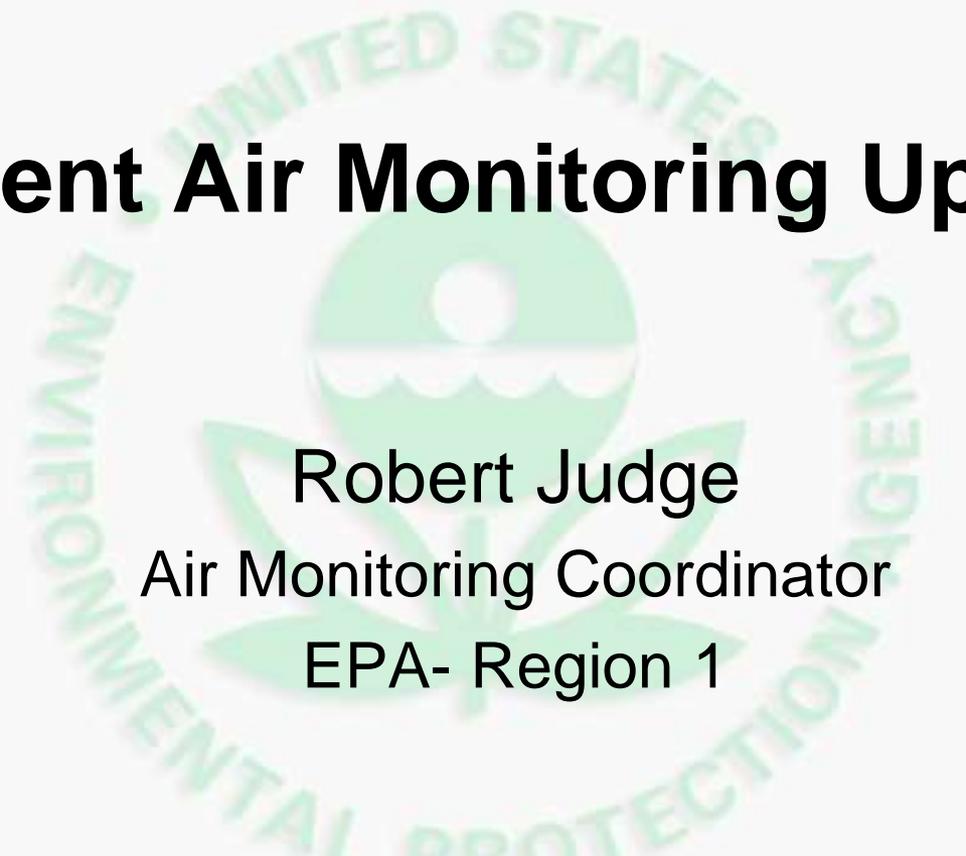


Ambient Air Monitoring Updates

A large, faint watermark of the United States Environmental Protection Agency (EPA) logo is centered in the background. The logo features a stylized flower with a sun in the center, surrounded by the text "UNITED STATES ENVIRONMENTAL PROTECTION AGENCY".

Robert Judge
Air Monitoring Coordinator
EPA- Region 1

Maine Ambient Air Monitoring Meeting
Augusta, ME – March 4, 2015



Outline of Today's Presentation

- Review of monitoring issues
 - Ambient Monitoring: Importance of Quality Assurance and TSAs
 - Continuous PM_{2.5} FEM “assessments”
 - Near road monitoring
 - Clarifications to 40 CFR Part 58 and Appendix A
 - NAAQS Updates- with ozone focus
 - Air Quality Sensors



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Recent Headlines

- **Louisville air monitoring fails state audit**

<http://www.whas11.com/news/local/Louisville-air-monitoring-fails-state-audit-218860081.html>

- **Bad news for Louisville: Air monitoring fails state audit; agency to undergo review - Mayor orders full review on years of air monitoring**

<http://cleanairmiddletn.wordpress.com/2013/08/21/bad-news-for-louisville-air-monitoring-fails-state-audit-agency-to-undergo-review/>

- **EPA praised Louisville Metro Air Pollution Control District monitoring program less than two years ago**

<http://blogs.courier-journal.com/watchdogearth/2013/08/20/epa-praised-louisville-metro-air-pollution-control-district-monitoring-program-less-than-two-years-ago/>



First Line of Data Quality Defense

- QA Project Plans need to be submitted, reviewed and approved (EPA Requirement)
 - Tracking information posted on AMTIC - <https://aqs.epa.gov/aqsweb/codes/data/QAPP.html>
- Participate in the required technical systems audits (TSAs) every three years
 - EPA findings and follow up on corrective actions
- Review the current consolidation of monitoring organizations into primary quality assurance organizations (PQAO)
 - Some consolidations may not be appropriate from a data quality or procedural standpoint
- Get involved in QA Workgroup Community
 - Regions and States need to have motivated and involved QA leads.
 - Participate in periodic calls, training sessions, and webinars
 - Make sure you are reading the QA EYE newsletter for up to date information; keep lines of communication open to head off problems
- Staff need to perform regular data quality and completeness assessments
 - QA data of little value if nobody looks at it!
 - Many problems can be caught early
 - Tools are available ; AQS P and A reports – and AMP-251, AMP-255, AMP-600, box and whisker plots, etc.



Recent Data Validation Issues



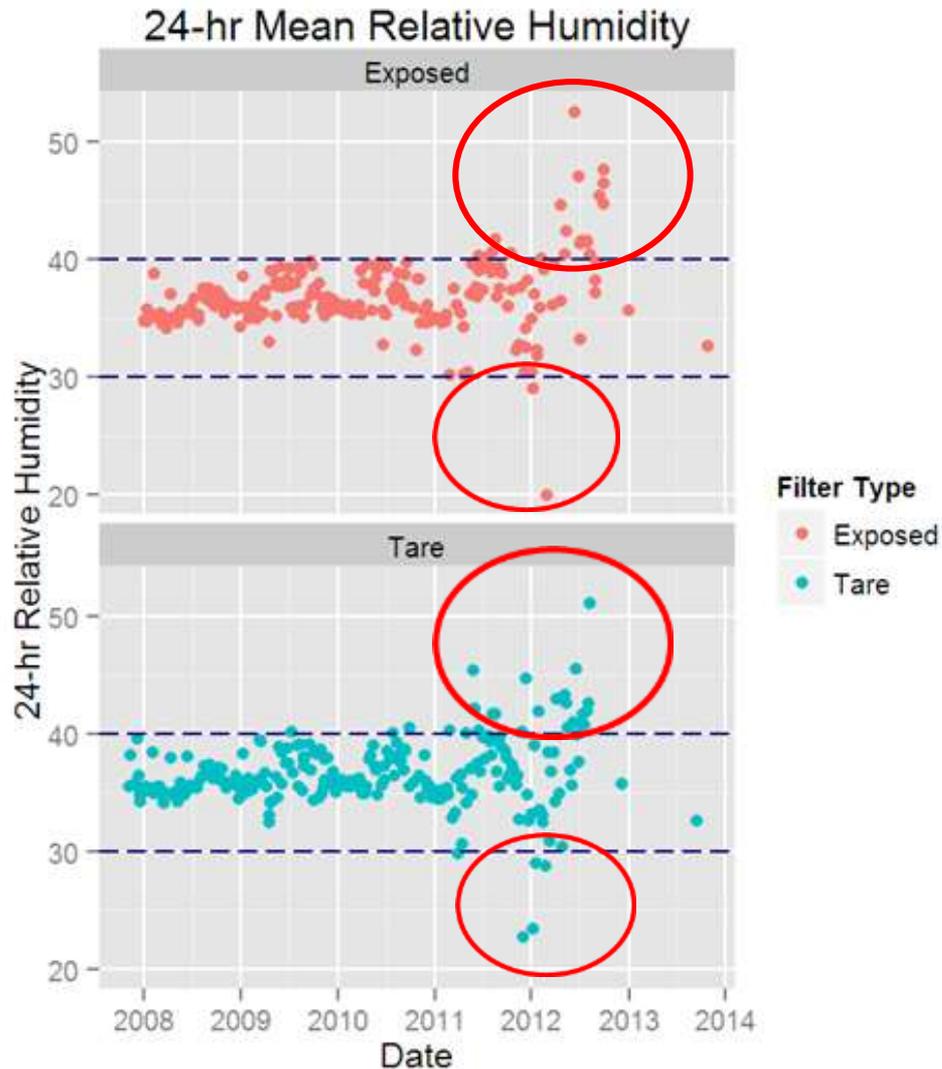
- Hayden AZ- No approved QAPP –Data not used
- Billings MT – QC Infractions for SO₂ data
- PM_{2.5} Gravimetric Lab Issues- Data Invalidations (years)

Some of these issues were identified during TSAs

- Louisville, KY
- Cook County, IL
- Knoxville, TN
- Atlanta, GA
- Oregon, DEQ

Based on Gravimetric Lab Issues

- Region 5 self-declared a FMFIA weakness
- Janet McCabe's identification of recent issues to the IG



Relative humidity 24-hr mean must be 30% - 40% RH

- 40 CFR Part 50, App.L Sec 8.2.3

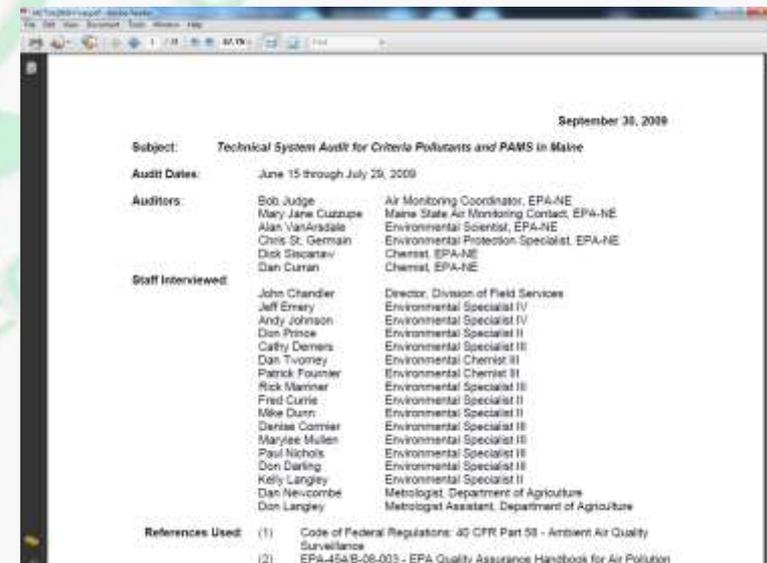
Electronic strip chart shows weighing conditions outside of the stated range

Resulted in invalidation of data points over multiple years

40 CFR Part 58, Appendix A...

2.5 Technical Systems Audit Program. Technical systems audits of each ambient air monitoring organization shall be conducted at least every 3 years by the appropriate EPA Regional Office and reported to the AQS. Systems audit programs are described in reference 10 of this appendix. For further instructions, monitoring organizations should contact the appropriate EPA Regional QA Coordinator.

Participate and respond to EPA in a Technical Systems Audit (TSA) for ME DEP during FY 2015. (OAQPS M07)	Andy Johnson 287-7047	Tech: Bob Judge - 8387
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Continuous PM_{2.5} FEM “assessments” overview:

PM NAAQS final rule {40 CFR § 58.11(e)}
allows certain PM_{2.5} continuous FEM data to
be excluded from comparison to the
NAAQS if...

1. Performance criteria are not met when
assessed with collocated FRM(s);
combination of multiplicative bias (slope) and additive bias
(intercept)
2. Monitoring agency requests exclusion of
data; **and**
3. EPA Regional Office approves exclusion of
data.

**Note- all PM_{2.5} continuous FEM data are to be submitted
under parameter code 88101, unless approved to be
excluded by EPA Regional office**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

April 20, 2013

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

MEMORANDUM

SUBJECT: Update on Use of PM_{2.5} Continuous FEMS

FROM: Richard A. Wayland, Director *Richard Wayland*
Air Quality Assessment Division (MD C304-02)

TO: Regional Air Division Directors

Enclosed find a document titled *Instructions and Template for Requesting that data from PM_{2.5} Continuous FEMs are not compared to the NAAQS*. Please pass along this email and attached file to your staff responsible for working with monitoring agencies on their annual monitoring network plans and/or PM_{2.5} continuous FEMs. Also, feel free to have your staff forward this information to monitoring agencies who may be interested in this process.

The file provides details and a template associated with the recently finalized PM NAAQS rule change (78 FR 3086) allowing monitoring agencies to request setting aside PM_{2.5} continuous FEM data under certain conditions. This information will be covered with Regional Office Technical staff on this month's Regional Monitoring call as well as a planned technical call with States later this month. For any questions, please contact Tim Hanley in the Ambient Air Monitoring Group of my division. Tim may be reached by phone at (919) 541-4417 or by email at hanley.tim@epa.gov.

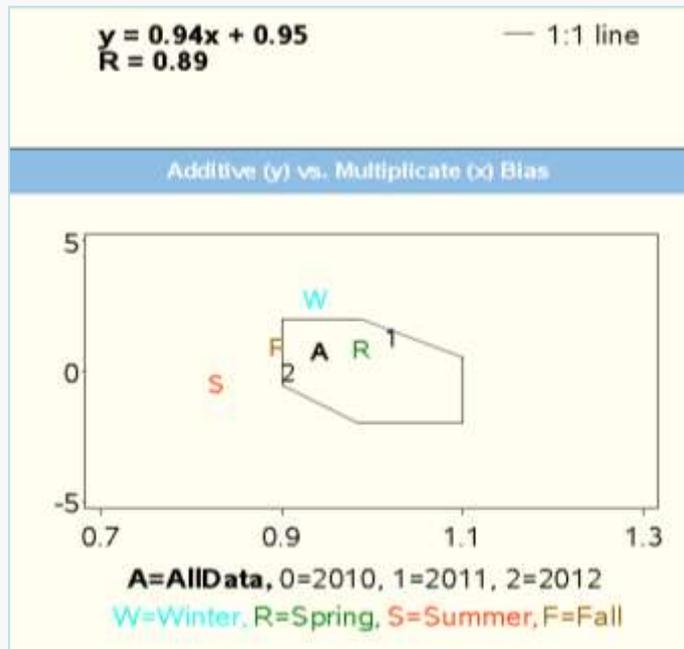
Attachment



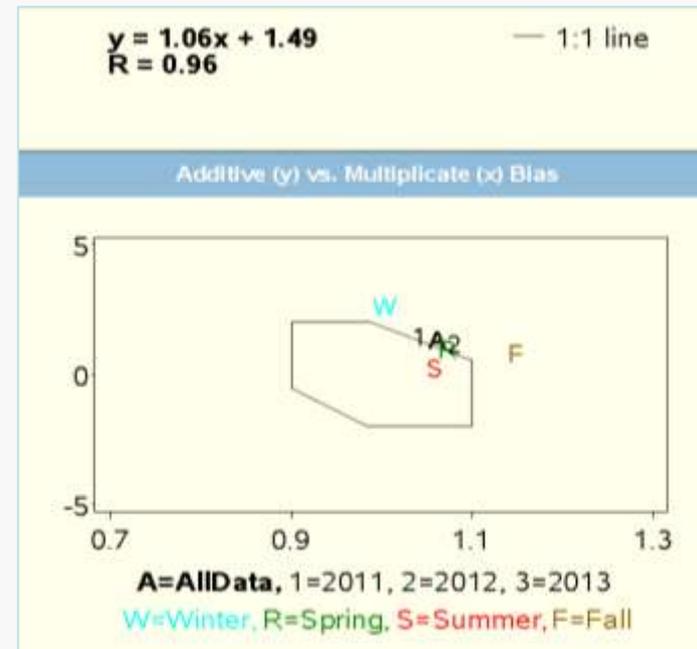
Comparability Criteria

- See details in § 58.11(e); references performance criteria from Table C-4 of Part 53.
- Bottom line is whether the collocated FRM/continuous FEM data set from the last 36 months meets or does not meet the bias requirement.
- Use one page assessment tool, excel spreadsheets (both on AMTIC), or your own assessment.

Example that meets Performance Criteria



Example that does not meet Performance



A = All Data



How should Monitoring Agencies Request Exclusion of Data?

- Follow requirements in § 58.11(e);
- Submit request as:
 - Part of Annual Monitoring Network Plan due by July 1, or
 - Submit a request in the form of a letter with the appropriate technical support
- Requests are submitted to EPA Regional office...
 - Address whether PM_{2.5} continuous FEM data will be used for the AQI, even if request is to exclude from NAAQS.
 - Requests should address already collected data as well as future data (e.g., next 18 months) expected over the time of the plan to be collected with PM_{2.5} continuous FEMs.
- EPA developed a template to assist monitoring agencies in this effort



EPA Regional Office Approval and next steps...

- EPA Regional Office approval - can occur as part of the annual monitoring network plan or separately, if appropriate.
- AQS - Once approved to be excluded, the monitoring agency should move data to the appropriate parameter code(s) and populate other AQS information appropriately.
 - Monitor Type and Primary Monitor Period
 - If applicable, use FEM method codes in parameter codes 88501 and 88502 (i.e., not the pre-FEM method codes)
- Future Annual Monitoring Network Plans should reflect the status of how data from PM_{2.5} continuous FEMs are utilized.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
NEW ENGLAND REGIONAL LABORATORY
OFFICE OF ENVIRONMENTAL MEASUREMENT & EVALUATION
11 TECHNOLOGY DRIVE
NORTH CHELSEA, MASSACHUSETTS 01865-2431

September 17, 2013

Anne Gobin, Chief
State of Connecticut Department of Environmental Protection
Bureau of Air Management
79 Elm Street
Hartford, CT 06106-5127

Dear Ms. Gobin:

Thank you for your submission of the Connecticut 2013 Annual Monitoring Network Plan which was submitted to us in final form on August 5, 2013. We appreciate that you addressed the comments we provided to you on June 28, 2013. EPA New England has evaluated your plan and finds that your plan meets the minimum requirements of 40 CFR Part 58.

We acknowledge the following modifications and future plans which you articulated as follows (in *italics*):

Proposed Network Changes

- 1) *Discontinuing federal reference method (FRM) PM_{2.5} sampling at the Norwich Courthouse.*
- 2) *Establishing continuous PM₁₀/PM_{2.5} sampling at Hartford Hawley Place.*
- 3) *Discontinuing SO₂ sampling at Westport Sherwood Island State Park.*
- 4) *Commencing to report continuous PM_{2.5} data from the Groton Fort Griswold, Waterbury Bank Street and Bridgeport Roosevelt School monitoring sites as federal equivalent method (FEM) data eligible for comparison to the PM_{2.5} NAAQS.*



Repeat from earlier slide

- ***Note- all $PM_{2.5}$ continuous FEM data are to be submitted under parameter code 88101, unless approved to be excluded by EPA Regional office***



Use of continuous $PM_{2.5}$ FEM monitors for NAAQS compliance in EPA Region 1

- CT- 4 of 8 (near road site not included. <24 months)
- MA- 9 of 10 (not including 3 FEMs < 24 months of data)
- **ME- 7 of 7**
- NH- 5 of 6
- RI- 5 of 5 (near road not excluded)
- VT- 3 of 4





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Near-Road Monitoring Timeline



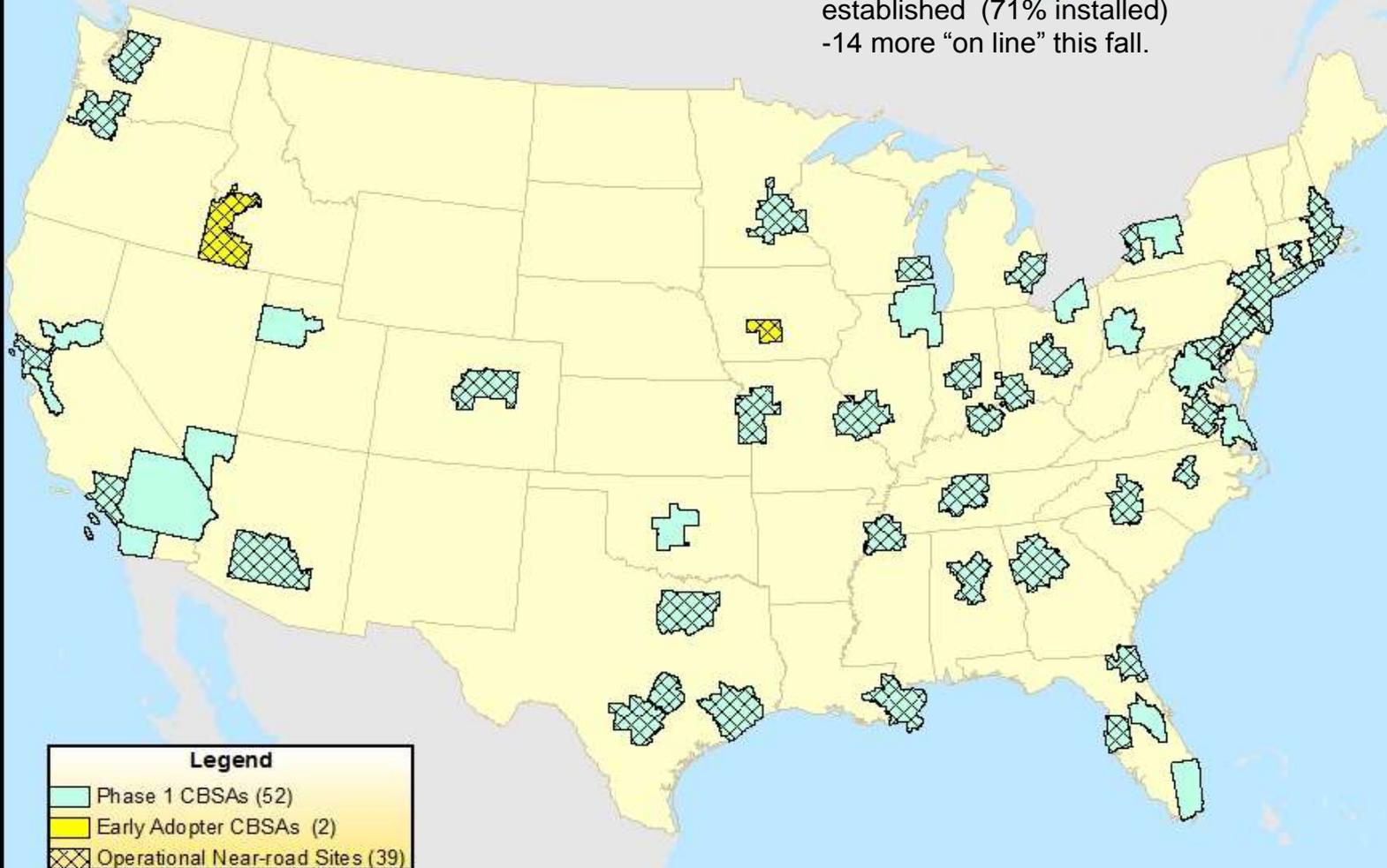
Implementation Phase	CBSA Population	NO ₂	CO*	PM _{2.5} *
<u>Phase 1</u> 52 Sites [funded]	≥ 1 Million	Jan 1, 2014	Jan 1, 2015 for CBSAs ≥ 2.5M Jan. 1, 2017 CBSAs ≥ 1M and ≤ 2.5M	Jan 1, 2015 for CBSAs ≥ 2.5M Jan. 1, 2017 CBSAs ≥ 1M and ≤ 2.5M
<u>Phase 2</u> 23 Sites (second sites) [funded]	≥2.5 Million OR road segment ≥250,000 AADT (NO ₂ only)	Jan 1, 2015 (second site)		
<u>Phase 3</u> 51 Sites [unfunded]	Between 500K and 1 Million	Jan 1, 2017		



*Near-road CO and PM_{2.5} monitors are required to be co-located with an NO₂ monitor.

Near-road Monitoring Network - Aug. 2014

-Of the 52 Phase 1 CBSAs, 37 are established (71% installed)
-14 more "on line" this fall.



Note: San Juan, PR (not shown) does not have its Phase 1 near-road site operational as of Aug. 2014.



Near road Monitoring requirements in New England – NO₂, CO, and PM_{2.5}

CBSA	Near Road NO₂ Monitor(s) Schedule	Near Road CO monitor Schedule	Near Road PM_{2.5} monitor Schedule
Bridgeport, CT	Jan. 1, 2017	Not required	Not required
Hartford, CT	Jan. 1, 2014	Jan. 1, 2017	Jan. 1, 2017
New Haven, CT	Jan. 1, 2017	Not required	Not required
Boston, MA/NH	Jan. 1, 2014 Jan. 1, 2015 (2nd)	Jan. 1, 2015 (1 site)	Jan. 1, 2015 (1 site)
Worcester, MA	Jan. 1, 2017	Not required	Not required
Springfield, MA	Jan. 1, 2017	Not required	Not required
Portland, ME	Jan. 1, 2017	Not required	Not required
Providence, RI/MA	Jan. 1, 2014	Jan. 1, 2017	Jan. 1, 2017

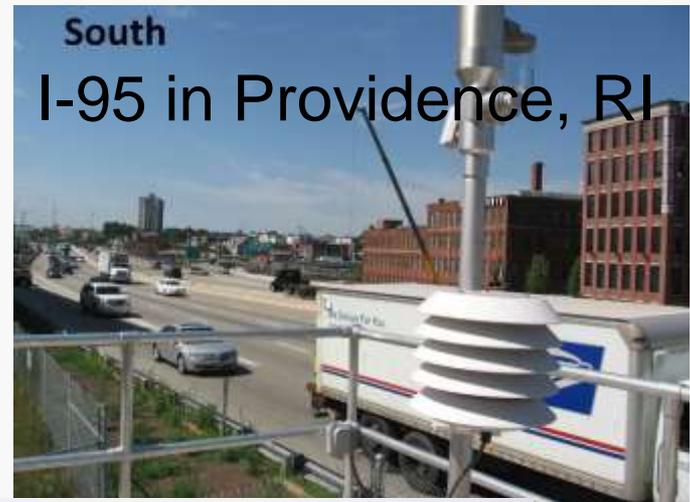
*Completed/ requirement met in red



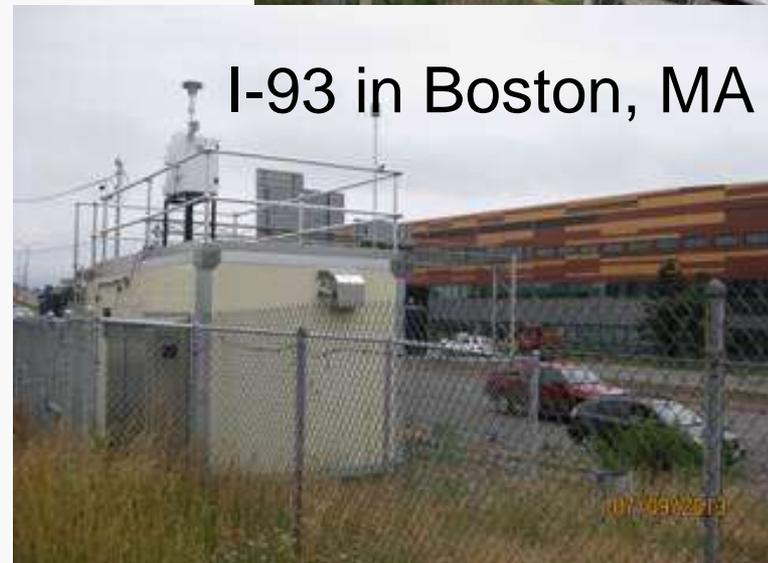
Near-road monitoring in New England

- Near road locations...

I-84 in Hartford, CT



I-93 in Boston, MA





Deering Oaks, State Street, Portland, ME

- Page 9 of EPA Approved 2014 Maine Annual Network Plan reads...
“Currently, EPA is working toward ensuring the near-road sites with the highest probability for high NO₂ concentrations begin monitoring as soon as possible, with smaller areas, such as Portland, being operational by January 1, 2017. Maine DEP will be working to demonstrate to EPA that the Portland Deering Oaks site is located at the site of maximum expected NO₂ concentrations. **However, at the present time EPA is skeptical the site meets the near-road siting criteria under the rule.** If we are unable to make an affirmative demonstration, then an additional monitor will be required. “

Near-Road Monitoring Specifics



- Multi-pollutant near-road sites will fill a number of current data gaps:
 - Improved understanding of human exposure on and near roads
 - Improved understanding of pollutant behavior, interaction, and dispersion in the near-road environment
- Required Metrics:
NO₂, CO, PM_{2.5}
- Optional Metrics:
Black Carbon, Ultrafine PM, Air Toxics, Ozone, Meteorology, Traffic Count



Near-Road Monitoring Preliminary Results



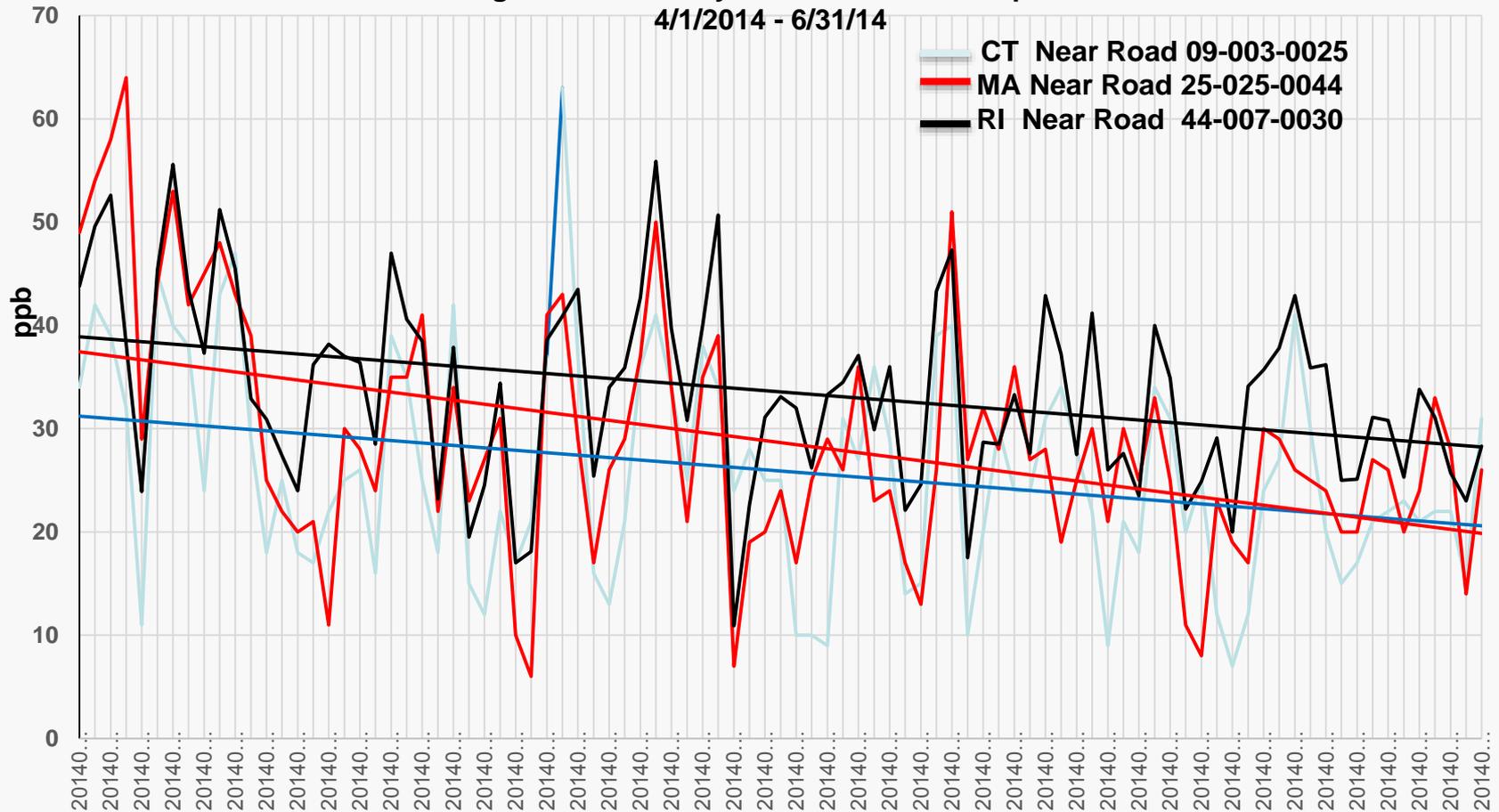
2012 & 2013 Near-road NO₂ Data Reported to AQS

Year	City	1-Hr Max.	98 th %ile	~Annual Avg.	Notes
2012	Detroit	51.0	43.0	25.1	Complete year
	Boise	49.8	44.3*	26.5*	*Incomplete year
2013	Denver	70.8	61.7*	41.1*	*Incomplete year
	St. Louis	64.7	50.4	26.9	Complete year
	Hartford	59.0	48.0*	29.1*	*Incomplete year
	Richmond	58.3	46.0*	26.7*	*Incomplete year
	Minneapolis	54.0	45.0*	24.6*	*Incomplete year
	Boston	50.0	45.0*	27.9*	*Incomplete year
	Detroit	48.0	43.0	23.9	Complete year
	Kansas City	46.1	40.7*	26.1*	*Incomplete year
	Boise	45.9	39.3	25.1	Complete year
	Des Moines	42.2	34.1	19.0	Complete year

UNITS in PPB - PRELIMINARY DATA ANALYSIS - DO NOT CITE OR QUOTE

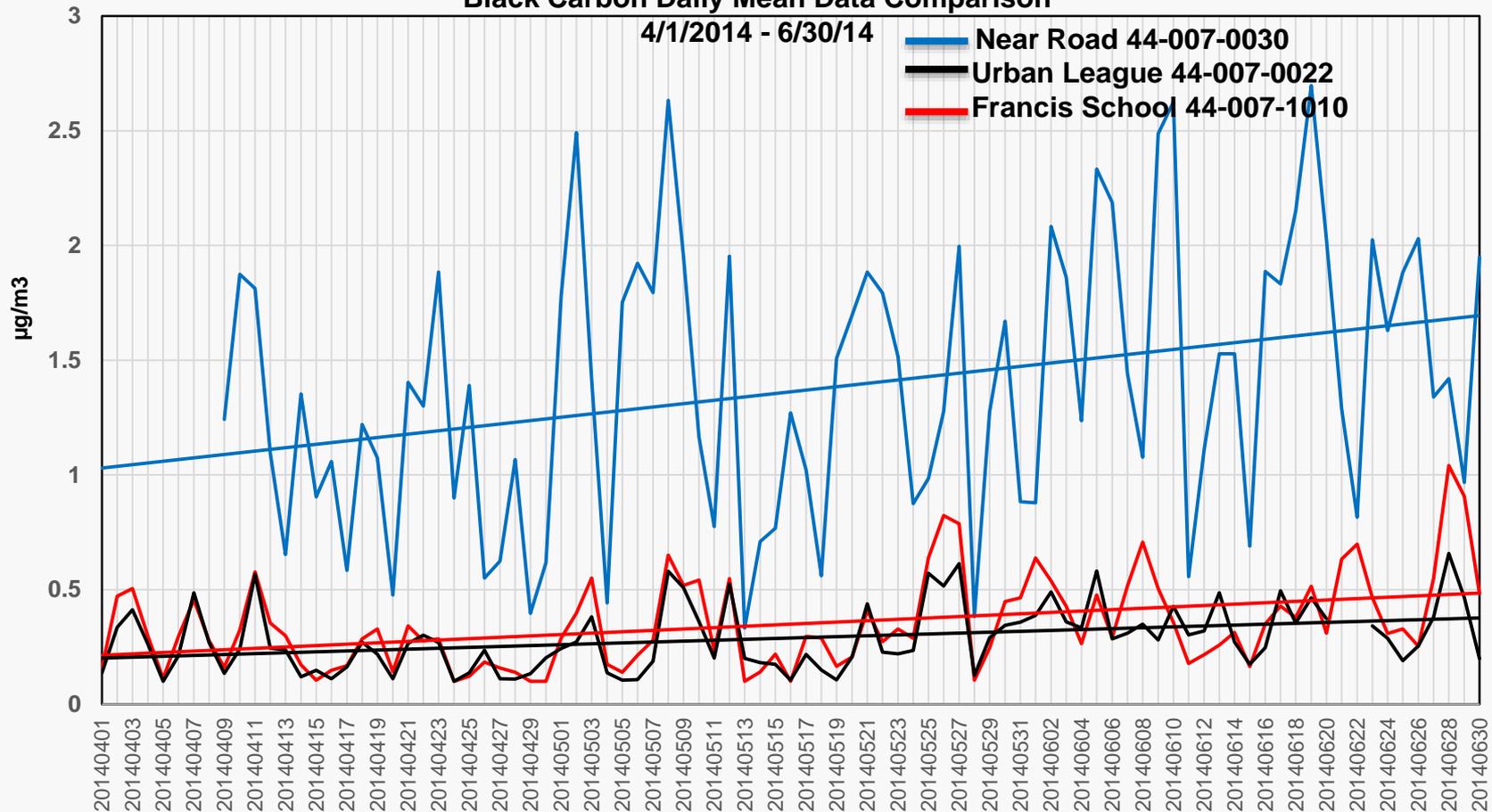


CT, MA and RI Near Road Sites Nitrogen Dioxide Daily Maximum Data Comparison 4/1/2014 - 6/31/14





Rhode Island Near Road and Other Sites Black Carbon Daily Mean Data Comparison





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Summary- Clarifications to 40 CFR Part 58 and Appendix A



- Proposes revisions to ambient air monitoring requirements for criteria pollutants to provide clarifications to existing requirements to reduce the compliance burden of monitoring agencies operating ambient networks.
 - Clarifies the annual monitoring network plan public notice requirements
 - Simplifies and reduces data reporting and certification requirements
 - Reduces network design criteria for nonsource lead monitoring
 - Reorganizes and clarifies quality assurance requirements for SLAMS and PSD
- Published September 11, 2014 at 79 FR 54356-54395
- Public comment period open for 60 days at Docket ID No. EPA-HQ-OAR-2013-0619 until November 10, 2014.
- Public comments (including those from NESCAUM) are being reviewed now.



Network Design Criteria (Appendix D)



Element (*Bob's listing of "important" changes)	CFR Cite	FR Page #
Removed requirement for NCore sites to measure speciated PM _{10-2.5} (cleanup from 2013 PM NAAQS Final Rule) to align with previous changes to § 58.16(a).	§ 58 Appendix D Section 3(b)	54364
Removed requirement for urban NCore sites to measure Lead (Pb). Monitors eligible to be discontinued after collecting 3 years of data per approval by Regional Office and showing compliance with 58.14(c).	§ 58 Appendix D Section 4.5(b) and 4.5(c)	54364

Quality Assurance Proposals

§ 58 App A



Element (*Bob's listing of "important" changes)	CFR Cite	FR Page #
<p>Lowering 1-point QC Check to 0.005 - 0.08 ppm for SO₂, NO₂, and O₃, and 0.5 - 5 ppm for CO monitors (currently 1 and 10 ppm). In addition, language clarified to be clear that this QC check concentration "... <i>must be related to the mean or median of the ambient concentrations normally measured...</i>"</p>	§ 58 App A Sec 3.1.1	54366
<p>Expanding Annual Performance Evaluation (PE) Audit from five to ten concentration ranges</p>	§ 58 App A Sec 3.1.2.1	54367
<p>Revise Annual PE language so that two of the audit levels selected represent a range of 10-80 percent of the typical ambient air concentrations and the third point at the NAAQS or above the highest 3-year routine concentration, whichever is greater.</p>	§ 58 App A Sec 3.1.2.1	54367



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NAAQS: ANTICIPATED SCHEDULES

NAAQS Reviews: Status Update

(as of October 10, 2014)



	Ozone	Lead	Primary NO ₂	Primary SO ₂	Secondary NO ₂ and SO ₂	PM	CO
Last Review Completed (final rule signed)	Mar 2008	Oct 2008	Jan 2010	Jun 2010	Mar 2012	Dec 2012	Aug 2011
Recent or Upcoming Major Milestone(s) ¹	<u>August 2014</u> Final REAs Final PA Nov. 25, 2014 Proposed rule <u>Oct 1, 2015</u> ² Final rule	<u>May 2014</u> Final PA <u>2014</u> Proposed rule	<u>June 2014</u> Final IRP <u>Fall 2014</u> 2 nd Draft ISA REA Planning Document	<u>Summer 2014</u> Final IRP	<u>Fall 2014</u> Draft IRP	Kickoff workshop for next review targeted for early 2015	<u>TBD</u> ³

¹ IRP – Integrated Review Plan; ISA – Integrated Science Assessment; REA – Risk and Exposure Assessment; PA – Policy Assessment

² Bold and underlined dates indicate court-ordered or settlement agreement deadlines

³ TBD ~~32~~ to be determined

Ambient Air Monitoring in New England under Proposed Ozone NAAQS





Overview

2014 Proposed Ozone Standards

Health-based: 65-70 ppb

Welfare-based: 65-70 ppb



- On November 25, 2014, EPA proposed to strengthen the national ambient air quality standards for ground-level ozone, based on extensive scientific evidence about ozone's effects on public health and welfare.
- The proposed updates will improve public health protection, particularly for children, the elderly and people of all ages who have lung diseases such as asthma.
- The proposed standards reflect strong scientific evidence regarding the harmful effects of ozone on human health and the environment – including more than 1,000 new studies.
 - Decades of scientific research links ozone to asthma attacks, bronchitis, heart attacks and premature death.
 - Elevated ozone levels can make it harder for even healthy people to breathe.
- Existing and proposed federal measures are leading to substantial reductions in ozone nationwide, which will help improve air quality and help many areas meet any revised standard.



Overview

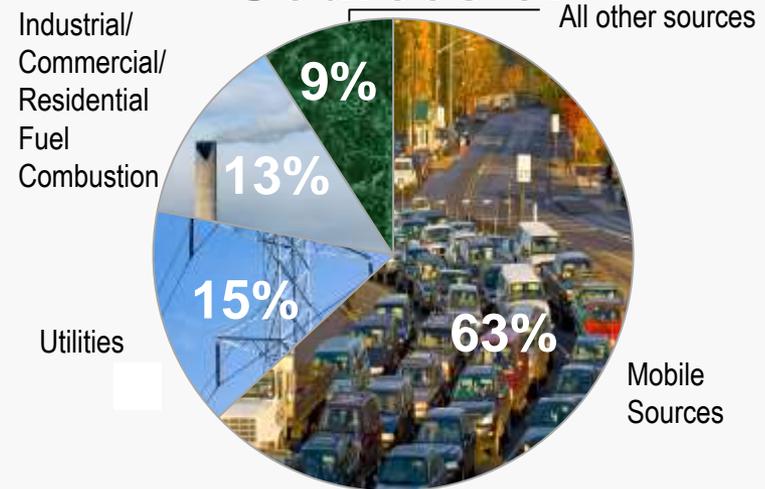
- The Clean Air Act requires primary standards to be “requisite to protect public health with an adequate margin of safety,” including the health of groups of people considered more at risk.
 - In making this judgment, the EPA Administrator considers factors such as the nature and severity of health effects, the size of the at-risk groups affected, and the degree of certainty and uncertainty in the science.
- The law requires EPA to review the standards every five years.
- EPA is proposing to strengthen the level of both the primary and secondary ozone standards to a level in the range of 65 to 70 ppb to improve public health protection for millions of Americans. The current standard is 75 ppb.
 - A rigorous review of the latest science and advice from the agency’s independent science advisors, the Clean Air Scientific Advisory Committee (CASAC), informed this proposal.
- EPA is also proposing to:
 - update the Air Quality Index (AQI) for ozone; and
 - make certain updates to monitoring and permitting requirements, which will smooth the transition and assure that the public has full information about air quality
- Implementing these standards is a federal, state, and tribal partnership. EPA will continue to do our part to assist states and tribes and streamline implementation. 35



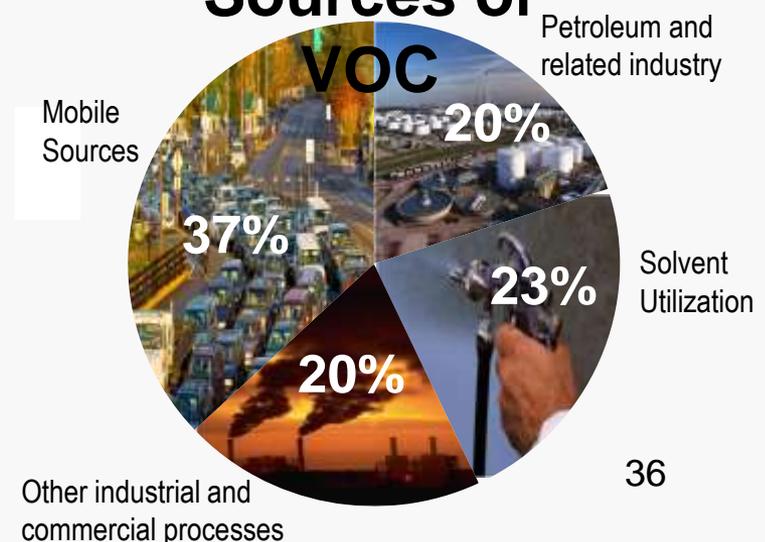
About Ground-Level Ozone

- Ozone is the main component of smog.
- It is not emitted directly into the air but forms when emissions of precursors, including nitrogen oxides (NO_x), volatile organic compounds (VOCs), carbon monoxide and methane “cook” in the sun.
- Emissions from industrial facilities, electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are the major man-made sources of NO_x and VOCs.

Sources of



Sources of VOC





Setting Ozone Standards - Primary

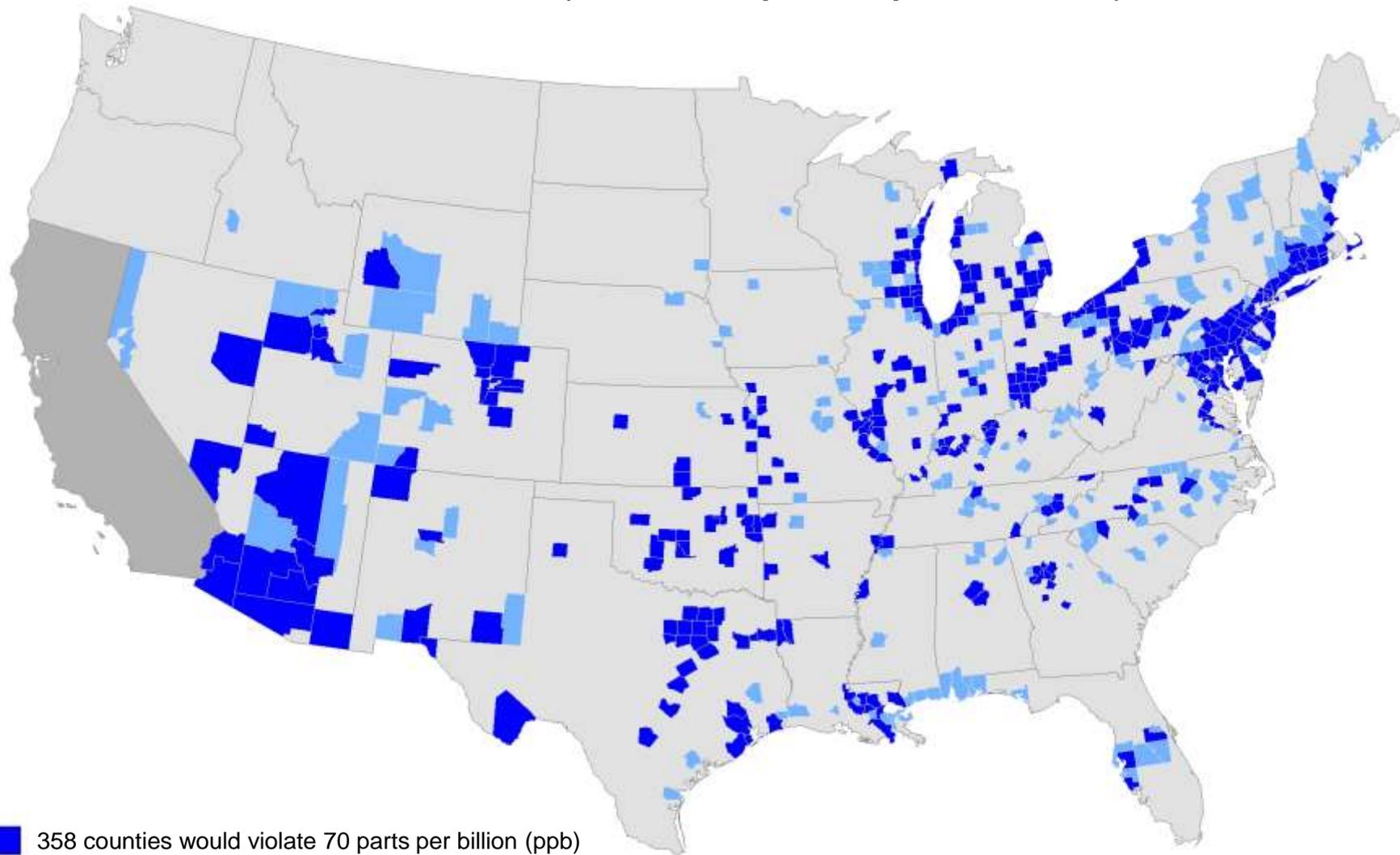
- Proposing health-based standard of **65-70 ppb** (8-hr average).
 - Taking comment on lower levels including 60 ppb and on the proposed decision that the current standard does not protect public health with an adequate margin of safety
- Proposing to retain the averaging time and form of the standard.
- CASAC and EPA staff experts concluded that the scientific evidence supports a standard within a range of 60 to 70 ppb.
- The Administrator did not include a standard of 60 ppb in the proposed range, because of increasing uncertainty in the scientific evidence at lower ozone concentrations.
 - This uncertainty reduces confidence that ozone standard levels set below 65 ppb will result in additional health improvements beyond those that would result from a standard in the proposed range of 65 to 70 ppb.



Setting Ozone Standards - Secondary

- The impact of ozone exposure on trees, plants and ecosystems is often assessed using a seasonal index.
- Proposing to define a target level of protection for public welfare in terms of a cumulative, seasonal metric (W126) index value within the range of 13 to 17 ppm-hrs (3-year average).
 - Soliciting comment on defining a target level of protection within the range of 7 to 13 ppm-hrs.
- Proposing **secondary** ozone standard to protect public welfare to a level within the range of 65 ppb to 70 ppb. Analyses show that a standard in this range would provide protection equivalent to a W126 index value of 13 to 17 ppm-hrs.
 - Soliciting comment on revising the secondary standard to a distinct W126-based standard within a range of 13 to 17 ppm-hrs.
 - Soliciting comment on a distinct W126-based standard within the range extending below 13 ppm-hrs down to 7 ppm-hrs.
 - Soliciting comment on retaining the current standard of 75 ppb.

Counties Where Measured Ozone is Above Proposed Range of Standards (65 – 70 parts per billion)



- 358 counties would violate 70 parts per billion (ppb)
- 200 additional counties would violate 65 ppb for a total of 558

Based on 2011 – 2013 monitoring data



Tentative timeline for designations and implementation

- After a standard is final, states and tribes work with EPA to make plans to meet it. This process is laid out in the Clean Air Act and some of the key milestones are shown here.

Designation Schedule		
	Schedule	Tentative Date
State and Tribe Recommendations	Within 1 year after NAAQS promulgation	October 2016
Final Designation	Within 2 years after NAAQS promulgation (Administrator has discretion to extend the deadline by one year to collect sufficient information.)	October 2017 Effective date may vary. (Air quality data years: 2014 –2016)
Implementation Schedule		
Infrastructure SIP	Within 3 years after NAAQS promulgation	October 2018
Attainment Plans Due	Within 36 - 48 months after designations depending on classification	October 2020-2021

Attainment Schedule by Classification	
Classification	Schedule*
Marginal	3 years to attain
Moderate	6 years to attain
Serious	9 years to attain
Severe	15 to 17 years to attain
Extreme	20 years to attain

*Areas must attain as expeditiously as practical, but not later than the schedule in the table. Two one-year extensions are available in certain circumstances based on air quality.



Proposed Changes to the Air Quality Index

- EPA is proposing updates to the Air Quality Index (AQI) for ozone pollution.
 - The AQI is EPA’s color-coded tool used by state and local governments to help inform the public about current and daily air quality and recommends steps that individuals can take to reduce their exposure to air pollution.
 - The AQI converts ozone concentrations to a number on a scale from 0 to 500.
- EPA is proposing to change the breakpoints for each AQI category based on the level of the proposed primary standard and information from the health studies examined in the review.
- EPA is soliciting comments on these proposed revisions to the AQI.

AQI Category	Index values	Current Breakpoints (2008 AQI) (ppb, 8-hour avg)	Proposed Breakpoints (ppb, 8-hour avg)
Good	0 - 50	0 - 59	0 – (49 to 54)
Moderate	51 – 100	60 – 75	(50 – 55) – (65 to 70)
Unhealthy for Sensitive Groups	101 - 150	76 - 95	(66 to 71) - 85
Unhealthy	151 - 200	96 - 115	86 - 105



Proposed Changes to Monitoring Requirements

- EPA is proposing changes to monitoring requirements to smooth the transition to any revised standards and assure that the public has full information about air quality.
- **Ozone monitoring season**
 - Proposing to extend the ozone monitoring season for 33 states, to match the times of year when data show ozone can approach unhealthy levels, and to alert the public;
 - Proposing to require year-round monitoring at 80 existing multipollutant monitoring sites (NCore) stations.
 - Implementation of revised seasons proposed for January 1, 2017.
- **Photochemical Assessment Monitoring Stations (PAMS)**
 - Revising PAMS applicability to all ozone non-attainment areas with NCore sites – uses existing network infrastructure.
 - Proposing changes to certain required methods.
 - Proposing changes to decrease monitoring burden and increase flexibility.
 - Implementation deadlines of 2017 or 2019 based on nonattainment status of areas.
- **Ozone Federal Reference Method**
 - Proposing to add a new ozone Federal Reference Method (FRM) while retaining the current FRM and Federal Equivalent Methods (FEMs).
 - Impact on state monitoring networks will be minimal as existing approved methods are adequate for continued operation.

Got it?

- What does this mean for me..?





Proposed Ozone Monitoring Season in Region 1 and 2 (NESCAUM)

- **Connecticut (March 1- Sept. 30)**
- **Maine (April 1- Sept. 30) (*unchanged*)**
- **Massachusetts (March 1- Sept. 30)**
- **New Hampshire (March 1- Sept. 30)**
- **Rhode Island (March 1- Sept. 30)**
- **Vermont (April 1- Sept. 30) (*unchanged*)**
- **New Jersey (March 1 – Oct. 31)**
- **New York (March 1 – Oct. 31)**

- NCore stations to be January – December (year round) regardless of location

- Proposed Deadline – revised season requirements to be effective on first day of ozone monitoring season in **2017** for existing stations.



Regulatory Revisions Being Proposed for PAMS

- Reduce number of required sites to 1 per area but expand PAMS applicability to all O₃ non-attainment (NA) areas
- Require PAMS at NCore sites in O₃ non-attainment areas but allow for Regional approval of alternative site (e.g., existing type 2 PAMS sites)
 - Require sites to collect hourly VOC data
 - Require sites to collect carbonyls (8 3-hour samples daily)
 - Require sites to measure “true NO₂” in addition to current NO_y
 - Change requirement for upper air meteorology to requirement for measuring mixing height
- Require all O₃ NA areas to also develop and implement an “enhanced ozone monitoring plan”
 - Could include additional O₃ sites, PAMS sites, radar profilers, mobile sites, etc.

(Considered limiting required PAMS to larger CBSAs, ie, greater than 1,000,000)



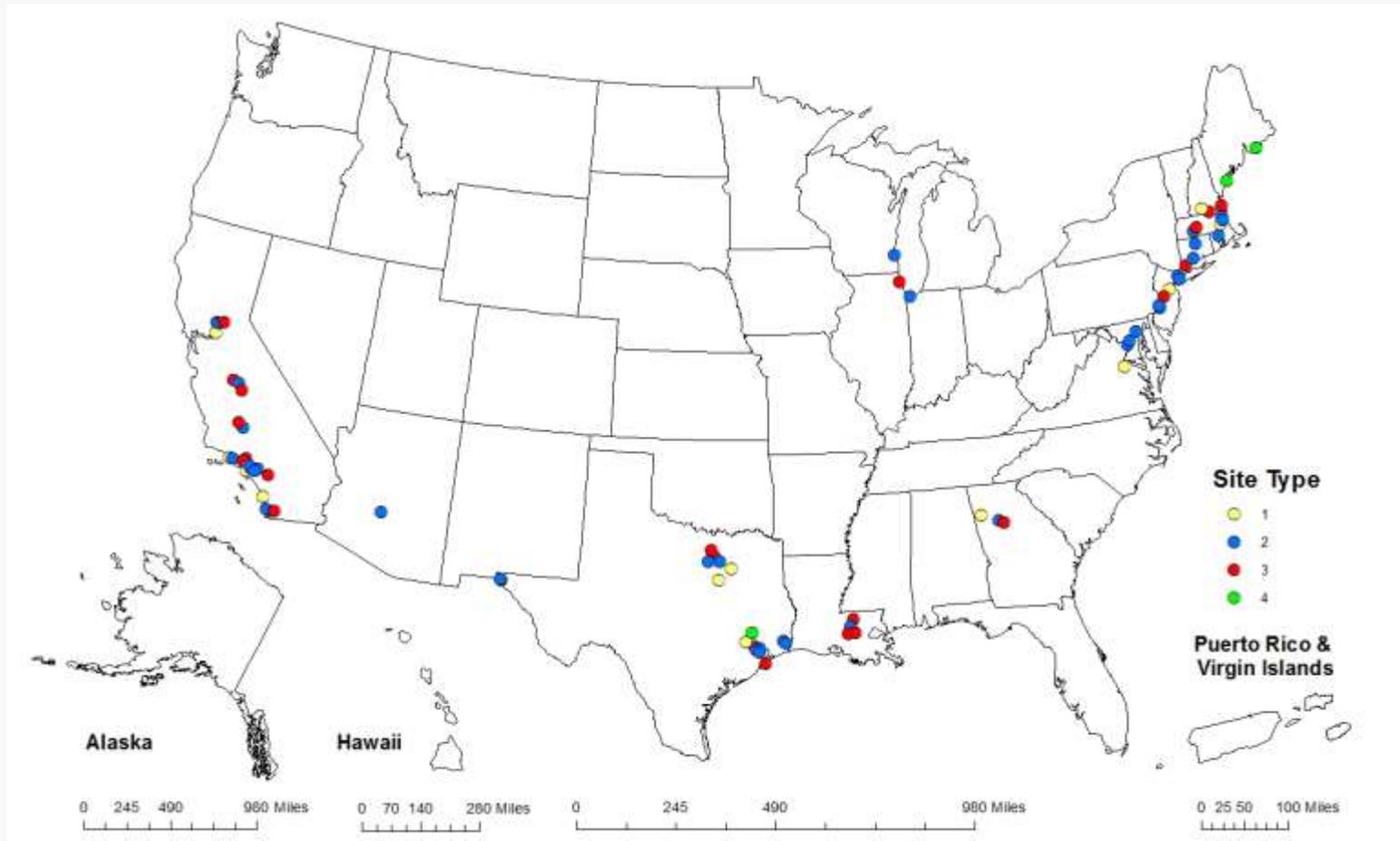
Estimated Impact of Level of Ozone NAAQS on Size of Required Network

Potential NAAQS Level (ppb)	Number of Sites (existing)
70	48 (16)
65	66 (17)

Estimates based on 2011-2013 ozone design values
PAMS requirements will be based on 2014-2016 data

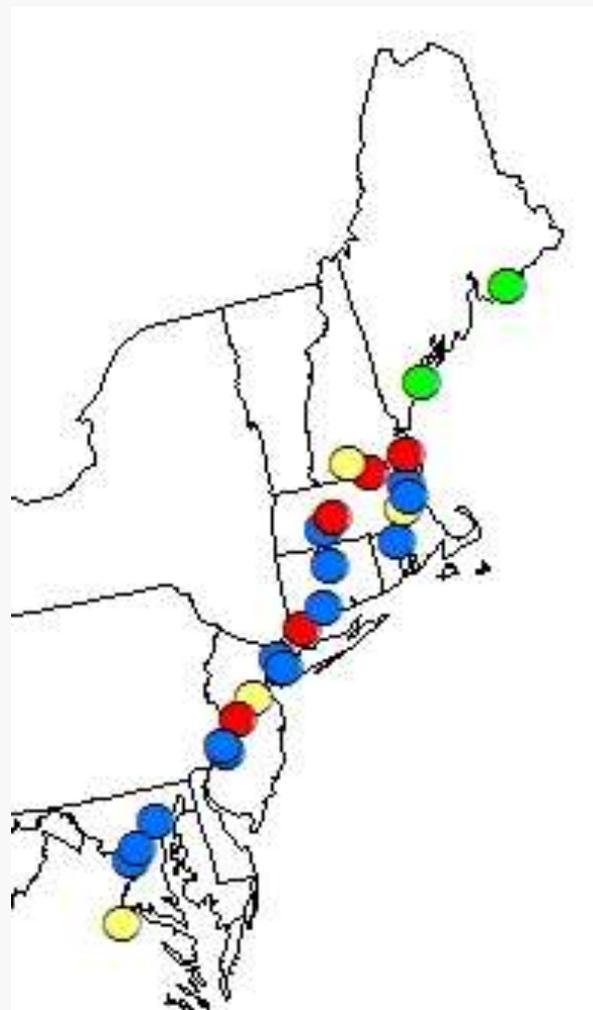


Current PAMS Network





Current PAMS Network in Northeast



Site Type

-  1
-  2
-  3
-  4



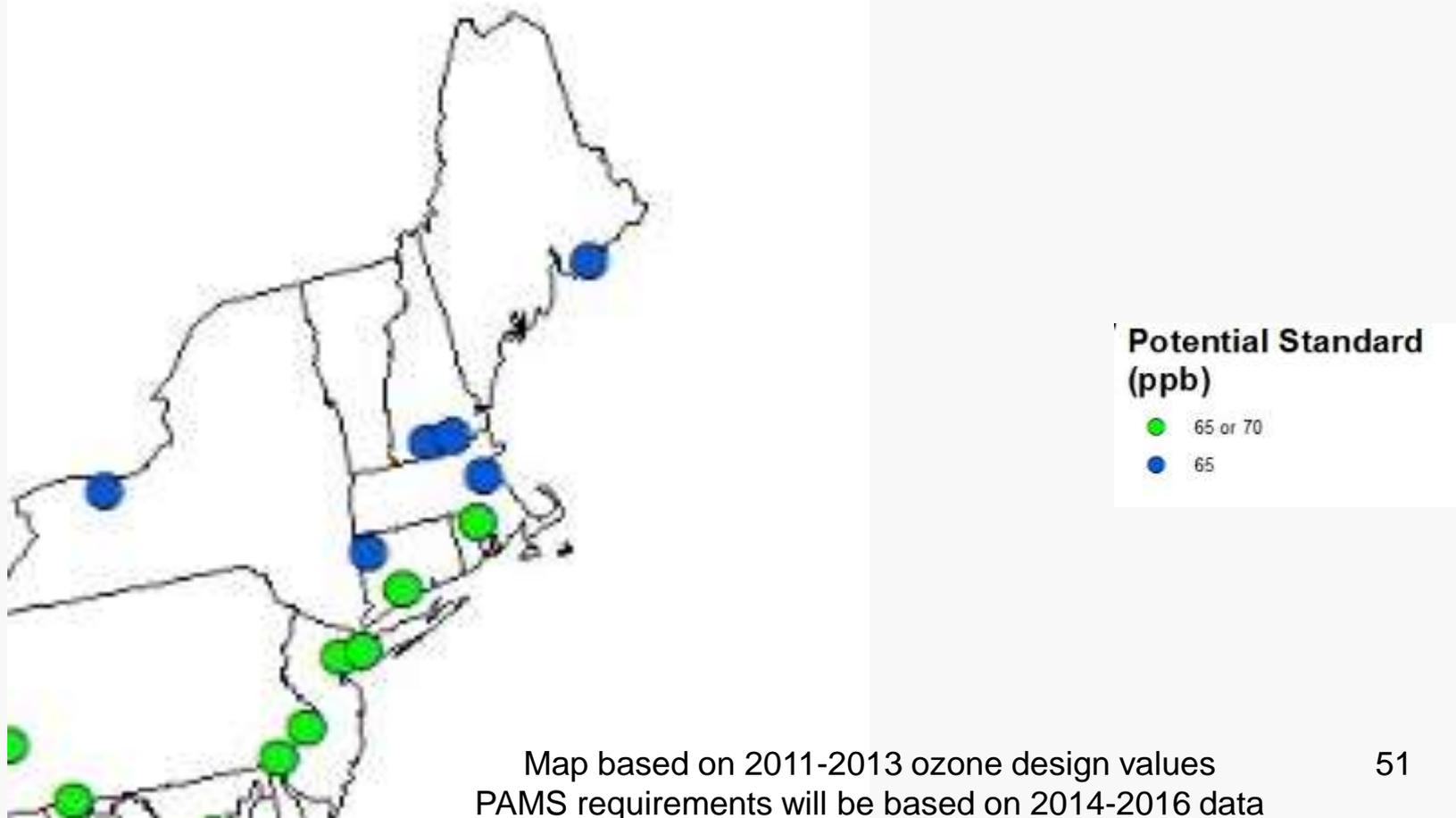
Potential New PAMS Network



Map based on 2011-2013 ozone design values
PAMS requirements will be based on 2014-2016 data



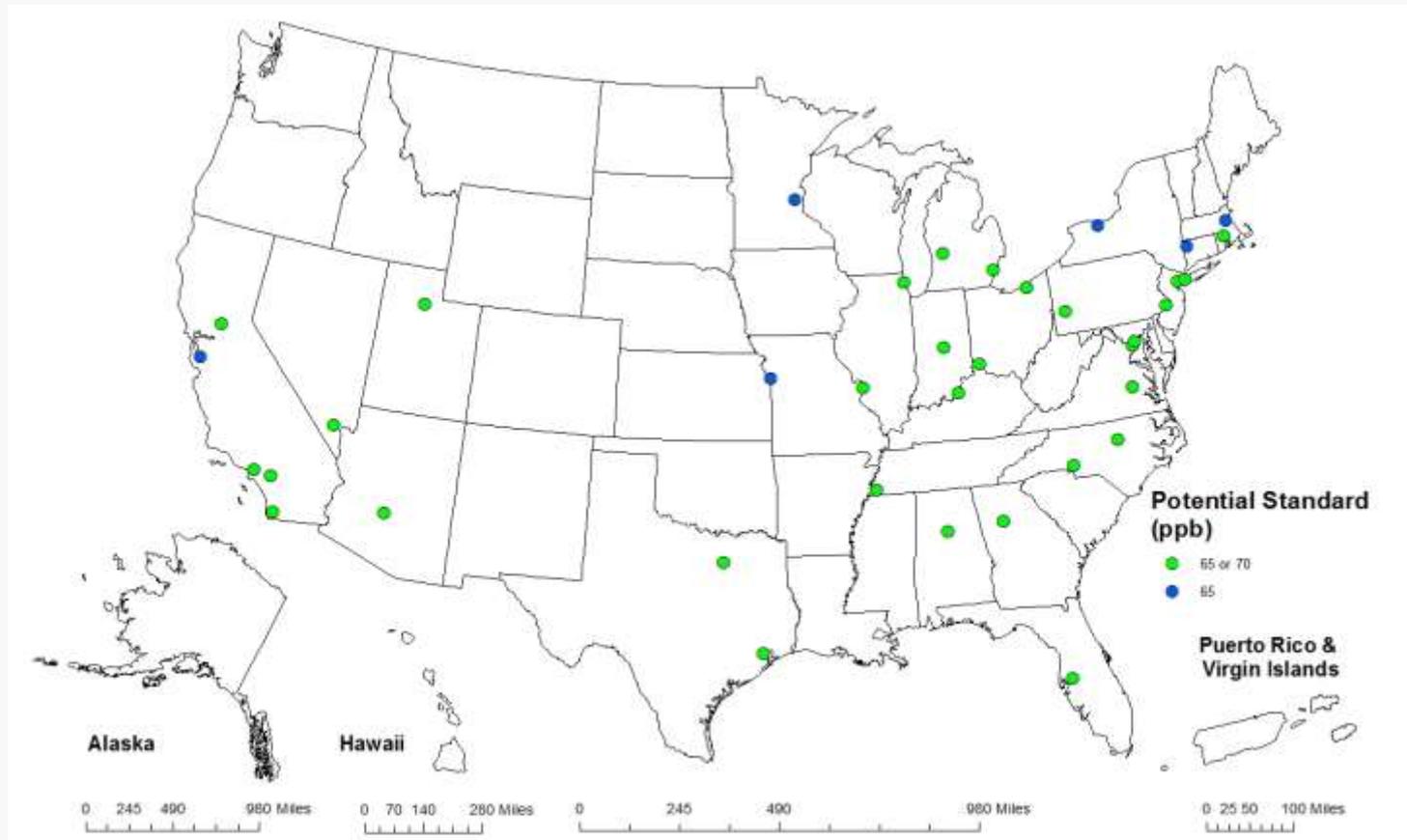
Potential New PAMS Network in Northeast



Map based on 2011-2013 ozone design values
PAMS requirements will be based on 2014-2016 data



Potential New PAMS Network w/ Population Limit



Map based on 2011-2013 ozone design values
PAMS requirements will be based on 2014-2016 data



PAMS Timing and other Logistical Considerations

- Proposed PAMS regulatory changes are included as part of the ozone NAAQS proposal which was signed November 25, 2014
- Final regulatory changes will be part of the final NAAQS package expected to be signed in October 2015
- We are planning a staggered deployment to allow time for monitoring agencies to buy equipment (autoGCs, true NO₂ analyzers, and ceilometers) and to train staff and develop SOPs and QAPPs
- Changes proposed to begin June 2017, extending through June 2019



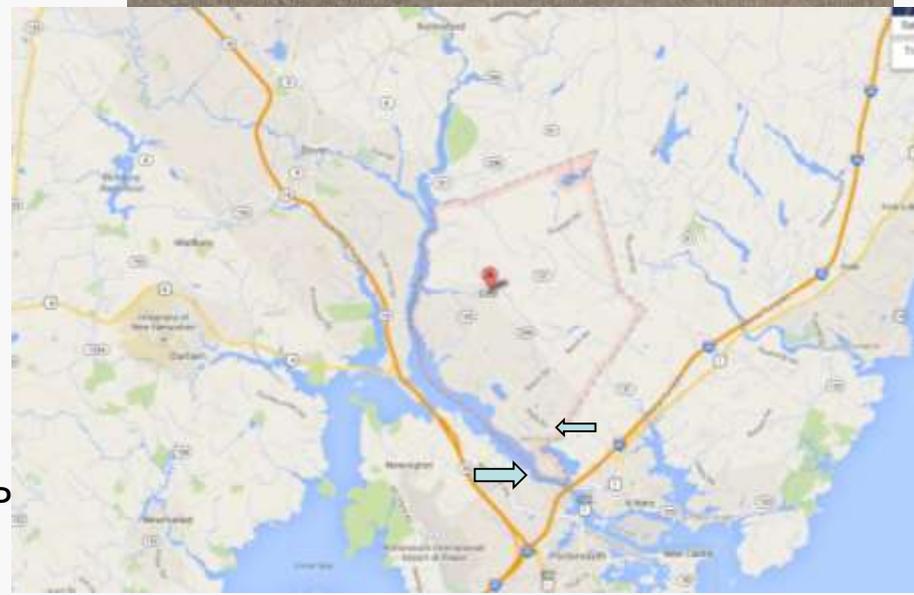
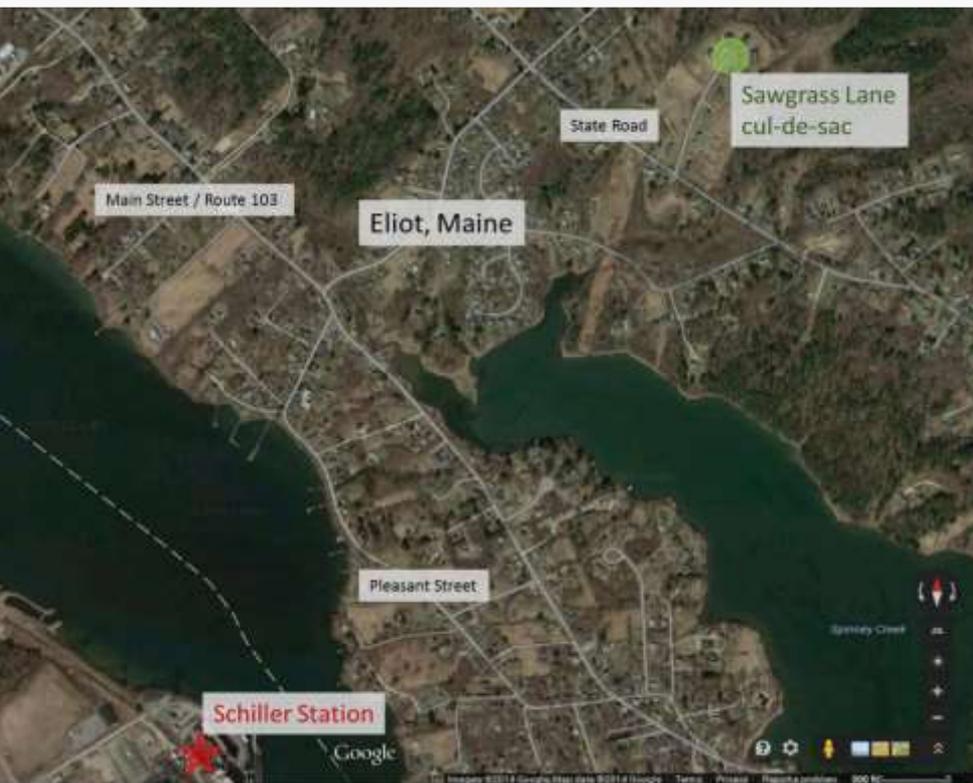


Ozone NAAQS Review Schedule

- **Proposal** signed on November 25, 2014
- **Public comment period** for 90 days after proposal is published in the Federal Register
 - Comments should be labeled with Docket ID number EPA-HQ-OAR-2008-0699
- **3 Public hearings** were held.
- **Final Rule** to be signed by October 1, 2015
- For more information on the rule and how to comment, go to <http://www.epa.gov/air/ozonepollution/>



SO₂ Special Study- Eliot, Maine



2/19/2015

U.S. Environmental P



Outline of Today's Presentation

- Review of monitoring issues
 - Ambient Monitoring: Importance of Quality Assurance and TSAs 
 - Continuous PM_{2.5} FEM “assessments” 
 - Near road monitoring 
 - Clarifications to 40 CFR Part 58 and Appendix A 
 - NAAQS Updates- with ozone focus 
 - **Air Quality Sensors**

A large, faint watermark of the Environmental Protection Agency (EPA) logo is centered in the background. The logo features a stylized flower with three leaves and a circular top, surrounded by the text "UNITED STATES ENVIRONMENTAL PROTECTION AGENCY".

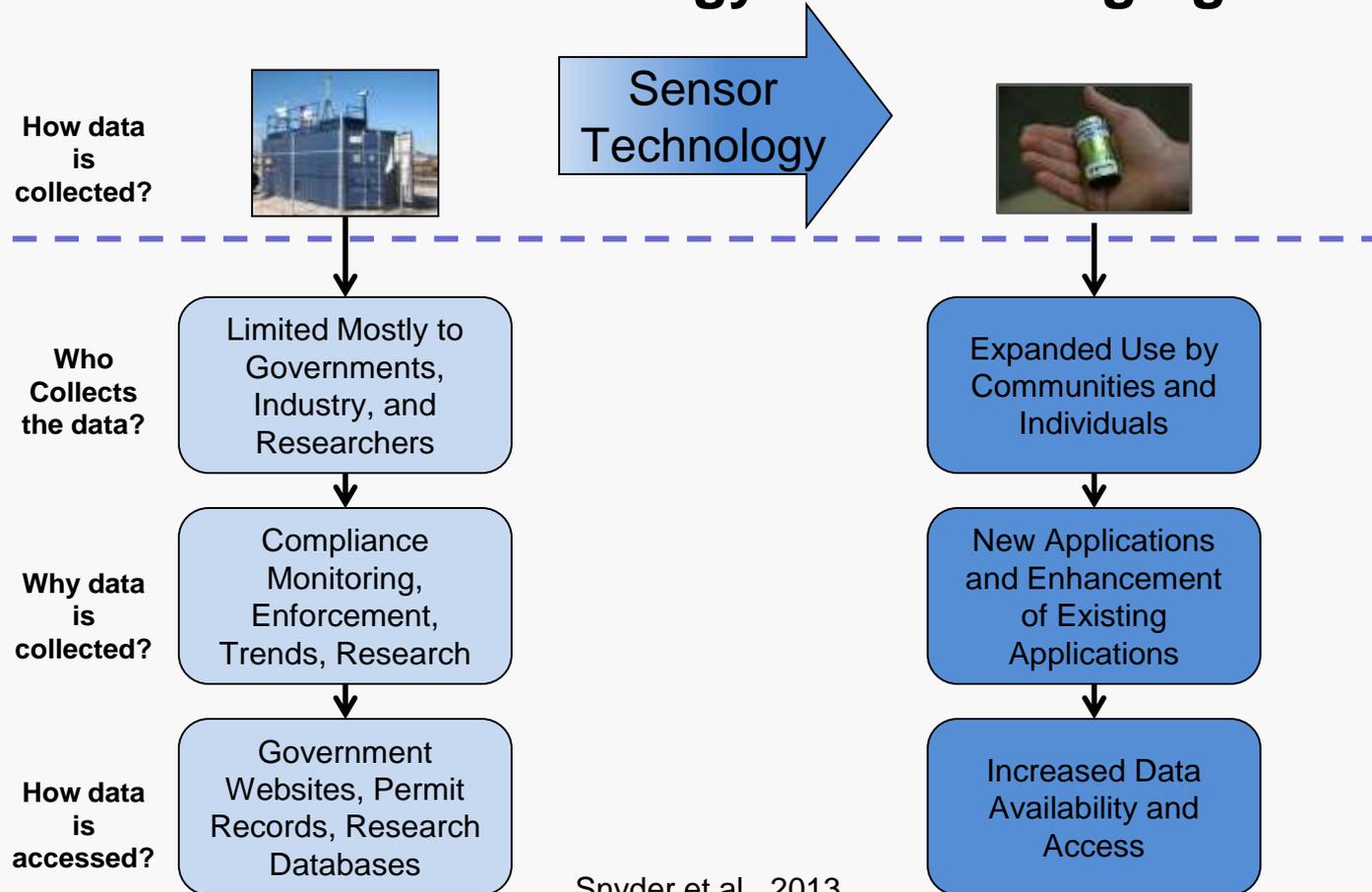
Air Quality Sensors

Advanced Monitoring Update

Air Quality Sensors



Role of Sensor Technology in the Changing Paradigm



Air Quality Sensors



Convergence of Technologies and Cultural Change

Miniaturized environmental sensors



e.g., CairClip

Introduction of low cost controls and communications



e.g., Arduino microprocessor

Emerging data-viewing/communication apps



AirCaring App

Smartphone / Tablet generation

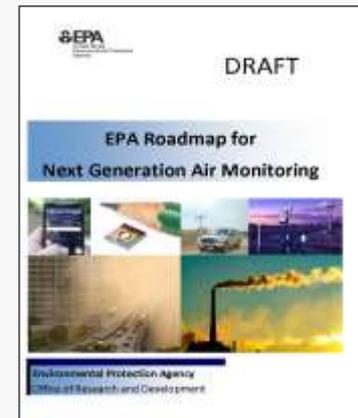
e.g., fitbit activity tracker





What is EPA doing?

- Stimulating collaboration and conversation
 - 4 NGAM Workshops since 2012
 - Government, Academia, International, DIY'ers
- Assessing emerging technology
 - Literature review of sensor technology
 - Sensor evaluation through laboratory and field analyses
- Thinking big picture about these developments and implications



<http://www.epa.gov/research/airscience/docs/roadmap-20130308.pdf>



EPA Sensor Evaluation Activities

- Ozone, NO₂, PM and VOC Sensor Evaluations
 - Ozone and NO₂ sensors evaluated in 2012/2013*
 - A host of low cost (<\$2500) PM_{2.5} and VOC sensors purchased or acquired for laboratory and/or field evaluation in 2013/2014
- Publications
 - Air Sensors Guidebook
 - Citizen Science Fact Sheet
 - Mobile Air Sensors & Applications for Air Pollutants
 - Sensor Evaluation Report
- Village Green Project
- Short Term Sensor Field Projects
 - Discover AQ; AIRS; Roadside, wildfire, fenceline
- Sensor Seal and other Evaluation efforts
 - FY16 Initiative
 - South Coast AQMD project





Benefits

- Enhanced capability to monitor at local levels
- Enhanced ability to understand people's exposure to air pollution as they actually experience it
- Combined with other technologies (e.g. satellites and models), improved understanding of air quality
- Improved ability for individuals to take specific actions to protect their health
- Over time, ability to improve compliance with air regulations

Challenges (Opportunities)

- Data quality & levels of detection
- Interpretation & communication of the data
- Big data



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 - Air Quality Sensors 

Air Quality Sensors

See you this summer!

- TSA





Questions?

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 - **Judge.robert@EPA.GOV**
- 617-918-8387**

