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Data in Brief

Data article

Wildfire spread, hazard and exposure metric raster grids for central Catalonia

Fermín J. Alcasena [a,*], Alan A. Ager [b], Michele Salis [c,d], Michelle A. Day [e], Cristina Vega-Garcia [a,f]

[a] Agriculture and Forest Engineering Department (EAGROF), University of Lleida, Alcalde Rovira Roure 191, 25198 Lleida, Catalonia, Spain
[b] USDA Forest Service, Pacific Northwest Research Station, Western Wildland Environmental Threat Assessment Center, 3160 NE 3rd Street, Prineville, OR 97754, USA
[c] National Research Council, Institute of Biometeorology (CNR-IBIMET), Regione Baldinca, 07100 Sassari, Italy
[d] Euro-Mediterranean Center on Climate Change (CMCC), IAFES Division, Via Enrico De Nicola 9, 07100 Sassari, Italy
[e] Oregon State University, College of Forestry, Forest Ecosystems & Society, 321 Richardson Hall, Corvallis, OR 97331, USA
[f] Forest Sciences Centre of Catalonia, Carretera de Sant Llorenç de Morunys km 2, Solsona 25280, Catalonia, Spain

A R T I C L E I N F O

A B S T R A C T

We provide 40 m resolution wildfire spread, hazard and exposure metric raster grids for the 0.13 million ha fire-prone Bages County in central Catalonia (northeastern Spain) corresponding to node influence grid (NIG), crown fraction burned (CFB) and fire transmission to residential houses (TR). Fire spread and behavior data (NIG, CFB and fire perimeters) were generated with fire simulation modeling considering wildfire season extreme fire weather conditions (97th percentile). Moreover, CFB was also generated for prescribed fire (Rx) mild weather conditions. The TR smoothed grid was obtained with a geospatial analysis considering large fire perimeters and individual residential structures located within the study area. We made these raster grids available to assist in the optimization of wildfire risk management plans within the study area and to help mitigate potential losses from catastrophic events.

Specifications Table

Subject area	Environmental sciences, forestry.
More specific subject area	Natural hazards
Type of data	Maps (×4)
How data was acquired	Fire simulation modeling and a geospatial analysis with a geographic information system (GIS).
Data format	Raster grids at 40 m resolution (.tif).
Experimental factors	Extreme fire weather conditions in terms of fuel moisture content and wind speed for the wildfire season dominant scenario (southern wind) were considered to model wildfire spread and behavior.
	We only considered residential houses within the study area for the transmission analysis, excluding industrial areas, farms and any other structures. Modeling output fire perimeters < 100 ha were excluded from the transmission analysis.
Experimental features	We used FlamMap for wildfire spread and behavior modeling (Finney 2006) and geographic information system software to conduct the transmission and geospatial analysis (ArcMap version 10.1). ArcFuels was used to create ensemble landscape input data for fire modeling (Ager et al., 2011), and the Fire Family Plus program was used to process weather data (Bradshaw and McCormick, 2000).
Data source location	All the landscape file fire modeling input data (topography, surface fuels and canopy metrics) corresponded to the Bages County in central Catalonia (northeastern Spain) plus a 6 km buffer.
	We used hourly meteorological data (1998 to 2016 records) from the Castellnou de Bages automatic weather station (U4 station reference, Longitude 1.832°N and Latitude 41.842°E) to characterize the fire weather modeling scenario.
Data accessibility	The repository of the University of Lleida (**URL**): http://hdl.handle.net/10459.1/60357
Related research article	Alcasena FJ, Ager AA, Salis M, Day MA, Vega-Garcia C. Otimizing prescribed fire allocation for managing fire risk in central Catalonia. Sci Total Environ. 2018 4:872-885.

Value of the Data

- We provide spatially-explicit value grids for major wildfire risk causative factors in Bages County, central Catalonia (northeastern Spain).
- The raster grids provide quantitative value data to assist ongoing fuels management programs aiming at reducing wildfire risk efficiently.
- The node influence grid (NIG) identifies high fire activity cells or pixels on the landscape (strategic areas) where fuel treatments restrict large fire potential.
- The crown fraction burned (CFB) grid provides data on wildfire effects to the overstory, related to tree mortality and crown fire activity. We generated CFB grids fore extreme fire weather and prescribed fire conditions. The data provide valuable information to prescribe fuel treatments on forested areas.
- Fire transmission to residential houses (TR) provides quantitative exposure data for large fires spreading long distances across the landscape and defines the scale of risk to communities.