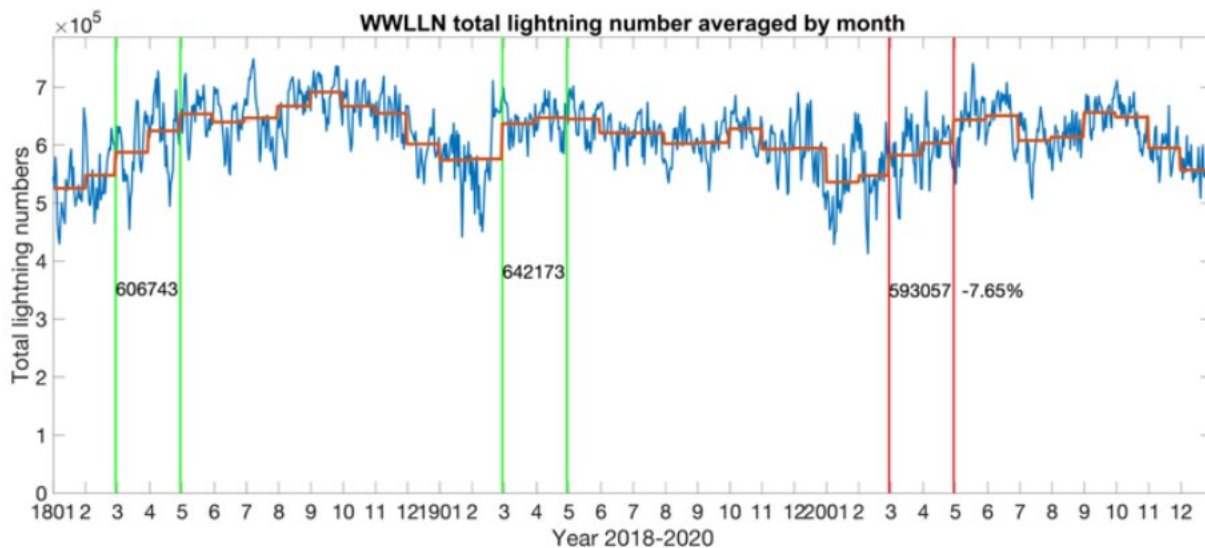


COVID-19 lockdowns lessened global lightning activity

December 16 2021



Lightning reduction during COVID-19 period was detected by the World Wide Lightning Location Network (WWLLN). The months March through May are bracketed with colored lines for the years 2018, 2019 and 2020. Credit: Yakun Liu

Global lightning activity dropped almost 8% during the 2020 COVID-19 lockdowns, according to new research being presented at the AGU Fall Meeting 2021 in New Orleans. The cause of the drop appears to be a connection between lightning and air pollution.

"When COVID-19 led to lock-downs, there was a reduction in pollution

everywhere," said Yakun Liu, a meteorological researcher at the Massachusetts Institute of Technology, who will present the work on Monday, 13 December at 08:53 a.m. CDT.

Less pollution means fewer microscopic particles hazing the sky and serving as points of nucleation for water droplets and ice crystals. Fewer tiny [ice crystals](#) in storm clouds means fewer collisions of crystals, which Liu and other researchers believed to be one of the ways thunderheads generate electrical charges that lead to [lightning](#).

The three-month lockdown period from March to May 2020 proved to be a valuable opportunity to test this idea by studying global lightning and aerosol data.

To measure the lightning activity they used data from the Global Lightning Detection Network (GLD 360) and the World Wide Lightning Location Network (WWLLN). For the aerosols they looked at satellite data showing the amount [air pollution](#) in the atmosphere, measured as Aerosol Optical Depth, which is based on the way aerosols absorb and reflect light.

Comparing the years 2018 to 2021, season to season, the researchers found a significant drop in lightning and aerosols in most places during the lockdown, as well as a significant drop in lightning activity worldwide. They found [aerosol pollution](#) and lightning generally followed the same pattern or tracked each other over Africa, Europe, Asia and the maritime countries of Southeast Asia, and smaller increases over much of the Americas.

This new research follows previous research by Liu and his colleagues, published earlier this year in the AGU journal *Geophysical Research Letters*, which showed dramatically how aerosols can affect lightning.

In that paper the researchers showed that lightning activity jumped as much as 270% compared with the same [time period](#) the year before over the Tasman Sea when the smoke from Australia's catastrophic fires 2019-2020 wildfires blew over the water.

The effect of lightning over the ocean is especially telling, said Liu, because the ocean is flat and less variable in temperature, and so less likely to influence how thunderclouds form or behave. That allows the effects of aerosols to shine through.

More information: Paper presentation:
[agu.confex.com/agu/fm21/meetin ... app.cgi/Paper/917688](https://agu.confex.com/agu/fm21/meetin...app.cgi/Paper/917688)

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