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A new research point out that climate change will increase fire activity in Mediterranean Europe.



In forthcoming decades summer fire risk may increase in Mediterranean Europe. A recent study published in *Scientific Reports*, led by researchers of the University of Barcelona and Barcelona Supercomputing Center, shows that the direct effect of climate change in regulating fuel moisture (i.e., drought leading to larger fires) is expected to be dominant, relative to the indirect effect of antecedent climate on fuel load and structure (i.e., warmer/drier conditions limiting fuel availability). The researchers draw this conclusion after analyzing a set of empirical models linking the summer burned area to key climatic drivers. These models are also promising for developing a seasonal forecast system supporting fire management strategies.

According to state-of-the-art regional fire risk projections, climate change projections point to an increase in fire risk, but the effects of climate change on burned areas are not always obvious. For instance, the direct effect of climate change in regulating fuel moisture (e.g. warmer conditions increasing fuel dryness) could be counterbalanced by the indirect effects on fuel structure (e.g. warmer conditions limiting fuel amount), affecting the transition between climate-driven and fuel-limited fire regimes as temperatures increase.

The research uses a large, high-quality database provided by the European Forest Fire Information System to analyse the impact of coincident drought and antecedent wet conditions on summer burned area in

Mediterranean Europe. “The conclusion of the study indicates that there is a statistically significant relationship between fire and same--summer droughts in most regions, while antecedent climate conditions play a relatively minor role, except in few specific eco-regions. In addition, the drought-fire relationship is stronger in northern regions”, explains Marco Turco, researcher of the [Meteorological Hazard Analysis group \(GAMA\)](#) of UB lead by the Professor Maria del Carme Llasat.

In other words, drought plays a more prominent role in northern (generally wetter and more productive) regions than in southern (drier) regions, possibly because in southern areas the vegetation is better adapted to water scarcity. Thus, in forthcoming decades, and especially for the northern Mediterranean regions, the direct effect of climate change in regulating fuel moisture (i.e., drought leading to larger fires) is expected to be dominant, relative to the indirect effect of antecedent climate on fuel load and structure (i.e., warmer/drier conditions that limit fuel availability).

Climate effects could thus overcome fire prevention efforts. In the past few decades, the measured trend of burned area in Mediterranean Europe has been generally negative, while drought conditions have been increasing. These opposite trends suggest that management actions have so far counterbalanced the climatic trend. However, keeping fire management actions at the current level might not be sufficient to balance a future increase in droughts, thus calling for a rethinking of current management strategies.

Finally, the ability to model the link between drought and forest fires is crucial to identifying key actions in adaptation strategies. The developed drought-fire models in this study appear to be promising for developing a seasonal forecast system supporting fire management strategies. Seasonal climate forecasts enable a more effective and dynamic adaptation to climate variability and change, offering an under-exploited opportunity to reduce the fire impact of adverse climate conditions.

Reference of the study:

Turco, M., von Hardenberg, J., AghaKouchak, A., Llasat, M. C., Provenzale, A., & Trigo, R. M. (2017). On the key role of droughts in the dynamics of summer fires in Mediterranean Europe. *Scientific reports*, 7(1), 81.

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