

# Air Toxics Ambient Monitoring

Air Toxics Data Analysis Workshop

October 2-4, 2007

Chicago IL

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# Agenda

- Program Background / Overview
- Funding
- NATTS
- Community-Scale Projects
- Methods
- Conclusions

# Basis and Background

- Air Toxics (a.k.a. Hazardous Air Pollutants or HAPs)
- Pollutants that are known or suspected to cause cancer or other serious health effects
- Principle pathway for most HAPs is inhalation
  - ✓ Deposition not a focus of NATTS / Community-Scale program
- Occurrence
  - ✓ Localized high concentrations / source oriented
  - ✓ High concentration locales – often heavily industrialized areas
  - ✓ HAP ambient concentrations of concern based on health risks
- Analysis of ambient air monitoring data can be an effective means of assessing:
  - ✓ Air quality and associated potential health risks
  - ✓ Trends and regulatory program effectiveness

# National Air Toxics Ambient Monitoring

## **NATTS:** National Air Toxics Trends Stations

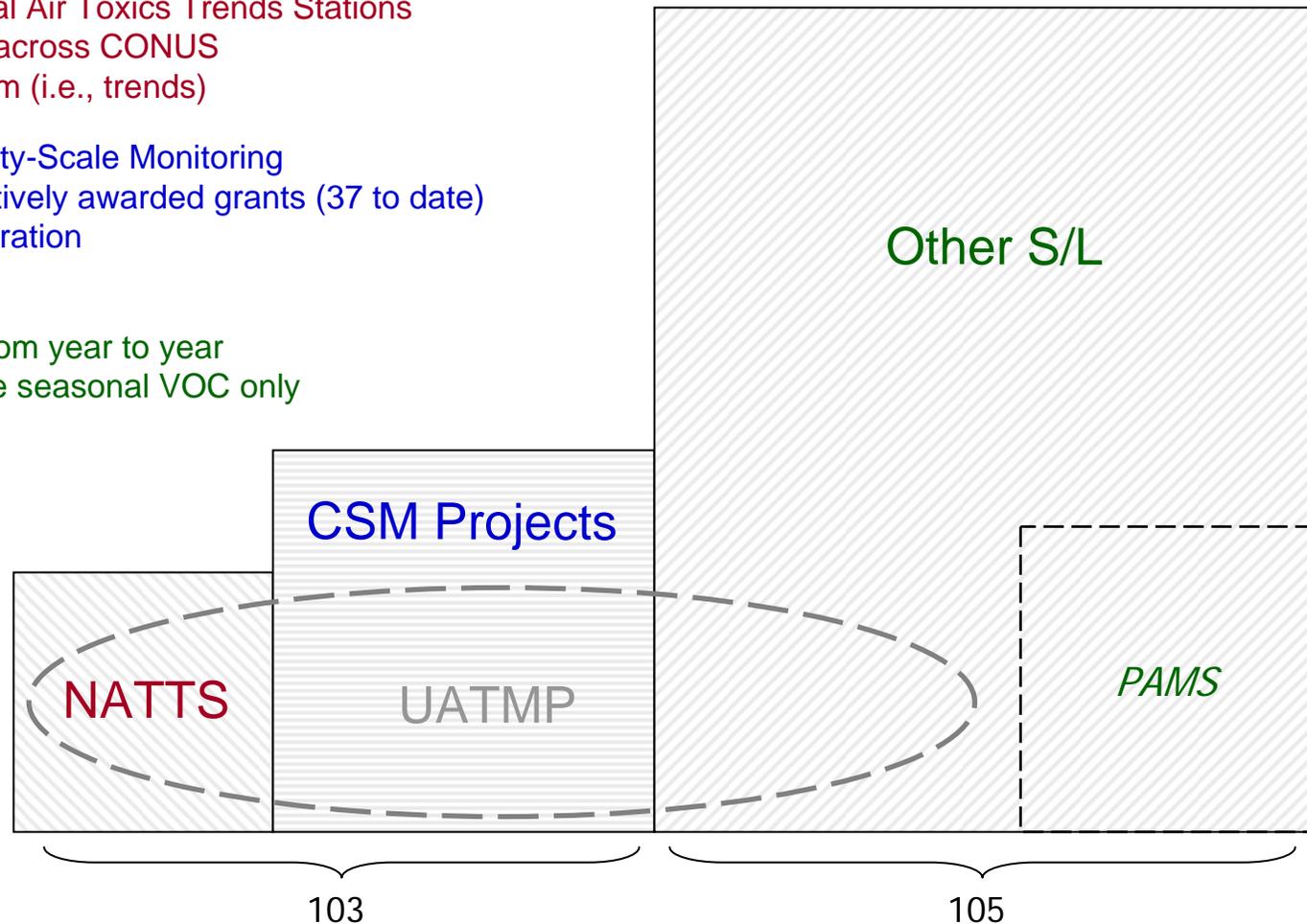
- 25 sites across CONUS
- Long-term (i.e., trends)

## **CSM:** Community-Scale Monitoring

- Competitively awarded grants (37 to date)
- ~ 2 yr duration

## **Other S/L:**

- Varies from year to year
- Many are seasonal VOC only

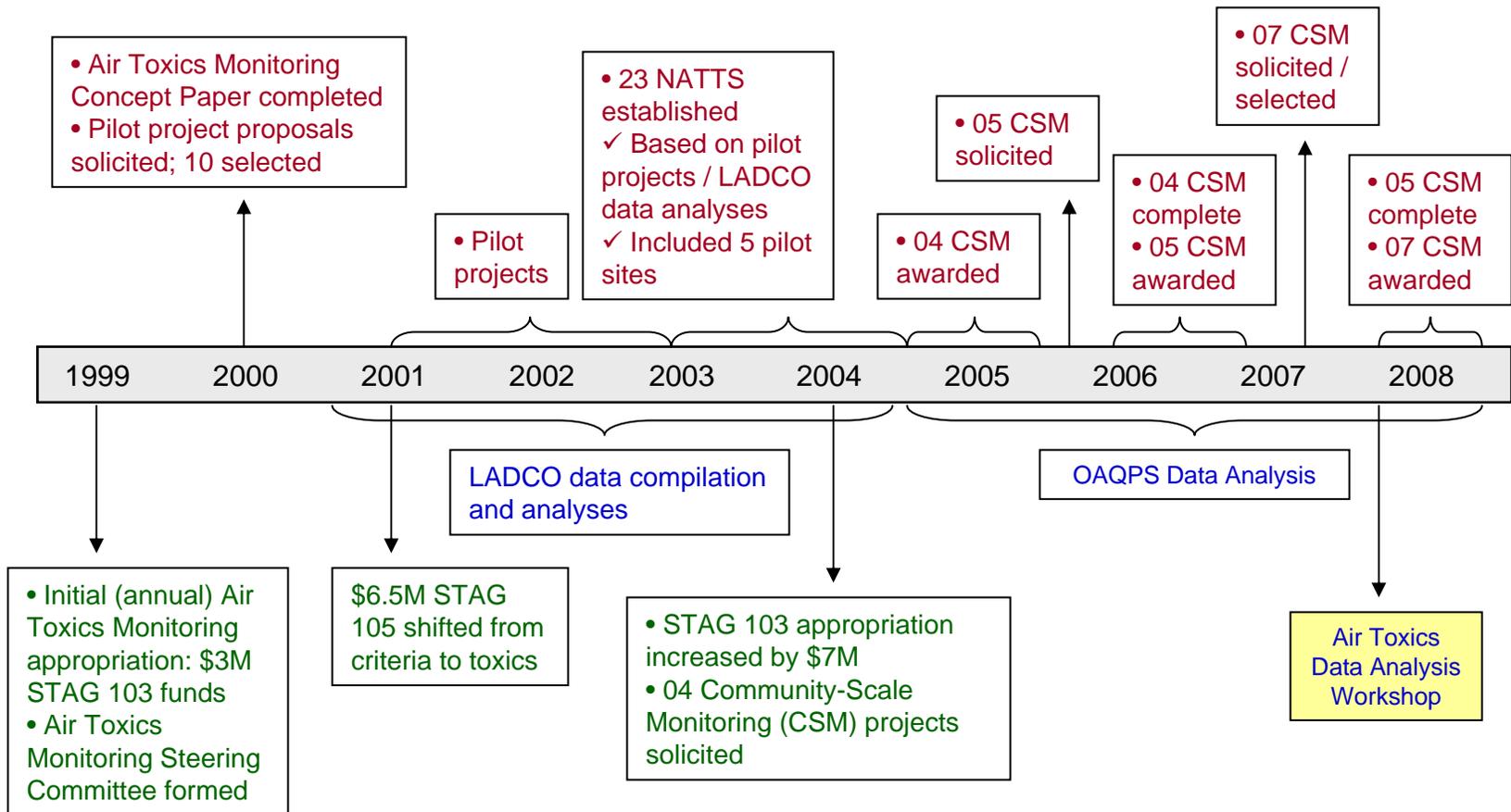


**UATMP:** Urban Air Toxics Monitoring Program

- Nat'l contract for sampling support / lab analysis

# Air Toxics Monitoring Timeline

Legend:  
 Monitoring  
 Data Analysis  
 Funding



# Funding History

## ➤ STAG Section 103

- ✓ \$3M / year beginning FY 99; increased to ~\$10M / year beginning FY 04

- FY 04 President's Budget requested an additional \$7 million in STAG in response to the OMB finding that the air toxics program lacked sufficient monitoring data

- Congress provided the additional funds; community-scale air toxics ambient monitoring studies initiated across U.S. in 2005

- ✓ Funds reallocated to different media program in FY 07; anticipate ~\$10M in FY 08

## ➤ STAG Section 105: \$6.5M / year beginning in FY 01

# FY07 Funding Adjustments

- Funding Scenario
  - ✓ FY07 Air Toxics STAG 103 redirected (unavailable)
  - ✓ Available: ~\$6M+ (recertified from FY06)
- Revised approach to NATTS grants
  - ✓ One-time project period reduction (12 to 6 months)
  - ✓ For CY08, Jan 1 – Jun 30 (vice Jan 1-Dec 31)
    - Net Effect
      - Restore a portion of '07 Community-Scale funding
      - Decrease NATTS funding lag
- Revised Community-Scale (recent competition)
  - ✓ Anticipated Funding: ~\$8.05M
    - FY07 E1C: \$3.49M and FY08: \$4.56M
  - ✓ Awards: upon funds availability (Nov '07 – Feb '08)

# FY08 and Beyond

## ➤ FY08

### ✓ NATTS

○ Operations and Maintenance	\$4.48M
○ Quality Assurance	\$ .33M
○ Methods / Instrumentation	\$ .18M
○ Data Analysis	<u>\$ .30M</u>
	\$5.29M

### ✓ Community-Scale

○ 2007 Competition	\$4.56M (~\$8.05M total)
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## ➤ FY09 - FY11

✓ Approximate same distribution as FY08

✓ FY11: assess CY05–CY10 NATTS data for trends

# National Air Toxics Trends Stations (NATTS)

- Initial network: 23 sites (15 urban, 7 rural)
  - ✓ 12 sites established in 2003
  - ✓ 11 more sites established in 2004
  - ✓ Limited data for 2003/04; first full year 2005
- Principle Objective: trends and accountability
- Scale: urban (5 km) and greater
- Leveraging: all collocated with PM<sub>2.5</sub> speciation samplers, some also with PAMS
- Sampling and analysis: VOCs, carbonyls, PM<sub>10</sub> HAP metals, TSP hexavalent chromium
  - ✓ Select sites now also monitoring for PAHs
- All sites follow prescribed QA program

# NATTS Expansion

- Increase number of sites
  - ✓ Two sites were added in 2007 (Los Angeles and Rubidoux)
  - ✓ Three or four will be added in 2008
    - Further expansion not anticipated
  - ✓ Key selection factors include
    - High HAP-related risk (NATA) – especially with regard to stationary source component
    - Substantial population (number and density)
    - “Geography”
    - NCore collocation
  - ✓ Two likely sites: Pittsburgh PA and Portland OR

# NATTS Expansion (cont.)

- Add PAHs at all sites
  - ✓ Full implementation by July 1, 2008
  - ✓ PAH monitoring “pilot” at the following:
    - Chesterfield SC and Houston TX
      - Sampling and analysis by operating agency
    - Atlanta GA
      - Collocated sampling and analysis by operating agency
      - 10% of collocate samples analyzed by national contract lab (results to date quite comparable)
    - Phoenix AZ, Los Angeles and Rubidoux CA
      - National contract lab only
      - Collocated at Rubidoux
        - ❖ Aug – Dec, 1 in 6; 10% thereafter

# NATTS Costs

- Typical analytical costs per site per year (*includes PAH*)
  - ✓ Does not include sampling equipment or site operations and maintenance

HAP Category and Method	Cost Per Sample	Number of Samples	Total Cost
VOC Sample Analysis Using TO-15	391	66	25,806
Carbonyl Sample Analysis Using TO-11A	139	78	10,842
Category V (Metals by ICP/MS)	247	72	17,784
Hexavalent Cr Sampling and Analysis	184	78	14,352
PAH / SVOC Using TO-13A	507	72	36,504
			105,288

- 104 target HAPs in 5 categories
  - ✓ Disparate sampling and analysis equipment and methods associated with each pollutant category at each site

# NATTS Sites and Pollutants

## Sites

Roxbury MA	Houston TX
Providence RI	Bronx NY
Washington DC	Hazard KY
Dearborn MI	St. Louis MO
San Jose CA	Bountiful UT
Seattle WA	Los Angeles CA
Underhill VT	Rubidoux CA
Rochester NY	
Chesterfield SC	
Chicago (Northbrook) IL	
Mayville WI	
Harrison County TX	
Grand Junction CO	
Phoenix AZ	
La Grande OR	
Tampa FL (1) – Hillsborough Co.	
Tampa FL (2) – Pinellas Co.	
Atlanta (Decatur) GA	

*Added Jan 2007*

## Pollutants (*Minimum Requirements*)

VOCs by TO-15 (analysis by GC/MS SIM)

Acrolein	Perchloroethylene
Benzene	Carbon Tetrachloride
Chloroform	Trichloroethylene
1,3-butadiene	1,2-dichloropropane
Vinyl Chloride	Dichloromethane

Carbonyls by TO-11A

Formaldehyde	Acetaldehyde
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PM10 Metals by IO 3.5

- Nickel compounds
- Arsenic compounds
- Cadmium compounds
- Manganese compounds
- Beryllium compounds
- Lead compounds

TSP Metal by modified CARB Method 039

Hexavalent Chromium

*SVOCs / PAHs by TO-13A*

*Benzo(a)pyrene*

*Naphthalene*

*21 required of 104 target HAPs*

# Community-Scale Air Toxics Ambient Monitoring

- Middle and Neighborhood scale (.5km to 4 km) air quality issues, where not addressed by NATTS network
- Competitively awarded grants / cooperative agreements
  - ✓ Grant competition centrally managed (Program Office)
  - ✓ Awards and post-award oversight by Regional Offices
- FY2004 – \$6.2 Million
  - ✓ 17 projects awarded from 49 proposals
  - ✓ Project completion dates from latter 2006 through 2007
- FY2005 – \$6.5 Million
  - ✓ 19 projects awarded from 56 proposals
  - ✓ Project completions anticipated 2008

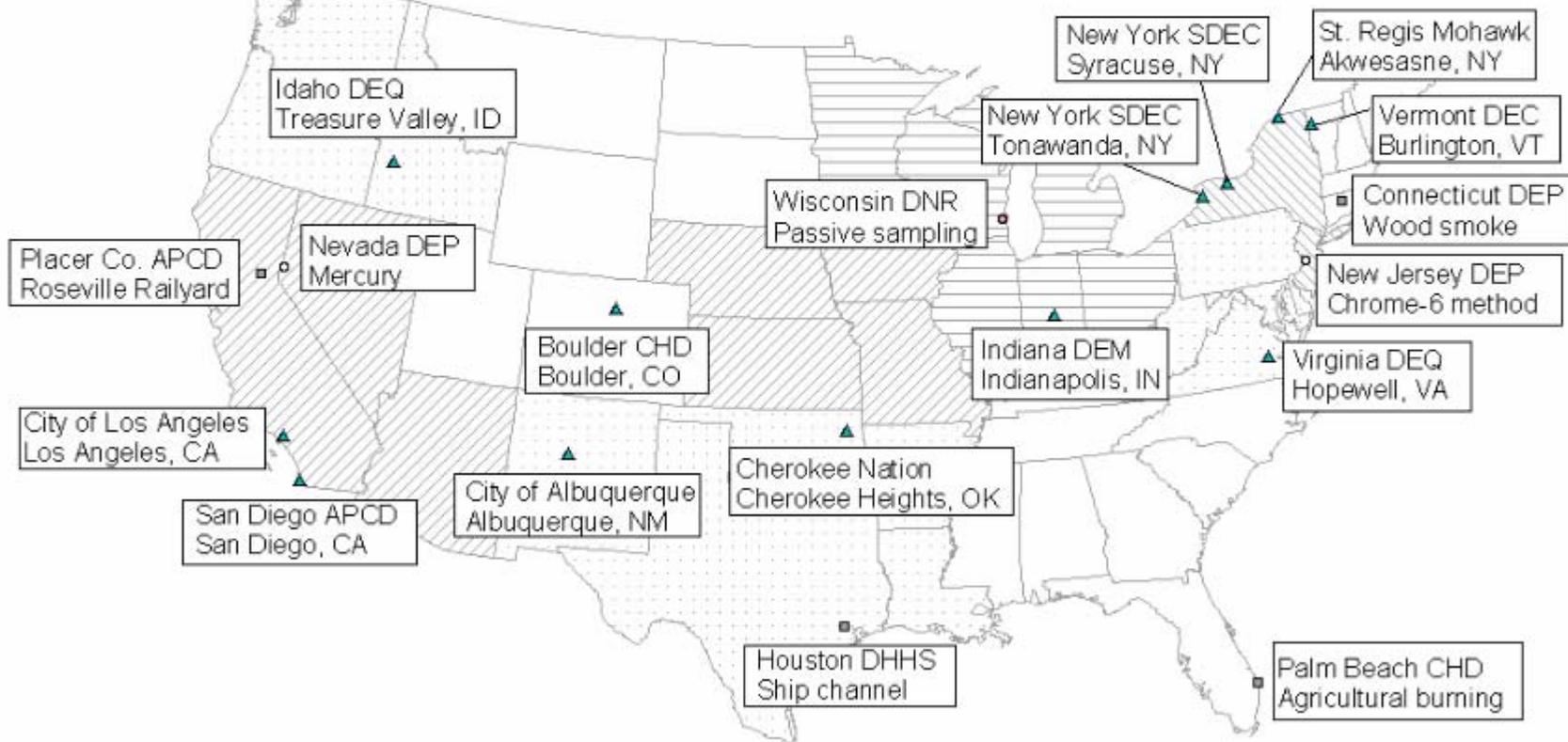
# Community-Scale Air Toxics Ambient Monitoring (cont.)

- FY2006 / 2007 / 2008 (combined) ~ \$8.05 Million
  - ✓ Three bins / categories
    - Community-scale assessments
    - Methods Development / Evaluation
    - Analysis of Existing Data
  - ✓ 23 of 60 projects recommended for award
    - Details embargoed (Congressional notification)
  - ✓ Awards anticipated late 2007 / early 2008
  - ✓ Project completions anticipated during 2010

# Local-scale monitoring projects FY 05

## Project sites

- Source identification and characterization
- Methods development
- Method evaluation and comparison
- ▲ Community-scale monitoring



# NATTS Method Focus Group

- Group comprised of NATTS laboratory contacts, consultants, and EPA Region / Program Offices
  - ✓ Goal is to resolve NATTS method inadequacies and inconsistencies
  - ✓ Desired “bonus” result includes transfer to non-NATTS
- Several issues have been raised for discussion
  - ✓ Group will focus on one issue at a time
    - Issue priority not yet fully established
  - ✓ Each issue will have a lead
    - Issue lead will be responsible for preparing brief issue “statement” to frame issue for discussion
- Agreements or resolutions will be documented and incorporated into the NATTS TAD

# NATTS Method Issues Identified

Issues raised thus far include:

- Calibration standard consistency
  - ✓ *First (and current) issue*
- Method Detection Limits (MDLs):
  - ✓ Inconsistencies in determination
  - ✓ Acceptable levels and data reporting / flagging
- HAP priority pollutants and associated MQOs / DQOs
- Acrolein and VOCs by Method TO-15A
  - ✓ Inconsistencies in sampling and analysis approaches (and PT results) remain
- Polycyclic Aromatic Hydrocarbons (PAHs) by TO-13A / ASTM D6209

# NATTS Method Issues (cont'd)

- Chrome VI sampling and analysis
  - ✓ Sample stability issues remain
- PT sample preparation
- Higher molecular weight aldehydes by TO-11A
  - ✓ Some interest in discussing feasibility
- Persistent analytical method background issues (e.g., methyl ethyl ketone - MEK)
  - ✓ Labs with concerns about having these issues and how to remove background laboratory contaminants

# NATTS Guidance Documentation

## ➤ Workplan Template

- ✓ Intended to promote sampling, analysis, and data reporting consistency across NATTS
- ✓ Revised version will be developed and distributed coincident with FY08 funds distribution

## ➤ Technical Assistance Document (TAD)

- ✓ Same intent as workplan, but much greater detail / descriptive technical content
- ✓ Section 5 (Data Management) recently revised
- ✓ Balance of TAD revisions to begin soon and will reflect Method Focus Group output

# Conclusions

## ➤ Successes

- ✓ Great strides made over past several years
  - Increasingly consistent application of sampling and analysis methodologies
  - Steadily improving QA and data reporting results
  - Data analysis efforts beginning to evaluate and quantify trends, assess program effectiveness, and identify areas and pollutants of concern / priority
  - Ambient data used to develop CMAQ boundary conditions
- ✓ Local-scale monitoring projects beginning to yield results
  - First round of projects concluded; project results being assessed by appropriate Agency staff
  - Quality projects underway; new projects also promising

# Conclusions

## ➤ Next Few Years

- ✓ Continue to strive for consistency!
- ✓ Continue LSM project grant competitions
- ✓ Assess LSM project results as they become available; look for commonalities, differences, and implications thereof
- ✓ NATTS trends work (2011) and continuation of data analysis efforts

## ➤ Key Program Office Contacts

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