

Downscaling of climate parameters in catchment area of Bode

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This project is a part of main program RIMAX "risk management of extreme flood events", which concerns itself of "extremes floodwater and damage potential in the catchment area of Bode river in Germany „with the variable occurrence of flood events in this area for the past 1000 years. The objective of project is to produce the local climate time series as the input for hydrologic model in the catchment area of Bode for the last 1000 years on a grid of 5x5 km as well as the estimation of the spatial distributions and temporal variability of the precipitation, the amount of precipitation and further meteorological parameter (temperature, wind, radiation and relative humidity) for this area. The nonlinear downscaling has been used to produce 1000 year climate time series. The global model ECHO from Max Plank institute with T30 resolution and 1000 year data has been used as the global input. The regional model REMO, with T42 resolution and 40 years data has been used as the second Input (regional input). The observation data, which includes 30 years precipitation, radiation, temperature, wind and relative humidity time series, have been used as third input. Considering a parameter from observation as predictand and parameters from regional model as predictors the first fuzzy model has been developed. It is to be noticed that 20 year have been considered as training data and 10 years as checking data. The second Fuzzy model, which describes the relationship between global scale and regional scale (ECHO and REMO) has been developed as second fuzzy model. Regarding this 2 fuzzy models, we achieve the objective of this project, which is the downscaling of climate parameter in the catchment area of Bode. There are 118 Stations in Bode, which have been classified through a low pass filter into 4 classes. This classification makes the fuzzy modelling much easier and faster, because for each class there have been 2 Fuzzy model (first and second) developed. For the first class the precipitation peak appears in summer, although for second class it appears in winter. The third class shows its precipitation peak in summer as well as in winter. The fourth class includes stations, which has its own characteristics; they are located in high land and mountainous region (Harz). In our poster the first results of fuzzy modelling will be presented.