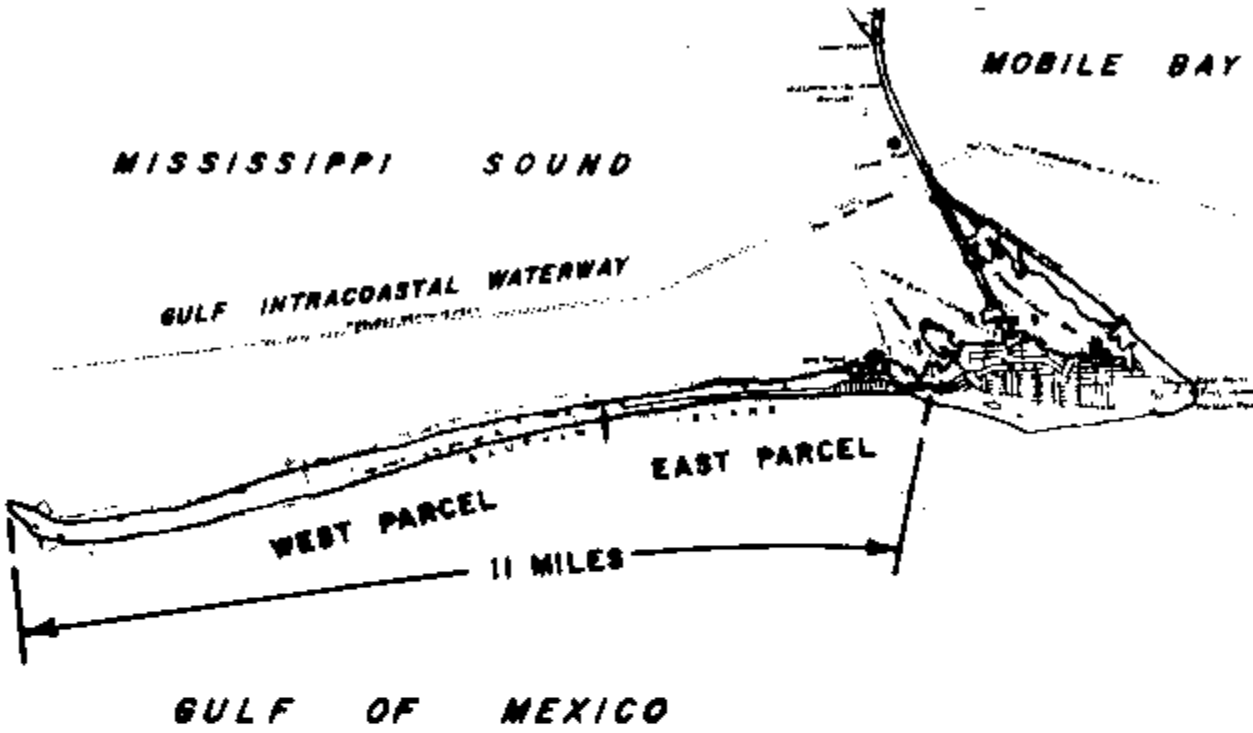

WESTERNMOST 11 MILES OF DAUPHIN ISLAND, ALA.

162. The east parcel consists of approximately 3.6 miles of developed property. It contains 142 waterfront lots and a small area of beach seaward of the 3 motels. Estimates regarding the value of these lots are based on 5 lot sales. The 2 latest sales both indicate a value of $1.75 per square foot. Although sales 3, 4, and 5 are older sales and have square foot values of $1.57, $1.42, and $1.25, respectively, it is felt that they support the $1.75 per square foot value of the newest sale. The front foot unit could have been used and would have resulted in values of about $300 per front foot; however, the square foot comparison appeared to be the most consistent. Therefore, the $1.75 value has been used to evaluate the developed beach area.

163. The west parcel is in single, private ownership and consists of about 7.4 miles of undeveloped property. The appraised value of $2,556,000 for this property was established by a local M.A.I. (Member Appraisal Institute) hired by a potential purchaser and the value was agreed to by the owners. It has a front foot value of $91.01. This is about 1/3 the front foot value for developed lots. This 1 to 3 ratio between raw land value and developed land value is the commonly accepted ratio in the real estate field and tends to support the appraised value for the offering. The square foot unit is not a significant figure on this property because of the large amount of extremely low land included in the sale. Applying the 1 to 3 ratio, referred to above, to the $1.75 per square foot value on the developed lots results in a value for this waterfront property of about $0.60 per square foot.

164. It is estimated that 4.6 feet of erosion per year could be alleviated by placing maintenance material directly onto the beach and allowing it to distribute over the western 11 miles of the island. Therefore, benefits gained from reducing erosion by this amount are summarized below.

Annual Benefits Derived From Reducing Erosion 4.6 Feet Per Year

West Parcel:	
7.4 miles = 39,072 ft.	
39,072 ft. x 4.6 ft. = 179,731 sq.ft.	
179,731 sq. ft. x $0.60/sq. ft. =	$108,000
East Parcel:	
3.6 miles = 19,008 ft.	
19,008 ft. x 4.6 ft. = 87,437 sq. ft.	
87,437 sq. ft. x $1.75/sq. ft. =	153,000
Total	$261,000

Average annual benefits accruing to this plan would be $261,000. In view of the increased costs and the benefits realized from this alternative, it would not be an economically feasible action. Therefore, it was dropped from further consideration.

165. Nearshore Nourishment. - On the average, 264,000 cubic yards of material per year are removed from the Mobile Bay entrance channel. With this alternative, the material would be deposited in the nearshore zone off the gulf coast of Dauphin Island in an effort to reduce erosion due to the rise in sea level. Mathematical studies conducted by the Waterways Experiment Station indicate that less than 0.1% of this material will be transported into the surf zone. Therefore, this plan will not directly reduce erosion. As noted earlier, 264,000 cubic yards of material are equivalent to 4.6 feet of erosion over a length of approximately 11 miles. Therefore, it is expected that providing the system with this volume of material will result in a stabilization of the system to effect a reduction in erosion of an equivalent amount of material or a reduction of about 4.6 feet of erosion on the westernmost 11 miles of the island's gulf shore.

166. To accomplish this, the loaded hopper dredge would place the dredged material in a 2 mile reach extending westwardly from longitude 88° 7.8', in waters 26-30 feet deep. About 396,000 cubic yards would be placed in this area every 1-1/2 years. Again, only those costs over and above current costs for present maintenance operations would be charged against this plan. The average annual costs are estimated to increase from the present $573,000 to about $789,000 or an increase of $216,000.

167. Benefits accrued to this alternative by reducing the annual rate of erosion by 4.6 feet. This rate is the same as that

achieved by the Beach Nourishment Alternative. The per square foot real estate values remain constant. Therefore, the benefits to be gained by implementing the Nearshore Nourishment Alternative are the same as those for the Beach Nourishment Alternative. In summary, average annual benefits stemming from this plan would be $261,000 and net benefits would be $45,000. The benefit/cost ratio is 1.21.

EFFECT ASSESSMENT

168. In planning for any action, care must be taken to see that all known and possible or probable effects are taken into consideration. Effect assessment is carried out in terms of the contribution each plan makes to the four accounts; National Economic Development (NED), Environmental Quality (EQ), Regional Development (RD), and Social Well-Being (SWB).

169. Effect assessment identifies the effects of all considered plans to determine the impacts that can be expected. Further, Section 122 of Public Law 91-611 supplements and extends the requirements of the National Environmental Policy Act of 1969 (PL 91-190) by requiring that the effect assessment identify the economic, social, and environmental factors associated with plans under consideration. Section 404 of Public Law 92-500 and Section 103 of Public Law 532 also requires that certain impacts on water quality be investigated and quantified before undertaking any action involving the discharge of dredged material into waters of the United States or ocean waters. Further criteria are established by Executive Orders 11990 and 11988 which direct that all Federal water resource planning minimize destruction, loss or degradation of wetlands and development in the flood plain. Therefore, the effect assessment process is carried out to assure that all significant effects have been identified and their impacts evaluated. A summary of the effects of the considered plans is given in the following paragraphs.

170. The effects of considered structural plans are compared with the "No Action" Alternative as a base condition. Herein only one structural solution, "The Nearshore Nourishment" Plan, has been indicated to be economically advisable and worthy of consideration. This plan relocates the hopper dredge disposal area for maintenance material from the Mobile Harbor entrance channel. With the exception of the direct and indirect monetary savings gained by the considered structural plan, its effects vary little from those that will occur from a continuation of present maintenance operations, as would be the case with the No Action Alternative.

171. The most significant impacts of either the No Action or Nearshore Nourishment Plan are their effects on water quality and marine organisms. In these respects their impacts are similar.

172. Studies conducted to determine the environmental effects of open water disposal of dredged material indicate a relatively minor disruption of the benthos in the disposal area. Motile species normally either avoid or leave the disposal area while the nonmotile forms are directly covered by the dredged material. However, the approximate community structure of both the dredged and disposal areas is essentially fully reestablished within 9 to 18 months after each maintenance operation.

173. Disposal of material dredged from the entrance channel by emptying the hopper dredge has resulted in a buildup of the sea bottom in the present disposal area. The process generates large clouds of suspended solids upon deposition. The time required for the induced turbidity to dissipate has not been specifically documented, but it is considered to be less than

one day. Solid material from the dumping action traps and smothers many organisms living in and traveling through the water column above the dumping grounds, as well as bottom organisms. Fish are frequently seen jumping from the water within the area of the turbid water. It is not known whether they are being pursued by larger predators and have sought cover within the turbid water or if they are jumping to avoid the increased turbidity.

174. Two samples have been taken along the entrance channel during preparation of the Mobile Harbor Operation and Maintenance Environmental Impact Statement. The physical characteristics of both these samples ar such that they are excluded from the requirement of elutriate analysis and are considered acceptable for open-water disposal. This material is characterized by a very high percentage of coarse sand with approximately 7% silts and clays. The silts and clays are responsible for the turbidity increases during the loading and unloading of the hopper dredge.

175. The No Action Alternative perceives a continuation of present conditions and practices without any provisions to reduce potential hurricane flooding or occurring beach erosion. Under this alternative dredged material would continue to be deposited in the closest suitable area to the entrance channel. No monetary or other resources would be expended to transfer the dredged material to Dauphin Island's littoral system, and erosion along the western end of the island could be expected to continue at its present pace. Erosion would continue to claim valuable property on the island, ultimately causing hardships for island property owners and a lessening of the area's attractiveness for recreational activities.

176. The Nearshore Nourishment Plan should significantly reduce the present rate of erosion along the western 11 miles of Dauphin Island producing a net savings in land values over the additional cost for implementing the plan. While not eliminating, it would delay the ultimate effects of the No Action Plan. The savings realized from the Nearshore Nourishment Plan should beneficially affect National economic development; local property values, employment, business activities, tax revenues, and general economic growth; public services and facilities; natural and manmade resources; recreation and aesthetic values; and community and regional cohesion and growth. The plan should have no effects on air quality, noise, known archaeological remains, municipal water supply, or threatened or endangered species. As previously noted the Nearshore Nourishment Plan would have temporary, adverse effects on water quality, benthic life, fisheries, and other marine life similar to the present (No Action Plan) method of operations. No known vegetation or wetlands other than submerged bottoms would be affected. The plan is considered acceptable to local interests and would be completely reversible. It is reasonably certain that benefits for the considered plan will be achieved; however, the effectiveness of the considered plan cannot be fully documented. The area of geographical impact would be limited to the southern shoreline of Dauphin Island and adjoining offshore waters.

177. Wetlands affected by the Nearshore Nourishment Plan are limited to submerged bottoms in the nearshore disposal area. Submerged bottoms in both the presently used disposal area and the new disposal area are characterized as generally clayey sand with occasional pockets of higher concentrations of silts and clays. The area between the considered nearshore disposal area is characterized by bands of clayey and silty sands with increasingly higher concentration of sand toward shore.

178. Benthic samples taken in the general area indicate that sediment type influences the type as well as the abundance of macro-infauna. Smaller numbers of organisms were found in fine sand and clay substrates, but the individual size of each organism was larger. This relationship suggests that in the fine sand-clay substrates bivalves dominated, while polychaetes dominated the coarser substrates.

179. Essentially all of Dauphin Island is located within a Flood Prone Area as designated by the South Alabama Regional Planning Commission. However, the area is currently enrolled in the Federal Flood Insurance Program which implies restrictions on flood plain developments. Key provisions for the Federal Flood Insurance Program are outlined in Appendix A. Considering the constraints under which development is permitted under this program, implementation of the Nearshore Nourishment Plan should have no appreciable effects on flood plain development.

SELECTING A PLAN

180. The selection of the best plan(s) to resolve the problems and meet the needs of the study area involves the comparison of the possible alternatives within the context of the formulation criteria outlined earlier. Herein, data on storm flood and damages and erosion problems, possible solutions and the desires of local interests have been assessed. Analyses of the structural alternatives indicate that except for utilizing maintenance material dredged from the Mobile Bay entrance channel to reduce erosion on Dauphin Island, structural alternatives are either unacceptable to local interests or not economically feasible. These analyses also indicate that essentially all practical nonstructural measures offering potential

benefits have been implemented in the study area. Accordingly, the only plan indicated to be economically feasible provides for nourishment of the gulf nearshore of Dauphin Island with material removed from the Mobile Bay entrance channel as part of the ongoing maintenance program for the Federal project for Mobile Harbor. The Nearshore Nourishment Plan would provide net benefits in the form of land values saved from erosion. The plan would beneficially affect national economic development, local economic and regional development, and recreation and aesthetic values. Adverse impacts of the considered plan would be temporary in nature and similar to those occurring from the present maintenance practice. These impacts would be keyed to the periodic (1½ years) maintenance dredging program. On the basis of these findings, the Nearshore Nourishment Plan, as defined herein, is considered "The Selected Plan".

THE SELECTED PLAN

PLAN DESCRIPTION

181. On an average, the entrance channel to Mobile Bay is dredged every 1½ years as part of the maintenance program for the Mobile Harbor Navigation Project. About 396,000 cubic yards of material are removed from the entrance channel each time maintenance dredging is performed. The proposed plan provides for placing this material offshore in an area extending west about 2 miles from longitude 88° 7.8'. The shoreward and seaward boundary of the dumping area would be about the existing 26-foot depth contour and the 30-foot depth contour respectively.

When more or less than 396,000 cubic yards of material is dumped, the seaward boundary would be adjusted as required. Dumping of the material would be accomplished in such a manner as to build the bottom of the dumping area up to a depth of 26 feet. This would be accomplished as described below and illustrated on plate IV.

a. Dredge would dispose of two loads of material along range 1 (n=1). As shown on plate IV, range 1 is the landward most range and is located near the 26-foot depth contour.

b. Dredge would continue to dump material along ranges 2 (n=2) through 9 (n=9) with the number of loads, N_n dumped on each range increasing as indicated in the table shown on plate IV.

This procedure is considered only a first order of approximation. However, the number of loads of material per range required to build the bottom up to a depth of 26 feet can be modified based on field experience.

DESIGN

182. The proposed plan will reduce the rate of shore erosion by partially stabilizing the slope of the nearshore zone.

183. The principal causes of shore erosion along the westernmost 11 miles of Dauphin Island are attributable to rise in sea level and maintenance dredging of the Mobile Bay entrance channel. Based on sea level stages recorded at Biloxi, Mississippi, the rates of rise of sea level between 1896 and 1972 and between 1940 and 1972 were .009 feet per year and .012 feet per year respectively. These data are shown on Plate II. Per Brunn, in the reference, Sea-Level Rise as a Cause of Shore Erosion, proposed the following formula for computing the rate of shoreline recession from the rate of sea level rise:

$$X = \frac{a\ b}{(e+d)}$$

X = shoreline recession per year

a = sea level rise per year

b = distance from shoreline to 60 ft. depth

e = elevation of dune line

d = 60 feet

This formula is based on the assumption that, with a rise in sea level, the slope of the nearshore zone is modified by littoral forces so as to reestablish the same depths relative to the water surface that existed prior to the sea level rise. This principal is illustrated in figure 31, obtained from the aforementioned report. Introducing in this equation data pertinent to Dauphin Island, the average shoreline recession attributable to sea level rise between 1896 and 1975 and between 1940 and 1972 is 4.57 feet per year and 6.09 feet per year respectively.

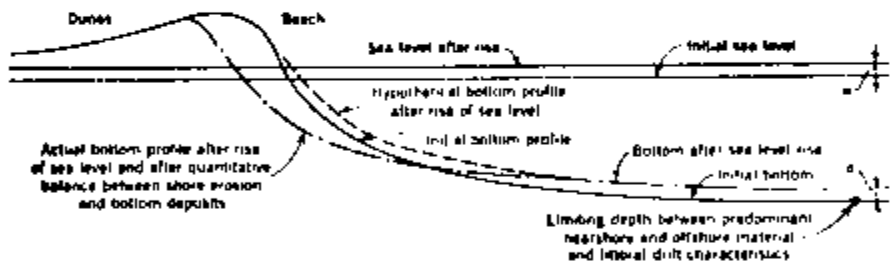

FIG. 31—INFLUENCE OF SEA-LEVEL RISE ON THE DEVELOPMENT OF BEACH AND OFFSHORE PROFILE

Considering figure 31, it follows that, if material is placed along the slope of the nearshore zone, the volume of material eroded from the slope as a result of sea level rise will be reduced by this amount. Material placed by a hopper dredge onto the slope will be moved parallel to the shore and onshore and offshore by wave action. However, it is generally accepted

that the net transport of sediment along the bottom because of the differential between onshore and offshore velocities associated with orbital motion of nearshore waves is toward the shore. In addition, it is probable that there is a seaward transport by diffusion of suspended material.

DUMPING PROCEDURE

184. The Corps of Engineers hopper dredge "McFarland" has a loaded draft of about 22 feet and can dump material in a water depth of about 26 feet. The dredge carries about 3,000 cubic yards of material, has hopper doors about 40 feet wide and a dump time of about 12 minutes. The dredge runs about 10 miles per hour when dumping. Thus, it follows, that the dredge would travel a distance of about 2.0 miles when dumping. The rate of dumping along a range would be about 1500 cubic yards per mile.

$$\frac{3{,}000}{2 \text{ mi}} \text{ cy} = 1500 \frac{\text{cy}}{\text{mi}}$$

185. It is estimated, when the material leaves the hopper, it would be dispersed over a width of about 100 feet. Thus, each load of material dumped over a range would increase the bottom elevation of the range about .077 feet.

$$\frac{3{,}000 \text{ cy} \times 27 \text{ cf/cy}}{2 \text{ mi} \times 5280 \frac{\text{ft}}{\text{mi}} \times 100 \text{ ft}} = .077$$

186. Considering the 2-mile long dumping area which extends seaward from the 26-foot depth contour, the total number of ranges, N_x required to dispose of the dredged material within the area would be as follows:

$$N_x = \left(\frac{(2V\ C)}{\tan a}\right)^{.5}$$

V = Total volume of material in cubic yards

C = Conversion constant = 2.5568×10^{-7}

a = Angle of slope of the gulf bottom from the 26-foot contour.

Where N_n equals the number of loads dumped on a range and n equals the number of the range, the following relation can be developed:

$$N_n = (651.85) \quad (n^2 - n_{-1}^2) \tan a$$

187. The total number of trips, T, required to dispose of the total volume, V, of material dredged would be as follows:

$$T = \frac{V}{3000}$$

188. Considering the volume of material, V, to be dredged to equal 396,000 cubic yards and introducing values pertinent to the proposed dumping area into the previously developed equations, the values given in the table shown on plate IV were computed.

189. In summary, the 2-mile long dumping area would have a width of about 900 feet extending seaward of the 26-foot depth contour, the material would be dumped along about 9 ranges, and the number of loads dumped along each range would vary from 2 at the landward most range (n=1) to 28 at range n=8. Only about 17 loads would be placed along the seaward most range, n=9. About 132 loads would be required to dispose of the material during each channel maintenance operation.

ECONOMICS OF SELECTED PLAN

COST

190. As previously indicated, costs for the selected plan would consist only of the additional charges necessary for disposal of the material dredged from the Mobile Harbor entrance channel as prescribed by the selected plan in lieu of that by the present practice. Increased costs would occur only as an annual charge since no initial construction would be involved. The increased cost would result from the increased haul distance and resulting travel time required of the hopper dredge. With the selected plan, costs of performing the required maintenance dredging of the Mobile Bay entrance channel every 1½ years will result in average annual charges increasing from $573,000 to about $789,000, or an increase of $216,000.

BENEFITS

191. The benefits that will stem from the proposed plan will accrue to the owners of the gulf front property located along the westernmost 11 miles of Dauphin Island. At present, this section of the island is losing about 13.5 acres of property per year to erosion. With the selected plan implemented, the erosion rate would be reduced from about 10.3 feet per year to about 5.7 feet per year; a loss of about 4.6 feet per year. The average equivalent annual value of the land saved by reducing erosion by 4.6 feet is estimated to be $261,000.

SUMMARY OF ECONOMICS

192. Benefits that would accrue in the form of the value of lands that would not be lost to erosion from implementing the selected plan are estimated at $261,000 annually. The benefits would exceed the estimated increased annual cost of the plan by $45,000. The resulting benefit to cost ratio would be 1.21.

DIVISION OF PLAN RESPONSIBILITIES

193. Implementation of the selected plan, as defined herein, would only involve a modification of the present operation and maintenance practice employed for the Mobile Harbor Navigation Project. The modification is considered within the prerogative of the Chief of Engineers for operation and maintenance of the navigation project and affects no areas of local responsibility for the project. Accordingly, total responsibility for implementation of the selected plan and associated costs are a Federal responsibility.

PLAN IMPLEMENTATION

194. Implementation of the selected plan is within the existing authority granted by the Congress to the Chief of Engineers for operation and maintenance of the existing Federal navigation project for Mobile Harbor. Therefore, further action of the Congress would not be necessary for plan implementation.

195. Implementation of the selected plan, under the operation and maintenance program for Mobile Harbor, will require administrative procedures by both the Corps of Engineers and the Environmental Protection Agency (EPA). Under the provisions

of Section 103 of Public Law 532, all ocean disposal sites will require the approval of EPA. The criteria for implementation of Public Law 532 in disposal site designations was promulgated by EPA on 11 January 1977. To date, offshore disposal sites presently in use have been given interim approval pending evaluation and approval in accordance with the newly established criteria. Therefore, continued use of the present site or the new site stipulated by the selected plan will require certain evaluations and approval by EPA. Corps of Engineers implementation of the selected plan would be contingent upon such approval by EPA.

196. Selection of the disposal site in accordance with the selected plan or continuation of the present practice will require that the following factors be determined:

a. Geographical position, depth of water, bottom topography and distance from coast;

b. Location in relation to breeding, spawning, nursery, feeding, or passage areas of living resources in adult or juvenile phases;

c. Location in relation to beaches and other amenity areas;

d. Types and quantities of wastes proposed to be disposed of, and proposed methods of release;

e. Feasibility of surveillance and monitoring;

f. Dispersal, horizontal transport and vertical mixing characteristics of the area, including prevailing current direction and velocity, if any;

g. Existence and effects of current and previous discharges and dumping in the area (including cumulative effects);

h. Interference with shipping, fishing. recreation, mineral extraction, desalination, fish and shellfish culture, areas of special scientific importance and other legitimate uses of the ocean;

i. The existing water quality and ecology of the site as determined by available data or by trend assessment or baseline surveys;

j. Potentiality for the development or recruitment of nuisance species in the disposal site;

k. Existence of or close proximity of any site of significant natural or cultural features of historical importance.

(Magnetometer Survey)

197. The results of a disposal site evaluation and/or designation study based on the criteria would be presented in an environmental assessment and would be used in the preparation of an environmental impact statement for either the existing or new site if required by the EPA.

COORDINATION

198. During the course of the investigation, all state and Federal agencies known to have affected interests in the study were contacted for comments and study suggestions. A public meeting and a workshop meeting were also held 31 July 1973, and 31 March 1975, to afford interested parties and the general public an opportunity to express their views concerning the improvements desired and the need and advisability of their execution. Primary concerns expressed at the public meeting pertained to erosion prevention. No particular interest in hurricane protection or flooding was indicated at that time.

199. At the workshop meeting, little interest was exhibited in implementing structural plans presented which would solve any erosion problems. There was strong opposition on the part of waterfront property owners to the establishment of public shoreline property or any measures that might restrict their

waterfront rights. However, certain interest was shown in the concept of disposal of dredged material from the Mobile Bay Navigation Project for erosion abatement. The feasibility of placing dredged material from the Mobile Ship Channel onto the eroding bay shoreline was subsequently pursued as part of the ongoing survey study for modifications of the existing Federal Navigation Project for Mobile Harbor and found to be opposed by a majority of affected interests. The results of these findings indicate that no works which would require congressional authorization and meaningfully address the study problems would be both economically feasible and acceptable to local interests. Accordingly, the congressional representative and local study sponsor were notified that the ongoing beach erosion and hurricane protection study for Mobile County would be concluded on the basis of those findings. Pertinent correspondence relating to these coordination efforts is contained in Appendix B.

CONCLUSIONS

200. In Mobile County, there is significant erosion occurring along the Mobile Bay shoreline and along the southern shores of Dauphin Island. There is also a potential for substantial hurricane flood damage along much of the county's low-lying coast. However, analysis of structural alternatives indicate that, except for utilizing maintenance material dredged from the Mobile Bay entrance channel to reduce erosion on Dauphin Island, such alternatives are either unacceptable to local interests or not economically feasible. Analyses also indicate that essentially all practical nonstructural measures offering potential benefits have been implemented in the study area.

Accordingly, the only plan indicated to be economically feasible provides for nourishment of the gulf nearshore of Dauphin Island with material removed from the Mobile Bay entrance channel as part of the ongoing maintenance program for the Federal project for Mobile Harbor.

201. The selected plan for nearshore nourishment of the littoral system along the southwestern shore of Dauphin Island with maintenance material dredged from the navigation project would only be a partial solution to erosion. However, the plan could be implemented at an additional annual maintenance cost for the navigation project of $216,000 and annual savings in the loss of lands of $261,000. Accordingly, the plan would have net benefits of $45,000 and a benefit to cost ratio of 1.21. The environmental impacts are not indicated to be significant or substantially different from those occurring from the present maintenance practice. Further, the selected plan could be implemented under the operation and maintenance authority of the Chief of Engineers for the existing Federal Navigation Project for Mobile Harbor, subject to EPA approval of site selection, without further action by the Congress.

202. After considering all technical information, public views and, in particular, the economic, environmental and social well-being impacts, it is concluded that the selected plan warrants implementation. There is no more appropriate alternative to the proposed action that could more meaningfully address the problems of the area at this time.

RECOMMENDATIONS

FOR THE CONGRESS

203. On the basis of studies presented herein, it is concluded that structural plans to meet the needs of the area that would require authorization by the Congress are either unacceptable to local interests or not economically feasible. On the basis of these findings, the District Engineer recommends that no additional improvements for beach erosion control and hurricane protection for Mobile County be authorized by the Congress at this time.

FOR THE CHIEF OF ENGINEERS

204. Studies herein indicate that the only acceptable measures that would be economically feasible that would partially resolve any of the flooding or erosion problems of the area would be the Nearshore Nourishment Plan defined herein as The Selected Plan. This plan would produce net economic benefits, is considered environmentally acceptable and subject to EPA approval of the disposal site designation, could be implemented under the authority of the Chief of Engineers for operation and maintenance of Mobile Harbor without additional authority from the Congress. Accordingly, the District Engineer recommends that the Chief of Engineers modify the present maintenance dredging practice for the entrance channel to Mobile Harbor to conform to the procedures outlined herein for the Selected Plan as soon as practical with such other modifications as he may deem appropriate.

CHARLIE L. BLALOCK
Colonel, CE
District Engineer

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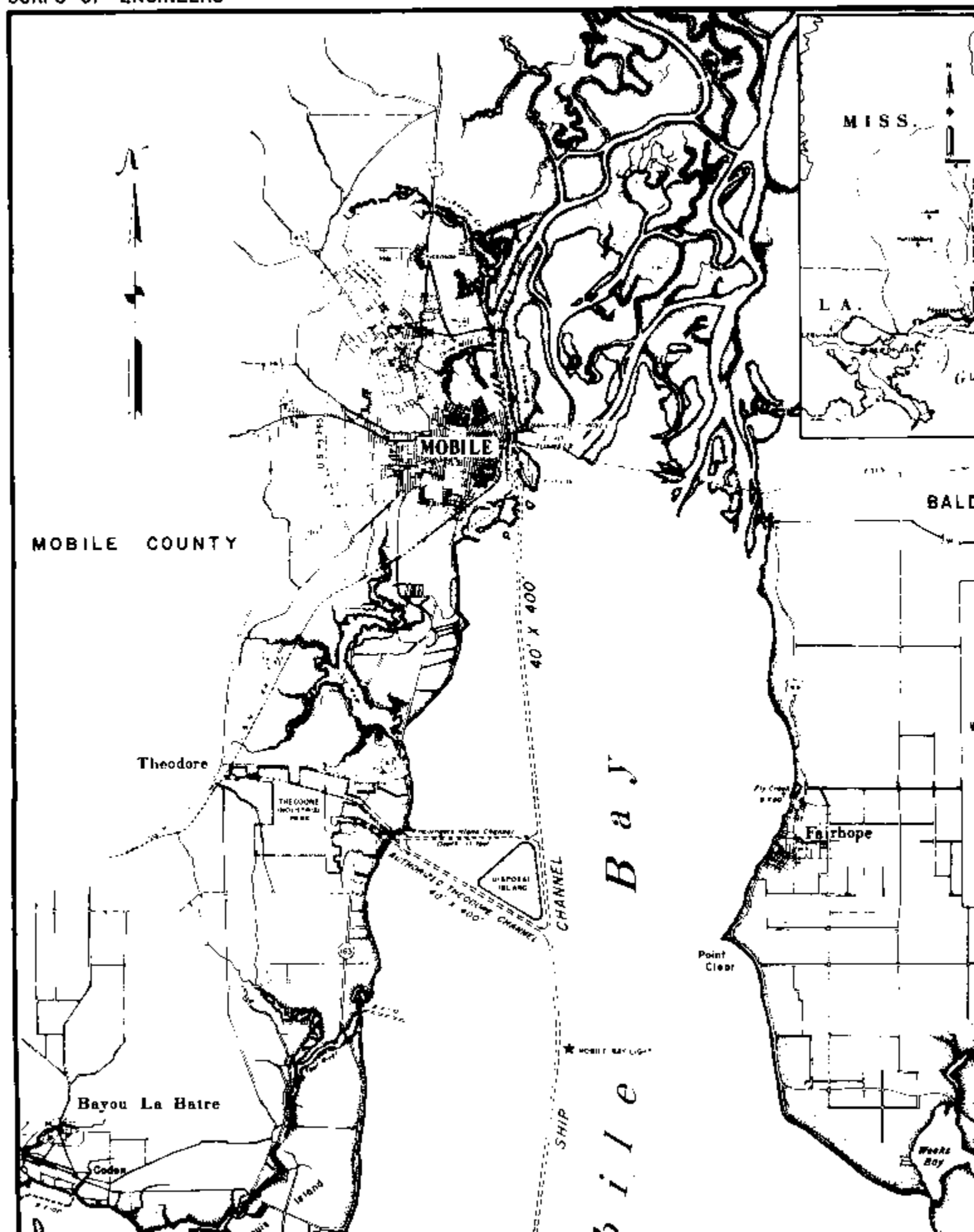
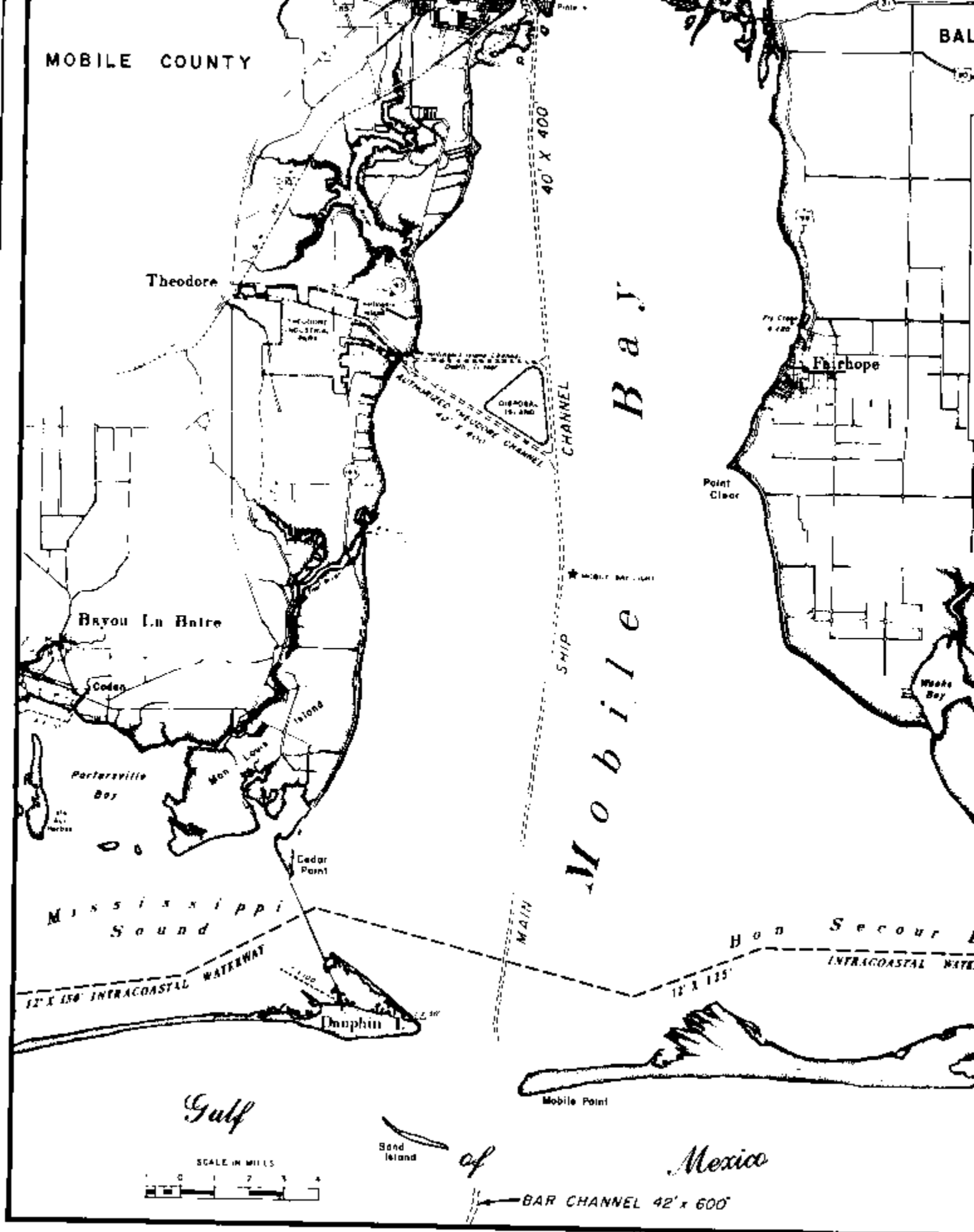
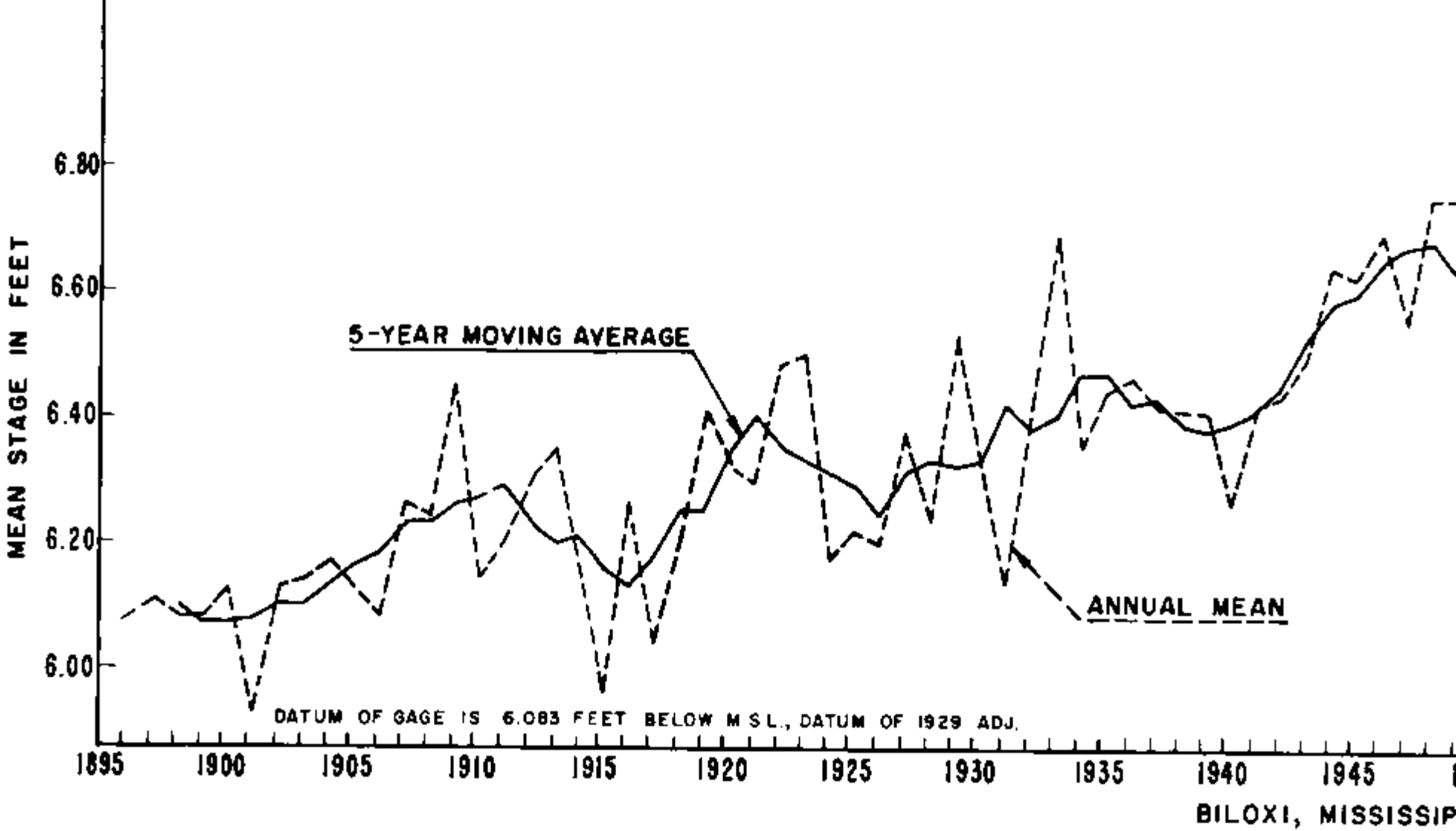
CORPS OF ENGINEERS




MOBILE COUNTY
BAL
40' X 400'
Theodore
Fairhope
Point Clear
CHANNEL
Bay
Mobile
SHIP
Bayou La Batre
Coden
Dauphin Island
Portersville Bay
Cedar Point
Mississippi Sound
MAIN
Mon Louis Island
Mon Secour
INTRACOASTAL WATERWAY
12' X 150' INTRACOASTAL WATERWAY
12' X 135'
Dauphin I.
Mobile Point
Gulf of Mexico
Sand Island
SCALE IN MILES
BAR CHANNEL 42' x 600'


MEAN STAGE IN FEET
6.80
6.60
6.40
6.20
6.00
5-YEAR MOVING AVERAGE
ANNUAL MEAN
DATUM OF GAGE IS 6.083 FEET BELOW M S L., DATUM OF 1929 ADJ.
1895
1900
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1910
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1920
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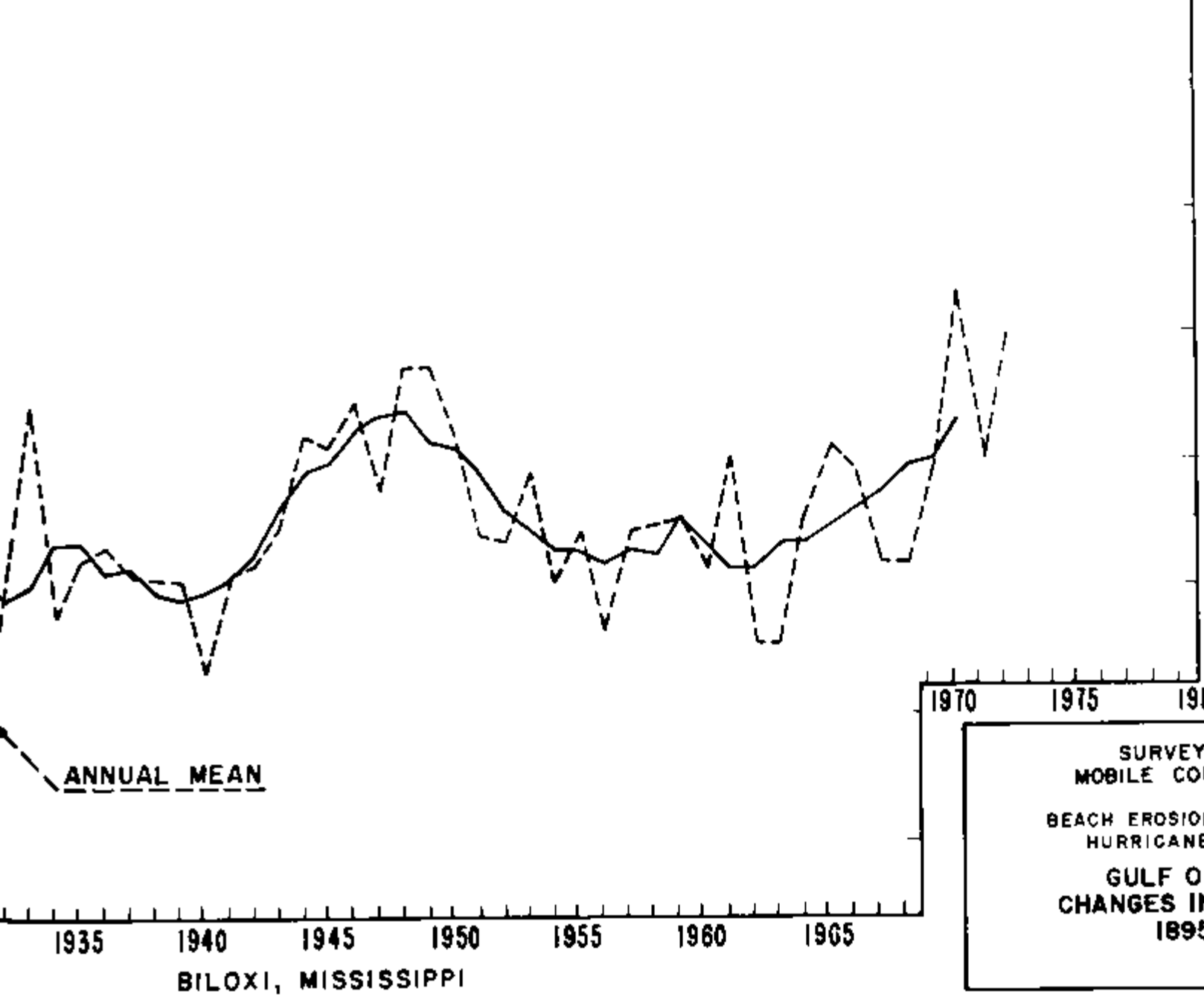


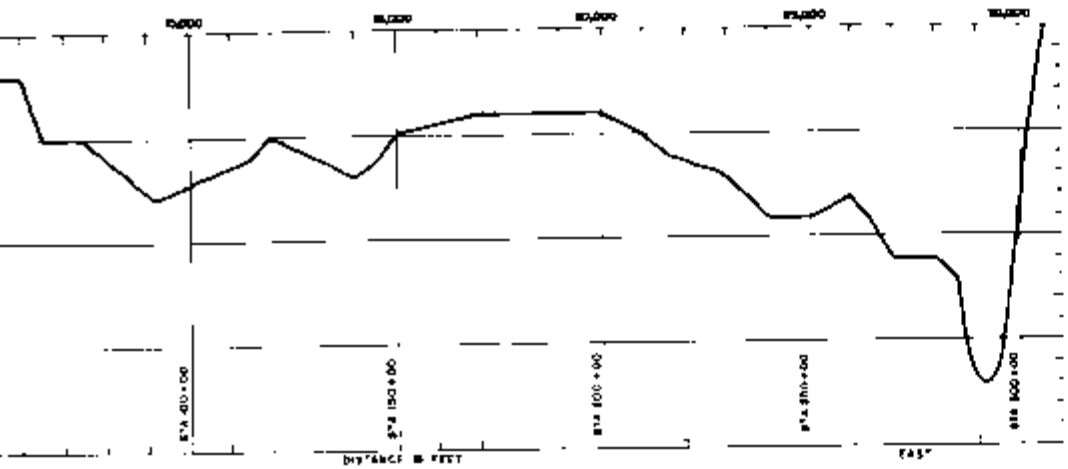
SURVEY REPORT ON
MOBILE COUNTY, ALABAMA
FOR
BEACH EROSION CONTROL AND
HURRICANE PROTECTION

GULF OF MEXICO
CHANGES IN SEA LEVEL
1895-1974

PLATE II

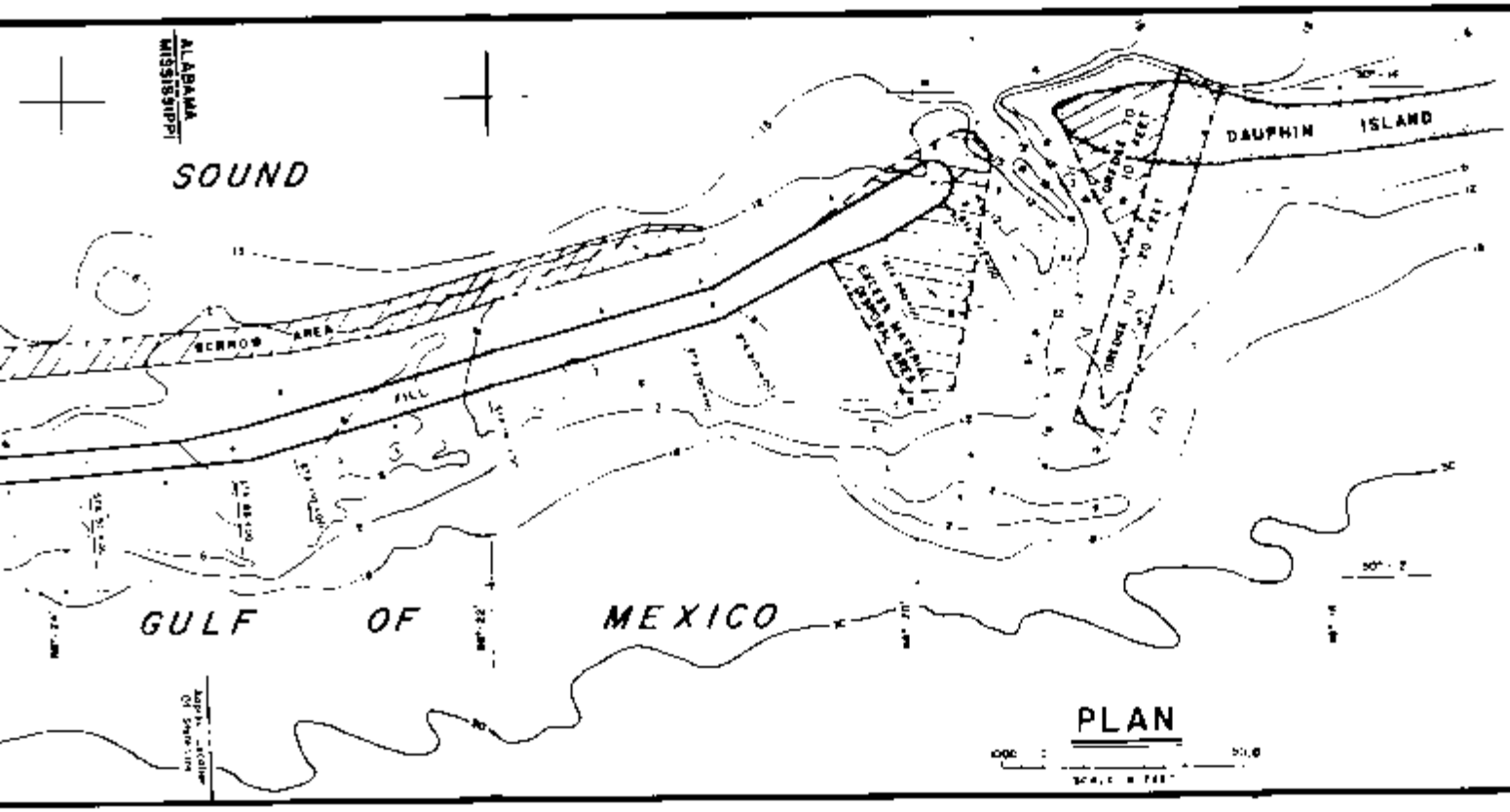
U. S. ARMY

REVISIONS

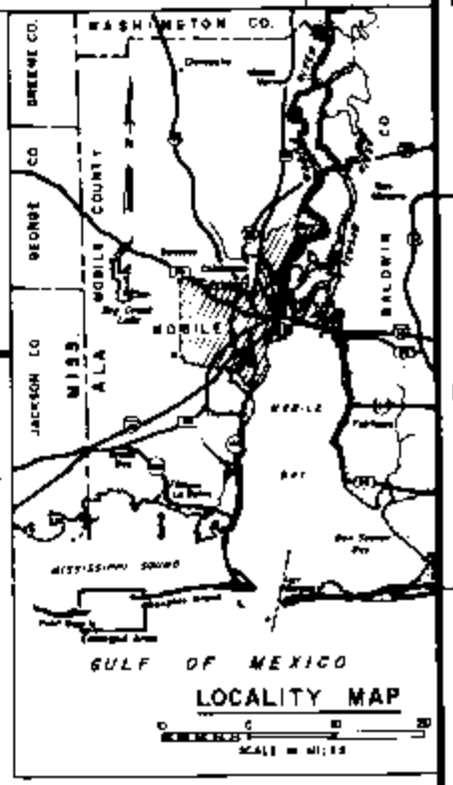


BOTTOM PROFILE

ALONG CENTERLINE OF FILL



PLAN



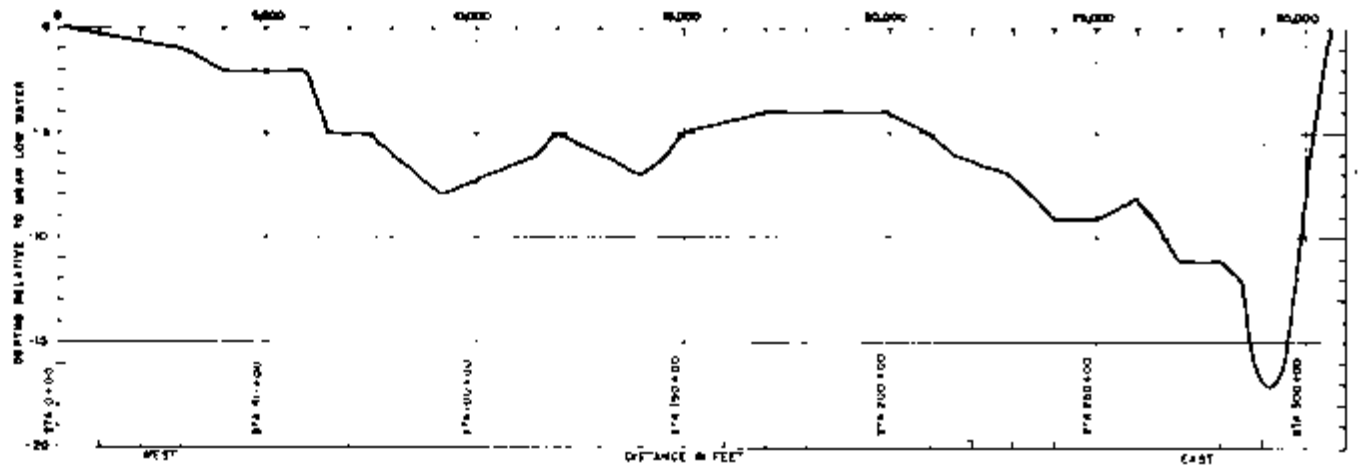
LOCALITY MAP

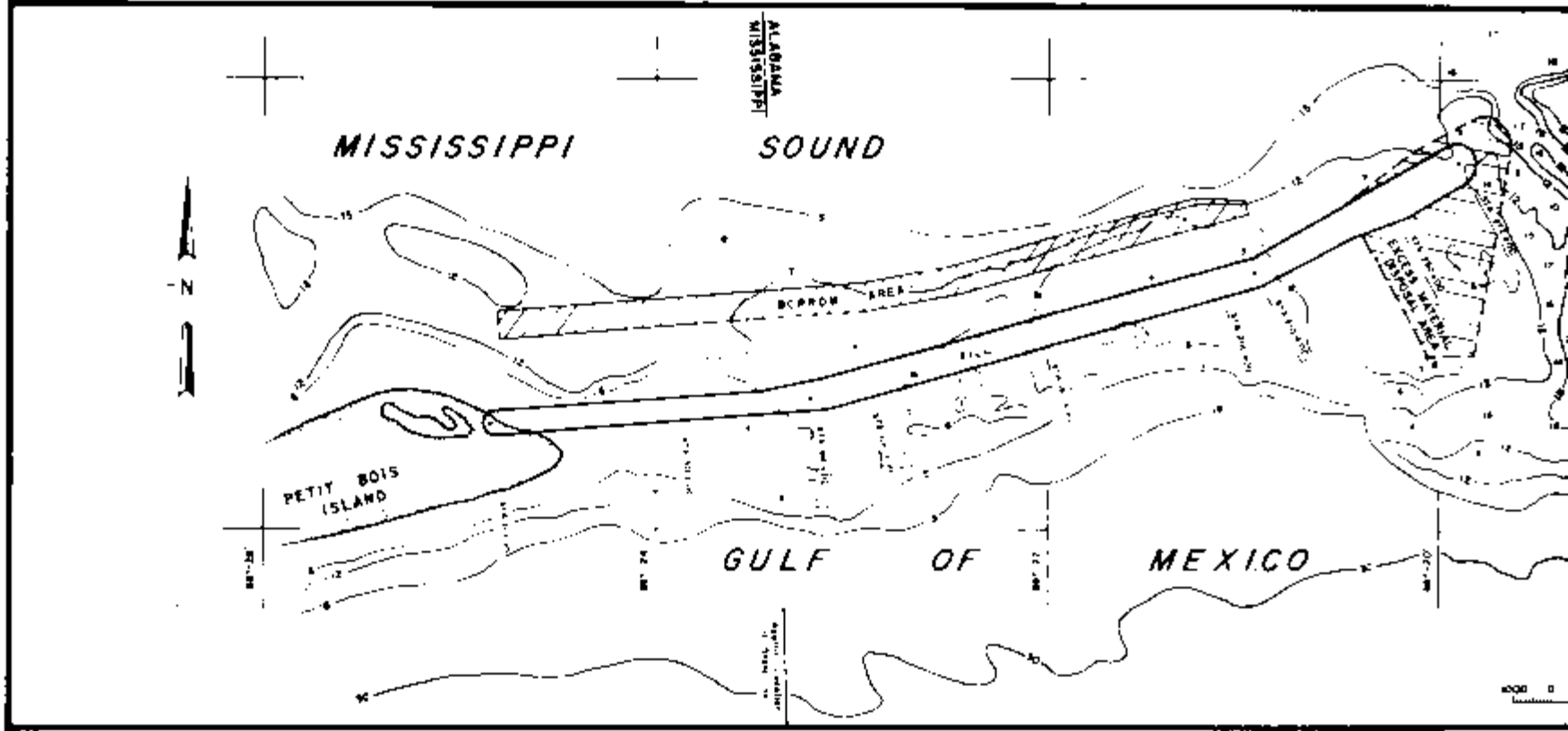
NOTES

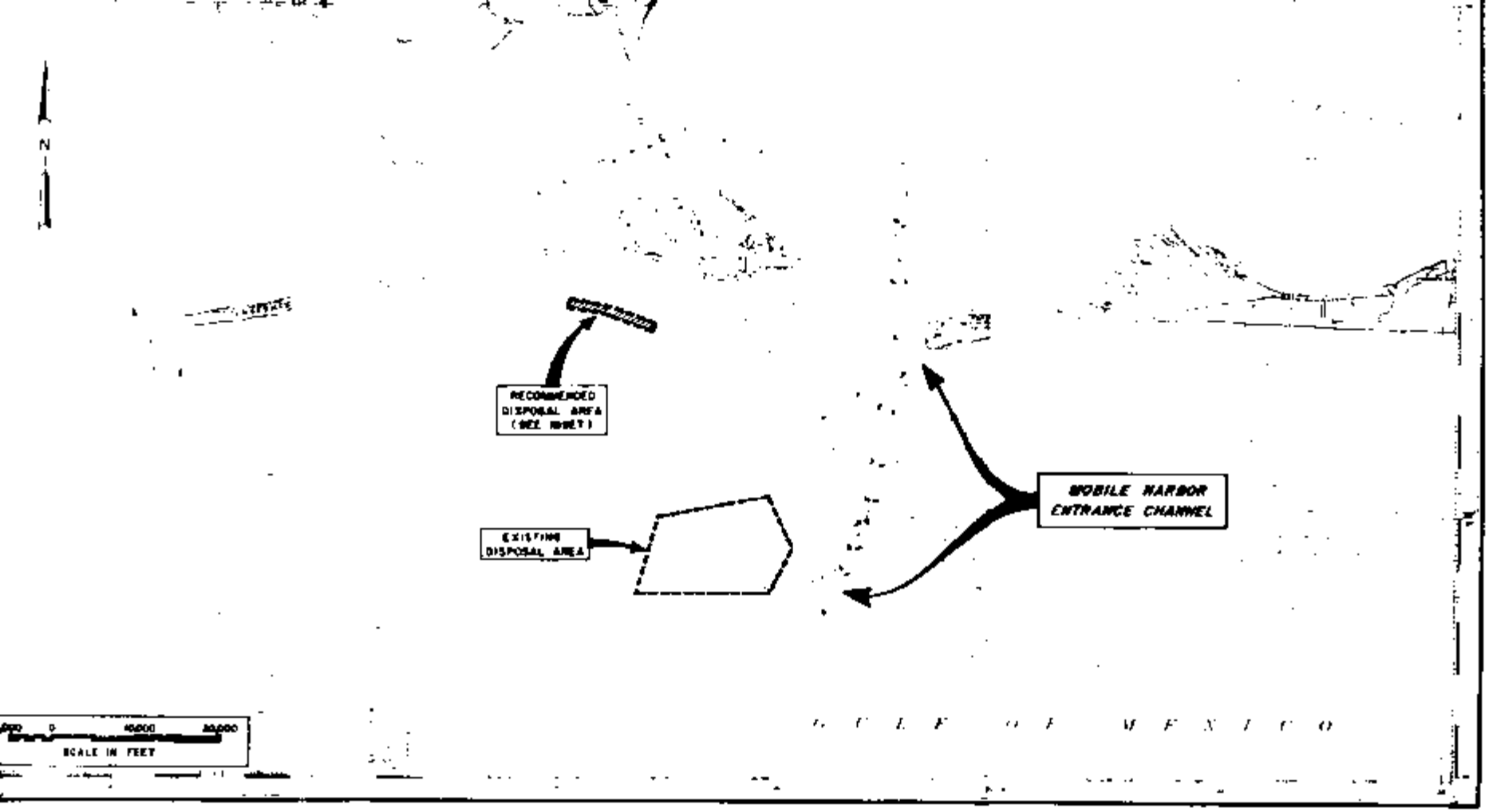
DEPTHS ARE IN FEET BELOW MEAN LOW WATER

DEPTHS WERE TAKEN FROM NAUTICAL CHART 11374 DATED NOVEMBER 1975, NOAA, U.S. DEPT OF COMMERCE

CORPS OF ENGINEERS







INSET

RECOMMENDED DISPOSAL AREA

SURVEY REPORT ON
MOBILE COUNTY, ALABAMA
FOR
BEACH EROSION CONTROL AND
HURRICANE PROTECTION

SELECTED PLAN