



Analysis of cyclones formed in the Mediterranean region based on the ERA-40 data

R. Pongrácz (1), J. Bartholy (1) and M. Pattantyús-Ábrahám (2)

(1) Dept. of Meteorology, Eötvös Loránd University, Budapest, Hungary, (2) Dept. of Hydraulic and Water Resources Engineering, Budapest University of Technology and Economics, Budapest, Hungary (prita@elte.hu/Fax: +36 1 372 2904)

Midlatitude cyclones are analyzed on a selected region covering most part of southern Europe and the Mediterranean Sea (i.e., 35-50°N, 10°W-25°E). On the base of mean sea level pressure fields of the ECMWF (European Centre for Medium-range Weather Forecast) Reanalysis Dataset (ERA-40), detailed evaluation of the Mediterranean cyclones is accomplished for the period between 1957 and 2002 on a 1-degree horizontal resolution grid. Cyclone centers are identified using anomaly fields, and then, the paths of these mid-latitude cyclone centers are tracked with a 6-hour time step (using 00 UTC, 06 UTC, 12 UTC, and 18 UTC). Decadal, annual, and seasonal statistical analysis of cyclone tracks includes the study of the genesis, the frequency and the activity of the Mediterranean cyclones, as well, as the variability of cyclone tracks. The results suggest that the cyclone frequency in the entire Mediterranean region increased in summer and autumn, and decreased in winter and spring. A special belt-shape area is identified, which plays a special role in cyclogenesis, and also, the cyclone tracks often remain within this belt. An overall decreasing trend is detected in winter and spring in the entire Mediterranean belt, while cyclone frequency increased in autumn. The largest positive and negative trend coefficients are identified in summer.