



## Interpolation of Global Monthly Rain-Gauge Observations for Climate Change Analysis

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Monthly precipitation sums are observed at thousands of meteorological stations worldwide. Different institutes (e.g. the Global Precipitation Climatology Centre, GPCC, and the Climatic Research Unit, CRU, of the University of East Anglia) interpolate these observations to regular grids. These data are used widely in climate research, e.g. for the investigation of the hydrological cycle and climate change.

Results of the interpolation depend on the station density, which varies considerably around the globe. It also depends on the interpolation method used (e.g. Ordinary Kriging and Shepard's Method). These methods are general interpolation methods that do not take into account the specifics of precipitation.

The question discussed in this presentation is whether we can do better by using an interpolation strategy especially designed for monthly precipitation observations. Based on a dense local dataset (one station per  $109\ km^2$ ) and a less dense global dataset (one station per  $27,000\ km^2$ ) of 50 years of monthly precipitation observations, various interpolation strategies are compared. This includes the interpolation of transformed variables, the consideration of local spatial correlation of precipitation as well as data quality. The Jack-knife error is used to compare the different strategies. The major result is that some strategies used so far are far from optimal.