Sea Level Rise and Coastal Flood Risk in Connecticut: An Overview

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Measurements of sea level by instruments in the water and satellite altimeters provide unambiguous evidence that the annual mean level of the ocean surface is rising. Coastal communities should expect that the frequency of coastal flooding will increase. The National Oceanic and Atmospheric Administration (NOAA) report CPO-1 (Parris et al. 2012) provided guidance on the magnitude of potential changes in the global mean sea level based on analyses of both models and data. Four projections were shared so that managers could select what they judged to be appropriate. To provide more local guidance for Connecticut we have reviewed and modified the projections to include the effects of local oceanographic conditions, more recent data and models, and local land motion (O'Donnell, 2017). A concise summary of the results are shown in Figure 1.

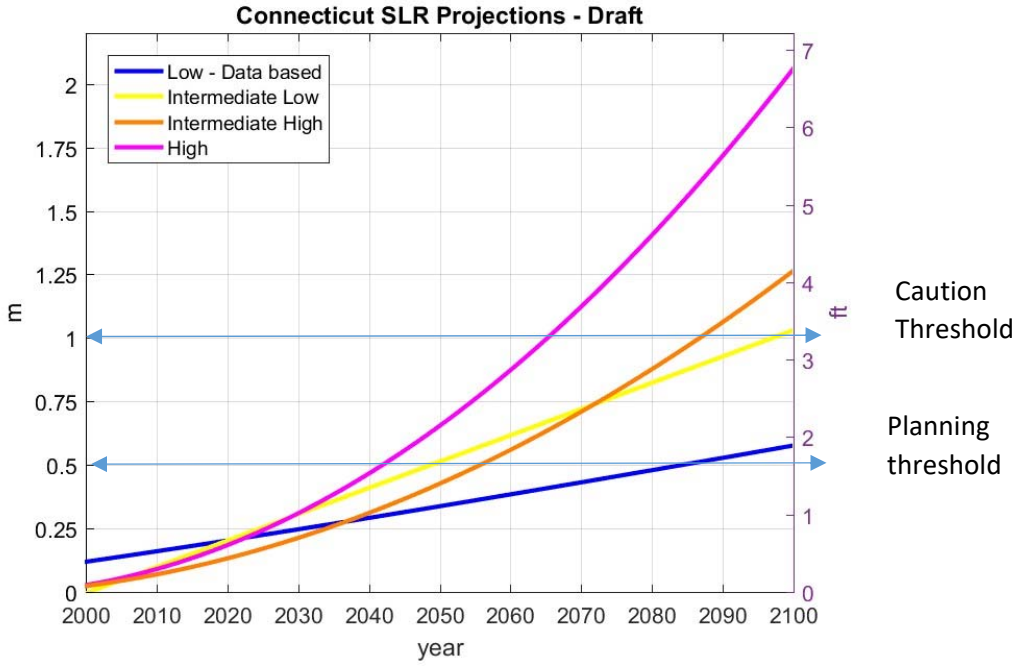

Figure 1. Sea level rise projections for Connecticut based on local tide gage observations (blue), the IPCC (2013) RCP 4.5 model simulations near Long Island Sound (yellow line), the semi-empirical models (orange line) and ice budgets (magenta line) as employed in the NOAA CPO-1 report (Parris et al., 2012).

Though we show the results of four different approaches for forecasting future annual mean sea level in Long Island Sound in Figure 1, the differences between them are not great until after mid-century. We do not expect a significant refinement in the accuracy of longer term forecasts until the character of future emissions of greenhouse gases can be predicted. We note the yellow line anticipates that emissions peak in 2040 and then fall rapidly, however, sea level late in the century is sensitive to emissions between now and 2050. We recommend that planning anticipates that sea level will be 0.5 m (1ft 8 inches) higher than the national tidal datum in Long Island Sound by 2050. It is likely that sea level will continue to increase after 2050. We recommend that global mean sea level measurements and projections be monitored and new assessments be provided to towns at decadal intervals to ensure that planning be informed by the best available science.

References

O'Donnell J., (2017) Sea Level Rise and Coastal Flood Risk in Connecticut. Draft Report to the CT Department of Energy and Environmental Protection.

Parris, A., P. Bromirski, V. Burkett, D. Cayan, M. Culver, J. Hall, R. Horton, K. Knuuti, R. Moss, J. Obeysekera, A. Sallenger, and J. Weiss (2012) Global Sea Level Rise Scenarios for the US National Climate Assessment. NOAA Tech Memo OAR CPO-1. 37 pp.