Abstract

Flooding in the U.S. annually accounts for almost $8 billion of property damages and social impact, prompting the need for insurance, aid, mitigation and other programs which rely on predictive flood damage modeling. The Federal Emergency Management Agency (FEMA) developed the HAZUS FL (FL) model to support these programs. FL creates estimates based on descriptions of people and property, known as the general building stock (GBS), which detail the number and types of buildings within each census block group (CBG). The accuracy of flood damage models is dependent on the relationship between the locations of the GBS and floodwaters. To ensure that FL remains relevant to a wide audience, techniques are needed to enhance the accuracy of these factors in the FL model which do not require additional detailed building datasets or alter the existing FL software code. Improving the GBS representation by applying dasymetry to the GBS would improve the accuracy of the FL model estimates. This thesis demonstrates the viability of dasymetric GBS by applying land use/land cover data to align the GBS with developed land to improve the accuracy of FL models. These effects are most pronounced in areas with partial flooding and/or low density development. CBGs experiencing severe flooding or high density development displayed limited damage differences compared to the current FL building format.