

**EVALUATION OF GRIDDED SNOW WATER EQUIVALENT AND  
SATELLITE SNOWCOVER PRODUCTS FOR MOUNTAIN  
BASINS IN A HYDROLOGIC MODEL**

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**ABSTRACT**

The USGS Precipitation Runoff Modeling System (PRMS) hydrologic model was used to evaluate experimental, gridded, 1-km<sup>2</sup> snow covered area (SCA) and snow water equivalent (SWE) products for two headwater basins within the Rio Grande (i.e. upper Rio Grande River basin) and Salt River (i.e. Black River basin) drainages in the Southwestern United States. The SCA product was the fraction of each 1-km<sup>2</sup> pixel covered by snow and was derived from NOAA Advanced Very High Resolution Radiometer imagery. The SWE product was developed by multiplying the SCA product by SWE estimates interpolated from National Resources Conservation Service Snow Telemetry (SNOTEL) point measurements for a six-year period (1995-2000). Measured SCA and SWE estimates were consistently lower than values estimated from temperature and precipitation within PRMS. Greatest differences occurred in the relatively complex terrain of the Rio Grande basin, as opposed to the relatively homogeneous terrain of the Black River basin where differences were small. Differences between modeled and measured snow were different for the accumulation period vs. the ablation period and had an elevational trend. Assimilating the measured snow fields into a version of PRMS calibrated to achieve water balance without assimilation reduced performance in estimating streamflow for the Rio Grande and increased performance in estimating streamflow for the Black River basin. Correcting the measured SCA and SWE for canopy effects improved simulations by adding snow mostly in the mid-to-high elevations where satellite estimates of SCA are lower than model estimates.

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