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# Climate change impacts of marine storminess along the coast of the Mediterranean sea: ensemble multi-model and multi-scenario projections

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The Mediterranean Sea, because of its complex morphology and intense air-sea interaction, is a very interesting case study for showing the importance of regional wave climate projections. This contribution reports on the results of a set of seamless simulations for the period 1950 2100 that have been performed with the WAM model. Wind forcings produced by different regional climate models and adopting multiple emission scenarios (A1B, RCP4.5, RCP8.5) have been used. Results allow identifying the parts of the coastline that will be most affected by future changes of storm intensity and of wave regimes.

The analysis is based on three sets of regional climate model simulations. A first set consists of former A1B “CMIP3” projections carried out within the fp6 CIRCE project, to which two recent sets of RCP4.5 and RCP8.5 projections produced within the MedCORDEX component of CORDEX are added. Each set consists of independent simulations carried out with different regional models and downscaling different global projections. The results are analyzed in terms of future changes ofextreme significant wave height, wave direction and frequency along the Mediterranean coast. This large set of data allows to explore uncertainty related to the emission scenario, model and decadal variability for a time range reaching the end of the 21st century.

This study is part of the activities of RISES-AMproject (FP7-EU-603396).

Results quite consistently show a progressive future reduction of marine storminess along most of the Mediterranean coastline, whose intensity decrease along the 21st century and with the emission level, being largest for the RCP8.5 scenario at the end of the 21st century. Results are combined with a classification of the Mediterranean coastline morphology to identify the parts of the Mediterranean coastline that are most vulnerable to climate change also accounting for the effect of sea level rise.

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