Geophysical Research Abstracts
Vol. 16, EGU2014-3417, 2014
EGU General Assembly 2014

Infilling and interpolation of precipitation at different temporal scales in South Africa

Geoff Pegram (1) and András Bárdossy (2)

(1) University of KwaZulu-Natal, Civil Engineering, Durban, South Africa: pegram@ukzn.ac.za, (2) Institute of Hydraulic Engineering, Universität Stuttgart, Stuttgart, Germany: andras.bardossy@iws.uni-stuttgart.de

Hydrological observations are often incomplete – equipment malfunction, transmission errors and other technical problems lead to unwanted gaps in observation time series. Furthermore, due to financial and organizational problems, many observation networks are in continuous decline. As an ameliorating stratagem, short time gaps can be filled using information from other locations or other variables, such as circulation patterns. The statistics of abandoned stations provide useful information for the process of extending records. In this contribution the authors present a comparison of different methods for infilling gaps using:
- nearest neighbours
- simple and multiple linear regression
- black box methods (fuzzy rules and neural nets)
- Expectation Maximization
- Copula based estimation

The methods are used at different time scales for infilling precipitation from daily through pentads and months to years. The copula based estimation provides not only an estimator for the expected value, but also a probability distribution for each of the missing values. Thus the method can be used for conditional simulation of realizations. Observed precipitation data from the Cape region in South Africa are used to illustrate the intercomparison of the methodologies.

An outlook suggesting how to use these data for spatial interpolation concludes the presentation.