



Climatic analysis of the conceptual model of cold air development

M. Tesouro (1), P. Ribera (2), D. Gallego (2), L. de la Torre (1), L. Gimeno (1)

(1) Campus Ourense, University of Vigo, Spain, (2) University of Pablo de Olavide, Sevilla, Spain

A complete 57 years climatology, between 1948 and 2004, of Cold Air Development (CAD) events has been developed. To do this, the following meteorological parameters: absolute topography; thermal front parameter; equivalent thickness; temperature advection and vorticity advection in several pressure levels were calculated. The data used to calculate those parameters consist on 6 hourly temperature, u-wind, v-wind, relative humidity and geopotential height from the NCAR-NCEP reanalysis for the region between 20°N to 70°N and 180°W and 180°E. With those data four principal areas of higher occurrence can be observed, one of these areas is found in the Northern Pacific, especially over the Gulf of Alaska, other area in the Mediterranean Sea, centred over Italy; a third area of occurrence of CADs can be detected over the North Atlantic, from the Hudson Bay to the Labrador Sea and a fourth area in the Northern Atlantic, being the two first ones most important areas in terms of occurrence. When the global seasonal distribution of CADs is analyzed we can observe a maximum during spring and a minimum during winter, being May the month with the highest frequency of occurrence and February the one with the lowest. We can also detect a significant positive trend in the annual number of CADs. We also analyzed duration and tracks of these systems, being the most remarkable result the fact that their duration is very short, most of them only last less than 24 hours.