Products of Phase V Data Analysis

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Products of this Data Analysis

- Air Toxics Data Analysis Workbook (working draft version 1)
- Maps!
- Trends!
- Google Earth layers
- Analysis compilation
- National concentration ranges
- Air toxics uncertainty estimates for source apportionment
- Updated air toxics database

Air Toxics Data Analysis Workbook

- The workbook documents methodology used in national-scale analyses, extends these methodologies to local-scale analyses, and suggests methodology for further exploration.
- Examples are provided from the national-scale analyses and some analyses were custom-designed for the workbook.
- A list of prescribed air toxics data analyses is also included to provide direction on those analyses that should be performed by air toxics monitoring agencies. This list is a proposed minimum set of analyses to help analysts understand air toxics concentrations. There are several key areas of interest:
  - Are data of sufficient quality for analysis?
  - How would air toxics be characterized in the area?
  - What are local sources of air toxics?
  - Do air toxics concentrations change over time?

Workbook Content Summary

Introduction

Brief overview of the workbook and its motivation.

Definitions and acronyms

Background

Summary of air toxics information to provide a basis for the analyst regarding emissions, formation, transport, and sampling/analysis of air toxics.

Preparing data for analysis

Methods and examples for validating air toxics data and preparing daily, quarterly, and annual averages.

Characterizing air toxics

Methods and examples of characterizing air toxics concentrations including spatial patterns, relationships, and time of day/seasonal variations.

Quantifying trends in air toxics

Methods and examples for preparing data for inter-annual trend analyses, identifying and quantifying trends, and tying these trends to changes in emissions.

Advanced data analysis techniques

Brief overview of advanced methods for data analysis including source apportionment.

Prescribed analyses

Summary of basic set of analyses that should be performed with air toxics at a local, state, and regional level to better understand the data and inform policy makers.

Maps

To facilitate exploration of air toxics measurements among sites, maps of the following data will be made available for all pollutants for the coterminous U.S.

- Concentrations
- MDLs
- Risk-weighted concentrations
- Hazard-weighted concentrations
- Trends (% change per year)

Trends

Trends in annual average concentrations are available for all sites with 5+ years of monitoring data in the United States

- Data are available in summary form or in all their gory detail
- Individual pollutant trends are available in spreadsheets
- Trends are available for multiple time periods
  - Trend periods for 1990-2006, 1995-2006, 2000-2006
  - Any trend of at least five years
- Trends are available using two selection criteria
  - Unique site and method
  - Unique site (method can float between years)

Google Earth

Air toxics sites from 2003-2005 were added to a Google Earth layer file

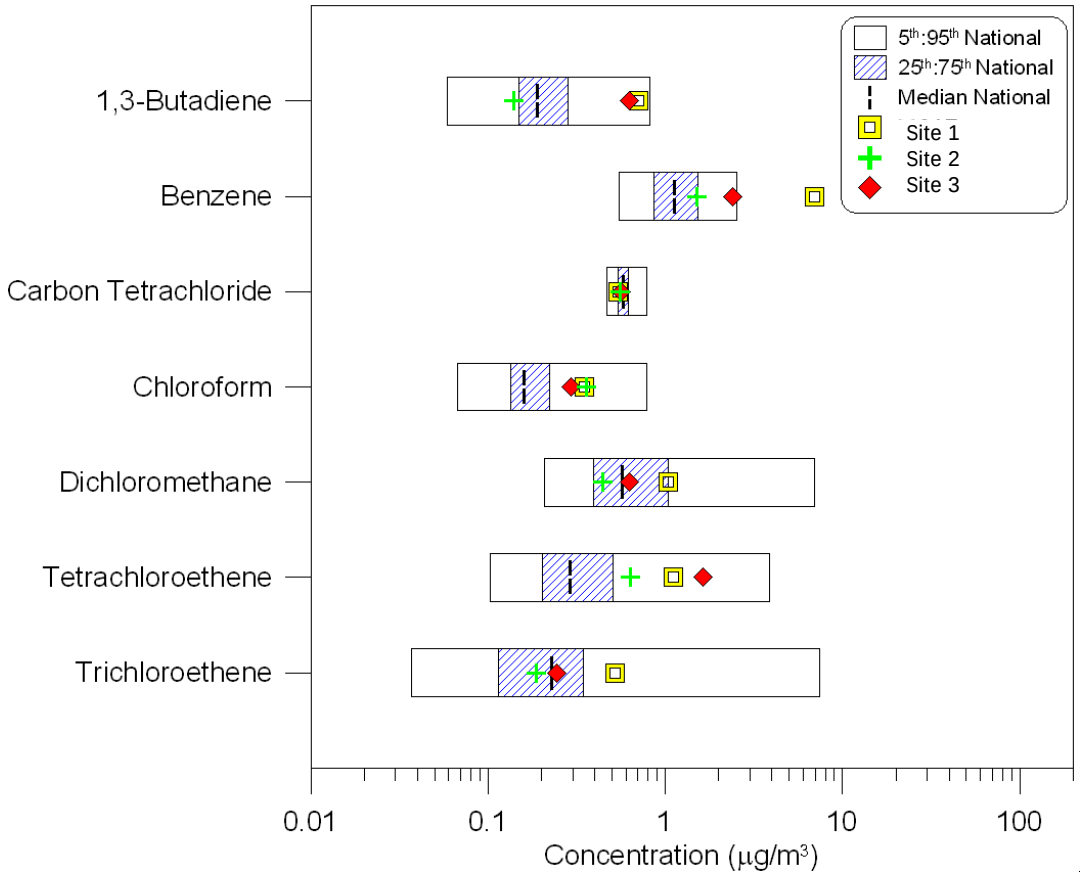
- Toxics monitors were grouped into four pollutant categories
  - VOCs
  - Carbonyls
  - Metals
  - SVOCs
- Clicking on a site reveals the list of air toxics monitored by site and method during the time period
- Available upon request from James Hemby, EPA OAQPS

National Concentration Distributions

One of the key methods for understanding concentrations is to be able to compare to other areas. If all sites in the U.S. are above the 10^{-6} benchmark for benzene, additional information about relative levels can be important for assessing the magnitude of a local problem.

National concentration distributions are available in spreadsheet and graphical formats upon request for all air toxics with data from 2003-2005.

An example figure comparing concentrations at three sites from the same urban area to national concentration distributions is shown here.



Air Toxics Uncertainty Estimates

- Some source apportionment techniques require uncertainty estimates for 24-hr measurements of toxics (e.g., positive matrix factorization, chemical mass balance model).
  - Uncertainty estimates for individual air toxics samples are rarely reported to AQS.
  - Precision and accuracy data are available for some toxics that can be used to estimate uncertainties.
- A technical memorandum is available that provides uncertainty estimates for air toxics based on the available data. These estimates can be used when individual estimates for the data of interest are not available.

Data Analysis Compilation

Interested in any particular study or analysis we've shown today? Need or want to see the details, approach, or methodology?

- All results from Phase V analysis will be available in a documented binder compilation
- Contact James Hemby at EPA for details

Air Toxics Database

- Multiple air toxics summary data tables are available
  - Daily averages
  - Monthly averages
  - Quarterly averages
  - Annual averages
- Data will be provided as text files that can be imported into database software of your choice.