

7-25-2007

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Recommended Citation

Knutson et al., Cody L., "Development of a Low Flow Early Warning System for the National Weather Service" (2007). 2007. Paper 23.
http://opensiuc.lib.siu.edu/ucowrconfs_2007/23

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Development of a Low Flow Early Warning System for the National Weather Service

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ABSTRACT

Monitoring the stage and flow of rivers and streams is critically important for ensuring the well-being of riparian ecosystems and human activities that rely on these water systems, especially during times of flooding and drought. With the invention of systematic forecasting tools, which have improved the prediction of flooding and water supply, immense progress has been made in providing early warning information for hazard mitigation and response. The National Weather Service's Advanced Hydrologic Prediction Service (AHPS) currently provides river flow/stage and forecast information at more than 3,600 forecast points across the United States. Along with this information, AHPS describes potential flood impacts that may occur within the upstream and downstream influence of the forecasts points. However, similar information is not available for low flow events. In order to incorporate low flow information into the current AHPS river forecast database, the National Weather Service has undertaken pilot studies to obtain relevant low flow impact information near 83 forecast points in the Upper Mississippi, Upper Missouri, and North Platte river basins. The National Drought Mitigation Center (NDMC) was contracted to compile low flow impact information through surveys of the literature and information provided by more than 160 local, state, tribal, and federal water authorities. These studies, conducted from 2004-2006, yielded a variety of potential low-flow impacts in each region. The impact information will be used to establish critical low flow and stage determinations for each forecast point and eventually incorporated into the AHPS database. Identifying this type of local impact information allows local regions, states, and federal interests to better understand their vulnerabilities and better prepare for and respond to potentially hazardous situations. Similar studies are currently underway in the Upper Trinity River Basin in Texas and the Red River of the North Basin along the border of North Dakota and Minnesota.

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