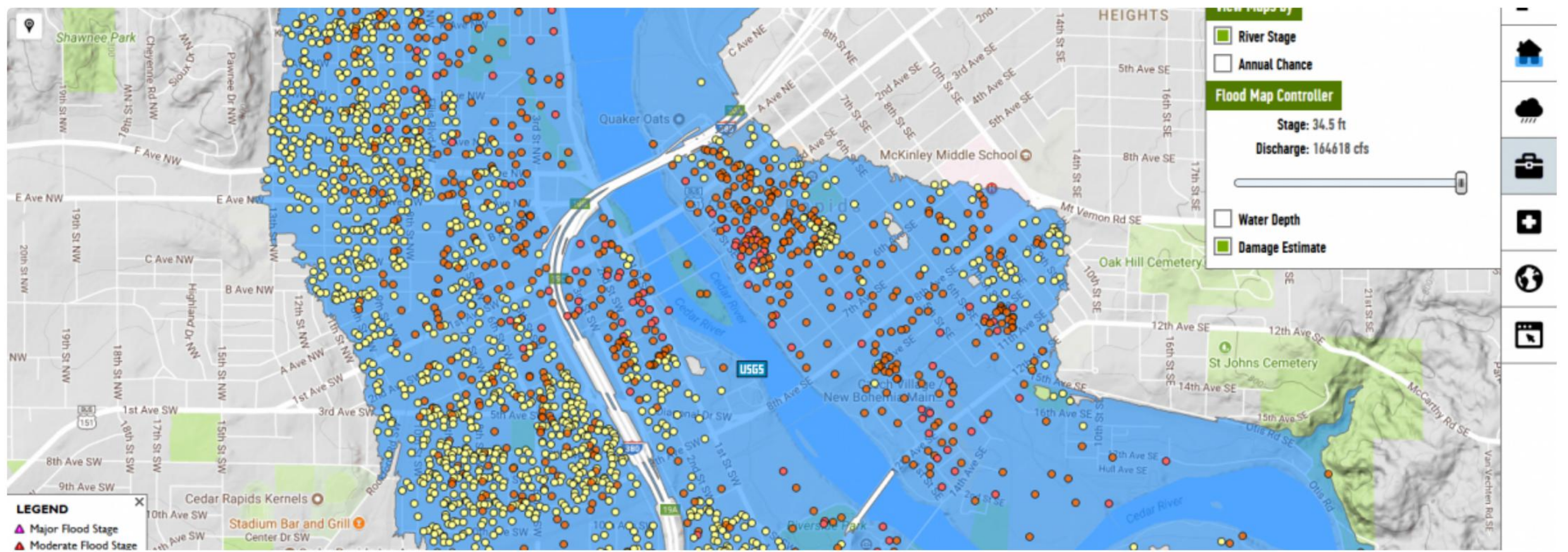




Modeling the Costs of Flood Damage



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In May 2017, the [Iowa Flood Information System \(IFIS\)](#) added data to the web from HAZUS, which allows users to estimate the cost of flood damages to buildings and other structures in various flooding scenarios. HAZUS data is currently available for seven Iowa communities, and Iowa Flood Center (IFC) researchers are working to expand the tool to cover the entire state.

HAZUS, developed and distributed by the Federal Emergency Management Agency (FEMA), is a multi-natural hazard analysis tool. FEMA first released HAZUS in 1997, and its most recent version, HAZUS 4.0, is capable of analyzing floods, hurricanes, tsunamis, and earthquakes. The web tool models the effects that natural hazards of various intensities can have on buildings and other structures in a given area, and then quantifies the total damage in dollars.

In 2017, IHR Research Engineer and Assistant Professor Ibrahim Demir and graduate research assistant Enes Yildirim integrated HAZUS datasets into IFIS. Yildirim extracted the flood related datasets from HAZUS, including census data on demographics, buildings, structural content, and the number of schools and critical structures near rivers, and integrated it into existing IFIS flood maps. Yildirim also analyzed how emergency responders could use HAZUS and created a user-friendly web-design that would be intuitive and easy for decision-makers and the public to use.

How does HAZUS work on IFIS?

Currently, IFIS provides flood loss and damage estimation for 12 communities: Cedar Rapids, Cedar Falls, Des Moines, Fort Dodge, Iowa City, Independence, Kalona, Monticello, Ottumwa, Rock Rapids, Rock Valley, and Waterloo. To calculate flood damage for one of these communities, users can hover their cursor over the “Flood Maps” tab and find their community under the “Flood Map Scenarios for Communities” button. Then, after clicking on the “Damage Estimate” button, users can toggle the “Flood Map Controller” to model different scenarios.

For example, users can select Iowa City, simulate a 30-foot stage flood, and receive a total damage estimate of \$19 million, which factors in the number of buildings damaged and the cost of the damage to their structure and content. Users can also click on individual buildings in the flooded area to access estimates of content and structural damage to those buildings. Demir says that level of detail will be useful for decision-makers and ordinary citizens who need to evaluate scenarios specific to them. Demir and Yildirim plan to add additional analysis layers that will include the number of schools, critical structures, and emergency centers affected in the damage estimate. Demir and his team will add the additional layers after bringing the current level of analysis to all Iowa communities.

Tags: FEMA, Flood Damage Costs, Hazus, IFIS

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