# Limited effect of COVID-19 on the 2020 fire season in Mediterranean Europe

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In a recent study, Rodrigues et al. (2020) analyze the impact of COVID-19 on fire activity. During this year's pandemic we have experienced extreme fire activity in many areas worldwide including Siberia (McCarty et al., 2020), western US (Pickrell and Pennisi, 2020), and different Latin American countries including Argentina, Bolivia or Paraguay. Interestingly, the authors argue that COVID-19 has led to a reduction in fire activity in EUMED countries (Portugal, Spain, France, Italy and Greece) because of the associated decrease in human activity.

Rodrigues et al. (2020) assumed that the main driver of burned area in the region was drought, a parameter they assessed with the 6-month Standardized Precipitation Evapotranspiration Index (SPEI-6). They report a negative SPEI-6 value for the region of -0.7, indicating a moderate drought. Given that there was some drought (albeit moderate), they expected a higher burned area than the one that occurred. Using their own words: "under similar drought-related circumstances (SPEI6 ≈ - 0.7), the expected burned area in 2020 during the lockdown period in the EU (March-May) would lay somewhere within the range of 38,800 ha ± 18,379 ha".

Assuming that drought is the main driver of fire activity is problematic. First, because a decoupling between the brunt of the fire season and the peak of the summer drought has been reported in different areas within the Mediterranean Basin (Resco de Dios, 2020). In Eastern Spain, for example, the peak of fire activity occurs in the first half of July, whereas the peak of the summer drought occurs towards the end of August (Balaguer-Romano et al., 2020). This is because a certain level of drought is required for fire activity, but other factors related to fire weather also play a role in determining total burned area (Boer et al., 2017).

Additionally, the main assumption of the manuscript, that SPEI-6 is a major driver of burned area, does not hold under closer examination. We can use the values

given in Table 1 from Rodrigues et al. (2020) to test whether SPEI-6 and burned area are correlated and, indeed, the correlation was marginal and not statistically significant ($p = 0.09$, $R^2 = 0.14$). The marginal trend appears to be driven by an outlier, the year with highest area burned at the top of the figure. Removing that outlier renders a $p$-value of 0.16.

Part of the problem lies in the use of SPEI-6 as a drought index. In fact, according to the European Drought Observatory (https://edo.jrc.ec.europa.eu/), the area under drought this summer in the Mediterranean part of the studied countries between July and August was very limited. A lack of drought could be an alternative mechanism driving the decline in fire activity this year.

At any rate, if the decline in fire activity this year was indeed driven by a decline in human activity, we would then need to see a decline in the number of ignitions. It is unfortunate that Rodrigues et al. (2020) did not examine this parameter. According to statistics reported by the European Forest Fire Information System (San-Miguel-Ayanz et al., 2012), which maps fires burning 30 ha or more, the number of ignitions during 2020 was 1,072 as of 9$^{th}$ of October. This number is higher that the average during 2008-2019 of 622. If we only count ignitions during the summer (24$^{th}$ June to 23$^{rd}$ September), we observe 726 ignitions in this year, which is also higher than the 10-years average of 428.

If the number of ignitions is above average, but burned area is below average, then it appears that the factor limiting this year's fire season is more related to factors driving fire spread and behaviour, rather than factors affecting ignitions. In other words, while the reason for this year low burned area awaits further testing, the mechanism is more likely related to this year's weather than to any COVID-19 related impacts on human activity.

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**Figure 1:** (a) The relationship between burned area and SPEI-6 is not statistically significant. (b) and (c) show that there was no water stress in most of the fire-prone Mediterranean region of EUMED countries according to the European Drought Observatory. As an example here we show data at the beginnig of July (b) and end of August (c) but the same pattern was apparent over the growing season. (d) number of fires during 2020 in EUMED countries from EFFIS data was higher than the 10 years average.