Air Quality Characterization for Environmental Health Tracking

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4. Centers for Disease Control; 5. NASA, Langley Research Center

EPA Science Forum 2004
Healthy Communities and Ecosystems

Linking Air Quality and Public Health?

Do different air quality characterization methods improve capabilities for environmental public health tracking?
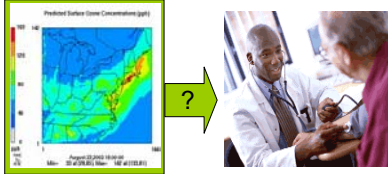
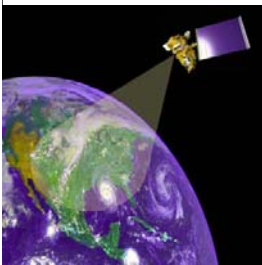

Sources of Air Quality Characterization Data

Ambient Air Monitoring

- True measure of air quality
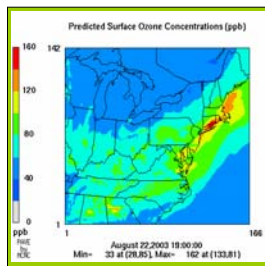- Spatial and Temporal Gaps
- Routinely available information

Satellite Data

- Emerging source of data
- Spatial and Temporal Gaps
- Routinely available data

Air Quality Modeling

- Estimate of air quality
- Good spatial and temporal coverage
- Air Quality Forecasting
 - Emerging source of routine data

Air Quality Information is Improving

Redesigning the Nation's Air Quality Networks

- Reduce redundant, "low-value" monitors
- Realign resources to address current or emerging priorities
- Multi-pollutant and real time measurements
- Integration and leveraging among monitoring programs

The use of Satellite Aerosol Optical Depth
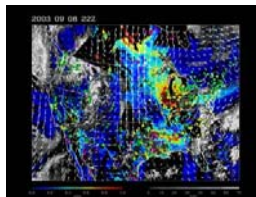
MODIS AOD captures spatial extent of large scale aerosol events during cloud free conditions (US EPA, 2003, Kittaka, C. 2004, and Engel-Cox, J. et al. 2004).

Air Quality Forecasting

NOAA-EPA Air Quality Forecasting applications will generate routinely available air quality modeling data for public health applications
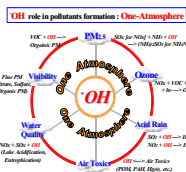
Progress in related science and technology

Combining Data Sources

New statistical techniques "combine" ambient monitoring and emerging sources of data (e.g., satellite and modeling output)
- Capitalize on the strengths of each data source
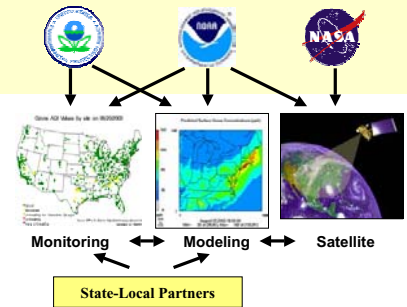- Improved measures of spatial and temporal uncertainty

Atmospheric Science and Technology

We have more complex problems and advanced technology to address these problems.

New Monitors -- Linked to Wireless Networks, Data Systems & Models

Partnerships in Characterization Air Quality

Monitoring ⟷ Modeling ⟷ Satellite

State-Local Partners

Public Health Air Surveillance Evaluation (PHASE) Project

- Joint CDC – EPA Project
- Develop and evaluate alternative air quality characterization methods for environmental public health tracking
  - Air Pollutants
    - Ozone and Particulate Matter
  - Health Endpoints
    - Asthma and Cardiovascular Disease
- Working with 3 CDC State EPHT Partners
  - Maine, New York, Wisconsin

Air Quality Characterization Methods

Monitoring

Modeling

Satellite
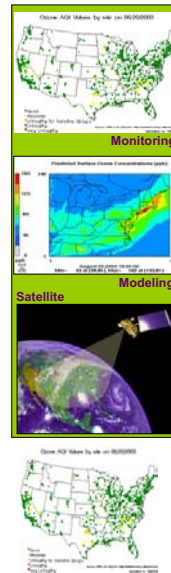
EVALUATION METRICS
- Resource Requirements
- Ease of Use
- Uncertainty
- Spatial and Temporal Coverage
- Correlation with Actual Human Exposure
- Impact on Environmental Public Health Tracking

Combined Data

Science and Innovation to Protect Health and the Environment