



Hydrology Seminar



Spatially Variable Flash Flood Guidance

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For several years National Weather Service (NWS) River Forecast Centers (RFC) have been distributing basin-averaged flash flood guidance (FFG) values under the label of “gridded FFG” in order to support operational use of the Flash Flood Monitoring and Prediction (FFMP) software package at NWS Weather Forecast Offices (WFO). While these data are gridded in format, the values themselves are still subject to the basin-averaging of input data. Therefore the values do not reflect the spatial variability of static data such as slope, soil quality and land use or dynamic data such as precipitation, soil moisture and evapotranspiration.

The Arkansas-Red Basin River Forecast Center (ABRFC) has developed a *truly* gridded FFG product that incorporates the application of a distributed hydrologic model to perform soil moisture accounting at the Hydrologic Rainfall Analysis Projection (HRAP) scale of 4km x 4km, the National Resource Conservation Service’s (NRCS) Curve Number runoff model and a novel calculation of the threshold runoff (ThreshR) parameter. OHD’s research distributed model is being fed with operational, hourly gridded precipitation data to estimate soil moisture on the HRAP scale. Gridded datasets of land use/land cover and soil quality are combined to produce NRCS curve numbers that vary based on the soil moisture. To estimate ThreshR, the ratio of critical flow and unit peak flow must be calculated. The peak unit runoff is calculated using the NRCS synthetic unit hydrograph method which allows for the incorporation of slope. The critical flow values are estimated by using the 5-year, 3-hour precipitation event and the average-condition curve number as input to the NRCS runoff model. The amount of rainfall required to produce runoff is then combined with the amount of runoff required to generate flash flooding to produce the gridded FFG. These three phases of the gridded FFG model mimic the current NWS River Forecast System basin-averaged flash flood guidance operation, just on a gridded scale. This similarity allows for objective comparisons of the gridded FFG to the basin-averaged FFG and the direct ingest to the FFMP application. Three WFOs served by the ABRFC are currently evaluating these FFG products via an internal website. ABRFC plans to deliver these products to its served WFOs for operational use by the end of the summer of 2006.

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Time: 12:45 P.M.

Location: NWS Headquarters

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