Wildfire Smoke Trends and the Air Quality Index

March 2024

State of Oregon
DEQ Department of Environmental Quality

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Erratum

In the March 2023 version of this report, DEQ identified an error in the database used for the trends of $PM_{2.5}$ Air Quality Index, which resulted in the undercounting of the number of days with an AQI that is Unhealthy for Sensitive Groups or worse in different communities, including Roseburg, Salem, and Sisters. Charts 3 to 26 in the 2022 report are based on the erroneous database so the AQI trends presented in these charts were inaccurate. DEQ corrected the database and charts 5 to 28 in this report, generated based on the corrected database, reflect the accurate data for the number of days with AQI at USG or worse during the 2022 wildfire season.

Executive Summary

Large wildfires have been increasing across the western United States over the last decade and are expected to become more frequent, according to the National Interagency Fire Center. This report summarizes Oregon DEQ's air quality monitoring for particulate matter during the 2023 wildfire season (June 1 to Oct. 12), how that information is translated into an Air Quality Index (AQI) with categories of potential health effects, and what trends the AQI are showing over the last several years.

State of Oregon Department of Environmental Quality

Across Oregon, smoke from wildfires is leading to a rise in the number of days characterized by AQI values that are **unhealthy for sensitive groups or worse**. Some examples from Eastern Oregon, Southern Oregon, and Western Oregon illustrate this.

Central Oregon (Bend):

- In 2023, Bend had 21 days with AQI values that were USG or worse, with thirteen USG days, seven unhealthy days, and one very unhealthy day.
- From 1989 to 2012, Bend only had seven days with AQI values that were USG or worse from wildfire smoke, or 0.3 days per year.
- From 2013 to 2023, Bend jumped to 83 days with AQI values that were USG or worse, 8.3 days per year. That is a nearly 28 fold increase in days impacted per year between the two ten-year periods.
- In all, there were 72 days with AQI values that are USG or worse occurred from 2017 to 2023.

Southeastern Oregon (Klamath Falls):

- In 2023, Klamath Falls had five days with AQI values that were USG or worse, with two USG days and three unhealthy days.
- From 1989 to 2012, Klamath Falls had 31 days with AQI values that were USG or worse due to wildfire smoke, or 1.34 days per year.
- From 2013 to 2023, they have had 128 days with AQI values that were USG or worse, or 12.8 days per year. That is a 9.55 fold increase in days impacted per year between the two ten-year periods.
- In all, there were 113 days with AQI values that were USG or worse from 2017 to 2023.

Southwestern Oregon (Medford):

- In 2023, Medford had 14 days with AQI values that were USG or worse, with two USG days, eleven unhealthy days, and one very unhealthy.
- From 1985 to 2012, Medford had 41 days with AQI values that were USG or worse due to wildfire smoke, or 1.5 days per year.
- From 2013 to 2023, Medford had 141 days with AQI values that were USG or worse, or 12.8 per year. That is a 8.5 fold increase in days impacted per year between the two ten-year periods.
- In all, there were 121 days with AQI values that were USG or worse from 2017 to 2023.
- Medford also had one hazardous AQI day between 1985 and 2012, and four from 2013 to 2023.

Northeastern Oregon (La Grande):

- In 2023, La Grande had no USG days with AQI values that were USG or worse.
- From 1989 to 2012, La Grande had seven days with AQI values that were USG or worse, or 0.30 days per year.
- From 2013 to 2023, La Grande had 35 with AQI values that were USG or worse, or 3.5 days per year. It was a 11.67 fold increase in days impacted per year between the two ten-year periods.
- In all, there were 29 days with AQI values that were USG or worse from 2017 to 2023.

Northwestern Oregon (Portland):

- In 2023, Portland had only one USG day with AQI values that were USG or worse due to wildfire smoke.
- Before 2015, Portland had no days with air quality at AQI values that were USG or worse due to wildfire smoke since DEQ air quality monitoring began in 1985.
- From 2015 to 2023, Portland had 27 days with AQI values that were USG or worse, or three days per year.

Willamette Valley (Eugene, Salem, and Oakridge):

Over the past few years, the wildfire's impacts in the northern and central regions of the Willamette Valley were comparatively less severe from those observed in Western areas like Oakridge.

- In 2023, Eugene had three USG days and one unhealthy day, yet no impact was observed in Salem. Oakridge had 12 USG or worse, with 6 USG and 6 unhealthy days.
- From 1985 to 2012, Eugene and Salem area had three days with AQI values that were USG or worse, or 0.11 days per year. From 1997 to 2012, Oakridge had 3 days with AQI values that were USG or worse from the wildfire smoke, or 1.5 days/year.

- From 2013 to 2023, Eugene and Salem had 65 days with AQI values that were USG or worse, or 6.5 days per year. That is a 59.1 fold increase in days impacted per year between the two ten-year periods. In 2020, Eugene and Salem had first days over unhealthy AQI. In Eugene, there were two days with very unhealthy AQI and seven hazardous days. Similarly, Salem had one very unhealthy day and seven hazardous days. In 2022, Eugene had seven USG days and Salem had one USG day and two unhealthy days. From 2013 to 2023, Oakridge had 102 days with AQI values that were USG or worse, or 10.2 days/yr. That is a 6.8 fold increase in days impacted per year between the two ten-year periods. In 2020, Oakridge had its first days above the unhealthy AQI level, with 3 very unhealthy and 5 hazardous days. In 2022, Oakridge had 37 days with AQI values that were USG or worse, with 3 USG days, 16 unhealthy days, 11 very unhealthy days, and 7 hazardous days.
- In all, there were with 60 days with AQI values that were USG or worse from 2017 to 2023, while Oakridge had 99 days at USG AQI levels or above between 2017 to 2023.

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Introduction

Oregon and adjacent states have abundant temperate rainforests west of the Cascade Mountains and drier ponderosa pine forests east of the Cascades. Fire is a natural part of the ecology of these forests and occasional burning is healthy for forests. Figure 1 demonstrates wildfire trends over the last decade for Oregon, Washington, and Northern California, using the 2023 fire data published by the National Interagency Coordination Center. Fires in these forests have recently become larger, with more acres burned, and a fire season that starts earlier and ends later.

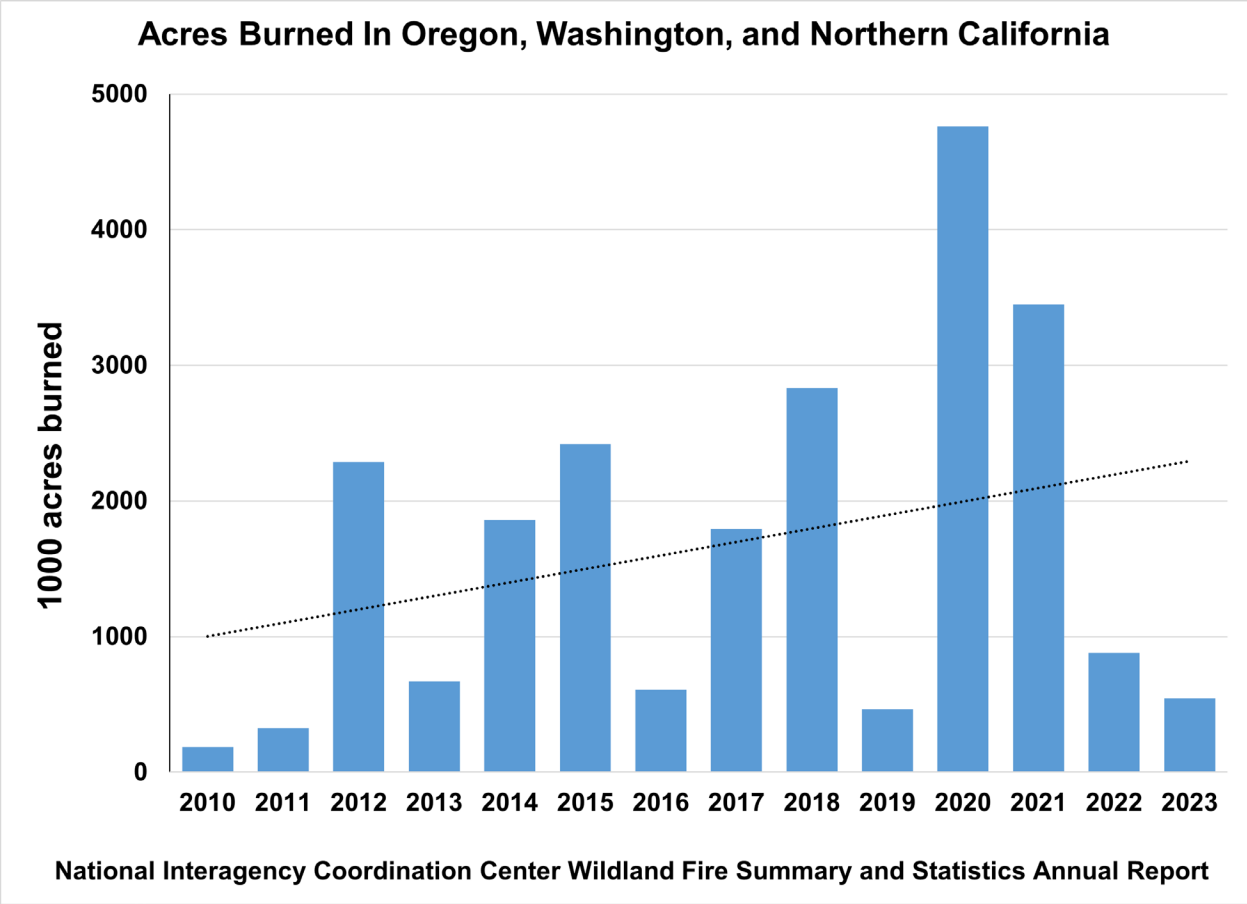

Figure 1. Acreage burned by wildfire in areas impacting the Pacific Northwest.

Scope of this report

This report is limited to the presentation of AQI $PM_{2.5}$ trends and associated categories of potential health impacts during wildfire season in Oregon (Jun. 1 to Oct. 12). This report is a useful reference for detailed discussion of the causes, prevalence, and impacts of wildfire smoke.

Wildfire smoke impacts

Oregon's wildfire season historically started in late July and continued into early September. In the last 3 years, there have been fires starting in mid-July and lasting until early October. Fires impacting Oregon have occurred in the Southern, Central and Northeastern Oregon and Northern California mountains. Some recent impacts have come from British Columbia and Central Washington. In 2020, large fires also occurred in the Cascades and on the coast.

Wildfire smoke emits a wide variety of pollutants measured as particulate matter ($PM_{2.5}$ and PM_{10}), black carbon, nitrogen dioxide (NO_2), carbon monoxide (CO), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs) and metals. According to the Oregon Health

Authority's publication, Wildfire Smoke and Your Health, of these pollutants, $PM_{2.5}$ may represent the greatest health concern since it can be inhaled deeply into the lungs and some may reach the bloodstream. Volatile organic compounds can cause early symptoms such as watery eyes, respiratory tract irritation and headaches. Higher levels of ozone (smog) can also be formed from an increase in the precursor pollutants: nitrogen dioxide and volatile organic compounds.

Air Quality Index

Six air pollutants known as "criteria pollutants" are carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter ($PM_{2.5}$ & PM_{10}) and sulfur (SO_2). The U.S. EPA created the color-coded Air Quality Index, or AQI, which is used to convert criteria pollutant concentrations into understandable health risk language. In Oregon, $PM_{2.5}$ and ozone measurements typically have the highest AQI and are therefore considered drivers of air quality related health risks. During the summer, ozone concentrations tend to rise in urban regions, particularly on days characterized by high maximum temperatures. This phenomenon often results in a higher Air Quality Index (AQI) for ozone compared to $PM_{2.5}$, unless there is wildfire smoke present. $PM_{2.5}$ and ozone have regularly updated National Ambient Air Quality Standards (NAAQS).

Calculating AQI trends

The AQI is useful for calculating trends of wildfire smoke impact on public health. The AQI used in the trends are calculated using $PM_{2.5}$ measurements because $PM_{2.5}$ has the highest AQI levels of any of the continuously measured pollutants during wildfire smoke intrusions.

DEQ measures $PM_{2.5}$ using Federal Reference Method (FRM) filter samplers in several locations. These work by passing air through a filter for 24 hours starting at midnight and sampling every third day. The filter samplers are co-located with nephelometers that measure continuous, real-time light scattering due to particulate matter. DEQ uses linear regression to compare the light scattering from the nephelometer and the $PM_{2.5}$ from the filter samplers to get a correlation between the two methods. The correlation equation is used to convert the nephelometer's light scattering into a real-time $PM_{2.5}$ estimate. The 24-hour $PM_{2.5}$ average is used to calculate the daily AQI presented in this report.

DEQ and Lane Regional Air Protection Agency have upgraded the $PM_{2.5}$ network by replacing FRM filter samplers with Federal Equivalence Method (FEM) monitors, which collect data hourly and operate continuously. The nephelometers are currently being correlated to the FEMs to update their calibration.

$PM_{2.5}$ estimate calculations

To calculate the AQI, the $PM_{2.5}$ FRM or FEM data is used when available. When there is no FRM/FEM data, the nephelometer derived $PM_{2.5}$ estimates are used. Most days and locations do not have FRM/FEM data so the $PM_{2.5}$ estimates consist of over half of the values. For this trend report, when no data was available for a monitor, DEQ used a nearby individual PurpleAir monitor and correlated that with the nearest DEQ nephelometer when both were running. The correlation was used to estimate $PM_{2.5}$ during times the DEQ monitor was down.

For this trend report, DEQ used the 2016 to 2018 $PM_{2.5}$ Federal Reference Method/nephelometer correlation equations to recalculate the nephelometer light scattering values. The $PM_{2.5}$ estimates were updated using a more recent correlation equation to eliminate variations from changing correlations over the years. *Note that correlation equations change very little, but a small change can be significant if the $PM_{2.5}$ estimate is near a break point between AQI categories.*

AQI calculations

The AQI was also updated using the most recent AQI breakpoints provided by EPA. The AQI breakpoints changed when EPA updated the $PM_{2.5}$ standards in 2012. To ensure past and present data are comparable, all the data must be recalculated using the same AQI breakpoints. The most recent breakpoints are based on the most current health information. The current EPA breakpoints are in Table 6 of the EPA's **Technical Assistance Document for the Reporting of Daily Air Quality – the Air Quality Index (AQI), September 2018.** The AQI calculation is Equation 1 in the document. The AQI categories and breakpoints are shown in Table 1 below. Although the EPA updated the AQI breakpoints in 2024, the older AQI breakpoints were applied and therefore used in this report at the time of its publication.

Table 1. The $PM_{2.5}$ Air Quality Index, breakpoints, and potential health effects.

Air Quality Index	Who Needs to be Concerned?	What Should I Do?
Good (0-50)	It's a great day to be active outside.	
Moderate (51-100)	Some people who may be unusually sensitive to particle pollution.	**Unusually sensitive people:** Consider making outdoor activities shorter and less intense. Watch for symptoms such as coughing or shortness of breath. These are signs to take it easier. **Everyone else:** It's a good day to be active outside.
Unhealthy for Sensitive Groups (101-150)	Sensitive groups include **people with heart or lung disease, older adults, children and teenagers, pregnant people, minority populations, and outdoor workers.**	**Sensitive groups:** Make outdoor activities shorter and less intense. It's OK to be active outdoors, but take more breaks. Watch for symptoms such as coughing or shortness of breath. **People with asthma:** Follow your asthma action plan and keep quick relief medicine handy. **People with heart disease:** Symptoms such as palpitations, shortness of breath, or unusual fatigue may indicate a serious problem. If you have any of these, contact your health care provider.
Unhealthy (151-200)	**Everyone**	**Sensitive groups:** Avoid long or intense outdoor activities. Consider rescheduling or moving activities indoors.* **Everyone else:** Reduce long or intense activities. Take more breaks during outdoor activities.
Very Unhealthy (201-300)	**Everyone**	**Sensitive groups:** Avoid all physical activity outdoors. Reschedule to a time when air quality is better or move activities indoors.* **Everyone else:** Avoid long or intense activities. Consider rescheduling or moving activities indoors.*
Hazardous (301-500)	**Everyone**	**Everyone:** Avoid all physical activity outdoors. **Sensitive groups:** Remain indoors and keep activity levels low. Follow tips for keeping particle levels low indoors.*

***Note:** If you don't have an air conditioner, staying inside with the windows closed may be dangerous in extremely hot weather. If you are hot, go someplace with air conditioning or check with your local government to find out if cooling centers are available in your community.

Trends

DEQ compiled the wildfire AQI trends for “Unhealthy for Sensitive Groups,” “Unhealthy,” “Very Unhealthy” or “Hazardous” categories of the AQI. Collectively these categories are known as unhealthy for sensitive groups or worse, or **≥USG** for short. In Oregon, wildfire smoke occurs during the summer, so for this report values from June 1 to October 20 were selected. July 4 was removed from the trends because of outliers due to fireworks. DEQ evaluated summertime AQI trends up to 2023 for 24 communities in Oregon. A map of wildfire related AQI trends for various cities around the state is shown in Figure 2. The charts on the map show the ≥USG for each city.

To simplify the discussion in this report, only four of the cities from across the state are provided in the main body. They are Bend, Klamath Falls, Medford and Portland. The trends for the number of days ≥USG for these cities are provided in

Figure 4 through Figure 28. The graphs for the remaining cities are shown in the appendix.

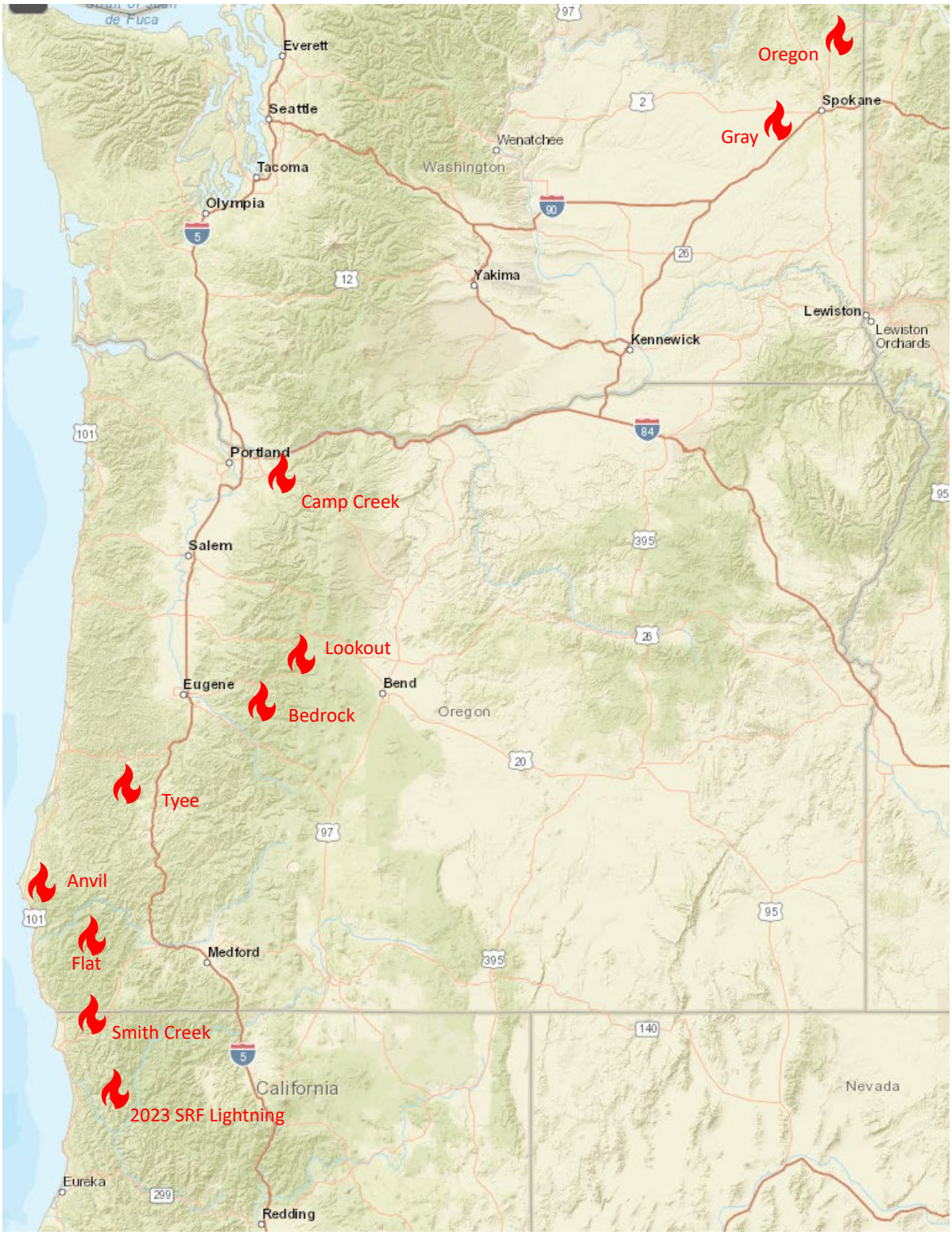

Figure 2. Map of 2023 fires that impacted Oregon communities with smoke.

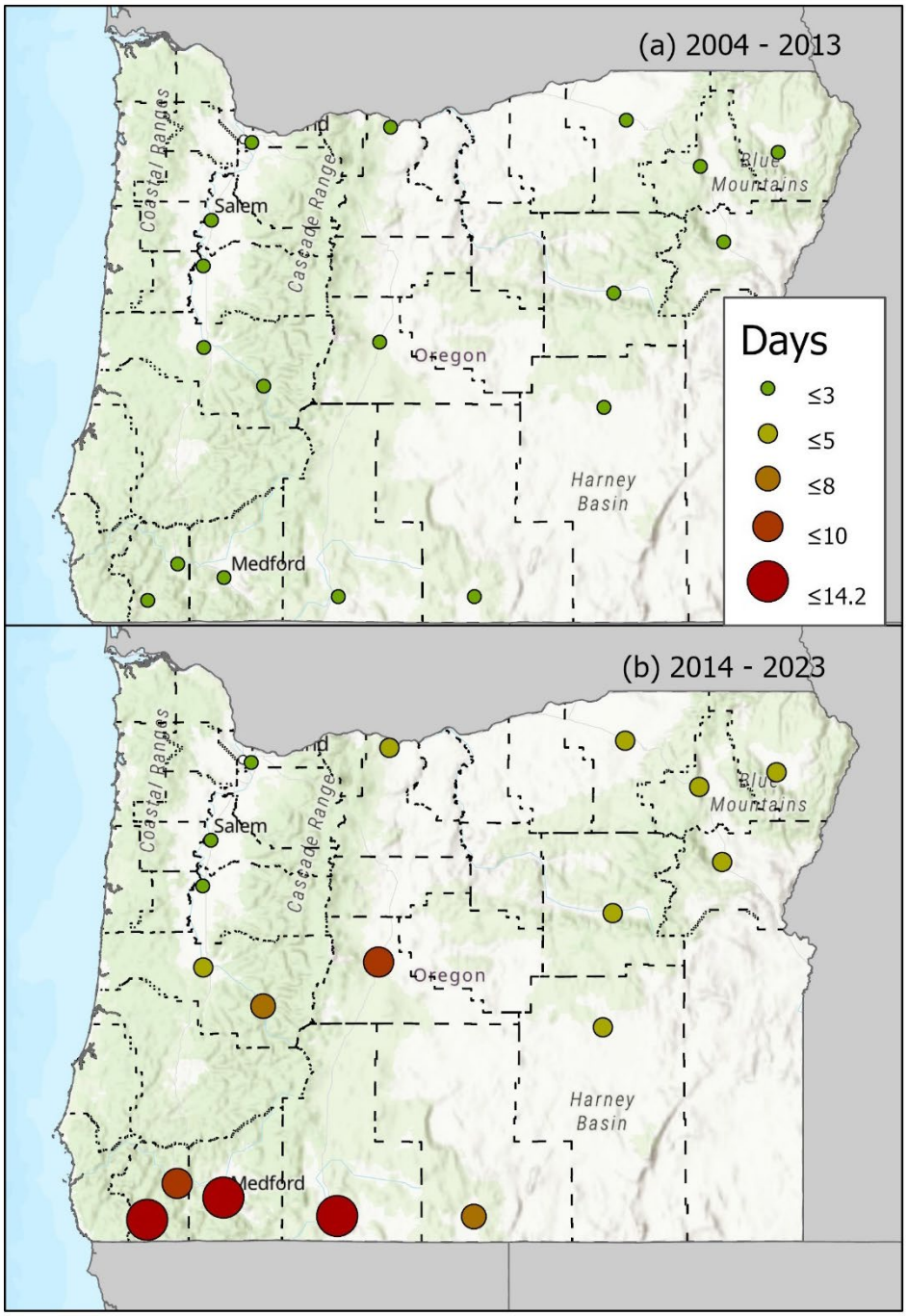

Figure 3. Average number of AQI days at USG or above from wildfire smoke, 2004 to 2023.

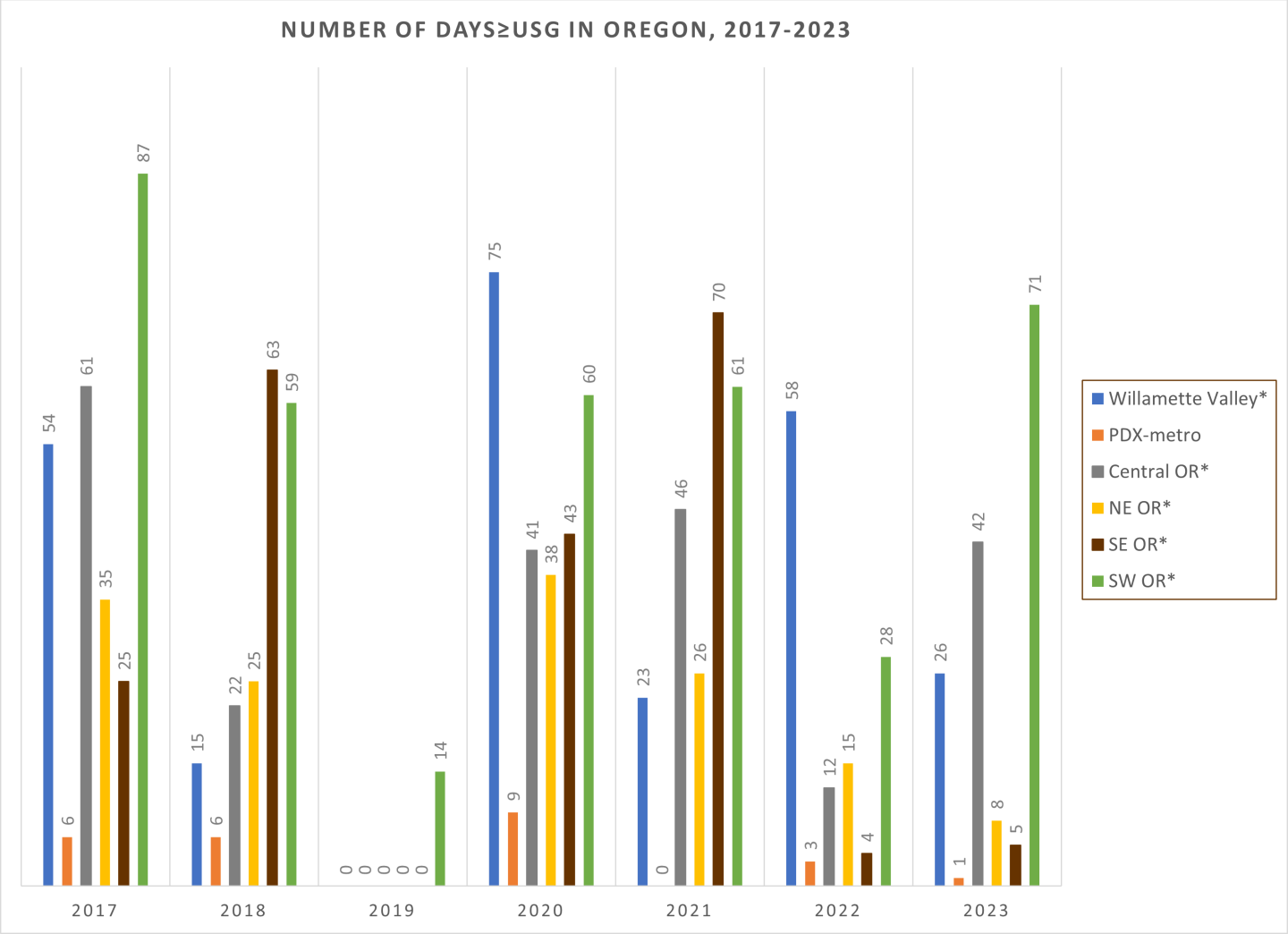

Figure 4. number of AQI days at USG or above from wildfire smoke in Oregon from 2017 to 2023. Willamette Valley*: Albany, Corvallis, Cottage Grove, Oakridge, Salem, Sweet Home. Central OR*: Bend, Sisters, John Day, Prineville. NE OR*: La Grande, Pendleton, Enterprise, The Dalles, Baker City. SE OR*: Lakeview, Burns, Klamath Falls. SW OR*: Cave junction, Grants Pass, Medford, Roseburg.

Discussion

The 2023 wildfire season saw substantial smoke impacts from fires in Oregon from east of Eugene/Springfield in Lane County, near the coast in Curry County, and near the Bull Run Reservoir in Clackamas County. Smoke from fires in northern California, Washington near Spokane, and Canada also had a significant impact on Oregon communities.

The Flat Fire, near Agness in Curry County, started on July 15th and burned 34,242 acres. The Rogue Valley experienced USG to unhealthy on July 16 and 20. Primarily concentrated around Agness, the smoke from the Flat Fire lingered, exerting moderate impacts on the communities of Brookings, Gold Beach, and Crescent City from the end of July through the initial weeks of August.

The Bedrock Fire near Lowell in Lane County, started on July 22nd and burned 31,590 acres. It was near the Lookout Fire, also in Lane County, which burned 25,754 acres. The smoke from both fires intermingled and impacted western and eastern Oregon. Most of the smoke impacts were from Eugene south in the west and in central Oregon to the east.

The Smith Creek Complex in Siskiyou County, CA started on August 15th, and burned 95,107 acres. This was followed by the 2023 SRF Lightning Complex in Del Norte County just to the south of Oregon, which started on August 17th and burned 50,198 acres. These fires mainly impacted south and SW Oregon and had some of the highest concentrations of $PM_{2.5}$ impacts during the summer, with levels in the very unhealthy category at times.

Tracking wildfire smoke using models and satellite images showed that smoke from Canadian fires might have contributed to poor air quality in N and NW OR on Aug 19th to 21st. On August 18th, two fires started near Spokane, WA, which also impacted northern Oregon. These were the Oregon Fire, which burned 10,817 acres, and the Gray Fire, which burned 10,085 acres. The smoke from these fires was transported from Kennewick, WA to Hermiston and Pendleton, OR and transported through Columbia River Gorge to reach the Willamette Valley, the Portland-metro area, Salem, and Eugene. In eastern Oregon, the smoke from these fires went as far as Bend. These were short-lived and only had impacts for a few days.

On August 24th, the Tyee Ridge Complex started near Sutherlin in Douglas County, and burned 7,945 acres. This fire impacted SW Oregon for around three days. On August 25th, the Anvil Fire started near Port Orford in Curry County. The fire burned 22,170 acres. Smoke from this fire mainly impacted southern Oregon up to Lane County in late September. Also on August 25th, the Camp Creek Fire started east of Gresham near the Bull Run Reservoir in Clackamas County. This fire only burned 2,055 acres but produced smoke that impacted the Portland/Vancouver Metro Area.

A map of these fire locations is shown in Figure 2.Wildfire smoke impacts are increasing across the state. There are more ≥ USG days per year and more years with at least one ≥USG event. The trends for the number of days ≥USG from 2017 to 2023 for all regions across Oregon is shown in

Figure 4. The most significant impacts from fires are typically in Southern Oregon; smoke impacts Eastern and Central Oregon, the Willamette Valley, and the Portland-metro area as well. Even though 2023 was not as smokey as 2017, 2018, 2020, or 2021, there were still long-lasting fires

producing USG to very unhealthy AQIs in communities of Central and SW Oregon. In Oregon, significant impacts from wildfire smoke were observed in 2020, with the most densely populated areas experiencing record-high concentrations of $PM_{2.5}$ (Figure 4).

The 2023 AQI data has been compiled into the following trends summaries.

- Between 1987 and 2012, Bend had three unhealthy days caused by wildfire smoke. Between 2013 to 2023, Bend had 83 days ≥ USG, with 29 unhealthy days, seven very unhealthy days, and seven hazardous days. There were 72 ≥ USG days occurring from 2017 to 2023. Bend had seven unhealthy days and one very unhealthy day in 2023.
- Between 1989 to 2012, Klamath Falls had 31 days ≥ USG, with sixteen unhealthy days. From 2013 to 2023, Klamath Falls had 128 days ≥ USG, with five very unhealthy days. Klamath Falls had 113 ≥ USG days from 2017 to 2023. There were two very unhealthy days before 2013, five between 2013 and 2023, and its first hazardous day in 2020. Klamath Falls had three days ≥ USG in 2023, with two USG and three unhealthy days.
- Between 1985 to 2012, Medford had 41 days ≥ USG with 14 unhealthy days and seven very unhealthy days, mostly in 1987. From 2013 to 2023, Medford had 141 ≥ USG days with 62 unhealthy days and 12 very unhealthy days. There were 121 ≥ USG days between 2017 to 2023. From 2013 to 2023 Medford had 12 very unhealthy days. Medford had one hazardous day in 1987 and did not have another one until 2017. It had three hazardous days in 2020.
- Portland had no unhealthy days or worse between 1985 and 2012 from wildfire smoke. From 2013 to 2023, Portland had 41 ≥ USG days; with 25 ≥ USG days between 2017 to 2023. From 2013 to 2023 it had seven unhealthy, three very unhealthy, and five hazardous days from wildfire smoke. The very unhealthy and hazardous days occurred in 2020.
- In Northern Willamette Valley, Eugene and Salem, there were 3 ≥ USG days before 2012. Eugene and Salem had 65 ≥ USG days from 2013 to 2023, with 9 unhealthy, 6 very unhealthy, and 15 hazardous days. Eugene and Salem had 59 ≥ USG days between 2017 to 2023; Eugene had one unhealthy day in 2023. However, in Eastern Willamette Valley, wildfire's impacts were differed from the northern part. Between 1997 and 2012, Oakridge had 3 ≥ USG days with no very unhealthy days or worse from wildfire smoke. Oakridge had no days with very unhealthy AQI or worst from wildfire smoke before 2013. There were 102 ≥ USG days from wildfire smoke between 2013 to 2023, with 41 unhealthy, 16 very unhealthy, and 12 hazardous days. There were 99 ≥ USG days between 2017 to 2023. Oakridge had 6 unhealthy days from wildfire smoke in 2023.
- In Northeastern OR, La Grande had 7 ≥ USG days from wildfire smoke between 1989 to 2012. There were 35 ≥ USG days from 2013 to 2023 with 11 unhealthy, 3 very unhealthy days, and no hazardous days. There were 26 ≥ USG days between 2017 to 2023. La Grande experienced one day with unhealthy AQI in 2006, and no unhealthy days were recorded until 2015, when there were two days of unhealthy.

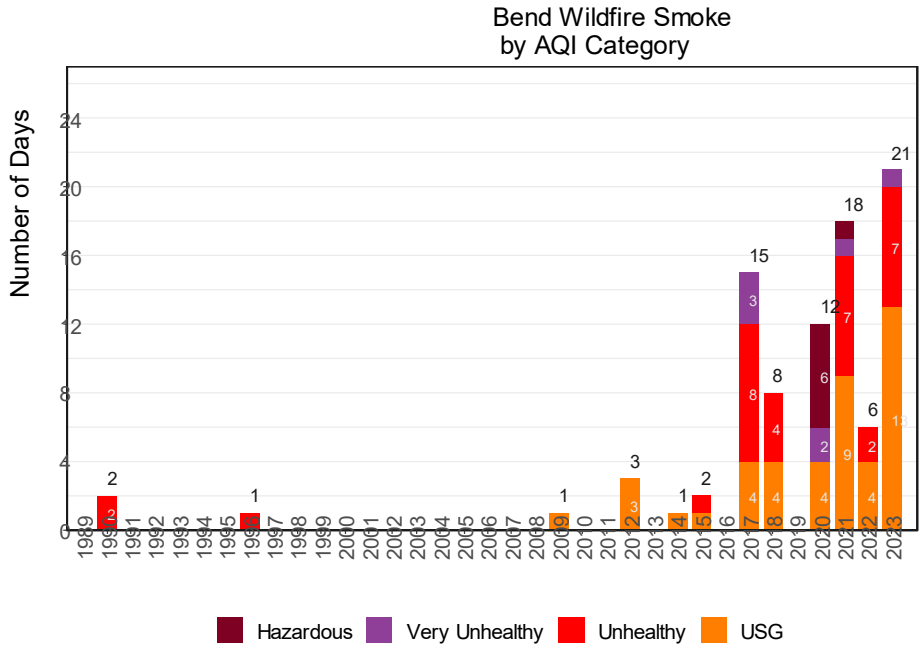

Figure 5. Bend ≥ USG AQI wildfire smoke trends.

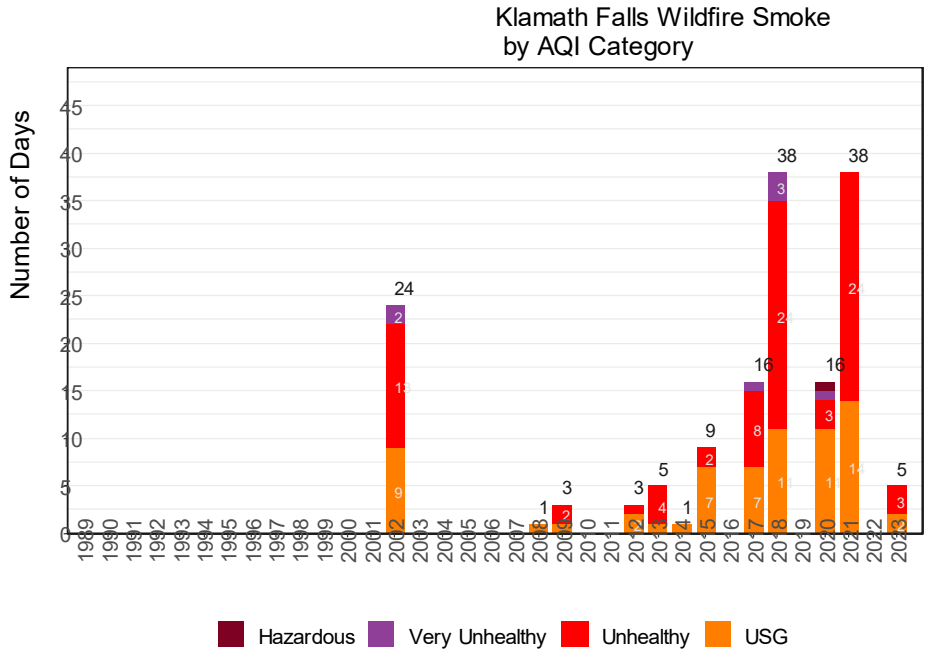

Figure 6. Klamath Falls ≥ USG AQI wildfire smoke trends.

Note: No data was collected during the summer from 1991 through 1995, 1997, and 1998.

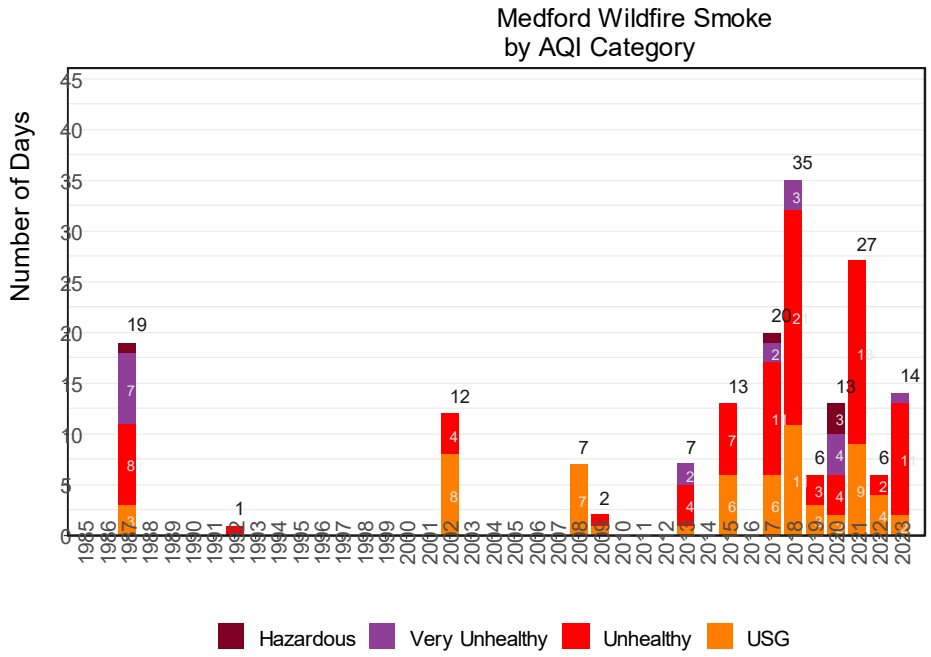

Figure 7. Medford ≥ USG AQI wildfire smoke trends.

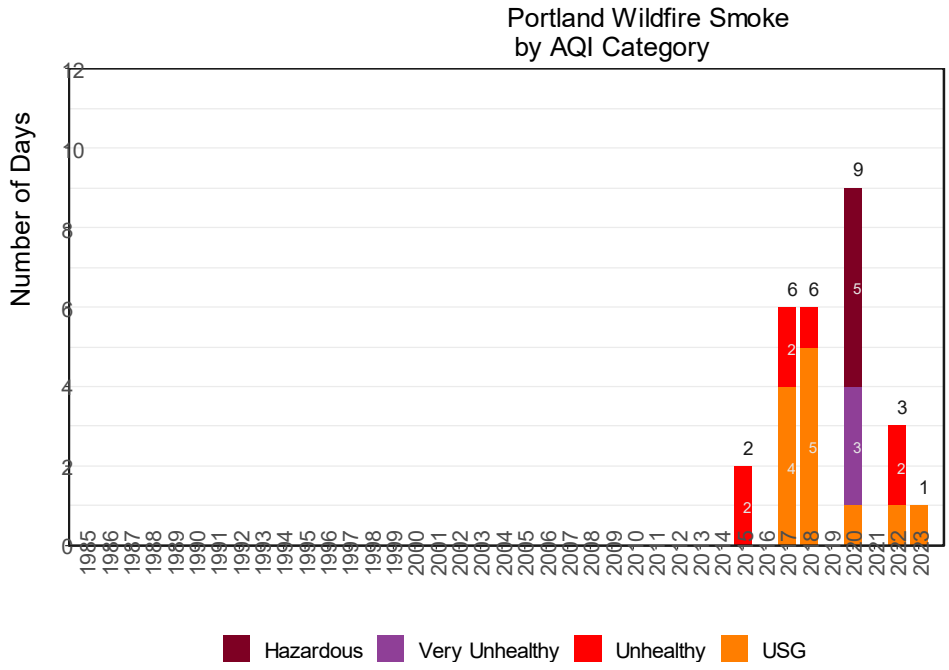

Figure 8. Portland ≥ USG AQI wildfire smoke trends.

Note: USG days not included: two in 1985, one in 1987, and one in 1990. These were likely from field burning.

Conclusion

This report explains the AQI and displays AQI trends from wildfire smoke impacts. The data show that AQI categories from wildfire smoke have been increasing starting around 2012, with more frequent days at “unhealthy” or worse levels, including the record-breaking events of September 2020. If these trends continue, Oregon expects to see an increasing number of days with an AQI ≥USG during the summer, not just in southern Oregon, but across the state. This will include areas which have historically not seen significant smoke impacts, such as the north coast area, the Willamette Valley, and the Portland-metro area.

Learn more

EPA’s Wildland Fire Publications, Fact Sheets and Other Resources

AQI – A Guide to Air Quality and Your Health

Track current air quality on DEQ’s online Air Quality Index or the free Oregon Air app.

During wildfire season, you can also track air quality at OregonSmoke.org.

Wildfire Smoke and Your Health, Public Health Division, Oregon Health Authority.

Appendix

Wildfire trends for individual communities

The graphs below show the number of days with an AQI ≥USG for 20 communities with monitoring data. The horizontal axis (or date) varies for each chart depending on when monitoring was started.

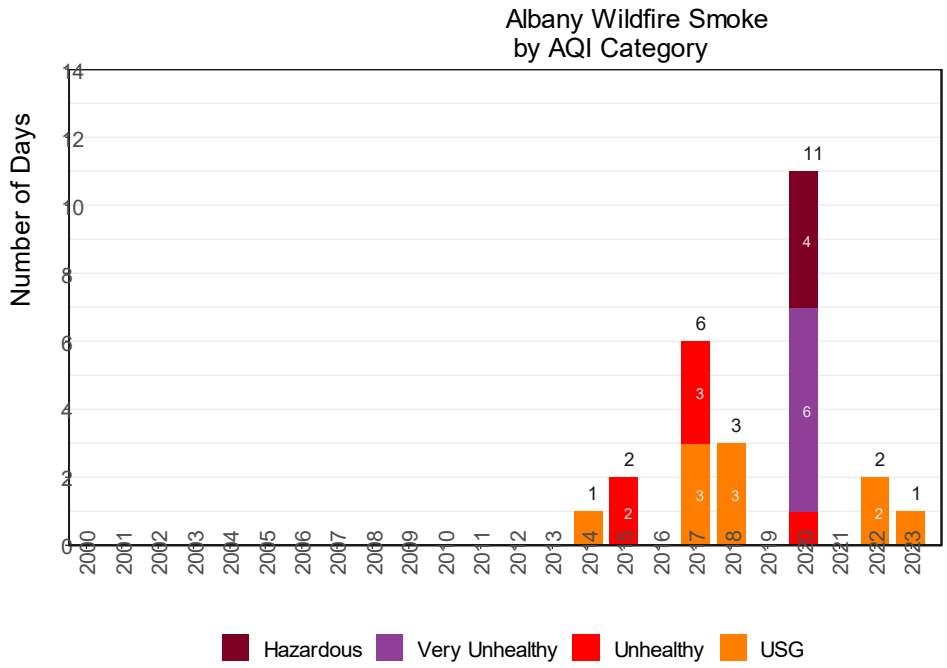

Figure 9. Albany wildfire ≥ USG AQI wildfire smoke trends.

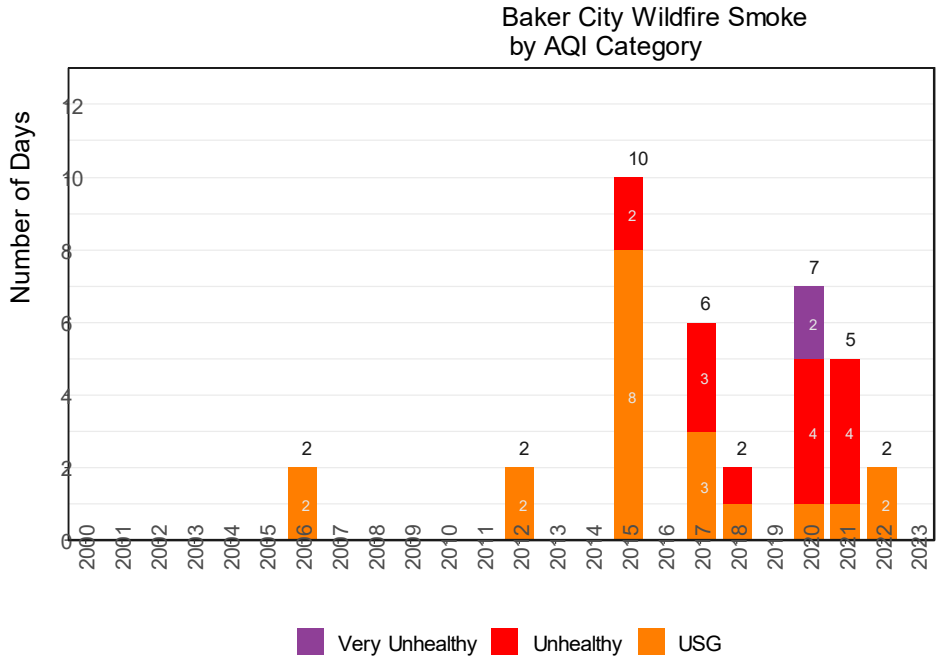

Figure 10. Baker City wildfire ≥ USG AQI wildfire smoke trends.

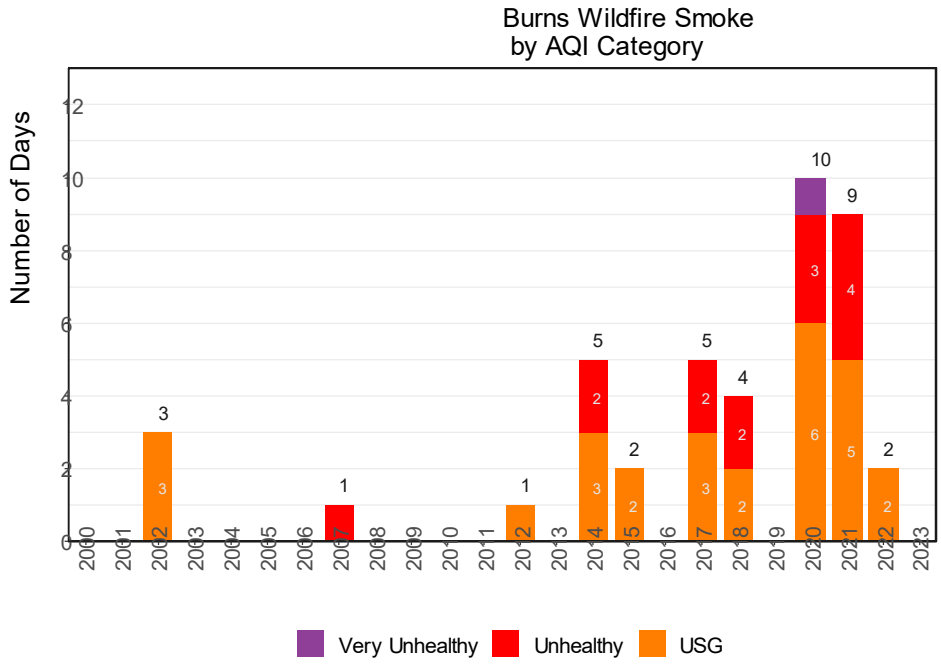

Figure 11. Burns wildfire ≥ USG AQI wildfire smoke trends.

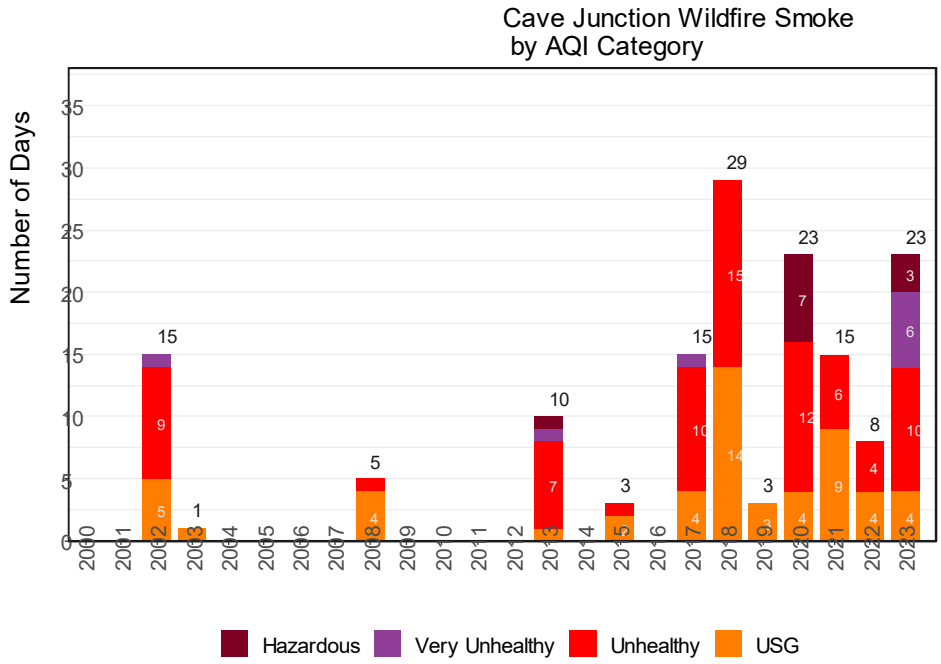

Figure 12. Cave Junction wildfire ≥ USG AQI wildfire smoke trends.

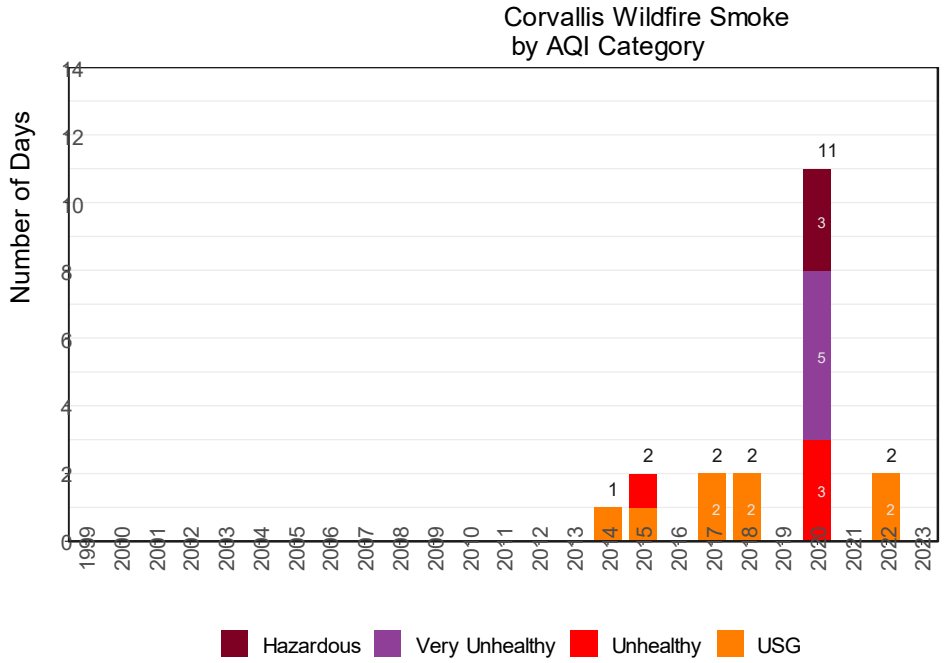

Figure 13. Corvallis wildfire ≥ USG AQI wildfire smoke trends.

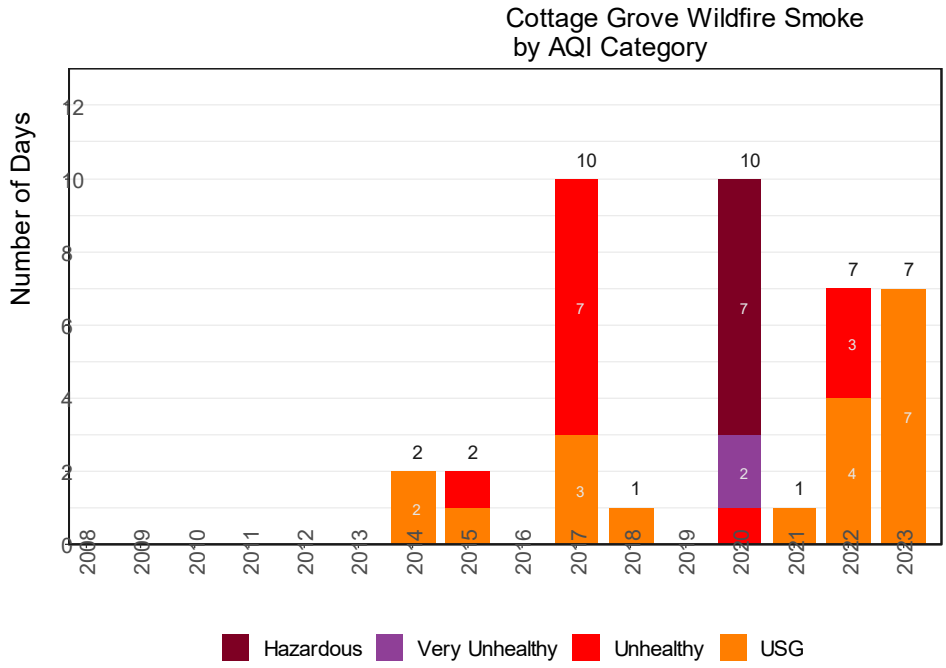

Figure 14. Cottage Grove wildfire ≥ USG AQI wildfire smoke trends.

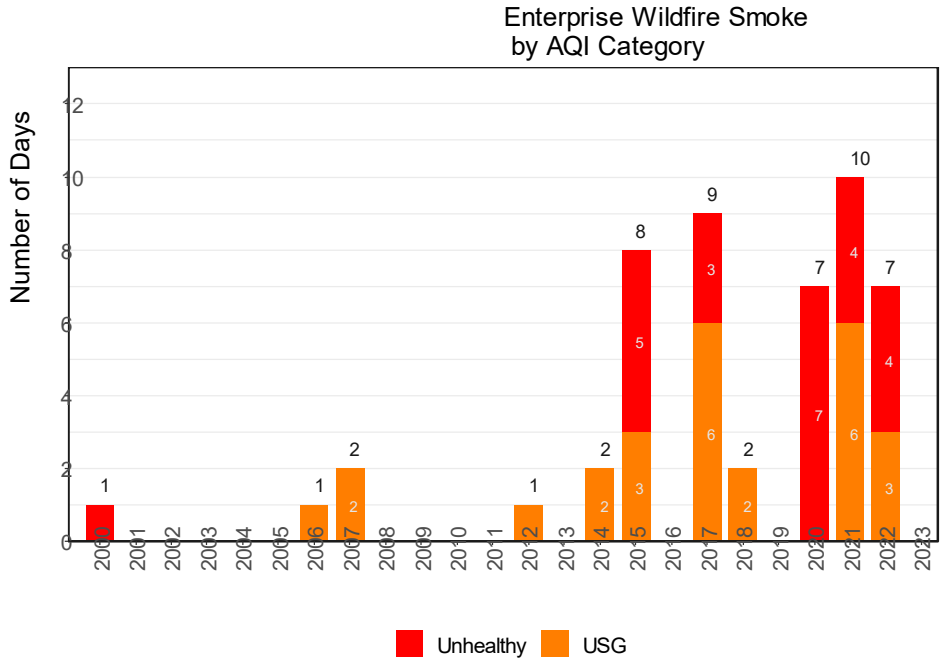

Figure 15. Enterprise wildfire ≥ USG AQI wildfire smoke trends.

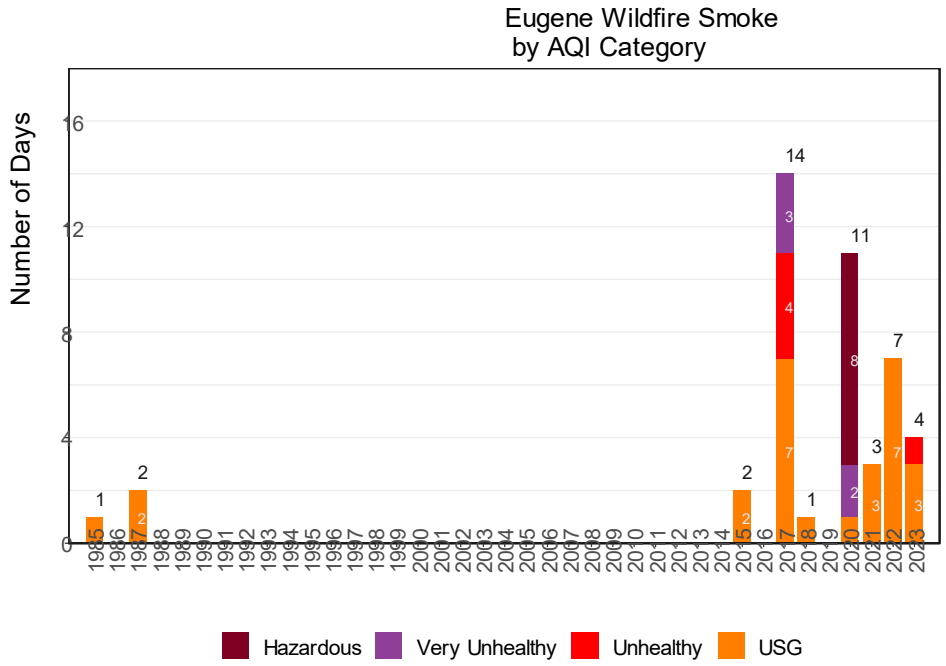

Figure 16. Eugene/Springfield wildfire ≥ USG AQI wildfire smoke trends.
1985 and 1987 were likely field burning.

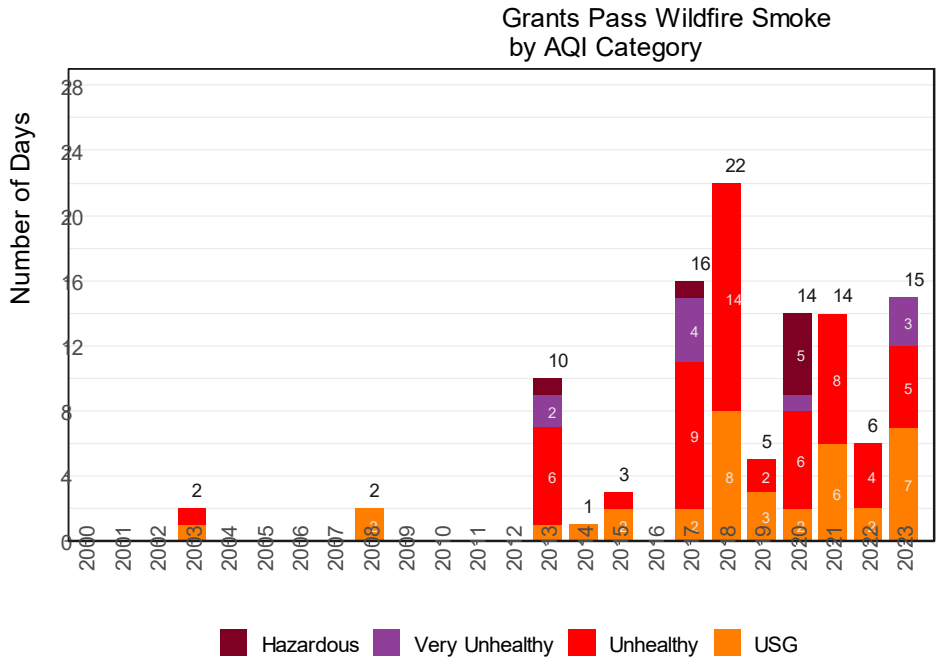

Figure 17. Grants Pass wildfire ≥ USG AQI wildfire smoke trends.

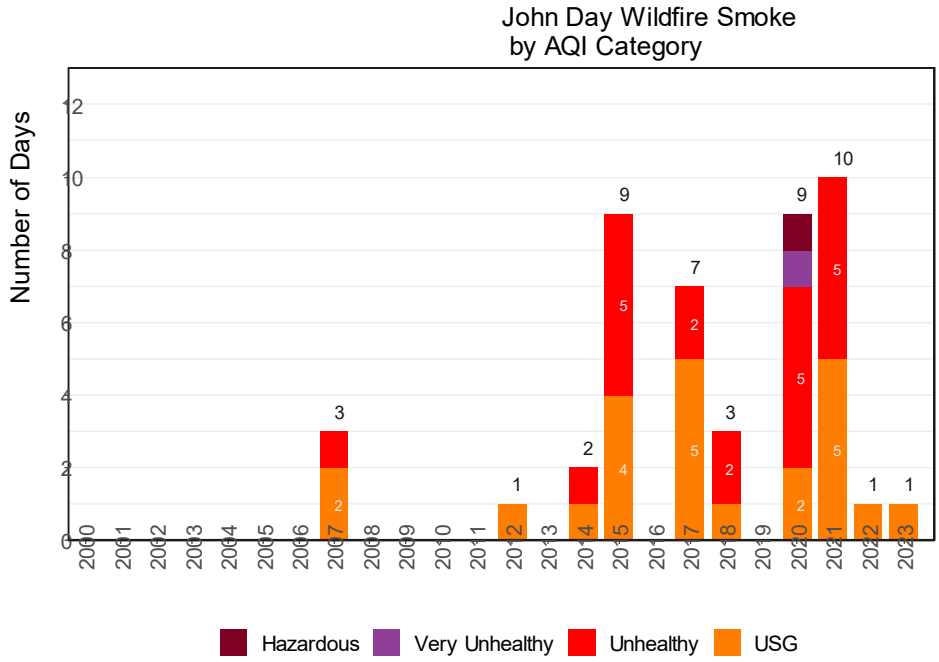

Figure 18. John Day wildfire ≥ USG AQI wildfire smoke trends.

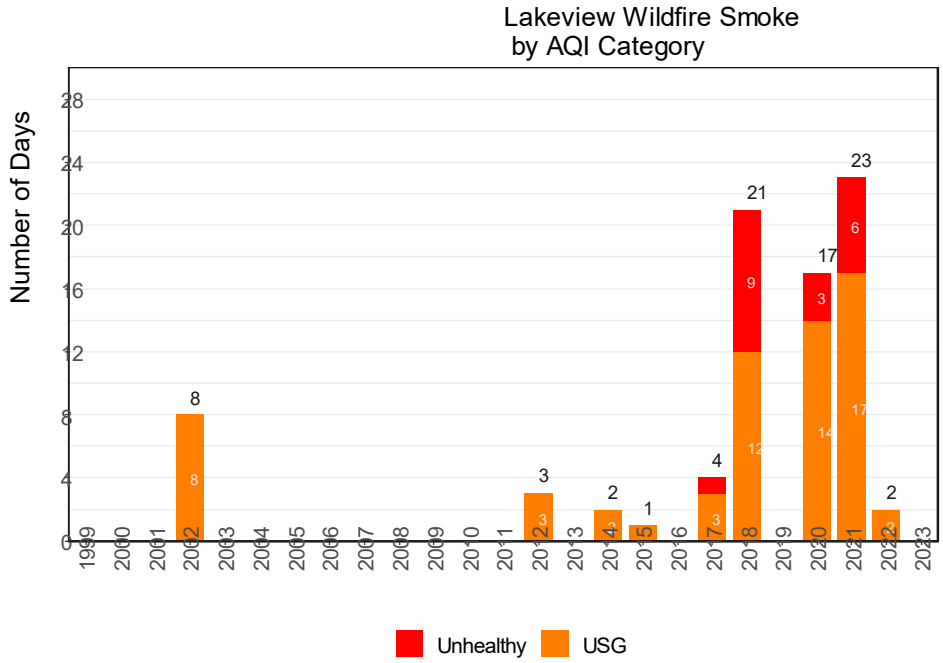

Figure 19. Lakeview wildfire ≥ USG AQI wildfire smoke trends.

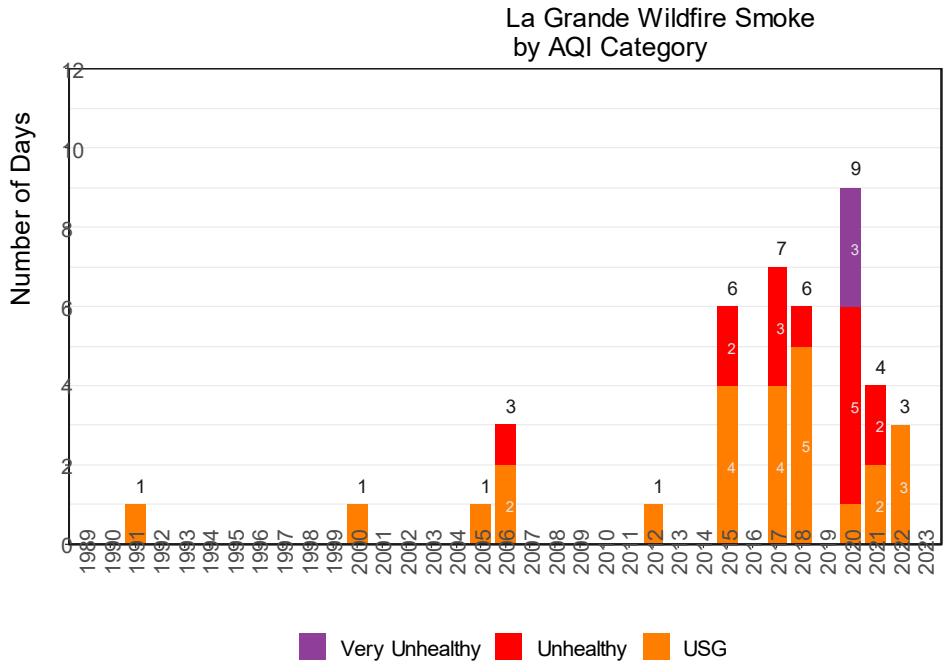

Figure 20. La Grande wildfire ≥ USG AQI wildfire smoke trends.

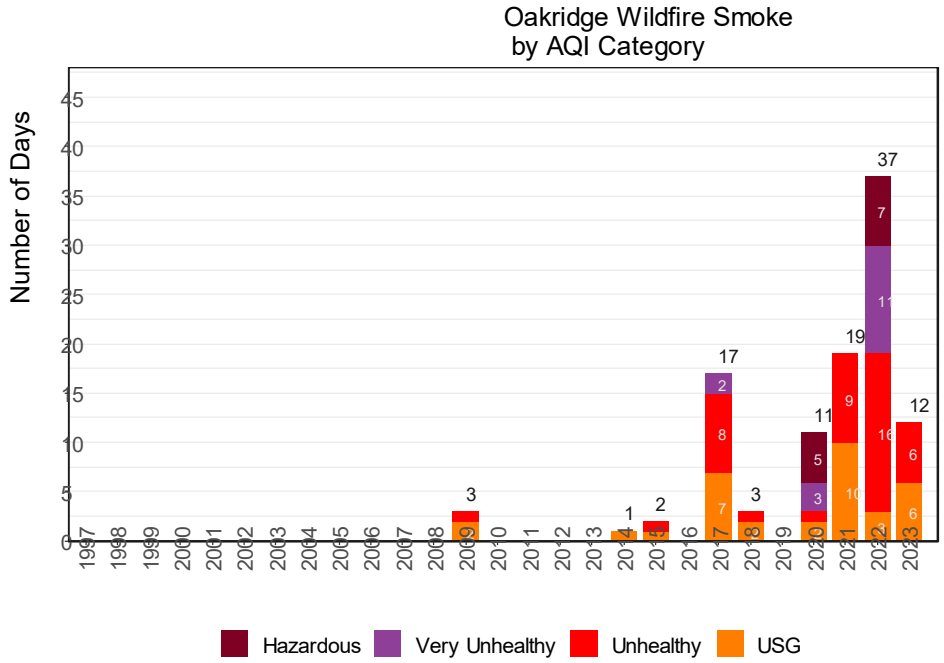

Figure 21. Oakridge wildfire ≥ USG AQI wildfire smoke trends.

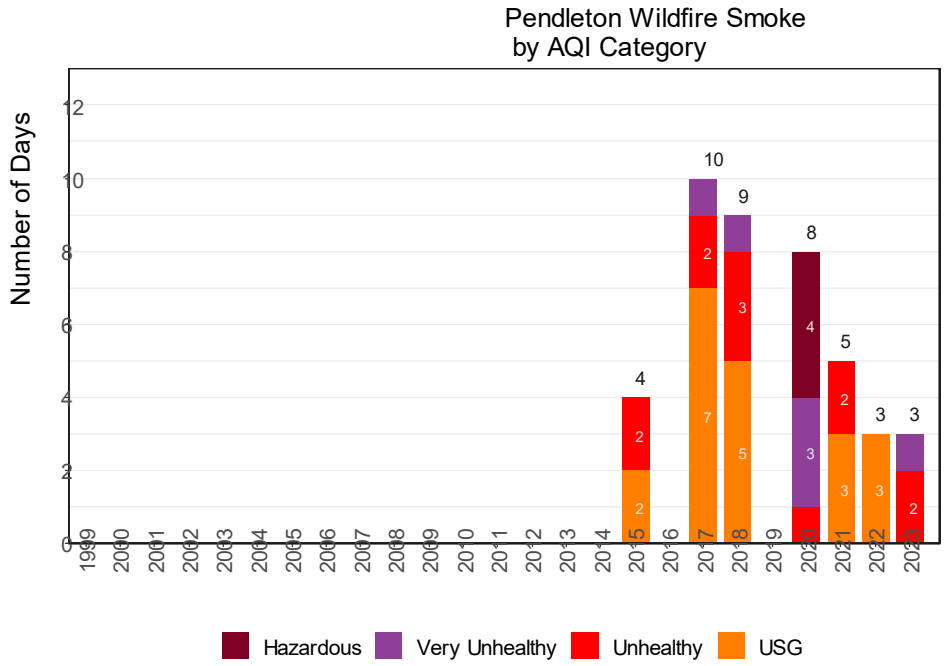

Figure 22. Pendleton wildfire ≥ USG AQI wildfire smoke trends.

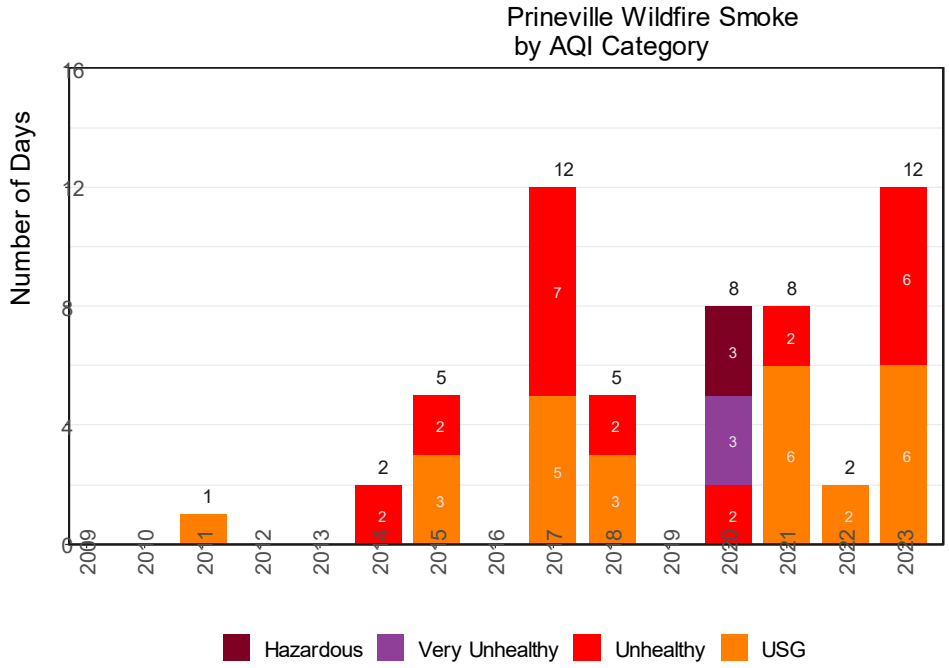

Figure 23. Prineville wildfire ≥ USG AQI wildfire smoke trends.

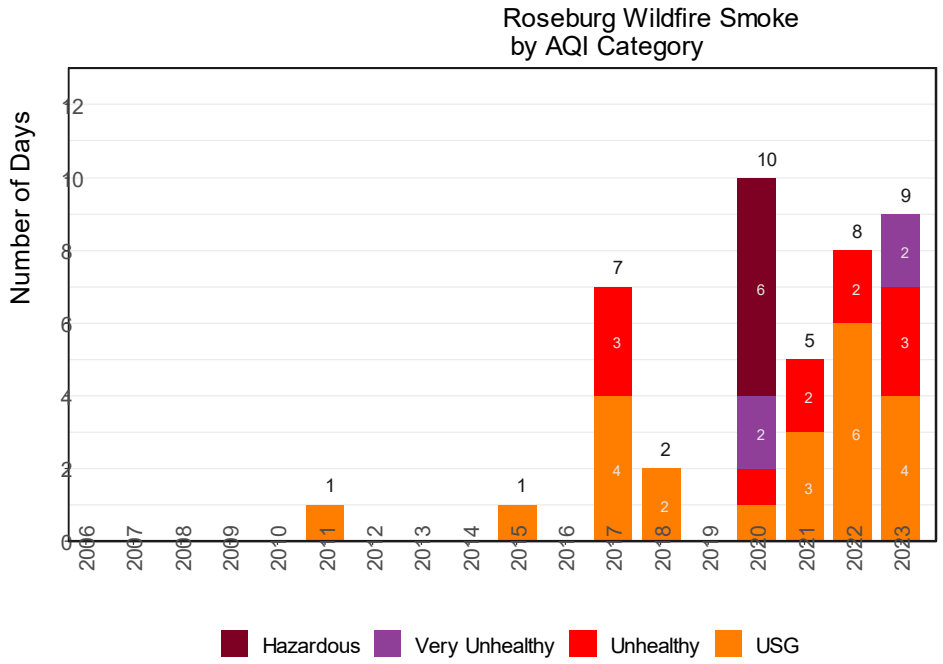

Figure 24. Roseburg wildfire ≥ USG AQI wildfire smoke trends.

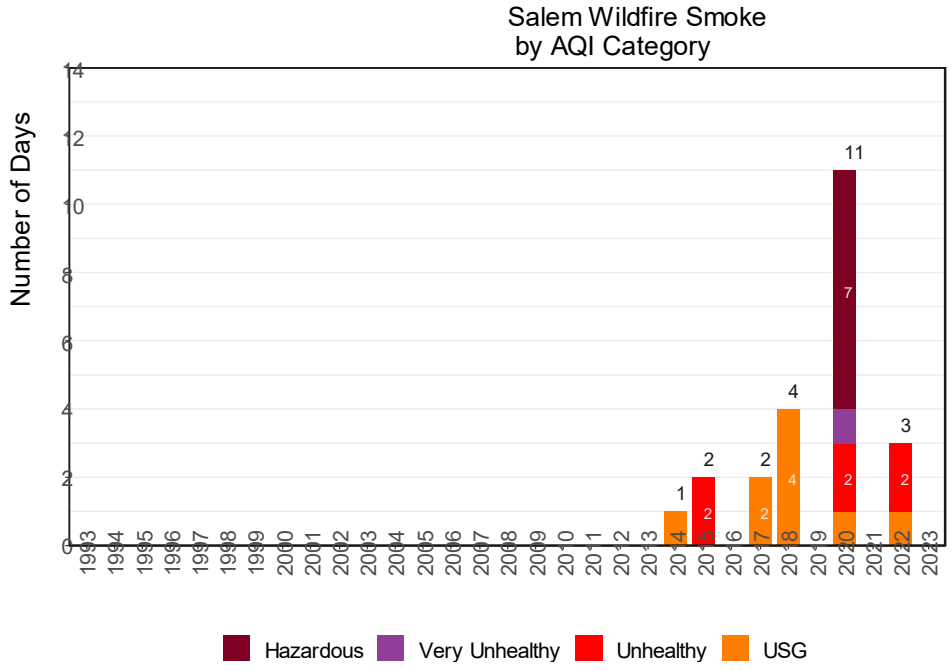

Figure 25. Salem wildfire ≥ USG AQI wildfire smoke trends.

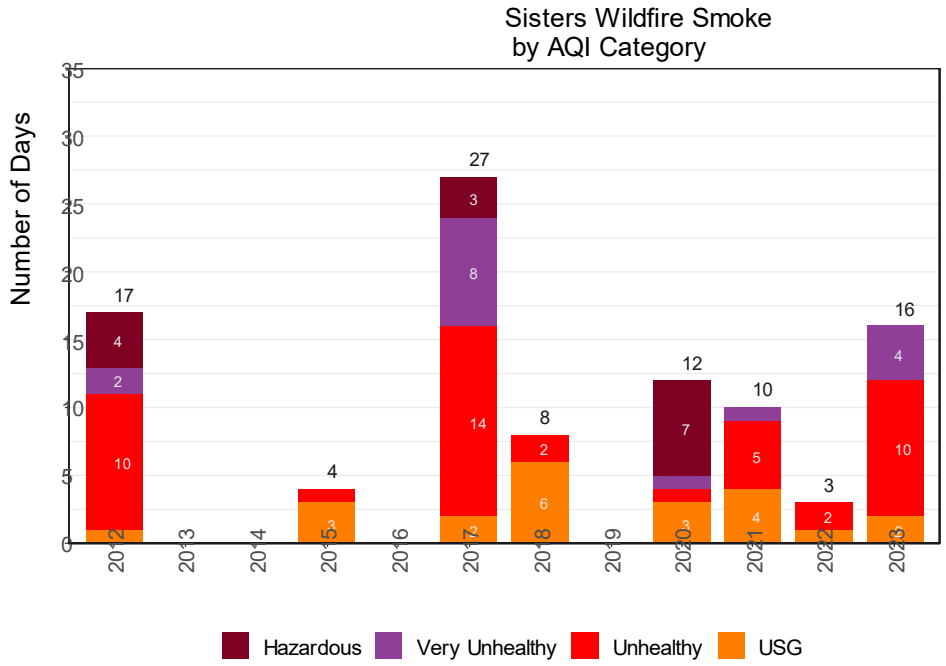

Figure 26. Sisters wildfire ≥ USG AQI wildfire smoke trends.

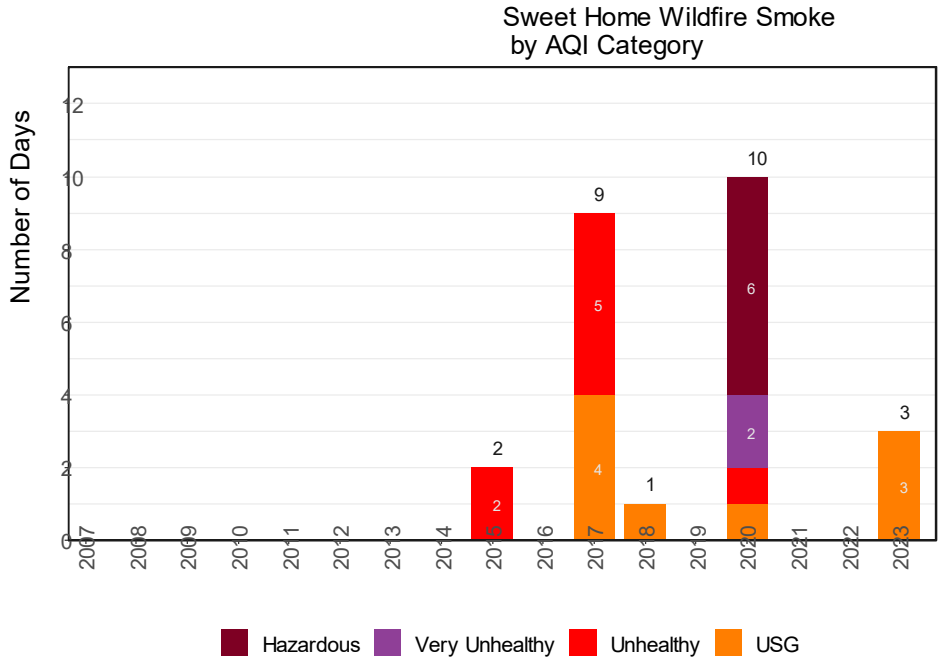

Figure 27. Sweet Home wildfire ≥ USG AQI wildfire smoke trends.

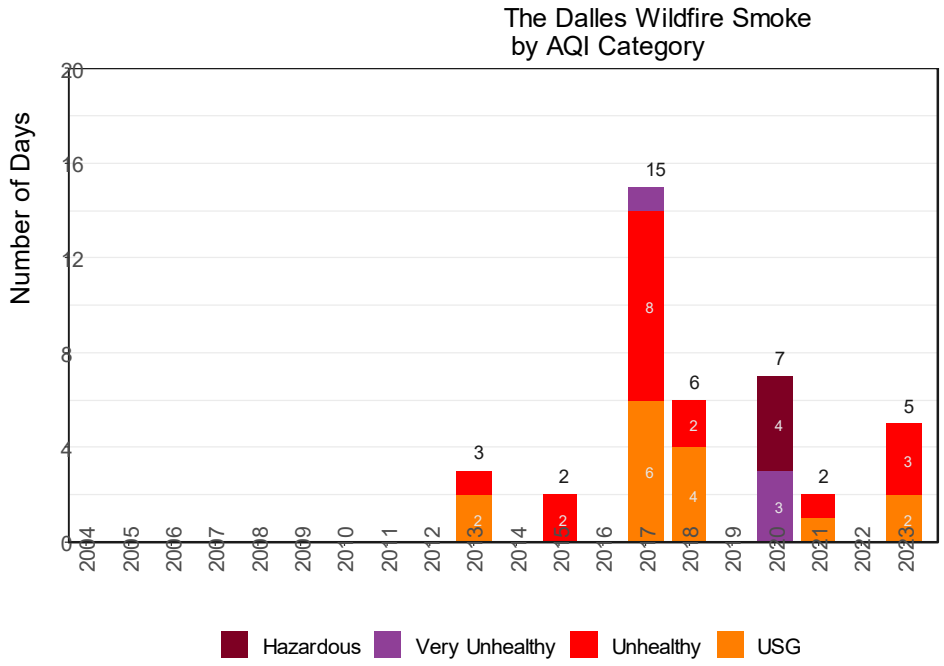

Figure 28. The Dalles wildfire ≥ USG AQI wildfire smoke trends.