MONITORING PLAN

PROJECT NO. TE-48 Raccoon Island
Shoreline Protection / Marsh Creation

ORIGINAL DATE: August 24, 2005
REVISED DATE: January 8, 2008

Preface

The monitoring plan was modified to update the data collection timeline. Specifically, this revision was necessary because of delays in project construction and changes in the Barrier Island Comprehensive Monitoring (BICM) program sampling intervals. These alterations to the monitoring plan have been incorporated into the monitoring strategies section.

Project Description

Raccoon Island is the western most island of the Isles Dernieres located approximately 50 miles (80 km) south of Houma, LA. The 3.2 mile (5.1 km) long island is one of four islands, Whiskey Island, Trinity Island, and East Island, which consist of a 20 mile (32 km) long island arc known as Isles Dernieres (McBride et al. 1989). These islands are separated from the mainland by Terrebonne Bay, Lake Pelto, and Caillou Bay, with the Gulf of Mexico as the southern boundary (figure 1).

The Isles Dernieres arc, which is part of the Lafourche deltaic complex, formed as a result of the abandonment of the Caillou Headland which occurred approximately 500 years before present (Penland and Boyd 1985). Following the river's abandonment, headland sand deposits were moved and deposited longshore forming flanking barriers (Penland et al. 1988). The submergence of the abandoned delta separated the headland from the shoreline and formed barrier islands. These islands experience narrowing and land loss as a consequence of the interactions among global sea level rise, compactual subsidence, inadequate sediment supply, human disturbance, and wave and storm processes (Penland et al. 1988; McBride et al. 1989; Williams et al. 1992).

The long-term shoreline change average between 1887 and 2002 for the Isles Dernieres shoreline was -34.7 feet/year (-10.6 meters/year) while the short-term average was -61.9 feet/year (-18.9 meters/year) for the period of 1988-2002. During these same periods, the change in area was -62.3 acres/year (-25.3 hectares/year) for the long-term and -25.0 acres/year (-10.1 hectares/year) for the short-term. Specifically, Raccoon Island's long-term average shoreline change between 1887 and 2002 was -27.4 feet/year (-8.4 meters/year) while the short-term (1988-2002) average was -60.5 feet/year (-18.4 meters/year) (US Army Corps 2004). The island has narrowed from 2,736 feet (834 meters) in 1887 to 813 feet (247.8 meters) in 1988 (McBride et al. 1992). During a fifteen year period (1978-1993), Raccoon Island exhibited a rapid decrease in area from 368.2 acres (149 hectares) to 99.2 acres (40.1 hectares) (US Army Corps 2004). From

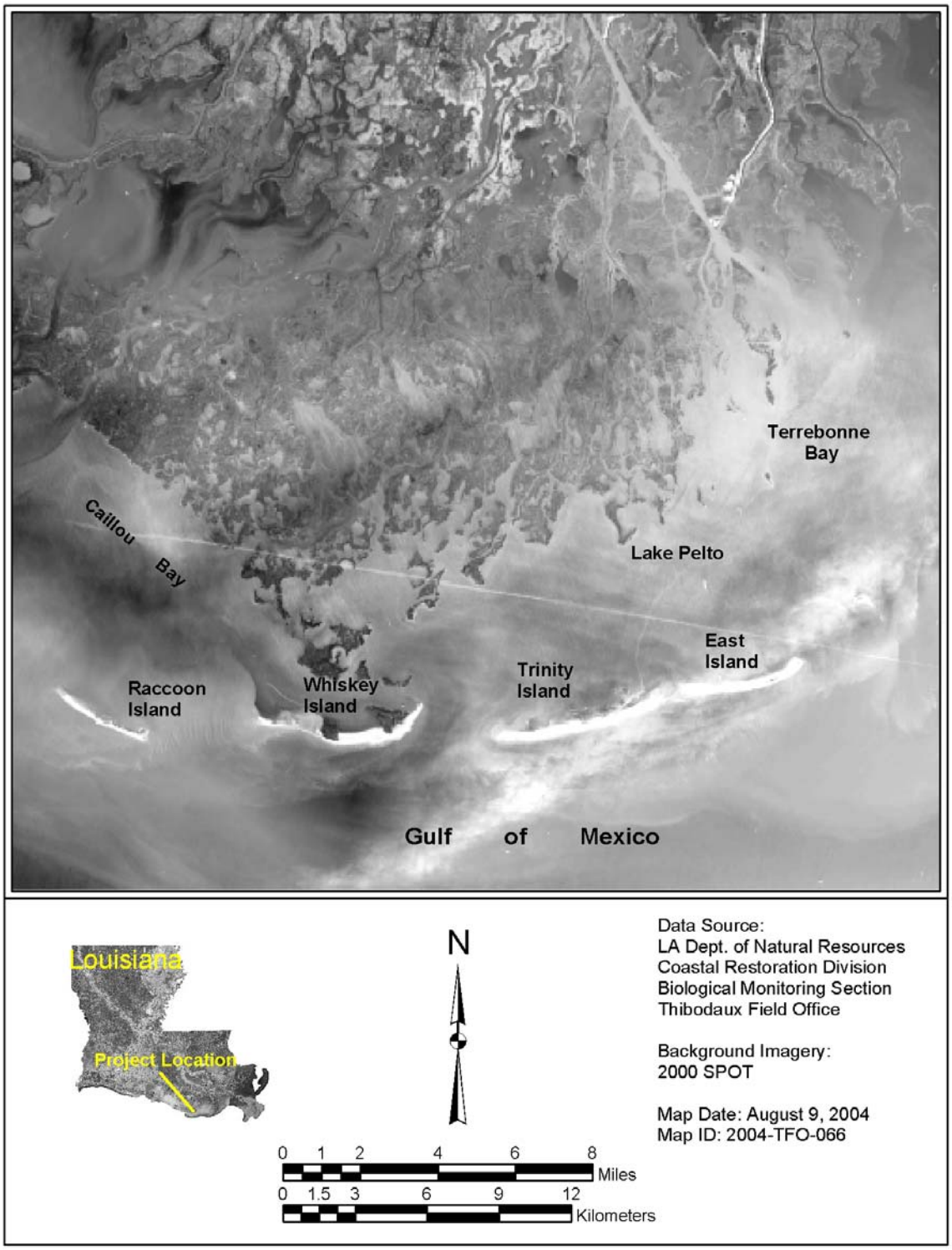

Figure 1. Project location, Raccoon Island, Isles Dernieres island chain, Terrebonne, Louisiana.

1994-2002, the island increased in size because of two restoration projects. The first project, a Federal Emergency Management Agency (FEMA) Restoration project in 1994, increased the size of the island to 127.2 acres (51.5 hectares) by 1996. By 2002, the island had an area of 145.5 acres (58.9 hectares) because of the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Raccoon Island Breakwaters Demonstration (TE-29) project (US Army Corps 2004).

The TE-29 project constructed eight (8) segmented breakwater structures along the eastern end of Raccoon Island in 1997 (figure 2). The segmented breakwaters were used to demonstrate their effectiveness for reducing shoreline erosion since they are designed "to reduce incident wave energy and create new diffraction and refraction patterns that cause a reduction in potential sediment transport and promote accretion or stability along the beach" (Armbruster 1999). The constructed breakwaters are 300 feet (91.4 meters) long, 10 feet (3 meters) wide at the crown with 3:1 side slopes, were placed 300 feet (91.4 meters) apart in 2-6 feet (0.6-1.8 meters) of water, and had an approximate crown elevation of 4.5 feet (NAVD88). During and immediately following construction, a net increase in the volume of sand was measured between the breakwaters and dune. This increase indicated that the sediment was being delivered from a source outside of the project area. Upon further investigation, a shoal was present gulfward off the island's eastern tip. These structures effectively captured sand from the shoal; however, the manner in which the breakwaters captured the sand was unanticipated. As sand was captured between the breakwaters and shoreline, reverse salients were observed which had not been previously documented as a response to segmented breakwaters (Stone 2003).

Since the short-term results of the demonstration project effectively protected the island from erosion, the Raccoon Island Shoreline Protection/Marsh Creation (TE-48) project was authorized by the CWPPRA Task Force. The project is co-sponsored by the United States Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) and the Louisiana Department of Natural Resources (LDNR). The project is designed to 1) reduce the rate of shoreline erosion along the western, gulfward side and 2) extend the longevity of northern backbay areas by creating 54 acres (21.9 ha) of intertidal wetlands that will serve as colonial wading bird and seabird nesting habitat.

During the design phase of the project, the geotechnical investigation (STE, Inc. 2003) concluded the material for the containment dikes and the marsh creation were not suitable materials for the project's design application. Consequently, the project was divided into two phases: Phase A – consists of the shoreline protection features and Phase B – consists of the marsh creation features. Presently, Phase A is being designed for construction while further investigations are being conducted for the feasibility of Phase B. The project is being installed in phases to prevent delays to providing support to the largest shorebird rookery along the Isle Dernieres. The island is an important nesting site for the brown pelican (*Pelecanus occidentalis*), roseate spoonbill (*Ajaia ajaja*), and the reddish egret (*Egretta rufescens*) while several other avian species utilize the island for nesting, which include, but are not limited to, the great egret (*Ardea alba*), white ibis (*Eudocimus*

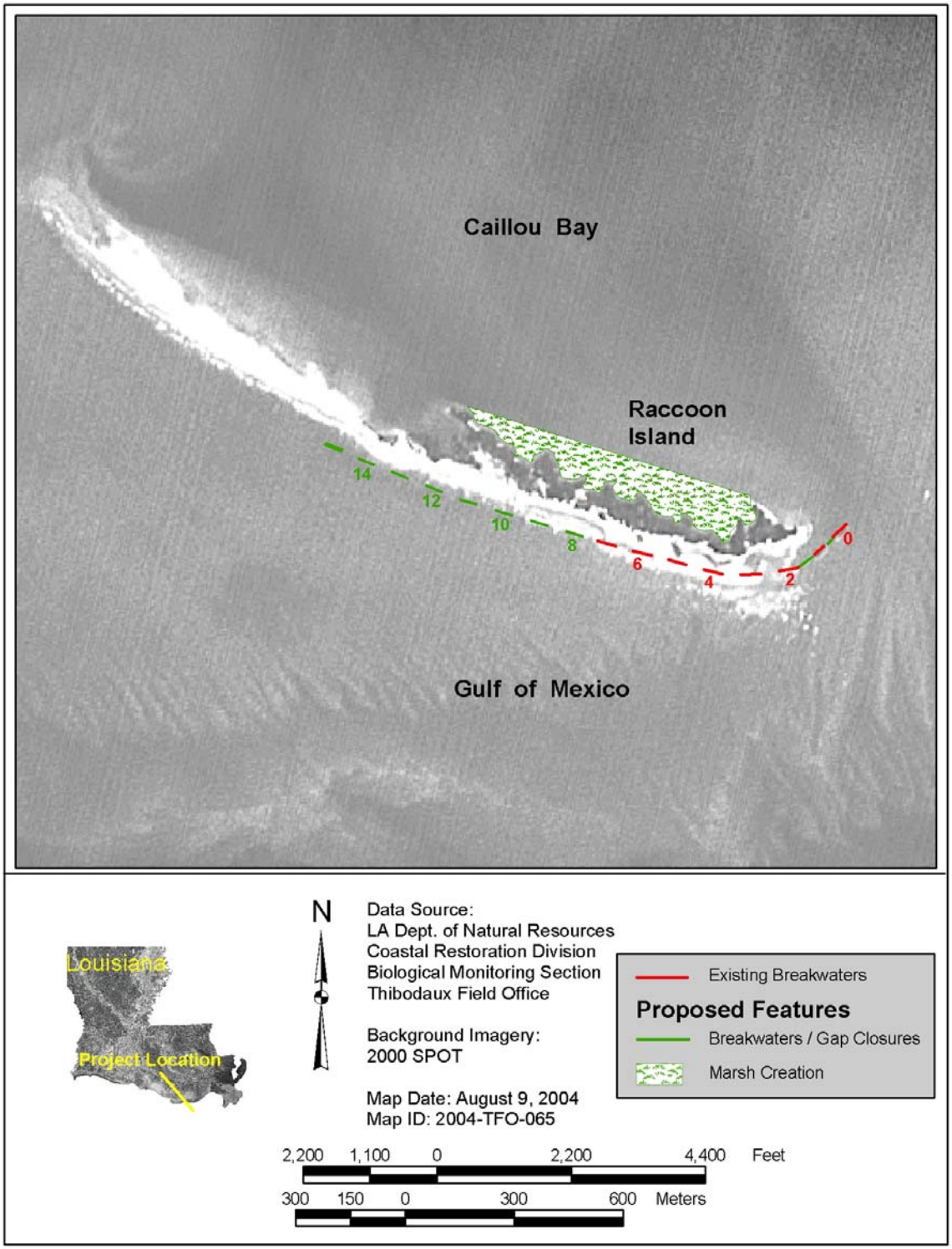

Figure 2. Existing breakwaters from TE-29 and original proposed structures for TE-48.

albus), black skimmer (*Rynchops niger*), least tern (*Sterna antillarum*), royal tern (*Sterna maxima*), and gull-billed tern (*Gelochelidon nilotica*) (Belhadjali 2004).

Project Goals and Strategies/Coast 2050 Strategies Addressed

The United States Department of Agriculture's Natural Resource Conservation Service (USDA/NRCS) stated the following project goal and strategies. Project Goal:

1. Reduce shoreline erosion to protect habitats sustaining Raccoon Island rookery and sea bird colonies.

Project Strategies:

1. Install 8 additional breakwaters to reduce shoreline erosion rates by approximately 60% [from 52 feet/year to 21 feet/year, as estimated by model calculations performed by Coastal Planning & Engineering, Inc. (2004)]."
2. Create 60 acres of intertidal wetlands to extend the longevity of the northern backbay areas and expand bird habitat.

The project goal and strategies address the ecosystem management strategy "restore barrier islands and gulf shorelines" outlined in Region 3 of Coast 2050: Toward a Sustainable Louisiana. The specific strategy is to "restore and maintain the Isles Dernieres" (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority 1998). The construction of the segmented breakwaters would maintain Raccoon Island while the creation of marsh would restore portions of the island.

Project Features

The Raccoon Island Shoreline Protection/Marsh Creation (TE-48) project consists of two major features, shoreline protection structures (Phase A) and a marsh creation area (Phase B). The shoreline protection phase of the TE-48 project will construct eight breakwaters and a groin (figure 3) to lower shoreline erosion rates while the marsh creation phase will elevate a subtidal area behind Raccoon Island to intertidal, supratidal, and dune elevations (figure 4).

The shoreline features that were proposed during the conception of the project included eight segmented breakwaters constructed exactly as the breakwaters for the Raccoon Island Breakwaters Demonstration (TE-29) Project west of the last existing breakwater (breakwater 7) and closing two of the gaps between existing breakwaters 0 and 1 and 1 and 2 (figure 2). As a result of the Raccoon Island Project (TE-48) Sediment Budget performed by Coastal Planning and Engineering, Inc. (2004), the spaces between the proposed breakwaters were reduced and the closing of the two gaps between the existing

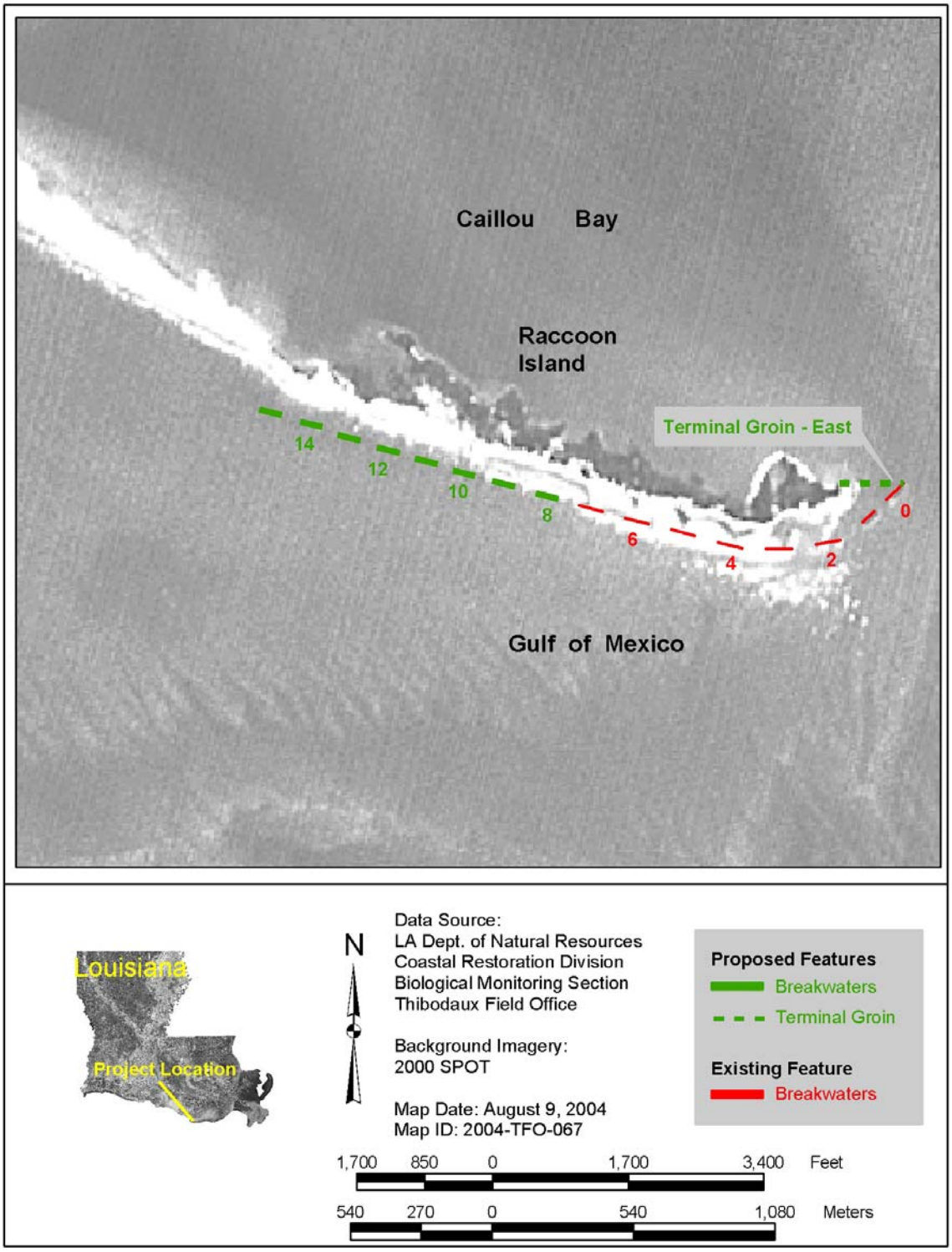

Figure 3. Layout of the proposed features along with the existing features from TE-29.

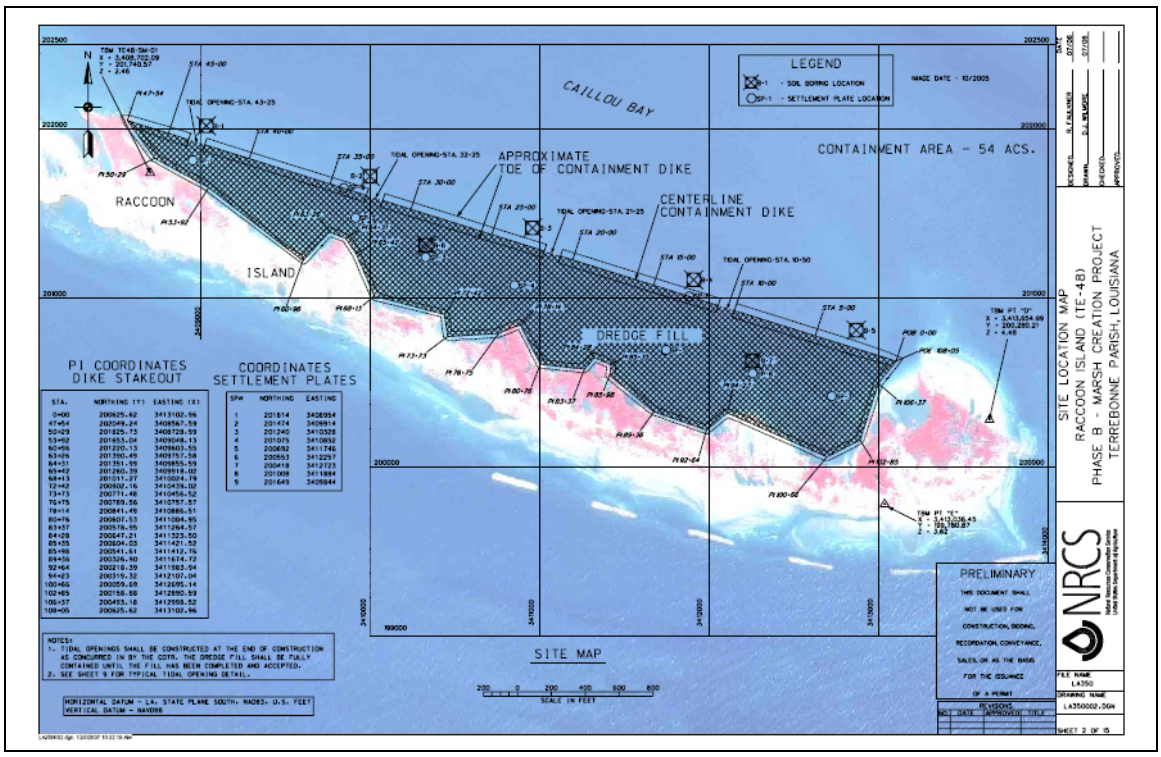

Figure 4. **Aerial view showing the location of the Raccoon Island Shoreline/Protection Marsh Creation (TE-48) containment dikes and the marsh creation area.**

breakwaters were eliminated. In place of closing the gaps, it was recommended that a terminal groin be constructed, connecting breakwater 0 to the shoreline. Lastly, the report suggested a terminal groin at the western end of the proposed breakwater field that would connect breakwater 15 to the shoreline; however, this terminal groin will not be constructed. The concern with the proposed western groin is that the sand spit west of the breakwater system would no longer receive any sand which may cause it to disappear over time. The Sediment Budget that was performed for the project did not analyze the response of the sand spit with respect to the groin; consequently, the federal sponsor decided not to include the groin as a project feature.

The two project features that will be constructed during Phase A of the project include:

1. Eight (8) segmented rock riprap breakwaters: These breakwaters will be constructed west of the existing breakwater 7 (figure 3). These breakwaters will be constructed to measure 300 feet (91.4 meters) in length, 10 feet (3 meters) wide at the crown, and an elevation of 4.5 feet (NAVD88) (1.4 meters) at the crest. They will consist of 3:1 side slopes and will be placed approximately 250 feet (76.2 meters) from the shoreline in varying depths of water depending on the tides. Each breakwater will have two settlement plates positioned within the breakwater. The spacing between each breakwater will vary as recommended by the Sediment Budget submitted by Coastal Planning and Engineering, Incorporated (2004). The breakwaters will begin 300 feet (91.4 meters) from breakwater 7. The gap width in succession from east to west will be 280 feet

(85.3 meters), 260 feet (79.2 meters), 240 feet (73.2 meters), 220 feet (67.1 meters), 200 feet (61.0 meters), 180 feet (54.9 meters), and 160 feet (48.8 meters).

2. Terminal groin – East: A terminal groin will connect the eastern most breakwater (breakwater 0) from the TE-29 project to the island (figure 3). The groin will be approximately 1,050 feet (320 meters) in length, have a 10 foot (3 meters) width, an elevation of 4.5 feet (NAVD88) (1.4 meters) at the crest, and a 3:1 side slope.

The Sediment Budget proposed the reduction of the gaps between each breakwater to more effectively capture the sediment transport which occurs from east to west along the shoreline. More importantly, the existence of the shoal that has contributed to the effectiveness of the existing breakwaters is not expected to have a dramatic effect on the proposed breakwaters. Consequently, the reduction will provide a more stable beach front.

The existence of a deep channel between the eastern tip of the island and the first 3 breakwaters has contributed to re-designing the gap closings between the breakwaters. Through the sediment budget analysis, it has been recommended that a terminal groin be constructed to halt the current through the existing breakwater field. Once the current has been deflected, the breakwaters will have the ability to capture the sediment and potentially create emergent areas for vegetation establishment and/or avian nesting.

The marsh creation phase of this project will consist of three project components: containment dikes, marsh creation in open water areas, and vegetation plantings. Containment dikes will confine and allow dredged material consolidation and will construct small areas of supratidal and dune habitat. Placement and settlement of dredged sediments will create intertidal back barrier marsh and will appreciably increase the width and sustainability of Raccoon Island. Vegetative plantings in back barrier marsh area will hasten the development of marsh communities and will support sediment retention (Lindquist 2007).

1. Containment Dikes - Two earthen containment dikes will be established to encircle the marsh creation area. These dikes will be designated as island side and bayside containment dikes and will extend for approximately 10,930 ft (3,331 m) (figures 4 and 5). These structures will be built to an elevation of 5.0 ft (1.5 m) NAVD 88, have a 20 ft (6.1 m) crown, and a 5H:1V slope on each side (figure 5). All containment dikes will have the same dimensions except the exterior slope of the bayside containment dike will have a 6H:1V slope. The containment dikes will be constructed using 102,567 yd^3 (78,418 m^3) of sediments bucket dredged from the marsh creation area (NRCS 2007). The borrow area for the containment dikes will be dredged to a depth not to exceed -13 ft (-4.0 m), and will be located approximately 25 ft (7.6 m) from the toe of the earthen structures (figure 5). These borrow areas will filled in during the marsh creation phase. After the marsh creation area has consolidated, the bayside containment dike will be lowered to the marsh elevation [2.5 ft (0.8 m) NAVD 88] in four locations to provide tidal exchange. The gaps will be 10 ft (3.0m) wide and will be spaced on 1000 ft (305 m) intervals (figure 4). The remaining containment dikes will not be breached and will be classified as supratidal or dune habitat depending on

elevation (NRCS 2007).

2. Marsh Creation - Once construction of the containment dikes are complete, marsh creation activities will be initiated by dredging sediments from an offshore borrow area located 3.8 mi (6.1 km) south of Raccoon Island. The sediments dredged from the borrow area will be hydrologically pumped into the marsh creation area. Open water areas in the disposal area will be filled to a maximum elevation of 2.5 ft (0.8 m) NAVD 88 to create new marsh (figures 4 and 5). Approximately, 477,986 yd^3 (365,447 m^3) of dredged material will be used to create 54 acres (21.9 ha) of intertidal habitat (NRCS 2007). Following five years of consolidation, the disposal area is anticipated to have an average elevation of 1.6 ft (0.5 m) NAVD 88 (NRCS 2007; Lindquist 2007).

3. Vegetation Plantings - To stabilize the marsh creation and containment dike areas and increase emergent and woody vegetation cover, 36,032 herbaceous and 16,196 woody wetland plants will be planted. Herbaceous species will be planted using vegetative plugs or 4 in containers while woody species will utilize trade-gallon-sized containers. Species selected will be based on soil conditions, elevation, and hydrology. Plantings will begin as soon as the dredged sediments have consolidated and will be conducted in 2 or 3 phases spanning 2 or 3 years (NRCS 2007).

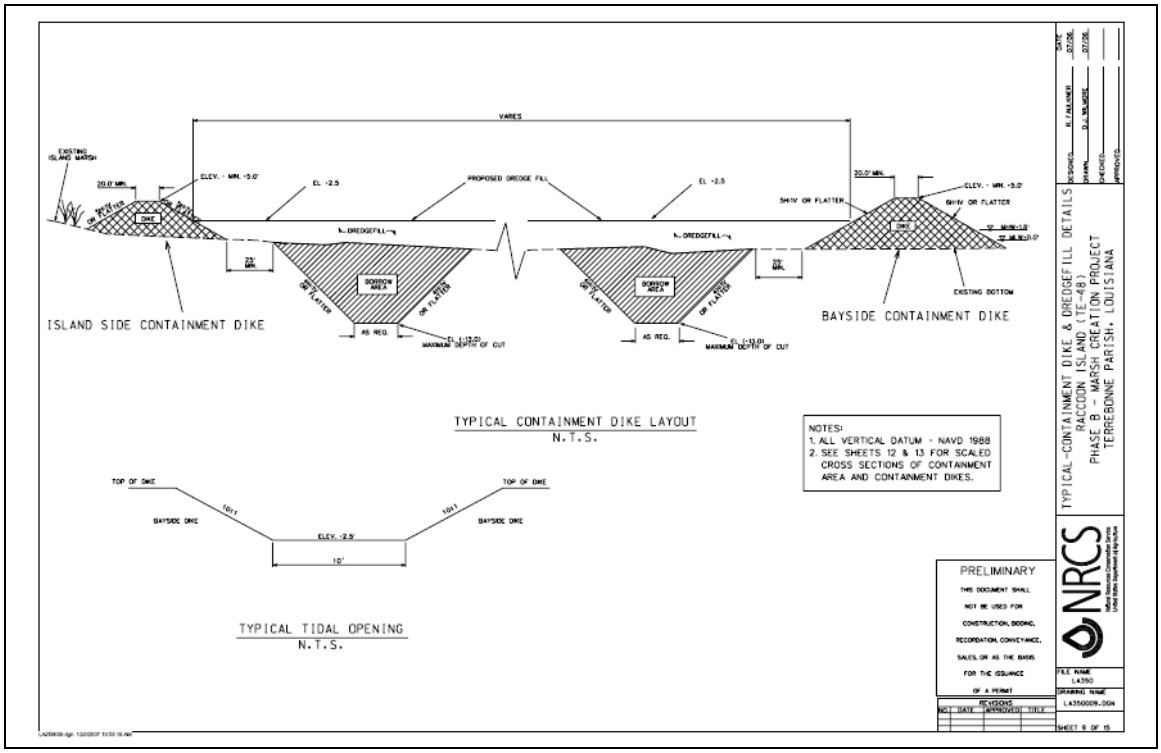

Figure 5. **Typical cross sections illustrating the Raccoon Island Shoreline/Protection Marsh Creation (TE-48) containment dikes and marsh creation area.**

Monitoring Goals

The Barrier Island Comprehensive Monitoring (BICM) Program has been proposed by the Louisiana Department of Natural Resources / Office of Coastal Restoration and Management and has been reviewed by the Louisiana Shoreline Science Restoration Team (SSRT). Expanding to a holistic barrier island monitoring program would enable comparisons and characterizations of physical and ecological change to be documented more precisely among each island independently as well as comparing the changes holistically. Utilizing the BICM program would provide long-term data that is consistent and accurate. Six variables would be collected on a pre-determined sampling frequency. These variables include: (1) Topographic/Light Detection and Ranging (LiDAR),, (2) BICM Bathymetry, (3) Topographic and bathymetric data, (4) Color infrared aerial photography (CIR), (5) Surficial sediments for the measurement of sediment grain size, sorting, percent sand and fines, organic matter content and bulk density, and (6) Wave, current, water level, and meteorological data.

Specific Monitoring Goals:

The goal of the BICM Program is "to provide long-term data on Louisiana's barrier islands to be used to plan, design, evaluate, and maintain current and future barrier island restoration projects" (Troutman et. al 2003). Five objectives have been recommended:

1. Determine the elevation, longevity, and conservation of mass of the barrier islands.
2. Determine major habitat types and the distribution and quantity of each habitat over time on the barrier islands.
3. Determine geotechnical properties of sediments on the barrier islands.
4. Relate available data on environmental forces that affect the ecology and morphology of the barrier islands to other BICM data sets.
5. Determine species composition and diversity of vegetation within major habitat types on the barrier islands.

The project goal and strategies parallel the objectives of the BICM program. Topographic/bathymetric surveys and LiDAR will be used to determine the elevation, longevity, and conservation of mass of the project area. Habitat classification will assess the major habitat types of the island once the marsh creation phase is completed. Push core samples will determine the geotechnical property changes in the project's area. Wave, current, water level, and meteorological data available through the world-wide-web and/or other government programs will be ascertained to determine the ecological and morphological affects on the project's area. In addition to the project objectives, the sand spit directly west of the TE-48 breakwater field will be intensively monitored during the first two years after construction to determine the affects of the breakwaters on the spit area.

Reference Area:

Collecting monitoring data on both project and reference areas provides a way to achieve statistically valid comparisons and thus a reliable evaluation of project effectiveness. Since the breakwaters will be constructed along the remainder of the island, no suitable area will provide an adequate reference area. However, if implemented the BICM program will enable comparisons among the other three islands in the Isle Dernieres chain as well as the other barrier islands in Louisiana not using breakwaters. Similarly, no reference area will be established for the back barrier marsh creation area (Phase B). The constructed marsh will be compared to other back barrier marsh creation projects in the vicinity.

Monitoring Strategies

The following monitoring strategies will provide the information necessary to evaluate the specific goals listed above.

1. Topographic/LiDAR — To estimate elevation and volume changes in the project areas and other barrier island habitats over time, Light Detection and Ranging (LiDAR) and traditional ground surveys will be employed. LiDAR surveys will topographically establish elevations for the subaerial extent of the island (Troutman et al. 2003). Additionally, topographic surveys will be performed along 20 cross sectional survey transects in the marsh creation area in accordance with Steyer et al. (1995). These survey transects will be separated on 250 ft (76.2 m) intervals with elevation points collected 20 ft (6.1 m) apart. Elevation and volume changes in the marsh creation area will be detected using both the cross section and LiDAR surveys (Ormsby and Alvi 1999). LiDAR surveys were conducted in 2006 (pre-construction) and will be conducted post-construction in 2011, 2016, and 2021. The cross sectional topographic survey data were collected in 2007 (pre-construction) and will be collected in 2009 (as-built). LiDAR data will be funded through BICM while the topographic surveys will be funded by the TE-48 construction budget.

2. BICM Bathymetry — To approximate subaqueous elevation and volumetric alterations in the island shoreface, gulf, and bay environments, bathymetric surveys will be undertaken. These survey transects will be separated on 1500 ft (457.2 m) intervals and will extend for 1.2 miles (2.0 km) outward from the island into the gulf and bay habitats. On the gulf side of the island, the transects will stretch past the 1.2 mile (2.0 km) boundary to 3.7 miles (6.0 km) on 4500 ft (1371.6

m) intervals. Data collected will be used to develop elevation models to compare elevation and volumetric changes using procedures established in Ormsby and Alvi (1999). Bathymetric survey data was collected in 2006 (pre-construction) and will be collected post-construction in 2011, 2016, and 2021. Bathymetry data collection will be funded through BICM.

3. Topographic/ Bathymetric Survey

To document volumetric changes associated with the movement of sediment from approximately the -7 foot (-2.1 meter) contour of the gulf to the vegetation line and to accurately document the shifting sand spit westward of the project's breakwaters, topographic and bathymetric data will be collected. In order to capture any volumetric changes associated with the spit, survey lines will extend from approximately the -7 foot (-2.1 meter) contour of the gulf floor over the spit to the -4 foot (-1.2 meter) contour of the bay. The Sediment Budget (Coastal Planning & Engineering, Inc. 2004) reported the gulf side depth of closure to be -6 feet (-1.83 meters) NAVD88. Topographic surveys associated with the breakwater's will extend from the vegetation line on the gulf side of the island to depths of 4-5 feet (1.2 – 1.5 meters) of water. Topographic surveys associated with the sand spit will extend across the spit to depths of 4-5 feet (1.2 – 1.5 meters) of water on the gulf and bay sides. These surveys will provide a quality assurance for the data collected using LiDAR. Topographic surveys will be compared to the LiDAR data from the water's edge to the vegetation line. Bathymetric surveys will slightly overlap the topographic survey at the 4-5 foot (1.2 – 1.5 meters) water depths, to assure no data gaps, and continue to the -7 foot (2.1 meter) contour of the gulf floor (Troutman et al. 2003) and to the -4 foot (-1.2 meter) contour of the bay floor along the spit.

Twelve (12) survey lines will be established prior to the installation of the breakwaters. These survey lines will be established by professional land surveyors. The survey lines will begin approximately 150 feet west of the TE-48 breakwater field and eleven (11) of the twelve (12) survey lines will be spaced every 750 feet through the TE-48 and TE-29 breakwater field ending eastward of the existing breakwaters. The twelfth survey line will be used to measure elevation changes associated with the groin on the east end of the island; therefore, the survey line will begin north of the groin and proceed through the groin near the

mid-point and continue to the last survey line (figure 6). Data collected will be used to develop elevation models to compare elevation and volumetric changes using procedures established in Ormsby and Alvi (1999). Surveys were conducted in 2006 (Pre-construction) and 2007 (As-Built), and will be conducted in post-construction years: 2009, 2011, 2016, and 2021. Topographic and bathymetric surveys will be funded through the TE-48 monitoring budget.

Six (6) survey lines will be established prior to the installation of the breakwaters west of the western most breakwater. These survey lines will be spaced 1,500 feet apart. These survey lines will extend from the -7 foot contour line in the gulf, across the sand spit, and conclude at the -4 foot contour in the bay (figure 6). These survey lines will be used to collect data intensively during the first two years of the project to monitor the sand spit movement. Data collected will be used to develop elevation models to compare elevation and volumetric changes using procedures established in Ormsby and Alvi (1999). Surveys will be conducted at six month intervals for the first two years for a total of five (5) data collection efforts. Surveys were conducted in 2006 (Pre-construction) and will be conducted at six month, 12 months, 18 months, and 24 months following the as-built survey. Topographic and bathymetric surveys will be funded through the TE-48 monitoring budget.

4. Habitat Classification

To determine habitat types and changes of vegetated and non-vegetated areas within the project area, near-vertical, color-infrared photography will be acquired. The photography will be photointerpreted, scanned, mosaicked, georectified, and analyzed according to the standard operating procedures outlined in Steyer et al. 1995, revised 2002 (Troutman et al. 2003). The photography will be acquired to assess the marsh creation portion of the project and will coincide with the LiDAR and topographic / bathymetric surveys. The photography will be obtained in 2006 (pre-construction), and post-construction in 2009 (as-built), 2011, 2013, 2016, 2019, and 2021. Habitat classification data will be funded through BICM in 2006, 2011, 2016, and 2021. The 2009 and 2019 habitat classification data will be funded through the TE-48 monitoring budget.

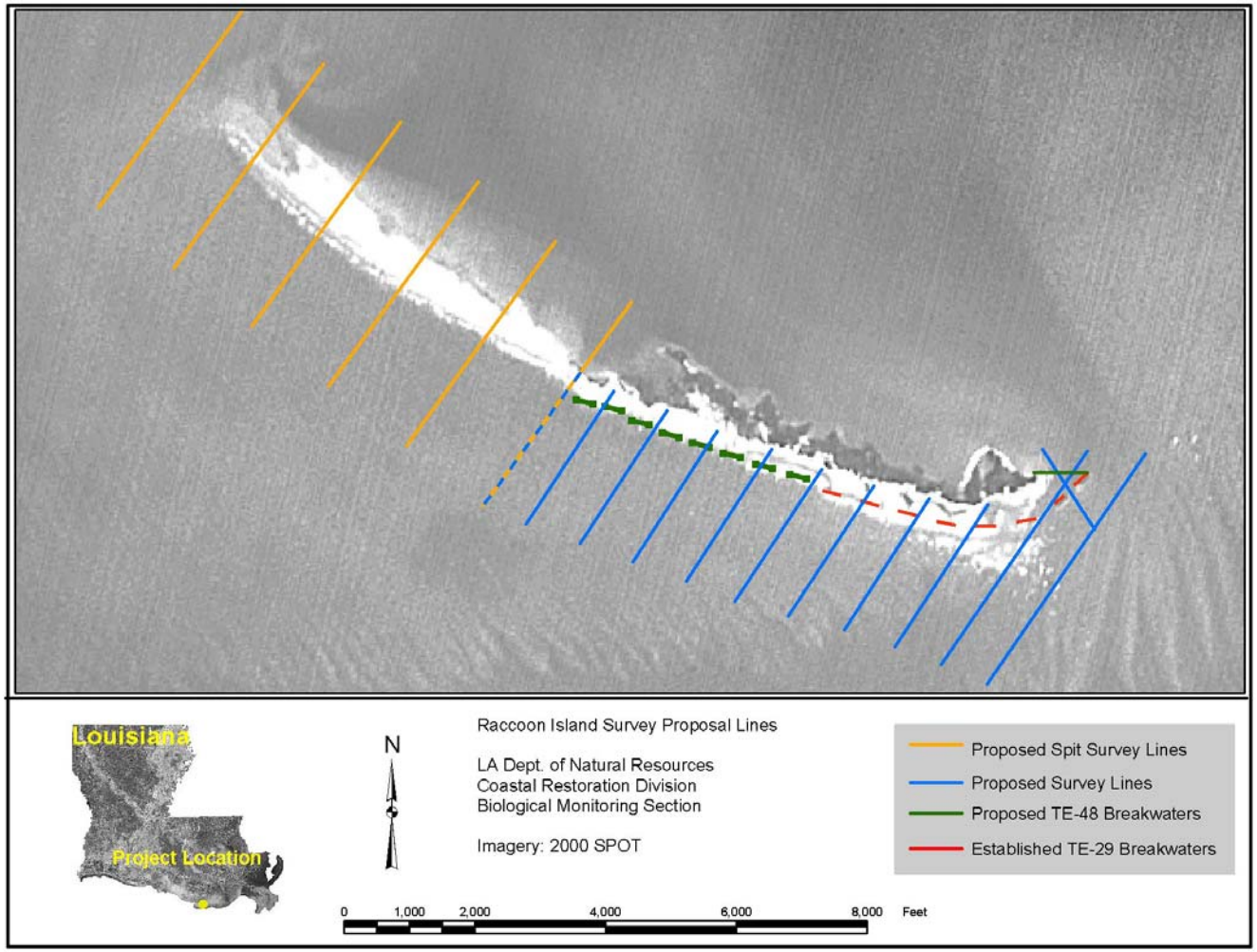

Figure 6. **Proposed survey lines for the TE-48 project area along with the survey lines for the sand spit area west of the proposed breakwater field.**

5. Sediment Properties/ Geotechnical — To characterize the median grain size and grain size distributions in the shoreface and other barrier island habitats, grab or push core samples will be obtained along cross-shore transects. These sediment transects will be separated on 3000 ft (914.4 m) intervals. The transect lines will begin on the gulf side of the island at the -15 ft (-4.6 m) contour and continue across the island into the back barrier marshes. One sample will be obtained from each distinguishable location: -15 ft (-4.6 m) contour, middle of shoreface, upper shoreface at mean low water, beach berm, dune, and back-barrier marsh. Each sample will measure sediment grain size, sorting, percent sand and fines, organic matter content, and bulk density (Troutman et al. 2003). Samples will be acquired and analyzed in 2008 (pre-construction) and post-construction in 2011, 2016, and 2021. Geotechnical data will be funded through BICM.

6. Process Data — Wave, current, water level, and meteorological data will be used to correlate changes in sediment volume and island geomorphology to environmental conditions over time. These data will be acquired from the many sources available through the world-wide-web or other governmental programs such as NOAA buoys, WAVCIS, LUMCON, USGS/LDNR monitoring stations, and CRMS sites (Troutman et al. 2003).

Monitoring Limitations

The project's original budget was utilized to acquire several topographic / bathymetric surveys throughout the project's 20 year monitoring period and two habitat mapping efforts (to be acquired when Phase B of the project has been completed).. Additional funding was approved to intensively monitor the short-term effects of the breakwaters to the sand spit area west of the TE-48 breakwaters. BICM will fund LiDAR, bathymetric, and habitat classification data in 2006, 2011, 2016, and 2021. Sediment properties data will also be funded through BICM in years 2008, 2011, 2016, and 2021.

Anticipated Statistical Analyses and Hypotheses

The following hypotheses correspond with the monitoring elements and will be used to evaluate the accomplishment of the project goals.

1. Descriptive and summary statistics utilizing the LiDAR and topographic and bathymetric survey data will be used to assess changes in island loss/gain rates over time and to assess whether the post-project features affected the island as predicted by the Coastal Planning and Engineering Sediment Budget (2004).

Goal: Reduce shoreline erosion rates behind the proposed breakwater field on Raccoon Island by approximately 60% (from 52 feet/year to 21 feet/year).

2. Descriptive and summary statistics utilizing habitat mapping data will be used to assess changes in island habitat over time once Phase B has been constructed.

   Goal: Extend the longevity of the island by maintaining and creating habitat for avian nesting.

3. Descriptive and summary statistics utilizing the geotechnical and sediment property data will be used to assess changes in the sediment composition.

   Goal: To determine how the surface sediment properties on and gulfward of Raccoon Island change over time.

Notes:

1. Proposed Implementation:

Phase A:	Start construction	September 2005
	End construction	January 2008
Phase B:	Start construction	June 2008
	End construction	April 2009

2. NRCS Point of Contact: Loland Broussard (337) 291-3060

3.

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4. Topographic / bathymetric surveys are subject to change depending on the end of construction date and the LiDAR flights. The total number of surveys will not change; however, the years in which the surveys are conducted are subject to change. Surveys and LiDAR flights shall be conducted in the same years to enhance the data collection efforts and formulate more decisive conclusions.

5. Habitat mapping will be conducted twice during the life of the project; however, the first efforts will be conducted once the marsh creation portion of the project has been constructed. The second effort will occur approximately 10-12 years after the end of construction.

6. Currently, the Louisiana Department of Natural Resources' Coastal Engineering Division and Coastal Restoration Division produce an Operations, Maintenance, and Monitoring Report during years when data is collected or when maintenance occurs on a project.

7. References:

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