

Trends in snow accumulation and melt in Rocky Mountain National Park, Colorado, USA

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Abstract. The seasonal snowpack in Rocky Mountain National Park is critical to the local and downstream water supply and the ecosystem of the park, and is important for winter recreational opportunities. Recent regional studies have illustrated that snow accumulation is decreasing, averaging on the order of -2 to -4 cm/decade; snowmelt is tending to be earlier, averaging on the order of -2 to -4 days/decade. Trends specific to Rocky Mountain National Park, on the other hand, appear to be less specific. From 30+ years of daily snow water equivalent (SWE) data collected at thirteen NRCS Snowpack Telemetry (SNOTEL) stations in and near the park, April 1 SWE has been changing by -4.7 to +1.1 cm/decade, with most stations slightly decreasing yet many of the changes being statistically significant. Trends in date of peak SWE were also increasing and decreasing, ranging from -4.4 to +3.2 days per decade. Monthly records from longer-term NRCS snow courses suggested that some declining trends began as early as the late 1930s, while other decreasing trends did not start until the late 1970s. Trends in April 1 SWE at snow courses ranged from <-1 to $>+4$ cm/decade.