



First interdisciplinary approach to the effects of an extreme climate event on Mediterranean coastal assemblages

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A severe storm hit the Catalan coast (NW Spanish Mediterranean) on December 26, 2008. The storm lasted for three days and generated waves up to 14m of Hmax, being the highest wave ever recorded instrumentally in the northern part of the Catalan coast since the last 50 years. This violent storm caused extensive damage in harbours, beach promenades, waterfronts, and other coastal infrastructures causing losses of millions of Euros and capturing national attention in the media. Over 45 marine biologists and engineers joined forces in an unprecedented collaborative attempt to investigate the ecological effects of this storm. The main goal was to shed light on the role of this infrequent and extreme event in shaping the structure and the dynamics of a variety of marine coastal communities and populations from 0 to 20m depth (rocky and sandy bottom communities, photophilic algae, deep algae, sea urchins, sponges, gorgonians, seagrasses, fishes, spiny lobsters, fan mussels, date mussels, etc.). The project benefited from long-term data series collected by some of the participating research groups. These series allowed to make invaluable detailed before/after storm comparisons. The methodological approach included direct field observations, modelling, and opinion polls. This study evidenced impacts ranging from 0% to 100% loss of individuals or cover, and allowed to identify the main factors and mechanisms leading to damage, and to match the shear stress forces with the estimated impacts. Overall, the project has provided the first comprehensive assessment of the resistance and resilience of coastal communities to extreme climate events.