The Economics of Oyster Reef Restoration in the Gulf of Mexico

A Case Study in Mobile Bay, Alabama

VOLUNTEERS HELP CONSTRUCT A OYSTER REEF BREAKWATER IN MOBILE BAY, ALABAMA. © ERIKA NORTEMANN/TNC

People have gathered oysters for food for thousands of years — a tradition that endures today, especially in the Gulf of Mexico, which accounts for approximately 67 percent of the nation's total oyster harvest. Aside from being a sought-after delicacy, oysters and the massive reefs they form **are the foundation of a healthy and resilient coastal ecosystem, providing valuable services to both people and nature**, including:

- Increased catches of fish and crabs that rely on oyster reefs for food or shelter;
- Protection from coastal erosion and flooding caused by waves; and
- Removal of nitrogen from coastal water, the cause of algal blooms and dead zones which negatively impact fisheries and tourism.

Globally, an estimated 85 percent of oyster reefs have been lost, more than any other marine habitat. Yet recent projects in the Gulf of Mexico show that **large-scale restoration can create man-made oyster reefs that duplicate many of the benefits of natural reefs.**

Oyster reef restoration makes good economic sense. Environmental economist Timm Kroeger, Ph.D., with The Nature Conservancy recently completed the most comprehensive study to date that measures the economic and social benefits that reef restoration provides to Gulf Coast communities, *Dollars and Sense: Economic Benefits and Impacts from Two Oyster Reef Restoration Projects in the Northern Gulf of Mexico*. The study is based on analysis of two planned restoration projects in Alabama and draws on findings from studies of restored and natural reefs in Mobile Bay and other parts of the Gulf. Kroeger's study estimates that an investment in oyster reef restoration will have a several-fold return on investment in terms of recreational and commercial fisheries and protection of property and public infrastructure. While not part of the study, this restoration may also indirectly influence water quality and tourism. All of these factors combined strengthen Gulf Coast communities and economies and make them more resilient.

An investment of $150 million in oyster reef restoration will

- Build 100 miles of oyster reefs
- Create 240 jobs per year for 10 years, or rather 2,400 jobs during the decade-long construction phase
- Boost regional household income by $7.6 million a year during the 10-year construction period
- Increase revenue and sales of crab, fish and oyster harvests by $6.87 million yearly
- Save property owners up to $150 million on the construction of bulkheads
- Enhance yearly saltwater angler spending by $4.9 million—and that's just in Alabama
- Increase annual sales by $7.3 million in the commercial seafood supply chain

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Investing in People

A one-time investment of $150 million will fund the construction of 100 miles of oyster reefs over 10 years in the northern Gulf of Mexico. This investment will return twice that amount in terms of goods and services produced in the local economy. An estimated 240 jobs per year will be supported during the 10-year construction phase, offering a boost to struggling coastal communities where 80 to 90 percent of households are dependent on seafood-related jobs.

ECONOMIC IMPACT FROM CONSTRUCTION OF OYSTER REEF BREAKWATERS	
1 Mile ($1.5 million)	**100 Miles ($150 million)**
Revenue/Sales – $2.3 million Household Income – $800,000 Jobs – 25	Revenue/Sales – $23 million* Household Income – $7.6 million* Jobs – 240*

*Annual impacts over the estimated 10-year construction period. Source: Bureau of Economic Analysis RIMS II total effect multipliers for Baldwin and Mobile counties in Alabama

Promoting Healthy Fisheries

Commercial and recreational fisheries are the lifeblood of the Gulf Coast economy. In 2008, commercial fishermen in the Gulf harvested 1.27 billion pounds of finfish and shellfish, earning $659 million in total landings revenue. That same year, recreational fishers took 24 million fishing trips in the Gulf. Restored oyster reefs are key to promoting healthy fisheries, which translates into an economic boon for the regional and national economy.

TOTAL ANNUAL ECONOMIC IMPACT FROM COMMERCIAL FISHERY ENHANCEMENT THROUGH OYSTER REEF BREAKWATER RESTORATION				
		Revenue/Sales	**Household Income**	**Jobs**
100 Miles	**Fish and Crabs**	$1.07 million	$300,000	15
	Oysters*	$6.80 million	$1.90 million	94

*Based on conservative harvest estimate of 10 oysters/m^2. Sources: Estimated based on data in Kirkley (2009) and Bureau of Economic Analysis RIMS II total effect multipliers for the Baldwin and Mobile counties in Alabama.

Protecting Our Coasts

Seven of the nation's 15 largest shipping ports are in the Gulf of Mexico. While the shipping industry is essential to the national and global economies, the wakes created by the cargo ships exacerbate erosion along an already eroding coastline. Not only are we losing valuable coastal property at an average rate of 5 feet a year, but the erosion is contributing to water quality issues.

Oyster reefs are designed to protect shorelines by absorbing wave energy and significantly reducing the energy of high power waves by as much as 76 to 93 percent, which, in turn, lessens the amount of coastal erosion, flooding, and costly damage to private property and public infrastructure. Without oyster reefs to dampen the wave energy, private property owners will continue to use rip-rap or bulkheads to protect their land, which requires costly maintenance. Constructing self-sustaining oyster reefs is likely to be more cost-effective in the long term. In terms of construction and replacement costs, estimates suggest that 100 miles of oyster reefs could **save** property owners up to $95 million on rip-rap or up to $150 million on bulkheads. (Source: MASGP-07-031)

FOR MORE INFORMATION PLEASE CONTACT

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Kirkley, J. 2009. The NMFS Commercial Fishing & Seafood Industry Input/Output Model (CFSI I/O Model). Prepared for the National Marine Fisheries Service (NMFS). Virginia Institute of Marine Science. August 2009. 30 pp.

Shoreline Protection Products: Cost Estimates. MASGP-07-031. Fact Sheet. Mississippi-Alabama Sea Grant.