

News: Pollution, Climate

Wildfires are making extreme air pollution even worse in the northwest U.S.

Smoke from blazes ravaging western states is counteracting clean air improvements

By Laurel Hamers 3:19pm, July 16, 2018



BAD BURN Wildfires such as this one, which burned almost 50,000 acres in Oregon and Washington in 2017, are one reason why the days with the worst air quality are becoming even worse in the northwestern United States.

Brian Tai/U.S. Forest Service ([Public Domain Mark 1.0](#))

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frequent wildfires that spew plumes of fine particulate matter into the sky are largely to blame, researchers report July 16 in *Proceedings of the National Academy of Sciences*.

By contrast, the rest of the country has seen decreasing trends in similar smog and haze over the last three decades. Legislation such as the Clean Air Act, which mandates air quality standards and the regulation of vehicle and factory emissions of particulate matter, is making a difference, says study coauthor Daniel Jaffe, an atmospheric scientist at the University of Washington in Bothell.

But the increase in lung-clogging particulate matter from wildfires shows how the effects of climate change — which is, in part, driving the worsening fires — can counteract those gains, Jaffe says.

Wildfire smoke is filled with fine particulates, minuscule solids or droplets that can be inhaled into the lungs, exacerbating breathing problems. Children, the elderly and people with asthma are most at risk, but communities near wildfires can temporarily experience levels of pollutants so high that it's unsafe for anyone to be outside for very long. "When we start to think about people's health, episodic events matter a lot," says Gannet Hallar, an atmospheric scientist at the University of Utah in Salt Lake City, who wasn't part of the study.

Regular exposure to elevated levels of these fine airborne pollutants (less than 2.5 micrometers wide, or about 3 percent of the width of a human hair) has also been linked to an increased risk of chronic health conditions [such as heart disease and diabetes](#) (*SN: 9/30/17, p. 18*).

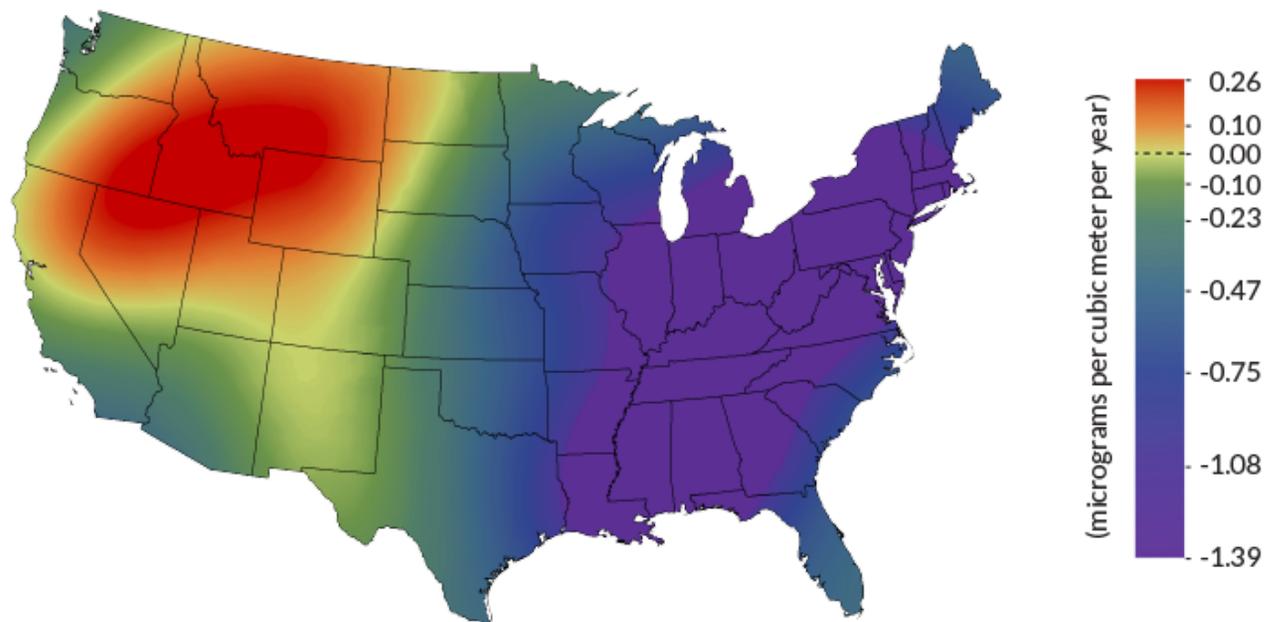
Tracking the broader influence of wildfires on air pollution can be tricky because the fires are intermittent and patchy, says Jaffe, who carried out the study with Crystal McClure, also an atmospheric scientist at the University of Washington in Bothell. "Most of the year, wildfires aren't impacting air quality, but on some of the worst days they are." And the blazes can hit one community hard, but leave neighboring towns relatively unaffected.

Jaffe and McClure looked at daily measurements of fine particulate matter at more than 100 rural monitoring sites around the country, from 1988 to 2016. In most parts of the country, the data showed a success story of cleaner air over time — but not in the northwest, an area that gets hit hard by wildfires every summer.

Where air pollution has gotten better or worse

This map shows the change from 1988 to 2016 in levels of fine particulate matter (smaller than 2.5 micrometers wide) on the days with the worst air quality. Over most of the country, this type of air pollution has decreased. But in the northwest, wildfires are making the bad air quality days worse than they used to be.

Change in microscopic particulate matter on extreme air pollution days (1988–2016)



C. McClure and D. Jaffe/Proceedings of the National Academy of Sciences 2018

The team made similar calculations for levels of a few specific pollutants — particulate carbon, a hallmark of fire emissions, and sulfate, a by-product of burning fossil fuels. Particulate carbon levels had increased over time in the northwest, but sulfate levels didn't, supporting the conclusion that wildfires are mainly driving the air pollution trend in the western United States, rather than industrial activity.

Wildfires weren't making air pollution on an average day worse in the northwest, the team found. Most of the time, air quality is fine — wildfires might only affect a given community for a few days or weeks out of a year. But the air quality on the bad days, when air pollutants are especially high, is getting worse over time, the analysis shows. Those particularly bad days tended to be in the summer, when wildfires are at their peak. In the northwest, levels of fine particulates on the handful of days with the worst air quality each year have increased at an average rate of 0.21 micrograms per cubic meter per year, though there's substantial local variability in that number.

State University in Fort Collins who wasn't part of the study. Those challenges include figuring out how to prevent and mitigate these more uncontrollable sources of air pollution that can't be regulated like emissions from human sources can, she says.

Citations

C. McClure and D. Jaffe. [US particulate matter air quality improves except in wildfire-prone areas](#). *Proceedings of the National Academy of Sciences*. Published online the week of July 16, 2018. doi:10.1073/pnas.1804353115.

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