Results of Neighborhood Level Analysis of Structural Storm Surge Damage to Residential Structures

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At the 4th International Workshop on Remote Sensing for Post-Disaster Response, the concept of assessing damage within a spatially tiered framework was presented (Adams et al., 2006). By creating methodologies for characterization of damage at increasing scales, approximations can be made based on availability of data, resources and time at the regional, neighborhood and individual building levels. Ground verified data documenting storm surge damage to residential structures was collected using the VIEWS™ system in the aftermath of Hurricane Katrina as part of an MCEER reconnaissance. The high definition video collected in this reconnaissance was later cataloged and building inventory characteristics and damage states were defined at the individual building level (Friedland et al, 2006).

Patterns of damage on a per building level were mapped and referenced to the debris line left by the hurricane storm surge, a very dominant feature of post-Katrina aerial and satellite remote sensing imagery. Results of this neighborhood level analysis show good correlation of structural damage with increasing distance from the debris line towards the coast. Methods for characterizing residential storm surge damage using optical imagery on a per building basis are being developed and current progress is also presented.

The present research is a multiyear endeavor to create a methodological framework for the development of a storm surge damage model for residential buildings. The approach used integrates the proposed damage model with the Advanced Circulation (ADCIRC) storm surge model to create and validate building damage estimates based on multi-source, multi-temporal remote sensing imagery and GIS data layers. Areas of coastal Mississippi impacted by Hurricane Katrina's storm surge are being used in the creation and validation of this model. The final goal of the research is integration of remote sensing and advanced technology techniques with physical storm surge characteristics modeled with ADCIRC to provide a means of estimating storm surge-induced structural damage for future events.

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