Title: Flash Flood Forecasting in an Ungaged Semi-Arid Basin with a Distributed Model

Topic: Storm Forecasting Tools

Abstract:

Headwater basins and canyons that quickly respond to heavy rainfall runoff pose a significant threat to life and property throughout the semi-arid western United States. The National Weather Service (NWS) has applied the real-time distributed KINematic runoff and EROsion model (KINEROS2) to the complex terrain of the Fish Creek basin located at the southern end of the Vallecito Mountains and the Carrizo Badlands in the Anza Borrego State Park near Borrego Springs, California. In NWS operations, KINEROS2 uses real-time radar data to produce a forecast hydrograph. Due to inherent uncertainties with forecasting for ungaged locations, the forecast will be categorical in nature (no flooding, minor flooding, moderate flooding, major flooding, or record flooding). The model was calibrated using a series of rainfall events representing a full range of flow outcomes from below flood stage up to record flood. Calibration was successful in reproducing all flows regardless of magnitude. The timing and magnitude of the peak flow, at an ungaged basin, is useful information currently not available using NWS flash flood forecasting methods.

Authors:

Michael Schaffner (presenter), Hydrology Program Manager, National Weather Service, Western Region Headquarters, 801-524-5137, 125 South State St., Salt Lake City, UT 84103, Mike.Schaffner@noaa.gov

Alexander Tardy, Warning Coordination Meteorologist, San Diego CA Weather Forecast Office, 858-675-8700, 11440 W. Bernardo Court, Suite 230, San Diego, CA 92127, Alexander.Tardy@noaa.gov

Jayme Laber (presenter), Service Hydrologist, National Weather Service, Oxnard CA Weather Forecast Office, 805-988-6621, 520 North Elevar St., Oxnard, CA 93030, Jayme.Laber@noaa.gov

Carl Unkrich, Hydrologist, USDA-ARS Southwest Watershed Research Center, 520-647-2897, 2000 E. Allen Rd., Tucson, AZ 85718, Carl.Unkrich@ARS.USDA.GOV

David Goodrich, Research Hydraulic Engineer and Lead Scientist, USDA-ARS Southwest Watershed Research Center, 520-647-9241, 2000 E. Allen Rd., Tucson, AZ 85719, Dave.Goodrich@ARS.USDA.GOV