DREDGED MATERIAL BENEFICIAL USE DISPOSAL HISTORY OF THE BARATARIA BAY WATERWAY

The Rivers and Harbors Act of March 2, 1919 authorized the CEMVN 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 (BBWW) 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 BBWW 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.

1990

BARATARIA BAY REACH (MILE 16-0)

Dredged material from construction of this reach of the channel was placed either in open water areas on either side of the channel, or in three upland confined disposal facilities located in the vicinity of Mile 10, at Pelican Point (Mile 7), and at Mendicant Island (Mile 3). This practice continued during maintenance events from 1965 through 1989.

Queen Bess Island

Background:
In 1989, the Louisiana Department of Natural Resources, Coastal Restoration Division, requested that the CEMVN consider placement of dredged material from maintenance of the BBWW Bay channel 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 navigation 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 CEMVN 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 CEMVN received authority and funding 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 1990 maintenance of the BBWW Mile 15.5 to Mile 2.7 reach (contract DACW29-90-C-0092: 27 August 1990 – 2 May 1991), dredged material removed from the BBWW Mile 2.7 to Mile 3.2 bay channel reach was placed into the Queen Bess Island restoration disposal site. The cutterhead dredge LOUSIANA and the mechanical dredge CONICAL performed all maintenance dredging for this contract. The LOUISIANA was responsible for placing dredged material at the Queen Bess Island disposal site.

Dredged Material Placement Event:
From 13 November 1990 through 15 November 1990, the LOUISIANA placed an estimated 82,000 cubic yards (CY) of material dredged from the navigation channel was pumped through approximately 7,600 feet of discharge pipeline into the approximately 8-acre Queen Bess Island disposal area to an initial elevation of +3.5 feet MLG (+2.7 feet NGVD). The 8-acre disposal site consisted of shallow open water located immediately adjacent to the western edge of Queen Bess Island. The dredged material effluent was allowed to flow east through and onto the adjacent existing Queen Bess Island marsh, using the marsh to reduce turbidity levels in the surrounding water (due to the presence of nearby oyster leases) as well as allowing effluent sediments to settle onto the subaerial portion of the island and potentially increase elevations.

Containment and Access:
A shell retaining dike was constructed to an elevation of 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. Filter fabric was placed under the shell to prevent settlement. The shell retention dike was approximately 1,600 feet long with a 5-foot crown and 3V to 1H side slopes. Earthen shore dikes were built to an elevation of approximately +3.5 feet MLG on both ends of the shell retention dike and all retaining dikes were covered with visqueen prior to discharge of dredged material. 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. Following completion of disposal operations at Queen Bess Island, all visqueen was removed.

To facilitate discharge pipeline and construction equipment access to Queen Bess Island, an approximately 1,000-foot flotation channel was dredged along the south side of the island.

Results:
Approximately 8 acres of marsh habitat was restored by the placement of about 82,000 CY of BBWW dredged material at Queen Bess Island.

Notes:
1. An elevation survey performed during October 1990 revealed that the average marsh elevation on the island was about +1.32 feet MLG and the highest elevations in the pelican nesting area was about +1.67 to +2.37 feet MLG.

2. This project cost a total of $561,250 ($400,000 Federal and $161,250 State of Louisiana).

3. A 24-hour watch was concentrated on the Brown Pelican nesting area to insure that disposal operations did not interfere with Brown Pelican activities.

4. In June, 1991, the State of Louisiana planted vegetation (black mangrove, wax myrtle, baccharis, matrimony vine, and marsh elder)on the dikes and within the Queen Bess Island disposal area to help retain and stabilize the dredged material as well as enhance Brown Pelican nesting substrate.

5. During October 1992, a riprap/crushed stone dike was constructed around the existing natural shore rim perimeter of the island to provide erosion protection. This dike was constructed to an elevation of about 3 feet above the island marsh level.

6. During May 1993, black mangroves were again planted on the western side of Queen Bess Island to increase suitable Brown Pelican nesting habitat.

Pelican Point (Mile 7)

Background:
During the 1990 maintenance of the BBWW Mile 15.5 to Mile 2.7 reach (contract DACW29-90-C-0092: 27 August 1990 – 2 May 1991), dredged material removed from the BBWW Mile 15.5 to Mile 3.2 bay channel reach was placed into several existing upland disposal sites located adjacent to the channel by the cutterhead dredge LOUISIANA.

Dredged Material Placement Event:
Between 13 November 1990 and 8 December 1990, the LOUISIANA placed an unknown quantity of dredged material into the Pelican Point upland confined disposal

area located at approximately Mile 7.0 on the left descending side of the BBWW bay channel.

Containment and Access:
Earthen containment dikes were refurbished prior to discharge of dredged material into the Pelican Point disposal site.

Results:
Approximately 60 acres of marsh and mud flats were created at the Pelican Point (Mile 7) placement site using an unknown quantity of dredged material.

Notes:
Although the Pelican Point (Mile 7) placement site was intended to be used as an upland confined disposal site, the dredged material placed there during the 1990 BBWW maintenance dredging effort did not achieve upland elevations. Instead, emergent marsh and mud flats were created at this site.

BBWW Mile 7.0 BU Site Post-Placement Event (1995)

1996

BARATARIA BAY REACH

Queen Bess Island

Background:
During the FY 1996 maintenance event (contract DACW29-96-C-0061: 3 August 1996 – 22 November 1996), dredged material from the Barataria Bay reach was placed confined at a shallow open water disposal site located along the southwestern side of Queen Bess Island to continue island restoration, and in wetlands development disposal areas in the vicinity of BBWW Mile 14 and Mile 6.5. The cutterhead dredge LOUISIANA performed all maintenance dredging under this contract.

The Coastal Wetland Planning, Protection, and Restoration Act (CWPPRA) of 1990 provided the authorization and funding for additional restoration efforts at Queen Bess Island (CWPPRA project BA-19).

Dredged Material Placement Event:
From 4 October 1996 through 12 October 1996, the LOUISIANA removed approximately 51,950 CY of dredged material from the BBWW Mile 2.7 to Mile 3.3 reach and discharged this material into the approximately 9-acre Queen Bess Island disposal area to a maximum initial elevation of +4.5 feet MLG (+3.7 feet NGVD). About 5,500 feet of discharge pipeline were used to transport dredged material from the BBWW channel to Queen Bess Island.

Effluent was routed through the 1990 placement site and the existing wetlands on Queen Bess Island. Silt screens were placed in the effluent outfall area to prevent impacts to adjacent oyster leases.

Containment and Access:
An approximately 1,650-foot geotextile reinforced shell core dike covered with riprap was constructed to a maximum elevation of about +5.8 feet MLG along the southwestern side of Queen Bess Island to enclose a 9-acre area of shallow open water.
The approximately 1,000-foot flotation channel excavated during the 1990 placement event was re-utilized for this placement effort. The flotation channel was re-excavated to a depth of -6.0 feet and a width of 70 feet. Flotation channel material was placed along the west side of the channel to allow the material to eventually refill the constructed channel.

Results:
No new land was created in the 9-acre placement site by this beneficial use of approximately 51,950 CY of dredged material effort.

Notes:
1. CWPPRA project BA-19 cost a total of $945,678.

2. Dredged material in the disposal area failed to achieve a subaerial elevation after 2

years. This remains a 9-acre shallow open water site that is surrounded by a shell dike. A small man-made breach was constructed in the western shell/rip rap dike sometime after 1996 in an effort to re-establish tidal connection between the disposal site interior and Barataria Bay.

3. Using December 2012 aerial photography, less than 3 acres of marsh habitat remain at the 1990 and 1996 Queen Bess Island disposal sites. The shell/rip rap dikes remain, but shallow open water occupies the majority of the two disposal cells.

Queen Bess Island (1995)

Queen Bess Island Post-Placement Event (1996)

Mile 14 and Mile 6.5

Background:
During the FY 1996 maintenance event (contract DACW29-96-C-0061: 3 August 1996 – 22 November 1996), dredged material was placed semi-confined into wetlands development disposal areas located at Mile 14 and Mile 6.5.

Dredged Material Placement Event:
Approximately 120,574 CY of dredged material was placed at the Mile 14 placement site 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 Mile 6.5 placement site to an initial elevation of +4.5 feet MLG (+3.7 feet NGVD).

Containment and Access:
Riprap dike closures were built to an elevation of about +5.0 feet MLG with a 5-foot crown width along the northern boundary of the Mile 14 site and along the eastern boundary of the Mile 6.5 site to prevent dredged material from entering adjacent waters containing numerous oyster leases.

Results:
1. Approximately 54 acres of marsh and mud flats were created at the Mile 14 placement site using about 120,574 CY of dredged material.

2. Approximately 14 acres of marsh and mud flats were created at the Mile 6.5 placement site using about 72,000 CY of dredged material.

Notes:
1. Mile 14 Placement Site:
    a. By 1997, the majority of habitat created at this site had converted back to shallow open water as a result of settlement, subsidence, and erosion.
    b. Water depths in this site averaged about +1.0 foot MLG.

2. Mile 6.5 Placement Site:
    a. By 2000, the dike separating the interior of the Mile 6.5 placement site from the adjacent Barataria Bay had begun to degrade and at least one gap had been formed.
    b. By 2007, the earthen dike along the channel side of the Mile 6.5 placement site had degraded sufficiently to allow the formation of an open water gap. This site was now directly connected with Barataria Bay on one side and the navigation channel on the other side.

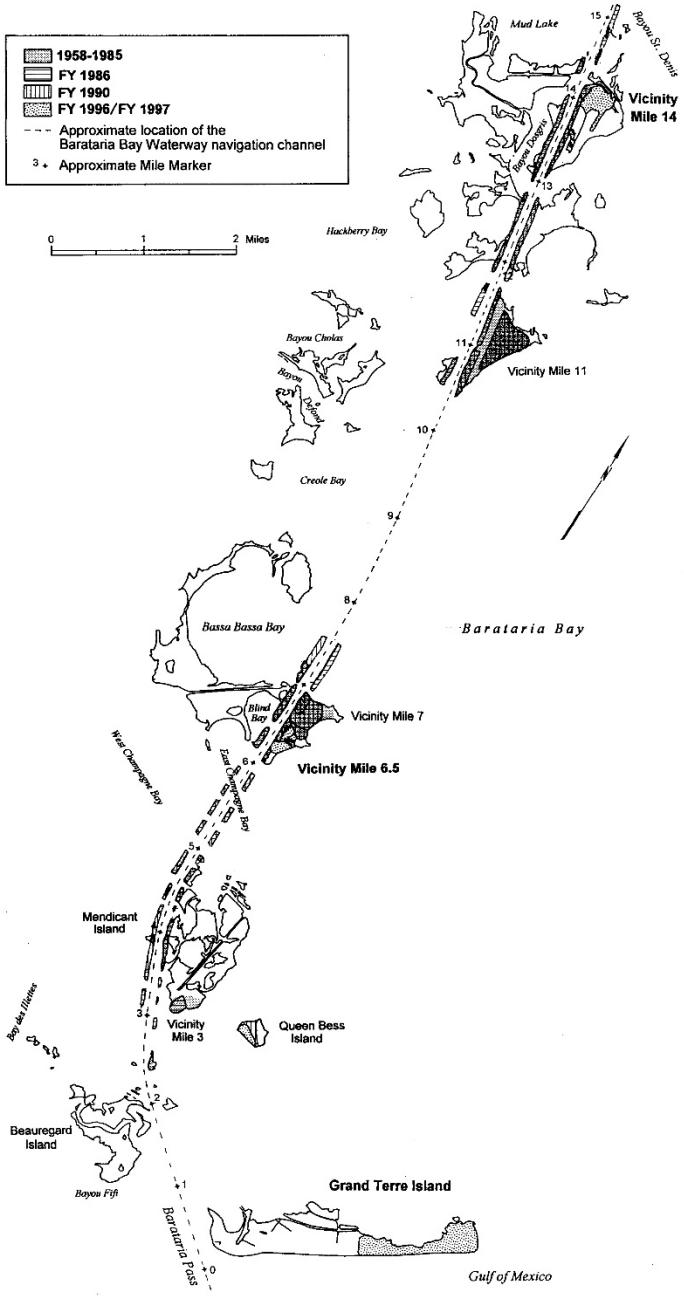
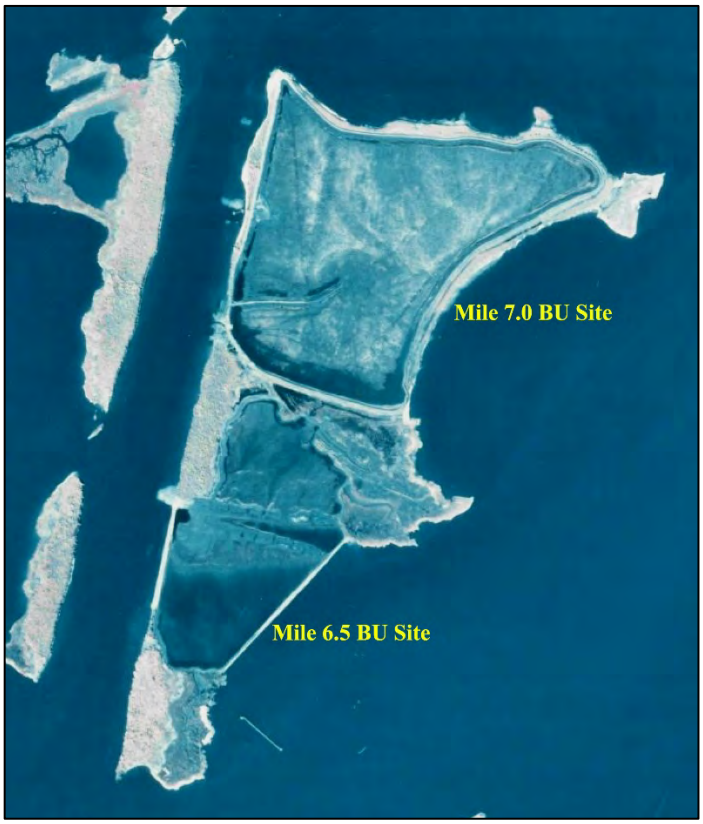


Figure 4. The dredged material disposal history for the lower Barataria Bay Waterway navigation channel in Louisiana including the Barataria Bay Reach and Grand Terre Island BUMP study areas.

BBWW Mile 14 BU Site (1996)

BBWW Mile 14 BU Site (1998)

BBWW Mile 6.5 BU Site Pre-Placement Event (1995)



BBWW Mile 6.5 BU Site Post-Placement Event (1996)

BBWW Mile 6.5 BU Site (1998)

BAR CHANNEL REACH (Mile 0 to Mile -3.8)

Prior to FY 1996, all dredged material removed during routine maintenance of the BBWW bar channel was placed in the ocean dredged material disposal site located adjacent to, and on the northeast side of, the channel, approximately 1.25 miles southeast of Grand Terre Island and approximately 2 miles east of Grand Isle.

Background:
In 1995, the CEMVN 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 of and enlargement of the island. The island had been breached in several locations in 1992 during Hurricane Andrew. The CEMVN 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 (Contract DACW29-96-C-0048: 24 June 1996 – 5 September 1996), a 130-acre hurricane overwash-eroded area was enclosed by earthen dikes, and the area was further sub-divided into two cells of 115 acres (Cell #1) and 15 acres (Cell #2) each. Cell #2 was built around existing pipeline canals located on the eastern end of Grand Terre Island.

Dredged Material Placement Event:
From 19 August 1996 through 5 September 1996, the cutterhead dredge GEORGE D. WILLIAMS placed an estimated 666,258 CY of dredged material into the 2 cells. The estimated initial elevation of the dredged material slurry was +9.0 feet MLG (+8.2 feet NGVD) in Cell #1 and +5.0 feet MLG (+4.2 feet NGVD) in Cell #2. The dredged material consisted primarily of soft silt with clay and very little sand. A Y-valve was utilized to regulate the discharge between the 2 cells.

Containment and Access:
1. The dike on the Gulf of Mexico side of the larger Cell #1 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). 5 spill boxes were located along the Gulf of Mexico side of Cell #1.

2. Dikes around the smaller Cell #2 were constructed to +7.0 feet MLG (+6.2 feet NGVD) with 3 spill boxes located along the cell's Gulf of Mexico side.

3. Containment dikes were constructed with a 5-foot crown width, a 2-on-1 side slope, and a 30-40 foot base. Visqueen fabric was placed on dikes that were constructed in shallow water to prevent wave erosion.

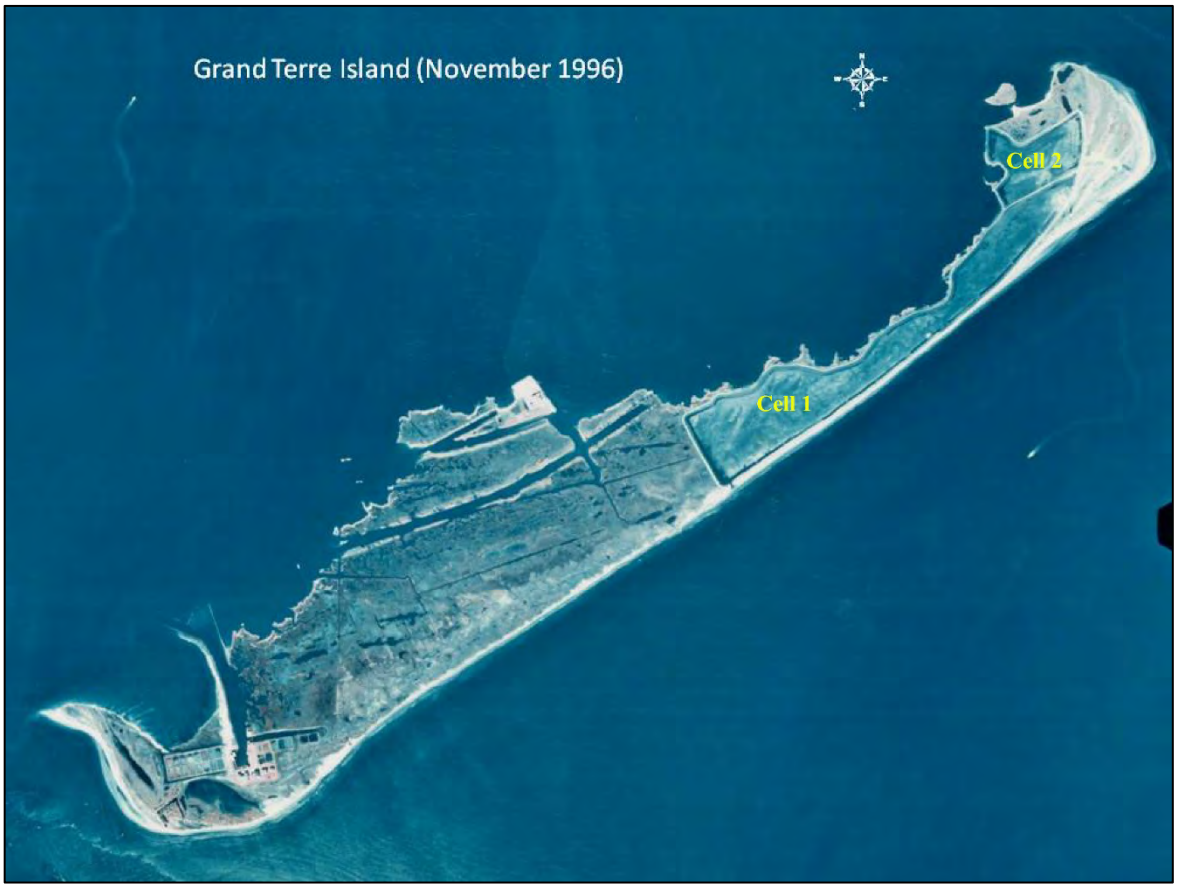
Results:
Approximately 100 acres of barrier island habitat was restored on Grand Terre Island using about 666,258 CY of dredged material removed from the BBWW bar channel.

Notes:
1. The passage of Hurricane Dolly resulted in the movement of the dredge to safe waters from 20-24 August 1996.

2. Cell #1:
    a. By 1998, the average relief at this placement site ranged from about +4.0 feet MLG to about +6.0 feet MLG, with the higher elevations typical to the northern half of this site.
    b. By 1998, earthen dike heights constructed along the gulf side of this site ranged from about +8.0 feet MLG to about +5.2 feet MLG.
    c. By 1998, earthen dike heights constructed along the northern (bay side) of this site ranged from about +8.0 feet MLG to about +4.0 feet MLG.
    d. By 1998, interior elevations within this site ranged from about +4.0 feet MLG to about +5.0 feet MLG.

3. By 1999, virtually no trace of the gulf side dikes could be detected, most likely as a result of wave-induced erosion.

Grand Terre Island Pre-1996 Placement Event



Grand Terre Island Post-1996 Placement Event

Grand Terre Island Cell 1

Grand Terre Island Cell 2

1999

DUPRE CUT INLAND REACH (Mile 36.7-16)

Background:
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 by bucket dredges.

During the FY 1999 BBWW Mile 31.0 to Mile 25.5 maintenance event (Contract DACW29-99-C-0042: 6 August 1999 – 11 November 1999), dredged material removed from the Mile 31.0 to Mile 25.5 reach was placed in an area of 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 CWPPRA project (BA-23 Barataria Bay Waterway West Side Shoreline Protection project) to construct a foreshore protection rock dike along the channel side boundary of this placement site provided an additional protection/retention feature for this site. The cutterhead dredges DREDGE 32 and GALVESTON performed all maintenance dredging under this contract.

Dredged Material Placement Event:
From 14 September 1999 through 4 November 1999, the DREDGE 32 and the GALVESTON placed approximately 527,323 cubic yards within three cells comprising the Dupre Cut placement area: the North Prairie Cell located north of a pipeline canal; the South Prairie Cell located south of the same pipeline canal; and the 500-foot wide Access Corridor Cell located in the South Prairie Cell between a CWPPRA-constructed foreshore protection rock dike and an earthen dike retention dike. 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 placed in the Access Corridor Cell was pumped to a minimum elevation of +3.5 feet MLG (+2.7 feet NGVD) and a maximum elevation of +4.0 feet MLG (+4.2 feet NGVD). Dredged material effluent was allowed to flow through and onto the adjacent existing marsh within the North and South Prairie cells.

Containment and Access:
An approximately 9,900-foot long foreshore protection rock dike was constructed as part of CWPPRA project BA-23 along the right-descending bank of the waterway between Mile 26.8 and Mile 25.8 to provide protection from wave-induced erosion resulting from boat traffic. A secondary function of this foreshore rock dike was to help ensure that dredged material placed within the Dupre Cut placement site did not re-enter the navigation channel. The foreshore rock dike was constructed to an elevation of about +4.4 feet NAVD88 with a crown width of about 6 feet.

An approximately 7,000-foot long earthen containment dike was built parallel to, and about 500 feet from, the foreshore rock dike to create an approximately 77-acre placement cell (Access Corridor Cell) within the South Prairie Cell. The natural ridge along the western side of the Dupre Cut placement area was sufficient to contain the dredged material without the construction of additional dikes.

Results:

1. Approximately 43 acres of marsh were created in the North Prairie Cell, approximately 83 acres of marsh were created in the South Prairie Cell, and approximately 43 acres of marsh were created in the Access Corridor Cell using about 527,323 cubic yards of dredged material.

Notes:

1. The recently installed 12-inch Jefferson Parish water line for Grand Isle was damaged during dredging operations.

2. A 6-foot wide by 3-feet deep ditch was excavated in the North Prairie Cell upon the landowner's request.

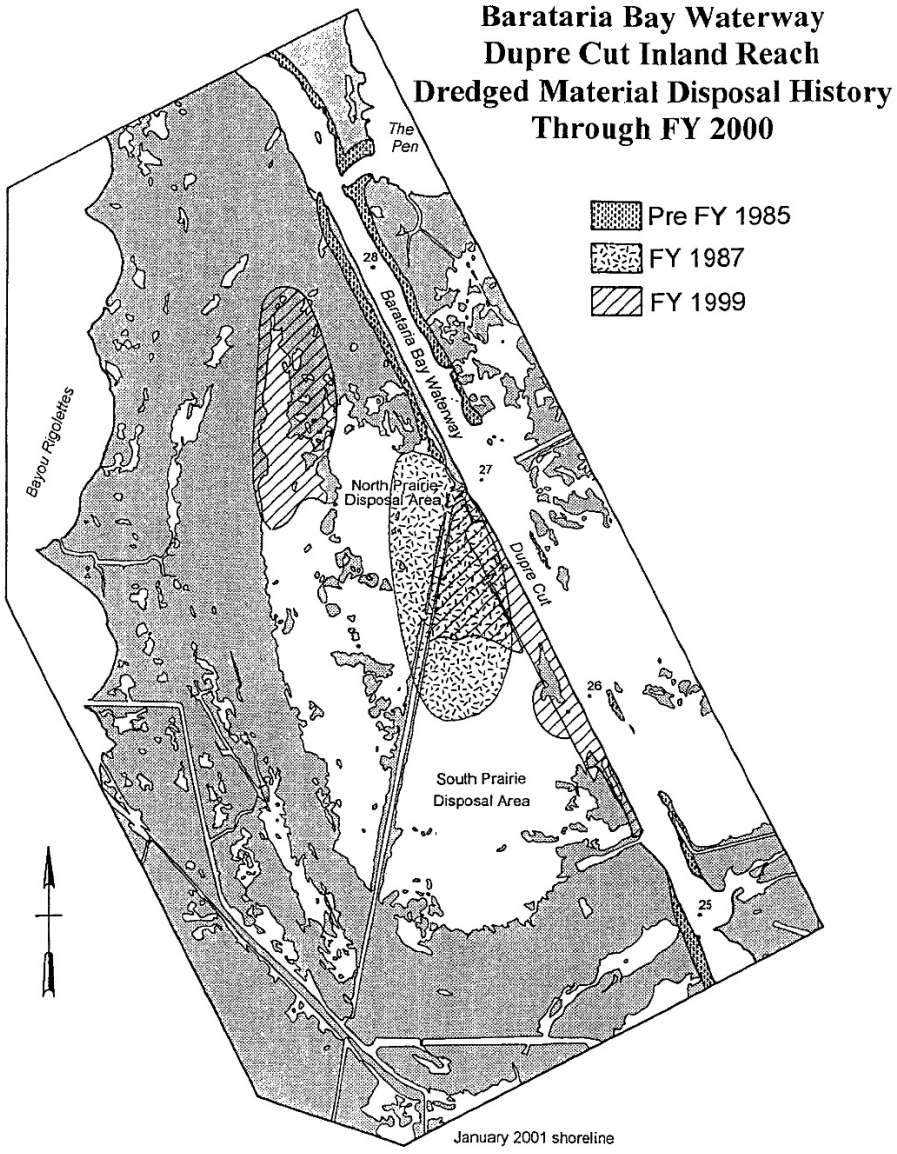
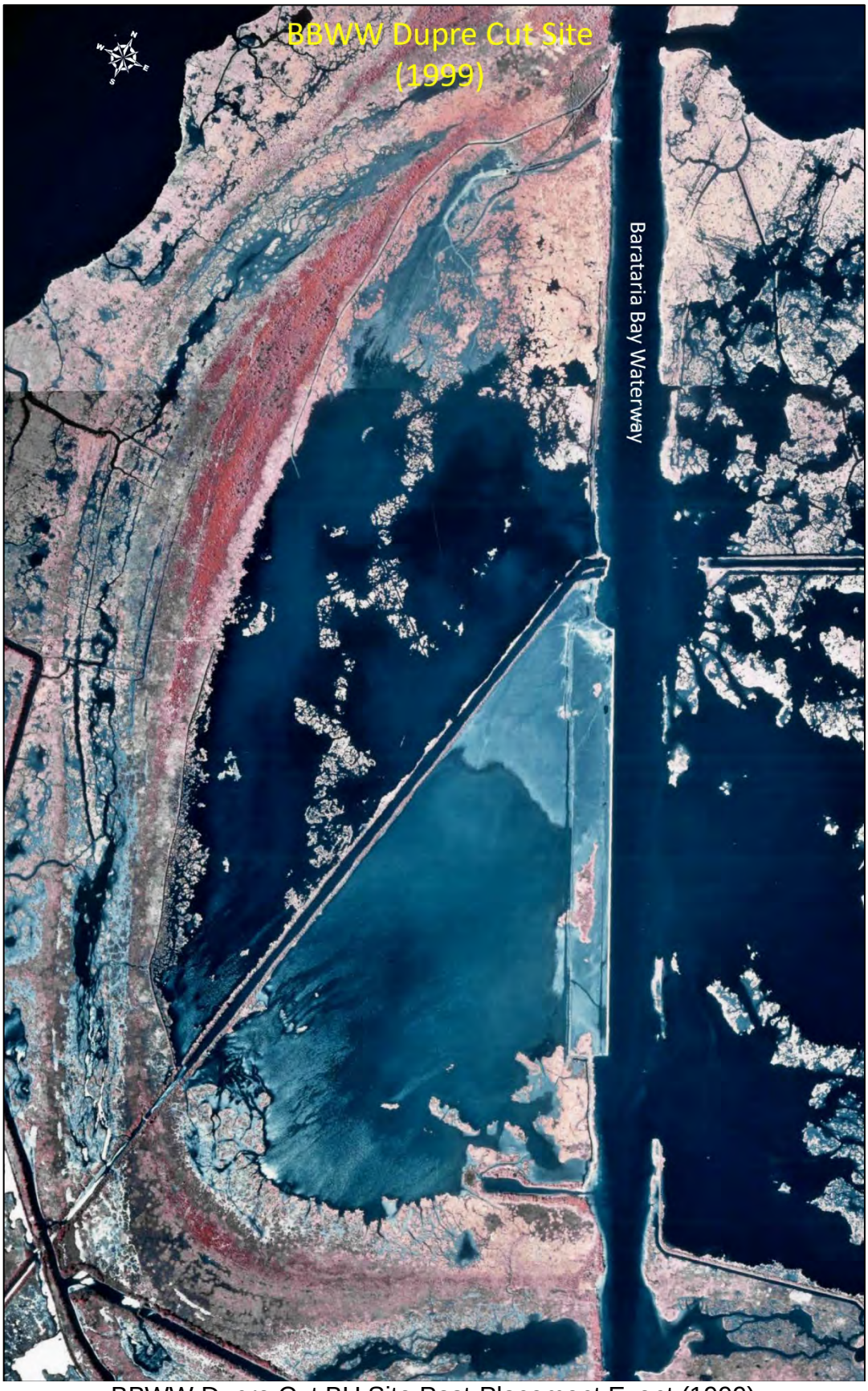


Figure 11. The dredged material disposal history for the upper Barataria Bay Waterway navigation channel - Inland Reach (Dupre Cut) BUMP study area in Louisiana.



BBWW Dupre Cut BU Site Post-Placement Event (1999)

BAR CHANNEL

Background:
During the FY 1999 BBWW bar channel maintenance event (Contract DACW29-99-C-0040: 16 July 1999 – 20 September 1999), dredged material removed from the Mile -0.7 to Mile -3.8 reach was placed at Grand Terre Island in a 185-acre back-bay placement area as part of a Section 204 of the Water Resources Development Act of 1992 project to restore marsh. The back-bay placement site was sub-divided into 3 cells to facilitate retention of dredged material to achieve marsh creation elevations. The cutterhead dredge MERIDIAN performed all maintenance dredging under this contract.

Dredged Material Placement Event:
From 8 September 1999 through 19 September 1999, the MERIDIAN placed approximately 617,654 cubic yards of dredged material primarily into the western and center cells to a maximum initial height of +3.75 feet MLG. The discharge location was situated within the westernmost cell.

Containment and Access:
To reduce the potential for adverse sedimentation impacts to nearby oyster leases in Barataria Bay, the back-bay placement area was confined on the bay side by an approximately 6,470-foot long rock dike constructed to an elevation of +5.0 feet MLG and divided into 3 cells by interior earthen dikes. The rock dike provided protection from wave-induced erosion for the back-bay placement site.

Two interior earthen dikes were constructed within the placement area to sub-divide it into 3 sub-cells. Interior dikes were built to an initial elevation of between +3.25 feet MLG and +3.75 feet MLG over a total length of approximately 3,000 linear feet.

Spillboxes were situated at the southern end of the interior dikes. Silt curtains were used at the western/bay end of an existing canal and at the eastern end of the rock dike to minimize the escape of sediments into Barataria Bay. Hay bales were used to minimize the overflow of dredged material slurry onto adjacent areas of marsh along the western end of the westernmost cell. The earthen dike marking the northern boundary of the 1996 placement cell was used as a containment feature that prevented dredged material from escaping the cells and entering the Gulf of Mexico.

All discharge pipeline and earthen dike construction equipment accessed the back-bay placement site from the Gulf of Mexico via a 150-foot wide overland access corridor located adjacent to, and on the eastern side of, the 1996 eastern retention dike.

Results:
Approximately 111 acres of marsh were created using about 617,654 cubic yards of shoal material in the back-bay placement site.

Notes:
1. While the western cell was filled to capacity, about 85% of the center cell was filled, and very little dredged material entered into the eastern cell.

2. An approximately 11-acre pond was formed along the eastern boundary of the center cell to connect the pond to Barataria Bay.

Grand Terre Island Post-Back Bay Placement Event (2000)

Grand Terre Island Post-Back Bay Placement Event (11 February 2000)

Grand Terre Island Post-Back Bay Placement Event (11 February 2000)

Grand Terre Island Post-Back Bay Placement Event (11 February 2000)

Grand Terre Island Post-Back Bay Placement Event (14 July 2000)

Grand Terre Island Post-Back Bay Placement Event (14 July 2000)