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Links between Sea Level in the NORTHER ADRIATIC SEA and large scale patterns

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This study explores the link between sea level in the Northern Adriatic sea, large scale SST (sea surface temperature), SLP (sea level pressure) and Mediterranean sea temperature and salinity at levels between 0 and 500 meters depth. Sea level data are provided by monthly values recorded at 7 tide gauges distributed along the northern coast of the basin, SLP data by the ERA-40 reanalysis that has been produced by ECMWF, SST by the extended reconstructed sea surface temperature (ERSST) that is based on the most recently available International Comprehensive Ocean-Atmosphere Data Set and is distributed by NCDC. Temperature and salinity data are provided by MEDATLAS/2002 database, from MEDAR/MEDATLAS project that stored temperature, salinity and bio-chemical parameters for the Mediterranean basin and Black Sea. The inverse barometric effect and the thermosteric effect provide the physical basis for the link, implying a sea level increase for increasing temperature and decreasing atmospheric pressure. The results are produced by a combination of PCA (Principal Component Analysis) and linear regression techniques. These linear statistical techniques have provided a good reconstruction of the temporal variability patterns and also of the individual time series of tide gauge stations.