



Do Vestige Atlantic Hurricanes Trigger Cyclonic Storms Over Mediterranean Basin ?

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One of the more interesting tropical - mid-latitude dynamics interactions is one that has important effects on precipitation within the Mediterranean basin. This interaction consists of an Atlantic tropical cyclone or cyclone vestige whose original disturbance travels eastward and northward across the Atlantic basin, eventually intermingling with a mid-latitude cyclone entering southern Europe and/or the western Mediterranean basin. The period for these interactions is from mid-September through the month of November. If the tropical cyclone and/or its vestige is able to make the eastward Atlantic transit within the low to mid-levels, or if an upper level potential vorticity perturbation (jet streak) emitted by a Hurricane in its latter stages within the central Atlantic is able to propagate into and along the longwave flow affecting the western Mediterranean basin, then there is the prospect for a tropical cyclone remnant to produce a modification of a mid-latitude storm system affecting the Mediterranean basin. For such an occurrence to take place, it is necessary for an amplifying baroclinic perturbation to be already situated to the rear of a longwave trough, or to be excited by the emitted jet streak to the rear of a longwave trough – in either case, preparing to affect the western Mediterranean. In the first part of this presentation, we present the past history and qualitative evidence for these interactions. Then in a second part, we explore through numerical modeling the quantitative process of how such an interaction might take place. The Algiers City flood of 9-10 November 2001, which killed some 700 people, was produced by a Mediterranean cyclone that most likely was influenced by the cumulative influence of Atlantic tropical storm Lorenzo and two vestige Atlantic hurricanes, Michelle and Noel. A published modeling study involving various of this study's authors, has already described the dynamical development of the Algiers storm as it amplified from a developing baroclinic disturbance within a Rossby wave train, into a northern Africa hazardous flood system – then lingered in the western Mediterranean basin as a semi-intense warm core cyclone. In retrospective modeling experiments, we investigate how the Atlantic tropical cyclone – Mediterranean storm interaction may have occurred, and the eventual impact on how the interaction influences precipitation in the Mediterranean basin.