Interim Results Briefing

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Three Projects

- Exploratory Analysis of PM Fine Organic Carbon & Gaseous Volatile Organic Compound Data.
- Assessing Urban Growth Land Use Patterns and Air Quality Trends in the Phoenix and Raleigh-Durham Metropolitan Areas. (*A study in Raleigh-Durham, NC and Phoenix, AZ – Does more growth mean more air pollution?)*
- Examine the Guidance for Statistical Evaluation of Hazardous Waste Constituent Levels in Soils. (*How Do We Define a Toxic Dump Site?)*

Exploratory Analysis of PM Fine Organic Carbon & Gaseous Volatile Organic Compound Data.

Jay Riley, David Dail and Doug Hayden

- Describe the PM fine organic carbon air pollution issue.
  - Why do we care? Possible carcinogens?
  - What volatile organic compounds best explain PM fine organic carbon?
- Data sets in four cities are being examined.
- Questions for clients:
  - Which olefins should we target?
  - Which paraffin's should we target?

Initial Scatter Plots

- *Scatter plots of PM fine organic carbon measurements versus total PM fine measurements.*
  - *Is there a relationship?*
  - *How does it vary by site?*
- *Show the scatter plots of daily VOC indicators with daily PM fine organic carbon measurements.*
  - *Is there a relationship?*
  - *Try different daily VOC indicators (24 hour average, 6 to 9 a.m. average, etc.)*

Initial Scatter Plots

- *For the New York site with hourly PM fine data show the scatter plots between various hourly VOC's and hourly PM fine data.*
  - *Are there relationships?*

Future Analysis

- *Apply regression analysis to see if there is a relationship between VOC's and PM fine organic carbon measurements .*
  - *Are PM fine organics more likely to be associated with aromatic VOC's with 8 or more carbons (styrene; m/p xylene; o-xylene; toluene; ethylbenzene; n-propylbenzene; 1,2,4-trimethylbenzene and1,3,5 – trimethylbenzene?*
  - *Introduce meteorology measurements into the regression analyses.*

Assessing Urban Growth Land Use Patterns and Air Quality Trends in the Phoenix and Raleigh-Durham Metropolitan Areas.

Caleb Rowe and Valerie Harris

- *Describe the problem.*
  - *Does increased land use development and population result in poorer air quality?*
- *Describe the data base*

Initial Scatter Plots

- *Look at pollutant indicators versus time.*
  - *Plot sites individually or multiple sites for same pollutant on same graph. What do they show?*
- *Conduct special analysis of particulate matter – what are the ratios of PM10 to TSP and PM fine to PM10?*
  - *These ratios are needed to present a trend line for PM for the twenty-year period (1982-2001).*
  - *Convert everything to PM fine.*
- *Look at scatter plots of pollutant indicators versus urbanization indicators.*
  - *What years of air pollution data do you pair with urban indicators? One year or more?*

Questions for Clients

- *A question on developing PM fine to PM10, PM10 to TSP and PM fine to TSP ratios*
  - *Can they provide us with one or more references? (Use this question with EPA (RTP).*
- *A question regarding historical data completeness criteria.*
  - *What percent of the annual or seasonal data data should we require (50%?) (Use this question with EPA (RTP).*
- *Other Questions? On Urbanized indicators?*

Future Analyses

- ***Apply regression analysis to the trend lines (pollution levels as a function of time)***
- ***Develop regression models to predict pollutant trends as a function of urbanization and time.***
- ***Look at alternative trend approaches – i.e. the trend in the maximum site.***

Examine the Guidance for Statistical Evaluation of Hazardous Waste Constituent Levels in Soils

Gary Beecham, Jane Eslinger & Christine Finger

- Describe the problem.
- How well does the proposed statistical test work?
- Objective: Use Monte Carlo Methods to evaluate statistical test in Guidance and propose alternative tests if appropriate.
- Data set
  - Describe the Coast Guard “Background” Data Set
  - Will focus on 8 trace metal pollutants?
  - Measurements at two depths
  - Are the data normally distributed?
  - How do we deal with outliers?

Initial Scatter Plots

- *Show box plots for each chemical at each depth.*
- *Look at the distributions of arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver.*
  - *Remember measurements are taken at 2 depths (one to 2 feet and 5 to 6 feet). Why? Factor this into your examination of the distributions of these chemicals.*
  - *Are the measurements taken at the two depths statistically different?*
  - *Focus on selected pollutants – i.e. lead*

Questions for clients

- *Focus on outliers*
- *Same data for two different pollutants.*
- *How should we handle outliers?*
  - *Discuss on one by one basis.*

Initial Scatter Plots

- *Discuss Monte Carlo Method*
  - *Discuss approach – compared different sampling sizes with ability to detect different degrees of contamination.*
- *Show initial table – exceed test?*

Future Analyses

- *Conduct Monte Carlo Simulations varying the sample size.*
- *Will create "confirmation" (contaminated) data sets, which are 10, 30, 50,100 and 150 percent higher than background.*
- *How well can we detect a shift in the contaminated waste site? What are the trade offs between reduced sampling and our ability to detect a shift in the mean of the data away from background?*
- *Provide a technical paper with options including alternative statistical tests to deal with problem.*