

EPA's Air, Climate, & Energy Research Program

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Air, Climate & Energy



Sustainable & Healthy Communities



Homeland Security



Chemical Safety for Sustainability



Human Health Risk Assessment

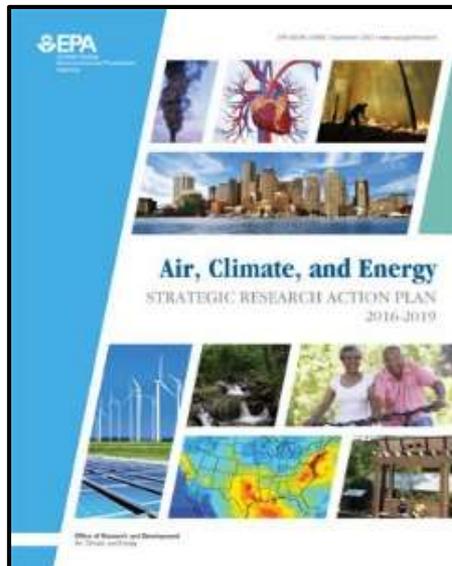


Safe & Sustainable Water Resources



Evolving EPA's Air, Climate, and Energy Research Program

- ACE program has been in existence since 2010
 - Shaped from prior Air and Climate national programs
 - Integrated energy elements as a critical link for a balanced program
- Recently took a fresh look at the ACE Program and how it is positioned to meet EPA's science challenges over the next 5-10 years
- Updated ACE Strategic Research Action Plan (StRAP) for 2016-2019



Available:
[Strategic Research Action Plan 2016-2019](#)

Overarching ACE Research Priorities



- Multipollutant nature of air pollution needs to be addressed
- Incorporation of new technology into monitoring networks
- Preparedness for climate change and the development of sustainable adaptation and mitigation options
- Human and environmental health impacts of current and future energy alternatives
- Tools and models needed to address environmental problems that range from global to local scales
- Social, behavioral and economic factors that influence the effectiveness of air quality and climate policies
- Translating what we have learned for *real-world* utility



Current ACE Research Themes

Climate Impacts Vulnerability and Adaptation

Assess the impacts of climate change on the environment and public health to inform the development of sustainable approaches to prepare for climate change

Emissions and Measurements

Develop innovative technologies and approaches to characterize source emissions and ambient air pollutants

Atmospheric and Integrated Modeling Systems

Develop and apply air quality and cross-media models to support regulatory and community-based decisions

Protecting Environmental Public Health and Wellbeing

Develop solutions-oriented approaches to assess multipollutant exposures and resulting human and ecological effects of air pollutant mixtures to inform policy and public health practices

Sustainable Energy and Mitigation

Assess the environmental impacts and those factors affecting energy sectors choices from extraction to end-use



2012 STAR RFA: Anthropogenic Influences on Organic Aerosol Formation and Regional Climate Implications

- How do anthropogenic emissions influence the oxidation of biogenic volatile organic compounds (BVOCs) and the subsequent formation of secondary organic aerosol, ozone, stable organic intermediates or reactive nitrogen compounds?
- How can linkages between gas phase chemistry and secondary organic aerosol formation be improved in air quality models using observations of gas and aerosol concentration and properties?
- How are the climatically relevant properties of biogenic secondary organic aerosols (either optical properties or cloud interactions) impacted by anthropogenic emissions?

Southeast Atmosphere Study

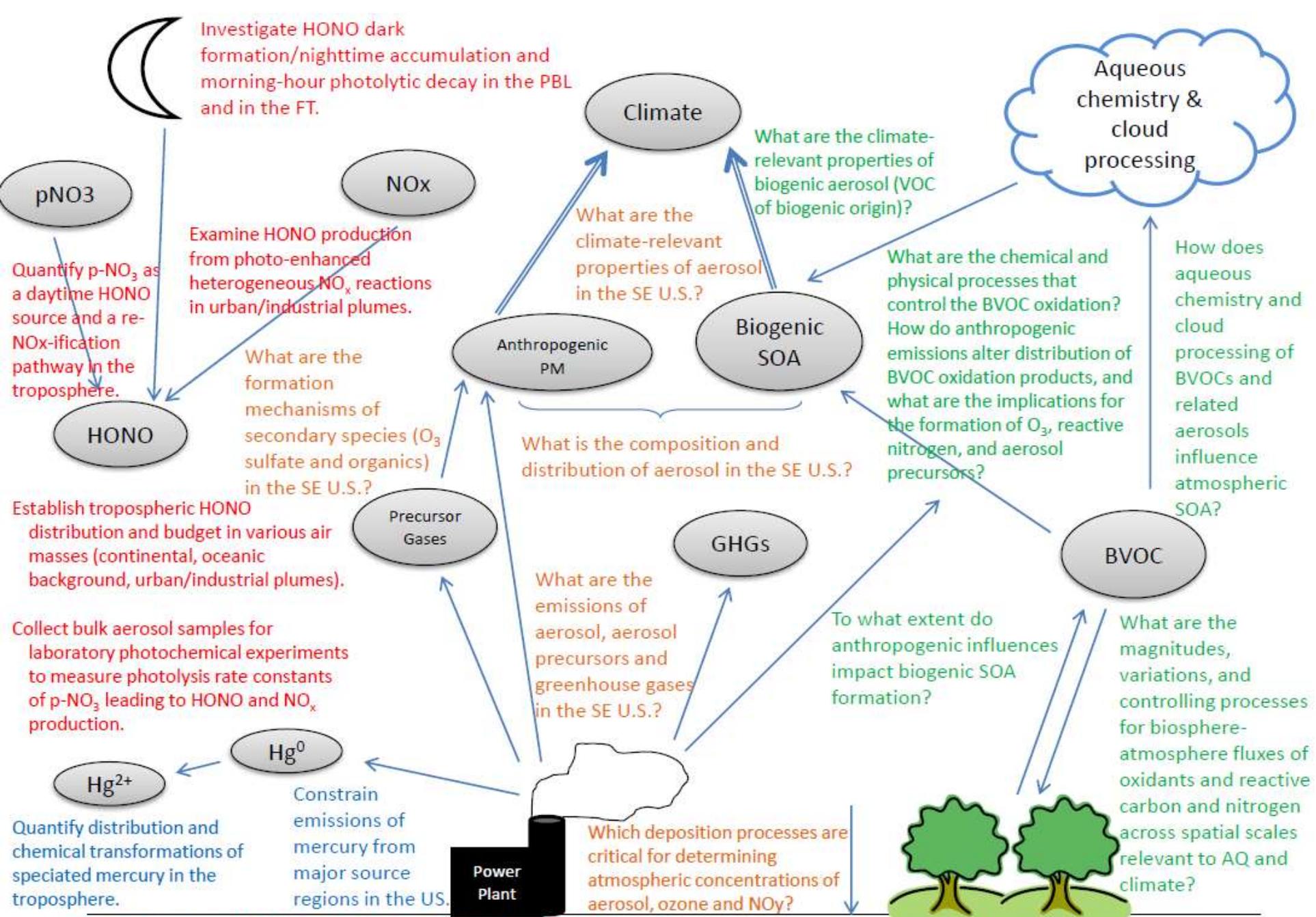
- Extensive, multi-institution effort involving measurements across the Southeast, an ideal location for studying organic aerosol
- EPA STAR funded 14 projects to investigate each part of the organic aerosol system, including emissions, climate impacts, and interactions with man-made pollution
- EPA scientists are also involved, using novel tracer method to differentiate between man-made and natural sources of organic aerosol



Interagency Coordination

- EPA worked closely with NSF, NOAA, and EPRI to ensure the work funded was complementary





How EPA ACE Work Fits Into SOAS

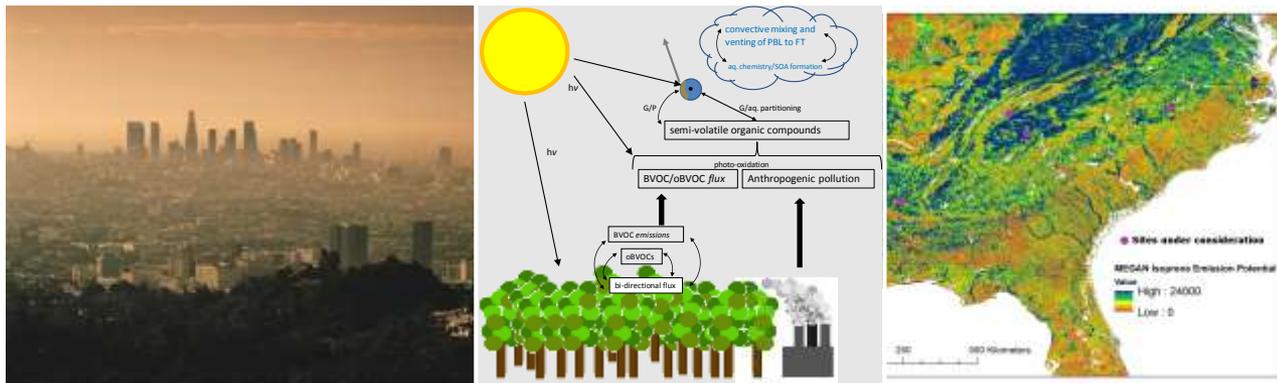
- EPA modelers and experimental physical scientists:
 - Performed pre-SOAS chamber experiments
 - Collaborated with NRMRL using their techniques and our own to reexamine SOA-specific tracer compounds and other aerosol parameters for potential application in the field
 - Participated in 2013 SOAS field study, carried out measurements in several locations
 - Planned 2014 post-SOAS RTP intercomparison study (focus on particle measurements); follow-on to gas-phase intercomparison.



Expected results

This work will:

- Improve understanding of organic aerosol
- Enable more accurate models of air pollution
- Enable more effective air quality management to allow more people to breathe cleaner air



Agenda Overview

- 9:15 am** **Background on the campaigns and new measurements of polar aerosols and water in the Southeast**
Barbara Turpin (University of North Carolina Chapel Hill)
Annmarie Carlton (Rutgers)
- 10:15 am** **Break**
- 10:35 am** **The role of nitrogen compounds and nighttime chemistry**
Nga Lee Ng (Georgia Institute of Technology)
Juliane Fry (Reed College)
- 11:35 am** Joost de Gouw (NOAA Earth System Research Laboratory)
- 12:00 pm** **Lunch**
- 12:30 pm** **Optional brownbag session with Athanasios Nenes (Georgia Institute of Technology) regarding the recent Nature Geoscience paper “High aerosol acidity despite declining atmospheric sulfate concentrations over the past 15 years”**
- 1:00 pm** **Poster Session**
- 2:20 pm** **SOA from isoprene-derived epoxides, organosulfates, and particle functional groups at Look Rook, TN**
Jason Surratt (University of North Carolina Chapel Hill)
Lynn Russell (University of California - San Diego), Paul Ziemann (University of Colorado – Boulder)
- 3:20 pm** **Break**
- 3:40 pm** Elizabeth Stone (University of Iowa)
- 4:20 pm** Brent Williams (Washington University)
- 5:00 pm** **Conclude Day I**
- 7:00 pm** **Optional group dinner at Carmen’s Cuban Café**

Agenda Overview

- 9:15 am** Spyros Pandis, Neil Donahue (Carnegie Mellon University)
- 10:00 am** Havala Pye (EPA ORD/NERL), Kirk Baker (EPA ORD/OAQPS)
- 10:40 am** **Break**
- 11:00 am** **Oxidative capacity of the pollution mixture**
Saewung Kim (University of California – Irvine)
Frank Keutsch (Harvard University)
- 12:00 pm** **Lunch**
- 1:00 pm** **Measurements aloft and at ground level – what can we learn from vertical distributions?**
John Mak (Stony Brook University), Allen Goldstein (University of California – Berkeley), Alex Guenther (National Center for Atmospheric Research)
Steve Bertman (Western Michigan University), Kerri Pratt (University of Michigan), John Seeley (Oakland University), Paul Shepson (Purdue University), Tim Starn (West Chester University of Pennsylvania)
- 2:00 pm** **Break**
- 2:20 pm** **Measurements of climatic properties of SOA**
Athanasios Nenes (Georgia Institute of Technology)
Andre Khlystov (Desert Research Institute), R. Subramanian (Carnegie Mellon University)
- 3:20 pm** Stefanie Sarnat (Emory University)
- 3:50 pm** **Closing**
- 4:00 pm** **Adjourn**