

**BENEFICIAL USE OF DREDGED MATERIAL  
DISPOSAL HISTORY  
ALONG SELECT NAVIGATIONAL CHANNELS IN LOUISIANA**

Prepared for  
The U.S. Army Corps of Engineers  
New Orleans District

Prepared by  
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## **INTRODUCTION**

Beginning in the late 1970's, the U.S. Army Corps of Engineers (USACE) began placing dredged material in an effort to create and restore coastal habitats. In 1994, the Beneficial Use Monitoring Program (BUMP) was instituted to quantify the amount of new habitat created and to improve dredge disposal placement in order to maximize the beneficial use. As part of BUMP, the University of New Orleans- Coastal Research Laboratory (UNO-CRL) performed a cumulative landscape history of the BUMP monitored sites between 1985 and 2000 to determine the net amount of sub-aerial land created by the USACE. The study will be continued on a yearly basis to determine the net land created between the current year and base year of 1985.

## **DATA**

The base year color infrared (CIR) photography used in the study was flown in December 1985 by the NASA- Ames Research Center. The photography was captured using a Wild RC10 camera at an altitude of 65,000 feet (1:65,000 scale).

For comparison, the current fiscal year (FY) CIR photography was used. The FY 2000 photography was flown by Aerial View Point in December of 2000 and January 2001. The photography was captured with a Wild RC30 camera at an altitude of 12,000 feet (1:24,000 scale).

## **METHODS**

The CIR photography was first scanned at a resolution of 600 dpi, and then imported into Erdas Imagine file format. The photography was then geo-referenced and a CIR photo-mosaic was created. For the land water classification, an ISODATA algorithm was performed on the CIR photo-mosaic to separate the imagery into 85 unique spectral classes. These 85 classes were then examined for spectral homogeneity and assigned either a final class of land or water. The image was then recoded to produce a land-water image. This procedure was followed for both the 1985 and FY 2000 CIR mosaics.

Once a land-water image was finalized for a study site, a change detection matrix was computed and a change detection image created. From this image, the areas of direct land created due to dredged material disposal was delineated using information from the disposal history of each study site.

## **RESULTS**

The goal of the study was to determine the amount of sub-aerial land created by the USACE. Since this study was a comparison of two time periods, the polygon delineations and acreage of BUMP created land represents a net change in the landscape based on current conditions. However, it was beyond the scope of the study to determine the amount of new land created by "BUMP assistance." The natural processes of re-working sediment placed into a system are numerous; making the determination of

BUMP assisted land creation difficult. Table 1 summarizes the results of the study and is followed by figures presenting the cumulative landscape change for each study site.

**Table 1** Summary of BUMP created land by study site.

<b>BUMP Study Site</b>	<b>BUMP Created (Acres)</b>	<b>BUMP Created (Hectares)</b>	<b>Figure Number</b>
Atchafalaya- Avoca Island	1,066	432	1
Atchafalaya- Delta	2,924	1,184	2
Atchafalaya- Horseshoe Bend	1,256	508	3
Baptiste Collette	6,239	2,527	4
Barataria- Inland	141	57	5
Barataria- Bay	60	24	6
Barataria- Grand Terre	121	49	7
Calcasieu- Brown Lake	195	79	8
Calcasieu- Sabine	745	302	9
Freshwater Bayou	21	8	10
Houma- Navigation Canal	13	5	11
Houma- Wine Inland	48	19	12
Mermentau River	63	25	13
MRGO- Inland	289	117	14
MRGO- Jetties	319	129	15
MRGO- Breton Island	29	12	16
South Pass	396	161	17
Southwest Pass	3,096	1,254	18
Tiger Pass	347	140	19
<b>Total</b>	<b>17,367</b>	<b>7,034</b>	

**BENEFICIAL USE OF DREDGED MATERIAL DISPOSAL HISTORY**  
**BARATARIA BAY WATERWAY, LA**  
**BARATARIA BAY REACH**  
Through FY 2000

The Rivers and Harbors Act of March 2, 1919 authorized the USACE-NOD to construct a 37-mile long channel, 5 feet deep by 50 feet wide from Bayou Villars to Grand Isle, Louisiana. This channel ran from Lake Salvador and Bayou Villars past the town of Barataria via Bayou Barataria, then through a newly cut channel called Dupre Cut to Bayou Cutler, thence along Bayou St. Denis and Mud Lake into the open Barataria Bay, and then through Barataria Pass. Disposal of dredged material was along the banks or in open water on either side of the new channel. The project was completed in 1925.

The Rivers and Harbors Act of July 3, 1958 authorized an enlargement and realignment of the channel. The 1958 Act provided for a channel approximately 37 miles long with a 12-foot depth and 125-foot width at Mean Low Gulf (MLG) from its beginning at the Gulf Intracoastal Waterway at Lake Salvador to Grand Isle. The new channel followed the route of the previous channel to Mile 15.5 in Bayou St. Denis, and then was relocated along the western shore of Barataria Bay and through Barataria Pass to the 12-foot depth contour in the Gulf of Mexico, with a 4.3-mile extension of the project to include the westerly 4.3 miles of Bayou Rigaud. This route was more direct and provided more shelter from wave action to vessels passing through Barataria Bay. This project modification was completed in 1963.

In 1967, authority was granted under Section 5 of the Rivers and Harbors Act of March 4, 1915 to widen the bar channel to Barataria Bay Waterway from 125 feet to 250 feet between Mile -1.26 and the 12-foot contour. The bar channel widening was completed in 1967. In 1978, authority was granted to increase the dimensions of the bar channel to 15 feet deep MLG by 250 feet wide from Mile 0 to the 15-foot contour of the Gulf of Mexico. However, deepening of the bar channel actually was completed in 1973.

For the purposes of this report, the Barataria Bay Waterway is divided into three reaches as follows: the Dupre Cut Inland Reach (Mile 36.7 to Mile 16); the Barataria Bay Reach (Mile 16 to Mile 0); and the Bar Channel Reach (Mile 0 to Mile -3.8). Areas that can be used for disposal of dredged material are limited in the lower part of the Dupre Cut reach and in the Barataria Bay reach because of the presence of oyster leases adjacent to the waterway. The dredged material must be confined or semi-confined to prevent adverse impacts to oyster leases. Since completion of construction, maintenance of discontinuous segments of these reaches has been conducted on an as-needed basis approximately every 2 to 3 years. Through FY 1997, beneficial use of dredged material has taken place only in the Barataria Bay Reach and the Bar Channel Reach.

**Barataria Bay Reach (Mile 16-Mile 0)**

Dredged material from construction of this reach of the channel was placed in open water on either side of the channel or into three upland confined disposal facilities located in the vicinity of Mile 10, at Pelican Point (Mile 7), and at Mendicant Island (Mile 3). During maintenance events

beginning in 1965 and continuing through 1989, this practice continued.

In 1989, the Louisiana Department of Natural Resources, Coastal Restoration Division, requested that the USACE-NOD consider placement of dredged material from maintenance of the Barataria Bay Reach on Queen Bess Island to restore the island to its 1978 dimensions. Queen Bess Island, a relict oyster reef located approximately one mile east of the navigational channel near Mile 3, was recognized as one of the few nesting areas for the endangered brown pelican. Erosion and subsidence were decreasing the area available for the expanding pelican population, and the island was subjected to frequent overwashing by even small storms.

The USACE-NOD worked with the Louisiana Department of Natural Resources, the Louisiana Department of Wildlife and Fisheries, and other state and Federal natural resources agencies to develop a disposal plan to restore the island. In 1990, the USACE-NOD received authority pursuant to Section 150 of the Water Resource Development Act of 1976 to protect and restore the island using dredged material from maintenance of the waterway, and the state of Louisiana cost-shared the project.

During the FY90 maintenance event (September 3, 1990 - November 15, 1990), a shell retaining dike in conjunction with shore dikes were constructed to approximately +3.8 feet MLG (+3.0 feet National Geodetic Vertical Datum) to enclose an 8-acre shallow water disposal area on the western edge of Queen Bess Island. An estimated 80,000 cubic yards (CY) of material dredged from the navigational channel were pumped into the disposal area to an initial elevation of +3.5 feet MLG (+2.7 feet NGVD). The dredged material effluent was allowed to flow through and onto the adjacent existing marsh, using the marsh to filter the effluent before it reached the surrounding waters. A shell dike also was built to keep the dredged material off the primary brown pelican nesting site on the northern end of the island.

In June, 1991, the State of Louisiana planted vegetation on the dikes and within the Queen Bess Island disposal area to help retain and stabilize the dredged material.

No maintenance took place in this reach of the waterway during FY 1992 through FY 1995.

During the FY 1996 maintenance event (August 3, 1996 - November 22, 1996), dredged material from the Barataria Bay Reach was placed on Queen Bess Island to continue island restoration and in wetlands development disposal areas in the vicinity of Mile 14 and Mile 6.5.

The Coastal Wetland Planning, Protection, and Restoration Act of 1990 authorized additional restoration efforts at Queen Bess Island. A 9-acre shallow water disposal area on the western edge of the island was enclosed by a geotextile reinforced shell core dike covered with riprap. Approximately 52,000 CY of dredged material was discharged into the disposal area to a maximum initial elevation of +4.5 feet MLG (+3.7 feet NGVD).

Dredged material was placed semi-confined into the wetlands development disposal area at Mile 14. Earthen dikes, constructed to an elevation of +6.0 feet MLG (+5.2 feet NGVD), and riprap dike closures were used to contain approximately 120,574 CY of dredged material to a maximum initial

elevation of +4.5 feet MLG (+3.7 feet NGVD). Approximately 72,000 CY of dredged material was placed into the confined wetlands development disposal area at the Mile 6.5 site to an initial elevation of +4.5 feet MLG (+3.7 feet NGVD).

No maintenance dredging occurred in this reach of the waterway during FY 1997 through FY 2000.

Figure 9 illustrates the dredging history for the lower Barataria Bay Waterway navigational channel.

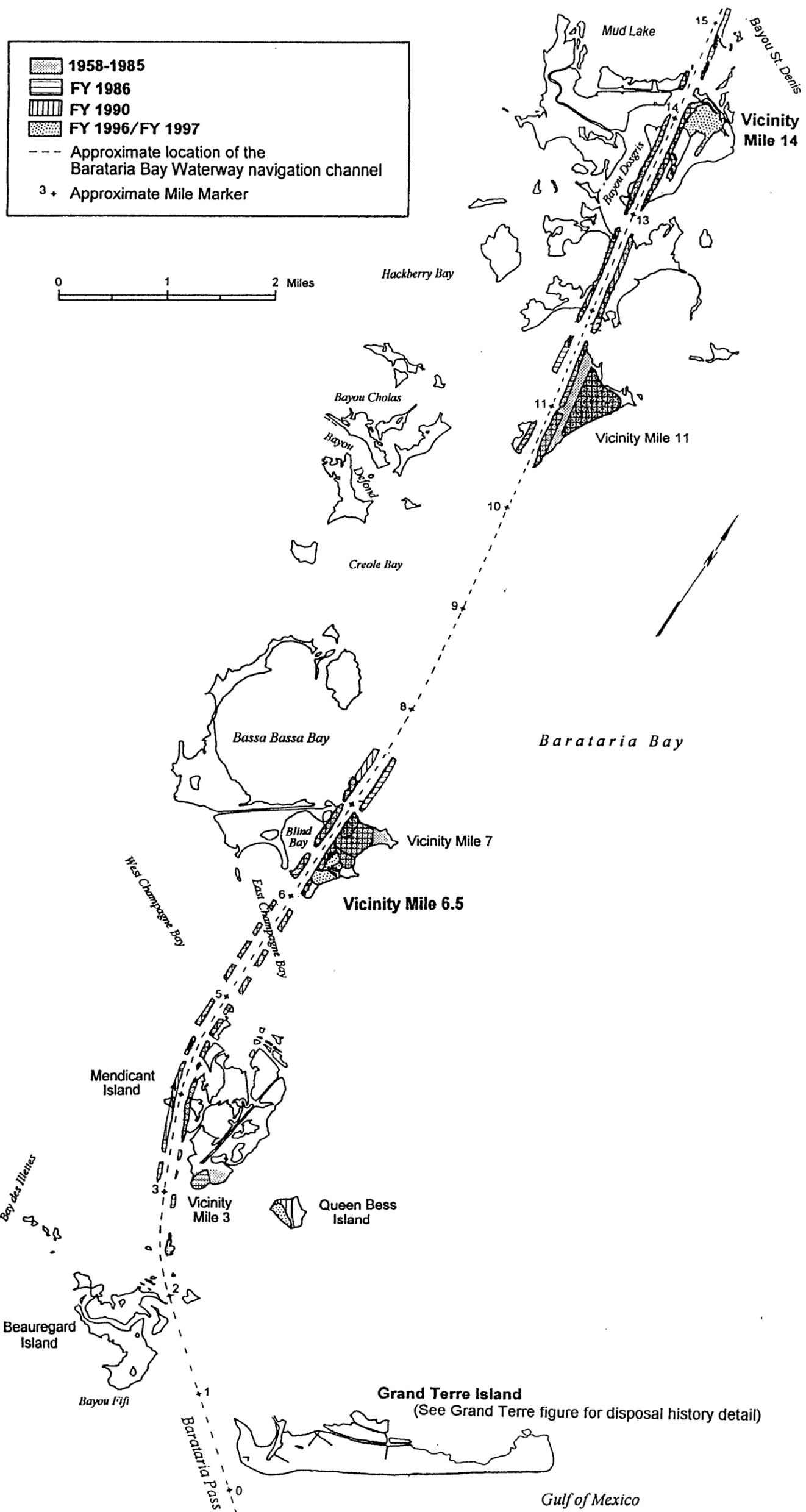


Figure 9. The dredged material disposal history for the lower Barataria Bay Waterway, Louisiana navigational channel - Barataria Bay Reach BUMP study area in Louisiana.

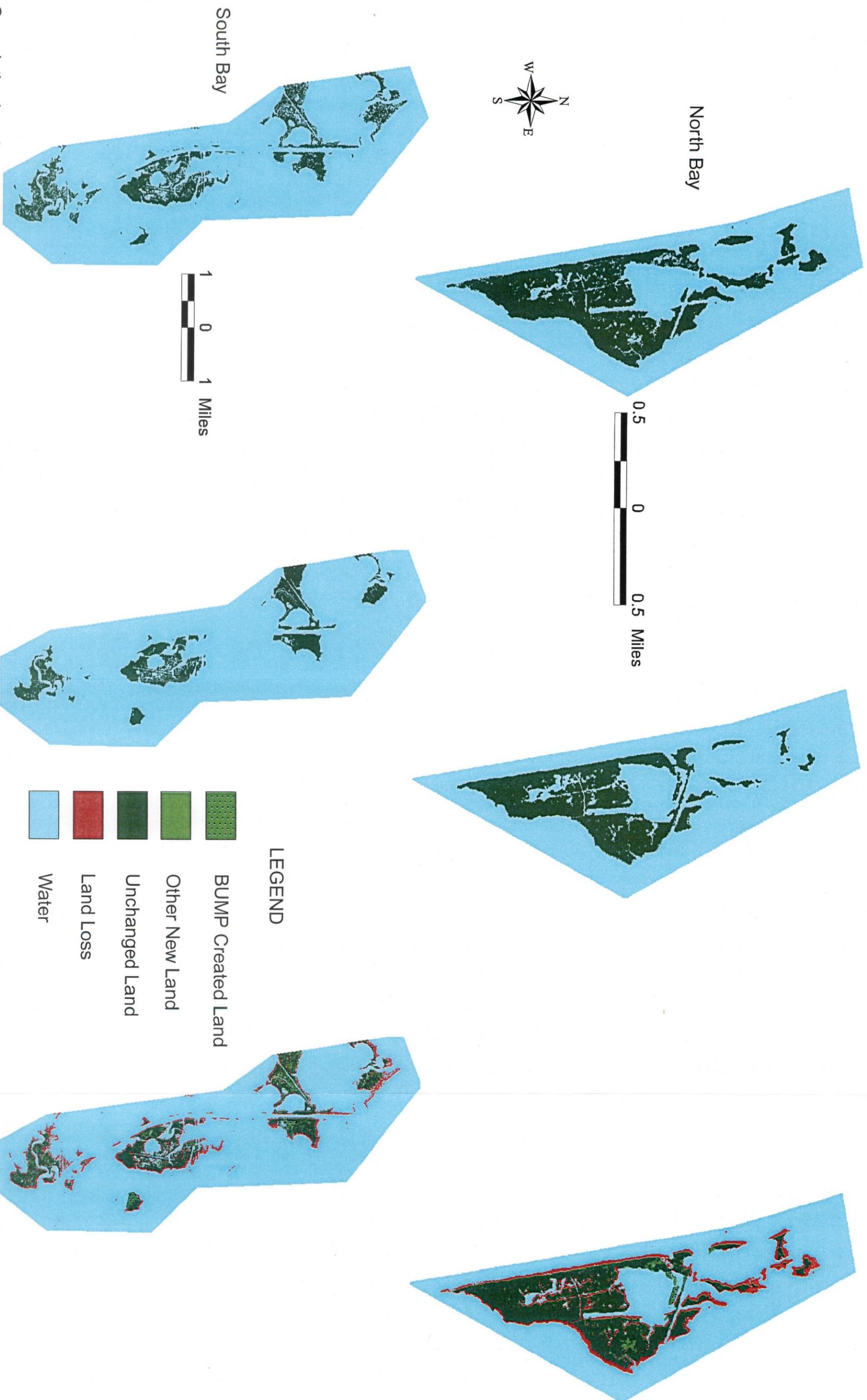


Figure 6 Cumulative Landscane Change for Barataria Bay. An Area

**BENEFICIAL USE OF DREDGED MATERIAL DISPOSAL HISTORY**  
**BARATARIA BAY WATERWAY, LA**  
**GRAND TERRE ISLAND REACH**  
Through FY 2000

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**Bar Channel Reach (Mile 0 to Mile -3.8)**

Prior to FY 1996, all dredged material removed during routine maintenance of the Barataria Bay Waterway bar channel was placed in the ocean dredged material disposal site located on the northeast side of the channel, approximately 1.25 miles southeast of Grand Terre Island and

approximately 2 miles east of Grand Isle.

In 1995, the USACE-NOD designated a 327-acre disposal area at Grand Terre Island pursuant to Section 404 of the Clean Water Act for placement of dredged material from maintenance of the bar channel for restoration and enlargement of the island. The island had been breached in several locations in 1992 during Hurricane Andrew. The USACE-NOD received authority and funding under Section 204 of the Water Resources and Development Act of 1992 to begin island restoration during the FY 1996 maintenance event. The state of Louisiana was the non-Federal sponsor for the project.

During the FY 1996 maintenance event (June 24, 1996 - September 5, 1996), a 130-acre area was enclosed by earthen dikes, and the area was further sub-divided into two cells of 115 acres and 15 acres, respectively. The dike on the Gulf side of the larger cell was constructed to +12 feet MLG (+11.2 feet NGVD) and the dike on the Barataria Bay side was constructed to +11 feet MLG (+10.2 feet NGVD). Dikes around the smaller cell were constructed to +7.0 feet MLG (+6.2 feet NGVD). An estimated 666,258 CY of dredged material were placed into the cells. The estimated initial elevation of the dredged material slurry was +9.0 feet MLG (+8.2 feet NGVD) in the larger cell and +5.0 feet MLG (+4.2 feet NGVD) in the smaller cell.

During the FY 1999 bar channel maintenance event (July 16, 1999 - September 20, 1999), dredged material was placed at Grand Terre Island in a 185-acre back bay disposal area as part of a Section 204 of the Water Resources Development Act of 1992 project to restore marsh. The back bay disposal area was confined on the bay side by a rock dike constructed to an elevation of +5.0 feet MLG and divided into 3 cells by interior earthen dikes. Two interior earthen dikes were constructed within the disposal area to an initial elevation of between +3.25 feet MLG and +3.75 feet MLG. Approximately 617,654 cubic yards of dredged material were placed into the western and center disposal area cells to a maximum initial height of +3.3 feet MLG.

Figure 10 illustrates the dredging history for the lower Barataria Bay Waterway navigational channel.

# Grand Terre Island Reach Dredged Material Disposal History FY1996-FY2000

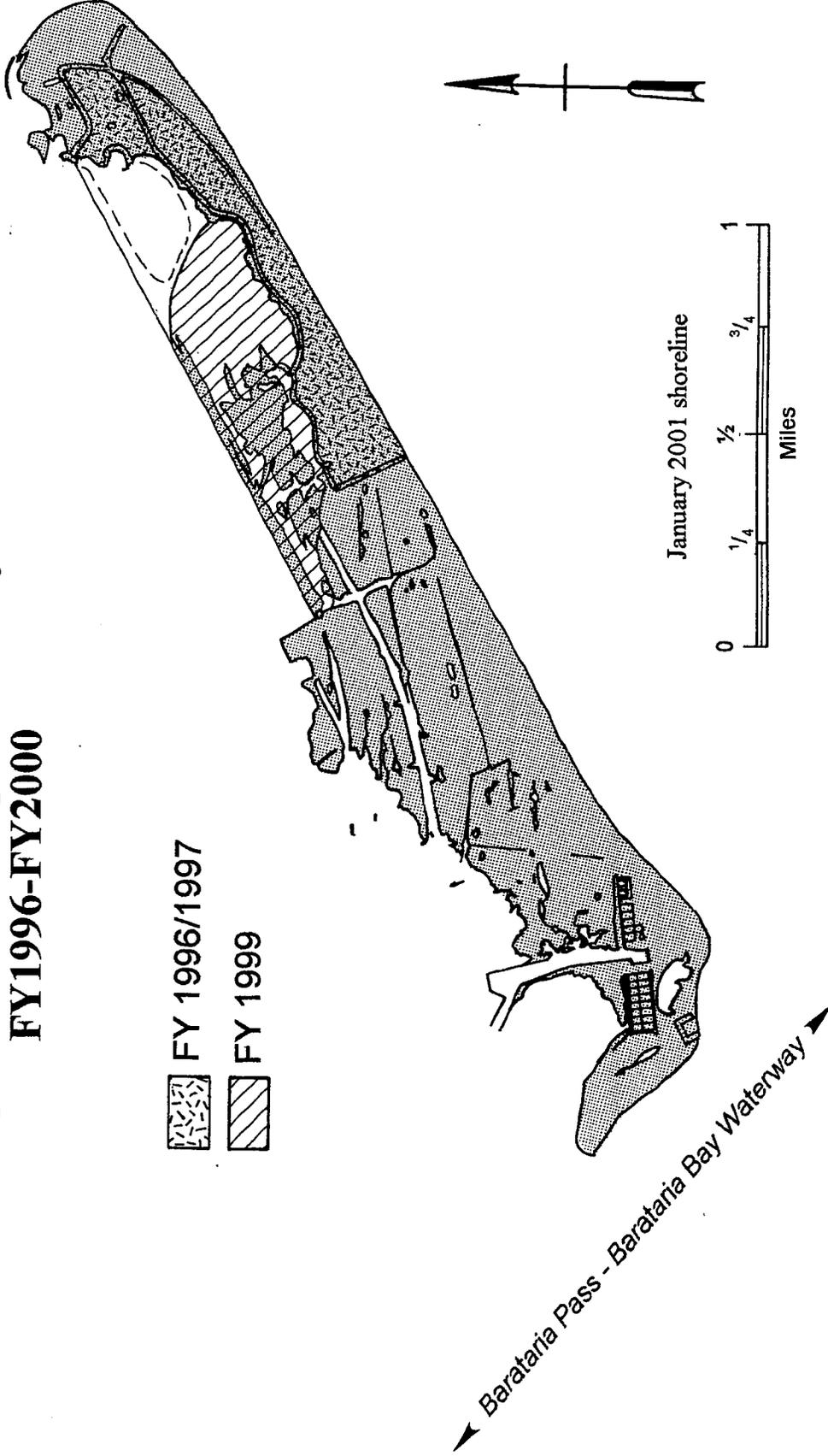
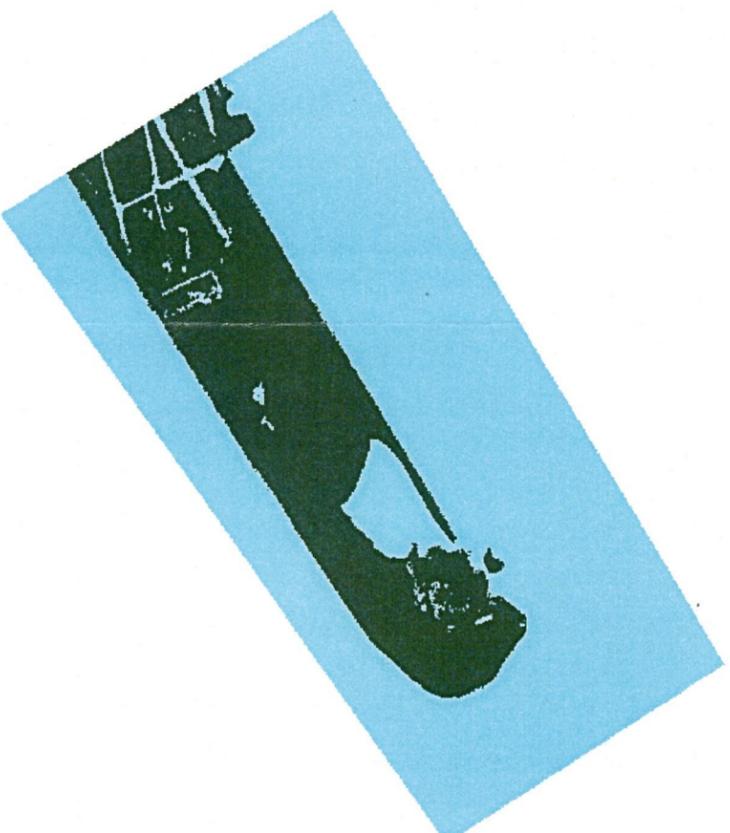


Figure 10. The dredged material disposal history for the lower Barataria Bay Waterway, Louisiana navigational channel - Grand Terre Island BUMP study area in Louisiana through FY 2000.

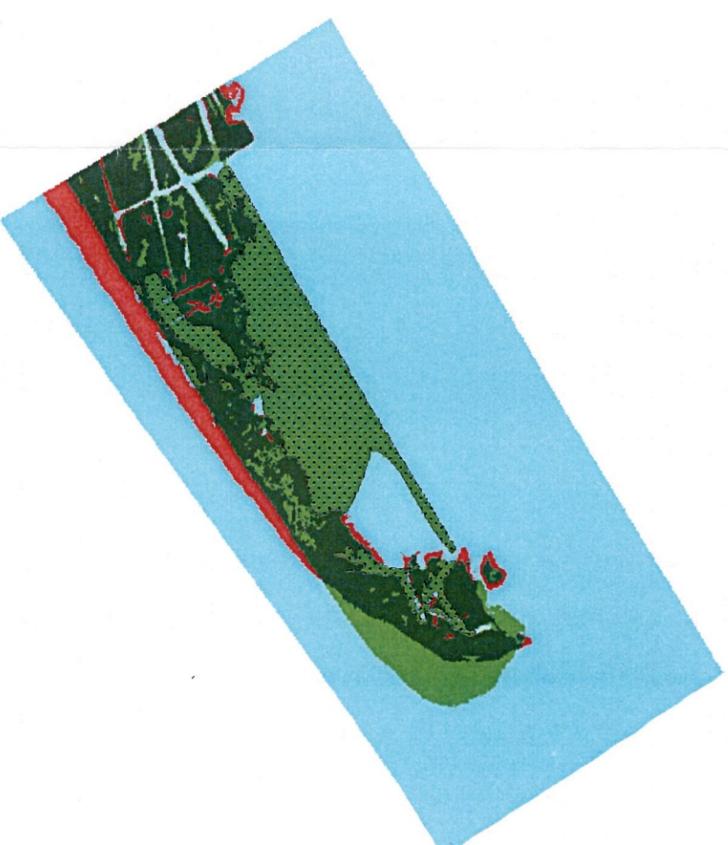
1985 Land-Water Classification



2000 Land-Water Classification



Change Detection: 1985-2000



LEGEND

-  BUMP Created Land
-  Other New Land
-  Unchanged Land
-  Land Loss
-  Water



Figure 7 Cumulative Landscape Change for Barataria- Grand Terre: 121 Acres

## South Pass Dredged Material Disposal History

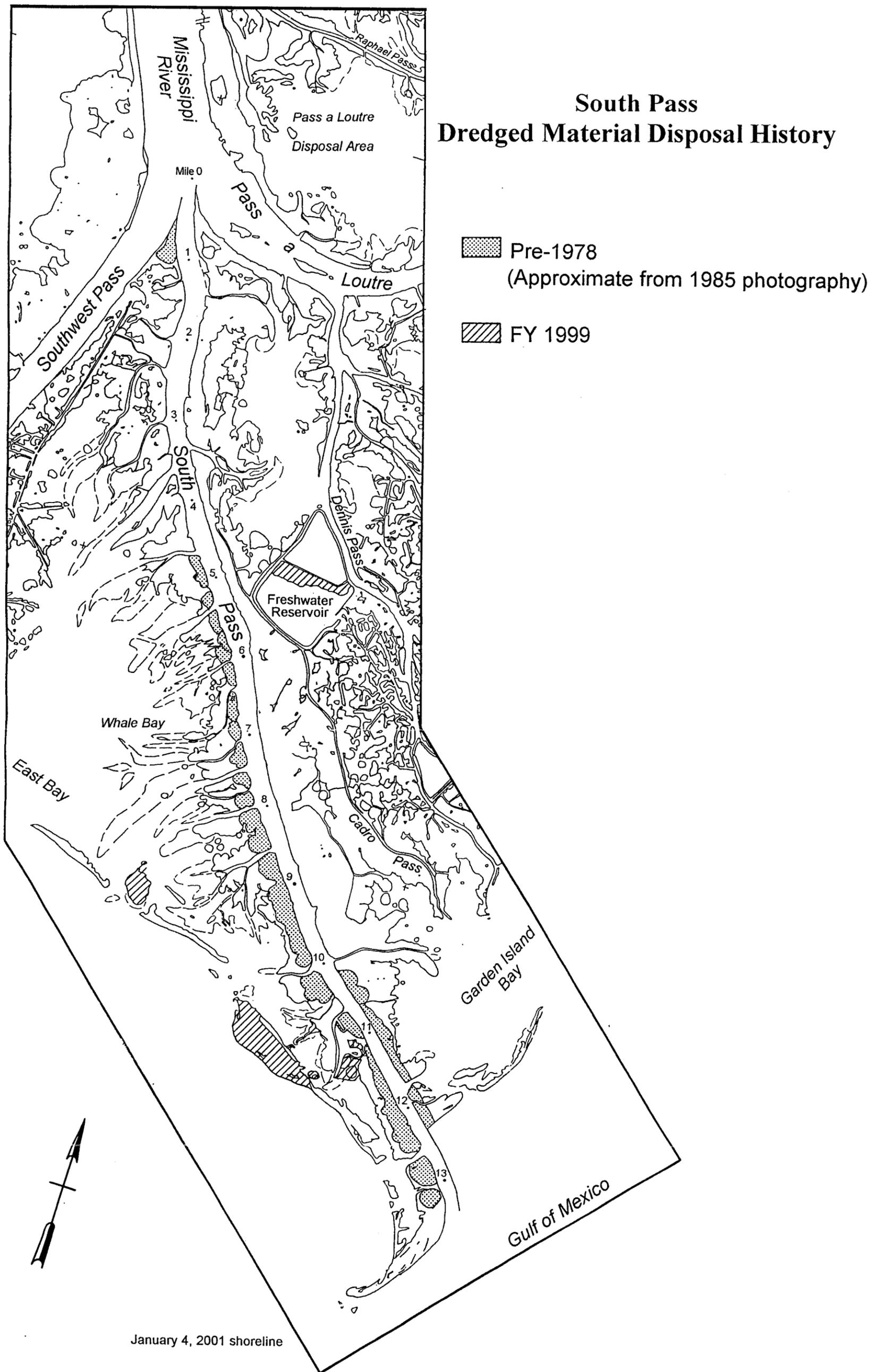


Figure 17. The dredged material disposal history for the Mississippi River - South Pass BUMP study area through FY 2000.

1985 Land-Water Classification

2000 Land-Water Classification

Change Detection: 1985-2000



Figure 17 Cumulative Landscape Change for South Pass: 396 Acres