

THE ROLE OF THE CORPS OF ENGINEERS IN COASTAL ZONE MANAGEMENT PLANNING

by

James B. Hildreth, P.E.

Sanitary Engineer, Environment & Resources Branch

U.S. Army Engineer District, Mobile

INTRODUCTION

"The coastal zone is rich in a variety of natural, commercial, recreational, industrial, and esthetic resources of immediate and potential value to the present and future well-being of the Nation." This statement, which so aptly explains the reason for National concern over the coastal zone, was taken from the Congressional Findings in the Coastal Zone Management Act of 1972 (Public Law 92-583, 92nd Congress, S. 3507, October 27, 1972). That Act establishes a National policy to preserve, protect, develop, and where possible, restore or enhance the resources of the coastal zone of the United States. It also provides for monetary assistance to the states to facilitate utilization of coastal zone resources, coupled with adequate protection of the coastal zone environment, through development and implementation of state-wide comprehensive Coastal Zone Management programs.

The purpose of this paper is to present the major activities of the Corps of Engineers that may impact on the coastal zone and bear directly on coastal zone management planning. It also presents ways in which the Corps can assist states in the preparation and implementation of coastal zone management plans as called for in the Coastal Zone Management Act of 1972.

CORPS OF ENGINEERS ACTIVITIES IN COASTAL ZONES

The Corps of Engineers shares the acute National concern for wise management of our coastal zone and is intensely interested in the efforts the states are making to accomplish this. Before outlining the various activities of the Corps, I will digress briefly to show how the Corps is involved in coastal zone management by explaining the Corps civil works responsibilities and organizations.

Since the early days of the Republic, when the only trained engineers available were Army Engineers, the Corps has been responsible for developing the Nation's water resources. At first, transportation and communication by water was of paramount importance, and navigation was the principal purpose of development. Later flood control, hydroelectric power, and shore protection purposes were added, and, still later, as the wisdom of multiple-purpose water resource development became apparent, a number of other purposes were added.

The Corps performs its civil work through a decentralized organization, under the direction of the Chief of Engineers at the Washington level. There are 11 geographical divisions engaged in civil works. The divisions are, in turn, subdivided into 36 geographical districts. Along the Gulf Coast there are four engineer districts, Galveston in the Southwestern Division, New Orleans in the Lower Mississippi Valley Division, and Mobile and Jacksonville, both in the South Atlantic Division.

Many of the activities of these four districts profoundly affect the coastal zones of the Gulf States, physically, economically, and socially. That is their purpose. Work performed by the Corps is in accordance with the desires of local people as authorized by the Congress and concurred in by the Governors of the states affected.

The hallmark of the Corps of Engineers has always been its ability to respond to the changing needs and demands of the American people, whether for economic development, protection from the ravages of nature, or enhancement of the quality of life.

Now I should like to review briefly the major activities of the Corps of Engineers in the Gulf Coastal Zone, using the Mobile District as an example.

Navigation

One of the major activities of the Corps, and probably the activity that has the most direct impact on the coastal zone, is the construction and maintenance of navigation improvements on channels and harbors. Although conditions have changed radically since the days when waterways were, in many cases, the only feasible means for transportation and communication, navigation is still of tremendous importance to the economy of the Nation. It is the most economical method of moving many bulk commodities between points within the country and the only feasible means of moving many commodities to and from overseas points.

In the Mobile District are six deep-draft harbors, including Gulfport, Pascagoula, Mobile, Pensacola, Panama City and Port St. Joe. Two of these, Mobile and Pascagoula, are at the mouths of extensive river systems and are surrounded by extensive marshlands and deltas. All have a decided impact on the coastal environment. Let's examine Mobile Harbor, the busiest of these harbors, as an example of a Corps navigation project.

The economic influence of the port of Mobile reaches far beyond the coastal zone of Alabama. It has served a wide area as a center of domestic and foreign trade since its settlement by the French in the early 1700's. In 1973 commerce at the port exceeded 30 million tons. The Corps of Engineers has repeatedly improved the harbor channels

since 1826. The present project consists of a channel 42 feet deep across the bar at the mouth of Mobile Bay, a channel 40 feet deep and 35 miles long through the bay and in the lower end of the Mobile River, and various turning basins and feeder channels. In 1970 there was authorized a 40-foot branch channel from the main ship channel in Mobile Bay to an industrial area on the western shore near Theodore. The first phase of advance planning for this channel and a draft environmental impact statement are under way. The Mobile District is also studying the advisability of deepening the main channels and providing additional turning and anchorage basins.

In addition to the six deep-draft harbors, the Mobile District also maintains over 20 shallow-draft harbors and coastal channels scattered along the Mississippi, Alabama, and northwest Florida coasts. These include small craft harbors at Biloxi and Pass Christian, Mississippi; the channel serving the fishing village of Bayou La Batre, Alabama; the barge channel in Escambia Bay and Escambia River, Florida; and the fishing port of Apalachicola, Florida. Several of the entrance channels from the Gulf are protected from shifting sands by stone jetties. All of these harbors and channels make important contributions to the economy of the coastal areas. All have an impact on the coastal environment.

One of the most important waterways in the Gulf Coastal Zone is the Gulf Intracoastal Waterway, a protected water route by which light-draft vessels not suited to navigating long stretches of the open Gulf can move to all coastal points from Carrabelle, Florida, to the Mexican border. It traverses coastal bays, sounds, and tidal estuaries, deepened as necessary and connected by artificial land cuts. In 1973 movements on this waterway amounted to 16-1/2 billion ton miles. The heaviest usage of this channel is along the Louisiana and Texas coasts, but it is an important artery of commerce for its entire length.

All of these projects involve dredging, both when first constructed, and periodically thereafter to maintain channel dimensions. Dredging has become one of the most controversial activities in the coastal zone. This is probably due in large part to the fact that it is so noticeable and is by its nature a dirty operation. The Corps has devoted a great deal of study on the effects of dredging and this study is continuing.

Initial dredging frequently causes a fairly sudden physical change. For example, deepening a coastal stream may permit the salt wedge to penetrate farther up the estuary, thus modifying the existing salinity regimen. Constructing a channel across an offshore bar may interfere with the transport of sand down the beach. Creating a mound of dredged material in a body of water may influence flushing values and currents.

The dredging process itself also has its effects. Most of the adverse effects from the process result from the placement of the

dredged material rather than from its removal. These adverse effects can be largely avoided if the material can be placed on land. The Corps is keenly aware of the difference between "land" and "wetland".

The most obvious effect of discharging any dredged material in water areas is turbidity. The immediate effect of the turbidity plume is the reduction of light penetration in the water column and a temporary reduction in the rate of photosynthesis in the floating and bottom plants. However, studies have shown that the primary productive capacity of estuaries is principally from marshes and tributary streams rather than from open water areas. Studies in Mobile Bay and other estuaries have indicated that surface turbidities from dredging operations approach normal levels within 1,200 to 1,500 feet from the point of discharge. Ambient wind and water conditions determine the existence and extent of visible plume.

The most significant adverse conditions produced during dredge material placement are due to sediment deposits or mud flows. The two primary factors causing mud flows are the kind and amount of particles resuspended. When silts and clays are deposited in open water, mud flows can be expected to occur. The thickness of the layer is reduced with increasing distance from the discharge point and with time. Mud flows have been found to extend up to 2,000 feet from the point of discharge. The mud flow covers the original bottom from one to several inches and some organisms capable of migrating up through it survive. But others, such as immobile and burrowing invertebrates and bottom-dwelling algal forms, may be covered and lost.

The effect of open water disposal on dissolved oxygen concentration is pronounced in the area surrounding the discharge point. There is an immediate oxygen demand when the sediments are dispersed. As a result, although the dissolved oxygen at the surface and mid-depth are only slightly depressed, a regimen of low dissolved-oxygen concentrations exists in the mud flow. On the bottom this condition has been observed to extend for approximately 800 to 1,700 feet.

In the last two years, the Corps of Engineers has spent a great deal of effort to determine if compounds bound to silts and clays are released when dredged material is placed in water areas. Studies are not complete, but some release of heavy metals such as zinc has been found to occur. Indications are that the released metals are reabsorbed by the particles at the earliest opportunity.

The biggest problem connected with a dredging project is finding suitable disposal areas for the dredged material. In earlier days the material was placed alongside the channel in open water areas and along the banks of streams. However, the buildup of dredged material in some areas, the increasing quantities of material which must be removed from the larger channels required today, the disappearance of undeveloped areas along the waterfronts for land disposal, and the necessity for preserving valuable estuarine systems, all combine to require a

different procedure. Throughout the coastal zone, the Corps is engaged in a search for disposal sites and methods that will insure continued maintenance of the navigation channels while at the same time protecting the estuaries and remaining economically feasible. This tremendous problem must be solved if ports and coastal waterways are to continue to exist.

In some instances, pleasing solutions have been found for the disposal of dredged material. It has been used to nourish eroded beaches, to build breakwaters for protection of shore facilities, and to construct islands that have been used as resting places by shorebirds. Other constructive uses for the dredged material need to be found.

A recent change has been made in the procedure for reviewing Corps of Engineers dredging projects. New regulations, promulgated by the Secretary of the Army in July of 1974, set out in detail the factors to be considered in the evaluation of all Federal dredging projects when they involve the disposal of material in navigable waters, whether they are inland, coastal or ocean waters. In general, these factors are the effects on marine ecosystems; wetlands; fish and wildlife; historic, recreational and scenic areas; and archeological and cultural sites. While consideration of these factors themselves is not new, a new step has been added whereby the Corps will issue a public notice of plans, coordinate the planned work with all interested parties, and even hold a public hearing at the request of any person who has a clear interest that may be affected by the dredging. Disposal sites will be selected in accordance with EPA guidelines for the disposal of dredged material. If following the guidelines would impair or prevent the continued maintenance of navigation, the economic impact will be evaluated and the question will be referred by the District Engineer to higher authority for resolution. The new procedure is now in effect.

Aquatic Plant Control

One of the special problems in the maintenance of navigation channels along the Gulf is the removal of water hyacinths and other aquatic growth which effectively obstruct passage if allowed to accumulate in streams.

The water hyacinth was introduced into the United States at the cotton exposition in New Orleans in 1884. By 1898, it had spread to such an extent that Congress was requested to intercede. The Corps has been combatting the plant by various means since 1900.

In 1965, Congress authorized a considerably expanded program for the control and progressive eradication of water hyacinths, alligatorweed, eurasian water milfoil, and other obnoxious aquatic plant growths from the navigable and allied waters of the United States in the combined interest of navigation, flood control, drainage, agriculture, fish,

and wildlife conservation, public health and related purposes. Under this program, all research and planning costs and 70 percent of operational costs are borne by the United States and 30 percent of operational costs are borne by local interests. The various Engineer Districts along the Gulf work with the appropriate state and local agencies on this program.

Shore Protection

Another important activity of the Corps of Engineers in the Coastal Zone is shore protection. Federal participation in beach erosion control projects is subject to special laws and regulations. The extent of Federal assistance depends on individual circumstances.

Basic research is done by the Corps of Engineers Coastal Engineering Research Center, which studies such matters as the transportation of sand by winds, waves, and currents; the measurement and management of the natural forces that shape beaches and dunes; the relationships between natural coastal forces and manmade structures; shoaling and pollution in tidal waters and rivers; the effects of shore and harbor programs on marine life; the natural forces involved in inlets, lagoons, sand bars, and the like, particularly as they affect navigation channels; the effectiveness of manmade works of various shapes, spacing, and materials in various coastal situations; and methods and effects of handling or moving sand and dredged materials.

At the present time, the Mobile District has under way studies to consider means for providing beach erosion and hurricane protection for the three coastal counties in Mississippi, Mobile and Baldwin Counties in Alabama, and the shores of northwest Florida from the Alabama Line to Indian Pass in Gulf County.

Flood Plain Information Services

Initiated in 1960, the flood plain information service is an activity of the Corps designed to provide the technical details required to promote wise use of flood plains, consistent with the flood risk and damage potential. At the request of local interests, the Corps conducts studies within the coastal zone and prepares reports that identify the magnitude and extent of the flood hazard in the area and provides guidance to non-Federal entities in planning uses of the flood plain. The Corps also provides basic hydrologic and damage information to the Federal Flood Insurance Administration under reimbursable agreement.

Regulatory Program

The Corps' regulatory program is designed by Congress to assure wise and orderly development in and along the Nation's inland and coastal

waters. The program requires a comprehensive review process involving all Federal, State, and local agencies vested with environmental authority.

The basis for the Corps of Engineers regulatory function over waterways was formed when Congress grouped several statutes into Sections 9 through 20 of the River and Harbor Act of 1899. Specifically, Section 10 provides that the creation of any obstruction not authorized by Congress to any navigable water of the United States is prohibited unless the work has been recommended by the Chief of Engineers and a permit obtained from the Secretary of the Army prior to the start of construction. This statute applies to all structures, from the smallest recreational dock to the largest commercial facility, and includes any dredging or excavation as well as fills which take place adjacent to or in navigable waters.

Navigable waters are defined as those which are presently, or have been in the past, or may be in the future susceptible for use by the public as a highway for trade and commerce. Federal regulatory jurisdiction extends laterally over the entire water surface and bed of a navigable waterway and includes all land and waters below the average high water mark in nontidal areas or below the mean high tide line in coastal areas. In addition, activities which affect navigable waters are subject to Federal jurisdiction, whether such activities occur within or outside navigable waters.

Private ownership of underlying lands has no bearing on the prevailing Federal jurisdiction. Marshlands and similar areas which are subject to inundation by mean high waters or the development of which would affect navigable waters are within the jurisdiction of the United States.

The requirement to obtain a permit for any work affecting navigable waters applies to Federal, State, County and municipal agencies, as well as to the general public. Failure to obtain a permit may subject the parties involved to criminal or civil prosecution, or possibly both.

In processing a permit, the Corps coordinates each application with all appropriate Federal, State, and local agencies and issues a notice to the general public allowing time, usually 30 days, for the submission of comments.

In evaluating the permit application, the Corps considers all the comments received and makes its own analysis of the impacts of the proposed activity upon the public interest.

On 3 April 1974, the Chief of Engineers issued revised regulations that considerably broaden the factors that are considered in balancing the benefits that reasonably may be expected to accrue from the proposal against its reasonably foreseeable detriments. These factors include conservation, economics, aesthetics, general environmental concerns,

historic values, fish and wildlife, flood damage prevention, land use classification, navigation, recreation, water supply and water quality. No permit will be granted unless its issuance is found to be in the public interest.

In addition to taking into consideration the National concern for both protection and utilization of important resources, the District Engineer must determine whether an environmental impact statement is required in connection with the permit application. If granting the permit appears to be warranted but the proposed activity would have a significant environmental impact, an environmental impact statement will be prepared, coordinated with interested agencies and individuals, and filed with the Council on Environmental Quality prior to final action on the application.

In some instances, the review may be a very time-consuming procedure. If there appears to be sufficient interest to justify it, a public meeting is held to make sure that all interested parties understand the work for which the permit is being requested and that both supporters and opponents have full opportunity to present their opinions in the matter. If a decision cannot be reached locally, all information is forwarded to the Chief of Engineers with a recommendation from the District Engineer.

Obviously, the Corps' permit program is an important element in coastal zone management; and, it is one that affords a continuing opportunity for the Corps of Engineers and State and local agencies to work together for the betterment of the coastal area.

COASTAL ZONE MANAGEMENT ACT OF 1972

Summary of the Act

The U. S. Congress, in Section 302 of the Act, declares a National interest in the effective management of the coastal zone; that present planning and regulation of land and water uses is inadequate; and that primary responsibility rests with State and local governments with Federal assistance.

The purpose of this Act, as referred to in the introduction of this paper, is to conserve the resources of the coastal zone; to encourage the States to develop and administer management programs for the coastal zone, giving consideration to ecological, cultural, historic, and aesthetic values and need for economic development; to insure cooperation between Federal agencies having programs affecting the coastal zone with State, local and regional agencies; to insure public participation in the development and management of coastal zone programs; and to encourage interstate and regional agreements for coastal zone management.

Section 305 of the Act authorizes the Secretary of Commerce to award grants to coastal States for the development of management programs for the land and water resources of the coastal zone. Under Section 306, the Secretary of Commerce is authorized to award grants to the States for the administration of the States' management programs after approval of the programs.

In addition to the above grants, Section 312 of the Act authorizes grants for the acquisition, development, and operation by the States of estuarine sanctuaries for the purpose of creating natural field laboratories.

Division of Responsibility

States: Coastal zone management programs and plans are the primary responsibility of the individual coastal States. The Governor of each coastal State has designated a single entity responsible for developing the State coastal zone management program and plan. For example, in Mississippi, the agency is the Mississippi Marine Resources Council; in Alabama, it is the Coastal Area Board; and in Florida, it is the Coastal Coordinating Council.

National Oceanic and Atmospheric Administration: The Federal responsibility for administering the Coastal Zone Management Act has been assigned to the Office of Coastal Zone Management of the National Oceanic and Atmospheric Administration (NOAA) under the direction of the Secretary of Commerce. NOAA serves as the primary Federal-State coordinating entity and is administering the grant program that may finance up to two-thirds of the annual costs of the States' program development and implementation. NOAA is also responsible for monitoring the administration of the States' plans to insure that they are refined and updated as needed.

Corps of Engineers: Although the Corps was not given a specific legislative assignment in the development of the State plan, Section 307 of the Act lists several ways in which the Corps shares in the responsibility of the coastal zone management program. As stated in the Act, these are:

1. "The Secretary shall not approve the management program submitted by a state pursuant to Section 306 unless the views of Federal agencies principally affected by such program have been adequately considered." (Section 307(b))

2. "Each Federal agency conducting or supporting activities directly affecting the coastal zone shall conduct or support those activities in a manner which is, to the maximum extent practicable, consistent with approved state management programs." (Section 307(c)(1))

3. "Any Federal agency which shall undertake any development project in the coastal zone of a state shall insure that the project is, to the maximum extent practicable, consistent with approved state management programs." (Section 307(c)(2))

4. "---any applicant for a required Federal license or permit to conduct an activity affecting land or water uses in the coastal zone of that state shall provide in the application to the licensing or permitting agency a certification that the proposed activity complies with the state's approved program---." (Section 307(c)(3))

Civil works activities of the Corps of Engineers in the coastal zone, as discussed earlier, fall within the above areas of Federal agencies' responsibilities. It should be noted that the Act does not diminish existing Corps of Engineers civil works responsibilities or authorities.

CORPS' CONTRIBUTION TO STATE COASTAL ZONE MANAGEMENT PLANNING

In keeping with the Coastal Zone Management Act, State programs and management plans must adequately address seven key management elements that are central to the development and subsequent review and approval of their programs. These elements are:

1. Boundaries of the coastal zone;
2. Permissible land and water uses;
3. Areas of particular concern;
4. Guidelines or priority of uses;
5. Means of exerting control over land and water uses;
6. Organizational structure proposed to implement the management program; and
7. National interests in siting of facilities.

These management elements will become the major focus of State consultation, and, where appropriate, Corps participation in management planning. Certain Corps activities bear directly on coastal zone management planning or provide information critical to the preparation and implementation of the States' plans.

Data collection by District offices for beach erosion control, hurricane and tidal flooding, and navigation studies may be useful for coastal zone planning, as are data from special reports such as the National Shoreline Study. Information developed on erosion rates, damage potential, pollution circulation, and impacts (environmental, aesthetic, social and economic) of implementing or not implementing various projects may help the State agency personnel develop adequate plans.

The Corps of Engineers operates several research laboratories such as the Waterways Experiment Station in Mississippi and the Coastal

Engineering Research Center at Fort Belvoir. Data collected by these laboratories in the course of research efforts or for area model studies may be useful to the States. In particular, data of a regional nature, such as wave statistics, littoral transport rates, seasonal beach changes, types of vegetation for dune stabilization in various geographic areas, and offshore sources of beach fill material, may impact on State planning.

Certain data and publications held in Corps Information and Analysis Centers (IAC) relate to coastal zone planning. Most Corps laboratories have or will soon have one or more IAC's to manage mission- or discipline-oriented files. The IAC at Coastal Engineering Research Center will be of special interest to the coastal zone management program. The Waterways Experimental Station may also provide substantial assistance through its data centers for concrete technology, hydraulic engineering, pavement and soil trafficability and soil mechanics.

In addition to the data available from ongoing Corps activities, State coastal zone management agencies may also request special studies (under Section 22 of the 1974 Water Resources Development Act, for example), including research, or other specific coastal zone management study needs identified in the coastal zone plan, which fall in areas of special Corps interests or expertise. These requests, of course, are subject to certain funding constraints.

SUMMARY

The coastal zone of this Nation is an area deserving critical concern. It is of tremendous value from an economic, ecological, and aesthetic viewpoint; so much so that the U. S. Congress has legislated a National policy to preserve, protect, develop, and restore or enhance the coastal zone. Congress recognizes the responsibility of the coastal States in planning for and managing its coastal zone and provided funds, through a grant program, to develop and implement coastal zone management programs.

The Corps of Engineers, a Federal agency with over 150 years of experience in planning for and developing in the coastal zone, conducts many activities which profoundly affect the coastal zone, physically, economically, and socially. In carrying out its civil works in the coastal zone, the Corps has amassed a great deal of data on the coastal zone that should be useful to the States in developing and implementing their programs. The Corps also has developed expertise in the field of coastal engineering which is available to the States. The States are offered the full cooperation of the Corps of Engineers in their efforts to manage wisely the valuable resources of the coastal zone.

REFERENCES

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