

NC scientists find that oyster reefs can grow faster than sea-level rise

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Climate scientists predict that by 2100, sea level will be 2 to 3 feet higher than it is today, but it appears that oyster reefs may adapt to the change.

New research at the University of North Carolina Marine Science Institute found that oyster reefs grow fast enough to keep pace with rising seas. Climate warming and sea-ice loss is causing sea levels to rise, threatening to swamp coastal ecosystems in the process.

A long history of overfishing and habitat degradation has led to the loss of about 95 percent of oyster reefs on the East Coast, making them particularly sensitive to any additional habitat loss from rising seas. Biologists Tony Rodriguez and Joel Fodrie at the institute are studying how oyster reefs respond to sea-level rise and how shoreline restoration improves their chance of survival.

The project began in 1997 when a graduate student planted artificial oyster reefs in the sand flats near Morehead City. With time, planted reefs transform into large dense structures of oysters, shell and sand. More than 10 years passed before UNC biologists at the institute surveyed the reefs again.

"They had grown really high," Rodriguez said. "We thought that just can't be right. ... So, we decided to try and measure their growth, and that is how it all started."

Rodriguez and Fodrie set out to take the first direct measurements of oyster reef expansion. They created 11 additional artificial reefs and measured their growth over the following two years.

Using laser scanning technology, Rodriguez and Fodrie generated topographic maps of the oyster reefs. The laser works by shooting at a rotating mirror, which scatters light onto the reef and

measures the return. The maps allow scientists to calculate precise rates of reef accumulation by comparing depths with original GPS coordinates.

They discovered that oyster reefs can grow up to 10 times faster than previous estimates and fast enough to outpace even the most extreme predictions of [sea-level rise](#).

Future oyster restoration projects will benefit from their findings, which were published in the April issue of *Nature Climate Change*. Their work gives guidelines on where to construct new reefs and how much material to put out to get the biggest and healthiest reef.

Rodriguez purchased [oyster shells](#) from a cannery for \$128, which he used to create an oyster bed the size of four queen-size mattresses. Over time, his reefs accumulated sediment, organic material and juvenile oysters. Now, more than 10 years later, the oyster beds are teeming with life and have more than doubled in size.

Rodriguez hopes coastal residents will consider protecting their homes by building oyster reefs instead of bulkheads.

"That [oyster reef](#) will grow up and give them some protection from erosion," he said.

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