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MODELING STREAMFLOW FROM SNOWMELT IN THE UPPER RIO GRANDE BASIN

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ABSTRACT: Annual, high elevation snowpack in the Upper Rio Grande (URG) basin is a vital source of surface water for irrigated agriculture in New Mexico. Maximum streamflow from the annual snowpack usually occurs in early May for the southernmost sub-basins (e.g., Ojo Caliente) and at the end of May for northernmost sub-basins (e.g., Del Norte). Increases in average daily temperatures due to climate warming will affect the timing of maximum streamflow from snowmelt and this will have repercussions for water storage and supply during the growing season. Moreover, different climate change scenarios indicate less reliable precipitation, which could affect the quantity of water from melting snow. It is essential that we understand and plan for potential changes in the amount of water from snowmelt. We have been assembling input data for the Snowmelt Runoff Model (SRM) for use in 24 important snow sub-basins in the URG. We present the results of this model for a good snow year (2005) and a poor snow year (2002) for a selection of sub-basins along a south-north transect. SRM is driven with climate data (temperature and precipitation) and remotely estimated snow cover data. Once SRM simulates runoff at acceptable levels for each sub-basin for both good and poor snow years, we will be able to use data from global climate models to predict how the timing of maximum streamflow and quantity of water from snowmelt will change.

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