

Smoke Impacts CA: 2020 Lessons - 2021 Actions

Communicating Current (and Future) Smoke Conditions to the Public



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“Minimize to the extent feasible COVID-19 exposure and transmission and smoke exposure to firefighters and communities”
(USFS Chief’s Wildfire 2020 Letter of Intent)

Wildfire Smoke and COVID-19 risks to fire personnel and down-wind communities:



Conservative view of risks of COVID-19 and wildfire smoke

Based on:

- 1) Wildfire smoke exposure could result in greater susceptibility to COVID-19 and other viruses/bacteria (decrease in local and systemic immune function)
- 2) Wildfire smoke could worsen COVID-19 symptoms (increase hospitalization?)
 - 1) If smoke heading to a community with existing cases at home, plan, notification, response?
- 3) Wildfire smoke exposure could worsen outcome of those infected by COVID-19
- 4) Wildfire smoke may pose a risk to those recovering from serious COVID-19 infection (due to inflammation in damaged lungs resulting from smoke)



United States Department of Agriculture



Woolsey Fire seen from Topanga, CA. (Photo courtesy of Peter Buschmann)

The purpose of this document is to provide Air Resource Advisors and other environmental health professionals with key messages about wildfire smoke and COVID-19. It also provides resources that can be given to communities affected by wildfire smoke during community spread of SARS-CoV-2, the virus that causes COVID-19. This document was created in collaboration with CDC and COVID-19 related information was reviewed and cleared by CDC.

Why do people need to consider COVID-19 along with wildfire smoke?

- The COVID-19 pandemic is overlapping with the occurrence of wildfires in the United States.

- People of low socioeconomic status, including those who are homeless and with limited access to medical care.

Who else is at risk from wildfire smoke during the COVID-19 pandemic?

The overlap of the COVID-19 pandemic with wildfire season in the United States complicates public health response to wildfire smoke. People who are either susceptible to or affected by COVID-19 may have health conditions that also make them vulnerable to wildfire smoke exposure. Persons who might also be at risk from wildfire smoke because of COVID-19 include:

- Those who are immunocompromised or taking drugs that suppress the immune system;
- Those with or recovering from COVID-19.

On front page of [wildlandfiresmoke.net](https://drive.google.com/file/d/1Lfc1I_PMZFAWZack2cqtUIBmBXLpve0Q/view) and direct link https://drive.google.com/file/d/1Lfc1I_PMZFAWZack2cqtUIBmBXLpve0Q/view



Translated into Spanish and Hmong with partial translations into Navajo, Apache and Hopi.

A 2021 revision in the works.

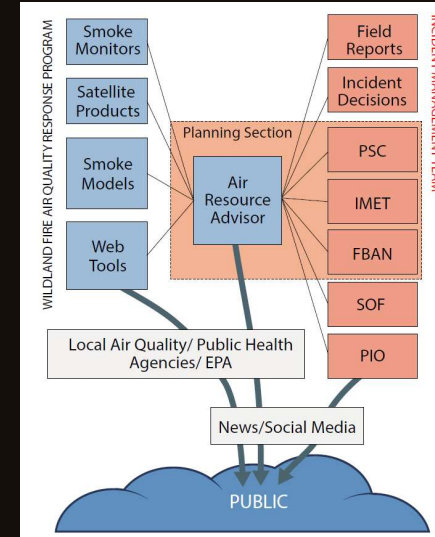
Interagency Wildland Fire Air Quality Response Program



Air Resource Advisors* – dispatched as part of Incident Mgmt Teams

- **Modeling:** BlueSky smoke dispersion modeling
- **Monitoring:** National cache of 38+ PM2.5 units
- **Monitoring:** Data display and analysis including PurpleAir (w/EPA)
- **Messaging:** Daily air quality outlooks
- **Coordination:** w/state/tribal/local air quality regulatory agencies, public health dept. and impacted communities

Enables: reduction of smoke exposure through behavior modification messages (public or personnel), provide roadway smoke forecasting (when needed)



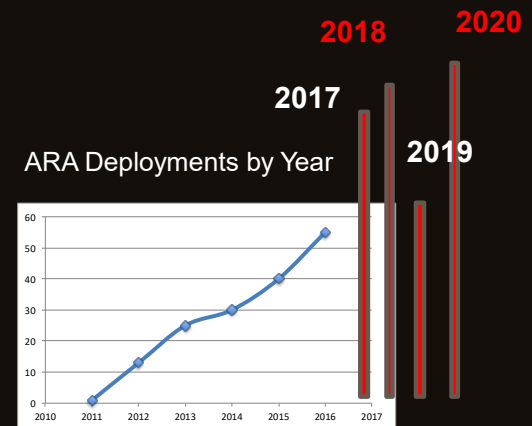
2018 ARA Smoke Outlooks covered area of 52 million people

2020 ARA Smoke Outlooks covered area of 60 million people

*Currently 60 ARA's and 35 trainees, multiple entities represented including: FS, BLM, NPS, FWS, EPA, State Forestry (NC, GA, FL, OR, WA) Tribes, NWS, NRCS, CDC, AD-Contract, State/County, Air/Regulatory/Health (NC, CO, Placer County, Washoe County)

Backgrounds: Wildland Fire, Air Quality, Meteorology

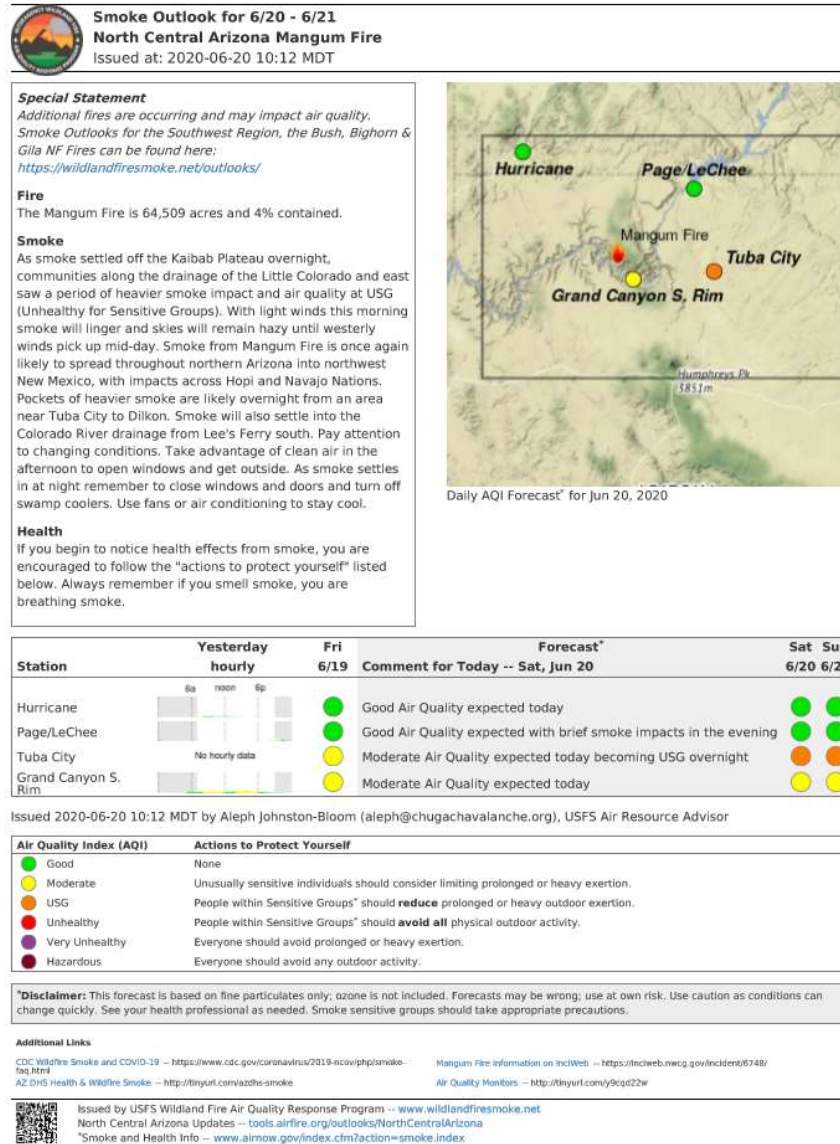
ARA's intersect with PIO, PSC, SOF, LOGS, IC, FBAN, IMET, and not there to regulate...



8 Million Plus Views in 2020

Local impact focus with
consistent messaging/format

Many Outlooks translated into
Spanish and other languages
in 2020.



Evolution of the IWFAQRP - March 2019 Authorized by US Congress S.47 - John D. Dingell, Jr. Conservation, Management, and Recreation Act



SEC. 1114. WILDFIRE TECHNOLOGY MODERNIZATION.

(a) PURPOSE.

—The purpose of this section is to promote the use of the best available technology to enhance the effective and cost-efficient response to wildfires—

- (1) to meet applicable protection objectives; and
- (2) to increase the safety of—
 - (A) firefighters; and
 - (B) the public.

Ordering an ARA is in the California Mobilization Guide and they are tied to the IMT. CalFIRE use increasing...Talk with the IMT and Agency Administrator to express need.

(f) SMOKE PROJECTIONS FROM ACTIVE WILDLAND FIRES.

—The Secretaries shall establish a program, to be known as the “Interagency Wildland Fire Air Quality Response Program”, under which the Secretary concerned

— (1) to the maximum extent practicable, shall assign 1 or more air resource advisors to a type 1 incident management team managing a Federal wildland fire; and

(2) may assign 1 or more air resource advisors to a type 2 incident management team managing a wildland fire.

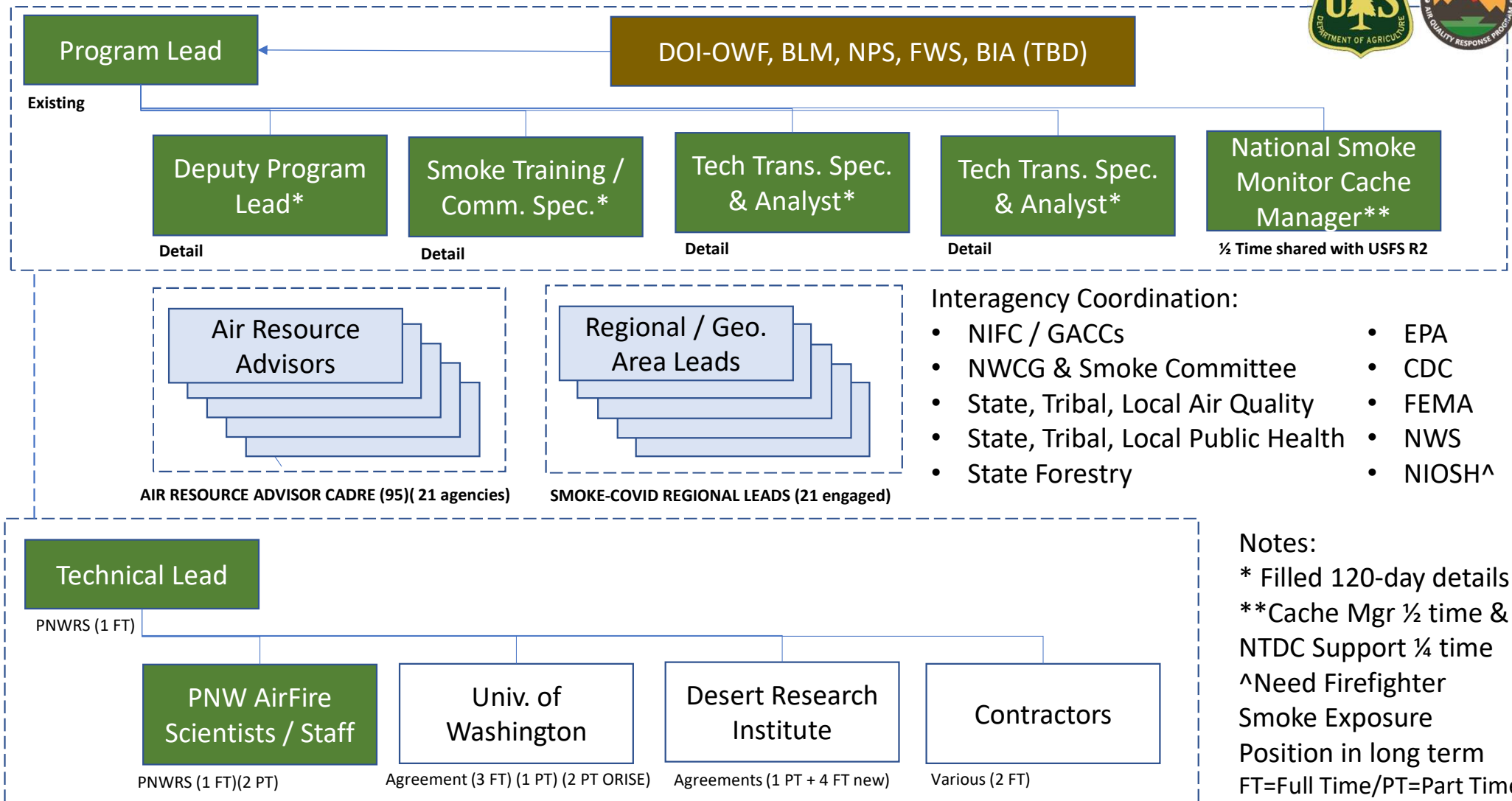


Interagency Wildland Fire Air Quality Response Program (USFS-Lead)

Wildland Fire Smoke COVID-19 Response Plan

- **Research & Development Response** (FS R&D-PNW AirFire Rx & WF Tools)
 - New Smoke Ensemble Forecast Tool to support ARAs
 - *COVID-19 and PM2.5 Dashboard* – See <https://covid.airfire.org/tracking/>
 - *Air Quality Sensor Display – with EPA – Pilot Fire and Smoke Map Pilot Study*
<https://fire.airnow.gov/>
- **Prepare and Train** - Interagency Wildland Fire Air Quality Response Program & Air Resource Advisors – Several 4-hour sessions of pre-season training
 - Implement weekly ARA Community calls to share experiences and emerging info
 - Weekly ARA Update email
- **USFS Regional Coordination on COVID-smoke risks and mitigation**
- **USFS, BLM, NPS, FWS, BIA, DOI-OWF Interagency Coordination calls on COVID-wildfire smoke risks mitigation**
- **Coordination with key agency partners and groups (EPA/CDC/NIOSH/FEMA)**
- **Preparation and Response Strategies** - Geographic Area Wildfire Response Plans

Interagency Wildland Fire Air Quality Response Program - Wildfire Smoke-COVID-19 2020 Organization



Notes:

- * Filled 120-day details
- **Cache Mgr ½ time & NTDC Support ¼ time
- ^Need Firefighter Smoke Exposure Position in long term
- FT=Full Time/PT=Part Time



2016 through 2020 Wildfire Smoke Impacted Monitor Days (P. Lahm & A. Marsha, 2021)

- Fixed and Temporary Monitors 2016-2020 May 1-November 30
- AQI Level At or Above PM2.5 Unhealthy for Sensitive Groups Levels

State	2016	2017	2018	2019	2020
CA	221	915	2036	79	3647

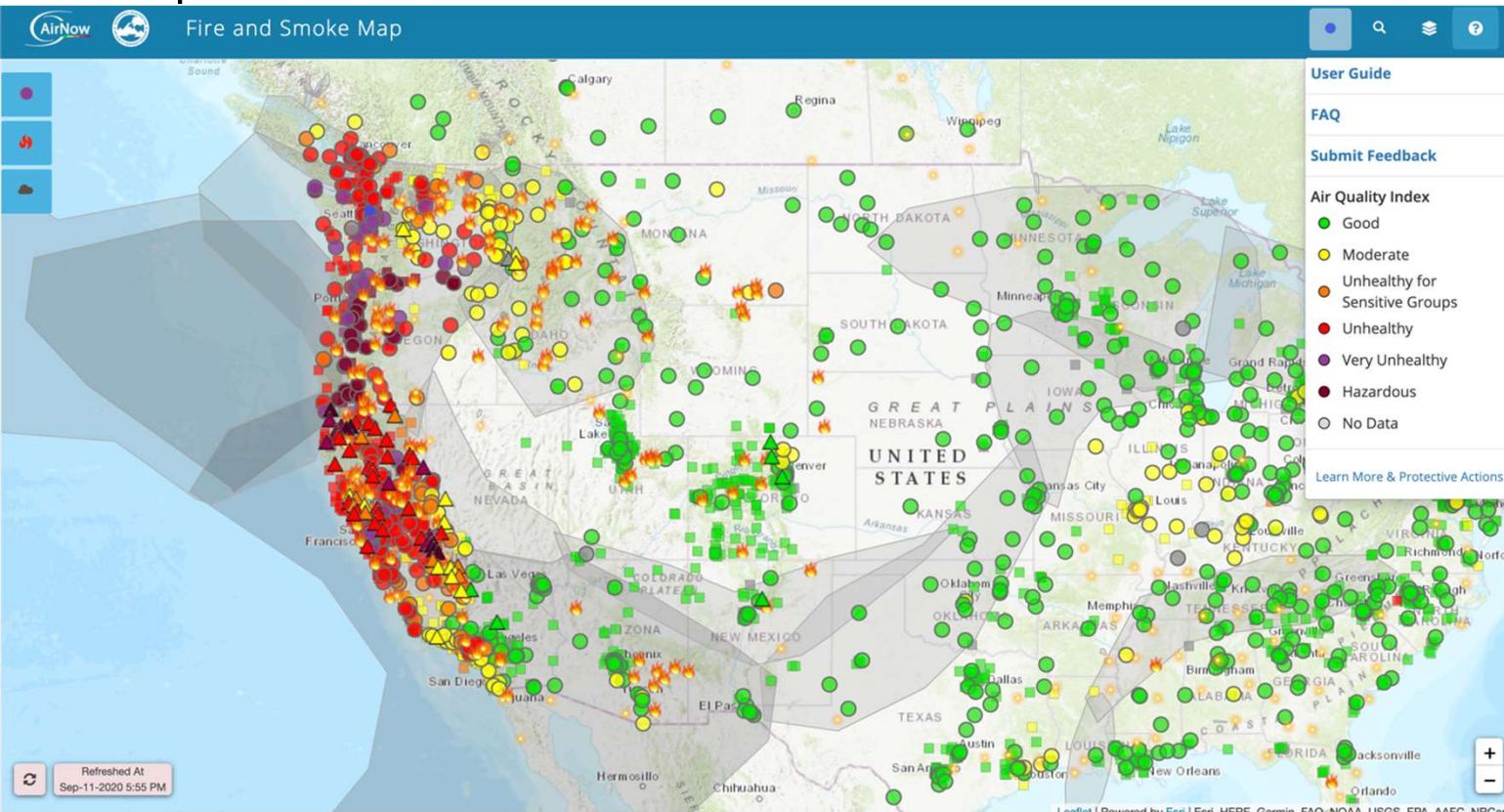
- Monitor number increased by about 25% from 2016 to 2020

Fire and Smoke Map v1

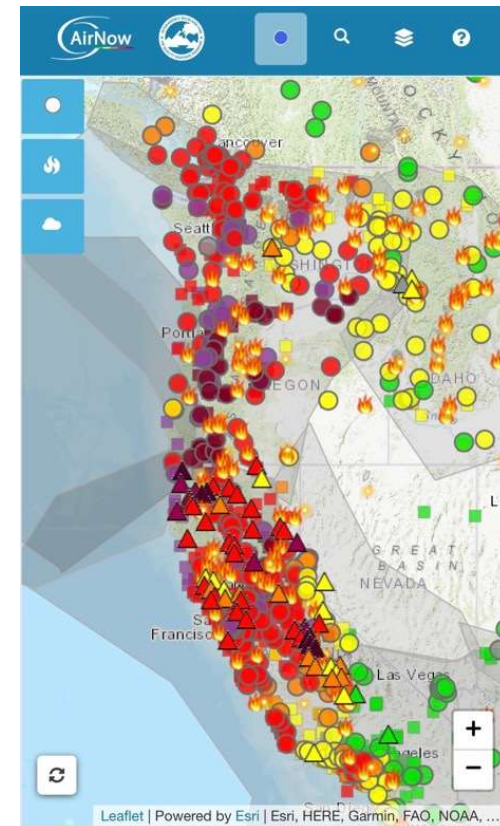
<https://fire.airnow.gov>

September 11, 2020 shown

Desktop:



Mobile:



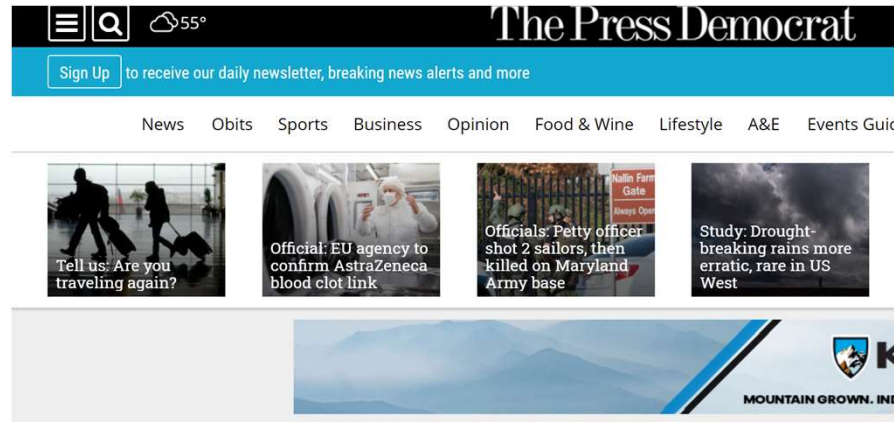
Integrates fire, smoke plume, and air quality monitors: Adds > 4500 low-cost sensors using EPA calibration algorithm

2020: 8/20 rollout after State, Tribal and Local input and modifications with over 7 million views in 2020

Carbon Monoxide...



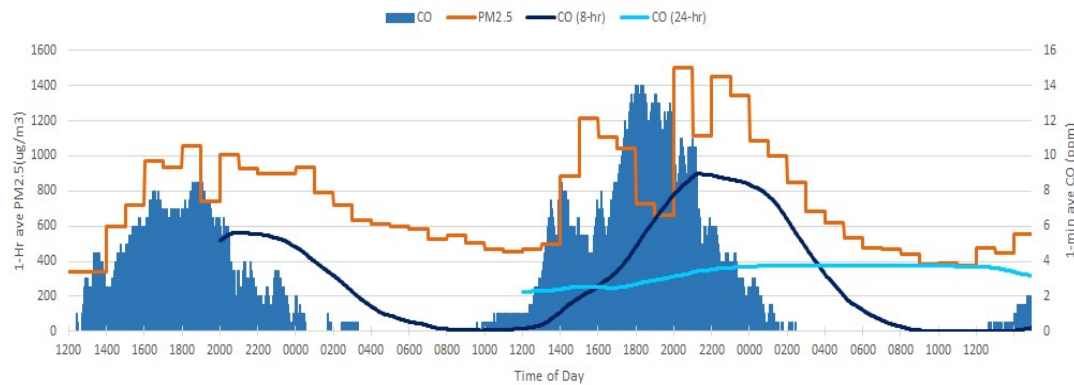
- Rolled out in mid-season effort to address reported CO symptoms
- Monitoring Plan (Peer-reviewed by medical doctor and scientists @ EPA)
- Deployed CO dosimeters to key locations
- Incident Management Team coordination increased esp CA and OR
- Masimo RAD 57 COHb measurement tool sent to Creek Fire
- Numbers can be above ambient
- Not just near fire as previously noted
- Work continuing...
- Fourteen RAD 57 now available from cache to IMT through ARAs for 2021
- Plans for CO monitoring in 2021



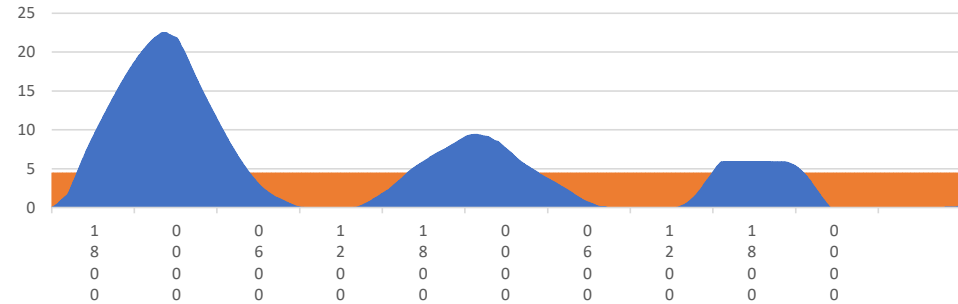
1 firefighter hospitalized, 15 examined at Glass fire base camp for potential carbon monoxide poisoning



CO vs. PM2.5 at Forks of Salmon during Red Salmon Wildfire
9/29/2020 - 10/1/2020



Forks of Salmon (10/1-4/2020)
8-HR running average CO, MSA Altair 4





Dispersed Camps...

- Potential for smoke in spike camps
- Challenges for monitoring and response
- Much greater IMT (SOF and MEDL) coordination by ARAs in 2020
- IMT's much more engaged on smoke and health issues
- Engagement with LOGS and others in smoke mitigation approaches
- ARAs have moved into the public and fire personnel smoke role
- Being a remote resource didn't work effectively for these critical relationships to develop...many issues in 2020 on remote assignments – inability to monitor, interact with PIO's, PSC...IMT and even local community-state partners



Cal/OSHA :: Advisory Meetings :: Worker Protection from Wildfire Smoke

Advisory Meeting for Proposing an Emergency Regulation to Protect Workers from Wildfire Smoke

General Industry Safety Orders
Chapter 4, subchapter 7, new section

May 8, 2019
10:00 am - 3:00 pm

Harris State Building
1515 Clay St., 2nd Floor, Room 1
Oakland, CA

In response to the Occupational Safety and Health Standards Board's [decision](#) on March 21, 2019 to GRANT in part Petition No. 573, the Division of Occupational Safety and Health (Cal/OSHA) will convene an advisory meeting seeking input on the development of an emergency rulemaking proposal addressing worker exposure to wildfire smoke. Cal/OSHA plans to hold this advisory committee meeting on May 8th, 2019 in Oakland.

Persons interested in receiving announcements and updates pertaining to the advisory meeting and persons interested in providing information and scientific data on employee exposure to wildfire smoke, control measures, feasibility, or costs may contact Deputy Chief of Health [Eric Berg](#) at (510) 286-7010 or Senior Safety Engineer [Amalia Neidhardt](#) at (916) 263-1944.

Meeting Documents

- [Post-meeting Comments](#)
- [Pre-meeting Comments](#)
- [Agenda](#)
- [Draft Regulatory Text including both Appendices - 5/21/2019](#)
- [Draft Regulatory Text for Discussion - 5/8/2019](#)

Background Documents

- [Petition 573](#)
- [Gavin Newsom, Governor of California, Executive Order N-05-19](#)
- [About the Emergency Rulemaking Process](#)
- [Flow Chart on Emergency Rulemaking](#)

Cal/OSHA

Quick Links

- ▶ [File a workplace safety complaint](#)
- ▶ [Obtain a free consultation](#)
- ▶ [Important Cal/OSHA updates](#)
- ▶ [Public records requests](#)

Cal/OSHA Branches & Units

Branches

- ▶ [Enforcement](#)
- ▶ [Consultation Services](#)

Units

- ▶ [Amusement Ride and Tramway](#)
- ▶ [Asbestos and Carcinogen](#)
- ▶ [Census of Fatal Occupational Injuries](#)
- ▶ [Communications Program](#)
- ▶ [Crane](#)
- ▶ [Elevator](#)
- ▶ [Heat and Agriculture Coordination Program](#)
- ▶ [High Hazard](#)
- ▶ [Labor Enforcement Task Force](#)
- ▶ [Legal and BOI](#)
- ▶ [Mining and Tunneling](#)

FINAL Regulation 11/2020

Smoke Ready

Individuals and communities have the knowledge and ability to stay reasonably safe and healthy during smoke episodes

Individuals can:

- Limit time outdoors
- Minimize sources of indoor air pollution
- Create a “clean room”
- Purchase an air filter
- Know how to determine air quality

Communities can:

- Create clean air spaces/clean air shelters
- Educate residents
- Have resources to help vulnerable and underserved

A poster titled "BE SAFE BE SMOKE READY". It features a photograph of a highway bridge with cars driving away, shrouded in a thick orange-brown haze from wildfire smoke. The sun is visible as a bright orange orb in the hazy sky. In the top right corner, there are logos for USDA and the U.S. Forest Service. The text on the poster reads: "BE SAFE BE SMOKE READY", "SETTING UP A 'CLEAN AIR' ROOM AT HOME CAN HELP REDUCE YOUR EXPOSURE TO DANGEROUS LEVELS OF WILDFIRE SMOKE WHILE INDOORS", and "DIY GUIDE: https://tinyurl.com/EPACleanroom".

 **BE SAFE
BE SMOKE
READY**

SETTING UP A 'CLEAN
AIR' ROOM AT HOME
CAN HELP REDUCE
YOUR EXPOSURE TO
DANGEROUS LEVELS
OF WILDFIRE SMOKE
WHILE INDOORS

DIY GUIDE:
[https://tinyurl.com/
EPACleanroom](https://tinyurl.com/EPACleanroom)

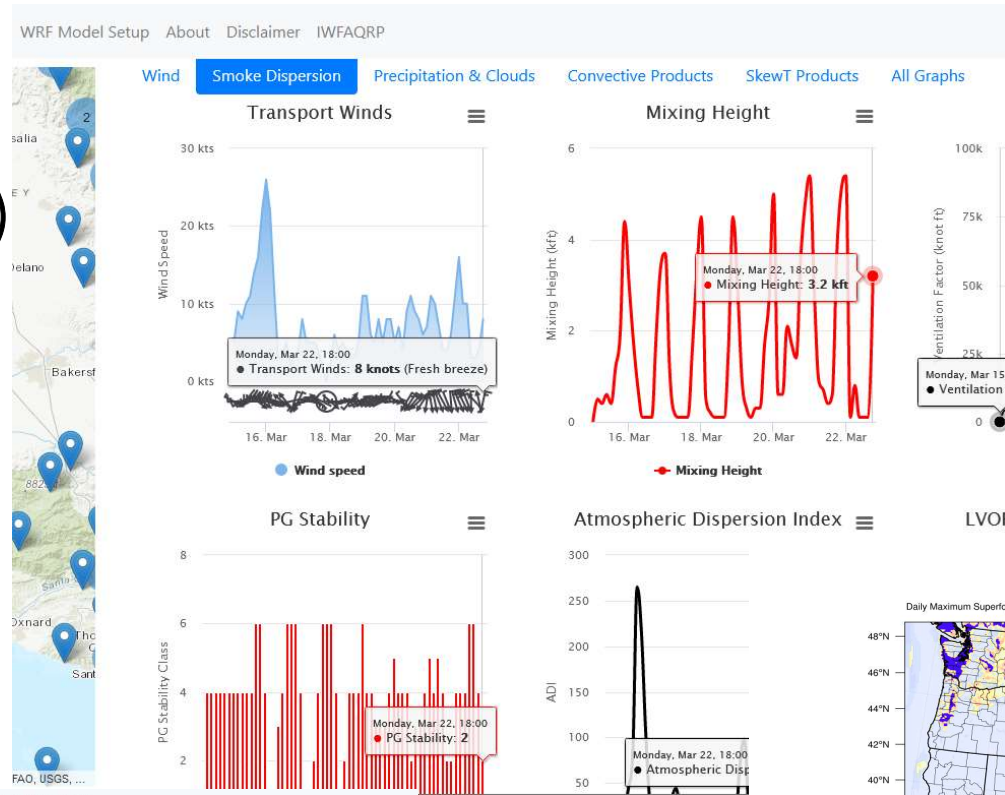
 

WRF Dashboard - Smoke Dispersion Forecast Products (WF & Rx utility)

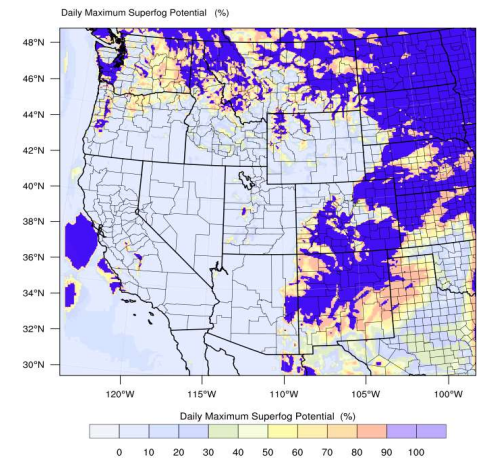
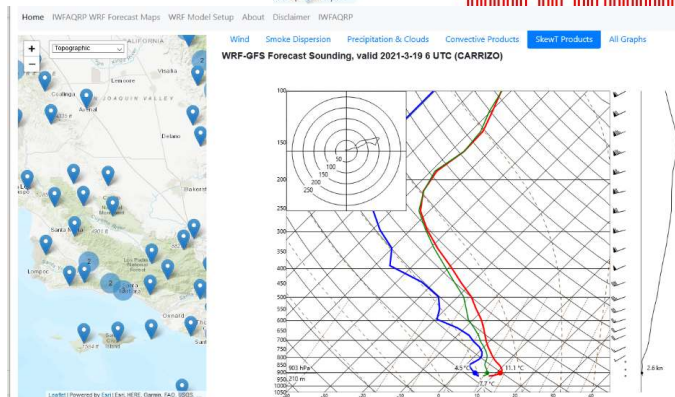
1. Transport Winds
2. Mixing Heights
3. Ventilation Index
4. Atmospheric Stability (PG Stability and Atmospheric Dispersion Index)
5. Transportation Safety (Low Visibility Risk Occurrence Index and Superfog Potential Index)

- Forecast maps at 54.215.0.128/smoke

- Point forecast at 54.215.0.128/wrf-dashboard



Init: 2020-10-21_00:00:00
Valid: 2020-10-28_15:00:00



OUTPUT FROM WRF V4.1.5 MODEL
WE = 310 ; SN = 275 ; Levels = 38 ; Dis = 6km ; Phys Opt = 8 ; PBL Opt = 1 ; Cu Opt = 3



2021...



- 2021 and COVID with respiratory health is still with us...
- ARAs have moved into the public and fire personnel smoke advisory role
- COVID Funding not available like 2020
- Hopefully next ARA training late fall 2021

Questions and Information

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COVID Dashboard and Smoke Model Ensemble Tools

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Weather Forecast Dashboard Info

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