

Swiss climate change scenarios: The CH2011 initiative

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The aim of the CH2011 initiative is to join expertise and knowledge of several Swiss climate research institutions and governmental offices to establish a robust assessment of how climate in Switzerland may change within the 21st century. This assessment provides an update of the previous climate scenarios referred to as CH2007. The update is based on high-resolution climate models from the ENSEMBLES project, includes an assessment of projection uncertainties based on a probabilistic Bayesian framework, and a review of relevant studies published in the scientific literature. The new CH2011 projections show that by the end of this century the Swiss climate will depart significantly from present and past conditions. Mean temperature will increase in all regions and seasons. Summer mean precipitation is expected to decrease by the end of this century all over Switzerland, while winter precipitation is likely to increase in Switzerland South of the Alps. In other seasons the changes in mean precipitation are uncertain. The magnitude of climate change in Switzerland depends on region and season, and particularly on the pathway of future greenhouse gas emissions. If emissions grow steadily (A2 scenario assumptions), the best estimate of the CH2011 projections indicates an increase of seasonal mean temperature of 3.3-4.7°C by the end of the century (2070-2099 relative to 1980-2009) depending on season and region, and a decrease of summer mean precipitation of 20-27% depending on region. On the other hand, if effective mitigation measures were implemented to halve global greenhouse gas emissions by 2050 (RCP3PD scenario assumptions), climate would still change in Switzerland over the next decades, but is projected to stabilize at 1.2-1.7°C warming and a summer drying of 8-10% by the end of the century. Along with these changes in temperature and precipitation means, also the nature of extreme events is expected to change, with potentially considerable impacts on society, economy and ecosystems. The assessment indicates more frequent, intense and longer-lasting summer warm spells and heat waves, while the number of cold winter nights and days is expected to decrease. Projections of the frequency and intensity of precipitation events are uncertain, but indicate more intense liquid precipitation events at the expense of snowfall events. The projections performed under the CH2011 initiative reflect the current level of scientific understanding and climate modeling capabilities, but will be subject to updates as new observations and model data become available.