Fire in the Earth System Abstracts
Vol. 2 FES-211
Granada, Spain, 4-8 July, 2023

Fire behavior in NW Europe: Spatiotemporal patterns and drivers

Quiñones, Tomás

Tecnosylva

Abstract

Greater fires have recently been recorded in Northwest Europe. Knowing the status of fire in this area is critical because several climate projections show that fire activity will increase in this temperate area in the future. Unknowns regarding the fire regime and drivers in northwest Europe are revealed by this study by characterizing key aspects of fire behavior: The Rate of spread and other indicators of fire progression, using an innovative approach to cluster VIIRS hotspots into fire perimeter isochrones. At this scale, we identified 102 large fires that occurred between 2012 and 2022. We evaluated the seasonality of fires as well as relationships between ROS and Burned Area. We also looked for environmental drivers such as land cover, fire weather rankings and fuel phenology (temporal variation of greenness/moisture). The results show significant differences in land cover, with ROS and burned area clearly peaking in March and April. The median ROS during these peak months is approximately 0.09 km/hr., and 66% of the burned area occurs during this spring period. This peak decreases in February and May, indicating the length of the main fire season. Fires with higher ROS tend to have a larger burned area. No significant relationship could be found between FWI and the occurrence of these larger fires. On the other hand, seasonal variation of vegetation indices, specifically the timing of season onset and offset, showed to be a key variable for describing different types of fire behavior. In less studied areas that are now seeing an increase in these types of disasters, it is crucial to describe the seasonal variation of fires and to unsterstand its drivers. Accurate ROS data is critical for determining elevated fire risk periods, the effectiveness of available suppression techniques, and appropriate land and fuel management strategies.

Keywords: Rate of Spread, VIIRS, Fire Occurrence, Burned Area, Land Cover, FWI, Vegetation Indices, Phenology

Acknowledgments: This project has received funding from the European Union's Horizon 2020 research and innovation program under the Marie Skłodowska-Curie grant agreement no. 860787