



The changing role of temperature, precipitation and elevation on snowpack variability in Switzerland

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Snowpack is a source of environmental and economic richness in the Swiss Alps. However, duration and depth of snowpack has suffered a reduction during the last three decades due to current climate warming. This is especially noticeable at low-to-middle elevation sites, where temperature is the main constraint for snowpack variability. This work assesses the role of elevation on determining the relative contribution of temperature and precipitation as predictors of snowpack variability in Switzerland. Multiple regression models allowed us finding a linear relationship between the predictive skill of temperature (negative) and precipitation (positive) on snowpack variability, and the terrain elevation. We, moreover identified a threshold around the 1400m a.s.l. below which temperature is the main explanatory variable, and above which precipitation becomes a better predictor of snowpack variability. Results highlights as well that the elevation of this threshold has increased over time as climate warmed. This has important implications for the future viability of snow-dependent industries in Switzerland, where projections indicate a continuous warming during the course of the 21st century.