



Reconstruction of missing precipitation data

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The raingauge networks throughout the world were established from the early 19th century onwards, but are now facing deterioration and a decrease in operational number. However, the recorded time-series are necessitated as valuable input to water resources management and engineering. A shortcoming of the recorded time-series is typically the absence of some data, either as single missing values or as entire missing recordings intervals. There are several standard methods (e.g. multiple linear regression, geostatistical regionalization) in order to address the shortcoming and to infill the missing data. In this study, these standard methods for the reconstruction of missing data are compared to the recently derived method of Quantile Kriging.

The method of Quantile Kriging firstly fits a selected two-parametric distribution function onto the recorded data of a specific raingauge. The estimated distribution parameters can be, therefore, assumed to be constant for the selected time interval and are, thus, known for every time-step, whether the raingauge was recording or not. As a consequence, only the remaining quantiles of the missing time-steps need to be regionalized to the location of the specific raingauge. The missing precipitation amount is ultimately estimated by reversion of the regionalized quantile and the specific distribution parameters to the absolute precipitation value. The variable for this comparative study are the time-series of monthly precipitation from 32 raingauges located within Northwestern Switzerland.