# EPA's Fourth NATTS Network Assessment

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# Acknowledgements


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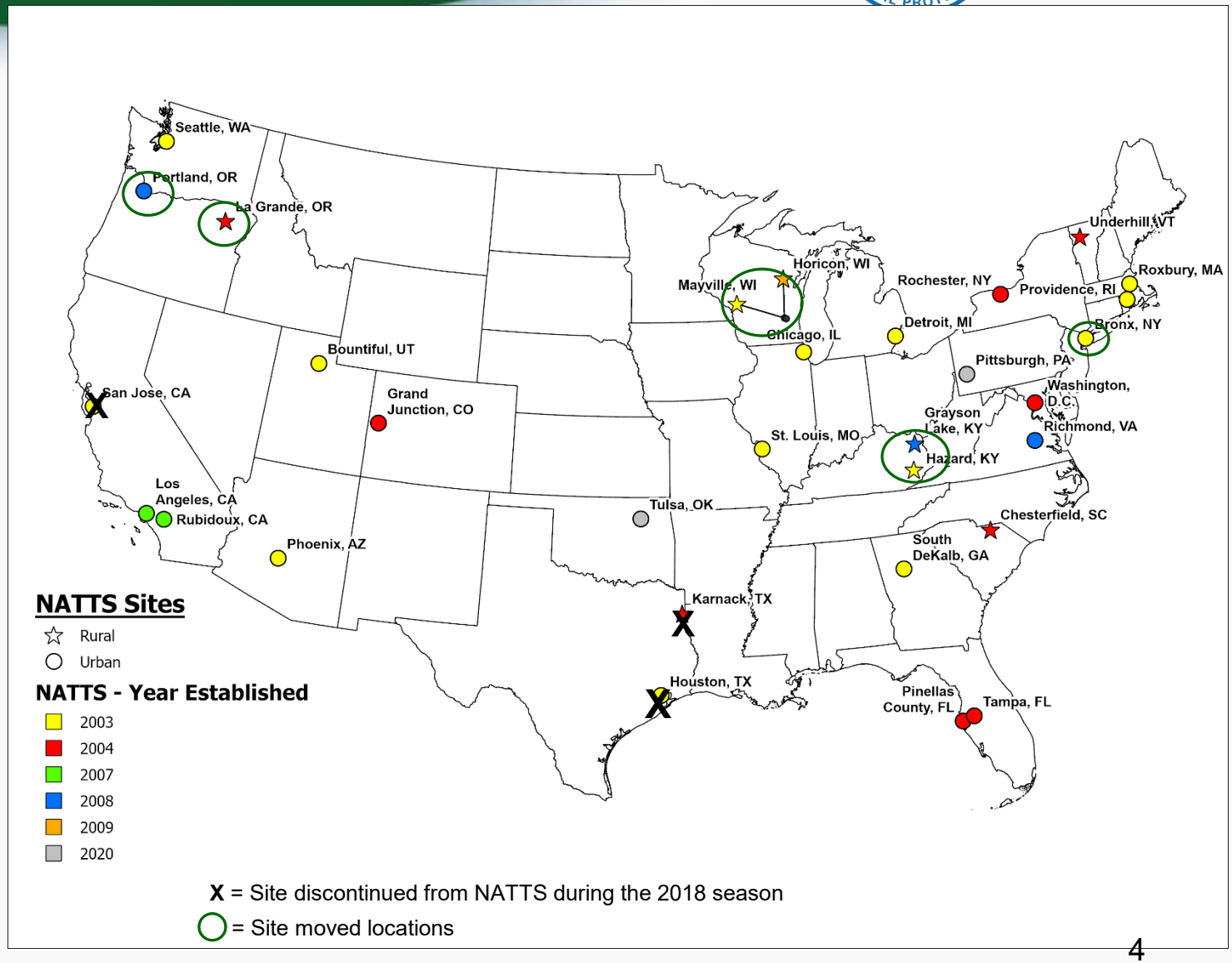
# Scope of the Assessment

- Goals…
  - *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 (through 2022)



# NATTS MQO Core HAPs

- Acetaldehyde
- Acrolein
- Benzene
- Benzo(a)Pyrene
- Beryllium (PM10)
- Butadiene, 1,3-
- Cadmium (PM10)
- Carbon Tetrachloride
- Chloroform
- Ethylene Oxide
- Formaldehyde
- Hexavalent Chromium
- Lead (PM10)
- Manganese (PM10)
- Naphthalene
- Nickel (PM10)
- Tetrachloroethylene
- Trichloroethylene
- Vinyl Chloride

Blue = Added in 2007
Red = Removed in 2014
Green = Added in 2020

# MQO Scoring

| MQO | A rated | B rated | Original weighting | Adjusted weighting |
|---|---|---|---|---|
| Completeness | ≥ 85% | 75%-85% | 25% | 40% |
| Sensitivity | MDL Ratio ≤ 1.00 | MDL Ratio > 1.00 to ≤ 2.00 | 25% | 30% |
| Bias (based on PTs) | ± 25% | >25% to ≤ 35%<br>< -25% to ≥ -35% | 25% | 20% |
| Precision | ≤15% | > 15% to ≤ 25% | 25% | 10% |

- Half the score is based on measurements; half the score is based on the supporting laboratory performance
- Not all MQOs are of equal weight and applied consistently each year

# MQO Scoring Scenarios

| For these available MQOs… | | | | …this is the *minimum* score for this rating. | | |
|---|---|---|---|---|---|---|
| MQO #1 Completeness (based on 1-in-6 day sampling) | MQO #2 Sensitivity (based on experimentally-determined MDLs) | MQO #3 Bias (based on PTs) | MQO #4 Precision (based on paired measurements ≥ MDL) | A-rated | B-rated | Does not meet MQO |
| ✓ | ✓ | ✓ | ✓ | 16 | 12 | <12 |
| ✓ | ✓ | ✓ | -- | 14.4 | 10.8 | <10.8 |
| ✓ | ✓ | -- | ✓ | 12.8 | 9.6 | <9.6 |
| ✓ | ✓ | -- | -- | 11.2 | 8.4 | <8.4 |
| ✓ | -- | -- | -- | Not scored because the pollutant dataset could not possibly reach the minimum score for B-rated data | | |
| -- | ✓ | -- | -- | | | |
| -- | -- | ✓ | -- | | | |
| -- | -- | -- | ✓ | | | |

"--" = MQO was not available for scoring

# 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

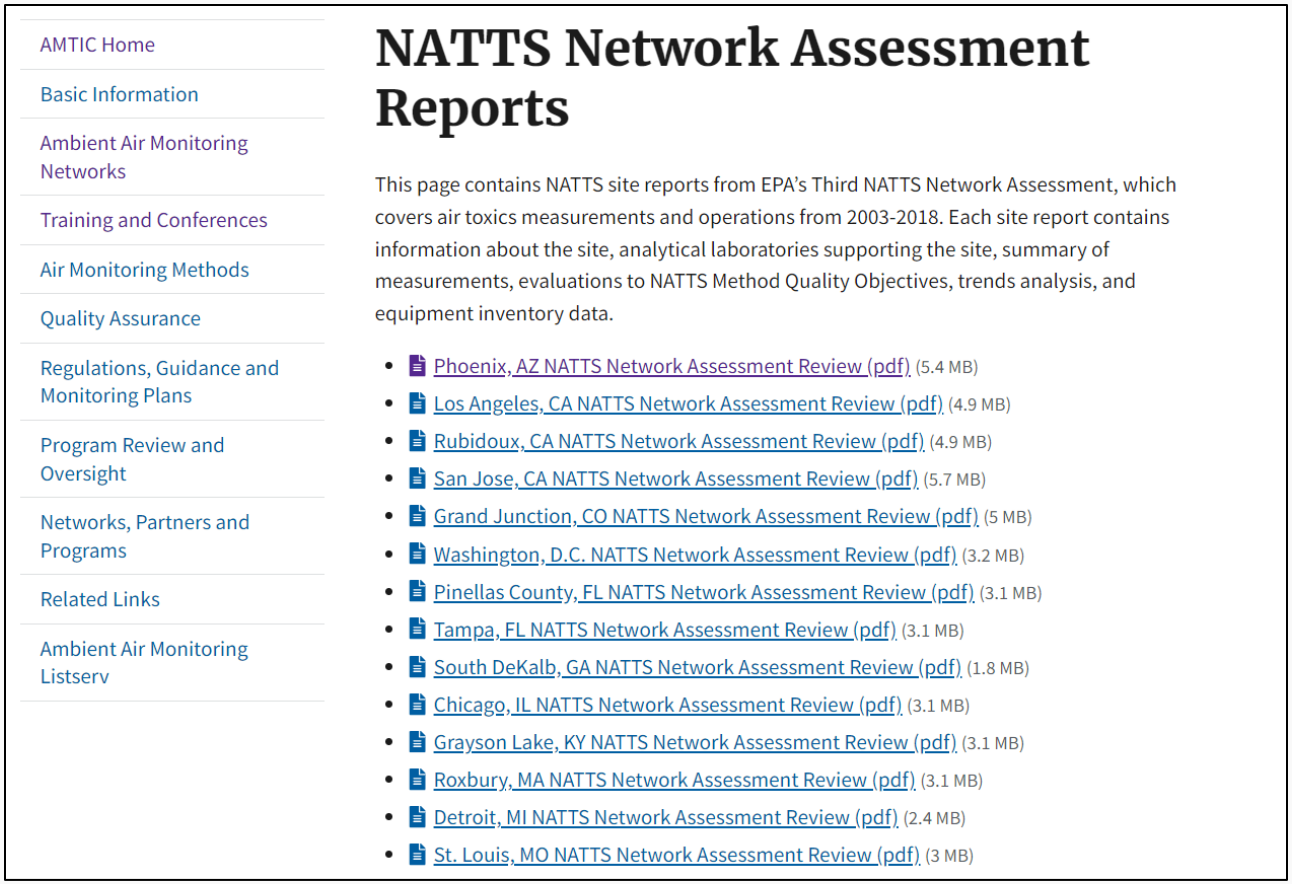
# Second Assessment Updates

- Data from 2003-2014
- Include naphthalene and benzo(a)pyrene
- Include data from new sites
  - Los Angeles, CA
  - Rubidoux, CA
  - Portland, OR
  - Richmond, VA
- 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 $PM_{10}$ metals (began sampling 2007)

# Third Assessment Updates

- Data from 2003-2018
- Include benzo(a)pyrene and naphthalene for all sites; end data review for hexavalent chromium
- Include data from new sites
  - Los Angeles, CA
  - Rubidoux, CA
  - Portland, OR
  - Richmond, VA
- Evaluated the Precision MQO to include analytical precision from laboratory replicates

# Third Assessment – Site Reports



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## NATTS Network Assessment Reports

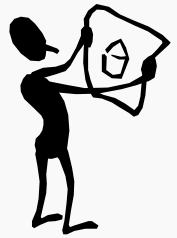
This page contains NATTS site reports from EPA's Third NATTS Network Assessment, which covers air toxics measurements and operations from 2003-2018. Each site report contains information about the site, analytical laboratories supporting the site, summary of measurements, evaluations to NATTS Method Quality Objectives, trends analysis, and equipment inventory data.

- Phoenix, AZ NATTS Network Assessment Review (pdf) (5.4 MB)
- Los Angeles, CA NATTS Network Assessment Review (pdf) (4.9 MB)
- Rubidoux, CA NATTS Network Assessment Review (pdf) (4.9 MB)
- San Jose, CA NATTS Network Assessment Review (pdf) (5.7 MB)
- Grand Junction, CO NATTS Network Assessment Review (pdf) (5 MB)
- Washington, D.C. NATTS Network Assessment Review (pdf) (3.2 MB)
- Pinellas County, FL NATTS Network Assessment Review (pdf) (3.1 MB)
- Tampa, FL NATTS Network Assessment Review (pdf) (3.1 MB)
- South DeKalb, GA NATTS Network Assessment Review (pdf) (1.8 MB)
- Chicago, IL NATTS Network Assessment Review (pdf) (3.1 MB)
- Grayson Lake, KY NATTS Network Assessment Review (pdf) (3.1 MB)
- Roxbury, MA NATTS Network Assessment Review (pdf) (3.1 MB)
- Detroit, MI NATTS Network Assessment Review (pdf) (2.4 MB)
- St. Louis, MO NATTS Network Assessment Review (pdf) (3 MB)

https://www.epa.gov/amtic/natts-network-assessment-reports

# 3rd Assessment Results (2003-2018)

- 3rd Assessment: Total datasets evaluated = 6,609
  - A-Rated = 60%
  - B-Rated = 27%
  - Does Not Meet = 13%



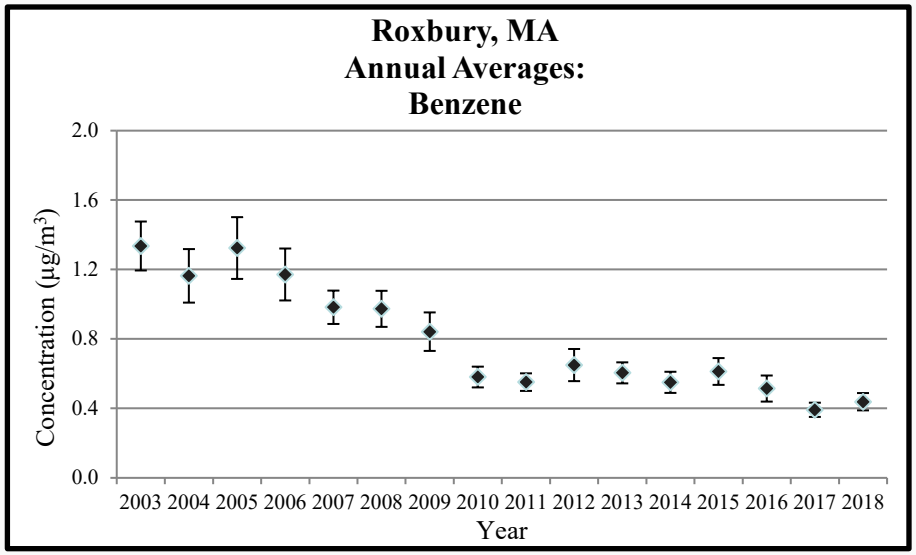
- By Type:

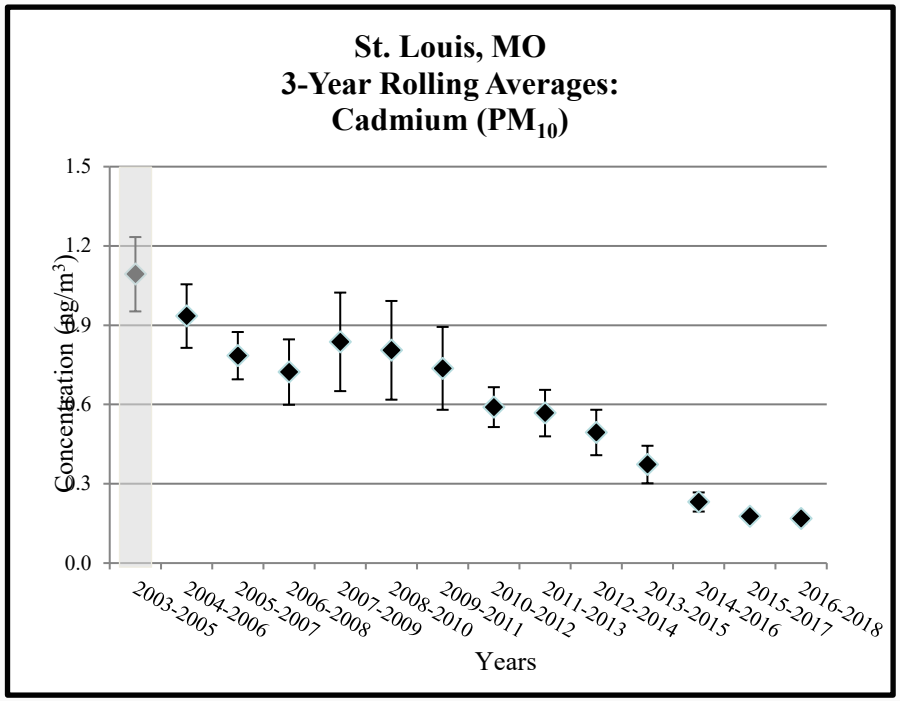
| Rating | VOCs | Carbonyls | PM10 Metals | Chromium VI | PAHs |
|---|---|---|---|---|---|
| A-rated | 53% | 67% | 61% | 74% | 74% |
| B-rated | 27% | 25% | 30% | 13% | 22% |
| Does Not Meet | 20% | 8% | 9% | 13% | 3% |

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

# Example 3rd Assessment Products

- Calculated Annual and 3-Year Rolling Averages



# 3rd Assessment Block Averages (2013-2015 vs. 2016-2018)

| Pollutant | % Difference | # Sites |
|---|---|---|
| Acetaldehyde | -7.7% | 19 |
| Arsenic (PM10) | -3.2% | 21 |
| Benzene | -10.2% | 19 |
| Benzo(a)pyrene | -23.2% | 21 |
| Beryllium (PM10) | -26.4% | 20 |
| Butadiene, 1,3- | -10.9% | 19 |
| Cadmium (PM10) | -43.0% | 21 |
| Carbon Tetrachloride | -4.7% | 15 |
| Chloroform | -0.4% | 20 |

| Pollutant | % Difference | # Sites |
|---|---|---|
| Chromium VI | -7.7% | 18 |
| Formaldehyde | -3.3% | 19 |
| Lead (PM10) | -8.9% | 21 |
| Manganese (PM10) | -1.6% | 20 |
| Naphthalene | -23.4% | 20 |
| Nickel (PM10) | -18.0% | 19 |
| Tetrachloroethylene | +17.2% | 19 |
| Trichloroethylene | +10.7% | 19 |
| Vinyl Chloride | -5.5% | 17 |

Highlighted values indicate greater than 15% reduction

# Fourth Assessment Updates

- Data from 2003-2022
- Include data from new sites
  - Pittsburgh, PA
  - Tulsa, OK
- Document sites ending since Third Assessment
  - Ended during 2018
    - San Jose, CA
    - Houston, TX
    - Karnack, TX
  - Horicon, WI ended at the end of 2022

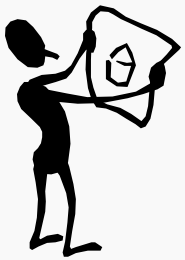
# NATTS AQS Data Reporting

- NATTS Workplan requires AQS reporting 180 days after calendar quarter.
  - e.g. 2022 data to be in AQS by 6/30/2023
  - EPA pulled all NATTS data on 11/1/2023

- Although data completeness increased, there were still issues:
  - Missing MQO datasets (e.g., entire 2019 PAHs)
  - Missing MDLs datasets (e.g., 2020 PM10 Metals)
  - Missing concentrations within a dataset (e.g., 2021 collocate data)

# 4th Assessment Status

- Measurements database finalized
  - Incorporated missing data since 11/1/2023 data pull (from AQS and NATTS Operators)
  - Subsequent data pulls throughout Q1 and Q2 of 2024
- Conducted NATTS Site Operator calls in Q1 and Q2 of 2024
- Updated equipment inventory through 2022



# 4th Assessment Status

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

# 4th Assessment Upcoming Activities

- Prepare draft individual site reports
- Follow-up meetings with sites
- Publish final site reports to EPA AMTIC
- Follow-up on identified action items

# THANK YOU!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