

# Wildfire Smoke and Health Impacts

## Messaging

June 26, 2019 Board of Health Spotlight

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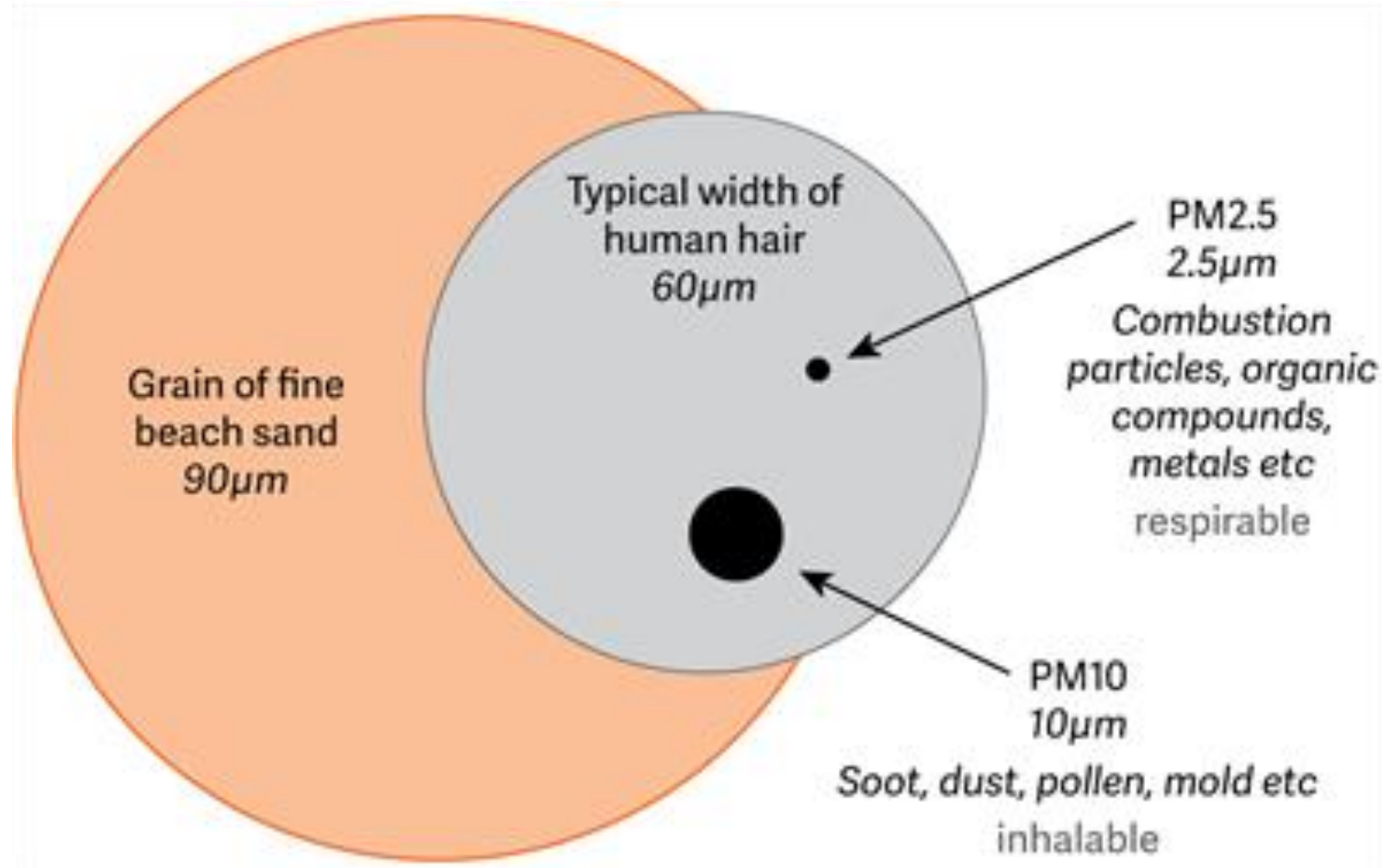


**Why is this important?**

**What can we do about this?**

**How can we prepare our community?**

WHY?



# PM<sub>2.5</sub> concentrations surge with wildfire smoke

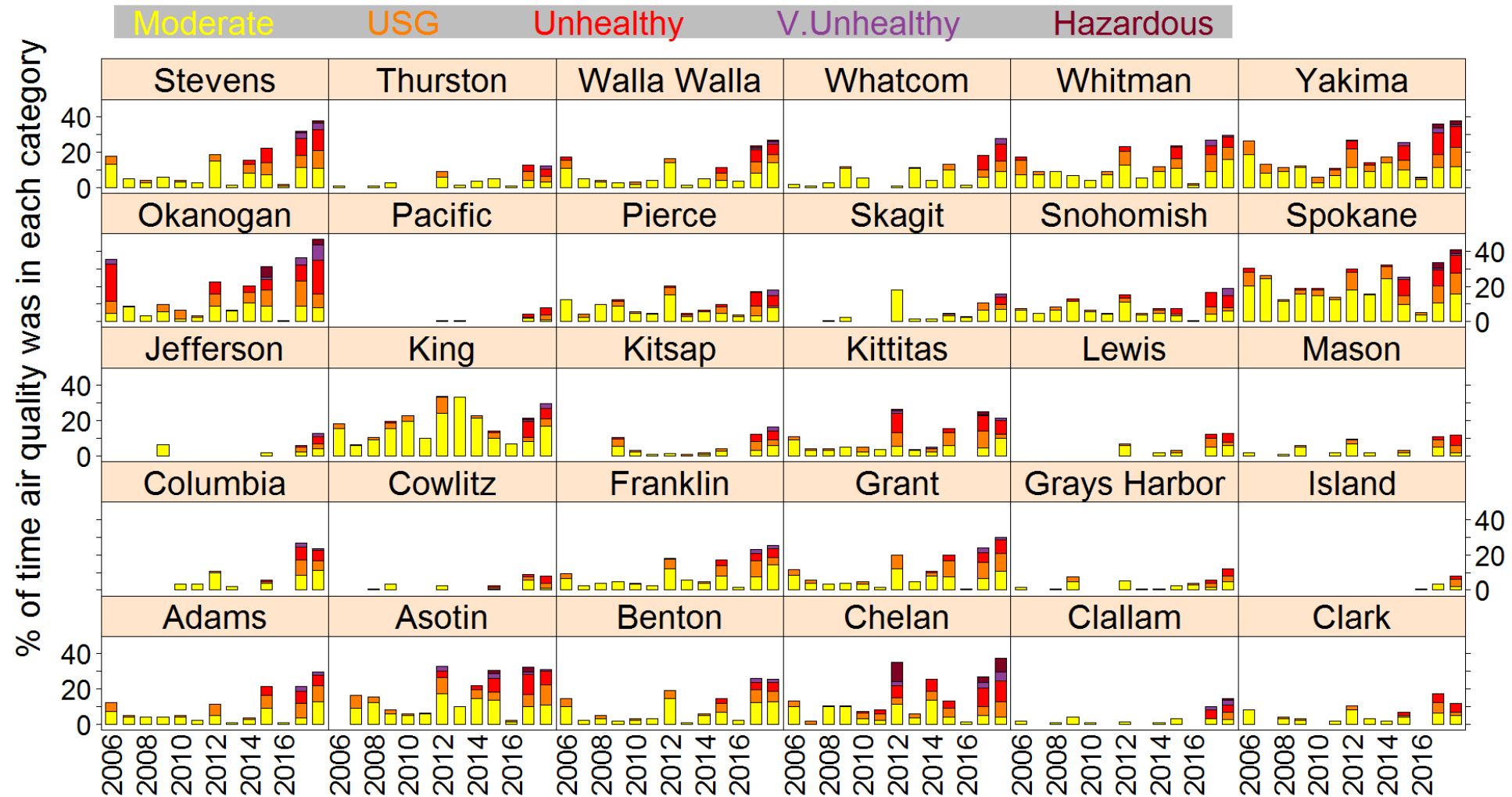


- Eye irritation
- Cough, wheeze
- Cardiovascular morbidities
- Respiratory morbidities
- Overall increased hospitalizations & deaths

So do health impacts...

Summer	Acres burned in WA	# of exceedences of PM <sub>2.5</sub> NAAQS (FEM/ FRMs) (35 ug/m3 24 hr avg)
2012	259,526	123 (5)
2013	152,603	3 (0)
2014	386,972	32 (0)
2015	1,137,664	198 (15)
2016	293,717	1 (0)
2017	409,989	488 (137)
2018	438,834	539 (140)

# Statewide air quality during recent wildfire seasons 2006-2018



Only days with degraded air (other than 'Good') between 1 June- 30 Sept are shown

WHAT?

# Wildfire Smoke Impacts Advisory Group

**27 Members**

**3 Sub Workgroups**

**3 Priorities for the 2019 Wildfire Season**

## Communication Workgroup

Develop custom toolkit for local outreach and communication

## Closures Workgroup

Develop guidance for school and outdoor event closures

## Sensors Workgroup

Develop guidance for low-cost sensors to use for health decisions

# Wildfire Smoke Response Toolkit

- Created catalogue of available resources for key messages for each audience and timing
- Developed resources to fill identified gaps
- Built Templates for communications mediums for local use

How?











# Resources developed to address gaps

- Cleaner Air Room/Shelter Guidance
- Improved N95 mask information with focus on avoiding exposure as first line of defense
- Outdoor Adult Activity Guide

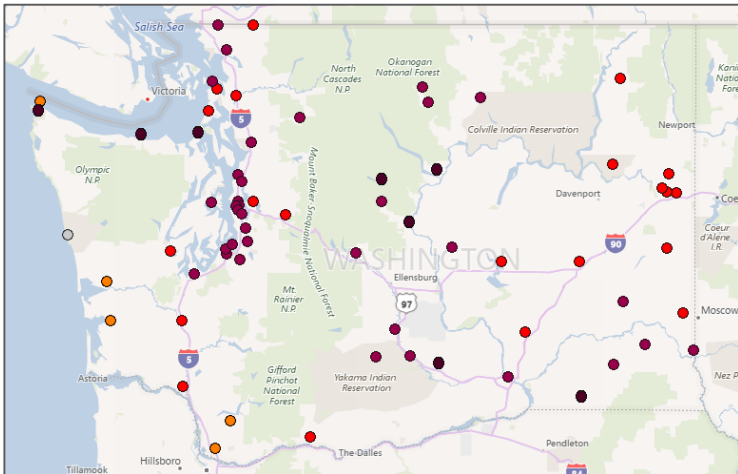
## Adult Outdoor Activity Guide

### Air Quality Conditions

Check your local air conditions at <https://fortress.wa.gov/ecy/enviwa/>

 Good	 Moderate	 Unhealthy for Sensitive Groups	 Unhealthy for Everyone	 Very Unhealthy for Everyone	 Hazardous for Everyone
Washington Air Quality Advisory (WAQA) Concentration Levels (PM2.5 $\mu\text{m}^3$ )					
0 to 12.0	12.1 to 20.4	20.5 to 35.4	35.5 to 80.4	80.5 to 150.4	Greater than 150.4
Air pollution is low, so there is little health risk. It's a great day for everyone to be outdoors.	People with health conditions should limit spending any time outdoors and avoid vigorous outdoor activities.  They may begin to have worsened symptoms.	All sensitive groups should limit spending any time outdoors.  People with health conditions may have worsened symptoms. Healthy people may start to have symptoms.	Everyone, especially sensitive groups, should limit time spent outdoors, avoid vigorous activities outdoors, and choose light indoor activities.	Everyone should stay indoors, avoid all vigorous activity, close windows and doors if it's not too hot, set your AC to recirculate, and use a HEPA air filter if possible.	People with heart or lung disease, or those who have had a stroke, should consult their healthcare provider about leaving the area and wearing a properly-fitted respiratory mask if they must go outdoors.  Follow burn bans and evacuation orders.

# Factors to consider for closures or cancellations



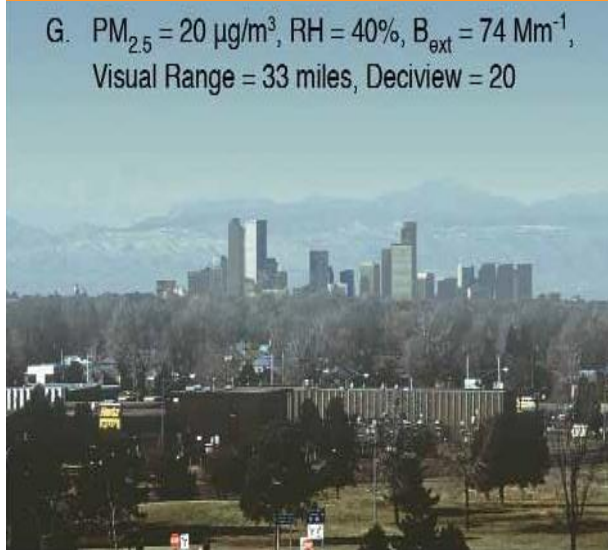
- What is the forecast for how long the wildfire smoke levels will remain high?
- Is there an option to relocate to an area with cleaner air?
- Is the visibility safe for driving?

# Different levels of $PM_{2.5}$

PM<sub>2.5</sub> Concentrations:

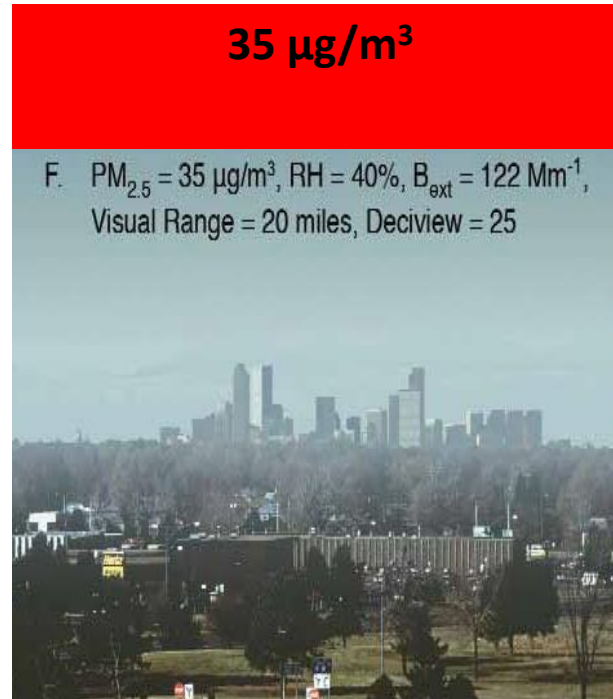
**$20 \mu\text{g}/\text{m}^3$**

G.  $PM_{2.5} = 20 \mu\text{g}/\text{m}^3$ ,  $RH = 40\%$ ,  $B_{\text{ext}} = 74 \text{ Mm}^{-1}$ ,  
Visual Range = 33 miles, Deciview = 20



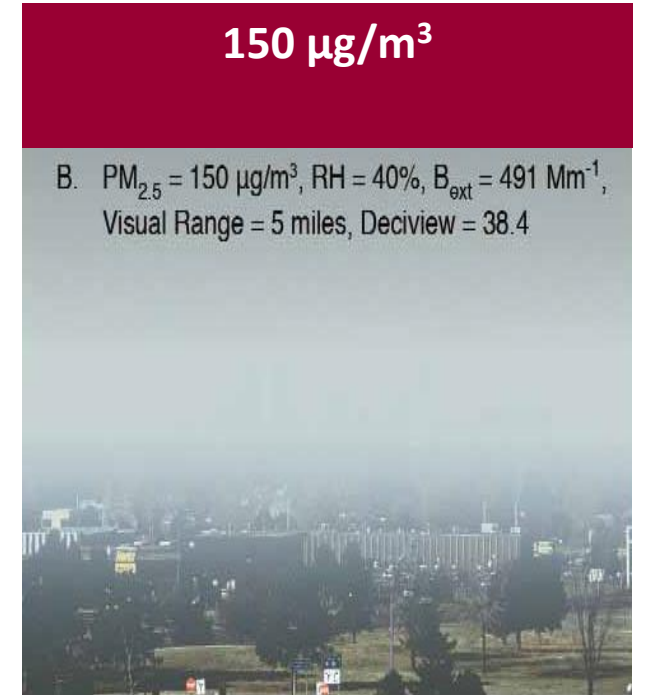
**$35 \mu\text{g}/\text{m}^3$**

F.  $PM_{2.5} = 35 \mu\text{g}/\text{m}^3$ ,  $RH = 40\%$ ,  $B_{\text{ext}} = 122 \text{ Mm}^{-1}$ ,  
Visual Range = 20 miles, Deciview = 25



**$150 \mu\text{g}/\text{m}^3$**

B.  $PM_{2.5} = 150 \mu\text{g}/\text{m}^3$ ,  $RH = 40\%$ ,  $B_{\text{ext}} = 491 \text{ Mm}^{-1}$ ,  
Visual Range = 5 miles, Deciview = 38.4



# Recommended Public Health Actions

Health Advisory Category, PM <sub>2.5</sub> Conc (µg/m <sup>3</sup> )	Recommended Public Health Actions
	For use with Washington Air Quality Advisory PM <sub>2.5</sub> concentrations: <a href="https://fortress.wa.gov/ecy/enviwa/">https://fortress.wa.gov/ecy/enviwa/</a>
<b>Good</b> PM <sub>2.5</sub> : 0 - 12.0	If smoke incident is forecasted in your area, review the Washington Wildfire Response document for Severe Smoke Episodes, the Wildfire Smoke Guide for Public Health Officials, and more health tips on the Washington State Department of Health website: <a href="http://www.doh.wa.gov/smokefromfires">www.doh.wa.gov/smokefromfires</a> . The WA Smoke Blog has information about air quality and wildfire information: <a href="https://wasmoke.blogspot.com/">https://wasmoke.blogspot.com/</a>
<b>Moderate</b> PM <sub>2.5</sub> : 12.1 – 20.4	<ul style="list-style-type: none"> <li>Distribute information to public health partners and the public.</li> <li>Focus on identifying and getting information to vulnerable populations.</li> <li>Refer people to the WA Smoke Blog for more information about status of wildfires</li> <li>Provide information about steps to take with health advisory categories: <a href="https://www.doh.wa.gov/Portals/1/Documents/4300/waqa%20infographic_English.pdf?ver=2018-07-26-131607-693">https://www.doh.wa.gov/Portals/1/Documents/4300/waqa%20infographic_English.pdf?ver=2018-07-26-131607-693</a></li> </ul>
<b>Unhealthy for Sensitive Groups</b> PM <sub>2.5</sub> : 20.5 – 35.4	<p>Above, plus:</p> <ul style="list-style-type: none"> <li>Issue a press release, outlining sensitive groups and encouraging them to reduce exposure.</li> <li>For extended duration of smoke, include consideration of spending time in a clean air setting in the community (i.e. air conditioned library) or leaving the area until air quality improves.</li> <li>For extended duration of smoke, consider opening a clean air shelter for sensitive groups.</li> <li>If school is in session, refer to Public Health Guidance for School Outdoor Activities during Wildfire Event: <a href="http://www.doh.wa.gov/Portals/1/Documents/Pubs/334-332.pdf">http://www.doh.wa.gov/Portals/1/Documents/Pubs/334-332.pdf</a></li> </ul>
<b>Unhealthy</b> PM <sub>2.5</sub> : 35.5 – 80.4	<p>Above, plus:</p> <ul style="list-style-type: none"> <li>Discuss with school administrators cancelling children's outdoor athletic events and practices or moving them to an indoor or outdoor space with good air quality.</li> <li>Consider and publicize limit strenuous outdoor activities.</li> <li>Recommend that sensitive groups shelter-in-place, spend time in a clean air setting in the community (i.e. air conditioned library) or consider leaving the area until air quality improves.</li> <li>For extended duration of smoke, open and publicize clean air shelters for sensitive groups.</li> </ul>
<b>Very Unhealthy</b> PM <sub>2.5</sub> : 80.5 – 150.4	<p>Above, plus:</p> <ul style="list-style-type: none"> <li>Consider recommending cancelling outdoor public events and activities.</li> <li>Recommend shelter-in-place for general population.</li> <li>Share info about periods of improved air quality to guide essential outdoor activity and ventilation of dwellings.</li> </ul>
<b>Hazardous</b> PM <sub>2.5</sub> : >150.4	<p>Above, plus:</p> <ul style="list-style-type: none"> <li>Recommend canceling outdoor public events and activities.</li> <li>If school is in session, discuss school closure with school administrators.</li> <li>Recommend voluntary evacuation for sensitive groups.</li> </ul>

Draft PM <sub>2.5</sub> Action Level (µg/m <sup>3</sup> )	Draft Closures & Cancelations
>35.4	<ul style="list-style-type: none"> <li>Cancel or move children's athletic events and practices to an area with good air quality</li> </ul>
>80.4	<ul style="list-style-type: none"> <li>Consider recommending cancelling outdoor public events and activities.</li> </ul>
>150.4	<ul style="list-style-type: none"> <li>Recommend cancelling outdoor public events and activities.</li> <li>If school is in session, discuss school closure with school administrators.</li> </ul>

# Plan to develop air monitoring guidance

Plan to draft guidance that builds on existing resources



<https://www.epa.gov/air-sensor-toolbox>

<http://www.aqmd.gov/aq-spec>

Assessment: Learn from those already using low cost sensors to manage health risks

- Best practices
- Research and validation work
- User-friendliness



# Questions?

