

Effect of climate change on storm occurrence in the Gulf of Lions
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Coastlines and coastal plains, especially those suffering from long-term erosion, are particularly susceptible to the impact of high energy events. Among the morphological responses to storm energy, impacts like marine submersion, breaching of the barrier are mostly inclined to affect lagoon systems. In a context of climate change, the rise of the mean sea level will increase the impact of marine storms, and a possible variation in storm occurrence and/or storm intensity is to be determined.

Within the European project MICORE (Morphological Impacts and Coastal Risks induced by extreme storm events), an analysis was undertaken to assess storminess trends along Europe for the last decades.

Using available datasets, the magnitude and frequency of storms had been analysed in order to determine storm trends over a period spanning the last 30 years. Meteorological and marine data available were included in the analysis. Here the aim was to improve understanding of coastal responses to changes in storminess and only events above a locally defined storm threshold were considered.

In the Gulf of Lion Region, backward modelling was performed to obtain wind and wave time series that were validated using the available datasets (wave series acquired by the Direction Régionale de l'Équipement). Quantitative and qualitative analysis was undertaken to determine the threshold for major morphological changes and for damages.

The storm duration analysis performed for the Gulf of Lions Region did not find any statistically significant change during the studied period. Variability was observed in the storm occurrence and storm intensity but it was not possible to observe any clear association between storminess changes and changes in the global climate. This does not imply that global climate change consequences (e.g., sea temperature increase, sea level rise etc.) will not have an influence on European storminess and on storminess impacts in the future. However, for the existing and available data sets at a European level, those impacts have not been detected in this study.