

Quantitative assessment of future climate conditions favorable to medicane development

Medicanes are extreme events that occasionally occur over the Mediterranean Sea, threatening the islands and coastal regions. These storms have smaller dimensions than tropical cyclones but similar development mechanisms and satellite appearance. A genesis index for tropical cyclones which involves some large-scale meteorological is revealed as an appropriate discriminating parameter to detect which areas have a potential risk to develop a medicane. Combining this result with our goal to evaluate the quantitative risk of medicanes under future climate conditions, this study implements the first steps towards that assessment. The ability of the MM5 model to simulate past medicanes is proved. These control simulations have been run and forced using large-scale analyses with a resolution at the same order than current GCMs. Then, areas presenting high values of the genesis index are identified and numerically simulated with MM5. Results from ERA-40 are compared against the satellite-based climatology of events and with GCM-derived results. Possible medicane development in the simulations is checked manually, but an automatic objective detection algorithm will be implemented.