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Weather types and the regime of wildfires in Portugal

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An objective classification scheme, as developed by Trigo and DaCamara (2000), was applied to classify the daily atmospheric circulation affecting Portugal between 1980 and 2007 into a set of 10 basic weather types (WTs). The classification scheme relies on a set of atmospheric circulation indices, namely southerly flow (SF), westerly flow (WF), total flow (F), southerly shear vorticity (ZS), westerly shear vorticity (ZW) and total vorticity (Z). The weather-typing approach, together with surfacemeteorological variables (e.g. intensity and direction of geostrophic wind, maximum and minimum temperature and precipitation) were then associated to wildfire events as recorded in the official Portuguese fire database consisting of information on each fire occurred in the 18 districts of Continental Portugal within the same period (>450.000 events).
The objective of this study is to explore the dependence of wildfire activity on weather and climate and then evaluate the potential of WTs to discriminate among recorded wildfires on what respects to their occurrence and development. Results show that days characterised by surface flow with an eastern component (i.e. NE, E and SE) account for a high percentage of daily burnt area, as opposed to surface westerly flow (NW, W and SW), which represents about a quarter of the total number of days but only accounts for a very low percentage of active fires and of burnt area. Meteorological variables such as minimum and maximum temperatures, that are closely associated to surface wind intensity and direction, also present a good ability to discriminate between the different types of fire events..

Trigo R.M., DaCamara C. (2000) "Circulation Weather Types and their impact on the precipitation regime in Portugal". Int J of Climatology, 20, 1559-1581.