CLEANER Workshop 2: Report of Breakout Group on Major Airsheds

Question 1: Examples of important research questions related to river basins that could not be addressed (or not addressed satisfactorily) unless you had an EFF.

How to define regions?
Distributed over cities, rural?
Review of data sources, we have
Sink – washout of pollutants
Deposition
Visibility
CO₂, CO for North America, 10 sites ➔ DOE, NOAA, NASA

Carbon cycle, effects of fossil fuels, effects of transportation, and other unintended policy outcomes

Understand dynamics of C, N, S, Hg in human environments
Improving the database ➔ fossil fuels ➔ CO₂, NOₓ, SOₓ, Hg
  a) regional (east)
  b) Sinks/reactions

Long-distance sources versus local sources
Emission-sensitive receptors
Who generates pollutants and where pollution comes from
Urbanization
Network of 50+ states

Suggestion: an integration approach ➔ emissions (modeling, monitoring) ➔ transport/modeling ➔ sinks/deposition

Global ➔ Regional ➔ Local
Dynamics
Filling in gaps to allow for enhancement of data being collected by the EPA, to allow for comparison, and to have the EFF be associated with enhancement of the national network

Question 2: Physical infrastructure needed for an effective EFF.

a) towers
b) balloons
c) new infrared sensor in satellites
d) access to PM10 available
e) Optimizing packages
f) Geographic scale
  a. Air sampling ➔ chemicals control lab
  b. Database
    i. Central facility ➔ META Analysis
    ii. Modeling ➔ distributed
    iii. Remotely piloted aircraft
iv. Aerosol Mass Spec  
v. Commercial Aircraft

Hazardous Air Pollutants  
Homeland Security Implication: Worst Case Scenarios  
Indoor Air

**Scale**  
Continental to regional to local with links to existing networks or planned

**Common Needs**  
Data/reporting/access  
Models  
Data Management Systems  
Land Cover Databases  
Data Layers  
Coupled with Meteorological Initiatives  
Outreach component  
Networking/Outreach  
Common Methods  
Education-Grad Training  
Interesting Science Questions  
Health Implications

**Question 3: Management structure for EFFs.**  
Associated with other EFFs  
Linked to relevant Federal Agencies: EPA, NOAA, DOE and states  
Central Database/Virtual Access  
Networked similar to NEES  
Whole greater than the sum of parts  
What to do/Why?

**Question 4: Organization and structural elements for effective collaboration across disciplines and universities**  
Network Office  
Ex. Committees ➔ representatives/partner  
Director ➔ P.I. (coordination)  
Adaptable – research questions  
Post-Docs  
Visiting Faculty  
Proposals ➔ to use facilities  
Partnerships ➔ EPA, LTER, USGS, NOAA, NIEHS, CDC  
Linkages to promote info Exchange  
Data Critical  
Strong links to other EFF’s  
Data Repository  
E.E. Science/Board
Further Questions:

*Question 1:* How should EFFs be linked to promote information exchange and enhance interdependency among systems and regions?

*Question 2:* What infrastructure would provide for rapid assessment of research needs? Should planning grants be used to better define EFFs before full-scale development?

- Building linkages ➔ regional campaigns
- META ➔ Archive
- Tell you where to get data or give data
- System Integration/Information Technology

*Question 3:* How can the networked EFF infrastructure be used to articulate science, engineering and policy alternatives?

- CO₂ ➔ geo-sequestration
- How to use better science coordination ➔ states
- Regional transport
- Increase domain of study
- Ammonia, fine particulates, Hg, Multimedia effects, cost analysis

*Question 4:* Extent (and how) should data collection and quality assurance protocols be standardized to improve data comparability among EFFs.

- Very Important-critical
- Setting up data reporting protocols
- SOP

*Question 5:* Role of modeling in experimental design/analysis and integration of information within and among EFFs

- At the core of Air EFF
- Forecasting

*Question 6:* EFF activities in relation to education at various levels and community outreach programs.

- A given, based on NSF Criteria 2
- Training-graduate/undergraduate
- K-12 Outreach
- Community outreach