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First steps towards a novel European forest fuel classification systems and a European forest fuel map

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Forest fires burn at the local scale, but their massive occurrence causes effects which have global dimensions. Furthermore climate change projections associate global warming to a significant increase in forest fire activity. Warmer and drier conditions are expected to increase the frequency, duration and intensity of fires, and greater amounts of fuel associated with forest areas in decline may cause more frequent and larger fires. These facts create the need for establishing strategies for harmonizing fire danger rating, fire risk assessment, and fire prevention policies at a supranational level.

Albeit forest fires are a permanent threat for European ecosystems, particularly in the south, there is no commonly accepted fuel classification scheme adopted for operational use by the Member States of the EU.

The European Commission (EC) DG Environment and JRC have launched a set of studies following a resolution of the European Parliament on the further development and enhancement of the European Forest Fire Information System (EFFIS), the EC focal point for information on forest fires in Europe. One of the studies that are being funded is the FUELMAP project. The objective of FUELMAP is to develop a novel fuel classification system and a new European fuel map that will be based on a comprehensive classification of fuel complexes representing the various vegetation types across EU27, plus Switzerland, Croatia and Turkey.

The overall work plan is grounded on a throughout knowledge of European forest landscapes and the key features of fuel situations occurring in natural areas. The method makes extended use of existing databases available in the Member States and European Institutions. Specifically, our proposed classification combines relevant information on ecoregions, land cover and uses, potential and actual vegetation, and stand structure. GIS techniques are used in order to define the geographic extent of the classification units and for identifying the main driving factors that determine the spatial distribution of the resulting fuel complexes. Furthermore, relevant parameters influencing fire potential and effects such as fuel load, live/dead ratio, and fuels' size classes' distribution are considered. National- and local-scale datasets (vegetation maps, forest inventory plots, fuel maps…) will be also studied and compared. Local ground- truth data will be used to assess the accuracy of the classification and will contribute, along with literature values and experts' opinion, to characterize the fuels' physical properties.

The resulting classification aims to support the characterization of the fire potential, serve as input in fire emissions models, and be used to assess the expected impact of fire in the European landscapes. The work plan includes the development of a GIS software tool to automatically update the fuel map from modified (up-to-date) input data layers. The fuel map of Europe is mainly intended to support the implementation of the EFFIS modules that can be enhanced by the use of improved information on forest fuel properties and spatial distribution, though it is also envisaged that the results of the project might be useful for other relevant applications at different spatial scales. To this purpose, the classification will be designed with a hierarchical and flexible structure for describing heterogeneous landscapes.

The work is on-going and this presentation shows the first results towards the envisaged European fuel map.