

Why are NASA and California Air Resources Board Collaborating during ARCTAS?

- **Sacramento (21 September 2007) – CARB, NOAA, and other interested parties meet to discuss an air quality field study planned for 2010.**
- **NASA participation in 2010 is prevented by fiscal limitations; however, it was recognized that NASA aircraft could perform flights out of Palmdale, CA in summer 2008 for little additional cost.**

NASA's commitment:

25 flight hours for the DC-8 and P-3B in support of CARB interests

CARB's commitment:

Joint funding of ARCTAS investigators within the University of California system.

Rationale:

- **The ARCTAS payloads are ideally suited to the Air Quality observations required by CARB**
- **Conditions in California during summer will provide a greater dynamic range for measurement intercomparisons (e.g., HOx, NMHCs, AMS, SP2)**
- **Flights will provide valuable contrast and planning information for the more extensive field study planned by NOAA in 2010**

Expectations:

- **CARB scientists will be heavily involved in the planning and implementation of flight hours**
- **Since ARCTAS data will be openly shared within the POLARCAT community, NOAA will be able to take advantage of these observations for modeling and advance planning for 2010.**

Schedule:

- **Meet CARB representatives at Palmdale during integration/test flights (exact dates TBD)**
- **CARB flights currently scheduled for 18-25 June with the Cold Lake deployment to follow (26 June to 14 July).**
- **Based on boreal fire conditions, we are still examining whether we have the flexibility to move the Cold Lake deployment forward to 18 June and perform CARB flights afterward.**

Key points of contact for NASA-CARB collaboration:

- **Hanwant Singh – NASA Science Lead**
- **Eileen McCauley – CARB Science Lead**
- **Don Blake – UC Principal Investigator**

ARB's Interests and a 2008 NASA Effort in California

Science Issues

Eileen McCauley, Research Division



California Air Resources Board

AB 32 requires CARB to:

- **Establish a statewide GHG emissions cap for 2020 based on 1990 emissions by January 1, 2008**
- **Adopt mandatory reporting rules for significant sources of GHGs by January 1, 2009**
- **Adopt a plan by January 1, 2009 indicating how emission reductions will be achieved from significant GHG sources via regulations, market mechanisms, and other actions**
- **Adopt regulations by January 1, 2011 to achieve the maximum technologically feasible and cost-effective reductions in GHGs, including provisions for using both market mechanisms and alternative compliance mechanisms**
- **Convene an Environmental Justice Advisory Committee and an Economic and Technology Advancement Committee to advise CARB**
- **Ensure public notice and opportunity for comment for all CARB actions**

ARB's Interests

- **Climate Change and GHGs**
- **Non-NO₃ Secondary PM**
- **Conditions Aloft**
- **Chemistry and Sources in the Marine Environment**

Climate Change

- **ARB's Long Term Interests include:**
 - **Improving the emissions inventory**
 - **Kyoto gases, ozone depleting substances, aerosols**
 - **Identifying statewide and regional contributions**
 - **Biogenic contributions**
 - **Collecting data useful for regional climate modeling**

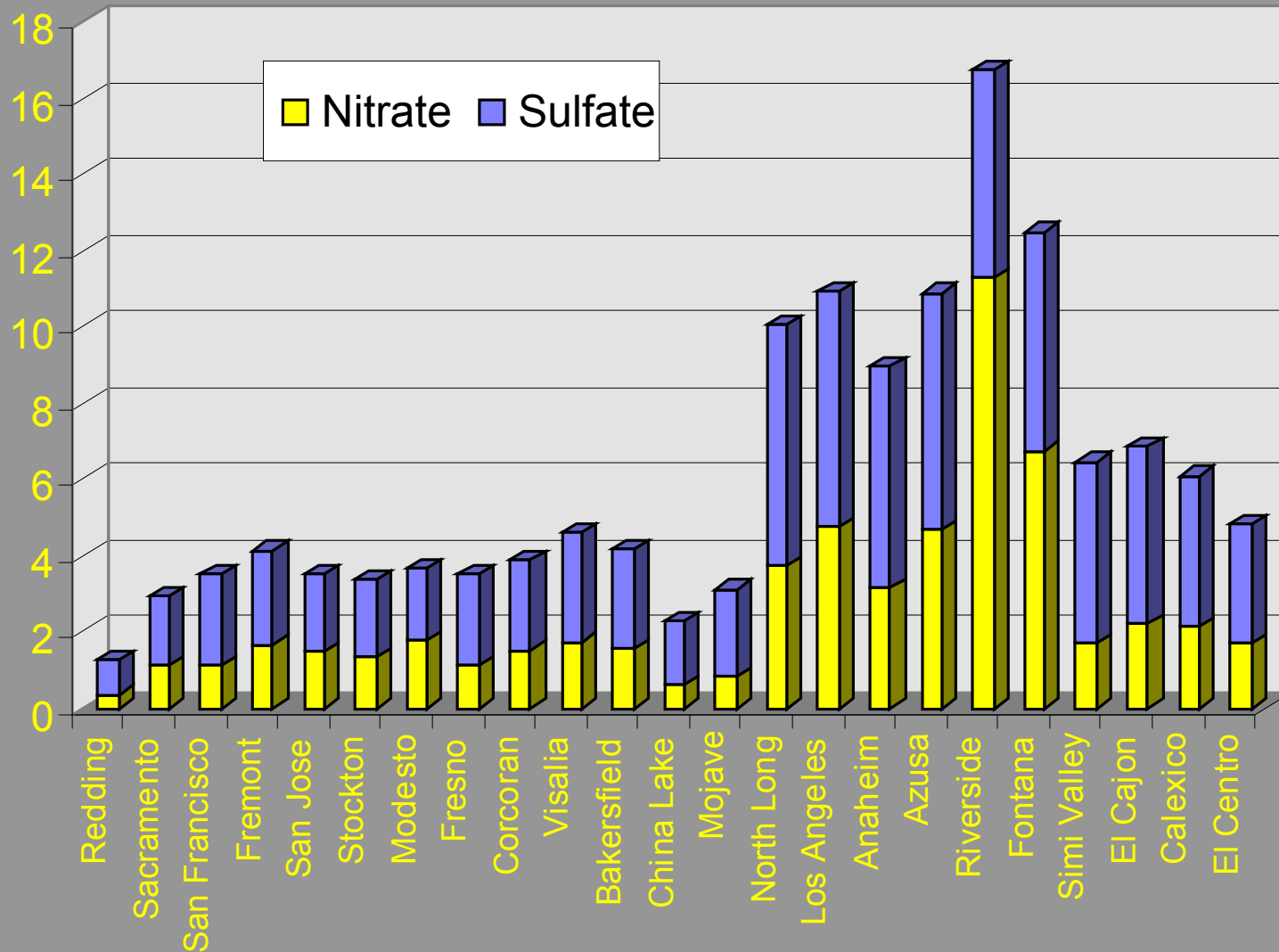
Emission Inventory

- **How to improve the emissions inventory for GHG and O₃ & aerosol precursors?**
- **How important are natural emissions?**
- **What measurements can help validate the use of satellite data to construct inventories?**

Secondary PM

- **Particulate matter is the criteria pollutant with the greatest health impacts**
- **More information is needed on sources and processes which contribute to secondary PM**

PM10 Nitrate and Sulfate Jun-Sep 1998-2000



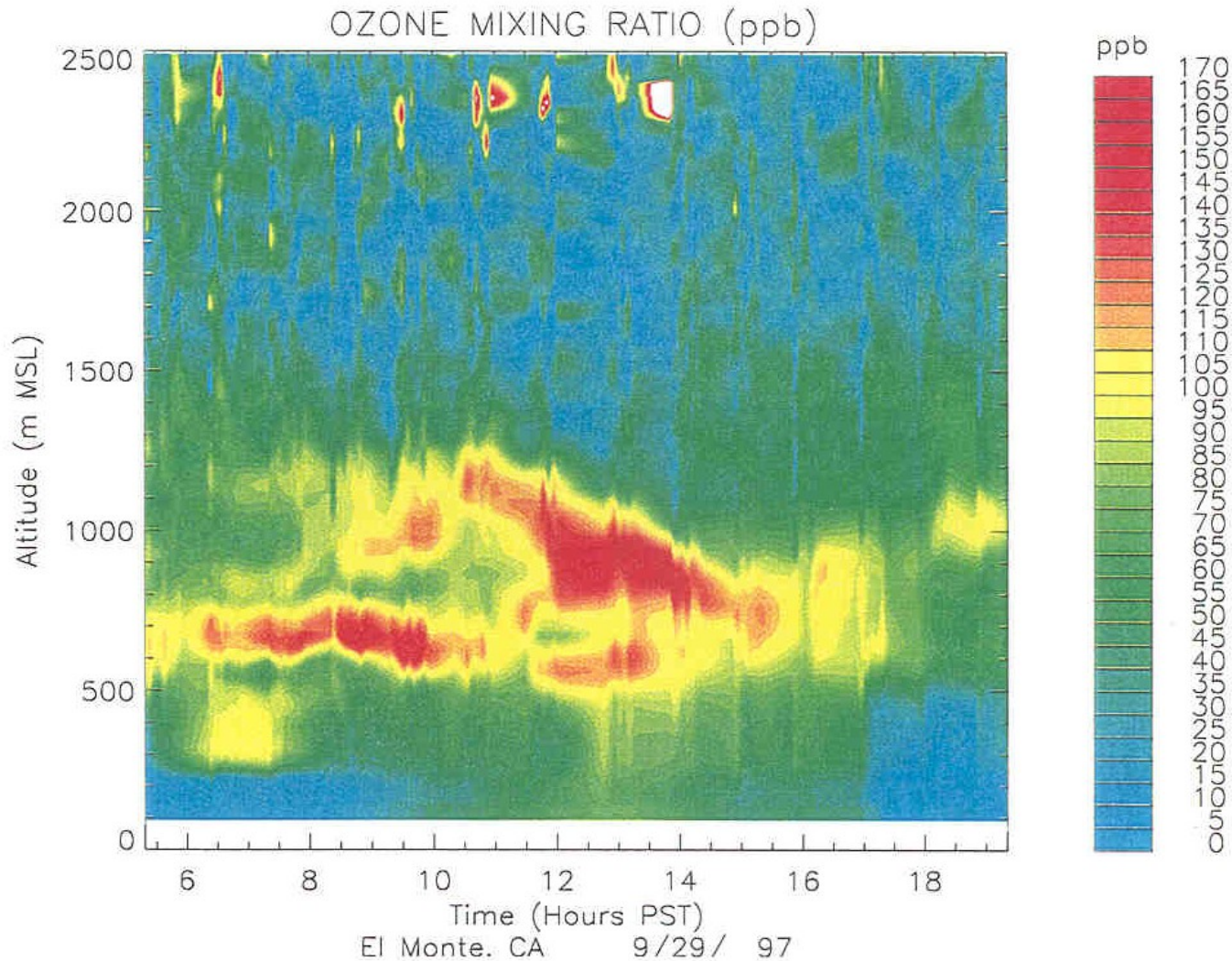
Sulfate

- **To what extent do natural emissions contribute to sulfate concentrations?**
- **Are there differences between northern and southern California?**
- **Are there sources and processes important to sulfate formation which are not in our inventory and models?**

Aloft

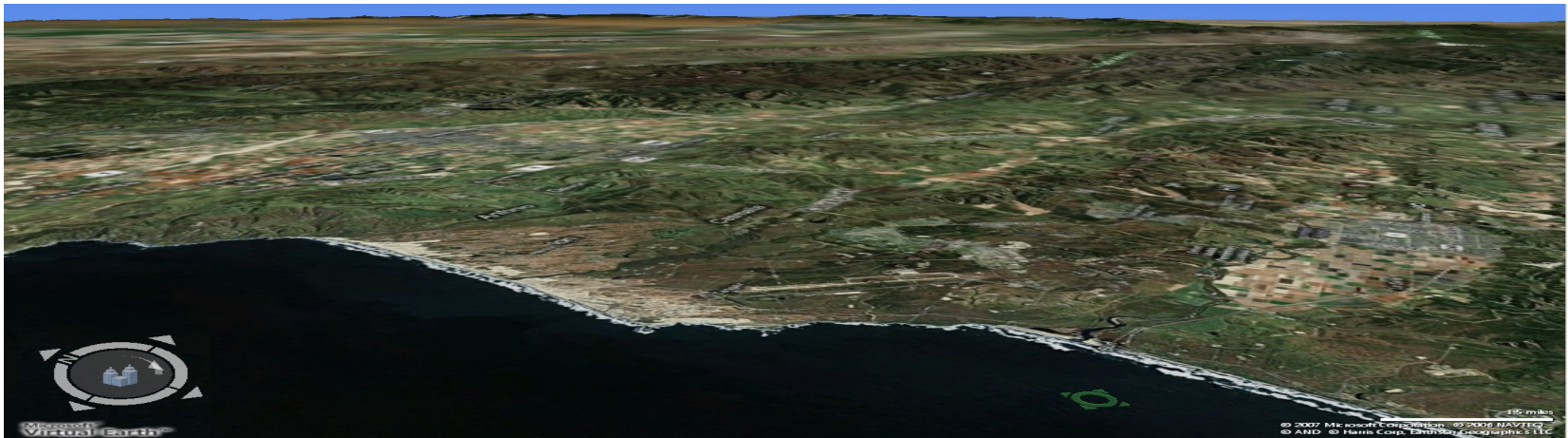
- **Data collected during SCOS97 suggest significant reservoirs of ozone aloft.**
 - **What are the characteristics of the atmosphere at 500 – 2000 m?**
 - **Are there significant reservoirs of important species?**

Ozone Vertical Profile



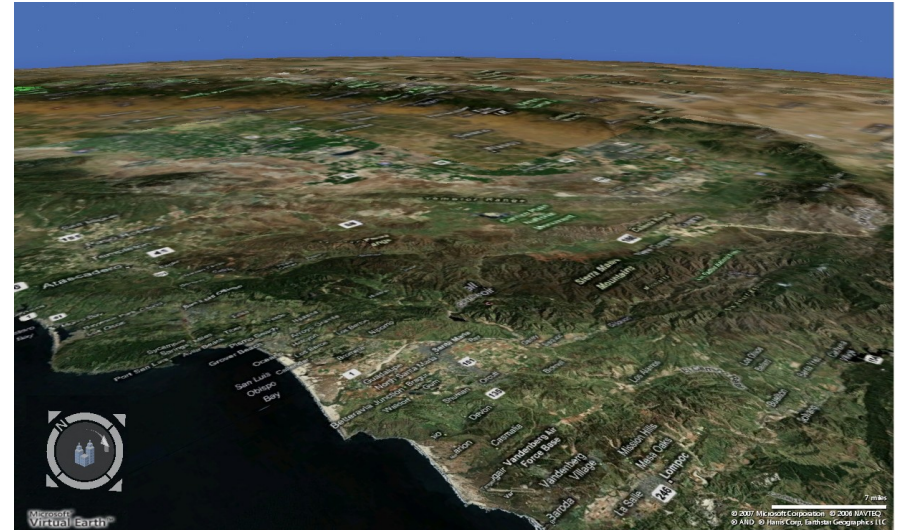
Oceanic Boundary Conditions

- What are proper oceanic boundary conditions?
- Are there differences between northern and southern California?
- How important are ship emissions on marine boundary layer composition?
- What are the important physical and chemical changes which occur as a parcel of air moves from off-shore through the shore zone?



Model Air Flow

- **How to characterize & model air flow in SoCAB & SJVAB?**
- **What are the characteristics of air flow between them?**
- **What role does recirculation north along the Sierra Nevada and Coastal ranges play in the SJVAB?**



Flight 7: California's Central Valley

- One leg North of Sacramento (first C.V. run)
- One leg between Fresno and Bakersfield (second C.V. run).
- Urban and agricultural pollution

