

**CENTRAL & SOUTHERN FLORIDA PROJECT
COMPREHENSIVE REVIEW STUDY:
ROAD MAP OR ROADBLOCK FOR THE FUTURE?
A CASE STUDY IN WATER RESOURCE PLANNING IN THE AGE OF
ECOSYSTEM MANAGEMENT**

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In the realm of water resource management, 1997/98 will long be remembered as the “El Niño Years.” Nationwide, we have watched temperatures soar or plummet while unrelenting storms and tornadoes have resulted in loss of life and extensive destruction. Extraordinary rains have caused serious flooding and erosion. Florida has had its share of “El Niño.” To date, the weather phenomenon has cost Florida more than \$500 million in damaged crops, businesses and homes. On a more somber note, 46 deaths have been attributed to storms caused by El Niño.¹

The effects of El Niño in South Florida can be summarized in a word: WET! In early 1998, the region’s typically dry winter months experienced close to 300% of normal rainfall. This came on top of already saturated conditions throughout the entire southern portion of the peninsula. In fact, the main water storage feature of South Florida, Lake Okeechobee, reached a record dry-season water level high of 18.33 ft. NGVD on February 27 causing serious problems for water managers in South Florida: The dike surrounding Lake Okeechobee showed signs of stress as twenty-three clear water boils were identified. High water levels in the managed lake required high discharges of water to be released through a system of canals that connect the lake to the Everglades and coastal estuaries.² In turn, these freshwater discharges wreaked havoc on estuaries and flooded critical bird-nesting habitat in the southern Everglades.

THE CENTRAL & SOUTHERN FLORIDA PROJECT

Despite these crises, South Florida was able to contend well with the water management challenges presented by El Niño. Its primary defense against the extremes of high water and torrential rains is a massive infrastructure system known as the Central & Southern Florida Project

for Flood Control and Other Purposes. (C&SF Project, for short) This United States Army Corps of Engineers project is truly a marvel of engineering, land planning and water control. Constructed primarily during the period of 1950 to 1975, the C&SF project’s authorized purposes include flood control, water supply, prevention of saltwater intrusion, provision of water supply for Everglades National Park, navigation and protection of fish and wildlife. The project stretches from just south of Orlando in central Florida to the southern tip of the peninsula. It includes over 1000 miles of canals and levees, 160 water control structures and 16 major pumping stations, and it encompasses an area of 18,000 square miles.³ Designed to move and store water throughout the incredibly flat, low-lying region of South Florida, the C&SF Project also includes six major water storage areas: Lake Okeechobee, Water Conservation Area 1 (which is also the U.S. Fish & Wildlife Service Loxahatchee Wildlife Refuge), Water Conservation Areas 2A and 2B, and Water Conservation Areas 3A and 3B (See Appendix A, Central & Southern Florida Project Map.)

More effectively than any land use planning effort, the C&SF Project established a comprehensive blue print for the development of southeast Florida. It designated the area south of Lake Okeechobee for farming (the Everglades Agricultural Area). It drew an “urban boundary line” - the east coast protective levee - which runs 100 miles from West Palm Beach to Homestead - effectively setting off the urbanized east coast from the Everglades. It established the Water Conservation Areas to remain as Everglades habitat and water storage areas, and it provided the facilities necessary to guarantee that Everglades National Park would always receive adequate water supply from the system. In fact, without the Central & Southern Florida Project, Florida and South Florida in particular would never have been able to develop into the major economic and population centers they are today. In 1950 when the project was just underway, Florida ranked 18th among the states with a

population of 2.8 million. By 1990, Florida had grown to nearly 13 million, making it the fourth largest state in the country. Forty-nine percent of Florida's population lives within the region served by the C&SF Project, and this region is critical to Florida's economy given the income generated by its agricultural and tourism industries.

What Price Drainage?

While the C&SF Project provides an array of direct and indirect benefits for South Florida, it has also caused substantial environmental problems. Florida's Everglades, one of its most prominent natural features, is the largest wetland in the United States. What we typically think of when we say the word "Everglades" consists today of two major geopolitical regions: the Everglades Water Conservation Areas, owned by the state, and Everglades National Park. Together these areas span well over a million acres. However, in its original state, the Everglades encompassed an area twice this size. While the idea of draining the Everglades was first espoused in an 1848 report to the United States Congress by Senator J.D. Westcott,⁴ it took many early attempts and ultimately the construction of the C&SF Project to eventually succeed in this effort.

The pre-drainage Everglades ecosystem was characterized by 1) extensive storage and natural sheet flow (the extremely shallow elevation gradient of South Florida - a drop in elevation of only 20 feet over the 100 mile distance from Lake Okeechobee to Florida Bay - meant that surface water in the wetland flowed very slowly); 2) an extraordinarily large spatial area (such large areas sustained habitat diversity by providing extensive feeding areas); and 3) heterogeneity of habitat.⁵ Drainage of this ecosystem and alteration of natural flow patterns (the timing and volume of water moving through the Everglades) has had two major negative side effects that are the fundamental problems we are dealing with in South Florida today: water quality deterioration and reduced water supply. Stormwater runoff from agricultural and urban activities is damaging the remaining Everglades system as well as coastal estuaries. In addition, the overall lowering of surface and groundwater levels in order to drain and develop areas and provide flood protection has resulted in a total water storage loss from the natural system of up to 6,000,000 acre feet.⁶ This pre-drainage storage in essence smoothed out the effects of erratic rainfall. It allowed water to recede gradually during the dry season and it also ameliorated floods and droughts.⁷ The loss of this storage combined with the extreme volumes of water that are either lost to evapotranspiration (estimated 10,470 million gallons a day) or that are discharged to the ocean by the canal system (estimated 3,531 million gallons a

day)⁸ demonstrate quite clearly how a region such as south Florida, which receives an average annual precipitation in excess of five feet and which is one of the two wettest areas in the country, can have a water supply problem.

EVERGLADES RESTORATION AND THE RESTDY OF THE C&SF PROJECT

For many years, efforts have been underway to restore the Everglades. Perhaps the most substantial of these was begun in 1983 when then-Governor Bob Graham initiated the state's Save Our Everglades program. The goal of this program was that by the year 2000 the Everglades would look and function more like they did in 1900 than when the program was begun in the 1980's. This noble but nebulous goal underscores one of the basic problems that we wrestle with in Florida when we debate the Everglades. While there is consensus that this ecosystem is severely damaged and in need of restoration, there is no agreement on what is meant by "restoring" the Everglades. One thing is clear, however, the key to Everglades restoration is hydrologic restoration. Water built the natural ecosystem of South Florida, and in order to restore that system, we need to restore the natural distribution and flow of water.⁹

Restoration of the Everglades inevitably leads to the C&SF Project. During the 1970's and '80's a number of adjustments were made to the project in the interest of environmental protection and enhancement. A "rainfall-driven" plan was instituted to improve water deliveries to Everglades National Park. Agricultural runoff was identified as a serious problem for Lake Okeechobee; as a result, severe land use restrictions were placed on property upstream of the lake and water management practices were altered to redirect stormwater flows away from the lake. The drive to restore the channelized Kissimmee River was begun. But by the early 1990's, these piecemeal activities gave way to the philosophy that a comprehensive review of the C&SF Project would be necessary in order to address the environmental impacts of the project as well as to retrofit this infrastructure system to provide for the water management needs of a dramatically larger and different socio-economic community that had evolved in South Florida since the project's inception. Interestingly, it was the experience of a severe South Florida drought during the period of 1988-1990 that ultimately focused sufficient attention on the need to correct the water management mistakes of the past and prepare for the water management needs of the future. The drama of threatened water supply combined with the plight of the Everglades ecosystem set the stage for congressional authorization of a comprehensive "restudy" of the Central & Southern Florida Project.

Restudy - The Early Years

The Central & Southern Florida Project Comprehensive Review Study (or “Restudy” as it is commonly called) was authorized by the U.S. Congress in 1992 (see Appendix B, C&SF Project Restudy - Alternative 5). In September of that year, two resolutions of the House Committee on Public Works & Transportation directed the Corps of Engineers to determine whether the C&SF Project should be modified “in the interest of environmental quality, water supply and other purposes” specifically citing purposes for Florida Bay (which at that time had garnered national attention as a result of large algae blooms that were occurring in the western reaches of the bay). One month later, Congress, as part of the 1992 Water Resources Development Act (Sec. 309(1)), authorized the Corps to determine if the project should be modified “due to significant changed physical, biological, demographic, or economic conditions with particular reference to modifying the project or its operation for improving the quality of the environment, improving protection of the aquifer, and improving the integrity, capability and conservation of urban water supplies affected by the project or its operation.”¹⁰

In order to fully appreciate the magnitude and complexity of this task which Congress had assigned the Corps of Engineers, it is important to understand the socio-political “atmosphere” which surrounds the Everglades. Simply put, the Everglades is a war zone where environmental interests clash with agricultural and urban interests over water quality and quantity. The Everglades is also a battlefield where federal interests in the form of national parks and wildlife refuges clash with the state’s rights in land use planning and water allocation. With close to five million people living adjacent to one of the most fragile and endangered ecosystems in the country, it is little wonder that consensus and cooperation are rare commodities in South Florida. In fact, at the time when the Restudy of the C&SF Project was authorized, many Everglades stakeholders of South Florida were being consumed by a prolonged legal fight over water quality entering the Everglades from the Everglades Agricultural Area. This lawsuit cost taxpayers an estimated \$25 million; it took almost five years to settle; it spawned tens of related suits; and it has created an unrelenting atmosphere of distrust and anger among the many competing interests who have a stake in Everglades protection and water management in South Florida.

Despite this contentious and litigious climate, the Restudy of the C&SF Project was met with great enthusiasm on all sides. No one questioned the fact that the 40-year-old canal system was causing damage to the environment and was incapable of providing the level of multi-purpose

service in the future that it had in the past. People welcomed the notion of revamping the project so that the Everglades could be enhanced and restored and so that human water supply needs and adequate flood protection for the region could be ensured. Furthermore, as a Corps of Engineers initiative, it was anticipated that the Restudy of the C&SF Project would bring substantial federal dollars to bear on resolving the environmental and water supply problems of South Florida.

THE RECONNAISSANCE STUDY

Although the Restudy was authorized in 1992, it was not until funding was appropriated the following year that work on the project began. From the start, it was clear that the Restudy would be unlike any traditional Corps project. Considering the size, complexity, and environmental, economic, political, and technical characteristics of the South Florida region, the Jacksonville District of the Corps of Engineers determined early on to approach the Restudy in an innovative manner. The Corps project team dedicated itself to an open and public process that would involve participation by every federal and state agency, interest group or concerned public with a stake in the Everglades and the management of water in South Florida.

Traditionally, a Corps of Engineers project involves a two-step planning process. The first step is known as a Reconnaissance Study which is entirely the responsibility of the federal government. During the Reconnaissance Study, issues are framed, problems are defined, and potential solutions are explored. If it is determined that sufficient federal interest exists to move beyond the problem identification stage, then the next planning step is a much more detailed feasibility study undertaken with a local sponsor (in this case, the South Florida Water Management District, local sponsor of the Central & Southern Florida Project) to identify a preferred plan of action to address the problem.

The C&SF Restudy Reconnaissance phase lasted approximately eighteen months. During that time, three rounds of public workshops were held throughout South Florida to solicit public input. However, despite the “openness” of this early data gathering process, property owners and water user interests who were looking to the Restudy to address long-term water supply needs of the region began to feel uncomfortable with the direction that the study was taking. As reported in the Reconnaissance Report, in July 1993, an initial project scoping session was held involving staff from the Corps of Engineers and the South Florida Water Management District. At that time, it was noted by the agency personnel that

federal policy dictates that state and local interests have primary responsibility for the development of water supply. It was further acknowledged that recent administrative policies of the federal government recommended against federal funding for water supply work undertaken by the Corps of Engineers. As such, “(T)he participants concluded that the Corps’ Review Study would focus on Everglades and Florida Bay ecosystem restoration while *accommodating other water resource demands.*” (Emphasis added)¹¹ This was quite a departure from the comprehensive approach to revisiting the multi-purpose attributes of the C&SF Project that many stakeholders in South Florida had anticipated in the Restudy.

The Science Sub-Group Report

Water user stakeholders’ confidence in the Reconnaissance Study was further undermined in November 1993 by the publication of a report by the Science Sub-Group of the federal South Florida Management & Coordination Working Group. About the time that the Restudy got underway, the federal government established an Interagency South Florida Ecosystem Restoration Task Force. This task force brought together all federal agencies involved in the Everglades (Interior, Commerce, Justice, Agriculture, Army Corps of Engineers and Environmental Protection Agency) to coordinate federal activities and budgetary planning on Everglades issues. The assistant-secretary level Task Force formed an interagency South Florida Working Group to coordinate activities at the local level. In September 1993, the federal Task Force determined that the management objectives being developed for the C&SF Restudy did not meet its expectations for Everglades restoration. The Task Force directed the South Florida Working Group to develop federal objectives for ecosystem restoration that could be submitted to the Corps of Engineers within 45 days for incorporation into the Reconnaissance Study.¹² The result of this mandate was a hastily-produced publication known as the Science Sub-Group Report.

By all accounts, the Science Sub-Group Report was a sketchy document. It provided an overview of the ecological problems that had developed in South Florida as a result of drainage and development, outlining how the natural landscape of the region had become highly fragmented with loss of habitat diversity.¹³ However, the document drew skeptics when it defined restoration as the reconstruction of pre-existing ecological conditions. As stated in the report, the “conceptual target of restoration of South Florida wetlands and estuaries is pre-drainage South Florida as defined for topography and hydrology by the 1858 military map.”¹⁴ For property owners and

others in South Florida, the fact that a federal document would suggest a return to the “typography and hydrology” of 1858 seemed preposterous. The broad conceptual restoration goals outlined in the report seemed reasonable: 1) Restore areal extent as well as hydrologic integrity of the system; 2) Adjust hydrologic restoration to maximize ecologic restoration; 3) establish a regional monitoring system to measure success. However, specific proposals recommended in the report were totally unrealistic. For example, one recommendation, which was described as a “minimum plan” to achieve restoration goals, was the conversion of a 150,000 acres of productive farmland (one third of the lands within the Everglades Agricultural Area) into a “flowway” that would hydrologically connect Lake Okeechobee with the Water Conservation Areas.¹⁵ Such fantastic notions drew harsh criticism from the potentially affected publics, property owners and local governments in the region and undermined the credibility of the document. Furthermore, the Science Sub-Group Report was entirely dedicated to environmental objectives. Water supply and other water-related needs of the region were completely absent from the document. If, in fact, the report represented the federal government’s objectives for the Restudy, it left many interests in South Florida feeling very uncomfortable about the federal motives for this project.

Reconnaissance Study Recommendations

A year after the release of the Science Sub-Group Report, the Corps of Engineers completed its Reconnaissance Report on the Comprehensive Review Study (November 1994). To its credit, the Corps presented a much more balanced publication which described an ecological goal for Everglades restoration as the recreation on a smaller scale of a healthy ecosystem that would be large enough and diverse enough to survive natural cycles of droughts, floods, and hurricanes.¹⁶ The Reconnaissance Report offered an optimistic outlook for Everglades restoration noting that in spite of the negative alterations that had occurred in the ecosystem, the opportunities for recovery are great. Much of the original Everglades system remains in public ownership and the total area of remaining wetlands is relatively large in size, allowing for almost all characteristic species to remain.

The report outlined a number of goals for the Restudy of the C&SF Project that included ecosystem restoration, water quality improvement, water supply development, flood control, and recreation. Still, most of the detailed substance of the report was dedicated primarily to the environmental restoration aspects of the Restudy. For instance, the Reconnaissance Report concluded the following:

- An adaptive management approach to the planning process should be taken.
- Florida Bay would benefit from restoring the timing and amount of natural freshwater flows into its northeast section. Additional research is needed on the bay.
- The spatial extent of wetlands in the system should be increased through surface storage areas, particularly along the eastern boundary of the east coast levee which separates urban Palm Beach, Broward and Dade Counties from the Everglades (this concept became known as the Water Preserve Areas), and through flowways.
- Operational changes to the C&SF Project alone could improve some natural communities and could improve flood protection. Operational changes in connection with more storage areas and flowways could substantially improve the ability to manage more natural sheet flows, especially to Everglades National Park.
- The models utilized in the Reconnaissance Study were not sufficient to address water quality issues.
- Very little was recommended with respect to water supply; however the report did acknowledge that its modeling had been based on 1990 water supply demands.
- In terms of economic impact, the Report concluded that the Restudy could have local and regional economic impacts owing in large part to the tremendous land acquisition activities that were envisioned - the Reconnaissance Report suggested that from 80,000 to 260,000 acres would need to be acquired through the Restudy Project in order to address environmental restoration.

Once again, the federal government had issued a document that weighed heavily in favor of the environmental restoration aspects of the Restudy of the C&SF Project while seemingly giving short shrift to the future water supply, flood control and other water management needs of South Florida. Despite the fact that property owners and water-user interests in South Florida raised considerable concern about the Reconnaissance Report, the recommendation of the Corps was to proceed to the next phase of the Restudy - the Feasibility Report.

THE FEASIBILITY STUDY

Whereas the Reconnaissance portion of the Restudy Project was conducted entirely by the Corps of Engineers, the second planning phase, the Feasibility Study, had to be undertaken in partnership with a local sponsor. In fact, the decision to proceed to the Feasibility phase was based on 1) the potential solution to problems identified by the Reconnaissance Study have a federal interest; 2) the solution is in keeping with federal policies and budgetary priorities; and 3) the solution is supported by a non-federal sponsor.¹⁷ In this case, the non-federal sponsor is the South Florida Water Management District, one of Florida's five regional water management agencies which have broad authority for planning, regulation and management of regional water resources. The South Florida Water Management District was established in 1949 (as the Flood Control District at that time) in order to serve as the local sponsor for the construction and operation of the Central & Southern Florida Project. The District is financed primarily through ad valorem taxes. As local sponsor for the Feasibility Study, the District was committed to a 50-50 cost share on the expense of the Feasibility Study. The terms of the study and responsibilities of the federal and local partners are spelled out in what is called a Project Study Plan.

The first Project Study Plan for the Restudy was issued in July 1995. During the time it took to develop the Project Study Plan, water-user interests in South Florida had stepped up their involvement with the Restudy Project and had voiced objections to any Restudy plan that would not adequately address water supply and other water management needs. For example, the water management district's Agricultural Advisory Committee expressed concerns in the spring of 1994 that the Corps Restudy Plan needed to address much more than just Everglades restoration. It needed to deal with socio-economic factors that depend on water supply and water management. Flood control needed to be included in the study, and goals and objectives needed to be clarified. For instance, what did the government agencies mean when they talked about ecosystem restoration? Could they define a "restored Everglades?" In a similar vein, Palm Beach, Broward and Dade counties' water utilities and other urban suppliers were concerned that the Restudy process was failing to address urban water needs and how these needs would be integrated with Everglades restoration.

As a result of this heightened attention to the Restudy and its perceived shortcomings, the Corps of Engineers and the water management district worked more closely with water-user interests in the drafting of the Project Study Plan for the Feasibility Study. The plan admitted that the Reconnaissance Study had identified important

components to achieve ecosystem restoration, but that water supply and water quality were not fully evaluated during the Reconnaissance phase. The Project Study Plan concluded that additional studies were needed.¹⁸ As such, it laid out a course of action wherein the Corps of Engineers would look to the South Florida Water Management District's water supply planning initiative for Florida's lower east coast (Palm Beach, Broward, Dade and Monroe counties) that had been begun in 1992

to serve as the basis for the Restudy's approach to addressing water supply. As the Project Study Plan noted, the Corps of Engineers would use the water management district's Lower East Coast Regional Water Supply Plan (which was scheduled to be completed by late 1996) to define water supply problems and develop alternative plans to address them.¹⁹

This approach provided some degree of comfort to water-user interests. Many of them had been participating directly with the water management district as part of an advisory committee on the development of the Lower East Coast Regional Water Supply Plan. Water users concurred that it made sense for the Corps of Engineers to look to the work of the water management district and to incorporate the locally-generated plan for addressing future water supply needs into the broader plan of Restudy of the C&SF Project.

Here, it is important to understand the role that a Feasibility Study plays in the traditional development of a Corps of Engineers water resource project. The Feasibility Study is the final planning step. The report of the study is submitted to the United States Congress for congressional approval prior to the Corps being able to proceed to undertake more detailed designs and engineering plans to implement a project. As such, and in accordance with the requirements laid out in the 1986 Water Resources Development Act, a Feasibility Study must describe with reasonable certainty the economic, environmental, social and engineering benefits and costs of the recommended alternative plans. A Feasibility Report serves as a complete decision-making document to allow decision makers to judge the recommend solution. (Emphasis added)²⁰

In recognition of these requirements for thorough analysis, the 1995 Project Study Plan presented a six-year work plan that included the development and peer review of computer models, specific hydrologic and economic studies and an \$18 million planning budget. While a typical feasibility study takes four years to complete, the 1995 work plan explained that the Feasibility Study for the Restudy of the C&SF Project would take six years to

finish. The Study Plan explained that this time frame is "necessary and justifiable" considering the size of the study area, the need to maintain an ecosystem-based focus, the magnitude of the project, and the fact that the "study area has complex and controversial problems that require intensive (and time consuming) public involvement and environmental evaluations. For these reasons, the six-year study time frame is reasonable and appropriate."²¹

Feasibility Study Changes Course

Given the thoughtful and reasonable study approach outlined in the 1995 Project Study Plan, property owners and water user interests in South Florida finally gained a level of comfort with the direction in which the Restudy of the C&SF Project was heading. So, it was not surprising that this comfort soon diminished as a series of events unfolded that dramatically changed the course of the Restudy Feasibility Study.

In the spring of 1994, Florida Governor Lawton Chiles established the Governor's Commission for a Sustainable South Florida. The commission's 47 members represented a variety of interests including federal, state, tribal, local and regional governments, environmental organizations, economic development representatives and agricultural interests. The mission of the Sustainable South Florida Commission was to examine all aspects of the South Florida ecosystem and to make recommendations to further a sustainable economy and maintain a quality of life for South Florida residents that is compatible with a healthy natural system. The commission's first report, issued in October 1995, contained 110 recommendations dealing with a multitude of social, economic, and environmental issues in the greater South Florida region.

While the scope of the Sustainable Commission's charge was much broader than that of the Restudy of the C&SF Project, many of the commission's deliberations focused on water as the key to both a sustainable economy and environment in South Florida. Many of the government agency members of the commission were directly involved with the Corps of Engineers Restudy project. And many of the initial recommendations of the Sustainable South Florida Commission paralleled the proposals being generated by the Reconnaissance Report and under development through the Feasibility Study. (This was not surprising since most of the staff and technical support for the Governor's Commission were being provided by the water management district.) In short, there were many similarities between the work of the Governor's Commission and that of the Corps and

the water management district in the Restudy Project. Given these de facto connections, it made sense for the Sustainable South Florida Commission to evolve as a forum for discussion and debate relating to the Restudy. So much so that in the immediate aftermath of the 1995 Project Study Plan for the Restudy Feasibility phase, the Sustainable South Florida Commission undertook its own review and analysis of Everglades restoration and water supply needs of the region in order to publish a

“Conceptual Plan for the Central & Southern Florida Project Restudy.”²²

This eleven-month review concluded that the C&SF Project Restudy plan should focus on thirteen main thematic concepts to accomplish its objective for restoring the environment and addressing the water supply and other water related needs of the South Florida region. These thematic concepts included:²³

8. The need to increase regional water storage in the headwaters of the Everglades and adjacent areas.
9. The need to revise Lake Okeechobee’s water level regulation schedule to enhance environmental protection and water supply.
10. The need to store more surface water in reservoirs within the Everglades Agricultural Area.
11. The need to construct Water Preserve Areas along the east coast to capture water that is otherwise discharged to the ocean; to ameliorate groundwater seepage from the Everglades; and to create a wetland buffer between the urbanized coastal area and the Everglades.
12. The need to establish continuity and spatial/hydrologic connections between natural areas within the Everglades ecosystem.
13. The need to address water supply and flood protection for urban and agricultural areas.
14. The need to ensure adequate water quality for the environment.
15. The need to expand the spatial extent and quality of wetlands outside of the boundaries of the Everglades.
16. The need to control non-native, invasive plant species in the Everglades ecosystem.
17. The need to further develop Aquifer Storage and Recovery as a potential solution for future water

supply.

18. The need to protect and restore estuarine and coastal marine ecosystems.
19. The need to enhance soil conservation, especially within the Everglades Agricultural Area.
20. The need to address modifications to the operation and maintenance of the C&SF Project.

The Sustainable South Florida Commission’s Conceptual Plan was developed through a participatory and consensus-based process which involved to as great a degree as possible all those who had a vested interest in Everglades issues. As a result, most water-user interests, economic development representatives and property owners felt it encompassed a more balanced approach and placed much greater emphasis on dealing with all water related needs of the region - not just environmental restoration.

Yet, there were a number of recommendations contained within the Governor’s Commission report that generated new concerns. For instance, the report expressed doubts about the capacity of the traditional Corps of Engineers project development process to deal with the Restudy of the C&SF Project. The Conceptual Plan stated that “given the complexity and size of the C&SF Project, the existing piecemeal approach would likely fail...”. The plan went on to recommend “an improved partnership between federal and state government that streamlines the review and authorization of the C&SF Project modifications...”.²⁴

What proved most distressing to some stakeholders who had participated in the Conceptual Plan’s formulation was a recommendation to accelerate the process of the Restudy so that a Feasibility Report would be submitted to Congress much earlier than originally planned. The Conceptual Plan went so far as to recommend that the Project Study Plan (which had been begun the preceding year and which was scheduled to take six years to complete) be finished as expeditiously as possible and be amended to reflect the Sustainable South Florida Commission’s Conceptual Plan. Furthermore, while the C&SF Project Restudy was being developed, the Commission recommended that Congress immediately authorize modifications to the C&SF Project consistent with the Commission’s Conceptual Plan, and that the Corps and the local sponsor should have authority to acquire lands consistent with the Commission’s Plan.²⁵ (Emphasis added.) It came as no surprise that many water-user interests and property owners began to sound the alarm over such proposals. Here, on the basis of little more than a conceptual plan (which by its own

admission did not involve a technical evaluation of its recommendations) an appointed commission was suggesting that Congress immediately undertake land acquisition and authorize changes to the way water is managed in South Florida!

The 1996 Water Resources Development Act

If the Sustainable South Florida Commission's Conceptual Plan had re-ignited the doubts and concerns

of water user interests and property owners in South Florida, then the ensuing passage of the 1996 Water Resources Development Act threw gas on the fire! In response to intense lobbying by environmental interests and the Department of Interior, the Congress adopted provisions in the act that substantially changed the course of the Restudy of the C&SF Project. The Act directed the secretary of the Army to develop as expeditiously as practicable a comprehensive plan (emphasis added) for the purpose of restoring, preserving and protecting the South Florida ecosystem. The comprehensive plan would provide for water quality in the Everglades (thereby authorizing the Corps of Engineers to undertake components that would address water quality - an issue heretofore left to the responsibility of state and local governments). As a result of last minute efforts by business and agricultural interests, the act also directed that the comprehensive plan would provide for the water related needs of the region including flood control, enhancement of water supplies and other objectives served by the C&SF Project.²⁶

The act mandated that the Corps would consider the conceptual framework specified in the Sustainable South Florida Commission's Conceptual Plan as the basis for the comprehensive plan. It went on to direct that the submittal of the C&SF Restudy Feasibility Report along with a Programmatic EIS be accelerated by two years. Under this congressional mandate, the Corps and the district must now present the Feasibility Report by July 1999.

As a result of the 1996 Water Resources Development Act, many stakeholders in South Florida were left wondering how the Corps and the district would proceed. Having admitted in their 1995 Project Study Plan that it would be very difficult to complete an adequate Feasibility Report in six years, they were now being directed to do so in less than four. Yet, according to the directive of the act, the Congress still required that a feasibility report be submitted. Could the Corps and the district achieve that level of analysis and detail required by a Corps feasibility report in such a short period of time? Many South Florida players participating in the

Restudy process did not believe this could be accomplished, despite assurances from Corps leadership. And in large part, many events that have unfolded in South Florida since the passage of the 1996 Water Resources Development Act have only served to bolster this conclusion.

STATUS OF THE C&SF RESTUDY - 1998

To their credit, the Corps of Engineers, Jacksonville District and the South Florida Water Management District have done a herculean task in trying to comply with the new congressionally-mandated schedule for the C&SF Restudy, to incorporate the Sustainable South Florida Commission's Conceptual Plan as the framework for the Restudy, and to continue to keep the Restudy process open to the public and affected interests. But some important components of a successful Restudy plan have been left undone.

For example, upon receiving the new directives from Congress, the Corps and the water management district set about to revise the Project Study Plan for the C&SF Restudy Feasibility phase. In May, 1997, a new work plan was adopted.²⁷ This \$39 million study outlined a course of action to identify the most plausible beneficial alternative plan components for South Florida ecosystem restoration and urban and agricultural water supply. The work plan specified, however, that considering the uncertainties regarding design and details - such as the locations that may be proposed for surface water storage reservoirs - the ultimate components recommended by the Feasibility Report may need to be revised in the future, especially in terms of design and cost estimates.²⁸

The 1997 Project Study Plan continued to place great emphasis on the utilization of the South Florida Water Management District's Lower East Coast Regional Water Supply Plan as the basis for determining much of the water supply portion of the Restudy Feasibility Report. Unfortunately, the Lower East Coast Plan was never completed. Work on a draft Lower East Coast Plan that was issued in March 1997 was disbanded in the fall of that year. In its place, a much smaller scale "interim" plan was adopted by the District in December 1997. There are several reasons for this. New state law requirements for water supply planning were difficult to incorporate into the existing planning process. However, it is just as likely that the water management district was unable to complete its water supply plan while at the same time meet the accelerated work schedule for the Restudy. While this is understandable, it does little to address the uncertainties of concerned water-user interests in the region.

Now, instead of a local water supply plan forming the basis for the Corps of Engineers long-term comprehensive program for the C&SF Project, the water management district will be looking to the results of the Restudy to direct regional water supply plans. And as we are quickly approaching the time when the Corps and the water management district will be selecting a preferred plan to recommend in the Feasibility Report to Congress,²⁹ what is the outlook for the Restudy recommendations?

Although the plan development is still in progress, South Florida stakeholders have been closely following the review and analysis of five alternative plans that have been presented to date by the Corps and the water management district. As of this writing, a sixth and final plan is being modeled. Many of the major components proposed for the Restudy have been reiterated from one alternative plan to the next. Alternative 5 (see Appendix B) includes the major proposals that the Restudy has featured to date: 1) construction of a series of large surface water storage reservoirs throughout the South Florida region that will store water for water supply purposes, ameliorate high water levels and provide enhanced protection for estuaries and other natural water bodies which presently bear the brunt of heavy discharges, and serve to restore more natural flows to the Everglades; 2) construction of hundreds of Aquifer Storage and Recovery Wells to address urban water supply needs; 3) re-establishment of more natural hydrologic connections within the Water Conservation Areas by removing canals and levees; and 4) creation of an “in-ground” reservoir in northwest Dade County to serve the water supply needs of greater Miami by constructing a curtain wall 100-200 feet deep around 8000 acres of rock mining pits.

While these concepts are intriguing, many stakeholders are left wondering about their cost-benefit and technical efficacy. As recently as the spring of this year, the Environmental Protection Agency voiced concerns about the regulatory impediments to large-scale aquifer storage and recovery. The Corps Restudy models assume that any ASR injection water will be pre-treated to comply with regulatory water quality issues. However, as several water utility directors note, assumptions may work in computer models, but when a plan is relying on 1.7 to 2 billion gallons per day of ASR capacity to meet future urban needs, the water quality treatment costs alone could add up to \$4 billion to the cost of the Restudy plan.³⁰

Urban water users were not the only ones to voice concerns about the water supply proposals being

presented in the Restudy. Everglades National Park publicly questioned the reasonableness of relying so heavily on ASR, especially considering that pilot projects in South Florida do not support the retrieval rate (70%) upon which the Corps and water management district were basing their analyses. Similarly, the Park raised concerns about the engineering feasibility of the in-ground water supply reservoir proposed in northwest Dade County that would be the future source of greater Miami’s water supply.³¹

And water supply is not the only issue that is drawing criticism: At an April 15, 1998 meeting of the South

Florida Water Management District, a number of stakeholders participated in a panel discussion to elaborate their concerns about the Restudy. Major questions were raised including:

1. The anticipated level of detail in the product being submitted to the United States Congress in July 1999 seems woefully inadequate in many people’s minds;
2. It is unclear what the role of the water management district will be - does the district, as local sponsor, have a responsibility to see that the final Feasibility product of the C&SF Restudy live up to the mandates of state water law?;
3. The practicality of relying excessively on ASR is questioned, especially when water users do not see any back-up proposals for addressing future urban water supply in the event that ASR does not work;
4. The proposals to decompartmentalize the Water Conservation Areas (i.e. remove the canals and levees that separate one Area from the next) raise questions about whether such actions would hurt rather than help the environment;
5. In general, the interested parties question the adequacy with which the Restudy plan is addressing urban and agricultural water supply needs;
6. The ability of the proposed surface reservoirs to retain water for water supply purposes during the dry season has come under fire. This is the time of year when evapotranspiration is at its highest and shallow surface waters typically add to water loss from the system rather than retention within the system. Likewise, in some areas the sandy sub-soils and the direct interface between surface and ground water lead may to believe that it would be impossible for a surface system to hold water during dry times;

7. There are concerns that the plan does very little to address water quality. Without this, it would likely be impossible for increased flows to be discharged into the Everglades;
8. Environmentalists question the capacity of the Restudy planning process to incorporate, at this late date, the findings of the U.S. Department of Interior Multi-Species Recovery Plan for South Florida;
9. The nominal degree of sensitivity and risk analysis that is being conducted as part of the Restudy planning process has given some cause for concern;
10. Finally, the fact that proposals are already being generated to modify the operations of the C&SF Project prior to the conclusion of the Restudy planning process, leave many people scratching their heads. Why would the Corps or the water management district want to change the water level regulation schedule on Lake Okeechobee, for instance, prior to completing its planning effort?³²

In short, there are many questions and concerns being raised about the Restudy plan even as the Corps of Engineers and the water management district are poised to select a preferred alternative plan during the summer of 1998 that will serve as the basis for a Feasibility Report recommendation to the United States Congress. None of the South Florida participants - the environmentalists, the economic development interests, the water suppliers, or agriculture - want to be perceived as “Naysayers” in this process. However, they do feel that they have a legitimate complaint: They are concerned about sending a report to Congress that is designed to result in Congressional authorization of a plan to dramatically alter the landscape and water management regime of South Florida, without more of their questions being answered first.

In fact, concerned South Florida interests are not sure exactly what the report that is going to Congress will be. By its own admission, the Corps of Engineers notes in its revised Project Study Plan that “Due to the geographic extent of the study area and the need to complete this study in a timely fashion, the level of detail will not be sufficient to proceed directly into detailed engineering design for the entire comprehensive plan. Many components or features of the comprehensive plan will require further study and additional evaluation before proceeding into final design and preparation of plans and specifications. Further, some work items, particularly computer modeling efforts, will be initiated during the feasibility phase in support of subsequent efforts.”³³ This being the case, South Florida interests question why a

report would be sent to Congress for authorization before the computer models, further study and additional evaluation are completed.

As a result of these concerns, water suppliers, property owners, local governments, agriculture and economic development interests took some rather dramatic and unprecedented measures to ensure that their interests are protected in this process. As of this writing, a bill is pending before the 1998 Florida legislature³⁴ that was promoted and lobbied by these interests. The bill requires that any project or modification to the existing C&SF Project that results from the Restudy plan would not only need approval of the local sponsor prior to implementation, but would also need review by the Florida legislature. Such a step involves the state much more directly in the federal process than it has been to date. The real rationale behind this legislative initiative is quite simple: Present cost estimates for the Restudy Plan range as high as \$5 billion. The South Florida Water Management District will not have the financial capacity within its ad valorem tax base to provide its 50% share of this funding in the future. As such, most of the local share will need to come from a new source such as higher taxes, water use fees, or additional monies from state land acquisition programs. In a nutshell, the Florida legislature will be asked to pay for this. It only makes sense then that the legislature be involved in reviewing and approving the Restudy plans and projects.

LESSONS LEARNED

As we are fast approaching the conclusion of the planning phase of the C&SF Project Restudy, what has our experience to date taught us? Perhaps the clearest lesson, when it comes to large-scale water resource planning, was best articulated by Chuck Aller, Director of Water Policy for the Florida Department of Agriculture and Consumer Services. In recent comments to the Governing Board of the South Florida Water Management District, Aller noted, commenting on the Restudy process, “When you increase the level of uncertainty, you increase the level of resistance.”³⁵ To date, despite the best efforts of the Corps and the water management district, there has been a huge degree of uncertainty in the Restudy process. The process has been substantially accelerated, and as a result, standard feasibility-level analyses have not been completed. It is unclear what the product that will be sent to Congress will achieve. Is it intended as a “comprehensive plan” that may well be very conceptual in nature, or is it intended to fulfill the Corps requirement of a detailed feasibility analysis? It is clear that until these concerns and others are addressed there will continue to be serious

resistance to the Restudy by many local South Florida interests. And this is understandable: people's land and water supply are at stake.

What can the Corps and the water management district do to resolve this resistance? As a starting point, and at a minimum, these government agencies can lay out a clear game plan with reasonable time schedules of how we proceed from this point forward. When will the necessary hydrologic, ecologic, and economic studies be completed? When will computer models be peer reviewed? How will these results be incorporated into the existing proposals for the Restudy, particularly if they demonstrate the lack of feasibility of any components of the Restudy plan? What alternatives to surface water reservoirs or ASR wells will the Corps and district pursue if these major foundations for the Restudy prove impractical?

Secondly, and more importantly, if a major goal of the C&SF Project Restudy is the restoration of the Everglades, then we need to engage the public policy debate over what our restoration goals for this ecosystem really are. They have yet to be defined in a manner that provides a useable guide for action by policy makers at local, state and federal levels. Some have argued that the Everglades of the mid 1800's should be our goal. But, since that system has been reduced to half its original size, is our real goal to create a smaller, but naturally functioning system? If this is the case, then some leading experts have pointed out that there is much we don't know or understand about how the ecosystem actually functioned prior to drainage. Some of the computer models that will help us understand the ecologic relationships of the system are still under development. And the hydrologic model that is being used to dictate hydropattern goals - the Natural Systems Model - is really a digital approximation of water levels and flows in pre-Colombian Florida. It may not be a good predictor of how best to restore environmental functions and values in

a system that has been dramatically altered.³⁶

On a final note, the C&SF Project Restudy process has certainly taught us how difficult, if not impossible, water resource planning is on a scale as large and complex as that of the Everglades. It underscores the tensions, contradictions and shifting goals and objectives with which the Corps and the water management district have had to struggle. On one hand there is ready agreement that we can no longer do water resource planning in a piecemeal fashion. We must integrate at a watershed or water basin level our goals for meeting the needs of the environment and the economy, recognizing the interrelationships that exist throughout the natural and manmade systems. The experience of the C&SF Project Restudy may yet demonstrate, however, that such a philosophy is noble but impractical on this scale. Just consider that when the Restudy was first begun in 1993, water shortages, a parched Everglades, and algae blooms on Florida Bay were the climactic and ecologic issues shaping the Restudy agenda. Five years later the Restudy focus has shifted to high water levels in Lake Okeechobee and excessive discharges to coastal estuaries. Can any single plan deal with the dramatically shifting hydrologic conditions, the competing socio-economic interests and the scientific uncertainties of a region twice the size of the state of New Jersey? Or will the comprehensive Restudy plan for the C&SF Project ultimately evolve into a series of smaller, discreet, site-specific plans?

It remains to be seen how the Restudy will proceed. But it is clear that the people of South Florida have great hopes that a consensus-based plan or plans will ultimately emerge to guide environmental protection and economic development into the future. It is also clear that water resource managers in South Florida will be kept busy here for years to come!

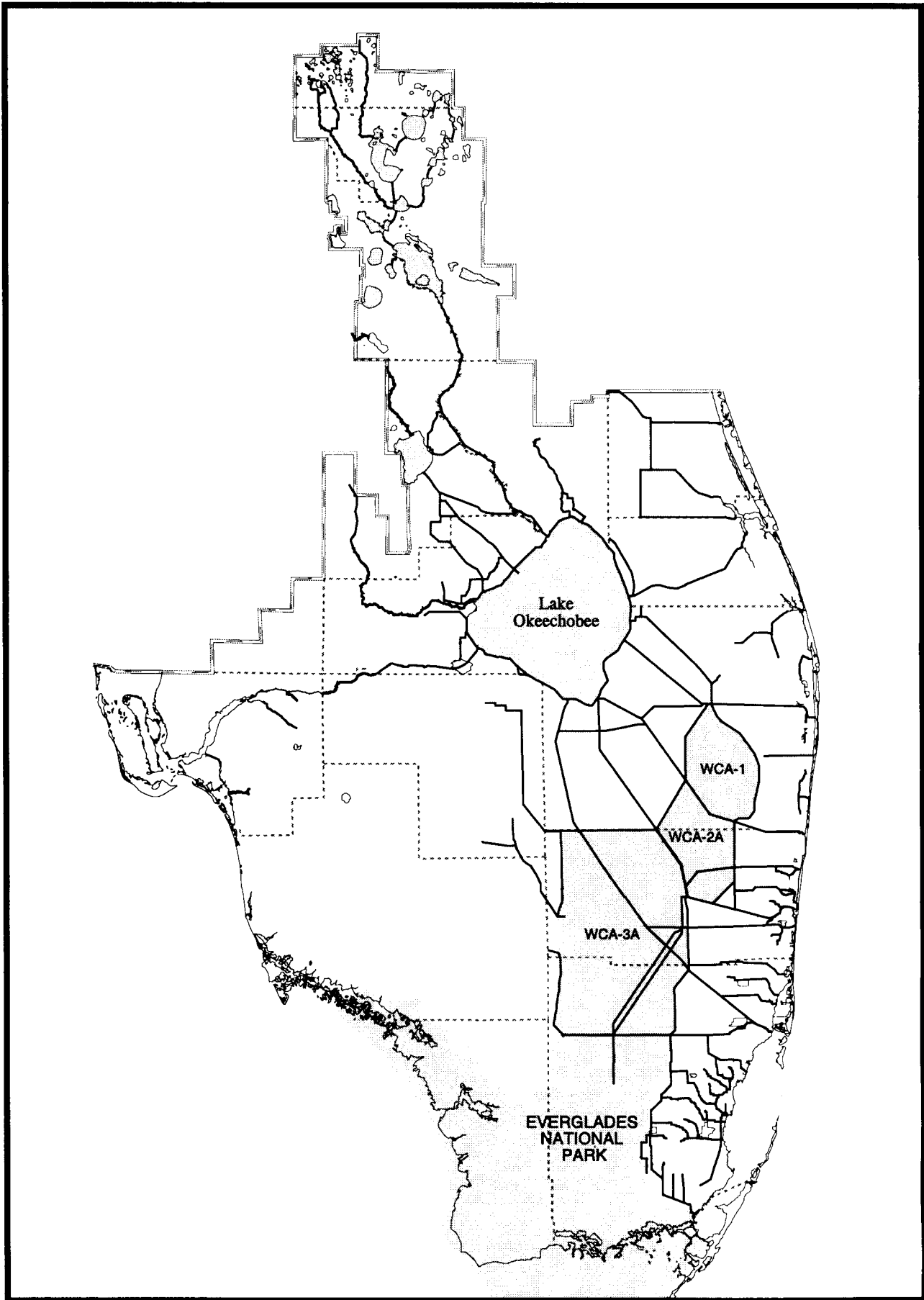
ENDNOTES

1. Long, Phil. "Forecast: Less El Niño and Not so Hot." The Miami Herald. Sunday, April 26, 1998, p. 6B.
2. In early March, over 8000 cubic feet per second was being released from the lake into the Caloosahatchee River to the west. On the lake's east side, 7000 c.f.s. were being sent down the St. Lucie River. (South Florida Water Management District, Water Conditions Summary, March 12, 1998)
3. U.S. Army Corps of Engineers. Central & Southern Florida Project. Reconnaissance Report - Comprehensive Review Study, November 1994, p.3.

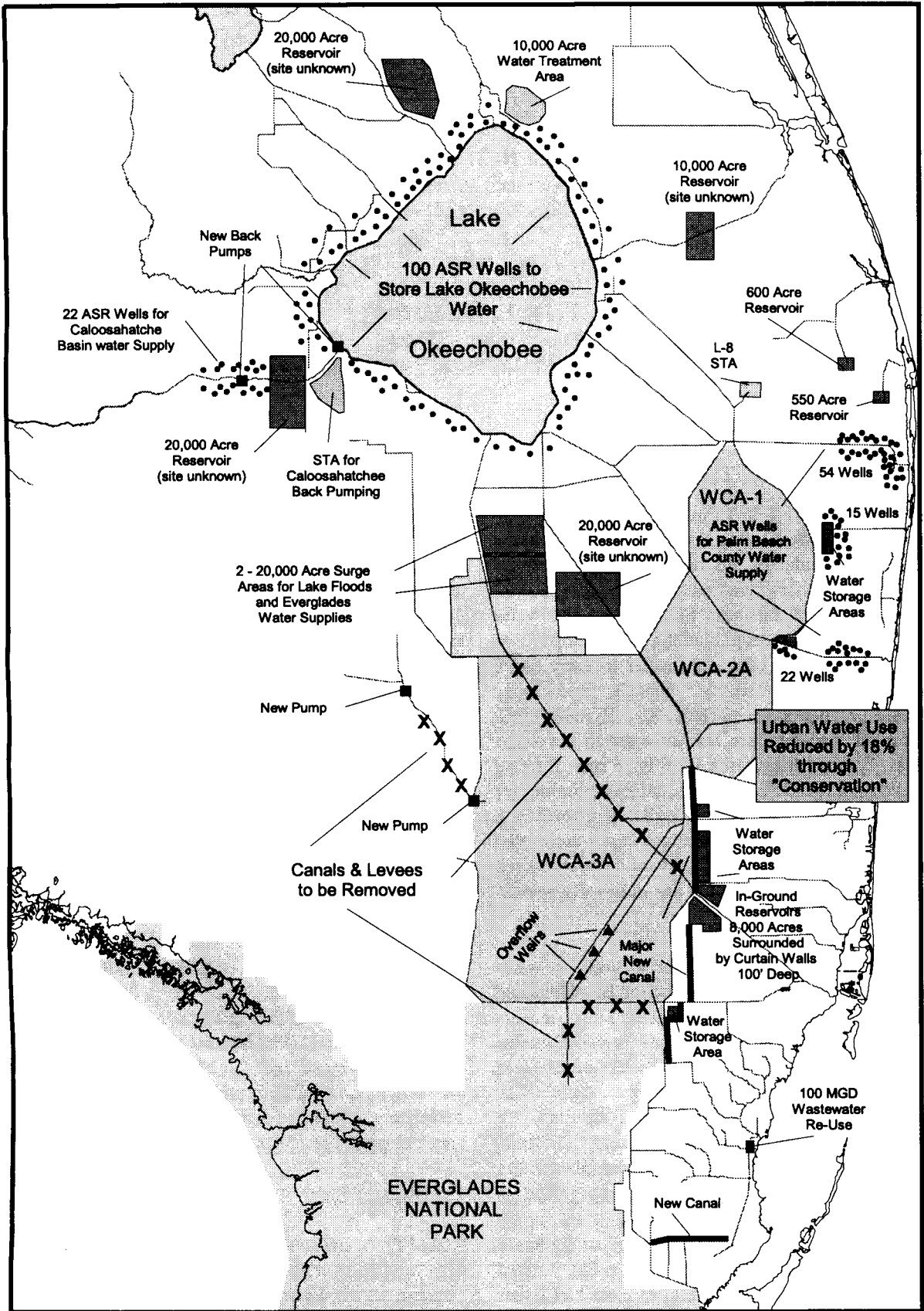
4. Reconnaissance Report - Comprehensive Review Study, p.19.
5. "Federal Objectives for the South Florida Restoration," Science Sub-Group Report of the South Florida Management & Coordination Working Group. November 15, 1993, p.3.
6. "Everglades Water Budget Presentation," Governor's Commission for a Sustainable South Florida. July 20, 1995, p. 22.
7. *ibid.*
8. "A Public Utility's Perspective on Water Supply Issues," Palm Beach County Water Utilities Department Presentation to the Governor's Commission for a Sustainable South Florida. March 27, 1998.
9. "Federal Objectives for the South Florida Restoration," p.1.
10. "Central & Southern Florida Project Review Study News," U.S. Army Corps of Engineers, Jacksonville District, June 1994, p.3.
11. Reconnaissance Report, p. 76.
12. Reconnaissance Report, p. 79.
13. "Federal Objectives for the South Florida Restoration," Science Sub-Group Report, p. 9.
14. Science Sub-Group Report, p. 15.
15. Science Sub-Group, pp. 46-47.
16. Reconnaissance Report, p. E-2.
17. Reconnaissance Report, p. 203.
18. Central & Southern Florida Project Comprehensive Review Study Project Study Plan, July 1995, p.13.
19. Project Study Plan, July 1995, p. 6.
20. Reconnaissance Report, p. 193.
21. Project Study Plan, July 1995, p. 13.
22. The Governor's Commission for a Sustainable South Florida, "A Conceptual Plan for the Central & Southern Florida Project Restudy," August 1996.
23. Conceptual Plan, pp. 2-3.
24. Conceptual Plan, p. 17.
25. Conceptual Plan, pp. 64-65.
26. Section 309 (1), Water Resources Development Act of 1996.
27. Central & Southern Florida Project Comprehensive Review Study, Project Study Plan for the Comprehensive Plan, the Water Preserve Areas and the L-28 Feasibility Study, May 1997.

28. Project Study Plan, May 1997, p. 21.
29. In order to meet the July 1999 deadline for submitting the Feasibility Report and Programmatic EIS to Congress, the Restudy project team must select a preferred plan by the summer of 1998 so that it can be publicly reviewed, approved by the water management district as local sponsor by October 1998 and forwarded for final Corps review.
30. Gary Dernlan, Palm Beach County Water Utility Director. Comments made at a public workshop of the Governing Board of the South Florida Water Management District, April 15, 1998.
31. Department of Interior Views on Selected Restudy Water Supply Components. Presentation to the Sustainable South Florida Commission, March 24, 1998.
32. South Florida Water Management District Governing Board Workshop. Presentation on the C&SF Restudy, April 15, 1998.
33. Central & Southern Florida Project Comprehensive Review Study, Project Study Plan, revised May 1997, p. 25.
34. House Bill 4141 and Senate Companion Bill 2356.
35. South Florida Water Management District Governing Board Workshop, April 15, 1998.
36. MacVicar, Thomas K. South Florida Water Management District Governing Board Workshop, April 15, 1998.

APPENDIX A



APPENDIX B



Major Features of Restudy Alternative 5

C&SF PROJECT RESTUDY - ALTERNATIVE FIVE