

DISCOVER-AQ OUTLOOK January 24, 2013

Cloudy and rainy conditions in Palmdale today. Rain also spread into the SJV overnight and early this morning. Heaviest rain at the southern end of the valley, which decreased the PM2.5 at the Bakersfield Municipal Airport station dramatically. The moisture is being pumped into the region by a cut-off low off the southern CA coast. This flow is expected to continue through tomorrow. A small window of opportunity for a PODEX flight over marine stratocumulus (with D-AQ aircraft as well) may exist for Saturday. A cold front associated with a cyclonic system coming out of the Gulf of Alaska will sweep through the SJV on Sunday, bringing clouds and a chance of further precipitation. This event will flush out the aerosol from the valley and "reset the aerosol clock". A strong northwesterly flow will follow the front on Monday and Tuesday with rather clean air. However, residual low-level cloudiness may persist behind the front. Next Wednesday may be the next clear day as a new Pacific Coast ridge will reestablish, leading to increases in aerosol. However, this ridge is not expected to be as strong as the one we dealt with previously, and minor short waves may ride over the ridge leading to complications in the forecasting next week.

The main forecast question for tomorrow will be whether a sufficient window will exist on Saturday for the marine Sc flight. PODEX would like Sc with no other cloud layers above it. Relatively clean conditions are expected over the Pacific with the exception of possible plumes from the San Francisco Bay and Los Angeles areas. Farther out away from shore the aerosol may be dominated by sea salt.

DISCOVER-AQ/PODEX Forecast Briefing

January 24, 2013

Ken Pickering, NASA/GSFC

Chris Loughner, ESSIC/GSFC

Melanie Follette-Cook, GESTAR/GSFC

Bryan Duncan, NASA/GSFC

Fresno:

| TODAY | TONIGHT | FRIDAY | FRIDAY NIGHT | SATURDAY | SATURDAY NIGHT | SUNDAY | SUNDAY NIGHT | MONDAY |
|--------------------------------|----------------------------------|--------------------------------|----------------------------------|-----------------------------------|----------------------------------|-------------------------------|----------------------------------|-----------------------------------|
| | | | | | | | | |
| Slight Chc Rain High: 63 °F | Slight Chc Showers Low: 47 °F | Slight Chc Rain High: 61 °F | Slight Chc Showers Low: 46 °F | Slight Chc Showers High: 61 °F | Slight Chc Showers Low: 44 °F | Chance Showers High: 57 °F | Slight Chc Showers Low: 38 °F | Slight Chc Showers High: 54 °F |

Hanford:

| TODAY | TONIGHT | FRIDAY | FRIDAY NIGHT | SATURDAY | SATURDAY NIGHT | SUNDAY | SUNDAY NIGHT | MONDAY |
|----------------------------|----------------------------------|--------------------------------|------------------------------|-----------------------------------|----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|
| | | | | | | | | |
| Chance Rain High: 63 °F | Slight Chc Showers Low: 46 °F | Slight Chc Rain High: 61 °F | Chance Showers Low: 44 °F | Slight Chc Showers High: 62 °F | Slight Chc Showers Low: 41 °F | Slight Chc Showers High: 57 °F | Slight Chc Showers Low: 35 °F | Slight Chc Showers High: 54 °F |

Bakersfield:

| TODAY | TONIGHT | FRIDAY | FRIDAY NIGHT | SATURDAY | SATURDAY NIGHT | SUNDAY | SUNDAY NIGHT | MONDAY |
|----------------------------|------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------------|-----------------------------------|-----------------------------|-----------------------------|
| | | | | | | | | |
| Chance Rain High: 65 °F | Chance Showers Low: 49 °F | Chance Rain High: 63 °F | Chance Showers Low: 45 °F | Slight Chc Showers High: 61 °F | Slight Chc Showers Low: 45 °F | Slight Chc Showers High: 54 °F | Mostly Cloudy Low: 38 °F | Partly Sunny High: 52 °F |

Catalina Island:

| TODAY | TONIGHT | FRIDAY | FRIDAY NIGHT | SATURDAY | SATURDAY NIGHT | SUNDAY | SUNDAY NIGHT | MONDAY |
|---------------------|---------------------------|---------------------|--------------------|-------------------------------|----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|
| | | | | | | | | |
| Rain High: 61 °F | Rain Likely Low: 56 °F | Rain High: 63 °F | Rain Low: 52 °F | Chance Showers High: 64 °F | Slight Chc Showers Low: 47 °F | Slight Chc Showers High: 61 °F | Slight Chc Showers Low: 44 °F | Slight Chc Showers High: 53 °F |

Current Conditions

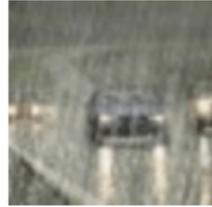
BAKERSFIELD CA



Lt Rain
55°F
 13°C

Humidity 80%
 Wind Speed ENE 7 MPH
 Barometer 30.09 in (1018.8 mb)
 Dewpoint 49°F (9°C)
 Visibility 10.00 mi
 Last Update on 24 Jan 6:54 am PST

AVALON, CATALINA AIRPORT CA

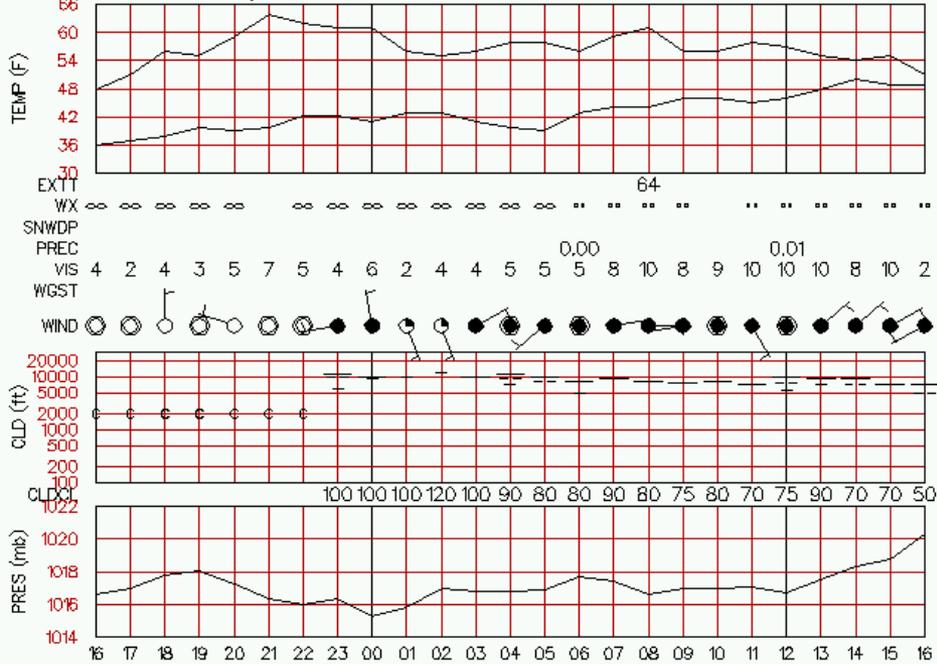


Mod Rain, Fog
54°F
 12°C

Humidity 100%
 Wind Speed SSE 10 G 17 MPH
 Barometer 30.12 in
 Dewpoint 54°F (12°C)
 Visibility 0.25 mi
 Last Update on 24 Jan 7:38 am PST

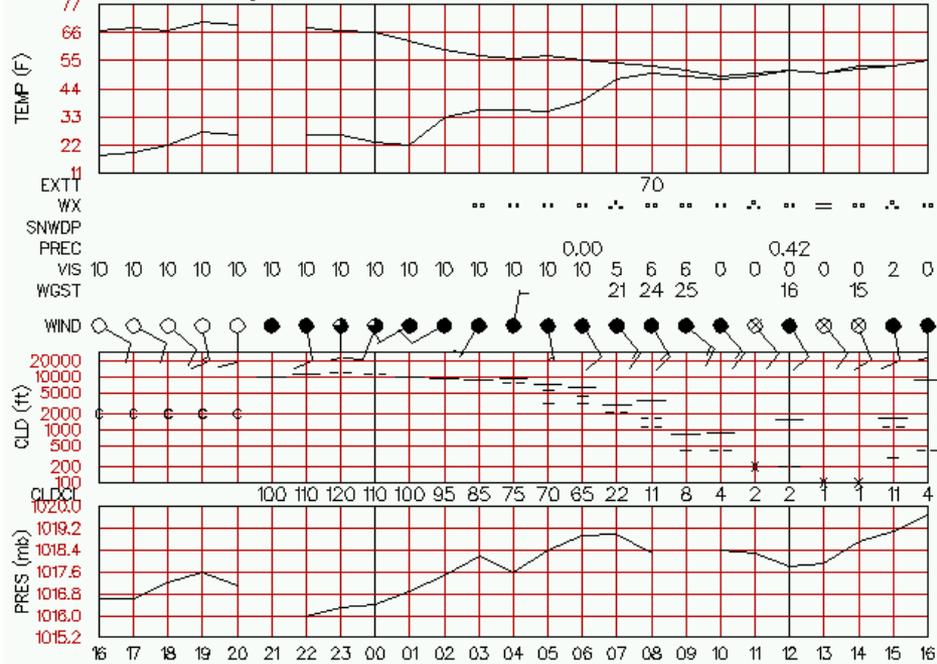
▼ Plymouth State Weather Center ▼

Meteogram for KBFL from 1600Z 23 JAN 13 to 1600Z 24 JAN 13

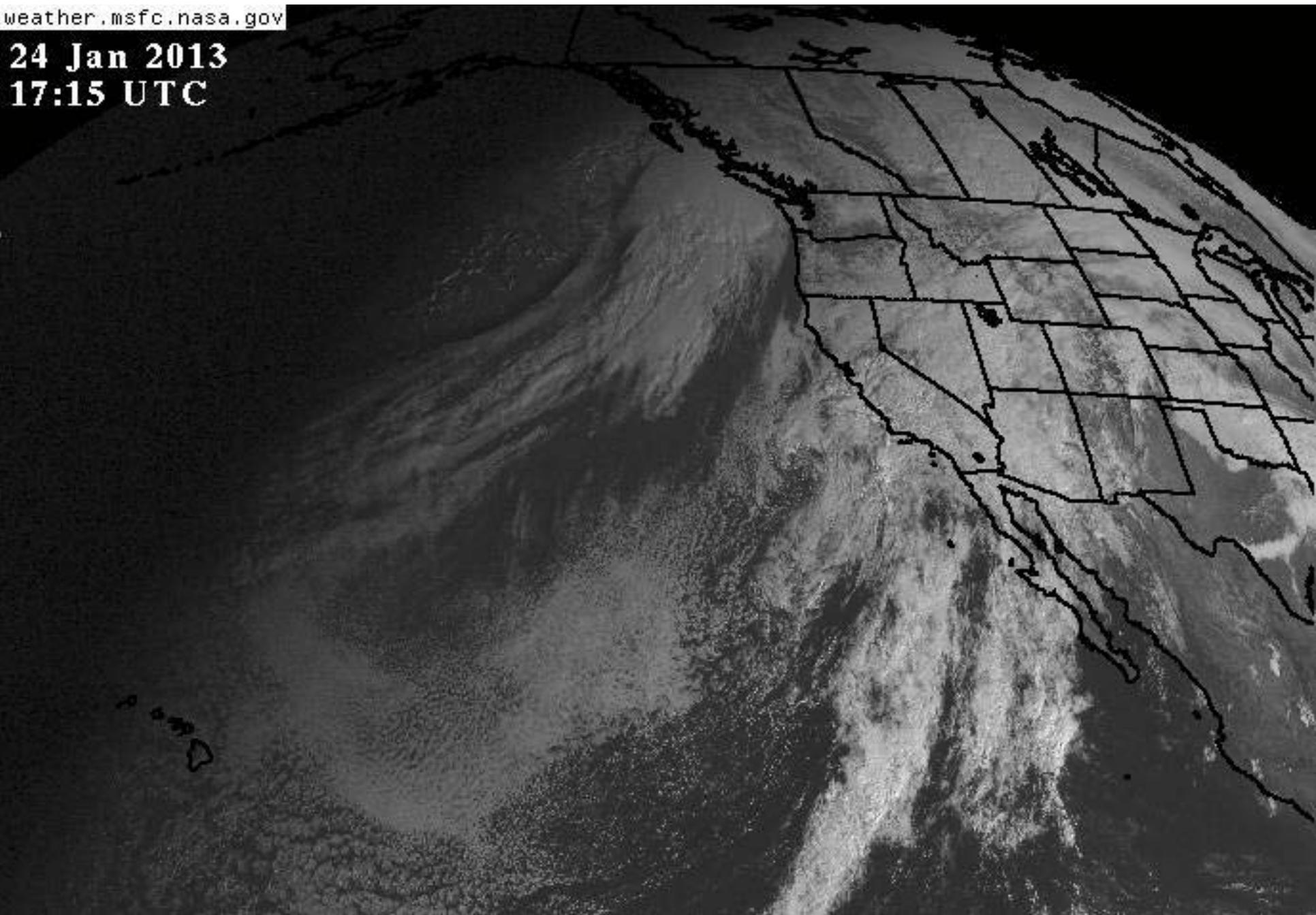


▼ Plymouth State Weather Center ▼

Meteogram for KAVX from 1600Z 23 JAN 13 to 1600Z 24 JAN 13

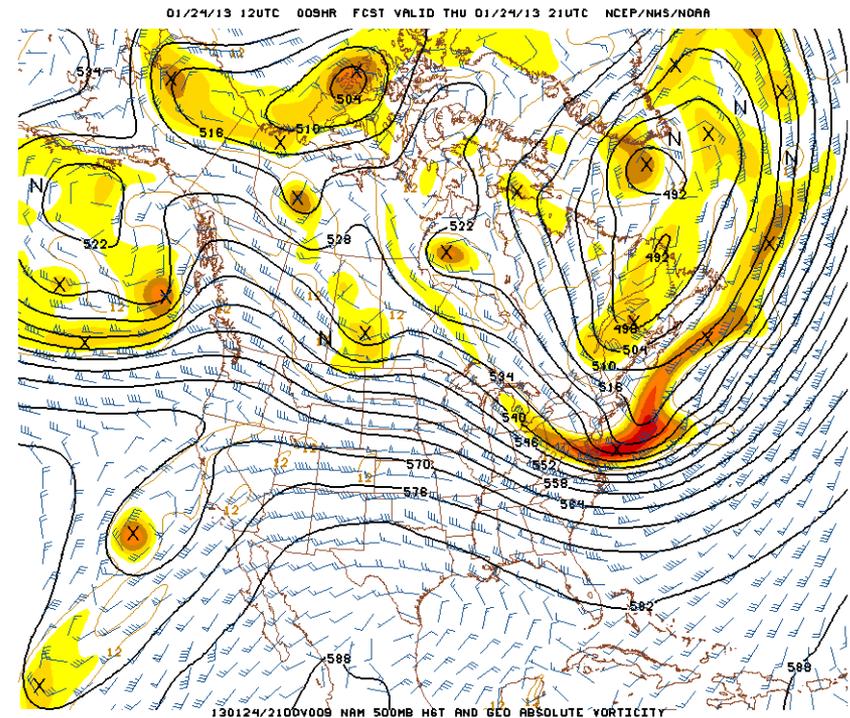
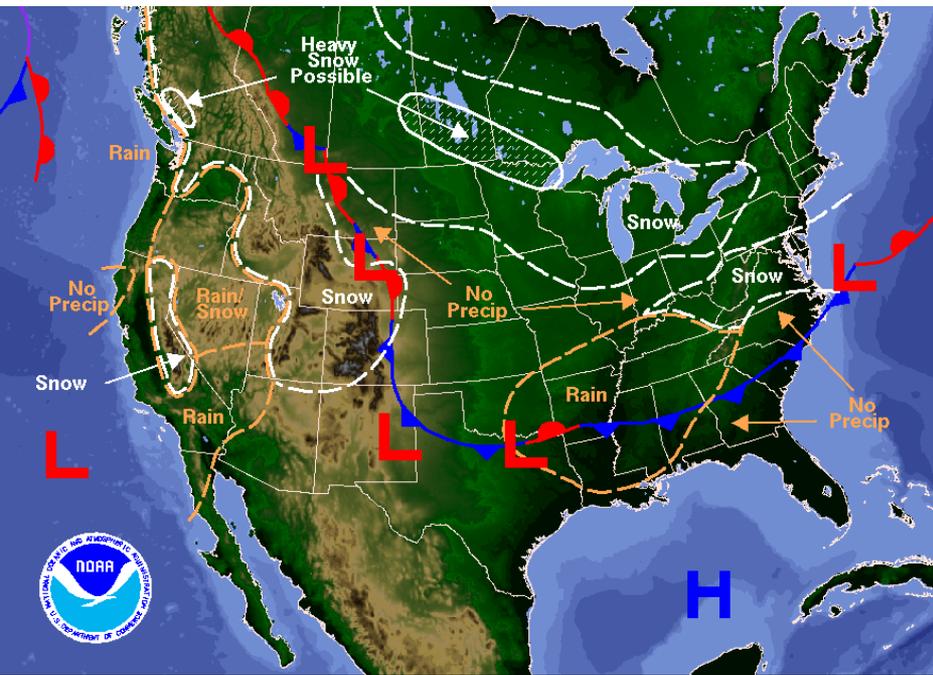


24 Jan 2013
17:15 UTC



Today : Cloudy as an upper level low moves toward southern CA.

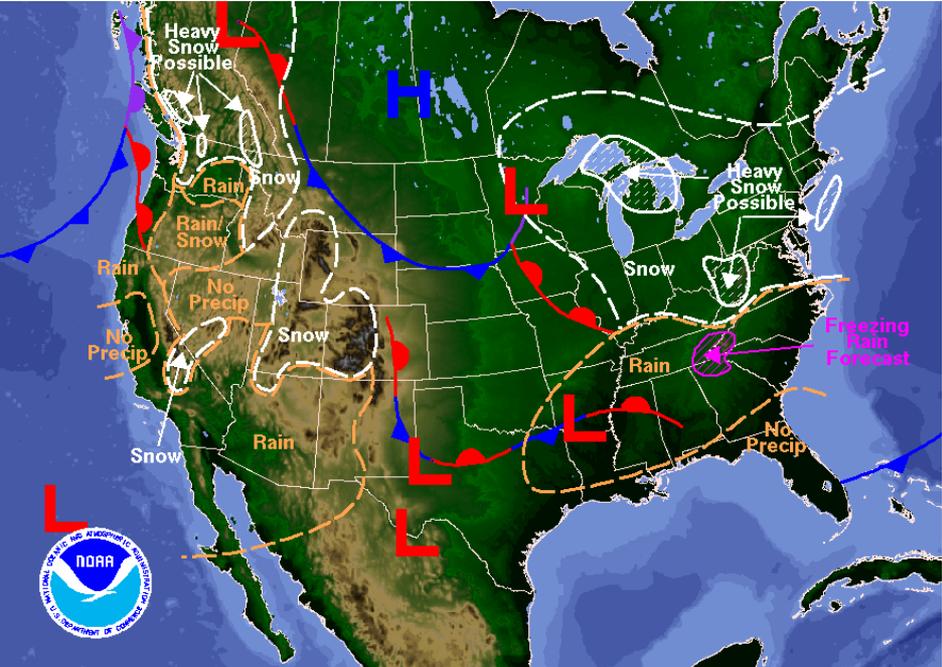
500 mb NAM at 1 PM.



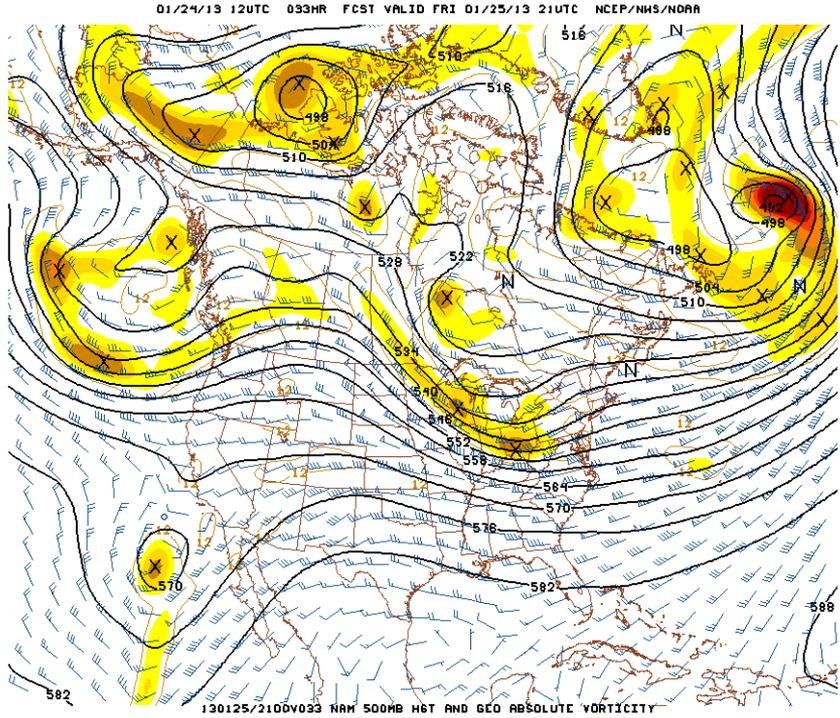
Weather Forecast for Thu, Jan 24, 2013, issued 3:14 AM EST
DOC/NOAA/NWS/NCEP/Hydrometeorological Prediction Center
Prepared by McReynolds based on HPC, SPC, and NHC forecasts

Tomorrow: Cloudy as an upper level low continues to move toward southern CA.

500 mb NAM at 1 PM.



Weather Forecast for Fri, Jan 25, 2013, issued 4:27 AM EST Thu, Jan 24, 2013
DOC/NOAA/NWS/NCEP/Hydrometeorological Prediction Center
Prepared by McCreynolds based on HFC, SPC, and NHC forecasts



130125/2100V033 NAM 500MB HGT AND GEO ABSOLUTE VORTICITY

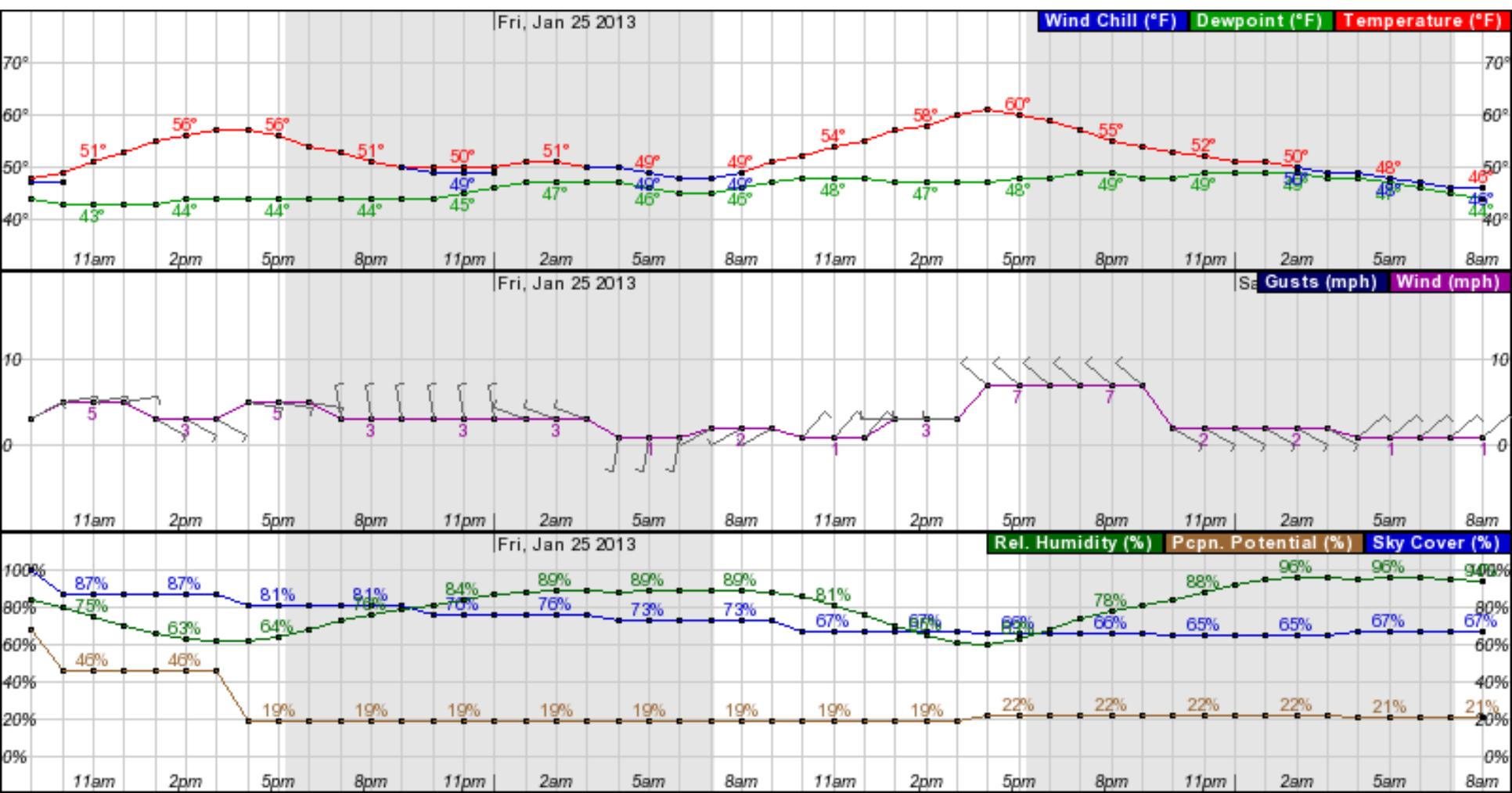
Fresno

Today: Mostly cloudy.

Tomorrow: Mostly cloudy.

Today →

Tomorrow →



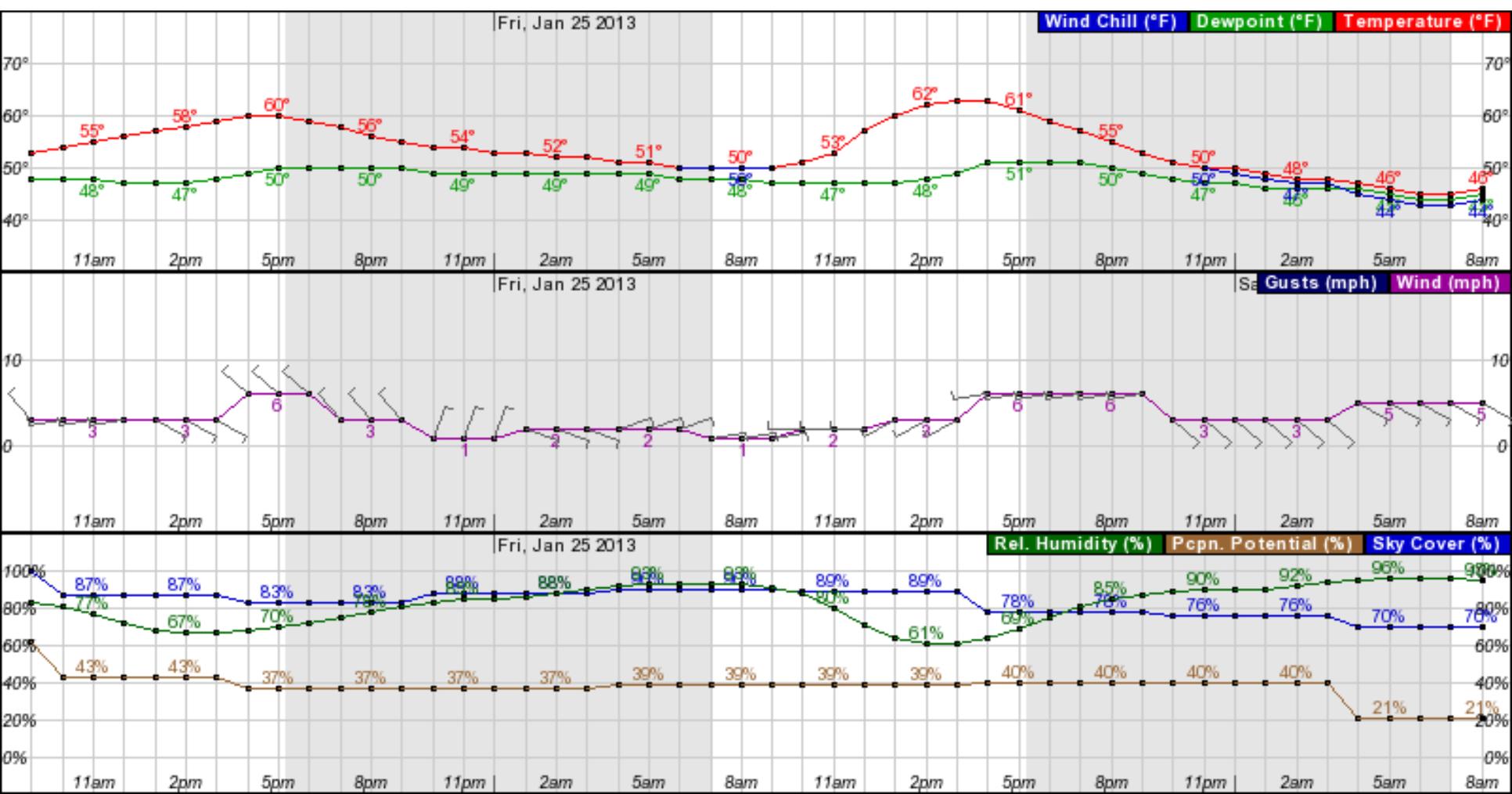
Bakersfield

Today: Mostly cloudy.

Tomorrow: Mostly cloudy.

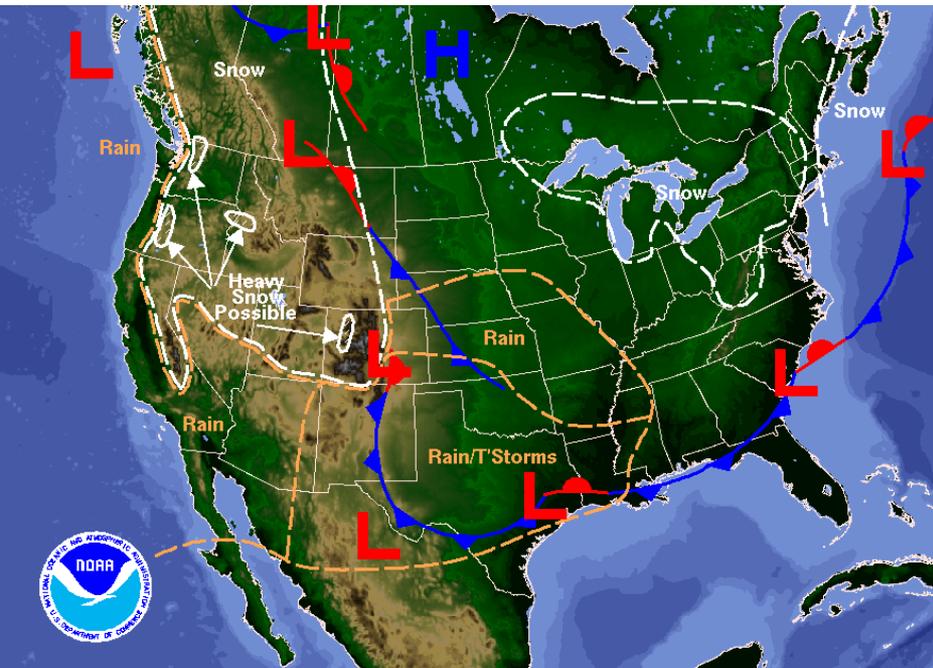
Today →

Tomorrow →

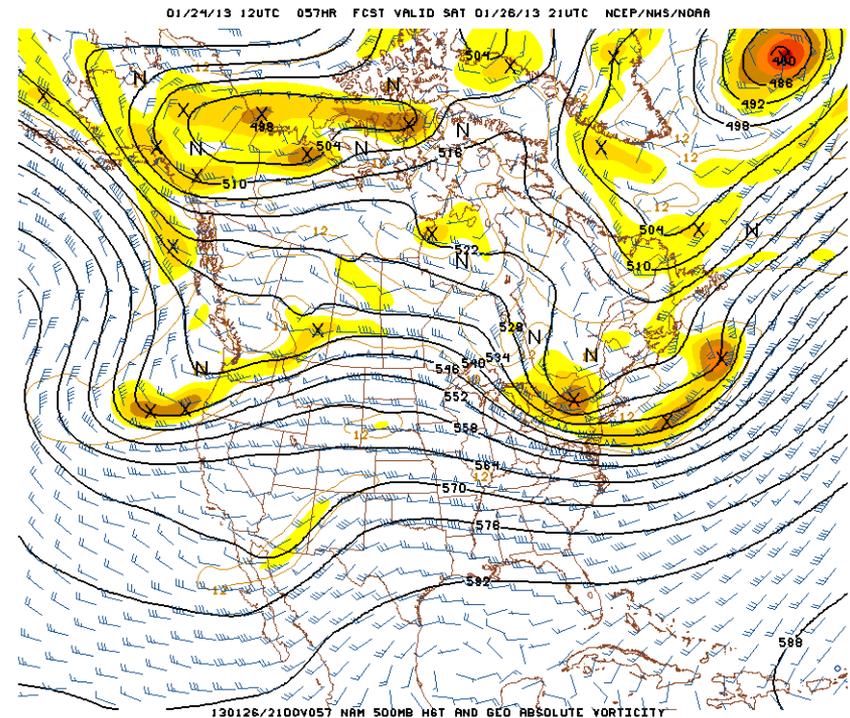


Saturday: Cloudy as an upper level trough moves into the Pacific Northwest.

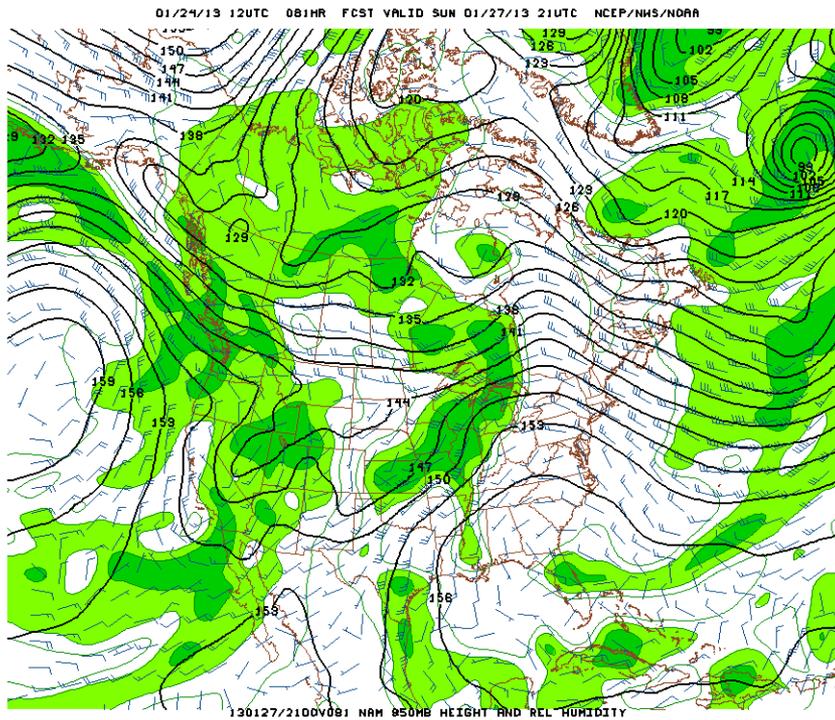
500 mb NAM at 1 PM.



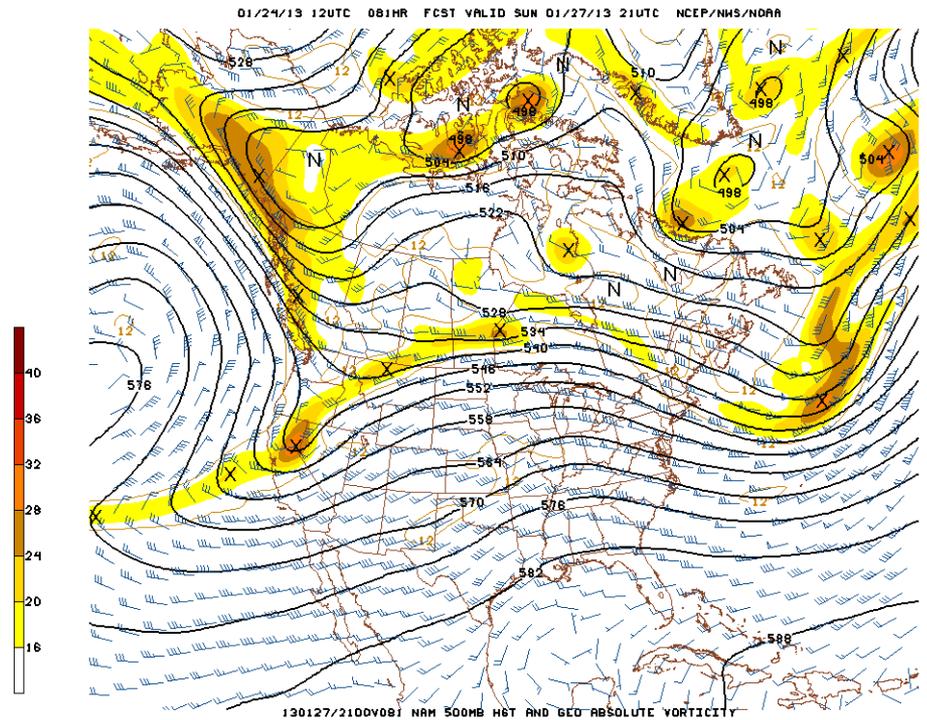
Weather Forecast for Sat, Jan 26, 2013, issued 5:11 AM EST Thu, Jan 24, 2013
DOC/NOAA/NWS/NCEP/Hydro-meteorological Prediction Center
Prepared by McReynolds based on HFC, SPC, and NHC forecasts



850 mb NAM Sunday 1 PM



500 mb NAM Sunday 1 PM



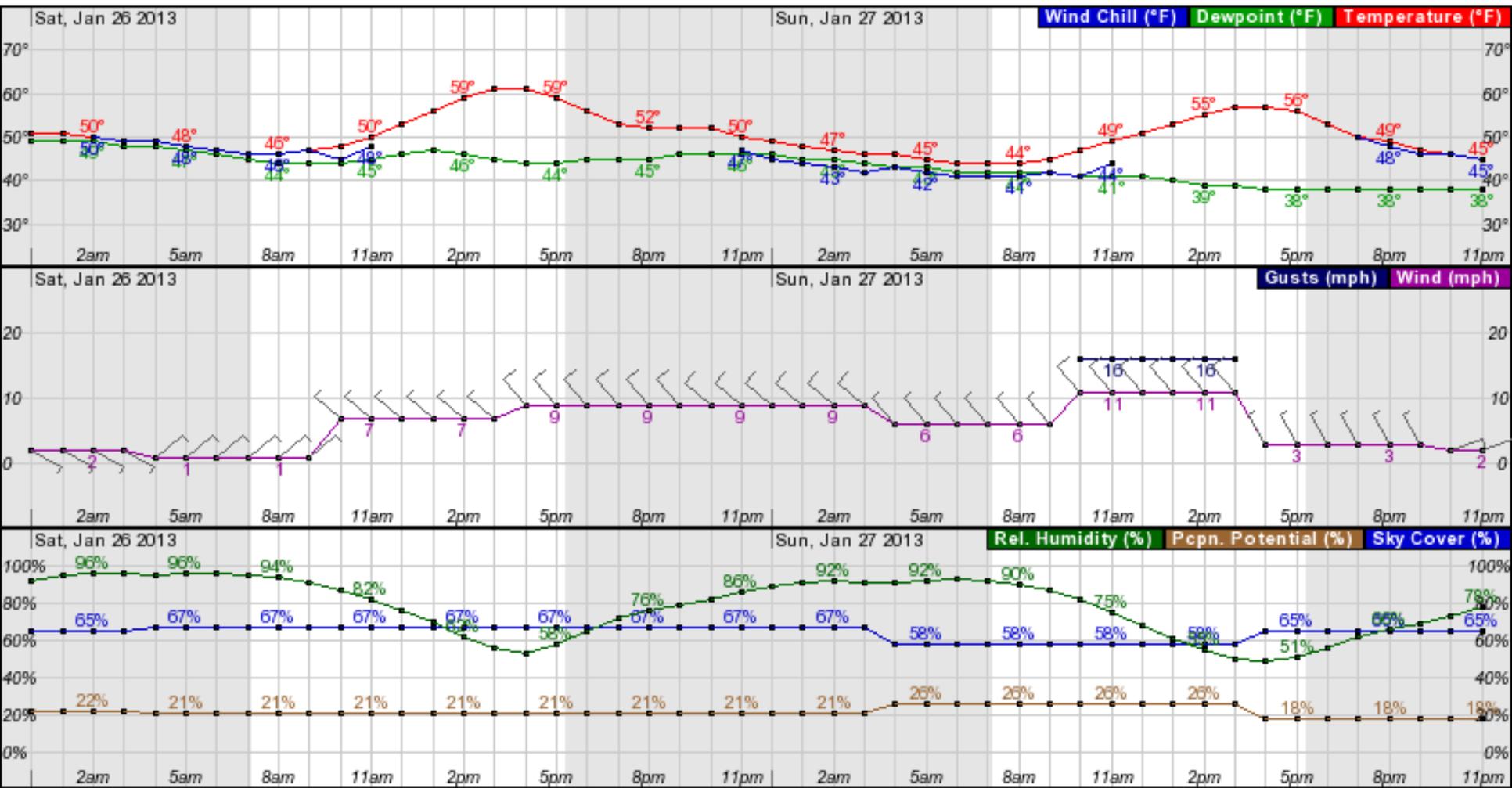
Fresno

Saturday: Mostly cloudy.

Sunday: Mostly cloudy.

Saturday →

Sunday →



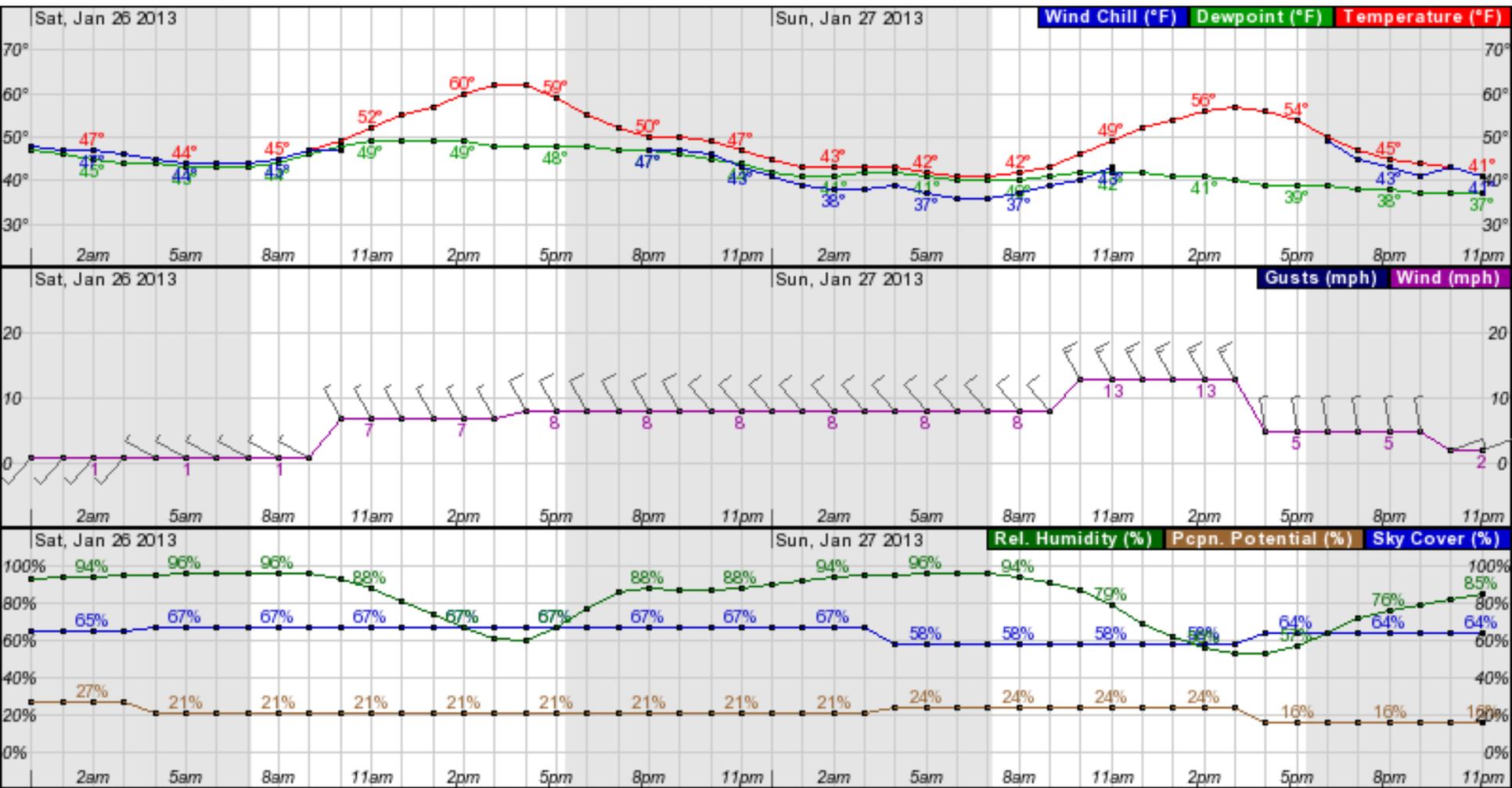
Hanford

Saturday: Mostly cloudy.

Sunday: Mostly cloudy.

Saturday →

Sunday →



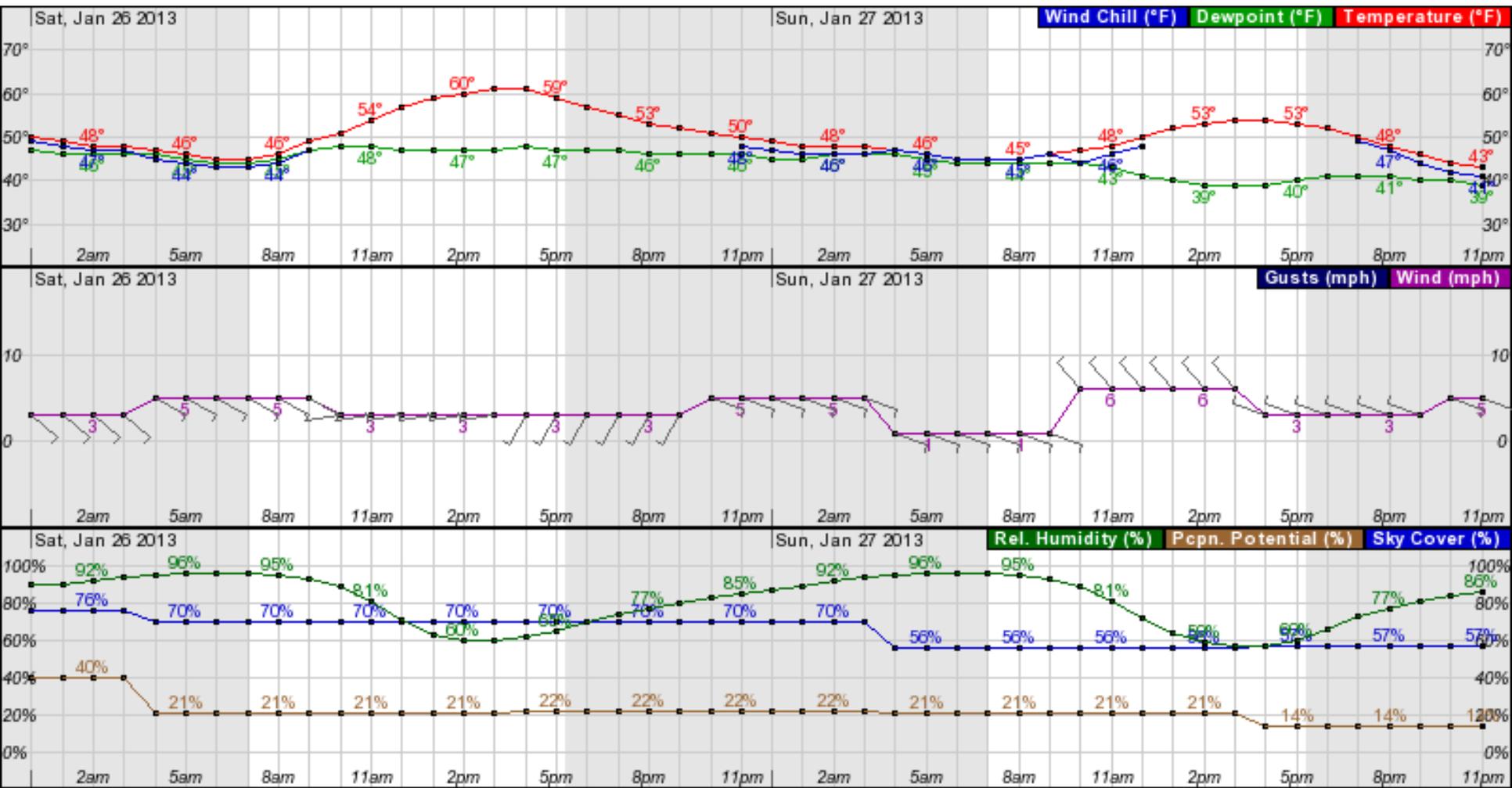
Bakersfield

Saturday: Mostly cloudy.

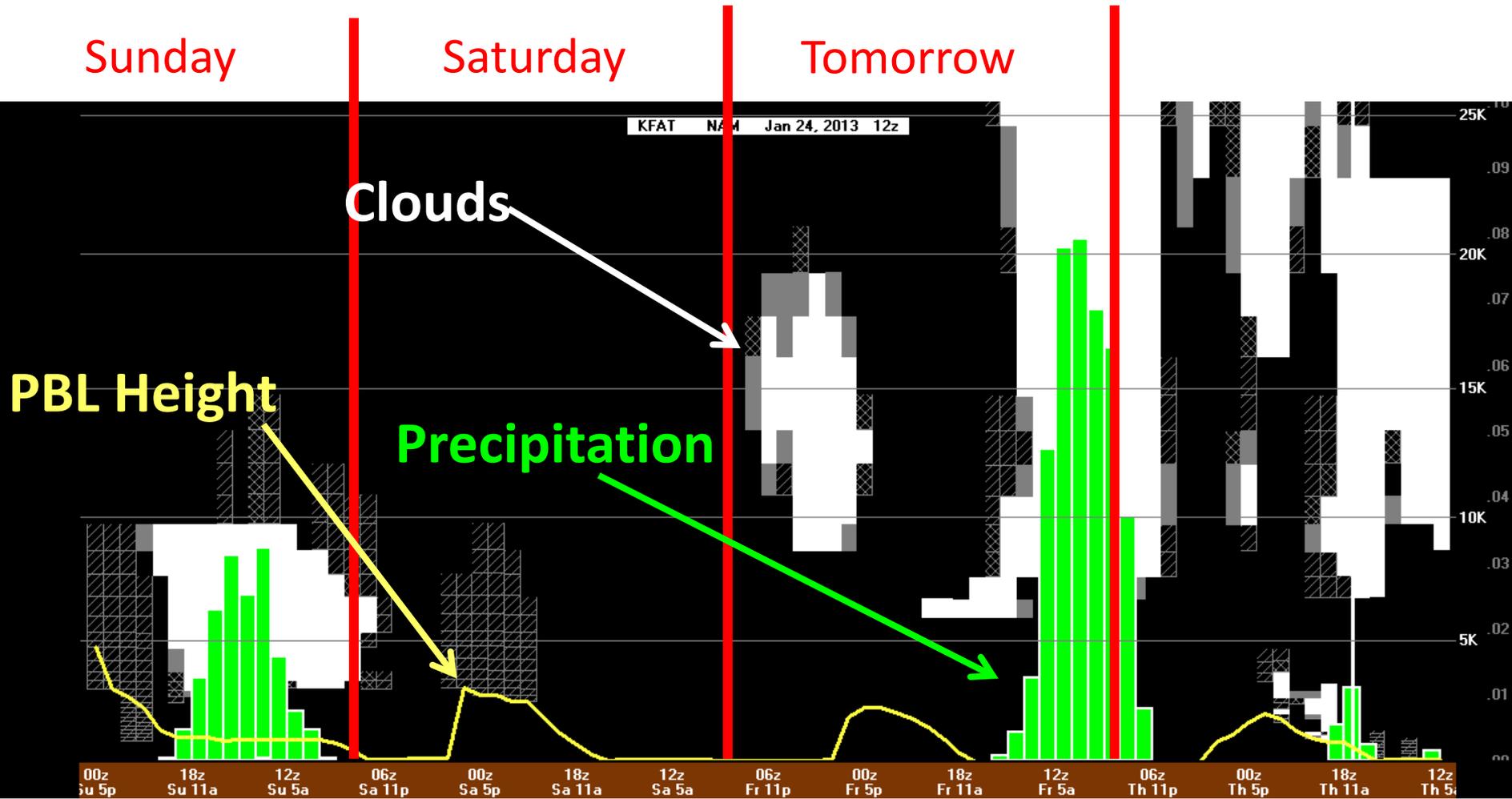
Sunday: Mostly cloudy.

Saturday →

Sunday →



Fresno; BUFKIT – NAM (12 UTC 24 January)



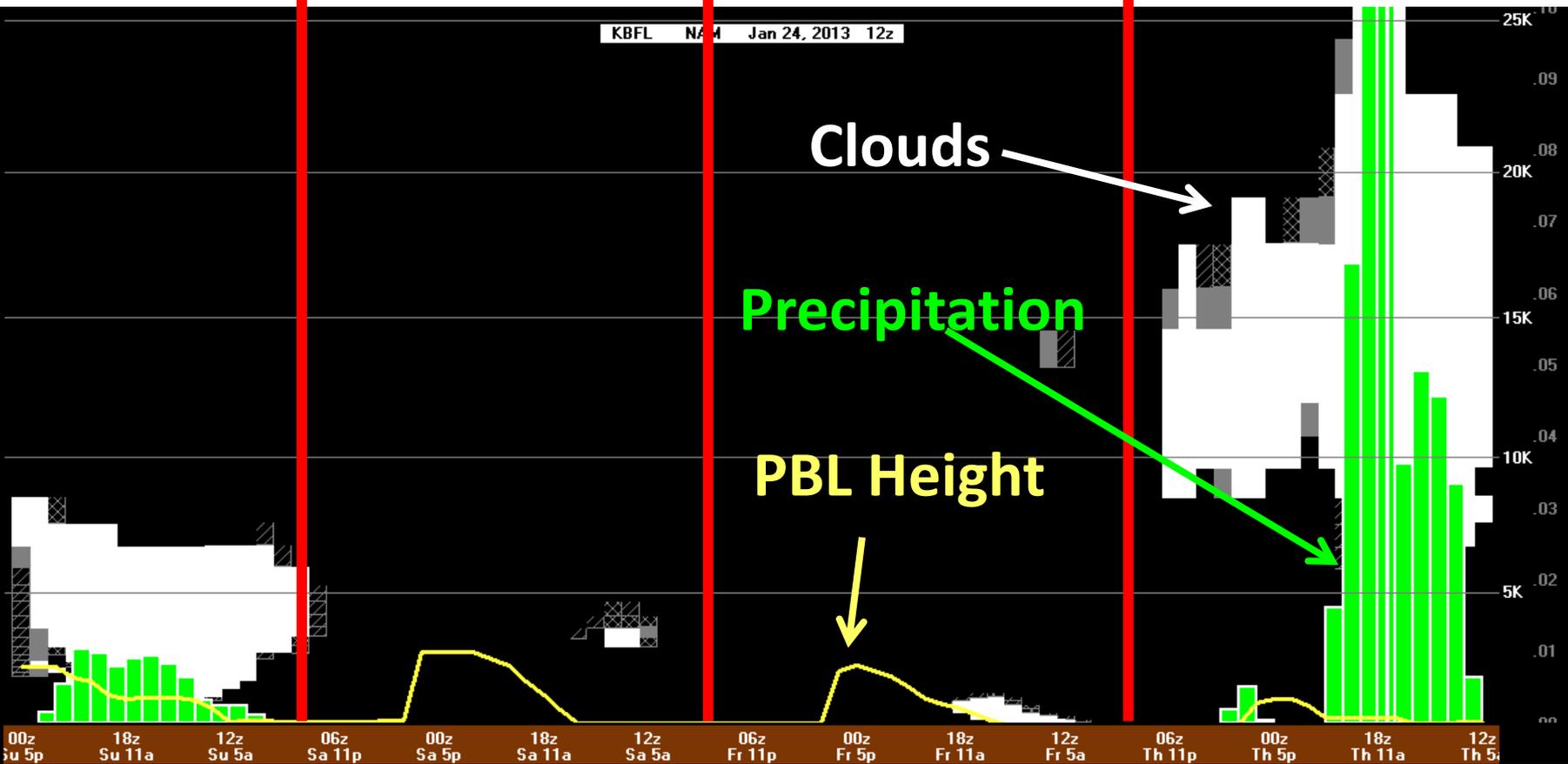
- Today and tomorrow: Mostly cloudy.
- Saturday: Partly cloudy.
- Sunday: Cloudy.

Bakersfield; BUFKIT – NAM (12 UTC 24 January)

Sunday

Saturday

Tomorrow

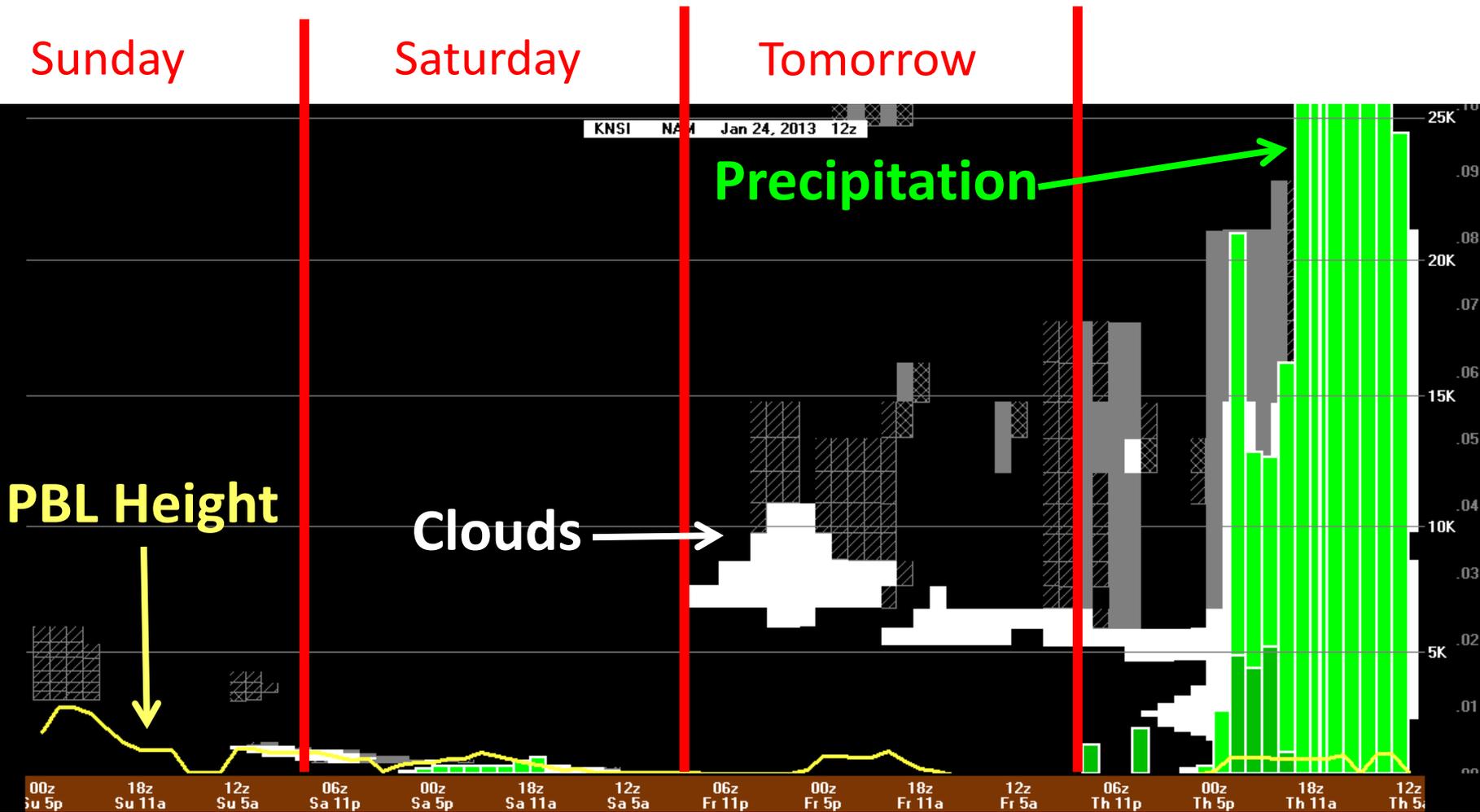


-Today: Mostly cloudy.

-Tomorrow and Saturday: A few clouds in the morning.

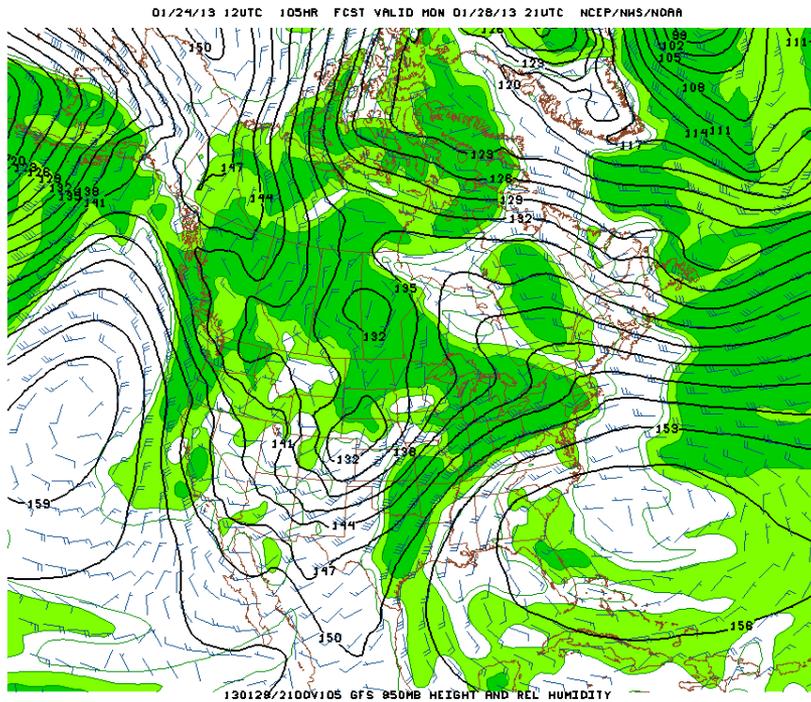
-Sunday: Mostly cloudy.

San Nicholas Island; BUFKIT – NAM (12 UTC 24 January)

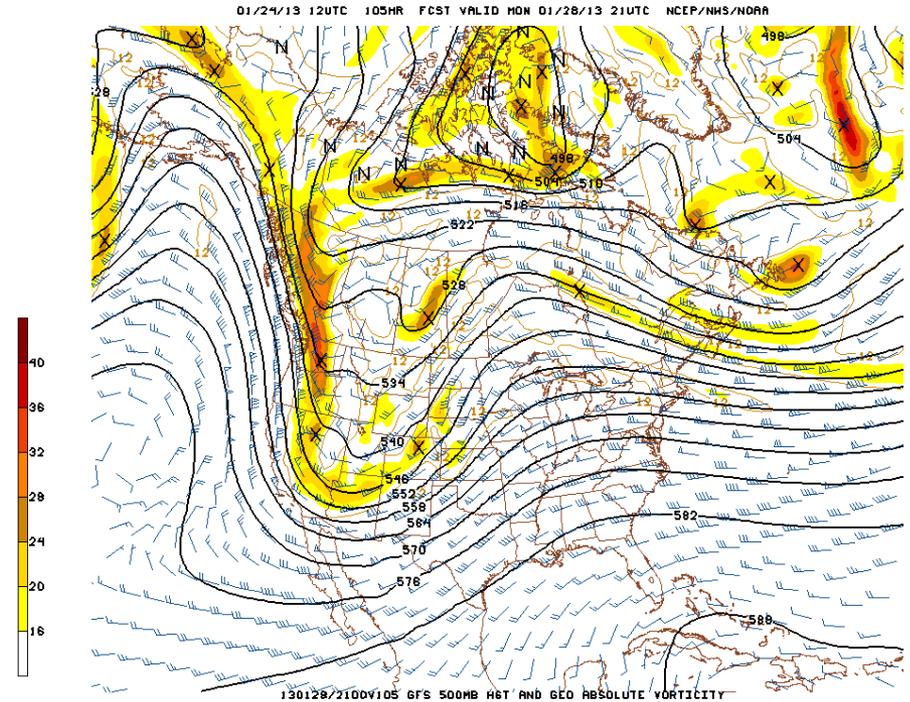


- Today and tomorrow: low, mid, and high level clouds.
- Saturday: Low clouds and a chance of some sprinkles.
- Sunday: A few clouds.

850 mb GFS Monday 1 PM



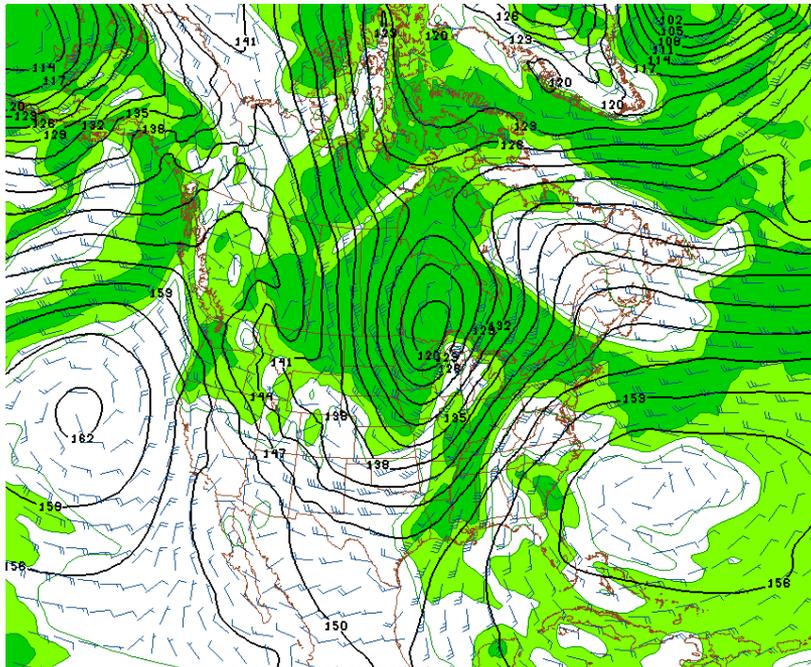
500 mb GFS Monday 1 PM



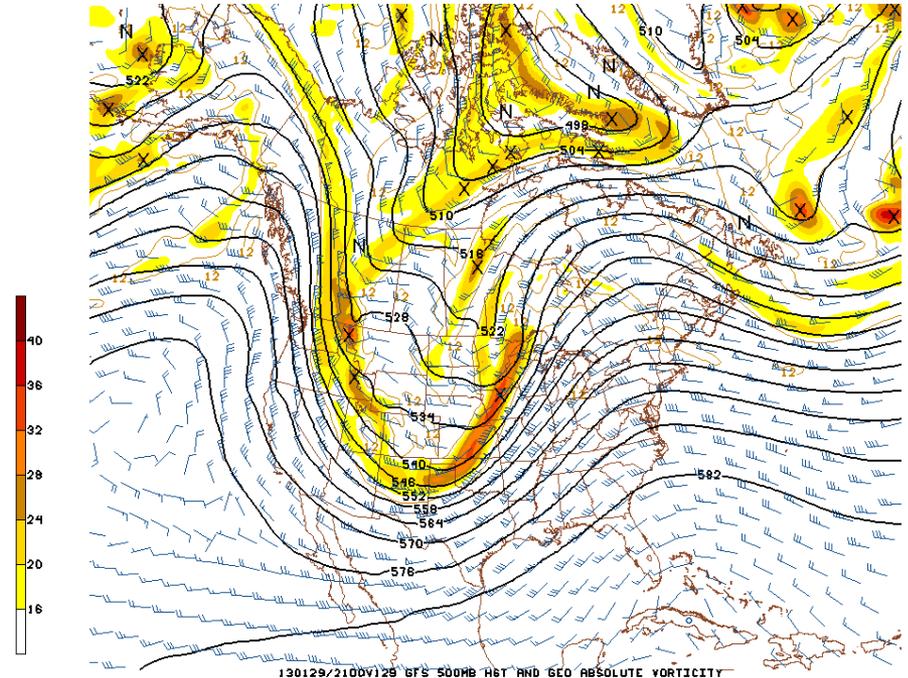
850 mb GFS Tuesday 1 PM

500 mb GFS Tuesday 1 PM

01/24/13 12UTC 129HR FCST VALID TUE 01/29/13 21UTC NCEP/NWS/NOAA



01/24/13 12UTC 129HR FCST VALID TUE 01/29/13 21UTC NCEP/NWS/NOAA



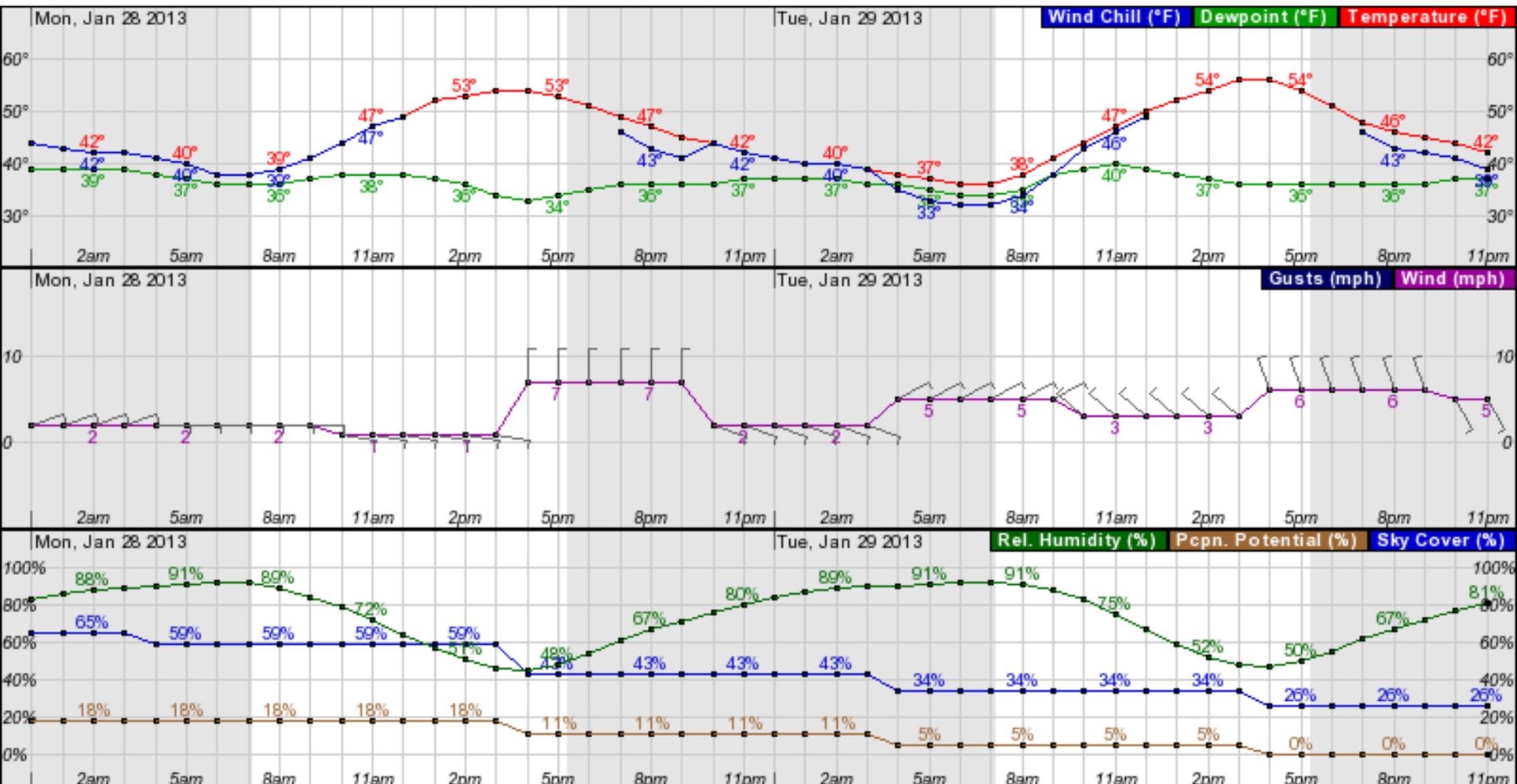
Fresno

Monday: Mostly cloudy.

Tuesday: Partly cloudy.

Monday →

Tuesday →



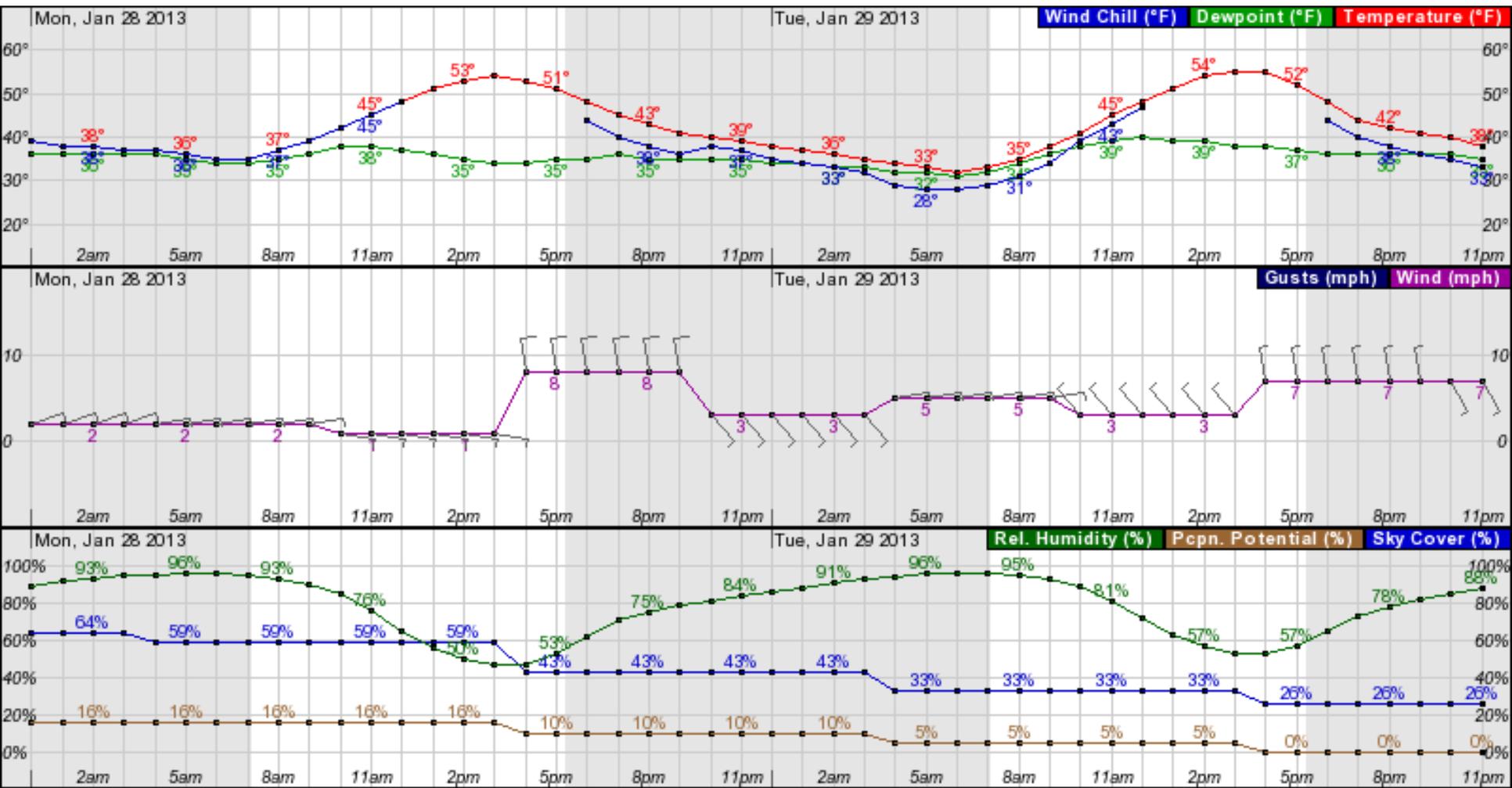
Hanford

Monday: Mostly cloudy.

Tuesday: Partly cloudy.

Monday →

Tuesday →



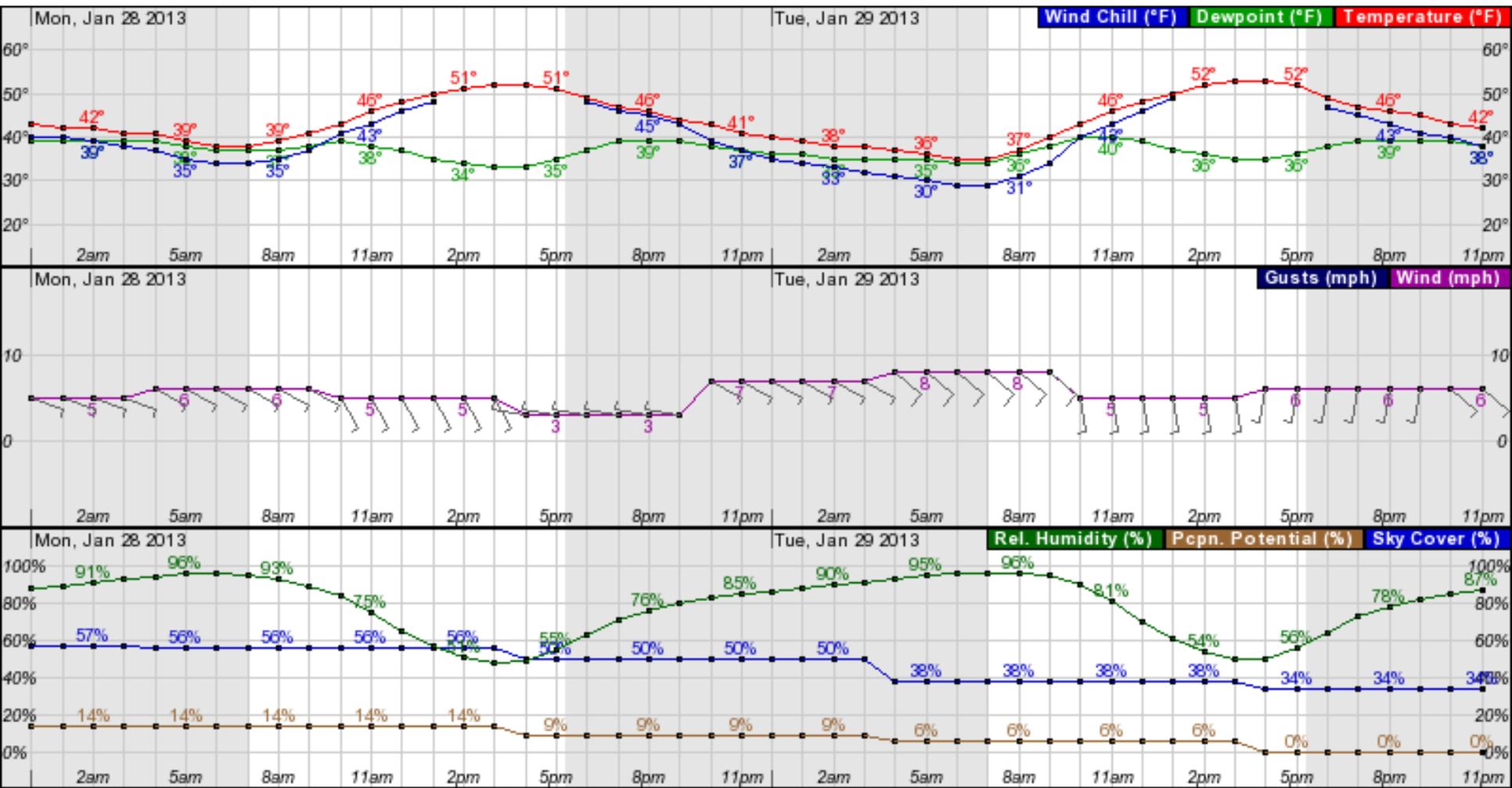
Bakersfield

Monday: Mostly cloudy.

Tuesday: Partly cloudy.

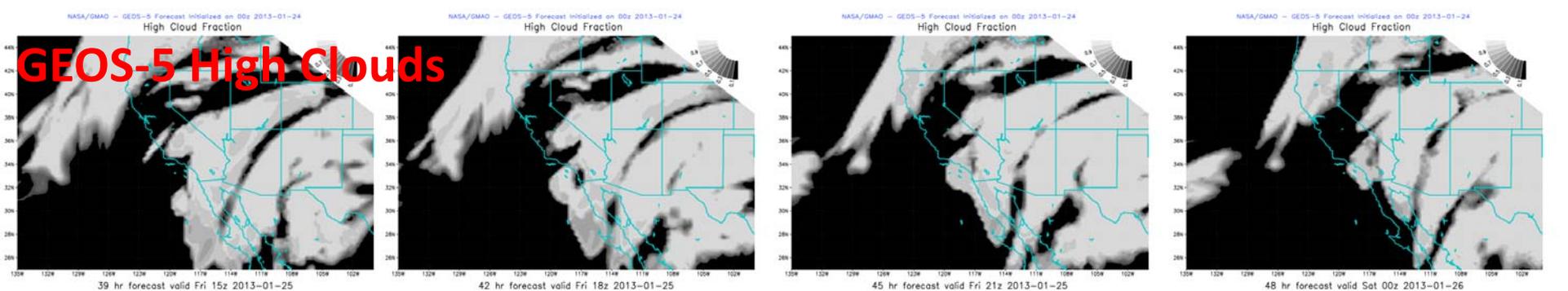
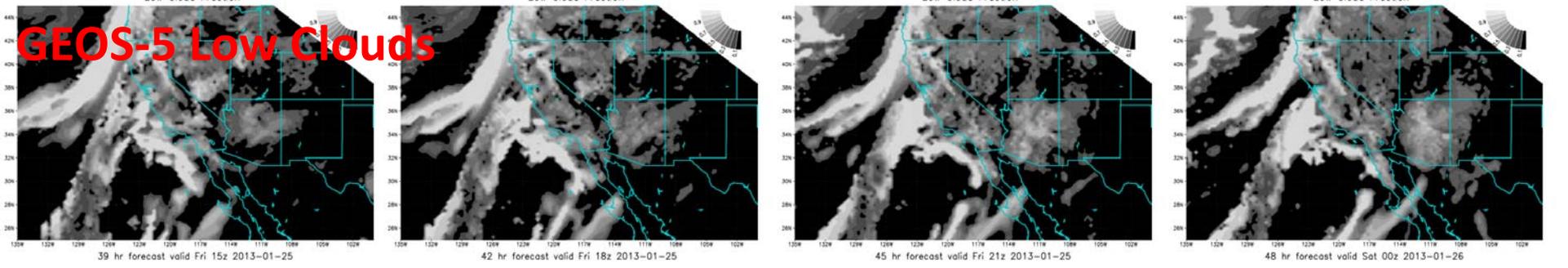
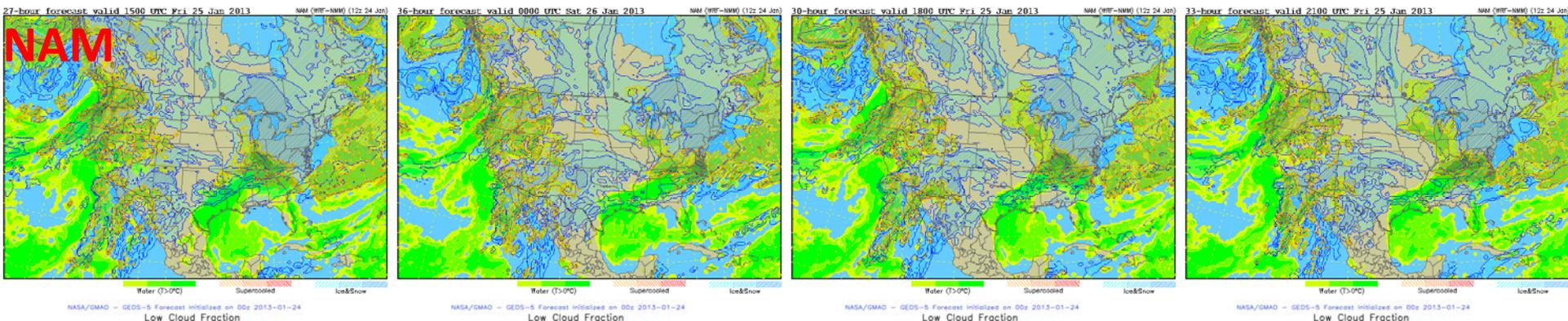
Monday →

Tuesday →



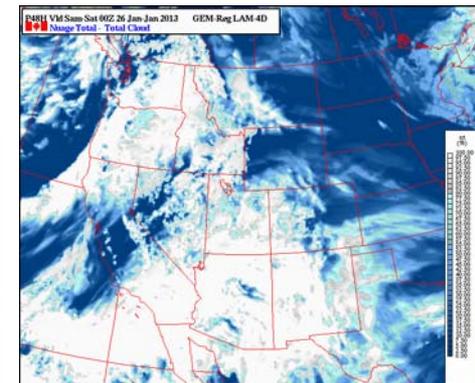
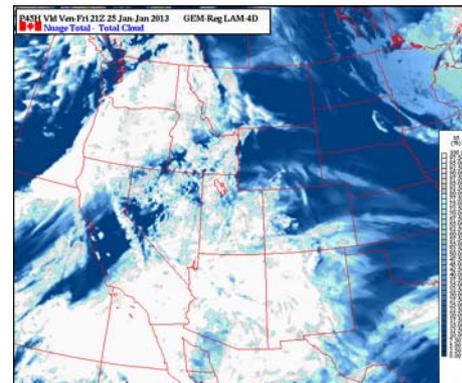
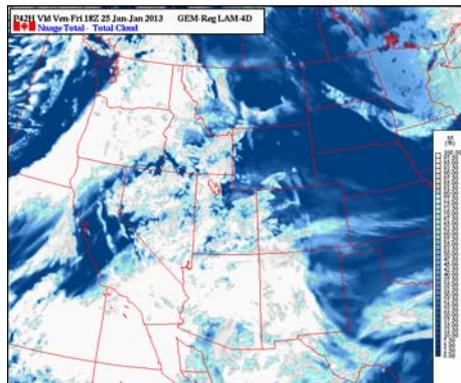
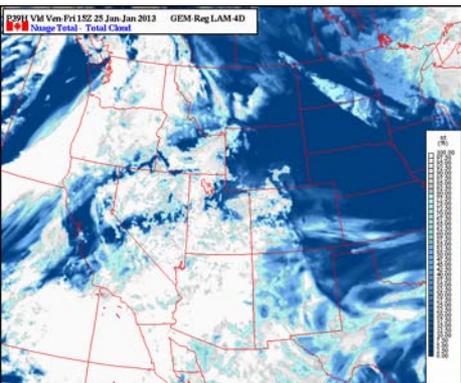
Tomorrow: NAM – mid and high level clouds, low level clearing out by midday; GEOS-5 – low, mid, and high level clouds. Mid level clouds clearing out in the middle of the day.

7 am Integrated liquid and frozen hydrometeors (all levels) **10 am** Integrated liquid and frozen hydrometeors (all levels) **1 pm** Integrated liquid and frozen hydrometeors (all levels) **4 pm** Integrated liquid and frozen hydrometeors (all levels)

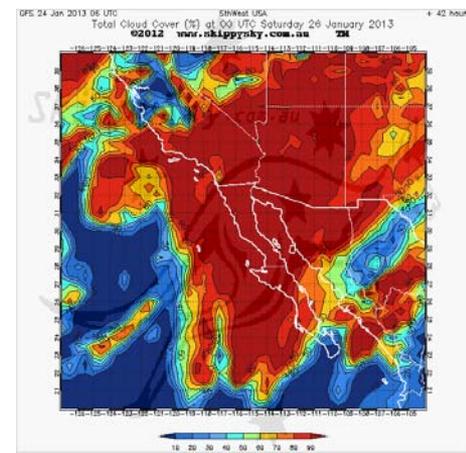
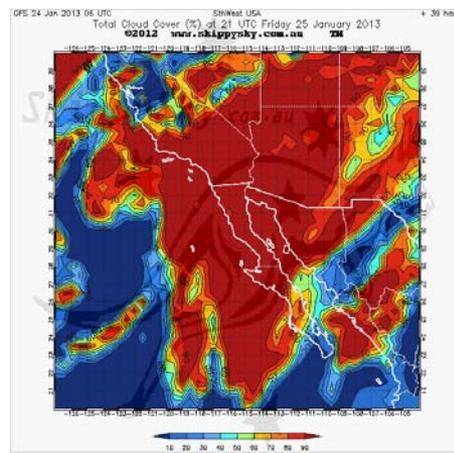
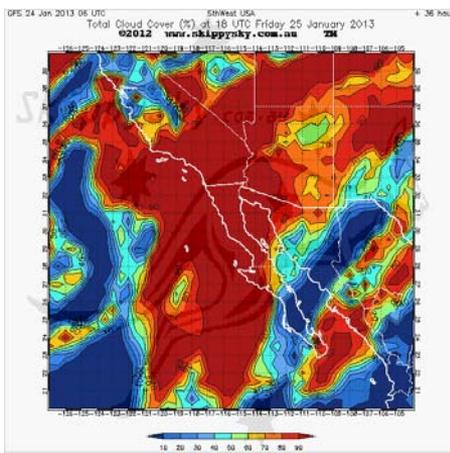
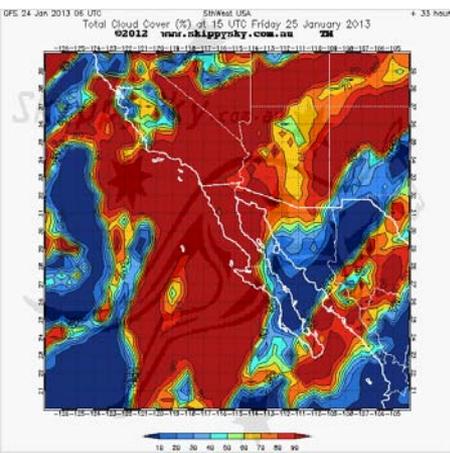


Tomorrow: Canadian model and GFS – cloudy.

7 am
Canadian



GFS



Sunday: NAM – low and mid level clouds around SJV, High level towards southern end of SJV towards 4p
 GEOS-5 – low level clouds over SJV early, no mid/high level clouds.

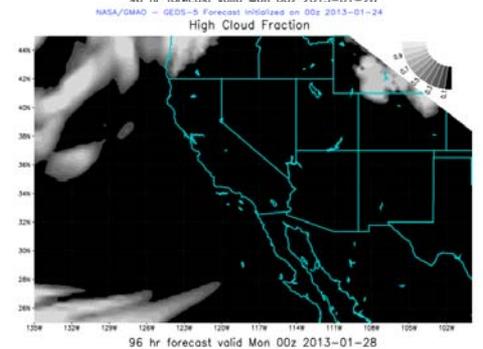
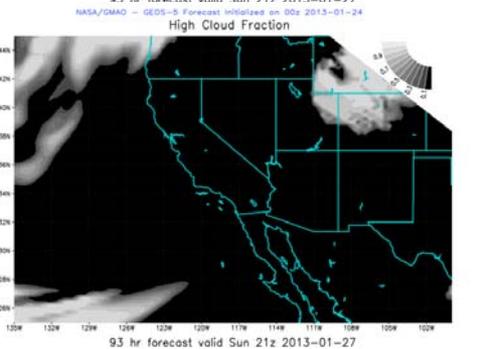
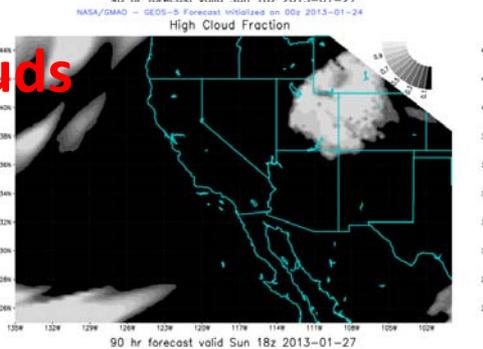
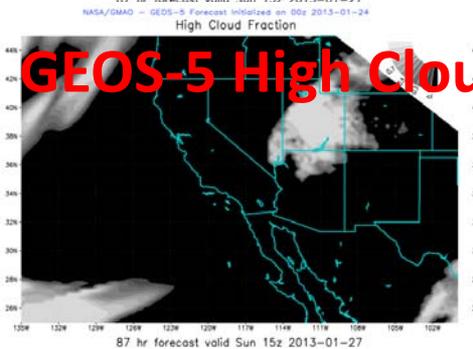
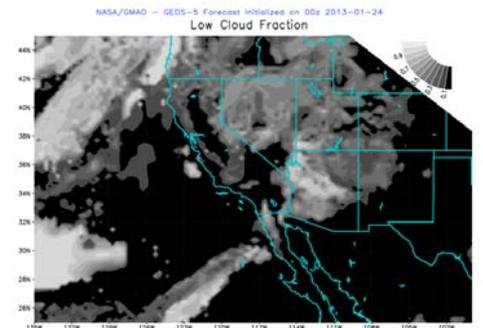
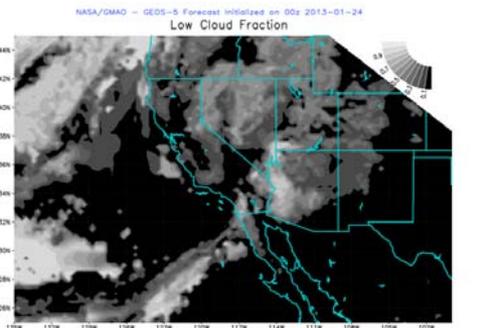
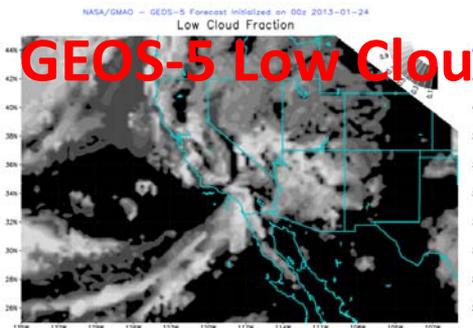
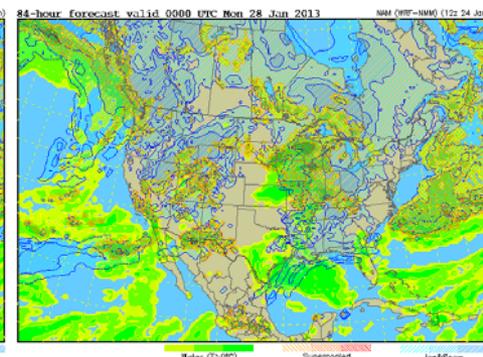
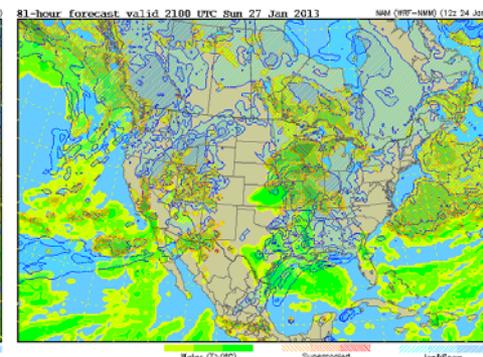
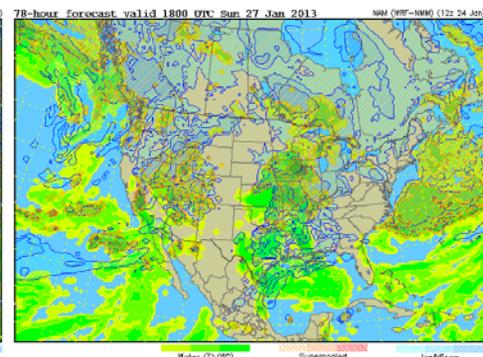
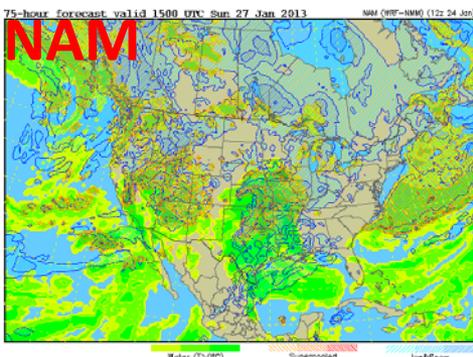
7 am

10 am

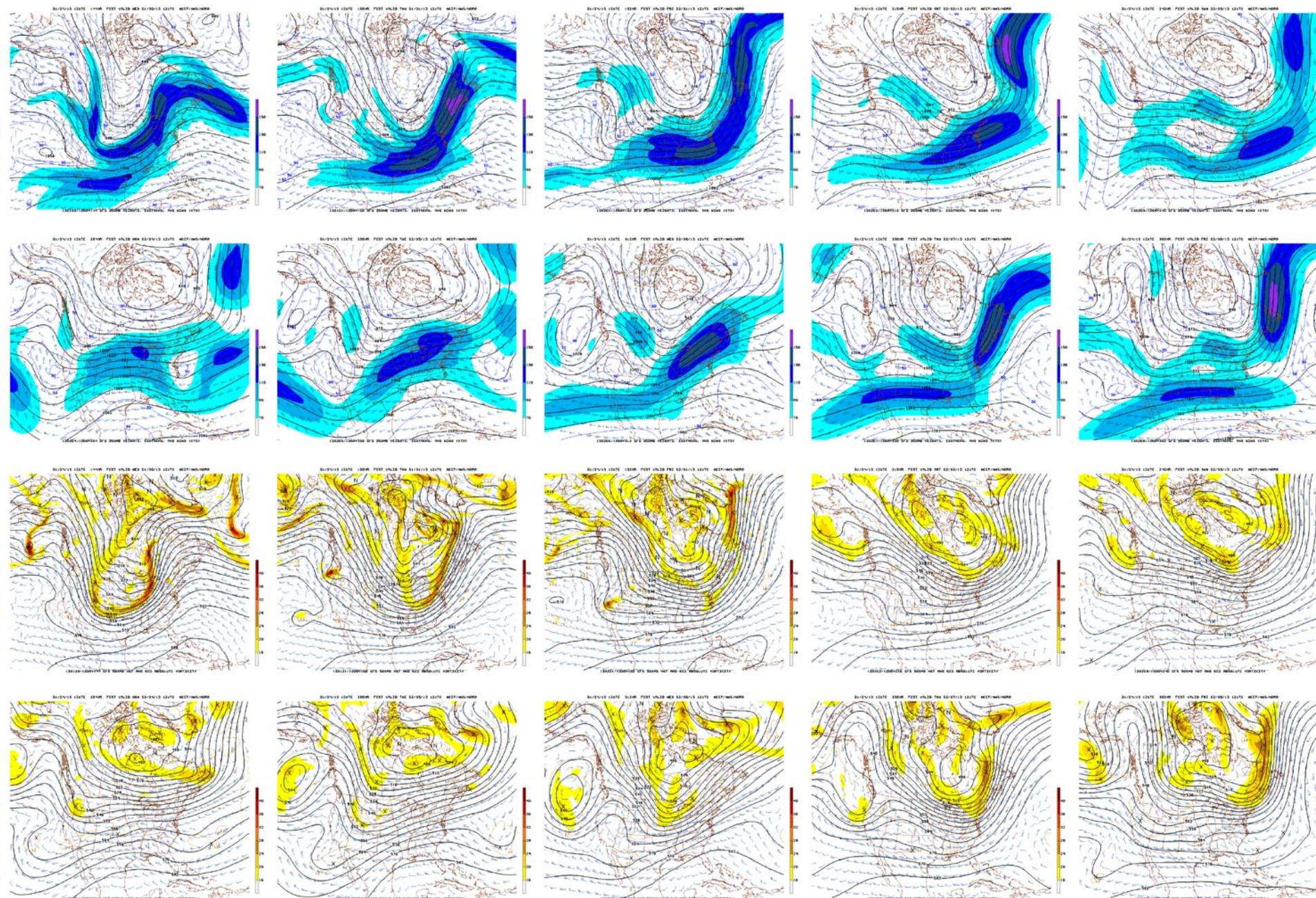
1 pm

4 pm

Integrated liquid and frozen hydrometeors (all levels)



Wed 30 Jan – Fri 8 Feb: 250 mb (top 2 rows) and 500 mb (bottom 2 rows) charts



[AREA FORECAST DISCUSSION](#)...UPDATED

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

737 AM [PST](#) THU JAN 24 2013

.UPDATE...

UPDATED FORECAST TO INCREASE [POPS](#) AND [QPF](#) AND LOWER [TEMPS](#) TODAY.

.SYNOPSIS...

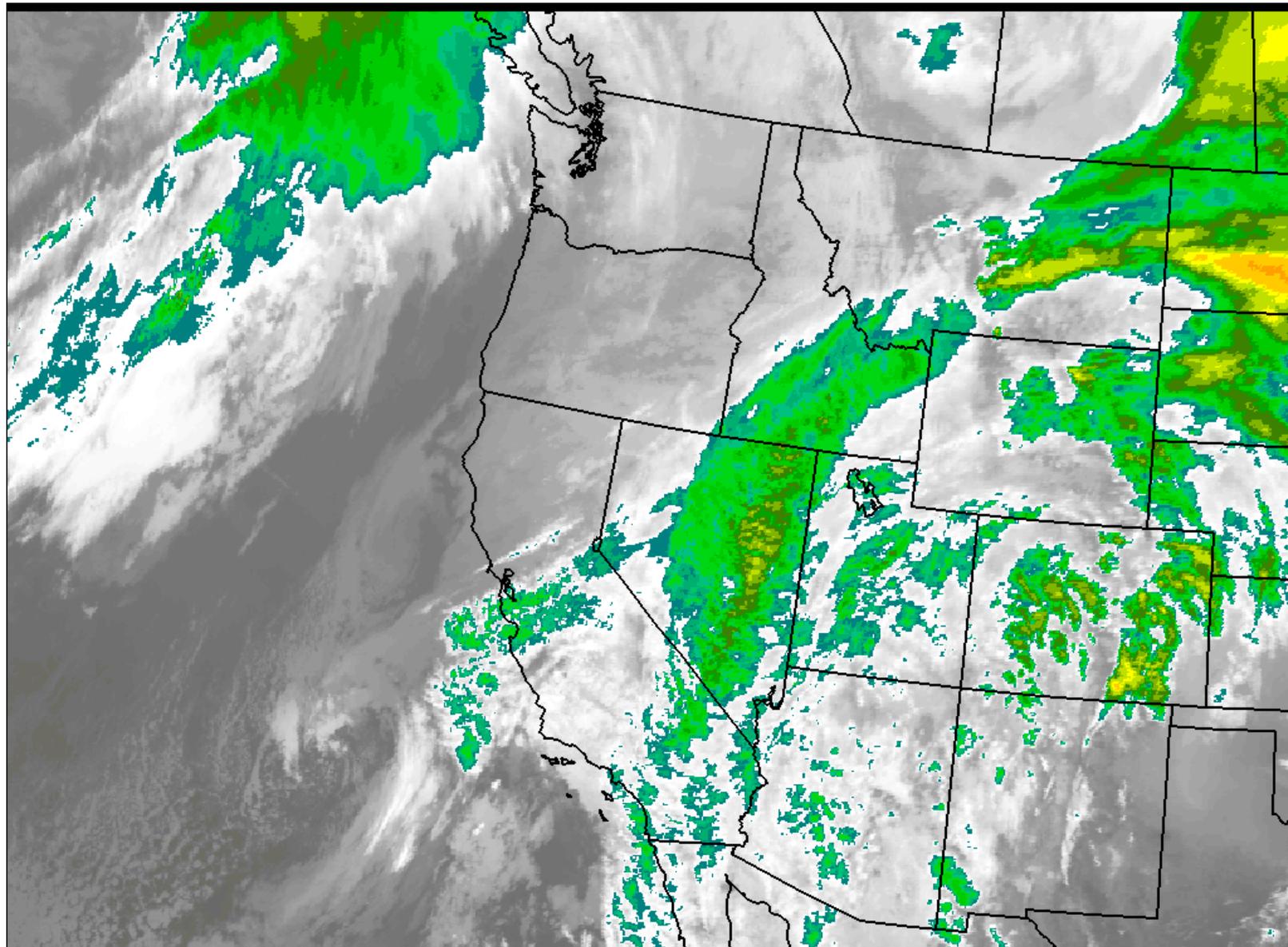
SEVERAL WEATHER DISTURBANCES ASSOCIATED WITH AN UPPER-LEVEL LOW STAYING OFF THE COAST OF CALIFORNIA WILL MOVE OVER THE REGION DURING THE NEXT FEW DAYS. OFF AND ON CHANCES OF [PRECIPITATION](#) WILL CONTINUE THROUGH EARLY NEXT WEEK.

&&

.DISCUSSION...

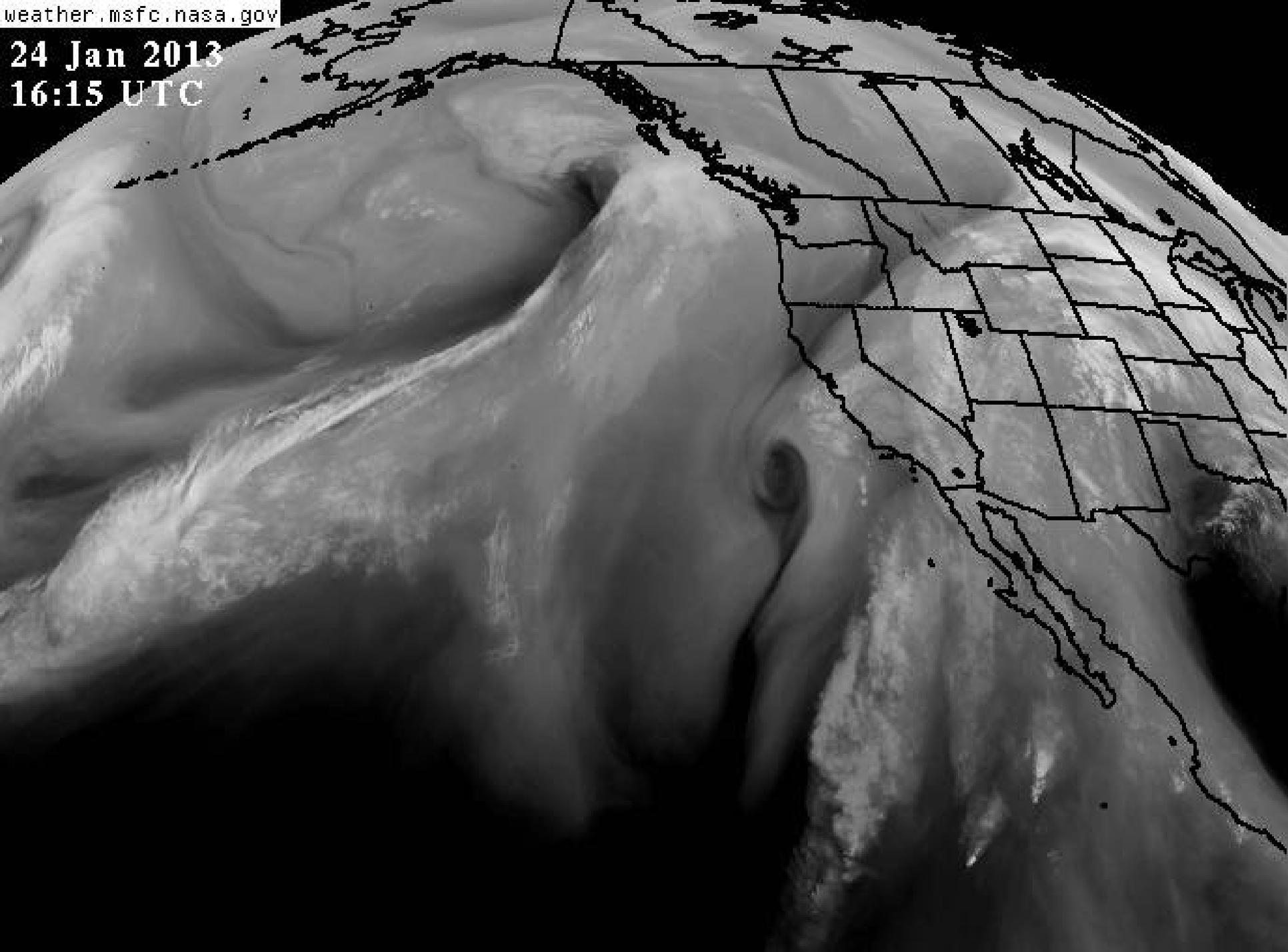
MODELS HAD A TOUGH TIME TRYING TO FIGURE THIS ONE OUT. PLENTY OF SUN TROPICAL [MOISTURE](#) SURGING AROUND AN UPPER LOW CENTER OFF THE CA COAST WILL KEEP SHOWERS AROUND TODAY. [QPF](#) WILL BE GENERALLY LIGHT IN THE VALLEY BUT UP TO ONE QUARTER OF AN INCH IS POSSIBLE IN THE FOOTHILLS. SNOW LEVEL REMAIN HIGH WITH THIS SYSTEM.

[WIND ADVISORY](#) IS STILL IN EFFECT FOR THE KERN COUNTY MOUNTAINS AS DOWNSLOPING THROUGH THE TEJON PASS IS PROVIDING GUSTY WINDS. WILL CONTINUE TO MONITOR AND SEE WHAT THE WINDS DO THIS AFTERNOON.



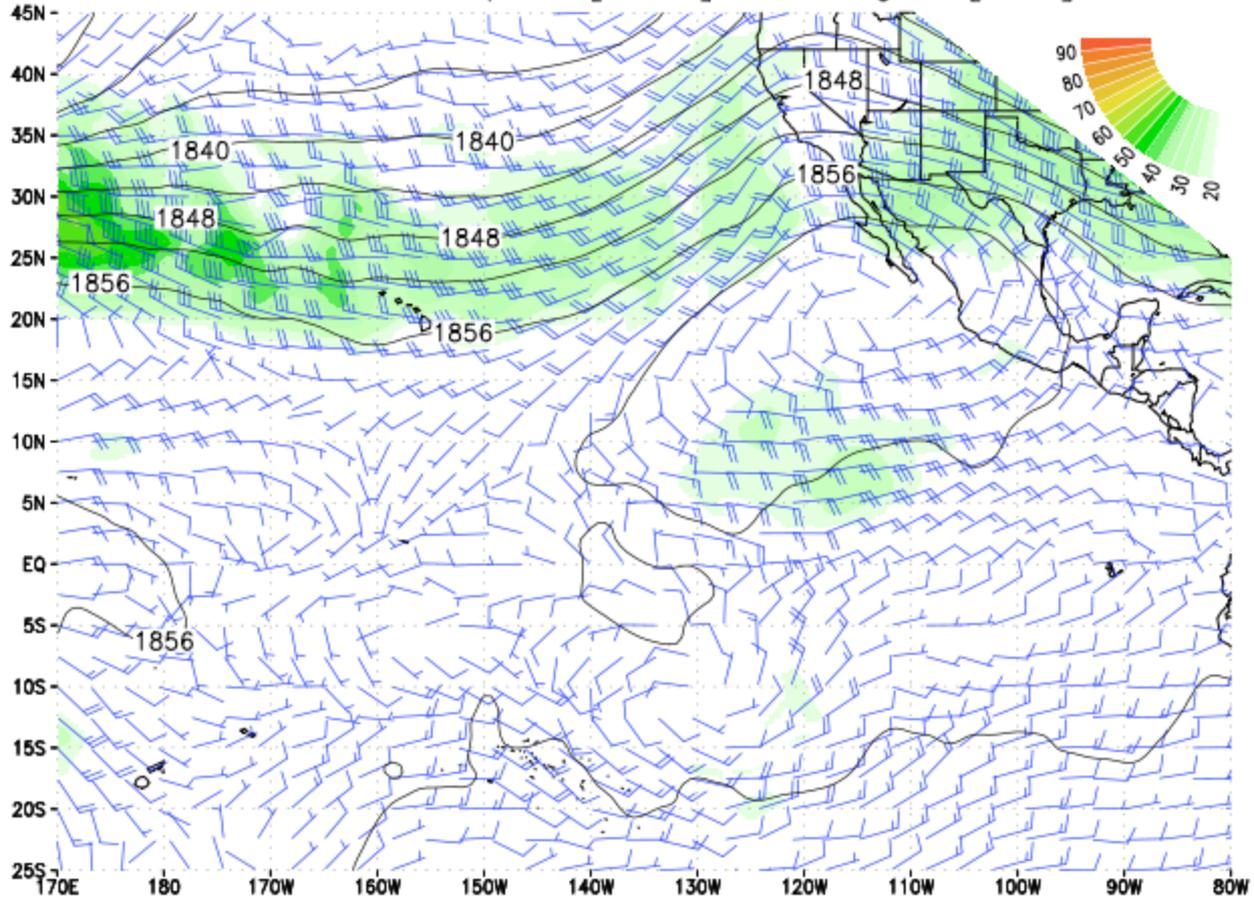
130124/1500 GOES15 IR4

24 Jan 2013
16:15 UTC



NASA/GMAO - GEOS-5 Forecast Initialized on 00z 2013-01-24

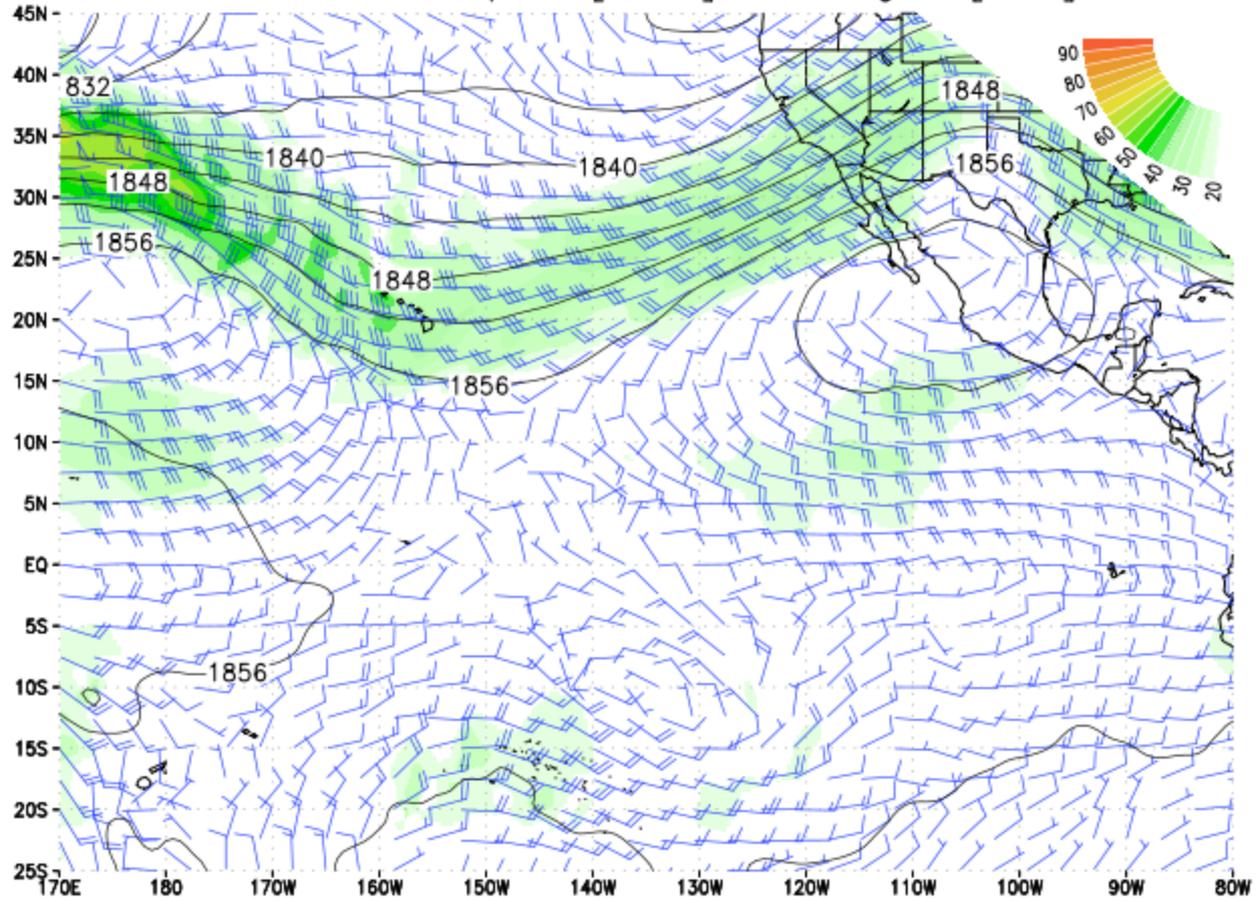
70 hPa Wind Speed [knots] and Heights [dam]



42 hr forecast valid Fri 18z 2013-01-25

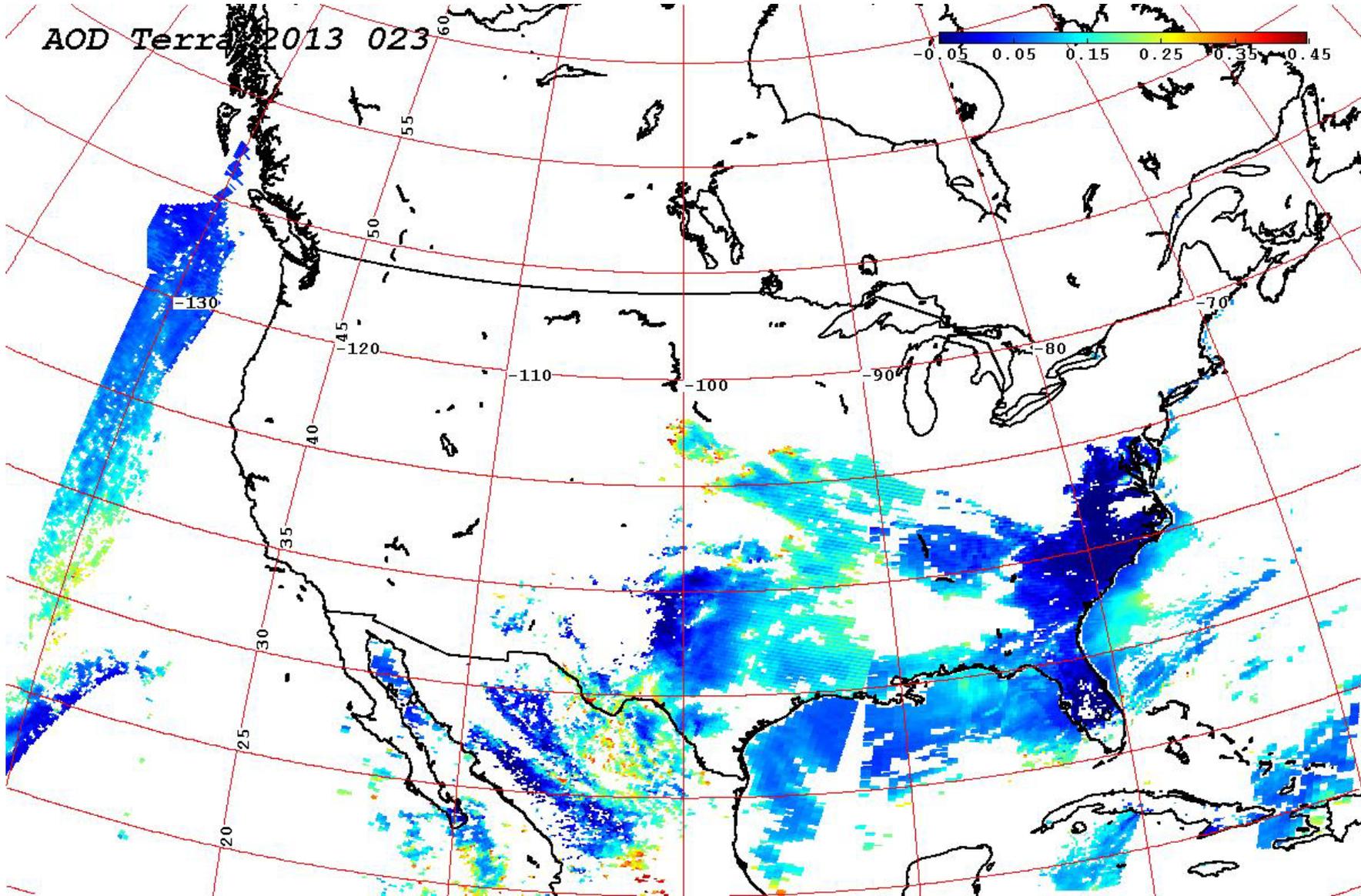
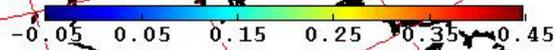
NASA/GMAO - GEOS-5 Forecast Initialized on 00z 2013-01-24

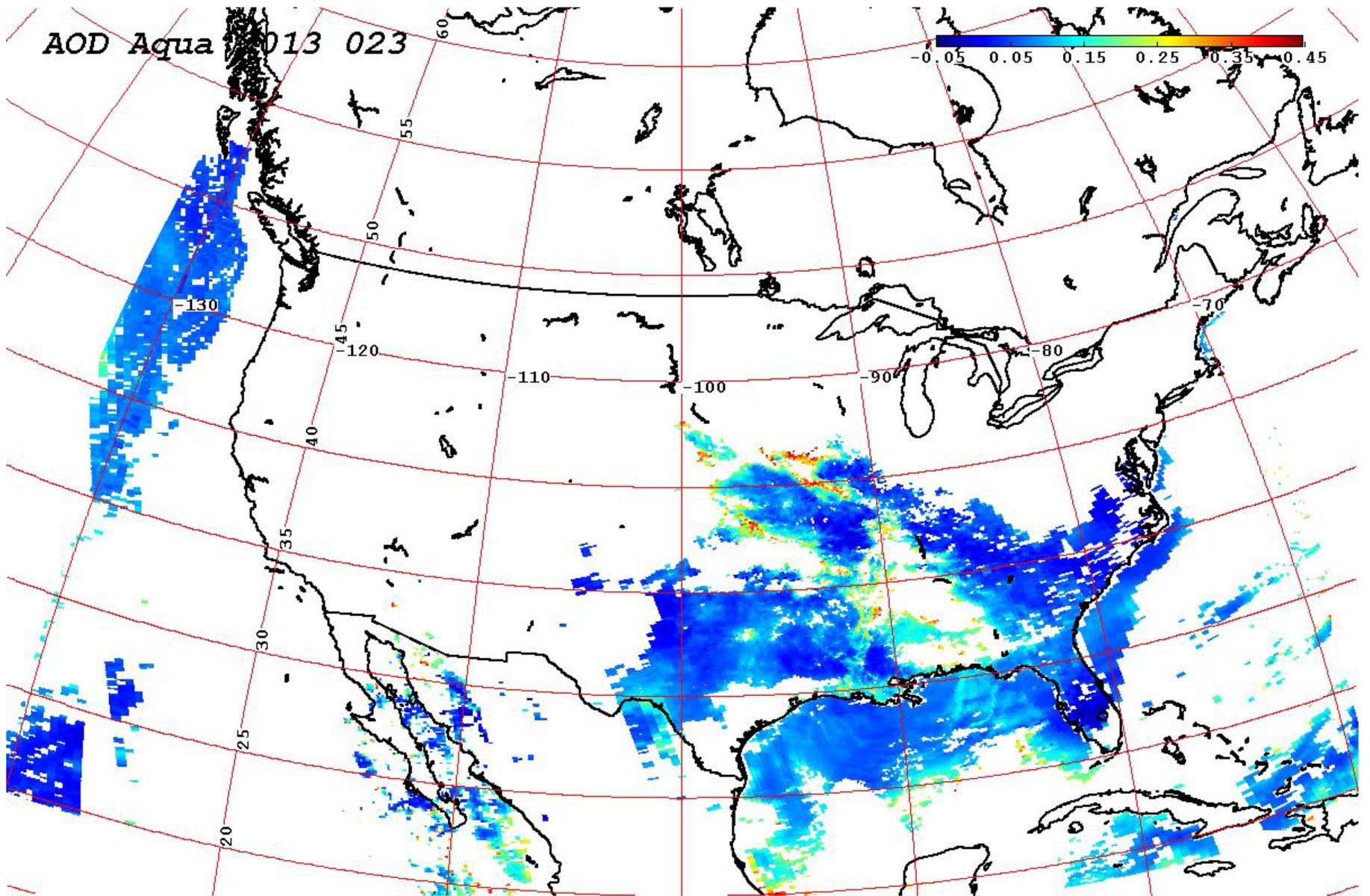
70 hPa Wind Speed [knots] and Heights [dam]



66 hr forecast valid Sat 18z 2013-01-26

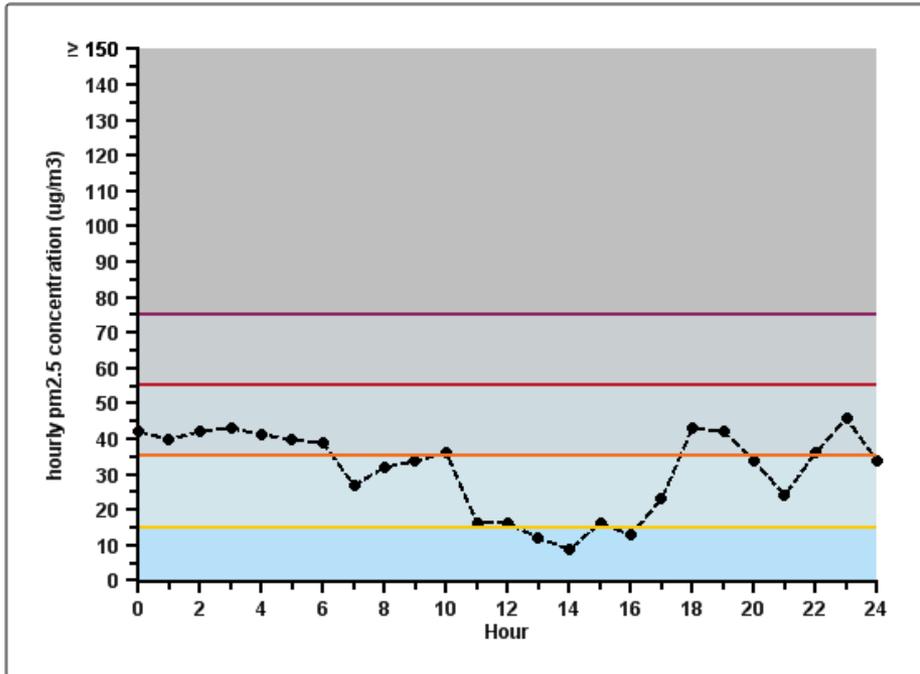
AOD Terra 2013 023



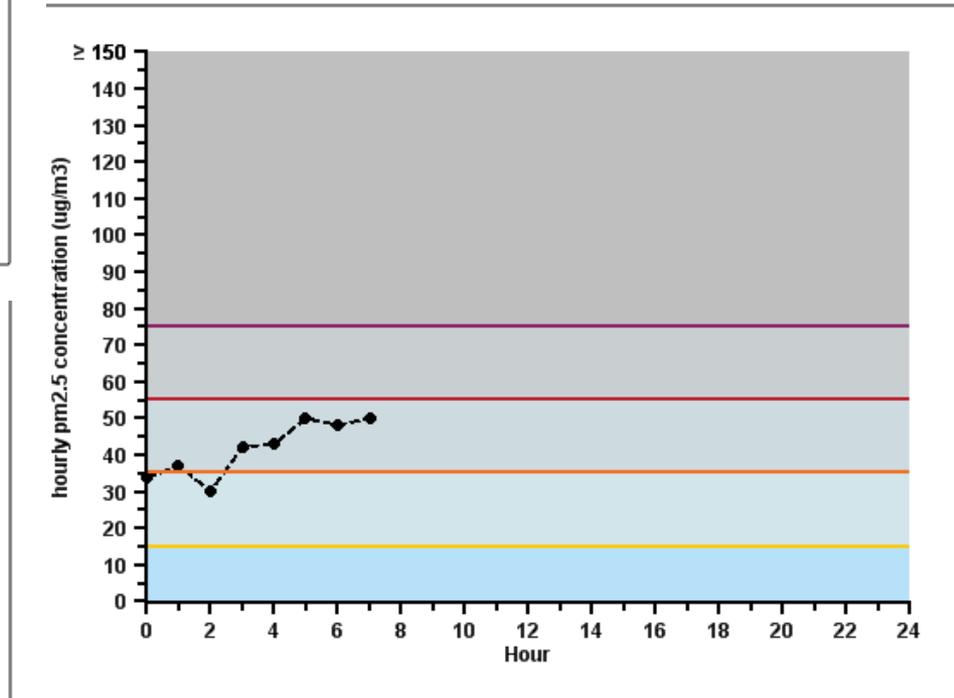


Fresno – Jan. 23rd & 24th

Air District Real-Time Outdoor Activity Risk

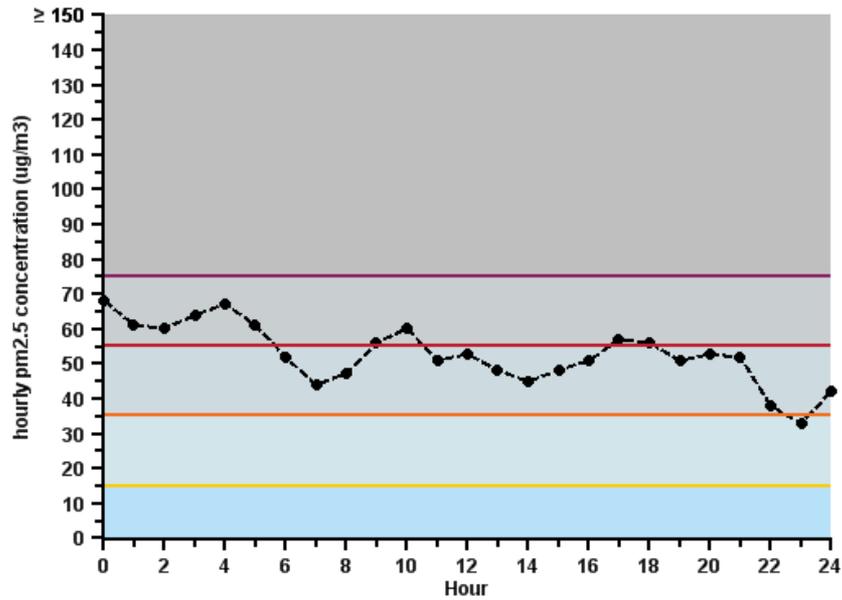


Air District Real-Time Outdoor Activity Risk

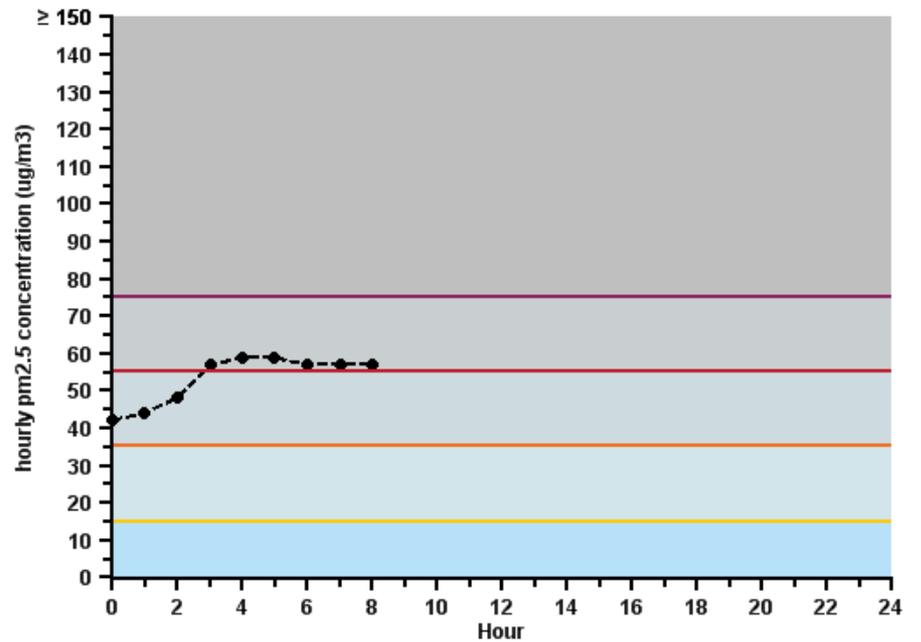


Corcoran – Jan. 23rd & 24th

Air District Real-Time Outdoor Activity Risk

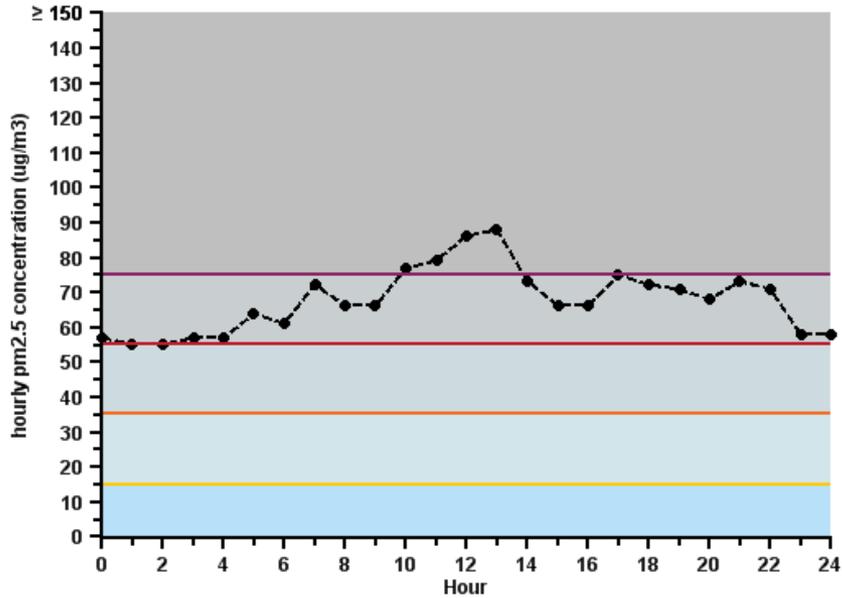


Air District Real-Time Outdoor Activity Risk

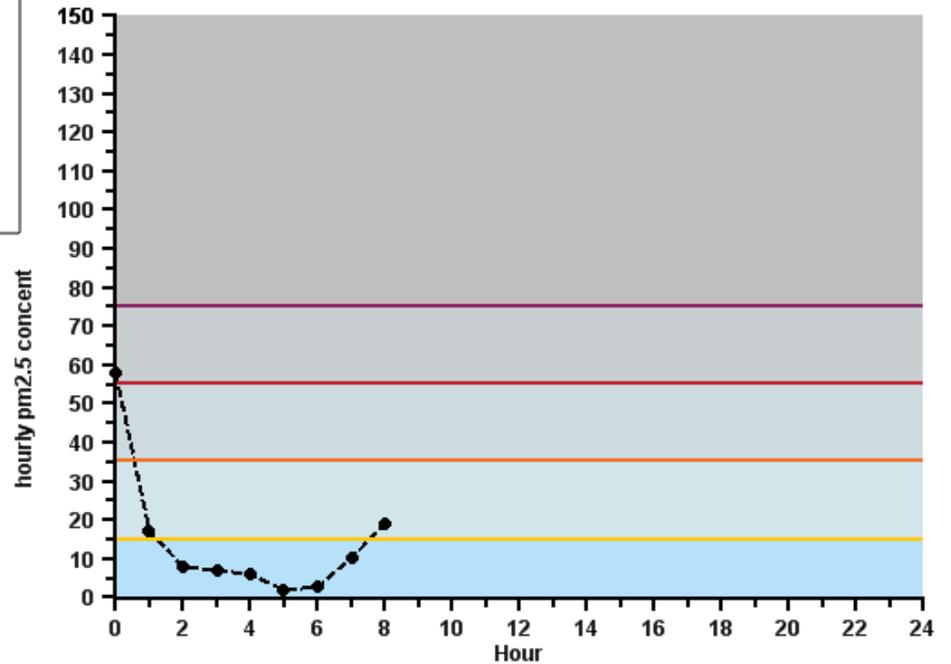


Bakersfield – Jan. 23rd & 24th

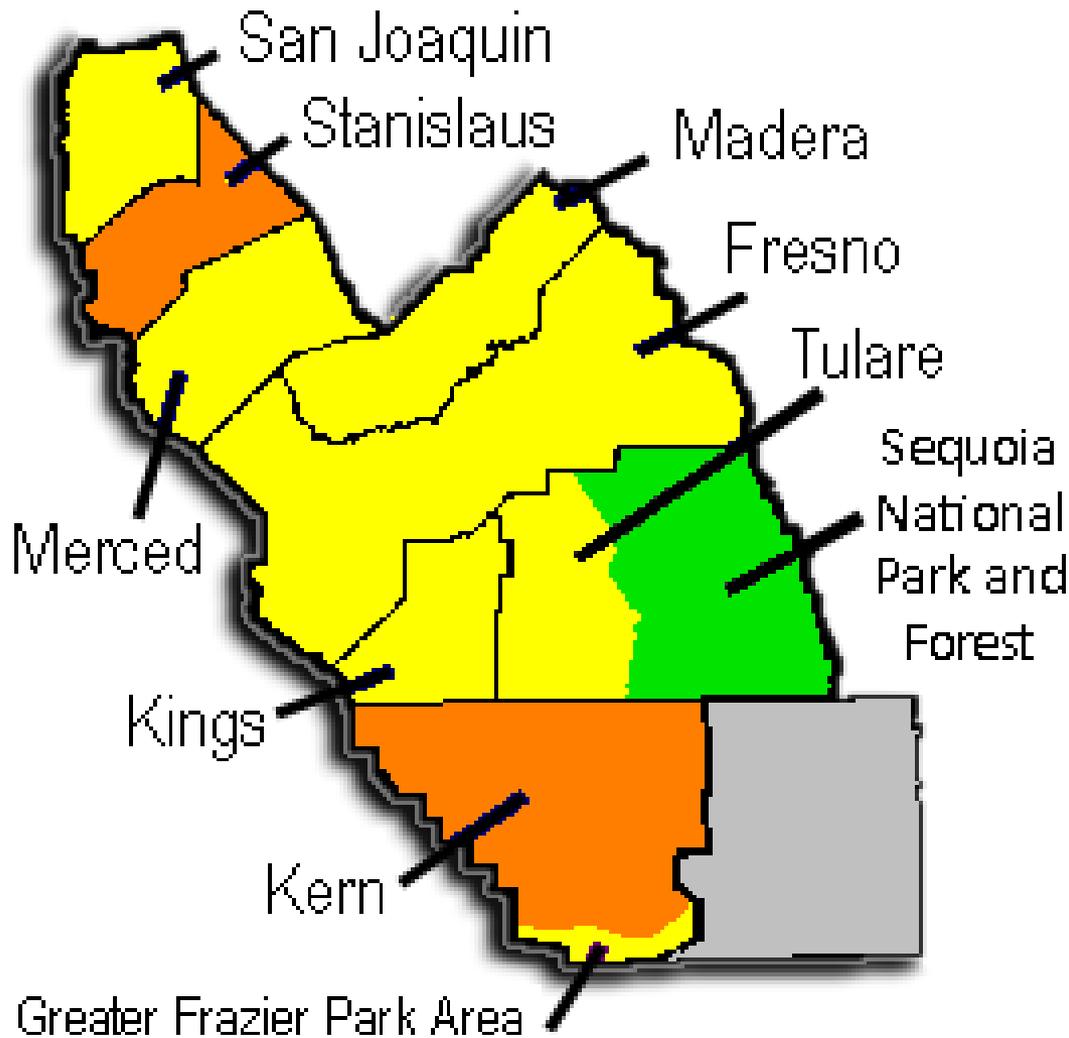
Air District Real-Time Outdoor Activity Risk



Air District Real-Time Outdoor Activity Risk



SJV APCD Daily Forecast – for TODAY (Jan 24)

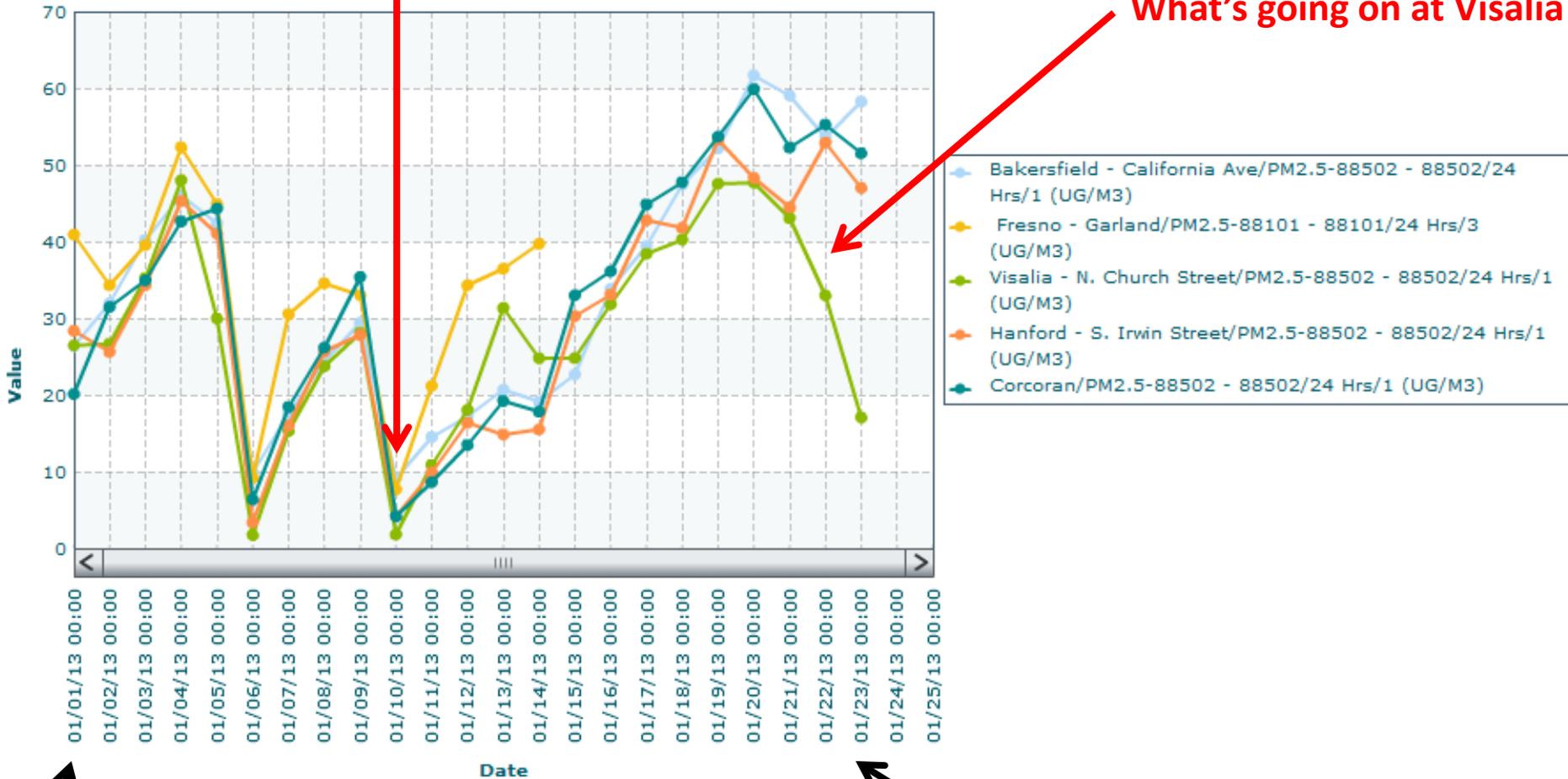


| ROAR LEVEL | Ozone (O ³) | Particulate Matter (PM 2.5) |
|--|-------------------------|-----------------------------|
| LEVEL 1 Good | 1-59 ppb | 1-15 µg/m ³ |
| LEVEL 2 Moderate | 60-75 ppb | 16-35 µg/m ³ |
| LEVEL 3 Unhealthy for Sensitive Groups | 76-95 ppb | 36-55 µg/m ³ |
| LEVEL 4 Unhealthy |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

Daily PM2.5: AirNowTech Sites

General increasing trend since January 10th.

What's going on at Visalia?

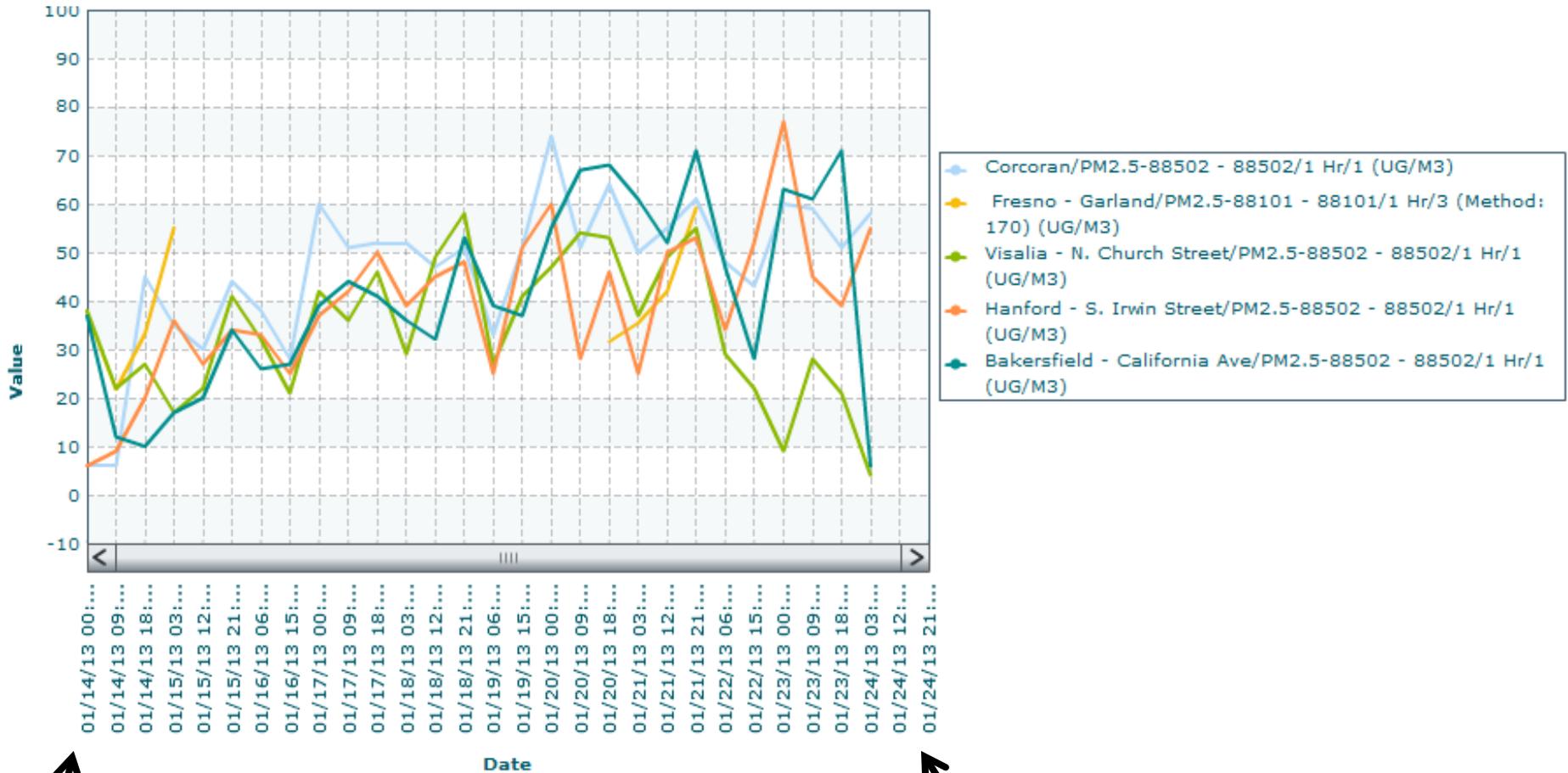


Jan. 1st

Jan. 23rd

Hourly PM2.5: AirNowTech Sites

PM2.5 dropping due to rain this morning.

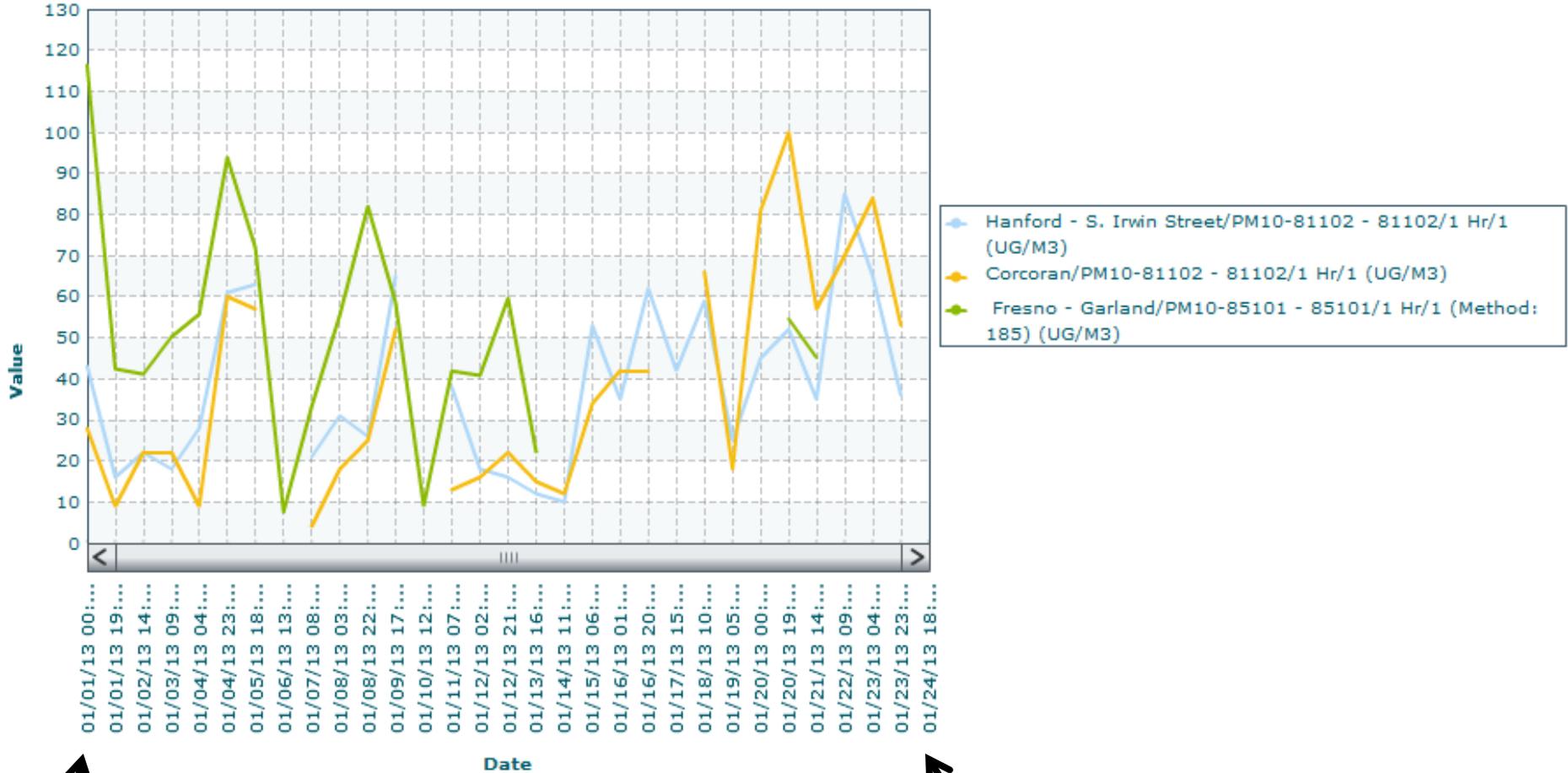


Jan. 14th

Jan. 24th

Hourly PM10: AirNowTech Sites

PM2.5 dropping due to rain this morning.

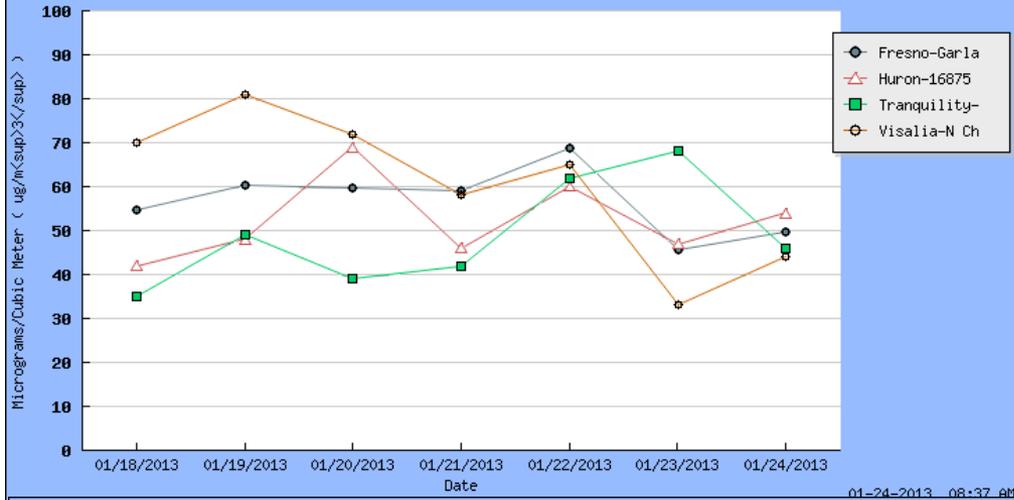


Jan. 1st

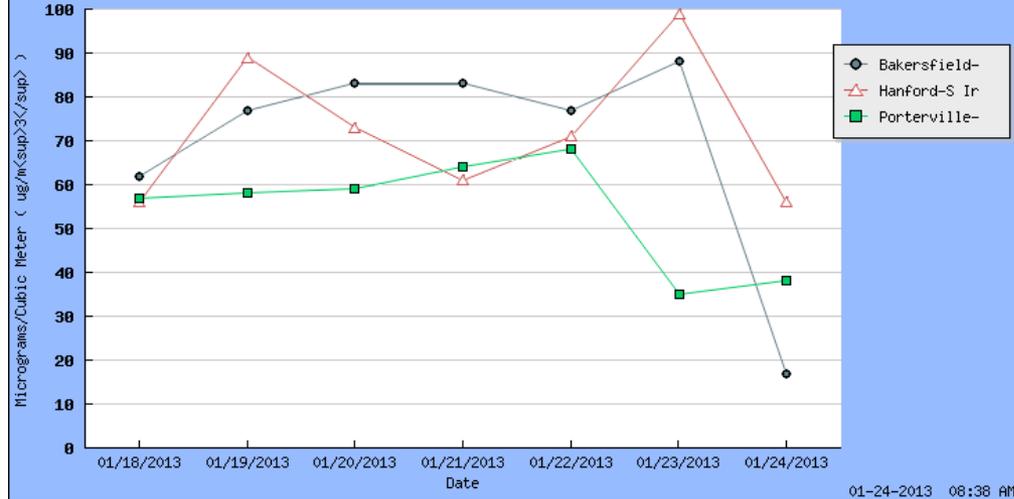
Jan. 24th

Daily PM2.5 & PM10: CARB Sites

Daily Max 1 Hr Avg PM25 Values



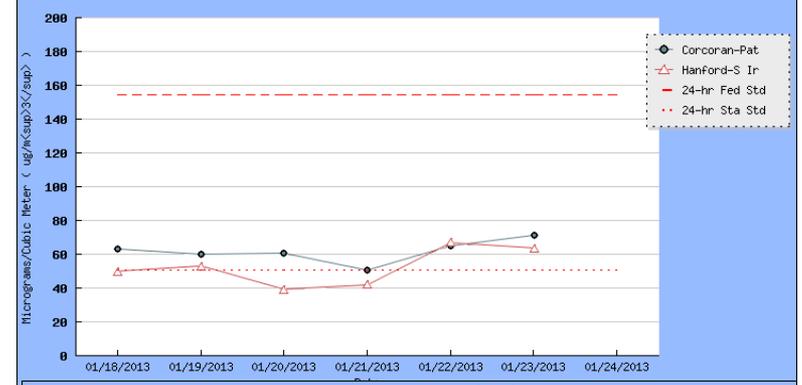
Daily Max 1 Hr Avg PM25 Values



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



Daily Average PM10 (TEOM) Values

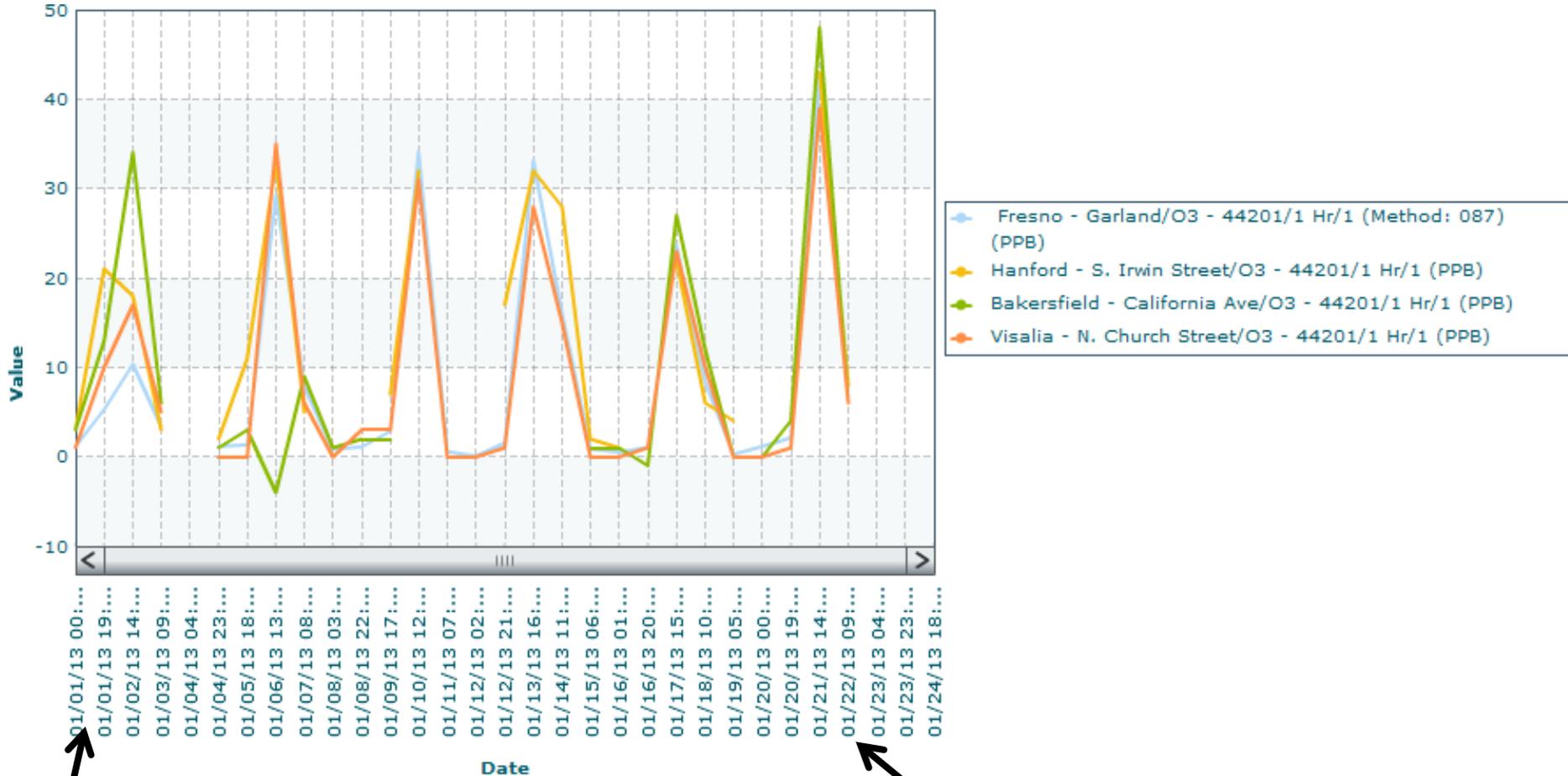


Daily Max 1 Hr Avg PM10 (Std) Values



Hourly Ozone: AirNowTech Sites

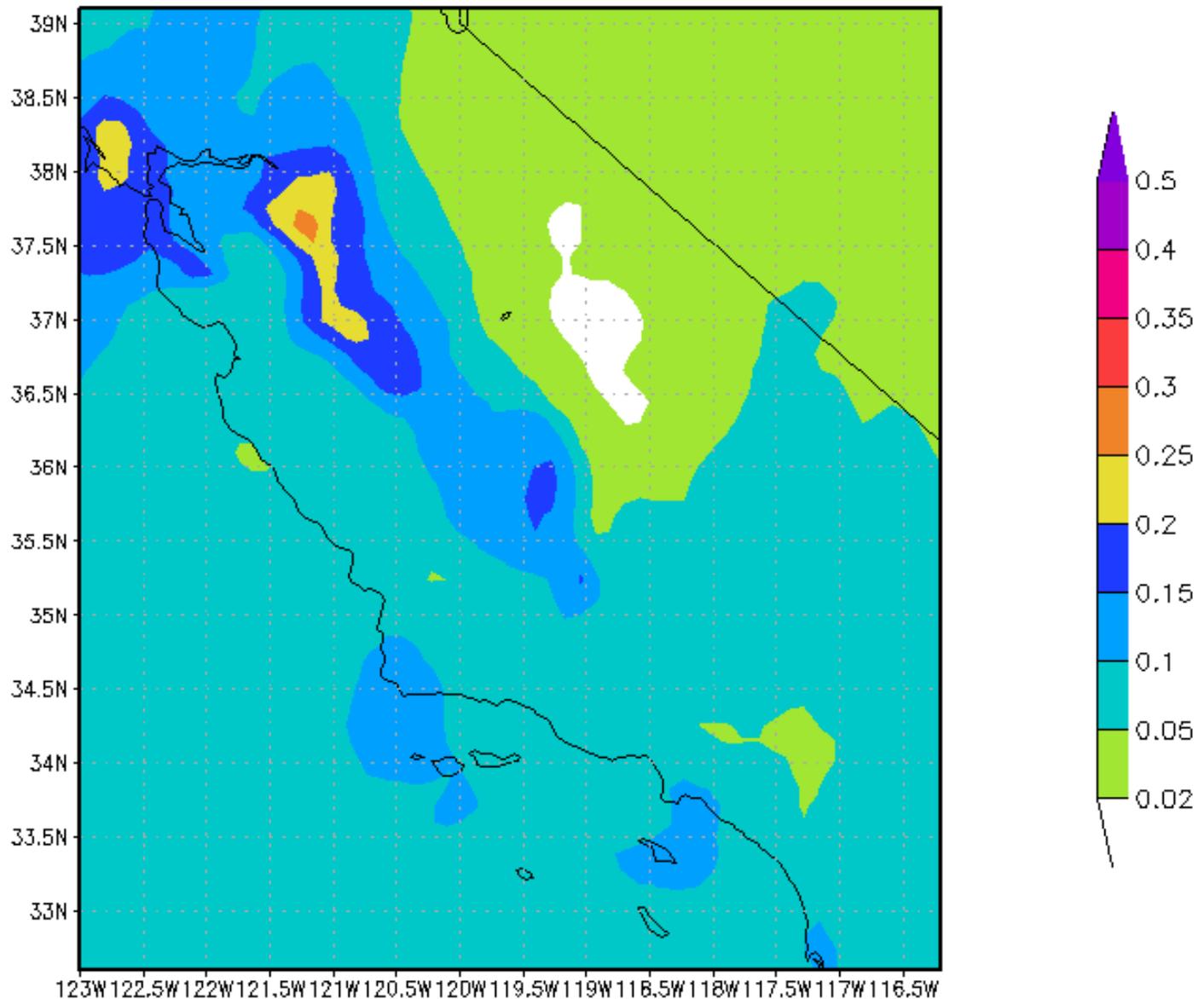
Ozone high on 21st, which is possibly consistent with TES????



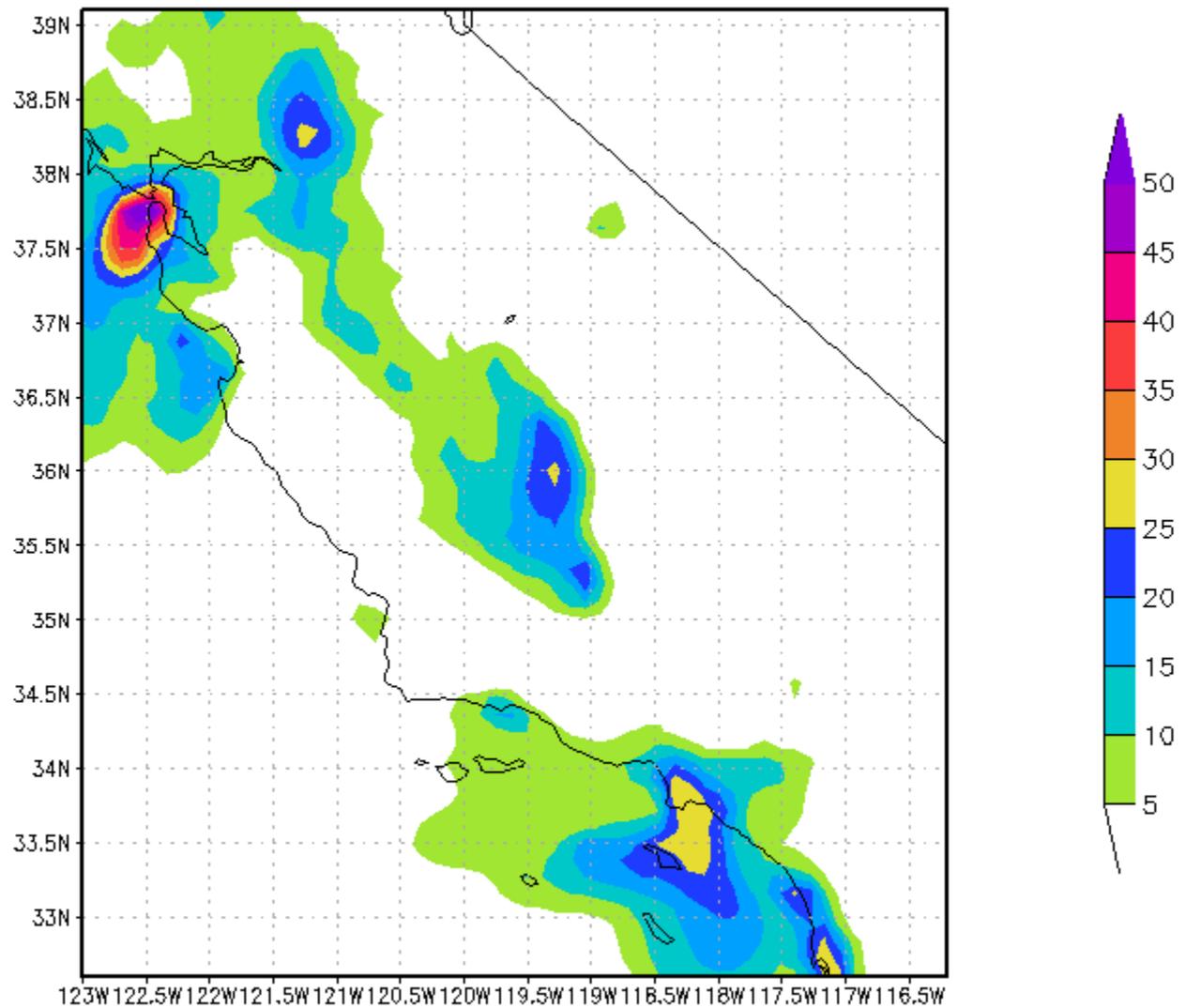
Jan. 1st

Jan. 22nd

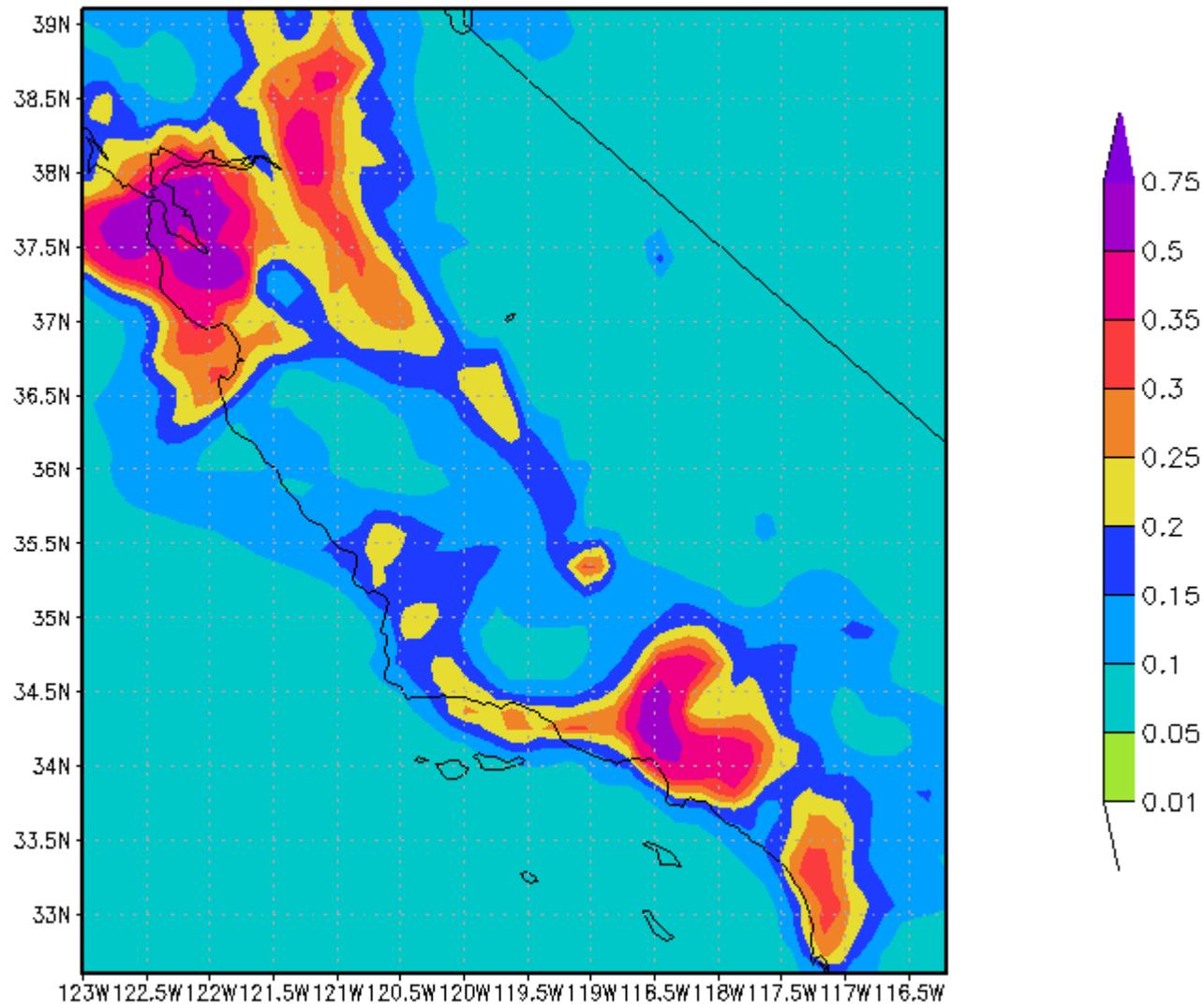
Column AOD [Dimensionless] at surface Valid 18 JAN 25 2013



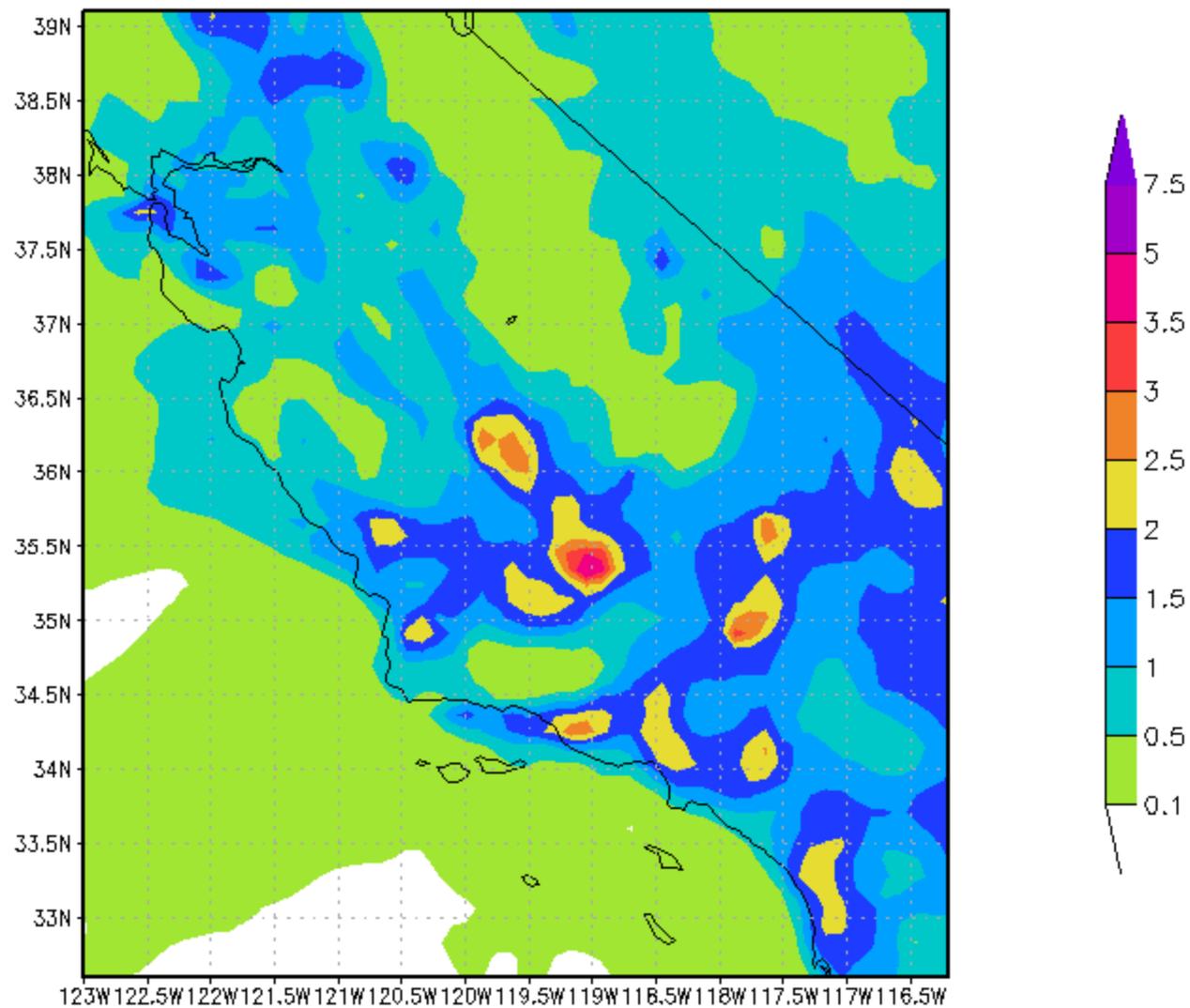
PM25 [$\mu\text{g}/\text{m}^3$] at surface Valid 18 JAN 25 2013



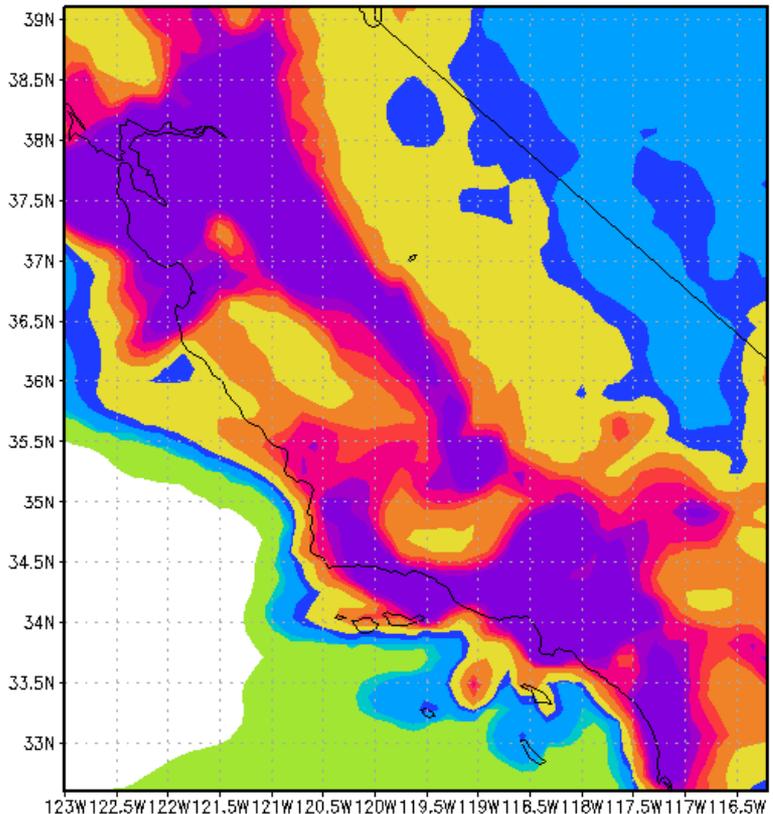
CO [ppm] at 1013 [hPa] Valid 18 JAN 25 2013



FORM [ppb] at 1013 [hPa] Valid 18 JAN 25 2013



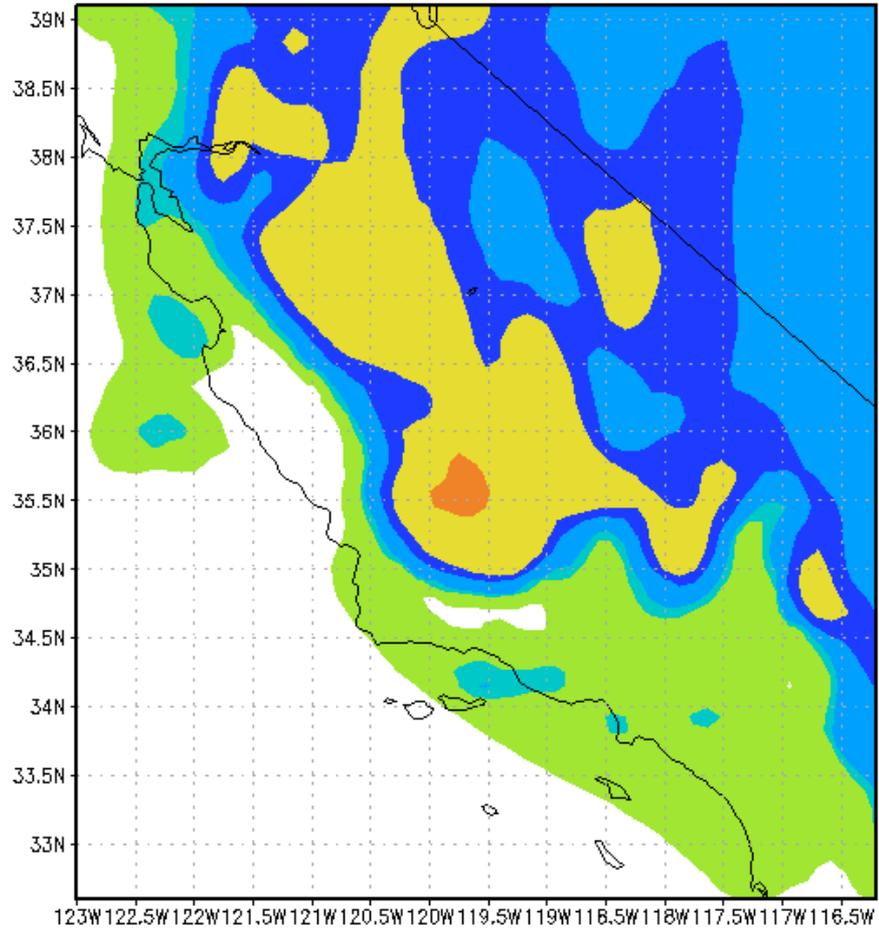
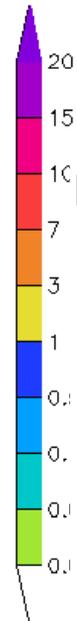
NO2 [ppb] at 1013 [hPa] Valid 18 JAN 25 2013



Surface

900 mb

NO2 [ppb] at 900 [hPa] Valid 18 JAN 25 2013

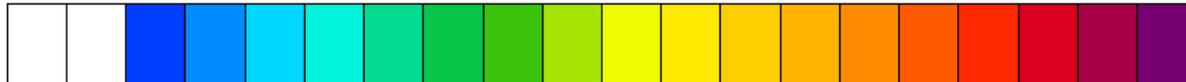
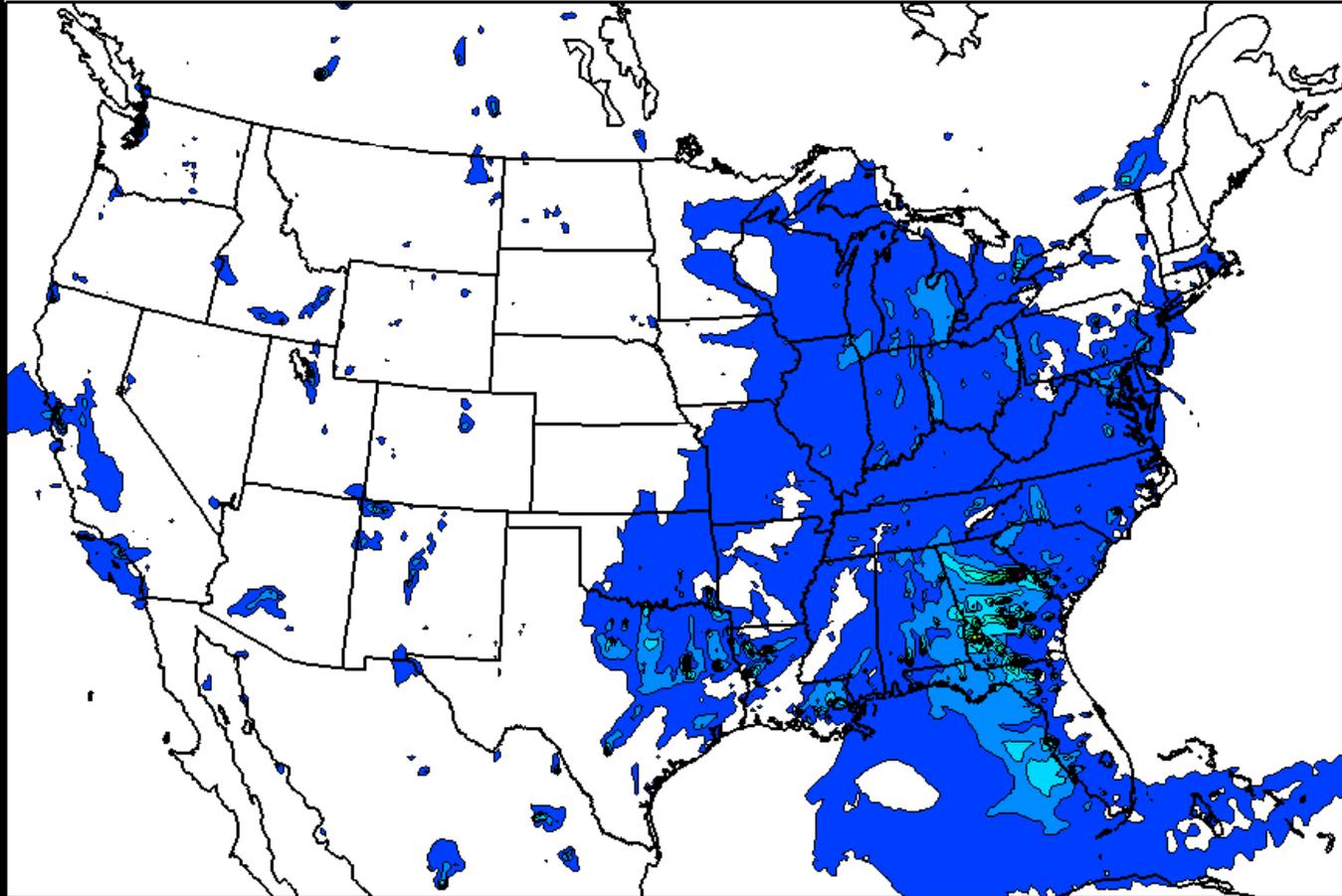


18Z Tomorrow - Friday

2013_01_24_00 FORECAST 42 FIELD PM2_5_DRY AT 0

pm2.5 aerosol dry mass

ug m⁻³

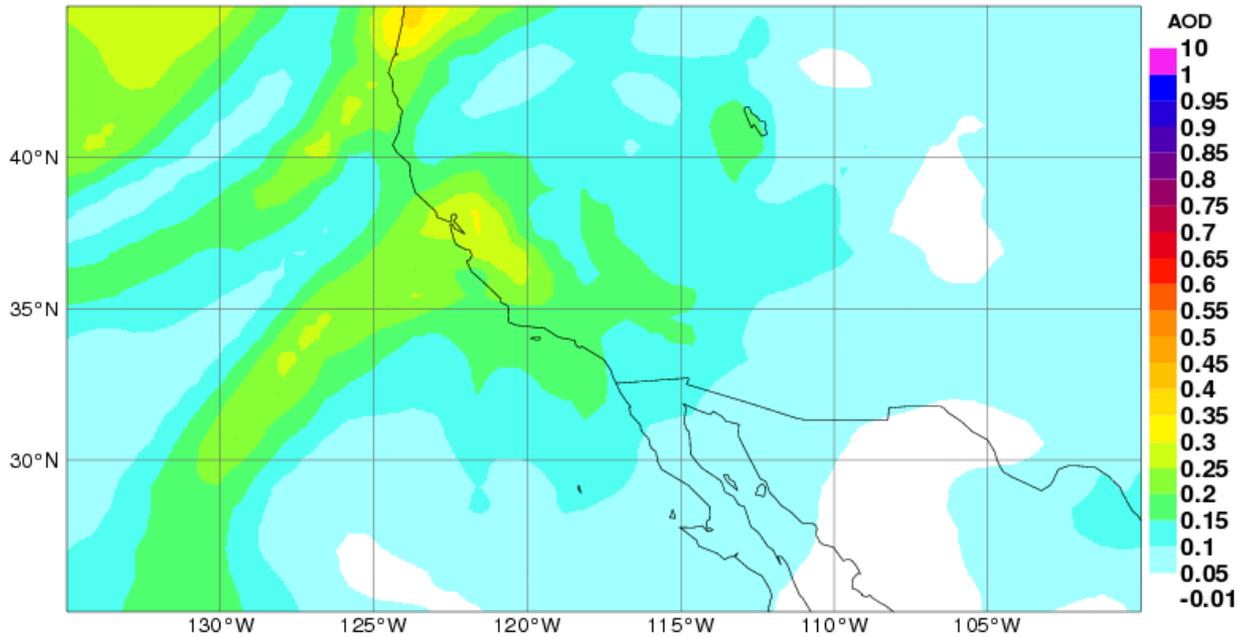


0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90

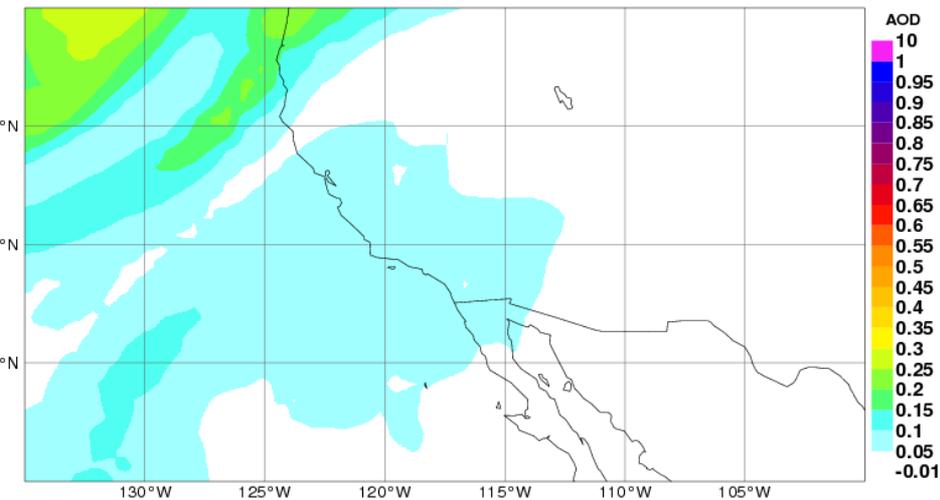
MACC forecast from Wednesday 23 January 2013 00Z valid at T+066: Friday 25 January 2013 18Z
Total AOD at 550nm

Friday 18Z

Total AOD

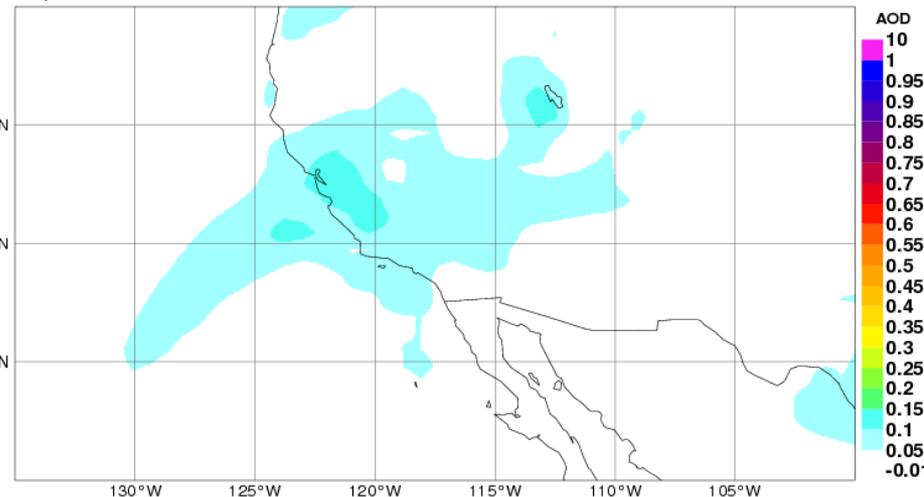


MACC forecast from Wednesday 23 January 2013 00Z valid at T+066: Friday 25 January 2013 18Z
Sea-Salt AOD at 550nm



Sea Salt

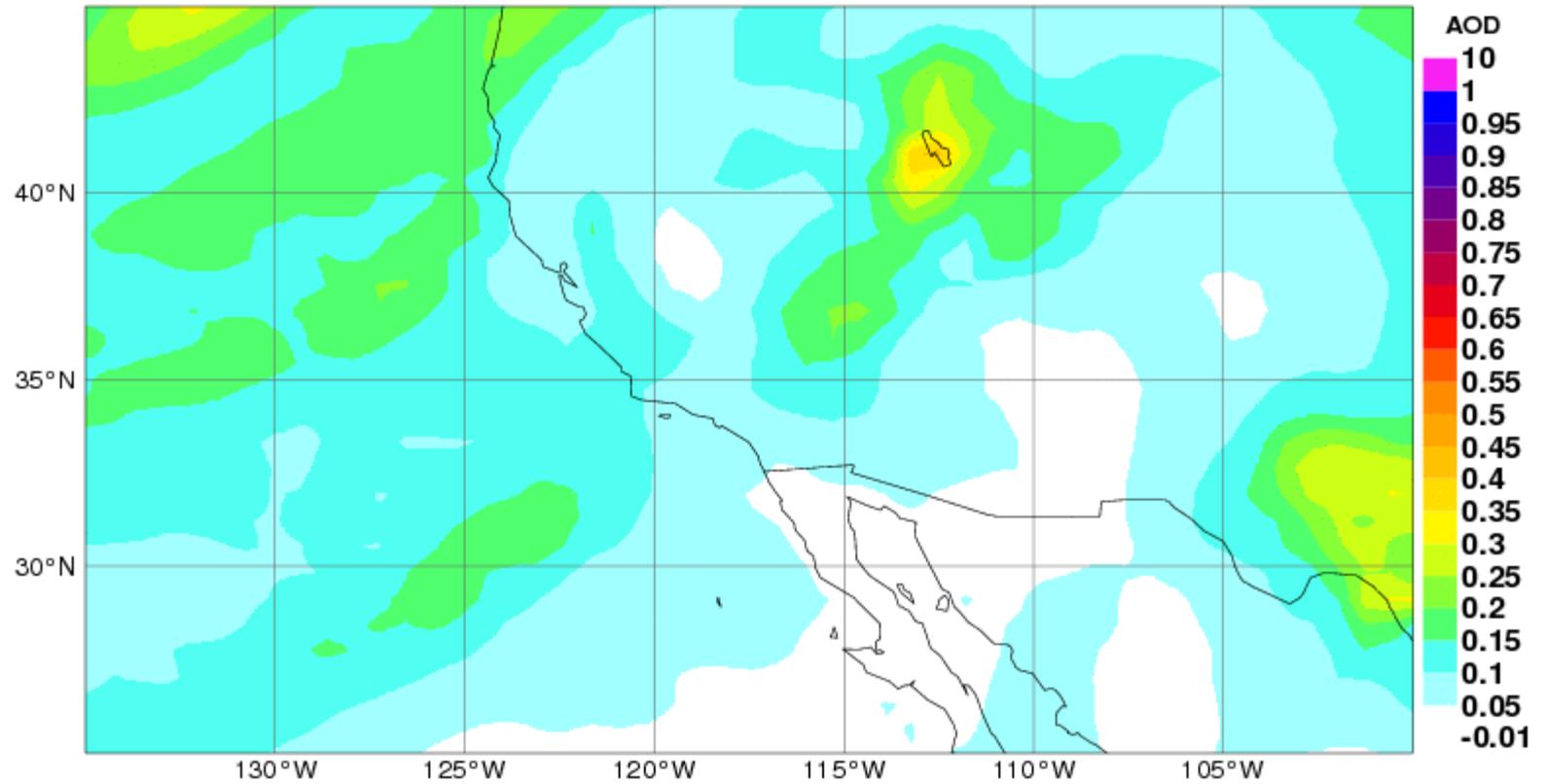
MACC forecast from Wednesday 23 January 2013 00Z valid at T+066: Friday 25 January 2013 18Z
Sulphate AOD at 550nm



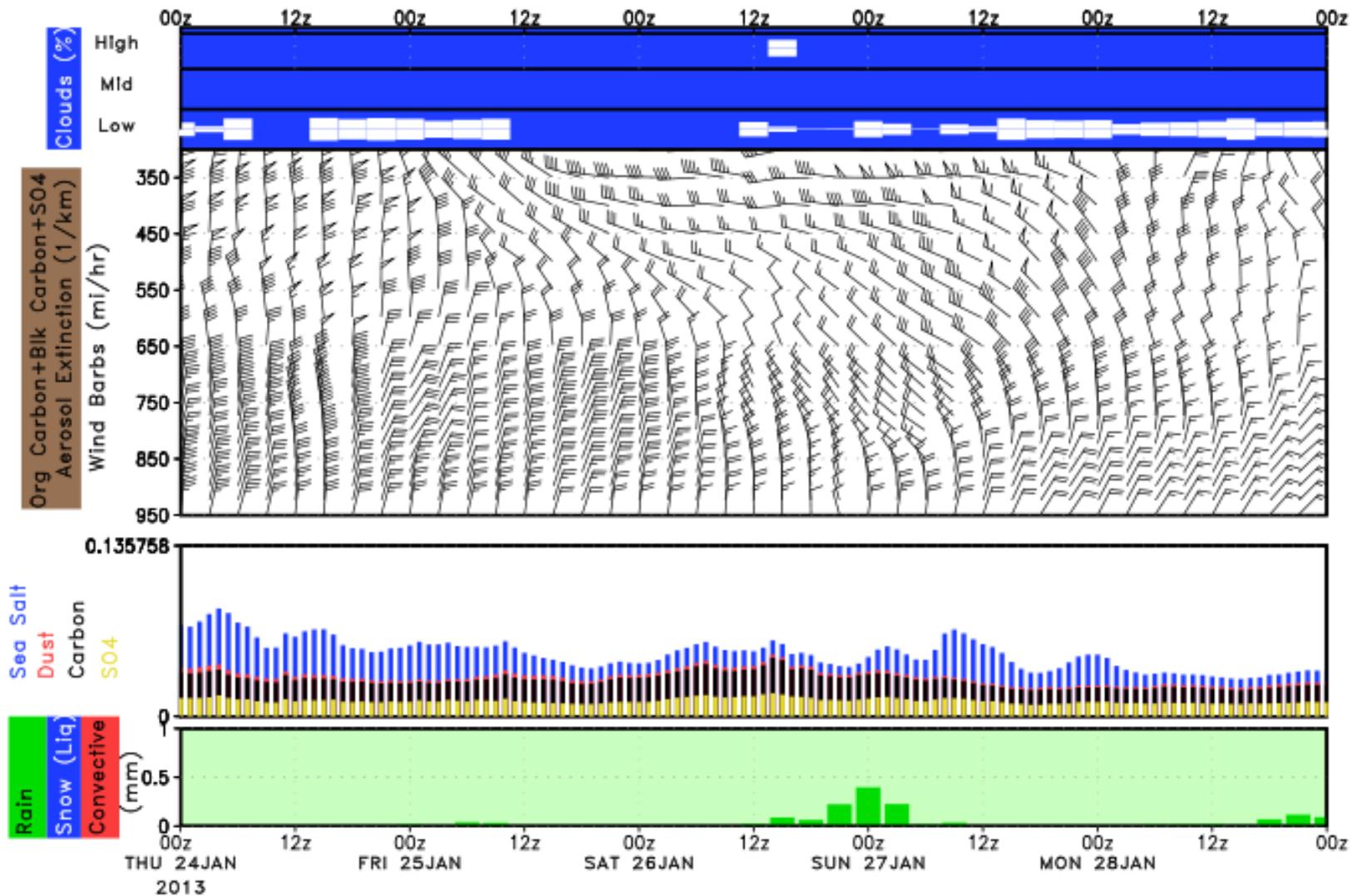
Sulphate

Saturday 18 Z

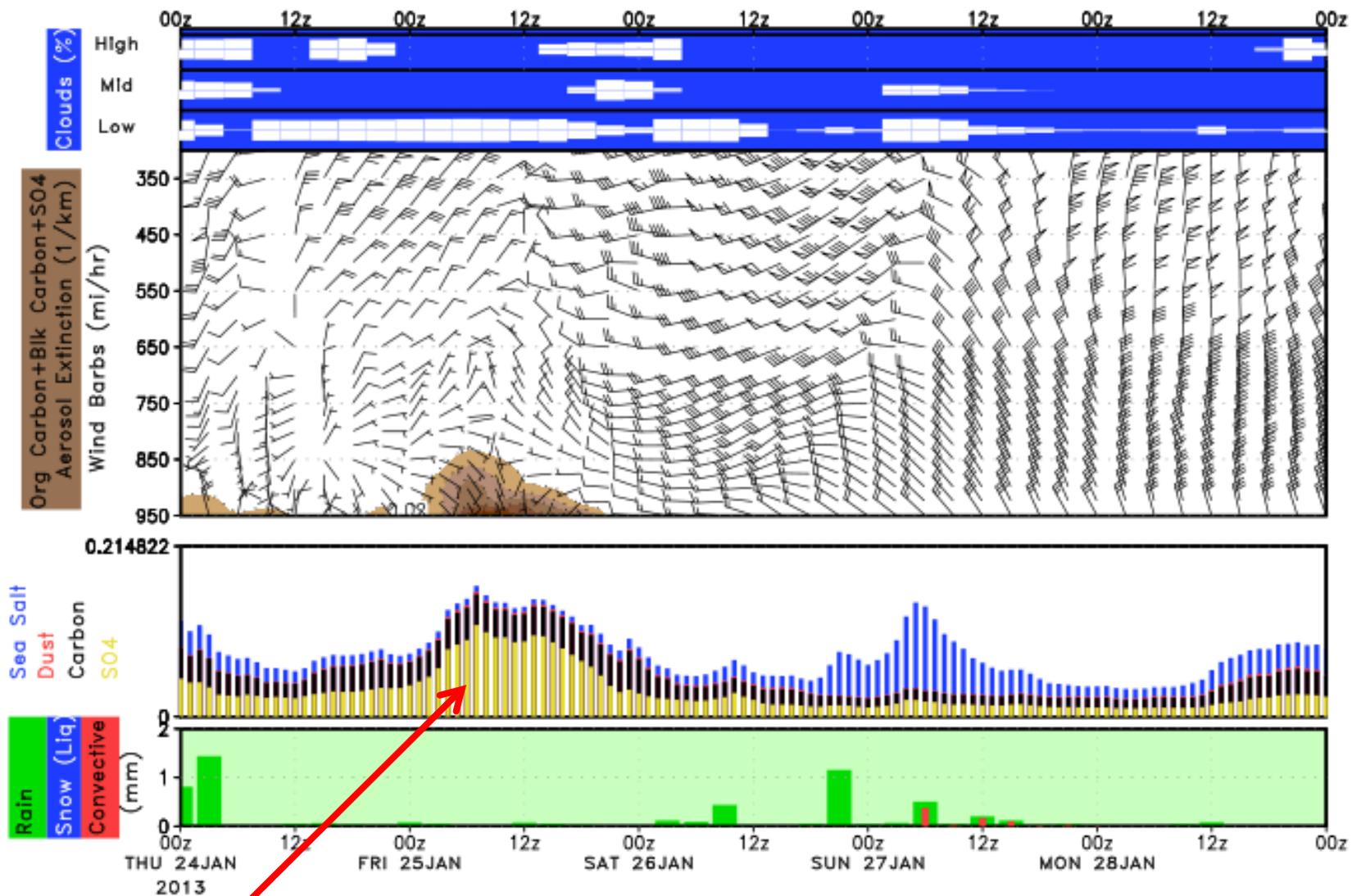
MACC forecast from Wednesday 23 January 2013 00Z valid at T+090: Saturday 26 January 2013 18Z
Total AOD at 550nm



GEOS-5 Forecast : 30N 130W

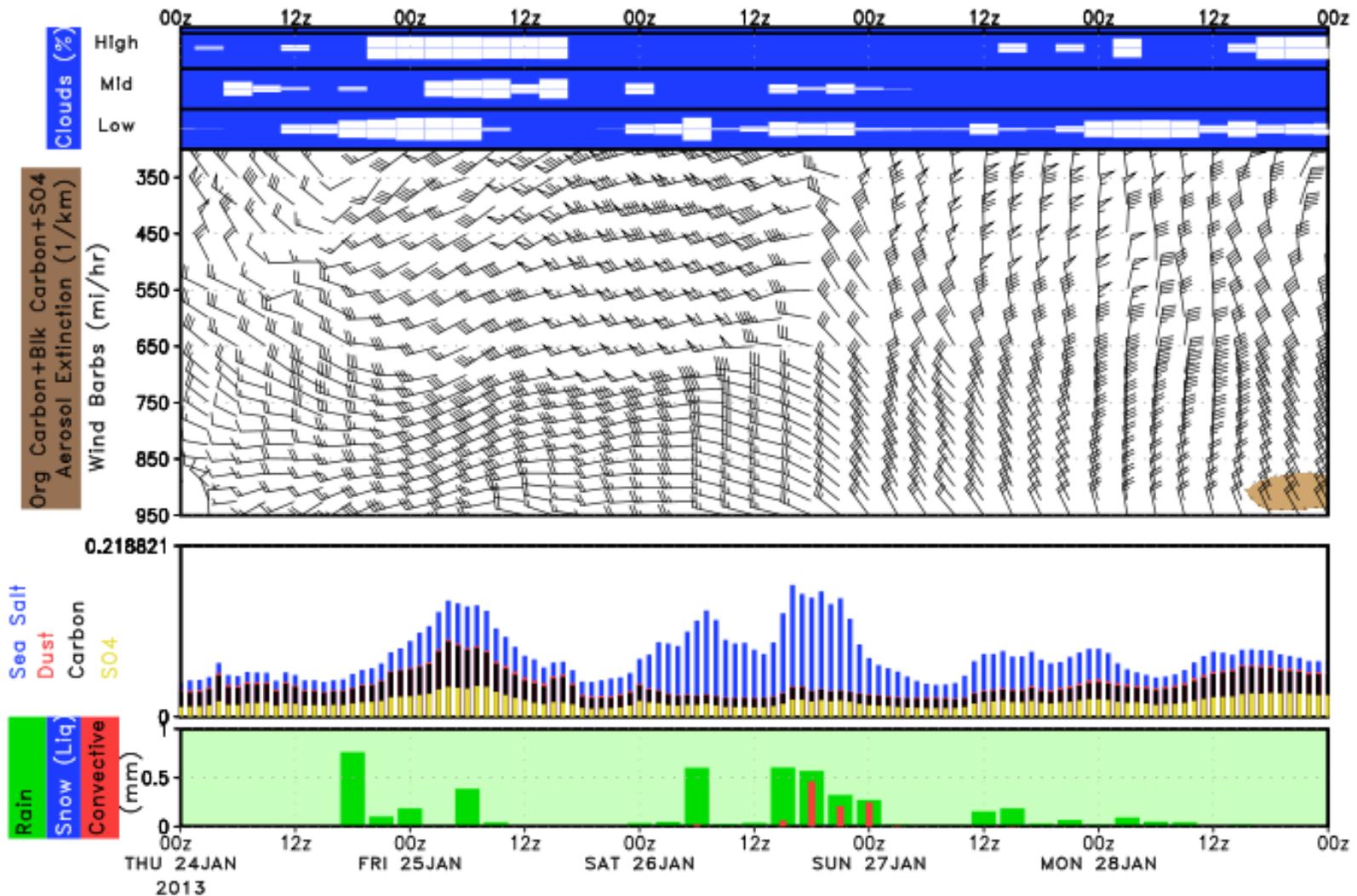


GEOS-5 Forecast : 38N 125W



Sulfate from San Francisco Bay?

GEOS-5 Forecast : 40N 130W



Recommendations

- **Friday – still clouds at multiple levels off coast. Likely not conducive for PODEX Sc flight**
- **Saturday – window of opportunity for Sc flight may only be in the early AM. Cirrus from new system coming from Gulf of AK may move in during day.**
- **Sunday – frontal passage -- SJV gets flushed out; “air quality clock gets reset”**
- **Monday and Tuesday -- possible residual clouds over SJV behind front; northwesterly flow;**
- **Wednesday – clear; aerosol increasing, but Pacific coast ridge remains offshore with possible “inside sliders” (small disturbances that may make forecasting difficult)**