

Global spatial assessment of WUI and related land cover in Portugal

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Forest fires as hazardous events are assuming an increasing importance all around the world, especially in relation to climate changes and to urban sprawl, which makes it difficult to outline a border between human infrastructures and wildland areas. This zone, known as the Wildland Urban Interface (WUI), is defined as the area where structures and other human development meet or intermingle with undeveloped wildland (USDA 2001). Its extension is influenced by anthropogenic features, since, as it was proved, the distance to roads and houses negatively influence the probability of forest fires ignitions, while the population density positively affects it. Land use is also a crucial feature to be considered in the analyses of the impact of forest fires, and each natural, semi-natural and artificial land cover can be affected in a different proportion.

The aim of the present study is to investigate and mapping the wildland urban interface and its temporal dynamic in Portugal at global scale. Secondly, it aims at providing a quantitative characterization of forest fires occurred in the last few decades (1990 – 2012) in relation to the burned area and the land covers evolution. The National mapping burnt area dataset (by the Institute for the Conservation of Nature and Forests) provided the information allowing to precisely localize forest fires. The land cover classes were derived from the Corinne Land Cover, available for four periods (1990-2000-2006-2012). The following two classes were retained to outline the WUI: 1) artificial surfaces, as representative of the human development; 2) forest and semi-natural area, as representative of undeveloped wildland. First, we investigated the distribution of the burned areas among the different detailed land covers classes. Then, to map the WUI, we considered a buffer distance around artificial surfaces located in proximity of forests and semi-natural areas. The descriptive statistic carried out individually within each district revealed that in the southern part of the country forest fires are highly dispersed, while in the northern regions they tend to be aggregated around the anthropogenic infrastructures. This WUI-model can be replicated to assess the WUI at different periods, namely 1990, 2000, 2006, and to analyses the evolution of the WUI up to 2012.

More accurate analyses at large scale for characterizing and mapping WUI using precise data (e.g. the true houses footprints) will be necessary to give practical indications in term of land and fire management. Nevertheless our study is necessary to give precious suggestions as for what is the global distribution on WUI in Portugal and which regions need to be prioritized in term of WUI extension and fires protection.

References:

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