

Where will sea-level rise hurt the most?

March 17 2016, by Kevin Krajick, Earth Institute, Columbia University



Natural coastal features like wetlands and sand dunes may be able to adjust somewhat to sea-level rise. Credit: Kevin Krajick

First, the bad news: a study out yesterday says that the lives of up to 13 million people in the United States may be disrupted by sea-level rise in the next century—more than three times most previous estimates. Unlike some other studies, this one accounts for projected population increases along coasts—part of why its forecast is so drastic.

Now, the somewhat less [bad news: another study also out yesterday](#) from the U.S. Geological Survey says that while much hard infrastructure like houses, piers, seawalls and roads may have to be kissed goodbye, some 70 percent of natural landforms along the Northeast Coast may be able to adjust themselves, and not suffer inundation. These would be things

like marshes, which may push their floors upward by adding new sediment and dead plant matter, and [barrier islands](#), beaches and dunes, which might migrate, change shape or otherwise redistribute sand to keep themselves above the waves.

The USGS study is based on a model developed in collaboration with Columbia University's Earth Institute. "Most previous coastal projections have treated the coast as static," said coauthor Radley Horton, a researcher at Columbia's Center for Climate Systems Research and the NASA Goddard Institute for Space Studies. "But landforms differ in their ability to respond to [sea-level rise](#). Wetlands aren't the same as seawalls or other human structures."

The new model is the first large-scale one for this region to factor in dynamic natural forces exerted by land, versus sheer sea level. It covers about 9.4 million acres of land.

"Geologists have always know that the coast has some potential for give and take," said lead author Erika Lentz, a USGS researcher based at Woods Hole, Mass. However, the readjustment of landforms may pose its own problems, she said. For instance, if barrier islands migrate, they might not protect existing coastal communities in the way they do now. "Things like roads and houses might actually be in the way if part of a barrier island starts to migrate," said Horton. Horton added that it is questionable whether all areas thought to be adjustable would be able to keep up should seas rise extremely fast, in line with some of the more dire projections.

In any case, the study finds that human infrastructure lying one meter or less above current [sea level](#) will likely face a tipping point by the 2030s. Then, decisions about how or whether to protect it will determine whether it survives or drowns.

More information: Read the U.S. Geological Survey story on the study: [www.usgs.gov/newsroom/article... ID=4471#.VugQck3QBaS](http://www.usgs.gov/newsroom/article...ID=4471#.VugQck3QBaS)

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