



## **The deviation of semi-enclosed basin sea level from the global mean level: the case of Mediterranean and Black Sea during the 20th and 21st century.**

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Future sea level rise is a major threat to coastal zones, where high concentration of population and economic activities produces high risks. Consequently, there is a large demand for reliable projections at regional scale, for assessing their uncertainty and possibly reducing them. For applications to semi-enclosed seas (such as the Mediterranean and the Black Seas) the global sea level is not a meaningful indicator, as it is argued that local factors can produce large departures from global behaviour and add uncertainty to the projections.

In this study we explore to which extent future mean sea level of Mediterranean and Black Sea would depart for global mean. A statistical model, based on a multi-linear regression technique and criteria (such as Principal Component Analysis) for the choice of predictors, describes the statistical relation linking three variables at global scale (mean sea level pressure, surface air temperature and the net precipitation-evaporation balance) to the regional sea level anomaly, which is computed as the difference between global sea level and Mediterranean or Black Sea level. In fact, correlation analysis shows a strong link between these fields and sea level anomaly and those variables are shown to provide a successful reconstruction of past observed variability. In this study observed sea level records are extracted from PSMSL (Permanent Service of Mean Sea Level) and projections are based on data provided by CMIP5 simulations. The use of multi-model data allows assessing uncertainties of the obtained projections.

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