

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

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

Prepared by  
University of New Orleans  
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## **INTRODUCTION**

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

## **DATA**

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

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

## **METHODS**

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

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

## **RESULTS**

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

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

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

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

**BENEFICIAL USE OF DREDGED MATERIAL DISPOSAL HISTORY**  
**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

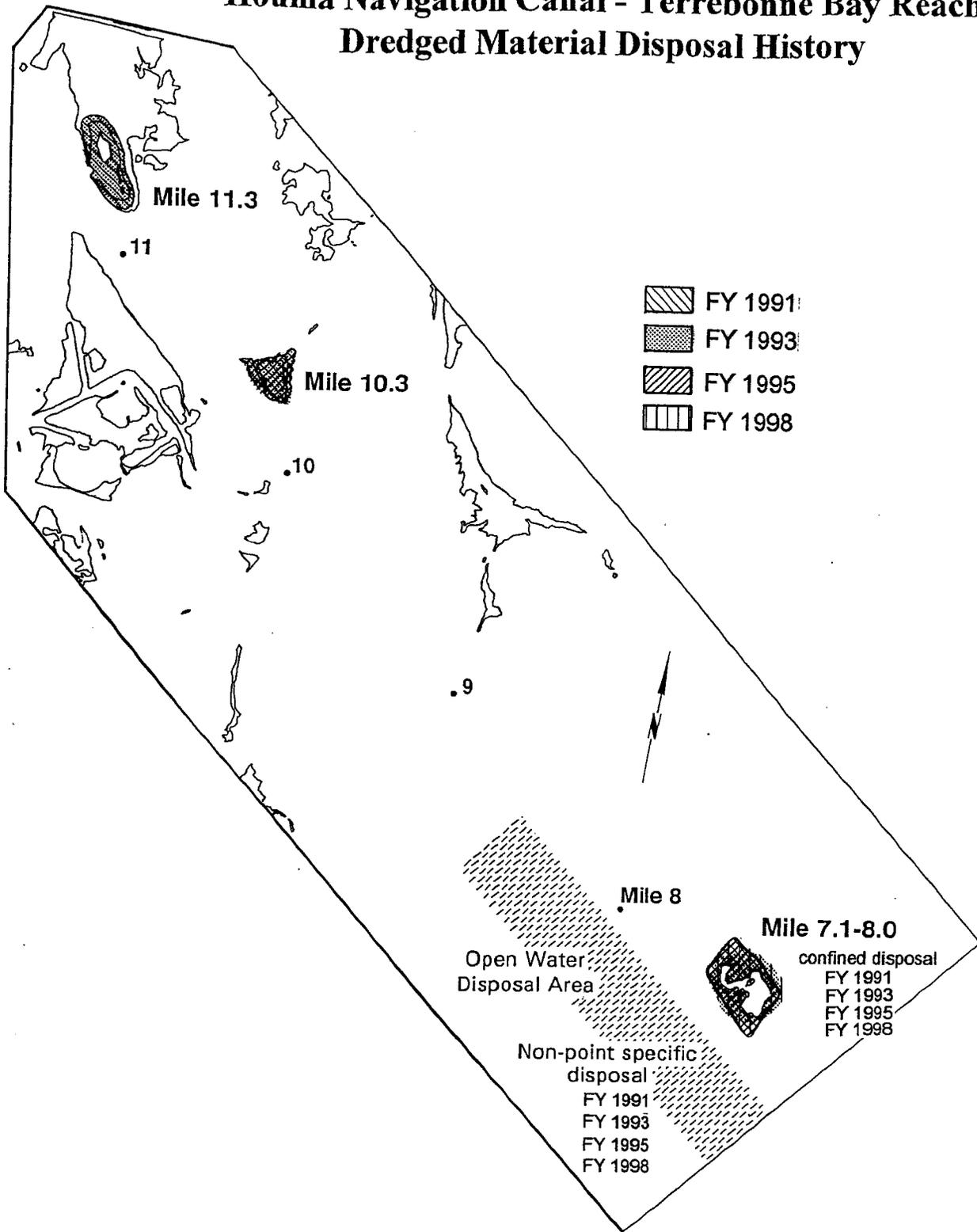
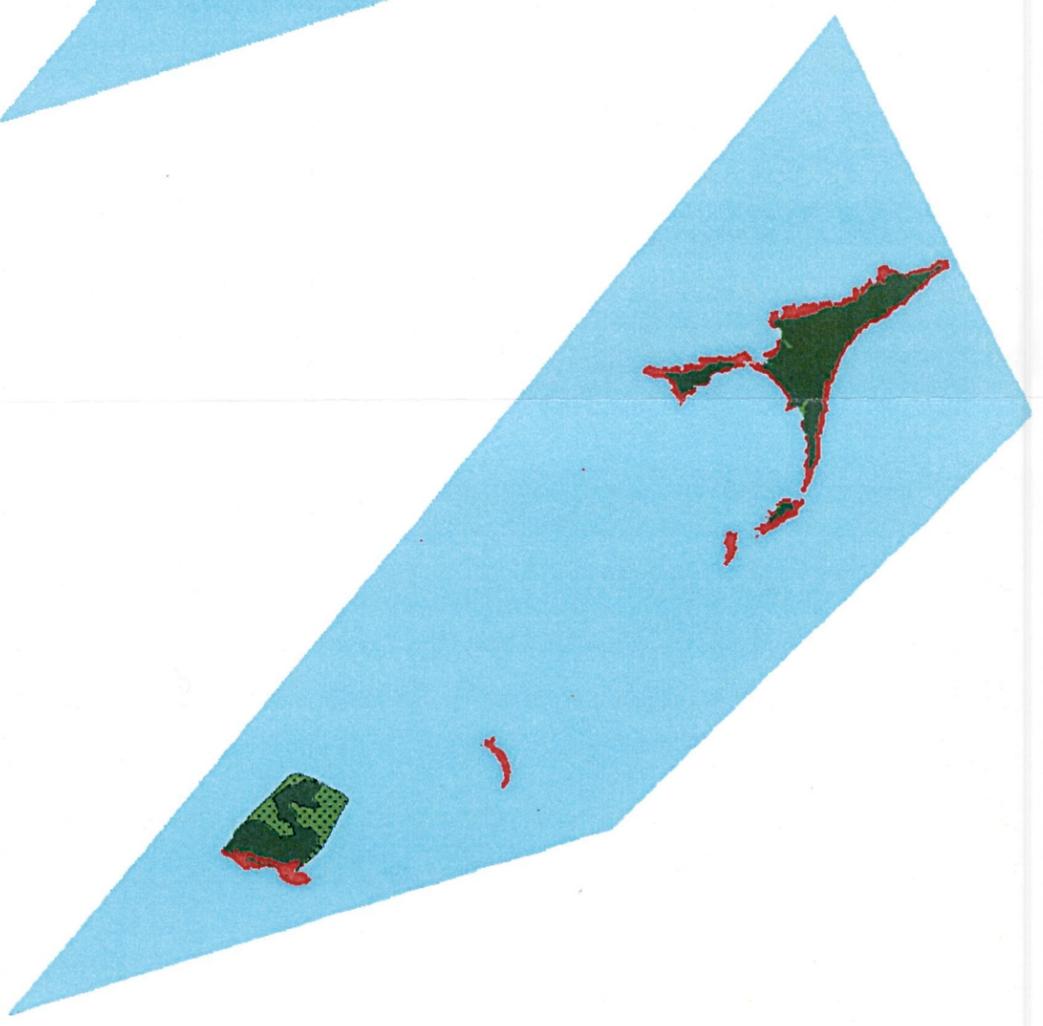
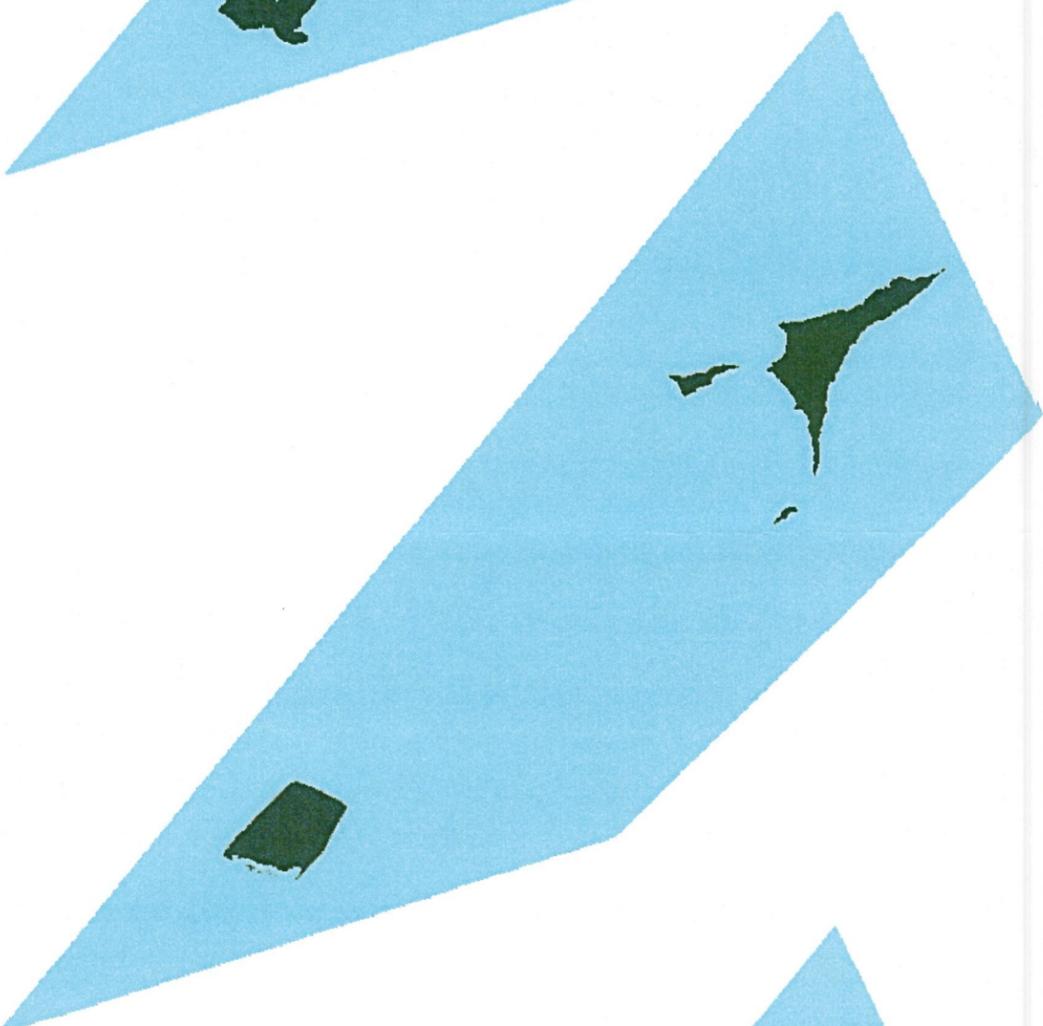
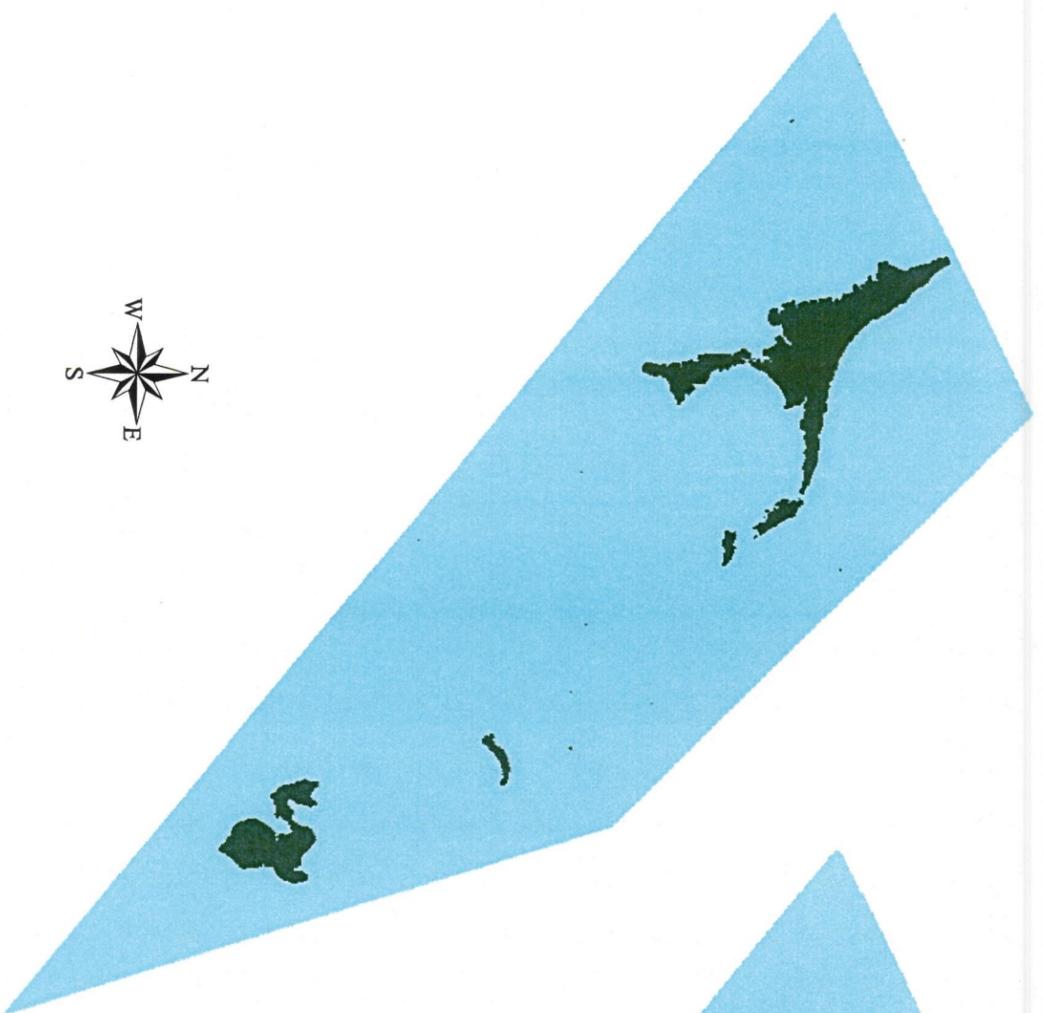


Figure 12A. The dredged material disposal history for the Houma Navigation Canal, Louisiana - Terrebonne Bay Reach BUMP study area 1990 through FY 2000.

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

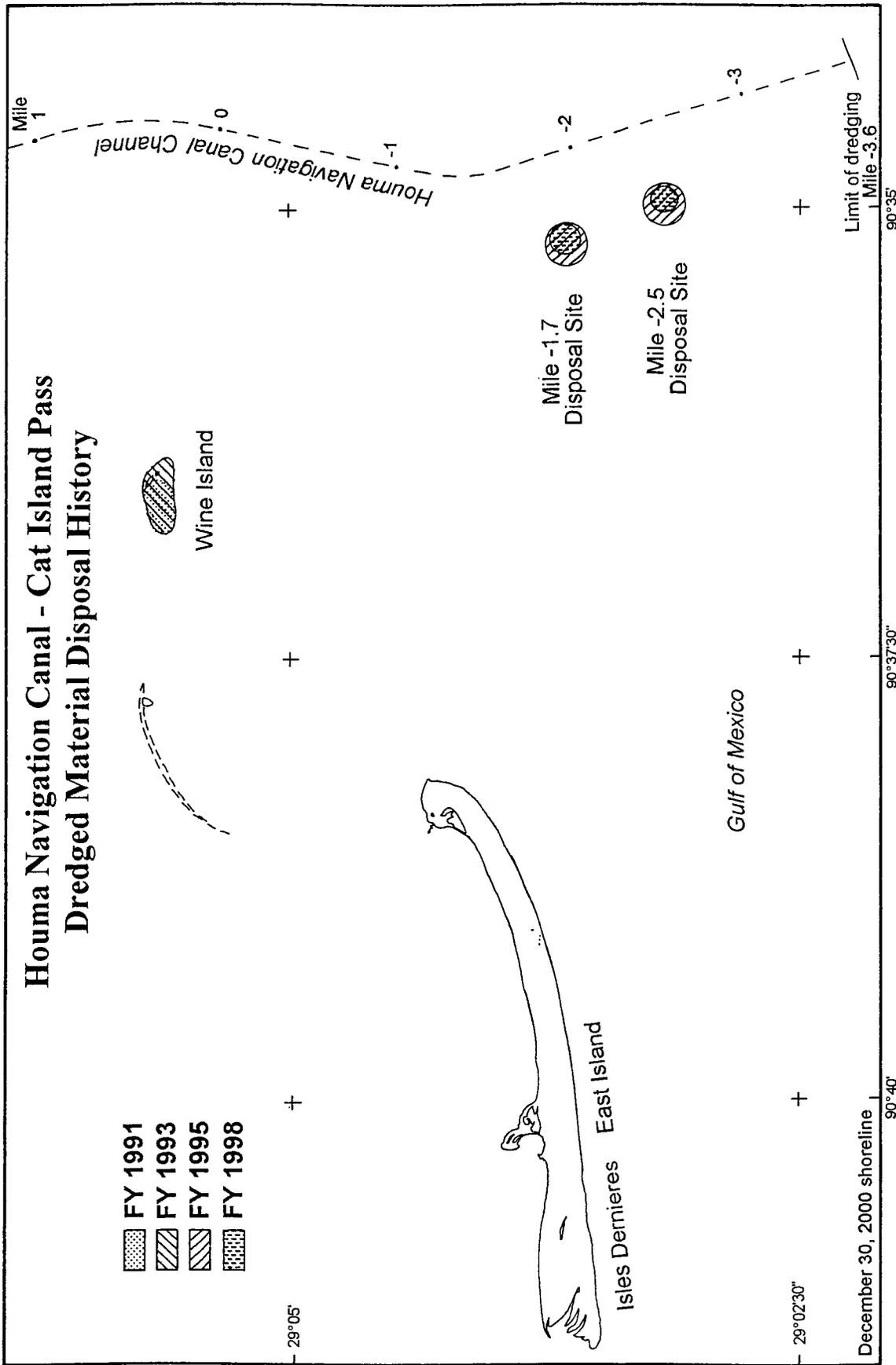
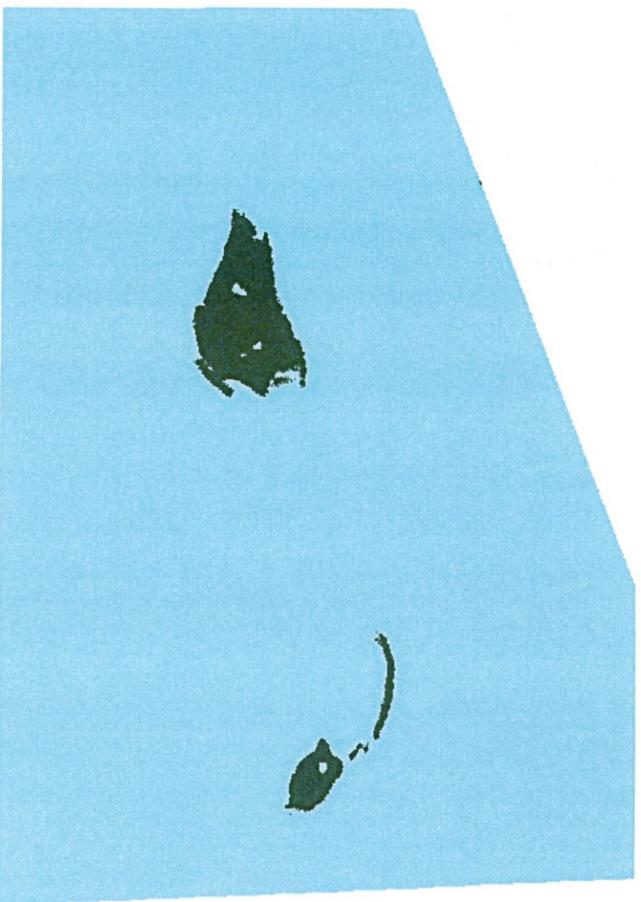
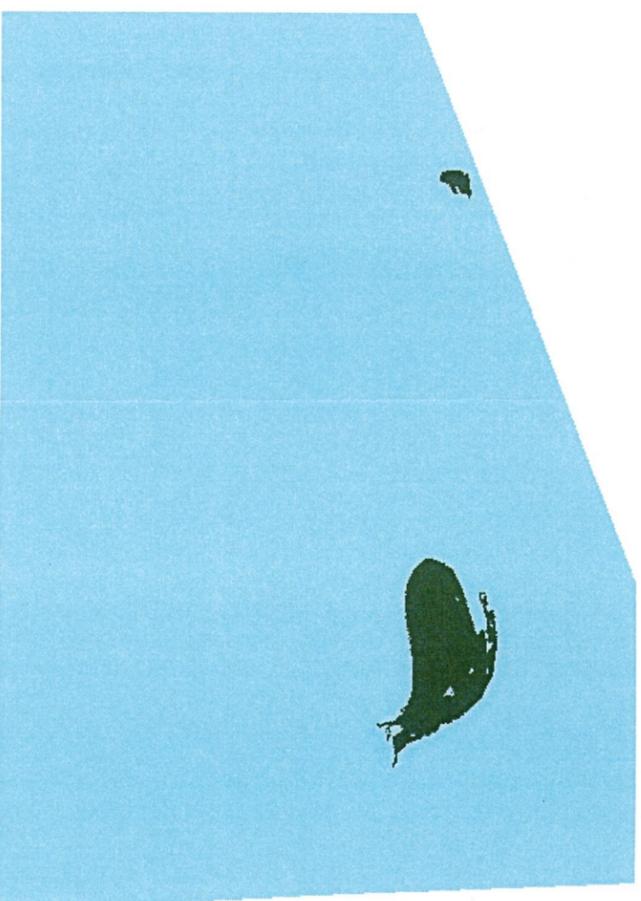


Figure 12B. The dredged material disposal history for the Houma Navigation Canal, Louisiana - Bar Channel/Cat Island Pass Reach BUMP study area through FY 2000.

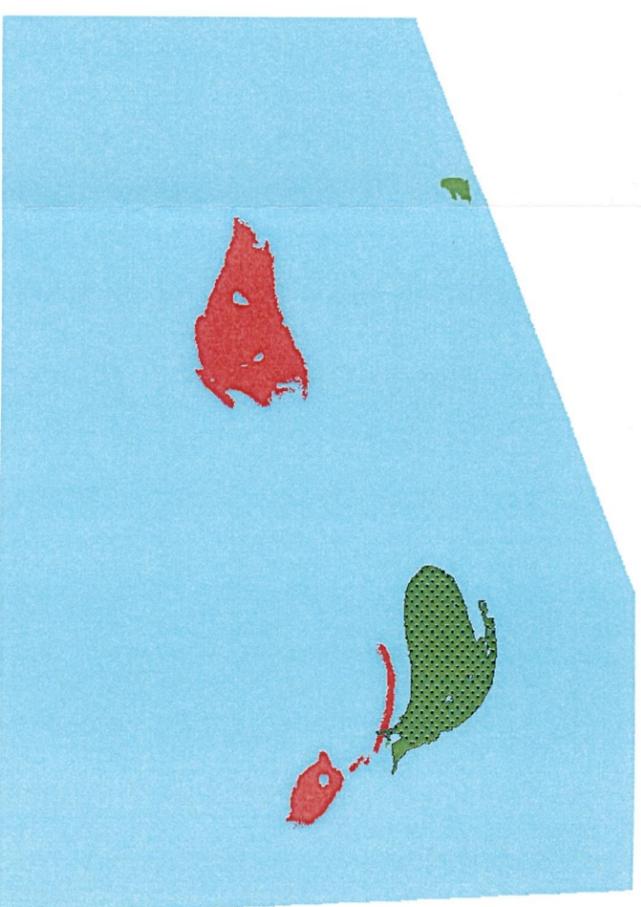
1985 Land-Water Classification



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

1985 Land-Water Classification

2000 Land-Water Classification

Change Detection: 1985-2000



Figure 17 Cumulative Landscape Change for South Pass: 396 Acres