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The Line of Sand Gets Thinner

By TINA KELLEY

BEACH HAVEN, N.J. - Robert Pacicco has owned the two-story house on the end of Merivale Avenue for a decade, but the Atlantic Ocean now seems poised to move in for the winter and beyond. Last winter, the waves broke over the foundation slab, from which the house rises on stilts. This year, half the pilings under the foundation have been exposed by the tides.

"Last year, a northeaster took out all my land," Mr. Pacicco said. "I can't keep putting tens of thousands of dollars in every year to replenish it."

The early large northeasters that hit the Jersey Shore and ended on Oct. 14 and 25 have made residents and environmental officials fear that so much sand has been swept away from beaches that they will not be able to blunt the impact of winter storms on homes, buildings and roads. [A third storm struck on Nov. 22, but did not cause significant damage, state environmental officials said.]

There are usually six to nine such storms each winter, blowing in from the northeast and often causing more damage than hurricanes because they last longer, through up to five high tides.

"These two early storms in October put us in a very precarious position," said Dave Rosenblatt, administrator of the office of engineering and construction for the State Department of Environmental Protection. As he visited a beach at the end of Princeton Avenue in Mantoloking, he held two photographs: one taken on Sept. 9 showing the beach reaching 42 yards from the base of the dunes to the water, and another taken on Oct. 25 showing the same beach essentially gone.

"Places in Atlantic County, Cape May County and Long Beach Island have had similar dramatic impacts," Mr. Rosenblatt said. The Oct. 25 storm alone shaved four to five vertical feet of sand off beaches in Loveladies, Harvey Cedars, North Beach, Surf City, Ship Bottom, Long Beach, Brant Beach, Beach Haven, Holgate and Atlantic City.

Mr. Rosenblatt said it was possible that homes could be damaged in a major storm this winter.

Beaches narrow and widen over the year, varying with each season. As fall settles over the coast, the tourists and summer residents recede, traffic lights up and down Long Beach Island flash a constant orange, and miles of sand gradually slip into the Atlantic. What remains is hacked away by the short, choppy waves of winter storms. But the beaches widen with the warm weather, as the longer, gentler spring and summer swells deposit sand on them.

Some beaches on the shore, however, are entering the winter storm season without the summer's surplus of sand. According to the environmental department's report on the storm that ended on Oct. 14, some Long Beach Island beaches "lost any natural protection that built up during summer months, leaving many areas vulnerable to storm surge and direct wave attacks."

Some of that sand moves back in after a storm, but natural forces do not repair dune damage until the summer, Mr. Rosenblatt said. "I think some beaches are more vulnerable than they would normally be," he said.

Over all, the state's beaches are shrinking, with this year's losses part of a larger war. Tides have risen 16 inches in the past century, and the rivers have not deposited enough sediment to replenish the sand, said Norbert Psuty, a coastal scientist for Rutgers who is based at Sandy Hook.

A Princeton University study this month has projected that global warming will contribute to a two-foot rise in sea levels over the next 100 years, which would push the [New Jersey](#) shoreline back about 240 feet.

"Communities have to be prepared to respond actively," said one of the authors, Michael Oppenheimer, a professor of geosciences and international affairs. "In some places, retreat will be the right thing to do, or beach restoration or hardening the coast may be chosen." Sea walls, which protect the property directly behind them, often cause worse erosion nearby, he said.

Neighboring states have also faced erosion problems. In New York, beaches and dunes on the South Shore of Long Island and bluffs on the island's North Shore sustained significant erosion leading into the winter.

In Connecticut, where the beaches along Long Island Sound are better protected from erosion, the state completed a \$2 million restoration of Hammonasset Beach State Park in Madison, where most of the sand of the west beach had been eroded away. The restored beach did not suffer much damage in the October northeasters, said Dennis Schain, a spokesman for the state.

Likewise, federal, state and local officials are battling nature to protect New Jersey's beaches, the real estate behind them, and the tourist dollars they draw.

This month, President Bush signed the 2006 Energy and Water Development Appropriations Act, in which New Jersey will receive \$32.7 million for beach projects, more than any other state, said Howard Marlowe, the legislative coordinator for the American Shore and Beach Preservation Association, a nonprofit group. The money will finance beach replenishment projects on Long Beach Island and in Avalon, among other places.

The Army Corps of Engineers said that in the past 20 years, \$195 million had been spent to pump sand back onto eroded beaches in Monmouth County between Sea Bright and Manasquan, a process known as beach replenishment to its supporters and beach fill to its critics. The beach reconstruction project is one of the largest in the nation's history, and calls for additional sand to be added to beaches approximately every six years. Other Army Corps projects have replenished Wrightsville Beach and Carolina Beach in North Carolina and Miami Beach in Florida.

The 50-year Army Corps program in Monmouth County is expected to cost \$800 million, with 65 percent provided by the federal government, and the rest divided between state and local governments. So far, 22 million cubic yards of sand has been pumped over 18 miles of beach, creating beaches 100 feet wide.

Monmouth County beaches did not lose much sand in the October storms, state officials said.

Farther south, as part of another project, the Army Corps began adding \$500,000 worth of fill to the beaches at the south end of Harvey Cedars. The restoration could not have come at a better time, said the mayor, Jonathan Oldham.

"If that was not happening right now, we would be extremely vulnerable," Mr. Oldham said. "We probably had enough for one more storm."

Critics of beach replenishment say the Army Corps program has destroyed habitats both where the sand is harvested - usually from offshore sandbars - and where it is deposited; has ruined surfing and fishing opportunities; and amounts to an expensive public subsidy of private beachfront property with little public access.

"People don't realize you're creating a desert underwater when you do beach replenishment," said Jeffrey Tittel, executive director of the New Jersey chapter of the Sierra Club. "We'd be better off raising the houses or moving them back, to protect the coast, instead of trying to squeeze in every last house on every last inch of property."

John Weber, the East Coast regional manager of the Surfrider Foundation, a nonprofit ocean preservation group, also advocates pulling development back from the beachfront. "Beach fill projects have had a tendency recently to give rise to further silly development," he said. "They kind of encourage the powers that be that they can build even closer."

But Noreen Bodman, president of the Jersey Shore Partnership, a membership organization that supports beach restoration, called the \$25 million a year dedicated to beach replenishment from real estate transfer fees "a good investment" in the beaches. Tourism is the state's second largest business sector after pharmaceuticals, taking in \$30 billion to \$32 billion in revenues, about half from the shore counties. Tourism results in \$2 billion in state taxes, according to state commerce officials.

Beach replenishment has had environmental benefits, Ms. Bodman said, including the return of the endangered piping plovers to some beaches where sand has been pumped. And state officials say efforts are under way to increase public access to rebuilt beaches.

"It's a balance, with the economy and ecology," she said. "Everything in life is a balance."

Stephen P. Leatherman, director of the Laboratory for Coastal Research at Florida International University in Miami, said New Jersey beaches erode about three or four feet a year, higher than the East Coast average of two to three feet, because New Jersey gets unusually high waves when northeasters stall over it, and because the clay soils under the state's sand have a tendency to dissolve. The state is unlucky to be heading into the cold weather with badly eroded beaches.

"The bad news is, normally northeasters don't pick up more until later, with January, February and March when we tend to get the biggest ones," he said.