ABSTRACT

The Federal Emergency Management Agency (FEMA) has broad responsibility for both hazard mitigation and response throughout the United States. For natural hazards, FEMA in 2011 released a major update of its GIS-based predictive modeling tool, HAZUS-MH 2.0® (hereafter HAZUS), which deals with earthquakes, floods, and severe weather events. For the latter two perils, losses to agriculture are modeled along with losses to life and property. This study offers an assessment of the HAZUS crop flood loss modeling methodology for Fremont County Iowa, specifically for heavy flooding that occurred there in June-August 2011. Fremont County had the largest estimated financial losses due to crop damage amongst all Iowa counties from the 2011 flood. This assessment compares HAZUS model runs against actual crop losses as determined by both the National Agricultural Statistical Service (NASS) and by the Iowa Farm Bureau Federation (IFBF). Predicted agricultural losses were generated using both HAZUS’ riverine method and the HAZUS user defined depth-grid methods. These results were compared against the actual NASS harvested acreage and yield results. The HAZUS results were also compared against a special IFBF study for Fremont County, which used the USDA IMPLAN® economic impact tool. Overall, differences among the HAZUS predictions and reality varied by up to 390%; differences between HAZUS and the IFBF predictions varied by up to 214%. FEMA’s HAZUS consistently overestimated. Based on the Fremont County flood, improvements in the HAZUS crop loss methodology are urgently recommended.