ABSTRACT: ALERT Users Group 2014 Symposium

The Colorado September 8-17, 2013 Extreme Rainfall Event: Real-time Rainfall Analysis, Quantification and Dam Safety Response

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A "perfect" mix of moisture, instability and a slow moving storm system brought record-breaking rainfall to northeastern Colorado during the period September 8-17, 2013. The Front Range foothills and adjacent plains of Colorado received up to 21 inches of rain in just a few days, shattering numerous rainfall records and producing catastrophic flooding. The storm claimed 8 lives and caused approximately $2 billion dollars in damage.

This paper will present data and methods used to analyze and quantify the rainfall during the storm. High-resolution rainfall maps were created based on quality contolled rain gauge data and NEXRAD radar data. The real-time rainfall maps were translated into an equivalent average recurrence interval (ARI), known as the Extreme Precipitation Index (EPI). The EPI maps effectively communicated areas of Colorado receiving the rarest and highest impact rainfall.

The rarest rainfall, which in some cases exceeded a 1,000-year event, caused several small dams to overtop and fail. The EPI maps were used to prioritize which dams actually experienced a hydrologic loading significant enough to warrant an emergency inspection. This allowed the Colorado Dam Safety Branch to rapidly inspect the priority dams in order to provide assurance to the general public, emergency responders and the Governor's office that the dams in the impacted area were safe and did not pose a latent threat to the recovery process.

BIOS

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Mr. Parzybok, President and Chief Meteorologist of Metstat, Inc, is a Certified Consulting Meteorologist (CCM) and Certified GIS Professional (GISP) and has 20 years of GIS and meteorological/climatological experience. Mr. Parzybok is the lead programmer/developer of the Extreme Precipitation Index (EPI) and the Storm Precipitation Analysis System (SPAS). He also leads the real-time precipitation gauge quality control project whereby over 20,000 precipitation observations are collected and quality controlled each hour for use in detailed spatial precipitation maps. Given Mr. Parzybok's comprehensive precipitation expertise, he is on the WMO extreme precipitation evaluation committee for assessing the potentially new world record rainfall intensities.

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Mr. Franz is the Design Review Engineer for the Colorado Dam Safety Branch. His responsibilities include performimg design reviews for new dams and repairs of existing dams, safety inspections of existing dams, and emergency preparedness coordination with private dam owners and emergency managers throughout the state. Mr. Franz has over 15 years of engineering experience focusing primarily on the impact of hydrology and hydraulics of infrastructure.