

## **Development of watershed-based large-domain modeling to support monitoring, prediction and water management applications**

*Andy Wood*

*(1) Climate and Global Dynamics Laboratory; (2) Research Applications Laboratory, National Center for Atmospheric Research, CU, Boulder, USA*

Most hydrological models used in the US for large-domain, national-scale applications in monitoring, prediction and water management applications are implemented with a gridded resolution (e.g., NLDAS, the NSSL FLASH system, the National Water Model), on a range of model resolutions spanning 250-m to 1/8<sup>th</sup> degree. In this presentation, we review past or existing efforts at large-domain modeling and we describe a new effort to develop and demonstrate the value of process-oriented, watershed-based large-domain modeling for such applications, using several models implemented on intermediate-scale hydrologic units from the USGS HUC12 geospatial dataset. This model discretization choice is made to allow for computational agility to support ensemble approaches (analysis and prediction), catchment-based classification and calibration methods, and to increase the perceived relevance of model outputs to water sector applications. We present in-progress results from a real-time monitoring and prediction implementation of the SUMMA hydrological modeling framework coupled to the mizuRoute channel routing model for the fine-scale NHDPlusv2 stream network. If results allow, we will also show early outcomes from a HUC12-based application of the WRF-Hydro model in support of National Water Center forecasting.