NATA: What South Carolina Learned As Related to Emission Inventories

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Abstract

When EPA opened the NATA website for state review and comments, South Carolina assembled a review team consisting of representatives from different areas within the agency that deal with air toxics. The group consisted of people from Emissions Inventory, Air Toxics (112(r) and MACT), Toxics Release Inventory (TRI), Air Monitoring Laboratory, Health Hazard Evaluation, and Outreach. The group focused the review on counties showing high concentrations (i.e., exceeding 90th percentile) for various hazardous air pollutants (HAPs). Most results from the larger, more industrial counties could be linked to specific sources, either point or mobile. However, several rural and relatively small counties showed relatively high concentrations for several HAPs. Results in several of those counties could be linked to known sources across the state's borders. The group's main concern was how we would explain to the public those small, rural counties that could not be linked to known sources.

Extensive review of state inventory data and much discussion with EPA led the group to believe that area sources may be major contributors to these rural counties. The answers to many of the questions led to more questions and to careful examination of some of the agency's procedures for creating and reviewing the initial inventory data. This exercise made the agency realize the importance of a good area source inventory. As well as explaining South Carolina's review process, this paper examines the findings, the changes South Carolina requested from EPA, and the results those changes have had on the final NATA results.

Introduction

Using 1996 emissions inventory data, the United States Environmental Protection Agency (EPA) created the National Air Toxics Assessment (NATA). Inventory data was derived from several sources, including but not limited to state and local agencies, the Toxics Release Inventory (TRI) and the Emissions Standards Division of EPA. This inventory data served as the input for the ASPEN model to determine ambient air concentration estimates. These ambient air concentration estimates then became the input for the HAPEM4 model to determine the inhalation exposure levels across the country. EPA created a website containing this information in the form of maps and charts. When EPA opened the website for state review and comments, South Carolina assembled a review team consisting of representatives from different areas of the agency that deal with air toxics. The team consisted of representatives from Emissions Inventory, Air Toxics (112(r) and MACT), Toxics Release Inventory (TRI), Air Monitoring Laboratory, Health Hazard Evaluation, and Outreach. Upper Management tasked the group to evaluate the contents of the website and develop a state response for inquiries about the site.

Findings

The group began by evaluating each of the 34 pollutants included in NATA, looking for pollutants that exceeded "1 in a million cancer risk" and "10 in a million cancer risk" and their associated counties. The following summarizes the findings:

Counties exceeding "1 in a million cancer risk"
Greenville (11 pollutants)
Richland (10 pollutants)
Spartanburg (10 pollutants)
York (10 pollutants)
Aiken (9 pollutants)
Anderson (9 pollutants)
Berkeley (9 pollutants)
Charleston (9 pollutants)
Cherokee (9 pollutants)
Lexington (9 pollutants)
Sumter (9 pollutants)
Dillon (8 pollutants)
Dorchester (8 pollutants)
Pickens (8 pollutants)
Hampton (7 pollutants)
Lancaster (7 pollutants)
Marlboro (7 pollutants)
Oconee (7 pollutants)
All other counties (6 pollutants)

Pollutants exceeding "1 in a million cancer risk"
Acetaldehyde (8 counties)
Benzene (all counties)
Chloroform (all counties)
Chromium Compounds (13 counties)
Ethylene Dibromide (all counties)
Ethylene Dichloride (all counties)
Formaldehyde (all counties)
Perchloroethylene (2 counties)
Polycyclic Organic Compounds (POMs) (17 counties)
1,3 Butadiene (11 counties)
Carbon Tetrachloride (all counties)

Pollutants exceeding "10 in a million" cancer risk
Benzene (Greenville & Richland Counties)
Formaldehyde (Greenville, Richland, and York Counties)
Carbon Tetrachloride (all counties)

Counties Exceeding Reference concentration (hazard quotient >1.0)
Acrolein (all counties)

The group then examined each pollutant to determine which types of sources might be causing the high levels. Mobile source emissions were correctly located in the expected counties. Background concentrations were found to be the major contributors for several of the other pollutants. The group examined the remaining pollutants, looking for source categories contributing to those specific pollutants.

Actions

The group identified municipal solid waste (MSW) landfills, public owned treatment works (POTWs), and drycleaners as sources included in the area source inventory that could be contributors and sources for which better estimates could be developed quickly and relatively easily. A list of MSW landfills was forwarded to the contractor developing the inventory data. For the 1996 inventory, locations of the landfills were verified and corrected. For the 1999 inventory, several landfills will have point source inventories created by the state. The others will at least use the corrected location data with EPA created estimates. For the POTWs, the state sent a list including sizes and locations to ensure appropriate distribution of these sources across the state. These sources were moved to the point source inventory for South Carolina for the 1999 inventory as well. For drycleaners, purchase records were sent to EPA for use in the 1999 inventory. Time and funds restricted their inclusion in the 1996 inventory.

Conclusions

Extensive review of state inventory data and much discussion with EPA showed the group the major contributions made by area sources to the total inventory. Emissions Inventory staff identified several source categories worthy of more data development. Staff members are developing point source estimates for some of these categories such as landfills and Public Owned Treatment Works (POTWs) to be used in the 1999 inventory and subsequently the 1999 version of NATA. Other staff are also developing better activity data for the remaining area source categories. The group was unable to determine the effects the changes had on the overall NATA project since changes were also made to the models at the same time.