

## **SESSION: (B4) S2D forecasts for decision making**

**(B4-05)**

### **Harnessing NMME predictions to support seasonal hydrologic prediction**

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Recent studies document an increasing influence of temperature on streamflow across the American West, including snow-melt driven rivers such as the Colorado or Rio Grande. At the same time, some basins are reporting decreasing skill in seasonal streamflow forecasts, termed water supply forecasts (WSFs), over the recent decade. While the skill in seasonal precipitation forecasts from dynamical models remains low, the little skill there is in seasonal temperature forecasts could potentially be harvested for WSFs in these temperature-sensitive basins. Here, we show that WSF skill can be improved by incorporating seasonal temperature forecasts from the National Multi-Model Ensemble (NMME) into traditional statistical streamflow forecast models. We find improved skill relative to traditional WSF approaches in a majority of headwater locations in the Colorado and Rio Grande basins at lead times of 1-5 months. Incorporation of temperature into WSFs can increase the resilience of streamflow forecasting and water management systems in the face of continuing warming as well as decadal-scale temperature variability and thus help to mitigate the impacts of climate non-stationarity on streamflow predictability. We discuss the potential for incorporation of these results into dynamic hydrologic forecasting models and explore NMME model weighting schemes to potentially further boost hydrologic prediction skill across the American West.