



## **Calendaricities and multimodality in the Eastern Mediterranean cyclonic activity**

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Calendaricities, or the occurrence of weather anomalies on fixed calendar dates, are investigated for the Eastern Mediterranean (EM) surface synoptic systems. Comparison of two 28-yr periods, 1948-75 and 1976-2003, based on the NCEP/NCAR reanalysis, showed similarity in the timing of peaks in EM cyclonic activity [1] as well in the seasonal courses for typical EM synoptic systems [2]. Considered anomalies are the maximum and minimum frequency of occurrence of the synoptic systems bearing rainfall. Those are mostly the Winter Lows (Mediterranean cyclones) passing over Cyprus en route eastward of the Ionian Sea where they are generated in situ or come to from N. Italy.

The Winter Lows produce rainfall over central and northern EM areas like Cyprus, Israel, Lebanon, NW Syria, W. Jordan. The EM winter was found to have five maxima of cyclonic activity, centered on early February and nearly bell-shaped over their magnitudes. This supports the earlier hypotheses of multimodality in the EM rainfall.

The southern EM areas, i.e. S. Israel and NE Egypt, get rainfall followed by floods due to both Winter Lows and some portion of the mostly dry Red Sea Troughs (RST) that under favorable conditions aloft turn out to cause heavy rainfall. The RST have their maximum occurrences in the late October - early November, and their rain-bearing portion falls as well on this period of a year. While the RST maximum occurrences keep their timing, their magnitudes change from year to year. The increasing annual trend in the RST maximum occurrences is linked to the same in their whole seasonal course [3]. This may explain the "rainfall paradox" with an increase in annual average rainfall observed over the past decades in southern parts of Israel and a decrease in the north. Extreme daily rainfall increased, despite a decrease in total rainfall [4].

References:

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