



## Climatic drivers explain the interannual variability of the global burned area

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Understanding the response of fire to climate variations is essential to adapt fire management systems under climate change. Although several studies have analysed the drivers of the average spatial variability of fire, the assessment of the temporal variability of fire in response to climate across the globe has proved challenging, largely due to complexity of the processes involved, the limitation of observation data and the compound effect of the multiple drivers, which usually cause non-linear effects.

In this study, we analyse how much of the interannual variability in observed burned area (BA) is linked with temporal variations in climate at global scale. To solve this question, we use the burned area data of the FireCCI51. product for the period 2001-2019 at the global scale, and different climate metrics that are directly related to drought occurrence, including indices like the Fire Weather Index (FWI), the Standardized Precipitation Evapotranspiration Index (SPEI), and the Standardized Precipitation Index (SPI). Our study shows complex spatial patterns in the relationship between climate drivers and BA variability, highlighting where variations in FWI, SPI, SPEI or their interaction explain BA variability. While in some areas the interannual variability of burned area does not show a statistically significant influence of climate variability, over a substantial portion of the global burnable area (~60%) the BA variability can be explained by interannual variability of climate drivers. Globally, climate variability accounts for roughly two thirds (64%) of the observed temporal BA variability.