



Mediterranean sea level variability changes and projections at high frequencies (1-100 days)

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Long-term sea level variability changes (1960-2000) and projections (2000-2100) over the Mediterranean have been investigated, in order to document the changes in sea level energy and extremes over different frequency bands (1-3, 3-10, 10-100 days). An ocean 2D numerical model with resolution of 1/60 has been forced by surface wind and air pressure fields derived from regional atmospheric model runs, under the control and three different climate scenario runs (A1B, A2, B1) forced by GHGs concentrations. Sea level variability obtained by the control run has been verified on the hindcast ocean model run forced by ARPEGE reanalysis surface fields, and on the available tide gauge data. A noteworthy decrease in sea level energies over the Mediterranean can be seen over 1-3 day periods for A2 and A1B scenarios, and smaller for B2 scenario, being compliant with a negative trends projected for cyclonic activity found in literature. For 3-10 and 10-100 day periods, of which the latter encompass the planetary wave dynamics and its influence to the sea, the decrease rate is much smaller and can be found in the eastern and western parts of the Mediterranean, while higher energies (and even increase in B2 projections) can be found in central Mediterranean and southern shorelines. A negative energy trends over planetary wave frequencies indicate a decrease in duration of coastal floods, which, together with a noteworthy decrease in cyclonic activities, may partially mitigate coastal flooding caused by the plausible increase in mean sea level.