

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

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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
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

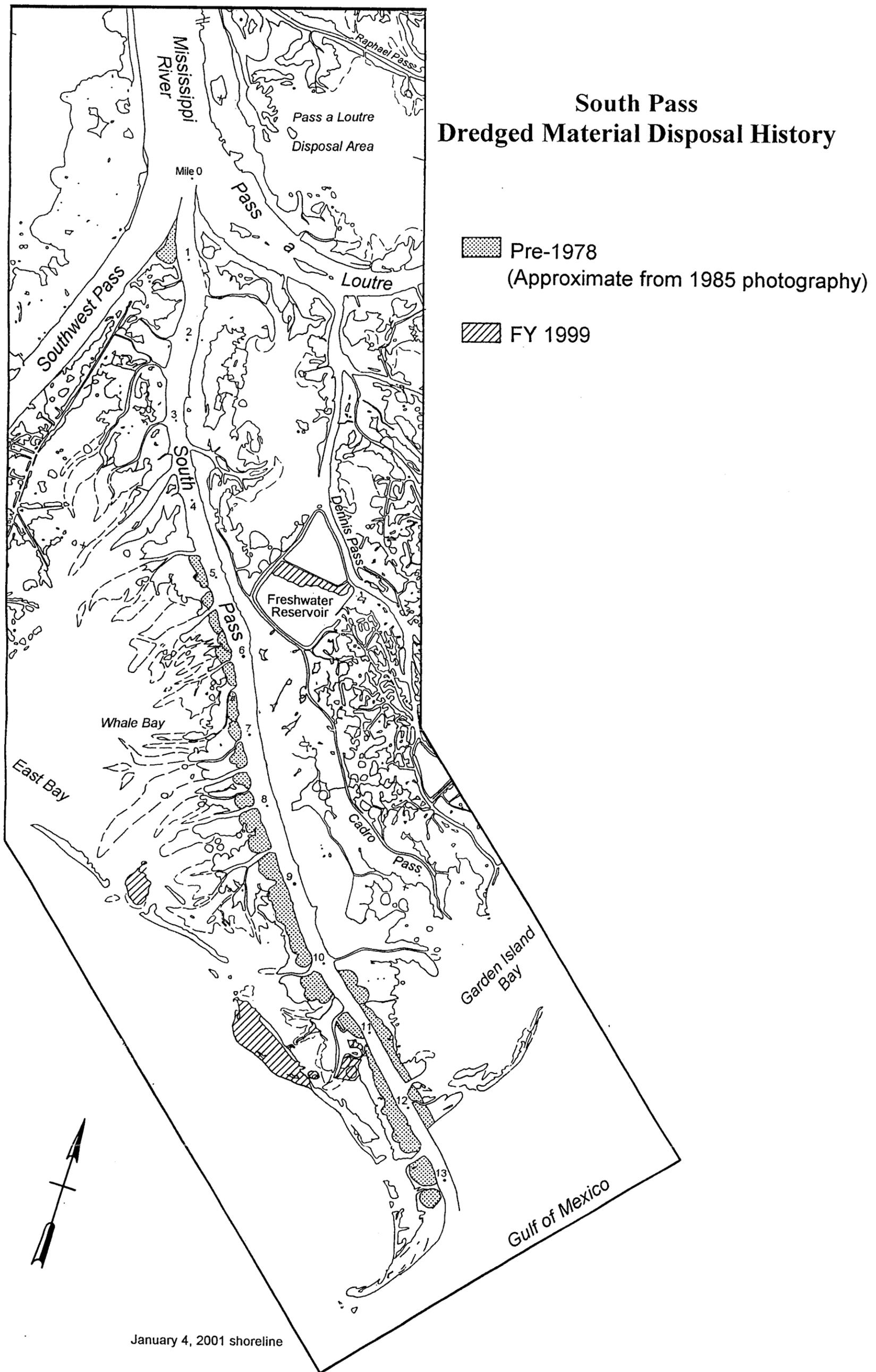


Figure 17. The dredged material disposal history for the Mississippi River - South Pass BUMP study area through FY 2000.

1985 Land-Water Classification

2000 Land-Water Classification

Change Detection: 1985-2000



Figure 17 Cumulative Landscape Change for South Pass: 396 Acres