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Forest fuel assessment by LiDAR data. A case study in NE Italy

Flavio Taccaliti, Lorenzo Venturini, Niccolò Marchi, and Emanuele Lingua

Università degli Studi di Padova, Dipartimento Territorio e Sistemi Agro Forestali, Legnaro, Italy

Fuel management is a crucial action to maintain wildland fires under the threshold of manageability; hence, in order to allocate resources in the best way, wildland fuel mapping is regarded as a necessary tool by land managers. Several studies have used Aerial Laser Scanner (ALS) data to estimate forest fuels characteristics at plot level, but few have extended such estimates at a zonal level.

In the context of the EU Interreg Project CROSSIT SAFER, a test of the possibilities of ALS data to predict fuels attributes has been performed in three different areas: an alpine basin, a coastal wildland-urban interface and a karstic highland. Eighteen sampling plots have been laid out over 6 forest categories, with a special focus on *Pinus nigra* J. F. Arnold artificial forests. Low density (average 4 points/m²) discrete return LiDAR data has been analysed with FUSION, a free point cloud analysis software tailored to forestry purposes; field and remote sensing data have been connected with simple statistical modelling and results have been spatialised over the case study areas to provide wall-to-wall inputs for FLAMMAP fire behaviour simulation software.

Resulting maps can be of relevance for land managers to better highlight the most vulnerable or fire prone areas at a mesoscale administrative level. Limitations and room for improvement are pointed out, in the view that land management should keep updated with the latest technology available.