

Overview of the 2014 National Air Toxic Assessment (NATA)

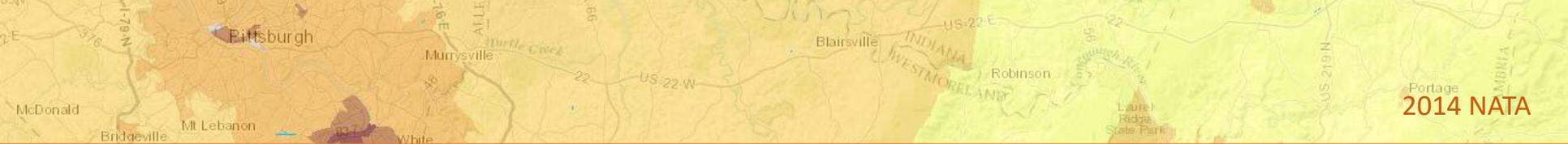
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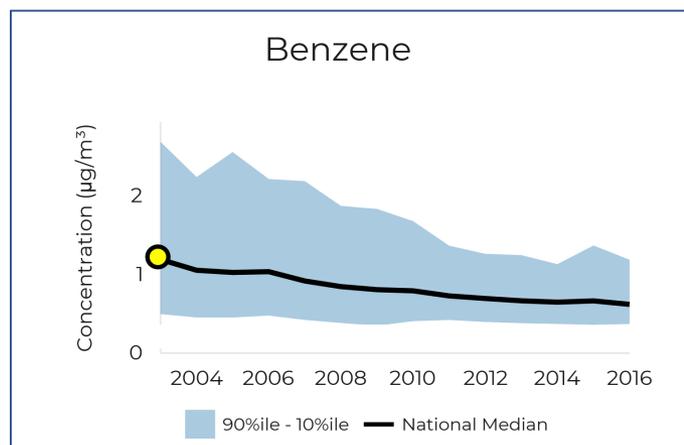
Presentation overview

- Background on NATA
- The 2014 NATA
 - Methods and Limitations
 - Updates
 - Results
- Website and Map App
- 2017 NATA Status
- Questions and Contacts

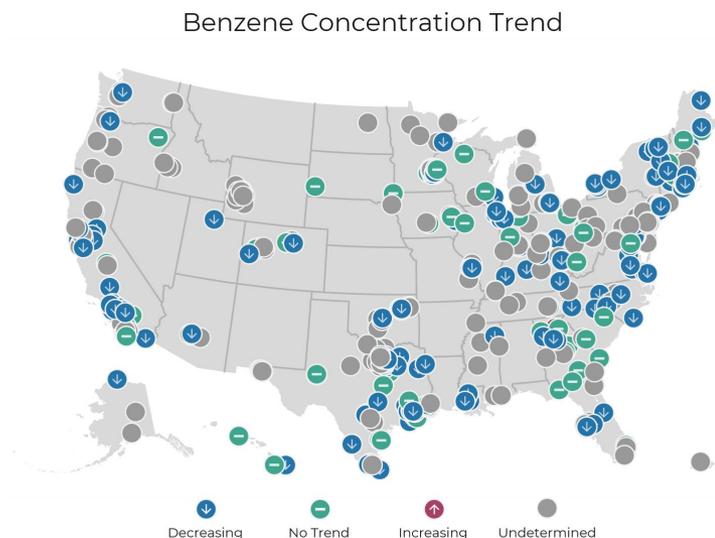
What is NATA?

- EPA's ongoing review of air toxics in the United States
- Uses the best science and emissions data available to estimate health risks from air toxics
- Periodically updated – this NATA is the 6th assessment based on the 2014 NEI
- *Screening tool* to help determine which pollutants or areas of the country to investigate further
- NATA should not be used:
 - to pinpoint risk or exposure values at a specific place (like a home or school);
 - to characterize or compare risks or exposures at local levels (such as between neighborhoods);
 - as the sole basis for risk reduction plans or regulations; or
 - to control specific sources or pollutants.

National air toxics trends are downward: benzene example



Our Nation's Air: Status and Trends Through 2017 : Benzene (2003 – 2016)



What data are included in NATA?

- Screening-level estimates of the risk of cancer and other serious health effects from breathing air toxics
- Estimates of annual ambient and exposure concentrations for 180 listed air toxics and diesel particulate matter
 - Diesel particulate matter is only assessed for noncancer effects
- NATA results are reported at the census tract level
- NATA results are provided by pollutant and source
 - Helps show the air toxics and source types that may contribute to health risks in certain places

Limitations

- Only outdoor sources via the inhalation route of exposure
- Results are more uncertain at finer geographic scales
 - Surrogates used to allocate mobile and nonpoint source emissions
- Results between different areas are not comparable
 - Underlying emissions data vary in level of detail from state to state
- Results between NATA years are not comparable
 - Emission changes and different modeling/emissions processing techniques lead to changes in results
 - Meteorological data and health values also change over time

Improvements & Updates

- **Inventory (2014 NEI):**
 - Updated spatial allocation for mobile and nonpoint sources
 - NEI improvements: oil & gas, onroad, nonroad, commercial marine vessels
 - AK, HI, PR, VI better characterized for AERMOD modeling
 - New emissions processing tool built for preparing AERMOD emissions
- **Photochemical/Dispersion Modeling:**
 - In CMAQ: improved boundary conditions and carbon tetrachloride treatment; nine more HAP modeled than for 2011 NATA
 - More spatially refined meteorology using prognostic meteorological modeling
- **Exposure Modeling:**
 - New features of HAPEM 7, including updated population and commuting patterns, activity pattern data, and commuting-related microenvironments
- **Risk Characterization:** Updated health benchmarks
- **Outreach:** Updated Map App features and User's Guide

NATA analytical steps

Compile
National
Emissions
Inventory
(2014 NEI)

2014 NEI includes stationary, mobile and natural sources (fires, biogenics).

NATA includes 180 air toxics plus diesel particulate matter (DPM).

Estimate
ambient
concentrations
of air toxics
across the U.S.

Uses models (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.

Source Attribution – Concentrations/Risks by 38 Groups

ONROAD (10)
Light duty gas on -network
Light duty diesel on -network
Refueling
Light duty gas off -network
Light duty diesel off -network
Heavy duty gas on -network
Heavy duty diesel on -network
Heavy duty gas off -network
Heavy duty diesel off network
Heavy duty diesel hoteling

NONPOINT STATIONARY (10)
Oil & Gas
Residential Wood Combustion
Miscellaneous Nonindustrial
Commercial Cooking
Solvents and Coatings
Storage and Transfer, Bulk Terminals, Stage1
Fuel Combustion except residential wood
Industrial
Waste Disposal
Agricultural livestock

NONROAD (13)
Recreational-inc-pleasure craft
Construction
Commercial Lawn & Garden
Residential Lawn & Garden
Agricultural Equipment
Commercial Equipment
All Other Nonroad Equipment
Commercial Marine Vessels-Ports-c1/c2
Commercial Marine Vessels-Ports-c3
Commercial Marine Vessels-Underway
Locomotives
Airports (point)
Railyards (point)

POINT (1)
Stationary point

(4)

OTHER
Fires -primary*
Biogenics - primary *
Secondary formation (includes all sources)
Background
* Only modeled in CMAQ

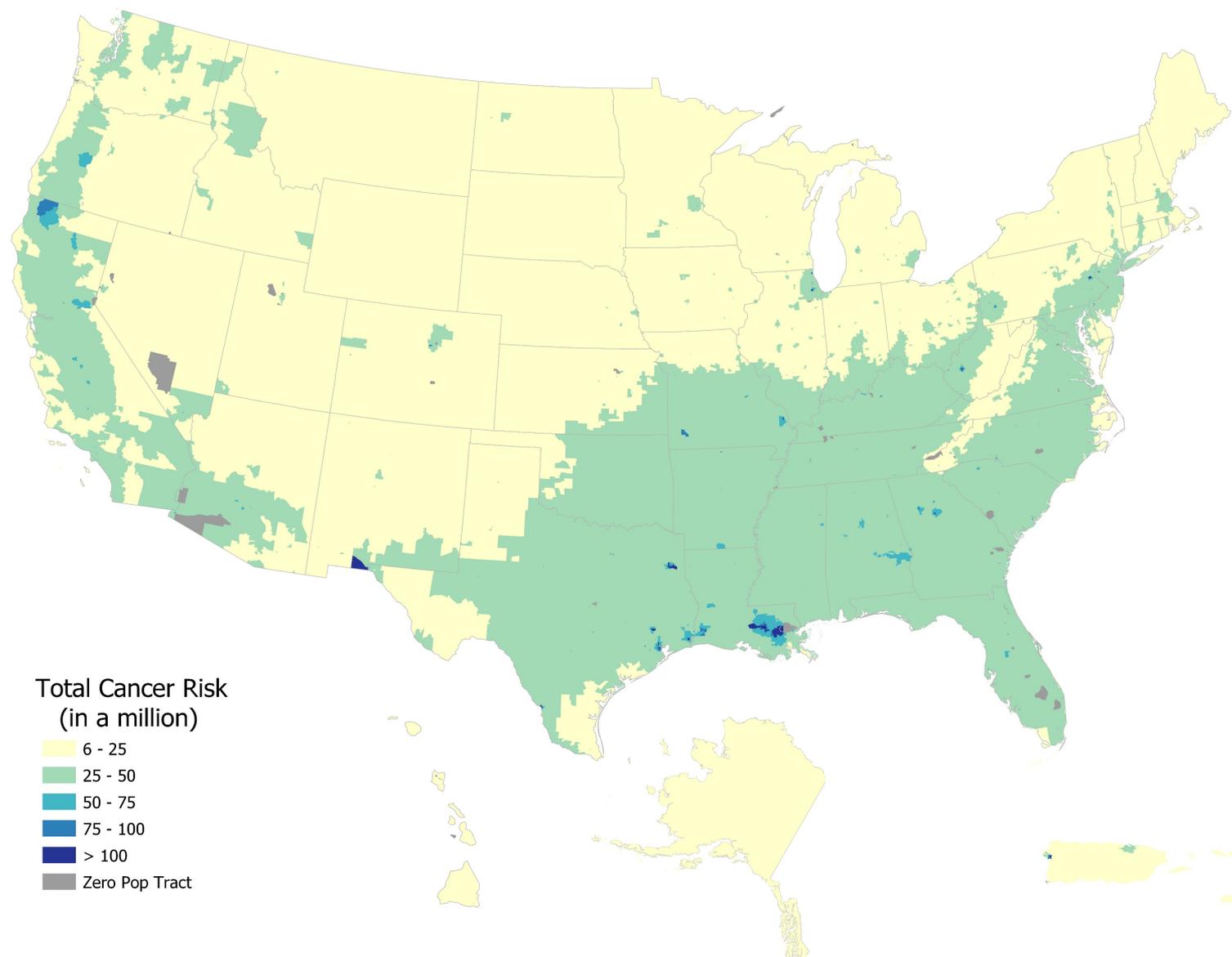
NATA General Approach to Spatial Allocation

Category	Inventory Resolution	Spatial Approach for AERMOD	Spatial approach for CMAQ
Point (non Airports)	Point	Point – vertical stack and fugitive	12km by 12 grid cells, Vertical based on plume calculations
Airports	Point	Point – runways & 10mX10m areas	12km by 12 grid cells
Locomotives	Point (railyards) and County/Shape	Nonpoint – 12 km grid cells* Point - Point Fugitives	12km by 12 grid cells
Commercial Marine Vessels	County/Shape	Shapes	12km by 12 grid cells
Onroad, Nonroad Equipment and other nonpoint	County	4 km grid cells for on network and diesel extended idling, oil and gas 12 km grid cells for others	12km by 12 grid cells
Fires (prescribed and wild)	Point	Not Modeled	12km by 12 grid cells, Vertical based on plume calculations

*For AK: 9 km grid cells and for PR/VI: 3 km grid cells

What 2014 NATA tells us

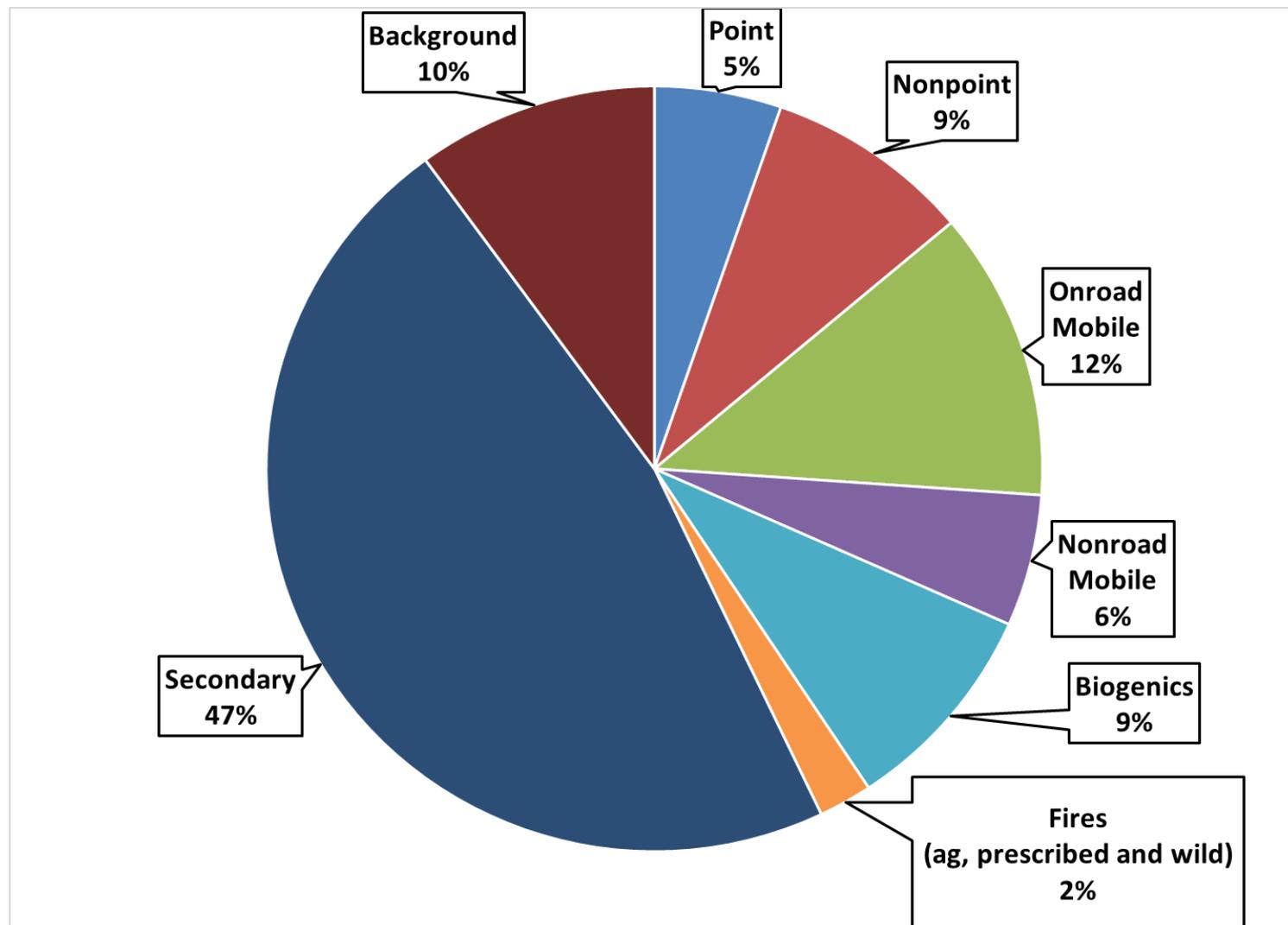
- National average cancer risk estimated to be 30-in-1 million
 - Formaldehyde and acetaldehyde contribute about half of the overall national average risk
 - Both can come from manmade and natural sources of emissions
- In some locations, NATA estimates elevated risk levels
 - Fewer than 1% of the census tracts have an estimated cancer risk above 100-in-1 million
 - Cancer risks in these census tracts are primarily driven by pollution from facilities that release ethylene oxide, chloroprene, and coke oven emissions



Total Cancer Risk
(in a million)

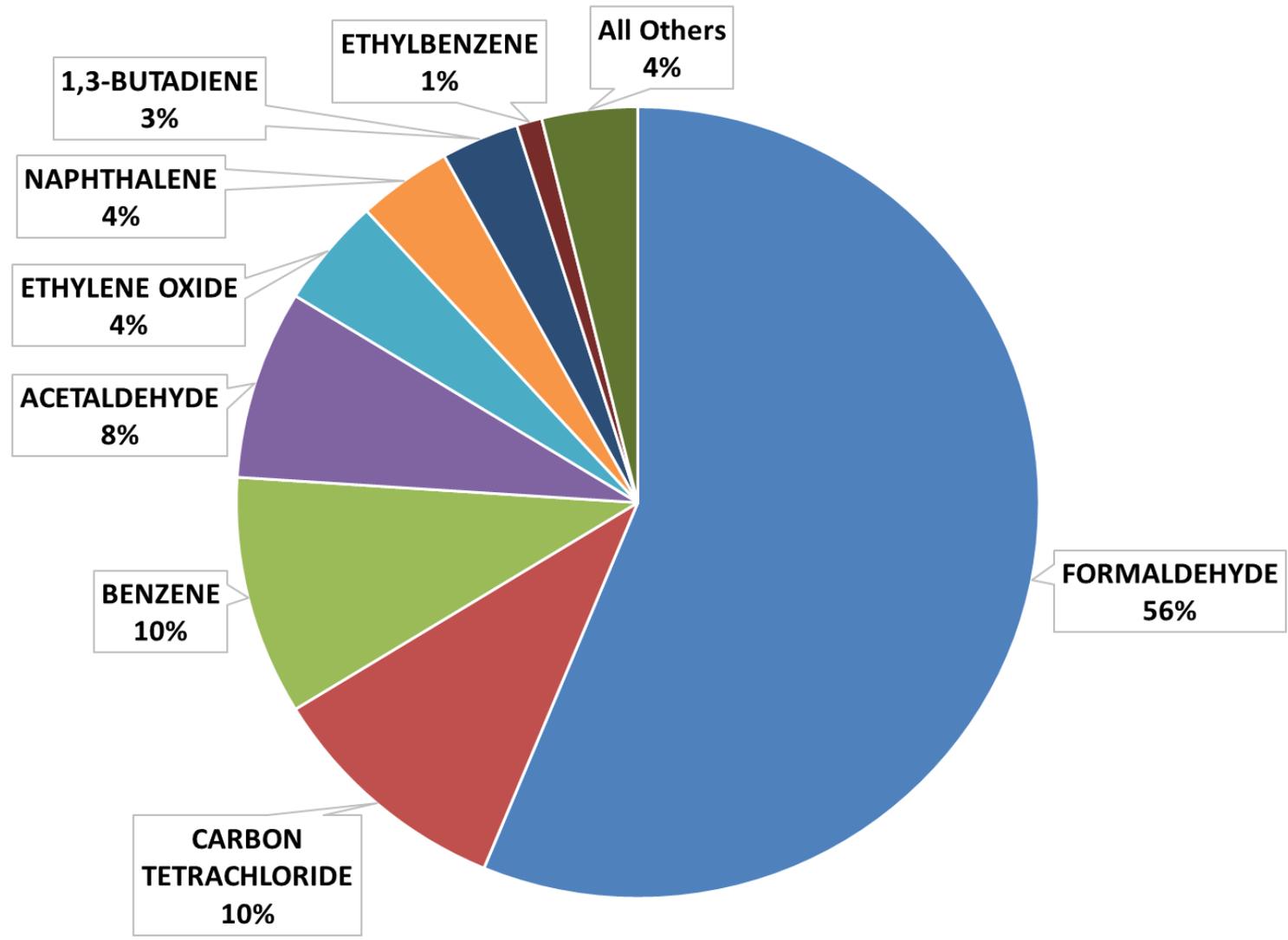
- 6 - 25
- 25 - 50
- 50 - 75
- 75 - 100
- > 100
- Zero Pop Tract

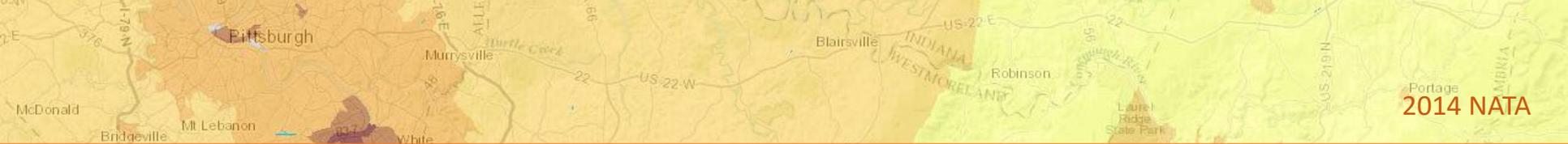
National Average Cancer Risk (30-in-1 million) - Source Contributions



National Average Cancer Risk (30-in-1 million) - Pollutant Contributions

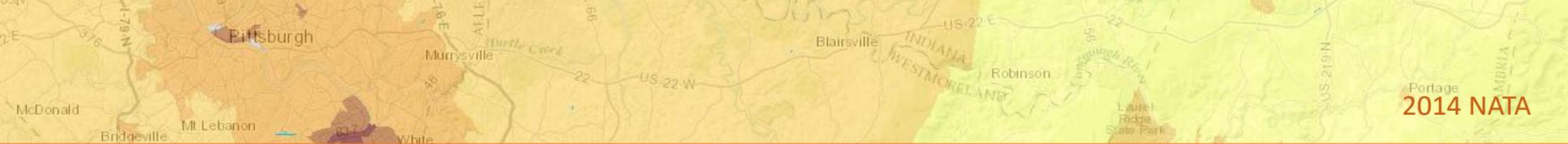
Portage
2014 NATA





New risk estimates for ethylene oxide

- Several areas of the country could have elevated cancer risks from long-term exposure to ethylene oxide
- These elevated risks are largely driven by an EPA risk value that was updated in late 2016
- EPA has begun to gather additional information in identified areas, focusing first on those areas with the largest estimated potential for risk



How can states/locals and tribes use NATA?

- Using NATA as an initial screening tool, air agencies can then study areas in more detail, focusing on where the risks to people may be greatest.
- NATA results can be used to:
 - prioritize pollutants and emission source types;
 - identify locations for further, more detailed study;
 - get a starting point for local assessments;
 - focus community efforts;
 - inform monitoring programs;
 - prioritize sensitive locations for ambient or emissions monitoring.

NATA on the Web

- 2014 NATA website:
<https://www.epa.gov/nata>

Overview, limitations,
glossary, frequent
questions



Methods, results, and
NATA Map



To view NATA results for your area:

- The Map App can quickly display risks and other data:
<https://www.epa.gov/national-air-toxics-assessment/2014-nata-map>
- “Zoom” to places of interest anywhere in the country, download NATA data and results, and run queries
- Map layers include:
 - cancer risks and respiratory hazard indexes;
 - annual ambient concentrations;
 - all emission sources modeled in NATA; and
 - air toxics monitoring sites with recent-year data.
- The NATA Map App is available for use on a computer or mobile device.

Map App – opening screen

2014 National Air Toxics Assessment [Click here to go to the NATA website](#)

Layers

Operational layers

- State Boundaries
- County Boundaries
- Tribal Boundaries
- 2014 NATA Monitor Data
- 2014 NATA Emissions
- 2014 NATA Risks, Hazard Indices, and Ambient Concentrations

Risks | Emissions | Monitors

Query | Results

- Query cancer risks by place/risk levels
- Query noncancer HI by place/HI levels

Legend

2014 NATA Emissions

Point

- Facility Level

2014 NATA Risks, Hazard Indices, and Ambient Concentrations

Cancer Risk - Total Risk

- > 100
- 75 - 100
- 50 - 75
- 25 - 50
- 6 - 25
- Zero Pop Tracts

Select

Select | Clear

Layer

- State Boundaries 0
- County Boundaries 0
- EPA Tribal Areas (2 of 4): A... 0

6mi | 36.126735 -115.428166 Degrees | Esri HERE, Garmin, USGS, NGA, EPA, USDA, N... | powered by esri



2017 NATA Status

- 2017 NATA will be based on 2017 NEI
- 2017 NEI cycle underway
 - NEI plan posted at: at <https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-plan>
- Targeting NEI completion in early 2020
- 2017 NATA schedule still being developed



- Questions?
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