



Prediction of spring Elbe discharge based on stable teleconnections with winter global temperature and precipitation

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We examine the predictability of Elbe flow anomalies during spring using previous winter sea surface temperature (SST), surface air temperature (TT) and precipitation (PP) anomalies. Based on running correlation analysis we identify several regions where the spring flow anomalies are stable correlated with SST, TT and PP anomalies from previous winter. We show that during the period 1902-1971 the Elbe spring flow is stable correlated previous winter PP anomalies from its catchment area, TT anomalies from Black Sea-Caspian Sea region, northwestern Europe and northern Canada as well as with SST anomalies from the tropical Pacific, Indian Oceans and several regions from North Pacific and North Atlantic. An index based on winter SST, TT and PP anomalies from these regions is highly significantly correlated with spring flow anomalies during this period. Based on SST, TT and PP anomalies from stable correlated regions a forecast scheme is developed and applied to predict spring flow anomalies during the last decades. The prediction based on our statistical scheme represents a marked improvement relative to the forecast based only on the El-Niño-Southern Oscillation (ENSO) or the North Atlantic Oscillation (NAO) indices. A skilful prediction can provide guidance for water management in the Elbe river catchment area.