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Detection and attribution of changes in flood probability

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The frequency, magnitude and type of extreme hydrological events are expected to change with climate change. However, other influences, such as construction of reservoirs, river training or land cover change, additionally affect the flood behaviour. Based on flood time series of more than 150 catchments in Germany, we analyse spatial patterns of changes in frequency, magnitude and probabilities of floods across Germany. In particular, we study the changes in the variability (or scale parameter) versus the changes in the mean (or location parameter), and the sensitivity of flood probability to changes in these parameters. In order to differentiate between climate-induced change and land cover change, we investigate if changes at inter-annual, decadal and multidecadal time scales are regionally stable, and if these changes can be linked to climatic variables. For selected catchments, an attempt is made to relate changes in flood behaviour to human-induced interventions in the catchments and to climatic change. Regionally and seasonally coherent results point to the influence of climate on changing flood probabilities in Germany in the last decades.