

**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
Contract DACW29-98-D-0008
May 2001

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
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

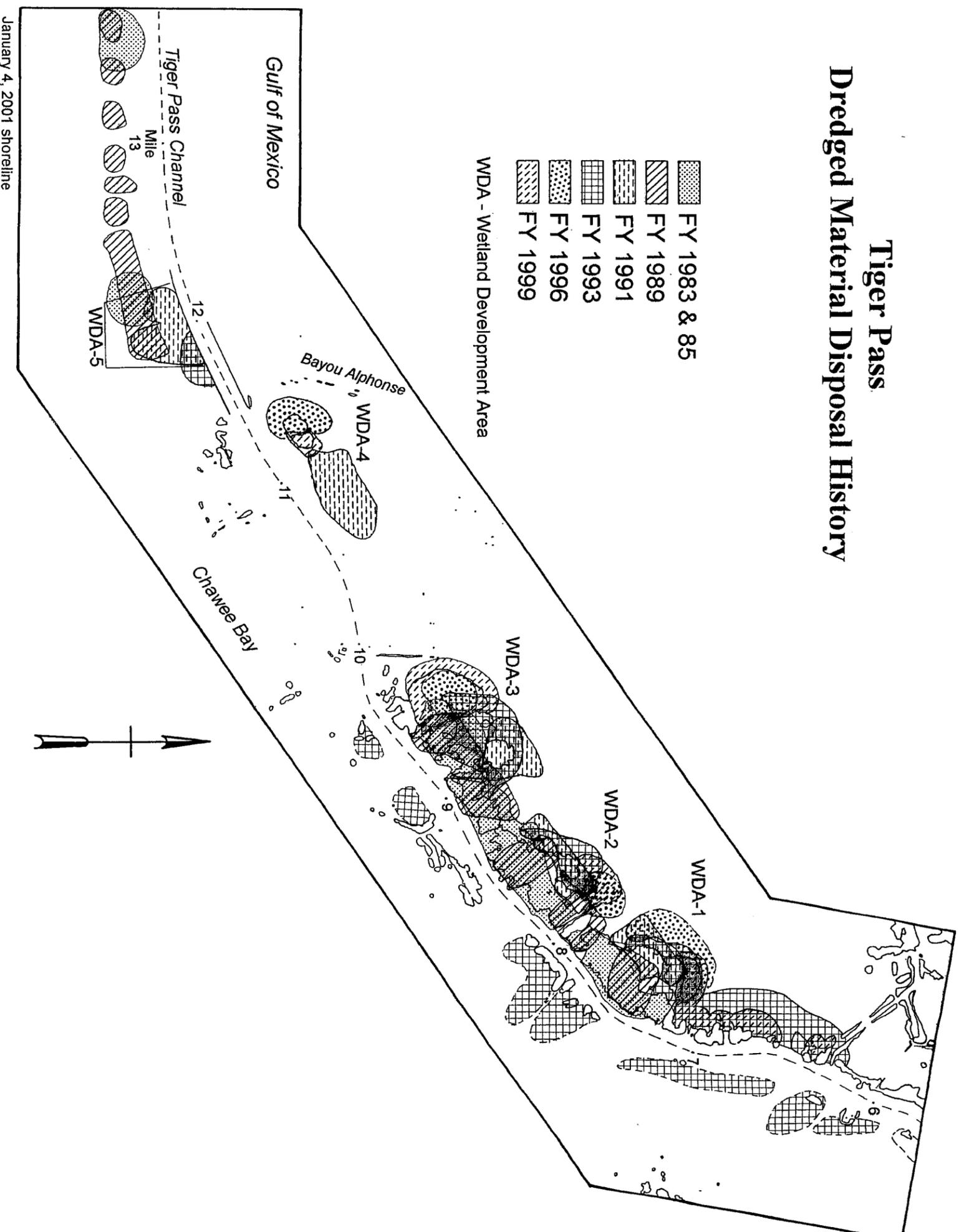


Figure 8. The dredged material disposal history for the Tiger Pass BUMP study area through FY 2000.

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 19 Cumulative Landscape Change for Tiger- Pass: 347 Acres