Contrasts between precipitation over Mediterranean Sea and adjacent continental areas based on decadal scale satellite estimates

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Most knowledge concerning the last century's climatology and climate dynamics of precipitation over the Mediterranean Sea basin is based on observations taken from rain gauges surrounding the sea itself. In turn, most of the observations come from Southern Europe, with many fewer measurements taken from widely scattered sites situated over North Africa, the Middle East, and the Balkans. This aspect of research on the Mediterranean Sea basin is apparent in a recent compilation of studies presented in book form concerning climate variability of the Mediterranean region [Lionello, P., P. Malanotte-Rizzoli, and R. Boscolo (eds.), 2006: *Mediterranean Climate Variability*. Elsevier, Amsterdam, 9 chapters.] In light of this missing link to over-water observations, this study (in conjunction with four companion studies by Z. Haddad, A. Mugnai, A. Mehta, and G. Stephens) will contrast the nature of precipitation variability directly over the Mediterranean Sea to precipitation variability over the surrounding land areas based on three decades of satellite-based precipitation estimates which have stood up well to validation scrutiny. The satellite observations are drawn from the Global Precipitation Climatology Project (GPCP) dataset extending back to 1979 and the TRMM Merged Algorithm 3b42 dataset extending back to 1998. Both datasets are mostly produced from microwave measurements, excepting the period from 1979 to mid-1987 when only infrared satellite measurements were available for the GPCP estimates. The purpose of this study is to emphasize how the salient properties of precipitation variability over land and sea across a hierarchy of space and time scales, and the salient differences in these properties, might be used in guiding short-term climate models to better predictions of future climate states under different regional temperature-change scenarios.