

Title: Assessment of an Approach to Integrate ADCIRC Data via CERA into the Hazus-MH Coastal Flood Model.

Institution: Louisiana State University

Student: Katherine Jones

Mentor/Faculty: Dr. Robert Twilley, Dr. Clint Willson, Carola Kaiser

This project focuses on integrating ADCIRC Surge Guidance System (ASGS) results, an operations product of ADCIRC simulations, provided by Coastal Emergency Risks Assessment (CERA) into the pre-existing hazard and planning tool Hazus-MH. Three Hazus-MH region types were used: Level 1 Combined Wind and Flood Study, Level 2 User Input Coastal study using the hazard produced by the Combined Wind and Flood Analysis (Level 2 Hazus), and Level 2 User Input Coastal study using the CERA provided ASGS flood depth grid (Level 2 CERA). The Level 1 Analysis was compared to the Level 2 CERA Analysis to determine how the CERA provided flood depth grid, modeled using an ASGS triangular mesh designed to focus resolution on hydraulically significant features, as input into Hazus differs in flood predictions and loss predictions to the unaltered Hazus-MH surge methodology. The Level 2 Hazus and Level 2 CERA analyses were compared to see how the loss predictions differ for the Hazus-MH and the CERA provided ASGS hazards when Hazus-MH NFIP flood zone assumptions, effecting the depth-damage curves used, are removed. These comparisons were done for Hurricane Isaac 2012, which affected the Greater New Orleans area, and for Hurricane Laura 2020, which affected the more rural, less protected area of Louisiana south of Lake Charles, to determine how these results may change based on density of land development and ADCIRC mesh resolution. For both hurricanes, the modeled surge levels were compared to observed high water marks (HWM) values, and for Hurricane Isaac the predicted losses were compared to reported loss values. There is evidence to conclude that ASGS provides more reliable surge values and extents, particularly in protected areas, that can provide loss predictions that more closely match reported building losses.