Air Quality Modeling, Monitoring and Other Technical Updates

NACAA Fall Meeting
October 20, 2022

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Ambient Monitoring Updates

Source: GAO File Photo.

2022 National Ambient Air Monitoring Conference - Pittsburgh, PA

- Conference was the first National Conference in four years
  - Routinely occurs every 2 years
  - We will start the process of planning another NAAMC to occur in 2024.

- <u>Took Place August 22 – 25, 2022</u> in Pittsburgh, PA.
  - 757 confirmed attendees of 800+ people registered
  - ~2/3 of attendees reported they are new to their agency in the last 3 years!
  - Agenda: https://projects.erg.com/conferences/ambientair/docs/Final%20NAAMC%202022%20Agenda_August%2021.pdf

- Highlights:
  - Janet McCabe & CMU researcher keynotes
  - Hands-on training sessions by instrument companies
  - Excellent interaction that is not possible in a remote setting
  - Growing interest and participation in both community monitoring and air toxics
  - Presented & interacted on GAO response concepts to SLTs
  - Very positive feedback

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National Ambient Air Monitoring Conference
PITTSBURGH
AUGUST 22-25, 2022

American Rescue Plan – Status Update

- Competitive Grant ($20M)
  - December 13, 2021 - Request for Applications (RFA) Opened
  - March 25, 2022 - RFA Closed; > 200 proposals received
  - October 2022- Anticipated Notification of Selection
  - November 2022- Anticipated Awards
- Direct Awards ($22.5M)
  - Direct award funding from the ARP is being used to address health outcome disparities from pollution and the COVID-19 pandemic.
  - Grants are being awarded to state, Tribal and local air agencies to enable continuous monitoring of fine particle pollution (PM2.5) and replace other aging air monitoring equipment.
  - Regional offices are currently working with SLTs on the grant award process.
- Regional Office Short-term Community Monitoring Projects ($5M)
  - EPA Regions are working on developing sensor loan programs and mobile monitoring platforms.

https://www.epa.gov/arp

PM NAAQS Reconsideration and Ambient Monitoring

- Two important monitoring related topics connected with the reconsideration:
  - PM$_{2.5}$ network design and relationship to environmental justice
  - How to improve FEM/FRM comparability
    - Monitoring agencies decide which PM$_{2.5}$ methods to employ.
    - Use of PM$_{2.5}$ continuous FEMs is dominated by two companies with a total of four methods (86% of the operating network):
      - Met One BAM 1020 and BAM 1022
      - Teledyne API T640 and T640x
    - EPA intends to propose a revision to the monitoring regs to allow improvement of PM concentration measurement performance for approved FEMs.
    - Teledyne API reports that they are working on an improvement to their T640 and T640x method performance that may be available as soon as the end of this year.
    - Recommend monitoring agencies assess their FRM and continuous FEM data quality and for cases where they may have one of more sites with outliers (relative to data in other agencies) pursue additional support and training as needed.

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Government Accountability Office (GAO) Report – EPA Response

- GAO report titled *Air Pollution: Opportunities to Better Sustain and Modernize the National Air Quality Monitoring System* (GAO-21-38) released November 2020 (https://www.gao.gov/products/gao-21-38)
  - Two key recommendations focused on asset management and modernization.
  - EPA committed to address each recommendation in coming years.
  - Asset management is being addressed first, with modernization to follow.
  - Examples of modernization are not just technology based, and include:
    - Increasing local-scale, real-time air quality data availability
    - Increasing air toxics monitoring capabilities and coverages
    - Addressing persistent and complex pollution (e.g., wildfires)
    - Evaluate increased use of low-cost sensors and satellite data
  - Each issue requires significant engagement and buy-in by state, local, and tribal air agencies as well as federal and other partners.
  - Funding is also a key consideration for success.

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GAO Response – Asset Management

- Asset management proposal has been drafted and shared internally with regional technical and RGC staff. Additional feedback is being sought before release to SLTs for comment.

- Asset management proposal concepts were shared at the NAAMC in Pittsburgh.
  - SLTs will share asset data with EPA regions on an annual basis, using a standard reporting template, focusing mainly on physical hardware, supporting infrastructure and IT that are needed to generate data.
  - We will pilot the effort in 2023 with intentions of requiring it in grant terms and conditions starting in 2024.
  - Regions will be able to use the data as submitted when they engage their SLTs on network planning, planned expenditure of funds, and more.

- Next steps:
  - Fall 2022: Release written proposal for SLT & federal partner review and comment.
  - Fall/Winter 2022/2023: Summarize feedback, modify proposal document, and plan for pilot project.
  - Spring/Summer 2023: Promote and manage pilot process.
  - Late 2023/Early 2024: Translate pilot experience into formal framework.

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AIRNow Fire & Smoke Map Updates

Version 3 enhancements released June 2022

- Toggle to assist individuals with color vision deficiencies view map

- Ability to save several favorite locations

- Adding a clickable box to help the public quickly get to additional information about the wildfire and smoke in their area (e.g., Smoke Outlook)

- Streamlined User Guide and FAQs

Over 25 million page views since release in Summer 2020

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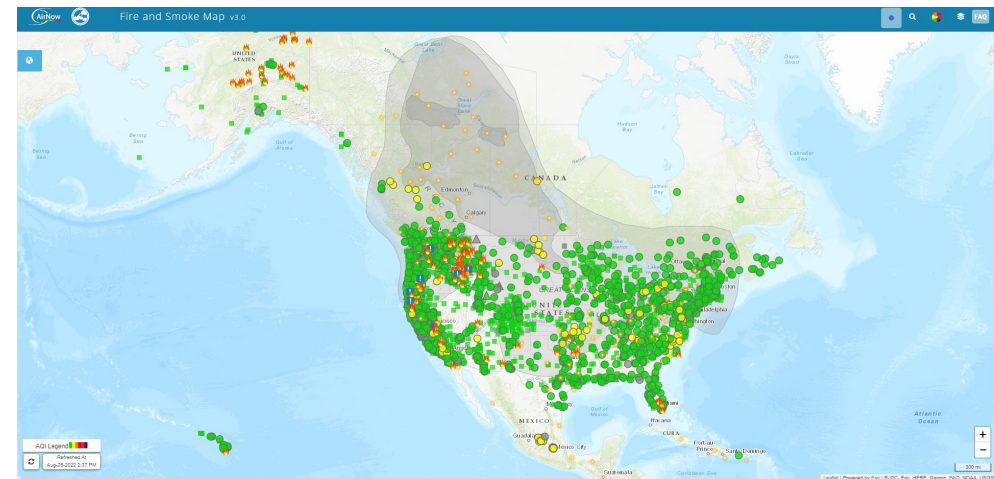
Emission Inventory Updates

AirToxScreen Update

- 2017 Air Toxics Data Update released via AirToxScreen and EJScreen
  - https://www.epa.gov/AirToxScreen

- 2018 AirToxScreen released August 31, 2022

- 2019 AirToxScreen planned release end of 2022/early 2023
  - Will be included in 2023 EJScreen update

- 2020 point source HAP review by SLTs
  - Will be part of main NEI data review before the first public version of 2020 point sources are released on website
  - 2020 HAP review scheduled from 9/1/22 – 10/27/22
  - Same plan for 2021 and beyond

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2016 Modeling Platform

- The 2016v2 platform emissions were released publicly on September 21, 2021

- These emissions were used for AQ modeling to support the proposed interstate transport "good neighbor" FIP for 2015 Ozone NAAQS
  - https://www.epa.gov/csapr/good-neighbor-plan-2015-ozone-naaqs

- EPA has reviewed comments on the 2016v2 platform emissions submitted on the proposal in addition to those submitted prior to the proposal

- A new version of the 2016 platform is being developed ("2016v3") that implements updates based on the comments and will be used in the AQ modeling for the final rules

- Emissions data availability
  - Updated Commercial Marine Vessel (CMV) and solvent emissions have been released to support ongoing MJO and state modeling efforts: https://gaftp.epa.gov/Air/emismod/2016/v3/preliminary_updates/

  - The full set of 2016v3 platform emissions will be released in December 2022

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2020 National Emissions Inventory Plans

- **Completed virtual training series** (**POC: Snyder.Jennifer@epa.gov**)
  - Recordings available at: airknowledge.gov or our NEI SharePoint Site

- **Now through winter 2022/2023**
  - Compilation and quality assurance of Point, Onroad/Nonroad Mobile, and Events data categories

  - State, local, tribal (SLT) collaboration on quality assurance - provides great value to the process

  - Final EPA estimates release for a few nonpoint data sources (agricultural NH3, Oil and Gas, ICI, Stage I Gasoline Distribution)

  - Continued NEI and EIS newsletter updates to stakeholders every 3-4 weeks

  - Point source review for air toxics (and all pollutants) for Air Toxics Data Update

  - EIS releases of Point, Onroad/Nonroad Mobile, and Event data categories as they are completed

  - Nonpoint data category compilation and QA

- **March 2023:** Full public release including documentation, summaries, and query tools

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Emissions Science Improvements

2020 NEI and platform

- Agricultural silage VOC, VOC-HAP added

- Solvent emissions overhauled

- Biogenic model revised and released

- Wildfires and prescribed fires with Bluesky pipeline and including Pb

- Residential wood combustion (RWC) $PM_{2.5}$ emission factors (EFs)

- Asphalt warm mix and hot mix processes added

- New SPECIATE profiles for VOC and $PM_{2.5}$ created and used

- 2020 temporal/spatial in platform customized

Selected upcoming plans

- Abandoned oil and gas wells (new)

- Roofing asphalt emissions (new) and further improvement of other asphalt methods

- Cooking emissions: commercial, residential (new), and food trucks (new)

- Gasoline distribution

- RWC activity methods, EFs, speciation, and projections

- Solvent usage in oil & gas operations (new)

- SPECIATE additions will continue

- Wildland-urban interface (new) and structural fires (new)

See also: https://www.epa.gov/air-emissions-inventories/emissions-science-improvements-emission-sectors

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Air Emissions Reporting Rule

- AERR updates under consideration for the 2023 inventory reporting year:
  - Updating the nonpoint emissions requirements to use current best practices and meet transparency and quality assurance goals
  - Ensure that AERR requirements are consistent with the latest emissions documentation available to data reporting agencies
  - Considering emissions reporting directly from permitted facilities in Indian Country when an Indian tribe is not required to report emissions data
  - An approach to acknowledge and incorporate CAERS in some cases

- AERR updates under consideration for later inventory years:
  - Improving air toxics emissions data
  - Improving fires emissions data for prescribed fires
  - Improving emissions from intermittent sources (e.g., backup generators)

- Late summer/fall we are completing the Small Business Advocacy Panel

- AERR shows on EPA regulatory agenda as a Spring 2023 proposal

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Air Quality Modeling Updates
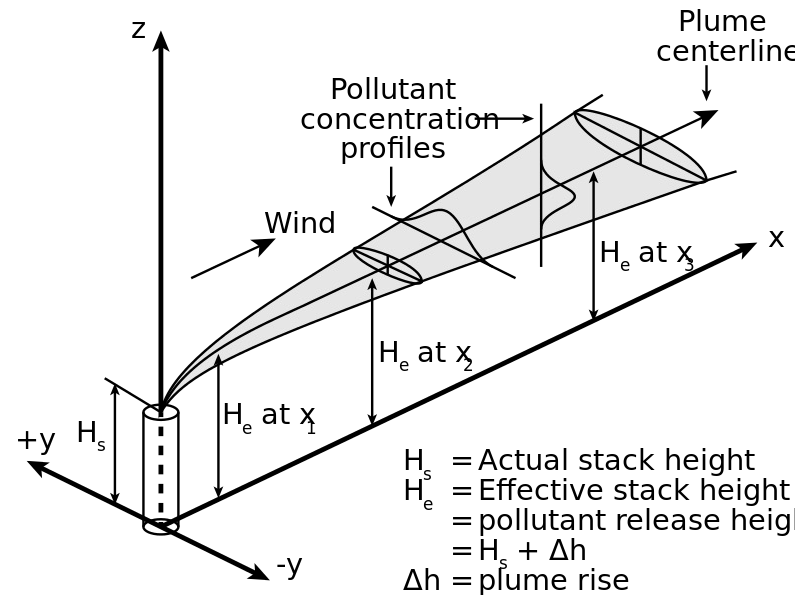
Ozone & PM Permit Modeling Guidance

- The *final* "Guidance for Ozone and Fine Particulate Matter Permit Modeling" was released on July 29th.

  - https://www.epa.gov/scram/guidance-ozone-and-fine-particulate-matter-permit-modeling

- The final guidance reflects the EPA's recommendations for how a stationary source seeking a PSD permit may demonstrate that it will not cause or contribute to a violation of the NAAQS for O_3 and $PM_{2.5}$ and PSD increments for $PM_{2.5}$, as required under Section 165(a)(3) of the Clean Air Act and 40 CFR sections 51.166(k) and 52.21(k).

- Based on the feedback received to both the February 2020 *draft* and September 2021 *revised draft* guidance documents. There were a few clarifications and associated updates, but the "Holistic" compliance demonstration approach and all other recommendations from the *revised draft* guidance were maintained.

- A release webinar was presented to the co-regulatory agencies and external stakeholders on August 11th.

  - https://www.epa.gov/scram/guidance-ozone-and-fine-particulate-matter-permit-modeling#webinar

- The EPA continues to recommend that permit applicants <u>engage early</u> with the appropriate reviewing authority and that the co-regulatory agencies consult with the appropriate EPA Regional Office regarding all O_3 and $PM_{2.5}$ compliance demonstrations.

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AERMOD Updates

- AERMOD/AERMET Version 22112

  - Released June 27, 2022

- 2023 Proposed Regulatory Update

  - Priority Development Activities
    - RLINE/RLINEXT (w/ terrain and solid barriers)
    - New NO_2 Conversion Options
      - Generic Reaction Set Method (GRSM)
      - Travel Time Reaction Method (TTRM)
    - PRIME Downwash Updates
    - COARE Algorithms in AERMET (buoy-based meteorological data)
    - AREA Source Meander
    - Urban Option Updates

  - 13th Conference on Air Quality Models
    - Conference and Proposed Regulatory Update, Fall 2023
    - Final Regulatory Update, Summer 2024

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Ozone Transport

- EPA has received numerous comments on the emissions inventories and air quality modeling used for the proposed SIP disapprovals and transport FIP.

- We are in the process of updating our 2016-based modeling platform in response to these comments.

- The updated platform will be used for air quality modeling to support the final SIP and FIP actions.

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Base Year Modeling Platform Review

- Analysis of 2020 base year data
  - Review of EPA's modeling guidance for selecting a base year
  - Emissions data and trends
  - Monitoring data and trends
    - Ozone, PM, NOy concentrations
  - Conducive meteorological conditions

- Review of regulatory calendar for key modeling deliverable dates
- Discussion with MJO's on possible base year and collaboration

Source Monitoring Updates

Fenceline / Sorbent Monitoring

- Work is underway to explore passive/active sorbents for fenceline measurement of
  - Chloroprene (recently completed)
  - 1,3, Butadiene (in progress)
  - Ethylene Oxide & Vinyl chloride (investigating)
    - (more volatile and reactive = more challenging)

- Method 325A/325B method can be used for measurement/reporting in other sectors

- Investing continuous well-site monitoring and other remote sensing options for the detection of methane in the oil and gas production sector

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Method 23 Updates

- Method 23 (Dioxin/Furan testing) updates – Final expected soon (Late fall 2023)
  - Improves analytical approach and sensitivity for Dioxins/Furans
  - Adds options to measure PCB compounds and PAH compounds, if desired
  - Laboratories already on notice and adapting to new analytical practices

- Proposal version published as OTM-046 to support ongoing ICR testing in several sector rules

- Starting work on EPA Method 31 – Dioxin/Furan testing using a different analytical finish to accommodate future laboratory technology (MS/MS)

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Wood Heater Updates

- Revocation of Alt 125 /127 (Cordwood test method) final Feb. 23, 2022
  - Crib wood test method remains available, along with Alt-140 (IDC method)
  - One new model-specific cord wood ATM has also been issued

- Large effort precision study of IDC wood heater test method and TEOM 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 – beginning soon

- 21 tests conducted with paired TEOM devices at EPA – ORD – complete
  - 21 tests examining TEOM measurements for ruggedness (sensitivity to change) completing August, 2022.

- Precision testing of hydronic heater IDC method to begin soon – April 2022
  - West coast lab work – 54 test runs of hydronic cord wood and pellet fired heaters
  - East coast lab work – Same 54 test runs, in different order than West coast. Exchanging appliances

- OAQPS supporting OECA on test report review of Alaska identified test report issues
  - New checklist revisions (April) to Third Party Certifiers has demonstrated to improve new report completeness

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Questions?