Geophysical Research Abstracts
Vol. 14, EGU2012-8974, 2012
EGU General Assembly 2012

Variability of Mediterranean cyclonic activity associated with the NAO and AMO

A. Polonsky (1) and M. Bardin (2)

(1) Marine Hydrophysical Institute, Marine Climate Research, Sevastopol, Ukraine (apolonsky5@mail.ru, +380 692 55-42-53), (2) Institute of Global Climate and Ecology, Moscow, Russia

In this presentation we describe connections between the seasonal statistics of Mediterranean synoptic-scale atmospheric vortices and phases of principal interannual to multi-decadal Atlantic climatic signals, or leading climate modes, such as North Atlantic Oscillation (NAO) and Atlantic Multi-decadal Oscillation (AMO). The relationships are derived from empirical data. Archives of Mediterranean cyclones and cyclone tracks from 1951 (and from 1901) to 2010 were compiled based on 6-hrs the 1000 hPa geopotential heights from NCEP/NCAR reanalysis data (and from the so-called "20th Century reanalysis", or R20C). The monthly characteristics of the cyclonic activity (cyclone frequency, area and intensity) for the cells of a 5-degree grid and for entire Mediterranean regions were used to calculate climate statistics and evaluate relationships between regional cyclonic activity and climate modes. Analysis of the interannual to multi-decadal variability of Mediterranean cyclonic characteristics associated with the NAO, and AMO showed that their joint influence accounts for significant proportion of total variance of winter cyclone parameters. The positive phase of the NAO and AMO is accompanied by decreased frequency and area of cyclones in the Mediterranean region. Both cyclogenesis and cyclolysis in the weak NAO phase are much more widespread over extratropics in the Atlantic – European sector. In the strong NAO phase, they are concentrated within the narrower band in the northern part of this region and in the western Mediterranean – the Near East.