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Climate change impacts on hydrological extremes in Central Europe

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An increase of hydro-climatic extremes can be observed worldwide and is challenging national and regional risk management and adaptation plans. Our study presents and discusses possible trends in climate drivers and hydro-climatic extremes in Europe observed and under future climate conditions. In a case study for Germany, impacts of different regional climate scenario ensembles are compared. To this end, a hydrological model was applied to transform the scenarios data into river runoff for more than 5000 river reaches in Germany. Extreme Value Distributions have been fitted to the hydrographs of the river reaches to derive the basic flood statistics. The results for each river reach have been linked to related damage functions as provided by the German Insurance Association considering damages on buildings and small enterprises. The robust result is that under scenario conditions a significant increase in flood related losses can be expected in Germany, while also the number of low flow events may rise.