



National Air Toxics Trends Stations (NATTS) Overview

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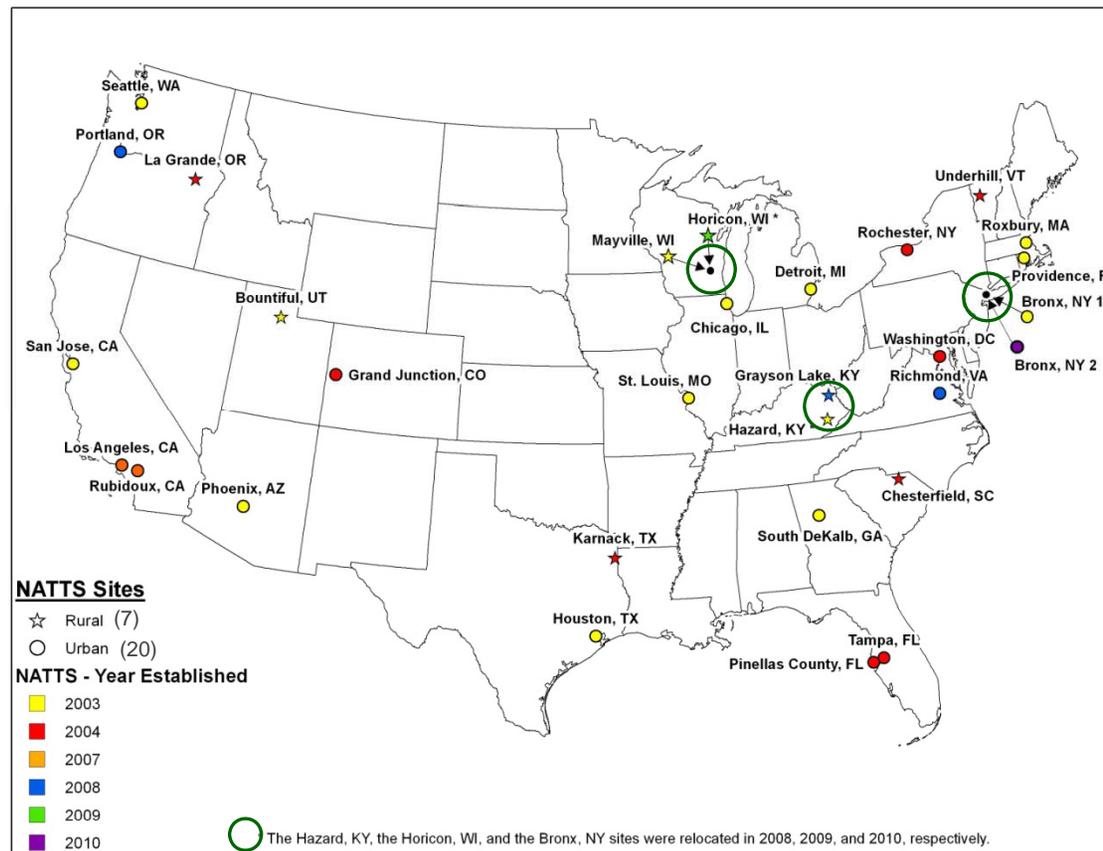


Background

- NATTS Network Created to Generate Long-Term, Quality Assured, Standardized Ambient Air Toxics Data to:
 - Identify Trends in Air Toxic Concentrations
 - Evaluate the Effectiveness of National Hazardous Air Pollutant (HAP) Reduction Efforts
 - Ground Truth Air Quality and Human Exposure Models
 - Direct Input into Source-Receptor Models
 - Assess Population Exposure and Background-Level Concentrations



NATTS Sites & Years Established





Minimum Required NATTS Analytes

VOCs

Acrolein

Benzene

Chloroform

1,3-butadiene

Vinyl Chloride

Perchloroethylene

Carbon Tetrachloride

Trichloroethylene

Carbonyls

Formaldehyde

Acetaldehyde

PAHs

*Benzo(a)pyrene**

*Naphthalene**

PM₁₀ Metals

Nickel compounds

Arsenic compounds

Cadmium compounds

Manganese compounds

Beryllium compounds

Lead compounds

*TSP Hexavalent Chromium**

* Not an original Core HAP



NATTS Network Assessment

- Review of the NATTS Network Required in the Final Draft of the *National Monitoring Strategy, Air Toxics Component* (U.S. EPA, 2004)
 - “Although the longevity of trends sites typically extends over a decade or more, the NATTS must be evaluated, and modified as needed, on 6-year intervals to assure continued relevancy, consistent with the procedures established under the National Strategy”
- Network is Older than 6 Years, However Many of the Original Sites did Not Begin to Fully Sample the Initial Core HAPs Consistently until 2005



Scope of Assessment

- Policy-relevant questions to be addressed using the assessment:
 - Is the network design appropriate/optimal to achieve the goals and objectives?
 - Are the NATTS goal and objectives still relevant?
 - Are the data collected adequate to meet the program goals?
 - What changes to the current network design would be appropriate to improve the NATTS
- Assessment examined whether data collected of complete and adequate quality to meet program-level data quality objective (DQO):
 - “To be able to detect a 15 percent difference (trend) between the annual mean concentrations of successive 3-year periods within acceptable levels of decision error.”

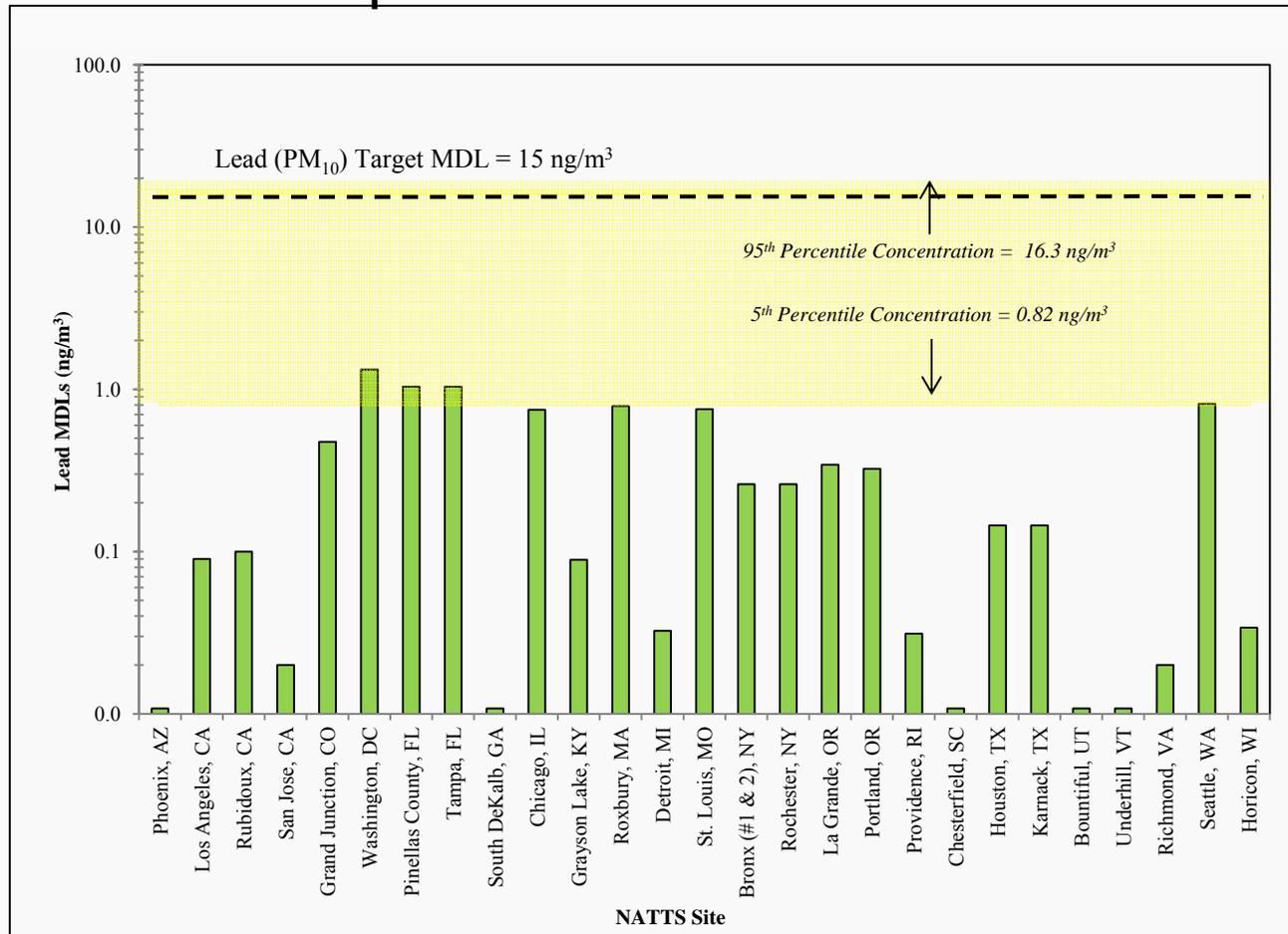


Draft Network Assessment Outline

- NATTS network sites
- Network requirements
- MQO scoring
- AQS reporting
- Statistical overview of data (preliminary)
- Trends results (preliminary)
- Site operator interviews
- Observations and recommendations



Preliminary Comparison of 2010 MDLs with Target MDL, 5th and 95th percentile observations for Lead



National Summary Statistics (Preliminary)



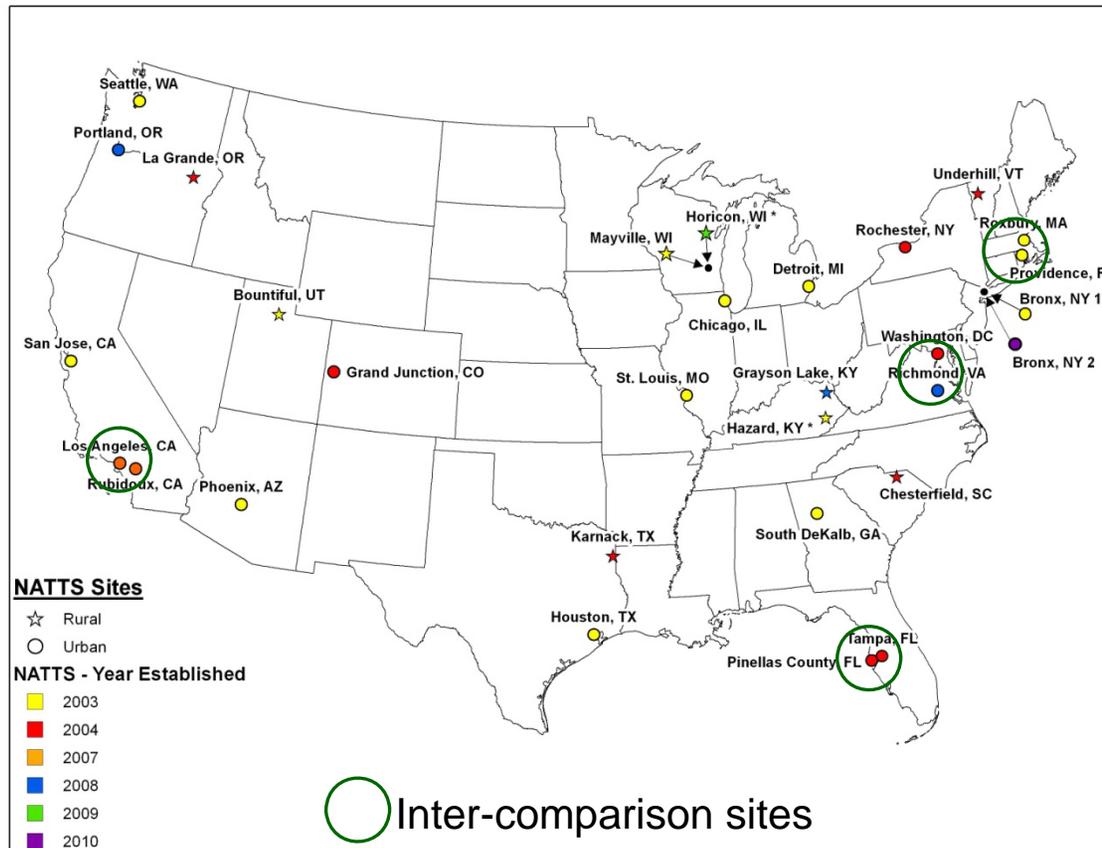
Analyte	Site Type	% Detections	Arithmetic Mean* ($\mu\text{g}/\text{m}^3$)
Acetaldehyde	Urban	100%	1.88 ± 0.05
	Rural	98%	1.57 ± 0.06
	All Sites	99%	1.79 ± 0.04
Benzene	Urban	100%	1.14 ± 0.02
	Rural	80%	0.64 ± 0.03
	All Sites	95%	1.01 ± 0.02
Butadiene, 1,3-	Urban	84%	0.129 ± 0.006
	Rural	19%	0.011 ± 0.003
	All Sites	68%	0.100 ± 0.005
Carbon Tetrachloride	Urban	97%	0.587 ± 0.004
	Rural	66%	0.368 ± 0.012
	All Sites	89%	0.534 ± 0.005
Chloroform	Urban	86%	0.2221 ± 0.015
	Rural	40%	0.042 ± 0.003
	All Sites	75%	0.177 ± 0.012

Analyte	Site Type	% Detections	Arithmetic Mean* ($\mu\text{g}/\text{m}^3$)
Formaldehyde	Urban	100%	2.99 ± 0.07
	Rural	100%	3.05 ± 0.11
	All Sites	100%	3.01 ± 0.06
Lead (PM ₁₀) (ng/m^3)	Urban	99%	5.62 ± 0.29
	Rural	99%	2.61 ± 0.19
	All Sites	99%	4.81 ± 0.22
Tetrachloroethylene	Urban	87%	0.395 ± 0.135
	Rural	25%	0.043 ± 0.013
	All Sites	72%	0.308 ± 0.102
Trichloroethylene	Urban	55%	0.076 ± 0.023
	Rural	13%	0.010 ± 0.003
	All Sites	45%	0.060 ± 0.018
Vinyl chloride	Urban	20%	0.006 ± 0.001
	Rural	13%	0.005 ± 0.001
	All Sites	18%	0.006 ± 0.001

* In calculations involving non-detects (ND), a value of 0 was used (similar to school air toxics approach) 10



Inter-comparison of Sites Close in Proximity

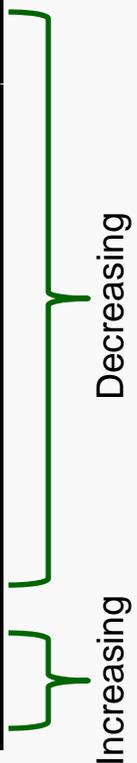


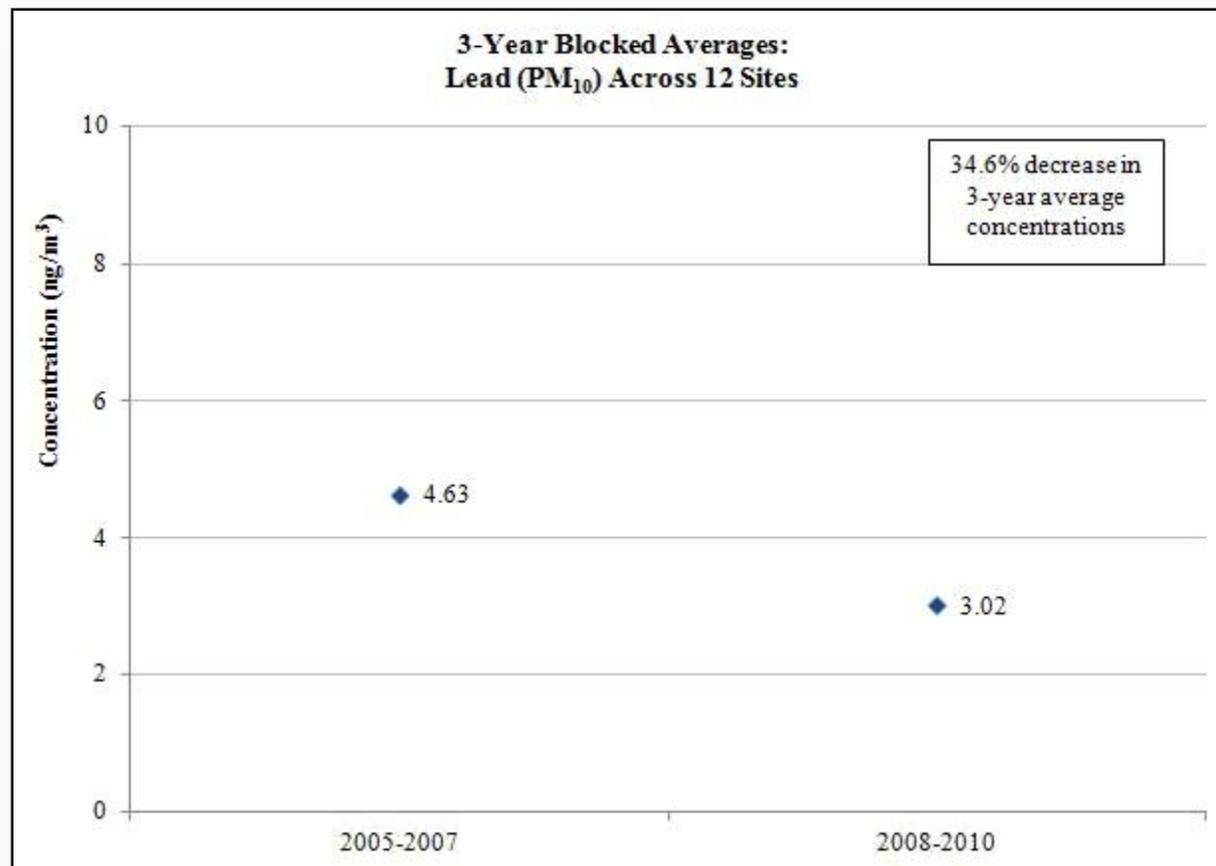
Paired Sites	# Pollutants, no sig. diff.	# Pollutants, sig. diff.
LA & Rubidoux, CA	12	6
Pinellas County & Tampa, FL	6	12
Providence, RI & Roxbury, MA	11	7
Richmond, VA & DC	8	10



Results of DQO Trends Analysis

Pollutant	Pollutant Group	Units of Measure	Number of Sites Used in Averaging	2005-2007	2008-2010	%Difference
Tetrachloroethylene	VOC	µg/m ³	12	0.39	0.22	-42.6%
Hexavalent Chromium	Hexavalent Chromium	ng/m ³	12	0.026	0.016	-37.4%
Lead (PM ₁₀)	PM ₁₀ Metal	ng/m ³	12	4.63	3.02	-34.6%
Trichloroethylene	VOC	µg/m ³	15	0.057	0.038	-33.5%
Nickel (PM ₁₀)	PM ₁₀ Metal	ng/m ³	11	1.85	1.25	-32.4%
Cadmium (PM ₁₀)	PM ₁₀ Metal	ng/m ³	14	0.27	0.19	-28.6%
Butadiene, 1,3-	VOC	µg/m ³	12	0.119	0.086	-28.3%
Beryllium (PM ₁₀)	PM ₁₀ Metal	ng/m ³	12	0.056	0.043	-22.2%
Formaldehyde	Carbonyl	µg/m ³	12	2.87	2.34	-18.6%
Benzene	VOC	µg/m ³	14	1.07	0.87	-18.2%
Acetaldehyde	Carbonyl	µg/m ³	13	1.93	1.62	-15.9%
Manganese (PM ₁₀)	PM ₁₀ Metal	ng/m ³	13	6.20	5.30	-14.6%
Arsenic (PM ₁₀)	PM ₁₀ Metal	ng/m ³	8	0.89	0.78	-12.2%
Carbon tetrachloride	VOC	µg/m ³	10	0.57	0.62	8.7%
Vinyl chloride	VOC	µg/m ³	13	0.0029	0.0034	15.9%
Chloroform	VOC	µg/m ³	15	0.21	0.24	16.5%







Observations & Recommendations

- DQO trends analysis indicates 13 pollutants decreasing and 3 increasing
 - Important to continue monitoring to determine if increase is due to lowering of MDLs (fewer substitutions for NDs), or is an actual trend
- High MDLs accounted for majority of datasets excluded from trends analysis
 - NATTS participants should use report to determine if any data excluded from trends analysis and what can be done to prevent this in the future (e.g., working with labs to lower MDLs)
- Many data reporting issues identified and resolved due to careful review of data in AQS for use in the assessment
 - More frequent review of NATTS data by OAQPS & regional office
- Important to monitor pollutants with chronic health benchmark levels & NATA risk drivers
 - Continue encouraging reporting of all monitoring data



Observations & Recommendations (cont.)

- NATTS Proficiency Testing (PT) program has been extremely beneficial in improving laboratory performance
 - Increase proficiency testing samples to twice annually
- Many sites and laboratories operating sampling and analytical equipment purchased prior to 2001
 - Work with regional offices to re-task residual funds for equipment upgrades
- Some sampling and analysis methods approved for the NATTs program have not been revised in over 10 years
 - Refine sampling and analytical methods (e.g. TO methods)



Future Plans for Network Assessment

- Determine whether:
 - Sites should be added or removed
 - Required analytes should be added or removed
 - Determination of target MDLs should be modified
 - Program-level DQOs should be refined
 - MQOs should be refined
 - Current analytical and/or method precision calculations should be revised
- Use assessment findings to update NATTS TAD



Going Forward...

Proposed Timeline:

- Now through early June - conference calls with NACAA monitoring steering committee, regions & states to review document & address comments
- **June 18th - comments due from stakeholders**
- July 9th - comments incorporated & next draft completed

Ongoing:

- Weekly/bi-weekly meetings with NATTS workgroup to begin addressing addition/reduction of sites & pollutants, MDLs, DQOs & MQOs, etc.
- Reinitiate quarterly air toxics calls with regions & states to review document & other NATTS issues

We are currently seeking S/L volunteers to join the NATTS Network Assessment Workgroup. If interested, please contact Beth Landis (landis.elizabeth@epa.gov)



Questions?

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