

BENEFICIAL USE MONITORING PROGRAM

Part I:

**Beneficial Use of Dredged Material
Disposal History
Along Selected Navigational Channels in Louisiana**

Part II:

**Cumulative Landscape History for the
Beneficial Use Monitoring Program Sites: 1985-2000**

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

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

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New Orleans District

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Contract DACW29-98-D-0008
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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.

BUMP Study Site	BUMP Created (Acres)	BUMP Created (Hectares)	Figure Number
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
Total	17,367	7,034	

**BENEFICIAL USE OF DREDGED MATERIAL DISPOSAL HISTORY
ATCHAFALAYA RIVER AND BAYOUS CHENE, BOEUF AND BLACK, LA
AVOCA ISLAND CUTOFF - BAYOU CHENE REACH**

Through FY 2000

The Atchafalaya River and Bayous Chene, Boeuf, and Black, Louisiana, project was authorized by the Rivers and Harbors Act of 1968, House Document 155, 90th Congress, 1st Session. It provided for the improvement of a channel 20 feet deep over a bottom width of 400 feet from the vicinity of the U.S. Highway 90 crossing over Bayou Boeuf to the Gulf of Mexico via the Gulf Intercoastal Waterway (GIWW), Bayou Chene, the Avoca Island Cutoff Bayou Drainage channel, the Lower Atchafalaya River, and the existing project across Atchafalaya Bay. This Act also provided for a 20 by 400 foot channel in Bayou Black and the GIWW from the major shipyard on Bayou Black at U.S. Highway 90 to Bayou Chene. Construction of the final reach, Bayou Chene and Avoca Island Cutoff commenced on October 23, 1980 and was completed on September 28, 1981.

Construction of the Avoca Island Cutoff-Bayou Chene reach of the navigational channel was performed during the Fiscal Year (FY) 1981, from November 13, 1980 to October 1, 1981. Approximately 17,754,281 cubic yards of dredged material were removed from the channel using a hydraulic cutterhead pipeline dredge. The material was placed in disposal area #5, located on the right descending bank of Bayou Chene on Avoca Island, to a maximum height of +3.0 feet Mean Low Gulf (MLG) for the creation of marsh and mounds for waterfowl habitat.

During the FY 1988 maintenance event (November 15, 1988 to February 15, 1989), approximately 873,000 cubic yards of dredged material were deposited for marsh creation into Avoca Island disposal areas #5 and #5A, located on the right descending bank of Bayou Chene. The dredged material was removed from the channel using a hydraulic cutterhead pipeline dredge, and was placed confined to a maximum elevation of +5.0 feet MLG.

During the FY 1989 maintenance event (May 24, 1989 to August 18, 1989), Bayou Chene curves #2, #4 and #5 were widened using a hydraulic cutterhead pipeline dredge. Material excavated from the curves was placed confined in disposal areas #5 and #5A for marsh creation. Dredged material was placed in mounds in area #5 to an elevation of 3.5 feet MLG. Dredged material in area #5A was placed to a maximum height of +5.0 feet MLG.

During the FY 1998 maintenance event (May 22, 1998 to October 12, 1998), approximately 3,827,625 cubic yards of dredged material were removed from the channel using a hydraulic cutterhead pipeline. Material was deposited confined in Avoca Island disposal areas #5 and #5A for marsh creation. Dredged material was placed to a maximum elevation of +4.5 feet MLG.

There was no maintenance of this reach of the waterway during FY 1999 and FY 2000.

Figure 1 illustrates the dredged material disposal history for the study area through FY 2000.

Atchafalaya Avoca Island Cutoff- Bayou Chene Reach Dredged Material Disposal History

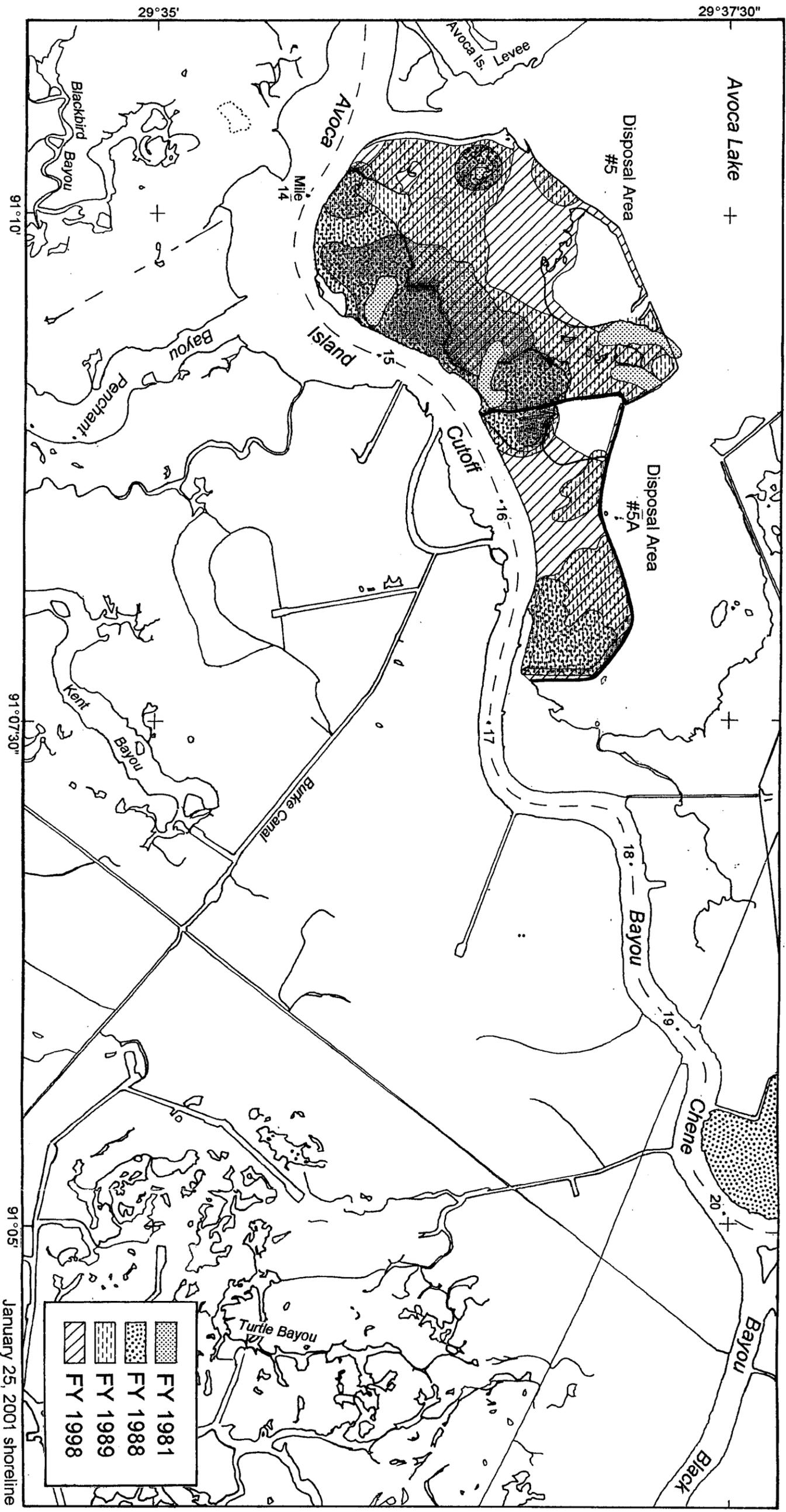
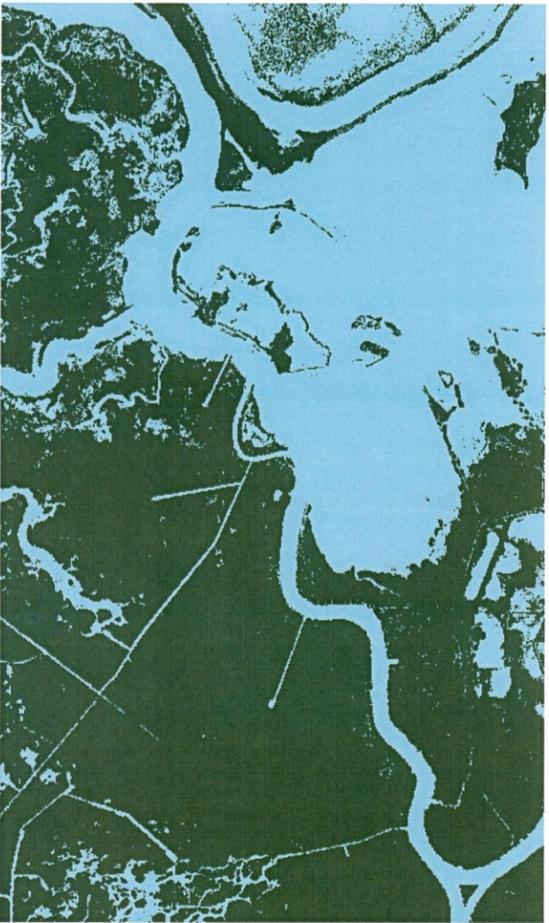
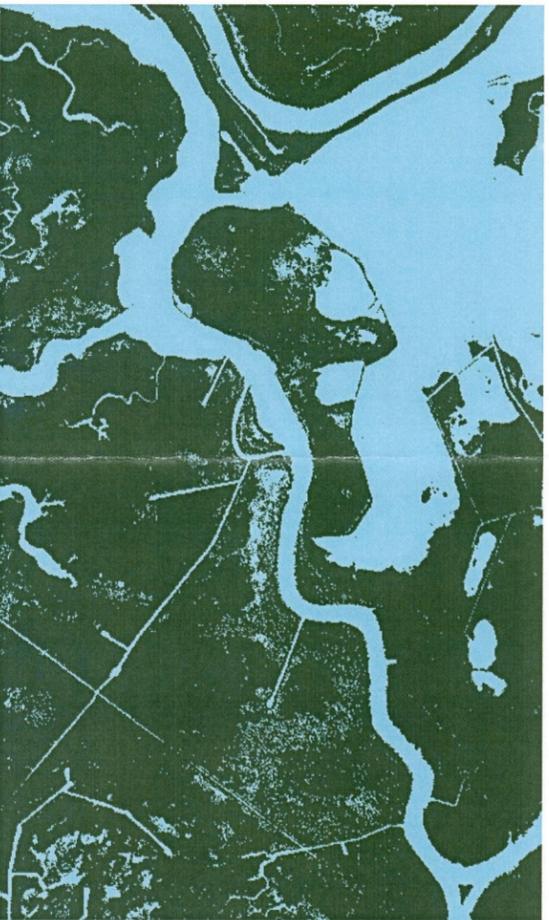


Figure 1. Dredged material disposal history and USACE-NOD disposal areas for the Atchafalaya River and Bayous Chene, Boeuf, and Black, Louisiana: Avoca Island Cutoff - Bayou Chene reach through FY 2000. Data from USACE-NOD and aerial photography.

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 1 Cumulative Landscape Change for Atchafalaya- Avoca: 1,066 Acres

**BENEFICIAL USE OF DREDGED MATERIAL DISPOSAL HISTORY
ATCHAFALAYA RIVER AND BAYOUS CHENE, BOEUF AND BLACK, LA
LOWER ATCHAFALAYA RIVER - HORSESHOE REACH**

Through FY 2000

The Rivers and Harbors Act of 25 June 1910 authorized the USACE-NOD to construct and maintain a navigational channel through the Atchafalaya River from Morgan City to the Gulf of Mexico with project dimensions 20 feet deep, 200 feet wide and 15.75 miles long from the 20 foot contour in the Atchafalaya Bay, approximately 4 miles beyond the mouth of the Atchafalaya River, to the 20 foot contour in the Gulf of Mexico. Traffic sufficient to warrant maintenance of the authorized navigational channel to full project dimensions did not immediately develop. The channel was progressively enlarged during maintenance events from 10 by 100-feet in 1939 to 20 by 200-feet in 1974.

The Rivers and Harbors Act of 1968 authorized construction and maintenance of the Atchafalaya River and Bayous Chene, Boeuf, and Black, Louisiana project which provided an increase in channel width to 400 feet of the navigational channel in the Lower Atchafalaya River - Horseshoe from the junction of Avoca Island Cutoff Bayou channel to the Atchafalaya Bay. Construction of the channel in the bay and Gulf was initiated in April, 1974 and was completed in December of the same year. Maintenance in Lower Atchafalaya River-Horseshoe was not required prior to FY 1990 because channel depth historically was in excess of authorized channel dimensions. Dredging records dating back to 1989 indicate discontinuous segments of this reach of the channel or a minor segment of the intersection of Bayou Chene and the Lower Atchafalaya River, have been maintained annually with disposal of dredged material taking place in the Lower Atchafalaya River since FY 1990. Since maintenance of the Lower Atchafalaya River began, dredged material has been deposited unconfined in open water and unconfined in open water adjacent to the existing river banks for wetlands development. No dredged material has been placed on the existing shoreline.

Figure 3 illustrates the dredged material disposal history and USACE-NOD disposal areas for the Lower Atchafalaya River - Horseshoe channel. During FY 1990, material dredged from the Lower Atchafalaya River-Horseshoe was deposited into open water at a depth in excess of -50 feet National Geodetic Vertical Datum (NGVD) and material dredged from Bayou Chene was deposited into a wetland development site located adjacent to the east bank of the Atchafalaya River. Material was placed in the wetland development site to an elevation of no greater than +5 feet Mean Low Gulf (MLG).

During FY 1991 and FY 1992, material dredged from the Lower Atchafalaya River - Horseshoe was placed into the wetland development site located adjacent to the east bank of the Atchafalaya River, at the intersection of the Lower Atchafalaya River and Bayou Chene, to an elevation of no greater than +5 feet MLG.

During FY 1993, material dredged from the Lower Atchafalaya River - Horseshoe was placed into a wetland development site (Site C) located adjacent to the west bank of the Atchafalaya River. Material was deposited to an elevation of +5 feet MLG.

During FY 1994 (May 27, 1994 - October 16, 1994), material dredged from the Lower Atchafalaya River-Horseshoe was placed in four wetland development sites (Sites A, C, D and the site at intersection of the Lower Atchafalaya River and Bayou Chene) located adjacent to the east and west banks of the Lower Atchafalaya River- Horseshoe. Material was deposited to an elevation not to exceed +5 feet MLG.

In FY 1995, approximately 1,273,256 cubic yards of dredged material were placed in three wetland development sites (Sites B, D, and E) located adjacent to the east and west banks of the Lower Atchafalaya River-Horseshoe. Material was deposited to an elevation no higher than +5 feet MLG.

During FY 1996 (April 18, 1996 - May 16, 1996, and August 23, 1996 - October 25, 1996), four wetland development sites (Sites A, B, D, and E) located adjacent to the east and west banks of the Lower Atchafalaya River-Horseshoe were utilized for dredged material placement. Material was deposited to an elevation of no higher than +5 feet MLG.

During FY 1997 (May 24, 1997 - July 25, 1997 and October 9, 1997 - November 7, 1997), two wetland development sites, Site D located adjacent to the west bank of the Lower Atchafalaya River - Horseshoe and Site B located adjacent to the east were used for dredged material placement. Approximately 1,117,411 cubic yards of dredged material were placed into wetland development Site D and approximately 944,300 cubic yards of material were placed at Site B. The material was deposited to an elevation no higher than +5.0 feet MLG.

Dredged material from both the Avoca Island Cutoff - Bayou Chene reach and the Lower Atchafalaya River - Horseshoe reach were placed into disposal sites within the Lower Atchafalaya River during the FY 1998 maintenance event (May 22, 1998 - October 12, 1998 and September 22, 1998 - December 29, 1998). Approximately 3,291,390 cubic yards of material from the Avoca Island Cutoff - Bayou Chene reach were placed into wetland development Sites G1 and G2 and approximately 748,000 cubic yards of material from the Lower Atchafalaya River - Horseshoe reach were placed into wetland development Site F. The dredged material was placed unconfined to an initial elevation no higher than +5.0 feet MLG.

During the FY 1999 maintenance event (August 30, 1999 - October 23, 1999), approximately 528,769 cubic yards of dredged material were removed from the Lower Atchafalaya River - Horseshoe reach. Approximately 319,069 cubic yards of material were placed into the abandoned shell borrow pit, Site H, and approximately 209,700 cubic yards of material were placed into Site B. At both sites, the dredged material was placed to an initial elevation no higher than +5.0 feet MLG.

There was no maintenance dredging in the Lower Atchafalaya River - Horseshoe reach during FY 2000.

Figure 2 illustrates the dredged material disposal history for the study area through FY 2000.

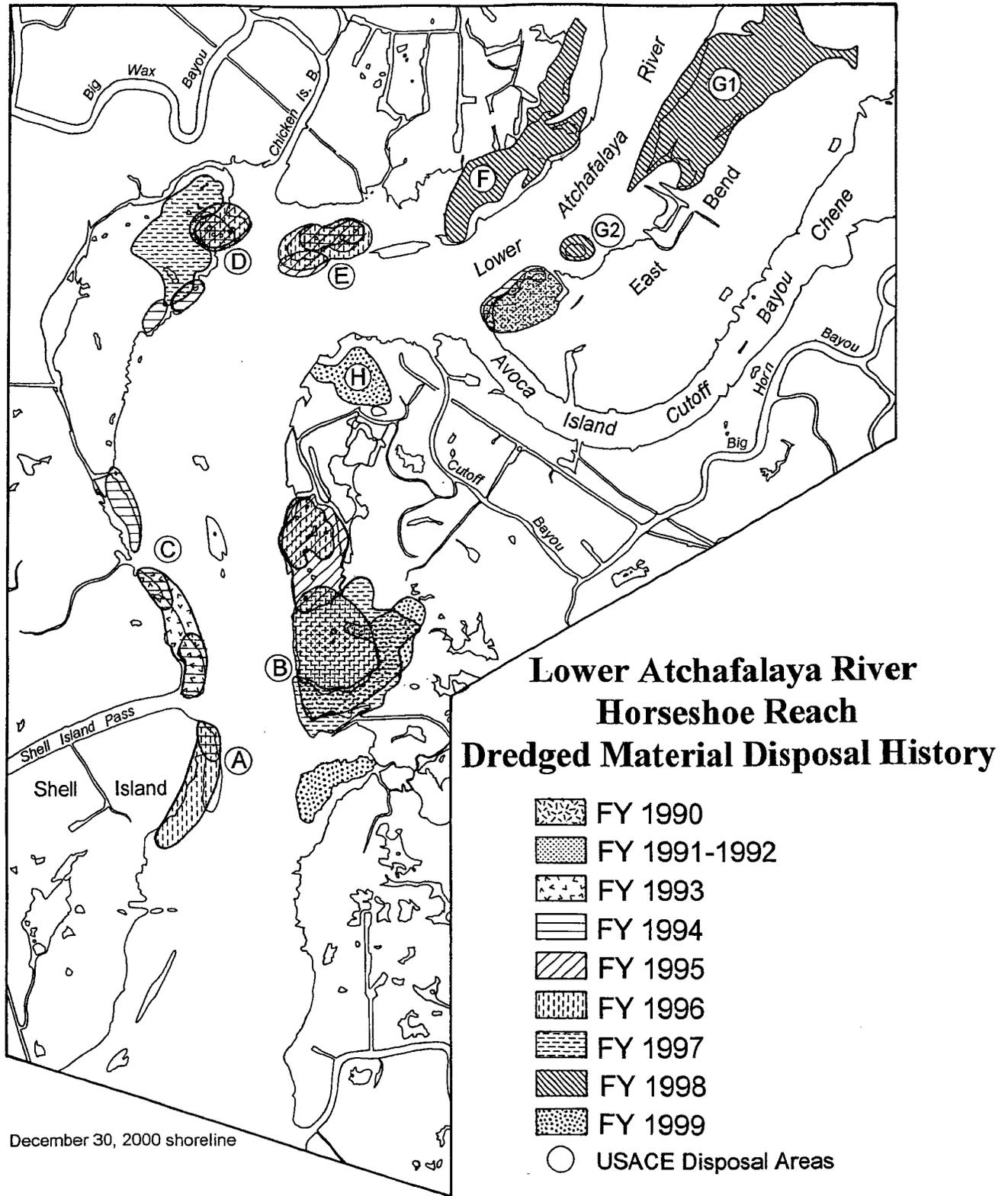


Figure 2. Dredged material disposal history and USACE-NOD disposal areas for the Lower Atchafalaya River Horseshoe reach through FY 2000. Data from USACE-NOD and aerial photography.

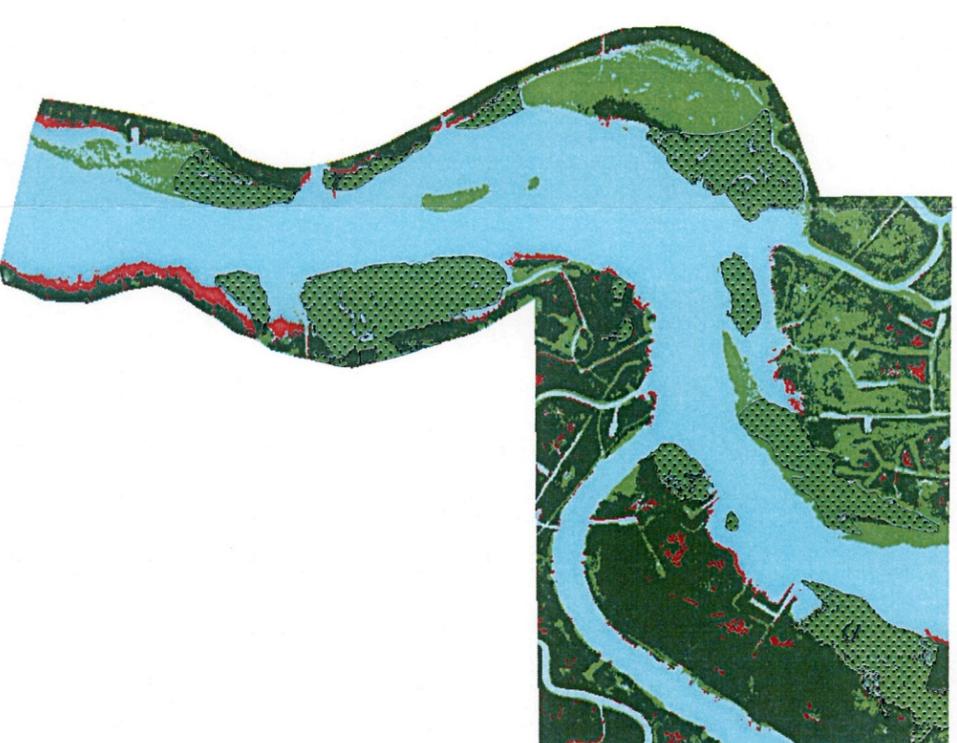
1985 Land-Water Classification



2000 Land-Water Classification



Change Detection: 1985-2000



LEGEND

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

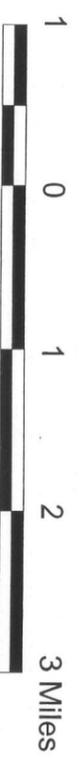


Figure 3 Cumulative Landscape Change for Atchafalaya- Horseshoe Bend: 1,256 Acres

**BENEFICIAL USE OF DREDGED MATERIAL DISPOSAL HISTORY
ATCHAFALAYA RIVER AND BAYOUS CHENE, BOEUF AND BLACK, LA
ATCHAFALAYA BAY AND BAR**

Through FY 2000

The Rivers and Harbors Act of 25 June 1910 authorized the USACE-NOD to construct and maintain the Atchafalaya River, Morgan City to the Gulf of Mexico, Louisiana, project which provided a navigational channel 20 feet deep, 200 feet wide and 15.75 miles long from the 20 foot contour in the Atchafalaya Bay, approximately 4 miles beyond the mouth of the Atchafalaya River, to the 20 foot contour in the Gulf of Mexico. Traffic sufficient to warrant maintenance of the authorized navigational channel to full project dimensions did not immediately develop. The channel was progressively enlarged during maintenance events from 10 by 100-feet in 1939 to 20 by 200-feet in 1974.

The Rivers and Harbors Act of 1968 authorized construction and maintenance of the Atchafalaya River and Bayous Chene, Boeuf, and Black, Louisiana, project. It incorporated the existing project and provided an increase in channel width of the navigational channel in Atchafalaya Bay and Bar to 400 feet. Construction of the channel in the bay and Gulf was initiated in April, 1974 and was complete in December of the same year.

Dredged material disposal history prior to construction of the enlarged channel in 1974 is sketchy. Dredging records dating back to 1957 indicate that maintenance of *discontinuous* reaches of the bay and/or bar channels occurred on an annual basis from 1957 until 1974 except for 1958. It is likely that dredged material was placed unconfined in open water on either side of the navigational channel.

Dredged material removed during new work dredging associated with construction of the 400 foot navigational channel in 1974 was placed in open water and on subaerial levees of existing delta lobes on the west side of the navigational channel. During maintenance events beginning in 1979 and continuing on an annual basis through 1985, this practice continued. During this period, Big Island was created; dredged material was used to construct a campground at the Louisiana Department of Wildlife and Fisheries Camp; dredged material was used to construct islands for colonial nesting seabirds; and some wetlands were created on the western side of Big Island (Figure 3).

In 1987, at the request of the Louisiana Department of Wildlife and Fisheries (LDWF) and the U.S. Fish and Wildlife Service (FWS), the New Orleans District began placement of dredged material on the east side of the navigational channel in an effort to stimulate growth of the east side of the delta. Disposal plans developed in coordination with the LDWF, FWS, and other state and Federal natural resources agencies, were designed to direct sediment-laden water through existing natural channels, i.e., God's Pass, East Pass, Ratcliffe Pass, to the east side of the delta. In general, dredged material was to be placed as a series of mounds on the eroding subaerial levees of existing delta lobes and on the heads of islands at existing channel bifurcations. The maximum initial height of the dredged material mounds was +5.0 feet Mean Low Gulf (+4.2 Mean Sea Level). The mounds of dredged material would refurbish the subaerial levees which would direct flows into the desired

locations within the developing delta. During high flow events, the re-furbished levees would be over-topped and sediment-laden waters would drop sediment behind them at elevations suitable for the establishment of fresh marsh (+2.3 feet Mean Low Gulf) and/or submerged aquatic vegetation. The refurbished levees also would protect the developing wetlands from wave-induced erosion.

In accordance with the plan during maintenance events in 1987, 1988, 1989, and 1990, in the upper bay/delta, dredged material was placed on the eroded subaerial levees of Roger Brown Island, Paule Deaux Island, and Roseate Island and on the heads of God's Island and Long Island. In the lower bay/delta, dredged material was used to maintain and construct islands for colonial nesting seabirds on the west side of the navigational channel. The initial height of the dredged material for bird island creation was +6.0 feet Mean Low Gulf (+5.2 Mean Sea Level).

By 1991 it became obvious that the refurbished levees were not being over-topped during high flow events. At the request of the LDWF, the maximum initial height of the dredged material was changed to +3.78 feet Mean Low Gulf (+3.0 Feet Mean Sea Level). Dredged material from the 1991 maintenance event was placed along the banks of the navigational channel on the east side of Big Island, on both sides of God's Island and Heron Island and on the banks of East Pass and Ratcliffe Pass. Dredged material also was placed behind previously refurbished levees on Paule Deaux and Roger Brown Islands, Long Island, and Roseate Island at an initial elevation of +2.78 feet Mean Low Gulf (+2.0 feet Mean Sea Level). Islands for colonial nesting seabirds were constructed and/or maintained with dredged material from the lower bay/delta.

Beginning with the 1992 maintenance event and in coordination with LDWF, FWS and other natural resources agencies, the dredged material disposal plan was modified to incorporate use of dredged material from the upper bay/delta to construct artificial delta lobes. The disposal plan developed was designed to direct flows between the lobes and to provide protected, shallow, open water areas within the lobes for the development of fresh marsh and submerged aquatic vegetation. During the 1992 maintenance event, the maximum initial height of the dredged material in that portion of the artificial delta lobes paralleling the channel was +4.0 feet Mean Sea Level/National Geodetic Vertical Datum (+4.78 feet Mean Low Gulf); the maximum initial height of the dredged material in that portion of the delta lobes perpendicular to the channel was +3.0 feet Mean Sea Level/National Geodetic Vertical Datum (+3.78 feet Mean Low Gulf). Both Mile Island and Community Island were constructed during the 1992 maintenance event. Islands for colonial nesting seabirds were constructed with dredged material from the lower bay/delta.

During the 1993 maintenance event, the maximum initial height of the dredged material for creation of the artificial delta lobes was +4.0 feet Mean Sea Level/National Geodetic Vertical Datum (+4.78 feet Mean Low Gulf) for all portions of the lobes. Construction of Andrew Island and Horseshoe Island commenced during the 1993 maintenance event and continued during the 1994 maintenance event. Dredged material also was placed at North Point and on God's Island during the 1993 maintenance event. Islands for colonial nesting seabirds were constructed with dredged material from the lower bay/delta during both 1993 and 1994, and were enlarged in 1995 and 1996. In 1995, a new delta lobe was created on the east side of the delta off of East Pass. Named Ibis Island, the bare, sandy formation was quickly claimed by nesting birds.

No maintenance dredging was necessary in the Atchafalaya Bay channel during 1996.

Dredged material was added to the artificial delta lobes at "A4" Island, Long Island, and Horseshoe Island during the 1997 maintenance event (September 4, 1997 - October 8, 1997). Skimmer Island also was used for dredged material placement during this maintenance event.

In 1998 (September 22, 1998 - December 29, 1998), dredged material from maintenance of the bay channel was placed on Poule Deaux Island, Long Island, and Skimmer Island.

During 1999 (November 26, 1999 - December 22, 1999), a new delta lobe, Natal Island, was created off of East Pass. Dredged material was added to Long Island during the 2000 maintenance event (December 12, 2000 - January 25, 2001).

Figure 3A illustrates the previous dredged material disposal history for the study area through FY 1995. Figure 3B details the recent dredged material disposal history for the study area through FY 2000.

In the bar channel between 1974 and 1991, all of the dredged material removed during routine maintenance was placed in an interim designated ocean dredged material disposal site (ODMDS) located on the east side of the navigational channel. Beginning with the 1991 maintenance event, dredged material suitable for stacking from the upper reach of the bar channel has been placed into an open water disposal area on the east side of the channel in a manner conducive to bird island construction and the material not suitable for stacking has been placed into the ODMDS.

Atchafalaya Bay and Bar Dredged Material Disposal History

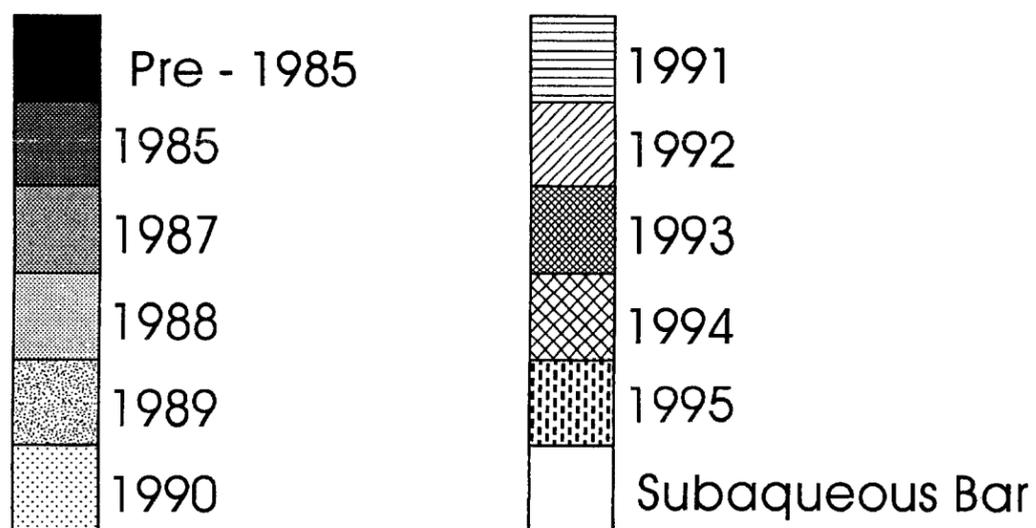
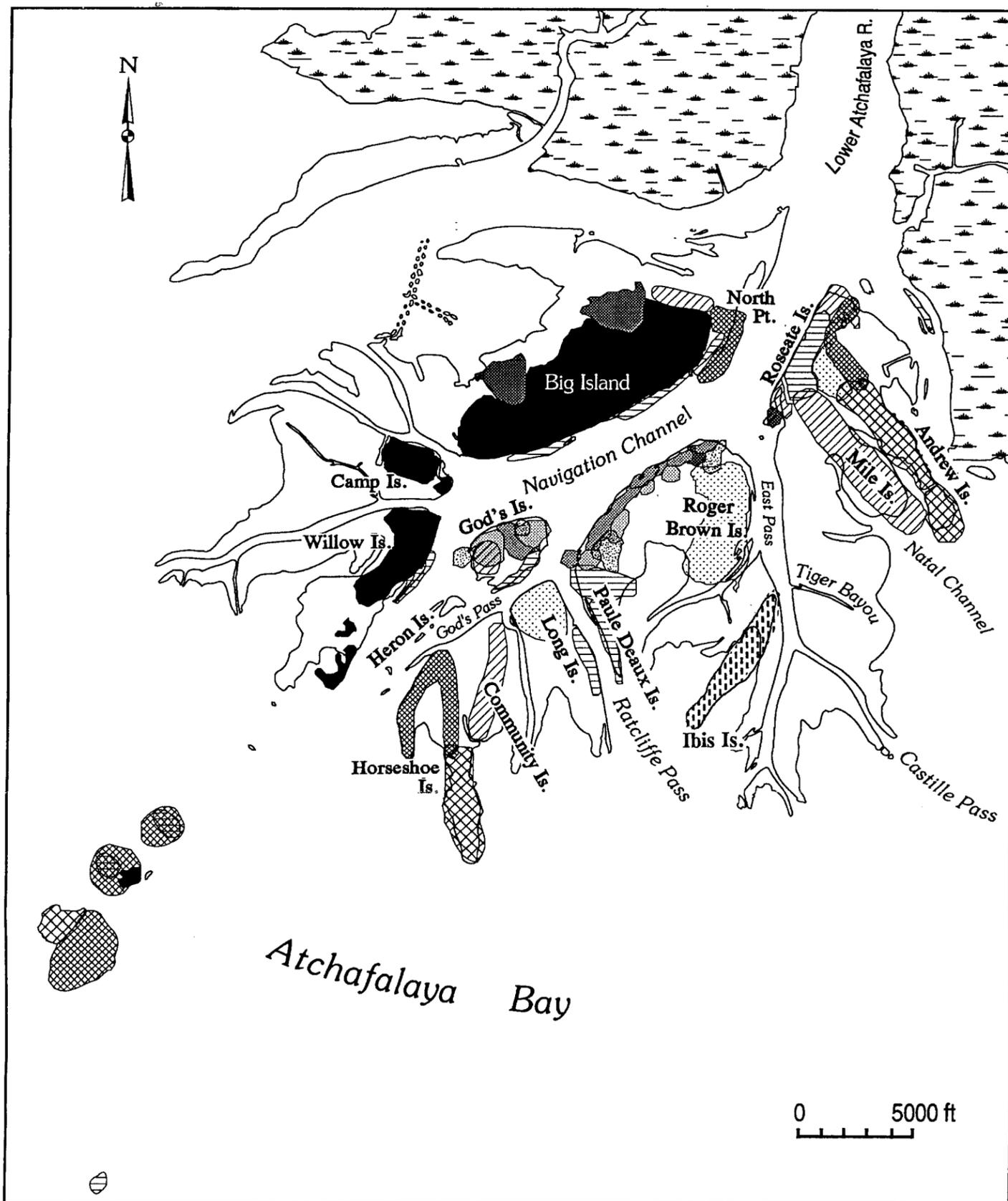


Figure 3A. Previous dredged material disposal history for the Lower Atchafalaya River Bay and Bar channel reaches through 1995. 1985 to 1990 data from Van Heerden, 1994; 1991 to 1995 data from USACE-NOD *as-builts*.

Atchafalaya Bay and Bar Dredged Material Disposal History

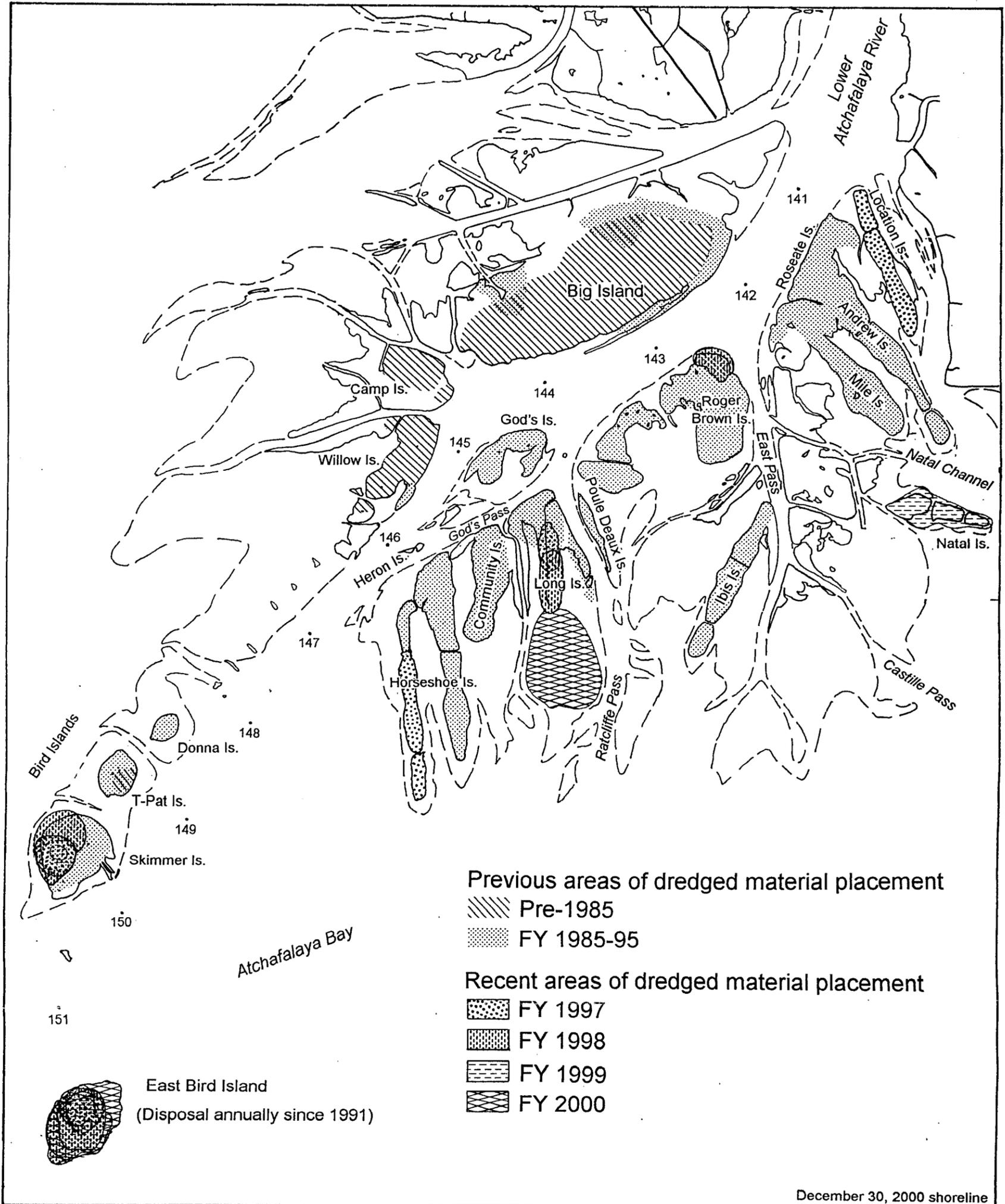


Figure 3B. Dredged material disposal history for the Lower Atchafalaya River Bay and Bar channel reaches with recent placement detailed FY 1996 through FY 2000. 1985 to 1990 data from Van Heerden, 1994; 1991 to 2000 data from USACE-NOD *as-built*s and aerial photography.

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 2 Cumulative Landscape Change for Atchafalaya- Delta: 2924.4 Acres

BENEFICIAL USE OF DREDGED MATERIAL DISPOSAL HISTORY
MISSISSIPPI RIVER-GULF OUTLET, LA
INLAND REACH
Through FY 2000

The Rivers and Harbors Act of 1956 authorized the USACE-NOD to construct and maintain a deep draft navigational channel 36 feet deep by 500 feet wide from the Inner Harbor Navigation Canal in New Orleans to the Chandeleur Islands (Mile 66.0 to Mile 0) and a channel 38 feet deep by 600 feet wide from the islands to the 38 foot contour in the Gulf of Mexico (Mile 0 to Mile -9.0). Construction of the Mississippi River - Gulf Outlet (MR-GO), Louisiana, navigational channel was initiated in 1958 and enlargement to full project dimensions was completed in 1968. Maintenance of discontinuous reaches of the channel has been accomplished on an annual basis since construction was completed.

Prior to and including the USACE-NOD Fiscal Year 1988 maintenance event, dredged material removed from the Inland Reach, Mile 66 to Mile 23 of the channel was placed into existing upland confined disposal facilities located on the south bank of the navigational channel.

Mile 60 to Mile 50

For the FY 1993 maintenance event, dredged material removed from the Inland Reach vicinity of Mile 60 to Mile 50 was placed within confined wetlands development disposal areas A, B, C, D and F located on the north bank of the navigational channel. The disposal areas are located between Lake Borgne and the MR-GO navigational channel. In general, the dredged material was pumped into shallow, open-water areas and ponds within the marsh and allowed to flow unrestricted within the confining dikes. The dikes were constructed along the perimeter of the disposal areas to prevent the dredged material from flowing into the navigational canal, Lake Borgne, Shell Beach Bayou and a no-work area. The maximum initial height of the dredged material placed for wetlands development/restoration was not to exceed +3.0 feet Mean Low Gulf (MLG) (+2.2 National Geodetic Vertical Datum (NGVD)).

During the FY 1995 maintenance events, dredged material removed from the Inland Reach vicinity of Mile 60 to Mile 50 and Michoud Canal was placed within confined wetlands development disposal areas B, D, E, and F. Dredged material was pumped into shallow open water areas within the disposal area and into the borrow canals that were excavated during retention dike construction and allowed to flow unrestricted into shallow ponds and broken marsh areas. At disposal area E earthen closures with a shell cap were constructed along Bayou Beinvenue bankline and plastic sheet pile closures were constructed along the Lake Borgne shoreline to prevent dredged material from flowing into Bayou Bienvenue and Lake Borgne. During FY 1995 the initial height of the dredged material placed in the disposal areas was not to exceed +3.5 feet MLG (+2.7 NGVD).

No maintenance dredging occurred in this reach of the MR-GO during FY 1996 - FY 2000.

Figure 4 illustrates the dredged material disposal history for the MR-GO-Inland Reach Vicinity Mile 60-50 BUMP study area prior to November 1996.

Mile 38 to Mile 32.6

During the FY 2000 maintenance event (October 9-December 21, 2000), shoal material removed from the Mile 38 to 32.6 reach was placed at 4 abandoned petroleum industry canal disposal areas (4, 5, 7A, and 7B) located along the north channel bank. Dredged material was placed to a maximum initial elevation of +3.5 feet MLG (+2.72 feet NGVD) and was allowed to overflow from these disposal areas to adjacent wetlands to nourish the existing marsh. Overflow material was not allowed to exceed a height of 1 foot above the existing marsh elevation. About 484,370 CY of dredged material was placed at disposal area 4; 722,316 CY at disposal area 5; 334,055 CY at disposal area 7A; and 490,000 CY was placed at disposal area 7B.

Mile 32.6 to Mile 27.0

During FY 1992 and FY 1995, two pipeline canals near Mile 27-28 were in-filled (figure 5).

MISSISSIPPI RIVER GULF OUTLET DREDGING HISTORY

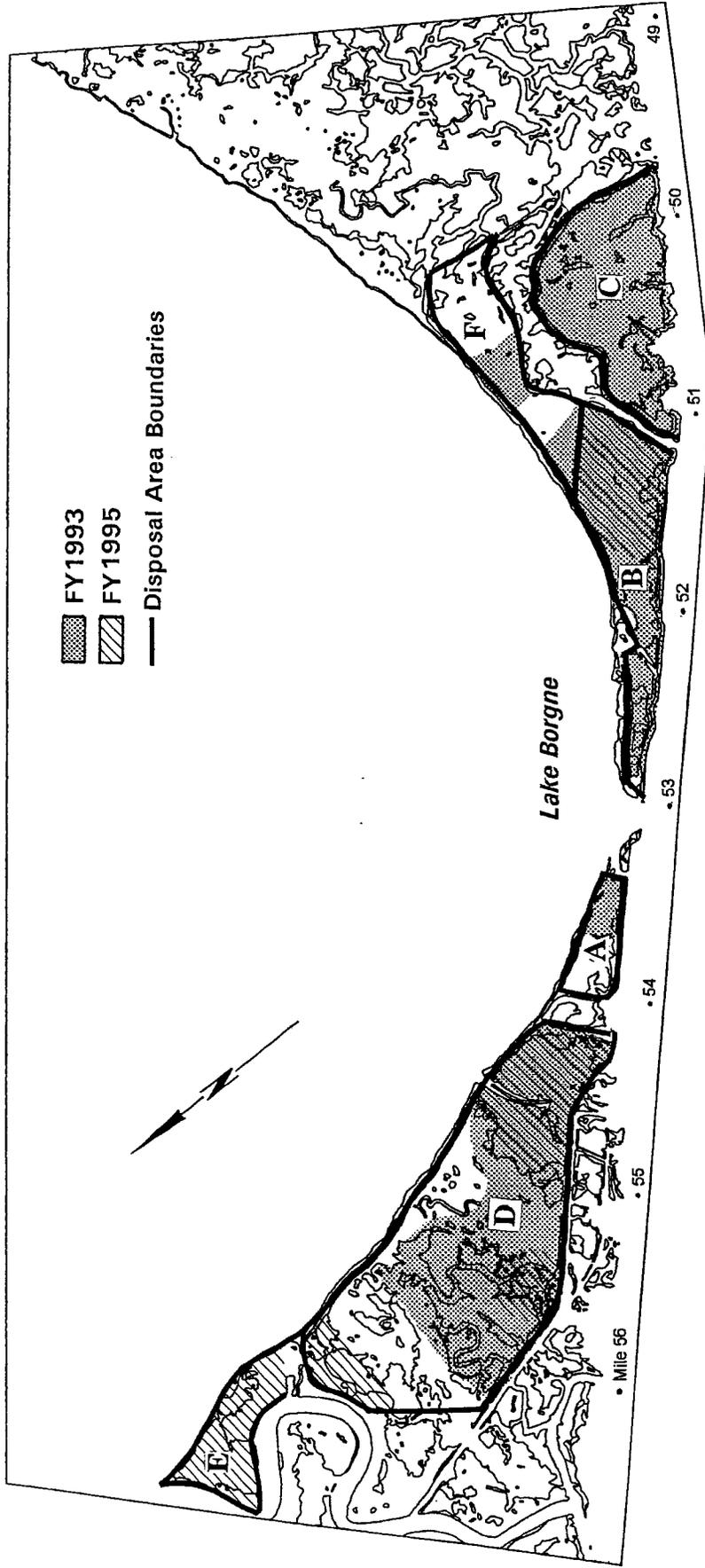
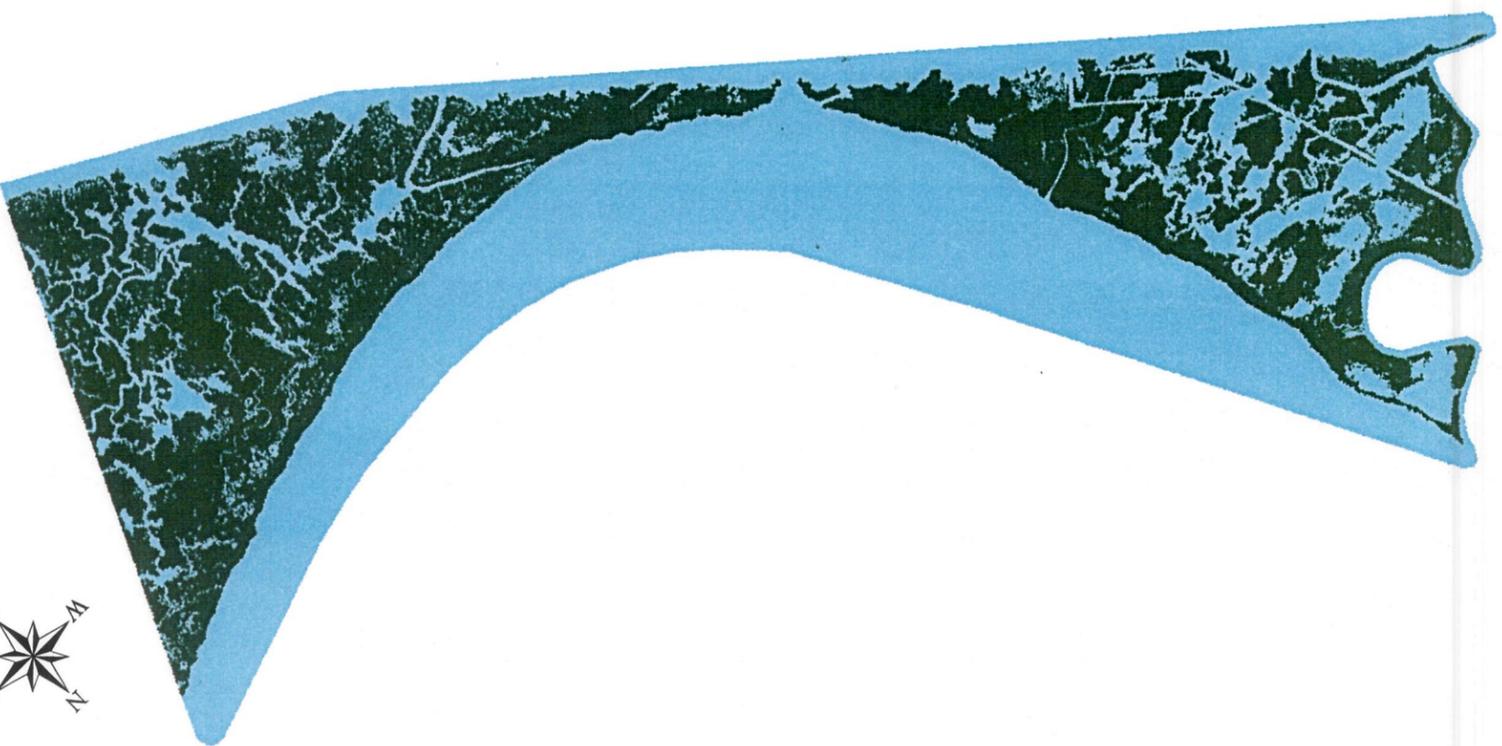
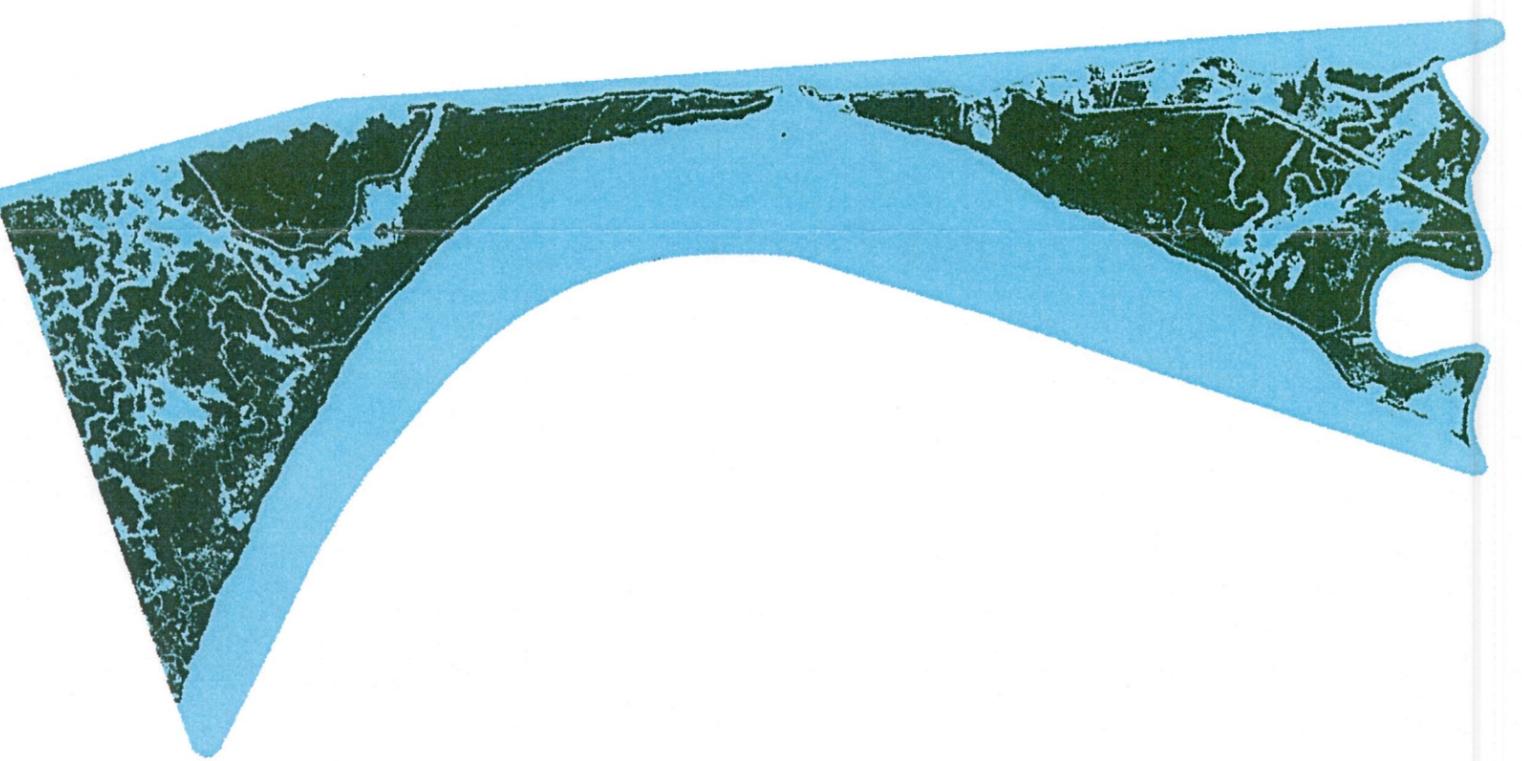


Figure 4. The dredged material disposal history for the Mississippi River-Gulf Outlet, Louisiana - Inland Reach Vicinity Mile 60-50 BUMP study area before November 1996, and the USACE-NOD designated disposal areas.

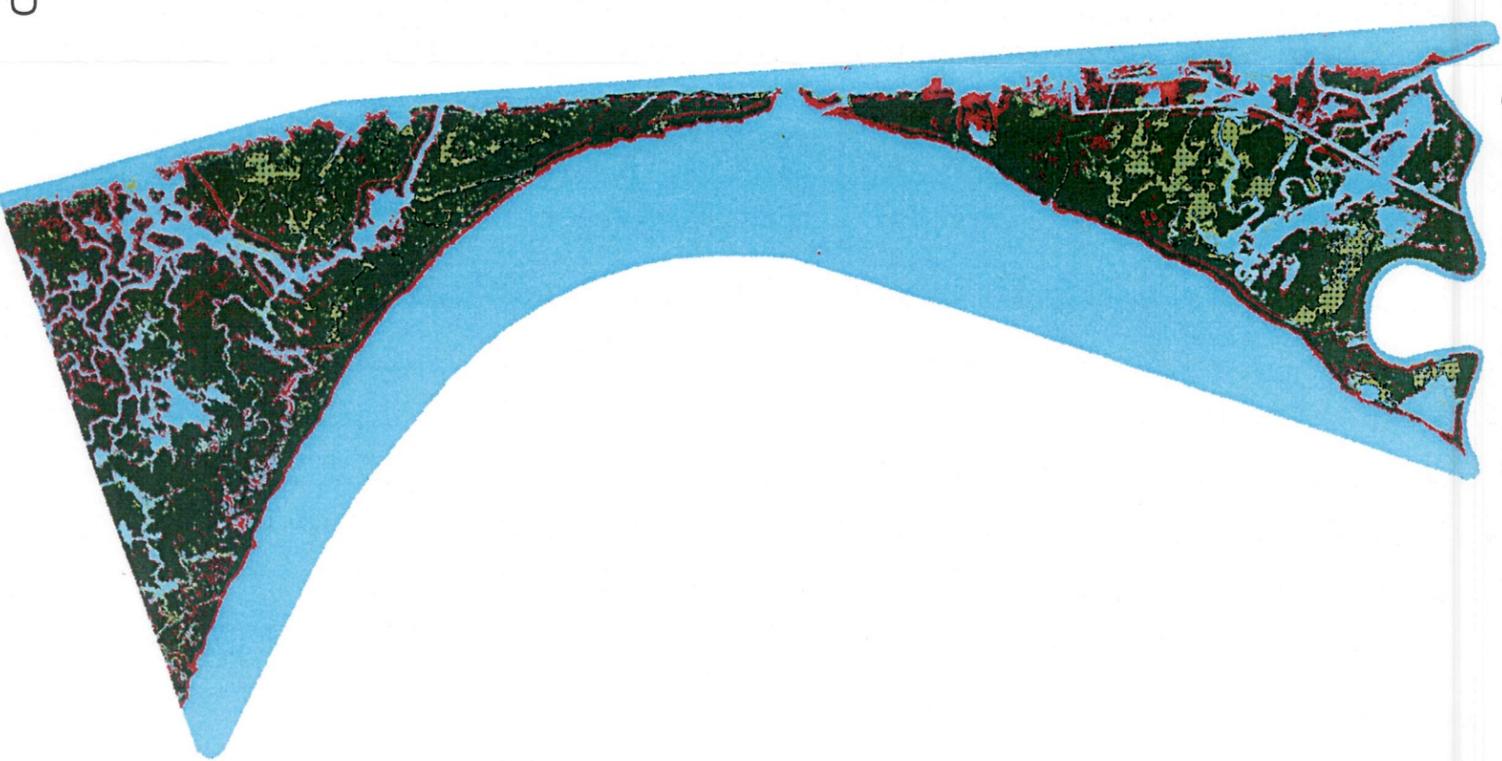
1985 Land-Water Classification



2000 Land-Water Classification



Change Detection: 1985-2000



LEGEND

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



Figure 14 Cumulative Landscape Change for MRGO-Inland: 289 Acres

BENEFICIAL USE OF DREDGED MATERIAL DISPOSAL HISTORY
MISSISSIPPI RIVER-GULF OUTLET, LA
JETTIES REACH AND BRETON SOUND

Through FY 2000

The Rivers and Harbors Act of 1956 authorized the USACE-NOD to construct and maintain a deep draft navigational channel 36 feet deep by 500 feet wide from the Inner Harbor Navigation Canal in New Orleans to the Chandeleur Islands (Mile 66.0 to Mile 0) and a channel 38 feet deep by 600 feet wide from the islands to the 38 foot contour in the Gulf of Mexico (Mile 0 to Mile -9.0). Construction of the Mississippi River - Gulf Outlet (MR-GO), Louisiana, navigational channel was initiated in 1958 and enlargement to full project dimensions was completed in 1968. Maintenance of discontinuous reaches of the channel has been accomplished on an annual basis since construction was completed.

Prior to and including the USACE-NOD Fiscal Year 1988 maintenance event, dredged material from the Mile 23.1 to Mile 15 reach of the channel was placed unconfined in shallow, open water adjacent to the south jetty for wetland creation. The initial height of the dredged material placed for wetland creation adjacent to the south jetty was +3.0 feet Mean Low Gulf (MLG) (+2.22 National Geodetic Vertical Datum (NGVD)).

During the FY 1991 maintenance event, dredged material from Mile 21.4 to Mile 15.3 reach was placed adjacent to the south jetty for wetland creation.

In FY 1992, dredged material from the Mile 27.0 to Mile 23.1 reach was placed into existing oil exploration canals and into shallow open water adjacent to the north jetty for wetland creation. The initial height of the dredged material placed into the canals was +3.5 feet MLG (+2.72 feet NGVD) and the initial height of the material placed adjacent to the north jetty was +5.78 feet MLG (+5.0 feet NGVD).

During the FY 1993 maintenance event, dredged material from the Mile 23.0 to Mile 22.5 reach was placed adjacent to the north jetty for wetland creation and material from the Mile 20 to Mile 15.3 reach was placed adjacent to the south jetty for wetland creation. Dredged material from the Mile 22.5 to Mile 20.5 reach was placed adjacent to the south jetty to begin construction of an *interior barrier island* perpendicular to the jetty. The initial height of the material for *barrier island* construction was +4.5 feet MLG (3.72 feet NGVD).

There was no maintenance dredging in the Mile 30 to Mile 18 reach of the navigational channel during FY 1994. However there was unconfined disposal at Mile 7, 9, 11, and 13 which remained intertidal.

During the FY 1995 maintenance event, dredged material from the Mile 18.0 to Mile 15.3 reach was placed adjacent to the south jetty, and at Mile 15 into a single point discharge area.

During the FY 1996 maintenance event, dredged material was placed at Mile 21 adjacent to the *interior barrier island* created in FY 93, at Mile 20.3, and at Mile 19.5.

During FY 1997, the passage of Tropical Storm Josephine (October 4-8, 1996) with its strong easterly winds resulted in severe shoaling of the MR-GO Breton Sound and bar channel reaches. Two vessel groundings following the storm's passage prompted emergency maintenance dredging activities. A hopper dredge was used in the Mile 18 to 0 reach to sidecast shoal material to either side of the navigational channel to quickly reopen the channel for safe vessel passage. A cutterhead dredge was subsequently deployed from April 14 to July 17, 1997, to remove this sidecast material from the channel. Shoal material removed from the Mile 18.1 to 7.5 reach by cutterhead dredging was placed unconfined behind the south jetty at single point discharge sites (SPDS) located at Miles 17.5, 16.5, and 15.5. Dredged material was placed to a maximum initial elevation of +3.0 feet MLG (+2.22 feet NGVD) at these sites. Shoal material was also placed unconfined at SPDS located at Miles 13, 11, 9, and 7. A water injection dredge was utilized between Miles 13.1 and 8.9 to facilitate the production rate of the cutterhead dredge working in this reach.

No maintenance dredging was necessary in the jetties reach of the MR-GO during FY 1998.

During FY 1999, the passage of Hurricane Georges (September 27-28, 1998) resulted in severe shoaling of the MR-GO Breton Sound and bar channel reaches. Beginning on October 4, 1998, emergency dredging activities were implemented to re-establish the navigational channel's authorized dimensions. A contract to dredge the Mile 23 to -3.3 MR-GO reach began on this date and was completed on August 20, 1999. Shoal material removed from this dredging reach during this contract was placed unconfined adjacent to the north jetty; adjacent to the south jetty at the *interior barrier island* disposal site; at SPDS located at Miles 19.5, 18.5, 17.5, 16.5 and 15.5; at SPDS located at Miles 2.5 and 1.0; and at Breton Island berm site. Placement of shoal material at the Mile 15.5 SPDS was performed as part of a Section 204 of the Water Resources and Development Act (WRDA) of 1992 project to develop wetlands. Approximately ~~3.5~~^{4,853,290} million cubic yards of material was placed at this site from February 7-21, 1999, to a maximum initial elevation of +3.0 feet MLG (+2.22 feet NGVD).

Four additional FY 1999 maintenance dredging contracts were awarded for the MR-GO Mile 27 to 2.3 reach. The Mile 12 to 8 reach was dredged between December 15, 1998, and March 6, 1999, and the dredged material was placed at SPDS located at Miles 11 and 9. The Mile 8 to 4 reach was dredged from April 19 through May 17, 1999, and the dredged material was placed at SPDS located at Miles 7 and 5. The Mile 27 to 23 reach was dredged from August 5 through September 3, 1999 and the dredged material was placed adjacent to the north jetty. The Mile 12 to 2.3 reach was dredged from August 24 through December 13, 1999, and dredged material was placed at SPDS located at Miles 11, 9, 7, and 5, and at Breton Island.

Mississippi River Gulf Outlet Jetties Reach Dredged Material Disposal History

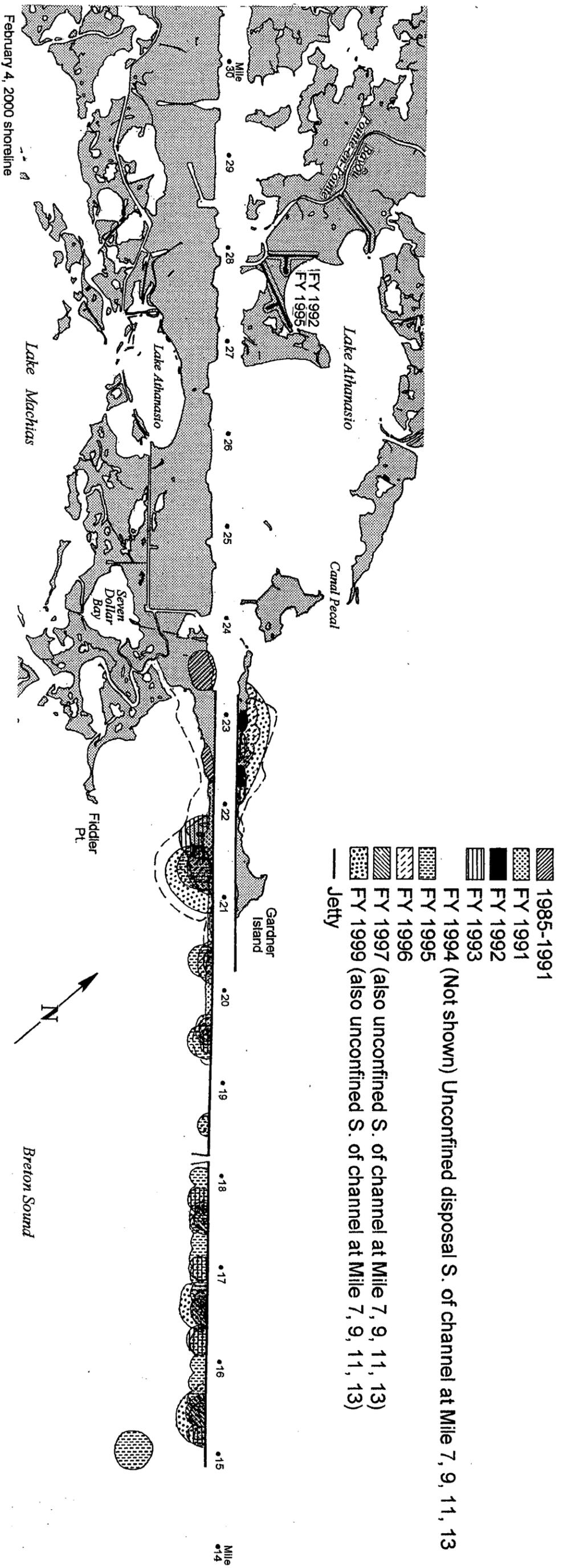
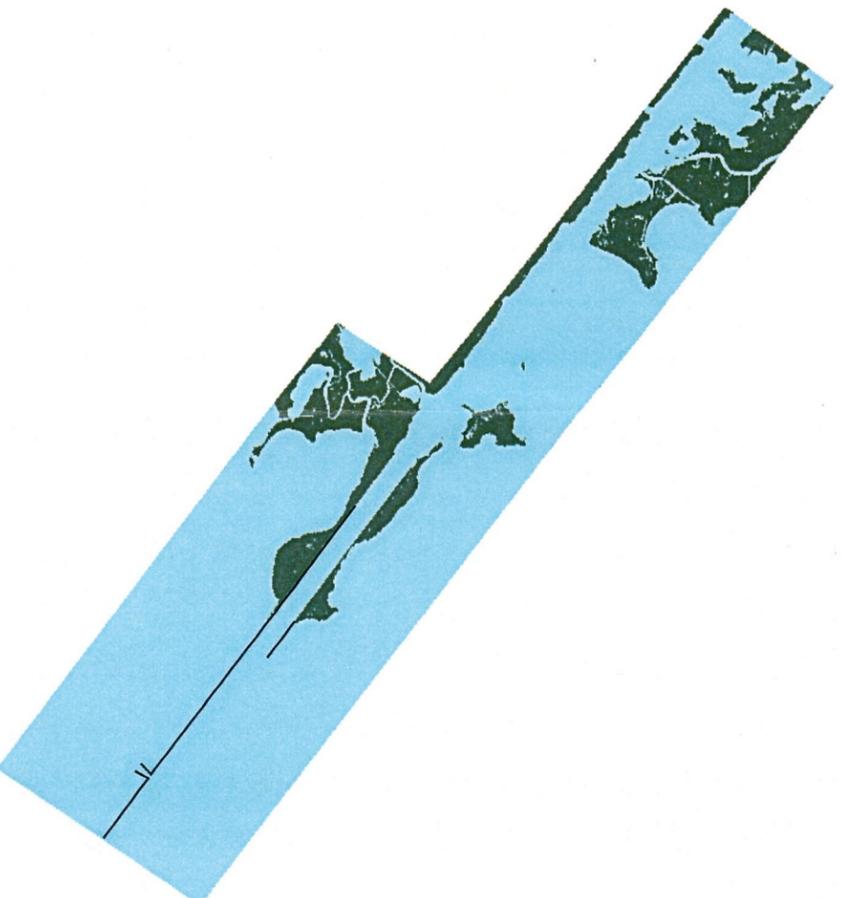
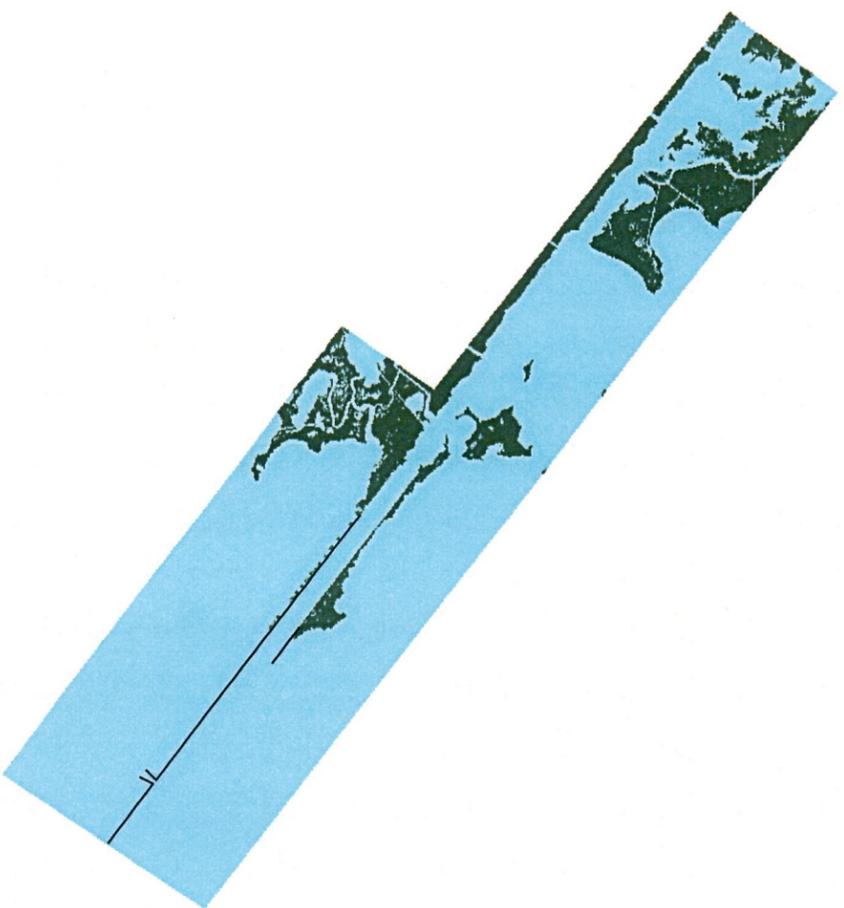


Figure 5. The dredged material disposal history for the Mississippi River-Gulf Outlet, Louisiana - Jetties BUMP study area through FY 2000.

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 15 Cumulative Landscape Change for MRGO- Jetties: 396 Acres

BENEFICIAL USE OF DREDGED MATERIAL DISPOSAL HISTORY
MISSISSIPPI RIVER-GULF OUTLET, LA
BRETON ISLAND
Through FY 1999

The Rivers and Harbors Act of 1956 authorized the USACE-NOD to construct and maintain a deep-draft navigational channel 36 feet deep by 500 feet wide from the Inner Harbor Navigation Canal in New Orleans to the Chandeleur Islands (Mile 66.0 to Mile 0) and a channel 38 feet deep by 600 feet wide from the islands to the 38-foot contour in the Gulf of Mexico (Mile 0 to Mile -9.0). Construction of the Mississippi River Gulf Outlet (MR-GO) channel was initiated in 1958 and enlargement to full project dimensions was completed in 1968. Maintenance of discontinuous reaches of the channel has been accomplished on an annual basis since construction was completed.

Historically, shoal material from the bar channel (Mile 0 to Mile 9.0) was removed by hopper dredges and placed into an Environmental Protection Agency designated ocean dredged material disposal site (ODMDS) located southwest of the navigational channel. During annual coordination prior to the Fiscal Year 1992 maintenance event, the Louisiana Department of Natural Resources (DNR) asked USACE-NOD to investigate the feasibility of berm construction with dredged material from the MRGO bar channel. According to DNR, construction of a berm adjacent to Breton Island could nourish and/or protect the island from continued erosion.

Scientists from the USACE Waterways Experiment Station's Coastal Engineering Resource Center (CERC) assisted USACE-NOD with development of a plan to construct and monitor a near-shore berm. CERC recommended construction of a *pilot* near-shore berm to 1) determine the constructability of a berm using a hydraulic cutterhead pipeline dredge; 2) investigate the mounding potential of the extremely fine-grained dredged material; and to 3) monitor dispersion of the berm. Little, if any, experience existed for constructing a near-shore berm by hydraulic pipeline using such fine-grained material. Therefore, experience gained from constructing and monitoring the pilot near-shore berm would be used to assess the feasibility of a larger berm to benefit Breton Island.

USACE-NOD determined the dredged material placement location and approximate configuration with guidance from CERC. Monitoring consisted of pre- and post-construction hydrographic surveys, seabed drifter studies, sediment sampling, dredging operations inspection and documentation, and data analysis.

Approximately 1.7 million cubic yards of dredged material from the Mile 0 to Mile -2.5 reach of the MRGO bar channel was placed at the pilot near shore berm location (Figure 6A) in September, 1993. Post-construction surveys revealed that approximately 400,000 cubic yards of the dredged material placed at the pilot near-shore berm site remained in a mound at the site following construction.

Breton Island is being monitored by the dredged material BUMP to determine the benefits of an offshore feeder berm to the adjacent shoreline. Breton Island is suffering from shoreline erosion rates in excess of 100 ft/yr and land loss rates of 6 acres/yr. The Breton Island feeder berm has two goals: shoreline nourishment and wave protection. The potential exists for onshore/longshore sediment transport from the feeder berm to nourish Breton Island and slow or halt the rate of shoreline erosion. The second benefit of the feeder berm is to potentially reduce and alter the near-shore wave climate

in such a manner as to reduce or locally reverse shoreline erosion.

During FY 1999, the passage of Hurricane Georges (September 27-28, 1998) resulted in severe shoaling of the MR-GO Breton Sound and bar channel reaches. Beginning on October 4, 1998, emergency dredging activities were implemented to re-establish the navigational channel's authorized dimensions. Approximately 3.8 million cubic yards (CY) of material were placed at the Breton Island berm site from May 26 through August 20, 1999.

Dredged material was placed directly on Breton Island from early September through October 23, 1999, as part of a Section 204 of WRDA 92 project to restore barrier island habitat damaged by storms and erosion. Dredged material was placed at 3 sites along the island's northeastern rim that had been breached. To plug these breaches, dredged material was placed to a maximum initial elevation of +1.5 feet MLG (+.72 feet NGVD). About 221,500 CY of dredged material was placed at Breach A, about 626,000 CY was placed at Breach B, and About 253,600 CY was placed at Breach C (Figure 6B).

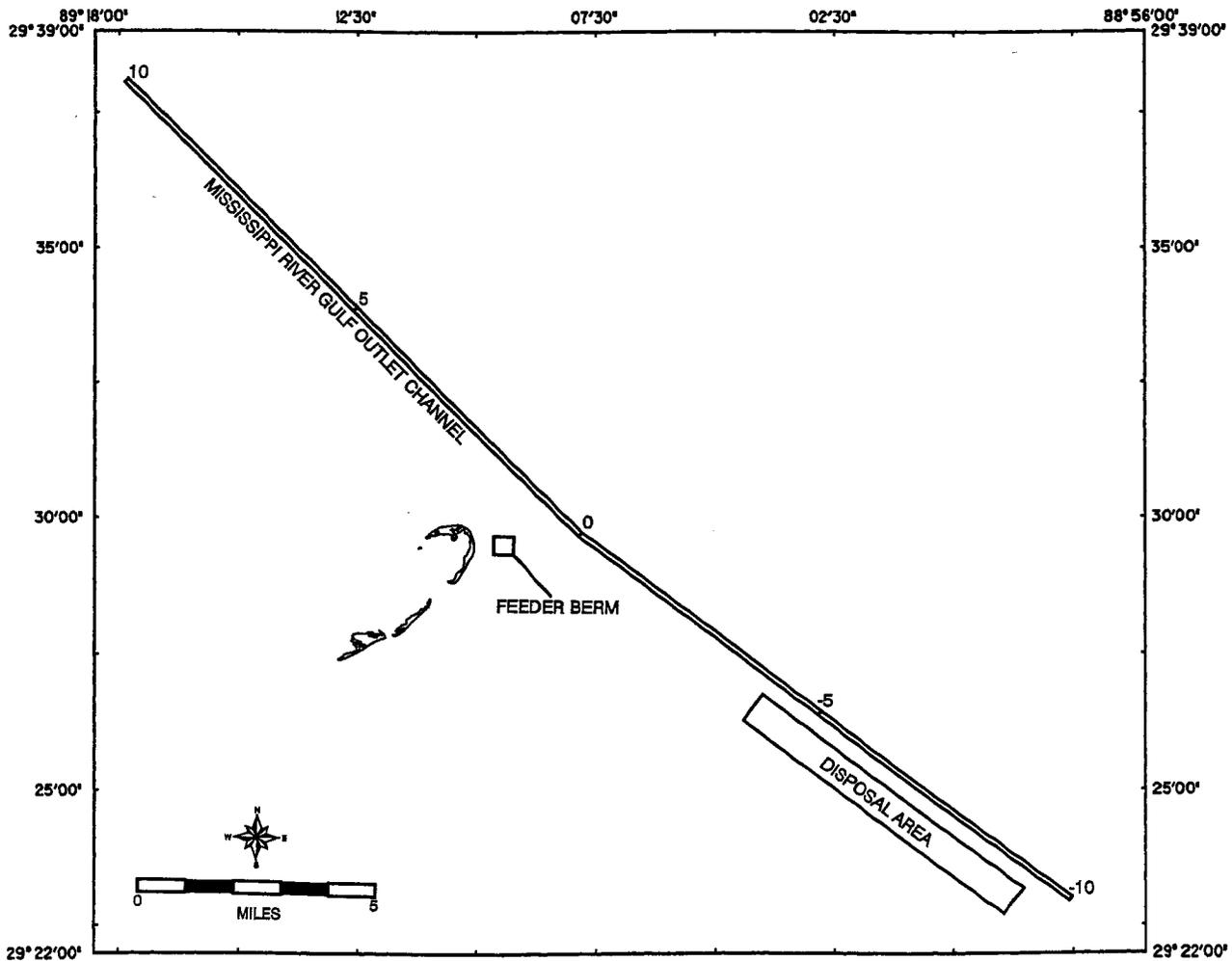


Figure 6A. The location of the beneficial use of dredged material offshore feeder berm in relation to Breton Island.

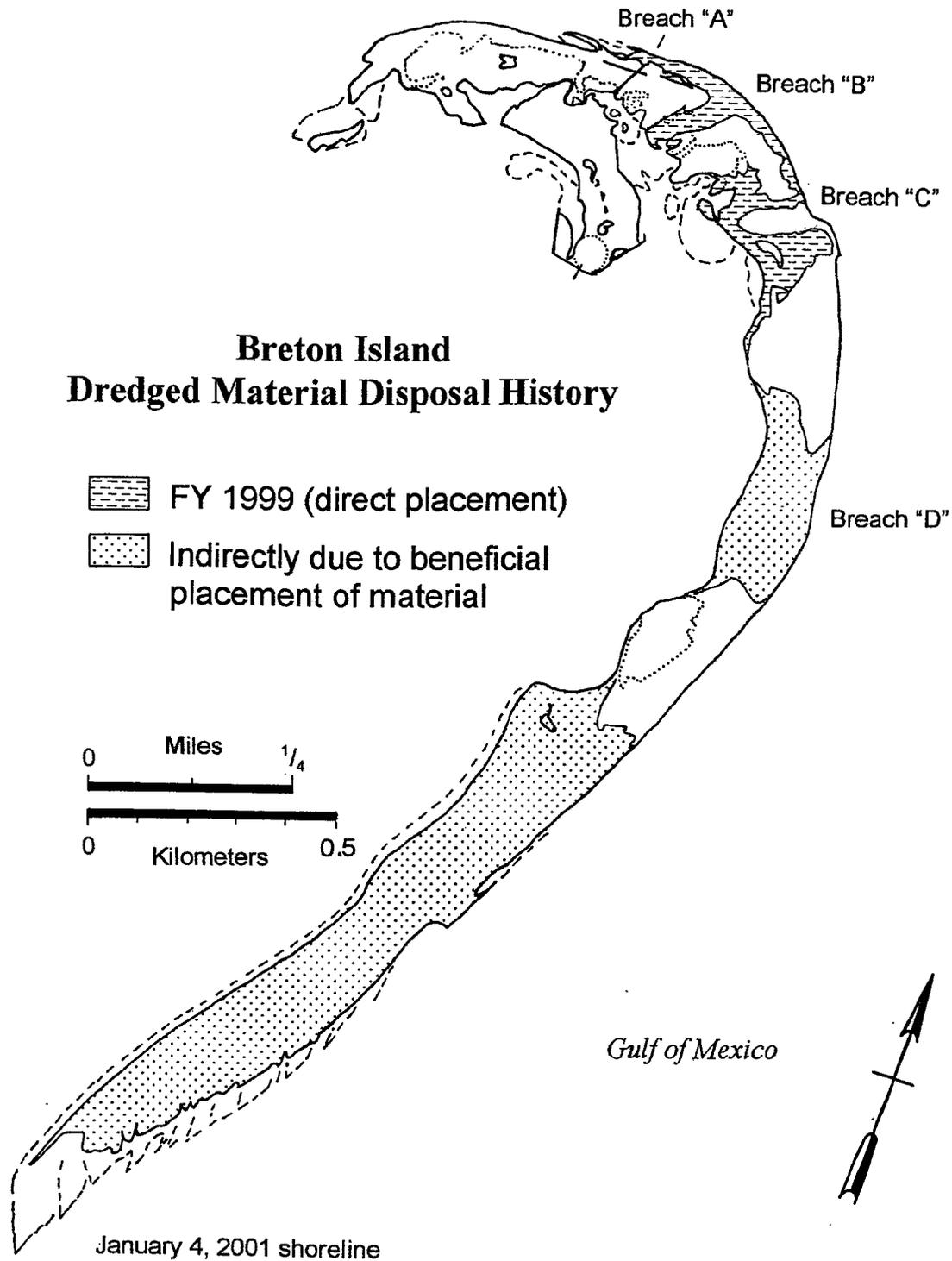
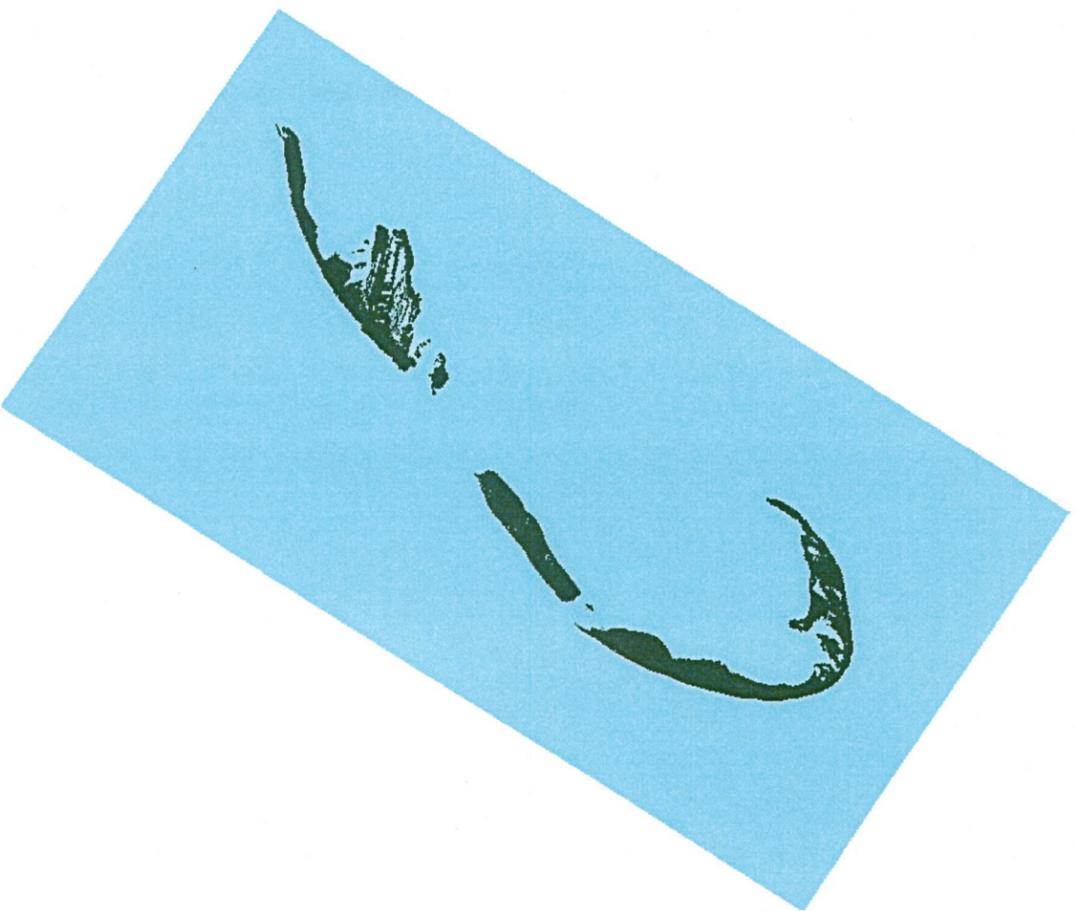
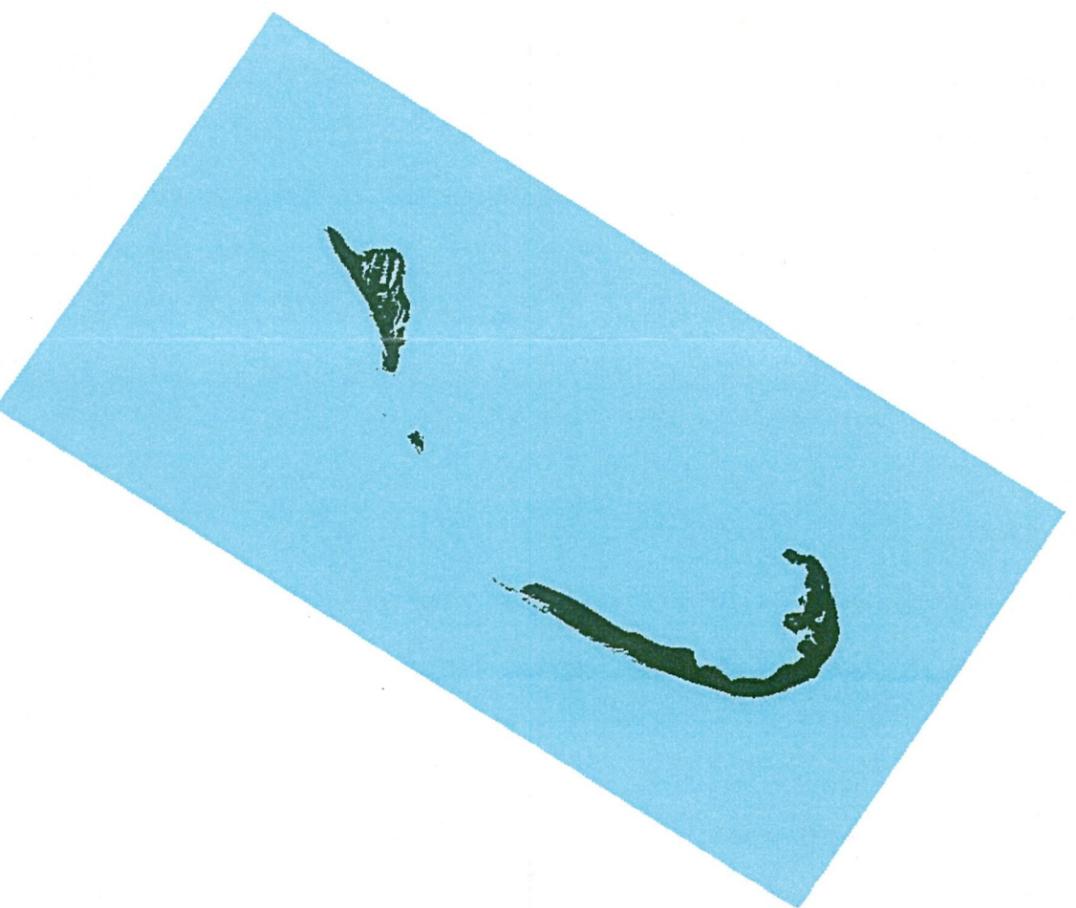


Figure 6B. The dredged material disposal history for the Mississippi River-Gulf Outlet, Louisiana - Breton Island BUMP study area through FY 2000.

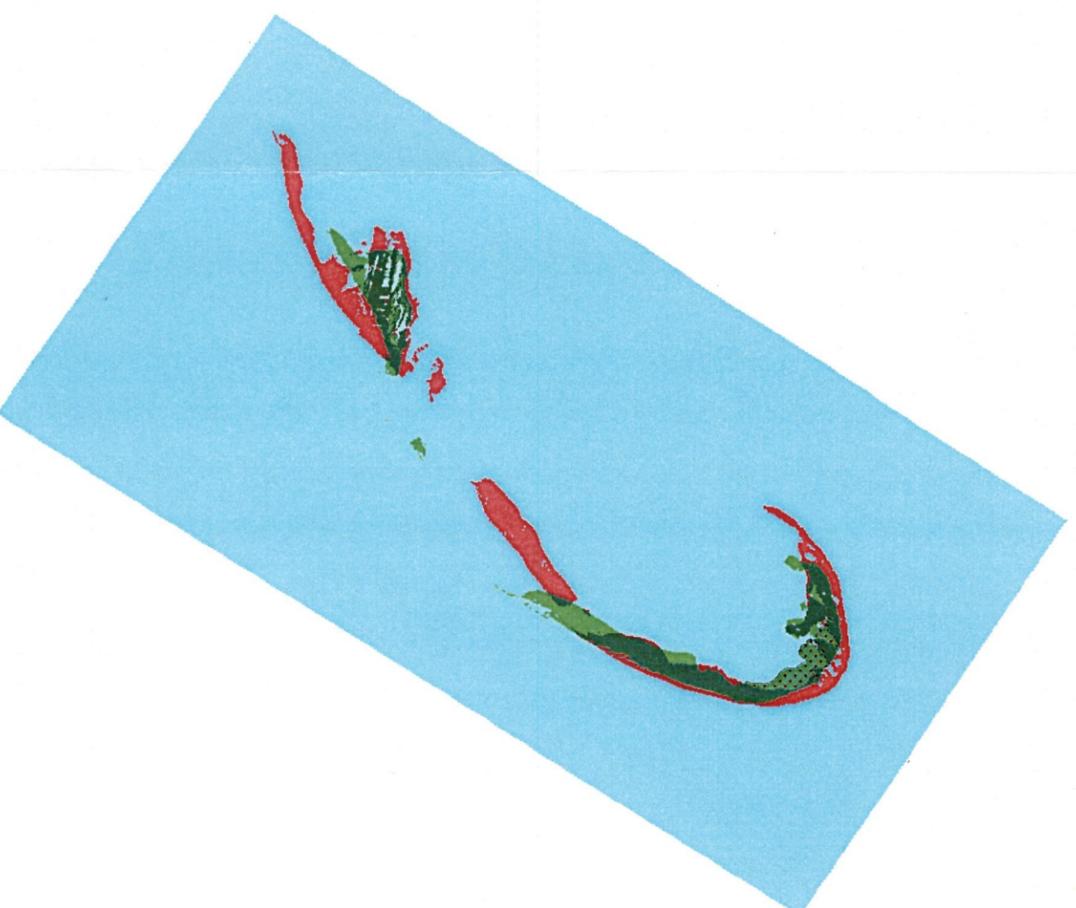
1985 Land-Water Classification



2000 Land-Water Classification



Change Detection: 1985-2000



LEGEND

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



Figure 16 Cumulative Landscape Change for MRCGO Breton Island: 29 Acres

BENEFICIAL USE OF DREDGED MATERIAL DISPOSAL HISTORY
MISSISSIPPI RIVER OUTLETS, VENICE, LA
BAPTISTE COLLETTE BAYOU
Through FY 2000

Baptiste Collette Bayou existed as a small canal in 1868 that extended between the river and what was then known as Bird Island Sound. In 1874, a crevasse occurred, and by 1893, a small subaerial subdelta had been formed. In 1908, the Corps of Engineers dammed the crevasse to maintain the flow through the navigational channels. In 1915, the dam was breached and growth of the subdelta resumed. The subdelta was nearly 20 square miles in 1959, but considerable subsidence and ponding was evident on the 1959 survey, indicating that the deterioration phase of this subdelta had already begun (Morgan, 1977).

The River and Harbors Act of 1968, approved August 13, 1968, authorized the USACE-NOD to enlarge the existing channel of Baptiste Collette Bayou to -14 feet Mean Low Gulf (MLG) over a bottom width of 150 feet with an entrance/bar channel in open water 16 feet deep over a bottom width of 250 feet. Jetties to the 6 foot depth contour also were authorized. Enlargement of the channel began in November, 1977 and was completed in May, 1978. Jetty construction was completed in May 1979.

Beneficial use of dredged material from maintenance of the Baptiste Collette bar channel began in 1977 with the placement of dredged material in shallow open water on the east side of the channel in a manner conducive to wetland creation and to the creation of islands for colonial nesting seabirds. Wetland creation on the west side of the jettied channel began in 1988. Maintenance dredging takes place annually and all dredged material is used for confined or unconfined wetland creation and the creation of islands suitable for avian habitat.

Figure 7 illustrates the dredged material disposal history for the study area through FY 2000.

Baptiste Collette Dredged Material Disposal History 1975-FY2000

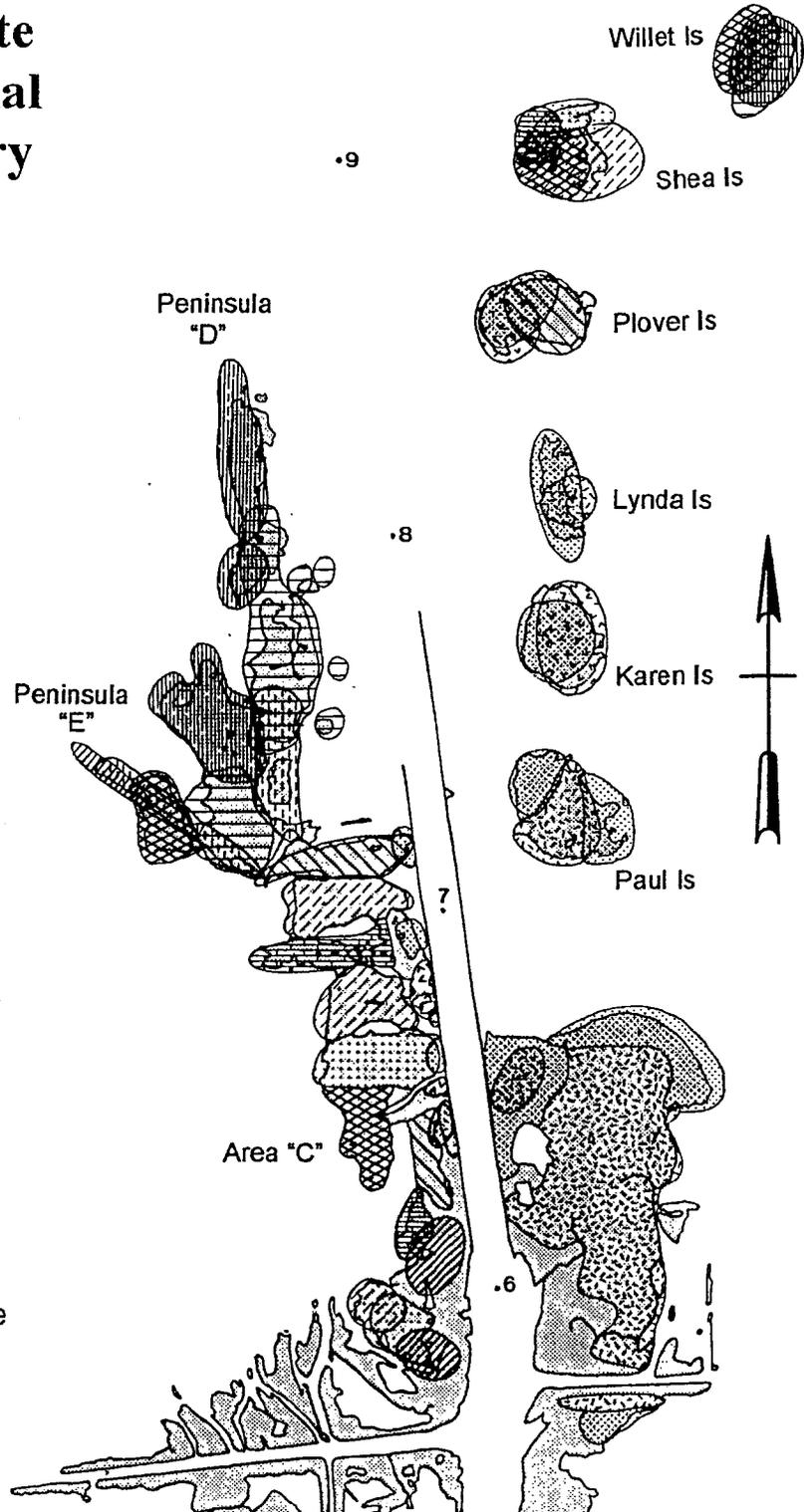
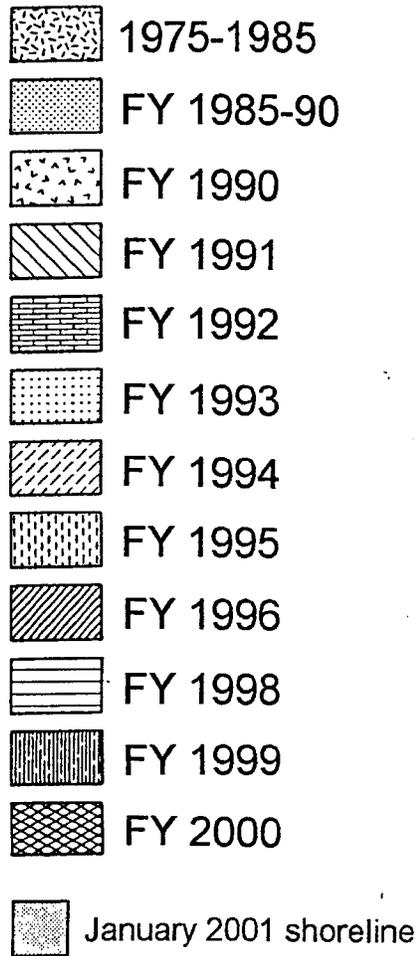
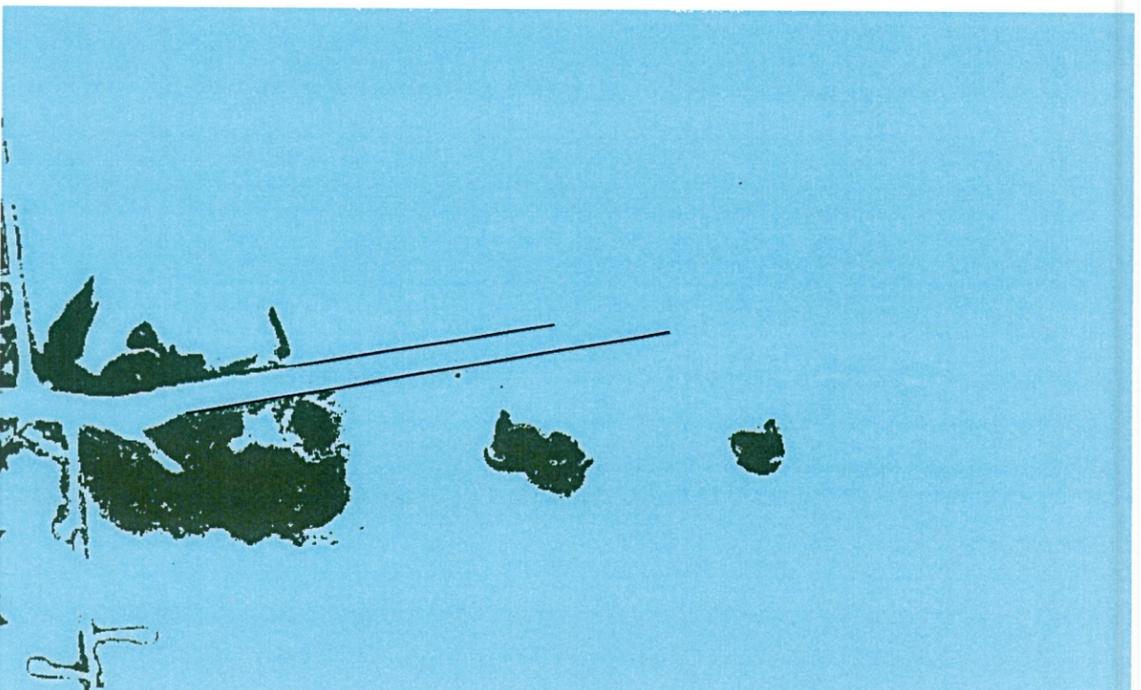
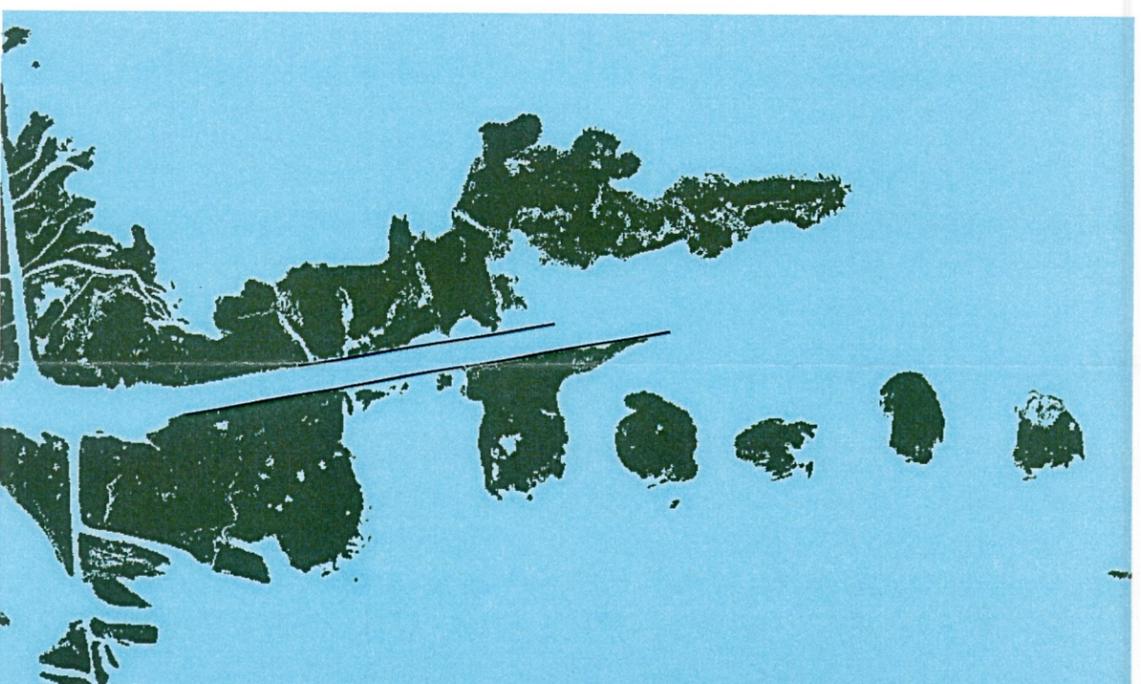


Figure 7. The dredged material disposal history for the Baptiste Collette Bayou study area through FY 2000.

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 4 Cumulative Landscape Change for Baptiste Collette: 6,239 Acres

BENEFICIAL USE OF DREDGED MATERIAL DISPOSAL HISTORY
MISSISSIPPI RIVER OUTLETS, VENICE, LA
TIGER PASS
Through FY 2000

The Mississippi River Outlets, Venice, Louisiana project was authorized by the Rivers and harbors Act of 1968, House Document 361 of the 90th Congress, 2nd Session. It allowed for additional navigation outlets from the Mississippi River in the vicinity of Venice, Louisiana by the enlargement of existing channels of Baptiste Collette Bayou and Grand-Tiger Passes to provide channels 14 feet deep (Mean Low Gulf) over a bottom width of 150 feet, with entrance channels in open water 16 feet deep over a bottom width of 250 feet. Jetties, to the 6-foot depth contour, are authorized under these provisions if and when it is justifiable to reduce the cost of maintenance dredging. The enlargement of Grand and Tiger Passes began in March 1978 and was completed in October 1978. Construction of the jetty at Tiger Pass was completed in March 1979.

Approximately 2,500,000 cubic yards are removed from Tiger Pass during each dredging cycle, using a hydraulic cutterhead pipeline dredge. Dredging records dating back to 1983 indicate that since construction, maintenance dredging has occurred every two to three years.

During the fiscal year (FY) 1983 maintenance event (May 8, 1983 - July 11, 1983), dredging from Mile 7.3 to Mile 13.9 was performed using a hydraulic cutterhead pipeline dredge. Approximately 2,214,838 cubic yards of dredged material were deposited unconfined in shallow open water areas on the right and left descending banks of the channel. Dredged material was placed to a maximum height no greater than +1.5 feet MLG from Mile 7.3 to Mile 9.3, and to a height not exceeding +3.5 feet MLG from approximately Mile 11.4 to Mile 14.0. Several islands were created for bird nesting sites.

In FY 1985 (July 14, 1985 - October 16, 1985), dredging from Mile 7.3 to Mile 14.0 was performed using a hydraulic cutterhead pipeline dredge, removing about 2,430,433 cubic yards of material from the channel. The dredged material was placed unconfined in shallow open water areas on the right and left descending banks of the channel and was pumped to an elevation of not greater than +8.0 feet MLG for marsh creation.

During fiscal year 1989 (December 1988 - February 22, 1989), maintenance dredging from Mile 7.3 to Mile 14.0 was performed using a hydraulic cutterhead pipeline dredge. Approximately 2,362,161 cubic yards of dredged material were placed unconfined in disposal sites located on both the right and left descending banks of the channel for wetland creation.

In FY 1991 (October 15, 1991 - January 31, 1992), maintenance dredging from Mile 7.3 to Mile 14.0 was performed using a hydraulic cutterhead pipeline dredge. Approximately 2,116,376 cubic yards of dredged material were removed from the channel. All material excavated from Mile 12.3 to Mile 14.0 was placed on the left descending bank of the channel to create a bird island in the vicinity of Mile 13.0. Dredged material from Mile 11.4 to Mile 12.3 was placed to a maximum height of +5.5 feet MLG behind the south jetty to develop wetlands. Dredged material from Mile 9.7 to mile 11.4 was placed in shallow open water on the right descending bank of the channel to

a maximum height of +5.0 feet MLG to restore wetlands. Material from Mile 7.3 to Mile 9.7 was placed in the disposal areas on the right descending bank of the channel in unconfined areas (on the right and left descending banks of the channel) and confined with earthen and haybale dikes. Approximately 94,952 cubic yards of dredged material were placed into the bay-bale dike disposal area, located on the right descending bank of the channel, for marsh creation (no higher than +5.0 feet MLG). Approximately 186,687 cubic yards of dredged material were placed into the earthen dike disposal site, located on the right descending bank of the channel for marsh creation as well (no higher than +5.0 feet MLG). Another 1,834,737 cubic yards of dredged material were placed unconfined in marsh creation disposal sites on both right and left descending banks of the channel. The placement of dredged material on the left descending bank of the channel was for the creation of a bird breeding island.

During FY 1993 (December 9, 1993 - January 26, 1994), maintenance dredging from Mile 7.3 to Mile 14.0 was performed. Approximately 2,313,255 cubic yards of dredged material were removed by hydraulic cutterhead dredge and deposited on the right and left descending banks of the channel, unconfined, in the open waters of Chawee Bay and nearshore of the Gulf of Mexico. Dredged material was placed to a maximum elevation of +5.0 feet MLG in wetland development areas and +5.5 feet MLG behind the jetty for wetland creation.

In the fiscal year 1996 maintenance event (September 19, 1996 - March 11, 1997), maintenance dredging from Mile 7.3 to Mile 14.0 was performed using a hydraulic cutterhead pipeline dredge. Approximately 3,154,906 cubic yards of dredged material were removed and deposited, unconfined, in open waters of Chawee Bay and the nearshore Gulf of Mexico for wetland development and restoration. Dredged material was placed to a maximum of +5.0 feet MLG in wetland development areas and +5.5 feet MLG behind the jetty.

During the FY 1999 maintenance event (October 11, 1999 - February 10, 2000), hydraulic maintenance dredging from mile 7.3 to Mile 14.0 was performed. A total of about 2,037,360 cubic yards of dredged material were removed from Tiger Pass. Dredged material was placed into five separate wetland development areas (WDAs) as follows: WDA-1: 77,707 cubic yards; WDA-2: 158,315 cubic yards; WDA-3: 285,723 cubic yards; WDA-4: 589,075 cubic yards; and WDA-5: 950,401 cubic yards. The first four WDAs are on the right descending bank of the channel with a maximum dredged material elevation of +5.0 feet MLG, while the fifth WDA is on the left descending bank of the channel adjacent to the jetty. The maximum elevation of the dredged material at WDA-5 only reached +2.0 feet MLG, well below the +5.5 feet MLG limit established for this WDA.

Figure 8 illustrates the dredged material disposal history for the study area through FY 2000.

Tiger Pass Dredged Material Disposal History

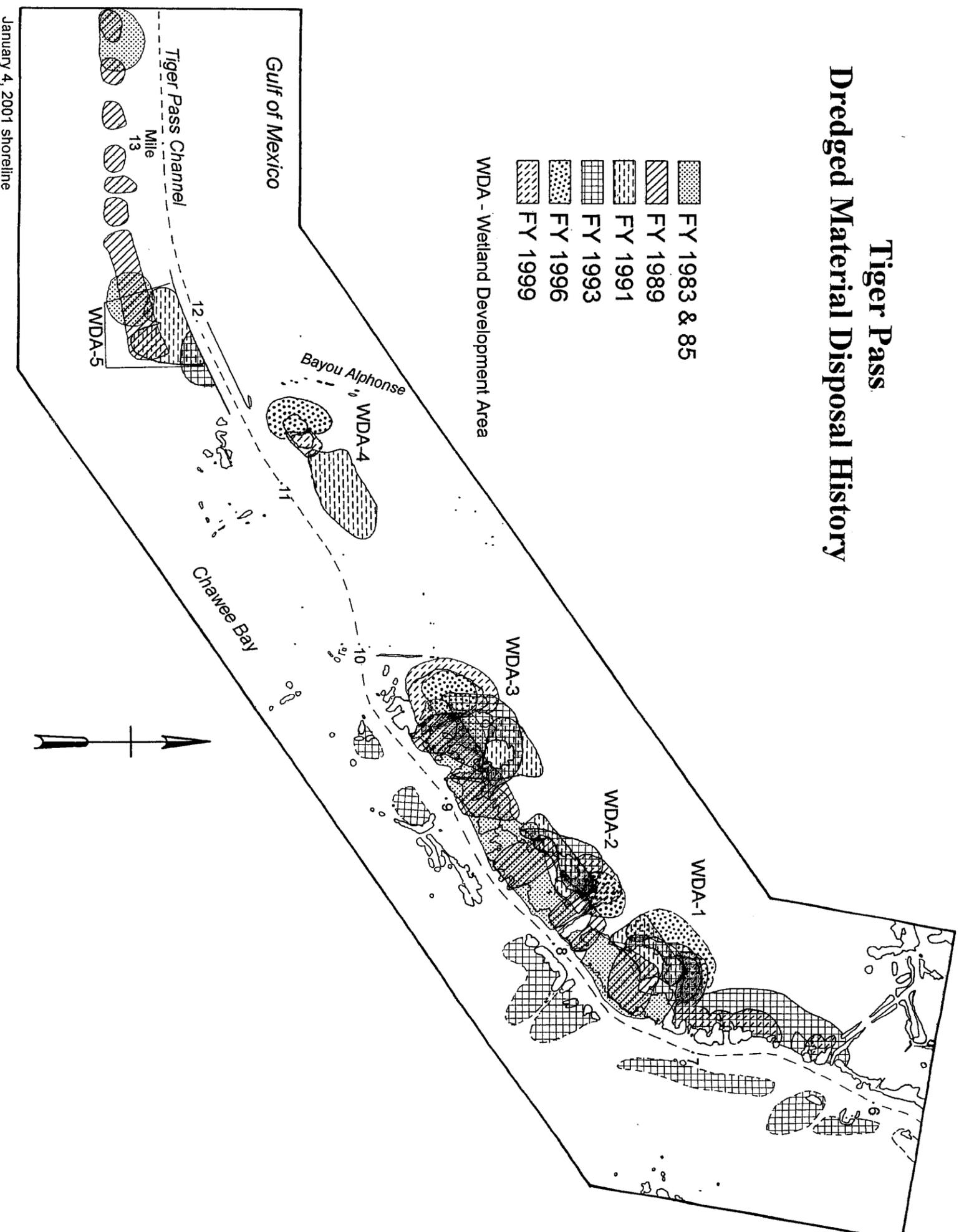


Figure 8. The dredged material disposal history for the Tiger Pass BUMP study area through FY 2000.

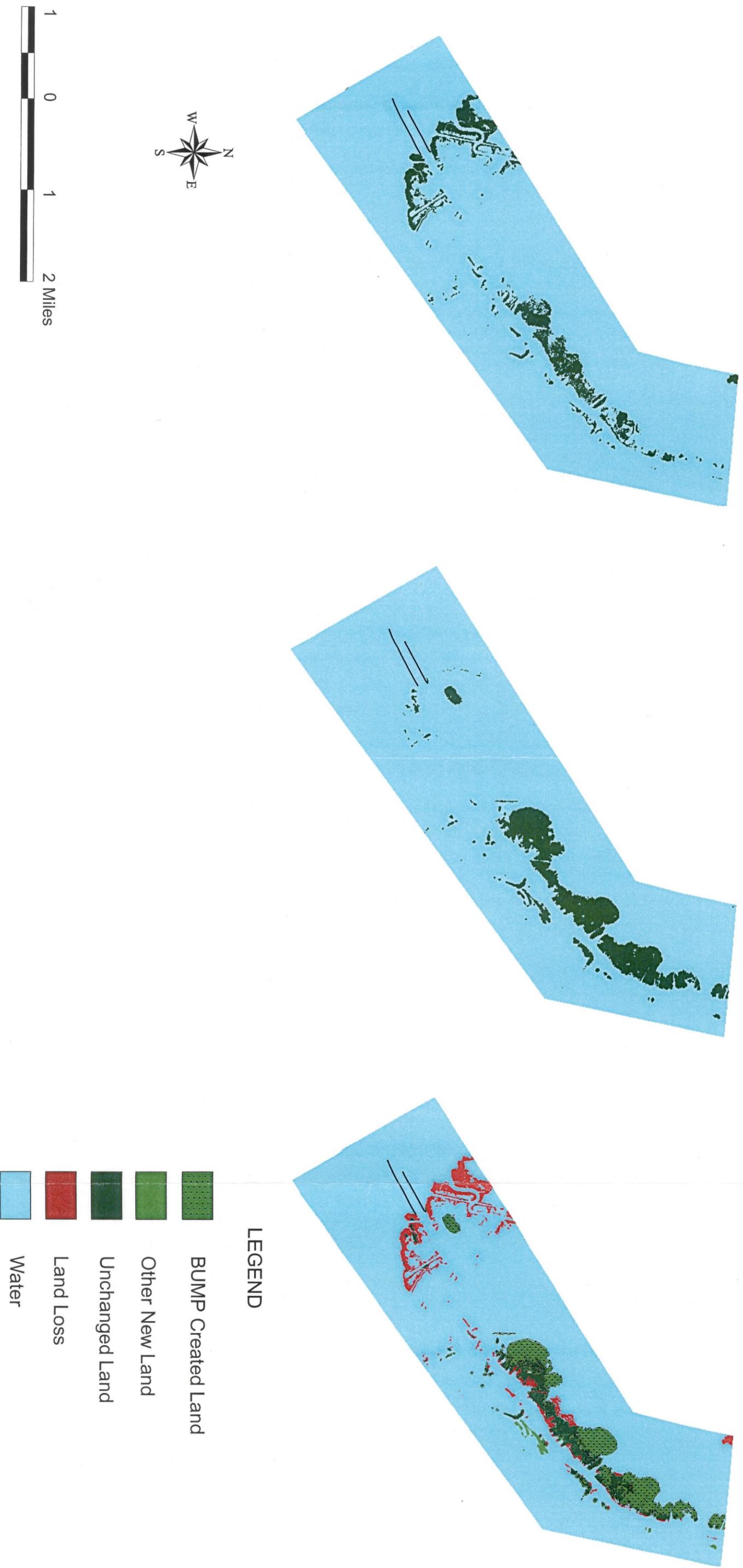


Figure 19 Cumulative Landscape Change for Tiger- Pass: 347 Acres

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.

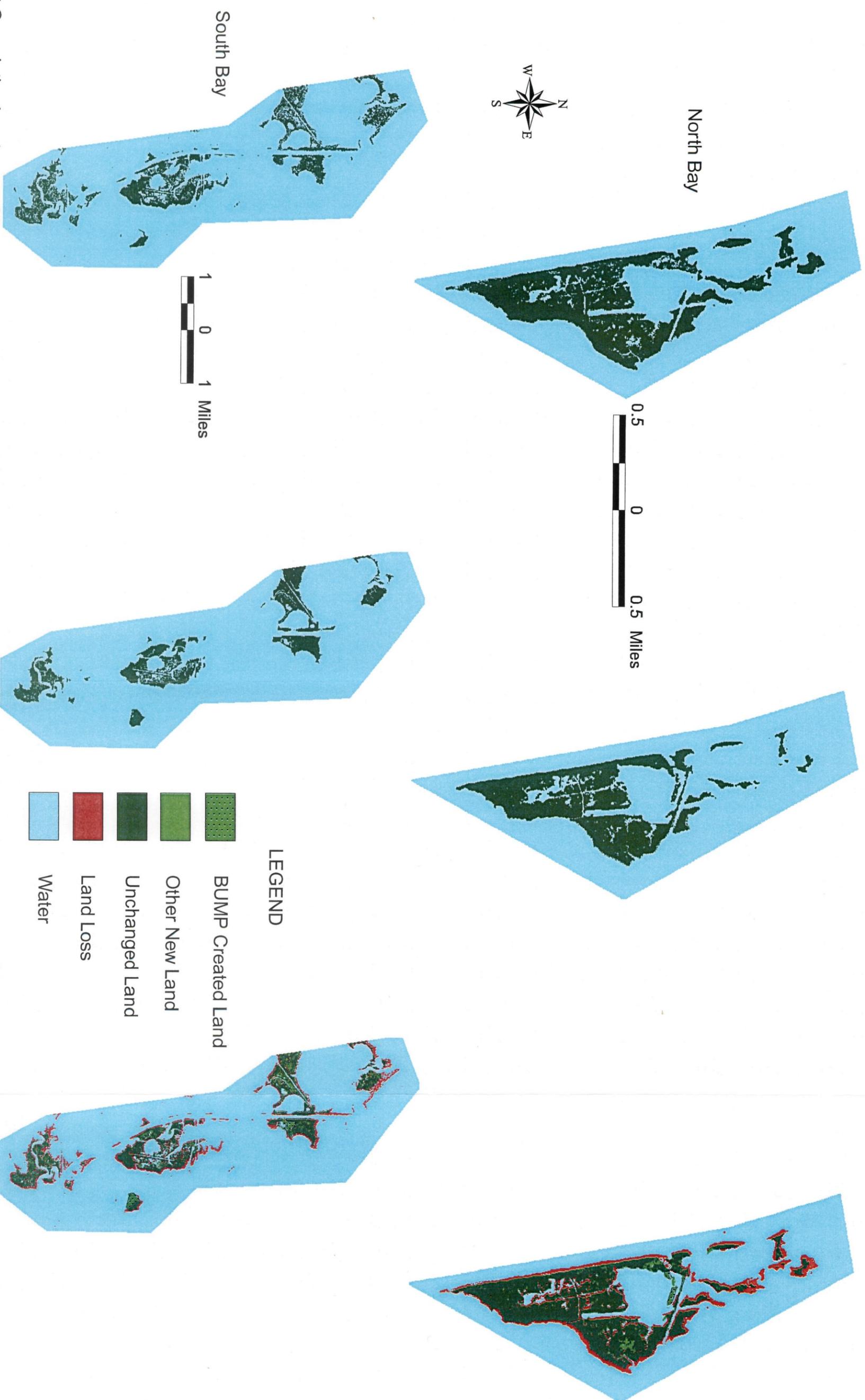


Figure 6 Cumulative Landscane Change for Barataria Bay. AN Area

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

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.

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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

-  FY 1996/1997
-  FY 1999

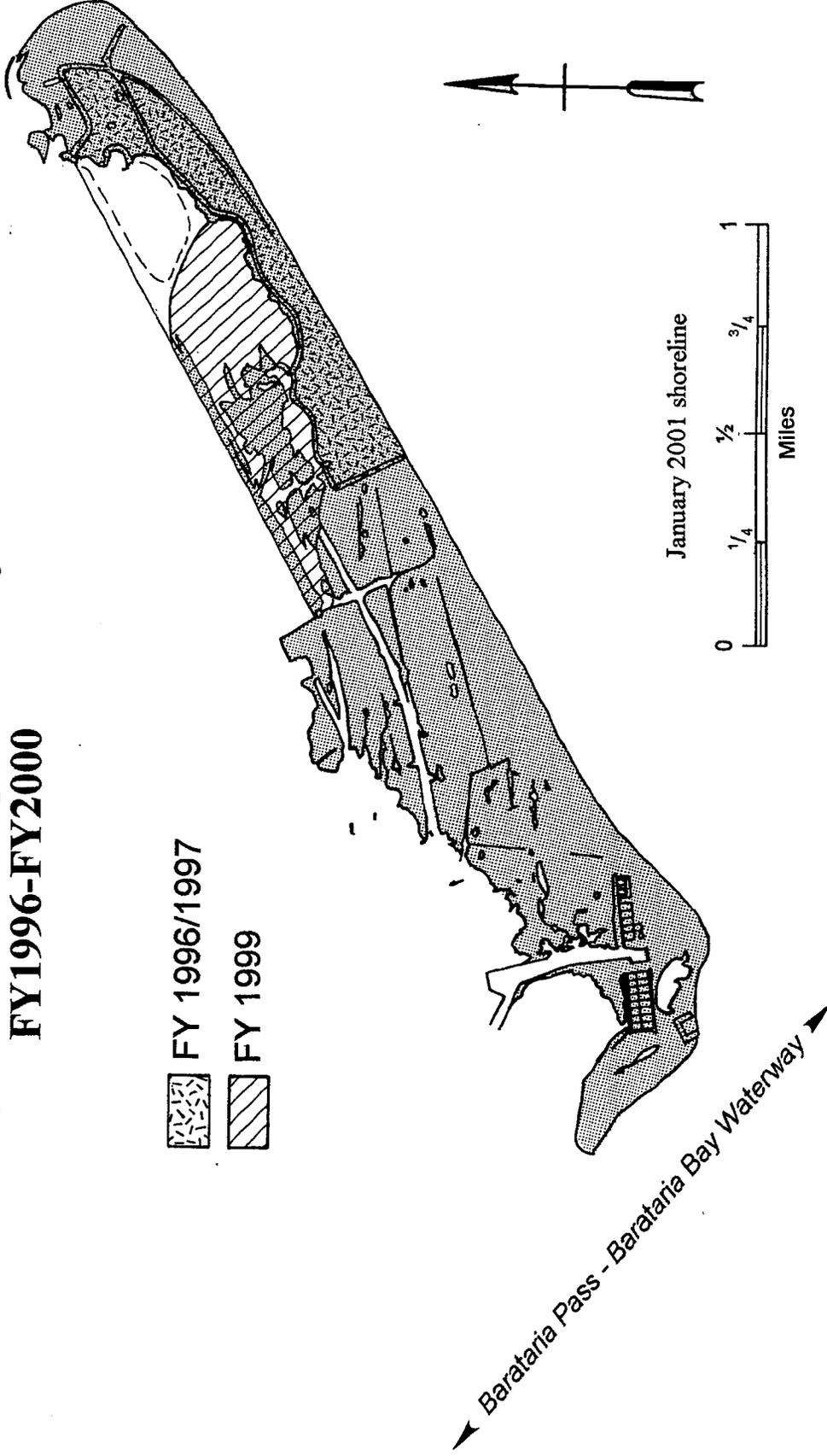
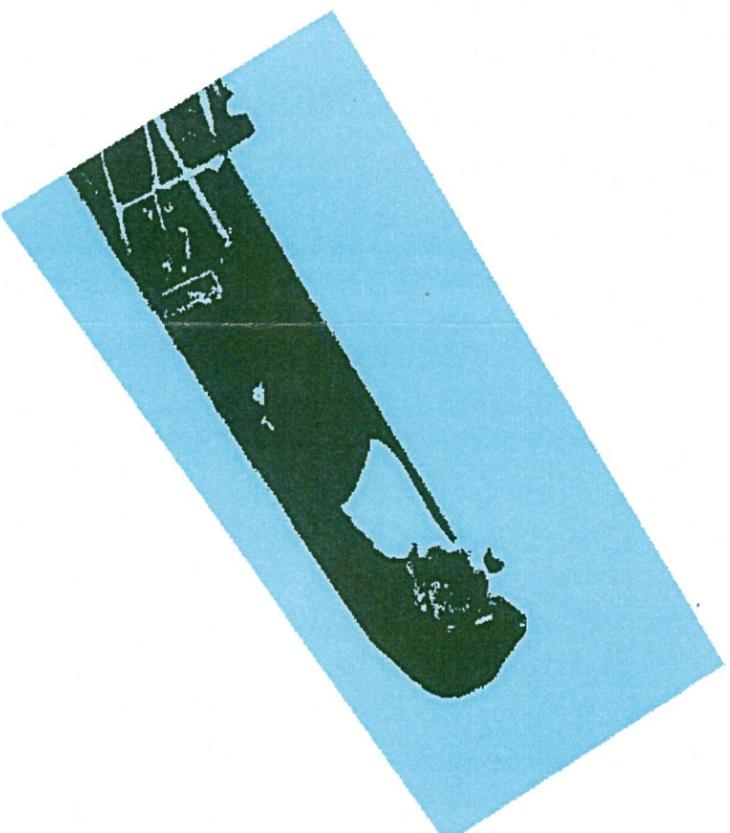


Figure 10. The dredged material disposal history for the lower Barataria Bay Waterway, Louisiana navigational channel - Grand Terre Island BUMP study area in Louisiana through FY 2000.

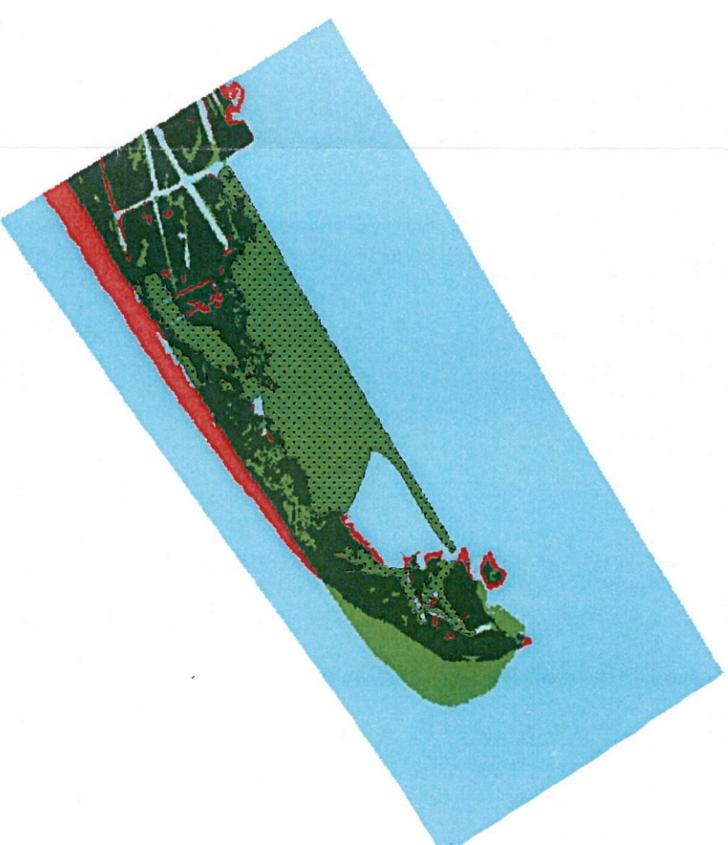
1985 Land-Water Classification



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

BENEFICIAL USE OF DREDGED MATERIAL DISPOSAL HISTORY
BARATARIA BAY WATERWAY, LA
INLAND 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 FY97, beneficial use of dredged material has taken place only in the Barataria Bay Reach and the Bar Channel Reach.

Dupre Cut Inland Reach (Mile 36.7-16)

Dredging records dating back to 1960 indicate that dredged material from construction and maintenance in this reach of the waterway was placed into confined disposal facilities and along the east and west banks of the waterway.

During the FY 1999 maintenance event (August 6, 1999 - November 11, 1999), dredged material from Mile 31.0 to Mile 25.5 was placed in degraded wetlands located adjacent to the channel's west bankline as part of a Section 204 of the Water Resources Development Act of 1992 project to restore marsh. A rock retention dike in conjunction with an earthen containment dike was constructed along the right-descending bank of the waterway between Mile 26.8 and Mile 25.8 to ensure that dredged material placed within the disposal area would not re-enter the navigational channel. The natural ridge along the western side of the disposal area was sufficient to contain the dredged material without construction of additional dikes.

Approximately 580,000 cubic yards were placed within three cells comprising the disposal area, i.e., one between the rock containment dike and the earthen containment dike; one north of a pipeline canal (North Prairie); and one south of the pipeline canal (South Prairie). Dredged material placed between the containment dikes was pumped to a minimum elevation of +3.5 feet MLG (+2.7 feet NGVD) and a maximum elevation of +4.0 feet MLG (+3.2 feet NGVD). Dredged material placed into the North Prairie and South Prairie cells was pumped to an initial elevation of +2.0 feet MLG (+ 1.2 feet NGVD). Dredged material effluent was allowed to flow through and onto the adjacent existing marsh within the North and South Prairie cells.

No maintenance dredging occurred in the inland reach of the Barataria Bay Waterway during FY 2000.

Figure 11 illustrates the dredging history for the Dupre Cut wetlands development area for Mile 25-29 of the upper Barataria Bay Waterway navigational channel.

Barataria Bay Waterway Dupre Cut Inland Reach Dredged Material Disposal History Through FY 2000

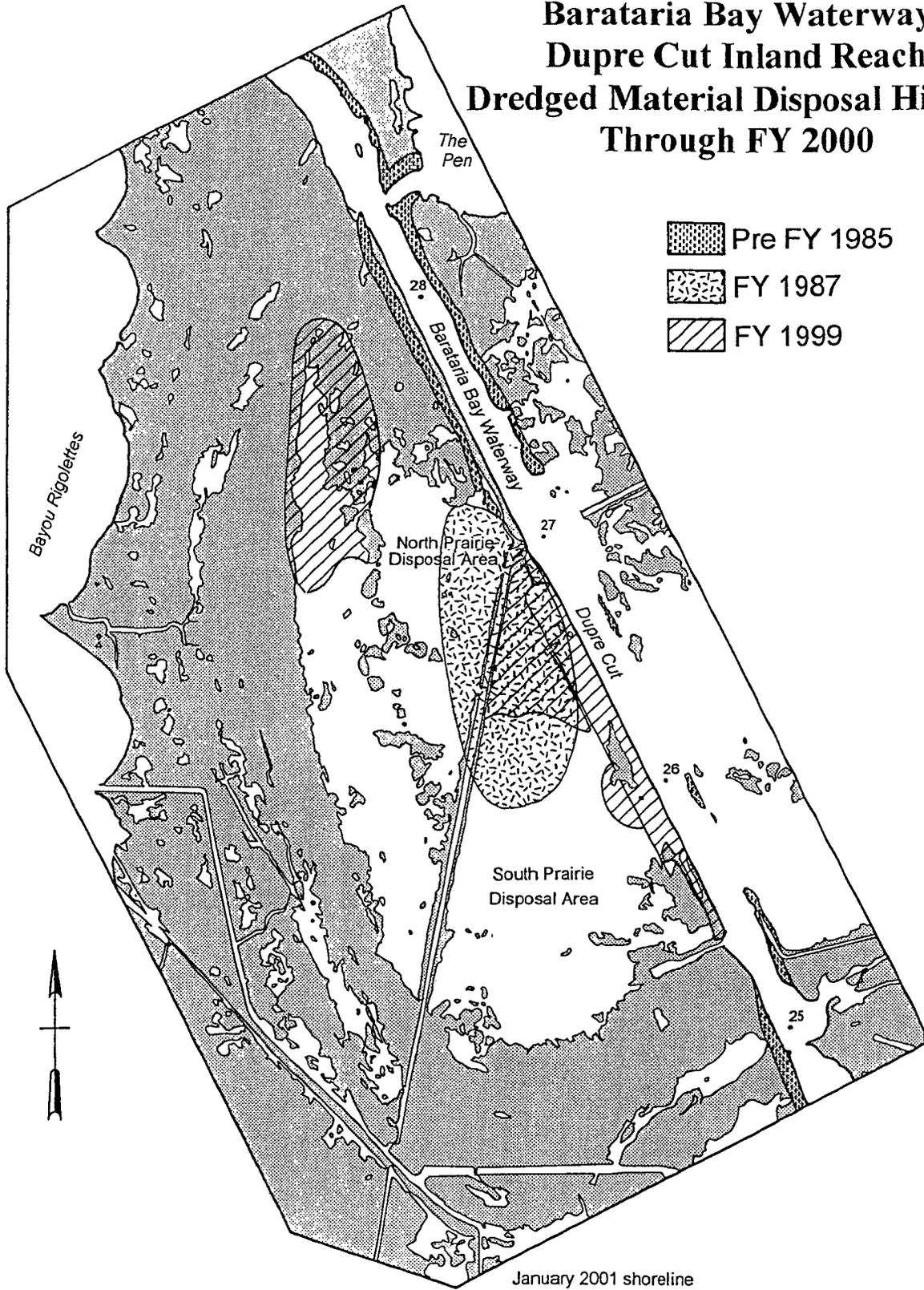
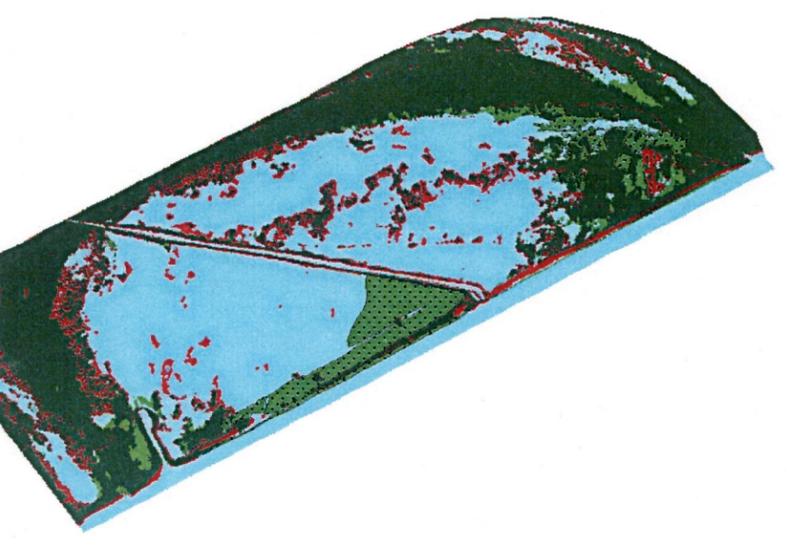
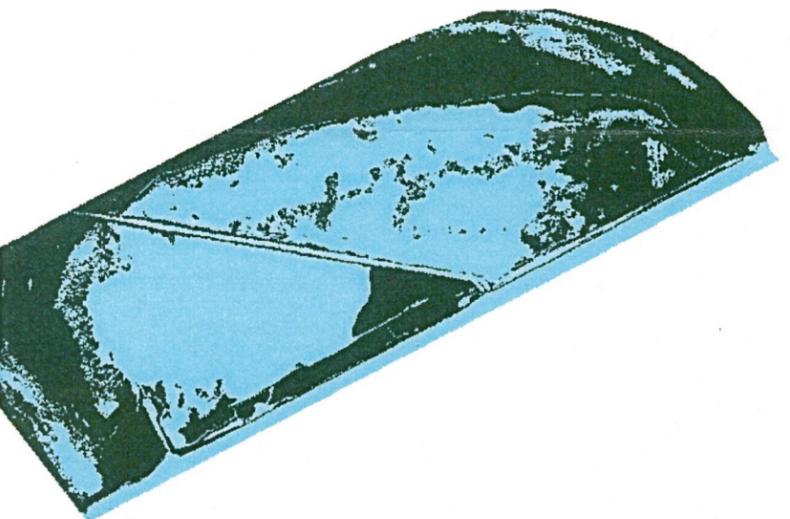
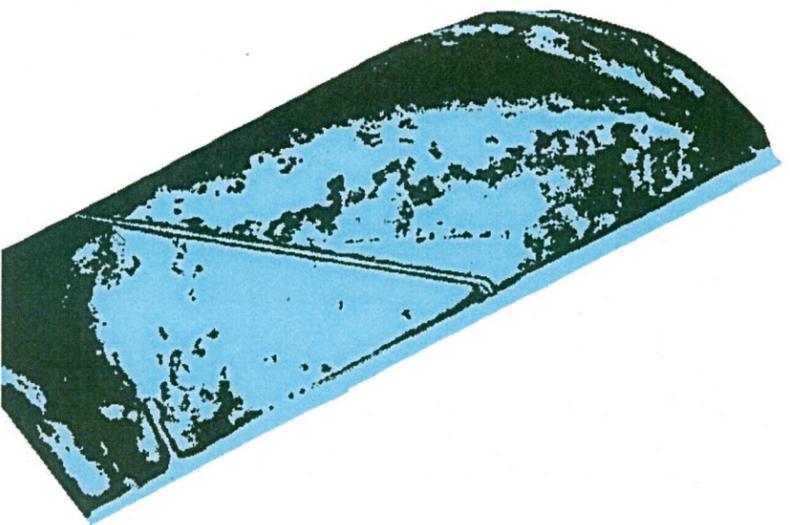


Figure 11. The dredged material disposal history for the upper Barataria Bay Waterway navigation channel - Inland Reach (Dupre Cut) BUMP study area in Louisiana.



LEGEND

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

Figure 5 Cumulative Landscape Change for Barataria- Inland: 141 Acres

BENEFICIAL USE OF DREDGED MATERIAL DISPOSAL HISTORY
HOUMA NAVIGATION CANAL, LA
Through FY 2000

The Rivers and Harbors Act of 1962 provided for the maintenance of a 15-foot-deep by 150-foot-wide channel from Houma, Louisiana, through Terrebonne Bay, and a 18-foot-deep by 300-foot-wide bar channel to the minus 18-foot contour constructed by local interests. Construction of the 150-foot-wide channel was completed in 1962, and the bar channel was enlarged to 300-foot width in 1974. Maintenance of discontinuous reaches of the channel have been accomplished on an as-needed basis since the Corps of Engineers assumed project maintenance in 1962.

Historically, material dredged from the Houma Navigation Canal during maintenance was deposited confined in upland confined disposal areas, along the bankline, and in open water.

Project maintenance is divided into three reaches: 1) inland reach Mile 36 to Mile 12 (Figure 2a), 2) Terrebonne Bay reach Mile 12 to Mile 0 (Figure 2b), and 3) bar channel /Cat Island Pass, Mile 0 to Mile -5 (Figure 2c). Only the Terrebonne Bay reach is included as the study area for this report. However, discussion of project maintenance of all three reaches is reviewed below.

Inland Reach (Mile 36-Mile 12)

Prior to FY 1991, material dredged from the inland reach has been deposited confined in upland disposal areas located on the east and west bank of the Houma Navigation Canal. During FY 1991 dredged material from the inland reach was placed confined into three marsh creation disposal sites as well as into upland confined areas. The maximum elevation of dredged material placement in the marsh creation disposal sites was +4 feet mean low gulf (MLG).

No maintenance was conducted in this reach of the Houma Navigation Canal in FY 1992, FY 1993, or FY 1994.

During FY 1995, maintenance was conducted in the inland reach near Mile 36 and dredged material was deposited in an upland confined disposal area.

No maintenance dredging was conducted in this reach in FY 1996 through FY 2000.

Terrebonne Bay Reach (Mile 12-Mile 0)

Prior to FY 1991, dredged material removed from this reach was placed either into confined disposal areas or into open water. In FY 1991, dredged material from the Terrebonne Bay reach was placed confined into upland disposal areas located opposite Mile 11.3 and Mile 10.3. Dredged material from the Terrebonne Bay reach also was placed confined for wetlands development at the Bay Chalant disposal site at Mile 7.1-Mile 8.0. Dredged material was placed to an elevation of no higher than +3.5 feet MLG. Dredged material from the Terrebonne Bay reach also was placed unconfined in open water approximately 1000 feet west of the Houma Navigation Canal.

No maintenance was conducted in this reach of the Houma Navigation Canal during FY 1992.

In FY 1993, dredged material from this reach was placed to an elevation no higher than +5 feet MLG in the confined disposal areas located opposite Mile 11.3 and Mile 10.3. Material was placed for wetlands development at the Bay Chaland disposal area at Mile 7.1-8.0 to a maximum disposal elevation of +3.5 feet MLG. Dredged material also was placed in open water approximately 1000 feet west of the Houma Navigation Canal centerline.

No maintenance was conducted in this reach during FY 1994.

In FY 1995, dredged material from this reach was placed confined in the disposal area located opposite Mile 10.3. Dredged material from this reach also was placed for wetlands development at the Bay Chaland disposal area. Prior to placing dredged material at Bay Chaland, retention dikes were constructed at the disposal area and capped with limestone. Dredged material was placed no higher than +3.5 feet MLG. Dredged material from this reach also was placed in open water approximately 1000 feet west of the Houma Navigation Canal centerline.

No maintenance dredging occurred in this reach during FY 1996 and FY 1997.

During the FY 1998 maintenance event (October, 1998 - May, 1999), approximately 1,130,884 cubic yards of dredged material were removed from the Terrebonne Bay reach (Mile 10.7 - Mile 1.0). Approximately 980,500 cubic yards of material from Mile 10.7 to Mile 5.0 were placed at the Bay Chaland disposal site for wetlands development. The dredged material was placed both within the existing Bay Chaland containment area and at an unconfined disposal site southeast of the containment area to an initial elevation of +4.0 feet MLG.

Figure 12A illustrates the dredged material disposal history for the study areas within the Houma Navigation Canal Terrebonne Bay reach since 1990.

Bar Channel/ Cat Island Pass (Mile 0- -5)

In the bar channel/Cat Island Pass reach, dredged material removed during routine maintenance between FY 1976 and FY 1990 was placed in the ocean dredged material disposal site (ODMDS) located on the east side of the channel.

During FY 1991, the New Orleans District obtained special funding and authority pursuant to Section 1135 of the Water Resources Development Act of 1986 to place dredged material from Cat Island Pass on Wine Island Shoal. The State of Louisiana and Terrebonne Parish jointly funded the construction of a retention dike encircling a 23-acre area at Wine Island Shoal.

No maintenance was conducted on this reach during FY 1992.

During 1992, Hurricane Andrew made landfall on the Louisiana coast causing significant property damage. State and Terrebonne Parish Governments supplied Federal Emergency Management Act funds to pay the costs of pumping dredged material to Wine Island Shoal. During FY 1993, these funds were utilized to place dredged material from this reach at Wine Island Shoal. Dredged material from this reach also was placed in the ODMDS during 1993.

No maintenance was conducted on this reach during FY 1994.

Prior to FY 1995, the New Orleans District designated two single-point discharge sites at two existing shoals for placement of dredged material. The two shoals are located within the ODMDS. The purpose of placing dredged material on the two shoals was twofold: 1) to concentrate material on the shoals; and 2) to monitor the natural transport of the material. If monitoring indicates dredged material placed on the shoals is transported or feeds sediments to barrier islands to the west of the canal, the New Orleans District would modify disposal operations to continue concentrating material at the shoals. To date, the results of monitoring neither support nor reject the hypothesis that the dredged material placed on the shoals is transported to the barrier islands.

During the FY 1995 maintenance of Mile 0.0 to -3.5 of the bar channel (May - June, 1995), approximately 479,749 cubic yards of material were placed at the single-point discharge sites in the vicinity of Mile -1.7. Approximately 536,643 cubic yards of material were placed at the single-point discharge site in the vicinity of Mile -2.5.

In FY 1998 (October, 1998 - May, 1999) during realignment of the channel in Cat Island Pass, approximately 608,810 cubic yards of dredged material were removed from the bar channel. Approximately 191,565 cubic yards of material were placed at the single-point discharge site at Mile -1.7 and approximately 417,245 cubic yards were placed at the single-point discharge site at Mile -2.5.

Figure 12B illustrates the dredged material disposal history for the study areas since 1985.

Houma Navigation Canal - Terrebonne Bay Reach Dredged Material Disposal History

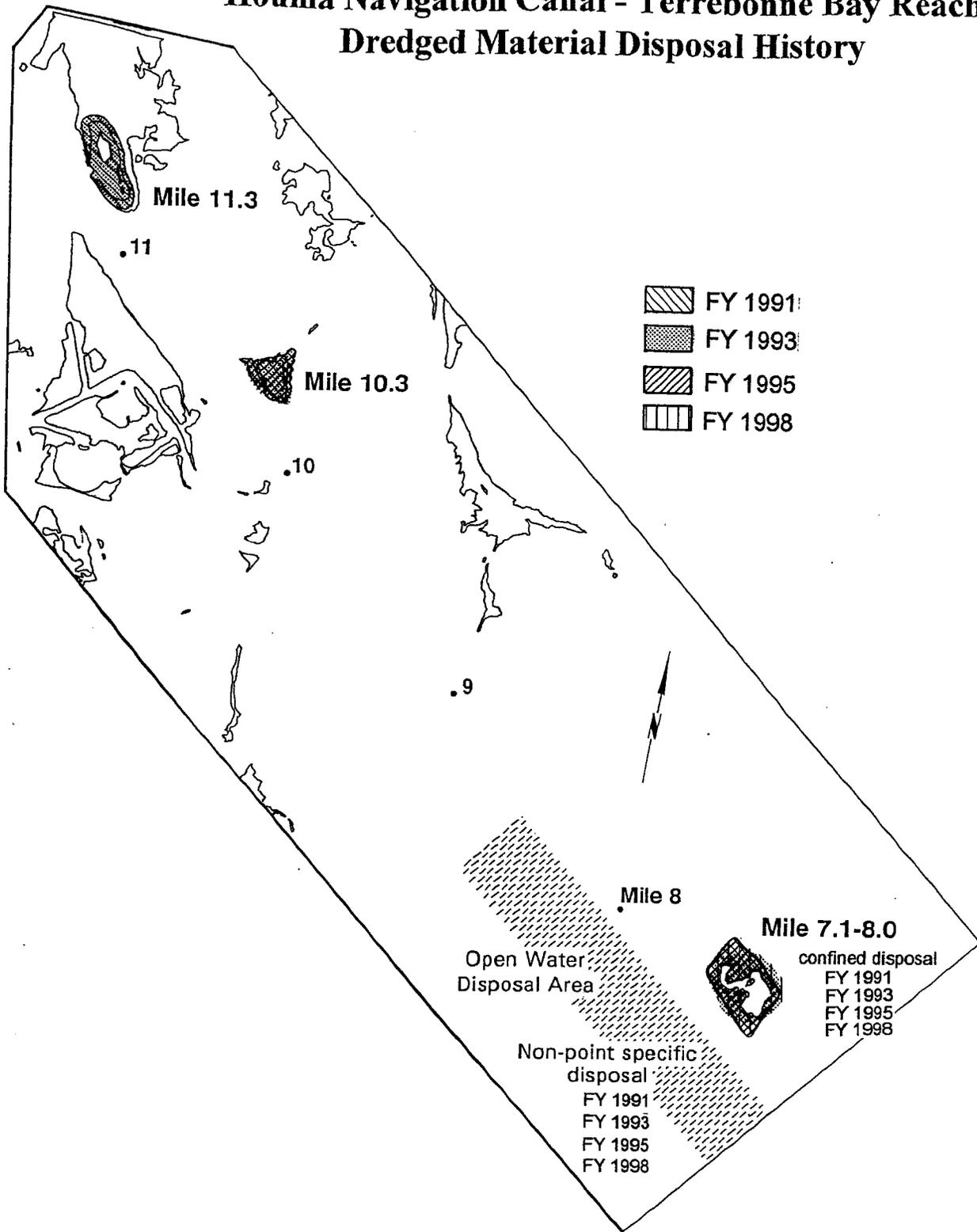
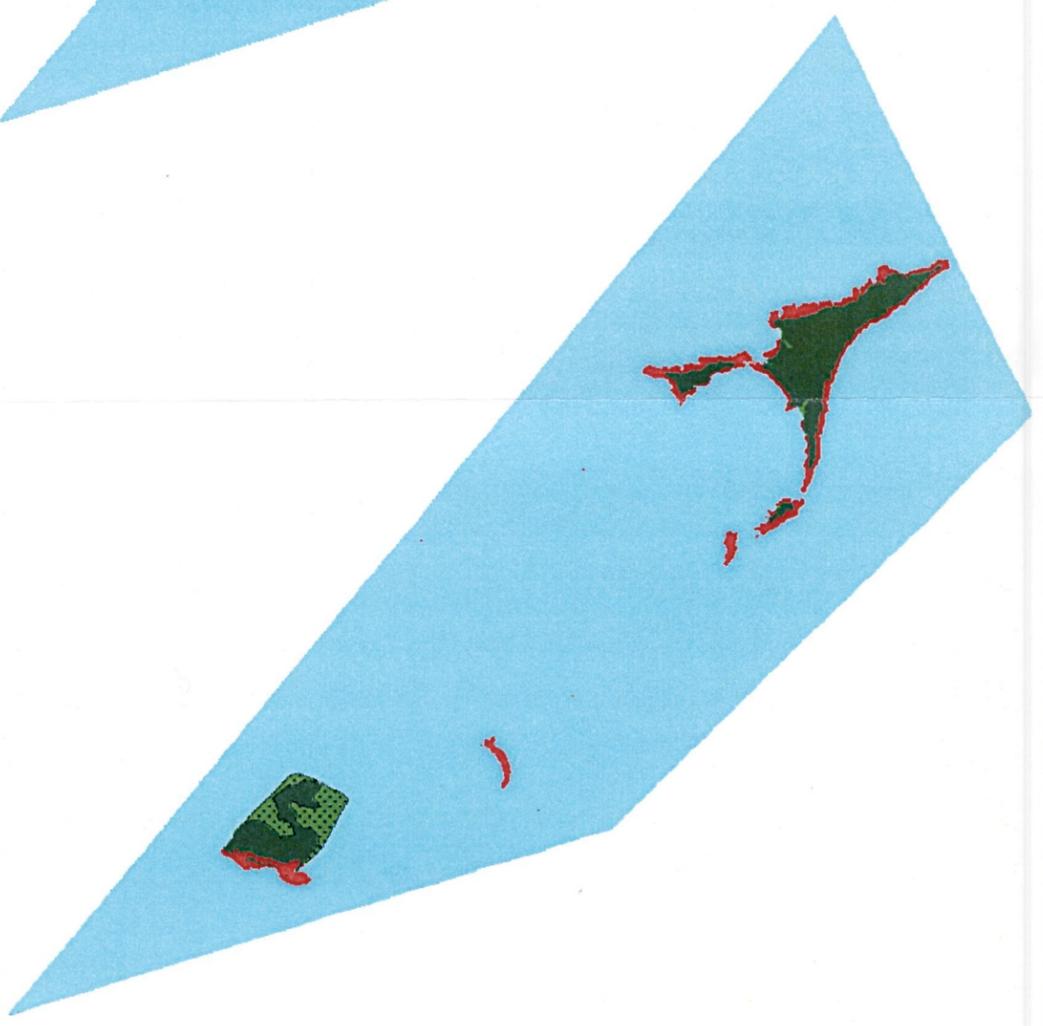
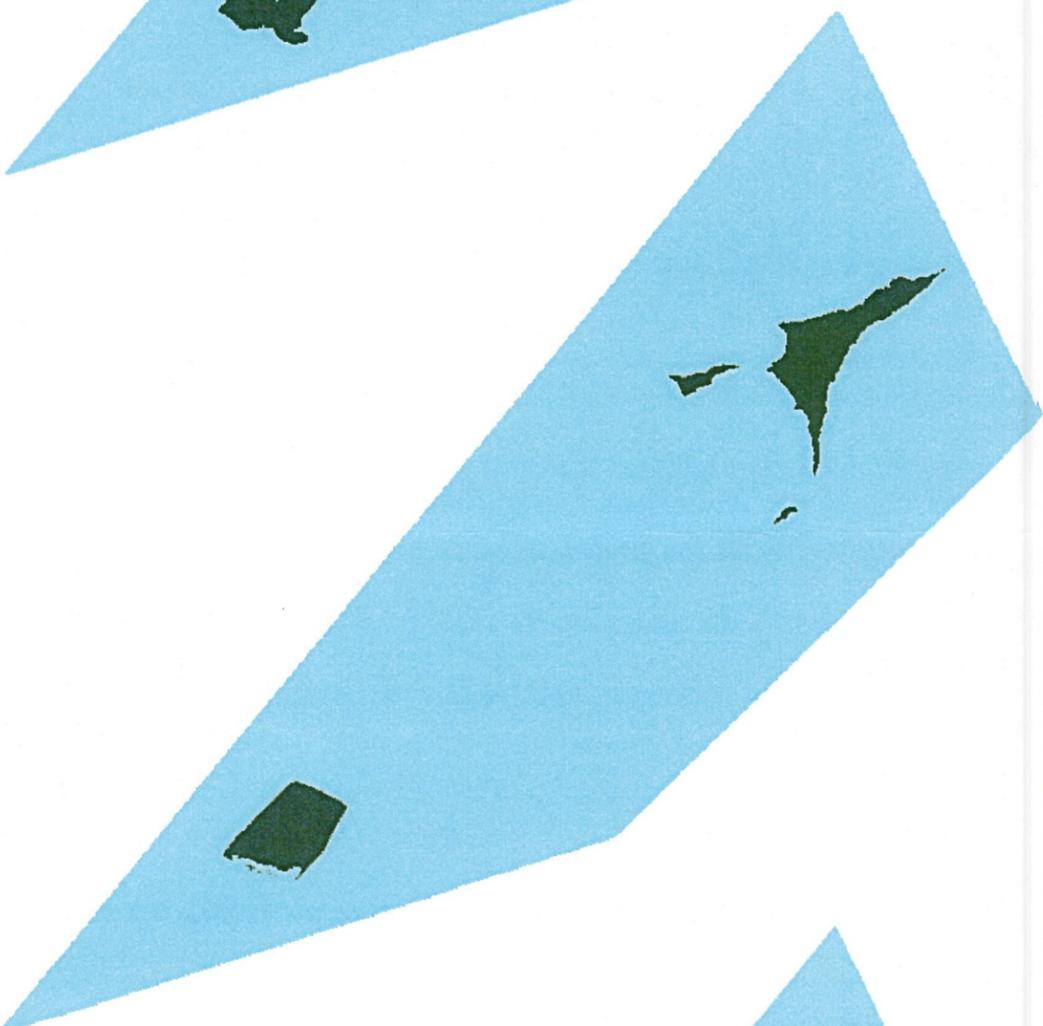
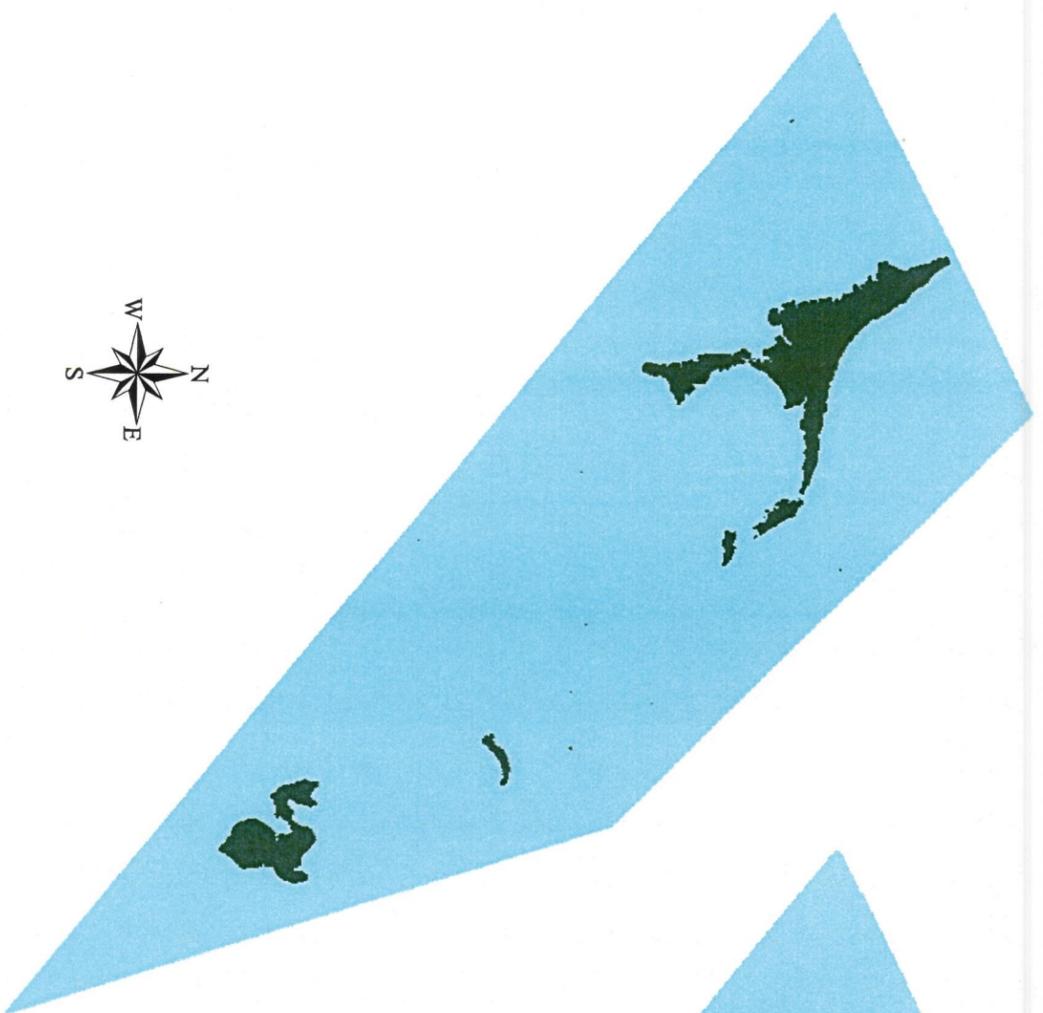


Figure 12A. The dredged material disposal history for the Houma Navigation Canal, Louisiana - Terrebonne Bay Reach BUMP study area 1990 through FY 2000.

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 11 Cumulative Landscape Change for Houma- Navigational Canal: 13 Acres

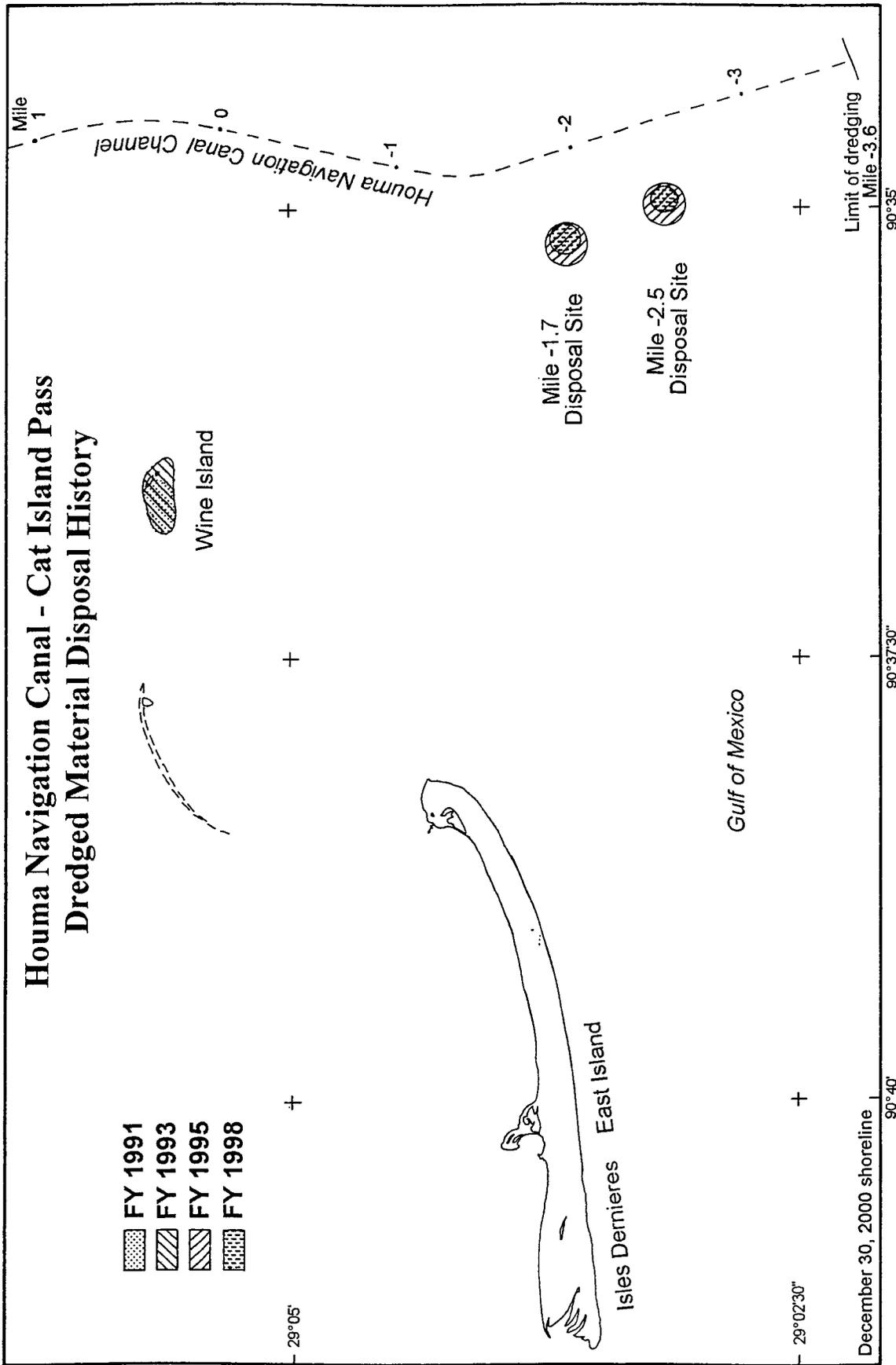
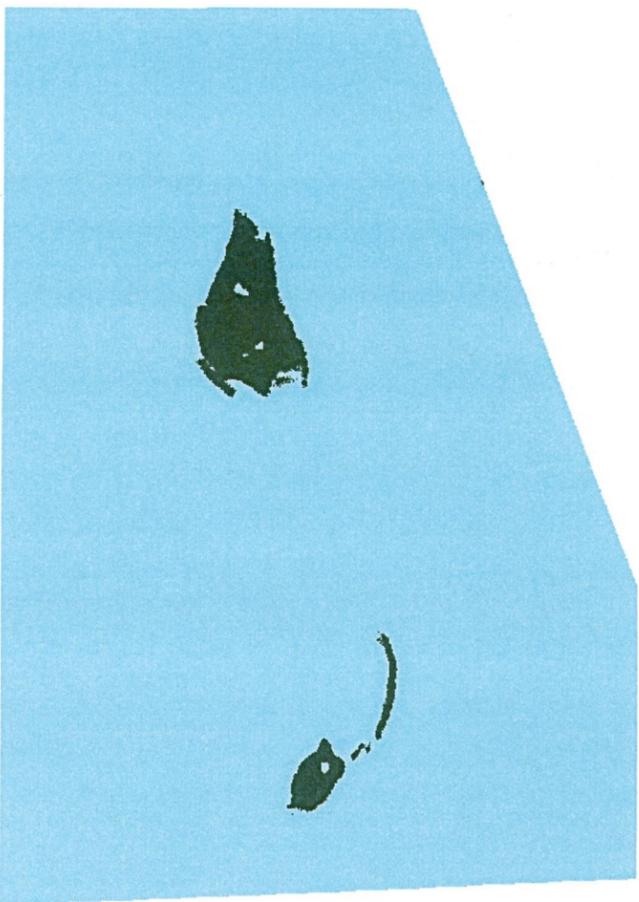
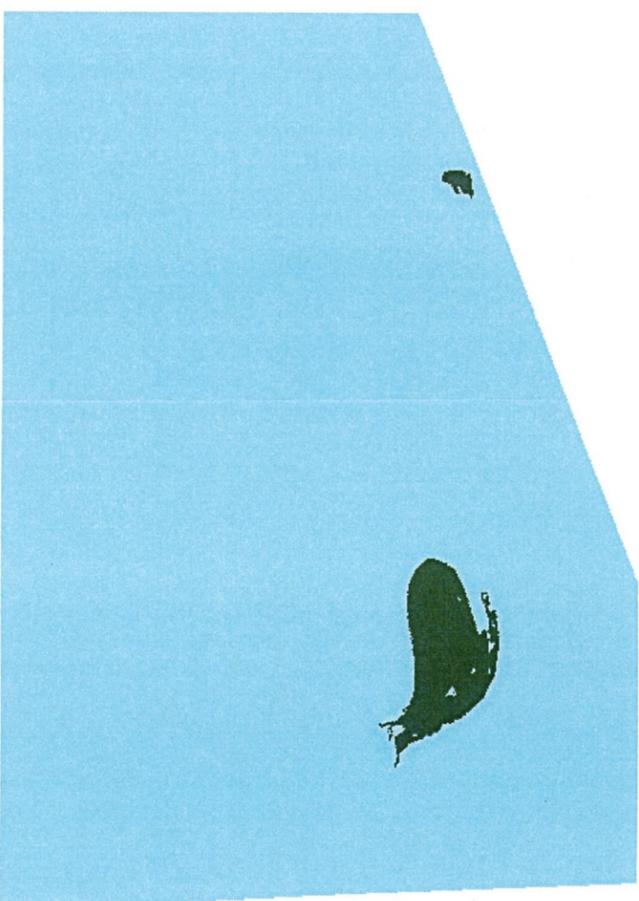


Figure 12B. The dredged material disposal history for the Houma Navigation Canal, Louisiana - Bar Channel/Cat Island Pass Reach BUMP study area through FY 2000.

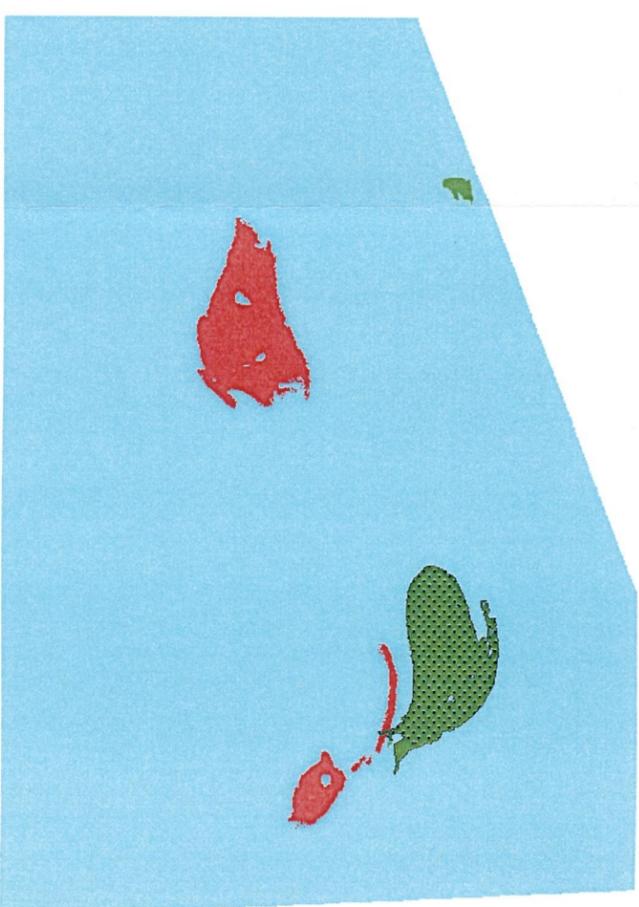
1985 Land-Water Classification



2000 Land-Water Classification



Change Detection: 1985-2000



LEGEND

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



Figure 12 Cumulative Landscape Change for Houma- Wine Island: 48 Acres

BENEFICIAL USE OF DREDGED MATERIAL DISPOSAL HISTORY
FRESHWATER BAYOU, LA
Through FY 2001

The Freshwater Bayou, Louisiana, project was authorized by the Rivers and Harbors Act of 1960, House Document 425, 86th Congress, 2nd Session. It provided for an enlargement of a navigational channel from the Gulf Intracoastal Waterway (GIWW) at Mile 161.2 west of the Harvey Lock to the 12-foot depth contour of the Gulf of Mexico west of Vermilion Bay. The authorized channel is 12 feet deep and 125 feet wide through the 20-mile long inland segment of the waterway, and 12 feet deep and 250 feet wide through a 4-mile long off-shore portion. Six additional feet of allowable overdepth and advanced maintenance dredging was also provided. This Act also provided for the construction of a lock 84 feet side, 600 feet long, and 16 feet deep. The construction of these provisions commenced in 1963 and was completed on August 26, 1968.

The inland reach (Mile 19.85 to Mile 1.3) begins at Freshwater Bayou Lock and extends to the GIWW. Approximately 2,500,000 cubic yards are removed from this reach each dredging cycle using a bucket and/or hydraulic cutterhead dredge. Dredging records dating back to 1970 indicate that the maintenance of discontinuous reaches of the 12-foot Gulf reach navigation project occurred biennially through 1985, at which time the frequency of dredging was changed and has commenced every 3 to 4 years since. Dredged material removed during the construction of the Gulf reach and all maintenance events through 1985 were placed in the ocean dredged material disposal site, located on the right descending bank of the channel.

Since 1990, dredged material has been placed unconfined at a beach nourishment disposal site on the west side of the channel and at the ocean dredged material disposal site. The beach nourishment disposal area extends from the beachline into the Gulf. The inner limit of the disposal area is 1,500 feet west of the channel centerline. During the fiscal year (FY) 1990 maintenance event (September 14, 1990 - October 17, 1990), about 251,507 cubic yards of dredged material were placed unconfined at the beach nourishment disposal site and 533,172 cubic yards were placed in the ocean dredged material disposal site.

During the FY 1994 event (March 11, 1994 - April 29, 1994), a total of 650,404 cubic yards of dredged material from the Mile 1.3 to Mile -1.3 reach were placed at the unconfined disposal site for beach nourishment. The dredged material was placed to an elevation no higher than +3.5 Mean Low Gulf (MLG). Approximately 338,637 cubic yards of material were placed in the ocean dredged material disposal site.

Approximately 843,385 cubic yards of dredged material from Mile 1.3 to Mile -4.0 were placed at the beach nourishment disposal site in the FY 2001 (November 23, 2000 to January 8, 2001). The dredged material was pumped to an elevation +2.0 feet MLG.

Figure 13 illustrates the dredged material disposal history through FY 2001 for Freshwater Bayou, and the general shoreline changes over the past 21 years for the study area. Notice that the east side of the channel has been experiencing shoreline retreat while the down-drift, west side of the channel has been experiencing shoreline progradation. This is opposite of the trend observed at channels with jetties that obstruct long-shore drift.

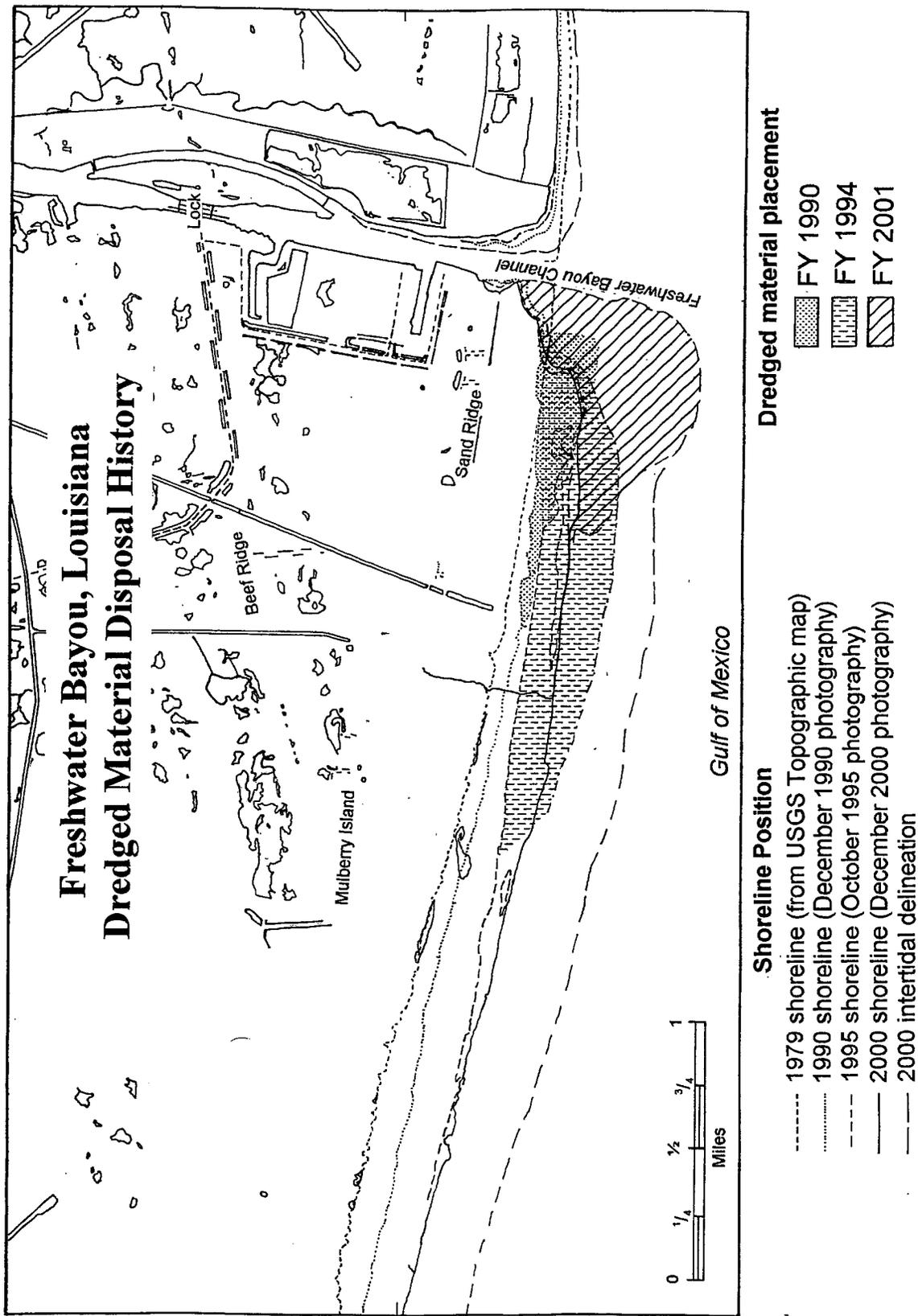
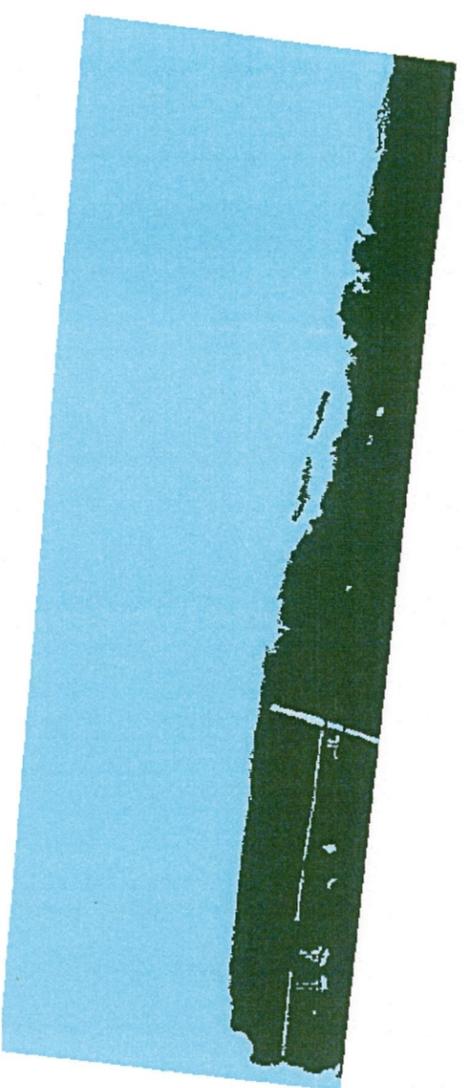
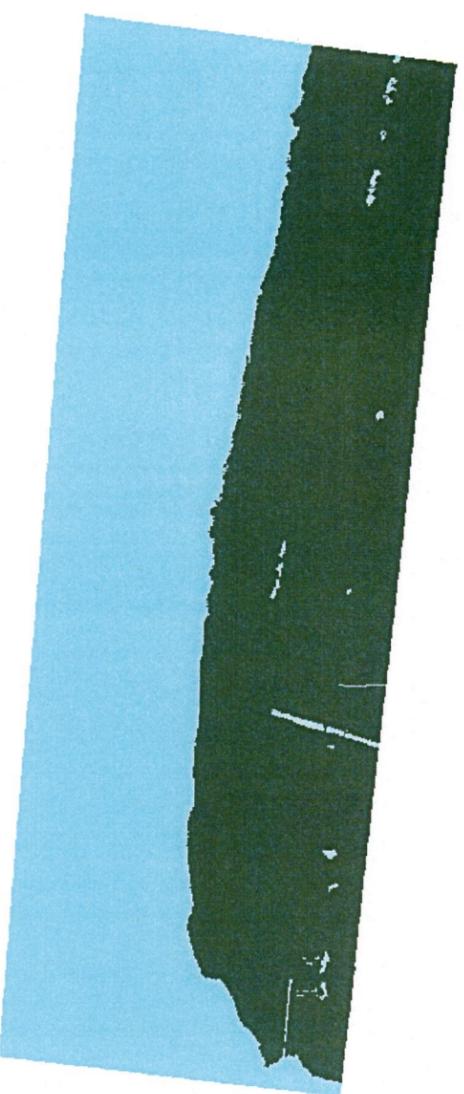


Figure 13. The dredged material disposal history and shoreline changes for the Freshwater Bayou, Louisiana BUMP study area, showing disposal through FY 2001.

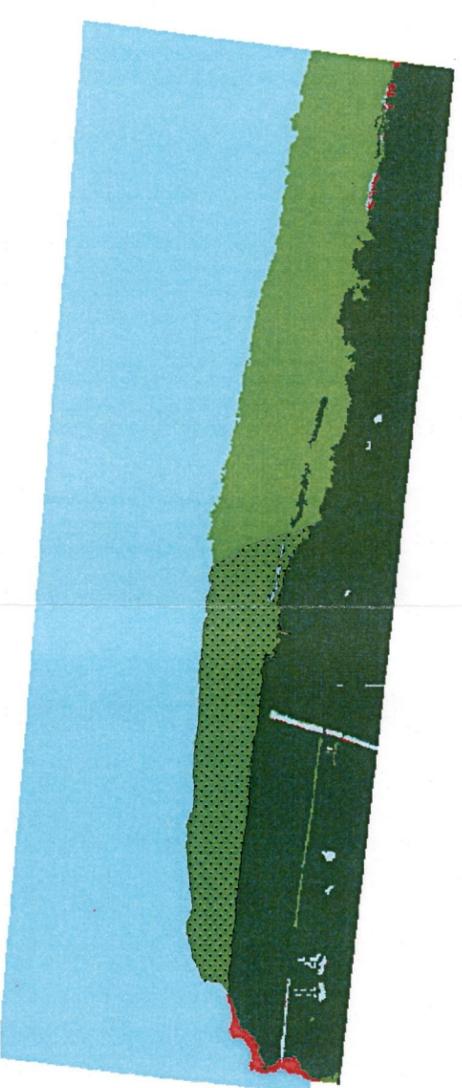
1985 Land-Water Classification



2000 Land-Water Classification



Change Detection: 1985-2000



LEGEND

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



Figure 10 Cumulative Landscape Change for Freshwater Bayou: 21 Acres

BENEFICIAL USE OF DREDGED MATERIAL DISPOSAL HISTORY
MERMENTAU RIVER, LA
Through FY 2000

The purpose of the Mermentau River, Louisiana project is to improve the discharge of flood flow in lower Mermentau River below Grand Lake and in the Inland Waterway from Vermilion Bay to Grand Lake; to improve navigation by enlargement of the North Prong of Schooner Bayou and Schooner Bayou Cutoff; and to maintain a navigational channel from Grand Chenier, Louisiana to the Gulf of Mexico, via the Lower Mermentau River, by removing bottom sediments with a hydraulic cutterhead dredge.

The Flood Control Act of 1941, as modified by the Rivers and Harbors Act of 1946, authorized enlargement of the Lower Mermentau River below Grand Lake to a minimum cross sectional area of 3,000 square feet below Mean Low Gulf (MLG) to accommodate discharge of flood flows; construction of a sector gated control structure in Mermentau River at Catfish Point, Mile 24; channel enlargement and realignment of the Inland Waterway from Vermilion Bay to Grand Lake to provide a minimum cross-sectional area of 3,000 square feet below Mean Low Gulf for discharge of flood flows and interflow between lakes; construction of a sector gated control structure in the enlarged channel near Schooner Bayou Lock; enlargement of the North Prong of Schooner Bayou and the Schooner Bayou Cut-off to a channel 6 by 60 feet at Mean Low Gulf level for navigation purposes. The Act further provides for incorporation into the Mermentau River, Louisiana Project, the existing projects: "Waterway for White Lake to Pecan Island, Louisiana" and that part of the "Inland Waterway from Franklin, Louisiana to the Mermentau River," west of Vermilion Bay. The Waterway from "White Lake to Pecan Island" consists of a channel 5 by 40 feet at Mean Low Gulf level.

The project was reclassified as an "Operation and Maintenance, General" project under the category, "Navigation (locks, dams, reservoirs and canals)" by authority of the Office, Chief of Engineers, in 1st Endorsement, 23 April 1956, on letter of the Division Engineer, U.S. Army Engineer Division, Lower Mississippi Valley, 6 March 1956, subject, "Classification of the Mermentau River and Bayou Teche and Vermilion River, Operation and Maintenance, General Projects."

A 4.6-mile channel from Grand Chenier to the Gulf of Mexico, described as "the Mermentau River, Gulf of Mexico Navigation Channel, LA, project," was constructed in 1971 by the East Cameron Port, Harbor, and Terminal District of Cameron Parish. Federal assumption of maintenance of this locally-constructed channel by USACE-NOD was authorized by Congress in 1976, under the Water Resources Development Act of 1976 (Public Law 94-587). Its point of entry is from the Mermentau River into Lower Mud Lake and extends in a southerly direction to the Gulf of Mexico.

The Mermentau River, Gulf of Mexico Navigation Channel, LA is maintained to a depth of -15.0 feet MLG over a width of 200 feet in the jetty and bar channel segments (from Mile 3.1 to Mile 1.2), and to a width of 100 feet in the inland segment from Grand Chenier at Mile 6.5 to the Gulf at Mile 3.1.

Usually about 1,000,000 cubic yards of material is removed from the Mile 6.5 to Mile 1.2 reach by cutterhead dredge every 3 to 4 years; the most recent dredging event occurred in late fall of 2000. The resultant dredged material is used to create wetlands in Lower Mud Lake and to attempt beach nourishment adjacent to the existing shoreline and west jetty. Until 1997, dredged material from the Gulf reach (Mile 3.1 to Mile 1.2) was placed in the Ocean Dredged Material Disposal Site (ODMDS) located on the right-descending bank of the bar channel.

History of Maintenance Dredging Events with a Beneficial Use Component

From November, 1962 through June, 1963, about 2,222,902 cubic yards of material were dredged from the Mermentau River from Mile -0.7 at the mouth of the Mermentau River in Vermilion Bay and to about Mile 13.0 of the waterway. Most of the material was placed in upland/confined disposal areas on either bank. However, at around Mile 6.5 in an area 1000 feet south of and parallel to the centerline of the channel, dredged material was placed in the upper part of Lower Mud Lake at a surface elevation not exceeding +3.0 feet MLG (Figure 14A). This could be considered the first example of beneficial use of dredged material for this waterway though likely unintentional. Due to the silty nature of the material, it probably would not stack any higher and settled to an elevation that encouraged wetland development for at least some time before erosion took its toll. At this time, the Mermentau River channel extended through the original mouth of the Mermentau River to the Gulf.

During FY 1982 (January 6 through February 21, 1982), USACE-NOD performed maintenance dredging of the “new” navigational channel from about Mile 6.2 at Grand Chenier through Mile 1.2 in the Gulf of Mexico (GOM). It was dredged by a hydraulic dredge and the dredged material was placed in one of three locations: an area about 500 yards west of the channel centerline in Lower Mud Lake at an elevation not to exceed +5.0 feet MLG in an effort to create marsh; in a confined disposal area on the east bank of the channel just north of the GOM shore; and in the ODMDS.

During FY 1985 (January 8 through January 27, 1985), maintenance of the Mile 6.2 to Mile 1.2 reach of the channel took place again. Approximately 724,000 cubic yards were removed from the channel and placed in the following designated disposal areas: the Lower Mud Lake disposal area west of the channel with the maximum elevation specified to not exceed +5.0 feet MLG; the ODMDS; and a new area identified as a “shoreline restoration area” in the near open waters west of the west jetty. High tidal energy in the last disposal area prevented subaerial accumulation of material.

The next maintenance event occurred during FY 1986 (March 15 - June 10, 1986), and extended from Mile 6.2 to about Mile 24.0 of the Mermentau River (not within study area). Most of the material was placed in confined disposal areas (dike height elevations ranging from +3.0 to +5.0 feet MLG) on either side of the waterway. Efforts were undertaken to create a bird island 2 to 3 acres in size in open water in the southern part of Upper Mud Lake. Due to the very soft nature of the dredged material, an island only one-half acre in size could be created, with a maximum height of +4.3 feet MLG. Tide elevation of +3.0 feet MLG rendered approximately 2000 square feet of subaerial island area.

During FY 1987 (June 22 through July 16, 1987), a cutterhead dredge removed material from Mile 6.2 to the GOM reach. All dredged material was placed in the same three disposal areas west of the channel used in 1985. The only difference in disposal was that the dredged material placed in the shoreline restoration areas was deposited at a minimum distance of 500 feet west of the existing jetty.

The next maintenance dredging event for this Mile 6.2 to GOM reach occurred during FY 1991 (April 29 through June 10, 1991). Material removed by cutterhead dredges was placed unconfined in the same disposal locations as happened in the 1987 maintenance event except that no material was placed in the ODMDS. About 390,000 cubic yards of dredged material normally placed in the ODMDS was placed in the lower southeast corner of the Lower Mud Lake disposal area, with a final average fill height of +3.5 feet MLG. No cubic yardage amounts were available for the disposal into the upper part of the Lower Mud Lake disposal area or into the shoreline restoration area. Elevation of dredged material in the shoreline restoration averaged about +4 to +4.5 feet MLG along the beachline. In this particular disposal area, dredged material was initially placed about 250 to 300 feet from the existing shoreline creating a "bar" and then material was placed in the area between the "bar" and the existing shoreline, with some material overflowing the "bar" gulfward by about 200 feet. The entire disposal area extended westerly for approximately 300 feet.

During FY 1996 (April 10, 1996 through May 22, 1996), dredged material from maintenance of the Mile 6.5 to Mile 1.2 reach was placed into the Lower Mud Lake disposal area which was subdivided into "Cell A" and "Cell B"; into the shoreline restoration area; and into the ODMDS. Cell A received approximately 234,778 cubic yards of dredged material while Cell B received about 172,362 cubic yards of material (the dredged material height did not exceed +4.0 feet MLG in either area). The shoreline restoration area and ODMDS received about 355,799 and 272,496 cubic yards of material, respectively. Dike work was required for this maintenance event prior to disposal in Lower Mud Lake. Dikes on the channel side of the Lower Mud Lake disposal areas were built to a surface elevation of +6.0 feet to prevent backflow of dredged material into the channel. The dikes constructed to contain the dredged material within the disposal cells were limited to a surface elevation of +4.0 feet MLG, and dredged material disposal surface heights in Cells A and B were restricted to +4.0 feet MLG.

The next maintenance dredging event for this reach occurred during FY 2000 (September 26, 2000 - November 9, 2000). Hydraulically removed dredged material was placed for beneficial use into the Lower Mud Lake disposal area (509,104 cubic yards) and into the shoreline restoration area (829,000 cubic yards). The Lower Mud Lake disposal area was divided into two areas, one on each side of a small channel leading from the navigational channel into Lower Mud Lake. Dike work was done to confine dredged material in the disposal area located on the south side of the small channel. The elevation of the containment dike was +4.0 feet MLG and the dredged material surface elevation was also restricted to +4.0 feet MLG. The average height of the dredged material in the shoreline restoration area was about +3.0 feet MLG with most of the buildup occurring near the jetty closure and along the shoreline.

Figure 14A illustrates the dredged material disposal history for the study area in detail between FY 1963 and FY 1987. Figure 14B illustrates the more recent dredged material disposal history up to

FY 2000, showing FY 1991 through FY 2000 disposal in detail.

Mermentau River, Louisiana

Dredged Material Disposal History

FY 1963 through FY 1987

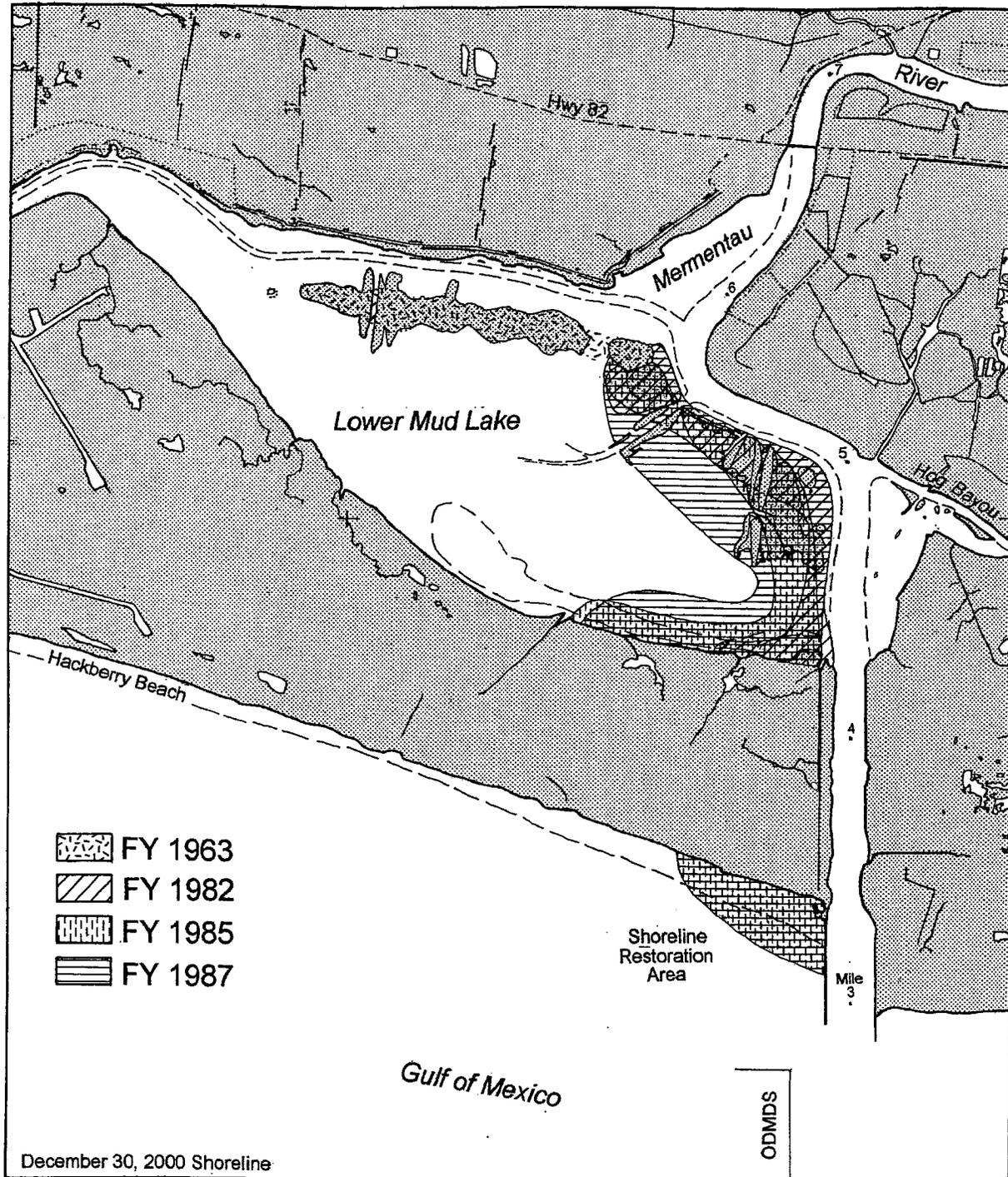


Figure 14A. The dredged material disposal history for the Mermentau River, La. BUMP study area, showing disposal through FY 1987. More recent disposal is detailed on the following figure.

Mermentau River, Louisiana Dredged Material Disposal History Through FY 2000

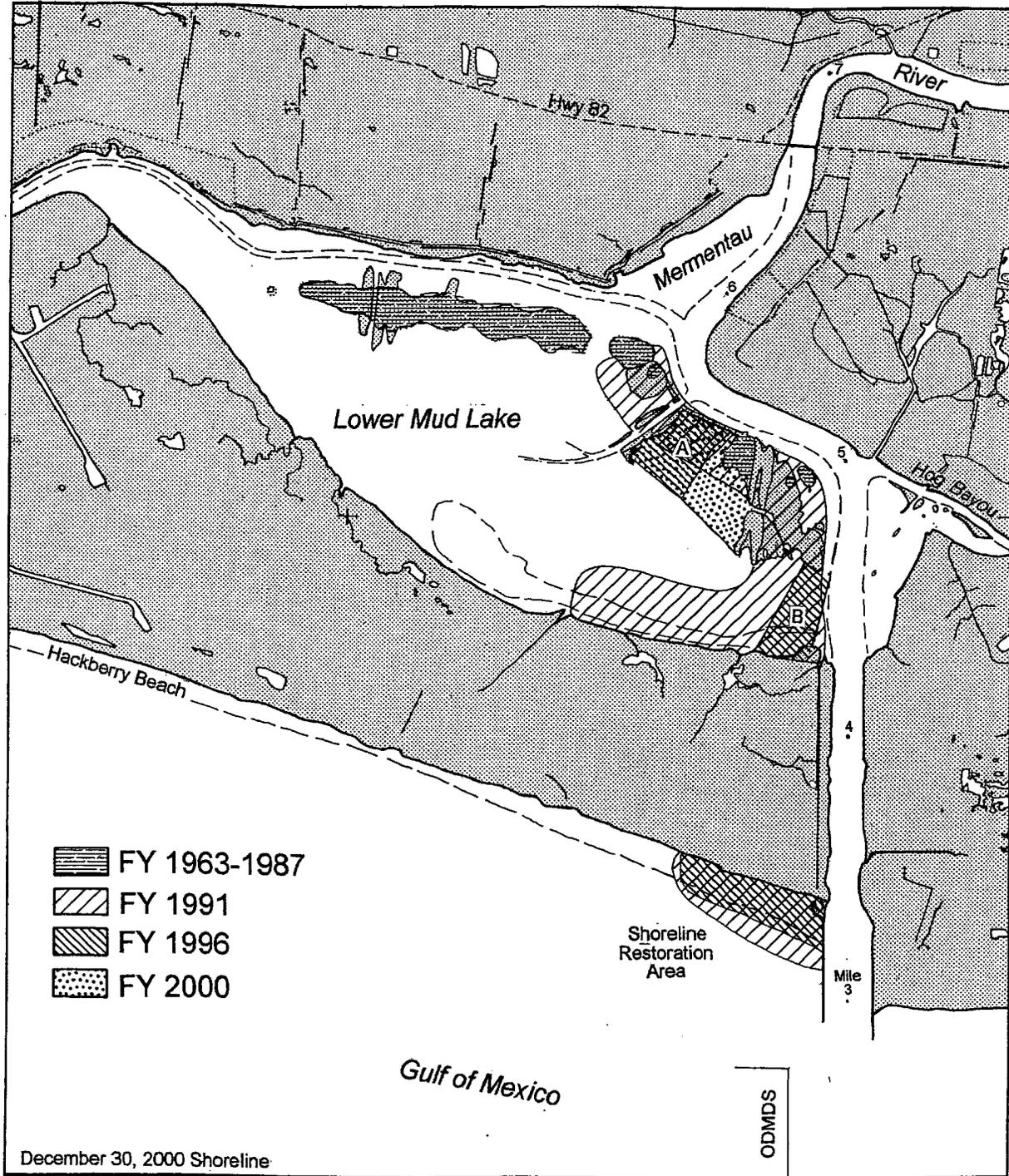
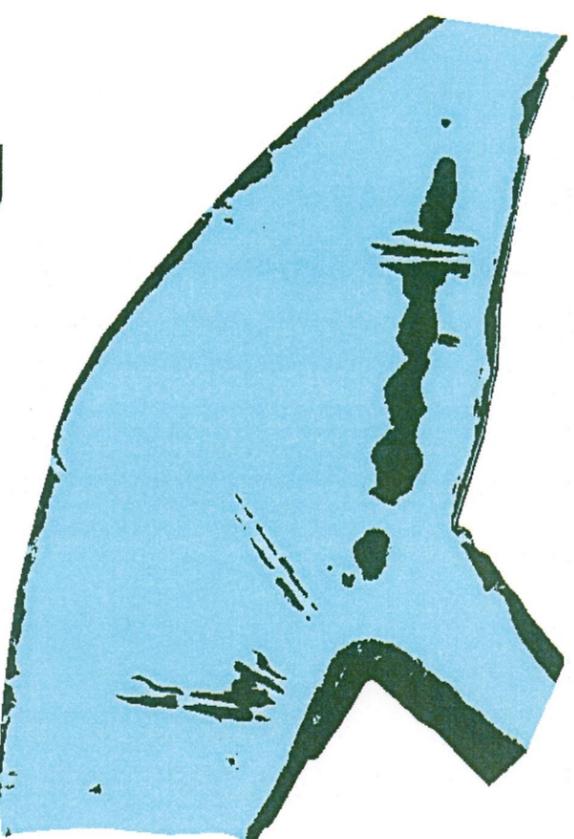


Figure 14B. The dredged material disposal history for the Mermentau River, Louisiana BUMP study area, showing disposal through FY 2000. Disposal prior to FY 1991 is detailed on previous figure.

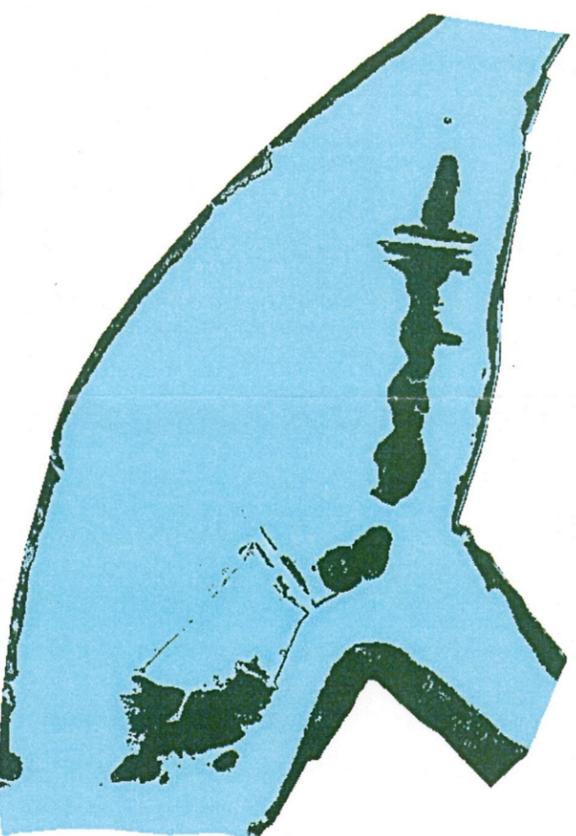
1985 Land-Water Classification

Lower Mud Lake



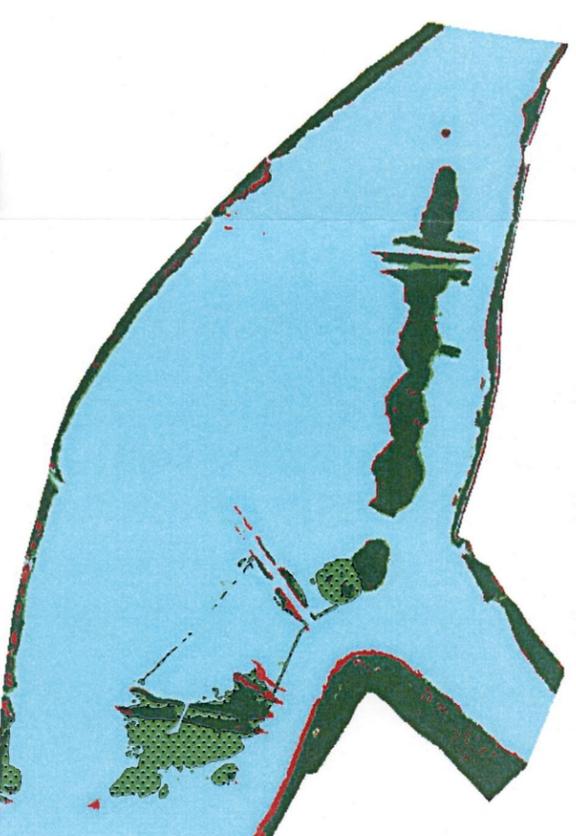
2000 Land-Water Classification

Lower Mud Lake



Change Detection: 1985-2000

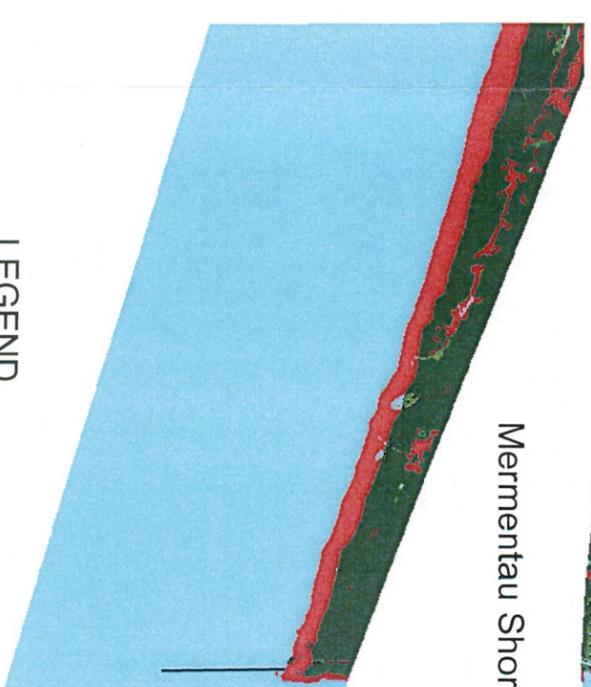
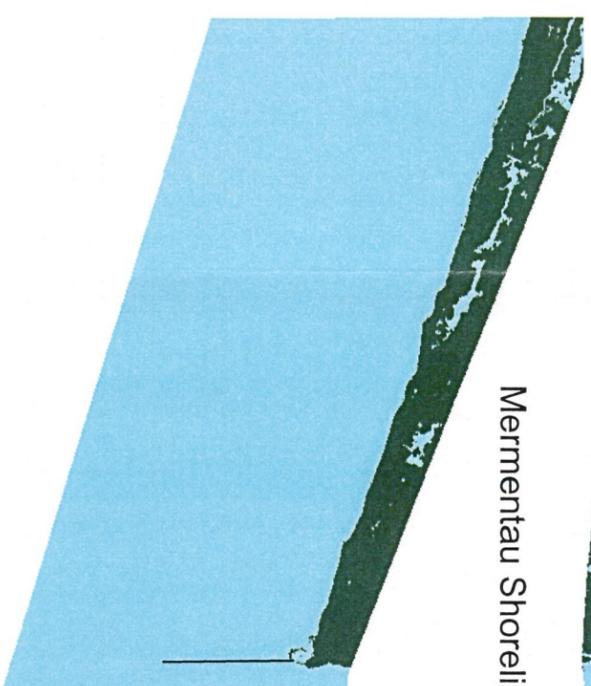
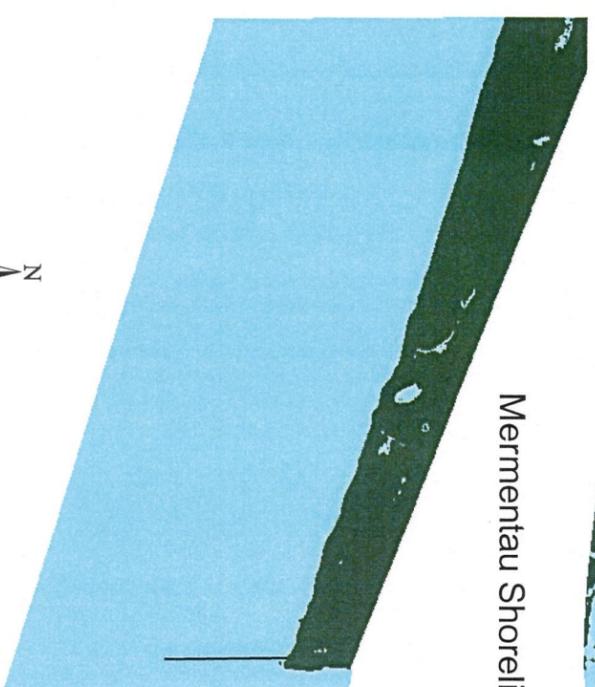
Lower Mud Lake



Mermentau Shoreline

Mermentau Shoreline

Mermentau Shoreline



LEGEND

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



Figure 13 Cumulative Landscape Change for Mermentau: 63 Acres

BENEFICIAL USE OF DREDGED MATERIAL DISPOSAL HISTORY
CALCASIEU RIVER AND PASS, LA
Through FY 2000

The Calcasieu River and Pass, Louisiana, project consists of a number of individual projects designed to improve navigation from the Gulf of Mexico to port facilities in and around Lake Charles, Louisiana, and to prevent salt water intrusion in the river above Lake Charles.

The Rivers and Harbors Act of July 24, 1946, House Document 190, 79th Congress, 2nd Session and prior Rivers and Harbors acts authorized the USACE-NOD to construct and maintain a channel 35 feet deep and 250 feet wide from the wharves of the Lake Charles Harbor and Terminal District (including the Loop around Clooney Island) to the Gulf of Mexico, via Calcasieu Lake and through Calcasieu Pass; a channel 35-37 feet deep and 250 feet wide between the jetties; and an approach channel 37 feet deep and 400 feet wide seaward to the 37-foot depth contour in the Gulf of Mexico. This act also authorized reconstruction and extension of improvement of the river from Lake Charles to Phillips Bluff by removing logs, snags, overhanging trees and dredging. Construction of these channel improvements was completed in April, 1953.

The Rivers and Harbors Act of July 14, 1960, House Document 436, 86th Congress, 2nd Session authorized modification of the existing project to provide an approach channel having a depth of 42 feet below Mean Low Gulf (MLG) over a bottom width of 800 feet from the 42-foot depth in the Gulf of Mexico to the jettied channel; a channel between the jetties varying in depth from 42 to 40 feet at the seaward end and shoreline, respectively, over a bottom width of 400 feet; a channel 40 feet deep over a bottom width of 400 feet from the shoreline at Mile 0.0 to the wharves of the Port of Lake Charles at Mile 34.1; enlargement of the existing turning basin at Mile 29.6 to a depth of 40 feet; a mooring basin at about Mile 3.0 having a width of 350 feet, a length of 2000 feet, and a depth of 40 feet; extension of the ship channel at a depth of 35 feet below MLG over a bottom width of 250 feet from the wharves of the Port of Lake Charles, Mile 34.1, to the vicinity of the bridge on U.S. Highway 90, Mile 36.0; a turning basin of the same depth at the upper end having a width of 750 feet and a length of 1000 feet; and maintenance of the existing channel 12 feet deep and 200 feet wide from the ship channel to Cameron, Louisiana, via the old channel of the Calcasieu River. Construction under this modification was initiated in April, 1962, and completed in October, 1968.

The Rivers and Harbors Act of October 23, 1962, House Document 582, 87th Congress, 2nd Session authorized construction of a salt water barrier structure with five 40-foot tainter gates in a new bypass channel; a parallel channel with navigation structure and a single sector type gate; an earth closure dam; and a woven lumber type revetment. The salt water barrier was completed in January, 1968.

The Senate Public Works committee on December 27, 1970, and the House Public Works committee on December 15, 1970, adopted resolutions giving the USACE-NOD authority to construct and maintain the project at Devil's Elbow under the provisions of Section 201 of the Flood Control Act of 1965 (Public Law 89-298; S.D. 91-111). This project involved enlarging 2.3 miles of the existing industrial channel to a 40-foot depth over a bottom width of 400 feet; a ½ mile

eastward extension of the enlarged channel; and the construction of a 1200-foot by 1400-foot turning basin south of the extended channel at its landward end. Construction of the Devil's Elbow Industrial Channel was begun in 1976 and completed in 1978.

Construction and maintenance of the Calcasieu River at Coon Island, Louisiana, project was authorized under Section 107 of the Rivers and Harbors Act of 1960, as amended by Section 310 and Section 112 of the Rivers and Harbors Acts of 1965 and 1979, respectively. The project consists of deepening and widening to -40 feet by 200 feet for a distance of 6,943 feet, and the existing turning basin to -40 feet by 750 feet by 1000 feet. Construction of this project commenced in 1973 and was completed in 1974.

Dredging records dating back to 1949 indicate that maintenance of discontinuous reaches of the inland reach and bar channel of the 35-foot navigation project occurred on an annual basis from 1953 to 1962. Dredged material from construction and all maintenance events within the inland reach (Mile 34.1 to Mile 0.0) was placed in confined disposal facilities or placed unconfined in open water in Calcasieu Lake. Material from the bar channel was placed in open water off the right-descending bank of the navigational channel.

Maintenance of discontinuous reaches of the inland reach (Mile 36.0 to Mile 0.0) and/or the bar channel of the deep-draft/40-foot navigation project has occurred every year since project completion except for 1970, 1974, 1977 and 1982. Maintenance dredging of the inland reach is accomplished using hydraulic cutterhead pipeline dredges; hopper dredges are used for maintenance of the bar channel. Dredged material removed during construction of the inland reach and during all maintenance events until 1983 was placed into confined disposal facilities located on either side of the channel. Dredged material from maintenance of the deep-draft channel in the bar is placed in open water off the right-descending bank of the navigational channel.

The first beneficial use of dredge material from maintenance of the Calcasieu River and Pass, Louisiana, navigational channel took place in 1983 (April 5, 1983 - July 28, 1983) as part of the maintenance of the Mile 5.0 to Mile 22.7 reach. Approximately 20,000 cubic yards of dredged material was placed at two sites within the Sabine National Wildlife Refuge off the right-descending bank of the channel adjacent to the Mile 10 in an attempt to stabilize the bank and restore eroded wetlands (Figure 15A). Earthen dikes were constructed on the channel-side of these open water disposal areas to prevent the flow of dredged material back into the navigational channel; however, no other dikes were constructed. The maximum height of the dredged material placed in these disposal areas was +4.0 feet Mean Low Gulf (MLG).

During the 1985 maintenance of the Mile 5.0 to Mile 22.7 reach (August - December, 1985), the open water areas located between the 1983 sites on Sabine National Wildlife Refuge were used for the placement of dredged material. Earthen dikes were constructed on the channel-side of these areas and dredged material was placed in the same manner as in 1983 except that earthen dikes also were constructed perpendicular to the channel on the north and south sides of these sites to keep the dredged material off the 1983 sites.

In 1992, the USACE-NOD designated shallow open water areas in the vicinity of Brown Lake and

in the Sabine National Wildlife Refuge pursuant to Section 404 of the Clean Water Act for the placement of dredged material from maintenance of the navigational channel for wetlands restoration. These areas had been identified as alternatives for the placement of dredged material for beneficial use during development of the Long Term Disposal Plan/Dredged Material Management Plan for the Calcasieu River and Pass, Louisiana, project; however, use of the sites required special authority and funding because placement of dredged material into these sites was beyond the Base Plan.

Prior to the 1993 maintenance of the Mile 5.0 to Mile 22.7 reach, Congress provided authorization and funding for the beneficial use of dredged material in association with maintenance of the navigation project in the Fiscal Year 1993 Energy and Water Appropriation Act. The USACE-NOD also sought and received authority and funding pursuant to Section 1135 of the Water Resources Development Act of 1986 for the beneficial use of dredged material at Sabine National Wildlife Refuge. The state of Louisiana was the non-Federal sponsor for the Section 1135 project. Detailed plans for the placement of dredged material at both Brown Lake and the Sabine National Wildlife Refuge were developed in coordination with state and Federal natural resources agencies, the Sabine National Wildlife Refuge manager, and private land owners.

During the 1993 maintenance event (February 26 - August 23, 1993), dredged material from Mile 5.0 to Mile 22.7 was placed at both Brown Lake and within the Sabine National Wildlife Refuge to restore wetlands. Five (5) contiguous containment cells were constructed on the eastern side of Brown Lake (Figure 15B). Containment dikes were constructed to a height sufficient to contain the dredged material to a maximum height of ~~+3.0~~^{+5.3} feet MLG. The interior dikes were constructed to allow the containment cells to be filled in pairs; dredged material was placed directly into one cell and the effluent from that cell passed through the next adjacent cell. Dredged material discharge was into cell #1, #2, #3, and #5. Approximately 756,000 cubic yards of material removed from Mile 18.0 to Mile 19.3 were placed in the Brown Lake containment cells during this event.

At Sabine National Wildlife Refuge, containment dikes were constructed only along the navigational channel and along the north bank of West Cove Canal; no back dikes were required (Figure 15A). Approximately ~~78,000~~^{1,830,343} cubic yards of dredged material removed from Mile 7.8 to Mile 12.2 of the navigational channel were placed in the refuge north of West Cove Canal. The maximum initial height of the dredged material was +4.0 feet MLG.

The USACE-NOD placed additional dredged material from maintenance of the Mile 5 to Mile 22.7 reach of the navigational channel in the Sabine National Wildlife Refuge pursuant to Section 204 of the Water Resources Development Act (WRDA) of 1992 during the 1996 maintenance event (May, 1996 - January 1997). The state of Louisiana was the non-federal sponsor for this project. The Sabine National Wildlife refuge staff and other state and Federal natural resources agencies participated in the development of the disposal plan. Containment dikes were constructed along the south bank of West Cove Canal and along the east bank of Hog Island Gully (Figure 15A). Approximately 1,291,236 cubic yards of material removed from Mile 7.0 to Mile 11.5 of the navigational channel were placed in the refuge south of West Cove Canal. The initial height of the dredged material slurry was +5.0 feet MLG.

During the 1998 maintenance of the Mile 14.0 to Mile 26.0 reach of the navigational channel (October, 1998 - July, 1999), the USACE-NOD obtained authority and funding under Section 204 of WRDA 1992 to place dredged material removed from Mile 16.5 to Mile 21.0 at Brown Lake. The state of Louisiana was the non-federal sponsor for this project and the property manager and other state and Federal natural resources agencies participated in the development of the disposal plan. The primary disposal site for this event consisted of four (4) additional contiguous containment cells, "A", "B", "C", and "D", constructed on the western side of Brown Lake (Figure 15B). Four (4) of the cells constructed during the 1993 maintenance event, cells #2, #3, #4, and #5, were specified as a secondary disposal site to be used if the primary disposal site could not contain all of the material from the specified reach. Although the contract specified that the perimeter dikes be constructed to a height of +8.0 feet MLG, soil conditions at the primary disposal site precluded construction of dikes at cell "C" and "D" to this height. Perimeter dikes at cells "A" and "B" were constructed to +8.0 feet MLG; dikes at cells "C" and "D" were built to +6.5 feet and +6.8 feet MLG, respectively. Low-level internal dikes constructed to +5.0 feet MLG separated the cells in the primary disposal area and allowed effluent to flow from one cell to the next. The dredged material discharge was directed into cell "A". Approximately 1,233,539 cubic yards of dredged material were placed into the primary disposal site before the discharge was placed in cell #2 of the secondary disposal site. The elevations of the dredged material slurry in the cells at the primary disposal site at the time that discharge therein was halted were as follows: in "A" +6.2 feet MLG to +6.0 feet MLG; in "B" +6.0 feet MLG to +4.4 feet MLG; in "C" +4.1 feet MLG to +4.0 feet MLG; and in "D" +3.9 feet MLG. Approximately 727,100 cubic feet of material was placed in cell #2 of the secondary disposal site. The elevation of the dredged material slurry in cell #2 was limited to +6.0 feet MLG.

The USACE-NOD again received Section 204 authority and funding to place dredged material from the Mile 5.0 to Mile 14.2 reach of the navigational channel in Sabine National Wildlife Refuge during the 1999 maintenance event (July - November, 1999). The state of Louisiana was the non-Federal sponsor for this project, and the Sabine National Wildlife Refuge staff and other state and Federal natural resources agencies participated in the development of the disposal plan. Perimeter dikes were constructed to an elevation of +8.0 feet MLG along the north bank of West Cove Canal and on the east and west boundaries of the disposal site; a low level dike was constructed to an elevation of +4.5 feet MLG along the northern boundary of the disposal site (Figure 15A). Approximately 1,394,000 cubic yards of dredged material from the Mile 7.0 to Mile 11.5 reach of the navigational channel was placed into the disposal site. The elevation of the dredged material slurry was limited to +5.0 feet MLG. A booster pump was required to pump the dredged material from the navigational channel to this disposal site.

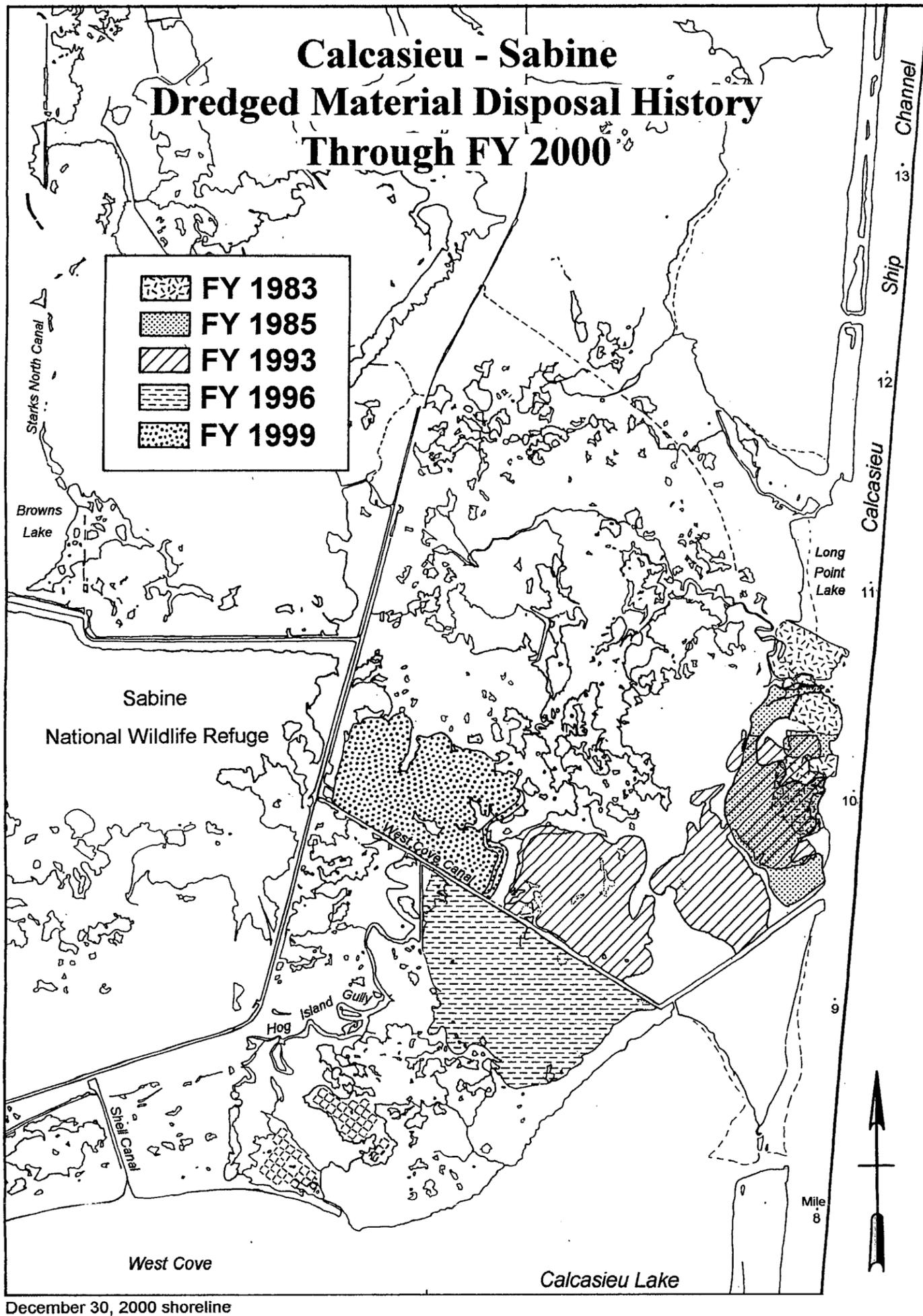
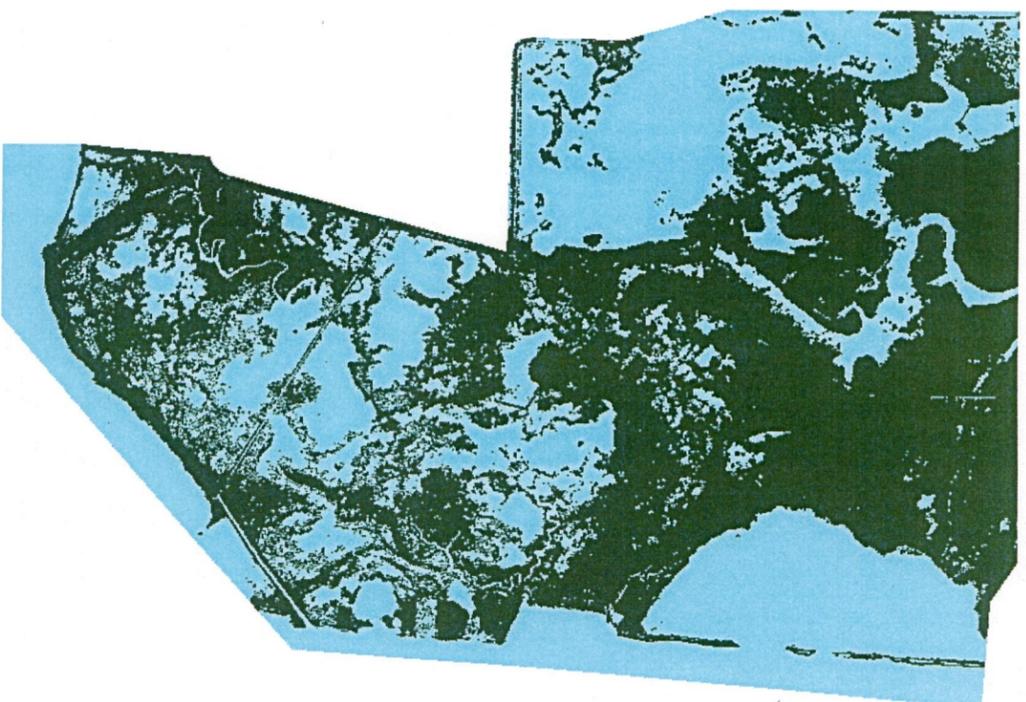
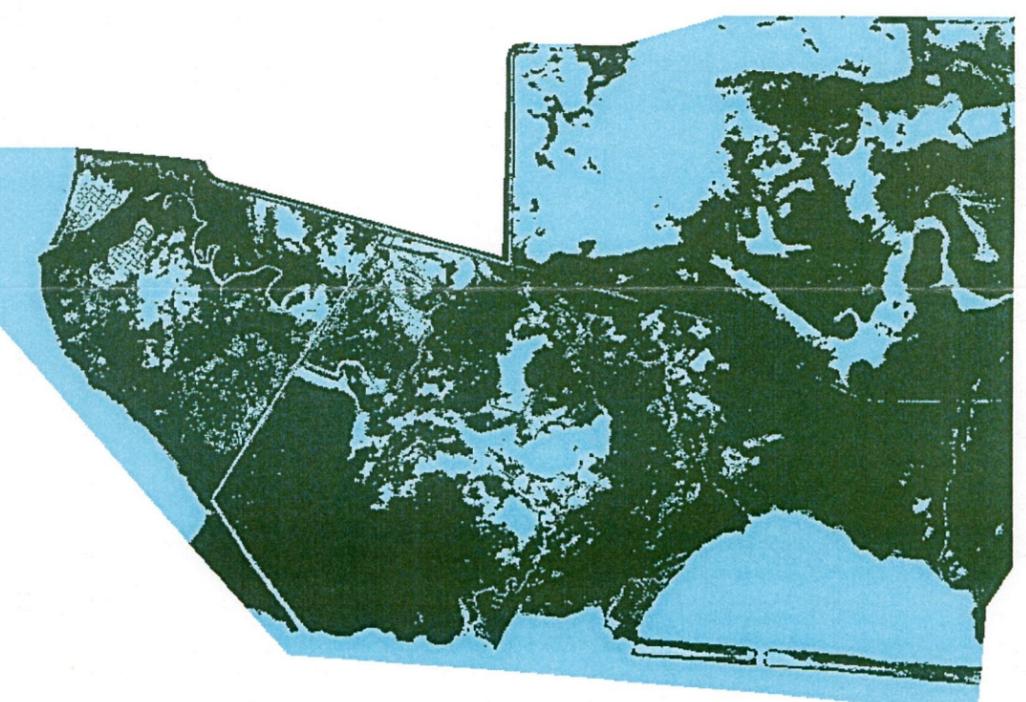


Figure 15A. The dredged material disposal history for the Calcasieu River and Pass, Louisiana - Sabine National Wildlife Refuge BUMP study area, showing disposal through FY 2000.

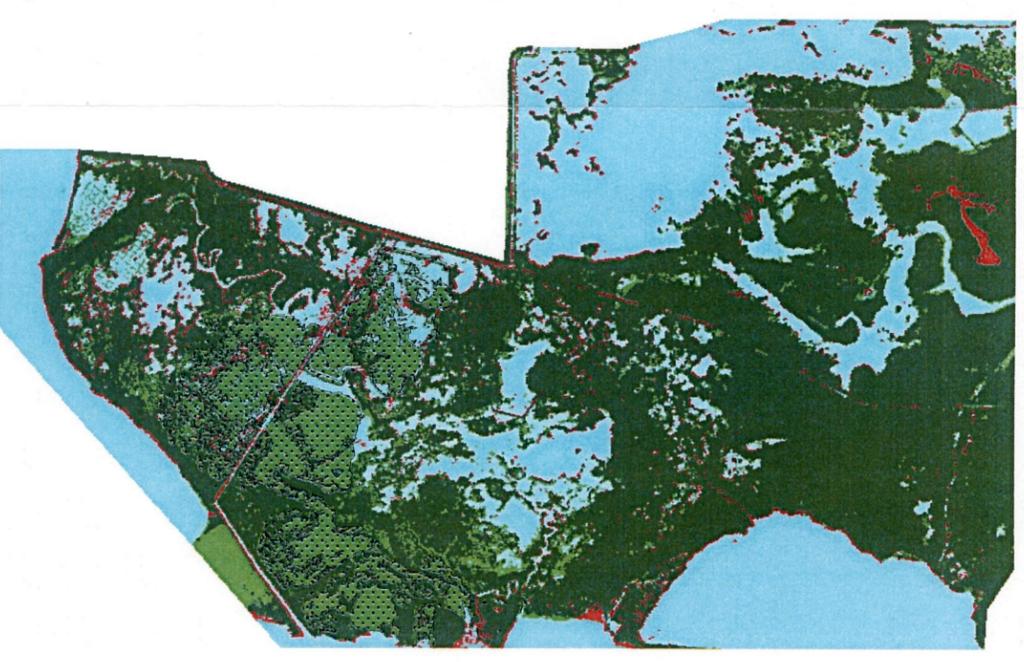
1985 Land-Water Classification



2000 Land-Water Classification



Change Detection: 1985-2000



LEGEND

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



Figure 9 Cumulative Landscape Change for Calcasieu Sabine: 745 Acres

Calcasieu - Brown Lake Dredged Material Disposal History Through FY 2000

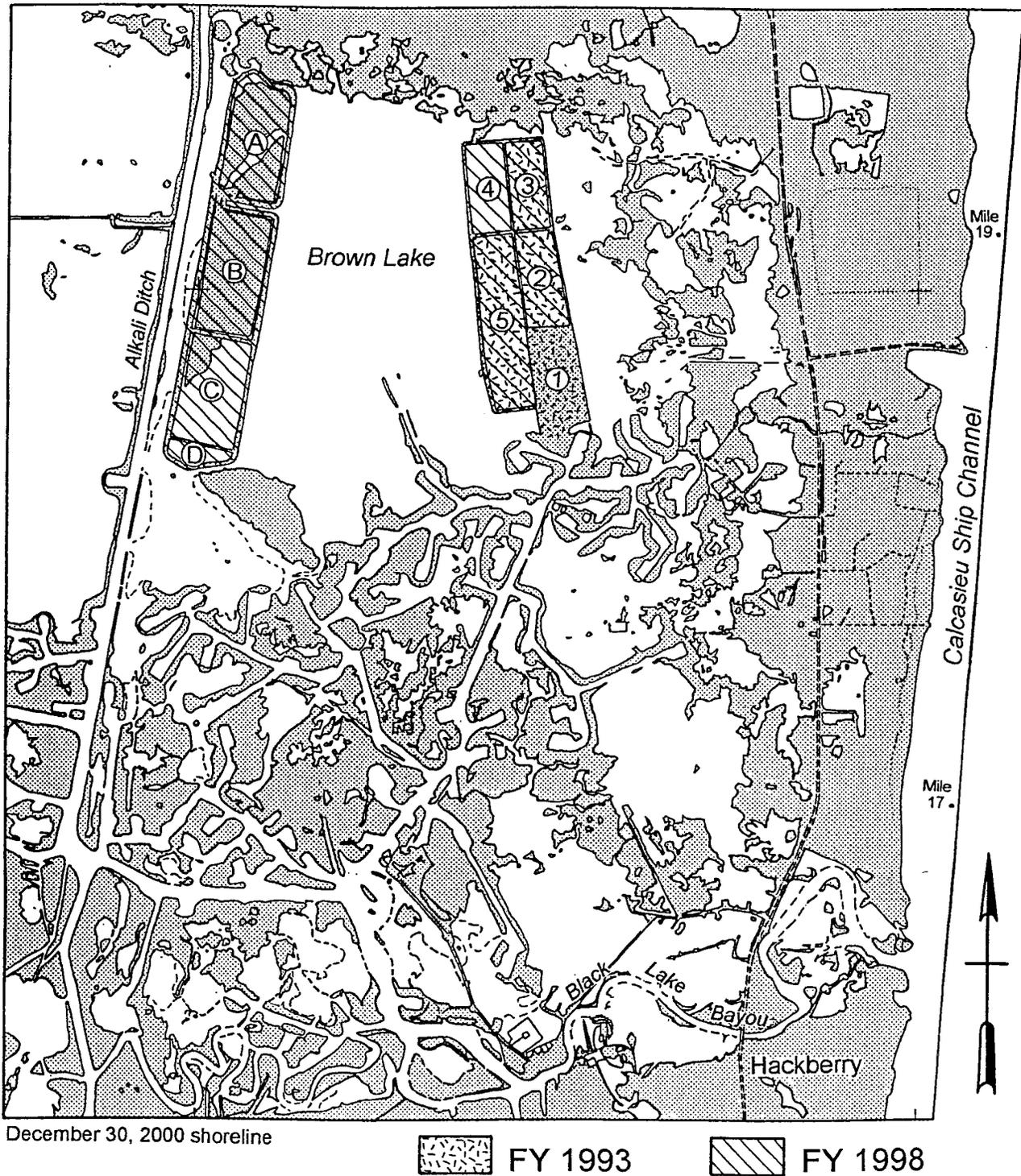
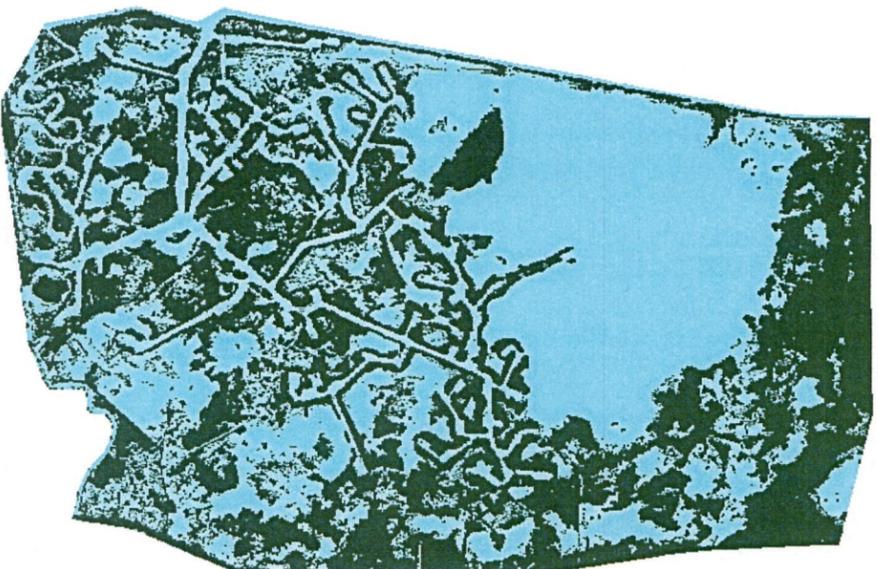
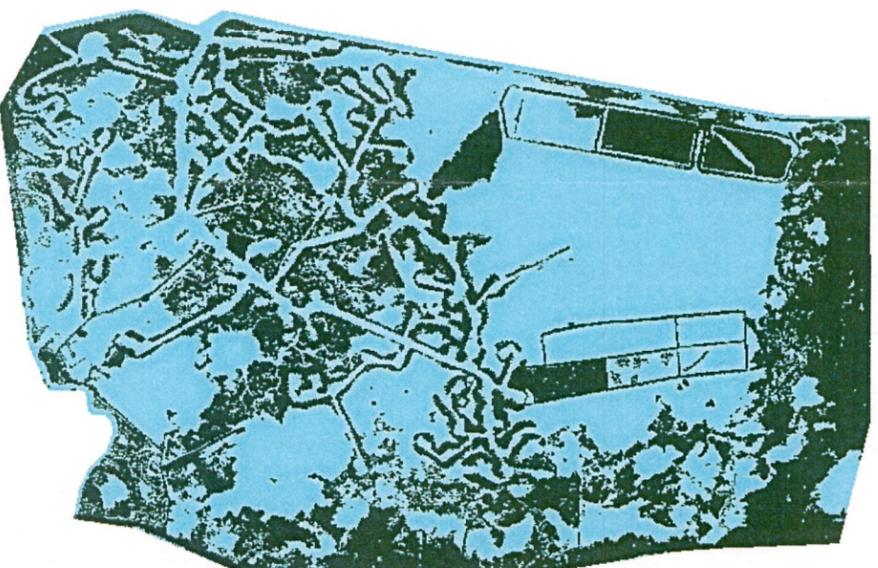


Figure 15B. The dredged material disposal history for the Calcasieu River and Pass, Louisiana - Brown Lake BUMP study area, showing disposal through FY 2000.

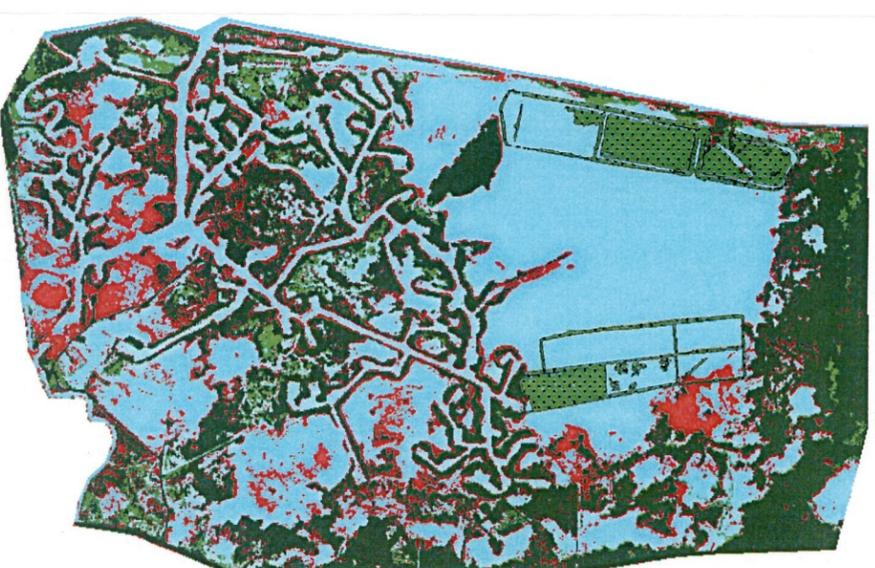
1985 Land-Water Classification



2000 Land-Water Classification



Change Detection: 1985-2000



LEGEND

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



Figure 8 Cumulative Landscape Change for Calcasieu- Brown Lake: 195 Acres

**NAVIGATION, DREDGING, AND
BENEFICIAL USE OF DREDGED MATERIAL DISPOSAL HISTORY
MISSISSIPPI RIVER, BATON ROUGE TO THE GULF OF MEXICO, LA
SOUTHWEST PASS
Through FY 2000**

The natural distributaries of the Mississippi River have been used as navigational channels by Europeans since 1682 when La Salle explored the mouth of the river. The site of New Orleans was selected in the early 1700s, and levee construction began as early as 1717 at New Orleans to control flooding. By 1726 a levee 5400 feet long, 18 feet wide and 3 feet high had been constructed. By 1735, levees extended on both sides of the river from 30 miles above New Orleans to 12 miles below, and by 1858 extended to the Ohio River. The effect of the levee system was largely to contain floodwaters within the river channel. Although the levees decreased the number of crevasses that occurred during flood stage of the river, they increased the intensity of the crevasses which did occur, and the modern delta experienced an overall growth in area between 1890s to the mid 1920s.

In 1720, only South Pass of the Mississippi River was utilized for navigation. However, since most commerce came from an easterly direction, a pilot station known as *Balize* was established on an island off of Balize Bayou which was a distributary of Northeast Pass. The Balize settlement was destroyed before 1767 by a flood and the pilot station was moved to the north shore of Northeast Pass. By the late 1700s, Northeast Pass was being surpassed by Pass a Loutre as a main navigational channel, and South Pass had shoaled considerably. Southwest Pass had the greatest water depth over the distributary mouth bar, and by 1813, had become the major channel. Between 1852 and 1869, attempts to increase the depth of the channel at Southwest Pass and Pass a Loutre included jettying, dredging the channel mouth bar, blasting mudlumps, agitation of the bottom with steam-driven propellers, and dragging iron harrows across the bar. None of these techniques were successful and bar deposits soon reformed when attempts ceased. The building of jetties at Southwest Pass commenced in 1902 and was largely completed in 1908, although work on the project continued for nearly another decade, including damming of upstream subsidiary channels (Morgan 1977).

During the first half of the 1900's, the Mississippi River's Southwest Pass (SWP) navigational channel was maintained to a 35-foot depth. The Rivers & Harbors Act of 1945 authorized a 40-foot deep by 800-foot wide navigational channel, and in 1961 the SWP navigational channel was enlarged to achieve a 40-foot depth. The Rivers & Harbors Act of 1985 authorized a 55-foot deep channel. The SWP navigational channel is currently maintained by the USACE-NOD at a 45-foot depth and 750-foot width between Mile 4.0 Above Head of Passes (AHP) to Mile 17.5 Below Head of Passes (BHP). Between Mile 17.5 BHP and Mile 22.0 BHP the navigational channel is maintained to a 45-foot depth and 600-foot width. Construction to enlarge the channel dimensions to the current 45-foot maintained depth began in 1987. The 45-foot channel was completed from SWP to Mile 181 in 1988. Construction of the 45-foot channel from Mile 181 to Baton Rouge (Mile 232.4) was initiated in 1994 and completed in the same year.

Although dredging records prior to 1956 are sketchy, records indicate that SWP has been dredged

annually in discontinuous reaches since at least 1945. Currently, SWP is dredged annually in discontinuous reaches from Mile 4.0 AHP to Mile 22.0 BHP. Both hopper and hydraulic cutterhead dredges are used to maintain the upper Mile 4.0 AHP to Mile 18.8 BHP reach, and hopper dredges are used to maintain the lower Mile 18.8 BHP to Mile 22.0 BHP reach. Hopper dredged material from the lower part of the reach including the lower jetty and bar channel reach of the river is either agitation dredged or deposited in a designated ocean dredged material disposal site. Hopper dredged material from the upper part of the reach is deposited in an open water disposal area, the Hopper Dredge Disposal Area (HDDA), at the entrances to Pass a Loutre and South Pass. Historically, this disposal area has been dispersive and shoal material has been scoured from the site during high river flows. Hydraulically dredged Southwest Pass shoal material historically has been placed into one of three different categories of disposal areas: 1) unconfined into the open waters located on either side of Southwest Pass (including East Bay and West Bay), 2) behind existing foreshore dikes for bank stabilization purposes, and 3) shallow open water areas for wetland creation.

Since 1975, material hydraulically dredged from Southwest Pass has been utilized to create marsh. The 1976 Mississippi River, Baton Rouge to the Gulf of Mexico Final Environmental Impact Statement (FEIS) Supplement, and the 1982 Deep-Draft Access to the Ports of New Orleans and Baton Rouge, Louisiana FEIS, both outlined placement of dredged material in open water habitats for marsh creation purposes. In 1975, a marsh creation experiment was conducted at East Bay. In coordination with the Louisiana Department of Wildlife and Fisheries, the NOD developed a plan in which approximately 4,000,000 cubic yards (CY) of dredged material was placed into the open water of East Bay to create marsh.

The 1985 Mississippi River, Baton Rouge to the Gulf of Mexico FEIS Supplement 2 discussed the utilization of material dredged from Mile 11.6 AHP to Mile 20.1 BHP for bank nourishment and marsh creation. Placement of dredged material behind foreshore dikes for bank nourishment between Mile 11.6 AHP to Mile 0.0 would be to a maximum initial height of +8.3 feet Mean Low Gulf (MLG) (+7.5 feet National Geodetic Vertical Datum (NGVD)) to achieve a maximum final height of +5.3 feet MLG (+4.5 feet NGVD). Between Mile 0.0 and Mile 20.1 BHP, dredged material placed for bank nourishment would be discharged to a maximum initial height of +7.8 feet MLG (+7.0 feet NGVD) to achieve a final height of +4.8 feet MLG (+4.0 feet NGVD). This maximum initial height restriction of dredged material was changed to +6.0 feet MLG (+5.2 feet NGVD) in 1987. Material excavated during maintenance dredging that was not used for bank nourishment would be discharged unconfined into open water habitats for marsh creation.

Since 1975, and probably earlier, open water placement of dredged material into East Bay was restricted to a maximum initial discharge height of +10.0 feet MLG (+9.2 feet NGVD) to offset the erosive effects of the high energy wave environments. Placement of dredged material into other open water habitats was restricted to a maximum initial height of +6.0 feet MLG (+5.2 feet NGVD). Subsequent consultation with the U.S. Fish and Wildlife Service led to the determination that dredged material placed at these heights did not result in the formation of intertidal marshland. In 1988, the maximum height restriction was changed to +6.0 feet MLG (+5.2 feet NGVD) for East Bay disposal and to +4.5 feet MLG (+3.7 feet NGVD) with an expected final height of +3.0 feet MLG (+2.2 feet NGVD) for other open water disposal areas to facilitate intertidal marsh formation. Further consultation with various state and Federal resource agencies resulted in another

modification of the initial height restriction for material placed in these other open water areas to +4.0 feet MLG (+3.2 feet NGVD) in 1996.

Open water disposal areas dedicated to wetland creation were established in 1992 at specific locations in the West Bay (West Bay Mandatory Disposal Area (WBMDA) at Mile 14.5 BHP) and in the East Bay (East Bay Mandatory Disposal Area (EBMDA) at Mile 9.5 BHP) of Southwest Pass. Initial plans for the WBMDA called for a crescent-shaped design to extend into West Bay in order to help retain dredged material from subsequent placements. Prior to 1996, a maximum discharge height for dredged material placed at the West Bay site was +6.0 feet MLG (+5.2 feet NGVD) with an expectation that, following dewatering and compaction, a final height of +3.0 feet MLG (+2.2 feet NGVD) would be achieved. This maximum elevation height restriction was chosen to offset the erosive effects of the high energy wave environment present in West Bay. The WBMDA design plan was altered in 1996 to create a continuous spit to be angled away from the existing shoreline. The maximum initial height of dredged material placed at this site was also changed to +4.5 feet MLG (+3.7 feet NGVD) with an expected final height of +3.0 feet MLG (+2.2 feet NGVD). Approximately 2,291,200 cy of dredged material have been placed at the WBMDA since 1992, including 274,200 cy in FY 99.

The EBMDA was authorized under Section 150 of the Water Resources Development Act of 1976. Prior to 1996, material placed at the EBMDA was not to exceed a maximum initial height of +4.5 feet MLG (+3.7 feet NGVD). This maximum height restriction was changed to +4.0 feet MLG (+3.2 feet NGVD) in 1996. Approximately 827,000 cy of dredged material have been placed at this site since 1992. Once this site had been filled to capacity, plans called for placing material into the open water of East Bay. The EBMDA was determined to be filled to capacity in 1996.

During FY 2000, no cutterhead dredging was performed in Southwest Pass due to the low water conditions experienced in the Mississippi River.

Figure 16A illustrates the dredged material disposal history for the Southwest Pass study area in detail between FY 1985 and FY 1995. Figure 16B illustrates the more recent dredged material disposal history up to FY 2000, showing FY 1996 through FY 2000 disposal in detail.

Approximately 7,000,000 cubic yards of material are discharged annually into the HDDA at the Head of Pass a Loutre and South Pass. The disposal material in the HDDA usually is scoured from the site during high river flows. However, on occasion, extensive shoaling in Southwest Pass results in the rapid temporary filling of this disposal area. In FY 1998, the New Orleans District implemented a management plan for the HDDA in order to insure continuous availability of the site for hopper dredge disposal. The management plan included dredging within the existing HDDA and placement of the dredged material into a 298-acre, shallow, open water area, the Pass a Loutre Disposal Area (PALDA) (Figure 16C), on the east side of the Mississippi River north of Pass a Loutre within the Delta National Wildlife Refuge in a manner conducive to wetlands development.

In FY 1998 (November 21, 1997 - February 21, 1998), approximately 1,051,661 CY of material were hydraulically dredged from the HDDA and placed unconfined in shallow open water in the northern one-third of the designated PALDA (Figure 16C). The specified maximum initial height

of the dredged material was +3.0 feet MLG (+2.2 NGVD); however, during construction, the material was stacked too high and had to be washed down. At the project's completion, the elevation of most of the dredged material placed in the PALDA was +3.0 feet MLG (+2.2 feet NGVD) or less. Following compaction and de-watering, final elevations of +1.0 to +0.5 feet MLG (+0.2 feet NGVD) are expected.

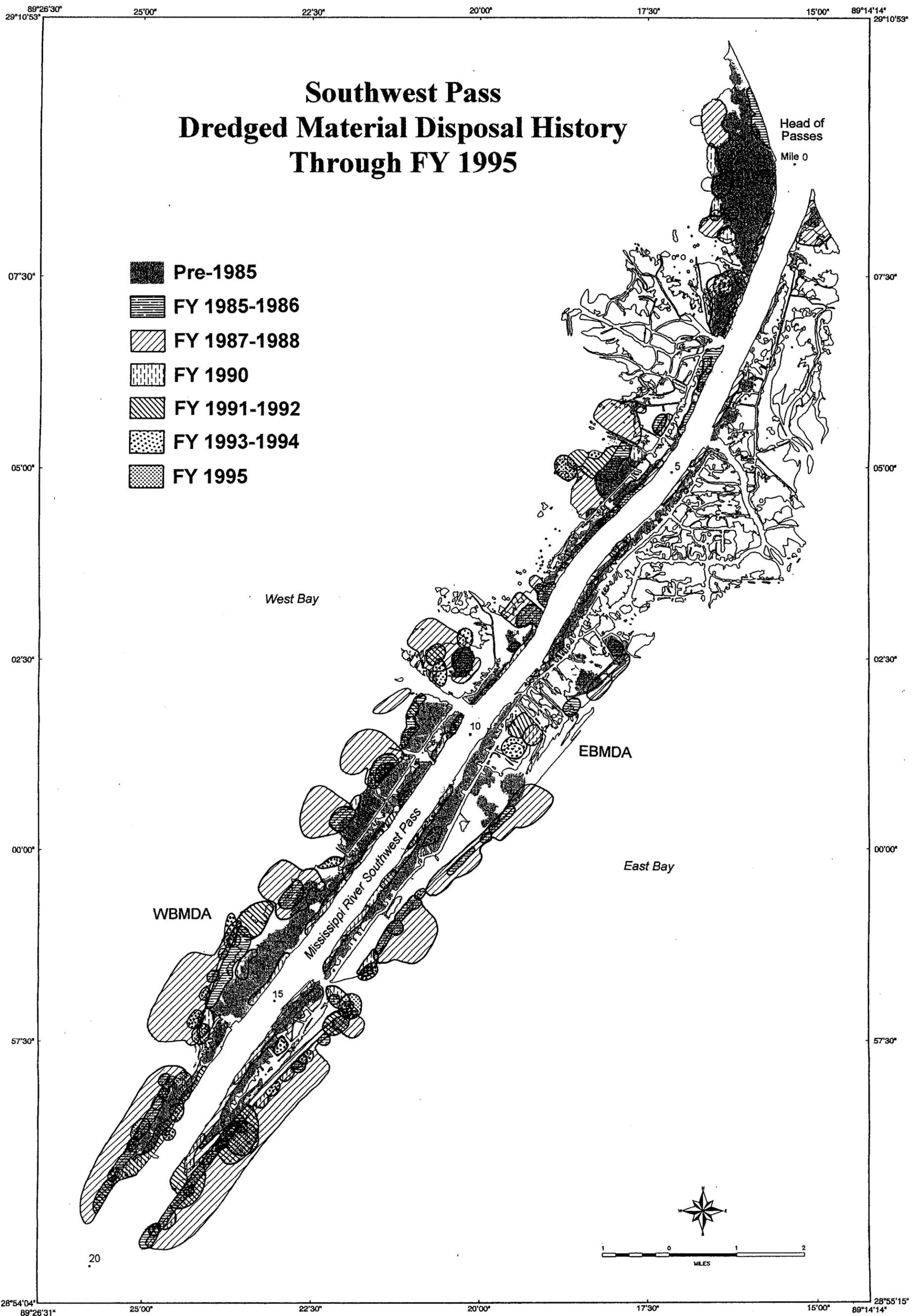


Figure 16A. The dredged material disposal history for the Mississippi River - Southwest Pass BUMP study area, showing FY 1985 through FY 1995 disposal in detail.

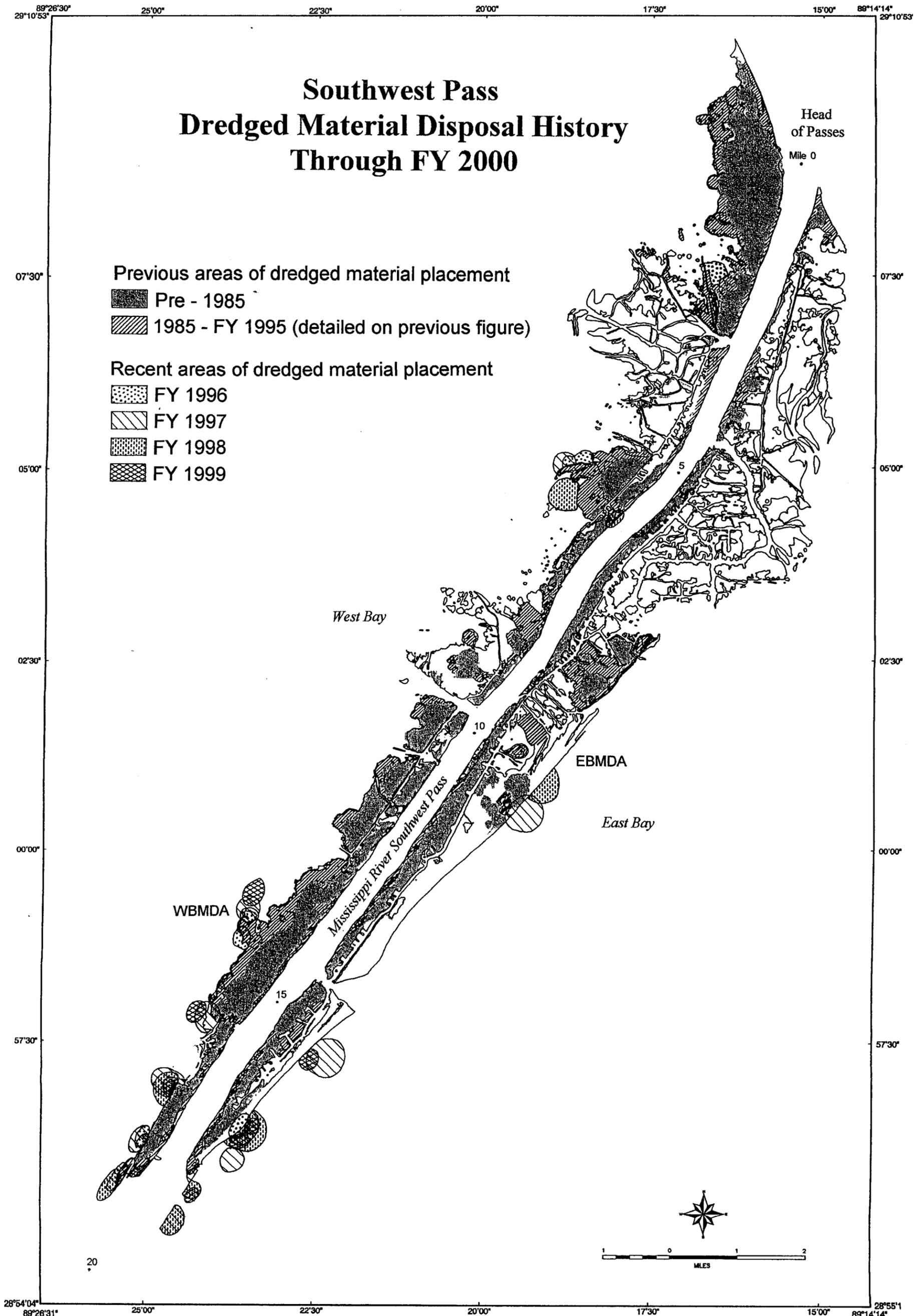


Figure 16B. The dredged material disposal history for the Mississippi River - Southwest Pass BUMP study area, showing the FY 1996 through FY 2000 disposal in detail. There was no cutterhead dredging, and therefore no beneficial use disposal, in FY 2000.

1985 Land-Water Classification

2000 Land-Water Classification

Change Detection: 1985-2000

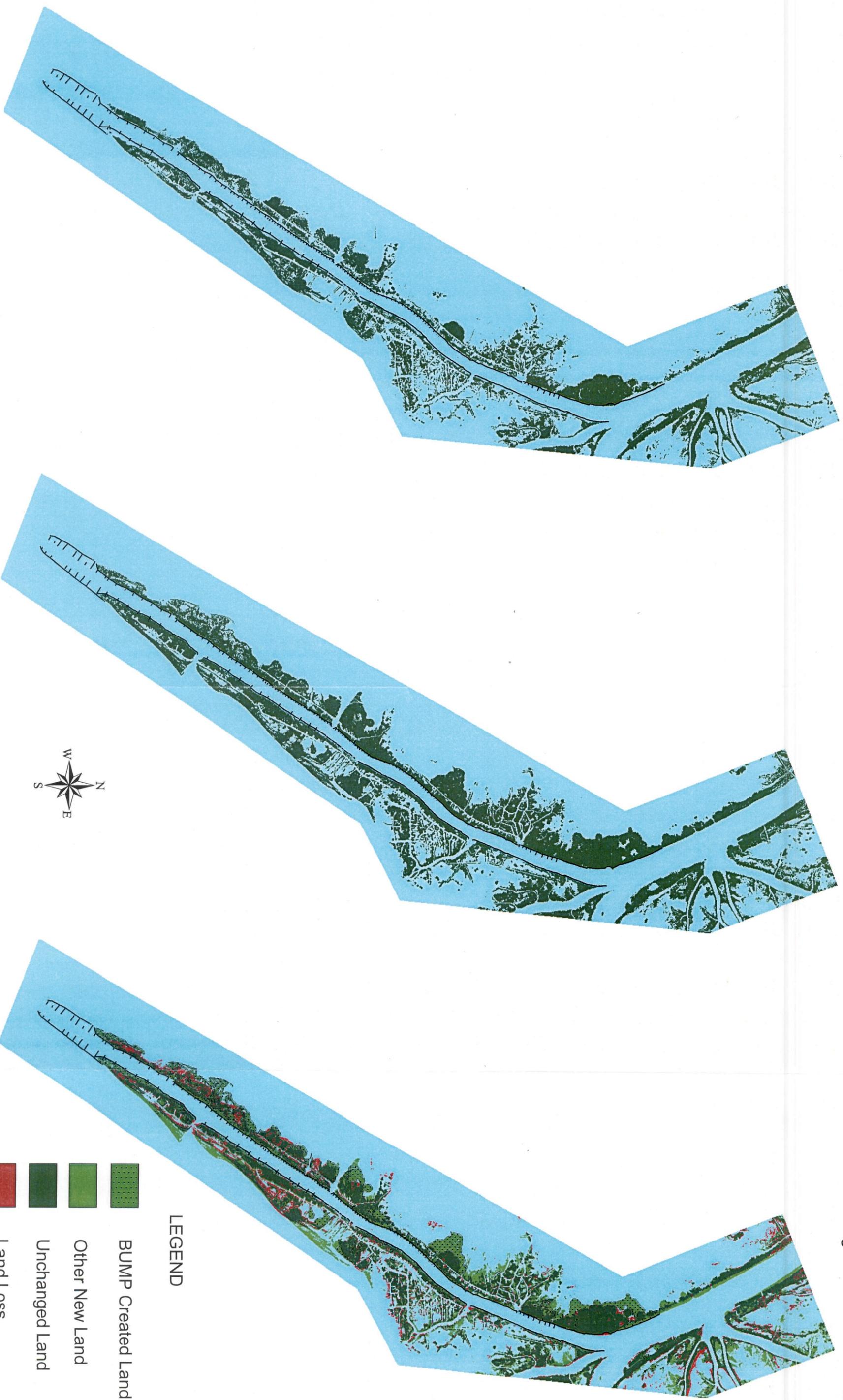


Figure 18 Cumulative Landscape Change for Southwest Pass: 3,096 Acres

Dredged Material Disposal History Pass a Loutre Disposal Area

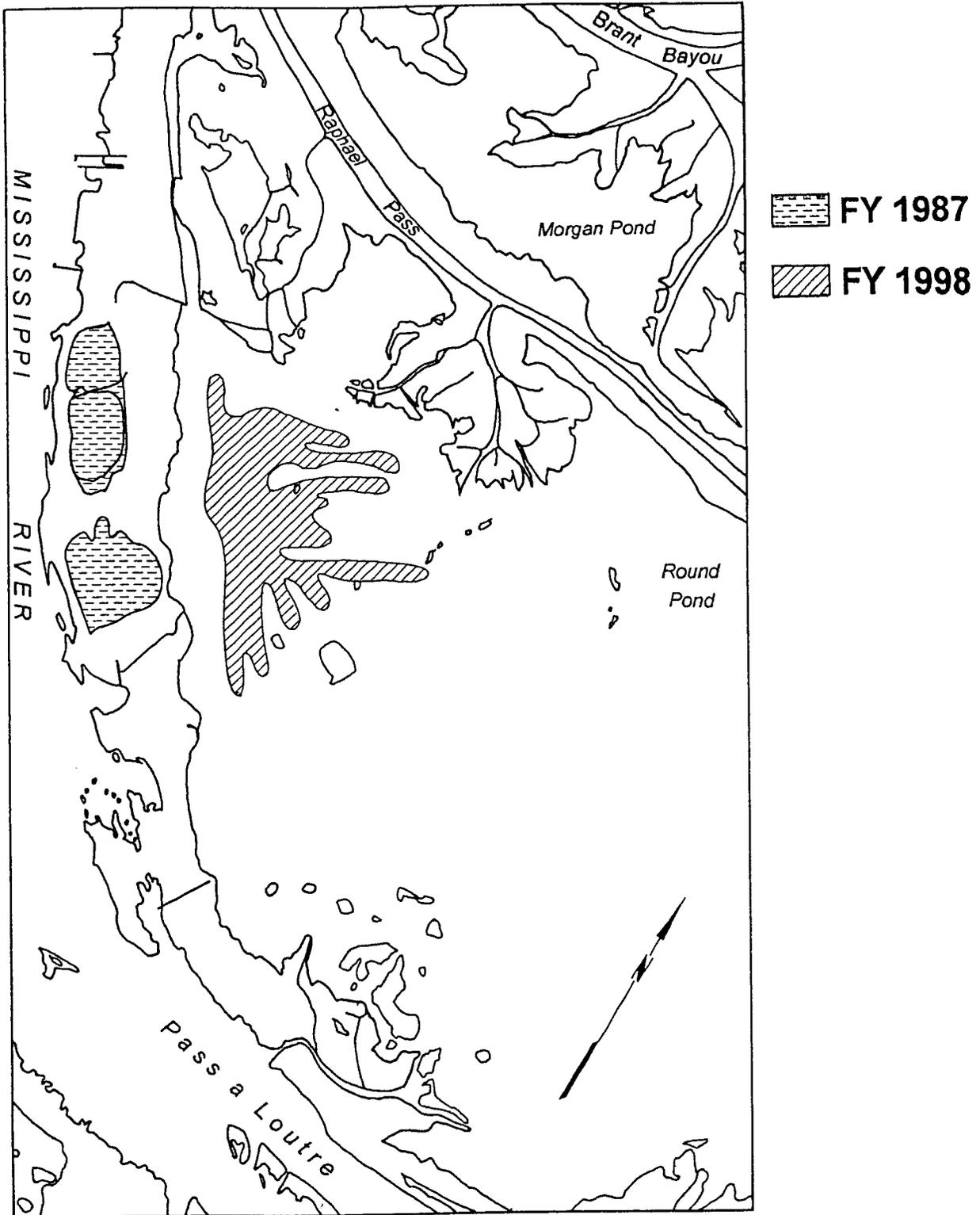


Figure 16C. The dredged material disposal history for the Pass a Loutre BUMP study area, showing disposal through FY 2000. The last disposal in this area was FY 1998.

**BENEFICIAL USE OF DREDGED MATERIAL DISPOSAL HISTORY
MISSISSIPPI RIVER BATON ROUGE TO THE GULF OF MEXICO, LA
SOUTH PASS
Through FY 1999**

This natural distributary of the Mississippi River has been used as a major navigational channel since the site of New Orleans was selected in the early 1700s. A historical description from *De Bow's Review* (1847) indicates that of the Mississippi's distributaries, only South Pass was utilized for navigation in 1720 (Morgan 1977). However, since most commerce came from an easterly direction, a pilot station known as *Balize* was established on an island off of Balize Bayou, a distributary of Northeast Pass, soon after settlement of New Orleans began. By the late 1700s, South Pass had shoaled considerably, and Balize Bayou was abandoned as the main navigational channel. Southwest Pass had the greatest water depth over the distributary mouth bar by 1813, and soon became a major navigational channel.

A lighthouse was constructed prior to 1874 and Port Eads was in evidence on maps by 1878. The east bank jetty system construction began in 1875 and was largely completed by 1878, although minor modifications were made for some time thereafter. There was almost continuous dredging by the U.S. Army Corps of Engineers between 1899 and 1909 (Morgan 1977).

Present day construction and maintenance of the navigational channel at South Pass is authorized under the Rivers and Harbors Act of March 2, 1945 and prior Rivers and Harbors Acts. The Act provides for a channel 30-feet deep by 450-feet wide in South Pass and a channel 30-feet deep by 600-feet wide in the South Pass bar channel.

Dredged material disposal history prior to 1970 is sketchy. During 1961, dredged material from maintenance of the inland reach (Mile 0.0 to Mile 12.6) was placed on the banks of the channel on both sides to restore the banks.

Maintenance dredging in South Pass occurred annually between 1970 and 1977. In the inland reach, hydraulic cutterhead pipeline dredges placed dredged material on either side of the channel to restore the banks. The bar channel (Mile 12.6 to Mile 14.5) was dredged annually between 1961 and 1978 using hopper dredges. Material removed from the bar channel was placed in the open water ocean dredged material disposal site located on the right-descending bank of the channel.

From 1978 to 1999, in keeping with Corps of Engineers policy that projects only be maintained consistent with reasonable needs of existing commerce, the channel in South Pass was maintained to a depth of 17.0 feet Mean Low Gulf (MLG) and a width of 300 feet. No maintenance dredging was required in either the inland reach or the bar channel during this period.

In 1996, the USACE-NOD designated a 4500-acre shallow, open water disposal area on the right-descending bank of the navigational channel within the Louisiana Department of Wildlife and Fisheries' Pass a Loutre Game and Fish Reserve State Public Hunting Grounds. Dredged material from routine maintenance of South Pass would be placed within the disposal area to restore barrier

island habitat, to create and restore wetland habitats, and to create upland habitat attractive to breeding waterfowl, alligators, and a variety of other wildlife species.

The disposal plan for the FY 1999 maintenance of Mile 5.0 to Mile 14.1 of the South Pass navigational channel consisted of unconfined placement of dredged material in open water adjacent to existing barrier island features to stabilize and enlarge the islands and to create mound features suitable for wildlife habitat. Subsequent to award of the contract, the Louisiana Department of Wildlife and Fisheries obtained a permit for placement of dredged material from the Mile 5.0 to 7.1 of the channel into the southern cell of the existing freshwater reservoir on the left-descending bank of the channel for marsh restoration. Approximately 1,160,942 cubic yards of material were placed within the reservoir to an initial elevation of approximately +1.78 feet MLG. A total of 576,418 cubic yards of material were placed adjacent to the barrier island feature in the vicinity of Mile 8.0 and 4,227,700 cubic yards of material were placed adjacent to the barrier island feature in the vicinity of Mile 10.0. The initial elevation of the dredged material was +4.5 feet MLG. An estimated 161,240 cubic yards of material were placed in mounds at elevation +4.5 feet MLG in the vicinity of Mile 11.0

Figure 17 illustrates the dredged material disposal history for the South Pass study area.

South Pass Dredged Material Disposal History

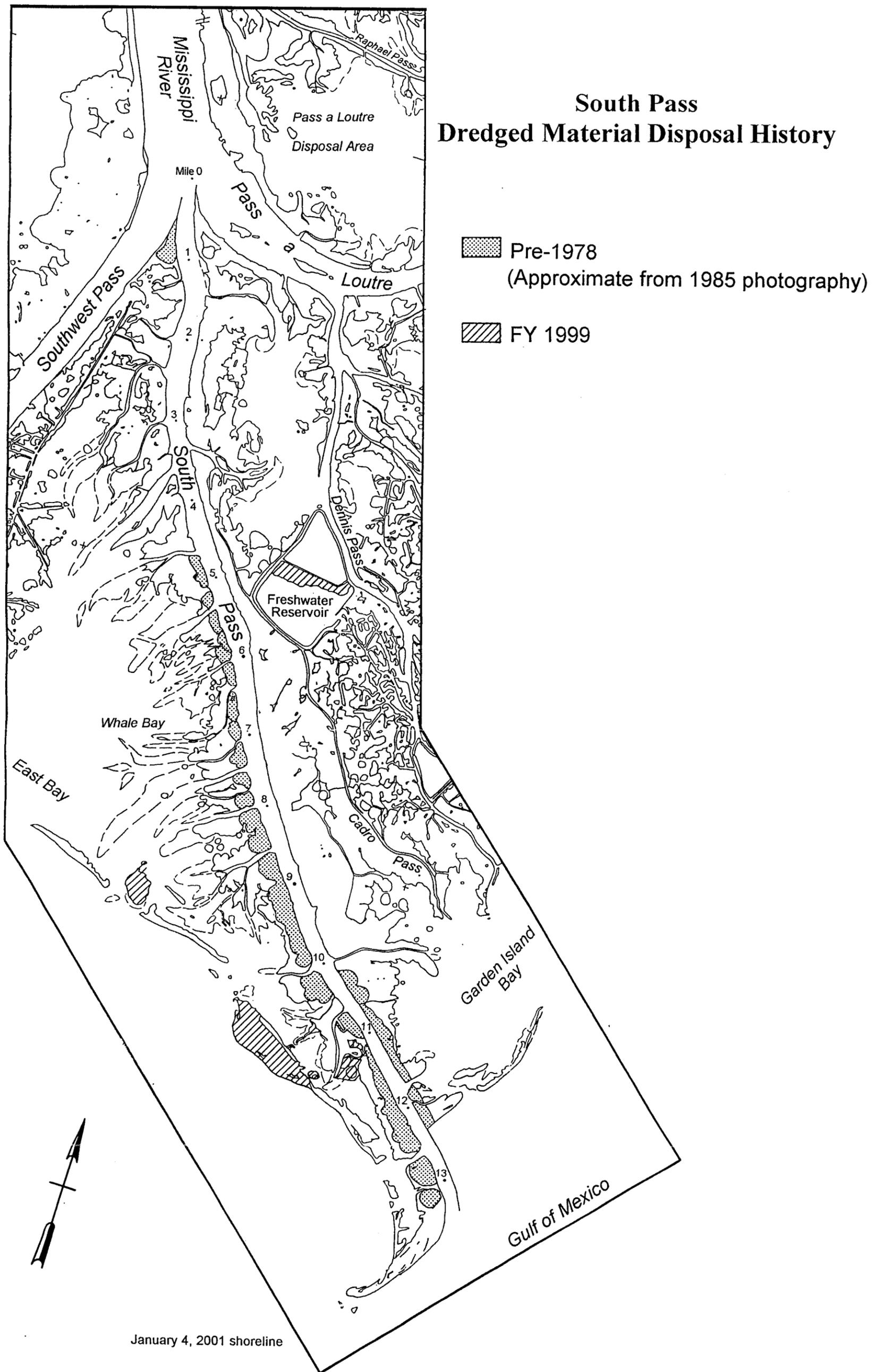


Figure 17. The dredged material disposal history for the Mississippi River - South Pass BUMP study area through FY 2000.

1985 Land-Water Classification

2000 Land-Water Classification

Change Detection: 1985-2000



Figure 17 Cumulative Landscape Change for South Pass: 396 Acres