



Improving the forecast of hazardous Mediterranean storms: A climatology of sensitivities

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The Mediterranean is a very populated region frequently affected by hazardous storms that produce high hydro-meteorological societal impact. One of the multiple approaches currently explored to mitigate their effects aims at improving the weather numerical forecasts, primary forecaster's guidance for these events due to the key role played by subsynoptic scales. During recent years, and under an ever increasing societal demand for cost cuts and more precise forecasts, great interest has grown within the operational weather community on the adaptable component of observational networks. EUMETNET is compromised along these lines and is designing and coordinating the evolution of the composite observing system (EUCOS) to be optimized at European scale with a view to improve short range forecasts over Europe without increasing the overall cost. Decisions regarding where to deploy new observations of special interest under threatening weather, or regarding permanent changes in observational strategies need support from sensitivity studies that determine areas where the addition of observations would optimally improve the skill of numerical predictions. In collaboration with EUCOS, the MEDEX project (<http://medex.inm.uib.es>) proposes the creation of a climatology of sensitivities of a collection of severe weather episodes in the Mediterranean. The main challenge of the study is the classification of events when no exhaustive and systematized database of Mediterranean high-impact weather episodes exists. Various approaches are explored to build the climatology of sensitivities. A first attempt makes use of the link between Mediterranean hazardous weather and intense cyclones. An objective classification of the most intense Mediterranean cyclones from the ECMWF ERA40 analysis is performed and sensitivities are computed for each group, resulting in a prototype sensitivity field for each class of intense cyclones. However, an important portion of the hazardous events in the

Mediterranean are not linked to significantly intense cyclones. For these cases, we use the MEDEX catalog of notable episodes and perform a subjective classification based on their geographical distribution and the type of event.

We explore various aspects of the sensitivity fields such as the temporal evolution, the intensity, or the most sensitive fields. Preliminary results show that although the sensitive areas for Mediterranean high impact weather are not particularly confined, it is remarkable how areas poorly sampled by the regular observing networks, such as North Africa and the eastern North-Atlantic, are highlighted in the climatological sensitivity maps.