

Air Toxics Updates for CAAAC Input: The National Air Toxics Assessment (NATA)

Subcommittee on Permits, NSR and Toxics
Clean Air Act Advisory Committee (CAAAC)
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Briefing Overview

- Background
- New in 2011 NATA
- Air Toxics Trends
- Significant Results
- Website/Map App Tool
- NATA Lean Event



Background

- 2011 NATA is the 5th National-scale assessment (1996, 1999, 2002, 2005) and was released to the public Dec 17, 2015.
- NATA is a screening-level characterization of air toxics across the nation.
 - Nationwide assessment with census tract resolution
 - Ambient concentration estimates for 180 Clean Air Act Hazardous Air Pollutants (HAPs) plus diesel PM (DPM)
 - Cancer and noncancer risk estimates for about 140 HAPs with health data based on chronic exposures
- Concentrations, exposures, and risks based on air quality modeling of emissions from the 2011 National Emissions Inventory (NEI) for Clean Air Act HAPs and DPM.
- NATA uses:
 - To identify locations of interest for further study
 - To prioritize pollutants and emission sources
 - To inform monitoring programs



Background (continued)

It's important to note that:

- Emissions, modeled ambient concentrations, and estimated inhalation exposures from outdoor sources and inhalation route of exposure only.
- Results more uncertain at finer geographic scales.
 - Surrogates used to allocate mobile and nonpoint source emissions
 - Results based on modeled data, not ambient monitoring data
- Results should not be used to compare risks among different areas of the country.
 - Underlying emissions data vary in level of detail from state to state
- 2011 NATA results should not be compared to previous NATAs.
 - Changes in results are due to both actual emission changes and the use of different modeling and emissions processing techniques.



Background (continued)

NATA Analytical Steps

Compile National Emissions Inventory (2011 NEI)

2011 NEI includes stationary, mobile and natural sources (fires, biogenics).

NATA includes 178 HAPs and diesel particulate from mobile sources.

Estimate ambient concentrations of air toxics across U.S.

Uses CMAQ and AERMOD to predict census tract ambient concentrations nationwide.

Estimate population exposures

Includes an exposure model (HAPEM7) to account for human activity data, commuting patterns, and near roadway exposures.

Characterize potential public health risks from inhalation

Census tract level cancer and noncancer risks nationwide.



New in 2011 NATA

The latest version of NATA includes several updates and enhancements:

- Improved emissions estimates
 - More detailed emissions (e.g. ports, airports, and oil and gas sectors).
 - Estimates of mobile emissions using most up-to-date mobile source emissions model (MOVES2014).
 - Improved estimates for fire emissions and biogenics.
- Improved dispersion modeling using a “hybrid approach” which blends both a local-scale and a long-range air quality model.
- Improved exposure analysis using updated human activity data.
- A new NATA Web App GIS Tool (discussed in more detail later).



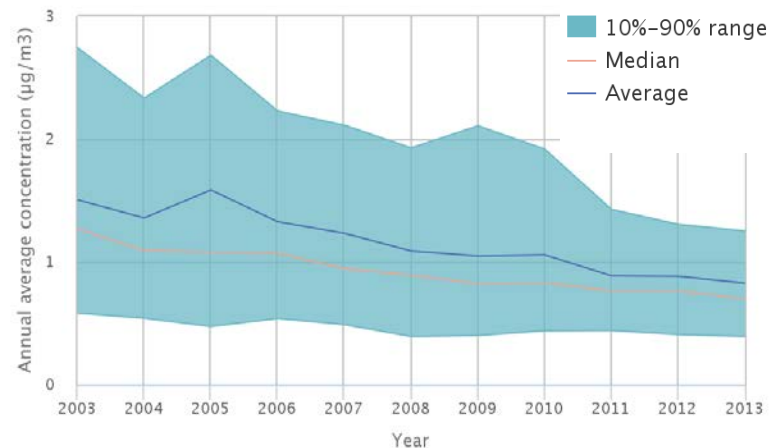
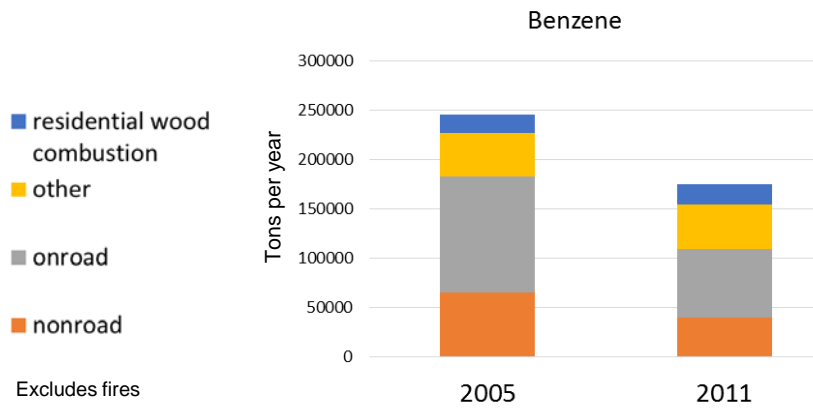
Air Toxic Trends

- Although NATA is not used to look at trends, emissions and monitoring data indicate a marked reduction in air toxics over past decade.
- Emissions reductions due in large part to programs such as the federal mobile source programs.

2005 and 2011: National Trends in Emissions and Monitored Concentrations -- Benzene

Benzene Trend 2003-2013, EPA's Report on the Environment (ROE)

Exhibit 3. Ambient benzene concentrations in the U.S., 2003-2013



Onroad and nonroad emissions continue to decrease. Monitoring data reflect this downward trend.

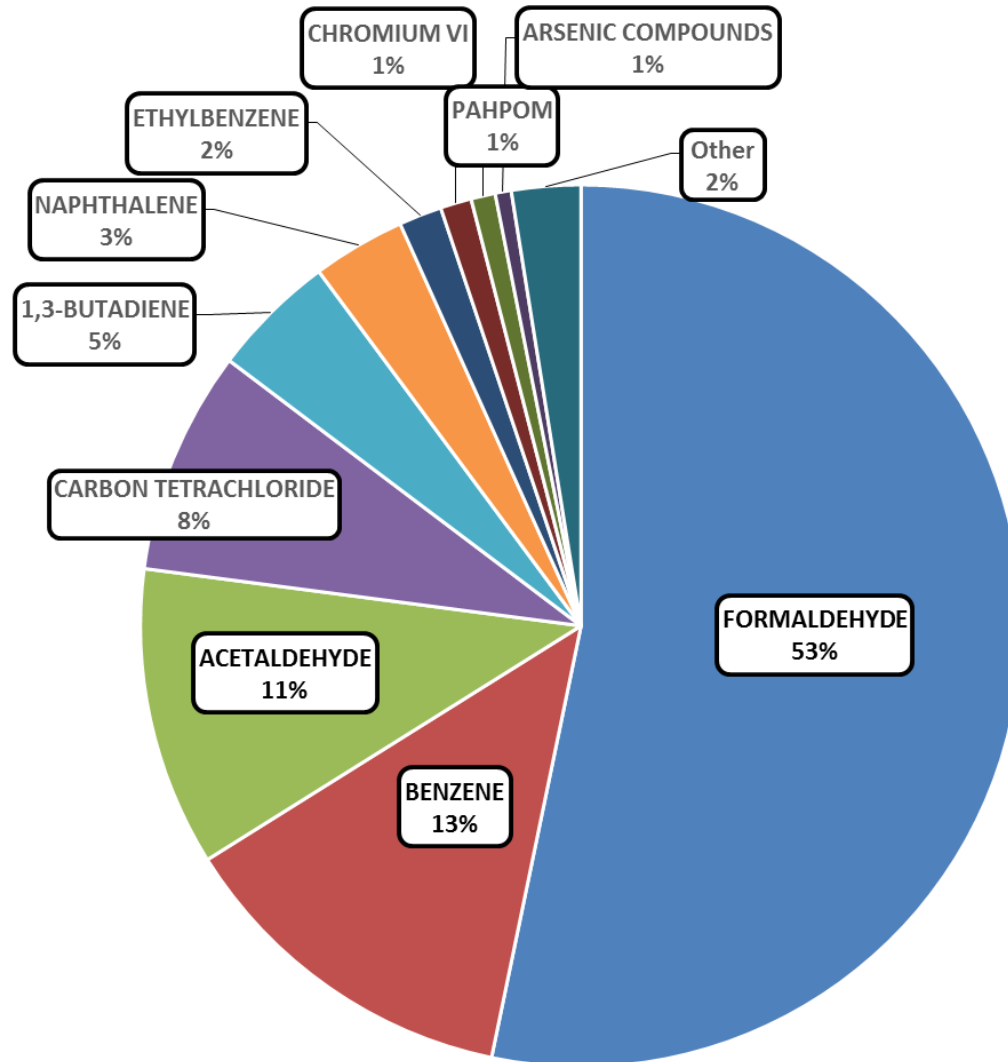


Significant Results

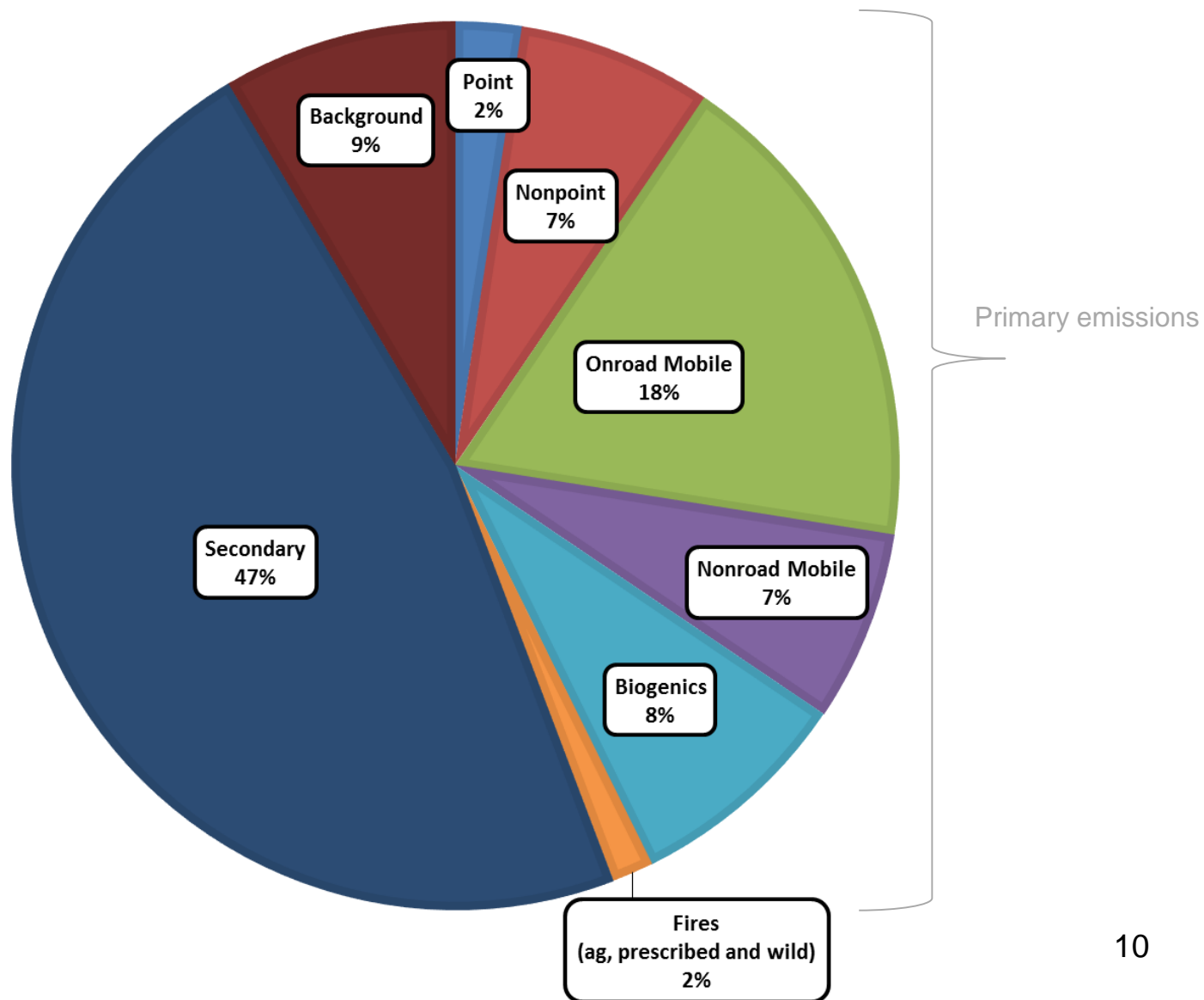
Cancer Risks

- National cancer risks are estimated by the 2011 NATA to be about 40-in-1 million.
- Top pollutants continue to be formaldehyde and acetaldehyde from photochemical activity (secondary) and benzene from onroad mobile activity.
- There are approximately 120 census tracts, 12 urban areas and 500,000 people with risks greater than 100-in-1 million.
- High risks in urban core centers from mobile sources.
 - Significant light duty gasoline vehicle emissions during “cold” starts. We find elevated emissions and risks in locations with significant vehicle parking such as in downtown locations.
- Point sources drive cancer risks in some local-scale areas.
 - Highest census tract cancer risks nationwide driven by industrial facilities such as chemical manufacturing and coke oven plants.

2011 NATA Cancer Risks Entire US - Pollutant Contributions

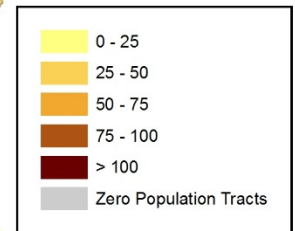


2011 NATA Cancer Risks Entire US – Source Category Contributions



2011 NATA Estimated Total Cancer Risk (in a million)

**12 Areas with Risks Greater
than 100-in-1 million**

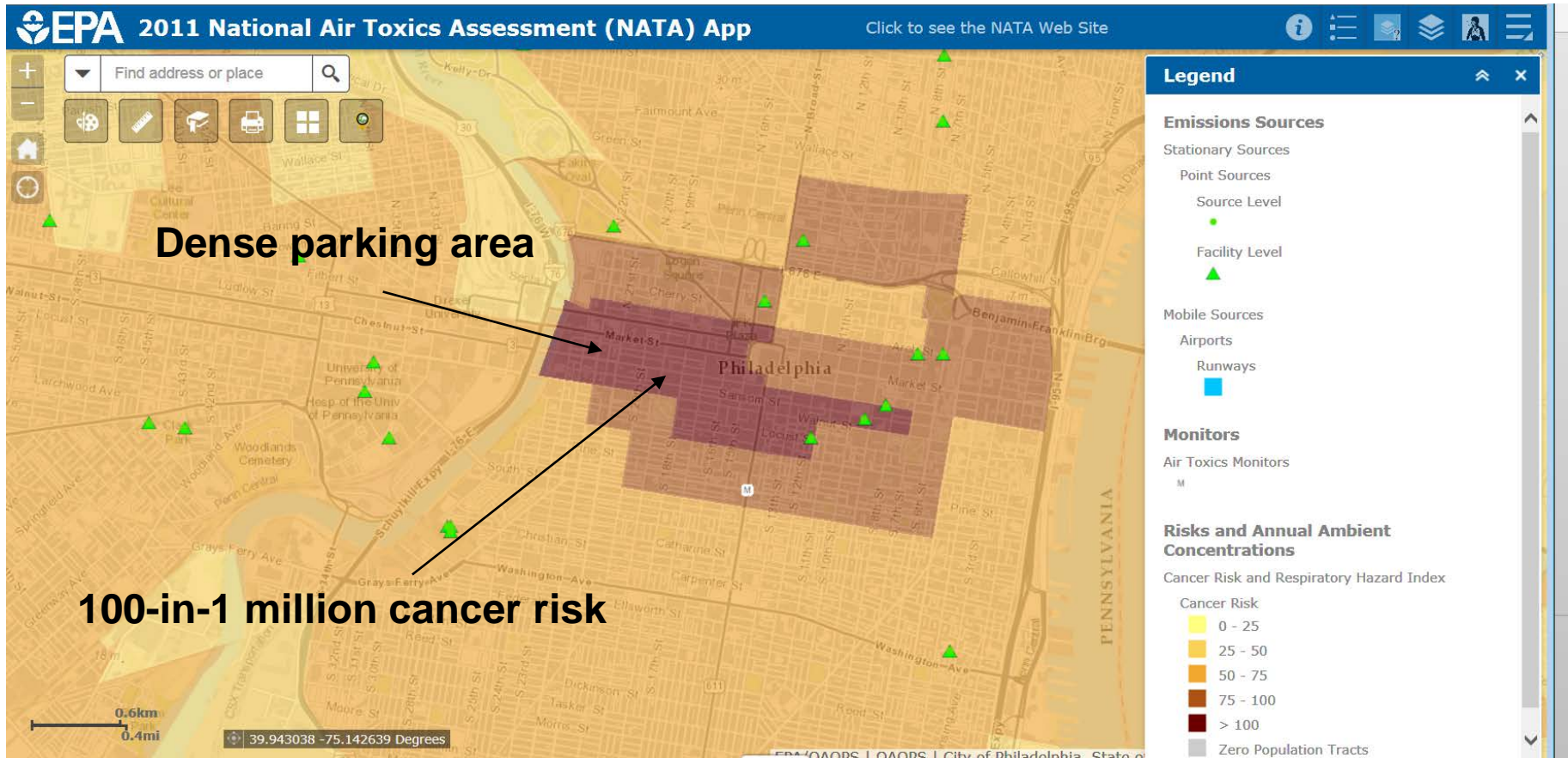


Urbanized Area	# of Tracts
New York–Newark, NY–NJ–CT	29
Seattle, WA	23
San Francisco–Oakland, CA	20
Pittsburgh, PA	15
Philadelphia, PA–NJ–DE–MD	7
New Orleans, LA	6
Birmingham, AL	6
Los Angeles–Long Beach–Anaheim, CA	3
Chicago, IL–IN	2
Denver–Aurora, CO	2
Washington, DC–VA–MD	1
Reading, PA	1

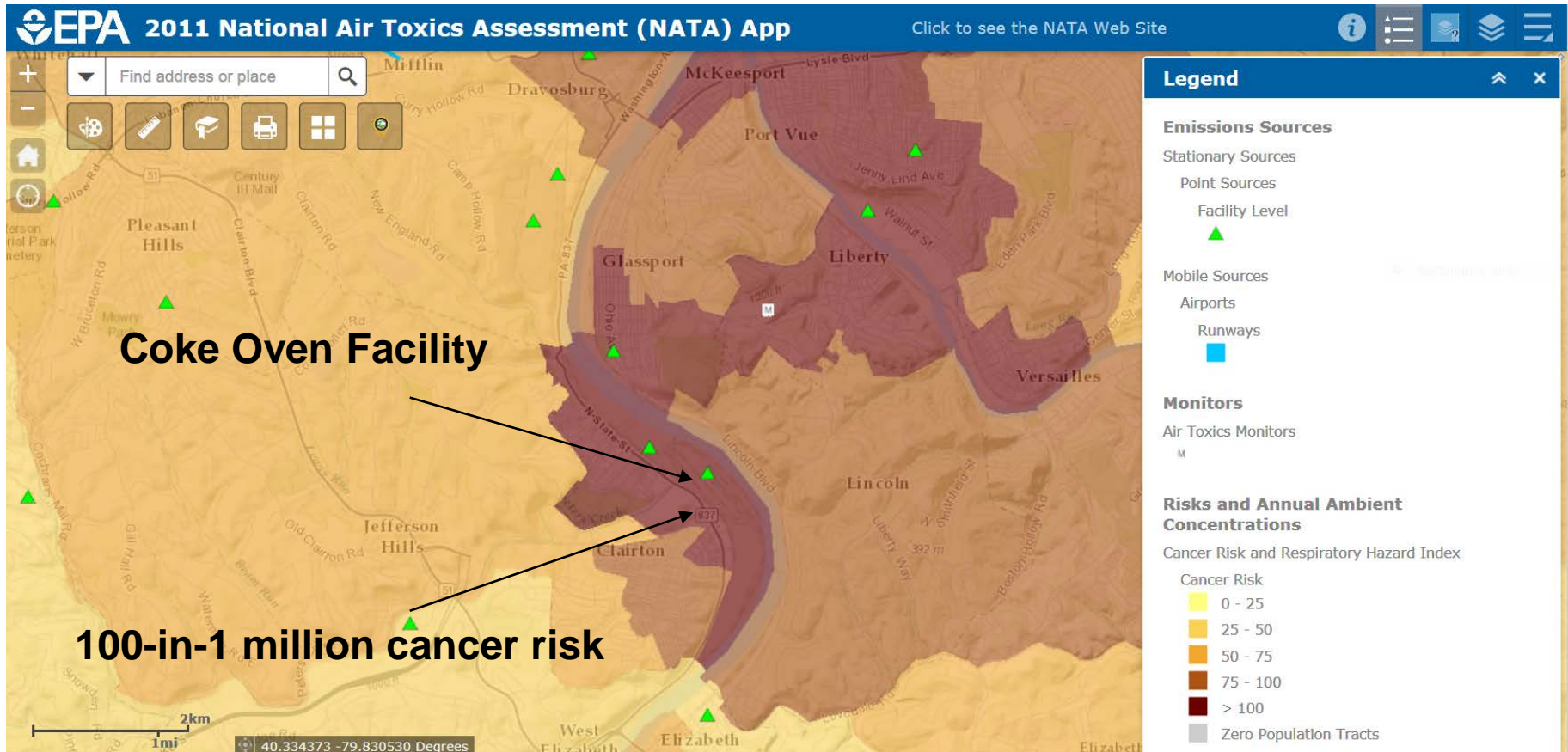
Blue dots indicate tracts with risk > 100 in a million
121 tracts nationwide (12 Urbanized Areas)

PR and VI

Mobile Source Driven Cancer Risk Example



Point Source Driven Cancer Risk Example



NATA Website

<http://www.epa.gov/national-air-toxics-assessment>



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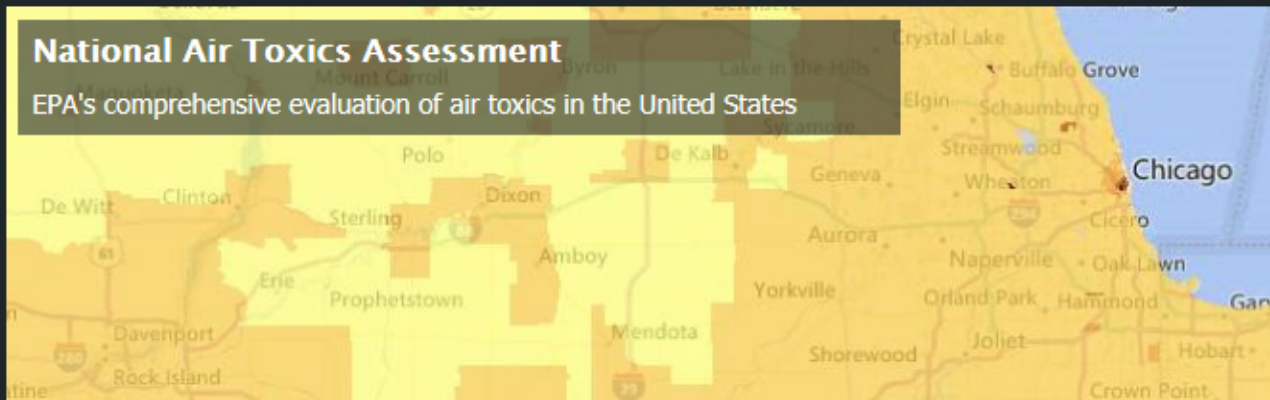


National Air Toxics Assessment

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National Air Toxics Assessment

EPA's comprehensive evaluation of air toxics in the United States



On December 17, 2015, EPA released the most recent update to the National Air Toxics Assessment (NATA). NATA contains emissions data from 2011 and uses models to make broad estimates of health risks over geographic areas of the country.

[Learn more](#)

NATA Overview

- [Limitations](#)
- [Glossary of Terms](#)
- [Frequent Questions](#)

2011 NATA Assessment

- [2011 Assessment Results](#)
- [2011 NATA Map](#)
- [2011 Assessment Methods](#)

Quick Links

- [Previous versions of NATA](#)
- [Other environmental screening tools](#)
- [Learn about risk assessment](#)
- [Hazardous Air Pollutants website](#)
- [Urban Air Toxics website](#)

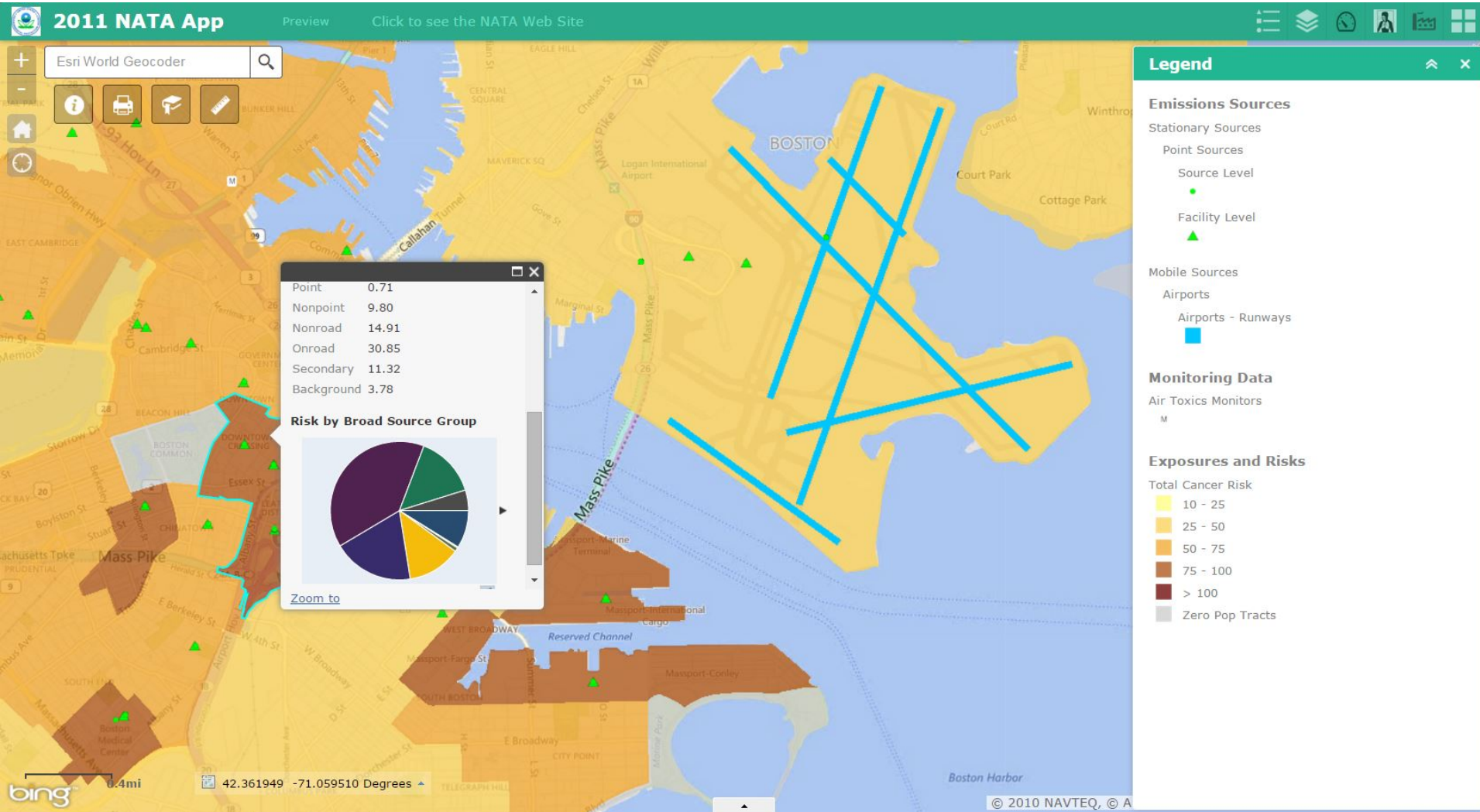


NATA Web App Tool

New NATA Web App GIS Tool

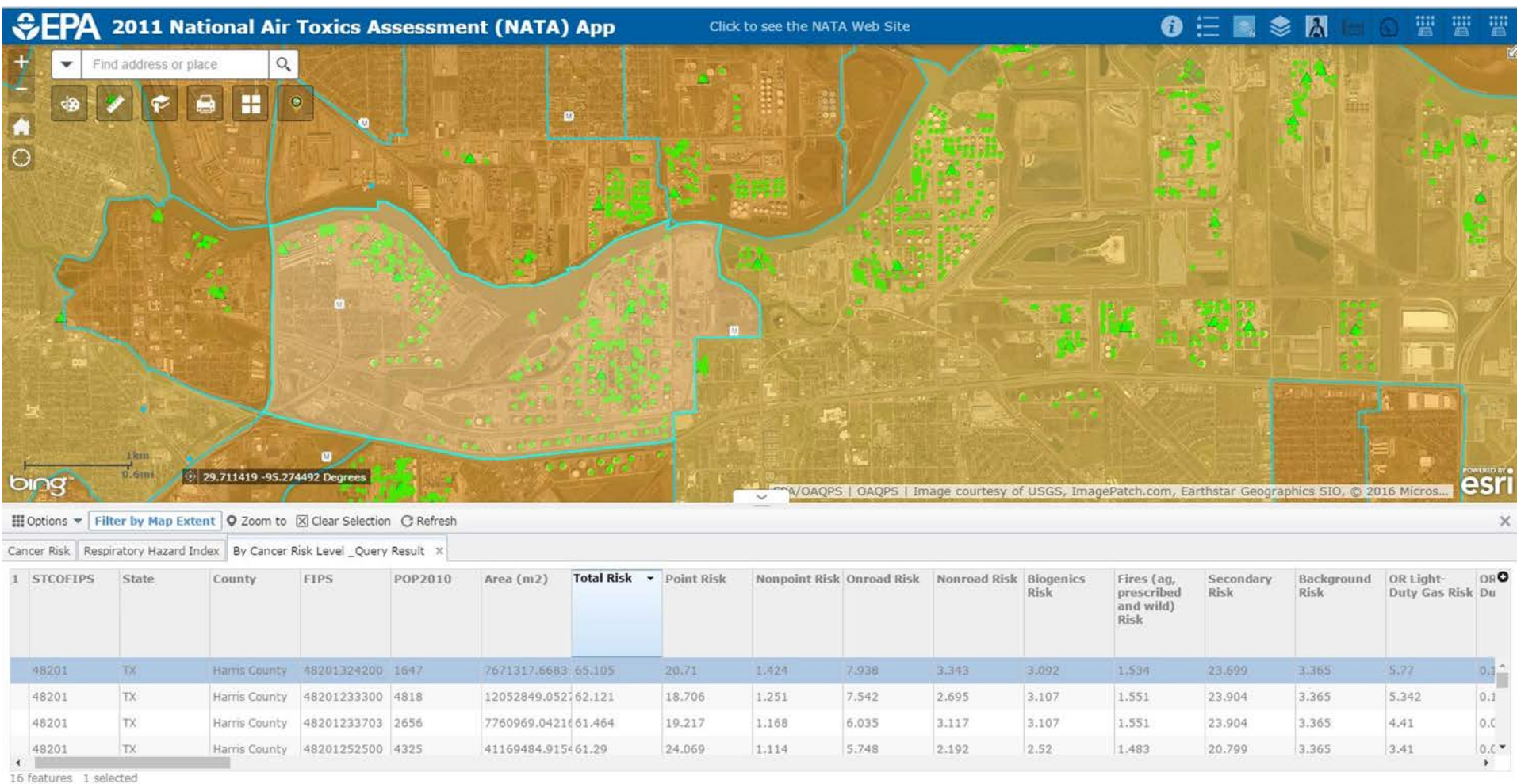
- Used to show estimated risks at the census tract level and display risks, emissions sources, and monitoring data on a map.
- The NATA web Map can help a community identify the sources and pollutants that drive risks in their community.
- The tool generates pie charts and tabular results of the data you explore.
- Can compare the NATA modeling results to local ambient monitors.
- The NATA web app is also available on tablets and smartphones.

NATA Web App – Tract Risk Breakdown



This slide shows the census tract risk by broad source group (e.g., point, nonpoint).

NATA Web App - Detailed Source Information



Green dots are individual emission points.



NATA Lean Event

- Following completion of the 2011 NATA, EPA conducted a “Lean” event to improve efficiency and reduce waste.
 - The Lean process helps improve processes by reducing errors, extra process steps, and waiting time.
 - Lean process involves key stakeholders and customers to help improve end products.
- How was the Lean process applied to NATA?
 - Focused on identifying ways to improve NATA while reducing turnaround time.
 - Identified key roles of NATA (e.g., to provide comprehensive air toxics information).
 - Mapped out current “as-is” process (2011 NATA).
 - Identified waste in process and their causes; identified potential solutions.
 - Mapped out future “to-be” process (2014 NATA) using potential solutions.
- Improvements for 2014 NATA identified during Lean process
 - Provide new tools to help expedite and focus State/Local/Tribe review process.
 - Improve efficiency in dispersion/risk modeling process.
 - Develop new capabilities to improve risk communication (e.g., improvements to the NATA WebApp to access community scale risks).