

1 October 1992

MEMORANDUM FOR Executive Office

SUBJECT: Fact Sheet on Erosion Problems, Dauphin Island, Alabama

1. PURPOSE. Provide information on current erosion problems on Dauphin Island, Alabama, and the Emergency Shoreline Erosion Protection studies on these problems now in progress.
2. RECOMMENDED USE. Briefing for Congressman Bevill.
3. INFORMATION.

a. The problem. Two separate reaches of Gulf of Mexico shoreline on Dauphin Island, Alabama, are experiencing severe erosion. One is at the east end of the island at Fort Gaines, a famous historic structure. The erosion there extends well past the fort to include the beach front property of the Marine Environmental Sciences Consortium, the U.S. Coast Guard recreation area, and the Dauphin Island Park and Beach Board (DIPBB) public campground. The other reach is about 3 miles west of the fort and is more or less centered on the DIPBB Main Beach Park. A fishing pier is a major feature of that park. The fort, the campground and the park are all public property administered by the DIPBB. These sites provide the only public access on the island to the Gulf of Mexico beach.

At the Fort Gaines reach the loss of sand to erosion has impaired public use of the area and that area is becoming increasingly unsafe. If the erosion continues unchecked damage to Fort Gaines will occur some time in the future. At the park, erosion resulting from the recent passage of Hurricane Andrew has left two pavilions originally built on top of the dune hanging over the edge of the erosion scarp. The hurricane passage also left the gulf edge of the public restrooms building over the erosion scarp. The fishing pier is being undermined by the recession of the shore profile. The landward end of the pier, about 150 feet in length, was originally constructed over dry beach. The pilings in that section were given less penetration than the section further gulfward and the continued safety of that section is suspect.

b. Historical Background. Dauphin Island is a barrier island with a long history of shoreline erosion and accretion and hurricane damage. The erosion/accretion processes occur and reoccur on some sort of semicyclical basis, but the cause(s) have never been determined. Dauphin Island was completely breached by a hurricane in the general area of the Main Beach Park between 1909 and 1917. That breach was not shown on maps as filled until

1942. The island was again breached by a hurricane in September 1948 and March 1950 aerial photographs showed it was rejoined. Hurricane Frederic in 1979 caused massive washover on the west end but a complete breach did not occur. Shoreline change maps for the period 1942 to 1974 show gulf shoreline erosion rates of about 6 feet per year. Accretion of the west end between 1917 and 1974 added about 2 miles to the island.

Late in the 1800's the Corps of Engineers began installing a revetment seawall and short groins around the east end of the island to protect Fort Gaines from ongoing erosion. There is a series of plans showing various installations of revetment plus stub groins from 1894 onward and all works were completed about 1909. These structures have survived with little to no maintenance and successfully protected the fort. There is evidence that the revetment seawall is beginning to fail as the soil behind it is eroded by wave action.

A recent study by Dr. Scott Douglass, a professor at the University of South Alabama, suggests that Sand and/or Pelican Island, a highly mobile island(s) just south of Dauphin Island, is actually a visible portion of the massive ebb tidal shoal at the mouth of Mobile Bay. As such, the island is part of the total sand transfer process. His work indicates that the island has migrated northward in the past, as it is now doing. This migration pushes Pelican Pass northward and erodes the shoreline on Dauphin Island until some natural force breaches the shoal island and restarts the migration process. Unfortunately, this is the site of the present public park and fishing pier.


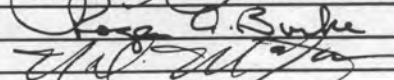

The 5-mile long entrance to the Mobile Harbor ship channel runs from deep water in the Gulf of Mexico, through Mobile Pass, and into Mobile Bay. Work on the existing project commenced in 1931 and was completed in 1981. Phase I of the channel improvement authorized by the 1986 WRDA was completed in 1990 and the entrance channel is presently maintained at 47 feet deep by 600 feet wide. Corps' records show that since 1974 about 15 million cubic yards of material has been removed from the entrance channel. Almost 7 million cubic yards of that amount was removed in 1990 for the channel improvement. The total amount removed is 1¼ percent of the total estimated ebb tidal shoal volume. Dr. Douglass has pointed out the annualized amount removed exceeds the estimated annual littoral transport volume for this area. While this may be correct, the littoral transport path estimated by Dr. Douglass indicates that any effects from this practice would be felt mostly on the west end of the island and not at the present problem areas.

c. Present Action. This year the Mobile District was funded for two Emergency Shoreline Erosion Protection studies under the authority of Section 14 of the Flood Control Act of 1946. These studies were named East End Dauphin Island, Alabama, and Dauphin Island Shoreline, Alabama. Both studies are nearing completion.

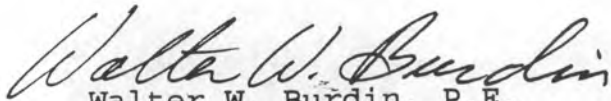
d. Study Results. The study of the Fort Gaines area, East End Dauphin Island, indicates that restoring the protection at the fort to the original 1909 configuration is feasible. The cost estimate is not completed, but it has advanced to the point where we can confidently say that the total project cost will be in the neighborhood of \$475,000. This will require cash cost share funding from the DIPBB or some other local non-Federal sponsor of about \$119,000 (25 percent). Environmental coordination on this study is being initiated and it is expected that the final report will be completed in December 1992.

We have been unable to find an economically feasible project for the Main Beach Park, the Dauphin Island Shoreline study. The value of the park structures, about \$600,000, is not sufficient to justify any project that would arrest the erosion there. We are preparing a report recommending no Federal action on a Section 14 project which should be complete in November 1992.

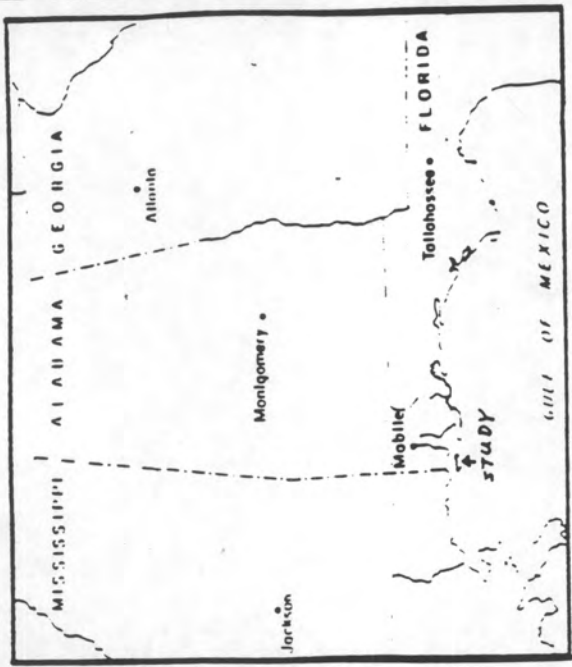
4. COORDINATION:

CESAM-PD-FP	Concur/ Nonconcur		(205) 690-3411
CESAM-PD-F	Concur/ Nonconcur		(205) 694-3809
CESAM-PD	Concur/ Nonconcur		(205) 694-3809

5. APPROVAL. The Chief, Planning and Environmental Branch, approved this fact sheet.


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Study Manager

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EAST END DAUPHIN ISLAND AND
 DAUPHIN ISLAND SHORELINE

SECTION 14



US Army Corps
 of Engineers
 Mobile District

