

The shutdown is clearing New York's air—but don't get too excited, geochemist says

March 26 2020, by Kevin Krajick



Crosswalk at Broadway and 104th Street, looking north, 4:50 pm, March 24, 2020, in front of the author's home. The avenue is normally clogged with traffic at this hour. Credit: Kevin Krajick/Earth Institute

Vehicle travel, factories, and other air pollution sources are shutting down in the wake of the coronavirus pandemic, and satellites operated by NASA and the European Space Agency can see the difference. A miasma of nitrous oxides, a nasty mix of elements released during incomplete combustion, normally swathes much of China. Starting in late January, it largely dissipated. A few weeks later, a similar clearing started over Italy. In the last two weeks, satellites have observed pollutants disappearing over Seattle, Los Angeles, and New York.

Researchers at Columbia University's Earth Institute are now documenting changes directly on the ground in New York. In recent months Róisín Commane, an atmospheric chemist at Lamont-Doherty Earth Observatory, has been monitoring pollutant levels from instruments attached to a building on the City College of New York campus at 135 St. and St. Nicholas Avenue in Harlem. Commane said that starting on March 17, the monitor has shown 10 percent drops in [carbon dioxide](#) and methane, and an astounding 50 percent drop in [carbon monoxide](#).

Carbon dioxide, of course, is the earth's main greenhouse gas. But since it mixes quickly into the global atmosphere and does not directly impact [human health](#), routine monitoring at a local level is rare; the efforts of Commane and her colleagues are an exception. Carbon monoxide, though, may boost chances of cardiovascular disease and other ailments, and is often monitored. Methane is both a potent greenhouse gas and a potential health problem. Various combinations of such pollutants come from diesel- and gas-powered vehicles, heating boilers in buildings, and facilities such as the giant municipal sewage-treatment plant at 145th Street along the Hudson River.

Pollutant levels in New York are, not surprisingly, higher than in surrounding areas. CO₂ can fluctuate up as high as 500 parts per million, far above the global average of about 413. During the last week or so, it

was down to about 430. Carbon monoxide went down much further, from a normal 350 parts per billion—it sometimes spikes as high as 800—to just 160. "The air is the cleanest I've ever seen it," said Commane.

That said, she is cautious about taking the data too literally, because pollutant levels can change with winds, humidity, time of day, and hyper-local factors such as CCNY's now-shuttered student chemistry labs. But one thing is certain, she says: There may be short-term health benefits around here, but it won't last. "Soon as business ramps up again, everything will go back to normal," she said. "This shows we can reduce emissions. But in the future, we're going to have to do it in a more controlled way, where half the people don't lose their jobs."

Wade McGillis, a geochemist at Lamont-Doherty, is making measurements from instruments atop an apartment building on 108th Street and Broadway. In the last week or so, he says he has seen a more than 50 percent drop in nitrous oxides, and big declines in other pollutants, in line with Commane's data.

He, too, is reluctant to applaud. "The bigger picture is that all kinds of emissions have kept going up over the long term," he said. For instance, in 2011, CO₂ concentrations over New York averaged about 406 parts per million, over a global average of about 392. Now, with local levels down to 430 during the shutdown, they are still far above what they were routinely in 2011. Similarly, he says, methane levels have dropped in recent days from a routine 2.3 parts per million to 2.1—but 10 years ago, the normal methane level in New York was at 1.96. "For me, it's continuing what our concern has been all along—levels just keep growing, and there are real effects on people's health," he said. The slightly lower carbon dioxide production at the moment will have no measurable effect on global climate now or in the long term, he added.

Another project led by Lamont-Doherty geochemist Steven Chillrud and Darby Jack of the Mailman School of Public Health has been gathering fine-scale data on levels of dangerous fine particulate matter in the air—common soot—by having volunteer bicyclists across the city wear personal monitors that record street levels block by block in real time. The researchers were planning to wrap up the data-gathering phase of the project, but are now re-recruiting volunteers. Jack himself plans to go biking with the instruments to gather data. He expects levels will have nosedived. "It's a crazy natural experiment," he said. "What happens to air quality when the whole economy shuts down?"

Jacqueline Klopp, co-director of the Earth Institute's Center for Sustainable Urban Development, called the pollution drop "a really important learning moment." Aside from the growing indirect effects of carbon dioxide on global climate, she noted, nine out of ten people live with high levels of air pollution, and [poor air quality directly kills an estimated 7 million people](#) each year.

Now, with air quality improving for the moment, "some media have called this a 'silver lining.'" Those are not the words I would use," she said. "As we face this moment of disarray, we don't want to be thinking an inch in front of our faces. A lot of money is going to be put into getting the economy going again, and if we just put it back into the same polluting industries, people will continue dying," she said. She argues for more investment in electric vehicles and renewable energy. And, as of now, many people are being forced to work remotely—arguably more energy efficient than driving to the office every day. "Now that we've shown it can be done, something like this might stick after things are over," she said. "When we're ready to reconstruct, we should make sure we're investing in things that can give us a better future."

Provided by Columbia University

Citation: The shutdown is clearing New York's air—but don't get too excited, geochemist says (2020, March 26) retrieved 16 July 2024 from <https://phys.org/news/2020-03-shutdown-york-airbut-dont-geochemist.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.