



Abstract

Typical Weather Conditions of Large Wildfires in Portugal (1980–2018) †

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Over the last few decades, Extreme Wildfire Events (EWE) have been reported, especially in the Mediterranean basin. In Portugal, major events occurred in 2003, 2005 and 2017. The year 2017 was a particularly severe year with two tragic EWE, the first on 17 June, related to the interaction between Mesoscale Convective Systems and fire fronts [1] and the second on 15 October, associated with an extended dry period and unusual rate of spread of the fire front, contributing to the extraordinary annual burned area (540,000 ha) [2–4]. Although these extreme events result from the combination of multiple factors, it was quite clear that meteorological conditions played an important role in ways not yet fully understood. In the framework of the FireStorm project, a methodology based on circulation weather patterns [5] was applied to provide a detailed description of the meteorological conditions during these events. To determine the relationship between CWT and EWE, extreme wildfire periods (EWP—periods with daily burned area over 3000 ha) were defined [6]. The results obtained suggest that northeast and east flows are predominant in the EWP, with air temperature and relative humidity anomalies at the low troposphere, about +5 °C and –20%, respectively. The Cyclonic pattern is marginally present in EWP, associated with a moderate or strong southerly flow. The importance of fuel moisture content in the vegetation and drought was also evaluated; the findings suggest the greater relevance of water deficit of 8 days preceding EWP. The Fine Fuel Moisture Code values were above the 90th percentile for 45 out of 53 EWP.

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