



CLIMATOLOGICAL AND METEOROLOGICAL ASPECTS OF WESTERN MEDITERRANEAN CYCLONES: IMPACTS ON PRECIPITATION

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Heavy rain and other high impact weather events in the Mediterranean (e. g. strong winds) are frequently associated to cyclones, which can range from synoptic to mesoscale in size, and from pure baroclinic systems to orographically or diabatically modulated disturbances in type. Any improvement of the climatology, physical understanding and forecasting of these atmospheric circulations becomes crucial for a better knowledge and forecasting of heavy rain and flooding, the Meteorology-related natural hazard of highest societal impact in the Mediterranean countries. Many national and international research efforts (e.g. MEDEX, a WWRP WMO project) have been directed towards such improvement. On the other hand, regional projections of the climate change effects on the frequency and spatial distribution of cyclones is an essential task to envisage future rainfall regimes and their extreme manifestations (floods and droughts). According to the spirit of the "Medal Lectures", physically-based and statistically-based numerical techniques used for the study of cyclones and their impact on precipitation will be described in general terms, understandable to any geoscientist. Focusing on the western Mediterranean region, where the awardee has devoted most of his work, some recent achievements concerning the genesis and nature of well-known catastrophic cyclone events and the regional impact of climate change will be described.