New methodology for mapping wildfire risk in the wildland-urban interface

Flavio Taccaliti[1], Raffaella Marzano[2], Rolando Rizzolo[3], Tina Bell[4], Domenico Fischetti[5], and Emanuele Lingua[1]

[1]Università degli Studi di Padova, Scuola di Agraria e Medicina veterinaria, Dipartimento Territorio e Sistemi Agro Forestali, Viale dell'Università 16, Legnaro (PD) 35020, Italy

[2]Università di Torino, Dipartimento di Scienze Agrarie, Forestali e Alimentari, Largo Paolo Braccini 2, Grugliasco (TO) 10095, Italy

[3]Regione del Veneto, Direzione Protezione Civile e Polizia Locale, Via Paolucci 34, Marghera (VE) 30175, Italy

[4]The University of Sydney, School of Life and Environmental Sciences, Faculty of Science, Biomedical Building, Australian Technology Park, Camperdown New South Wales 2006, Australia

[5]Città Metropolitana di Venezia, Via Forte Marghera 191, Venezia Mestre 30173 (VE), Italy

Wildfires pose a great threat to the wildland-urban interface (WUI), the zone of contact between wildland vegetation and the human-settled environment. In these areas, high fuel loads often coexist with high value assets, which are more exposed to ignition than equivalent structures in an urban context. At the WUI, wildfires can quickly exhaust the resources normally available to urban firefighters, and the value of assets do not allow the use of large-scale, resource-saving techniques common in wildland fires management.

Mapping the WUI represents a first important step in wildfire risk management due to the primary importance of prevention in a setting that is difficult to defend in the face of emergencies. In addition, as the WUI is not only a possible target for wildfires, it is often a source of them, prevention of fire in these areas is a critical part of risk management.

Several methods are currently available to detect and map the WUI, differing according to the scale and the scope of the analysis. Pioneering methods mainly used aggregated data (e.g. census data, large scale vegetation maps) while recent techniques are increasingly using high precision remote sensing data to identify single structures and local changes in topography and vegetation.

In the context of the UE Interreg project Italia-Slovenija CROSSIT SAFER, a new methodology will be described to analyse and map wildfire risk at the WUI relying on state-of-the-art data and technologies. Specifically, high precision LiDAR data and segmentation processes are used to characterise wildland fuel precisely and efficiently.