

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 three leaves and a circular center, surrounded by the text "UNITED STATES ENVIRONMENTAL PROTECTION AGENCY".

# **Ambient Air Toxics Data Review: NATTS Network Assessment and the Ambient Monitoring Archive for HAPs**

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# Acknowledgements

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# Part 1 – NATTS Network Assessment Update

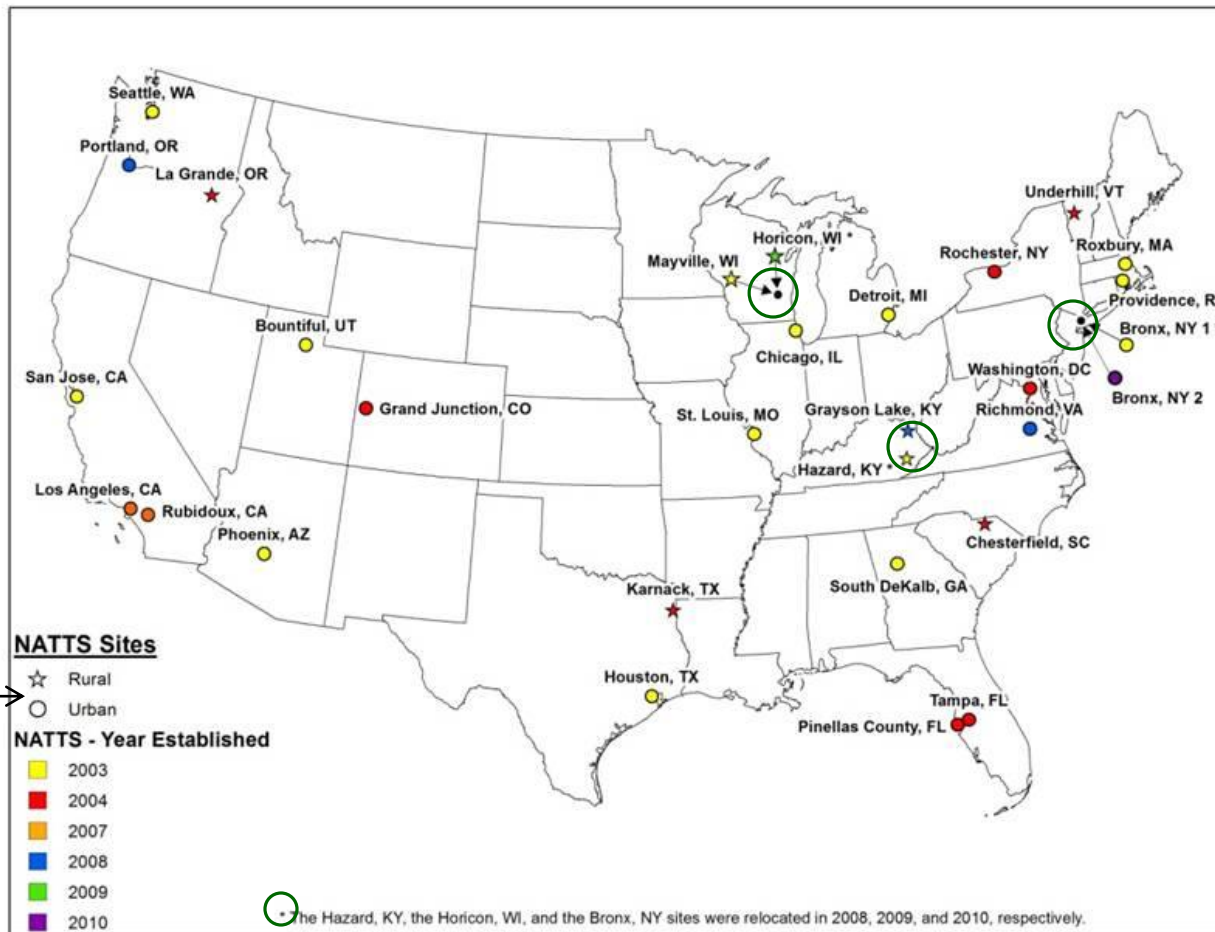


## Scope of the Assessment

- Goal is to determine...
  - *Are the NATTS goals and objectives still relevant?*
  - *Are the NATTS data collected adequate to meet the program goals?*
  - *What changes to the current network design would be appropriate to improve the NATTS?*
- Assess the NATTS Trends Data Quality Objective:  
*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.*



# NATTS Sites and Years





## First Assessment

- Provided Background/History of NATTS Program
- Covered measurements from 2003-2010
  - Special focus on 2005-2010
- Evaluated NATTS AQS data reporting
- Evaluated MQOs and scored each pollutant dataset
  - Completeness
  - Sensitivity
  - Bias
  - Precision





## MQO Scoring

MQO	A rated	B rated	Original weighting	Adjusted weighting
Completeness	$\geq 85\%$	75%-85%	25%	40%
Sensitivity	Ratio $\leq 1.00$	Ratio $> 1.00$ to $\leq 2.00$	25%	30%
Bias	$\pm 25\%$	$>25\%$ to $\leq 35\%$ $< -25\%$ to $\geq -35\%$	25%	20%
Precision	$\leq 15\%$	$> 15\%$ to $\leq 25\%$	25%	10%

- 1<sup>st</sup> Assessment: Total datasets evaluated = 2,827
  - A-Rated = 61%
  - B-Rated = 22%
  - Does Not Meet MQO = 17%



## Second Assessment Rationale

- Include naphthalene and benzo(a)pyrene
- Include data from new sites
  - Los Angeles, CA
  - Rubidoux, CA
  - Portland, OR
- Include data from original sites
  - San Jose, CA (began 1-in-6 day sampling in 2008)
  - Seattle, WA (data issues in 2005)
  - Rochester, NY for PM<sub>10</sub> metals (began sampling 2007)





## NATTS AQS Data Reporting Update

- NATTS Workplan requires AQS reporting 120 days after calendar quarter.
  - e.g. 2013 data to be in AQS by 4/30/2014
  - EPA pulled all NATTS data on 5/1/2014
- Although percent completeness increased, there were still issues:
  - Missing MQO datasets (e.g., entire 2013 VOCs)
  - Missing pollutant datasets (e.g., 2012 benzene)
  - Missing concentrations within a dataset (e.g., 2<sup>nd</sup> quarter acetaldehyde)





# NATTS AQS Data Reporting Update

- Evaluated:
  - Reporting of Alternative Method Detection Limits (MDLs)
  - Sample days vs. national calendar
  - Reported engineering units
  - Reporting of non-detects
    - report zero sample value, flag
  - Reporting of under-MDL data
  - Miscoding of data elements
  - Reporting of Analytical Precision data
    - required beginning 2011 Grant Cycle (beginning 7/1/2011)



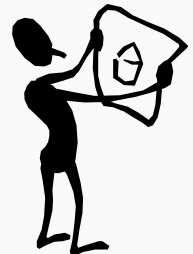
## NATTS AQS Data Reporting Update (cont.)

- Other Metrics Evaluated:
  - Use of data qualifiers and null data codes
  - Reporting of collocated/replicate/duplicate data
  - Reporting of other (non-NATTS MQO Core) HAPs
  - Reporting of non-HAPs
  - Reporting of criteria pollutants
  - Reporting of meteorological measurements
  - Identification of NATTS monitors within AQS



## 2<sup>nd</sup> Assessment Status

- Measurements database finalized
  - Incorporated missing data since 5/1/2014 data pull (from AQS and NATTS Operators)
- Assessed TSA Instrument Performance Audits (IPAs)
- Updated equipment inventory through 2013
- Conducted NATTS Site Operator surveys





## 2<sup>nd</sup> Assessment Status

- Calculated summary statistics
- Calculated pollutant dataset completeness (MQO 1)
- Assessed reported MDLs (MQO 2)
- Reviewed PT results (MQO 3)
- Calculated precision statistics (MQO 4)
- Applied MQO scoring routine



## 2<sup>nd</sup> Assessment Status

- 2<sup>nd</sup> Assessment: Total datasets evaluated = 4,258
  - A-Rated = 62%
  - B-Rated = 23%
  - Does Not Meet = 15%



- By Year:

Rating	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
A-rated	27%	44%	52%	60%	67%	62%	59%	67%	73%	66%	71%
B-rated	20%	29%	26%	16%	17%	22%	29%	21%	21%	27%	21%
Does Not Meet	53%	27%	22%	24%	16%	16%	12%	12%	6%	7%	8%

*A-rated and B-rated are considered suitable for trends analysis*



## 2<sup>nd</sup> Assessment Status

- Calculated 3-year block averages (316 site-polls)

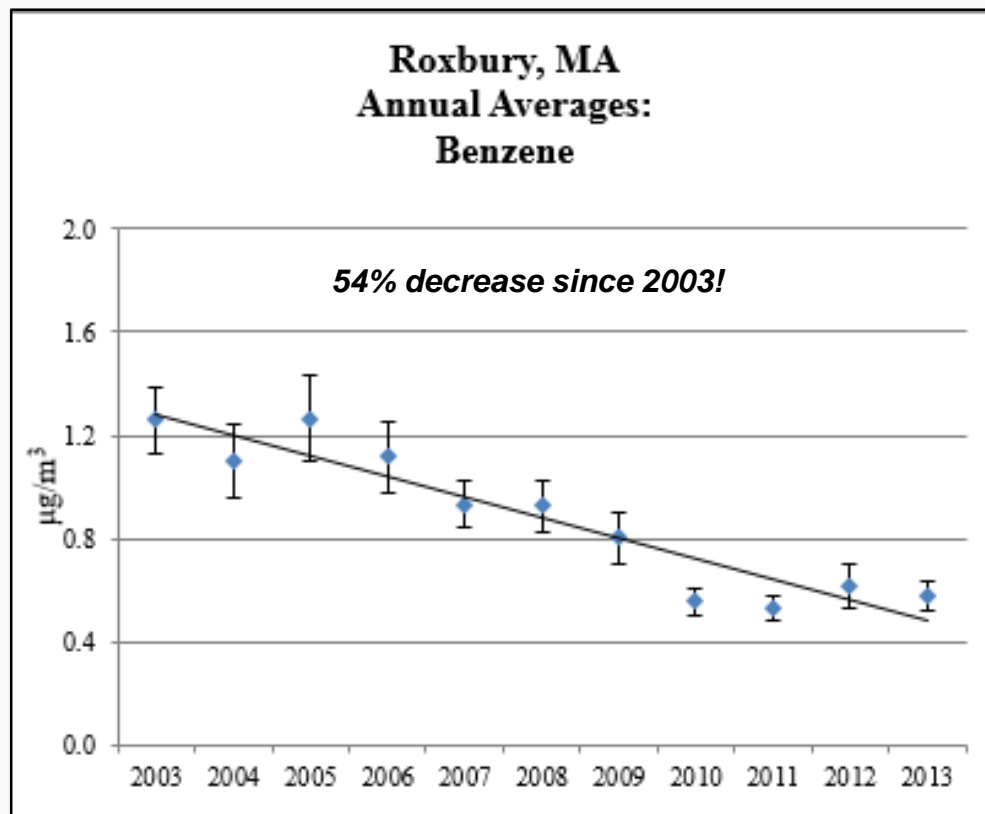
Pollutant	# Sites	
	1st	2nd
Acetaldehyde	13	19
Arsenic (PM10)	8	18
Benzene	14	17
Benzo(a)pyrene	NA	8
Beryllium (PM10)	12	20
Butadiene, 1,3-	12	16
Cadmium (PM10)	14	21
Carbon Tetrachloride	11	16
Chloroform	16	22

Pollutant	# Sites	
	1st	2nd
Chromium VI	12	17
Formaldehyde	12	19
Lead (PM10)	14	21
Manganese (PM10)	13	20
Naphthalene	NA	8
Nickel (PM10)	12	21
Tetrachloroethylene	14	16
Trichloroethylene	16	22
Vinyl Chloride	13	15



## 2<sup>nd</sup> Assessment Status

- Calculated Annual and 3-Year Rolling Averages







## Upcoming Activities (cont.)

- Update NATTS emission source maps/data
  - Include 2011 NEI and 2011-2013 TRI
- Update NATTS site windroses
- Prepare/finalize assessment report
- Prepare individual site reports





## Part 2 - Ambient Monitoring Archive



## Archive Overview

- **Primary** – Develop a centralized database of hazardous air pollutant (HAP) measurements. Although HAPs have been measured for 20+ years, they were not required in early monitoring programs to report to AQS.





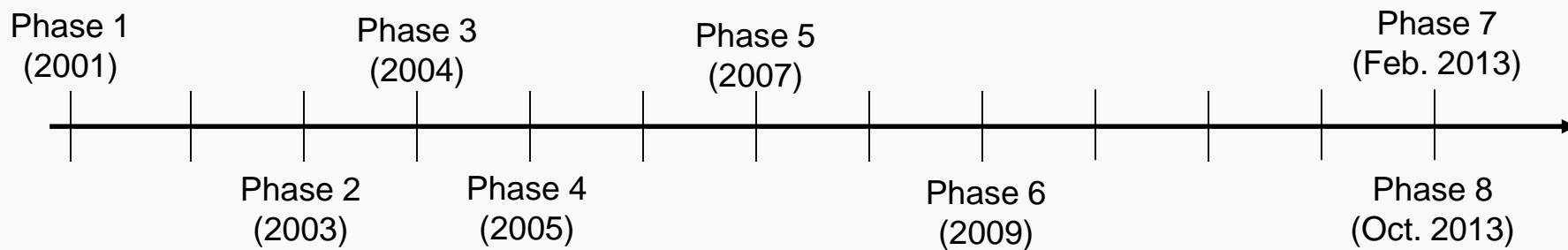
## Recent/Current Archive Applications

- NATA Background Concentrations
- NATA/CMAQ Model Evaluation
- EPA Office of Compliance targeting activities
- EPA Report On Environment
- EPA Trends Report
- EPA Report to Congress





# Archive Timeline (2001-2015)



- **Phase 9 (Jan. 2015)**
  - Brought AMA to 2013, includes data from:
    - AQS
    - NATTS Network Assessment
    - NADP, Xact, special studies
- **46 million HAP records**



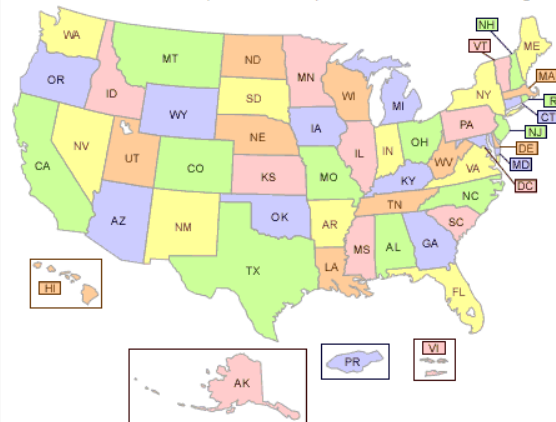


# Data Posted (By State)

EPA recently finalized Phase IX of the Ambient Monitoring Archive (AMA) for hazardous air pollutants (HAPs), also referred to as the Historical Archive. The archive covers measurements from as early as 1973 to 2013. The AMA for HAPs currently houses 46 million data records from over 2,600 monitoring sites. Approximately 84% of the measurements are from 2000 to 2013, as a result of air toxic programs, such as the 10-City Pilot Study, the NATTS Network, the PAMS Network, the IMPROVE Network, and the Urban Air Toxics Monitoring Program. Due to the size of the AMA for HAPs, the data have been split by state and year.

The AMA for HAPs data for each individual state are presented in zipped Microsoft Access databases. Simply click on the individual state in the map or the state name in the table below the map to obtain the data for that state.

Choose a state or territory from the map below or the list to the right.



<a href="#">Alabama</a> (zipped, 6.3 MB)	<a href="#">Alaska</a> (zipped, 2.1 MB)	<a href="#">Arizona</a> (zipped, 9.5 MB)	<a href="#">Arkansas</a> (zipped, 1.1 MB)
<a href="#">California</a> (zipped, 90.6 MB)	<a href="#">Colorado</a> (zipped, 8.8 MB)	<a href="#">Connecticut</a> (zipped, 28.2 MB)	<a href="#">Delaware</a> (zipped, 8.4 MB)

<http://www3.epa.gov/ttn/amtic/toxdat.html#data>



# Data Posted (By Year)

**Additionally, annual HAP data files** are presented in zipped Microsoft Access databases. Simply click on the year in the table below to obtain the data for that year. Warning, these files are large.

<a href="#">2013</a> (zipped, 97.5 MB)	<a href="#">2012</a> (zipped, 103.3 MB)	<a href="#">2011</a> (zipped, 109.2 MB)	<a href="#">2010</a> (zipped, 105.5 MB)	<a href="#">2009</a> (zipped, 100.2 MB)
<a href="#">2008</a> (zipped, 95.6 MB)	<a href="#">2007</a> (zipped, 98.7 MB)	<a href="#">2006</a> (zipped, 93.8 MB)	<a href="#">2005</a> (zipped, 94.0 MB)	<a href="#">2004</a> (zipped, 83.7 MB)
<a href="#">2003</a> (zipped, 73.6 MB)	<a href="#">2002</a> (zipped, 68.1 MB)	<a href="#">2001</a> (zipped, 66.3 MB)	<a href="#">2000</a> (zipped, 55.0 MB)	<a href="#">1999</a> (zipped, 50.2 MB)
<a href="#">1998</a> (zipped, 46.0 MB)	<a href="#">1997</a> (zipped, 40.3 MB)	<a href="#">1996</a> (zipped, 33.4 MB)	<a href="#">1995</a> (zipped, 27.8 MB)	<a href="#">1994</a> (zipped, 16.1 MB)
<a href="#">1993</a> (zipped, 5.8 MB)	<a href="#">1992</a> (zipped, 7.3 MB)	<a href="#">1991</a> (zipped, 6.1 MB)	<a href="#">1990</a> (zipped, 5.1 MB)	<a href="#">pre-1990</a> (zipped, 1.9 MB)

<http://www3.epa.gov/ttn/amtic/toxdat.html#data>



# Planned Phase 10 Updates (2015/16)

## Phase 10

- Bring AMA to 2014 (include AQS, NATTS Network Assessment, Special Studies, etc.)
  - Include all HAP data since 1990
- Populate missing Collection Frequency Code
- Prepare Local Conditions concentrations in  $\mu\text{g}/\text{m}^3$ 
  - Apply temperature and pressure data from AQS/NWS, where needed.







## Planned Phase 10 Updates (2015/16)

- QA/General Maintenance:
  - Identification of ½MDL records for Non-Detects
  - Conversion of negative concentrations to zero
  - Identification of invalidated datasets (e.g., acrolein <2005)
  - Identification of below MDL values
  - Extreme/unusually high measurements
  - Duplicate data (e.g., SC and LC reported for same sample)
  - Identify Monitoring Programs/Networks for the data records





# THANK YOU!

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