

DISCOVER-AQ OUTLOOK January 22, 2013

Large aerosol loadings continue in the SJV today, which is likely the last day of the major aerosol episode. High thin cirrus clouds have moved over the region today from the weather system approaching from the west. However, for the most part these cirrus have been above the flight level for the B-200. A narrow ribbon of fog existed in the usual location in the valley this morning, but it was not as deep (300- 400 ft) as prior days. We were able to get the missed approaches in at Corcoran and Hanford on the first circuit. The high cloudiness will increase in coverage and thicken tomorrow as the trough passes to our north. On Thursday, moisture from the cut-off low off the southern CA coast will begin advecting into the region, leading to saturation down to 700 hPa. A small amount of light precipitation may occur in southern CA from this system. The effects of this system will persist on Friday with considerable cloudiness and a chance of precipitation. On Saturday a new trough will approach from the Gulf of Alaska, but the main cloudiness from this system may hold off until Saturday evening. This system will swing a cold front through the SJV on Sunday, leading to possible showers, followed by a change in air mass. Monday will be partly cloudy and Tuesday will see a cold northerly flow. Enhanced pollution conditions in the SJV may not develop again until next Wednesday.

The recommendation will be to not fly on Wednesday. The clouds will likely preclude normal SJV flights on Thurs. and Fri. as well, but we hold out the chance of a PODEX support flight on either Thurs. or Fri.

DISCOVER-AQ/PODEX Forecast Briefing

January 22, 2013

Ken Pickering, NASA/GSFC
Chris Loughner, ESSIC/GSFC

Fresno:

TODAY	TONIGHT	WEDNESDAY	WEDNESDAY NIGHT	THURSDAY	THURSDAY NIGHT	FRIDAY	FRIDAY NIGHT	SATURDAY
								
Sunny High: 65 °F	Partly Cloudy Low: 42 °F	Partly Sunny High: 66 °F	Mostly Cloudy Low: 45 °F	Mostly Sunny High: 65 °F	Partly Cloudy Low: 44 °F	Mostly Sunny High: 65 °F	Mostly Cloudy Low: 45 °F	Slight Chc Showers High: 65 °F 20%

Hanford:

TODAY	TONIGHT	WEDNESDAY	WEDNESDAY NIGHT	THURSDAY	THURSDAY NIGHT	FRIDAY	FRIDAY NIGHT	SATURDAY
								
Dense Fog High: 67 °F	Partly Cloudy Low: 37 °F	Partly Sunny High: 66 °F	Mostly Cloudy Low: 42 °F	Mostly Sunny High: 64 °F	Partly Cloudy Low: 42 °F	Partly Sunny High: 66 °F	Mostly Cloudy Low: 43 °F	Slight Chc Showers High: 66 °F 20%

Bakersfield:

TODAY	TONIGHT	WEDNESDAY	WEDNESDAY NIGHT	THURSDAY	THURSDAY NIGHT	FRIDAY	FRIDAY NIGHT	SATURDAY
								
Sunny High: 69 °F	Mostly Clear Low: 41 °F	Partly Sunny High: 70 °F	Mostly Cloudy Low: 46 °F	Mostly Sunny High: 64 °F	Partly Cloudy Low: 44 °F	Partly Sunny High: 66 °F	Mostly Cloudy Low: 45 °F	Slight Chc Showers High: 61 °F 20%

Current Conditions

BAKERSFIELD CA

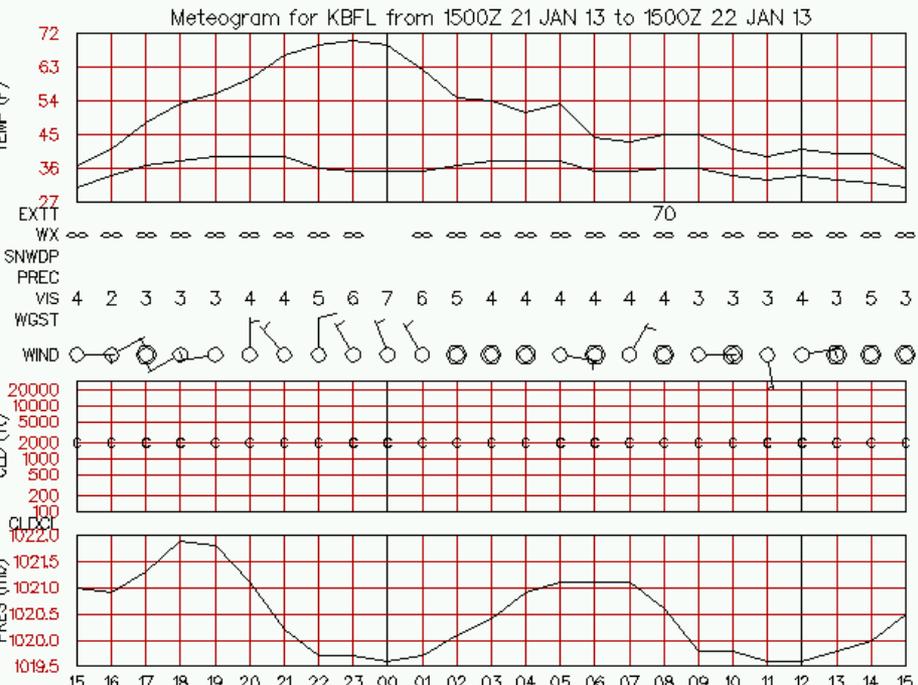
Haze

37°F
3°C

Humidity 75%
Wind Speed S 3 MPH
Barometer 30.14 in
Dewpoint 30°F (-1°C)
Visibility 2.50 mi

Last Update on 22 Jan 7:05 am PST

Plymouth State Weather Center



Fresno



Fresno

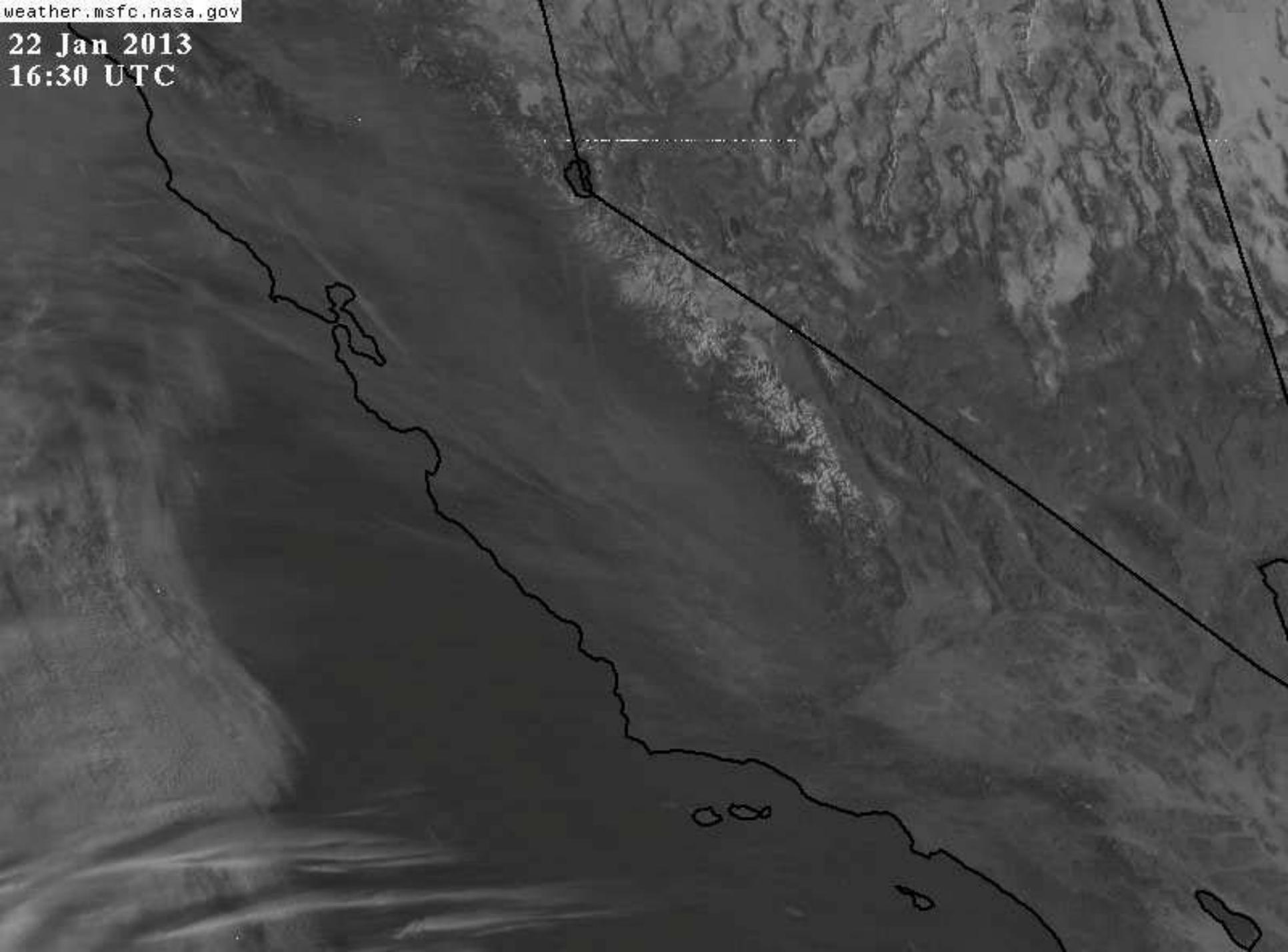


Visalia



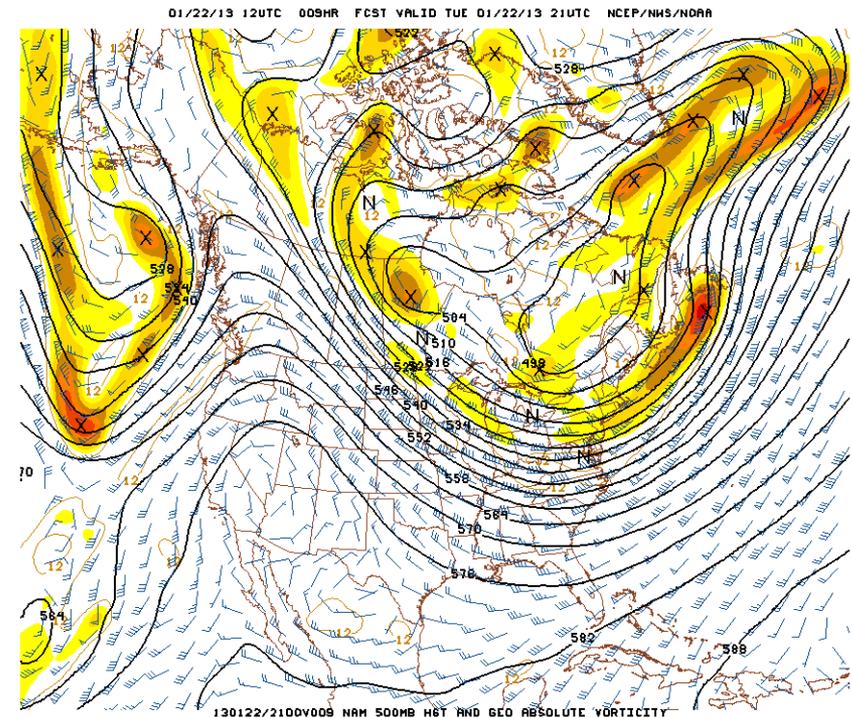
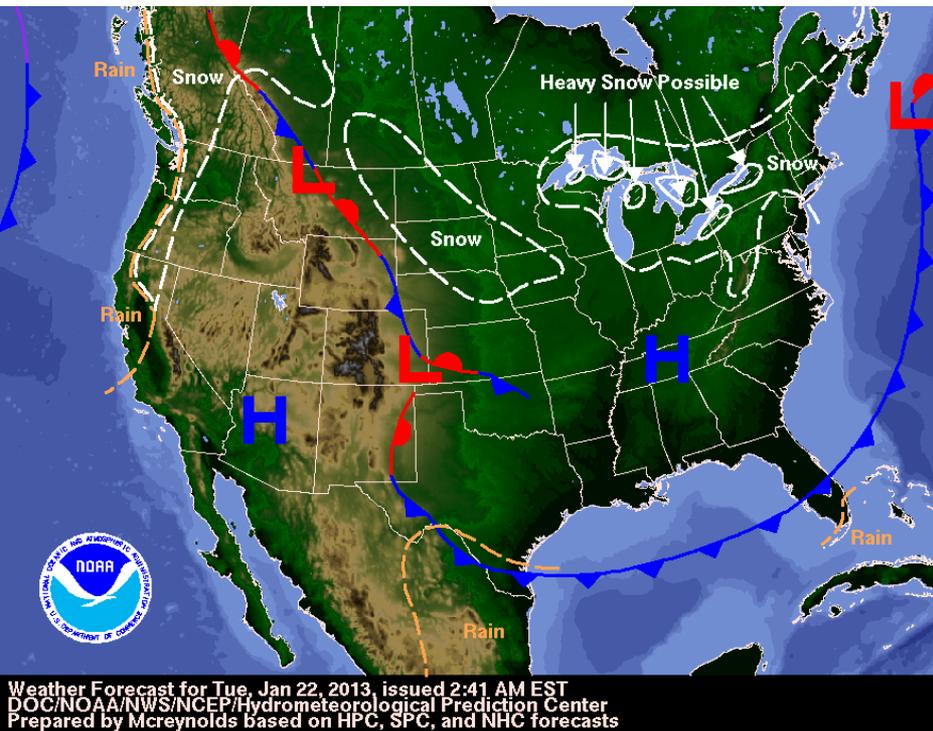
22 Jan 2013

16:30 UTC



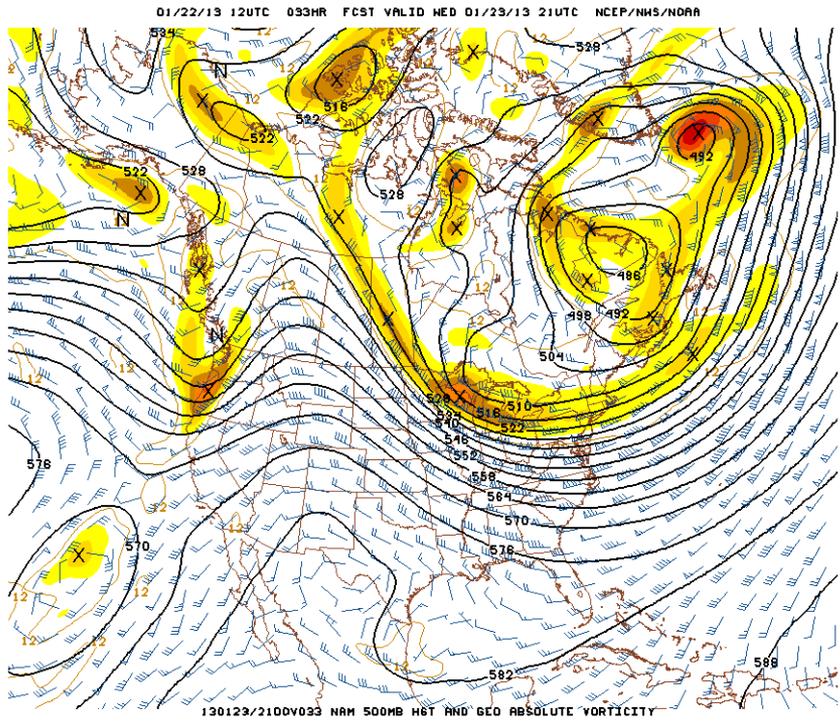
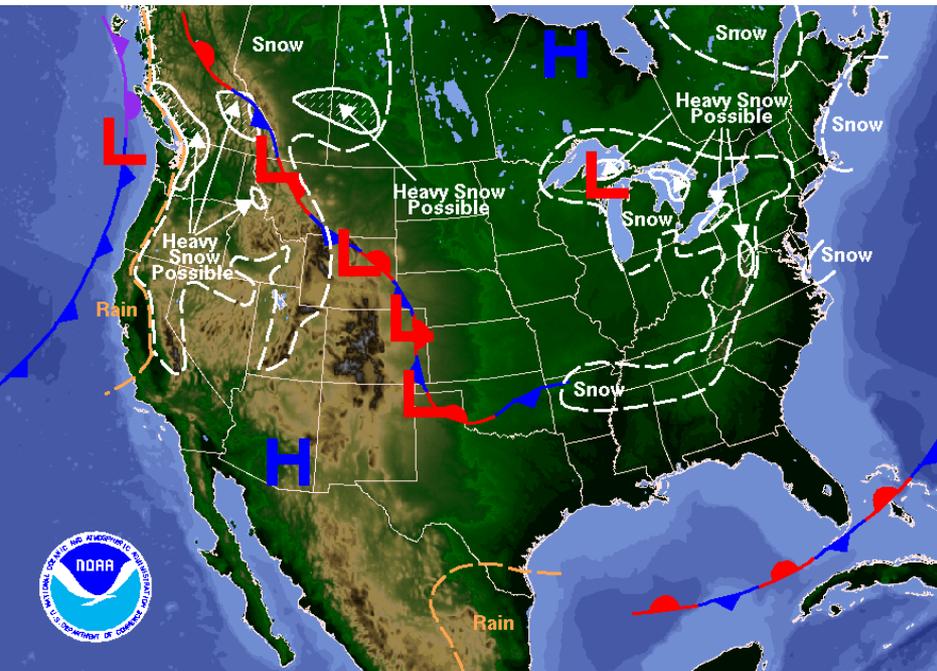
Today : Cirrus clouds moving into the region as a trough moves into the Pacific Northwest.

500 mb NAM at 1 PM.



Tomorrow: Cloudy as a shortwave trough passes to our north.

500 mb NAM at 1 PM.



Weather Forecast for Wed, Jan 23, 2013, issued 3:41 AM EST Tue, Jan 22, 2013
DOC/NOAA/NWS/NCEP/Hydrometeorological Prediction Center
Prepared by McCreynolds based on HPC, SPC, and NHC forecasts

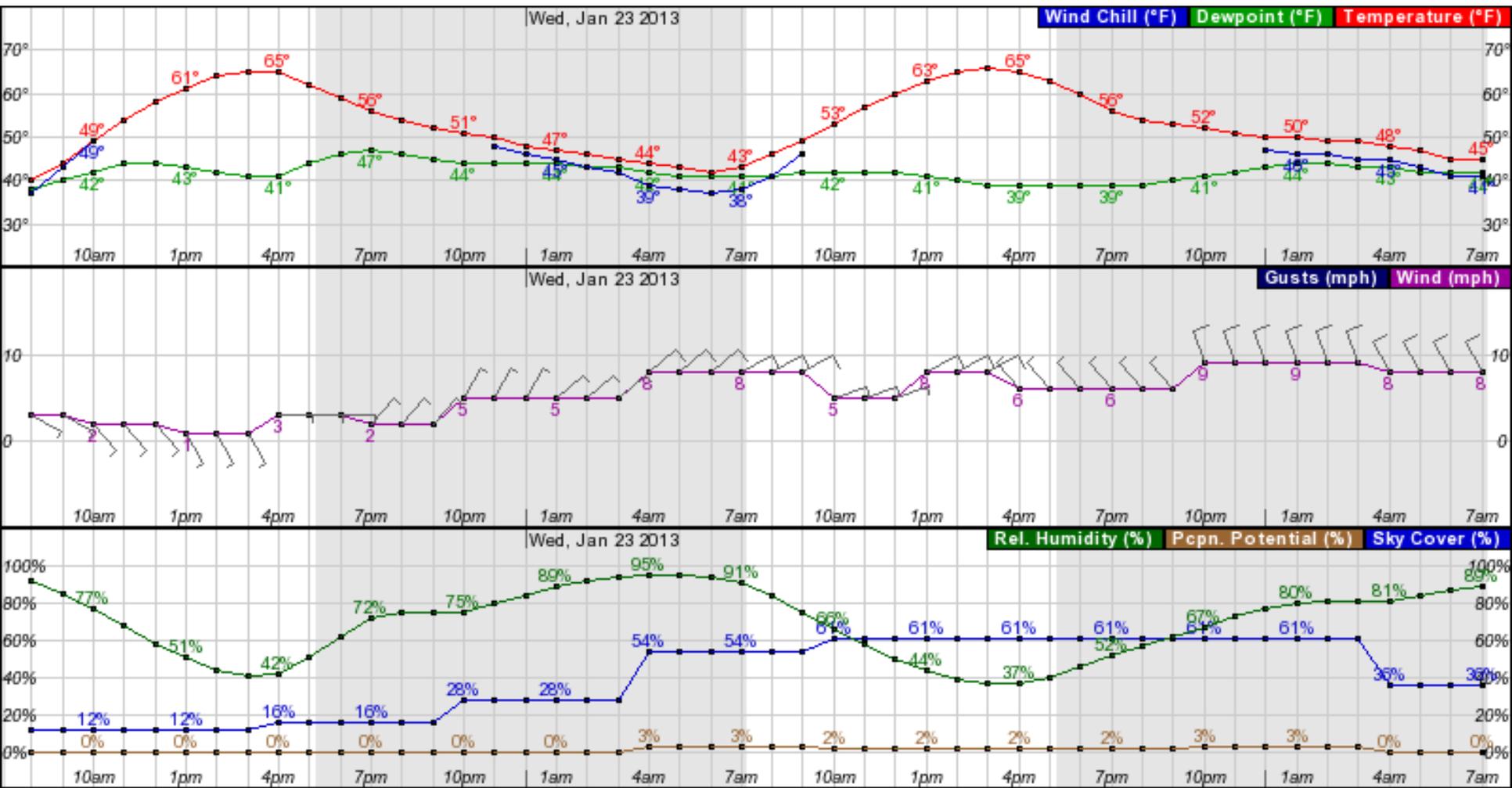
Fresno

Today: Mostly sunny.

Tomorrow: Mostly cloudy.

Today →

Tomorrow →



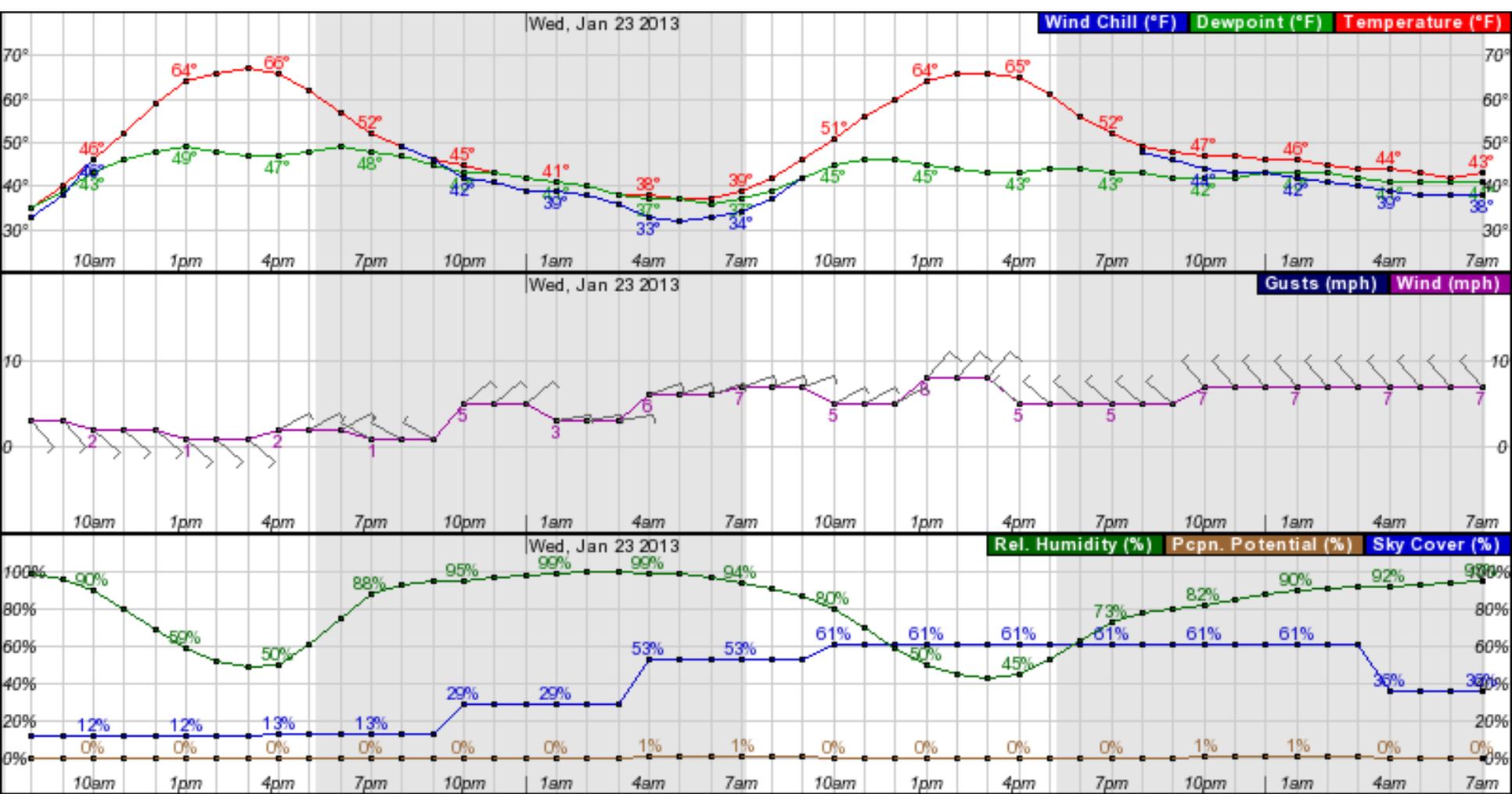
Hanford

Today: Mostly sunny.

Tomorrow: Mostly cloudy and a chance of morning fog.

Today →

Tomorrow →



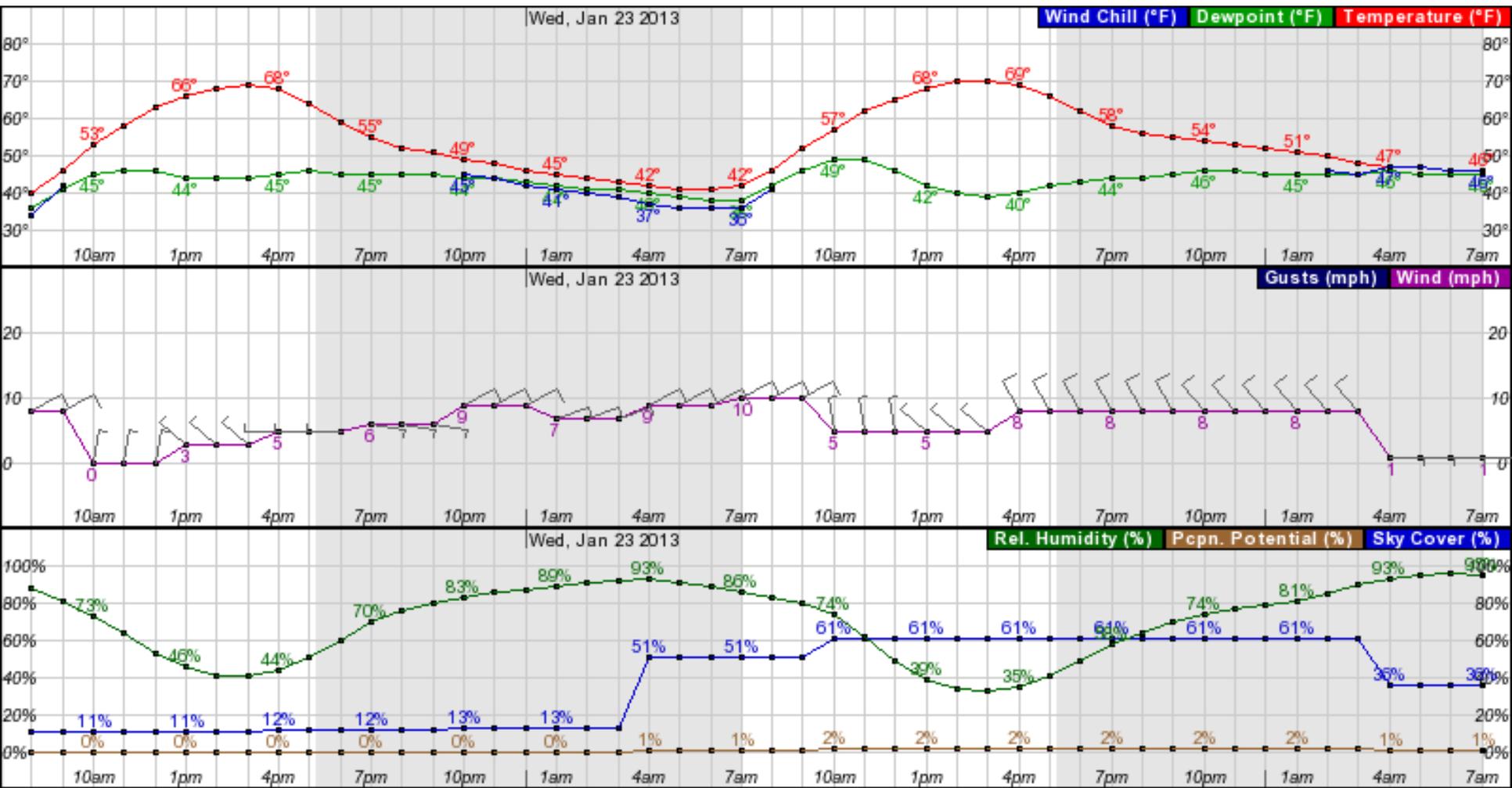
Bakersfield

Today: Mostly sunny.

Tomorrow: Mostly cloudy.

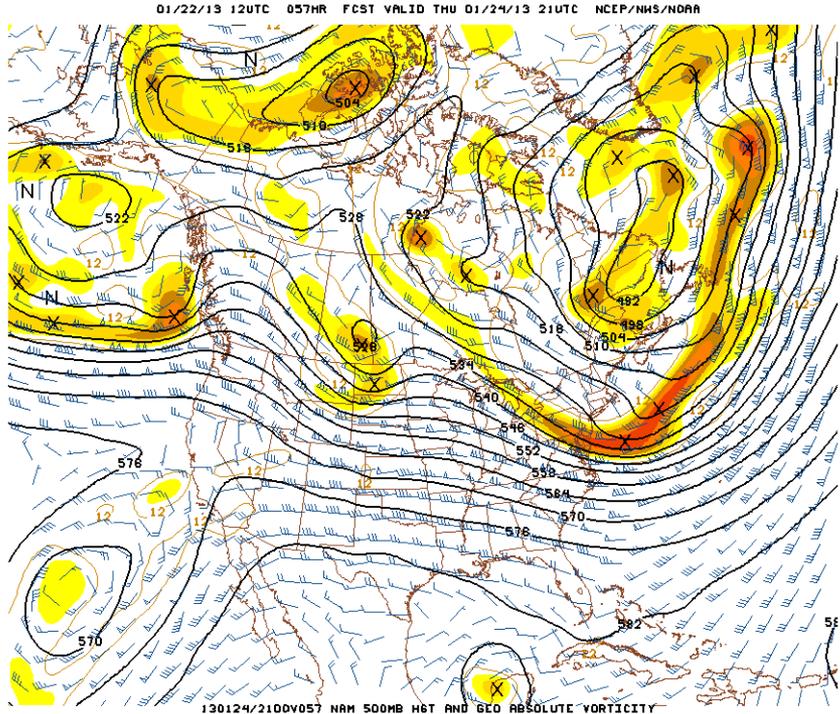
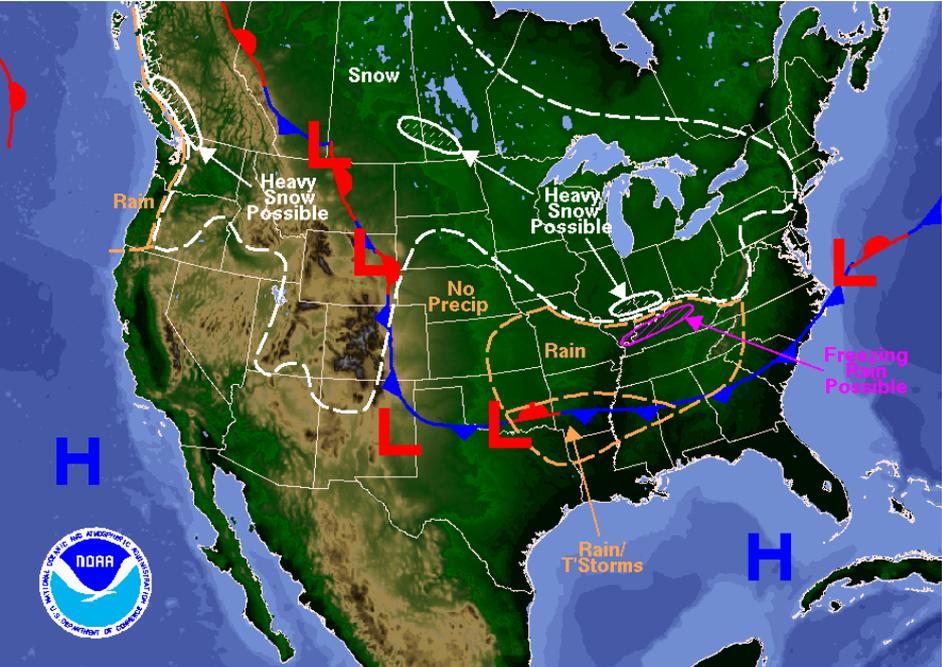
Today →

Tomorrow →



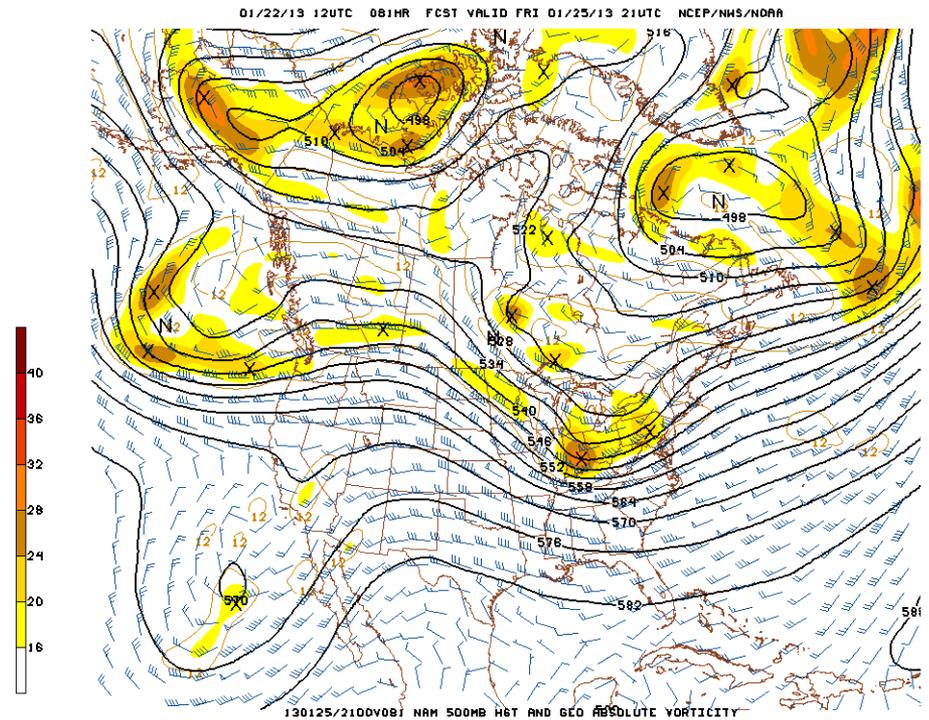
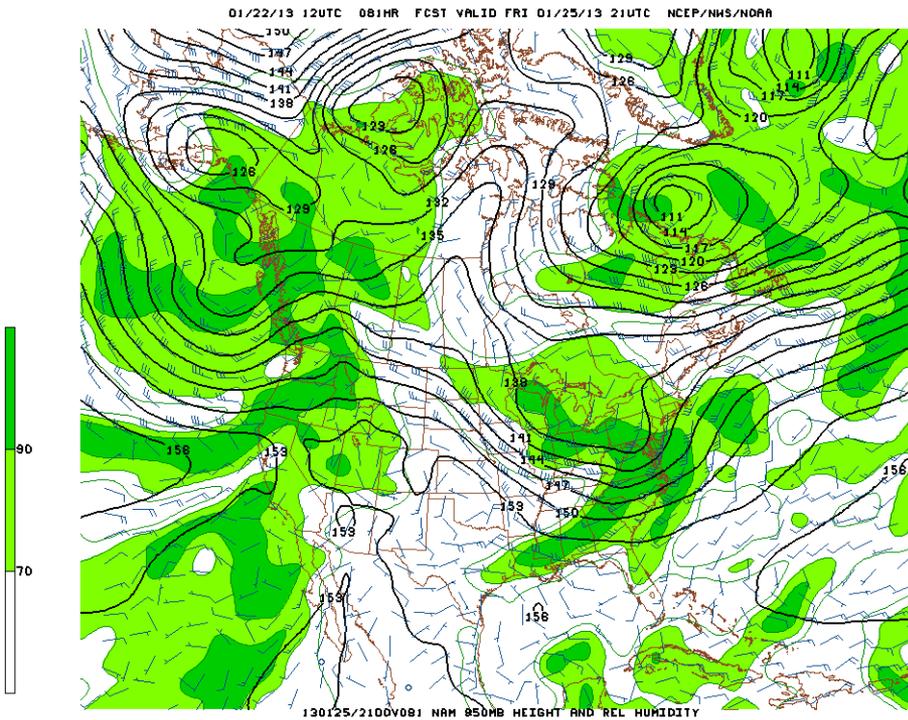
Thursday: A mix of sun and clouds as an upper level low approaches from the southwest.

500 mb NAM at 1 PM.



850 mb NAM Friday 1 PM

500 mb NAM Friday 1 PM



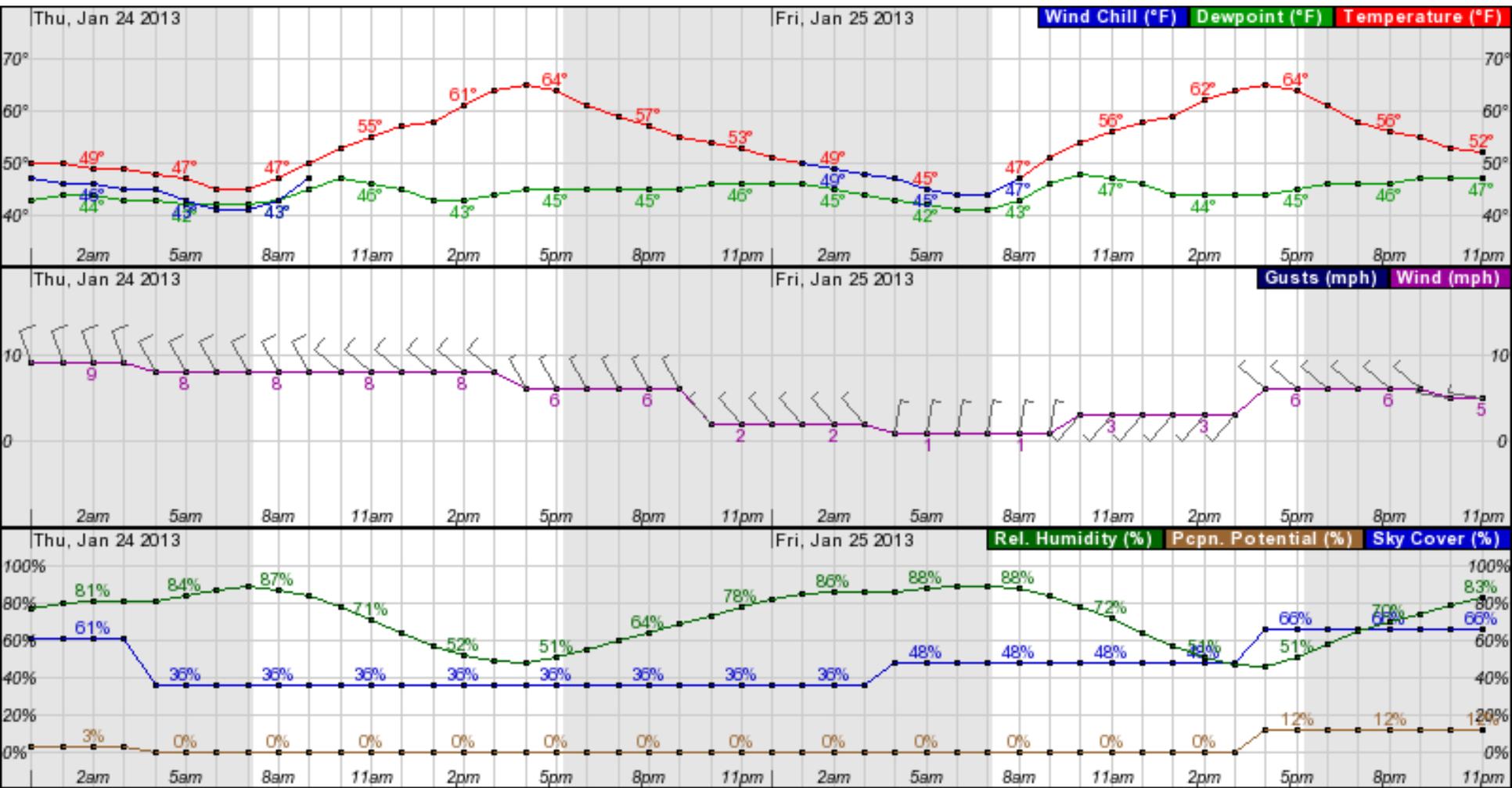
Fresno

Thursday: Partly cloudy.

Friday: Partly cloudy with cloud coverage increasing in the afternoon.

Thursday →

Friday →



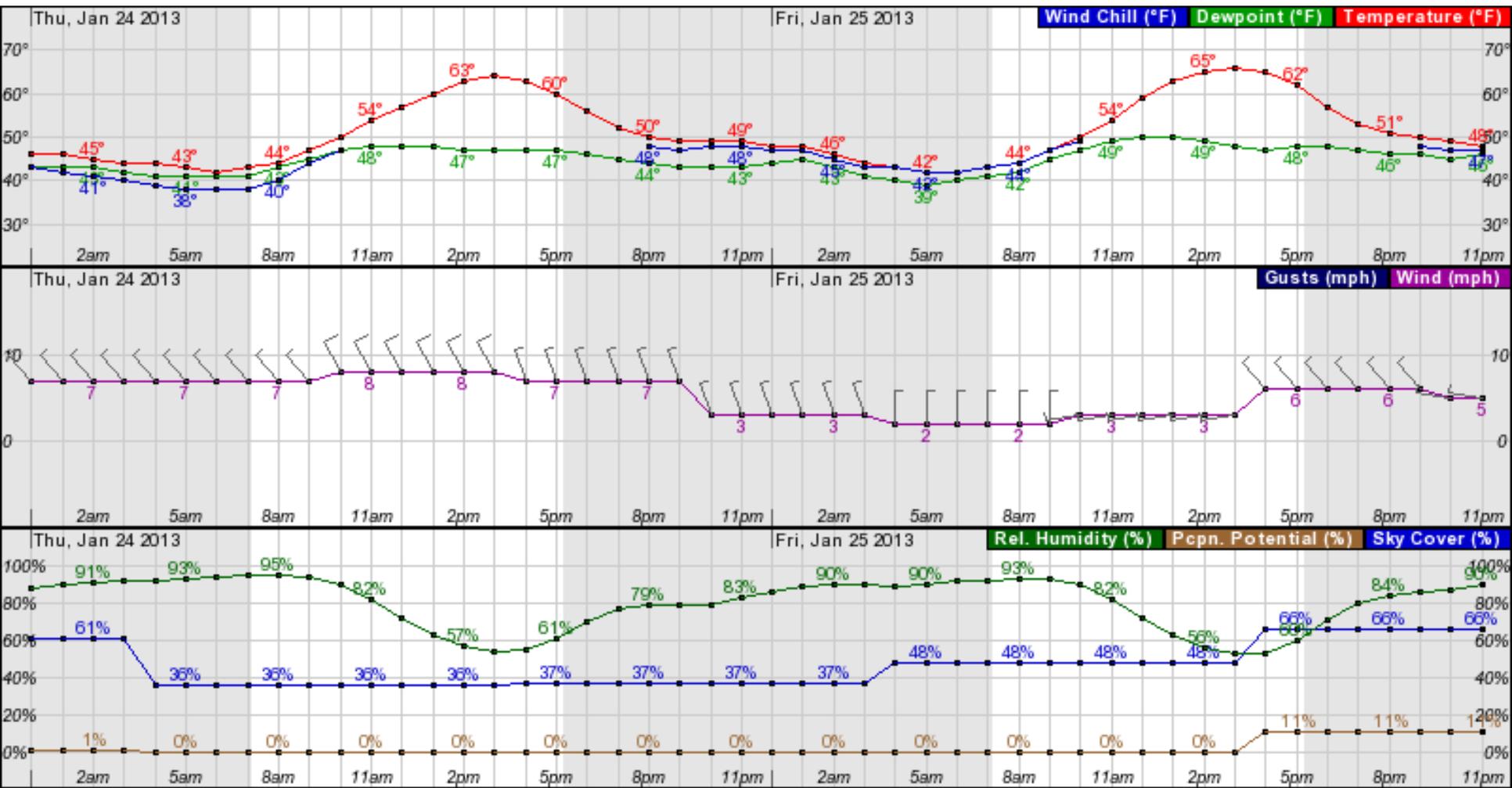
Hanford

Thursday: Partly cloudy.

Friday: Partly cloudy with cloud coverage increasing in the afternoon.

Thursday →

Friday →



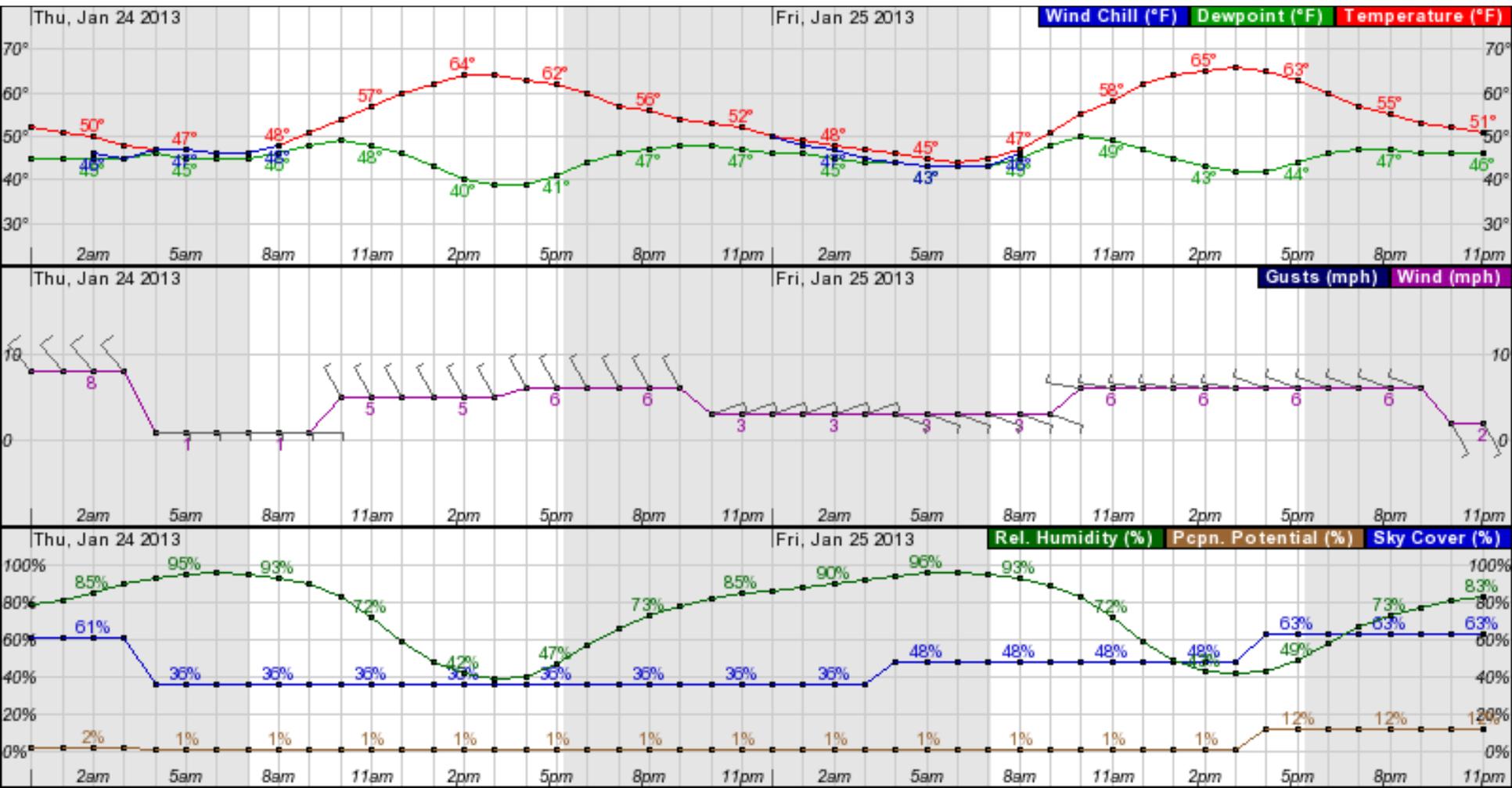
Bakersfield

Thursday: Partly cloudy.

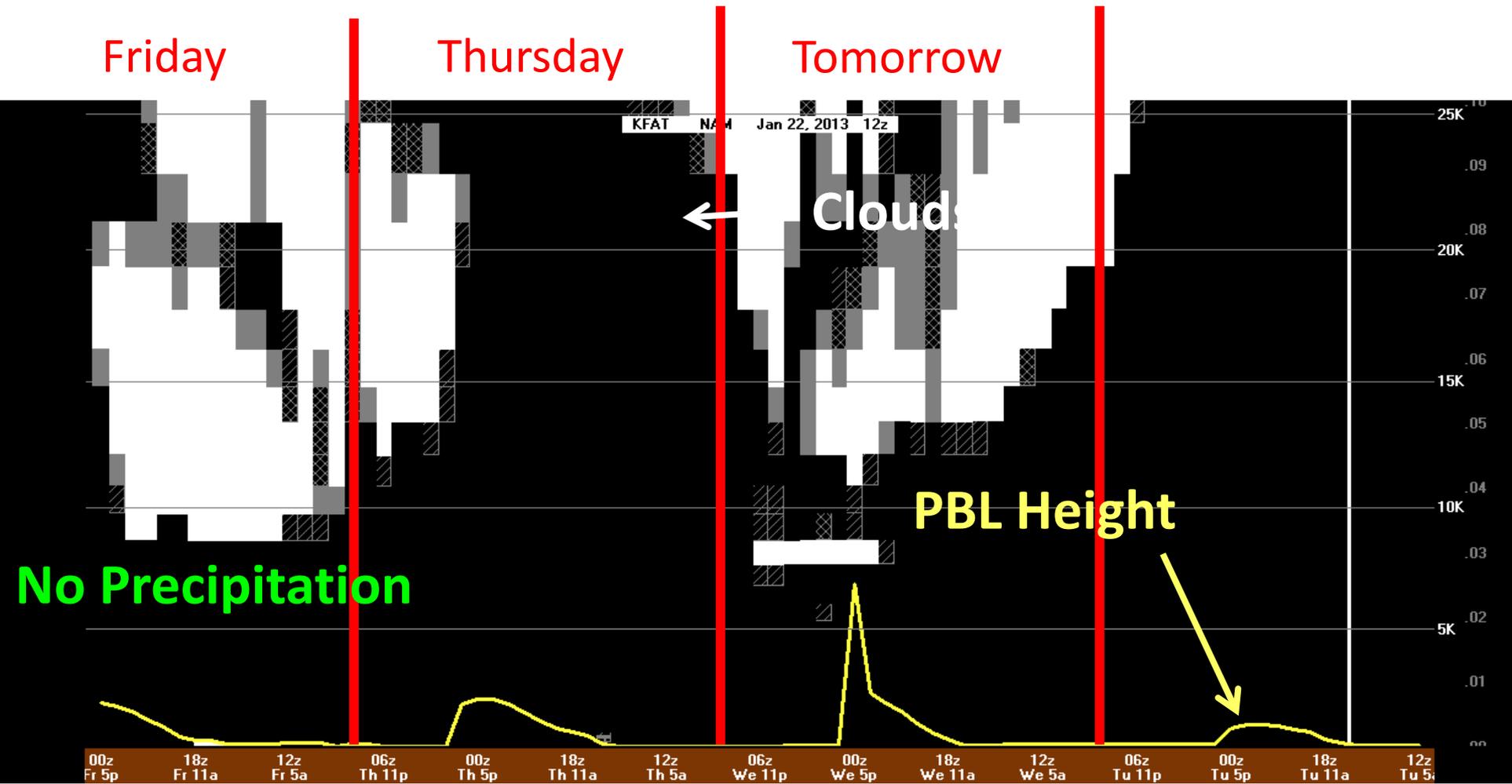
Friday: Partly cloudy with cloud coverage increasing in the afternoon.

Thursday →

Friday →

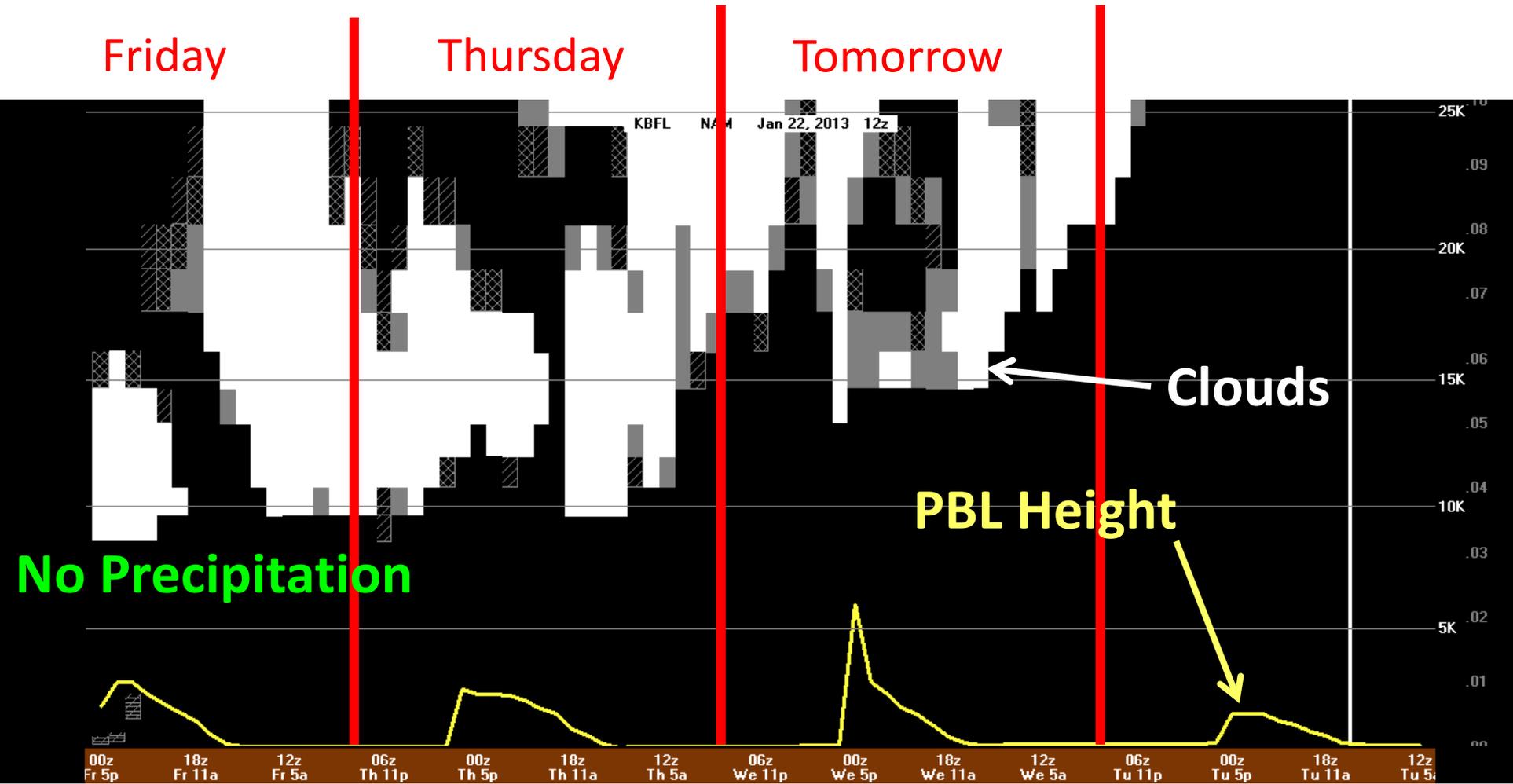


Fresno; BUFKIT – NAM (12 UTC 22 January)



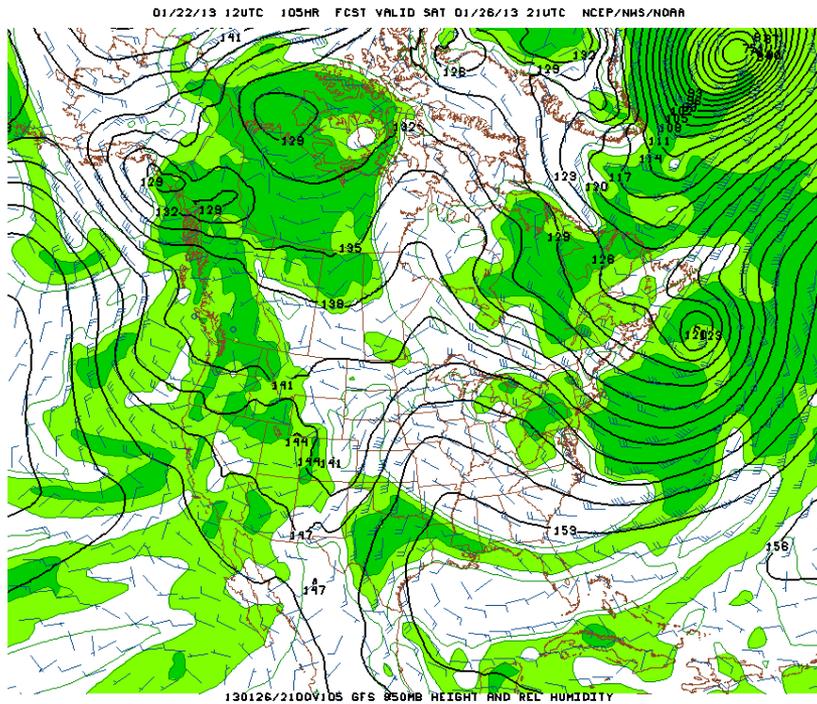
- Tomorrow and Friday: Cloudy.
- Thursday: Clouds developing in the afternoon.

Bakersfield; BUFKIT – NAM (12 UTC 22 January)

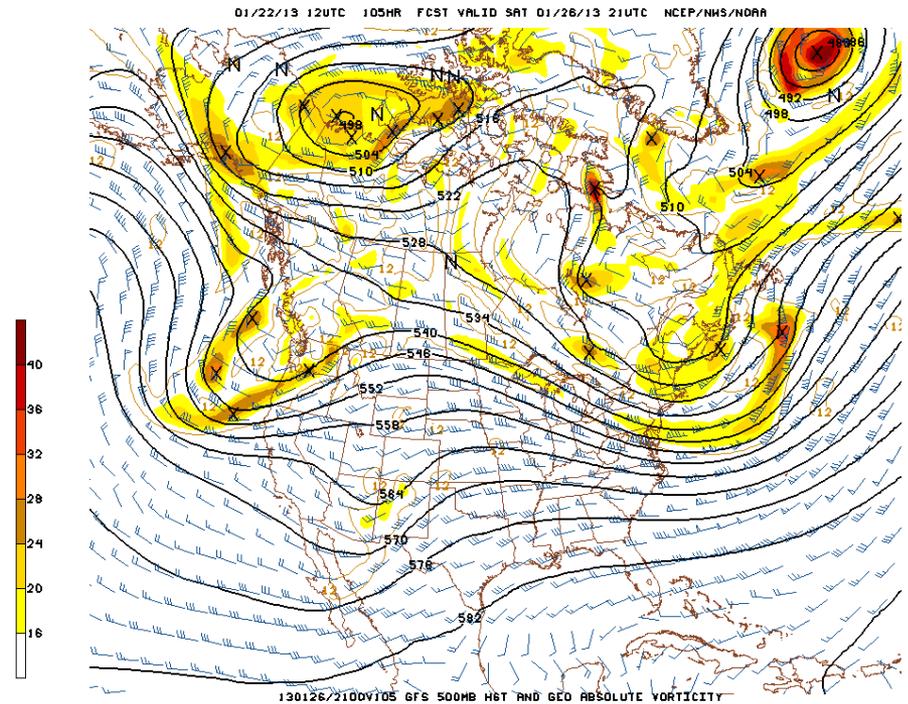


-Tomorrow through Friday: Cloudy.

850 mb GFS Saturday 1 PM

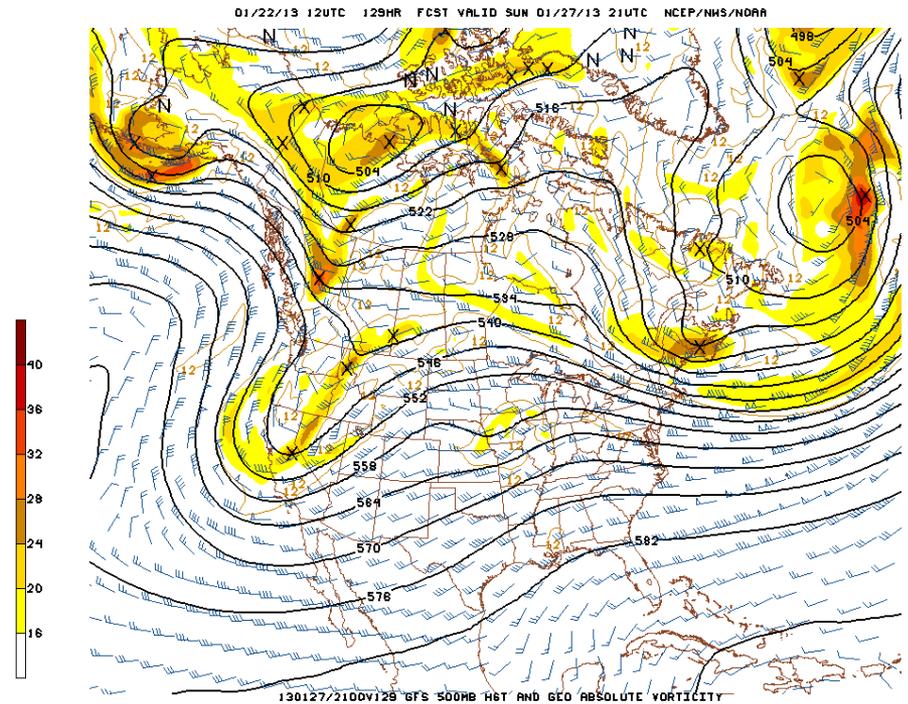
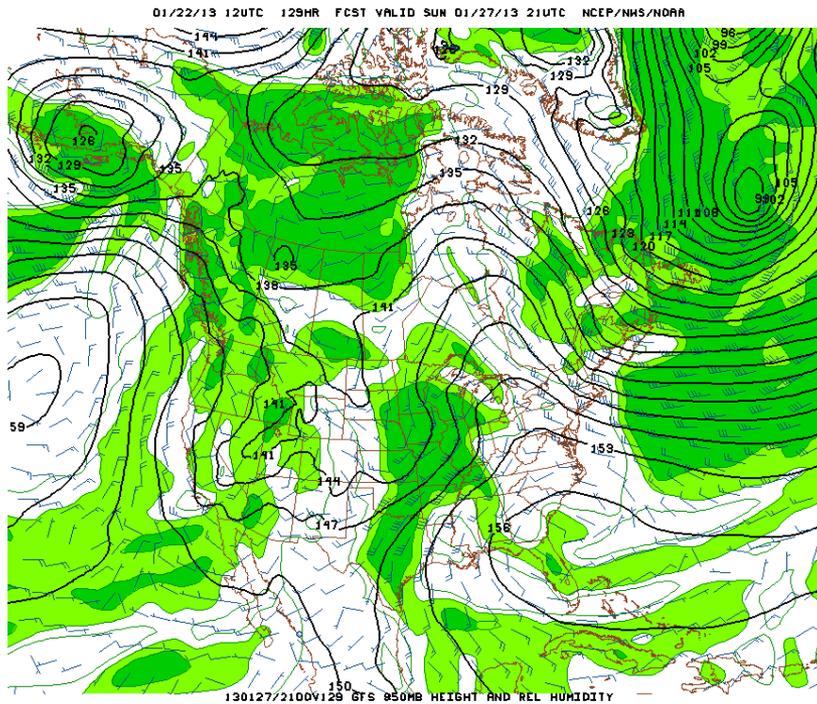


500 mb GFS Saturday 1 PM



850 mb GFS Sunday 1 PM

500 mb GFS Sunday 1 PM



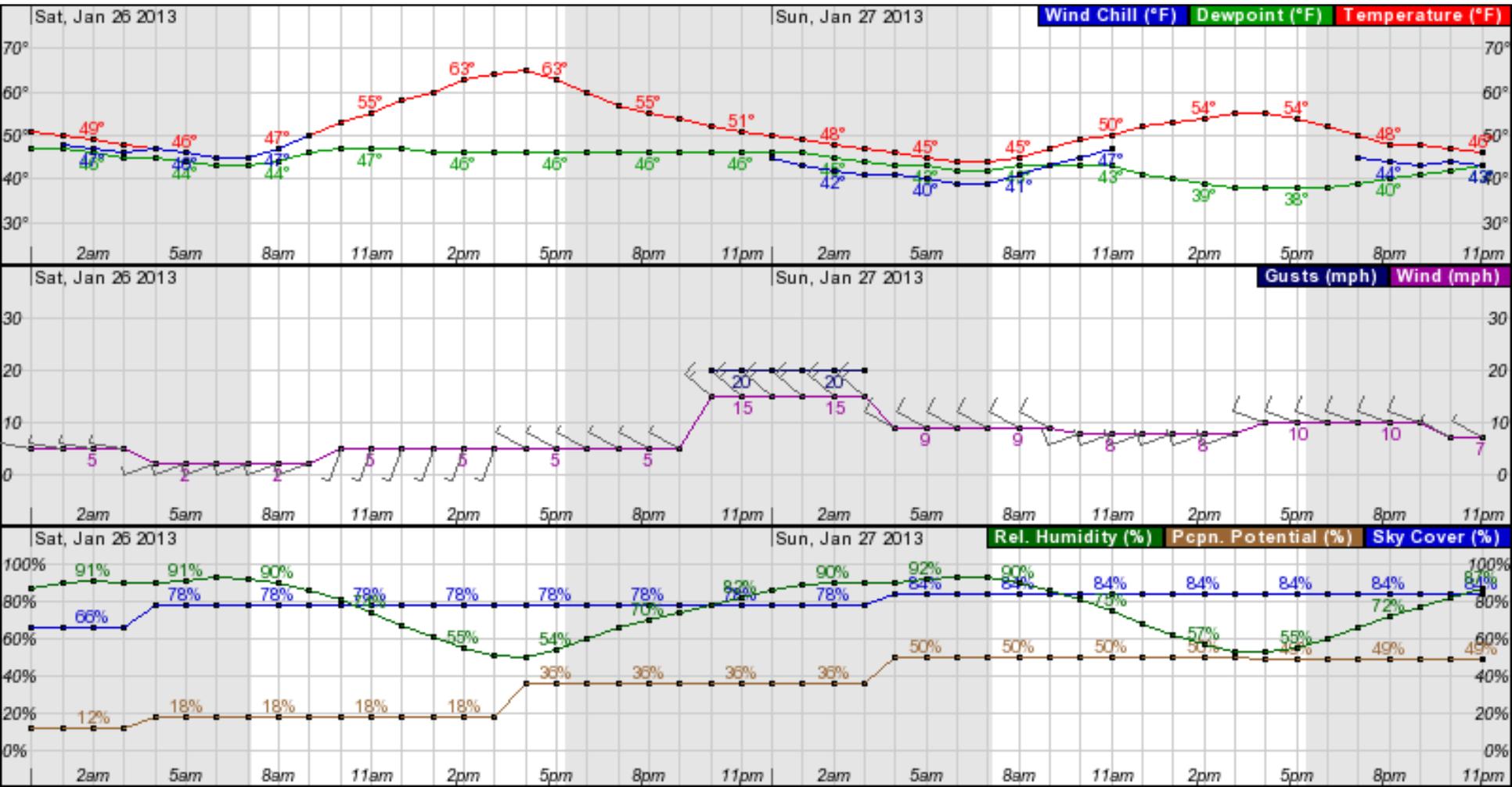
Fresno

Saturday: Mostly cloudy.

Sunday: Mostly cloudy.

Saturday →

Sunday →



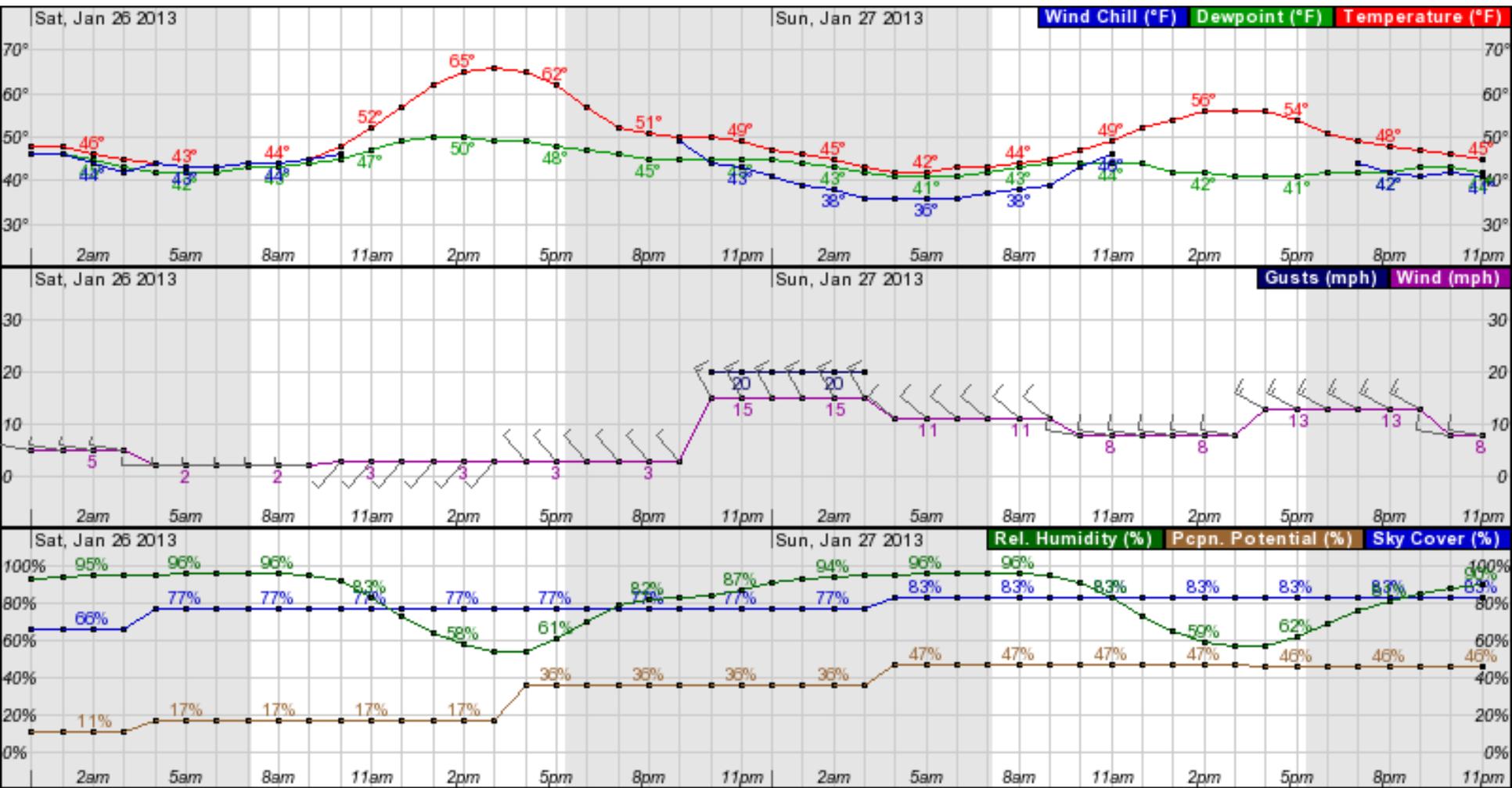
Hanford

Saturday: Mostly cloudy.

Sunday: Mostly cloudy.

Saturday →

Sunday →



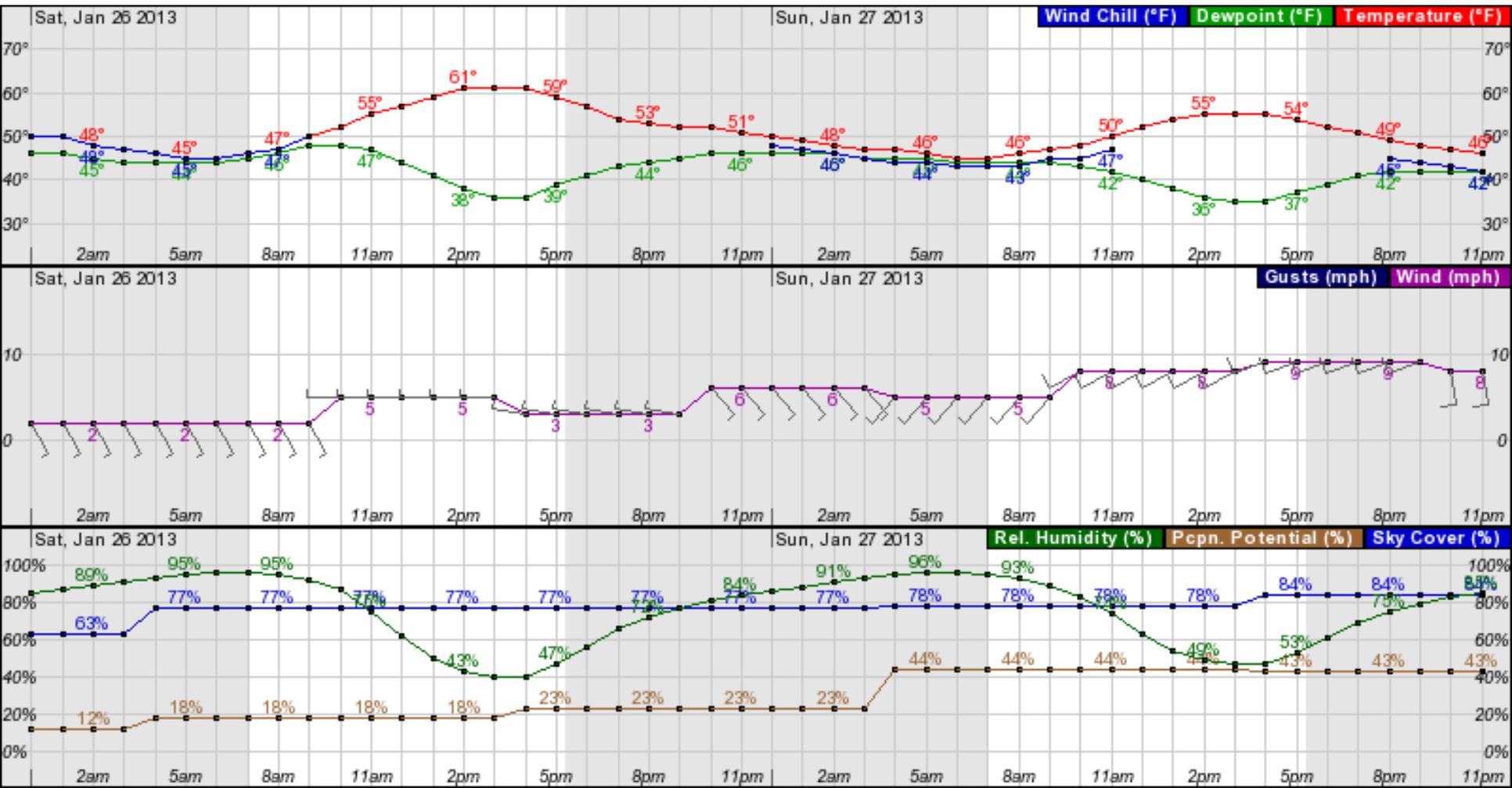
Bakersfield

Saturday: Mostly cloudy.

Sunday: Mostly cloudy.

Saturday →

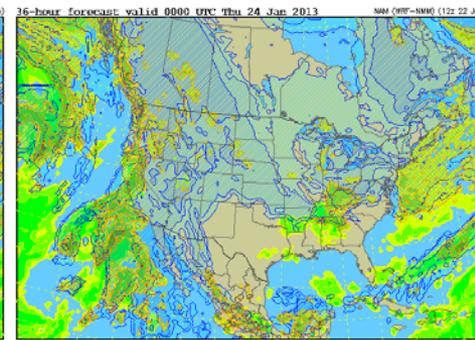
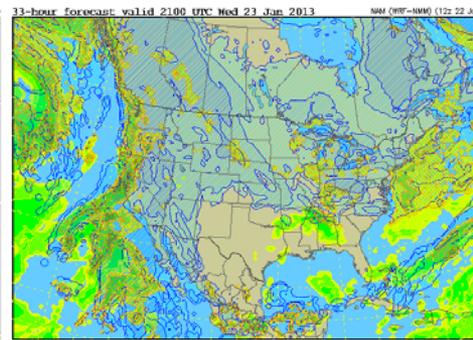
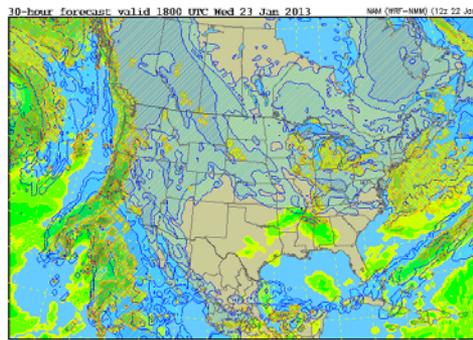
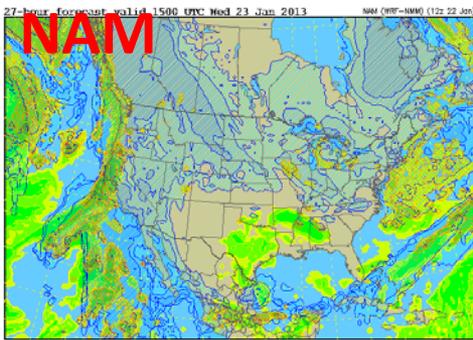
Sunday →



Tomorrow: NAM – mid and high level clouds; GEOS-5 – cloudy.

7 am 10 am 1 pm 4 pm

Integrated liquid and frozen hydrometeors (all levels)

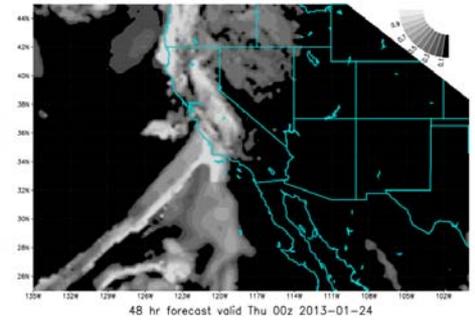
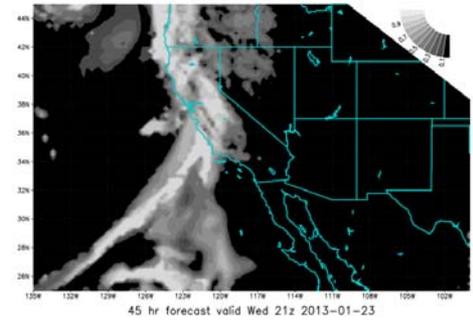
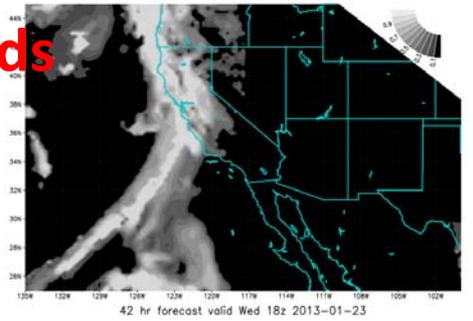
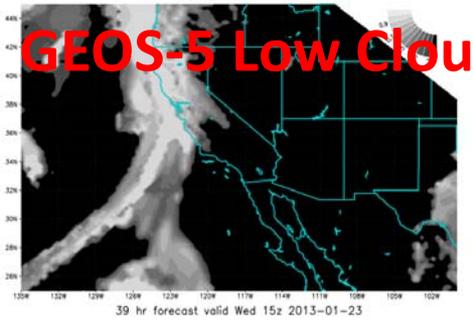


NASA/GMAO – GEOS-5 Forecast Initialized on 00z 2013-01-22
 Low Cloud Fraction

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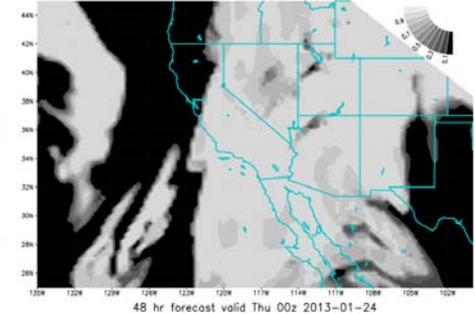
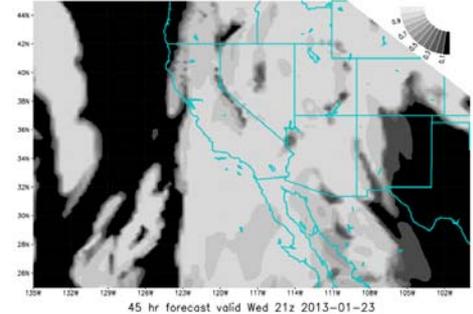
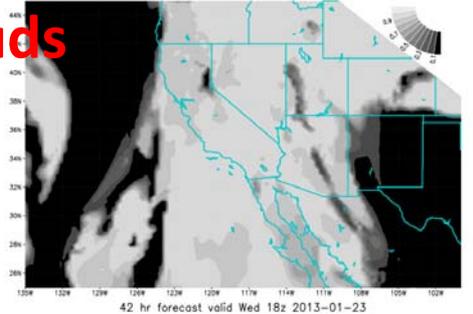
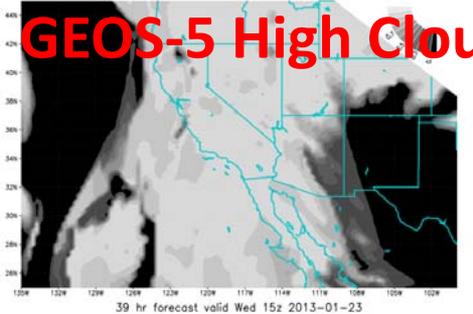


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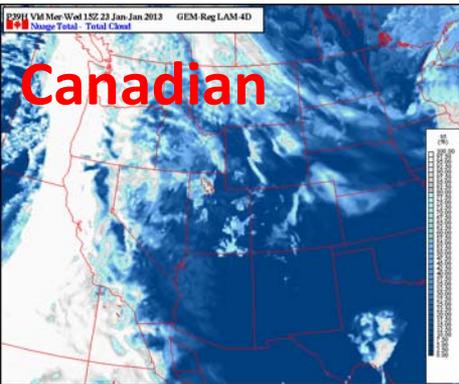
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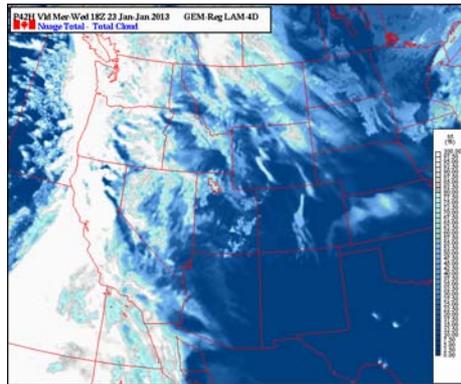


Tomorrow: Canadian – cloudy; GFS – cloudy.

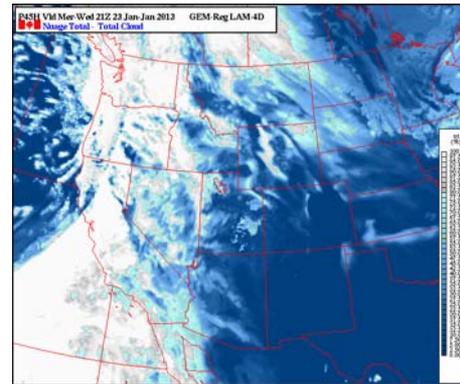
7 am



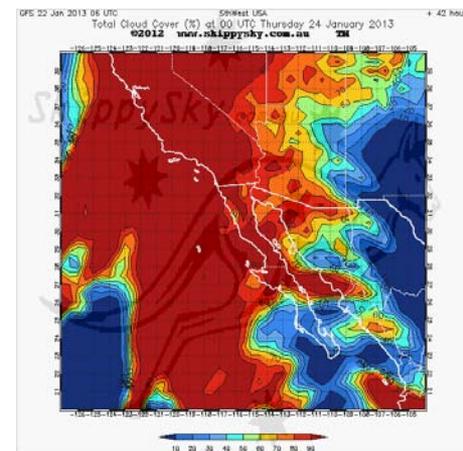
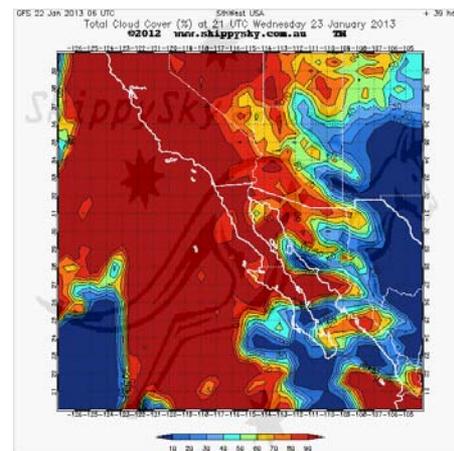
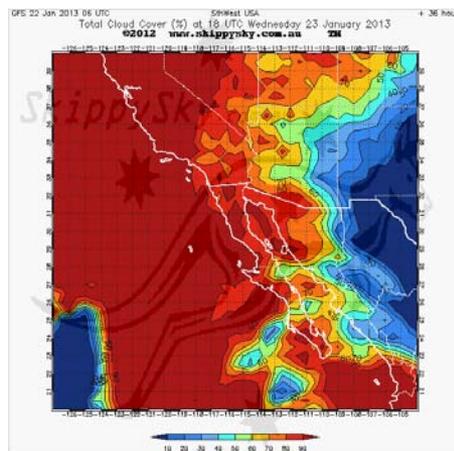
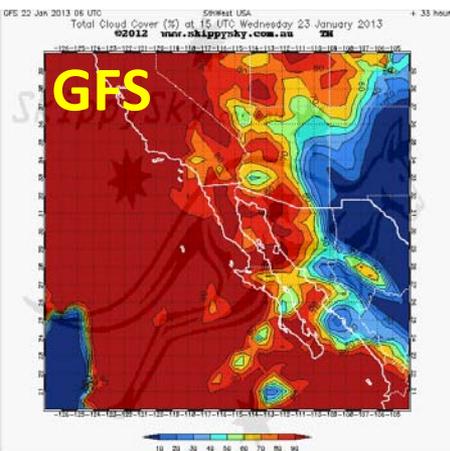
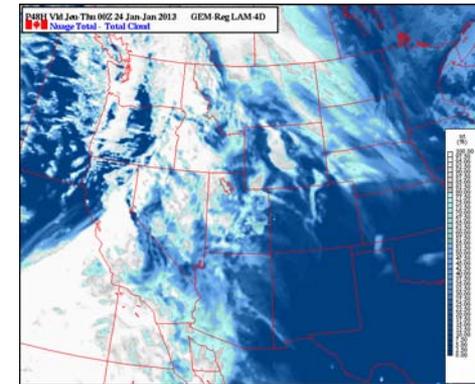
10 am



1 pm



4 pm



Thursday: NAM – mid and high level clouds; GEOS-5 – low level clouds.

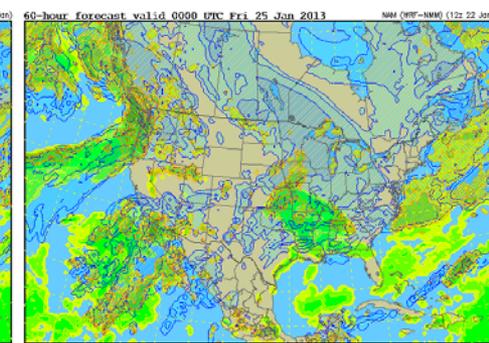
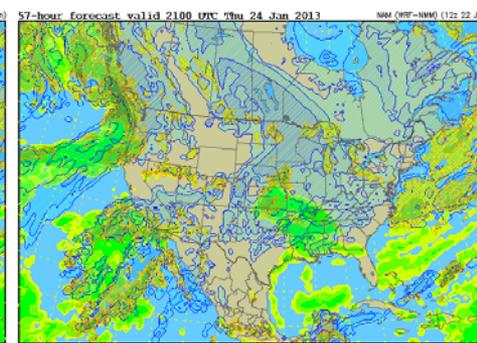
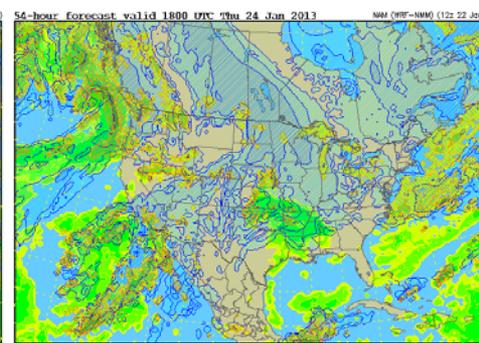
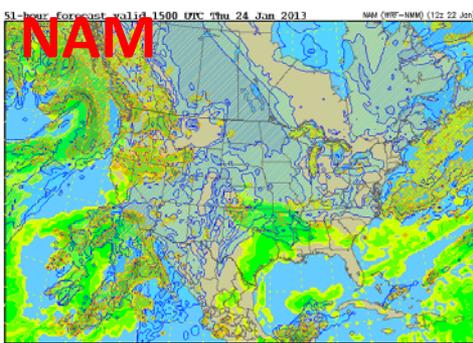
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10 am

1 pm

4 pm

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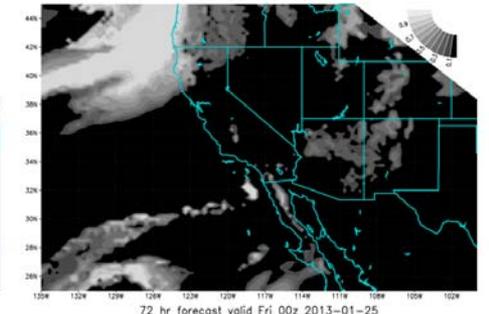
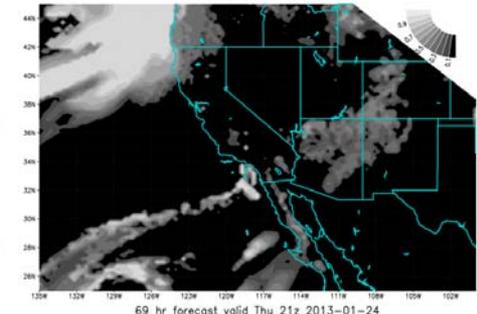
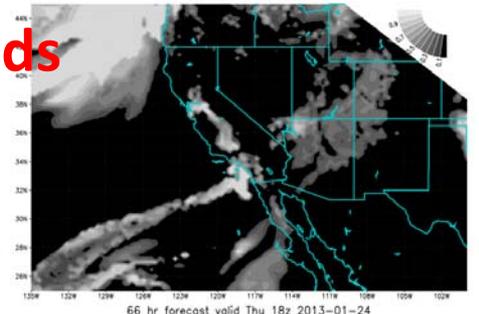
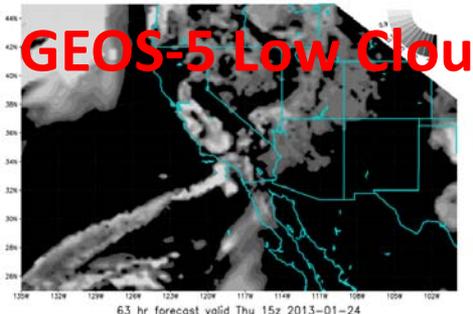


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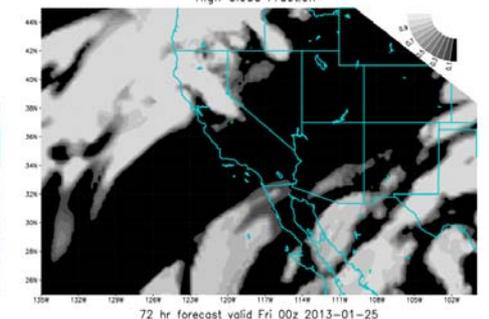
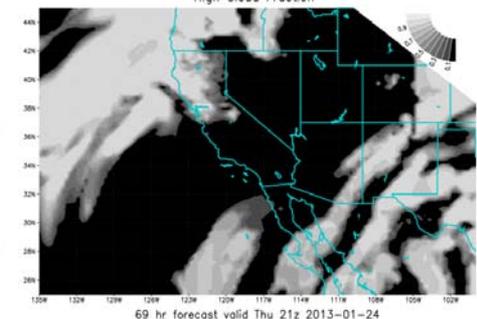
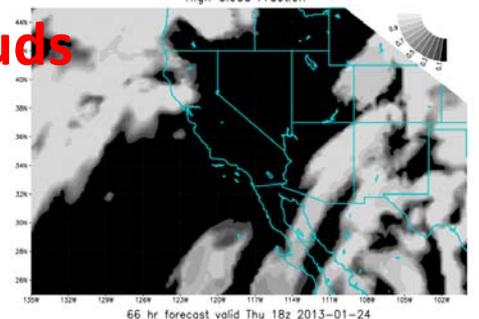
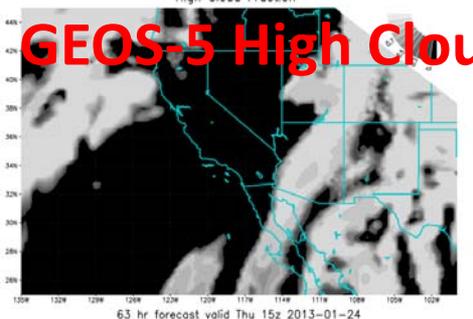


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High Cloud Fraction



Thursday: NAM low clouds (top) and NAM high clouds (bottom)

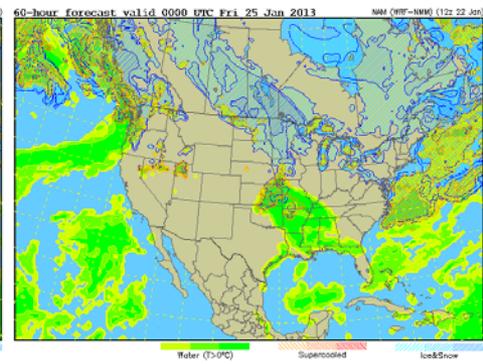
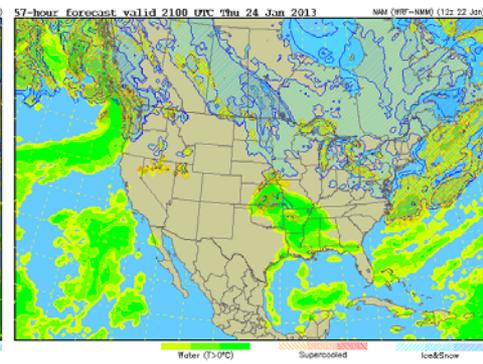
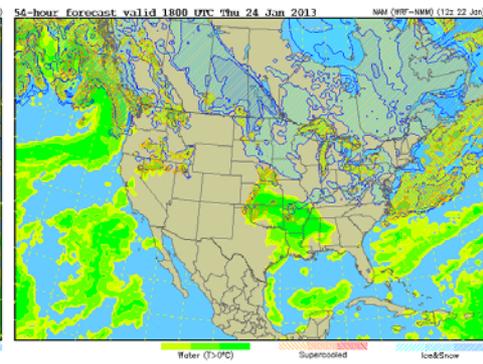
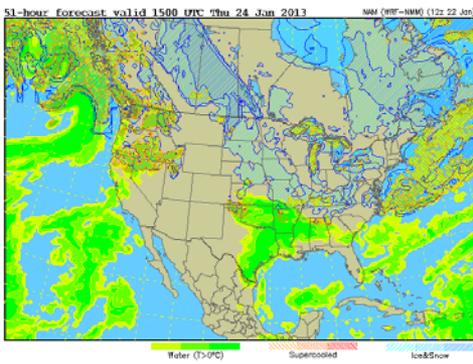
7 am 10 am 1 pm 4 pm

Integrated liquid and frozen hydrometeors (below 6 Kft MSL)

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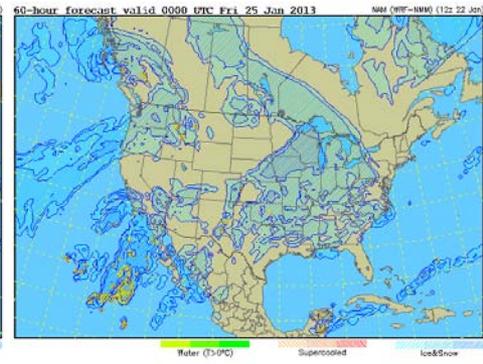
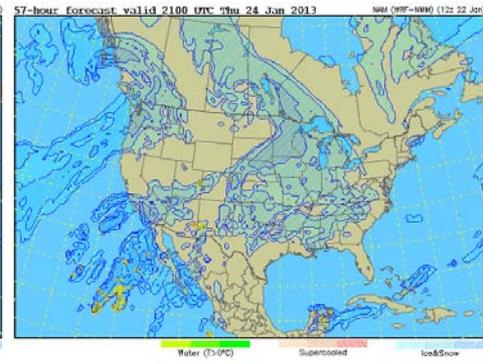
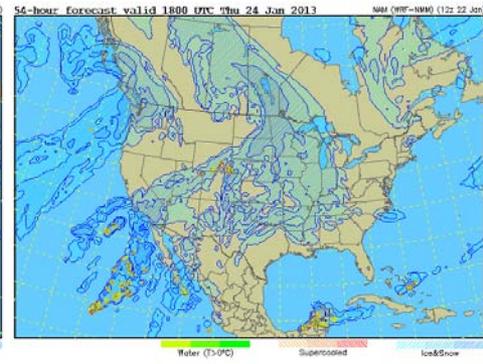
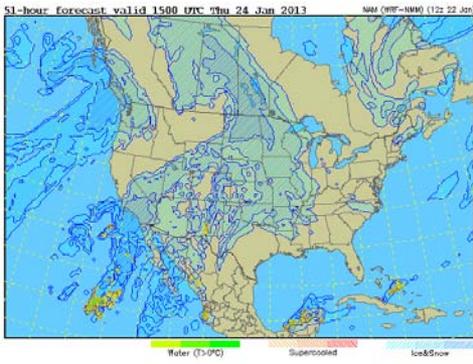


Integrated liquid and frozen hydrometeors (above 18 Kft MSL)

Integrated liquid and frozen hydrometeors (above 18 Kft MSL)

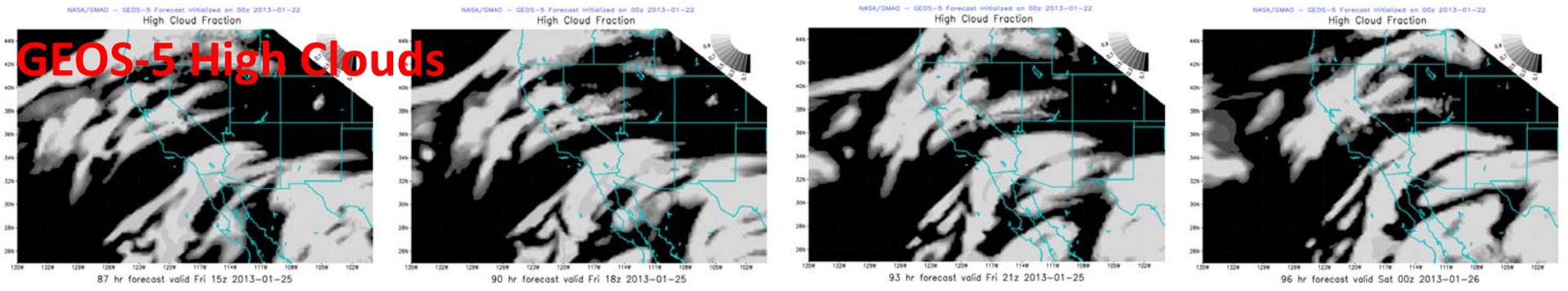
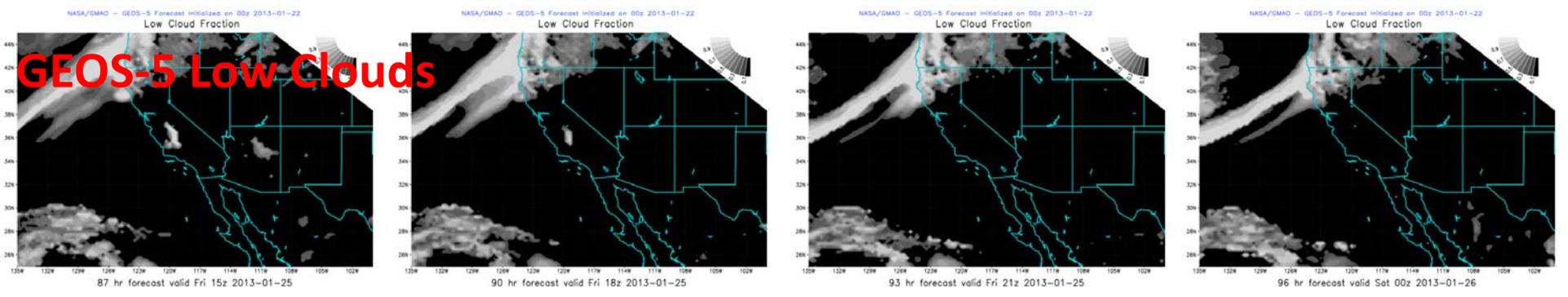
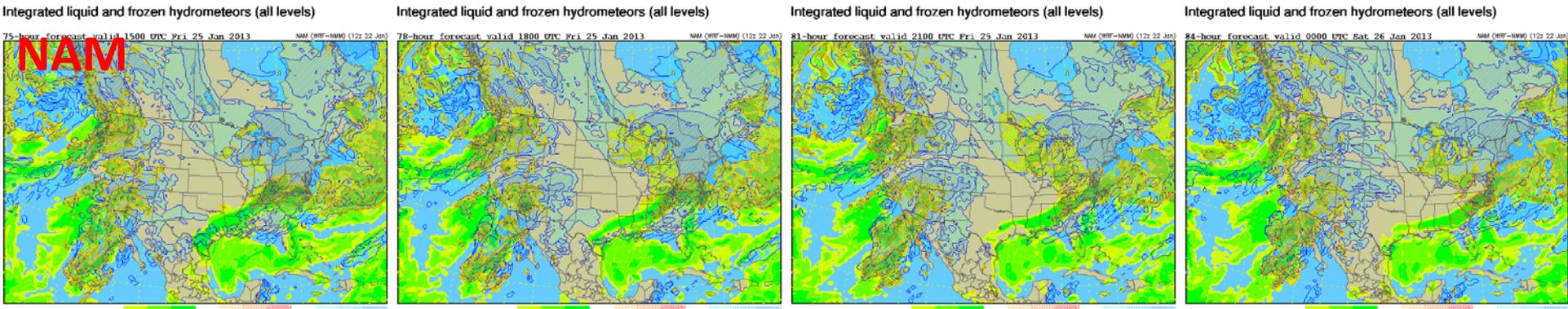
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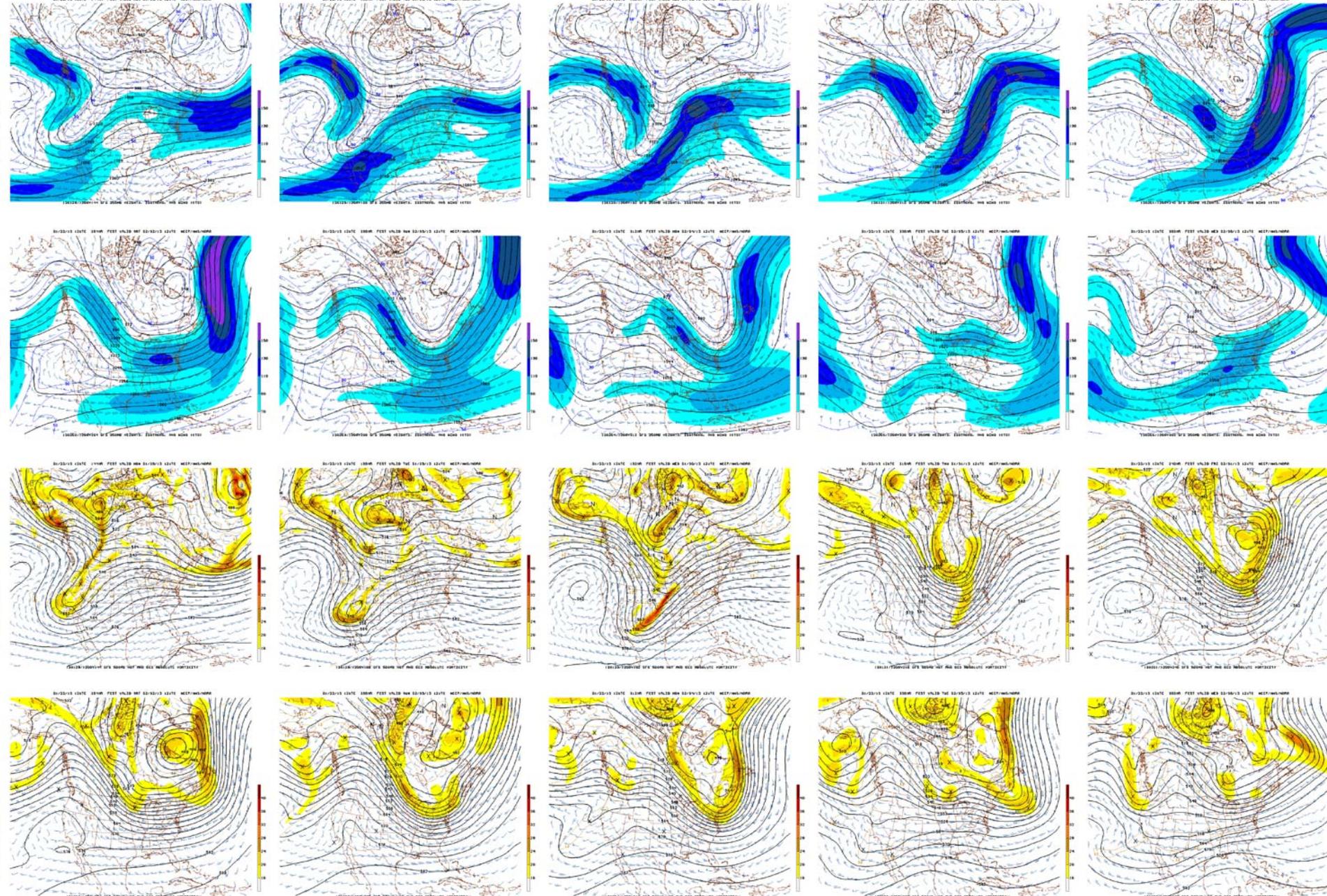


Friday: NAM – mid and high level clouds; GEOS-5 – morning fog and high level clouds.

7 am 10 am 1 pm 4 pm



Mon 28 Jan – Wed 6 Feb: 250 mb (top 2 rows) and 500 mb (bottom 2 rows) charts



[AREA FORECAST DISCUSSION](#)

[NATIONAL WEATHER SERVICE](#) SAN JOAQUIN VALLEY - HANFORD CA

256 AM [PST](#) TUE JAN 22 2013

.SYNOPSIS...

PERSISTENT HIGH PRESSURE WILL WEAKEN TODAY AND WEDNESDAY ALLOWING A WEATHER SYSTEM TO MOVE ACROSS NORTHERN CALIFORNIA WEDNESDAY NIGHT. ANOTHER [LOW PRESSURE SYSTEM](#) WILL MOVE INTO THE REGION LATE IN THE WEEK AND OVER THE WEEKEND BRINGING THE THREAT OF [PRECIPITATION](#) TO THE CENTRAL CALIFORNIA INTERIOR.

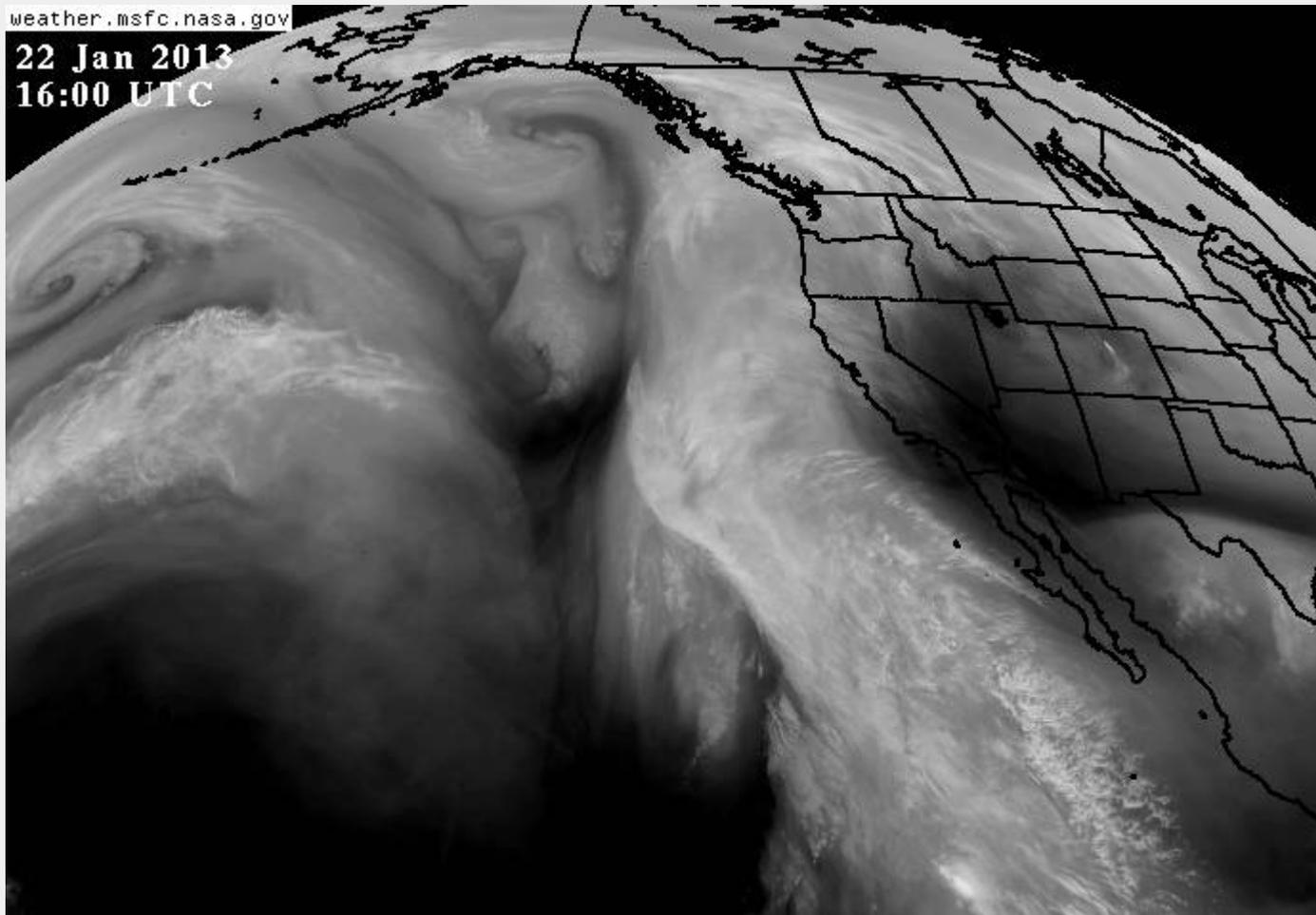
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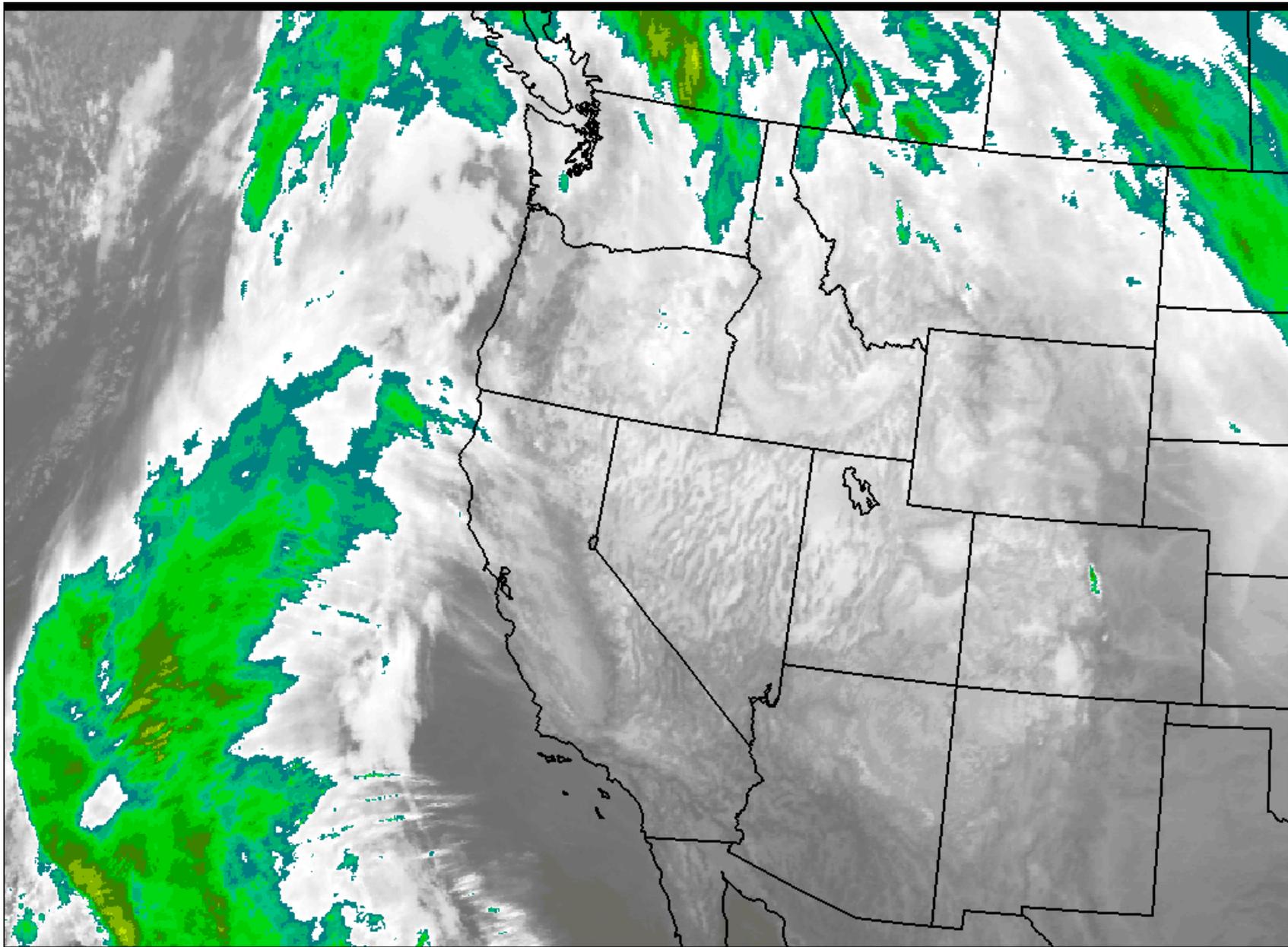
. .DISCUSSION...NO [FOG](#) FORMATION AS OF YET BASED ON SURFACE [OBS](#). SATELLITE IMAGERY SHOWS SOME [CIRRUS](#) CLOUDS SPREADING OVER THE [RIDGE](#) TONIGHT BUT OTHER THAN OBSCURING ANY SURFACE BASED [FOG](#) OR [STRATUS](#) THAT'S ABOUT IT. THE [RIDGE](#) CONTINUES TO DOMINATE THE PATTERN OVER THE WEST HOWEVER THE EAST PACIFIC IS GETTING MORE ACTIVE. FORECAST MODELS BRING A WEAKENING FRONTAL SYSTEM ACROSS NORTHERN CALIFORNIA WEDNESDAY AND WEDNESDAY NIGHT HOWEVER IT LOOKS AT THIS TIME THAT IT WILL ONLY AFFECT AREAS OF NORTHERN CALIFORNIA. FORECAST MODELS THEN BRING INTO SOUTHERN CALIFORNIA ON FRIDAY THE LOW NOW CENTERED OUT NEAR 22N/130W AS AN OPEN WAVE AND BRING SOME [PRECIPITATION](#) THREAT. TIMING AND AMOUNT OF AVAILABLE [MOISTURE](#) ARE QUESTIONABLE. CURRENT FORECAST HAS CHANCE [POPS](#) EXTENDING INTO SATURDAY AND THIS SEEMS REASONABLE AT THIS TIME. FOR SUNDAY, FORECAST MODELS ARE ACTUALLY IN GOOD AGREEMENT IN BRINGING SOUTHWARD, A RATHER COLD SYSTEM FROM ALASKA AND TRACKING THIS FEATURE INTO CENTRAL CALIFORNIA. GIVEN THIS SCENARIO SNOW LEVELS SHOULD FALL RATHER QUICKLY ON SUNDAY.

FOR MONDAY AND TUESDAY OF NEXT WEEK, THE LOW IS PROJECTED TO MOVE SOUTHEAST OF CENTRAL CALIFORNIA FOR AN END TO THE [PRECIPITATION](#) THREAT. ALL IN ALL A BIG CHANGE IN THE PATTERN FOR A VERY WARM AND PERSISTENT [RIDGE](#) TO A MORE NORMAL WET SCENARIO.

weather.msfc.nasa.gov

22 Jan 2013
16:00 UTC

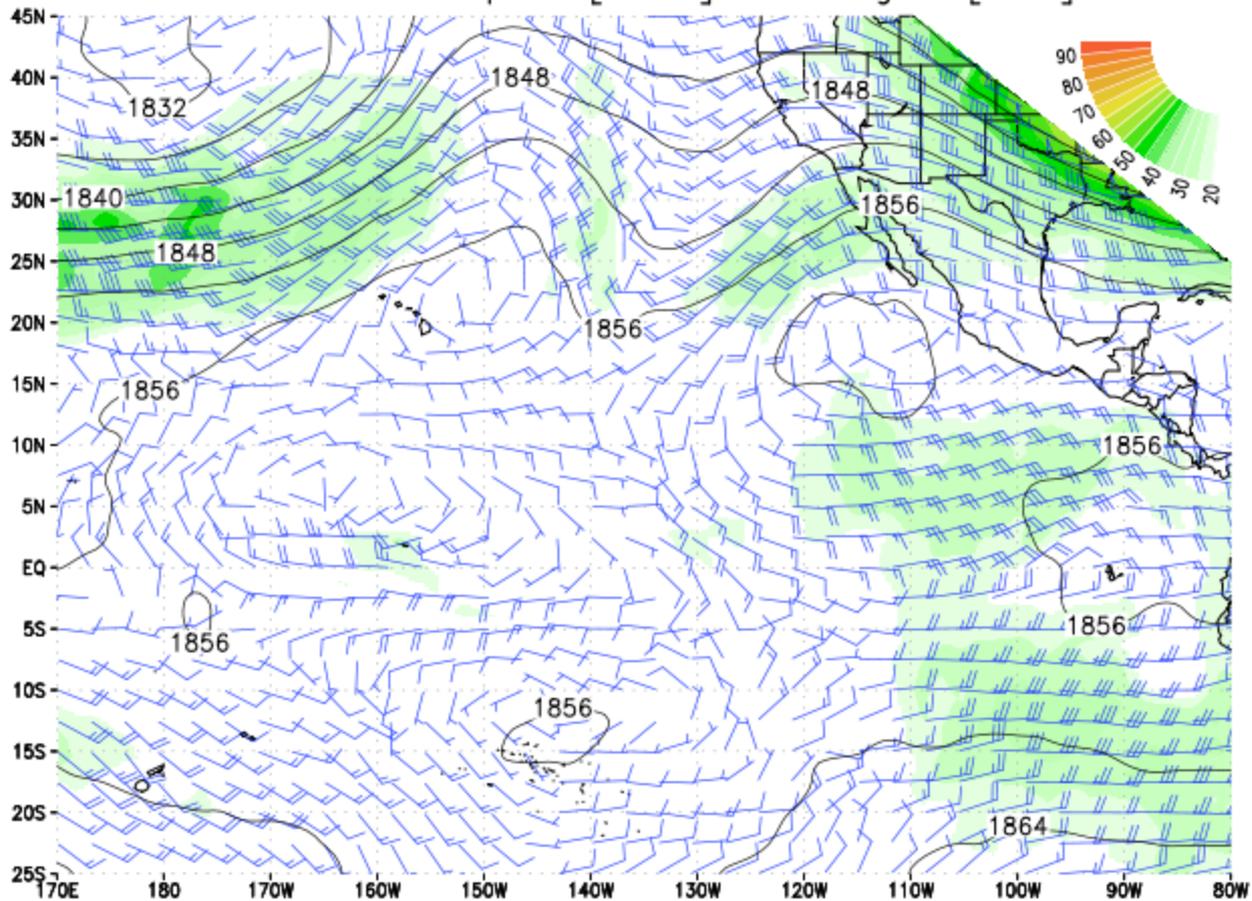




130122/1530 60E515 IR4

NASA/GMAO - GEOS-5 Forecast Initialized on 00z 2013-01-22

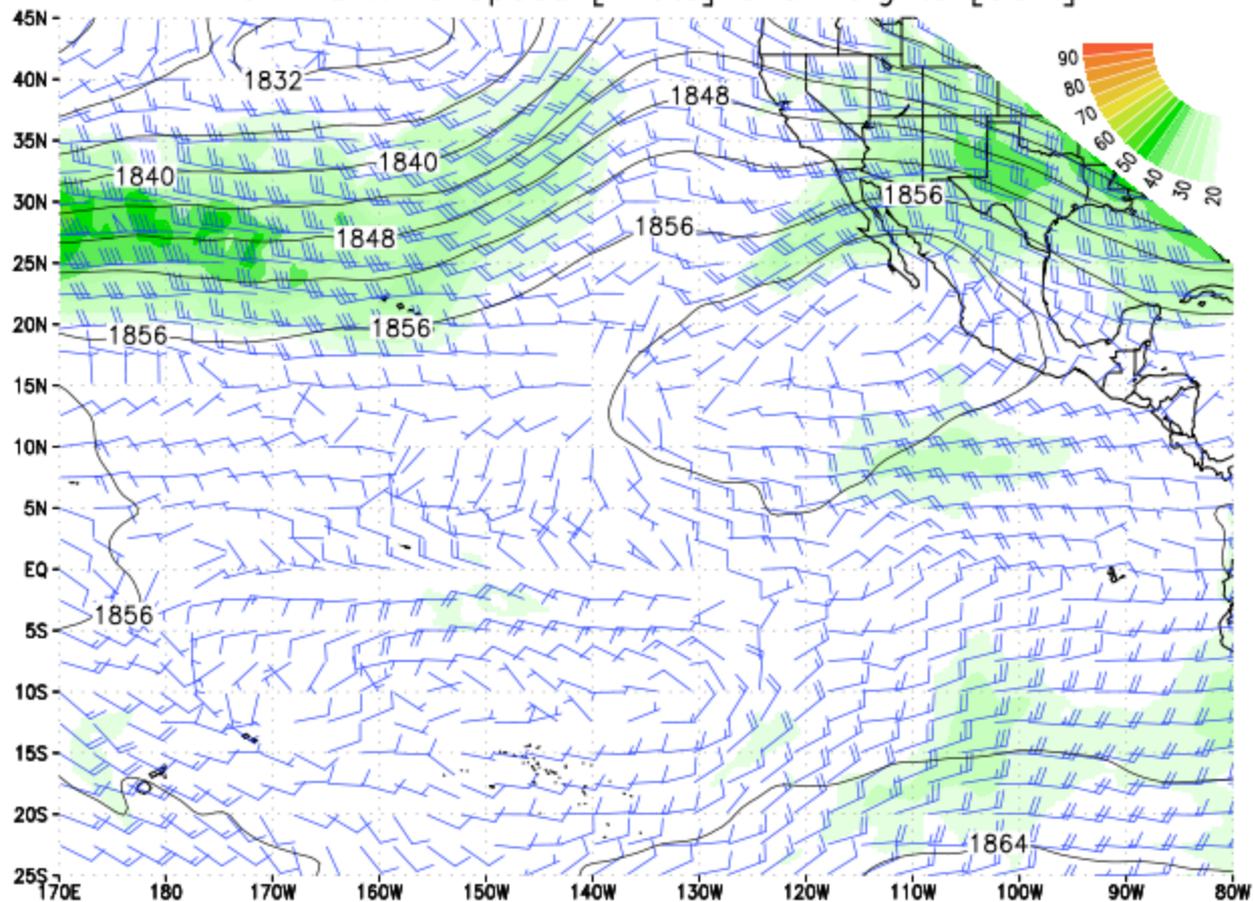
70 hPa Wind Speed [knots] and Heights [dam]



42 hr forecast valid Wed 18z 2013-01-23

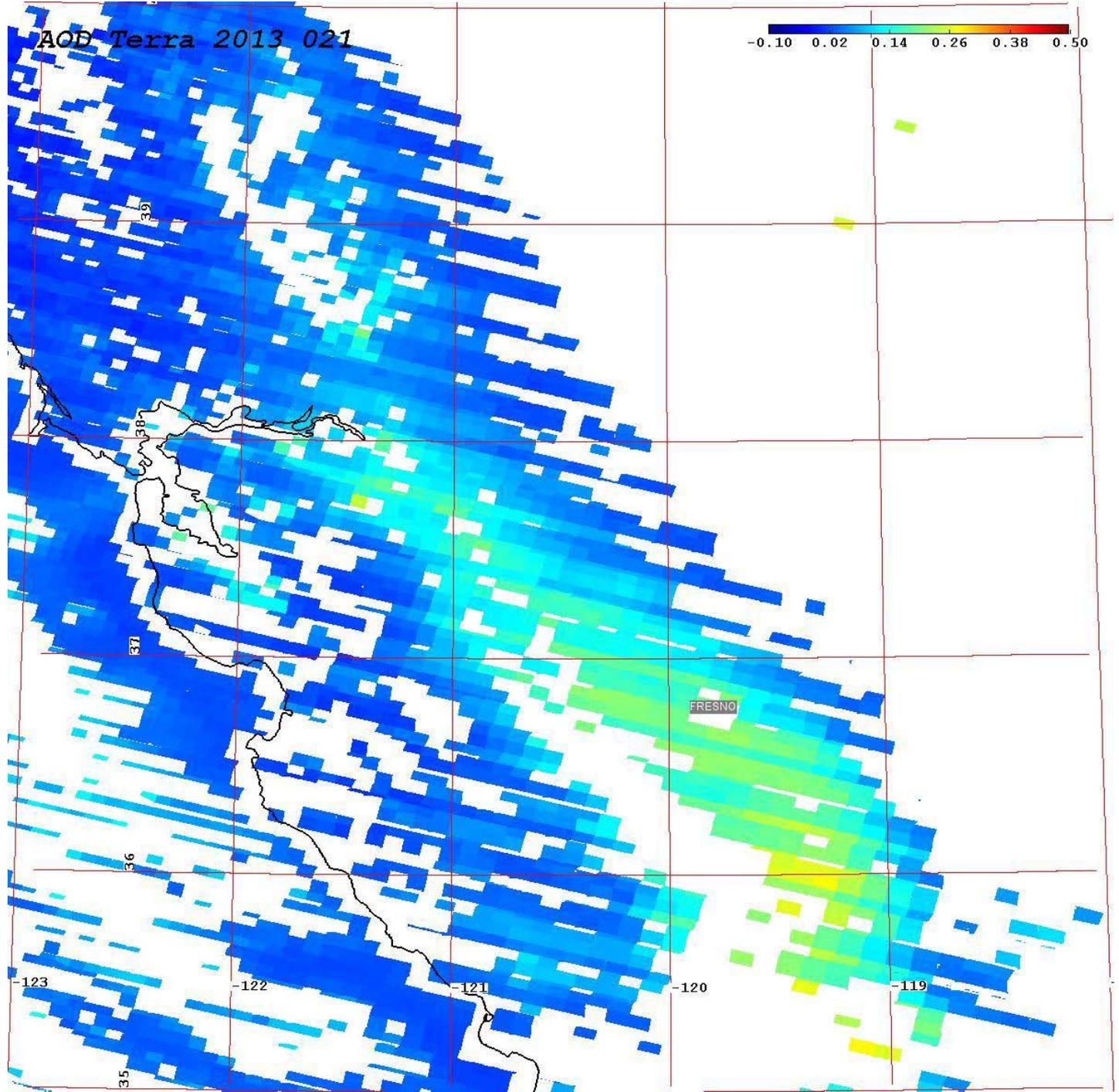
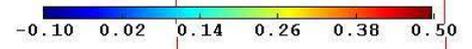
NASA/GMAO - GEOS-5 Forecast Initialized on 00z 2013-01-22

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

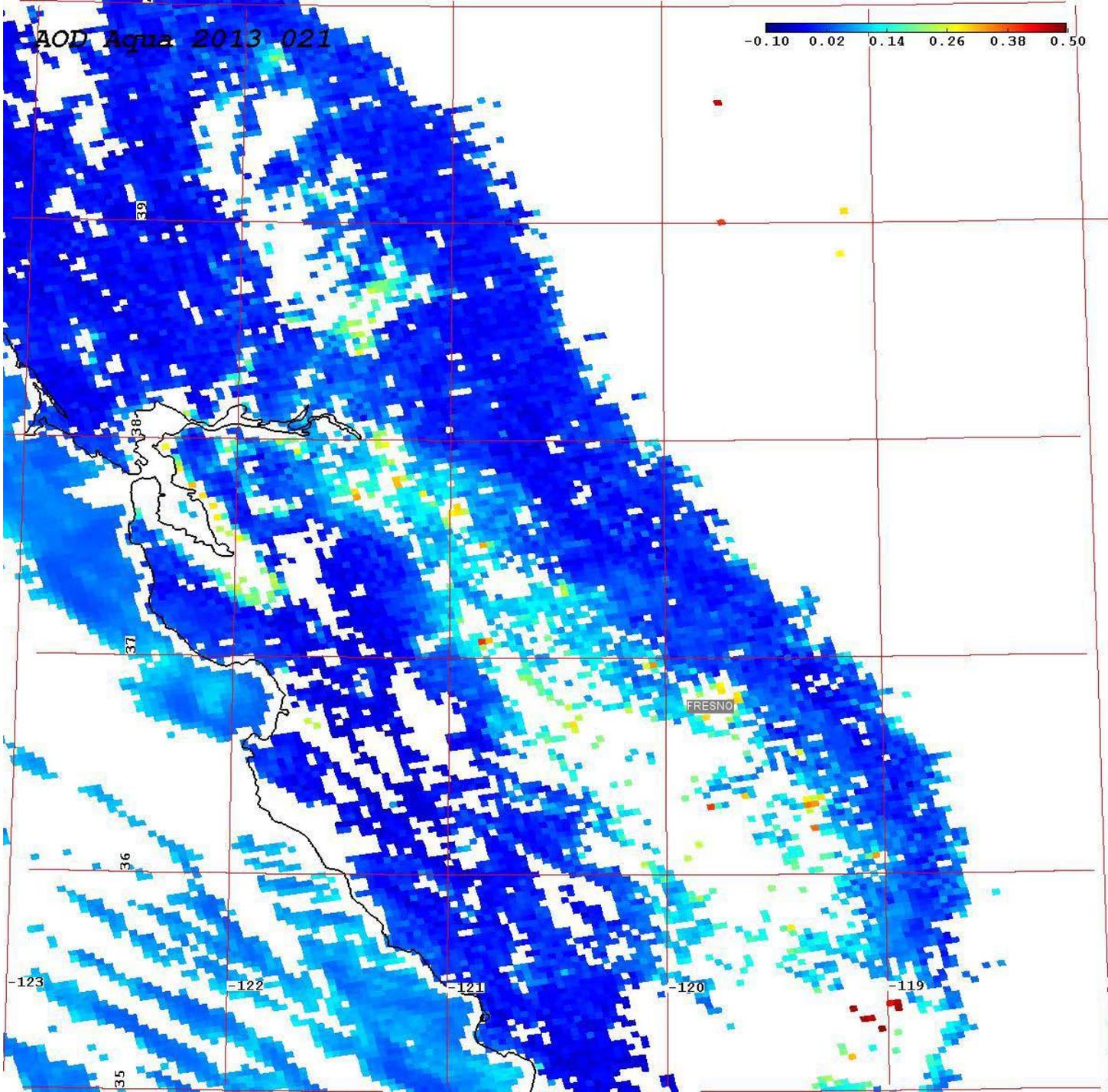
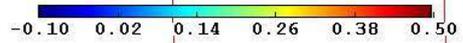


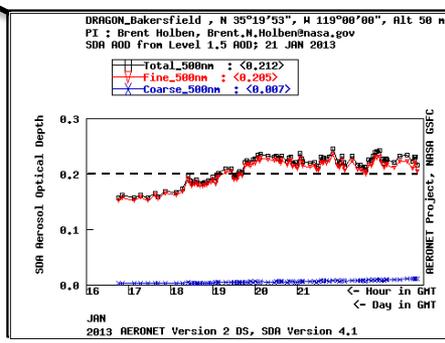
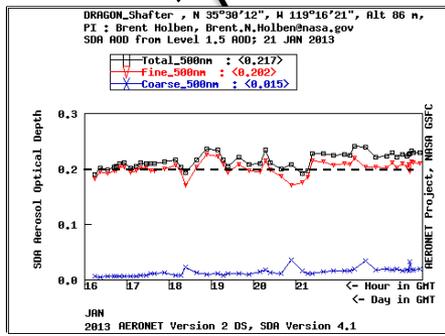
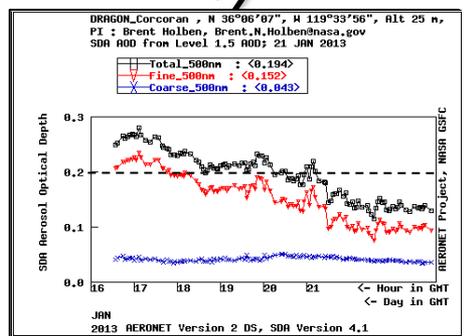
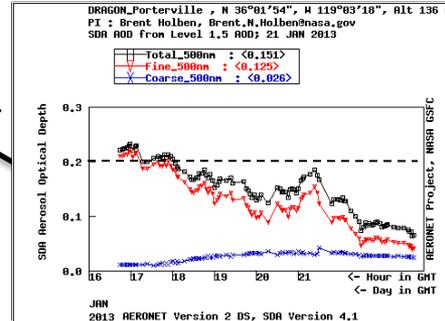
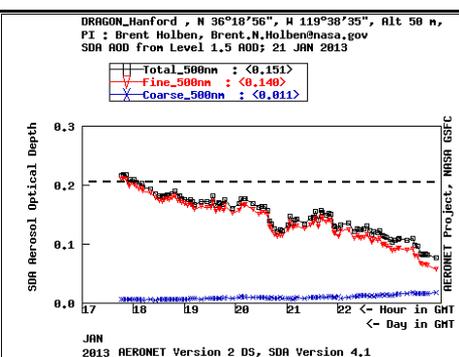
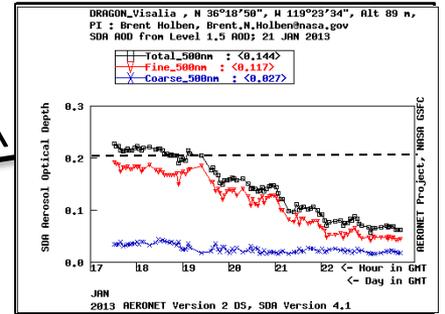
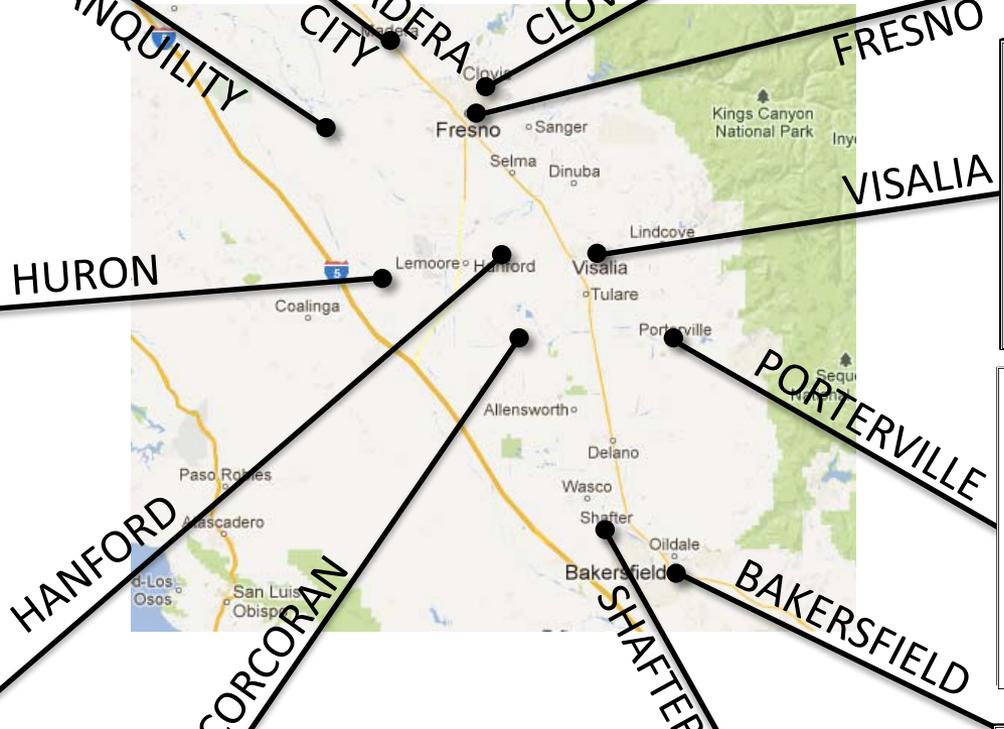
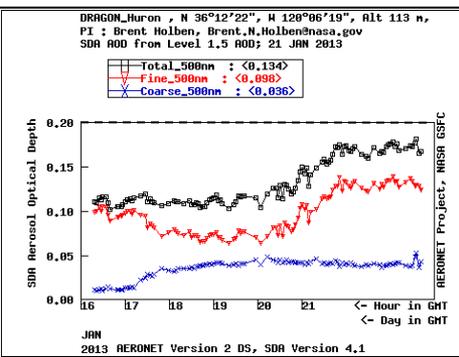
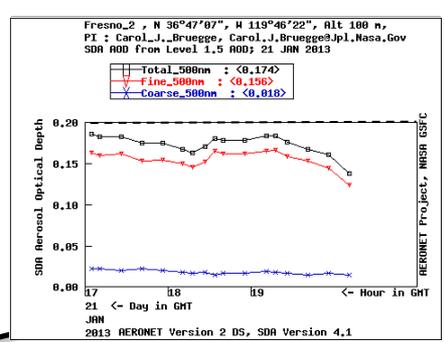
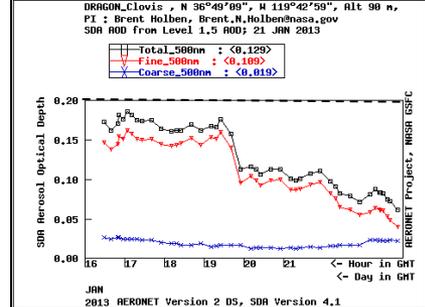
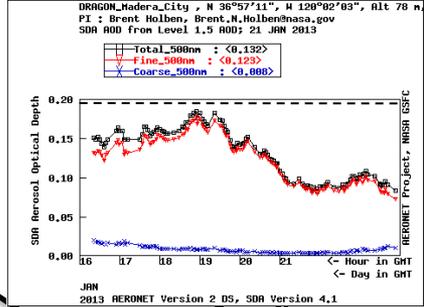
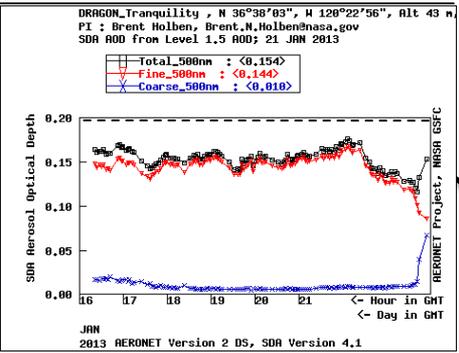
66 hr forecast valid Thu 18z 2013-01-24

AOD Terra 2013 021



AOD Aqua 2013_021





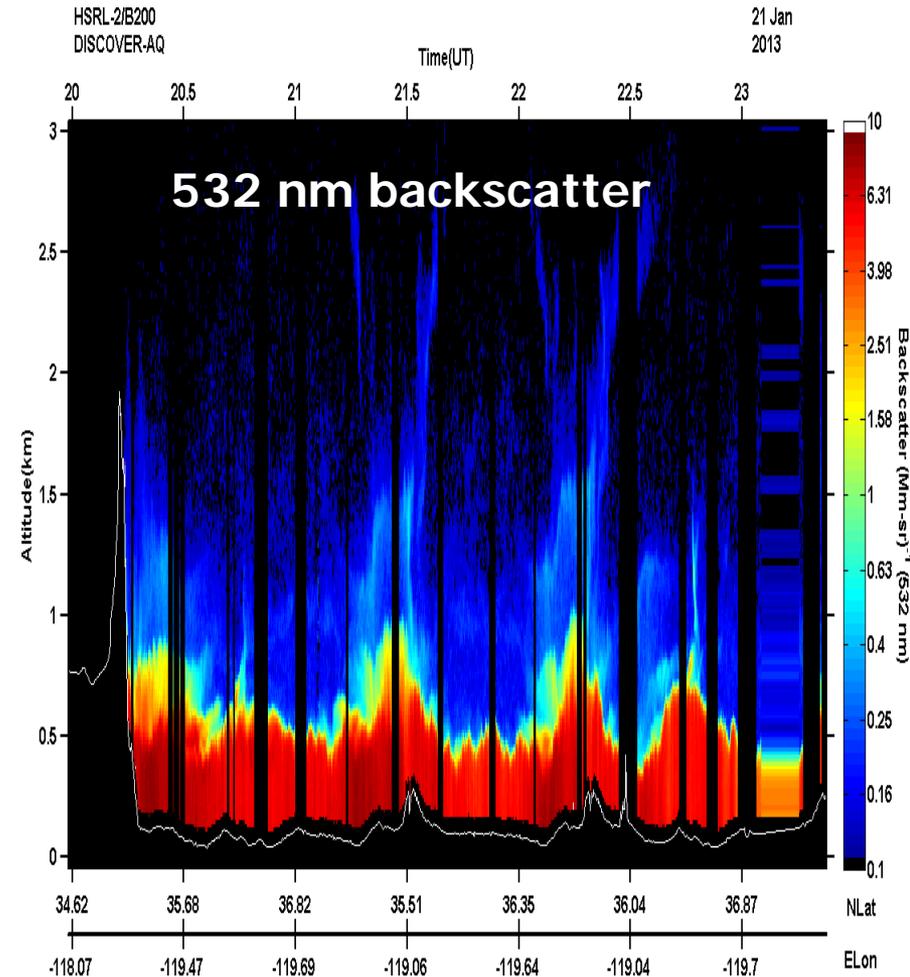
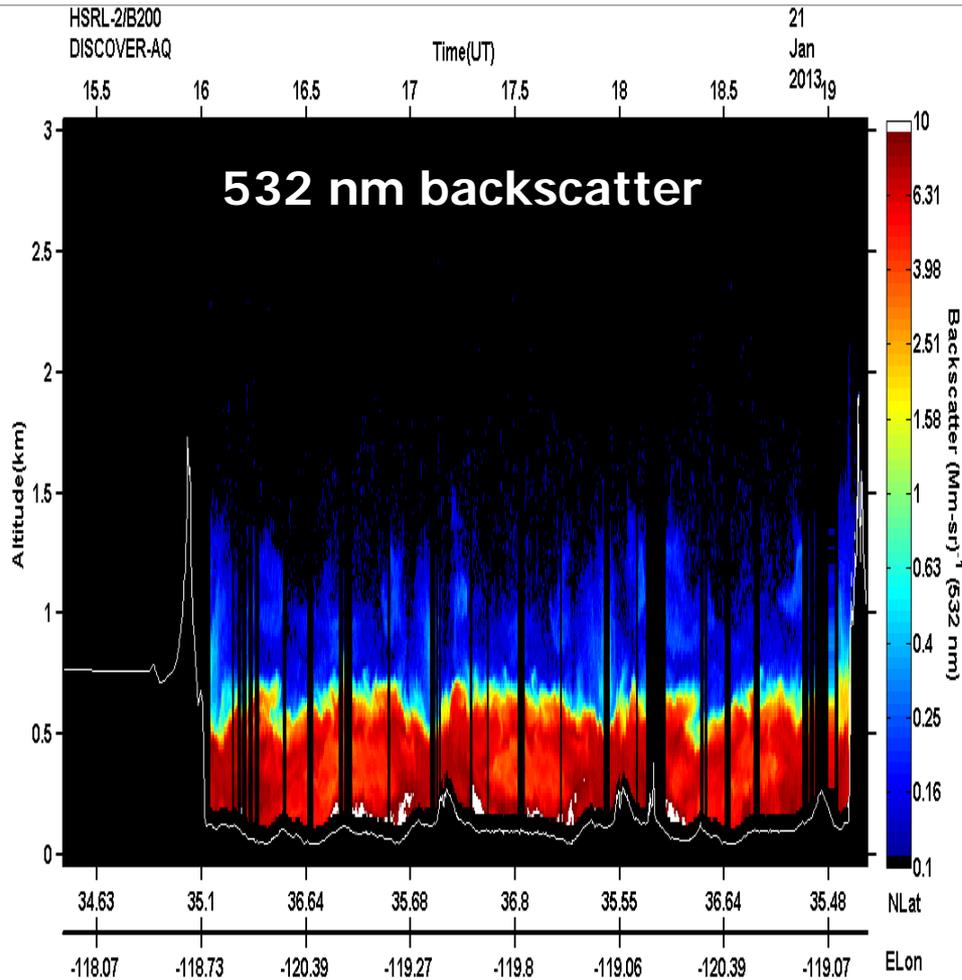
JAN 21 2013

HSRL-2 measurements of temporal and vertical aerosol variability (Jan. 21, 2013)



Morning

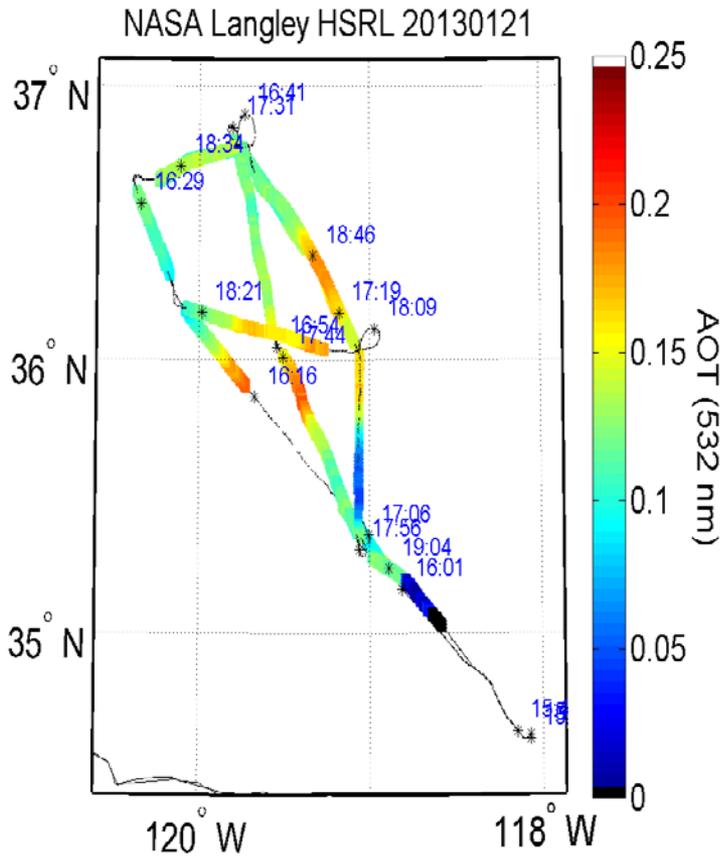
Afternoon



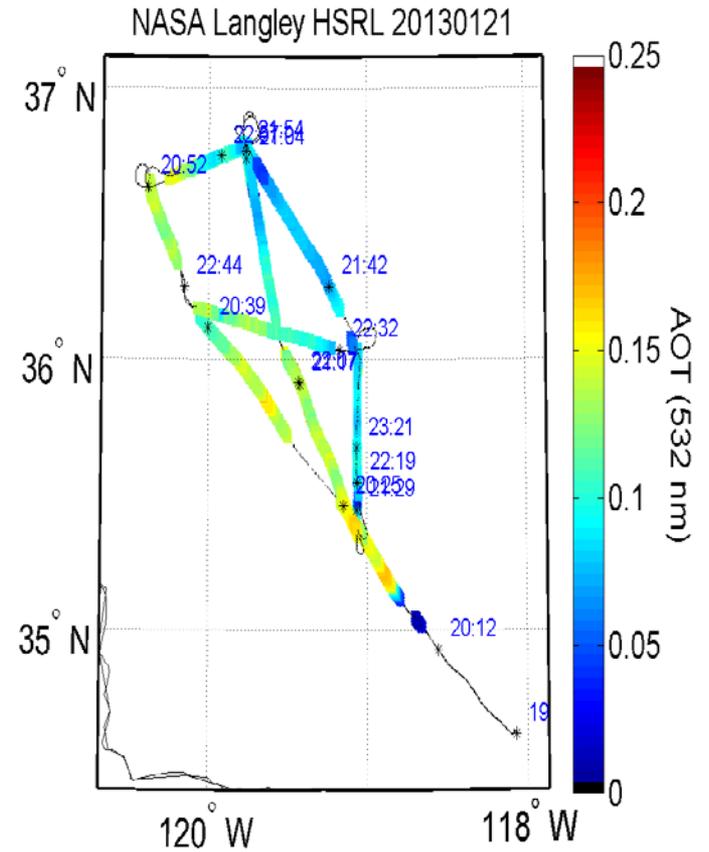


HSRL-2 AOT from Jan. 21 2013

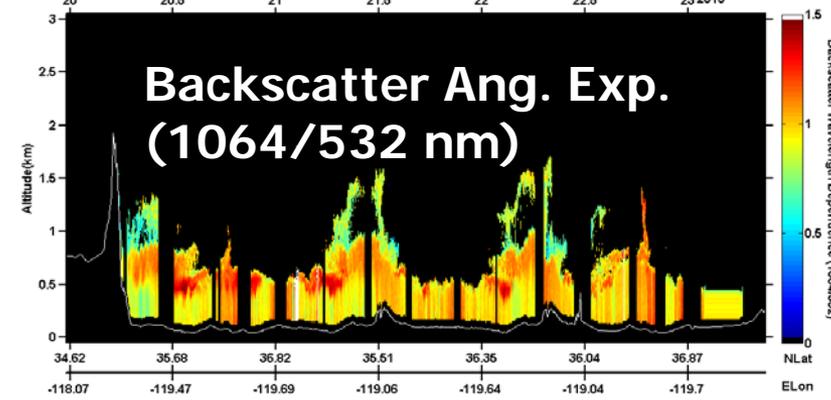
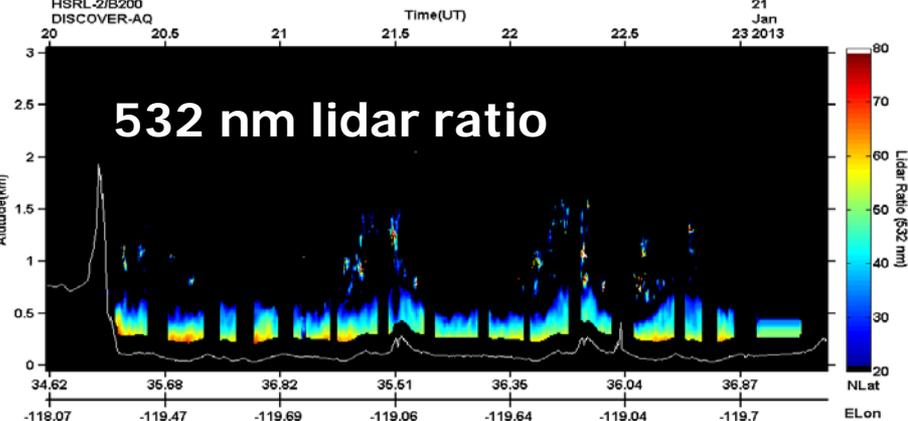
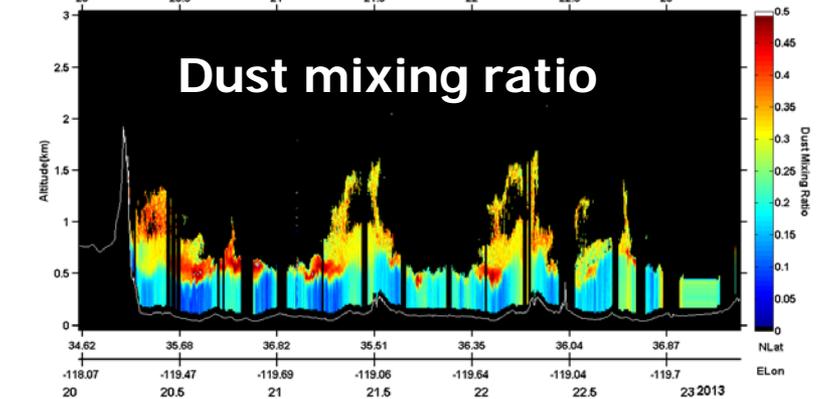
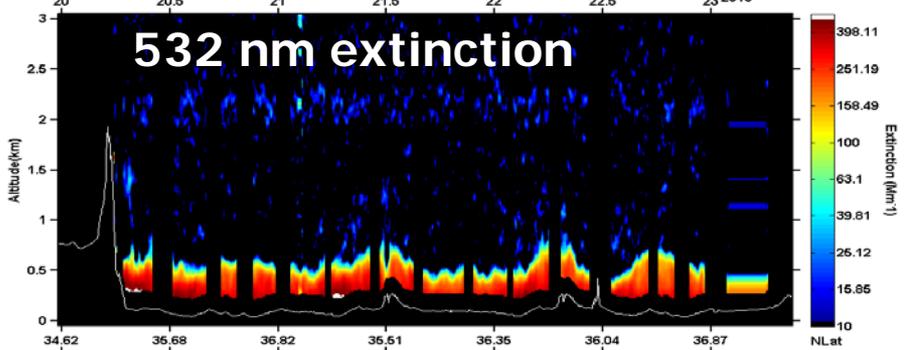
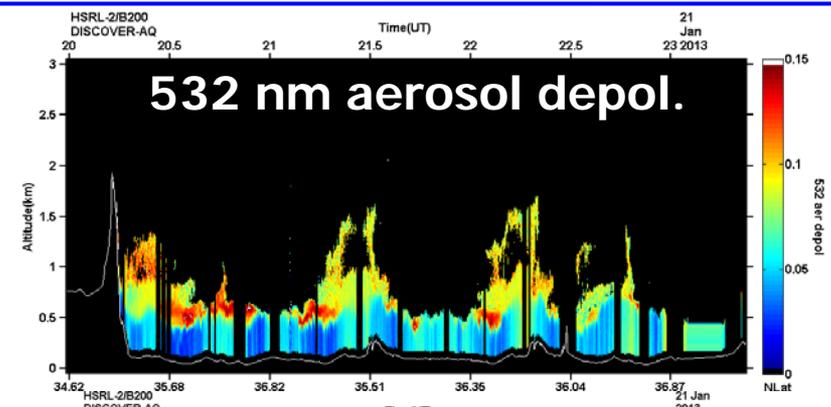
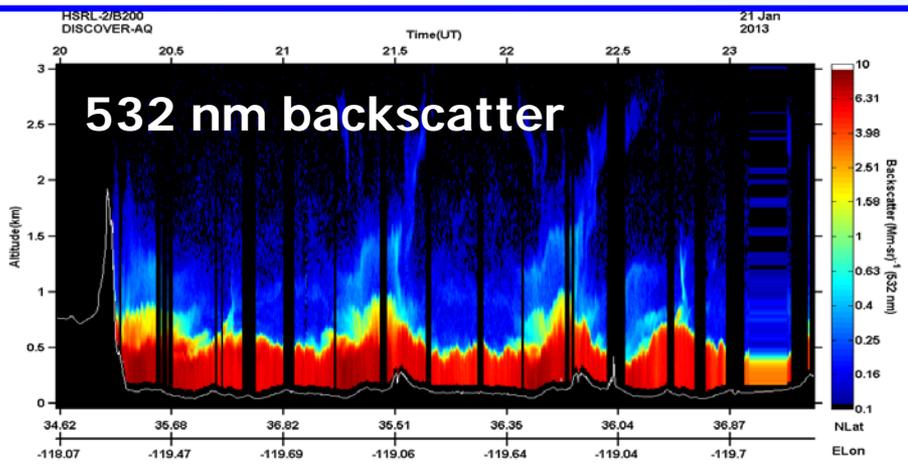
Morning



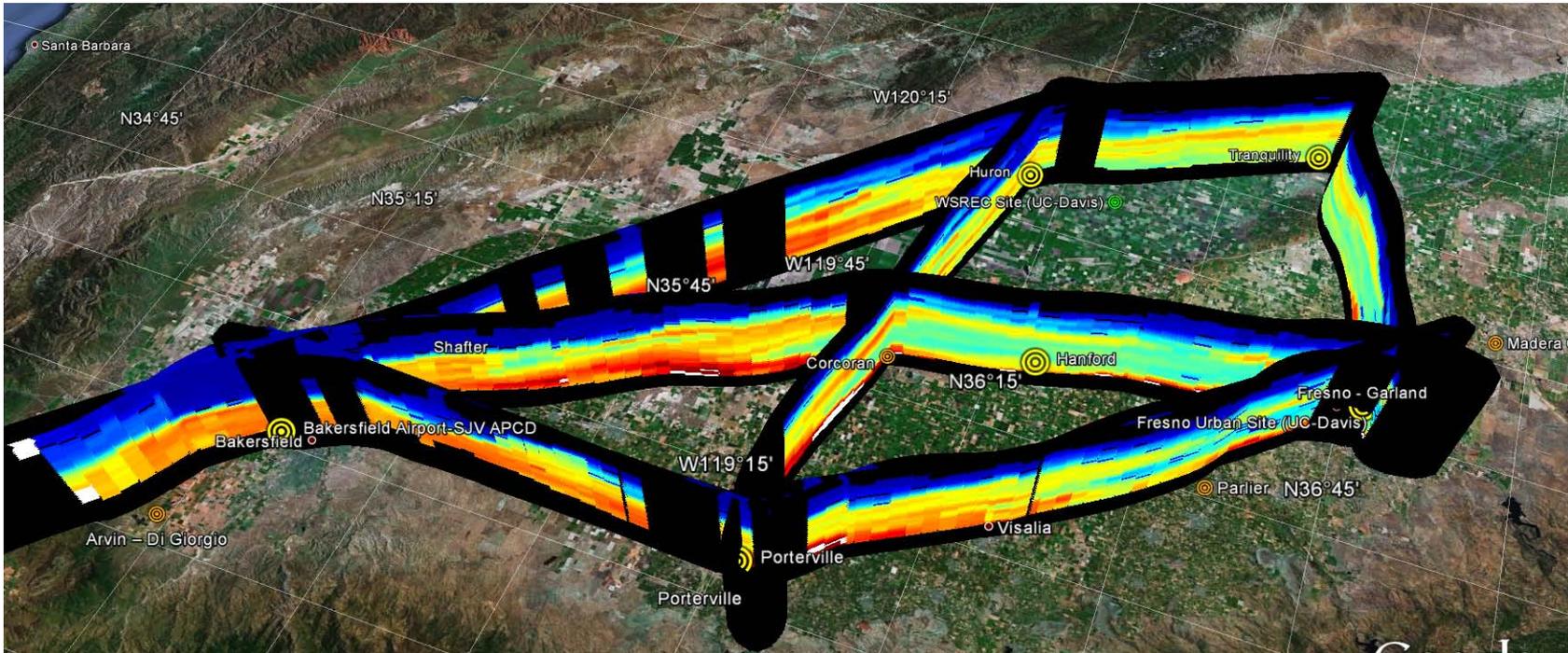
Afternoon



HSRL-2 Jan. 21, 2013 afternoon flight

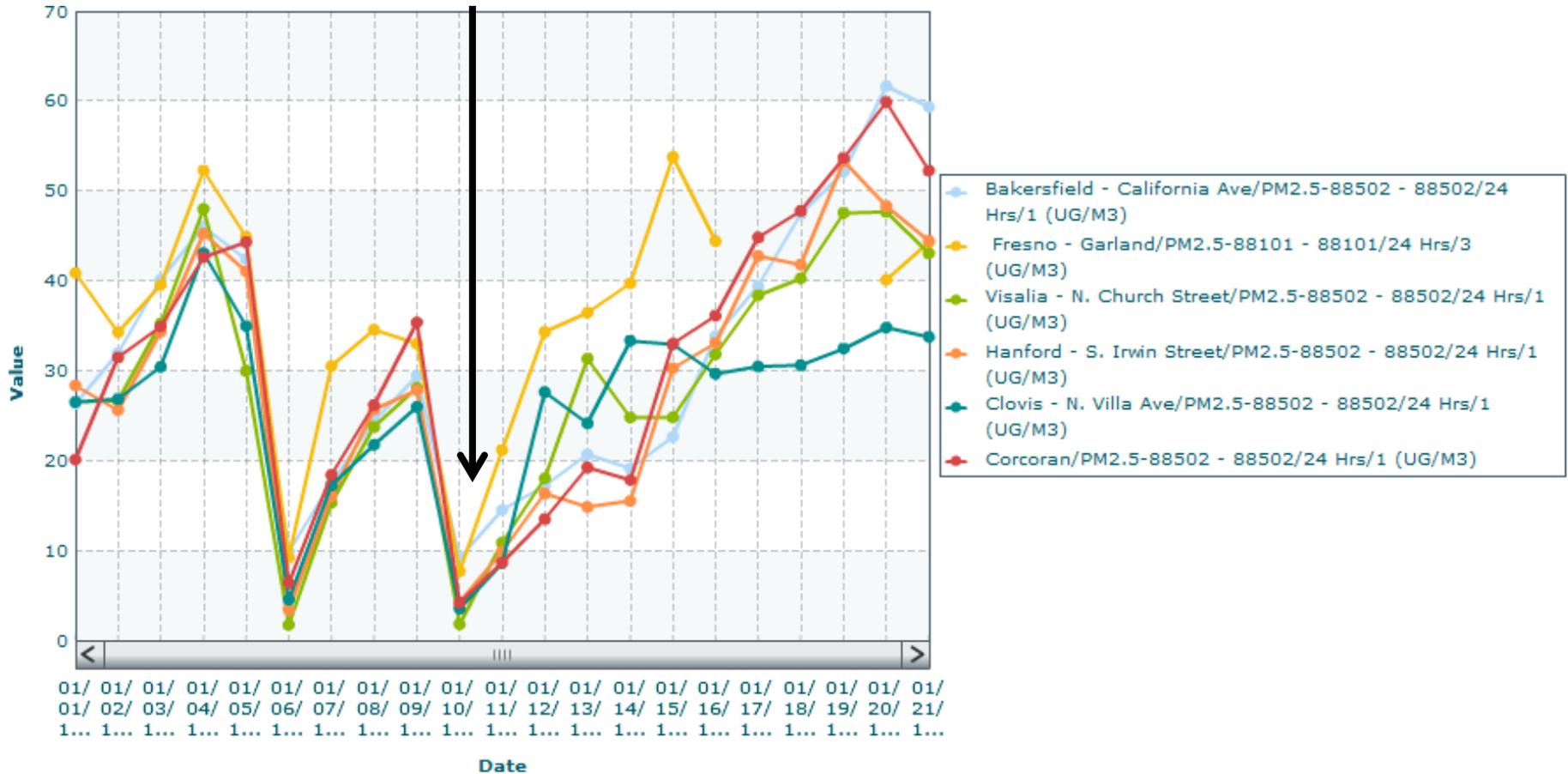


HSRL-2 Aerosol Backscatter (Jan. 21 morning)



Daily PM2.5: AirNowTech Sites

General increasing trend since January 10th.



↗
Jan. 1st

↖
Jan. 22nd

Hourly PM2.5: AirNowTech Sites

General increasing trend since Thursday, except at Clovis.

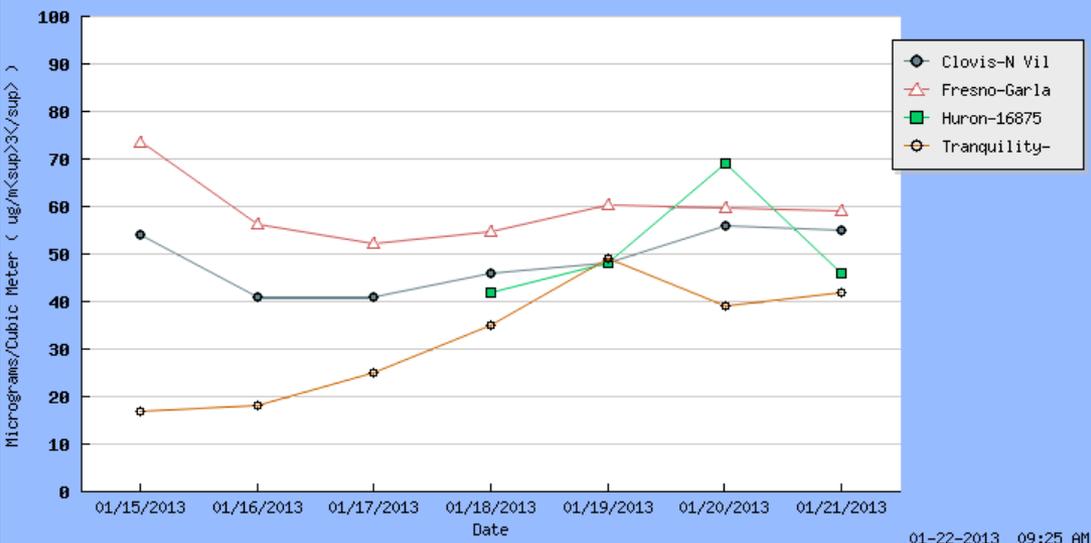


↖
Jan. 17th

↖
Jan. 22nd

Daily PM2.5 & PM10: CARB Sites

Daily Max 1 Hr Avg PM25 Values



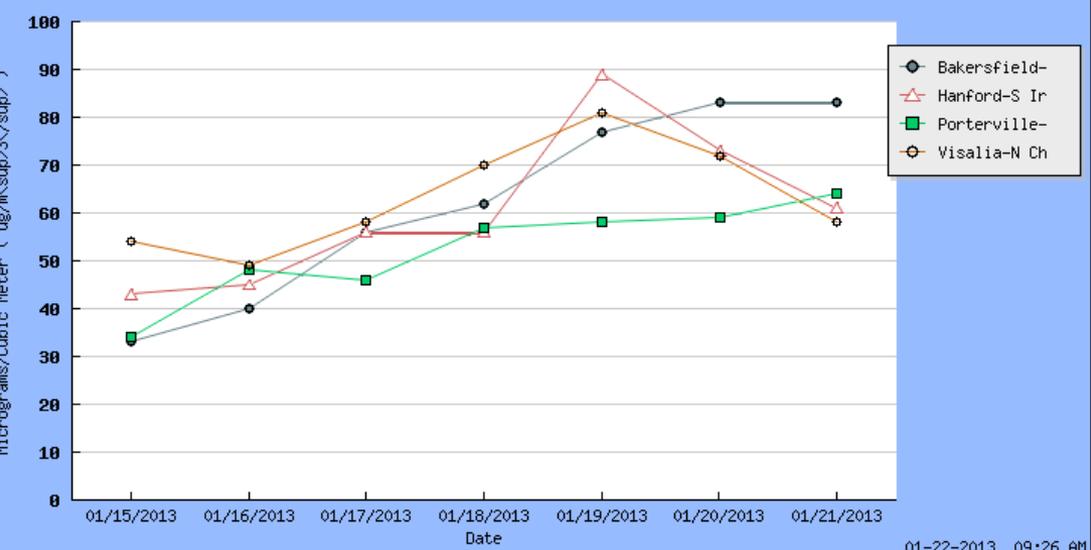
Daily Average PM10 (BAM) Values for Bakersfield-Municipal Airport



Daily Average PM10 (TEOM) Values



Daily Max 1 Hr Avg PM25 Values

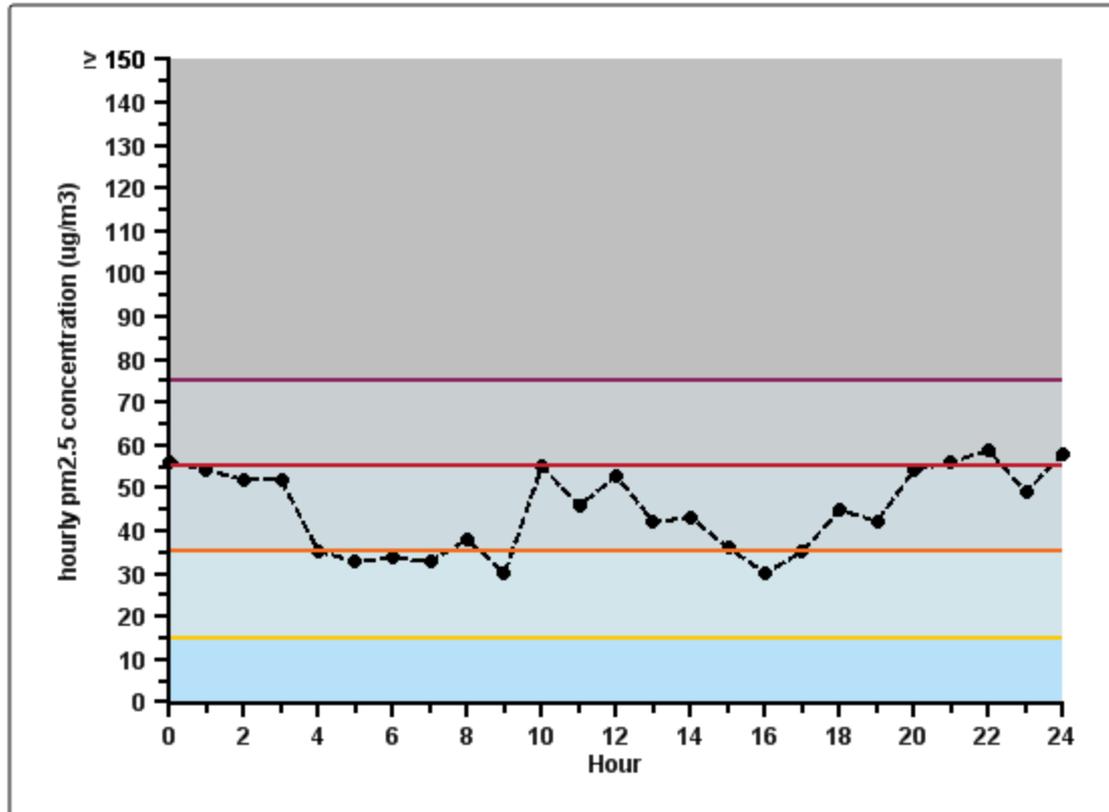


Daily Max 1 Hr Avg PM10 (Std) Values



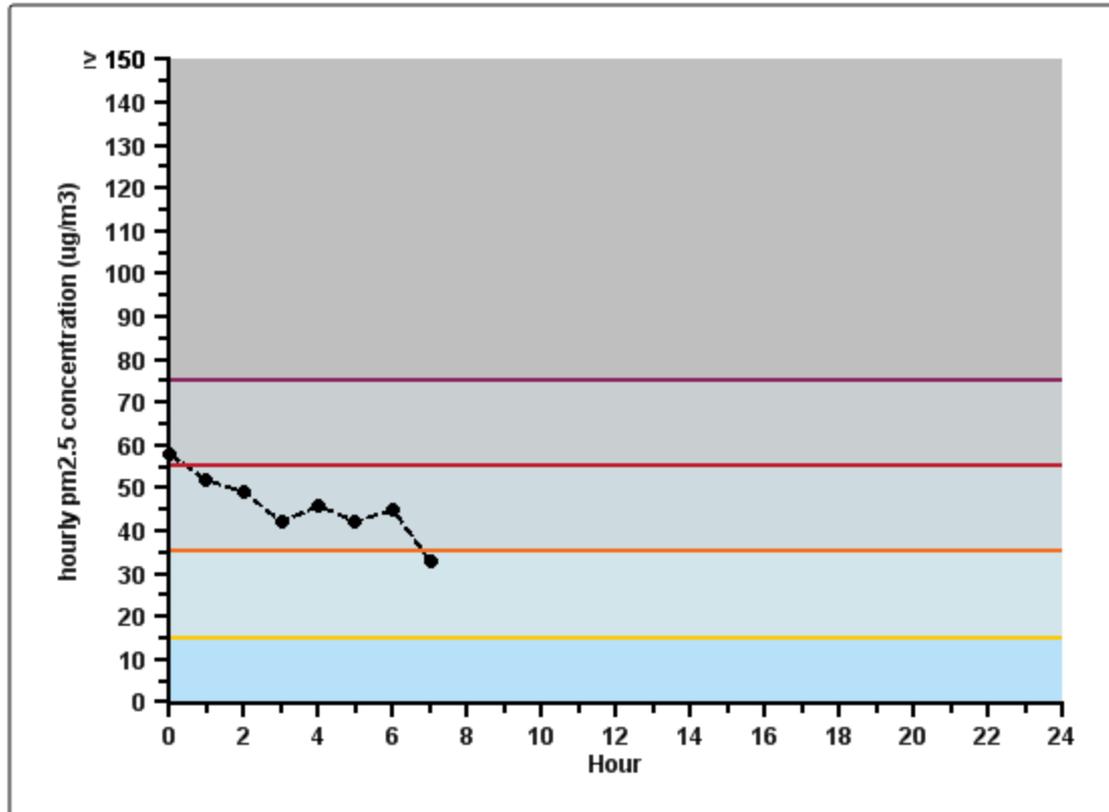
Fresno – Garland Jan. 21, 2013

Air District Real-Time Outdoor Activity Risk



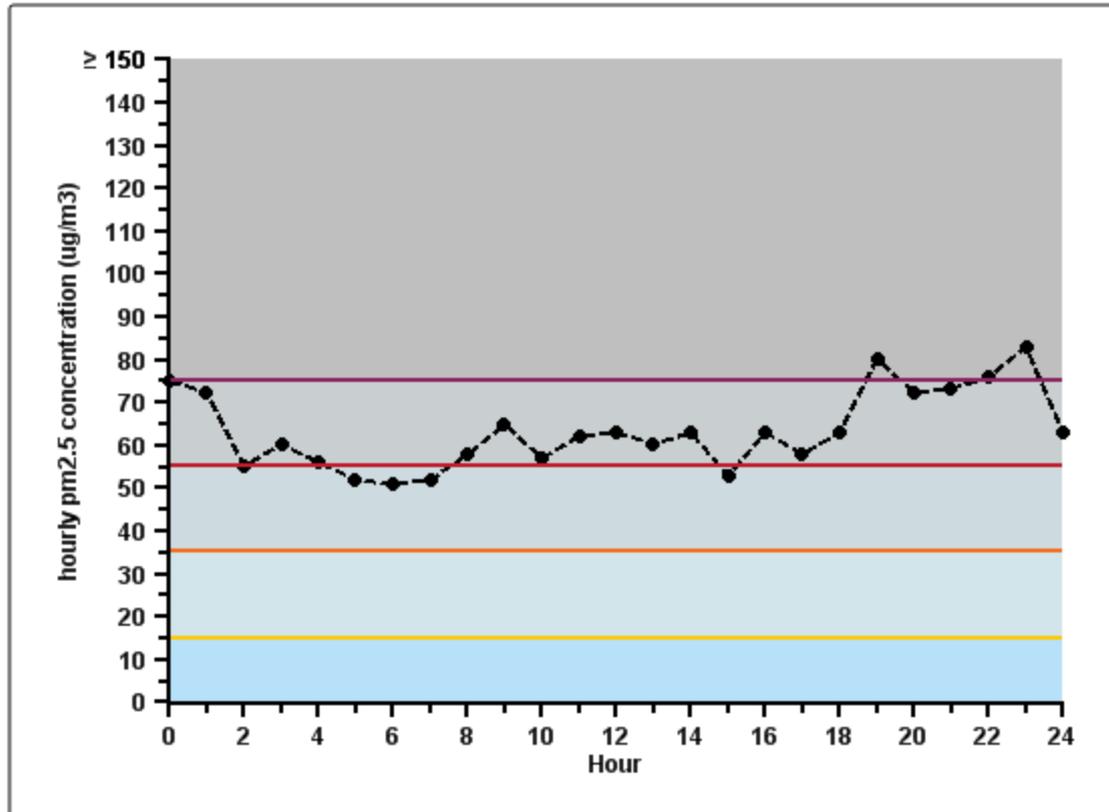
Fresno – Garland January 22, 2013

Air District Real-Time Outdoor Activity Risk



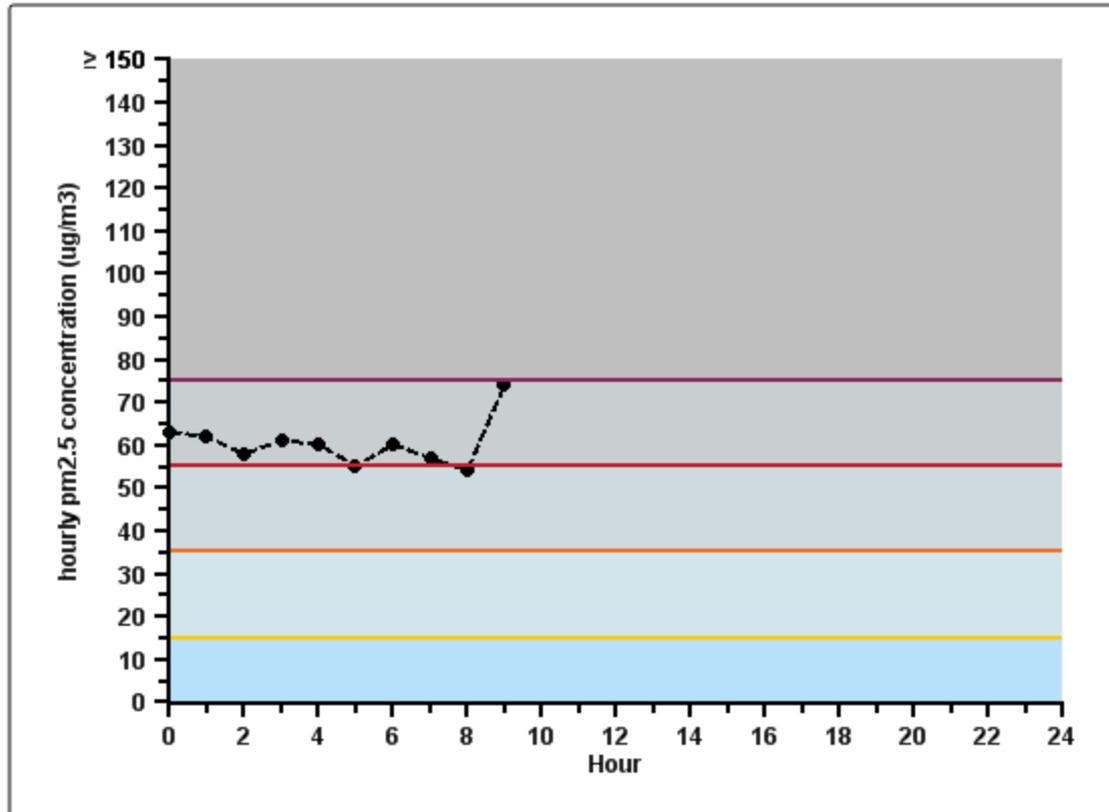
Bakersfield Munic. Airp. - Jan. 21, 2013

Air District Real-Time Outdoor Activity Risk

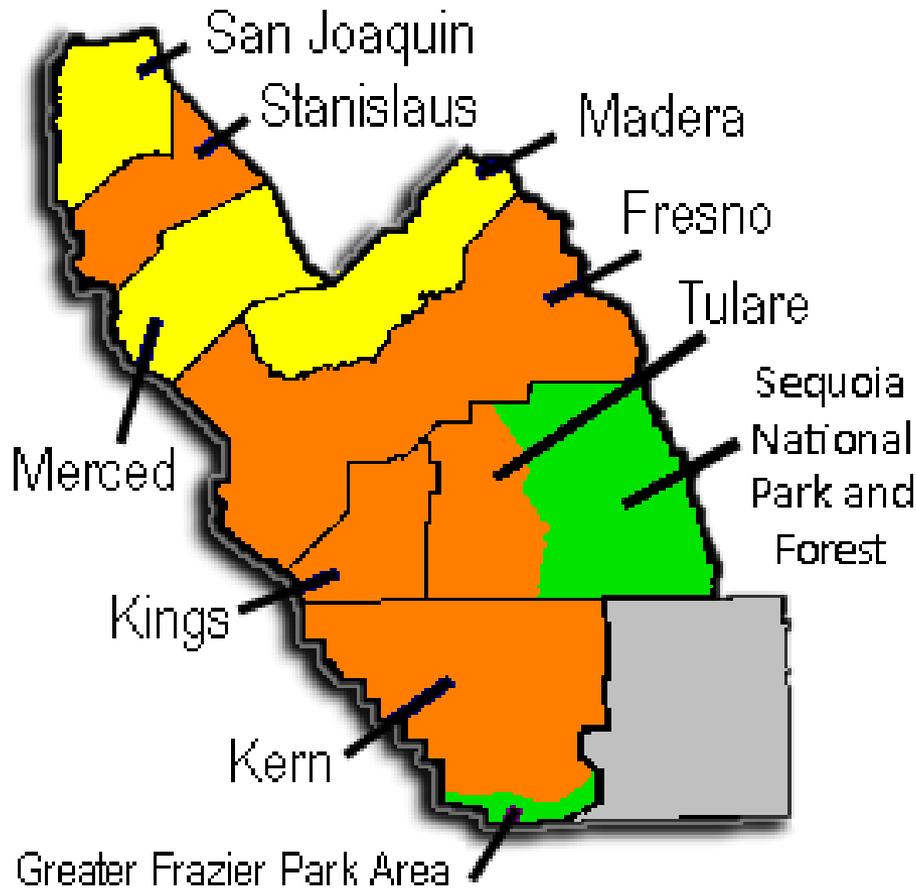


Bakersfield Munic. Airp. - Jan. 22, 2013

Air District Real-Time Outdoor Activity Risk

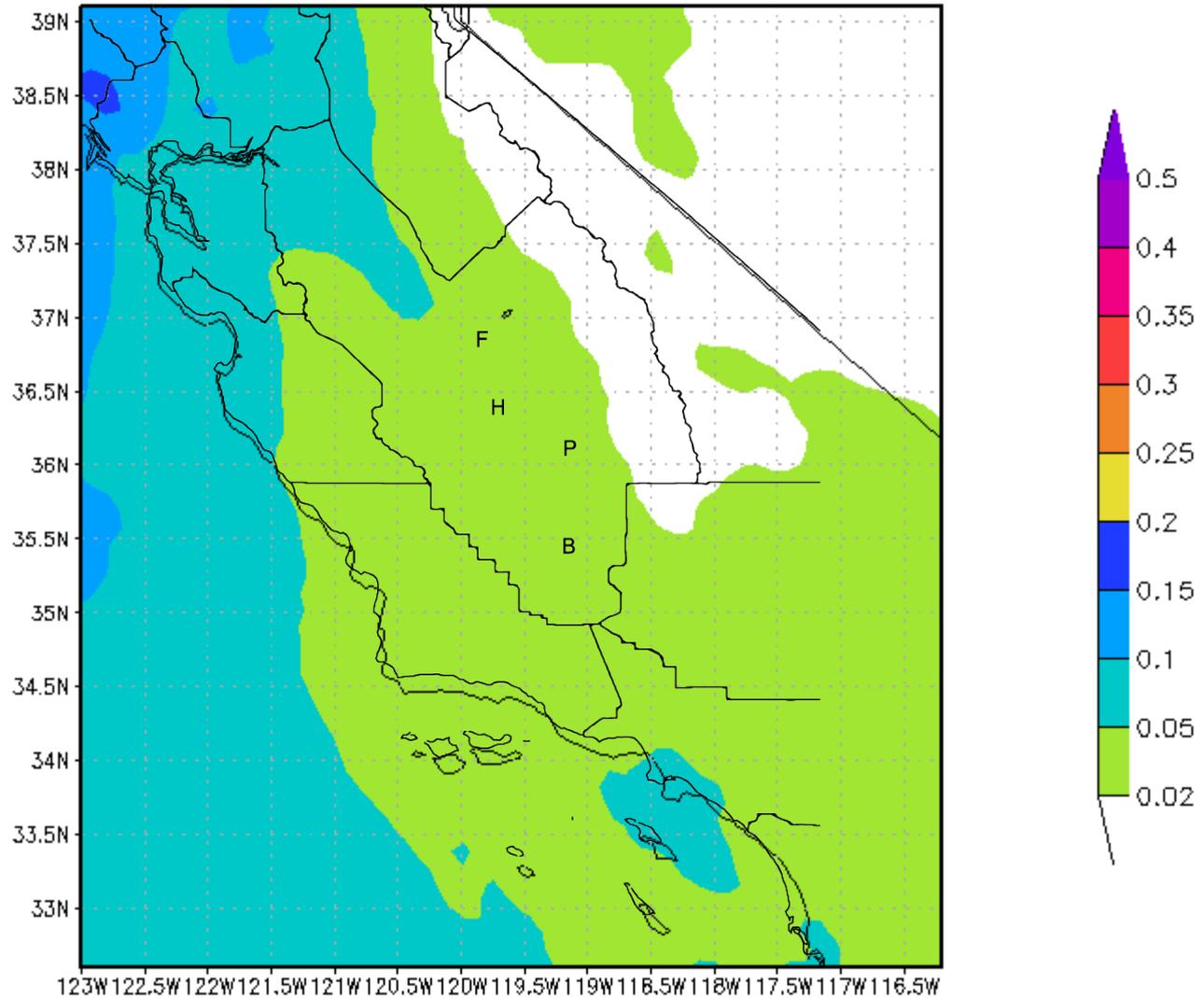


SJVAPCD Air Quality Forecast for Jan. 22, 2013

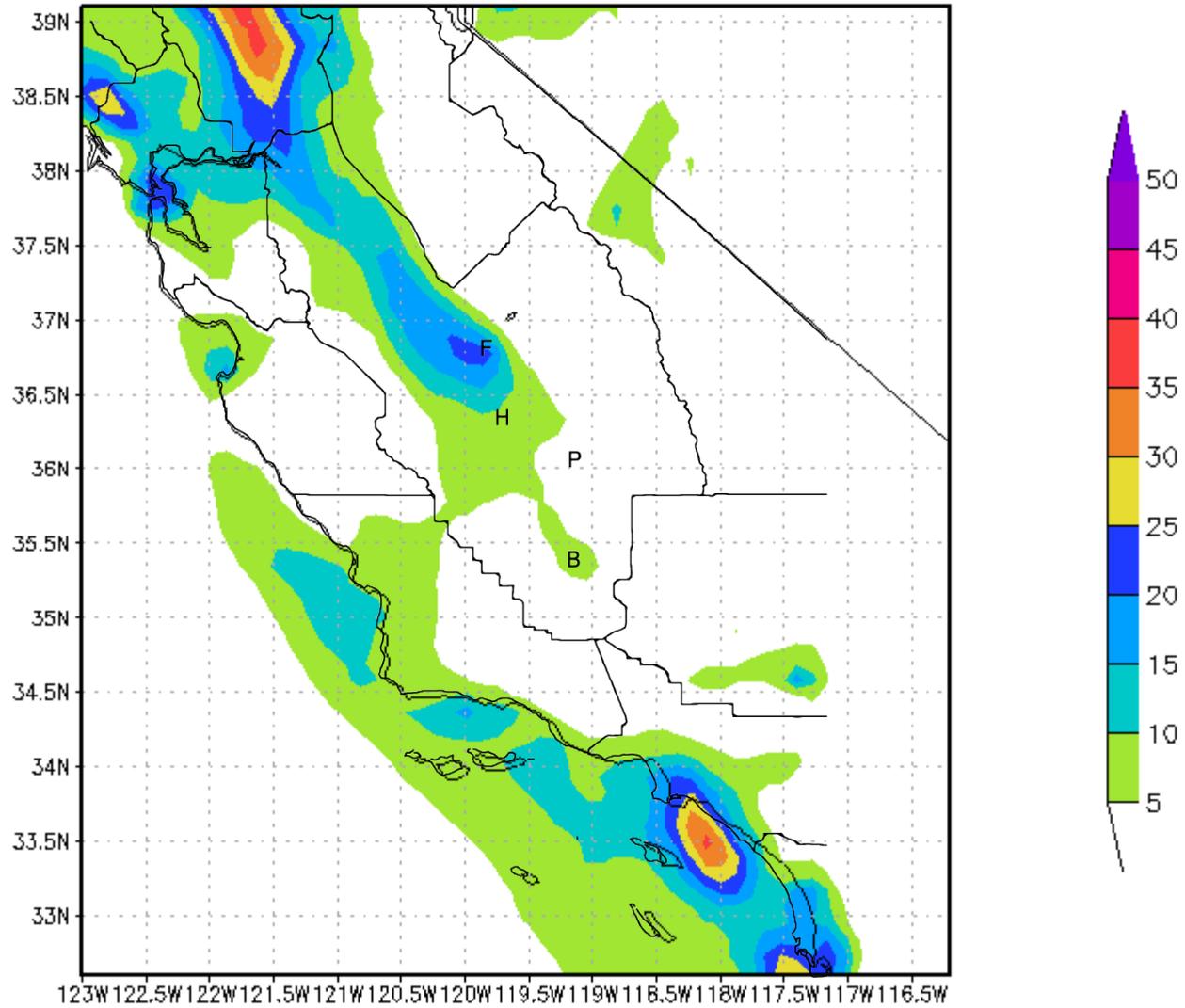


ROAR LEVEL	Ozone (O ₃)	Particulate Matter (PM 2.5)
 LEVEL 1 Good	1-59 ppb	1-15 µg/m ³
 LEVEL 2 Moderate	60-75 ppb	16-35 µg/m ³
 LEVEL 3 Unhealthy for Sensitive Groups	76-95 ppb	36-55 µg/m ³
 LEVEL 4 Unhealthy	96-115 ppb	56-75 µg/m ³
 LEVEL 5 Very Unhealthy	>115 ppb	>75 µg/m ³

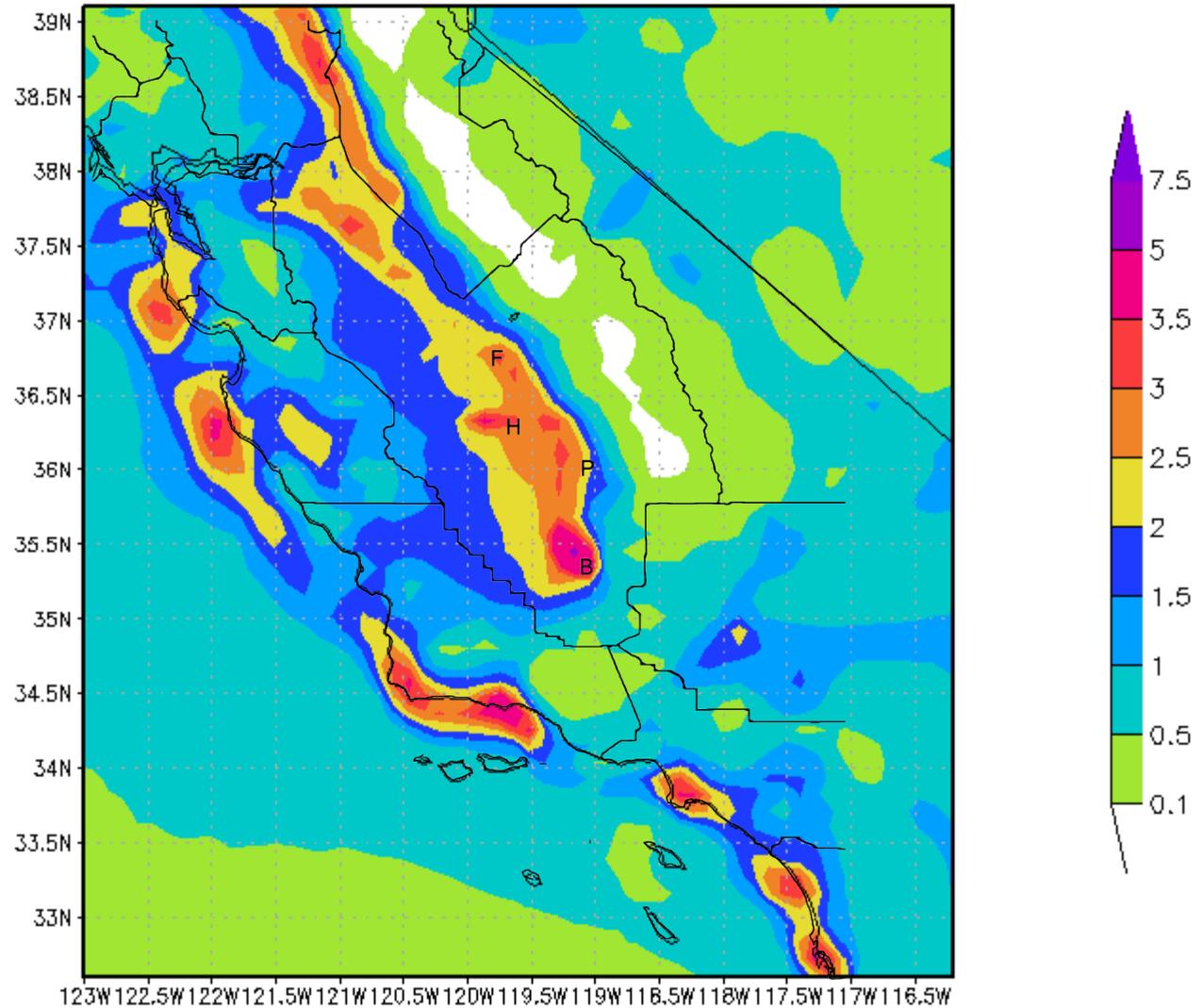
Column AOD [Dimensionless] at surface Valid 18 JAN 23 2013



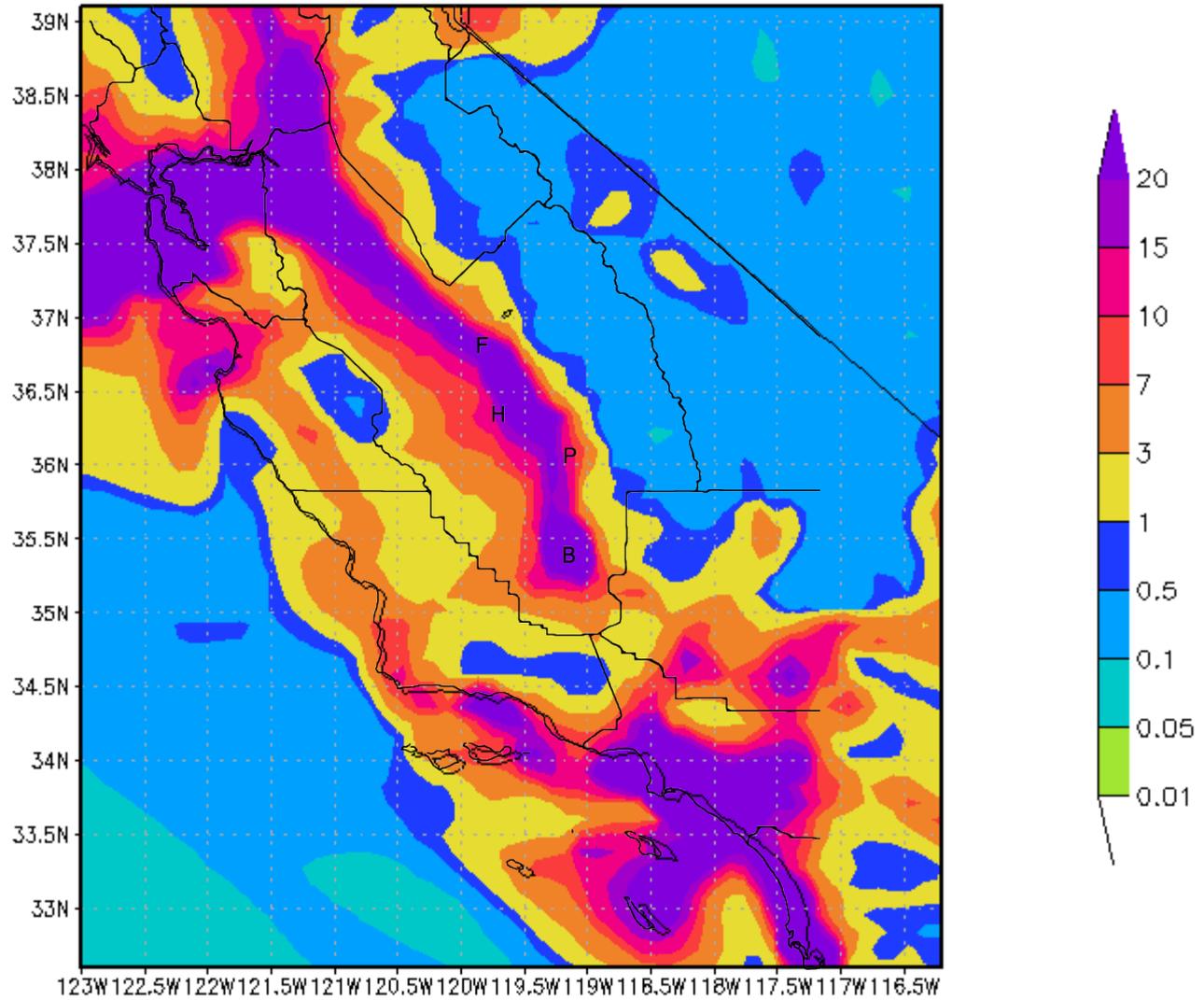
PM25 [$\mu\text{g}/\text{m}^3$] at surface Valid 18 JAN 23 2013



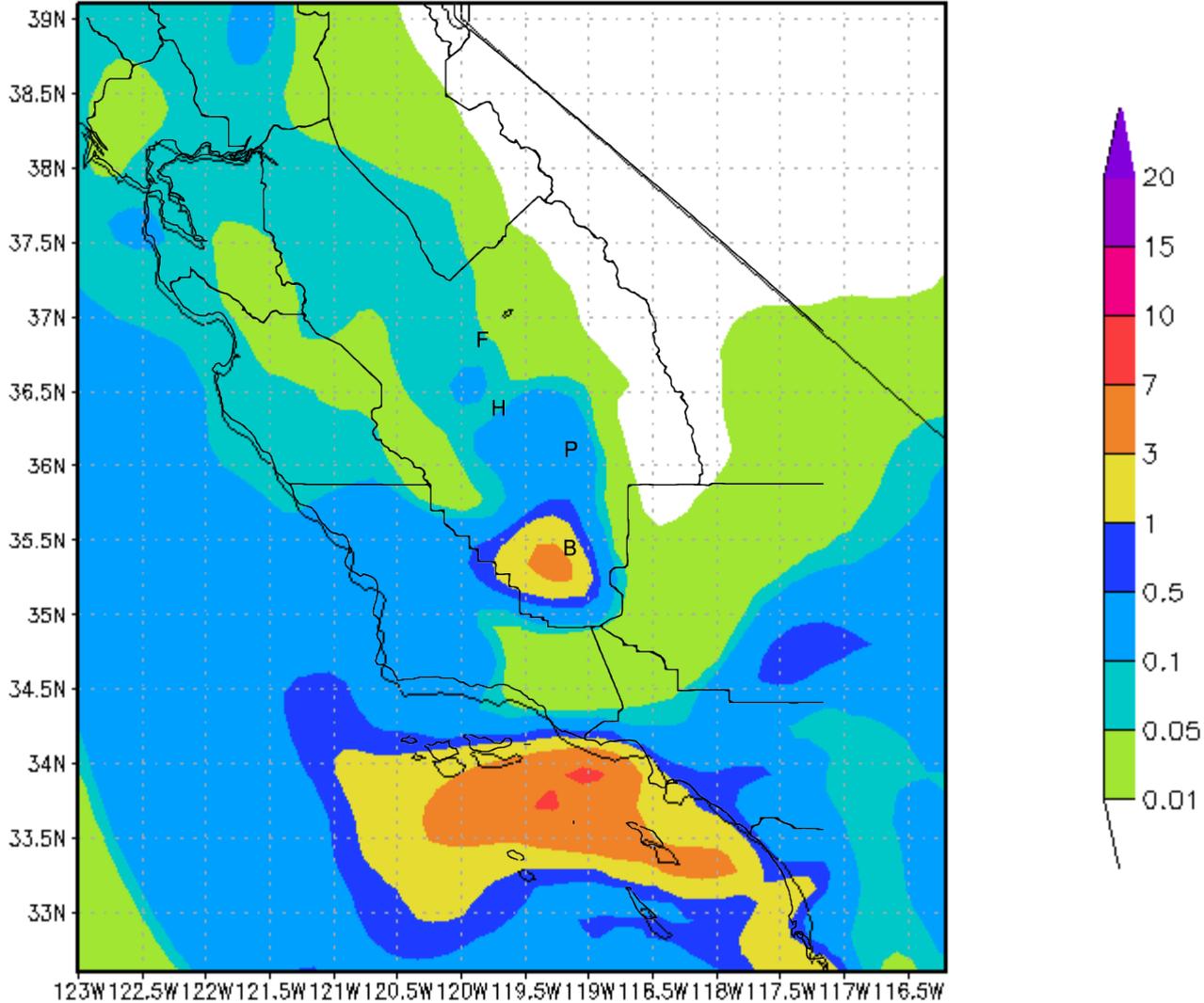
FORM [ppb] at 1013 [hPa] Valid 18 JAN 23 2013



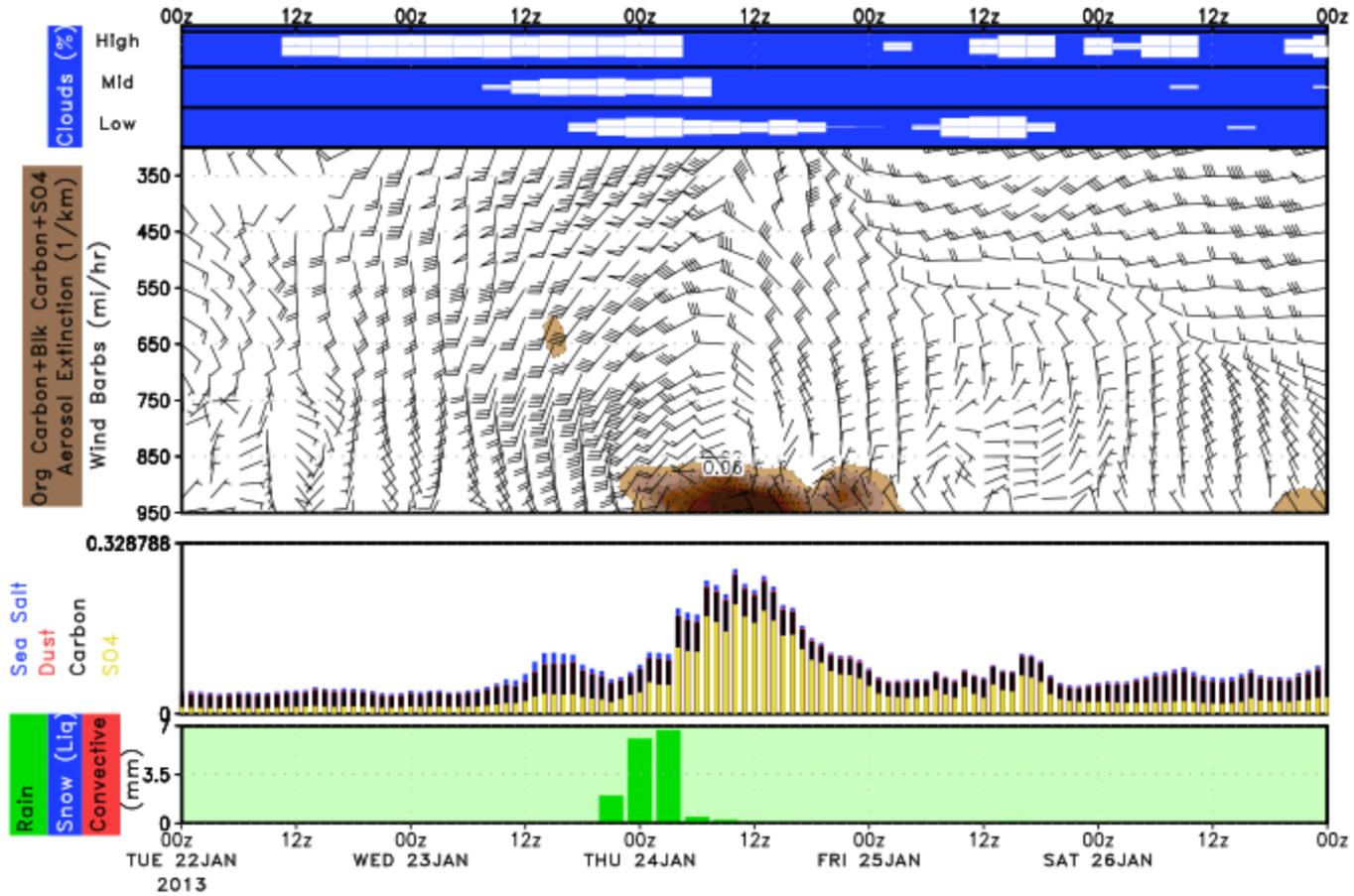
NO₂ [ppb] at 1013 [hPa] Valid 18 JAN 23 2013



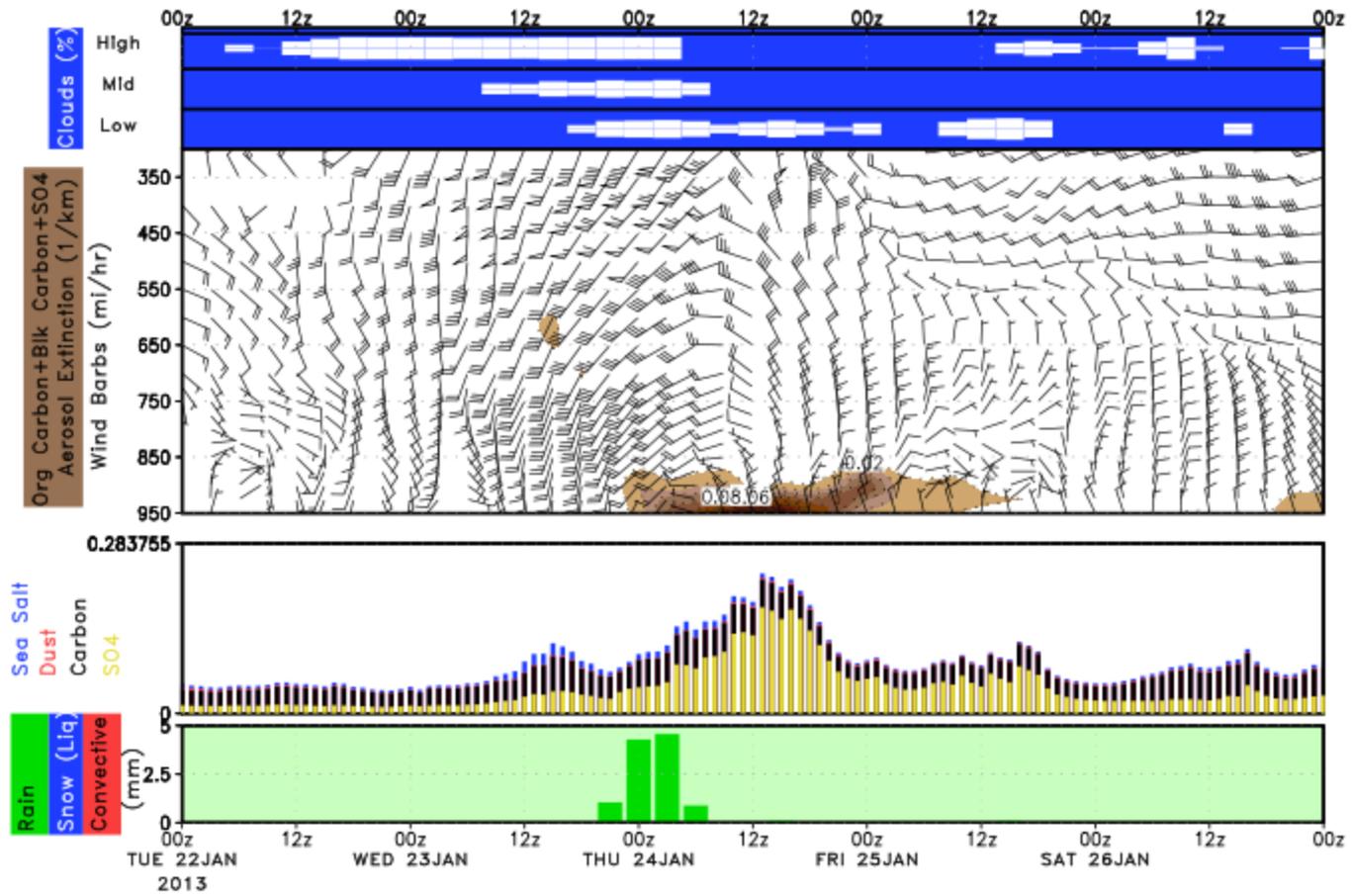
NO2 [ppb] at 900 [hPa] Valid 18 JAN 23 2013



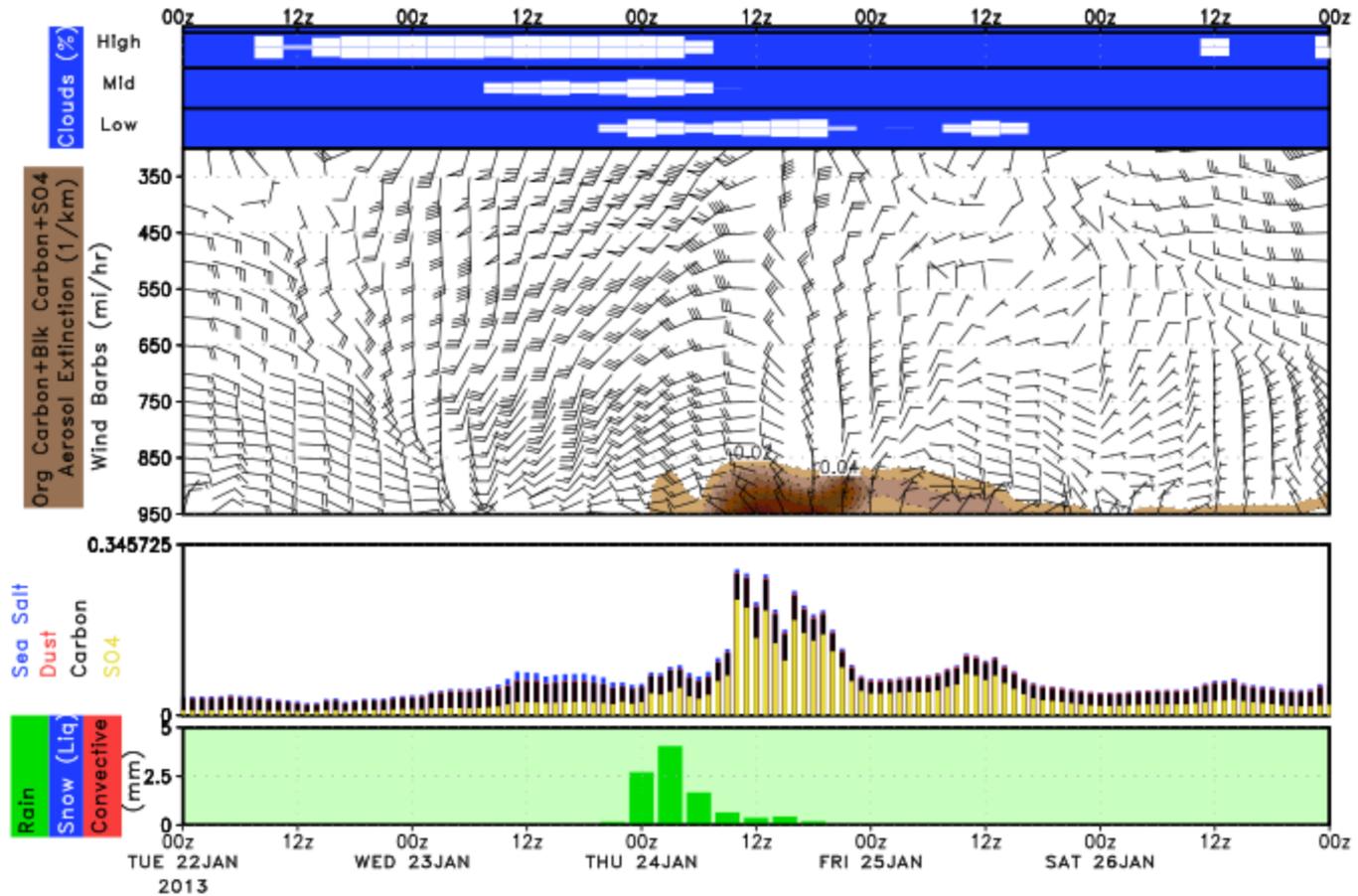
Fresno – GEOS-5 Aerosol Forecast



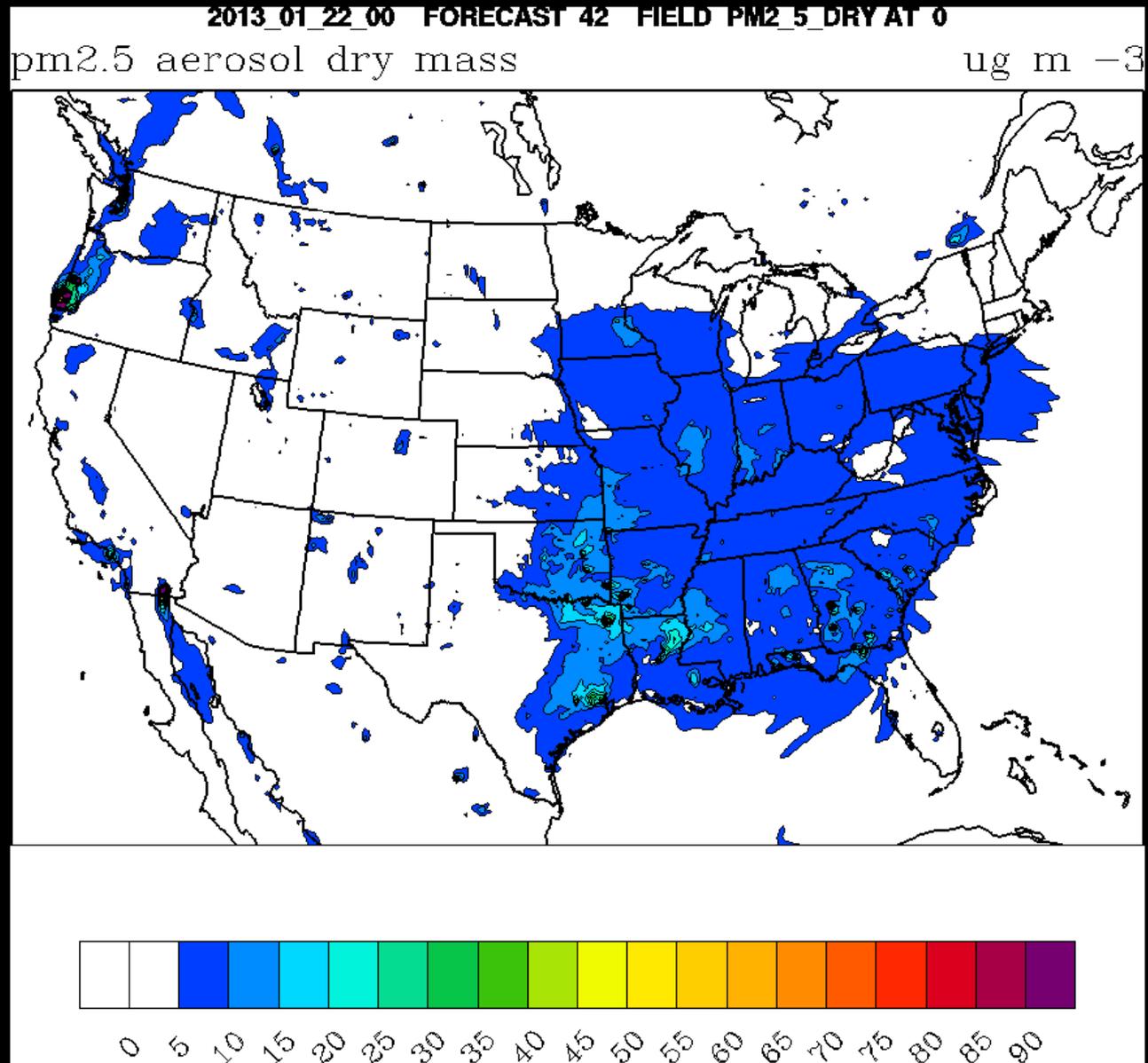
Hanford – GEOS-5 Aerosol Forecast



Bakersfield – GEOS-5 Aerosol Forecast



NOAA RAP PM2.5 Forecast (13-km res.)



Recommendations

- **Wed. – increased cloudiness associated with trough passing to our north. Saturated above 20Kft after 12Z. No flights.**
- **Thurs – quite a bit of moisture to be pumped into the region at mid and upper levels (above 700 hPa) from southerly system. Possible light precip. No flights.**
- **Friday – Continued saturation down to 700 hPa. Possible precip. No flights.**
- **Saturday – some upper level clouds in early AM -- dries out after 18Z. Possible flights.**
- **Sat. night and Sunday - new Gulf of AK trough brings front through region with precip. and windy conditions**
- **Monday – showers still over Sierra Nevada; partly cloudy in SJV**
- **Tuesday - cold northerly flow**