



The Fire Story: Episode 2 Resource Guide

The History of Air Quality in Oregon:

Oregon experienced record-breaking hazardous air quality in 2020. The Oregon Department of Environmental Quality (DEQ) began monitoring air quality in Portland, Eugene, Medford and Bend in the 1980's. According to recent data from DEQ and the Lane Regional Air Protection Agency (LRAPA), [AQI records for hazardous air quality were broken in all areas across the state on Sept 12-13, 2020, with sensors recording the most hazardous air quality to date in Oregon.](#) Wildfire smoke impacts were particularly bad in 2020, [but a report from DEQ on the historical trends of wildfire smoke show that impacts are increasing across the state on a longer timescale.](#) The most significant impacts are in Southern Oregon, but trends of increasing smoke impacts across the state can be seen starting around 2012. According to the report, Oregonians should expect to see an increasing number of unhealthy or hazardous air quality days around the state in upcoming summers.

Monitoring Air Quality in Oregon:

For citizens interested in real-time air quality monitoring, they can turn to the [Oregon DEQ Air Quality Map](#) or [Purple Air](#). DEQ monitors air quality through a network of sensors placed across the state, primarily in population centers, **which are calibrated and regularly checked for accuracy.** Purple Air sensors can be used by individuals and organizations to get more localized air quality information, **though they are not calibrated.** Throughout Oregon, agencies and individuals are using these smaller Purple Air sensors to measure air quality in their homes and communities. For the Purple Air sensors at lower levels of PM2.5, such as below an AQI of 150 or so and above and AQI of about 50, they tend to read high. Nominally about 1.5 times higher than the DEQ monitors. On the Purple Air monitoring site, there is a drop-down menu where the LRAPA conversion can be selected to better reflect the true particulate matter levels being monitored. Or a quick and dirty (or simple but not quite the LRAPA conversion) conversion would be to divide the Purple Air value by 1.5

Terms Outlined in this Episode:

[AQI](#) is the U.S. Environmental Protection Agency's tool for communicating daily air quality. It uses color-coded categories and provides statements for each category that tell you about air quality in your area, which groups may be affected, and steps you can take to reduce your exposure to air pollution. Think of the AQI as a yardstick that runs from 0 to 500. The higher the AQI value, the greater the level of air pollution and concern for public health. For example, an

AQI value of 50 or below represents good air quality, while an AQI value over 300 represents hazardous air quality.

[**PM2.5**](#) is the label for fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller. To give perspective on how small 2.5 micrometers is, think about a single hair from your head. The average human hair is about 70 micrometers in diameter – making it 30 times larger than the largest fine particle. PM stands for particulate matter (also called particle pollution), a mixture of solid particles and liquid droplets found in the air. PM2.5 is the most dangerous type of particle for human health.

[**Short-term and Long-term Exposure**](#) to PM2.5 carries health effects. For PM2.5, short-term exposures (up to 24-hours duration) have been associated with some adverse health effects primarily in infants, children, and older adults with preexisting heart or lung diseases. Long-term (months to years) exposure to PM2.5 has been linked to premature death, particularly in people who have chronic heart or lung diseases, and reduced lung function growth in children.

[**MERV 13 and HEPA Filters**](#) are both filters for improving air quality. MERV stands for Minimum Efficiency Reporting Value. The higher the MERV rating, the better the filtration. A filter with a MERV rating of 13 to 16 is considered a high-ranking filter and can remove up to 75 percent of all airborne particles 0.3 microns or greater from the air. HEPA, or High Efficiency Particulate Air filters, are designed for applications where contaminants must be trapped on the first go around (like in a hospital). HEPA filters can capture up to 99.7 percent of all contaminants 0.3 microns or greater. In most cases, you can strike a good balance between air cleanliness and HVAC efficiency with a MERV-rated filter. Remember that the air in your home is recirculated, so the same air will pass through your filter multiple times each day. After several rounds, each of which captures up to 75 percent of airborne particles, your air will get cleaner. [Examples of how to make a DIY filter with a box fan and MERV 13 filter can be found here.](#)

Additional Information and Programs Discussed:

- [Oregon Health Authority](#): The OHA provides Oregon residents with information regarding wildfires and public health. Relevant to the issue of smoke, residents can find answers to [frequently asked questions about wildfire smoke and public health](#).
- [The State of Oregon's Department of Environmental Quality's](#) role when it comes to wildfires is to let the public know about air quality and how citizens can protect themselves. The agency leads a growing network of government, tribal, and health organizations, which began after the 2012 Pole Creek Fire near Sisters, Oregon, that tracks smoke across the state and provides air quality advisories.
- [Oregon DEQ has also developed a 5-3-1 Index as a way to use visibility to estimate potential harmful health effects from smoke](#). While you can check the tool for specific guidelines, the general rule of thumb is that if visibility is over five miles, air quality is good. If visibility is under five miles, air quality is unhealthy for sensitive groups. If under three miles, air quality is unhealthy for everyone and sensitive groups specifically should limit exposure. If under one mile, everyone should limit outdoor exposure.

- The EPA has a [Smoke-Ready Toolbox for Wildfires](#) with smoke advisories and maps, fact sheets, and information about [how to protect indoor air quality](#) during a wildfire.

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The [Wayne Morse Center for Law and Politics](#) encourages civic engagement and inspires enlightened dialogue by bringing students, scholars, activists, policymakers, and communities together to discuss issues affecting Oregon, our nation, and the world.

The [Northwest Fire Science Consortium](#) is a regional fire science delivery system for disseminating knowledge and tools; a framework for coordinating fire science delivery; and a venue for increasing researcher understanding of the needs of managers & practitioners.

The [Institute for a Sustainable Environment](#) is a center for innovative, interdisciplinary research at the nexus of ecological, economic, and social sustainability.

