

## DISCOVER-AQ OUTLOOK Saturday January 26, 2013

The rain ended before sunrise and the skies became partly sunny by mid-morning in Palmdale today. Moisture continues to be pumped into the SJV by a cut-off low that moved inland from the southern CA coast. The trough near the Pacific NW moves into Northern CA and brings chance of showers to Kern County this morning, and slight chance of precipitation for the SJV valley this afternoon. The cold front associated with a cyclonic system coming out of the Gulf of Alaska is forecast to pass through the SJV on Sunday, bringing clouds and a chance of further precipitation which may linger into Monday. This event should flush out the aerosol from the valley and “reset the aerosol clock”. The trough lags over CA into Monday bringing northeast flow aloft. Cold, dry air is expected to be advected into SJV region; however, the forecaster at the Hanford NWS expects some low clouds to linger in the valley, particularly the southern portion (Bakersfield), which is at odds with the models. An upper level ridge is forecast to build off the coast of CA by ~mid-week, but 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 . Consequently, clouds will need to be monitored closely during the forecast period. With a stable airmass over the region, areas of fog in the SJV will be possible beginning Tuesday night and continuing through the forecast period; the recent rainfall has elevated soil moisture.

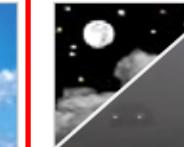
# DISCOVER-AQ / PODEX forecast briefing

January 26, 2013

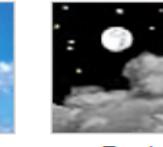
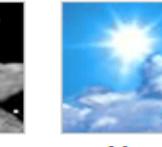
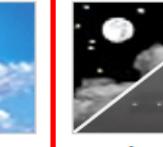
Melanie Follette-Cook

Bryan Duncan

# Fresno:

TODAY	TONIGHT	SUNDAY	SUNDAY NIGHT	MONDAY	MONDAY NIGHT	TUESDAY	TUESDAY NIGHT	WEDNESDAY
								
20%	30%	20%	20%	Partly Sunny High: 62 °F	Partly Cloudy Low: 36 °F	Mostly Sunny High: 57 °F	Areas Fog Low: 38 °F	Areas Fog High: 61 °F
Slight Chc Showers High: 62 °F	Chance Showers Low: 45 °F	Slight Chc Showers High: 56 °F	Slight Chc Showers Low: 37 °F	Partly Sunny High: 54 °F	Partly Cloudy Low: 36 °F	Mostly Sunny High: 57 °F	Areas Fog Low: 38 °F	Areas Fog High: 61 °F

# Hanford:

TODAY	TONIGHT	SUNDAY	SUNDAY NIGHT	MONDAY	MONDAY NIGHT	TUESDAY	TUESDAY NIGHT	WEDNESDAY
								
20%	20%	20%	20%	Mostly Sunny High: 55 °F	Partly Cloudy Low: 33 °F	Mostly Sunny High: 57 °F	Areas Fog Low: 34 °F	Areas Fog High: 61 °F
Slight Chc Showers High: 59 °F	Slight Chc Showers Low: 45 °F	Slight Chc Showers High: 57 °F	Slight Chc Showers Low: 35 °F	Mostly Sunny High: 55 °F	Partly Cloudy Low: 33 °F	Mostly Sunny High: 57 °F	Areas Fog Low: 34 °F	Areas Fog High: 61 °F

# Bakersfield:

TODAY	TONIGHT	SUNDAY	SUNDAY NIGHT	MONDAY	MONDAY NIGHT	TUESDAY	TUESDAY NIGHT	WEDNESDAY
								
30%	20%	30%	20%	Partly Sunny High: 58 °F	Partly Cloudy Low: 34 °F	Mostly Sunny High: 55 °F	Mostly Clear Low: 37 °F	Sunny High: 60 °F
Chance Showers High: 58 °F	Slight Chc Showers Low: 47 °F	Chance Showers High: 53 °F	Slight Chc Showers Low: 37 °F	Partly Sunny High: 52 °F	Partly Cloudy Low: 34 °F	Mostly Sunny High: 55 °F	Mostly Clear Low: 37 °F	Sunny High: 60 °F

# Current Conditions

## FRESNO CA



**Fog**  
**55°F**  
13°C

Humidity 94%  
Wind Speed WNW 5 MPH  
Barometer 30.00 in  
Dewpoint 54°F (12°C)  
Visibility 1.75 mi

Last Update on 26 Jan 8:04 am PST

## HANFORD CA



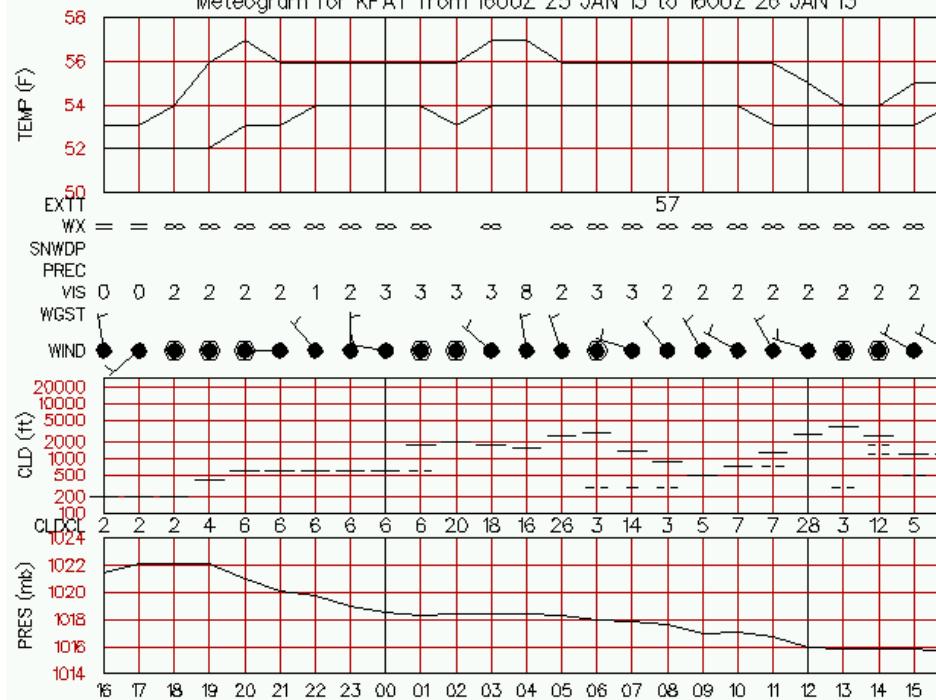
**Fog**  
**54°F**  
12°C

Humidity 100%  
Wind Speed calm  
Barometer 30.00 in  
Dewpoint 54°F (12°C)  
Visibility 3.00 mi

Last Update on 26 Jan 8:35 am PST

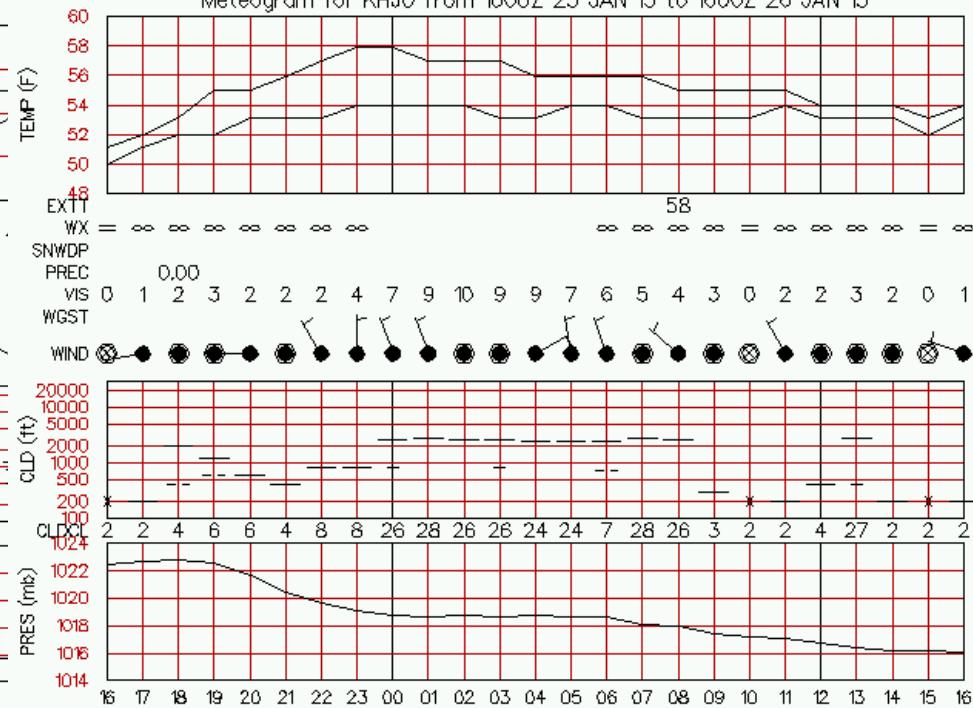
## Plymouth State Weather Center

Meteogram for KFAT from 1600Z 25 JAN 13 to 1600Z 26 JAN 13



## Plymouth State Weather Center

Meteogram for KHJO from 1600Z 25 JAN 13 to 1600Z 26 JAN 13



# Current Conditions

## BAKERSFIELD CA



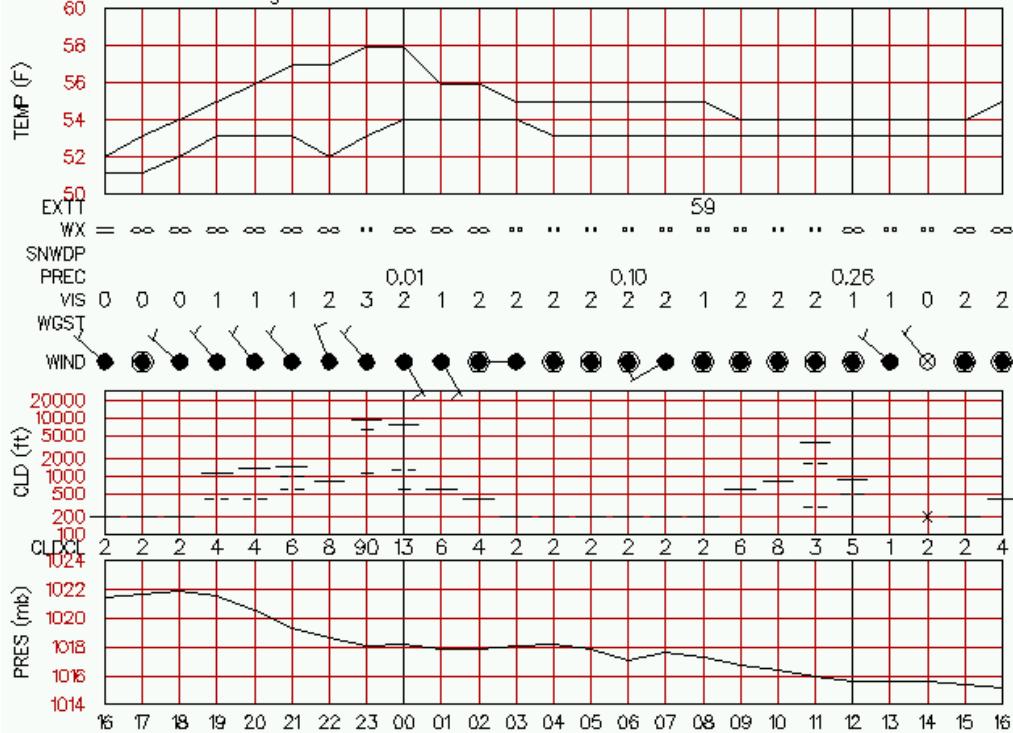
Fog  
**54°F**  
12°C

Humidity 100%  
Wind Speed calm  
Barometer 29.99 in  
Dewpoint 54°F (12°C)  
Visibility 1.25 mi

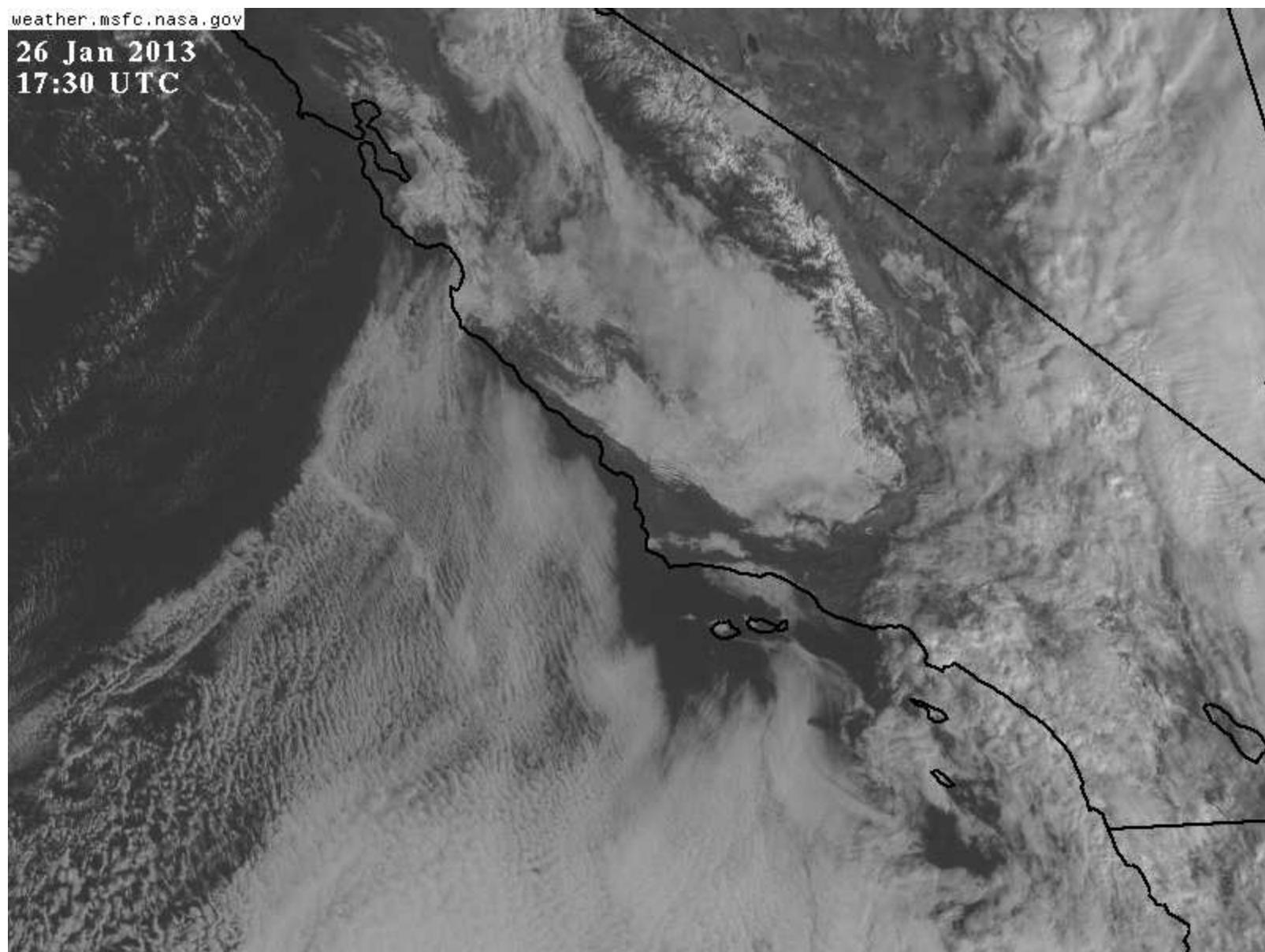
Last Update on 26 Jan 8:37 am PST

## ▼ Plymouth State Weather Center ▼

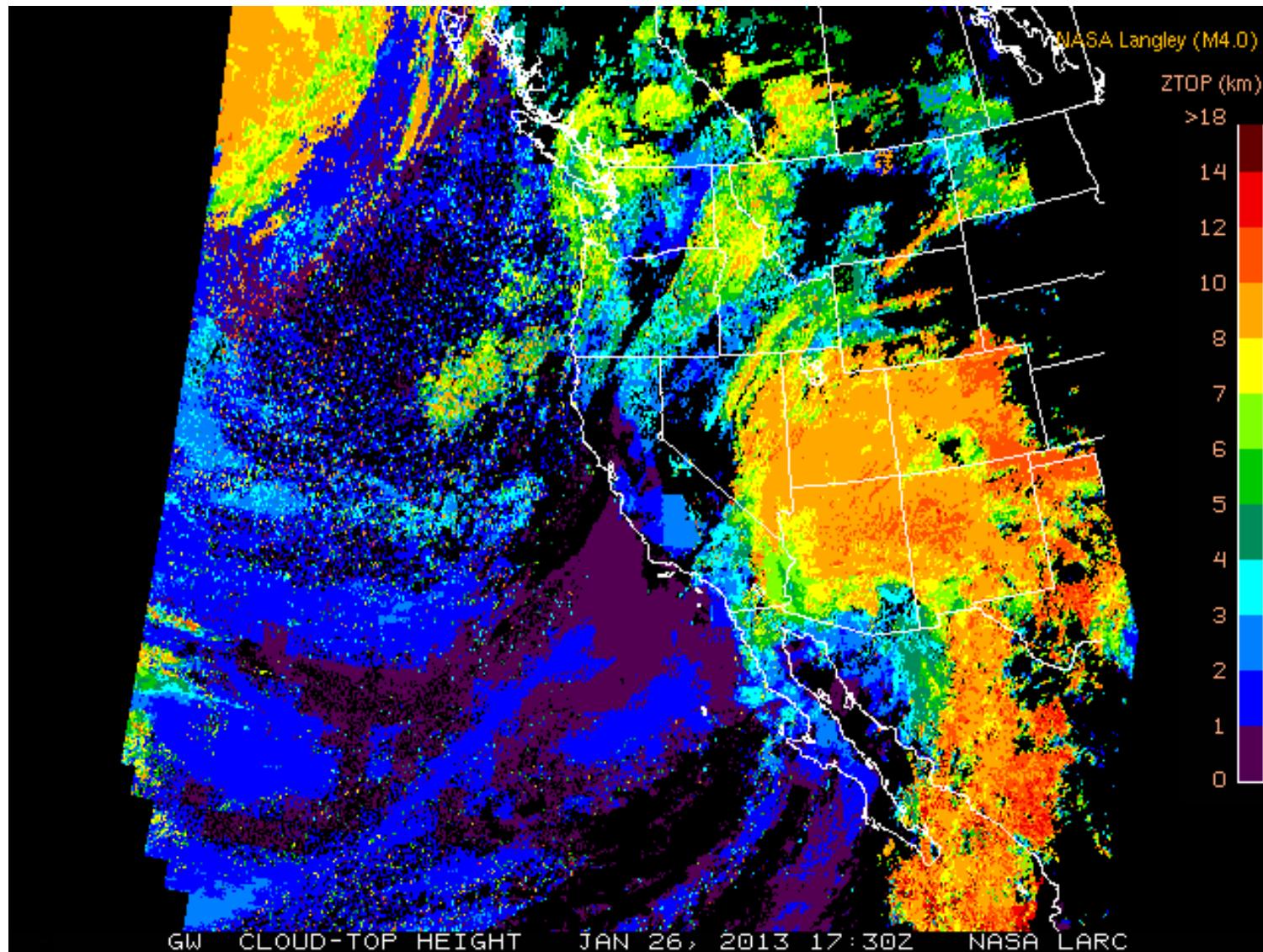
Meteogram for KBFL from 1600Z 25 JAN 13 to 1600Z 26 JAN 13



# GOES Imagery : Visible

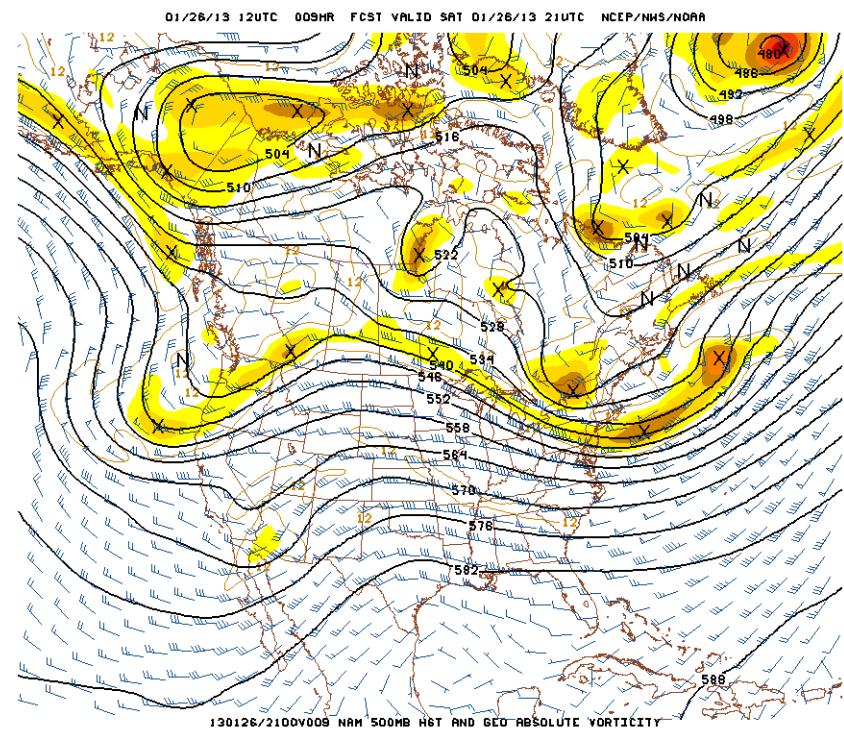
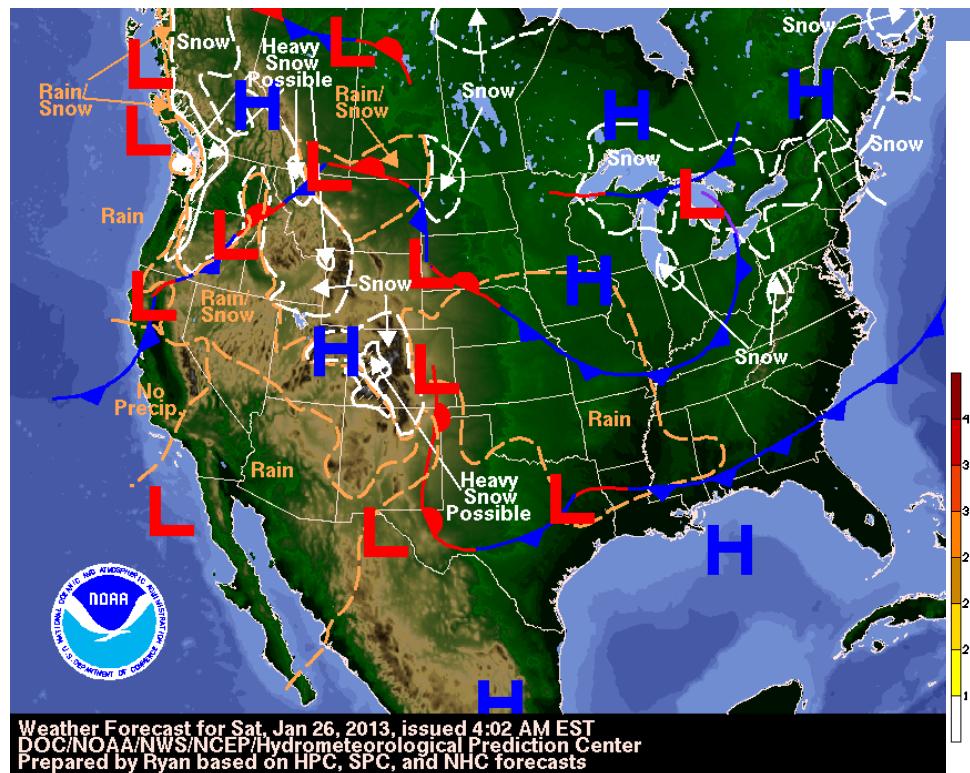


# GOES Imagery : Cloud top height



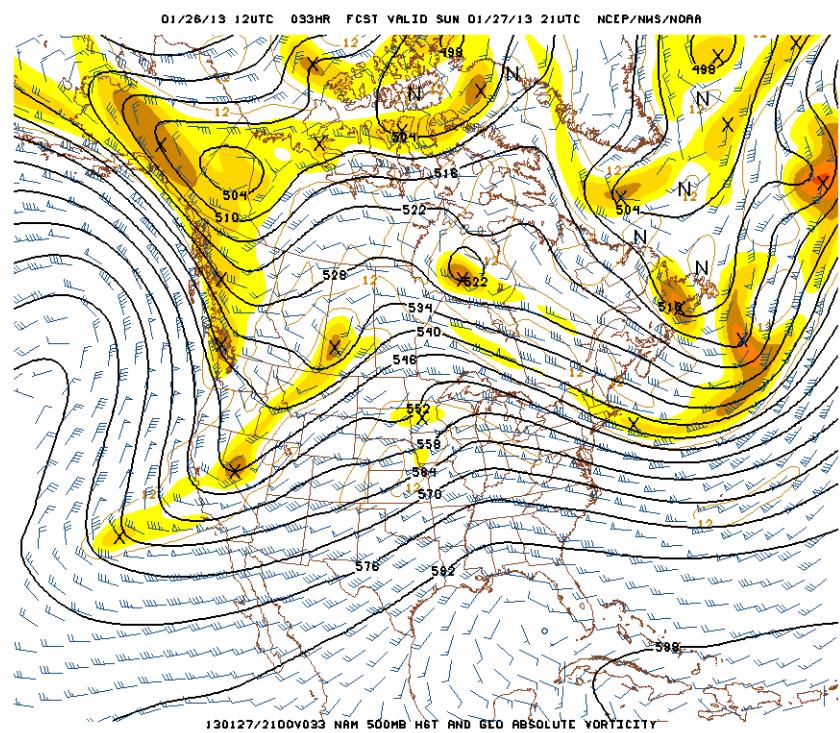
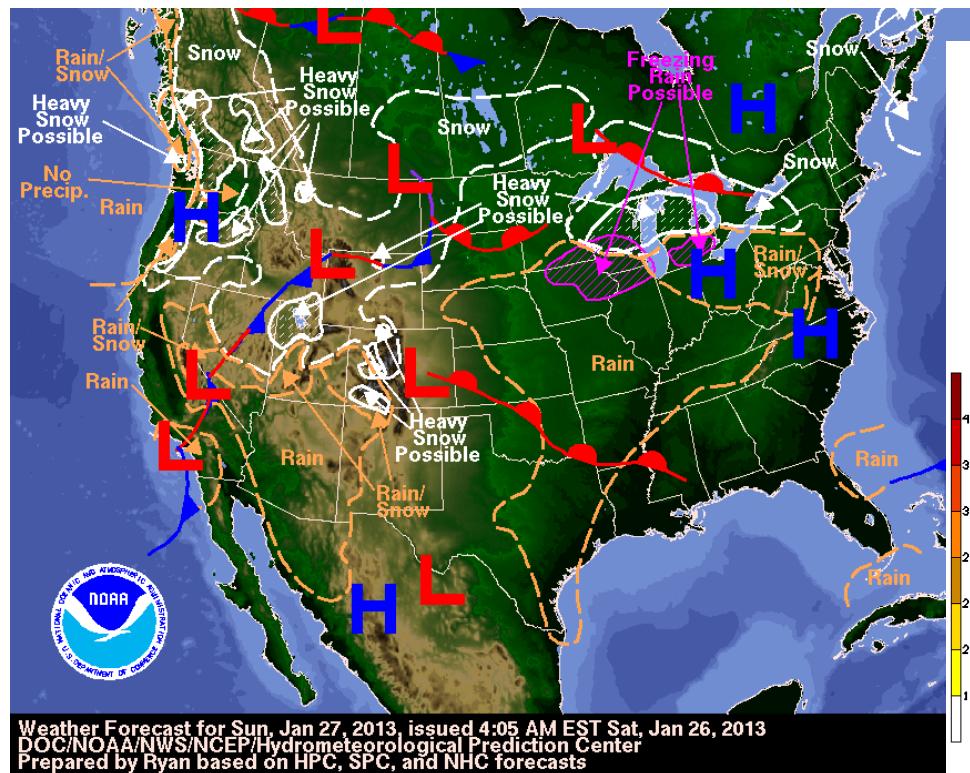
## Today:

As forecasted, the upper level low opened, moved east, and is now near Baja California. Circulation around the low continues to draw moisture in the SJV region. The trough near the Pacific NW moves into Northern CA and brings chance of showers to Kern County this morning, and slight chance of precipitation for the SJV valley this afternoon.



**Tomorrow (Sunday):**

The now merged southern upper level low and Pacific NW trough moves through Central CA on Sunday. Might trigger showers Sunday into Monday.



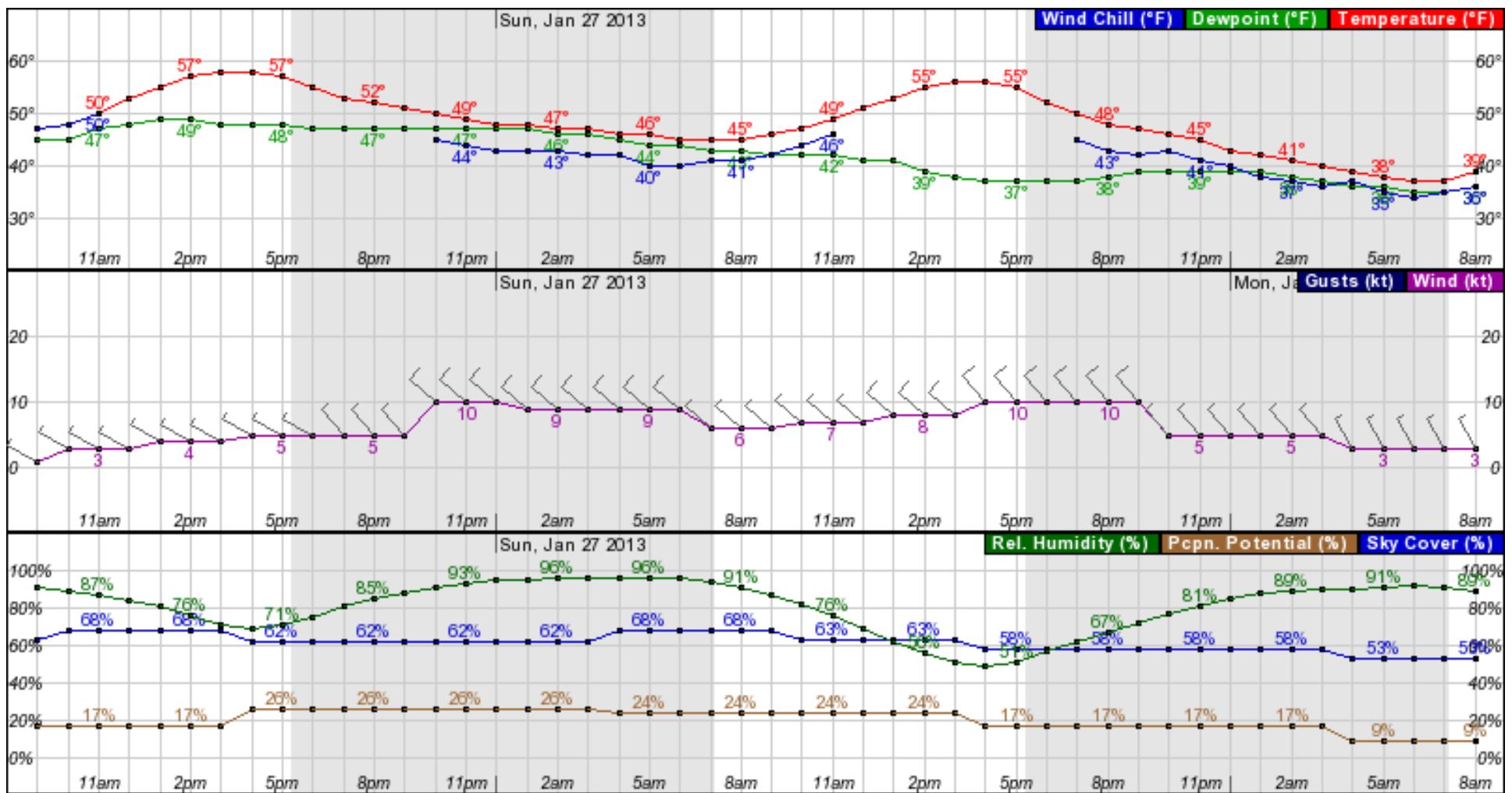
# Fresno

Today: Mostly cloudy

Sunday: Mostly cloudy

Today →

Tomorrow →



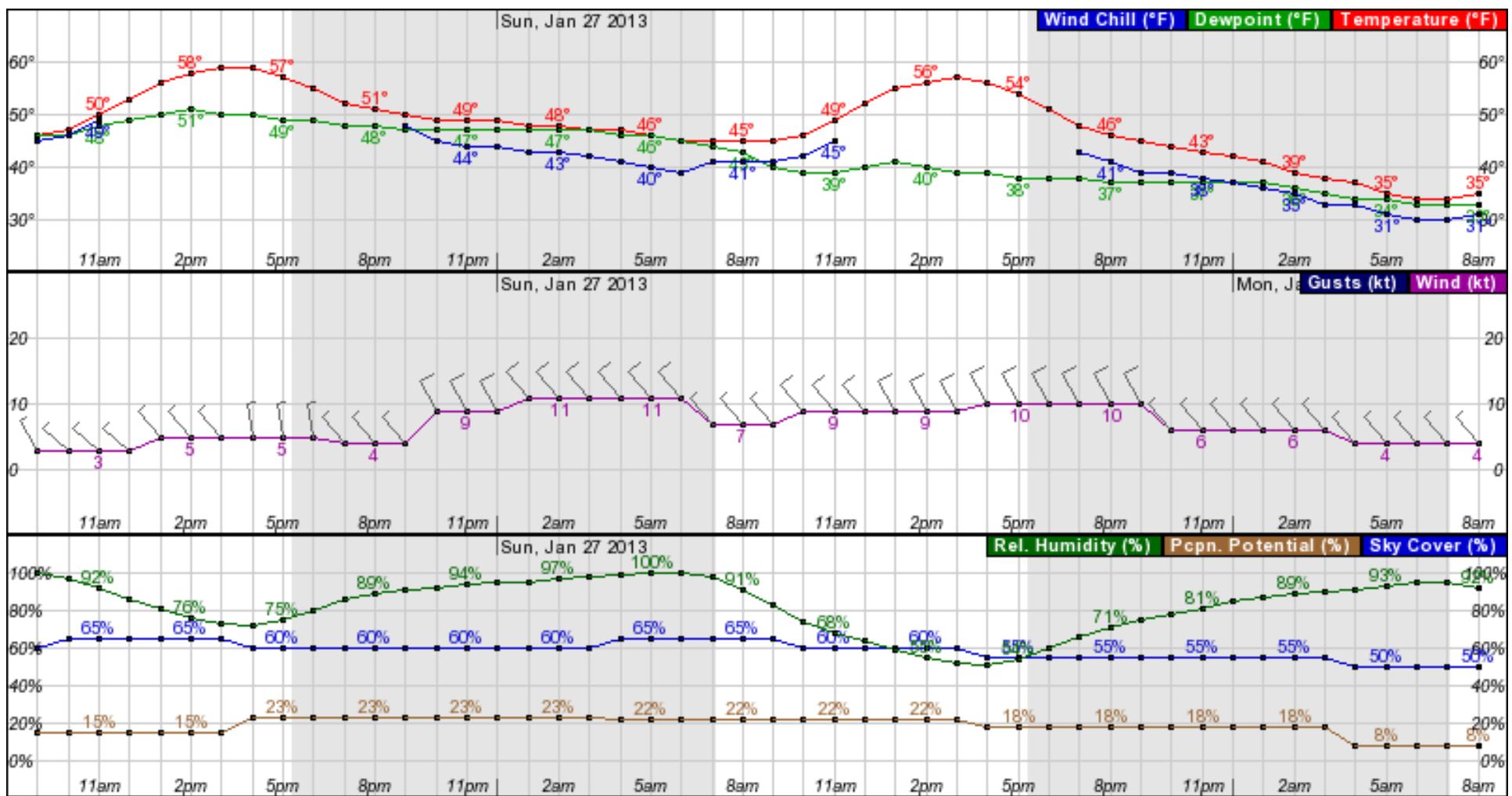
# Hanford

Today: Mostly cloudy

Sunday: Mostly cloudy

Today →

Tomorrow →



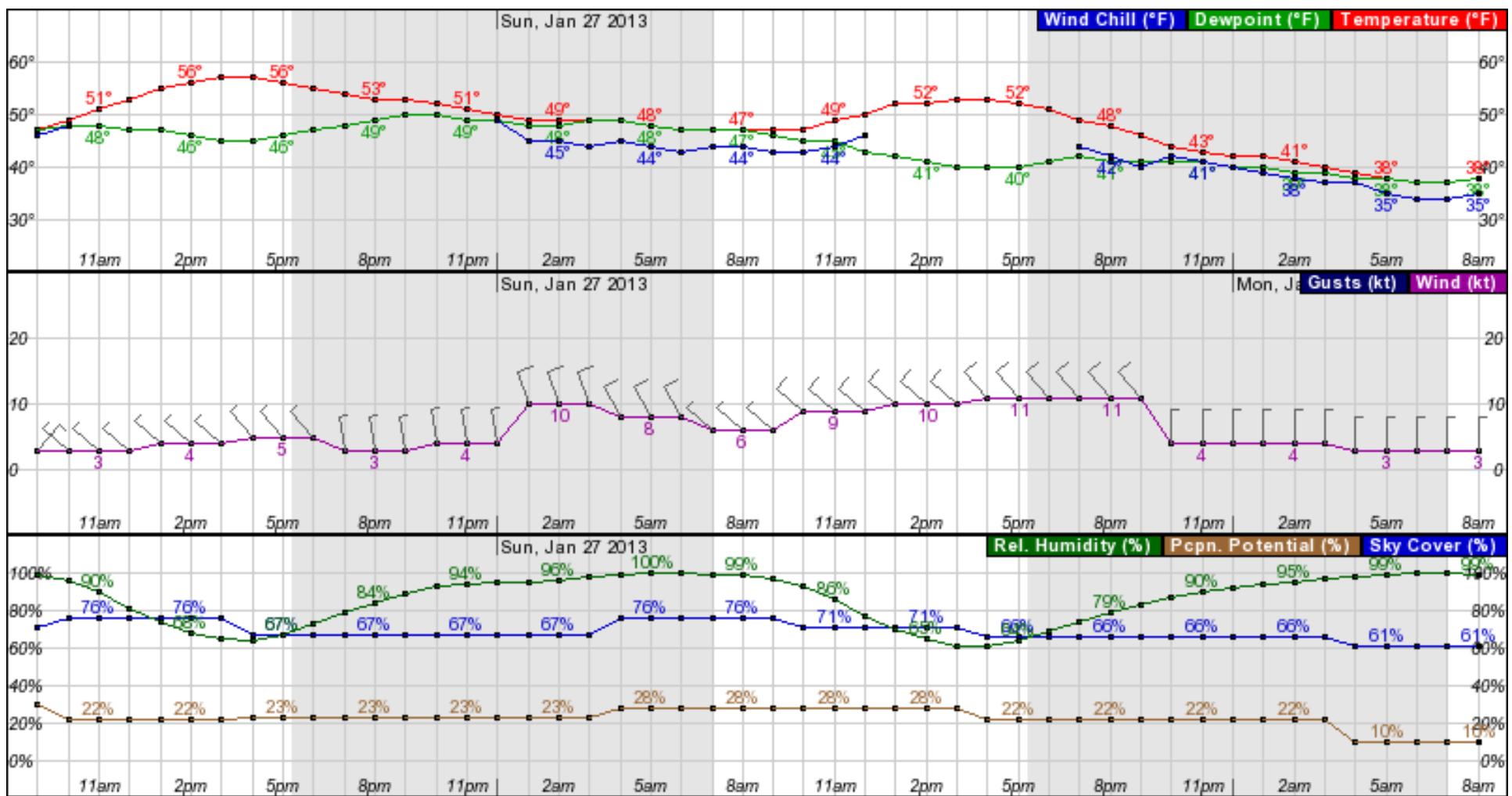
# Bakersfield

Today: Mostly cloudy

Sunday: Mostly cloudy

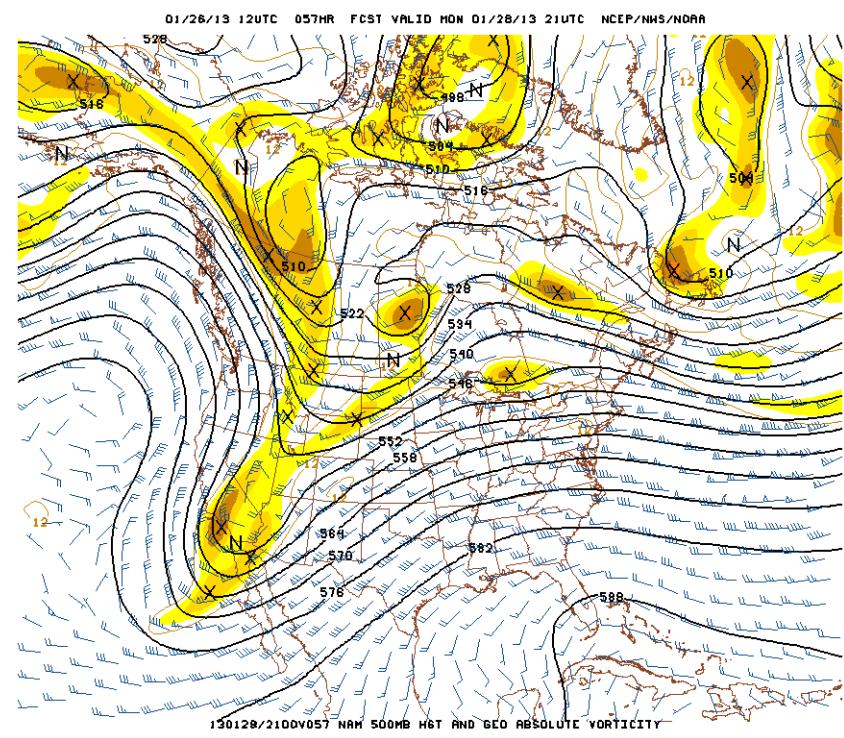
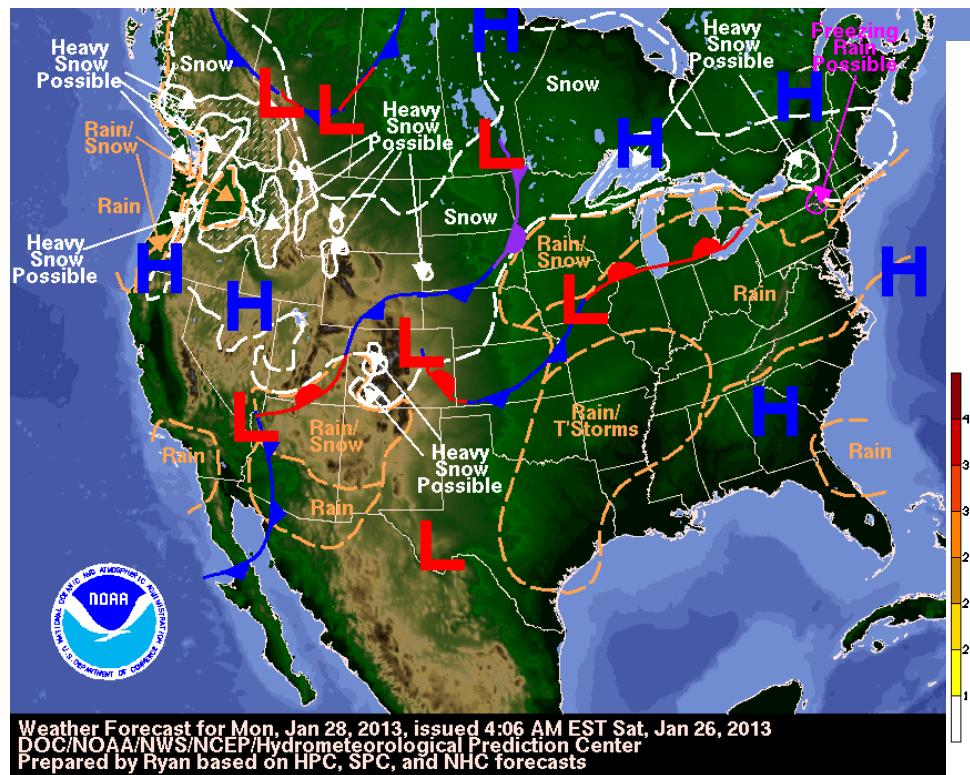
Today →

Tomorrow →



Monday:

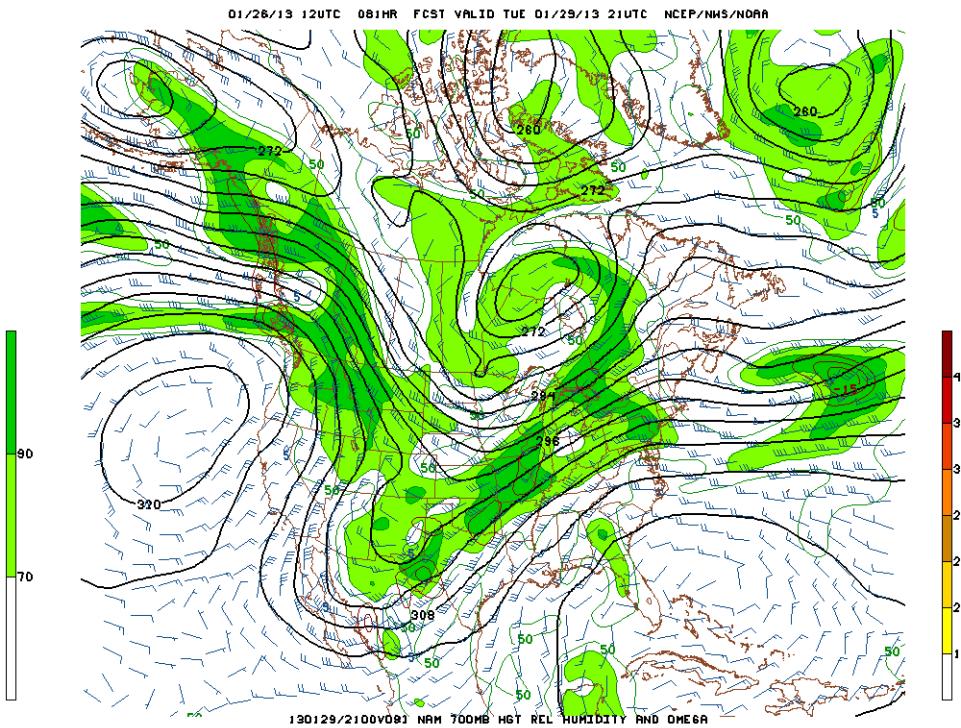
The trough lags over CA into Monday bringing northeast flow aloft. Cold, dry air expected to be advected into SJV region.



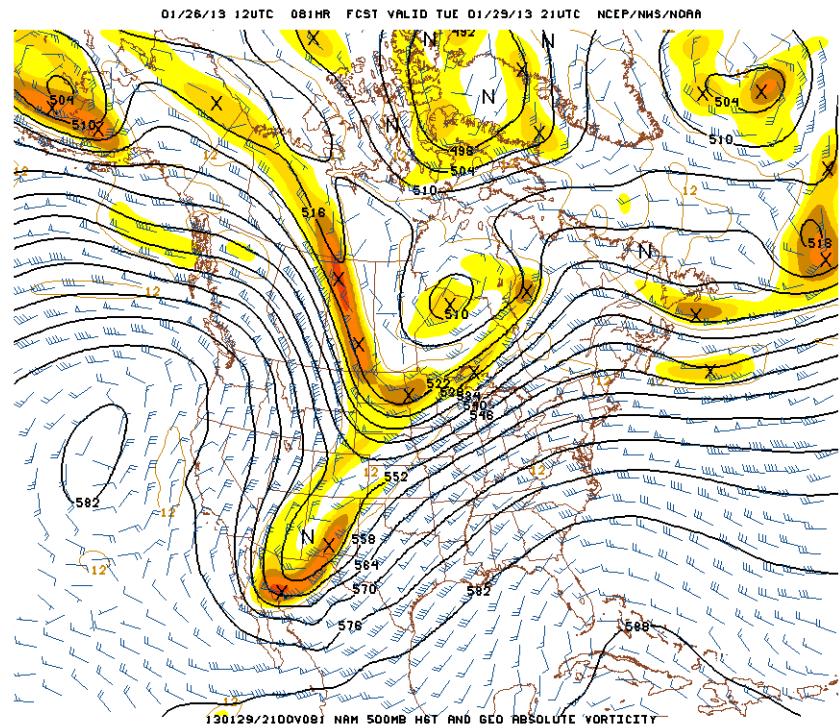
## Tuesday:

An upper level ridge is forecast to build off the coast of CA by ~mid-week. With a stable airmass over the region, areas of fog in the SJV will be possible beginning Tuesday night and continuing through the forecast period.

### 700 mb NAM Tuesday 1 PM



### 500 mb NAM Tuesday 1 PM



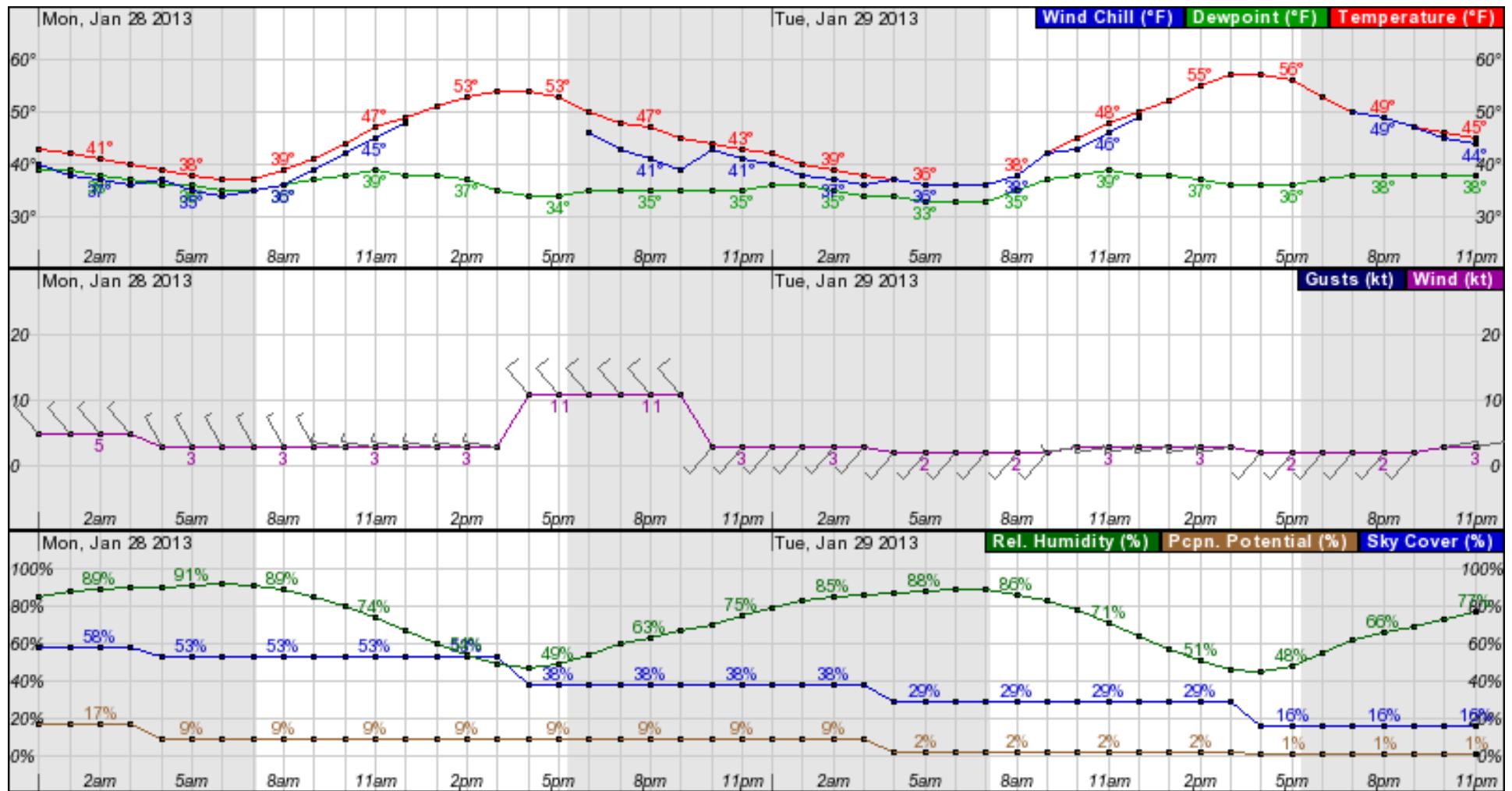
# Fresno

Monday: >50% cloud cover forecast

Tuesday: Clearer

Monday →

Tuesday →



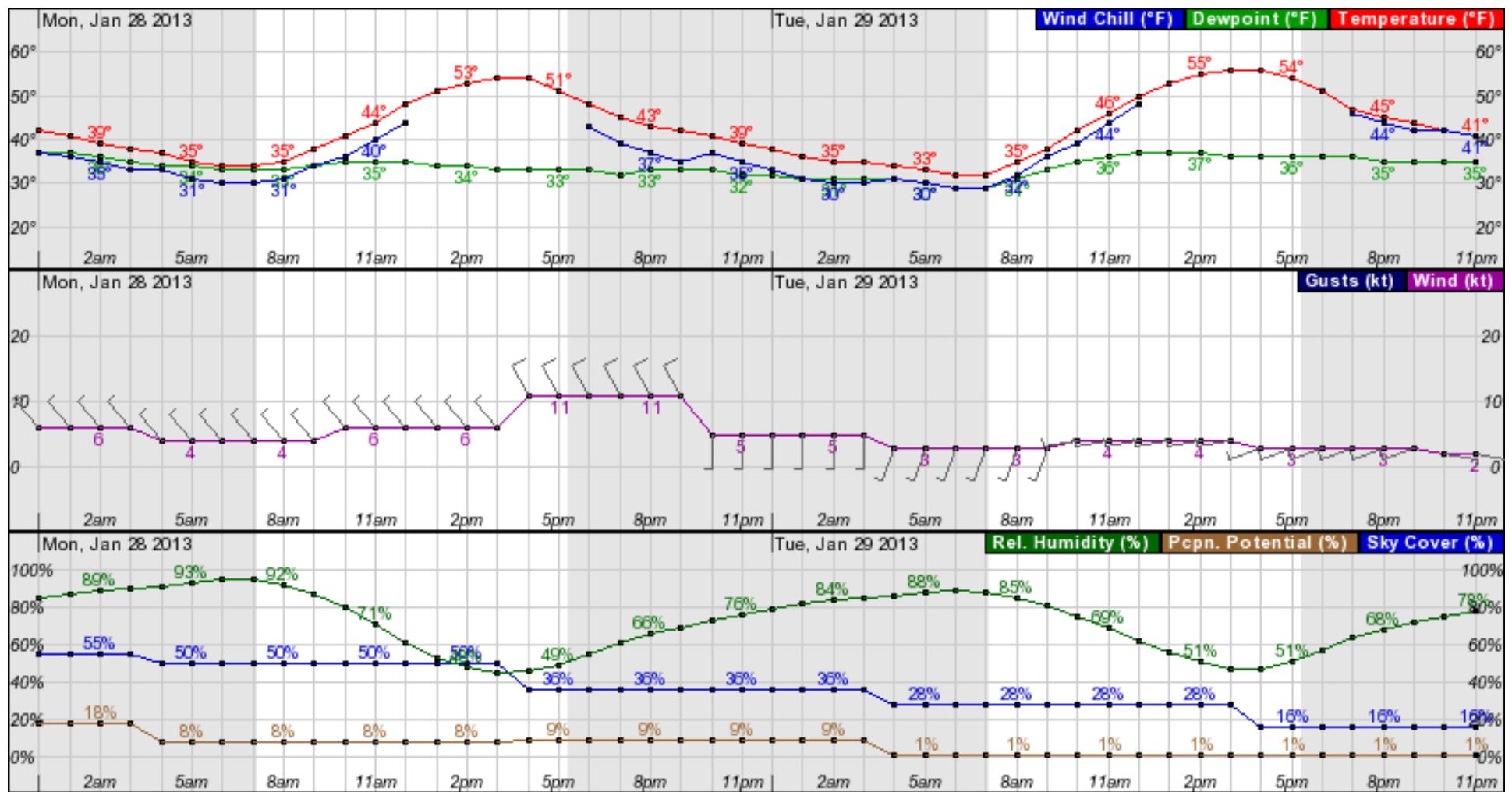
# Hanford

## Monday: ~50% cloud cover forecast

## Tuesday: Clearer

### Monday →

### Tuesday →



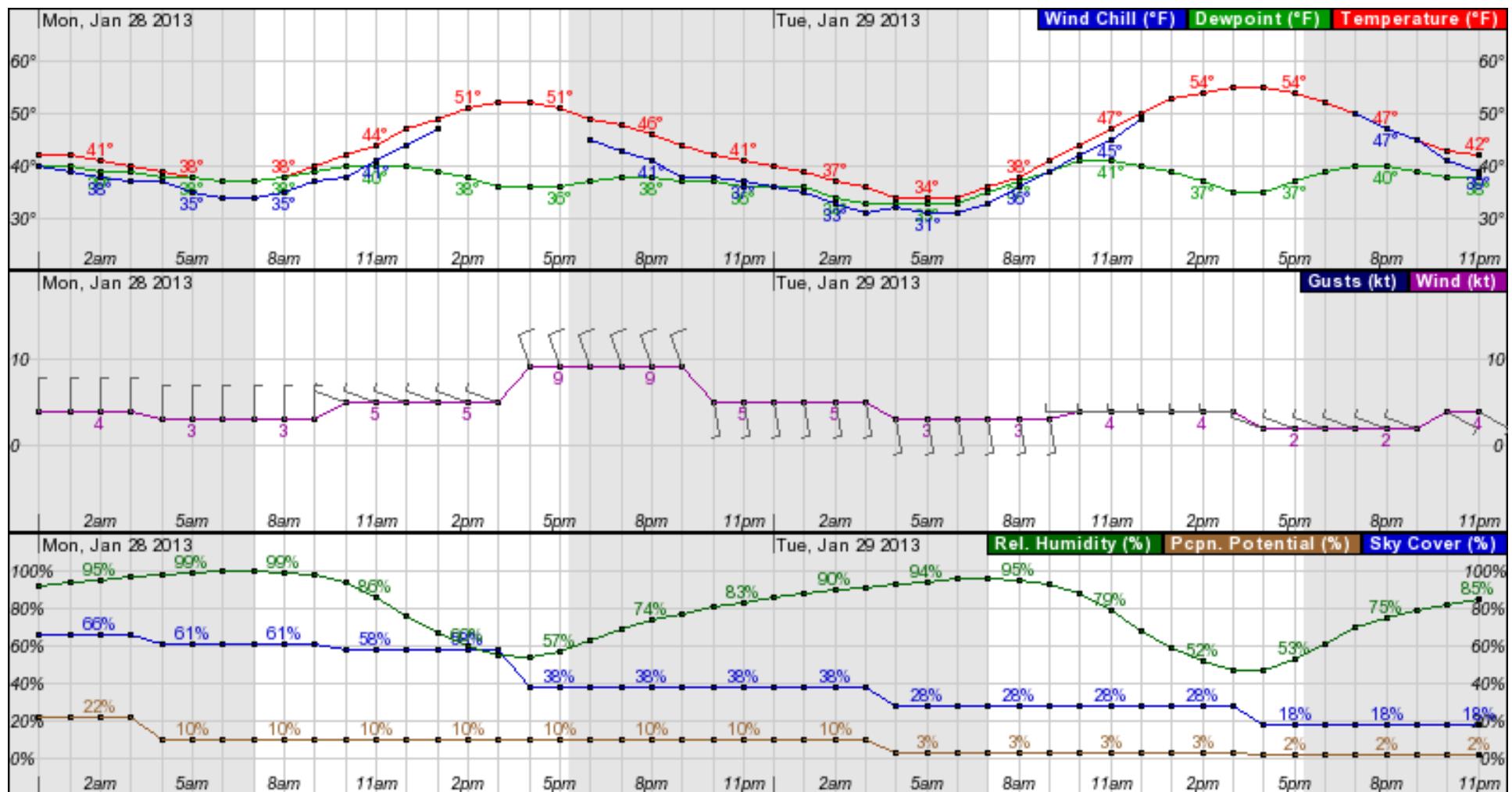
# Bakersfield

Monday: >50% cloud cover forecast, RH > 95% indicating chance of morning fog

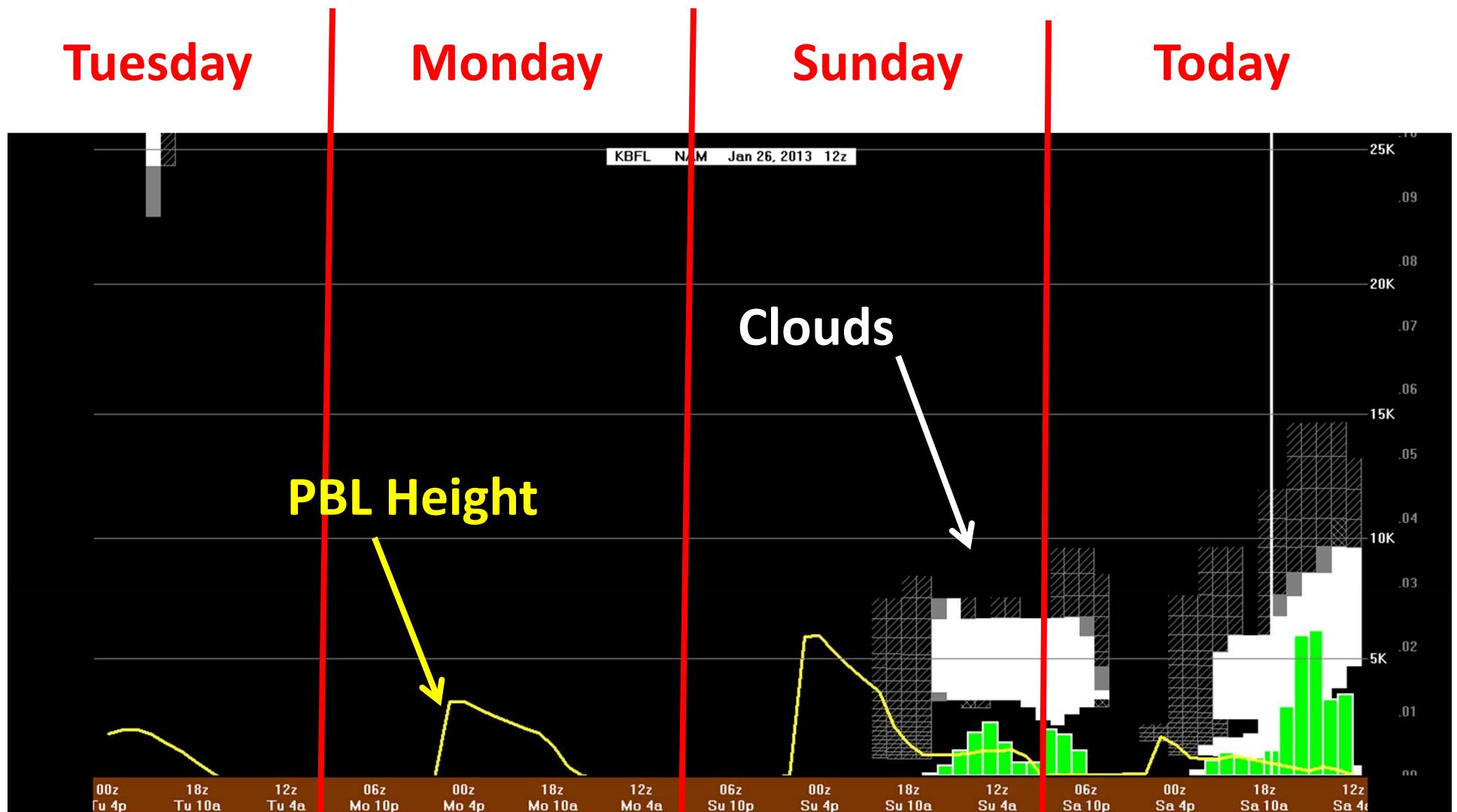
Tuesday: Clearer

Monday →

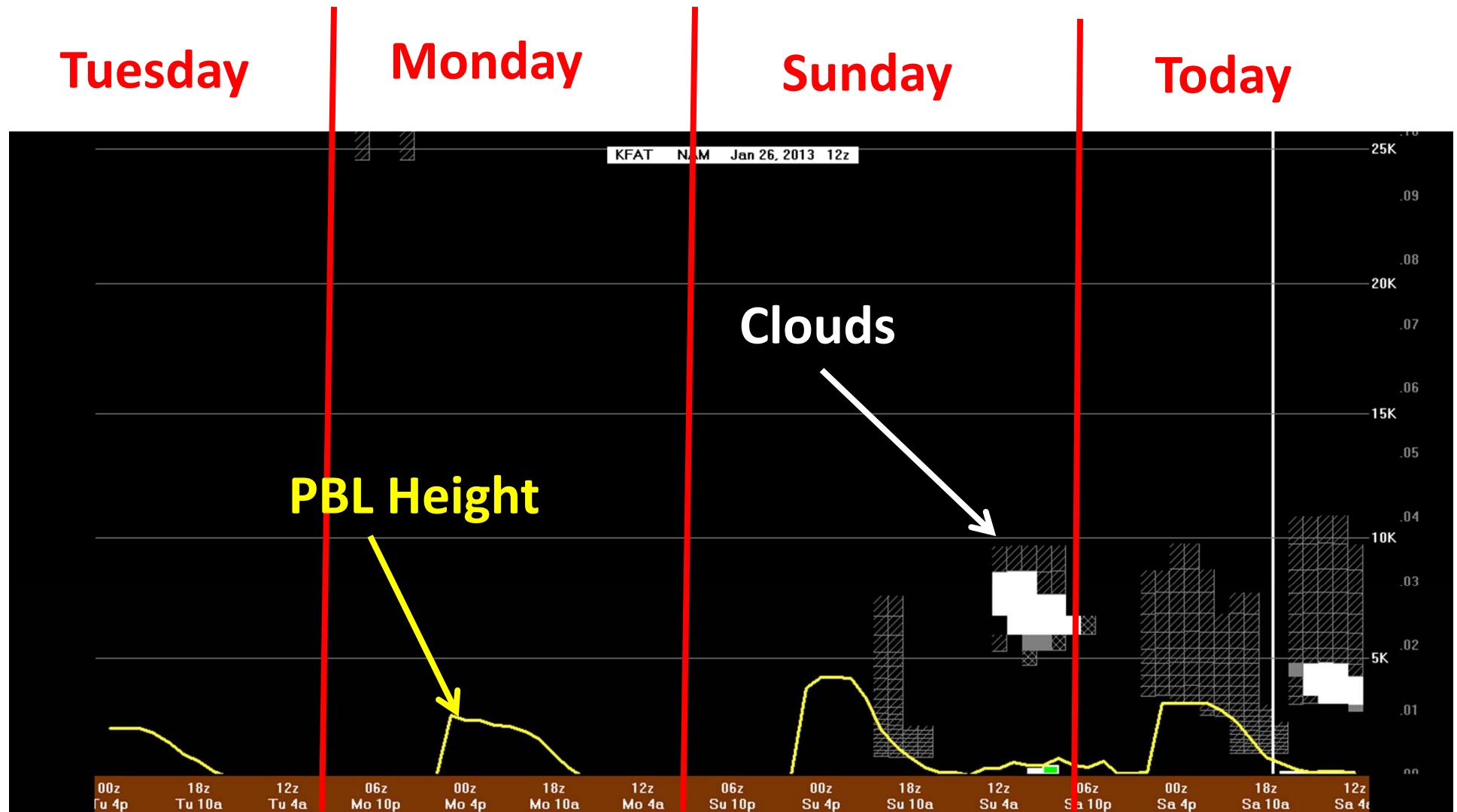
Tuesday →



# Bakersfield : BUFKIT NAM 12 UTC Saturday January 26

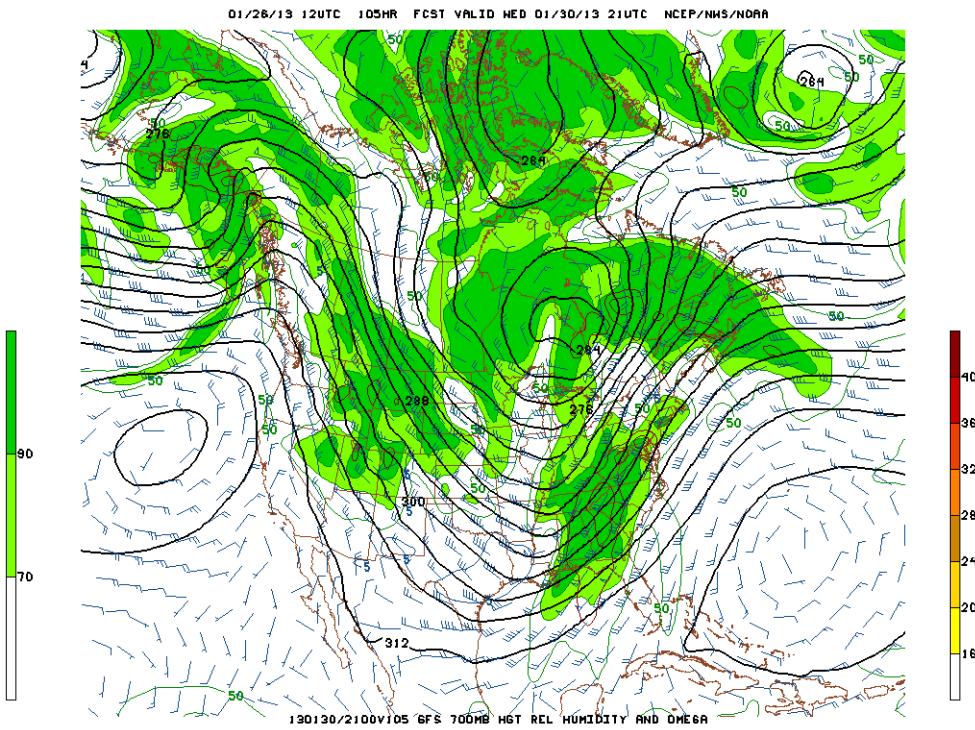


# Fresno : BUFKIT NAM 12 UTC Saturday January 26

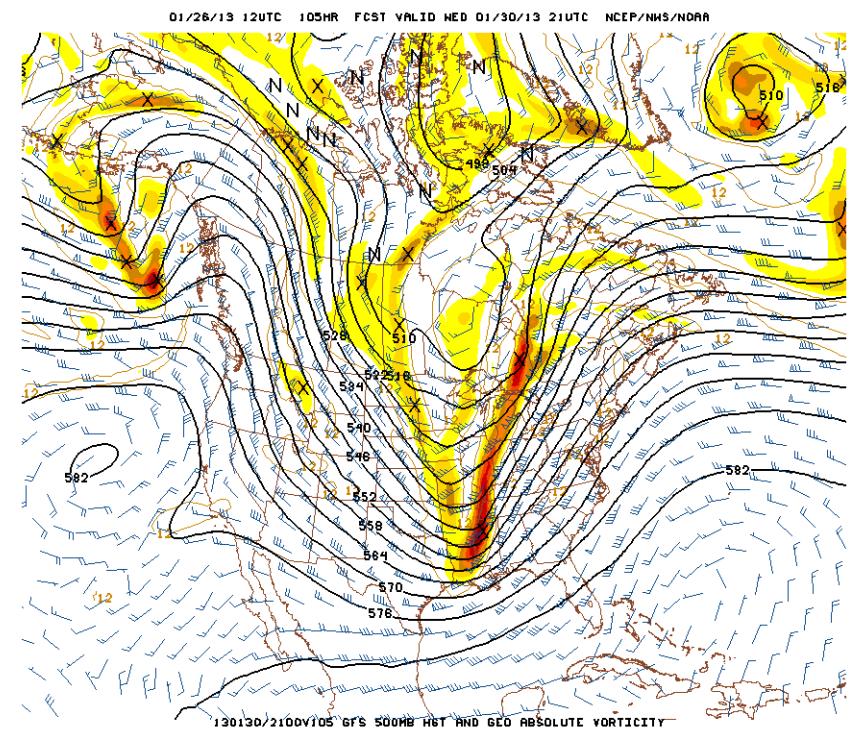


Wednesday

**700 mb GFS  
Wednesday 1 PM**

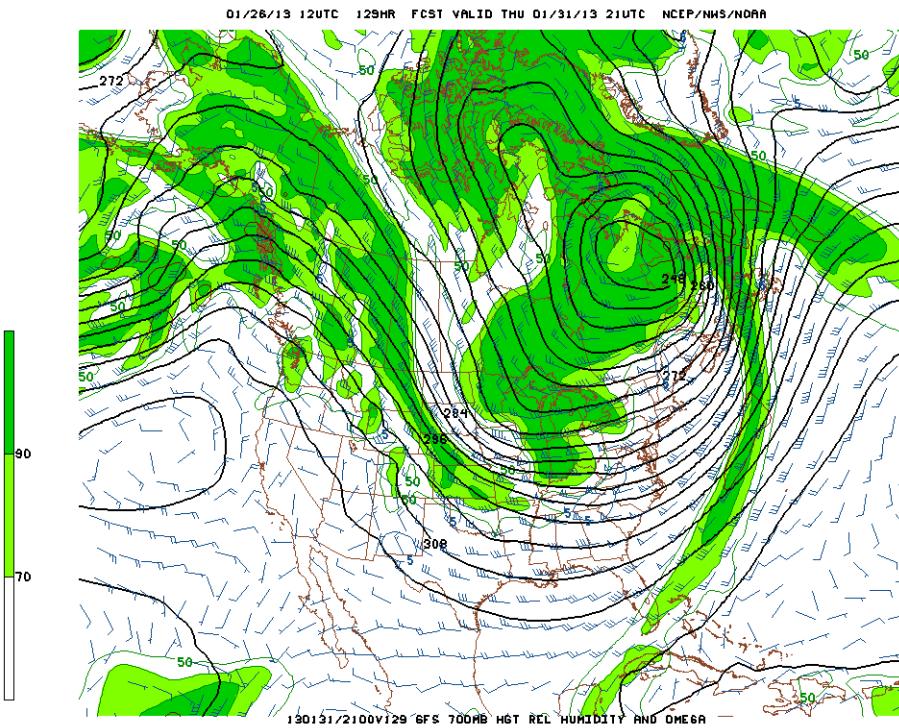


**500 mb GFS  
Wednesday 1 PM**

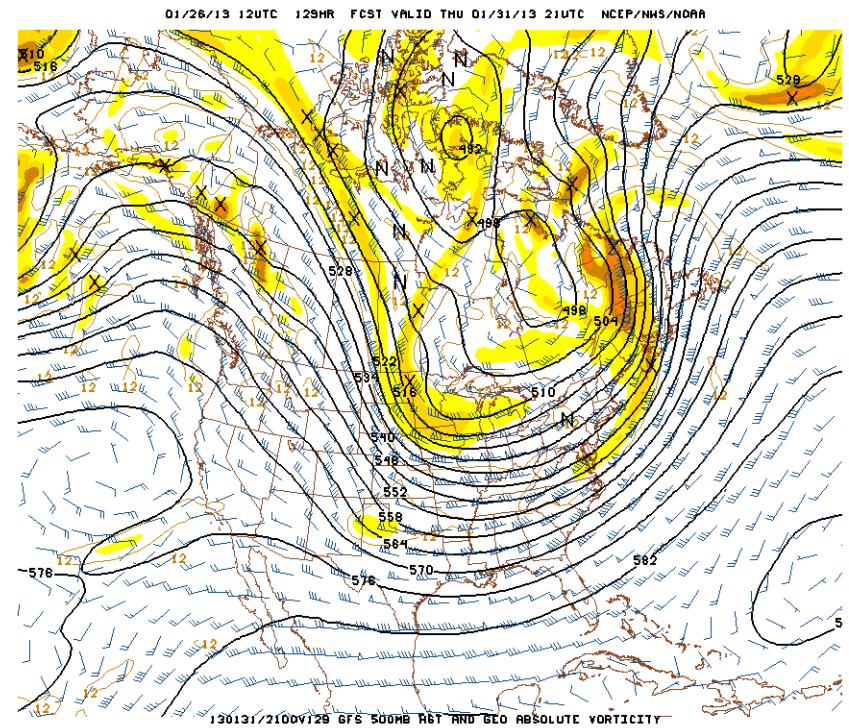


Thursday

**700 mb GFS  
Thursday 1 PM**



**500 mb GFS  
Thursday 1 PM**



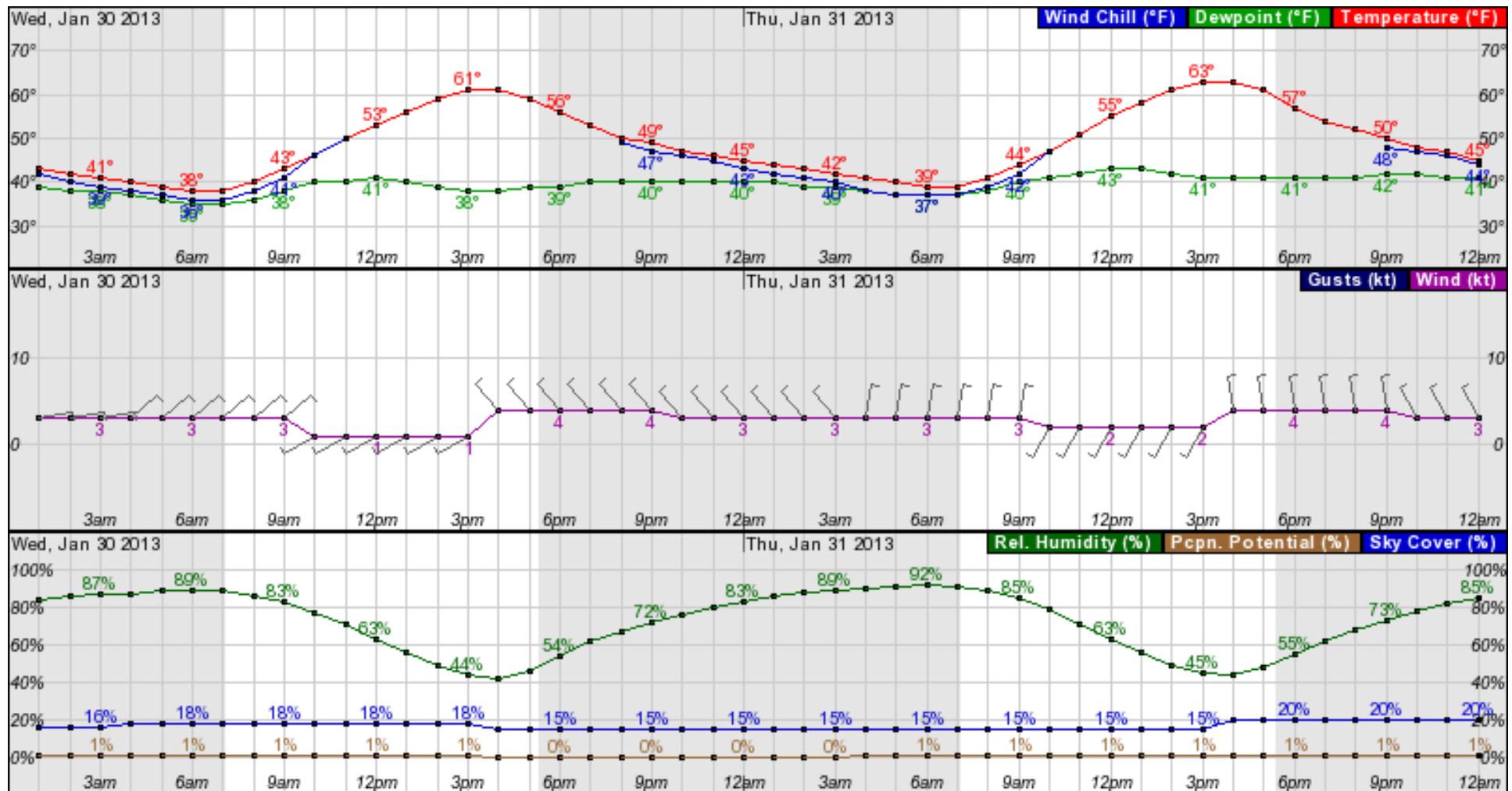
# Fresno

Wednesday: Mostly sunny

Thursday: Mostly sunny

Wednesday →

Thursday →



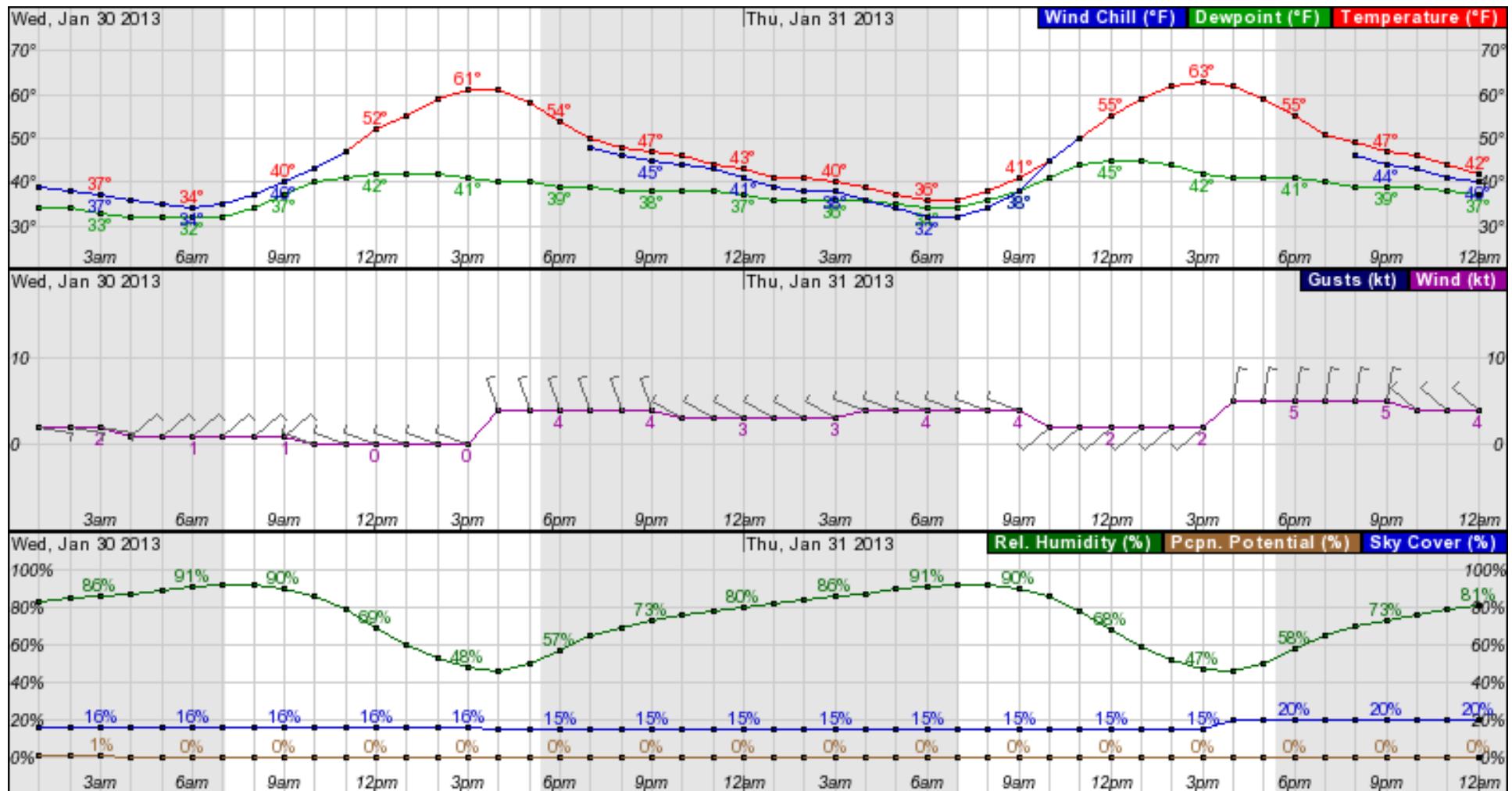
# Hanford

Wednesday: Mostly sunny

Thursday: Mostly sunny

Wednesday →

Thursday →



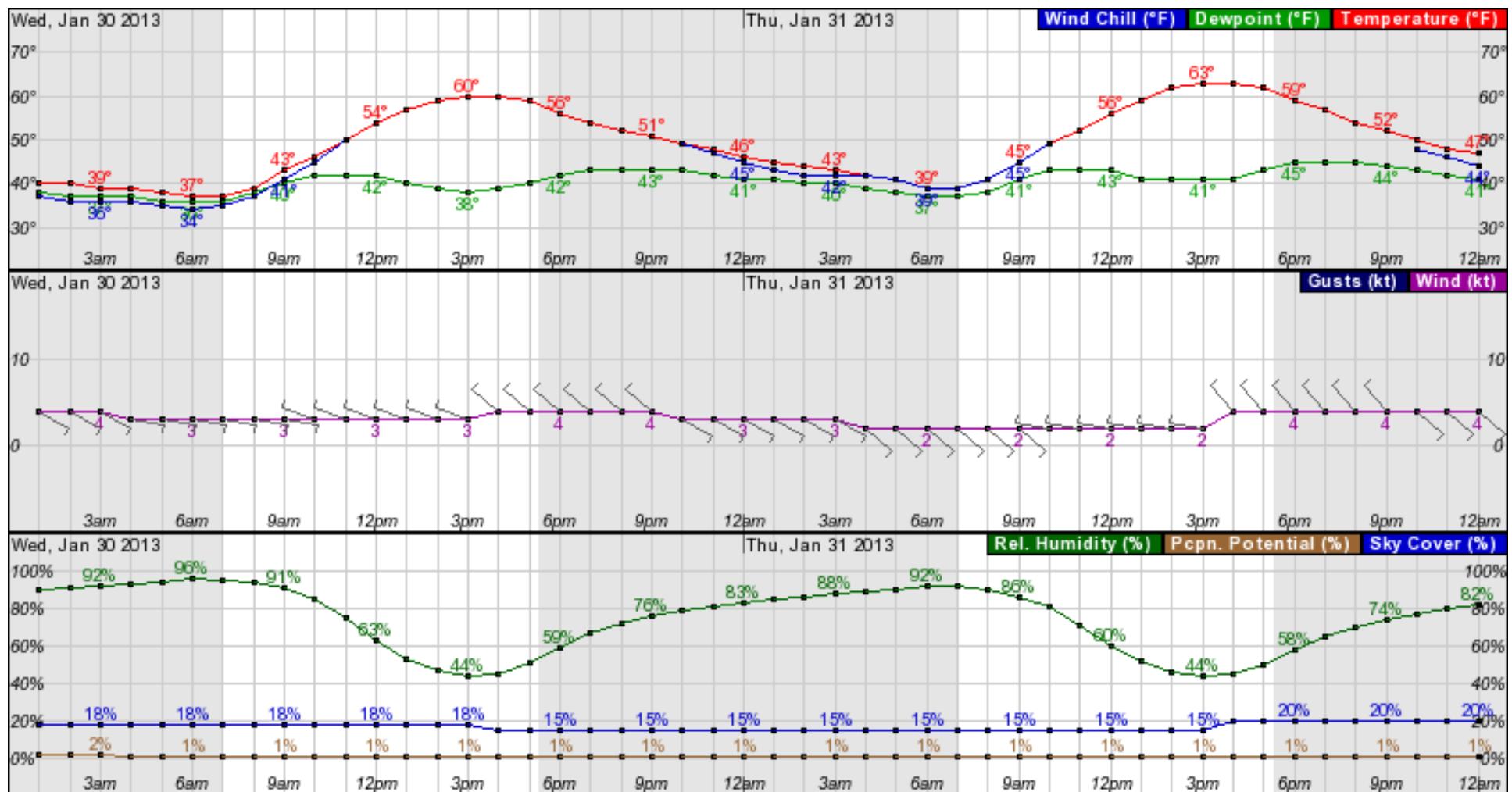
# Bakersfield

Wednesday: Mostly sunny

Thursday: Mostly sunny

Wednesday →

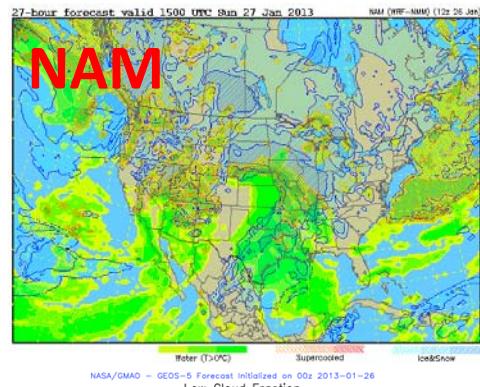
Thursday →



**Tomorrow:** NAM – low level clouds in the morning clearing by 10a, mid level clouds by 4p, no high level clouds; GEOS-5 – low clouds all day, few high clouds, more by afternoon

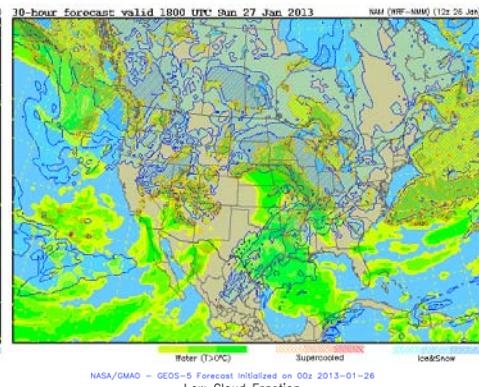
**7 am**

Integrated liquid and frozen hydrometeors (all levels)



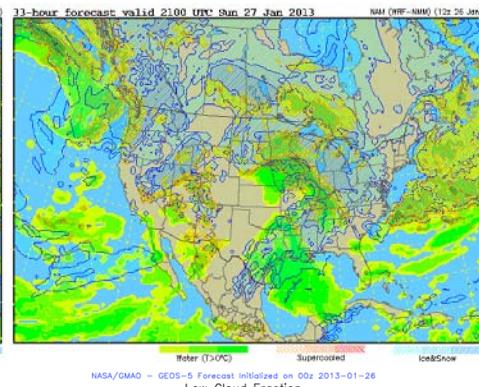
**10 am**

Integrated liquid and frozen hydrometeors (all levels)



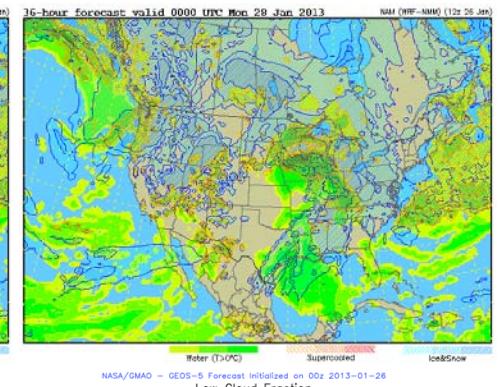
**1 pm**

Integrated liquid and frozen hydrometeors (all levels)

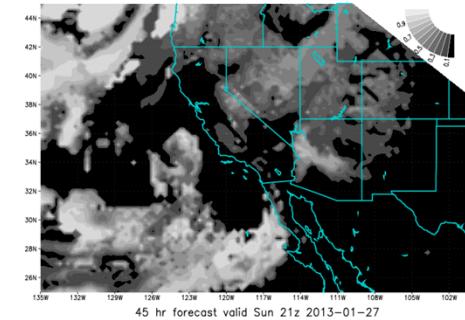
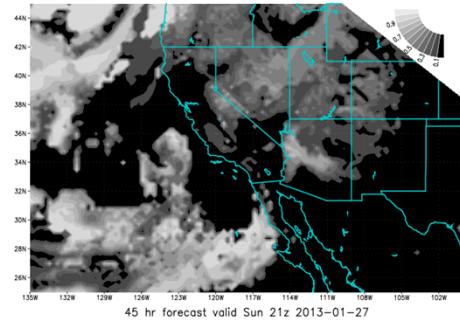
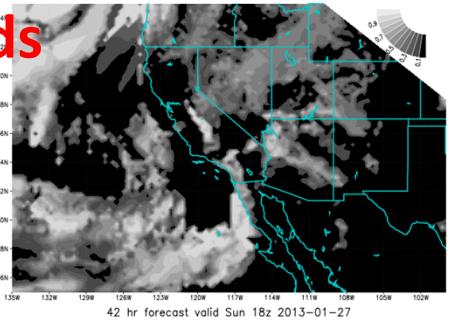
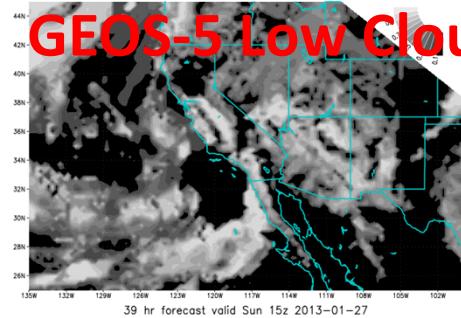


**4 pm**

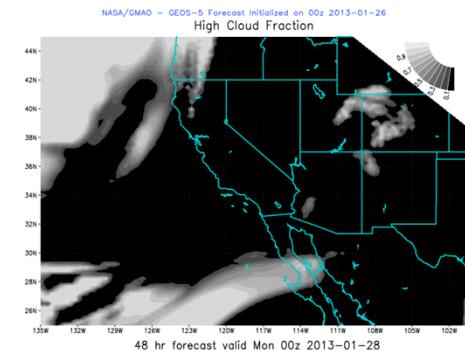
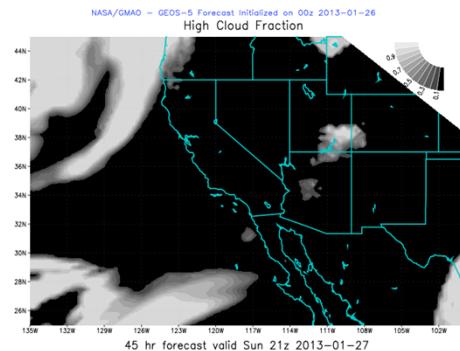
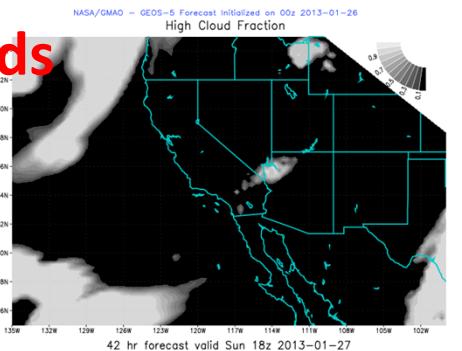
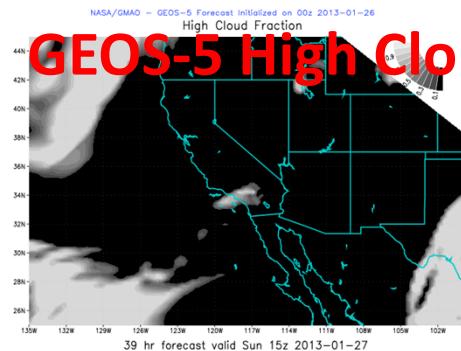
Integrated liquid and frozen hydrometeors (all levels)



**GEOS-5 Low Clouds**



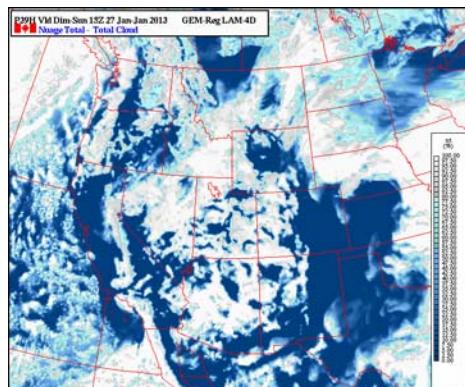
**GEOS-5 High Clouds**



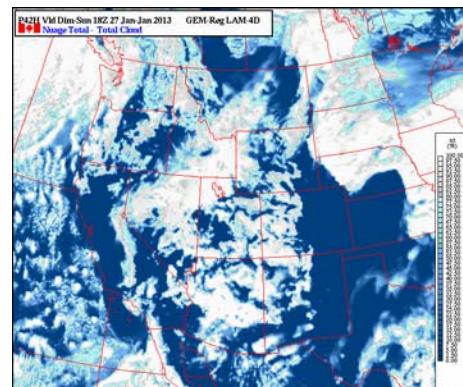
**Tomorrow:** Canadian – clouds forecasted over SJV throughout the day; GFS – low level clouds throughout SJV region.

7 am

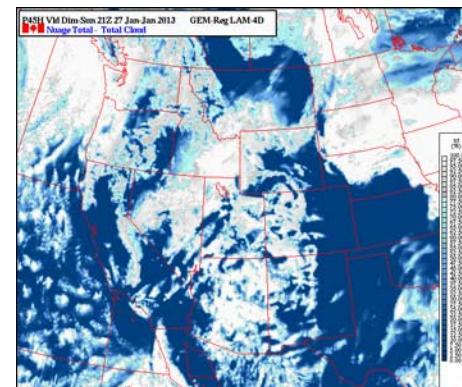
**Canadian**



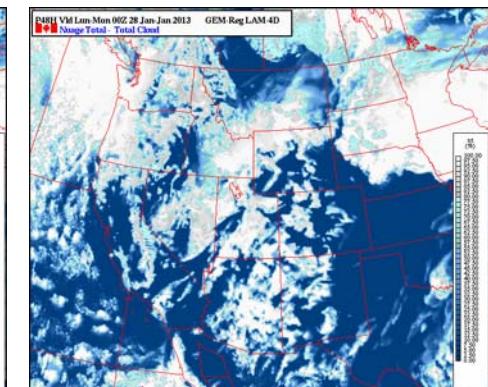
10 am



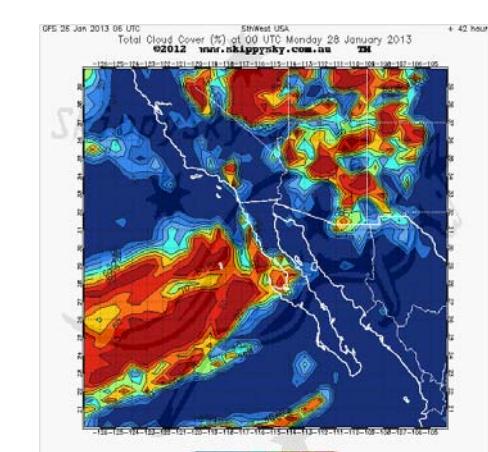
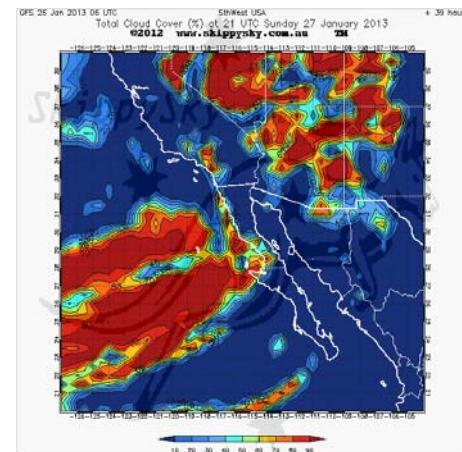
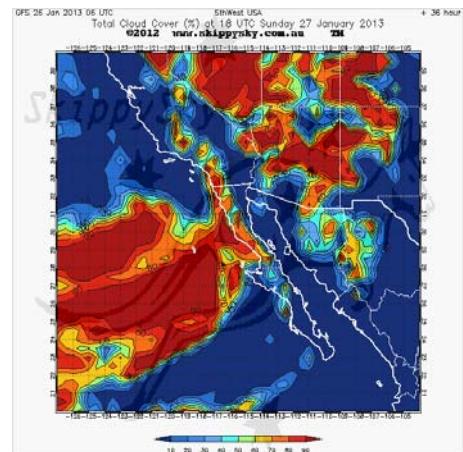
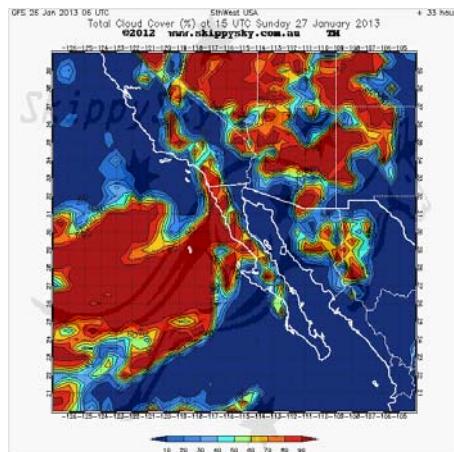
1 pm



4 pm



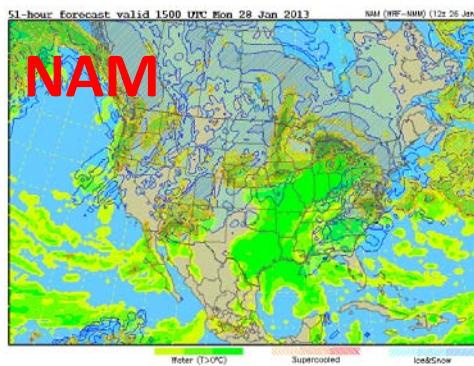
**GFS**



**Monday:** NAM – no low level clouds in forecast, some mid level at southern end of SJV at 4p, some high level at northern end of SJV by 4p; GEOS-5 – Possible fog in morning, but gone by 10a, low clouds return in early afternoon. High level clouds approaching from the north, but never get to SJV.

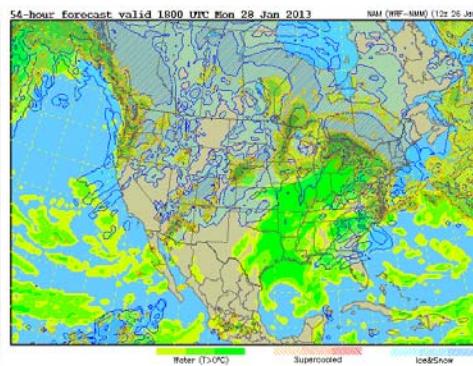
7 am

Integrated liquid and frozen hydrometeors (all levels)



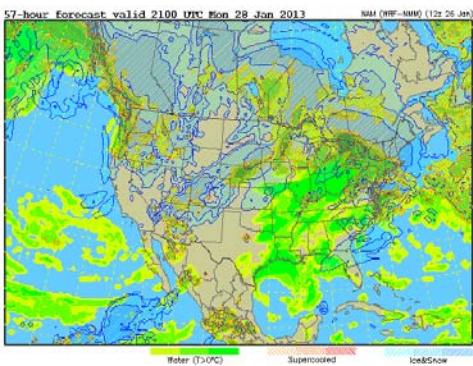
10 am

Integrated liquid and frozen hydrometeors (all levels)



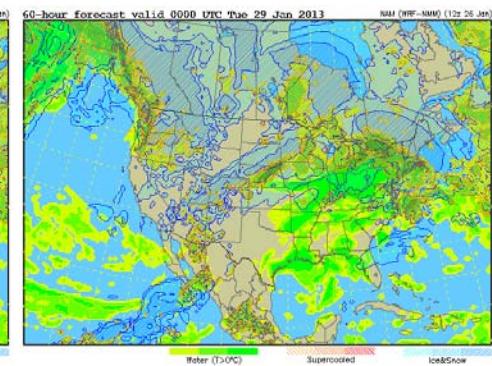
1 pm

Integrated liquid and frozen hydrometeors (all levels)

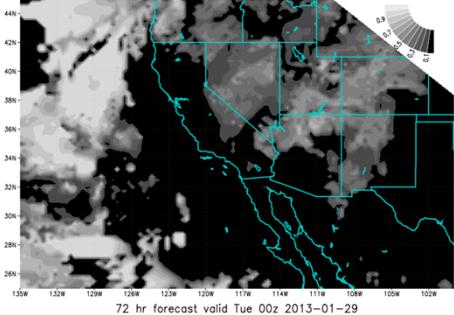
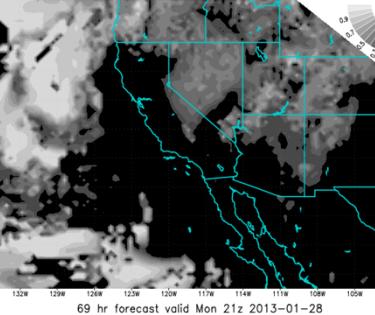
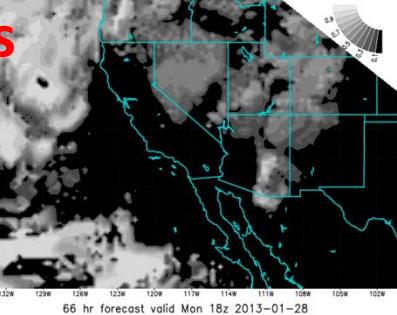


4 pm

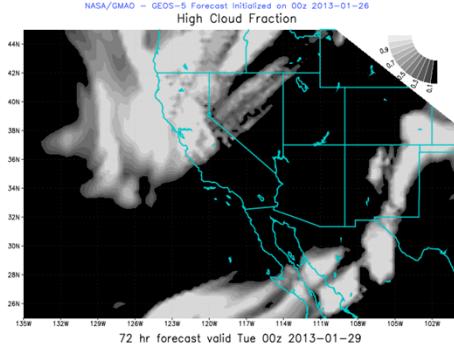
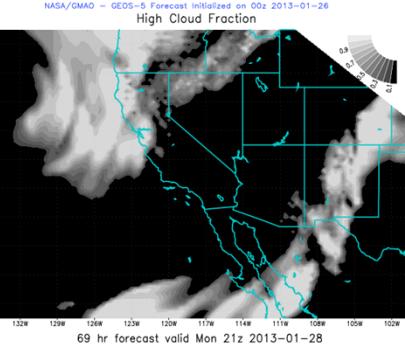
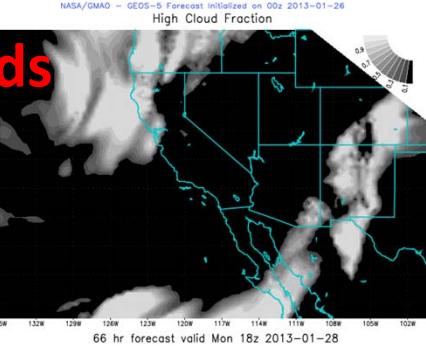
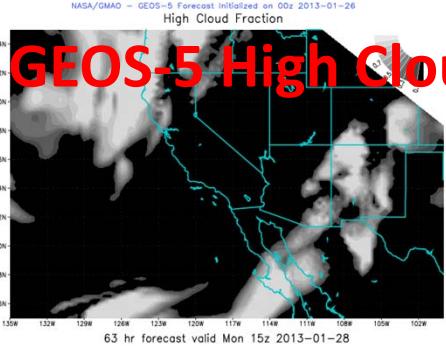
Integrated liquid and frozen hydrometeors (all levels)



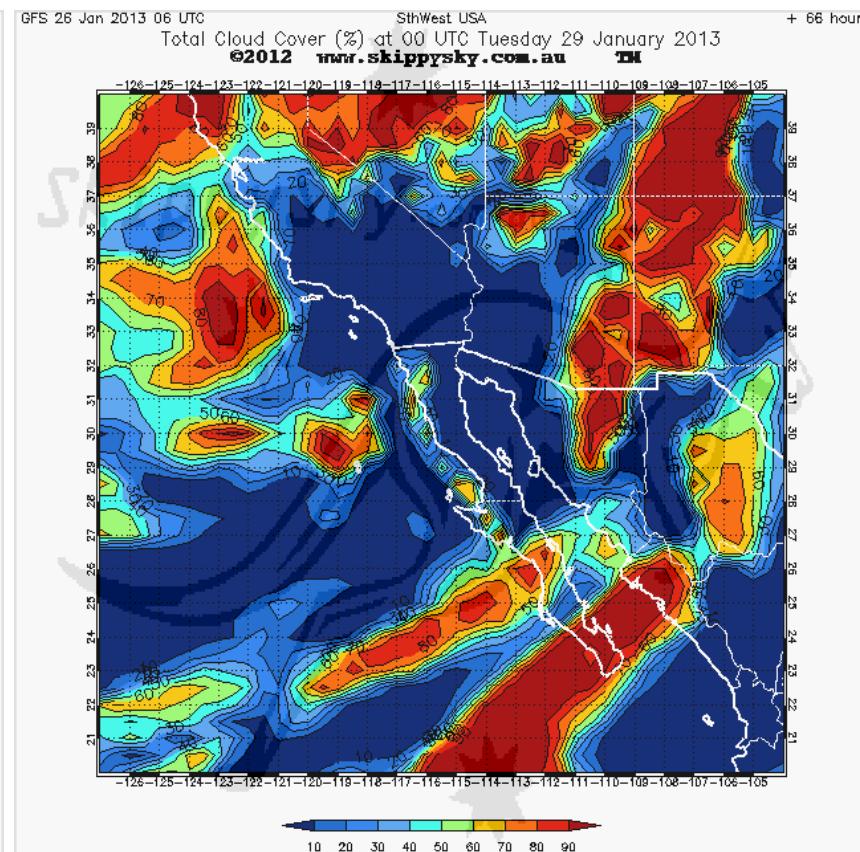
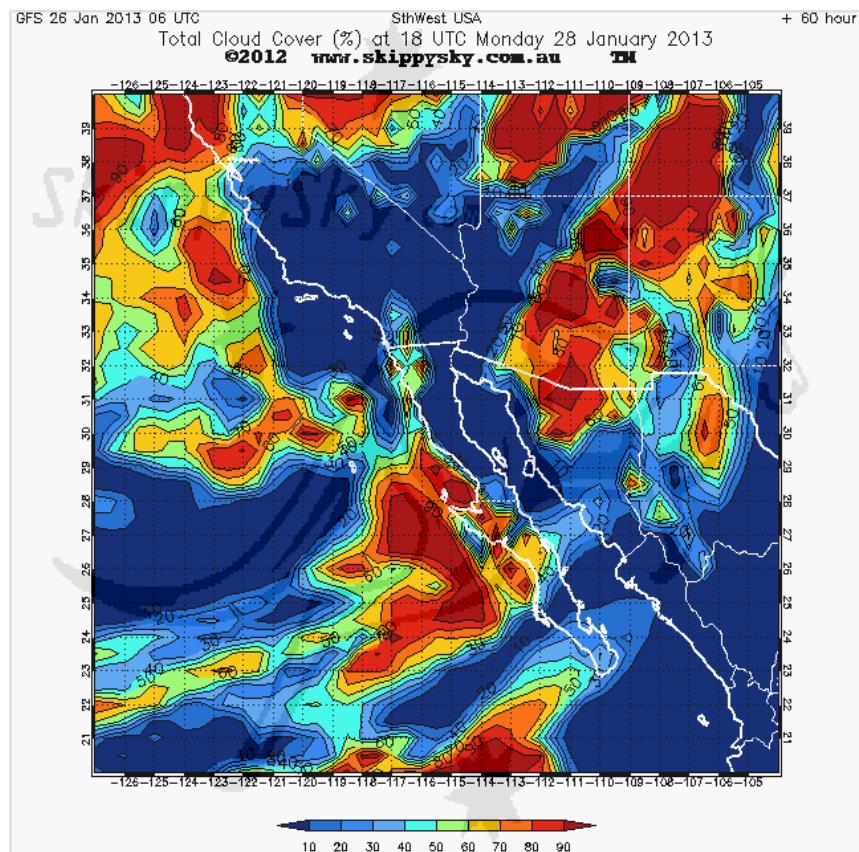
GEOS-5 Low Clouds



GEOS-5 High Clouds



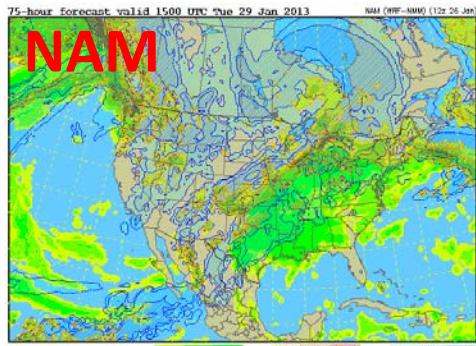
## Monday: GFS – forecasts mostly clear skies



**Tuesday:** NAM –; GEOS-5 – no low level clouds in forecast, some mid level around 10 am, high level clouds all day

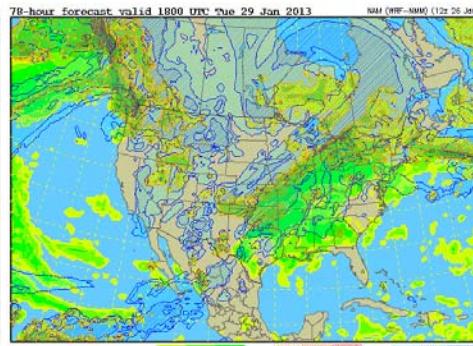
**7 am**

Integrated liquid and frozen hydrometeors (all levels)



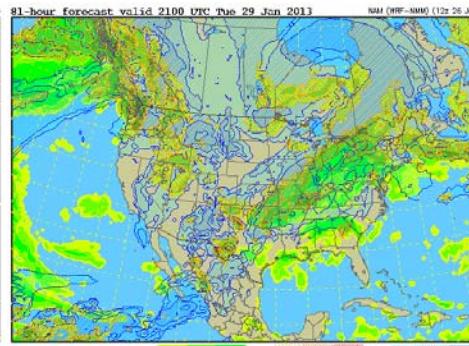
**10 am**

Integrated liquid and frozen hydrometeors (all levels)



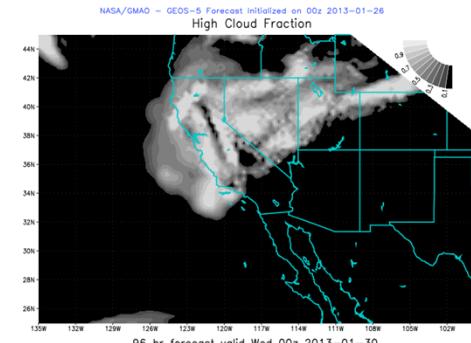
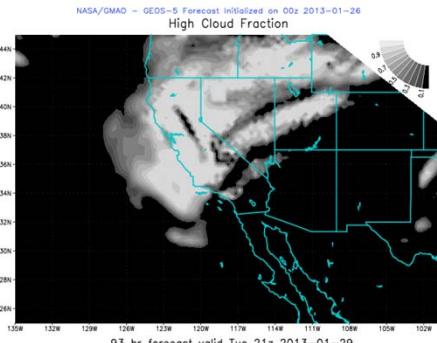
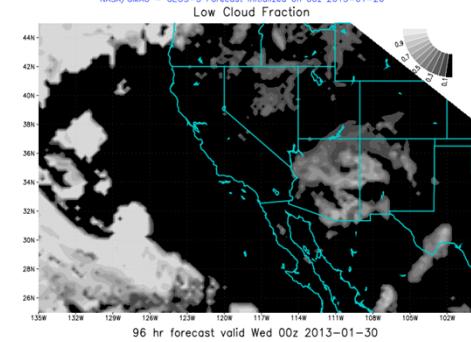
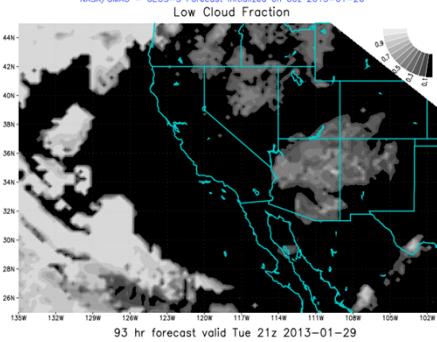
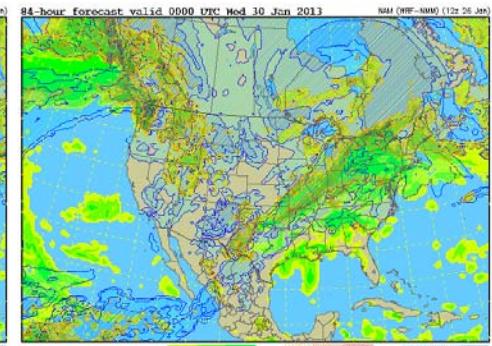
**1 pm**

Integrated liquid and frozen hydrometeors (all levels)

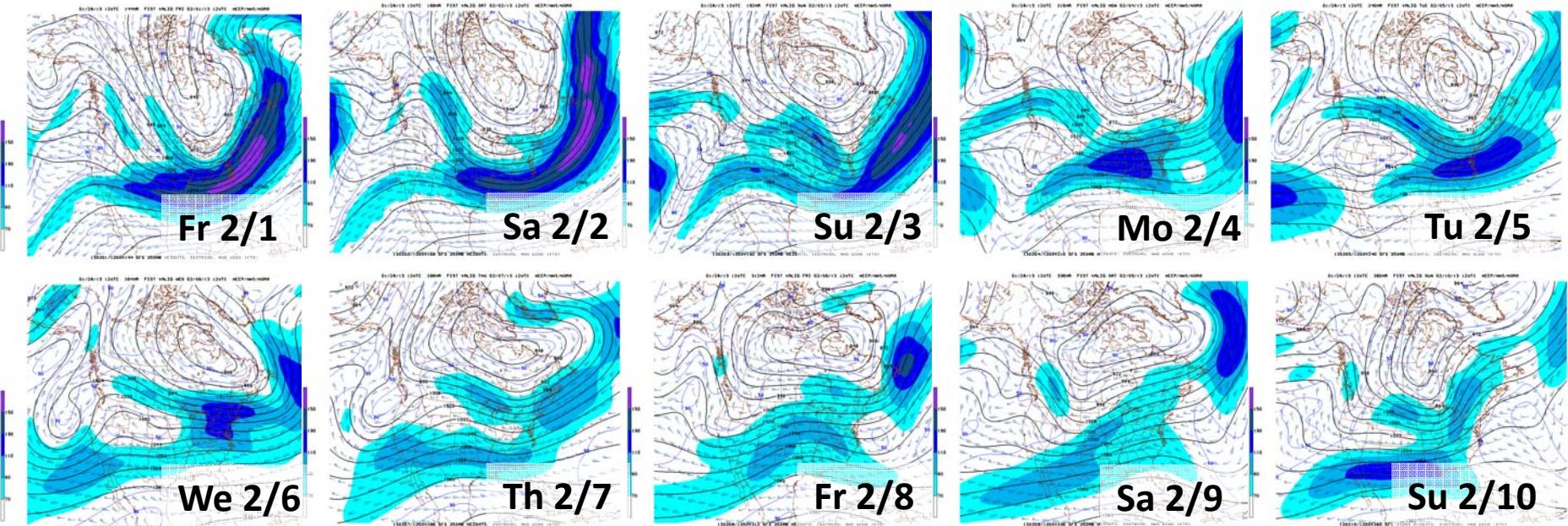


**4 pm**

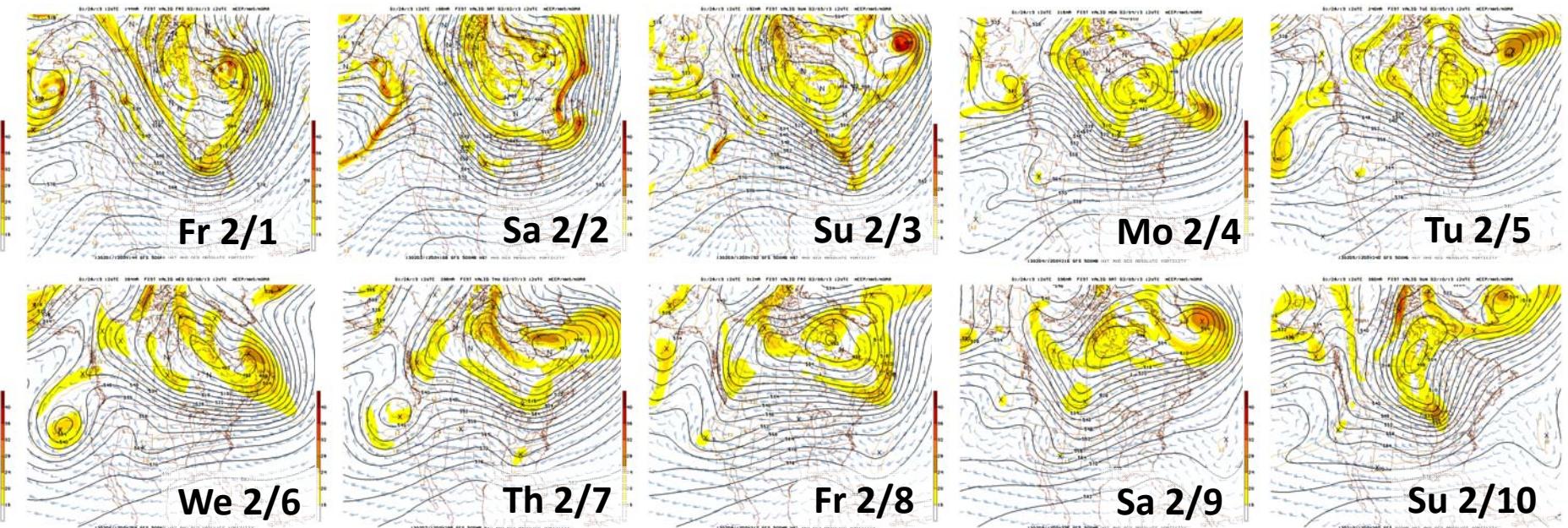
Integrated liquid and frozen hydrometeors (all levels)



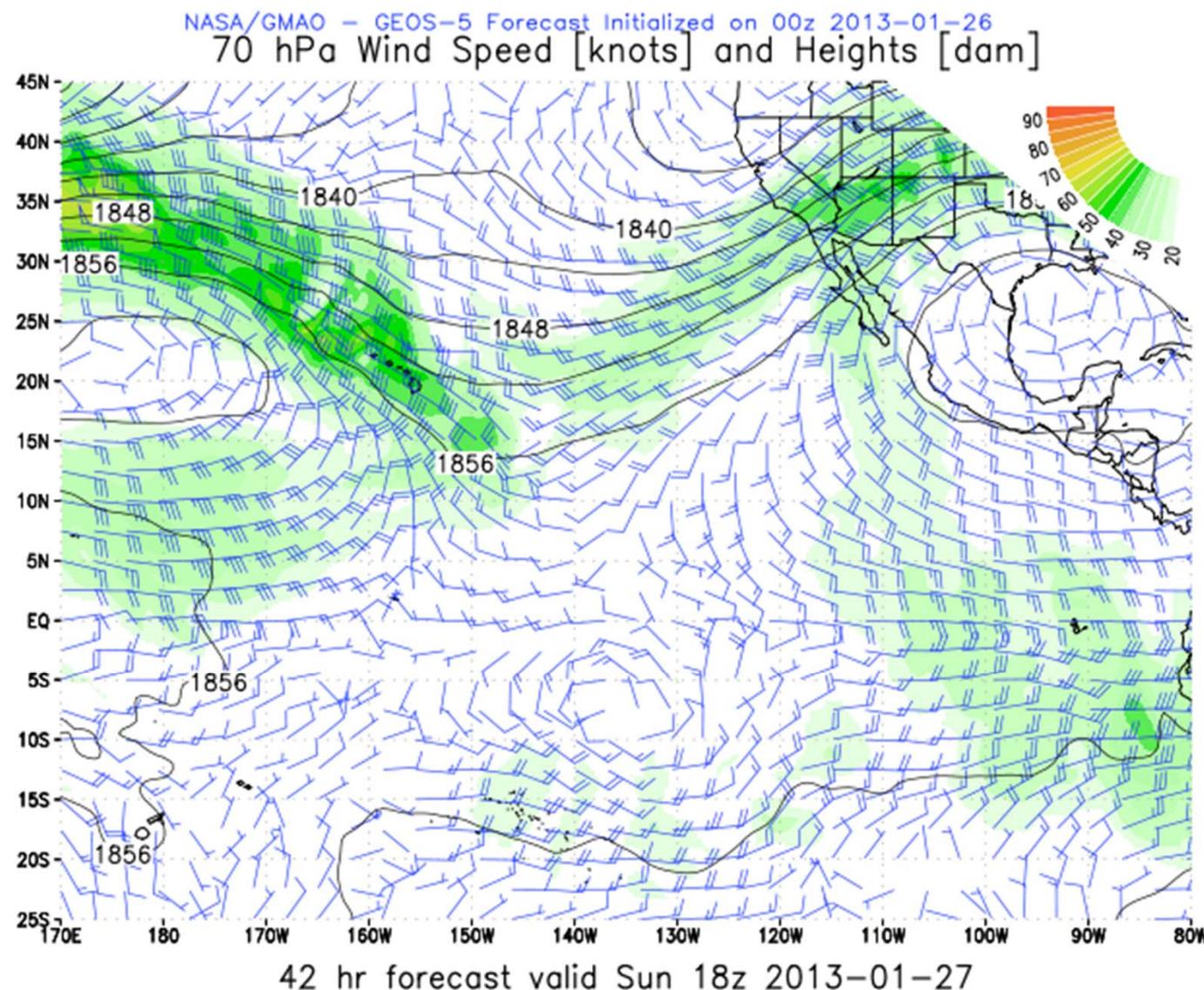
## GFS - 250 mb winds - Extended forecast



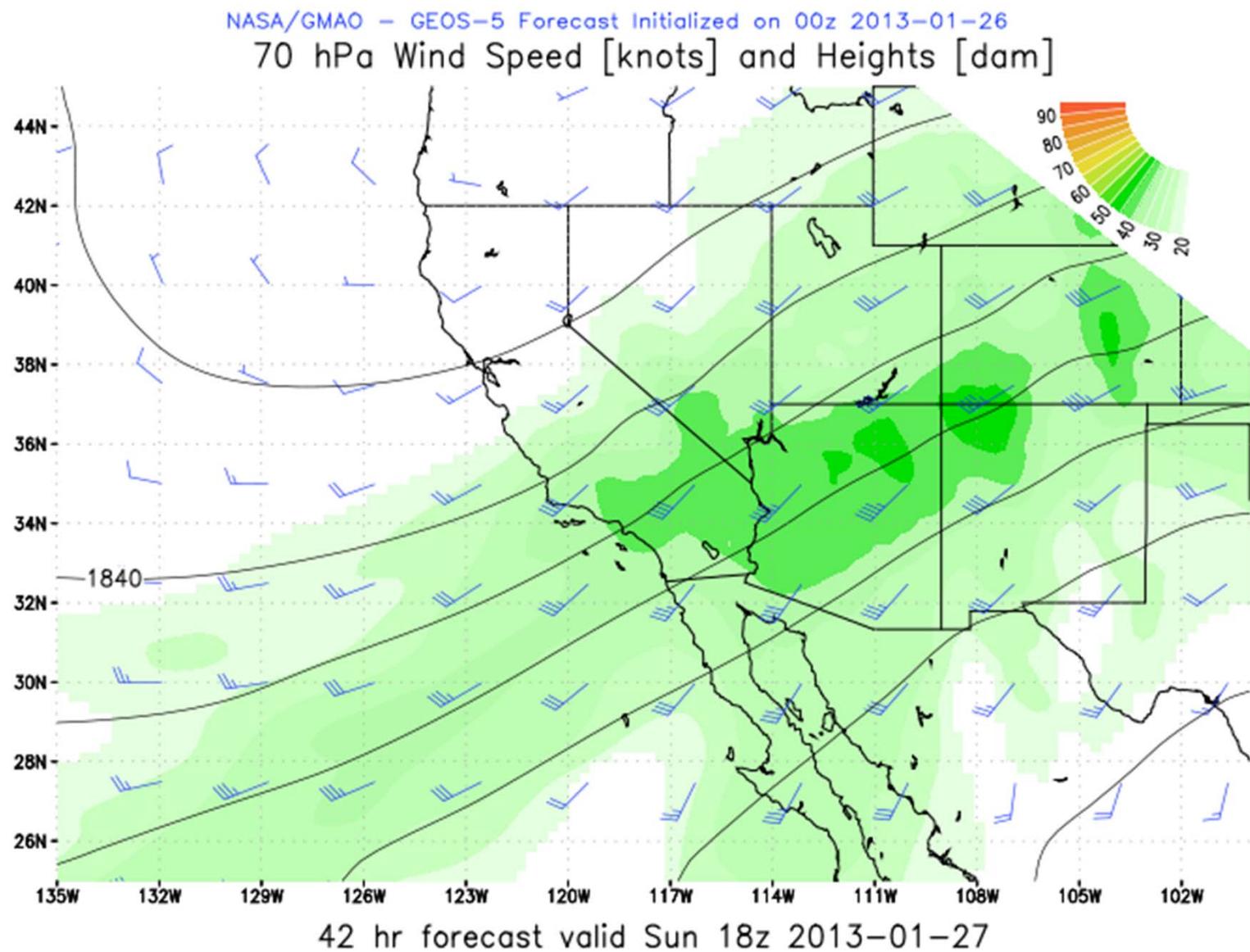
## GFS - 500 mb vorticity - Extended forecast

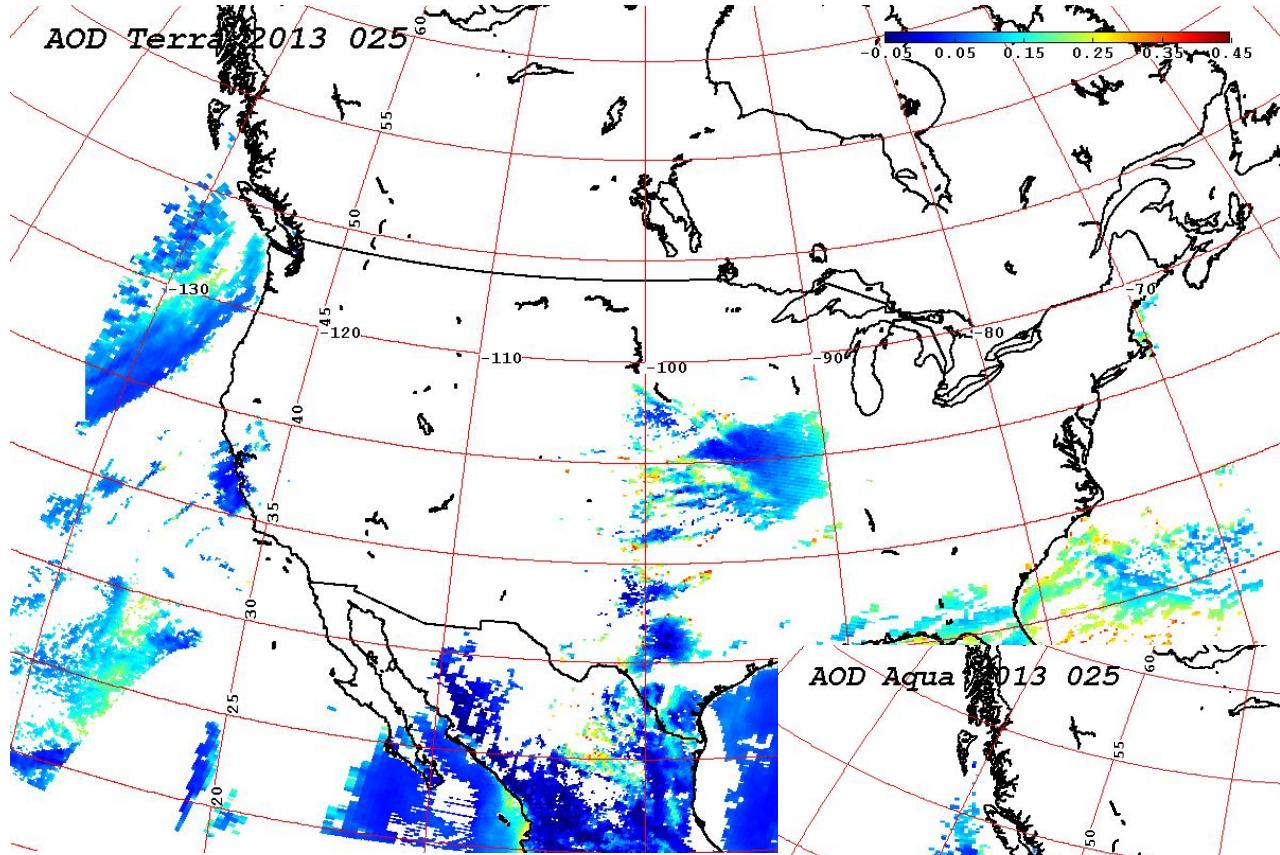


# GEOS-5: Sunday 18Z = 10 PST

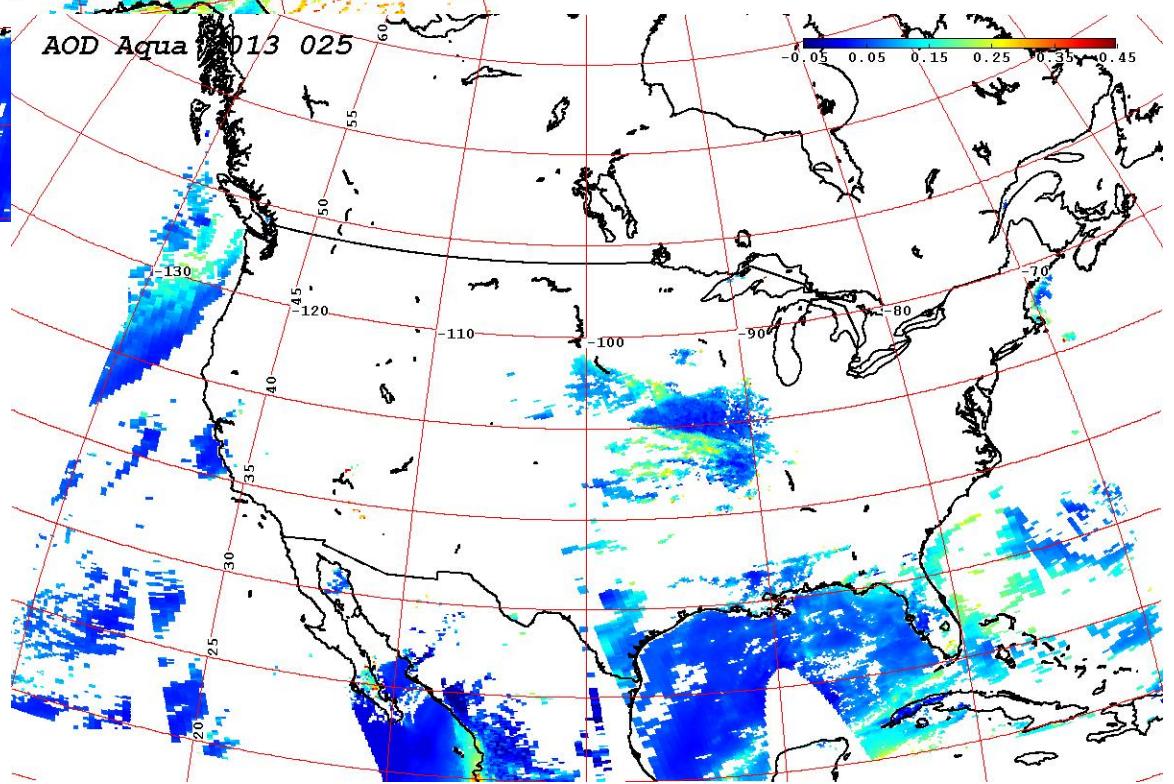


# GEOS-5: Sunday 18Z = 10 PST

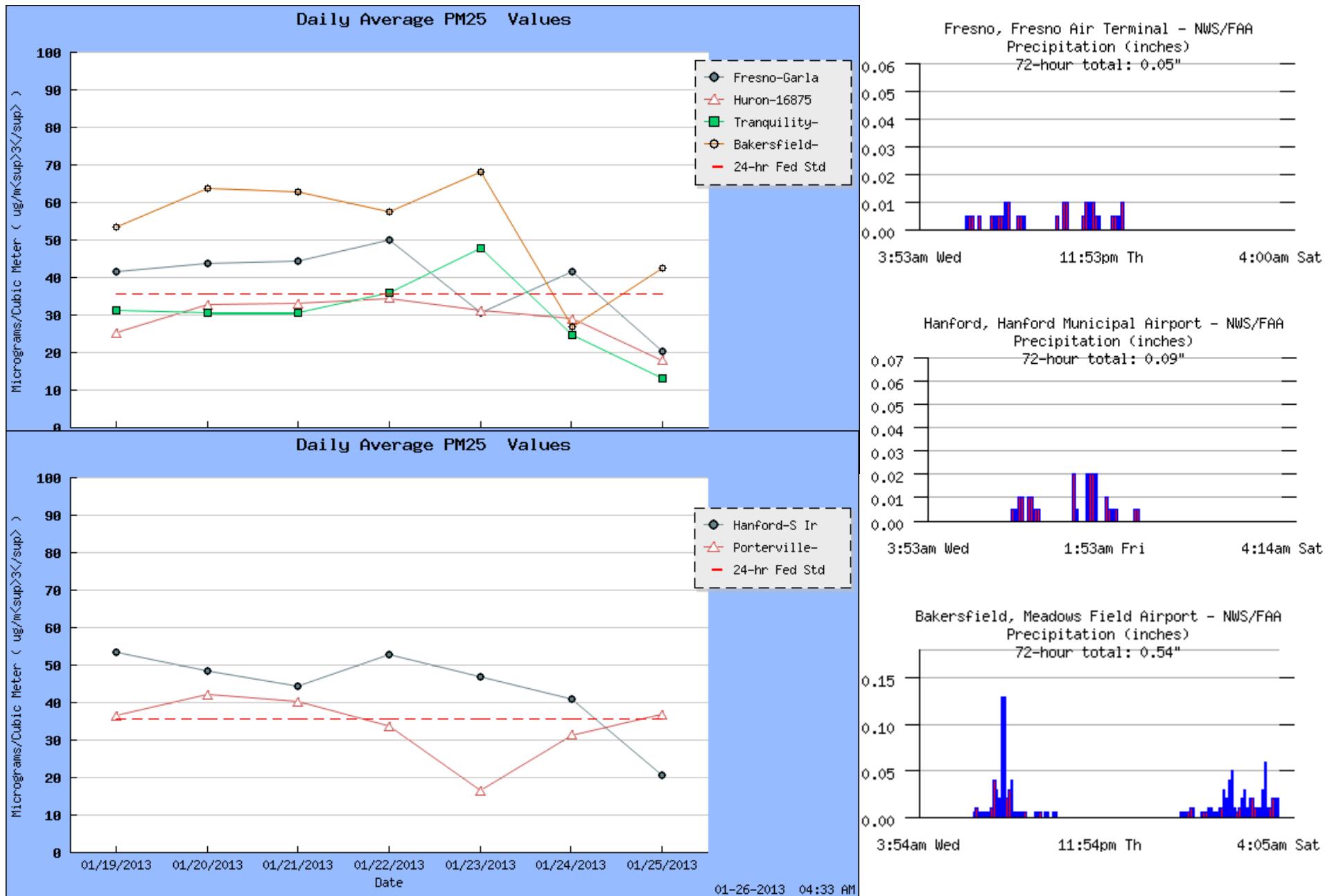




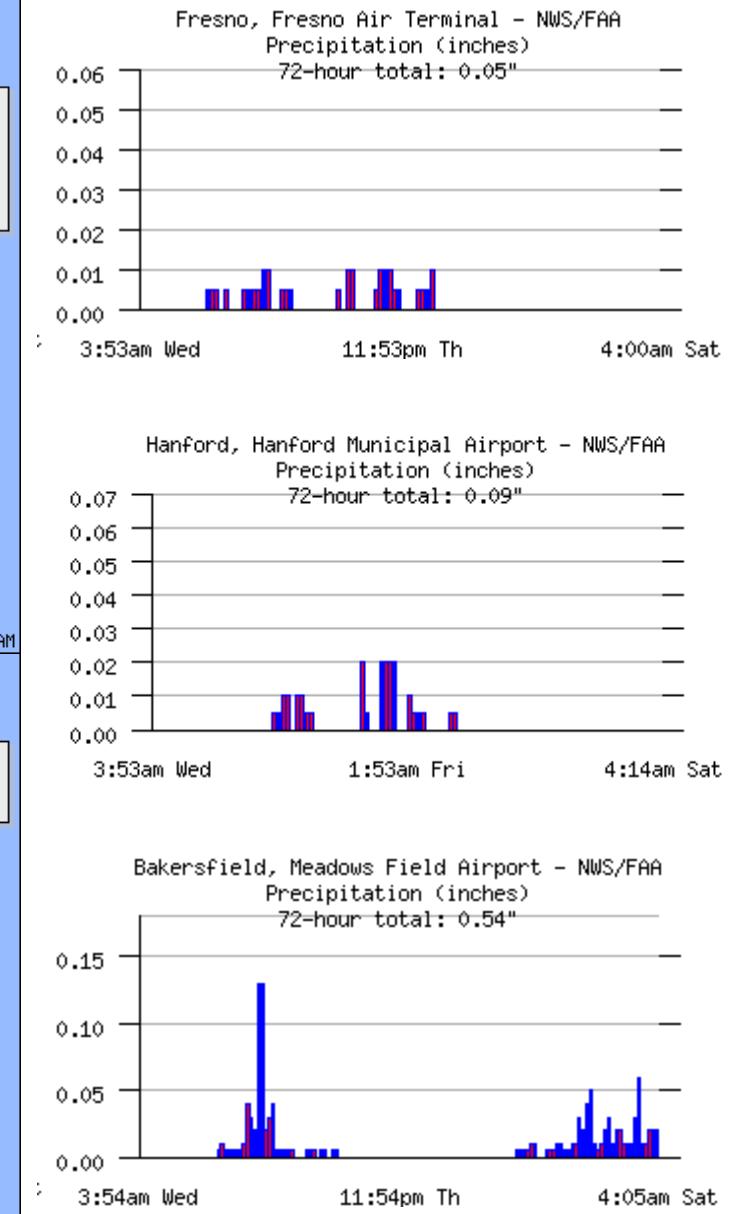
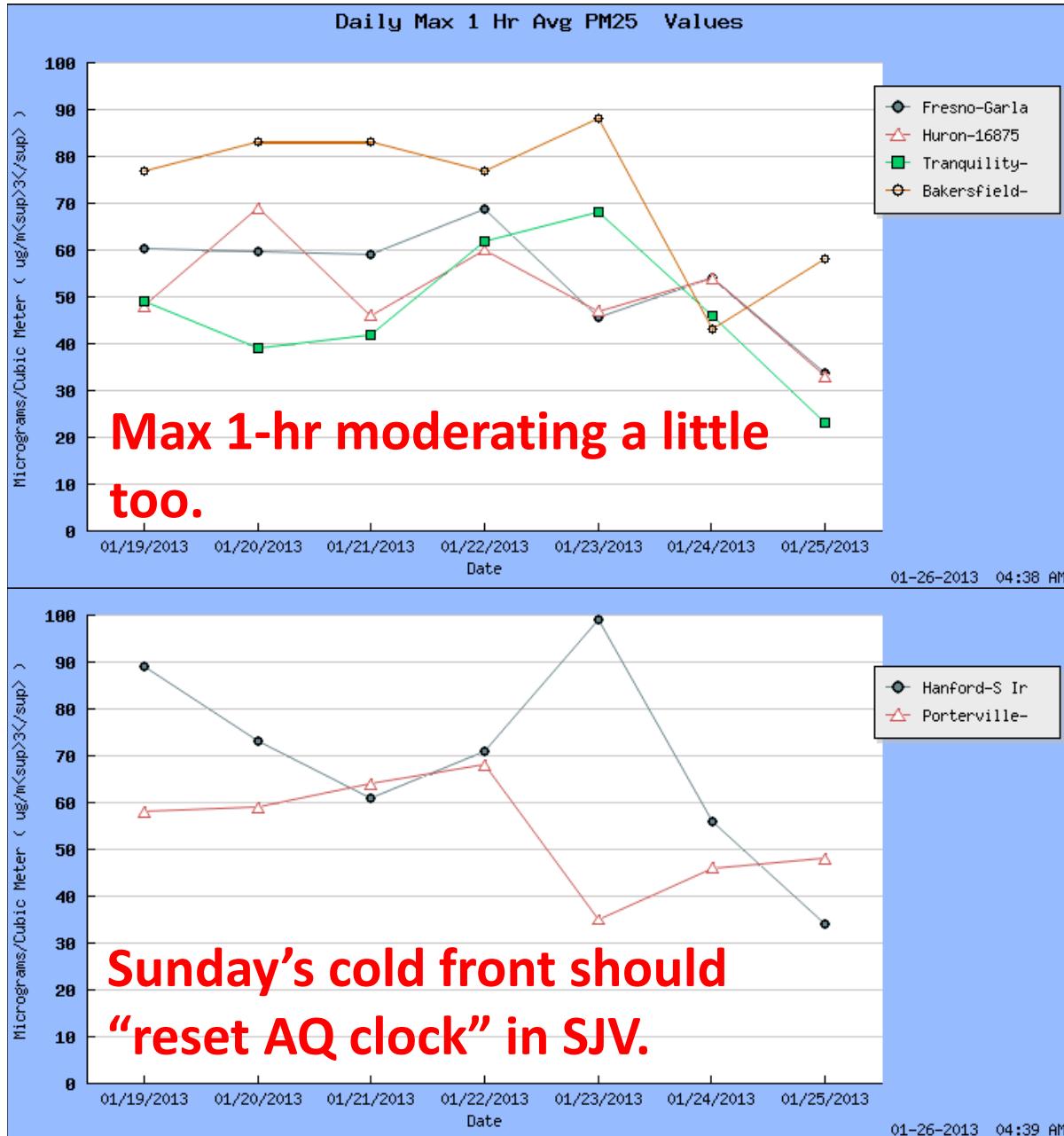
**Too cloudy for AOD  
observations from  
MODIS yesterday,  
January 25<sup>th</sup>.**



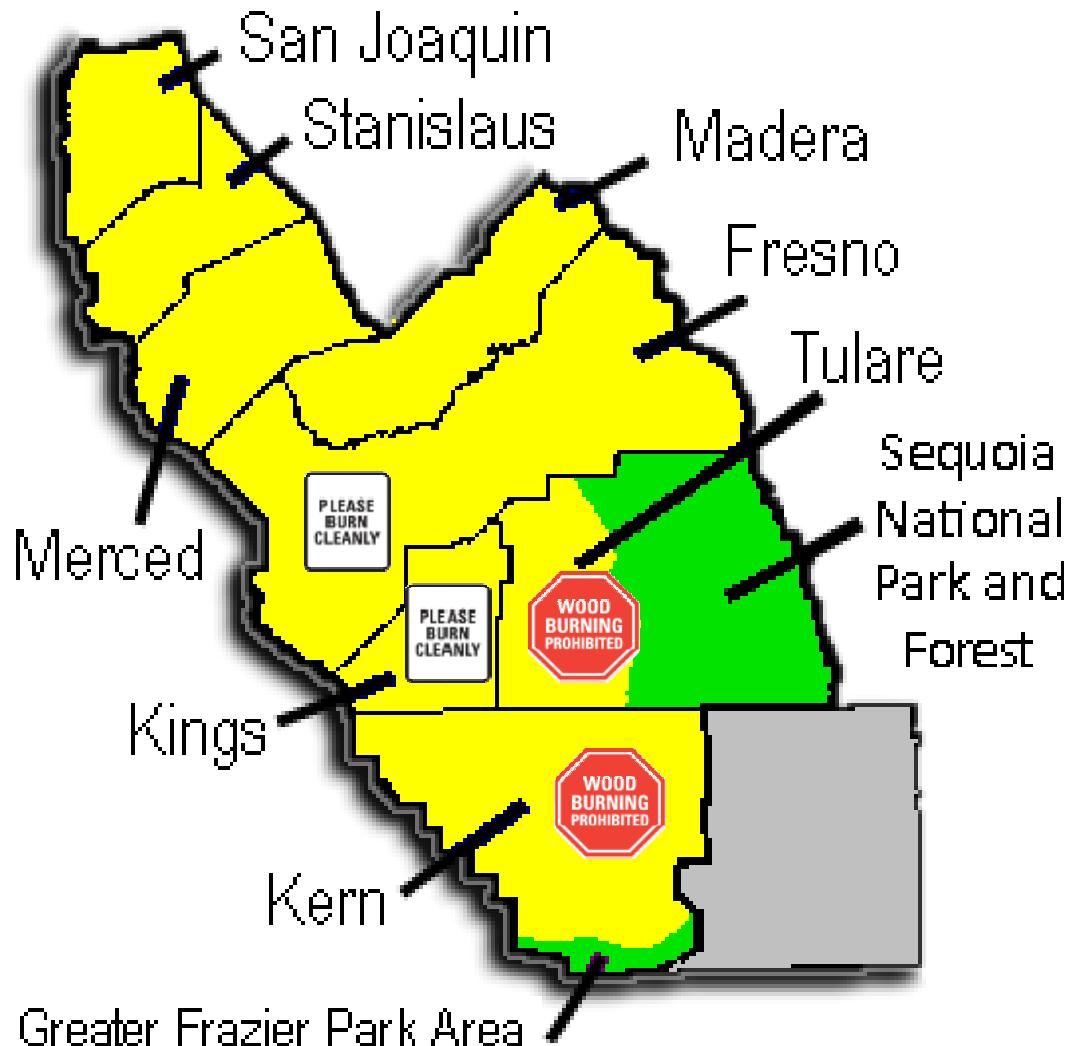
# Daily PM2.5 Avg: CARB Sites



# Daily PM2.5 Max 1 Hr Avg: CARB Sites

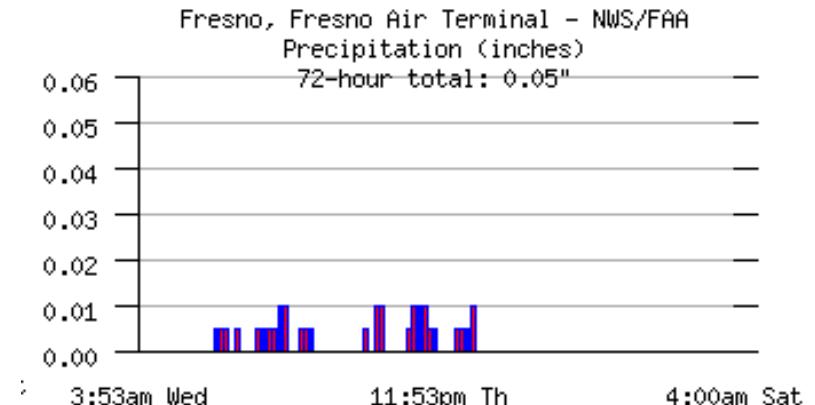


# SJV APCD Daily Forecast – for TODAY (Jan 26)



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

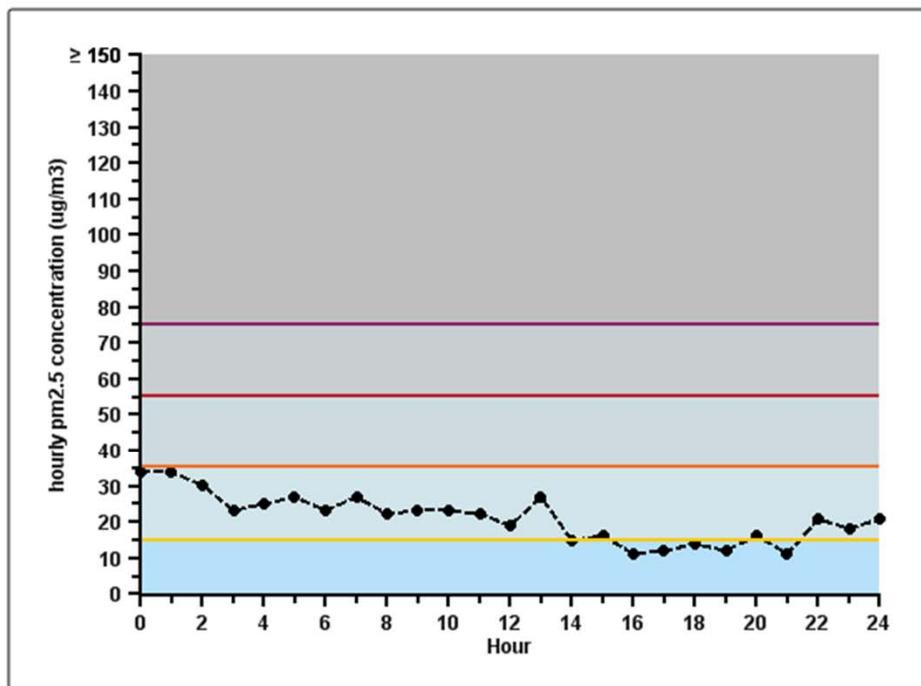
# Fresno-Garland



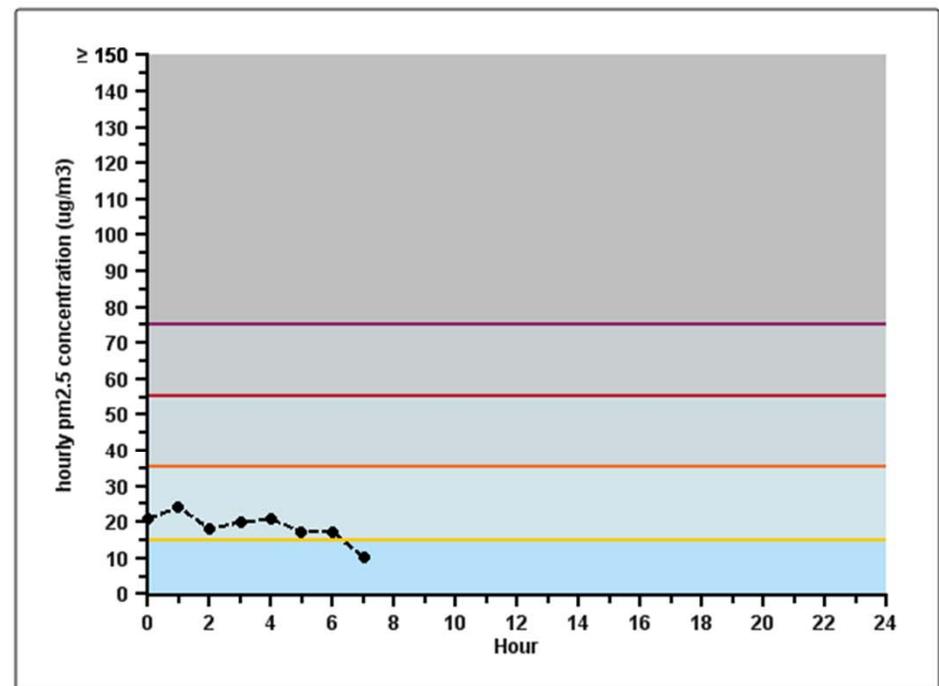
January 25<sup>th</sup> Yesterday

January 26<sup>th</sup> Today

Air District Real-Time Outdoor Activity Risk

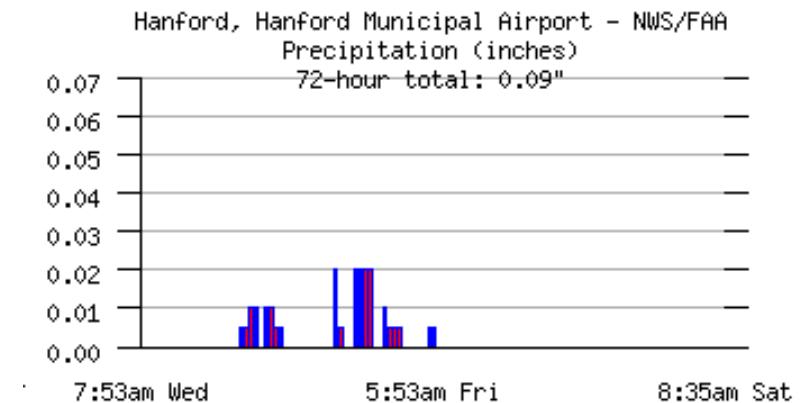


Air District Real-Time Outdoor Activity Risk



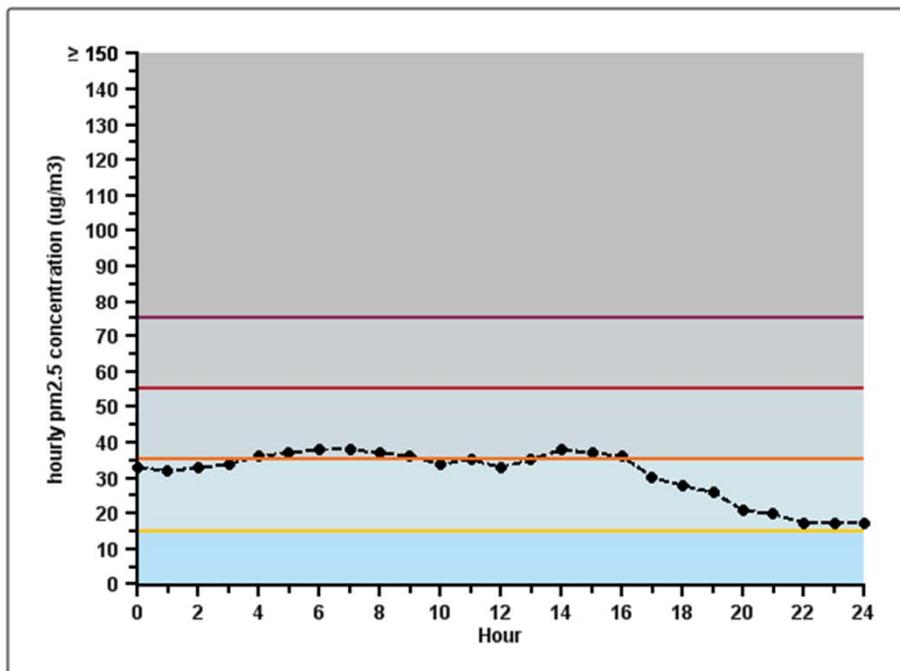
# Corcoran

January 25<sup>th</sup> Yesterday

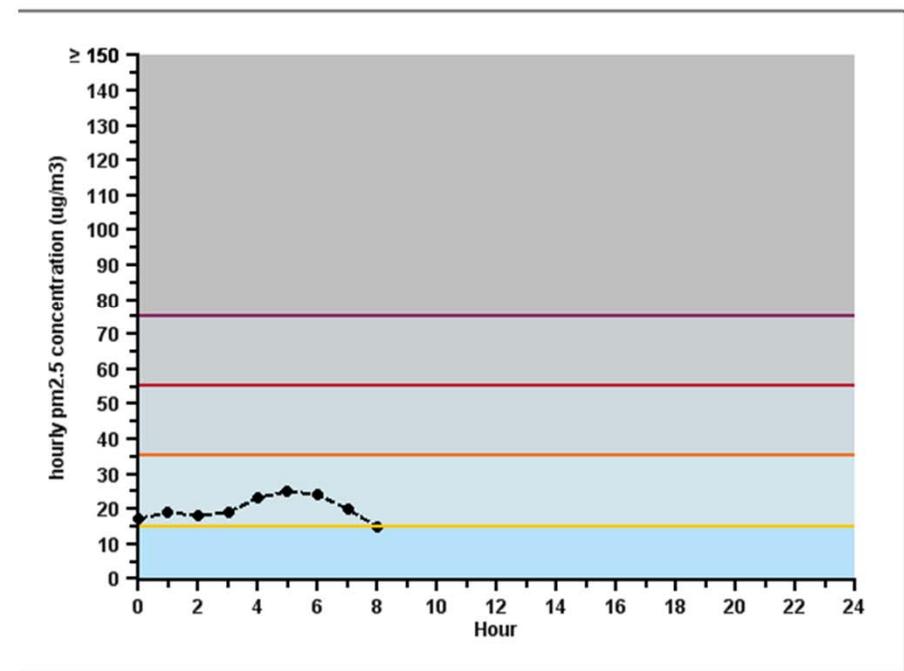


January 26<sup>th</sup> Today

Air District Real-Time Outdoor Activity Risk

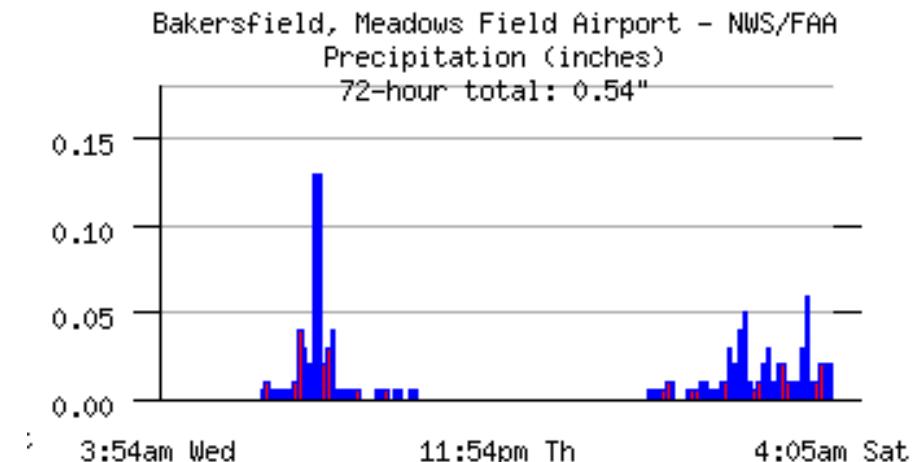
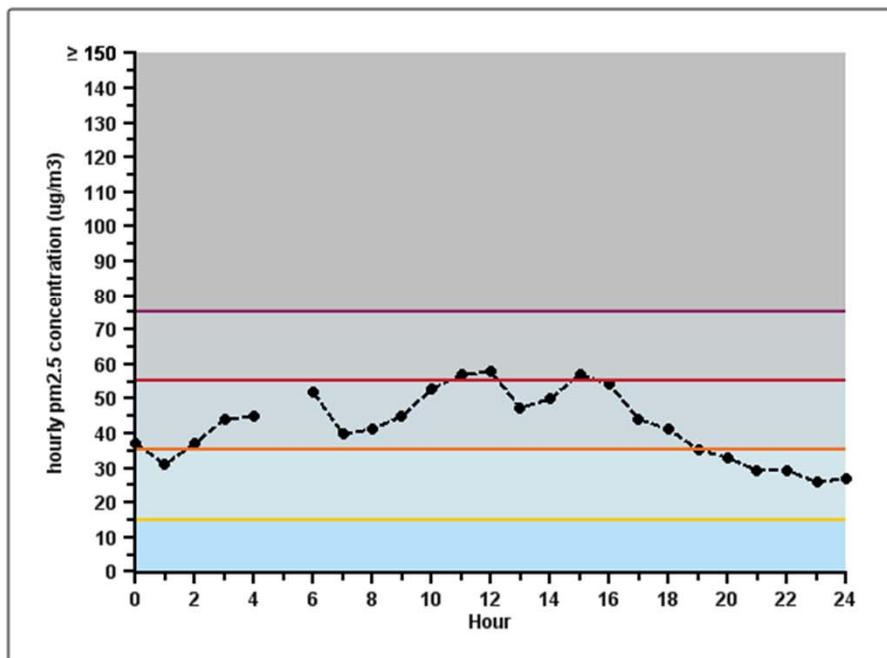


Air District Real-Time Outdoor Activity Risk

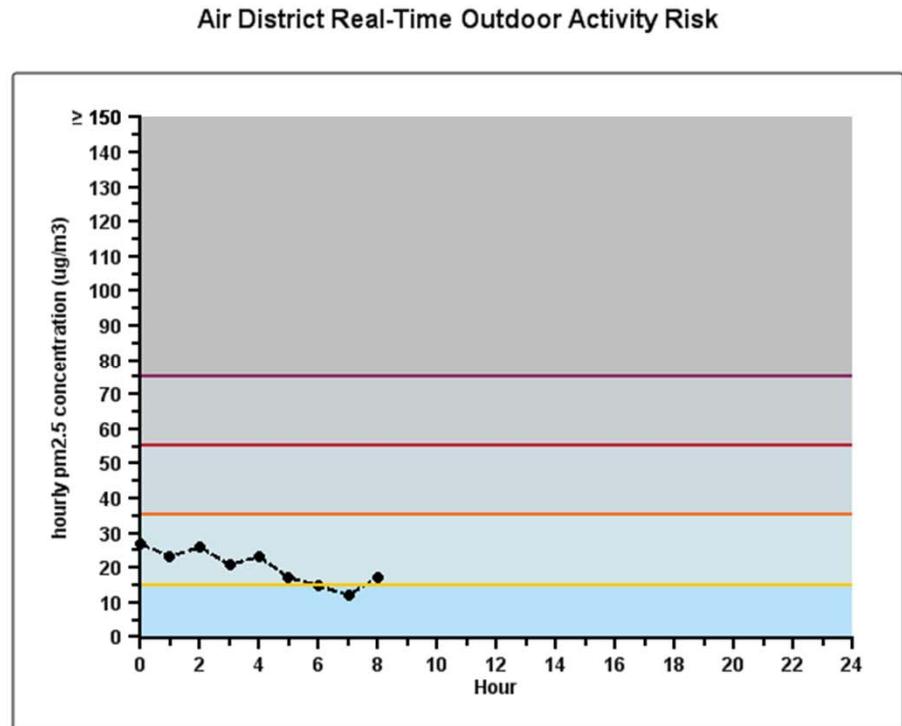


# Bakersfield Municipal Airport

January 25<sup>th</sup> Yesterday



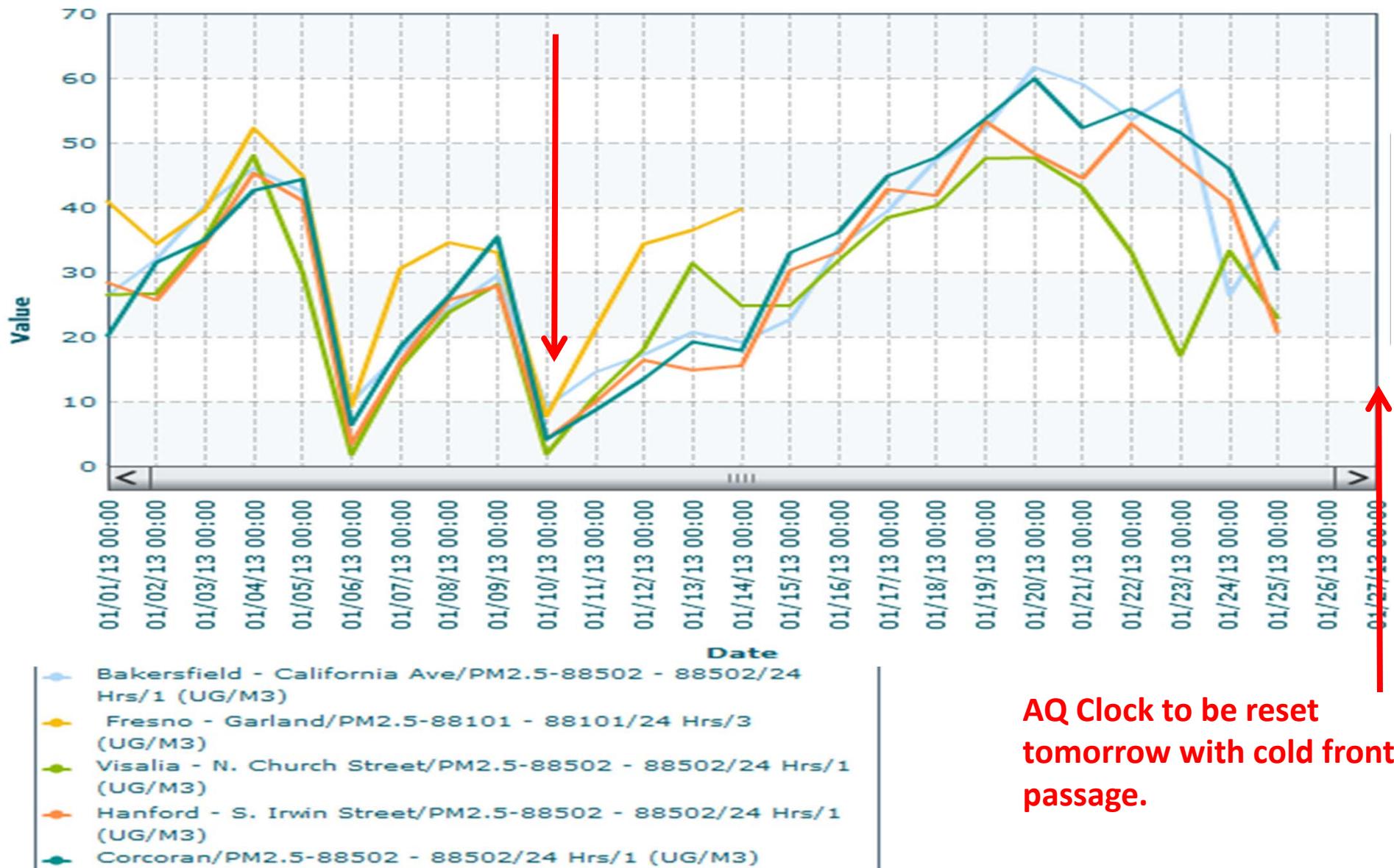
January 26<sup>th</sup> Today



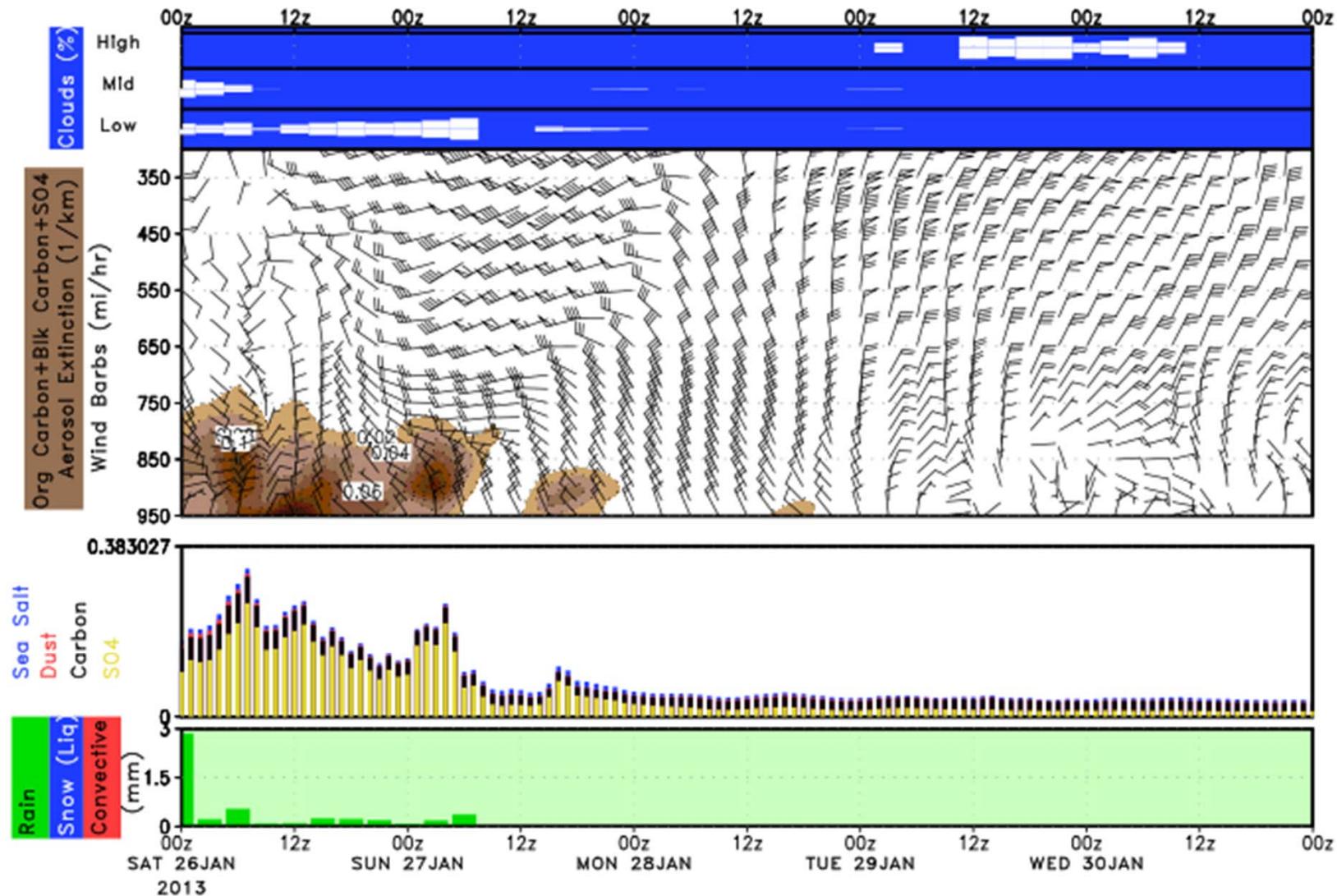
# AirNowTech Data: Daily PM<sub>2.5</sub> since January 1<sup>st</sup>

AQ Clock  
reset on 10th

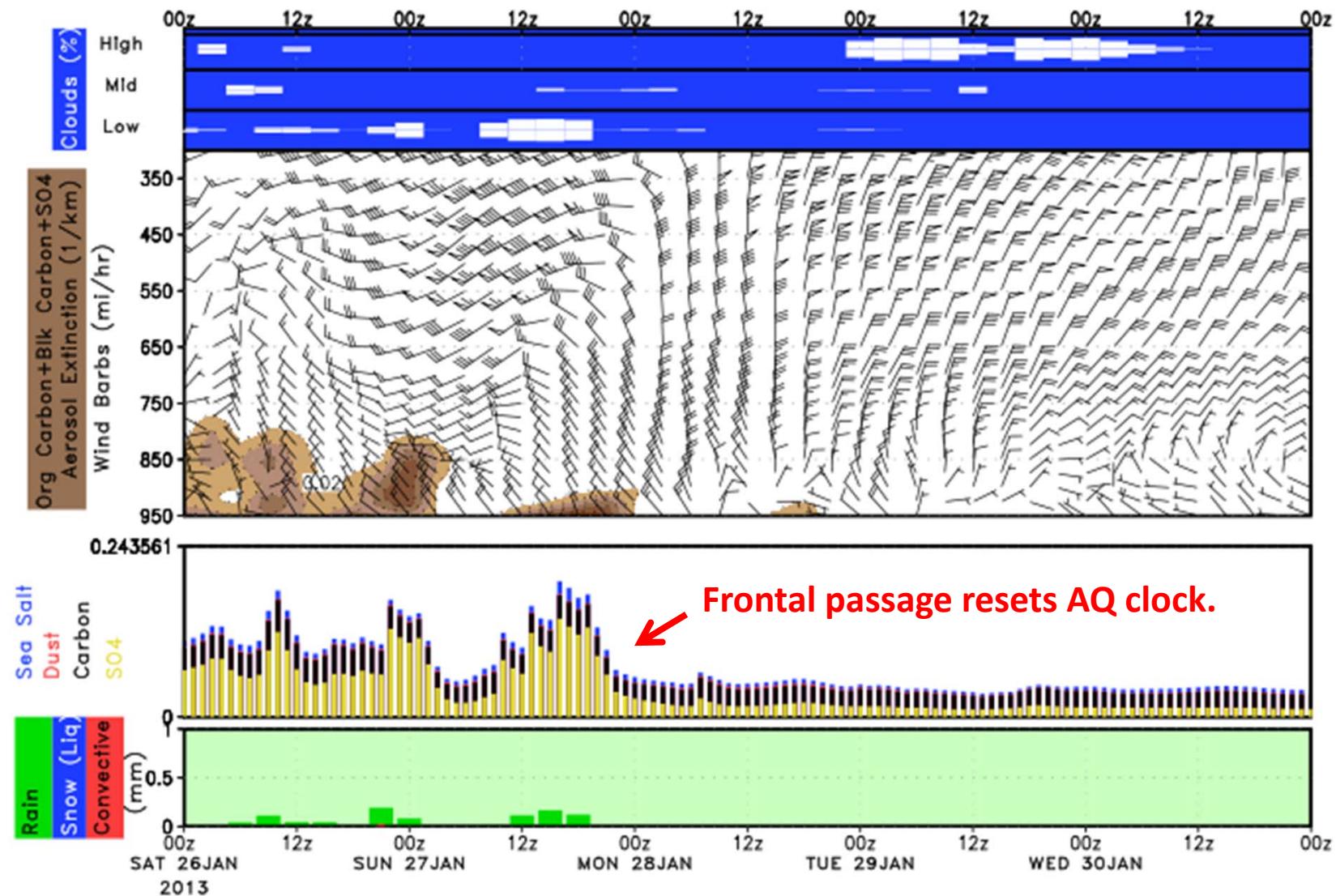
AQ Clock knocked back to levels at  
start of mission (14<sup>th</sup>) with Rain.



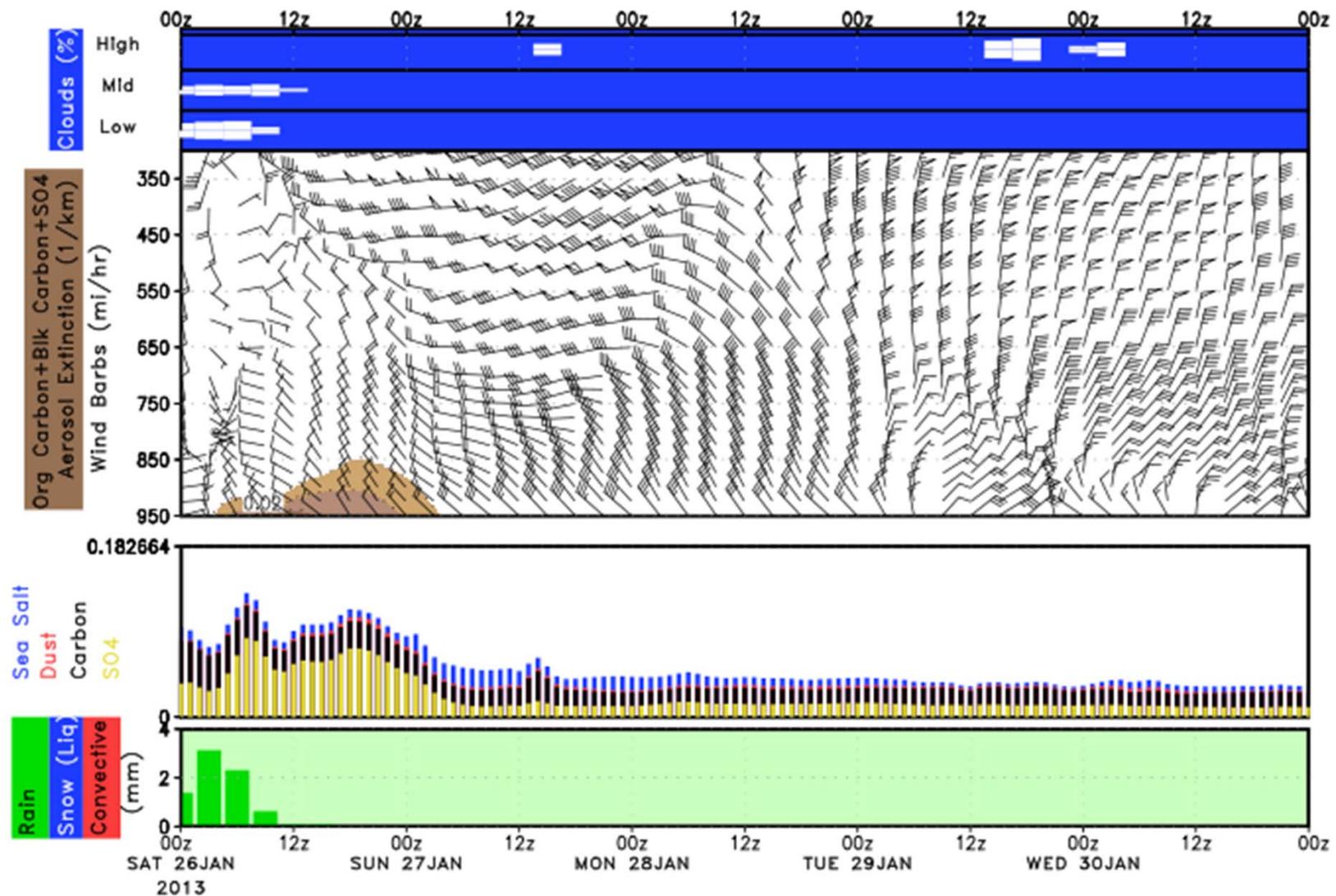
# GMAO GEOS5: Bakersfield



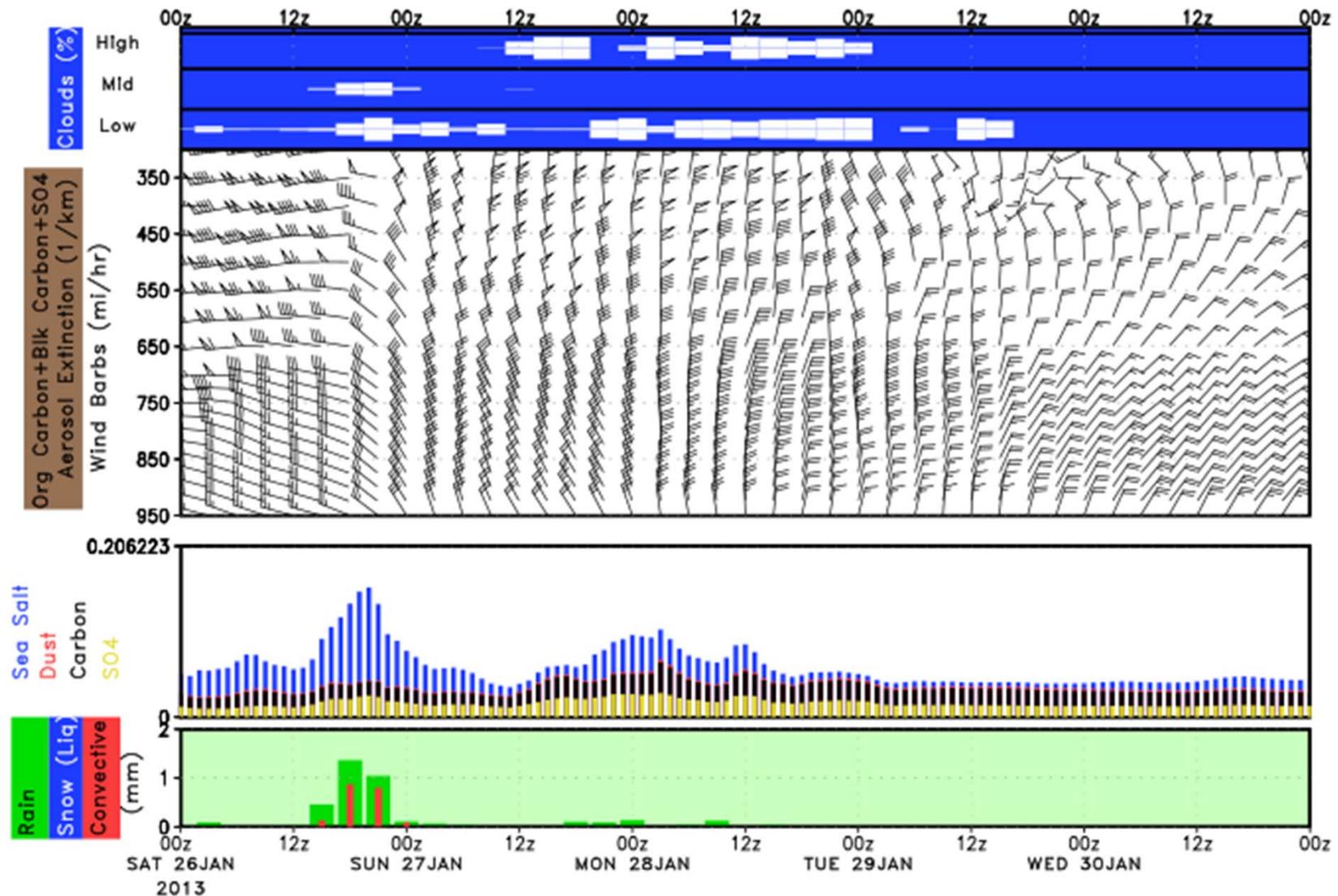
# GMAO GEOS5: Fresno



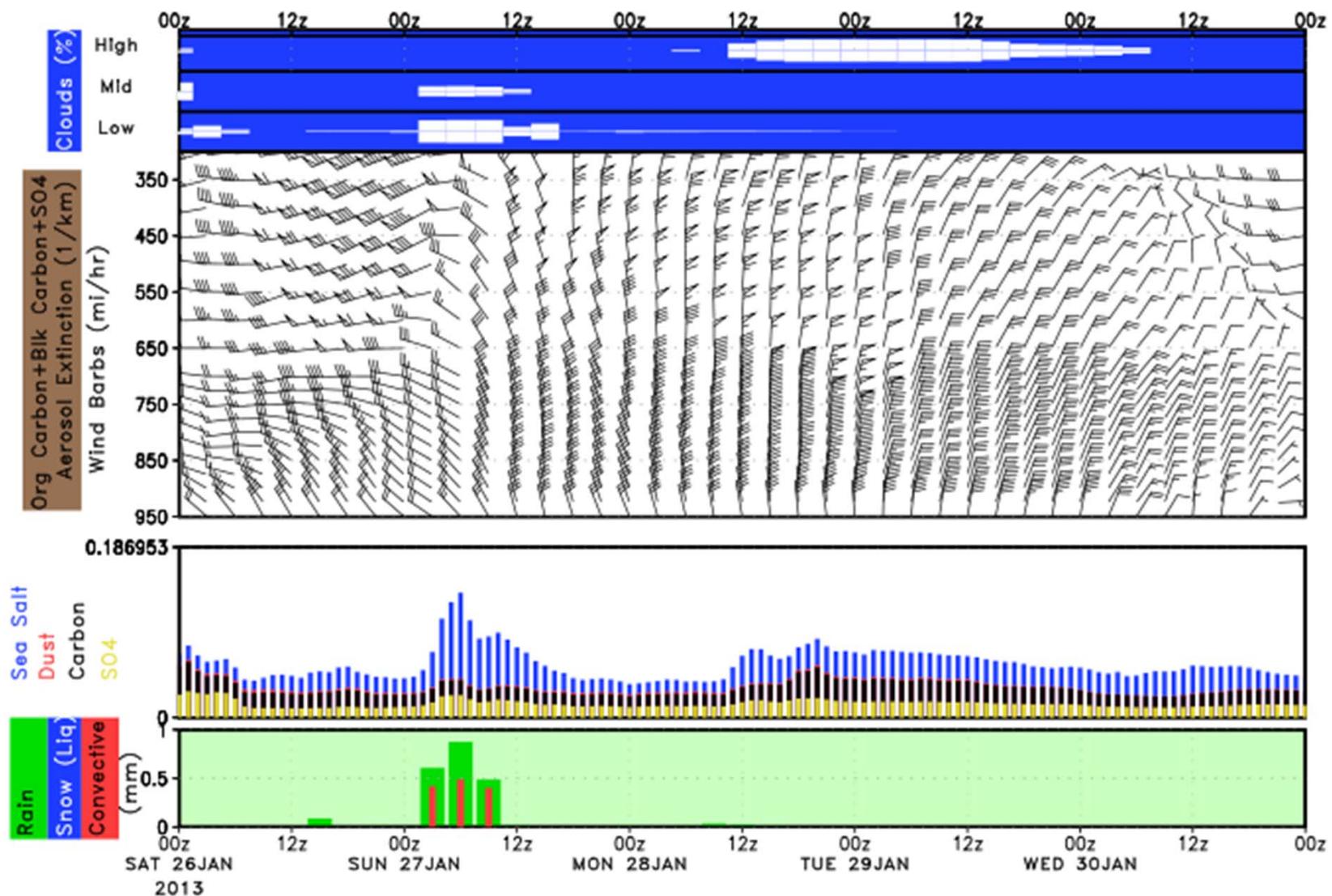
# GMAO GEOS5: San Nicholas



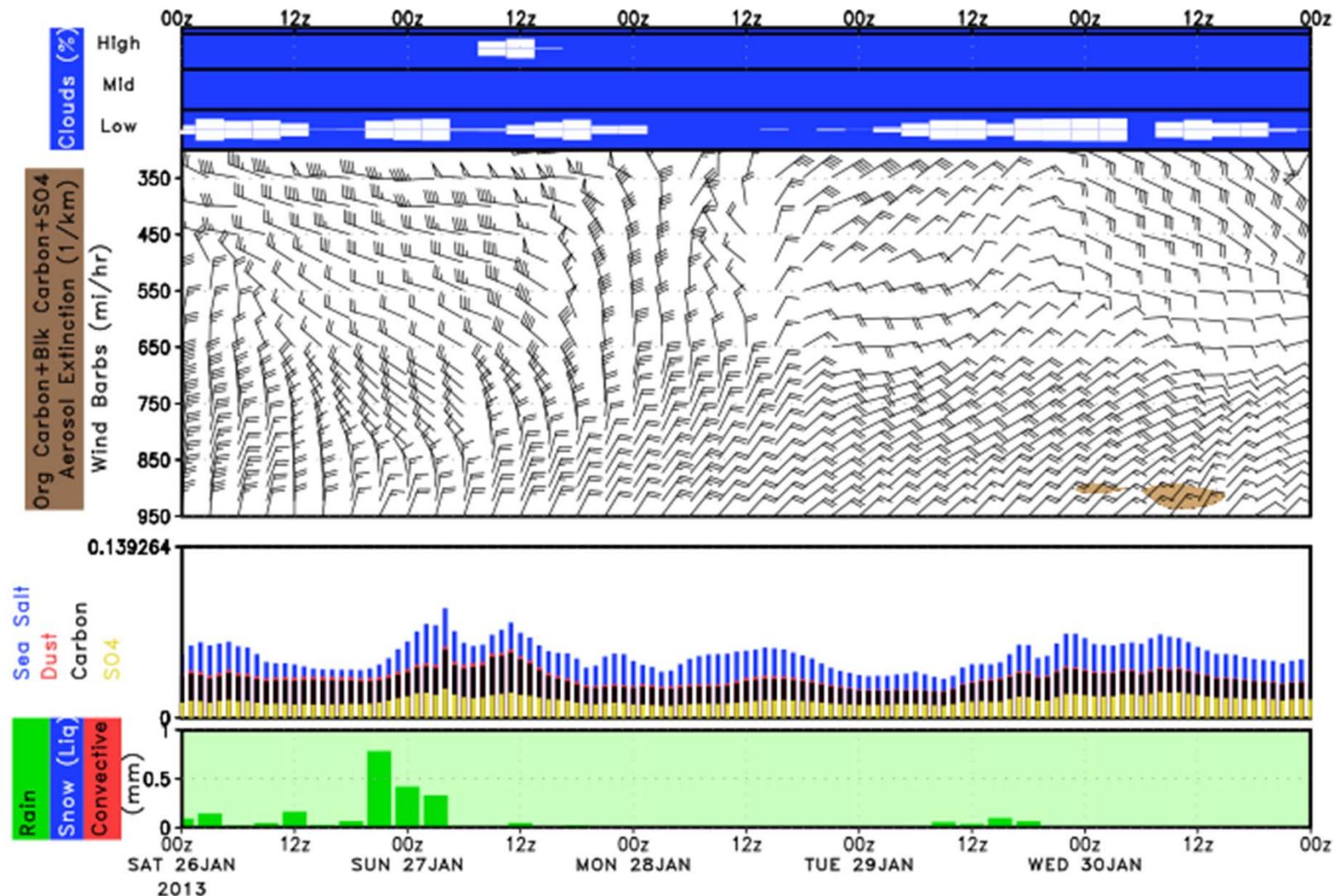
# GMAO GEOS5: Ocean 40 N 130 W



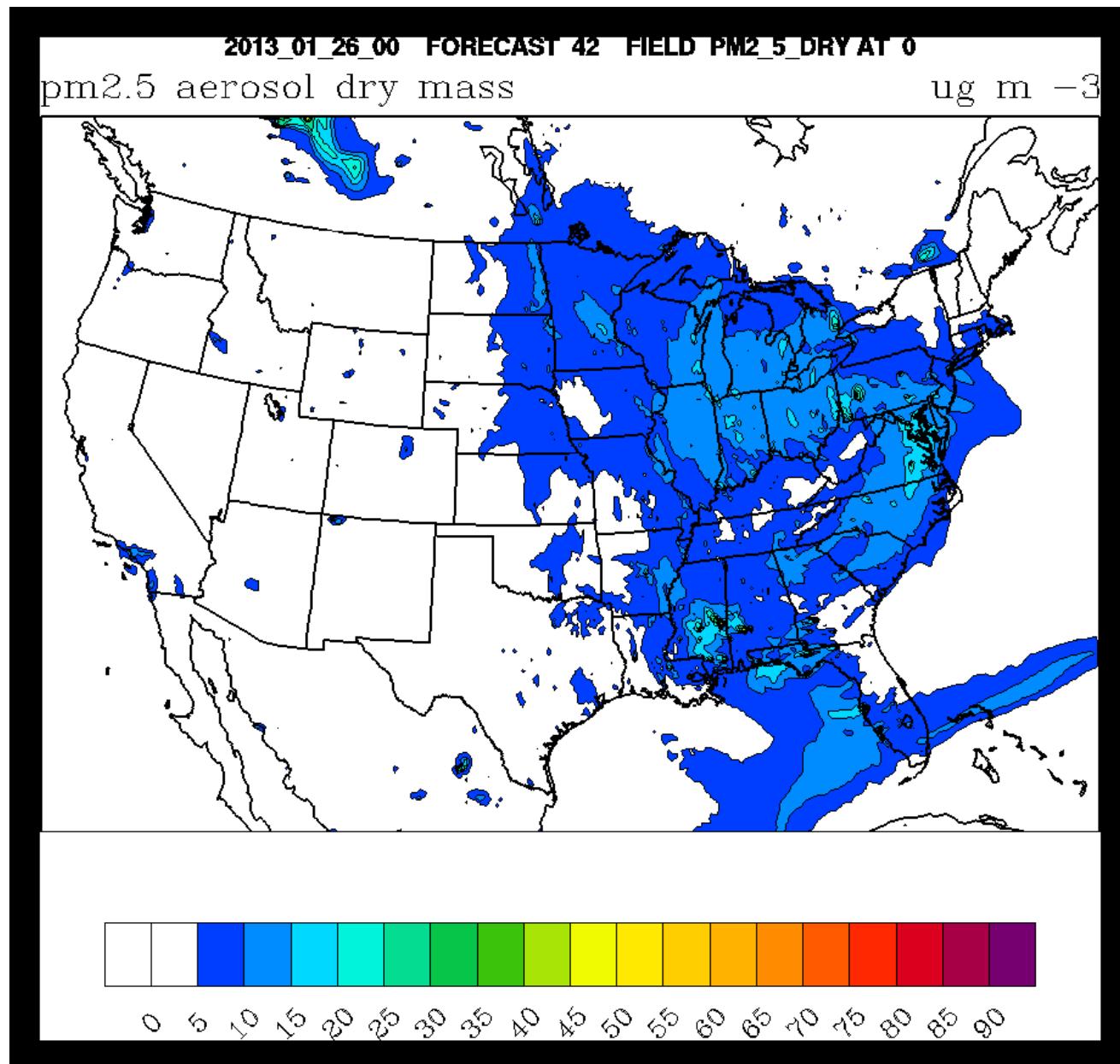
# GMAO GEOS5: Ocean 38 N 125 W



# GMAO GEOS5: Ocean 30 N 130 W

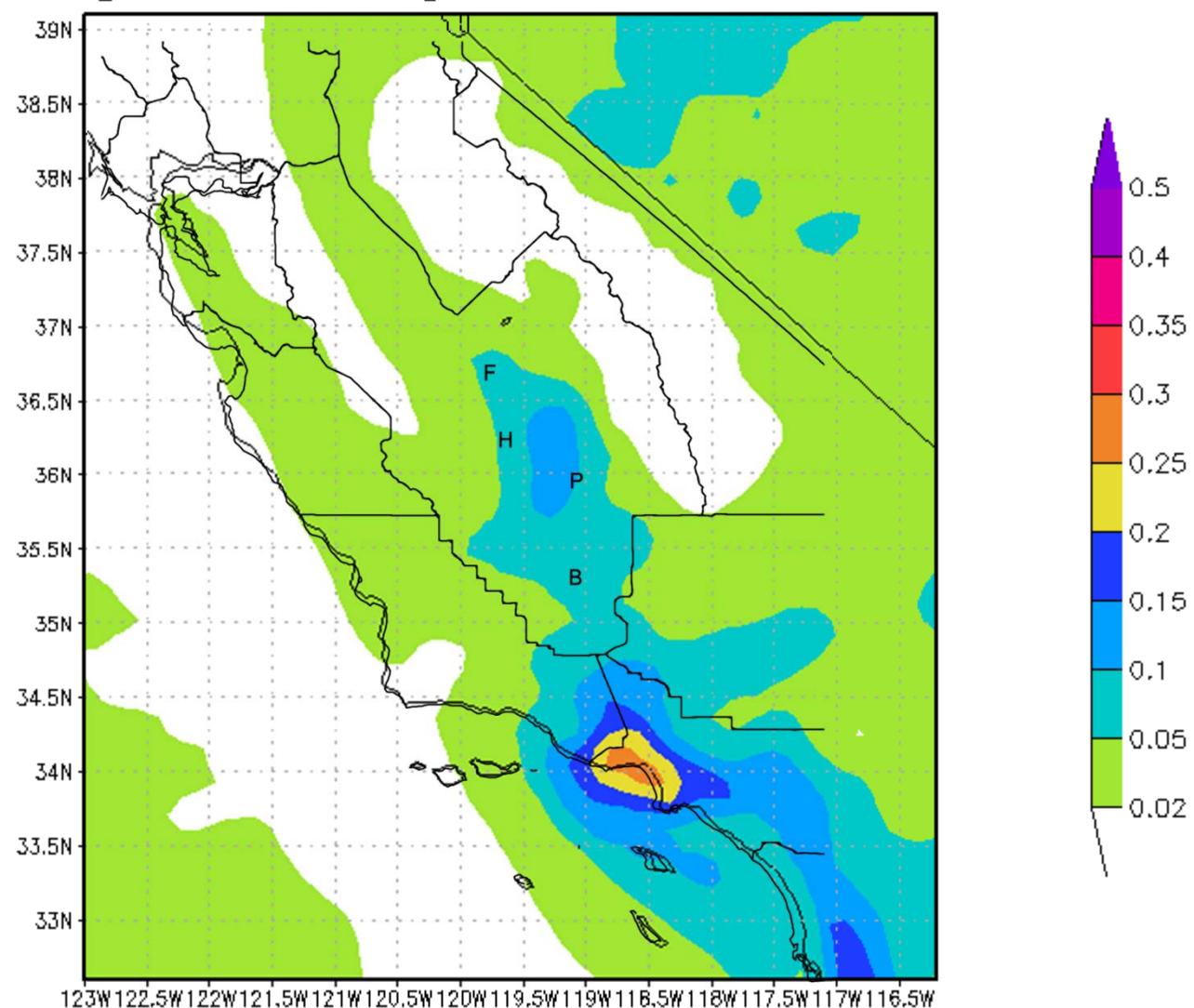


**Sunday 10 am = 18 Z**



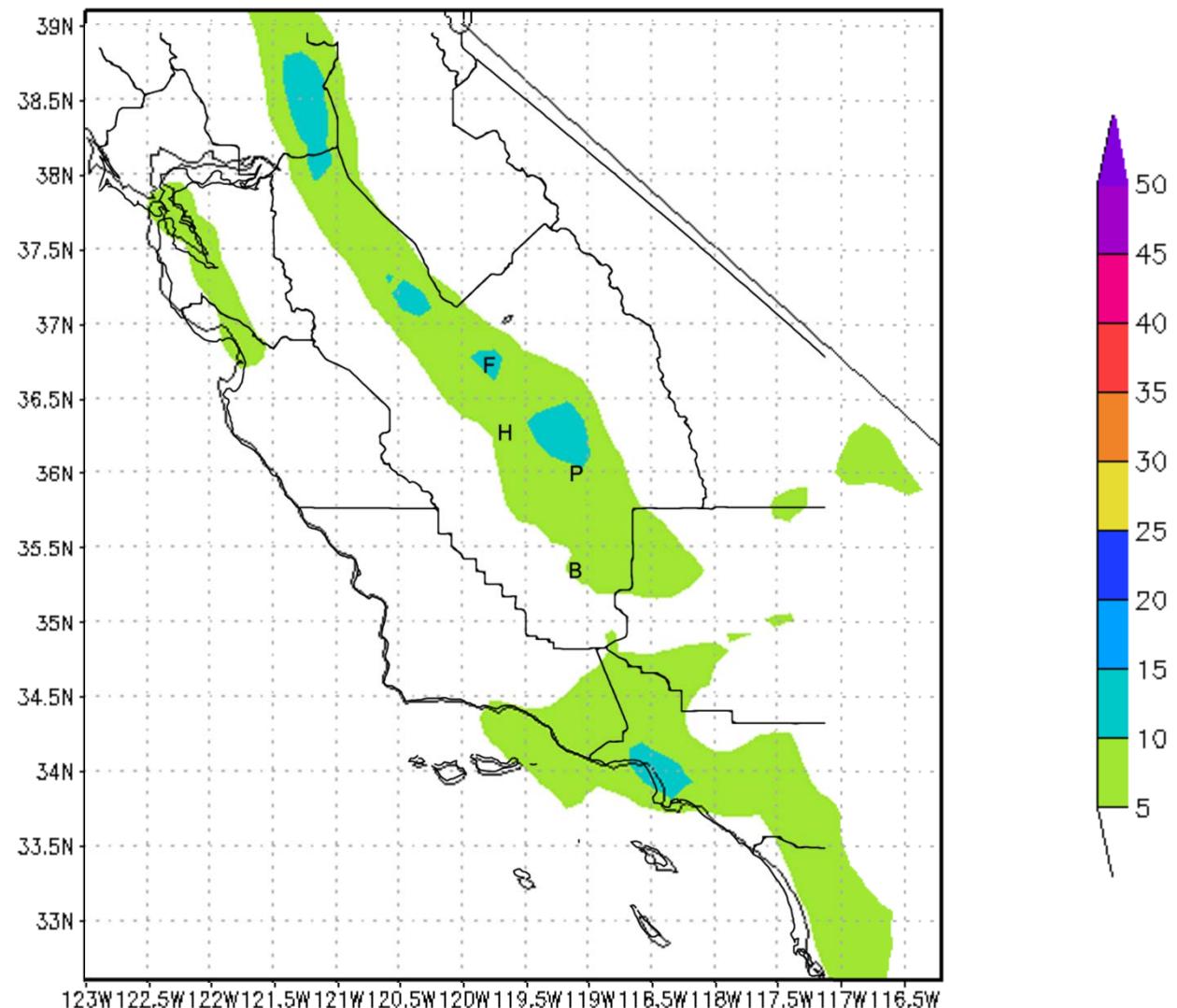
# NOAA CMAQ: Sunday 10 am = 18 Z

Column AOD [Dimensionless] at surface Valid 18 JAN 27 2013



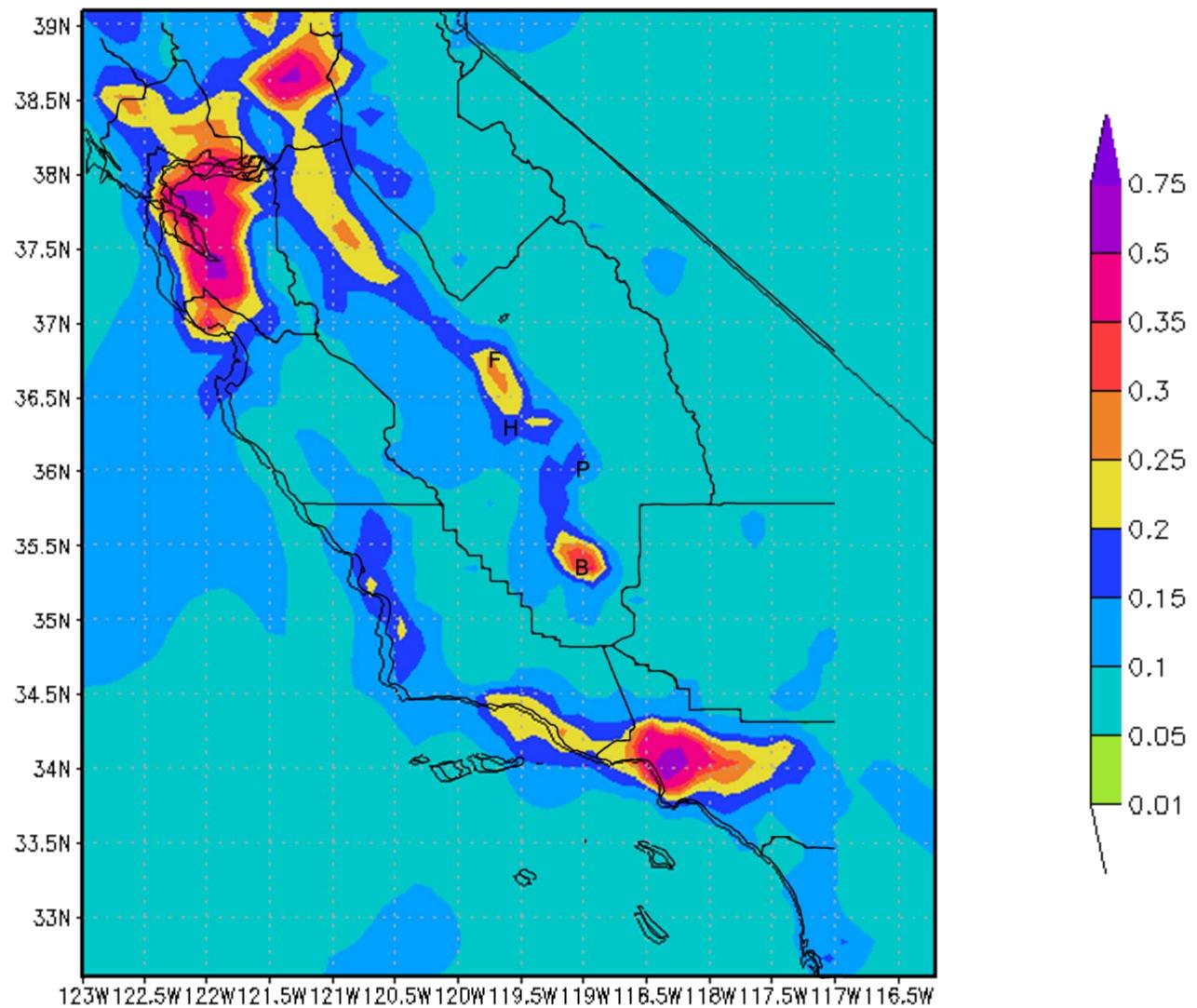
**Sunday 10 am = 18 Z**

**PM25 [ $\mu\text{g}/\text{m}^3$ ] at surface Valid 18 JAN 27 2013**



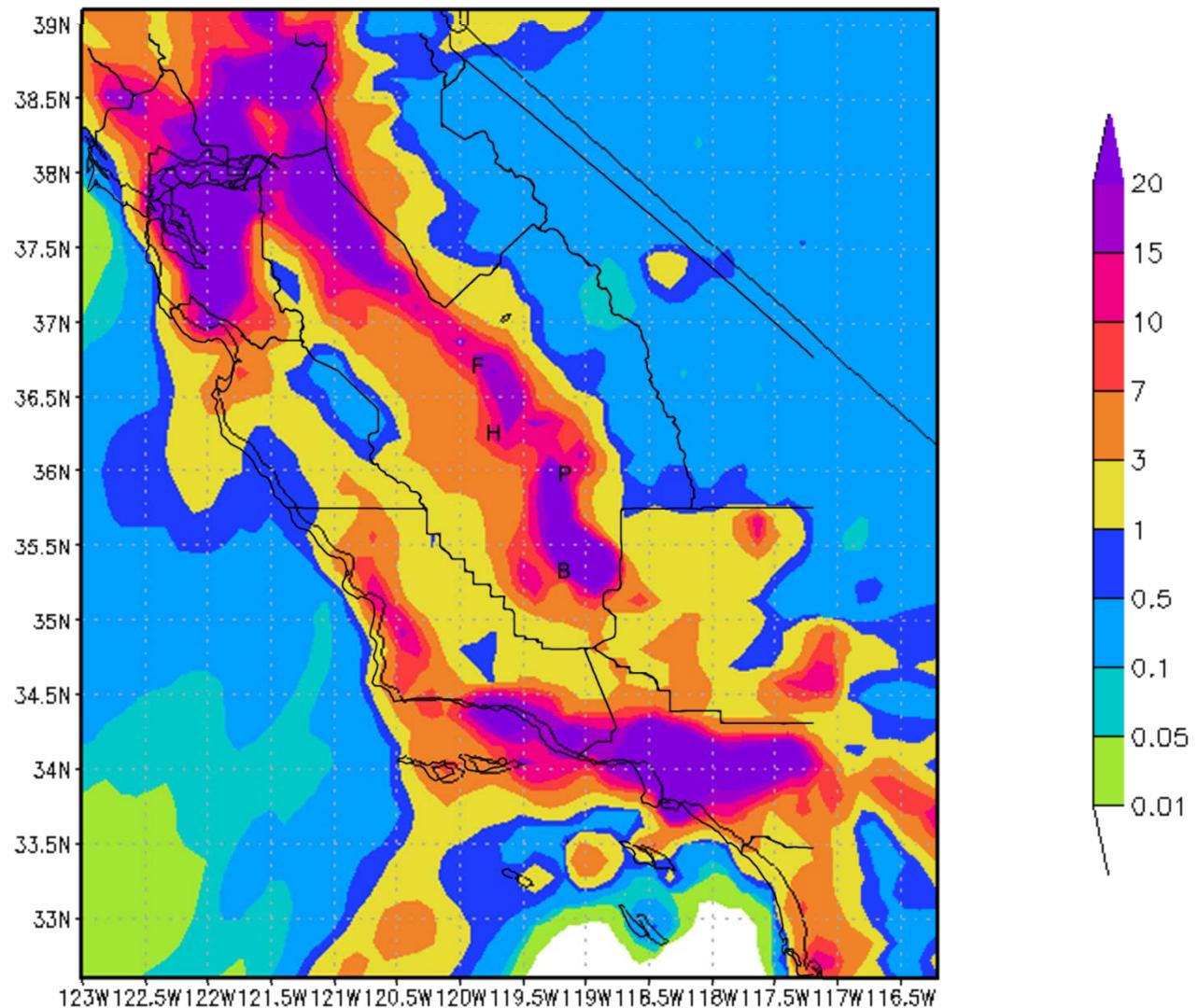
**Sunday 10 am = 18 Z**

CO [ppm] at 1013 [hPa] Valid 18 JAN 27 2013



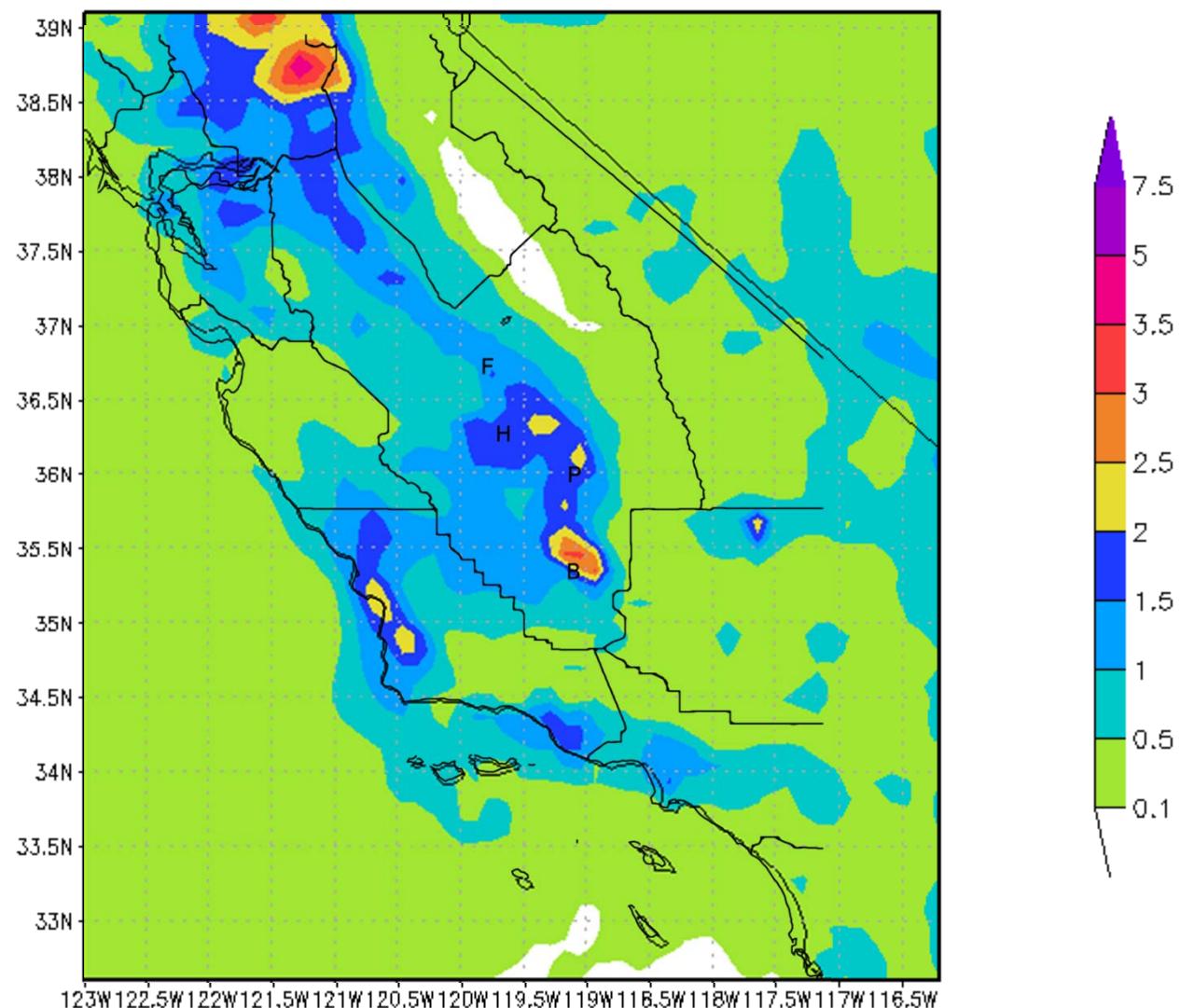
**Saturday 10 am = 18 Z**

NO<sub>2</sub> [ppb] at 1013 [hPa] Valid 18 JAN 27 2013



**Saturday 10 am = 18 Z**

FORM [ppb] at 1013 [hPa] Valid 18 JAN 27 2013



## Recommendations

**Sunday** – frontal passage – cloudy and rainy conditions over SJV in advance of the front

**Monday** – NWS forecaster and models disagree on speed of cloud clearing behind the front. NAM, GFS, and GEOS5 indicate relatively clear skies, while NWS predicts low level cloud cover through even Tuesday.

**Tuesday** – NWS forecaster and models continue to disagree about cloud forecast. NAM and GEOS5 indicate high level cloud cover throughout the day, the NWS office predicts possibility of lingering low level clouds and high level clouds coming in Tuesday night into Wednesday.

**Wednesday & Thursday** – clearer skies forecast, but fog chances begin to increase as ridge sets up off the west coast of US