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Long-term forest fire retardants are chemical substances widely used to reduce the combustibility of fuels. The different factors that influence the effectiveness of these fire retardants have been studied with the aim of improving their use. This article introduces the state of the art regarding the most significant factors involved in the use and effectiveness of forest fire retardants.

Models of wildfire threat are often used in the management of fire-prone areas. Such models use mapped or geographical data as inputs. Inaccuracies in these data may lead to erroneous predictions of wildfire threat. Using simulation techniques, possible scenarios of over- and under-estimating wildfire risks are assessed for an Australian wildfire threat model.

With a large increase of prescribed fire forecasted in the next decades, it is important to learn about the impacts of fire on stream water chemistry. In the Lake Tahoe Basin, California, stream water calcium concentrations increased in burned watersheds whereas soluble phosphorus concentrations were not changed. Stream monitoring data indicates that the stream water quality effects lasted for approximately 3 months.

An original method was developed to measure in a finest way the temperature and upward gas velocity distribution within a flame of a fire spreading across a pine needle fuel bed, in laboratory conditions. The experimental data were compared to a physical 2-phase model of forest fire behavior.

A new treatment for fireline motion is presented appropriate for coupled fire–atmosphere models. The method uses four points in each fuel cell defining both the region burning as well as the fire line position. Instead of prescribing the fireline shape, it evolves through fire–atmosphere interactions. Tests are presented showing the methods performance both with and without fire–atmosphere interactions.

Calculation of radiation heat transfer terms in a fire spread model requires the previous estimation of the radiation extinction coefficient of the fuel bed. For homogeneous and isotropic beds of pine needles in a normal range of packing-ratio, we verified that the standard estimation formula is in error by no more than 10%. But for a non-isotropic bed, much more common in nature, the error may be significantly larger. Two alternative formulae are thus proposed, respectively for predominantly horizontal and vertical radiation, which are shown, in a particular case, to have errors less than 5%.

Post-fire seeding of burned sites had negative ecosystem impacts in this ponderosa pine forest, including loss of native plant diversity and changes in community structure. The massive seeding had a positive effect on reducing first year alien invasion. Negative impacts may continue in subsequent years because of the ecological vacuum created by the loss of the non-persistent variety of cereal grass and extensive thatch that could contribute to repeat fires.

Because of increased fire frequency, gorse shrublands have expanded significantly in western Mediterranean regions. Mediterranean gorse (*Ulex parviflorus*) is a fire-prone community and its presence increases the risk that new fires might occur. Our results show mature gorse shrublands to be communities with high biomass values in which the proportion of fine dead fuel fractions with low moisture content is around 50%. Both the fire-line intensity values and the fire severity values observed can be considered high with respect to those observed in other Mediterranean communities, thus confirming Mediterranean gorse as a high-risk community.

Fire frequency is one of the most relevant patterns characterizing fire regimes of any region in the world. The occurrence in time of fires helps to locate recurrently burned areas and define consequent management plans. A fire history map has been reconstructed for Catalonia (NE Spain) by means of remote sensing images of the last 24 years in order to assist in analyzing fire regime in this region.

This study based on laboratory experiments showed that, whenever wind velocity or terrain slope is high, fire has a dynamic behaviour and its rate of spread changes during fire growth. We demonstrated that a steady-state regime in fire propagation cannot be claimed in the general case and that, even in some nominally permanent and uniform boundary conditions, the rate of spread does not remain constant.

Methods were developed for estimating fuel loading distributions to a 30 m resolution using a combination of field data, topographic data and Landsat imagery. The models provide potentially useful information to managers that need predictions of forest fuel distributions to make decisions regarding fire hazard and risk.

Corrigendum to:

Certain parameter terms in Table 5 were incorrectly given positive rather than negative values.