

US EPA ARCHIVE DOCUMENT

HEI's RIOPA and Other Air Quality Databases

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Health Effects Institute

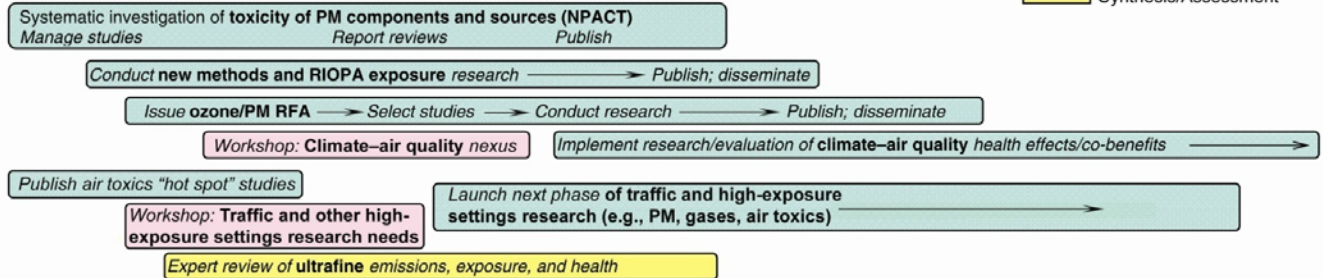


The HEI Strategic Plan – 2010 - 2015

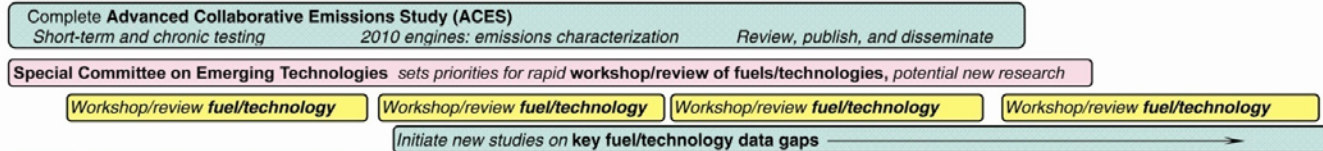
Fiscal Year:	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016 and beyond
Major Upcoming Standard-Setting and Other Regulatory Events	<ul style="list-style-type: none"> - NO₂, NAAQS - CAFE, GHG emissions - 2010 heavy-duty vehicle - Euro 5 - Asia, Latin America, Euro, U.S. emissions - Renewable fuel 	<ul style="list-style-type: none"> - PM, O₃, NAAQS - CALLEV 3 - Renewable fuel - Asia, Latin America, Euro, U.S. emissions - LCFS 	<ul style="list-style-type: none"> - Renewable fuel - Asia, Latin America, Euro, U.S. emissions - LCFS 	<ul style="list-style-type: none"> - EPA Tier-3 auto emissions? - O₃, NAAQS? - Renewable fuel - LCFS - Asia, Latin America, Euro, U.S. emissions 	<ul style="list-style-type: none"> - New round of GHG emissions standards beyond 2016? - Renewable fuel - LCFS - Asia, Latin America, Euro, U.S. emissions 	<ul style="list-style-type: none"> - Euro 6 - NO₂, NAAQS - Renewable fuel - LCFS - Asia, Latin America, Euro, U.S. emissions 	<ul style="list-style-type: none"> - PM, NO₂, NAAQS - CAFE/GHG emissions standards take effect/next phase? - Renewable fuel - LCFS

HEI Strategic Plan 2010–2015

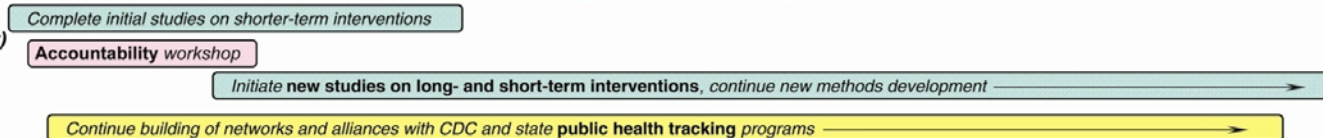
Multipollutant Exposure and Health



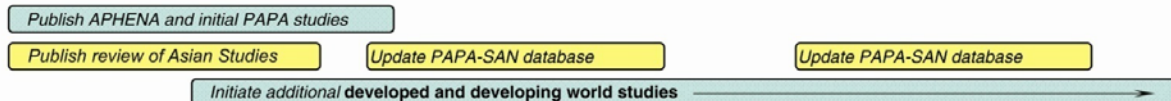
Emerging Technologies for Air Quality and Climate



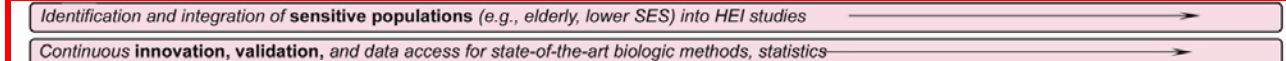
Assessing Health Impact of Air Quality Actions (Accountability)



International Perspective



Cross-Cutting Issues



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 : SO₂, O₃, 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.

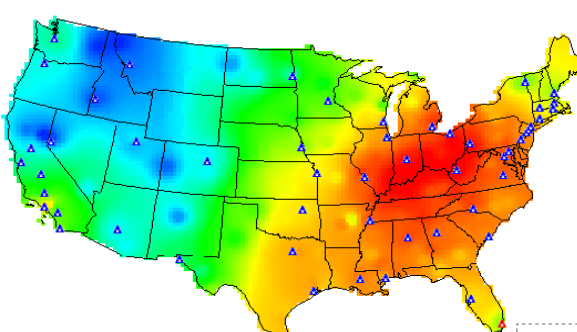


Searching for information

HEI HEI Air Quality Database

Home Log Out schen@aer.com

Site Browser: sulfate map
(2005 average concentration in $\mu\text{g}/\text{m}^3$)



site browser help

- all sites
- core sites

(please note: the display of all sites may be slow)

2005 Avg SO4 $\mu\text{g}/\text{m}^3$

6.1
3.4
1.9
1.2
0.6

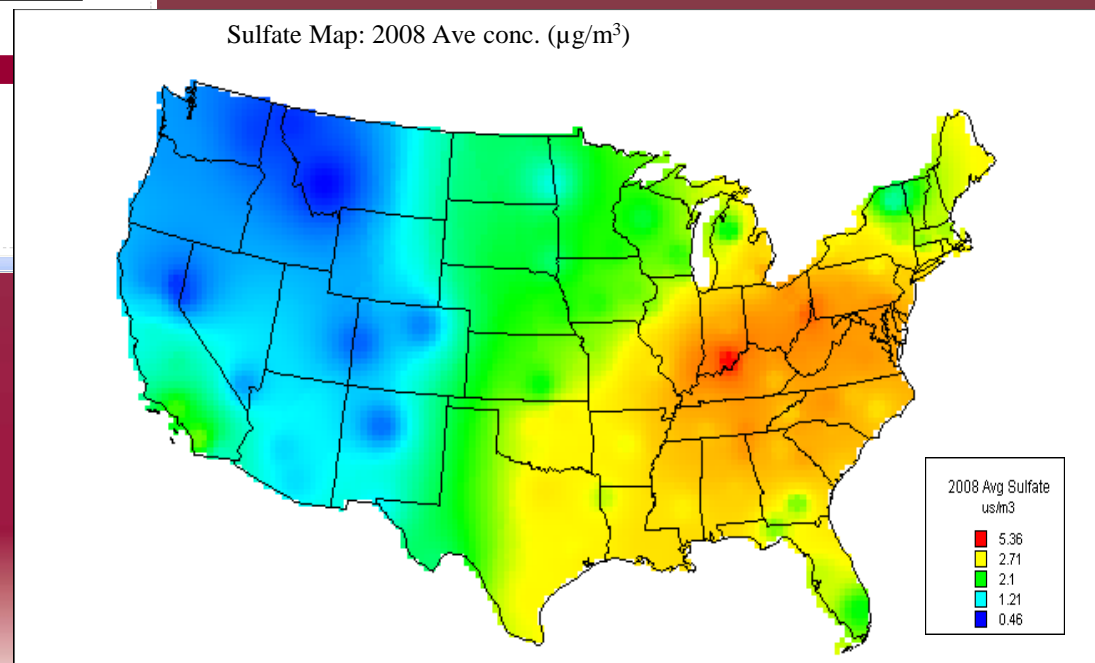
EC OC nitrate FPM ammonium sulfate

Miami
code: 120061016
lat: 25.8
lon: -80.2
pop.: 362470

About this Web Site | Contact | Privacy Statement | Help Pages

Health Effects Institute

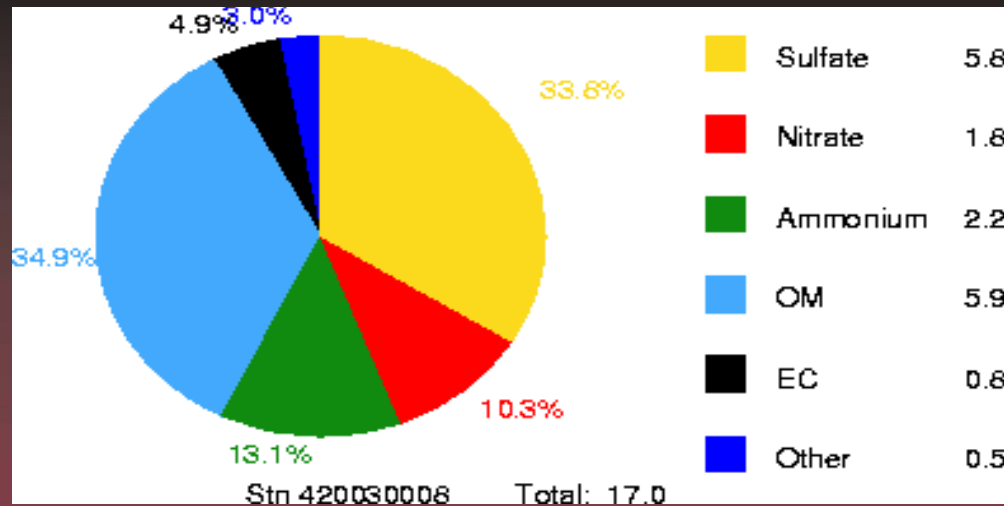
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- "Cursor-over" feature
- Bottom: select pollutant

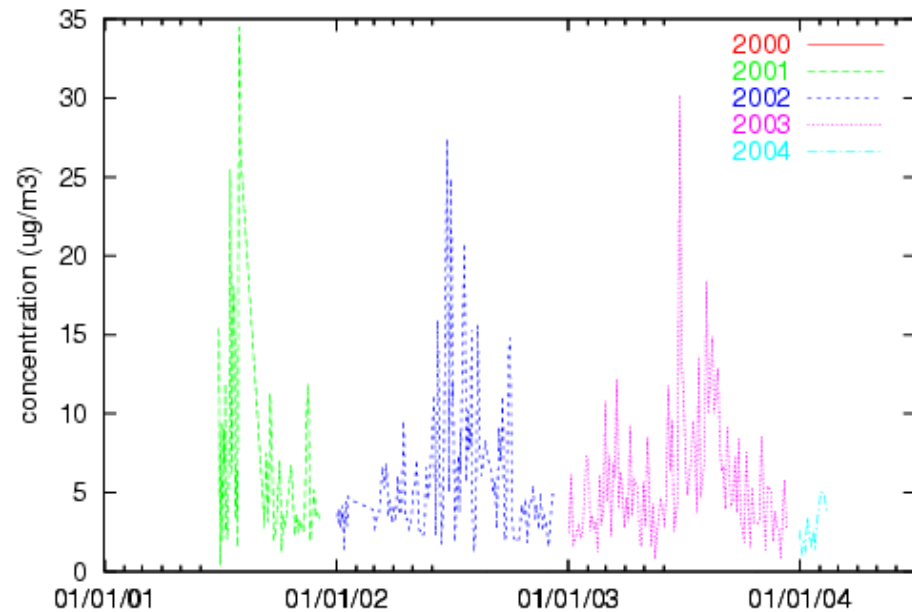
Click on Site to See Summary Graphics

- Pie chart

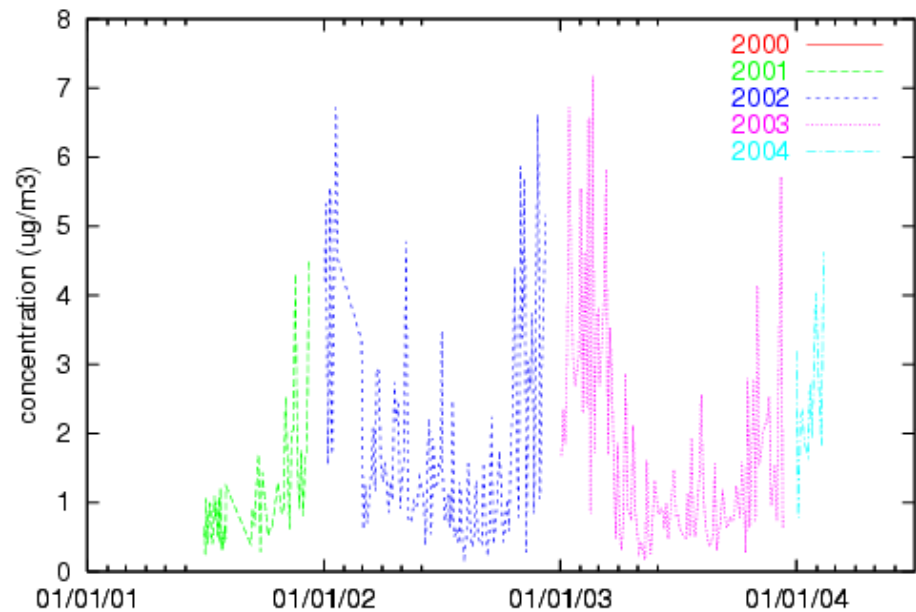


- Longitudinal

sulfate at 420030008

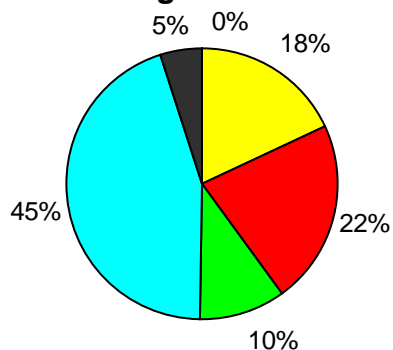


nitrate at 420030008

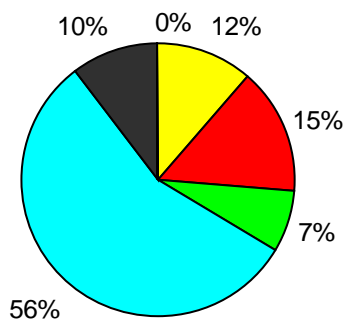


PM Composition Varies Among Cities

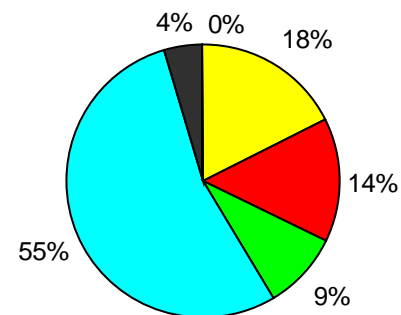
El Cajon, CA
High nitrate



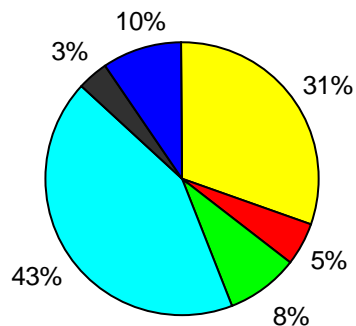
Commerce City, CO
High EC



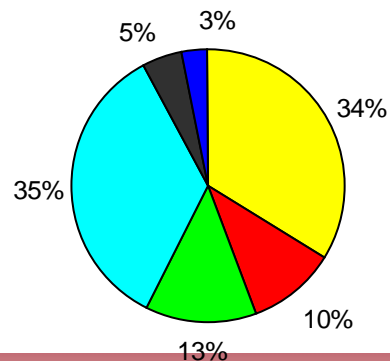
Kansas City, KS
High OM



Gulfport, MS
High acidity



Pittsburgh, PA
High sulfate



- Sulfate
- Nitrate
- Ammonium
- OM
- EC
- Other



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 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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www.HealthEffects.org