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# Global Streamflow Prediction and Dynamic HAND Flood Maps

Corey Krewson
*Brigham Young University*, coreykrewson@gmail.com

Michael A. Souffront Alcantara
*Brigham Young University*, masouffront@gmail.com

Jim Nelson
*Brigham Young University - Utah*, jimn@byu.edu

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# Global Streamflow Prediction and Dynamic HAND Flood Mapping

Corey Krewson[a], Michael Souffront[b], Jim Nelson[c]
[a]*Brigham Young University. coreykrewson@gmail.com*
[b]*Brigham Young University. masouffront@gmail.com*
[c]*Brigham Young University. jimn@byu.edu*

**Abstract:** Streamflow prediction provides direct insight to water availability and related risks. Global models are important in regions of the world that lack this critical insight from the local models or historical records. Some of the challenges regarding global models are their accuracy at a relatively low resolution, big data management, communication, and local acceptance. Using the Global Flood Awareness System (GloFAS), and the Routing Application for Parallel Computation of Discharge (RAPID) we have developed a high-density streamflow prediction system for Africa, North America, South Asia, and South America. An all-around structure has been developed on the cloud to automatically compute, store, and communicate results. Other developments include a generic open-access web application where results can be visualized, the use of a REST API to access streamflow data programmatically, and tools that facilitate incorporation of forecasts into regional or local systems. State-of-the-art techniques have been applied using GIS tools to provide a streamflow animation service to better visualize how flowrates change over the forecasted time and exceed return periods. The REST API and flow forecasts are being used to develop other applications including dynamic flood maps in various parts of the world. These applications are valuable tools for agencies charged with disaster management and overall supervision of national water programs.

***Keywords**:* Hydrologic Model; Streamflow Forecast; Flood Mapping; HAND;