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Department of Marine Sciences
Presents a Seminar By

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The Implication of Sea Level Rise on the Escalation of Coastal Flood Risk in Connecticut

The risk of flooding at the coast, or its expected frequency, is well characterized at sites where there are long records of sea level measurements. Though there are several alternative approaches to characterizing flooding statistics, they generally show that the risk of the water exceeding a particular level decreases exponentially with level. The rate that risk decreases is determined by the coastal geomorphology and the local meteorology and is related to the scale parameter of the extreme value distribution. Many numerical models of coastal ocean hydrodynamics have been developed to provide analogous information where observations are unavailable. The levels with a risk of 1/100 and 1/500 of being inundated in any year are often published to guide coastal management decisions and provide design targets for coastal engineers. Global warming is expected to increase the mean sea level and this will modify coastal flooding risk estimates and government agencies are considering how best to include sea level rise in planning decisions. To provide guidance we assume that the statistics of meteorological forcing does not change substantially and then use a simple formulation of water level fluctuation statistics and a linear parameterization of forecasted sea level rise to develop formulae that predict the evolution of the risk of coastal flooding in the future. We show that a linear secular trends in sea level results in an exponential increase in risk. The time for an order of magnitude (factor of 10) increase in risk varies with the product of the sea level rise rate and the shape parameter. Both of these have substantial geographic variation and we provide example calculations to illustrate the consequence of the observed range of value and then comment on the impact of our results on coastal management.

Host: Frank Bohlen

Time & Date: 11:00 am, Friday, February 3, 2017

Place: Marine Sciences Building, Seminar Room 103

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