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A Web-based Data Intensive Visualization of Real-time River Drainage Network Response to Rainfall

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The Iowa Flood Information System (IFIS) is a web-based platform developed by the Iowa Flood Center (IFC) to provide access to and visualization of flood inundation maps, real-time flood conditions, flood forecasts both short-term and seasonal, and other flood-related data for communities in Iowa. The key element of the system's architecture is the notion of community. Locations of the communities, those near streams and rivers, define basin boundaries. The IFIS streams rainfall data from NEXRAD radar, and provides three interfaces including animation for rainfall intensity, daily rainfall totals and rainfall accumulations for past 14 days for Iowa. A real-time interactive visualization interface is developed using past rainfall intensity data. The interface creates community-based rainfall products on-demand using watershed boundaries of each community as a mask. Each individual rainfall pixel is tracked in the interface along the drainage network, and the ones drains to same pixel location are accumulated. The interface loads recent rainfall data in five minute intervals that are combined with current values. Latest web technologies are utilized for the development of the interface including HTML 5 Canvas, and JavaScript. The performance of the interface is optimized to run smoothly on modern web browsers. The interface controls allow users to change internal parameters of the system, and operation conditions of the animation. The interface will help communities understand the effects of rainfall on water transport in stream and river networks and make better-informed decisions regarding the threat of floods. This presentation provides an overview of a unique visualization interface and discusses future plans for real-time dynamic presentations of streamflow forecasting.