The National Air Toxics Assessment

Overview

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Overview

- Context of the assessment
  - Clean Air Act Air Toxics Strategy
  - EPA's Air Toxics Program
  - Focus on NATA
  - Focus on the National-Scale Assessment
  - Charge for Science Advisory Board review
  - Plan for today
1990 Clean Air Act Amendments: Air Toxics Strategy

- **Main principles**
  - First phase: technology-based actions
  - Second phase: risk-based actions to fill gaps left by first phase
- **First phase focused on major stationary sources**
  - Also smaller "area" sources clustered in urban areas
  - Integrated with mobile source regulations and indoor air strategies

The Air Toxics Program

- Designed to characterize, prioritize, and equitably address the serious impacts of hazardous air pollutants on public health and the environment through a strategic combination of:
  - Regulatory approaches
  - Voluntary partnerships
  - Ongoing research and assessments
  - Educational outreach
Components of the Air Toxics Program

- Source-specific standards and sector-based standards (e.g., MACTs, Utilities Study)
- Initiatives to focus on multimedia and cumulative risks (e.g., Great Waters, Mercury initiatives, Urban Air Program)
- Educational outreach
- National air toxics assessments (NATA)

NATA activities are...

...a number of technical support activities designed to provide all parts of EPA's Air Toxics Program with the following quantitative, policy-relevant, and consistent information:
- Emissions inventories
- Monitoring network
- Air quality, exposure, and risk modeling
- Research on effects and assessment tools
NATA encompasses:

- National-scale assessments
- Regional-scale assessments
- Urban-scale assessments
- Local-scale assessments

The 1996 NATA National Scale Assessment

- Emission Inventory Development (NTI; NET VOC; Diesel PM)
- Air Dispersion Modeling (ASPEN)
- Inhalation Exposure Modeling (HAPEM4)
- Dose-Response Assessment
- Risk Assessment/Characterization
- Comparison with Ambient Concentration Monitoring
- Comparison with Personal Monitoring
### Scope of the National-Scale Assessment

- Inhalation exposure only
- Chronic exposures only
- 1996 emissions data
- Indoor sources excluded
- Focuses on average exposures, not individual extremes
- Census tract-level calculations; county-level and higher presentations
- 33 HAPs only

### Scope of the National-Scale Assessment: 33 Pollutants

- acetaldehyde
- acrolein
- acrylonitrile
- arsenic compounds
- benzene
- beryllium compounds
- 1,3-butadiene
- cadmium compounds
- carbon tetrachloride
- chloroform
- chromium compounds
- coke oven emissions
- 1,2-dibromoethane (ethylene dibromide)
- 1,2-dichloropropane (propylene dichloride)
- 1,3-dichloropropene
- ethylene dichloride (1,2-dichloroethane)
- ethylene oxide
- formaldehyde
- hexachlorobenzene
- hydrazine
- lead compounds
- manganese compounds
- mercury compounds
- methylene chloride (dichloromethane)
- nickel compounds
- polychlorinated biphenyls (PCBs)
- polycyclic organic matter (POM)
- quinoline
- 1,1,2,2-tetrachloroethane
- tetrachloroethylene (perchloroethylene)
- trichloroethylene
- vinyl chloride
- diesel particulate matter
The NATA
National Scale Assessment is...

- ...being used to help identify priority air toxics and sources
- ...being used to help identify potential national-scale air toxics problems
- ...being used to help prioritize future data collection and localized modeling efforts
- ...being used to inform air toxics program development
- ...NOT being used to make specific regulatory decisions

Peer Review for the National-Scale Assessment

- National Toxics Inventory (NTI) and modeled ambient concentrations:
  - State/ local government review (July 2000)
- Modeled exposure estimates:
  - State/ local government review (prior to public release).
- AQ model evaluation methods (model:monitor comparison):
  - SAB peer review (spring 2000).
- HAPEM microenvironment factors and assessment methodology:
  - External peer review (spring/summer 2000)
- Risk characterization
  - SAB peer review (spring 2001)
**Important Limitations of the National-Scale Assessment**

- Does not currently include CDDs/ CDFs
- Background levels approximate; need more research
- Model comparison to monitors shows tendency to underpredict; means risks may be underestimated
- Bottom-up uncertainty analysis was not possible
  - Report provides illustration of top-down approach
  - OAQPS is developing a plan for full uncertainty analysis over the next year

**Air Toxics Risk Warehouse, Pre-NATA**

- Small sections illuminated by local studies
- Most of warehouse not visible

Source: *Raiders of the Lost Ark*, Lucasfilm, Ltd. and Paramount Pictures.
Air Toxics Risk Warehouse, post-NATA

- Large sections of warehouse dimly illuminated
- Shows where to shine flashlight

Source: *Raiders of the Lost Ark*, Lucasfilm, Ltd. and Paramount Pictures.

### Important Outcomes of the National-Scale Assessment

- Better overall understanding of part of the air toxics problem
- Improved process for developing and sharing high quality air toxics emission data between EPA and stakeholders
  - First time for such an expansive effort
  - Sets stage for future improvements in databases and knowledge
- Improved sharing of information between EPA, stakeholders, and interested public
**EPA will use the SAB's review of the NATA National-Scale Assessment to...**

- ...shape EPA's risk communication efforts to educate the public about the Air Toxics Program
- ...improve the analysis and presentation of the initial assessment under review
- ...improve the design of future National-Scale Assessments
  - EPA will repeat every three years to track trends
- ...prioritize EPA resources to develop risk assessment tools and information

**Charge for SAB Review**

- **Scope:**
  - Overall approach
  - Each element of the approach
- **Areas of interest:**
  - Use of data
  - Integration of models
  - How to improve individual elements
  - Methods used to summarize and communicate results
  - Consistency with CASAC (diesel PM) and potential for benefits analysis
  - Any other areas of concern to SAB
## Today's EPA Presentations

- Overview of each major component
- Summarize methods; major results
- Discuss limitations/uncertainties in each
- Discuss propagation of uncertainties & variabilities with illustration in risk characterization section
- Brief discussions on presenting results to public and EPA's air toxics research strategy
- Clarifying questions encouraged
- Can engage in more detailed Q&A during charge question discussions