Flood Modeller Pro

Case Study

Gowanus Canal and Newtown Creek Storm Surge Barrier Studies, NY, USA

CH2M recently completed a study for the New York City Economic Development Corporation on flood protection for the areas surrounding New York City's Gowanus Canal and Newtown Creek.

In 2012, Superstorm Sandy caused substantial flood damage to the neighborhoods surrounding these waterways. The Mayor's Office identified the waterways' flood protection as one of the priorities in the "NYC Special Initiative for Rebuilding and Resiliency" (SIRR) in June 2013. CH2M provided prioritized concept options for storm surge barriers, levees and floodwalls that would prevent and mitigate upland flooding and inform federal agencies involved in the flood control project, such as the U.S Army Corps of Engineers.

Modeling of storm surge considering sea level rise was completed for both existing conditions and various flood protection mitigation measures in 2015. The modeling strategy entailed coupling a two-dimensional (2D) depth-averaged regional MIKE 21 hydrodynamic model (the "surge model") covering the water domain and a flood propagation/inundation Flood Modeller Pro FAST model (the "flood model") covering the upland areas landward of the shoreline.

This proved to be a computationally efficient approach combining the spatially expansive surge model extending over the North Atlantic Ocean and the abutting coastal waters to take into account the storm genesis and development area, and the fast computing ability of the flood model that takes into account land topography and features in great detail.

Validation efforts involved utilizing surge inputs from Hurricane Sandy in the FAST model and the results compared against the FEMA Modeling Task Force (MOTF) Hurricane Sandy Impact Analysis field-verified MOTF Sandy Inundation extent. The comparison, represented in figure 1, shows that the FAST-simulated depth grid closely matches the recorded Hurricane Sandy inundation extents.

CH2M used the modeling analysis to examine potential secondary economic and quality of life benefits and challenges of the flood protection strategy. These included impacts on: the working waterfront, critical infrastructure and upland businesses communities, connectivity between neighborhoods and industrial areas, public waterfront access and open space, recreational and educational/cultural/ecological programming, adjacent properties, and water quality and habitat.

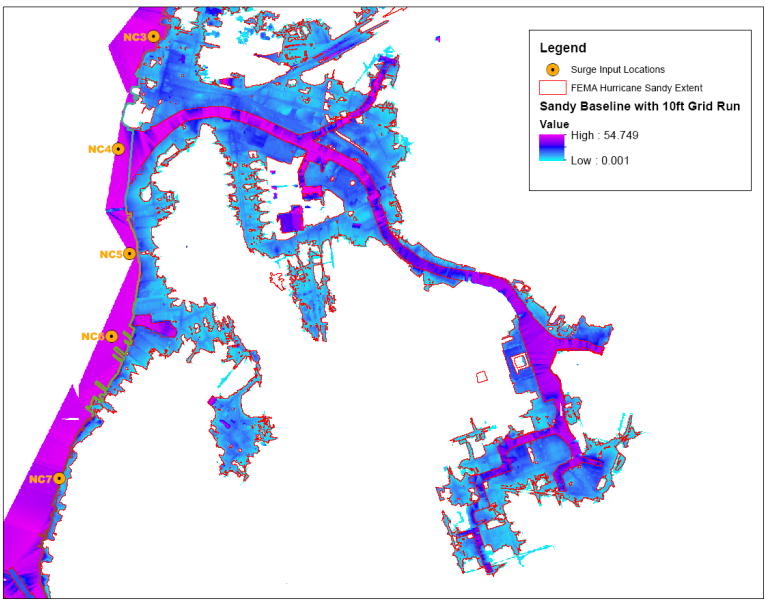

Figure 1: Newtown Canal

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