environmental sciences proceedings

MDPI

Abstract

Spatiotemporal Patterns of Wildfire Likelihood and Intensity in Ardabil Province, NW Iran †

Roghayeh Jahdi [1,2,*], Liliana Del Giudice [1] and Michele Salis [1]

[1] National Research Council, Institute of BioEconomy (CNR-IBE), 07100 Li Punti, Italy
[2] Faculty of Agriculture and Natural Resources, University of Mohaghegh Ardabili, Ardabil 56199-11367, Iran
* Correspondence: roghayeh.jahdi@uma.ac.ir
† Presented at the Third International Conference on Fire Behavior and Risk, Sardinia, Italy, 3–6 May 2022.

Abstract: We analysed the spatiotemporal patterns of wildfire likelihood and intensity in the Ardabil Province, NW Iran. Wildfire simulation modelling based on the minimum travel time (MTT) fire spread algorithm (Finney 2002) was applied to estimate the fire occurrence, size, flame length, and burn probability in the area within the study period (2005–2018). To inform wildfire simulations, we gathered fuel types, fire weather conditions, and topography input data. Historical hourly wind and weather data for the study period were obtained from the Ardabil weather station. Moreover, we obtained historical ignition data from the Ardabil Natural Resources Department and FRWO, Iran. On average, about 97 ignitions per year were observed in the study area. According to the simulations, the burn probability, conditional flame length, and fire size ranged from 0.0003 to 0.01, 0 to 6.75 m, and 0 to 5200 ha, respectively. The highest values of the simulations, and consequently the largest and most severe wildfires, occurred in July, especially in the southern and northern portions of the province. The simulation outputs were consistent with historical fire frequency and current knowledge about fire patterns within the study area. The methodology proposed in this study provides a valuable contribution to the improvement of fuel management and wildfire risk mitigation strategies, adjusted to the specific wildfire conditions of different areas.

Keywords: burn probability; historical fires; minimum travel time; wildfire exposure

Citation: Jahdi, R.; Del Giudice, L.; Salis, M. Spatiotemporal Patterns of Wildfire Likelihood and Intensity in Ardabil Province, NW Iran. *Environ. Sci. Proc.* **2022**, *17*, 18. https://doi.org/10.3390/environsciproc2022017018

Academic Editors: Pierpaolo Duce, Donatella Spano, Bachisio Arca, Valentina Bacciu, Grazia Pellizzaro and Costantino Sirca

Published: 8 August 2022

Author Contributions: Conceptualization, R.J. and M.S.; methodology, M.S.; software, R.J.; validation, R.J., L.D.G. and M.S.; formal analysis, R.J.; investigation, R.J.; resources, R.J.; data curation, R.J.; writing—original draft preparation, R.J.; writing—review and editing, R.J., L.D.G. and M.S.; visualization, R.J.; supervision, M.S.; project administration, M.S.; funding acquisition, R.J. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.