

Negligent and intentional fires in Portugal: the role of human and biophysical drivers on the temporal distribution

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Portugal is the European country with higher number of fires (NF) and burnt area (BA) per unit of land area. The annual number of fires for which the cause of fire is known is not constant and relatively small (typically less than 50% of annual number of records). Nevertheless, the analysis of the fire causes reveals that the vast majority (99%) of the fires in Portugal are of human origin and only a small fraction are of natural origin (1% caused by lightning). The study period will be the recent years of 2012 – 2014, when fire recording procedures are more reliable and the cause of ignition was assessed for more than 50% (19376) of the fires. The fires with approximately seventy different causes of fire defined/recognized by the Portuguese Forest Service (ICNF) were grouped into negligent, intentional and natural fires. For this study the authors proposes the use of the Nomenclature of Territorial Units for Statistics level II, which divides Portugal in 5 basic economic regions, namely Norte, Centro, Área Metropolitana de Lisboa, Alentejo, and Algarve. Most of the fires (54%) occur in the so-called critical period defined between July and September, but high wildfire activity may also occur in few periods of the remaining months (especially in February and March). The intentional fires represent 40% of total NF but accounts for 53% of total BA during the study period. The temporal distribution are described and interpreted in terms of the climate, fire weather, land use land cover (LULC), distance to communication routes (roads and railways) and topographic variables (altitude, slope) using statistical analysis and GIS techniques. Results points to: a) higher number of negligent than intentional fires; b) higher BA on critical period in years 2012 and 2013; c) decrease in time and decrease from critical period to non-critical period of the number of fires, in all regions; and d) the dominant role of fire weather in the observed temporal patterns. We strongly believe that the findings of this study contribute to a better fire prevention, firefighting and crisis management.

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