UC Davis Climate Sentinel Stations

Angelo Coast Range Reserve

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

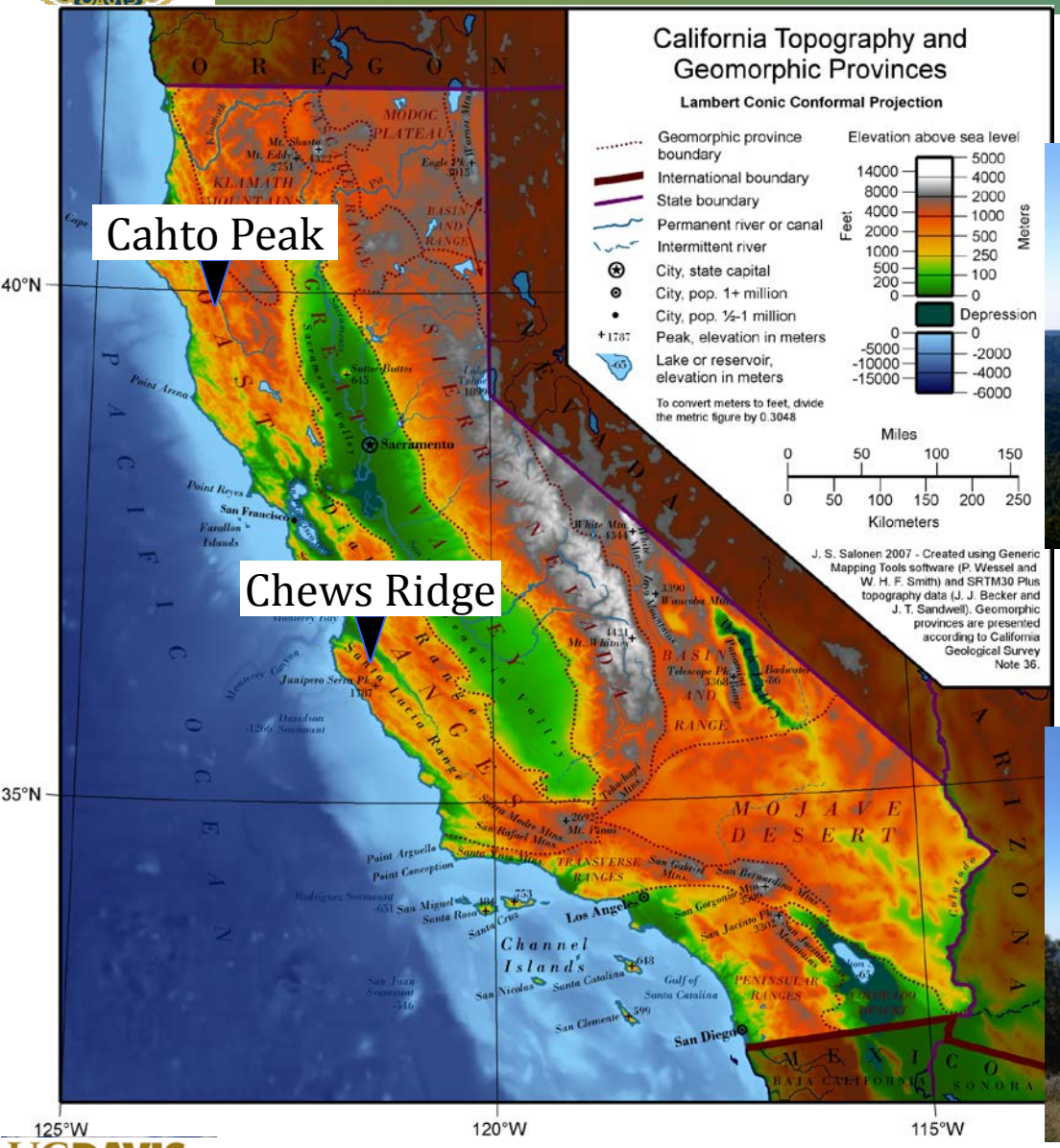
MONTEREY INSTITUTE for RESEARCH in ASTRONOMY
MIRA

California Environmental Protection Agency
Air Resources Board

A Bird's Eye View of The Changing Airscape of California

Ian Faloona, Steven Conley, & Andy Post
(UC Davis Atmospheric Science)

The UC Davis Climate Sentinel Sites



Cahto Peak: 1250 m asl, O_3 + met

Chews Ridge: 1450 m asl, O_3 , aerosol size & composition, + met

Airborne Research at UC Davis

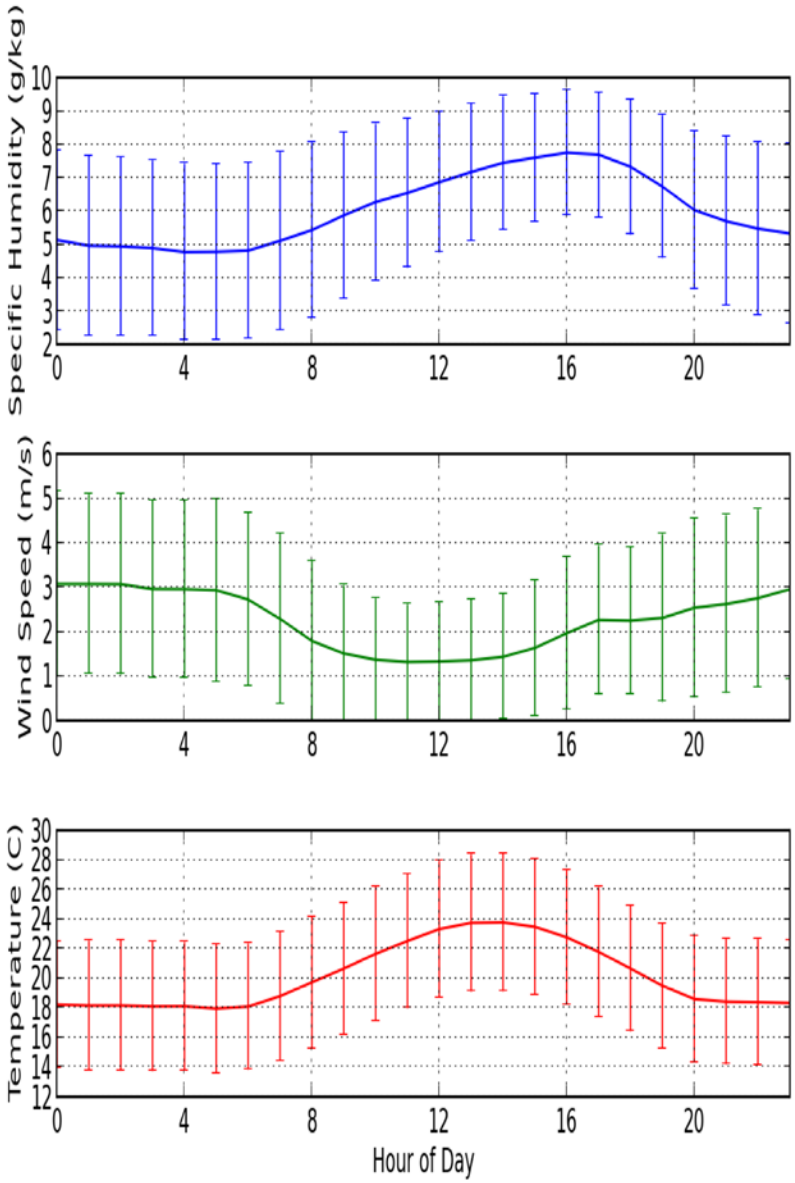
SCIENTIFIC AVIATION

Description	
Make & Model	Mooney M20M TLS
Maximum Cruise Speed	200 kts @ 18 gallons/hr
Minimum Cruise Speed	100 kts @ 10 gallons/hr
Payload	925 pounds (including fuel)
Fuel Capacity	89 gallons
Payload with full fuel	407 pounds
110V A/C Power Available	500 Watts

Measurements	Technique
Horizontal Winds	Differential GPS (1 second)
Methane, CO_2, H_2O	PICARRO CaRDS (10 Hz)
Temperature/Humidity	Vaisala Probe (wing mount)
Ozone	2B Model 205

Other, non-routine payloads: LGR NO_2
Aerodyne C_2H_6
NOAA & UCI Whole Air Samples

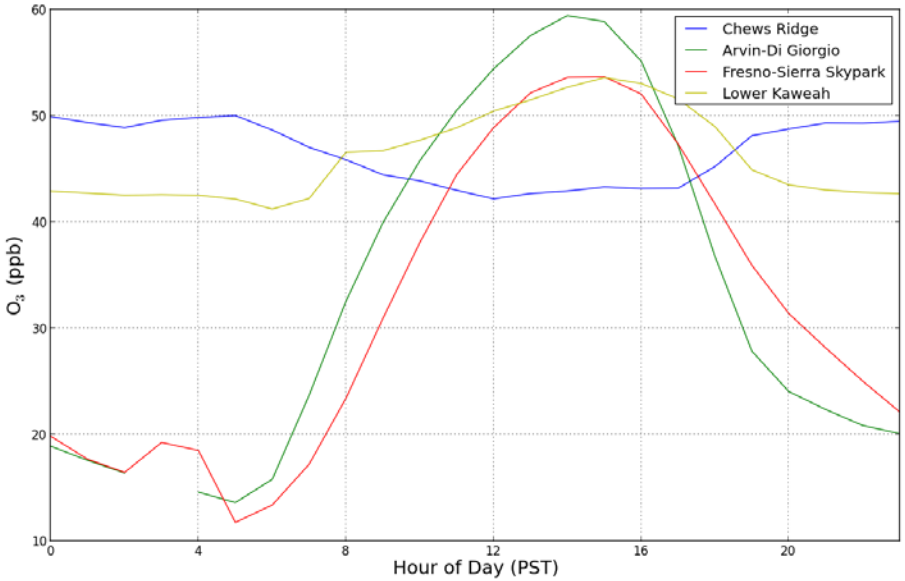
Diurnal Cycles on Chews Ridge



✧ O_3 is typically 6-12 ppb ***lower*** during the daytime;

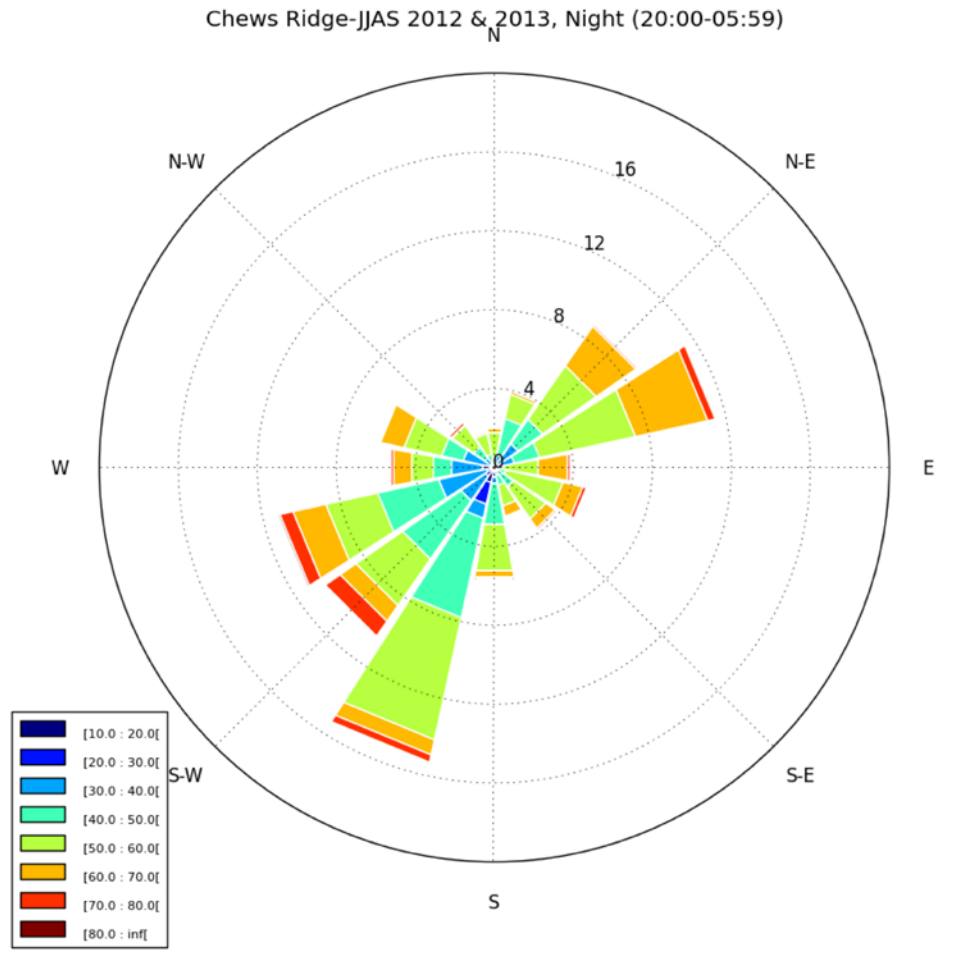
✧ Specific humidity ***rises*** and winds ***slacken***;

✧ These diurnal trends indicate a summertime ***convective boundary*** *layer* on the ridge: stomatal uptake, evapotranspiration, and increased drag during daytime surface heating.

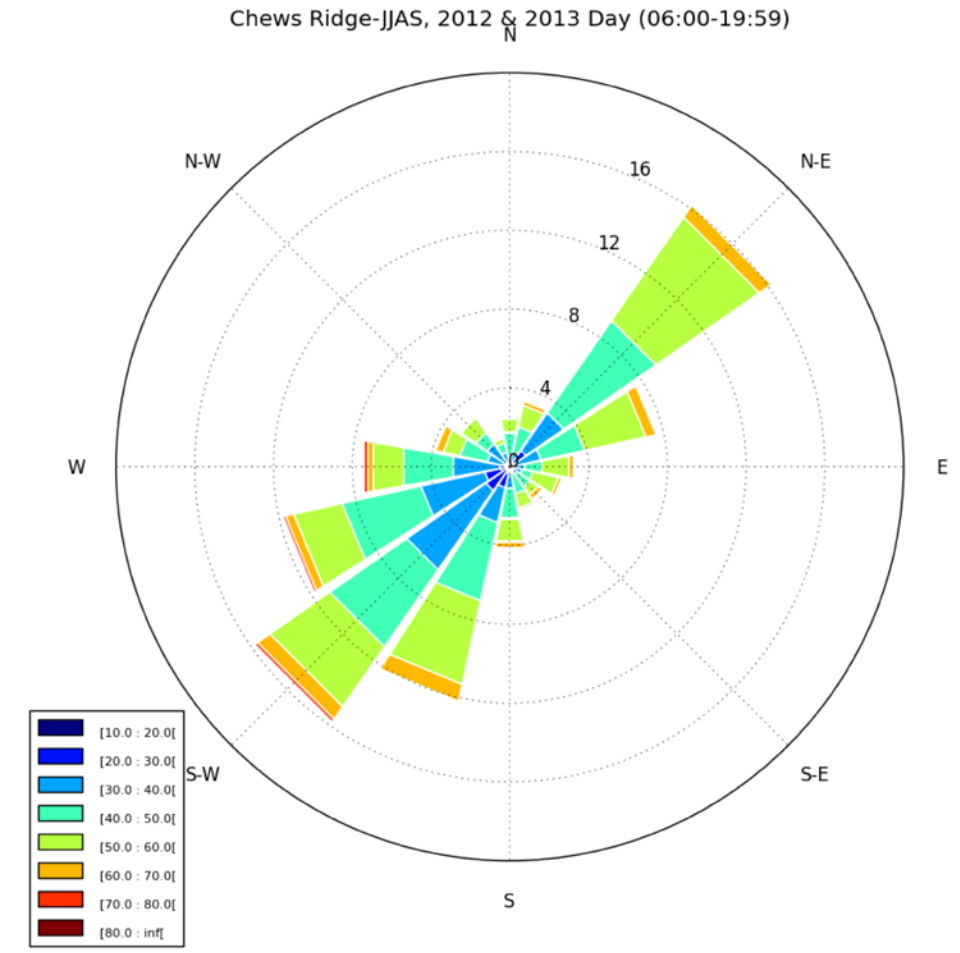


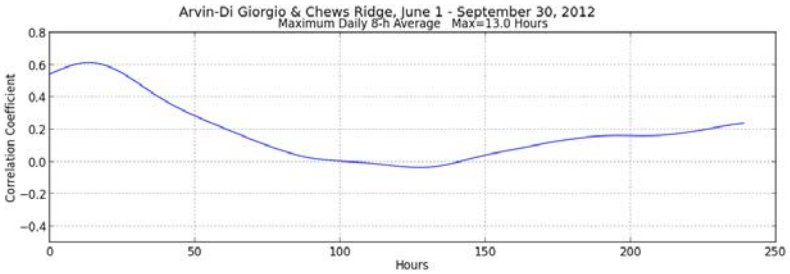
Chews Ridge, O_3 vs. Wind Dir.

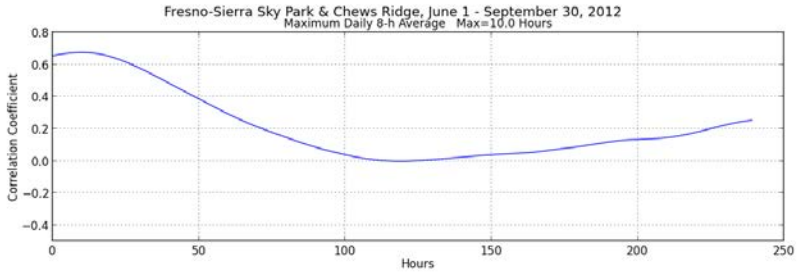
O_3 Nighttime Pollution Rose

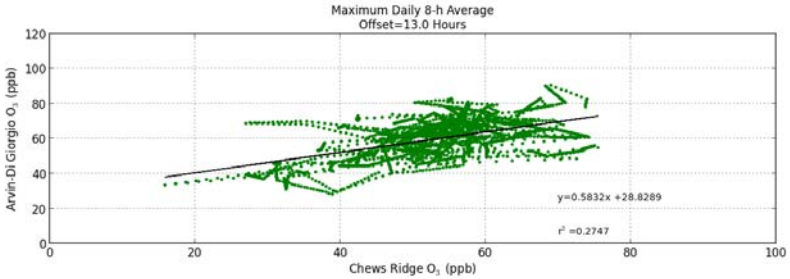


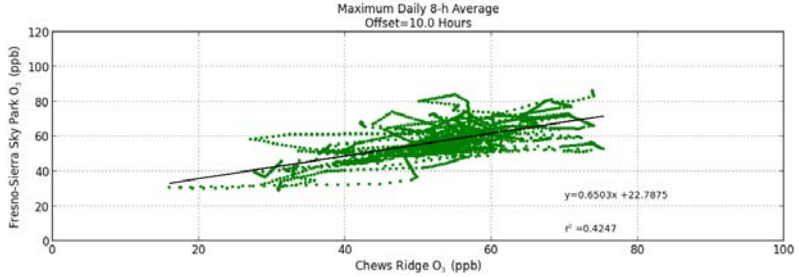
O_3 Daytime Pollution Rose

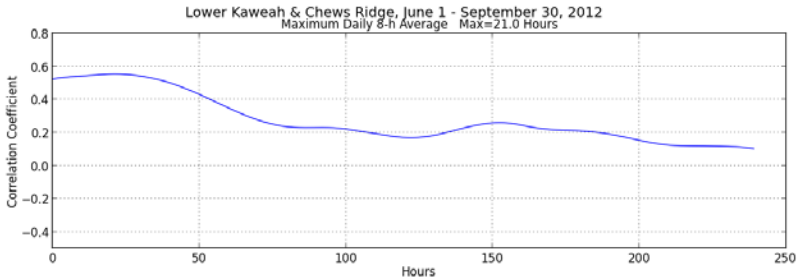


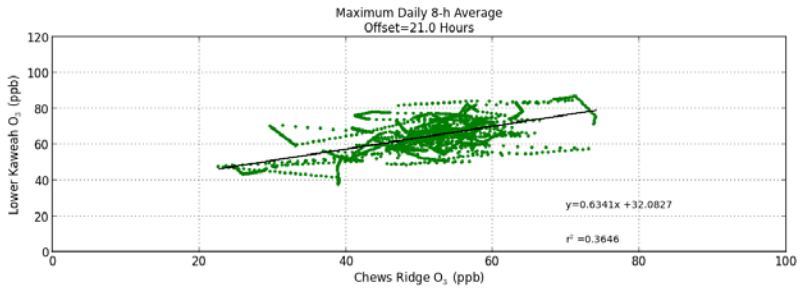












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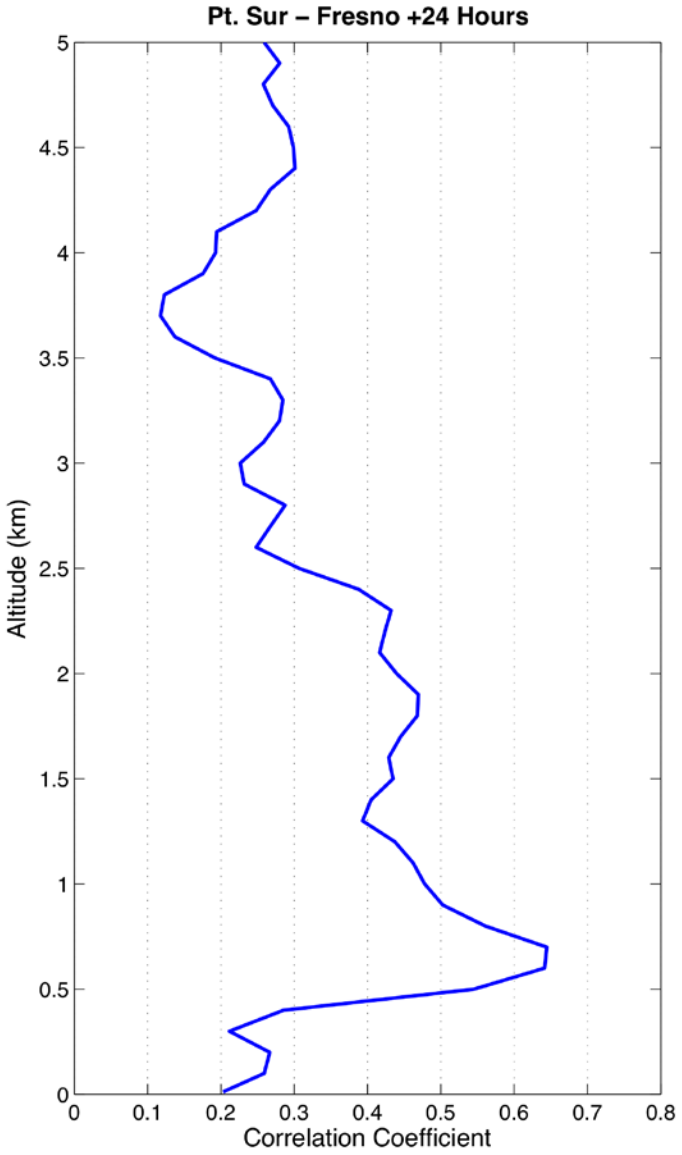
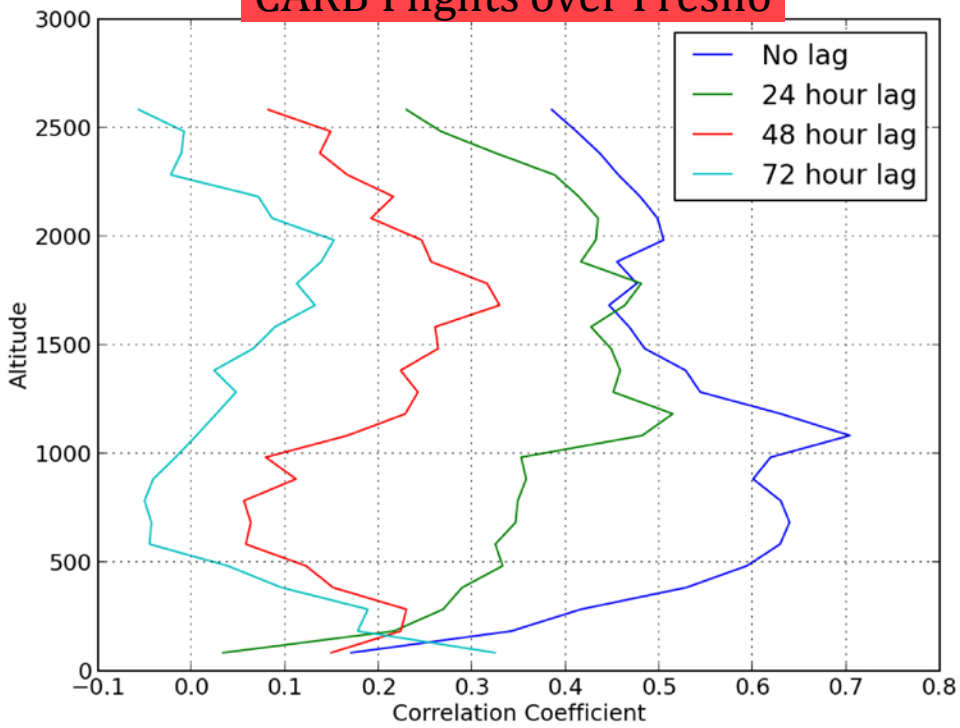
CalNex O_3sondes (Pt. Sur), Chews, & Fresno

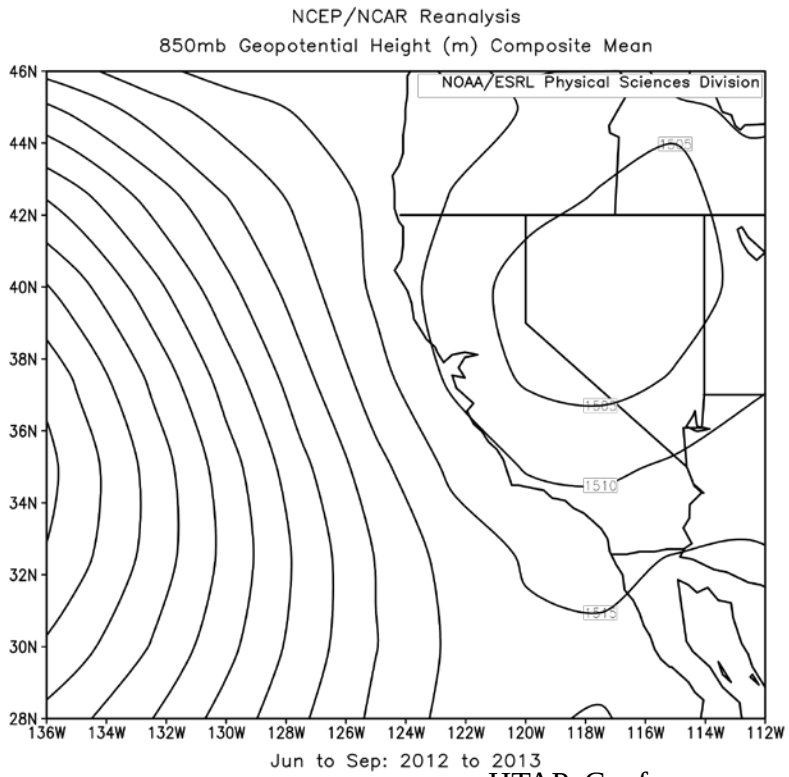


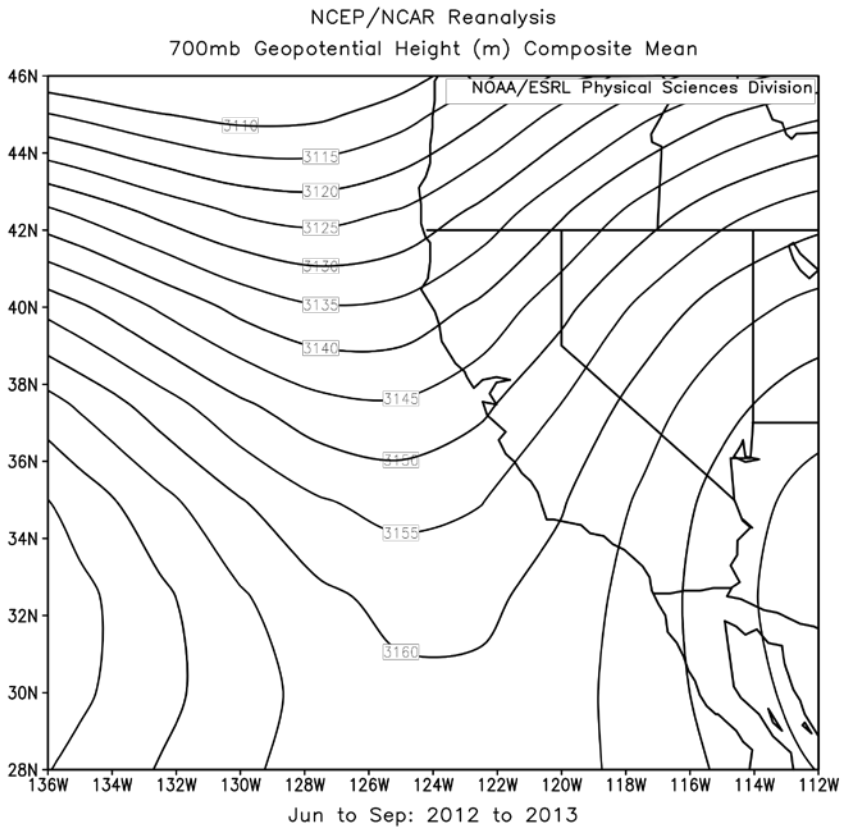
CARB Flights over Fresno



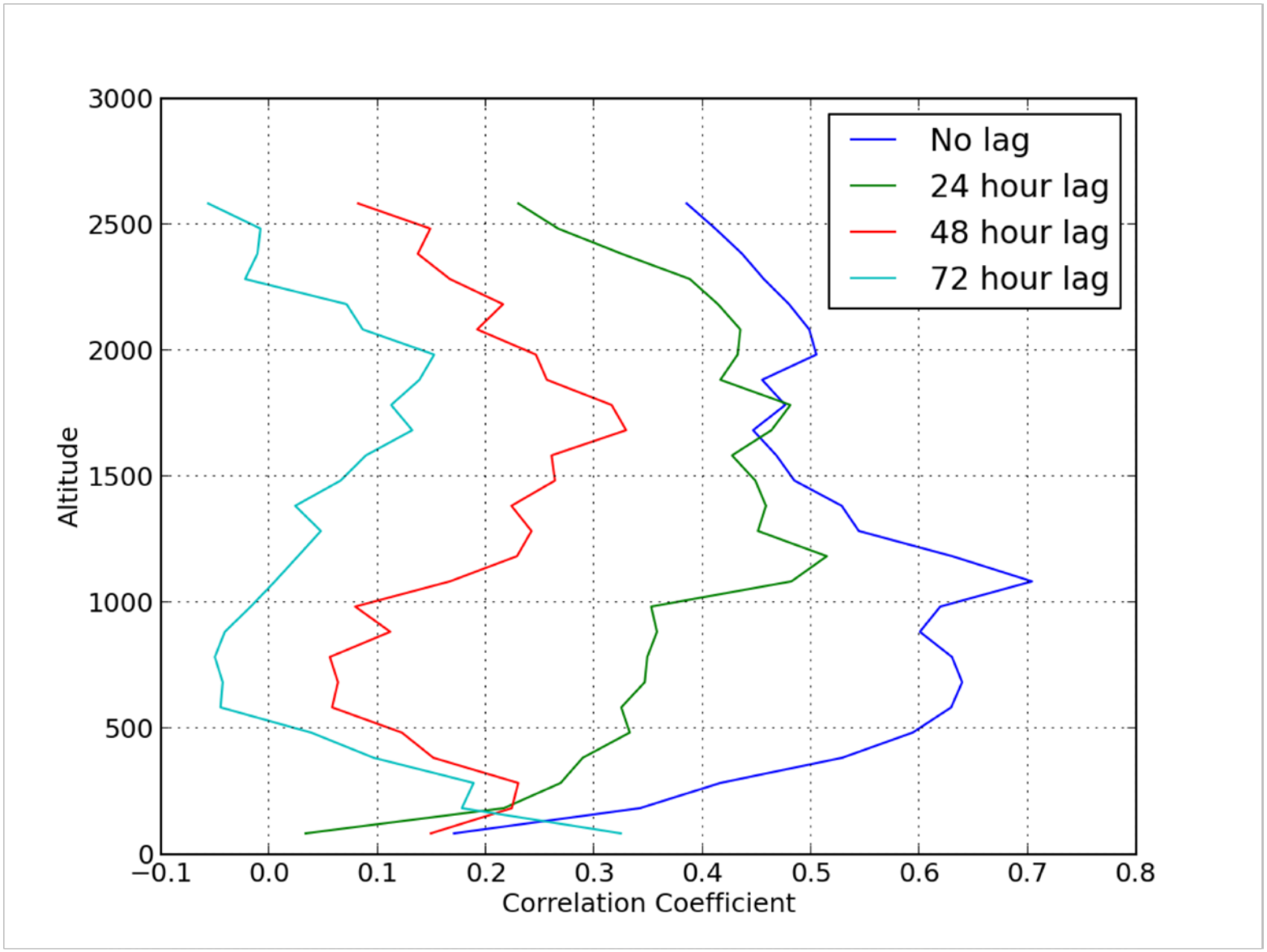
Strong Shear in Lower FT (700-800 hPa)

- Gentle trough along the west coast at 700 hPa ➔
- While at 850 hPa there is a strong zonal pressure gradient off the coast ➔





CARB Flights over Fresno vs. Chews Ridge O_3



AGU

Dr. Ian Faloona

Session: Constituent Source Characterization, Transport and Chemistry I (cosponsored by AMS)
A52B-02: Airborne Quantification of Ozone Transport and Photochemical Production in the Southern San Joaquin Valley
10:35 a.m. Friday, Moscone West 3010

Email: apost@ucdavis.edu