

# Report: N.C. among most at risk to rising seas

**Erosion combined with rising water levels could reach a point that some barrier islands break apart.**

By Wade Rawlins  
wade.rawlins@newsobserver.com  
Posted: Wednesday, Jan. 21, 2009

With its long low coastline and large land area less than two feet above sea level, North Carolina is among the states most vulnerable to sea-level rise, a new federal report warns.

The new report focuses on the coastal states from North Carolina to New York where the rates of sea level rise are moderately high. The region has extensive coastal development, a high population and is likely to be at increased risk.

After Florida and Louisiana, North Carolina and Texas have the largest land areas threatened by sea-level rise.

“You're vulnerable,” said Jim Titus, project manager for sea-level rise for the U.S. Environmental Protection Agency and lead author of the report, “Coastal Sensitivity to Sea Level Rise: A Focus on the Mid-Atlantic Region.” “The people whose land could be permanently submerged aren't even flooded today.”

A rise in sea level increases the vulnerability of development in coastal floodplains and diminishes the rate at which low-lying areas drain. It will result in a loss of wetlands in the mid-Atlantic.

Rising temperatures cause ocean waters to warm and expand, like water heated in a tea kettle. In addition, rising temperatures near the poles cause massive ice sheets to melt, adding to the volume of water.

The report predicts that coastal erosion will occur at higher rates as sea level rises. Particularly in the sandy shore of the mid-Atlantic coast, the report says, it is nearly certain that barrier islands, spits and coastal headlands will erode faster due to sea-level rise. The Outer Banks are particularly vulnerable.

The report, produced by a collaboration among agencies including the U.S. Geological Survey, the National Oceanic and Atmospheric Administration and the Department of Transportation, offers three scenarios for sea-level rise by 2100: A rise of about 16 inches; of about two feet, and of about three feet.

In 2007, an international scientific panel projected that sea level would likely rise between 7 inches and two feet by 2100. Those estimates do not take into account any contribution from rapid changes in ice flow from Antarctica or Greenland.

Rising sea levels might be especially disastrous to North Carolina, as some sections of the coast are slowly sinking, magnifying the effects of rising seas.

Tide-gauge readings in the mid-Atlantic indicate that relative sea level rise (the combination of rising waters and sinking land) was generally higher – by about a foot – than the global average during the 20th century.

If sea level should rise more than three feet during the 21st century, the report says, “it is likely that some barrier islands in this region will cross a threshold” destabilizing and breaking apart.

Rob Young, director of the Program for the Study of Developed Shorelines at Western Carolina University, said the report underscored that sea-level rise is a real management concern.

“There is some very important stuff in here that North Carolinians should take seriously,” said Young, who said state policy-makers and coastal communities should use a three-foot sea level rise by 2100 as a target.

“Whether sea level is rising is not something scientists argue about it,” Young said. “It is. It's different than an argument about whether humans are causing global warming. We have directly measured an acceleration ... over the last two decades.”

As sea level rises, the most basic decision that states and beach communities must wrestle with is whether to try to hold back the sea or let nature take its course. Both have costs. Replenishing sand on eroding beaches allows houses and businesses to remain in place for a period of time, but is expensive to maintain. Retreating from the rising sea avoids the costs but concedes a loss of land and, in a worse case, entire communities, the report notes.

Greg Rudolph, shore protection officer for Carteret County, said people generally accept that sea level is rising. But planning for something that is occurring over decades is difficult.

“Let's face it, we live on four-year cycles when people are elected,” Rudolph said. “Not many people are going to plan out 14 years or 21 years in advance.”

Beach towns representing about a third of the North Carolina's 325 miles of coastline are seeking to replenish the sand on their beaches. But holding the beach may be an increasingly expensive response if erosion rates increase. “One size does not fit all,” Rudolph said.

Titus, of EPA, said the report shows it is rational to take into consideration the risk of accelerated sea-level rise.

“A reasonable hope is people making decisions will start factoring it in, rather than continuing to assume that sea level is stable,” Titus said. “Anyone who is making an investment, a regulation or a policy, has good reason to ask: how does sea level change the outcome of my decision?”