

## Development of Dam Breach Inundation Studies Using Advanced Remote Sensing (LiDAR) for Emergency Action Planning

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Accurate dam breach analyses and inundation mapping are critical components for constructing useful Emergency Action Plans (EAPs) within downstream environment zones. Recent national guidance suggests EAP development as a top priority for all high hazard dams. The Missouri Department of Natural Resources (department) Water Resources Center (WRC) is creating a methodology to utilize high resolution LiDAR data to enhance breach inundation mapping. The WRC is using a combination of LIDAR and field survey, in conjunction with HEC-RAS and GEO-RAS, to perform these analyses.

This inundation mapping is very different than the 100 year flood event. A dam breach and subsequent flood wave develop over time and flow dynamically through the downstream environment rather than a steady state backwater calculation. One of the deliverables is a map of the downstream environment zone displaying the structures that are inundated by at least 2' of water during the time of maximum water surface elevation. Over time, as these analyses are completed, the inundation mapping will be transferred to the owner and county emergency managers for additional development of the site EAP. Once several of these analyses are completed for a particular county, public meetings are proposed to bring together stakeholders for discussion and education. It is critical that emergency managers focus their limited resources where they are needed most in the event of a dam failure. The objective of accurate inundation mapping is to facilitate this focus. For this work to be effective, cooperation of the department, dam owners, emergency responders, and input from the public is necessary. A case study involving a high hazard dam will be presented to demonstrate the dam breach and inundation mapping methodology.