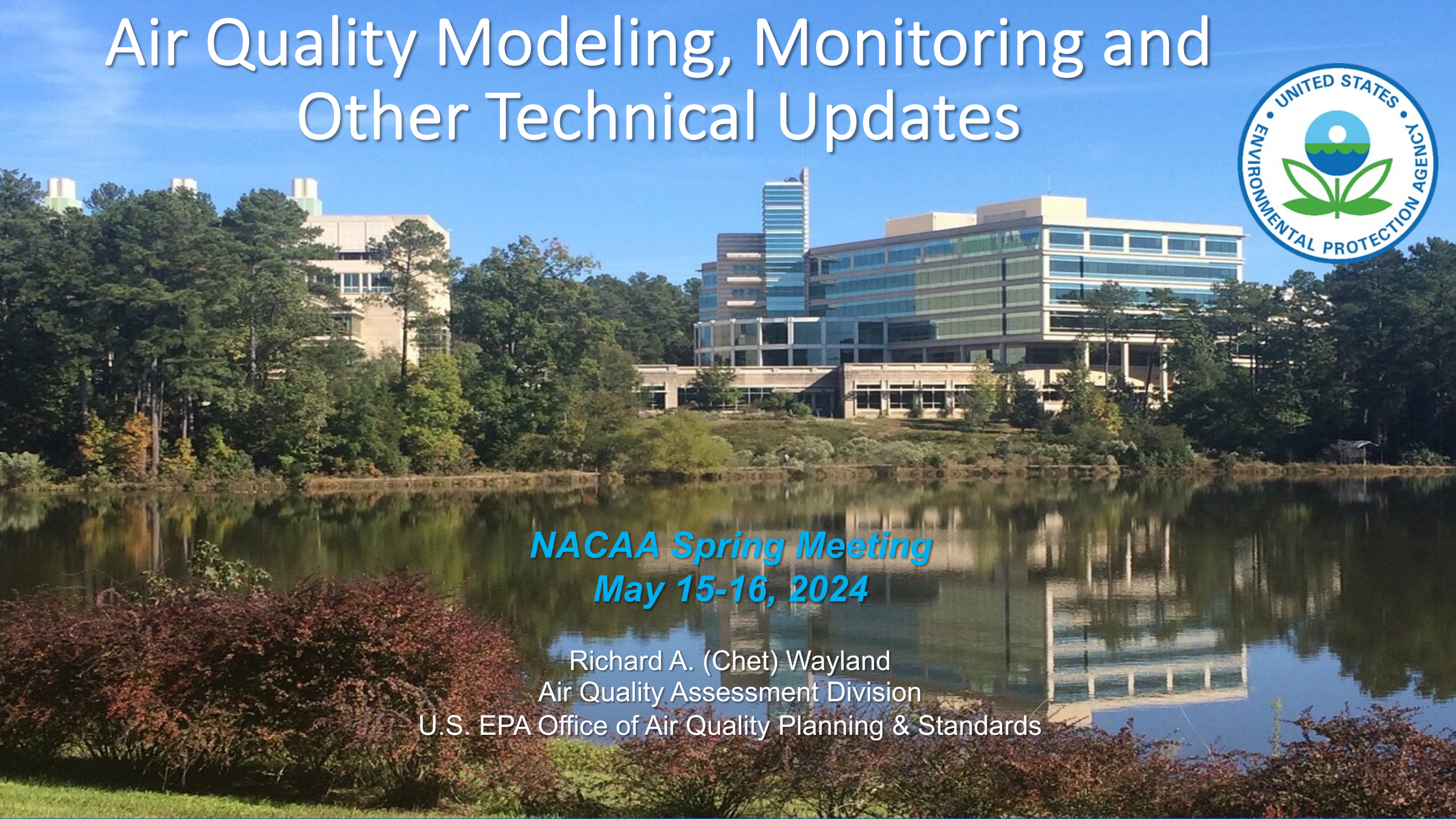
Air Quality Modeling, Monitoring and Other Technical Updates



NACAA Spring Meeting
May 15-16, 2024

Richard A. (Chet) Wayland
Air Quality Assessment Division
U.S. EPA Office of Air Quality Planning & Standards

Ambient Monitoring Updates

Source: GAO File Photo.

Inflation Reduction Act

IRA Air Monitoring and Air Sensors Direct Grant Awards

- On February 16, 2024, EPA announced plans to make direct, non-competitive grant awards to eligible state, local, Tribal, and territorial air agencies using **a portion** of funds available under IRA sections 60105(a-c).
- EPA released two grant guidance documents:
  1. **Fenceline/Multipollutant grant guidance** for activities that will result in either establishing new monitoring activities or in maintaining, operating, or upgrading existing monitoring stations [60105(a)-(b)]. Approximately $81M available.
  2. **Air Sensors grant guidance** for activities that will result in more air quality sensor data in and around low-income and disadvantaged communities [60105(c)]. Approximately $2M available.

Inflation Reduction Act

IRA Air Monitoring and Air Sensors Direct Grant Awards

- These IRA direct awards will be **awarded under CAA 103**, with no cost share required.
- **Eligible entities** include pollution control agencies currently involved in air monitoring activities and that have a history of receiving CAA Section 103 or 105 grants either annually or every few years.
- These are **one-time funds** and air agencies should have plans to sustain the work after the term of these grants.
- The maximum **period of performance** for these grants is up to five years. The period of performance should be based on the time required to accomplish the workplan components.

Inflation Reduction Act

IRA Air Monitoring and Air Sensors Direct Grant Awards

Target Deadline	Milestone
February 16, 2024	EPA Released Grants Guidance for SLT Air Agencies
Now	SLT Air Agency Work with EPA Regional Office regarding “Please Apply” Letters
Spring 2024	SLT Air Agency Workplan Development
May 31, 2024 (but ASAP)	SLT Grant Applications Due

EPA Regional Office Contact List for 60105(a-c) eligible SLT direct award questions

EPA Region	Point(s) of Contact	Email Contact
1	Jennifer Brady	brady.jenniferL@epa.gov
2	Emmet Keveney	Keveney.Emmet@epa.gov
3	Krista Gonzalez AJ McCullough	gonzalez.krista@epa.gov Mccullough.amanda@epa.gov
4	Janine Morris Todd Rinck	morris.janine@epa.gov Rinck.Todd@epa.gov
5	Michelle Becker Nora Suntken	becker.michelle@epa.gov suntken.nora@epa.gov
6	Donnett Patterson (S/L) Aunjanee Gautreaux (Tribal)	Patterson.Donnett@epa.gov Gautreaux.Aunjanee@epa.gov
7	Stephanie Doolan Andy Hawkins	Doolan.Stephanie@epa.gov hawkins.andy@epa.gov
8	Marisa McPhilliamy Emily Bertram	McPhilliamy.Marisa@epa.gov bertram.emily@epa.gov
9	Angela Latigue Jean Samolis	latigue.angela@epa.gov samolis.jean@epa.gov
10	Christina Miller (S/L) Sandra Brozusky (Tribal)	miller.christina@epa.gov brozusky.sandra@epa.gov

Inflation Reduction Act

Other IRA Air Monitoring Activities

- Planning for a Community Scale Air Toxics Ambient Monitoring Grant Competition in 2025
- Investing in ambient and fenceline Air Toxics Measurement and Method Development
- Supporting EPA Regional Office Mobile Monitoring Platforms and Sensor Loan Programs
- Planning to offer Training Webinar on Air Sensors
- OAP is investing in the CASTNET program by procuring and installing new equipment to enable robust air quality, climate, and environmental assessments to support rural and tribal communities (POC: Melissa Puchalski, puchalski.melissa@epa.gov)

Ambient Monitoring Topics in the Final Rule: Reconsideration of the PM NAAQS

Promulgated on February 7th, 2024 – What we finalized

- **$PM_{2.5}$ Network Design** – Modified the $PM_{2.5}$ network design criteria to require monitoring in at-risk communities where there are anticipated effects from sources in the area contributing to poor air quality. (see next slide)
- **PM Federal Equivalent Methods (FEMs)** - Finalized that valid State, local, and Tribal air monitoring data generated in routine networks and submitted to the EPA may be used to improve the PM concentration measurement performance of approved FEMs.
- **Remaining Technical Areas** – Finalized editing several technical areas for clarification, consistency with current practices, changes in aerosol composition, and lower concentration levels. These areas include:
  - Data calculations, commercially available second stage separator for the $PM_{2.5}$ FRM, reference and equivalent methods, quality assurance requirements, probe and siting criteria, and monitoring aspects of Air Quality Index (AQI) reporting.

POC: Hanley.Tim@epa.gov

$PM_{2.5}$ Network Design and monitoring in At-Risk Communities

$PM_{2.5}$ Network Design

- Finalized proposal on modifying the $PM_{2.5}$ network design criteria to require monitoring in at-risk communities where there are anticipated effects from sources in the area contributing to poor air quality.
- Requirement applies to cases where an additional site is required and not already in use for either near road or maximum concentration site.
- Such sites would still need to meet the requirement for being considered ‘‘areawide’’ air quality.

Additional Notes on $PM_{2.5}$ Monitoring Network Design Criteria to Address At-Risk Communities

- Many existing sites will likely already be in areas that meet this new requirement.
- Desire is to be in an area of poor air quality that also meets EJ criteria as some EJ areas will not have the air quality impacts that others do.
- There is some flexibility for monitoring agencies to pick sites within the construct provided.
- Definition of “At-risk communities” is explicitly tied to the science cited in proposal (PA and ISA).
- While this network design criteria applies in limited cases, the criteria for siting of monitors in “at-risk” communities can certainly be applied to additional communities above the minimum monitoring requirements.

POC: Hanley.Tim@epa.gov

Notice of Proposed Update of $PM_{2.5}$ Data from T640/T640x PM Mass Monitors

Notice posted on February 15th, 2024; comments were due March 15, 2024; final signature on May 8, 2024

Overview of Update Process

- EPA implemented the data update entirely within AQS
  - Data: all hourly T640 and T640X $PM_{2.5}$ concentration data starting in 2017
  - Years: 2017 to present
- Updated data added automatically to AQS
  - The original data will remain in AQS and be publicly available
  - Users will be able to distinguish between the updated data and newer T640 and T640x data measured with the Network Data Alignment
- To implement the Network Data Alignment methodology, EPA will use the hourly ambient temperature data in AQS associated with the site
  - If hourly ambient temperature data are unavailable, the more conservative warmer temperature correction will be used
  - **EPA strongly encourages monitoring agencies to submit the hourly ambient temperature data**
  - Monitoring Agencies will have the opportunity to review the updated data in AQS before the data will be considered certified

POC: Gantt.Brett@epa.gov

Near-Road PM2.5 Monitoring Sites

- **Are $PM_{2.5}$ monitoring data from near-road sites applicable to the $PM_{2.5}$ annual NAAQS?**
  - Yes. This is addressed in the preamble of 2012 PM NAAQS final rule. In that preamble EPA identified that $PM_{2.5}$ data from micro- and middle-scale near-road sites are "…representative of many such locations throughout an area." and thus are applicable to the $PM_{2.5}$ annual NAAQS. See: https://www.federalregister.gov/d/2012-30946/p-1491
- **Is there any case in which $PM_{2.5}$ data from a near-road site would not be applicable to the $PM_{2.5}$ annual NAAQS?**
  - At this time, no $PM_{2.5}$ monitors at near-road sites have been identified as appropriate for exclusion to the $PM_{2.5}$ annual NAAQS. However, EPA did consider this issue in response to comments for the 2012 $PM_{2.5}$ annual NAAQS. See: https://www.federalregister.gov/d/2012-30946/p-1492. It is important to note that our default position is that all near-road $PM_{2.5}$ monitors are comparable to the annual standard.

POC: Hanley.Tim@epa.gov

GAO Response – Asset Management

- SLTs will share asset data with EPA Regions on an annual basis, using a standard reporting template, focusing mainly on physical hardware and direct supporting infrastructure that are needed to generate data.
- EPA provided a final asset management plan in a memo signed January 25 (posted on AMTIC).
  - https://www.epa.gov/system/files/documents/2024-02/air-monitoring-asset-management-plan_jan24-.pdf

POC: Mocka.Corey@epa.gov, Hillis.Berkley@epa.gov

Ambient Air Toxics Overview

National Air Toxics Trends Station (NATTS) update

- As of January 2023, we have 25 active NATTS sites, measuring VOCs, PAHs, Carbonyls, and metals.
  - We require 19 "Tier 1" compounds within NATTS, but routinely get nearly 100 compounds reported.
- Eastern Research Group (ERG) continues serving as our national contract laboratory.
- IRA funding will be used to streamline and modestly grow NATTS; planning currently commencing.

Methods Development

- OAQPS continues to work with ORD to develop, improve, and characterize measurement methods.
- Ongoing efforts to evaluate and improve characterization of EtO using TO-15/A.
- Efforts to evaluate emerging continuous technologies for EtO, Formaldehyde, and multi-pollutant platforms.
- Investigating new work for sorbent method improvement or development for priority or high interest compounds.

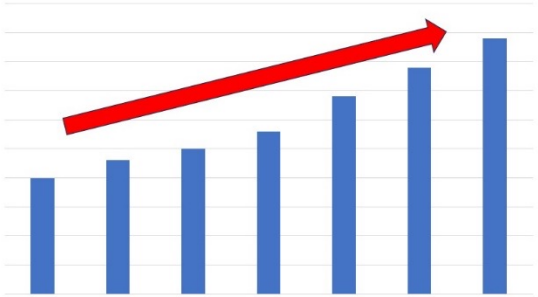
PAMS Support and Budget

- EPA solicited input from State monitoring staff on support needed for PAMS operational and data verification
- Many States requested additional support for their PAMS sites, especially in 4 specific regions
- Funding is a zero-sum game, and while for FY24, we believe we can address this increased operational need, it is not sustainable on an ongoing basis
- This is funding that should not be expected to be used for annual site operation, but we do expect funding to continue to be available for annual maintenance, parts, and standards for CAS auto-GCs specifically.
- Why?:
  - Generally, PAMS contractor's unit costs **increased by 4.5%** in 2024
  - The overall PAMS National Contract Order **increased by over $700K**
  - Some specific line-item orders decreased in 2024
    - **EPA saved $30,592 in shipping costs** in 2024 by having contractor combine shipments and/or change shipping methods
  - Generally, the site support line item **increased by ~$730,000** in 2024
    - Due to requests to reduce the burden on air agencies and get PAMS sites fully operational
    - Provide operational and data verification support for **one-year** to train SLTs and increase their ability to operate and maintain sites as required by regulation.

POC: Mocka.Corey@epa.gov

National Monitoring Contracts & Costs

- The Ambient Air Monitoring Group manages several national air monitoring contracts, including contracts supporting and/or operating Air Toxics/NATTS, CSN, PAMS; national QA activities; and sample shipment.
- Costs for these contracts (shipping and labor) have increased significantly across programs between FY23 and FY24.
- Assuming a flat FY24 budget, we are working hard to preserve STAG direct award funding levels by leveraging opportunities under IRA to fund new sites, enhance monitoring activities at existing sites, and support air toxics monitoring.
- EPA will be working with SLTs starting in the Fall of 2024 to discuss options to address cost increases if Congress doesn't provide an increase in STAG allocations to support our existing networks.



POC: Benedict.Kristen@epa.gov

Emission Inventory Updates

Update on 2022 Regulatory Platform Emissions

The Collaborative process to develop the 2022 platform is ongoing

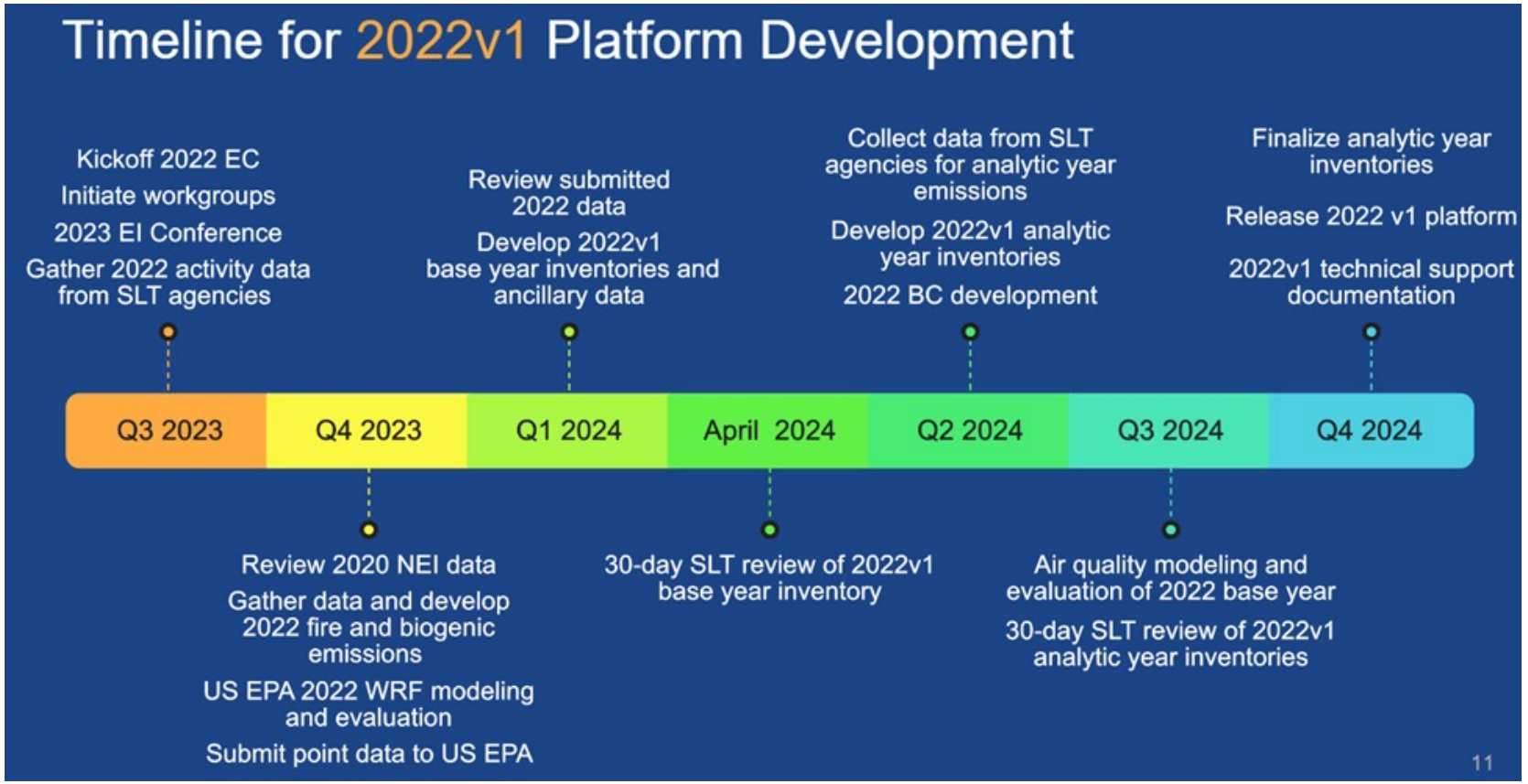
- Co-leads: Zac Adelman (LADCO), Mary Uhl (WESTAR), Alison Eyth (OAQPS)
- Quarterly update webinars were provided in 2023 (August, November) and 2024 (February, May)
- Draft emissions data for the year 2022 have been prepared and the data review process started April 1
- Information on submitting comments and useful links are available here: https://www.epa.gov/air-emissions-modeling/2022v1-emissions-modeling-platform

2022v1 timing

- Base year inventories will be finalized by June 2024 and premerged emissions will be made available during August 2024
- Draft analytic year inventories will be prepared during Summer 2024 and a data review will start late summer
- Analytic year emissions for 2026, 2032, and 2038 will be finalized by fall 2024

POC: Eyth.Alison@epa.gov

Update on 2022 Regulatory Platform



POC: Eyth.Alison@epa.gov

AirToxScreen Updates

2020 AirToxScreen will be released Spring 2024

- First edition with risk at higher geographic resolution (census-block level)
- Point source emission edits submitted by SLTs during 2022 review process were included in final 2020 NEI and modeled.
- Preview made available to SLTs on February 1, 2024
  - Webinars for SLTs on February 29 and March 4
  - Additional time for State, Local, and Tribal (SLT) preview prior to release (comments officially due 3/15/2024)
- Email airtoxics@epa.gov if you have questions

2021 AirToxScreen still on schedule for December 2024 release

2022 AirToxScreen Point Source Emissions Review still on schedule to begin this summer

Emissions POC: Diem.Art@epa.gov
Risk POC: Woody.Matt@epa.gov

Air Emissions Reporting Rule (AERR)

- Comment period closed in November 2023
- We received about 180 comment documents, some as long as 80 pages
- These comments spanned the range on most of the proposed requirements from fully supportive to fully opposed
- Many comments concerned about burden and resources for states
- As a result of these comments, the EPA is incorporating important changes from proposal to the final rule
- Target for final rule release is this summer
- Clarifying questions can be sent to NEI_Help@epa.gov (Please include AERR in the subject line)

POC: Houyoux.Marc@epa.gov

National Emissions Inventory (NEI) Recent Milestones and Plans

Completed Fall 2023 through March 2024

- Draft release of 2022 NEI Point inventory in EIS
- Updated Air Emissions Trends summaries – New year 2023 added and updated estimates for years 2021 & 2022
- Additional revisions to 2020 NEI TSD errata as States work on 2022 emissions modeling platform
- 2021 AirToxScreen Point Source Review (September 17 – November 17, 2023)

Ongoing

- Migration of all nonpoint (Wagon Wheel) input templates into EIS
- New methodologies for several nonpoint categories, including residential wood combustion, fertilizer application, cooking, structure fires, motor vehicle fires, and more
- Incorporate changes from 2021 AirToxScreen Point Source Review into EIS and process for modeling

Spring 2024

- Finalizing new inventory codes into EIS and EIS input templates for SLT submittals + training for SLTs
- Updating Nonpoint Survey and QA reports for SLTs
- Continued NEI and EIS newsletter updates to stakeholders every 3-4 weeks

POC: Mason.Rich@epa.gov

Planned 2023 NEI Emissions Science and Methods Updates*

New national methods for:

Oil & Gas:
- Abandoned wells
- Solvent usage during operations

Residential cooking, food trucks

Barrel stoves (residential wood combustion)

Pile burns, campfires, structural and motor vehicle fires

Roofing asphalt

Non-agriculture NH_3 emissions

Dioxins and furans: adding individual congeners for sectors for which data are available

Method improvements:

Commercial cooking

RWC activity, emission factors, speciation, and projection

Road asphalt

Gasoline distribution

SPECIATE additions and improvements

*** SLTs can review and comment on new and revised methods by participating in the 2023 NEI process. Depending on timing and reviews, some new methods could be included in 2022 platform v2 inventories**

Emissions Data for IRA Climate Pollution Reduction Grants

- Preliminary Climate Action Plans have been submitted by States and MJOs; Tribes and Territories will submit by April 1.
- Implementation Grant applications for the general competition and the Tribes and Territories competition are due April 1 and May 1, respectively.
- EPA is working to extract data from CPRG deliverables and applications to enable air quality analyses resulting from this program.
  - Will be ongoing work for several years, with iterations occurring as newer and better data are submitted.

POC: Seltzer.Karl@epa.gov

Combined Air Emissions Reporting System (CAERS) Update

CAERS V5 released February 5, 2024. Current users - feature customizations:

- AZ – Piloting use of API to retrieve data from CAERS automatically
- GA – Opt In Process,
- DC – Monthly Reporting
- ME – GHG emission factors from GHGRP
- RI – Adding their minors
- ID, Pima AZ – CAERS “as is”
- Additional SLTs have test accounts, and/or are seeking management approval to adopt CAERS
- Always seeking new SLTs for our Product Design Team (PDT)

Process:

- Test accounts can be used to explore CAERS – several states are testing and providing feedback to us
- Ready to onboard?
  - Start CROMERR process ASAP
  - Customizations possible through EPA or EN Grant applications are an option for funding.
- Discuss “must haves” with CAERS Team by May for onboarding the following calendar year
- Trainings available for industry for SLTs and help desk assistance

Ongoing and Upcoming:

- Ongoing enhancements requested by industry and SLTs; Facility data alignment and stack test data sharing with CEDRI; Enhancements to flow with TRI

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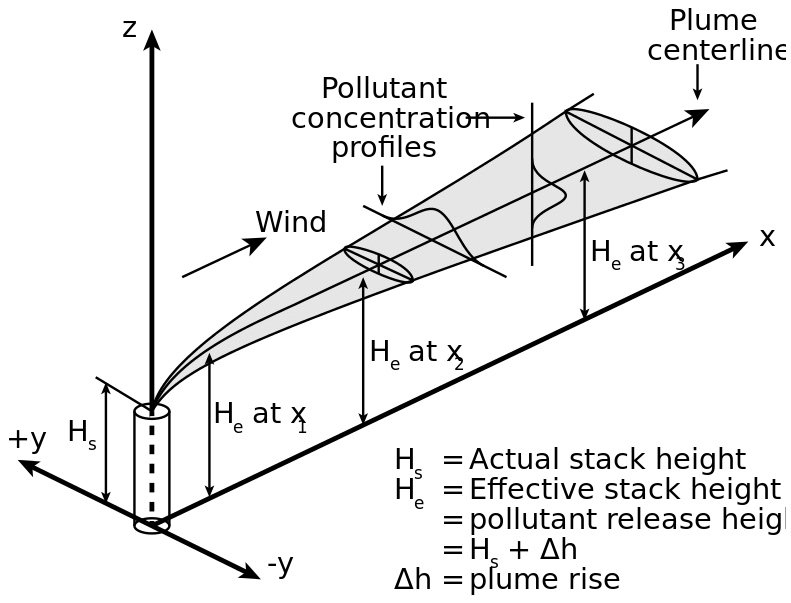
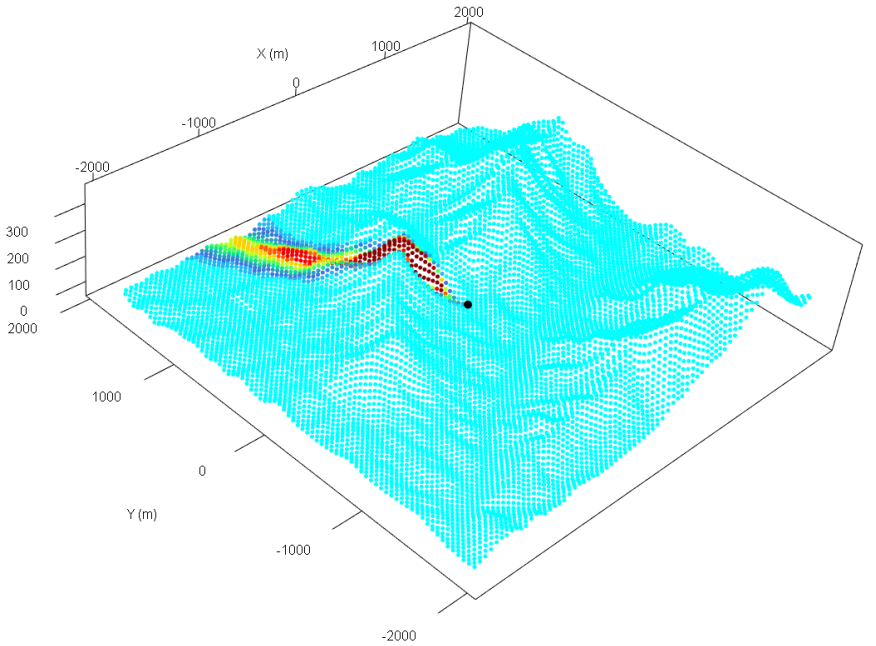
Air Quality Modeling Updates





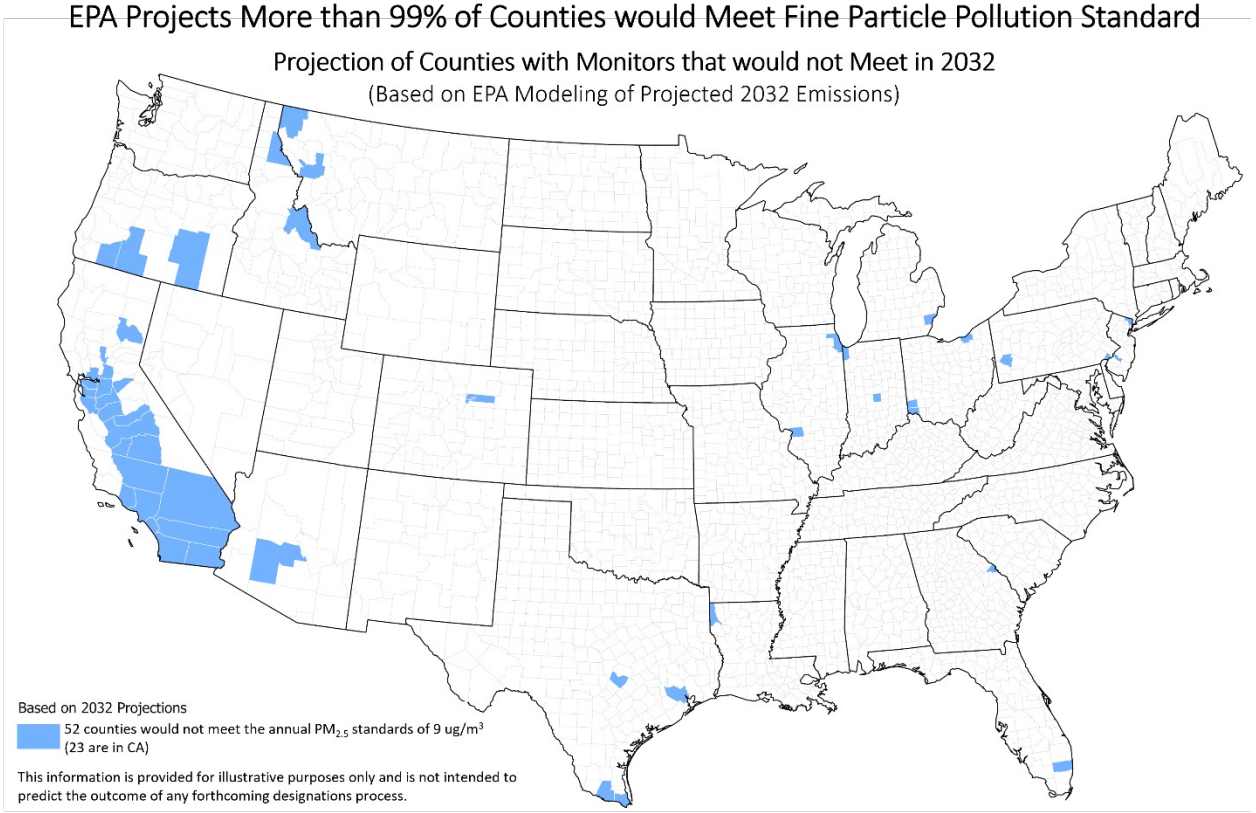
Guideline / AERMOD Revisions Rule

- In October 2023, EPA proposed to revise the scientific formulation in the AERMOD Modeling System and to make minor revisions to the *Guideline on Air Quality Models* (https://www.epa.gov/scram/2023-appendix-w-proposed-rule).
  - Proposed adding 3 new formulation options:
    1. Incorporation of COARE algorithms into AERMET for use in overwater marine boundary layer environments
    2. Proposed addition of a new Tier 3 detailed screening technique for NO2 (GRSM)
    3. Proposed addition of RLINE as mobile source type
    - **Only adding formulation options to the model system…**
      …not removing any existing option or imposing any new requirements.
  - Refinement to the recommendations regarding the determination of an appropriate background concentration for NAAQS implementation modeling, including new draft guidance.
    - "Draft Guidance on Developing Background Concentrations for Use in Modeling Demonstrations" details the EPA-recommended framework of considering the representativeness of relevant emissions, air quality monitoring, and pre-existing air quality modeling to appropriately represent background concentration for cumulative impact analyses.
  - "Appendix A" to Appendix W shifting to "Addendum A" due to new Federal Register requirements
- The goal is for the final rule publication with a corresponding 24XXX release version of the AERMOD Modeling System and final version of the Background Concentration Guidance by mid-summer 2024.

POC: Bridgers.George@epa.gov

PM NAAQS Reconsideration Regulatory Impact Analysis

- $PM_{2.5}$ design values were projected to 2032 to inform the PM NAAQS Regulatory Impact Analysis
  - 2018v2-based modeling platform
  - Limited screening of extreme values to help address wildfire influence in 2016-2020 base-year monitoring
- Emission reductions from 'on-the-books' rules in the 2032 case continue the progress in $PM_{2.5}$ concentrations in recent decades
  - The number of counties above 9 $\mu g/m^3$ in the 2032 projection is under half the number for 2022 DVs
- Reductions in direct PM emission in exceedance areas will be important beyond the 'on-the-books' rules
  - Also helps to address exposure disparities



POC: Kelly.James@epa.gov

PM2.5 Implementation Efforts

- EPA recognizes the challenges with new source permitting under the more stringent, health protective PM2.5 NAAQS and expect to continue to work successfully with state and local air agencies and Tribes in implementing new source permitting under the Clean Air Act.
- EPA released supplemental guidance with a new PM2.5 Significant Impact Level (SIL) value for the revised annual standard – **April 30, 2024** (*see next slide*).
- EPA will work with facilities and reviewing authorities on a case-by-case basis to identify the existing data, models and tools to demonstrate compliance under revised standard and, as appropriate, ***exercise the inherent discretion and flexibilities*** with the permitting process to best evaluate impacts from a proposed new project.
  - Develop representative background for PSD demonstrations that involves discretion in ambient data adjustments (per Data Exclusions Memo) and selection of representative monitors and nearby sources (per *Guideline* update and guidance on developing background concentrations)
  - EPA updates to AERMOD formulation and PM2.5 MERPs for PM2.5 (more hypothetical sources in database) to better represent new source impacts along with a streamlined Model Clearinghouse process for alternative model approvals.

Updated $PM_{2.5}$ SILs for PSD Permitting

- The 2018 Guidance on SILs for Ozone and PM in the PSD Permitting Program recommended SIL values developed based on…
  - Technical analysis of the inherent variability in monitored pollutant concentrations
  - The level of the corresponding NAAQS
- Given the strengthening of the annual $PM_{2.5}$ NAAQS, EPA updated the SILs value corresponding with the new level of the standard and updated technical analysis with more recent design value data
- EPA released a Supplement to the 2018 Guidance and Supporting Documents on SILs for Ozone and $PM_{2.5}$ on **April 30, 2024**
  - Revised annual $PM_{2.5}$ SILs for NAAQS and PSD increments
  - Retain the Ozone and $PM_{2.5}$ 24-hour SILs
  - Updated technical analysis using the same peer-reviewed approach based on inherent variability in monitored pollutant concentrations

https://www.epa.gov/nsr/significant-impact-levels-ozone-and-fine-particles

POC: Piliero.Alyssa@epa.gov

AQ Modeling Workshops & Conferences

- **13th Conference on Air Quality Models**
  - Conducted November 14-15, 2023 in RTP, NC
  - Triennial AQ Modeling Conference (CAA, Section 320)
  - Public hearing for proposed revisions to the *Guideline on Air Quality Modeling* and AERMOD
  - Please reference the following website for the conference proceedings (presentations and transcripts) and information on the proposed rule: https://www.epa.gov/scram/13th-conference-air-quality-modeling
- **2024 Regional, State, and Local Dispersion Modelers' Workshop**
  - Planned for July 29 – August 1, 2024 at Colorado Dept of Public Health offices in Denver, CO
  - There will be a virtual option but strongly encourage as much in-person participation as possible
  - Agenda planning is underway and Workshop info / draft agenda will be posted to SCRAM by April 15th
  - There will be focused engagements on PM NAAQS compliance demonstration concerns / issues
  - Please reach out to the State & Local Modeling Rep (Sam Sampieri) and George Bridgers with recommendation for discussion / presentation topics

POC: Bridgers.George@epa.gov

Source Monitoring Updates

Fenceline / Sorbent Monitoring

- EPA has recently proposed expanded applications of fenceline monitoring
  - Hazardous Organic NESHAP (HON), benzene, butadiene, vinyl chloride, ethylene oxide, ethylene dichloride, and chloroprene
  - Coke Oven NESHAP, Benzene
  - Integrated Iron and Steel, Chromium

- Method Development
  - Proposed Method 327, canister-based measurement for volatile organic HAPS (ethylene oxide and vinyl chloride) – **FINAL Spring 2024**
  - Future Revisions to 325A/B, expanded compound list and new sorbent material – **Proposal Summer/Fall 2024**
  - New Method for Fenceline, Metals – **Fall 2026**
  - Formaldehyde fenceline method - **Researching**

POC: Shappley.Ned@epa.gov

PFAS Methods Update

Other Test Method 45 – Available at www.epa.gov/emc

- Provides sampling and analysis procedure to measure 50 polyfluorinated alkyl substances (PFAS) from stationary source vents or stacks
- Originally posted in January 2021
- Commercially available target compound and internal standards are now available.
- Currently being revised based on stakeholder experience to include improved sample preparation and compound recovery.
- Anticipated update release Summer 2024

Other Test Method 50 – Now Available (01/2024)

- Provides sampling and analysis procedure to measure volatile fluorinated compounds
- Includes water and acid gas management approach for whole gas sampling from stationary combustion sources
- Target compounds include refrigerants, climate change compounds, PFAS precursors.
- Target compounds also include products from incomplete thermal treatment of PFAS and fluoropolymers.

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Wood Heater Updates

Precision study of IDC wood heater test method and measurement of PM

- West coast lab work – 52 test runs on 3 wood heater models burning D. fir and maple – **completed**
- East coast lab work – Same stoves, 52 more tests, maple and birch – **completed**

Precision testing of hydronic heater IDC method – West coast testing complete

- West coast lab work – 54 test runs of hydronic cord wood and pellet fired heaters
- East coast lab work – Same 54 test runs, now underway.

Precision testing of Pellet heaters using IDC method

- East coast lab work – underway
- EPA ORD lab work – pending

Precision testing of Forced-air furnaces

- Method development in progress

IRA Grant of 8.8M to NESCAUM for wood heater testing/ranking

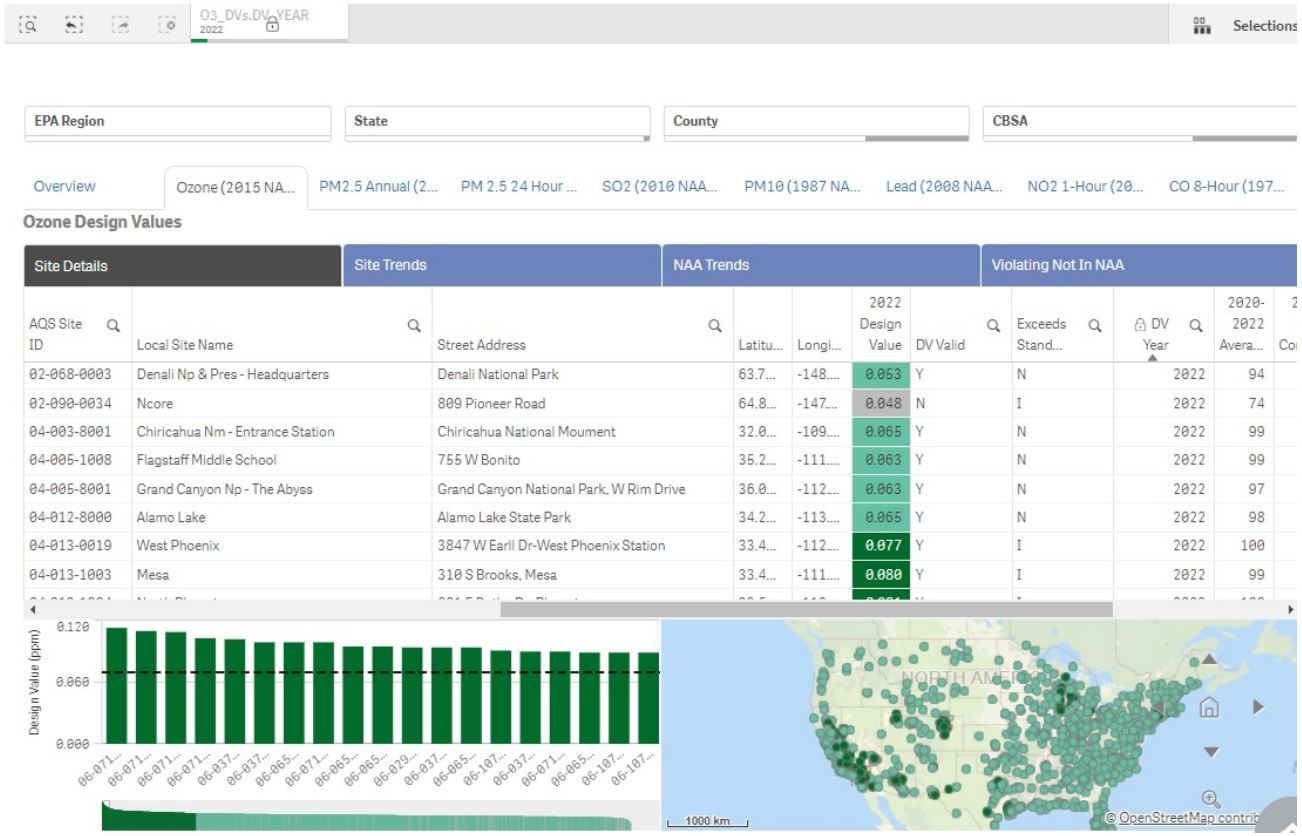
- https://www.epa.gov/grants/grant-funding-emissions-wood-heaters
- Planning underway

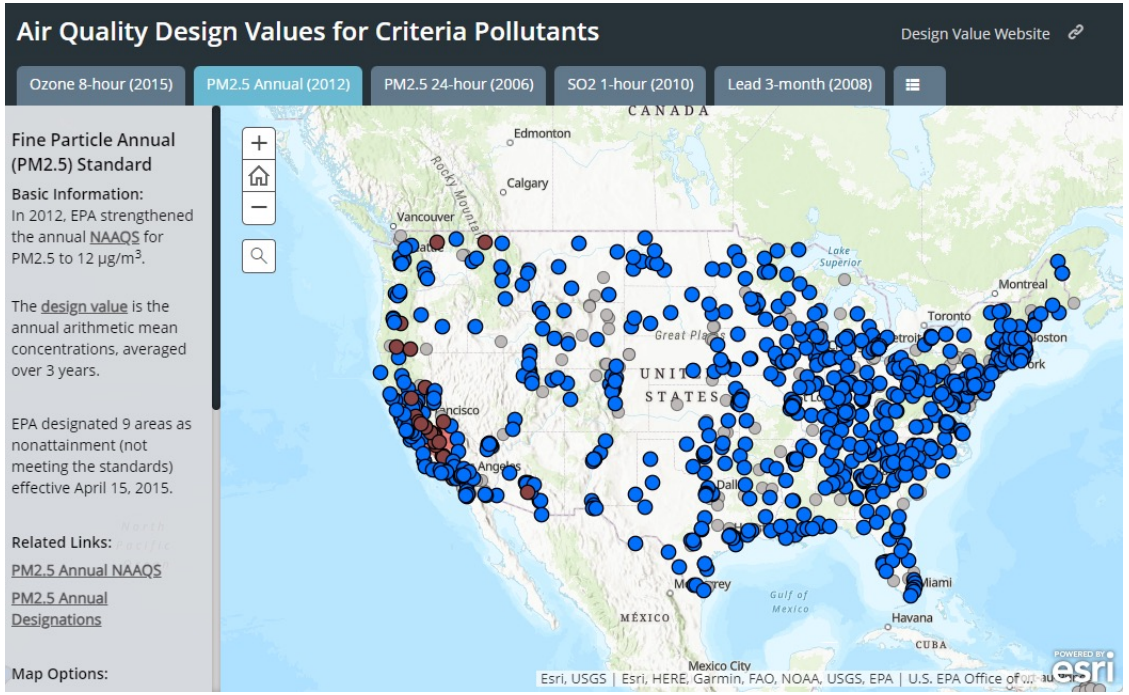
POC: Johnson.Steffan@epa.gov

Tools and Resources

Design Value Resources

Design Value Interactive Tool





https://www.epa.gov/air-trends/air-quality-design-values

POC: Fox.Loren@epa.gov

Exceptional Events Visualization Tools

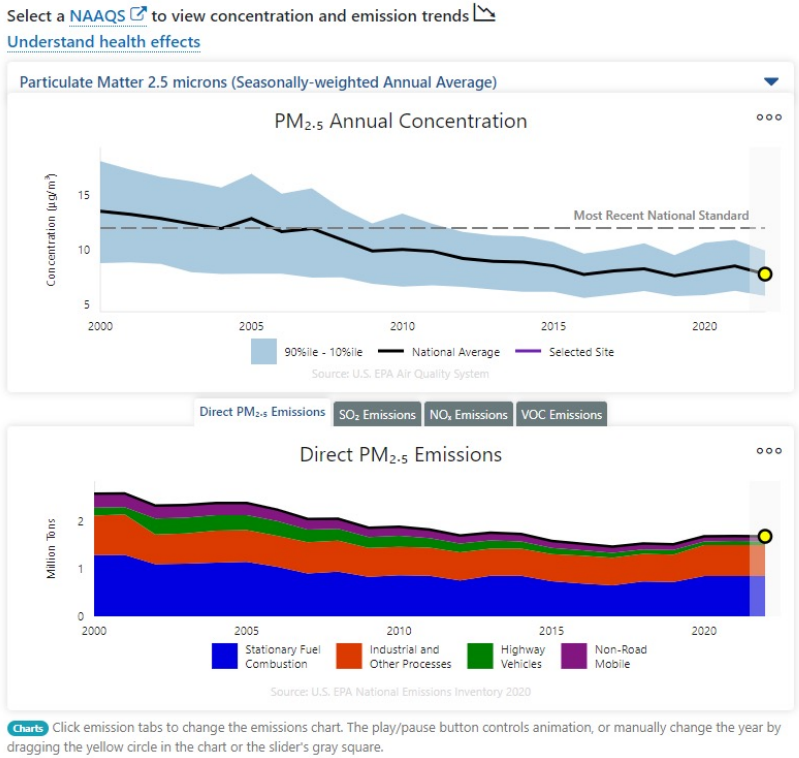
- Identify days potentially impacted by exceptional events.
- Assess potential regulatory significance.
- Determine exceptional event tier category for your site(s).

POC: Evangelista.Mark@epa.gov

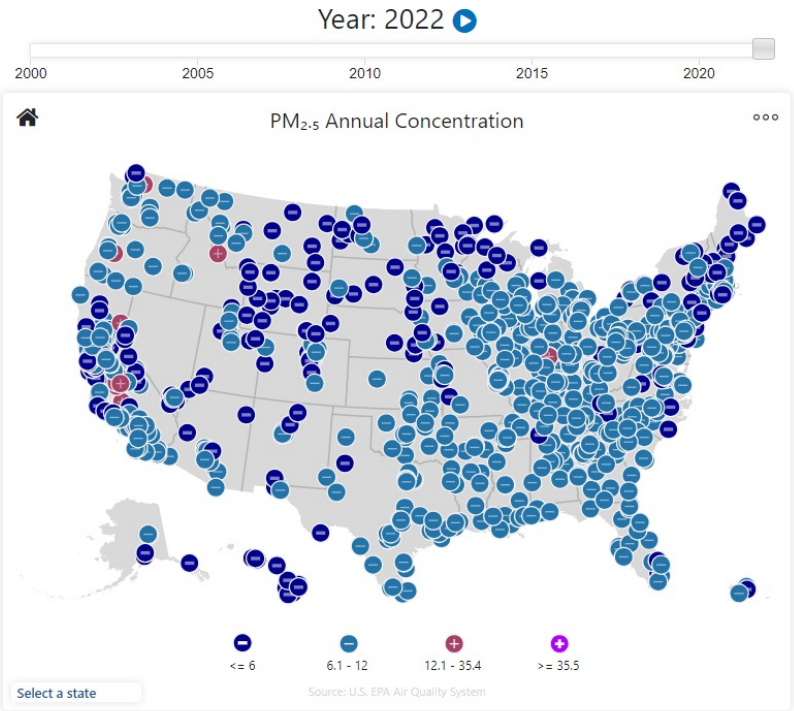
https://www.epa.gov/air-quality-analysis/exceptional-events-analysis-and-visualization-tools

Air Quality Trends

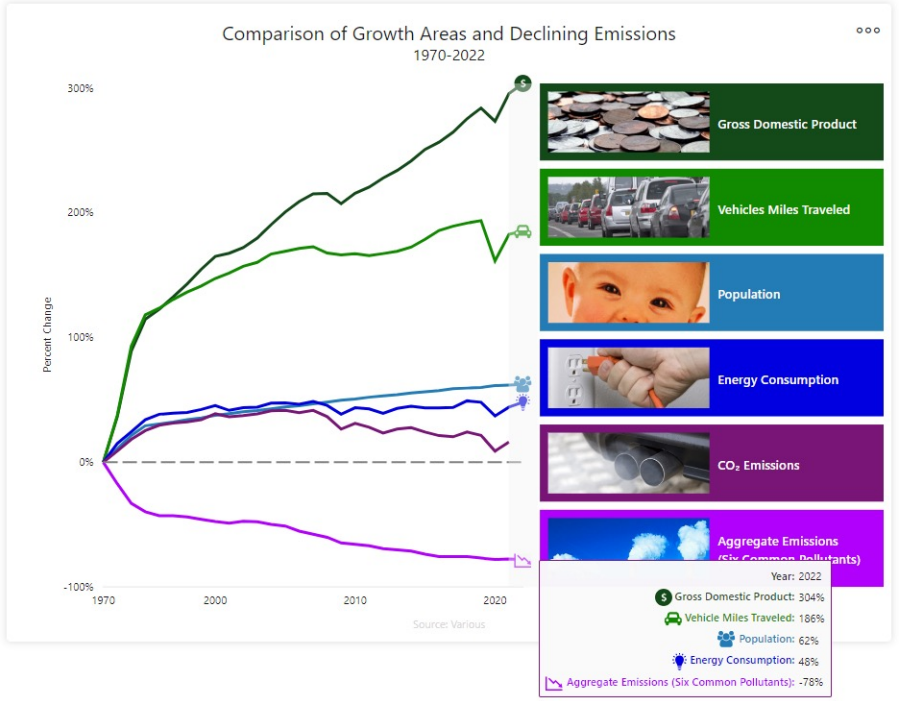
Criteria Pollutant Trends Show Clean Air Progress



Charts Click emission tabs to change the emissions chart. The play/pause button controls animation, or manually change the year by dragging the yellow circle in the chart or the slider's gray square.



Map Symbols indicate values above or below the most recent standard. Click any point to display annual concentration data. Double click the map to zoom in and click the home button to reset. Please be patient with map exports.



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Questions?