

During heat waves, urban trees can increase ground-level ozone

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Credit: Yinan Chen/public domain

Planting trees is a popular strategy to help make cities "greener," both literally and figuratively. But scientists have found a counterintuitive effect of urban vegetation: During heat waves, it can increase air pollution levels and the formation of ozone. Their study appears in ACS' journal *Environmental Science & Technology*.

Previous research has shown that [planting trees](#) in cities can have multiple benefits, including storing carbon, controlling storm water and cooling areas off by providing shade. This has spurred efforts in cities across the U.S. and Europe to encourage the practice. However, it's also known that trees and other plants release [volatile organic compounds](#), or VOCs, that can interact with other substances and contribute to air pollution. And when it's hot, plants release higher levels of VOCs. Galina Churkina and colleagues wanted to investigate what effects [heat waves](#) and urban vegetation might have on air pollution.

The researchers compared computer models of air pollutant concentrations in the Berlin-Brandenburg metropolitan area in Germany in the summer of

2006, when there was a [heat](#) wave, and the summer of 2014, which had more typical seasonal temperatures. The simulation showed that during the summer of 2006, VOCs from urban greenery contributed to about 6 to 20 percent of the ozone formation, and that during the heat wave period, the contribution spiked to up to 60 percent. The researchers suggest that in addition to tree-planting campaigns, efforts to improve cities' environments should include other measures such as reducing vehicular traffic, a major source of nitrogen oxides that can react with VOCs and form ozone.

More information: Effect of VOC Emissions from Vegetation on Air Quality in Berlin during a Heatwave, *Environmental Science & Technology* (2017).

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