

CLEAN
AIR



COOL
PLANET

Basis for maps of coastal inundation

Clean Air-Cool Planet's East Coast maps were prepared by Stratus Consulting Inc. of Boulder, Colorado, an environmental consulting firm whose clients include federal, state, tribal, and international government agencies, as well as utilities, industries, and law firms. (www.stratusconsulting.com).

Stratus prepared the inundation maps for three main scenarios: 1.6 feet (half a meter), 3.3 feet (1 meter), and 6.6 feet (two meters) – with and without storm surge.

The maps depict the vulnerability to sea level rise for each scenario shown on the map relative to the average spring high water elevation over the tidal epoch (1983-2001). The sea level rise scenarios shown reflect areas at risk of inundation based on modeled elevation alone. They do not take into account adaptation measures such as shoreline armoring that could, in some cases, prevent specific low lying areas from being flooded. Additionally, the maps do not depict isolated inland areas below modeled sea level, which could become inundated as the water table rises.

Elevation data used in this analysis are from the highest quality data sets that are publicly available from the U.S. Geologic Survey (Gesch, 2007; Gesch et. al., 2002) or U.S. Environmental Protection Agency (Titus and Wang, 2008; Jones and Wang, 2008). However, since the elevation data is based on computer models as opposed to survey data, there is an inherent amount of uncertainty associated with the “true” elevation at any particular location. Additionally, the accuracy of the elevation value varies spatially depending on the quality of the source data sets used to generate the elevation models. The ranges of inundation shown on the maps reflect this uncertainty in the underlying elevation data but do not portray a probability, i.e., the low, central, or high estimates are of equal likelihood. The uncertainty information is an important, but often ignored, aspect of sea level rise mapping.

As noted above, the sea level rise scenarios are relative to the spring high water (SHW) elevation. This value was used as it represents the highest elevation regularly inundated on a monthly basis. SHW was derived from tide gauge data (NOAA, 2008) and represents the monthly high tides averaged over either the tidal epoch (1983-2001), if available, or the period of record for the nearest tide gauge. Storm surge values were calculated from the highest observed water level over the period of record at the nearest gauge's high water data.

Sea level rise scenarios depicted in the maps are framed to reflect the current range of predictions of total sea level rise and sea level rise contributions from the Greenland ice sheet and other sources, based on peer-reviewed published research. Learn more about the underlying science of ice sheet dynamics and sea level rise at www.cleanair-coolplanet.org/science.

Note: CA-CP maps of Charleston, SC and of locations along the Gulf Coast use different methodologies and data sets. (MORE)

References

U.S. Geological Survey National Elevation Dataset (NED)

Gesch, D.B. 2007. The national elevation dataset. In *Digital Elevation Model Technologies and Applications: The DEM Users Manual*, D. Maune (ed.). 2nd Edition. American Society for Photogrammetry and Remote Sensing, Bethesda, MD. pp. 99-118.

Gesch, D., M. Oimoen, S. Greenlee, C. Nelson, M. Steuck, and D. Tyler. 2002. The national elevation dataset. *Photogrammetric Engineering and Remote Sensing* 68(1):5-11.

Digital Elevation Model (DEM) Data is available from:
<http://seamless.usgs.gov/index.php>. Accessed October 13, 2009.

U.S. Environmental Protection Agency Elevation Data

Titus, J.G. and J. Wang. 2008. Maps of lands close to sea level along the middle Atlantic Coast of the United States: An elevation data set to use while waiting for LIDAR. Section 1.1 in *Background Documents Supporting Climate Change Science Program Synthesis and Assessment Product 4.1*, J.G. Titus and E.M. Strange (eds.). EPA 430R07004. U.S. Environmental Protection Agency, Washington, DC.

Tide Gage and Storm Surge Data

NOAA, 2008. Center for Operational Oceanographic Products and Services (CO-OPS). Available: <http://tidesandcurrents.noaa.gov/index.shtml>. Accessed October 13, 2008.