High resolution climatology
- towards climate change services

Analyses of newly digitised and reconstructed snow series over the last 100+ years in Switzerland

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Snow is an important socio-economic factor in the Swiss Alpine region (tourism, hydro-electricity, drinking water) and responsible for considerable natural hazards such as avalanches. In addition, high-quality long-term snow series can be used as an excellent indicator of climate change.

The objectives of this study are threefold. First, suitable long-term snow series from different altitudes and regions in Switzerland have been selected, missing data digitized and the entire series quality checked. Second, the long-term snow series have been used for trend analyses over a time period >100 years. Third, snow depth series have been reconstructed using daily new snow, temperature and precipitation as input variables. This made it possible to analyse snow depth related variables such as days with snow pack.

Results show that the snow cover is varying substantially on seasonal and decadal time scales. The analyses of the decadal new snow trends during the last 100 years shows unprecedented low new snow sums in the winter seasons (DJF) of the 1990s. The 100 year trend of days with snow pack reveals a significant decrease for stations below 800 m asl in the winter season (DJF) and for stations around 1800 m asl in spring (MAM). Similar results were found for seasonal new snow sums. The results of the trend analyses are also discussed with respect to temperature and precipitation trends.

Finally we will also shortly discuss how especially "precious" snow measurements have been identified and incorporated in a National Basic Climatological Network (NBCN) as well as in the Global Climate Observing System (GCOS).