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Peter Fule,
Northern Arizona University, United States

*CORRESPONDENCE
Guillermo E. Defossé
✉ gedefotur@gmail.com

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Editorial: Fires in the wildland urban interface: An emerging global phenomenon threatening modern society

Guillermo E. Defossé*

Fire Ecology and Meteorology Laboratory (LEMIV), Esquel Research Center for Patagonian Mountains and Steppes (CIEMEP), University of Patagonia (UNPSJB, Esquel Branch) and National Research Council of Argentina (CONICET), Esquel, Argentina

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Editorial on the Research Topic
Fires in the wildland urban interface: An emerging global phenomenon threatening modern society

Wildland Urban Interfaces (WUIs) are broadly defined as "areas in which urbanizations intermingle with wildland vegetation" (USDA and USDI, 2001; Radeloff et al., 2005). In the last 30–40 years, WUIs increasingly expanded in many countries around the world (Theobald and Romme, 2007; Lampin-Maillet et al., 2010; Galiana Martín, 2012; Martinuzzi et al., 2015; Godoy et al., 2019). While these expansions may obey to different causes, always implies changes of previous land use. In southern Europe, WUIs expansion has been related to dwellings abandonment around former grazing lands, migration of dwellers to cities, and the reduction of traditional forest activities and other intensive wildland vegetation uses (Mitsopoulos et al., 2015). In some regions of the Americas or in Australia, instead, urban development of former wilderness areas is the main cause of WUIs expansion. Examples of how fast these WUIs grew in recent decades were observed in the conterminous USA, in which the number of houses grew from 30.8 to 43.4 million from 1990 to 2010 (41% growth), while the surface area considered as WUI increased by 33% (Martinuzzi et al., 2015). From 1981 to 2016 in an amenity-rich region of central-western Patagonia in Argentina, the WUI increased by 76%, and the number of houses by 74% (Godoy et al., 2019). Similar growth patterns are found in many other countries, in which rates of WUIs growth are by far greater than the normal rates of population growth in towns, cities, or countries as a whole.

The transformation of wildland areas into WUIs have generated many human–environmental conflicts (Johnson, 2001; Radeloff et al., 2005, 2018). One of them (shared by most WUIs worldwide), is that housing expansion is done with lack or unplanned management of surrounding vegetation. This situation has led to unprecedented biomass accumulation and, in many fire prone-areas, directly related to increasing frequency of wildfire ignitions (Chas-Amil et al., 2013; Radeloff et al., 2018). This is so because most of the fires occurring in WUI areas are related to human activities and fueled by biomass of surrounding vegetation. As a consequence, the probability of fire ignitions and megafires have dramatically increased in these WUIs during the last 20 years, resulting in great losses of human lives and infrastructure, creating health hazards and psychological impacts in the communities where they occur.

In this issue, we presented four studies focusing on various aspects of fire hazard in WUIs of different regions of northern and southern countries of the Western Hemisphere, although their results and conclusions could be of reference for many WUIs around the globe. These studies implied different disciplinary perspectives (from ecological to social sciences) and increasing levels of complexity. The first study, by Gonzalez et al. was carried out in a WUI within Laguna Blanca National Park (LBNP), located in Neuquén province (Patagonia, Argentina), in a typical landscape dominated by Patagonian-steppe vegetation. Although this WUI is inhabited by a few permanent settlers, human population drastically increase during the summer season (which is also the fire season), as a consequence of tourism and transhumance pastoralism. While permanent settlers are used and safely deal with wildfires, tourists and pastoralists do not. The study assessed fire hazard based on differences of plant flammability at community and species scales, establishing fire hazard categories and elaborating a fire hazard map for the park, which constitutes a valuable tool for identifying the most fire-vulnerable WUI areas within it. The study emphasizes the importance of including flammability and fuel load studies in fire management plans to better protect human lives and natural resources in WUI and protected areas. The second study, by Godoy et al. dealt with WUI growth in the last 40 years in central-western Chubut, Argentina. Its objectives were to map former and current WUI, quantify its changes in the last 40 years, and analyze the relationships among WUIs, vegetation types, and wildfire occurrence. Between 1981 and 2021, the WUI area increased by 80%, and information on wildfires distribution revealed that 65% of the ignition points of the recent fires in the region occurred within the WUI. As in many other WUIs around the world, this study suggests that continuing, unplanned housing expansion in WUIs without appropriate vegetation management, will likely increase wildfire risk, scaling up further human-environmental conflicts. Taking into account the increasing level of complexity that WUIs represent as part of the so-called Coupled Human and Natural Systems (CHANS, Liu et al., 2007), the third paper, by Moritz et al., addressed the fact that although most strategic plans for protecting WUIs rely on fuel reduction in strategic locations, there still are many vulnerabilities not directly addressed by fuel reduction. The authors propose a Regional Wildfire Mitigation Program (RWMP) for Santa Barbara, California, USA, as an example to expand traditional approaches for wildfire protection. This RWMP includes retrofitting the built environment, buffering the landscape with a mosaic of less flammable land uses, and training the WUI residents to become a fire-adapted community. This methodology for assessing risk and mitigation priorities at landscape, building, and community levels, could be implemented in other WUIs environments elsewhere. The fourth study, by Copes-Gerbitz et al. focused on community engagement with proactive wildfire management in British Columbia (BC), Canada. The authors recognized that an important step toward better management of wildfire risk in many WUIs has been the paradigm shift toward proactive wildfire management that prioritizes prevention and preparedness instead of response. However, they showed that despite this shift, many BC communities still remain unprepared for wildfires in the WUI due to diverse individual and social-political factors influencing engagement with proactive management approaches. The study concluded that communities have differences in their own knowledges, needs, desires, and behavior. These aspects should be recognized and taken into account for the successful application of proactive wildfire management programs.

Based on different approaches, these articles increased the knowledge of wildfire risk of specific WUIs in which they were conducted. However, the generated information could be useful for other WUIs around the world sharing similar problems.

Author contributions

The author confirms being the sole contributor of this work and has approved it for publication.

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Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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