



Wildfire Smoke & Worker Health

Kevin Riley

PI, Western Region Universities Consortium (WRUC)

Director, UCLA Labor Occupational Safety and Health (LOSH) Program

NIEHS Technical Workshop, May 2022

Cal/OSHA Protection from Wildfire Smoke Standard

CCR Title 8 Section 5141.1

[Cal/OSHA](#) | [Advisory Meetings](#) | [Worker Protection from Wildfire Smoke](#)
| Worker Protection from Wildfire Smoke

Worker Protection from Wildfire Smoke



Objectives

- Identify health effects of wildfire smoke exposure
- Use online tool to determine real time air quality
- Describe Cal/OSHA wildfire smoke protections for workers
- List the benefits and limitations of N95 respirators



8 of the 10 largest wildfires on record in California have occurred since 2017

August Complex (*Aug 2020*)

Dixie (*July 2021*)

Mendocino Complex (*July 2018*)

SCU Lightning Complex (*Aug 2020*)

Creek (*Sept 2020*)

LNU Lightning Complex (*Aug 2020*)

North Complex (*Aug 2020*)

Thomas (*Dec 2017*)



Dixie Fire, California, July-Oct 2021

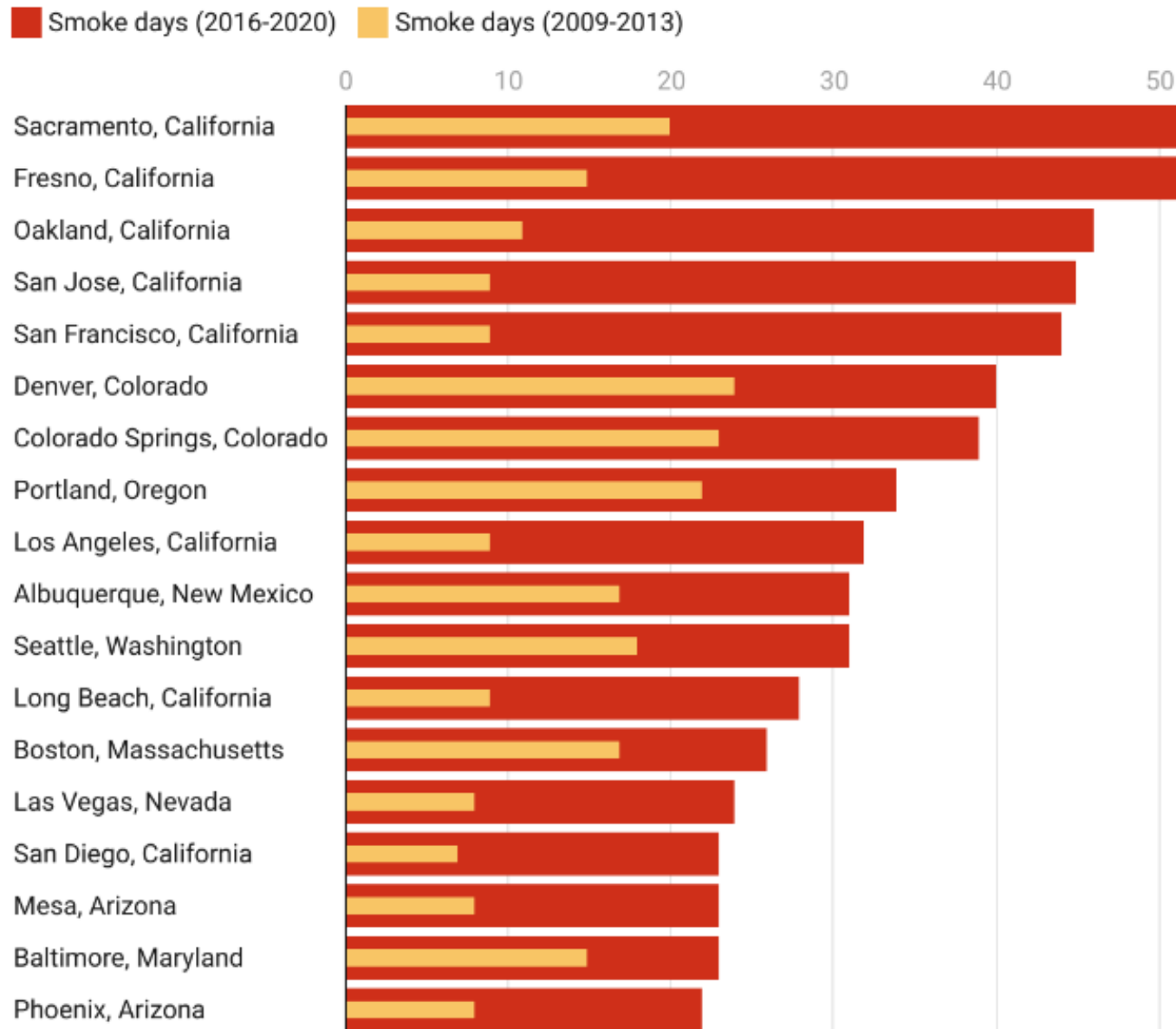


Bootleg Fire, Oregon, July-Aug 2021





Major cities with significant increases in smoke days

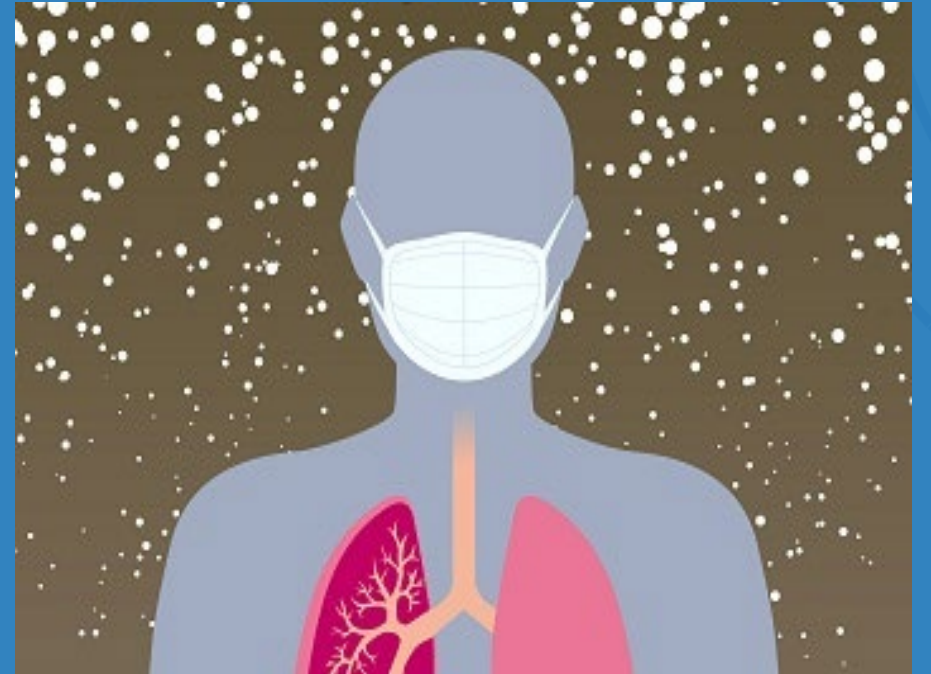


SOURCE: Dangerous Air: As California Burns, America Breathes Toxic Smoke, KQED Sept 2021 <https://www.kqed.org/news/11890211/dangerous-air-as-california-burns-america-breathes-toxic-smoke>

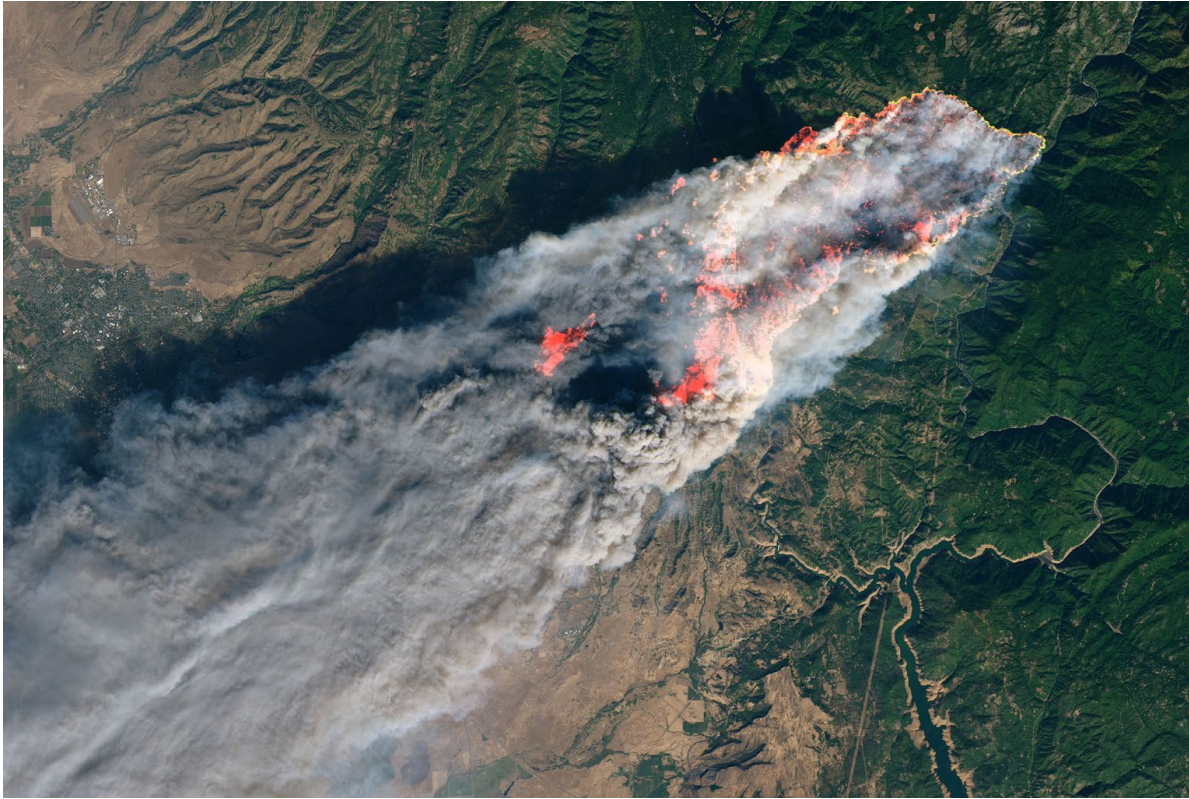
What type of workers may be exposed to wildfire smoke?



Wildfire Smoke & Health Impacts



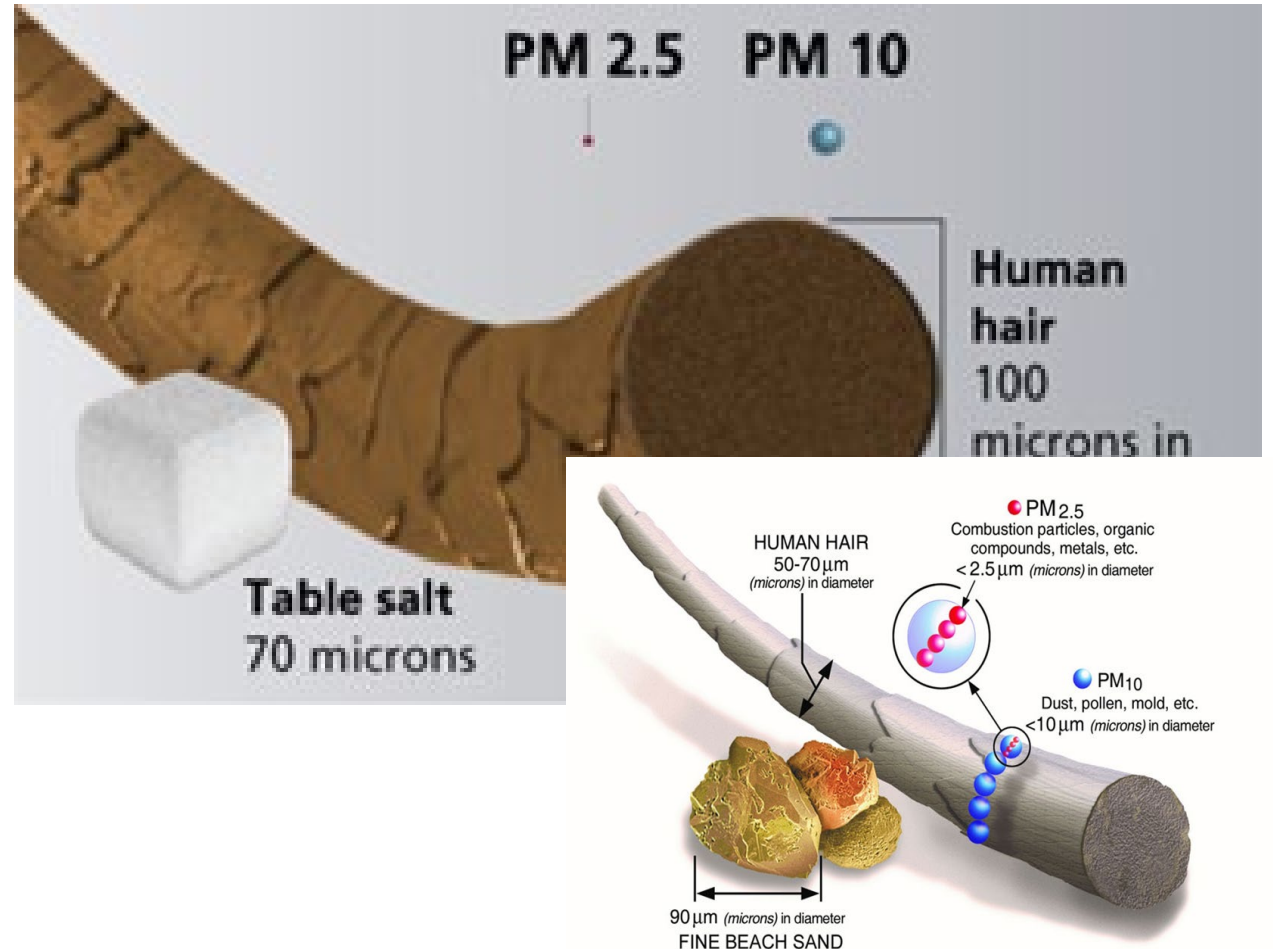
Wildfire Smoke

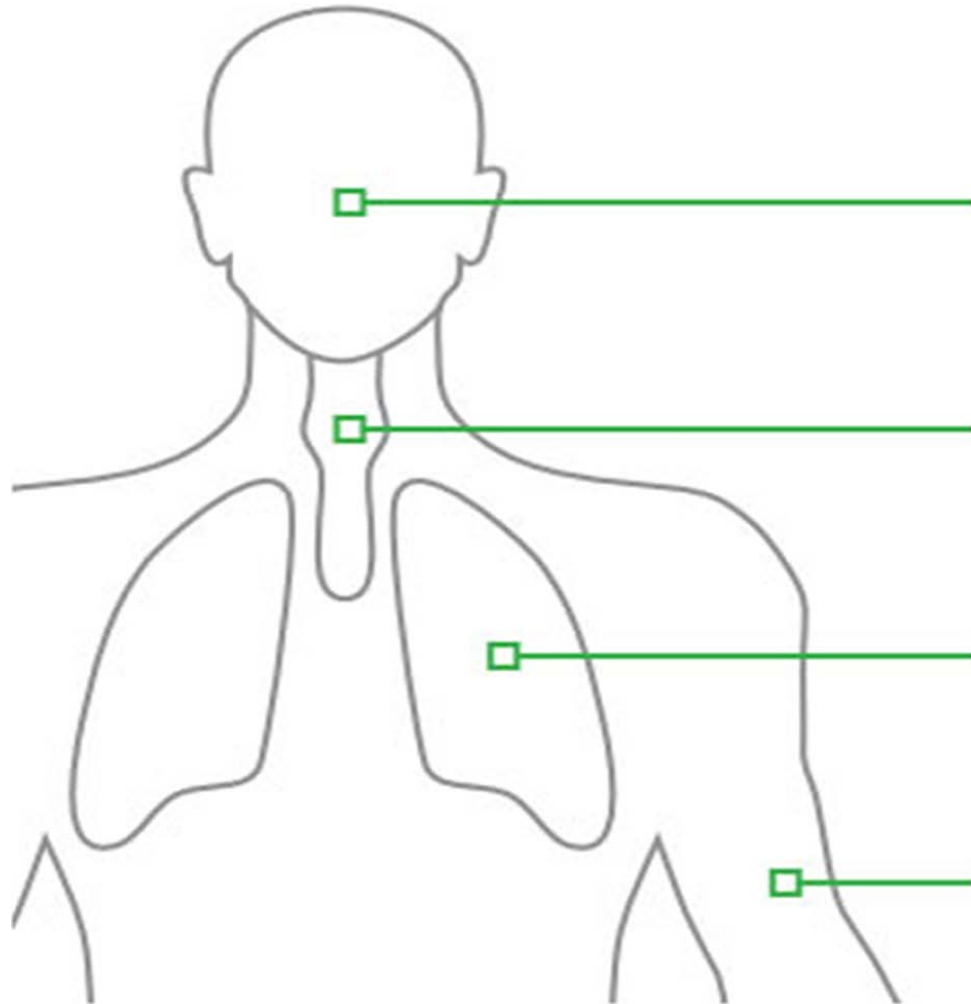


Includes ash and tiny particles
(which are made up of whatever is being burned, not only plants and vegetation)

Tiny Particles (PM 2.5)

- Particles (or “particulate matter”) with a diameter of 2.5 micrometers or less
- About 3% the thickness of a strand of human hair





100 PM

Trapped in the nose

10 PM

Trapped in the throat

2.5 PM

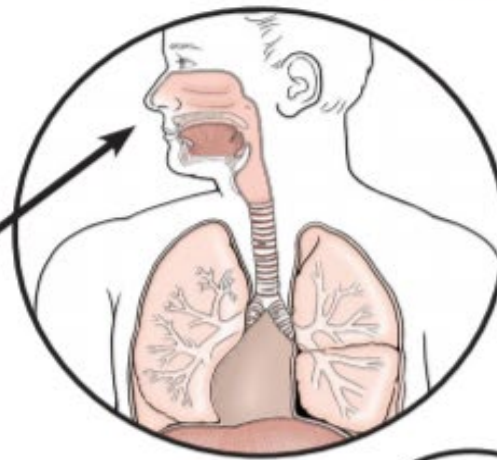
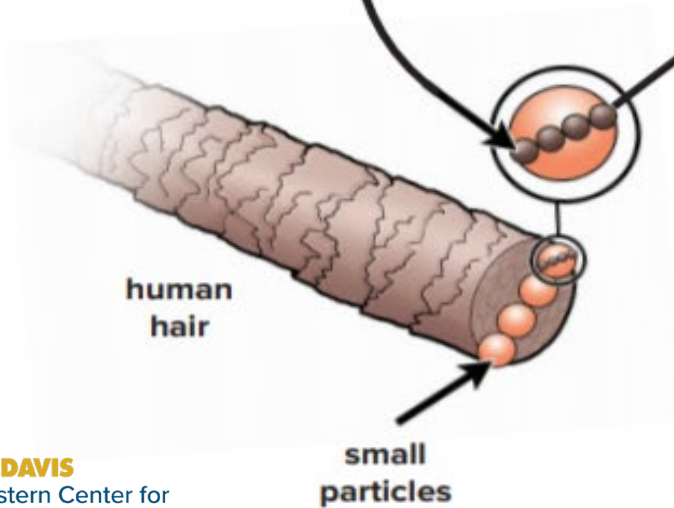
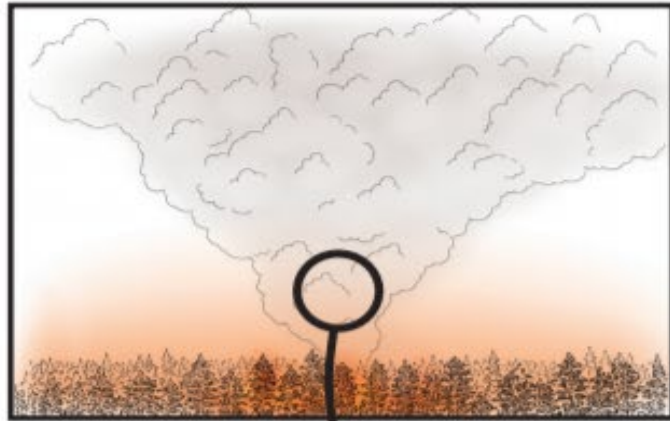
Reaches deep into the lungs

1 PM

Enters the bloodstream



Health Effects of Wildfires



burning eyes



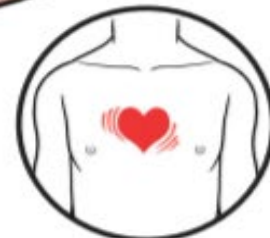
runny nose



chest pain



fatigue



rapid heartbeat



difficulty breathing



coughing

Measuring Air Quality

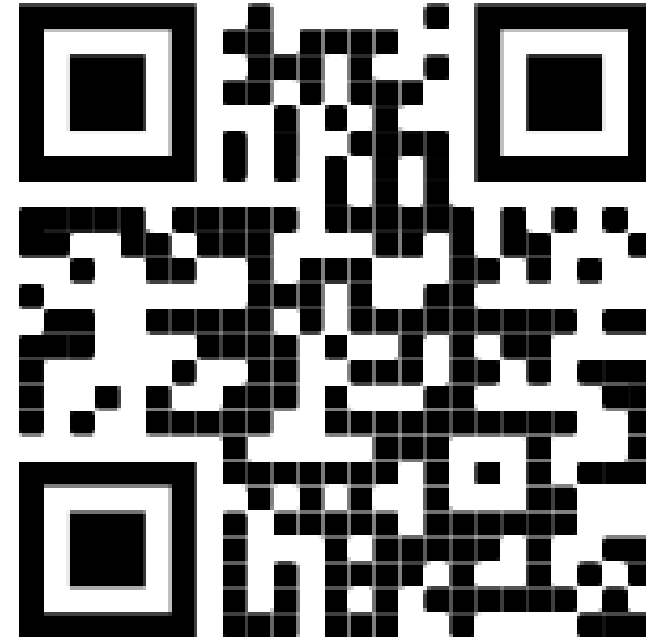
AQI: Air Quality Index

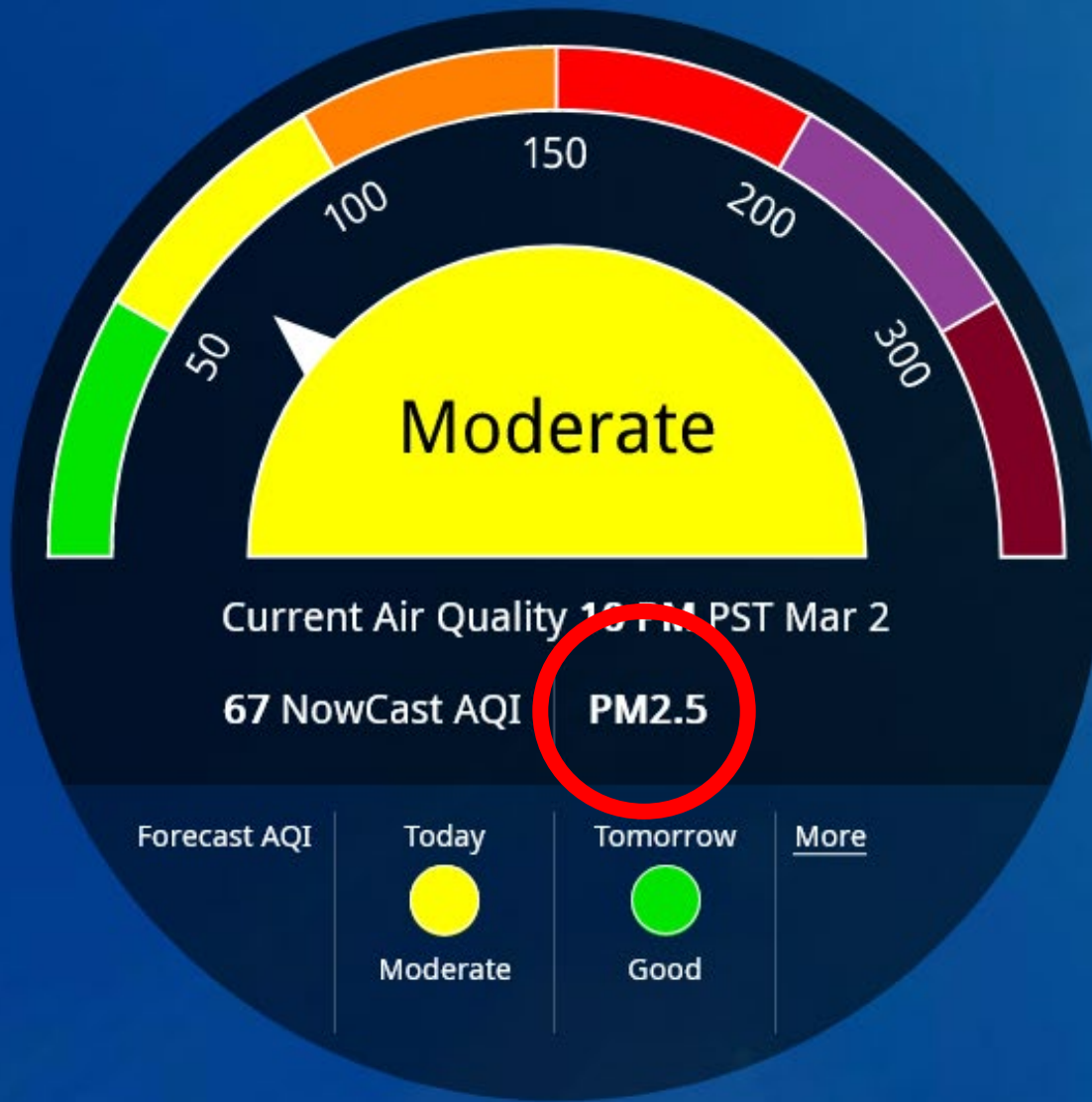
- Shows air pollution and health concerns
- AQI for several pollutants, including PM_{2.5}

Air Quality Index - Particulate Matter	
301 – 500	Hazardous
201 – 300	Very Unhealthy
151 – 200	Unhealthy
101 – 150	Unhealthy for Sensitive Groups
51 – 100	Moderate
0 – 50	Good



- Real-time AQI for any location in the U.S is available at:
www.airnow.gov





90043

Los Angeles, CA

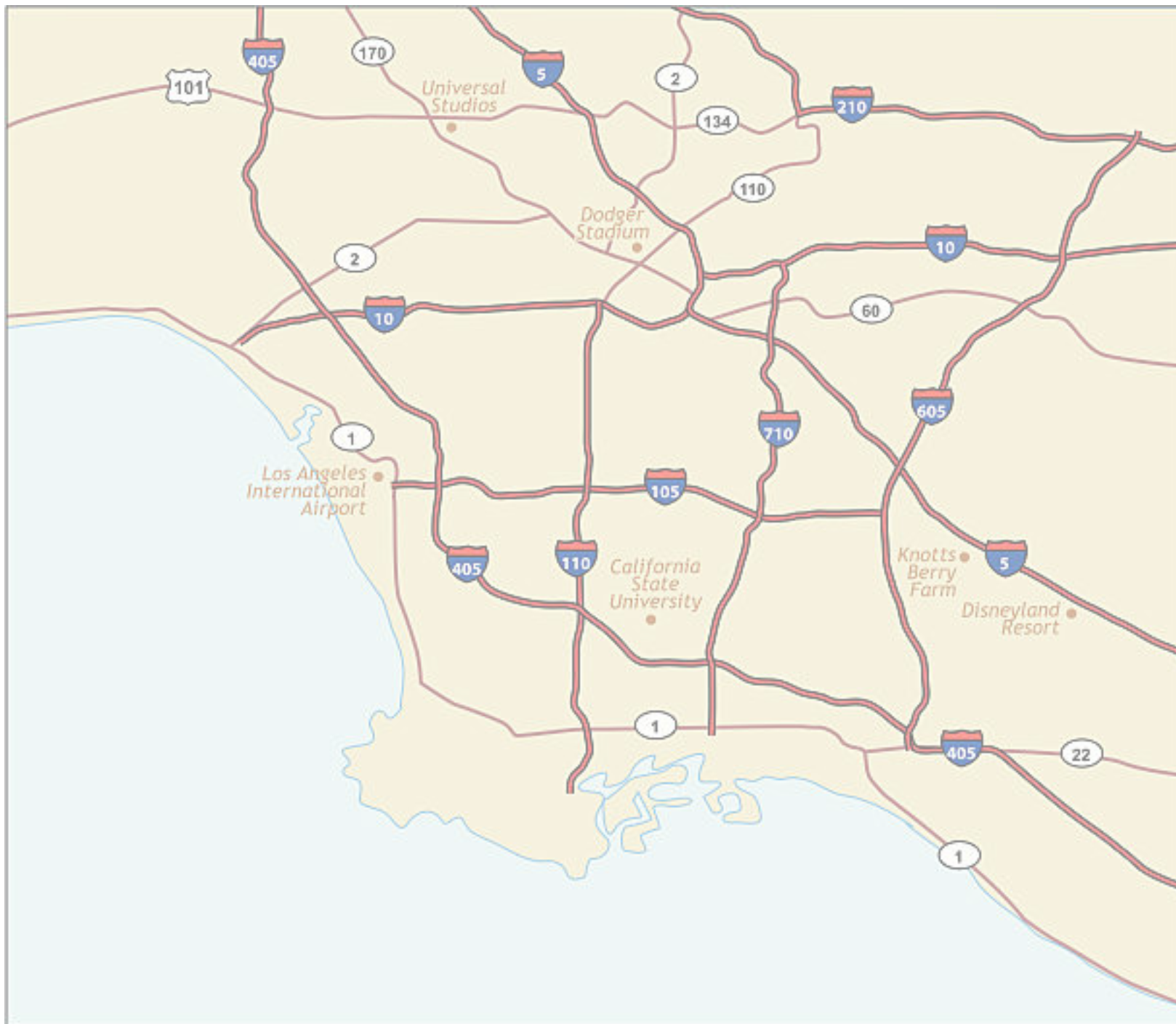
SW Coastal LA Reporting Area

Monitors Near Me

Recent Trends

U.S. EPA: [AirNow.gov](https://www.airnow.gov)

**What is the AQI for PM2.5
where you are located?**





Worker Protections from Wildfire Smoke

Who does this standard apply to?

- Outdoor and indoor workers exposed to wildfire smoke for more than 1 hour a day, even if they are not directly impacted by fires
- Does *not* apply to wildland firefighters or indoor workers with filtered air



When are employers required to act?

- The standard applies when **AQI for PM2.5 is 151 or higher**
- Employers are responsible for monitoring air quality at the worksite

Air Quality Index - Particulate Matter	
301 – 500	Hazardous
201 – 300	Very Unhealthy
151 – 200	Unhealthy
101 – 150	Unhealthy for Sensitive Groups
51 – 100	Moderate
0 – 50	Good

Employers are required to:

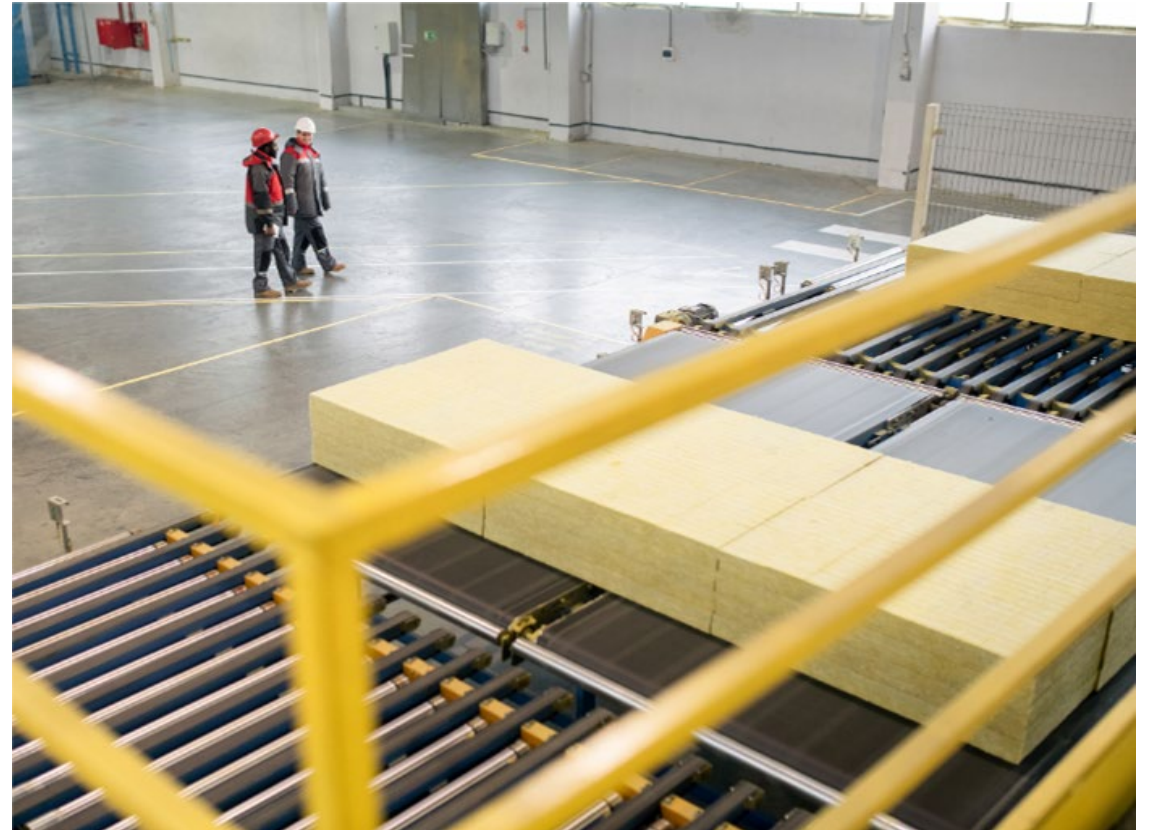
- 1. Provide training** on wildfire smoke health risks and protections available to them
- 2. Communicate with workers** about current AQI for PM_{2.5} at the worksite



Employers are required to:

3. Reduce workers' exposure to wildfire smoke:

- Relocate work
- Change work schedules
- Reduce intensity of work
- Give longer rest breaks



Employers are required to:



4. **Provide respirators** (NIOSH-approved N95 filtering facepiece respirators) and encourage their use

Air Quality Index - Particulate Matter

301 – 500	Hazardous
201 – 300	Very Unhealthy
151 – 200	Unhealthy
101 – 150	Unhealthy for Sensitive Groups
51 – 100	Moderate
0 – 50	Good

If AQI for PM_{2.5} is greater than 500, workers are required to wear respirators

THANK YOU

Kevin Riley, PhD MPH

UCLA Labor Occupational Safety and Health Program

kriley@irle.ucla.edu

UCLA

**Labor Occupational
Safety & Health Program**