



**SULFUR IN SOUTHERN  
CALIFORNIA:  
A CalNex 2010 Special Study**

Overview  
for  
CalNex Planning Meeting  
February 5, 2009

# GOALS:

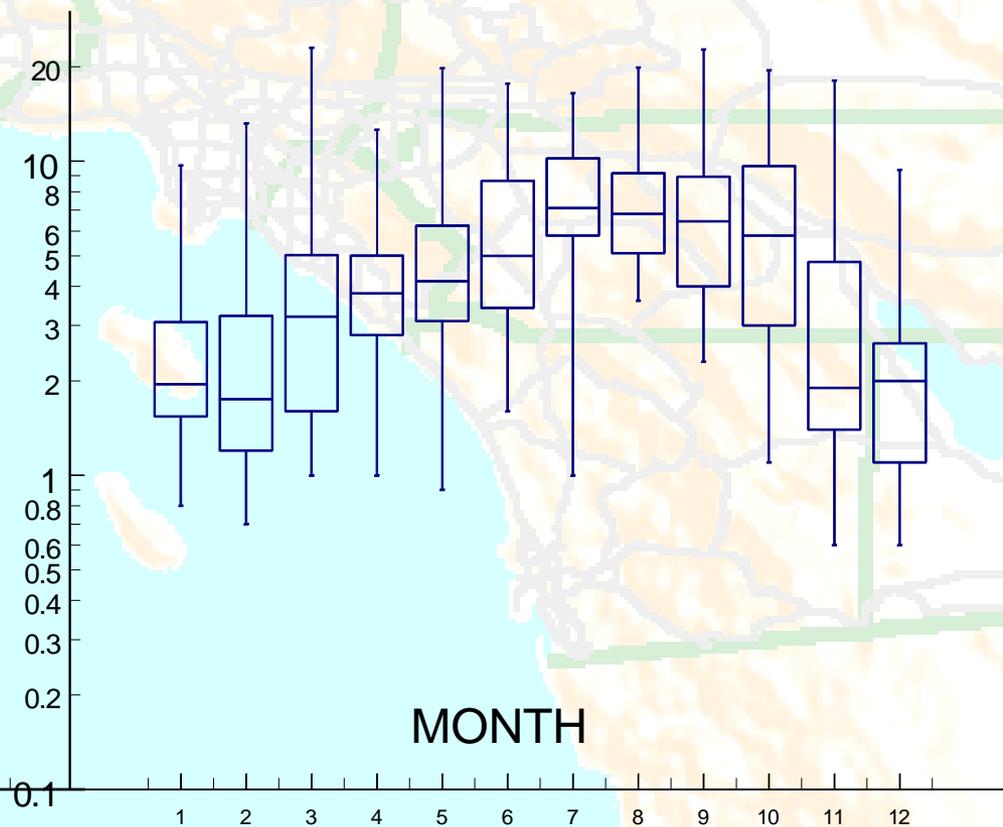
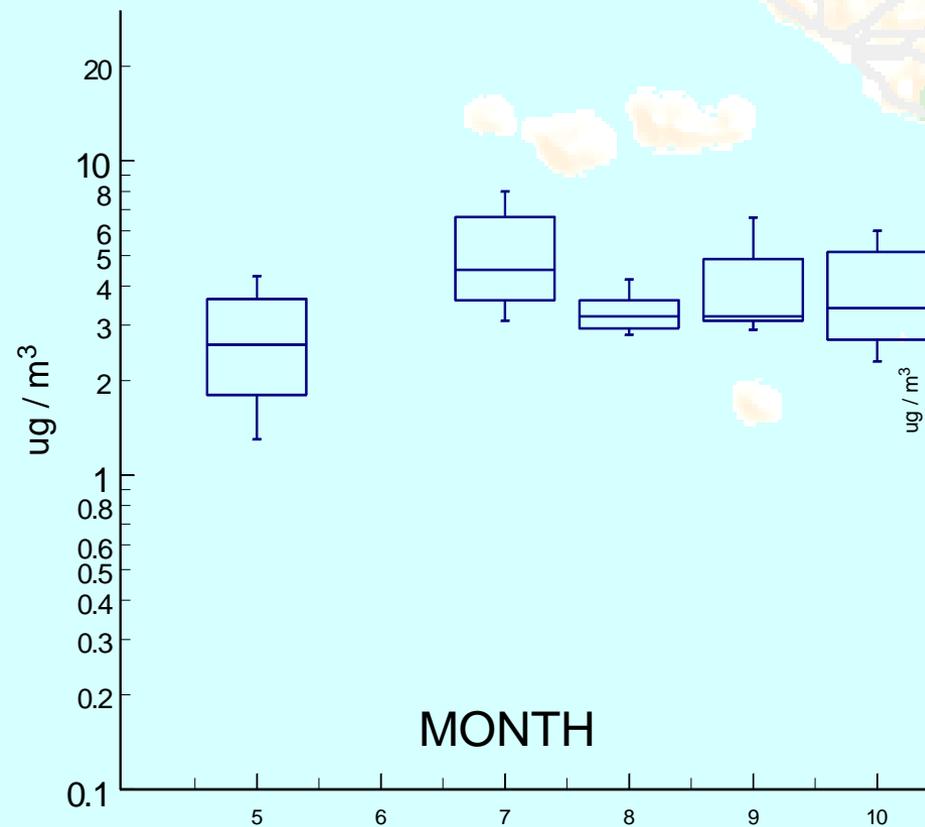
- Identify and validate fluxes for sulfur from major natural and anthropogenic sources, including:
  - Ship Emissions
  - DMS production
  - DMS and  $\text{SO}_2$  oxidation
  - Sulfur partitioning to aerosol and gas phases
  - Deposition to sea salt, clouds, and ocean
- Develop a basis for unified modeling of ocean and land areas.

# What We Know

Limited historical data suggest “excess” aerosol  $\text{SO}_4$  over land and water

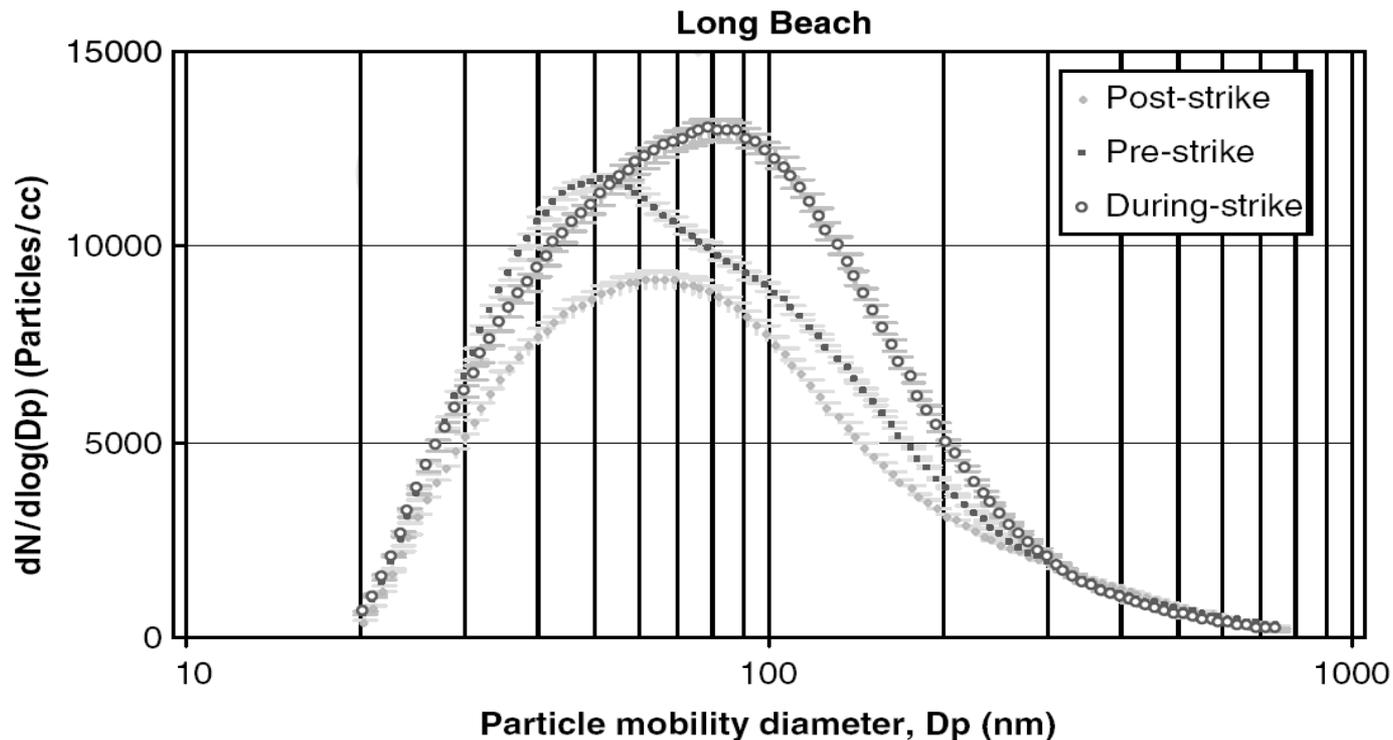
AVALON

HAWTHORNE



# What We Know

- L.A. – Long Beach Harbor is the busiest port on the west coast, with a discernable local impact on aerosols loading

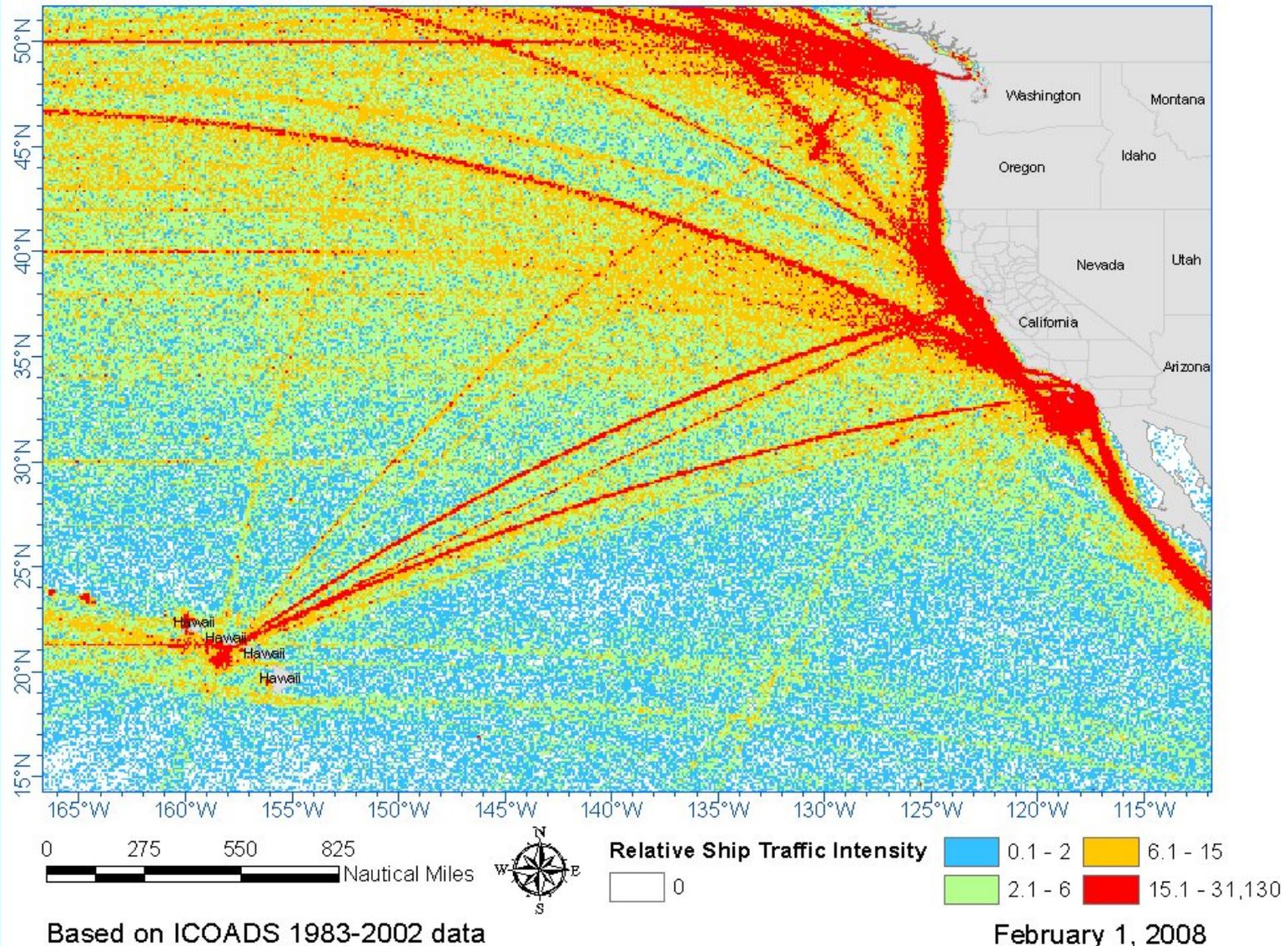


**Figure 12.** Average particle number size distribution before, during and after the port strike at Long Beach in Sep–Oct 2002.

(Singh *et al.* *J. Expos. Anal. & Env. Epidem.*, 2005)

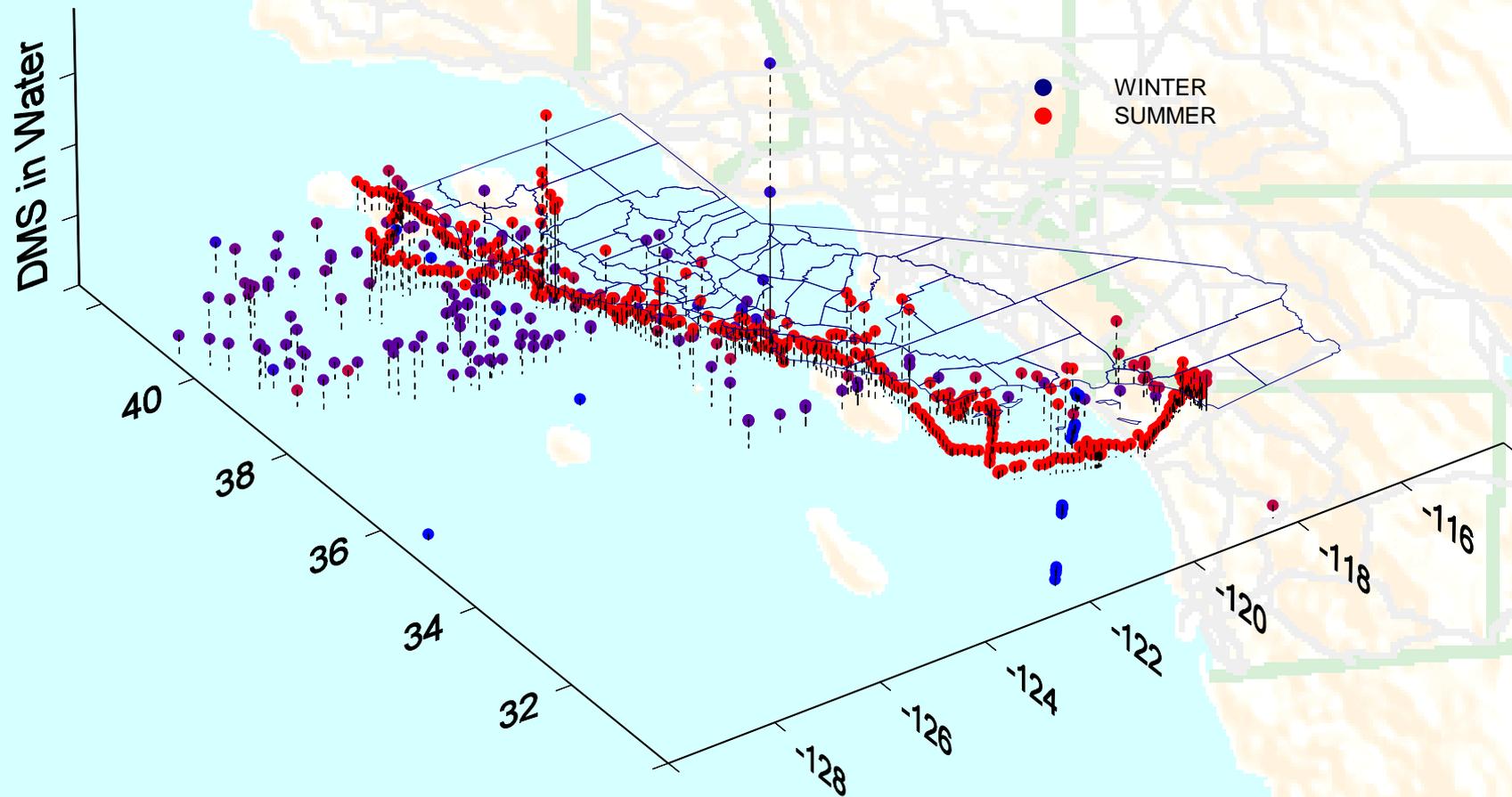
# What We Know

Much of E. Pacific Shipping passes So. California



# What We Know

Marine biogenic emissions are poorly known,  
and appear variable



# Project Plan

- Supplement WP3 and Ron Brown programs with a year of surface data:
  - Enhanced instrumentation at 7 existing SoCAB monitoring sites
  - Establish new sites on Santa Catalina Island
    - Surface (MBL) site at Wrigley Inst. (Isthmus)
    - Surface (LFT) site near FAA radar on top of island

# Monitoring Sites

SCAQMD sites enhanced with high-sensitivity SO<sub>2</sub> and CO plus real-time sulfate monitors



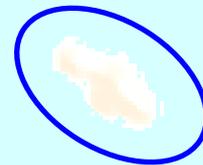
Santa Catalina Island Sites - high-sensitivity SO<sub>2</sub>, NO<sub>y</sub> and CO plus real-time sulfate monitors



View NE toward L.A. – Long Beach Ports

**WRIGLEY INSTITUTE**  
(sea level at isthmus)

(AIRPORT)



**BLACK JACK MT.**  
(radar site - 610 m)

## Santa Catalina Island Temporary Monitoring Sites

♪ “24 miles across the sea...” ♪

# Summary

Management of SoCAB Sulfate needs improved knowledge of:

- Natural and anthropogenic emissions
- Oxidation mechanisms in marine and terrestrial zones
- Transport and deposition over water and land
- Models to predict effects of control measures

Cooperators Welcome!