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## **THE EVERGLADES**

“... a wet prairie, a golden ocean of saw grass waving under sun-drenched skies. From a distance the prairie appears vast and lifeless. Up close, however these glades are on intricate collage, full of life and surprises.”

(Connie Troops, naturalists, writer, photographer)

“There are no other Everglades in the world. They have always been one of the unique regions of the earth, remote, never wholly known. Nothing else is like them: their vast glittering openness, wider than the enormous visible round of the horizon, the racing free saltness and sweetness of their massive winds, under the dazzling blue heights of space. They are unique also in simplicity, the diversity, the related harmony of the forms of life they enclose ... It is a river of grass.”

(Marjory Stoneman Douglas, poet).

“... one of most beautiful places on earth. It is hard to measure what art does to the heart. But I hope it inspires the same sprit as that of the late Marjory Stoneman Douglas; to do what is right, not what is convenient.”

(Clyde Butcher, Everglades photographer)

Despite what we read and hear about today in regards to the politics of the Everglades and its restoration plan, it is the private citizen, the individual who's ingenious love for the simplistic beauty and unparalleled uniqueness of a tropical area, which has become a symbol of primal land that offers a spiritual freeing of the stressors

of everyday life that has made a difference in whatever progress has been made in the public's vision of the necessity to "save the Everglades." Every aspect of the Everglades relates to some level of human interest and involvement since the Calusa Indians embarked on this wet prairie some two thousand years ago. This paper will examine how the Everglades reached the point of requiring a restoration plan and what that plan includes and claims to accomplish. It will also explore who the people are behind the thrust of the Everglades restoration and what their groups' goals are.

## **GEOLOGY**

The interaction of the opposing force of rock and water over thousands of years has created what we know today as the Everglades. It is a huge freshwater marshland and peatland that developed recently, so to speak, on a geological time scale during a globally controlled meeting of climatic change and sea level rise within a shallow bedrock trough located in south Florida. "The recession of glaciers in North America at the end of the Pleistocene period and the change to a subtropical climate in south Florida provided both the abundant precipitation and the seasonal rainfall climate necessary for the generation of the Everglades wetland ecosystem" (Davis, 149). The rising sea level has slowed run off and downward leakage out of the trough and contributed to the water retainage inside the Everglades basin.

The Florida peninsula was once an ancient sea bottom, which is why it is so flat and low. The highest point in the Everglades is only 10 feet above sea level, excluding the Calusa shell mounds. Limestone is the area's bedrock, which is made up of marine

sedimentary rock. The alteration of its landscape was caused by the continuous contraction and expansion of continental glaciers. At least four times in recent geological history, Florida has been completely emerged under the sea and raised above the waters due to this process. As the glaciers melted and the seas returned, the water level was lowered, because much of the land mass was slowly rising. However, the lower areas of Florida continued to hold water, which created inland lakes as huge as Lake Okeechobee. During these periods when the land was submerged, millions of plants and animals decomposed and deposited calcium carbonate onto the sea floor. This calcium carbonate accumulated around grains of sand and hardened into oolites. Limestone composed of oolites is very porous and sponge like. Today, it is this oolitic limestone that forms the gently sloping bedrock of the Everglades.

## **SETTLERS**

Two separate groups of indigenous people known as the “people of the Glades” migrated here approximately 11,000 years ago. The Tequestas settled on the southeastern coast and the Calusas on the south and the west of the Everglades. Both groups settled at the mouth of rivers, on offshore islands, and on hammocks. The Europeans arrived in the early 1500’s and took over most of the land through wars, etc. Later, in the early 1800’s, native bands of Creek and Muskogee Creek people, who were forced south from northern adjacent states, collectively became known as non-native Seminoles. By the turn of the century, South Florida was becoming home to poachers, plume hunters, and “gold

diggers” (from ship wrecks). Despite the discomfort of the heat, mosquitoes, razor-edged grass, and mud, the Everglades has held a fascination unprecedented by any other environmental area in history.

## **IN THE BEGINNING**

The Everglades is, in actuality, a part of a larger watershed; the Kissimmee – Okeechobee – Everglades system (figure 4.2). The size of the main watershed is 10,890 square miles (approximately 310 miles north to south and 62 miles east to west). The natural system was connected hydrologically prior to drainage and the installation of water structures. During its wet cycles, the Kissimmee River discharges into Lake Okeechobee and historically, the lake would overflow its south bank, which in turn would provide additional flow to the Everglades.

The design of the Water Conservation Areas, was an attempt to accomplish seven objectives:

- Receive and store agricultural runoff from the Everglades Agricultural Area
- Prevent waters accumulated in the Everglades from overflowing into urban and agricultural lands
- Recharge regional ground water and prevent saltwater intrusion
- Store and convey water supply for agricultural irrigation, municipal and industrial use, and natural system requirements in the Everglades National Park
- Enhance fish and wildlife and recreation
- Receive regulation releases from Lake Okeechobee

- Dampen the effect of hurricane-induced wind tides by maintaining marsh vegetation in the system (Davis, 51).

Water conservation Areas 1, 2 and 3 are managed as surface water reservoirs; areas 2B and 3B recharge and maintain ground water levels in coastal areas to the east; the Everglades Agricultural Areas lay directly north and is served by 15 project canals and 25 water control structures; south of the Water Conservation Areas is the Everglades National Park (figure 4.1). The National Park is a natural preserve, therefore disallowing direct influence of human alteration, however, it is still affected by project water control structures and canals through surface water inflows into the basin.

As early as the turn of the 20<sup>th</sup> century, people had already begun to notice the toll that man was taking on this subtropical preserve and subsequently began efforts to preserve this rare and unique area. Plume hunting was banned; the southern portion of the park was established as a tropical preserve; in 1947 the Florida legislator appropriated monies to purchase the Everglades National Park, which consequently, over the years, has received international classification as an outstanding subtropical, preserve.

## **RECLAMATION**

In 1845, when Florida became a state, its population was 50,000; of which 90% lived north of Gainesville. Fifty percent of the population was slaves, who were unproductive in contributing to the prosperity of the state's income. The state had very little commerce and virtually no industry. In order to encourage settlement, the 10-month

old state made the issue of draining the interior of the peninsula its main priority. Referred to as the reclamation of the Everglades, it was determined that in order for this project to be successful, it would be necessary to lower the level of Lake Okeechobee by draining it through the Caloosahatchee River to the west and the Loxahatchee or St. Lucie rivers to the east and that several drains through the Everglades would be needed to carry surplus waters to tidewater. It was predicted that this process “would be profitable for the production of coffee, sugar, cotton, rice, tobacco, sisal hemp, citrus, bananas, figs, olives, pineapples, coconuts, and other tropical crops and fruits (Davis, 86).

In 1865, the Internal Improvement Fund and Trustees was established to manage the lands ceded to the state from the federal government. The Swamplands Act of 1850 authorized the transfer of 20 million acres to Florida for the purpose of drainage and reclamation. In 1881, a Philadelphia millionaire named Hamilton Disston purchased four million acres. In just ten years time he drained more than 50,000 acres, connected headwater lakes, opened the Kissimmee River for navigation, connected the Caloosahatchee River to Lake Okeechobee, and has been credited with being the first to attempt draining the Everglades by excavating 11 miles of canal.

Several other attempts to act out a drainage plan were made by politicians and wealthy business tycoons over the following years, all of which had failed until 1904, when Governor Napoleon Bonaparte Broward came up with a sure fire way to not run out of funds this time. He got the legislator to create a Board of Drainage commissioners that would be empowered to levy yearly drainage taxes on drainage districts. The Everglades Drainage District was created. It encompassed all of the Everglades and surrounding prairies and timberlands. Eventually, seven subdrainage districts were created. Then,

once again, after dredging began for the North New River Canal, money ran out, partly due to suits by landowners that felt that they were illegally being taxed.

In 1908, the governor convinced Richard J. Bolles, who made a fortune in selling farm tracts in Oregon, to buy into the Everglades. He purchased 500,000 acres for \$2 an acre, to be paid over an 8-year period of which half of the payment was to be solely used for drainage and reclamation purpose. Bolles' plan was to sell farmland tracts just as he did in Oregon. He had a team of salesmen travel rural communities in the mid west representing the Everglades as a "tropical paradise," the "promised land," the "land of destiny," and the "magnet whose climate and agriculture would bring the human flood." By 1911, he had hired 50 agencies just in Chicago alone to help sell off his investment. However, by the time takers had come to settle their claim to paradise, most areas were still under water. A "flood" of lawsuits was eventually filed against the land salesman claiming that they were misled and had been sold "land by the gallon."

Amazingly so, sufficient funding was acquired to continue the damage project through land sales, improved tax collection, the sale of bonds by the Everglades Drainage District. Not until 1949 were state revenues used for drainage when the Central and South Florida Flood Control districts were established. By mid-1927, 433 miles of canal, 54 miles of levee, and 14 canal locks had been completed (Davis, 88). The St. Lucie Canal was operating at 70% of its capacity.

## **THE U.S. ARMY CORPS OF ENGINEERS** **AND THE REAL DAMAGE**

Then more doom was brought upon this venture continually plagued by funding problems. The depression of the 1930's forced the project into bankruptcy and the wars to follow only made matters worse. Major hurricanes that followed in 1947 and 1948 kept the land under water for up to six months. At the request of the state for help, the U.S. Army Corps of Engineers (ACOE) published their Comprehensive Plan in 1948 and Congress created the Central and Southern Florida Project for Flood Control and Other Purposes. Ultimately, the project lowered water tables by four to five feet east of the protective levee.

Now, with the combination of feeling secure against flooding, mosquito control, technological advances in refrigeration, and concrete block construction, came the impetus for growth. From 1950 to 1990 the population in Dade, Broward, Palm Beach, and Monroe counties skyrocketed from approximately 750,000 to close to four million residents (Davis, 58). The federal government responded by creating and joining together Flood Control districts. The U.S. Army Corps of Engineers designed a plan that was carried out using four principal technologies; levees, water storage areas, channel improvements, and large-scale pumps to supplement gravity drainage.

Over the next 40 years, this project continually expanded and enlarged its original plan. It went through approximately 25 different phases (see figures 4.4, 4.9, 4.10, and 4.14 for progression of changes). This project can be credited with the explosion of urban and agricultural growth. Ironically, it is this exponential growth that single-handedly created the demise of one of the most unique and irreplaceable treasures of the

world. In the rush of man's greed he never once considered that what he was using as a selling tool he would end up destroying. "Post water management practices and the construction of related works have resulted in:

- the loss of the transitional glades, which provided an early season feeding habitat for wading birds,
- modification of flow pattern (attenuated to pulse), which reduced hydroperiods,
- unnatural pooling and overdrainage as a result of canals and levees,
- accelerated reversal from muck building to rapid oxidation,
- abandonment of wading birds nesting area in Everglades National Park due to change in hydroperiod, and
- unnatural and reduced flow of fresh water to Florida Bay (Davis, 81)"

## **THE RESTORATION**

Fifty-two years later, the same agency that published the plan, which would eventually destroy the Everglades, has now drafted the \$7.8 billion plan to redistribute the region's water again. Today, the Everglades is the most valuable and critical resource in Florida. It is habitat for the greatest number of listed species in the state, the fundamental component in water supplies for all of South Florida, and nationally important in agriculture, fisheries, tourism, and other human concerns (Tirrell, Everglades). In one sentence: If the Everglades shuts down, the entire state shuts down.

This has been an on-going concern for the past couple of decades. What is really meant by the expression "save the Everglades"? That depends on whom you ask. If you

ask anyone on the economic side of the issue, they will tell you that it means to get the water distribution right, so that further development would not be impeded and the needs of agricultural interests, especially the region's sugar interest, would be met. If you ask anyone in local government, they will tell you it is to get the water distribution right in order to continue reaping the region's \$13 billion annual tourist industry. Ask someone related to an environmental interest group and they will tell you that to save the Everglades means to revitalize the home of 1500 varieties of plants and wildlife from wading birds to alligators, including at least 68 threatened or endangered species (Farrington, Optimism Blooms For the Everglades).

This is what makes this Everglades Restoration Bill so controversial. Environmentalists have touted it as a "comprehensive water plan." "Stuart Stroll, the National Audubon Society's Everglades director, points out that bugs and birds don't have the same clout as say, sugar executive Alfonso Fanjul, who got President Clinton on the phone during one of his encounters with Monica S. Lowinsky" (Farrington, Associated Press News Service). He states that the project would have never gotten off of the ground if it were only ecological. And the fight goes on. However, the fact is that *everyone* stands to reap benefits from the restoration plan, if in fact it is carried out as promised.

Before the ACOE arrived in the 1940's and began an overly ambitious flood-control project to dry up the vast acres of the Everglades and shrink the many miles of saw-grass marshes and swamplands to half of what they once were, the River of Grass used to flow clockwise from Lake Okeechobee west of Palm Beach, all the way to the coral reef and estuaries of the Florida Bay. There are several steps to this complicated

40-year plan, but many believe (politicians, as well as environmentalists) that it starts with Lake Okeechobee.

If the lake is sick, the Everglades is sick. It is not as if the lake is some independent organ. It is as integral a part of the Everglades system as the heart is an integral part of the human anatomy (U.S. Senator Bob Graham D-FL).

Approximately \$2.4 billion of the restoration project will help Lake Okeechobee in some way, either by removing pollution or creating new reservoirs. Lake water would go into massive aboveground reservoirs to be used for drinking water, irrigating farms, and replenishing the Everglades. To do this however, the water must be clean. The price tag put on removing all of the pollution from the lake is additional to the plan and comes to \$1.6 billion; where it is coming from remains a mystery. According to the General Accounting Office, “the lake is a crucial part of the Everglades system and fixing it could add \$1 billion to the restoration...” Governor Jeb Bush signed the Lake Okeechobee Protection Act this year to begin a 15-year “crash” effort to clean up decades of pollution.

State agencies were given \$38 million for Lake Okeechobee this year alone, with a promise to continue funding until the job is completed. Florida’s \$763 million, 6-year clean up of the northern Everglades receives a guaranteed steady income each year from special taxes paid by sugar growers and South Florida property taxes. This year’s \$38 million was spent on buying land, restoring wetlands, and other projects, as opposed to the past when federal money was spent on research. Within the next two years, the water district expects to have 50 employees working on the lake, nearly three times the number of employees five years ago.

The closing of more than half of the 49 dairies north of the lake wiped out hundreds of jobs. Twenty-three million dollars was spent in buying out farmers and

pursuing other dairy programs. The farmers themselves spent \$36 million claiming to have cut their pollution outflow by 80 percent. On the 24 dairies still functioning, with their 26,000 cows, farmers have dug pollution lagoons and created elaborate water-circulation systems. Maintenance of new water systems costs each dairy as much as \$10,000 per month. Taking that into consideration, they must still compete on price with dairies nation wide that do not have this expense to incur when considering profits. In relation to the fishing industry, people brought foreign plants to South Florida for beauty, farming, and landscaping (exotic invasives) for which today millions of dollars are being spent in trying to kill those nuisance plants. On Lake Okeechobee, they are trying to eradicate the weeds with the use of chemical sprays. The fishermen blame this practice for wiping out beneficial plants to their industry.

There are many unanswered questions concerning how the government plans to play a role in Lake Okeechobee's clean up; what actions will be taken, exactly how much money will be allotted and what guidelines and policies will have to be followed. But, the question of who stands to gain from Lake Okeechobee's cleanup is very clear. The Everglades, of course, will be the big winner! The entire economy around Lake Okeechobee, as well as that of all of Florida will reap in the residual benefits. The fishing industry may once again thrive, construction will boom, the remaining dairy farmers can stay (if they can afford to), and residents, as well as the tourists industry can once again enjoy the beauty and health of the lake. Environmentalists hopefully will feel as though they are benefactors of their long haul to bring Lake Okeechobee to its "original" healthy state to continue on as the heart of the Everglades.

Aside from the Lake Okeechobee clean up there are a total of 60 projects written into the Restoration Plan. Four pilot projects include spending \$6 million for deep wells to pump water into the Floridian Aquifer from the Caloosahatchee River; a \$23 million study on new reservoir methods in the Lake Belt area of northwest Miami-Dade County as part of in-ground reservoir technology; a \$10 million study on seepage management in water preserve areas; and another \$30 million will be spent on studying ways to treat and reuse waste water.

Ten major construction projects include:

- 1) C-44 Basin Storage Reservoir - \$112.5 million to build a 40,000-acre-foot reservoir in Martin County to capture local runoff from the C-44 Basin and return it to the basin when needed,
- 2) Everglades Agricultural Area Storage Reservoirs - \$233.4 million to construct one or more aboveground reservoirs with a total capacity of 240,000 acre-foot on land associated with the Talisman properties. The initial design calls for two 20,000-acre reservoirs,
- 3) Site 1 Impoundment - \$38.5 million to construct an above-ground reservoir with a total storage capacity of about 15,000 acre-feet in southern Palm Beach County adjacent to the Hillsboro Canal and Arthur R. Marshall Loxahatchee National Wildlife Refuge and Water Conservation Area 2A. The initial design covers 2,460 acres,
- 4) Levee Seepage Management, Water Conservation Areas 3A/3B - \$100.3 million to construct a seepage collection system along the eastern edge of the

water conservation areas in Palm Beach and Broward counties to recover losses because of seepage to the coast,

- 5) C-11 Storm-water Treatment Area - \$124.8 million for construction of a storm-water treatment and storage area in Broward County,
- 6) C-9 Storm-water Treatment Area – 489.1 million for construction of a storm-water treatment and storage area in Broward County,
- 7) Taylor Creek/Nubbin Slough - \$104 million for a 2.1-acre water storage and treatment area in Okeechobee County just west of the Martin-St. Lucie county line,
- 8) Tamiami Trail - \$26.9 million to raise and bridge the east portion of the Tamiami Trail and fill the Miami Canal within Water Conservation Area 3,
- 9) New River - \$77 million for restoration of the north fork of the New River in Fort Lauderdale, and
- 10) C-111 - \$94 million to remove levees along the C-111 Canal in south Miami-Dade County to allow water to flow more easily into eastern Florida Bay.

There, of course, is much of debate about how much this project will actually cost, how long it will take before it is labeled complete and successful, and even if it is actually possible to return the Everglades to its natural state. A congressional report was released in mid-September 2000 stating that the project's cost could increase substantially in the effort to establish adequate water quality throughout the entire South Florida ecosystem. There is mention of the project taking up to 50 years, but most reports claim that the largest part of the plan will be completed by 2020, with full

completion expected in 2036, but that the first phase will only benefit the water supply to the 12 million people expected to be living in South Florida by the project's end and that the true environmental projects will not happen until the second half, which by then may be too late to save anything. Several environmental organizations claim that it is not physically possible to restore the Everglade's back to its natural state; that nothing about the methods we are planning to use are "natural," including the "Lake Belt," which they say resembles no natural lakes ever seen in South Florida.

## **THE REAL HEROS**

So, who are the people behind the scenes? Who is really responsible for this heroic effort to "save the Everglades"? The politicians would love to claim responsibility for this one. Vice President Al Gore, Governor Jeb Bush, Senators Bob Graham, and Connie Mack were all for the plan. Is it coincidental that this is an election year and all politicians are in favor of saving the Everglades? If however, you take a close look at how long it has actually taken for this issue to rise to the top and become one of the most famous environmental issues in history and how it eventually climbed its way to the forefront of an election year, you will find some very interesting people. Many people have always respected and understood the Everglades' vital part to the ecosystem. People who have absolutely *nothing* to gain by pressuring politicians to stop the madness – no sugar farms, no tourists dollars, no water for agriculture, no pecuniary benefits of any kind.

The most renowned of course, being Marjory Stoneman Douglas who spent most of her 108 years of life fighting to save her great love, her impetus for poetry. In her book “River of Grass,” published in 1947, she writes, “We simply cannot let everything be destroyed...not if we want water. We’ve got to take care of what we had.” Just like Marjory, there are millions of others who realize what the Everglades is *really* all about and care enough to volunteer millions of hours of their time to dozens of different organizations each year in there justly rewarded effort to make a positive contribution to their version of “saving the Everglades.” It is these people who helped to establish 16 parks and preserves in the Everglades region. It is these people who have donated their valuable and precious time to nine environmental organizations involved in Everglades issues; organizations like The Conservancy of Southwest Florida, Friends of the Everglades, and Tropical Audubon Society. These are the heroes, most of whom we will never know. They are the people responsible for helping those organizations that were able to educate the public and pressure the politicians on what saving the Everglades really means. It is the organizations that are responsible for lobbying for decades to protect the Everglades. Robert L. Bendick Jr., Director of The Nature Conservancy Florida Chapter, explains it perfectly.

Why do they do it? Why the long hours, late-night phone calls, generous donations of time and money, days spent in the field under the hot summer sun? They do it because they fear all of this will vanish without their efforts. They do it because they believe by working together we can accomplish almost anything. They do it because they want Florida to remain a good home for the next generations of plants, animals and people.

From its earliest settlers to its modern day residents, whether it was looked at as having too much water or not enough water, the Everglades has always held an intense

fascination by man and have always been at the forefront of economical and political discussions. Politicians are not responsible for the reclamation of the Everglades and politicians are not are not responsible for the restoration efforts. It is its inhabitants, the everyday people who have their own individual agendas, who force the changes that the Everglades has gone through in the past and in the present; whether it is the ingenious love for its beauty and uniqueness, or some form of financial gain. For whatever the reason one has behind saving the Everglades, we all stand to win. There may be a few wrinkles to iron out in the Restoration Plan, however we all must realize that Congress' passing of the bill is truly a victory for us all. Whether a sugar farmer, a dairy farmer, a city or county water agency, an economists watching tourists dollars, or a pure environmentalists, we must never give up in the endeavor to bring back to whatever extent we are capable of this "national jewel." And when the following generations look back into the history of the restoration, maybe they will have more people like Marjory Stoneman Douglas to thank.

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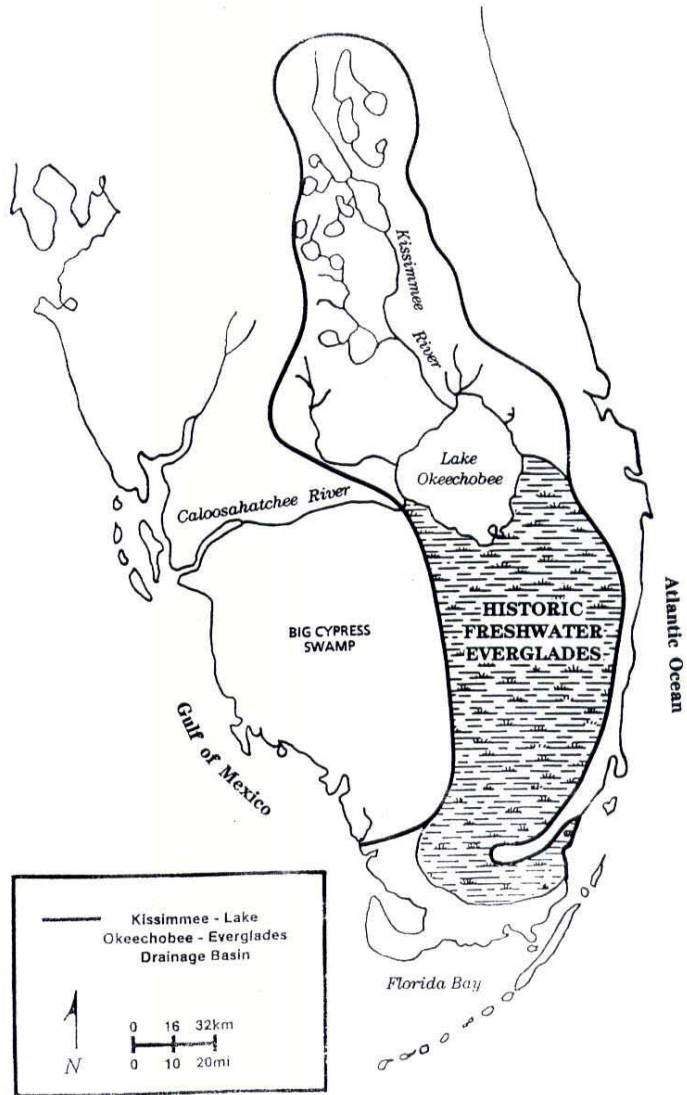


Figure 4.2 Location of Kissimmee-Okeechobee-Everglades watershed in south Florida.

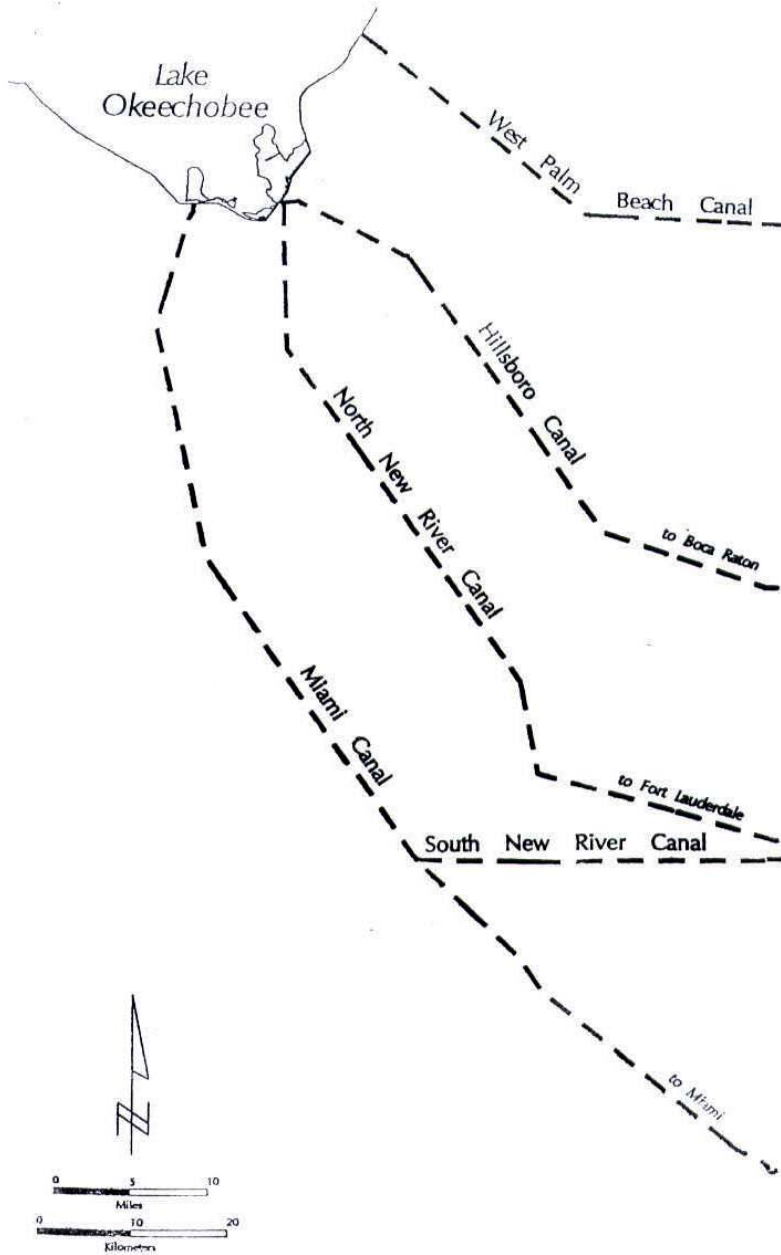


Figure 4.4 Four muck-scaped canals that dissected the Everglades by 1917.

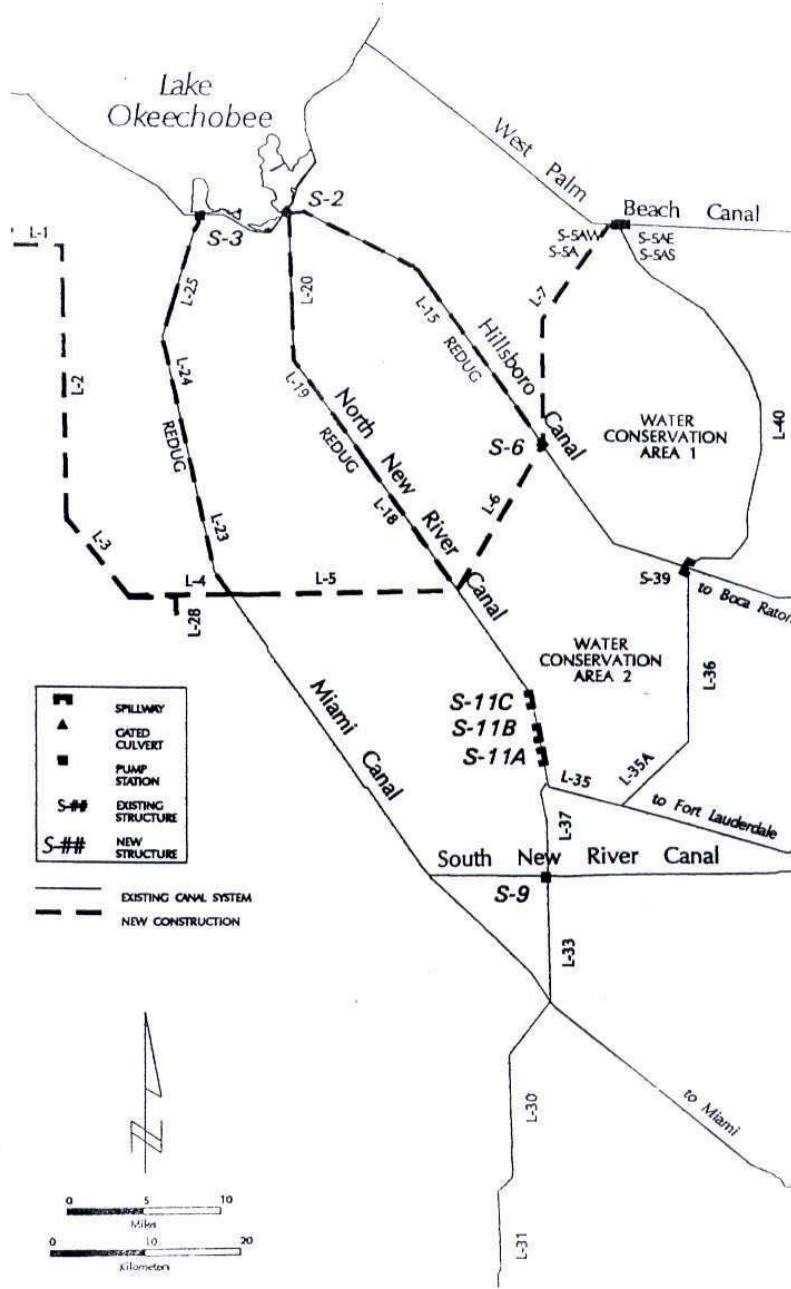


Figure 4.9 Construction of Everglades Agricultural Area (1954-59).

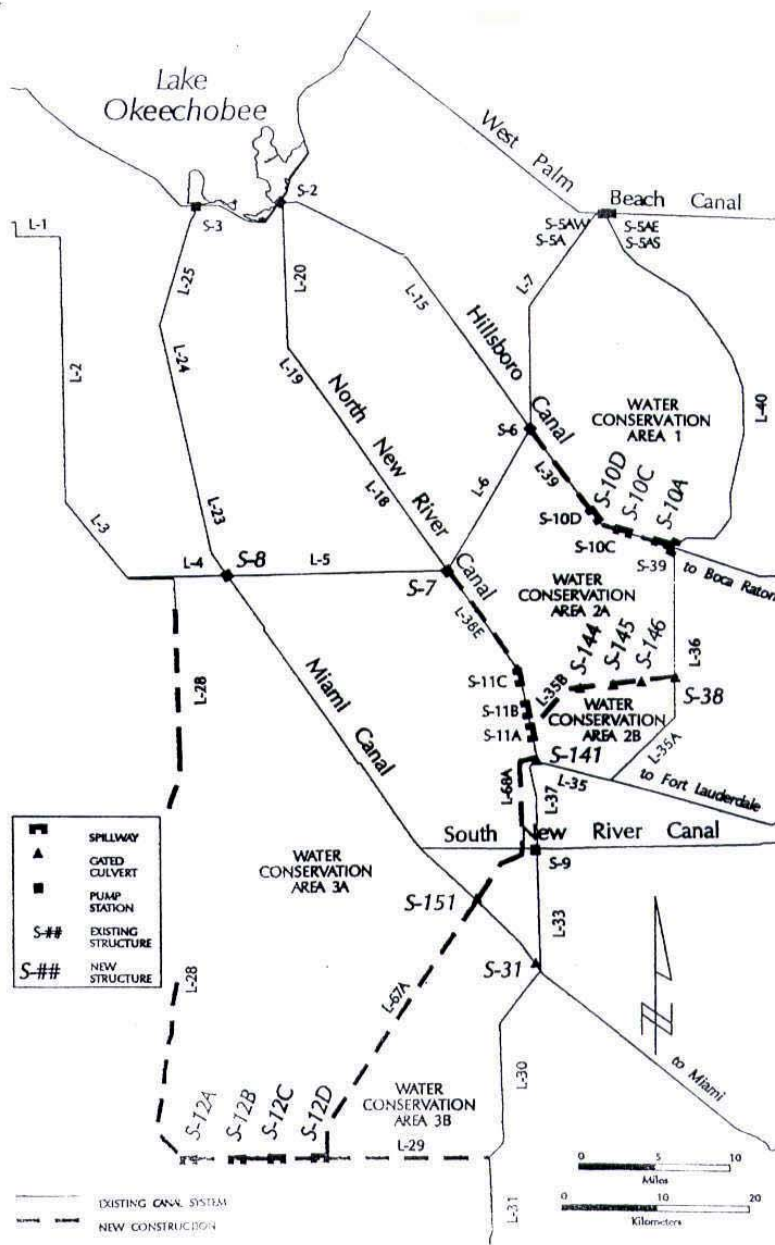


Figure 4.10 Water Conservation Area construction (1960-65).

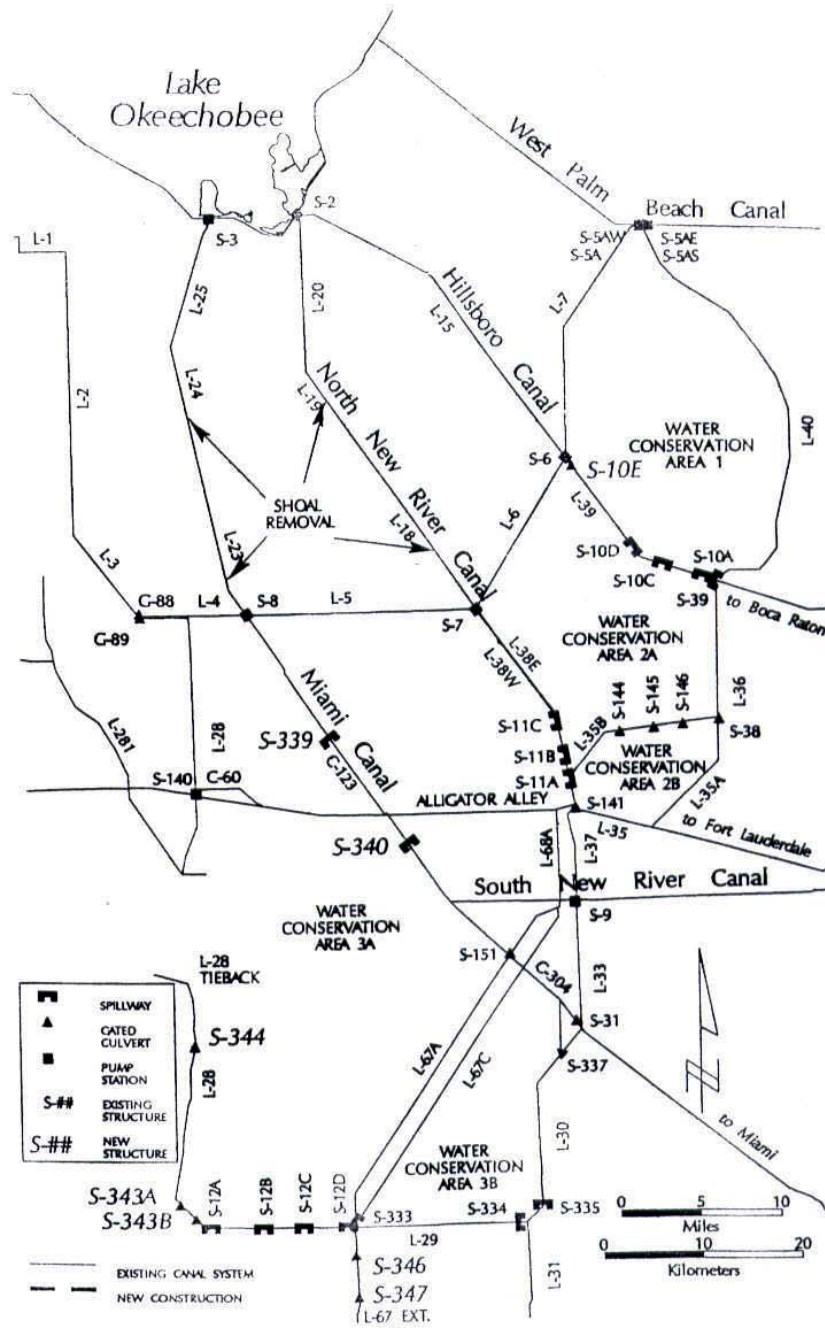


Figure 4.14 Environmental modifications to the Central and Southern Florida Project (1980-85).

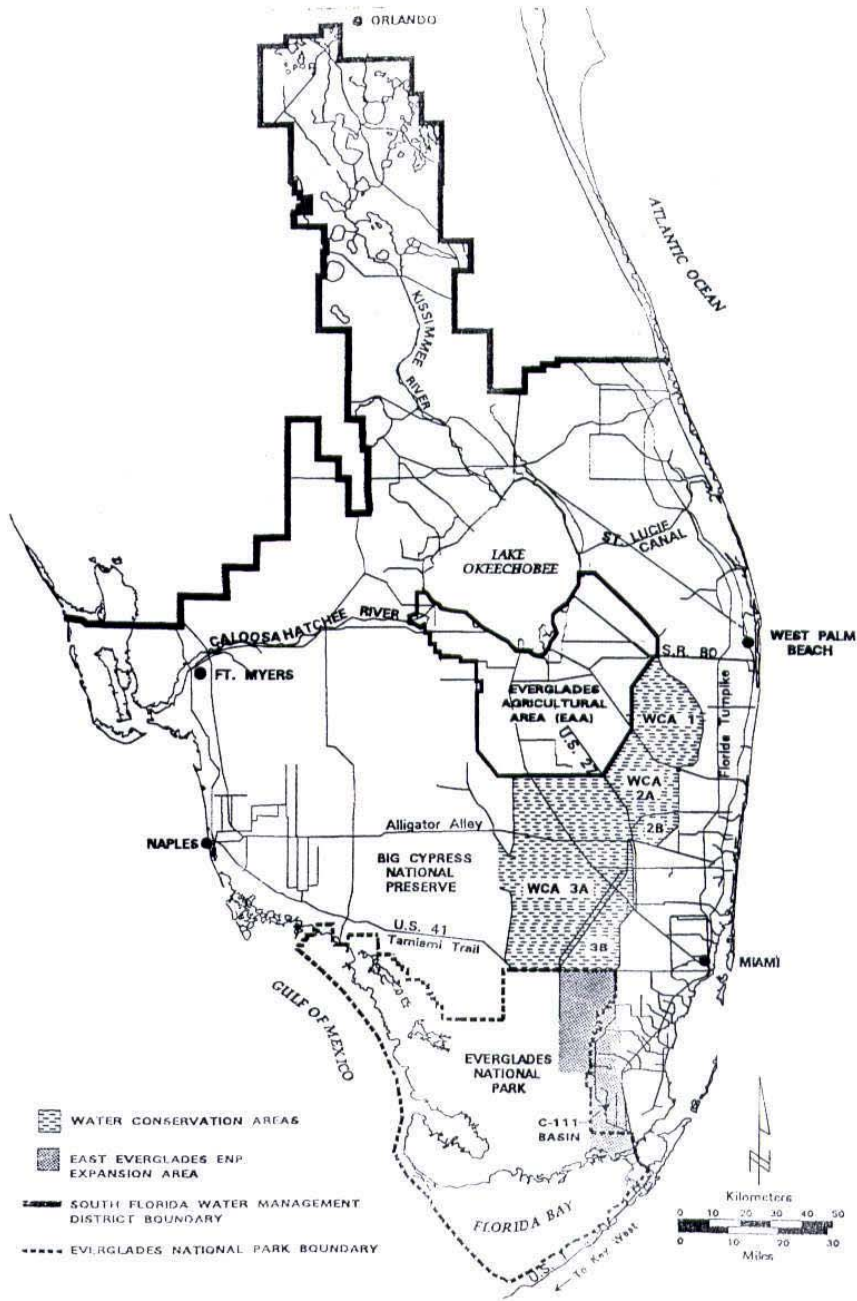


Figure 4.1 The South Florida Water Management District and major federal lands in the region.