

Patterns of Snowmelt Rates Across the Southern Rocky Mountains, U.S.A.

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Abstract. Melting snow in mountainous areas accounts for about 20% of the world population's water supply. These areas have limited *in situ* monitoring of snow accumulation and melt due to the few number of stations and the lack of representativeness these stations provide in this terrain. Most of the existing stations only collect precipitation and temperature data, thus modeling of snowmelt often uses temperature as an index of the full energy balance needed to physically model melt. Across the Western United States (U.S.), there are currently about 700 snow telemetry (SNOTEL) stations that monitor precipitation and temperature, as well as snow water equivalent (SWE) and snow depth. Across the Southern Rocky Mountains in the central-western U.S., 90 SNOTEL stations have been operating since the late 1970s or mid-1980s. These stations were used to estimate the daily snowmelt rate as a function of the daily average air temperature over ½ month periods to consider the seasonality of incoming solar radiation. The various melt rates, in millimeters of snow per day per degrees Celsius were then evaluated based on the location, topography, and canopy characteristics of each station. It is anticipated that the spatio-temporal variability in the melt rates can be applied to other continental regions.