Snow depth distribution and storm events of high mountain Central Chile: A new experimental setup

Thomas E. Shaw[1], Pablo Mendoza[1,2], Christian Oberli[3], James McPhee[1,2]
1 Advanced Mining Technology Center, Universidad de Chile, Santiago, Chile
2 Department of Civil Engineering, Universidad de Chile, Santiago, Chile
3 Escuela de Ingeniería Pontificia Universidad Católica de Chile, Chile

The quantity of water storage in the Chilean Andes is highly important for industry, agriculture and water supply to the region (approximately 40% of Chile's population live in Santiago), though remains poorly understood. Lack of high elevation in situ observations, combined with the complex topography of the Andes range, make predictions about the spatial and temporal variability of snow water equivalent difficult.

A particular uncertainty is associated with the preferential deposition and re-distribution of snow during storm events, which may be amplified by dry conditions of the region. Here we present the details of a newly established experimental catchment with the purpose of understanding local effects of wind on spatial snow depth distribution. Our setup combines multiple in situ observations between a 14 wirelessly networked automatic weather stations (recording air temperature, relative humidity, sonic snow depth and sonic wind speed and direction) and repeat high resolution scans of a VZ6000 terrestrial LiDAR (Light Ranging and Detection) system. We explore potential applications of our dataset at high elevation (~3500-3800 m a.s.l.) and provide a brief comparison of two distinct scan periods.