



Snow depth and snow duration variability in Trentino (North-East Italy)

Giorgia Marcolini (1,2), Alberto Bellin (1), Markus Disse (2), and Gabriele Chiogna (2)

(1) University of Trento, DICAM, Italy, Italy (giorgia.marcolini@unitn.it), (2) Technical University of Munich, Faculty of Civil, Geo and Environmental Engineering, Germany

Snowpack dynamics is an important indicator in assessing climate change in mountainous regions. In fact, it is strongly influenced by temperature and precipitation behavior and is the strongest single element controlling the hydrological cycle of Alpine catchments. Furthermore, related quantities, such as snow cover duration and extension, affect many aspects of life in mountainous regions, from economical activities, such as winter tourism and hydropower production, to water availability and ecosystem dynamics. Available data on snowpack are often heterogeneous and long time series, useful for climate analysis, are often obtained by merging data of different origins. This, among other factors, calls for robust homogenization techniques. We apply the Standard Normal Homogeneity Test (SNHT) to detect breakpoints in 109 timeseries of snowpack collected in Trentino (North-East Italy). After having performed the detection of anthropogenic breakpoints, we investigated the occurrence of anomalies and changes in the mean seasonal snow-depth, in the number of days with snowfall, in the snow cover duration and the correlation of these variables with the altitude of the sites. We mainly focus on the period 1950-2013, since it is the richest in terms of data availability. The analyses clearly indicate that the period 1990-2000 was critical in terms of seasonal mean snow depth and snow-cover duration, in particular for stations below 1600 m a.s.l.