



## **Decadal variability of the Elbe river streamflow**

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The decadal variability (>7 years) of annual Elbe river flow in connection with large scale atmospheric circulation is analysed for the period 1902-2002. The relationship with precipitation (PP) and temperature (TT) in the European sector and global sea surface temperature (SST) and atmospheric circulation over the Northern Hemisphere is investigated.

The correlation map with PP shows that high values of PP throughout the river catchment area occur in connection with high values of Elbe flow. Elbe flow is highly positive correlated with a PP index defined as the average PP over Elbe's basin.

On decadal time scale, high flow anomalies are strongly correlated with winter TT over land. There is an out-of-phase relationship between Elbe flow and TT over Scandinavian region. High positive correlation is also found with the TT over the northern part of Canada. This pattern in the TT field is similar to the negative phase of the Arctic Oscillation.

High anomalies of the river flow are associated with a tripole-like pattern in the North Atlantic and with negative SST anomalies in the central North Pacific and positive anomalies in the eastern and central tropical Pacific. The pattern identified in the sea level (SLP) field resembles the Arctic Oscillation pattern.

Two distinct decadal time components of  $\sim 12$ -13yr and  $\sim 20$  yr in the time series are identified by using the Singular Spectral Analysis.

These results have implications for predicting the evolution of Elbe river discharge on decadal time scales.