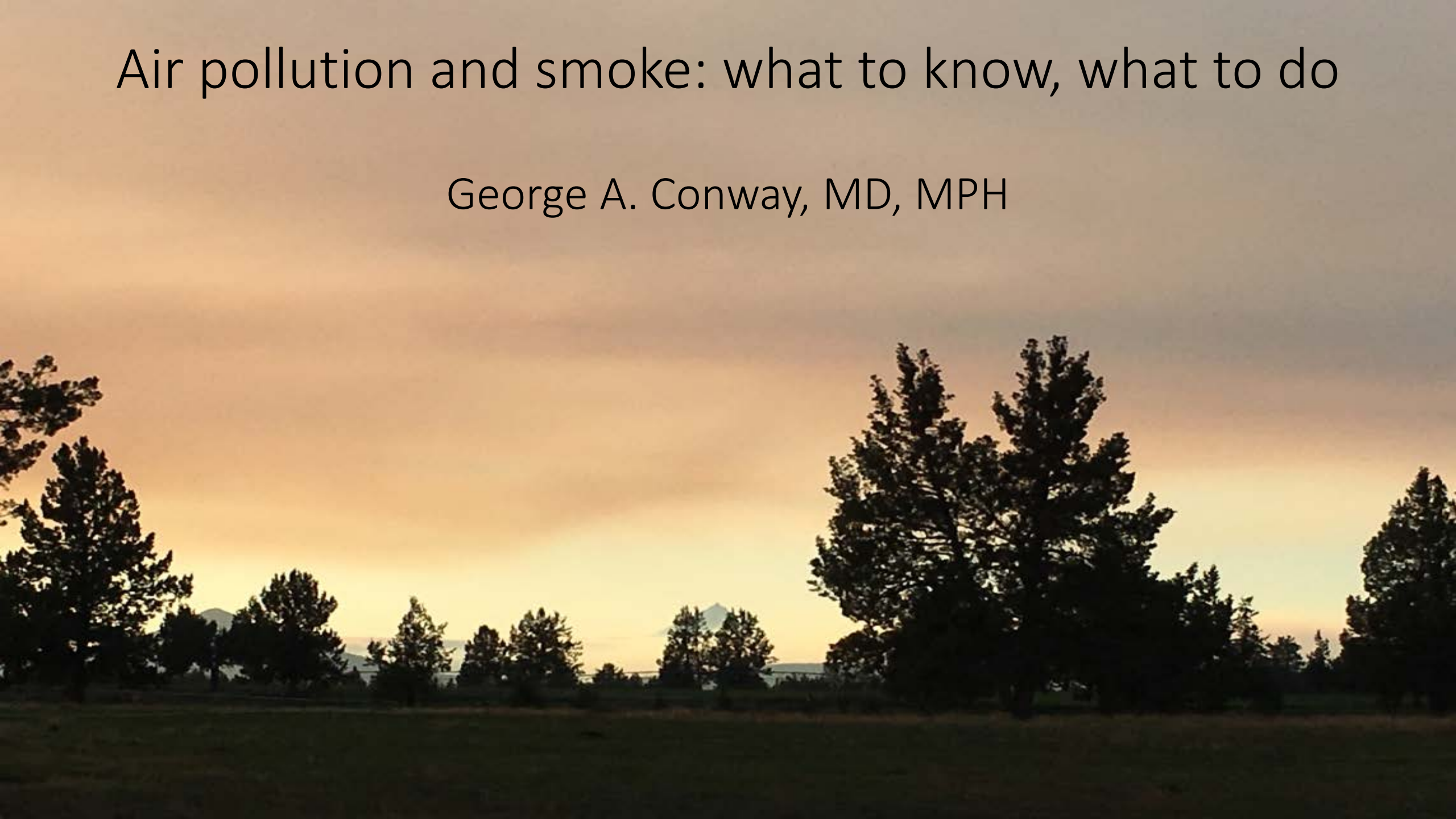


Air pollution and smoke: what to know, what to do

George A. Conway, MD, MPH



Moderator: please click on hyperlink below. When the site opens, please click on the arrow to play a 4.5 min video. After that, please click on the second link for a 45 second clip:

<https://www.deschutes.org/health/page/health-tips-wildfire-smoke> then
<https://www.youtube.com/watch?v=4qr1Aj6Di7w>

The screenshot shows a web browser at the URL `deschutes.org/health/page/health-tips-wildfire-smoke`. The website has a dark blue header with a logo and navigation links: 'About Us', 'How Do I', 'Departments', and 'Stay Connected'. Below the header is a search bar. On the left side, there is a sidebar with a list of services: 'Health Services Home', '+ Public Health', '+ Behavioral Health', '+ Intellectual/Developmental Disabilities Program', '+ Health Information and Data', 'Document Central', and 'Health Services Locations'. Below the sidebar, there is a 'Contact Information' section with phone numbers for Public Health and Behavioral Health, and a 'Medical Records Secure Fax Number'. The main content area is titled 'Health Tips for Wildfire Smoke' and contains a paragraph of text about wildfire smoke. Below the text is a video player showing a man speaking, with a play button overlay. To the right of the video player are links for 'Watch later' and 'Share'. Below the video player, there is a section titled 'Protect yourself from wildfire smoke' with a list of three bullet points: 'Reduce time spent outdoors when smoke is present.', 'Use an indoor high-efficiency air filter (HEPA) or electrostatic precipitator in your home to help create one or more rooms with cleaner air to breathe.', and 'Set your A/C or heating unit to recycle or recirculate when at home or in your car.'

deschutes.org/health/page/health-tips-wildfire-smoke

Health Services Home

- + Public Health
- + Behavioral Health
- + Intellectual/Developmental Disabilities Program
- + Health Information and Data

Document Central

Health Services Locations

Contact Information

(541) 322-7400 Public Health Phone
(541) 322-7500 Behavioral Health Phone

Medical Records Secure Fax Number:
(541) 322-7567

Health Tips for Wildfire Smoke

Deschutes County Health Services advises residents to take health precautions during periods of smoke. Wildfire smoke can irritate your lungs, cause inflammation, affect your immune system, and make you more prone to lung infections, including SARS-CoV-2, the virus that cause COVID-19.

Smoke and Your Health

Watch later Share

Protect yourself from wildfire smoke

- Reduce time spent outdoors when smoke is present.
- Use an indoor high-efficiency air filter (HEPA) or electrostatic precipitator in your home to help create one or more rooms with cleaner air to breathe.
- Set your A/C or heating unit to recycle or recirculate when at home or in your car.

Public messaging

Protecting yourself, family, and community from Wildfire Smoke: Behavior

- Check the AQI frequently
- Check AQI (or wind speed and direction) predictions if available
- Visual inspection of visibility if AQI not available
- Avoid bad air by:
 - Limiting time outside
 - Sheltering in place
 - Indoor exercise options
- Take advantage of good air by going outside, exercising

It's wildfire season in [Deschutes County](#). Learn how to minimize the impacts of smoke on yourself and your family and find out how to check the air quality.

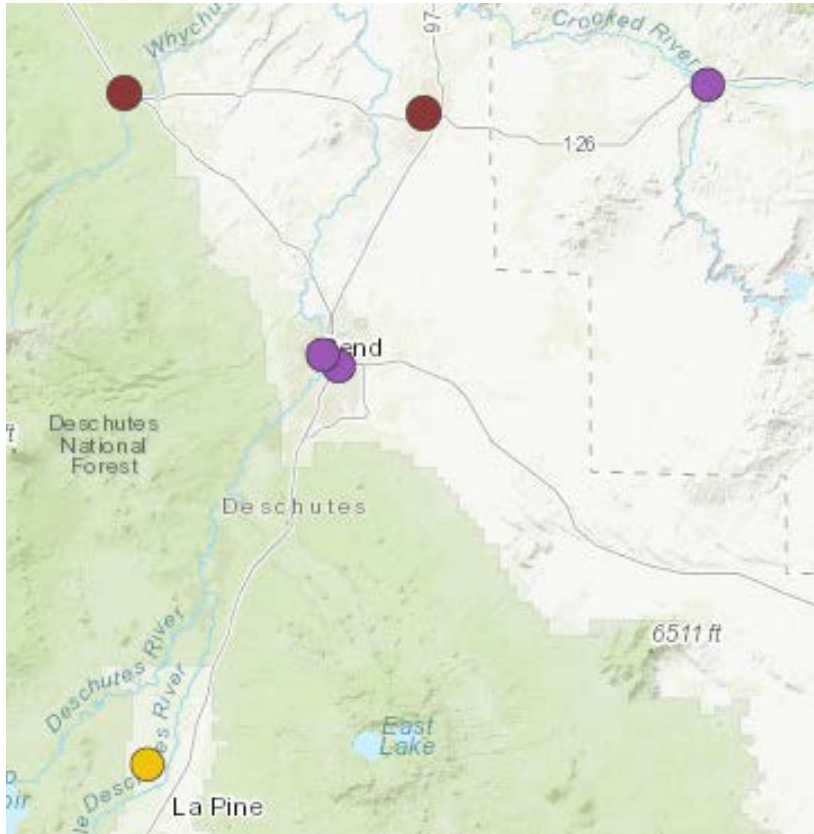


[DESCHUTES.ORG](#)

Smoke | Deschutes County Oregon

Deschutes County Health Services advises residents to be aware of...

Air Quality



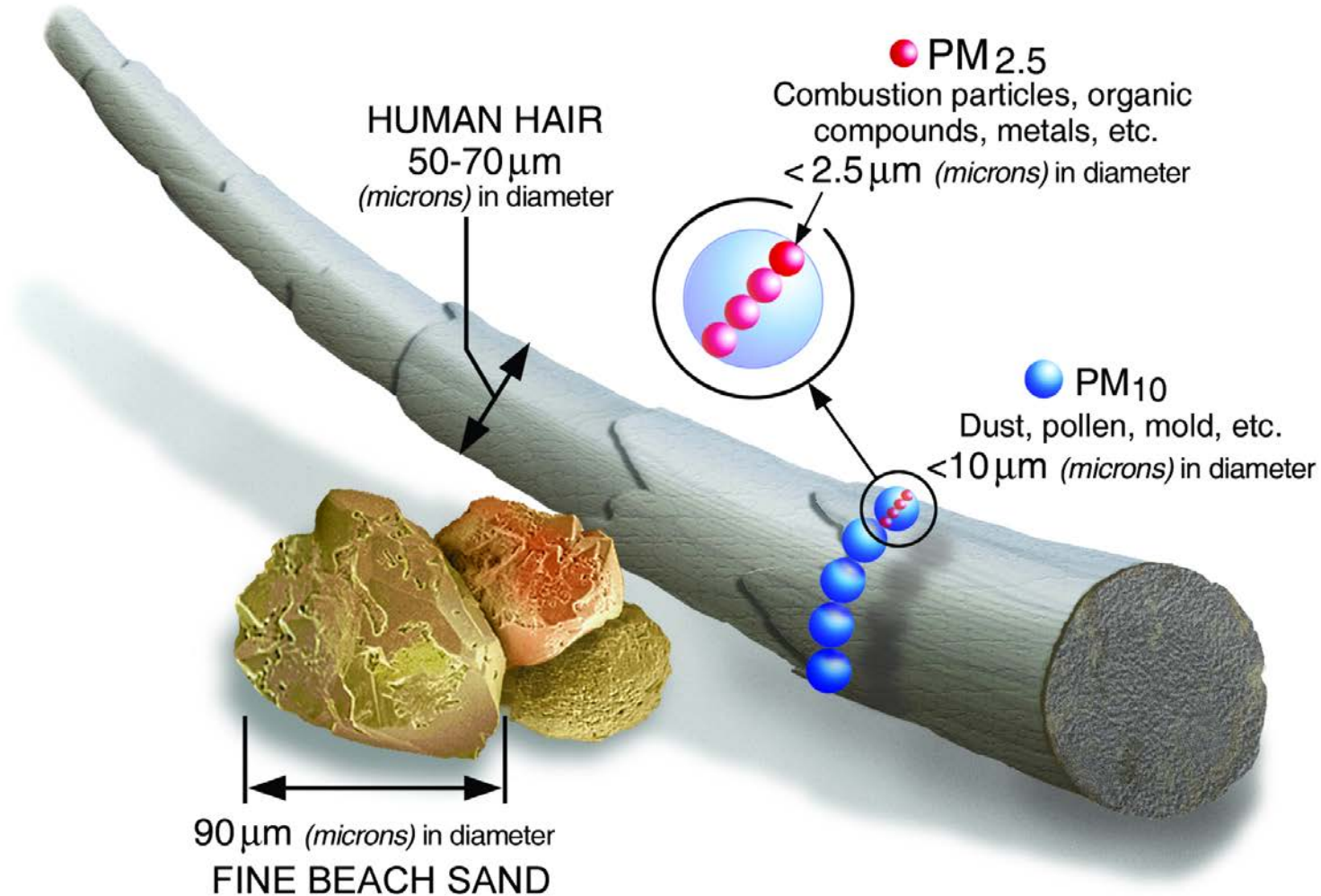
Hazardous and unhealthy air quality

Links to view air quality and other tips:

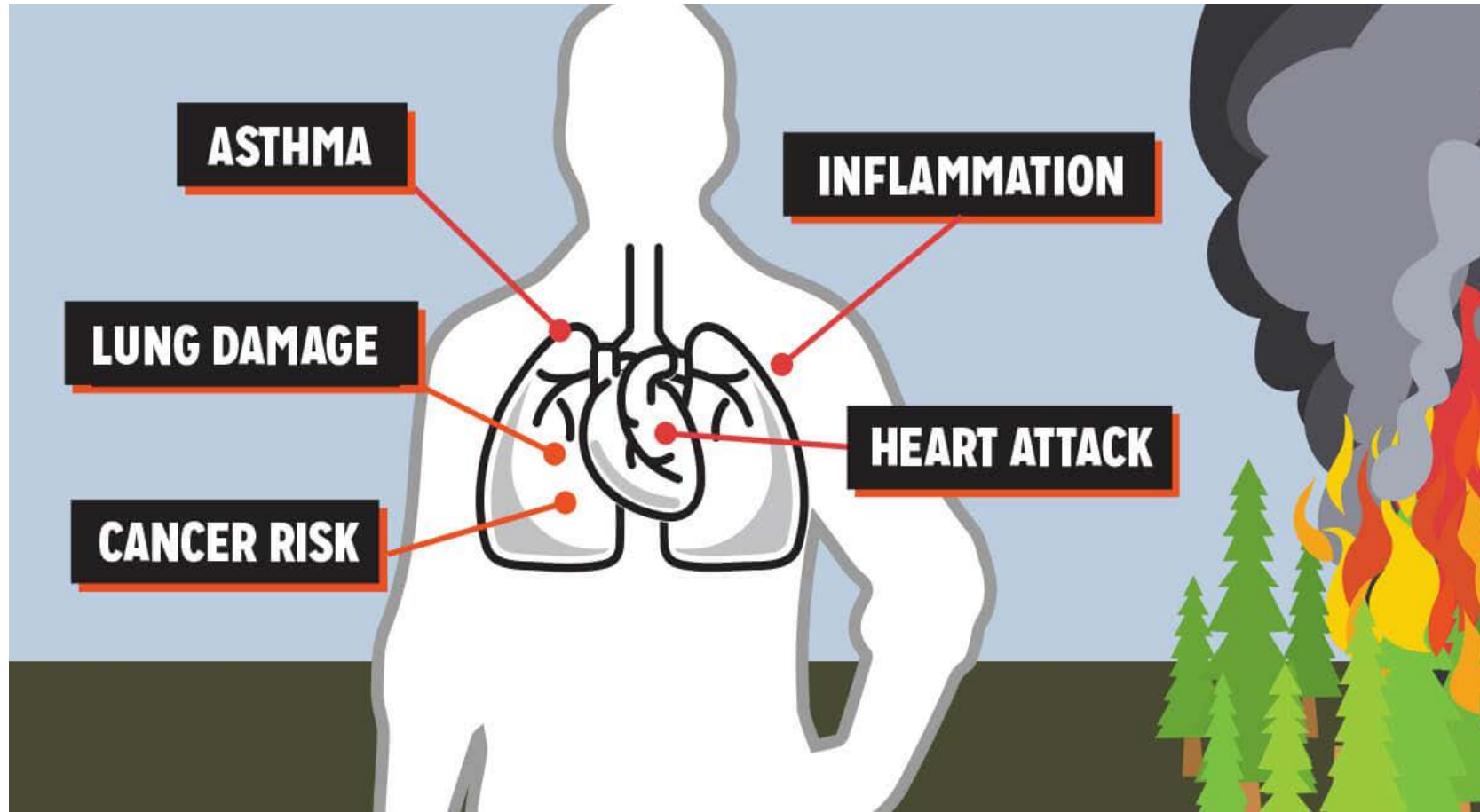
www.deschutes.org/smoke



Particulate Matter



Potential Health Impacts of PM2.5 inhalation



Masks

Cloth masks for COVID

- Trap respiratory droplets when you cough, sneeze, talk, yell
- Does not protect you from particulate matter in wildfire smoke



N95 Mask

- When properly fitted can protect you from particulate matter in wildfire smoke
- Not for young children or frail adults
- Ask your doctor if advisable



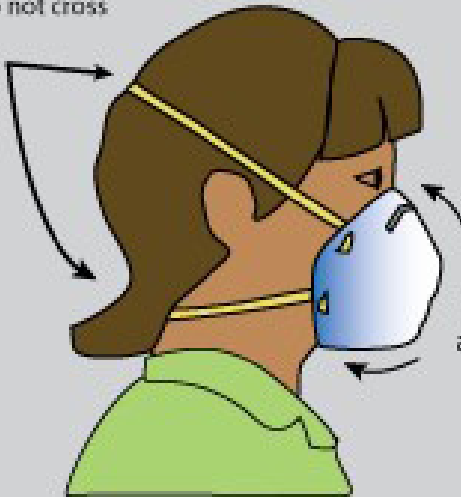


The right respirator* and proper fit can reduce your exposure to wildfire smoke.

Cloth (wet or dry), paper masks, and tissues will **NOT** filter out wildfire smoke. Look for respirators (masks) marked NIOSH with N95 or P100. They can be found online, or in hardware, home repair, or drugstores.

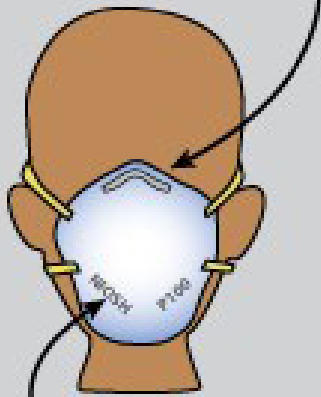
* Respirators are not designed to fit children. Facial hair prevents proper fit and reduces effectiveness.

1 strap above and 1 strap below ears
Do not cross



Fits over nose and under chin

Pinch bar to shape of nose



NIOSH with N95 or P100

Respirator should collapse as you breathe in and not let air in from the sides.

Ask your doctor before using if you have heart or lung health issues.	Throw mask away if it's dirty or you find it difficult to breathe.	If you are dizzy or nauseous, go to where there is less smoke and seek medical attention.
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Use a respirator only after first trying other, more effective methods to avoid smoke. That includes staying indoors and reducing activity. When possible, people at risk should move away from the smoky area.

Protect Your Health

- Stay indoors
- Use a HEPA filter, box fan + MERV 13 or better filter and/or A/C on recirculate
- Stay hydrated
- Don't vacuum, burn candles or fry/broil food
- Call your doctor if you have health concerns
- More tips: www.deschutes.org/smoke



Messaging to Local Officials, via Association of Oregon Counties (AOC)

As Commissioners and your Counties you can:

- Increase wildfire awareness before wildfire season
- Dust off/ check/ update your emergency preparation plan
- Support partnerships, e.g., your county Public Health Dept with OHA, DEQ, USFS, and BLM “fire partners”
- Establish and promote clean air spaces/shelters (e.g., libraries)
- Early warning before controlled burns, with precautionary advice
- Proactive risk communication – full use of Public Health tools & mtl

(Deschutes BOCC update, 09/16/20):

COVID-19 technical assistance to local fire-fighting/containment crews:

- 8 persons working 3 major fires tested + for SARS-CoA-2 (COVID-19) infection
- Investigated and traced 2 outbreaks:
 - 20 crew (with 3 infections detected),
 - 6 crew (with 4 infections).
- Cases reported concerns about portable toilet hygiene and standing in food lines as possible exposures.
 - Response: Hand washing stations and boxed catering.
- Upside: N95 masks and hand hygiene reduced incidence of “camp crud” (gastrointestinal and respiratory symptoms common in fire crews)



This archived version of the previous AirNow website will be **shut down** on January 31, 2021. Please use the current website at www.airnow.gov.

This website is historical material reflecting the AirNow website as it existed on March 25, 2020. This website is no longer updated and links to external websites and some internal pages may not work.

AQI Calculator



*DIRECTIONS: Choose the tab for **AQI to Concentration** or the tab for **Concentration to AQI**. Select a pollutant, then enter the AQI value or the concentration (in units). Click on "Calculate" to see the results.*

AQI to Concentration

Concentration to AQI

Select a Pollutant

PM2.5 - Particulate <2.5 microns (24hr avg) ▼

Enter the AQI:

Calculate

Reset

Concentration

Units:

AQI Category

ug/m3

US AQI inflates lower and discounts higher concentrations

Air Quality Guide for Particle Pollution

Harmful particle pollution is one of our nation's most common air pollutants. Use the chart below to help reduce your exposure and protect your health. For your local air quality forecast, visit www.airnow.gov

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 reducing prolonged or heavy exertion. 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.	Sensitive groups: Reduce prolonged or heavy exertion. It's OK to be active outside, but take more breaks and do less intense activities. Watch for symptoms such as coughing or shortness of breath. People with asthma should follow their asthma action plans and keep quick relief medicine handy. If you have 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 prolonged or heavy exertion. Consider moving activities indoors or rescheduling. Everyone else: Reduce prolonged or heavy exertion. Take more breaks during outdoor activities.
Very Unhealthy (201-300)	Everyone	Sensitive groups: Avoid all physical activity outdoors. Move activities indoors or reschedule to a time when air quality is better. Everyone else: Avoid prolonged or heavy exertion. Consider moving activities indoors or rescheduling to a time when air quality is better.
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.

US AQI

PM2.5 $\mu\text{g}/\text{M}$

50

12

100

35.4

150

55.4

200

150.4

300

250.4

400

350.4

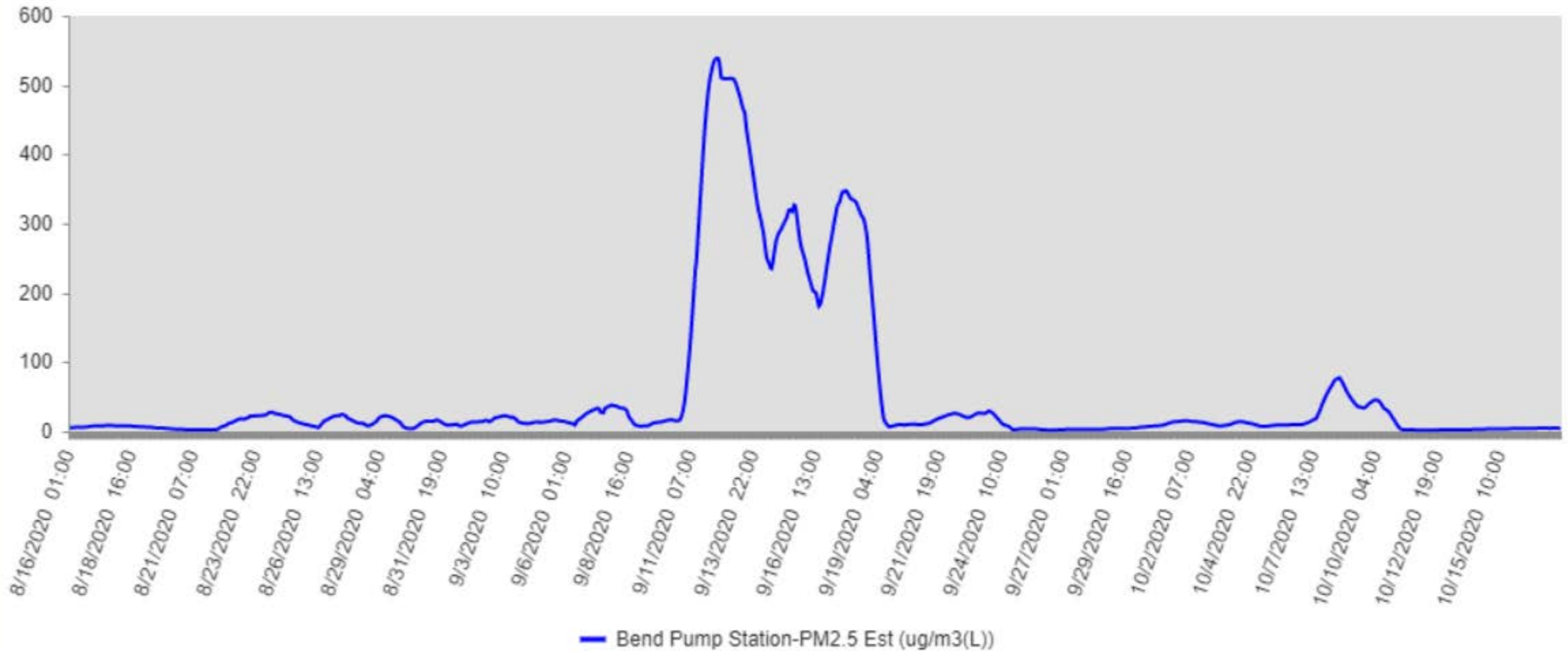
500

500.5

>500

"beyond AQI"

Risk management challenge for outdoor workers and exercise:
PM2.5 Concentration, Bend, OR, 8/16-10/17/20 (running 24 hr mean)



Thoughts for this NAS committee:

- During US smoke, air pollution episodes, and epidemics (and for many US diplomats, dependents, and expats working overseas), many workers and others will want respiratory protection, and have not been fit-tested
- Universal or sized/ shaped options for masks with good air seal
- Simple labeling and icons for purpose
- Messaging for “seal test”
- Simple home and office air cleaning options (to shelter in place)
- Energetic attention to supply chain, availability, cost, stockpiling
- Apply technical expertise and innovation to ensure wide availability of “good enough” protection in non-regulated settings
- Improve risk communication during smoke emergencies and clarify AQI and PM 2.5 concentrations
- Age guidance for child use, bearing in mind head size, respiratory tidal volume, head size
- Medical exclusions for mask wearing, and “shelter in place” guidance
- Guidance for sports and human-powered transportation (walking, bicycling)
- Apply an equity lens and attention to living circumstance and informal/ small employer work

Acknowledgment: Morgan Emerson, MPH – title photo and content

Thanks! George.Conway@Deschutes.org



Additional/ question slides

What is the U.S. Air Quality Index (AQI)?

The U.S. AQI is EPA's index for reporting air quality.

How does the AQI work?

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 the greater the health concern. For example, an AQI value of 50 or below represents good air quality, while an AQI value over 300 represents hazardous air quality.

For each pollutant an AQI value of 100 generally corresponds to an ambient air concentration that equals the level of the short-term national ambient air quality standard for protection of public health. AQI values at or below 100 are generally thought of as satisfactory. When AQI values are above 100, air quality is unhealthy: at first for certain sensitive groups of people, then for everyone as AQI values get higher.

The AQI is divided into six categories. Each category corresponds to a different level of health concern. Each category also has a specific color. The color makes it easy for people to quickly determine whether air quality is reaching unhealthy levels in their communities.

AQI Basics for Ozone and Particle Pollution

Daily AQI Color	Levels of Concern	Values of Index	Description of Air Quality
Green	Good	0 to 50	Air quality is satisfactory, and air pollution poses little or no risk.
Yellow	Moderate	51 to 100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Orange	Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Red	Unhealthy	151 to 200	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Purple	Very Unhealthy	201 to 300	Health alert: The risk of health effects is increased for everyone.
Maroon	Hazardous	301 and higher	Health warning of emergency conditions: everyone is more likely to be affected.

Table 5

Using the 5-3-1 Visibility Index			
Distance you can see*	And you are:		Or you have:
	• An Adult • A Teenager • An older child	• Age 65 & over • Pregnant • A young child	• Asthma • Repertory Illness • Lung or Heart
5 miles	Check visibility	Minimize outdoor activity	
3 miles	Minimize outdoor activity	Stay Inside	
1 mile	Stay Inside	Stay Inside	
<i>No matter how far you can see, if you feel like you are having health effects from smoke exposure, take extra care to stay inside or get to an area with better air quality. You should also see your doctor or other health professional as needed.</i>			
<i>* less reliable when humidity is high</i>			



Type here to search



3:06 PM
4/25/2018



Keeping household, school & office indoor air fresh:

- Check for and seal gaps
 - Windows
 - Doors
 - Negative pressure testing with door insert if available
- Reduce indoor pollutants by
 - Not smoking
 - Using gas stoves sparingly
 - Reduce VOCs (cleaning compounds, scented candles)
- Prevent mold and mildew
 - Making your dwelling too tight without replacement air may cause this
 - Reduce moisture production (e.g., by timing laundry)
 - Air home on good air days

Protecting yourself and family from Air Pollution: Technology

- Home and office air cleaners - wide variety available
 - High-end – lower noise with Charcoal/VOC filtration (e.g., IQ Air)
 - Mid-price with HEPA and (typically) electrostatic precipitation (e.g., Blue Air and many others). Caveat: electrostatic activity increases ozone
 - Home-made (HEPA filter + fan). Multiple proven designs available open source
 - Performance dependent on fan speed/ air volume
- Vehicle HEPA-grade cabin air filters – available in many modern vehicles

Protecting yourself and family from Air Pollution: Technology (2)

Masks/respirators if you must be outside when the air is bad

- Buy minimum N-95 (US) Standard
- Shop for comfort and good seal against skin
- Fit test essential if work-related or for endurance sports training
- Self “seal test” if fit testing not available and your exposure will be less
- May require more effort for the same task without a mask
- Generally not recommended for children (as may reduce airflow and respiratory tidal volume) or medically frail.
- As much as possible, the young and frail should be sheltered in place in clean air on bad air days.

Typical N-95 mask



Resources:

- OHA's Wildfire Smoke Risk Communication Toolkit: (<https://www.oregon.gov/oha/ph/Preparedness/Partners/Pages/riskcommunicationtools.aspx> you have to click on "Wildfire Smoke"): premade social media messages, press releases, and talking points.
- [Link to Deschutes County Wildfire Smoke Tips :](https://www.deschutes.org/health/page/health-tips-wildfire-smoke)
<https://www.deschutes.org/health/page/health-tips-wildfire-smoke>
- [Link to the EPA's how-to sheet for N95 masks](https://www.oregon.gov/oha/PH/Preparedness/Partners/Documents/cerc/EPA-How-to-Wear-A-Mask-Palm-Card-PRINT.PDF) (OHA-endorsed) :
<https://www.oregon.gov/oha/PH/Preparedness/Partners/Documents/cerc/EPA-How-to-Wear-A-Mask-Palm-Card-PRINT.PDF>
- Screenshot of one of our risk communications follows...