



Incorporating Decadal Temperature Predictions into Streamflow Forecasts and Operational Reservoir Projections in the Colorado River

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Abstract:

Decadal climate prediction is an evolving field that aims to provide society with climate outlooks years to a decade in advance. Skillful decadal temperature predictions (up to 5 years out) offer a potential opportunity for water managers, especially in the Colorado River Basin (CRB), where streamflows are sensitive to temperature and the water system is highly managed. Given this motivation, with CU student Mr. David Woodson and collaborators, we develop and demonstrate a framework for incorporating temperature predictions into streamflow forecasting and operational projections. Specifically, the streamflow hindcasts from the Ensemble Streamflow Prediction (ESP) method – an operationally used forecast method in the CRB – are post-processed to reflect the temperature predictions and run through an operational model to obtain reservoir projections for Lakes Powell and Mead. This study provides an example of an iterative and collaborative process with CRB stakeholders that helped to align climate skill with water management needs. Further, it underscores the importance of evaluating improvements in streamflow forecasts in decision-relevant terms.

Speaker Bio: Dr. Erin Towler is a Project Scientist at the National Center for Atmospheric Research (NCAR), with research interests spanning the water-climate-decision interface. Her work contributes to understanding weather and climate risks to water quantity and quality across timescales, and she has applied her expertise to streamflow prediction, water management, and impact assessments. Erin received her PhD in Water Resources Engineering from the University of Colorado Boulder, is a Postdocs Applying Climate Expertise (PACE) alumni, and currently serves on the U.S. CLIVAR Predictability, Predictions, and Applications, Interface (PPAI) Panel.