



More intensive and variable precipitation in Switzerland since 1945

Pascal Hänggi (1,3), Markéta Jetel (2,3), Marcel Küttel (2,3), Heinz Wanner (2,3), Rolf Weingartner (1,3)

(1) Hydrology Research Group, University of Bern, Bern, Switzerland (pascal.haenggi@giub.unibe.ch), (2) Climatology and Meteorology Research Group, University of Bern, Bern, Switzerland, (3) Oeschger Centre for Climate Change Research, University of Bern, Bern, Switzerland

The analysis of how precipitation is related to and/or affected by a changing climate is also of importance in hydrology research, as precipitation represents the most important input in the hydrological system. In particular, knowledge about the underlying mechanism and possible impacts of changes in the interannual variability are of interest.

We analysed how changes in the frequency of the alpine weather types (AWT) by Schüepp can influence seasonal and annual precipitation over Switzerland. The AWT can be derived from the Alpine Weather Statistics, a semi-objective catalogue by MeteoSwiss which provides daily weather characteristics for the central part of the European Alps since 1945. The analysis included a comparison of trends in both, precipitation amount and variability, with the frequency (number of days) and precipitation-productivity (average amount per season and per weather type) of the AWT. The results show more intensive precipitation within most of the AWT, and especially within those types which contribute higher-than-average to the total amount of precipitation. To explain the observed changes in precipitation amounts both the changes in frequency and productivity of the AWT have been used: The former mainly explain changes within the convective AWT, the latter within the advective ones. For spring a significant increase of precipitation variability was found, which results from increased variability of productiveness within the AWT. However, the driving forces behind the observed changes in the AWT still remain unclear. Future analysis of other climate-relevant data may be helpful.