MDPI

A Multi-Component Approach for Mapping Wildfire Risk in the Wildland–Urban Interface [†]

Jose Maria Costa-Saura [1,2,*], Claudio Ribotta [1], David Caballero [1], Christophe Bouillon [3], Eric Maille [3], Donatella Spano [1,2], Valentina Bacciu [4], Costantino Sirca [1,2], Salvatore Cabiddu [5] and Leandro Usai [5]

1 Department of Agricultural Sciences, University of Sassari (UNISS), 07100 Sassari, Italy
2 Foundation Euro-Mediterranean Center on Climate Change (CMCC), Division Impacts on Agriculture, Forests and Ecosystem Services (IAFES), 07100 Sassari, Italy
3 Institut National de Recherche pour l'Agriculture, l'Alimentation et l'Environnement (INRAE), RECOVER, 40061 Aix-en-Provence, France
4 National Research Council of Italy (CNR), Institute of BioEconomy, 07100 Sassari, Italy
5 Corpo Forestale e di Vigilanza Ambientale—Regione Autonoma della Sardegna, 09131 Cagliari, Italy
* Correspondence: jmcostasaura@uniss.it
† Presented at the Third International Conference on Fire Behavior and Risk, Sardinia, Italy, 3–6 May 2022.

Abstract: Global change is increasing concerns regarding fire risk, especially for the wildland–urban interface (WUI). Indeed, different cross-national funded projects aim to develop new methodologies and technologies for assessing and reducing fire risk at the WUI. Traditional approaches focused on multi-criteria decision analysis usually neglecting the interaction of multiple fine-scale components. Here, within the framework of the Italy–France Maritime INTERMED project, we develop a new fire risk assessment methodology following the IPCC guidelines, i.e., considering the three main risk determinants: hazard, exposure and vulnerability. Each single risk determinant integrates multiple components which were estimated using high-resolution data from the European Spatial Agency (ESA), field data, fire spread simulators and local administrations' geo-data. Hazard components run at the local scale, involving weather and fuel moisture conditions, and also ignition patterns, whereas fire exposure components integrate both percolation and spot potentials (fire pathways and micro-scale land flammability) and postfrontal combustion (residential fuels). Finally, vulnerability components include the type of house and its configuration but also the existence of protection devices. Preliminary results suggest that this methodology might help fire risk planning in WUIs at both landscape and community scales.

Keywords: WUI

Conflicts of Interest: The authors declare no conflict of interest.