

EPA Technical Update

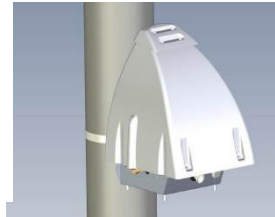
Fall NACAA Meeting

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

October 15, 2018

Advanced Monitoring (Sensors)



Advancing Sensors: Focus Areas

1. Data Quality
2. Data Interpretation
3. Data Management

Advancing Sensors: Policy Perspective

- ▶ Instruments, including sensors, intended for regulatory decisions should:
 - Meet the applicable requirements in the Code of Federal Regulations (CFR) – Part(s) of [Title 40, Protection of Environment](#)
 - Meet the requirements in other state environmental regulations
 - Requirements include detailed sampling, siting, and quality assurance conditions
- However, sensors can still very useful in providing a better understanding of local air quality, siting regulatory monitors, identifying hot spots, and in other non-regulatory applications

Data Quality

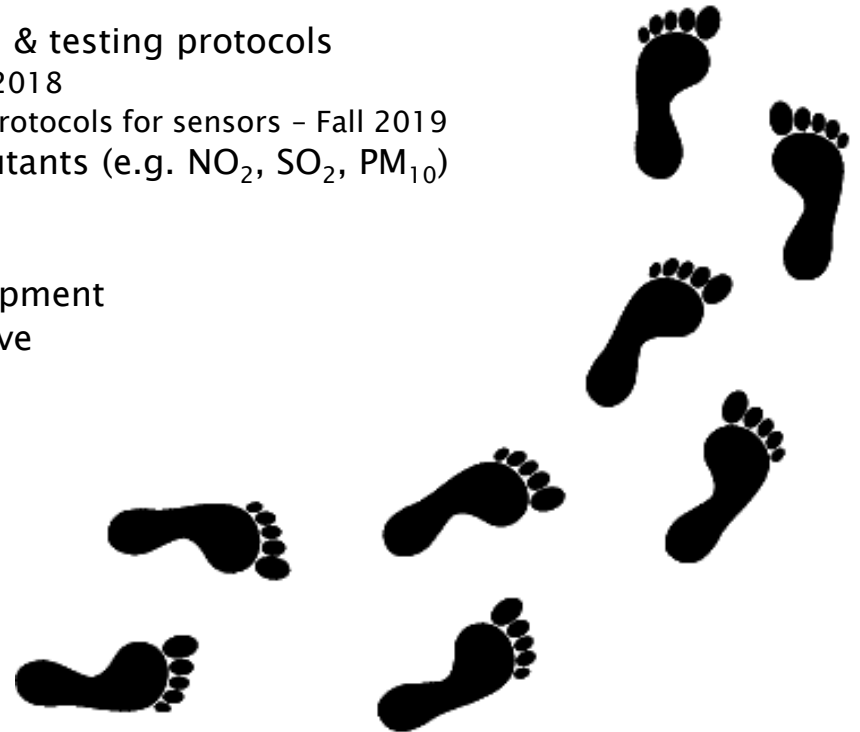
- ▶ Lack of systematic data quality characterization
- ▶ Disparity in how well technologies perform under various meteorological conditions
- ▶ Variations in meeting basic data quality indicators of performance (e.g. accuracy and precision)
- ▶ Uncertainty in how long the devices perform over time
- ▶ Questions in accuracy of measurements near sources

Deliberating Performance Targets for Air Quality Sensors (June 25–26, 2018)		
Attendee	Approximate % of Various Groups	Note
International	8%	~700 registered participants representing dozens of countries
Private Sector/Manufacturers	26%	
Academics	22%	
State/Local/Tribal Agencies	25%	
Community Groups/Nonprofits	5%	
EPA & Other Federal Government Agencies	14%	

<https://www.epa.gov/air-research/presentations-deliberating-performance-targets-air-quality-sensors-workshop>

Data Quality

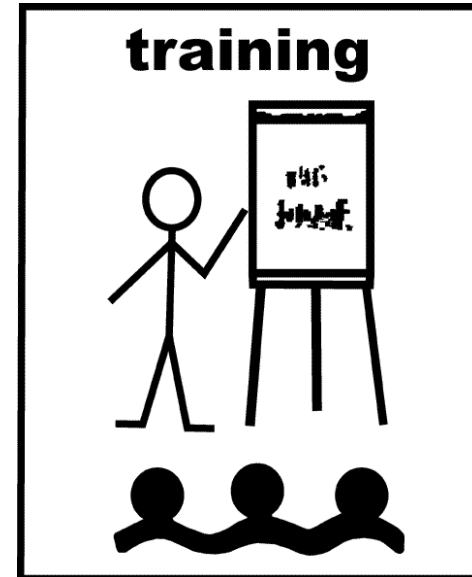
- Next Steps (Ongoing)
 - Non-regulatory PM_{2.5} & O₃ performance targets & testing protocols
 - Journal publication of workshop findings – late 2018
 - EPA report with performance targets & testing protocols for sensors – Fall 2019
 - 2019 Late Summer Workshop – additional pollutants (e.g. NO₂, SO₂, PM₁₀)
 - Long term performance evaluations
- Intermediate Steps (1–2 years)
 - Additional lab and field testing protocol development
 - Coordinating public/private partnership initiative
 - Possible VOC workshop
- Future Steps (2–3 years)
 - Evolving, TBD in agile manner



Ambient Monitoring Update

Emphasis on Training

- Multi-year effort to completely update APTI 470 – Quality Assurance for Air Pollution Measurement Systems (1999)
 - Led by Mike Papp and Stephanie McCarthy and coordinated through MARAMA
- Emphasis on more basic curriculum and reaching less experienced target audiences
 - Monitoring 101 training provided for EPA/OGC attorneys in March 2018
 - Basic training at national conference in Portland (150+ people)
 - Multiple regional training workshops

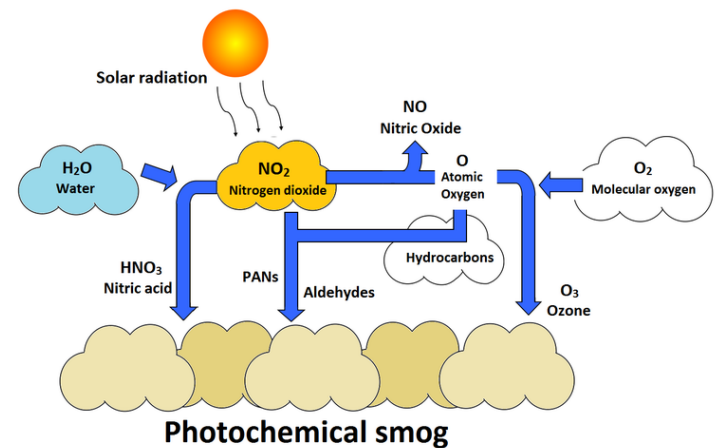


PAMS Network Update (1 of 2)

- ▶ Funds were distributed in FY17 for early adopting agencies to procure equipment (auto-GC's, true NO2, ceilometers)
- ▶ National contract (GSA) established in FY18 for most requested auto-GC configuration and hold-back funds being used for purchases
 - Next step (FY19 and FY20) to establish national contracts for additional GC selection, true NO2 and ceilometer
- ▶ National model QAPP is out for final regional review and pre-approval; agencies can use this QAPP for their programs

PAMS Network Update (2 of 2)

- ▶ We are also completing work on an updated Technical Assistance Document, instrument SOP's, and Enhanced Monitoring Plan (EMP) Guidance
 - Handling of ceilometer (mixing height) data will be an issue
- ▶ Continuing to work with all stakeholders on STAG funding questions



https://energyeducation.ca/encyclopedia/Photochemical_smog#cite_ref-5

QA Challenges – 2018 version

- So much information – so little time
- Ambient signal is diminishing – challenging procedures and metrics like collocation results and low level audit points
- Continued investment in newer calibration/audit equipment
- Ramping up QA on PAMS
- Completing the *Leaning* of our audit programs

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Report: Differences in Processing Practices Could Decrease the Reliability of Ozone Data Used for Assessing Air Quality to Protect Public Health

Report #18-P-0105, February 28, 2018

What Was Found

There is a risk that the state, local and tribal agencies that monitor ambient air quality are not always implementing the EPA's recommended QA practices for validating ozone data. This risk could reduce the quality of the data that the EPA uses to determine whether the air is healthy to breathe.

Report Materials

You may need a PDF reader to view files on this page. See EPA's [About PDF page](#) to learn more.

- [Report at a Glance \(PDF\)](#) (1 pg, 50 K)
- [Full Report \(PDF\)](#) (41 pp, 636 K)

QA Lessons learned from OIG Exercise

- ▶ The vast majority of ozone data being collected easily meets QA requirements
- ▶ Some legitimate issues were found:
 - QAPP's not meeting CFR requirements or QA Handbook critical criteria
 - QAPP's not always reviewed/approved on regular cycle
 - Inconsistent agency actions when QC checks exceeded criteria
 - Occasional deviations from recommended data validating procedures (zero adjustments)
 - Better linkage needed between TSA's and critical criteria
- ▶ All commitments expected to be met in FY19

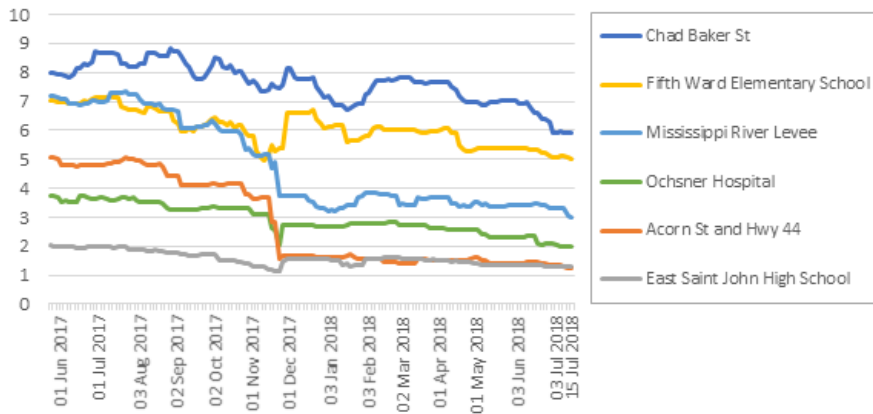


Near-road Network Status

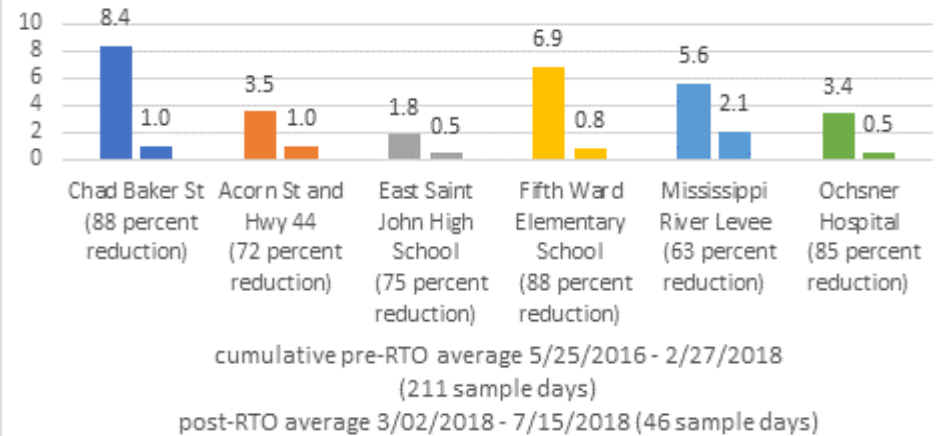
- ▶ There are currently 78 required near-road sites.
 - 54 are multi-pollutant (NO₂, CO, PM_{2.5}) sites in CBSAs over 1 million persons.
 - 24 are NO₂-only “second” sites required in CBSAs over 2.5 million persons and/or because the CBSA has one or more very heavily trafficked road segments ($\geq 250,000$ AADT).
- ▶ There are 69 operational near-road sites.
 - 1 operational site is technically not required yet (Fresno, CA).
 - 6 sites are delinquent and 4 missing sites are relatively newly required due to population growth
- ▶ We anticipate 5 more sites to become officially required in the next two years, based on census data and growth trends.

Special Air Toxics Monitoring Projects

Ambient concentrations of chloroprene
in LaPlace, Louisiana
Rolling annual average ($\mu\text{g}/\text{m}^3$)



Comparing pre-RTO and post-RTO average
chloroprene concentrations ($\mu\text{g}/\text{m}^3$)



- Chloroprene surveillance – LaPlace, LA
- Art Glass facility characterization – Kokomo IN, Pittsburgh PA, Paden City WV
- Cr+6 – Wylam AL

2016 Base Year Modeling Platform

Overview of the Platform Collaborative

- ▶ A new multi-purpose emissions modeling platform based is needed to replace the 2011 platform
 - State Implementation Plans, federal analyses
 - For the first time, EPA, states, and MJOs are engaging in collaborative emissions modeling platform development
 - The 2016 base year was selected via a collaborative process
 - Some data is 2016-specific and some taken from 2014NEIv2
 - Some applications may also use 2014 or 2015
- ▶ Future years selected due to regulatory relevance
 - 2023 is relevant for Ozone NAAQS moderate areas
 - 2028 for regional haze

Workgroups in Collaborative

Workgroups cover the emission modeling sectors:

- ▶ Electric Generating Units (EGUs)
- ▶ Non-EGU Point (including aircraft)
- ▶ Nonpoint (agriculture, fugitive dust, res. wood, other)
- ▶ Oil and gas (point and nonpoint)
- ▶ Onroad (also VIN-decoding subgroup)
- ▶ Nonroad
- ▶ Rail
- ▶ Commercial Marine Vessels (CMV)
- ▶ Fires
- ▶ Biogenic
- ▶ Wiki hosted by Intermountain West Data Warehouse has more information and notes from each workgroup
 - <http://views.cira.colostate.edu/wiki/wiki/9169>

2016 EMP Schedule

- ▶ Several versions of 2016 platform will be developed
 - **Alpha:** *preliminary* version based on 2014NEIv2 for some and 2016 for other key sectors (released March–April, 2018)
 - Used for initial testing of 2016 model runs
 - Compatible versions of 2014 and 2015 were also released
 - **Beta:** *improved and/or new* version of 2016 emissions for most sectors and preliminary projected emissions to 2023 and 2028 (November, 2018)
 - Use for base and future year preliminary analyses
 - **V1.0:** *fully updated* 2016 emissions and complete projected emissions for 2023 and 2028 (Winter–spring, 2019)
- ▶ 2016 schedule overlaps with 2017 NEI Development
 - States should prioritize 2016 vs 2017 as they see fit
 - 2017 NEI has regulatory requirements (AERR), 2016 is voluntary (default methods will be available for 2016)

Reference: Overview of Beta Emissions

- ▶ **Biogenics:** BEIS 3.61 and MEGANv3 run with 2016 meteorology
- ▶ **CMV:** 2014NEIv2 with SO₂ adjustments and projection to 2023/2028
- ▶ **EGUs:** 2016 point submittals; ERTAC and IPM for 2023/2028
- ▶ **Fires:** 2016 wild and prescribed fires based on updated inputs, agricultural fires by point and day, non-US fires
- ▶ **Non-EGU point:** 2016 point submittals
 - Incorporate growth, consent decrees and key regulations for 2023/2028, project airports
- ▶ **Nonpoint:** Start with 2014NEIv2; adjust paved road dust, livestock, and some others to 2016; project all to 2023, 2028
- ▶ **Nonpoint oil and gas:** oil and gas tool run for 2016 plus new surrogates and temporal profiles; simple projections to 2023/2028
- ▶ **Nonroad:** MOVES2014b outputs for all years
- ▶ **Onroad:** SLT 2016 activity with alpha emission factors, new surrogates
- ▶ **Rail:** New 2016 inventory, including new commuter rail
- ▶ **Canada:** New 2015 emissions expected, plus projection to 2025
- ▶ **Mexico:** 2008 projected to 2016, 2023, 2028 plus MOVES-Mexico for all years

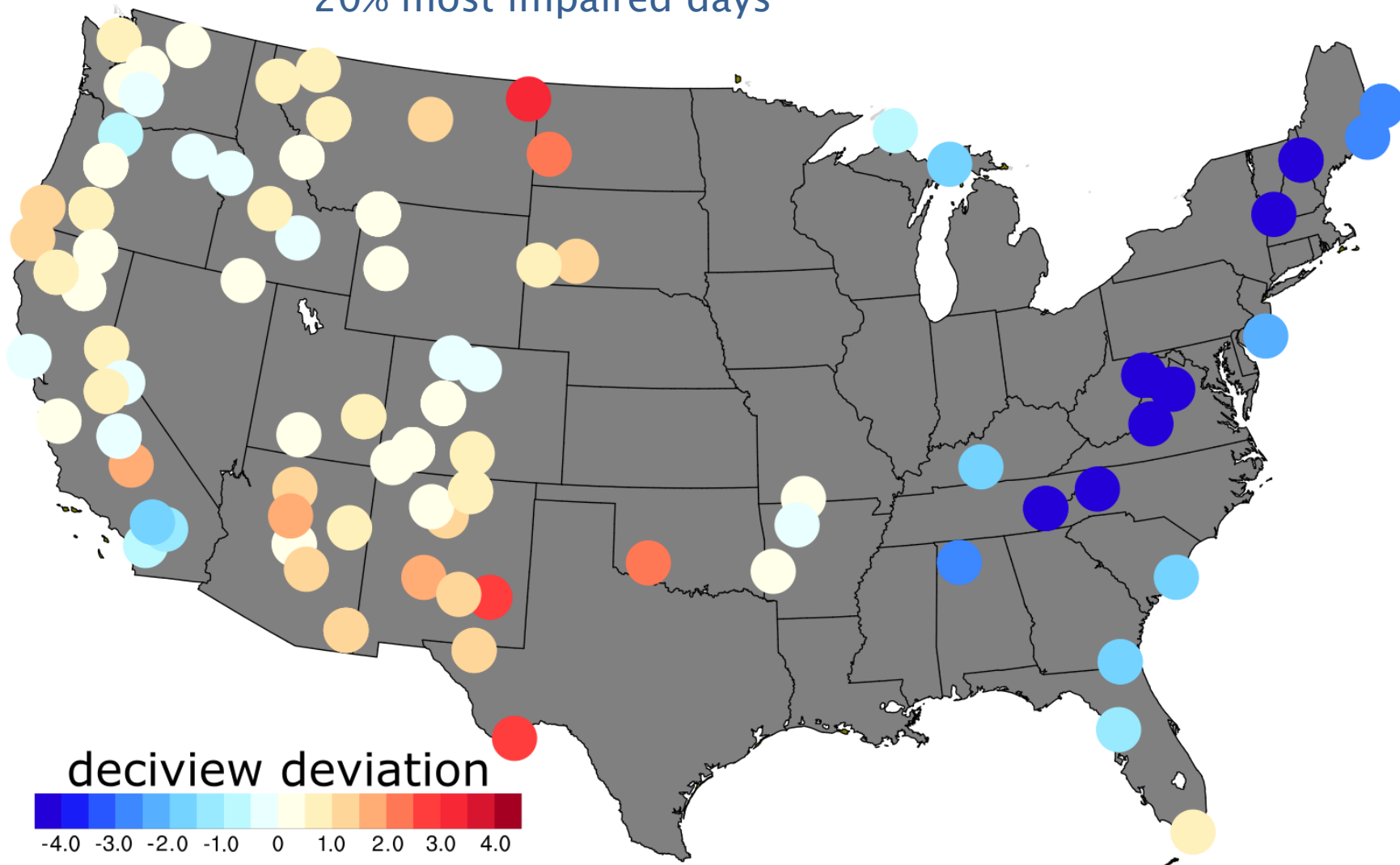
Regional Haze Modeling

EPA Regional Haze Modeling

- ▶ EPA released initial regional haze air quality modeling for 2028 to evaluate visibility impairment for each Class I area/IMPROVE site, including source sector contribution information.
 - Presented to MJOs in July 2017
 - Documentation released in October 2017
 - https://www3.epa.gov/ttn/scram/reports/2028_Regional_Haze_Modeling-TSD.pdf
- ▶ Identified a list of modeling improvements and updates that may be needed for the next round of modeling
 - Important model performance issues should be addressed before the results can be confidently used *in some areas*.
- ▶ Continue to work collaboratively with MJOs, states, and FLMs to make improvements and update the modeling where necessary.

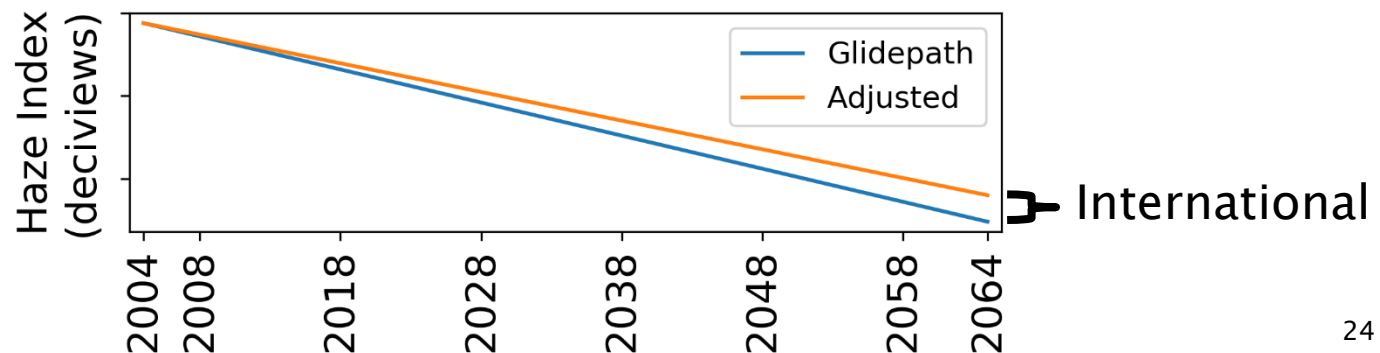
Projected Glidepath Status in 2028 (Preliminary modeling)

2028 Deviation from *Unadjusted* Glidepath
20% most impaired days



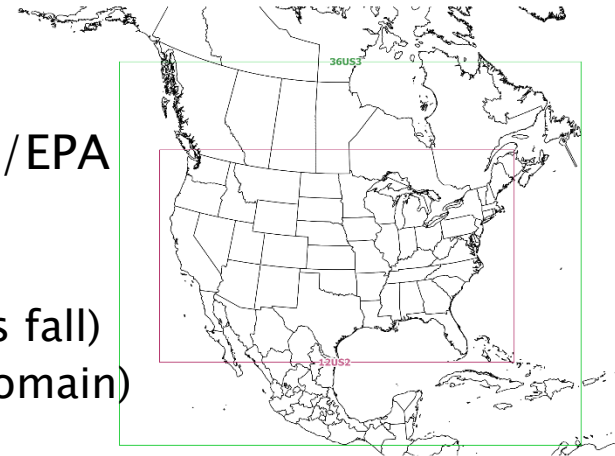
International Adjustment

- ▶ Current analysis uses the EPA draft recommended natural conditions to calculate the glidepath (i.e., “unadjusted glidepath”).
 - 2017 RHR allows states to adjust the endpoint of the glidepath upwards to account for international impacts (and prescribed fires).
 - 51.308(f)(1)(vi)(B): *As part of its implementation plan submission, the State may propose (1) an adjustment to the uniform rate of progress for a mandatory Class I Federal area to account for impacts from anthropogenic sources outside the United States and/or (2) an adjustment.... to account for impacts from wildland prescribed fires....*
 - Modeled estimates of international transport (and prescribed fires) can be used to adjust the endpoint and glidepath.



Updated EPA Regional Haze Modeling

- ▶ Updated modeling over the next year
 - New 2016 based modeling platform with emissions projections to 2028, including sector-based source apportionment
 - Model Improvements
 - New 2016 and 2028 emissions from the State/EPA platform collaborative
 - Regional model improvements
 - Updates to CAMx (also new version of CMAQ this fall)
 - Larger regional domain (including 36km outer domain)
 - Hemispheric CMAQ and/or GEOS-Chem
 - Updated boundary conditions
 - Estimate of international anthropogenic contributions
- ▶ Also may need to examine “natural conditions” with possible adjustments to draft recommended values



Next Steps

- ▶ Continue outreach to MJOs and prioritize list of technical issues
- ▶ As appropriate, modeling improvements will be developed and implemented in EPA's 2016 modeling platform.
- ▶ EPA will then conduct updated photochemical modeling with the 2016 modeling platform (including hemispheric/global modeling)
 - Results for regional haze will then be discussed with the MJOs and their member states.
- ▶ Associated timing of such modeling is not yet certain.

Update on Residential Wood Heaters (Wood Stoves, Hydronic Heaters and Forced-Air Furnaces)

Overview

- Regulatory Activities
- 1988 and 2015 NSPS Rulemakings
- 2018 Notice of Proposed Rulemaking
- 2018 Advance Notice of Proposed Rulemaking
- Cordwood Test Method Development
- ASTM
- Integrated Duty Cycle
- EPA Assistance to States

Air Agency Concerns

- Wood smoke is a major contributor to areas exceeding or close to exceeding NAAQS for fine particles (PM_{2.5} measured over 24 hour period):
 - Fairbanks, AK
 - Greater Salt Lake, UT area
 - West Silver Valley, ID
 - Plumas County, CA
- State/local air agencies (and EPA) regularly receive nuisance complaints from citizens concerned about excessive smoke from neighbor's wood-burning devices.
- In absence of an effective national standard, individual state actions will result in a regulatory patchwork – tighter, disparate emission standards and burn bans.

1988 and 2015 NSPS

- The original New Source Performance Standards (NSPS), issued in 1988, covered only new adjustable burn-rate woodstoves and fireplace inserts.
- The 2015 NSPS, published on March 16, 2015
 - Regulates new residential wood heaters
 - Covers adjustable and single burn-rate woodstoves, pellet stoves, hydronic heaters, forced air furnaces, and fireplace inserts
 - Does NOT regulate existing heating devices currently in use, masonry heaters, fireplaces, pizza ovens, barbecues, chimeneas, fire pits, or heaters fueled solely by oil, gas, coal

Overview of 2015 NSPS

Because 90% of wood heater manufacturers are small businesses, a number of accommodations in the 2015 final rule included:

- Phased compliance approach: Step 1 in May 2015 and Step 2 in May 2020
- 8-month sell-through period for existing non-Step 1 compliant appliances
- Automatic Step 1 certification:
 - for the 85% of wood heaters previously certified under the 1988 NSPS
 - for 70 hydronic heater models qualified under EPA's Voluntary Program, plus an additional 20 models approved under New York hydronic heater programs
 - for forced-air furnaces that have test reports that are independently certified (not self-tested)

Ongoing Engagement

- Implementation of 2015 NSPS
 - Appliances compliant with Step 2 emission limits as of Spring 2018:
 - Wood & pellet stoves – 77 models
 - Hydronic heaters – 9 models
 - Forced-air furnaces – 1 model, plus another currently being reviewed by EPA
 - Encouraging States to take delegation of rule
 - Developing Electronic Reporting Tool (ERT) and cordwood test method
 - Supporting wood stove change-out programs and Burn Wise education program
- Non-Rulemaking Changes
 - Collaborating with masonry heater industry to collect preliminary data
 - Cordwood test method development is ongoing, but industry can request it as an alternative test method now. Cordwood methods for HHs and FAFs were allowed in the 2015 NSPS.
 - ERT should be available in 2019

Plan for Revising the Woodheater NSPS

- Summer/Fall 2018
 - Propose changes to 2015 rule via a Notice of Proposed Rulemaking (NPRM), proposing a 2-year sell-through provision and soliciting comment on pellet fuel requirements
 - Currently under OMB review (accepted August 3)
 - Solicit ideas about other issues via an Advanced Notice of Proposed Rulemaking (ANPRM). These other issues may include Step 2 compliance date, emission limits, and audit testing.
 - Currently under OMB review (accepted August 10)
- Fall/Winter 2018: Publish final rule regarding sell-through and pellet fuel requirements and a proposal on other issues based on responses to ANPRM.
- Mid-2019: Issue a Final Rule addressing the Step 2 compliance date, emissions limits, audit testing, and/or other issues, as appropriate.
- Next several years: work with stakeholders to develop a cordwood test method and fueling protocol, collect sufficient test data with this method/protocol, revisit BSER, and if necessary, revise NSPS.

Development of Cordwood Test Method

- Test Methods in 2015 Rule

	AAA Woodstoves	QQQQ Hydronic Heaters	QQQQ Forced Air Furnaces
PM Method		ASTM E2515 (crib)	
Operating Protocol	EPA 28 R (crib) ASTM E3053 (cord) - approved alternative	<u>No Thermal Storage</u> EPA 28 WHH, ASTM E2618 <u>Partial Thermal Storage</u> EPA 28 WHH-PTS, ASTM E2618 Annex 1 <u>Full Thermal Storage</u> ASTM E2618 Annex 2	CSA 415.1-10

- Cordwood Test Method Collaborative Process (Fall 2015 – Spring 2018)

- NESCAUM/WESTAR will facilitate the process, EPA will participate in an advisory role and communicate EPA information requirements
- Steering Committee and Technical Workgroups (PM Measurement and Fueling/operational Protocols)
- EPA Discussion Paper: “Process for Developing Improved Cordwood Test Methods for Wood Heaters” (March 2016)

- Status

- Recently met with HPBA to discuss ASTM E3053 and Integrated Duty Cycle – see <https://www.regulations.gov/docket?D=EPA-HQ-OAR-2016-0130>.
- Upcoming state meetings
- Will also be soliciting stakeholder input via ANPRM

EPA Assistance to States

- Voluntary Programs
 - Burnwise
 - PM Advance
- Grant Programs
 - Targeted Airshed Grants
 - Community–Scale Air Toxics Monitoring Grants