



Polar Lows in Reanalyses and High Resolution Global Climate Models

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Polar lows are maritime meso-cyclones associated with intense surface wind speeds and oceanic heat fluxes at high latitudes. The ability of the ERA-Interim (ERA-I) reanalysis to represent polar lows in the North Atlantic is assessed by comparing ERA-I and the ECMWF operational analysis for the period 2008–2011. The operational analysis has vorticity structures that better resemble the observed cloud patterns and stronger surface wind speed intensities compared to those in ERA-I. By applying objective identification criteria, about 55% of the satellite observed polar lows are identified and tracked in ERA-I, while this fraction increases to about 70% in the operational analysis. Particularly in ERA-I, the remaining observed polar lows are mainly not identified because they have too weak wind speed and vorticity intensity compared to the tested criteria. The implications of the tendency of ERA-I to underestimate the polar low dynamical intensity for future studies of polar lows is discussed. The ability of the Met Office HadGEM3 global climate model at different horizontal resolutions (150km, 60km and 25km) to capture Polar Lows will also be discussed.