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Impact of climate aggregation over different scales on regional NPP modelling

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In spatial modelling of Net Primary Productivity (NPP), predictability and uncertainty depends on the availability of input data, as well as on the scale of the available data sets. Therefore, the study presented here quantifies the impact of aggregation effect of input data of different scales for a regional modelling approach using 5 different resolutions. As part of this study, the presentation focuses on the impact of the climate aggregation on the simulation of NPP. The effect is investigated on the

model results of 11 different crop and biogeochemical models simulating NPP for wheat and maize for the area of the German state of North Rhine-Westphalia. The focus of the study is on the impact of drought effects across the scales considered. The data are analysed on annual time steps we followed two approaches to investigate the impact of water limitation on primary production: First, two model runs, one considers water limitation and the other one ignores the impacts of water limitation on plant production second, an external definition of dry conditions by a drought index, only considering climate data, enables a separation of grid-cells and years with drought impacts, independent of the model internal functions. The results show hardly any difference between the overall average NPP across the scales, but some variability for the impact of extreme weather conditions on the simulated NPP.