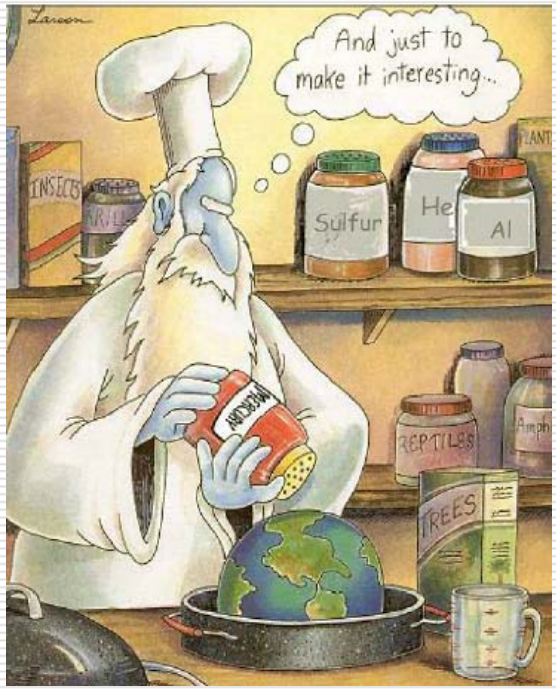
AIR TOXICS PANEL DISCUSSION



Emission Inventory Conference
Baltimore, MD
April 16, 2009

Panel Participants

- Frank Behan, EPA Office of Resource Conservation and Recovery
- Andrew Hass, EPA Region 3
- Ted Palma, EPA OAQPS Sector-Based Assessment Group
- Anne Pope, EPA OAQPS Program Design Group

Air Toxics History – Part 1

PHS Air Pollution Control Act

1st CAA

65 CAAA

67 CAAA

70 CAAA EPA

77 CAAA

90 CAAA

1955 — **Research Tech. Assistance for Air Pollution Control**

1963 — **Prevention & Abatement of Air Pollution**

1965 — **Mobile Sources**

1967 — **SIPS**

1970 — **Air Quality for CAPS & HAPS**

1977 — **PSD Mobile Sources**

1989

1990

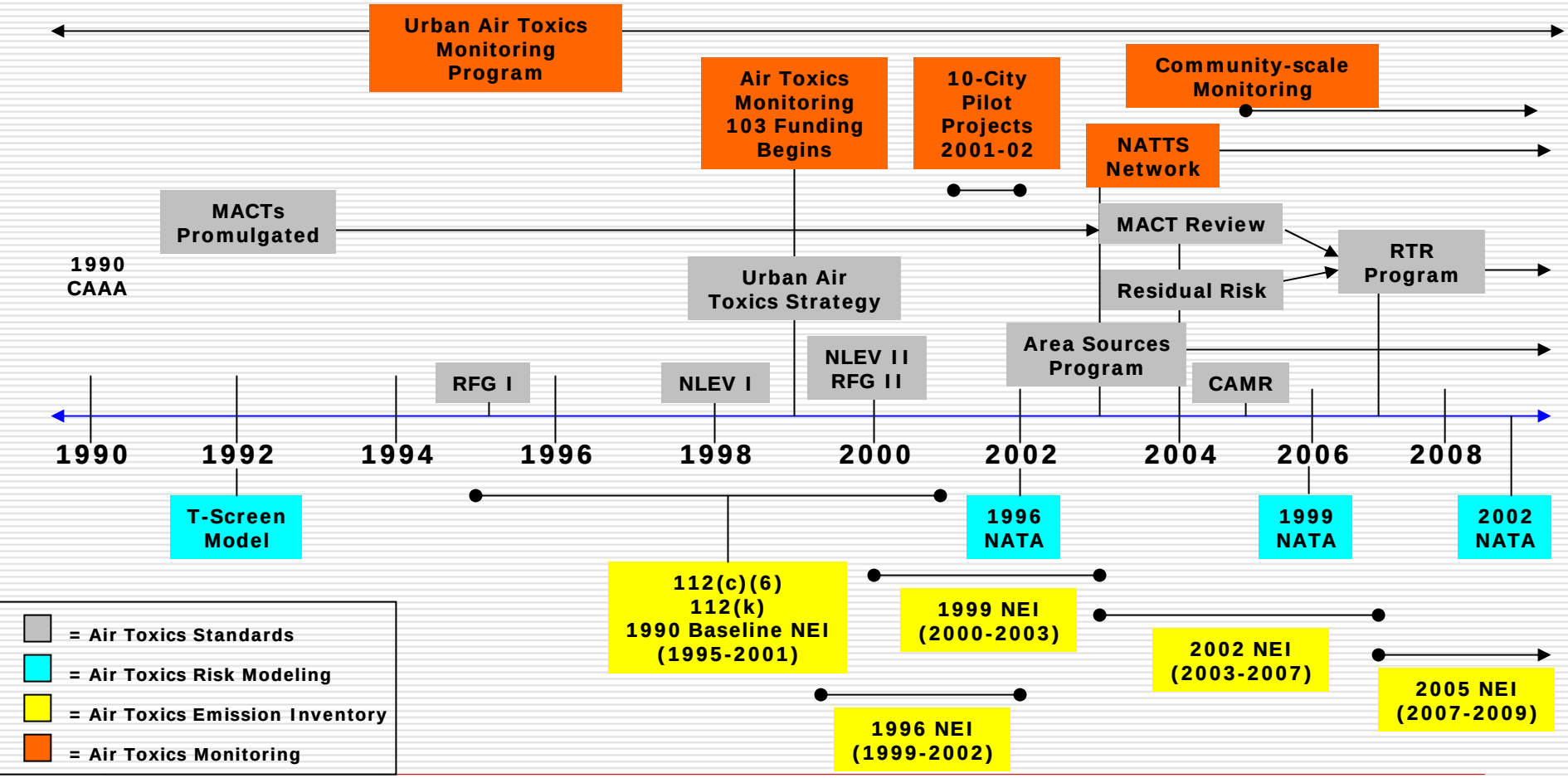
FUTURE

6 NESHAPS
(1977 thru 1989)

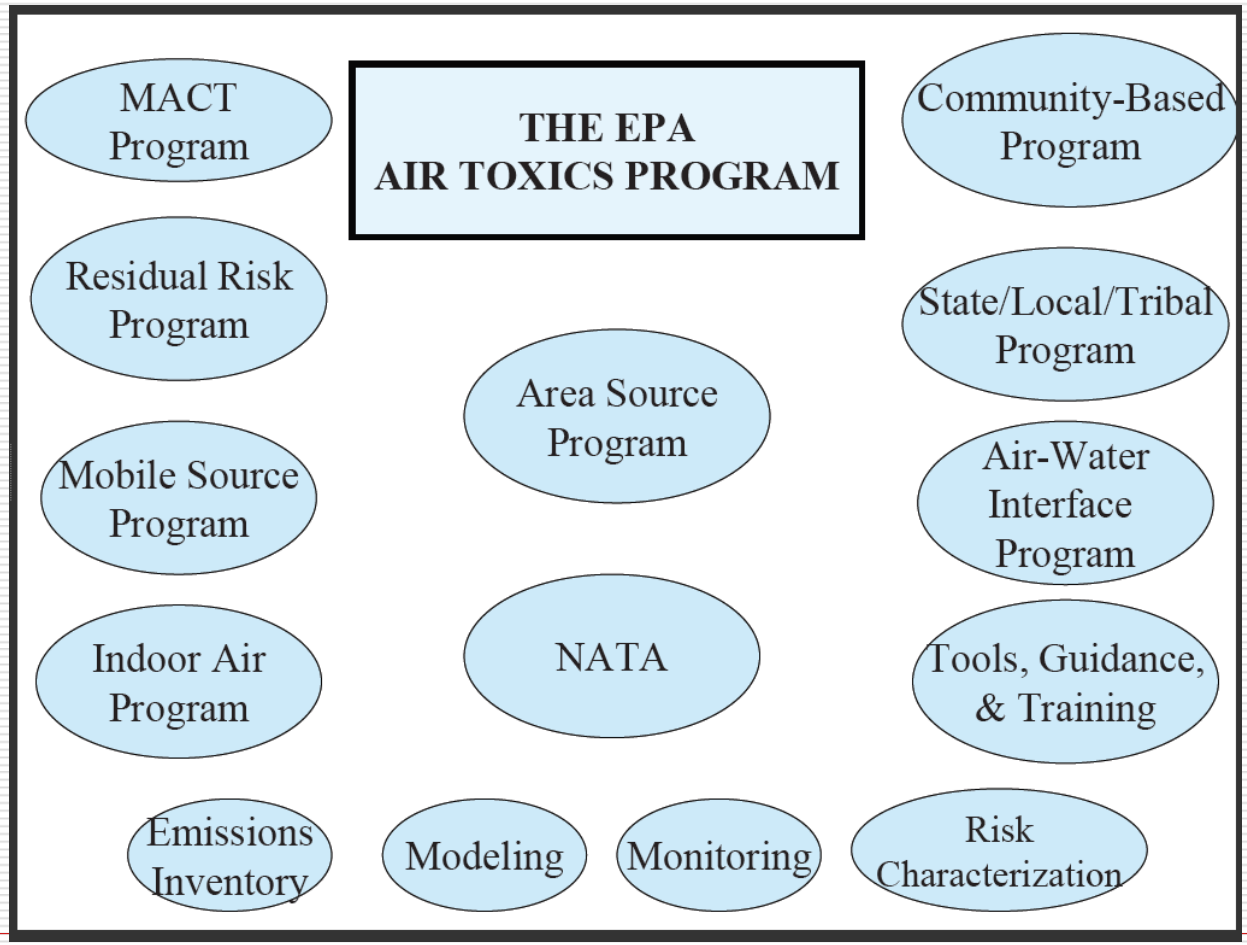
Benzene NESHAP
10-6 as Ample
Margin of Safety

HAPS:
202–Mobile Air Toxics
129–Combustion – Sources
112b–List 189 HAPS
112d–MACT
112f– Residual Risk
112c6–7 PBTS
112c3/112k–Urban Area Source
112m–Great Waters
112n–Special Studies, Hg

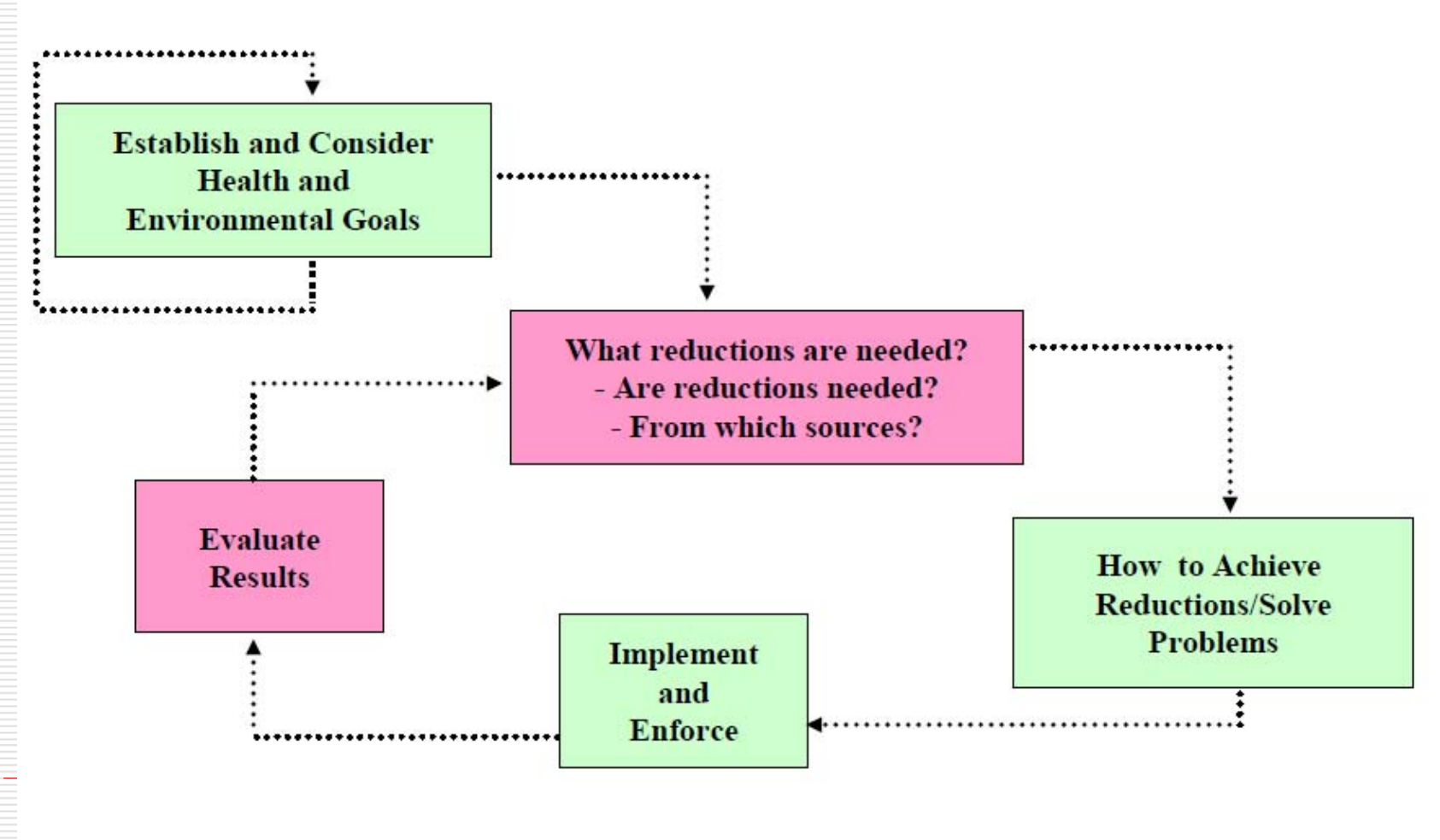
Air Toxics History – Part 2



Air Toxics Program



Air Toxics Management Model



National Emissions Inventory (NEI) Overview

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What Is an Air Pollutant Emission Inventory?

Inventory - comprehensive listing by sources of air pollutant emissions in a geographic area during a specific time period

Aircraft Locomotives
Marine Vessels

NonPoint
Sources

Mobile NonRoad
Sources

Point Sources

Mobile OnRoad
Sources

Why is the NEI for HAPs Important?

The NEI for HAPs is used to meet several specific needs, including:

- Key input to regional/national modeling by EPA, RPO's, S/L/T's, etc.
- Used for regulatory development , e,g, RTR
- Used in modeling to show 75% cancer incidence of stationary sources as required in CAAA 112k/112c3
- Basis for National Air Toxics Assessment (NATA) analyses
- Identification of Lead monitoring sites for lead NAAQS
- Identification of schools to monitor for air toxics
- Mercury modeling/trends
- Sector development
- Multi-pollutant assessments
- Trends and GPRA tracking
- Public information (esp. important with expanded use of web)
- International Reporting

NEI Characteristics

CHARACTERISTICS	NEI
Pollutant Coverage	☐CAPs: VOC, NOx, CO, NH3, PM10, PM2.5, SO2, Pb ☐HAPs: CAA list of HAPs and individual compounds for compounds groups (> 400 individual compounds), Pb and compounds
Geographic Coverage	50 states, DC, Tribes, Territories
Source Category Coverage	☐Facility (major and area sources) - data at individual process level with stack and fugitive releases ☐Nonpoint stationary emissions– county level ☐Offshore Platforms (facility) - point data at individual process level individual stack and fugitive releases ☐Fires – wildfires/prescribed burns (event) – individual points with daily data; lat/long ☐Mobile Onroad– county level ☐Mobile Nonroad – county level ☐Mobile Airport (facility) (point) data at individual process level with fugitive releases for each runway ☐Mobile Commercial Marine Vessels - Currently at county level; will be more refined in 2008 ☐Mobile Railroad – county level

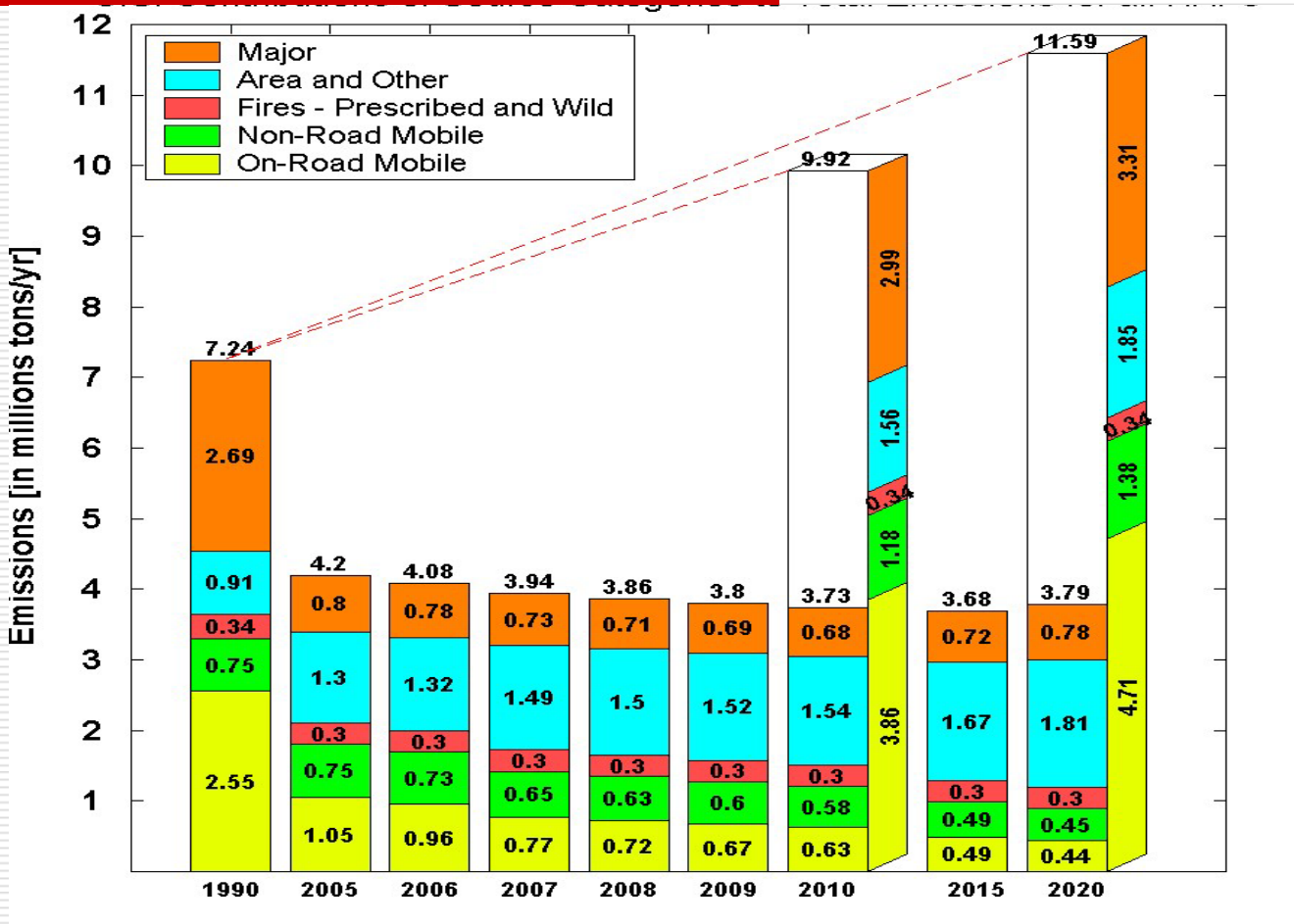
NEI Characteristics (cont.)

CHARACTERISTICS	NEI
Speciation of HAP Compounds	Speciation of all compounds groups including Hg (elemental gaseous/ divalent particulate/divalent gaseous), Cr (Cr+6/Cr+3), POM (individual PAHs), Dioxins (congeners), etc.
Timeframe	☐Annual for CAPs 1990 - 2005 ☐HAPs – every 3 yrs, 1990, 1996, 1999, 2002, 2005
Number Facilities in 2005 inventory emitting CAA HAPs	90,000 out of 101,600 total facilities
Modeling Parameters	☐Stack parameters for individual processes ☐Latitude/longitude for individual processes ☐Control devices and efficiencies

NEI Characteristics (cont.)

CHARACTERISTICS	NEI
Category Descriptions	☐NAICS Codes – describe type of business or products ☐MACT Codes – identify processes within facilities subject to EPA regulations ☐SCC (Source Classification Codes) that describe specific emitting processes, fuel type, etc.
Reporting Thresholds	☐No reporting thresholds for HAPs ☐CAP reporting thresholds – emissions based; required by Consolidated Emission Reporting Rule (CERR)
Source of Data	☐State and local agencies ☐Tribes ☐CEM data for electric utilities ☐Compliance Source Testing ☐EPA regulatory development data, e.g., RTR ☐EPA developed data for nonpoint categories ☐MMS data for offshore platforms ☐Fires developed from satellite data ☐Mobile source data developed by OTAQ using state and local input data for onroad and nonroad sources ☐TRI

Source Categories to Total HAP Emissions



AIR TOXIC MONITORING

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History of Air Toxic Ambient Air Monitoring Programs

-Urban Air Toxic Monitoring Program (UATMP)

-Started in 1987

-S/L agency operated sites…usually at their discretion

-100's of stations throughout US

-Nation Air Toxics Trends Station (NATTS)

-Started in 2001 as (10) station pilot program; permanent sites established beginning in 2003

-Long-term sites for trends analysis

-Grown to 28 throughout US…both Urban and Rural

History of Air Toxic Ambient Air Monitoring Programs (cont.)

-Community–Scale Air Toxic Monitoring Station (CSATM)

-Competitively awarded grant $$$ for air toxic monitoring projects

-First competition was in 2003

-# of projects varies depending on awarded $$$

-RECENTLY : **Air Toxic monitoring for special school study**

-Targeted sites chosen through using risk-assessment tools (i.e., NATA)

Air Toxics Monitoring Station

Stations are not “one-size” fits all

Air Toxic Monitoring/Analysis Methods

Volatile Organic Compounds (VOC)

-Use Stainless-Steel canisters to collect air samples

-Analysis of sample is performed by Gas Chromatography – Mass Spectrometry (EPA Method TO-15)

Carbonyls

-Draw air through special coated cartridges to collect sample

-Analysis of sample is performed by Liquid Chromatography – UV Detector (EPA Method TO-11)

Metals

-Draw air through quartz filters top collect particulates

-Analysis of sample is performed by Inductively Couple Plasma-Mass Spectrometry (EPA Method IO-3.5)

Air Toxic Monitoring/Analysis Methods (cont.)

Polycyclic Aromatic Hydrocarbons (PAH)

-Draw air through polyurethane foam (PUF) along w/ a special resin and glass fiber filter

-Analysis of sample is performed by Gas Chromatography – Mass Spectrometry (EPA Method TO-13A)

Hexavalent Chromium (Cr+6)

-Draw air through treated cellulose filter top collect particulates

-Analysis of sample is performed by Ion Chromatography (modified CARB Method 039)

Pollutants Monitored

- 1990 CAA list 188 Hazardous Air Pollutants (HAPS)
- 33 HAPS were listed in the Integrated Urban Air Toxic Strategy
- NATTS are required, as a minimum, to monitor for these:

VOC	Carbonyls	Metals	PAHs
▪Acrolein ▪Perchloroethylene (tetrachloroethylene) ▪Benzene ▪Carbon tetrachloride ▪Chloroform ▪Trichloroethylene ▪1,3-butadiene ▪1,2-dichloropropane ▪Dichloromethane ▪Vinyl chloride	▪Formaldehyde ▪Acetaldehyde	▪Nickel compounds ▪Arsenic compounds ▪Cadmium compounds ▪Manganese compounds ▪Beryllium ▪Lead ▪Hexavalent chromium	▪Benzo(a)pyrene ▪Napthalene

More Information

Additional information on Air Toxic Ambient Air Monitoring can be found on-line at:

http://www.epa.gov/ttn/amtic/airtoxpg.html

RISK MODELING

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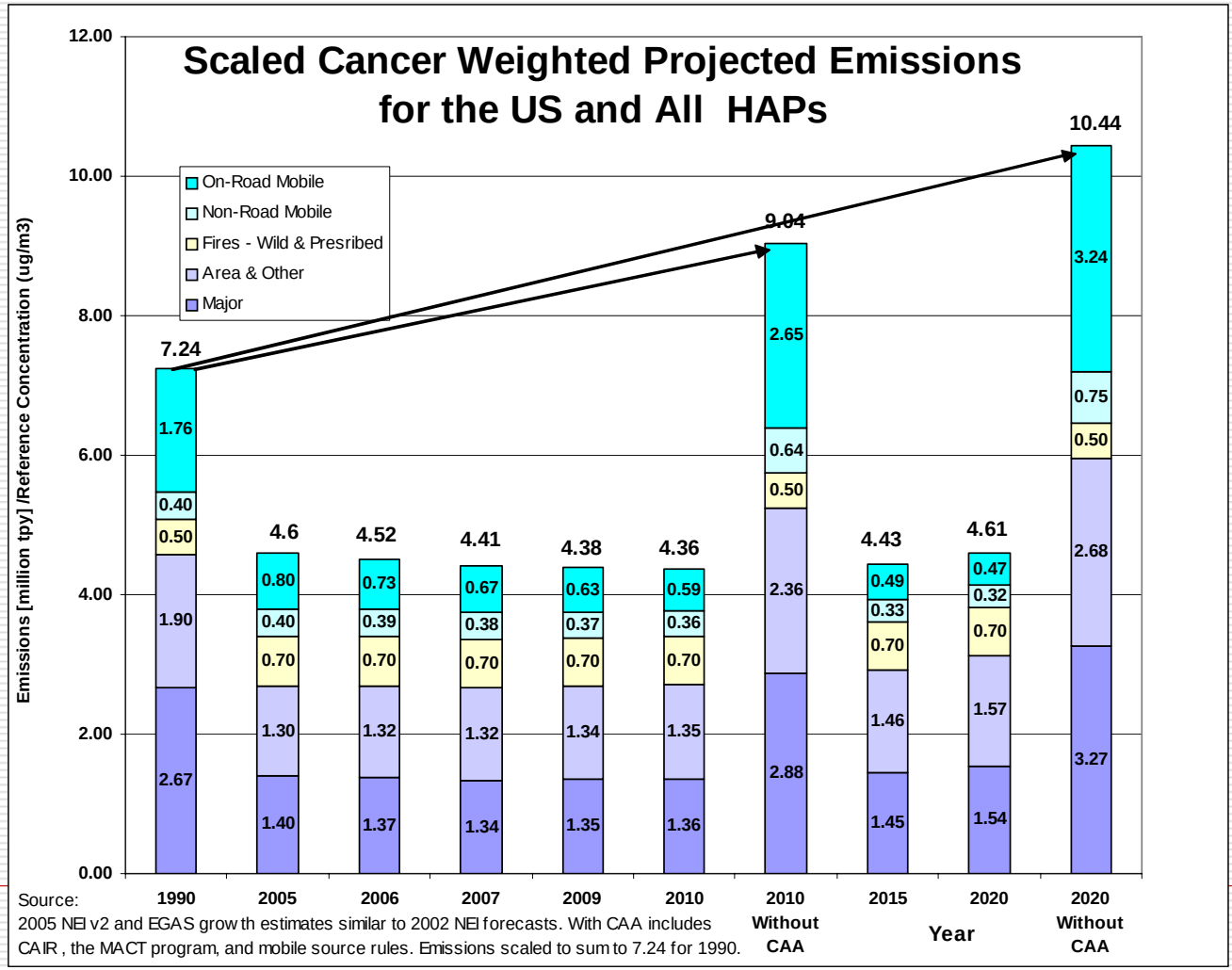
So how does the EPA uses these air toxic inventories anyway ?

- Program Accountability
  - GPRA reporting
  - MACT program
- Risk Characterizations
  - Residual Risk (RTR)
  - National Air toxic Assessment (NATA)

Program Accountability



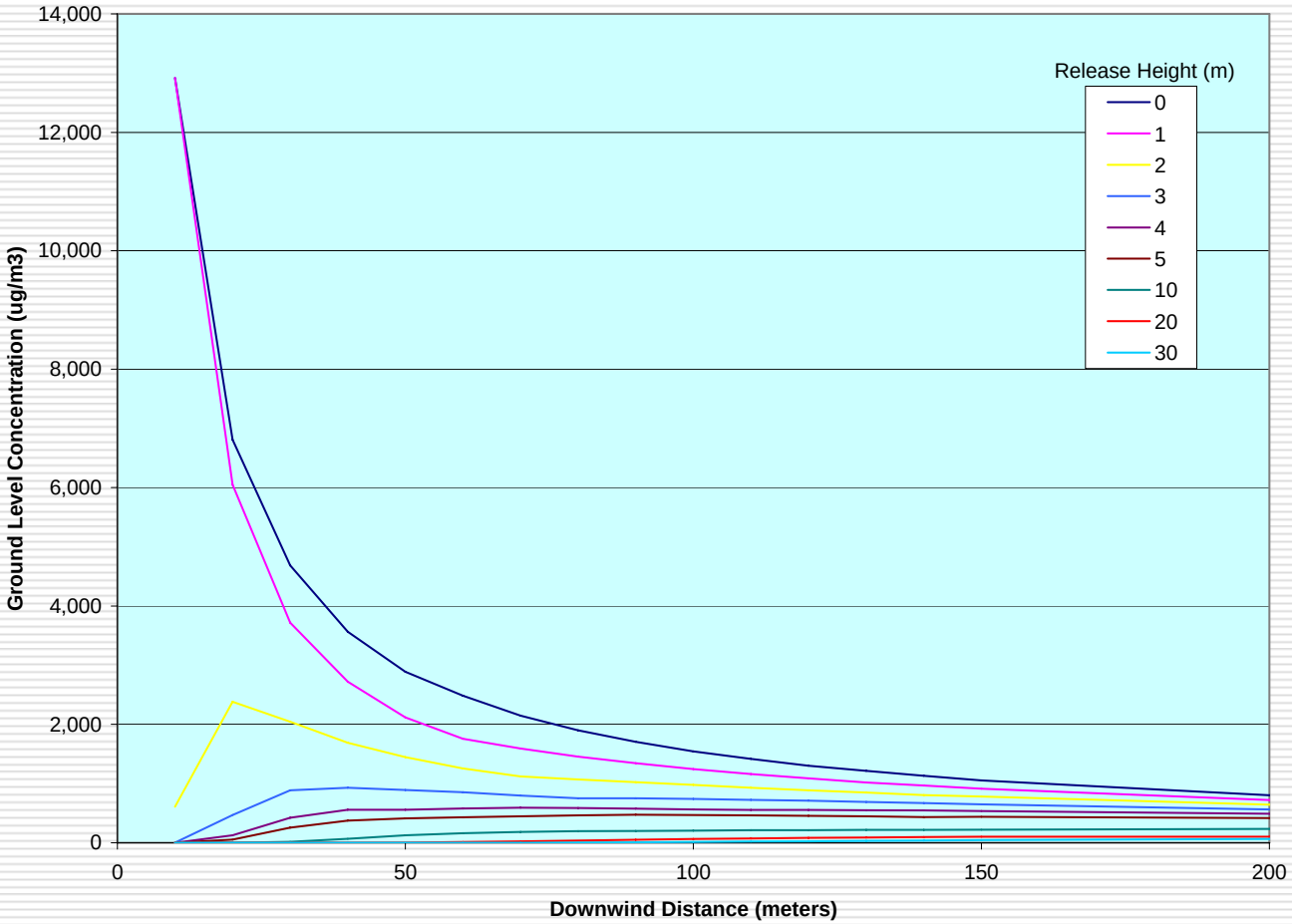
Risky Business

- How did we perform the risk characterizations for programs such as RTR and NATA?
  - Inhalation Assessment
    - Utilizes dispersion models such as AERMOD
  - Mulitpathway/Ecological Assessment
    - Utilizes TRIM Screen Model

How does the inventory effect risk in these models?

- Amount of specific HAP compounds emitted (Q)
  - Concentration (and risk) is directly proportional to the emission rate
- Emission release point/stack coordinates (x)
  - Concentration is inversely proportional plume travel distance
- Stack parameters: height, diameter, exit gas temperature, exit gas velocity, exit gas flow rate. (h)
  - Concentration is inversely proportional plume release elevation (physical plume height and plume rise)
- Area Source parameter: width, length, height of area source
  - Concentration is inversely proportional to surface area

Plume concentration as a function of release height and downwind distance



Where might my inventory data end up?

for Monitoring Data Used in Designations for the 2008 Ozone NAAQS'' as a direct final rule on October 6, 2008, 73 FR 58042. The direct final rule revises the schedule for the flagging and submission of documentation of data impacted by exceptional events that may be used for designations under the 2008 ozone National Ambient Air Quality Standards (NAAQS). For a detailed description of the ozone NAAQS and the Exceptional Events Rule, please see the rulemaking actions which are available at EPA's Web sites at *http://www.epa.gov/groundlevelozone/actions.html* and *http://www.epa.gov/EPA-AIR/2008/October/Day-06/a23520.htm* and also in the **Federal Register** at 73 FR 16436 and 73 FR 58042.

We stated in the direct final rule amendments that if we received adverse comment by November 20, 2008, we would publish a timely notice of withdrawal in the **Federal Register**. We received an adverse comment on the direct final rule amendments on November 20, 2008. Because EPA received adverse comment, we are withdrawing the direct final rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 63

[EPA–HQ–OAR–2007–0211; FRL–8752–5]

RIN 2060–AO16

National Emission Standards for Hazardous Air Pollutant Emissions: Group I Polymers and Resins (Polysulfide Rubber Production, Ethylene Propylene Rubber Production, Butyl Rubber Production, Neoprene Production); National Emission Standards for Hazardous Air Pollutants for Epoxy Resins Production and Non-Nylon Polyamides Production; National Emission Standards for Hazardous Air Pollutants for Source Categories: Generic Maximum Achievable Control Technology Standards (Acetal Resins Production and Hydrogen Fluoride Production) (Risk and Technology Review)

AGENCY: Environmental Protection Agency (EPA).

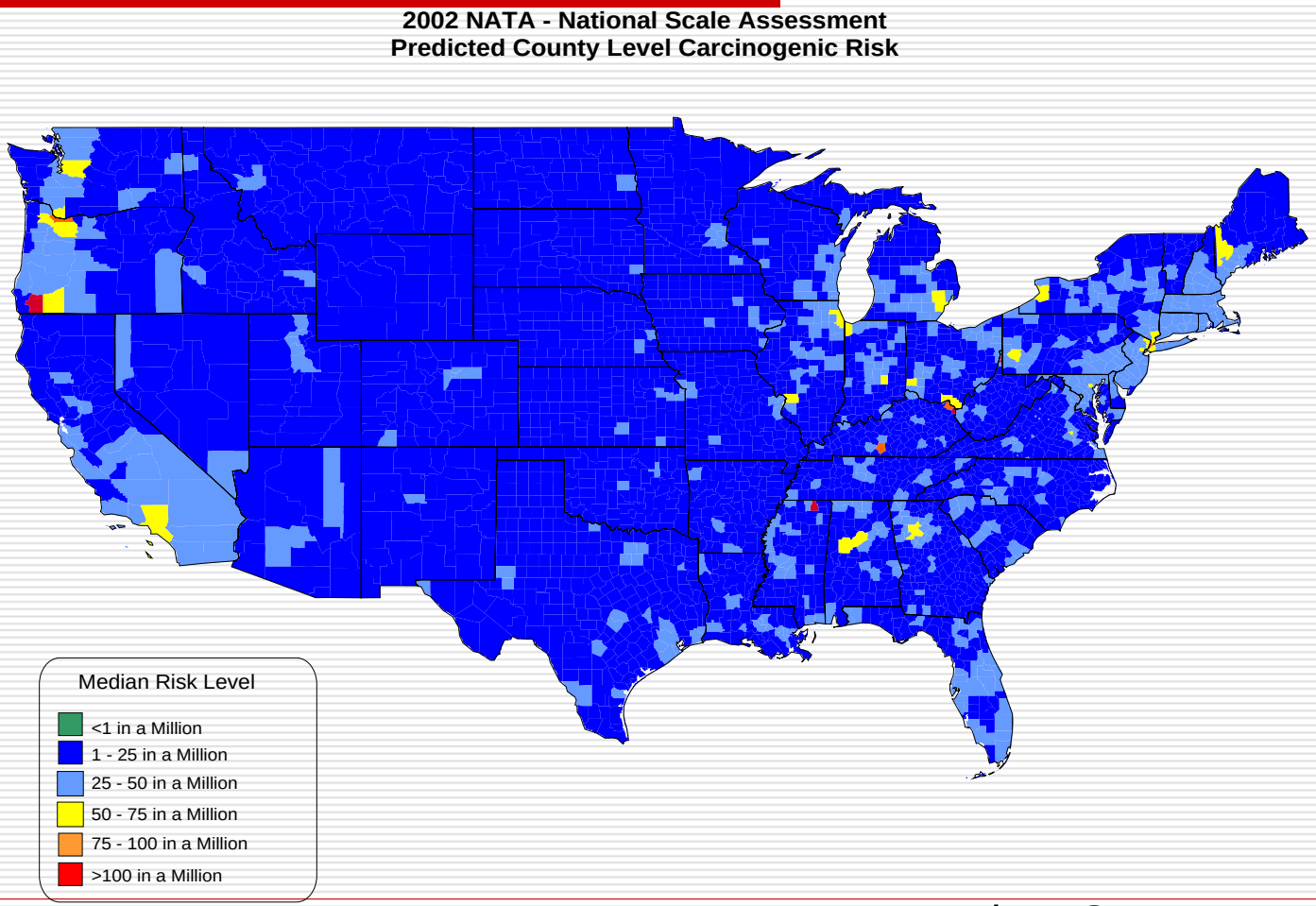
ACTION: Final rule.

requirements are warranted under section 112(f)(2) or 112(d)(6) of the Clean Air Act at this time.

DATES: This final action is effective on December 16, 2008.

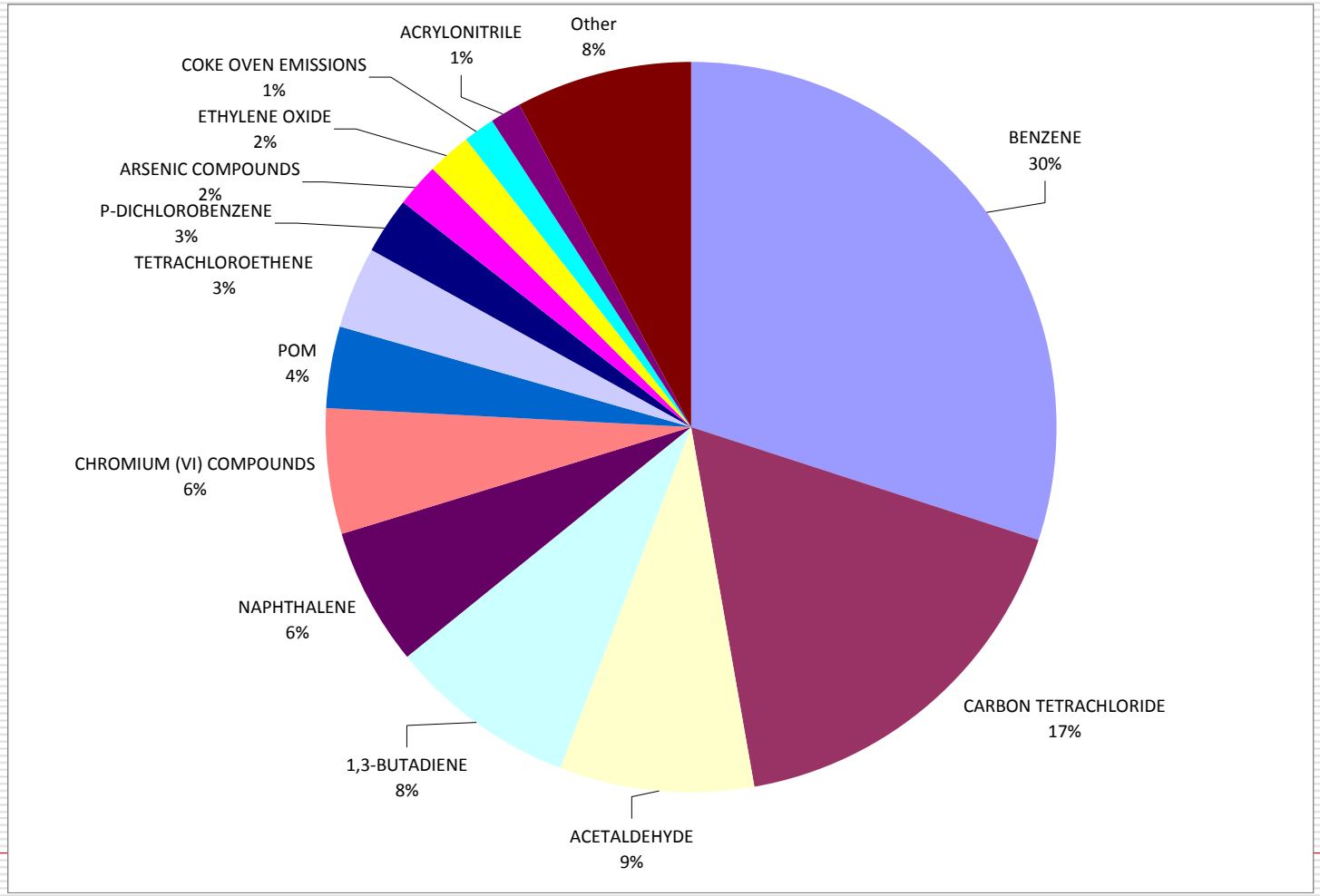
ADDRESSES: We have established a docket for this action under Docket ID No. EPA–HQ–OAR–2007–0211. All documents in the docket are listed on the *www.regulations.gov* Web site. Although listed in the index, some information is not publicly available, e.g., confidential business information or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically through *www.regulations.gov* or in hard copy at the EPA Docket Center, Docket ID No. EPA–HQ–OAR–2007–0211, EPA West Building, Room 3334, 1301 Constitution Avenue, NW., Washington, DC. The Public Reading Room is open from 8:30

Where might my inventory data end up?

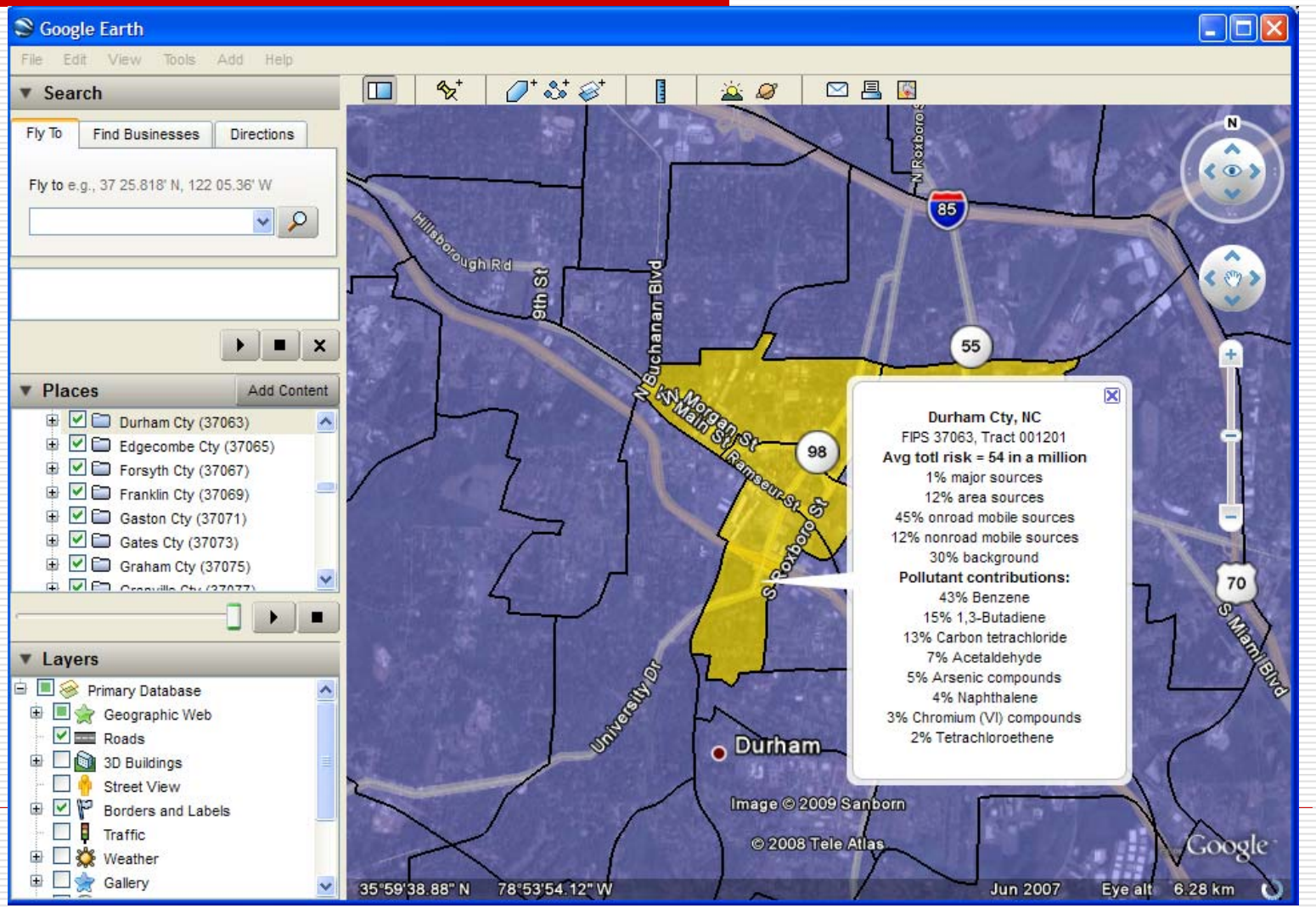


Based on County Averages

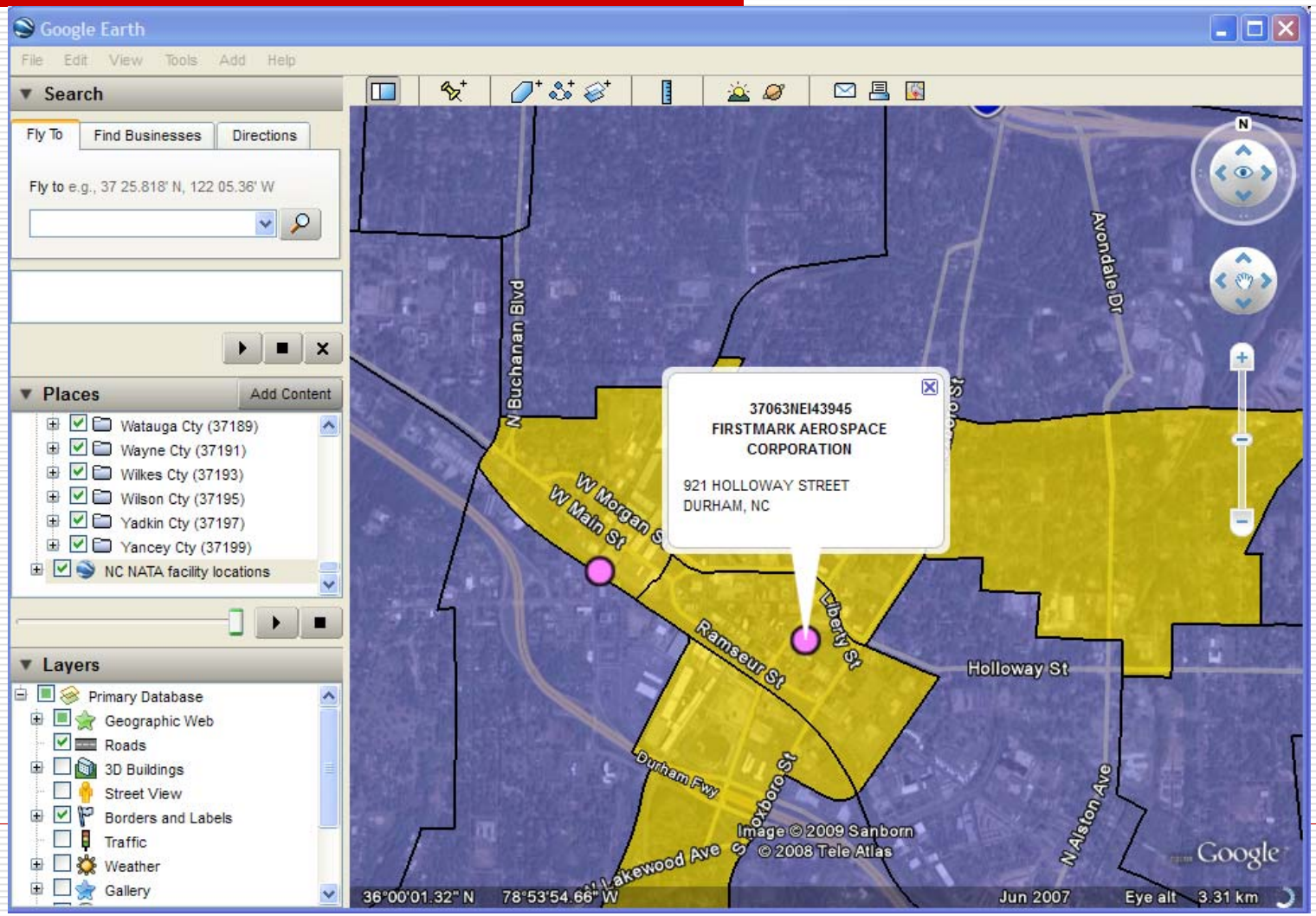
2002 NATA Pollutant Drivers



2002 NATA - Risk Results in Google Earth (detailed tract information)

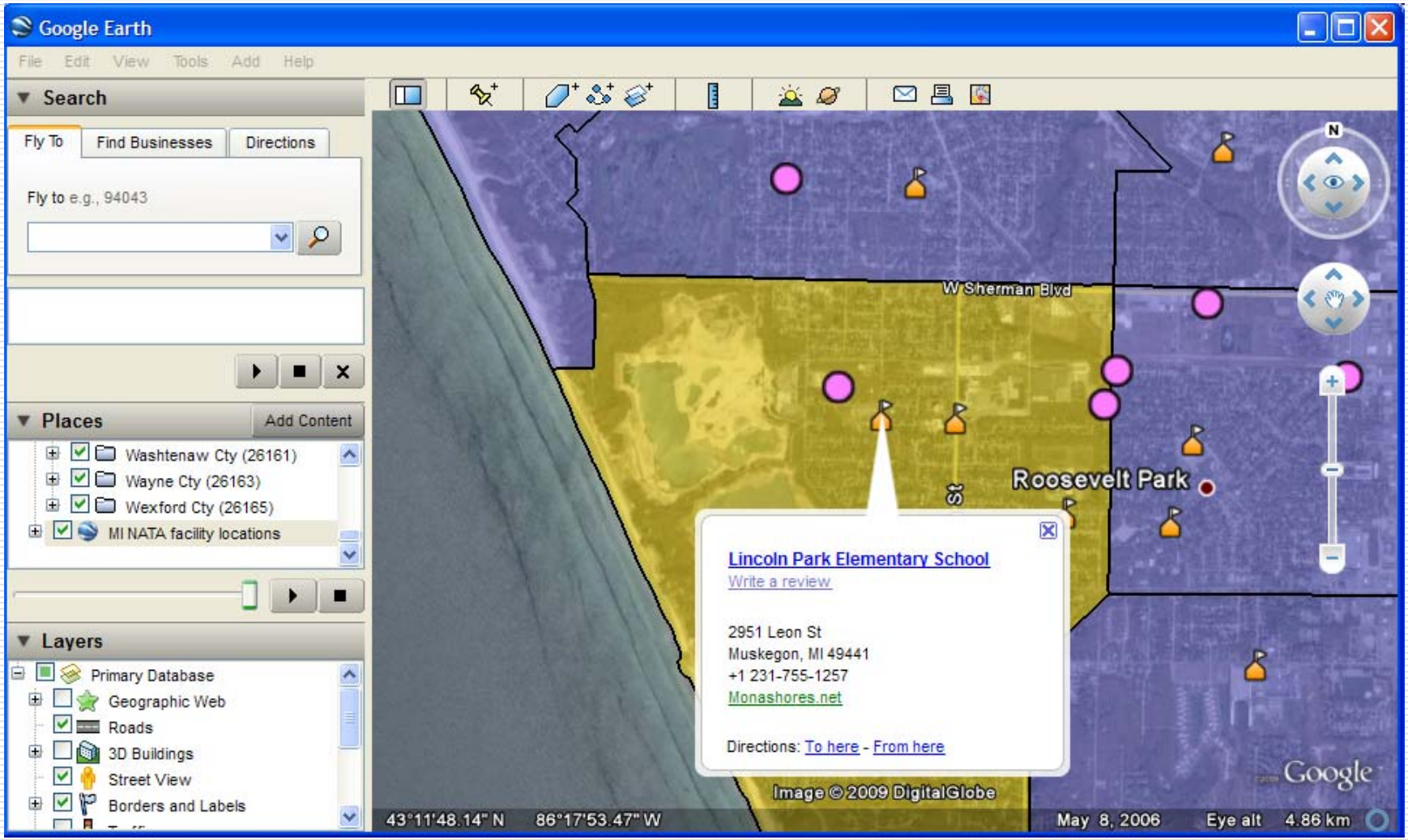


2002 NATA - Risk Results in Google Earth (source information)



Where might my inventory data end up?

2002 NATA - Risk Results in Google Earth (school locations)



Air Toxics Regulations

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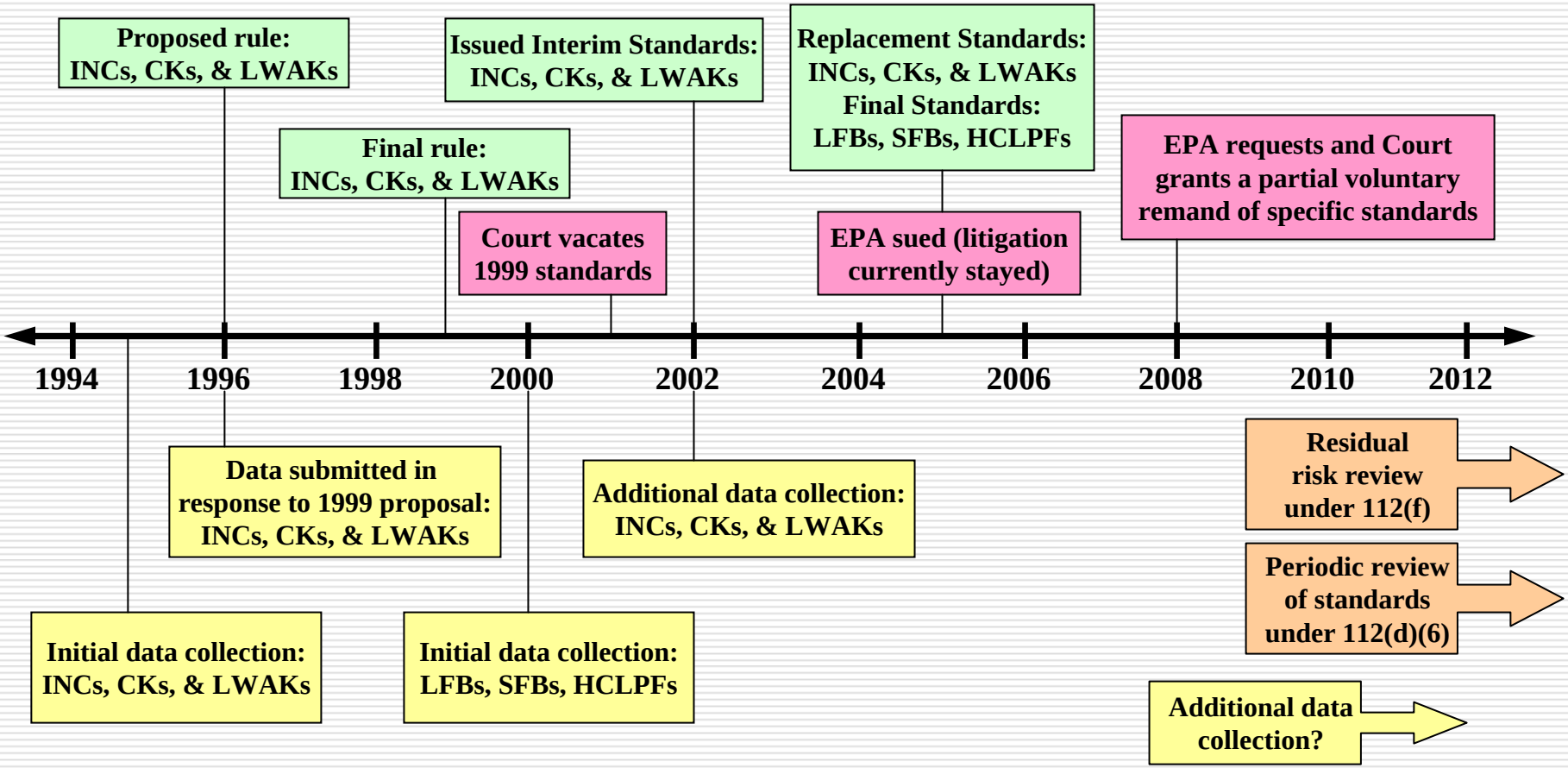
Air Toxics Regulations

- Many CAA programs reduce emissions of air toxics
  - Focus of panel presentation: National Emission Standards for Hazardous Air Pollutants (NESHAP) rules under CAA 112
    - Since 1990, EPA has issued ~100 rules that are projected to reduce annual air toxics by ~1.7 million tons
  - Example NESHAP for panel discussion: Rules for Hazardous Waste Combustors (HWCs)
    - Incinerators (INCs)
    - Cement Kilns (CKs)
    - Lightweight Aggregate Kilns (LWAKs)
    - Industrial Boilers (LFBs & SFBs)
    - HCl Production Furnaces (HCLPFs)
  - CAA 112 sections pertinent to HWC Rule:
    - 112(d)(2) – MACT emission standards
    - 112(c)(6) – Standards for specific pollutants
    - 112(k) – Urban area source program
    - 112(f) – Residual risk program
    - 112(d)(6) – Periodic review of standards

Typical Rulemaking

- Identify universe of sources
- Gather emissions data & information
- Develop baseline emissions
- Evaluate controls/options
- Propose standards and other compliance & monitoring requirements
- Solicit public comment
- Respond to public comments
- Publish final rule
- Provide rule implementation support

Example – HW Combustor Rulemaking



Emissions Estimates for HWCs

- Standards and emission estimates based on a compiled data base of RCRA compliance testing results
  - Periodic emissions testing required – often able to collect multiple test results for individual combustors
  - Pollutants: D/Fs, individual metals, PM, HCl/Cl, CO/HC
- Emissions estimates based on a "bottom-up" approach vs a "top-down" approach
  - Bottom-up → uses emissions rates of individual combustors
  - Top-down → uses emissions factors and activity rates
- Remarks – HWC data and estimates
  - HWC emission estimates generally represent allowable emissions vs actual emissions
  - Not all sources measure all HAP of concern – data imputation
  - Emissions characteristics of individual sources change over time
  - Universe of operating sources changes over time
  - Multiple emissions baselines for HWCs

More Information

- Air toxics rules posted at:
  www.epa.gov/ttn/atw/eparules.html

- Additional information on the HWC MACT rule can be found at:
  www.epa.gov/hwcmact