

New Exceptional Events Tools

INFORMATIONAL WEBINAR
JANUARY 11, 2024

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COMPLIANCE ASSISTANCE.

Topics for Discussion

- Exceptional Events Overview
- Summary of New Implementation Tools
 - Suite of Data Visualization and Comparison Tools
 - Supplemental PM_{2.5} Wildland Fire Exceptional Events Tiering Document
 - Prescribed Fire Demonstration
- Questions related to topics presented

Overview of Exceptional Events Rule

- The Exceptional Events Rule implements Clean Air Act (CAA) Section 319(b), Air Quality Monitoring Data Influenced by Exceptional Events.
- Exceptional events are defined in the CAA as events that affect air quality, are not reasonably controllable or preventable, and are either natural events or caused by human activity unlikely to recur.
- Air agencies can request exclusion of data influenced by exceptional events from use in regulatory decisions, such as initial area designations of a revised NAAQS.

Exceptional Events and Fires

- Wildfires
 - The Exceptional Events Rule defines a wildfire as “any fire started by an unplanned ignition caused by lightning; volcanoes; other acts of nature; unauthorized activity; or accidental, human-caused actions, or a prescribed fire that has developed into a wildfire.”
 - Under the Exceptional Events Rule a wildfire that predominantly occurs on wildland is a natural event.
 - Wildland means an area in which human activity and development are essentially non-existent, except for roads, railroads, power lines, and similar transportation facilities. Structures, if any, are widely scattered.
- Prescribed Fires on Wildland
 - The Exceptional Events Rule defines prescribed fires as “any fire intentionally ignited by management actions in accordance with applicable laws, policies, and regulations to meet specific land or resource management objectives”.
 - Under the Exceptional Events Rule prescribed fires are “human activities”.
- Both wildfires and prescribed fires on wildland are events that may be subject to data exclusion under the Exceptional Events Rule.

Exceptional Events Demonstrations

An exceptional events demonstration must include the following elements:

1. A narrative conceptual model that describes the event(s) causing the exceedance or violation and a discussion of how emissions from the event(s) led to the exceedance or violation at the affected monitor(s);
2. A demonstration that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation;
3. Analyses comparing the claimed event-influenced concentration(s) to concentrations at the same monitoring site at other times;
4. A demonstration that the event was both not reasonably controllable and not reasonably preventable;
5. A demonstration that the event was caused by human activity that is unlikely to recur at a particular location or was a natural event; and
6. Documentation that the submitting air agency followed the public comment process.

New Exceptional Events Implementation Resources Under Development

Data visualization and comparison tools. To help air agencies identify event-influenced PM_{2.5} data most likely to have regulatory significance.

PM_{2.5} Wildfire Exceptional Events Tiering Supplement. Information on tiering wildfire/PM events, similar to the tiering approach used for wildfire/ozone events, to help “right-size” demonstrations.

Prescribed Fire Demonstration Example. EPA is working with the State of California, relevant air districts and other collaborators to develop an exceptional events demonstration for a prescribed fire. The local public comment period for the demonstration concluded on December 29, 2023.

Tool 1: Data Visualization and Comparison Tools

Data Visualization

- A suite of data visualization tools will be available on EPA's webpage.
- Tools will assist air agencies in identifying which impacted days affect design values and whether the events have regulatory significance.
- Graphics and data generated by these tools can be incorporated into exceptional events demonstrations.
- Tools will be a "living" resource, as we plan to update them based on feedback.

<https://www.epa.gov/air-quality-analysis/exceptional-events-analysis-and-visualization-tools>

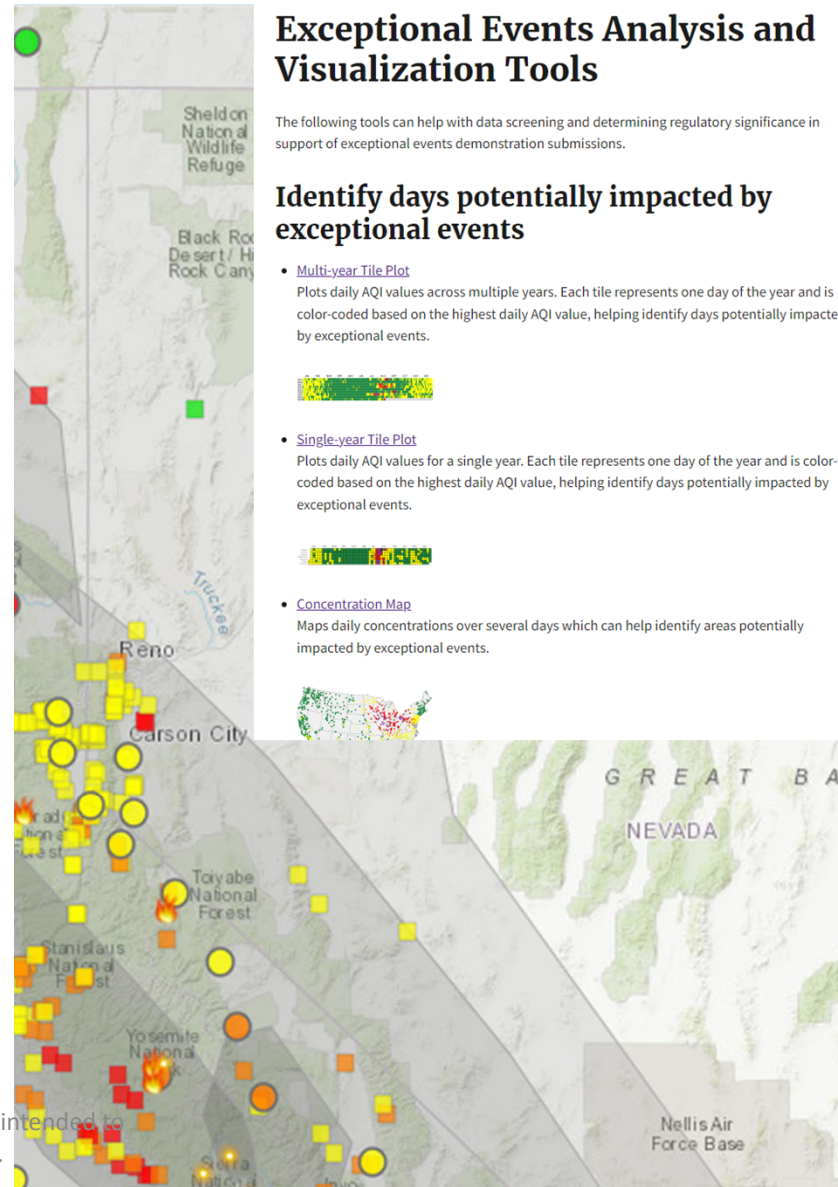
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Exceptional Events Analysis and Visualization Tools

The following tools can help with data screening and determining regulatory significance in support of exceptional events demonstration submissions.

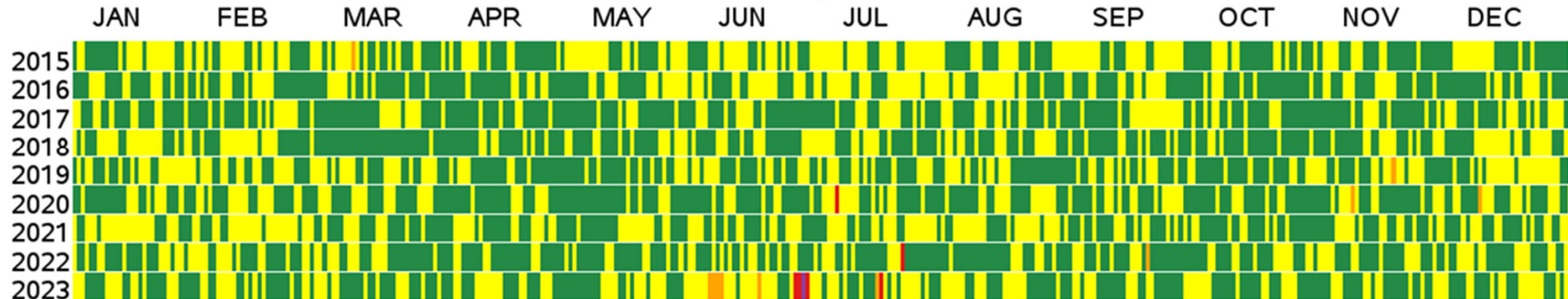
Identify days potentially impacted by exceptional events

- **Multi-year Tile Plot**
Plots daily AQI values across multiple years. Each tile represents one day of the year and is color-coded based on the highest daily AQI value, helping identify days potentially impacted by exceptional events.
- **Single-year Tile Plot**
Plots daily AQI values for a single year. Each tile represents one day of the year and is color-coded based on the highest daily AQI value, helping identify days potentially impacted by exceptional events.
- **Concentration Map**
Maps daily concentrations over several days which can help identify areas potentially impacted by exceptional events.



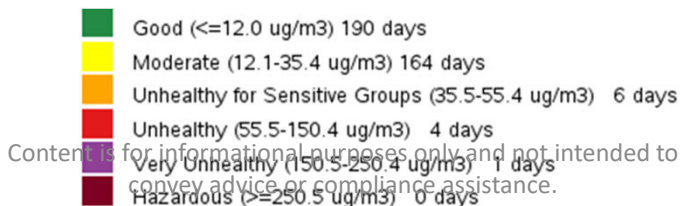
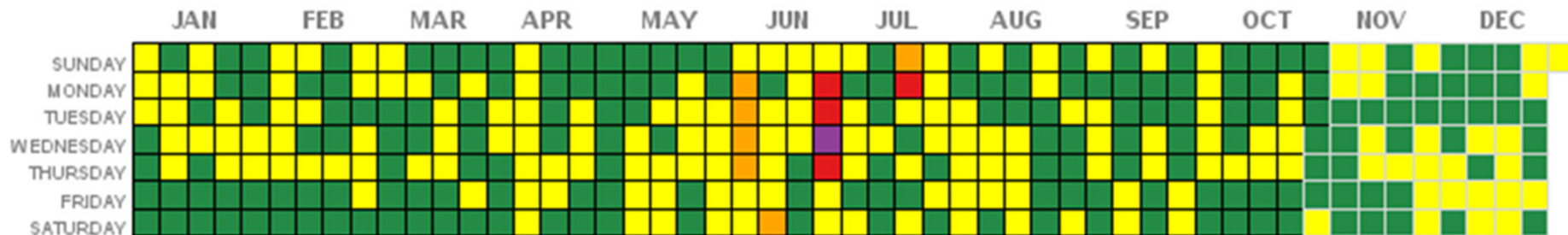
PM2.5 Daily AQI Values, 2015 to 2023

Cleveland-Elyria, OH

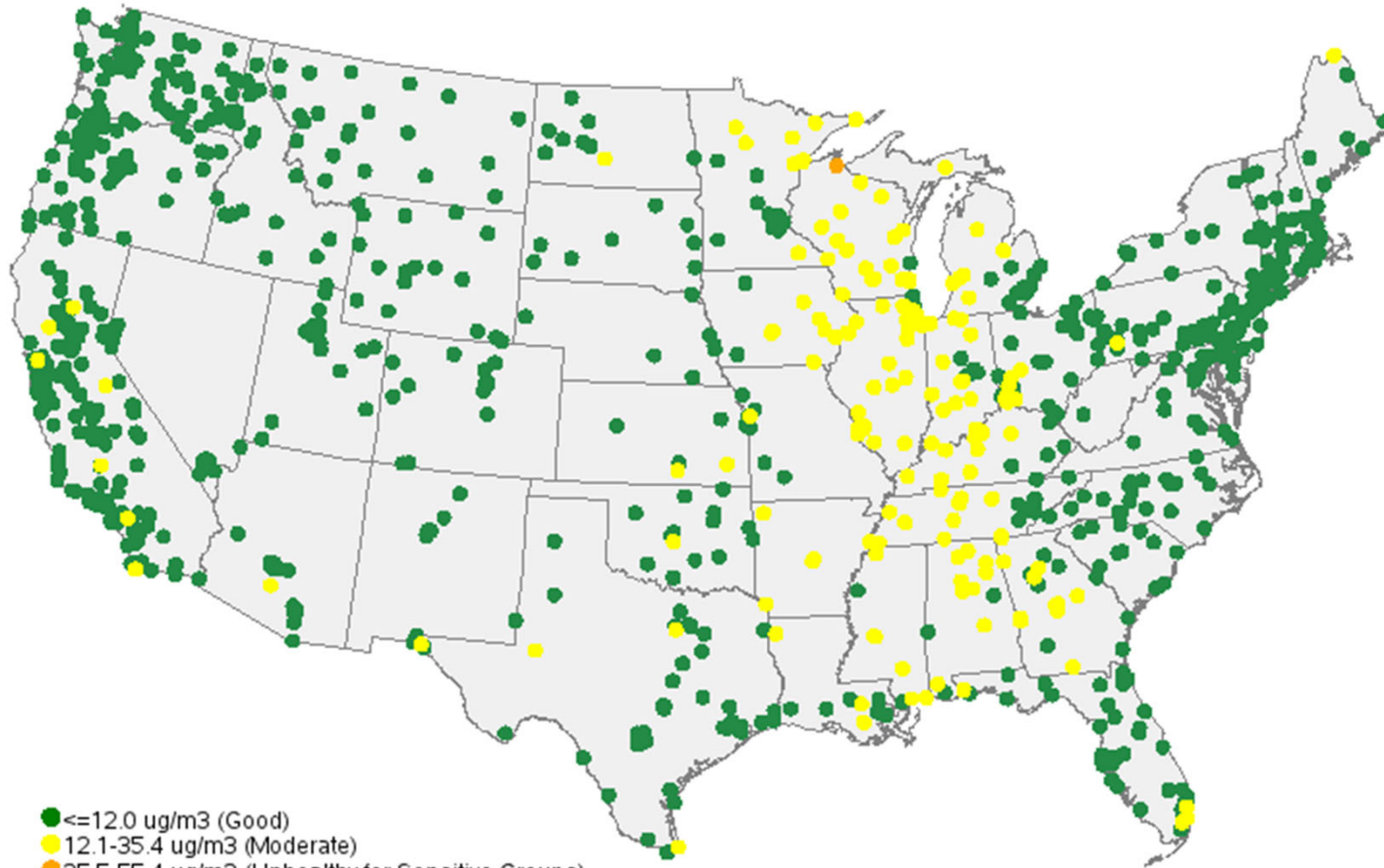


PM2.5 Daily AQI Values in 2023

Cleveland-Elyria, OH



PM2.5 AQI Values by site on 06/24/2023



- ≤ 12.0 $\mu\text{g}/\text{m}^3$ (Good)
- 12.1-35.4 $\mu\text{g}/\text{m}^3$ (Moderate)
- 35.5-55.4 $\mu\text{g}/\text{m}^3$ (Unhealthy for Sensitive Groups)
- 55.5-150.4 $\mu\text{g}/\text{m}^3$ (Unhealthy)
- 150.5-250.4 $\mu\text{g}/\text{m}^3$ (Very Unhealthy)
- ≥ 250.5 $\mu\text{g}/\text{m}^3$ (Hazardous)

Source: U.S. EPA AirData <<https://www.epa.gov/air-data>>

Generated: January 4, 2024

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Exceptional Events Design Value Tool

Select a Pollutant:
PM2.5 ▼

Select a NAAQS:
2012 Annual NAAQS (12 ug/m³) ▼

Select an EPA Region:
National ▼

Select a State:
▼

Select a Design Value Period:
2020-2022 ▼

Selections include:

Request Exclusion Flags
 Informational Flags
 NAAQS Exceedance Days

This tool allows users to determine the regulatory significance of submitted or anticipated Exceptional Events demonstrations pursuant to 40 CFR §50.14 by re-calculating the design values for Ozone or PM2.5 monitoring sites with reported concentrations potentially affected by exceptional events excluded from the calculation.

To use this tool, start by choosing a pollutant, standard, state, county, site ID, and design value period from the drop-down menus in the left-hand panel. You may choose to exclude days with Request Exclusion flags, Informational flags, and/or NAAQS exceedances. Once these selections have been made, click on the 'Get Selections' button below to retrieve concentration data from AQS and calculate the design value. NOTE: Initial AQS data retrieval and design value calculations may take up to a minute to complete.

Once the data retrieval and design value calculations have completed, this window should populate with the relevant design value statistics based on the menu selections, and a list of days available for exclusion should appear in a new menu at the bottom of the screen. At this point, you may select days to exclude from the design value calculation. If Ozone is selected, a second menu should also appear to the right allowing you to select hourly concentrations for exclusion. You can use Ctrl+click to select multiple values, and Shift+click to select a range of values.

Once you have finished selecting values for exclusion, click on the button that appears beneath the selection menu to re-calculate the design value. The text window above should re-populate with the design value statistics calculated with the selected values excluded. This should take no more than a few seconds to complete.

At any time after the initial design value calculation is complete, you may click the 'Download Site Design Value Data' link which should appear in the bottom left of the screen to download the design values and daily data in an Excel spreadsheet. The spreadsheet includes formulas to calculate the design value statistics, so that you can continue to exclude days from the design value calculations in Excel by clearing the concentrations on those days in the daily data tabs. NOTE: The spreadsheet may open in protected mode, in which case the formulas will not work. Clicking the 'Enable Editing' button at the top of the screen in Excel should enable the formulas.

Finally, clicking the 'Clear Selections' button will reset all current selections to their initial values. NOTE: It is strongly recommended that you click this button before selecting a new pollutant, monitoring site, or design value period.

For questions, comments, or to report a problem, please contact Ben Wells by phone at 919-541-7507 or by email at Wells.Benjamin@epa.gov.

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Tool 2: PM_{2.5}/Wildland Fire Tiering Document

Tiering for PM_{2.5} and Wildland Fire Events

In September 2016, EPA issued a guidance document focused on a tiering structure for wildfire events and ozone impacts.

This resource is a document outlining a similar tiering structure with a focus on PM_{2.5} and wildland fires. Like the 2016 document, this document is expected to guide agencies in determining how much evidence is appropriate to support the “clear causal relationship” criterion within a demonstration.

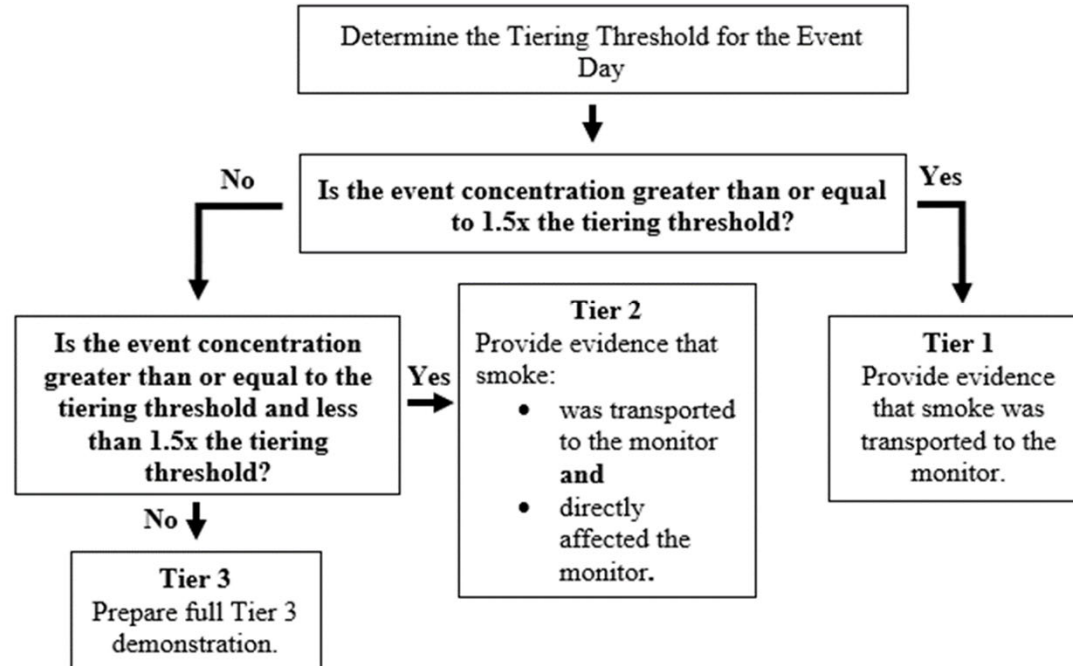
The tiering is conceptually similar to the tiering in the Wildfire Ozone Guidance Document.

- 3-tiered approach (e.g., Tier 1, Tier 2, Tier 3)
- Lower tier events (i.e., Tier 1) will generally require less evidence

The tiering structure is applicable to wildland fire events affecting PM_{2.5} concentrations (annual or 24-hour standards).

Tiering Thresholds & Methodology

Figure 1. Process to Determine the Appropriate Tier for the Clear Causal Relationship Criterion



Tool 3: Prescribed Fire Demonstration

Prescribed Fire in the 2016 Rule

The 2016 Rule clarified that prescribed fires on wildland can meet certain criteria of the Exceptional Events Rule in the following ways:

- **Not reasonably controllable:** By being conducted under a certified Smoke Management Program or through the use of Basic Smoke Management Practices at the time of the burn.
- **Not reasonably preventable:** By demonstrating the benefits that would be foregone had the prescribed fire not been conducted.
- **Human Activity Unlikely to Recur:** By demonstrating that recurrence is based on the natural fire return interval or an interval consistent with ecosystem restoration/maintenance.

EPA is committed to providing a pathway under the Exceptional Events Rule that allows for increases in the use of strategic and coordinated prescribed fire as a tool to mitigate the adverse effects of high severity wildfire.

Prescribed Fire Demonstration

EPA has not received an exceptional events demonstration for a prescribed fire on wildland (for any NAAQS) since the Agency revised the Exceptional Events Rule in 2016.

To provide an example demonstration, EPA worked with the US Forest Service, State of California, Placer County Air Pollution Control District, and Northern Sierra Air Quality Management District to develop an exceptional events demonstration for a prescribed fire.

Exceptional Event Demonstration for an Exceedance of the 2012 Annual PM_{2.5} NAAQS at Grass Valley, California on April 20, 2021 Due to Smoke From a Prescribed Fire

January 2024

Prepared by:

U.S. Environmental Protection Agency
Exceptional Events Prescribed Fire Demonstration Development Team

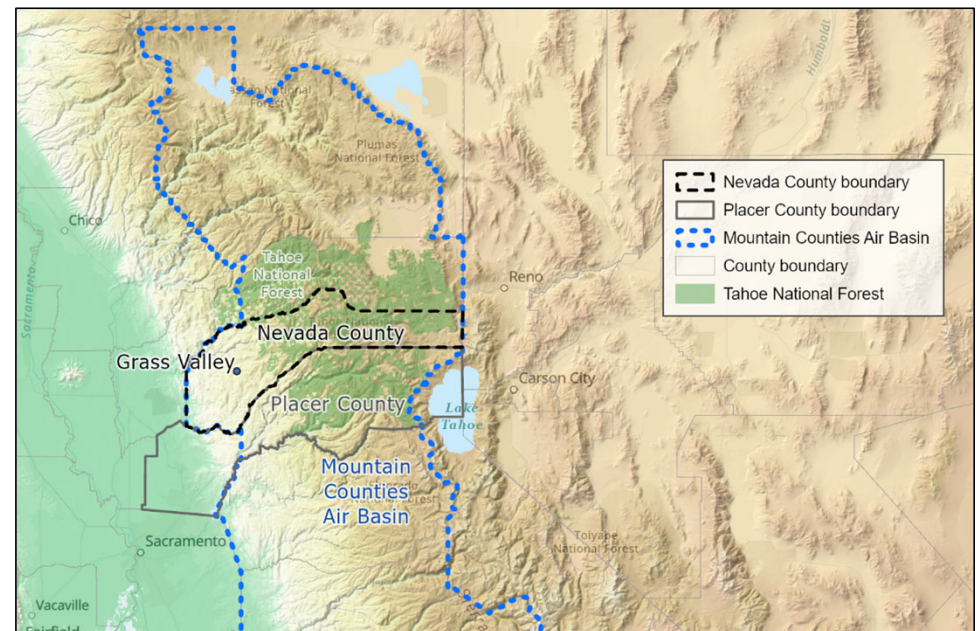
Submitted to the EPA by:

Northern Sierra Air Quality Management District/
California Air Resources Board

Prescribed Fire Demonstration

About The Prescribed Fire:

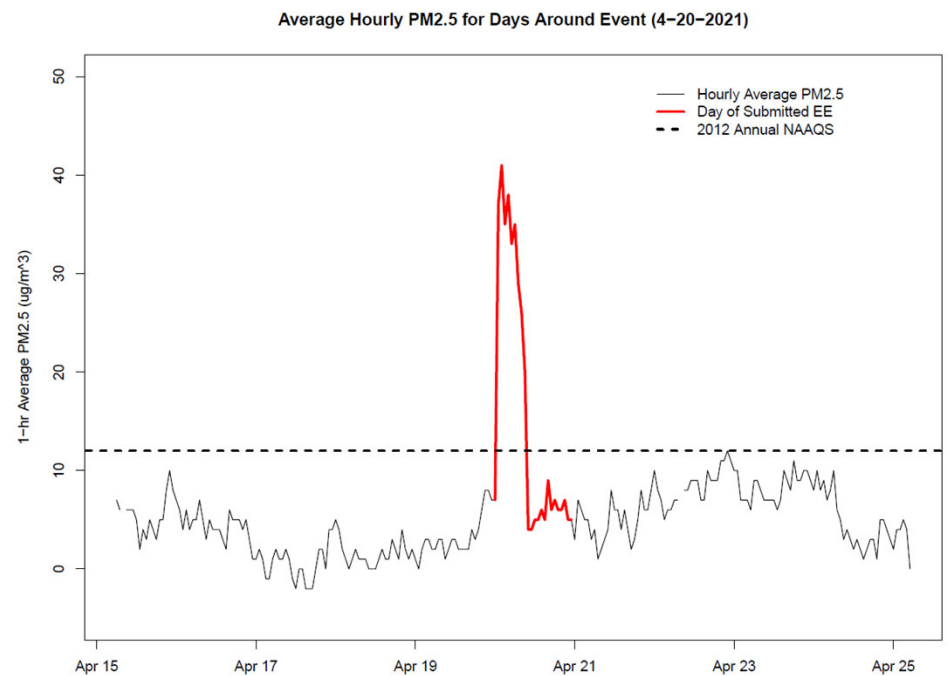
- Conducted by the USFS as a part of a project in the Tahoe National Forest in Placer County, California.
- Conducted under a certified Smoke Management Program and multi-year land management plan.
- Influenced PM_{2.5} concentrations in the town of Grass Valley in Nevada County, California.



Prescribed Fire Demonstration

About The Demonstration

- Exceedance of the 2012 Annual PM_{2.5} NAAQS (value between the 24-Hour and annual standards).
- Undergoing full exceptional events process:
 - Demonstration development;
 - state-conducted public comment period;
 - EPA review and decision/action.



Additional Prescribed Fire on Wildland Tools & Resources Under Consideration

- Prescribed Fire Demonstration Development Frequently Asked Questions (FAQ) document
- Prescribed Fire Demonstration Template
- Example Supplemental Analyses for Clear Causal Relationship Demonstrations

Additional Exceptional Events Tools & Resources for Wildland Fire Events

- [EPA's Exceptional Events Guidance: Preparation of Demonstrations for Wildfire Events that may Influence Ozone Concentrations](#) (issued September 2016).
- [EPA's Exceptional Events Guidance: Prescribed Fire on Wildland that may Influence Ozone and Particulate Matter Concentrations](#) (issued August 2019).
- EPA's [Wildfire Resource Document](#) "Analytical Tools for Preparing Exceptional Events Demonstrations for Wildfire Events that May Influence Ozone and Particulate Matter Concentrations" (issued August 2023).
- [Example Demonstrations and EPA Responses Prepared under the 2016 Exceptional Events Rule](#)
- [EPA Fire and Smoke Map](#)
- [EPA Airknowledge E-Learning](#)
- Resources and Tools are available on EPA's webpage: <https://www.epa.gov/air-quality-analysis/treatment-air-quality-monitoring-data-influenced-exceptional-events>

Questions and Comments

- EPA has opened a non-regulatory docket to gather feedback on these tools.
- Comments should be submitted to the non-regulatory docket, identified by Docket ID No. EPA-HQ-OAR-2023-0586.
- Comment Period closes on February 2, 2024.
- EPA intends to finalize the tools discussed today in late February.