



## **Signatures of climate and weather regimes in runoff of the Middle Elbe near Dresden, Germany**

P. Carl and H. Behrendt

Leibniz Institute of Freshwater Ecology and Inland Fisheries, Limnology of Shallow Lakes and Lowland Rivers, Berlin, Germany (pcarl@wias-berlin.de)

To follow the traces that climate variability and change may have left in archives of terrestrial runoff, empirical modal structures are explored of observed streamflow and related climate and weather time series of the instrumental period. Here the signals are presented and discussed which may be found when using a strategy of two techniques of time series analysis in combination: matching pursuit (MP) and functional streamflow disaggregation (FSD). Hydrologic target of the study is the long daily record of Middle Elbe discharge at a gauging station near Dresden, Germany (period of interest: 1870-1997). At the regional scale, annual frequencies of occurrence of the leading five grosswetterlagen (i.e., weather regimes) for Europe are analyzed, together with annual Central European surface air temperature, German precipitation, and sea level pressure at the two action centers of the North Atlantic Oscillation (NAO), Azores high and Iceland low. Tropic/subtropical links via the NAO and Eastern Pacific sea surface temperatures to the Southern Oscillation, as well as more direct connections to Asian monsoon dynamics, are confirmed and demonstrated in terms of the purely empirical, yet non-probabilistic, uncalibrated functional (i.e., dynamic) signal relationships found.