39. An open-access platform for spatial data processing and harmonization to support wildfire simulation

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Wildfires are increasing in frequency, extent, duration, and impacts on natural resources, as well as agricultural and urban infrastructures [1]. These trends highlight the need for accurate, up-to-date information on ecosystems and vegetation fuels, alongside integrated approaches, harmonised protocols, and shared risk governance mechanisms [2,3]. Advances in remote sensing and simulation models support these needs, with wildfire behaviour modelling becoming essential to risk assessment and management [4,5]. The European context, in particular, with environmental heterogeneity and increasingly frequent and severe wildfires driven by climate change, land-use changes, fuel accumulation, and prolonged drought, highlights the need for reliable tools to simulate fire spread under varying conditions [5]. Integrated and dynamic fire behaviour models support operational wildfire management, emergency planning, fuel-reduction interventions, and long-term landscape management by estimating fire spread, intensity, and potential burned areas under varying weather, topographic, and fuel conditions [4,6,7]. However, operational use remains constrained by data accessibility, harmonisation, complex preprocessing, and integration with simulation platforms. Required inputs include surface fuel models, canopy fuels, topography, weather scenarios, and ignition coordinates [8]. This work presents an open-access digital platform developed in R to facilitate the import, parametrisation, preprocessing, and harmonisation of spatial and non-spatial inputs for wildfire simulations. Intended for local operational, academic, and educational use, the interface guides users through dataset selection and upload, checks formats, consistency, and completeness prior to export, and flags potential issues that could affect subsequent simulations. Inputs include fuel maps, terrain data, meteorological information, and ignition coordinates. Users can configure real or virtual scenarios using observed data or manually specified parameters, including simulation dates, duration, weather, and fuel conditions. The platform currently focuses on input preparation, while future developments aim to enable model selection and simulation execution directly through the interface.