



While Wildfires Ravage the Forests, Our Lungs Are at Risk, Too

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WEDNESDAY, JULY 6, 2016 AT 8:48 A.M.



The San Gabriel Complex fire in June 2016

Ted Soqui

This year's wildfire season is off to a dramatic and early start, and so is the worry about what that smoke is doing to our lungs. Big wildfires started burning in Southern California in early June, and since then, air-quality agencies have been warning residents that pollution from those Southern California fires could make breathing a risky pastime. Residents of cities as far away as Las Vegas are being advised to limit their exposure to the smoke from Southern California fires.

Smoke from wildfires can contain a bewildering assortment of dangerous pollutants. They can range from the dioxins and furans released when structures catch fire and the plastic objects in them burn, to toxic but completely natural oils released from burning poison oak, which can cause fatal reactions when inhaled.

But the biggest public health threat from wildfires comes in the form of fine particulate matter, the microscopic particles of soot that darken skies for hundreds of miles downwind and make the air in distant cities as dirty as anything that famously smoggy Beijing has to offer.

“Wildfires are a major source of the same kind of particulate matter pollution that kills tens of thousands of people worldwide each year,” says Greg Karras, senior scientist with the environmental justice group Communities for a Better Environment (CBE). “And in places like the L.A. Basin where air pollution accumulates, wildfire smoke is a serious health hazard.”

“For people with asthma and other respiratory diseases, wildfire smoke can be life-threatening,” says Julia May, Karras’ fellow senior scientist at CBE. “Climate change is making fires worse and more frequent, and that has direct effects on human health.”



Wildfires such as the San Gabriel Complex fire are a major source of particulate matter pollution.

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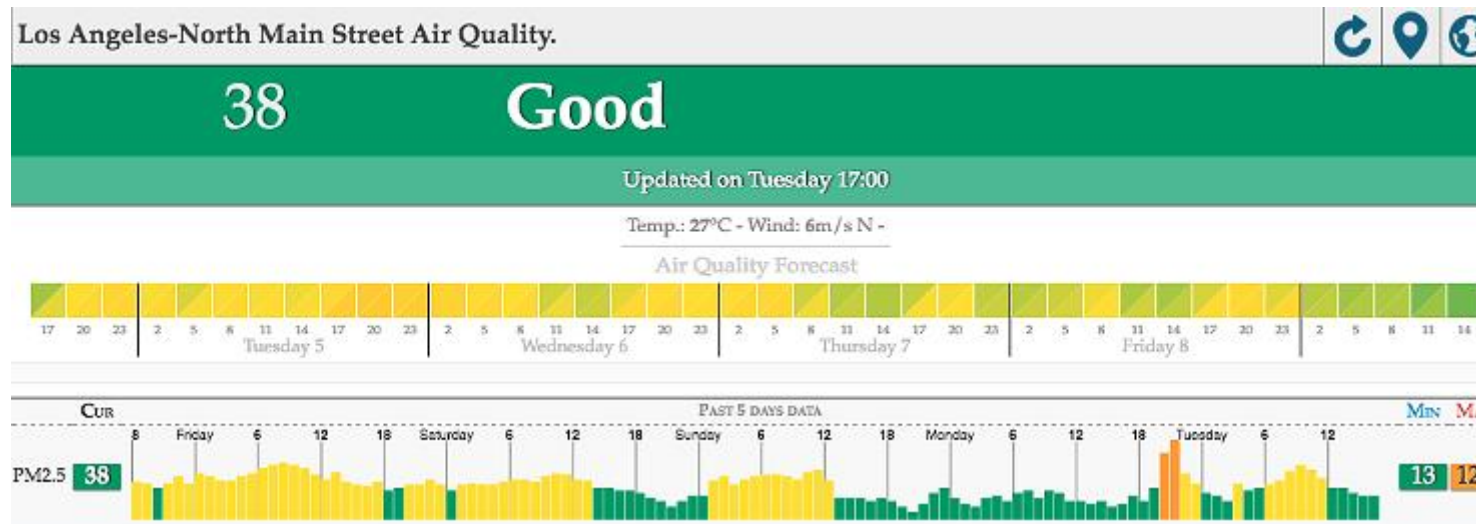
Fine particulate matter, which environmental scientists call PM_{2.5}, is made up of particles that are smaller than one-30th the width of an average human hair. (That's about 2.5 microns or less, hence the official abbreviation.) Particles that small can easily be drawn deep into your lungs. Once they land there, they stay, causing problems ranging from asthma to cancer to cardiovascular illness. Smaller particles can even move directly into your bloodstream, spurring ailments as serious as sudden heart attacks.

Kids are one of the groups most at risk of harm from fine particulate pollution, in large part because they tend to spend more time outside, engaging in strenuous play and breathing hard, sucking that PM2.5 deep into their growing lungs. The elderly, and people of any age with existing lung or heart disorders, are likewise at special risk. At high enough levels, PM2.5 can harm even the healthiest people after even brief periods of exposure to fine particulates. The results can range from mild difficulty in breathing to sudden death.

There's always at least a little bit of fine particulate matter in even the cleanest air. The U.S. Environmental Protection Agency is responsible for determining how much PM2.5 is too much; every five years, the EPA looks at the available science and sets both long-term and short-term exposure levels. Those regulations are due for review in 2017; at the moment, the agency considers PM2.5 concentrations under 12 micrograms per cubic meter of air to be safe.

Air with 35.5 micrograms of PM2.5 is considered unhealthful for sensitive groups, namely children, the elderly and people with heart and lung ailments. At 55.5 micrograms per cubic meter, the air becomes unhealthful for everyone; even the relatively healthy should reconsider running that 5K, while sensitive groups might best avoid strenuous activity altogether. Above 300 micrograms per cubic meter, we're all better off staying inside and running the air filter on our AC. (Swamp coolers and whole-house fans, which don't filter out PM2.5, aren't much help.)

On Monday evening, the PM2.5 levels in Los Angeles reached a five-day high of 124 micrograms per cubic meter, according to the [Real-time Air Quality Index](#):



A 2013 report by the group Climate Central found that even in vehicle-choked urban Southern California, wildfires often far outstrip other sources of particulate matter pollution. During the 2003 Cedar Fire in San Diego County, for instance, fine particulate matter levels in L.A.’s air peaked at just below 120 micrograms per cubic meter. That was almost 10 times the acceptable long-term limit, and more than twice the threshold for “unhealthful” air. It was also around three times worse than the worst non-wildfire-related PM2.5 pollution L.A. endured, in 2003.

It’s worth noting that people without the resources to leave town – or whose jobs may require that they perform strenuous labor outside regardless of air quality, or whose respiratory systems may already have been affected by industrial pollution – bear a greater risk of illness from PM2.5. And wildfire-related PM2.5 isn’t going away anytime soon.

“Climate change is making fires worse, and the fires release the carbon the forests had stored into the atmosphere,” CBE’s May says. “That makes it even more important that we reduce the amount of PM2.5 from vehicle exhaust, oil refining and other sources we can control directly.”

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