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Assessing fire danger under climate change conditions for the Euro-Mediterranean fire prone ecosystems

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Wildfire occurrence in fire prone ecosystems is expected to be affected due to climate change, mainly through the change of fire weather patterns and the modification of vegetation composition and structure. Thus, fire risk assessments have to be reconsidered under different climate conditions.

Fire danger requires the assessment of both static and dynamic factors that control the wildfire regime. Fire weather comprises the dynamic factor that can be estimated by the Fire Weather Index (FWI), a meteorologically based index used worldwide [1]. The vegetation flammability can be considered as the major static factor, along with topography.

Specifically, ignitability, flammability's key component, is calculated, using time to ignition (TTI in *sec*) as a proxy, over the examined area through its relationship with the specific leaf area (SLA in cm^2g^{-1}) suggested by [2]. On the other hand, SLA, the ratio of leaf area to leaf dry mass, is derived as a function of climatic variables [3]. The climate data used for the calculations are obtained from the ECMWF ERA-Interim database for the present climate, while for the future climate assessment an ensemble of EURO-CORDEX models is applied.

Subsequently, the ignitability component is combined with the FWI for the development of an integrated index of fire danger for the current and future climate based solely on climatic drivers, using probabilistic techniques for approximating their optimum relationship for the examined Euro-Mediterranean region. This will enable the integration of functional biogeographic data with widely applied fire risk assessment methodologies at regional to global spatial scales.

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