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CCHydro2018 – Transient Runoff Simulations from 1980-2099 in Switzerland

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Assessing future changes in runoff is very crucial for adaptation planners and decision-making authorities. While climate change impact assessments are standard today, transient simulations that also allow for estimation of the time-of-emergence of societal-relevant changes are far less carried out. Under the comprehensive framework Hydro-CH2018, we are simulating future runoff (1980-2099) using the new transient Swiss climate change scenarios CH2018 (will be published by end of 2018). The hydrological simulations are based on the semi-distributed hydrological model PREVAH. Changes in the glacier extent are incorporated from external simulation of glacier development for the next century. The impact of land use changes on the simulations is considered in a sensitivity framework. Over 180 catchments distributed over Switzerland covering a wide range of different catchment characteristics are simulated and analyzed. The project will determine potential runoff regime shifts under climate change. The transient property of the climate change scenarios enables the study to focus on the time of emergence of potential regime shifts. Further, analyzing trends in low flow (e.g. Q347) and high flow (e.g. flood frequency) indices provides a comprehensive perspective on the Swiss hydrological responses to climate change. The general concept and preliminary results are presented.