

Integrating "poor-man's" ensemble weather risk forecasts into spatial hydrologic modeling systems for small stream flooding and hazard assessment

Fuka, D. R., Easton, Z.M., Walter, M.T., and Steenhuis, T.S.

Dept. Biological and Environmental Engineering, Cornell University, Ithaca NY 14853

Hydrologic modeling at daily or sub daily resolution requires accurate precipitation data, which is particularly important when assessing flood risk in small runoff dominated watersheds. Precipitation gage data pose a variety of challenges, including the fact that they are located outside of many watersheds of interest and thus, may not accurately represent the actual rainfall in the watershed. We show that by integrating global forecast products from the atmospheric modeling community into the hydrologic models commonly used that we can circumvent some of the issues with point of measure rain gauges. Traditionally in hydrologic forecasting, a precipitation forecast is used from a nearby precipitation station on which the hydrologic model has been calibrated. In this study, we compare and contrast calibrating a watershed model (SWAT) using derived statistical representations of precipitation forecasts from "poor- man's" ensembles of raw gridded atmospheric models interpolated to the center of subbasins vs using the closest precipitation gage measurement and NWS forecasts for that gage location. In addition, we look at what scales and radii using direct gridded model output may introduce equal or less error to watershed modeling projects than using the closest station.