



The Composition of Wildfire Smoke

Wildfire smoke is a complex mixture of many gases and small particles. The mixture can change quickly depending on the weather, what is burning, the temperature of the fire, and how far the smoke has travelled.



Of all the pollutants in wildfire smoke, fine particulate matter (PM_{2.5}) poses the greatest risk to human health.



Exposure to PM_{2.5} from wildfire smoke can be just as harmful as exposure to PM_{2.5} from other sources, such as traffic and industry.

- PM_{2.5} refers to all particles that measure 2.5 millionths of a meter (µm or microns) or less in diameter (Figure 1).
- PM_{2.5} can be inhaled deep into the lungs, where it can cause irritation that may lead to inflammation that affects other parts of the body.
- PM_{2.5} can also irritate the eyes, nose, and throat.

- All PM_{2.5} can be inhaled deep into the lungs, regardless of its source.
- The size of the particles in air pollution is more important than their origin, with smaller particles having a bigger effect on human health.
- Measures to reduce PM_{2.5} exposure, such as using a portable air cleaner, can have health benefits for many different sources of PM_{2.5}, including wildfire smoke.

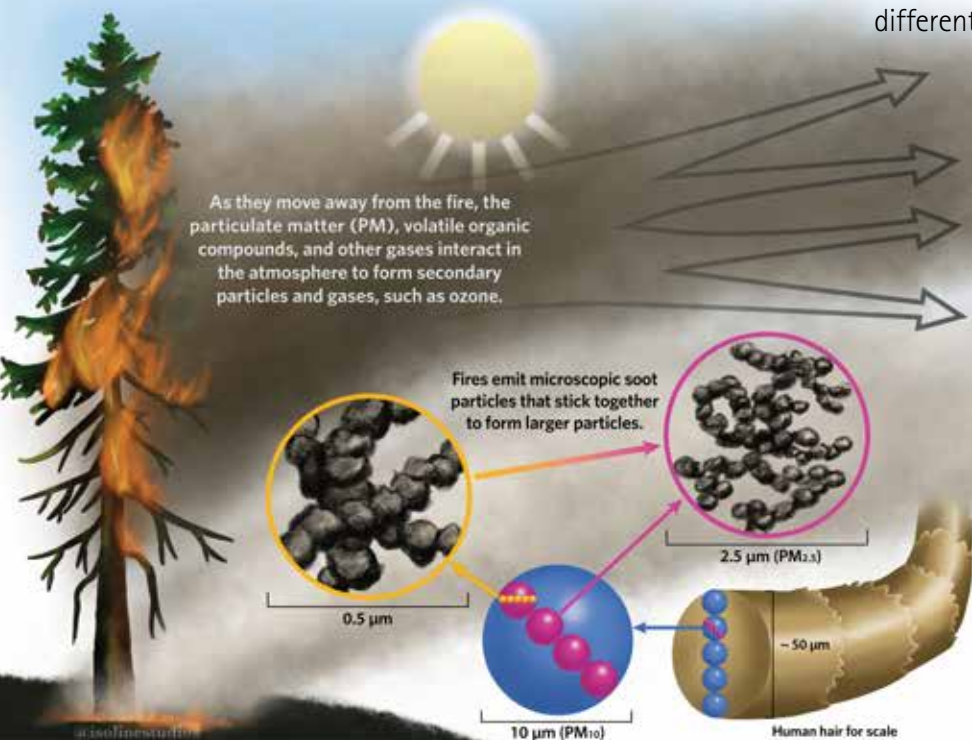


FIGURE 1

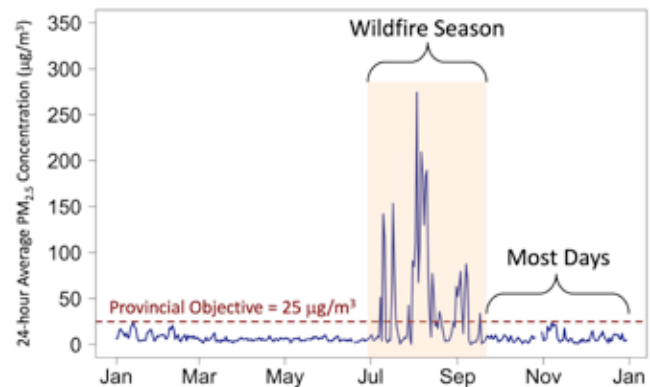
Wildfire smoke is a complex mixture of gases and particles that interact and change as they move away from the fire. The smaller the particles, the more harmful they are to human health.

Exposure to PM_{2.5} from wildfire smoke is less predictable and more variable than exposure to PM_{2.5} from other sources, such as traffic and industry.

- Wildfire smoke causes episodes of extremely high PM_{2.5} concentrations that can last for hours, days, or weeks.
- Most communities in British Columbia have low concentrations of PM_{2.5} on most days, *but concentrations can be more than twenty times higher than usual on smoky days* (Figure 2).
- Wildfire seasons are getting longer and more extreme in British Columbia, so pre-season planning <https://u.nu/utpys> is important for protecting your health from wildfire smoke.

FIGURE 2

Concentrations of PM_{2.5} can be more than twenty times higher than usual on smoky days.



In addition to PM_{2.5}, wildfire smoke contains many different gases that can affect air quality and health.

- Volatile organic compounds (VOCs) are gases that evaporate quickly. They give burning wood its characteristic smell.
- Wildfires generate very large amounts of VOCs, which can irritate the eyes, nose, throat, and lungs in the same way as campfire smoke. The levels of VOCs are higher closer to the fire.
- Wildfire smoke can also contain nitrogen dioxide (NO₂), sulphur dioxide (SO₂), and ozone (O₃). Exposure to these gases can irritate airways, especially in people with asthma and chronic obstructive pulmonary disease (COPD).
- Carbon monoxide is a particular concern for anyone working in very close proximity to wildfires.



BC Centre for Disease Control
Provincial Health Services Authority

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FOR MORE INFORMATION bccdc.ca/wildfiresmoke