

Improving Seasonal Predictions of Climate Variability and Water Availability at the  
Catchment Scale

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Abstract

In a water-stressed region, such as the southwestern United States, it is essential to improve current seasonal hydroclimatic predictions. Typically, seasonal hydroclimatic predictions have been conditioned by standard climate indices, e.g., NINO3 and PDO. In this work, the statistically unique relationships between sea surface temperatures (SSTs) and a basin's hydroclimate are explored. The regions of the Pacific where the SSTs are most correlated with the Little Colorado River basin's hydroclimate are located throughout the year and at varying time lags. The SSTs, from these regions of highest correlation, are used as predictors of the hydroclimate in the Little Colorado. This methodology, named basin-specific climate prediction (BSCP), is further used to perform hindcasts. The hydroclimatic hindcasts obtained using BSCP are shown to be closer to the historical record, in the Little Colorado, than the hindcasts using the standard climate indices as predictors.