

Moisture fluxes towards Switzerland: investigating future changes in CMIP5 climate models

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High integrated vapor transport (IVT) in the atmosphere directed perpendicular to the orography is an important proxy for flood related precipitation in many mountainous areas around the world. Here we focus on flood related IVT and its changes in a warmer climate in Switzerland, where most high-impact floods events in the past 30 years were connected to exceptional IVT upstream of the mountains.

Our study aims at investigating how these critical IVT values are projected to evolve in the future in a changing climate. The IVT is computed from 15 CMIP5 climate models for the past (1950-2005) and the future (2006-2100) under the RCP 8.5 scenario ("business as usual"). In order to check the accuracy of the models and the effect of the varying resolution, present day IVT from the CMIP5 models is compared with the ERA-Interim reanalysis data (period 1979-2015). A quantile mapping technique is then used to correct biases. The same bias corrections are applied to the future (2006-2100) IVT data. Finally, future changes in extreme IVT are investigated. This includes an analysis of changes in the magnitude and direction of the moisture flux in the different seasons for different regions in Switzerland.