Geophysical Research Abstracts,
Vol. 11, EGU2009-6232-3, 2009
EGU General Assembly 2009

Warm water events - Benguela Niños - in the southeast Atlantic Ocean since the beginning of the last century

J. Rathmann and J. Jacobeit

University of Augsburg, Institute of Geography, Universitaetsstrasse 10, D-86135 Augsburg, Germany
(joachim.rathmann@geo.uni-augsburg.de)

The occasional occurrence of anomalous warm water events in the upwelling regions of the Benguela Current, so called Benguela Niños (BNs), has striking effects on regional rainfall and on the local ecosystem, hence on the fisheries. However, whereas BNs have been studied based on data for the recent years, long-term studies are still lacking. Long-term trend analyses demonstrate a strong increase in the SSTs of the southern Atlantic whereas precipitation shows a high variability but no significant long-term trend pattern in the region of Angola and Namibia. Thus, the study focuses on extreme precipitation events as a possible result of BNs.

The present study is based on monthly observational data since 1901, including HadISST1.1 (1°x1° spatial resolution), HadSLP2 (5°x5°) and precipitation data (0.5°x0.5°), originally obtained from the Climatic Research Unit (Norwich) being updated and improved within the Potsdam Institute for Climate Impact Research.

First, rotated s-mode Principal Component Analyses (PCA) are applied in order to show coherent regions of SST-variability. The resulting time coefficients are analysed by Canonical Correlation Analyses (CCA) in order to investigate the influence of the Atlantic Ocean SSTs on the precipitation of southern Africa. Additional CCAs show possible links of tropical SSTs between the Atlantic, Indian and Pacific Ocean basins.

A useful BN-Index is described by the SST-PC time coefficients and compared to different SST indices. The normalized values of this index are used for composite analyses. The results confirm that BNs are generated by SLP-changes above the west-central equatorial Atlantic and show anomalously high SSTs in the Benguela Current and high coastal precipitation values. However, the CCA results clearly reveal that each BN has its own characteristic according to the amount of coastal precipitation. This makes BN forecasts difficult; additionally, regarding time series analyses, spectral and Wavelet analyses couldn't detect any significant cycle in the long-term BN occurrence.