Probabilistic forecast of daily areal precipitation by an analogue method using large-scale weather patterns as additional information

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Statistical downscaling methods can be used to estimate the forecast uncertainty of meteorological hazards at the local scale. As a first choice of these methods the analogue method is frequently chosen due to its downscaling efficiency and computational simplicity. However, the forecast quality of the analogue method depends on the type of the large-scale weather pattern, which is often neglected in forecasting. To account this issue two approaches are presented in this study. In the first approach only analogue situations from the same weather pattern type are selected to provide a forecast. In the second approach a variable predictor domain is used depending on the weather pattern type. The large-scale weather patterns are described by daily circulation patterns derived from a fuzzy-rule based classification. As predictand daily areal precipitation of three mesoscale catchments is chosen located in the Rhine and Elbe basin in Germany. Predictors are taken from the NCEP/NCAR reanalysis project. The validation of both approaches is done for a period from 1958 to 2005 using a jacknife-method. The forecast quality is described by the ranked probability skill score and the economic value with focus on extreme events. In this presentation a short introduction in the methodology is given and the outcomes of the new approaches are compared to the result of the traditional method.