

# Particulate Monitoring in Emergencies: Health Metrics & Messaging



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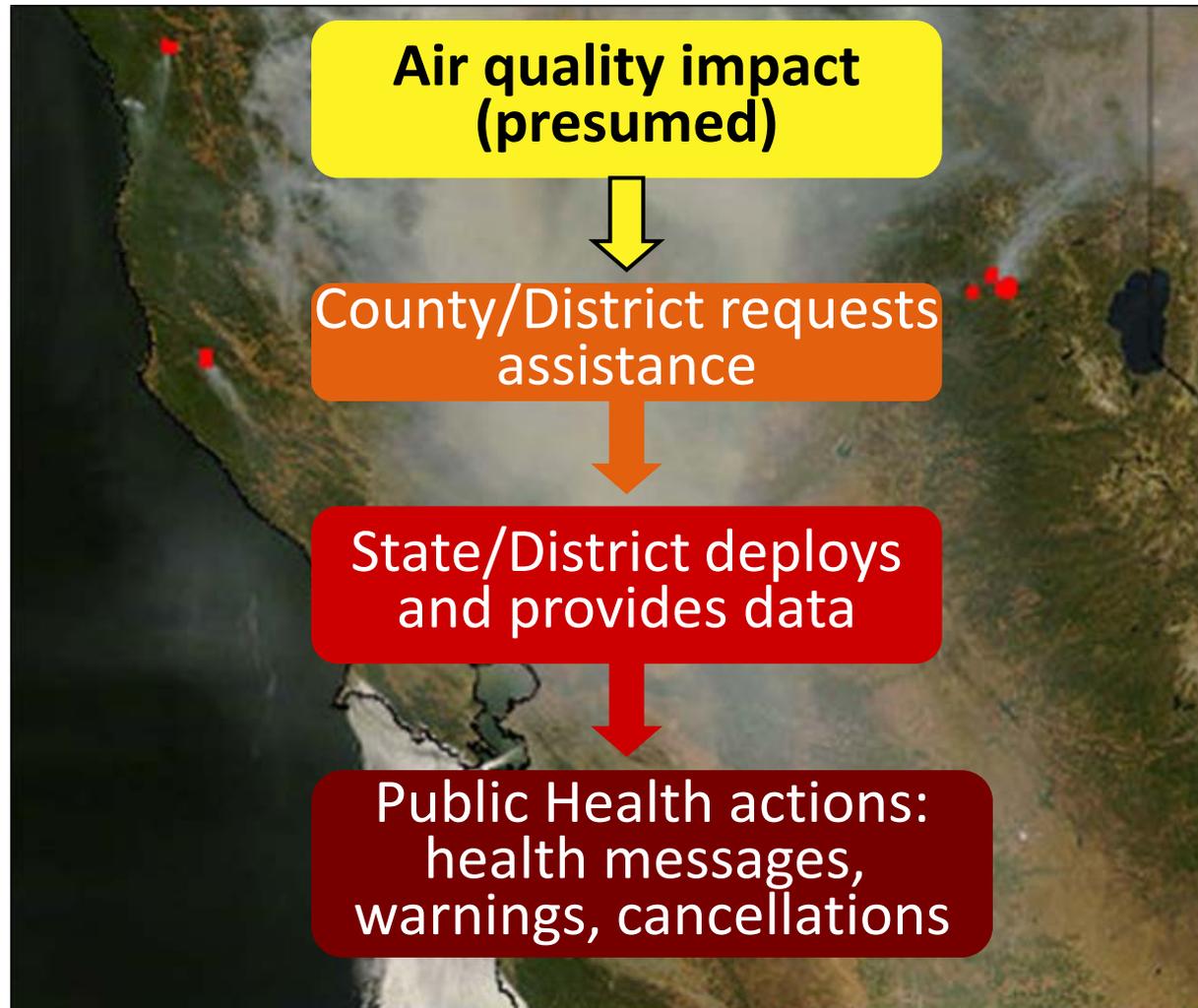
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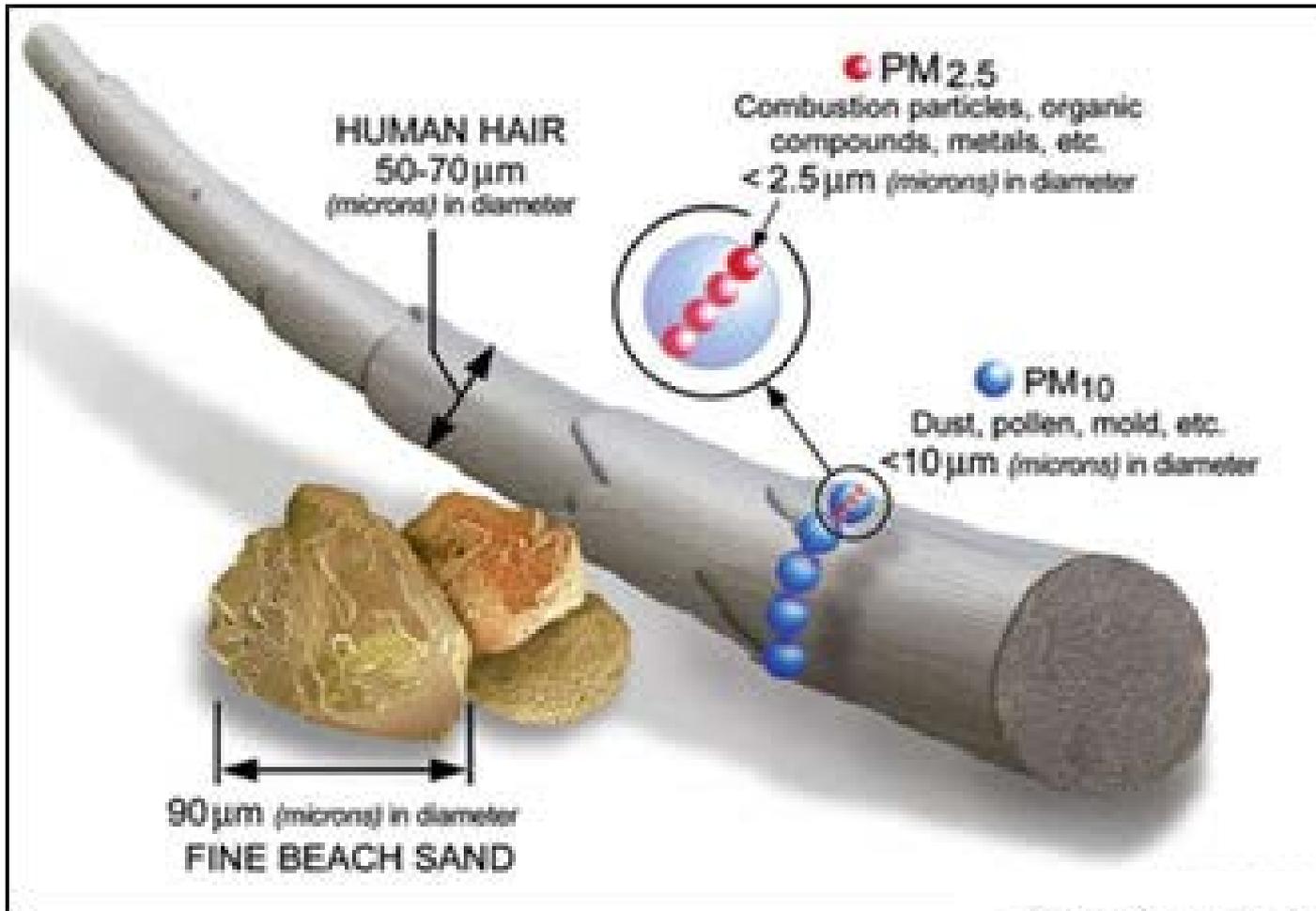




# Transforming Air Quality Data into a Message about Health



# Particulate Matter (PM)



## Wildfire Smoke and Your Health

When smoke levels are high, even healthy people may have symptoms or health problems. **The best thing to do is to limit your exposure to smoke.** Depending on your situation, a combination of the strategies below may work best and give you the most protection from wildfire smoke. The more you do to limit your exposure to wildfire smoke, the more you'll reduce your chances of having health effects.

### Keep indoor air as clean as possible.

Keep windows and doors closed. Use a high-efficiency particulate air (HEPA) filter to reduce indoor air pollution. Avoid smoking tobacco, using wood-burning stoves or fireplaces, burning candles, incenses or vacuuming.



Listen to your body and contact your healthcare provider or 911 if you are experiencing health symptoms.



Drink plenty of water.

Reduce the amount of time spent in the smoky area.

### If you have to spend time outside when the air quality is hazardous:

Do not rely on paper or dust masks for protection. N95 masks properly worn may offer some protection.



Reduce the amount of time spent outdoors. Avoid vigorous outdoor activities.



# Sensitive Populations

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Breathing smoke is not good for anyone, even healthy people. Wildfire smoke is especially harmful to:

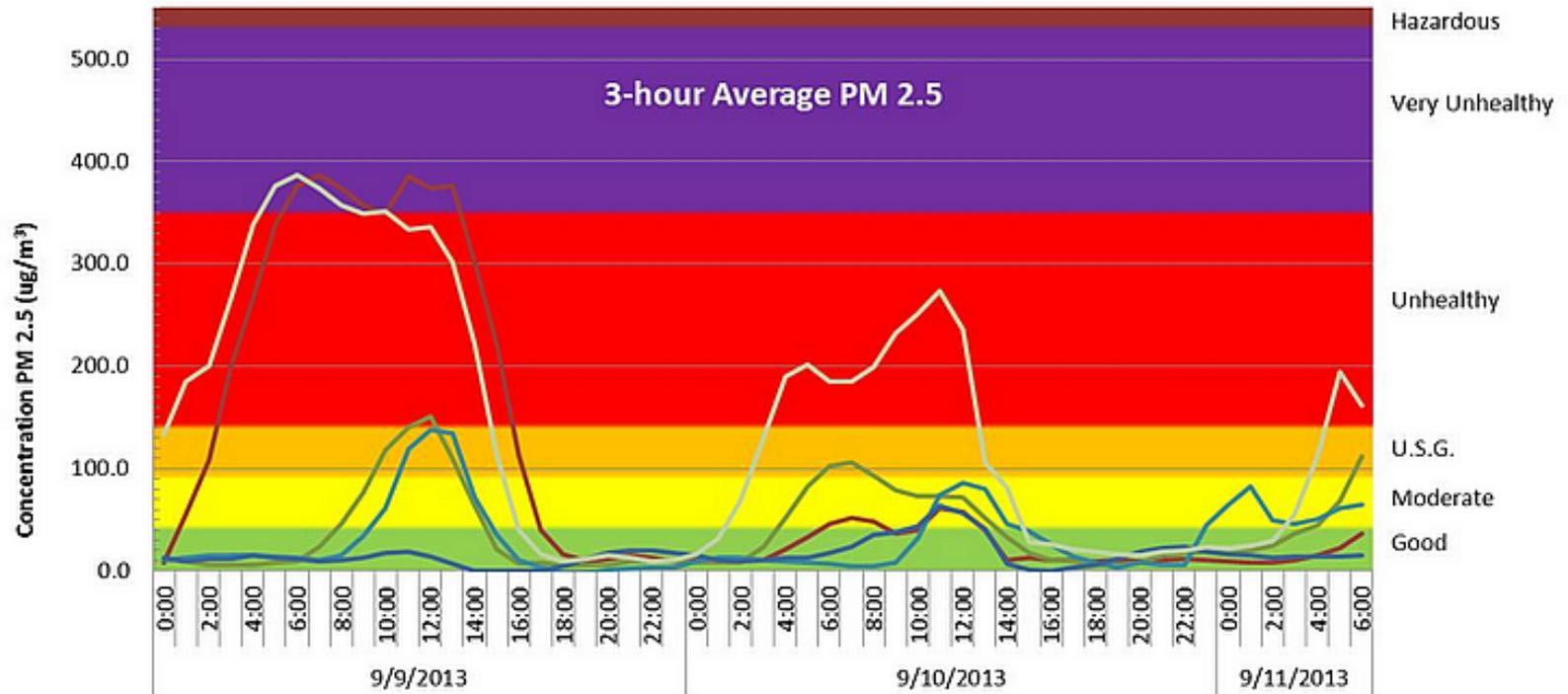
- Infants and young children (especially children age 7 or younger). Young children breathe in more air per pound of body weight and are more susceptible to smoke.
- Older adults, over 65 years of age. An elderly person's lungs are generally not as efficient as when he or she was younger.
- Pregnant women. Wildfire smoke may contain pollutants that may be harmful to developing babies. It is best for pregnant women to avoid being outdoors for long periods of time when wildfire smoke is in the air.
- People with pre-existing lung and cardiovascular conditions. This includes people with respiratory infections, asthma, chronic obstructive pulmonary disease (COPD), coronary artery disease, congestive heart failure and those who previously had a heart attack or stroke.

# Wildfire Smoke Guide (Rev. 2012)

AQI Values	PM 2.5 ( $\mu\text{g}/\text{m}^3$ ; 3-hr avg)	Health Effects
Good (0 to 50)	0-38	None expected
Moderate (51 to 100)	39-88	Possible aggravation of heart, lung disease
Unhealthy for Sensitive Groups (101 to 150)	89-138	Increased likelihood of respiratory or cardiac symptoms, especially in sensitive persons
Unhealthy (151 to 200)	139-351	Increased aggravation of CVD; premature mortality; general population respiratory effects
Very Unhealthy	352-526	Significant aggravation of heart, lung disease; premature mortality; significant respiratory effects
Hazardous	>526	Serious aggravation of heart, lung disease; premature mortality; serious respiratory effects



# Sample Air Quality Monitoring Data and the Air Quality Index (AQI)(3 hr avg)





**Local Air Quality Conditions**  
 Zip Code:  Go State: Alabama  Go National Su

## Air Quality Index (AQI) Basics



The AQI is an index for reporting daily air quality. It tells you how clean or polluted your air is, and what associated health effects might be a concern for you. The AQI focuses on health effects you may experience within a few hours or days after breathing polluted air. EPA calculates the AQI for five major air pollutants regulated by the Clean Air Act: ground-level ozone, particle pollution (also known as particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide. For each of these pollutants, EPA has established national air quality standards to protect public health. Ground-level ozone and airborne particles are the two pollutants that pose the greatest threat to human health in this country.

### 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 represents good air quality with little potential to affect public health, while an AQI value over 300 represents hazardous air quality.

An AQI value of 100 generally corresponds to the national air quality standard for the pollutant, which is the level EPA has set to protect public health. AQI values below 100 are generally thought of as satisfactory. When AQI values are above 100, air quality is considered to be unhealthy-at first for certain sensitive groups of people, then for everyone as AQI values get higher.

### Understanding the AQI

The purpose of the AQI is to help you understand what local air quality means to your health. To make it easier to understand, the AQI is divided into six categories:

Air Quality Index (AQI) Values	Levels of Health Concern	Colors
<i>When the AQI is in this range:</i>	<i>...air quality conditions are:</i>	<i>...as symbolized by this color:</i>

### Publications

- [Air Quality Index - A Guide to Air Quality and Your Health](#)
- [Air Quality Guide for Ozone](#)
- [Air Quality Guide for Particle Pollution](#)
- [Other AirNow Publications](#)
- [Other AirNow Publications En Español](#)
- [AQI Calculator: AQI to Concentration](#)
- [AQI Calculator: Concentration to AQI](#)
- Order any of our AirNow publications from [EPA's NSCEP](#)



# Air Quality Index - A Guide to Air Quality and Your Health

[View or print guide in PDF](#) (12 pp., 333KB, [about PDF](#))

*"It's a code red day  
for ozone."*

*"Particle pollution levels  
are forecast to be unhealthy  
for sensitive groups."*

*"Local air quality is very  
unhealthy today"*

You may hear these alerts on radio or TV or read them in the newspaper.  
But what do they mean if you:

- > Are active outdoors?
- > Have children who play outdoors?
- > Are an older adult?
- > Have heart or lung disease?

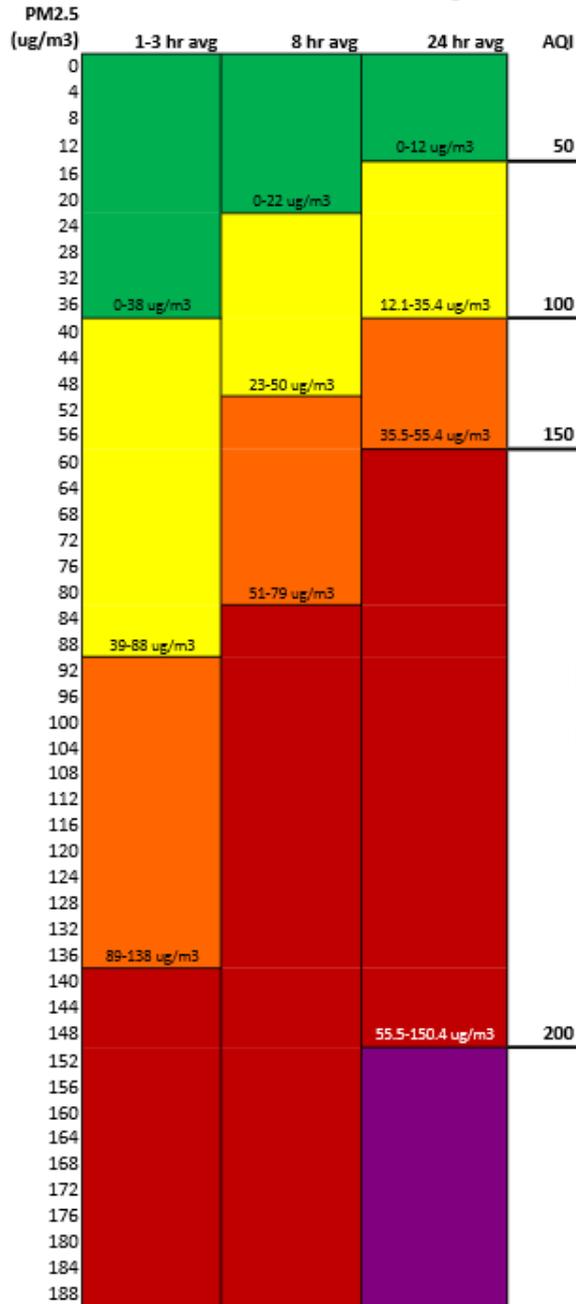
Air Quality Index	Who Needs to be Concerned?	What Should I Do?
Good 0-50	No one. Air quality is good for everyone.	It's a great day to be active outside!
Moderate 51-100	Some people may be unusually sensitive to particle pollution and may need to take precautions.	Unusually sensitive people: <i>Consider reducing prolonged or heavy exertion.</i> Watch for symptoms such as coughing or shortness of breath. These are signs to take it a little 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 to 200	Everyone can be affected.	Sensitive groups: Avoid prolonged or heavy exertion. Consider moving activities indoors or rescheduling.  Everyone else: Reduce prolonged or heavy exertion. Take more breaks during all outdoor activities.
Very Unhealthy Alert 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.

## 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.



Wildfire Smoke Guide with 24hr Std Changes



AQI Category	Index Values	PM2.5 conc (ug/m3)
Good	0-50	
Moderate	51-100	
Unhealthy for Sensitive Groups	101-150	depends on averaging time
Unhealthy	151-200	
Very Unhealthy	201-300	
hazardous	301-500	

<http://www.arb.ca.gov/carpa/toolkit/data-to-mes/particulate-avg-new-aqi.pdf>



## Actions based on AQ data

Health officers,  
air districts  
issue warnings/  
cancellations

**Local & tribal  
emergency  
declarations**

**Clean air  
shelters;  
portable  
HVACs**

**Distribute  
respirators  
and guidance**

# Public Health Actions

## Protect Your Lungs from Wildfire Smoke



N95 respirators can help protect your lungs from wildfire smoke. Straps must go above and below the ears.

Wildfire smoke can irritate your eyes, nose, throat and lungs. It can make you cough and wheeze, and can make it hard to breathe. If you have asthma or another lung disease, or heart disease, inhaling wildfire smoke can be especially harmful.

If you cannot **leave** the smoky area, good ways to protect your lungs from wildfire smoke include staying indoors and reducing physical activity. Wearing a special mask called a “**particulate respirator**” can also help protect your lungs from wildfire smoke.

### How to Choose the Correct Mask to Protect Your Lungs

- Choose a mask called a “**particulate respirator**” that has the word “**NIOSH**” and either “**N95**” or “**P100**” printed on it. These are sold at many hardware and home repair stores and pharmacies.
- Choose a mask that has **two straps** that go around your head. **DO NOT** choose a mask with only one strap or with straps that just hook over the ears.
- Choose a size that will fit over your nose and under your chin. It should seal tightly to your face. These masks do not come in sizes that fit young children.

# CalEPA Emergency Response Webpage: Fire Response and Recovery: <http://calepa.ca.gov/Disaster/Fire/default.htm>

## Fire Response and Recovery

Wildfires can create widespread threats to public health and the environment. Air quality can be affected by smoke, ash, toxins, and dust. Soil and water quality can be affected by uncontrolled hazardous materials and debris.

It is critical that response and recovery efforts quickly address any potential hazards. This will reduce impacts to surrounding communities.

### Air Quality Issues

Wildfire smoke is a complex mixture of chemicals, gases, and fine particles. The biggest health threat from smoke comes from breathing fine particles.

Local officials may issue health warnings with specific instructions. Take steps to protect yourself and your family, such as avoiding smoky conditions and reducing outdoor work or exercise. Seek medical assistance if you have difficulty breathing or experience chest discomfort, wheezing, or shortness of breath. Even healthy people may experience some of these symptoms in smoky conditions.



- [Protect yourself from wildfire smoke \(video\)](#)
- [Learn how to protect your lungs from wildfire smoke and the proper use of face masks \(PDF\)](#)
- [How to protect your family from the health effects of smoke](#)
- [Wildfire Smoke: A Guide for Public Health Officials](#)
- [Wildfires: Guidance for Health Professionals on the Health Risks for Children \(Acute Phase\) \(PDF\)](#)
- [Wildfires: Guidance for Parents and Community Members on the Health Risks for Children \(Acute Phase\) \(PDF\)](#)
- [Wildfires: Guidance for Health Professionals on the Health Risks for Children \(Aftermath\) \(PDF\)](#)
- [Wildfires: Guidance for Parents and Community Members on the Health Risks for Children \(Aftermath\) \(PDF\)](#)
- [Current air quality conditions for California](#)



# Air Quality Alerts



## NEWSRelease

www.valleyair.org



24hr Media Cell Phone (559) 284-6317

For immediate release **8-27-13**

Attn: Local news, weather, health and assignment editors

Northern region – Modesto  
Anthony Presto (209) 557-6472  
Central region – Fresno  
Heather Hejls (559) 230-5898  
Southern region – Bakersfield  
Jaime Holt (661) 381-1809  
Spanish-language contact  
Ana Reyes (559) 230-5851

### Health caution for smoke impacts from fire *Rim fire poses threat*

The Yosemite-area Rim fire has prompted local air officials to issue a health cautionary statement for smoke impacts at various locations in the Valley through the weekend.

The fire, located in and around northern Yosemite National Park, is sending smoke into the Valley in eastern Merced, Stanislaus and San Joaquin counties. Meteorological conditions tomorrow should mirror those of today, therefore smoke impacts may continue.

“As always, the best rule of thumb for residents is that if you can see and smell smoke, take appropriate precautions,” said Samir Sheikh, the Air District’s director of air quality analysis.

Smoke from fires produces fine-particulate matter (PM2.5), which can cause serious health problems including lung disease, asthma attacks and increased risk of heart attacks and stroke. Where conditions warrant, people with heart or lung disease should follow their doctors’ advice for dealing with episodes of particulate exposure. Additionally, older adults and children should avoid prolonged exposure or heavy exertion, depending on their local conditions.

Residents can check the nearest air monitor to their location to determine localized air-quality conditions. Visit the Real-time Air Advisory Network page on the District’s website to subscribe for free:

[http://www.valleyair.org/Programs/RAAN/raan\\_landing.htm](http://www.valleyair.org/Programs/RAAN/raan_landing.htm). They can also receive updated fire information at: <http://www.inciweb.org/>

For more information, visit [www.valleyair.org](http://www.valleyair.org) or call a District office in Fresno (559-230-6000), Modesto (209-557-6400) or Bakersfield (661-381-1809).



# State Emergency Proclamation



Office of the Governor

ARNOLD SCHWARZENEGGER  
THE PEOPLE'S GOVERNOR

“WHEREAS the wildfires in Humboldt County and throughout California have generated unprecedented smoke conditions, creating unhealthy air and posing a continuing danger to people; and

WHEREAS the Hoopa, Karuk, and Yurok Tribal Nations have declared local emergencies for their reservations in and near Humboldt County as a result of the fires and the unhealthy air caused by the fires and smoke; and

...

NOW, THEREFORE, I, Arnold Schwarzenegger, Governor of the State of California, in accordance with the authority vested in me by the state Constitution and statutes, including the California Emergency Services Act, and in particular, section 8625 of the California Government Code,  
HEREBY PROCLAIM A STATE OF EMERGENCY to exist within the County of Humboldt.



# Working with the Media

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Community will judge  
credibility, empathy,  
competence, honesty

**Highest credibility:  
health professionals  
first responders  
teachers**

**First 30 seconds of  
message is crucial**

# Message Mapping

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- A tool to **clarify** and **simplify** message
- 3 key messages (10 words, 30 sec)
- 3 supporting statements

Credit: Vincent T. Covello, PhD, Director of the Center for Risk Communication



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## Anatomy of a Message Map

<b>Key Message 1</b>	<b>Key Message 2</b>	<b>Key Message 3</b>
<b>Supporting Fact 1-1</b>	<b>Supporting Fact 2-1</b>	<b>Supporting Fact 3-1</b>

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Tell the truth. Be transparent.

State conclusion first, then supporting data

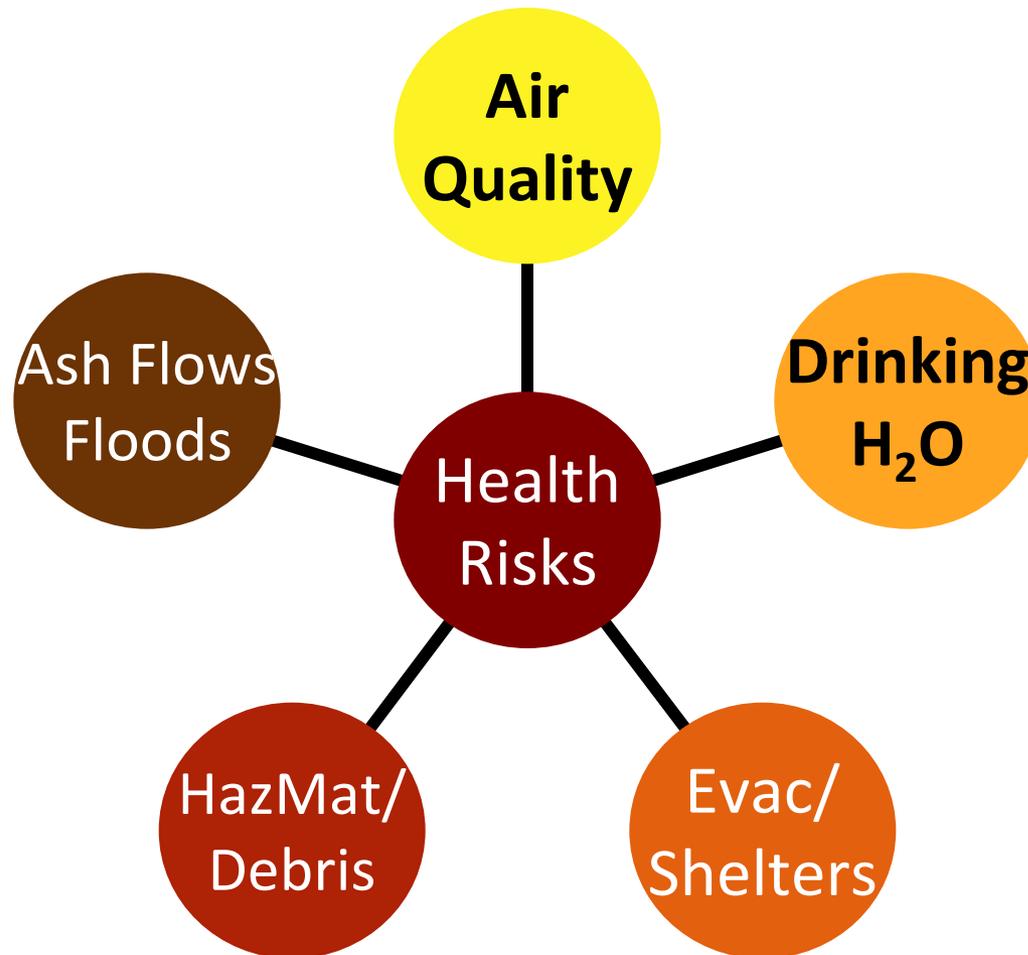
Key Message

Share dilemmas and empathize

Embody your agency's identity

# Public Health Issues with Wildfires

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# Final Points

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- ✓ Wildfire Smoke Guide
- ✓ Sharing data - [www.airnow.gov](http://www.airnow.gov)
- ✓ Get to know partners before an emergency
- ✓ Strive for consistency in public health actions and messages across jurisdictions
- ✓ Know what resources are available

# How to Request Help: ARB

<http://www.arb.ca.gov/carpa/carpa.htm>

**California Environmental Protection Agency**  
**Air Resources Board**

About ARB | Calendars | A-Z Index | Contact Us

Search ARB

Home | Reducing Air Pollution | Air Quality | Business Assistance | Laws & Regulations | Health

CARPA Logo

**UP LINKS**

- ARB Homepage
  - Outreach Programs
    - California Air Response Planning Alliance (CARPA)**

**PROGRAM LINKS**

- Background and Mission
  - Charter
- Fire Information Page
- Newsletter
- Steering Committee (login required)
- Subcommittees
- Tool Kit
  - Data
    - Data to Message
    - Message to Audience
    - Emergency Response
- Trainings / Meetings

**RESOURCES**

- Contact Us
- Join the CARPA Email List
- RSS / Newsfeed

**In the event of an emergency, contact:**

California State Warning Center	(800) 852-7550
US EPA Region 9 Duty Officer	(800) 300-2193
CDC/ATSDR 24-Hour Emergency Response Center	(770) 488-7100

**Current Emergencies**

There are no current fires with major impacts in California. More information can be found at:

- California Smoke Information Blog
- CAL FIRE Current Incidents
- Fire Information Map - PFIRS
- Federal Interagency Smoke Management Site
- Interagency Incident Information System (Inciweb)
- How to Request Emergency Air Monitoring Support from the ARB: Office of Emergency Response

**New fire related articles of interest:**

**California 2014 Fire Conditions Forecast** (January 29, 2014) (pdf)  
This document was created by the California Air Resources Board: Office of Emergency Response in support of a forthcoming 2014 Wildfire Air Monitoring Plan. The Office of Emergency Response (OER) is enhancing its air emergency response procedures and resources to better support local air districts. These enhanced procedures combined with additional resources will provide California with improved response capabilities and increased effectiveness during this wildfire season.

**2014 Summer Assessment** (January 31, 2014) (pdf)  
This report was presented by Calfire Operations Division during the January 31st, 2014 CARPA Meeting. This presentation provides a projection of the upcoming fire season in California.

**Latest Information**

# How to Request Help: CalEPA

<http://calepa.ca.gov/Disaster/Contacts/>

## Contacts: Emergency Response Management Committee

Our efforts are in support of local emergency management and incident command. The CalEPA Emergency Operations Center may be activated by authority of the Secretary or at request of Cal OES.

**CalEPA, Office of the Secretary**  
Jim Bohon

**Air Resources Board**  
Greg Vlasek | Charles Pearson

**Department of Pesticide Regulation**  
Eileen Mahoney

**Department of Resources Recycling and Recovery (CalRecycle)**  
Todd Thalhamer | Glenn Young

**Department of Toxic Substances Control**  
Adam Palmer | Nancy McGee

**Office of Environmental Health Hazard Assessment**  
Karen Riveles | Susan Klasing

**State and Regional Water Boards**  
James Maughan | Ken Coulter

### About CalEPA's Emergency Response and Disaster Preparedness

CalEPA's emergency response and recovery responsibilities mirror the Agency's mission-essential tasks of protecting public health and the environment:

- Scientific support for toxicology, pesticide exposure and drift, aquatic and ecotoxicology, exposure and risk assessment
- Debris management and regulatory consult
- Technical and regulatory consultation for disinfection/decontamination
- Air monitoring and modeling (with mobile and stationary lab capabilities)
- Mobile and stationary chemical identification capabilities
- Emergency removals from clandestine drug labs
- Technical support for surface and groundwater contamination

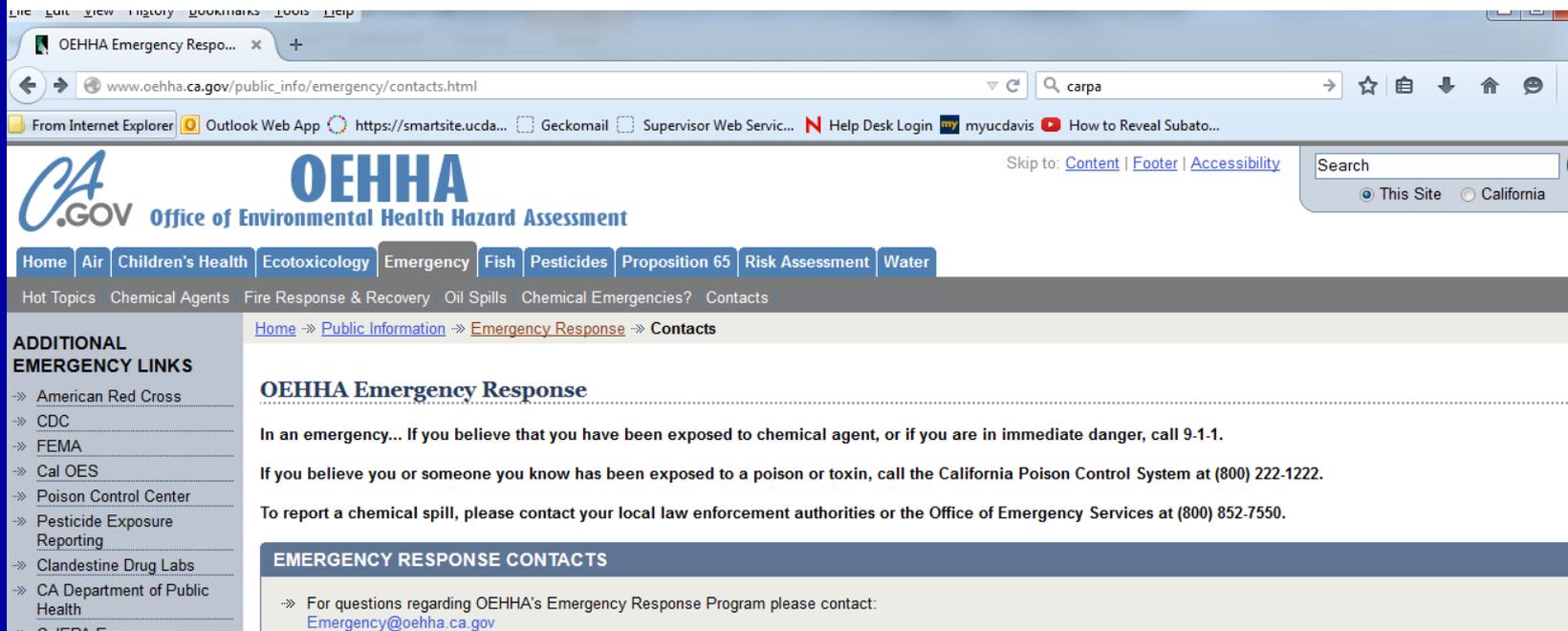
**Emergency Response and Disaster Preparedness**



CALIFORNIA  
ENVIRONMENTAL  
PROTECTION  
AGENCY

# How to Request Help: OEHHA

[http://www.oehha.ca.gov/public\\_info/emergency/contacts.html](http://www.oehha.ca.gov/public_info/emergency/contacts.html)



The screenshot shows a web browser displaying the OEHHA Emergency Response Contacts page. The browser's address bar shows the URL [www.oehha.ca.gov/public\\_info/emergency/contacts.html](http://www.oehha.ca.gov/public_info/emergency/contacts.html). The page header includes the OEHHA logo and the text "Office of Environmental Health Hazard Assessment". A navigation menu contains links for Home, Air, Children's Health, Ecotoxicology, Emergency, Fish, Pesticides, Proposition 65, Risk Assessment, and Water. Below the menu, there are links for Hot Topics, Chemical Agents, Fire Response & Recovery, Oil Spills, Chemical Emergencies?, and Contacts. The main content area is titled "OEHHA Emergency Response" and contains the following text:

**ADDITIONAL EMERGENCY LINKS**

- American Red Cross
- CDC
- FEMA
- Cal OES
- Poison Control Center
- Pesticide Exposure Reporting
- Clandestine Drug Labs
- CA Department of Public Health
- CalEPA Emergency

**OEHHA Emergency Response**

In an emergency... If you believe that you have been exposed to chemical agent, or if you are in immediate danger, call 9-1-1.

If you believe you or someone you know has been exposed to a poison or toxin, call the California Poison Control System at (800) 222-1222.

To report a chemical spill, please contact your local law enforcement authorities or the Office of Emergency Services at (800) 852-7550.

**EMERGENCY RESPONSE CONTACTS**

→ For questions regarding OEHHA's Emergency Response Program please contact:  
[Emergency@oehha.ca.gov](mailto:Emergency@oehha.ca.gov)



# THANK YOU!

