

# Re-engineering America's Beaches, 1 Tax Dollar at a Time

**Pumping sediment onto the nation's beaches is an expensive fix for the erosion caused by coastal development — and often a bad fix at that. [Click here](#) for a podcast on taming the coast.**

By Chris Dixon

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**On a chilly day** in late January, Darren Buscemi took his 10-year-old daughter, Ali, and 8-year-old son, David, to the beach at Surf City, N.J., to try out a new metal detector. The U.S. Army Corps of Engineers had just begun to pump 33,000 dumptruck loads' worth of sediment onto the shore, and Buscemi, a real estate developer, suspected he might find something interesting. When telltale beeping led him to a rusty cylinder 412 in. long, Buscemi thought it was a pin from the wooden beam of an old sailing ship. "I was jumping for joy," he says, "like, 'Look what I found.'"

To remove barnacles and rust, David banged on the pin with a butter knife and scrubbed it with a Brillo pad; Buscemi planned to mount the object on a wall. But two months later, when a beachcomber made a similar find, Buscemi learned that his son had been handling unexploded ordnance. The cylinder was a World War II-era bomb fuse.

In the following weeks, more than 200 fuses, many still potentially explosive, were excavated in Surf City. Beaches remained closed while contractors ran powerful magnetometers across the sand. The closures scared off buyers for a pair of half-million-dollar beach condos Buscemi had renovated, but what angers him most is simply thinking about what might have happened: "That thing could have blown my son's arm off."

Depositing sediment onto a beach and bulldozing it into place — a practice called beach nourishment — has become one of the more controversial functions of the Corps' Civil Works Directorate. Besides building levees, dredging harbors and running hydropower plants, the agency is tasked with restoring the nation's coastlines.

Nourishment projects are supposed to replace lost sand. Unfortunately, sediment is not the same thing. Even the stuff that doesn't carry ordnance is often the wrong size and color — and it rarely stays put. But most of all, critics say, these projects are a colossal waste of taxpayer dollars. Fifty to 100 percent of the funding is drawn from the directorate's roughly \$5 billion budget; the rest of the money comes from state or local coffers.

**At the northern** end of Folly Island, S.C., Duke University coastal scientist Orrin Pilkey points at a pair of houses rising from the surf. A wall of boulders stretches between them. "This should be illegal," Pilkey says. "The seawall is causing erosion and taxpayers will have to fix this."

Despite forecasts of rising sea levels and stronger storms, federally insured coastal development is booming. About 453,000 single-family homes and 303,000 multifamily units are built in coastal areas each year; along the East Coast, 654 people are packed into every square mile. But while development doesn't move, beach sand is in a constant state of flux — shifting inland and out, and up and down the shore. "Erosion becomes a problem when we're foolish enough to put a house in its way," Pilkey says. Homeowners or communities may erect seawalls or groins to trap sand, but on the other side of the barrier sand continues to erode. "You'll get a wider beach in front of your house," he says, "but your neighbor will get a narrow beach." This pattern prompts calls for yet more intervention.

Where Pilkey stands, there is scant evidence of a \$12.5 million, 2 million cubic-yard beach nourishment project completed two years ago. Waves have swept the sediment to the island's southern half. There, the beaches are wide, but an unsettling gray — a color common to sediment from the seafloor. This fine material erodes from two to 10 times faster than natural golden or white beach sand, which consists of tiny grains of quartz that are able to withstand the waves' motion.

When high in clay and silt, dredge material can smother near-shore creatures such as sand fleas, damaging the food chain. It can also cause plumes of turbidity, or suspended sediment, that settle onto coral reefs, smothering them, too. In Palm Beach, Fla., in 2006, lifeguards closed the beaches because 11 miles of plumes made swimmers nearly invisible to schooling sharks.

Poor sediment can come from inshore, as well. In Port St. Lucie, Fla., a contractor dumped inland fill onto denuded sand dunes in 2004. The material concretized when dry, trapping turtle hatchlings beneath the surface. The contractor hauled it back off the beach in 2006. "The stuff was so bad that when they tried to transfer it to a landfill no one would take it," says Ericka D'Avanzo, Florida regional manager for Surfrider Foundation, an ocean conservation group. "The water wouldn't percolate through it."

Charles Chesnutt is a coastal engineer with the U.S. Army Engineer Institute for Water Resources, which aids the Corps in long-range planning. He admits that there have been problems with ill-matched sediment. But, he says, "It is important to remember that many miles of American shoreline have been nourished without incident.

"Many of the recent projects aren't systemically bad, but can be traced back to insufficient geological sampling," he says. "That shouldn't be considered a condemnation of the program as a whole. But it does shine a big bright light on problems we should focus on."

**According to the** Program for the Study of Developed Shorelines at Western Carolina University (WCU), at least \$1.1 billion worth of dredge material — 127 million cubic yards, or enough to fill the Superdome 27 times — has been pumped onto the nation's beaches since 2000. An estimated 48 projects were put in motion in 2006.

Howard Marlowe, president of Marlowe & Company, says the steep price tag is worth it. His firm charges more than 40 clients an average of \$40,000 a year to lobby for coastal projects. If you add up property taxes, tourism revenue and recreational benefits, he says, beach nourishment can generate far more money than it costs — sometimes on the order of more than 4:1.

It can also buffer property on the front line of storms. "During Hurricanes Frances and Jeanne, part of a \$44 million project in Florida's Brevard County was lost," says Harry Simmons, the mayor of Caswell Beach, N.C., and president of the American Shore and Beach Preservation Association. "This project, however, protected \$2 billion worth of property. People in the stock market would love to see that kind of return on an investment."

But the return on nourishment projects goes mainly to owners of expensive seasonal homes. According to a WCU study, fewer than 4 percent of all oceanfront properties in Dare County, N.C., are someone's primary residence. Of the 2087 properties with a single-family home, the average total oceanfront tax value for 2006 was \$1.2 million (the market value would be higher). Because 72 percent of owners are not from North Carolina, the Corps can say that multiple states benefit from these projects, says Andy Coburn, associate director of WCU's developed shorelines program. "But the primary beneficiaries are a tiny fraction of all the people in any state."

Many coastal residents are not willing to pay the price. In 2001, the Corps authorized a proposal for a 14-mile-long, \$94 million project in Nags Head, N.C., but it didn't receive federal funding. County commissioners passed a 1 percent sales tax instead; voters rejected it. Nags Head officials proposed a cheaper, locally funded plan. Again, voters rejected it. "Why," asks WCU program director Rob Young, "should federal taxpayers bail out a beachfront when local residents won't?"

Nourishment projects could be avoided by investing in new breakwater technologies and in pumps to bypass sand around jetties, or could be made smarter by sampling sediment extensively or by using artificial sand made from crushed glass.

But the least expensive, most effective solution, Coburn says, would be to move homes from threatened beachfronts. "You would improve aesthetics, have a healthier ecosystem and make it easier to maintain a dune line by reinforcing it with vegetation. That would mitigate property damage. It would be a benign approach and basically free. You're letting the shoreline do what it wants, rather than using brute force to make it do what you want."

John Wilson, the mayor of Manteo, N.C., owns a generations-old Nags Head beach house that has been moved inland three times. "In the long run," he says, "retreat is the only viable option."