other types of water pollution beyond phosphorus.** While phosphorus levels in Everglades water is of primary concern, other types of pollution also threaten the Everglades and estuaries. New research on reducing mercury, nitrates, and other substances like herbicides and pesticides must be implemented.

- **Limit water quality degradation associated with new developments in the Everglades watershed**. New development must be designed with assurances that their stormwater is managed and retained on-site whenever possible, and that appropriate treatment will prevent any further degradation to water quality. This will require significant additional water storage in each new development project.

- **The South Florida Water Management District should inventory and model the entire range of public and private canals and water control structures in the Lake Okeechobee Basin.** The District should then institute a project to place control structures in uncontrolled canals and ditches to restore more natural groundwater levels, and when possible, recreate shallow marsh wetlands in cooperation with landowners. Specifically, surface water quality control efforts should be incorporated into restoration efforts related to water storage features within the *Upper Chain of Lakes Headwaters Revitalization Project,* Lake Istokpoga's watershed, and the more recent Northern Everglades initiative.

Above: Under phosphorus enrichment cattails outcompete and replace sawgrass, forming dense stands of vegetation that impede water flow and reduce habitat quality.

Right: Recreating a more natural timing and distribution of water will allow for a more natural annual wetting and drying cycle in the Everglades marshes, which will in turn provide improved habitat.

Essential #2

Restore the Kissimmee River Watershed

Restoration efforts on the Kissimmee River Floodplain have demonstrated that Everglades restoration is feasible and can be successful.

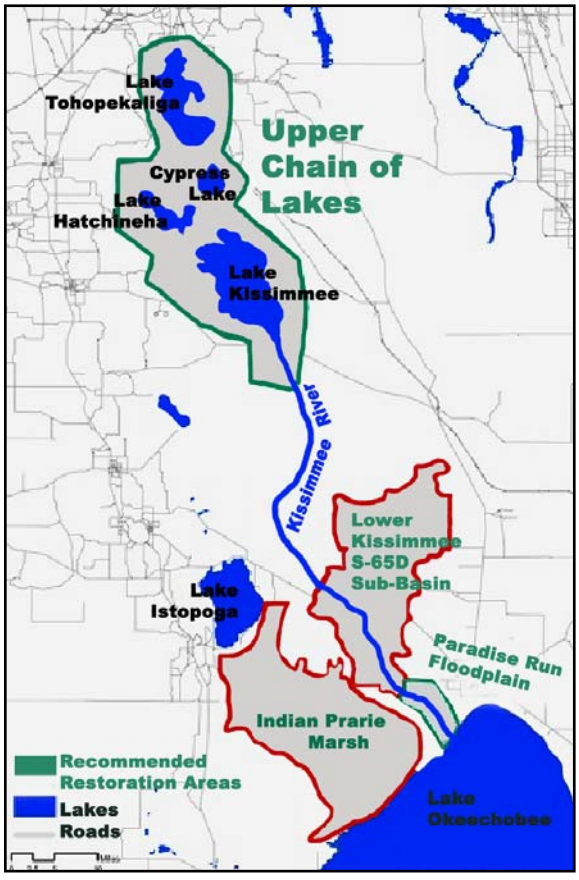
The Problem

Historically, the Kissimmee River flowed south from Lake Kissimmee to Lake Okeechobee over a 103-mile long shallow path. The meandering river was very shallow and created a vast floodplain up to two miles wide. Covering approximately 50,000 acres, this floodplain contained a diverse mosaic of wetland communities that supported birds, fish, and other wildlife. The Kissimmee River's meandering flow moderated high water and wet season flows, sequestering nutrients and sediments before releasing water into Lake Okeechobee.

But in the late 1960's, the Kissimmee was transformed into a 56-mile long ditch, eliminating two-thirds of the historical wetlands, and destroying valuable wintering waterfowl and fish habitats. The river's transformation also impacted the Upper Chain of Lakes—reducing their depth and forcing their flows into strictly regulated discharges sent rapidly into Lake Okeechobee. The folly of ditching the Kissimmee River was recognized almost the day it was completed, and the magnitude of the ecological catastrophe led to public outcry.

Three decades after the initial hearings and investigations by the Corps of Engineers, there has been real progress in reversing this disaster. Almost 22 miles of the middle section of the canal will be filled in, and about half of the floodplain will be restored. The recovery of wetland function has been much faster than expected, with rapid re-colonization by native plants and animals.

The Kissimmee River Restoration is a true Florida environmental success story three decades in the making. But much more can be done. The Kissimmee Valley remains one of the most pristine and beautiful natural areas in Florida. We need to act now to continue the restoration efforts, and make the Kissimmee Valley a lasting legacy.



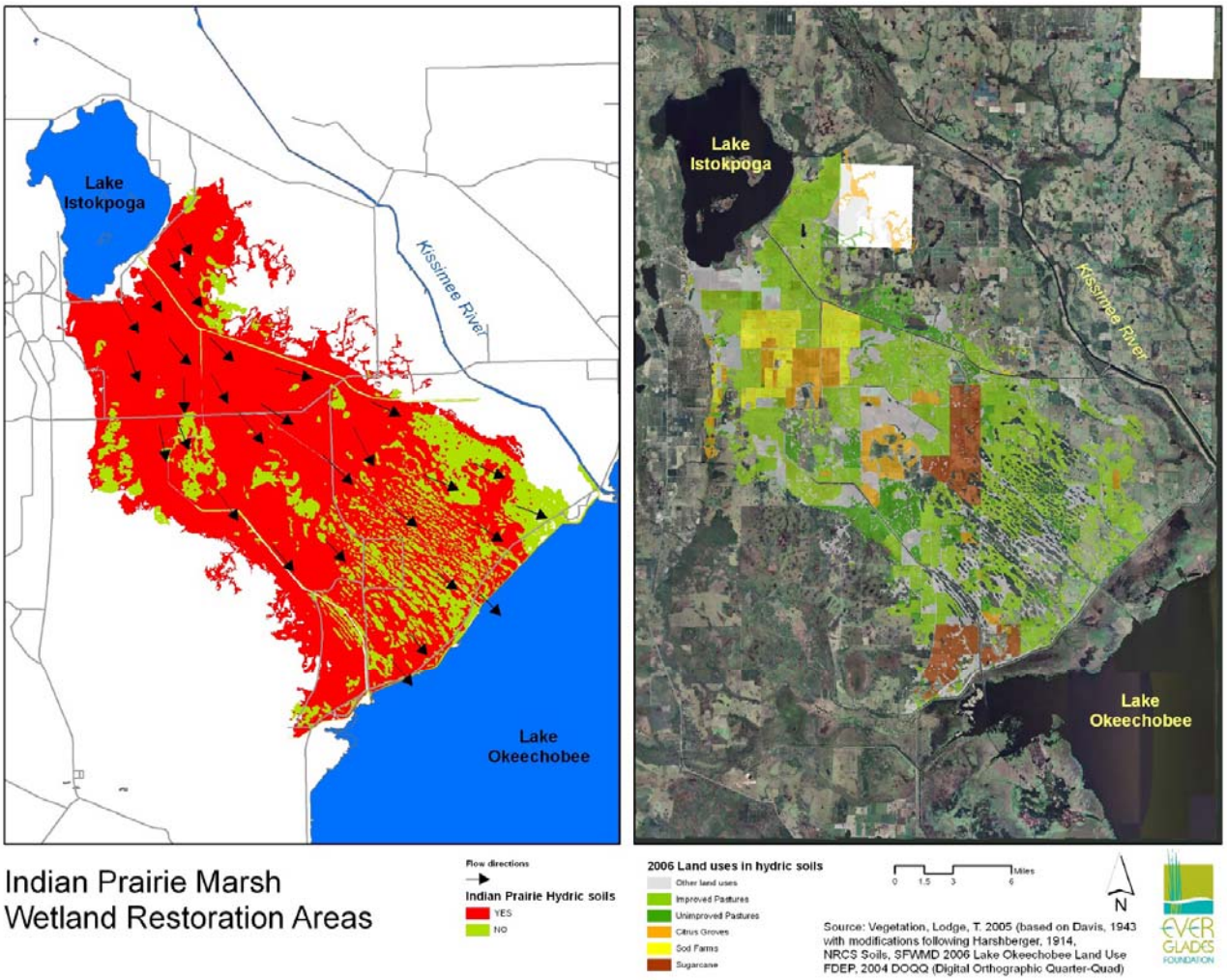
Essential #2

Restore the Kissimmee River Watershed

The Solution

The question is now *"Where should the restoration of the Kissimmee River basin proceed next?"* Watershed restoration in the lower basin, floodplain restoration in the lower Kissimmee River, and headwaters enhancements in the upper basin are key to the restoration of the Kissimmee River Watershed. These efforts include projects in four sub-basins--the Indian Prairie sub-basin, the S-65D basin, the Paradise Run reach of the lower Kissimmee River, and the Upper Chain of Lakes.

- **Improve wetlands in the Indian Prairie Marsh.** The area between Lake Istokpoga and Lake Okeechobee known as the Indian Prairie Marsh once functioned as a "mini-Everglades." 115,500 acres of former wetlands in this area have been identified that could provide functional water retention, and could become restored marshes. Degrading the northwestern section of the Herbert Hoover Dike would reconnect these wetlands with Lake Okeechobee, providing enormous habitat benefits.

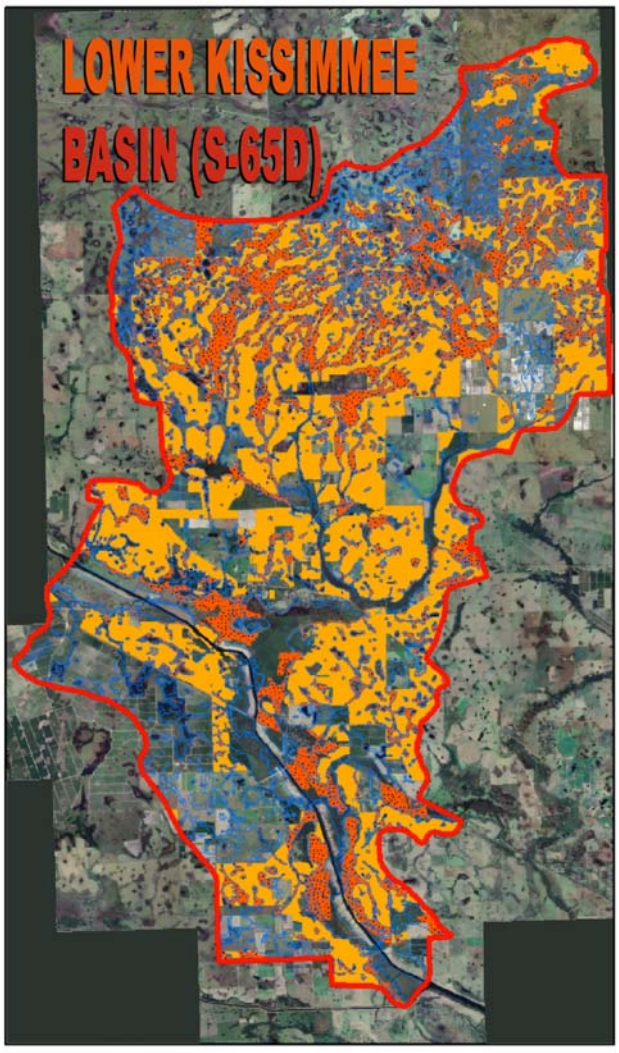


Essential #2

Restore the Kissimmee River Watershed

The Solution continued…

- **Work with ranchers in the S-65D basin to protect wetlands in the watershed.** Approximately 24,000 acres in the S-65D sub-basin represent pastures that have soils and elevations that would sustain wetlands. These lands (shown in orange below), are excellent candidates for conservation programs such as the Wetland Reserve Program, or other programs that offer incentives to rural landowners for providing water recharge and storage benefits on their property.



- **Restore the Paradise Run section of the Kissimmee River.** This is the last reach of the Kissimmee River before it empties into Lake Okeechobee. This section of historic floodplain could be restored much like the section further north, recovering an additional 10 miles of river and 3,950 acres of high quality habitat without requiring the expensive task of filling the C-38.

- **Improve hydrologic conditions in the Upper Chain of Lakes, including Lake Kissimmee, Lake Hatchineha and Cypress Lake.** These lakes are highly managed, and while there will be some improvements from the Headwaters Revitalization Project, additional changes are needed. The regulation schedules for the lakes and canals need to simulate the natural patterns of wetting and drying, and vary with the amount of rainfall. This effort will require the South Florida Water Management District to acquire more land and replace water control structures with more sophisticated equipment to hold additional water.

Essentials #3, #4, #5

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

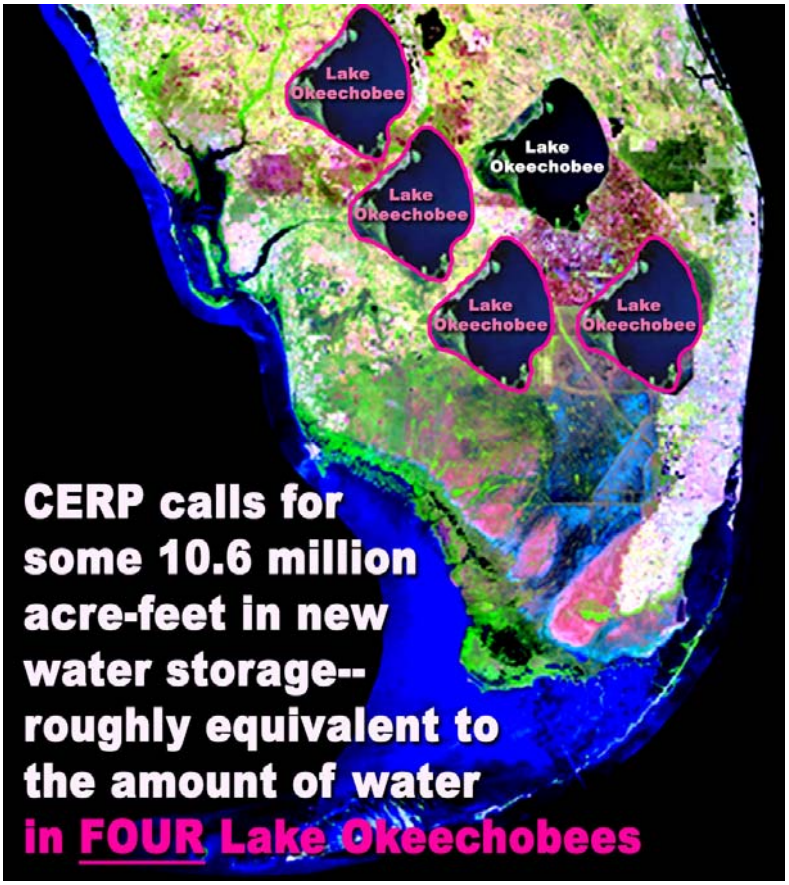
The Background

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.

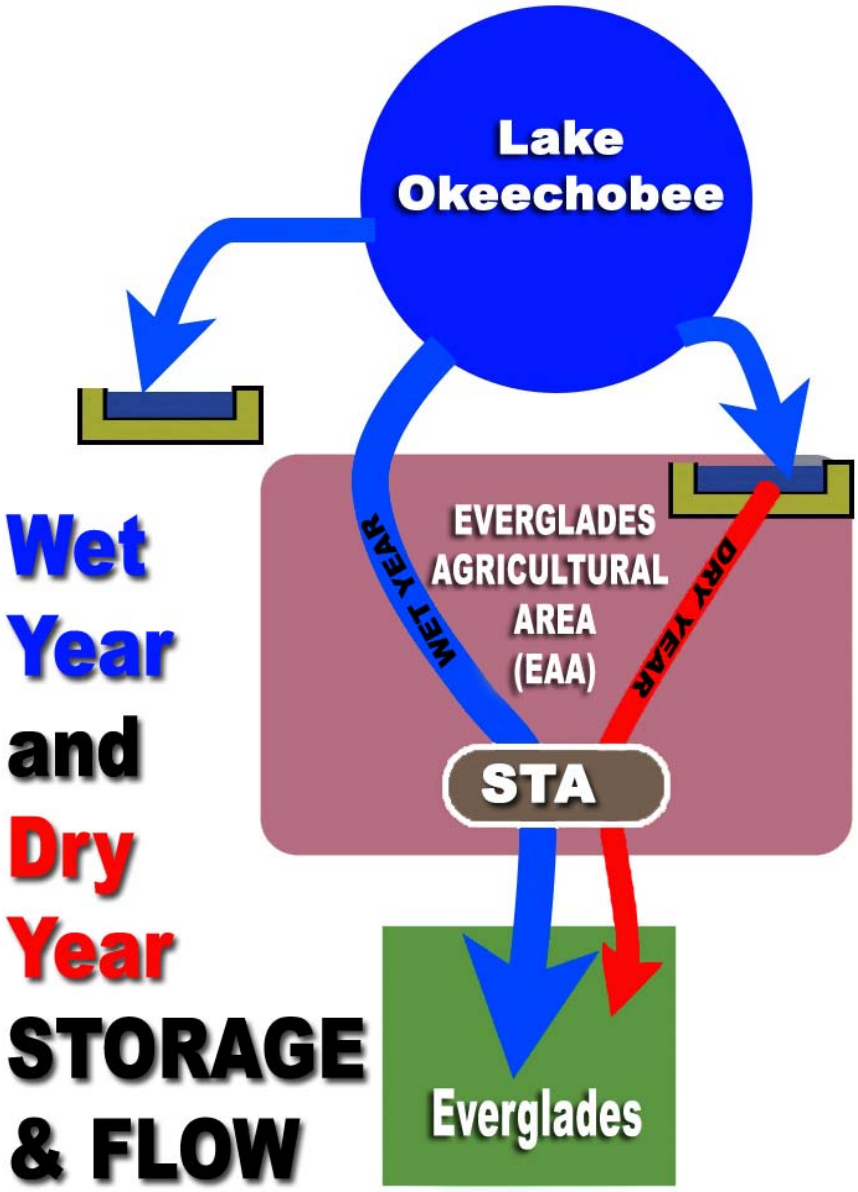


The fate of CERP relies on the plan's ability to provide this storage. Yet the 2000 plan suggested that 90 percent of this new storage could be provided by Aquifer Storage and Recovery (ASR) wells. Beyond the ASRs, CERP also planned to store another 3 percent of the water necessary in "reclaimed" rock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

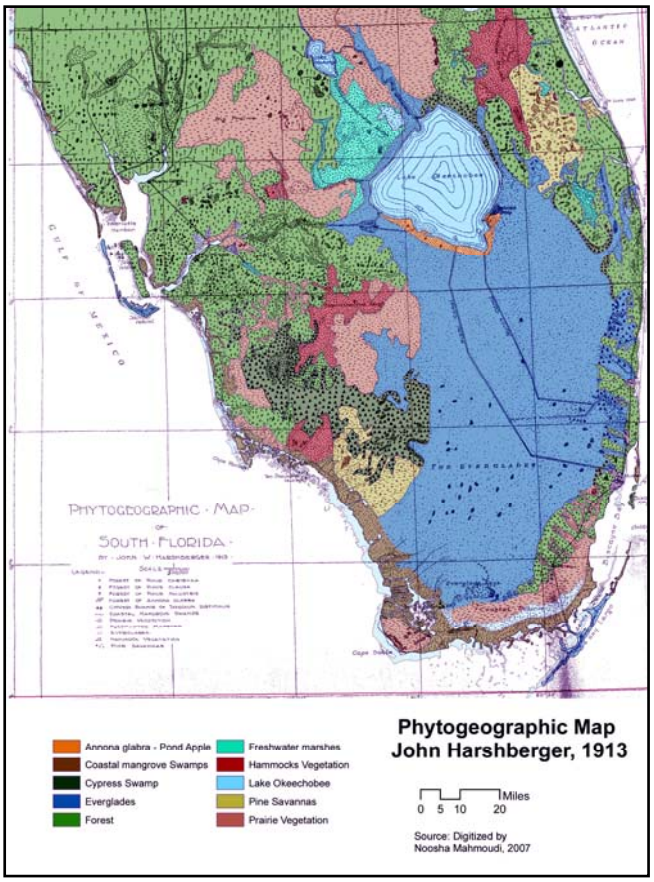
First, store sufficient water in a surface reservoir to supply the Everglades with enough water during droughts. (Essential #3)

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)

Essential #3

Provide adequate water storage for the ecological needs of Everglades National Park and the Water Conservation Areas (WCAs)



The John Harshberger Map of 1913 shows that the Everglades was a continuous wetland system from just north of Orlando to Florida Bay. Note the "mini-Everglades" north of the Lake on the western side.

The Problem

The Everglades used to flow as a broad, shallow sheet of water through a marsh roughly the size of New Jersey. This "sheetflow" was a defining characteristic of the Everglades.

One of the major engineering challenges to completing the Comprehensive Everglades Restoration Plan (CERP) is figuring out how to sustain the River of Grass during droughts--given that about half of the wetlands in the Everglades are gone, and the Lake is no longer as deep as it once was.

The Solution

Everglades Foundation computer simulations indicate that to maintain sheetflow and ecological function in the Everglades during droughts, approximately 1.5 million acre-ft of storage is needed. Moreover, a true cost accounting will show that the most reliable, lowest cost storage is a surface reservoir in the Everglades Agricultural Area.

This analysis indicates the need to:

- **Construct a 1.5 million acre-ft reservoir in the EAA** fed by releases from Lake Okeechobee during wet years that will supply water to the Everglades during dry seasons and droughts.
- **Implement a plan for full removal of barriers to sheetflow in Water Conservation Area 3 and Everglades National Park.** This would allow a natural drying pattern that would result in the greatest benefit to the Everglades.
- **Build seepage control features along the eastern side of the Everglades Protection Area.** Controlling the loss of water from seepage during droughts will help stabilize drying patterns during droughts.

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.

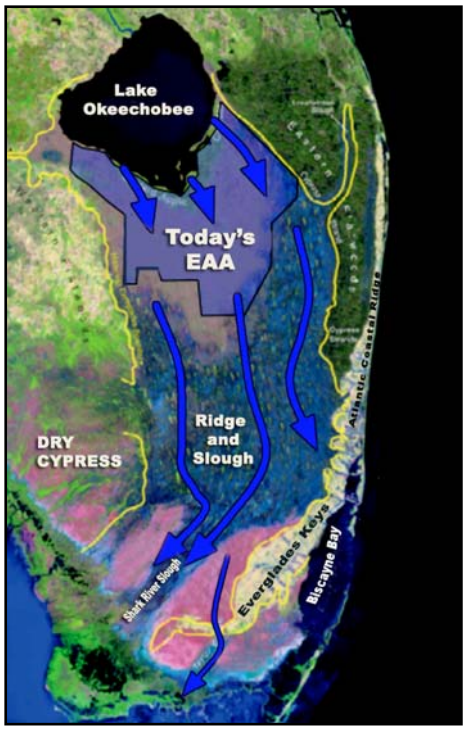
- ***How much water from Lake Okeechobee can be sent southward?***
- ***What will it take to clean up the polluted Lake water before it reaches the Everglades?***
- ***What is the best way to convey the water from the Lake to the Everglades?***

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.



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

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.

Essential #4

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

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 of Lake Okeechobee during the drought of 2007

Essential #5

Provide additional water storage to protect the estuaries and Lake Okeechobee

The Problem

The water issues surrounding Lake Okeechobee and the St. Lucie and Caloosahatchee estuaries are as complex and contentious as any in the country. When the southern reaches of the Herbert Hoover Dike was completed in 1933, outflows from the Lake to the Everglades were cut off--with all major releases sent to the St. Lucie and Caloosahatchee instead. During these destructive releases, plumes of nutrient and sediment-laden water from Lake Okeechobee are observed well into the Gulf of Mexico and the Atlantic Ocean. The pollution of Lake Okeechobee, which only gets worse with each passing year, has further aggravated the problems associated with these releases adding the threat of algae blooms, low dissolved oxygen levels, fish lesions, and a host of other maladies that damage these delicate estuarine systems and threatens the Everglades.

Large volumes of polluted water are frequently released into the St. Lucie Canal from Lake Okeechobee, in some instances causing large pollution plumes in the Atlantic Ocean.

Artificial manipulation of water levels within Lake Okeechobee started in the 1880s and continues today. Around 1913, water levels in the Lake dropped from around 22 feet above mean sea level to about 15 feet above mean sea level, primarily to provide flood control. As a result, large releases have been sent to the estuaries during wet years ever since. By maintaining Lake Okeechobee at these lower levels, the system has also lost its single largest place to store water in the Everglades. Attempts to establish a fishery in the Lake by maintaining low levels has been hampered by the highly variable inflows. These inflows also confound attempts to compensate for high nutrient levels in the Lake by holding the Lake at lower stages.

Adding to the environmental woes of the Lake are the operational rules, which are largely determined by flood control and water supply. An aging Herbert Hoover Dike has limited options for the Lake. Fearing a levee failure, the U.S. Army Corps of Engineers has opted for large and sustained releases to the estuaries.

As a result of trying to manage the Lake for various interests, no one is satisfied and these policies have created the “perfect storm” for a collapse of the Lake.

Essential #5

Provide additional water storage to protect the estuaries and Lake Okeechobee

The Solution

The answer to the problem of discharges to the estuaries and to the wild swings in Lake Okeechobee water levels is straightforward: ***More Storage***.

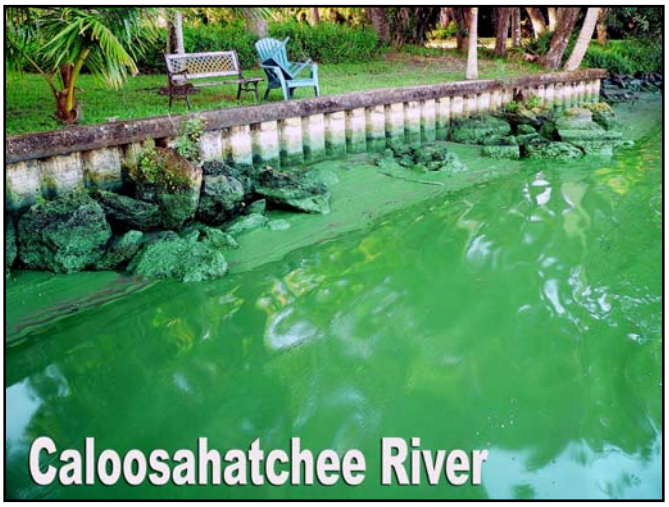
The Comprehensive Everglades Restoration Plan (CERP) proposed solving the storage issues in the Lake with Aquifer Storage and Recovery (ASR) wells, where water is pumped underground instead of diverted to the estuaries or the Everglades, and then recovered later. Recent simulations estimate Lake Okeechobee ASR storage at 5.4 million acre-ft--roughly 4.5 times the capacity of the Lake itself. Given the inherent risks with ASR at this massive scope, practicality would suggest looking at a variety of alternative solutions. These solutions, including deep reservoir technology, should be evaluated to assess cost, energy efficiency, and overall ecological benefits to the system.

This storage requirement can be significantly reduced by a few common-sense steps. First, send as much water as possible (after treatment) through the Everglades (Essential #4). Secondly, construct about 1.5 million acre-ft of storage for water supply in the Everglades Agricultural Area (Essential #3). Then, build about 2.8 million acre-ft of additional storage, near Lake Okeechobee, which will buffer lake stages (changes in water levels) and eliminate damaging discharges to the estuaries.

Unfortunately no single solution is likely to appear that will realize capacities of this magnitude. Therefore, several approaches are called for:

- **Increase natural wetland, groundwater, and lake storage in the Lake Okeechobee watershed.** Restoring wetland function to the wetlands in the Kissimmee River basin, the Lake Istokpoga basin, and Upper Chain of Lakes (Essential #2) will greatly ease the amount of water draining into the Lake from the north, easing the pressure on Lake levels that require estuary discharges.

  Hundreds of miles of private drainage ditches flow toward South Florida Water Management District canals with few modern water control structures. These ditches over drain the land and unnecessarily lower groundwater levels--sending the water toward Lake Okeechobee far too quickly. Inventorying, modeling, and modernizing this haphazard drainage system with



Discharges of polluted water from Lake Okeechobee into the Caloosahatchee Canal cause massive blooms of algae which in turn cause fish kills due to low oxygen levels in the water column

Essential #5

Provide additional water storage to protect the estuaries and Lake Okeechobee

The Solution continued…

new control structures could add millions of feet of storage. Additionally, programs to encourage and increase water storage on private lands should be pursued and implemented.

- **Consider a suite of storage options, including surface storage in the Kissimmee basin and in the Everglades Agricultural Area (EAA) south of the Lake.** Finding an effective and efficient storage solution will require constructing a storage feature along with an aggressive program to restore wetlands in the Kissimmee River Watershed.

- **Thoroughly examine the trade-offs of raising the level of Lake Okeechobee for additional storage.** The National Academy of Sciences review of storage options suggests that scientists investigate and report on the options and trade-offs related to Lake levels. Only then can an informed decision be determined.

- **Proceed with the repair of Herbert Hoover Dike.** The U.S. Army Corps of Engineers is supported in their efforts to rehabilitate Herbert Hoover Dike. The Corps also needs to be vigilant in controlling activities that undermine the integrity of this structure, or preclude future retrofits--such as incompatible land uses like rock mining and development adjacent to the levee.

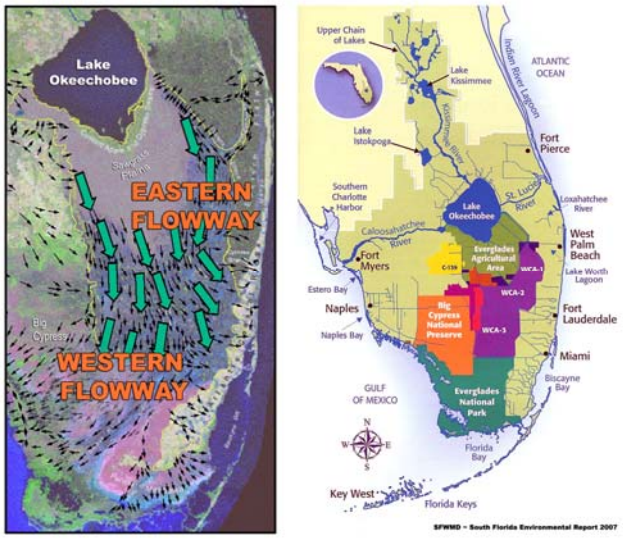
The Everglades Agricultural Area (EAA) is over 700,000 acres in size, equivalent to the size of Lake Okeechobee. Soil loss has dropped land elevations as much as 6 feet in the agricultural area, making it virtually impossible to recreate a natural flowway from the lake to the southern Everglades.

Essential #6

Restore historic sheetflow within the Everglades by removing artificial impediments to flow

The Problem

The concepts of storage and flow are linked, and during wet years three actions are needed. First, sufficient water must be stored in a surface reservoir to supply the Everglades with water during droughts (Essential #3). Next, as much water as possible needs to be treated to remove pollutants, and that water must be conveyed South to the Everglades.



The historic flow of the Everglades has been truncated by a series of canals and dikes that have compartmentalized the remaining Everglades' habitat.

While attempts to modify the Everglades landscape date to the 1800s, the construction of the Central and Southern Florida Flood Control Project starting in the late 1940s was unprecedented in scale. The Everglades, once a slow-moving, broad, shallow sheet of water was dammed and ditched until it became a series of reservoirs--with only the Everglades National Park remaining free-flowing. The flow of this sheet of water ("sheetflow") is recognized as one of the defining characteristics of the Everglades. Nearly all of the basic processes of the Everglades, such as nutrient cycling, wetting and drying patterns, fire, soil formation, and vegetation patterns are dependent on flowing water.

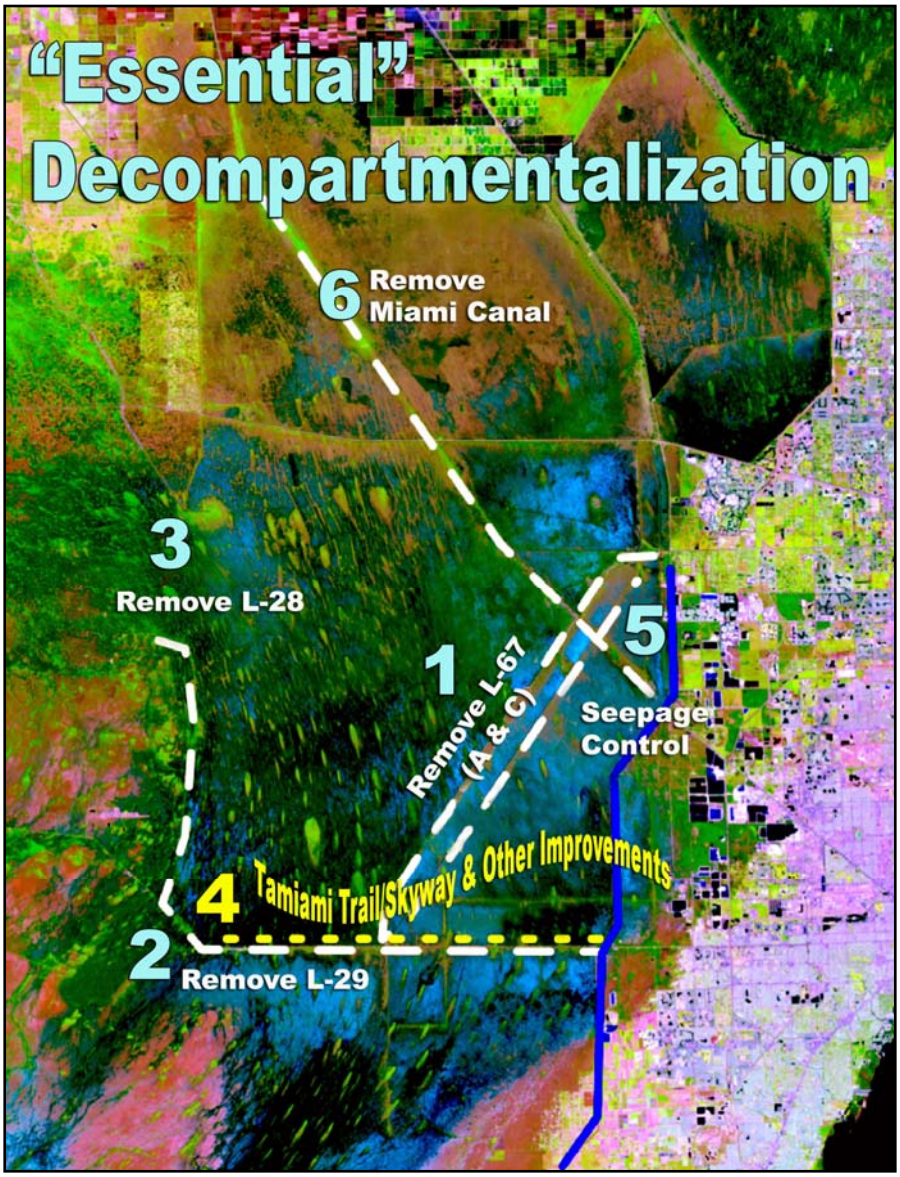
Not all of the remaining Everglades can be restored to a flowing sheet of water. But sheetflow can be recovered in the largest remnant tract of Everglades. By reconnecting the State-owned Water Conservation Area 3 to the federally-owned Everglades National Park, the southern-most piece of the River of Grass can be restored.

This recovery of sheetflow is especially critical to the St. Lucie and Caloosahatchee estuaries. Unless the barriers to sheetflow are removed, it will not be possible to put large, wet year flows from Lake Okeechobee into the Everglades. The only alternative is releases to the estuaries. Unless these dams and diversion canals are removed, large flows will simply pile up, obliterating the Everglades. The key to improving the health of the estuaries is the removal of these barriers.

The Everglades cannot be restored without restoring sheetflow. The Caloosahatchee and St. Lucie estuaries cannot be protected without restoring sheetflow. Freshwater flows to Florida Bay *cannot* be restored without restoring sheetflow.

Essential #6

Restore historic sheetflow within the Everglades by removing artificial impediments to flow



The goal of Decompartmentalization is to reconnect large segments of the remaining Everglades, allowing for sheetflow to once again be the predominant hydrologic feature.

The Solution

1. Remove the L-67A and L-67C levees and canals
2. Remove the L-29 levee
3. Remove the L-28 levee
4. Bridge the Tamiami Trail and remove the existing Tamiami Trail (SR 41) as an impediment to sheetflow
5. Implement seepage control along the east side of the Everglades
6. Remove the Miami Canal

Essential #7

Restore Florida Bay and improve Biscayne Bay by restoring sheetflow in the southern Glades

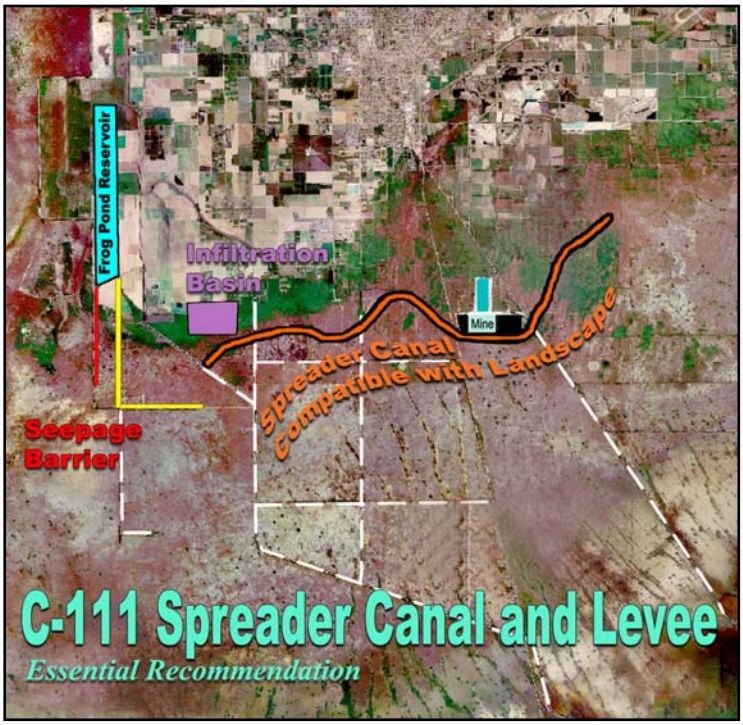
The Problem

Florida Bay and Biscayne Bay are among the most spectacular natural treasures anywhere on Earth. With almost all of Florida Bay within Everglades National Park and about half of Biscayne Bay within Biscayne National Park, they enjoy the highest level of national and international protection. Moreover, these bays contribute significantly to the local, tourism-based economies.

Still, Florida and Biscayne Bays have suffered tremendously from the changes to the water regimes wrought by the Central and Southern Florida Flood Control Project. In 1992, Florida Bay suffered a catastrophic algae bloom, killing thousands of acres of sea-grass. A similar bloom is occurring now. Biscayne Bay has also suffered a loss of its estuarine functions, and lack of freshwater has transformed it into a marine lagoon.

The Solution

If Florida Bay and Biscayne Bay are to be restored, the first step is to restore the upland and wetland systems they depend upon. The degree to which these wetlands can be recovered will determine the degree of restoration success. Therefore, the restoration focus should be the restoration of the wetlands that support both Florida and Biscayne Bay. This requires the following actions:



- **The construction of a C-111 North Spreader Project that restores the patterns of freshwater to Florida Bay.** This project should include a reservoir in the Frog Pond and seepage control near Everglades National Park; the removal of canals and levees that disrupt sheetflow; a spreader canal that follows the landscape (and does not simply repeat past mistakes with a new spreader canal); and, appropriate water quality treatment.

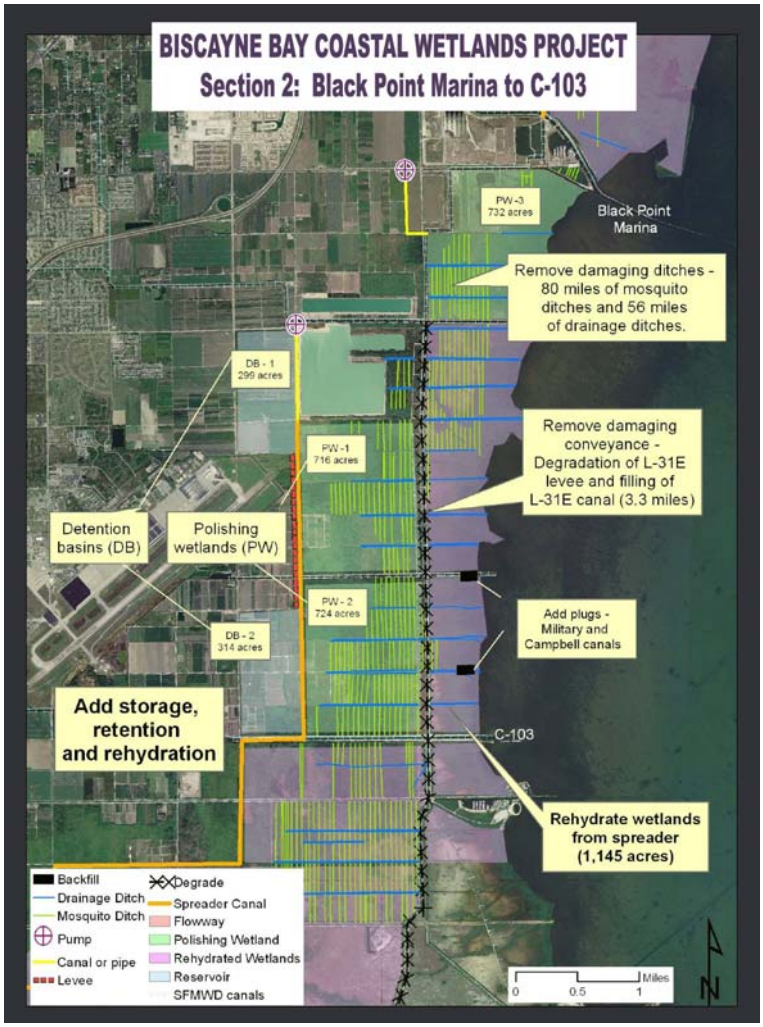
This project needs to restore the area where water enters Florida Bay, and the spreader canal needs to be designed to minimize the damage from the flood control system's stormwater releases from developed areas. To support this step, an estimated 12,000 acres of wetlands currently in private ownership will need to be acquired or secured through conservation easements.

Essential #7

Restore Florida Bay and improve Biscayne Bay by restoring sheetflow in the southern Glades

The Solution continued…

- **Implement a comprehensive strategy to secure the long-term management, restoration, and protection of the coastal wetlands upon which Florida Bay and Biscayne Bay depend.** The focus of restoration of the twin jewels of Florida Bay and Biscayne Bay should be the restoration of the wetlands that support them. The wetlands between Biscayne and Florida Bays (the Southern Glades and Model Lands) should be protected as a county or state preserve. A comprehensive plan that showcases this area as the portal to the Everglades and Biscayne National Parks and the Florida Keys must be developed to ensure the area contributes to the recreational, economic, and educational opportunities while preserving the natural values of the region. For instance, a regional visitor center and recreational trails connecting the region to both national parks will provide recreation, education, and economic opportunities for these strategically located open lands.



- **Build the Biscayne Bay Coastal Wetlands (BBCW) Project to address three primary goals--to restore the distribution of wet season flows; to reduce the timing of wet season flows into the dry season; and, to recover the wetland functions that contribute flows to the Bay.** The critical component that has been lost between the CERP formulation and the current planning process is water storage. BBCW needs to recover some of the storage provided by the coastal wetlands which have been lost to development. This is the only way to change the timing and distribution of flows into Biscayne Bay.

Essential #8

Prevent development that undermines the Greater Everglades

The Problem

While billions of dollars of taxpayer money will be required to protect and restore the Everglades and estuaries, all of the results achieved by these expenditures will be at risk if we do not address new development pressures taking place on the perimeters of the system.

South Florida's growing economy will require more water and land—creating the connected demand for higher levels of flood protection and drainage. Forecast scenarios expect a population growth of 71 percent—a population of 11 million people by 2030 in South Florida. The amount of urban land needed for this growing urban population has been estimated at 1 million acres spread out over the four south Florida sub-regions. Forty-seven percent of this new urban land is expected to be necessary to meet the needs of the Lower West Coast sub-region population.

The Solution

The primary tool available to address this problem is strict compliance with Florida's Growth Management Act. As a key Florida planning law, the Act requires local county and city governments to prepare comprehensive land use plans. State approval of these local comprehensive plans provides important control over local land use decisions that may impact (or benefit) greater Everglades restoration efforts.

In collaboration with the requirements of the State's Growth Management Act, county commissions and local municipalities need to take shared responsibility for Everglades restoration by accommodating restoration goals with their local planning decisions. The Florida Department of Community Affairs (DCA) must require consistency with Everglades restoration objectives through its review of all local government plans and plan amendments. DCA should amend Rule 9J-5 to attain this goal if it deems such an amendment necessary.

DCA must also evaluate the use of the Area of Critical Concern program under FS 380.05 to provide focused protection of state infrastructure (Everglades Restoration) and establish *Principles for Guiding Development* that protect Everglades resources. Other mechanisms employed successfully by DCA in different locations such as the "Wekiva Task Force" model should be considered for deployment in areas where development confronts and threatens Everglades restoration objectives.

Even under the strictest of growth management approaches, existing land use rights and land use values will surpass restoration efforts unless the State acts quickly to permanently secure more natural lands. An increased focus on the State's *Florida Forever* land acquisition program is recommended to make this a billion dollar-a-year initiative.

Essential #8

Prevent development that undermines the Greater Everglades

The Solution continued…

Rather than accommodating traditional urban sprawl, directives for new development should encourage the compact development and urban infill models of "Smart Growth." Specific examples of actions that have been or should be implemented include:

- Develop habitat-based designation of local plans, such as the "tier maps," in the **Florida Keys**.
- Maintain **Miami-Dade County's** current Urban Development boundary (UDB) until at least 2025.
- Discourage adverse mining activities and fragmentation of natural areas by new roads or urban development in **Palm Beach County**.
- Incorporate a regional vision for sustainable development in the comprehensive plans of **Lee and Collier Counties** that includes an Urban Service Boundary.
- Provide technical assistance to encourage the rural interior counties of **Okeechobee, Glades, and Hendry** to develop a regional vision for environmentally responsible development.
- Evaluate the effectiveness of programs such as the Rural Fringe Transfer of Development Rights, the Rural Lands Stewardship Area, and Private-Public partnerships and determine effective models that will help limit sprawl and accommodate growth in other rural areas such as **Hendry and Glades counties**.
- The rural character of the Kissimmee Basin must be retained by limiting development to strict urban growth boundaries. Rural Stewardship Area proposals should be considered--provided that they result in compact functional nodes of development, and guarantee 80 percent of more preservation and permanent agriculture on tracts 50,000 acres or larger. Conservation of agricultural lands should be empowered by supporting Transferable Development Rights (TDR) systems that will allow density transfers from the rural area to within the designated urban growth boundaries and result in permanent conservation or agricultural easements protecting the rural area.

Essential #9

Restore the federal-state partnership

The Problem

The federal government and the State of Florida share responsibility for managing and restoring the greater Everglades ecosystem. From the jurisdictional wetlands and farmlands to the coastal estuaries, there are overlapping duties, powers and programs. For Everglades restoration to succeed, the various state and federal agencies—and their respective laws, rules and programming—must operate in synchrony.

The Essentials for Everglades and Estuaries Restoration—all of them—can only be achieved by the renewal of a full working and funding partnership between the federal government and the State of Florida.

The Everglades restoration is suffering from a lack of leadership in the Congress and within the Administration. Effective leadership is critical to maintaining consensus while implementing restoration programs within an ever-changing political and physical Florida landscape.

The Solution

We need to rebuild public and bipartisan support to implement the federal-state partnership in Tallahassee and Washington. The CERP is of such size and scope that the President and the Governor need to take joint public responsibility for its execution:

- **The President and Governor should each appoint one individual who will be accountable for the federal and state roles and responsibilities, respectively, to lead renewed efforts to implement CERP and other aspects of Everglades restoration.** Additionally, the President and Governor must entrust their representatives on the South Florida Ecosystem Restoration Task Force with the authority to raise and address the challenges of Everglades restoration in an open and publically accessible forum. With this strategy, full partnership can be restored and essential actions necessary to move Everglades restoration forward can be developed.

- **A new recognition that important federal assets are at stake, including: Everglades National Park, Biscayne National Park, Big Cypress National Preserve, Loxahatchee and several other National Wildlife Refuges, and North America's only coral reef.** Federal funding for South Florida restoration efforts will need to increase to protect these significant federal interests.

- **Active land acquisition efforts need to be continued and expanded.** The livability of South Florida is at stake--its coastal estuaries, its water supplies, its bordering oceans, gulfs and bays, and the human values dependent on those. The State of Florida should continue to pursue the acquisition of those areas critical to the success of CERP and encourage local and private partnerships to secure protection of these lands.

Pictured here are the national, state, and local staff from the over 20 environmental organizations that form the Everglades Foundation's Environmental Advisory Council (EAC)…