

Ambient Monitoring Update



US

Air Monitoring
Professionals

THEM

Everybody Else (not monitoring)

Lewis Weinstock

Office of Air Quality Planning and Standards

National Ambient Air Monitoring Conference August 2014

OAQPS Ambient Monitoring Group

Areas of Focus

- Implementing new national programs
- Assessing key networks
- Identifying efficiencies
- Maintaining data quality and defensibility



Near-road Monitoring Status

- Near-road NO₂ monitoring requirements were promulgated in 2010 NO₂ NAAQS revision
 - Health-based evidence suggested a majority of exposures are linked to mobile sources, prompting the new near-road monitoring requirements
- Subsequent requirements added for CO and PM_{2.5} during NAAQS rulemakings
- Installation deadlines revised in 2013, introducing a phased implementation plan
- Approximately \$15M in funding provided by EPA

Los Angeles Times

One-fifth of U.S. lives near roads with higher air pollution, study says

October 02, 2013 | By Tony Barboza



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Nearly one-fifth of the U.S. population lives near a high-volume road where pollution levels are typically elevated from vehicle exhaust, a new study says.

The analysis found 60 million people living within about one-third of a mile from a busy road. In California, 40% of the population lives that close to traffic, the highest of any state.



A University of New Mexico study found that nearly one-fifth of the U.S.... (Frederic J. Brown / AFP/Getty...)

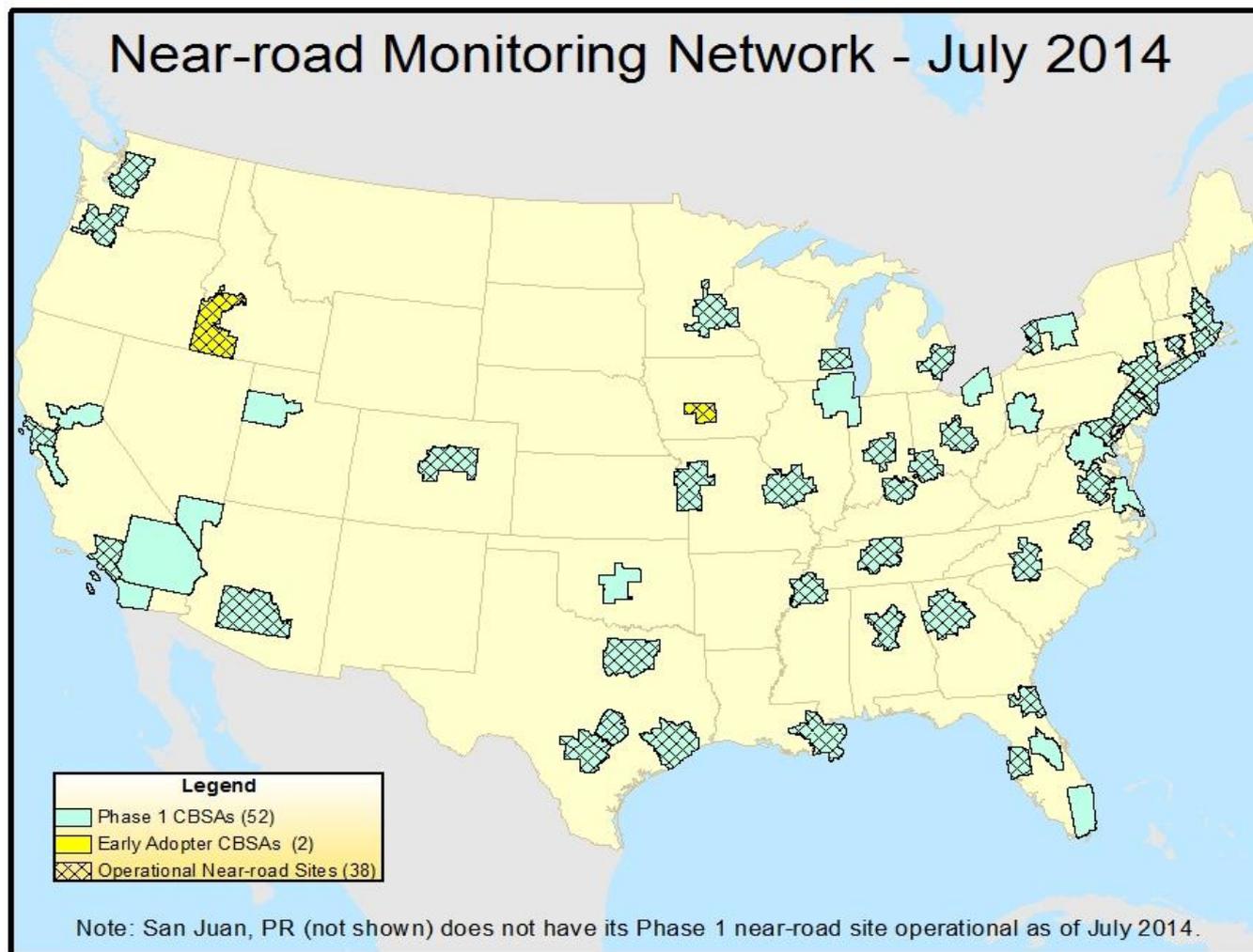
<http://www.sciencedirect.com/science/article/pii/S1361920913001107>

Near-Road Monitoring Requirements

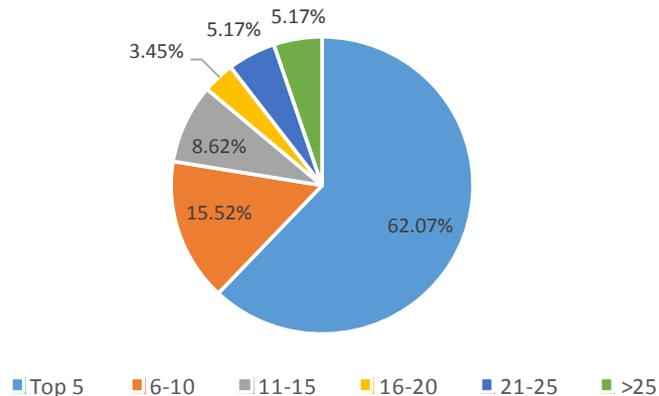
Implementation Phase	CBSA Population	NO ₂	CO*	PM _{2.5} *
<u>Phase 1</u> 52 Sites [funded]	≥ 1 Million	Jan 1, 2014	Jan 1, 2015 for CBSAs ≥ 2.5M Jan. 1, 2017 for CBSAs ≥ 1M and ≤ 2.5M	Jan 1, 2015 for CBSAs ≥ 2.5M Jan. 1, 2017 for CBSAs ≥ 1M and ≤ 2.5M
<u>Phase 2</u> 23 Sites (second sites) [funded]	≥2.5 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.

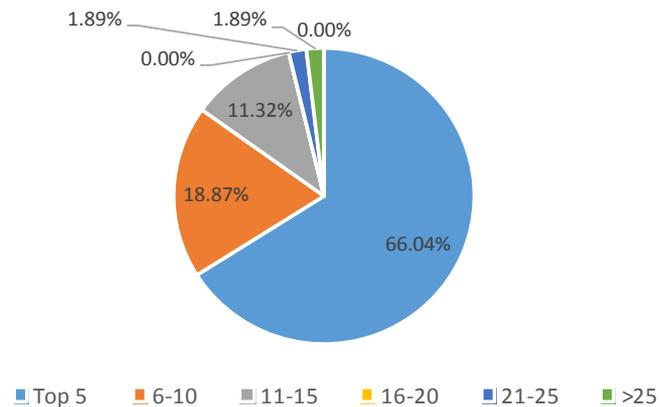
Implementing new national programs



Target Road AADT - CBSA Rank Percentages



Target Road FE-AADT - CBSA Rank Percentages



Target Roadway Rankings (July 2014)

- A majority of sites target a top 5 trafficked road segment in their CBSA
 - 20 sites along #1 ranked road segment for AADT
 - 16 sites along #1 ranked road segment for FE-AADT*
- Over 75% of sites along a top 10 ranked AADT road
- Over 95% of sites along a top 15 ranked road for FE-AADT

*Fleet Equivalent AADT (FE-AADT) is a single metric accounting for both traffic volume and fleet mix (diesel vs gasoline ratio)

Implementing new national programs

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

Implementing new national programs

Selected 1st Quarter 2014 Near-road NO₂ Data Reported to AQS

City	1-Hr Max.	98 th percentile	1 st Qtr. Avg.
Denver	96.8	71.1	44.7
Hartford	80.0	63.0	34.3
St. Louis	71.2	65.7	35.3
Cincinnati	68.0	67.0	42.3
Philadelphia	65.0	59.6	36.3
Indianapolis	64.4	63.8	38.4
Boston	64.0	60.0	36.8
S.F. - Oakland	60.6	54.5	30.2
Richmond	59.4	54.9	34.6
Houston	49.1	48.4	29.2
Boise	48.1	40.7	26.7
Des Moines	41.1	37.9	20.6

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

Take Home Messages

- Phase 1 is nearing completion - great job – let's get it finished!
 - Phase 2 (2nd site) implementation is underway
- Don't rush to judgment about data – earliest design values available in spring 2016 – most will be 2017
- Multi-pollutant aspects critically important – NAAQS, black carbon, ultra-fines, toxics, meteorology, traffic counts



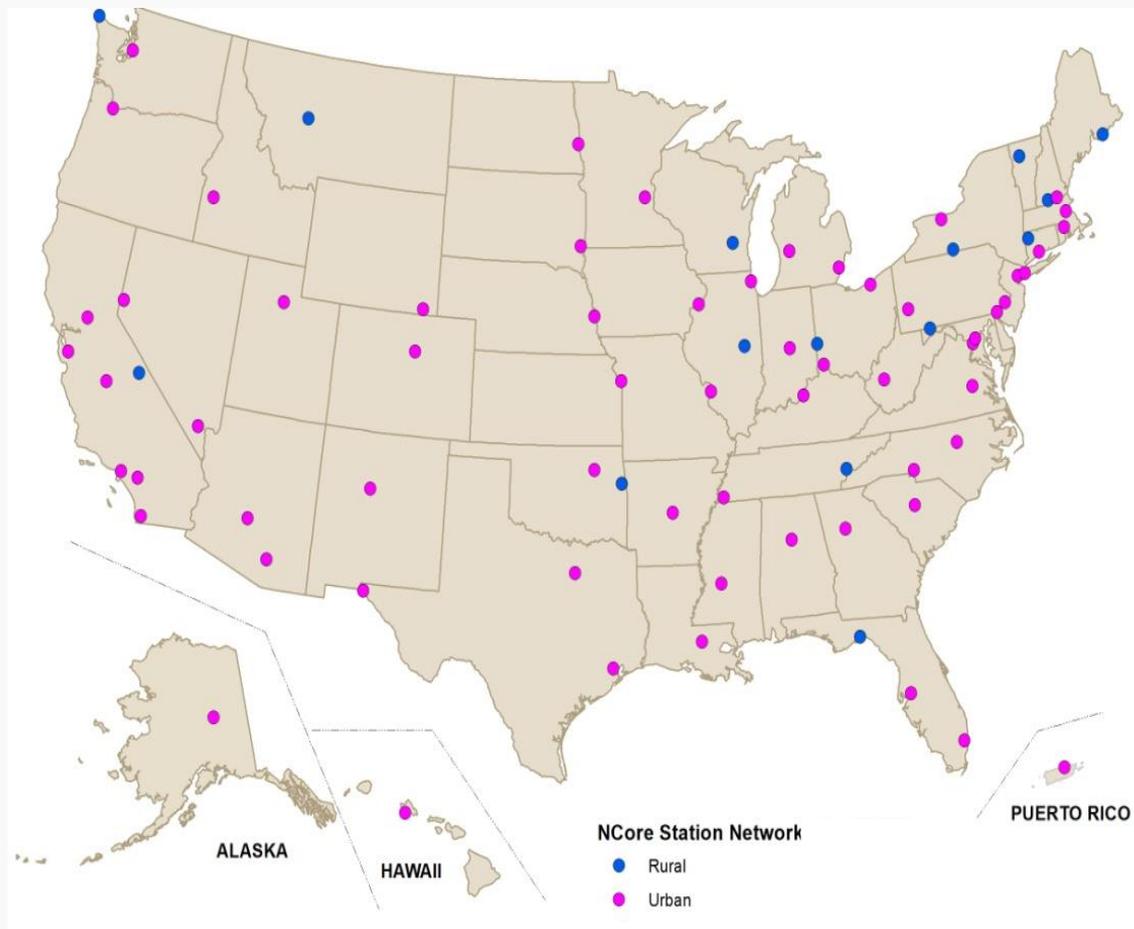
NCore Network Accomplishments

- Established multi-pollutant sites that support many types of objectives besides NAAQS compliance
- NCore provides collocated measurements to reduce uncertainties, support interpretation of air pollution episodes, long-term trends, health studies, modeling, and SIP work
- Implemented the multi-pollutant paradigm to potentially reduce number of physical sites to maintain while leveraging calibration systems, standards, and data systems
- New technology driver – trace gas methods, digital data systems, capability for lower level calibrations and audits, and wider use of automation



NCore Monitoring Network – 78 Stations

- Most sites have been running successfully for several years now
- NCore stations have become the anchors of the Ambient Air Monitoring Network
 - Collocation with many other networks (PAMS, NATTS, IMPROVE, CSN/STN)
 - Used for technology testing
 - NO_y highly valued measurement in modelling guidance



New NCore Stations in 2014

- Four NCore stations were or will be added this year
 - San Juan, Puerto Rico
 - St. Marks, Florida – Rural Station leveraged with IMPROVE
 - Charleston, West Virginia
 - Broward County (South Florida);

**New station in
San Juan, Puerto Rico**



**Inside Station
San Juan, Puerto Rico**



**New station in
St. Marks, Florida**

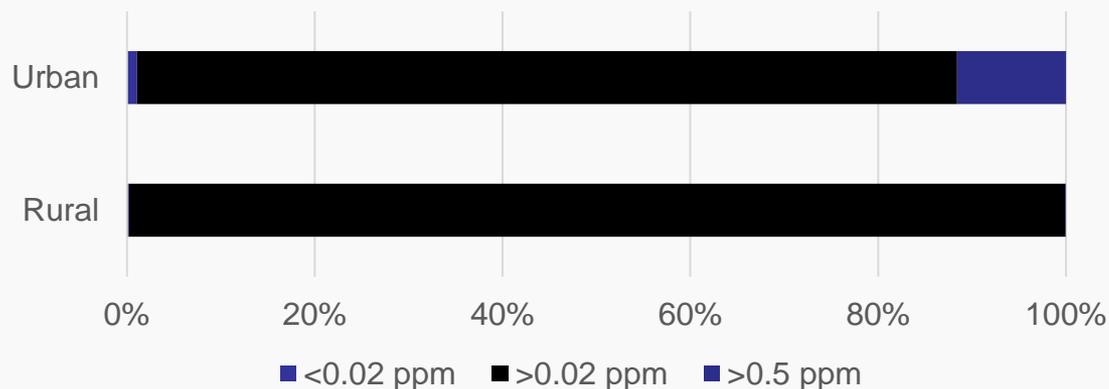


NCore Gas Data and Reporting

	CO	SO ₂	NO _y	Ozone
Average Data Completeness <i>(sites that ran full year in 2013)</i>	93%	91%	87%	95%

Focus on Carbon Monoxide

CO at NCore (CY13) with Trace Gas Analyzers
% of data below Trace level MDL (<0.02 ppm)
% of data below conventional CO MDL (<0.5 ppm)



The much better MDL of trace gas CO analyzers is critical to using these data.

Implementing new national programs

NCore Gas Data and Reporting

Reg	State	AQS ID	City	Site Name	Location Set	Count of Observations (Annual)																		
						42101 Carbon Monoxide	42401 Sulfur Dioxide	42406 So2 Max 5	42600 Reactive C	42601 Nitric Oxid	42602 Nitrogen D	44201 Ozone	61101 Wind Sp	61102 Wind Dir	61103 Wind Sp	61104 Wind Dir	62101 Outdoor	62201 Relative						
						1 HOUR	1 HOUR	5 MINUTE	1 HOUR	1 HOUR	1 HOUR	1 HOUR	1 HOUR	1 HOUR	1 HOUR	1 HOUR	1 HOUR	1 HOUR	1 HOUR	1 HOUR				
01	Connecticut	090050005	Cornwall	Mohawk Mt-Cornwall	RURAL	8133	17194	101440				8197	8477	16954	8508						8443	741		
		090090027	New Haven	Criscuolo Park-New Ha	URBAN AND	8314	17094	101180				2731	8627	17252	8463						8747	743		
	Maine	230090103	Not in a city	MCFARLAND HILL Air	RURAL	8622	17196				8588	8567	8562		8467	8686	8297	8232	8274	8734	8746			
	Massachusetts	250250042	Boston	DUDLEY SQUARE RO	URBAN AND	8194	16584				8264	7233	16041	16068	8447	8755	5920	4401	5920	8757	8757			
	New Hampshire	330115001	Peterborough (P	MILLER STATE PARK	RURAL	8570	17142	101561				7272	7271		8618	4624	4623	3918	3678	8734	8739			
		330150018	Not in a city	MOOSEHILL SCHOOL	RURAL	8579	15052	89970				8438	8437		8576					8660	8667	8736	8747	
	Rhode Island	440071010	East Providence	FRANCIS SCHOOL Ea	SUBURBAN	8205	16090				8045	8405	16668	16526	8432					8688	8688	8589	8589	
	Vermont	500070007	Underhill (Town	PROCTOR MAPLE RE	RURAL	7865	12200					7689	5065		8105									
02	New Jersey	340130003	Newark	Newark - Firehouse	URBAN AND	8369	17366	103303				8570	17149	17156	8593	8729	8755	8755	8755	8755	8755	8755		
	New York	360551007	Rochester	ROCHESTER 2	URBAN AND	8603	17208	103196				8248	8277		8572					8593	8751	8699		
		360810124	New York	QUEENS COLLEGE 2	URBAN AND	8432	17032	103440				8361	16101	16858	8448					8572	6466	8609	3427	
		361010003	Not in a city	PINNACLE STATE PA	RURAL	8272	17106	102856				8197	8088		7628									
	Puerto Rico	720210010	Bayamon		SUBURBAN	8406	13388	80822																
03	Delaware	100032004	Wilmington	CORNER OF MLK BLV	URBAN AND	7748	14434				7123	7941	15280	16318	8153					7717	8001	8001	7667	
	District Of Colum	110010043	Washington	MCMILLAN PAMS	URBAN AND	8358	17014					8464	16975	16884	8630					7883	7899	8477		
	Maryland	240230002	Grantsville	Piney Run	RURAL	8626	13314	77146				8522	8522		8700	8608	8608					8746	8746	
		240330030	Beltsville	HU-Beltsville	SUBURBAN	8689	15544	93439				8345	16981	17272	8717	8737	8737					8737	8737	
	Pennsylvania	420030008	Pittsburgh	Lawrenceville	SUBURBAN	8283	16494	99429				7949	16928	17382	8670	8729	8730			8694	8695	8757	8757	
		421010048	Philadelphia	North East Waste (NEV	URBAN AND	1761	3350	20552				1492		1742	5699	5283						1780		
	Virginia	510870014	East Highland P	MathScience Innovati	SUBURBAN	8469	16938	102235				5273	13666	16954	8512	0	0					8647	8647	
	West Virginia	540390011	Not in a city		RURAL																			
04	Alabama	010730023	Birmingham	North Birmingham	URBAN AND	7799	15454				7670	4854	5593	1478	8629					8608	8606	8746	8746	
	Florida	120111002	Davie	U of F Ag Research Ce	SUBURBAN																			
		120573002	Valrico	SYDNEY	RURAL	8461	16986	101798				7698	7651		6844						8601	8601	8422	8533
		121290001	Saint Marks	WITHIN ST. MARKS W	RURAL										8730								8760	
	Georgia	130890002	Not in a city	South DeKalb	SUBURBAN	8472	16612				8283	8330	8427	16854	8633	8741	8741					8566	8563	
	Kentucky	211110067	Louisville	CANNONS LANE	SUBURBAN	8489	17092				8571	5878	14335	16914	8634	7810	7810			7717	7717	8647	8650	
	Mississippi	280490020	Jackson	Jackson NCore	URBAN AND	4182	8332				4165	4164	4164		4195					4316	4316	4316	4316	
	North Carolina	371190041	Charlotte	Garinger High School	URBAN AND	17149	16958	101998				8373	16814	16882	8353	8690	8690			8690	8690	8727	8727	
		371830014	Raleigh	Millbrook School	SUBURBAN	8032	16194	98227				8101	8101		8235					8705	8705	17402	8701	
	South Carolina	450790007	Dentsville (Dents	PARKLANE	SUBURBAN	8159	17334	80529				5597	5597		8649					8760	8760			
	Tennessee	470090101	Not in a city	Great Smoky Mountai	RURAL	5249	5052						9335		8639	8682				8535	8535	8692	8675	
		471570075	Memphis	Memphis NCore site	SUBURBAN	8629	17278				8639	8646	8657		8314	8629	8755					8755	8755	
05	Illinois	170191001	Not in a city	ISWS CLIMATE STATI	RURAL	7144	15800					6795	7843		7602									
		170314201	Northbrook	NORTHBROOK WATE	SUBURBAN	4424	15210				7548	5049	13746	17250	8104					3708	3708	6117	4172	
	Indiana	180970078	Indianapolis (Re	Indpls- Washington Par	SUBURBAN	8427	16368				8251	7839	15874	16066	8591	8735				8735	8735	8750	8749	
	Michigan	260810020	Grand Rapids	GR-Monroe	URBAN AND	7535	16360	97081				8598	8599		8279					8749	8749	8671	8671	
		261630001	Allen Park	Allen Park	SUBURBAN	8322	16184	101017				8459	8460		8168					8752	8752	8751	8752	
	Minnesota	270031002	Blaine	Anoka Airport	SUBURBAN							1	8566	17134	8651					4341	4341	4341	4229	
	Ohio	390350060	Cleveland	GT CRAIG	URBAN AND	8231	32964				8238	8158	16366	16422	8215									
		390610040	Cincinnati	TAFT	URBAN AND	8263	16438				8266	7980	15450	15368	8734					8576	8576	8679	8699	
		391351001	New Paris	NATIONAL TRAIL SCH	RURAL	7256	15378				7582	6628	6689		8529					7132	7134	7031	7032	
	Wisconsin	550270001	Horicon	Horicon Wildlife Area	RURAL	8309	16444	74949				8160	8159		8566	153	153			8472	8591	8743	8750	

PM_{2.5} Monitoring Changes from the 2012 PM NAAQS Final Rule

- Terminology Changes
 - Aligned siting requirements with definition of ambient air; revoked requirement that PM_{2.5} sites are required to be “population oriented” for comparison to the NAAQS.
 - Clarified applicability of micro and middle scale sites to the annual NAAQS when they are considered to represent “area-wide” locations.
- Addition of PM_{2.5} at Near Road Sites
 - Areas over 2.5M people by January 1, 2015 (22 areas)
 - Areas between 1M and 2.5M by January 1, 2017 (30 areas)
- Flexibility added to allow exclusion of certain PM_{2.5} continuous data from NAAQS [§ 58.11(e)]
- Revoked Requirement for PM_{10-2.5} speciation at NCore

Status of Ozone NAAQS & Monitoring Changes

- Proposal court-ordered deadline – December 1, 2014
- NAAQS proposed rule will address monitoring and data handling issues including:
 - Changes to ozone monitoring seasons
 - Revisions to PAMS requirements
 - Commensurate revisions to AQI breakpoints
 - New Federal Reference Method and equivalent method testing requirements
 - New data handling appendix U



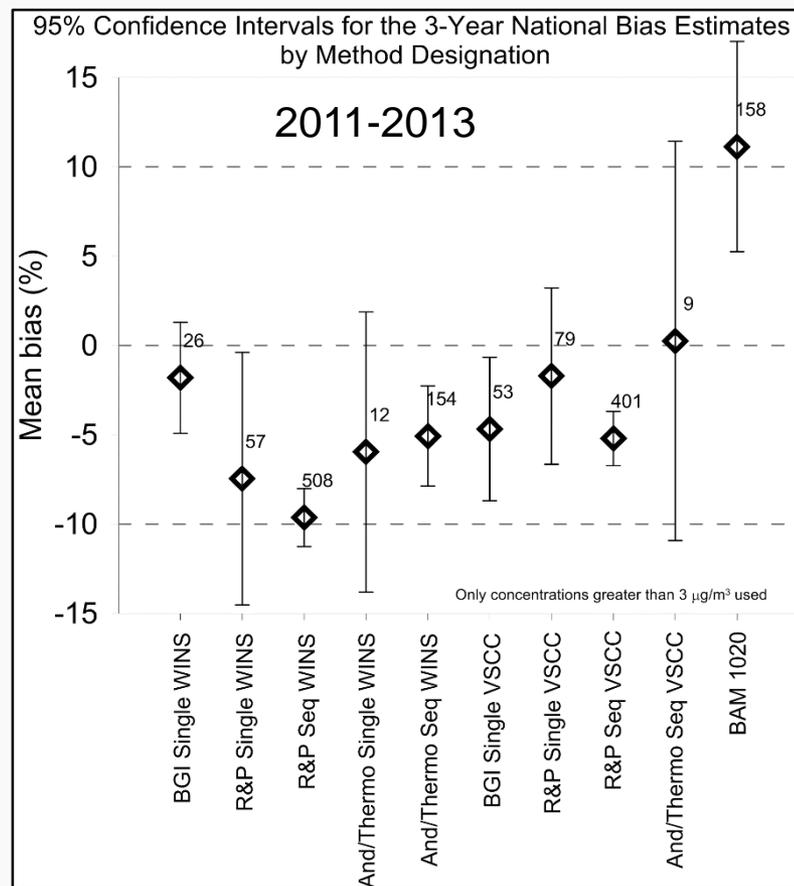
Ozone Monitoring Network

SO₂ Data Requirements Rule

- Proposal signed April 17, 2014
 - Public comment period closed July 14, 2014
 - 75 public comments received
- Final rule expected late 2014
- Intent of Rule: Increase characterization of air quality around SO₂ sources, allowing an informed assessment of the NAAQS in unmonitored areas where exposure to peak concentrations may occur
- Characterization of air quality is proposed to be achieved through monitoring and/or modeling (where states have a choice)
- SO₂ sources around which air quality is to be characterized will be selected based on annual emissions and presence inside CBSAs of a certain population
 - E.g., 1,000 tpy sources in CBSAs of 1 million persons; 2,000 tpy sources outside those CBSAs
- Various deadlines between 2016 and 2020
- <http://www.epa.gov/airquality/sulfurdioxide/implement.html>

Why the focus on assessments?

- Program objectives change over time
 - *How have changes in ambient ozone levels impacted PAMS?*
- Our needs are great but our resources are not
 - *How can we keep the CSN budget in-line with resources while looking forward to the future?*
- Technological improvements are important
 - *Should NATTS incorporate revised air toxics methods?*
- QA results must be reviewed and corrective actions taken in a timely manner
 - *What are we learning from PEP and NPAP audits?*



Status of Revisions to Monitoring CFR

- Originally discussed at a dedicated technical session during the 2012 Monitoring Conference
- Goals
 - Common sense burden reductions
 - Restructuring of QA sections for clarity
 - Focus on non-controversial issues
- Progress
 - Discussions with regions during fall 2013
 - Issues shared with NACAA MSC – Dec 2013
 - Proposal advancing through EPA review chain



Potential Components of the Monitoring CFR

- Additional flexibility in PM_{2.5} sampling schedules
- Focusing scope of data certification requirement
- Reducing data reporting requirements
- Elimination of NCore Pb requirement
- Reorganization of QA sections
 - Requirements listed by pollutant
 - Targeted reduction or elimination of lower priority requirements
 - PSD requirements clarified and placed in dedicated appendix



Success Stories

- Revised PM filter procurement process to better gather national input and track deliveries
- Developed new data certification and concurrence report in AQS to facilitate input on flagging
- Rolling out new QA transaction in AQS to ease reporting
- Improved AIRNowTech to provide better access to real-time data
 - Working on updating VocDAT tool in similar way



QA Issues are Front & Center

- Data quality issues are central to key national air quality management actions
 - Designations
 - Clean data determinations
 - Petitions for reconsideration
- Stakeholders are putting air quality data under the microscope
 - CFR requirements
 - QA handbook
 - Agency logbooks
 - Slightest deviations are subject to potential litigation



Data Quality Starts With You

- QA Project Plans need to be submitted, reviewed and approved (EPA Requirement)
- Regions need to perform the required technical systems audits (TSAs) every three years (CFR requirement)
 - Corrective actions need to be taken
- Review QA Data
 - QA data of little value if nobody looks at it!
Question poor results!
- Get involved in QA Workgroup Community
 - Participate in periodic calls, training sessions, and webinars
 - Read the QA EYE newsletter



A large, faded watermark of the Environmental Protection Agency (EPA) logo is centered on the page. The logo consists of a circular border containing the text "UNITED STATES" at the top and "ENVIRONMENTAL PROTECTION AGENCY" at the bottom. In the center of the circle is a stylized flower with a round head and three leaves.

Questions?