EPA’s National Air Toxics Assessment (NATA) and the role of TRI data

TRI Training Conference
October 19, 2016

Madeleine Strum
US Environmental Protection Agency
Office of Air Quality Planning and Standards
NATA Background

• NATA is a screening-level characterization of air toxics across the nation
  – Nationwide assessment with census tract resolution
  – Cancer and noncancer risk estimates for about 140 HAP with health data based on chronic exposures
  – Ambient concentration estimates for 180 Clean Air Act hazardous air pollutants (HAP) plus diesel particulate matter (DPM)

• NATA Uses
  – To identify locations of interest for further study
  – To prioritize pollutants and emission sources
  – To inform monitoring programs

• 2011 NATA is the 5th national-scale air toxics assessment (1996, 1999, 2002, 2005) and was released to the public Dec 17, 2015
  – Concentrations, exposures, and risks based on air quality modeling of emissions from the 2011 National Emissions Inventory (NEI)
It’s important to note that:

• Emissions, modeled ambient concentrations, and estimated inhalation exposures are only from sources of outdoor origin via the inhalation route of exposure.

• Results are 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
2011 NATA Methods

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.
How do TRI data get used in NATA?

- The toxics release inventory (TRI) is incorporated into EPA’s Emission Inventory System, which is used to build the NEI
  - Used to QA the State/local/tribal (S/L/T) submitted data
  - Used to gap fill NEI where S/L/T missing (HAP reporting by S/L/T is voluntary)
  - Requires matching TRI and EIS facilities – special efforts taken to find matches/add TRI facilities to EIS for facilities emitting arsenic, chromium, nickel and lead
- Decisions needed when putting TRI into NEI
  - Require 1-to-1 matching of facilities
  - Assign release point parameters to TRI stack and fugitive air releases
  - Assign source classification codes (process descriptions)
  - Where there are ranges, midpoint is used *
  - Speciate chromium -- to estimate hexavalent chromium *

* Have been able to get more detailed information where these assumptions resulted in elevated risk areas
Percent of facilities in 2011 NATA that use TRI emissions data

Excludes airports and lead (Pb) a criteria pollutant
2011 NATA Cancer Risks for Entire US - Pollutant Contributions

- FORMALDEHYDE: 53%
- BENZENE: 13%
- ACETALDEHYDE: 11%
- CARBON TETRACHLORIDE: 8%
- 1,3-BUTADIENE: 5%
- NAPHTHALENE: 3%
- ETHYLBENZENE: 2%
- CHROMIUM VI: 1%
- ARSENIC COMPOUNDS: 1%
- PAH/POM: 1%
- Other: 2%
2011 NATA Cancer Risks for Entire US – Source Category Contributions

Point, Nonpoint, Onroad Mobile, Nonroad Mobile and Biogenics include the contribution from only primary emissions.
2011 NATA Noncancer Respiratory Risk for Entire US - Pollutant Contributions
2011 NATA Noncancer Respiratory Risks for Entire US - Source Sector Contributions

Point, Nonpoint, Onroad Mobile, Nonroad Mobile and Biogenics include only the primary emissions contribution.
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

http://www.epa.gov/nata
NATA Web App

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.
The next slide drills down on this area to show risk.
This slide shows the census tract risk by broad source group (e.g., point, nonpoint).
Green dots are individual emission points.
2014 NATA in Progress

• Began effort with LEAN event – cut time to complete NATA
• 2014 NEI version 1 released September 23
• Reviewing 2014 NEI facility data, including S/L/T-submitted and TRI data
• Beginning to model all source categories
• Comprehensive review in Spring 2017
• 2014 NEI v2 next summer
• 2014 NATA Release in 2018
Thanks to the NATA Team


OTAQ: Rich Cook, Chad Bailey, Ken Davidson (and Region 9)

OEI: Velu Senthil

ORD: Deborah Luecken

Regions: Susan Lancey, Carol Bellizzi, Alice Chow, Egide Louis, Suzanne King, Ruben Casso, Kyle Olson, Stephanie Doolan, Ken Davidson (and OTAQ), Madonna Narvaez