



## **Northern Hemisphere midlatitude cyclones: A comparison of detection and tracking methods and different reanalyses**

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The applicability of three different cyclone detection and tracking schemes is investigated in ECMWF (ERA-40) and the NCEP-NCAR reanalysis data set. Cyclone climatologies and cyclone characteristics are intercompared within the data sets and the three methods. ERA-40 shows systematically more cyclones, and therefore a higher cyclone center density than NCEP-NCAR. Geopotential height gradients around cyclone centres, a measure of cyclone intensity, are enhanced in ERA-40 compared to NCEP-NCAR. The variability of the number of cyclones per season is significantly correlated between the two reanalysis data sets, but the time series of the cyclone intensity exhibit a higher correlation. This suggests that the cyclone intensity is a more robust measure of variability than the number of cyclones. The comparison of the methods is based on the ERA-40 data set and shows a generally good correspondence between different schemes. There are two technical aspects, differences in criteria of the cyclone identification and different approaches in cyclone tracking. Differences in both lead to deviations in cyclone length. Applying life-time thresholds, some of the cyclone tracks might be too short to be included in statistical measures of cyclones. Thus, it is often not clear which scheme is correct or wrong. Nevertheless, conse-

quences of these differences in the mean cyclone characteristics are minor, but for specific research questions, e.g., what is the cyclone activity in the Mediterranean in winter, the users should be aware of these potential differences and if necessary adjust their scheme.