

Did the drop in COVID-related emissions affect the climate?

May 5 2021, by Kate Wheeling



COVID-19 lockdowns in cities across the United States kept cars off the road, as seen here in Portland, Ore., which contributed to a drop in global emissions.

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As social and economic activity ground to a halt around the world in 2020 in the face of the COVID-19 pandemic, emissions of greenhouse gases and aerosols dropped. In the United States, where lockdowns that began in March kept many Americans off the roads, emissions fell by almost 13%. Globally, carbon dioxide (CO₂) emissions dropped by nearly 7%. However, it's not clear that emissions will remain low as global economies open back up, which raises the question: What impact will the short-term drop in emissions have on the climate?

In a new study, Jones et al. answer that question by comparing the results from an ensemble of a dozen Earth system models. Such multi-Earth system [model](#) intercomparison projects (MIPs), which usually take years to design and carry out, can detect even small climate signals. The first results from the current project, known as [COVID-MIP](#), focus on the immediate impacts of COVID-related emissions decreases and assume that global emissions will rebound to baseline levels by 2022.

The models showed a decrease in [aerosol](#) optical depth—a measure of how much sunlight is blocked from reaching Earth's surface because of aerosol particles—and an increase in the amount of solar radiation reaching the planet's surface, with the greatest impact seen over India and China. The authors then examine how the changes in aerosol levels might affect shortwave radiation, temperature, and precipitation patterns.

The researchers saw a slight increase in the amount of solar radiation reaching the planet's surface, but there was little impact on either temperature or rainfall. The biggest aerosol reductions were over Asia, but even there, most models showed a small amount of warming, less than 0.1°C—about half the size of the standard deviation across the models in the ensemble.

The authors conclude that the drop in global emissions due to

COVID-19 is too small in both magnitude and duration to have any significant impact on global climate. Still, the results can direct priorities for future work, and the authors identify seven areas where future analyses may be warranted, including the longer-term implications of the emissions reductions and of economic recovery decisions.

More information: Chris D. Jones et al. The Climate Response to Emissions Reductions Due to COVID-19: Initial Results From COVIDMIP, *Geophysical Research Letters* (2021). [DOI: 10.1029/2020GL091883](https://doi.org/10.1029/2020GL091883)

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