Air Quality Modeling, Monitoring and Other Technical Updates

AAPCA Fall Meeting
August 28-30, 2024

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U.S. EPA Office of Air Quality Planning & Standards

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Ambient Monitoring

Source: GAO File Photo.

60105(a) Fenceline Monitoring

- **Community Monitoring Grant Competition**
  - Allocated over $30M in IRA funds to EPA Regions to award to grant recipients in 2023
  - Enhanced Air Quality Monitoring for Communities (arcgis.com)
- **Direct Awards to S/L/Ts**
  - Allocated ~$41M in IRA funds to EPA Regions to award to SLTs to deploy, integrate, support and maintain criteria and air toxics air monitoring in 2024
  - Air Monitoring and Air Quality Sensors Grants under the Inflation Reduction Act | US EPA
- **Regional Mobile Monitoring Support**
  - Provided funds to EPA Regions for regional mobile monitoring platform equipment and O&M in 2023
- **Funding Ambient & Fenceline Air Toxics Measurement and Method Development**
- **Community Scale Air Toxics Grants**
  - Next competition planned for 2025

60105(b) Multipollutant Monitoring

Direct Awards to S/L/Ts

- ~$41M allocated to EPA Regions to award to SLTs to increase the number of new air monitoring sites and to replace, repair, operate, and maintain existing sites. Air Monitoring and Air Quality Sensors Grants under the Inflation Reduction Act | US EPA

CASTNET

- $5M allocated to OAP to invest in existing sites, procure and install new equipment to enable robust air quality, climate, and health assessments, and establish new multipollutant monitoring sites on tribal lands

Grant Implementation

- The remainder of funds under this provision are being used to administer the grants and support implementation

60105(c) Sensors

Direct Awards to S/L/Ts

- ~$1,982,000 allocated to EPA Regions to award to SLTs to deploy, integrate, and operate air quality sensors in low-income and disadvantaged communities Air Monitoring and Air Quality Sensors Grants under the Inflation Reduction Act | US EPA

EPA Regional Sensor Loan Programs, Trainings, and Outreach

- Funded EPA Regions for new or existing EPA Sensor Loan Programs for Communities in 2023 (link)
- Completed a Community Monitoring webinar series in spring 2024 (link to presentations and recordings)
- EPA's 2025 Air Sensors Workshop – March 18-20th, RTP, NC

EPA’s 2025 Air Sensors Workshop

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

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2024 National Ambient Air Monitoring Conference – New Orleans, LA

- Took Place August 12 – 15, 2024 in New Orleans, LA.
  - Over 900 confirmed attendees!
  - Conference Website
- Highlights:
  - Topics covering Air Toxics/EtO, PM/PM-speciation, Sensors, PAMS, Automation, Criteria Gases, and Tribal Monitoring
  - Community Monitoring Showcase
  - Excellent interaction that is not possible in a remote setting
  - Over 100 presentations and 70 exhibitors
  - Hands-on training sessions by instrument companies
  - Very positive feedback

AAPCA THE ASSOCIATION OF AIR POLLUTION CONTROL AGENCIES EPA NACAA national association of clean air agencies

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Major Highlights/Accomplishments

$PM_{2.5}$ Final NAAQS Rulemaking

New CSN contract awarded

IRA Direct Awards Grant Guidance Posted

(link)

GAO Asset Management

Community Air Monitoring/Sensor Trainings (link/link)

Final rule revising the Ozone Cross-Section in the Ozone FRM

Air Toxics/EtO Measurement and Method Developments

PAMS Dashboard

(link)

ARP/IRA Competitive Grant Implementation

ARP and IRA Regional Air Sensor Loan Programs (link)

Secondary SOx/NOx/PM NAAQS

- EPA's proposal to revise the Secondary SOx standard and retain the Secondary NOx and PM standards was published on April 15, 2024.
  - EPA proposed to change the Secondary SO2 standard
    - From: 0.5 ppm, 3-hour standard not to be exceeded more than once per year,
    - To: Range of 10 to 15 ppb, Annually averaged over 3 years
  - EPA solicited comment on the proposed level and form,
  - EPA proposed no new ambient monitoring, taking comment on the position that the current network is adequate.
- Public notice and comment period closed on June 14, 2024.
- EPA is reviewing public comments and working to finalize the review by December 10, 2024, in accordance with a consent decree.
- Any needed implementation guidance would be expected concurrent with a final rule or shortly thereafter.

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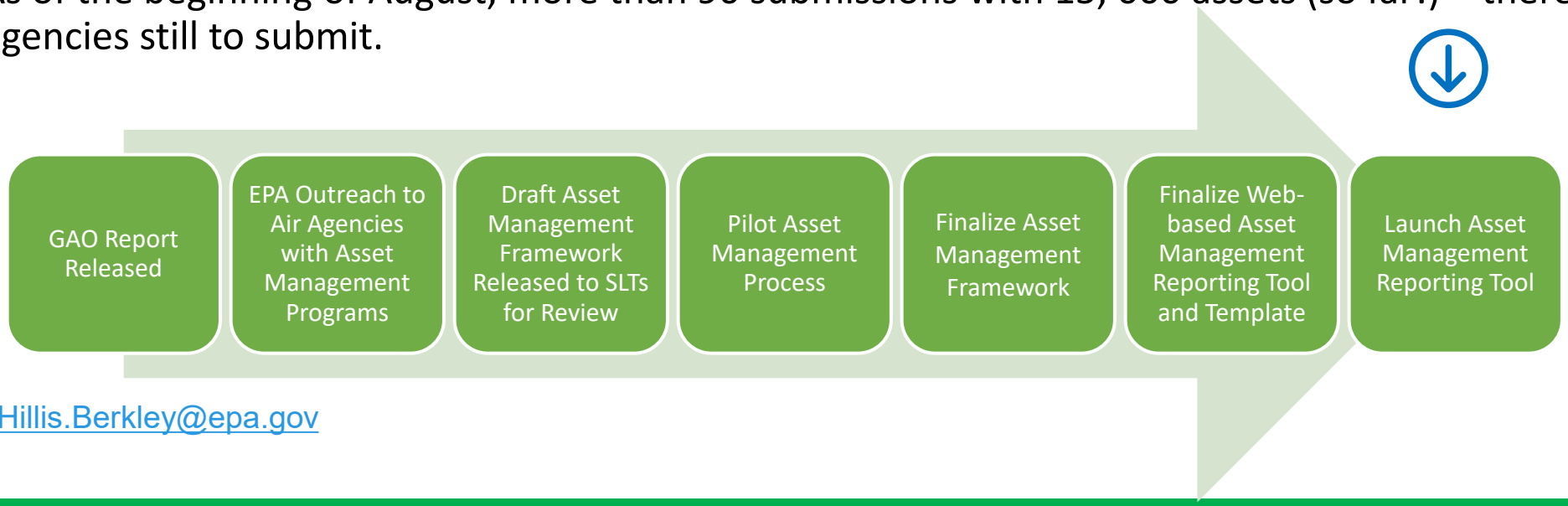
GAO Response – Asset Management

- 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
- As of the beginning of August, more than 90 submissions with 15, 000 assets (so far!) – there are agencies still to submit.



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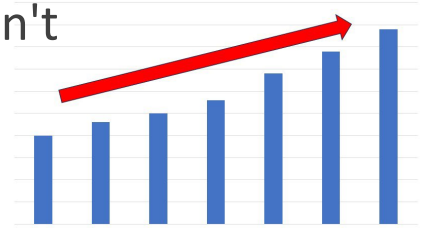
National Monitoring Contracts & Costs

- 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 FY25 budget, we are working hard on STAG funding decisions by leveraging opportunities under IRA to fund new sites, enhance monitoring activities at existing sites, and support air toxics monitoring.
- EPA is working with SLTs as part of the GAO modernization efforts to address cost increases and help develop an approach for managing networks if Congress doesn't provide an increase in STAG allocations to support our existing networks.



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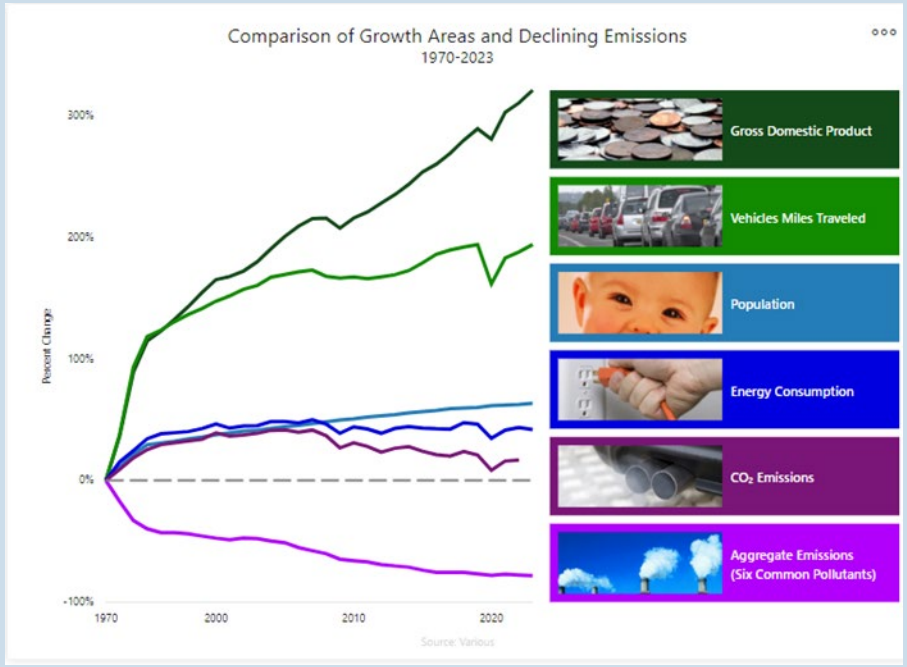
Air Quality Analysis



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

Overview of Update Process

- Final Notice signed May 8, 2024
- 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 used the hourly ambient temperature data in AQS associated with the site
  - If hourly ambient temperature data were unavailable, the more conservative warmer temperature correction was used
- Initial updates completed in June 2024 for review and comment
- Additional updates completed in June through August 2024
- Final Design Values posted August 9, 2024

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Update to AIRNow Fire & Smoke Map

Version 4 has an updated look and feel, English and Spanish editions

Now contains roughly 1000 Canadian based air quality sensors

Beta released to public on July 17th, about a quarter of total views are beta version currently, final in a few weeks

More “at a glance” information about your location

- A consistent approach whether you are on a computer or mobile device

Other underlying features (e.g. correction equation) remain unchanged

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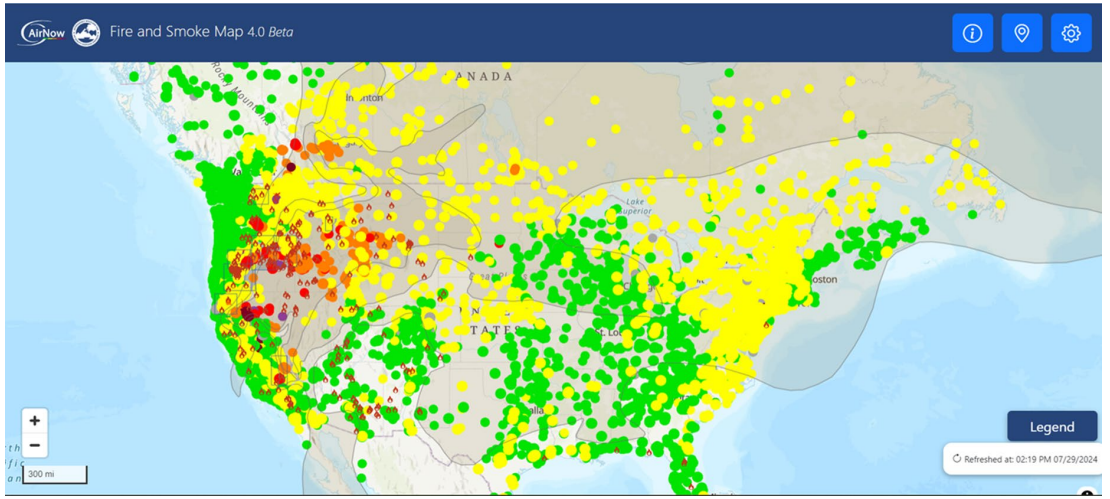
Some new and updated features

- Much faster loading
- An indication when ozone or PM10 are the controlling pollutant
- More explanatory information when a user digs down
- Better fire information display

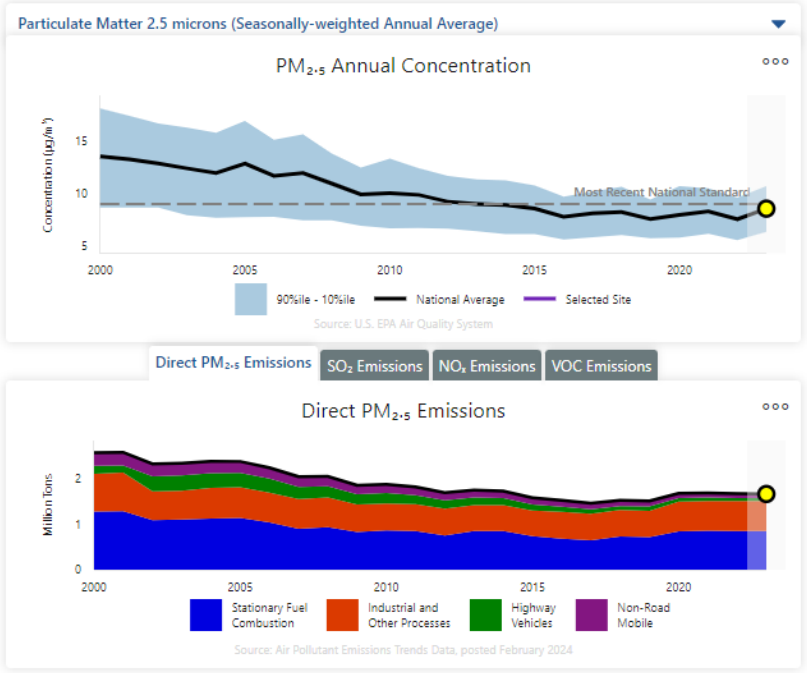


Air Quality Trends

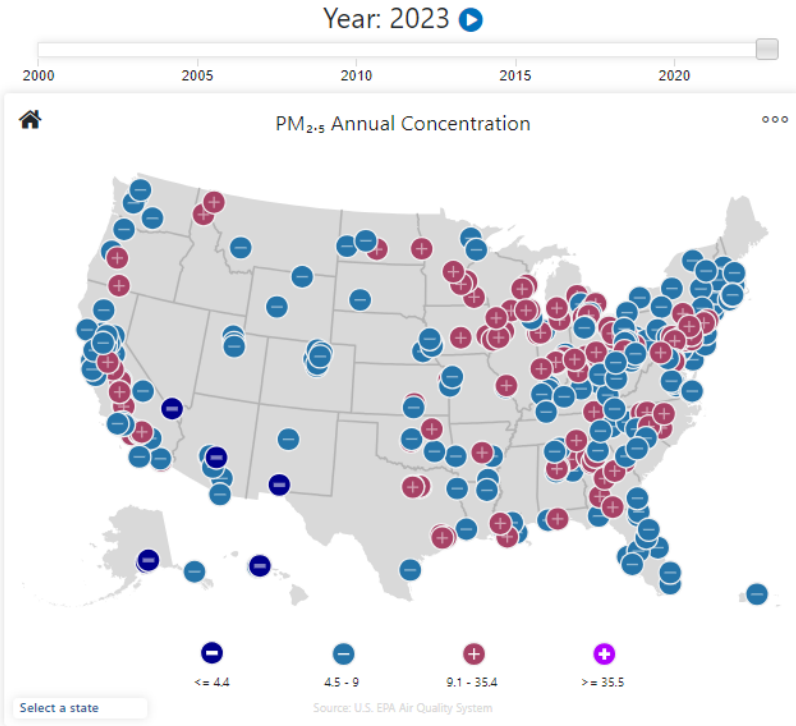
Criteria Pollutant Trends Show Clean Air Progress

Select a NAAQS to view concentration and emission trends

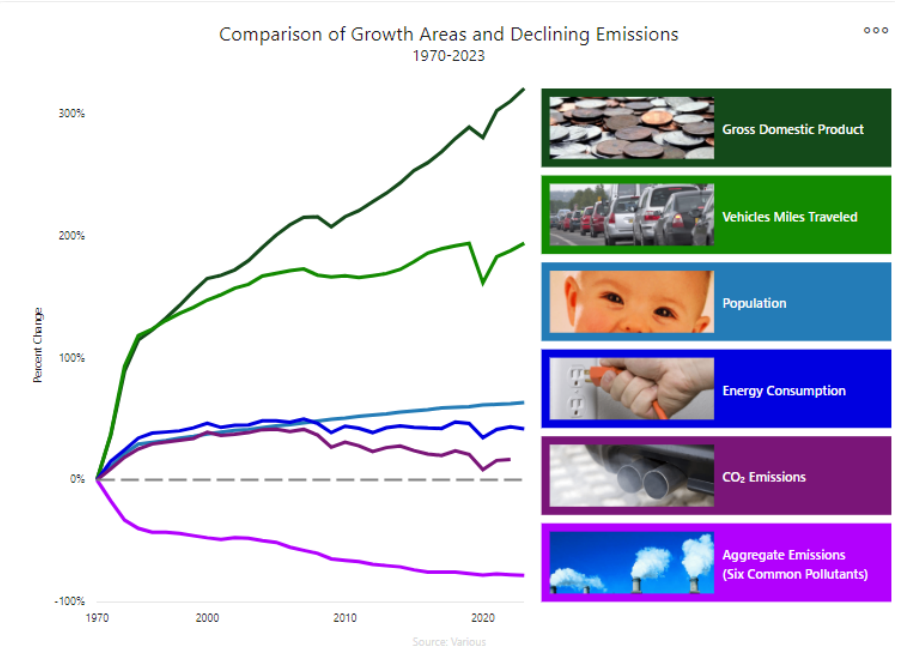
Understand health effects



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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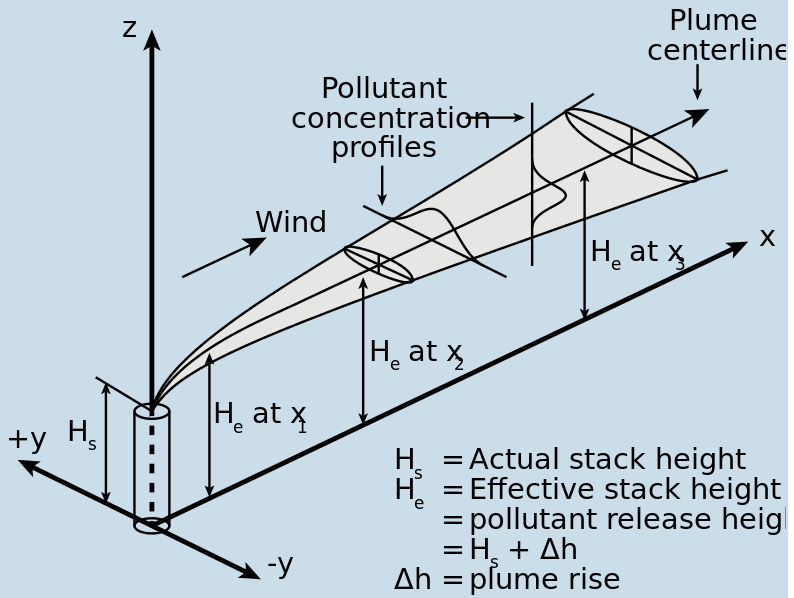
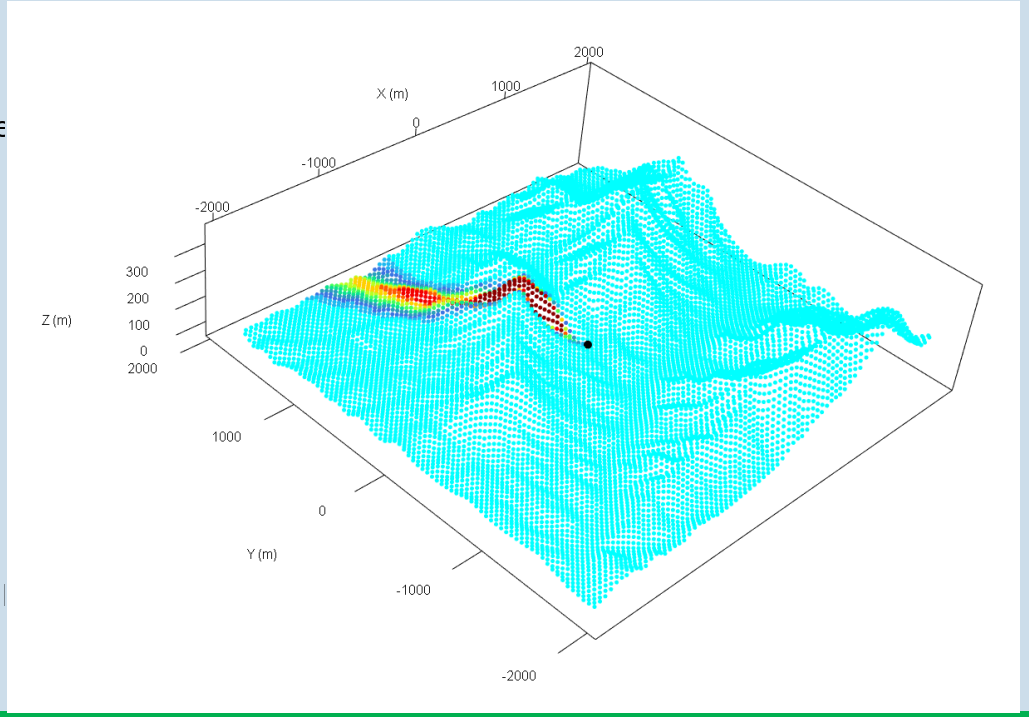
https://gispub.epa.gov/air/trendsreport/2023

Air Quality Modeling





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 with no changes to any existing model 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
  - 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
- Final rule package is undergoing review by our Regulatory Workgroup and should enter the OAQPS/OAR signature chain in early September with a targeted mid-October Administrator signature.
- The AERMOD Modeling System and final Background Concentration Guidance will be released upon final rule signature.

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AERMOD Modeling System Updates

AERMOD/AERMET v23132, MMIF v4.1

- Concurrent release with *Guideline* / AERMOD proposed rule in October 2023

Full AERMOD Modeling System (AERMET, AERMOD, AERMAP) and AERSURFACE v24142

- Concurrent release with *Guideline*/AERMOD final rule projected for mid-October 2024

Active Ongoing AERMOD Development

- Roadside barrier algorithms (continuous barriers, edge effects, vegetative barriers)
- Downwash (PRIME, BPIPPRM, Offshore Platforms)
- Shoreline fumigation
- Aircraft plume rise
- Highly buoyant plumes
- Area meander
- Urban categorization
- Improvements to surface characteristics

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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

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2022 Regulatory Platform Update: Non-emission data

Non-emissions data sets available on EPA AWS

Global model outputs (global):

- GEOS-Chem and CMAQ-HEMI

Boundary conditions (bcon):

- Domain: 36US3
- GEOS-Chem, GEOS-CF*, and CMAQ-HEMI

Meteorology model outputs (WRF):

- Domain: 12US1

CMAQ-ready meteorology inputs (MCIP):

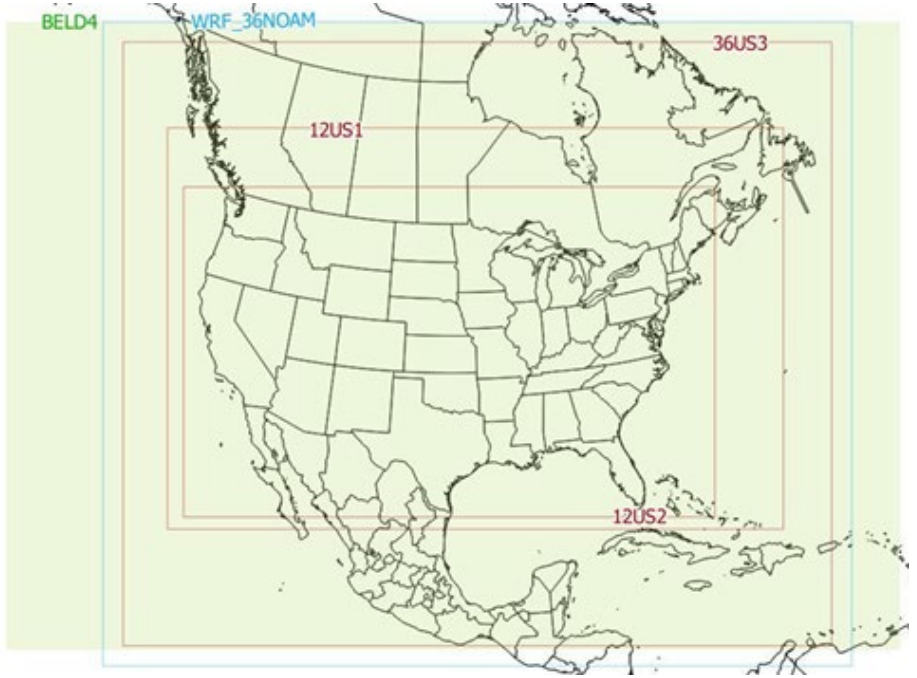
- Domain: 12US1 and 36US3

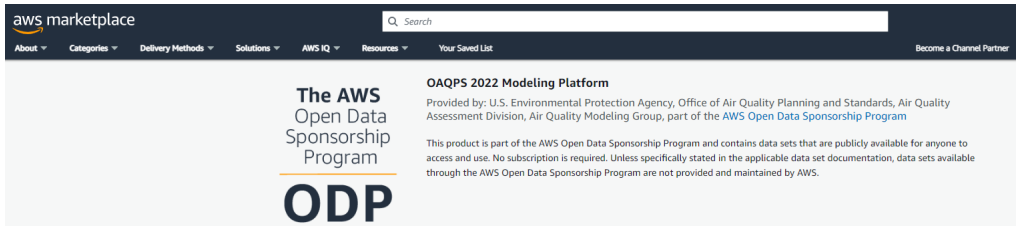
CAMx-ready meteorology inputs (wrfcamx):

- Domain: 12US1

We plan to provide additional model input and output files later this year into early 2025

*GEOS-CF model outputs are available for download from NASA: https://gmao.gsfc.nasa.gov/weather_prediction/GEOS-CF/data_access/





AQ Modeling Workshops & Conferences

- **Upcoming:**
  - **2025 Regional, State, and Local Dispersion Modelers' Workshop** *(Hybrid event, but in-person strongly encouraged)*
    - Preliminary planning already underway with a "Save the Date" notice going out before Thanksgiving
    - Tentatively looking at either Nashville, TN or Minneapolis, MN in late April or early May 2025
  - **2025 Regional, State, and Local Photochemical Modelers' Workshop** *(Hybrid event, but in-person strongly encouraged)*
    - Desire to host a Photochemical Modelers' version of the RSL Workshop next year… last time was 2012 in Chicago
    - It may be held jointly with the Dispersion Modelers' Workshop or held separately in RTP, NC.
    - Seeking feedback from state/locals on what works best for their staff and travel budgets
- **Previous:**
  - **13th Conference on Air Quality Models** *(November 14-15, 2023)*
    - Conference proceedings (presentations and transcripts) and information on the *Guideline*/AERMOD revisions proposed rule: https://www.epa.gov/scram/13th-conference-air-quality-modeling
  - **2024 Regional, State, and Local Dispersion Modelers' Workshop** *(July 30 – August 1, 2024)*
    - Workshop presentations: https://gaftp.epa.gov/Air/aqmg/SCRAM/workshops/2024_RSL_Modelers_Workshop/2024_RSL_Modelers_Workshop-Final_Agenda.pdf

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Emission Inventory Updates

Update on 2022 Regulatory Platform Emissions

The Collaborative process to develop the 2022v1 platform is ongoing

- Co-leads: Zac Adelman (LADCO), Mary Uhl (WESTAR), Jeff Vukovich (OAQPS)
- In 2024, quarterly update webinars were provided in February, May, and August (next: November)
- A special projection and control webinar was held in June
  - 18 S/L agencies provided closure and control information
- Base year inventories were finalized in July 2024 and CMAQ-ready emissions are scheduled to be posted to the AWS Open Data Program during August (CAMx emissions will be in October)
- S/L/T Review of draft emissions data for 2026, 2032 and 2038 is scheduled to start mid-September
- Information on the platform and on submitting comments is available here: https://www.epa.gov/air-emissions-modeling/2022v1-emissions-modeling-platform
- EPA plans to finalize analytic year inventories for 2026, 2032 and 2038* by December
  - Summary data will be available on the website for all years
  - AQM-ready emissions files for 2026 will be available in December, with 2032 files and documentation in January

POC: Vukovich.Jeffrey@epa.gov (Alison Eyth is on a temporary assignment through January 2025)

AirToxScreen Updates

2020 AirToxScreen was released Spring 2024

- First edition with risk at higher geographic resolution (census-block level)
- Cancer Risk available via AirToxScreen Mapping Tool
- Hazard Index (HI) risk assessment results will be loaded into Mapping Tool in the coming months

2021 AirToxScreen tentatively scheduled for March 2025 release

- Will be at the census-block level again
- SLTs will have a preview period in early 2025

2022 AirToxScreen Point Source Emissions Review will be October 2024

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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
- As a result of these comments, the EPA has made improvements to the package, which have been submitted to OMB for interagency review
- EPA received and addressed interagency comments
- Target for final rule release has been summer 2024, but signature date is pending

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National Emissions Inventory (NEI) Recent Milestones and Plans

Completed Spring 2024 through August 2024

- 2023 NEI reporting window is open for SLT submittals in the Emissions Inventory System (EIS)
- 2023 nonpoint tools (Wagon Wheel) available with new EIS input templates & provided training to SLTs
- Updated release of 2022 NEI point inventory in EIS
- Incorporated SLT comments from 2021 AirToxScreen point source review into EIS

Ongoing

- 2023 Point Source data completeness for SLT submittals
- Additional revisions to 2020 NEI TSD errata as States continue work on 2022 emissions modeling platform
- NOMAD training on updated residential wood combustion (RWC) tool

Fall - Winter 2024 - 2025

- Finalize methodologies and acquire 2023 activity data for next Wagon Wheel updates for RWC and fertilizer application
- Next version of wagon wheel
- Nonpoint SLT submittal quality assurance
- Continued NEI and EIS newsletter updates to stakeholders every 3-4 weeks

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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

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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, MJOs, Tribes, and Territories.
- 25 Implementation Grant awards for the General Competition have been announced. Announcements for the Implementation Grant awards for the Tribes & Territories competition are planned for later this summer.
- 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.

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Combined Air Emissions Reporting System (CAERS) Update

CAERS V6 re-release January 2025. 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 – Added their minors
- ID, Pima AZ, Allegheny Co – 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 workflow with TRI

POC: Gamas.Julia@epa.gov

Source Monitoring Updates

Fenceline / Sorbent Monitoring

- EPA has recognized the effectiveness of fenceline monitoring work practice for lowering emissions and health risks to surrounding communities. As a result, EPA has incorporated fenceline monitoring in the following regulations:
  - Petroleum Sector – Part 63 Subpart CC
  - Iron and Steel Manufacturing – Part 63 Subpart FFFFF
  - Synthetic Organic Chemical Manufacturing Industry (HON-SOCMI) – Part 63 Subparts F, G, H, I
  - Coke Ovens – Part 63 Subpart L

- Methods to support fenceline monitoring work practice:
  - EPA Method 325A/B – Revision proposal targeted for October 2024
  - EPA Method 327 – Promulgated with the HON
  - Total chromium – Currently in development

POC's: Shappley.Ned@epa.gov Berkowitz.David@epa.gov

EPA Method 320 Revisions – Proposal

EPA proposed revisions to Method 320 (FT-IR) on February 29, 2024

- https://www.govinfo.gov/content/pkg/FR-2024-03-01/pdf/2024-04359.pdf
- First revision since method development in 1999
- Popular test method for HAP emissions

Public Comment Period is now CLOSED:

- EPA is reviewing comments and preparing responses.
- We anticipate finalizing this test method in the summer of 2025

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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
- Revision 1 posted on in July, 2024

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

- Provides sampling and analysis procedure to measure volatile fluorinated compounds
- First source testing method using canisters for sample collection
- Includes procedures for water and acid gas management
- Target compounds include industrial fluorinated compounds (refrigerants), GHG, PFAS precursors.
- Target compounds also include products of incomplete thermal treatment of PFAS and fluoropolymers.

Other Test Method 55

- ORD CEMM continues progress on a third stationary source test method for nonpolar PFAS targets and products of incomplete thermal treatment of PFAS.

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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**
- **EPA STAKEHOLDER MEETING SCHEDULED FOR OCTOBER 16, in RTP**

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

- West coast lab work – 54 test runs of hydronic cord wood and pellet fired heaters - Underway
- East coast lab work – 54 test runs of hydronic cord wood and pellet fired heaters

Precision testing of Pellet heaters using IDC method

- East coast lab work – underway
- EPA ORD lab work – to follow East coast work

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
- Test approach planning underway

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Thank you!