



REBUILDING THE ECONOMY, ONE OYSTER AT A TIME

NORTH CAROLINA SEA GRANT • SUMMER 2010

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BY BENJAMIN YOUNG LANDIS

REBUILDING THE Economy, ONE AT A TIME OYSTER

Fishery Resource Grant research
helped paved way for a federal stimulus project
benefiting North Carolina's estuaries

Pamlico Sound's economy and ecosystems are getting a much-needed boost this year, courtesy of the American Recovery and Reinvestment Act. More than 130 jobs are being created for contractors, barge workers, commercial fishermen, truck drivers and many other coastal residents — all from a \$5 million Recovery Act grant to restore 49 acres of oyster reefs in local waters.

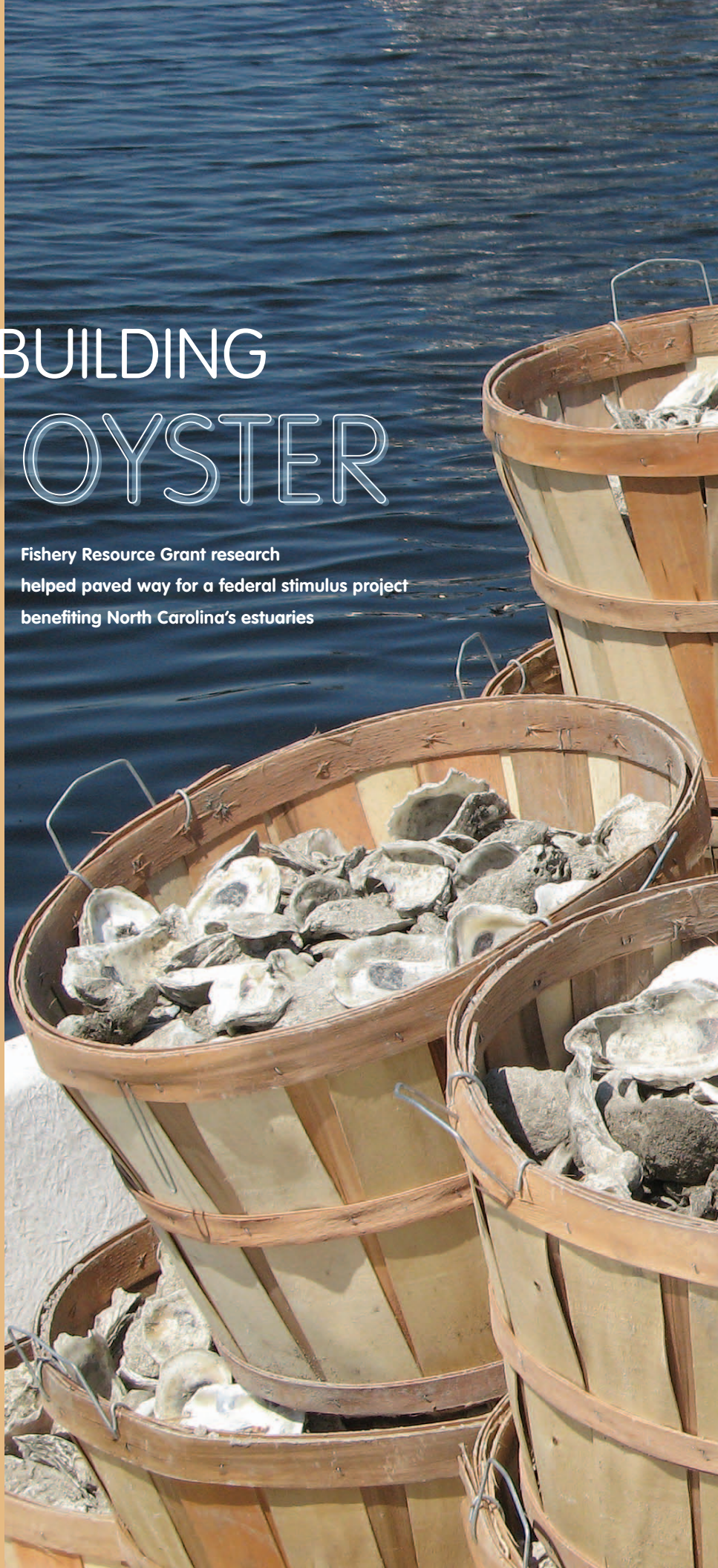
The grant was awarded to the North Carolina Coastal Federation, a nonprofit organization that is managing this oyster restoration program with the cooperation of the N.C. Division of Marine Fisheries (DMF) and others.

But the scientific studies that helped determine the optimal locations for these new oyster reefs took place years earlier, and included research conducted through the N.C. Fishery Resource Grant (FRG) Program. FRG is funded by the North Carolina General Assembly and administered by North Carolina Sea Grant.

Earlier FRG studies led by North Carolina State University researcher David Eggleston and Ocracoke commercial fisherman Eugene Ballance focused on how water currents shape the distribution of oyster populations in Pamlico Sound. Now, the findings are being used to inform and guide this federal stimulus project.

Ecosystem and economic benefits are expected. The Recovery Act project hires local workers and commercial fishermen to create artificial reefs out of limestone rock and old oyster shell. The hard rock and shell substrate will attract the tiny, free-drifting larvae of oysters to settle upon.

Continued



THIS PAGE: These oyster shells will reap benefits for the North Carolina coast.

Benjamin Young Landis



Eventually, new oyster colonies will form, creating crucial habitat for baitfish and gamefish, removing excess bacteria and nutrients out of local waters, and providing future harvests for working watermen.



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GRAY GOLD

The Recovery Act project began in October 2009, when the Coastal Federation, along with its DMF and local business partners, started building a large oyster reef off of Stumpy Point at Crab Hole. That site and a second major reef off of Hatteras Island at Clam Shoal are now complete.

Workers deployed 54,450 tons of gray limestone between the two sites, which total almost 47 acres. The limestone for the Hatteras reef was quarried from New Bern. Coincidentally, the composition of this rock includes fossilized remnants of long-dead bivalves — shellfish from the past serving as foundations for shellfish in the future.

The limestone, of course, doesn't swim out to Hatteras by itself. Stevens Towing, a company partly based in Edenton, was able to bring back four laid-off workers and activate 14 furloughed workers with project funding.

"Last year, I had to lay off a number of people from my company," says Simon Rich III, the general manager of Stevens Towing Company. "When this project came through, I hired many of them back."

Rich's three crews were soon working 24 hours a day on the project, alongside employees from Cape Dredging in Buxton.

Smaller reefs are being created elsewhere in Pamlico Sound, but using old oyster shell gathered from oyster recycling efforts and trucked in from an oyster shucking house. Since March, commercial fishermen have been paid \$2 a bushel to plant 41,000 bushels of oyster shell throughout North Carolina. DMF recruited the fishermen, whose smaller, more agile vessels can reach shallower restoration sites inaccessible to large barges. DMF plans to distribute 10,000 bushels of shell in Hyde County, 11,000 bushels in Carteret County,



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Scott Taylor



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THIS PAGE, CLOCKWISE FROM TOP LEFT: The project created new job opportunities for many like Joe Galatio, who now helps with shell plantings at Cedar Island. • Down East locals prepare bushels of oyster shell. • N.C. DENR Secretary Freeman, right, praised the project during an April visit. • DMF's Craig Hardy. • Sea Grant's Brian Efland. • Small commercial fishing vessels can reach shallower planting areas.

18,000 bushels in Onslow County and 2,000 bushels in New Hanover County.

Overall, the project has brought some welcome media and political attention to communities in the Outer Banks and Down East.

Local newspapers and news stations reported on the project. In early April, Secretary Dee Freeman of the N.C. Department of Environment and Natural Resources visited a Cedar Island reef planting demonstration. John Gray, the director of legislative and intergovernmental affairs for the National Oceanographic and Atmospheric Administration (NOAA), visited the Hatteras site later in April.

There, Gray presented NOAA's Excellence in Restoration Award to Todd Miller, executive director of the Coastal Federation, for the federation's long-time work on coastal issues.

Miller was quick to deflect some of the praise. "This award honors not only our work, but that of our many partners," Miller said. "We don't go at it alone — that doesn't work. We live where we work, and take on projects and issues that the communities value."

BENEFITS REVEALED

Other studies funded by North Carolina Sea Grant will help shed light on the success of oyster restoration projects. Past research by Troy Alphin, Martin Posey and Jay Styron, as well as efforts by Cynthia Cudaback, have investigated the optimal shape for new reefs and the movement and settlement success of larval oysters. Fisherman Eugene Ballance will lead another FRG project this year using side-scan sonar to "see" how well oyster reefs are rebuilding. (See FRG story, page 25.)

As for determining any immediate benefits of the Recovery Act project, North Carolina Sea Grant will work with the N.C. Coastal Federation to evaluate the economic benefits of the restored oyster reefs. Over the coming year, Brian Efland, Sea Grant enterprise development specialist, and N.C. State's Eggleston will help study recreational fishing activity at these reefs through aerial fly-by surveys.

An ecological component of that study will also observe whether the new reefs attract higher abundances of key species like striped bass, blacktip sharks and red drum.



THIS PAGE, CLOCKWISE FROM TOP LEFT: Heavy machinery is needed to plant the limestone substrate. The barges are staffed by Cape Dredging in Buxton. • The New Bern limestone contains fossils of ancient shellfish.

- Todd Miller of the N.C. Coastal Federation (left) receives an award from NOAA's John Gray.
- Simon Rich III inspects a small piece of limestone.

“We’re going to see if the fishing economy improves with this stimulus project,” Efland says. “I’m excited to talk with all the local folks and visitors and hear what they think of these new oyster reefs.”

In addition to the North Carolina Coastal Federation, North Carolina Sea Grant and NC DMF, institutional partners on this Recovery Act project include North Carolina State University and University of North Carolina at Wilmington.

To watch videos of the Recovery Act oyster reef construction projects, visit our YouTube channel at www.youtube.com/ncseagrant.

Have you or someone you know benefited from this Recovery Act project? Tell us your story. Write to Katie Mosher at katie_mosher@ncsu.edu.

SHOVEL-READY PROJECTS? TRY ROD-AND-REEL READY



Anglers won’t have to wait long for the fishing benefits of the Recovery Act oyster projects.

Often, the fish begin to show up on the reef the same or the day after workers dump the marl in the water, says Craig Hardy, chief of the N.C. Division of Marine Fisheries Resource Enhancement Section.

“We’ve seen sheepshead and black sea bass on them within hours,” Hardy says.

Anglers can start using the sites as soon as workers are out of the way.

“We’ve seen people already fishing on new reef areas while we’re still deploying on the other end of the site,” Hardy says.

Although hook-and-line fishing is allowed on the new reefs, it is illegal to use a trawl net, long haul seine or swipe net at the sites. It also is illegal to take oysters or clams from the Crab Hole and Clam Shoal oyster sanctuaries, as their purpose is to maintain colonies of healthy adult oysters that will spawn and send millions upon millions of oyster larvae into the currents each year, drifting away and restocking legal harvest beds elsewhere in Pamlico Sound.

Here is a list of GPS coordinates of the oyster reefs created so far by the Recovery Act project. To check whether any new locations have wrapped construction and are ready for fishing, please call Hardy at 252/808-8046.

REGION	SITE	LATITUDE	LONGITUDE
• Stumpy Point	Crab Hole	35° 43.5966	75° 40.6300
• Hatteras	Clam Shoal	35° 17.3944	75° 37.2985
• Beaufort	North River	34° 45.1568	76° 33.8026
• Beaufort	North River	34° 47.7795	76° 36.5475
• Beaufort	North River	34° 47.6865	76° 36.5320
• Beaufort	North River	34° 47.6822	76° 36.6196
• Cedar Island	North Bay	35° 01.1779	76° 19.7820
• Cedar Island	North Bay	35° 01.1359	76° 19.6789
• Cedar Island	North Bay	35° 01.1029	76° 19.7260
• Cedar Island	North Bay	35° 01.1370	76° 19.8070

Contributed by Patricia Smith (DMF) and Christine Miller (N.C. Coastal Federation). Map courtesy of DMF.

Putting Private Industry to Work Rebuilding North Carolina's Oyster Habitats

The National Oceanic and Atmospheric Administration Coastal and Marine Habitat Restoration grants, under the American Recovery and Reinvestment Act, enabled North Carolina to take a significant step in restoring the state's oyster population while growing its coastal economy.

From July 1, 2009, to June 30, 2011, the N.C. Coastal Federation, the N.C. Division of Marine Fisheries and their partners, including North Carolina Sea Grant, accomplished nearly 10 years of restoration in 18 months by putting private industry to work rebuilding the state's oyster habitats. The project also equipped DMF and its nonprofit, conservation and academic partners with the tools and knowledge necessary to maintain an aggressive pace of restoration long after these stimulus dollars were spent.

Finally, the grant provided numerous training opportunities for high-school, undergraduate and graduate students. In addition, community members were educated about the benefits of this project through many outreach efforts.

"By the end of the project, we were able to meet — and at many times exceed — our goals," says Lexia Weaver, coastal scientist for the federation.

Here is a list of accomplishments achieved by this Recovery Act project, as noted in the final report:

- *A total of 56.63 acres of reefs were created at the Crab Hole and Clam Shoal oyster sanctuaries, as well as an additional sanctuary, Gibbs Shoal. A total of 52,978.5 tons of Class B limestone rip rap were used to create the reefs.*
- *A total of 22.03 acres of oyster reefs were created by 51 fishermen at 10 sites in four coastal counties using 41,753.45 bushels of oyster cultch.*
- *Using oyster shells, 6.1 acres of patch oyster reef habitat and 0.1 acres of oyster shell bag sill were created at Jones Island, located at the mouth of the White Oak River, and in the lower Lockwood Folly River.*
- *A total of 196.42 jobs were created or retained through this project, including those industries hard-hit by the economic downturn.*
- *The University of North Carolina at Chapel Hill's Institute of Marine Sciences found the Crab Hole and Clam Shoal oyster reef sanctuaries collectively provide ecosystem services totaling more than \$11,000 per acre annually, as a conservative estimate, returning the investment in the project within nine years.*
- *Field sampling for oysters, fish, stone crabs and recreational angling at two oyster sanctuaries — Clam Shoal and Crab Hole — was performed by staff with North Carolina State University's Center for Marine Sciences and Technology and North Carolina Sea Grant from August 2009 until June 2011. Researchers at the University of North Carolina Wilmington monitored reefs at both Jones and Permuda islands in the seven months following their establishment to determine initial reef development, noting live oyster density, size distribution of oysters and oyster condition as initial measures of potential long-term success.*

Find out more about this federal project, NA09NMF4630305, at go.ncsu.edu/nknczm.

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