SPRING 2014 SEMINAR SERIES

DEPARTMENT OF OCEAN, EARTH, AND ATMOSPHERIC SCIENCES
3PM – ROOM 200 IN THE OCEANOGRAPHY/PHYSICS BUILDING
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"The Storm Surge and Sub-Grid Inundation Modeling In New York City during Hurricane Sandy."

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ABSTRACT

Hurricane Sandy inflicted a heavy damage in the New York City and the New Jersey coast as the second costliest storm in the history. A large-scale, unstructured grid storm tide model SELFE was used to hindcast water level variation during Hurricane Sandy in the mid-Atlantic potion of the US East coast. The model was forced by 8 tidal constituents at the open boundary condition, 1500 km away from the coast, and the wind and pressure fields from atmospheric model RAMS provided by Weatherflow Inc. The comparisons of modeled storm tide with the NOAA gauge stations from Montauk, NY, Long Island Sound, encompassing New York Harbor, Atlantic City, NJ to Duck, NC were in good agreements, with overall root mean square error and relative error on the order of 15-20 cm and 5-7% respectively. Furthermore, using large scale model outputs as the boundary conditions, a separate, sub-grid inundation model that incorporating LIDAR data for the major portion of the New York City was also setup to investigate the detailed inundation process. The model results compared favorably with USGS' Hurricane Sandy Mapper database in terms of its timing, local inundation area, and the depth of the flooding water. To that end, the street-level inundation with water bypassing the city building was created and the maximum extent of horizontal inundation was calculated, which was within 30 m of the data-derived estimate by USGS.

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