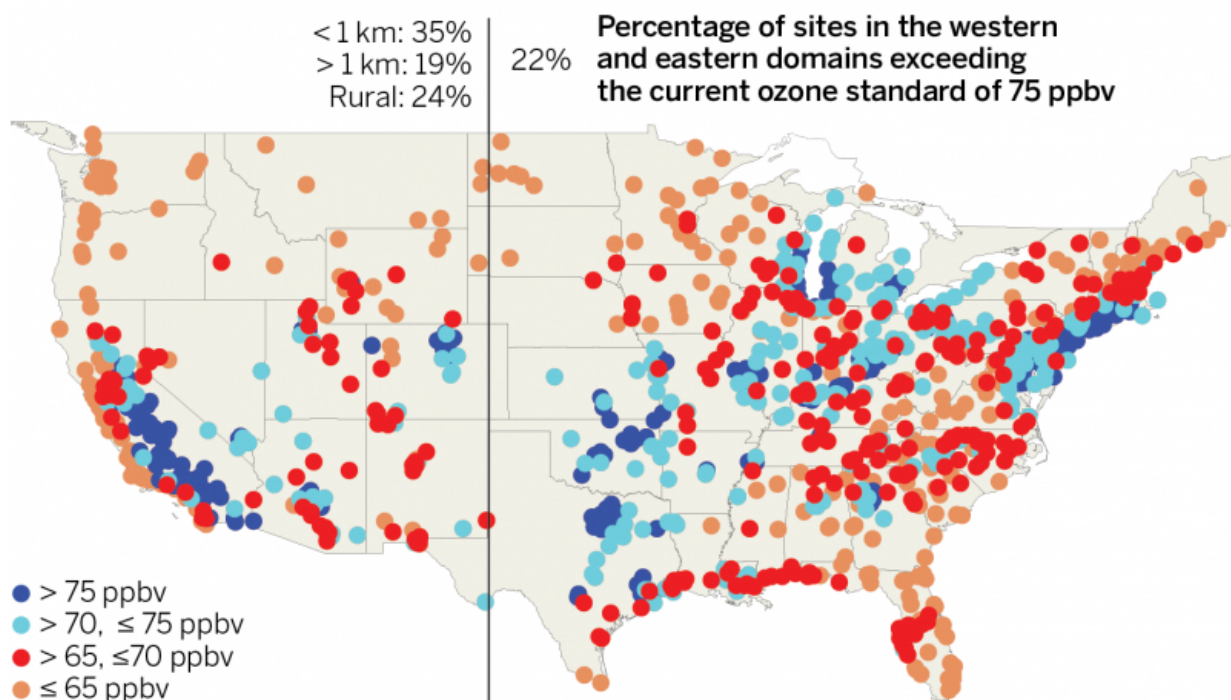


Stricter limits for ozone pollution would boost need for science, measurements

June 4 2015

EPA-approved ozone monitoring sites



U.S. ozone-monitoring sites. Dark blue dots show sites that did not comply with the health-based federal standard of 75 parts per billion (ppbv) between 2011 and 2013. Additional sites would have been out of compliance with a 70 ppbv standard (light blue), a 65 ppbv standard (red), and a 60 ppbv standard (orange). Credit: Map: O. Cooper et al., *Science*

A tougher federal standard for ozone pollution, under consideration to

improve public health, would ramp up the importance of scientific measurements and models, according to a new commentary published in the June 5 edition of *Science* by researchers at NOAA and its cooperative institute at the University of Colorado Boulder.

The commentary, led by Owen Cooper of the Cooperative Institute for Research in Environmental Sciences and NOAA's Earth System Research Laboratory, looks at how a new, stricter [ozone](#) standard would pose challenges for air quality managers at state and local levels. Last November, the Environmental Protection Agency proposed lowering the primary ozone standard from 75 parts per billion (ppb) to 70 or 65 ppb, based on ozone's known effects on children, the elderly, and people who have lung diseases such as asthma. A decision by the EPA Administrator is expected in October 2015.

The problem for state and local officials is that [ozone pollution](#) has several sources, some of which are beyond their borders. At any given place, a certain amount of the ozone pollution comes from local emissions by vehicles and other sources. Additional amounts can blow in from pollution sources across the ocean or in other parts of the United States. And some ozone is produced from natural sources or descends from the upper atmosphere's [ozone layer](#).

Sorting all this out is where science comes in, says Cooper. "It's not easy, but we do know how to figure out where the ozone comes from. This source information is exactly what air quality managers will need to know when the margin for allowable locally produced ozone shrinks."

Ozone is a pollutant that has respiratory health effects in humans and also impairs plant growth and damages crops. It is produced when emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) react in the presence of sunlight. Controls on NO_x and VOC emissions from vehicles, power plants, and other sources have enabled

many U.S. counties to meet the 75 ppb standard, but the number of counties in "nonattainment" status (currently at 227) would jump to 358 or 558 if the standard is revised to 70 or 65 ppb, respectively.

The new commentary suggests that to quantify how much ozone flows into the United States from all upwind sources, additional measurements would be needed, from instruments on the ground, on balloons, and on aircraft. These observations could help scientists and air quality managers evaluate the performance of the computer models that are used to determine sources of ozone at a particular location. Once the models can successfully replicate the observed [ozone levels](#), scientists and air quality managers will have greater confidence in the model estimates of how much of that observed ozone is beyond the reach of domestic control measures.

That information is critical because the U.S. regulatory framework has procedures for exceptions and other allowances if non-local factors are significant for a given locality. And, those outside factors have been growing in recent decades, with sources in South and East Asia pushing up the baseline of ozone that enters the western U.S., for example.

"The ozone baseline is rising, especially in high-elevation regions of the western U.S. that are more strongly influenced by high ozone coming from upwind sources or from the stratosphere. Lowering the federal ozone standard to protect public health will reduce the wiggle room for [air quality](#) managers. We point out that measurements and science will be crucial to successfully navigating the new regulatory landscape," said Cooper said.

The EPA has stated that in their upcoming regulations and guidance, they will assist states in ensuring that sources of ozone that are outside of U.S. borders do not create unnecessary control obligations.

More information: Challenges of a lowered U.S. ozone standard, *Science*, [www.sciencemag.org/lookup/doi/ ... 1126/science.aaa5748](http://www.sciencemag.org/lookup/doi/10.1126/science.aaa5748)

Provided by University of Colorado at Boulder

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