



Daily precipitation in a changing climate: lessons learnt from Swiss national climate change scenario initiatives

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Precipitation is a key variable in the climate system that affects many aspects of the hydrological cycle such as river runoff, snow amount, or droughts. Climate change projections of precipitation and related impacts are therefore of fundamental concern for multiple sectors in many regions. Within the Swiss national climate change initiatives CH2011 and CH2014, several precipitation-dependent impacts were quantitatively assessed. This included consideration of projections of the mean annual cycle, as well as changes in extremes, wet-day frequency, and spell lengths. To better understand the needs of the primary and intermediary users of climate model data in Switzerland, a dialogue between the climate modeling and impact communities was established over recent years. In this presentation, we like to report about our experience with these needs, and on the steps we undertook to approach the emerging challenges regarding changes in precipitation.

In our work beyond CH2011, the multi-faceted characteristics of precipitation change over Switzerland are investigated based on the joint analysis of several regional climate model (RCM) simulations from ENSEMBLES at the A1B emission scenario. In some seasons, changes in precipitation frequency and intensity compensate each other, in other seasons just one of these two components changes. Yet, extreme daily precipitation events are projected to intensify in most seasons. In summer, a reduction of frequency yields an augmented risk of more multi-day dry spells and meteorological summer droughts. It is also in summer, when the model simulations exhibit an elevation-dependent shift in precipitation type toward more convective precipitation.

To accommodate the common need of many end-users in obtaining quantitative future projection data at multiple stations, we use a stochastic multi-site precipitation generator as main downscaling technique. In the presentation, we will present first results thereof and discuss, how end-users can handle changes in daily precipitation statistics for climate change scenarios.