



## **A climatology of Cold Air Development based on objective methods**

**M. Tesouro (1), P. Ribera (2), D. Gallego (2), L. de la Torre (1), L. Gimeno (1), R. Garcia-Herrera (3), A. Redaño (4), A. Garcia (5)**

(1) Campus Ourense, University of Vigo, (2) University of Pablo de Olavide, Sevilla, (3) University Complutense, Madrid, (4) University of Barcelona, Barcelona, (5) University of Extremadura, Badajoz, SPAIN

An objective method has been developed to produce a complete climatology of Cold Air Development (CAD) events from the following meteorological parameters: (1) Absolute topography at 500 hPa and 1000 hPa; (2) Thermal front parameter at 500 hPa; (3) Equivalent thickness at 500-850 hPa; (4) Temperature advection at 500hPa; (5) Vorticity advection at 300 and 500 hPa. To do this we used 6 hourly data from the NCAR-NCEP reanalysis for the region between 20°N to 70°N and 180°W and 180°E. 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. 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.