# CWPPRA

## PPL 33 Regional Planning Team (RPT) Meetings

## Demonstration and Coastwide Projects

# Demonstration Projects

| Project ID | Agency | Project Name |
|---|---|---|
| Demo - 01 | Independent | Louisiana Coastal Restoration 2023 Reefbud Project |
| Demo - 02 | Independent | AquaRockBags |

# Coastwide Projects

| Project ID | Agency | Project Name |
|---|---|---|
| Coastwide - 01 | EPA | Marsh Creation Containment |
| Coastwide - 02 | NMFS | mall/Micro Dredging for Hydrologic Improvements |

reefbuds

the only good thing to drop into the ocean

# LOUISIANA COASTAL RESTORATION

# 2023 REEFBUD PROJECT

PRESENTED BY MATHEW BERNIER AND CHRIS TALBOT |

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## EXECUTIVE SUMMARY

Dear Team,

Per the RFP, we have condensed our creative Executive Summary to be as concise and informative as possible, reserving the details for our standup presentation. We look forward to illustrating how we will get this project done, the various components we will integrate, and how they will deliver a real solution for Louisiana in a most cost-effective way. Most importantly, **we want to protect our shorelines and for marine life to thrive**— we're building a solution that solves for both.

Once again, thank you for your consideration. We look forward to presenting to you in person. Warm regards,

**Mathew Bernier**

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## GENERAL APPROACH

**With over a decade of research under our belt, we intimately understand the Gulf States Coastlines, the marine life, and need for innovative thinking around coastal restoration—what works and what doesn't, what can be improved to enhance and maximize the stability of our shorelines and waterways, and help marine life thrive.**

That said, our main goals are environmental benefits and cost-effectiveness. We accomplish this with a two-pronged strategy. First and foremost is our team—highly passionate and experienced in this industry—and extensively trained in executing environmental studies, supporting the delivery of maximum project knowledge and learnings.

Second is our proprietary **Reefbuds material solution** used to construct and fortify barrier islands, wave-breaks and other attenuation, and surge protection systems.

## THE SOLUTION

Reefbuds. The reason this project is a winner.

**What are Reefbuds?** Reefbuds are made of environmentally friendly all natural organic and inorganic materials, such as shredded coconut husk, rice stalks, volcanic rock, activated carbon, sand and cement all combined to form a rough hollow pyramid structure. The key features and benefits include:

- POROSITY - Reefbuds structures are like solid sponges that absorb sea water. (up to 30% of its weight)
- PH – The entire Reefbud takes on the PH of the surrounding water as it penetrates the structure through capillary action. The absorbed marine life germinates quickly within the fertile environment inside the Reefbuds.
- CALCIFICATION - The blend of materials in the Reefbuds reacts with seawater and triggers a calcification process very much like the natural process that takes place continuously in the sea. e.g., calcification in coral structures, crab shells, crustaceans, turtle shells, etc. This makes the Reefbuds a rock solid natural habitat for all forms of marine life.
- STABILITY - Because they are heavy massive structures and become even heavier as they absorb sea water and marine life, Reefbuds cannot be moved by strong currents during storms. Moreover, they are built with an aquadynamic shape that allows currents to simply glide around the structures instead of pushing on them. Stability allows the Reefbuds to become permanent homes and spawning grounds for marine life.
- COMPATIBILITY - Reefbuds were formulated to use beach sand and sea water as basic raw materials. REEFBUD mix (25% of volume) are mixed and formed with beach sand and the cheapest cement (20% of volume). This ensures Reefbuds compatibility with the waters where they will be deployed. Use of materials in close proximity to the seas are major sustainability and logistical benefits of employing our Reefbuds technology.

SPEED of GROWTH - This is perhaps the best feature of Reefbuds. Marine life such as algae, seaweeds, oysters, etc. can be found plentiful on Reefbuds in as little as 4 weeks after being dropped in a marine dead area (with only sand and/or mud). Reefbuds have been found to be one of the most effective and fastest ways to rekindle a marine ecosystem which has disappeared or severely damaged. https://youtu.be/4GTMkJ1_Sqk

**PROJECT DESCRIPTION**

**The project goals** include bringing an internationally proven technology to Louisiana. Scientific studies on massive Reefbuds projects like Boracay island show revival of a dead marine environment of coral rubble covering hundreds of hectares. The environmental benefits include shoreline protection (wave attenuation) as well as habitat creation. (Reference the 2006 World Bank Country Development Marketplace, "Development with Equity" contest) https://youtu.be/7HSiiqO_JCI

We seek to reproduce the results of the studies that show given coral spawning seasons, natural coral recruits taking life on Reefbuds surfaces are at least 6 times more than if the spawn fell on the natural environment of sand, rocks, coral rubble and other debris. The studies also show that coral branches grafted onto Reefbuds surfaces exhibit healthy growth and are able to withstand the battering of powerful typhoons like Yolanda in 2013. For that matter the Reefbuds structures in the different projects (some of which go back over a decade), have remained intact as they continue to grow and play host to various forms of marine life.

We seek to demonstrate that Reefbuds can play a vital role in fish enhancement even in areas not suitable to coral growth as they did in the highly polluted seas in and around Manila Bay. In Rosario Cavite, a Reefbuds project supported by the Cavite Export Processing Zone Authority since 2009, some 1400 Reefbuds structures have played host to various forms of edible marine life such as fish, crabs, clams, and shrimps. Until now, we have only been able to imagine what it could do for coastal restoration and revitalization in Louisiana.

- **Demo Project Location and Plan:** We are open to deploy wherever our solution is needed. We believe deploying in - **the Chandeleur Islands and the Rockefeller Refuge** would be a great place to prove Reefbuds is the right solution for our coastline.
    - Ref: ChandeleurIslands.pdf (usgs.gov)
    - Ref for Rockefeller: ptrosclair@wlf.la.gov
- We aim to design, create, deploy and monitor a reefbud wall similar to the picture below. However, our application would be positioned at different depths and distances from the coastline and will help with managing coastal erosion, storm surge and wave attenuation. It will also build a habitat that will boost the ecosystem in the area.
- Phillip Trosclair with LWF has agreed to sponsor a location for us to deploy in the Rockefeller Refuge (see photo attached of area highlighted in yellow).

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## SOLUTIONS AND ADVANTAGES

Reefbuds' proprietary mix is engineered to rapidly restore marine life in dead or depleted areas while being more cost efficient and environmentally friendly than other materials like concrete, rock, and scrap materials.

## Solutions

- Living shorelines and sustainable Reefbuds planters providing anchoring for planting projects along the Gulf Coast in partnership with RES.gov Resource Environmental Solutions, LLC
- Surge and shoreline Protection: Southern and Coastal parishes including St. Tammany
- Wave attenuation: Reefbud speed bumps, sandbars, and natural wave breaks
- Land bridges/bulkheads: Kremnitz Wall
- Marine Life/habitat/safe haven for oyster, crab, shrimp, and fish

## Key Advantages

Reefbuds are a more sustainable cost-effective method of rebuilding a marine ecosystem and protecting shorelines. The popular method of deploying rock or rubble results in excessive settlement in weak, coastal Louisiana soils. The material erodes over time, supports minimal marine life growth, and is expensive to deploy.

Additional advantages include:

- Adaptable along all coasts, different regions
- Cost effective
- Environmentally friendly
- Multiple designs and molds
- Rapid growth
- Easy to construct
- Sustainable, Resilient, Synergy, environmental beneficial
- Anchor system for planting projects
- Proven technology , successfully deployed, monitored, and data
- Shelter/safe haven for smaller species allow successful spawning and growth

## Problems Solved by Reefbuds

Reefbuds represent a new and effective way of reviving near shore marine ecosystems that have been severely damaged by unregulated human activity. In addition to environmental benefits and cost-effectiveness, our demonstration seeks to evaluate different deployment methods in order to find the one that bears the best results (geometries, anchor systems, Gulf coast, bays and lakes, channel shoreline stabilization,bulkheads, etc.). As we can create different molds for particular areas to assist with diverse issues such as surge protection, wave breaks, natural sandbars and speed bumps to help with wave attenuation.

For Example: The Kremnitz Wall:

The Kremnitz Wall is conceived to be an immovable stable structure that is free from the dependence of binders by virtue of its hexagonal locking mechanism. This concept was inspired by one of nature's most stable structures, the beehive honeycomb. Each tube acts as a brace for its counterpart and increases the overall stability of the wall. The Kremnitz Wall is specifically engineered to act as a wave-mitigating sieve, effectively serving as an anti-erosion alternative to the traditional Reefbuds design. Moreover, because the wall is made of Reefbud mix, it becomes an increasingly hardened yet porous shell-like construction with marine life making the structure their home.

- Anti-Erosion Above and Below Sea Level
- Hexagonal Locking Mechanism
- Long Term Stability
- Customizable Wall Dimensions

## GETTING IT DONE - STRATEGY

Having successfully studied the growth of this solution globally for almost ten years gives us inside knowledge of how to execute efficiently within budget. Your 2023 program comes with a budget that we take very seriously. Our approach to delivering a successful project within these parameters includes a prototype testing phase and a schedule for gathering metrics and data throughout the project timeline.

1. **Prototype Testing**
   Working with our sponsor at the Rockefeller refuge, we will design, build, and deploy the correct size structures using Reefbud materials.

2. **Monitoring Plan**

   We are prepared to collect data, monitor the reefs, and surrounding areas for as long and as often needed to document this study.

3. **Summary of Project Budget**

   We are asking for a grant to protect the shoreline of the Rockefeller refuge. Our cost to construct, deploy, and monitor will be determined by the size of the project, and funds available.

## FINAL WORDS.

We're thrilled at the option of partnering with you on this project and know we can make it a success. We're looking forward to presenting to your team in person and further illustrating our ideas and strategy.

Thank you !

Links to more information on Reefbuds:

https://reefbuds.net/about-us/

https://youtu.be/7HSiiqO_JCI

https://youtu.be/_jXzNGwyuHc

https://youtu.be/L6JgFD30jgo

https://youtu.be/efTaBx7jrw4

https://youtu.be/4GTMkJ1_Sqk

https://www.facebook.com/RBGCorals/

https://www.dropbox.com/s/6wyuzssrxj131wh/Monitoring-of-Reefbuds-efficacy-December-2015.pdf?dl=0

reefbuds

the only good thing to drop into the ocean

- Award-Winning
- Internationally patented
- All-natural
- Simple and easy construction and deployment

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1

1

## Reedbud Solutions

Reefbud Dome

Kremnitz Wall assembly

Kremnitz Wall

Living Shoreline

Domes ready to deploy

Living Shorelines, Bulkheads, Landbridges

Wave Attenuation, Surge Protection

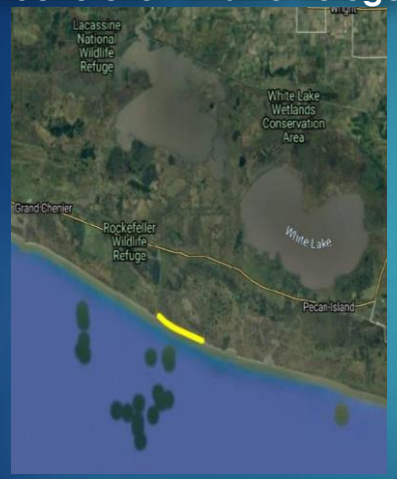
Habitat Restoration: oysters, shrimp, fish

Simple Deployment

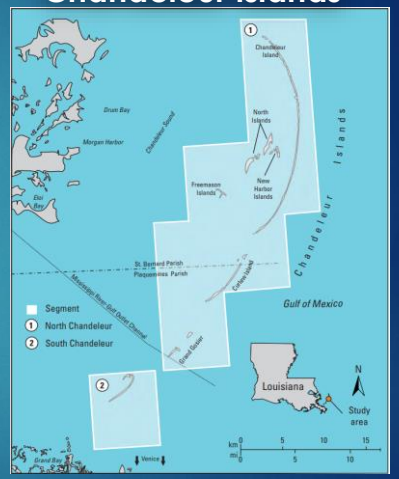
2

2

## Rockefeller Wildlife Refuge




## Chandeleur Islands

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3

## The REEFBUDS Difference!

Concrete Structures

At first glance they look the same, BUT:

REEFBUDS- porous organic/inorganic structures

| | |
|---|---|
| Inactive structure | Absorbent fertile structure |
| Slow, limited growth | Rapid growth and propagation |
| Heavy and Expensive | Lighter and Cheaper |

4

4

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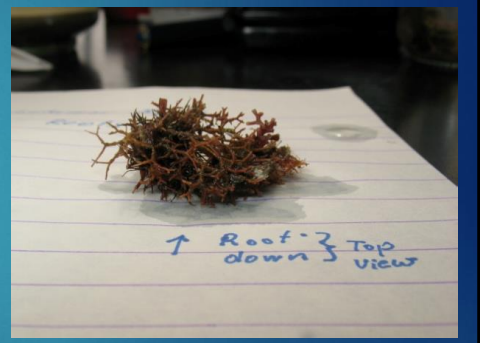
## Rapid marine life growth and propagation on REEFBUDS


After about 6 weeks (installations at Cavite/Rosario)

5

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Geostar Technologies LLC
3351 Millbranch Road, Memphis, TN 38116
(901) 881–2517 | Geostartechnolgies.com

# AquaRockBag

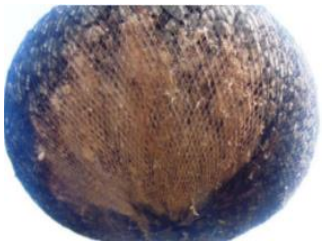
# 2-Ton Data Sheet

**Raw Material**: HDPE

| *Parameter* | *Values** | *Test-Method* |
|---|---|---|
| Tensile Strength MD | 1713 lbs/ft | EN ISO 10319 |
| Tensile Strength CMD | 582 lbs/ft | EN ISO 10319 |
| Elongation at Maximum Load MD | 15% | EN ISO 10319 |
| Elongation at Maximum Load CMD | 75% | EN ISO 10319 |
| Mass / Unit | 5.75 oz/yd$^2$ | ISO 9864 |
| Thickness @ 2 kPa | 2 mm | ISO 9863-1 |
| Resistance to Hydrolysis | Retained Strength: 85% | EN 12447 |
| Microbiological Resistance | Retained Strength: 80% | EM ISO 12225 |
| Resistance to Chemical Degradation Method A | Retained Strength: 90% | ISO TR 12960 |
| Resistance to Chemical Degradation Method B | Retained Strength: 90% | ISO TR 12960 |
| Resistance to Weathering | Retained Strength: 85% | EN 12224 |
| *Durability* | | |
| | >25 years in soils with PH-value 4-9 and soil-temperature <25°C | EN 13251: 2016, Annex B |
| *Environmental Impact* | | |
| | Not harmful to the environment | M Geok E, Edition 2016 |
| *Properties* | *Units* | |
| Filled Dimensions | Diameter: 6.46 ft<br>Height: 0.65 ft<br>Volume: 44 ft$^3$ | |
| Number of nets per pallet | 60 nets / pallet | |
| Weight of nets incl. ring (before filling) | 14.33 lbs | |
| Dimensions of the filling jig | 120cm x 120cm x 90cm | |
| Mesh sizes | 25mm | |
| Stone sizes to be used | >50mm | |
| *Drag-Test: The product with complete 2-Ton load has been dragged for 10 meters on natural terrain* | | |
| Observation 1: No Holes \| Observation 2: No Tears | | |

Observation 1

Observation 2



Notes:

* All values are average-values

-Dimensions can vary based on type of fill material

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3351 Millbranch Road, Memphis, TN 38116
(901) 881–2517 | Geostartechnolgies.com

# AquaRockBag

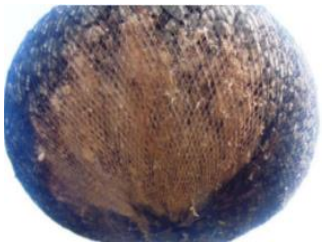
# 4-Ton Data Sheet

**Raw Material**: HDPE

| *Parameter* | *Values** | *Test-Method* |
|---|---|---|
| Tensile Strength MD | 2398 lbs/ft | EN ISO 10319 |
| Tensile Strength CMD | 1027 lbs/ft | EN ISO 10319 |
| Elongation at Maximum Load MD | 15% | EN ISO 10319 |
| Elongation at Maximum Load CMD | 75% | EN ISO 10319 |
| Mass / Unit | 8.848 oz/yd$^2$ | ISO 9864 |
| Thickness @ 2 kPa | 2.4 mm | ISO 9863-1 |
| Resistance to Hydrolysis | Retained Strength: 85% | EN 12447 |
| Microbiological Resistance | Retained Strength: 80% | EM ISO 12225 |
| Resistance to Chemical Degradation Method A | Retained Strength: 90% | ISO TR 12960 |
| Resistance to Chemical Degradation Method B | Retained Strength: 90% | ISO TR 12960 |
| Resistance to Weathering | Retained Strength: 85% | EN 12224 |
| *Durability* | | |
| | >25 years in soils with PH-value 4-9 and soil-temperature <25°C | EN 13251: 2016, Annex B |
| *Environmental Impact* | | |
| | Not harmful to the environment | M Geok E, Edition 2016 |
| *Properties* | *Units* | |
| Filled Dimensions | Diameter: 7.21 ft<br>Height: 2.78 ft<br>Volume: 88.28 ft$^3$ | |
| Number of nets per pallet | 48 nets / pallet | |
| Weight of nets incl. ring (before filling) | 30.86 lbs | |
| Dimensions of the filling jig | 150cm x 150cm x 120cm | |
| Mesh sizes | 25mm | |
| Stone sizes to be used | >50mm | |
| *Drag-Test: The product with complete 2-Ton load has been dragged for 10 meters on natural terrain* | | |
| Observation 1: No Holes \| Observation 2: No Tears | | |

Observation 1

Observation 2



Notes:

* All values are average-values

-Dimensions can vary based on type of fill material

PROJECT NOMINEE FACT SHEET
Date: 2/2/23

Project Name: **Geostar Technologies - AquaRockBags**

Coast 2050 Strategy: **Maintenance of Bay and Lake Shoreline Integrity; Stabilization of Major Navigation Channels; Maintain or Restore Ridge Functions; Vegetative Plantings**

Project Location: **Coast-wide**

Problem: **Shoreline/bank erosion; bridge/structure stability; prevent damage from storm surges**

Goals : **Reestablish and reinforce previous bank/shoreline levels. Reinforce abutments and levees for permanent and temporary/emergency applications.**

Proposed Solutions: **ARBs to be filled, placed, and submerged or vegetated to reestablish the appropriate level of bank or shoreline. ARBs to be placed around abutments to reinforce existing structures.**

Preliminary Project Benefits:

1) What is the total acreage benefited both directly and indirectly? **TBD**
2) How many acres of wetlands will be protected/created over the project life? **TBD**
3) What is the anticipated loss rate reduction throughout the area of direct benefits over the project life (<25%, 25-49%, 50-74% and >75%)? **TBD**
4) Do any project features maintain or restore structural components of the coastal ecosystem such as barrier islands, natural or artificial levee ridges, beach and lake rims, cheniers, etc. **ARBs are designed to help prevent damage from heavy currents and storm surges, and can be placed in difficult to access environments more easily than traditional methods.**
5) What is the net impact of the project on critical and non-critical infrastructure? **TBD- ARBs will help reduce overall cost of repair and maintenance to infrastructure.**
6) To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects? **TBD**

Identification of Potential Issues:
The proposed project has the following potential issues:

Preliminary Construction Costs: **TBD**
Lump sum construction costs. Agency representative will provide supporting documentation on estimated costs of all project features.

Preparer(s) of Fact Sheet:
**Justin Webb**
**Geostar Technologies**
**(901) 881-2517**
**justin@geostartechnologies.com**

Project Map: **TBD**
List name and number of project (same as on Fact Sheet)
Project features should be displayed in their exact locations.
Indicate proposed project boundary area.
Scale (1 inch = __) and north arrow.
Identify waterbodies and landmarks
One copy of map will be sent to each official Engineering and Environmental Work Group member.

_____

# Geostar Technologies

## AquaRockBags

**Justin Webb- Business Development**

AQUAROCKBAG®

# ARB- Features, Uses & Benefits

- Virgin HDPE
- UV Resistant
- Classified as environmentally innocuous in the EU
- 2-Ton, 4-Ton, 8-Ton and custom sizes available
- Fast and easy filling- minimal labor
- Low cost installation
- Easier installation in deep water and difficult to access situations
  - Can be filled off-site and transported
  - Precise placement
- Long-term durability
- Stackable

- Shoreline Protection
- Scour Protection
- Bioengineering Solutions
- Abutment Applications
- Revetment Applications
- Artificial Reefs
- Shoreline/Bank Restoration
- Temporary Work Solutions
- EMERGENCY APPLICATIONS


| Size | Diameter | Height | Volume |
|---|---|---|---|
| 2T | 6.46’ | 0.65’ | 44 cu ft |
| 4T | 7.21’ | 2.78’ | 88.3 cu ft |
| 8T | 12.6’ | 3.3’ | 176.6 cu ft |

VIDEO

AQUAROCKBAG®

# Past Project

## Yaerls Weir River

### Site location

The site is located on a reach of the river Derwent in Barepot, about 0.75km east of Workington, Cumbria, UK.

### Initial situation pre AquaRockBag

Following two major floodings (winters of 2009 & 2015) increased erosion had impacted upon key assets:

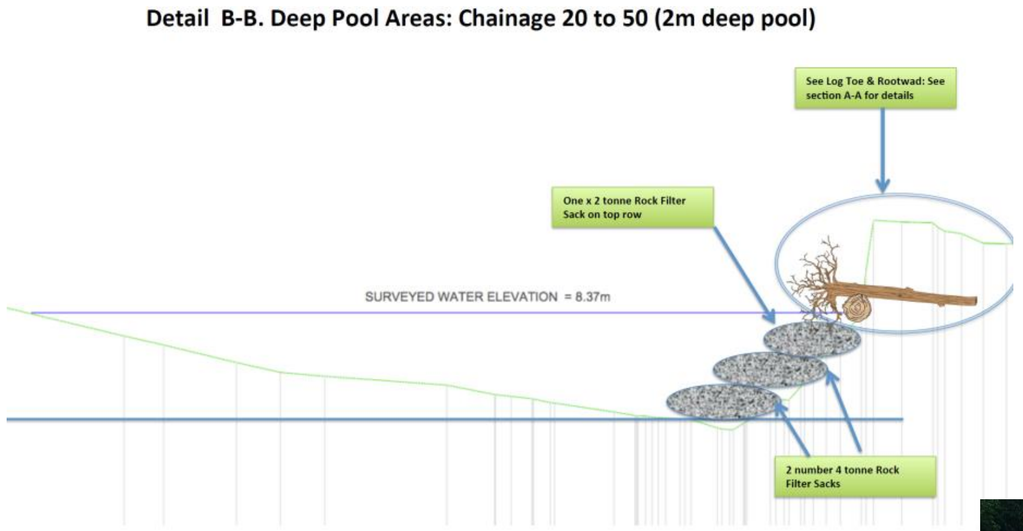
- Access track to the south of Yearl Pumping Station
- Bank between Yearl Weir and Yearl Weir Pumping Station
- Bank immediately upstream of Yearl Weir, threatening the structural stability of the Weir
  The erosion processes were threefold:
- Severe bank erosion caused by toe scour
- Stripping back of the turf (sod) layer on the floodplain
- River began to cut a new channel on a shorter course across the floodplain, bypassing a large weir structure

# Past Project

## Yaerls Weir River (cont.)

### On-site ground investigation

- Records of British Geological Survey indicate site is underlain by alluvium and river terrace deposits over carboniferous pennine middle coal measure
- Further ground investigation and geomorphological survey concludes that fine week alluvial soils that were highly erodible with the alluvium found to comprise ‘dark grey’ and ‘brown’ fine to coarse sands
- Vegetation structure was heavily grazed agricultural and the eroding banks were devoid of any vegetation cover at all



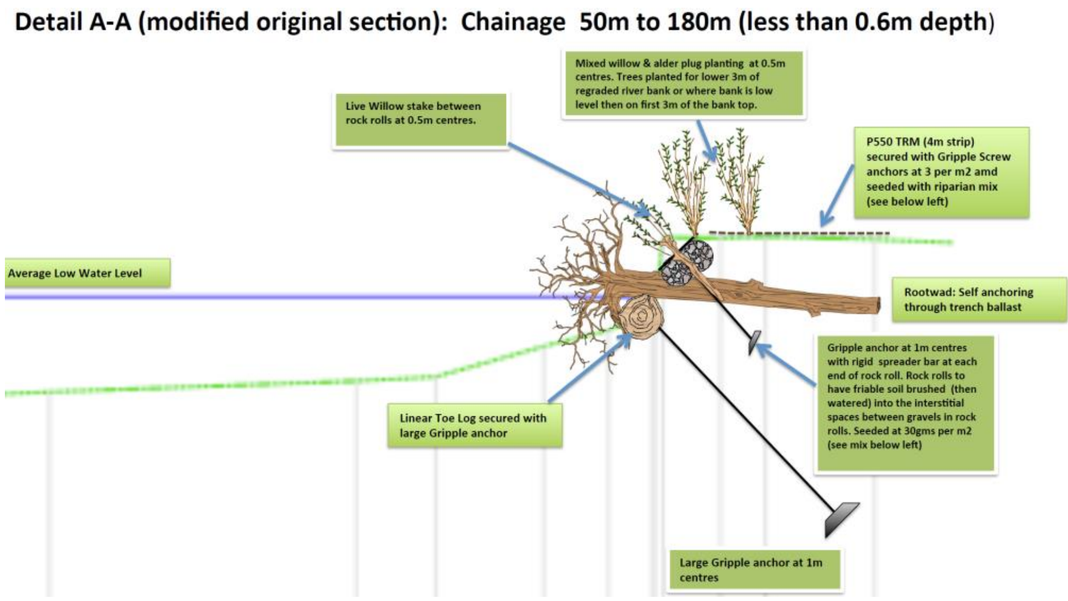

## Solution (1)

Detailed bathometric survey undertaken in late 2017, followed by hydraulic modelling of the existing channel and flood plain to build a map of bed, bank and floodplain flow velocities and map shear stress for 1:200-year flood return events

- Data informed the design process

- Once design had been agreed upon, a further model was produced to inform the client and statutory permit agency of any potential future channel change as a result of the bank reinstatement works
  As an ecologically sensitive site the use of traditional hard engineered bank protection was not an option and bioengineered designs were favoured
  - The scour pools provided a particular challenge, as bioengineering techniques would not control the rate of erosion in 2-3 metres of water
  - Rip-rap stone ruled out due to geomorphological impact downstream and the adverse ecological impact

➢ The solution to controlling the erosion in the scour pools came in the form of AquaRockBags® combined with further bioengineering elements




## Solution (2)

Further bioengineering solutions include

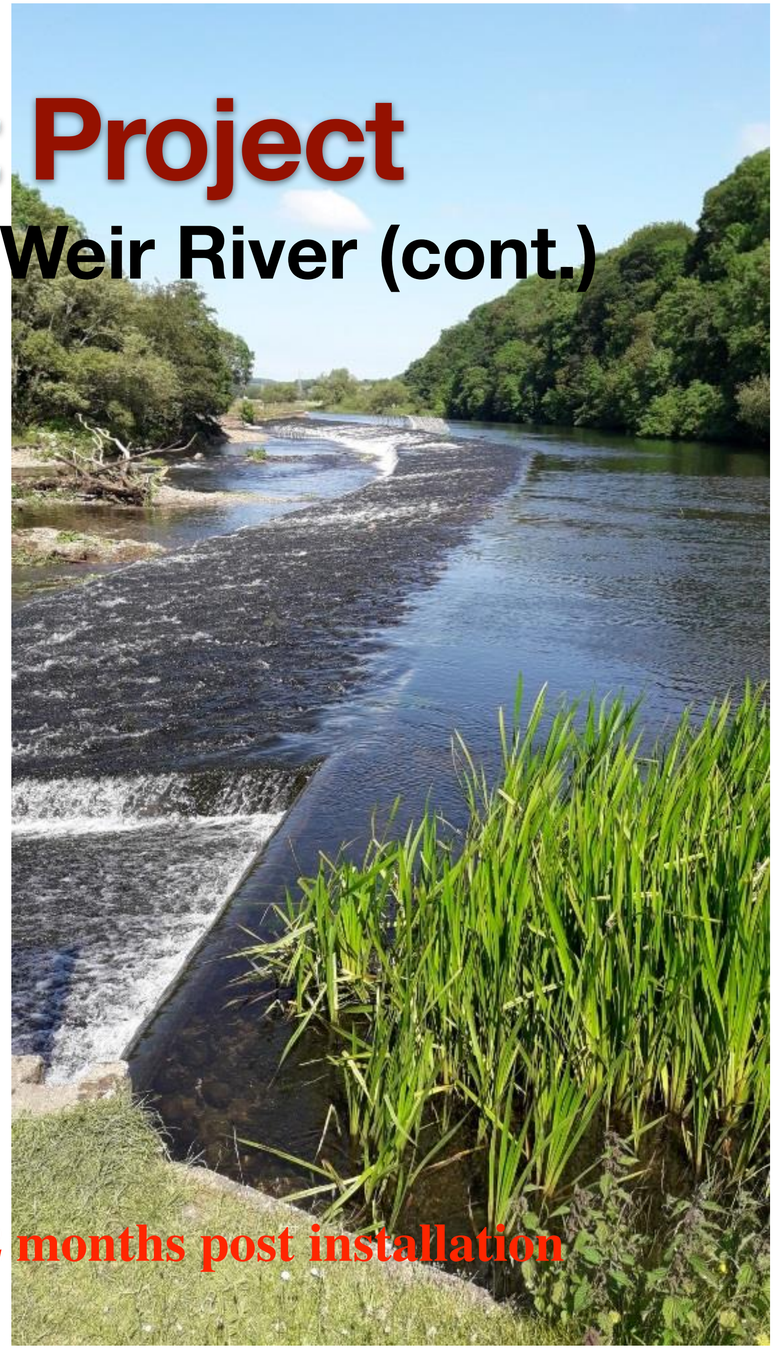
- Continuous run of liner toe logs, rootwads and live willow staking from average low flow water level
- Additional tree planting on the reprofiled river banks and the adjacent floodplain will slow flood flows and reduce erosive force in the future
- Banks also protected with a high performance turf reinforcement system: Combination of woven HP-TRM and ground anchors
- Matting was extended from the bank to also cover the area where avulsion process had created the new river channel in the floodplain and where future major floods would otherwise try to reform this channel feature

AquaRockBag® installation into deep scour pool. The bioengineering element can then be built up at and above average low water level.

AQUAROCKBAG®

# Past Project

## Yaerls Weir River (cont.)



**Final result: 2 months post installation**

# Potential Uses in The State of Louisiana

- Levee reinforcement and restoration
- Bioengineering solutions in swamp/marsh land
- Emergency applications- fast, easy fill on or off site
  - Easily placed and removed
    - Temporary abutment protection & reinforcement for bridges
    - Roadway protection
    - Temporary water diversion
- Pier and shoreline protection
- Riverbank restoration


AQUAROCKBAG®

# PPL33 PROJECT FACT SHEET
**February 9, 2023**

**Project Name**
Coastwide: Marsh Creation Containment

**Master Plan Strategy**
This project constructs containment for CWPPRA projects to expedite construction, reduce costs and beneficially use sediments.

**Project Location**
Coastwide

**Problem**
The costs of restoration projects are rising, and funding sources are limited. Sediments generated from dredging events are often "disposed of" offshore or in upland borrow areas. Multiple projects designate the same borrow locations with use on a first come, first served basis. A borrow source may not be available when the project design is completed. Designed projects wait for the annual allocation of construction funds resulting in a backlog of these projects.

**Proposed Solution**
This coastwide concept provides for constructing containment/earthen berms for marsh creation projects and using sediments dredged by others. Constructing the containment portion of a project saves project restoration dollars as dredging is the most expensive feature of a marsh creation project. The Marsh Creation Containment coastwide would enhance CWPPRA's ability to build more marsh creation projects faster and at a lower cost. Both large and small dredging projects can build marsh and eliminate project issues or scope changes that often present a major barrier to project construction.

**Project Benefits**
The cost of dredging is often the most expensive project feature in coastal restoration projects. This approach facilitates and encourages use of all dredged sediment resources to build acres of marsh, while reducing CWPPRA project costs and time for project construction. Sediments currently disposed of offshore could be used in coastal restoration projects. In addition to expediting marsh creation benefits, the containment dikes/berms create habitat and variety in the landscape supporting eco diversity and provide a measure of storm resilience. Containment or low ridges reduce wave erosion and the tidal prism, and provide "hard" support for marsh projects so that they don't subside faster. The coastwide concept is estimated to build containment for four projects over the 20 year life for less cost than one marsh creation project. Supports USACE 70/30 goal for beneficial use.

**Project Costs**
The estimated cost including 25% contingency is $25M - $30M.

**Preparer(s) of Fact Sheet:**
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Sharon L. Osowski, Ph.D.; (214) 665-7506; osowski.sharon@epa.gov
Jennifer Byrd; 214-665-7377; byrd.jennifer@epa.gov

## Coastwide: Marsh Creation Containment

- Constructs marsh creation project containment
  - Expedites project construction
  - Facilitates beneficial use
  - Reduces project costs
  - Maximizes restoration priorities

Multiple projects implemented over 20-year life

Coastal Wetlands Planning, Protection and Restoration Act

1

## Benefits (SOP Appendix F Consistency)

- Provides direct wetland benefits (SOP Appx F #1)
  - Earthen berms/containment dikes have benefits and naturally vegetate like ridges, provide for diverse habitat types
- Constructed/designed/applied across multiple years and/or sites (SOP Appx F #5)
- Implemented in increments, scaled up/down (SOP Appx F #4)
- Containment/earthen berms are relatively simple and low-cost project features (SOP Appx F #3)
- Technique applied across the coast and not limited to any marsh type or basin (SOP Appx F #2)

Coastal Wetlands Planning, Protection and Restoration Act

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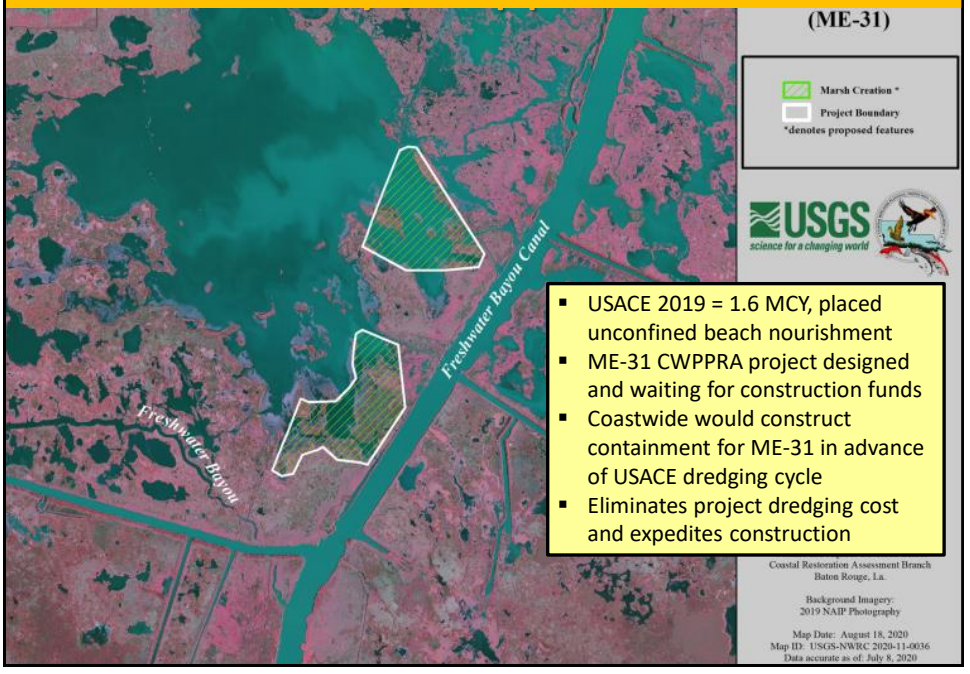
# Freshwater Bayou – ME 31 Project Example




- USACE 2019 = 1.6 MCY, placed unconfined beach nourishment
- ME-31 CWPPRA project designed and waiting for construction funds
- Coastwide would construct containment for ME-31 in advance of USACE dredging cycle
- Eliminates project dredging cost and expedites construction

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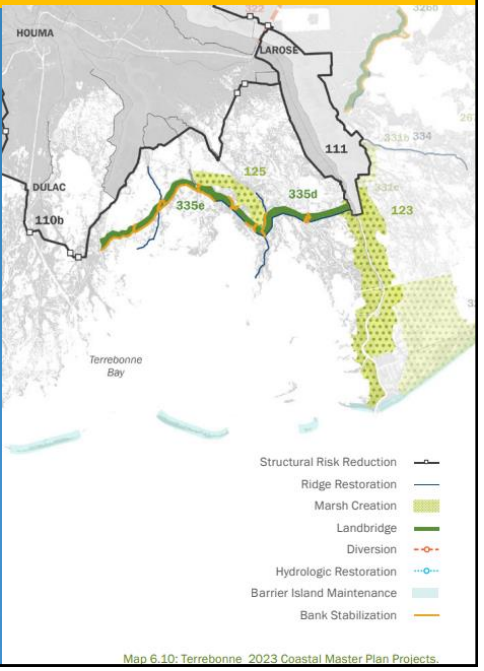
# East Terrebonne Landbridge/Berm Creation

- Construct the landbridge/bank stabilization for planned marsh creation projects
- Berms provide a measure of resiliency in addition to containment

Dredged Material Sources:
- Industry dredging - new construction
- Recurring slip/berth maintenance
- USACE channel maintenance

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# Calcasieu – Numerous Marsh Creation Opportunities


Dredged Material Sources:
- Industry dredging - new construction
- Recurring slip/berth maintenance
- USACE channel maintenance

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# Project Goal Summary

- Faster implementation of CWPPRA marsh creation projects at a lower cost
- Strategically use sediments dredged by others
- Cost would be spread over the 20-year life so the incremental burden to CWPPRA would be small
- Facilitates beneficial use – USACE 70/30 goal
- Four marsh creation projects constructed

Construction plus 25% contingency = $25M - $30M

Coastal Wetlands Planning, Protection and Restoration Act

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**PPL33 PROJECT NOMINEE FACT SHEET**
**February 9, 2023**

**Project Name**
Coastwide Small/Micro Dredging for Hydrologic Improvements

**Project Location**
Coastwide, Louisiana

**Problem**
Frequent tropical storms of the past decade have redistributed sediments and vegetation across Louisiana's coast. Often those sediments end up in bayous, canals, and other channels that alter hydrology, reduce habitat value, and can limit local recreational and commercial fisheries.

**Goals**
The project goal is to fund a CWPPRA project that will dredge accumulated sediments from bayous, canals, and other channels to achieve improved hydrology and access to fisheries habitat. Those sediments will be placed into adjacent wetlands that desperately need additional elevation. This project could implement a single restoration technique that has been proven in the past, but has yet to be implemented through the CWPPRA program at scale.

**Proposed Solution**
The proposed solution is to improve hydrology and habitat by dredging 1,400,000 cubic yards of sediment from obstructed waterways and place into adjacent wetlands to nourish and create marsh. Containment dikes are not anticipated to be utilized in this project. Any temporary containment needed will be accomplished through hay bales thus eliminating the need for any long term maintenance. Sediment placement would not be limited to typical hydraulic dredges. Spray dredging and mechanical dredging have also proven to be effective at accomplishing this project's goal. Up to 28 miles of waterway would be dredged at an estimated 50,000 cubic yards per mile. Using typical marsh creation volume cut/acre created calculations, it is expected that 1,400,000 CY can be beneficially used to have a direct positive impact on as much as 450 acres of deteriorating wetlands depending on the ratio of creation to nourishment acres of the individual sites.

**Preliminary Project Benefits**
1) *What is the total acreage benefited both directly and indirectly*? The total acres benefited is estimated to be up to 450 acres.

2) *How many acres of wetlands will be protected/created over the project life*? The total net acres of marsh protected/created over the project life is approximately 200 - 250 acres.

3) *What is the anticipated loss rate reduction throughout the area of direct benefits over the project life (<25%, 25-49%, 50-74% and >75%).* The anticipated loss rate reduction throughout the area of direct benefits is estimated to be 50%.

4) *Do any project features maintain or restore structural components of the coastal ecosystem such as barrier islands, natural or artificial levee ridges, beach and lake rims, cheniers, etc.* Yes. The strategic location of this project along bayous will aid in re-establishing the structural framework and hydrology of marshes across Louisiana's coast.

5) *What is the net impact of the project on critical and non-critical infrastructure*? The project could have a net positive on critical and non-critical infrastructure depending on final selection of project locations.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects*? The project could have synergistic effects with other approved and constructed projects as many of these concepts that have historically been proposed near other restoration projects.

**Considerations**

Considerations for this project are unknown at this time. The work is not uncommon to Louisiana's coast, but each project site will have its own unique set of considerations.

**Preliminary Cost**

The estimated constructed cost + 25% contingency range is $10M - $15M.

**Preparer of Fact Sheet**

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