

Niveograph Interpolation to Estimate Peak Accumulation of SWE in Rocky Mountain National Park

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Abstract. Since the late 1970s the US Department of Agriculture's Natural Resources Conservation Service has used snow pillows at snowpack telemetry (SNOTEL) stations to measure the pressure of the overlying snowpack to provide a real-time daily record of snow water equivalent (SWE). Manual snowcourse SWE measurements have been taken on or around the 1st of February, March, April and May 1st for up to 75 years of record, with the April 1st SWE value typically used to represent peak SWE. However these have been shown to be in the order of 10% less than the actual peak, based on the SNOTEL record. In this paper, the daily SNOTEL SWE data were used to improve the estimation of peak SWE from the monthly measurements. First of the month SWE values were used to adjust the median time series to produce estimates of peak SWE for each year of record. Average annual niveographs (graphs of SWE versus time) for a) the entire time series and b) specific years averaged for high, medium and low snow accumulation were created. Five SNOTEL stations in and near Rocky Mountain National Park, with at least 30 years of record, are being used to characterize the snowpack in the park. For these five stations, with average annual peak SWE values ranging from 143 to 720 mm, this method produced good estimates of peak SWE. The estimates were improved when the amount of snow accumulation on May 1 was considered.