

Atmospheric Rivers – A Potential Tool for Improving Sub-Seasonal to Seasonal Precipitation Forecasting?

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Having skillful forecasts of precipitation beyond the two-week timeframe of operational weather modeling – at sub-seasonal to seasonal (S2S) time scales – has long been a desire of water managers. California’s recent drought has renewed the emphasis for developing useful forecasts to help inform water agency decision-making. Improved forecasts would have many applications. Sub-seasonal forecasts made during the winter wet season in the western U.S. could help in planning reservoir operations and in making water allocations, and would have particular relevance for flood management applications. Seasonal forecasts made at the beginning of the winter season would further support programmatic decisions regarding allocating budgetary resources, negotiating water transfers, performing environmental regulatory compliance, and other actions associated with drought preparedness and response.



Will drought in California continue in Water Year 2017?

Climate change adaptation is a high priority for California, where mountain snowpack plays an important role in balancing the operation of major reservoirs between the sometimes opposing goals of flood management and water storage. Projected end of century dramatic reductions in mountain snowpack will require many adaptive measures, one of which is forecast-informed reservoir operations. Skillful S2S forecasting is central to moving forward with this concept.

Recent National Research Council reports have assessed present capabilities of S2S forecasting and proposed a ten-year research agenda for improving forecasting skill at spatial and temporal resolutions suitable for aiding decision-making. From a water manager’s perspective, the picture painted in these reports for near-term improvement in useful, applicable skill does not appear very encouraging. CDWR, often in partnership with the Western States Water Council,

has spent the last decade seeking near-term improvements for the western U.S. that might be achieved through forecasts of opportunity, focused research, or any other approach. The potential for predictive capability associated with atmospheric river (AR) storms has emerged as the leading contender for useful improvement for California. The state's annual water budget is determined by a small number of storms, with the absence or intensification of two or three events being capable of tipping the balance between a dry year and a wet one. CDWR has partnered with the research community on initial groundwork associated with understanding and monitoring ARs, and looks forward to someday getting the (skillful) answer to the question, "will next year be wet or dry?"