

Variability of Snow Density Measurements in the Rio Esera Valley, Pyrenees Mountains, Spain

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Abstract. An accurate assessment of snow depth and snow density is essential to determine that amount of water stored in the snowpack, i.e., snow water equivalent (SWE). The measurement of snow density is much more difficult and time consuming than snow depth. The variability in snow density is evaluated for a 5.4-km stretch of the Rio Esera headwaters in the Spanish Pyrenees Mountains. The traditional snow tube method is compared to the more labour-intensive but accurate snow pit method. The former method measures snow depth and extracts a snow core that is weighed. The latter method uses a wedge cutter to extract a 1-L snow sample to estimate density at 10-cm intervals through the snowpack. The variability in snowpack density is not systematic and can only be explained at lower elevation when the snowpack is known to be melting, as identify by an isothermal snowpack at zero degrees Celsius. This occurred during a mid-January survey. A late-April survey showed that these lower elevation sites were still more dense.

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