

BAY AREA MODELING

Status of District's Modeling Work

**Modeling Advisory Committee Meeting
September 16, 2003**

Saffet Tanrikulu, Ph.D.

Steve Soong, Ph.D.

Phil Martien

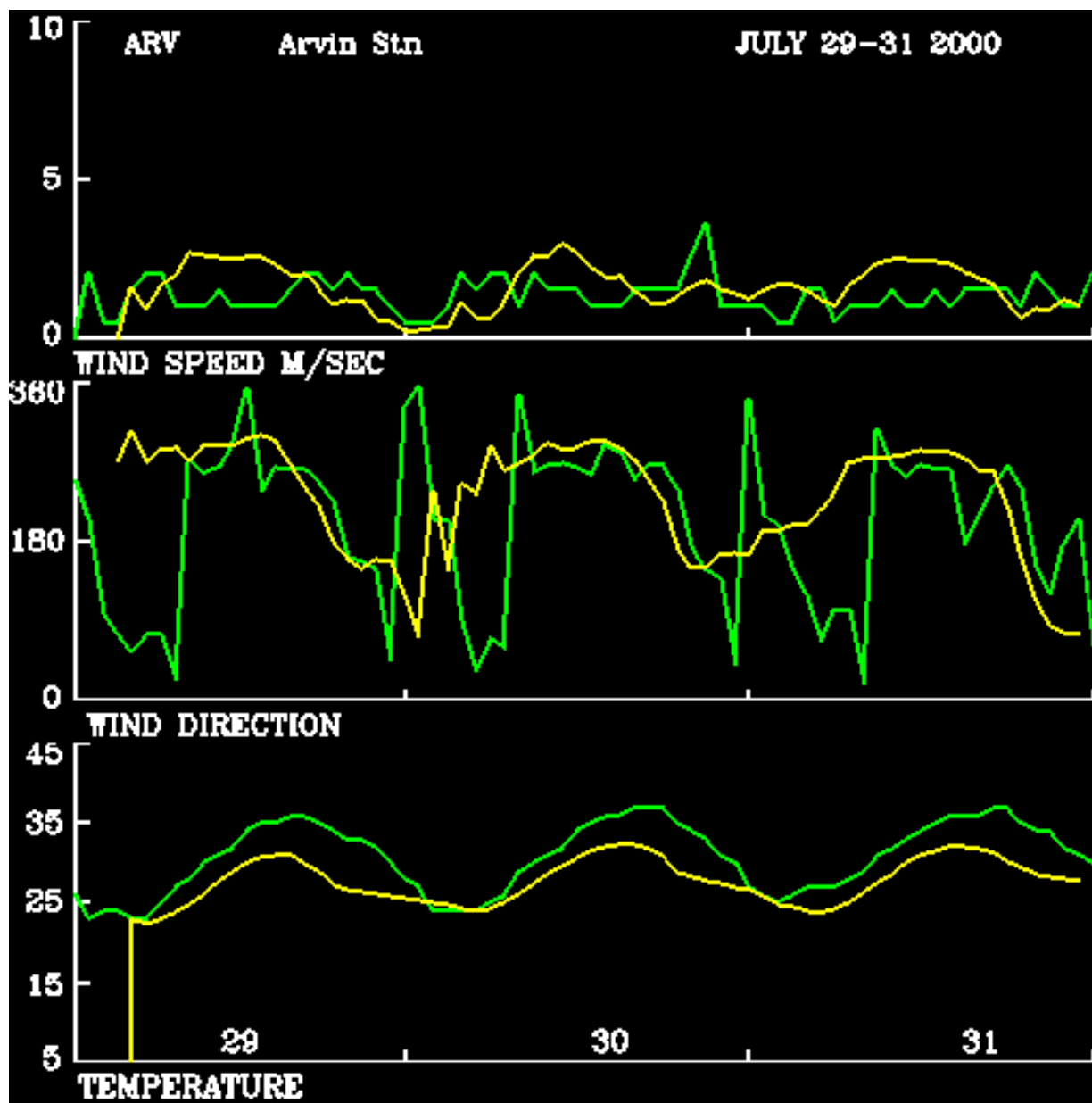
Status of District's Work

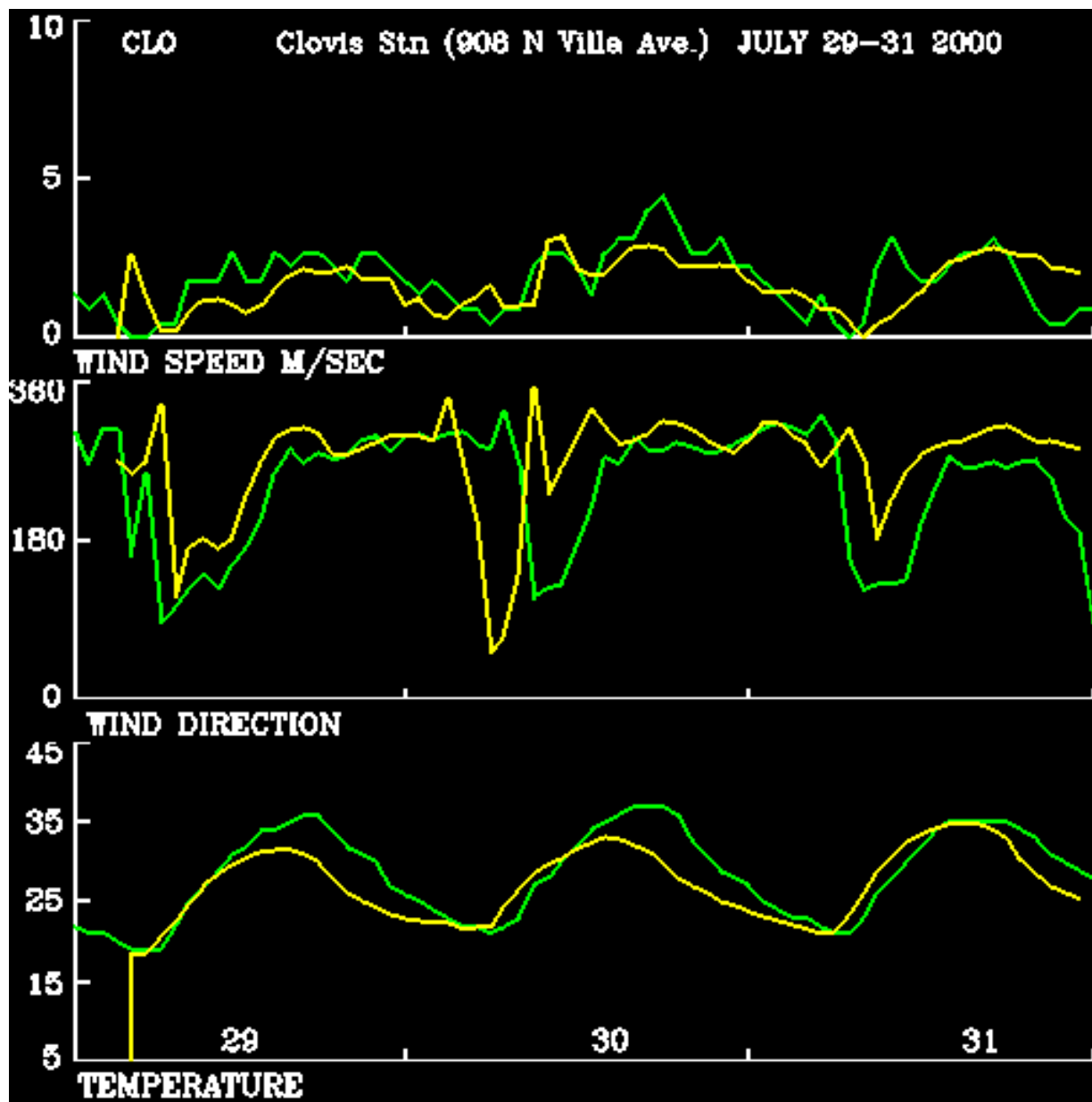
- Performing QA/QC for CCOS data
- Analyzing CCOS data to better understand ozone formation
- Examining the causes of underestimation of predicted ozone
- Conducting investigative simulations

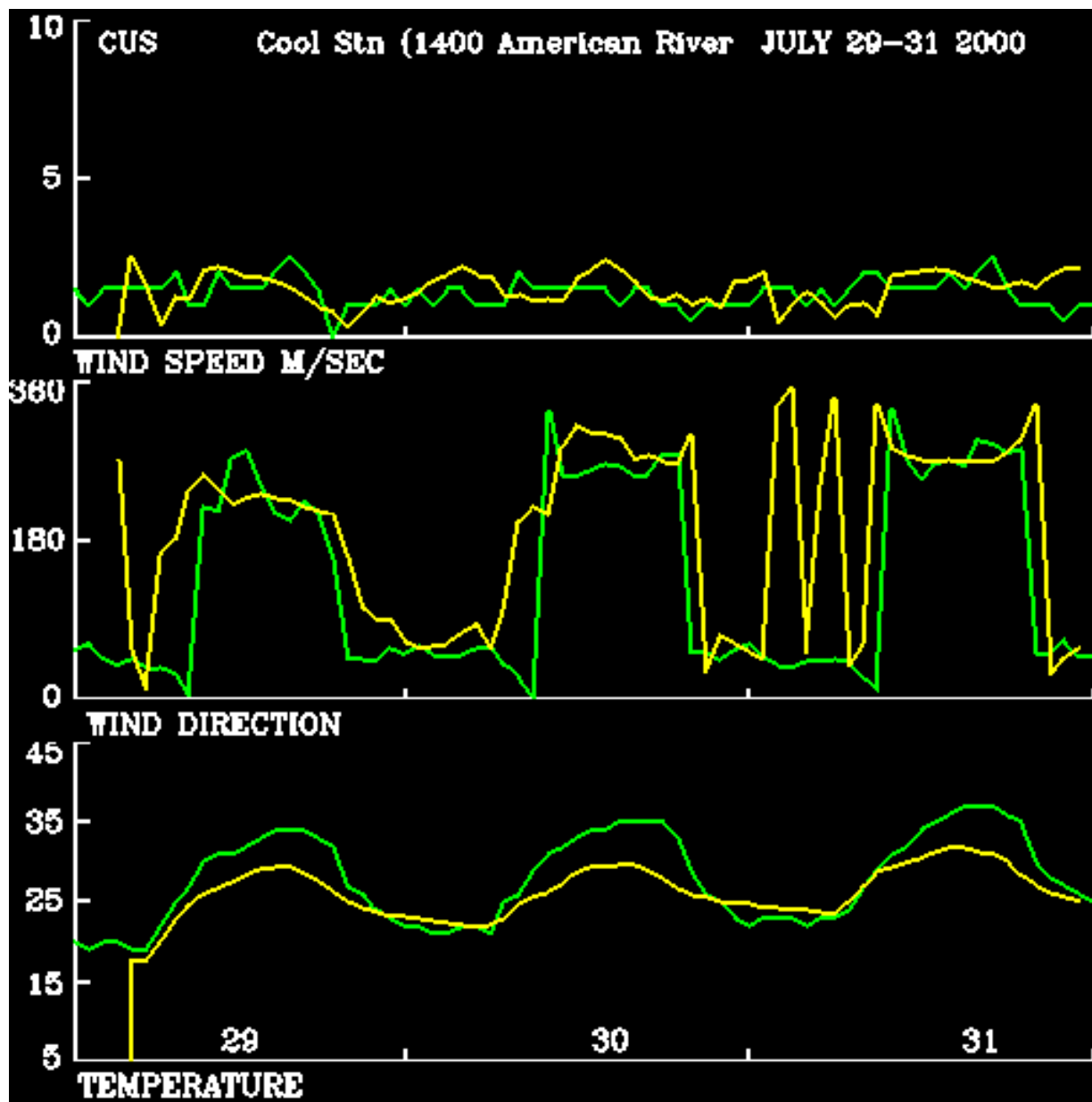
Status of District's Work

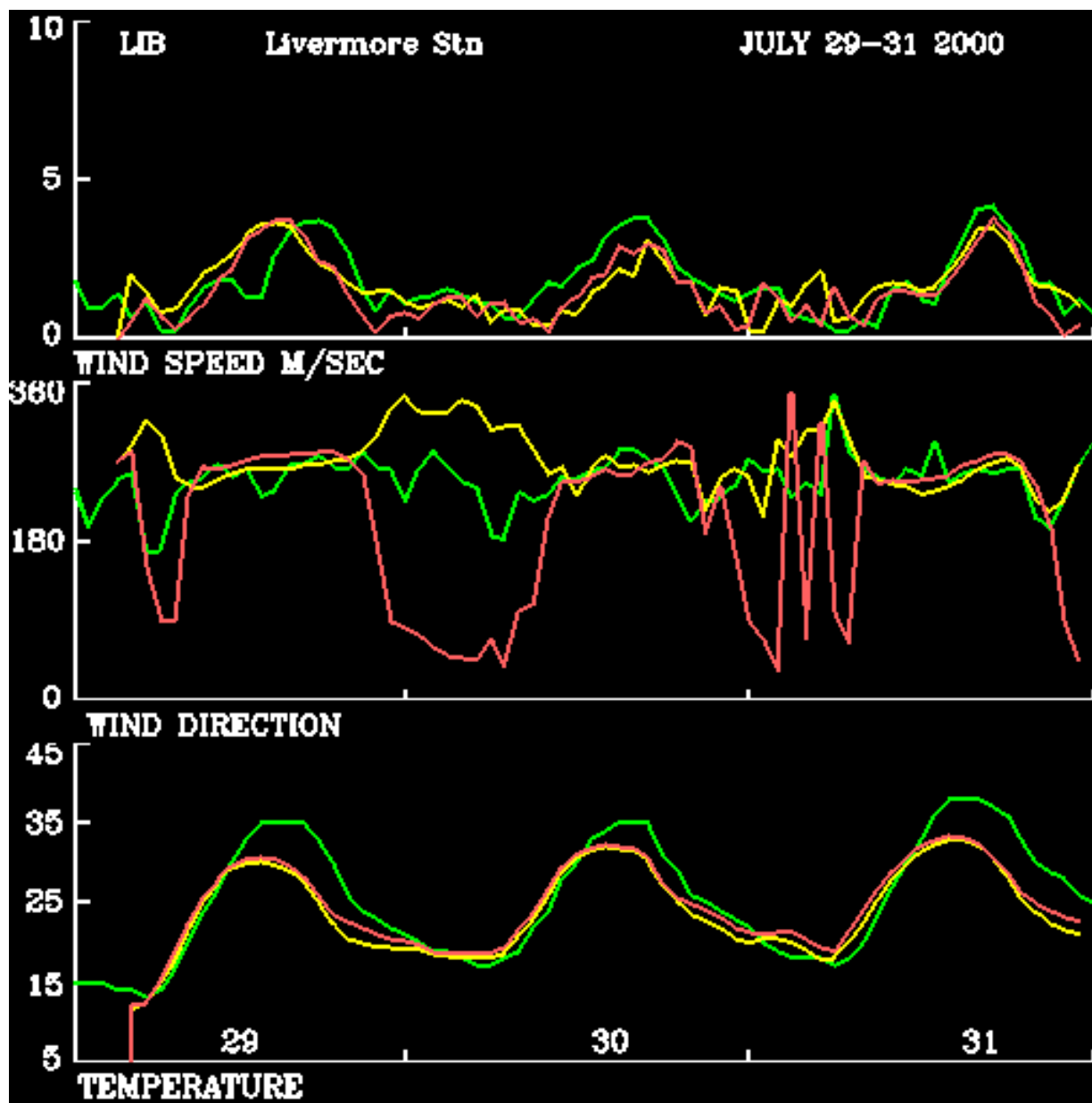
Today's presentation

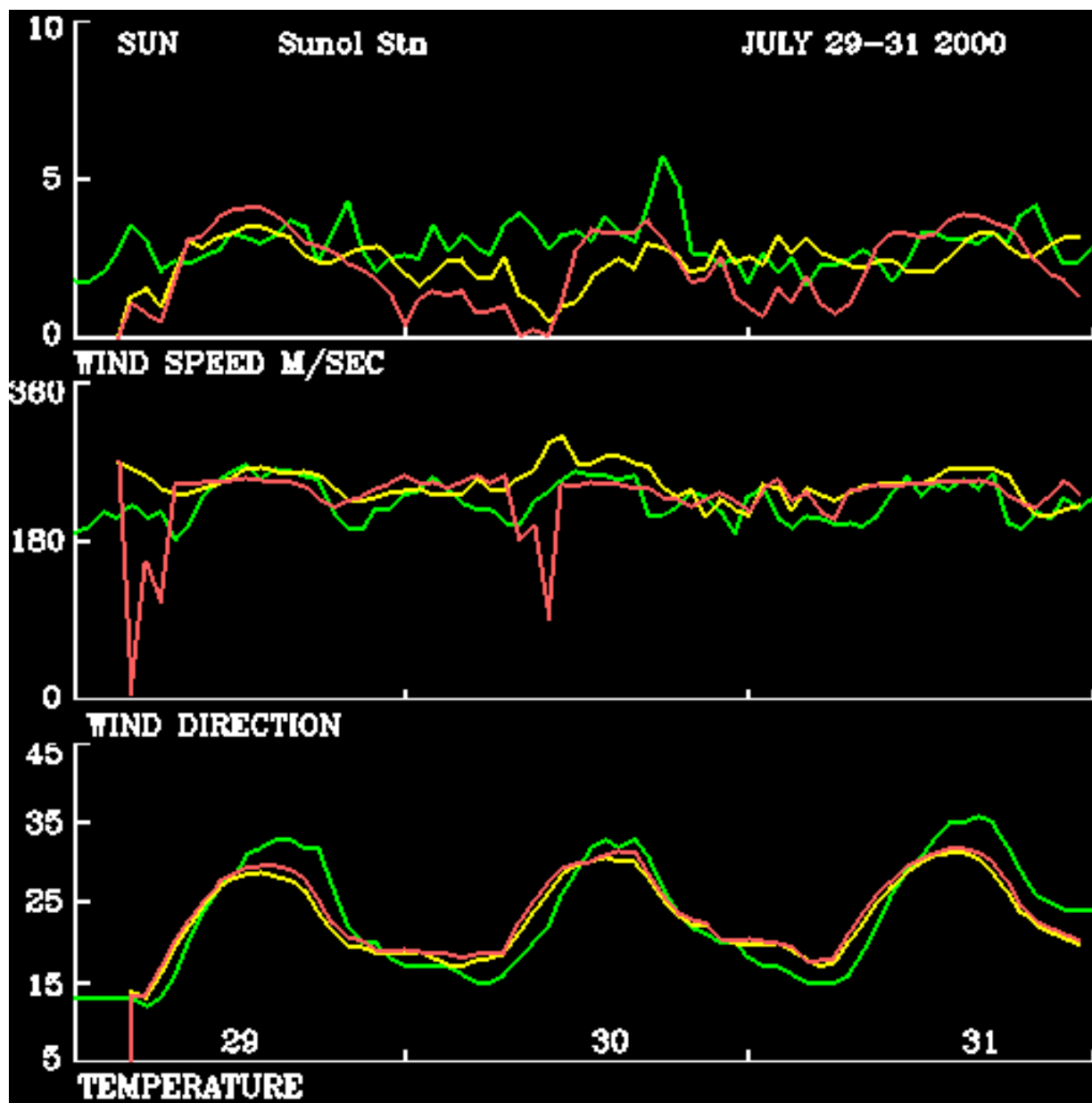
- Sensitivity of CAMx to wind speed
- Sensitivity of CAMx to ambient temperature
- Old versus new inventories
- Effects of wildfire emissions on ozone
- Updating boundary conditions

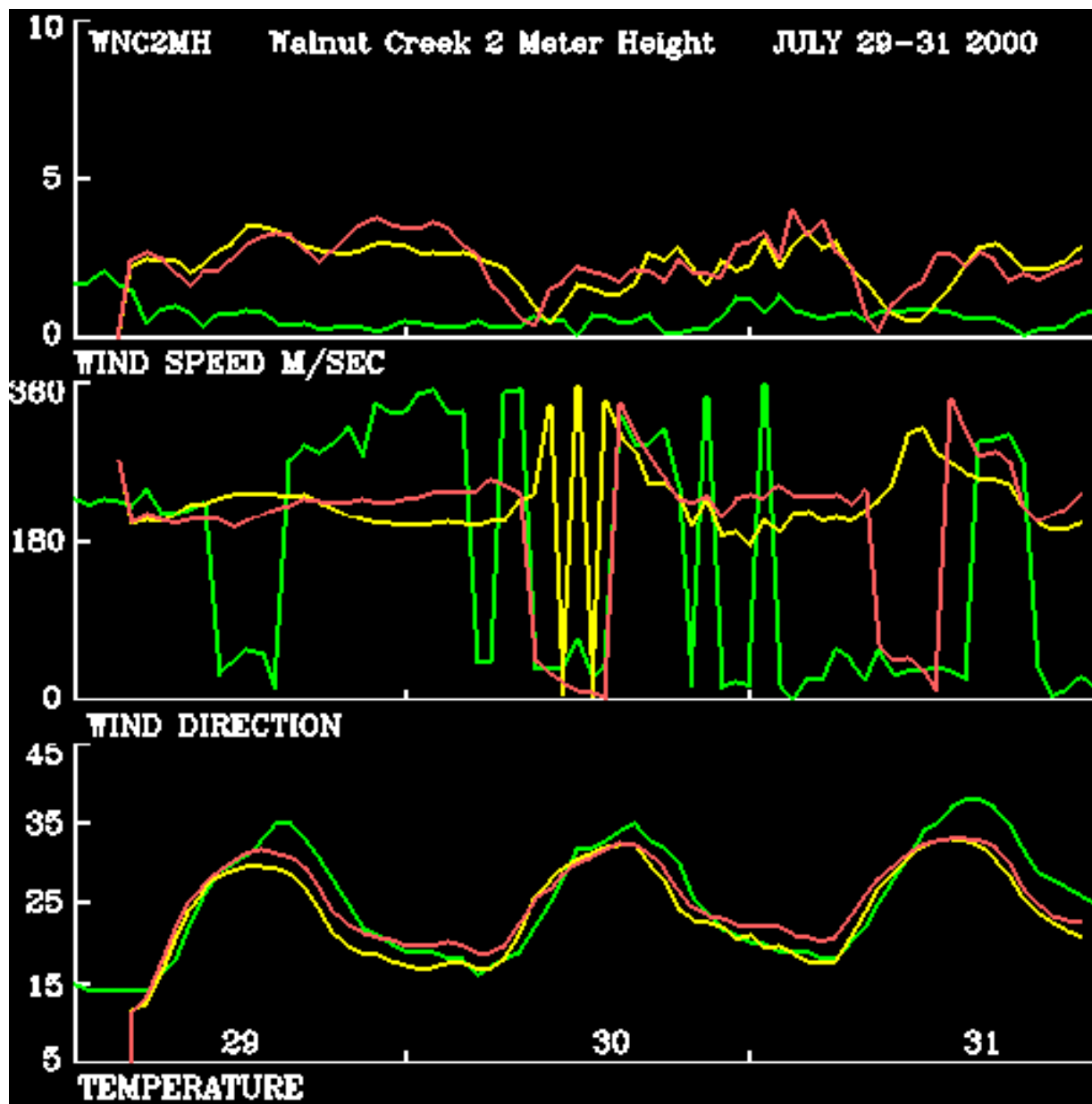


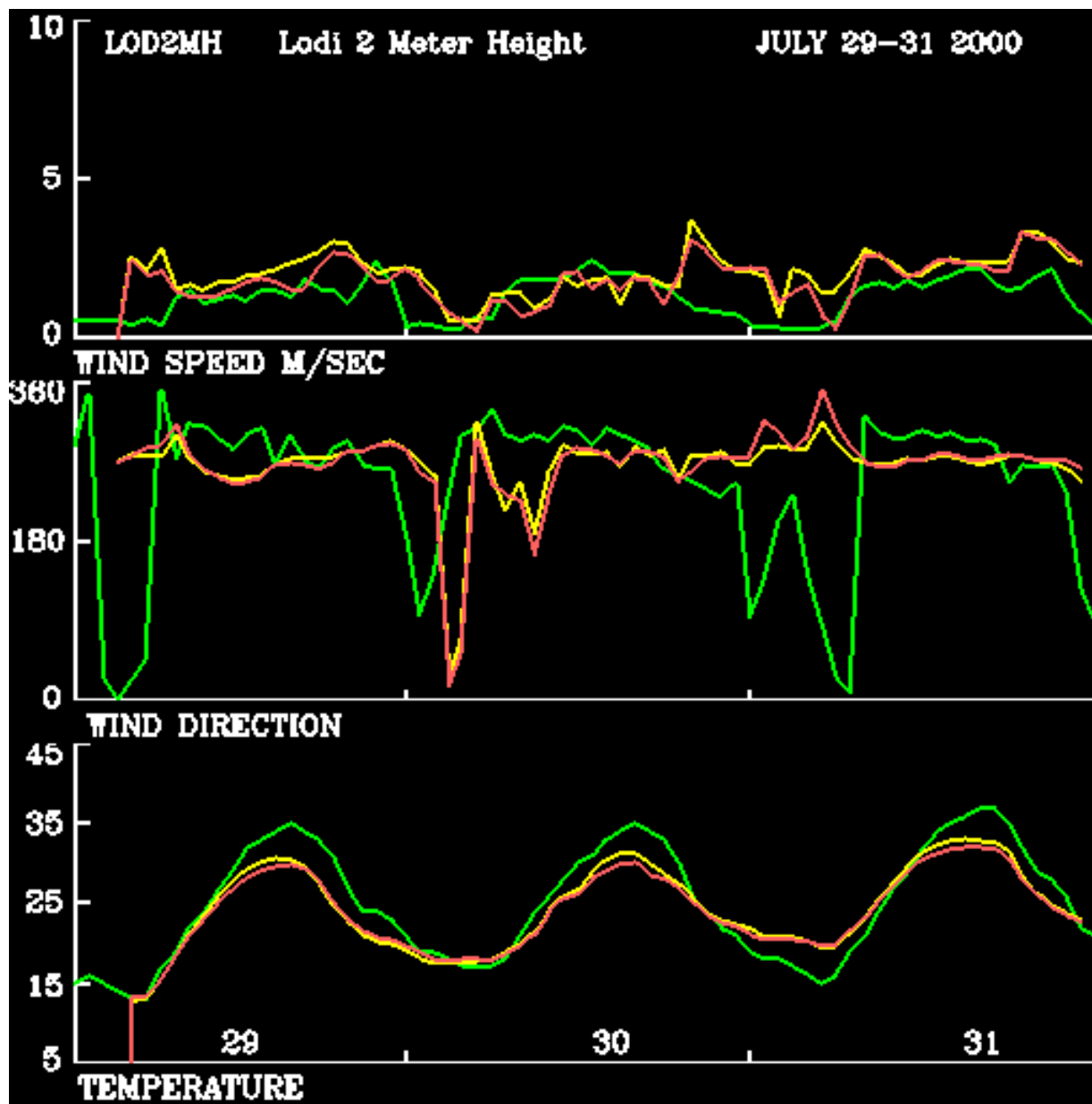






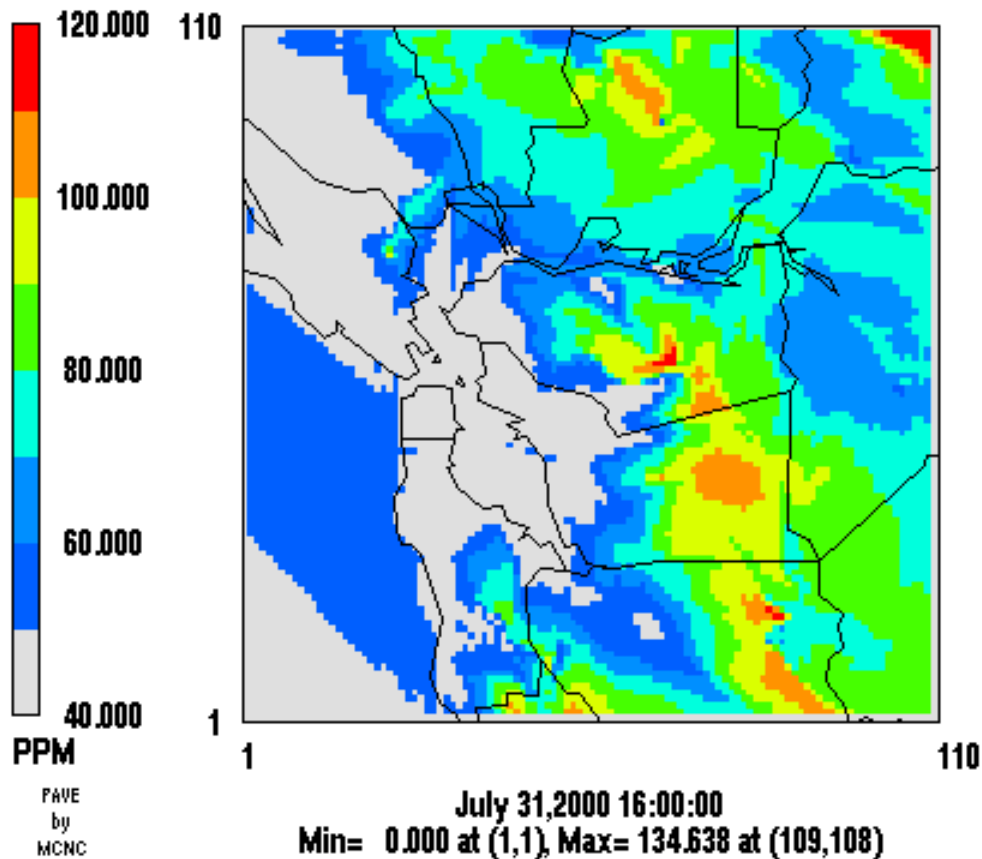






Layer 1 O3

CCOS Base CB4 old emissions w/ fire, 731
a=data.000731O3.favrg

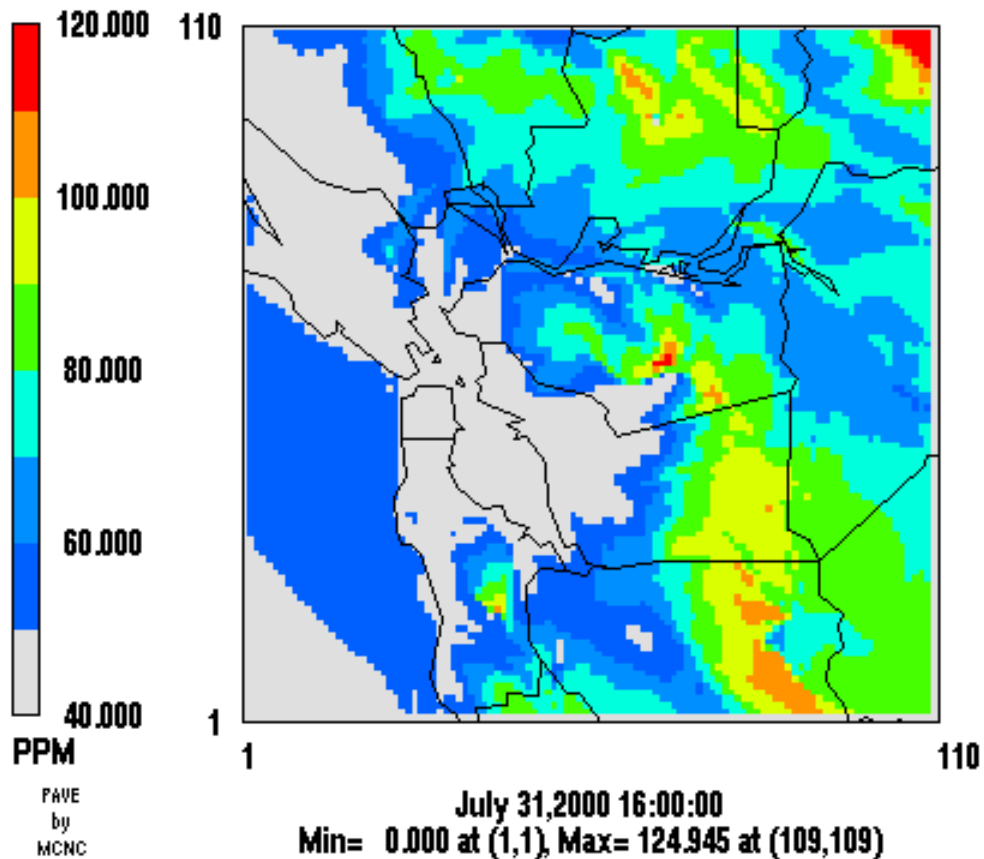


Simulated Maximum Ozone Concentrations (ppb)

	15 km NW	10 km N	15 km SE
Base Case Old			
Inv	117	108	105
Mod Temp +5C	130	124	118
Mod Temp +8C day, -5C night	132	127	120
Base Case New			
Inv	115	103	98
Mod Temp +8C day, -5C night	129	115	114

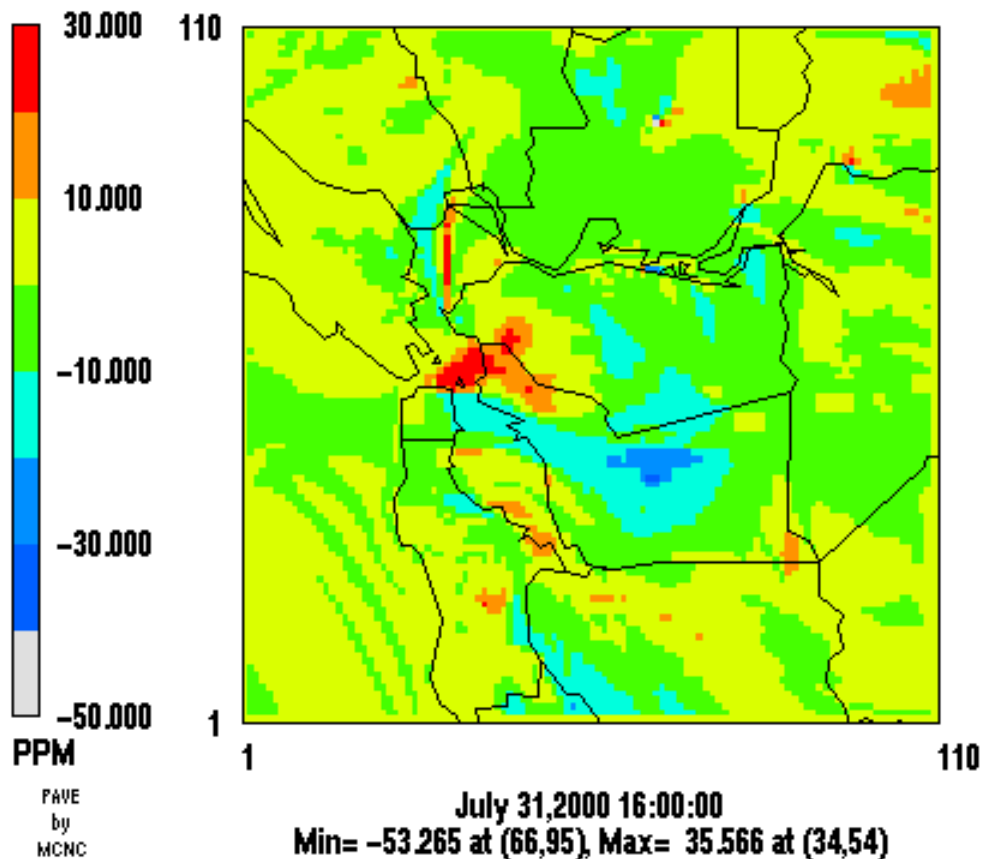
Layer 1 O3

CCOS Base CB4 new emissions w/ fire, 731
c=data.000731O3.favg



Layer 1 O3 difference

CCOS New - Old Base CB4 emissions w/ fire, 731
a=data.000731O3.favrg, c=data.000731O3.favrg



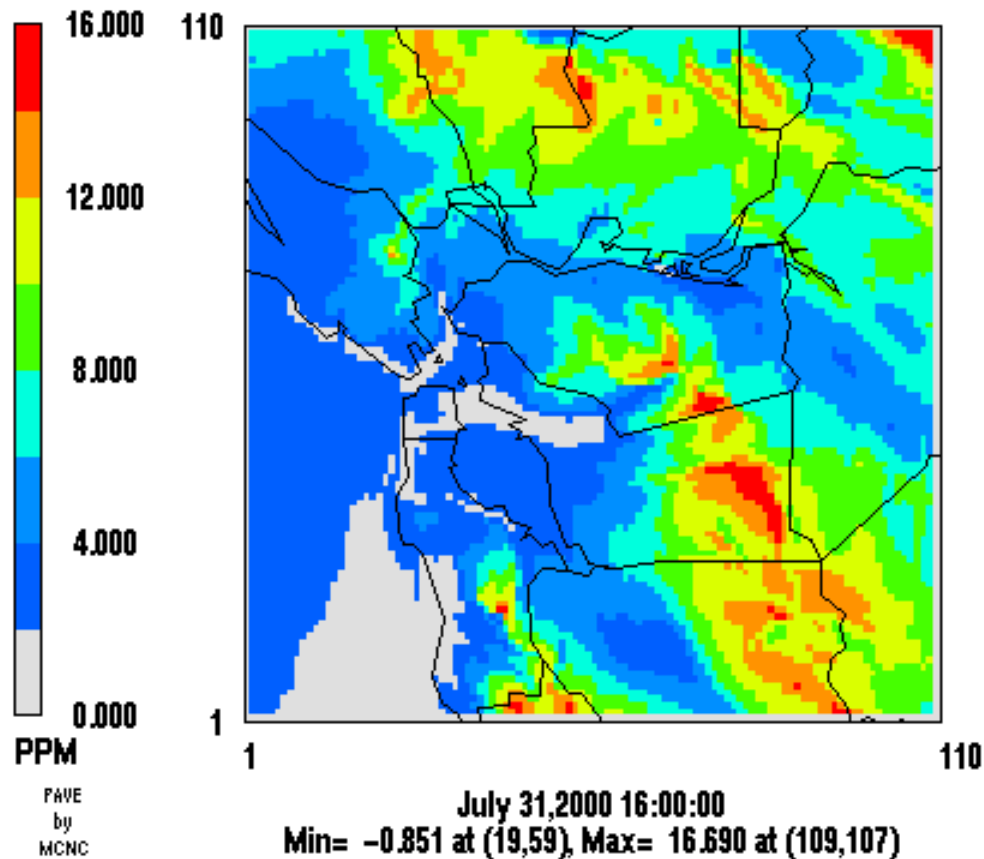
Layer 1 O3

CCOS (Temp +8 -5) CB4 new emissions w/ fire, 731
e=data.000731O3.favrg



Layer 1 O3 difference

CCOS (Temp +8 -5) - Base CB4 new emissions w/ fire, 731
c=data.000731O3.favrg, e=data.000731O3.favrg



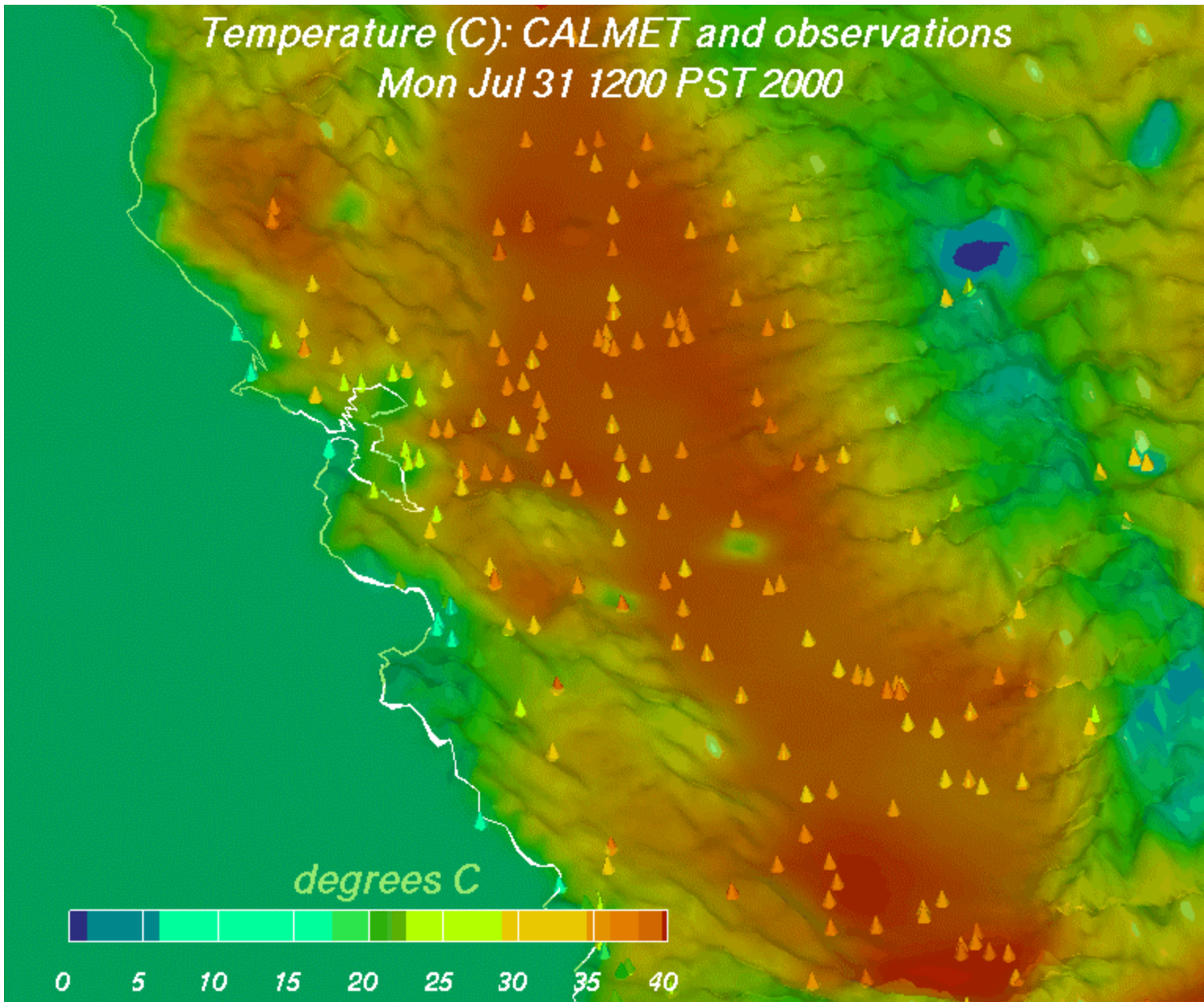
Modeling Emissions Inventory Totals for July 31, 2000

Emissions Category	Bay Area TOG (tons/day)	Other TOG (tons/day)	Bay Area NOx (tons/day)	Other NOx (tons/day)
Motor Vehicle Emissions based on MM5 meteorological inputs	240	631	332	869
Motor Vehicle Emissions based on CALMET meteorological inputs	228	667	343	957
Biogenic Emissions based on MM5 meteorological inputs	937	9521	0 *	0 *
Biogenic Emissions based on CALMET meteorological inputs	454	4592	10 **	160 **

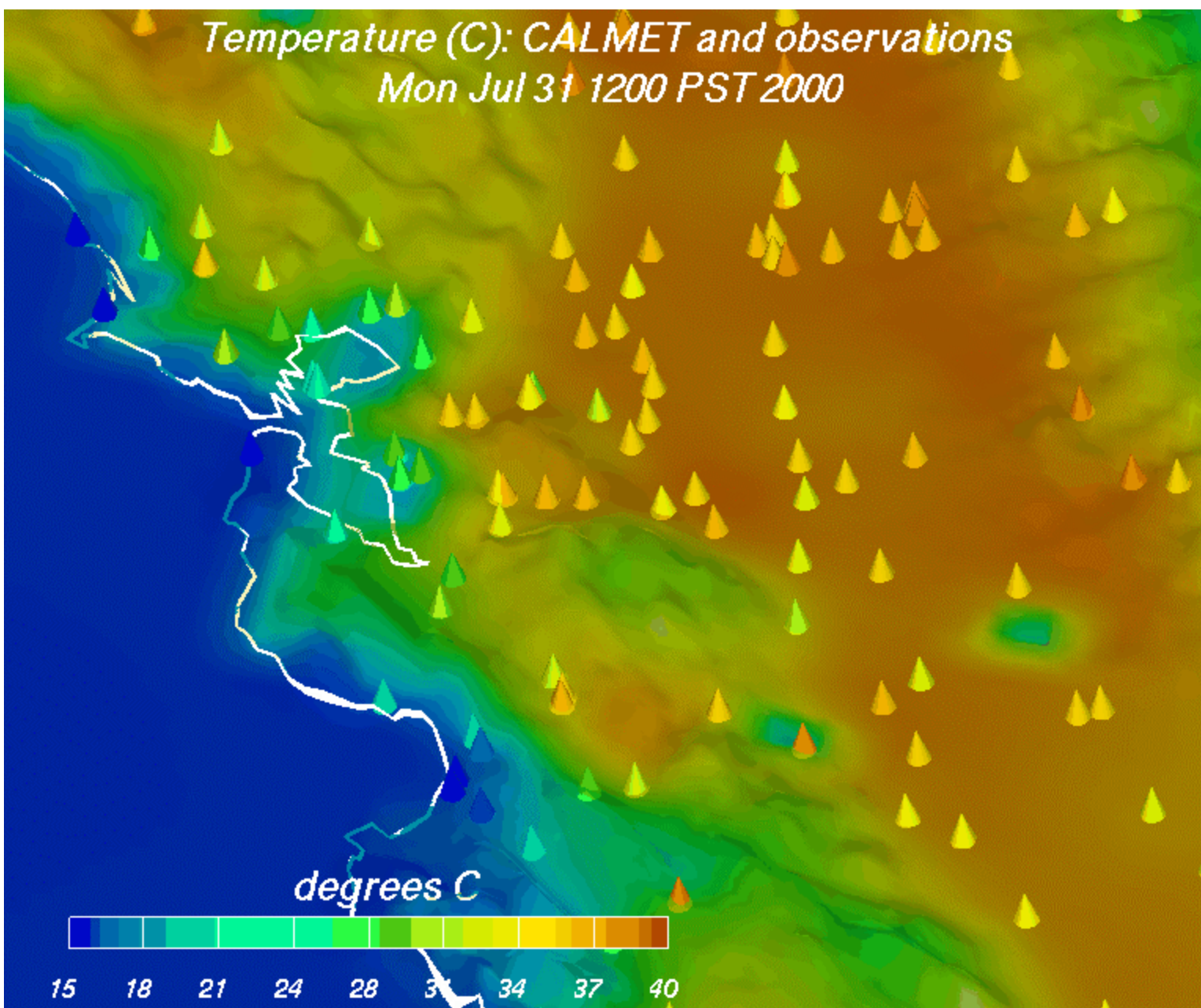
* No Soil NOx in this version.

** Approximate totals.

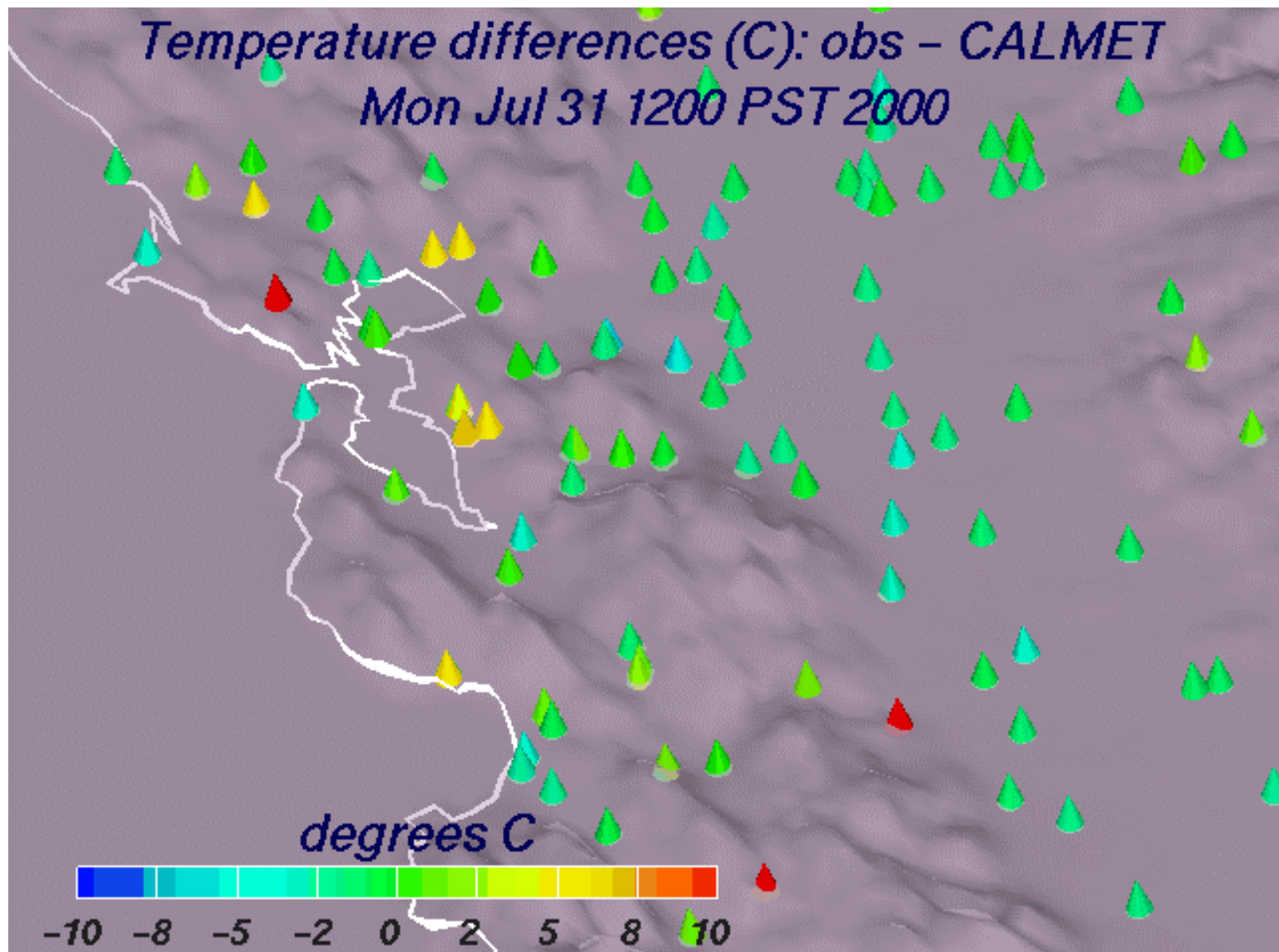
Temperature (C): CALMET and observations
Mon Jul 31 1200 PST 2000



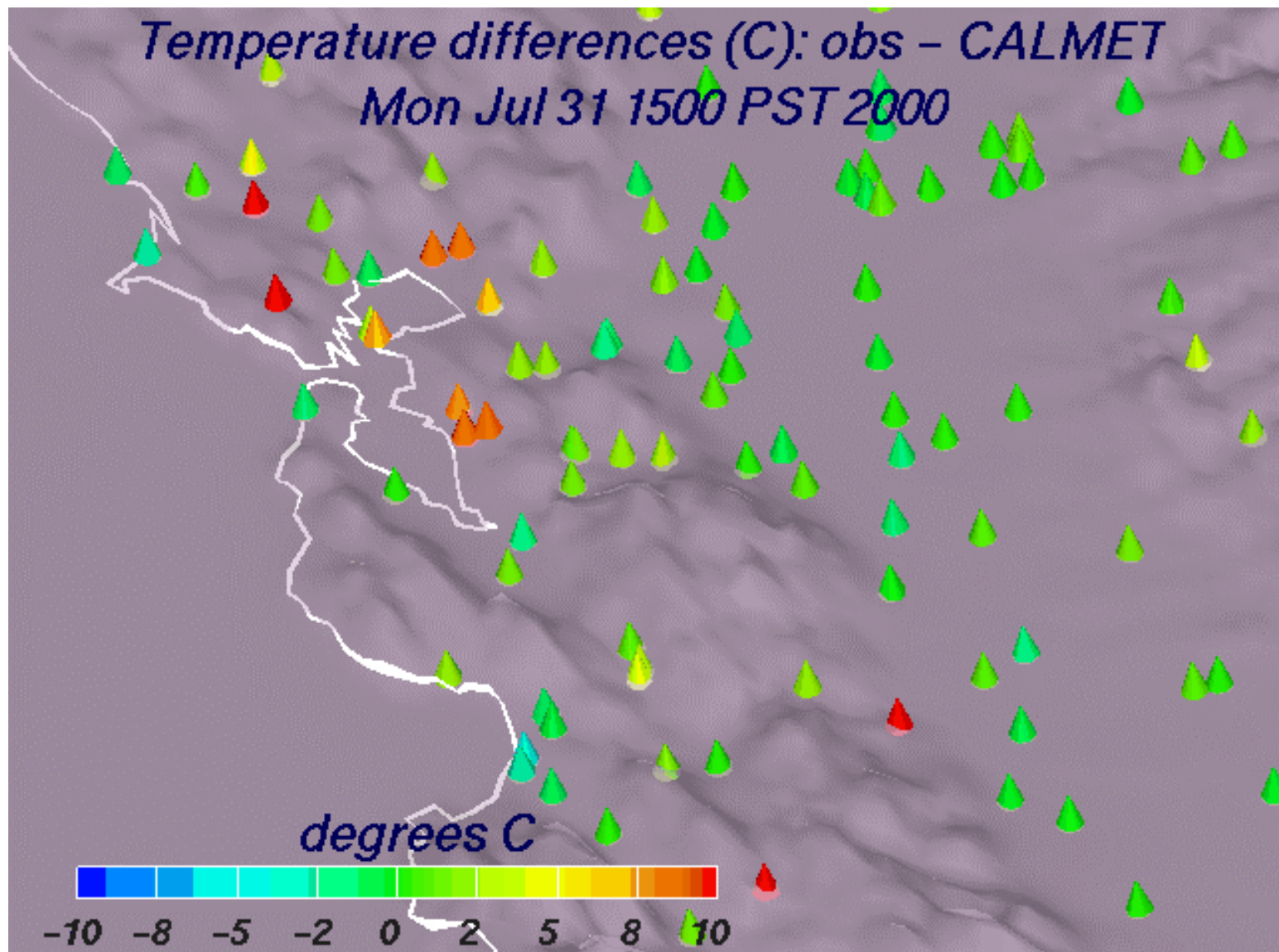
Temperature (C): CALMET and observations
Mon Jul 31 1200 PST 2000



Temperature differences (C): obs - CALMET
Mon Jul 31 1200 PST 2000



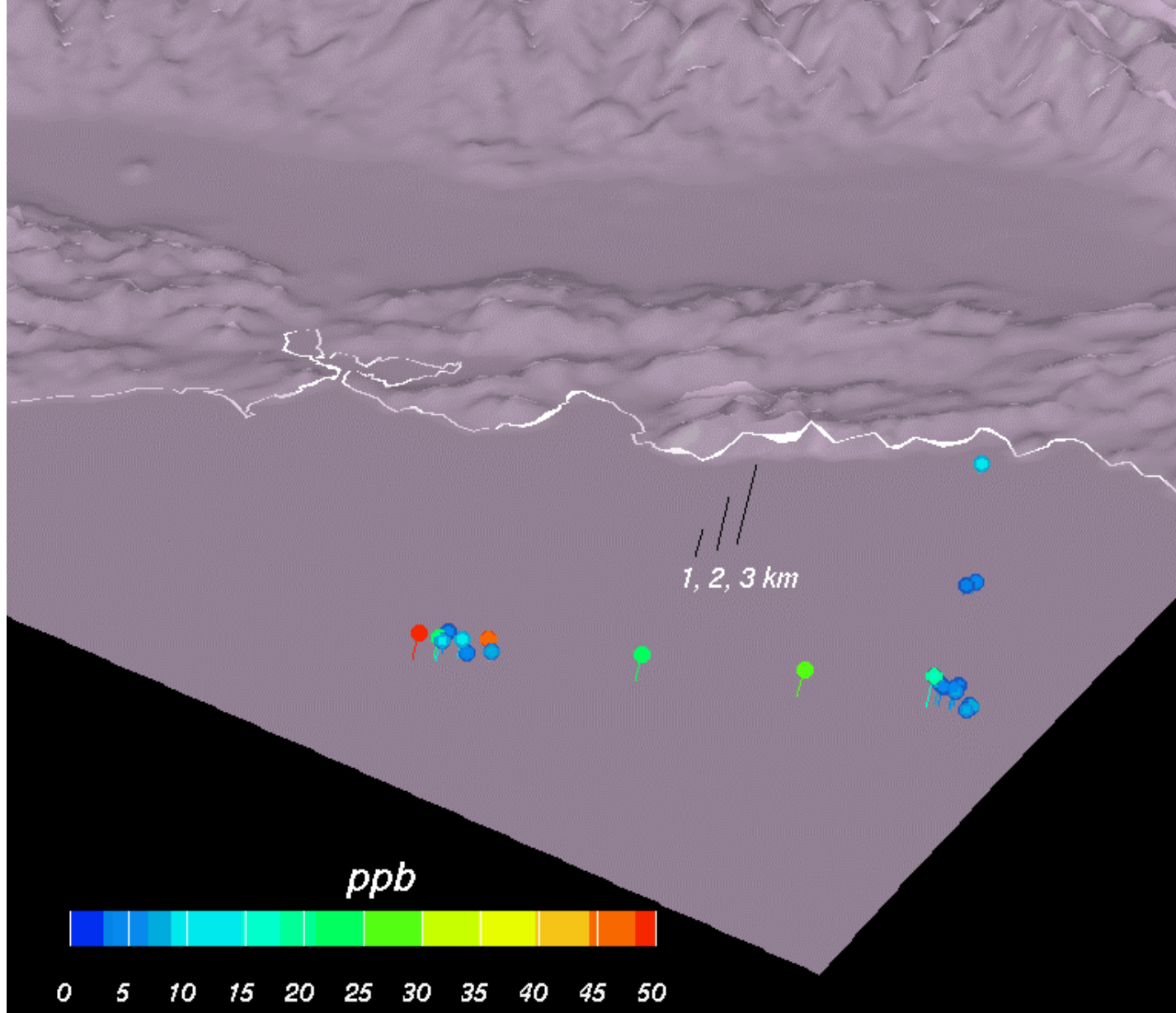
Temperature differences (C): obs - CALMET
Mon Jul 31 1500 PST 2000



Status of CCOS VOC Aircraft Data

- **Many VOC species apparently missing**
- **Working with ARB to QA database**
- **Data converted to common units**
- **Data speciated to CB-IV and SAPRC-99**

PAR based on aircraft observations (ppb)
All CCOS far-offshore flights (except PNNL)



Preliminary Modeling Boundary Conditions Based on CCOS Aircraft VOC Samples

Species	CCOS * (ppb)	SARMAP ** (ppb)
O3 (@100m)	25	40
O3 (@1000m)	50	70
NO	0.05	0.5
NO2	1	2.5
PAR	20	20.5
MEOH	3	-
ETOH	1	-
TOL	0.1	0.246
XYL	0.05	0.135
ETH	0.5	0.702
OLE	0.5	0.414
ISOP	0.05	0.05
FORM	2	5.78
ALD2	5	1.52

* Recommended based on off-shore aircraft VOC data

** "Generation 4" boundary conditions.

NEXT STEPS

- Investigate land-use in MM5 (update friction velocity)
- Investigate mixing depth
- Use 1 km resolution
- Investigate winds and temperature in aloft layers
- Use terrain barrier
- Use FDDA

NEXT STEPS (Cont.)

- Use SAPRC chemistry/EI
- Update lateral boundary conditions
- Investigate surface deposition
- Conduct statistical model performance