Wildfire Health Community Advisory Board

MEETING #3: DUST AND SOIL

8.12.25

Led by Dr. Katherine McNamara, Dr. Savanna Carson, and Dr. Arleen Brown

Please request before sharing slides.

Community!

Spiegel Family Fund

LA FIRE HEALTH STUDY

Caltech

UCLA CTSI

UCLA Health

Community Engagement & Research Program

UCLA Fielding School of Public Health

County of Los Angeles Public Health

Recap from last meeting (session #2):

Air Pollution during Wildfires

1. During wildfires, PM 2.5 readings can help determine rapid changes in air quality (EPA AirNow or Purple Air).
2. Wildfire smoke travels far, and AQI or PM2.5 measurement readings may not accurately represent all the harmful contaminants.
3. Los Angeles faced hazardous levels of smoke, containing lead and other toxins, during the fires. Fortunately, for the most part, air quality returned to normal levels within a week.
4. Los Angeles faced increases in emergency room and outpatient medical visits during the fires.
5. Therefore, it is crucial for people to reduce exposure to air pollution. This is true not only for local populations, but also for those who can be farther away and still face poor air quality from the smoke.

Recap meeting #2: What we heard from you!

Air quality in real time during the fires can conflict and be hard to follow.

Is there anything we can do *now* if we had poor air quality exposures?

Fire survivors are often overwhelmed and inundated with challenges and information as they attempt to rebuild their lives. Health information is another layer of stress, confusion, and frustration.

Today's Topic:

Soil and dust contaminants post-fire

Thinking Through Health and Fire Impacts

General timeline of priority health concerns, length of time when information or research is shared, and what the public may focus on over time.

Immediate Health Concerns

- Physical safety
- Air quality and reducing smoke exposures

Short and Long-term Health Concerns

- Water quality
- **Dust and soil contaminants**
- Mental health

Post-fire exposures we're covering today

Session #3: Learning & Discussion Objectives

1. **Contaminants in Dust and Soil**: A focus on Lead
2. **Lead and human health**
3. **Blood lead levels** (measuring actual exposure)
4. **Lead in dust and soil** (measuring potential exposure)
5. **Reducing exposures**

NOTE:
Data reported in this presentation may be preliminary (early reporting) and may be incomplete. Please find updates on the Los Angeles County Department of Public Health Post-Fire Assessment Dashboard, or refer to the website and contact information provided on each slide.

Thank you!!

Scientists and agencies who supported review or development of today's concepts and slides:

- Valerie Hanley, Toxicologist, DTSC Human and Ecological Risk Office
- June Weintraub, Deputy Director for Environmental Health, CDPH
- Jeff Wagner, Chief, Environmental Health Laboratory Branch, Center for Laboratory Sciences, CDPH
- Karen Riveles, Toxicologist, OEHHA Community Health and Environmental Impacts Section
- Soils working team for the LA Fires of LA County Department of Public Health, Environmental Health Division
- Office of Worker Health and Safety, LA County DPH
- Hilary Godwin, Dean, University of Washington School of Public Health
- Thomas McKone, Professor Emeritus, UC Berkeley Dept of Environmental Health Sciences
- Bruce Lanphear, Faculty of Health Sciences, Simon Fraser University

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- Chapman
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- USC CLEAN
- LA FIRE HEALTH
- CAP.LA
- SDSU
- EFRU

Funders of the Community Advisory Board to advance wildfire health communications:

Spiegel Family Fund

UniHealth FOUNDATION

Cindy and Alan Horn

Today's focus on Dust and Soil contaminants:
Why the focus on Lead?

- **Lead has known health impacts**
- **Lead is one of the most significant toxic contaminants burned in the LA fires**
  - Lead is found in paint from older homes, old appliances, historical leaded gasoline and pesticides, modern car batteries, pipe solder, and wiring.
  - These sources have contributed to the presence of lead in dust and soil *before* the fires.
- **Lead was measured in the smoky air during the fire and in settled ash, dust, and soil after the fire.**
  - *However*, we may not know *how much* of this lead dust is from the fires, or was there previously, as this is not routinely tested.
- **Other toxins may result from the fires, but won't be covered today** (for example, Arsenic, Cadmium, and Mercury).

Regulatory lead levels for protecting health

Agencies set regulatory levels for toxins to protect us from harmful exposures.

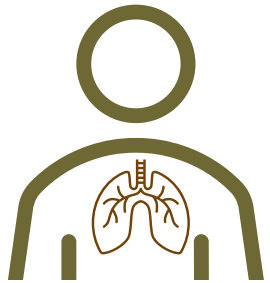
Exposures are not an exact science. These levels of exposure depend on:

- How **toxic** something is,
- How **we're exposed** (the route of exposure),
- The **amount and how often** we're exposed

Regulated levels of Lead (or Pb) as health-based thresholds		
Agency	**Media**	**Level of concern**
EPA	Air	0.15 µg/m^3 (micrograms Pb per cubic meter of air) as a 3 month rolling average
CDC	Blood	3.5 µg/dL (micrograms Pb per deciliter of blood)
CalEPA	Soil	80 mg/kg residential (milligrams Pb per kilogram, or parts per million, PPM) 500 mg/kg commercial
US EPA	Dust	5 µg/ft^2 for floors (micrograms Pb per square foot) 40 µg/ft^2 for windowsills 100 µg/ft^2 for window trough

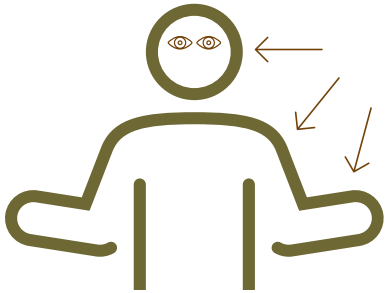
Post-fire exposures we're covering today

How are we exposed? Routes of exposure



Inhalation
(breathing in smoke or dust)

Ingestion
(drinking, eating, hand to mouth)



Skin/eye contact
(touching, eye contact)

Lead and Human Health

Sources of Lead and Health Effects

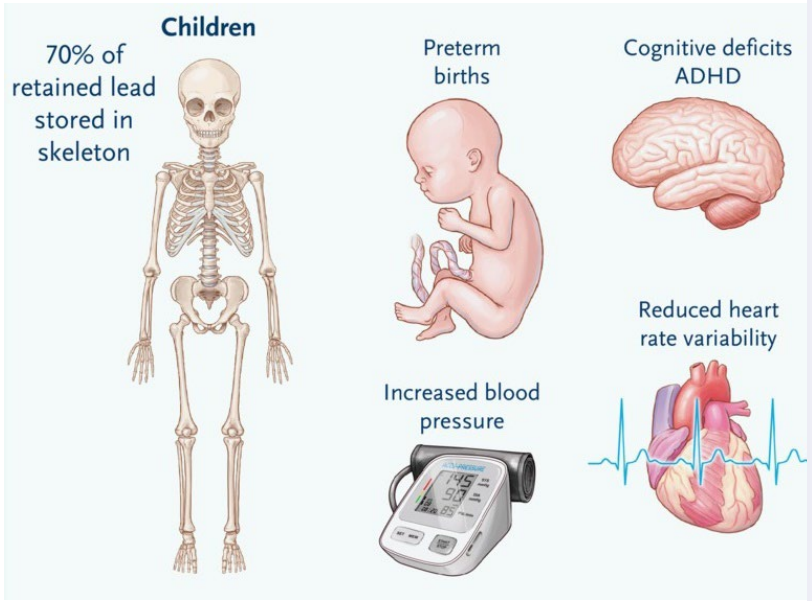
Lead causes oxygen deprivation and can kill red blood cells. Health effects from lead exposure can be permanent.

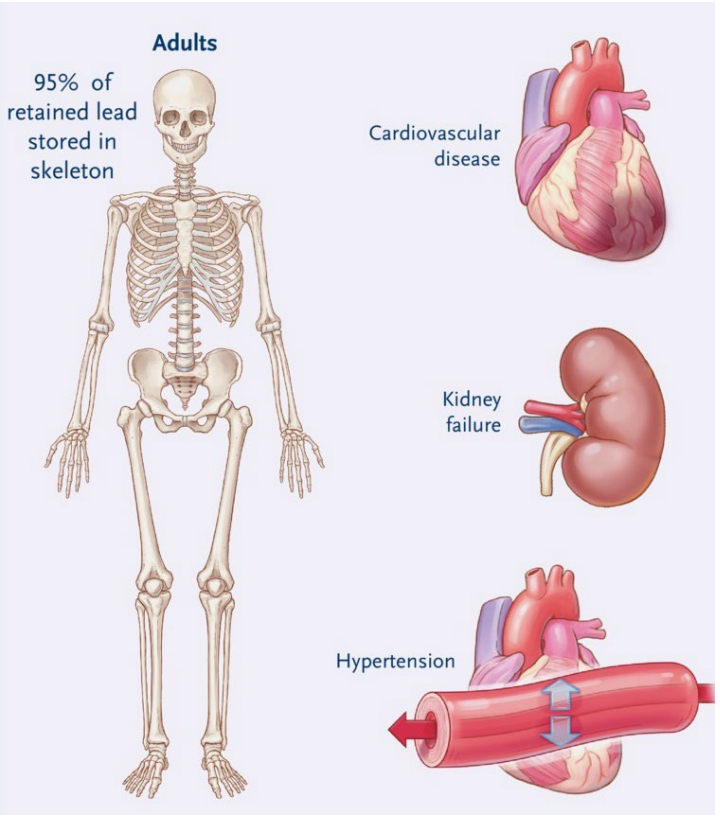
Major Historical Sources of Lead

Historically, lead poisoning is *typically* from exposure to lead-based paint.

**Infrastructure fires may also have site-specific factors for lead hot spots (we'll discuss in later slides).*

Consequences of Low-Level Lead Poisoning





Lanphear B et al. N Engl J Med 2024;391:1621-1631

The NEW ENGLAND JOURNAL of MEDICINE

Common sources of lead poisoning

Cases of lead poisoning are often linked to dust in older homes with lead paint and sometimes, commercial products.

Soil ingestion is rarer, and it's easy to avoid hand-to-mouth contact with soil, but it can still contribute to lead exposure.

Recent recalled products with high lead levels:
http://publichealth.lacounty.gov/lead/

The US Food and Drug Administration has issued a recall for Shop Me Ca's "Diệp Bảo Cream" baby cream (info in Vietnamese)

Public Health Warns of Lead Poisoning Hazards in Recalled Children's Products

Recall Flyer (English/Spanish)

How is Lead in the body measured?

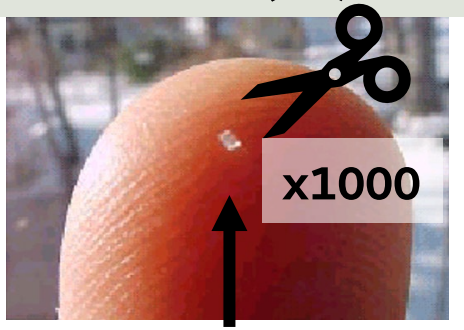
A blood test (Blood Lead Level, or BLL) is the only way to measure if one has had lead exposure.

- Measures lead in the blood at a *given moment*.
- Cannot assess the overall historic body burden of lead, including potential other exposures that may not be present in the blood.
- Lead in the body typically reduces in half in one month if no further exposure occurs (its half-life).

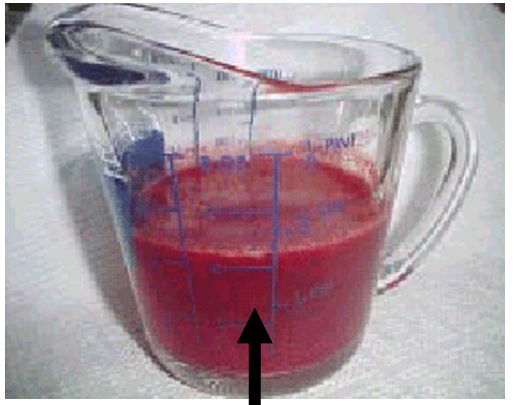
BLL is measured in micrograms (µg) of lead per deciliter (dL) of blood (see pictures).

- A 165-pound person has ~60 deciliters of blood.
- A one-year-old baby typically has about 8-10 deciliters.
- More than **3.5** µg/dL is considered a level of concern for children and pregnant women (or women who may get pregnant).

Visualizing micrograms (µg) of lead per deciliter (dL)



One microgram (µg) = a single grain of sugar *cut into 1,000 pieces*

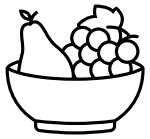


One deciliter (dL) = about a half cup

Binns, H.J., Campbell, C., Brown, M.J. and Advisory Committee on Childhood Lead Poisoning Prevention, 2007. Interpreting and managing blood lead levels of less than 10 µg/dL in children and reducing childhood exposure to lead: Recommendations of the Centers for Disease Control and Prevention Advisory Committee on Childhood Lead Poisoning Prevention. *Pediatrics*, *120*(5), pp.e1285-e1298.

Children and Lead

- Children's smaller bodies result in higher lead exposure than adults.
- Children absorb **up to 40-50%** of the lead they ingest (eat/drink) while other adults absorb 10-15%. Pregnant women are at increased risk of passing on lead stored in their bodies or from new exposures to their babies.
- Minority and low-income children may be at higher risk of lead exposure:
  - Live in older, poor-quality housing units (i.e., old, chipping paint).
  - More likely to miss out on healthy nutrition. Nutrients like vitamin C, iron, and calcium help *reduce* lead absorption in the body.



  - Vegetables such as broccoli, avocados, leafy greens, and sweet potatoes, as well as fruits like bananas. Iron and calcium can also be found in meat and dairy products.

Key point:

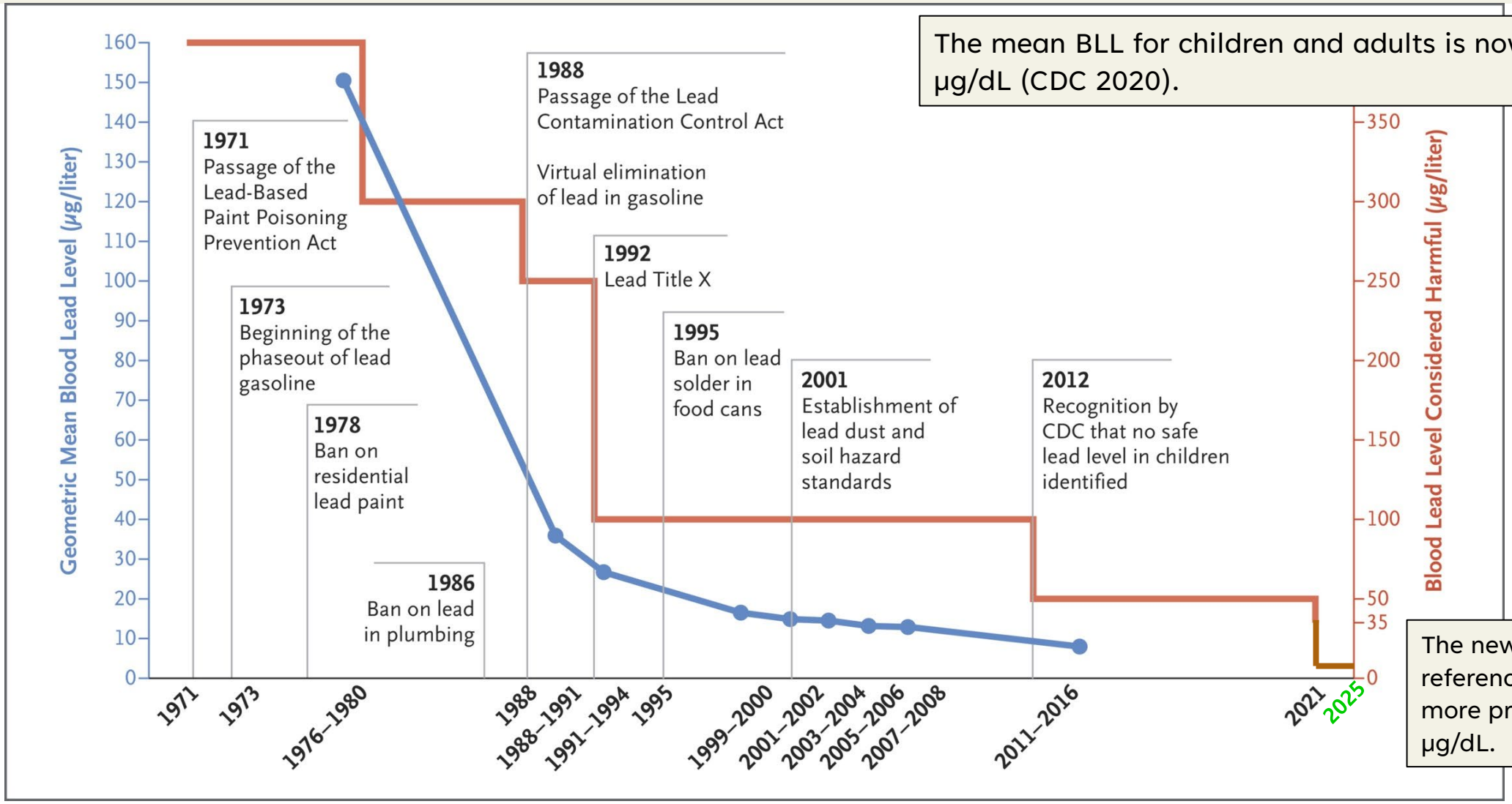
Children and pregnant women are more vulnerable to lead exposure, especially if they live in older homes or do not eat enough healthy foods.

Agency for Toxic Substance and Disease Registry (ATSDR) Toxicological Profile for Lead. US Department of Health and Human Services; 2020.
Sample J. Lead exposure in children: failure to protect the most vulnerable. The Journal of Pediatric Pharmacology and Therapeutics. 2024 Jun 1;29(3):212-4.

The good news!

Child Blood Lead Levels over time have reduced significantly!

Children between 1-5 years of age



The mean BLL for children and adults is now less than 1 µg/dL (CDC 2020).

The new **2025** CDC BLL reference levels are even more protective at 3.5 µg/dL.

Lanphear B et al. N Engl J Med2024;391:1621-1631

https://www.epa.gov/americaschildrenenvironment/biomonitoring-lead

Current Recommended Lead Treatments:

Blood Lead Levels of concern for children

Remove and reduce exposure(s)!!

Reduce exposure(s) **and** consider medical interventions.

Immediate medical attention

CDC Recommended Treatment for Children's Blood Lead Levels	
BLL Result	**Recommended Treatment Action**
Less than 3.5 µg/dL	**Reduce exposure** and educate on common sources and how to prevent exposures.
3.5-19 µg/dL	**All of the above, plus**: • Explore any **potential exposures** and arrange home investigation (Dept. of Public Health). • **Check child development**. • Discuss **diet and nutrition, focusing on iron and calcium**, which can help reduce lead absorption. Ensure no iron deficiency. • Follow-up blood lead level testing.
20-44 µg/dL	**All of the above, plus**: • Arrange for a **lead hazard reduction program**. • Consider an **abdominal X-ray to check for lead-based paint chips and other objects**, which is especially important for young children who tend to ingest non-food items. • Contact a **Pediatric Environmental Health Specialty Unit or the Poison Control Center**.

Above 45 µg/dL	**All of the above, plus**:
	• **Consider admitting to the hospital if an unknown exposure or further lead exposure (unsafe home)**.
	• **If signs of lead poisoning are present, seek immediate medical attention at a hospital**. Signs include confusion, weakness, seizures, coma, nausea, vomiting, and abdominal pain.
	• **Consult with a medical toxicologist or specialist** to initiate:
	  ◦ Gastrointestinal decontamination (removal of lead using laxatives) or
	  ◦ Chelation therapy (medication used to remove lead from the body).

Key point:

High blood lead levels (BLLs) are rare, but when they occur, medical treatment *typically* focuses on identifying and reducing further exposure, followed by re-testing.

CDC: https://www.cdc.gov/lead-prevention/php/news-features/updates-blood-lead-reference-value.html

Blood Lead Levels: Fire-affected Communities

Free post-fire testing provided by LAC DPH

As of August 4, 2025 (7 months post-fire)	Blood Lead Test Completed	# of Children	# of Adults	Results less than or equal to 3.5 µg/dL	Results more than 3.5 µg/dL
Quest Lab Visit	590	83	507	588	2
Community Event	1,190	105	1,085	1,183	7
Total	1,780	188	1,592	**1,771**	**9***

***All adults more than 40 years of age, all under 10 µg/dL**

Key point:

Blood Lead Level (BLL) testing following the fires has not shown any children with increased BLL, but less than 200 have been tested. Adults were within or below typical averages. Testing is still free and ongoing!

https://storymaps.arcgis.com/stories/28efe1b6956b4438a88b2849542bd816?cover=false

Blood Lead Levels

Main points:

- Health risks can still result from low lead exposures, but overall, lead exposures have reduced in the past 30-50 years.
- Lead exposures may have resulted from the LA fires through air, soil, ash, and dust.
- **We have not seen any children with elevated BLLs following the fires *(this is good news!)*, but only ~180 children have been tested.**

  This is the best measurement of any potential exposure and is reassuring.

  Note: Free testing is still available (see slide 52 for more details).

Lead in Soils: Overview

Regulatory Thresholds for Lead in Soil

Soil screening levels are based on daily exposure and are set to protect people, especially children and pregnant women.

The level is based on studies that indicate that a 1 microgram per deciliter (1 µg/dL) increase in blood lead levels can result in a loss of one IQ point in children.

Agency	Lead in Soil Screening level* **a way to check if further investigation or cleanup is needed*
CalEPA California Environmental Protection Agency / DTSC Department of Toxic Substances Control	• **80 ppm** residential *(lowest in U.S!)* • **500 ppm** commercial
US EPA	• **200 ppm** residential • **800 ppm** commercial

***To set the 80-ppm screening level*, CalEPA estimated a "worst-case" scenario for a child's lead exposure, 1-6 years old, to be EVERY DAY for 90 days:**

1. Incidental ingestion 80 mg of soil (about 1/4 of a teaspoon) contributes 98% to their estimated soil exposure, and small amounts of lead in soil dust are inhaled (<2%) and absorbed through the skin (<.05%).
2. Assumes a high level (60%) is freed from the soil and taken up by the body (where the rest typically binds to other soil minerals), and 16% dissolves in the bloodstream.

Key point: **This level of daily exposure is rare and unlikely to occur for most children, even in homes where the soil contains 80 ppm of lead.**

https://dtsc.ca.gov/wp-content/uploads/sites/31/2025/05/LeadSpread-9.1-Information-for-Users-December-2024.pdf

What might 80 ppm *look like as* sugar?

80 ppm would be about 80 grains of sugar mixed ***within*** 1,000,000 grains of sugar.

This is a very tiny amount, or 0.008% of the big mound of sugar.

For lead in soil, 80 ppm represents 80 mg of lead in 1,000,000 mg (1kg) of soil (or 2.2 pounds!).

Key point:

Measurements in ppm are very small and are considered trace amounts. It may be helpful to keep this in mind when interpreting soil results in ppm.

Soil lead results: When to worry, what to do?

Potential actions to consider based on your soil lead test results

		Lowest risk	Lower risk	Moderate to higher risk	Hazardous waste
Where was the soil tested? Likelihood of soil contact:		**≤80 ppm** Cal EPA/DTSC screening level	**≤200 ppm** U.S. EPA screening Level	**<1,000 ppm**	**1,000+ ppm** Cal EPA/DTSC: Treat as hazardous waste
	**Infrequent soil contact:** *Rarely* reached by adults doing maintenance.	Wash hands or body after touching soil.	*Exposure is still unlikely.* Wash hands or body after touching soil.	*Exposure is still unlikely.* Wash hands or body after touching soil.	*Exposure is still unlikely.* Consider the options below if concerned. Wash your hands or body after touching soil.
	**Limited soil contact:** Under grass, pavers, or has limited access.	Wash your hands or body after touching soil.	Consider further testing, remediation options, or check blood lead levels. Wash your hands or body after touching soil.	Consider further testing, remediation options, or check blood lead levels. Wash your hands or body after touching soil.	Confirm with additional testing. Consider remediation options (cover or remove soil); check blood lead levels. Wash your hands or body after touching soil.
	**Frequent soil contact:** Walkway, child play area, vegetable garden.	Wash hands or body after touching soil.	Consider further testing, remediation options, or check blood lead levels. Wash your hands or body after touching soil.	Consider further testing; remediation is recommended (cover or remove soil); check blood lead levels. Wash your hands or body after touching soil.	Remediation is recommended (cover or remove soil); check blood lead levels. Wash your hands or body after touching soil.

***Note**: If a single sample exceeds a threshold, it doesn't necessarily require action, as typical practice is to collect multiple samples and average them. If you have concerns, consider where the samples were taken in the yard, consider remediation, or consult an expert.*

Created in collaboration with the LAC DPH post-fire soils working group and the USC CLEAN project http://publichealth.lacounty.gov/media/eaton-soil-testing/

LAC DPH http://publichealth.lacounty.gov/media/eaton-soil-testing/

Images: Getty, Posh in progress

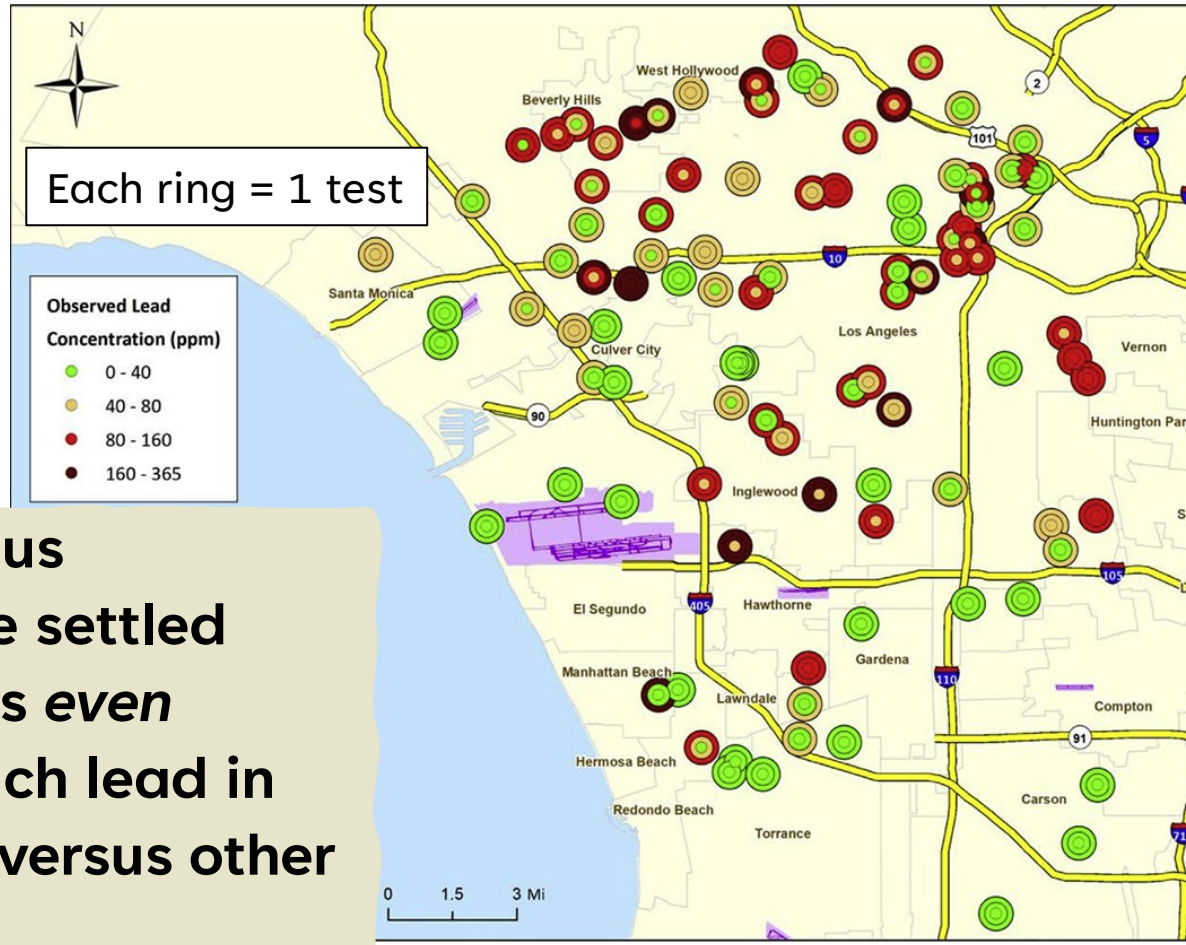
Background levels of lead in LA soils

WHAT WAS TESTED: 100 Los Angeles Public Parks

WHAT WAS FOUND:

- Average lead concentration in park soil was 65.5ppm (range: 0.969–363ppm)
- 35 parks had lead levels above 80ppm
- Areas *within* parks showed very different lead levels.

2018 study of LA Parks and soil sampling of lead



Key point:

Ideally, soil lead levels *before the fire* can help us understand how much lead from the fire smoke settled into the soil. Public parks had higher lead levels *even before the fire*, so it can be hard to tell how much lead in recent samples comes from the 2025 wildfires versus other historical sources.

Hung WC, Hernandez-Cira M, Jimenez K, Elston I, Jay JA. Preliminary assessment of lead concentrations in topsoil of 100 parks in Los Angeles, California. Applied Geochemistry. 2018 Dec 1;99:13-21.

Results of Soil Lead Levels After Fires

Preliminary results as of August 2025

USC Clean
LAC DPH/Roux
CAP.LA
LA Times
Duke University & Honey Girl Grows
Chapman
City of Pasadena

Soil results post-fires

USC CLEAN Project, ~3,000 samples, as of June 2025

WHAT WAS TESTED: Lead in resident home soil

WHAT WAS FOUND *SO FAR*:

- 57% at or below California Screening Level (80 ppm)
- 90% at or below EPA Screening Level (200 ppm)
- 16 of 2,808 samples are Hazardous Waste (1000 ppm+)
- Eaton area levels were higher than the Palisades
- Areas with older homes burned show higher lead levels

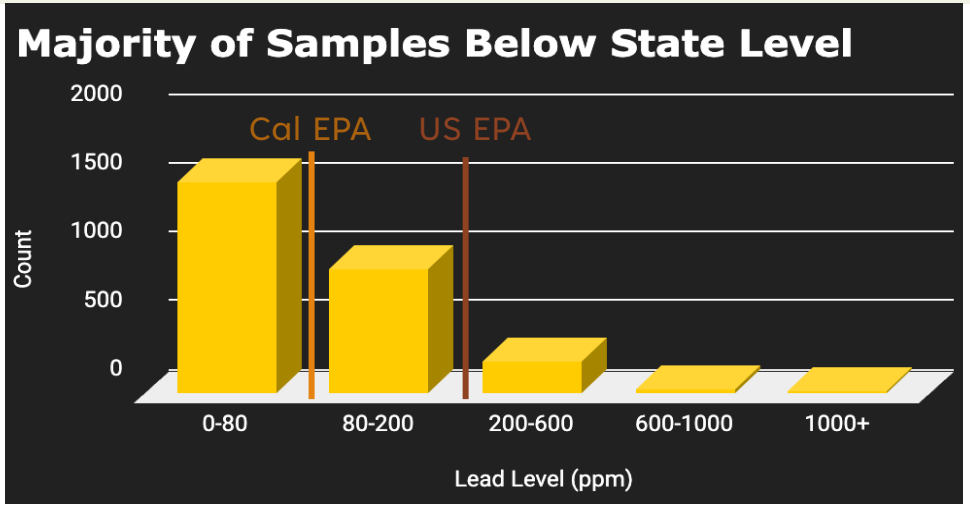
MORE TO COME: More results and testing beyond lead to come! Public events! Sign up for the newsletter!

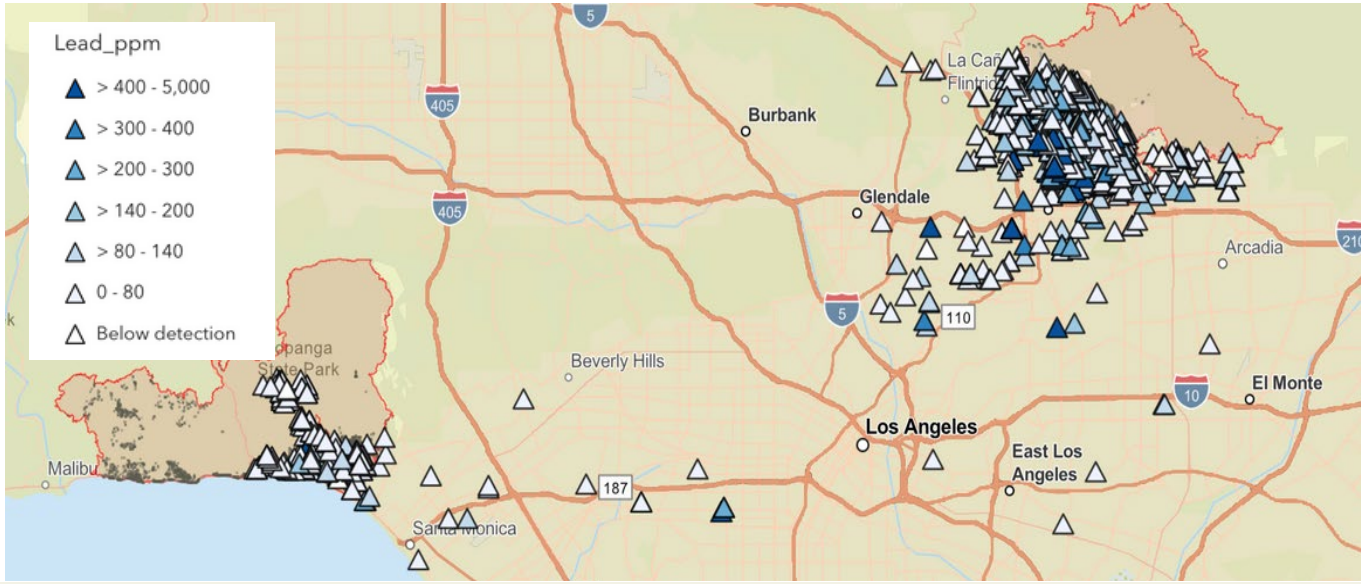
Now collecting soil samples all over LA (at least through the end of 2025) with local drop boxes!

The Contaminant Level Evaluation & Analysis (CLEAN) Project

CLEAN is a free, rapid-response soil testing project to quickly evaluate and communicate the levels of contamination in soils in the wake of the 2025 Los Angeles wildfires. The program is available to anyone in Los Angeles County.

tinyurl.com/CleanUSC





PUBLIC EXCHANGE™ Keck Medicine of USC USCDornsife Spatial Sciences Institute FIRE AID

Soil results post-fires

LAC DPH, ~1500 samples, as of June 30, 2025

WHAT WAS TESTED (2 sets of results):

1. Lead in resident home soil from Eaton and Palisades (LAC DPH/Roux), 780 sites
2. Eaton resident soils (LAC DPH), 846 sites

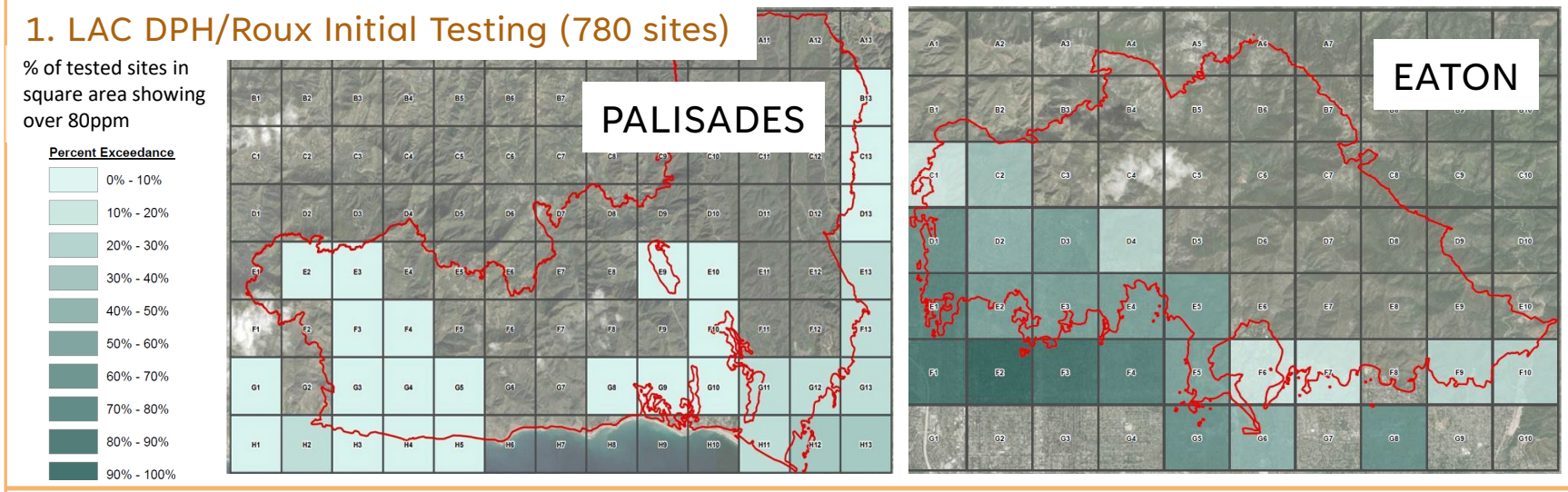
WHAT WAS FOUND:

- About half of the samples from fire-affected parcels showed no results over 80 PPM.
- Some zip codes immediately downwind had higher numbers of results above 80 PPM.

MORE TO COME:

Final reports to come. Further assessments are needed to understand the variability in lead detection.

1. LAC DPH/Roux Initial Testing (780 sites)



2. LAC DPH Eaton Soil Testing (846 sites)

Eaton Zip Codes (with enough samples)	91024	91001	91103	91104	91107
Less than 80 PPM	**78.13% (25)**	**52.24% (257)**	11.36% (5)	28.43% (58)	**61.7% (29)**
81-200 PPM	21.88% (7)	37.4% (184)	**59.09% (26)**	**48.53% (99)**	31.91% (15)
201-1000 PPM		10.16% (50)	29.55% (13)	22.06% (45)	6.38% (3)
More than 1000 PPM		0.2% (1)		0.98% (2)	

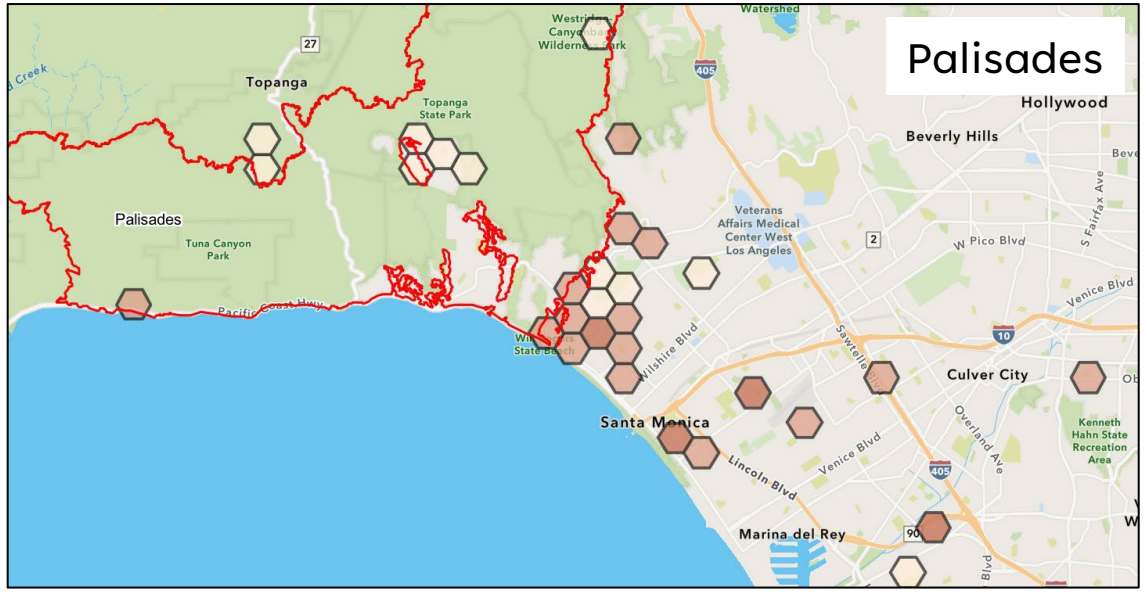
https://storymaps.arcgis.com/stories/667412ef37ee4392bddb5c90da3480f1?cover=false
http://publichealth.lacounty.gov/media/wildfire/docs/Roux_LA_Fires_Soil_Prelim_Results.pdf

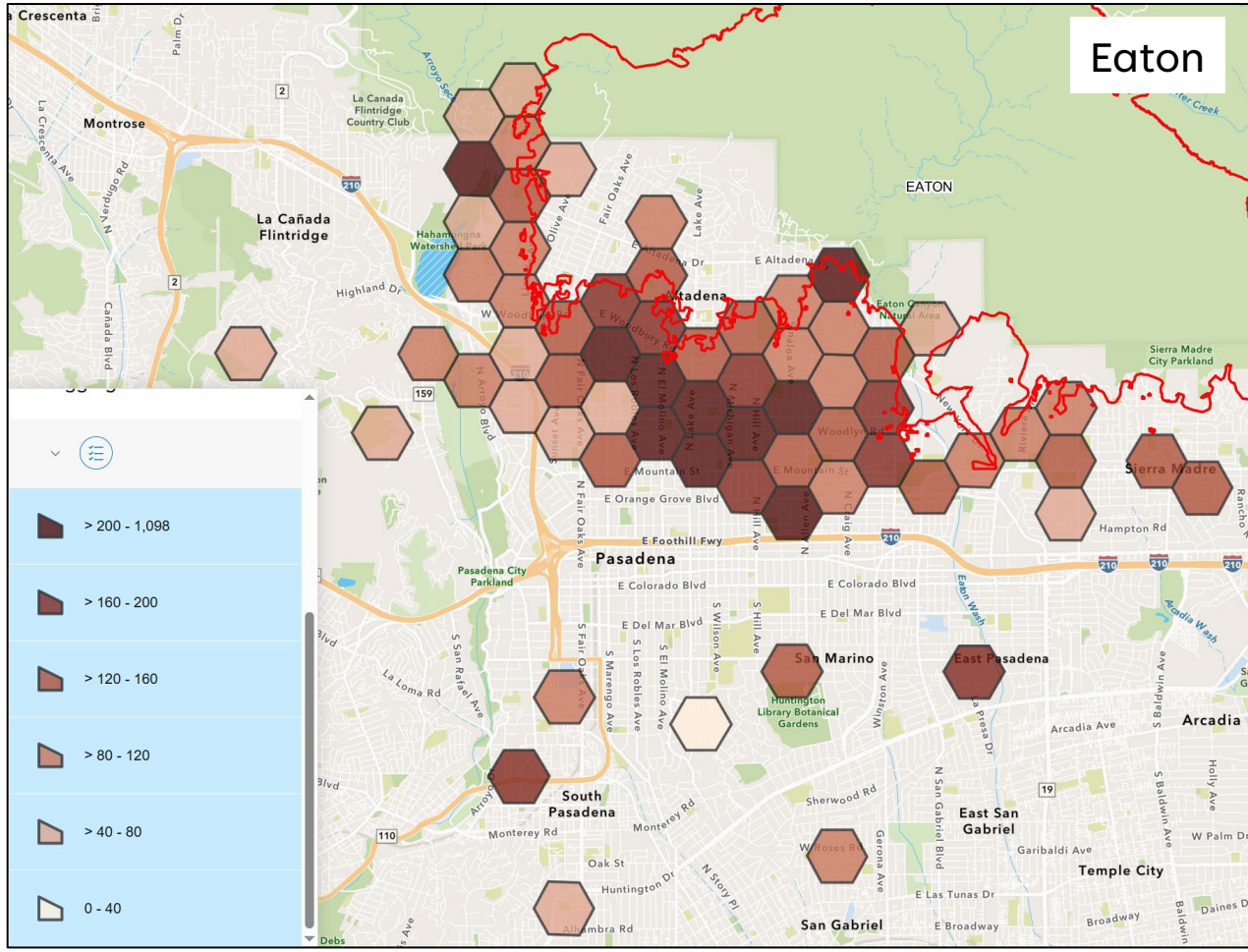
County of Los Angeles Public Health

ROUX

Soil results post-fires

CAP.LA (LMU/UCLA/Purdue), ~421 samples, as of Aug. 2025:





WHAT WAS TESTED: Self-collected resident/home soils, results show the average largest lead level

WHAT WAS FOUND:

- At a glance, we see higher levels around Eaton and downwind of the fire smoke plume.
- Some areas have a limited number of tests.

MORE TO COME:

- Study team collected soil samples (fire area only) to come

Soil results post-fires

Chapman, UC Davis, Merced, 421 samples, as of April 2025

WHAT WAS TESTED:

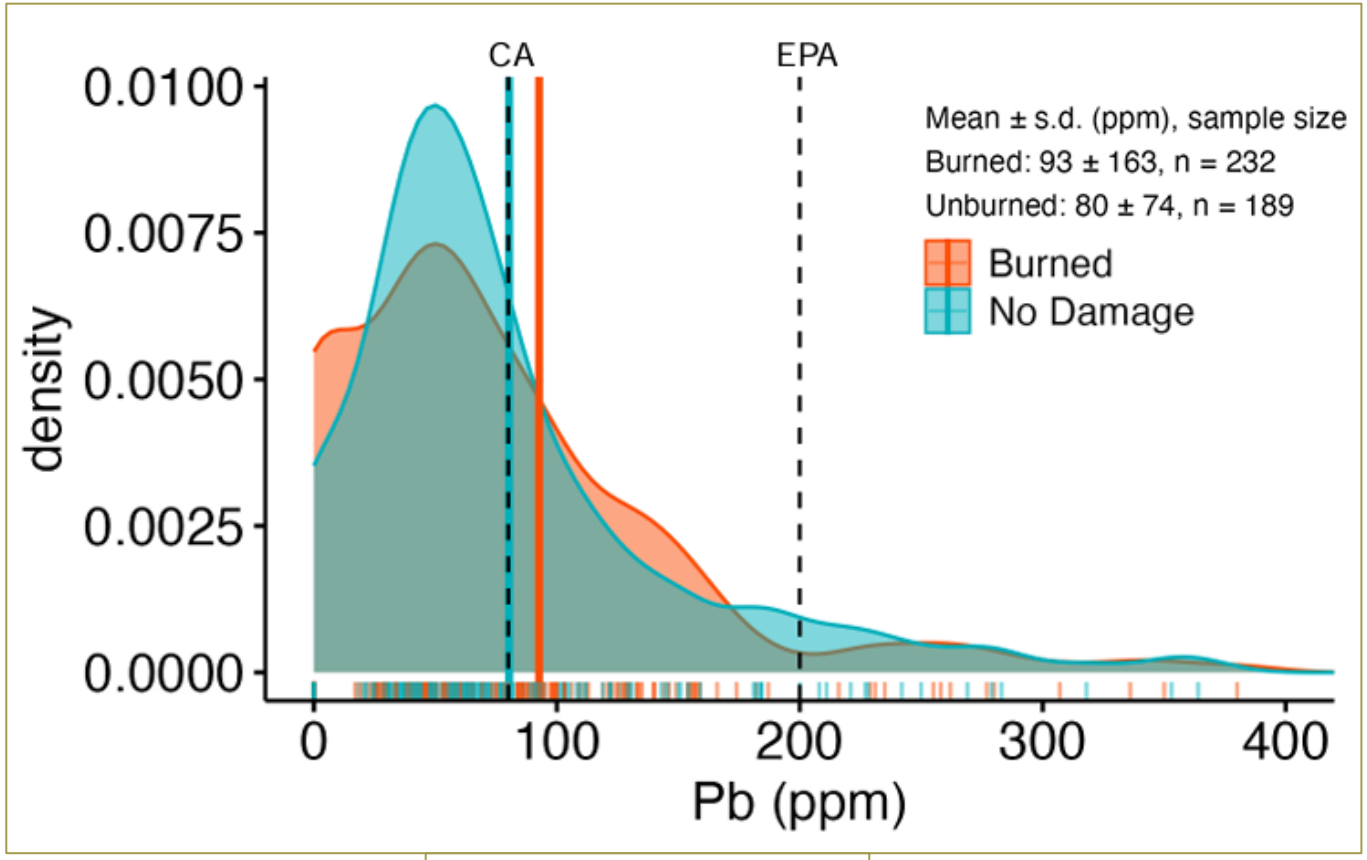
- 20 residential properties not slated to have soil removal (10 with burned structures, 10 unburned) with 10-50 samples per site; unburned homes were <3 km from the burn zone

WHAT WAS FOUND:

- In ~35% of tests, lead exceeded 80 ppm (CA EPA) levels
- In ~7% of tests, lead exceeded 200 ppm (EPA)

MORE TO COME:

- Follow-up testing!
- Working on learning how much of the lead in soil was bioaccessible (how much lead can be taken up by the body if soil gets in the body)
- Garden testing and if lead is taken up by fruit and vegetables



- > 80 ppm (CA DTSC): 37.8% (18/232) burned obs, 33.8% (14/189) unburned obs.
- > 200 ppm (EPA): 7.8% (87/232) burned obs; 7.4% (64/189) unburned obs.

CHAPMAN UNIVERSITY

Contact: coconn@chapman.edu

Researchers: Christine Sierra O'Connell, Ratish Ragavendiran, Rebecca Ryals, Jasquelin Peña, and Christopher Kim

Soil results post-fires

Duke Univ. & Honey Girl Grows, 300 samples, as of March 2025

WHAT WAS TESTED:

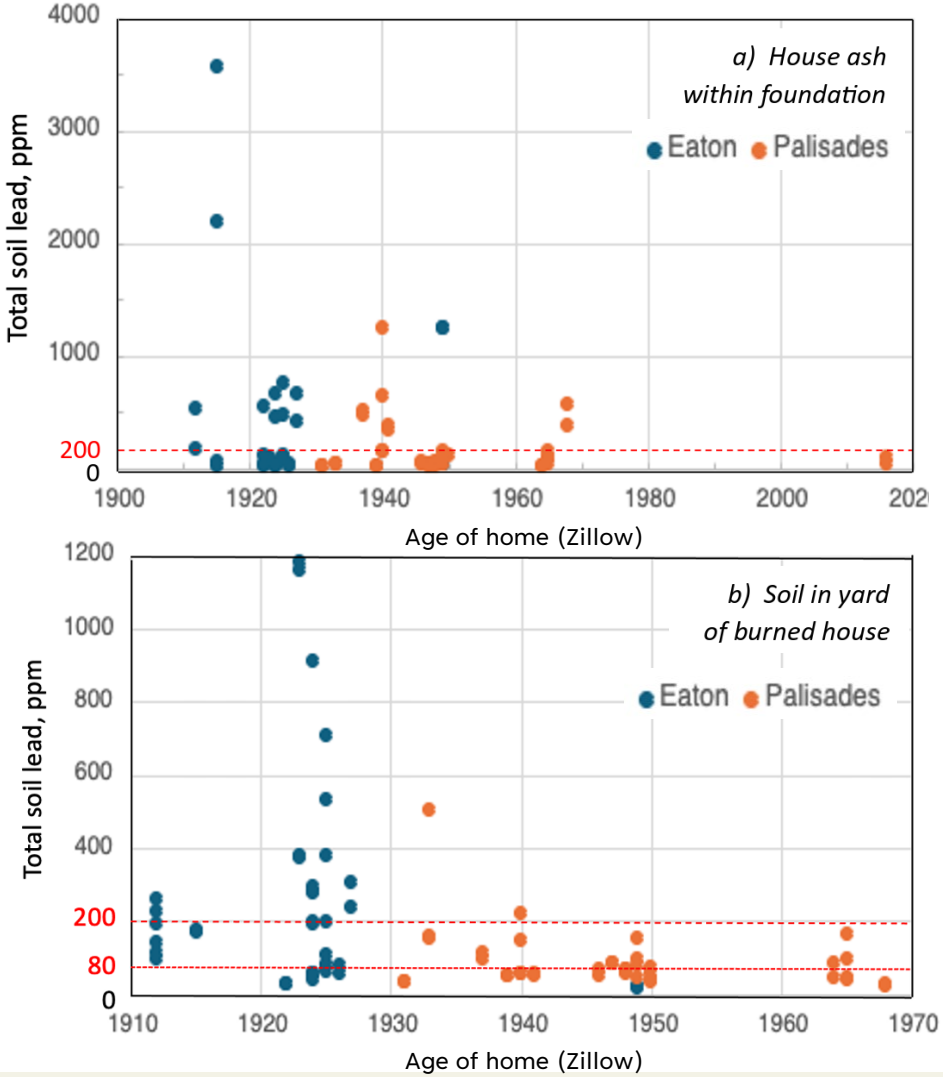
- *Early sampling* (Jan-March) of soil, ash, and curbside dust

WHAT WAS FOUND:

- Lead in soils and ash shows some relationship with home age.
- Lead along curbside soil in burned and unburned communities shows little difference in lead (likely due to historical leaded gasoline prior to the 1980s)

MORE TO COME:

Resampling after settling/soil dynamics and remediation.



Soil results post-fires

City of Pasadena: Public Health & Parks & Recreation Departments, May 2025

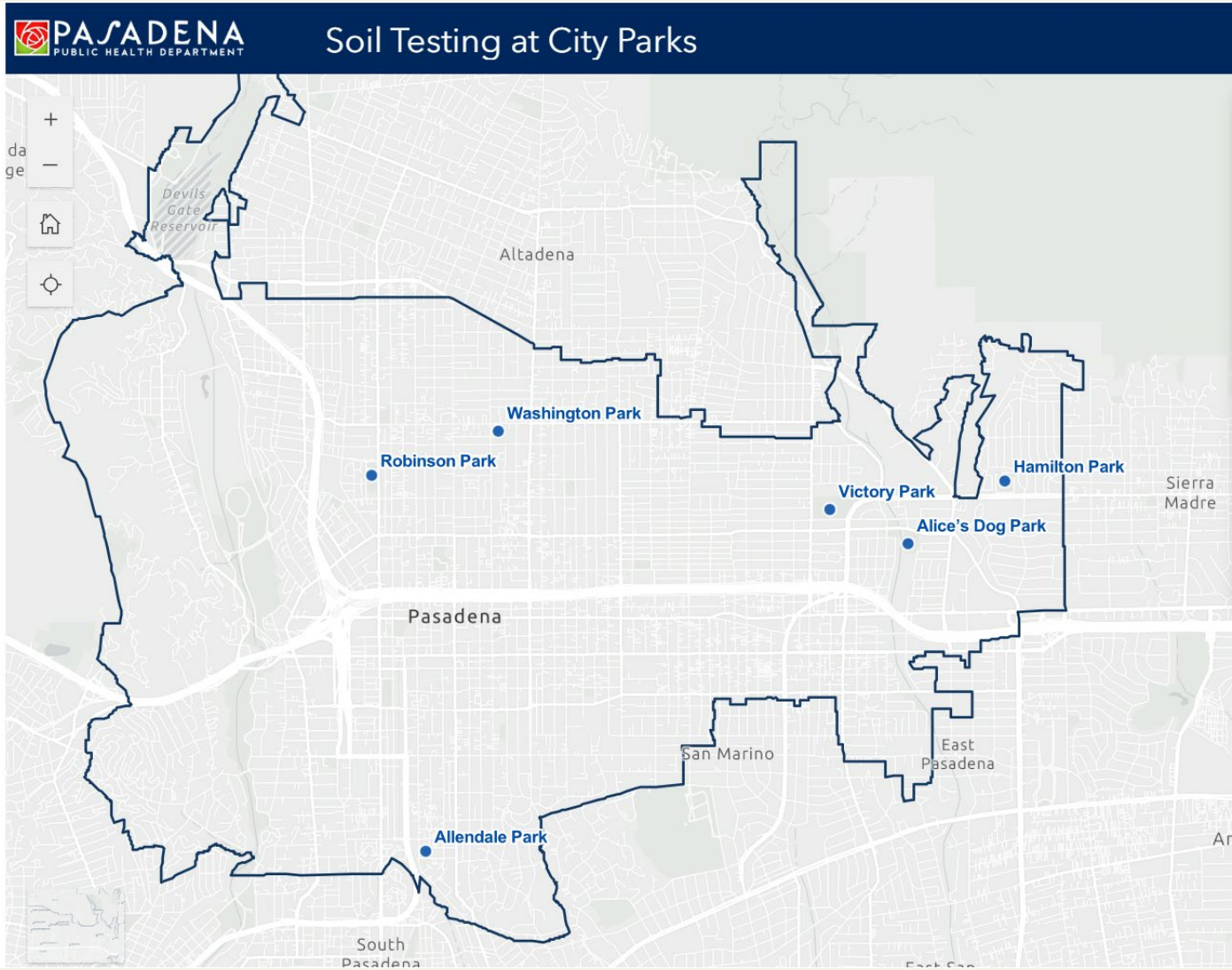
WHAT WAS TESTED: 5 Pasadena Parks close to the Eaton fire zone

WHAT WAS FOUND:

- All parks had lead levels below 80 ppm.
- The highest lead level detected was 51.9 ppm at Washington Park (Tree Area), and the lowest was 1.6 ppm at Robinson Park (North Ball Field). Test results for other heavy metals were also within safe limits.
- Parks have been reopened for public use. The findings confirm that there is no current risk to human health from lead or heavy metals in soil at these sites.

MORE TO COME:

None. Testing complete!



https://www.cityofpasadena.net/public-health/news-announcements/11414/
https://www.cityofpasadena.net/city-manager/eaton-fire/

Soil results post-fires

LA Times, 40 homes, April 2025

WHAT WAS TESTED:

40 homes, 10 with Army Corps-remediated soil (6-inch soil removal)

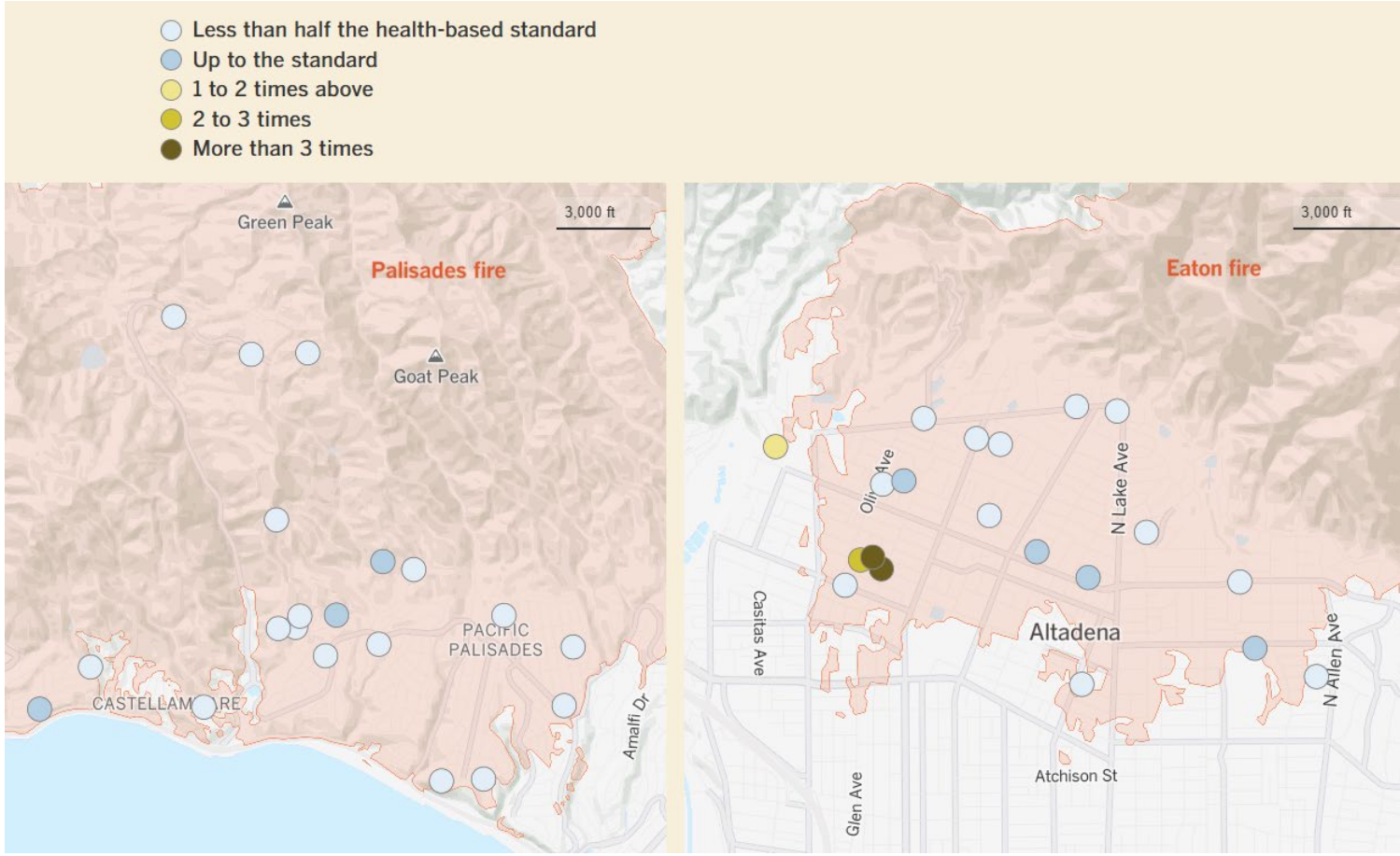
WHAT WAS FOUND:

Some remediated homes in Eaton area still had lead levels above the Cal EPA limits

MORE TO COME:

N/A

Lead results from homes



Los Angeles Times

By Tony Briscoe, Noah Haggerty and Hayley Smith
https://www.latimes.com/environment/story/2025-05-04/the-government-wont-test-soil-on-properties-burned-in-the-la-fires-so-we-did-it-ourselves

Summary of post-fire lead soil results

Preliminary results as of August 2025

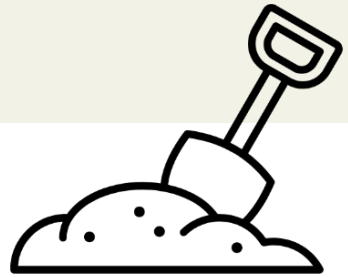
Please see the linked sources for detailed methods, testing info, results, and more results to come (slide meant for summary purposes only)

			Lowest risk	Lower risk	Moderate to higher risk	Hazardous waste
Testing source	**Homes or Areas tested**	**# of parcels**	**≤80 ppm** Cal EPA/DTSC screening level	**≤200 ppm** U.S. EPA screening Level	**<1,000 ppm**	**1,000+ ppm** Cal EPA/DTSC: Treat as hazardous waste
USC CLEAN	Fire area homes + wider	~3,000	57%	33%	9%	Less then 1%
LAC DPH Eaton	Fire area homes: Eaton	~800	46%	40%	14%	Less then 1%
CAP.LA	Fire area homes + wider	~300	34%	41%	14%	Less then 1%
Chapman U.*	Fire area homes *not* slated for soil removal: 10 burned, 10 unburned	~20	34-38%	35%	41-45%	-
Duke U. & Honey Girl Grows*	Fire area homes *slated for* soil removal/destroyed	~44	41%	23%	32%	5%
City of Pasadena	Parks in fire area	5	100%	-	-	-
LA Times*	Fire area homes: 10 after Army Corps soil removal	~40	90%	2%	7.3%	0%

Key point: **Most soil lead levels were generally below the state screening level. Higher soil lead levels may be attributed to older, burned homes and/or some tests conducted prior to remediation/removal. Very few tests were at the "hazardous waste" level.**

Data for these sources are not presented in the exact categories, so numbers are **preliminary ranges or averages based on available online reports.*

Lead in Soil found after the fires



Main points:

Lead poisoning from soil is rare.

Pre-fire background levels of lead in LA soils may also reach over 80 ppm.

The fires likely contributed to additional lead in soils.

Higher levels of lead in soil were found near the Eaton fire than the Palisades fire, likely due to a higher presence of older homes with lead paint.

A majority of soil lead levels were below the state Cal EPA screening levels (80 ppm). Some homes or areas may have higher soil lead levels due to the presence of lead paint, being downwind of the fire, or other site-specific factors.* Overall, very few tests were at the “hazardous waste” level (above 1,000 ppm).

If you are concerned about lead levels in soil, or if your household may be more vulnerable to lead exposures (including pregnant persons and small children), consider remediation and getting a blood lead test for you and your family.

*Site-specific factors could include hot spots from lead burned in car batteries (non-EV), or other historical factors/sources such as lead paint, lead in stained glass, lead pipe caulk, lead pesticides, lead-galvanized pipes/siding, etc.

Lead in Dust: Overview

Regulatory Levels for Lead in Dust

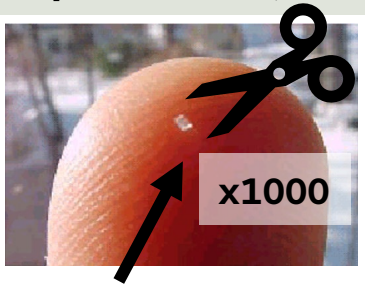
This measurement is based on how much lead is within the *amount of surface area tested*.

This measurement was developed to respond to deteriorating lead paint since small paint chips are easier for kids to "grab".

Dust is more accessible in the home to people, especially children, and is one of the most likely lead sources for children.

Regulated levels of Lead (or Pb) as health-based thresholds		
Agency	**Media**	**Action Level**
US EPA	Dust	• 5 µg/ft^2 for floors (micrograms Pb per square foot) • 40 µg/ft^2 for windowsills • 100 µg/ft^2 for window trough

Visualizing micrograms (µg) of lead per square foot (ft^2)



One microgram (µg) = a single grain of sugar *cut in 1,000 pieces*

One square foot (ft^2) = 12 inches x 12 inches for wet wiping dust

https://archive.cdc.gov/www_atsdr_cdc_gov/csem/leadtoxicity/who_at_risk.html

Lead in Dust: Results After LA Fires

Preliminary results as of August 2025

Caltech

U.S. National Science Foundation

SDSU

San Diego State University

Caltech
SDSU
Eaton Fire Residents United

EFRU EATON FIRE RESIDENTS UNITED

Dust results post-Fires

CalTech, ~300 samples, February 2025: Eaton Area

WHAT WAS TESTED: Separate samples from cleaned and uncleaned locations (not same samples pre/post).

WHAT WAS FOUND:

- Most uncleaned indoor surfaces had lead levels above EPA health limits.
- Lead was highest near windows and doors.
- Cleaning, including wet wiping with soap and water (and not professional remediation), reduced lead levels by up to 90%. In about 10% of cases, cleaned surfaces still exceeded EPA limits.

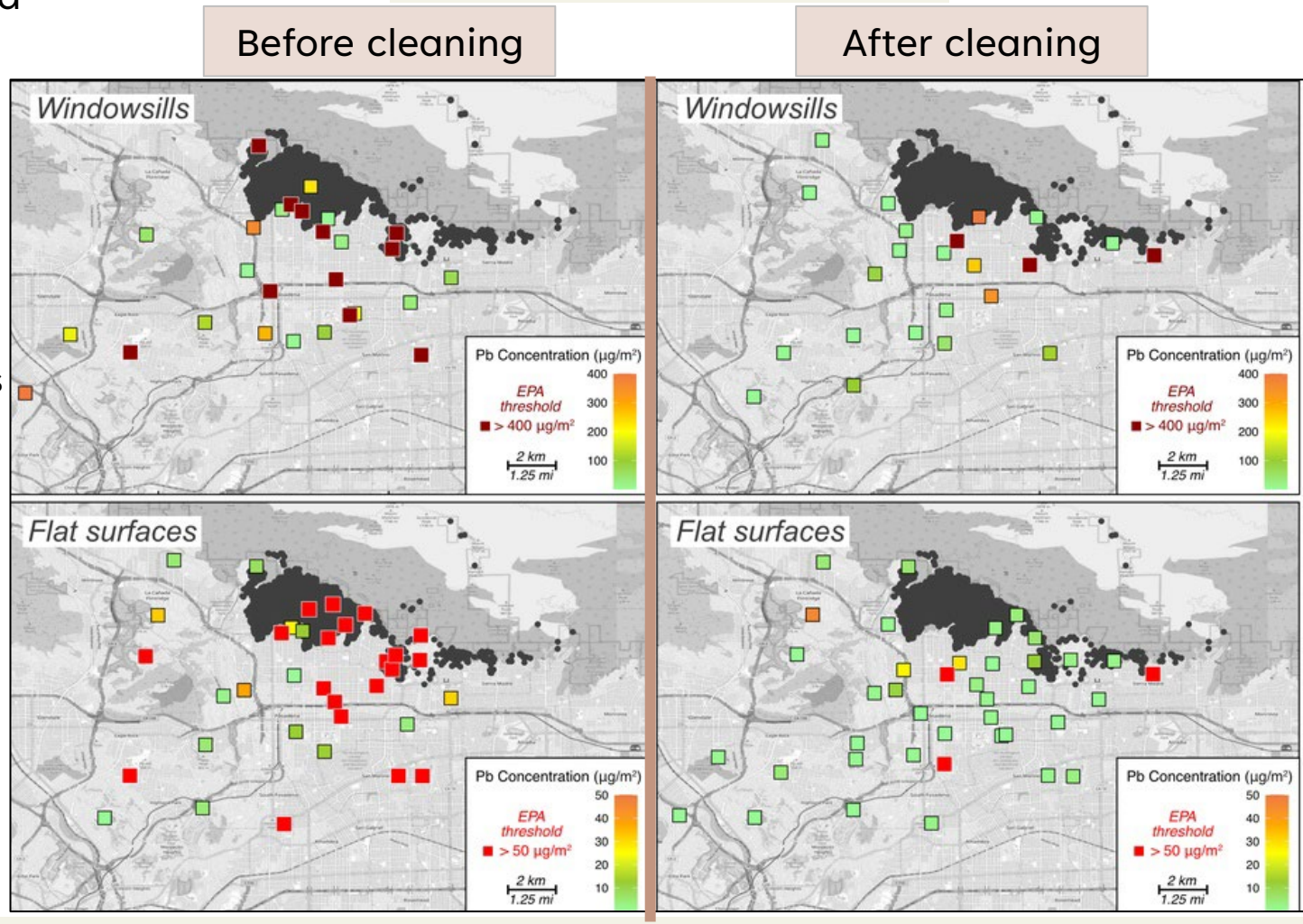
KEY POINT:

Thorough, repeated indoor cleaning helps to reduce dust lead levels—especially near entry points, such as windows. The use of protective equipment and HEPA vacuums is recommended during cleaning.

MORE TO COME:

Testing after debris removal to assess the amount of residual lead present.

Lead on Indoor Surfaces



Dust results post-Fires

CalTech, ~300 samples, February 2025: Eaton Area

Distance from the window	At window		Less than 3 feet		More than 3 feet	
Where sample taken	Windowsills		Flat surface (table, counter, floor, etc.)			
Lead Level (µg/ft²)*	Below EPA Level	Above EPA Level	Below EPA Level	Above EPA Level	Below EPA Level	Above EPA Level
Not Cleaned (# of samples)	39	21	10	24	29	18
Cleaned (# of samples)	24	4	10	5	43	4
% of uncleaned samples below EPA action level	65%		29%		62%	
% of cleaned samples below EPA action level	86%		67%		91%	

Windowsill EPA Dust Action Level = 40 µg/ft²
Floor EPA Dust Action Level = 5 µg/ft²

- ✓ Overall, average lead levels were higher near dust entry points (windows), data not shown.
- ✓ A majority of areas cleaned had lead levels below EPA action level (non-professional cleaning)
- ✓ However, some areas with elevated lead levels may require professional remediation or repeated cleanings

Dust results post-Fires

San Diego State University, 30 samples, March 2025

WHAT WAS TESTED:

- Indoor windowsills and surfaces in 19 homes
- 3 homes had been cleaned before testing

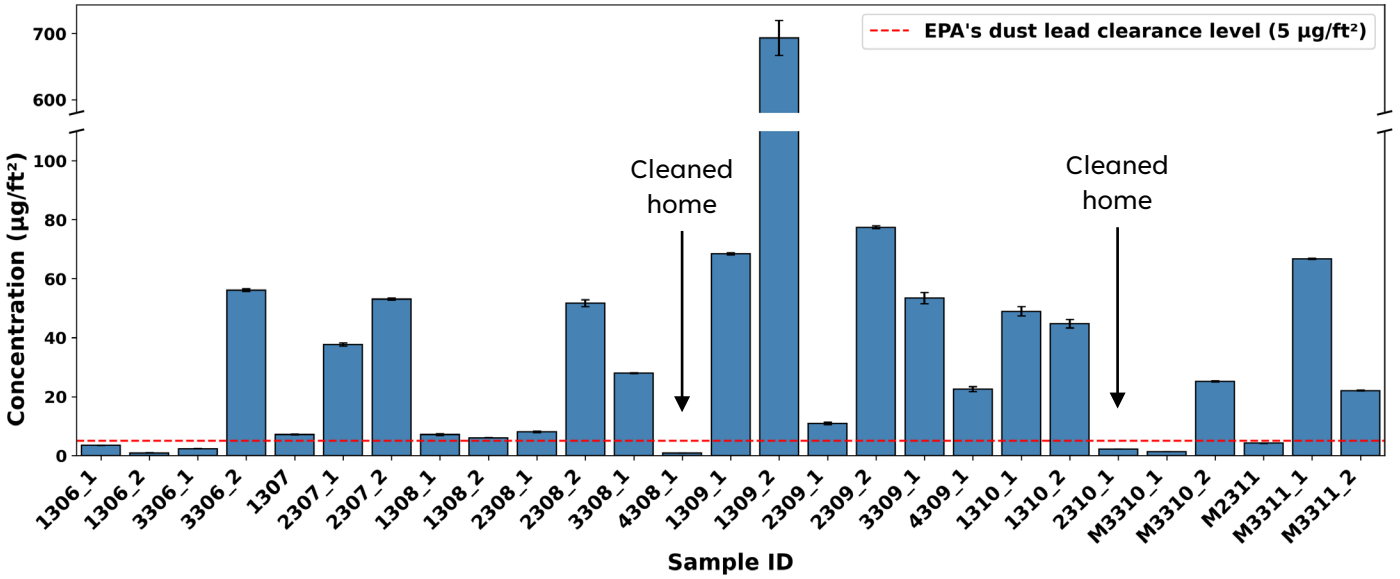
WHAT WAS FOUND:

- Most uncleaned surfaces exceeded EPA dust lead clearance levels
- Highest lead:
  - Windowsills: 61 µg/ft²
  - Entry floors: 77 µg/ft²
  - One garage floor: 693 µg/ft²
- Cleaning (professionally and wet wiping) showed significant lead reduction.

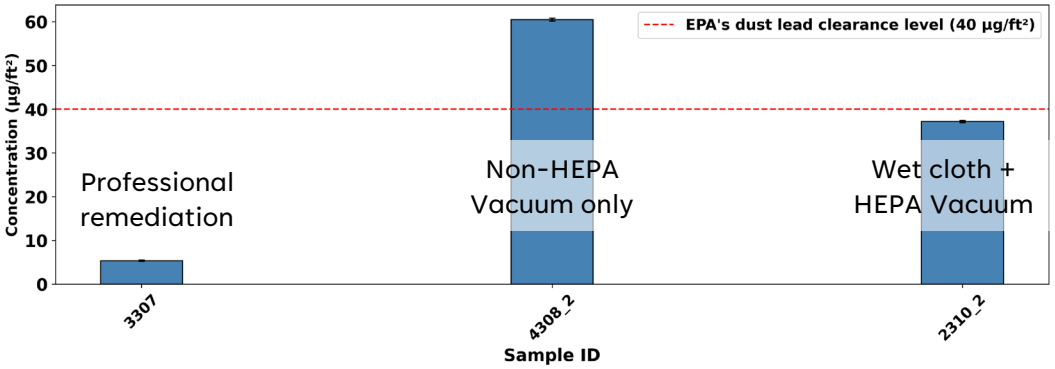
MORE TO COME:

- A second round of indoor sampling was conducted in early August.
- Results are currently being analyzed.
- We will assess the persistence of lead contamination over time and the long-term effectiveness of different cleaning methods.

Indoor surfaces: Cleaned and uncleaned



Indoor windowsills: Cleaning method comparison



SDSU San Diego State University

Dr. Hanyang Li lab with Ehsan Goftari Jose Rivera Carias, London Fulford. Preprint: Post-Wildfire Indoor Pollution in WUI Areas Following the 2025 Los Angeles Fires — Part I: Establishing Baseline Contaminant Levels Prior to Home Reoccupation https://eartharxiv.org/repository/view/9805/

Dust results post-Fires

Eaton Fire Residents United, ~198 homes, Updated July 6, 2025

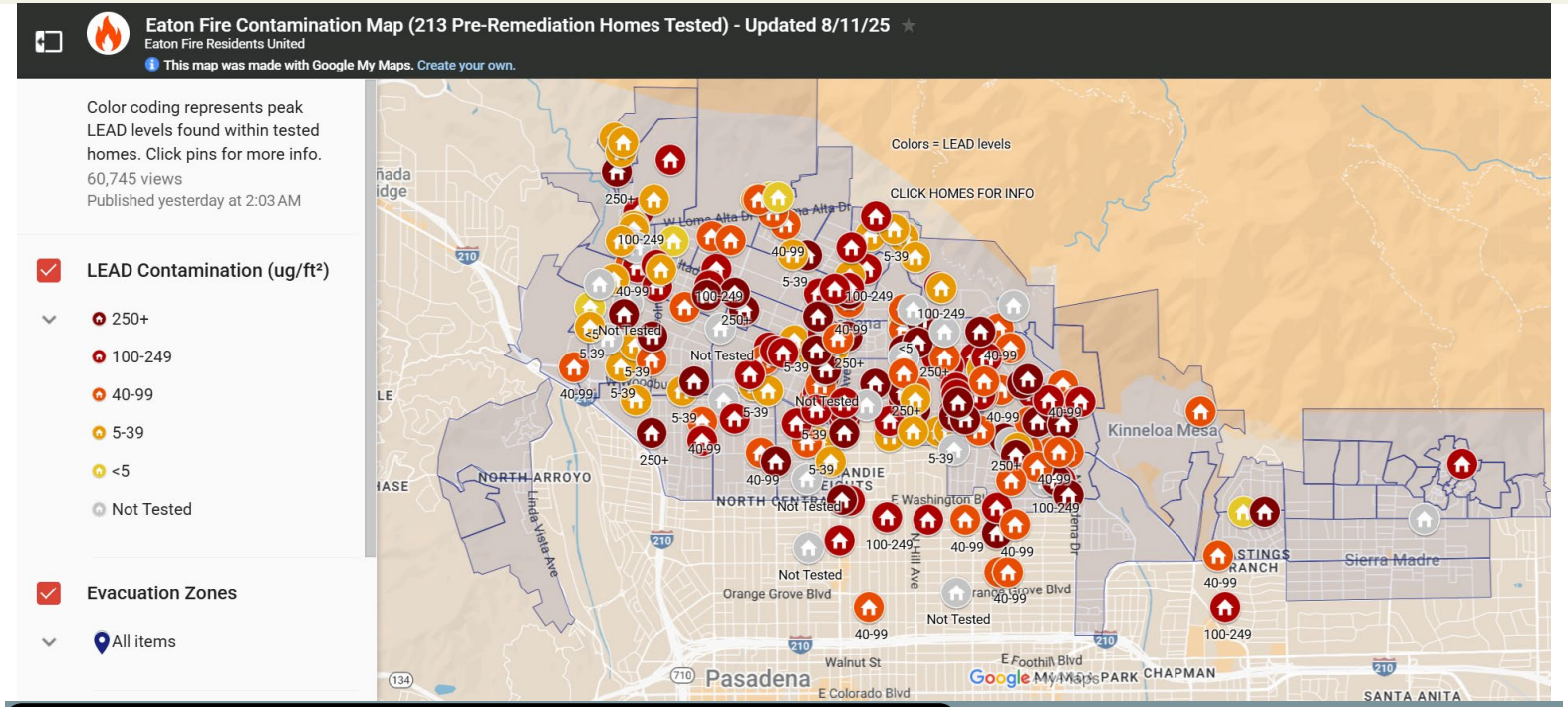
WHAT WAS TESTED: Professional testing of wildfire debris, asbestos, and CAM-17 metals in standing structures, paid for by insurance or private/personal funds by various labs.

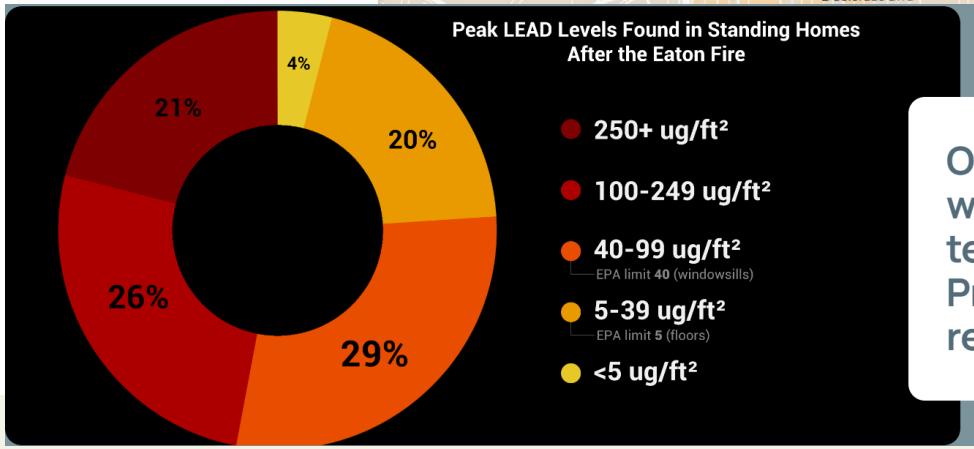
WHAT WAS FOUND:

- All homes had various levels of lead in the dust, most over EPA action levels.
- Results for pre-remediation wildfire debris, asbestos, and CAM-17 metals available now at efru.la

MORE TO COME:

- Post-remediation confirmation testing
- Effectiveness of remediation (professional and DIY) in removing contaminants
- Further analysis of contamination by surface (e.g., floor vs. windowsill) and geographic location
- Advocacy initiatives





Of the 192 standing homes that were tested for LEAD, 100% tested positive. Professional remediation was recommended in all cases.

Lead in Dust - after the fires

Main points:

Lead was found in house dust following the fires, even miles away.

Reducing dust is **most important for children** who tend to play closer to the floor and often put their hands in their mouths.

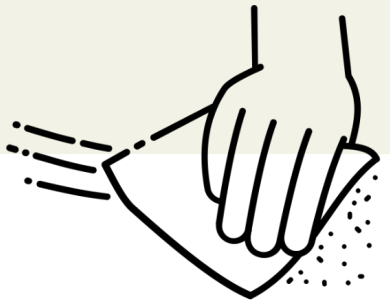
Early results from soap and water cleaning and wet wiping showed lead levels below the EPA action level. PPE is always recommended.

In areas where lead was elevated, PPE, professional remediation, repeat testing, and follow-up cleaning may be required.

Routine cleaning of ongoing dust in fire areas is also recommended.

Reducing exposures to dust and soil

Practical Tips



Wear personal protection (gloves, N95 masks, Tyvek suits,etc).

Clean, but use wet wiping/mopping with soap and water.

- Routinely clean door thresholds and windowsills (or other entry points for dust, such as chimneys).
- After a fire, do not use vacuums or sweep to reduce re-suspension of contaminants in dust or soil.

Carpets, rugs, and soft materials are harder to clean.

- Use/rent a HEPA-filtered vacuum. Take rugs outside to wash. Alternatively, layer washable rugs or blankets for babies close to the ground *until* the carpets can be properly cleaned.
- Wash soft materials when possible.

Reduce dust tracked into the home.

- Removing shoes, clothes after gardening.
- Cleaning paws of pets, or limiting pet access to contaminated areas.

Clean spaces for kids/babies frequently.

- Lay down clean, washable blankets or clean areas.
- Focus on where babies may conduct hand-to-mouth activities (where babies can reach).

Remediation for soil with higher lead levels may include:

- Covering contaminated soil with new, clean soil (note: soil from a hardware store is not routinely tested for metals).
- Planting vegetation (such as grass) to act as a barrier.
- If able, the best remediation strategy is for professionals to scrape off layer(s) of soil and retest until the soil is at background or health screening levels before adding clean soil on top.

More reading: https://dtsc.ca.gov/emergency-guidance-on-wildfires-1/ and https://dtsc.ca.gov/emergency-guidance-on-wildfires-2-2/
https://scienceexchange.caltech.edu/topics/sustainability/ask-expert-sustainability/wildfire-california-hazards-of-smoke-paul-wennberg
https://cires.colorado.edu/news/how-mitigate-post-fire-smoke-impacts-your-home

Vulnerabilities to lead exposures in dust and soil

Populations who may have *higher* exposures or who are *more vulnerable* to lead (or other fire contaminants) from dust or soil

Infants, toddlers, young children:

- Everything goes into the mouth (increasing eating dust, dirt)
- On the floor and close to the ground more often
- Especially at risk if already living in older, poor-quality housing and/or living near airports (who still can use some lead gasoline)
- Especially if nutrition is limited

Cleanup or outdoor workers:

- Workers without PPE (or who incorrectly wear PPE) who are routinely cleaning up dust, ash, or soil

Other specific scenarios with higher lead exposures for self *and* family:

- Jobs include smelting, battery recycling, and construction, such as renovation of older homes.
- Use of some lead-containing products: jewelry, ceramics, spices, etc.
- Persons who use firearms or have retained bullet fragments in their bodies.

Lanphear B et al. N Engl J Med 2024;391:1621-1631

Wrap-up and Discussion

Post-Fire: Dust and soil

Main points:

Toxic heavy metals have been found in soil and in dust following the fires.

Lead (or other contaminants) in dust and soil are a health risk:

- If they are present at *high* levels AND
- If there is a chance of eating or breathing in a significant amount of soil and disturbed dust (particularly for children, pregnant persons, or other vulnerable populations)

In general, and especially if levels were low, **routine cleaning is a great option for reducing contaminants in your home**. If levels were high, consider professional remediation and other measures.

Lead is only one of the contaminants that may be present in dust, soil, or ash from the fires. Testing is still happening, we're still learning, and protecting yourself as much as possible is always best practice.

If you have concerns, the best way to understand your or your family's lead exposure is to **get your Blood Lead Levels tested**.

Discussion questions

- **If you go back to January during the fires, what info would you have wanted to know immediately about dust and soil? Did any of you or your communities work with ash, dust, or soil soon after the fires (i.e., sifting/raking of ash looking for valuables, cleaning, etc)?**
- **What was understandable, and what was missing from what we presented today? What could be improved in the communication and understanding of soil and dust?** Particularly for vulnerable or at-risk groups?
- Have you noticed excess dust or ash around your home following the fire? Have you had professional cleaning done, or have you cleaned the area yourself?
- What is more concerning to you, soil or dust with high lead levels?

Kids and babies

Example scenario:

Grace: You are 10 years old, have asthma, live directly across from the fire zone, and walk to school.

- Live in a 1920s small apartment rental.
- Unaffected by fire damage, but within a few miles of the fire.
- 1-year-old sister loves looking out the window, and hand-to-mouth is common.
- Outside is bare soil with mulch, but concrete sidewalks lead to and from the house.

What might the family consider?

Workers

Example scenario:

Clara: You are 60 years old, have high blood pressure, and work in housekeeping in the fire zones. It's hard for you to do housekeeping in a mask, and you don't think you need to wear one if indoors. Plus, you don't want your clients to believe you are sick.

- Cleaning homes 8 hours a day using what is available in the home: vacuuming, wiping surfaces, dry sweeping, etc.
- Young kids at home school pickup after

What might the family consider?

Los Angeles Times

CLIMATE & ENVIRONMENT

Only a fraction of fire cleanup workers are protecting themselves against toxic debris. One community center is fighting to change that

Debora Gonzalez, left, and Jonas Mendoza, right, teach fire cleanup workers safety training such as proper fitting and use of a respirator and proper wearing of protective clothing for cleaning disaster sites through the National Day Laborer Organizing Network in Pasadena on Jan. 31. (Allen J. Schaben / Los Angeles Times)

By Noah Haggerty
Staff Writer | Follow

Published May 22, 2025 | Updated May 23, 2025 8:55 AM PT

Current Free Resources

LA County FREE blood lead level testing:

- http://publichealth.lacounty.gov/media/Wildfire/
- http://publichealth.lacounty.gov/media/eaton-soil-testing/ - LEAD Blood Testing: http://publichealth.lacounty.gov/media/wildfire/#:~:text=FREE%20BLOOD%20LEAD%20TESTING

LA County FREE soil testing:

http://publichealth.lacounty.gov/media/eaton-soil-testing/

USC CLEAN FREE soil testing (at least until end of 2025):

https://publicexchange.usc.edu/la-wildfire-soil-testing/

Blood lead level screening:

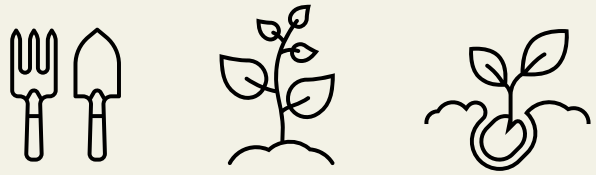
•Visit Your Medical Provider

- Ask your doctor for a blood lead test.
- Testing is covered by most insurance plans, including Medi-Cal.

•Go to a Quest Lab for a Free Blood Lead Test

- Dial 1-800-LA-4-LEAD to request a free appointment through Quest Labs.
- Simple, convenient, and confidential.

Gardening and Lead in Soil



Always ideal to get your soil tested to know if you have issues!

Raised beds can help reduce risk, but remember that soil from hardware stores is not tested for metals such as lead.

Wash produce!

Wash yourself before and after gardening activities!

Great guides and information for gardeners with potential soil contaminants:

- https://ucanr.edu/site/urban-agriculture/soil-contaminants-and-soil-testing
- http://publichealth.lacounty.gov/eh/docs/ab1990_soilwatertestingguidelines.pdf
- https://extension.oregonstate.edu/catalog/pub/em-9397-5-steps-healthy-produce-during-wildfire-smoke