EGU25-10235, updated on 12 Feb 2026
https://doi.org/10.5194/egusphere-egu25-10235
EGU General Assembly 2025

Assessing the impact of climate change on wildfire development: insights from analogues and regional climate models

Chen Lu[1], Rita Nogherotto[1,2], Tommaso Alberti[3], Gabriele Messori[4,5,6], Erika Coppola[1], and Davide Faranda[7,8,9]

[1]The Abdus Salam International Centre for Theoretical Physics, Earth System Physics, Regina, Italy
[2]Istituto di Scienze Atmosferiche e Clima, CNR, Bologna, Italy
[3]Istituto Nazionale di Geofisica e Vulcanologia, Rome, Italy
[4]Department of Earth Sciences, Uppsala University, Uppsala, Sweden
[5]Swedish Centre for Impacts of Climate Extremes (climes), Uppsala University, Uppsala, Sweden
[6]Department of Meteorology and Bolin Centre for Climate Research, Stockholm University, Stockholm, Sweden
[7]Laboratoire des Sciences du Climat et de l'Environnement, UMR 8212 CEA-CNRS-UVSQ, Université Paris-Saclay & IPSL, CE Saclay l'Orme des Merisiers, 91191, Gif-sur-Yvette, France
[8]London Mathematical Laboratory, 8 Margravine Gardens, London, W6 8RH, British Islands
[9]Laboratoire de Météorologie Dynamique/IPSL, École Normale Supérieure, PSL Research University, Sorbonne Université, École Polytechnique, IP Paris, CNRS, 75005, Paris, France

Climate change is an ongoing process that is modifying weather patterns and influencing weather phenomena and extreme events such as heatwaves, droughts, and floods. In this study, we investigate whether climate change can also play a role in enhancing wildfires by focusing on a set of three recent wildfires in Europe (i.e., events occurred in Central Sweden in July 2018, France in July 2022, and in Sicily and Greece in July 2023). We employ the concept of analogues to assess the influence of climate change on the atmospheric conditions underlying wildfire development monitored through the fire weather index, by comparing past and present atmospheric patterns similar to those that occurred during the wildfire. Our analysis focuses on both reanalysis data and high-resolution regional climate models to attribute the observed changes and provide future projections. Our findings show that climate change has altered critical factors supporting wildfire development, such as temperature, humidity, and wind patterns. The results from our sample of three events point out that climate change has increased wildfire hazards in Europe, which is projected to further increase for similar fire weather conditions in the future.