



Analysis of drought variability in data sparse regions

M. Seibert and H. Apel

GFZ Potsdam, Hydrology, Germany (mathias.seibert@gfz-potsdam.de)

Drought impacts can be mitigated by enhancing preparedness. For better disaster management an effective drought forecasting and monitoring system has to be combined with detailed knowledge of drought variability and local impact. In regions with low data availability remotely sensed data and global reanalysis data and forecasts play an important role to supplement low density monitoring systems. Many sources of data are available to the public and represent most of the complex aspects of drought. To investigate drought variability – temporal and spatial – several statistical methods have to be combined to characterize a region.

Here, we analyze drought variability in the Limpopo basin (southeastern Africa). We combine reanalysis data and drought indices to investigate meteorological drought. Vegetation indices provide an indicator of drought impact. We use empirical orthogonal function analysis and cluster analysis to find spatiotemporal patterns in drought conditions and identify homogeneous regions. For these homogeneous regions we extract a meteorological drought signal. Then, we employ wavelet analysis to investigate major characteristics of the drought signal. We seek to identify external climate factors such as ENSO having a major influence on drought occurrence. These factors can serve as a starting point for the investigation of predictors in a drought foreshadowing system enabling estimation of drought likelihood and severity with several months lead times. The foreshadowing based on statistical analysis and large scale climatic factors can complement physical model based forecasts for enhanced drought preparedness.