

Advancing Water Supply Forecasts in the Colorado River Basin for Improved Decision Making

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Water supply forecasting in the western United States is inextricably linked to snowmelt processes, as approximately 70-85% of total annual runoff comes from water stored in seasonal mountain snowpacks. Snowmelt-generated streamflow is vital to a variety of downstream uses; the Upper Colorado River Basin (UCRB) alone provides water supply for 25 million people, irrigation water for 3.5 million acres, and drives hydropower generation at Lake Powell. April-July water supply forecasts produced by the National Weather Service (NWS) Colorado Basin River Forecast Center (CBRFC) are critical to basin water management. The primary objective of this project as part of the NASA Water Resources Applied Science Program, is to improve water supply forecasting for the UCRB by assimilating satellite and ground snowpack observations into a distributed hydrologic model (HL-RDHM). Verification of Ensemble Streamflow Prediction (ESP) reforecast are compared to baseline CBRFC reforecasts to assess improvements in forecast skill. The final forecasting framework developed during this project will be delivered to CBRFC and run operationally for a set of pilot basins. In addition, work with Denver Water and the Dolores Water Conservancy District is ongoing to demonstrate how the probabilistic ensemble forecast information can be used to improve water management decision making.