Development of Sub-seasonal to Seasonal Watershed-scale Hydroclimate Forecast Techniques to Support Water Management: Case study in the Colorado River Basin

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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. To enhance the usability and relevance of S2S climate forecasts for the water management community, climate forecasts were translated to a watershed scale and made available in real-time. An example of S2S climate forecast use in water management is through streamflow forecasting. Applications of climate forecast informed streamflow forecast were explored in the Colorado River Basin. An experimental streamflow forecast method was developed with a simple stochastic trace weighting technique, which ingests watershed-based climate forecasts. Current and experimental streamflow forecasting techniques were explored in the Colorado Basin Streamflow Forecast Testbed, which compares the hydrologic skill and projections of reservoir operations.