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Spatial and temporal patterns of large forest fires in Europe

Andrea Camia (1,2), Jesús San-Miguel-Ayanz (1), Lara Vilar del Hoyo (1), and Tracy Durrant Houston (1)
(1) Joint Research Centre of the European Commission, Institute for Environment and Sustainability, Ispra, Italy, (2) andrea.camia@jrc.ec.europa.eu

The distributions of forest fires by final size are typically highly skewed, most events having a small final burned area and few reaching remarkable size. Despite being few, most of the resulting damage is concentrated in those few, large fires that have the highest impact. Thus it is very important to investigate the major events and their pattern in a region to improve our understanding of the driving forces behind them and to mitigate the adverse impacts of forest fires.
In this contribution we focus on fires occurring in Southern Europe with final size >=500 ha, often referred to in the literature as “mega fires”. For the analysis we have used the European fire database and the burned area products of the European Forest Fire Information System (EFFIS). EFFIS is the European Commission (EC) focal point of information on forest fires established by the Joint Research Centre (JRC) and the Directorate General for Environment to support the national services in charge of the protection of forests against fires in the EU and neighbouring countries. The fire database of EFFIS is the largest repository of information on individual fire events in Europe, built thanks to long term collaboration between European countries and the EC on forest fires.
According to the database in the 25 years period 1985-2009, a total of 3108 large fires (>=500 ha) were reported in the 5 most affected European countries (Portugal, Spain, France, Italy and Greece). Although such large fires comprised just 0.24% of the total number of events in Southern Europe in this time period, they affected an area of about 4.7 million ha, which corresponds to 41.7% of the total burned area in the region. Most of the large fires occurred in the Iberian Peninsula and were markedly concentrated from June to September.
Although to a lesser extent, large fires are also reported (for variable time periods depending on country) and had major impacts in other countries participating in the EFFIS network such as Bulgaria (23), Switzerland (2), Cyprus (10), Estonia, Hungary (2) Poland (4), Sweden (7) and Turkey (11).
The spatial and temporal analysis of large fires we have carried out is based on the information on each fire event contained in the database, i.e. fire location (administrative district), date and time of alert, start and end of intervention, fire extent and land cover affected, and presumed fire cause, combined with databases of comparable time/space resolutions, such as meteorological or socio-economic data.
Additionally, for the more recent 10 years (2000 to 2009) we could complement such data with spatial explicit information coming from the burned area product of EFFIS. The fire perimeters mapped daily by the rapid damage assessment module of the system were linked to the fire records of the database compiled by the national fire services, allowing the integration of higher resolution ancillary geospatial datasets into the analysis.