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Developing new watershed-based climate forecast products for water managers

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Operational sub-seasonal to seasonal (S2S) climate predictions have advanced in skill in recent years but are not yet broadly utilized by stakeholders in the water management sector. While some of the challenges that relate to fundamental predictability are difficult or impossible to surmount, other hurdles related to forecast product formulation, translation, and accessibility can be directly addressed. These include products being misaligned with users' space-time needs, products disseminated in formats users cannot easily process, and products based on raw model outputs that are biased relative to user climatologies. In each of these areas, more can be done to bridge the gap by enhancing the usability, quality, and relevance of water-oriented predictions. In addition, water stakeholder impacts can benefit from short-range extremes predictions (such as 2-3 day storms or 1-week heat waves) at S2S time-scales, for which few products exist.

We present results from a research to operations (R2O) effort sponsored by the NOAA MAPP Climate Testbed to create post-processed climate prediction products to reduce hurdles in water stakeholder adoption and improve the skill of S2S climate forecasts on a watershed scale. The project is using NCEP's Climate Forecast System version 2 (CFSv2) and National Multimodel Ensemble (NMME) reforecasts and forecasts to develop real-time watershed-based climate forecast products, and to train post-processing approaches to enhance the skill and reliability of raw real-time S2S forecasts using partial least squares regression (PLSR) techniques. Prototype S2S climate data products (forecasts and associated skill analyses) are now being operationally disseminated from NCAR on a public website to facilitate further product development through interactions with water managers. Products include CFSv2-based bi-weekly climate forecasts (weeks 1-2, 2-3, and 3-4) for sub-regional scale hydrologic units, and NMME-based monthly and seasonal prediction products.

Website: http://hydro.rap.ucar.edu/s2s/