

**Dickinson Bay Oyster Reef/Wetland Restoration  
Demonstration Project**

**Edward (Eddie) Seidensticker**  
**USDA/Natural Resources Conservation Service**

Eddie is a Resource Conservationist specializing in coastal erosion for the entire Texas Coast. He is known as a pioneer in the restoration and creation of coastal marshes in the Galveston Bay system. He developed an Action Plan Demonstration Project for the Galveston Bay National Estuary Program using vegetation for erosion control and habitat restoration. His latest accomplishment was the planting wetland vegetation on the Beneficial Uses Group Demonstration Marsh at Atkinson Island. This 220-acre project was the largest single marsh creation project on the Texas Coast.

Eddie is currently developing further cultivation and restoration technology that will be implemented in a variety of habitat restoration projects in the Galveston Bay system. In addition to his conservation activities, Eddie has also been the Project Manager of the award-winning AmeriCorps Program in Galveston Bay.

Eddie Co-Authored the Dune Protection Manual for the Texas Coast for the General Land Office. He also co-authored the Texas Coastal Marsh Handbook for the Natural Resources Conservation Service.

**Affiliations**

Galveston Bay Estuary Program

Member Galveston Bay Council

Member Natural Resources Subcommittee

Galveston Bay Foundation - Advisory Trustee since 1990

Member of Following:

Interagency Coordination Team for the Houston Ship Channel

Beneficial Uses of Dredge Material Work Group- Port of Houston

Gulf of Mexico Program - Shoreline Erosion Committee

Texas Coastal Management Program Task Force

Texas Soil and Water Conservation District Shoreline Erosion Committee.

Received the USDA - Distinguished Service Award 1991 From Secretary of Agriculture.

(This is the Highest Award a Civil Service Employee can receive.)

1997 - EPA Environmental Excellence Award Region 6

1998 - Coastal Public Service Award, Texas General Land Office

1990 - Present - Chairman for the Education Activities in Education Exhibit at Gator Fest

## **DICKINSON BAY OYSTER REEF/WETLAND RESTORATION DEMONSTRATION PROJECT**

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Resource Conservationist  
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U.S.D.A.

A high priority of the Galveston Bay Plan Habitat Protection Plan is to restore, create and protect wetlands. The Dickinson Bay Oyster Reef/Wetland Restoration Demonstration Project will provide protection for newly created emergent wetlands on the East shore of Dickinson Bay. This information will be useful to Galveston Bay stakeholders during the implementation of the Galveston Bay Plan.

The project consists of 1400 feet of oyster reef creation and planting of smooth cordgrass along the shoreline adjacent to the reef. This paper will give the results of the project including oyster spat set, establishment of vegetation and shoreline erosion rate measurement during the 1997-98 year of the contract.

### **EXECUTIVE SUMMARY**

The Galveston Bay System represents a huge economic, cultural, and environmental asset to Texas and the Nation. In order to maintain this value of bay assets for the future, and to address current problems which have been documented by the Galveston Bay National Estuary Program. In order to accomplish this demonstration projects are intended to display technology and to educate users of the bay the

A high priority of the Galveston Bay Plan Habitat Protection Plan is to restore, create and protect wetlands. The Dickinson Bay Oyster Reef/Wetland Restoration Demonstration Project attempts to provide protection for newly created emergent wetlands on the East shore of Dickinson Bay. This information will be useful to Galveston Bay stakeholders during the implementation of the Galveston Bay Plan.

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This report is intended to provide information on the feasibility of using oyster reefs to not only provide much needed habitat but to determine it's effect on shoreline erosion. The site of Dickinson Bay suffers from a severe erosion rate and has very little shallow oyster reef habitat close to the shoreline. The scope of the contract is not enough time to document the effects of reef creation on erosion rates but the Natural Resources Conservation Service is committed to monitor this site for

the next five years and will report to the Estuary Program thru the Galveston Bay Council.

## PROJECT CONCLUSIONS

Work began on the project in October 1996. A total of one full time and five part time employees worked on the project until August 31, 1997. The remainder of the time was spent on monitoring and some maintenance.

The oyster fence was constructed first by installing the posts and then installing the two by four boards and the fence material. This process was very labor intensive and required a lot of time to complete the installation. The posts were driven by hand. It took almost 6 months to complete the fence. If this oyster fence proves successful then we should do something to reduce both the time and cost.

The fence was filled with oyster shell beginning in March 1997. We filled the shallow areas with a custom built barge. This was also difficult because we could only haul two yards at time. We did contract with a larger boat that could haul 16 yards at one time but we could only use this during periods of high tide. The process of filling the fence material took approximately 30 days. The fence material supported the oyster shell very well. Some of the boards did break but it did not have any effect on keeping the shell in place.

As shown in the data collection for the oyster monitoring we have a well established growing oyster reef. There has been some damage to the fence over time but this has not materially effected the function of the reef. There is a good colonization of oysters not only on the top of the reef but also along the sides. It has been noticed that there is a small amount of sediment has accumulated on the inside of the shell fence. This may be something we may consider monitoring in the future.

The cost of installation for the oyster shell reef was \$78.83 per foot. This cost was higher than anticipated. The cost of labor was almost twice as much as the cost of the material.

This reef is built in an area where no oyster reefs are currently located. There are reefs in the area and there are individual oysters on scattered tires and other hard objects. The bottom is unconsolidated soft bottom. This bottom material is not generally considered suitable material for oyster clutch.

In addition this area of Dickinson Bay and the portion of Dickinson Bayou upstream from the area has been closed to oyster production for a number of years. The purpose of the oyster reef is not designed to be for harvesting. The major purpose of this reef is for habitat restoration. In addition it is hoped it will have some effect on erosion and water quality.

Approximately 200' of shore protection was installed at an adjacent site. The principle investigators wanted to have a comparison using hard shore protection to see both the effects and to have a cost comparison to the oyster shell reef. Tri-lock concrete blocks were installed on a 3:1 slope from the top of the bank to 2' below normal tide elevation. The tri-lock was installed according to

manufactures recommendations and has not required any maintenance. It was anticipated that vegetation would grow in the interspace but all of the soil material was washed out. We will continue to monitor this site to see if vegetation will develop. The top of the bank that was disturbed during construction was revegetated with common bermudagrass. There is no erosion occurring at this site.

The cost of the Tri-lock was \$ 171.37/foot. This was higher than other shore protection such as bulkheading but the tri-lock is more aesthetically pleasing. It will also be a good alternative to concrete rip-rap if vegetation will grow and provide habitat.

We installed five reference stakes on the shoreline to monitor the long term erosion rates at each treatment. One reference stake was placed at a control site. All of the reference stations showed 3 feet of erosion except one of the sites behind the angle reef showed 4 feet. We consider that there has been no difference in the erosion rates between any of the treatments and a control area. We believe that this is due to the fact that the reef is new and the effects of the reef creation will increase as the reef develops. This will be one of the most important areas to monitor in the future and the Principle Investigator has made a commitment to monitor the reference stakes for at least five years.