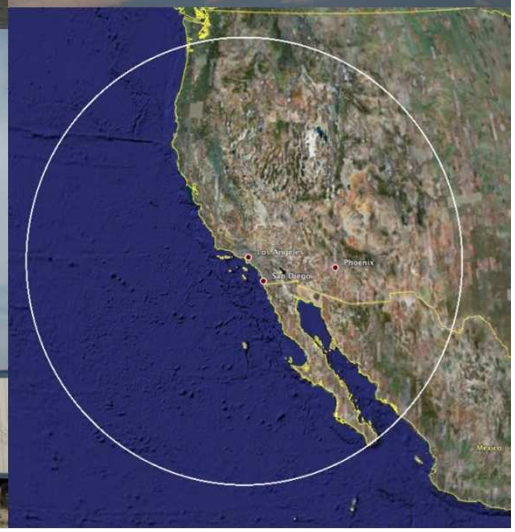


CalNex 2010: An Update

May 26, 2011

California Environmental Protection Agency

Air Resources Board

Air Quality Field Studies in California

- 40 years of studies
- Improved understanding of sources and processes that form pollution
- Further improvements to inventory and more sophisticated AQ models require additional data
- New focus on GHG and climate science

Source: John Watson

Some CalNex Measurement Platforms

Challenges addressed by CalNex

Meeting Stringent Air Quality Standards

Verify VOC and NO_X emissions
Los Angeles - San Joaquin Valley differences
Sources of sulfate and organic carbon
Role and source of high ozone aloft
Role of transport from Asia

Meeting Greenhouse Gas Targets

Verify emissions and trends
Find under-inventoried sources

Integrating AQ/GHG Control Programs

Role of air pollutants in climate change
Identify co-benefits and tradeoffs

Benefits from CalNex

Policy-relevant Science

Addresses 12 primary science questions

World-class researchers

Unprecedented Scope

Statewide, offshore and aloft

First study of nexus issues

Timely Information

Results expected within two years

CalNex Results Will Inform

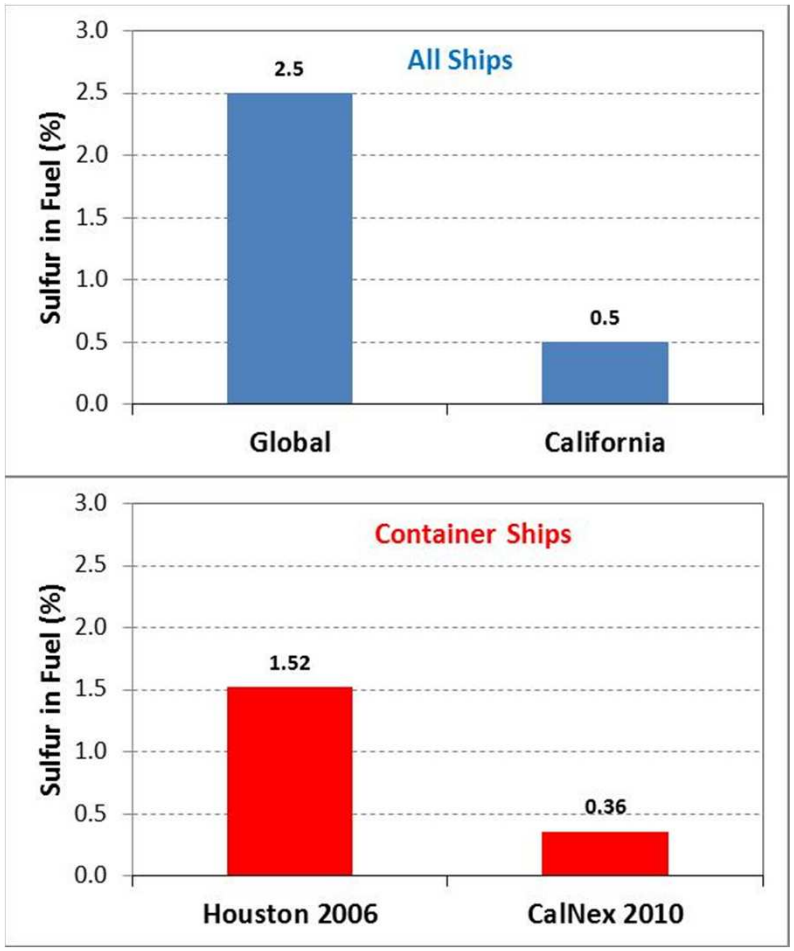
- Efforts to reduce PM2.5
- Efforts to reduce ozone
- Role of air quality on climate

RV Atlantis and Sulfur Dioxide Emissions from Ships During CalNex 2010

Eric Williams, NOAA/ESRL/CSD

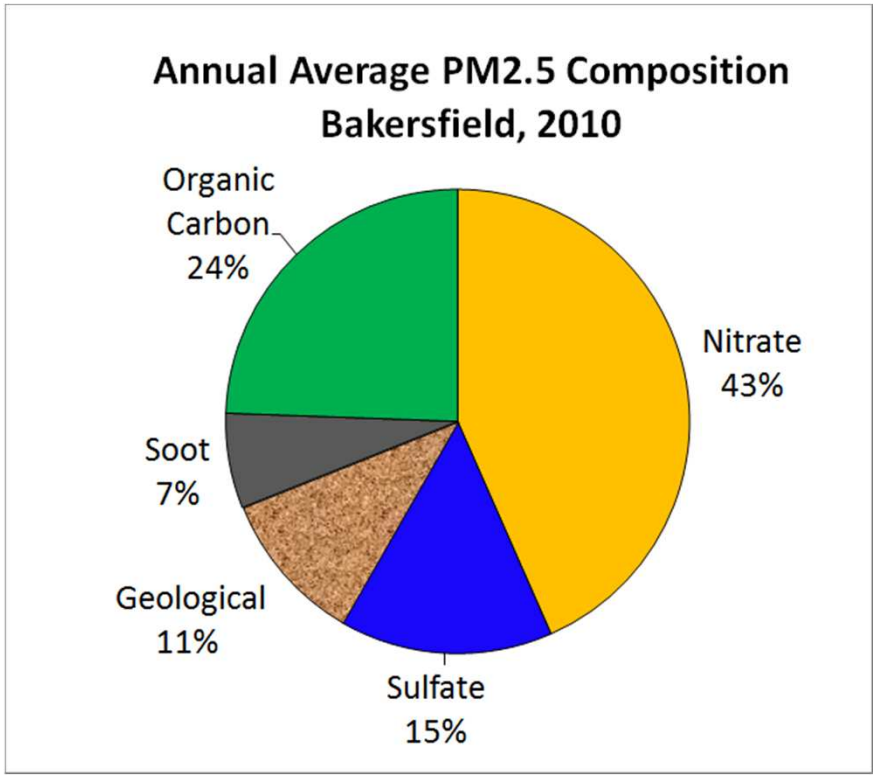
Results

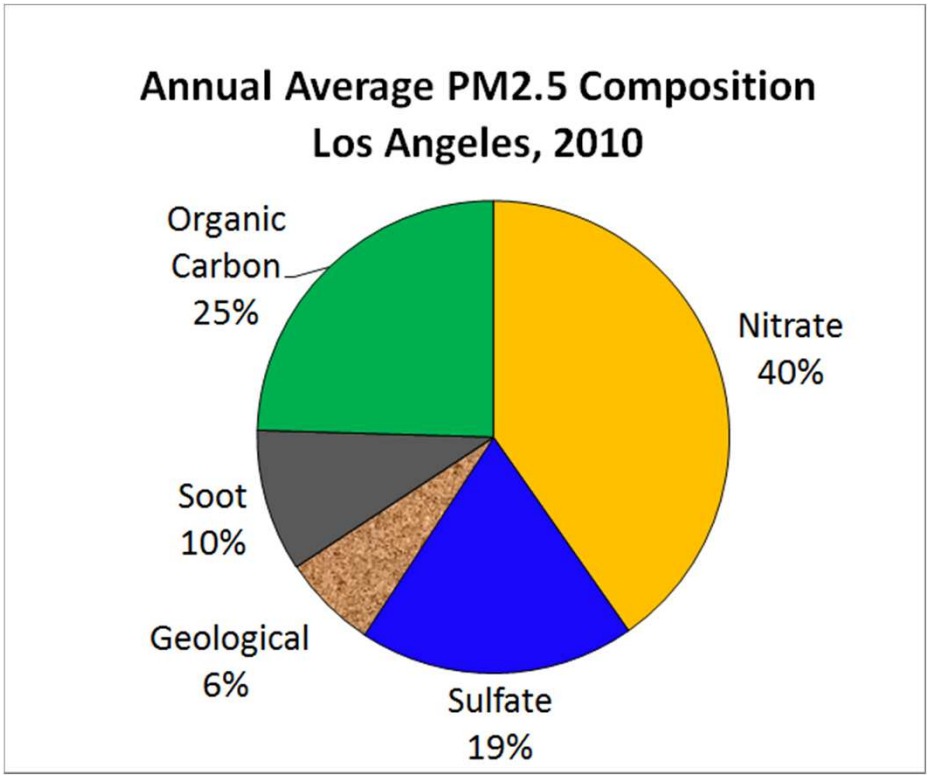
- 123 ship plume analyses
- All using fuels with less than 1.5% fuel sulfur
- More than 80% using fuels with less than 0.5% sulfur
- About 75% less than levels observed in Houston in 2006 (container ships)



Organic Particulate Matter

- Organic particulate matter is an increasing fraction of PM2.5
- Sources and chemistry not well understood
- Major focus of CalNex





CalNex Results Will Inform

- Efforts to reduce PM2.5
- Efforts to reduce ozone
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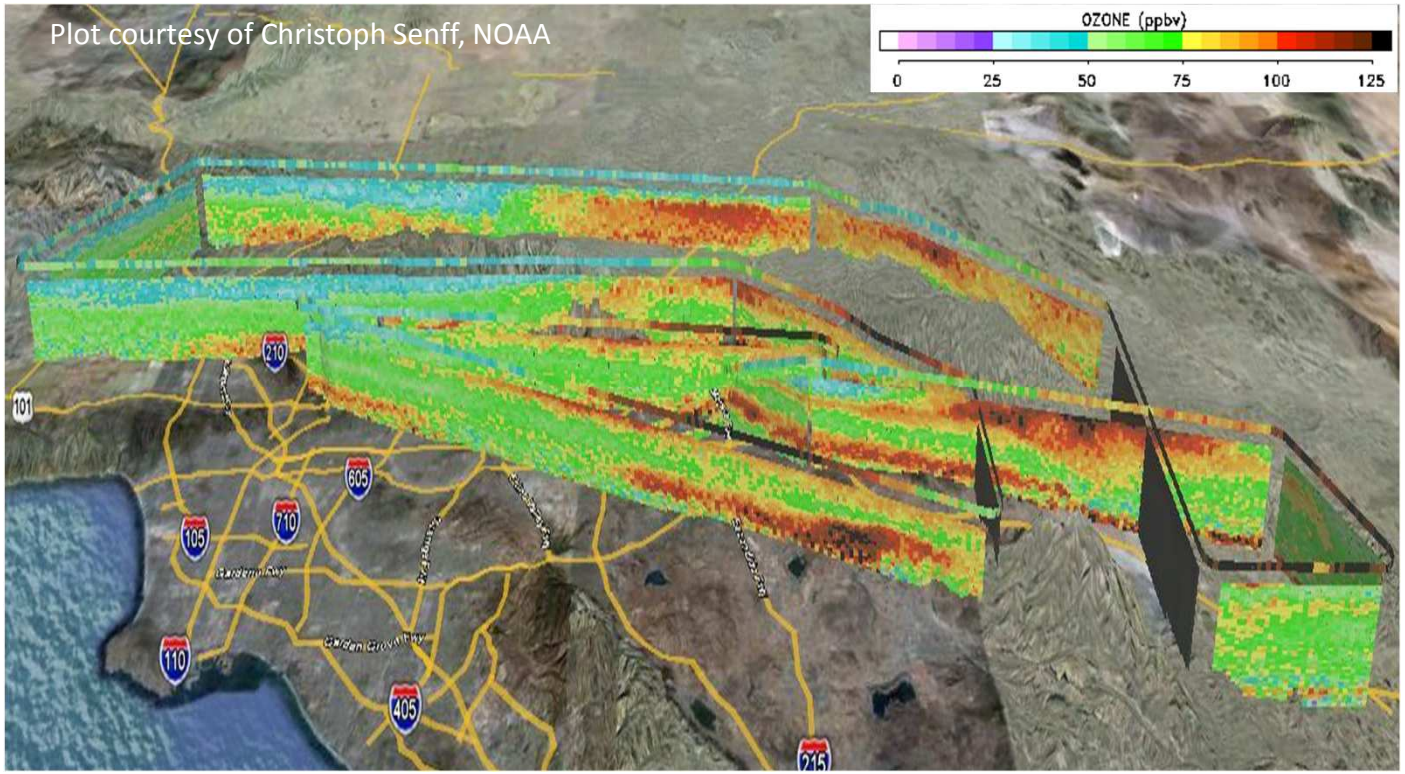
Ozone Research Efforts



- Measurements of ozone aloft to assess sources and impacts
- Measurements to characterize current atmospheric chemistry
- Relative effectiveness of VOC and NOx controls
- Weekend effect – higher ozone on weekends

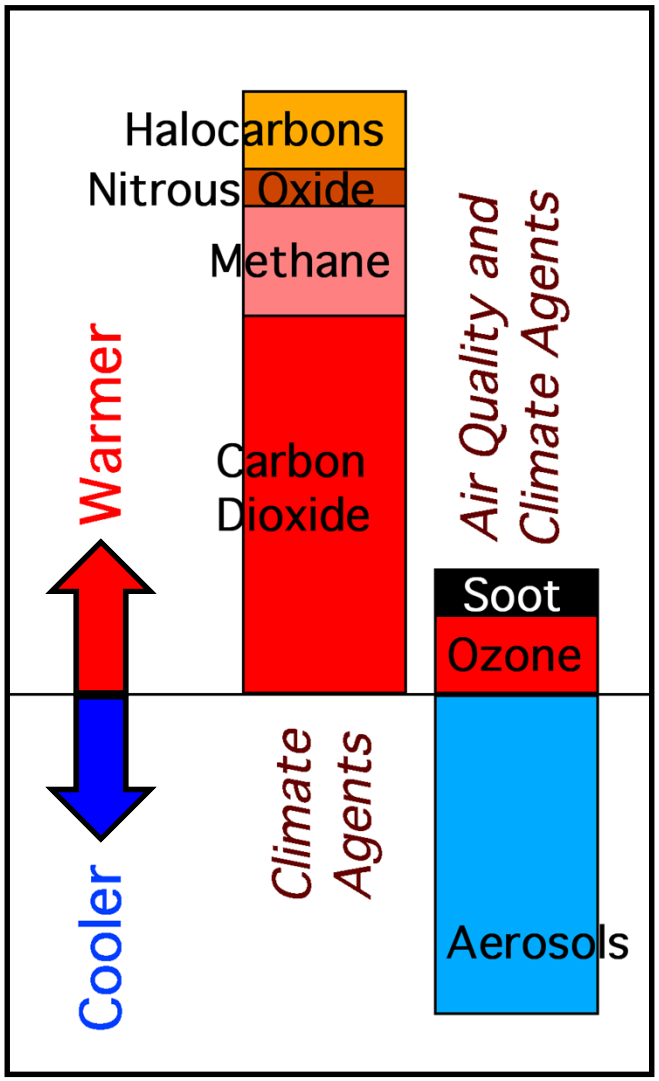
CalNex Results Will Inform

- Efforts to reduce PM2.5
- Efforts to reduce ozone
- Role of air quality on climate

CalNex: Studying Climate and Air Quality

Benefits of dealing with climate change and air quality together

- Major air pollutants—aerosols (including soot) and ozone—are also important climate change forcing agents.
- These "common agents" are short-lived (days to months), compared to centuries for CO_2. Can give quick payoffs for climate (years instead of many decades).
- Agents all have common sources (transportation, industry, agriculture, forests).



IPCC 2007 AR4

Workshop Overview

- Less than a year after completion of field study – a very rapid turn around
- May 16 – 19, 2011 in the Cal/EPA building
- Over 100 scientists from governmental and academic research units
- Over 90 posters and presentations

Future Activities

- Topical working groups to maximize collaboration
- "Synthesis of Policy Relevant Findings from the CalNex 2010 Field Study" – report by NOAA in 2012
- Papers collected in a special issue of JGR - Atmospheres

Thank you