Air Quality Modeling, Monitoring and Other Technical Updates

NACAA Spring Meeting
May 18, 2022

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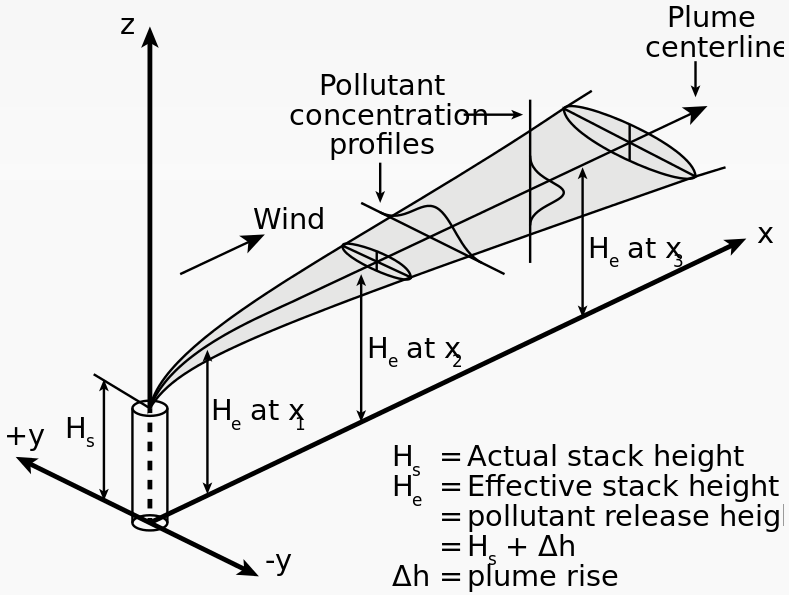
U.S. EPA Office of Air Quality Planning & Standards

Air Quality Modeling Updates



Revised Draft Guidance on O3/PM2.5 Permit Modeling

- Sept 2021 revised draft released for informal public comment
- OAQPS/OGC has reviewed the comments and working on appropriate tweaks to the guidance
  - 13 comment packages received from state/local agencies, tribal nations, and industrial stakeholders
- Final review version of the guidance planned for submission to OMB for Interagency Review in April (*though OMB is currently backlogged*)
- OMB Interagency Review (60 – 90 days)
  - May require additional revisions or updates to guidance
- Once cleared OMB, EPA will release the guidance as "final" in Fall 2022 or ASAP
- In the interim, we continue to recommend all state/local agencies follow the recommendations in the Sept 2021 revised draft guidance and to reach out to their EPA Regional Offices for coordination/consultation on all O_3 or $PM_{2.5}$ PSD compliance demonstration

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2022 AERMOD Modeling System Release

- Release in the late-May timeframe
- AERMOD
  - General code maintenance
  - Bug fixes (*e.g.*, NO_X background, BUOYLINE, RLINE)
  - Updates to NO_2 options:
    - TTRM being integrated into all three NO_2 Tier 3 methods
    - GRSM transitioning from Alpha to Beta
  - Alpha platform downwash option (from OCD)
  - Alpha option (new source type, for now) for "sidewash" effects testing and eventual integration into PRIME
- AERMET
  - Draft AERMET to replace current AERMET based on feedback received
    - https://www.epa.gov/scram/draft-aermet
  - Overwater processing of prognostic data

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Emission Inventory Updates

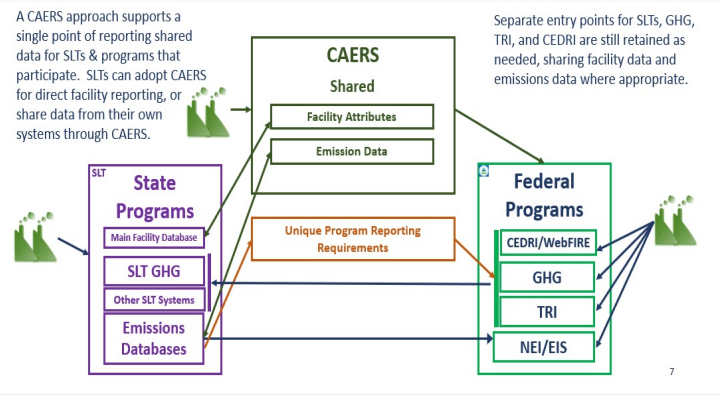
Air Emissions Reporting Rule

- 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)
- Two listening sessions with state/local/tribal agencies were held in April 2021
  - Additional input has also been received by email and can be sent to the POCs listed below

POCs: Houyoux.Marc@epa.gov

CAERS Update

- CAERS (Combined Air Emissions Reporting System):
  - Participating State/Local/Tribal (SLT) agencies & inventory year: GA (2019), DC, & Pima AZ (2020), RI (2021), AZ, ME, MT (2022-2024)
  - Several more SLTs have requested test accounts, some seeking management approval to adopt CAERS
  - CAERS V3 released February 2022 includes new customizations for SLTs
  - Reporting for inventory year 2022 started February 2nd
- We are recruiting SLTs on an ongoing basis:
  - SLTs who want to adopt CAERS "as-is" can start onboarding any time
  - EPA is exploring sharing code with SLTs so they can develop their module
  - Interested SLTs who aren't on our Product Design Team (PDT) can join any time to provide input towards the continued development of CAERS



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Air Toxics Data Updates (2017-2019)

- 2017 Air Toxics Data Update released via AirToxScreen and EJScreen
  - https://www.epa.gov/AirToxScreen
- 2018 AirToxScreen planned release summer 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 for late summer 2022
  - Same plan for 2021 and beyond

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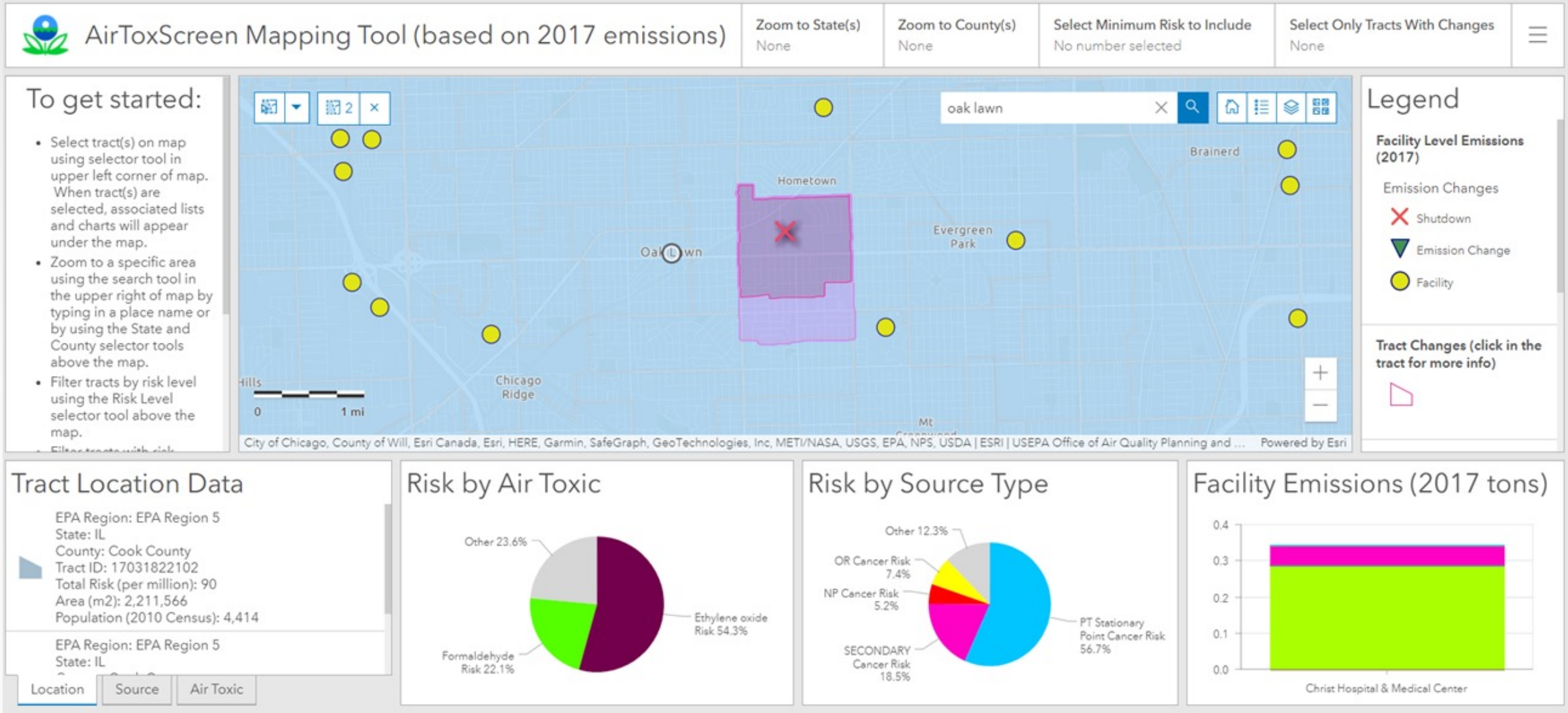
Risk POC: Woody.Matt@epa.gov

AirToxScreen Mapping Tool

www.epa.gov/AirToxScreen



2020 National Emissions Inventory Plans

- **Ongoing virtual trainings** (POC: Snyder.Jennifer@epa.gov)
  - See https://www.epa.gov/air-emissions-inventories/air-emissions-inventory-training
- **Now through 2022**
  - 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
  - Methods and draft data review for a few nonpoint data sources (agricultural NH3, CMV, Oil and Gas)
  - Nonpoint data category compilation and QA
- **March 31, 2022:** Reporting deadline for nonpoint data category (input templates, survey, emissions)
- **April 2022:** Final feedback reports sent to Air Directors
- **May/June 2022:** Point source review for air toxics (and all pollutants) for Air Toxics Data Update
- **Fall 2022:** Releases of Point, Onroad/Nonroad Mobile, and Event data categories as they are completed
- **March 2023:** Full public release including documentation, summaries, and query tools

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Ambient Monitoring Updates

Source: GAO File Photo.

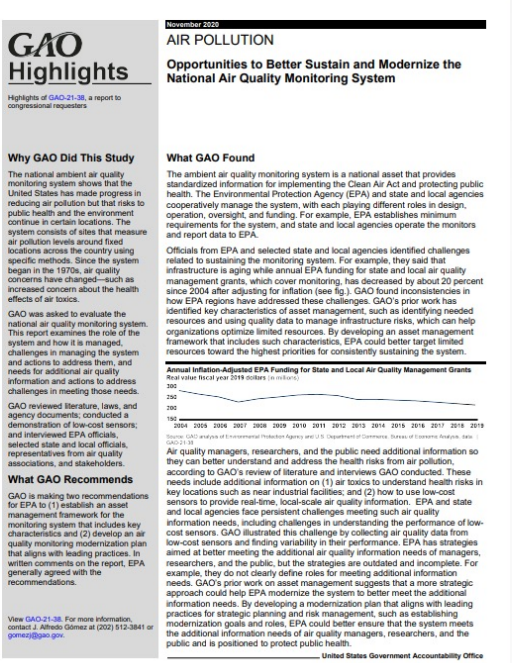
American Rescue Plan – Status Update

- Competitive Grant ($20M)
  - December 13, 2021 - Request for Applications (RFA) Opened
  - March 25, 2022 - RFA Closed; > 200 proposals received
  - August-September 2022- Anticipated Notification of Selection
  - October-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 will be 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 will work with SLTs in the coming months 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

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.



November 2020

AIR POLLUTION

Opportunities to Better Sustain and Modernize the National Air Quality Monitoring System

GAO Highlights

Highlights of GAO-21-38, a report to congressional requesters

Why GAO Did This Study

The national ambient air quality monitoring system shows that the United States has made progress in reducing air pollution but that risks to public health and the environment continue in certain locations. The system consists of sites that measure air pollution levels around fixed locations across the country using specific methods. Since the system began in the 1970s, air quality concerns have changed—such as increased concern about the health effects of air toxics.

GAO was asked to evaluate the national air quality monitoring system. This report examines the role of the system and how it is managed, challenges in managing the system and actions to address them, and needs for additional air quality information and actions to address challenges in meeting those needs.

GAO reviewed literature, laws, and agency documents; conducted a demonstration of low-cost sensors; and interviewed EPA officials, selected state and local officials, representatives from air quality associations, and stakeholders.

What GAO Recommends

GAO is making two recommendations for EPA to (1) establish an asset management framework for the monitoring system that includes key characteristics and (2) develop an air quality monitoring modernization plan that aligns with leading practices. In written comments on the report, EPA generally agreed with the recommendations.

View GAO-21-38. For more information, contact J. Alfredo Gómez at (202) 512-3841 or gomezj@gao.gov.

What GAO Found

The ambient air quality monitoring system is a national asset that provides standardized information for implementing the Clean Air Act and protecting public health. The Environmental Protection Agency (EPA) and state and local agencies cooperatively manage the system, with each playing different roles in design, operation, oversight, and funding. For example, EPA establishes minimum requirements for the system, and state and local agencies operate the monitors and report data to EPA.

Officials from EPA and selected state and local agencies identified challenges related to sustaining the monitoring system. For example, they said that infrastructure is aging while annual EPA funding for state and local air quality management grants, which cover monitoring, has decreased by about 20 percent since 2004 after adjusting for inflation (see fig.). GAO found inconsistencies in how EPA regions have addressed these challenges. GAO's prior work has identified key characteristics of asset management, such as identifying needed resources and using quality data to manage infrastructure risks, which can help organizations optimize limited resources. By developing an asset management framework that includes such characteristics, EPA could better target limited resources toward the highest priorities for consistently sustaining the system.

Annual Inflation-Adjusted EPA Funding for State and Local Air Quality Management Grants

Real value fiscal year 2019 dollars (in millions)

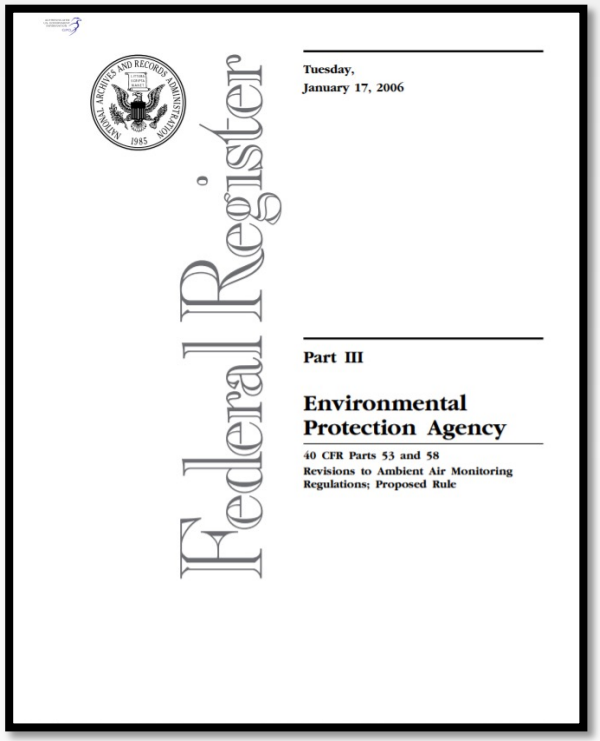
Source: GAO analysis of Environmental Protection Agency and U.S. Department of Commerce, Bureau of Economic Analysis, data. | GAO-21-38

Air quality managers, researchers, and the public need additional information so they can better understand and address the health risks from air pollution, according to GAO's review of literature and interviews GAO conducted. These needs include additional information on (1) air toxics to understand health risks in key locations such as near industrial facilities; and (2) how to use low-cost sensors to provide real-time, local-scale air quality information. EPA and state and local agencies face persistent challenges meeting such air quality information needs, including challenges in understanding the performance of low-cost sensors. GAO illustrated this challenge by collecting air quality data from low-cost sensors and finding variability in their performance. EPA has strategies aimed at better meeting the additional air quality information needs of managers, researchers, and the public, but the strategies are outdated and incomplete. For example, they do not clearly define roles for meeting additional information needs. GAO's prior work on asset management suggests that a more strategic approach could help EPA modernize the system to better meet the additional information needs. By developing a modernization plan that aligns with leading practices for strategic planning and risk management, such as establishing modernization goals and roles, EPA could better ensure that the system meets the additional information needs of air quality managers, researchers, and the public and is positioned to protect public health.

United States Government Accountability Office

PM NAAQS Reconsideration and Ambient Air Monitoring

- EPA continues to work on reconsideration of the particulate matter (PM) National Ambient Air Quality Standards (NAAQS).
- Two important monitoring related topics we are working on:
  - How to improve FEM/FRM comparability
  - $PM_{2.5}$ network design and relationship to environmental justice
- Our technical staff have had several calls over the winter with SLTs on these and additional technical topics to help improve the clarity, fixing any issues, and putting current practices into regs, where appropriate.
- Additional technical topics include:
  - Data calculations
  - Reference and Equivalent Methods
  - Quality Assurance and Quality Control
  - PM10 topics that are technical in nature and could be considered without affecting the PM10 NAAQS
  - Probe and Siting Criteria in Appendix E



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Air Toxics Monitoring

- Ethylene Oxide (EtO)
  - Added as a required analyte to NATTS in 2019
  - Continued evaluation of EtO measurements by TO-15/TO-15A with ORD, national contract lab and canister manufacturers
    - Communicated current knowledge and lesson learned with monitoring community through technical webinars and technical notes on this canister-based GC/MS method
  - NATTS TAD revision to incorporate Method TO-15A
    - Final revision and communication webinars expected in late spring 2022
  - Collaborate with ORD and State partners to evaluate emerging monitoring technologies

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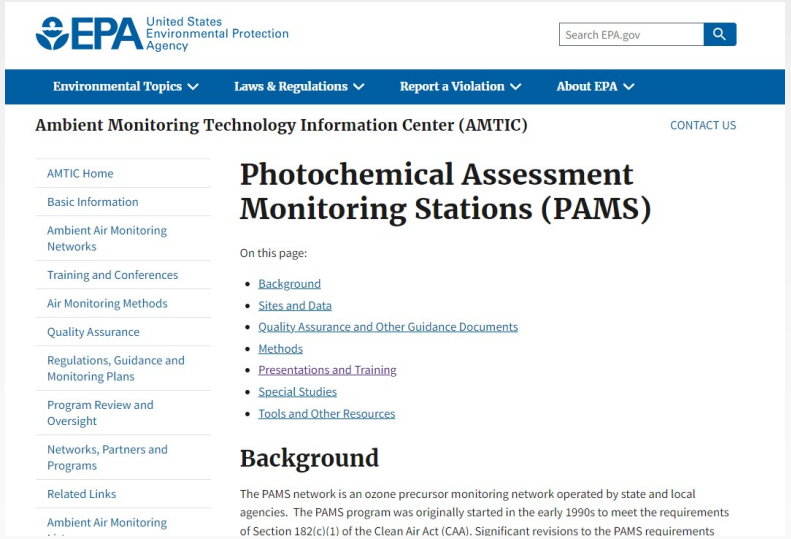
PAMS Update

- 2021 PAMS Season
  - First PAMS required year of operation included some challenges
    - COVID caused delays in equipment installations, site support, and training
    - Equipment issues (particularly noted with the CAS auto-GC)
  - More than half of the PAMS sites collected data in 2021
  - States are required to meet the PAMS requirements, but EPA recognizes the unique challenges presented in 2021 and 2022 PAMS Seasons
- EPA Support in 2022
  - National orders collected and being processed
  - Unified Ceilometer Network (UCN) available for collecting, storing, and retrieving ceilometer data
  - EPA investigating issues with CAS Auto-GC and working to simplify data processing and reporting
  - Nearing finalization of a recompeted National Lab contract



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Preparing for 2022 National Ambient Air Monitoring Conference

- This conference routinely occurs every 2 years.
  - Draws upwards of 700 attendees from federal, state, local, and tribal government organizations, plus industry, instrument manufacturers and vendors, academics, and other air quality management professionals.
  - Considered a highly valuable activity to provide training, interactivity and networking, and critical informational updates on all things ambient air monitoring.
- 2020 iteration was cancelled/postponed due to COVID.
- Save the Date! August 22 – 25, 2022 in Pittsburgh, PA.
  - Planning to be fully in-person conference.
  - Call for papers closed April 1, 2022.
  - Tentative Agenda expected in May 2022.

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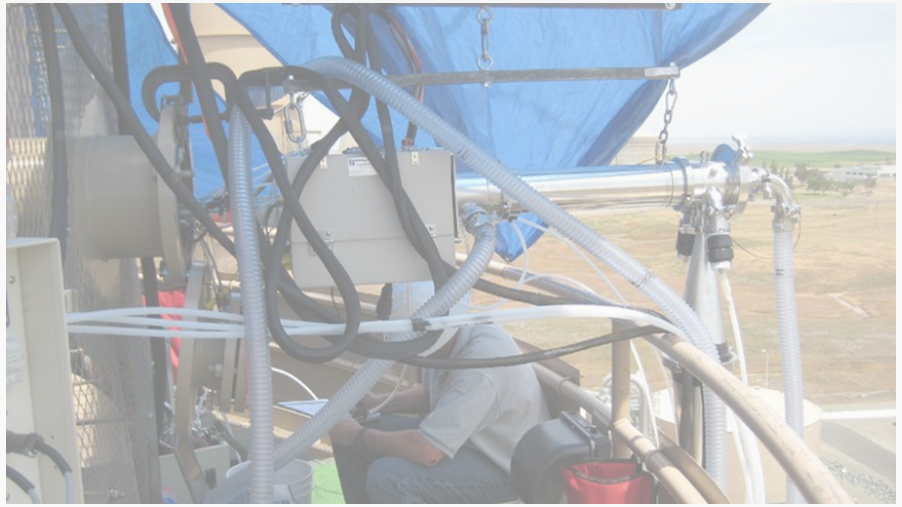
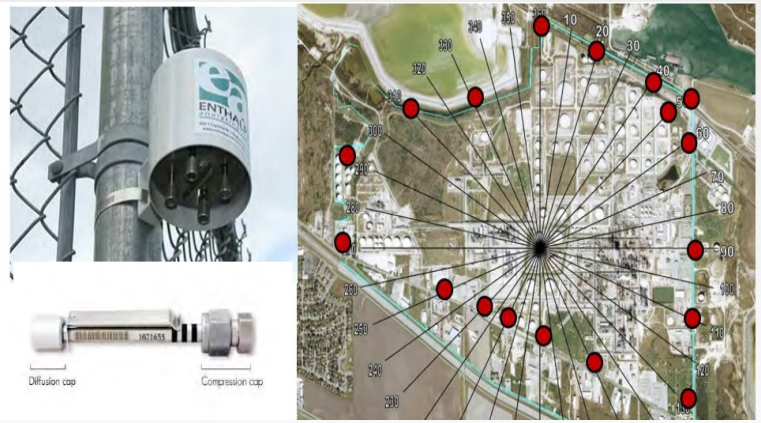
Source Monitoring Updates



Fenceline /sorbent monitoring

- Work is underway to study sorbent materials for fenceline measurement of
  - Chloroprene
  - Ethylene Oxide
  - 1,3, Butadiene
  - Vinyl chloride
- Method 325A/325B method can be used for measurement/reporting in other sectors
- Investigation into large area methane monitoring also underway



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Residential Wood Heating

- Revocation of Alt 125 /127 (Cordwood test method) final Feb. 23, 2022
  - Crib wood test method remains available, along with Alt-140 (IDC method)

- 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) scheduled for May, 2022

- Precision testing of hydronic heater IDC method to begin soon – April 2022

- OAQPS supporting OECA on test report review of Alaska identified test report issues
  - New checklist to Third Party Certifiers has demonstrated to improve new report completeness
  - First revision to that checklist under internal EPA review – Expected to release in April 2022

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Questions?