

Colorado fire pollution rivaled worst days in Mexico City, Los Angeles, new study says

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High Park Fire Summer 2012.

(Phys.org)—Particulate matter from the summer's devastating High Park Fire exceeded some of the worst air pollution days in Mexico City or Los Angeles over the past decade, say Colorado State University researchers, who are giving scientists additional quantitative data on the fire's impact.

"Not only was the air pollution some of the highest we've seen in decades in Colorado during the fire, its toxic strength rivaled the worst days we see in those cities," said John Volckens, a professor of Environmental and Radiological Health Sciences who conducted the study with Chuck Henry, a professor of Chemistry. "On days before the High Park Fire, the air pollution levels were some of the cleanest in the country."

Researchers took the toxicity measurements with a small, inexpensive test devices made from paper they created and attached to individuals who wore them for the duration of the fire. The device, worn on the shoulder, measured oxidative intake of particulate air pollution - otherwise known as the

ability of inhaled particles to cause stress within the body.

"It lives on your shoulder, it's tiny and it breathes the same air you're breathing, so at the end of the day, if you were outside more often on a bad fire day, you'd have more oxidative intake," Henry said. "Particulate air pollution has the potential to cause oxidative stress in our bodies, which is one of the reasons it's healthy to eat [antioxidants](#) as part of our diet. Oxidative stress potential is a new genre of air pollution measurement – and the beauty of this technology is that it's low-cost and simple."

The device could help scientists better understand the effects of air pollution on people. Knowing how individuals are affected could help researchers understand how pollution leads to disease over a person's lifetime and how to target the sources of pollution that cause the most harm.

Volckens and Henry recently published a study in [Environmental Science and Technology](#) that describes this new measurement technology and how they measured oxidative air pollution on Fort Collins residents during the High Park Fire in June 2012. The paper is available at pubs.acs.org/doi/abs/10.1021/es304662w.

"We have different lifestyles, different sources of air pollution in our homes and live in different proximity to major sources of air pollution in our homes," Henry said. "We've always looked at air pollution from 30,000 feet. Monitoring the individual could also help people know when they're inhaling pollutants or bringing them home from work."

"When we understand where we're getting our air pollution exposures, we can control those sources or modify our behaviors so we get lower exposures," Volckens said. "Not all air pollution is created equally for everyone. Diesel exhaust may be worse than wood smoke. Industrial dust is worse than things like sea spray or biogenic particles we

find in pristine forests. We can use this technology to measure the relative toxicity of different types of air pollution – it helps us prioritize which forms of [air pollution](#) may be worse."

Henry and Volckens said their next steps are to create a network of citizen scientists who could test the devices and help them create a map of [air pollution levels](#) around the city.

"We're hoping to advance this technology even more in the next year or two," Volckens said.

More information:

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Provided by Colorado State University

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