The Mon Louis Island Report #5

Prepared by the Mobile Bay National Estuary Program
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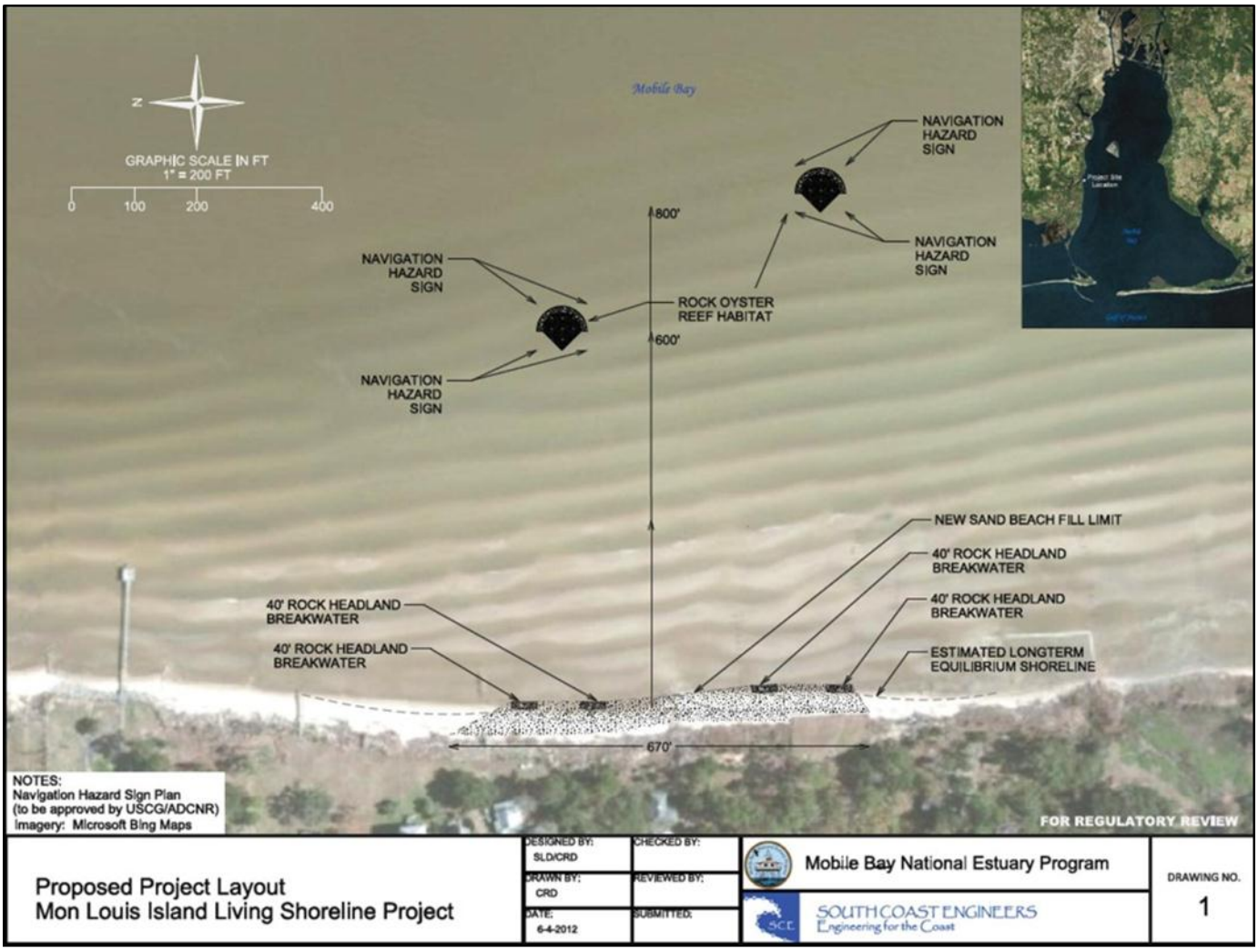
This fifth report to Mon Louis Island (MLI) waterfront property owners summarizes recent activities that include the April 12, 2012 public unveiling of the "final" engineering plan for the habitat creation/shoreline stabilization project, reaction by funders and subsequent plan modification, and the need for State regulatory revision. In November 2011, Mobile Bay National Estuary Program (MBNEP) solicited proposals for engineering design services for a project along the Mon Louis Island Mobile Bay shoreline. After interviewing all three respondents, a panel of property owners and resource managers selected South Coast Engineers (SCE) to develop a plan to create oyster reefs and salt marsh and stabilize an erosion-impacted 670-foot stretch of northern MLI. SCE met frequently with property owners to refine plans to meet project goals and the budget. They prepared and presented final project plans at St. Rose of Lima Parish Hall at the April 12 meeting.

April 12 Public Meeting. Project Manager Caren Reid Dixon presented the plans with SCE President Dr. Scott Douglass and University of South Alabama Engineering Professor Dr. Bret Webb, who provided quality assurance review, in attendance.

Ms. Dixon began her presentation (viewable at ***http://www.mobilebaynep.com/images/uploads/library/MLI_Public_meeting.pdf)*** with a map of the project area and introduced the team of property owners that included Dottie and Greg Lawley, Ron and Linda Lowe, Claude Doublet, Leo Hickman, Joyce Summerlin-Wolfe, and Frank and Lynn Foley.

Ms. Dixon reviewed project engineering goals that included optimizing sandy areas along the shoreline, installing reef structure to provide oyster settlement opportunities, and establishing a low-energy inshore area to restore emergent marsh vegetation. She used Dr. Webb's *Coastal Processes* presentation (viewable at ***http://www.mobilebaynep.com/images/uploads/library/CoastalProcesses_MonLouisIsland_DrBretWebb.pdf***) to display 1) wave climate diagrams indicating that waves approach from both northerly and southerly directions, 2) average annual sediment transport patterns showing net sand transport movement towards the north, and 3) historic shoreline data demonstrating progressive shoreline retreat along the project area over time.

SCE field investigations revealed examples of local habitat types including oysters attached to a nearshore wall adjacent to the Lawley property and numerous flounder holes photographed in project area tidal flats, but no historical record of marsh along this shoreline area. She explained that a 1990 investigation by Dr. Judy Stout described an optimal fetch (length of water over which winds can generate wave energy) for salt marsh vegetation between zero and 1,000 meters (m), with an "acceptably favorable" range between 1,000 and 9,000 m. The MLI shoreline is exposed to an average fetch of 22,000 m with a maximal fetch of 36,000 m. Despite these conditions, investigations revealed that marsh naturally occurs near the mouth of Fowl River to the north of the project area and along the shoreline approximately two miles to the south. Both smooth cord grass (*Spartina alterniflora)* and black needle rush (*Juncus roemerianus)* were observed to grow between "mean lower low water" and "mean higher high water."



Modified Proposed Project Layout for Mon Louis Island Living Shorelines Project showing project features including rock headland breakwaters with clean sand fill and submerged oyster reefs with navigation hazard signs. Note absence of rock-lined marsh island, removed upon recommendation by funders.

The depth profile shown from the shoreline out to 500 feet revealed the gradual slope, shallow character, and generally sandy substrate of the project area. Ms. Dixon displayed a sample of geo-grid fabric that will be used to underlie and provide added support to heavy rock structures prescribed in the plan.

A list of project components included placement of clean sand fill with four headland breakwaters; an emergent offshore island consisting of a rock breakwater surrounding clean sand fill and marsh plantings; and two submerged rock structures placed farther offshore to support oyster settlement. Engineering measurements were used to calculate wave diffraction and transmission and determine wave tolerance of the proposed marsh vegetation. A schematic diagram of the project layout was displayed that showed all features in the project layout.

Ms. Dixon first explained the nearshore breakwater system intended to stabilize the shoreline and create oyster habitat. Four breakwaters consisting of class #3 riprap (with a median weight of 200 lbs) will be installed near the mean low water line. Clean sand fill will be placed behind the four breakwaters (and the single fallen oak tree that has occupied a place in the center of the project area for over a decade). Placement of fill will ensure that sand transport will not be interrupted and that properties to the north (downstream) of the project area would gain, rather than lose, sand as a result of

the project. Over time, some loss of sand from the new shoreline is expected between the breakwaters, resulting in crescent-shaped forms (indicated by dotted lines on the projected diagram) between the breakwaters once equilibration has been reached. This profile should be permanent, with only positive effects on northern properties.

The installed marsh island was designed for placement about 350 feet from the shoreline in the center of the project area and included class #3 riprap surrounding a planting area supplemented with clean sand fill. Rock will be emergent, with three to four feet exposed to protect the planted *Spartina* (deeper areas) and *Juncus* (shallower areas) from wave energy while providing attachment opportunities for oysters.

Two submerged rock breakwater structures will be placed on either side of the installed marsh island, 600 and 800 feet from the shore, respectively. The increased distance is designed to provide adequate depth to give oysters the greatest chance for survival in winter when north winds drive water out of the bay and temperatures drop dangerously. These structures will be constructed of a seaward breakwater arc of class #3 riprap protecting an inner layer of smaller class #1 rock (median weight of 50 lbs) tailing approximately 35 feet landward of the ends of the breakwater arc.

Several questions were answered by SCE during and after the formal presentation, including:

Q: Why is there a 100-foot gap between breakwaters?
A: Engineering equations determined appropriate gap width. Structure dimensions – including the height of the breakwater surrounding the marsh island – were determined based upon characteristic wave heights and periods. This "cutting edge" design is based upon the best local knowledge.

Q: Will installed oyster reefs attenuate shore-bound wave energy?
A: Submerged reefs and even the emergent marsh island will provide habitat for oysters and other estuarine living resources without significantly decreasing shore bound wave energy. Headland breakwaters and sand fill will be used to stabilize the impacted shoreline.

Q: How long will the project take to complete?
A: Following permitting and contracting of a marine construction firm, the project should take approximately 30-days to construct. Post construction monitoring will be ongoing.

Q: What was the per foot cost of the project?
A: Apart from measures directed solely towards habitat creation, the cost to stabilize about 700 feet of shoreline was approximately $30K for placed sand and rocks, reflecting a unit cost of about $43/foot.

Q: How will the project impact properties outside of the project area (to the north and south)?
A: Dr. Douglass expressed confidence that there will be no negative impact to the north or the south. Sand transport along shore will not be interrupted, and in fact properties directly north of the project area may benefit from the sand added to the system.

Several property owners expressed disappointment that they were not included in the project, including the owner of a single parcel over 1,000 feet in length located at the northern end of the island. He argued that the original plan was to work from north to south and therefore felt that his property should have been selected. MBNEP responded that a main goal of the project was to engage *multiple* private property owners working together with the primary goal of enhancing fisheries while stabilizing an erosion-impacted shoreline. Finding a 670-foot "contiguous chain" of owners willing to engage in the project was challenging. MBNEP Director Roberta Swann expressed hopes that, through the MBNEP or another organization, the project could ultimately be expanded to include that particularly-impacted

northern shoreline property as well as properties of several other MLI shoreline residents enthusiastic about the idea and design.

Owners of two properties excluded from the contiguous chain by neighbors unwilling to participate in the project and two others who only learned about the project at the meeting engaged MBNEP staff and project engineers to determine whether inclusion was possible. MBNEP staff assured them that thought and creativity would be directed towards them and reiterated that future activities might include their properties. Residents interested in the details of development of this project are invited to view materials located on the MBNEP website at ***http://www.mobilebaynep. com/static/mon _louis_island***. At least two shoreline property owners engaged engineers to discuss individual implementation of habitat creation/shoreline stabilization measures.

Funder Reservations and Resolution Representatives of the U. S. Fish and Wildlife Service (F&WS) Coastal Programs and the Gulf of Mexico Foundation expressed reservations over 1) the small acreage of marsh habitat included in project designs and 2) the disproportionate expense of creating that acreage. At a May meeting, "living shorelines" definitions were debated, and SCE engineers defended the design, citing the challenges of creating marsh habitat in the previously described wave climate. Dr. Douglass explained that in such a severe wave climate, headland breakwaters and placement of sand fill to create pocket beach areas offered the most feasible and habitat-friendly alternative to bulkheads or rock armoring. Patric Harper of F&WS recommended abandoning the marsh island concept and devoting more funding to creation of potential oyster habitat. MBNEP, SCE, and project funders agreed to **1) eliminate the marsh island concept from the design, 2) increase acreage of submerged oyster habitat, and 3) expand headland breakwaters from 25-ft to 40-ft widths.** SCE made the recommended modifications, and provided amended project plans, viewable at ***http://wwwmobilebaynep.com/images/uploads/library/MLI%20Modified%20Drawings. pdf***.

State Regulatory Revision. On April 25, 2012, MBNEP submitted an application for a Living Shorelines General Permit under ALG10-2011 to the U. S. Army Corps of Engineers. This permit is contingent on State approval and consistency with State of Alabama Administrative Code. An existing *obstacle* to the completion of this project is State Administrative Code Regulation 220-4-.09 (4) (a) 5 regarding fill:

> 5. Reclamation activities on state owned submerged lands shall be approved *only if* avulsion or artificial erosion is affirmatively demonstrated. Other activities involving the placement of fill material below the ordinary low water line of non-tidal streams or the mean high tide line of tidal water *shall not be approved*.

Part of the value of this project is demonstrating the benefits it provides, and we understood that we would encounter and address this obstacle in the process of implementation. Discussions are ongoing with the resource agencies responsible for these activities in coastal Alabama.

Next Steps. We anticipate that one vehicle that will be considered to protect public benefit will be the execution of Conservation Easements with each of the property owners. To prepare for this possibility, MBNEP is currently investigating which organizations in the Mobile Bay area can hold such easements. In addition, we will begin preparing a construction bid package in anticipation of the permit being approved. We anticipate beginning construction in October 2012.