

***The Asian Continental  
Aerosol Plume:  
Impacts on California***

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**ARB Research**

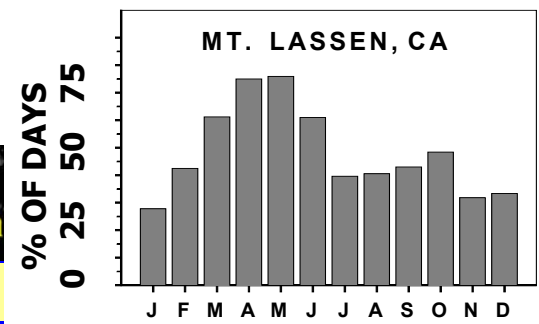
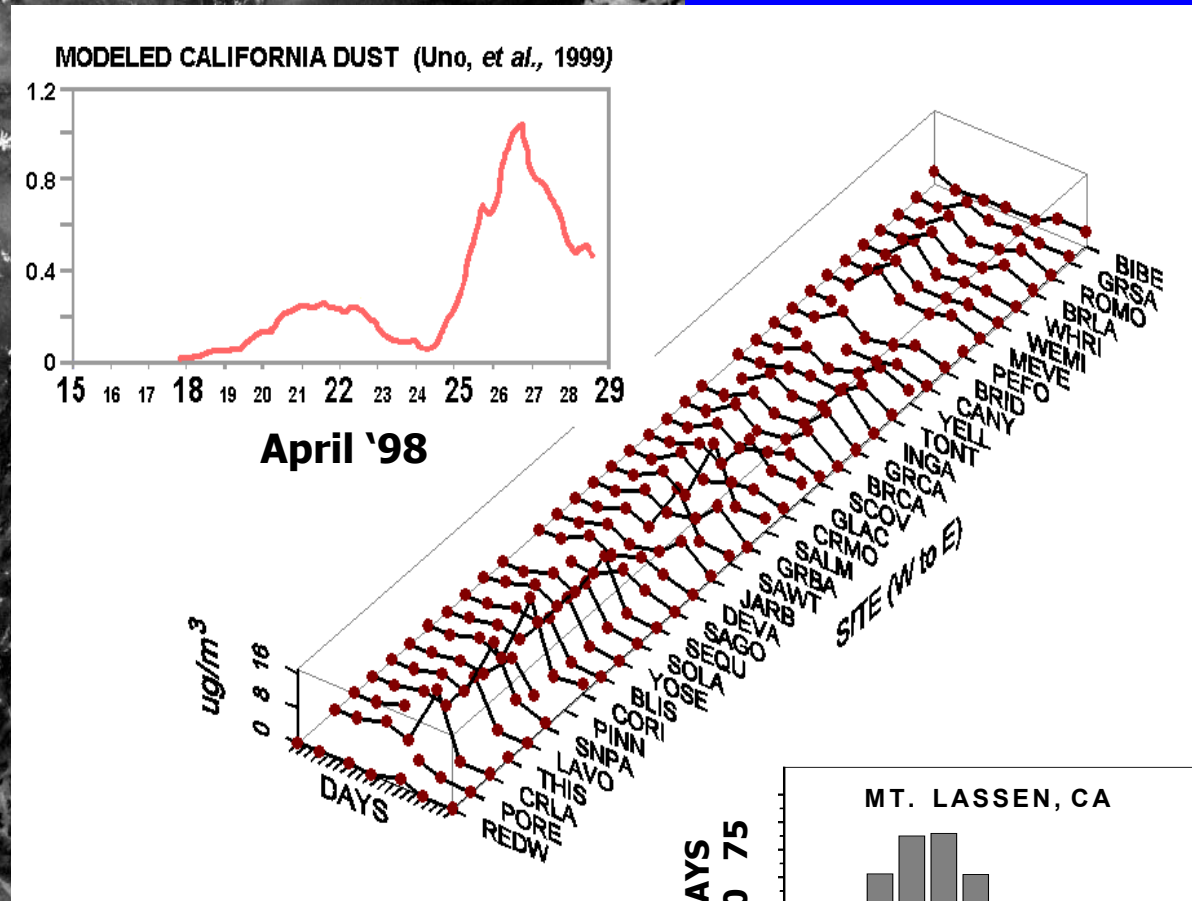
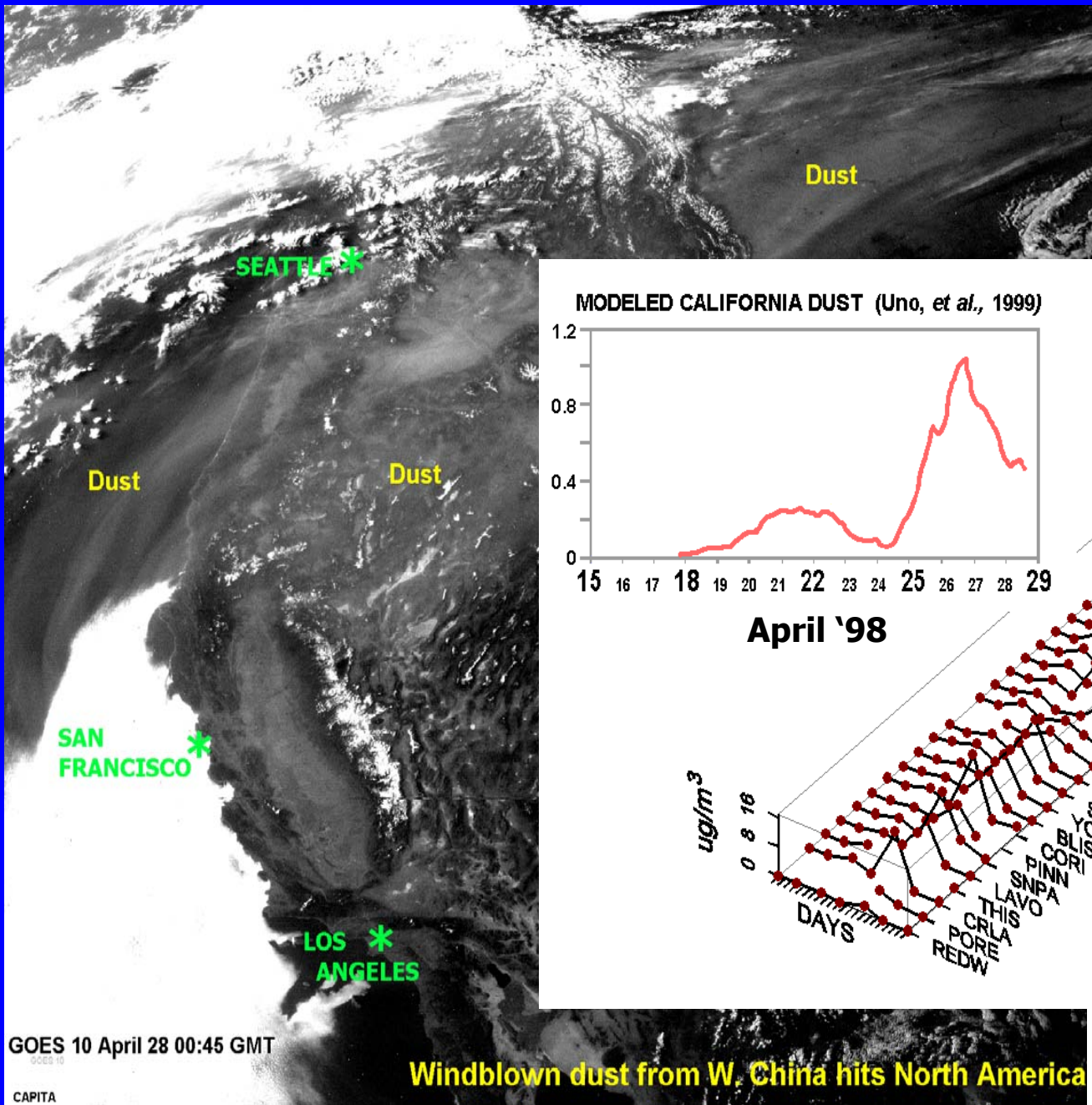
**January 22, 2004**

A global map showing Carbon Monoxide concentration over the Pacific Ocean. The map uses a color scale from blue (low concentration) to red (high concentration). The highest concentrations are shown in the northern Pacific, particularly in the North Pacific and North Atlantic regions, with values reaching into the red and orange ranges. The concentration decreases as one moves south, with the southern Pacific and Atlantic showing lower concentrations in the blue and cyan ranges. The map is centered on the Pacific Ocean, with the Americas visible on the left and Europe and Africa on the right.

# Carbon Monoxide over Pacific Ocean

NASA MOPITT March-Dec. 2000

# Recognizing Asian Dust Transport

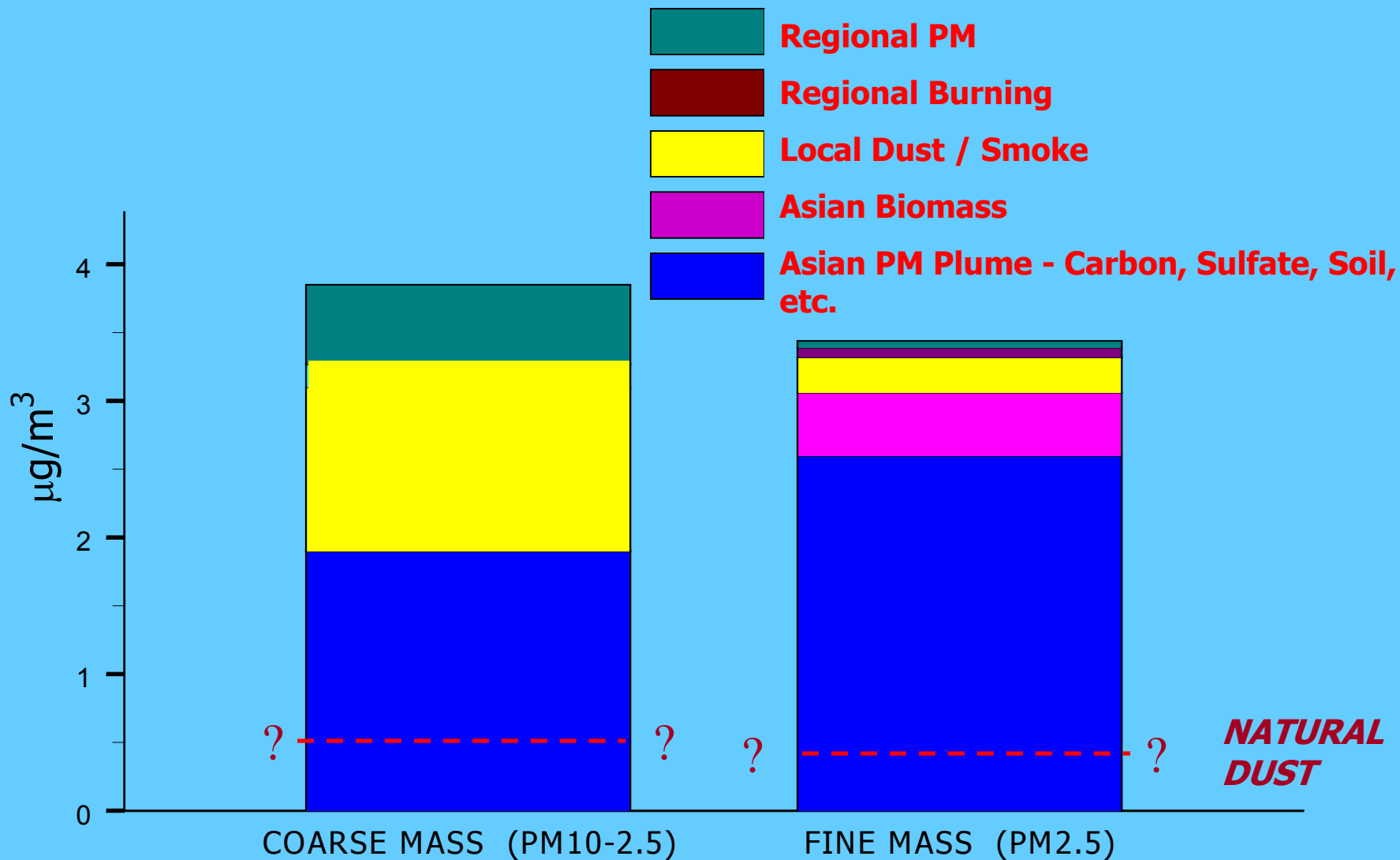


**Windblown dust from W. China hits North America**

VanCuren, R., and T. Cahill, *J. Geophys. Res.* 107, December, 2002.

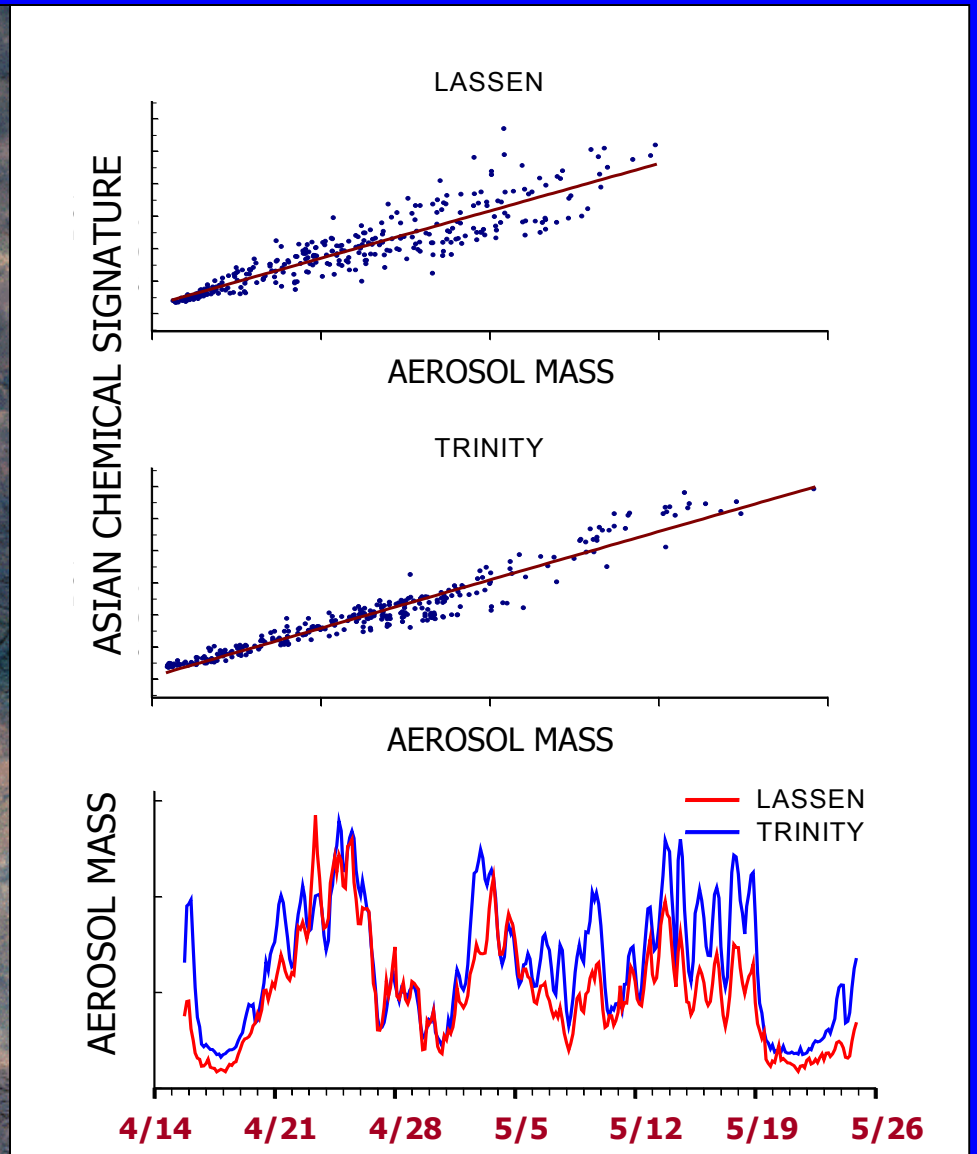
# Mean Aerosol Composition

March - October 1989-1999 at Crater Lake and Mt. Lassen



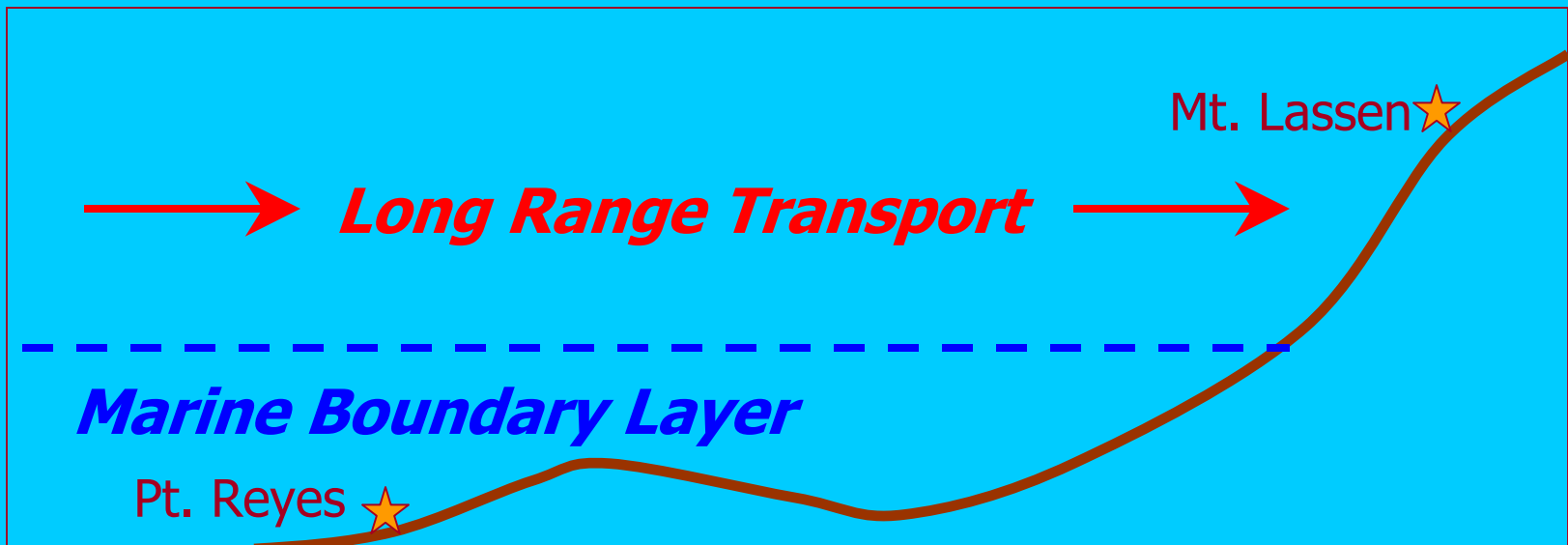
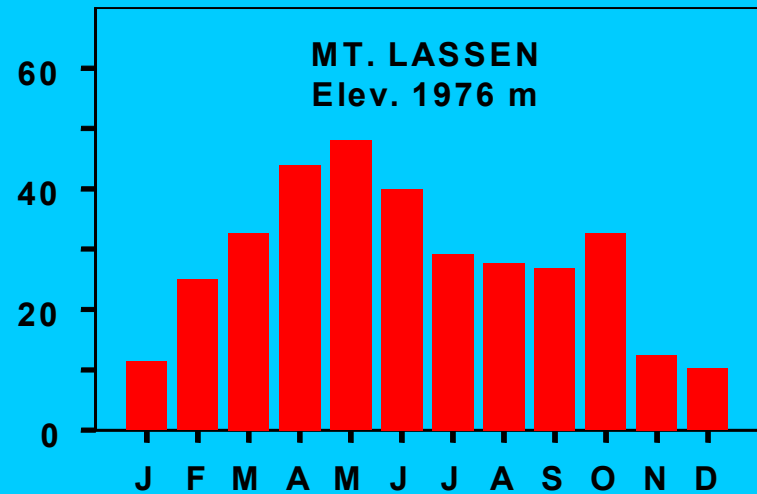
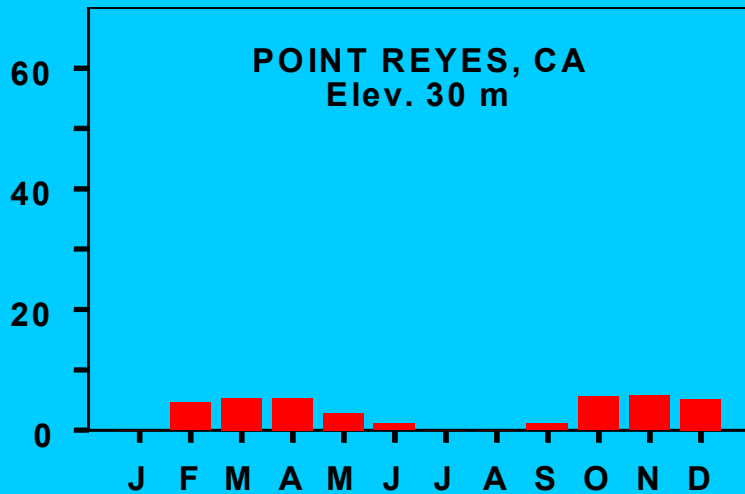
VanCuren, R. A., *J. Geophys. Res.*, 108, October 2003.

# ITCT-2K2 Confirms Asian Influence



# Mountain vs. Coastal Impact

## Asian Dust Frequency %



# Findings

- **Some Asian dust is natural - not itself a major problem**
- **Dust is accompanied by biomass smoke, agricultural dust, motor vehicle and industrial emissions**
- **Average Asian aerosol load at mountain sites is about 1/4 of CA PM10 and PM2.5 standards; 1/5 and 1/10 of Federal PM10 and PM2.5 standards.**
- **Asian aerosols can be a major component of PM in otherwise “clean” rural sites.**
- **Asian aerosols are a minor component of PM in heavily polluted areas, and the same conditions that trap pollutants near the ground preclude Asian PM from contributing to peak PM concentrations.**

# Implications

- **Typical low concentrations are a “floor” for PM concentrations**
  - Only a small contribution to human exposure
  - Needs to be considered in Regional Haze programs
- **Rare high concentrations (e.g. 1998 dust storms) may exceed PM standards**
  - Low frequency (once a decade?) has little health significance
  - Need to be recognized as exceptional events
- **Asian emissions may grow with economic expansion**
  - Need to improve understanding and track changes