



CH2018 - New climate scenarios for Switzerland: How to construct multi-model projections from ensembles of opportunity

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The new Swiss Climate Scenarios (CH2018) were released in November 2018, and consist of several datasets derived through various methods that provide robust and relevant information on climate change in Switzerland. The scenarios build upon the latest Regional Climate Model (RCM) projections for Europe produced through the internationally coordinated downscaling effort EURO-CORDEX. The model ensemble from EURO-CORDEX is by far one of the most downscaled domains, and consist of simulations at two spatial resolution (12 km and 50 km), a large number of dynamically downscaled Global Climate Models (GCMs) for three explicitly simulated emission scenarios (Representative Concentration Pathways, RCPs). However, with this unique dataset of regional climate scenarios, there are also practical challenges when it comes to interpret the model ensemble that contains an uneven number of simulations per RCP, per GCM and spatial resolution. Here we present the methodological chain to generate a multi-model ensemble that is consistent across RCPs and is used as a basis for deriving specific scenario-products. The different steps involve a thorough evaluation of the full EURO-CORDEX model ensemble, a pattern scaling approach to obtain equal number of simulations for each scenario in addition to scale from scenarios to warming targets. Since the CH2018 projections are the result of a cascade of processing steps, including the selection of GCMs contributing to the EURO-CORDEX ensemble in combinations with selected RCMs used for dynamical downscaling, the choice of RCM-GCM chains considered for multi-model analysis is associated with uncertainties that eventually add to the overall scientific uncertainty of the climate change signal. Therefore, in the end, a comparison of the probabilistic projections is done where uncertainties from these different effects are compared. The main goal of this presentation is to describe the procedure of which pragmatic choices and circumventions need to be undertaken to come up with a model ensemble, where all of the available regional climate simulations are considered.