Smoke Readiness: Preparing for Wildfire Smoke

Smoke exposure from wildfires is an increasingly common public health hazard to communities throughout California. Knowing where to find accurate information and being prepared to act when smoke is in the air can help you protect yourself and your family. This factsheet provides background on the health impacts of smoke and an introduction to preparing yourself during smoke events.

What is Smoke?

Smoke is made up of a mixture of chemical compounds, including carbon dioxide, water vapor, and particles. **Particulate matter (PM)** is a primary pollutant of public health concern from short- and long-term smoke exposure. Particulate matter is grouped into two size classes: **PM_{10}** (inhalable particles <10 microns) and **$PM_{2.5}$** (fine particles < 2.5 microns). While smoke particles range in size, studies show that 90% of smoke particles from wildland fires fall into the PM_{10} category and about 90% of those particles are within the $PM_{2.5}$ size range.

Health Effects of $PM_{2.5}$ Exposure

Fine particulate matter ($PM_{2.5}$) can penetrate deep into a person's lungs causing inflammation, respiratory tract irritation, and other respiratory and cardiovascular impacts. The level and duration of smoke exposure, age, sensitivity, and other factors determine whether someone experiences adverse health effects from smoke. **While most healthy adults and children may not experience long-term effects from smoke exposure, the following populations may be more vulnerable to the health impacts of smoke**: children with developing lungs, children and adults with underlying pulmonary and cardiovascular diseases (e.g., asthma and COPD), outdoor workers, unhoused individuals, socioeconomically disadvantaged persons, and pregnant people. These groups should take greater precautions and be aware of the potential effect of pollutants on their health during wildfire events.

Understanding Air Quality Index (AQI)

The Air Quality Index (AQI) was created by the US Environmental Protection Agency to report air quality data in simple, understandable metrics. The AQI ranges from 0 to 500 with the higher numbers representing increasing levels of air pollution with greater public health concerns. The AQI is divided into six color-coded categories for quickly identifying air quality conditions (Table 1).

Color	Index	Category	Recommendation
GREEN	0-50	Good	Enjoy your usual outdoor activities
YELLOW	51-100	Moderate	Extremely sensitive children and adults should refrain from strenuous outdoor activities
ORANGE	101-150	Unhealthy for Sensitive Groups	Sensitive children and adults should limit prolonged outdoor activity
RED	151-200	Unhealthy	Sensitive groups should avoid outdoor exposure and others should limit prolonged outdoor activity
PURPLE	201-300	Very Unhealthy	Sensitive groups should stay indoors and others should avoid outdoor activity
MAROON	301 +	Hazardous	Everyone should avoid all outdoor exertion. Stay indoors with windows and doors closed

Table 1: Air Quality Index (AQI) color, corresponding index, category, & health recommendations (Source: CARB).

Strategies for Reducing Smoke Exposure

Stay indoors	✓	Keep doors and windows closed and seal gaps as much as possible
	✗	To keep indoor air pollution at a minimum, avoid activities such as smoking, burning candles and incense, using gas and wood stoves, frying and boiling foods, and vacuuming
Reduce activity	✗	Avoid outdoor physical activity to reduce the amount of smoke inhaled
Use air conditioners and filters	✓	If you have central air conditioning, install a high-efficiency air filter, ideally with a MERV 13 rating or higher and set your unit to recirculate and run continuously. *Check manufacturer recommendations to find the highest MERV rating recommendation for your unit.*
	✓	Set window air conditioning units to operate in recirculation mode
	✓	Set the air conditioning in your car to recirculate mode in your vehicle when driving
	✗	Avoid using exhaust fans and other cooling systems (i.e., swamp coolers) that bring large volumes of outside air into the home unless necessary due to a concurrent heat emergency
Use an air cleaner *	✓	Purchase a California Air Resources Board (CARB)-certified air cleaner and run it continuously on the highest setting. Choose an air cleaner with a clean air delivery rate (CADR) that matches the size of the space you want to clean
	✓	Build a low-cost DIY box fan air cleaner using filters with a MERV 13 rating or higher
Wear a respirator	✓	Wear a NIOSH-certified N95 respirator mask that fits your face without gaps and has a good seal *if you must be outdoors during poor air quality events*
	✗	If you have existing respiratory, lung, or heart conditions, consult your doctor before relying on N95 masks for protection
Find a clean air shelter	✓	if you are unable to create a clean air space or it is too warm to stay indoors with the windows closed: • Visit the California Clean Air Centers Map (https://ww2.arb.ca.gov/cleanaircenters) to find permanent and temporary Clean Air Shelters near you. • Contact your local air pollution control district (APCD) to find a local clean air shelter. *Find your local APCD at https://ww2.arb.ca.gov/california-air-districts*

Table 2: Strategies for reducing smoke exposure.
**Visit https://ww2.arb.ca.gov/smokereadyca to learn more about air cleaners and DIY box fan air cleaners.*

Differences Between Prescribed Fire and Wildfire Smoke

The use of prescribed burns in strategic locations will help prevent wildfires from having extreme behavior, resulting in less smoke if a wildfire occurs in the treated area. While prescribed fire smoke can impact local air quality, prescribed fires are key to reducing long-term wildfire smoke exposure to communities. Prescribed fires typically produce less smoke than wildfires because they are planned events. Prescribed fires are only authorized during favorable weather conditions making them less likely to worsen overall air quality. Managers consider weather conditions so prescribed fires will be less intense and slower moving than wildfires and smoke will lift and disperse. Smoke from prescribed fires is also often less toxic than wildfire smoke because only vegetation is burned.

Additional Resources

The **California Smoke Spotter** app (https://ww2.arb.ca.gov/resources/fact-sheets/california-smoke-spotter) provides the latest information on prescribed fires and wildfires, air quality, and smoke forecasts throughout California. This free app can be downloaded from the App Store or Google Play on your mobile device. Available in English and Spanish.

The **AirNow Fire and Smoke Map** (https://fire.airnow.gov/) provides current information on PM 2.5, wildfire locations and smoke plumes, and special smoke outlooks when available.

The **California Smoke Blog** (https://californiasmokeinfo.blogspot.com/) provides smoke outlooks for communities affected by wildfire smoke and other resources to protect yourself from smoke.

The **California Air Resources Board (CARB) Smoke Ready California webpage** (https://ww2.arb.ca.gov/smokereadyca) provides information and resources to protect yourself from smoke including how to create a Clean Air Space, how to wear N95 masks correctly and how to construct DIY air cleaners.

The **California Clean Air Centers Map** (https://ww2.arb.ca.gov/cleanaircenters) is an interactive, statewide map where you can find information about permanent and temporary clean air shelters, including their address, operating hours, and contact information.

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