DISCOVER-AQ FORECAST SUMMARY **February 2, 2013**

AQ Discussion Summary

PM2.5 continues to build in the SJV and is expected to build through Tuesday. Will levels reach the previous high around January 20th? The SJV sites are dirtier than the Sacramento sites: High PM2.5 levels at night due to fireplaces and inversion. Corcoran had the highest levels again overnight. PM2.5 levels are expected to be code yellow – code orange this weekend. CMAQ indicates less offshore flow and, subsequently, less pollution over the ocean. There shouldn't be a "clean-out" event of the SJV until Wednesday or Thursday.

Weather Summary

Sunday

PODEX (SF) – Cirrus currently over region should clear out by tomorrow. Skies should be clear except for the occasional wisp of cirrus around 20K ft. Lower level solid stratus clouds are expected over the region of interest.

Monday – SJV – Ground fog expected. Should be patchy, shallow, much like the fog conditions we've seen recently. No significant clouds are expected right now. A thin, shallow, patchy layer over cirrus moves into the region at about 4 pm, so we'll have to look again tomorrow and make sure that timing holds.

Tuesday – SJV – The cirrus layer coming in Monday night sticks around Tuesday. A relatively solid layer from 400-200 mb is forecast.

Wednesday – SJV – Currently forecast to be clearer than Tuesday. Possible residual thin layer of upper level clouds at ~250 mb.

Thursday – SJV – Increased clouds due to approaching trough.

DISCOVER-AQ / PODEX
Forecast Briefing

February 2, 2013

Melanie Follette-Cook
Bryan Duncan
Clare Flynn

….FORECAST

Outlook is promising for a Raven's victory. Go Ravens!!

Fresno

TODAY	TONIGHT	SUNDAY	SUNDAY NIGHT	MONDAY	MONDAY NIGHT	TUESDAY	TUESDAY NIGHT	WEDNESDAY
Patchy Fog	Patchy Fog	Patchy Fog	Patchy Fog	Patchy Fog	Partly Cloudy	Mostly Sunny	Partly Cloudy	Partly Sunny
High: 64 °F	Low: 44 °F	High: 64 °F	Low: 41 °F	High: 67 °F	Low: 42 °F	High: 65 °F	Low: 42 °F	High: 61 °F

Hanford

TODAY	TONIGHT	SUNDAY	SUNDAY NIGHT	MONDAY	MONDAY NIGHT	TUESDAY	TUESDAY NIGHT	WEDNESDAY
Patchy Fog	Patchy Fog	Patchy Fog	Patchy Fog	Patchy Fog	Partly Cloudy	Mostly Sunny	Partly Cloudy	Partly Sunny
High: 64 °F	Low: 41 °F	High: 65 °F	Low: 38 °F	High: 66 °F	Low: 39 °F	High: 65 °F	Low: 40 °F	High: 61 °F

Bakersfield

TODAY	TONIGHT	SUNDAY	SUNDAY NIGHT	MONDAY	MONDAY NIGHT	TUESDAY	TUESDAY NIGHT	WEDNESDAY
Partly Sunny	Mostly Cloudy	Partly Sunny	Partly Cloudy	Mostly Sunny	Partly Cloudy	Mostly Sunny	Partly Cloudy	Mostly Sunny
High: 64 °F	Low: 45 °F	High: 62 °F	Low: 42 °F	High: 64 °F	Low: 42 °F	High: 64 °F	Low: 42 °F	High: 59 °F

Palmdale

TODAY	TONIGHT	SUNDAY	SUNDAY NIGHT	MONDAY	MONDAY NIGHT	TUESDAY	TUESDAY NIGHT	WEDNESDAY
Partly Sunny	Mostly Cloudy	Partly Sunny	Partly Cloudy	Mostly Sunny	Mostly Clear	Mostly Sunny	Partly Cloudy	Mostly Sunny
High: 67 °F	Low: 42 °F	High: 68 °F	Low: 40 °F	High: 69 °F	Low: 40 °F	High: 67 °F	Low: 39 °F	High: 61 °F

Current Conditions

FRESNO CA

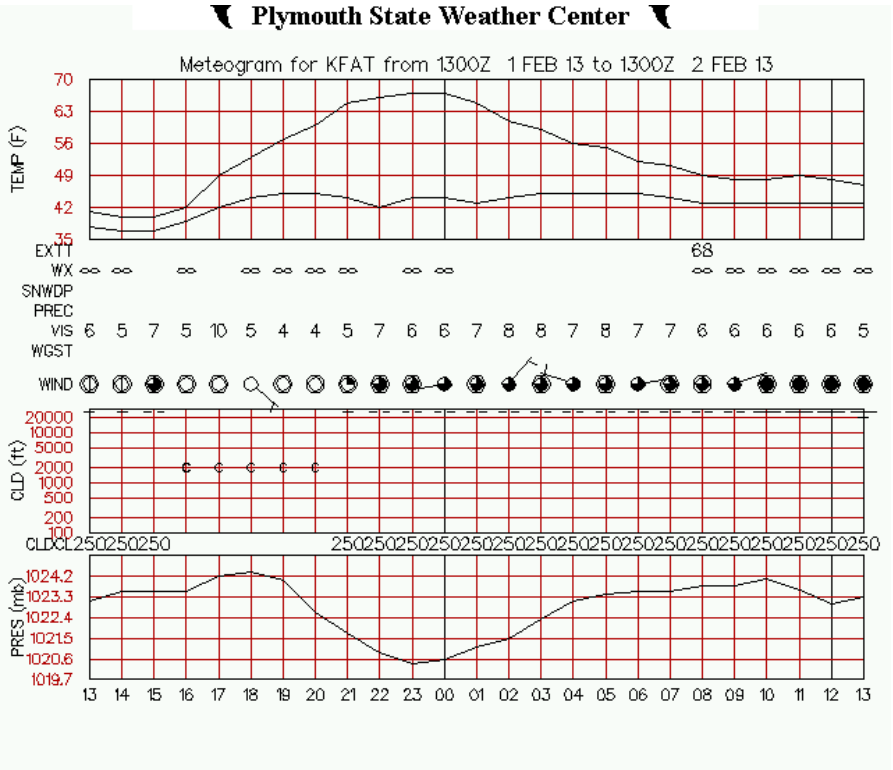
Fog

47°F

8°C

Humidity	86%
Wind Speed	calm
Barometer	30.22 in (1023.3 mb)
Dewpoint	43°F (6°C)
Visibility	5.00 mi

Last Update on 02 Feb 4:53 am PST



HANFORD CA

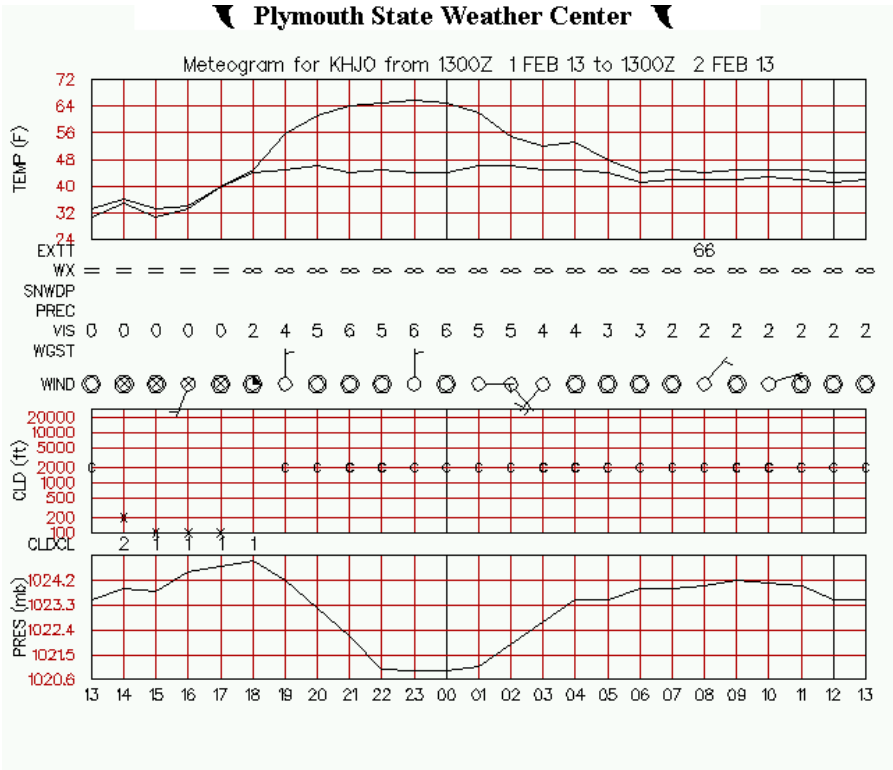
Fog

45°F

7°C

Humidity	93%
Wind Speed	calm
Barometer	30.23 in
Dewpoint	43°F (6°C)
Visibility	1.75 mi

Last Update on 02 Feb 5:36 am PST



Current Conditions

BAKERSFIELD CA

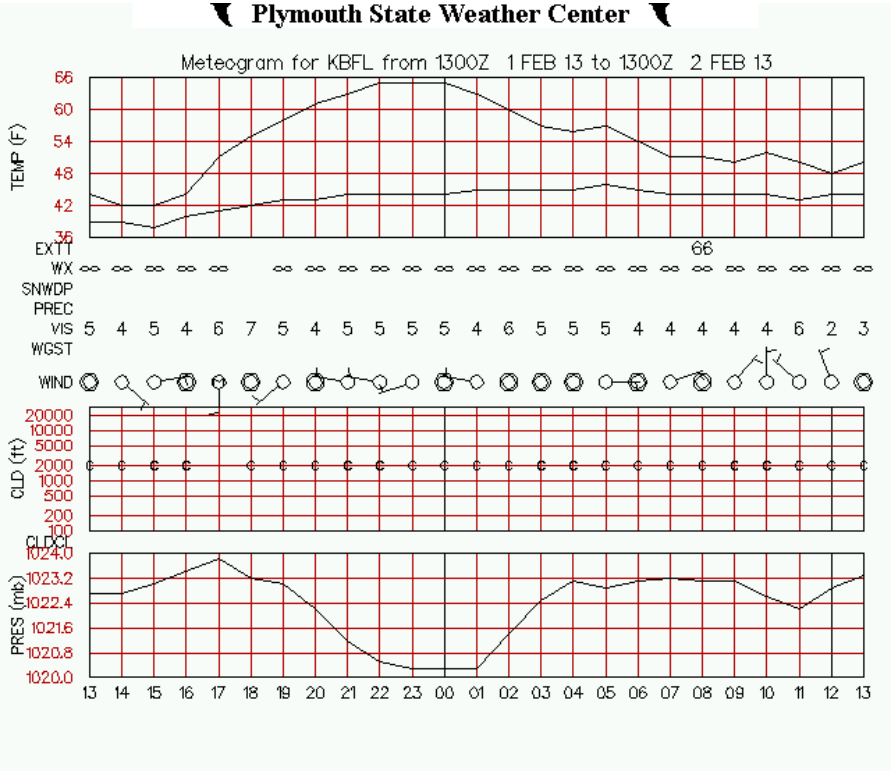
Haze

50°F

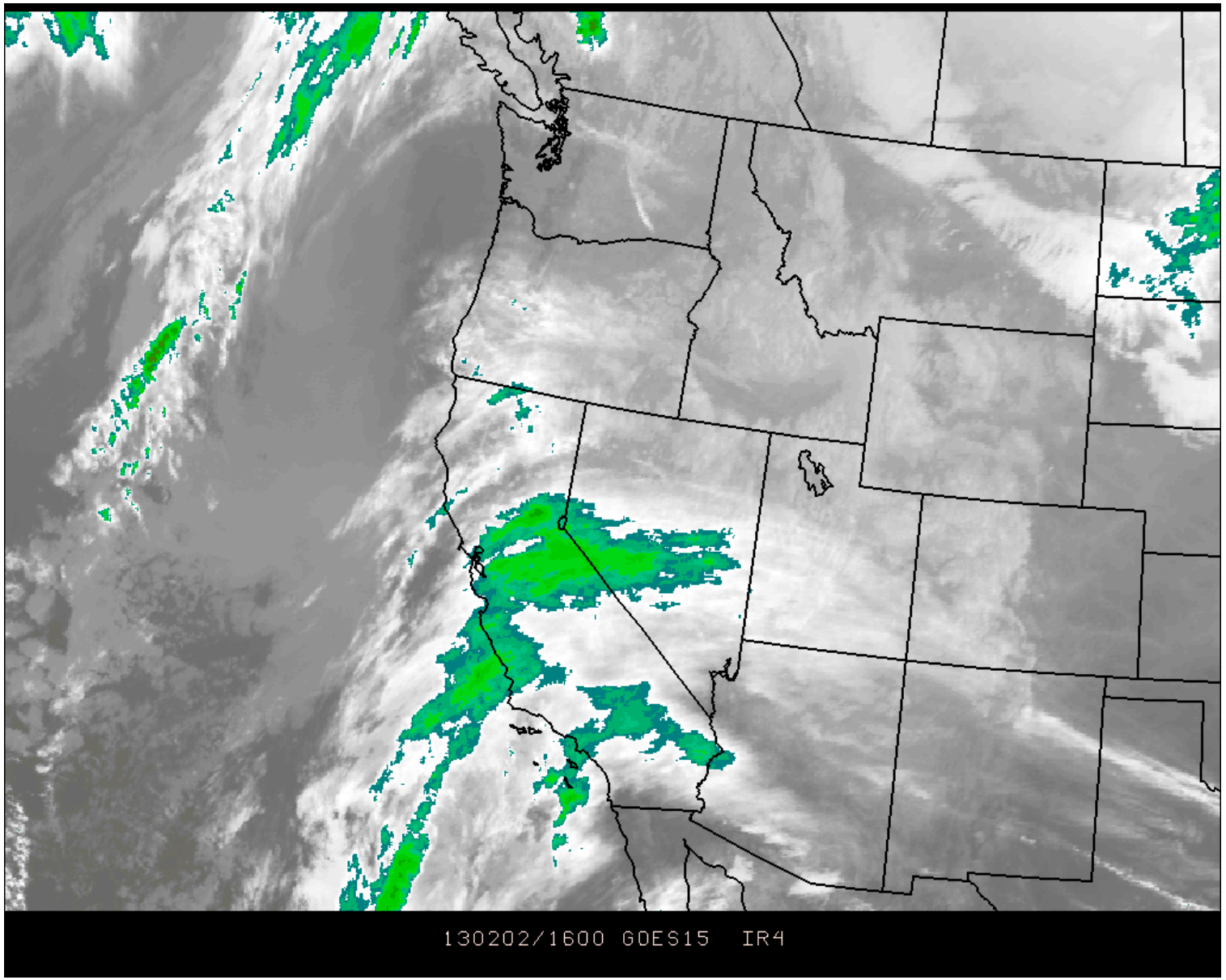
10°C

Humidity	82%
Wind Speed	calm
Barometer	30.22 in (1023.3 mb)
Dewpoint	45°F (7°C)
Visibility	3.00 mi

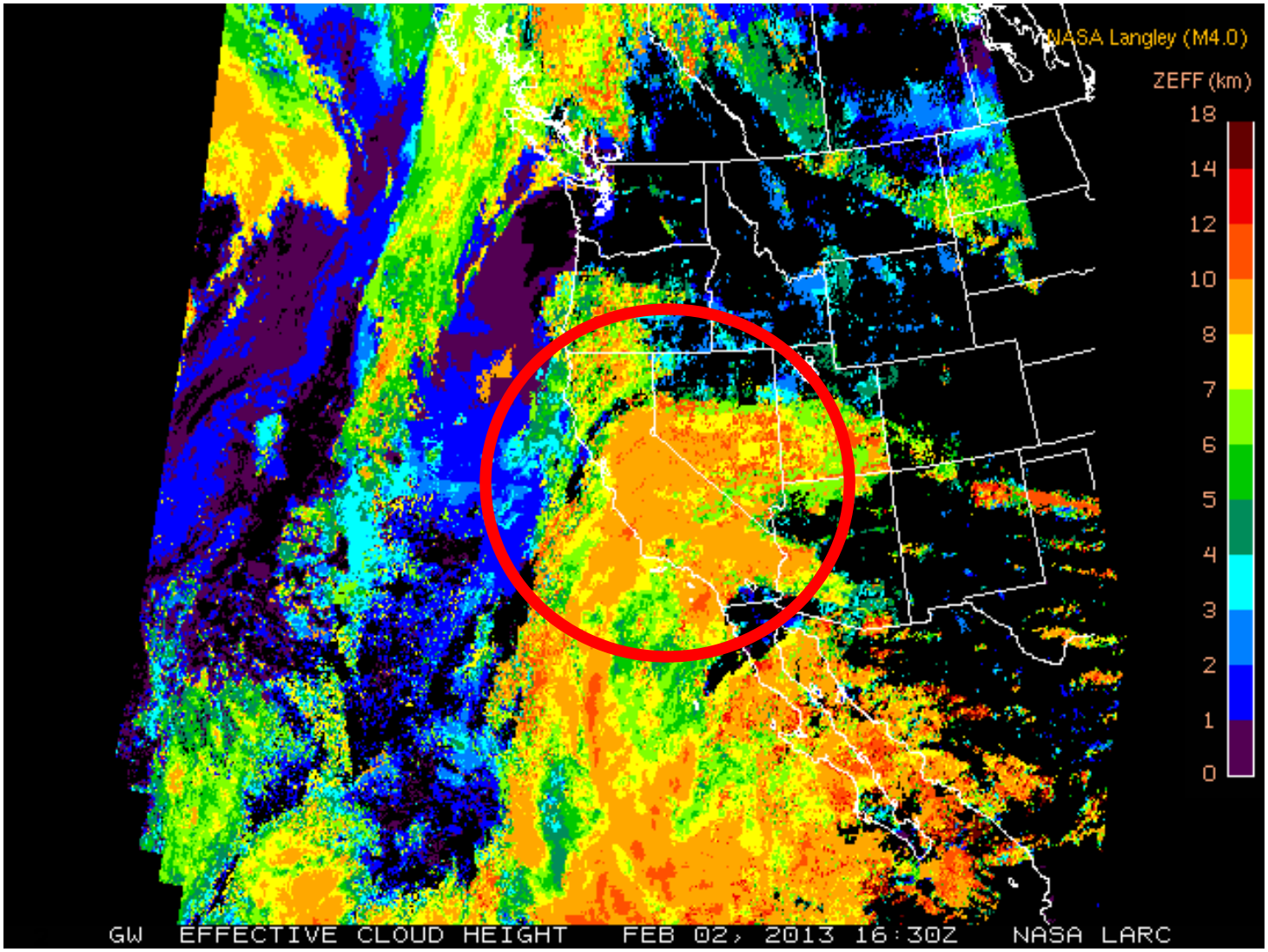
Last Update on 02 Feb 4:54 am PST



GOES: IR at 1600 UTC (8 am) Today

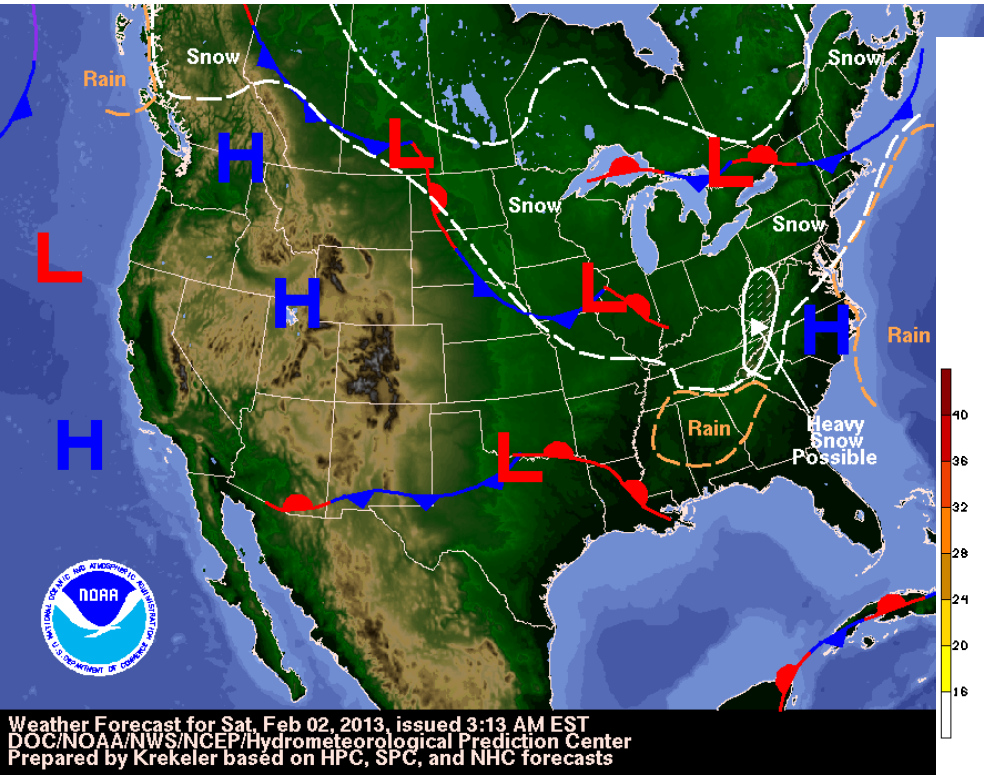


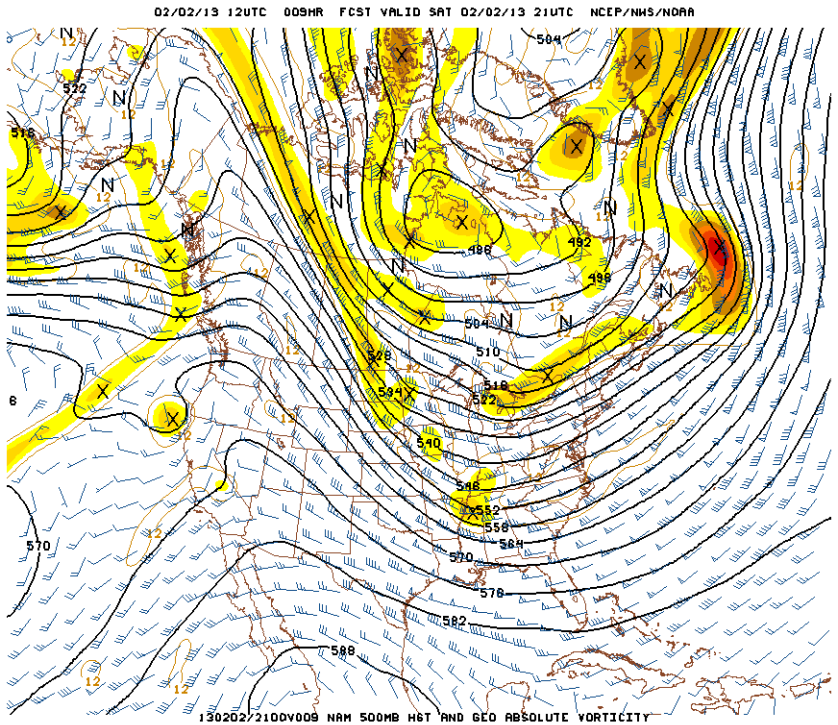
GOES: Cloud Top Height at 1630 UTC (8:30 am) Today



Today:

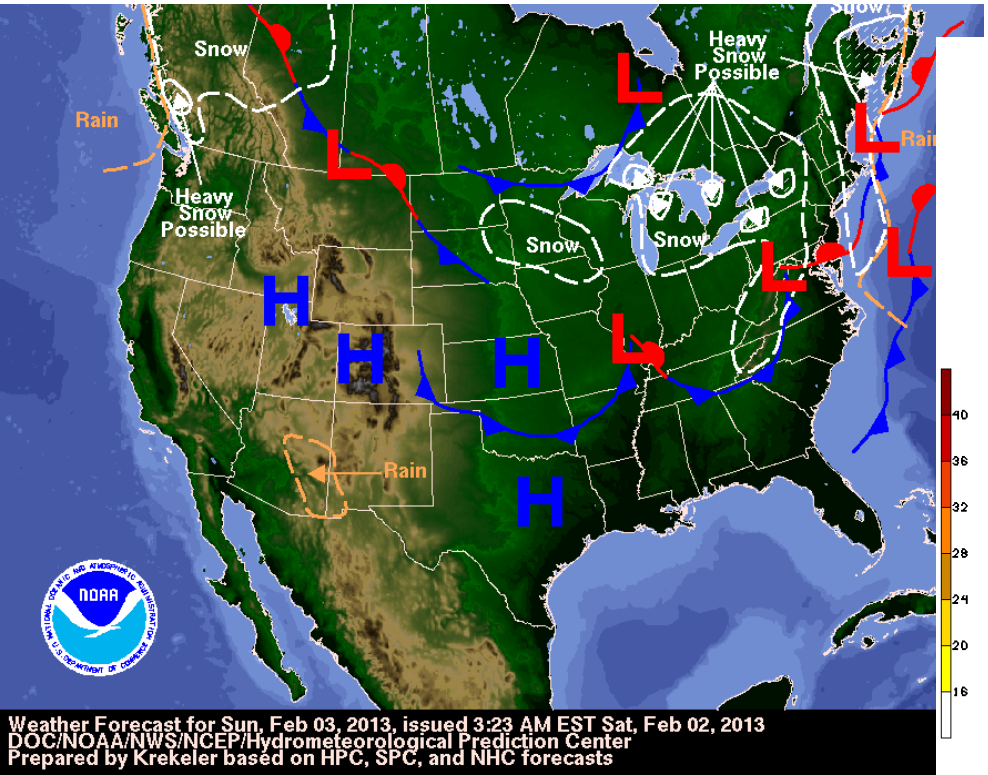
Mid and high level clouds stream northward today. An embedded vorticity center is forecast to travel around the periphery of the ridge into northern CA by tonight.

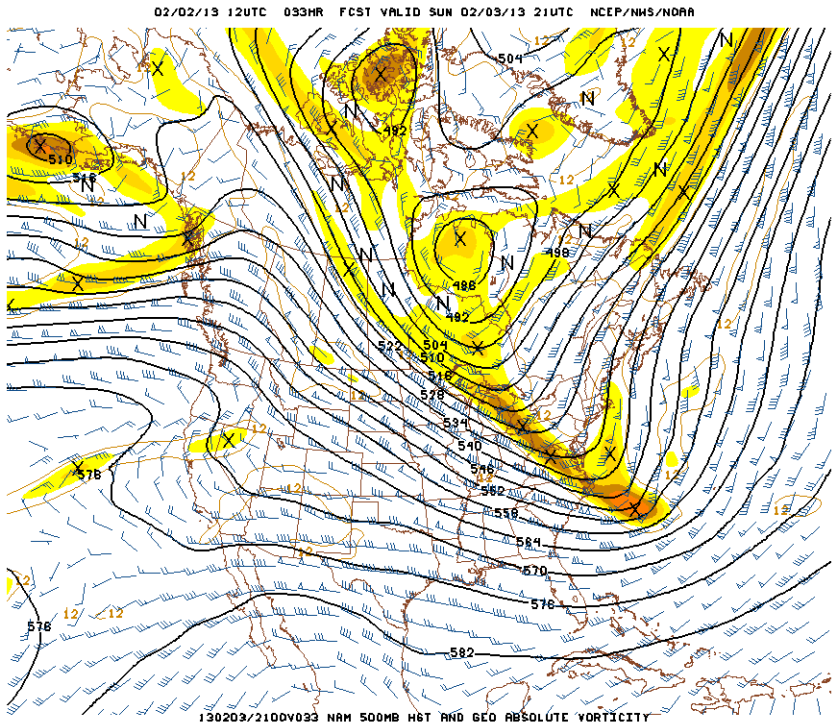




Tomorrow (Sunday):

The ridge is forecast to rebound through Sunday and Monday as a small shortwave trough travels down the CA/NE border. This shortwave might bring some precipitation to the mountains. The upper level cyclonic circulation in the East Pacific could keep high clouds in place.



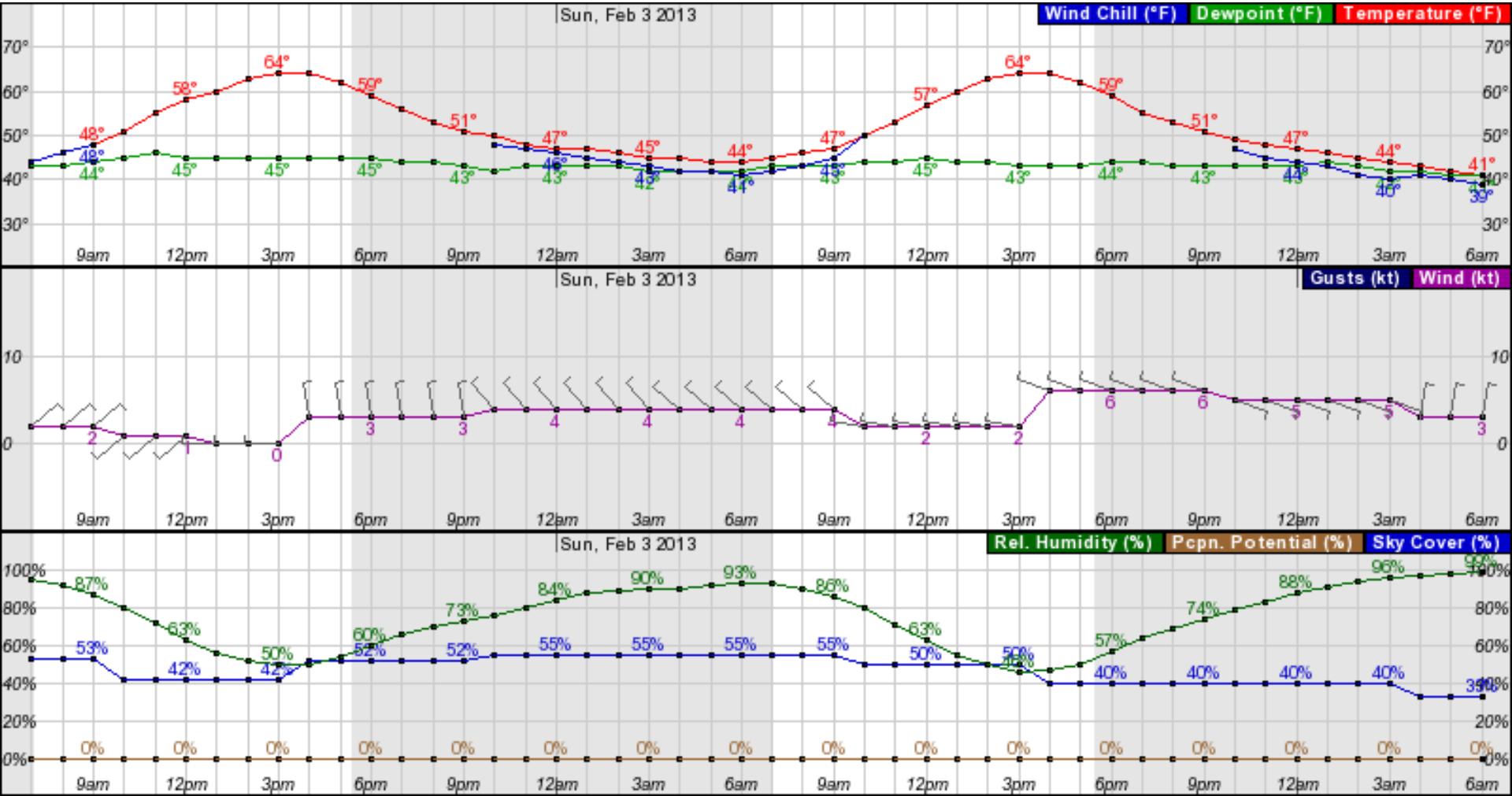


Fresno

Today: Cloudy

Sunday: Cloud cover over 50% most of the day

Today → **Sunday →**

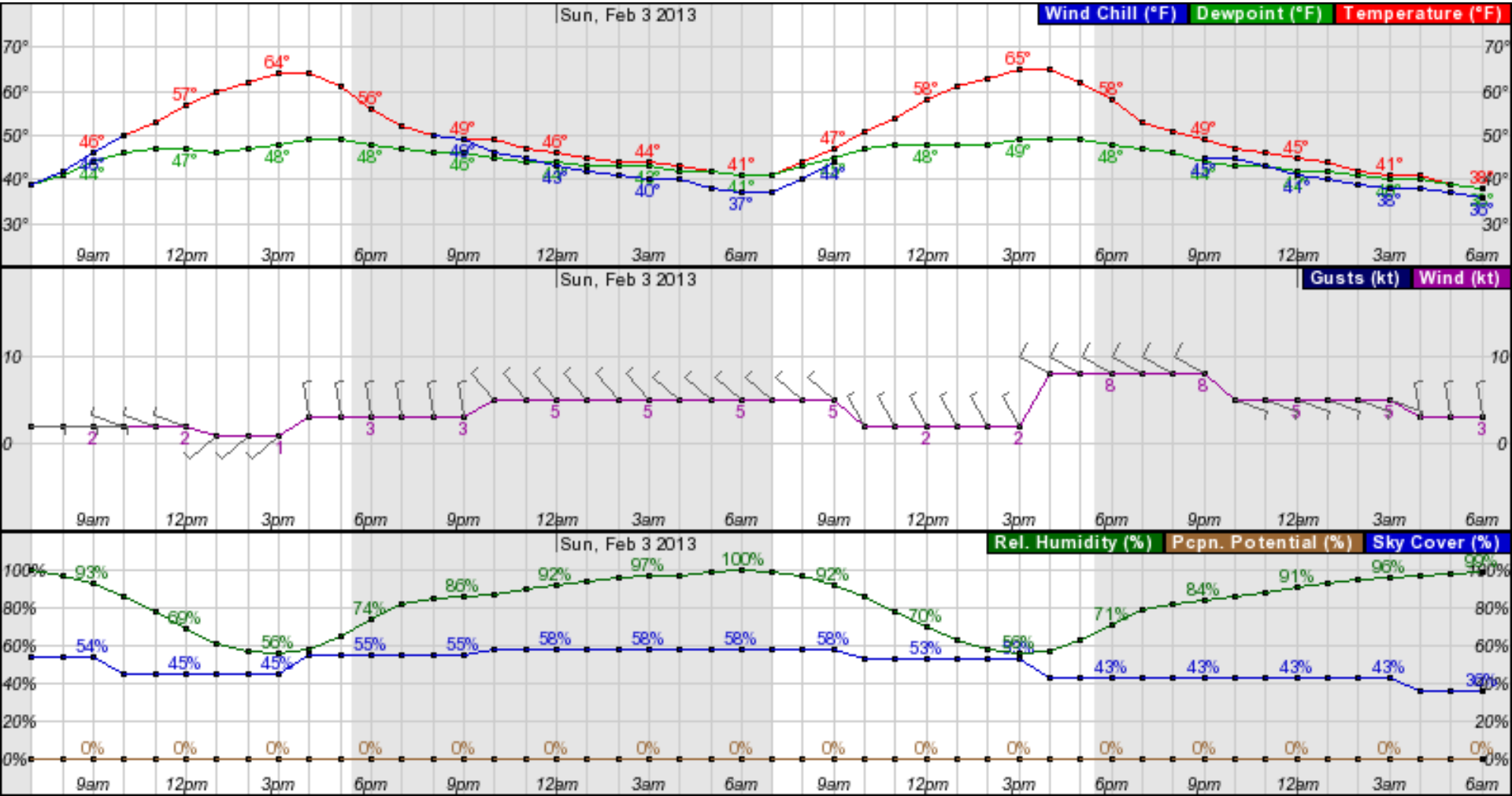


Hanford

Today: Cloudy

Sunday: Cloud cover decreases throughout the day

Today → **Sunday →**

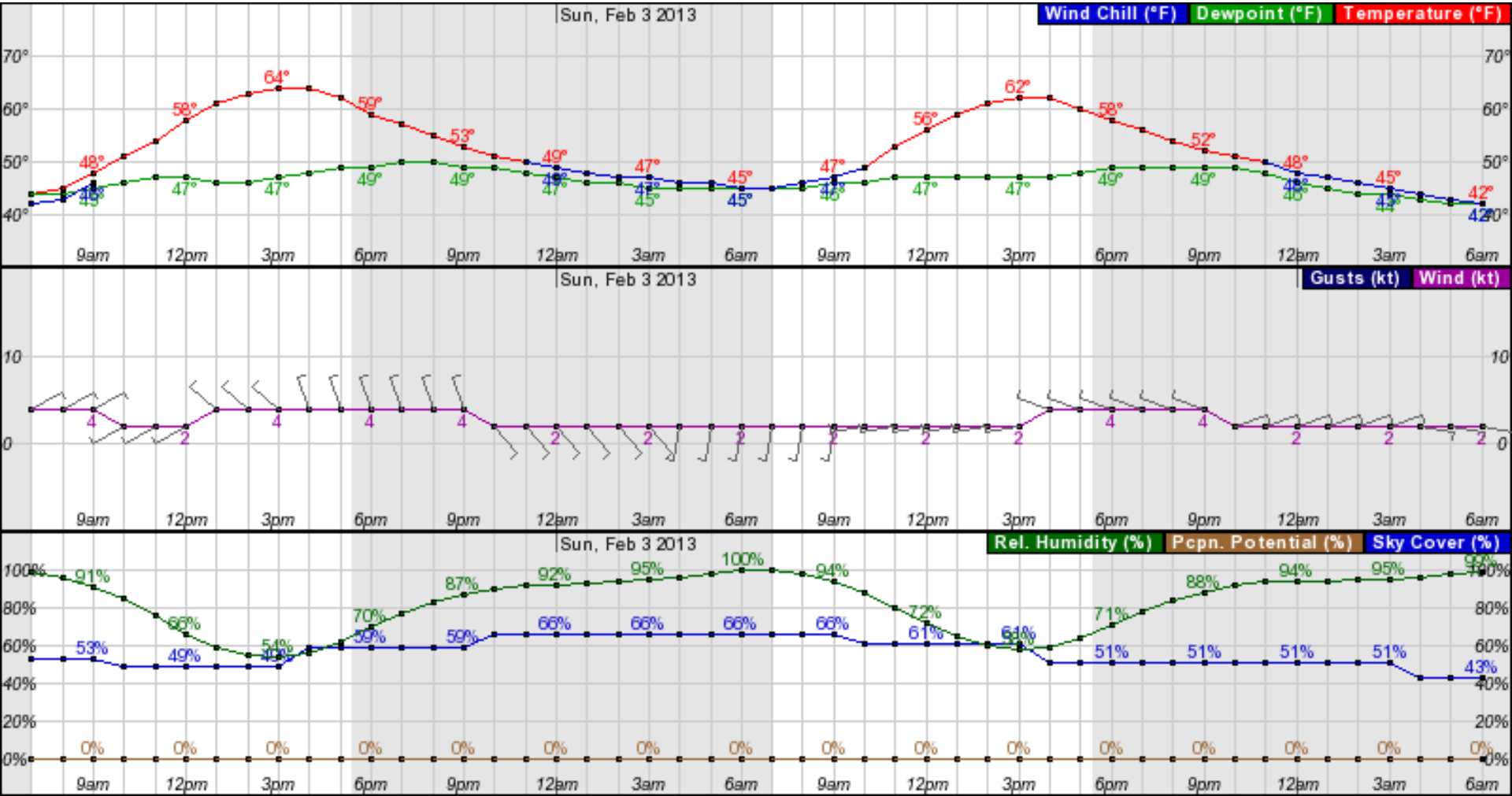


Bakersfield

Today: Cloudy

Sunday: Cloud cover over 50%

Today → **Sunday →**

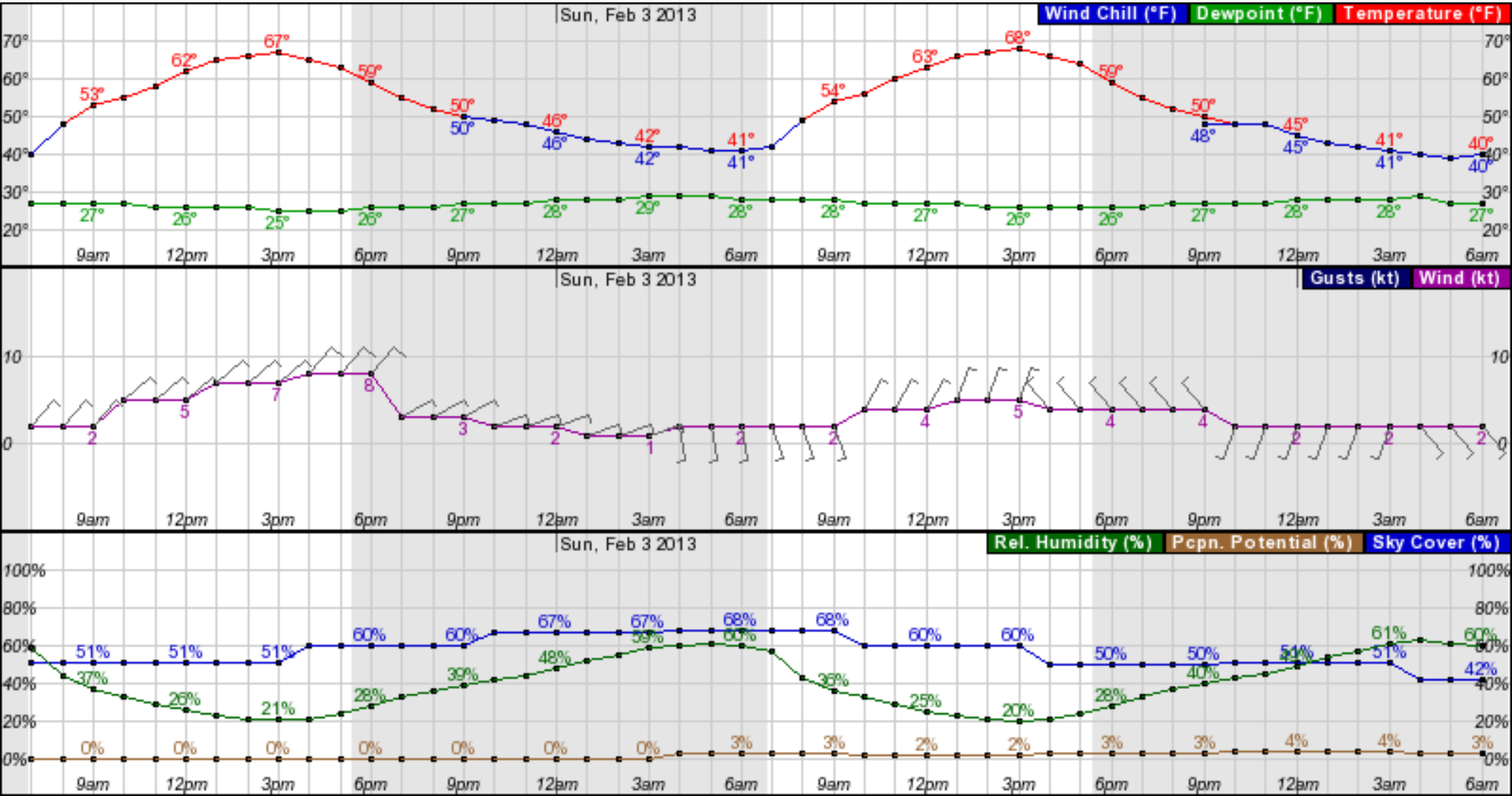


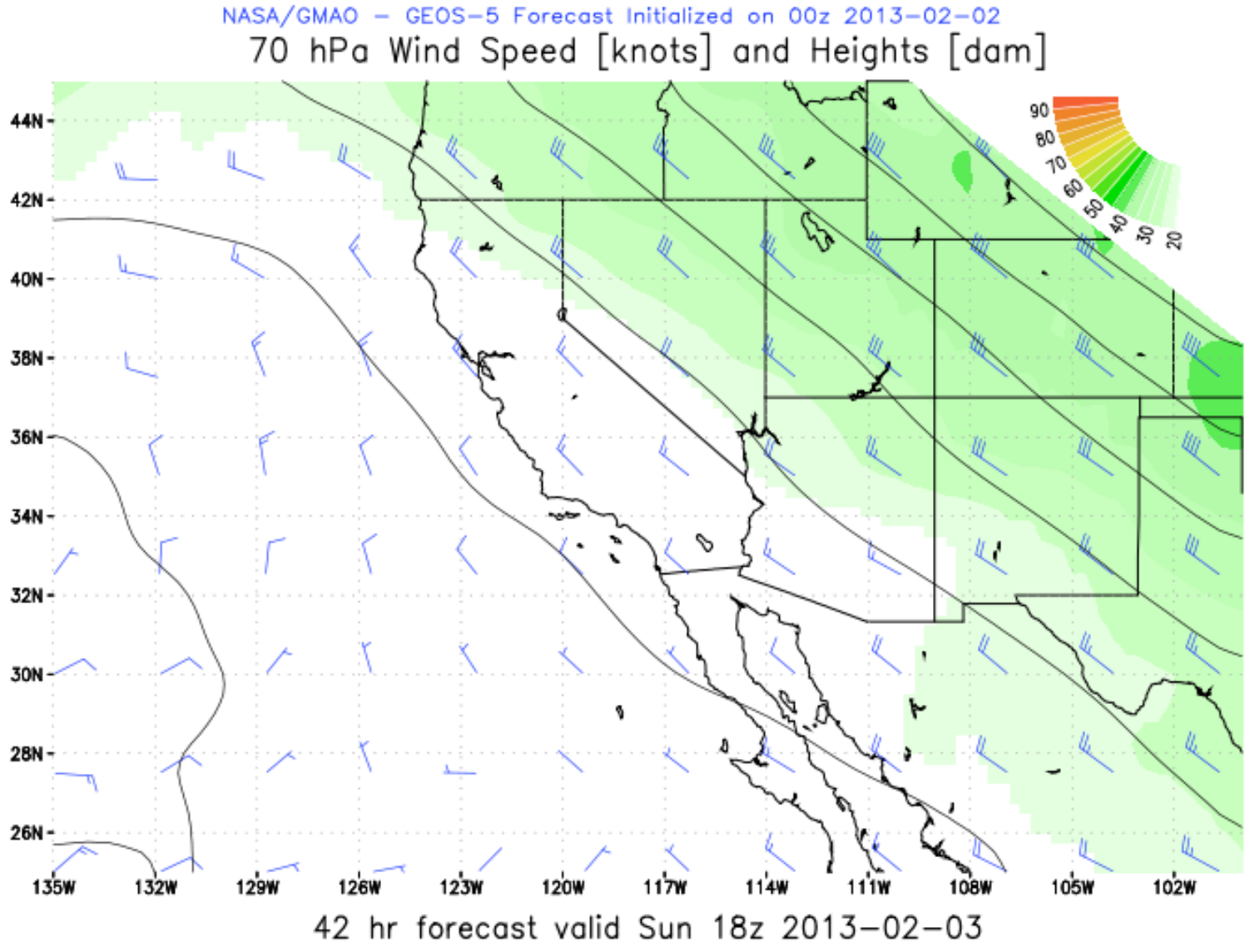
Palmdale

Today: Cloudy

Sunday: Light winds, little to no chance of precipitation

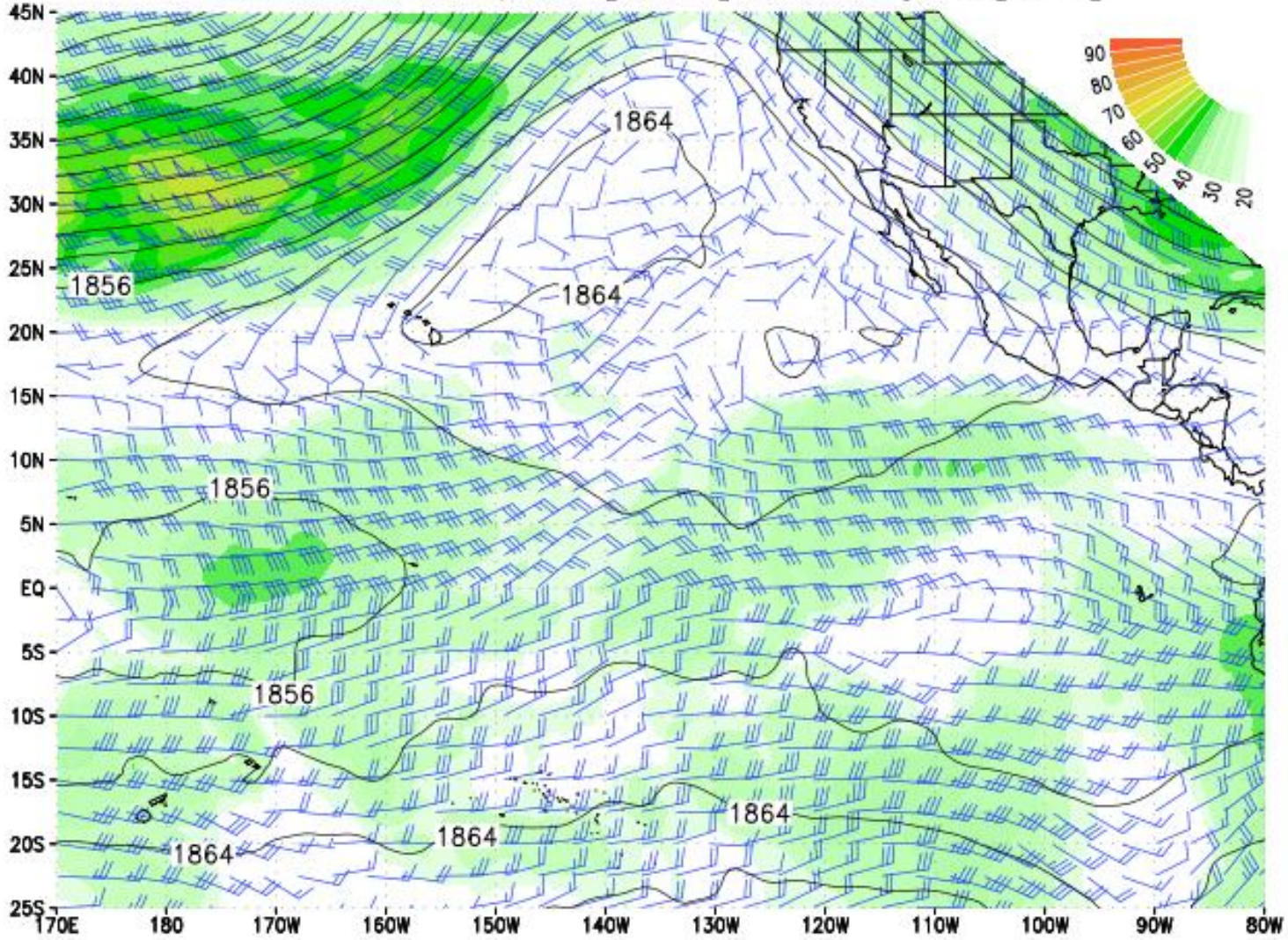
Today → **Sunday →**




NASA/GMAO – GEOS-5 Forecast Initialized on 00z 2013-02-02
70 hPa Wind Speed [knots] and Heights [dam]
90
80
70
60
50
40
30
20
44N
42N
40N
38N
36N
34N
32N
30N
28N
26N
135W
132W
129W
126W
123W
120W
117W
114W
111W
108W
105W
102W
42 hr forecast valid Sun 18z 2013-02-03

NASA/GMAO – GEOS-5 Forecast Initialized on 00z 2013-02-02

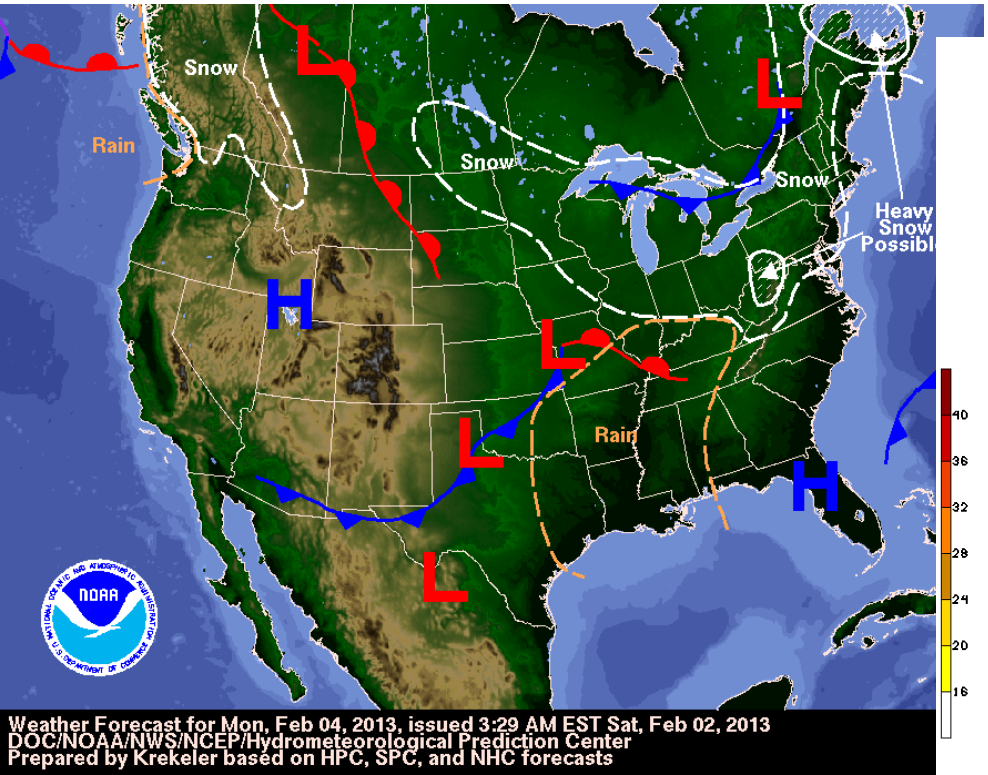
70 hPa Wind Speed [knots] and Heights [dam]

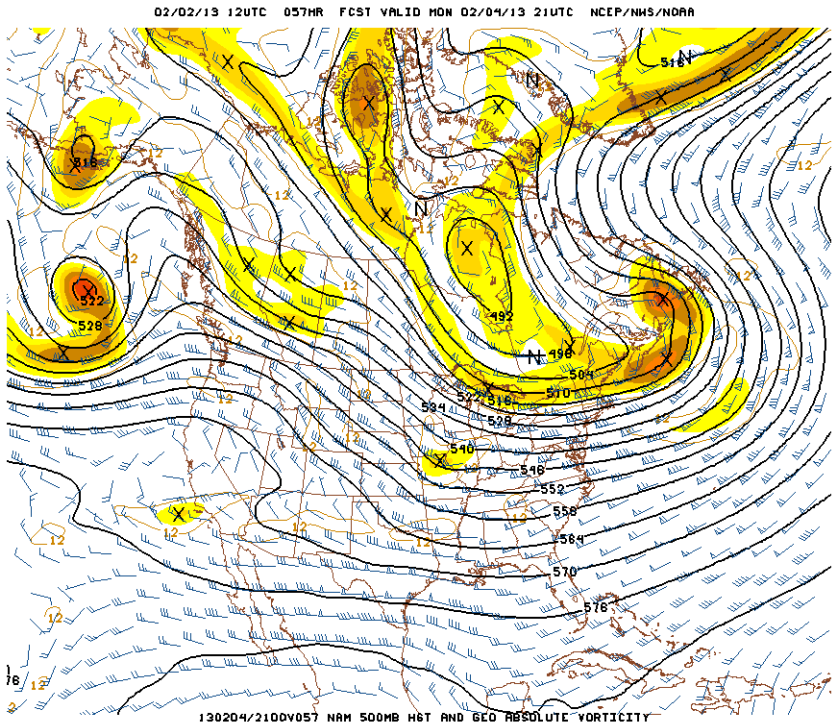


42 hr forecast valid Sun 18z 2013-02-03

Monday:

The upper level ridge rebounds as the small shortwave moves towards Mexico

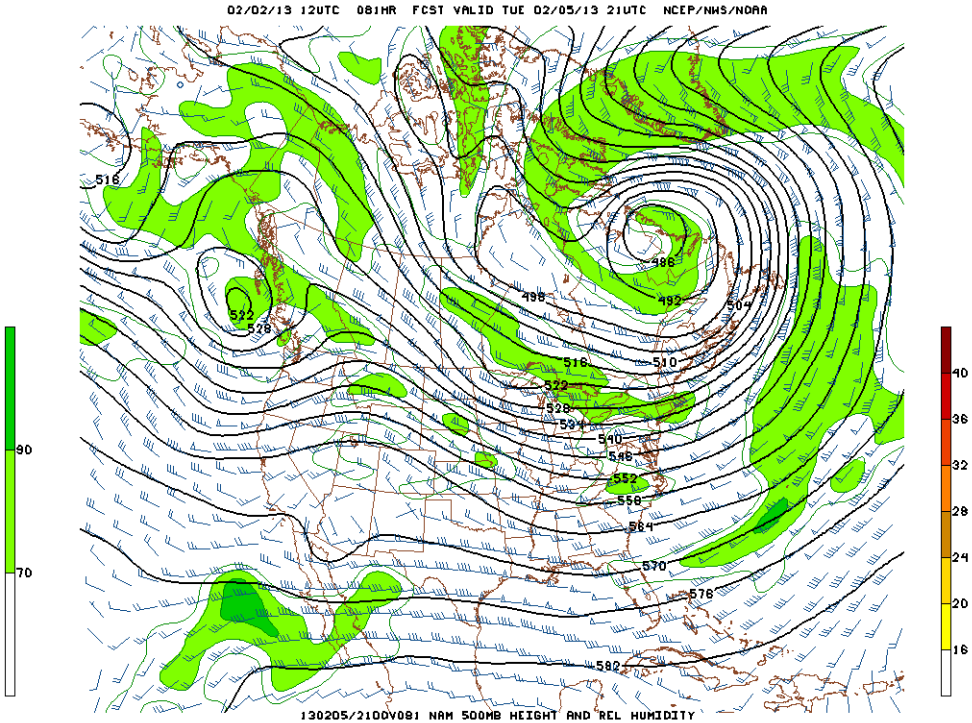




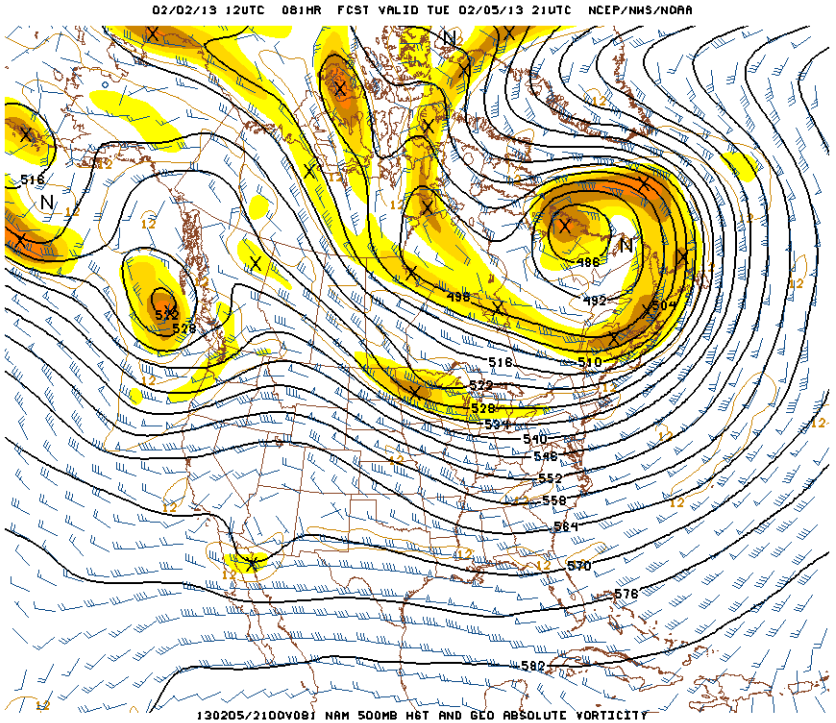
Tuesday:

A weak shortwave crosses the Pacific NW on Tuesday

500 mb NAM
Tuesday 1 PM



500 mb NAM
Tuesday 1 PM

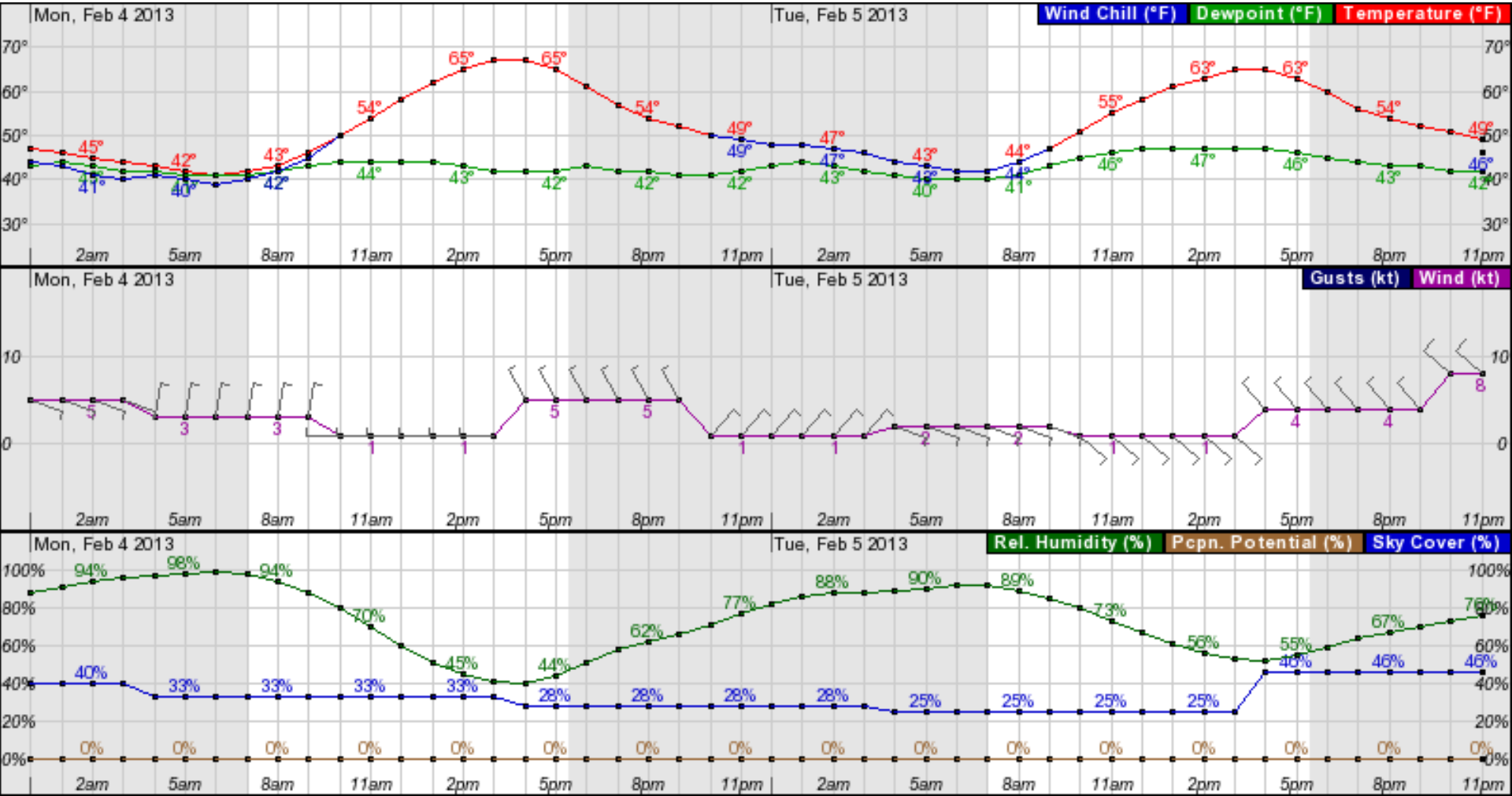


Fresno

Monday: Cloud cover ~30%, fog likely

Tuesday: Cloud cover decreases to 25% with an increase in the afternoon, fog possible

Monday → **Tuesday →**

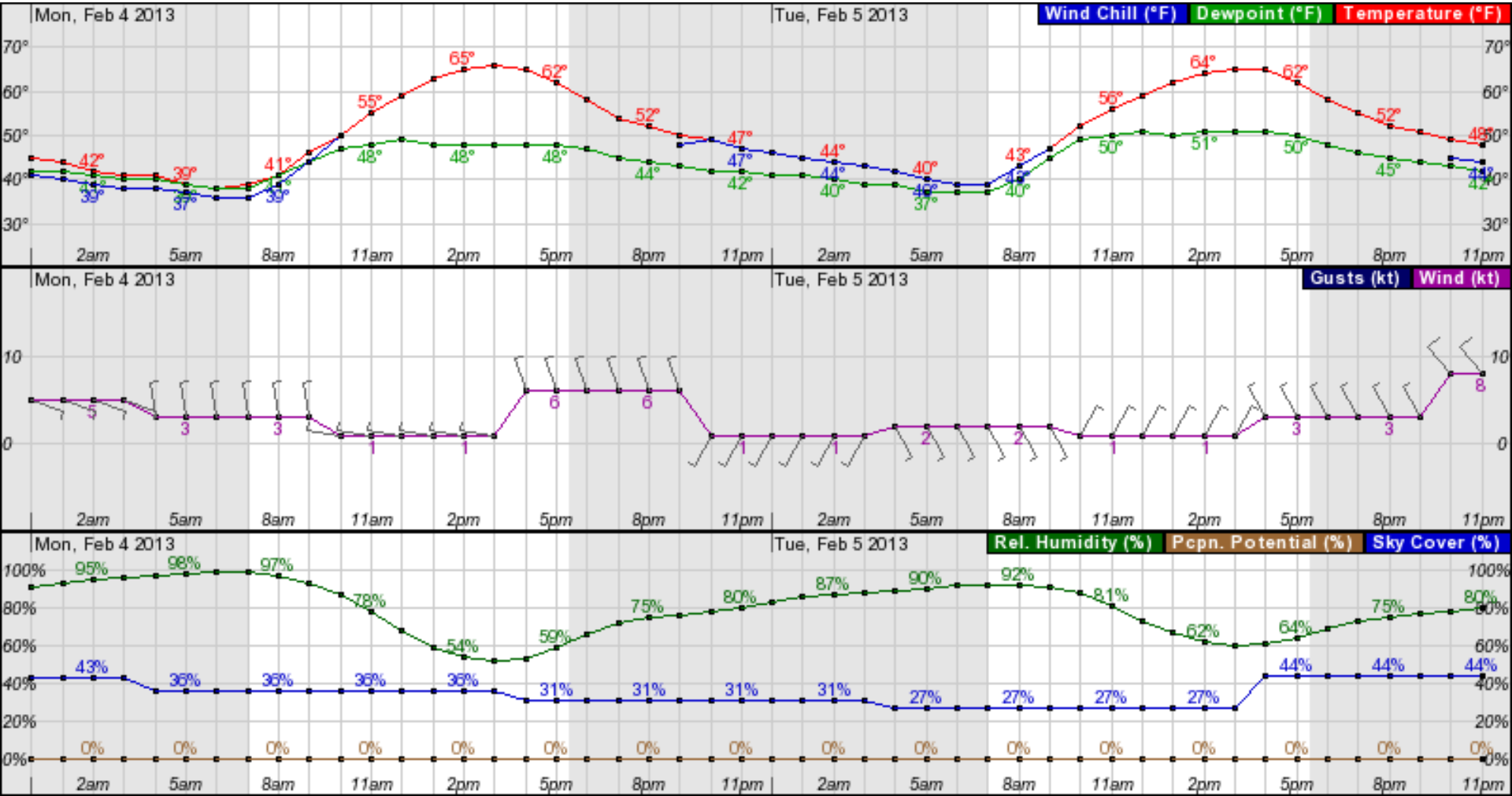


Hanford

Monday: Cloud cover ~35%, fog likely

Tuesday: Cloud cover decreases to ~27% with an increase in the afternoon, fog possible

Monday → **Tuesday →**

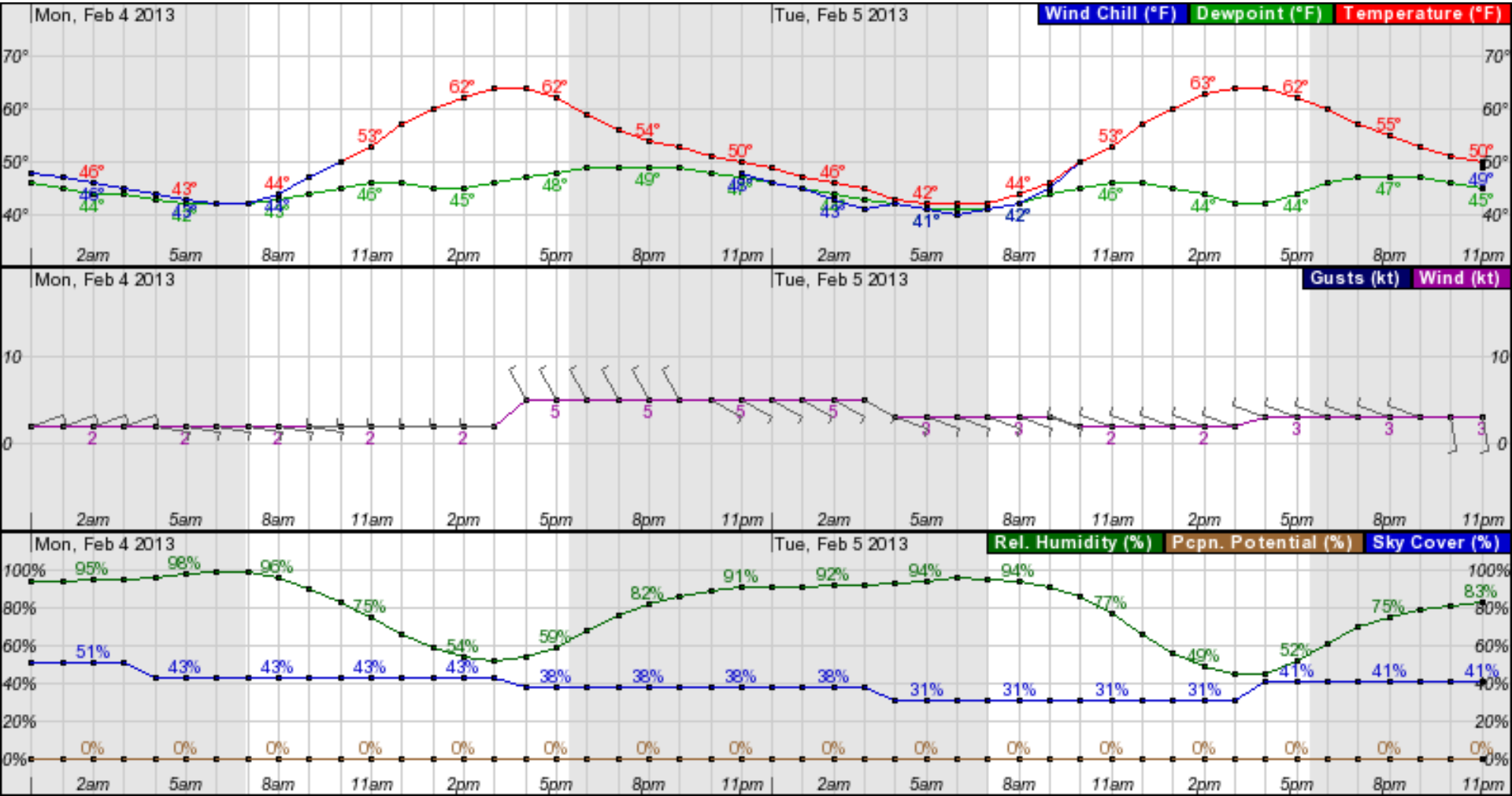


Bakersfield

Monday: Cloud cover ~40%, fog likely

Tuesday: Cloud cover decreases to 30% with an increase in the afternoon, fog possible

Monday → **Tuesday →**



Palmdale

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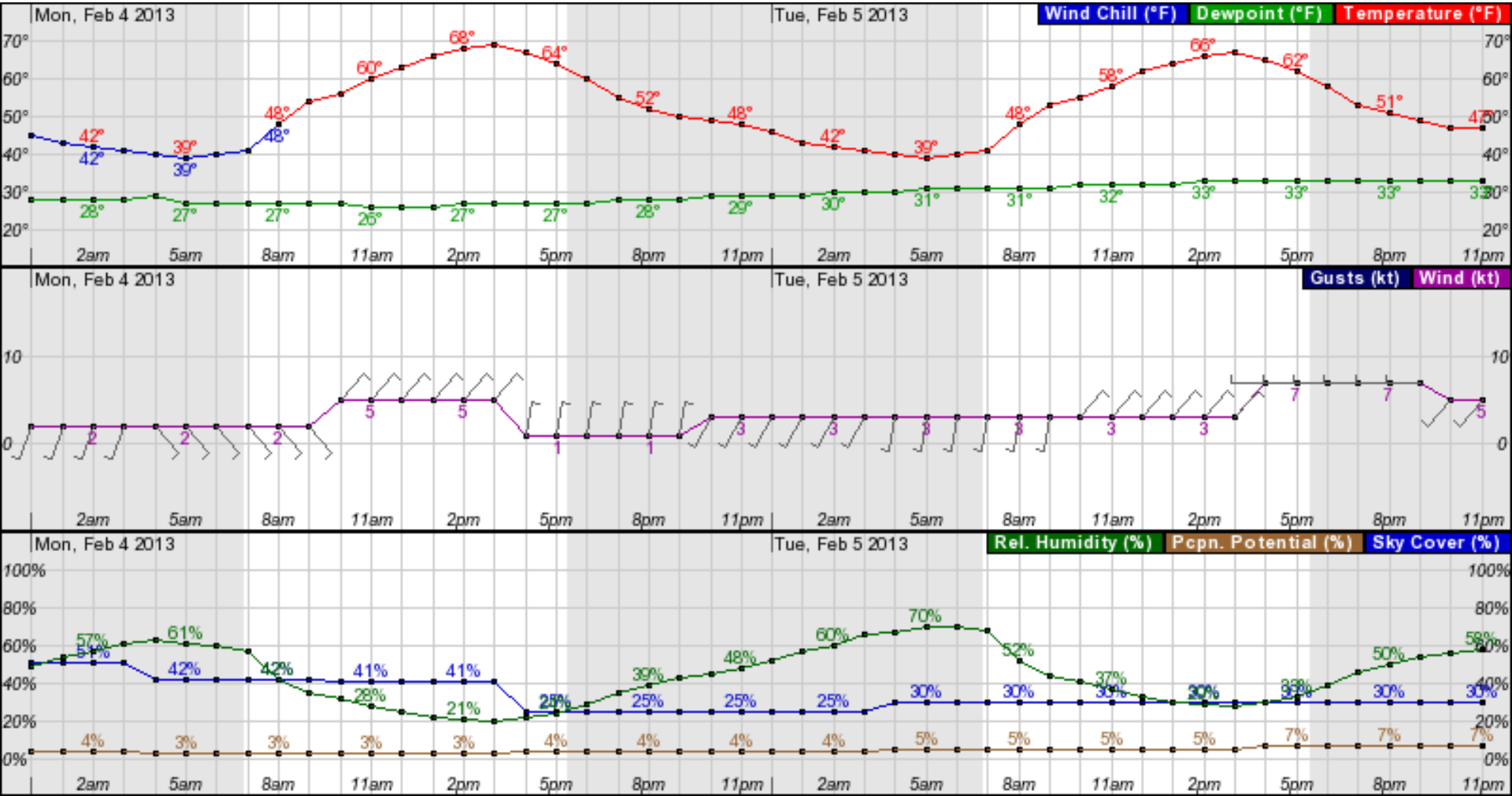
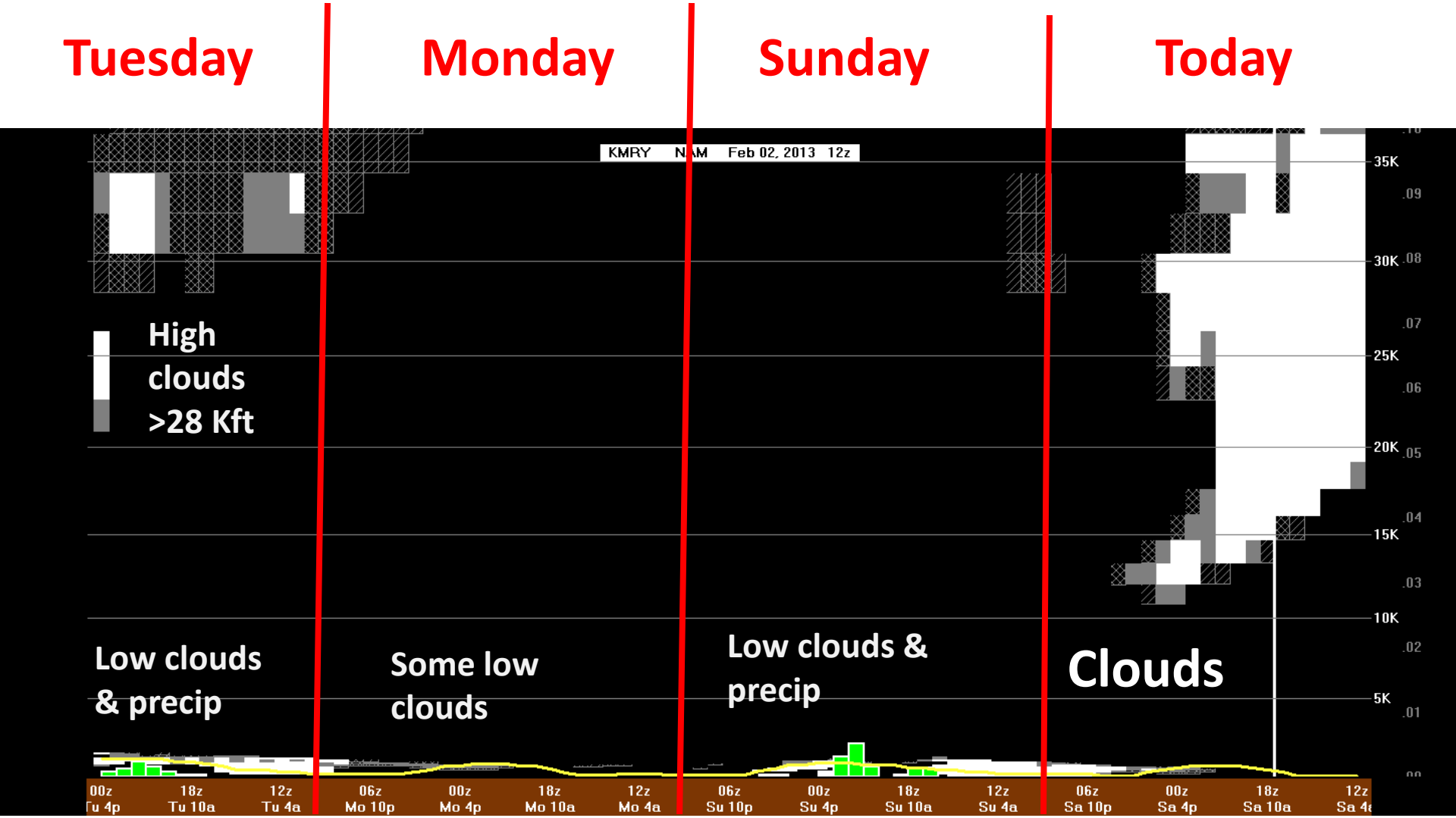
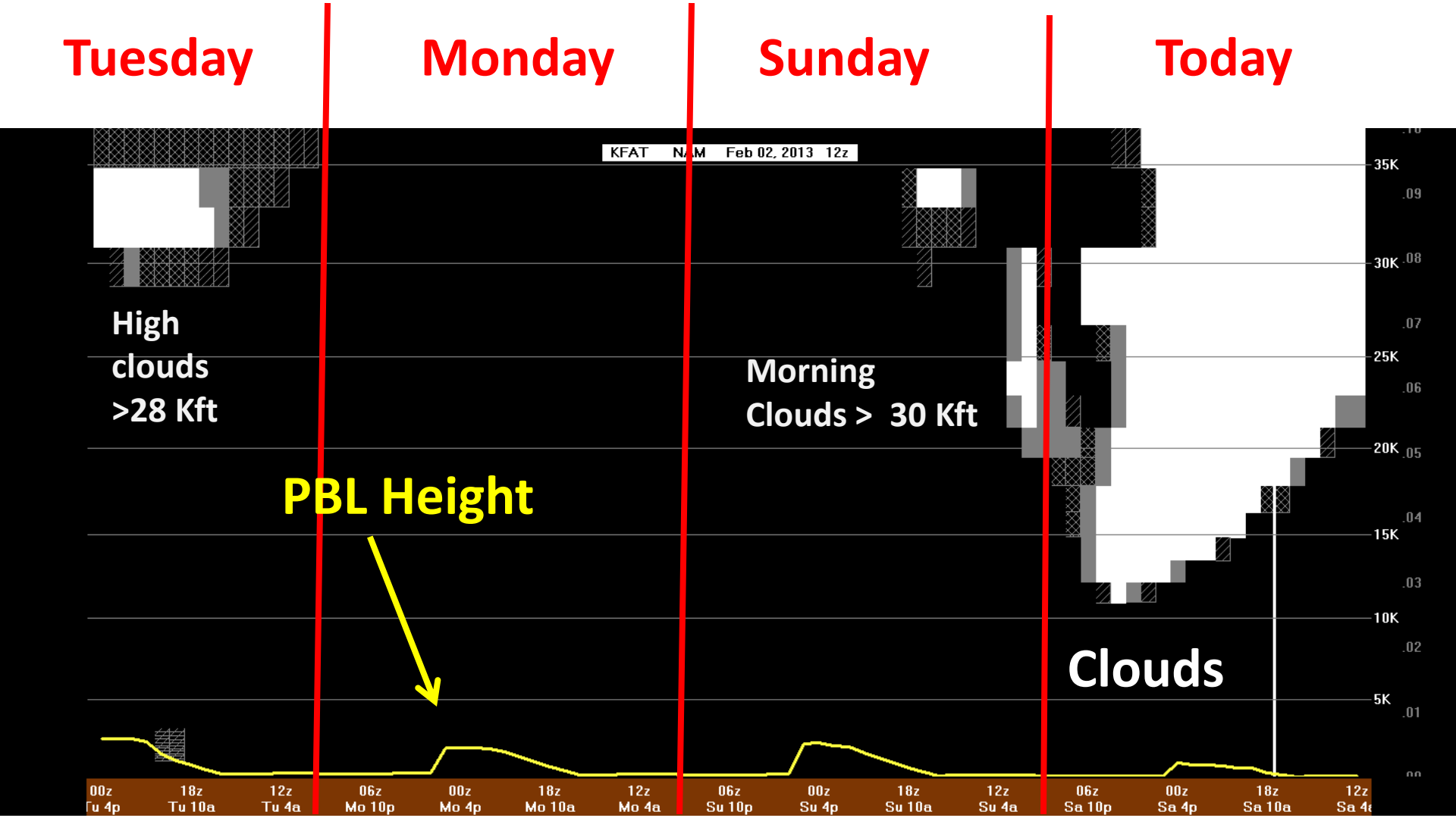
Monday → **Tuesday →**



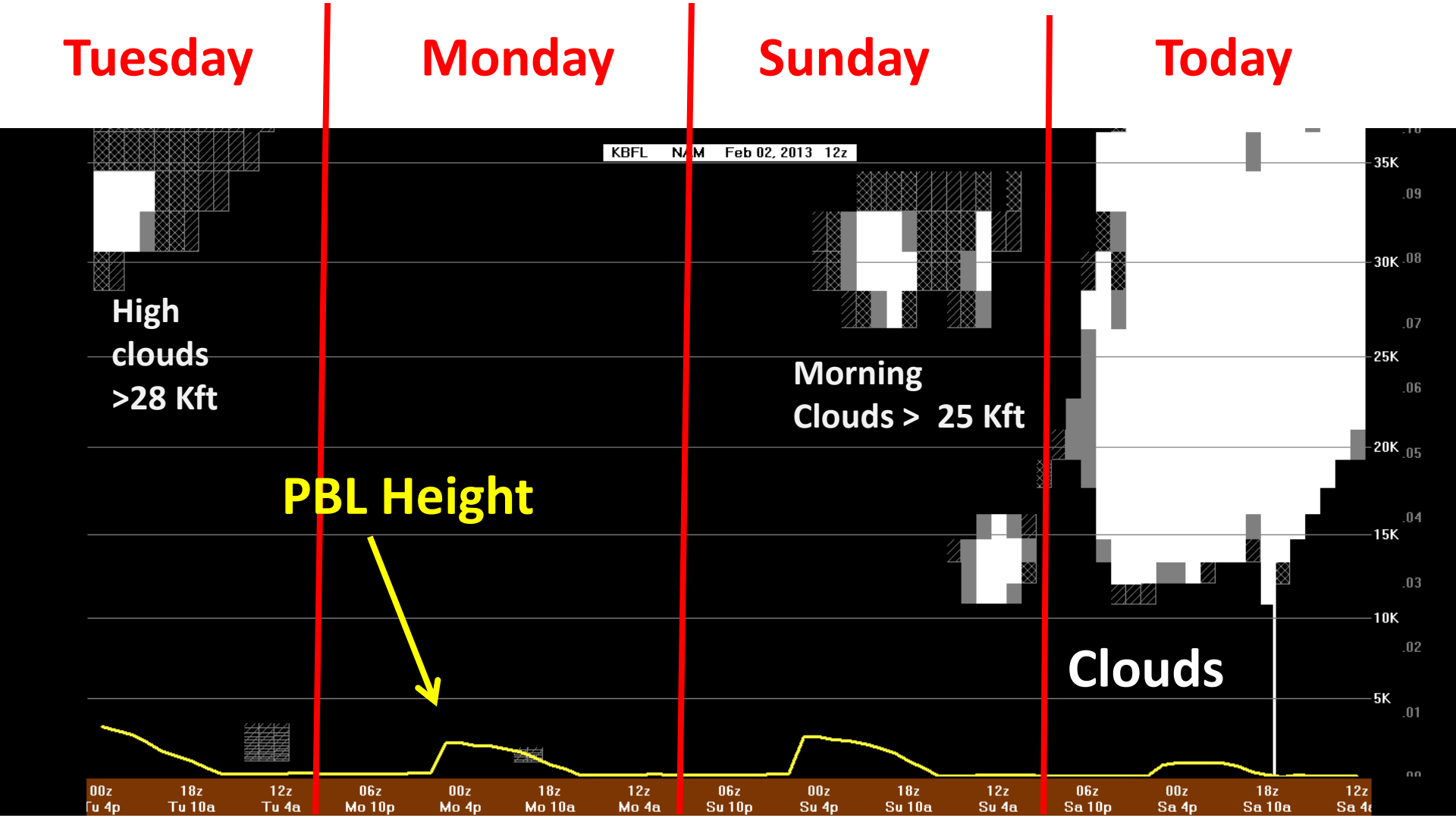
Monterey : BUFKIT NAM 12 UTC Saturday Feb. 2



Fresno : BUFKIT NAM 12 UTC Saturday Feb. 2



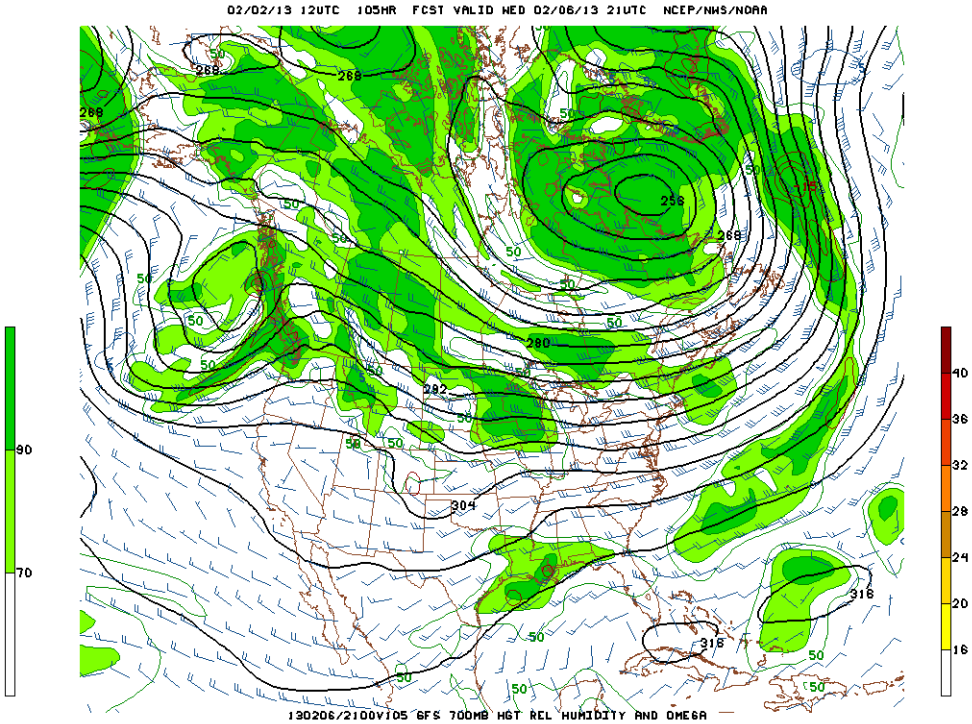
Bakersfield : BUFKIT NAM 12 UTC Saturday Feb. 2



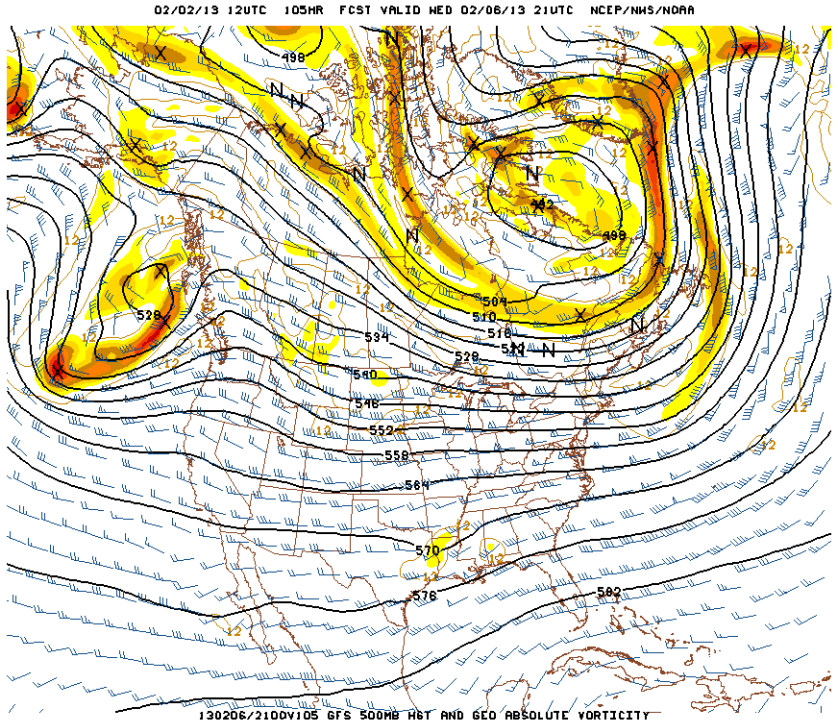
Wednesday:

A deeper upper level trough approaches the area

500 mb GFS
Wednesday 1 PM



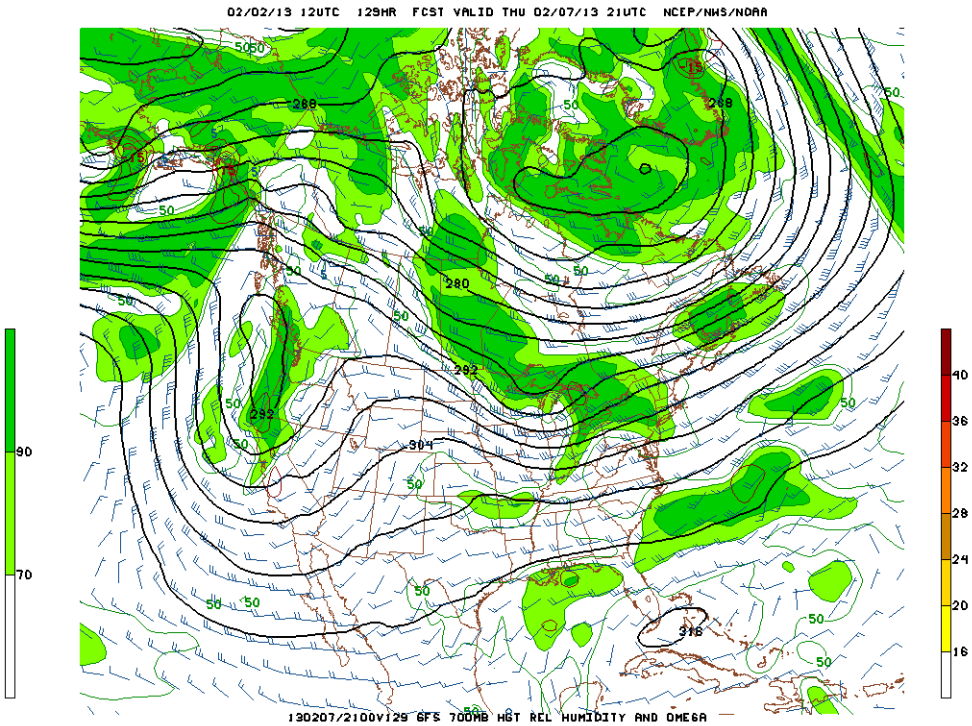
500 mb GFS
Wednesday 1 PM



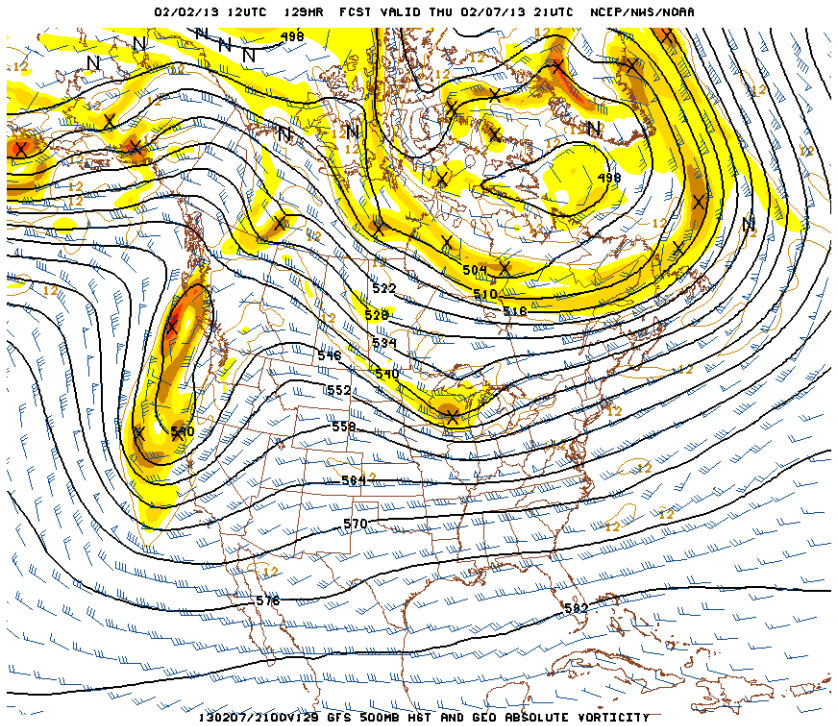
Thursday:

Both the GFS and the ECMWF forecast a chance for some rain for the SJV

500 mb GFS
Thursday 1 PM



500 mb GFS
Thursday 1 PM

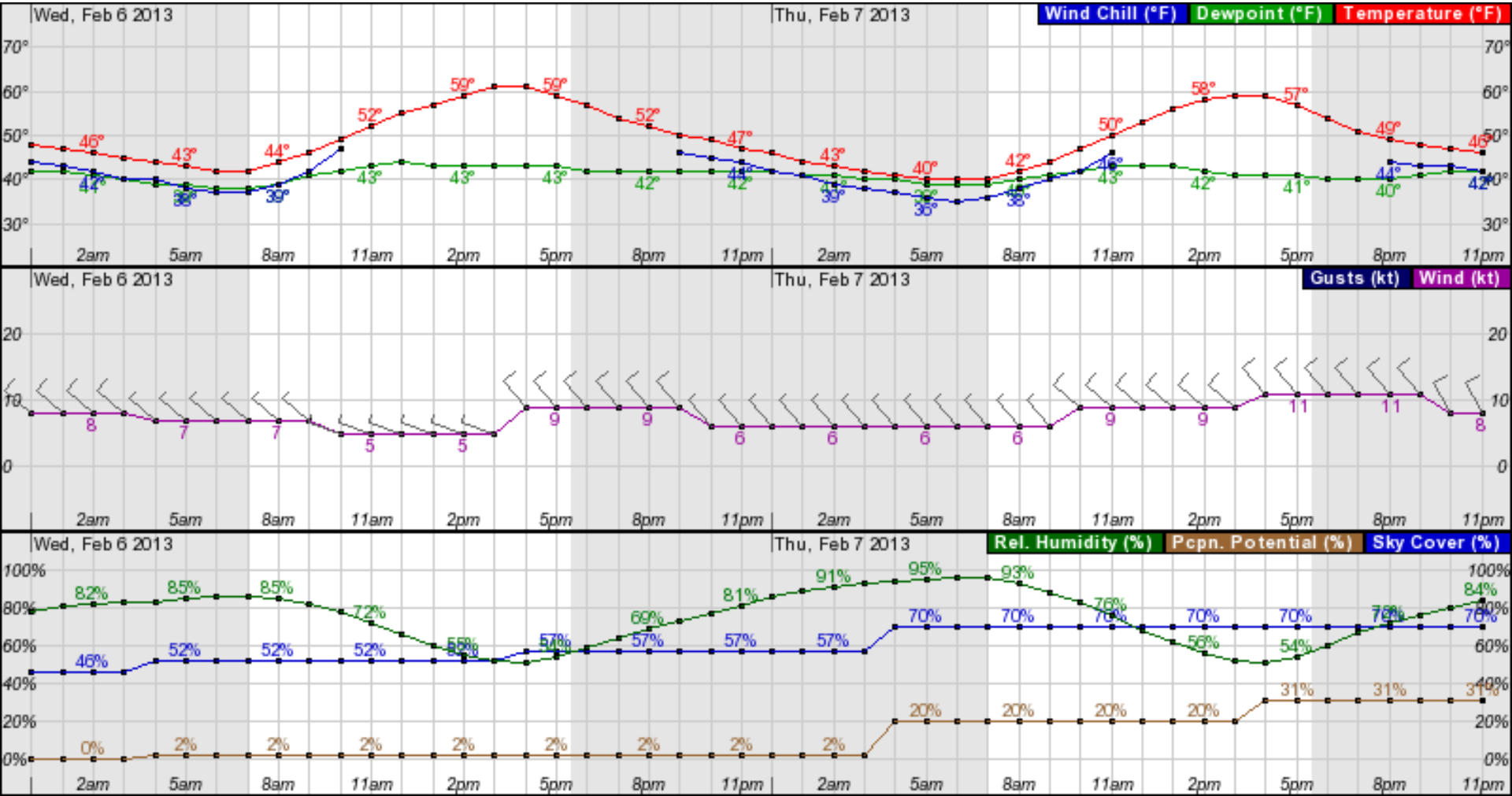


Fresno

Wednesday: Cloud cover >50%

Thursday: Cloud cover >50%

Wednesday → **Thursday →**



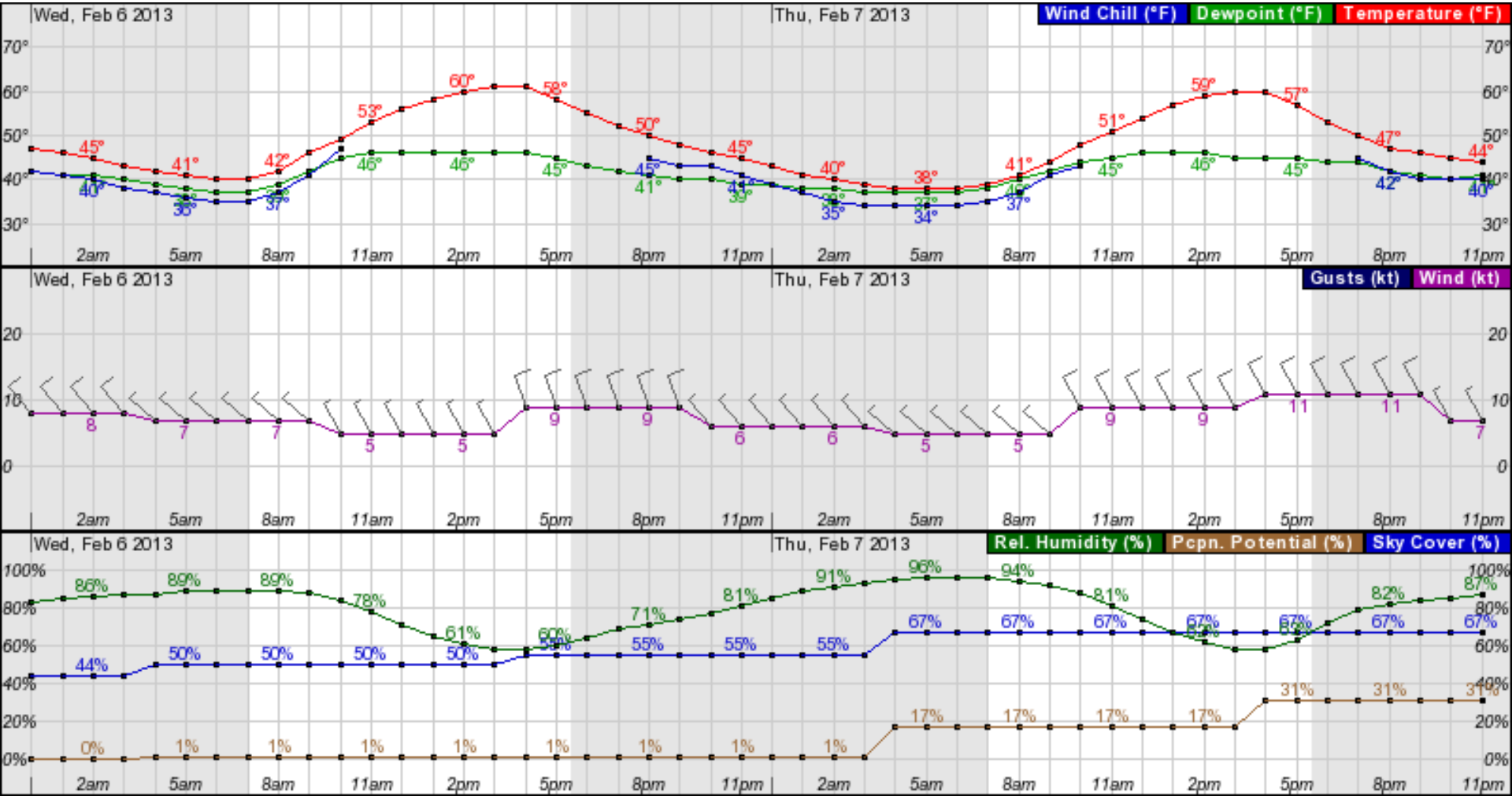
Hanford

Wednesday: Cloud cover ≥50%

Thursday: Cloud cover >50%

Wednesday →

Thursday →

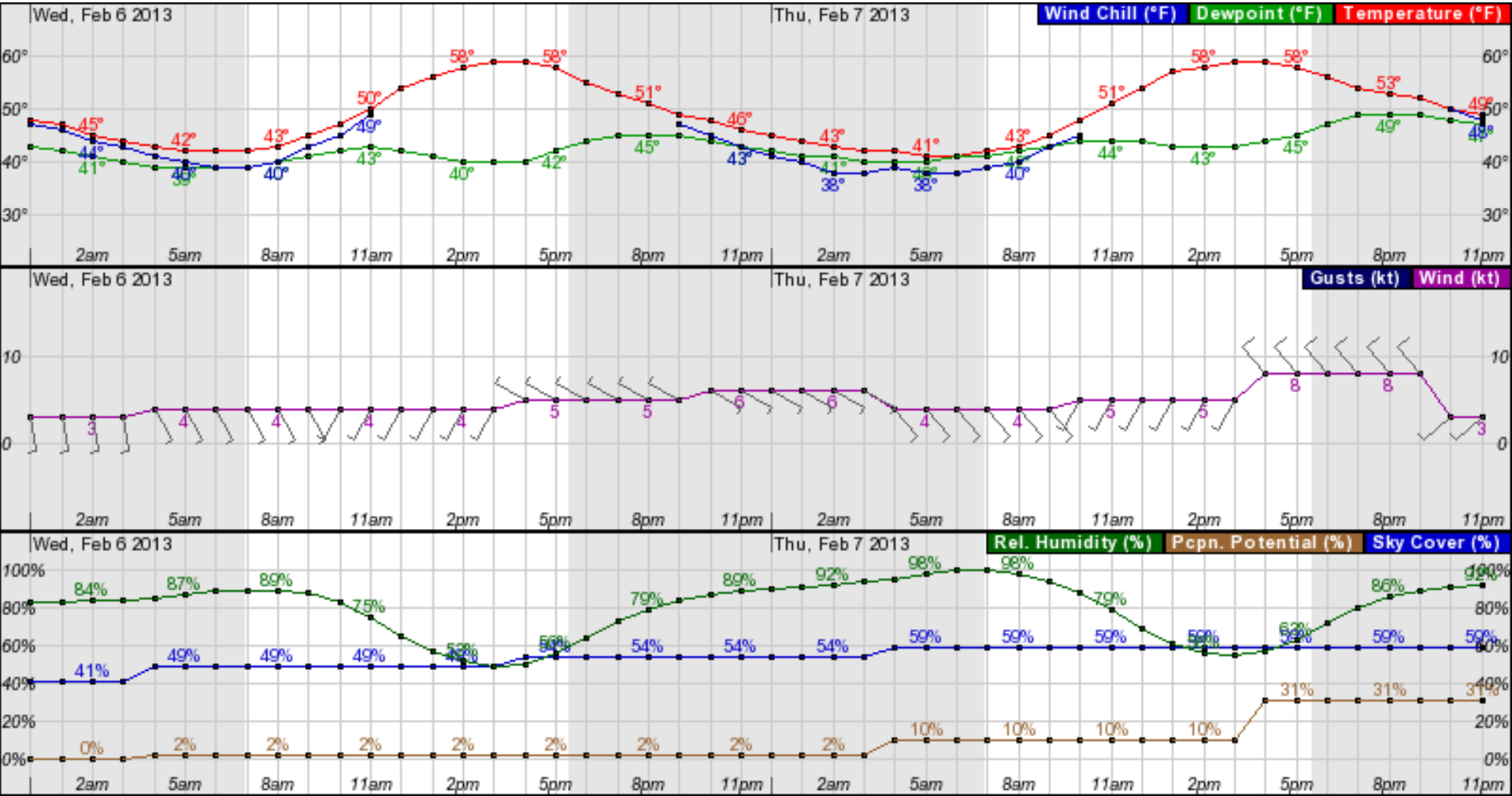


Bakersfield

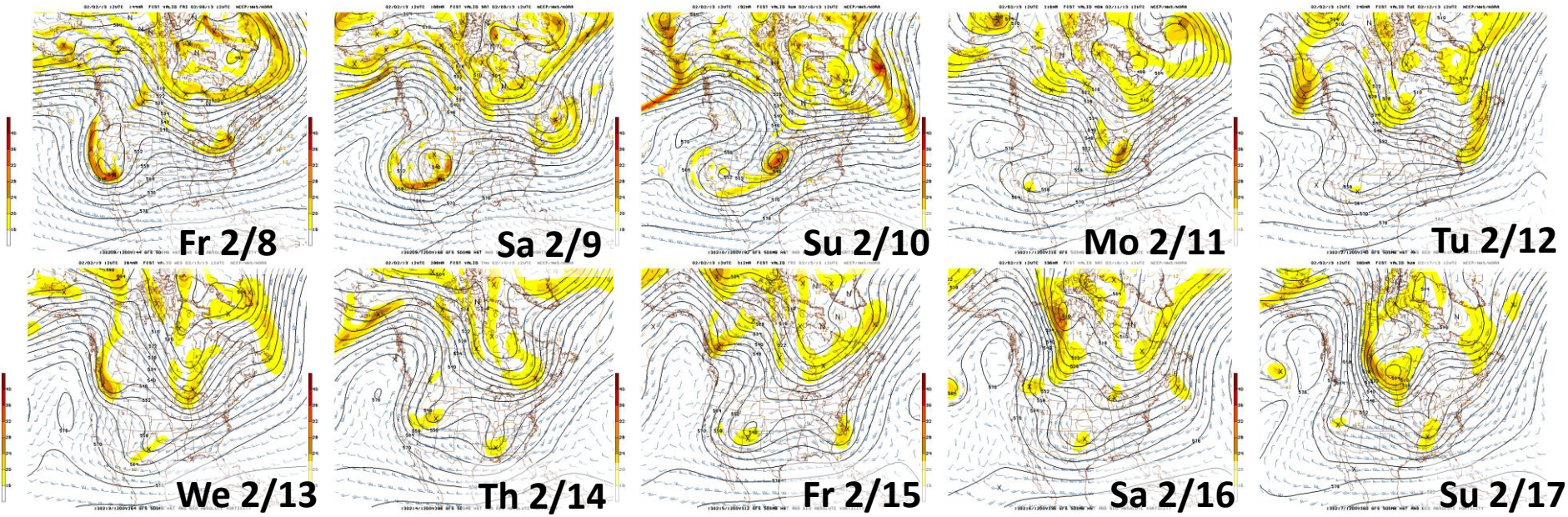
Wednesday: Cloud cover ~50%

Thursday: Cloud cover >50%

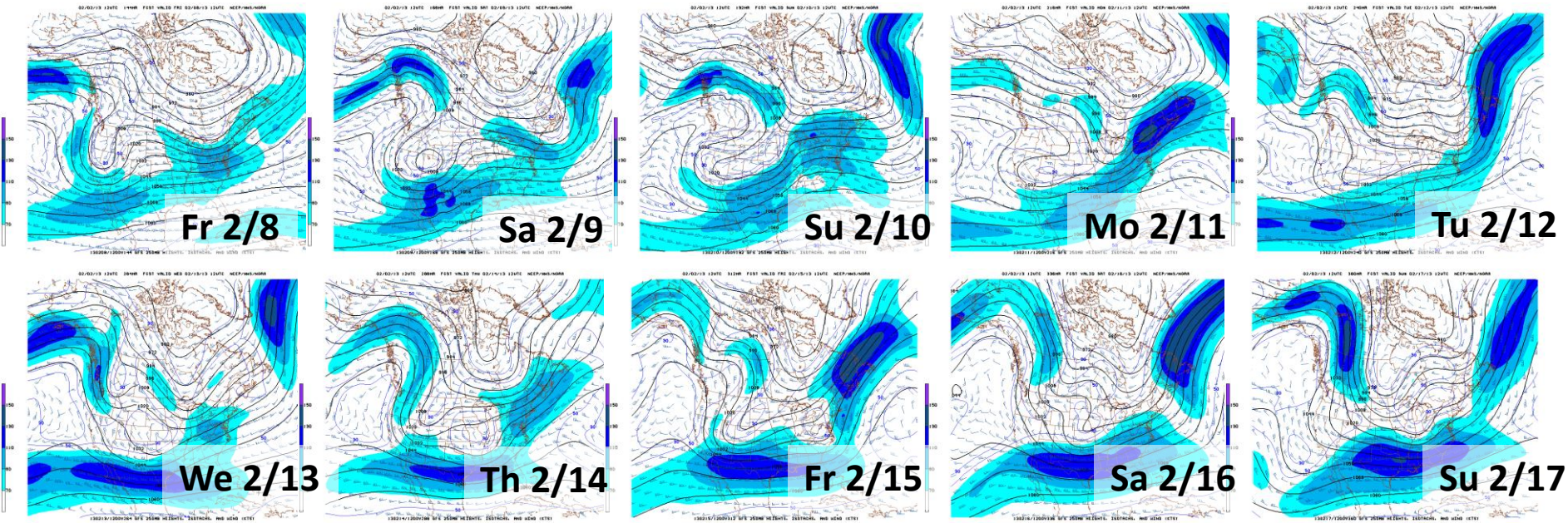
Wednesday → **Thursday →**



GFS - 500 mb vorticity - Extended forecast

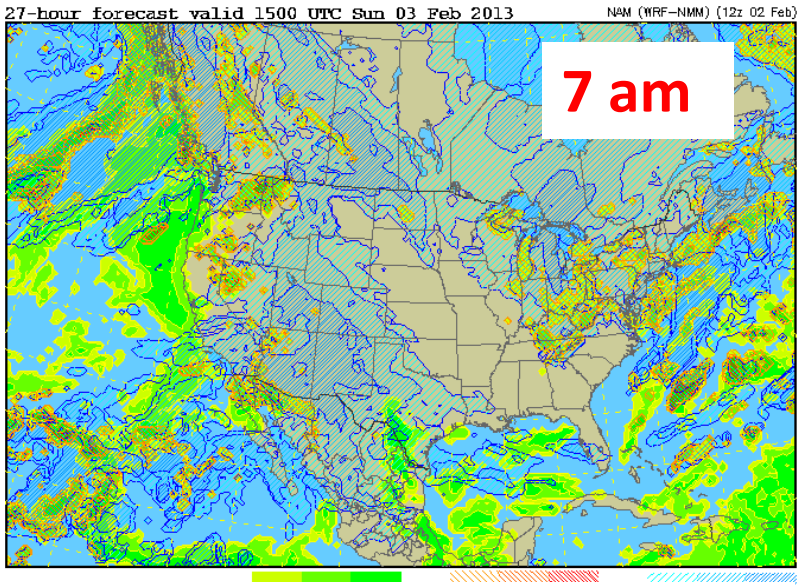


GFS - 250 mb winds - Extended forecast

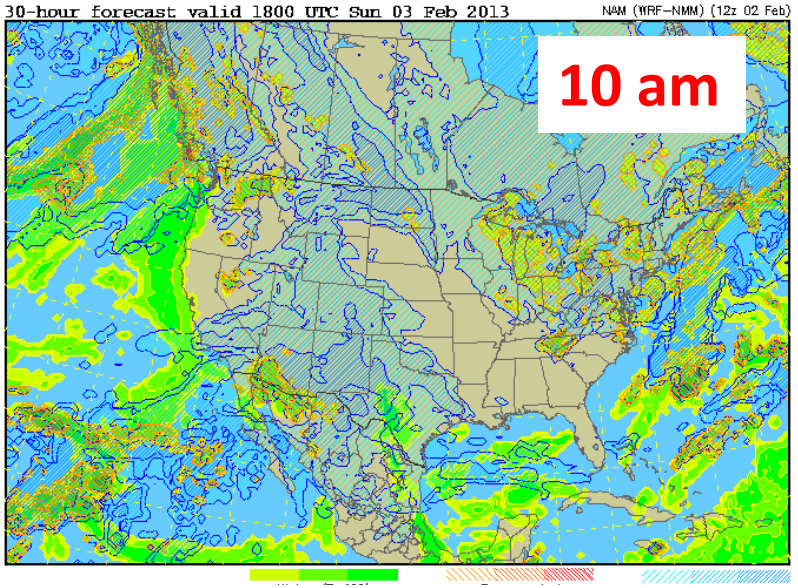


Tomorrow: NAM – High level clouds (>18K ft) over SJV all day, with low level clouds off the Bay Area.

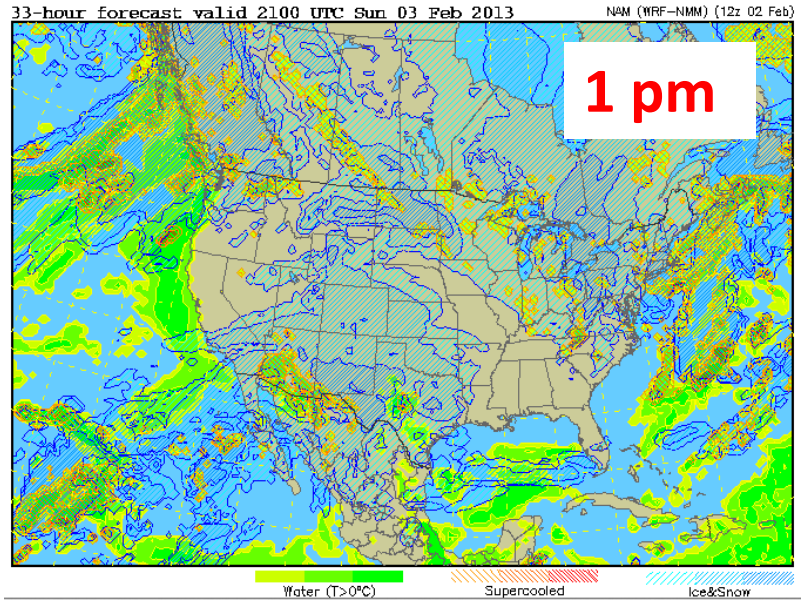
Integrated liquid and frozen hydrometeors (all levels)



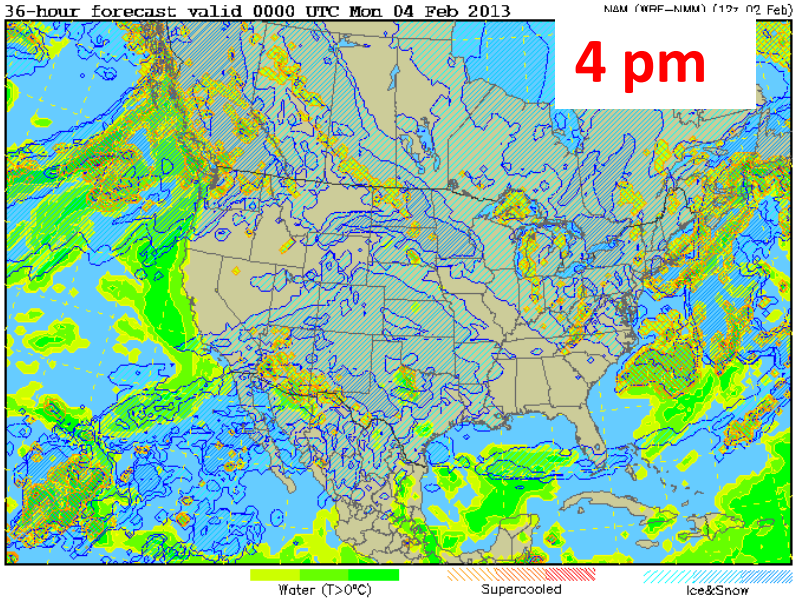
Integrated liquid and frozen hydrometeors (all levels)



Integrated liquid and frozen hydrometeors (all levels)



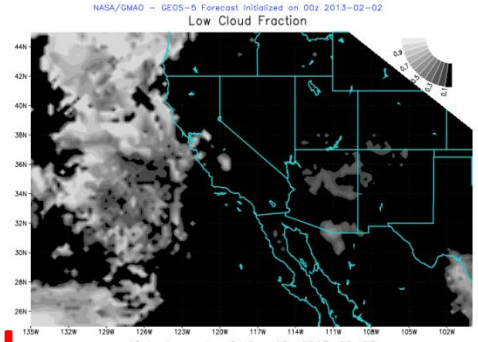
Integrated liquid and frozen hydrometeors (all levels)

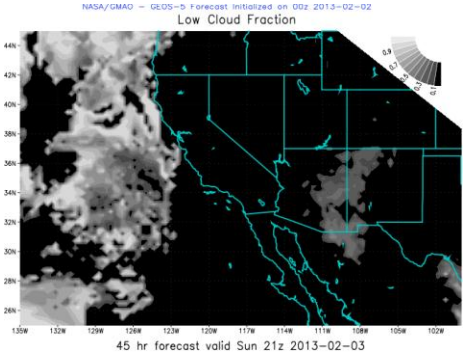


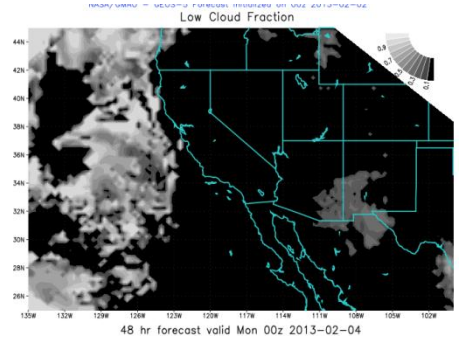
Sunday: GEOS5 – high level clouds all day with low level clouds offshore of Bay Area.

7 am | 10 am | 1 pm | 4 pm

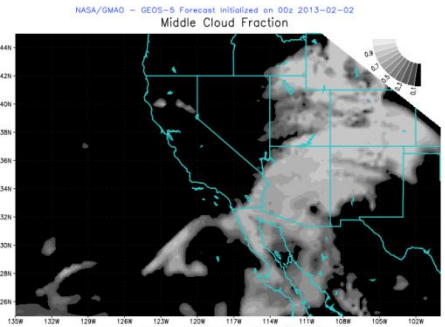
GEOS5 – Low level

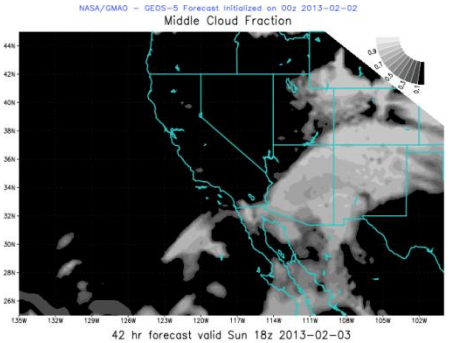


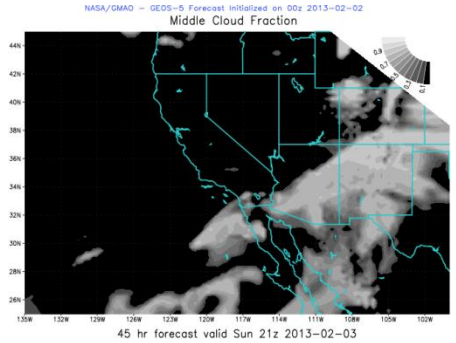


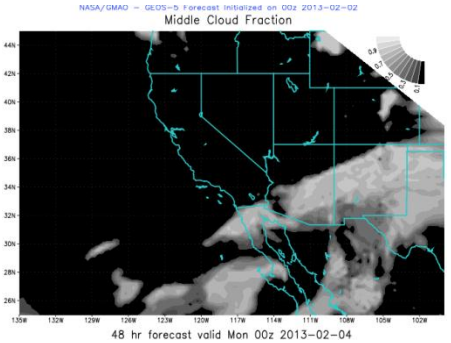


GEOS5 – Mid level

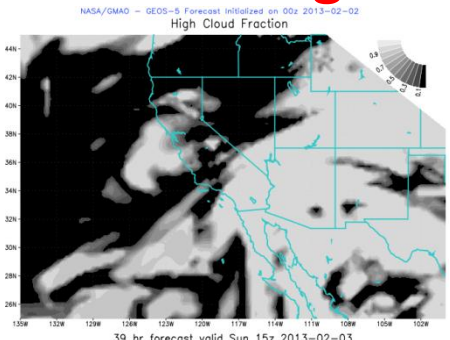


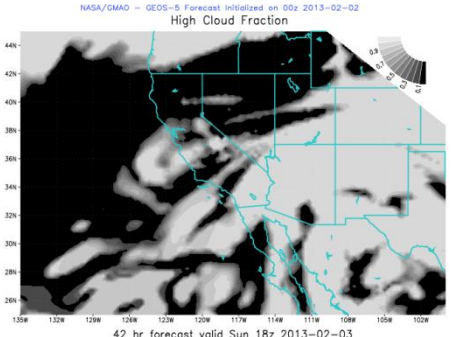


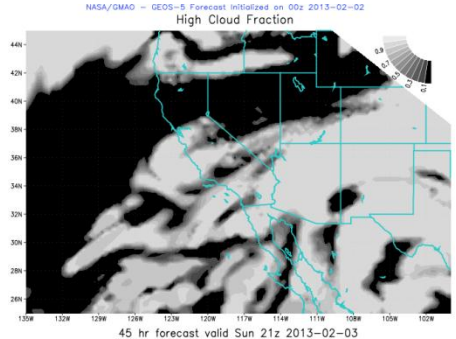


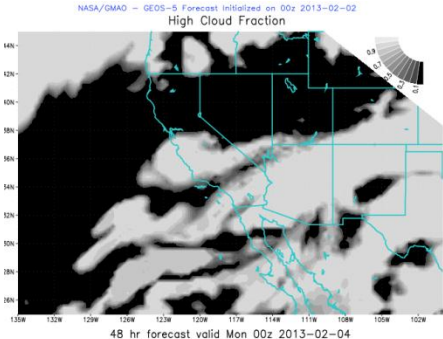


GEOS5 – High level





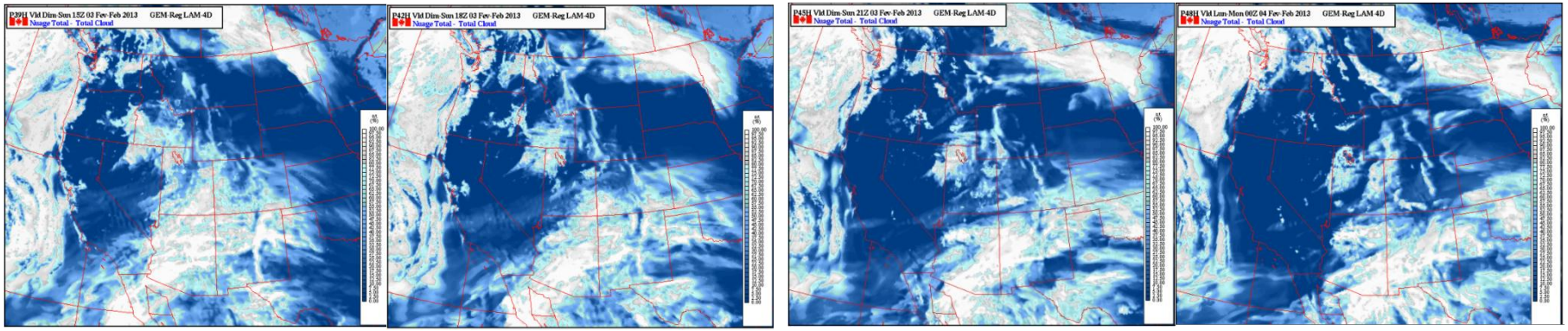




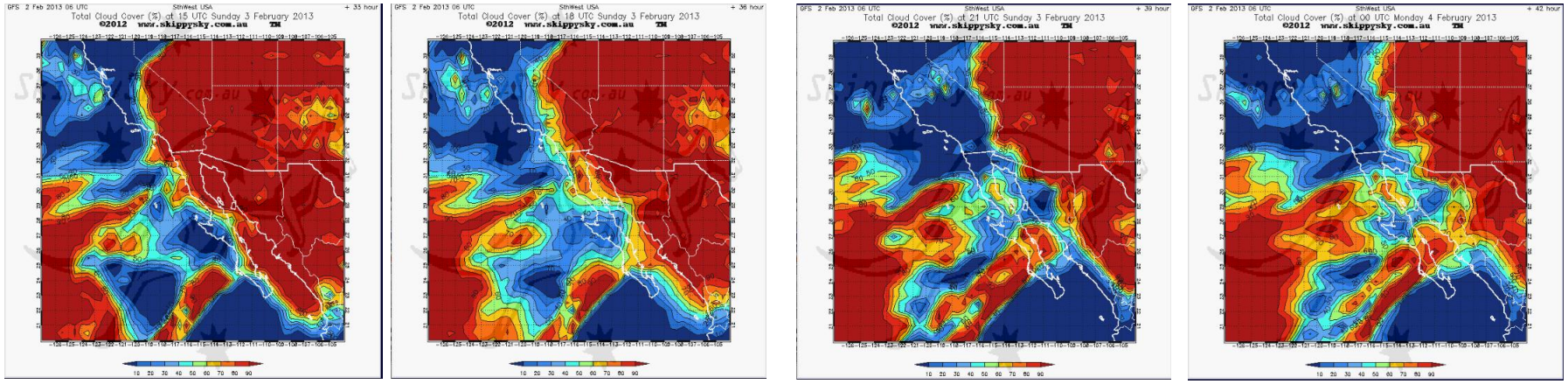
Tomorrow: Canadian – Some cirrus over SJV during morning, moving out by mid-afternoon with low level clouds off shore of Bay Area; GFS – Cirrus over SJV moving out by mid-afternoon, but less low level cloud than GEM.

7 am 10 am 1 pm 4 pm

Canadian

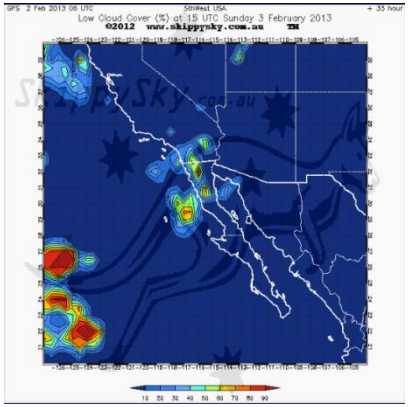


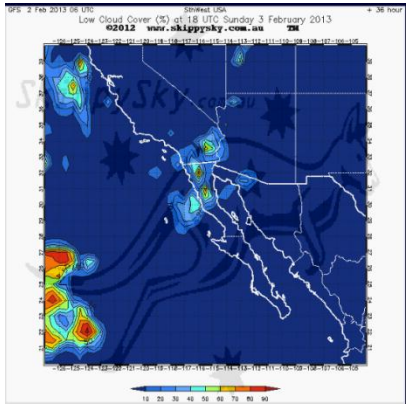
GFS – Total Cloud

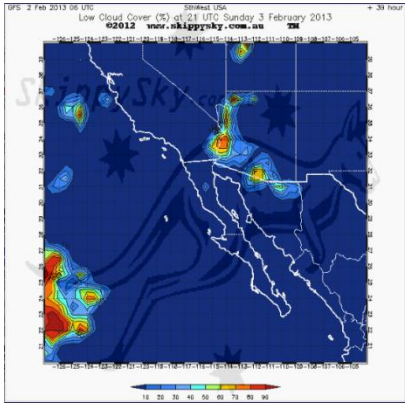


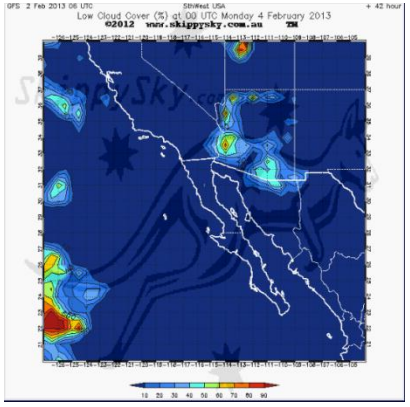
7 am 10 am 1 pm 4 pm

GFS - Low level

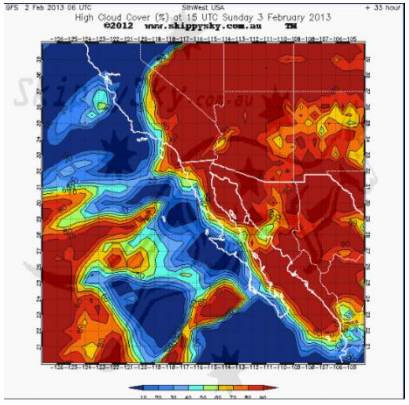


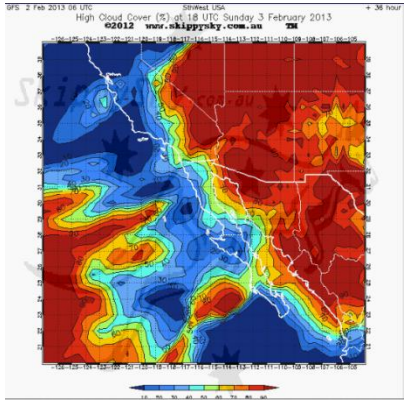


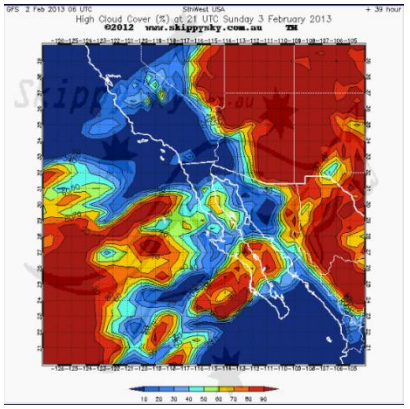


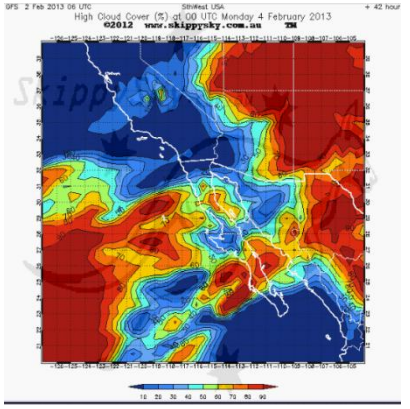


GFS - High level



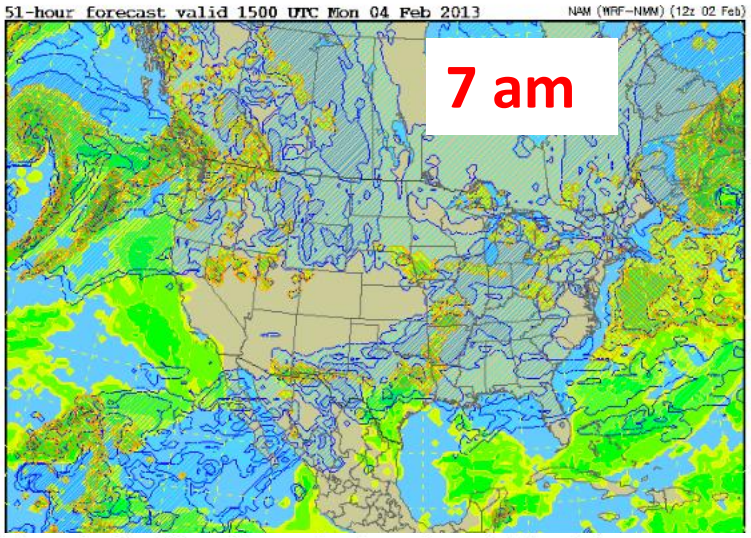




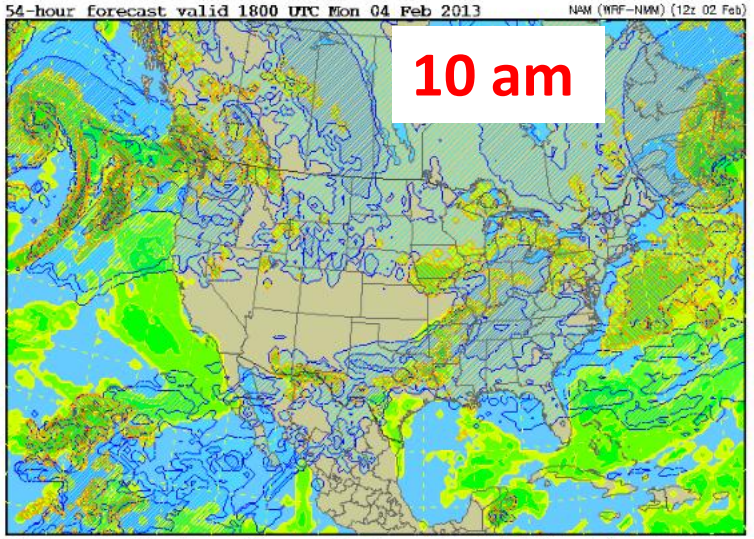


Monday: NAM – SJV mainly cloud-free over entire day. Low level clouds forecast to be very close to the coast.

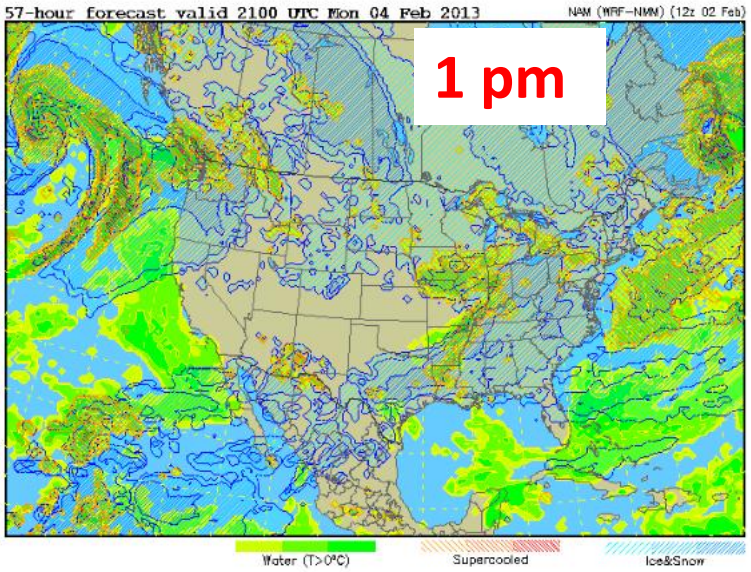
Integrated liquid and frozen hydrometeors (all levels)



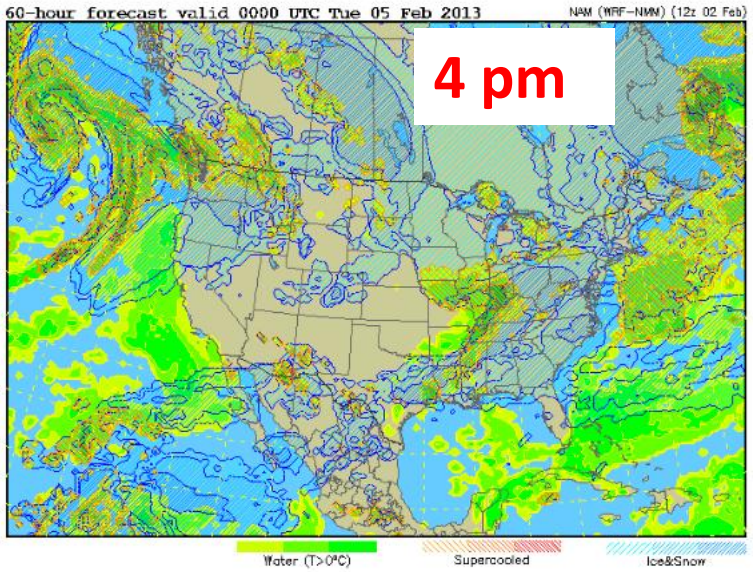
Integrated liquid and frozen hydrometeors (all levels)



Integrated liquid and frozen hydrometeors (all levels)



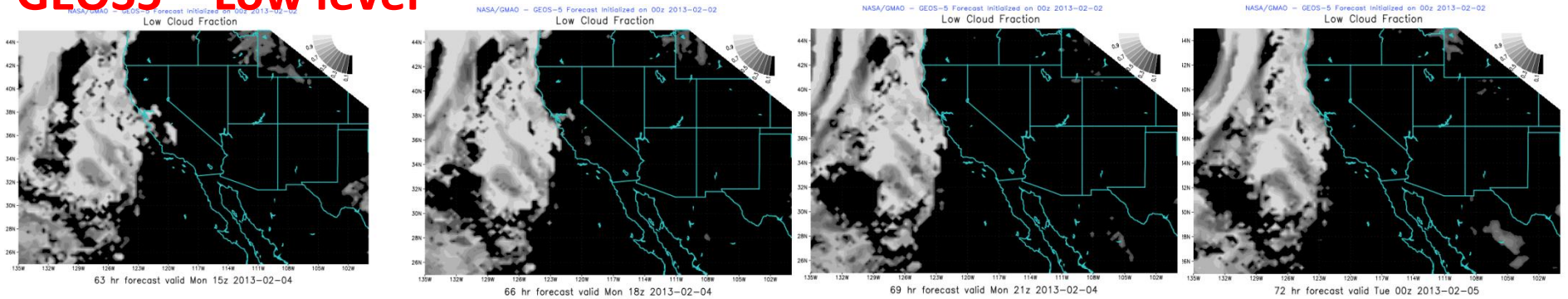
Integrated liquid and frozen hydrometeors (all levels)



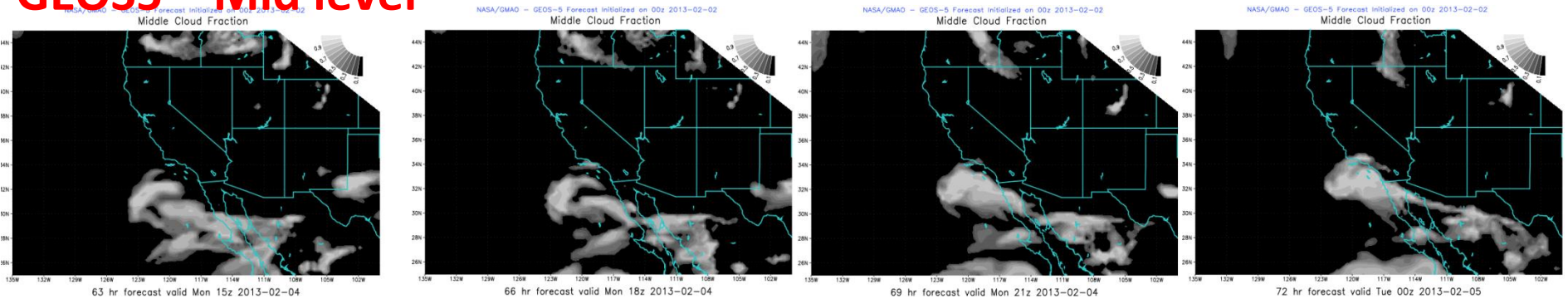
Monday: GEOS5 – Low level clouds off the coast, some high level clouds possibly over the southern SJV region by the afternoon

7 am 10 am 1 pm 4 pm

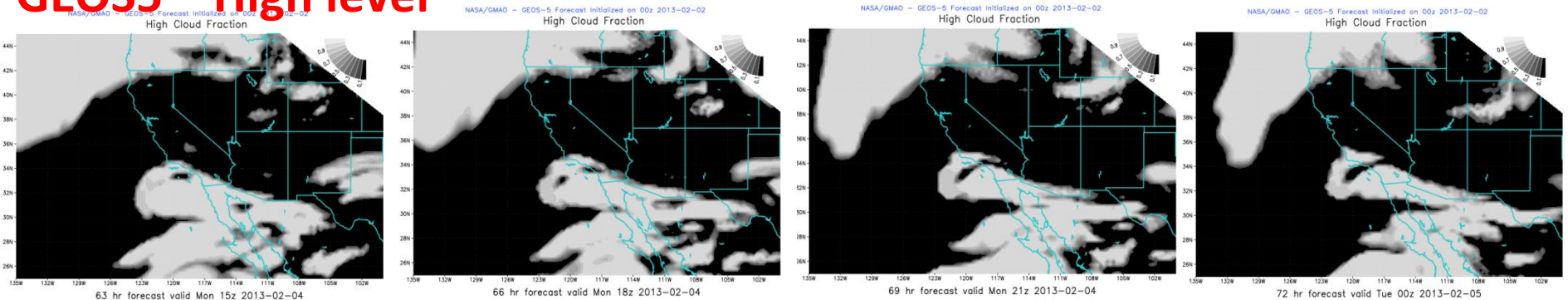
GEOS5 – Low level



GEOS5 – Mid level

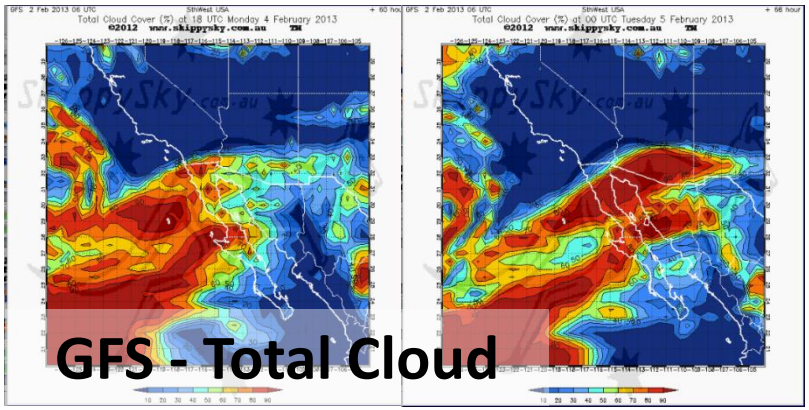


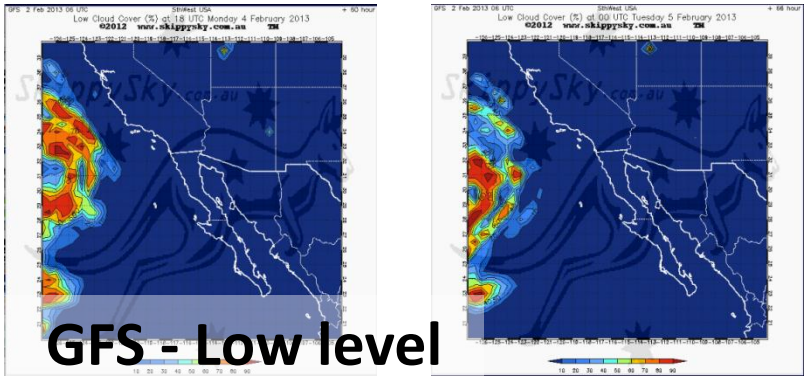
GEOS5 – High level

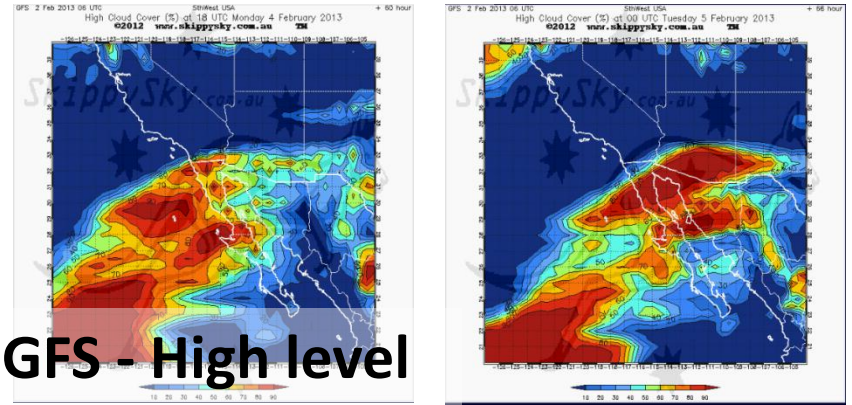


Monday: GFS – SJV region clear of clouds all day.

10 am 4 pm

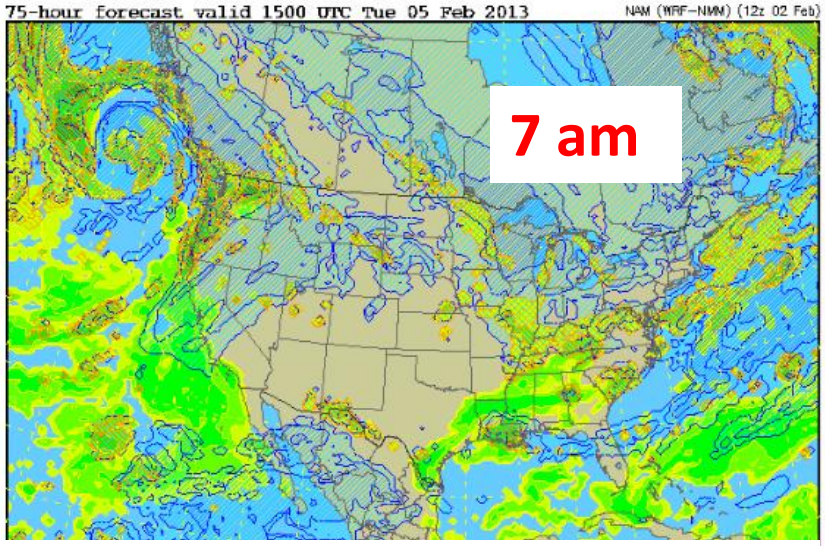






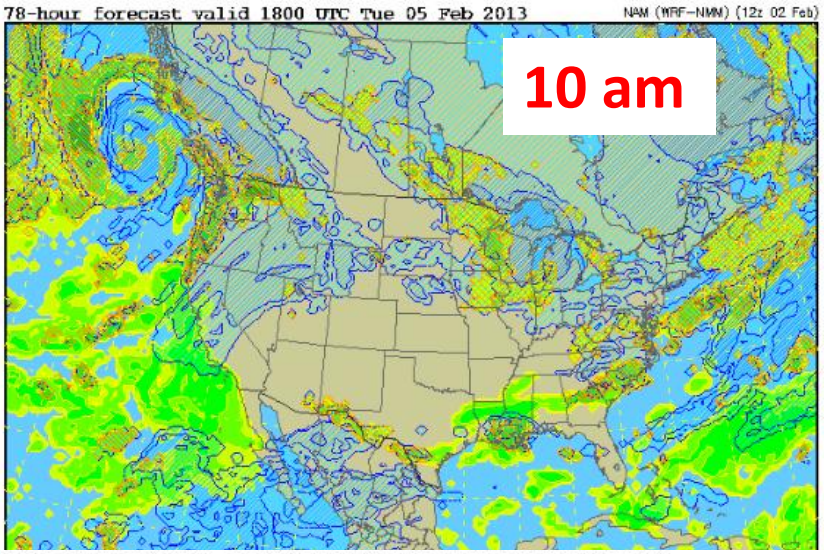
Tuesday: NAM – low level clouds (<6K ft) close to the coast. High level clouds moving into the northern SJV and Bay Area by 7 am and over the entire SJV region by 1 pm.

Integrated liquid and frozen hydrometeors (all levels)

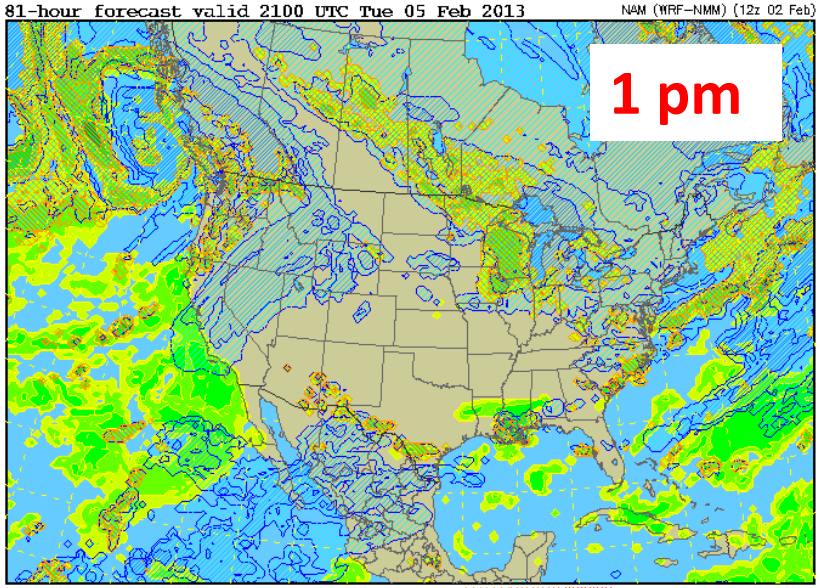


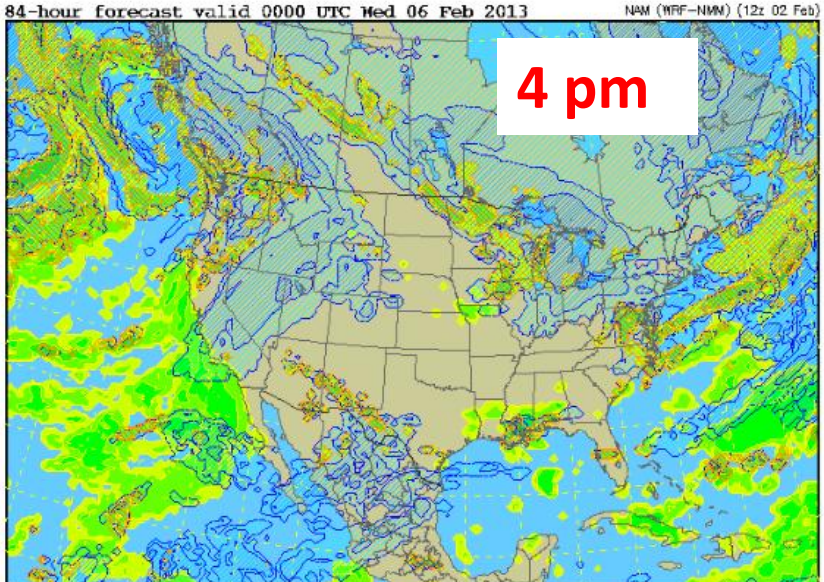
Integrated liquid and frozen hydrometeors (all levels)

Integrated liquid and frozen hydrometeors (all levels)



Integrated liquid and frozen hydrometeors (all levels)

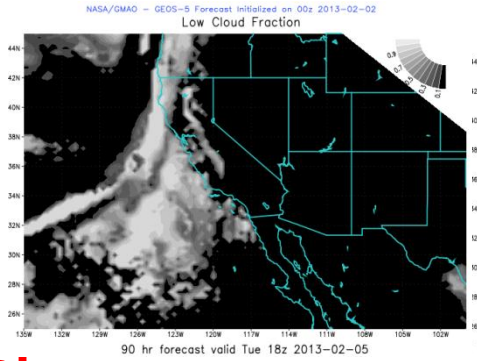


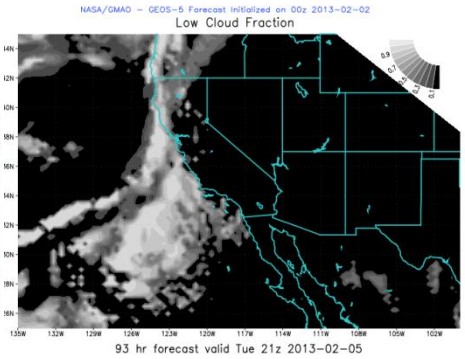


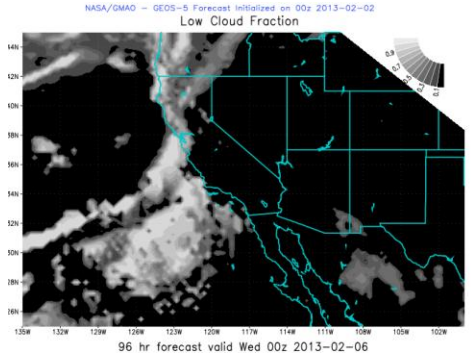
Tuesday: GEOS5 – Low level clouds along the coast, high level clouds over SJV but less coverage than the NAM

7 am 10 am 1 pm 4 pm

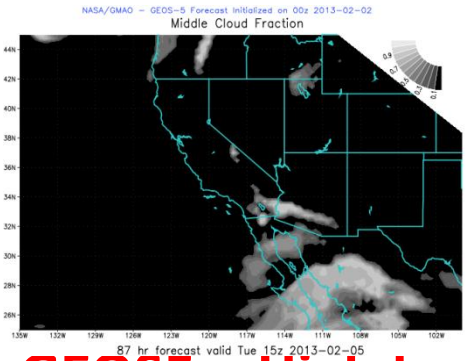
GEOS5 – Low level

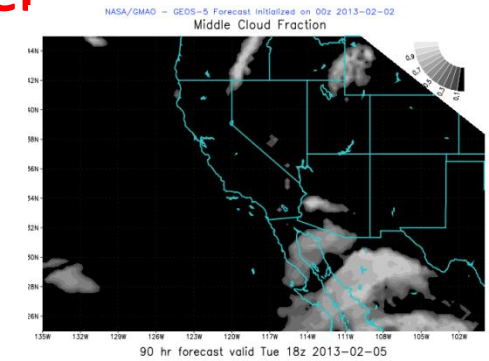


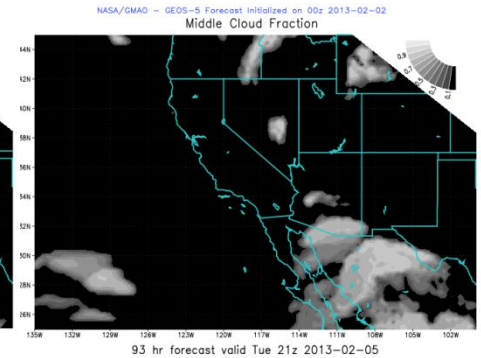


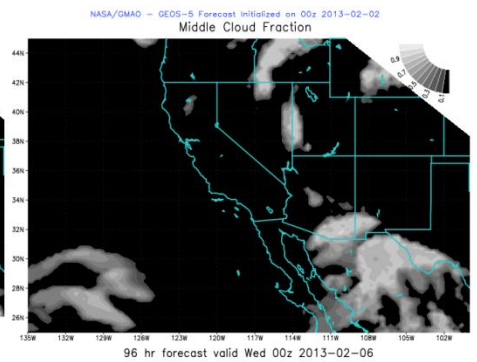


GEOS5 – Mid level

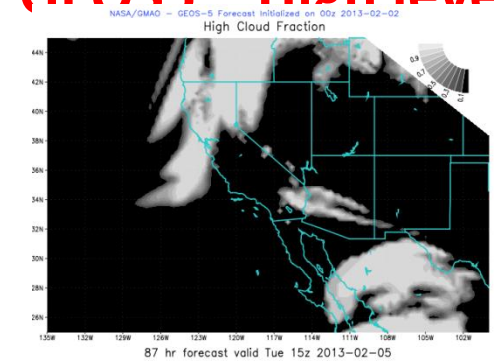


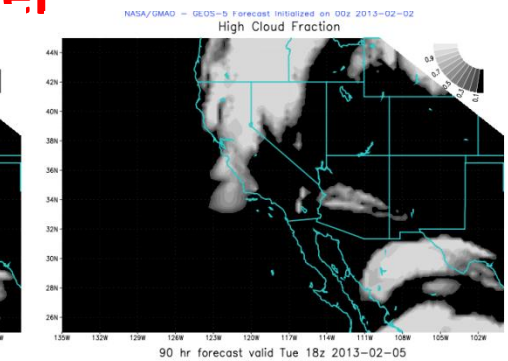


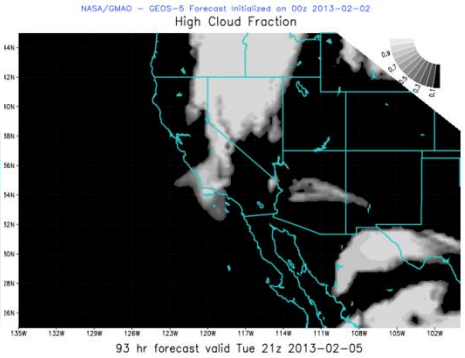


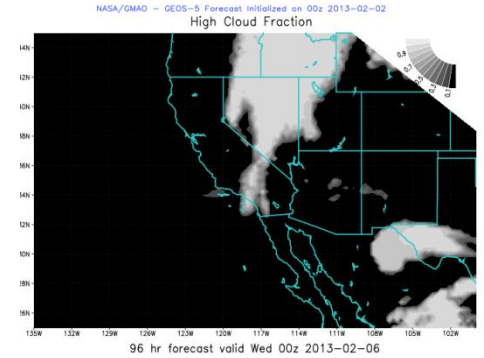


GEOS5 – High level

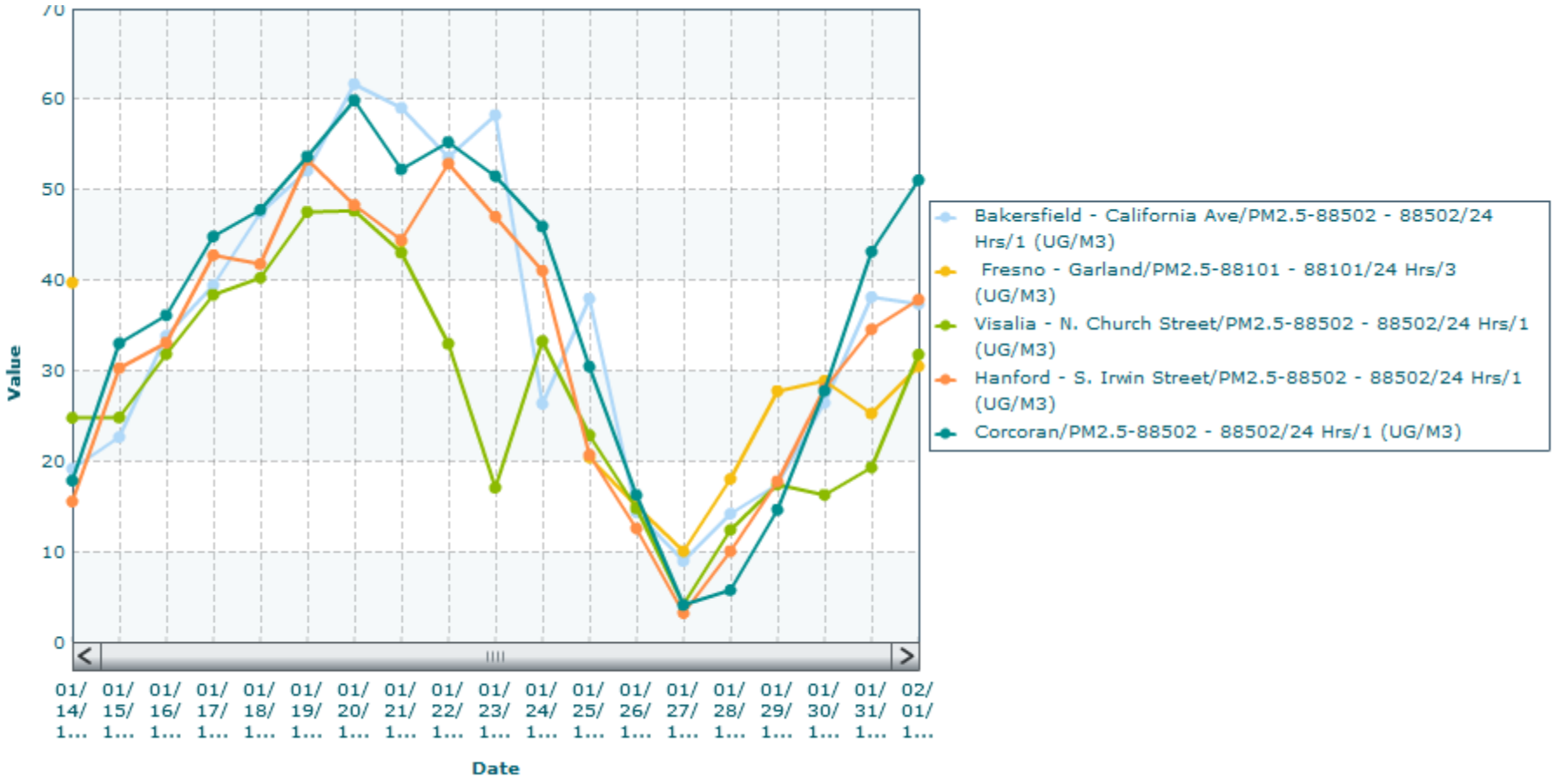








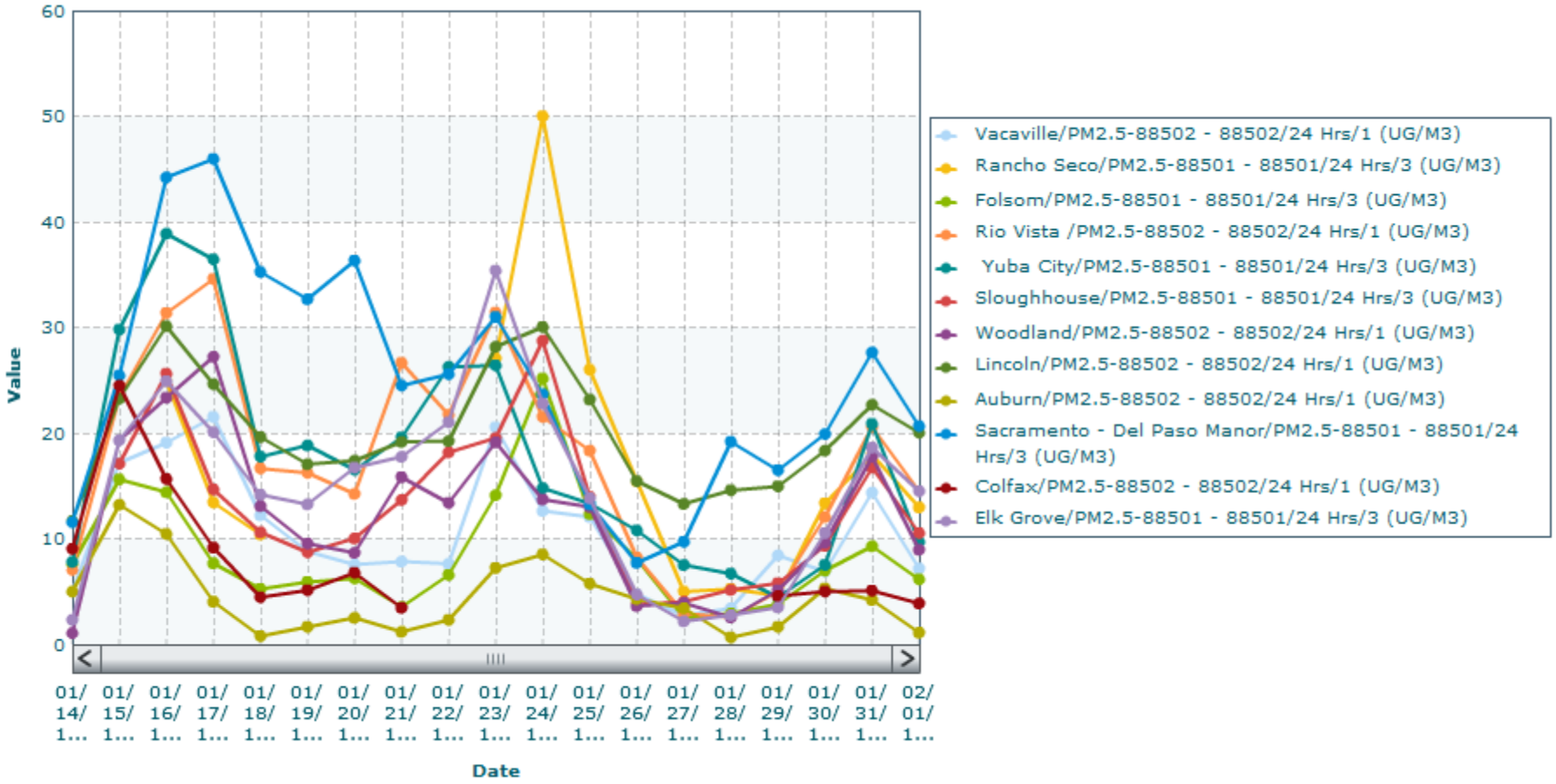
DISCOVER-AQ Sites: Daily PM2.5 (ug/m3)



1/14 **2/01**

DISCOVER-AQ period characterized by two pollution events and one gradual clean-out.

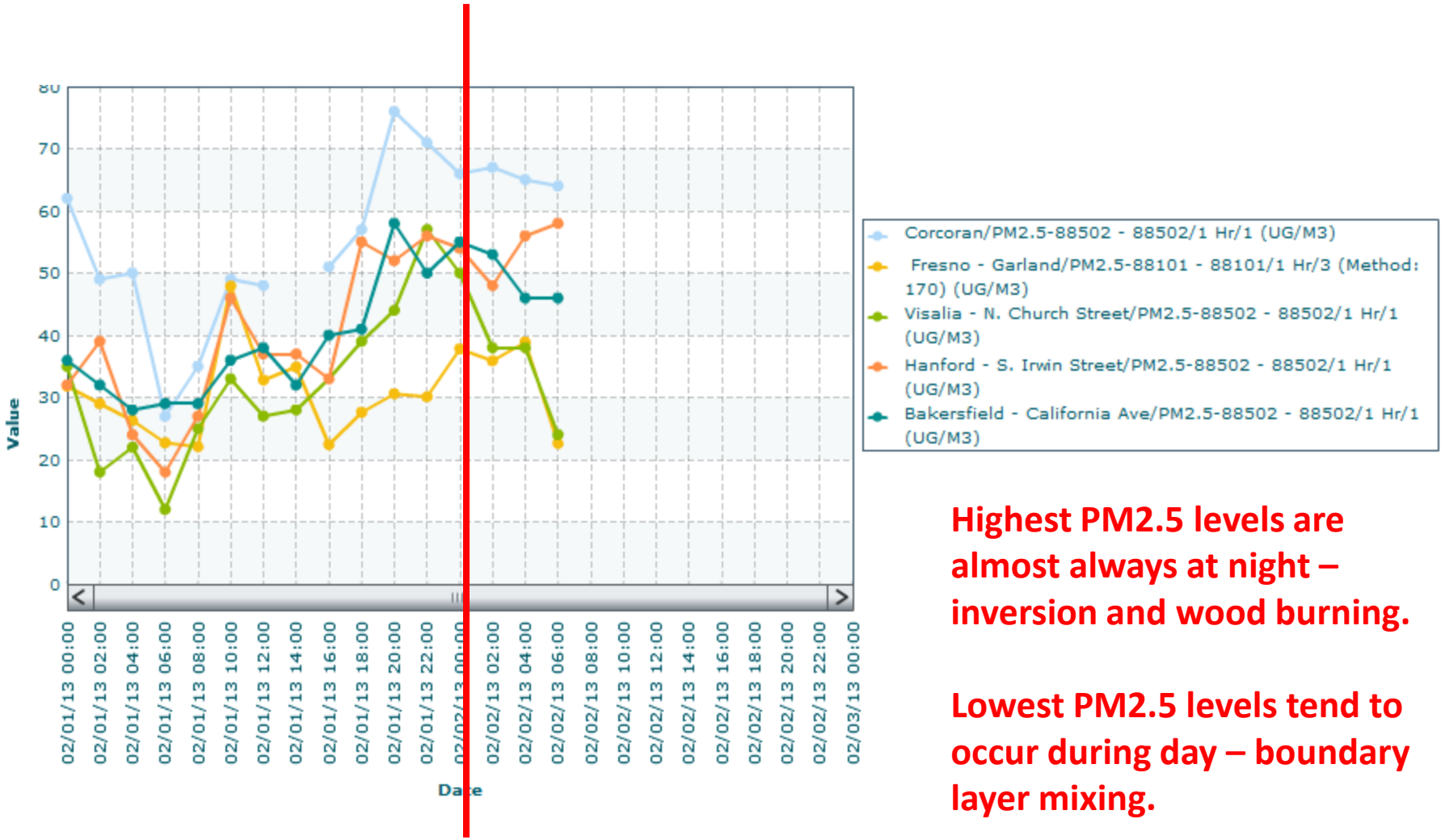
Sacramento Metro Sites: Daily PM2.5 (ug/m3)



1/14 **2/01**

DISCOVER-AQ period characterized by moderate levels of PM2.5 and three small events.

DISCOVER-AQ Sites: Hourly PM2.5 (ug/m3)

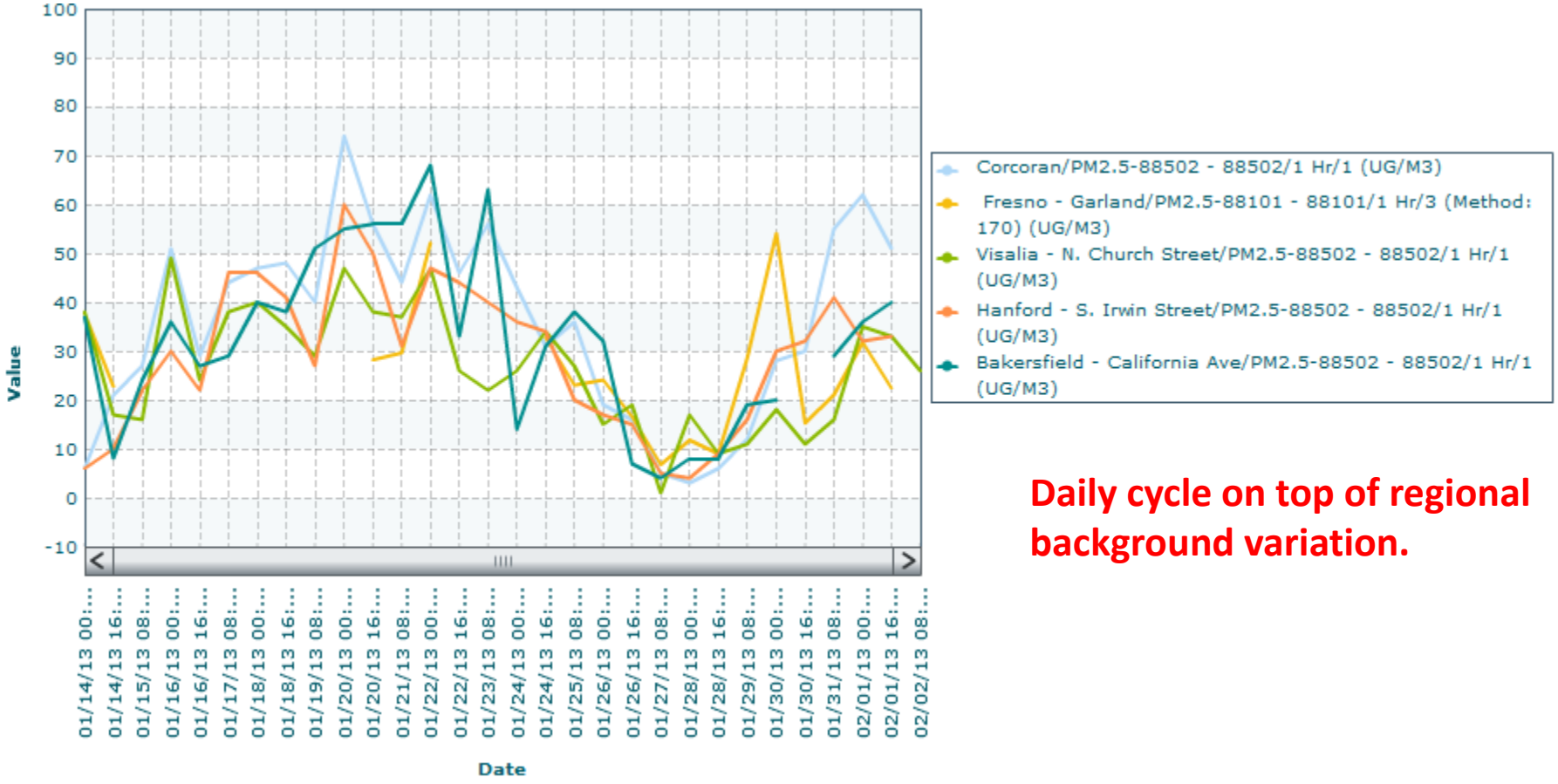


midnight

Highest PM2.5 levels are almost always at night – inversion and wood burning.

Lowest PM2.5 levels tend to occur during day – boundary layer mixing.

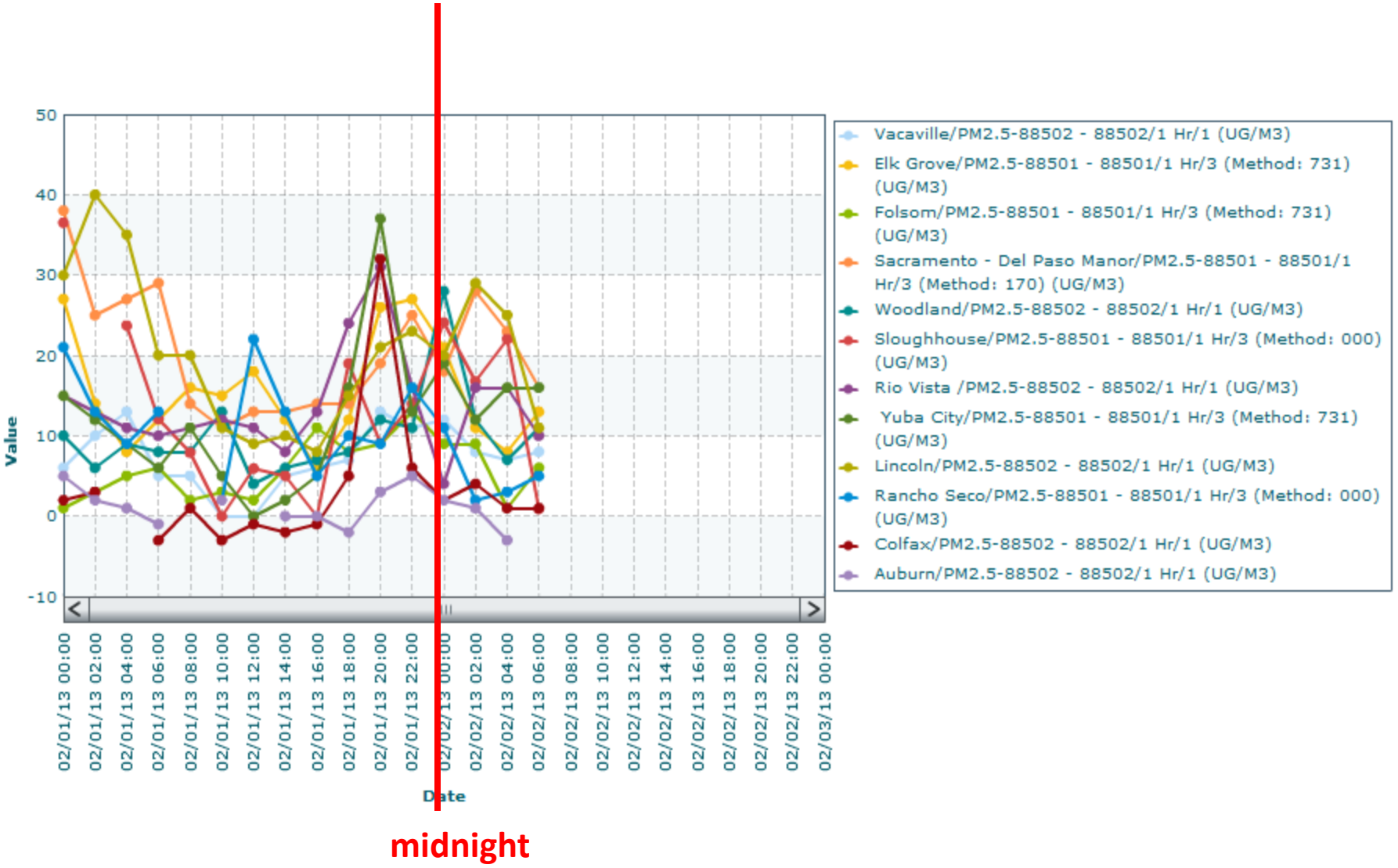
DISCOVER-AQ Sites: Hourly PM2.5 (ug/m3)



Daily cycle on top of regional background variation.

1/14 **2/02**

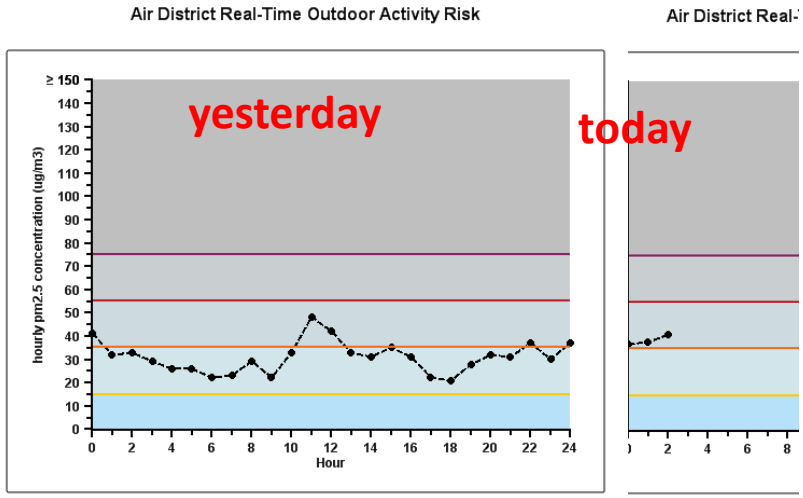
Sacramento Metro: Hourly PM2.5 (ug/m3)



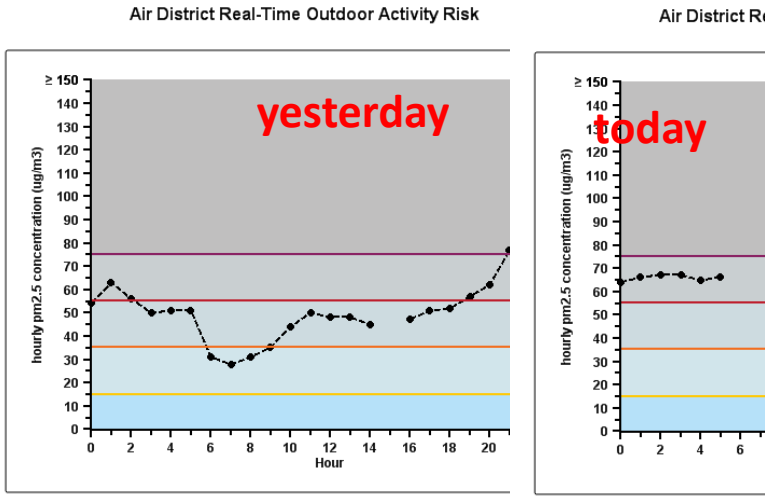
midnight

February 1 (Friday) & February 2 (Today)

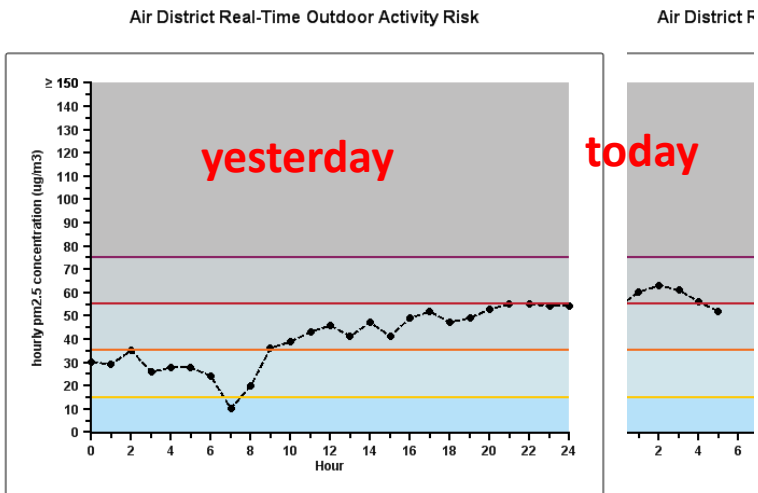
Fresno-Garland



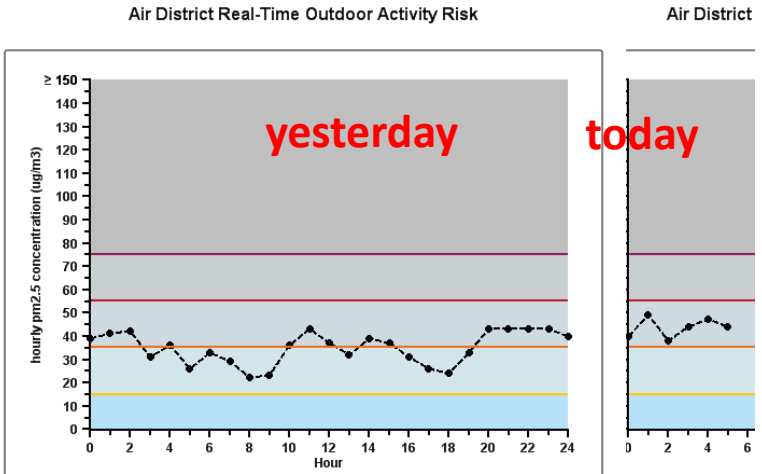
Corcoran



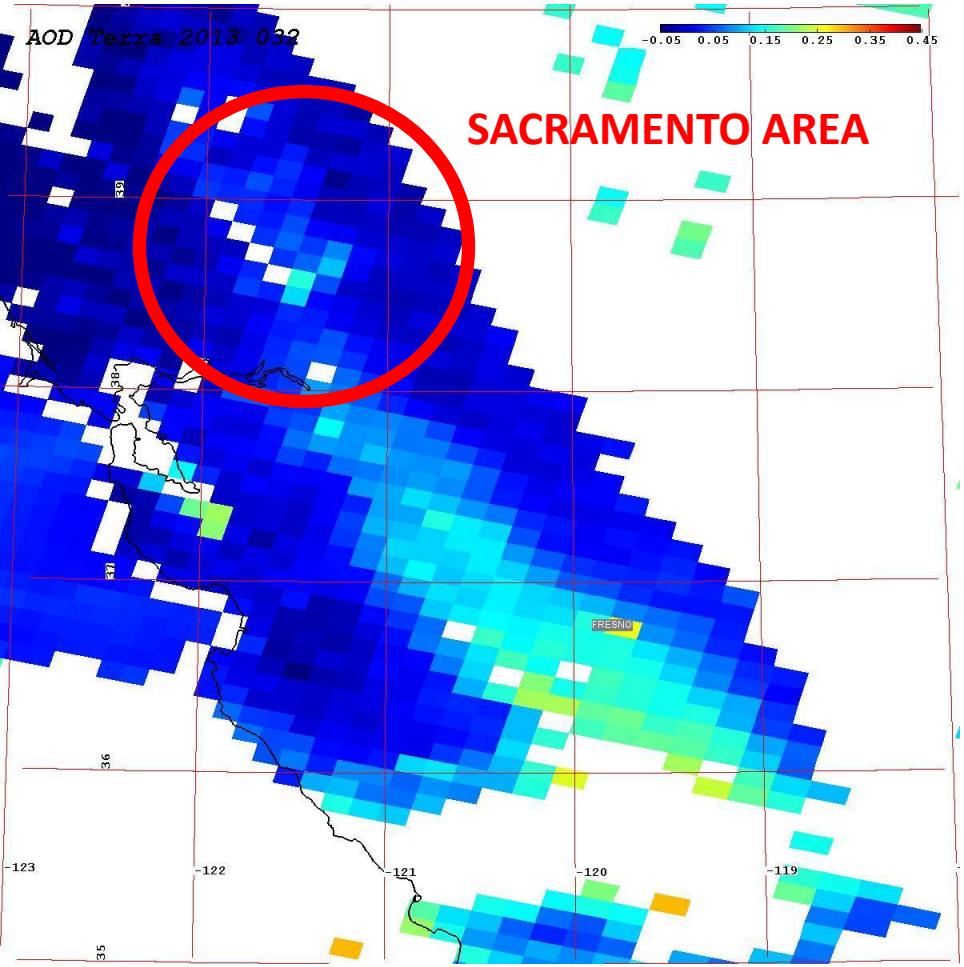
Bakersfield

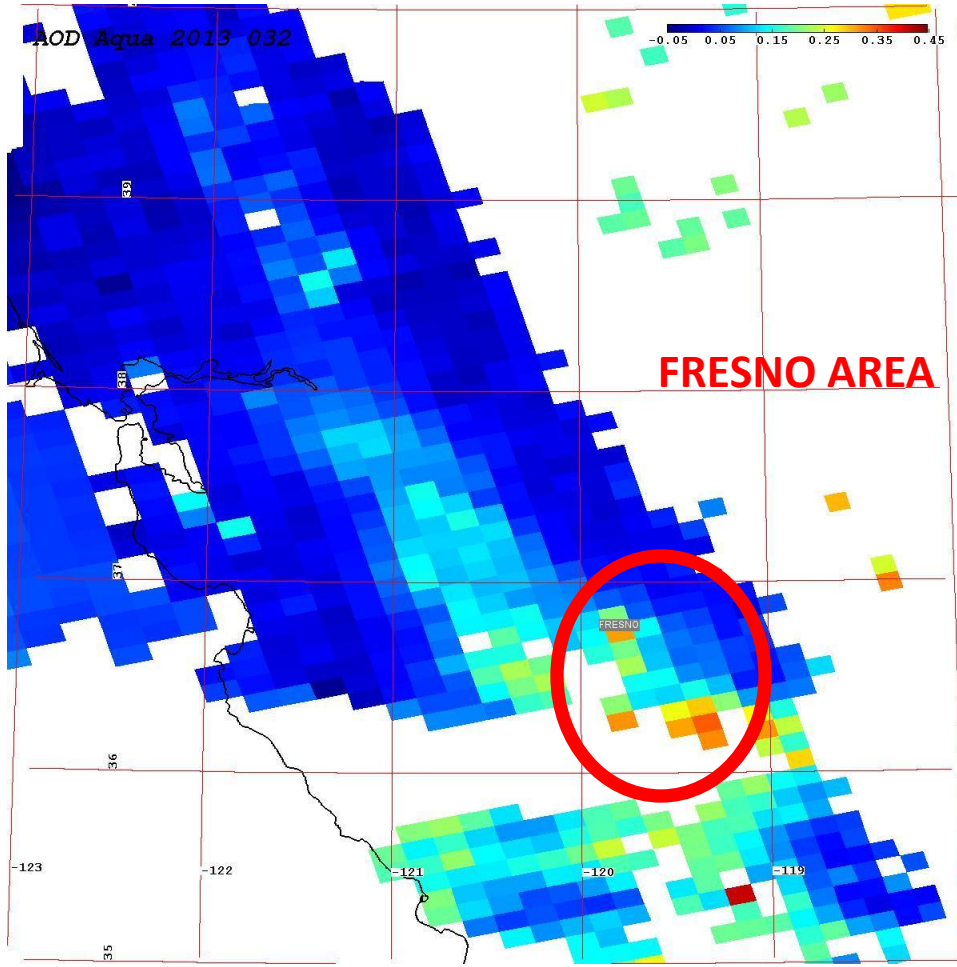


Stockton

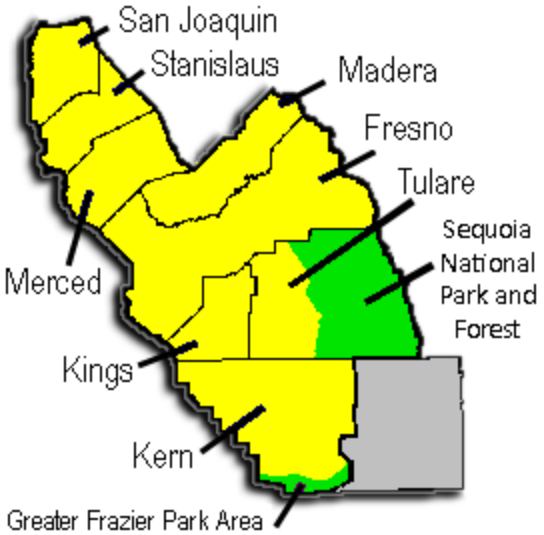


Terra & Aqua AOD : Yesterday : February 1

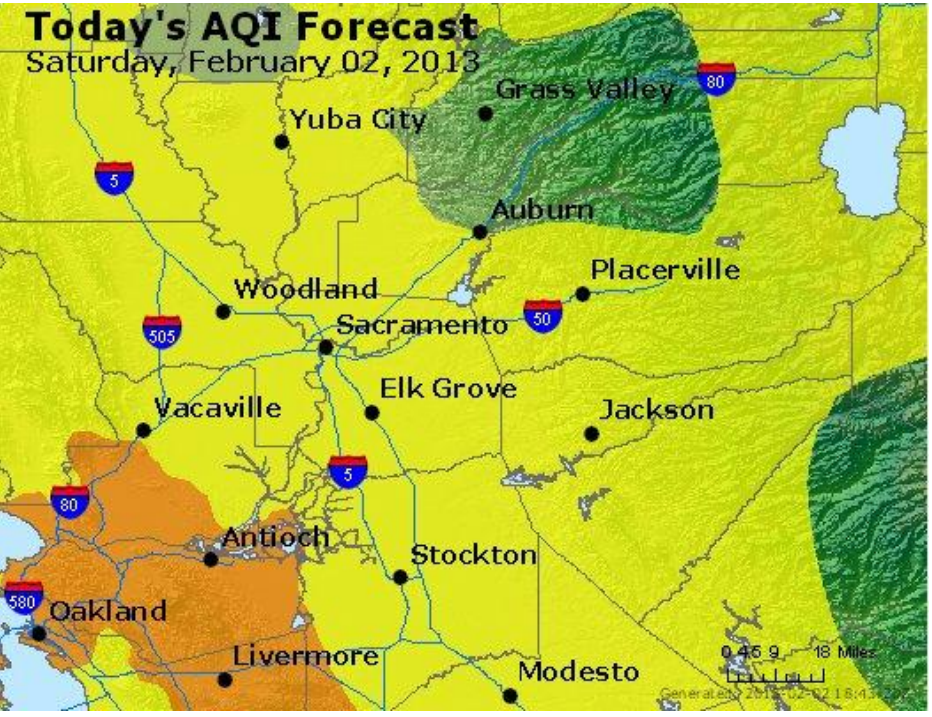




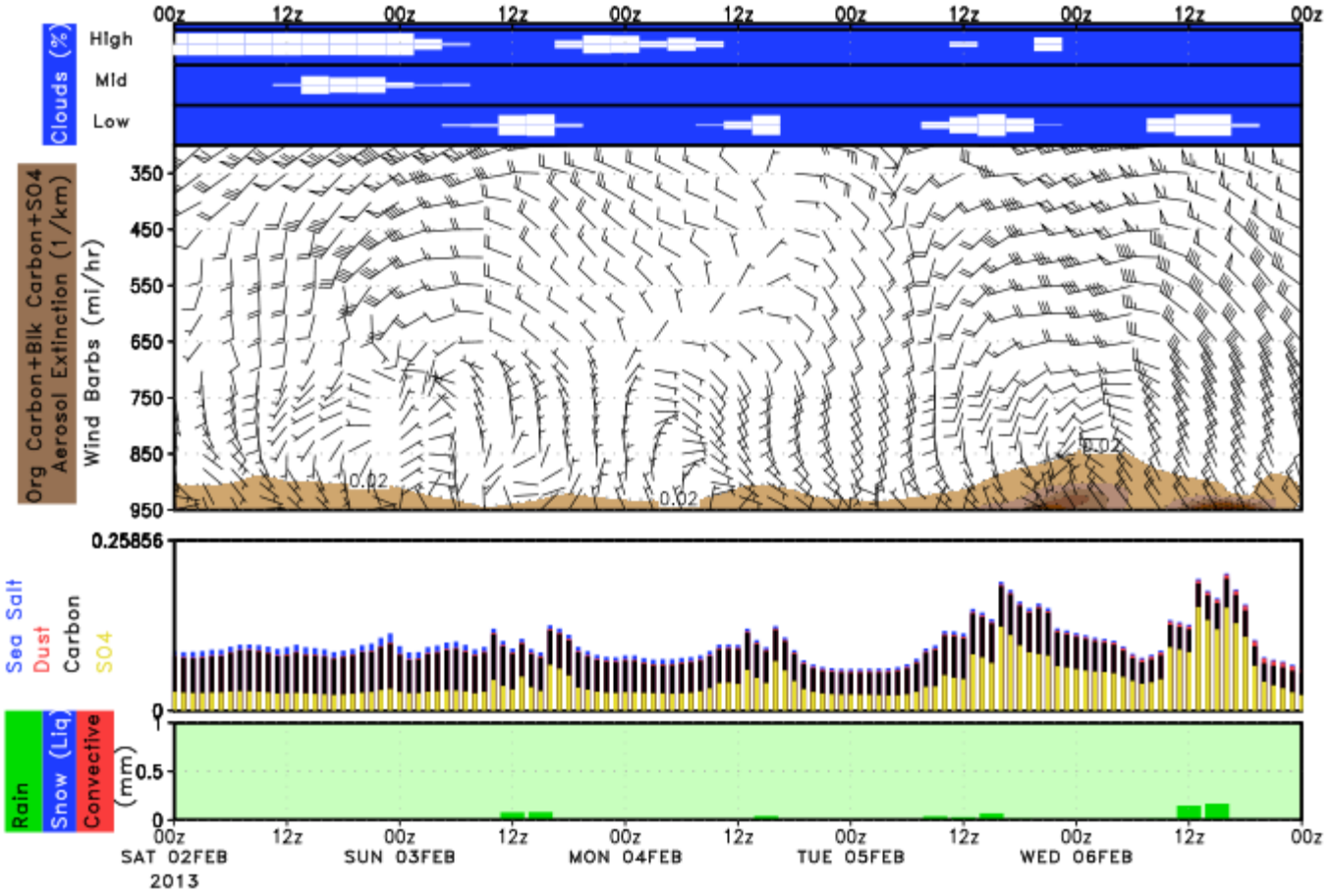
SJV APCD Daily Forecast – for TODAY (February 2)



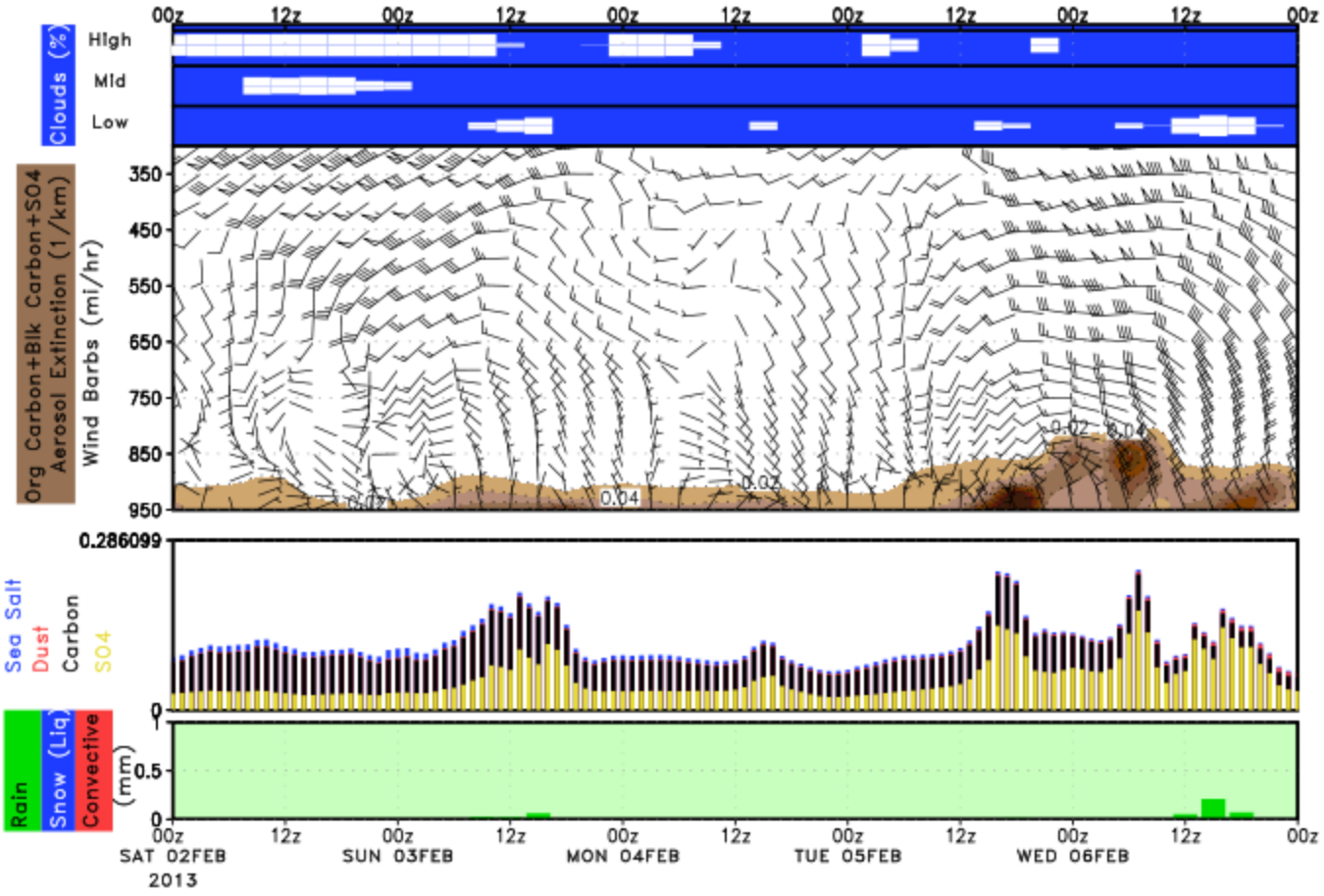
ROAR LEVEL	Ozone (O^3)	Particulate Matter (PM 2.5)
LEVEL 1 Good	1-59 ppb	1-15 µg/m³
LEVEL 2 Moderate	60-75 ppb	16-35 µg/m³
LEVEL 3 Unhealthy for Sensitive Groups	76-95 ppb	36-55 µg/m³
LEVEL 4 Unhealthy	96-115 ppb	56-75 µg/m³
LEVEL 5 Very Unhealthy	>115 ppb	>75 µg/m³



GMAO GEOS5: Fresno



GMAO GEOS5: Bakersfield



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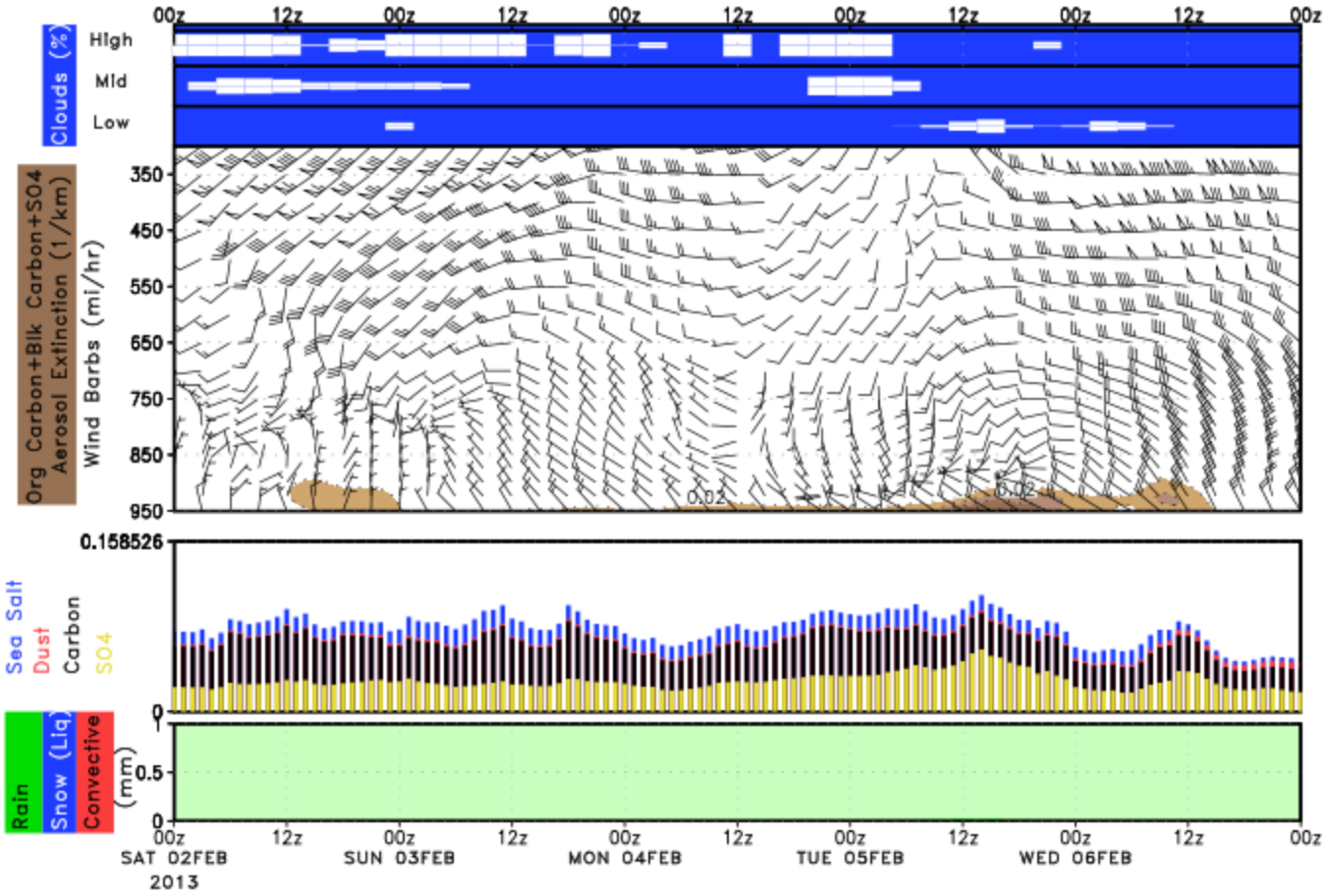
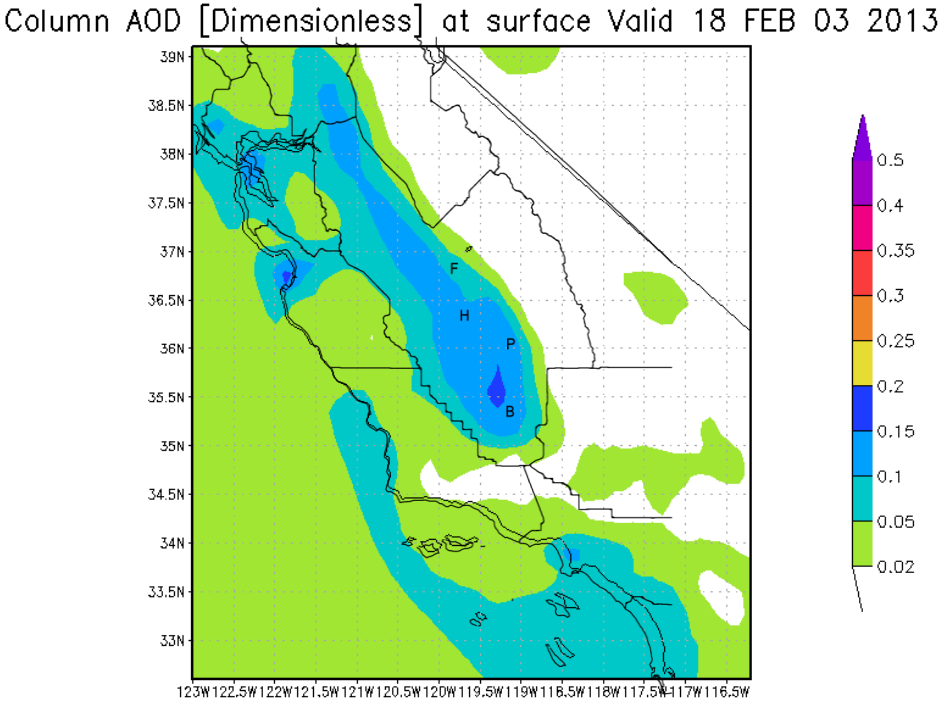
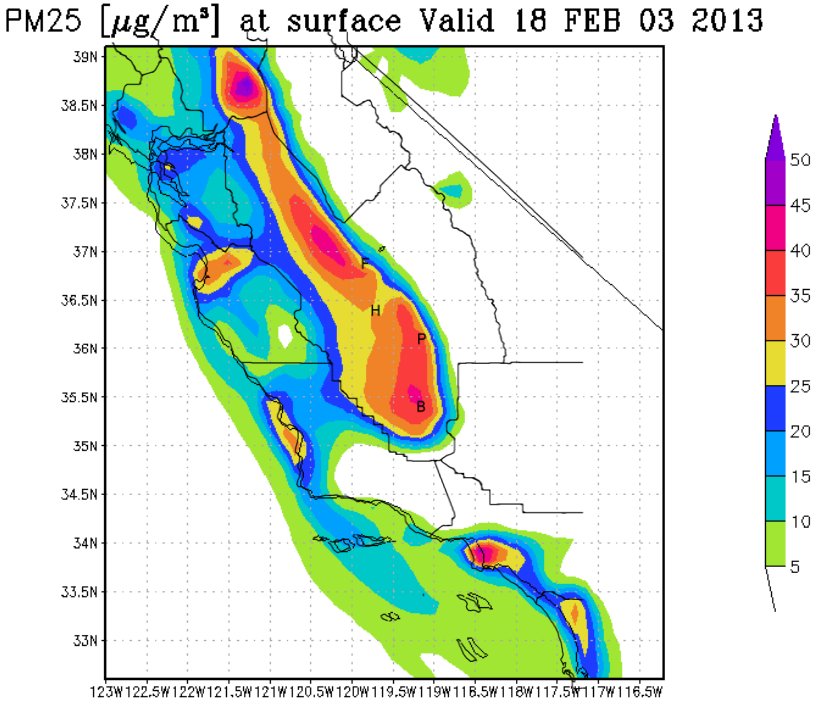


NOAA CMAQ: Sunday 10 am = 18 Z





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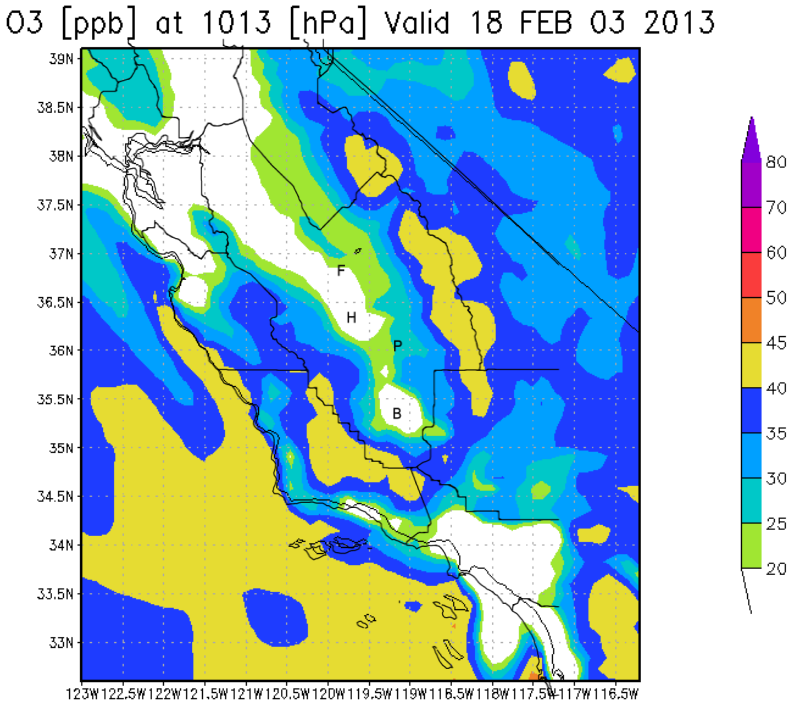

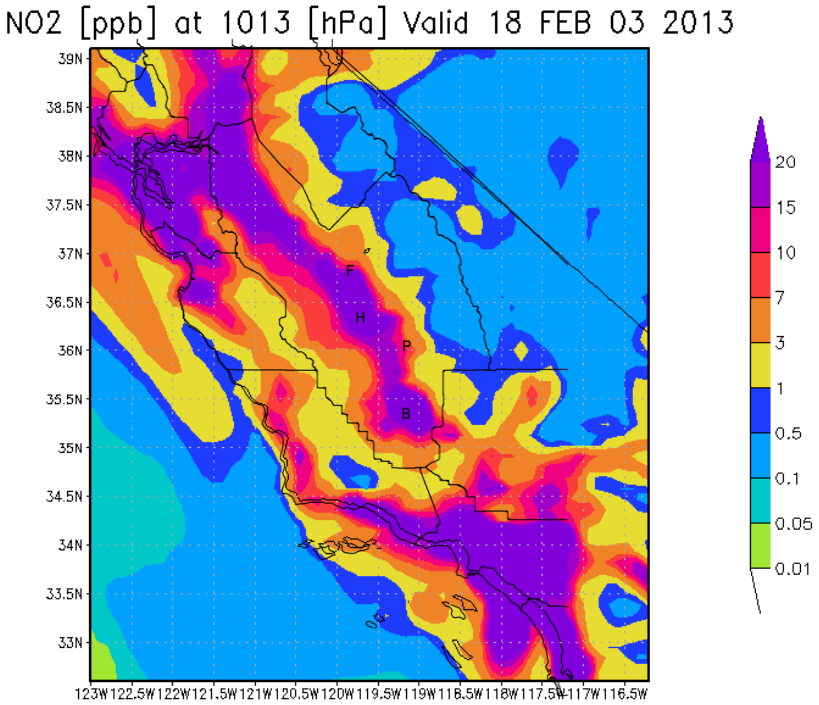

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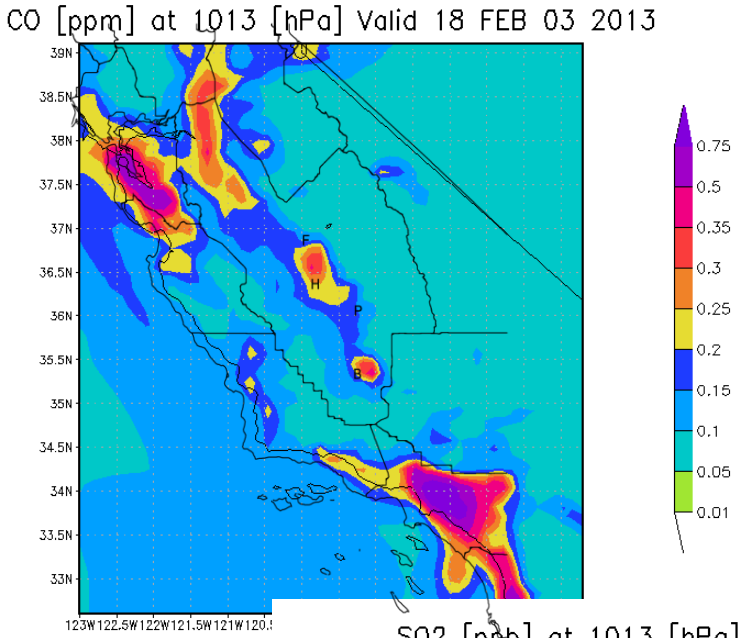

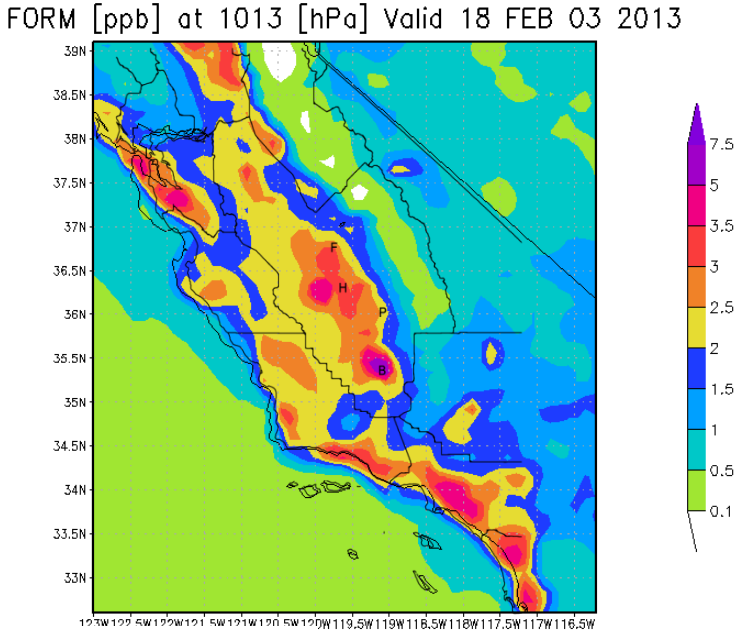

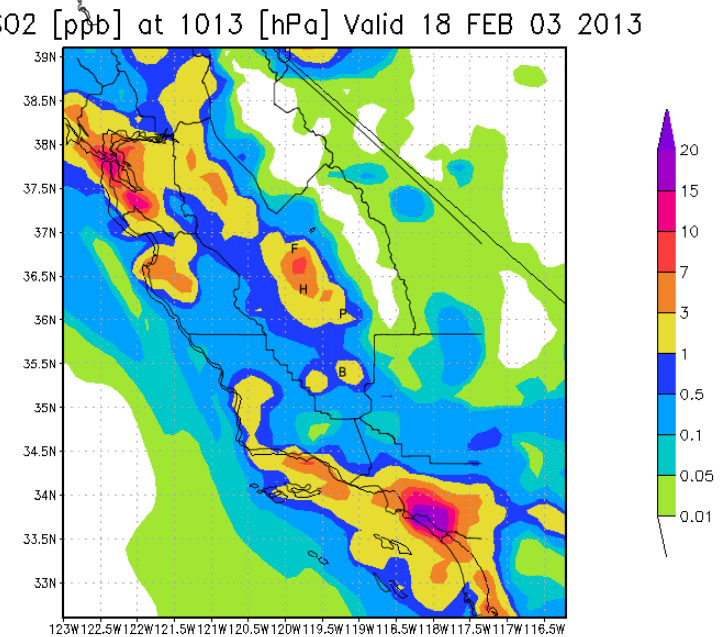

AQ Discussion Summary

1) PM2.5 continues to build in the SJV and is expected to build through Tuesday. Will levels reach the previous high around January 20th?

2) SJV sites dirtier than Sacramento sites: High PM2.5 levels at night due to fireplaces and inversion. Corcoran highest again overnight.

3) PM2.5 levels to remain similar through weekend : code yellow – code orange.

4) CMAQ indicates less offshore flow and, subsequently, less pollution over ocean.

5) There shouldn't be a "clean-out" event of the SJV until Wednesday or Thursday.

Recommendations

Sunday

PODEX (SF) – Cirrus currently over region should clear out by tomorrow. Skies should be clear except for the occasional wisp of cirrus around 20K ft. Lower level solid stratus clouds are expected over the region of interest.

Monday – SJV – Ground fog expected. Should be patchy, shallow, much like the fog conditions we've seen recently. No significant clouds are expected right now. A thin, shallow, patchy layer over cirrus moves into the region at about 4 pm, so we'll have to look again tomorrow and make sure that timing holds.

Tuesday – SJV – The cirrus layer coming in Monday night sticks around Tuesday. A relatively solid layer from 400-200 mb is forecast.

Wednesday – SJV – Currently forecast to be clearer than Tuesday. Possible residual thin layer of upper level clouds at ~250 mb.

Thursday – SJV – Increased clouds due to approaching trough