Frequency of extreme precipitation climate events over the Mediterranean region according to NNRP data for 1961-2000

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Interannual variability of extreme precipitation events (Prec) over the Euro-Mediterranean region is investigated based on data on the number of days/month with extreme values of several atmospheric characteristics. The frequencies are calculated based on the NCEP/NCAR reanalysis daily 3D data from 1961 to 2000 available with 2.5 x 2.5 deg resolution. The daily data available from the NNRP dataset are complemented by 2D those on dynamic tropopause pressures (PDT). Frequencies of days with extreme values of the Prec, PDT and integrated water vapor (IWV) in each month of the 40 year period are then determined (Carril et al. 2008). Frequencies of days with the IWV values higher that 10 kg m^{-2}, are also calculated. Maps of spatial correlations between teleconnection indices of the NAO, EAWR, SCAND, NINO3.4 and EAWM with each of the three characteristics are constructed. The NAO, EAWR, SCAND and NINO3.4 time series used are those from the CPC NCEP website (http://www.cpc.noaa.gov/data/). Used in the analysis time series of the EAWM are calculated from the IWV frequency data using the EOF analysis approach to identify the area where the EAWM-associated extremes maximize.

Figs. 1a-d present the patterns with frequencies of extreme IWV days for September, November, January and March respectively. The eastern part of the Mediterranean region (EM) is found here in a zone with a low frequency of extreme IWV days. A gradual decrease in the frequency of extreme Prec from November to March may be noted over

north-Africa. A rise in the number of days with extreme Prec events over the EM may be noted to the end of the cool season. The tendency (Figs. 2a-d) appears to be associated with an increase of contribution of the water vapor originating from the Indian Ocean area in the EM precipitation due to progress in formation of the Indian summer monsoon circulation patter to the end of cool season.

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References:

Carril AF, S. Gualdi, A. Cherchi, A. Navarra (2008) Heatwaves in Europe: areas of homogeneous variability and links with the regional to large-scale atmospheric and SST's anomalies

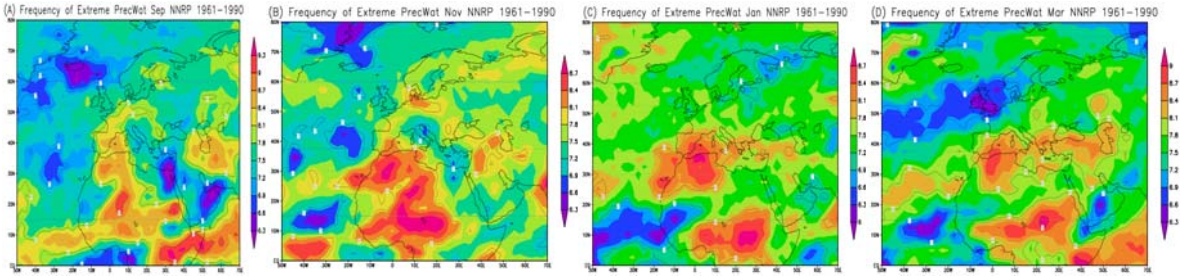

Fig. 1 Mean 40-years of days with extreme IWV values over the Euro-Mediterranean region during (a) September, (b) November, (c) January and (d) March,

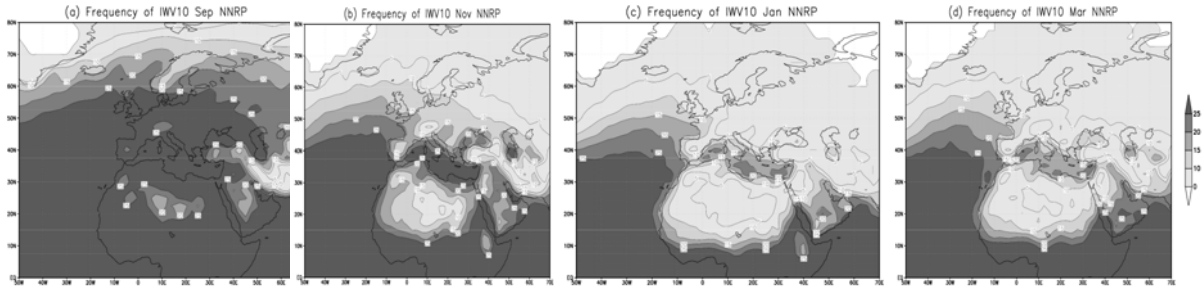

Fig. 2 Same as in Fig. 1, but for the days with IWV values greater than 10 kg m^{-2}