



# IMPROVING READINESS TO PREVENT HEALTH IMPACTS OF HEAT AND WILDFIRE SMOKE

DOH Executive Office of Resiliency and Health Security
DOH Climate & Health Section

# Session Objectives

- Introduce DOH team / roles in climate readiness, response, and risk communications
- Principles of risk communication for effective prevention
- How weather-related hazards in WA are changing
- Impacts to human health and populations bearing more risk
- Case study: preventing health harms during high heat
- Case study: preventing health harms during wildfire smoke
- Learn about audience members' experiences, roles and partners

# DOH Executive Office of Resiliency and Health Security



**Cory Portner** 

Director, Office of Emergency Medical Logistics

- Oversees DOH medical countermeasures, medical logistics, and volunteer management programs
- Type-3 All-Hazards IMT Ops Chief
   + Public Information Officer



**Emily O'Donnell-Pazderka** 

Preparedness Content Strategist

- -All-hazards + seasonal risk comms
- -Crisis and emergency risk communications (CERC)
- -Partnerships, media relations, strategy, content creation

### **Erika Estrada**

Health Equity & Justice Coord.

# DOH Environmental Public Health



**Kaitlyn Kelly** Air Quality Policy Specialist

- -Wildfire smoke public health response
- -Policy, interventions, partnerships, & risk communication



### **Marnie Boardman**

Climate & Health Coordinator

- Partners, communication, training
- Foundational Public Health Services
- Climate & health assessment

Why is CERC Important for Hazard Prevention and Mitigation?

# "The right message at the right time from the right person can save lives."

-Barbara Reynolds, PhD

CDC Senior Crisis and Risk Communication Advisor

# The Six Principles of CERC



### 1. Be First

First source information often becomes preferred source



# 2. Be Right

Accuracy establishes credibility



### 3. Be Credible

Do not compromise honesty

# The Six Principles of CERC



### 4. Express Empathy

Acknowledge the harm that has occurred



### 5. Promote Action

Give people meaningful action items to help calm anxiety, restore order, and promote sense of control



### 6. Show Respect

Respectful communication when people feel vulnerable is key to promoting cooperation

# The CERC Rhythm

# Five Pitfalls to Avoid

- 1. Mixed messages from multiple experts
- 2. Information released late
- 3. Paternalistic attitudes
- 4. Not countering rumors and myths in real-time
- 5. Public power struggles and confusion

# Climate change impacts on health - what does the evidence say?

- Changing frequency, severity, duration and location of weather hazards will amplify existing health problems and introduce new ones.
- Health impacts are already being observed and will grow.
- Everyone will experience increasing climate-related risks to health.
- Some people bear disproportionate risks and impacts.
- Adaptation and greenhouse gas emission reduction can avoid harms.
- Many actions could benefit health now, and address inequities at the same time.

health2016.globalchange.gov; nca2018.globalchange.gov www.ipcc.ch/report/ar6/wg2



# **Impact of Climate Change on Human Health**

Injuries, fatalities, mental health impacts

Asthma, cardiovascular disease

**Heat-related illness** and death, cardiovascular failure

Severe Weather

Air **Pollution** 

> Changes in Vector **Ecology**

Malaria, dengue, encephalitis, hantavirus, Rift Valley fever, Lyme disease, chikungunya, **West Nile virus** 

Forced migration, civil conflict, mental health impacts

Environmental **Degradation** 

**Extreme** 

Heat

**Increasing** Allergens

Respiratory allergies, asthma

**Water and Food Supply Impacts** 

Water **Quality Impacts** 

Malnutrition, diarrheal disease

Cholera, cryptosporidiosis, campylobacter, leptospirosis, harmful algal blooms



# Health impacts from heat and smoke range from mild to severe



### Risks from heat exposure:

Heat rash

Sunburn

Heat cramps

Heat exhaustion

Heat stroke

Heat-related death

Heat contributing to other injury, illness and death



### Risks from wildfire smoke:

Eye, nose, throat irritation

Fatigue

Headache, coughing

Wheezing

Psychological stress

Aggravated heart, lung disease, including chest pain, difficulty breathing

# Sensitive and Overburdened Groups and with Increased Risk

- People with low income
- People 18 and younger or older than 65
- Pregnant people
- Tribal and indigenous people
- Some immigrant groups & English learners
- People of color
- Some occupational groups (e.g., outdoor laborers)
- People with pre-existing physical and mental illnesses.



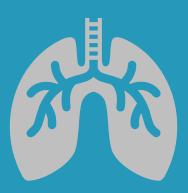
# Concurrent public health disasters

Wildfire Smoke

COVID-19

Heat

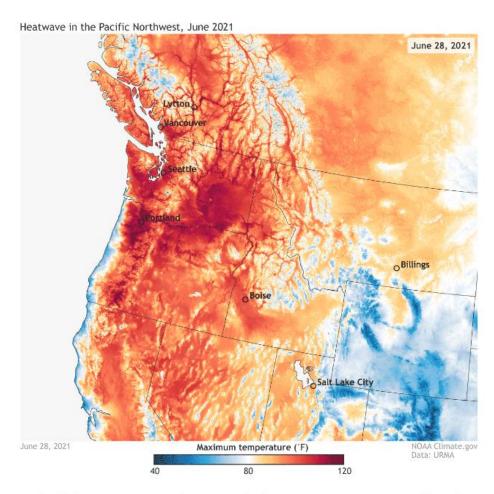






Heat Case Study

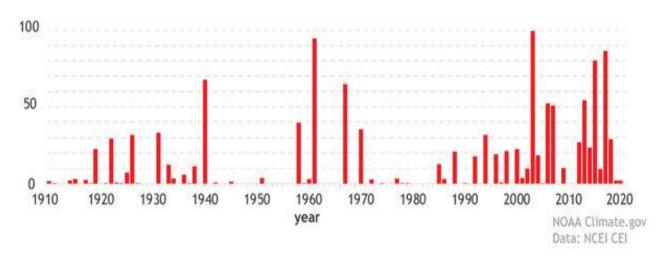
# 2021 Heat Dome - Preparing for Future Heat



Daytime high temperatures across the western United States on June 23-28, 2021, according to data from NOAA's Real-Time Mesoscale Analysis/URMA. Climate.gov animation based on NOAA URMA data.

### Expanding footprint of extreme summer heat in the Northwest

Percent area of Oregon, Washington, and Idaho having extremely hot daytime high temperatures



Red bars show the percent of the U.S. Northwest (Oregon, Washington, and Idaho) having extremely warm days—daytime high temperatures in the top ten percent of the historical record—each summer from 1910–2020. The footprint of extreme heat in the has ballooned in the past 20 years. NOAA Climate.gov image, based on data from NOAA's Climate Extreme Index.

# DOH Communications Strategy for Heat Safety

- Hot weather precautions to reduce the risk of heat exhaustion and heat stroke
- Hot weather precautions for outside
- Hot weather precautions if the power goes out and/or air conditioning is not available
- One-pager resources
  - Spanish, Chinese, Korean, Russian, Somali, Ukrainian, Vietnamese



# Be Prepared, Be Safe

English

Learn how to prepare and be safe during an emergency. Know what steps you and your family can take before, during and after an emergency or hazard.

- Get Ready for an Emergency
- Severe Weather and Natural Disasters
- Diseases
- Bioterrorism and Terrorism
- Emergency Information for Specific Groups
- Publications

### **For Professionals**

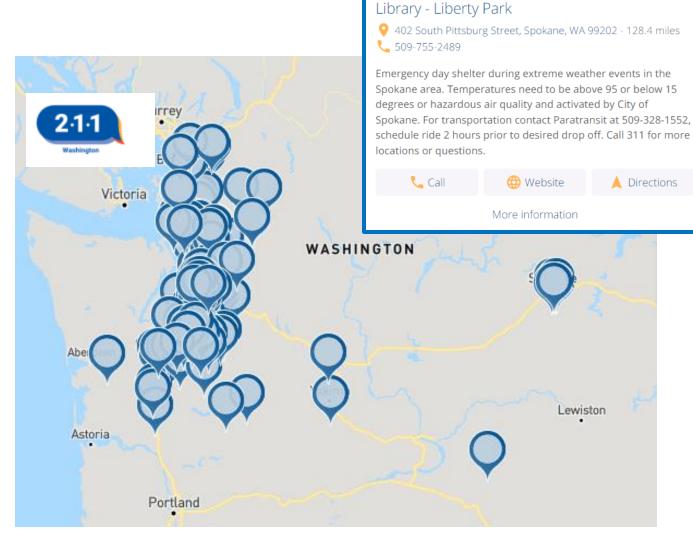
- Fact sheets in English and other languages
- <u>Drinking water emergencies</u>
- Emergency communications toolkit
- Isolation and quarantine forms and guidance
- Patient transport planning
- Public health emergency center resources
- Radiological emergency preparedness
- More emergency-prep information

### Contact and Connect

- About the Office of Resiliency and Health Security
- Questions:
   DOH.Information@doh.wa.gov

# DOH Response to High Heat in 2021 – Cooling Centers

- Some people are at higher risk for heat-related illness
- People 65 years of age and older
- Infants and children up to 4 years of age
- People who are overweight
- People who are ill or on certain medications



Spokane Cooling Center at Spokane City Public

### Examples of Actions tied to NWS HeatRisk Categories:

# Washington Guide for Public Health Actions for Extreme Heat

### <u>Green</u> - 0 -

### Prior to and during extreme heat season:

- Maintain connections with each of the four NWS Offices ((<u>Pendleton</u>, <u>Portland</u>, <u>Seattle</u>, and <u>Spokane</u>)
- Stand-up the Extreme Heat Group for situational awareness.
- Monitor forecasts and risk for Washington State via NWS HeatRisk

### Yellow - 1 -

### During extreme heat season all the above recommendations, plus:

- Distribute health information to the public per HeatRisk categories and health advisories
- Focus outreach for sensitive groups (see CDC guidance for infants and children, athletes, older adults and people with chronic medical conditions)

### <u>Orange</u> - 2 -

### Initiate Early Warnings, Public Messaging, and Response Activities:

- Share 2-1-1 information regarding cooling centers
- Disseminate public health safety messages to at-risk populations and organizations serving at-risk populations

# Red - 3 -

### **Recommend Activation of Cooling Centers & Reduction in Outdoor Activities:**

- Activate daytime cooling centers
- Recommend cancelation of outdoor activities and events for children, camps, athletic practice and games

# <u>Magenta</u>

### **Recommend Cancelation of Outdoor Public Events and Activities:**

- Recommend cancelation of outdoor activities and events during hottest time of day
- Recommend expanding cooling center hours to accommodate overnight use
- **Strongly recommend** everyone take steps to reduce exposure to heat

# National Weather Service HeatRisk Tool Anticipates Risks to Health

### NWS HeatRisk Prototype

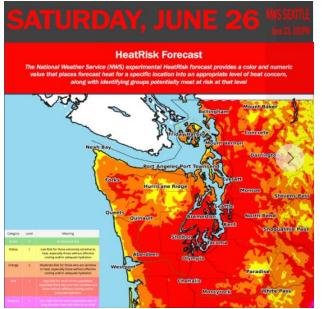
Identifying Potential Heat Risks in the Seven Day Forecast

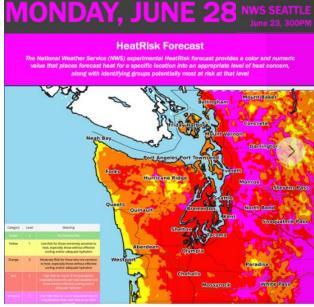
Thu	Fri	Sat	Sun	Mon	Tue	Wed
4/27	4/28	4/29	4/30	5/1	5/2	5/3

Click map for potential heat risks and NWS forecast for a location.

Category	Level	Meaning	
Green	0	No Elevated Risk	
Yellow	1	Low Risk for those extremely sensitive to heat, especially those without effective cooling and/or adequate hydration	
Orange	2	Moderate Risk for those who are sensitive to heat, especially those without effective cooling and/or adequate hydration	
Red	3	High Risk for much of the population, especially those who are heat sensitive and those without effective cooling and/or adequate hydration	
Magenta	4	Very High Risk for entire population due to long duration heat, with little to no relief overnight	

### HeatRisk Tool forecasts posted June 23, 2021









**National Weather Service** 

# Adapting for future heat events



### Partnering to create:

- Heat Response Plans
- Alignment with NWS forecasts
- Outreach and education resources





### Future collaboration needed for:

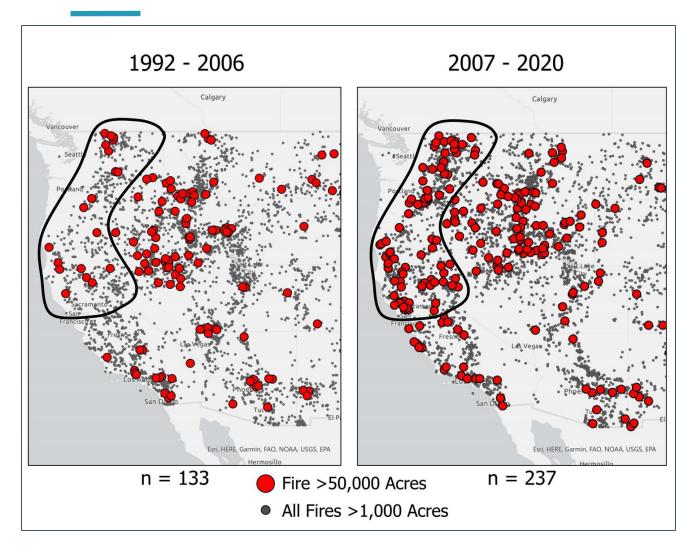
- Early Warning Systems
- Heat Adaptation Plans / Haz Mitigation
- Community-based interventions
- Cooler buildings and environments
- Indicators and assessment tools
- Evaluation measures and improvement

Wildfire Smoke Case Study

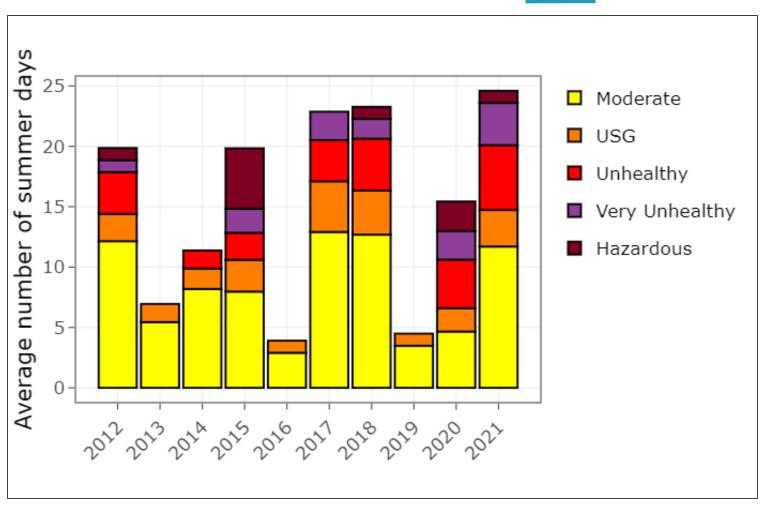
# The Number of Very Large Wildfires is Increasing Along the West Coast

- The West Coast States (WA, OR, CA) are now seeing the increase in large fires and acres burned that we saw in the interior west in the late 90s and early 2000s
- Under both RCP 4.5 and RCP 8.5, 50k acre fires will become 2.1-2.7x more likely in the PNW between 2031-2050

Map Source: Matthew Dehr, Meteorologist, WA DNR. Data obtained from Short, Karen C. 2022. Spatial wildfire occurrence data for the United States, 1992-2020



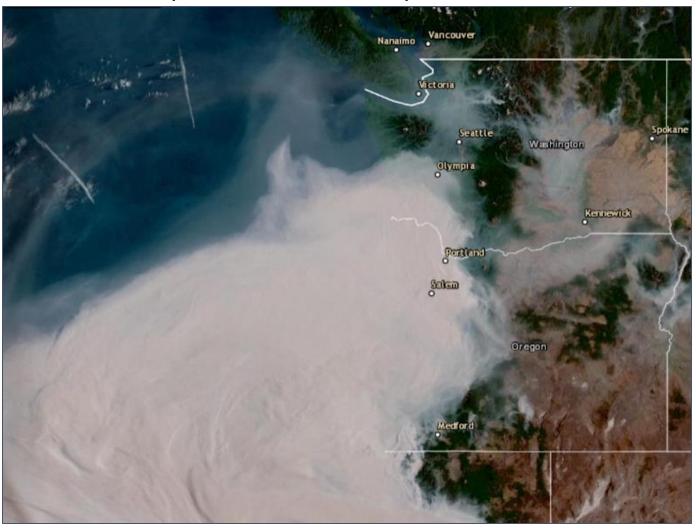
# Washington Wildfire Smoke Exposures Increasing



- Smoke also from outside of Washington
- Different populations exposed as smoke shifts

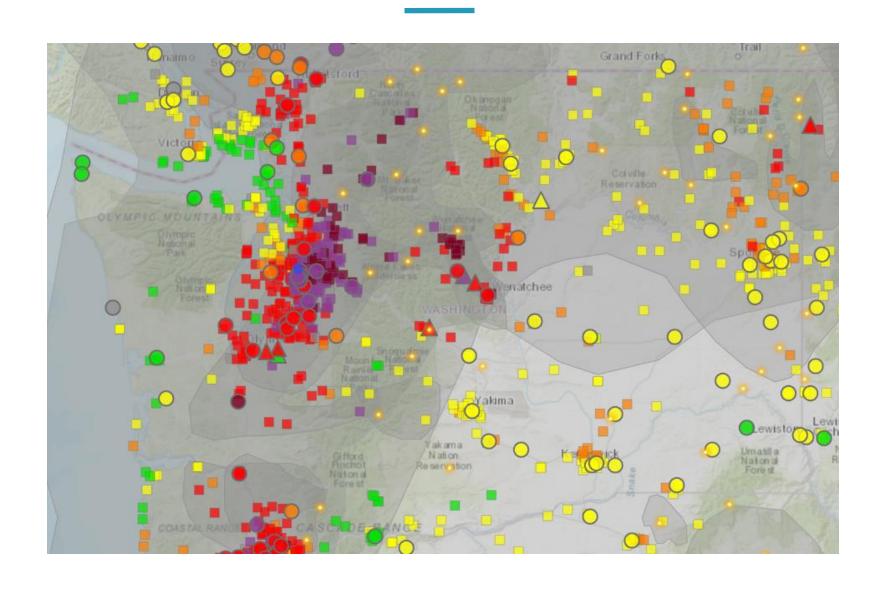
Image Source: Washington Department of Ecology, Air Quality Program, Jill Schulte, 2022.

The "super massive" plume of 2020



Source: WA Smokeblog, Washington Department of Ecology, Air Quality Program, 2020.

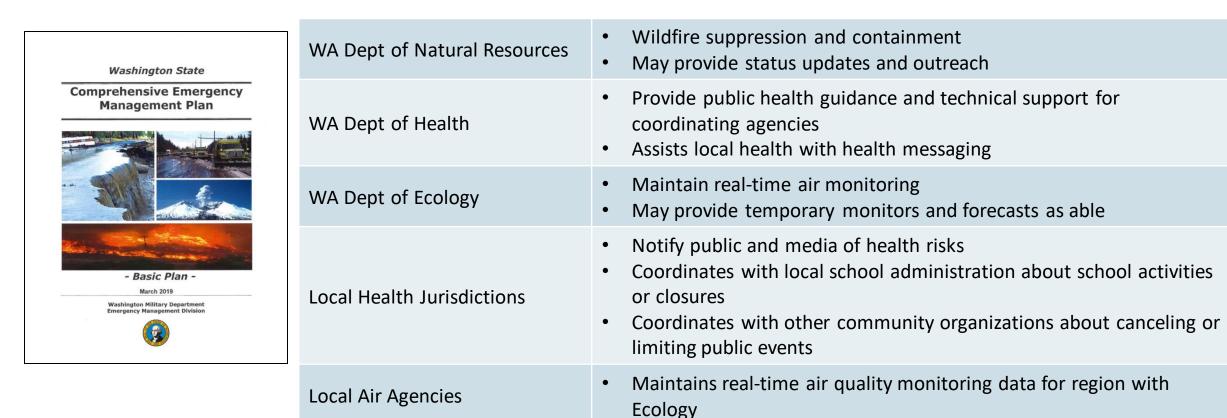
# 2022 October Wildfire Smoke Event



The increasing frequency and intensity of wildfire smoke events necessitates increased coordination, collaboration, and alignment by agencies involved in responding.

# Washington Comprehensive Emergency Management Plan for Wildfire Smoke

### Examples of Agency Roles (see plan for more)



ESF8, Appendix 5, Attach 1: Wildfire Response—Severe Smoke Episodes

# Washington Wildfire Smoke Impacts Advisory Group

Formed at the request of local health jurisdictions in 2018.

### Goals

- Develop and improve evidencebased health guidance
- Achieve more consistent health messaging across agencies

### 33 Members, including:

- WA Dept of Health and local health jurisdictions
- WA Depts of Ecology, Labor & Industries, and Natural Resources
- Regional clean air authorities
- Tribal communities
- University of Washington
- EPA and USFS

One-Pager: 333-242-WFSImpactsAdvisGroupFINAL.pdf (wa.gov)

# Review evidence & best practices







Develop guidance & materials









Share resources

Syndromic Surveillance

# Washington Guide for Public Health Actions for Wildfire Smoke

### Washington Guide for Public Health Actions for Wildfire Smoke

This guide is designed for air quality, public health, and other officials making local decisions.



	DOH 334-429 April 2022
Air Quality	Recommended Public Health Actions
Index	Check current and forecast air quality at <u>enviwa.ecology.wa.gov</u>
Good (0-50)	Prior to wildfire season: Coordinate a local plan for public health actions and distribute preparedness information to the public. Identify indoor spaces where individuals will seek cleaner air during wildfire smoke events and develop plans to protect indoor air quality, including filtration. Indoor spaces used by sensitive groups, such as schools, child care facilities, and long-term care facilities. Community cleaner air settings, such as libraries. Temporary cleaner air shelters.  During wildfire season: Monitor wildfires, smoke forecasts, and air quality at WA Smoke Blog. If forecasts predict smoke in your area, review the Washington Wildfire Response document for Severe Smoke Episodes and the Wildfire Smoke Guide for Public Health Officials.
Moderate (51-100)	Above recommendations, plus:  Distribute health information to the public, including steps to take with health advisory categories Washington Air Quality Guide for Particle Pollution.  Refer to the WA Smoke Blog for information about wildfires, smoke forecasts, and air quality.  Identify and focus outreach efforts for sensitive groups.  Coordinate with public health partners to follow recommended public health actions.  Recommend following the Washington Air Quality Guide for School and Child Care Activities.  For outdoor workers, start following WA Department of Labor and Industries' requirements.
Unhealthy for Sensitive Groups (101-150)	Above recommendations, plus:  Recommend sensitive groups take steps to reduce exposure (limit time outside, avoid strenuous outdoor activity, and follow tips for cleaner indoor air).  Recommend sensitive groups spend time in a cleaner air setting in the community, such as a library, if they cannot maintain cleaner air at home.  Cancel children's outdoor athletic events and practices or move them to an area with safe air quality, either indoors or at a different outside location: Washington Air Quality Guide for School Activities.  For an extended duration of smoke, consider opening a cleaner air shelter for sensitive groups.
Unhealthy (151-200)	Above recommendations, plus:  Recommend everyone take steps to reduce exposure (limit time outside, avoid strenuous outdoor activity, and follow tips for cleaner indoor air).  Recommend everyone spend time in an identified cleaner air setting in the community, such as a library, if they cannot maintain cleaner air in their residence.  Consider canceling outdoor public events and activities: Wildfire Smoke Guidance for Canceling Outdoor Events or Activities and Closing Schools.  For an extended duration of smoke, consider opening a cleaner air shelter for the public.
Very Unhealthy (201-300)	<ul> <li>Above recommendations, plus:</li> <li>Strongly recommend everyone take steps to reduce exposure (stay inside and filter indoor air to keep it cleaner; go elsewhere for cleaner air if needed and possible).</li> <li>Cancel outdoor public events and activities: Wildfire Smoke Guidance for Canceling Outdoor Events or Activities and Closing Schools.</li> <li>If school is in session, discuss school closure with administrators if indoor air cannot be kept lower than PM<sub>2.5</sub> 150.5 μg/m³ (AQI value of 201): Wildfire Smoke Guidance for Canceling Outdoor Events or Activities and Closing Schools.</li> <li>Distribute NIOSH-approved particulate respirators, such as N95 masks, as available, for limited use outside. Include training material for proper fit and use.</li> <li>For an extended duration of smoke, consider recommending that sensitive groups voluntarily relocate to an unimpacted area.</li> </ul>
Hazardous (>300)	Above recommendations, plus:  For an extended duration of smoke, consider recommending that everyone voluntarily relocate to an unimpacted area.

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# Environmental Health & Emergency Preparedness Partnership

# Cycle

- PRE WILDFIRE SEASON: prepare and establish roles, relationships, and responsibilities in advance of wildfire season
  - Pre-season all staff meeting
  - Public health action plan
  - Review & update DOH guidance and website materials
- DURING WILDFIRE SEASON: communicate, coordinate, & respond
  - Status reports—where's the smoke, who's bad is it, what are we doing
  - Set up emergency response structure as need (as needed)
- AFTER WILDFIRE SEASON: evaluate and identify opportunities to improve
  - Host hot wash

# Wildfire Smoke Status Report (Internal Communication)

### Good morning,

Below is an update on wildfire smokes status for 10/19 as of 10:30 am. This status report is to support internal coordination, preparation, and response to wildfire smoke.

Bottom-Line Up Front: Forecasts for a fall storm on Friday are promising for relief, but until then smoke will continue to impact much of Western and Central Washington, ranging from Unhealthy for Sensitive Groups to Very Unhealthy.

WA Smoke Blog map of wildfires and current air quality conditions



10/20 Forecast

10/21 Forecast



### Current EPH Smoke Preparedness & Response Efforts:

- We are receiving a variety of technical questions from partners, including local health across the state, primarily around children's health and school outdoor activities, indoor air quality, and low-cost sensors.
- We worked with OPAE to put out social media messaging and a press release on 10/13, as well as a post on the WA Smoke Blog.
- The RHINO team is currently experiencing data issues, and we will continue to coordinate with them to evaluate healthcare encounter data once the data issues are resolve.

### **Key Messages:**

- Track the WA Smoke blog for fire and smoke conditions. Follow health recommendations associated with AQI level in your area.
- With the extended duration of smoke, it is especially important to find a way to filter indoor air. Smoke can start to seep into homes after a few days, even if you do your best to keep windows and doors closed. Build a DIY box fan filter or buy a HEPA portable air cleaner.
- For recommendations for school and child care activities during poor air quality from smoke, see DOH's Air Pollution and School Activities - Public Health Recommendations for Schools (wa.gov).
- More information available on DOH's Smoke from fires webpage.

# Increasing Access to Wildfire Smoke Interventions

# Public health & emergency management can partner to distribute resources and interventions

### Example 1:

 DOH maintains a stock of N95 Respirators that can be requested by local health and emergency management

Public health knows the interventions & training, emergency management understands the logistics & distribution

### Example 2:

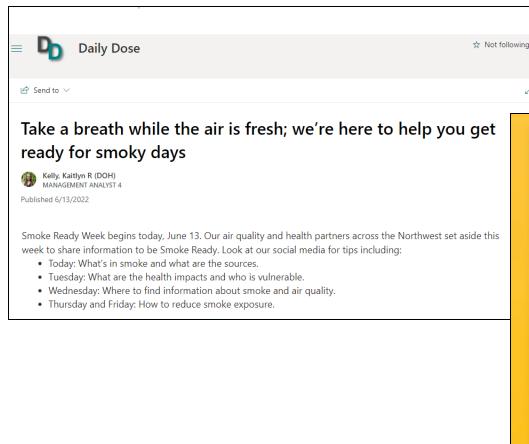
 Community level efforts to distribute DIY box fan filter kits and HEPA portable air cleaners

# Smoke Ready

"Being smoke ready means that communities and individuals have the knowledge and ability to stay reasonably safe and healthy during smoke episodes."

- Interagency Wildland Fire Air Quality Response Program
- Know how to access forecast and current air quality conditions
- 2. Know what's in smoke and why it's bad for health
- Know the health effects and symptoms of exposure to smoke and who is at risk
- 4. Know how to reduce exposure to smoke and have the resources and ability to do so

# Smoke Ready Week: June 12-16<sup>th</sup>







# Welcome to the Washington Smoke blog, a partnership between state, county, and federal agencies, and Indian Tribes. We coordinate to collectively share info for Washington communities affected by wildfire smoke. If the air monitoring map doesn't display here, links to additional monitoring maps can be found under the "Monitoring & Forecasting" tab. Fire and Smoke Map | v2.0 | Current Conditions Select Forecast Date Aug 19 Inn. Aug 23 Selected: Current Conditions Wendchee Wendchee Wendchee Wendchee Wendchee Wendchee Wendchee Wendchee Wendchee

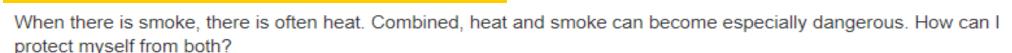
# WA Smoke Blog

wasmoke.blogspot.com



### FRIDAY, AUGUST 13, 2021

Wildfire Smoke and Heat: A Double Whammy



Staying inside and keeping doors and windows closed will keep smoky air out of our homes, but it can be hard to manage indoor temperatures while doing so. If it's hot indoors and you don't have air conditioning, these steps can help you stay cooler inside during poor air quality:

N95 respirator tfire smoke. Take ng a clean air

# Wildfire Smoke Case Study - Lessons Learned

- Build relationships, meet people, know what they do prior to wildfire season
- 2. Build awareness & keep people up to date about what's happening
  - Set up a channel for communication (Microsoft channel or teams chat, Basecamp)
  - People (leadership) usually just want (need) know you're working on it
- Identify what information you need about the hazard and when it's bad enough so they can ramp up and down
  - Hang out with meteorologists/weather people (see NWS's presentation tomorrow)
- 4. Alignment in key health messages
  - And action-oriented messages
- 5. Learn & be flexible and adaptive
  - Research changes quickly in climate & health

Experiences & Input from Session Participants

# Questions for Discussion

Experiences in managing impacts of smoke and/or heat events?

Challenges or impediments to protecting people you serve during heat/smoke events?

Areas of intra- or inter-agency coordination that have been effective?

Partnerships that have been especially useful or successful?

Resources, approaches, trainings that could be helpful for other practitioners?



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