

Wildfire Smoke Basics

Sarah Coefield – Air Quality Specialist, Missoula City-County Health Department

Welcome to Wildfire Smoke Ready Week 2023!

We're finally hitting some hot summer days and we've seen heavy smoke hit both the Midwest and the East Coast. That means it's time for all of us to get Wildfire Smoke Ready! Over the next several days, I'll cover steps you can take to reduce smoke exposure for yourself, your family, your employees and your customers. We'll cover selecting an air cleaner, making your own air cleaner, using furnace filters for whole-house cleaning, and keeping smoke out of commercial spaces. We'll also cover outdoor activities and respirators. But first, I want to give you some background about wildfire smoke, why we care so much, and how you can check the air quality.

Hundreds of chemicals form when a fire burns the forest. Even more form when fires burn homes, businesses, and cars. Volatile organic chemicals (acrolein, formaldehyde, benzene, etc.) give smoke that familiar campfire smell and can cause stinging eyes, headaches, and irritated respiratory tracts. This is bad enough, but we're most concerned about the tiny particles that form during incomplete combustion. We call these particles PM_{2.5}, for fine particulate matter 2.5 microns in diameter and smaller. The particles in smoke are part of that "and smaller" fraction - usually less than 1 micron in diameter. Their small size allows them to burrow deep into your lungs and even pass into your blood stream where they set off an inflammatory response. The particles in wildfire smoke cause reduced lung function, worsened chronic obstructive pulmonary disease (COPD) symptoms, worsened asthma attacks, increased susceptibility to infectious disease and increased risk of stroke, heart attack and death.

Wildfire smoke is bad for everyone, but it does not impact everyone equally. Smoke is particularly harmful to children, the elderly, pregnant people, and people with heart and lung disease. There are also people who cannot escape smoke by retreating to an indoor space with cleaner air: outdoor workers, wildland firefighters, the unhoused, and those who may not have access to filtered air even indoors. Altogether, a significant portion of our community is at heightened risk every time smoke rolls into our valleys.

So, how can you know what's happening to your air? Happily, there are several ways you can stay on top of current air quality:

1. Check EPA's Fire and Smoke Map ([fire.airnow.gov](https://www.fire.airnow.gov)) for hourly PM_{2.5} data at permanent monitoring stations, temporary monitors, and Purple Air sensors across the country.
2. No monitor near your location? Look outside! If you can't see five miles, the air quality is unhealthy. If you can't see two miles, it's very unhealthy.
3. Consider investing in a consumer-grade particulate sensor. These are rarely as accurate as permanent monitors, but they can do an excellent job tracking air quality changes over time. If your sensor indicates air quality is deteriorating, take steps to clean the indoor air or reduce your activity levels.
4. Bookmark MissoulaCounty.us/CurrentAQ for daily wildfire smoke forecasts specific to the Missoula County area (complete with satellite imagery and occasional dumb smoke jokes!)

In addition to checking the air quality, pay attention to how your body responds to the smoke. Human health is a spectrum; people will respond differently to wildfire smoke. Also, the longer a smoke event drags on, the less smoke you'll likely be able to tolerate. If you're noticing shortness of breath/wheezing/etc., respect that signal and take steps to reduce your smoke exposure.

For now, visit MontanaWildfireSmoke.org for details about this week and stay tuned for tips to stay healthy this fire season!