DISCOVER-AQ California – Outlook Summary – Tuesday, January 15, 2013

The study region is under the influence of a very strong ridge of high pressure located just off the Pacific Coast. The northerly flow on the leading edge of this ridge has brought well below normal temperatures to both the San Joaquin Valley and the Palmdale region over the past few days. As the ridge moves a bit to the east over the next couple of days, there will be a warming trend. With this airmass in place, the very low dew points have prevented any significant fog formation in the SJV. Dew points will be rising over the next few days, with possible patchy fog on Wednesday and Thursday, and more widespread and persistent fog on Friday and over the weekend. Air quality has been hovering on the border of Code Yellow and Code Orange for PM2.5 (35 micrograms per cubic meter) in the Fresno area with cleaner conditions farther south. The air quality for PM2.5 is expected to deteriorate in the Fresno area on Wednesday as the inversion under the strong high pressure lowers and strengthens. Southeasterly flow at the surface has kept the southern end of the Valley much cleaner.

Recommendation is to fly on Wednesday with an update on the fog situation early in the morning. Thursday will be another good day for flying, but logistical considerations will likely postpone the second flight until Friday. The fog situation for Friday will be the subject of intense scrutiny in the forecasts on Wednesday and Thursday.

DISCOVER-AQ/PODEX Forecasting Briefing

January 15, 2013

Ken Pickering, NASA/GSFC
Chris Loughner, ESSIC/GSFC
Bob Chatfield, NASA/Ames

Fresno:

TODAY	TONIGHT	WEDNESDAY	WEDNESDAY NIGHT	THURSDAY	THURSDAY NIGHT	FRIDAY	FRIDAY NIGHT	SATURDAY
Morning Frost	Clear	Sunny	Clear	Sunny	Clear	Sunny	Clear	Sunny
High: 48 °F	Low: 33 °F	High: 51 °F	Low: 35 °F	High: 57 °F	Low: 38 °F	High: 60 °F	Low: 39 °F	High: 61 °F

Hanford:

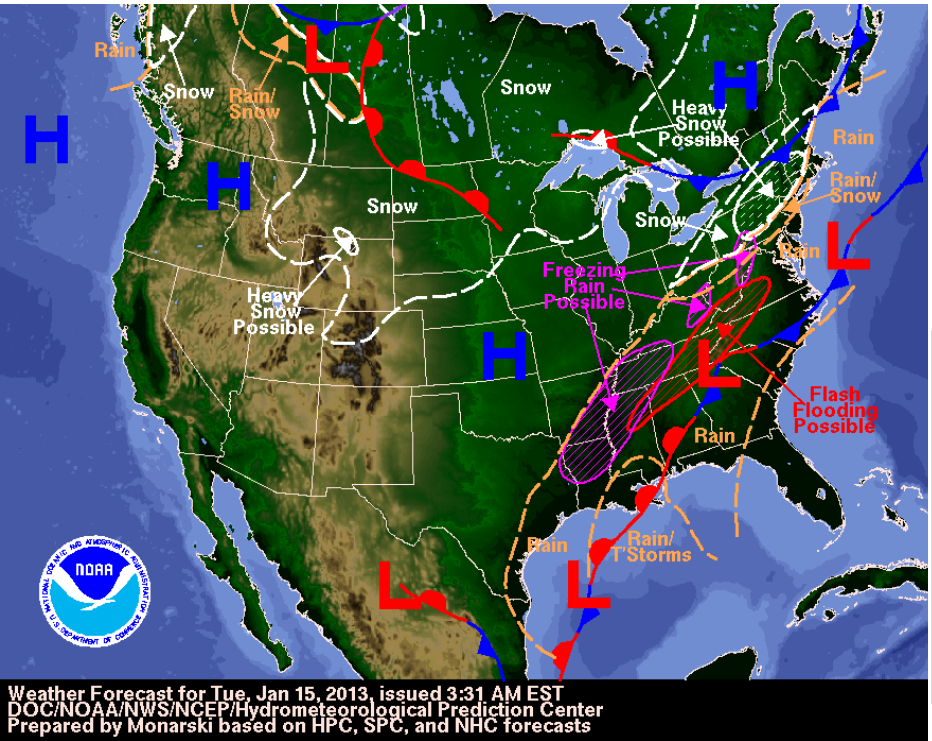
TODAY	TONIGHT	WEDNESDAY	WEDNESDAY NIGHT	THURSDAY	THURSDAY NIGHT	FRIDAY	FRIDAY NIGHT	SATURDAY
Morning Frost	Areas Frost	Morning Frost	Patchy Frost	Morning Frost	Clear	Sunny	Clear	Sunny
High: 50 °F	Low: 28 °F	High: 53 °F	Low: 31 °F	High: 58 °F	Low: 34 °F	High: 60 °F	Low: 34 °F	High: 61 °F

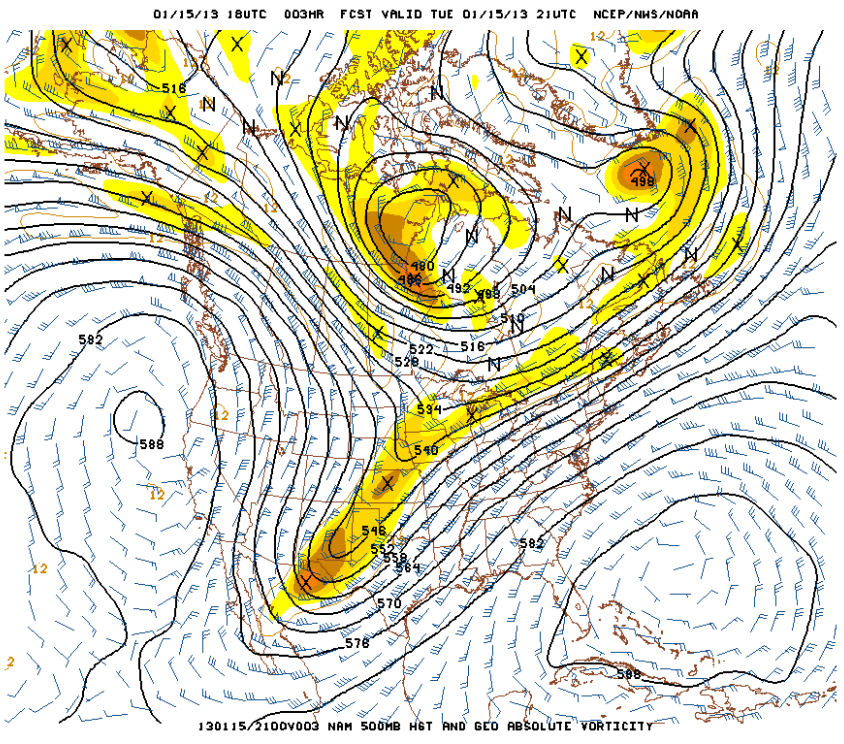
Bakersfield:

TODAY	TONIGHT	WEDNESDAY	WEDNESDAY NIGHT	THURSDAY	THURSDAY NIGHT	FRIDAY	FRIDAY NIGHT	SATURDAY
Morning Frost	Areas Frost	Morning Frost	Clear	Sunny	Clear	Sunny	Clear	Sunny
High: 50 °F	Low: 32 °F	High: 53 °F	Low: 35 °F	High: 59 °F	Low: 37 °F	High: 61 °F	Low: 38 °F	High: 62 °F

Today : Sunny. Large upper level ridge to the west.

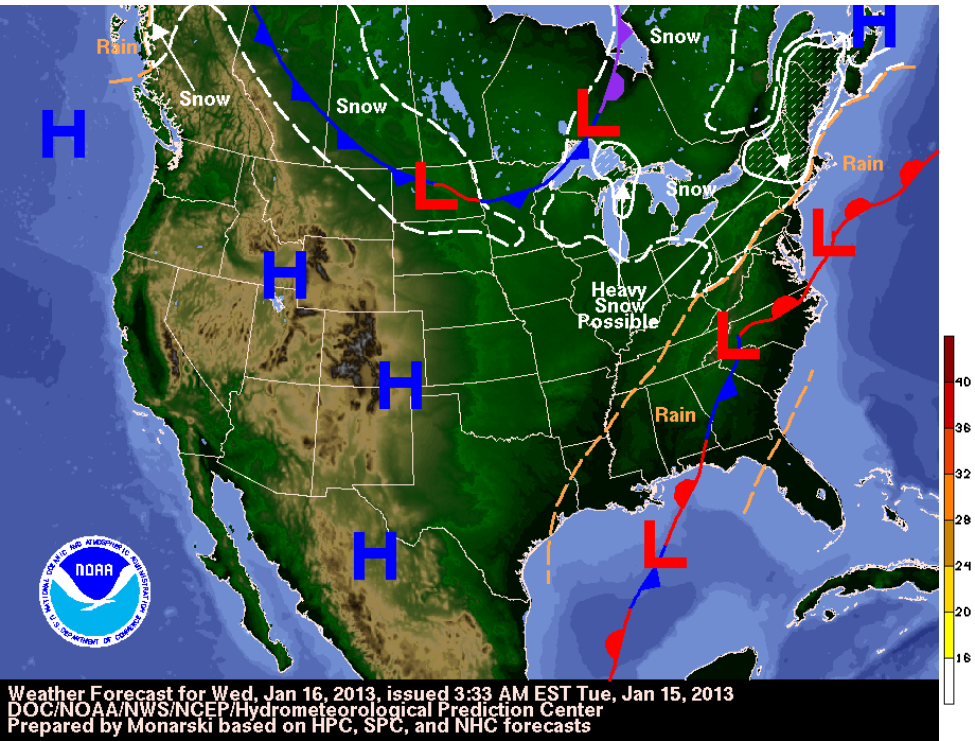
500 mb NAM at 1 PM.

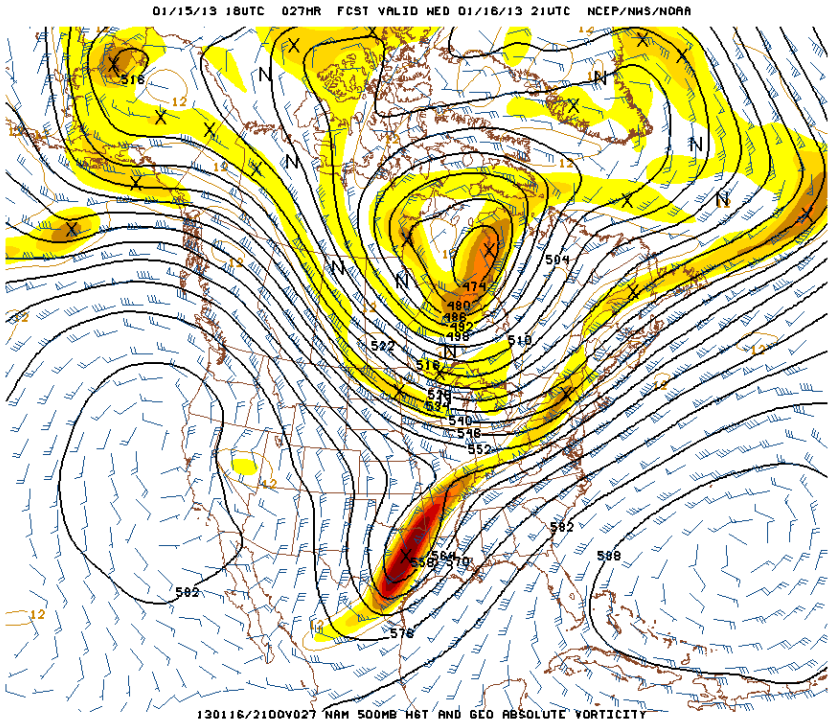




Tomorrow: Sunny. Upper level ridge slowly moving onshore.

500 mb NAM at 1 PM.



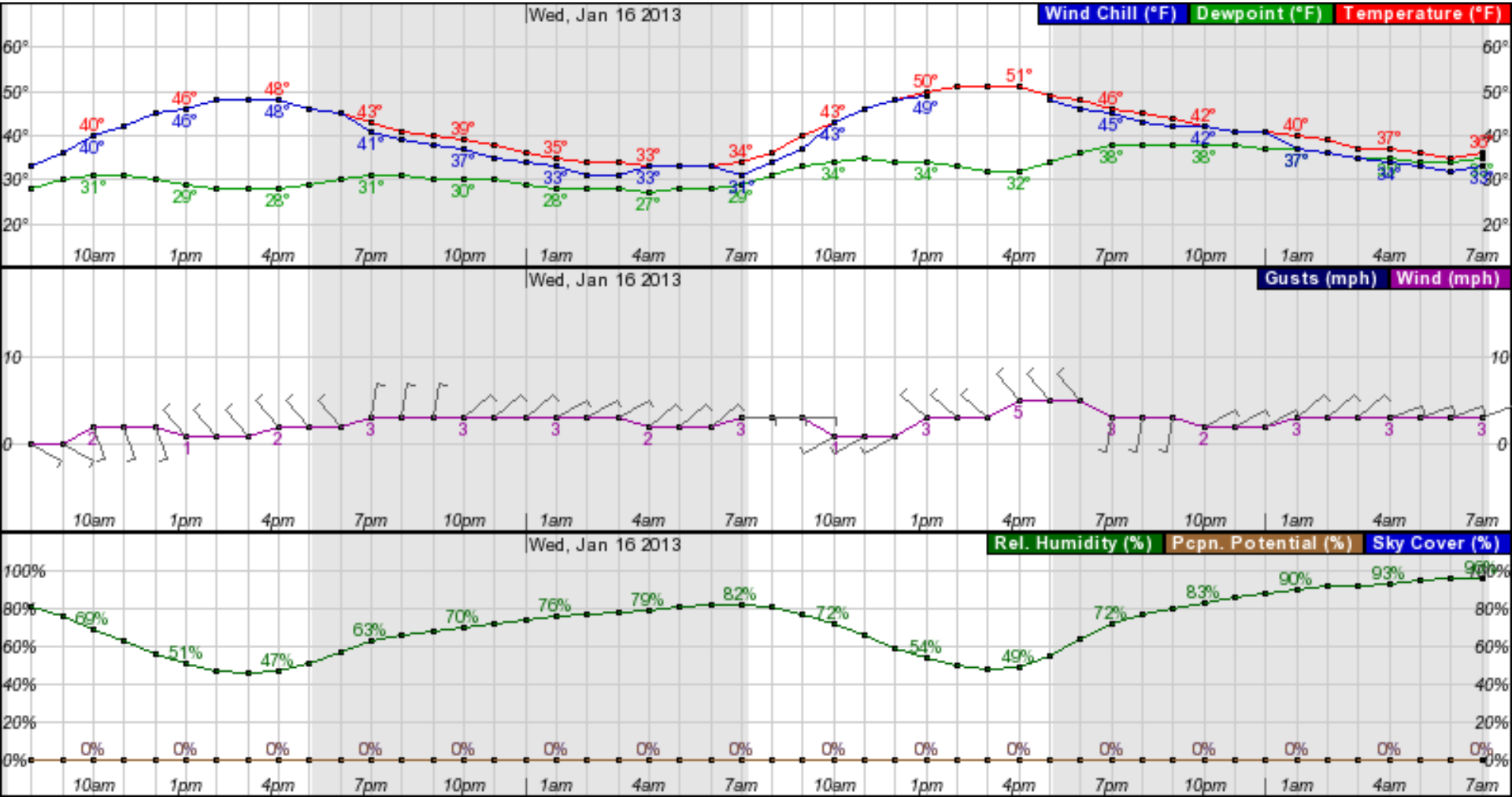


Fresno

Today: Sunny.

Tomorrow: Sunny. Chance of patchy morning fog.

Today → **Tomorrow →**

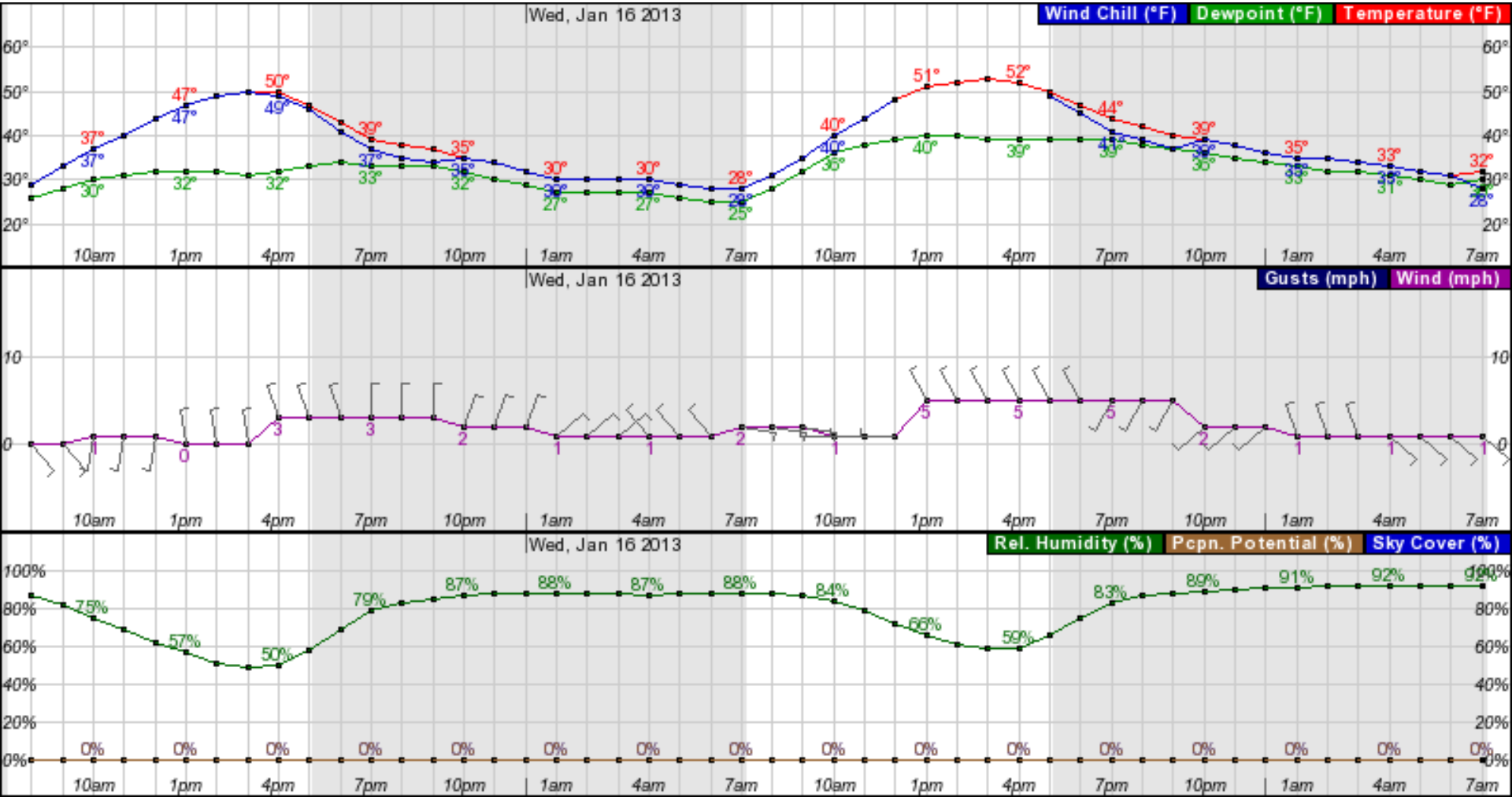


Hanford

Today: Sunny.

Tomorrow: Sunny. Chance of localized fog.

Today → **Tomorrow →**

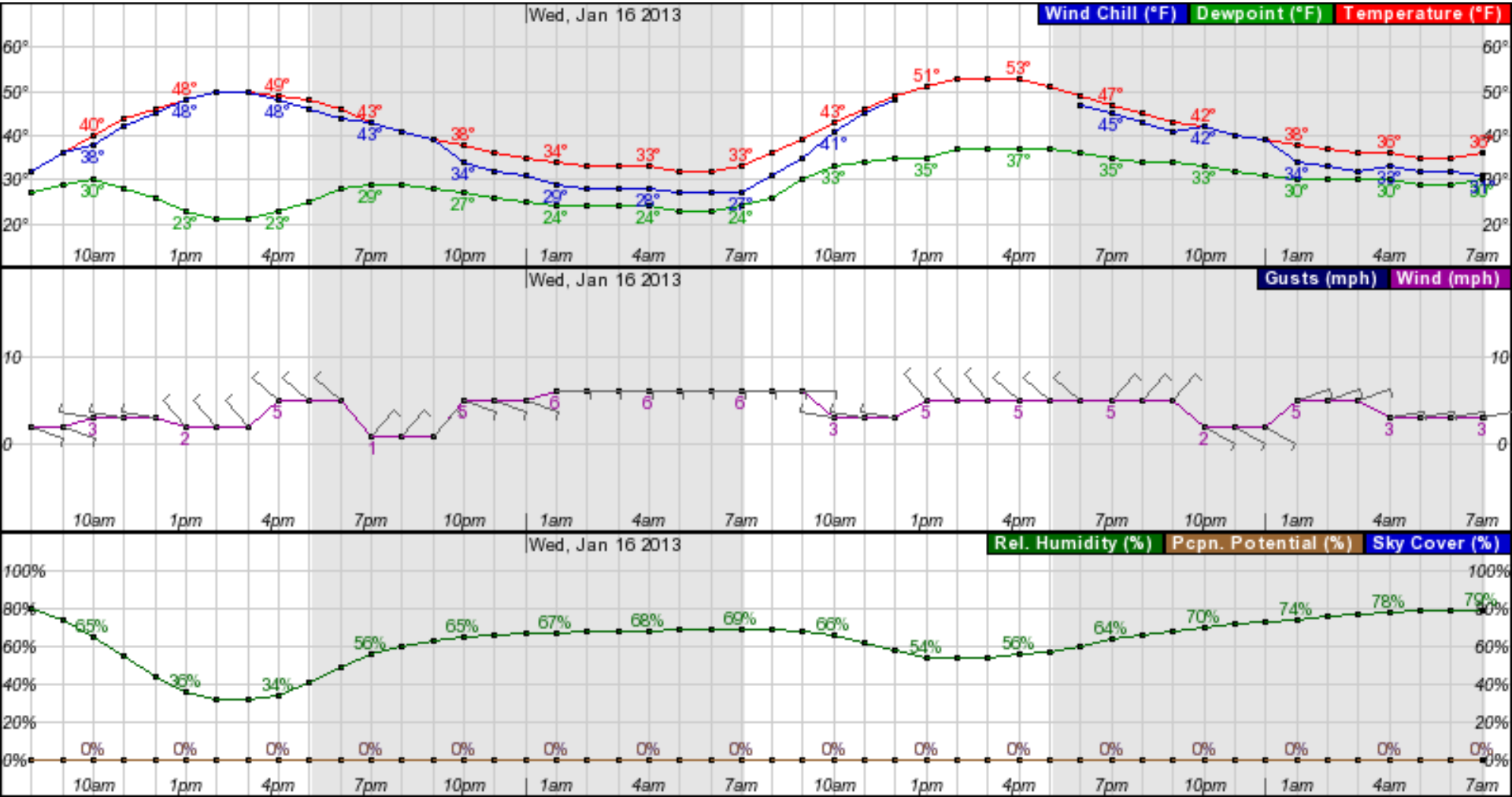


Bakersfield

Today: Sunny.

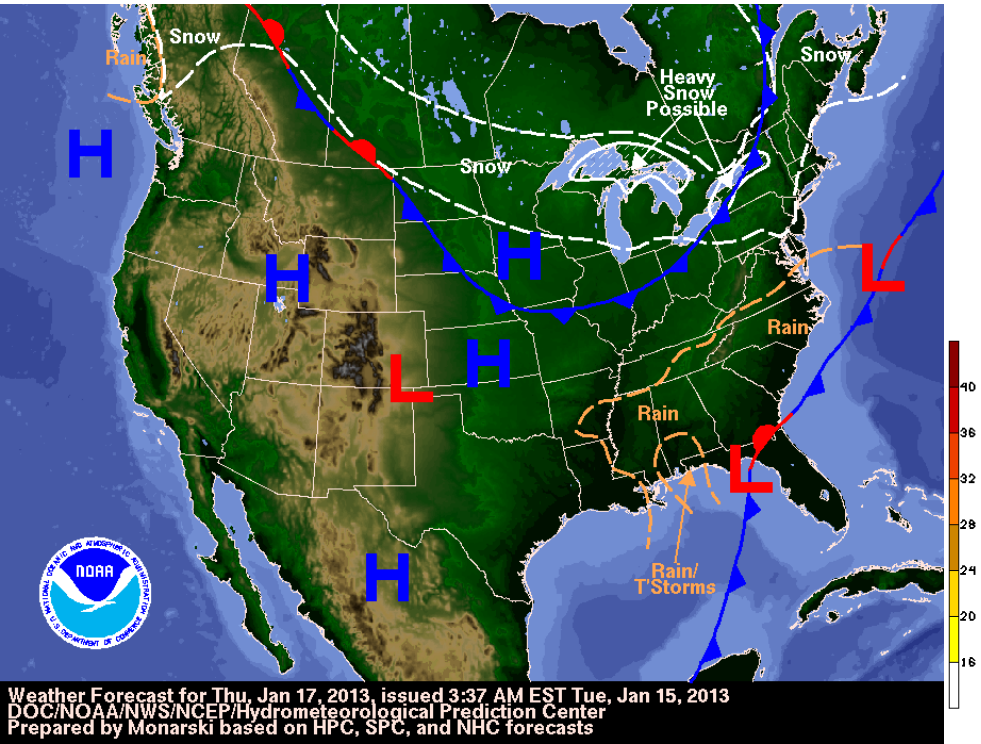
Tomorrow: Sunny.

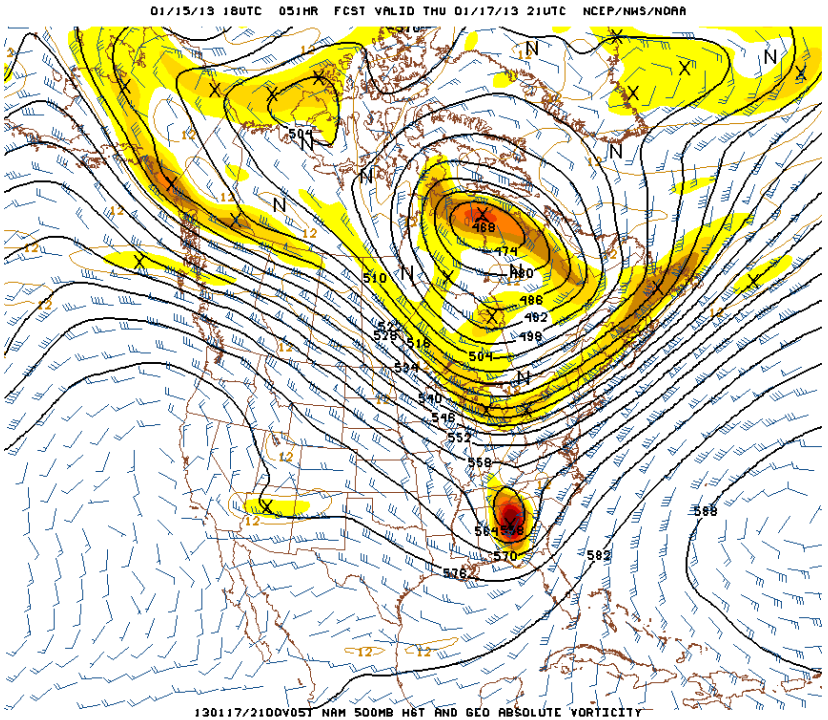
Today → **Tomorrow →**



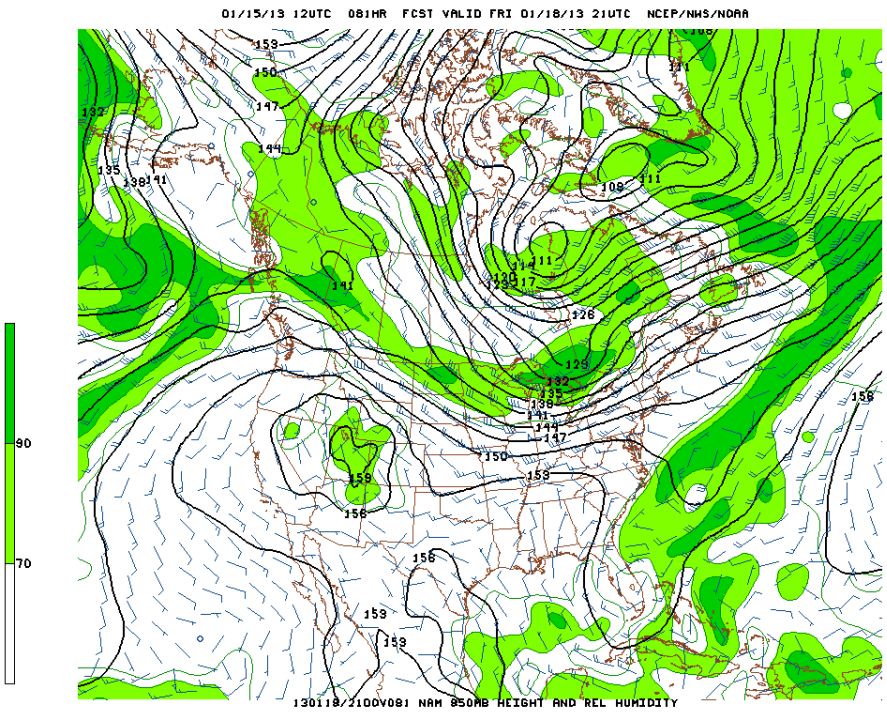
Thursday: Mostly sunny.

500 mb NAM at 1 PM.

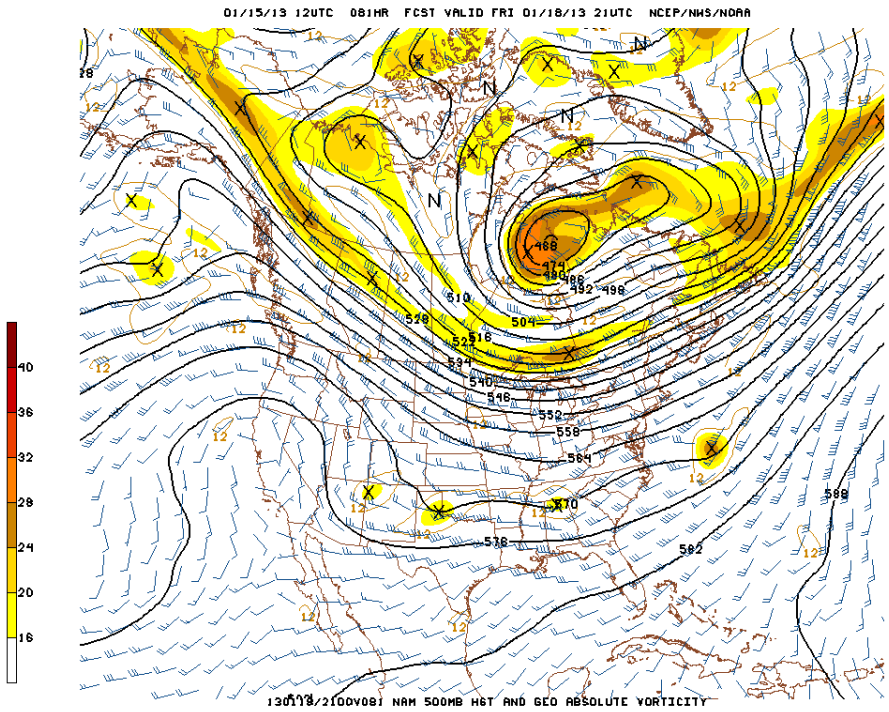




850 mb NAM
Friday 1 PM



500 mb NAM
Friday 1 PM

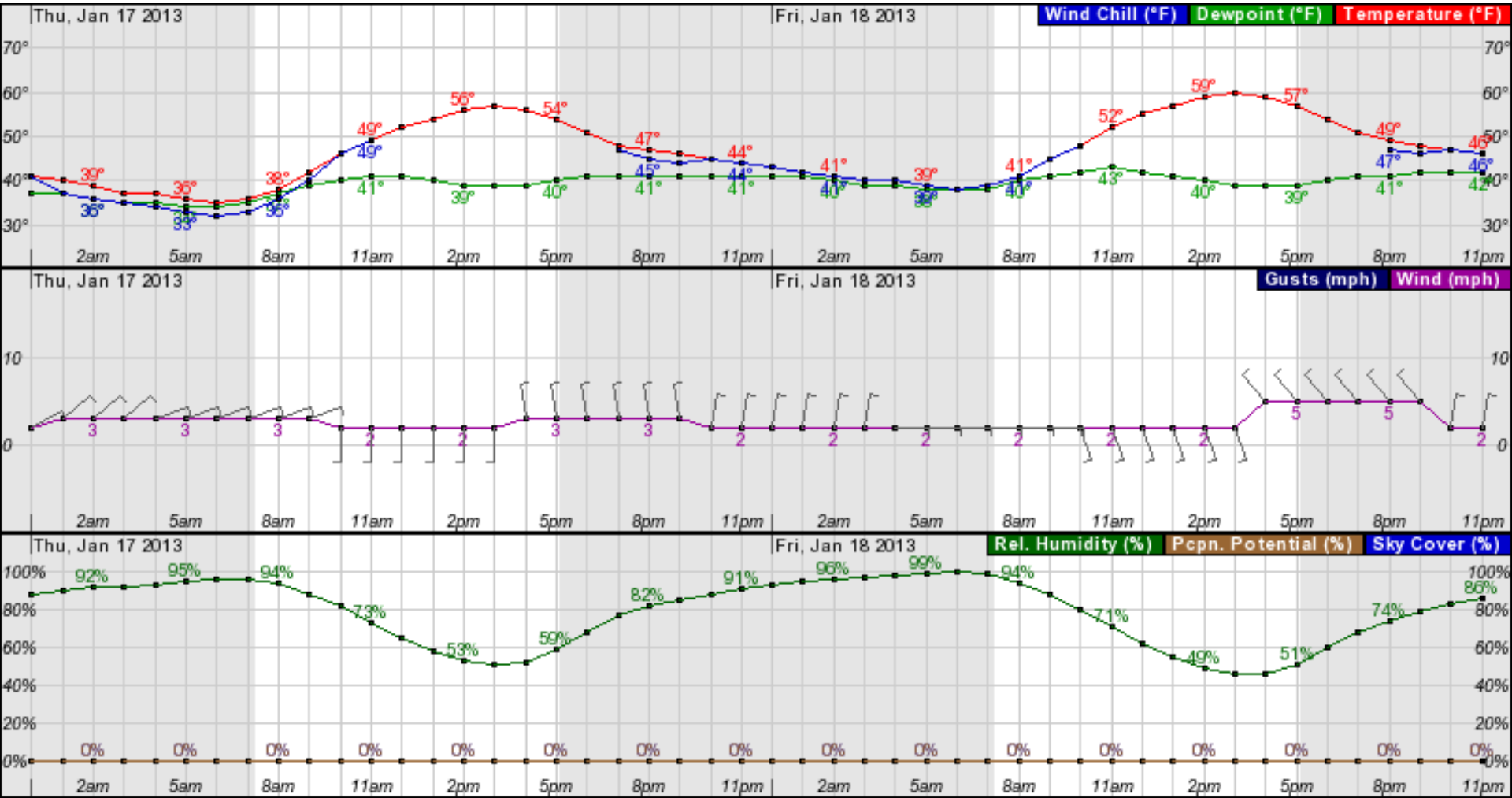


Fresno

Thursday: Mostly sunny. Possibly some fog in the morning.

Friday: Mostly sunny with a greater chance of morning fog.

Thursday → **Friday →**

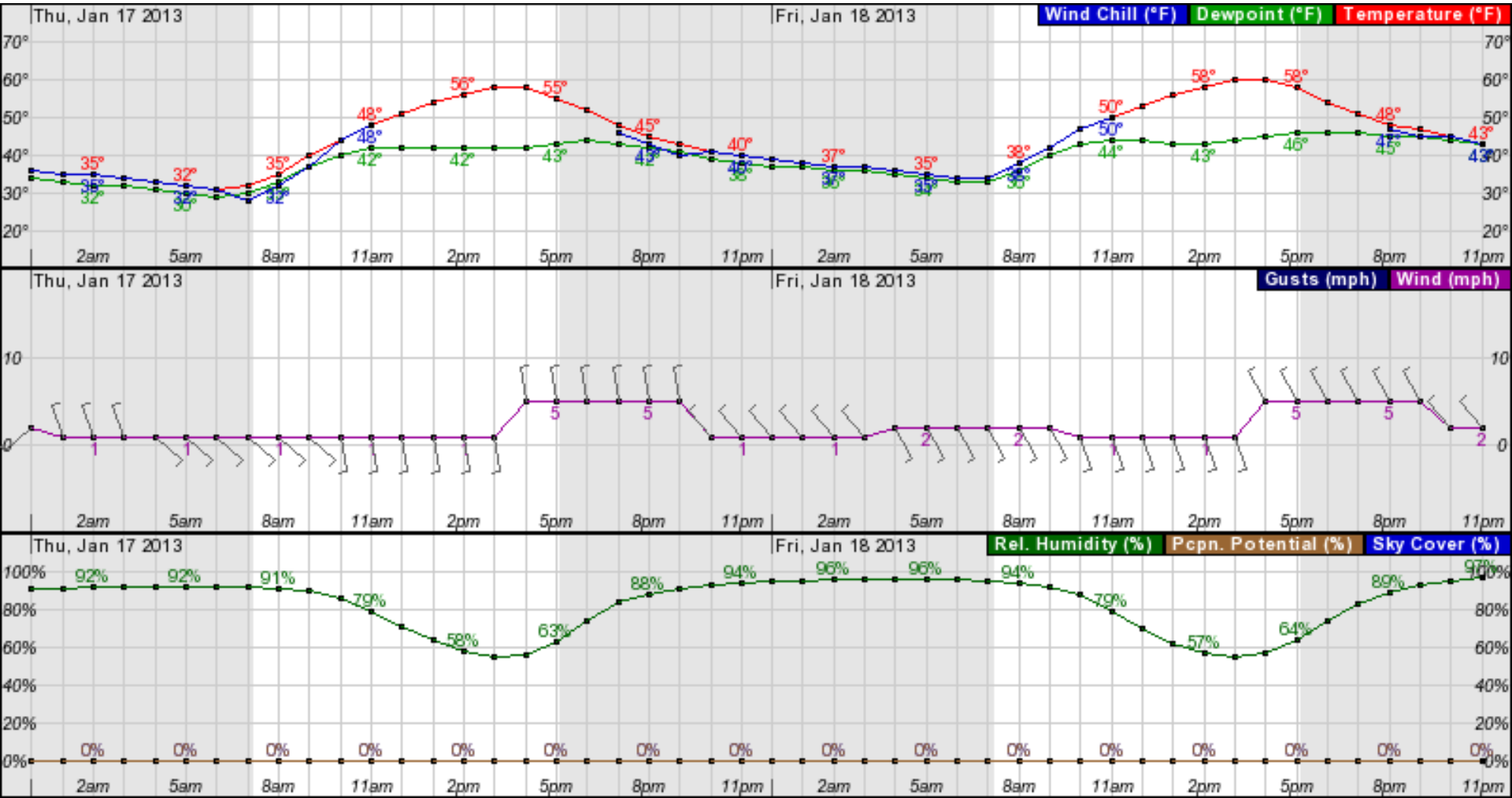


Hanford

Thursday: Sunny with a chance of morning fog.

Friday: Sunny and a chance of morning fog.

Thursday → **Friday →**

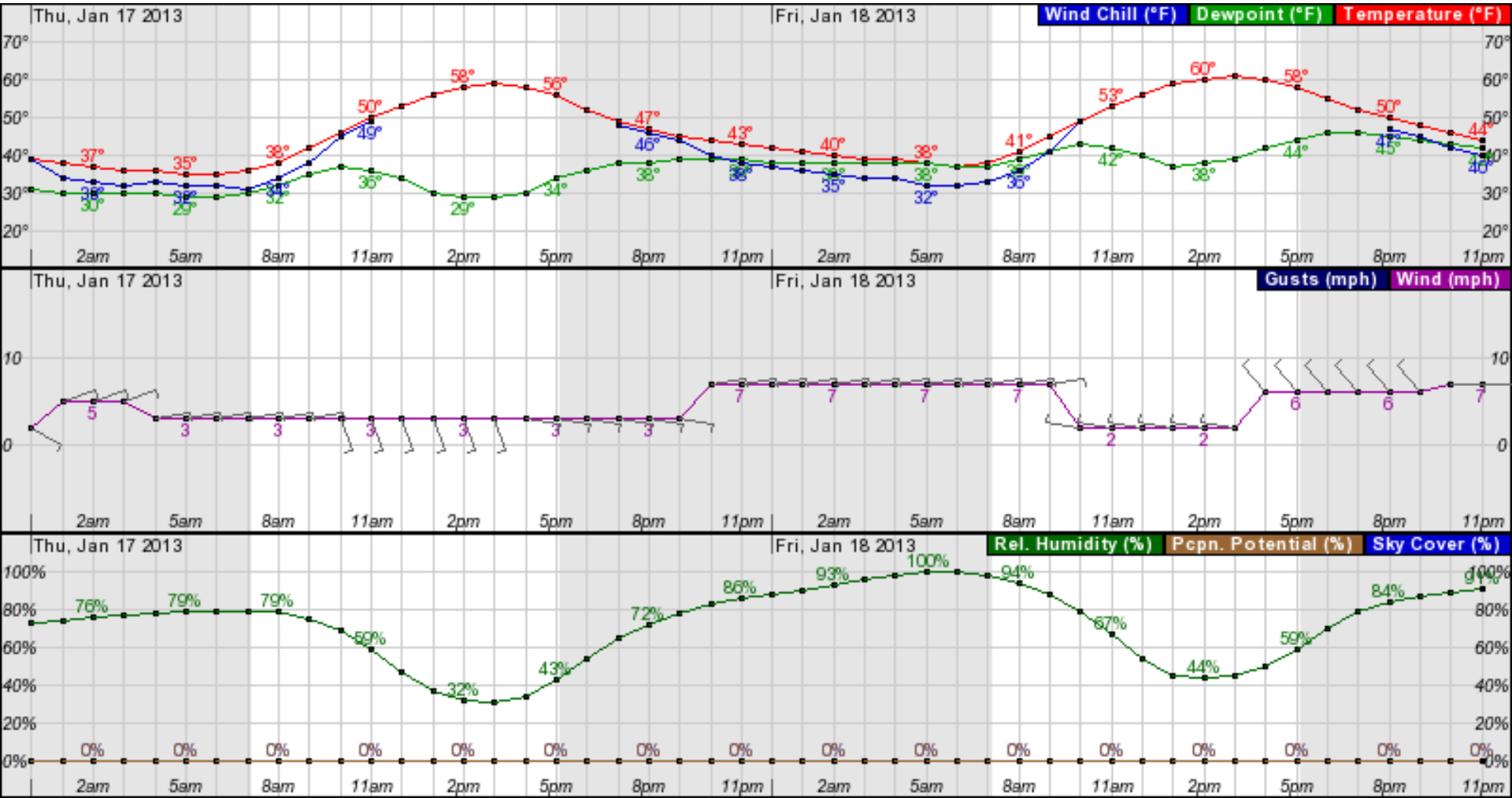


Bakersfield

Thursday: Sunny.

Friday: Foggy morning – sunny afternoon.

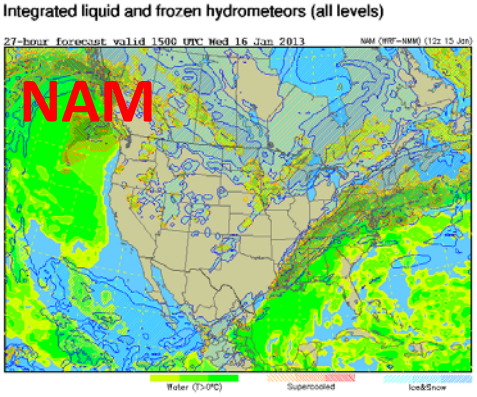
Thursday → **Friday →**

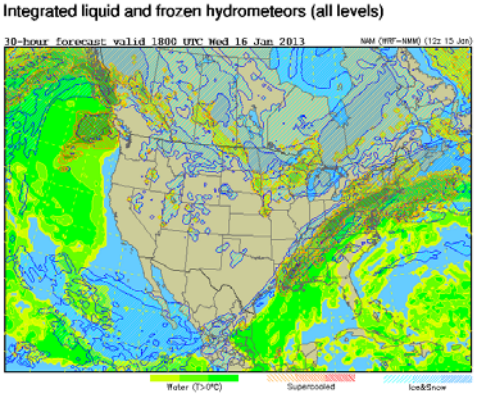


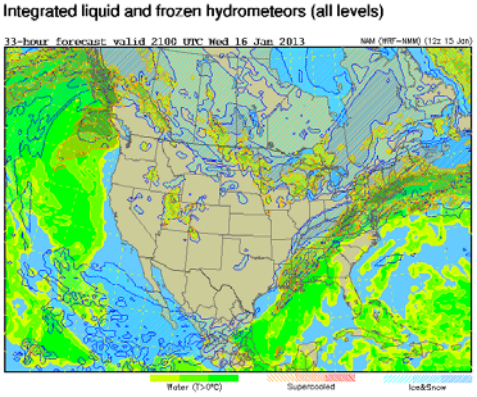
Tomorrow: No clouds

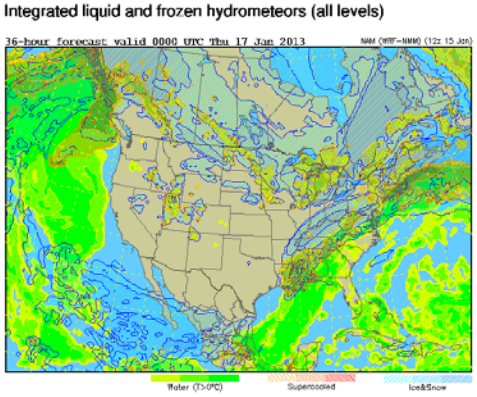
7 am | 10 am | 1 pm | 4 pm

NAM

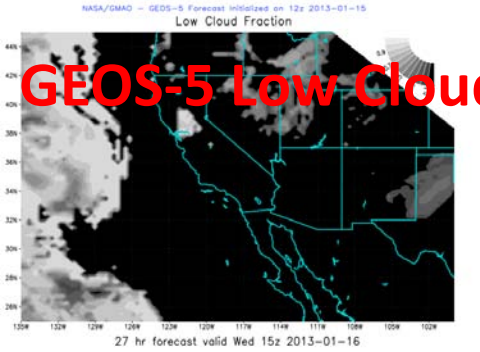


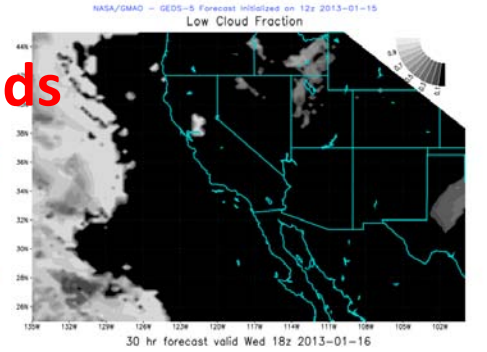


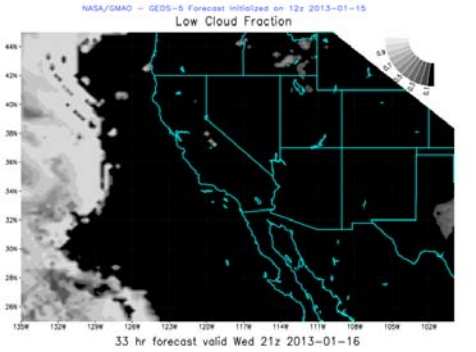


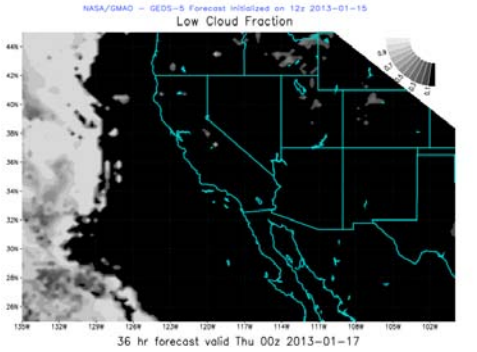


GEOS-5 Low Clouds

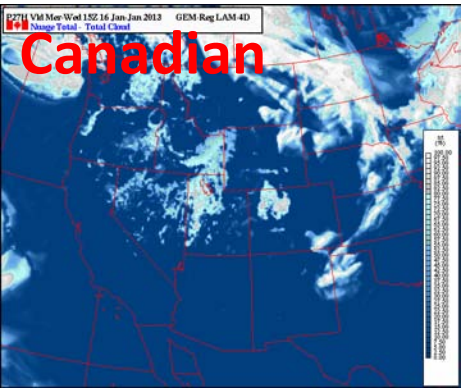


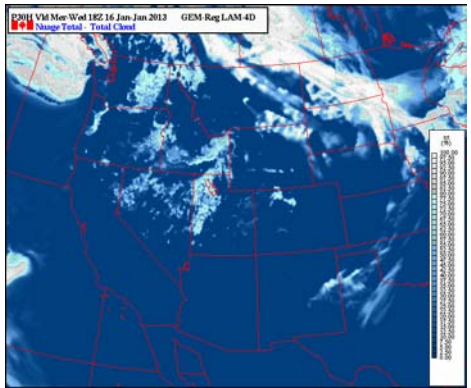


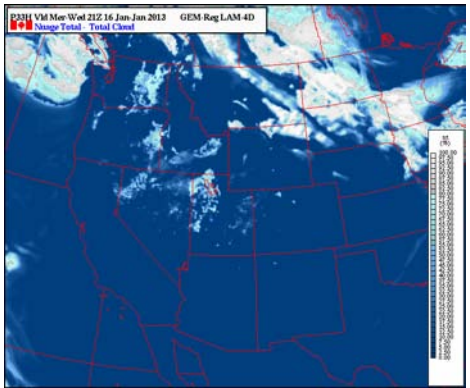


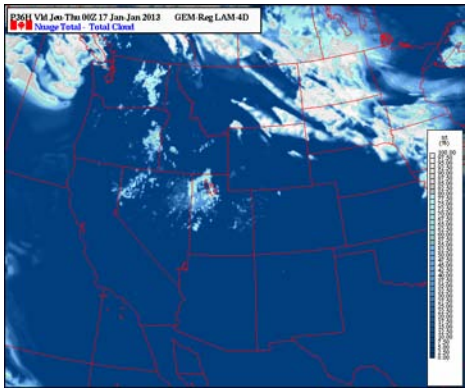


Canadian





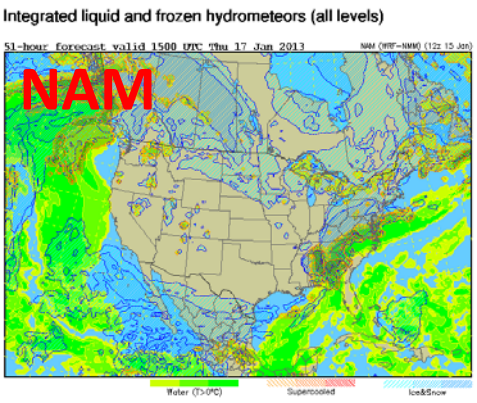


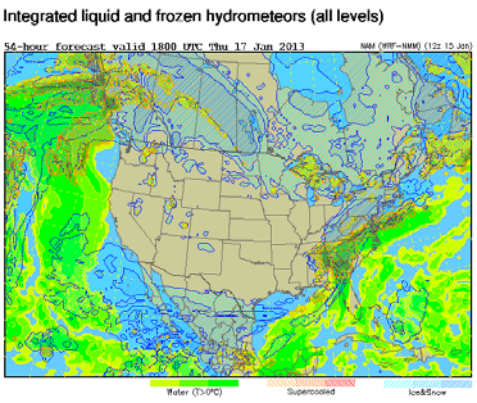


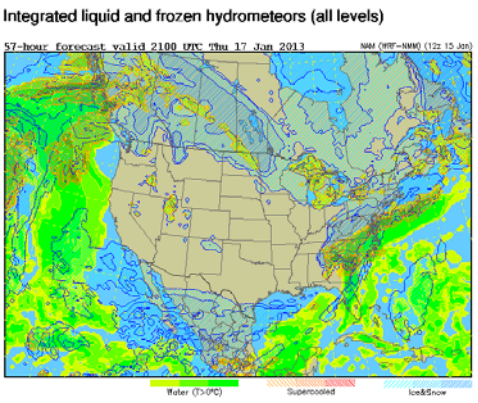
Thursday: NAM - no clouds in SJV; clouds above 18,000 ft off southern CA coast. GEOS-5 – morning fog.

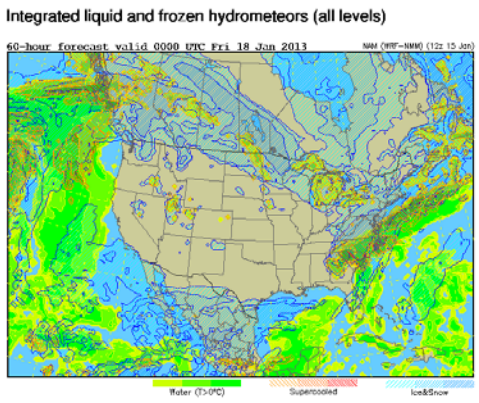
7 am | 10 am | 1 pm | 4 pm

NAM

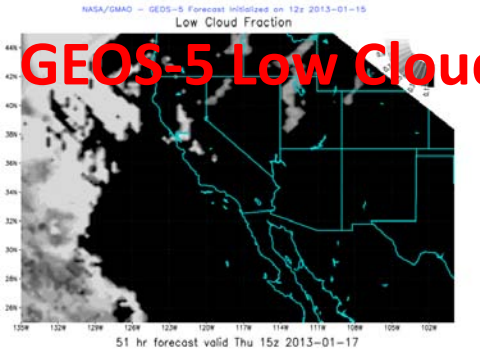


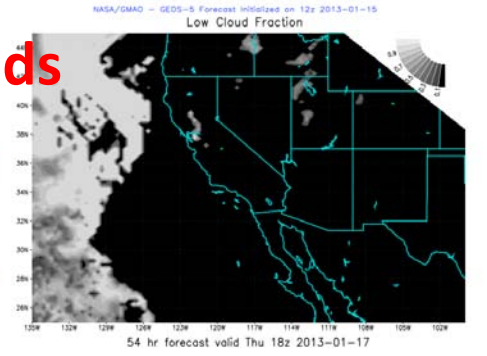


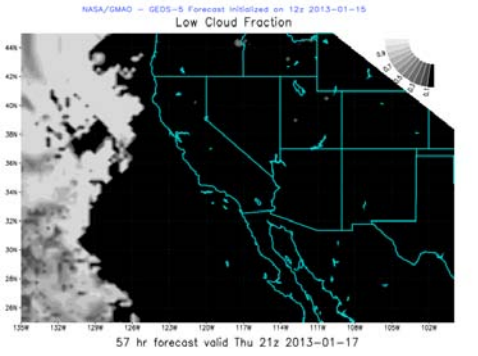


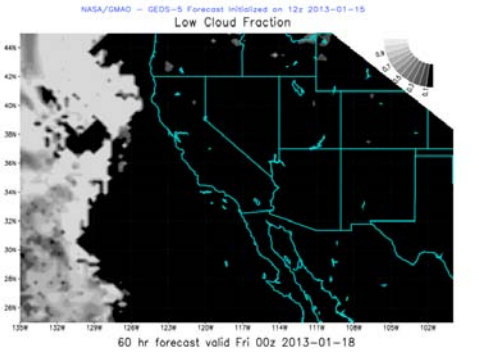


GEOS-5 Low Clouds

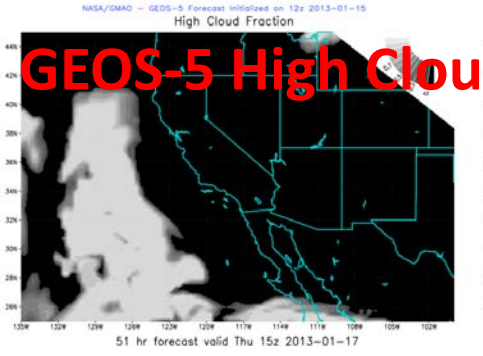


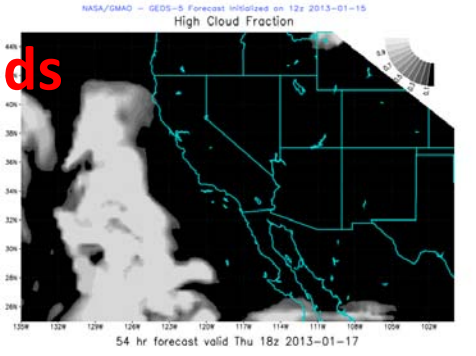


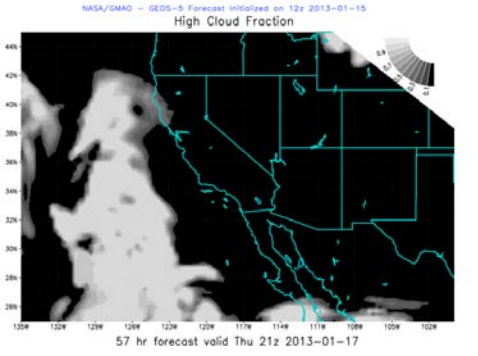


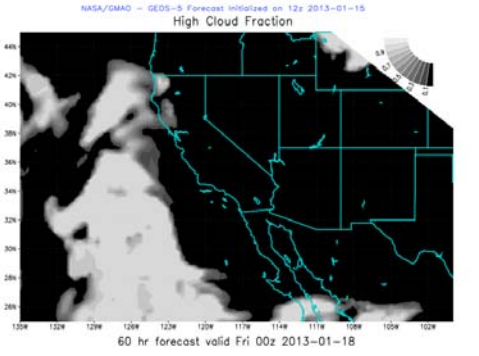


GEOS-5 High Clouds





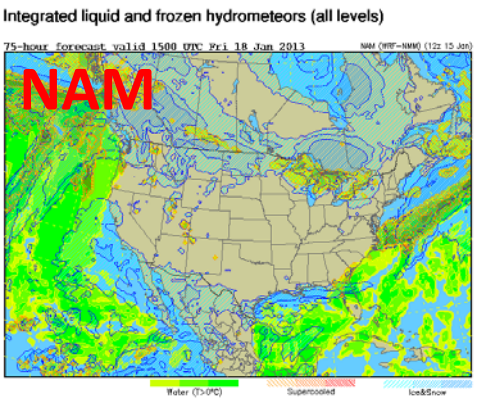


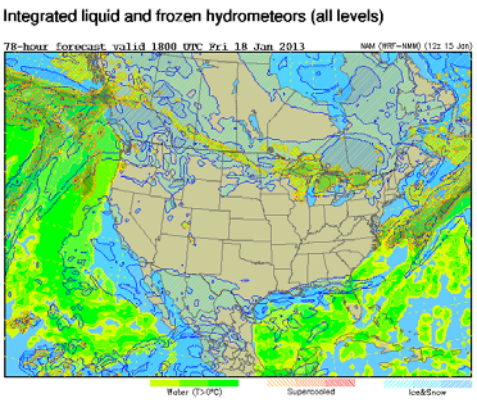


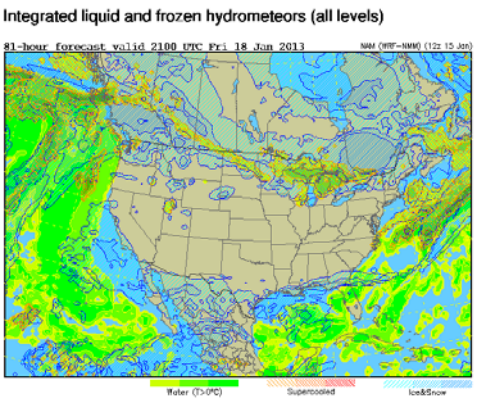
Friday: NAM – no clouds in SJV; clouds above 18,000 ft off southern CA coast. GEOS-5 – morning fog.

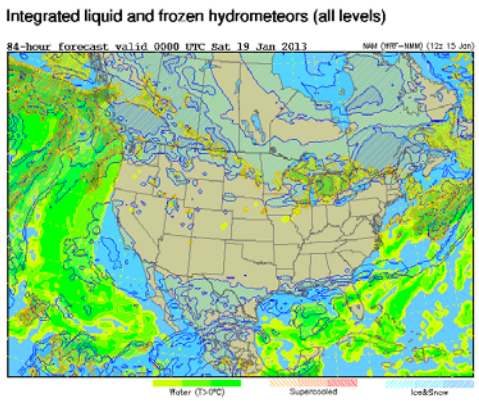
7 am | 10 am | 1 pm | 4 pm

NAM

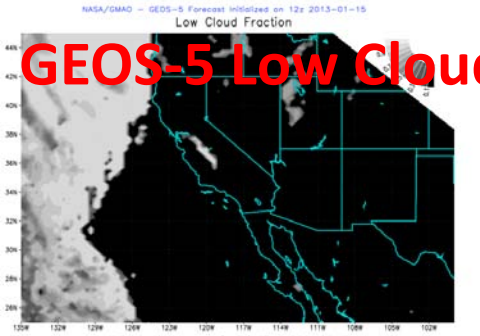


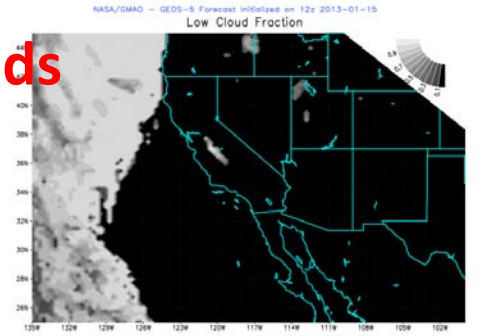


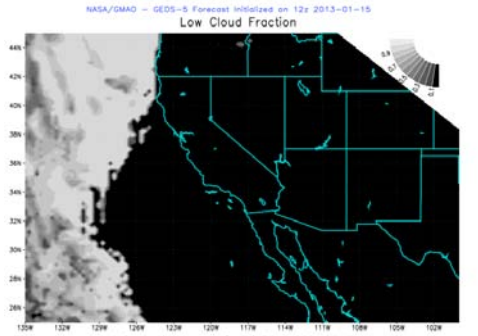


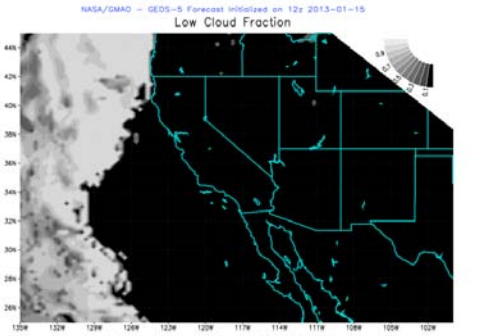


GEOS-5 Low Clouds

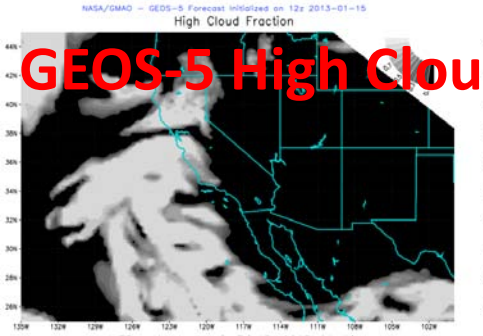


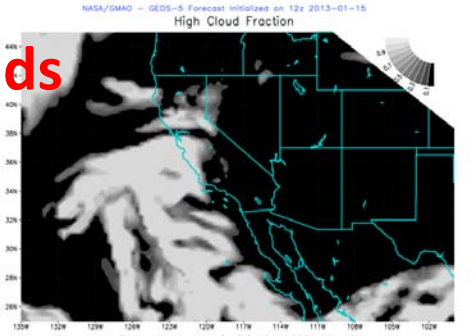


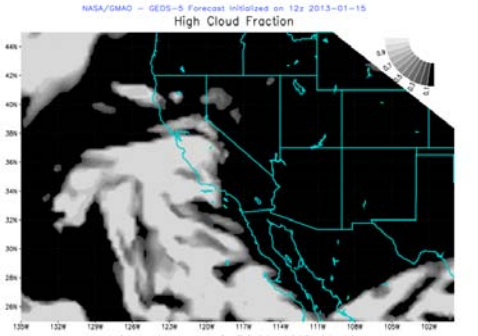


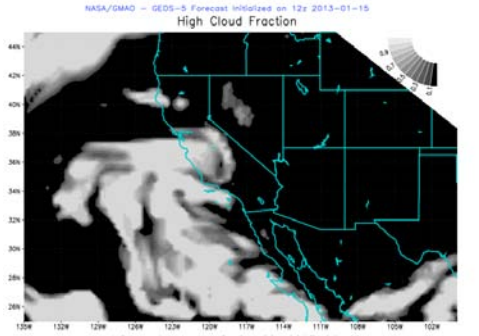


GEOS-5 High Clouds



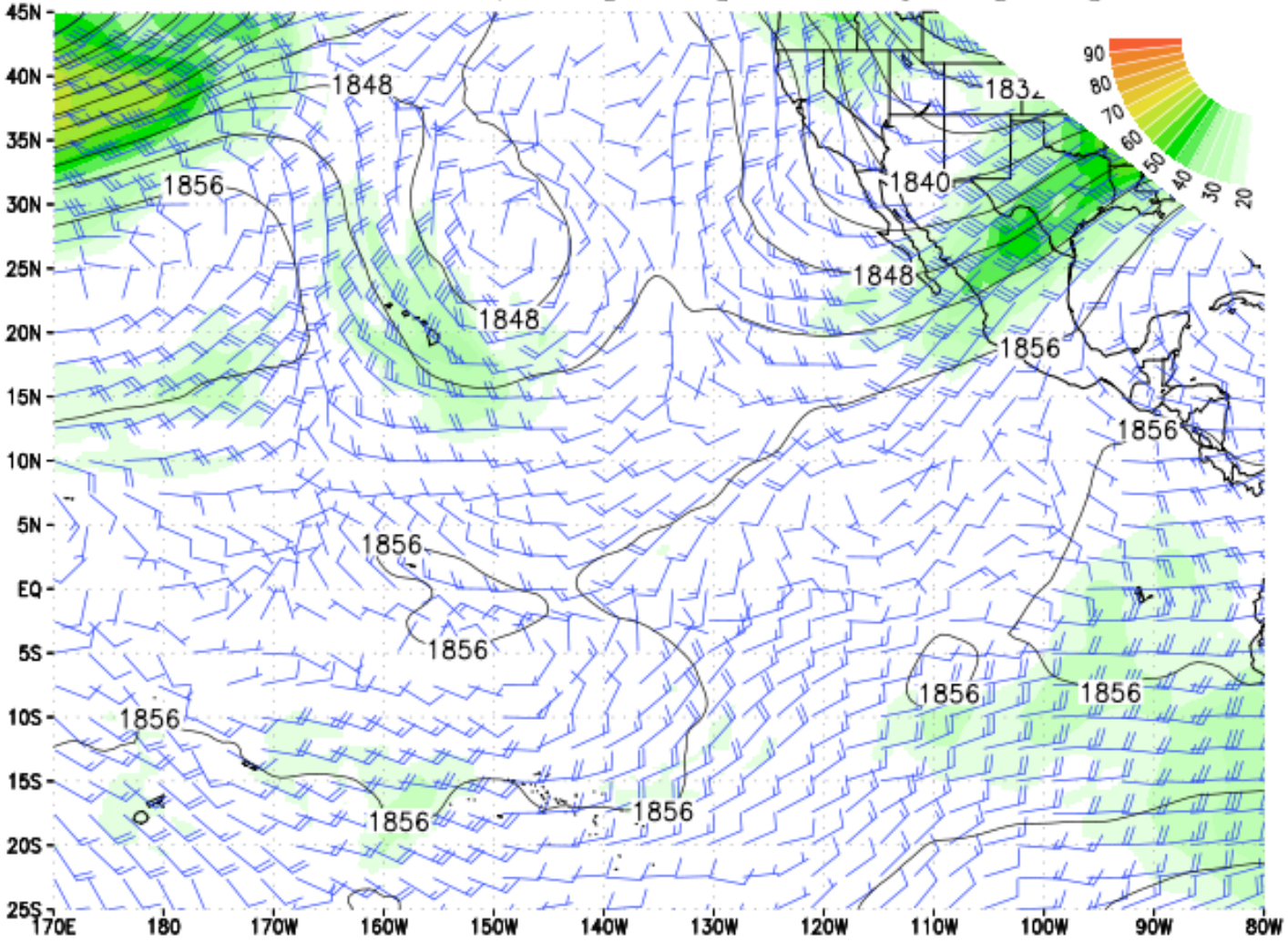






NASA/GMAO – GEOS-5 Forecast Initialized on 00z 2013-01-15

70 hPa Wind Speed [knots] and Heights [dam]

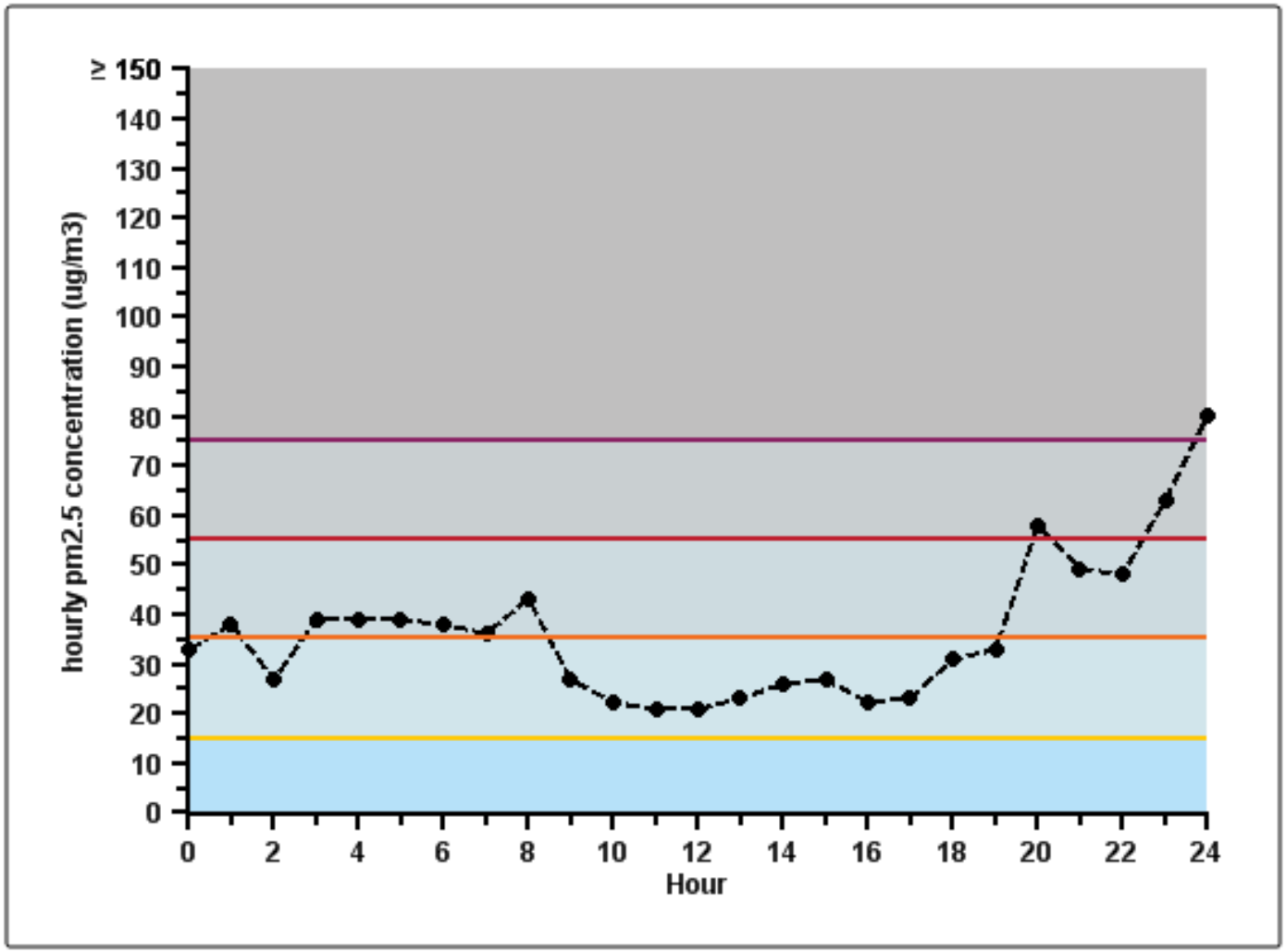


42 hr forecast valid Wed 18z 2013-01-16

Meteorology Summary

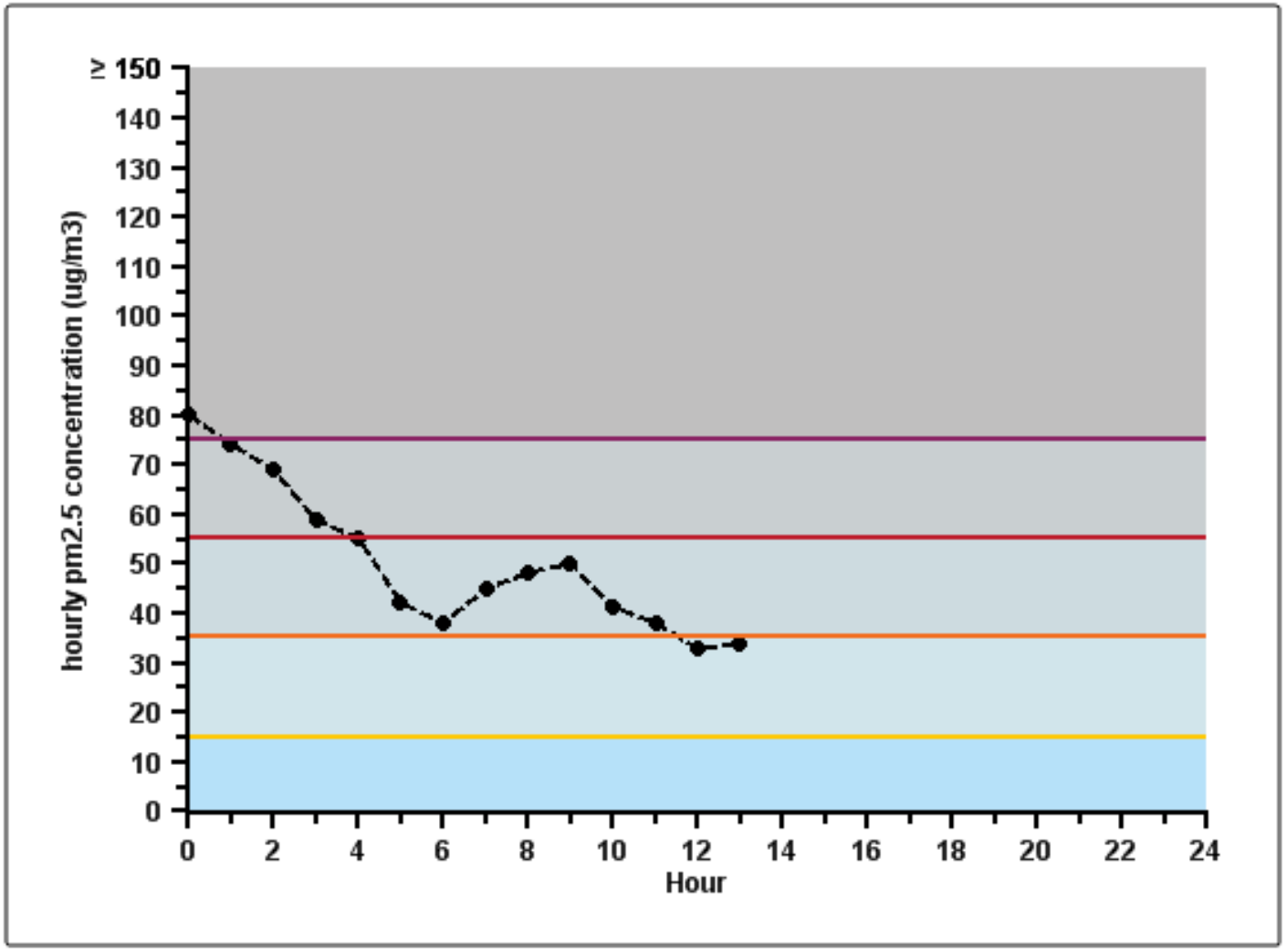
- Strong ridge off Pacific coast moves inland over the next couple of days keeping clear skies over the region.
- Expect shallow patchy fog on Wed. AM and Thurs. AM
- Increasing dew points over time will lead to more widespread early AM fog formation as we progress to Friday and the weekend. Fog will likely persist to 10 AM or later.

Fresno – Garland -- Monday, Jan. 14, 2013

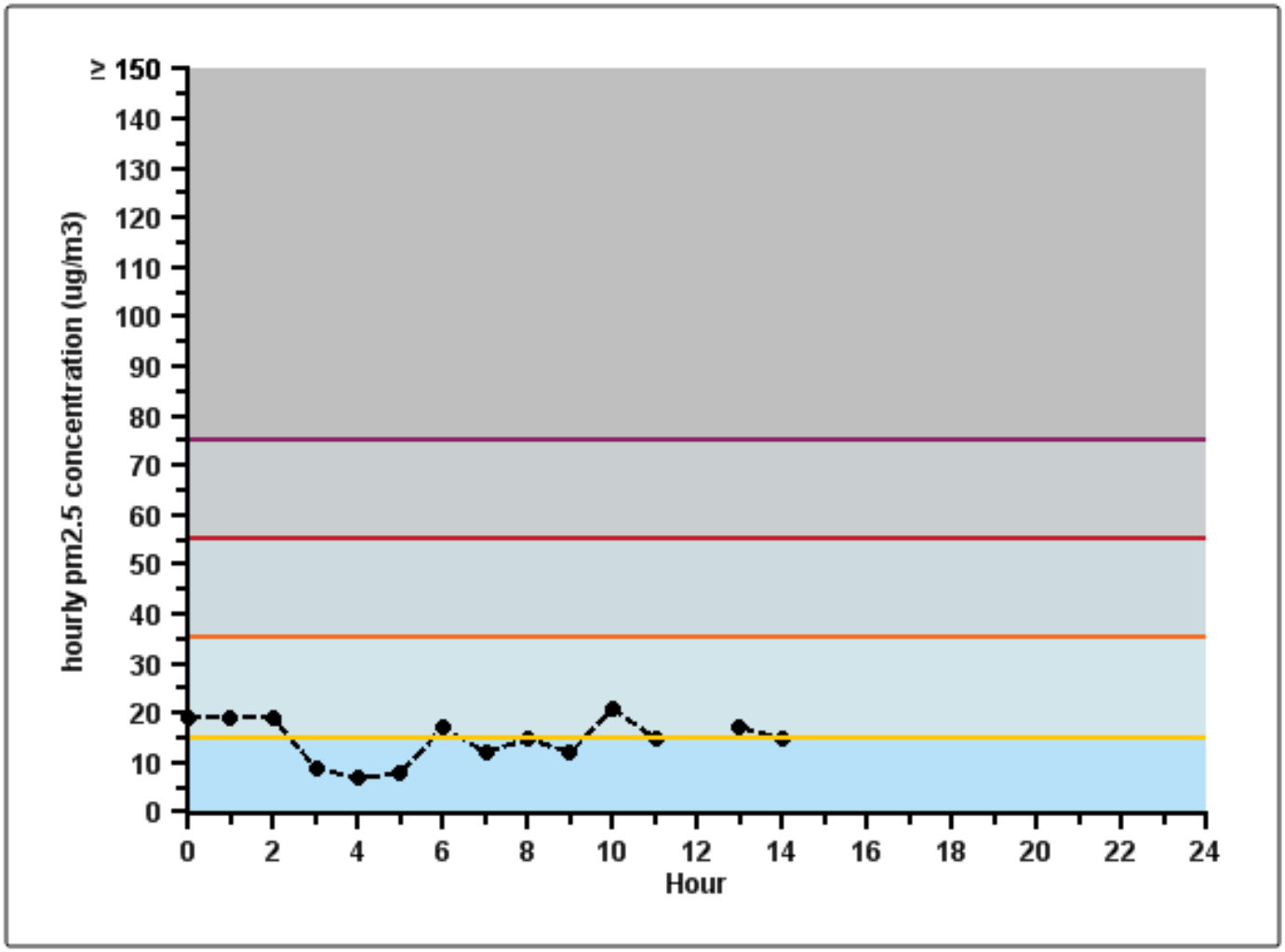


Fresno – Garland -- Januarv 15. 2013

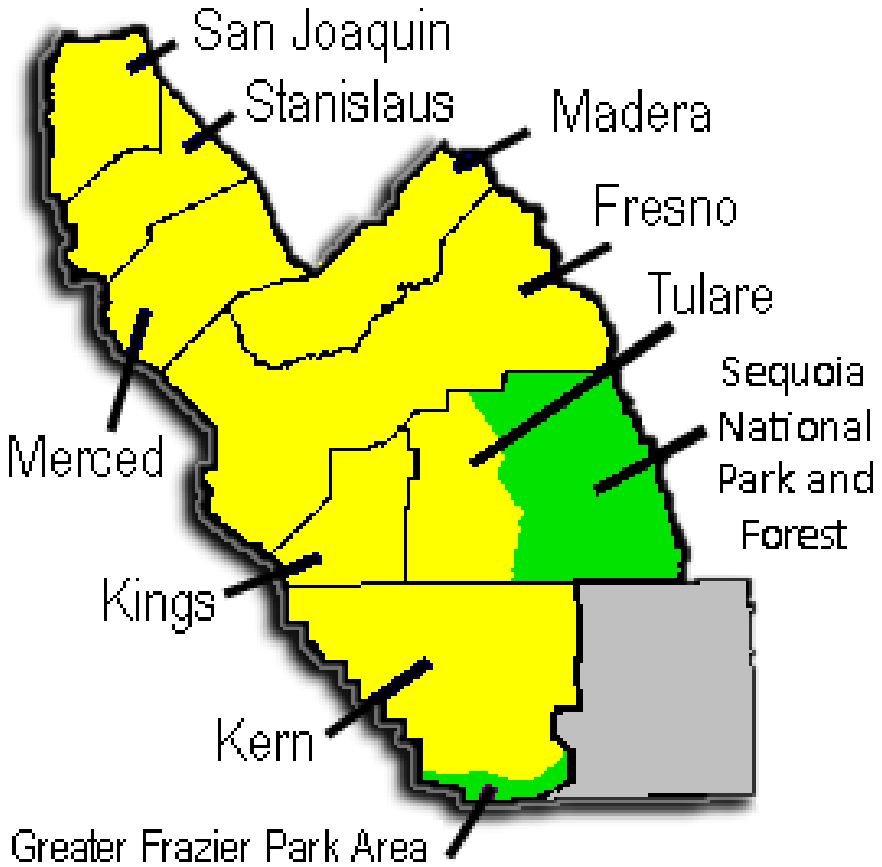
Air District Real-Time Outdoor Activity Risk



Bakersfield – Mun. Airport - Jan. 15, 2013



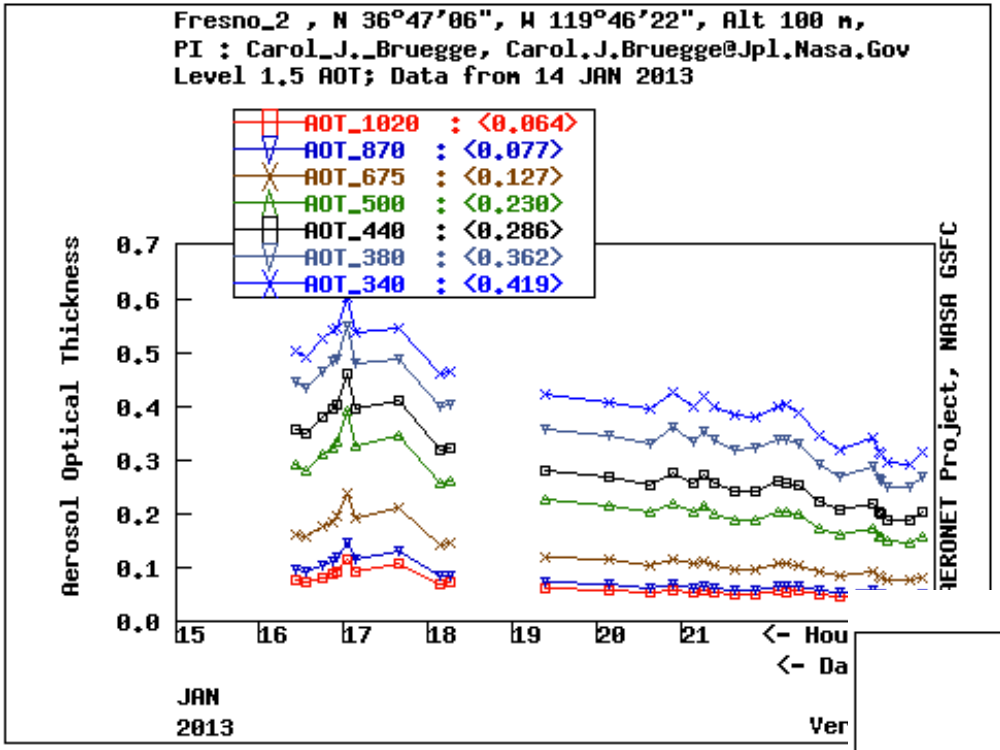
SJV Forecast for 1/15/2013



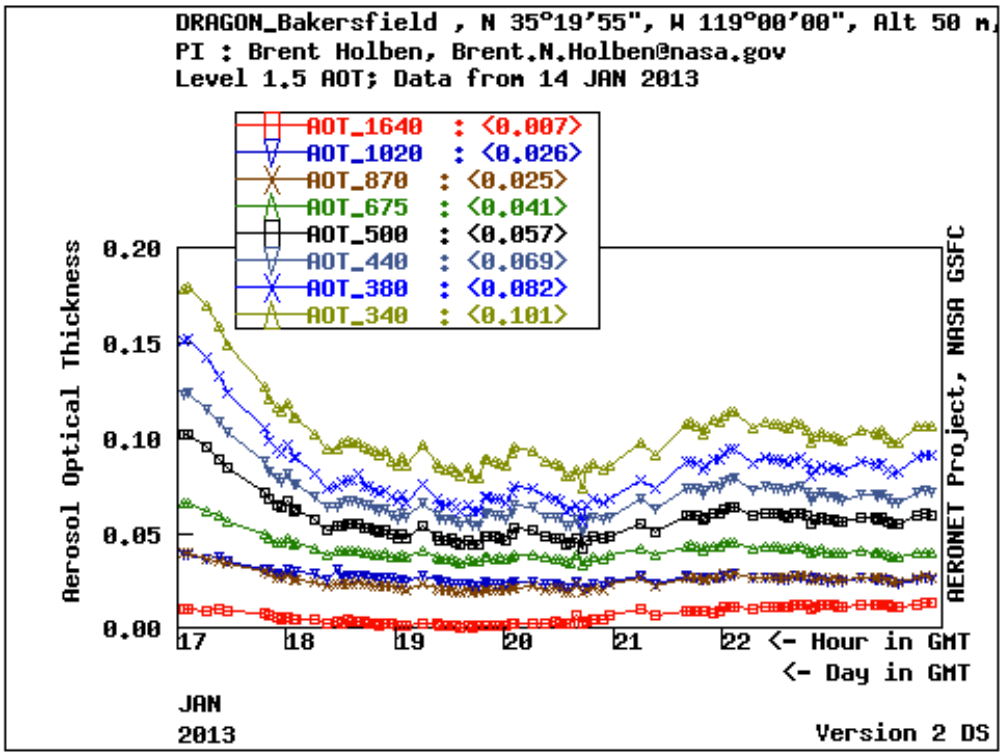
ROAR LEVEL	Ozone (O^3)	Particulate Matter (PM 2.5)
LEVEL 1 Good	1-59 ppb	1-15 µg/m³
LEVEL 2 Moderate	60-75 ppb	16-35 µg/m³
LEVEL 3 Unhealthy for Sensitive Groups	76-95 ppb	36-55 µg/m³
LEVEL 4 Unhealthy	96-115 ppb	56-75 µg/m³
LEVEL 5 Very Unhealthy	>115 ppb	>75 µg/m³

Forecast for 1/16/2013:
Fresno and Kings - Orange
Elsewhere - Yellow

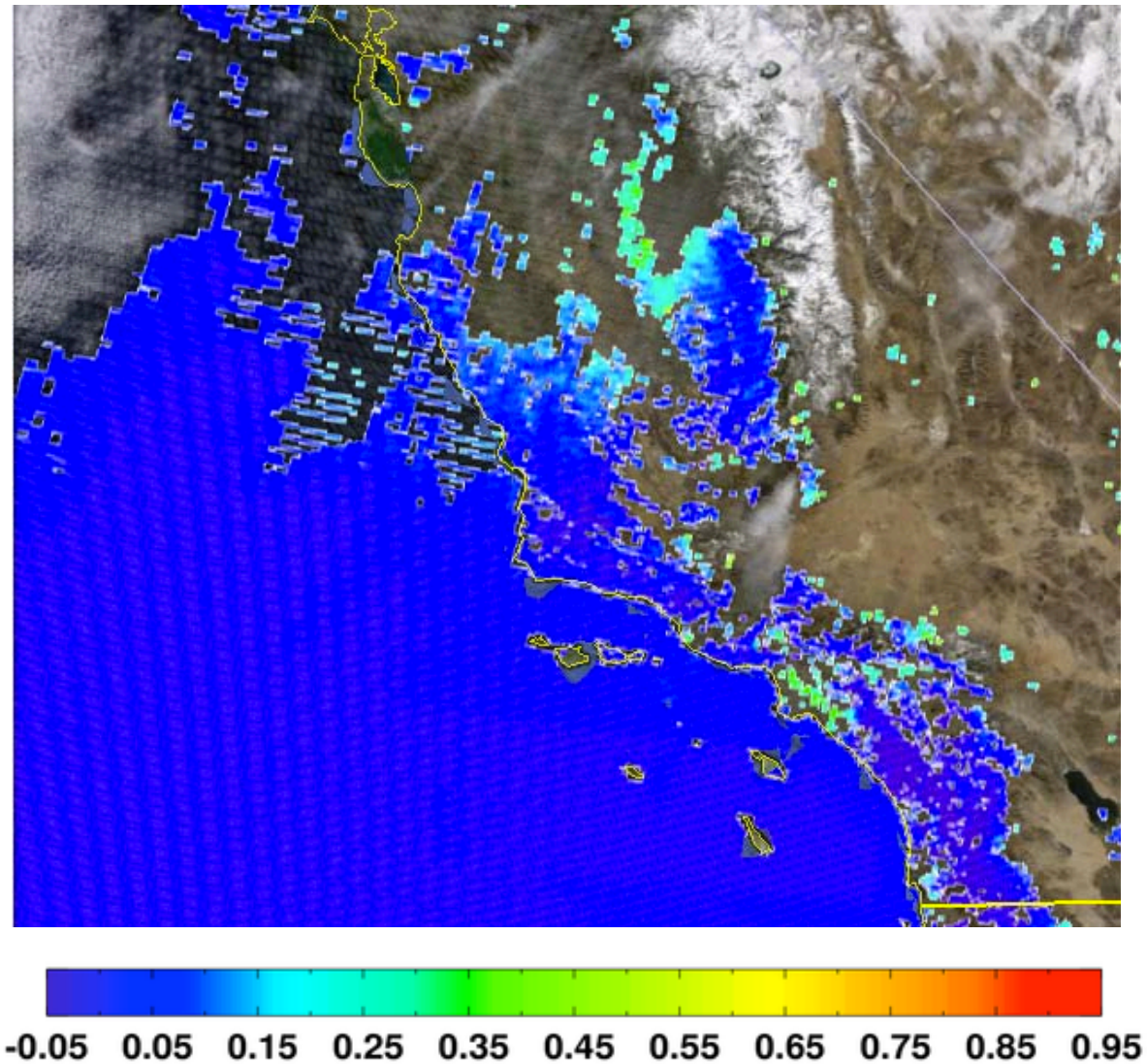
AOD Level 1.5 data from JAN 14 of 2013



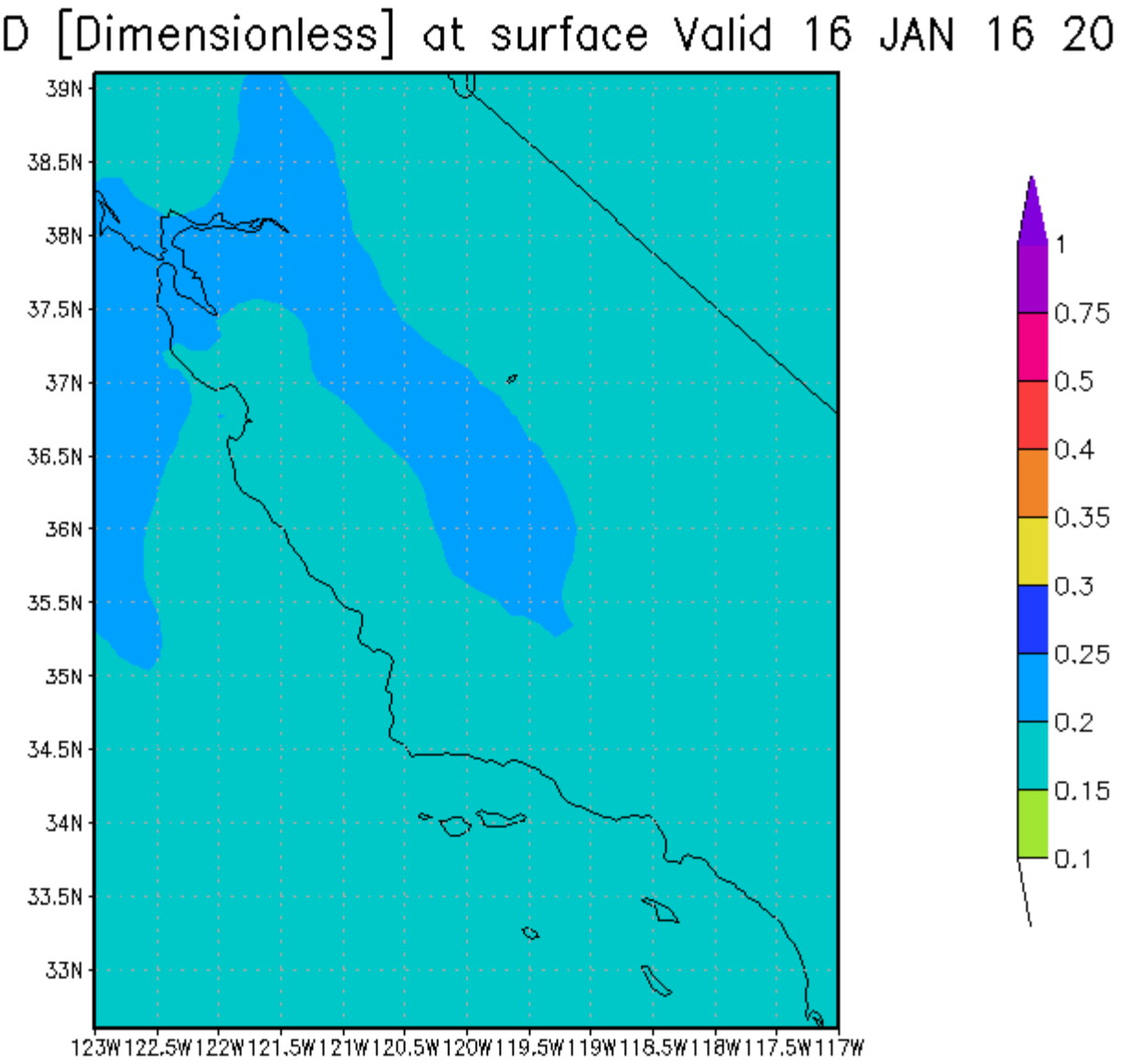
AOD Level 1.5 data from JAN 14 of 2013

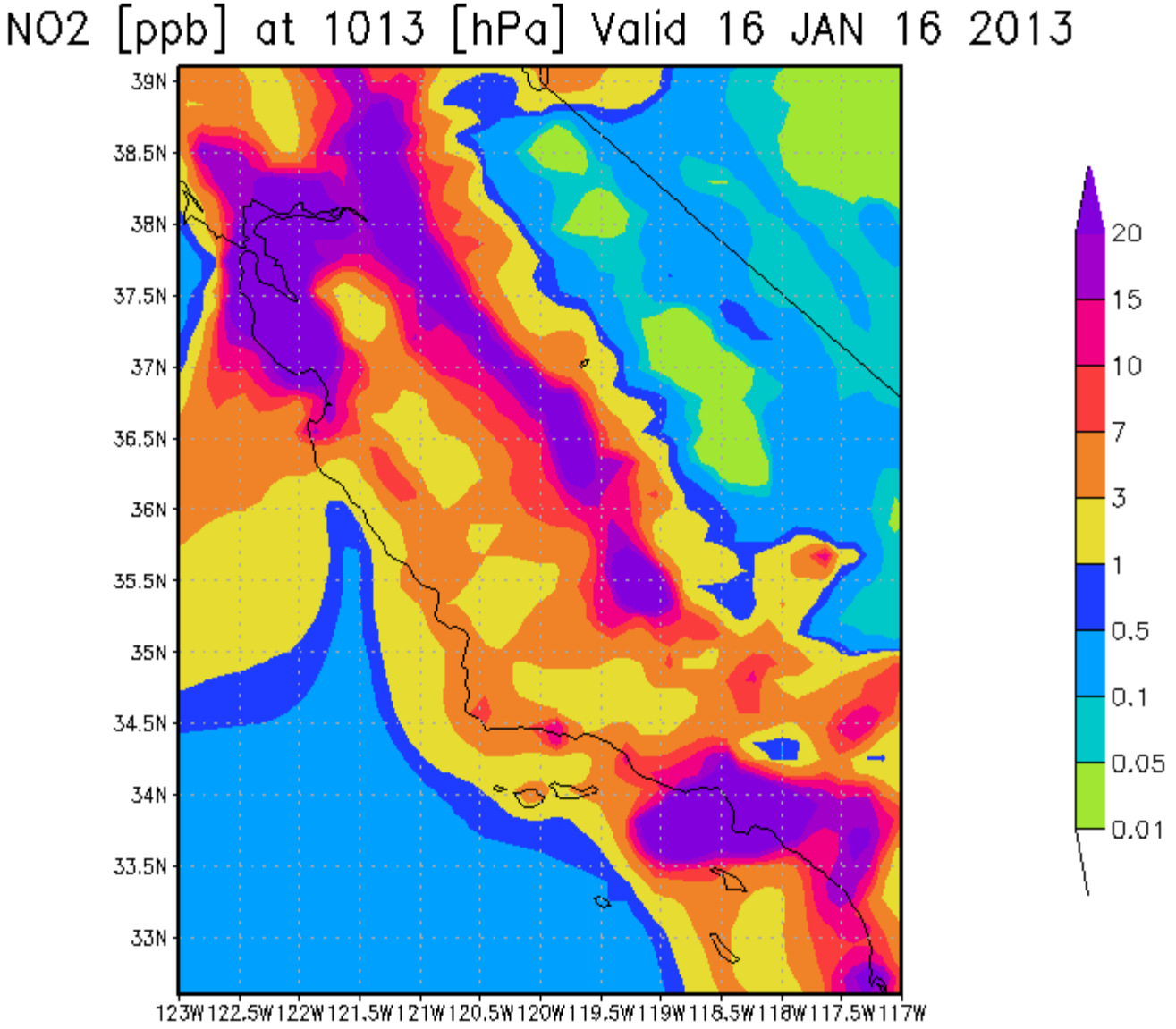


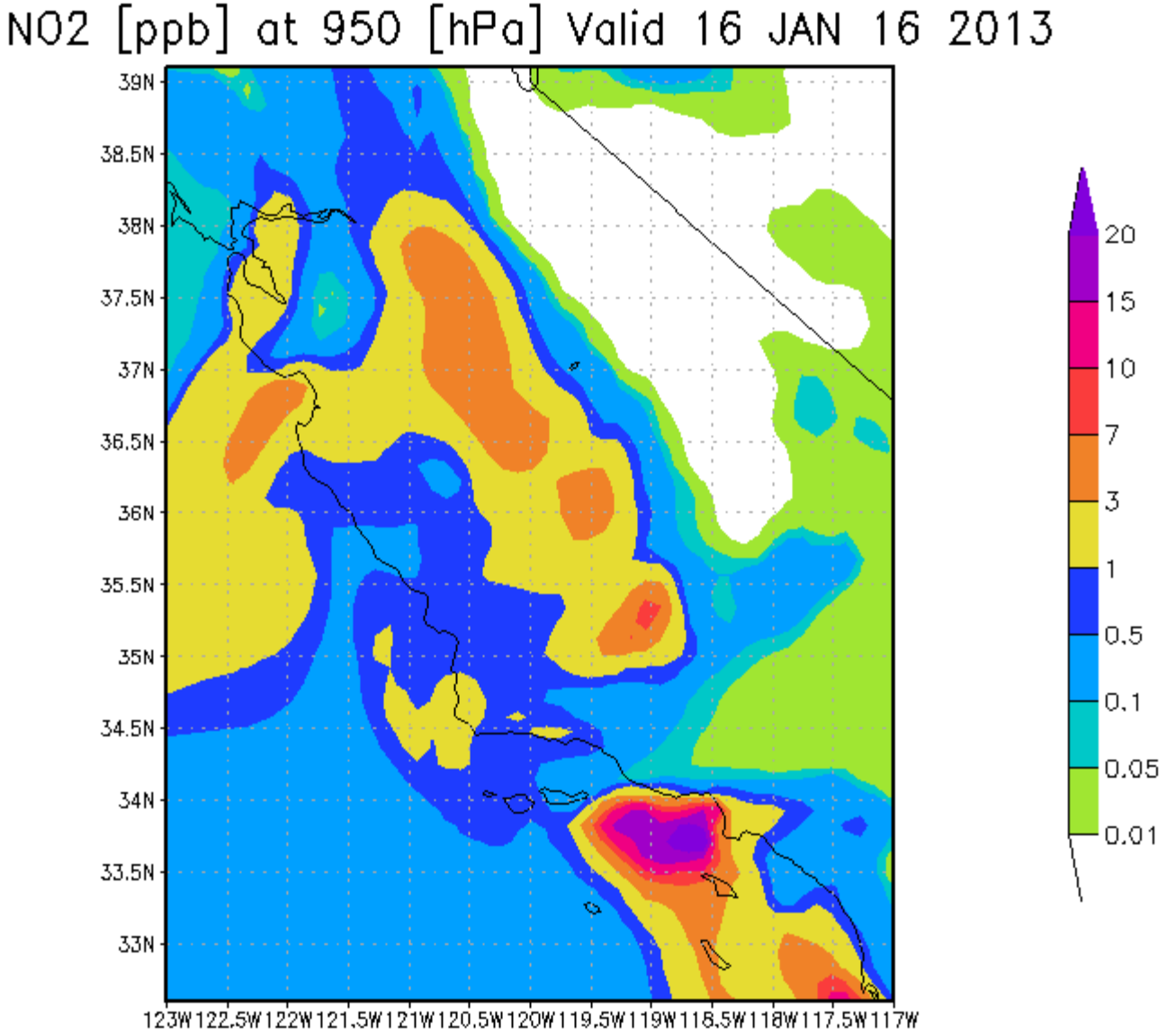
2013/015 –Terra (DT, 3 km)
550 nm AOD

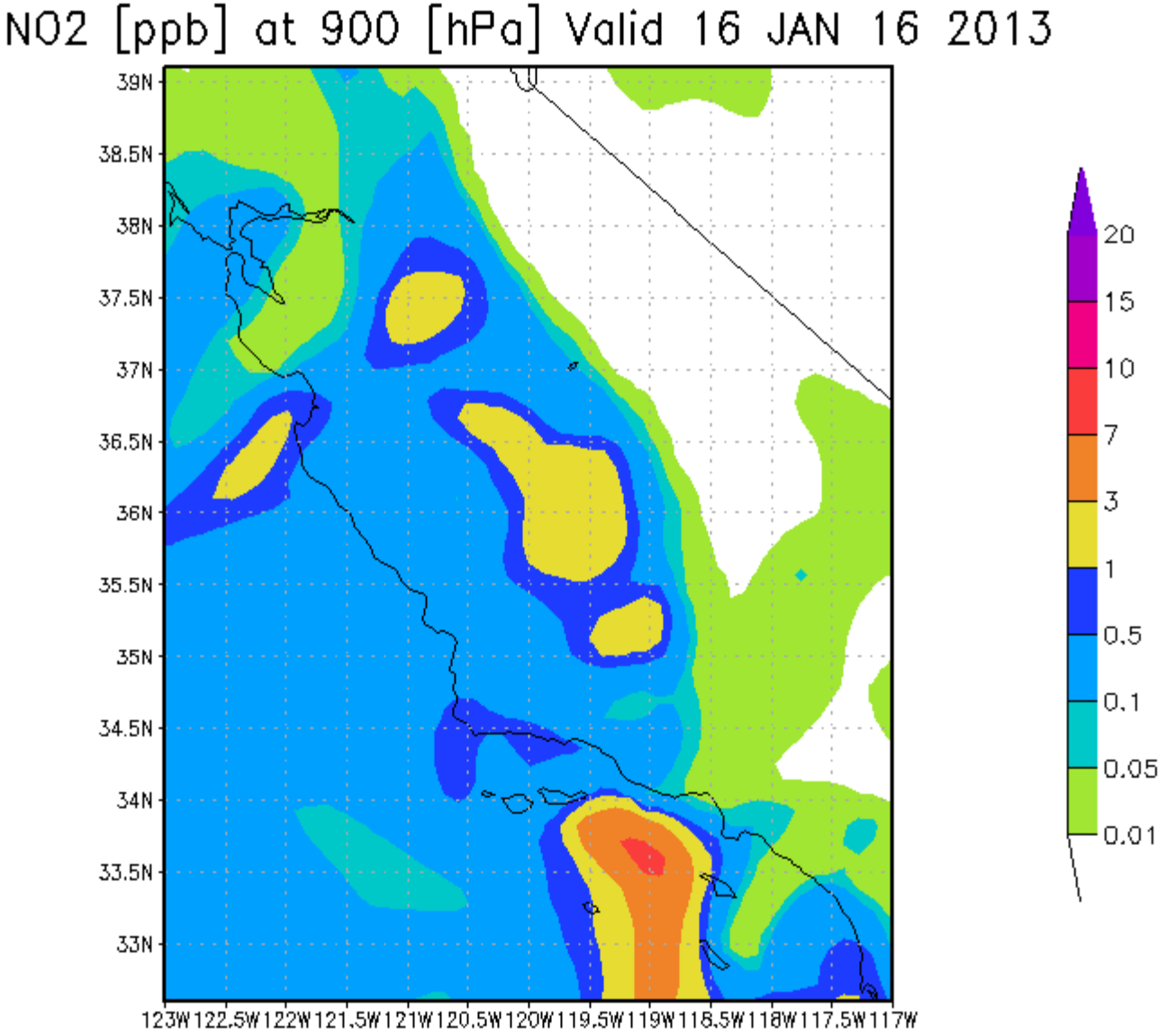


NOAA/CMAQ experimental

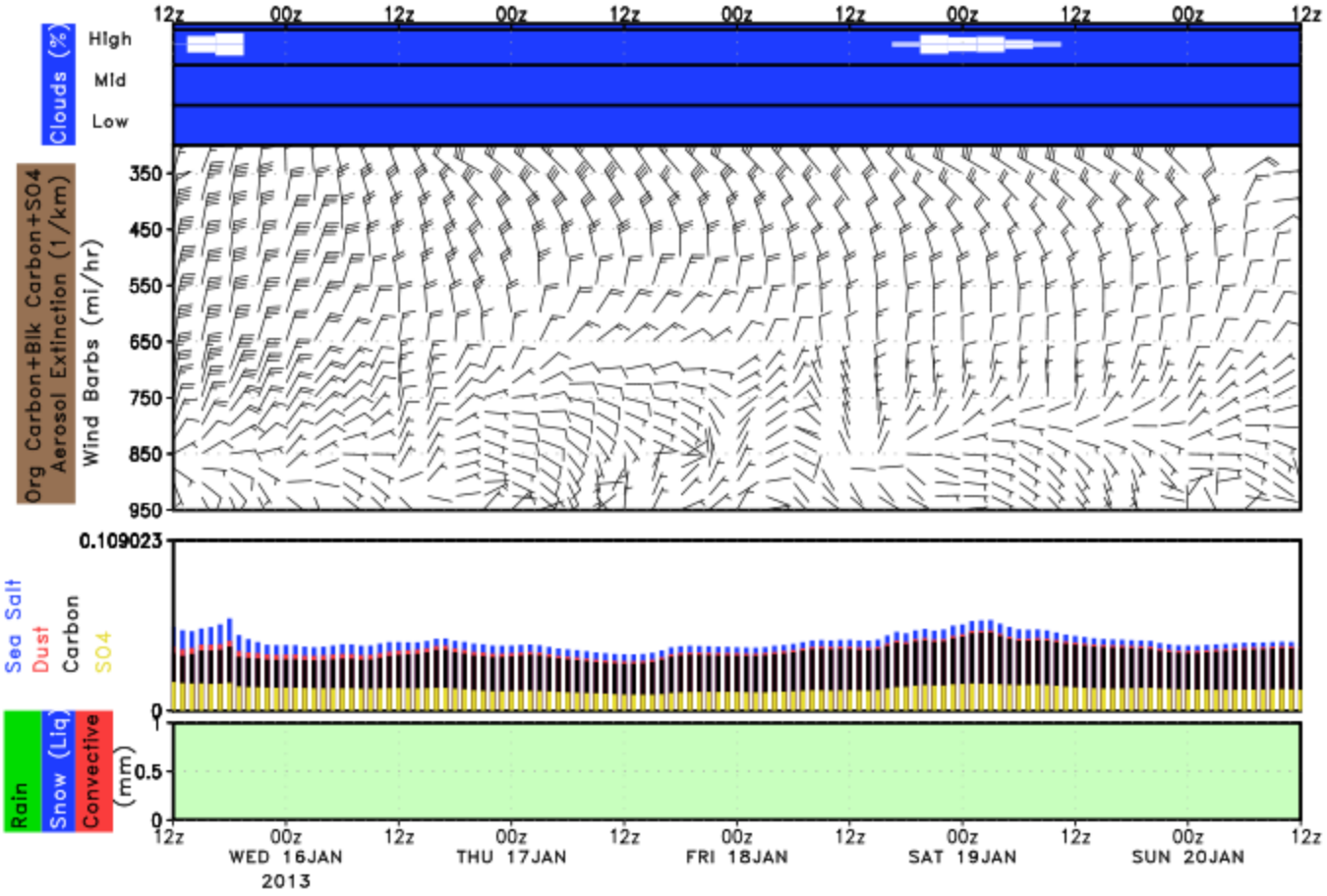



NO2 [ppb] at 1013 [hPa] Valid 16 JAN 16 2013
39N
38.5N
38N
37.5N
37N
36.5N
36N
35.5N
35N
34.5N
34N
33.5N
33N
123W 122.5W 122W 121.5W 121W 120.5W 120W 119.5W 119W 118.5W 118W 117.5W 117W
20
15
10
7
3
1
0.5
0.1
0.05
0.01

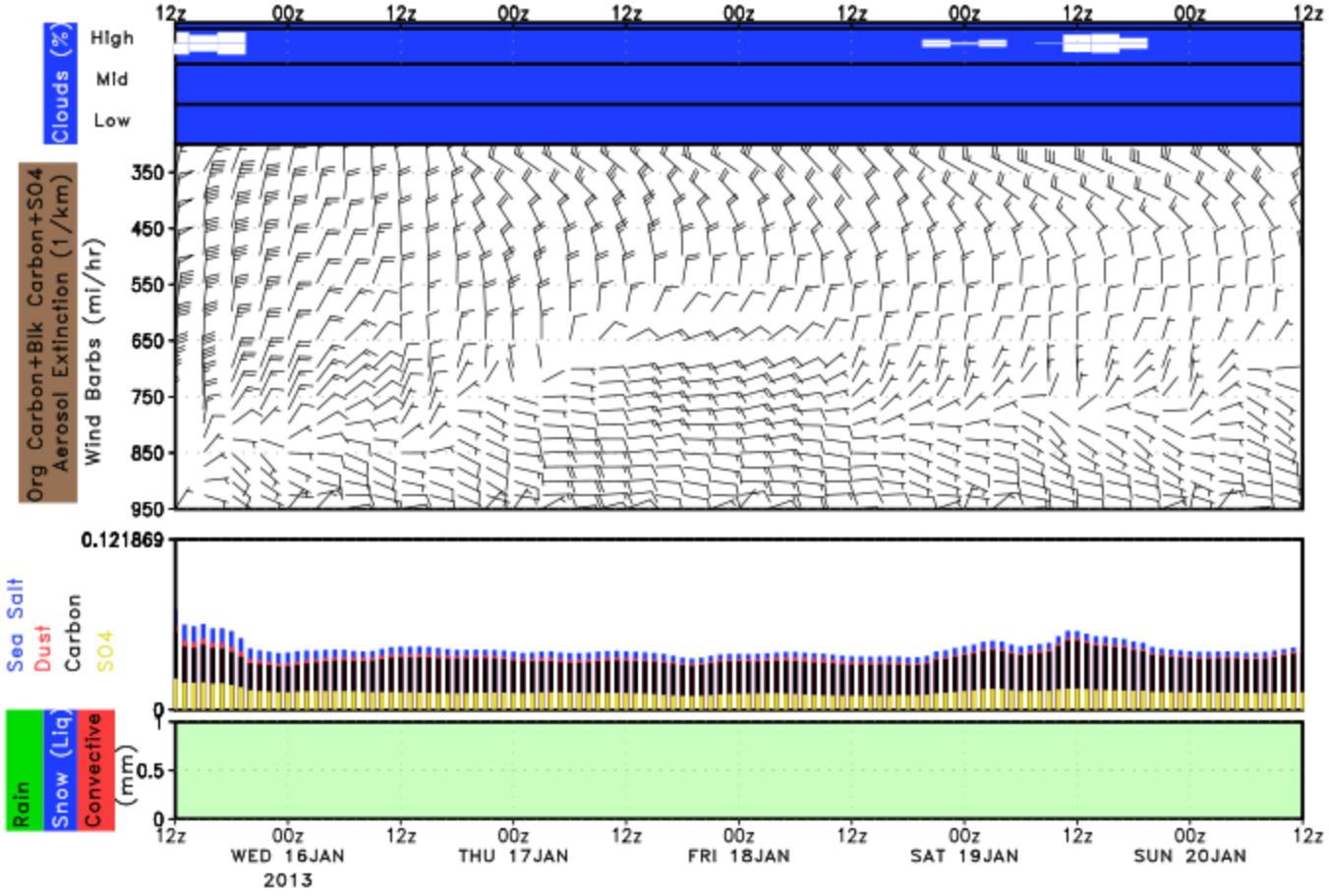

NO2 [ppb] at 950 [hPa] Valid 16 JAN 16 2013
39N
38.5N
38N
37.5N
37N
36.5N
36N
35.5N
35N
34.5N
34N
33.5N
33N
123W 122.5W 122W 121.5W 121W 120.5W 120W 119.5W 119W 118.5W 118W 117.5W 117W
20
15
10
7
3
1
0.5
0.1
0.05
0.01


NO2 [ppb] at 900 [hPa] Valid 16 JAN 16 2013
39N
38.5N
38N
37.5N
37N
36.5N
36N
35.5N
35N
34.5N
34N
33.5N
33N
123W 122.5W 122W 121.5W 121W 120.5W 120W 119.5W 119W 118.5W 118W 117.5W 117W
20
15
10
7
3
1
0.5
0.1
0.05
0.01

GEOS-5 Aerosol Forecast -- Fresno



GEOS-5 Aerosol Forecast -- Bakersfield



Air Quality Summary

- Wed – Code Orange for PM2.5 Fresno and Kings County; cleaner to the south
- PM2.5 conditions expected to be similar at least thru Sunday

Recommendations

- Wednesday -- A definitely good day to fly. Update on fog conditions needed in the early AM
- Thursday – would also be a good day to fly, if it was feasible logistically
- Friday – likely good conditions will continue, but with increased risk of more widespread and persistent morning fog