

LIVING WITH SMOKE:

How to be prepared for smoke exposure



EXTENSION
College of Agriculture,
Biotechnology & Natural Resources

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What is in wildfire smoke?

All wildfire smoke differs and depends upon the fuel type (i.e., trees, shrubs, buildings, etc.) that was burned, the wildfire's temperature and the wind conditions. In general, wildfire smoke is composed of carbon dioxide, water vapor, carbon monoxide, particulate matter, nitrogen oxides, hydrocarbons and other organic chemicals, trace minerals, and thousands of other compounds.

Why should you be concerned about wildfire smoke?

Of all the pollutants found in wildfire smoke, fine particulate matter is the most concerning for the public's health. Particulate Matter, or "PM," is a general term used to describe a combination of solid particles and liquid droplets that are suspended into the air. Fine Particulate Matter, (PM_{2.5}), is a microscopic pollutant that is smaller than 2.5 microns in diameter (for reference, a strand of hair is 70 microns in diameter). These microscopic particles can enter your eyes or be inhaled deep into your respiratory system. PM_{2.5} can cause burning, watery and itchy eyes; a runny nose; coughing; phlegm; wheezing; shortness of breath; or illnesses such as bronchitis. Fine particulate matter can also worsen chronic lung or heart conditions; lead to premature death; cause low birth weight in infants; and suppress one's immune response, therefore impacting how one can fight off viruses and bacteria.



Smoke rises from the 2018 Hogan Fire near Wells, Nev. Photo: Bureau of Land Management Nevada, July 5, 2018.

How to protect yourself from wildfire smoke:



Monitor air quality, and if possible, wait for less smoky conditions before going outdoors.



Stay safe indoors and reduce or stop outdoor activity if possible.



Protect yourself from smoke if you must stay outdoors to reduce the health impacts from smoke exposure.

Other considerations:

- If you have heart or lung disease, follow your doctor's advice. If you have asthma, follow your asthma management plan. Have a five-day supply of medication on hand.
- Use a National Institute of Occupational Safety and Health (NIOSH) approved N95 or P100 respirator to filter particulates. These should be fit tested.* Cloth and surgical face coverings that reduce the spread of COVID-19 do not protect you from ozone or fine particulate matter.
***To learn more, visit, "Notes about respirators" on Page 3.**



Monitor air quality:

View the latest air quality index (AQI) forecast and current conditions at [AirNow.gov](https://www.airnow.gov). When wildfire smoke hits, go to [Fire.AirNow.gov](https://www.fire.airnow.gov) or scan the QR code below.



Stay safe indoors during smoke events:

- ▶ Keep windows and doors closed with the air conditioner on (if available).
- ▶ If applicable, close the heating, ventilation and air-conditioning (HVAC) units fresh air intake (meaning it pulls outside air to cool or heat it) and change the system to “recirculate mode.” Generally, home HVAC systems utilize an air intake inside of the home, so you do not need to worry about this. But, check with your HVAC specialist.
- ▶ If your home utilizes a swamp cooler or has a window air-conditioning unit, these units intake outside air and should be turned off.
- ▶ If you lack air conditioning, closing the windows during hot weather can be unsafe. Consider staying elsewhere.
- ▶ Air filters are rated on the Minimum Efficiency Reporting Values (MERV) scale, and a MERV 13 or higher rated filter can help to reduce PM amounts indoors. Check with your HVAC technician before installing a MERV 13 filter in your HVAC air intake.
- ▶ Create a “clean room” in your home.
- ▶ Avoid creating additional smoke or particulate matter in the home, as these can impact the indoor air quality. Do not:
 - Smoke
 - Use gas, propane or wood-burning stoves or fireplaces
 - Burn candles or incense

How to create a clean room:

- Choose a room with no fireplace, few windows and doors that can fit everyone in your household.
- Use a portable air cleaner, also known as an air purifier, or air sanitizers that do not produce ozone. Ensure that whatever type of purifying mechanism you use is the appropriate size for the room.
- If you lack a portable air purifier, you can make your own box fan filtration unit. Go to bit.ly/DIYFanFilter to learn how, or scan the QR code below.



NOTE: Never leave these box fan filtration units unattended.

- Use aerosol spray cans
- Fry or broil foods
- Vacuum. Instead, clean with a wet towel or wipe.



Protect yourself from smoke if you must stay outdoors:

Some people work outdoors and cannot remain indoors during smoky conditions. If you must remain outdoors, the following tips will help reduce your exposure and health impacts:

- ▶ Stay hydrated. Adequate hydration keeps your airway lubricated, which keeps you safer from health impacts related to smoke.
- ▶ Use NIOSH N95 or P100 respirators if you must be outside.

- ▶ If possible, reduce strenuous activities, and take frequent breaks indoors to limit the amount of smoke inhaled.
- ▶ View the air quality index (AQI) on [Fire.AirNow.gov](https://www.fire.airnow.gov), which is updated every hour at :31. If possible, wait for less smoky air quality before going outdoors.
- ▶ To reduce the amount of smoke while driving in a vehicle, close windows and vents and use the air conditioner on “recirculate mode.”

Notes about respirators:

Go to bit.ly/N95HowTo to learn how to properly use an N95 respirator, or scan the QR code to the right.



- NIOSH N95 or P100 respirators are typically fit tested to be most effective. However, the respirators can be beneficial even if they are not fit tested. The respirators will be labeled “NIOSH” and “N95” or “P100.”
- These respirators are not designed for children or for people with beards.
- Cloth, surgical or dust masks will not protect against ozone or particulate matter.

The difference between prescribed fire smoke and wildfire smoke:

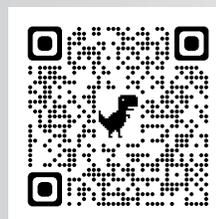
Like wildfire, prescribed fire produces smoke that can negatively impact health. Prescribed fire smoke, however, is different from wildfire smoke.

- ▶ Prescribed fires are carefully planned and must meet the requirements of air quality districts that are designed to limit smoke exposure to nearby communities.
- ▶ Exposure to smoke from prescribed fire is usually confined to areas surrounding the burn, whereas smoke from uncontrolled wildfires can enter the upper atmosphere and travel long distances, potentially impacting a greater number of people.
- ▶ Prescribed burns typically consume less biomass (i.e organic matter that is a fuel) than wildfires, therefore they produce less smoke. **If prescribed fire smoke were equivalent to lighting a match, then wildfire smoke would be like lighting a bonfire.**
- ▶ In contrast to prescribed fires, which usually only burn vegetation, the composition of wildfire smoke can include particulate matter from burned homes, vehicles and hazardous materials.
- ▶ Wildfires tend to happen during hot and dry months that create the conditions for extreme fire behavior. Prescribed fires are usually ignited during milder weather conditions.

What is prescribed fire and why is it used?

Prescribed fire, or “controlled burning,” is a valuable tool that land managers use to meet certain objectives. Controlled burns restore the ecological health benefits of low-intensity fires and reduce hazardous fuels and the threat of catastrophic wildfire.

To learn more about prescribed fire in the Humboldt-Toiyabe National Forest, go to bit.ly/PrescribedFireHumboldt-Toiyabe or scan the QR code below.



How to mitigate the health risks of prescribed fire smoke:

Follow the same recommendations about living more safely with wildfire smoke. Additionally, stay informed about potential prescribed fire smoke in your area by registering for emergency alerts and following your local fire, land management and air quality agencies on social media.

Resources:

- » AirNow.Gov Fires and Your Health. <https://www.airnow.gov/air-quality-and-health/fires-and-your-health/>
- » Air Cleaners and Air Filters in the Home. <https://www.epa.gov/indoor-air-quality-iaq/air-cleaners-and-air-filters-home>
- » Berger, C., Fitzgerald, S., Leavell, D., & Peterson, J. (2018, June). FIRE FAQ'S: Air quality impacts from prescribed fire and wildfire: How do they compare? <https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/em9203.pdf>
- » Create a Clean Room to Protect Indoor Air Quality During a Wildfire. <https://www.epa.gov/indoor-air-quality-iaq/create-clean-room-protect-indoor-air-quality-during-wildfire#how>
- » National Wildfire Coordinating Group. 2020. NWCG Smoke Management Guide for Prescribed Fire. PMS 420-3 | NFES 1279, 306. <https://www.nwcg.gov/sites/default/files/publications/pms420-3.pdf>
- » Price, O. F., Horsey, B., & Jiang, N. (2016). Local and regional smoke impacts from prescribed fires. Natural Hazards and Earth System Sciences, 16(10), 2247-2257. <http://dx.doi.org.unr.idm.oclc.org/10.5194/nhess-16-2247-2016>
- » Washoe County Health District, Be Smoke Smart. <https://www.washoecounty.us/health/programs-and-services/air-quality/Be%20Smoke%20Smart.php>
- » Wildfire and Indoor Air Quality. <https://www.epa.gov/indoor-air-quality-iaq/wildfires-and-indoor-air-quality-iaq>
- » Wildfire Smoke Factsheet, Reduce Your Smoke Exposure. <https://www.airnow.gov/sites/default/files/2021-07/reduce-your-smoke-exposure.pdf>



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