HEI's RIOPA and Other Air Quality Databases

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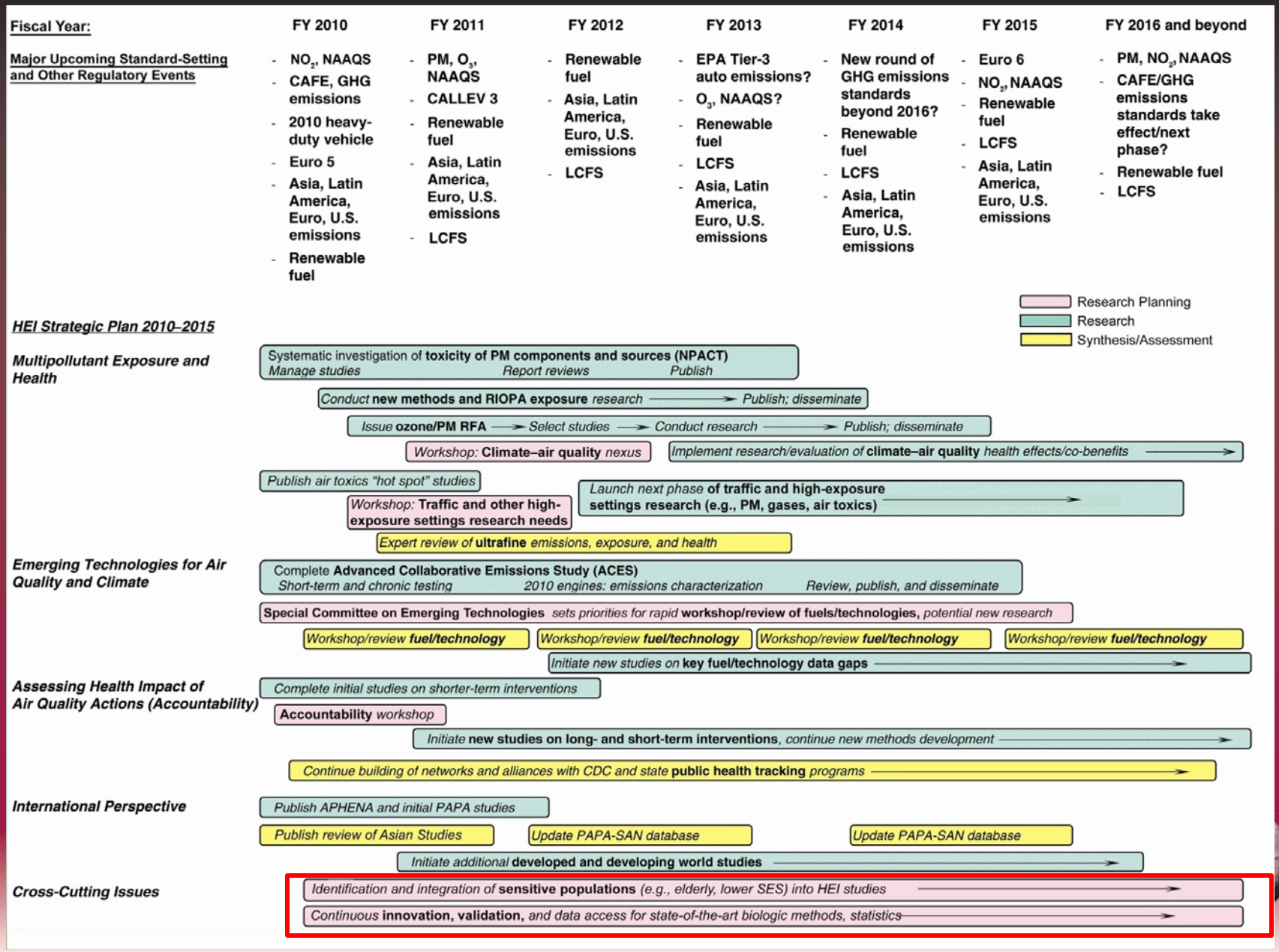
Health Effects Institute

The HEI Strategic Plan – 2010 - 2015



Cross-Cutting Issues in HEI Research

- Sensitive Populations
- Innovation and Validation:
  - Enhanced Statistical Techniques
  - New Methods for Toxicity Testing
  - New Biomarkers
  - Increasing Access to High Quality Air Pollution Data: Three Web-based Databases
    - Air Quality Databases
    - RIOPA Databases
    - iHAPSS Database

HEI Databases

- HEI Policy on Data Access "…… *it is the policy of the Health Effects Institute to provide access expeditiously to data for studies that it has funded and to provide that data in a manner that facilitates review and validation of the work* but also protects the confidentiality of any subjects who may have participated in the study and respects the intellectual interests of the investigator in the work."

- HEI has developed publicly-accessible databases:
  - Where underlying data can be made public
  - Information would be of wide interest in the scientific community
  - Where HEI development or support can make the database more accessible and user friendly

HEI Air Quality Database*

Sources of Raw Data:

- EPA's AQS Particulate Matter Air Quality Data Station Meta Data
- NEI $PM_{2.5}$ Emission Inventory Data
- Census Population Data
- EPA's AQS Particulate Matter Air Quality Data
- EPA's AQS Gaseous Air Quality Data
- Meteorological Data

- Goal: Provide a user-friendly portal for all these data
- Updated every six months
- HEI has more flexibility in selecting data sources and data presentation

* Site Maintained by: AER at http//hei.aer.com;

For access: contact hei@aer.com

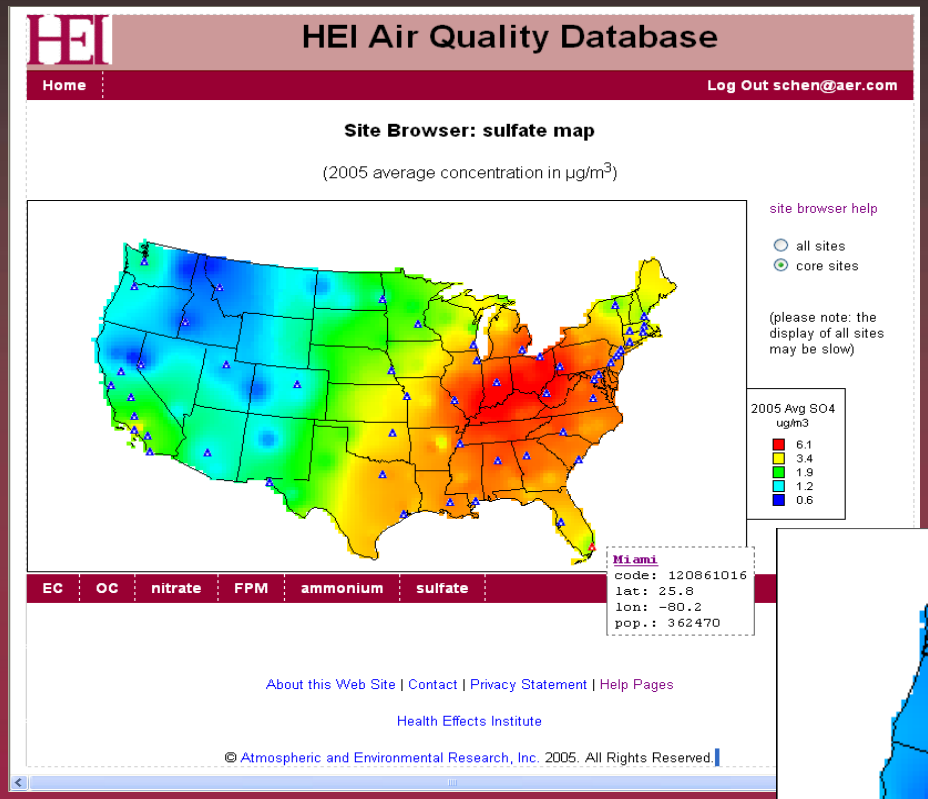
Version 1.8, Released November 2010

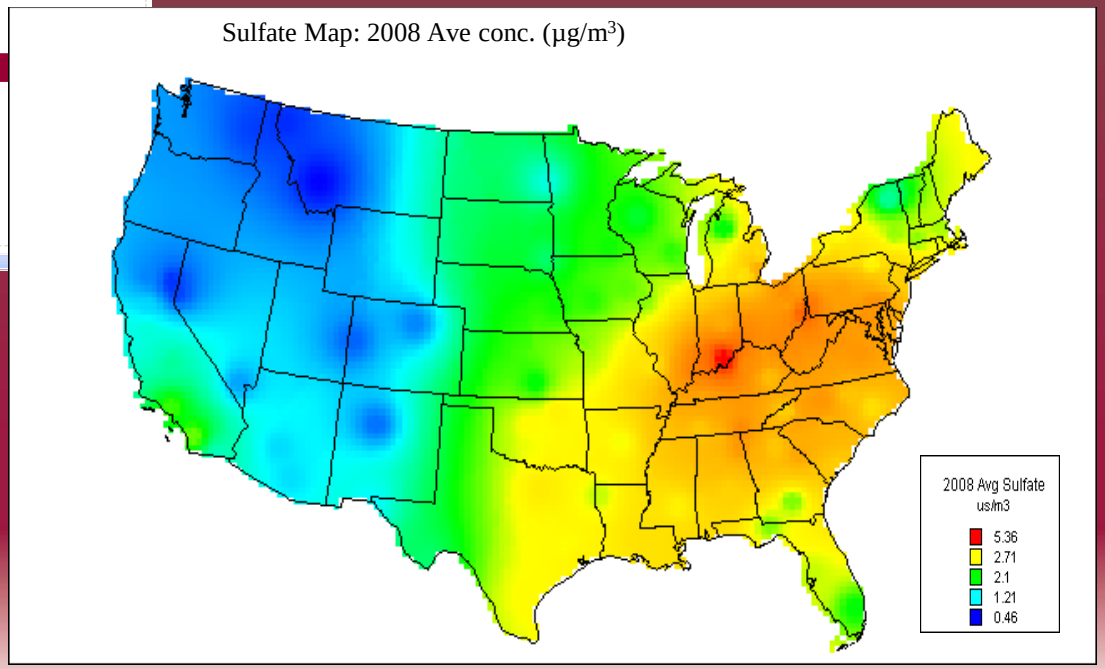
Available Data

- Speciated PM measurements from the EPA's AQS Database
  - $PM_{2.5}$ mass
  - Ions: sulfate, nitrate, ammonium
  - Carbon: elemental and organic
  - Many metals
- Meteorology data from both EPA's AQS Database and the National Climatic Data Center (NCDC)
- Gases : SO_2, O_3, NO_x, CO
- Census population data
- Emission estimates from EPA's National Emissions Inventory (NEI)

- Includes detailed and useful description of data sources, collection methods, analytical procedures, etc.

Searching for information



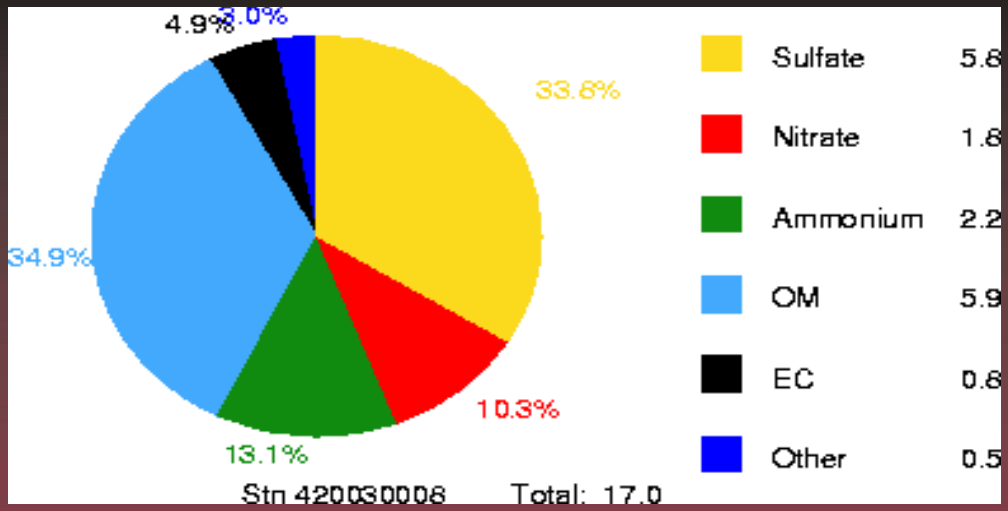


-- "Cursor-over" feature

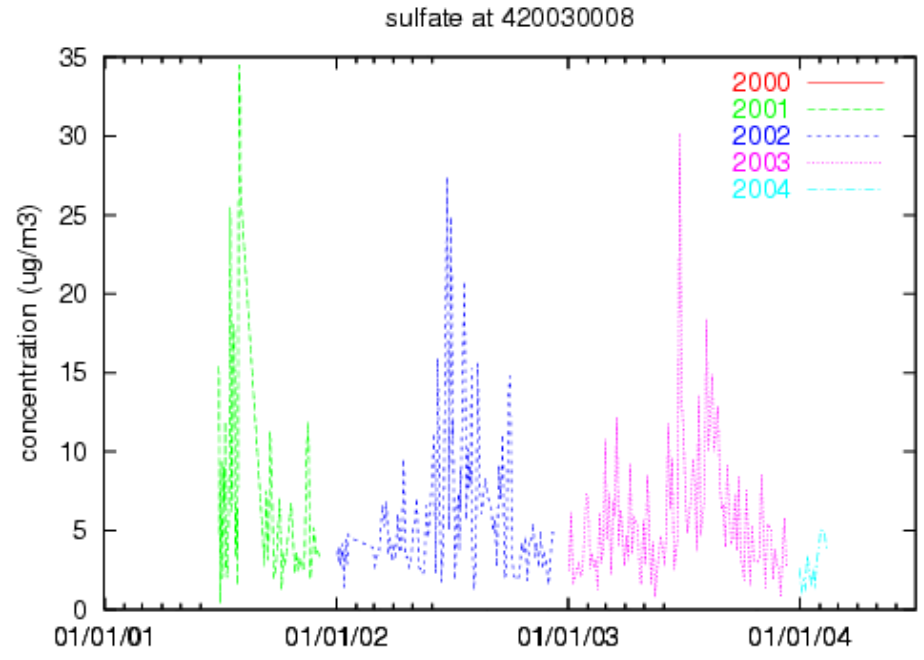
-- Bottom: select pollutant

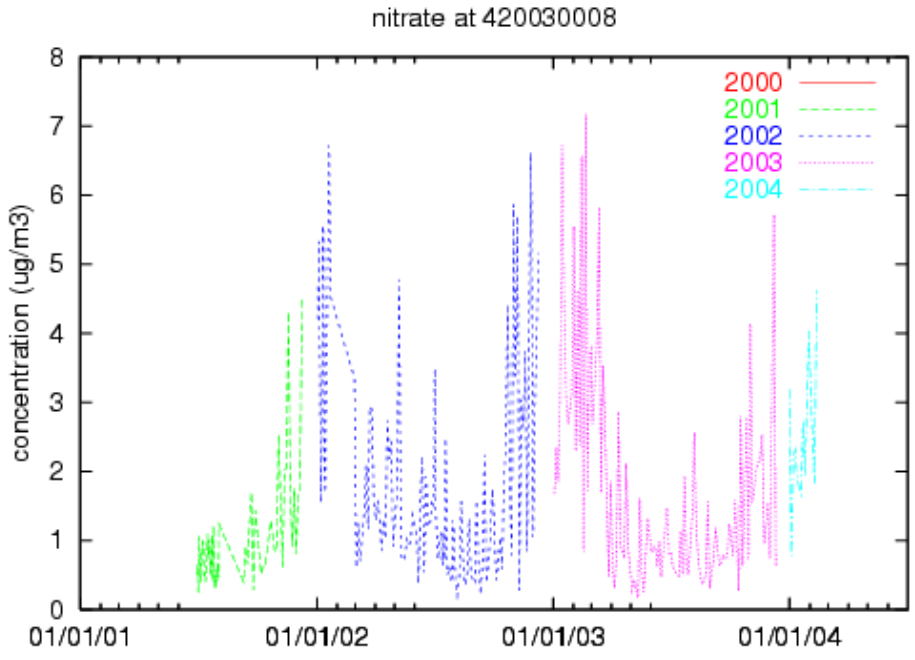
Click on Site to See Summary Graphics

- Pie chart

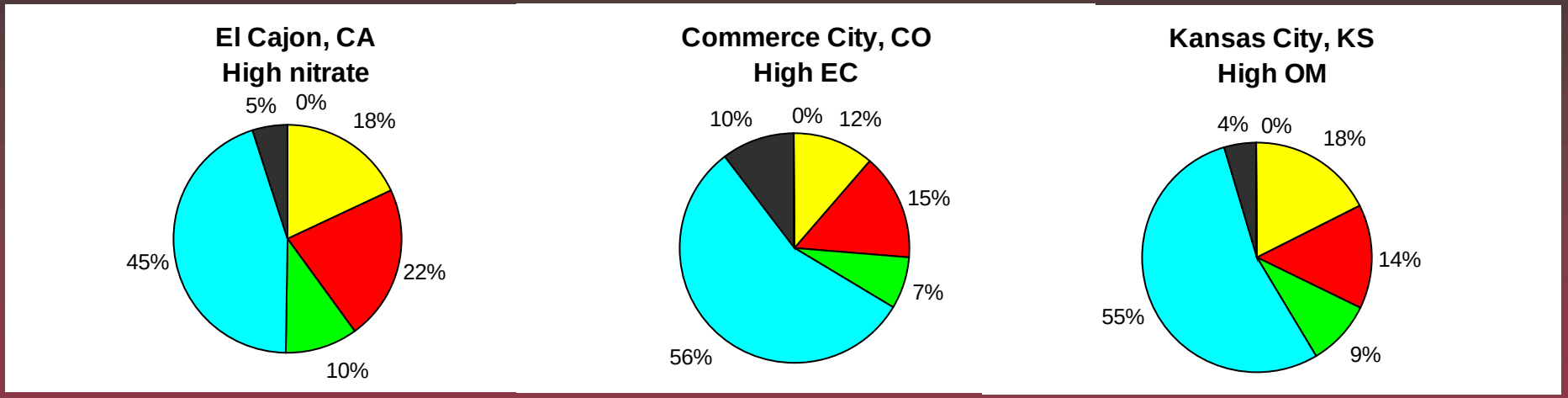


- Longitudinal





PM Composition Varies Among Cities



The RIOPA Data

- Relationships between indoor, outdoor, and personal air (RIOPA)
- Pollutant measurements:
  - Indoor, Outdoor and Personal Sampling
  - Three urban centers, 100 homes each
    - Elizabeth, NJ: mixture of point, mobile, area & commercial sources near residences
    - Houston, TX: predominantly industrial point sources
    - Los Angeles, CA: predominantly mobile sources
- Co-funded by HEI and NUATRC
- Investigators: Barbara Turpin, Clifford Weisel, et al.
- Results of initial analyses published as HEI Research Report 130 (2005, 2007)
- Web Database maintained by AER; http://riopa.aer.com
- Secure

The RIOPA Database

- **Includes measurements of:**
  - VOCs (18)
  - carbonyl compounds (10)
  - PM2.5 mass and species
  - OC and EC
  - elements (22)
  - PAHs (32) and chlordanes (6) (gas and particle)
  - In-vehicle carbonyls

- **Other data**
  - Household
  - air exchange rates
  - neighborhood / surroundings
  - subject
  - activity

Data recently added to the RIOPA Database

- Traffic flow for nearest highway
- Traffic intensity
- Elevation
- Intensity of development in developed areas
- Wind speed
- Prevailing wind direction

Use of the RIOPA Data

- HEI recently funded two new studies to further analyze the RIOPA data
  - Stuart Batterman, University of Michigan
  - Patrick Ryan, University of Cincinnati
- Many investigators have used this database, resulting in many published articles

The iHAPPS Database

- Contains data and and analytical software from HEI's National Morbidity, Mortality and Air Pollution Study (NMMAPS) – published as HEI Reports and multiple publications from Johns Hopkins group
- Study evaluated associations between air pollutants and morbidity and mortality in 108 US cities from 1987-2000
- Data include multiple pollutants (EPA's AQS Database), meteorological (National Climatic Data Center), and census
- Site found at Dept. of Biostatistics, Johns Hopkins Bloomberg School of Public Health, http://www.ihapss.jhsph.edu/

HEI Annual Conference

- Boston. May 1 – 3, 2011
- Sessions on: how low can NAAQS go; emissions and exposure – with emphasis on remote sensing; long range transport; others
- 40+ posters (HEI and other studies)
- EPA, Auto industry and lot of other scientists

- Contact HEI for more information: www.HealthEffects.org

Pre-Conference Workshop:

The Evolution of Statistical Methods Used to Assess the Health Effects of Air Pollution

- **Assessing Health Effects of Short-Term Exposures to Air Pollution**
  - From Single-City to Multi-City Coordinated Analyses *(F Dominici)*
  - Alternative Models and Approaches *(R Smith)*
- **Assessing Health Effects of Long-Term Exposures to Air Pollution**
  - Impact of Long-Term Exposures to Air Pollution *(A Pope)*
  - Characterizing Exposure Measurement Error *(A Szpiro)*
  - Summary and New Directions *(L Sheppard)*

- **Boston. SUNDAY, MAY 1, 2011, 8:30–11:30 AM**

Thank you!!!

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