

Long-term sea level rise could threaten government agencies, cost Washington, D.C. billions

November 2 2012

(Phys.org)—A University of Maryland study projects that Washington, D.C., city and federal property could suffer billions of dollars in damage if sea level rise from global warming increases over the next century. Potential for significant damage will be even greater in the event of extreme weather like Hurricane Sandy.

The study by Civil and Environmental Engineering Professor Bilal Ayyub, Haralamb Braileanu and Naeem Qureshi, of the Clark School of Engineering's Center for Technology and Systems Management, looks at possible long term effects of projected sea level rise on Washington, D.C., real-estate property and government infrastructure. They conclude that over the next 100 years, continuing sea level rise could cause damages of more than \$24.6 billion to Washington's commercial property, museums, and government agencies.

The study, "Prediction and Impact of Sea Level Rise on Properties and Infrastructure of Washington, D.C.," appears in the November 2012 issue of *Risk Analysis*, published by the Society for Risk Analysis.

Current trends and predicted increases suggest the nation's capital is likely to face flooding and infrastructure damage brought about by sea level rise linked to thermal expansion of the oceans and melting of global ice sheets caused by global warming.

"Climate change not only results in increasing the sea level but also the annual rate and intensity of storms," says Ayyub. "Our loss predictions at high sea levels are partly intended to account for these extreme storms. However, due to lack of information available to us, they underestimate direct losses by not considering, for example, underground utilities, or including economic valuations of interruption of business and government operations."

Bolling, FBI, IRS

Using Geographic Information System (GIS) tools, data from government agencies and real-estate listings for property values, the University of Maryland researchers compared their results to models on sea level rise generated by authoritative international bodies and experts.

The results, based on what the authors say may be an optimistic model, show that the current rate of sea level rise in Washington, D.C., is about 3.16 millimeters per year. At the low levels of increase expected in the near future, sea level rise would lead to a minimal loss of city area. However, if sea level rises 0.1 meters by the year 2043, flooding about 103 properties and other infrastructure, damages would cost the city about \$2.1 billion. Bolling Air Force Base would have 23 buildings impacted.

If sea level rise were to reach 5.0 meters over the next 100 years, the authors warn of significant damages, in excess of \$24.6 billion, to commercial buildings, military installations, museums and government agencies, including the Federal Bureau of Investigation, the Justice Department, the Internal Revenue Service, the Federal Trade Commission and the Department of Education.

Extreme Weather Effects

While a long-term rise of 5.0 meters is considered unlikely, it may represent storm surges and waves created by extreme storms such as Hurricane Sandy, Tropical Storm Isabel in 2003, and the high tides and rains in April 2011, which triggered waterfront flooding in the city and Northern Virginia.

The study recommends that "Decisions must be made in the near future by lawmakers or city planners on how to reduce the impact of and adapt to sea level rise. Cost-effective methods to deal with [sea level](#) rise should be developed, and long-term solutions that extend well into this millennium are necessary."

More information: [onlinelibrary.wiley.com/doi/10...
24.2011.01710.x/full](https://onlinelibrary.wiley.com/doi/10.1111/24.2011.01710.x/full)

Provided by University of Maryland

Citation: Long-term sea level rise could threaten government agencies, cost Washington, D.C. billions (2012, November 2) retrieved 26 April 2024 from <https://phys.org/news/2012-11-long-term-sea-threaten-agencies-washington.html>

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