Basis for maps of coastal inundation

The maps being used today were prepared by Stratus Consulting Inc. of Boulder, Colorado, an environmental consulting firm that does work for the U.S. Fish and Wildlife Service and U.S. Environmental Protection Agency among many other government and academic clients (see http://www.stratusconsulting.com/).

Stratus prepared the inundation maps for several scenarios: half a meter (i.e. 50 centimeters), one meter, and two meters.

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 Greenland, based on published research conducted under the recently concluded International Polar Year (IPY).

(MORE)

References

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