BY THE U.S. GENERAL ACCOUNTING OFFICE

Report To The Secretary Of The Army

Improved Planning And Management Of The Central And Southern Florida Flood Control Project Is Needed

The Corps' plan contains proposed work that will require major modification or may never be done. Priorities and a valid schedule have not been established for the remaining project work to ensure orderly, efficient, and effective completion. Also, a realistic project cost estimate has not been prepared or reported to the Congress.

GAO recommends that the Secretary of the Army require the Chief of Engineers to take specific steps to improve the planning and management of this multibillion dollar project.

GAO/MASAD-82-35
MAY 14, 1982

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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

MISSION ANALYSIS AND
SYSTEMS ACQUISITION DIVISION

B-206945

The Honorable John O. Marsh, Jr.
The Secretary of the Army

Attention: The Inspector General DAIG-AI

Dear Mr. Secretary:

We reviewed the effectiveness of project planning and management for the Central and Southern Florida Flood Control Project which includes major works such as canals, levees, water conservation areas, pumping stations, floodway control and diversion structures, navigation locks, and bridge relocations. The Corps of Engineers is responsible for managing the project and currently estimates it will be completed in 1999 at a total cost of about $2.2 billion.

Based upon our work, we believe that the Corps' planning and management of the project needs to be improved. Specifically,

--the Corps' project plan is inadequate because it contains proposed work that will require major modifications or may never be done;

--priorities and valid schedule milestones have not been established for the remaining work to ensure that it is completed in the most orderly, efficient, and effective manner; and

--a realistic project cost estimate has not been prepared.

Accordingly, we recommend that you require the Chief of Engineers to restructure the existing project plan to include realistic schedule milestones, revised cost estimates, and long-term priorities for essential project segments to be constructed. We also recommend that this restructured plan be provided to the Congress in the next annual budget submission.

Corps' officials agreed with the thrust of this report. These officials, however, pointed out the difficulties involved in project planning and cost estimating, especially in establishing long-term priorities for water projects.

Details of our findings, views of responsible officials, conclusions, and recommendations are contained in the appendix.

As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Operations not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the cognizant House and Senate legislative and appropriation committees; the Director, Office of Management and Budget; and the Chief of Engineers.

Sincerely yours,

for Donald E. Day

W. H. Sheley, Jr.
Director

Contents

REVIEW OF PROJECT PLANNING AND MANAGEMENT FOR THE CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL PROJECT

OBJECTIVES, SCOPE, AND METHODOLOGY

Our examination of the Central and Southern Florida Flood Control Project was directed primarily toward evaluating the effectiveness of the Corps' planning efforts. We reviewed its legislative history to determine the authorized work scope since inception of the project. We then reviewed the Corps, State of Florida, and water management districts' studies, plans, and reports to determine whether (1) the authorized work was still considered relevant and essential to the project objective in view of current requirements and conditions, (2) time-phased priorities had been agreed to and established for the remaining work, (3) the overall completion date for the project was reasonable, and (4) the estimated project cost was reasonable considering the above factors.

We discussed various aspects of these matters with officials of the Corps of Engineers, the State of Florida, and water management districts. We visited and obtained information from the Office of the Chief of Engineers, Washington, D.C.; Army Corps of Engineers District Office, Jacksonville, Florida; Florida State Department of Environmental Regulation, Tallahassee, Florida; St. Johns River Water Management District office, Palatka, Florida; South Florida Water Management District office, West Palm Beach, Florida; and various project sites.

Our review was performed in accordance with our "Standards for Audit of Governmental Organizations, Programs, Activities, and Functions."

DESCRIPTION AND STATUS OF PROJECT

The Central and Southern Florida Flood Control Project was initially authorized by the Flood Control Act of 1948, Public Law 858-80, after a major flood in 1947. The initial work was focused on flood control, but seven subsequent authorizations significantly broadened the project's scope to include building numerous facilities to conserve and distribute fresh water throughout the area, protect urban and agricultural development, conserve fish and wildlife, and provide for navigation.

The project covers an area of about 16,000 square miles which includes all or part of 18 counties in central and southern Florida. The project area encompasses Lake Okeechobee in southern and central Florida, its outlets, a large portion of the Everglades, the upper St. Johns and Kissimmee River basins, and the lower east coast of Florida. The major works planned for the project include: 987 miles of canals, 900 miles of levees, 3 giant water conservation areas totaling 1,340 square miles, 30 water pumping

plants, 194 floodway control and diversion structures, 25 navigation locks, and 57 bridge relocations.

In February 1982, the Corps reported to the Congress that the project would cost about $2.2 billion, of which the Federal share was about $1.5 billion, with the remaining $705 million representing the State and local districts' share. From 1949 through fiscal year 1981, about $253 million in Federal funds and $49 million in State and local funds have been allocated to the Corps to build levees, canals, control structures, and pumping stations, many of which have been completed and accepted for operation and maintenance by the State water management districts. The Corps estimates that all work should be completed by 1999.

NEED TO REDEFINE AND RESTRUCTURE EXISTING PROJECT PLAN

A complete and current project plan is vital to the effective, efficient, and orderly management of a major project. The existing project plan needs to be redefined and restructured because it includes significant works estimated to cost about $239 million which either may need major modification or which may not be constructed since they could cause adverse environmental impacts or may not be desired by the local sponsor. Since initial authorization in 1948, the project has been redirected in response to a shift in water management needs from primarily flood control to other needs, including more emphasis on water supply and quality. Water management needs can be expected to continue to change overtime and will thus tend to perpetuate the project unless an agreed upon project scope and schedule are defined and established to serve as a framework for project management.

Project emphasis has changed

Management emphasis of water resources in Florida was initially directed toward protection against flooding which damaged agricultural and residential areas. Since 1960, however, Florida has experienced rainfall deficiencies in some areas and periods of drought conditions at some locations. Florida also has been faced with a rapidly expanding population and greater water demands from the expanding urban and agricultural areas.

The Flood Control Act of 1968 expanded the project to provide for increased storage and conservation of water and for improved water distribution throughout much of the project area. Also, the Florida Legislature enacted the Water Resources Act of 1972 which created five water management districts with broad scope and authority to manage water resources.

Project plans contain questionable features

In 1973 the Congress directed the Corps to conduct an economic update of the project. As a result, the Corps identified project

components valued at about $50 million, some of which were no longer economically justified and others were not necessary. These components were placed on inactive status and deleted from project plans and cost estimates, but were not deauthorized. 1/

Since the economic update, the St. Johns River Water Management District has withdrawn its support for certain small boat navigation features, such as channels and locks, authorized in 1970 and costing an estimated $49 million. Also, intensified concern for environmental matters has resulted in changing emphasis by State and local interests in the upper St. Johns River basin. As a result, authorized features, such as canals, levees, and spillways, costing about $190 million may never be constructed in the river basin.

Aside from specific project component studies, an economic update of the project has not been performed since 1973, nor have any other project components been placed on inactive status or deauthorized. We analyzed the Corps' detailed schedules showing planned construction activity through fiscal year 1987 and identified about $365 million in project works, including channels, canals, levees, bridge relocations, and floodway control and diversion structures for which little or no work had been performed since authorization during 1948 through 1968. Furthermore, no work is scheduled on these features through fiscal year 1987. Corps officials said, however, that these features could not be considered for inactive status until an indepth analysis, including coordination with local levels, had been performed. Corps and water management district officials agreed that to have a more accurate project plan, an analysis similar in scope to the 1973 study should be performed so that unnecessary project works could be placed on inactive status and deleted from project plans and cost estimates.

Potential changes

Both the Corps and the State of Florida are in the process of identifying and evaluating many alternatives to alleviate water supply concerns. Some of the alternatives currently under study include

--demineralizing water,

--further raising the levee around Lake Okeechobee,

--backpumping water to conservation areas, and

--deep aquifer storage and retrieval.

1/Projects placed on inactive status are either not economically justified, not adequate to meet current needs, or are opposed by local interests.

The Corps expects to complete its part of these studies during 1984. In addition to these studies, the Corps has pending investigations to determine the economic justification of new project features and modifications. For example, the Corps is investigating the feasibility of restoring the Kissimmee River similar to its former state. Recent studies show that the Corps' construction of a canal along the Kissimmee River has had a number of detrimental environmental effects, such as loss of fish and wildlife habitat and loss of water storage areas. Furthermore, water management needs in the entire project area are expected to continue changing as population, urban, agricultural, and weather conditions change.

A major uncompleted portion of the project is located in the upper St. Johns River basin. Work stopped on this project segment in 1972 because acceptable environmental impact studies had not been performed. Later, the St. Johns River Water Management District developed an approach which provided for a combination of nonstructural and structural measures. Nonstructural water management means adapting to existing natural conditions rather than trying to modify them. The Corps is currently evaluating the St. Johns plan and has a number of other studies underway which include nonstructural approaches among the alternatives.

The nonstructural approach also includes many alternatives for dealing with water problems, including floodplain acquisition, regulation, and zoning; floodproofing of new or existing structures; vegetative measures to reduce runoff; and more efficient use of existing water supplies. The State of Florida is very supportive of nonstructural approaches and believes that the use of such measures often minimizes the need for expensive, environmentally damaging dams, canals, locks, and other structures.

However, there may be some impediments to using nonstructural approaches. For example, according to State officials, proposed Federal water project planning guidelines would significantly reduce the emphasis given to environmental quality in relation to economic benefits. Also, under existing authorizations, the local sponsor may have to provide all lands which, in some cases, could prohibitively increase their costs. For the Federal Government to provide funds for land acquisition, such as in the upper St. Johns River basin, additional congressional authorization may have to be obtained.

NEED FOR LONG-TERM PRIORITIES AND REALISTIC COMPLETION SCHEDULES

The Corps needs to establish long-term priorities for major project segments to ensure that remaining work can be adequately identified, scheduled, and performed in the most orderly and efficient manner. Also, the Corps' current schedule completion estimate of 1999 is extremely optimistic in view of historical funding. Completing currently authorized work may be much later, and ongoing studies could result in additional authorizations which may extend the project completion date even further.

Short- and long-term priorities

The Corps and water management districts establish priorities for constructing project components over 5-year periods. Currently, priorities are established and project components are scheduled for work through fiscal year 1987. These short-term priorities are updated annually through Corps and water management district coordination efforts and are reported within the Corps in annual detailed project schedules. However, long-term priorities are needed so that remaining work can be identified, scheduled for construction, and accomplished in the most orderly and efficient manner. The long-term priorities would also provide better management and oversight visibility over project progress and potential problems.

Corps, State of Florida, and water management district officials agreed that long-term priorities would be useful but difficult to establish. In this regard, Corps officials advised us of plans for beginning annual coordination with water management districts to set priorities for the coming 12 years. However, Corps, State, and water management district officials pointed out, and we agree, that long-term priorities would need to be flexible and continually evaluated in light of changing conditions.

Project schedule

The Corps' latest project completion estimate of 1999 was not based on commonly applied methods of considering the uncompleted work segments, sequencing such segments in an orderly manner, estimating the time required to complete all segments, and giving consideration to anticipated available resources. Instead, the completion date was determined by using an arbitrarily established funding level. Furthermore, ongoing studies mentioned on pages 3 and 4 could further extend the project completion date.

No schedule milestones were established in connection with the many authorizations for this project. In October 1980, the Corps' Jacksonville District estimated that the project could be completed in the year 2010 provided an annual funding level of $15.4 million was maintained. However, the Office of the Chief of Engineers and the South Atlantic Division reported estimated project completion sooner by increasing the projected funding level to $25 million which shortened the project completion date to 1998. The Corps reported the 1998 date in its fiscal year 1982 congressional budget submission.

Allotments received each year since the project began show that the funding levels used by the Corps to estimate the completion schedule were too high. Funds allotted for the project between fiscal years 1950 and 1981 averaged only $7.9 million. Using the actual average funding level of $7.9 million a year, work currently authorized would not be completed until about the year 2030.

NEED FOR MORE MEANINGFUL COST ESTIMATES

The uncertain scope of the project prevents the Corps from preparing and reporting meaningful cost estimates. Authorized project components estimated to cost about $239 million as discussed on page 3 may not be acquired because of environmental concerns and lack of local interest. Also, as discussed on page 3, a number of project elements estimated to cost about $365 million have been authorized for many years, but little or no work has been done on them and none is scheduled. Also, other project features now being studied could add millions of dollars to the project's cost. Furthermore, the estimated project cost may be greatly understated because higher than normal funding levels were used in its development, which resulted in a shorter completion time frame and a lower inflation estimate. Valid cost estimates are needed by the Congress, Office of Management and Budget, State of Florida, and the Corps to discharge their respective oversight and management responsibilities.

Project plan contains costs for work that may not be done

Two major project segments estimated to cost $239 million and contained in the project plan may not be constructed. Project work on one of these segments, the upper St. Johns River basin, was stopped in 1972 due to the lack of an acceptable environmental impact statement. The cost estimate contained in the project plan still includes about $190 million for unconstructed facilities in the river basin. Therefore, the previously estimated cost for this project segment is no longer valid. Also, the small boat navigation work in the upper St. Johns River, authorized in 1970, may not be done because the sponsoring water management district presently has no interest in its construction. The project cost estimate currently includes $49 million for these authorized navigation features.

Also, a number of other components within the plan may not be constructed. For example, the project cost estimate includes about $365 million for a large number of project components on which little or no work has been done, since authorization and no work is scheduled for the next 5 years.

Costs for new work not recognized in estimate

In response to changing water resource needs, the Senate and House Public Works Committees have authorized the Corps to conduct several studies for providing flood and water control works at a number of additional localities in the State of Florida. However, these studies have not progressed far enough to permit the Corps to estimate costs for new facilities that might be authorized. If authorized, the cost of these additional features could increase project costs by many millions of dollars. For example, the costs of alternatives being considered in the study to determine the

feasibility of improving waterflow into one of the project areas of the Everglades National Park are estimated to amount to as much as $130 million.

Inflation understated in cost estimate

In addition to the uncertain project scope, the provision for inflation is understated. The Corps used an annual funding level of $25 million for completing work and reported the estimated project completion sooner than had been computed by the Corps' Jacksonville District. But the average annual funding had been running at about $7.9 million and was a more probable level of funding than the $25 million level used by the Corps. Use of the average annual funding allocation of $7.9 million would have increased the project cost estimate, as reported to the Congress, by $0.7 billion to $10.9 billion based on inflation rates varying from 5.6 percent to 10.4 percent. The estimated completion date would have been about the year 2030.

Development and use of a meaningful funding level is essential for good cost and schedule estimates. The table below illustrates the importance of this.

Estimated funding levels	Projected Cost	Projected Completion dates
----------(millions)----------		
$ 7.9	a/$2,900.0 - $13,100.0	2030
15.4	3,300.0	2010
25.0	2,100.0	1998

a/Based on inflation rates of 5.6 percent to 10.4 percent.

In October 1980, the Corps' Jacksonville District, using a funding level of $15.4 million a year, which it felt was reasonable, forecast a project completion in the year 2010 and computed an estimated total project cost of $3.3 billion, which included inflation. However, to show project completion sooner, the Office of the Chief of Engineers and the Corps' South Atlantic Division increased the Federal funding level to $25 million a year which resulted in decreasing the project cost estimate by $1.2 billion.

Comparing annual estimated and actual allotments, since project inception, showed that both the $15.4 million and $25 million estimated funding levels were much higher than actual funding levels. The amounts of Federal funds allotted to the project during fiscal years 1950 through 1981 varied from 0 to $16.3 million and averaged about $7.9 million. There was no upward trend in the funding levels for the project over these years. In fact, the average annual funding level decreased from $12.1 million in the 1960s to $6.9 million in the 1970s.

At our request, the Corps recomputed a project completion year and estimated project cost using the average $7.9 million annual funding level and inflation rates of 5.6 percent to 10.4 percent. These recomputations indicated that the project would be completed in about the year 2030 at a cost of $2.9 billion to $13.1 billion or $0.7 billion to $10.9 billion more than the $2.2 billion reported to the Congress in the fiscal year 1983 budget submission.

We recognize that estimating for inflation is very difficult and has been a major cause of extensive cost growth on Federal acquisitions. In a statement relating to the cost growth on weapon systems before the Special Panel on Defense Procurement Procedures of the House Armed Services Committee during October 1981, we said that the Department of Defense's inflation rate projections on major weapons have traditionally been lower than actual inflation. Accordingly, appropriations have not funded everything in the budgets and cost estimates have been periodically increased to reflect the experienced inflation. Also, we mentioned that optimistic inflation rates used in developing cost estimates also account for considerable cost growth. Estimating the rate of inflation, we concluded, is speculative and provides no guarantee of actual costs to be incurred. However, the Congress should be aware that funds needed for dealing with future budgets and appropriations may be considerably more than program estimates would indicate.

VIEWS OF RESPONSIBLE OFFICIALS

We discussed the issues raised in this report with officials of the Corps' Office of the Chief of Engineers, St. Johns River Water Management District, South Florida Water Management District, Florida Department of Environmental Regulation, and the Corps' South Atlantic Division and Jacksonville District. These officials agreed with the thrust of the report, including the conclusions and recommendations.

Officials in the Office of the Chief of Engineers said that the Corps' South Atlantic Division and Jacksonville District were directed in December 1980 to take action similar to what we are recommending. However, the division reported that a meaningful review could not be completed within the short time frame (1 week) required by the Office of the Chief of Engineers. To date, such a review has not been made by the Corps and still no actions have been taken.

The Executive Director of the St. Johns River Water Management District said that the district hoped

> "* * * the final recommendations resulting from this investigation can and will be carried out in such a manner as to protect the goals of the project * * *"

in the upper St. Johns River area. We believe these recommendations can be implemented so as not to delay or in anyway interfere with the water management district's goals.

CONCLUSIONS

Although the initial work authorized in 1948 was primarily for flood control, the emphasis of the project has shifted over the years to also include water storage and conservation, protection of urban and agricultural development, fish and wildlife conservation, and navigation work. Authorized work now includes elements that will probably never be constructed and segments that will require major modifications or alterations before initiating construction. Also, several Corps evaluations are currently underway that may require major changes or even new authorizations before further work can be undertaken.

The overall project plan has not been updated and is not current, complete, or accurate. Moreover, long-range priorities have not been established for the remaining major work segments; an overall project completion milestone has been arbitrarily established; and, based on the uncertain project scope, inaccurate cost estimates have been provided to the Congress. Water management needs in central and southern Florida are expected to continue to change as population, urban, agricultural, and weather conditions change. These changes will tend to perpetuate this project with potentially high costs, unless an agreed project scope and priorities are established to serve as a framework to complete the acquisition. For these reasons--recognizing that there may be future modification because of changing conditions--we believe that the project plan should be restructured to clearly define the cost, schedule, and scope of remaining work that the Corps, State, and water management districts believe is essential to be accomplished. Also, we believe that this restructured project plan is essential for effective project management and oversight.

RECOMMENDATIONS

To improve the planning and management of this $2.2 billion project, we recommend that the Secretary of the Army require the Chief of Engineers, based on the best information available, to

--identify and set long-term priorities for project segments that the Corps and local sponsors agree are essential to complete the project and either place the remaining work segments in a deferred or inactive status or submit them for deauthorization and

--provide the Congress in the next annual budget submission a restructured project plan containing a realistic completion date, a revised cost estimate, and priorities for the remaining major work segments.

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