



## **Hydrological modeling as an evaluation tool of EURO-CORDEX RCMs and bias correction methods**

Kirsti Hakala (1), Jan Seibert (1), and Nans Addor (2)

(1) Department of Geography, University of Zurich, Zurich Switzerland, (2) National Center for Atmospheric Research, Boulder CO, USA

This research explores the impacts of climate change on catchment discharge and addresses the challenge of characterizing and communicating their uncertainties. It particularly focuses on the integrated evaluation of EURO-CORDEX regional climate model simulations, using hydrological modeling at the catchment scale.

For the evaluation of the various RCMs combined with different bias correction operations there are two main approaches: 1) Separate evaluation of the statistical properties of each climate variable in terms of its statistical properties such as annual mean, seasonal variation, frequency of extreme events. This first approach is the standard way to evaluate RCM runs and bias correction methods. It also prevails by far in the literature. Here we introduce an alternative evaluation approach, which relies on hydrological modeling, 2) Combined evaluation of the different variables at the catchment scale; that is the evaluation is based on hydrological simulation results, which integrate the different variables (mainly temperature, precipitation and evaporation). Although more time demanding, this second approach has a critical advantage in that it allows a focus on the statistical properties of the climate variables which are most important for catchment-scale runoff. We rely on the semi-distributed hydrological model HBV and apply it to Swiss catchments representative of different hydrological regimes and expected responses to climate change.

This research investigates both approaches, however the second approach will be discussed in greater depth as an elegant way to consider the multitude of factors relevant for hydrological modeling all at once.