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Report to the Chairman, Subcommittee on Transportation and Infrastructure, Committee on Environment and Public Works, U.S. Senate

September 2000

COMPREHENSIVE EVERGLADES RESTORATION PLAN

Additional Water Quality Projects May Be Needed and Could Increase Costs

GAO

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Abbreviations

EPA	Environmental Protection Agency
GAO	General Accounting Office
RCED	Resources, Community, and Economic Development Division

United States General Accounting Office
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Resources, Community, and
Economic Development Division

B-285227

September 14, 2000

The Honorable George V. Voinovich
Chairman, Subcommittee on Transportation
and Infrastructure
Committee on Environment and Public Works
United States Senate

Dear Mr. Chairman:

The South Florida Ecosystem Restoration Initiative is a complex, long-term effort to restore the South Florida ecosystem, which includes the Everglades. Because water is key to restoring the ecosystem, one of the initiative's major goals is "getting the water right"—or improving the quality, quantity, timing, and distribution of water in the ecosystem. The primary means of achieving this goal is through the U. S. Army Corps of Engineers' Comprehensive Everglades Restoration Plan (the Plan). Although achieving the right quantity, timing, and distribution of water is important, improving water quality is critical to sustaining and restoring the South Florida ecosystem. Currently, pollutants such as excessive nutrients, metals, and other contaminants have diminished the quality of water in the ecosystem and harmed plants, fish, and other wildlife. To achieve and sustain the restoration of the ecosystem, its water needs to be clean and unimpaired by pollutants.

In April 2000, the administration presented proposed legislation to the Congress requesting the approval of the Plan as a framework for restoring the ecosystem and authorizing an initial group of projects. The Plan, whose development was authorized by the Congress in the Water Resources Development acts of 1992 and 1996, provides a road map for increasing the region's freshwater supply and improving the delivery and quality of water to natural areas. This Plan represents one of the most ambitious restoration efforts the Corps has ever undertaken; it contains 66 individual projects that will take more than 20 years to complete.[1,2] Implementing the Plan is currently estimated to cost $7.8 billion—a cost that will be shared equally by the federal government and the state of Florida. The effort is unique in that the Plan is conceptual. Because the Plan consists of a large number of projects that will be designed and constructed over a long period of time, it does not provide the level of detail normally found in a Corps feasibility study. The Congress is currently considering this proposal. In May 2000, Florida passed legislation approving the Plan and initially committed $2 billion in resources for the effort. The legislation also included a requirement for an annual report that provides information on the funds received and expended for the implementation of the Plan as well as the progress being made in implementing the Plan.

Because the Plan is conceptual and water quality is critical to sustaining the restoration of the South Florida ecosystem, you asked us to (1) describe the role of the Corps' Comprehensive Everglades Restoration Plan in addressing the major water quality concerns in the ecosystem and (2) identify modifications that may be needed as the Corps implements the Plan after it has been authorized by the Congress. The information presented in this report is primarily based on our discussions with officials from federal and state agencies that have responsibilities for managing water supplies and ensuring water quality in South Florida. Reliance on discussions with federal and state officials was necessary because the Plan is a conceptual document and detailed plans of the projects to be constructed are not yet available. We also reviewed the portions of the Plan

[1]The Plan includes 68 projects, but 2 of these projects were funded under another program's authority. As a result, there are 66 projects remaining in the Plan. Many of the projects have multiple purposes and contain multiple features. Throughout this report, we use the term "projects" to refer to the 66 projects and their features.

[2]The Corps estimates that most projects will be completed within 20 years; however, the projected time frames for two large reservoir projects extend over 35 years. According to Corps officials, appropriation levels will affect these time frames.

that describe water quality projects and obtained and reviewed other pertinent water quality reports and studies.

This is our third report on efforts to restore the South Florida ecosystem. In April 1999, we reported on the federal funding provided for the South Florida Ecosystem Restoration Initiative and how well the initiative was being coordinated and managed. In April 2000, we reported on the status of land acquisition plans for the initiative.[3] In our first report, we recommended that the Task Force, a multi-agency group responsible for coordinating and facilitating the overall effort, develop a strategic plan. The strategic plan would lay out how the initiative's three goals—getting the water right, restoring and enhancing the natural system, and fostering the compatibility of human and natural systems—would be accomplished. Our second report recommended that the Task Force develop a land acquisition plan to supplement the strategic plan. At the request of the Congress, the Department of the Interior, which chairs the Task Force, estimated that achieving all three of the initiative's goals would cost $14.8 billion. This figure includes the estimated cost of the Plan—$7.8 billion—as well as the estimated costs for land acquisition programs and several other federal and state efforts.

Results in Brief

The Comprehensive Everglades Restoration Plan provides a conceptual framework for improving the quality, quantity, timing, and distribution of water in the South Florida ecosystem. Twenty-four of the Plan's 66 projects are intended, among other things, to improve the quality of water in the natural areas of the ecosystem; the remaining projects deal more with the water's quantity, timing, and distribution. The water quality projects in the Plan are intended to supplement the efforts of the state, which has the primary responsibility for achieving water quality standards in Florida. Under the Water Resources Development Act of 1996, the Corps is allowed to include water quality projects in the Plan and equally share the costs with Florida if the projects are essential to restoring the Everglades.

Currently, there are too many uncertainties to estimate the number and costs of the Corps projects that will ultimately be needed to address water

[3] *South Florida Ecosystem Restoration: An Overall Strategic Plan and a Decision-Making Process Are Needed to Keep the Effort on Track* (GAO/RCED-99-121, Apr. 22, 1999) and *South Florida Ecosystem Restoration: A Land Acquisition Plan Would Help Identify Lands That Need to Be Acquired* (GAO/RCED-00-84, Apr. 5, 2000).

quality in the ecosystem. As uncertainties related to implementing the Plan's projects are resolved and more information is gathered about the extent of the ecosystem's water quality problems, it is likely that modifications and additions to the Plan will be necessary and that these changes could increase the total cost of the Plan over the Corps' current estimate of $7.8 billion. For example, the state is currently determining the level of pollutants that Lake Okeechobee can receive and what actions are needed to clean up the lake. Some of the actions being considered, such as dredging the lake to remove contaminated sediment, could cost over $1 billion. Because the lake is the source of much of the water in the ecosystem, the Corps could become involved in the effort if it determines that the lake's cleanup is essential to the ecosystem's restoration. Other efforts, such as the completion of feasibility studies for areas in the ecosystem not covered by the Plan, could also lead to additional water quality projects. The Corps has acknowledged the level of uncertainty in the Plan and has included a process for incorporating project modifications and additions in its future reports to the Congress. It has not, however, included a means for reporting (1) cumulative changes in projects and costs for the Plan as a whole and (2) the progress being made in implementing the Plan. Such information will be important for the Congress in authorizing future projects. We recommend in this report that the Corps provide for such reporting.

We provided a draft of this report to the Corps, the U.S. Environmental Protection Agency, the Florida Department of Environmental Protection, and the South Florida Water Management District for review and comment. The Corps, the Department, and the District agreed with our recommendation and noted that they will be producing varied reports that will help them meet our recommended reporting requirement. While they agreed with the recommendation, the Corps, the Department, and the District noted areas in which they believed the report was misleading. For example, the Corps believes that it fully disclosed the uncertainties associated with the Plan and developed a methodology to deal with the uncertainties, and it does not believe that the Plan's total costs will necessarily increase. In our report, we recognize that the Corps was aware of the uncertainties and describe the process that it has in place for incorporating change. Furthermore, we acknowledge that the Corps may achieve some cost savings in some areas, but overall, we believe that the costs of implementing the Plan may increase. In addition, the Corps and the Department objected to the inclusion in our report of the $1 billion estimated cost of dredging Lake Okeechobee and did not agree with our conclusion that the lake's cleanup could become part of the Plan. We

revised the report to indicate that the cost estimate is preliminary, and we indicated the source of the estimate. However, we continue to believe that projects to improve the lake's water quality—if deemed essential to restore the ecosystem—should be included in the Plan. The Department also objected to our inclusion of the estimated costs for the entire restoration effort in the report, saying that this total was not an agreed-upon cost. However, we believe that the cost of the overall restoration is an important piece of information that places the Plan in context, and therefore we did not remove this information. We did identify the source of the estimate and clarify what it includes. Finally, each of the agencies, including the Environmental Protection Agency, provided technical comments that we incorporated as appropriate.

Background

The South Florida ecosystem extends from the Chain of Lakes south of Orlando to the reefs southwest of the Florida Keys. The ecosystem includes such major water bodies as Lake Okeechobee; the Kissimmee, Caloosahatchee, and St. Lucie rivers; portions of the Indian River Lagoon; and Biscayne and Florida bays. Following major droughts from the 1930s through the mid-1940s and drenching hurricanes in 1947, the Congress authorized the Corps to construct the Central and Southern Florida Project. The project—an extensive system of 1,700 miles of canals and levees and 16 major pump stations—prevents flooding and saltwater intrusion into the state's aquifer while providing drainage and water to the residents of South Florida. The project's canals now divert much of the water that historically flowed south from Lake Okeechobee through the Everglades to Florida Bay east and west to the ocean or to agricultural and urban uses. The Everglades, which used to extend from Lake Okeechobee to Florida Bay, has been reduced to about half its former size.

Although the Corps' Central and Southern Florida Project accomplished its objectives, it had unintended detrimental environmental effects. Coupled with urban and agricultural development, the project has led to significant deterioration in the South Florida ecosystem's water quality. By draining off water to the ocean that historically flowed through the ecosystem to Florida Bay and opening large land tracts for urban development and agricultural practices, the project disrupts natural drainage patterns in the region and releases stormwater runoff into the ecosystem in many areas. Pollutants in the runoff, including excess nutrients such as phosphorus and nitrogen, metals such as mercury (which is primarily deposited from atmospheric incinerator emissions), and pesticides, have degraded the natural areas of the ecosystem. Excess nutrients have caused a decline in

natural vegetation, such as sawgrass, and have caused the increase of undesirable species, such as cattails. Mercury, which increases in concentration as it moves up the food chain, and some pesticides can be toxic to fish and wildlife.

Recognizing that the Central and Southern Florida Project needed to be modified to address its negative impact on the environment of South Florida, the Congress included provisions relating to the project in the Water Resources Development acts of 1992 and 1996. The 1992 act provided the Secretary of the Army, who delegated this responsibility to the Corps, with the authority to study the original design of the project in order to determine whether modifications were needed because of changes in the ecosystem's physical, biological, demographic, or economic conditions. The 1996 act directed the Corps, on the basis of its initial review, to prepare a feasibility report and a programmatic environmental impact statement to determine what changes were needed to restore the South Florida ecosystem. The act required that the Corps report back to the Congress by July 1999.

Using the authority provided by the acts, the Corps, with the cooperation and assistance of multiple federal, state, local, and tribal agencies, completed the feasibility study and developed the Comprehensive Everglades Restoration Plan. The Plan, which was presented to the Congress in July 1999, proposes a set of 66 projects to modify the Central and Southern Florida Project to protect and restore the South Florida ecosystem at an estimated cost of $7.8 billion. The projects in the Plan, if authorized and built, will restore water to the natural areas of the ecosystem and also supply water to agricultural and urban areas. The natural areas of the ecosystem are made up of federal and state lands, including the water conservation areas owned by the state,[4] wildlife refuges managed by the U.S. Fish and Wildlife Service and the state, Everglades National Park, Big Cypress National Preserve, and the coastal waters, estuaries, bays, and islands. The goal of the Plan is to increase the water available for the ecosystem by capturing much of the water that is now being drained, storing the water in many different reservoirs and

[4]The state has three water conservation areas that comprise about 1,350 square miles of land south of Lake Okeechobee. These areas—one of which is managed by the U.S. Fish and Wildlife Service as a national wildlife refuge—are natural areas of remnant Everglades that are used for multiple purposes, such as storing water that has been discharged from Lake Okeechobee and other sources. The areas also serve as a source of water for Everglades National Park, the lower east coast agricultural lands, and urban areas.

underground storage wells, and releasing it when it is needed. (See app. I for additional details on the projects included in the Plan.)

The administration presented proposed legislation in April 2000 asking the Congress to approve the Plan with its projects as a conceptual framework for restoring the ecosystem.[5] Because the Plan consists of a large number of projects that will be designed and constructed over a long period of time, it is not as detailed as typical Corps feasibility studies. For example, it does not identify specific sites for the proposed projects. The Corps also plans to conduct additional feasibility studies because the time allotted to complete the Plan did not allow for a thorough investigation of all of the regional water resource problems in South Florida. The Corps will design the projects in more detail and expects to request the Congress to authorize a new set of projects every 2 years until all the projects are authorized, which the Corps anticipates will take until 2014.[6]

The Plan will be carried out primarily by one federal agency—the Corps—and one state agency—the South Florida Water Management District (the District), which manages water resources for South Florida and is the Corps' local sponsor, or partner.[7] These agencies are responsible for operating the Central and Southern Florida Project as it is currently configured and will be responsible for planning, designing, and constructing the Plan's projects to reconfigure it. The agencies are responsible for meeting both the water supply and water quality goals in the Plan. Furthermore, under the Clean Water Act, which seeks to restore and maintain the physical, chemical, and biological integrity of the nation's waters, the projects must be designed to meet applicable state water quality standards.[8]

[5]The administration's proposal also asks the Congress to authorize 4 pilot projects, 10 initial projects, and 25 smaller projects that will have immediate benefits if implemented.

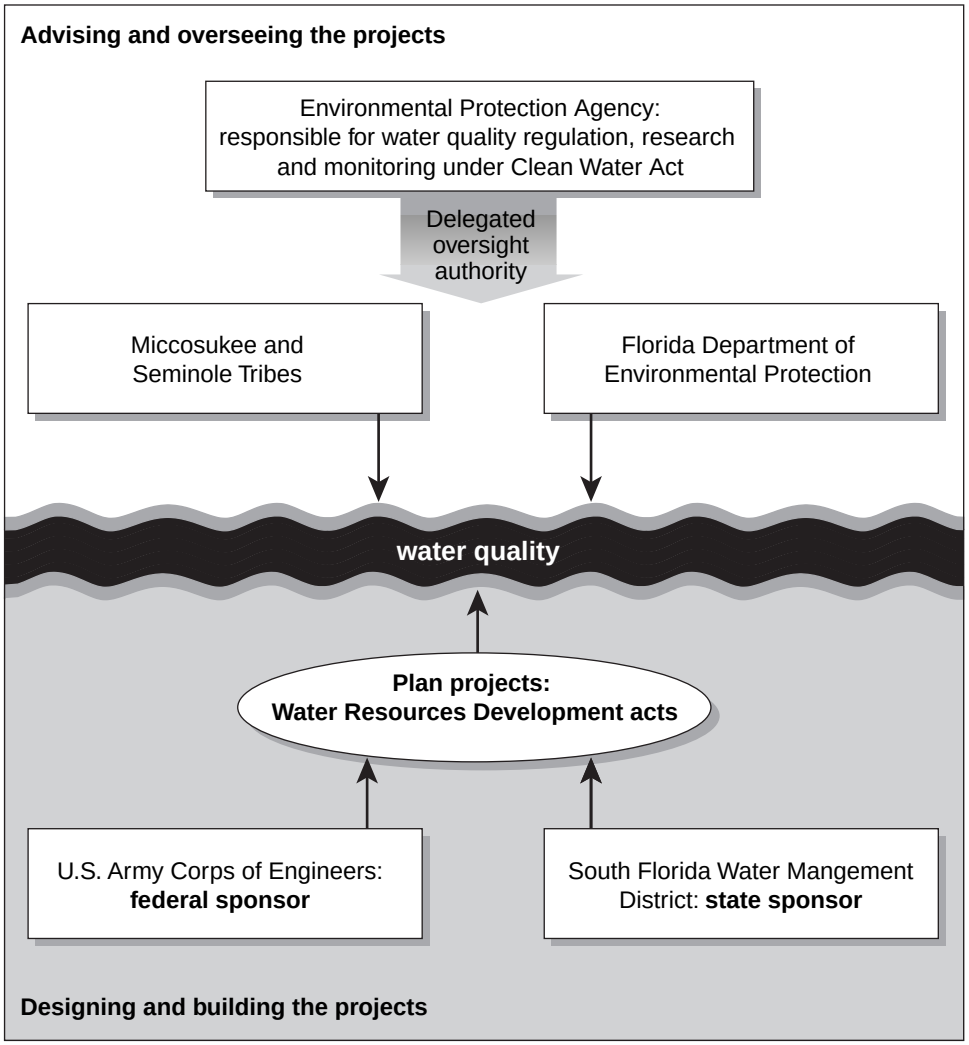
[6]Design work is already progressing under the authority of an existing design agreement between the Corps and the District.

[7]Although the South Florida Water Management District is the primary nonfederal sponsor, as many as five counties and city governments and Native American tribes could also serve as nonfederal sponsors for portions of the Plan. The Seminole Tribe of Florida signed a project coordination agreement with the Corps in Jan. 2000 to implement a water resources project on its Big Cypress Reservation.

[8]Enacted in 1972, the Federal Water Pollution Control Act is commonly called the Clean Water Act (33 U.S.C. 1251-1387).

The entities responsible for ensuring that the Plan's projects meets the requirements of the Clean Water Act are the U.S. Environmental Protection Agency (EPA), the Florida Department of Environmental Protection, and the Miccosukee and Seminole tribes. EPA is responsible for developing regulations and guidance for implementing the act, while the state and the tribes have primary responsibility for programs to manage water quality. Florida's Department of Environmental Protection is responsible for (1) classifying the types of water in the state by designated use, (2) establishing water quality standards for each type of water designed to protect the designated use, (3) regulating discharges into waters, (4) determining and reporting waters that do not meet standards to EPA and (5) making plans to improve the quality of water that does not meet standards. In addition, the Department is responsible for monitoring the quality of each water body. In the South Florida ecosystem, the Department has delegated water quality monitoring and assessment to the District. Other agencies, such as the U.S. Geological Survey, contribute to water quality monitoring and analysis. The tribes are responsible for these activities on their reservation lands, which encompass about 165,000 acres in the South Florida ecosystem. Figure 1 shows the relationship of the federal and state agencies and tribes involved in improving water quality in the South Florida ecosystem.

Figure 1: Relationship of Federal and State Agencies and Tribes Involved in Implementing the Plan to Improve Water Quality in the South Florida Ecosystem



Note: The Florida Department of Environmental Protection has delegated responsibility for water quality monitoring and assessment in the ecosystem to the South Florida Water Management District.

The Projects in the Corps' Plan Supplement Florida's Efforts to Address Water Quality in the Ecosystem

The water quality projects included in the Corps' Plan supplement the efforts of Florida, which is primarily responsible for ensuring compliance with water quality standards in the ecosystem and for ensuring that the projects meet state water quality standards. As authorized by the Water Resources Development Act of 1996, the Corps included projects in the Plan to improve water quality in the South Florida ecosystem that the Corps deemed essential to achieve the restoration of the Everglades. The federal and state governments will equally share the costs of these projects. The Corps developed guidance establishing which water quality projects would be considered essential for restoration purposes. Generally, the guidance calls for the construction of water quality projects in locations where the Corps will reintroduce water to natural areas of the ecosystem. Therefore, some of the Plan's projects involve not only collecting, storing, and diverting water that is now being drained by the existing Central and Southern Florida Project, but also constructing water quality projects, such as treatment facilities, to ensure that the water being put back into the natural areas is clean.

Florida Has Primary Responsibility for Addressing Water Quality in the Ecosystem

Florida has the primary responsibility for achieving water quality standards in the state and is taking steps outside the Plan to achieve water quality standards in the ecosystem. Most significantly, the state is beginning to develop pollutant reduction plans to improve the waters in the state. Under the Clean Water Act, the state has to report water bodies to EPA that do not meet the agency's standards or are considered "impaired."[9] In 1998, the state identified and reported 150 such water bodies or water segments in the South Florida ecosystem. To improve these impaired waters, the state must establish the amount of each pollutant that can be discharged into a particular water body and still meet standards and limit discharges to those levels. Florida currently has a 13-year schedule to establish the allowable amounts of each pollutant, known as a "total maximum daily load," that can be discharged into each body of water in the state, including those in the South Florida ecosystem.[10] If the state fails to establish the total maximum daily loads, EPA is required to establish the amounts.

In addition to its statewide water quality programs, Florida has initiated several efforts specifically designed to address the quality of water in the Everglades and other natural areas in the South Florida ecosystem. For example, Florida's Everglades Forever Act,[11] passed in 1994, established a plan to restore significant portions of the ecosystem through construction, research, and regulation. Most importantly, the act requires the state to reduce phosphorus levels entering the natural areas of the ecosystem. To do this, six wetlands, called stormwater treatment areas, are being constructed to filter pollutants in runoff from the agricultural areas south of Lake Okeechobee.[12] In addition, the state must develop a numeric criterion for phosphorus in the Everglades. Another important state effort

[9]The state indicated that there are questions about the process and data used to achieve this listing. GAO has reported on the inaccuracy of the data used by the states to report impaired waters in *Water Quality: Key EPA and State Decisions Limited by Inconsistent and Incomplete Data* (GAO/RCED-00-54, Mar. 15, 2000).

[10]Florida's schedule has been adjusted to reflect the results of a lawsuit against EPA for not reviewing the establishment of total maximum daily loads in the state. The state has rescheduled the establishment of some total maximum daily loads to meet the schedule set in the consent decree settling the lawsuit.

[11]The Everglades Forever Act codifies much of a consent decree establishing a settlement agreement between the United States and the state. The consent decree settled a lawsuit against the state for not enforcing its water quality standards in federal areas.

[12]Under the consent decree cited in footnote 11, the state will build five of these areas and the federal government will build one.

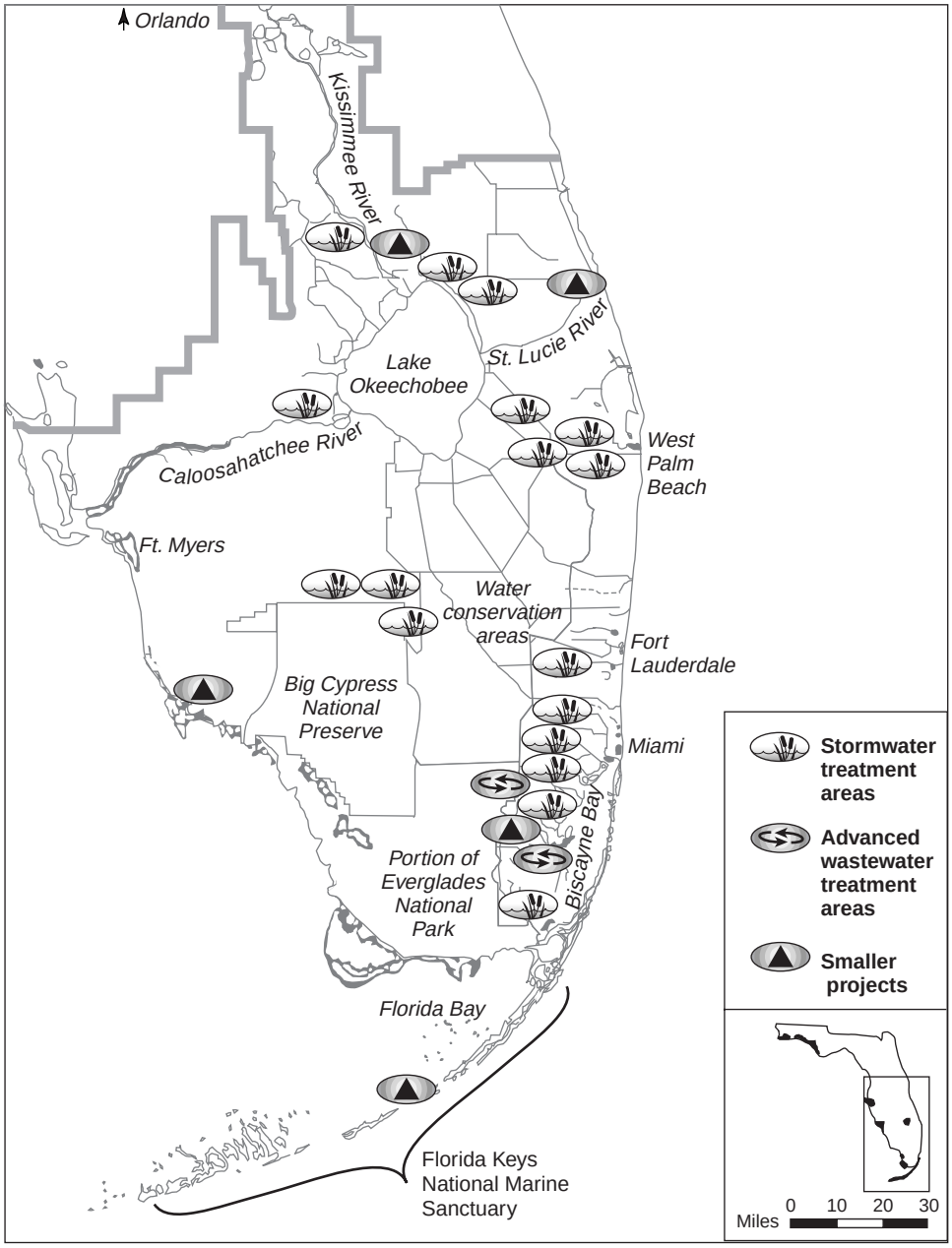
to address water quality in the ecosystem, the Lake Okeechobee Protection Program, was passed in May 2000. These and other state efforts intended to improve the quality of water of the South Florida ecosystem are described in appendix II.

With funding through a grant from EPA, Florida recently initiated an effort, called the South Florida Water Quality Protection Program, to coordinate the various ongoing efforts to improve water quality in the ecosystem. The purpose of the program, which will be developed primarily by those entities that have water quality responsibilities in South Florida, will be to identify water quality problems in the ecosystem; recommend actions to deal with these problems; and identify and coordinate the efforts of the federal, state, tribal, or local agencies that will be responsible for taking action. The key programs that will be coordinated are the state's total maximum daily load program and its activities under the Everglades Forever Act, as well as the Corps' projects in the Plan.

Corps' Plan Includes Projects to Address Some Water Quality Concerns

Twenty-four of the 66 projects that the Corps included in its Plan are intended to improve water quality in the ecosystem. Many of the Plan's other projects will also improve the quality of water by increasing the quantity or changing the flow of water to degraded areas, but these 24 projects were included specifically to improve water quality. To identify these projects, the Corps established two criteria. First, the Corps included projects to treat water that is being "reclaimed" as part of the Plan. This water is now being discharged by the Central and Southern Florida Project into the ocean, but under the Plan, it will be diverted, stored, and discharged into natural areas to supplement water supply and improve habitat. Second, the Corps included treatment projects for water that will be "reused." This water will also be reclaimed, but its final use will be changed. For example, the Corps now releases water from Lake Okeechobee to the water conservation areas for flood control purposes and water supply, but under the Plan it will also release water for environmental purposes. Figure 2 shows the location of the 24 water quality projects included in the Plan.

Figure 2: Location of the Plan's Water Quality Projects



Source: GAO's adaptation of an illustration prepared by the U.S. Army Corps of Engineers.

The Plan includes 19 stormwater treatment areas (17 projects—2 projects each contain 2 treatment areas) in locations where new storage sites will be built to reclaim water or modify its use. One of the major purposes of the Plan is to create new storage for the 1.7 billion gallons of water per day that historically flowed south into the Everglades but is now, because of the Central and Southern Florida Project, being discharged into the ocean or released for flood control purposes, thus depriving the Everglades of much needed water. While this water generally meets standards for discharge into the ocean, it will require additional treatment before it can be released into the natural areas of the ecosystem because these areas are less able to assimilate specific pollutants, such as phosphorus. A team of federal and state water quality experts used available water quality models to evaluate the potential effects of the Plan's projects on water quality and to identify areas in which known water quality problems could be addressed by the Plan's projects. As a result, the Corps added over 35,500 acres of stormwater treatment areas. Ten treatment areas will be constructed along the east coast between the natural areas and the developed coastal areas, five are located around Lake Okeechobee to treat water entering the lake, and four treat water entering the natural areas northwest of Everglades National Park. In addition, the Plan relies on the six stormwater treatment areas being constructed under the Everglades Forever Act to treat water released from the Everglades Agricultural Area, Lake Okeechobee, and a reservoir planned for the area. The design of the treatment areas was based on that of the areas being built by the state under the act.

In addition to the stormwater treatment areas, the Corps identified a need for two advanced wastewater treatment facilities to treat wastewater for reuse to benefit natural areas. The two plants will take wastewater from the Miami area, treat it, and return it to natural areas to increase the amount of water being provided there. Water that is currently being released from wastewater treatment facilities will be treated and used to recharge groundwater to prevent water from seeping underground from Everglades National Park and to meet the freshwater needs of Biscayne Bay. The Corps included these projects as part of the Plan because it needed additional water in these areas but faced limited supplies. Because of concerns about potential overflows and accidents, such as pipe ruptures, the Corps is considering alternatives for at least the facility near Biscayne Bay.

Finally, the Plan included five smaller projects that were selected because they will have an immediate environmental benefit.[13] These projects include such activities as restoring wetlands or dredging sediments from lakes or other water bodies. For example, one project involves dredging the tributaries that flow into Lake Okeechobee to remove sediments, which will help remove nutrients that contribute to algal blooms.

Resolution of Project Uncertainties and Outcomes of Studies May Lead to Additional Water Quality Projects and Costs

As the Corps implements the Plan over the next 20 or more years, Corps officials believe that modifications to existing projects and additional projects may be necessary, as their details are further developed and as uncertainties about their implementation are resolved. In addition, the Corps plans to conduct several studies that may further identify water quality problems in the ecosystem. If additional water quality projects are identified during the Plan's implementation or as a result of these studies, the costs to implement the Plan could increase above the Corps' current $7.8 billion estimate. Recognizing that additional projects could be needed as the Plan is implemented, the Corps included a process in the Plan to incorporate and report to the Congress on modifications and additions to it. However, the Corps has not included a process for updating the Congress on the cumulative effects of the individual changes on the overall Plan.

Resolution of Implementation Uncertainties

The Corps acknowledged that a number of uncertainties associated with implementing the Plan's projects have not yet been resolved and could lead to additional water quality projects. These uncertainties include (1) whether planned stormwater treatment areas will be successful in achieving the lowest phosphorus concentration needed, (2) whether 245,000 acre-feet of additional water will be needed for Everglades National Park;[14] and (3) what type and level of treatment will be necessary

[13]Most of the small-scale projects were selected from the list of critical projects compiled under the 1996 Water Resources Development Act that allowed the Corps to construct small projects that would have an immediate environmental effect. This list of critical projects was developed by the South Florida Ecosystem Restoration Task Force, and about half of them have been funded. In addition, some small-scale projects were selected from a list of projects submitted by the Florida Governor's Commission's Conceptual Plan for ecosystem restoration and from suggestions by the scientists and agency officials compiling the Plan.

[14]An acre-foot of water is equal to about 326,000 gallons of water—enough to cover 1 acre to a depth of 1 foot.

for water stored in and retrieved from aquifer storage and recovery wells—large underground wells that are one of the primary means in the Plan for storing water.

Uncertainties About Stormwater Treatment Areas May Lead to Additional Projects

Uncertainties about the degree to which pollutants can be removed by the planned stormwater treatment areas may lead to additional water quality projects. In particular, some natural areas in the ecosystem, such as Everglades National Park and the water conservation areas, have a low tolerance for phosphorus—only about 10 parts per billion of phosphorus can be in the water without adversely affecting its designated use. Two or three of the stormwater treatment areas in the Corps' Plan will be used to reduce the levels of phosphorus in water that is being released into these areas, and the treatment areas will have to be built so the released water meets Florida's water quality standards for all pollutants. The state, however, does not currently have a numerical standard for phosphorus in these water bodies, although it is in the process of establishing one. The Corps based the design of its stormwater treatment areas on similar areas being built by the state that are designed to reduce phosphorus levels to meet an interim standard of 50 parts per billion. Evidence gathered by EPA and the state support a numeric criterion for phosphorus of 10 parts per billion; the final standard will involve methods of monitoring and determining compliance that could affect treatment options.[15] If the state establishes a lower phosphorus standard—for example 10 parts per billion—for Everglades National Park and the water conservation areas, then the Corps will likely be required to modify the stormwater treatment areas being built for these areas to achieve that standard.

Additional Water for Park, If Needed, Could Require Water Quality Treatment

If the Corps determines that an additional 245,000 acre-feet of water will be essential to the restoration of natural areas, particularly Everglades National Park, it may need to add another water quality project. In

[15]The Miccosukee Tribe adopted a phosphorus standard of 10 parts per billion for its lands in the water conservation area. In May 1999, EPA approved that standard determining that the Tribe's 10-parts-per-billion criterion is protective of the water's designated use, is reasonable and is scientifically defensible.

response to concerns by the Department of the Interior about needing additional water for the Park during certain times of the year, the Corps determined that an extra 245,000 acre-feet of water could be made available from eastern urban areas. Because of uncertainties in the models for water quantity in the Park, some federal and state officials disagree that the extra water is needed for the Park. In the meantime, the Corps has considered ways to bring the water to the Park, but it will not study the matter fully until a decision is made on the amount of water needed. In addition, the amount of water for the Park may be affected by the amount of water needed in Florida Bay, which will be determined as part of follow-on feasibility studies for the Bay. If the Corps and others determine that more water is needed for the Park, then additional water treatment facilities could be needed to ensure the quality of the water entering the natural areas. Under its criteria to include reclamation projects to protect the quality of water in natural areas, the Corps could be involved in constructing and funding the project. According to Corps officials and others, because undeveloped land is scarce on the east side of the natural areas, water treatment facilities using traditional chemical treatment are the most likely option. According to District officials, another option could be to relocate or resize some of the treatment projects already included in the Plan.

Uncertainties About the Treatment Needed for Water Stored in Wells May Result in Additional Water Quality Projects

Uncertainties about the type and extent of treatment needed for water being pumped into and retrieved from over 300 aquifer storage and recovery wells may result in additional water quality projects. The Corps has included plans and costs for chlorination and filtration facilities to treat the water being injected into more than 250 of these wells. Although the need for chlorination has not yet been determined, concerns have been raised about a possible chemical reaction between chlorinated surface water and the aquifer's groundwater. According to Corps and state officials that we spoke with, such a reaction could create trihalomethane compounds, which are carcinogenic. In addition, the level of filtration required may vary according to the quality of the water being injected into wells; in some cases simple filtration will likely be needed to remove debris, but in other cases, ultrafiltration may be needed to remove pathogens such as coliforms. Corps officials think it is unlikely that chlorination and ultrafiltration will be needed, and if not, the Corps estimates that about $500 million could be saved. The Corps will design and implement pilot projects to determine if these treatments will be needed

and what problems arise from using untreated or chlorinated surface water. If additional information from the pilots indicates that chlorination and ultrafiltration are necessary, additional projects to address water quality problems arising from chemical reactions may be necessary.

Regardless of whether chlorination and filtration are used, other chemical reactions could occur in the water stored underground, resulting in a need for additional projects to improve the quality of water retrieved from the wells. Some federal and state officials and scientists believe that chemical reactions could occur when water is injected underground. For example, un-ionized ammonia—which in excess amounts can kill freshwater species, including fish—could be formed. Florida's monitoring of a small well has demonstrated that underground chemical reactions have contaminated the water with arsenic and radioactive materials, such as uranium, although not at levels exceeding federal drinking water standards. According to officials from EPA and the Florida Department of Environmental Protection, if such chemical reactions occur, the water will require treatment when it is retrieved from the wells. Corps and District officials said that any pretreatment facilities, if constructed, could be used to treat the water recovered from wells to handle such problems if they occur. Corps officials noted that pilot projects the Corps has designed will gather information to resolve these uncertainties and will identify any additional projects that may be needed to address water quality issues created by the technology. If the pilots indicate that the use of this technology is not feasible, Corps officials said that other storage options would be substituted.

Impact of Ongoing and Planned Studies

Recognizing that all the water quality problems of the South Florida ecosystem have not been identified, the Corps plans to conduct several feasibility studies to identify water resource problems in areas of the ecosystem that were not included when it developed the Plan. These studies will likely identify new water quality projects to add to the Plan. Moreover, the Plan recommends the development of a comprehensive integrated water quality plan to evaluate and determine whether any additional water quality projects recommended by the state should be added to the Plan. Any projects identified by these studies will be in addition to those needed to address the uncertainties involved in implementing the Plan.

Feasibility Studies Will Likely Identify Additional Water Quality Projects

In addition to the 66 projects in the Plan, the Corps included several feasibility studies for other areas of the South Florida ecosystem, which could result in the addition of other water quality projects to the Plan. These feasibility studies, which deal with the Southwest Florida and Florida Bay/Florida Keys areas, were included because there was not enough time when the Plan was being developed to allow for a thorough investigation of all the water resource problems in these areas of the ecosystem. In particular, water models and water quality models that exist for Biscayne Bay and Florida Bay have not been calibrated or validated, and, as a result, the Corps and other agency scientists could not rely on these models to conduct detailed studies of the projects needed to improve the quality, quantity, timing, or distribution of water for these areas. The feasibility studies will identify new projects to be included in the Comprehensive Everglades Restoration Plan to help solve any problems with water quality, quantity, timing, and distribution. The Corps, in conjunction with other federal and state agencies, is currently refining water flow and quality models for both bays.

More detailed project designs and analysis from each feasibility study could reveal additional water quality concerns and could result in additional water quality projects. For example, the Corps' Plan already includes a project to improve the circulation and quality of water in Florida Bay by removing portions of the roadbed that fills some of the waterways between islands in the Keys. The Corps will include this as a project in the Florida Bay feasibility study, as well as other projects that have not yet been identified. Additional projects may include solutions for the decline in sea grasses and increases in algae that have occurred in the Bay. Federal and state scientists and other experts are aware of the excess nutrients and salinity in some parts of the Bay, and they believe that either one or both are contributing to these problems. However, they have not reached consensus on the source or effects of these problems or on the potential actions needed to resolve them. As more information becomes known, additional projects to improve water quality in the Bay may be identified. For these, as for other water quality projects, the Corps will determine its involvement according to whether they involve reclaiming water for the natural system or reusing water.

In addition to the feasibility studies proposed in the Plan, the Corps is currently conducting two feasibility studies under the authority of the

Water Resources Development Act of 1996—the Indian River Lagoon Feasibility Study and the Water Preserve Areas Feasibility Study—and is conducting a third for Biscayne Bay under a separate authority. According to a Corps official, the Plan already includes most of the projects that will be recommended in these reports, but the Indian River Lagoon study has identified at least one water quality project that is not in the Plan. As a result of the study, the Corps will likely add a water quality project to its Plan to dredge the lagoon to remove sediments from the St. Lucie estuary, a major tributary of the lagoon, to improve the water's quality and clarity.

Comprehensive Integrated Water Quality Plan May Identify Additional Projects

Although Florida has the primary responsibility to clean up impaired waters and ensure water quality in the South Florida ecosystem, the Corps of Engineers could have a role in future water quality efforts if it determines that the projects are essential for ecosystem restoration under the provisions of the Water Resources Development Act of 1996. Recognizing that not all of the ecosystem's water quality problems have been identified, the Corps has included a recommendation in the Plan for the development of a comprehensive integrated water quality plan. According to Corps officials, the water quality plan will be closely coordinated with the South Florida Water Quality Protection Program, which was recently initiated by the state. Through their participation in the Indian River Lagoon Feasibility Study, program officials have already helped to identify one modification to the Plan—the need to add a stormwater treatment area to a reservoir project on the St. Lucie River to help reduce the flow of sediment and pollutants into the St. Lucie estuary.

As the state program identifies additional projects to improve water quality, the Corps will evaluate whether the projects are essential and whether the federal government should participate in them, share their costs, and include them in its water quality plan. One of Florida's major efforts to improve water quality will be identifying and enforcing total maximum daily loads. To complete its 13-year schedule to establish total maximum daily loads, the state will establish hundreds of load amounts for the almost 150 impaired water bodies or segments of water bodies in the South Florida ecosystem. The state will also be developing plans that will identify projects for reducing the amounts of pollutants entering these water bodies. This does not include efforts that will need to be undertaken to address future impaired waters. According to Corps officials, the Corps will apply the same criteria it originally used to include water quality projects in

the Plan to determine which additional water quality projects it will participate in under its comprehensive water quality plan.

For example, the cleanup of Lake Okeechobee, which has been described as the "liquid heart of the ecosystem," may require a number of projects to restore the quality of the lake's water and, according to Corps officials, could eventually require the Corps' involvement. Currently, Lake Okeechobee—which was once a sandy-bottomed, clear, shallow lake—has high levels of phosphorus that make it prone to algal blooms and cattail growth, adversely affecting the quantity and types of plants and fish in the lake. Despite the implementation of certain permitting programs by the state, the annual phosphorus amounts exceed the state targets. Our discussions with state officials responsible for water quality in Florida indicate that a combination of actions, such as agricultural best management practices and the use of storm water treatment areas, will be needed to lower the levels of phosphorus entering the lake. The state passed legislation on recovering Lake Okeechobee this year and will put in place additional best management practices for agricultural lands, will build pilot projects to test sediment removal and stormwater treatment areas, and will begin other programs to reduce phosphorus in the lake, but it does not yet know how many stormwater treatment areas may be needed. The Corps has already included five treatment facilities in its Plan to remove phosphorus from some of the lake's tributaries. The number of stormwater treatment areas that will be needed in addition to those already planned by the Corps will depend on the final target concentration that is set for reducing phosphorus in the lake and the effectiveness of nonregulatory and regulatory actions in helping to reach that target. According to Corps officials, the Corps may participate in the construction of other stormwater treatment areas if the state determines the areas are needed.

Large deposits of phosphorus-laden sediment in the lake further exacerbate the phosphorus problem. Some federal and state officials believe that if the sediment remains in the lake, the lake's water quality will remain a significant problem. However, dredging will involve removing as much as 30,000 metric tons of phosphorus from the lake's sediment and disposing of it either in landfill or as potential fertilizer. No final decision has been made on what actions to take pending Florida's completion of a feasibility study on options to remove the sediment, which range from dredging the entire lake to sealing or capping phosphorus-laden sediments. If a decision is made to take some action to remove the sediments, then the Corps would decide if the proposed action is essential to the restoration of the ecosystem and if the federal government should become involved and share the costs of the project(s). According to Corps officials, improving the water quality of Lake Okeechobee, which is the source of much of the water in the South Florida ecosystem, is critical to the lake's restoration. The Corps has already included two similar, but much smaller, projects in the Plan—the Lake Trafford[16] and Lake Worth Lagoon dredging projects. In our discussions with both federal and state officials, the main difference between these two projects and a project to dredge Lake Okeechobee is that Lake Okeechobee is many times larger and would cost more to clean up. A preliminary estimate prepared by an issue team of federal and state scientists showed that fully dredging the lake could cost at least $1 billion.

Another area that may involve the Corps in future water quality projects is the abatement of mercury in the ecosystem. Mercury accumulates in fish and in wildlife that eat fish affected with mercury and concentrates as it moves up the food chain. Scientists believe that mercury in the atmosphere from waste incineration and power generation is deposited in South Florida and, under specific conditions, is converted to a toxic form that accumulates and concentrates in fish and animals. At present, scientists continue to research the problem. However, because of high concentrations of mercury in fish and wildlife on federal lands, such as Everglades National Park, the Corps or other federal agencies could become involved in trying to remove mercury from these areas. Other federal agencies, such as EPA and the Department of the Interior's U.S. Geological Survey, are already involved in addressing the mercury problem to some extent through research and monitoring programs.

[16]The Lake Trafford project was funded as a critical project.

The Plan Includes a Process for Incorporating and Reporting Change

To allow for changes that will result as uncertainties involved in implementing the Plan's projects are resolved, including the possible addition of water quality projects, the Corps' Plan includes three ways to incorporate changes: (1) additional efforts, such as surveys, mapping, and water quality analyses, that are needed to develop the final design of the projects; (2) pilot projects conducted to resolve technical uncertainties; and (3) an adaptive assessment process. The adaptive assessment process involves monitoring the systemwide effects of projects on the ecosystem as they are implemented, evaluating the achievement of each project's objectives, and including the monitoring and evaluation results and new information learned from continuing research to refine or alter the design or sequencing of projects. According to the Corps, adaptive assessment will allow it to recognize the need for change and adapt the Plan if the intended results are not achieved or if new ways to increase the benefits to the ecosystem are identified.

The Corps has also included a process in the Plan for authorizing future projects, including any changes, either modifications or additions, that result from its additional planning efforts. As it prepares to move forward with a project, the Corps will submit to the Congress a project implementation report that includes the detailed technical information necessary to design a project or groups of similar projects. The reports will contain the results of additional efforts, such as surveys and mapping, economic analyses, and water quality analyses that are needed to develop the final design of the projects. These reports will be used to add, remove, or modify projects in the Plan and, except for the projects presented for initial authorization, will be presented to the Congress for authorization every 2 years until 2014—when the Corps anticipates that all of the projects needed for the restoration effort will have been authorized. The reports will contain recommendations for any modifications to the Plan whose need was determined by systemwide evaluations. However, according to Corps officials, the Corps does not currently plan to report to the Congress on the cumulative changes that have been made to the Plan. Such a report would provide the Congress and the state with an understanding of how the Plan is evolving, as well as an update every 2 years on the costs of the projects and the Plan.

Conclusions

Achieving water quality improvements in the South Florida ecosystem will depend on several programs and efforts, including the Corps' Plan. Although the Plan currently includes 24 projects to address the quality of

water in natural areas of the ecosystem, there are too many uncertainties to estimate the number and costs of the projects that will ultimately be needed to improve water quality. Even though the Corps believes that the costs of some projects could be reduced, we believe that, with the potential addition of a number of water quality projects to the Plan, it is likely that the overall costs to improve water quality could result in an increase in the current estimate of $7.8 billion for implementing the Plan. The Plan's water quality monitoring and adaptive assessment process will be key to ensuring success in addressing the water quality problems of the natural areas. Congressional oversight of future project authorizations will be important to ensure that the Corps consistently applies its criteria for including additional water quality projects and monitors their additional costs. The Corps has correctly acknowledged the Plan's need for flexibility and adaptability and has included a means for reporting changes to the Congress. Where the Plan falls short is in the type of report that the Corps will provide to assist the Congress in its oversight. Although our review identifies the potential for modifying and adding water quality projects, the other projects in the Plan, such as the construction of surface storage reservoirs and barriers to prevent underground water seepage, are subject to similar changes because they have not yet been designed. If the Congress approves the Corps' blueprint for restoration this year, given its conceptual nature and the likelihood of changes and additions to its projects, the Congress—as well as Florida, which is equally sharing the costs of implementing the Plan—will need to understand how the Plan has evolved from the original blueprint and how these changes will affect the Plan's total implementation costs.

Recommendation

To promote well-informed decisions about the Plan's projects that are presented for approval in future authorization acts, we recommend that the Secretary of the Army provide the Congress with updates that (1) reflect the cumulative project and cost changes to the overall Plan and (2) indicate the progress being made toward implementing the Plan. The updates should be made at the same time as subsequent authorization proposals. The Corps should also provide these updates to the state of Florida.

Agency Comments and Our Evaluation

We provided a draft of this report to the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the South Florida Water Management District, and the Florida Department of Environmental Protection for their review and comment.

The Corps advised us that it concurs with our recommendation and plans to implement it. The Corps noted that the recently finalized Master Program Management Plan calls for the Restoration Coordination and Verification team, which will evaluate and assess the performance of the Comprehensive Everglades Restoration Plan, to produce five categories of written reports covering such topics as the performance of the Plan and recommendations for design and operational criteria. The Corps also expects to issue an annual report card on the status, trends, and success of the Comprehensive Everglades Restoration Plan. The Corps indicated that it would use the information presented in these reports to implement our recommendation to prepare an overall update to the Congress on the cumulative project and cost changes to the Plan as well as on the progress being made in implementing the Plan. The Corps also pointed out that the administration's proposal contains a provision requiring periodic reports to the Congress on the implementation of the Plan. The Corps expects to submit these reports every 5 years. We share the Corps' views on the importance of providing the Congress with information showing the progress being made in implementing the Plan. However, we believe that the Corps' progress report should include an update of the cumulative changes that have been made to the Plan and the effect of those changes on the Plan's implementation cost and schedule and should be provided every 2 years when the Corps is submitting its request for congressional authorization of a new set of projects.

The Corps also agreed that there are many uncertainties associated with the implementation of the overall Plan and the projects to improve water quality in the South Florida ecosystem. The Corps believes that the uncertainties have been fully disclosed and has proposed a methodology that will address them. This methodology includes the development of project implementation reports. The Corps disagreed that the uncertainties will absolutely lead to cost increases. We recognize in our report that the Corps was aware of the uncertainties associated with the implementation of the Plan and describe, in detail, the process that the Corps included in the Plan to incorporate changes as the uncertainties are resolved. We believe that the resolution of these uncertainties may lead to additional water quality projects and will likely result in cost increases. However, because we recognize that the Corps may also have opportunities to reduce the costs of some projects, our report does not state that the resolution of these uncertainties will absolutely result in an increase in the current estimate of $7.8 billion for implementing the Plan.

The Corps believed that it was premature to suggest that dredging Lake Okeechobee could increase the cost of the Plan and questioned the inclusion of an estimate of the costs in our report. We specifically point out in our report that the state is currently conducting a feasibility study on the options to remove phosphorus-laden sediment from the lake and that no decision on dredging Lake Okeechobee has yet been made. We also recognize that any involvement by the Corps would be contingent on the Corps' determination that the project(s) would be essential for the ecosystem's restoration. However, we believe that the cleanup of Lake Okeechobee is the type of water quality effort that could involve the Corps in the future because (1) Lake Okeechobee is an important component of the South Florida ecosystem, (2) the Corps has already included projects in the Plan to address the lake's water quality, and (3) the Corps' Plan already includes two similar, but much smaller, dredging projects. We revised the report to identify the source of the $1 billion cost estimate for the possible dredging of Lake Okeechobee.

The Florida Department of Environmental Protection concurred with our recommendation. The Department stated that the recommendation is consistent with state law and requested that we recognize that Florida already requires that cumulative project and cost information be reported. We commend the state for having the foresight to establish this requirement and have revised the report to include this information. However, we believe that it would be useful for the Congress to receive information that shows how the Plan has evolved and how those changes affect the Plan's original cost and implementation schedule. For that reason, we have recommended that the Corps provide such information to the Congress at the same time that it submits new project authorization requests. The Department also stated its belief that our report is misleading in the following instances:

First, the Department believes that the title of our draft report implied that the Corps and the state were either unaware of the uncertainties associated with the implementation of the Comprehensive Everglades Restoration Plan or downplayed the uncertainties. We did not intend to imply that the Corps and the state were either unaware of or downplayed these uncertainties. However, we agree that the title could have been misconstrued and, to prevent further misinterpretation, we revised the title of our report to indicate that additional water quality projects may be needed and could increase the Plan's cost.

Second, the Department took exception to the inclusion in the report of (1) the $14.8 billion cost estimate to achieve all three goals of the South Florida Ecosystem Restoration Initiative and (2) the $1 billion figure for the possible dredging of Lake Okeechobee. The Department stated that any reference to the $14.8 billion cost estimate should be deleted. In the Department's view, the $14.8 billion figure is not comparable to the cost estimate developed for the Plan and there is no consensus among state and local governments on this amount. We believe it is important to recognize that restoring the South Florida ecosystem will require more than implementing the Corps' Comprehensive Everglades Restoration Plan, which primarily addresses one of the initiative's goals. We agree that we should acknowledge the source of this estimate, and we revised the report to indicate that the $14.8 billion cost estimate was calculated by the Department of the Interior, which chairs the interagency task force that facilitates the overall restoration effort, at the request of the House and Senate Appropriations Committees. In addition, the interagency task force's recently published strategic plan, requested by the Congress, also uses the $14.8 billion figure in discussing the estimated cost of restoring the ecosystem.[17]

In taking exception to the inclusion of the $1 billion cost estimate for dredging Lake Okeechobee, the Department maintained that we represented this estimate as an official rather than as a rough estimate and that we characterized the Corps' involvement as inevitable. We recognize that the cost estimate is preliminary and agree that we should indicate its source and precision. Accordingly, we revised the report to include this information. We do not believe that we have characterized the Corps' involvement in dredging Lake Okeechobee as inevitable. We included Lake Okeechobee as an example of an area where, through the state's efforts to identify actions needed to improve water quality in the South Florida ecosystem, the Corps could have a future role. We already point out that the state has not yet determined all of the actions that will be needed to clean up Lake Okeechobee and that the Corps' role has not yet been defined. However, to emphasize that point, we revised this section of the report to reiterate that once the state determines which projects are necessary, the Corps will determine if the additional projects are essential to the ecosystem's restoration and decide if the federal government will participate in and share the costs of the additional projects.

[17] *Coordinating Success: Strategy for Restoration of the South Florida Ecosystem*, July 31, 2000.

Third, the Department believes that our discussion of the uncertainties associated with stormwater treatment areas is misleading and that we misunderstood the applicability of the numeric criterion to be established for phosphorus. We disagree. We recognize that the stormwater treatment areas being built by the state are not part of the Corps' Plan and the Corps assumed that these areas would achieve the numeric criterion that will eventually be established. Furthermore, we specifically state that several stormwater treatment areas in the Corps' Plan will release water into areas of the natural system, such as Everglades National Park and the water conservation areas, that will be affected by the numeric criterion that the state is in the process of establishing. We acknowledge the state's experience in constructing stormwater treatment areas to reduce phosphorus levels and point out that the Corps used the stormwater treatment areas being built by the state as part of the Everglades Construction Project as the "model" for those included in its Plan. The state's stormwater treatment areas, which are part of the Everglades Construction Project, were designed to reduce phosphorus levels to the interim target of 50 parts per billion. However, if the state establishes a 10-parts-per-billion numeric criterion for Everglades National Park and the water conservation areas, we believe that the Corps will be required to modify the stormwater treatment areas included in its Plan that release water into this protected area.

Fourth, the state believes that our report characterizes two state programs—the Lake Okeechobee Protection Program and the South Florida Water Quality Protection Program—as dependent on the Corps' Plan. We disagree. We concluded that the state's efforts to improve water quality in the ecosystem could identify additional projects for the Corps to consider as part of its integrated water quality plan, which was included in the Plan because the Corps recognized that not all the water quality problems of the ecosystem had been identified. The Plan is intended to be a "comprehensive plan for restoring, preserving, and protecting the South Florida ecosystem," and as a result, any future water projects that the Corps determines the federal government should participate in as essential for the restoration of the ecosystem would be part of the Plan.

Finally, the Department provided comments on several other issues. The Department pointed out that the Corps had not yet decided to include the water quality project to dredge the Indian River Lagoon in the Plan. We agree and revised the report to indicate that the Corps will likely add this project to the Plan. The Department also commented that our report implies that the other projects in the Plan do nothing for water quality. Our

report states that many of the Plan's other projects will also improve water quality by changing the flow of water to degraded areas. The report notes, however, that the 24 projects discussed in it were specifically included in the Plan to improve water quality. The Department believed that the appendix on the state's initiatives to improve water quality in the ecosystem did not mention essential activities, such as the state's water regulatory and water quality monitoring programs. We agree that these are important parts of Florida's overall effort to protect water quality in the state, including the South Florida ecosystem. We discussed Florida's regulatory responsibilities for managing water quality programs in the main body of the report and did not include the information in appendix II because the purpose of the appendix was to discuss the additional efforts the state has undertaken specifically to improve water quality in the South Florida ecosystem. For this reason, we did not add a discussion of Florida's regulatory programs for water quality to appendix II. The Department's comments are in appendix III.

The District also concurred with our recommendation and stated that it will work with the Corps to carry it out. The District did not believe, however, that we should characterize the Plan as unusual or atypical because of the uncertainties associated with its implementation. We do not characterize the Plan as atypical because of its uncertainties. It is atypical because it does not provide the level of detail normally found in a Corps feasibility study—a fact that the Corps recognizes—as a result of the large number of projects that would be designed and constructed over a long period of time. For this reason, we did not modify the report to reflect this concern. The District's comments are in appendix III.

Finally, each of the agencies, including EPA, provided technical comments that we incorporated as appropriate.

Scope and Methodology

To describe the role of the Corps' Comprehensive Everglades Restoration Plan in addressing the major water quality concerns of the South Florida ecosystem, we reviewed portions of the Plan that described the water quality projects. We also obtained and reviewed reports and studies, such as the *Everglades Consolidated Report*, the *South Florida Ecosystem Assessment Interim Report*, and the *South Florida Water Quality Protection Program: Phase I Document* that identify water quality concerns of the ecosystem.

To identify the modifications that might be needed as the Corps implements the Plan, we contacted officials from the Corps and discussed the ecosystem's water quality concerns, how the Plan's water quality projects address them, and the potential need for additional projects and modifications as the Plan is implemented. We also contacted officials from EPA, the Department of the Interior's National Park Service and Fish and Wildlife Service, and Florida's Department of Environmental Protection and South Florida Water Management District. These federal and state agencies were among those involved in the Plan's development and have responsibility for (1) designing and constructing the Plan's projects, (2) ensuring water quality, or (3) managing lands within the ecosystem. We discussed the water quality problems of the ecosystem, the projects included in the Plan to address them, and potential future problems and projects. Because the majority of the projects in the Plan have multiple purposes, the cost estimate for each project is an aggregate cost for construction components that make up the project, such as levees, canals, pumps and structures. For this reason, the cost estimates attributable to water quality were not readily available.

We also contacted the staff of the Committee on the Restoration of the Greater Everglades Ecosystem, the peer review committee for the restoration effort, to discuss the committee's draft work plan as it related to water quality. Although the committee does not yet have a final work plan, it has drafted a work plan that includes studies that address aspects of water quality. Finally, we contacted the head of the Florida Keys National Marine Sanctuary and representatives of the Miccosukee and Seminole tribes, the National Audubon Society, and other environmental and special interest groups and organizations participating in the effort to restore the South Florida ecosystem to discuss their concerns about how the Plan addresses water quality.

We conducted our review from May 2000 to August 2000 in accordance with generally accepted auditing standards.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 15 days after the date of this letter. At that time, we will send copies to the Honorable Louis Caldera, Secretary of the Army; the Honorable Carol Browner, Administrator, Environmental Protection Agency; the Honorable Jeb Bush, Governor of Florida; and other interested parties. We will also make copies available to others on request.

If you or your staff have any questions, please call me at (202) 512-3841. Key contributors to this report are listed in appendix IV.

Sincerely yours,

Jim Wells
Director, Energy, Resources,
and Science Issues

Description of the Major Types of Projects Included in the Corps' Comprehensive Everglades Restoration Plan

The Comprehensive Everglades Restoration Plan (the Plan) was presented to the Congress in July 1999. As it was presented, the Plan contained 68 projects to modify the Central and Southern Florida Project, which consists of a system of 1,700 miles of canals and levees and 16 major pump stations that drain water from the ecosystem and provide water and flood protection to the developed areas of South Florida. If implemented, the Plan will increase the region's freshwater supply and improve the delivery and quality of water to natural areas in the ecosystem.

The Plan, as it was presented to the Congress, consisted of 41 large-scale projects to modify the Central and Southern Florida Project and 27 smaller projects that were selected by the Corps, with the assistance of other federal and state agencies participating in the restoration effort, to provide immediate environmental improvements. Since the Plan was introduced, two of the projects have been funded under an authority, called the critical projects authority, in the 1996 Water Resources Development Act. This authority allowed the Corps to construct small projects that would have an immediate environmental effect. As a result, the Plan has 66 projects—25 small-scale projects and 41 large projects. The 41 projects can be generally categorized by the type of function they will serve in the ecosystem:

- Surface storage reservoirs: More than 180,000 acres of reservoirs will provide 1.5 million acre-feet[1] of water storage in areas around Lake Okeechobee, the Caloosahatchee and St. Lucie rivers, and the Everglades Agricultural Area and along the lower east coast of Florida.

- Aquifer storage and recovery: More than 300 underground wells will be built to store water at a rate of as much as 1.6 billion gallons a day with little evaporation loss, for use during dry periods.

[1]An acre-foot of water is equal to about 326,000 gallons of water—enough to cover 1 acre to a depth of 1-foot.

- Stormwater treatment areas: Approximately 35,600 acres of man-made wetlands will be built to treat urban and agricultural runoff before it is discharged to natural areas, including Lake Okeechobee, the Caloosahatchee River, the Everglades, and Florida's lower east coast. This is in addition to 47,000 acres of stormwater treatment areas (41,500 acres of effective treatment area) being constructed by the state in the Everglades Agricultural Area.[2]

- Seepage management: Millions of gallons of water per day seep underground or through levees and canals from the Everglades toward the east coast. Along the eastern side of Everglades National Park and the water conservation areas, impervious barriers will be built in levees, pumps will be installed to redirect water back into natural areas, and water levels will be held higher to prevent such seepage.

- Reuse water: Two advanced wastewater treatment plants, which will have increased capability to remove pollutants from the wastewater, will treat 220 million gallons of water per day in Miami-Dade County for release into underground aquifers and wetlands along Biscayne Bay.

- Removing barriers to sheetflow: More than 240 miles of canals and internal levees that are part of the original Central and Southern Florida Project and that lie within the Everglades and the water conservation areas will be removed to establish the natural broad, shallow flow of water in the ecosystem.

- Operational changes: The delivery of water to different parts of the ecosystem will be changed to improve the health of Lake Okeechobee and to enhance the timing of water flows.

[2]The Everglades Agricultural Area consists of 1,122 square miles of highly productive agricultural land directly south of Lake Okeechobee and north of the state's water conservation areas.

Florida's Initiatives to Specifically Address Water Quality in the South Florida Ecosystem

Outside of the Comprehensive Everglades Restoration Plan (the Plan), Florida has initiated several efforts specifically designed to address the quality of water in the Everglades and other natural areas of the South Florida ecosystem. In addition to developing numeric phosphorus standards, the state has several ongoing efforts, including the Dairy Rule, the Works of the District, the 1994 Everglades Forever Act, and the Lake Okeechobee Protection Program. The following sections describe the details of these initiatives.

The Dairy Rule

In 1987, the state adopted the Dairy Rule in response to serious water quality problems contributing to the degradation of Lake Okeechobee. The water quality problems were determined to be associated, at least in part, with the nutrient-rich runoff from dairy farms in the Lake Okeechobee basin. The Dairy Rule requires farm owners in the Lake Okeechobee area, who were previously exempt from permitting requirements, to obtain permits from the Florida Department of Environmental Protection. The rule also requires the dairy farmers to construct waste management systems and to use best management practices to control runoff from their dairy farms. Runoff from the area around the barns, which is heavy with animal manure, is collected and treated as wastewater. Many facilities reuse the wastewater by applying it to their farmland and using the nutrient-rich water as fertilizer. The farmers must obtain industrial waste permits that require monitoring of effluent and groundwater near the application sites.

Works of the District

In the Lake Okeechobee and Everglades basins, Works of the District permits are required for landowners who discharge water to the canals, rights of way, lakes, streams and other water resources for which the South Florida Water Management District (the District) has responsibility. The Lake Okeechobee permit program uses performance-based phosphorus controls designed to achieve the annual phosphorus loading targets set for Lake Okeechobee. The Everglades permit program requires all landowners in the Everglades Agricultural Area with land that discharges to District works to obtain a permit, implement best management practices, and monitor the quality and quantity of water they discharge and provide this information to the District. If a permit holder fails to comply with the terms of a permit, the District retains the right to revoke it or take appropriate legal action.

Everglades Forever Act

In 1994, the state enacted the Everglades Forever Act. The legislation was a result of a lawsuit filed against the state of Florida by the federal government for allegedly not enforcing its water quality standards in federal areas such as Everglades National Park. The Florida Legislature found that the Everglades was endangered by adverse changes in the quality, quantity, timing, and distribution of water flows. The Legislature also found that the programs established by the District and the Florida Department of Environmental Protection to improve the tributary waters of the Everglades were not being implemented in a timely manner. The waters flowing into the Everglades contained excessive levels of phosphorus that endangered the flora and fauna of the Everglades. The act established an Everglades Protection Area that includes Everglades National Park and the state water conservation areas. The act is intended to expedite the state's plans and programs for improving water quality and quantity in this area; provide water supply for Everglades National Park, urban and agricultural areas, and Florida Bay; and replace water previously available from the coastal ridge in areas of southern Dade County.

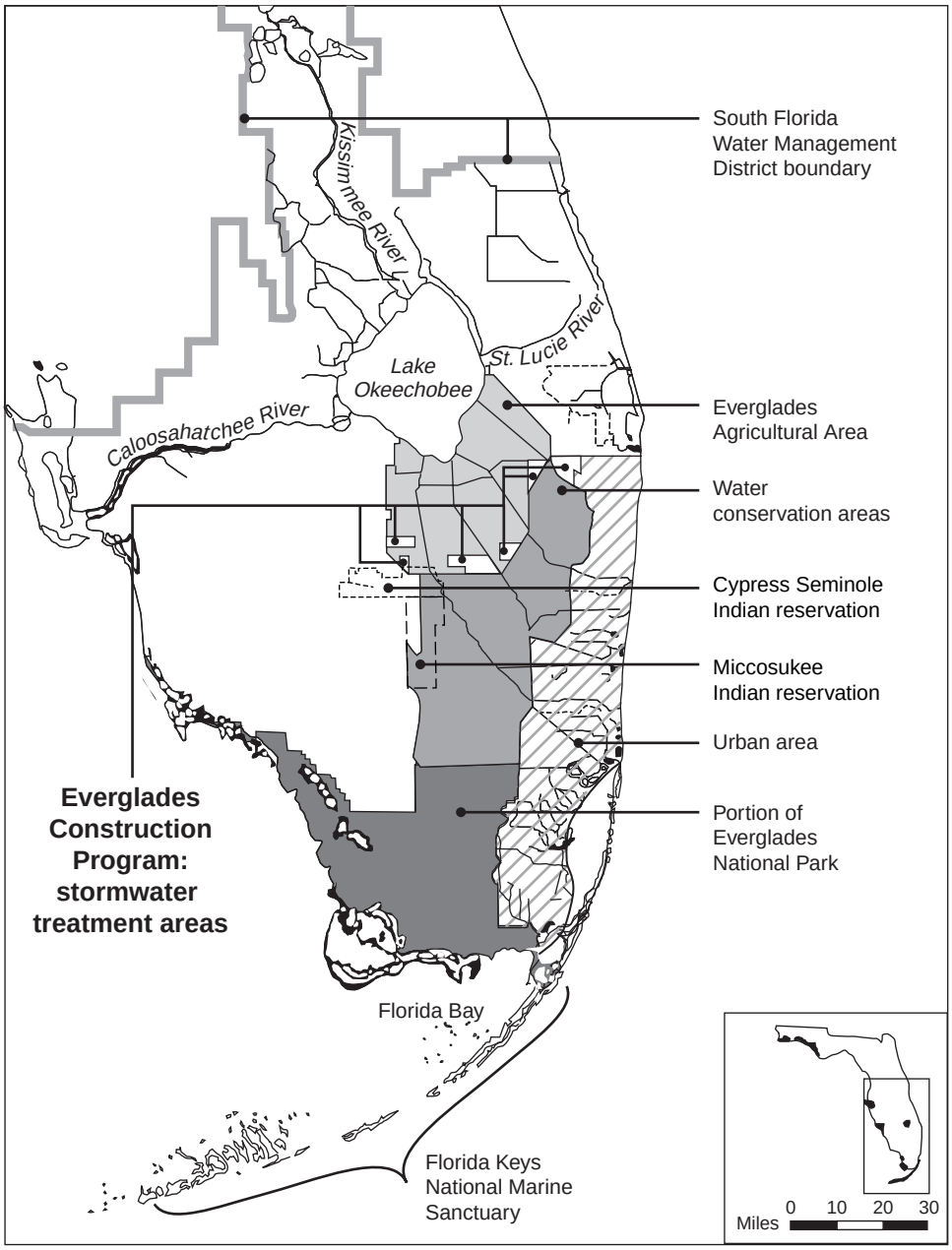
The long-term goal of the Everglades Forever Act is to ensure that waters discharged into the Everglades Protection Area achieve water quality standards by December 31, 2006. The act directs the state to review existing water quality standards and to establish a numeric criterion for phosphorus in the Everglades Protection Area. The long-term goal is to reduce phosphorus discharges to levels that do not cause an imbalance in natural populations of aquatic plants and animals. Although the standard for phosphorus has not yet been set, the Everglades Forever Act provides a default standard of 10 parts per billion if a standard is not adopted by December 31, 2003. In addition, the act requires farmers in the Everglades Agricultural Area to implement best management practices to reduce pollutants in runoff from their farms and to pay an Agricultural Privilege Tax to fund the construction of stormwater treatment areas to provide additional water quality treatment. The Everglades Forever Act establishes a monitoring program to determine the effectiveness of best management practices, which are determined by the District in cooperation with the Florida Department of Environmental Protection. Finally, the act also requires the state to implement advanced water quality treatment measures and increase the amount of water flowing to the Everglades by 28 percent.

Everglades Construction Project

The Everglades Forever Act establishes a state plan to restore significant portions of the remaining Everglades ecosystem, including a program of

construction projects, research, and regulation. A critical element of this program is the Everglades Construction Project, whose primary component consists of six large stormwater treatment areas. The treatment areas will encompass 47,000 acres, of which about 40,000 acres were once used as farmland, and will reduce the phosphorus content of stormwater runoff from the Everglades Agricultural Area and some releases from Lake Okeechobee into the Everglades Protection Area. (Fig. 3 shows the location of the stormwater treatment areas.)

Figure 3: Location of Everglades Construction Project Stormwater Treatment Areas



Source: GAO's adaptation of an illustration prepared by the South Florida Water Management District.

Under a consent decree settling the lawsuit between the federal and state governments, the District is responsible for the design and construction of five of the stormwater treatment areas, and the Corps is responsible for the design and construction of one area. In conjunction with best management practices, the treatment areas are designed to reduce phosphorus concentrations to an interim target of 50 parts per billion. The long-term target is to reduce phosphorus concentrations to achieve and maintain compliance with the long-term water qualty standard that the state will establish. As of August 2000, the District had completed the construction of over 18,000 acres of wetlands in four treatment areas, and it will begin constructing the fifth area within several months. The Corps began constructing the sixth treatment area this year. Achieving the long-term standards may require future modification of treatment areas.

Everglades Stormwater Program

The Everglades Stormwater Program was established by the District after the Florida Legislature passed the Everglades Forever Act of 1994 to improve water quality in basins not addressed by the Everglades Construction Project. The program includes two main components, the Everglades Agricultural Area phosphorus reduction program and the Urban and Tributary Basins Program. The District's staff is working with local governments, state and federal agencies, drainage districts, Indian tribes, affected landowners, and members of the general public in these efforts.

The goal of the Everglades Agricultural Area phosphorus reduction program is to reduce by 25 percent the annual phosphorus load—that is, the mass of phosphorus mixed in with runoff—discharging into the Everglades from the area. The program includes regulatory programs developed to reduce phosphorus loads from the area by reducing phosphorus on the surrounding farms and other adjacent land. The 25-percent reduction goal is to be accomplished by implementing best management practices that eliminate or reduce pollutants at their source rather than treating stormwater runoff downstream. The best management practices in use include new methods of fertilizing farms, detaining stormwater runoff, controlling sediments, and other management methods that prevent or reduce the introduction of pollutants into surface waters. The District has issued each farm parcel within the Everglades Agricultural Area a permit that details the best management practices and water quality monitoring program being implemented on each farm. Records are kept to ensure accurate implementation of the practices, and each farm must also measure the flow and phosphorus level of water discharging from the farm. If the discharges from the Everglades Agricultural Area into the Everglades

meet the 25-percent reduction goal, then the area is determined to be in compliance with the District's permits, and the farmers receive state tax credits. If the discharges do not meet the goal, the individual farms with the highest measured phosphorus discharges are identified and required to implement additional best management practices. According to recent water monitoring data, the farmers have reduced phosphorus loading for 1997 through 1999 by an average of 44 percent (19 percent above the required 25-percent level).

The Urban and Tributary Basins Program was developed to ensure that eight basins discharging into the Everglades other than those included in the Everglades Agricultural Area meet state water quality standards. The program identifies schedules and strategies for achieving compliance by December 31, 2006. It tests over 250 pollutants (such as phosphorus, metals and pesticides) at more than 40 structures that discharge water into, within, or from the Everglades Protection Area. The District is required to collect, review, and evaluate the water quality data in order to measure progress toward achieving compliance with state water quality standards. In particular, a key goal of the program is to lower phosphorus concentrations in the water discharged from these basins to comply with the state's long-term water quality standard. If the Florida Department of Environmental Protection does not establish a standard by December 31, 2003, the default will be 10 parts per billion. For the period from May 1, 1998, through April 30, 1999, phosphorus concentrations were well below 50 parts per billion at most structures.

Everglades Restoration Investment Act

On May 16, 2000, the state enacted the Everglades Restoration Investment Act, which represents the state's commitment to paying 50 percent of the costs of the Corps' Comprehensive Everglades Restoration Plan. The provisions of the law indicate that, over the next decade, more than $2 billion in state and local resources will be directed toward restoration. Through the newly created "Save Our Everglades Trust Fund," resources will be carried forward across fiscal years to help ensure that resources will be available when needed. The law also requires accountability based on performance for all involved in restoration activities.

Lake Okeechobee Protection Program and Lake Okeechobee Protection Trust Fund

Also enacted on May 16, 2000, were two pieces of legislation dealing with the restoration of Lake Okeechobee. One act created the Lake Okeechobee Protection Program, which is intended to achieve and maintain compliance with state water quality standards for the lake through a phased, comprehensive program to reduce phosphorus levels both in the lake and outside of it. The act requires that the state's actions to clean up Lake Okeechobee be coordinated with, and if possible, developed through the Corps' Plan. The program will proceed in a phased approach and will commit the state to a long-term effort to construct new water containment and treatment structures to better control phosphorus at its source. An initial focus will be to cooperate with landowners around the lake basin to promote existing efforts to reduce and control the release of excess phosphorus from their farms. The act provides for

- a watershed phosphorus control program, calling for the phased implementation of phosphorus load reductions, a total maximum daily load proposal, and the formal establishment of restoration goals;
- a phased protection plan that will include the accelerated construction of stormwater treatment areas and the restoration of isolated wetlands;
- an internal phosphorus management and control program, which uses best management practices for agricultural and nonagricultural sources of pollution that do not come from wastewater treatment or other specific points of discharge;
- a comprehensive research and water quality monitoring program;
- the identification and eradication of invasive exotic species; and
- the completion of a feasibility study on the removal of phosphorus-laden sediment in the lake.

A second piece of legislation created the Lake Okeechobee Protection Trust Fund to pay primarily for the requirements of the Protection Program. Trust funds will be appropriated annually by the Legislature. Of the $38.5 million that will be spent on Lake Okeechobee this year, $15 million will be spent to research, develop, demonstrate, and implement best management practices and other measures to improve Lake Okeechobee's water quality. The remaining $23.5 million will be used to implement the Source Control Grant Program, restore isolated wetlands,

retrofit water control structures, and buy land to construct a reservoir-assisted stormwater treatment area in the watershed.

Comments From the State of Florida

Department of
Environmental Protection

Jeb Bush
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

David B. Struhs
Secretary

August 17, 2000

Mr. Jim Wells, Director
Energy, Resources and Science Issues
United States General Accounting Office
Washington, DC 20548

Dear Mr. Wells:

This letter transmits our comments and those of the South Florida Water Management District (SFWMD) on the Draft GAO Report on the Comprehensive Everglades Restoration Plan: *Implementation Uncertainties May Lead to Additional Water Quality Projects and Costs.*

We appreciate the opportunity to comment on the draft report and request that this letter and the attached comments be incorporated into the final report. We anticipate your favorable consideration of our comments and incorporation of the recommended changes into the final report. We agree with the South Florida Water Management comments in the attached letter dated August 10, 2000 and offer the following additional comments:

The main recommendation of the Draft GAO Report is to have the U.S. Army Corps of Engineers provide better updates that 1) reflect the cumulative project and cost changes to the overall Comprehensive Everglades Restoration Plan (Plan), and 2) indicate the progress being made toward implementing the Plan. This recommendation is consistent with the reporting requirements of S. 2797, Restoring the Everglades, an American Legacy Act that is pending before Congress and the State of Florida supports the reporting requirements contained in the bill. Furthermore, the GAO recommendation concerning updating and reporting on cumulative project and cost changes is already a requirement in state law (s. 373.470(7), F.S.) and the report should indicate this.

The title "*Implementation Uncertainties May Lead to Additional Water Quality Projects and Costs*" is misleading. This title implies that USACE/SFWMD/FDEP were either unaware of these uncertainties and had to have them pointed out by GAO or that we suppressed or downplayed the uncertainties. Neither is true, and the April 1999 Restudy report to Congress contains several statements acknowledging these uncertainties. To avoid misrepresenting the conclusions that were reached over a year ago, the GAO should re-title the report: "*Additional Water Quality Projects and Costs May be Needed*".

The GAO report includes, for illustrative and comparative purposes, two other cost figures that were not estimated with the same technical rigor as the $ 7.8 billion cost estimate for the CERP. Specifically, p. 2 states that "achieving all three of the initiative's goals is estimated to cost $14.8 billion." This figure was calculated independently by the U. S Department of the Interior as the cost to implement all natural resource management programs in South Florida and there is no consensus amongst state or local governments on this amount. The federal interest of the $14.8 billion has not

Mr. Jim Wells
August 17, 2000
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been officially recommended to Congress or determined by Congress. We recommend that references to this figure be deleted altogether. If the GAO feels compelled to use this figure, the source and meaningfulness of the $ 14.8 billion cost estimate should be described by the GAO in the report.

The estimated $ 1 billion dredging cost for Lake Okeechobee dredging (p.19) is cited as if it was also an official cost estimate. At best, the $ 1 billion figure for Lake Okeechobee dredging is a rough estimate prepared by SFWMD scientists to bracket the cost for dredging. The SFWMD is embarking on a more detailed feasibility evaluation to evaluate true costs and technical feasibility. This may lead to a determination that a large-scale dredging project is not recommended, yet the GAO report makes it sound as if a $ 1 billion dredging project is a reliable cost estimate that will inevitably be added to the cost to implement the CERP. The source, technical rigor, and meaningfulness of this $ 1 billion figure should be explained by the GAO in the report. Furthermore, GAO should note in the report that Lake Okeechobee dredging is not contemplated as part of the CERP and if the feasibility evaluation were to determine the necessity of dredging, the Army Corps of Engineers would have to complete a feasibility study and submit it to Congress for authorization of an entirely new project.

The section of the report entitled "Uncertainties About Stormwater Treatment Areas May Lead to Additional Projects" is also misleading and reflects a lack of understanding by the GAO about the assumptions in the Plan, the difference between planning and modeling, changes in flows to the Everglades Protection Area brought about by the CERP, and the applicability of the 10 parts per billion (ppb) and 50 ppb numeric criteria for phosphorus. The report (p. 14) states:

> "For planning purposes, the Corps modeled its stormwater treatment areas (STA) on similar areas being built by the state that are designed to reduce phosphorus levels to about 50 parts per billion."

In fact, the "Without Plan" condition for the CERP is that the Everglades Construction Project (ECP) STAs, as designed per the Everglades Forever Act and Settlement Agreement, are achieving the DEP-established or default 10 ppb criterion for the Everglades. The ECP was modeled at 50 ppb during the CERP planning to evaluate differences in flows into, phosphorus loading of, and performance of the ECP compared to the underlying design assumptions for the ECP. This modeling effort did not change the planning assumptions for the CERP (that the EFA is fully implemented by 12/31/06). Furthermore, as explained to the GAO, the planning work done for the CERP indicates that the CERP is not likely to adversely affect the design and operation of the ECP; yet, the GAO report states: "the Corps may be required to modify the stormwater treatment areas being built for these areas to achieve that standard". Our present conclusion, is that this, is not, in fact, the case at all for the ECP.

It is unclear if GAO fully understood or disclosed the applicability of the to-be-established or default criterion for phosphorus. This criterion will only apply to the Everglades. Yet the CERP includes STAs to treat water for many other watersheds throughout the planning area (Upper East Coast, Lower East Coast, Lake Okeechobee). For planning purposes during the development of the CERP, it was generally accepted by the interagency team that a 50 ppb design target (the basis for the sizing of the STAs in the CERP) was adequate to achieve water quality restoration in these other watersheds. The GAO report confuses the Everglades Protection Area and its water quality criterion with other watersheds and their water quality criterion.

Mr. Jim Wells
August 17, 2000
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On p. 17, in its discussion on the Indian River Lagoon (IRL) study, the GAO report states "the Corps will add a water quality project to its Plan to dredge the lagoon to remove sediments from the St. Lucie estuary...." This is a premature and incorrect statement on the part of GAO. The IRL interagency planning team has not yet decided that dredging will be included in the draft recommended plan. The draft recommended plan is not due for several months to come.

The GAO report states (p. 3, p. 21) that 24 of the CERP projects are intended to improve water quality, implying that the other 46 projects do nothing for water quality. This is not true, and the July 1 Report to Congress confirms otherwise. The Project Implementation Report (PIR) development process built into the implementation of the CERP will ensure that wherever possible, CERP features will be designed, constructed, and operated to achieve as much as possible, given other restoration objectives for the project components, water quality restoration objectives for the watersheds in which the projects are located.

The Draft GAO Report provides an appraisal of those uncertainties associated with water quality features associated with the Comprehensive Everglades Restoration Plan (CERP) components or feasibility studies. However, the report includes a discussion of potential water quality projects associated with the Lake Okeechobee Protection Program and South Florida Water Quality Protection Program (WQPP). These programs are not dependent on the CERP and are moving forward whether the CERP is authorized by Congress or not. Accordingly, the reference to these projects should be clarified to reduce the impression that all water quality project costs associated with these ongoing programs are dependent upon the CERP. We recognize the WQPP is certainly related to the CERP, as it will serve as the reconnaissance phase of the WQ feasibility study in the CERP. However, the extent of the future federal participation in the activities identified in the WQPP and Lake Okeechobee Protection Program is unchanged by the CERP. A determination of federal interest in these other future water quality projects would stand alone regardless of whether or not we even had a CERP.

Appendix II, "Florida's Initiatives to Specifically Address Water Quality In the South Florida Ecosystem", does not mention Florida's water quality regulatory programs, nonpoint source control programs, water quality monitoring programs and land acquisition programs. These are all essential parts of the overall effort to protect water quality in south Florida.

In addition to these comments, attached are several specific technical and grammatical comments for your consideration. Once again, thank you for the opportunity to comment and if you have any questions, please do not hesitate to contact me at (850) 488-4892.

Sincerely,

John B. Cutland

for Ernie Barnett
Director of Ecosystem Projects

attachments

Cc: David B. Struhs
Frank Finch

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
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GOV 02-04-02

August 10, 2000

Secretary David B. Struhs
Florida Department of Environmental Protection
3900 Commonwealth Boulevard, MS 10
Tallahassee, FL 32399-3000

Dear Secretary Struhs:

The South Florida Water Management District has reviewed the *Draft GAO Report* concerning implementation uncertainties that may lead to additional water quality projects and costs for the Comprehensive Everglades Restoration Plan.

The main recommendation of the *Draft GAO Report* is to have the U.S. Army Corps of Engineers provide better updates that 1) reflect the cumulative project and cost changes to the overall Plan, and 2) indicate the progress being made toward implementing the Plan. We agree with this recommendation and will work with the U.S. Army Corps of Engineers to carry this out.

The *Comprehensive Everglades Restoration Plan's Master Program Management Plan* contains sections that address the recommendation in the *Draft GAO Report*. The District's Governing Board approved the master plan today. The U.S. Army Corps of Engineers should also be approving it soon.

The uncertainties in any long-term, conceptual plan like the Comprehensive Everglades Restoration Plan are natural and unavoidable and were recognized in the plan. The *Draft GAO Report* correctly concludes, "The Plan's water quality monitoring and adaptive assessment process will be key to ensuring that success in addressing the water quality problems of the natural areas".

We have attached several more specific comments for your use and appreciate the opportunity of having reviewed the *Draft GAO Report*.

Sincerely,

Frank R. Finch, P.E.
Executive Director

FRF/pv
Attachment
VIA AIRBORNE EXPRESS

c: Ernest Barnett, FDEP

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SFWMD Comments on GAO Draft Report
Implementation Uncertainties May Lead to Additional Water Quality Projects and Costs

General Comments

Although it is basically well written, the context of the narrative in several areas could be improved. We offer our comments to try to improve the reader's understanding of this issue. In addition, there are some technical inaccuracies that our comments address.

This report makes a good case that the costs of the Comprehensive Everglades Restoration Plan are not certain. The report outlines a process for incorporating and reporting changes to the Plan. The major recommendation of the report is that the Corps provides Congress with updates that reflect the cumulative project and cost changes to the Plan and indicate the progress being made towards the Plan.

The *Master Program Management Plan* for the Comprehensive Everglades Restoration Plan describes the format and content for the Project Implementation Reports that will go to Congress for authorization of projects. A section of each Project Implementation Report will specifically address any changes to the Comprehensive Plan that result from that project. The *Master Plan* also includes an outline for future versions of *Volume II, the Annual Report and Work Plan*. These *Volume II* updates will include a summary of progress and accomplishments on implementation of the plan (Section 2) and a specific section that will summarize refinements to the Comprehensive Plan (Section 8). These summaries will be used to prepare reports to the Florida Legislature required by the 2000 Everglades Restoration Investment Act and any Progress Reports for Congress that result from WRDA-2000.

Pilot Projects and the Adaptive Assessment process, including RECOVER, were built into the Comprehensive Everglades Restoration Plan because there are many unknowns in this massive effort and it will have to be "fine tuned" over the years. The GAO report should not frame the Comprehensive Everglades Restoration Plan as being unusual or not typical for having implementation uncertainties, but should convey that uncertainties and unknowns can be encountered in any type of project -large and small - no matter how detailed the planning and cost estimation effort is. The larger and more complex the project and the longer the implementation period, however, the more uncertainties there are going to be. Flexibility and contingencies need to be built into any project planning effort, along with a means to assess the progress so rational, informed decisions can be made.

GAO Contact and Staff Acknowledgments

GAO Contact

Barry Hill (202) 512-3841

Acknowledgments

Steve Elstein, Melissa Francis, Susan Iott, Chet Janik, Patricia McClure, and Sherry McDonald also made key contributions to this report.

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