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## Northeast U.S. to suffer most from future sea rise

By Seth Borenstein, AP Science Writer

WASHINGTON — The northeastern U.S. coast is likely to see the world's biggest sea level rise from man-made global warming, a new study predicts.

However much the oceans rise by the end of the century, add an extra 8 inches or so for New York, Boston and other spots along the coast from the mid-Atlantic to New England. That's because of predicted changes in ocean currents, according to a study based on computer models published online Sunday in the journal *Nature Geoscience*.

An extra 8 inches — on top of a possible 2 or 3 feet of sea rise globally by 2100 — is a big deal, especially when nor'easters and hurricanes hit, experts said.

"It's not just waterfront homes and wetlands that are at stake here," said Donald Boesch, president of the University of Maryland Center for Environmental Science, who wasn't part of the study. "Those kind of rises in sea level when placed on top of the storm surges we see today, put in jeopardy lots of infrastructure, including the New York subway system."

For years, scientists have talked about rising sea levels due to global warming — both from warm water expanding and the melt of ice sheets in Greenland and West Antarctica. Predictions for the average worldwide sea rise keep changing along with the rate of ice melt. Recently, more scientists are saying the situation has worsened so that a 3-foot rise in sea level by 2100 is becoming a common theme.

But the oceans won't rise at the same rate everywhere, said study author Jianjun Yin of the Center for Ocean-Atmospheric Prediction Studies at Florida State University. It will be "greater and faster" for the Northeast, with Boston one of the worst hit among major cities, he said. So, if it's 3 feet, add another 8 inches for that region.

The explanation involves complicated ocean currents. Computer models forecast that as climate change continues, there will be a slowdown of the great ocean conveyor belt. That system moves heat energy in warm currents from the tropics to the North Atlantic and pushes the cooler, saltier water down, moving it farther south around Africa and into the Pacific. As the conveyor belt slows, so will the Gulf Stream and North Atlantic current. Those two fast-running currents have kept the Northeast's sea level unusually low because of a combination of physics and geography, Yin said.

Slow down the conveyor belt 33 to 43% as predicted by computer models, and the Northeast sea level rises faster, Yin said.

So far, the conveyor belt has not yet noticeably slowed.

A decade ago, scientists worried about the possibility that this current conveyor belt would halt altogether — something that would cause abrupt and catastrophic climate change like that shown in the movie "The Day After Tomorrow." But in recent years, they have concluded that a shutdown is unlikely to happen this century.

Other experts who reviewed Yin's work say it makes sense.

"Our coastlines aren't designed for that extra 8 inches of storm surge you get out of that sea level rise effect," said Jonathan Overpeck, director of an Earth studies institute at the University of Arizona.

While Boston and New York are looking at an additional 8 inches, other places wouldn't get that much extra rise. The study suggests Miami and much of the Southeast would get about 2 inches above the global sea rise average of perhaps 3 feet, and San Francisco would get less than an extra inch. Parts of southern Australia, northern Asia and southern and western South America would get less than the global average sea level rise.


This study along with another one last month looking at regional sea level rise from the projected melt of the west Antarctic ice sheet "provide a compelling argument for anticipating and preparing for higher rates of sea level rise," said Virginia Burkett, chief scientist for Global Change Research at the U.S. Geological Survey.

Burkett, who is based in Louisiana, said eventually New Englanders could be in the same "vulnerability situation" to storms and sea level rise as New Orleans.

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