Ambient Data Analysis: Overview

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Session Objectives

- Meet each other
- For the non-analysts in the audience:
  - Introduce data analysis concepts
  - Stimulate your interest
  - Help you converse with your own analysts
- For the analysts in the audience:
  - Share a few analytical approaches and data products that may not yet be familiar to you
  - Find out how far you are in developing a conceptual model for your area and supporting it via data analysis
- Answer your questions on anything related to data analysis, time permitting

What are the goals of air quality data analysis?

- The goals at this stage (before writing down a conceptual model or doing air quality modeling):
  - To gain insight on what's happening with air pollution in your focus area
    - What's the problem?
    - What's causing the problem?
  - Also, to appreciate the uncertainties within the data and in conclusions formed from the data, and whether and how they could be reduced (if this is possible)
- Later, another goal will be to validate/improve your air quality modeling platform

Questions to investigate, more detailed

- What data resources are available?
- Which way does the wind blow, and when?
- How high are concentrations at the monitors?
- How do concentrations vary by location and time? Do they vary together?
- What is the composition of the PM?
- Do different pollutants have common sources?
- What are the common and non-common sources? Where are they?
- Are the answers different in different seasons?
- Was the year under study typical or atypical?
- What can be inferred about locations without monitors?

Many types of data and ready-to-wear data products are available

- Routine air monitoring data – yours, ours, and others'
  - PM2.5 mass and species, PM10, ozone, HAPs, other gases, wet deposition, etc.
  - Archived PM filters
  - Important to ask about and understand the "meta data"!
  - Multiple websites are available to help summarize and visualize the data, before using a spreadsheet or statistical software on your own
- Meteorological data
  - National Weather Service (complete met); OAQPS keeps a "most used variables" data set current which could be shared.
  - At NCORE and other monitoring sites (limited met)
- Emission inventory data
  - Point sources and county totals: tables and visualizations
  - Gridded versions, with as much detail as you can handle
- Census data, traffic estimates, land use types, etc.
- EPA-prepared nation-wide estimates of concentrations:
  - NATA for HAPs
  - CDC PHASE for ozone and PM2.5
  - Predictions of future-year ozone and PM2.5, from national rule projects

Many types of local analysis can shed light on the detailed questions

- Cross-pollutant correlations
- Temporal patterns
- Spatial interpolation of air concentrations
- Model/monitor data fusion
- Trajectories
- Emissions summaries and visual displays
- Drilling down through NATA outputs
- Meteorological “normalization” of AQ trends
- Wind and pollution roses
- Non-parametric regression to identify source areas
- Source-receptor modeling to identify source types
- Urban increments
- Land use regression modeling
- Air quality modeling
  - Gridded
  - Dispersion
  - Hybrid

Session Plan

- 3 Presentations
  - Getting to the data and to pictures of the data
    - David Mintz, OAQPS
  - Source Apportionment: Baltimore Example
    - Ellen Baldridge, OAQPS
  - Data Analysis for MP Planning (including non-parametric regression)
    - Donna Kenski, LADCO/MRPO
- Panel discussion, including more OAQPS practitioners: Q&A