

DEMONSTRATION PROJECTS

DEMONSTRATION PROJECTS

Project Number	Project Proposals
DEMO-01	Wave Robber (Wave Suppressor Sediment Collection System)
DEMO-02	Shoreline Protection, Preservation, & Restoration (SPPR) Panel

DEMO-01

Wave Robber
(Wave Suppressor Sediment Collection System)

PPL25 DEMONSTRATION PROJECT NOMINEE FACT SHEET

January 27, 2015

Demonstration Project Name:

The Wave Robber (Wave Suppressor Sediment Collection System)**Louisiana's 2012 Coastal Master Plan**

Shoreline Protection

Potential Demonstration Project Location(s):

Region 2, Barataria Basin, Lafourche Parish, southwestern shore of Little Lake

Problem:

What problem will the demonstration project try to solve? The Wave Suppressor Sediment Collection System addresses two critical areas of need in Coastal Louisiana. First, the WSSC is a system designed to protect the shorelines and wetlands from erosion caused by wave action or tidal surge. Second, the WSSC system can assist in the rebuilding of shorelines and restoration of wetlands loss from wave action and tidal surge.

What evidence is there for the nature and scope of the problem in the project area? The southwestern portion of Little Lake is currently experiencing a high shoreline erosion rate of between 20' and 40' per year. The WSSC system serves as a barrier to disrupt the tidal wave flow into the shorelines and wetlands while at the same time allowing sediment to be carried through the system by the wave action and water currents. The sediment is trapped and deposited between the system and the shorelines and wetlands. Trapped sediment would then consolidate to form a solid base for the establishment of emergent marsh.

Goals:

What does the demonstration project hope to accomplish? The primary goal of this demonstration is to manufacture, deploy and test an alternative method of shoreline protection equivalent to traditional methods, while trapping ambient sediments to facilitate expansion of emergent marsh.

Proposed Solution:

Describe demonstration project features in as much detail as possible. The WSSC system serves as a barrier to disrupt the tidal wave flow into the shorelines and wetlands while at the same time allowing sediment to be carried through the system by the wave action and water currents. The sediment is trapped and deposited between the system and the shorelines and wetlands.

Install 45 WSSC units along three different shorelines (500LF each shoreline), with two different spacing patterns at each site. The first spacing would be installing a 10' gap every 50 LF (5 WSSC units) for 3 50' segments, then increase the number of WSSC units to 10 units (100 LF) between 10' gaps, for a total of 45 WSSC units per shoreline location. All gaps would be made using the same material as the WSSC units. The spacing is as follows:

Shoreline

5 WSSC / 10' / 5 WSSC / 10' / 5 WSSC / 10' / 10 WSSC / 10' / 10 WSSC / 10' / 10 WSSC

Bay

Project Benefits:

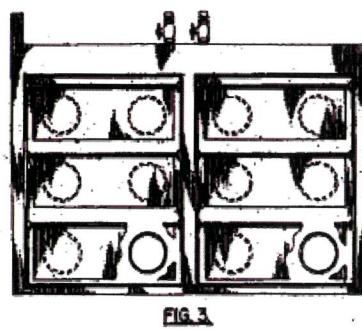
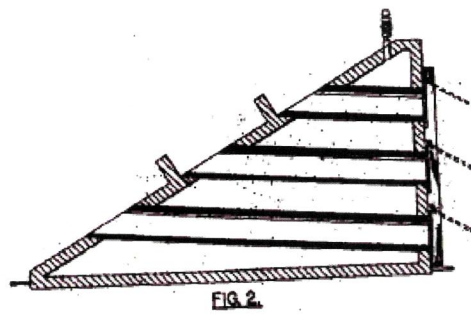
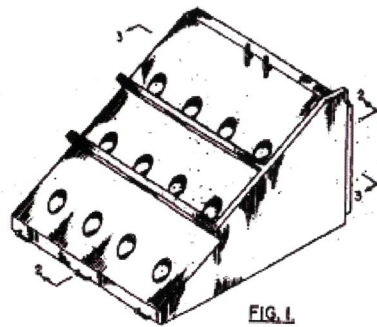
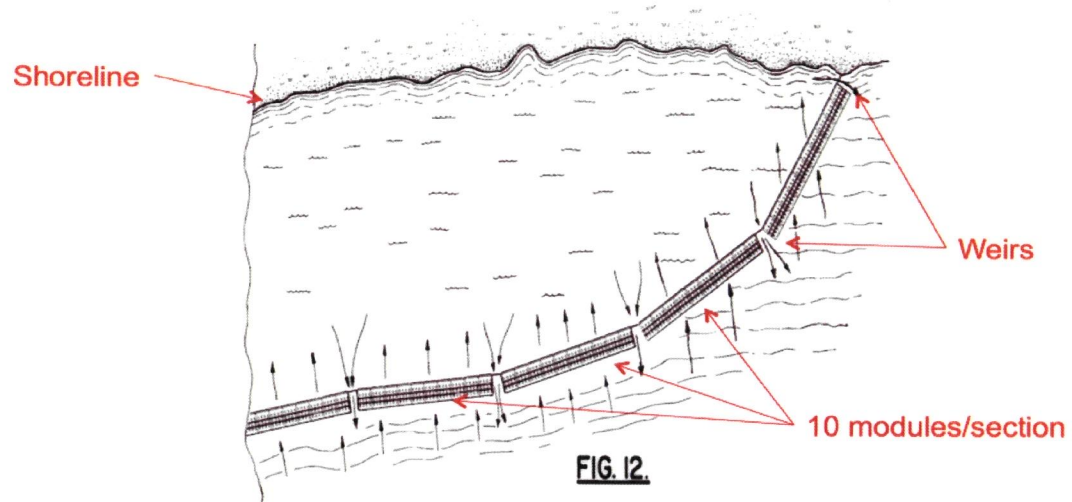
Describe demonstration project benefits in as much detail as possible. Trapped sediment would then consolidate to form a solid base for the establishment of emergent marsh. The WSSC system has several distinct advantages over other wave suppression and sediment retention structures that makes it ideal for the rebuilding and restoring of the degraded wetlands of south Louisiana as well as other areas in the United States and throughout the world. One major advantage is that the WSSC system is transportable and can be easily installed along shorelines and wetlands. Additionally, the WSSC units are reusable and designed to be removed from one location and easily moved to another. The WSSC system is also less expensive than fixed dike structures, a distinct advantage in managing project cost. Lastly, the WSSC system allows a continuous water exchange for ecological support rather than isolating areas behind the structure. If successful the product could be a low cost option in shoreline protection, dredge spoil containment, barrier island protection and island creation, direct creation of habitat in shallow waters where turbidity could be decreased, and used as an addition to both interior lake and exposed coastal bay shorelines and open bay waters.

Project Costs:

The estimated cost to implement the demonstration project including 25% contingency is \$1.0 million.

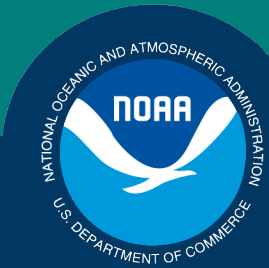
Preparer(s) of Fact Sheet:

John D. Foret. Ph.D., NOAA Fisheries Service, (337) 291-2107, john.foret@noaa.gov.
Webster Pierce, Pierce Industries, (985) 855-5363



Schematic drawings of the WSSC System

Science, Service, Stewardship

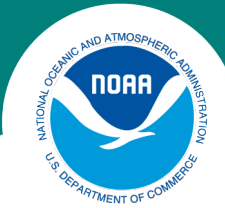


Wave Robber Demonstration Project

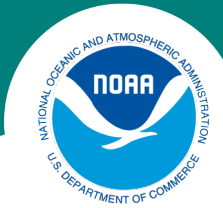
**Region IV – Regional Planning Team
Meeting**

January 27, 2015

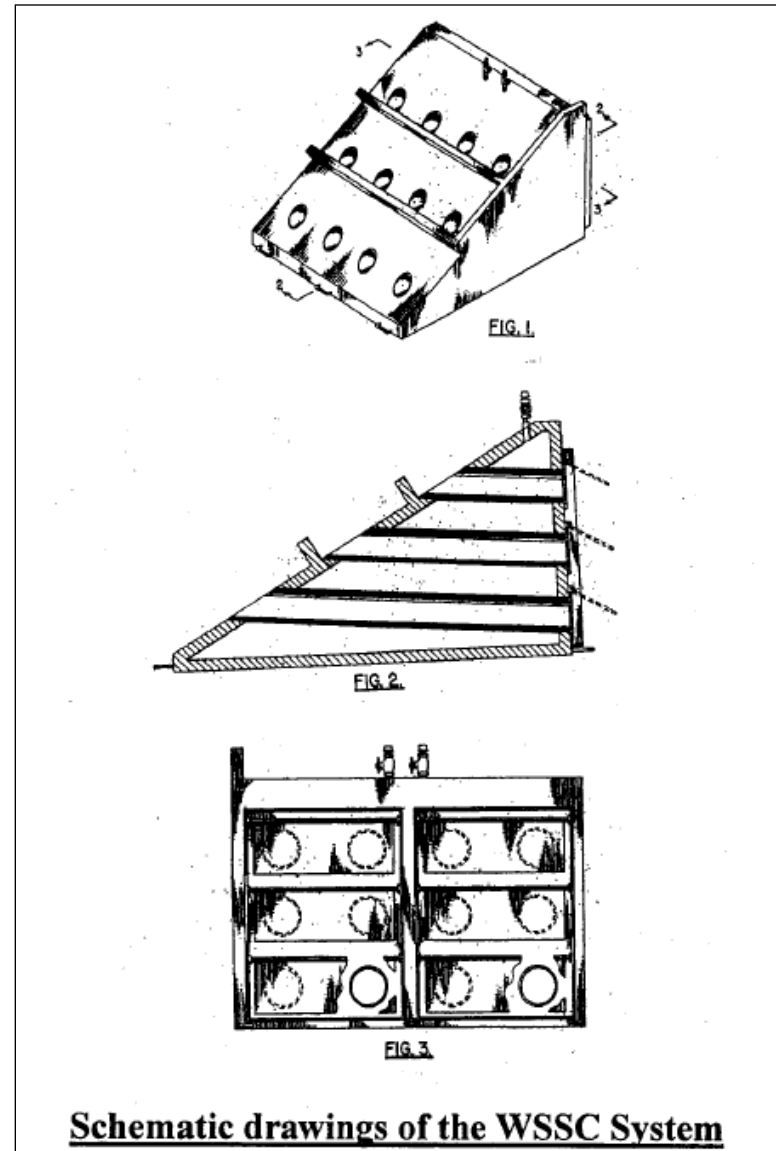
**NOAA
FISHERIES
SERVICE**



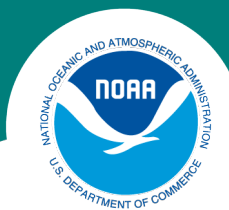
- Wave Robber is a system designed to protect the shorelines and wetlands from erosion caused by wave action or tidal surge.

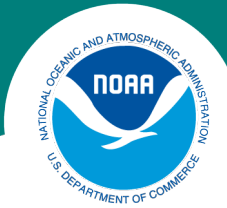


- The Wave Robber system serves as a barrier to disrupt the tidal wave flow into the shorelines and wetland while at the same time allowing sediment to be carried through the system by the wave action and water currents.
- Easily transported to site.
- Buoyant to location, then flooded with water and anchored in place.
- Design allows for continuous water exchange for ecological support.



NOAA FISHERIES SERVICE





Shoreline

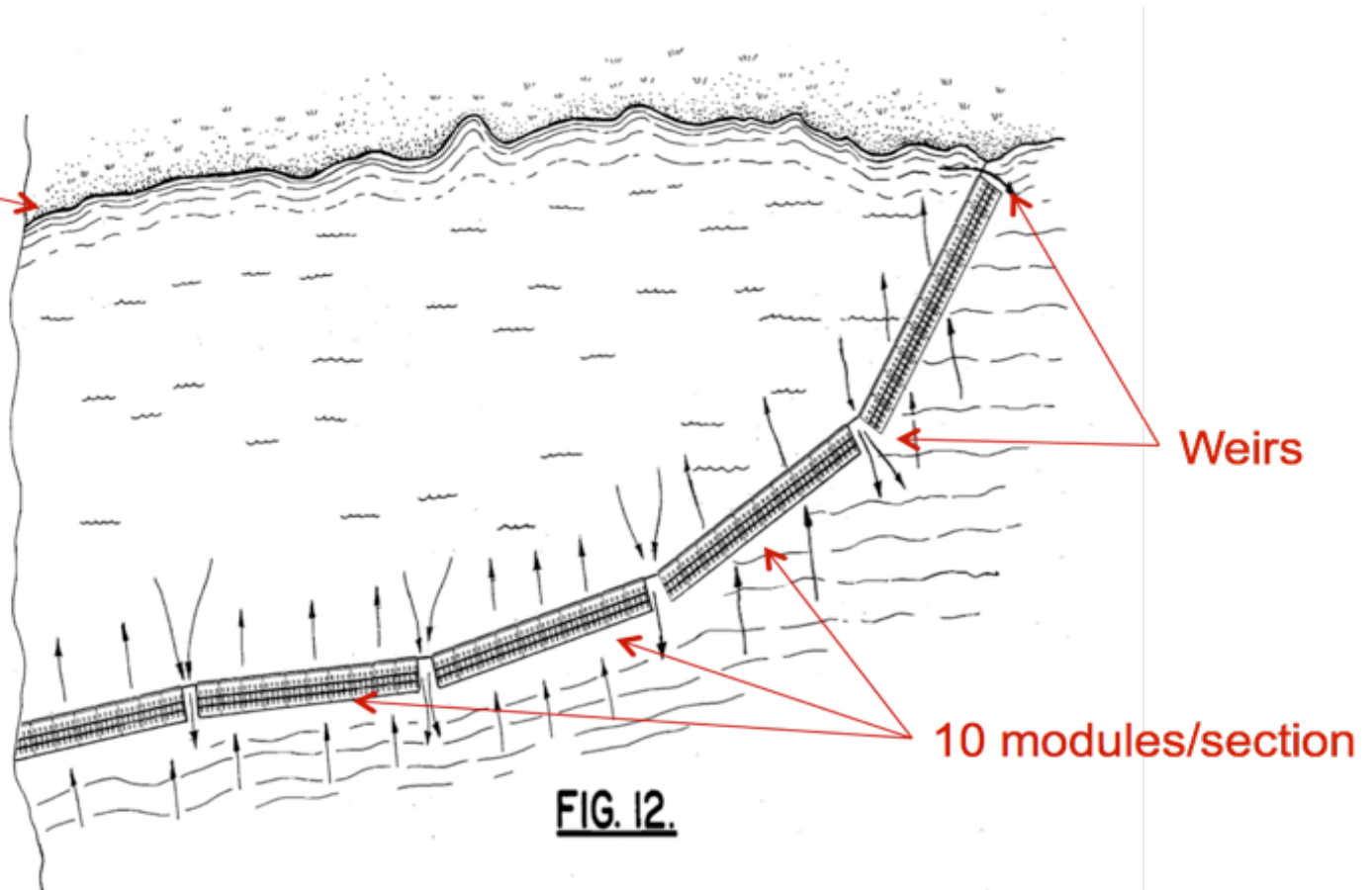
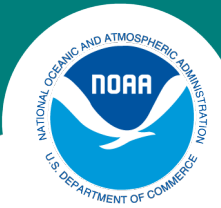


FIG. 12.



Project Features

- Install 15 Wave Robber units at 3 shoreline locations (500 LF at each location)
- Utilize 2 different spacing patterns at each site with a 10' gap between each spacing pattern
- Easily transported to location.
- Buoyant to location, then flooded with water and anchored in place.
- Design allows for continuous water exchange for ecological support.
- Construction Cost with 25% contingency = \$1 million

DEMO-02

Shoreline Protection, Preservation, & Restoration (SPPR) Panel

PPL25 DEMONSTRATION PROJECT NOMINEE FACT SHEET
January 27, 2015

Demonstration Project Name:

Shoreline Protection, Preservation, and Restoration Panel (*SPPR Panel*)

Louisiana's 2012 Coastal Master Plan

Shoreline Protection

Potential Demonstration Project Location(s):

Coastwide

Problem:

What problem will the demonstration project try to solve?

The demonstration project would introduce an innovative solution for shoreline protection and dredge containment projects, which can be installed at a significant savings to the project owner. The demonstration project would help reduce shoreline retreat in areas that have experienced excessive amounts of erosion and would also have the intent to offset increased rates of land loss to wetlands that become exposed due the loss of protective shorelines features through the protection of the shoreline and collection/retention of suspended sediments behind the structures.

What evidence is there for the nature and scope of the problem in the project area?

Historically Louisiana's coastal shoreline, bays, and lake rims have experience high levels of retreat and land loss. The approach to repairing these areas have utilized heavy, hard engineering methods that eventually settle into the substrate, which has not achieved the goal and even presented additional hazards. Through the use of pre-fabrication of the proposed units, the landowner will see a 60%-80% reduction in installation costs when compared to typical rock rip-rap construction.

Goals:

What does the demonstration project hope to accomplish?

The proposed demonstration project would stabilize existing shoreline features and attenuate shoreline retreat and potentially enhance interior marshes and an accretion platform behind the structure. The goal of the proposed demonstration project is to provide a cost effective construction alternative to rip rap for shoreline protection.

Proposed Solution:

Describe demonstration project features in as much detail as possible.

The SPPR Panel is a pre-cast, saltwater tolerant concrete panel system (with no carbon steel reinforcement), the dimensions and density of which can be adjusted to site conditions. The SPPR Panel units resemble a chain when joined together allowing for on site adjustments to irregular shorelines. The project has several aspects, in that it is shoreline protection and restoration, marsh protection, restoration, and enhancement system that would deflect wave energy, protect and enhance vegetation, trap sediment, protect and create emergent marsh, and provide nursery habitat.

1. The SPPR Panels have a variety of application possibilities that can be adjusted to best suit the problem area to best restore and enhance shorelines and marshes in many different types of coastal environments.
2. Each panel has planned openings (vents) within the face of the unit that allows for some sediment to penetrate. The vents can be adjusted in size and location on the unit

(depending on location and water depth) to allow for the most beneficial capture of available sediment.

3. When connected, there is a 0.3' to 0.5' gap between SPPR Panels to allow for water drainage from behind the units, as well as, estuarine animal ingress/egress.

The demonstration would include the selection of 3 diverse application sites for treatment with water depths ranging from 2 to 5 feet. Each treatment would include 3 replicate 300-foot sections for a total project installation of 2,700 linear feet. Project effectiveness would be monitored and evaluated after construction according to the CWPPRA workgroups' recommendation for this product in Phase 0. The conceptual treatment is shown in Figure 1.

By using a pre-cast SPPR Panel, owners can see significant savings from traditional rip-rap embankments by;

- Project construction phase time is reduced
- Reduced initial installation cost compared to rip rap embankments (60%-80% the cost of rip rap per linear foot depending upon water depths)
- Reduced life-cycle cost compared to rip rap embankments (no additional lifts required)
- Minimal settlement (designed for LA-16 Shark Island location which has 15' – 20' of peat...Engineering theory shows the units will only settle 6-9 inches)
- Can be installed in water as shallow as 2-3 feet and as deep as 5 feet with minimal footprints
- Provides fisheries access on landward side
- Collects/retains suspended sediments

Project Benefits:

Describe demonstration project benefits in as much detail as possible.

The proposed project would:

1. Deflect wave energy;
2. Protect and enhance existing or planted shoreline vegetation;
3. Allow ingress and egress of aquatic species;
4. Collect sediment by reducing wave energy;
5. Reduce interior marsh loss;
6. Cost savings.

Project Costs:

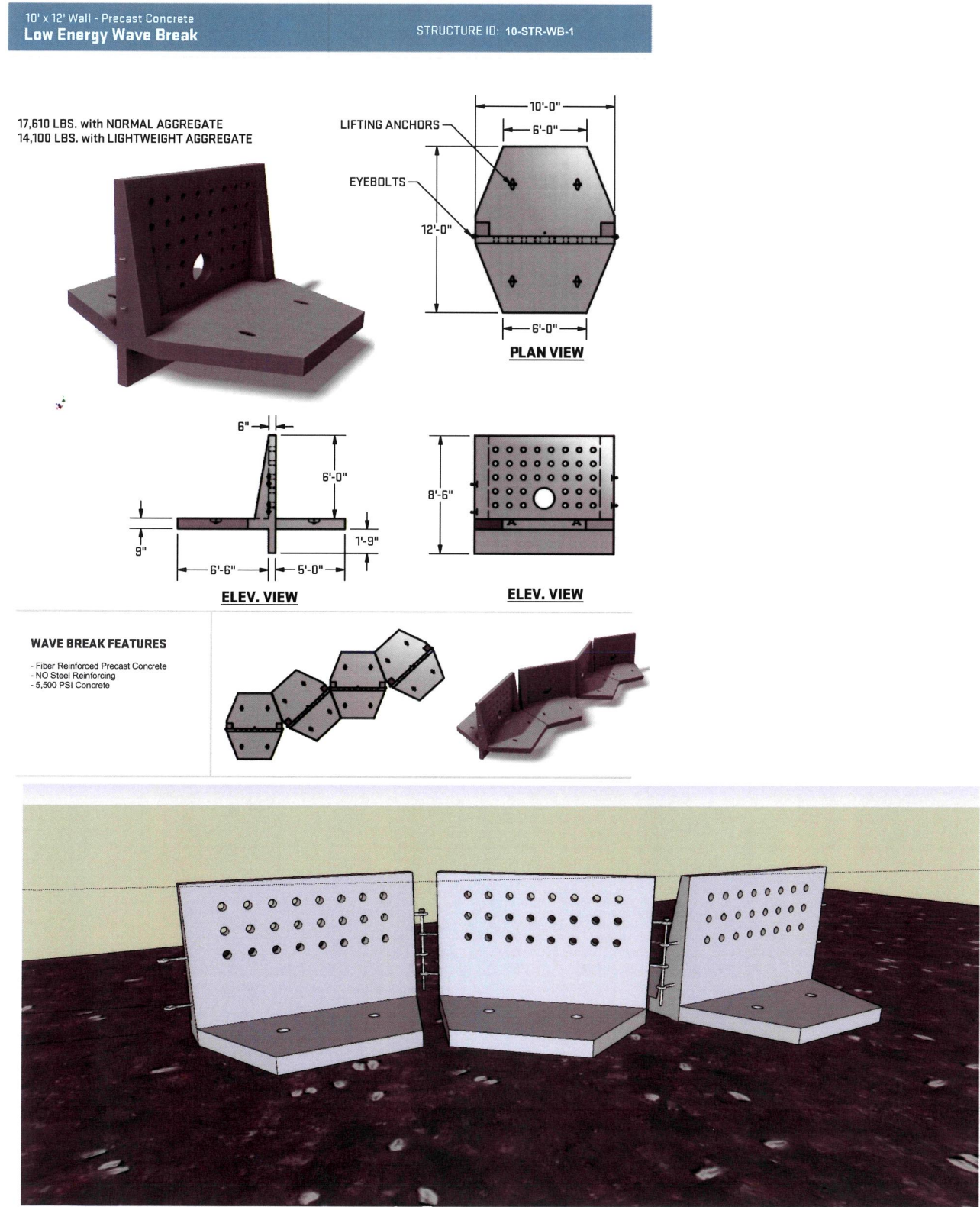
The estimated construction cost including 25% contingency is \$1.01 M.

Preparer(s) of Fact Sheet:

John D. Foret, Ph.D. (NMFS), 337.291.2107, John.foret@noaa.gov

David Minton, The Cypress Group, 337.504.7755, david.minton@cypressgrouppla.com

Figure 1. Example SPPR Panel dimensions, layout, and vent placement.





Shoreline Protection Preservation and Restoration Panel

Dr. John Foret
David W. Minton, PE/CFM

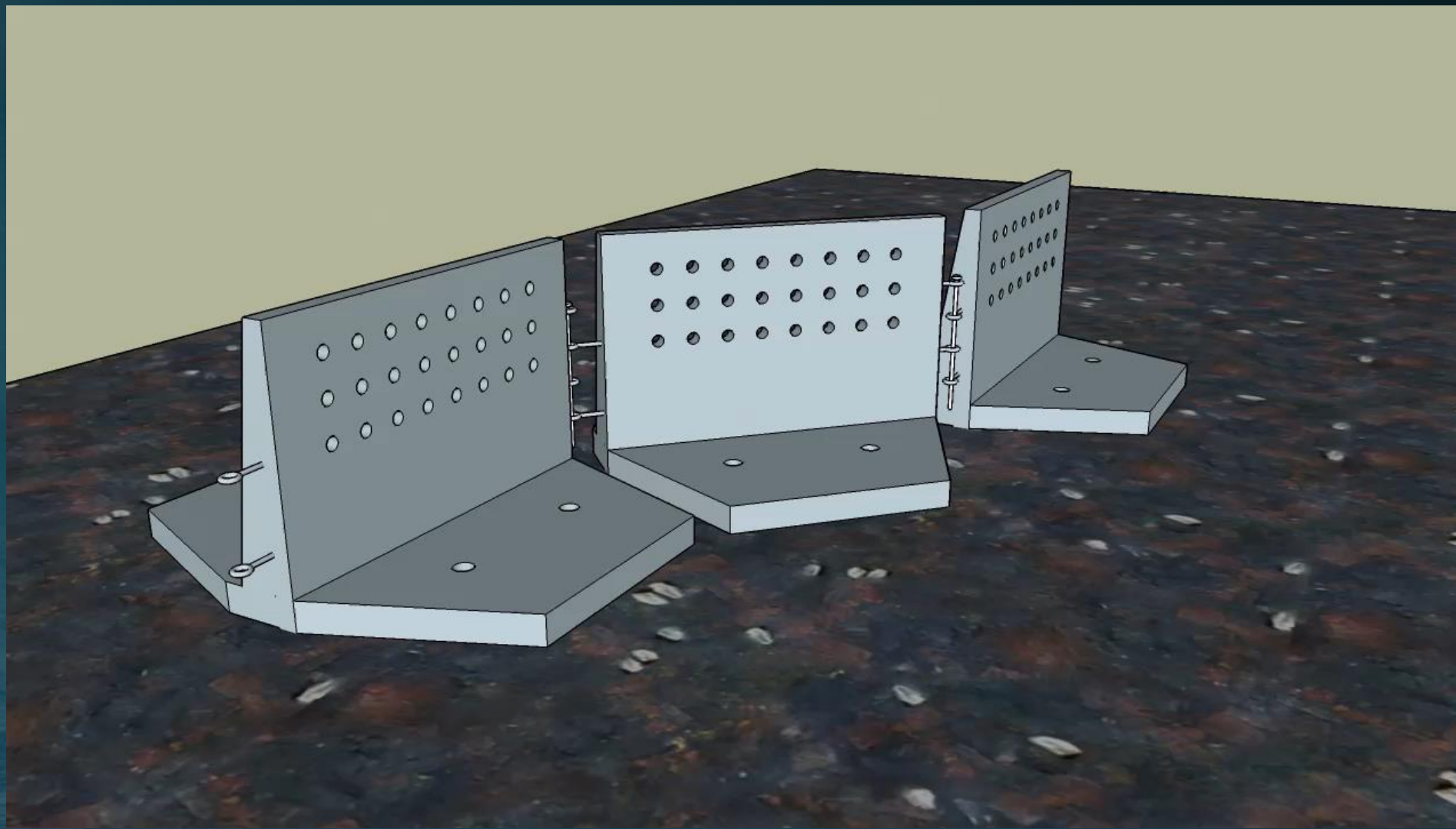
3/4/2012



Post Installation North Bank of GIWW (03/2012)

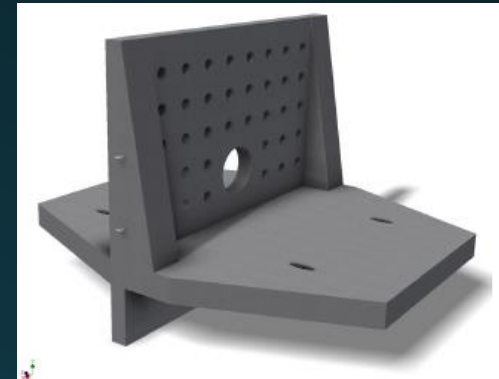
GOC

SPPR PANEL

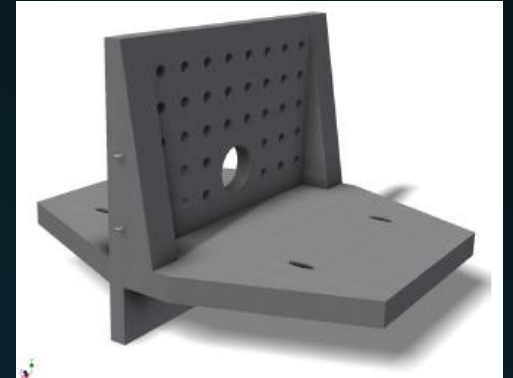


SPPR PANEL – How Does It Work???

- Reduced initial installation cost compared to rip rap embankments (60%-80% the cost of rip rap per linear foot depending upon water depths)
- Reduced life-cycle cost compared to rip rap embankments (no additional lifts required)
- 100% concrete construction (50+ year construction life)
- Salt water tolerant concrete mix design
- **No carbon steel within the concrete**
- Minimal settlement
- Can be installed in water as shallow as 2-3 feet and as deep at 6-7 feet with minimal footprints
- Provides fisheries access on landward side
- Project timelines are greatly reduced (construction phase time is reduced)



Benefits to State of Louisiana



Region	Project Name	CPRA Cost	SPPR Project Cost	Project Savings
SW	SUBTOTAL	\$668,000,000	\$370,000,000	\$298,000,000
C	SUBTOTAL	\$851,000,000	\$386,500,000	\$464,500,000
E	SUBTOTAL	\$337,000,000	\$112,500,000	\$224,500,000
	TOTAL	\$1,856,000,000	\$869,000,000	\$987,000,000
	MASTER PLAN PERCENT SAVINGS			1.97%