

Variability in snow-depth time series within the Adige catchment

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Snow cover extension and duration is particularly sensitive to climate change because strongly influenced by changes in temperature and precipitation. It affects the hydrological cycle of Alpine catchments as well as many other aspects of life in mountainous regions, such as ecosystem functioning and economy. Despite its relevance, variability in snow related parameters has not been investigated in the Southern side of the Alps as extensively as in the Northern side of the Alps. In this work, we investigate the temporal variability of mean seasonal snow depth (computed by averaging the daily snow depth in the period 1 November-30 April between two following years) and of snow cover duration (defined, similarly, as the number of days in the period 1 November-30 April with snow depth higher than 30 cm) for the homogeneous stations within the Adige catchment (North-East Italy) by using wavelets transform. We focus our analysis on the period 1980-2010, which with 37 time series is the richest of data and we group the stations in four elevation classes (below 1350 m a.s.l., between 1350 m a.s.l. and 1650 m a.s.l., between 1650 m a.s.l. and 2000 m a.s.l. and above 2000 m a.s.l.). Stations located above and below 1650 m a.s.l. show different behaviors, with the latter showing in the last decades a larger reduction of mean seasonal snow depth and snow cover duration, than the former. We also observe that starting from the late '80s snow cover duration and mean seasonal snow depth display values below the average in the study area, confirming the observations performed in other regions of the Alps. We also find an elevation-dependent correlation between the increase in winter temperature and snow cover extension and duration.