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Scenarios for Future sea level change in the Mediterranean Sea

Marta Marcos and Michael N. Tsimplis
Ocean Observing and Climate, National Oceanography Centre, Southampton, UK

Global sea level rise estimates during the 21^{st} century range between 9 and 54 cm according to the 4^{th} Assessment Report of the Intergovernmental Panel of Climate Change (IPCC), released in 2007. In this framework, atmosphere-ocean global coupled models (AOGCM) simulate the thermal expansion of the oceans under different emission scenarios, which describe different demographic and socio-economic conditions and future greenhouse and sulphur emissions.

We have used the potential temperatures (ϑ) and salinities (S) coming out from the models and we have extracted the region of the Mediterranean Sea and the adjacent Atlantic area (longitude -15W to 36E, latitude 30N to 47 N). Changes in ϑ and S profiles are investigated at particular points in the Eastern and Western basins of the Mediterranean Sea with the aim of inferring the possible warming and salinification of intermediate and deep waters. The Mediterranean Sea is particularly interesting due to its locally forced thermohaline circulation independent of the Atlantic Ocean. We have also computed the regional sea level for the different climate scenarios defined by the IPCC using the available numerical AOGCMs.

The results of a regional model under the A2 scenario are used to determine the benefits of global versus regional modelling. Sea level trends for the 21^{st} century are obtained for the Mediterranean basin and sub-basins and compared with global estimates of sea level rise.