

Study predicts city flood threat due to warming

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By Susan Milligan, Globe Staff | February 15, 2005

WASHINGTON -- By the end of this century, global warming threatens to raise the sea level enough that a heavy storm would send flood waters into Boston's downtown waterfront, the Financial District, and much of the Back Bay, based on projections in a federally funded report to be released today.

The five-year study, commissioned by the US Environmental Protection Agency and completed by university researchers, indicates that the mildest impact of global warming would leave local landmarks such as Massachusetts General Hospital, the Public Garden, the Esplanade, and MIT in a pool of water after a strong storm surge in the harbor.

Global warming, which melts polar ice and has been gradually raising the atmospheric temperature, could actually cause the sea level in the Boston area to rise as much as 3 feet in the next 100 years, the researchers predict.

The overall effects of climate change on buildings, emergency services, and energy prices could cost the Boston metropolitan area as much as \$94 billion over the coming century, the study concludes. Coastal flooding would extend from Rockport to Duxbury.

"The big message is it makes sense to take action," said Paul Kirshen, a Tufts University professor who oversaw the study. "It makes a lot more sense to adjust to climate change before we actually start feeling the impacts."

The report is the first heavily detailed, EPA-sanctioned study of the effects of global warming on a metropolitan area. Scientists believe gases from fossil fuels used to generate energy are heating the atmosphere, a trend that would lead to higher air temperatures and water levels. Those effects would in turn cause a variety of threats to humans, such as more air pollution and higher mortality from heat stroke, the report said. Commerce would also be affected because trucks would not be able to move as quickly during heavy flooding, the report said.

The study, conducted by researchers at Tufts University, Boston University, and the University of Maryland, said that while reducing greenhouse gas emissions would be the most effective way of easing climate change, the Boston area should start to flood-proof buildings and improve energy efficiency.

Both Mayor Thomas M. Menino's office and Governor Mitt Romney's office declined to comment on the report because officials had not seen it.

Frustrated by the unwillingness of a Republican-controlled Congress to address the issue of global warming, the Clinton administration had commissioned a series of reports on metropolitan areas, including the Boston area. The Boston report was completed last year.

Researchers and advisers on the study said they were releasing it this week because it took time to prepare the findings. They said they had not been discouraged from publicizing the report by the Bush administration, which has been skeptical of the effects of greenhouse gas emissions on global warming.

According to the report, the sea level could rise by about 2 to 3 feet during the coming century, increasing the likelihood of flooding during a storm. In the worst-case scenario of a 1-meter (a little more than a 3-foot) rise in the water level, homeowners in flood-threatened areas could sustain damage averaging between \$7,000 and \$18,000 per home, the report said. Also, motorists could spend an estimated 80 percent more time on the road during and immediately after a storm because of flood-related delays, it said.

"We need to work on both mitigation of and adaptation to the threat of climate change," said state Representative Jim Marzilli, an Arlington Democrat who advised the researchers. Even if greenhouse gas emissions are dramatically lowered in coming years, the effects of global warming will still surface because of atmospheric changes already occurring, he said. "We need to be prepared for sea levels to rise even if we act rapidly," said Marzilli, who has attended several of the conferences on the Kyoto Accord, an international treaty on global warming that goes into effect tomorrow.

The United States has not signed the Kyoto treaty, despite pressure from environmentalists. President Bush, who in his 2000 campaign was openly skeptical of the threat of global warming, has since come closer to acknowledging a connection between greenhouse gas emissions and the warming of the atmosphere. The EPA website states that "there is new and stronger evidence that most of the warming over the last 50 years is attributable to human activities."

But Bush has not moved to regulate greenhouse gases, instead offering proposals for hydrogen fuel-sourced cars and nuclear energy that he said would reduce the use of fossil fuels.

The EPA did not return several calls yesterday seeking comment on the Boston study.

For the Boston metropolitan area, global warming could lead to a series of public health and infrastructure problems. For example, while Boston now experiences an average of 13 days per year when the temperature is over 90 degrees, climate changes could raise that number to 23 days per year by 2030 and by 30 days per year by the end of the century, according to the report.

The city's infrastructure -- both private homes and public buildings, bridges, and tunnels -- are also at risk, the report said, noting that parts of the Boston subway and sewer systems are more than 100 years old. By 2050, 1.4 million people in the Boston area will be living along the coast, the study said.

If no improvements are made in structures, the flood damage alone would amount to \$57 billion in the next 100 years -- \$26 billion more in damage than would occur if there were no global warming, the report said.

One exception to the projected damage is the Big Dig, said William Anderson, a Boston University geography professor who worked on the study. "The Big Dig is probably the last piece of infrastructure you should worry about because it has the best design tolerance, in terms of storm" threats, Anderson said.

Nonetheless, a computerized projection of flooding shows water covering the surface of the Interstate 93 tunnel downtown. The surge from a "100-year storm," an unusually heavy rainstorm, would also send water into the Back Bay, from Storrow Drive to Commonwealth Avenue. That flooding would occur because seawater would be pushed over the top of the Charles River Dam.

Environmentalists said the report makes a strong argument for regulation to control greenhouse gas emissions.

"This presents a very stark picture of what Boston may look like if we take no significant action to address climate change. It's a question of political will," said Philip Warburg, president of the Conservation Law Foundation, which is based in Boston. ■