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Classroom Experiences of Using an Augmented Reality Sandbox to Simulate the 2013 Colorado Floods and Mitigation Options

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Over the course of two days in September 2013, the front range of Colorado in the United States received rainfall totals exceeding 20 inches in parts of Boulder County. This historic flood resulted in numerous flash floods, property destruction and loss of life with an economic impact estimated at $2 billion dollars. Students throughout the front range were affected – questions related to the floods and the future abounded.

Originally developed in 2014 by a team from University of California Davis' W.M. Keck Center for Active Visualization in the Earth Sciences, the augmented reality sandbox was provides a unique interface for students to experience topography, water flow, and watersheds in the classroom. Utilizing a Microsoft Kinect 3D camera and a projector, users can interact with the projection, visually seeing the topography and virtual water flow across the generated landscape.

Classroom implementation has shown that students have gained a higher degree of understanding of the effect of landscape on water flow and the abstract concepts of topography through the visualization. By recreating the environment that existed at the time of the floods and then developing plans on how to alter the impacts, students quickly gained insights in the challenges faced by planners and engineers.