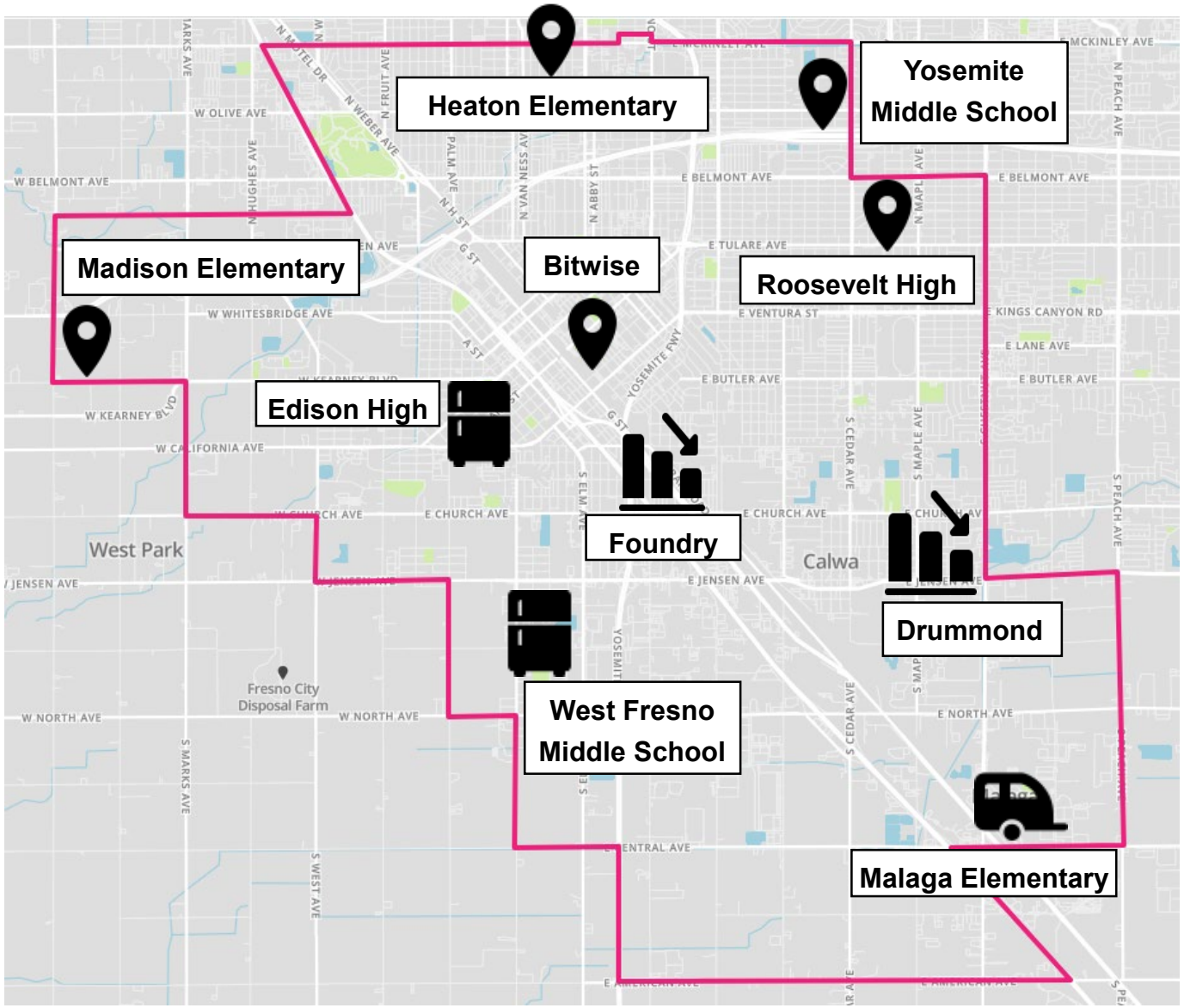
Update on South Central Fresno Community Air Monitoring

South Central Fresno CSC
March 20, 2024

Air Monitoring Update

- Status of Community Air Monitoring Plan Implementation
- Review Air Monitoring Data Collected
- Questions, Comments, And Recommendations

Air Monitoring Locations



PM2.5 Monitor

Compact System: PM2.5, Black Carbon, Ozone, BTEX, NOx, VOC, CO (Edison), Toxics (Edison), SO2 (West Fresno)

Regulatory Air Monitor: Foundry (PM2.5), Drummond (Ozone, NO2, PM10)

Trailer: PM2.5, Black Carbon, Ozone, CO, NO2/NO, H2S/SO2, BTEX

Mobile Monitoring

Van: respond to community concern

Community Air Monitoring Platforms

Community Air Monitoring Platforms (cont'd)

Ongoing Community Air Monitoring

- District continuing to conduct localized air monitoring in the South Central Fresno community and providing weekly updates in English and Spanish
- Fully deployed air monitoring platforms across the community, according to Community Steering Committee recommended network design
- Air monitoring van available to monitor pollutants in areas of interest of the community
- Extensive PM2.5 and VOC speciation sampling and laboratory analysis being conducted since late 2019
- Continue to seek input from CSC for suggestions (during CSC meetings, via email or phone)

Air Monitoring Update Summary

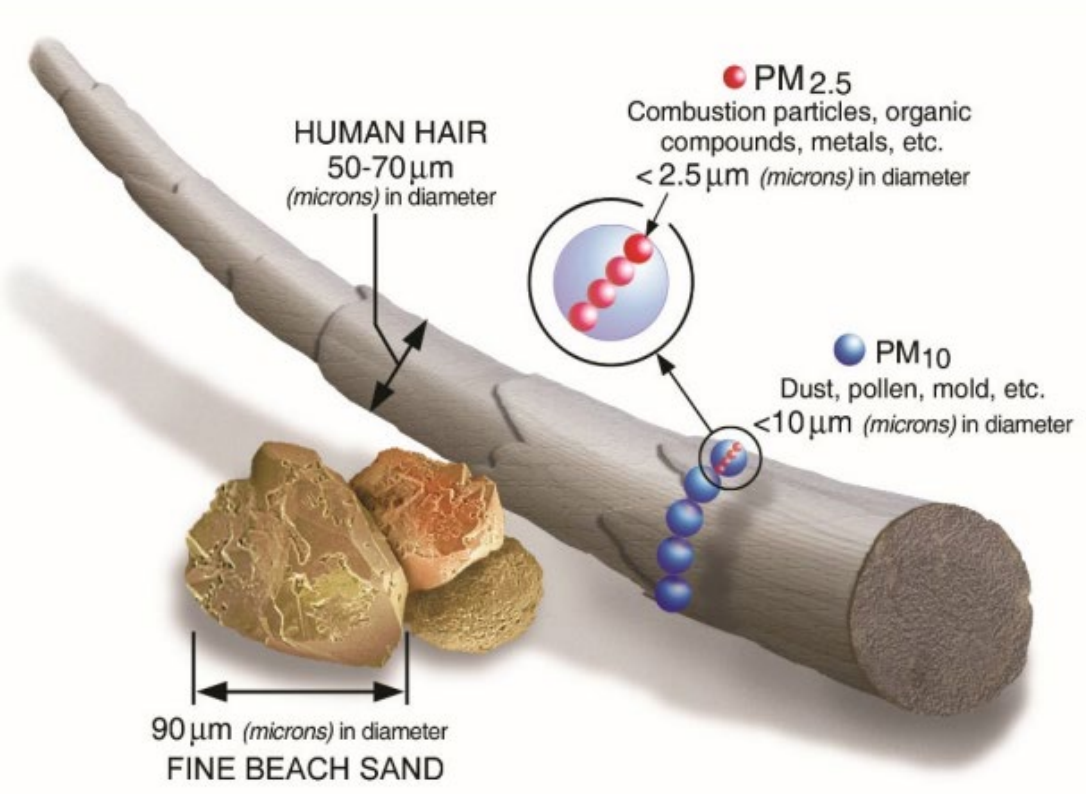
Overall PM2.5 levels in 2023 mostly lower than 2022

For 2023, PM2.5 levels at Fresno AB 617 sites below current federal annual PM2.5 standard

In 4th quarter, PM2.5 levels typically rise due to stagnant air and wood burning

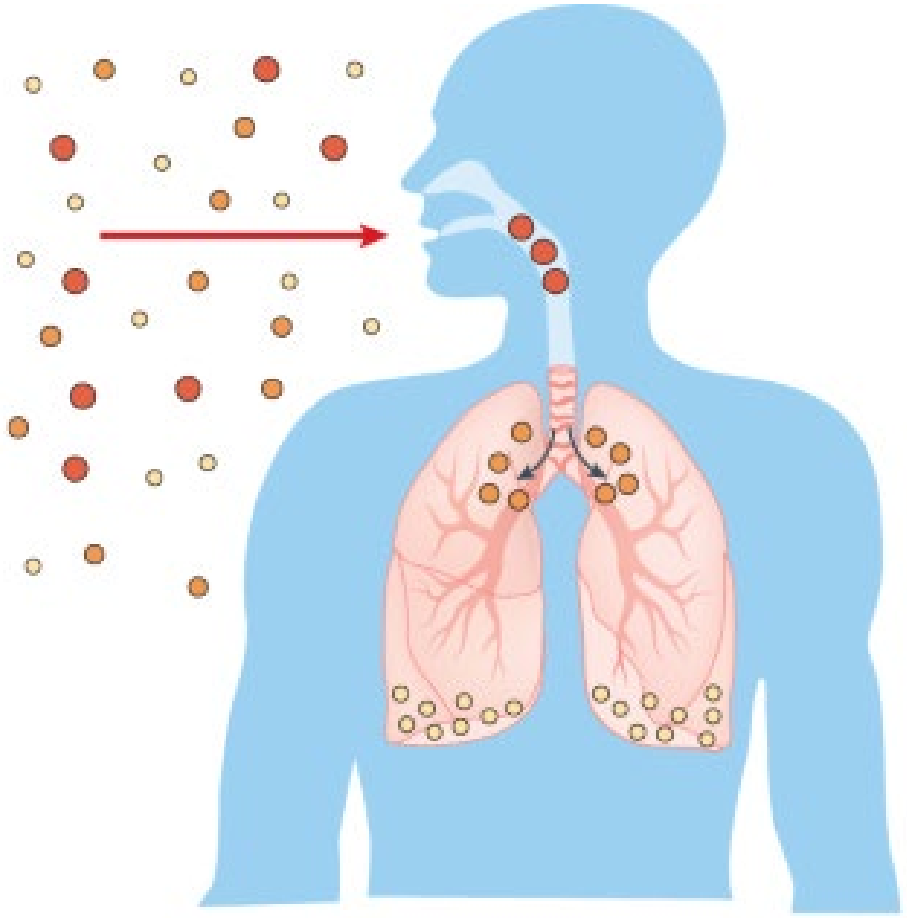
Winter Air Pollution: PM 2.5

- PM2.5 is primary pollutant during winter
- Can be emitted directly, like smoke from fireplaces
- Can be formed in the atmosphere when certain compounds are present, like NOx from trucks
- PM levels worse when inversion layer, or lid, sits over Valley



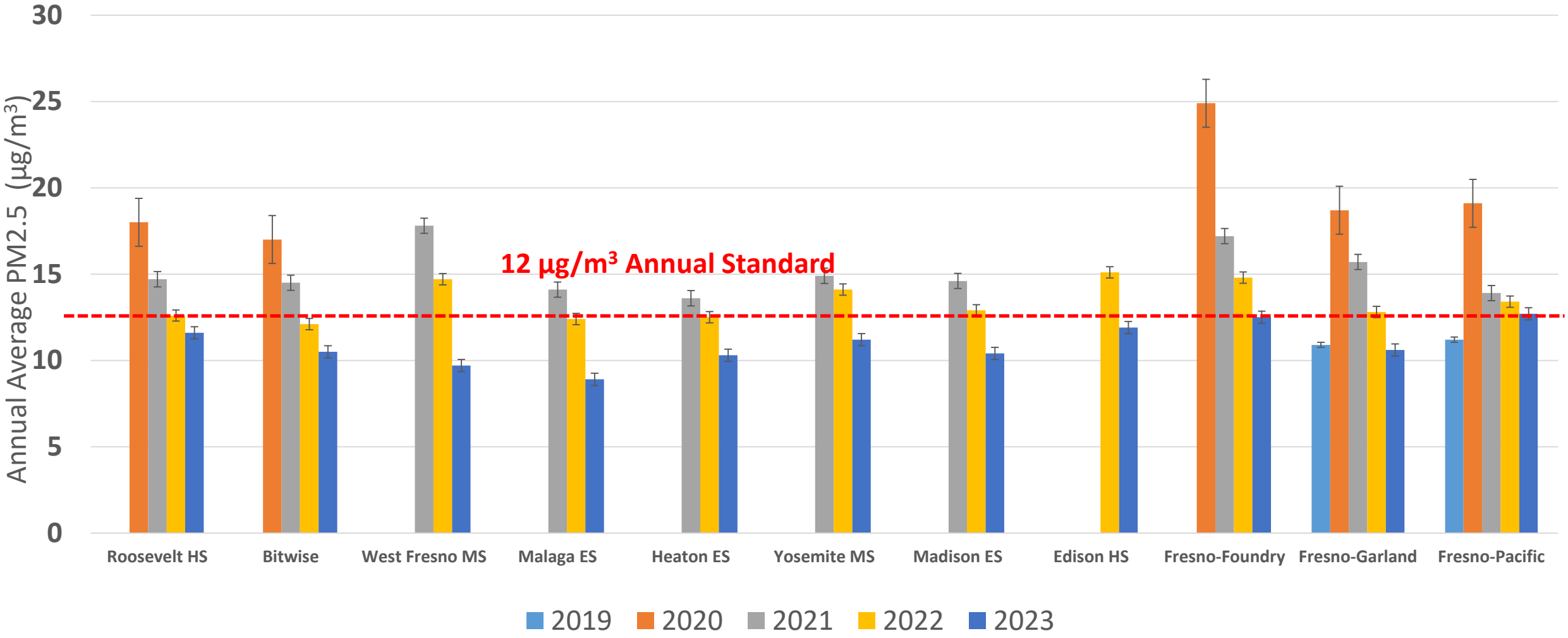
Health Effects of PM2.5

- Premature death in people with heart or lung disease
- Aggravated asthma
- Increased respiratory symptoms – irritation of the airways, coughing, difficulty breathing
- Decreased lung function in children
- Irregular heartbeat and nonfatal heart attacks
- Increased respiratory and cardiovascular hospitalizations
- Chronic bronchitis
- Lung cancer



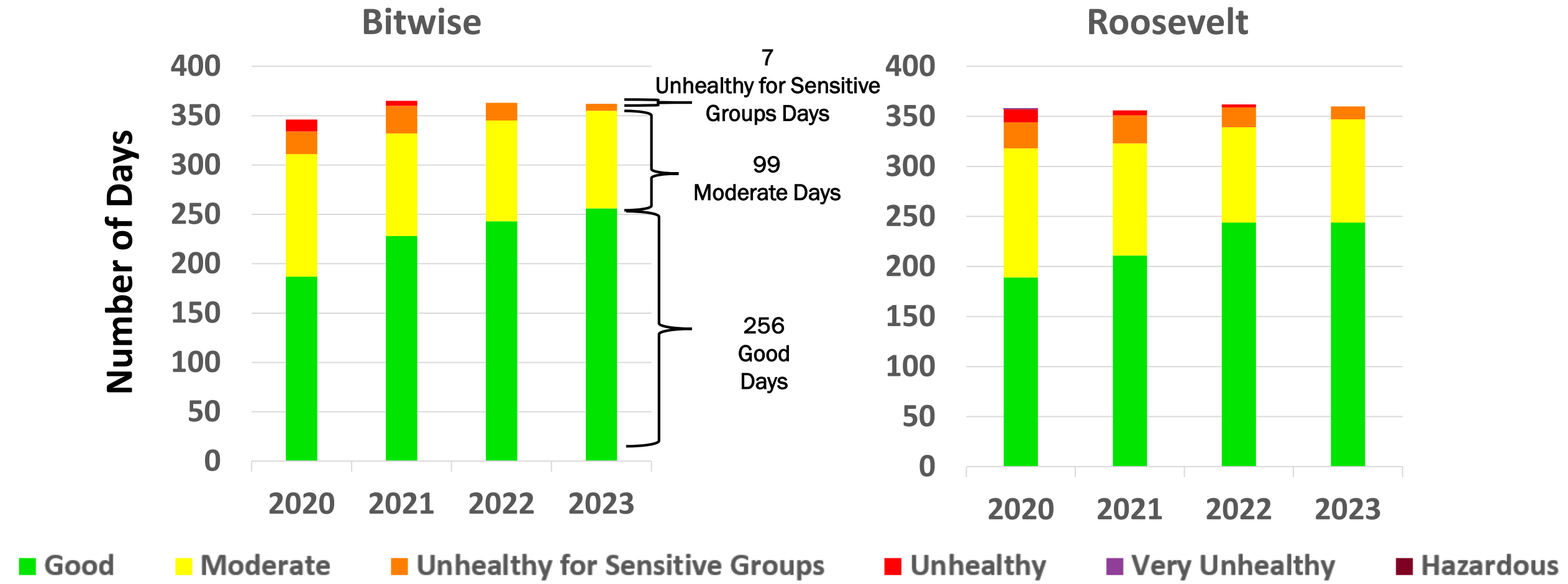
What is an Inversion Layer?

Update on 2023 Annual PM2.5 Average



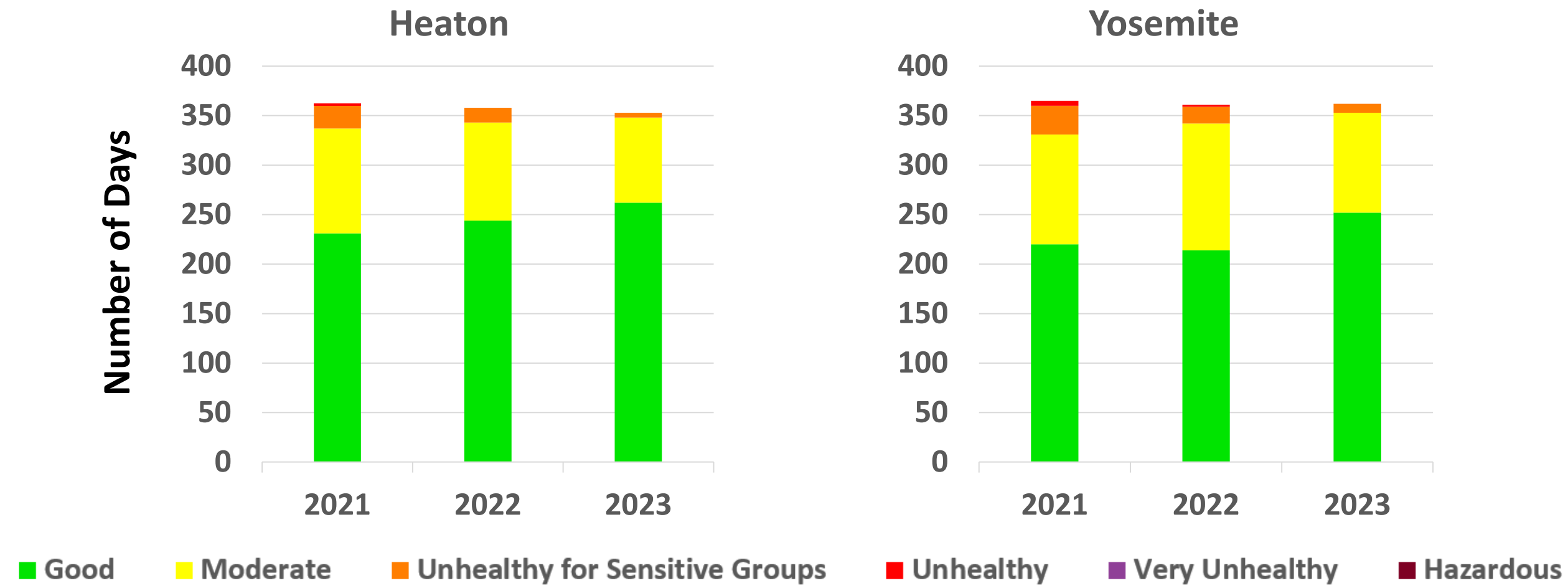
Decreasing PM2.5 levels year over year at all locations

Annual Air Quality Trends



Majority of days are "Good" and improving

Annual Air Quality Trends



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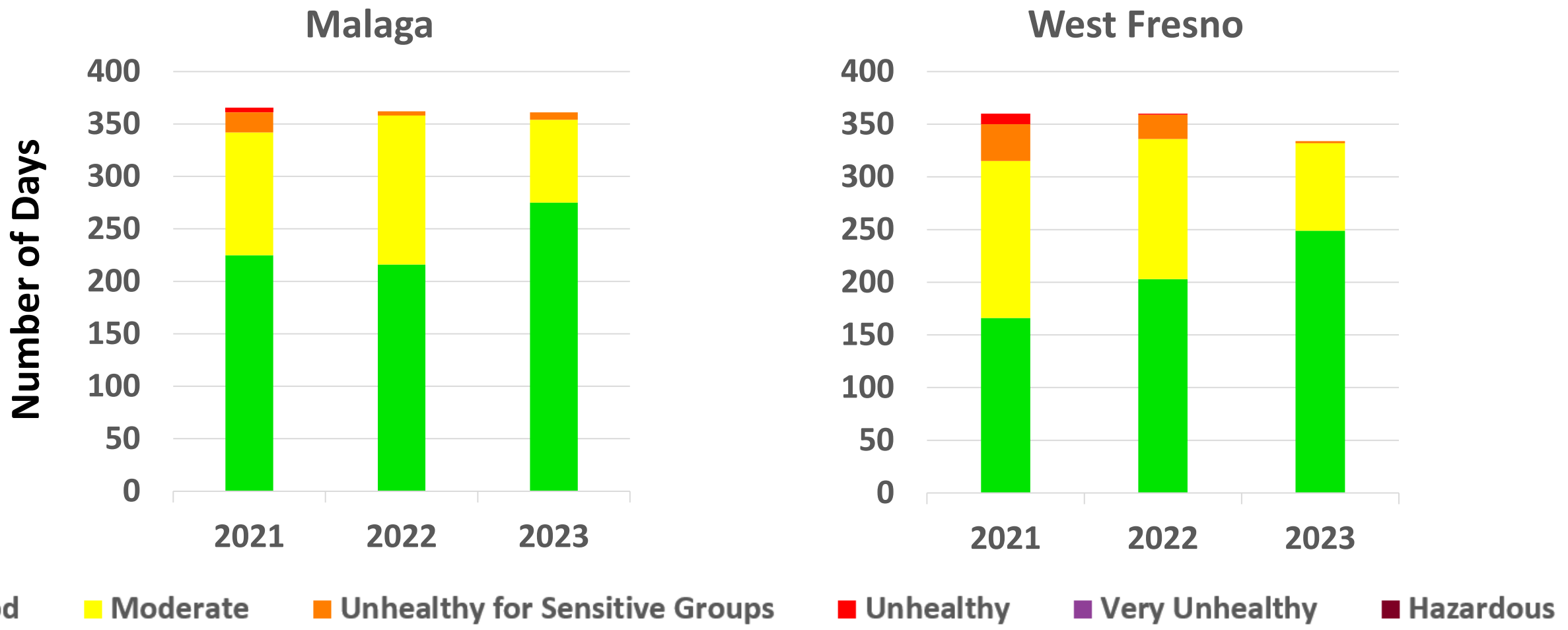

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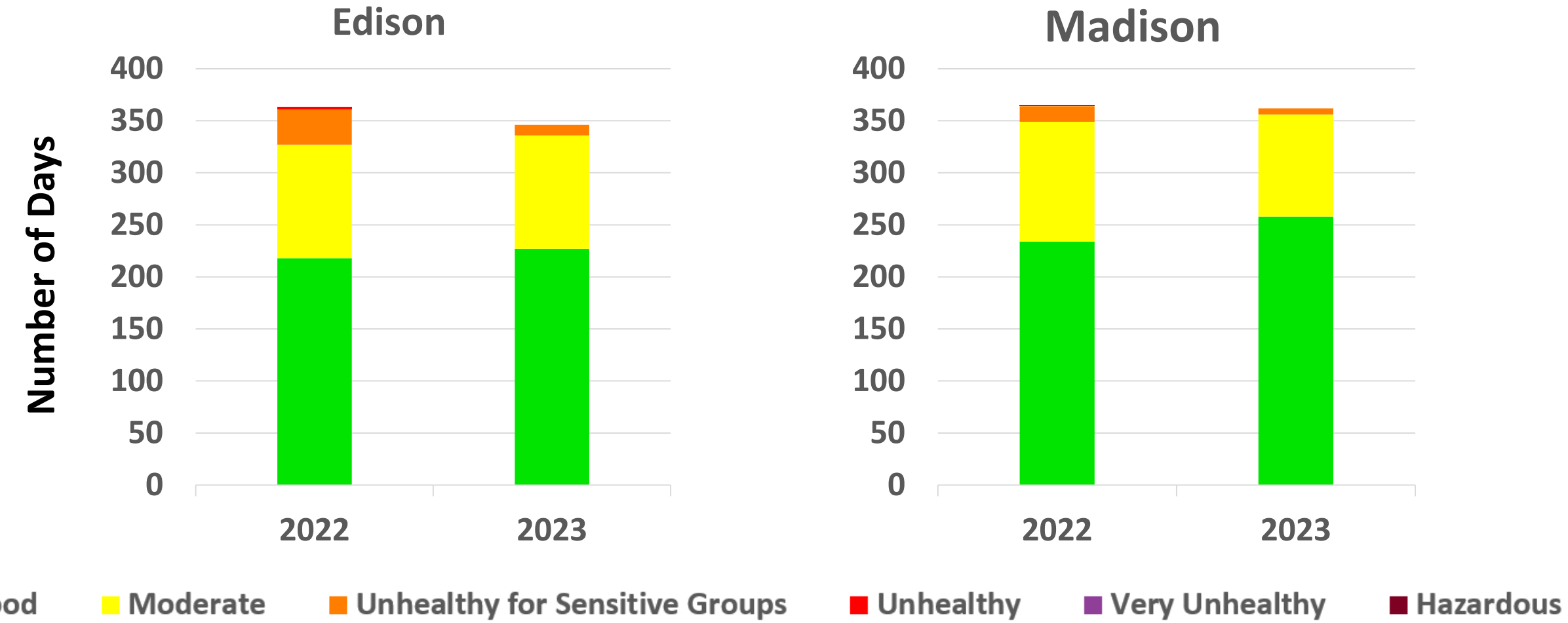

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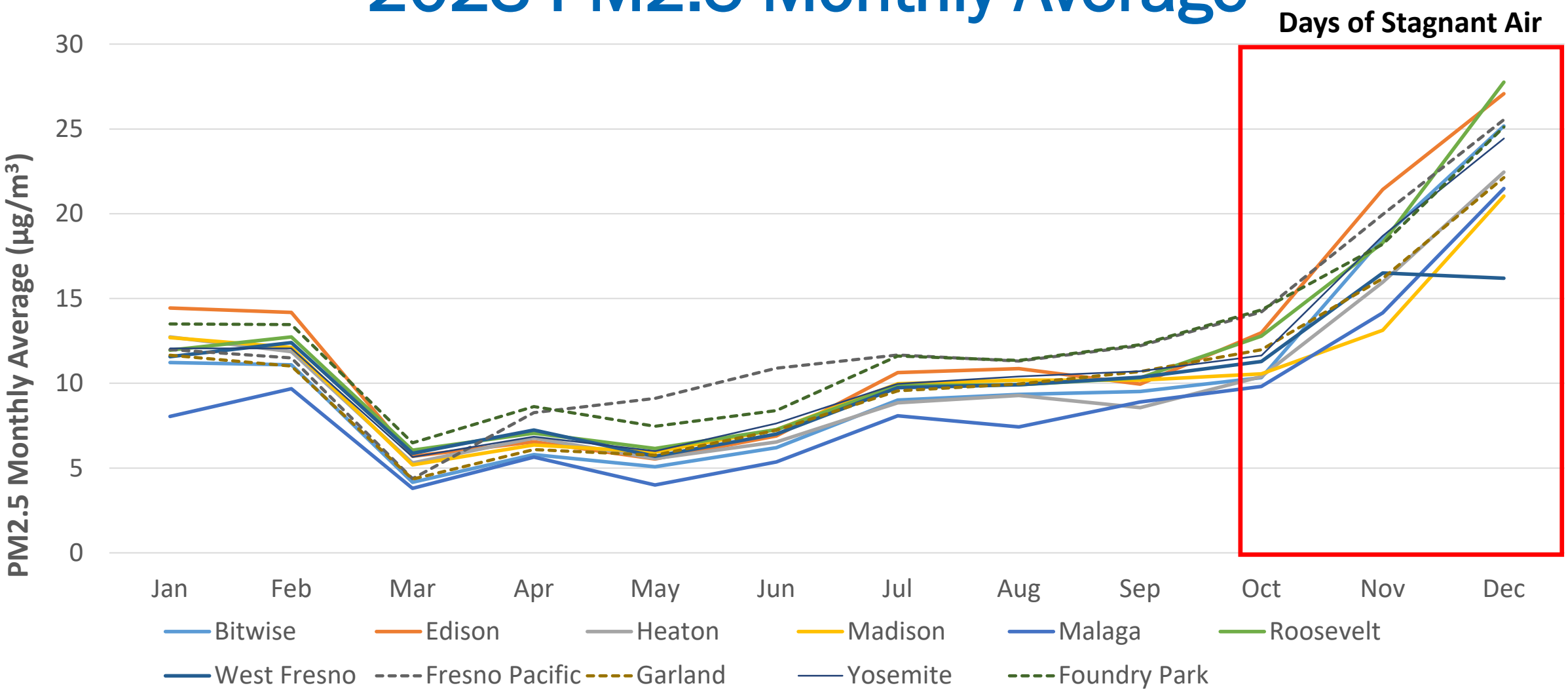
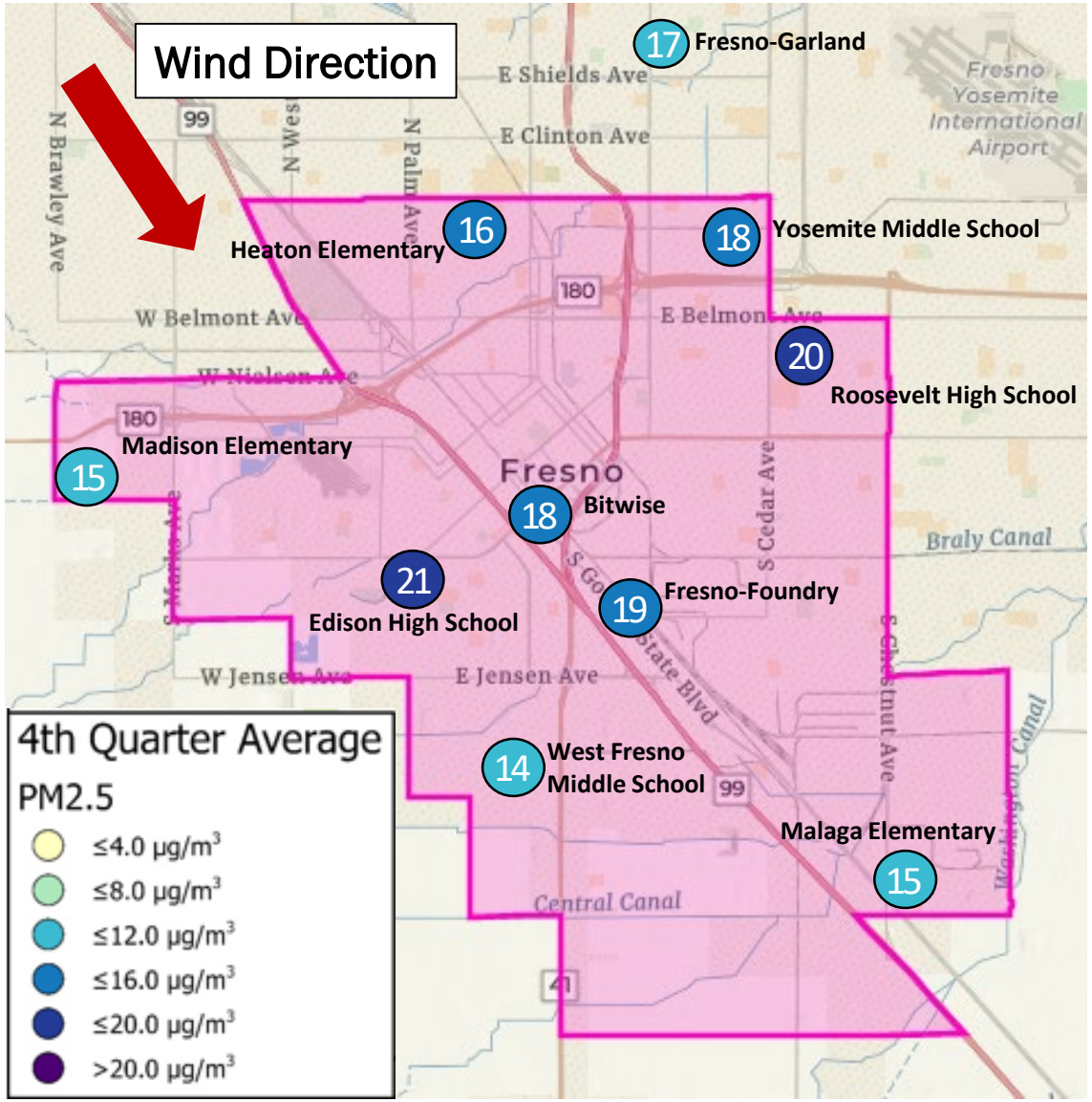
2023 PM2.5 Monthly Average



Increased PM2.5 levels are typical in winter. Differences among sites explored in following slides.

October-December 2023 Average PM2.5 Levels

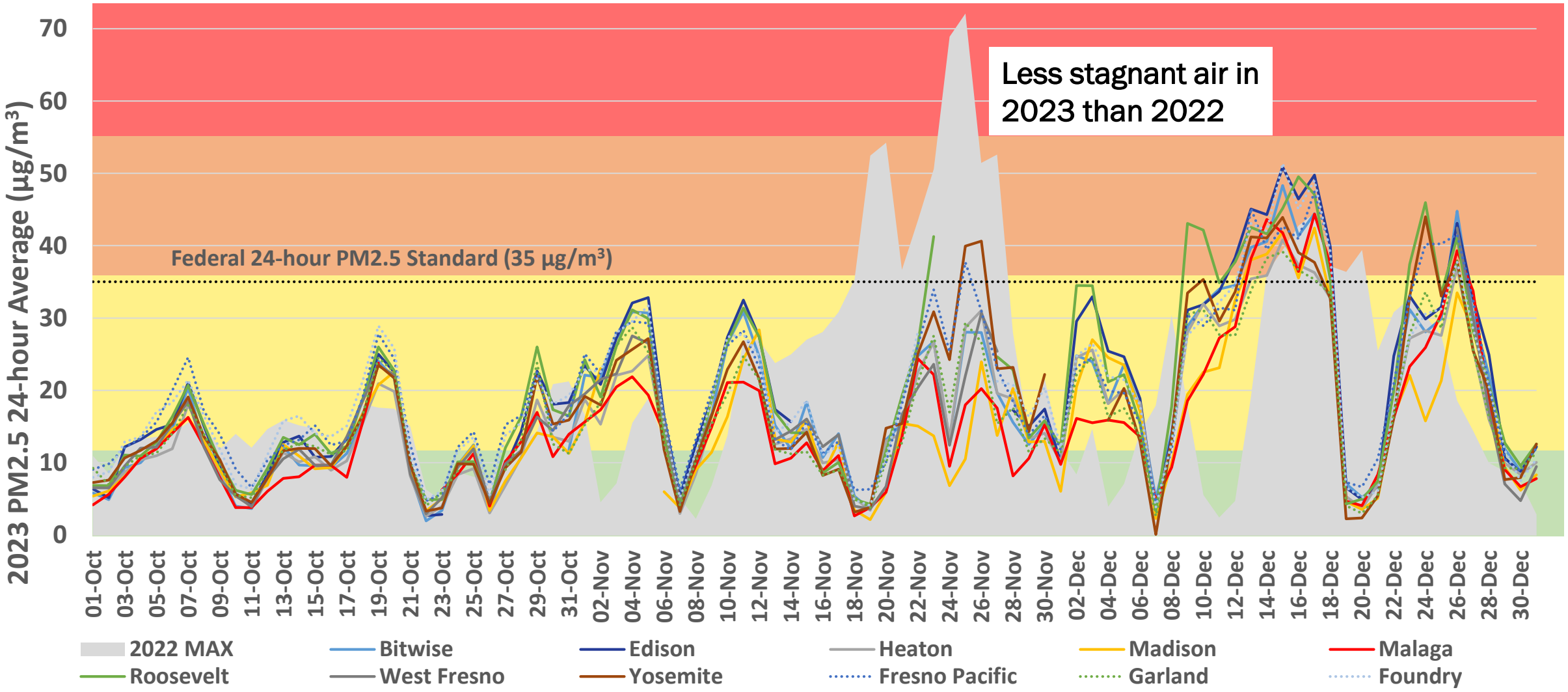


Highest quarterly PM2.5 average was 21 µg/m³ at **Edison High**

Lowest quarterly PM2.5 average was at West Fresno Middle School

2023 quarterly PM2.5 average at all sites similar to 2022

Daily Average PM2.5 October – December 2023

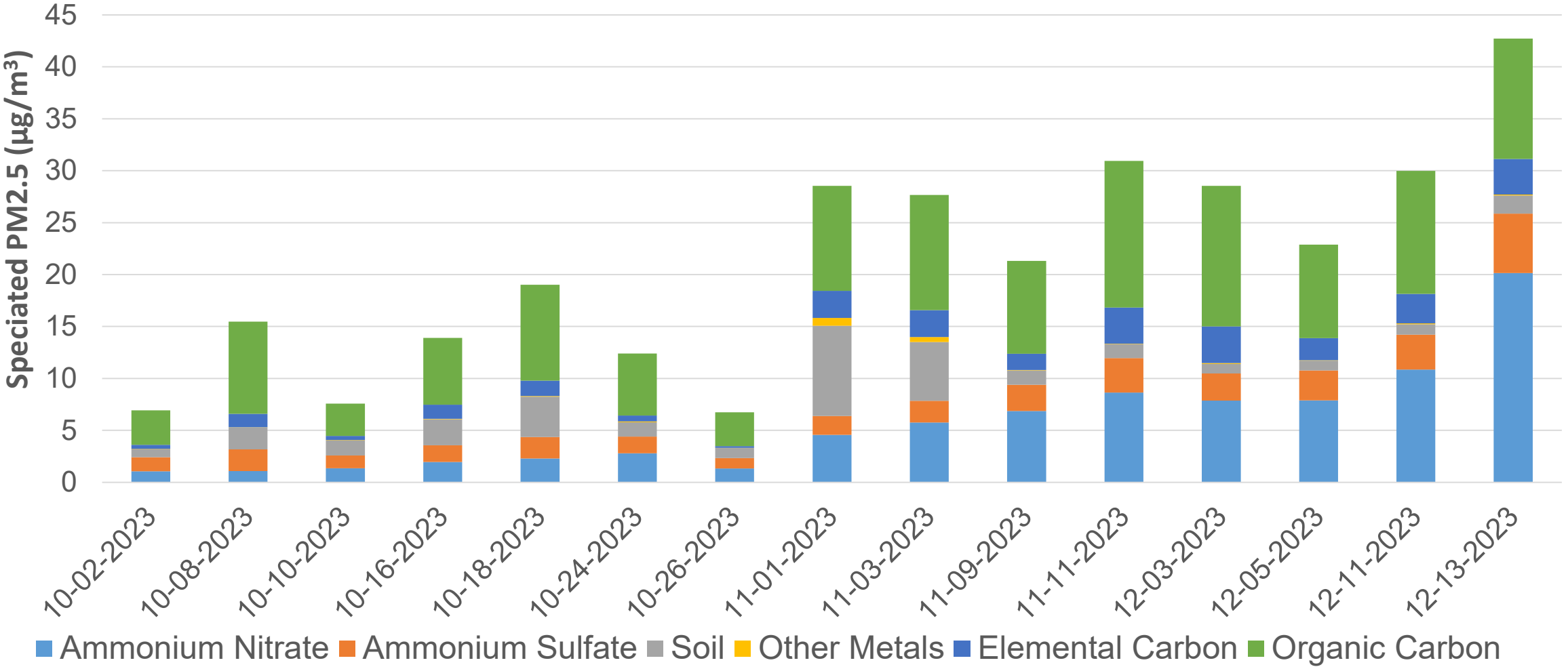


Lower Peak PM2.5 level in 2023 than 2022 due to less stagnant air.

Types of PM2.5

Ammonium Nitrate:	• Formed in atmosphere (not emitted) from emissions of nitrogen oxides (NOx), which is mostly from mobile sources.
Ammonium Sulfate:	• Formed in atmosphere (not emitted) from emissions of sulfur oxide (SOx) from mobile sources and industrial processes.
Organic carbon:	• **Directly Emitted:** combustion including cooking, industrial processes, mobile source exhaust, tire wear, and wood burning • **Formed in Atmosphere**: from wood burning, solvent use, and industrial processes. • **Wood burning indicators:** Levoglucosan, mannosan, galactosan, potassium ions
Elemental Carbon:	• Directly emitted, also known as soot or black carbon, and is formed during incomplete combustion in fuels, including mobile exhaust (mainly diesel) and wood burning
Soil:	• Road dust and soil dust in the air from activity, such as soil disturbance or airflow from traffic.
Other Metals:	• Components from soil emissions or found in other particulates having been emitted in connection with combustion from engine wear, brake wear, and similar processes. Also fireworks.

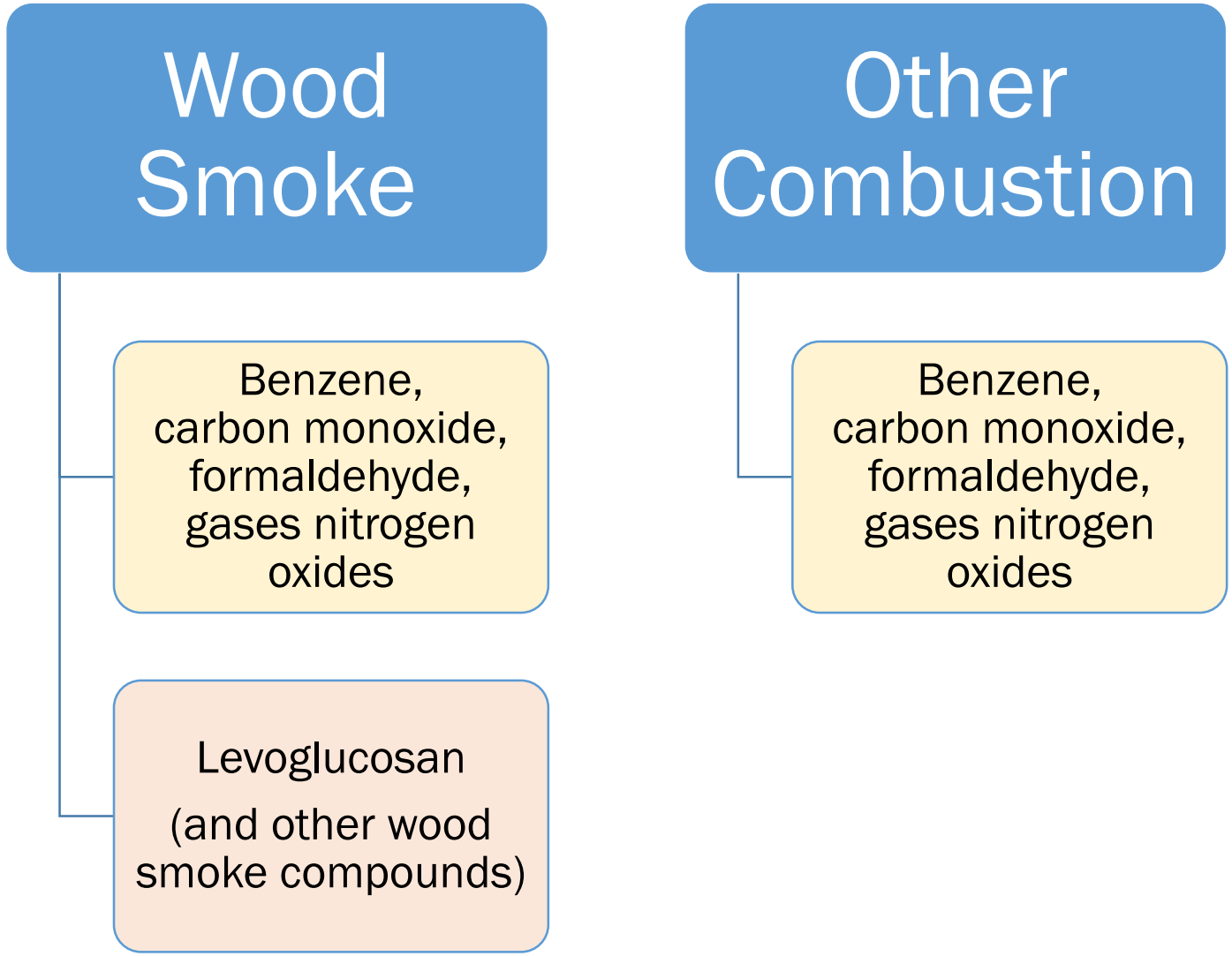
Types of PM2.5 at Edison High School
October – December 2023



PM2.5 levels rise in the winter with more ammonium nitrate and increase in organic carbon.

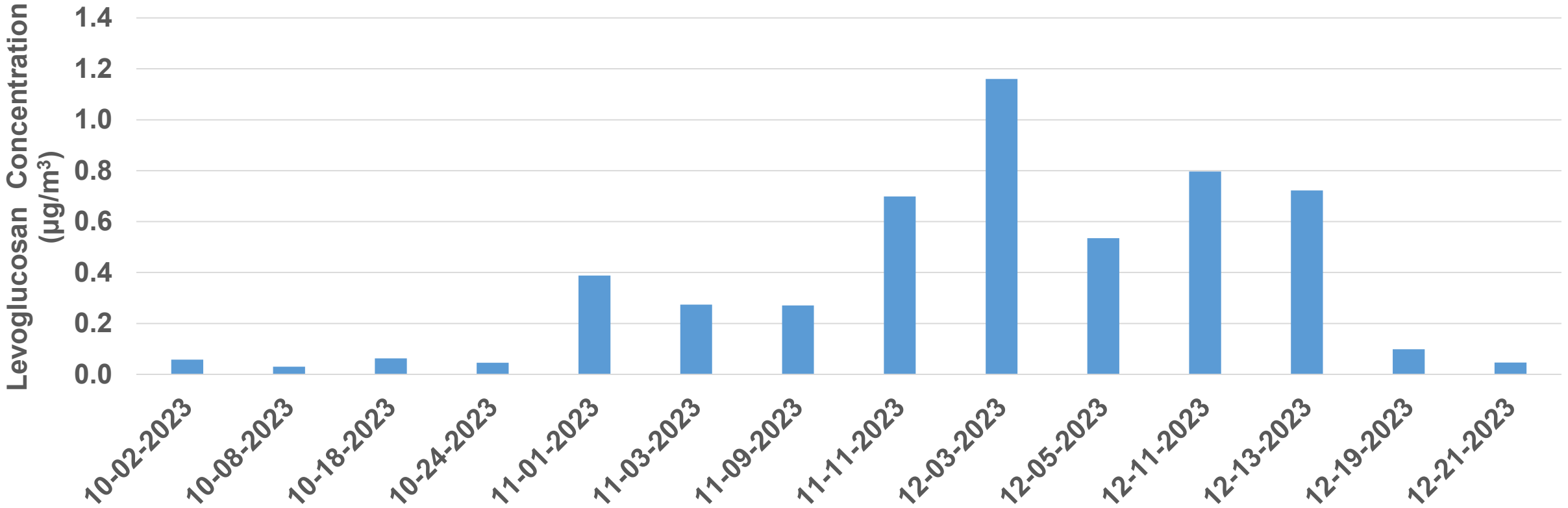
How can we tell if the PM2.5 is from wood burning?

- As an example, here are some compounds and chemicals that are present in wood smoke and other types of combustion
- Levoglucosan is monitored because it is not from other types of combustion
- Levoglucosan is only from wood smoke



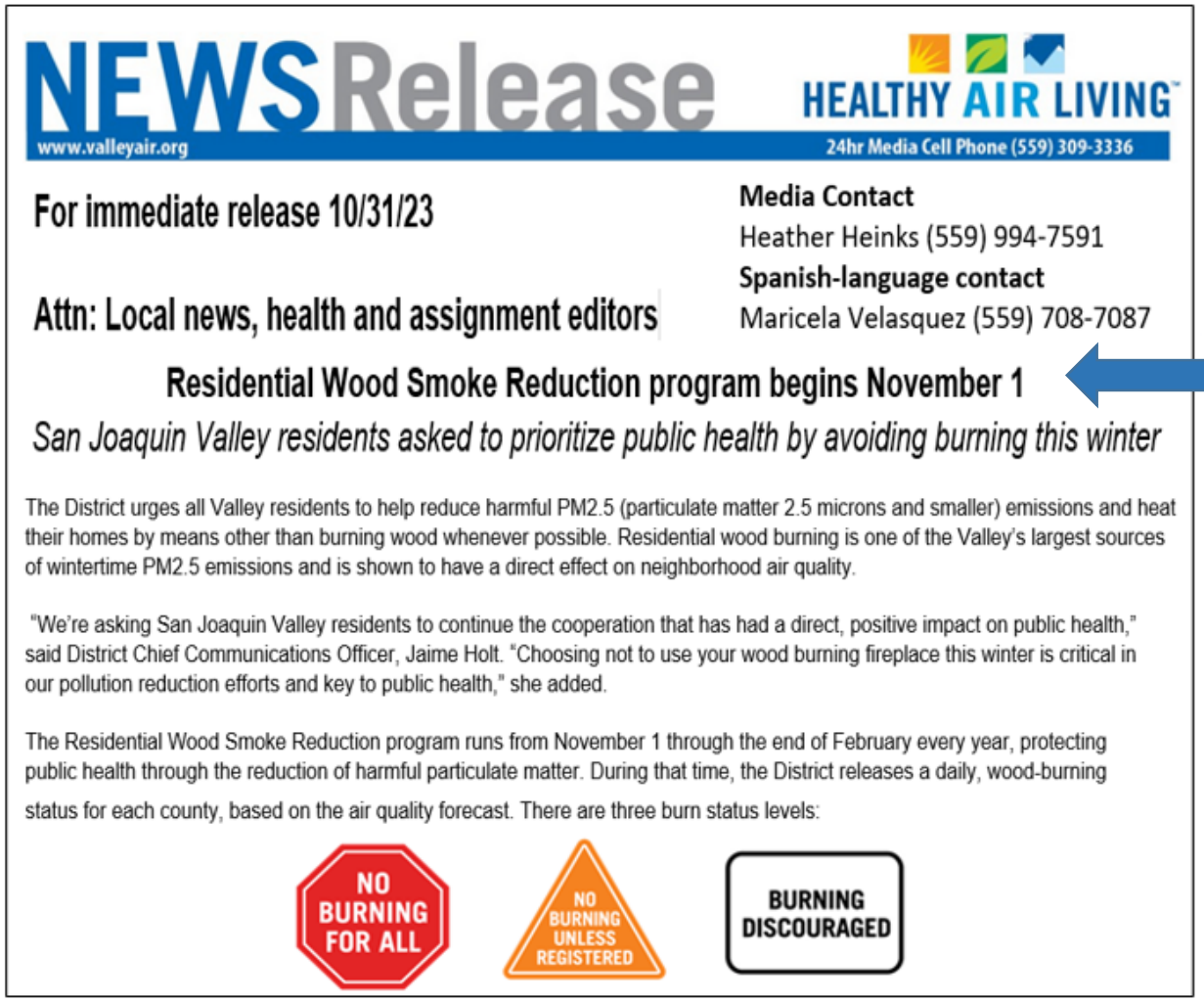
How can we tell if the PM2.5 is from wood burning?

There is a compound called “levoglucosan” that can let us know whether the PM2.5 we collected came from wood burning. Based on the CSC and District concerns, we began testing in October 2022.



Increase in wood burning starting in November. This can mean that wood burning of any kind is occurring, including residential & illegal open burning.

How can the District make sure the community knows that we expect worse air quality?



NEWS Release

HEALTHY AIR LIVING

www.valleyair.org

24hr Media Cell Phone (559) 309-3336

For immediate release 10/31/23

Media Contact
Heather Heinks (559) 994-7591
Spanish-language contact
Maricela Velasquez (559) 708-7087

Attn: Local news, health and assignment editors

Residential Wood Smoke Reduction program begins November 1

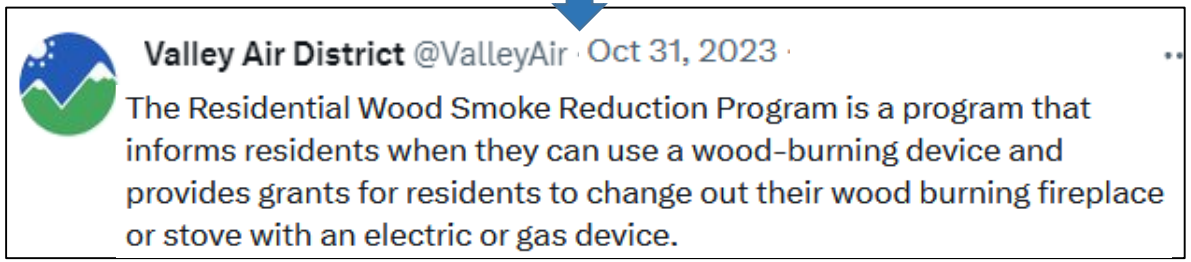
San Joaquin Valley residents asked to prioritize public health by avoiding burning this winter

The District urges all Valley residents to help reduce harmful PM2.5 (particulate matter 2.5 microns and smaller) emissions and heat their homes by means other than burning wood whenever possible. Residential wood burning is one of the Valley's largest sources of wintertime PM2.5 emissions and is shown to have a direct effect on neighborhood air quality.

"We're asking San Joaquin Valley residents to continue the cooperation that has had a direct, positive impact on public health," said District Chief Communications Officer, Jaime Holt. "Choosing not to use your wood burning fireplace this winter is critical in our pollution reduction efforts and key to public health," she added.

The Residential Wood Smoke Reduction program runs from November 1 through the end of February every year, protecting public health through the reduction of harmful particulate matter. During that time, the District releases a daily, wood-burning status for each county, based on the air quality forecast. There are three burn status levels:

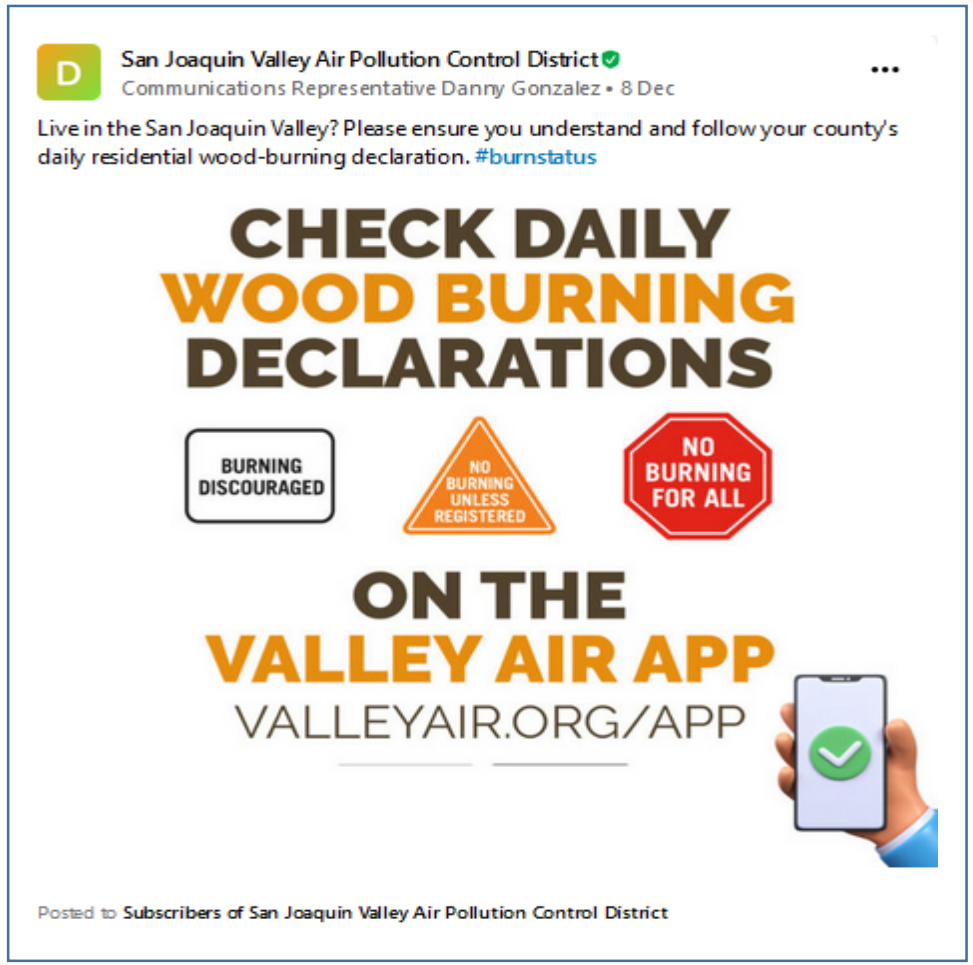
- Schools participate in the Healthy Air Living school program
- News releases are issued before known and expected high pollution days
- District posts updates to social media sites like Facebook, Twitter, and Nextdoor

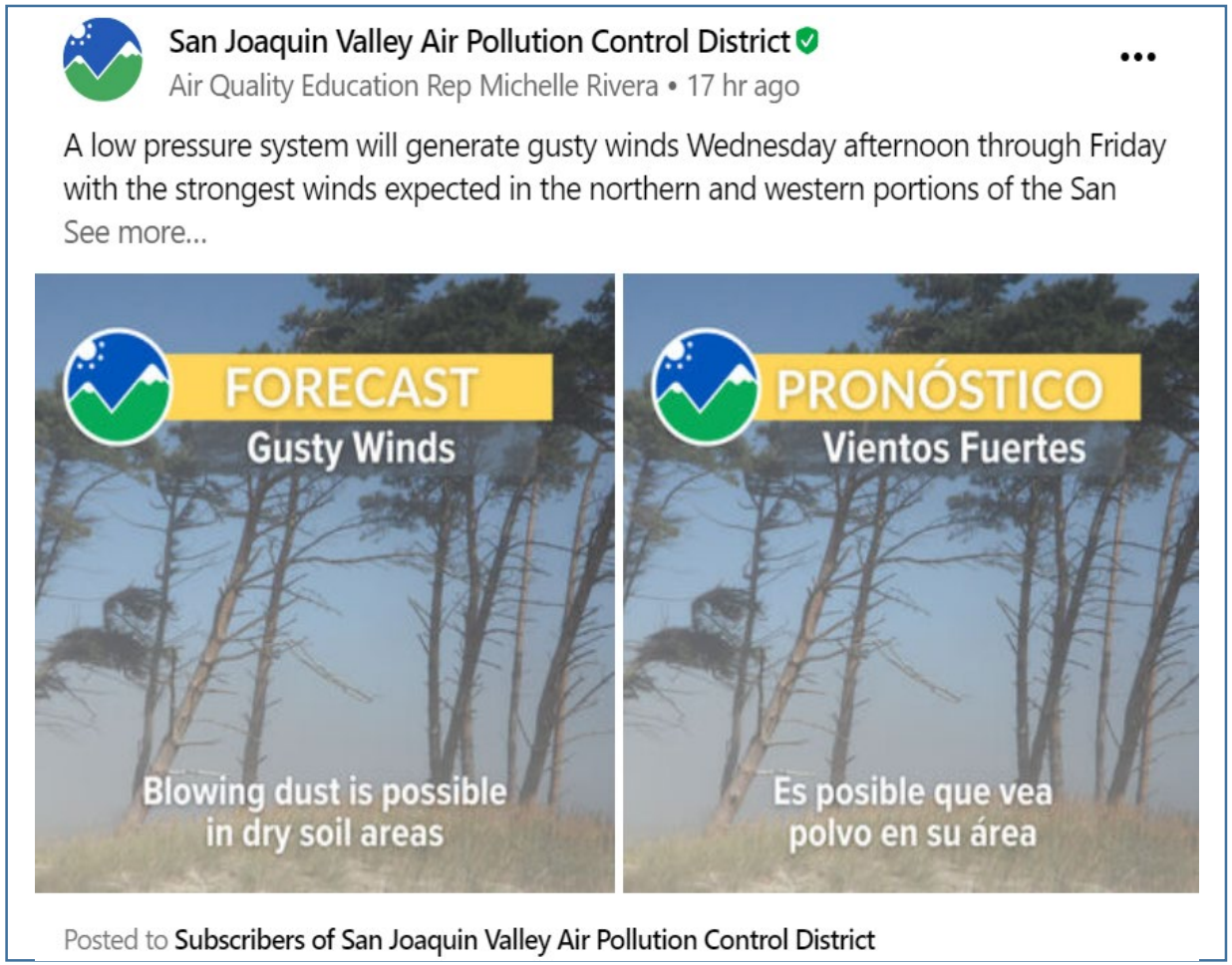


Valley Air District @ValleyAir · Oct 31, 2023 ··

The Residential Wood Smoke Reduction Program is a program that informs residents when they can use a wood-burning device and provides grants for residents to change out their wood burning fireplace or stove with an electric or gas device.

How can the District make sure the community knows that we expect worse air quality?





Efforts to Understand Causes of High PM2.5

Surveillance and Enforcement

- Inspectors and air monitoring operators are looking for activity around the area

Air Pollution Monitoring Network

- Lab analysis of the PM2.5 air samples

Enhanced Winter Enforcement in the Community

Enhanced Enforcement of Residential Wood Burning

District staff conducted a minimum of 4 hours of proactive surveillance on each declared curtailment day, including weekends and holidays, in addition to responding to public complaints.

Enhanced Enforcement of Diesel Idling Regulation

District staff conducted 20 hours of proactive surveillance for idling trucks during the 4th quarter.

Enhanced Enforcement of Open Outdoor Burning

District staff conducted proactive surveillance for open burning on four occasions during the 4th quarter in addition to responding to public complaints.

Enhanced Inspection Frequency of Stationary Sources

All permitted sources that have received an emissions violation in the past three years are inspected every 6 months until they go four consecutive inspections without another emissions violation.

What does enforcement look like during the winter season?

- Enforcement and education happens throughout the community boundary
- Respond to community complaints and concerns
- Focused enforcement efforts when air monitoring shows that air quality is poor
- Increased surveillance on “no burn” days
- Continued inspections of stationary sources at regular intervals

Next Steps

- Continue to analyze air quality information, including concentration levels, wind direction, and wind speed
- Will use information to inform enhanced enforcement efforts
  - Help identify certain areas that may most contribute to higher levels of pollution
  - Times of day where were are generally seeing higher levels and conducting enforcement at those times
- Continue to conduct night time and weekend enforcement, especially on days where we are seeing or are expecting to see higher levels of PM2.5
- Suggestions for locations for additional monitoring using van
- Expand PM2.5 speciation sampling to Roosevelt High School

Community Air Quality Data

- District AB 617 webpage at: http://community.valleyair.org/community-air-monitoring
  - Real-time community air monitoring data
  - Quarterly reports
  - Weekly air monitoring updates

Comments/Questions?