Geophysical Research Abstracts
Vol. 14, EGU2012-5430, 2012
EGU General Assembly 2012

Defining random and systematic error in precipitation interpolation

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Variogram-based interpolation methods are widely applied for hydrology. Kriging estimates an expectation value and an associated distribution while simulations provide a distribution of possible realizations of the random function at the unknown location. The associated error in both cases is random and characterized by the convergence of its sum over time to zero, being convenient for subsequent hydrological modelling.
This study addresses the quantification of a random and a systematic error for the mentioned interpolation methods. Firstly, monthly precipitation observations are fit to a two-parametric, theoretical distribution at each observation point. Prior to interpolation, the observations are decomposed into two distribution parameters and their corresponding quantiles. The distribution parameters and their quantiles are interpolated to the unknown location and finally recomposed back to precipitation amounts.
This method bears the capability of addressing two types of errors: a random error defined by simulating the quantiles and associated expectation value of the parameters, and a systematic error defined by simulating the parameters and the expectation value of the quantiles. The defined random error converges over time to zero while the systematic error does not, but creates a bias.
With perspective to subsequent hydrological modelling, the input uncertainty of the interpolated (areal) precipitation is thus described by a random and a systematic error.