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Analysing the FWI on a global scale

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Wildfires are a global phenomenon, resulting from a combination of different factors, including climate, fuel structure, and human socioeconomic activities. However, the analysis of their temporal distribution reveals that there are regions more affected than others, both in terms of the number of events and in terms of the corresponding area burned. Indeed, the majority of the total burned area occurs in intertropical region, in just 4 biomes of Grasslands, Savannas and Shrublands as well asjust 3 types of climate (Equatorial, Arid and Warm temperate). On the other hand, ecoregions and climate types at middle and high latitudes present much lower fire incidence. These results highlight the role of climate type and variability on fire incidence patterns. Therefore, the main objective of this work is to study the spatial and temporal distribution of fire weather at global scale. We adopted the Canadian Forest Fire Weather Index (FWI) System to assess fire weather, since it has been demonstrated that its indices perform well in different regions and has been adopted by fire management and meteorological agencies around the world. This study benefits from the existence of reliable fire and fire weather datasets as well as a good characterization of the terrestrial biomes and ecoregions. We used Terra and Aqua combined MCD64A1 Version 6 Burned Area data product, Global ECMWF Fire Forecasting model (GEFF) and RESOLVE Ecoregions 2017 (Dinerstein et al., 2017) datasets. We analysed the spatial-temporal distribution of the different indices that make up the Canadian FWI and calibrated fire danger thresholds in each ecoregion. The results obtained allow improved fire management planning and operations.

Dinerstein, E., Olson, D., Joshi, A., Vynne, C., Burgess, N. D., Wikramanayake, E., ... & Hansen, M. (2017). An ecoregion-based approach to protecting half the terrestrial realm. BioScience, 67(6), 534-545.

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