

US EPA ARCHIVE DOCUMENT



EPA's Air, Climate, & Energy Research Program

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Office of Research and Development
Air, Climate, & Energy Research Program





Who and where we are in EPA: an illustration

Office of Research and Development

- Comprises six research programs, including ACE
- Intramural and extramural components
- Funds grants to develop science that enables smart policy design and implementation

Office of Air and Radiation

- Enacts policies that ORD-funded and other science may inform
- OTAQ (located within OAR) regulates air pollution from motor vehicles, engines, and fuel, to protect public health

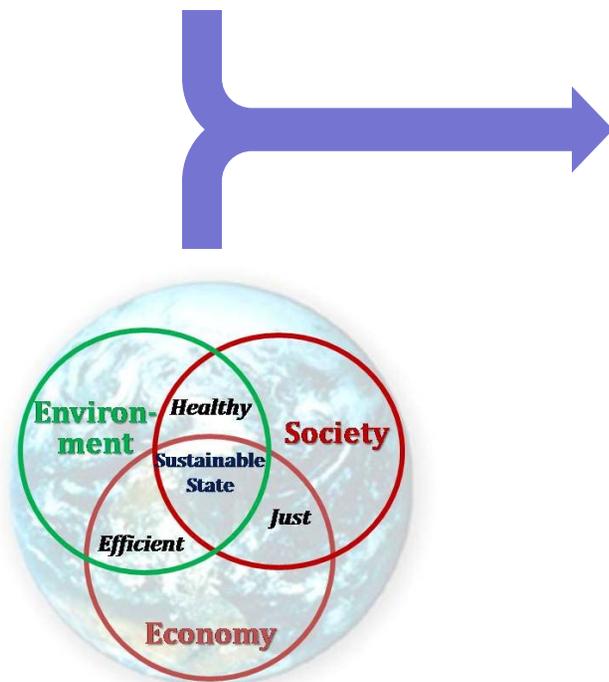


ORD National Research Programs: Building Sustainability and Systems Thinking into EPA Research

Previous ORD Research Programs

- | | |
|----------------------|--------------------------|
| Air | Global |
| Drinking Water | Water Quality |
| Human Health | Ecosystems |
| Mercury | Land |
| Homeland Security | Human Health Risk Assmt |
| Endocrine Disruptors | Safe Pesticides/Products |
| Sustainability | Computational Toxicology |

New ORD Research Programs



Earth Systems



Air
Ambient Air Quality
Pollutant Deposition

Climate
Changes in:
Temperature · Extremes
Precipitation · Sea Level

Exposures to and Effects on:

Ecosystems · Watersheds
Human Health and Communities

Responses
Mitigation
Prevention
Adaptation

Social Factors
Population · Public Health · Economy
Technology · Transportation · Behavior
Water/Food Supply · Land Use Change

Responses
Mitigation
Prevention
Adaptation

Energy
Emissions of Air
Pollutants
and Other Environmental
Stressors

Human Systems

Adapted from IPCC 2007



How ACE responds to policy office research needs

- Administrator Priorities
- OAR AA communications
- OAR topic discussions with staff and science advisor
- ACE programmatic and project reviews
- Science community exchanges
- One-on-one communications
- Unanticipated issues that arise



ACE Research Themes

Theme 1: Assess Impacts

Assess human and ecosystem exposures and effects associated with air pollutants and climate change at individual, community, regional, and global scales



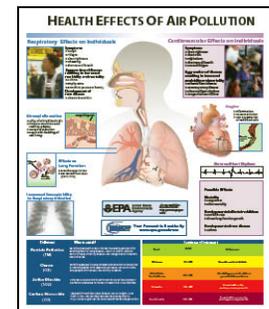
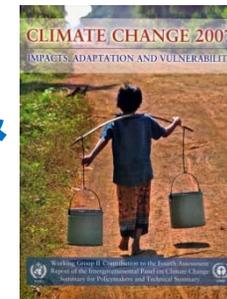
Theme 2: Prevent and Reduce Emissions

Provide data & tools to develop and evaluate approaches to prevent and reduce emissions of pollutants to the atmosphere, particularly environmentally sustainable, cost effective, and innovative multipollutant and sector-based approaches



Theme 3: Respond to Changes in Climate & Air Quality

Provide human exposure and environmental modeling, monitoring, metrics and information needed by individuals, communities, and governmental agencies to adapt to the impacts of climate change and make informed public health decisions regarding air quality





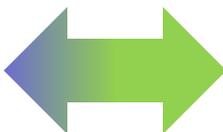
ACE Themes and Research Topics

ACE Themes

Theme 1:
Assess Impacts

Theme 2:
Prevent / Reduce
Emissions

Theme 3:
Respond to Changes



Research Topics for ACE Partner Needs

Climate Impacts
Mitigation and
Adaptation

Emissions and
Measurements

NAAQS and
Multipollutant

Modeling/Decision
Support Tools

Sustainable
Energy Evaluation



Key Issues for ACE

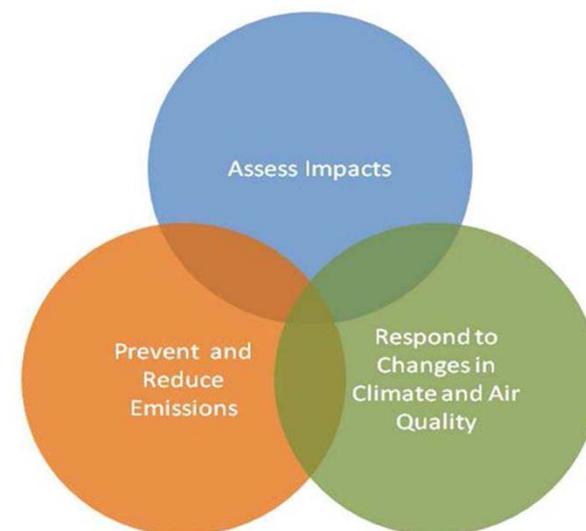
- Implementation science – solving problems
- The multipollutant nature of air pollution
- The impacts of climate change and the development and evaluation of sustainable adaptation and mitigation options
- The human health and environmental impacts of current and future energy alternatives
- The expanding and contracting scales of environmental problems that range from global to local
- The social, behavioral, and economic factors that influence the effectiveness of air quality and climate policies



About ACE: Both intramural and extramural

Intramural science

- RTP, DC, Cincinnati, and several smaller sites
- Some major topics of research:
 - Health impacts of air pollution
 - Air quality modeling
 - Measurement and characterization (ambient + emissions)
 - Decision analysis
 - Control technologies
 - Life-cycle assessment
 - Climate-ecosystem interactions
 - Climate change impacts



ACE Research Themes



How ACE responds to policy office research needs

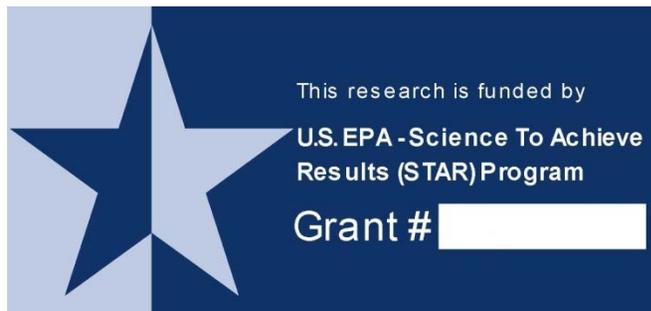
- STAR program
 - Science needs beyond intramural expertise
 - Forward looking science
 - Complimentary expertise
 - Proposal for upcoming solicitations
 - Participation in RFA writing teams
 - Relevancy review of STAR proposals
- STAR program is designed to complement the intramural program



About ACE: Both intramural and extramural

Extramural science

- STAR Grants
- Cooperative agreements
- Health Effects Institute





Information exchange: How ACE gets the results out

- Journal articles
- Scientific conferences
- Newsletters
- Webinars
- Product delivery
- Meetings (with intramural scientists and grantees)
- One-on-one interactions with program office staff





Goals

- High-quality science
- Relevant for policy and decision making
- But not in a vacuum: always looking for new ideas
 - Communication
 - Research ideas
 - Partnerships



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Agenda – Wednesday, March 5th

- 9:20 am **Christopher Frey**, North Carolina State University
Framework for Context-Sensitive Spatially- and Temporally-Resolved Onroad Mobile Source Emissions Inventories
- 9:45 am **Rich Baldauf**, US EPA
Transportation Research in EPA's Air, Climate, & Energy and Sustainable and Health Communities Research Programs
- 10:15 am **Break**
- 10:40 am **K. Max Zhang**, Cornell University
Quantifying the Effects of the Mixing Process in Fabricated Dilution Systems on Particulate Emission Measurements via an Integrated Experimental and Modeling Approach
- 11:05 am **Lab Tour**
- 12:05 pm **Lunch**
- 12:50 pm **Gunnar Schade**, Texas A & M University
Improving Emission Inventories Using Direct Flux Measurements and Modeling
- 1:15pm **Tami Bond and Yanfeng Ouyang**, University of Illinois at Urbana-Champaign
Global-to-Urban Models for Minimizing Air Quality and Climate Impacts of Freight Choice
- 1:40pm **Ed Nam**, US EPA
MOVES Update
- 2:05 pm **Jesse Kroll**, Massachusetts Institute of Technology
Investigating the Effects of Atmospheric Aging on the Radiative Properties and Climate Impacts of Black Carbon Aerosol
- 2:30 pm **Jamie Schauer**, University of Wisconsin-Madison
Development of a Quantitative Accounting Framework for Black Carbon and Brown Carbon from Emissions Inventory to Impacts
- 2:55 pm **Rich Cook**, US EPA, Office of Transportation and Air Quality
Concluding Remarks