Nat. Hazards Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/nhess-2017-346-RC1, 2017

Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Fire danger rating over Mediterranean Europe based on fire radiative power derived from Meteosat" *by* Miguel M. Pinto et al.

P. Fernandes (Referee)

pamfernand@gmail.com

Received and published: 7 November 2017

The manuscript proposes a method able to generate pixel-level daily fire danger forecasts for the Mediterranean Basin, combining historical information of remotely sensed radiative energy and FWI forecasts. Fire danger is taken as the probability of exceeding pre-defined energy levels, i.e the probability of occurrence of fires that are increasingly (and simultaneously) intense and large. This approach is interesting and a valid addition to the toolbox available for fire management in Europe. It falls midway between the two classical fire danger rating options, respectively fire-behaviour based (i.e. objective and directly translated into operational decision-making), adopted by english-speaking

Printer-friendly version

Discussion paper

countries, and based on measures of fire activity or statistics of fire weather variables or indices, used in Europe. Regarding the more technical aspects of the manuscript I don't have much to point out, as the approach and methods seem competent and are described in detail. However, I would appreciate more discussion (see specific comments), even if at the expenses of other manuscript sections. I have just one relevant concern: the locations of energy release and static probability of exceedance in fig. 5 and fig. 7. seem quite marked by specific fire events, e.g. the very large and severe fire in Arouca, Portugal, 2016. Isn't the validation period too short, and did this affect calibration and consequently the general applicability of the procedure? P1, L19. Replace "that is more than the double of the" by "that more than doubles the". P2, L7-9. I know this is a common assumption but I would prefer to see this sentence removed or toned down. Studies in Europe that examined this assumption by considering other variables in the analysis, namely confounding effects, could not find evidence that the assumption holds. Both ecophysiology and fire behaviour disprove the assumption. Plant productivity depends also of temperature and easily saturates under the influence of either higher temperatures or higher rainfall, and created biomass is different from fuel, or different from fuel available to burn in the same year. Additionally, this assumption is true in fuel-limited ecosystems or grass-dominated fuel complexes, and neither is the case in Mediterranean Europe. P2, L9-10. "high temperature, strong wind, low fuel moisture and low relative humidity". Temperature and RH have no direct effect on fire ignition and spread and are only relevant in their effect upon fuel moisture. To avoid redundancy and confusion between short- and mid-to-long-term processes I advise rephrasing as "strong wind and low fuel moisture" or as "high temperature, strong wind, low relative humidity and drought". P2, L30. Be clearer as this sentence can be interpreted in distinct ways. Fires are always dependent on fire weather, regardless of their size. In fact, because fire size is dependent on landscape properties, fire weather will be increasingly less relevant as minimum weather thresholds for attaining certain fire sizes are crossed. P3, L10. State up-front why this is information needed. P4, L7. "cumulated", replace by "cumulative" or "accumulated". P4, L17. The equations have

Printer-friendly version

Discussion paper

not changed but for ease of calculation see the current programing codes in Wang et al. (2015). Reference: Wang, Y., Anderson, K. R., & Suddaby, R. M. (2015). Updated source code for calculating fire danger indices in the Canadian Forest Fire Weather Index System. Information Report NOR-X-424. Canadian Forest Service Northern Forestry Centre. P5, L13. If you are referring to forest, shrubland and agriculture it's land cover type rather than vegetation type. P6, L26. A more accurate heading would be "Fire danger rating classes". P7, L1-8. Please explain the rationale for the partition criteria. How does it compare with other common criteria, e.g. Andrews et al. (2003)? Reference: Andrews, P. L., Loftsgaarden, D. O., & Bradshaw, L. S. (2003). Evaluation of fire danger rating indexes using logistic regression and percentile analysis. International Journal of Wildland Fire, 12(2), 213-226. P8, L8. And yet what made the Pedrogão Grande event unique is that the fatalities and fast fire growth happened on the 1st day of the fire. I suggest a brief reference to this as well as discussion (advantages or disadvantages of the developed classification) of the fact that the atmospheric conditions responsible for the event (gust front from a thunderstorm and highly unstable atmosphere that jointly allowed PyroCb development) are not captured by the FWI. P8. L8. "extremely", not "extreme". P9, L9. Use "at the nearest station". P19, L13-14. Replace "fire prevention" by "fire management". Fire danger rating is important for a variety of activities, including prevention, preparedness and suppression planning. P20, L23. There's a 2017 paper in the IJWF that explicitly relates FRP with fireline intensity.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., https://doi.org/10.5194/nhess-2017-346, 2017.