



Drought occurrence in the Alpine Region, 1864-2050

P. Calanca (1) and M. Spörri (2)

(1) Agroscope Reckenholz-Tänikon (ART), Air Pollution & Climate, 8046 Zurich, Switzerland

(pierluigi.calanca@art.admin.ch), (2) ETH Zurich, Institute for Atmospheric and Climate Science, 8092 Zurich, Switzerland

Drought is one of the major threats to agricultural production worldwide. It occasionally affects agriculture in the Alpine region, although more intermittently than in other areas of Europe, notably the Mediterranean. Things may change, though, in the future if climate projections developed for the Alpine region in the context of the IPCC Fourth Assessment Report or the PRUDENCE project come true, with enhanced drought risk calling for adaptation.

The focus of this contribution is on the characterization of drought occurrence in the Alpine region during 1864-2050. The analysis relies on historical weather records from Switzerland covering the period 1864-2010 and projections from the ENSEMBLES project for 2010-2050. Drought is quantified in terms of the standardized precipitation index (SPI), the modified moisture index (MMI) and the seasonal mean soil moisture availability.

We show that the last decades were less prone to drought than the second half of the 19th century or the mid 20th century. We further examine these results using time series analysis and discuss regional differences. We then illustrate that according to the ENSEMBLES scenarios shifts in the drought regime until 2050 are likely to be less pronounced than previously thought, despite a marked warming and a moderate but significant increase in the length of dry spells. This suggests that further studies are needed to better understand changes in the hydrological cycle and their implications for drought risk.