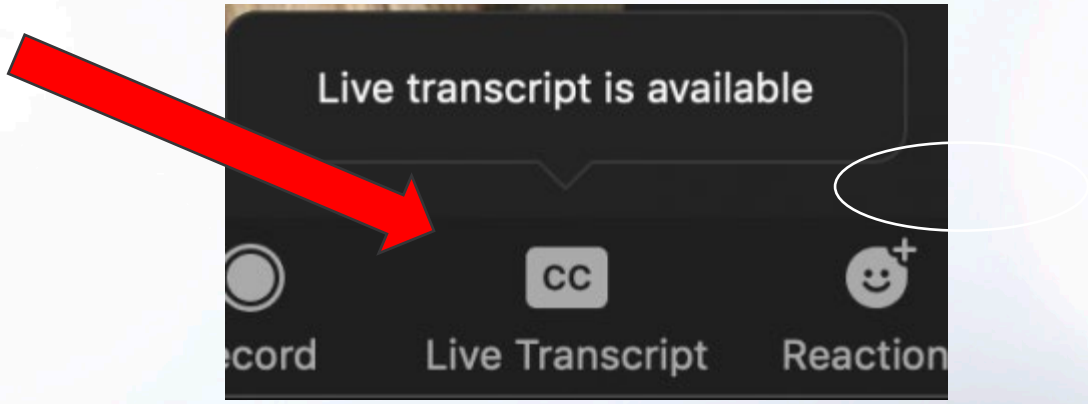
Understanding Air Quality After the LA Fires

February 10, 2025
6:00pm - 7:00pm

Turning on Closed Captions in Zoom



Language Interpretation through Zoom

- **Spanish Interpretation is being provided.**
- All attendees are asked to find and click on the Interpretation Icon.
  - Those choosing **English** must select **Off**
  - Those choosing **Spanish** must select **Spanish** and then **Mute Original Audio**
- **Note:** In order to use the Language Interpretation feature, attendees must **download the Zoom application** on their desktop.

Interpretación de Idiomas en Zoom

- **Tendremos servicio de interpretación.**
- A todos los participantes se les pide que busquen y opriman el ícono de interpretación (Interpretation)
  - Para **inglés**, tiene que hacer clic en **inglés (English)** y luego hacer clic en **Silenciar Audio Original (Mute Original Audio)**.
  - Para **español**, tiene que hacer clic en **español (Spanish)** y luego hacer clic en **Silenciar Audio Original (Mute Original Audio)**.
- **Observación:** Para usar la función de interpretación de idioma, los participantes tienen que **descargar la aplicación de Zoom** en su desktop (escritorio)**.**

Welcome & Agenda

Courtney Smith, Principal Deputy Executive Officer,
California Air Resources Board

Agenda

- Recovery Operations – Household Hazardous Materials Removal
- Air Quality Monitoring
- Public Health Impacts
- Protecting Yourself
- Resources & Assistance

Household Hazardous Materials Removal

Harry Allen, On-Scene Coordinator
Emergency Response Section
EPA Region 9

Debris Recovery: Phase I and Phase II

Phase I

- U.S. Environmental Protection Agency
  - Household hazardous materials
  - Removed by hand by experts trained to work with chemicals
  - The first step in the recovery process

Phase II

- U. S. Army Corps of Engineers
  - Bulk debris, soil, ash
  - Materials removed with heavy equipment
  - Occurs after a property is Phase I complete

2025 Southern California Wildfire Response

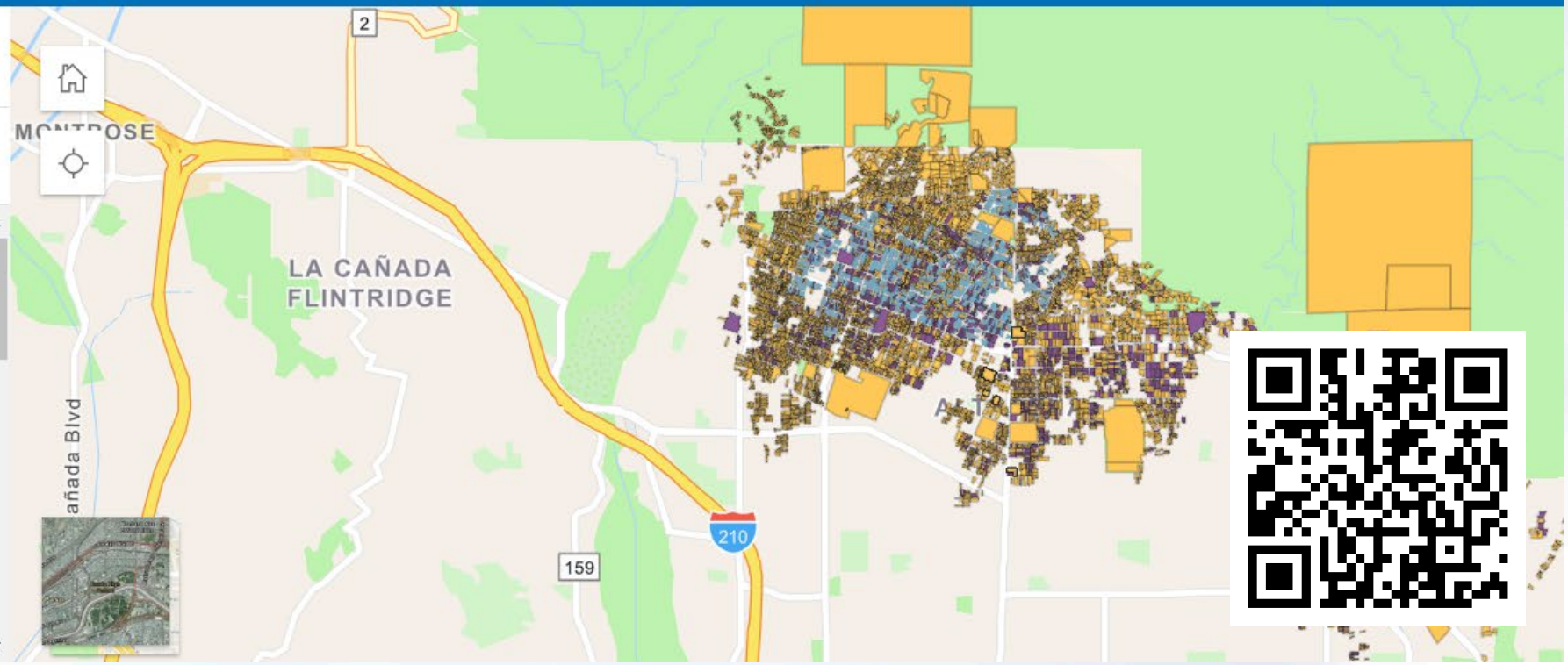
U.S. EPA Involvement & Progress | Parcel Status Look Up | Cleanup Activities | Staging Areas

SoCal Fires 2025 - Parcel Status LookUp

Search by APN or Address

Search for an address or parcel to learn about its assessment status.

Enter an address with abbreviated suffixes (e.g. St, Dr, Pl), or an Assessor Parcel Number (APN) in the search bar. This tool operates best on a web browser. Assessment statuses are updated nightly.



Debris Removal Phase II

Cory Koger, Ph.D., Debris Removal Subject Matter Expert,
US Army Corps of Engineers

Air Quality Monitoring

Dr. Jason Low, Deputy Executive Officer
Monitoring and Analysis
South Coast Air Quality Management District

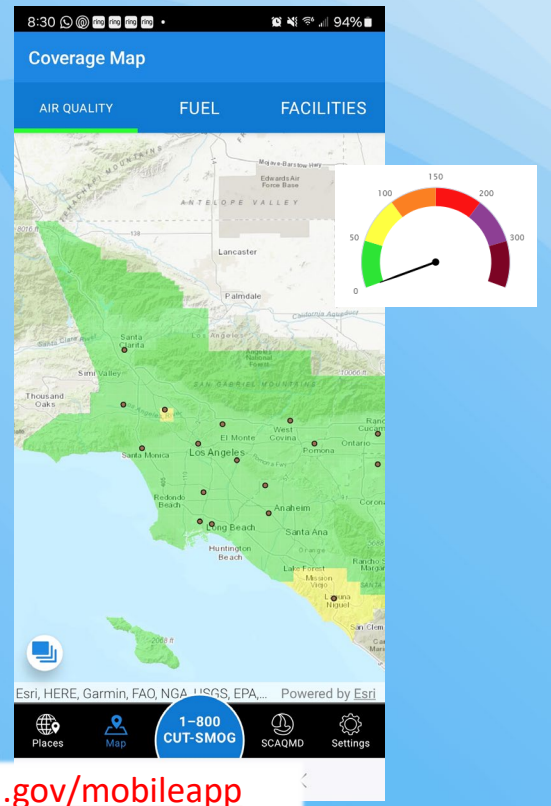
Dr. Scott Epstein, Air Quality Assessment Manager
Air Quality Assessment & Air Toxics Hot Spot Program
South Coast Air Quality Management District

Air Quality Index (AQI)

- PM 2.5 (total mixture of all solid and liquid compounds < 2.5 µm)
- PM 10 (total mixture of all solid and liquid compounds < 10 µm)
- Ozone (smog)
- Carbon monoxide
- Nitrogen dioxide

Health effects research

Recommended precautions based on air pollution levels

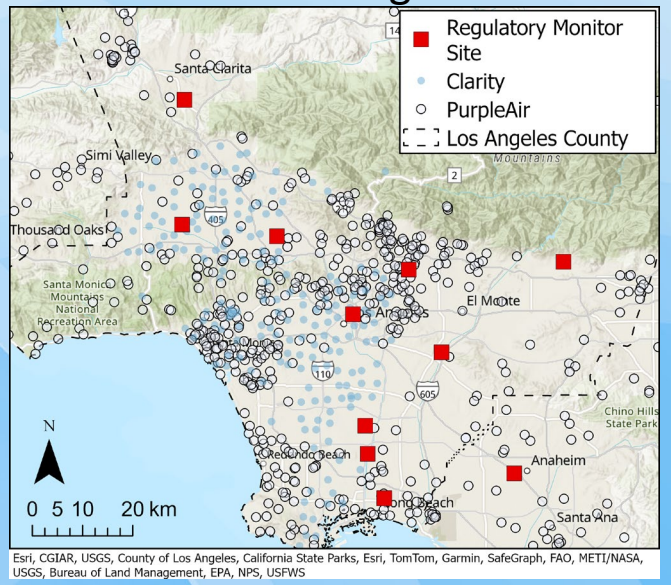


www.aqmd.gov/mobileapp

Air Pollutants of Concern

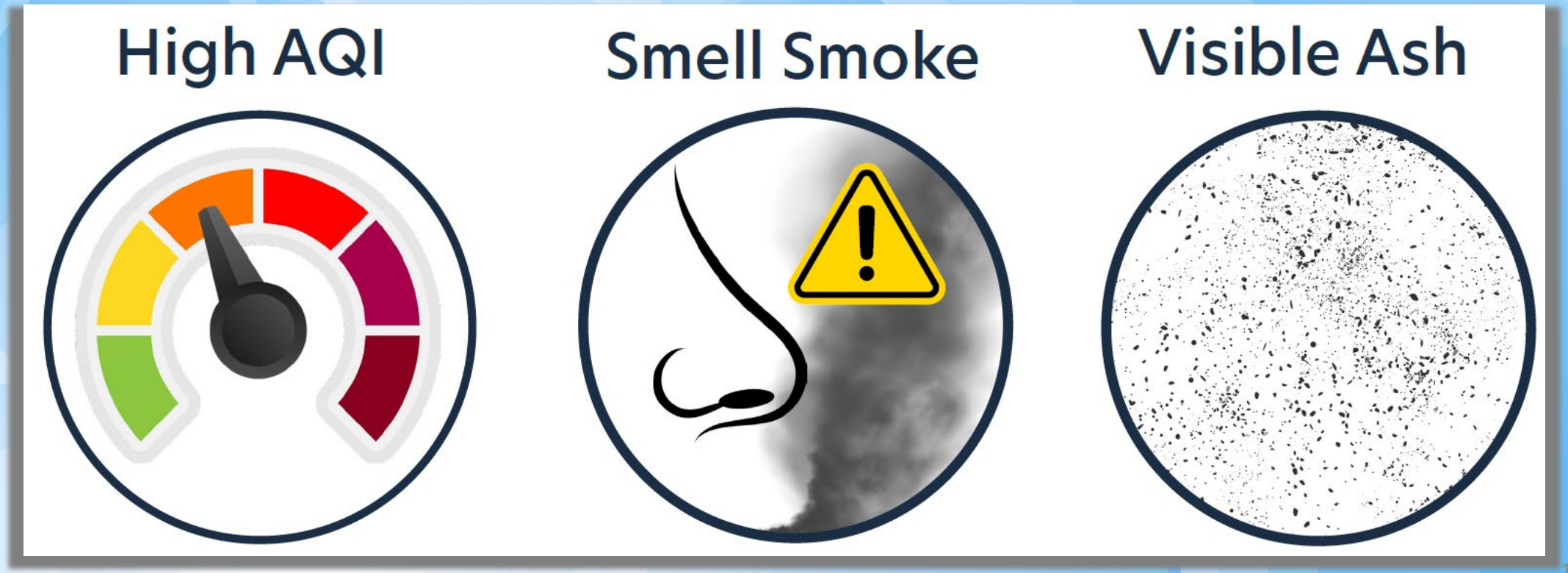
- Solid & liquid air toxics including metals (arsenic, lead, etc.)
  - Total mixture of small particles are measured by PM2.5 monitors and sensors
  - Large particles are visible to the naked eye in the form of ash
- Gaseous air toxics
  - When from combustion, typically present along with wide variety of odorous compounds

PM2.5 Monitoring Network



Ash resuspension is a concern during high winds or ground activity

Take precautions when <u>any one</u> of the following occurs:

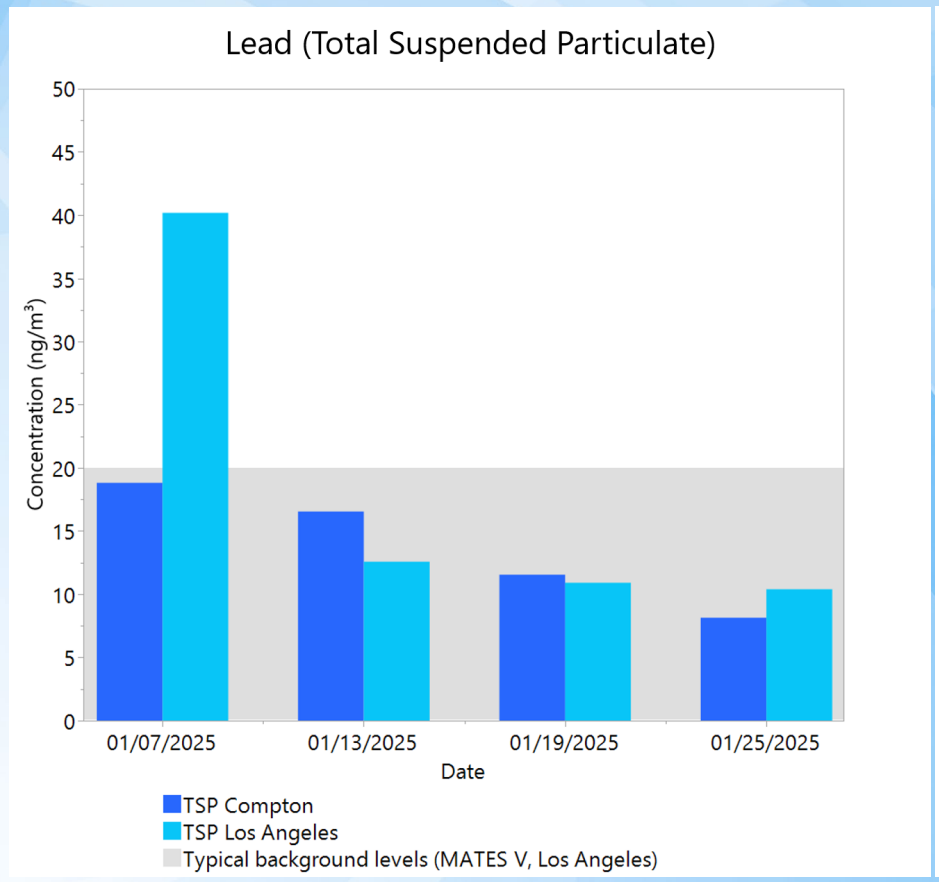


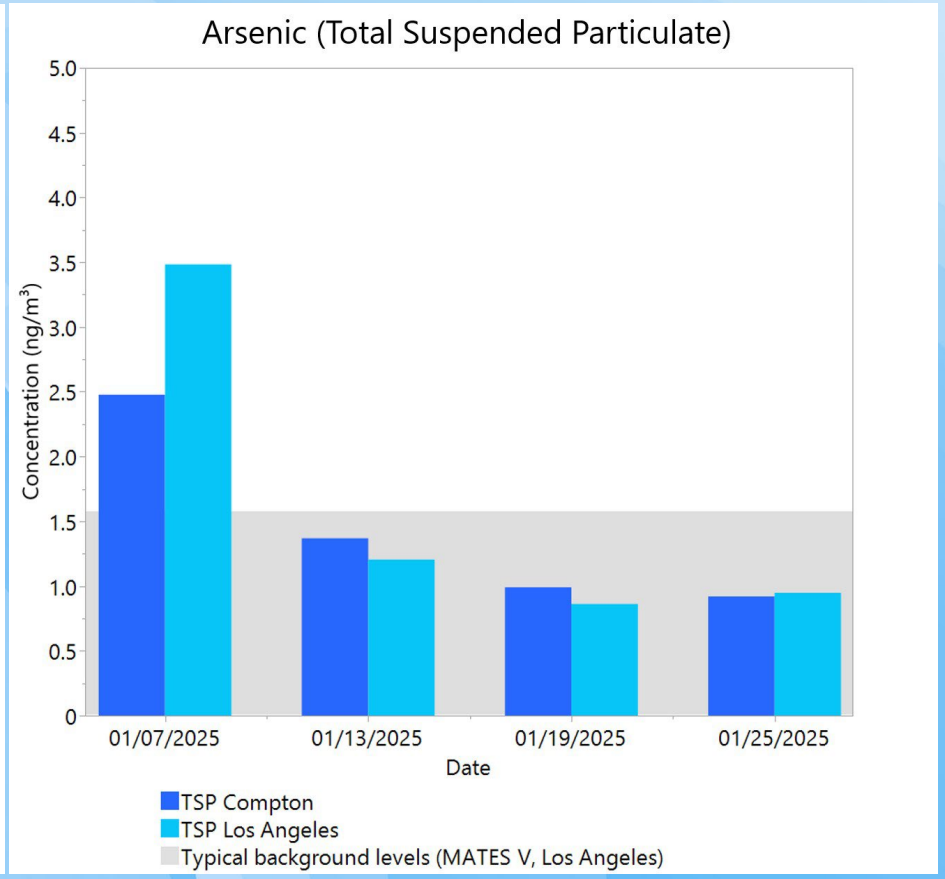
How Regional Air Toxics Data Can Be Used

- Useful for quantifying the health risk from exposure to various air toxics
- Identify whether wildfire related sources are still contributing to urban air toxic levels

Regional Air Toxics Network

- Lead measurements at seven locations in the Basin
- Lead, arsenic, and other air toxic metals also measured at several Los Angeles sites

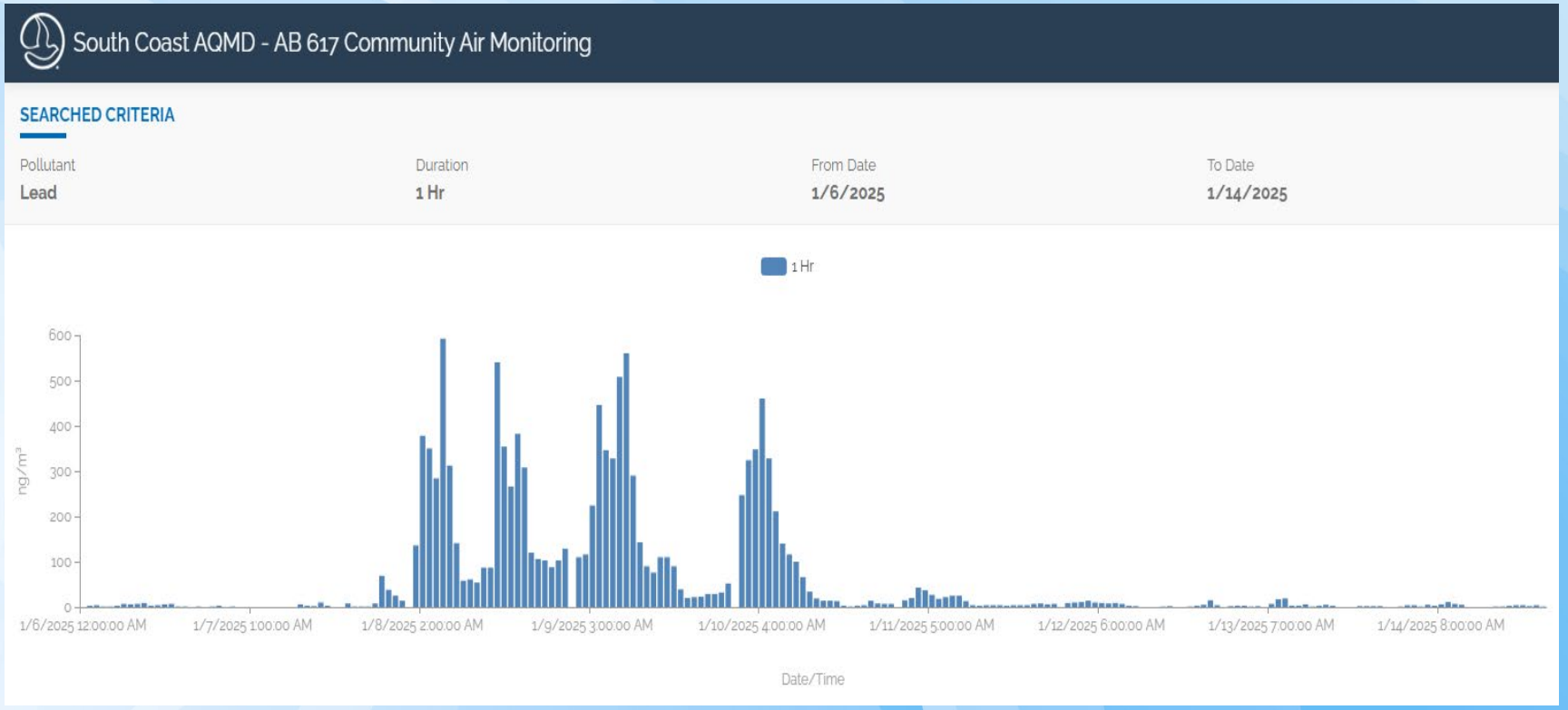




Other Air Monitoring Sites

- Ongoing community air monitoring in certain areas in Los Angeles area utilize advanced research-grade air monitoring
- Lead, arsenic, and other air toxics measured at these sites

Huntington Park Site



https://xappprod.aqmd.gov/AB617CommunityAirMonitoring/Home/Index/selaunity Air Monitoring

Expanded Air Monitoring - Wildfires

- Monitoring efforts began on January 31, 2025
- Initiative will assess air quality during cleanup activities
- Monitoring is supported by US.EPA and conducted in collaboration with CARB
- Continue to work closely with federal, state and local agencies supporting cleanup efforts

Expanded Air Monitoring - Wildfires

Step One: Mobile Monitoring of Air Toxics

- Four Mobile Monitoring Surveys
  - 2 Eaton Fire Area
  - 2 Palisades Fire Area
- Measurements for air toxic metals and volatile organic compounds (VOCs)
- Identify potential pollutants that may have concerning elevated levels
- Results may help identify locations for the temporary stationary air monitoring

Expanded Air Monitoring - Wildfires

Step Two: Stationary Air Monitoring

Placement of monitoring stations will be determined based on:

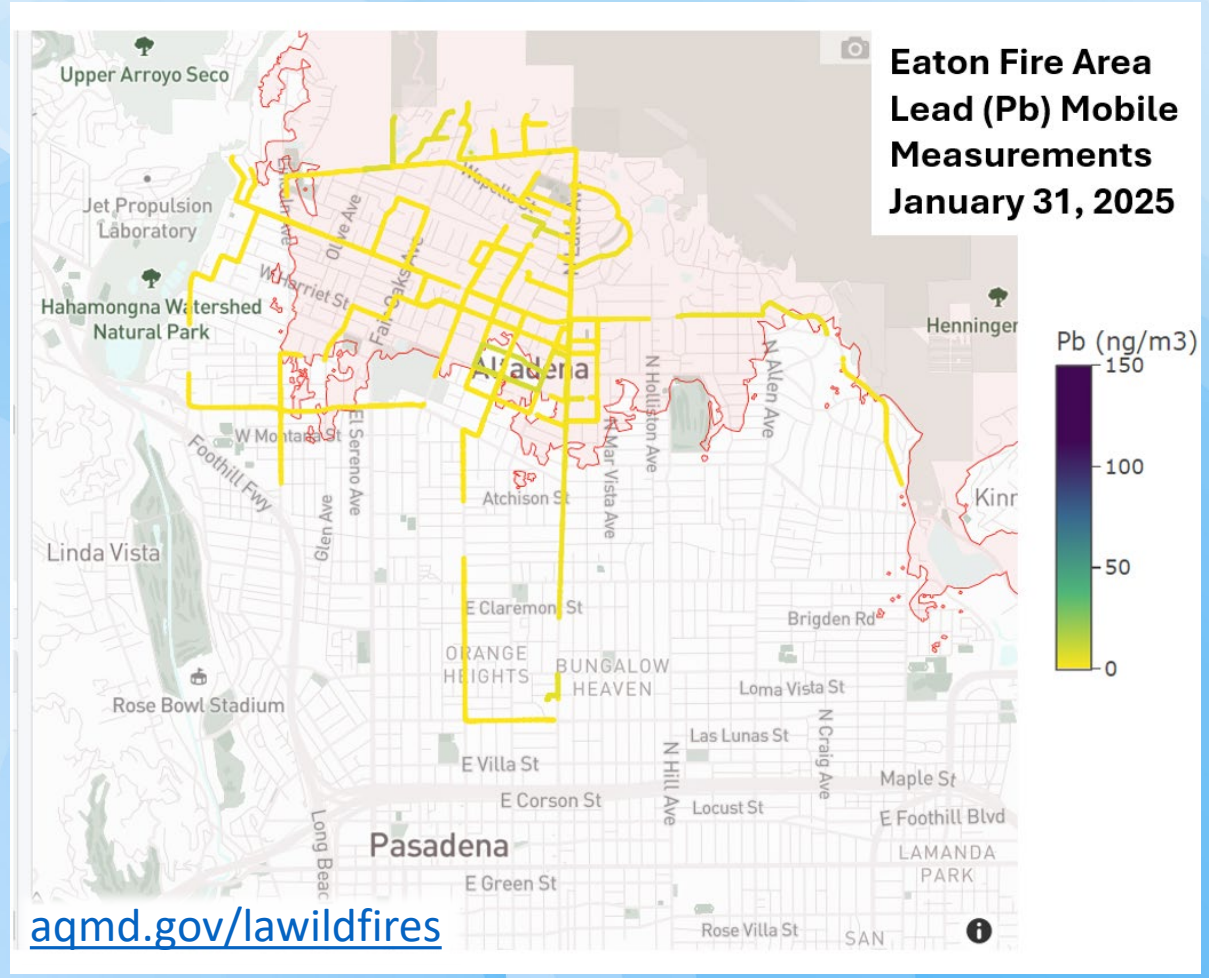
- Mobile monitoring results
- Cleanup activity
- Sensitive receptors (residents/schools)
- Meteorological conditions

Air monitors provide data for:

- Toxic metals, including lead and arsenic
- Asbestos, and
- Particulates (PM2.5 and PM10 levels)

Mobile Survey—Eaton Area

- January 31, 2025: Two mobile platforms took measurements in the Eaton Fire area near cleanup and re-populated zones
- Measured for:
  - Air toxic metals including lead and arsenic
  - VOCs including benzene
- Results show no elevated levels of air toxics
- Overall, the results were within background levels (air quality on a typical day)
- Below National standards and state health thresholds
- Some elevated levels of methane detected and working with agency partners to conduct follow-up actions



Next Steps

Complete mobile monitoring surveys

Deploy temporary stationary air monitoring stations

Work with partner agencies

Data is posted: aqmd.gov/lawildfires

Public Health Impacts

Dr. John Balmes

Professor of Medicine Emeritus, Divisions of Occupational, Environmental and Climate Medicine and Pulmonary/Critical Care Medicine, UCSF

Professor Environmental Health Sciences Emeritus, School of Public Health, UC Berkeley

Physician Member, CA Air Resources Board

Public Health and Wildfire Smoke

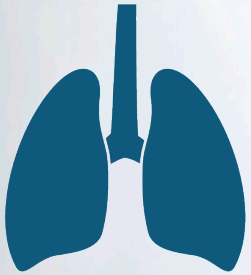
Wildfire smoke is a complex mixture of carbon monoxide, particulate matter, organic chemicals, toxic substances. Wildland-urban interface (WUI) fires have more toxic emissions from burning structures, cars, plastics, electronics, etc.

- Particulate Matter (PM2.5)
  - Fine particles inhaled into deepest recesses of the lung
  - Tiniest particles cross into the bloodstream and can affect the heart and other organs
  - Can include toxic metals
  - Main pollutant of concern in wildfires
- Toxic compounds (mainly in WUI fires):
  - Carbon monoxide (CO) and hydrogen cyanide
  - High levels of metals
  - Polycyclic Aromatic Hydrocarbons (PAH) exposure
  - Volatile Organic Compounds (VOCs) exposure – benzene, formaldehyde

Photo courtesy of CalFire

Wildfire Smoke Increases Respiratory and Cardiovascular Illness

Health research has focused mainly on short-term exposures to PM2.5 and smoke during wildfire events or within days afterwards.

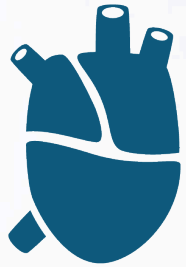


Respiratory

- Asthma exacerbations
- Hospital/Emergency room visits
- COPD (Chronic Obstructive Pulmonary Disease)
- Growing evidence of respiratory Infections (Pneumonia, Bronchitis)

Cardiovascular

- Heart attacks
- Strokes
- Abnormal heart rhythm
- Heart failure



What are Long Term Effects from Wildfire Exposures?

There are few long-term studies on wildfire effects but some health risk studies on firefighters

- Wildland firefighters show pre-post season change in lung function, airway responsiveness, airway inflammation
- Career wildland firefighters may be at increased risk of cardiovascular mortality and lung cancer
- Career structural firefighters are increased risk for certain cancers
- More research needed on long-term effects

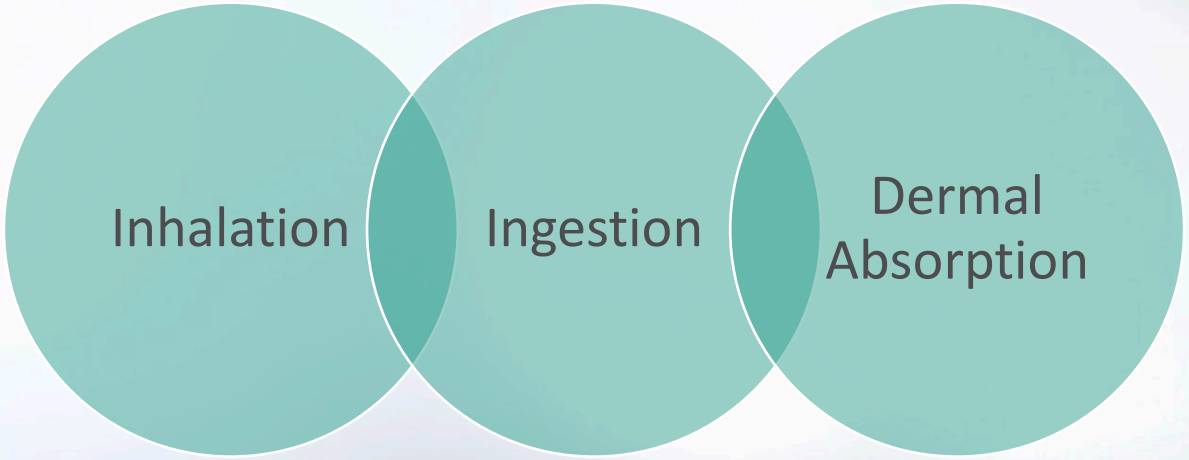
Photo courtesy of CalFire

Who is Most Impacted By Wildfire Smoke and Ash?

- Children and infants
- Seniors
- People with existing heart or lung conditions including asthma
- Pregnant people
- Individuals with higher exposures to smoke and ash
- Low income and under resourced communities of color
- Outdoor workers
- Unsheltered people

Smoke and Ash: Multiple Pathways of Exposure

- Outdoor air pollution from smoke emissions and ash
- Indoor air pollution via infiltration from outdoors
- Indoor surfaces contaminated by deposition of airborne particles
- Soil contaminated via ash residue from airborne emissions
- Surface water contaminated from ash and aerosol deposition
- Runoff from contaminated soils
- Drinking water contamination



National Academies of Sciences, Engineering, and Medicine. 2022. The Chemistry of Fires at the Wildland-Urban Interface. Washington, DC: The National Academies Press. https://doi.org/10.17226/26460.

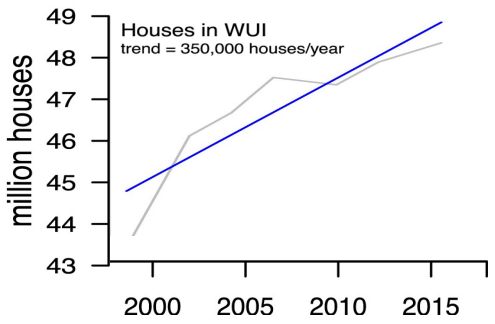
Public Health Impacts: Protecting Yourself

Dr. Cyrus Rangan, California Department of Public Health

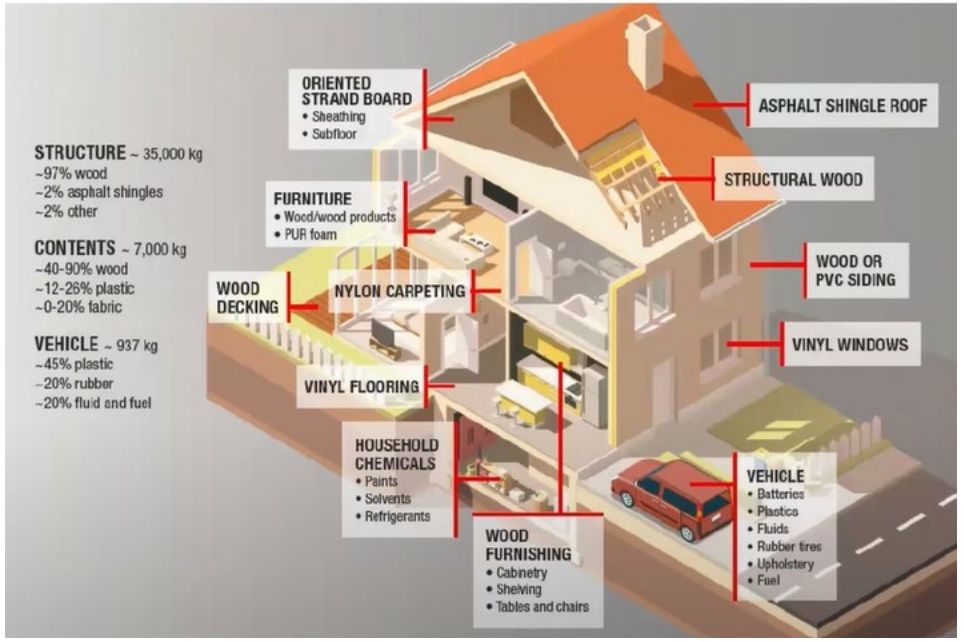
CDPH

Wildland-Urban Interface (WUI)

- CA has the greatest number of houses in WUI
- 5 million housing units (45% of CA's total housing) are in WUI (Li et al., 2022)
- Expansion of homes in WUI brings structures and populations in closer proximity to WF-prone areas
- Smoke from treated wood used in structures generate toxic fumes

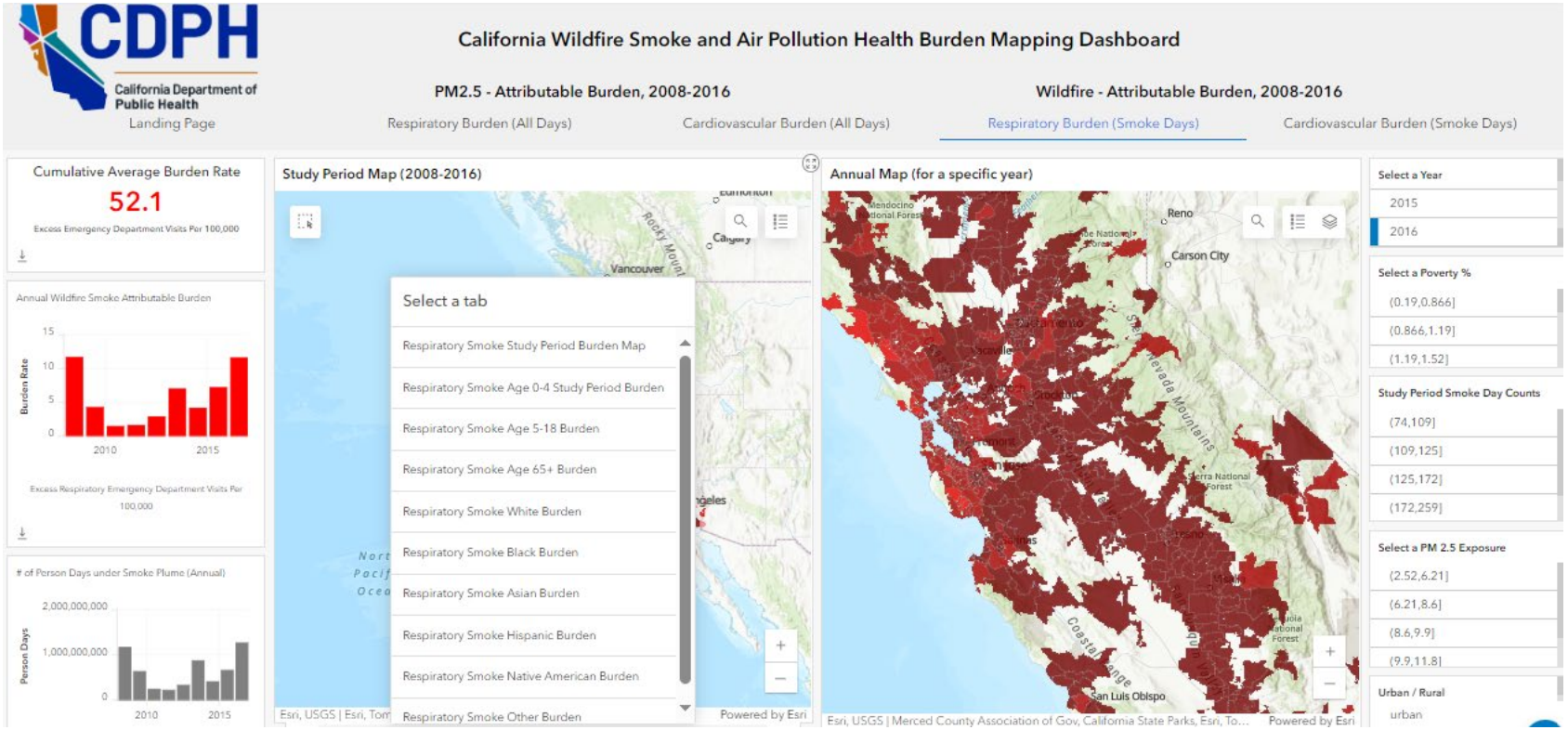


Burke et al. (2020)



Averett et al. (2024)

Climate Change and Health Unit (CCHU)



Wildfire Smoke and Air Pollution Dashboard

Dashboard displays rates of cardiorespiratory ED visits attributed to PM2.5 and wildfire smoke, annually, by age groups, race/ethnicity for the period 2008 to 2016.

CDPH Wildfire Smoke and Air Pollution Dashboard

What's in the Ash and Soot?

- Mixture of burned materials including:
  - Charred wood
  - Fine carbon dusts
  - Metal fragments/dusts (lead, arsenic, others)
  - Asbestos, pesticides
  - Household chemicals and solvents

Should I get the Ash and Soot Tested?

- Testing could reveal presence of any or all of these materials/compounds… but there are few standards for interpretation of potential risks from exposure
- Goal question: Would the results modify/alter clean-up guidelines and recommendations?
- In most situations, testing does not change the “treatment”

How can I protect myself during cleanup?

- In the absence of formal Phase I & II EPA cleanup protocols (i.e. people will return to non-damaged homes with ash/soot deposition:
  - Wear N95 or P100 respirator masks (no “wet cloths”)
  - Use gloves to protect hands from ash, dust, dirt, and chemicals during inspection
  - Long-sleeved shirt/pants
  - Closed-toe shoes
  - Safety Goggles
  - Double bag clothes and wash thoroughly after use

Risks of exposure to ash/soot?

- Ash and soot can increase health risks, especially for children, seniors, and people with respiratory, heart, immune issues
  - Risks come from stirred up particulate matter.
  - Open windows and doors to ventilate indoor spaces after returning after outdoor air quality has improved.
  - Also ventilate after debris has been cleaned up
  - Use portable air purifiers/cleaners using charcoal-based filters
  - Cleaning HVAC ducts and change filters (MERV 13 or better)
  - Use recirculation mode
  - Dry sweeping and dry vacuuming can spread ash and soot

Home mitigation recommendations

Sweeping:

- Gently sweep surfaces to collect larger materials and use plastic trash bags

Vacuuming:

- Only use HEPA-filter vacuuming to filter out smaller particles on surfaces

Wet wiping/mopping:

- Best method for removal of ash, soot, and dust from surfaces

I’ve cleaned…
but my neighbors still have ash/soot

- Keep doors/windows closed to reduce entry of outdoor ash/soot or smoke
- Wash hands and toys frequently
- Prevent children and pets from playing outdoors near affected areas
- Take off shoes before entering home
- Monitor Your Health: respiratory symptoms, eye, nose and throat irritation

Public Health Impacts

Bonnie Holmes-Gen, Chief of the Health & Exposure Assessment Branch, California Air Resources Board

How to Select an Air Cleaner for Your Home

CARB certified air cleaners help reduce particulate matter, dust, and allergens from the air.

- Portable units are best used for single rooms such as those designated as a cleaner air space
- Air cleaners should have High Efficiency Particulate Air (HEPA) filtration*
- Consult CARB's certified air cleaner website for devices that meet electrical safety and ozone emissions limits
- Ensure that air cleaning device is adequate for a given room size by checking its clean air delivery rate (CADR)
- Never use an ozone generator for air cleaning in your home

Meets California ozone emissions limit: CARB certified

*MERV 13 or higher, Filter Performance Rating (FPR) 10 or 12

How To Make A Do It Yourself (DIY) Air Cleaner

Consult CARB's website for additional information including detailed instructions, "how to" videos

Instructions available at: arb.ca.gov/smokereadyca

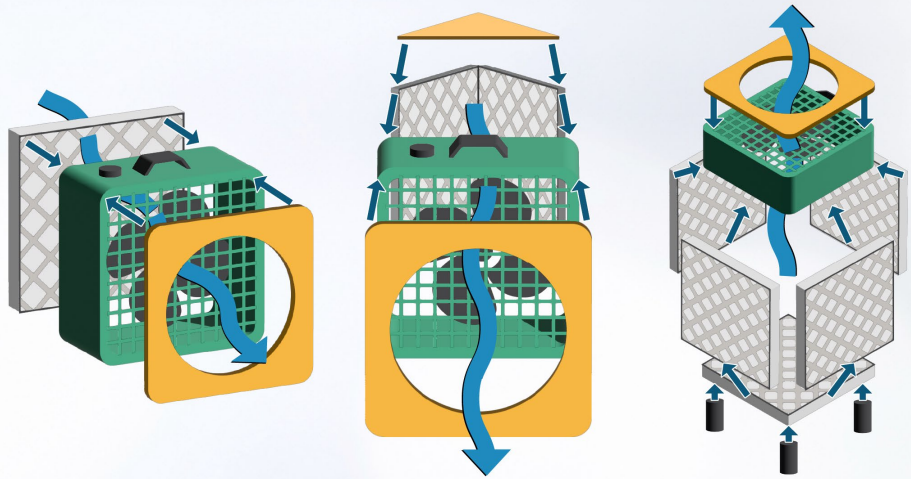
Image courtesy of U.S. EPA

Image courtesy of Wikipedia

DIY Air Cleaner Designs

Materials

- 20"x 20" box fan (2012 model or newer)
- 20"x 20" MERV 13 air filters (1-5 depending on design)
- Duct tape or bungee cords
- Optional: Cardboard for shroud



CARB

Analysis of 2018 Camp Fire Toxic Impacts Informed New Research

- Thousands of structures burned contributed to high levels of toxic compounds including metals in smoke
- Elevated levels of metals measured from the fire included lead and zinc, calcium, iron, and manganese
- Some of these metals traveled up to 150 miles away from the fire
- Maximum PM2.5 levels during the fire were 3 times the levels seen in other years for the same time frame

Report available online

CARB Research Is Investigating Impacts of Wildfire Smoke

CARB research is examining the air quality and health effects of wildfire

- Emissions from wildfires including structural burning
- Air quality during smoke events
- Health impacts of smoke exposure
- Risk communication and interventions to reduce smoke exposures

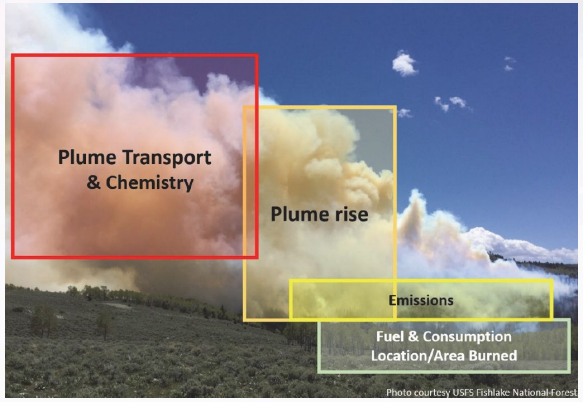


Photo courtesy of CalFire

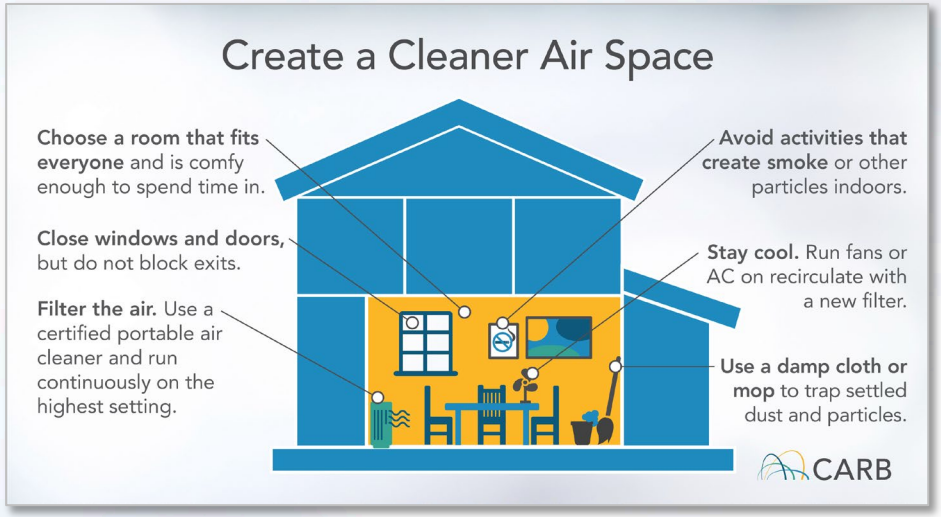
Submit Research Ideas in English or Spanish

Resources & Assistance

Amy MacPherson, Public Information Officer,
California Air Resources Board

Smoke Ready California

- Learn how to protect yourself
  arb.ca.gov/SmokeReadyCA



CALIFORNIA CLEAN AIR CENTERS MAP

Find relief from wildfire smoke and air pollution near you!

INTERACTIVE MAP FEATURES

- Permanent & Temporary Locations
- Address & Contact Information
- Operating Hours
- On-Site Resources

CLEAN AIR CENTER

CARB

arb.ca.gov/cleanaircenters

CARB

California Smoke Spotter

FORECASTING & FEATURES

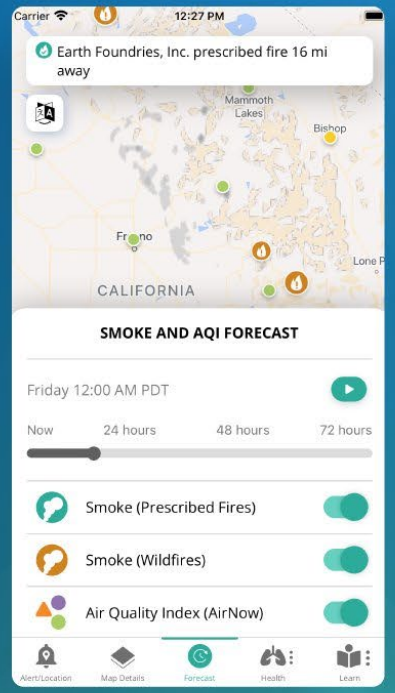
Clean Air Centers

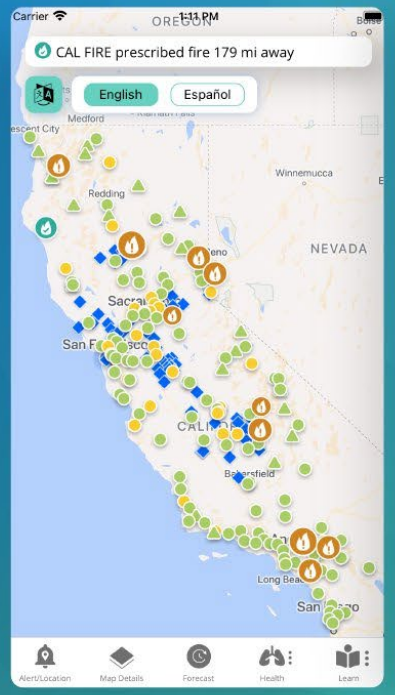
72-hr smoke & AQI forecasts

Detailed fire information

Smoke Impacts on Health

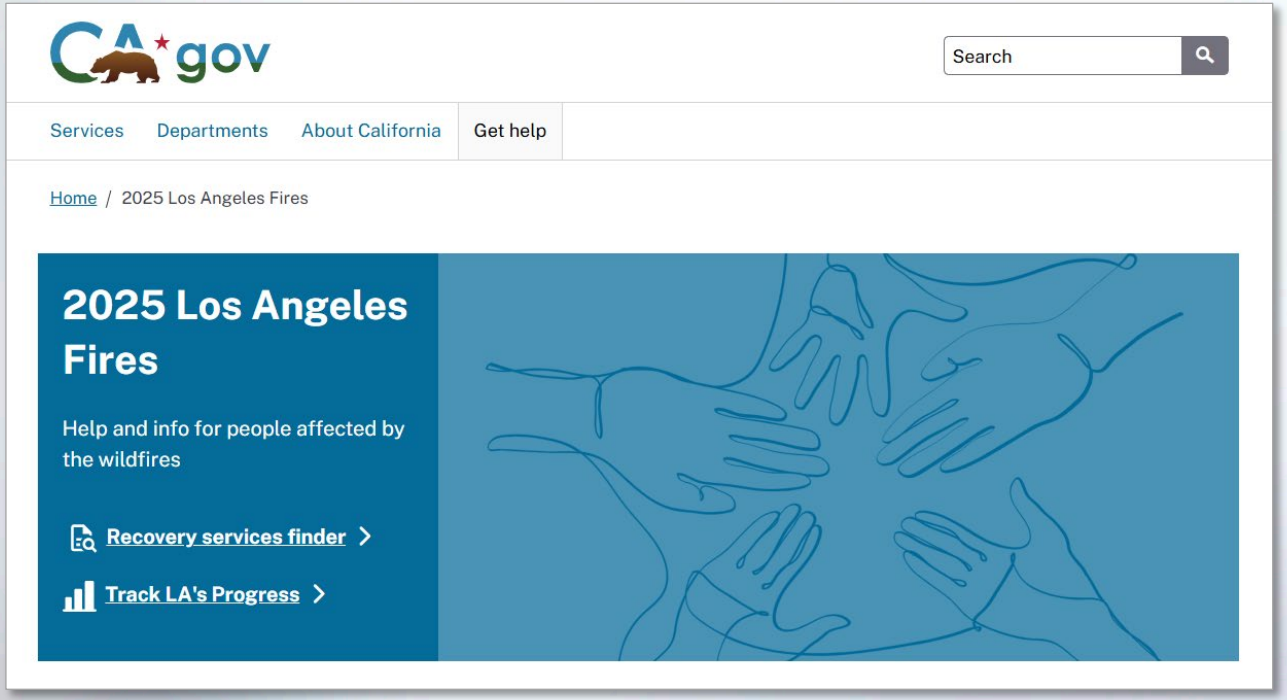
Available in Spanish





Download on the App Store

GET IT ON Google Play

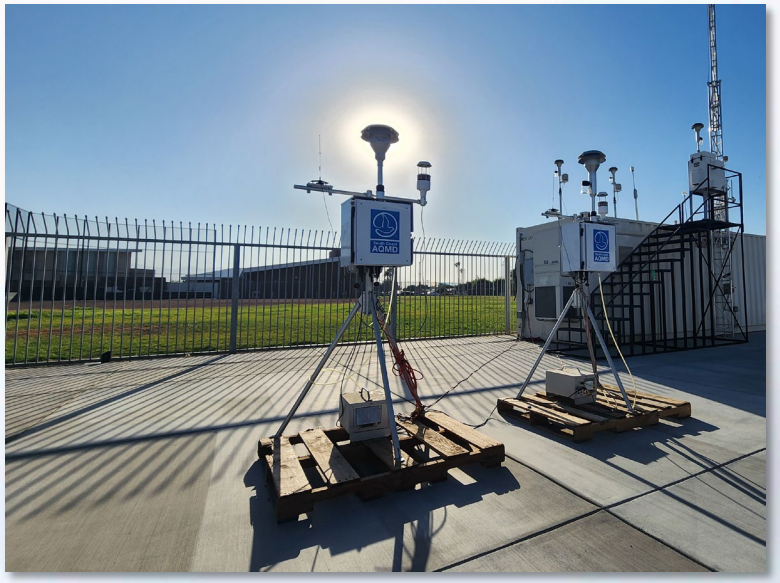


ca.gov/lafires

recovery.lacounty.gov

Air Monitoring Data

Posted online: aqmd.gov/lawildfires



Thank You

Email air quality questions to lafiresairquality@arb.ca.gov.

Visit arb.ca.gov for webinar recording and links shared in tonight's presentation.