DISCOVER-AQ OUTLOOK -- September 24, 2013

Despite stubbornness from low-level clouds and cumulus formed during the late morning hours, a full flight was completed today. Cloud conditions started overcast or broken in the Hobby-Ellington area, with clearer skies both to the north and south. The low cloud deck moved south through Smith Point and Galveston in the late morning, inhibiting the depth of a few profiles. The TCEQ forecast for today was Code Yellow for both ozone and $PM_{2.5}$.

Tomorrow (Wednesday) DISCOVER-AQ will fly and looks to be the best day of the month so far, both meteorologically and for poor air quality conditions. Winds will be light from the north, perhaps light enough to allow a Gulf breeze to develop, with little to no cloud cover. The TCEQ has forecast Code Orange for ozone tomorrow S and SW of Houston, Code Yellow for $PM_{2.5}$.

Thursday should be another good day to fly with calm morning winds and little or no cloud cover to start. Winds will shift to SE during the day as a cold front slowly approaches the area from the west. The wind shift will bring some low-level moisture and possibly allow for cumulus development in the afternoon. The TCEQ forecast is for Code Orange for ozone Thursday W, NW and N of Houston, and Code Yellow for $PM_{2.5}$.

Friday becomes a bit less favorable as deep-layer flow from the Gulf returns us to a moisture-rich environment and the likelihood of at least some cloud development and shower activity, especially in the afternoon. Still, an impending frontal system for the weekend impels us to recommend flying on Friday as well. The TCEQ forecast is again for Code Orange conditions for ozone and Code Yellow for $PM_{2.5}$ on Friday.

9/24/2013 Weather Briefing

Ryan Stauffer

Recommendations

- Wednesday: Likely Fly Day. Clouds not a factor and potential for very interesting circulation patterns
- Thursday: Likely Fly Day. Morning much like Wed., winds will shift to SE by later in the day, maybe scattered clouds with wind shift
- Friday: Likely Fly Day. Winds from the Gulf will extend up through 700mb layer, so clouds and a few showers may become a PM problem. By Saturday the window is probably closed for any more good flights

Conroe:

THIS AFTERNOON	TONIGHT	WEDNESDAY	WEDNESDAY NIGHT	THURSDAY	THURSDAY NIGHT	FRIDAY	FRIDAY NIGHT	SATURDAY
Mostly Sunny High: 95 °F	Mostly Clear Low: 58 °F	Sunny High: 93 °F	Partly Cloudy Low: 58 °F	Mostly Sunny High: 93 °F	Partly Cloudy Low: 65 °F	Slight Chc Showers High: 92 °F	Mostly Cloudy Low: 72 °F	Chance Showers High: 91 °F

Houston Hobby:

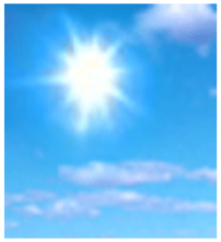
THIS AFTERNOON	TONIGHT	WEDNESDAY	WEDNESDAY NIGHT	THURSDAY	THURSDAY NIGHT	FRIDAY	FRIDAY NIGHT	SATURDAY
Slight Chc Thunderstorms High: 94 °F	Mostly Clear Low: 65 °F	Sunny High: 93 °F	Partly Cloudy Low: 66 °F	Mostly Sunny High: 93 °F	Partly Cloudy Low: 73 °F	Slight Chc Showers High: 91 °F	Mostly Cloudy Low: 76 °F	Chance Showers High: 90 °F

Galveston:

THIS AFTERNOON	TONIGHT	WEDNESDAY	WEDNESDAY NIGHT	THURSDAY	THURSDAY NIGHT	FRIDAY	FRIDAY NIGHT	SATURDAY
Slight Chc Thunderstorms High: 87 °F	Mostly Clear Low: 77 °F	Mostly Sunny High: 89 °F	Partly Cloudy Low: 75 °F	Mostly Sunny High: 87 °F	Partly Cloudy Low: 76 °F	Slight Chc Showers High: 87 °F	Mostly Cloudy Low: 78 °F	Chance Showers High: 86 °F

Current Conditions

Conroe:



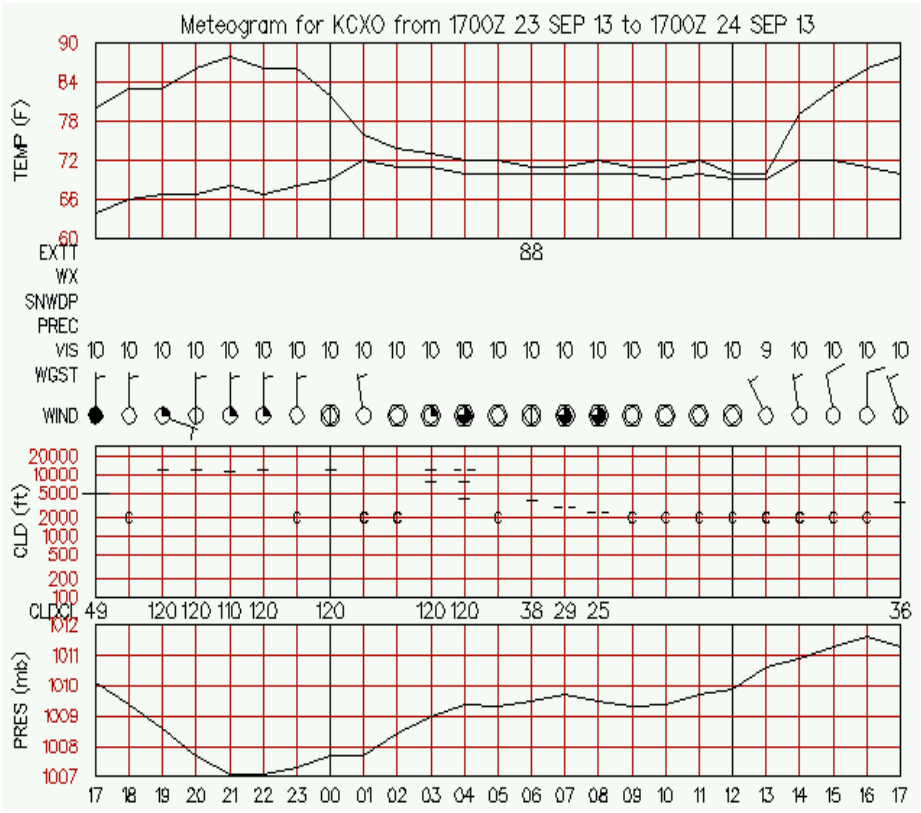
A Few Clouds

88°F

31°C

Humidity	55%
Wind Speed	N 8 mph
Barometer	29.88 in (1011.3 mb)
Dewpoint	70°F (21°C)
Visibility	10.00 mi
Heat Index	93°F (34°C)

Last Update on 24 Sep 11:53 am CDT



Houston Hobby:

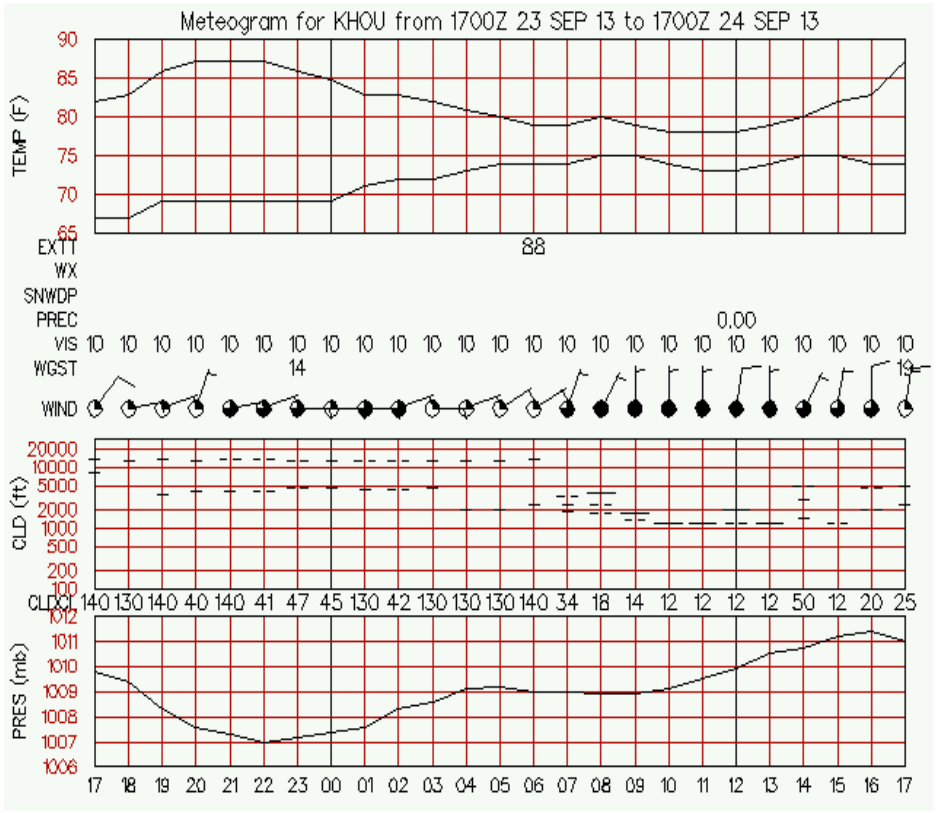
Partly Cloudy

87°F

31°C

Humidity	65%
Wind Speed	N 17 G 22 mph
Barometer	29.85 in (1011.0 mb)
Dewpoint	74°F (23°C)
Visibility	10.00 mi
Heat Index	95°F (35°C)

Last Update on 24 Sep 11:53 am CDT



Current Conditions

Galveston:

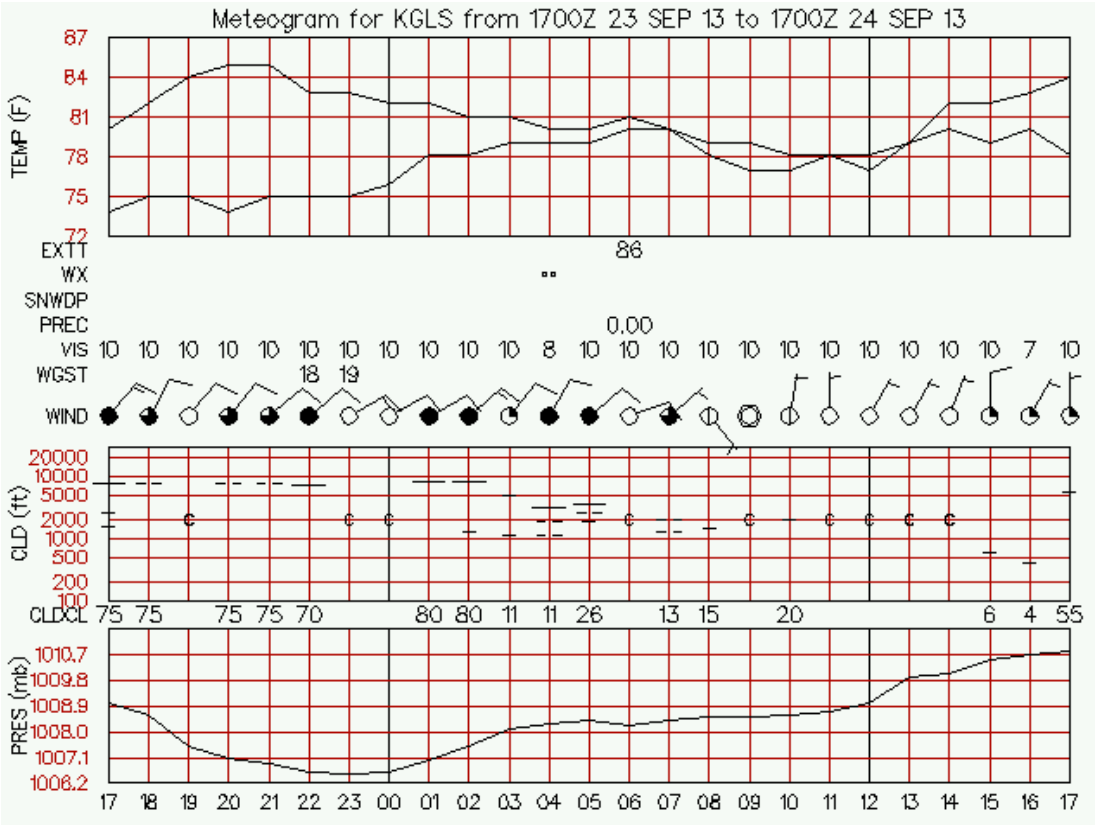
Partly Cloudy

84°F

29°C

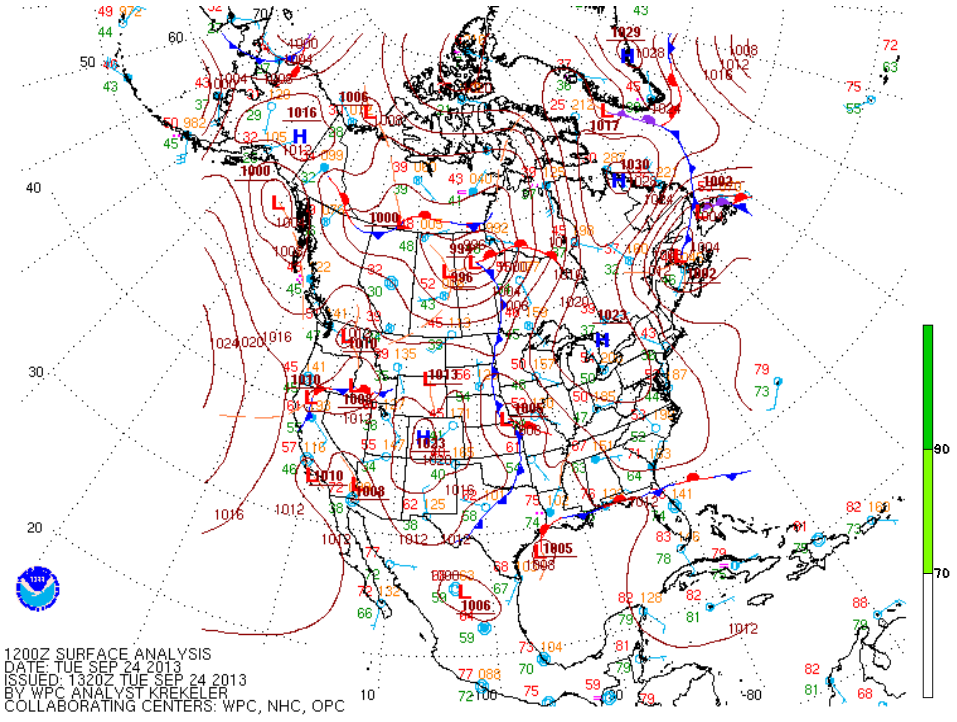
Humidity	82%
Wind Speed	N 8 mph
Barometer	29.85 in (1010.8 mb)
Dewpoint	78°F (26°C)
Visibility	10.00 mi
Heat Index	95°F (35°C)

Last Update on 24 Sep 11:52 am CDT

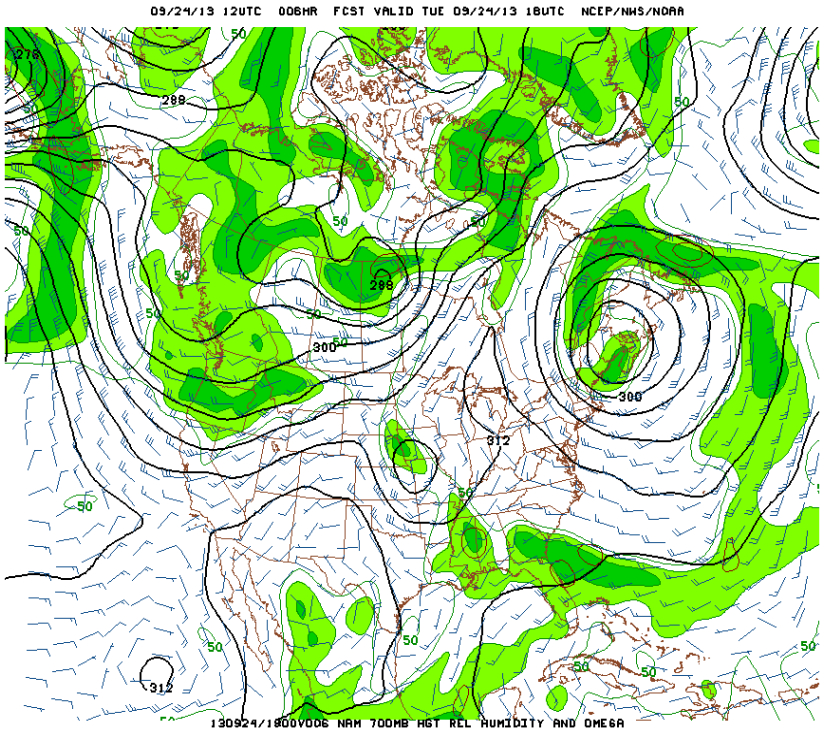


Today: Weak Sfc Low is pushed (good riddance) to the ENE by upper level trough and surface feature causing showers and tstorms in far E TX/LA/MS. Skies should slowly clear across the region this afternoon, but sprinkles still a possibility until then

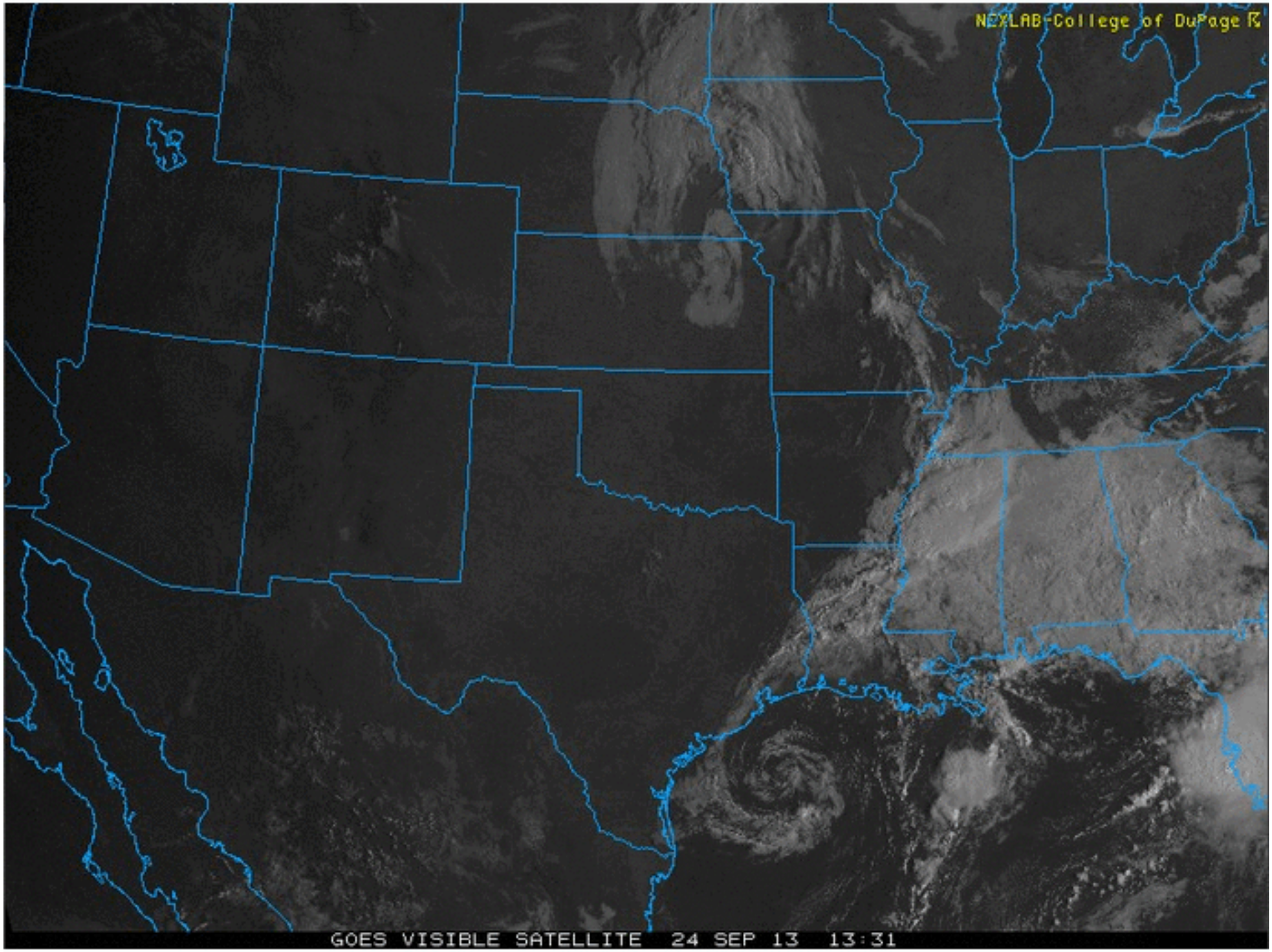
12z Surface Analysis

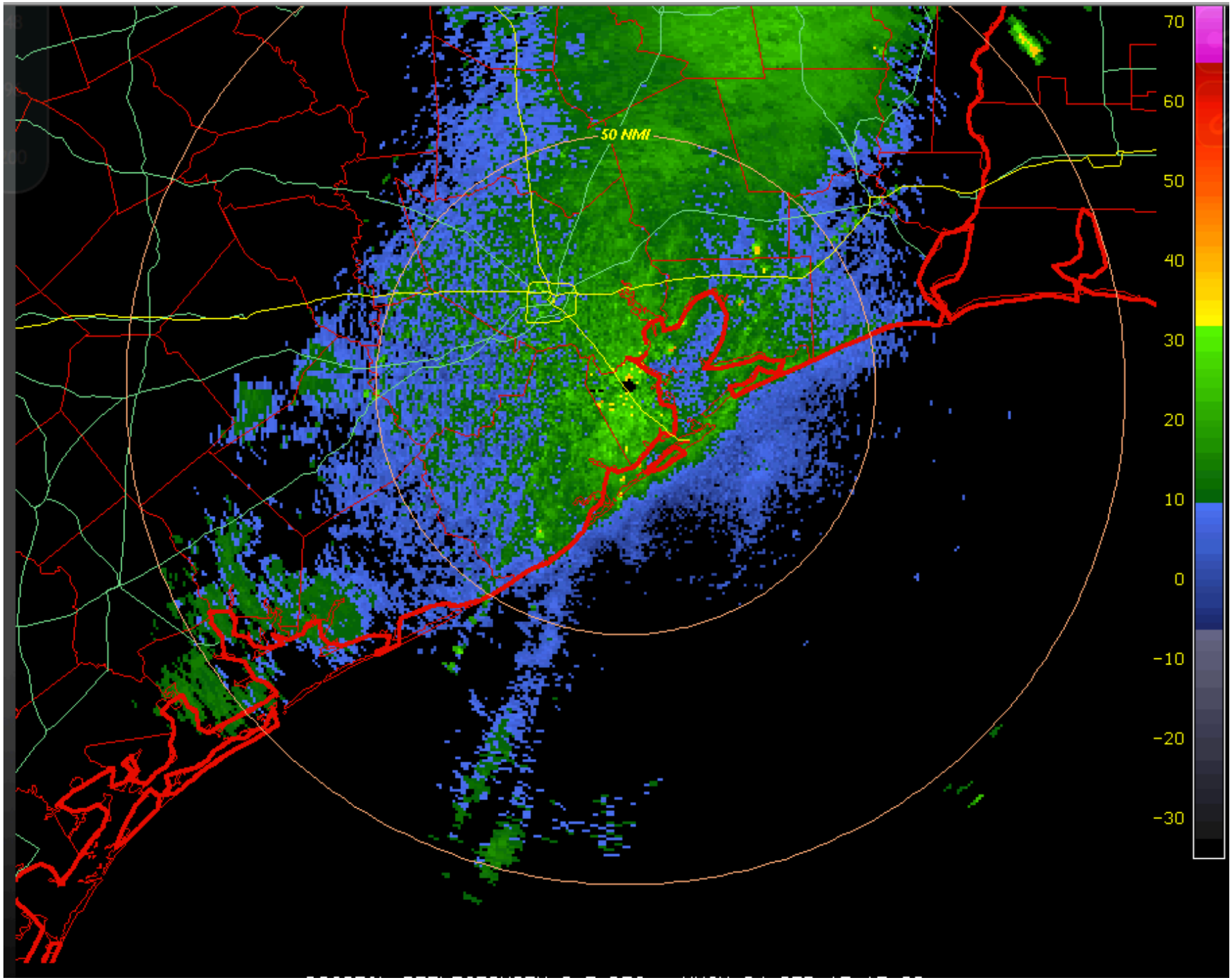


7 AM CDT NAM
700 mb RH



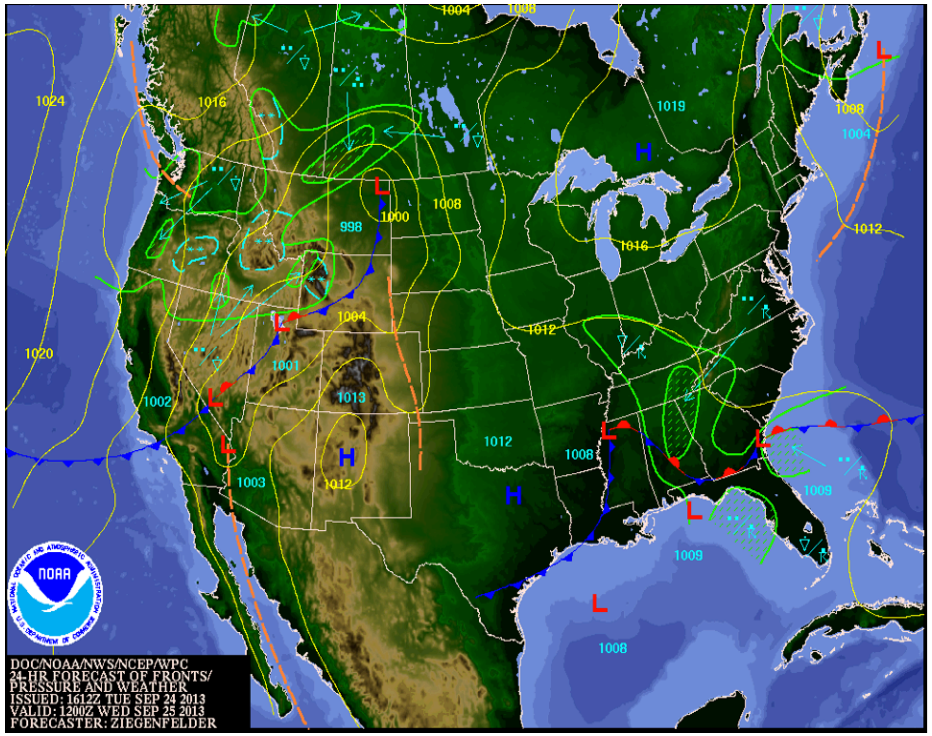
While the most of the low stratus cloud deck moved away as of 11am at Ellington, very moist 925 and 850hPa dew points are holding us in a death grip and the morning sun was able to build cumulus clouds and even a quick sprinkle


NCXLAB-College of DuPage
GOES VISIBLE SATELLITE 24 SEP 13 13:31

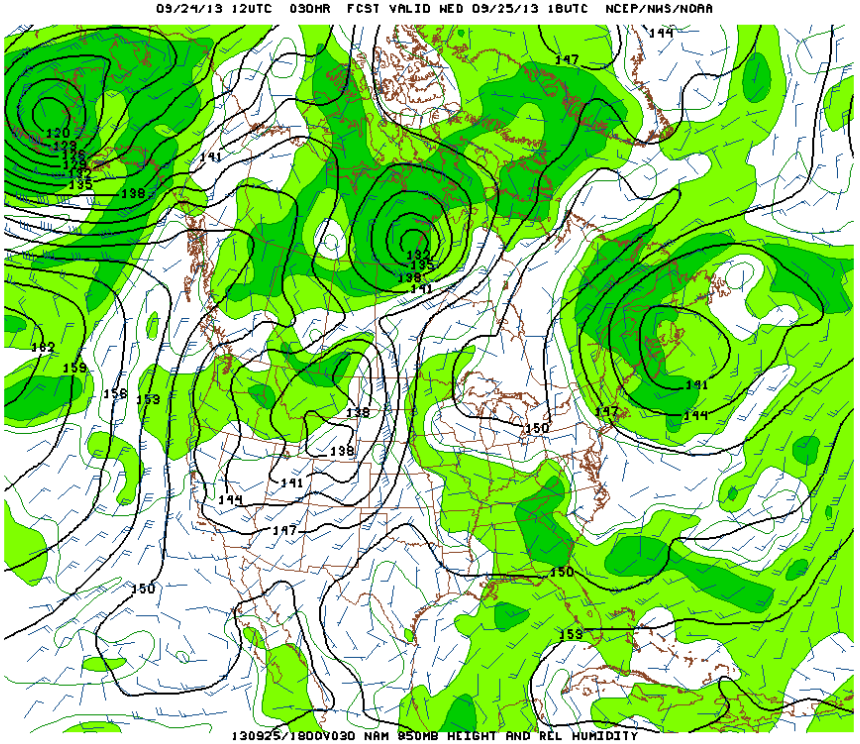

50 NMI
70
60
50
40
30
20
10
0
-10
-20
-30

Tomorrow: Finally the entire column of the atmosphere is dry. A ridge continues to build over us and leads to light N winds at the surface. Note that “cold” front will be a dry passage and won’t even really be noticed other than a drop in humidity and pressure rise

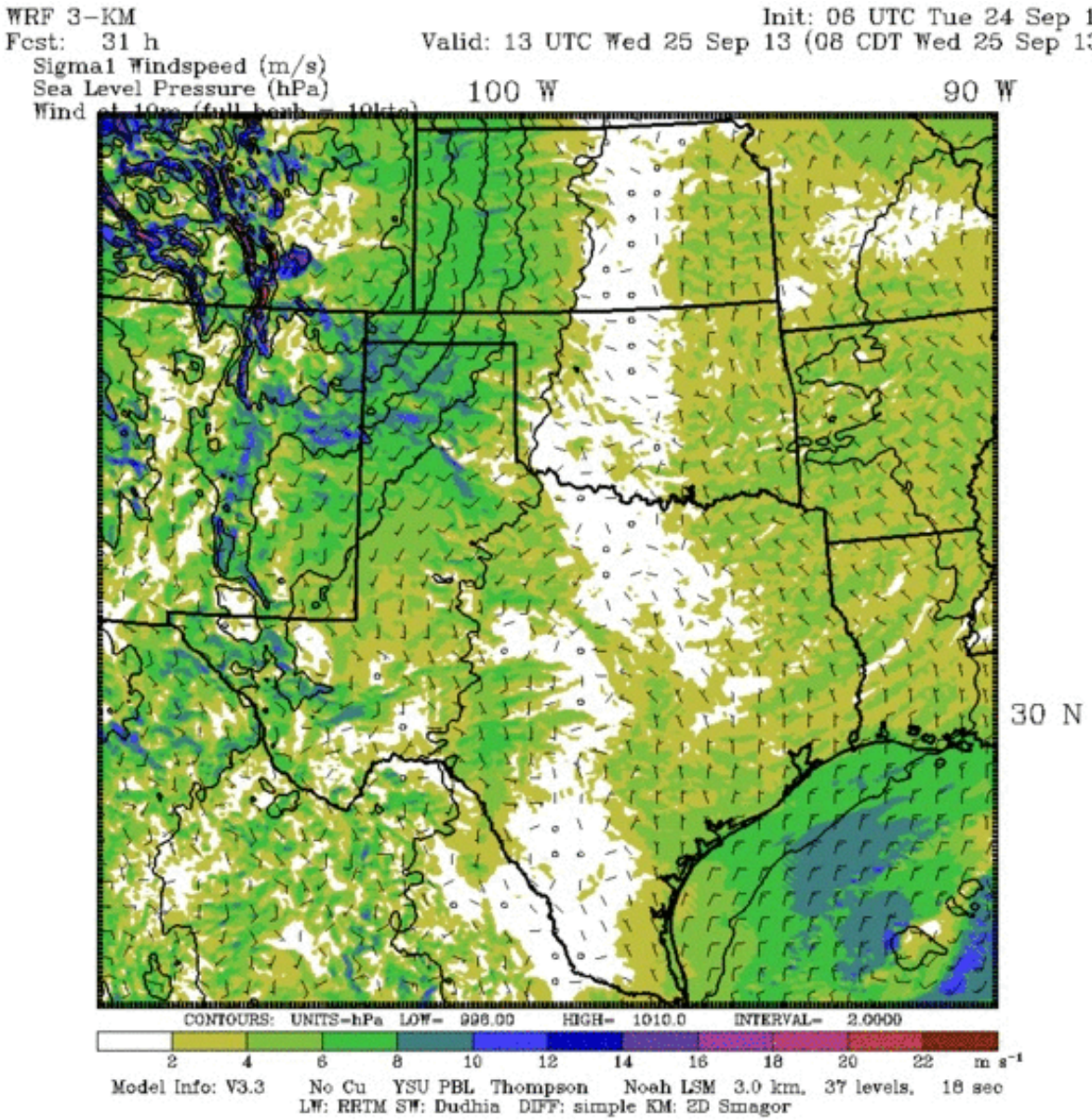
12z Surface Forecast



1 PM CDT NAM
850 mb RH



10 m winds 08-20 CDT tomorrow



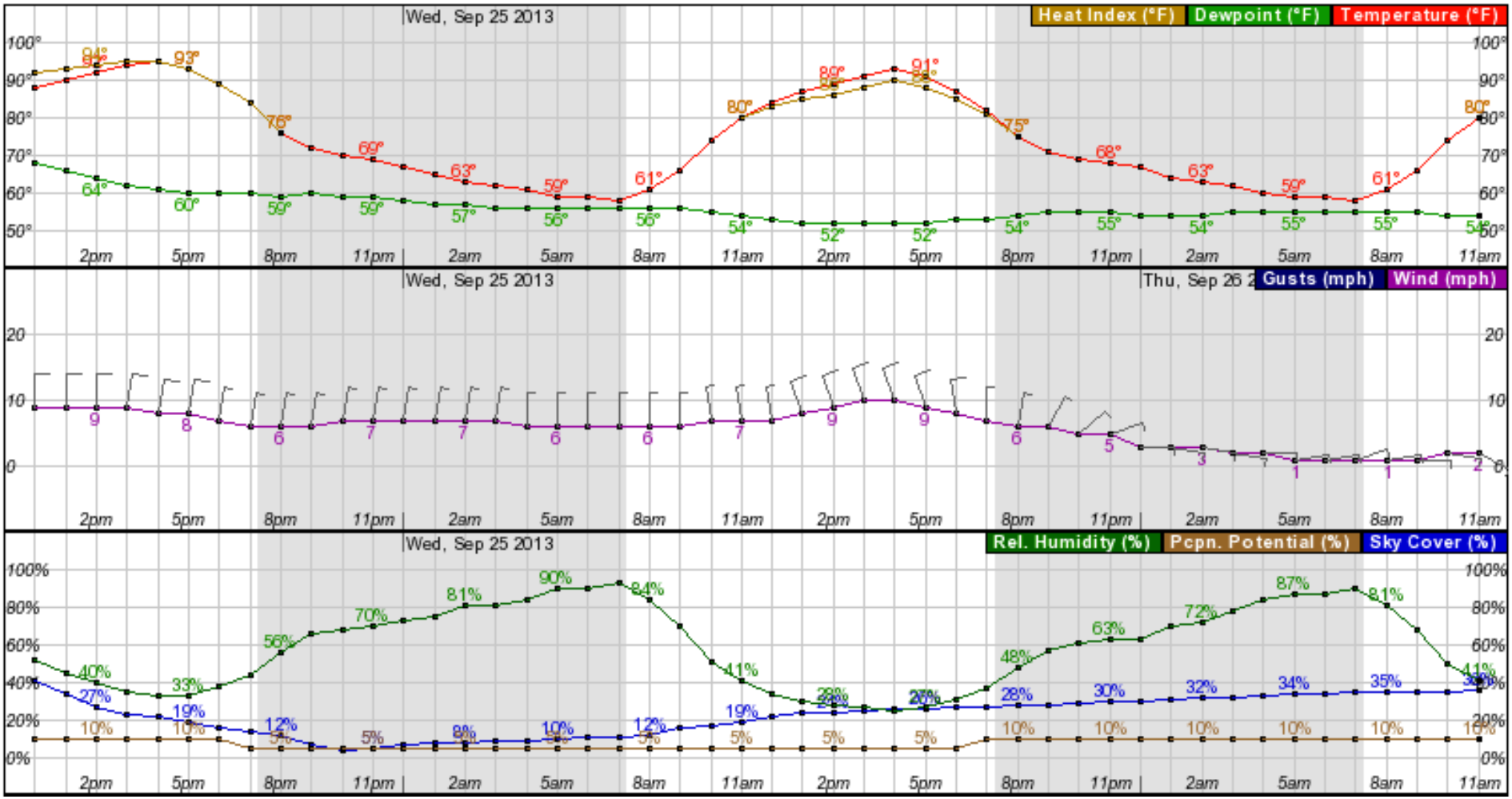
Light N winds potentially lead to recirculation event, warm waters may be an inhibiting factor though

Conroe

Today: Mostly sunny rest of the day

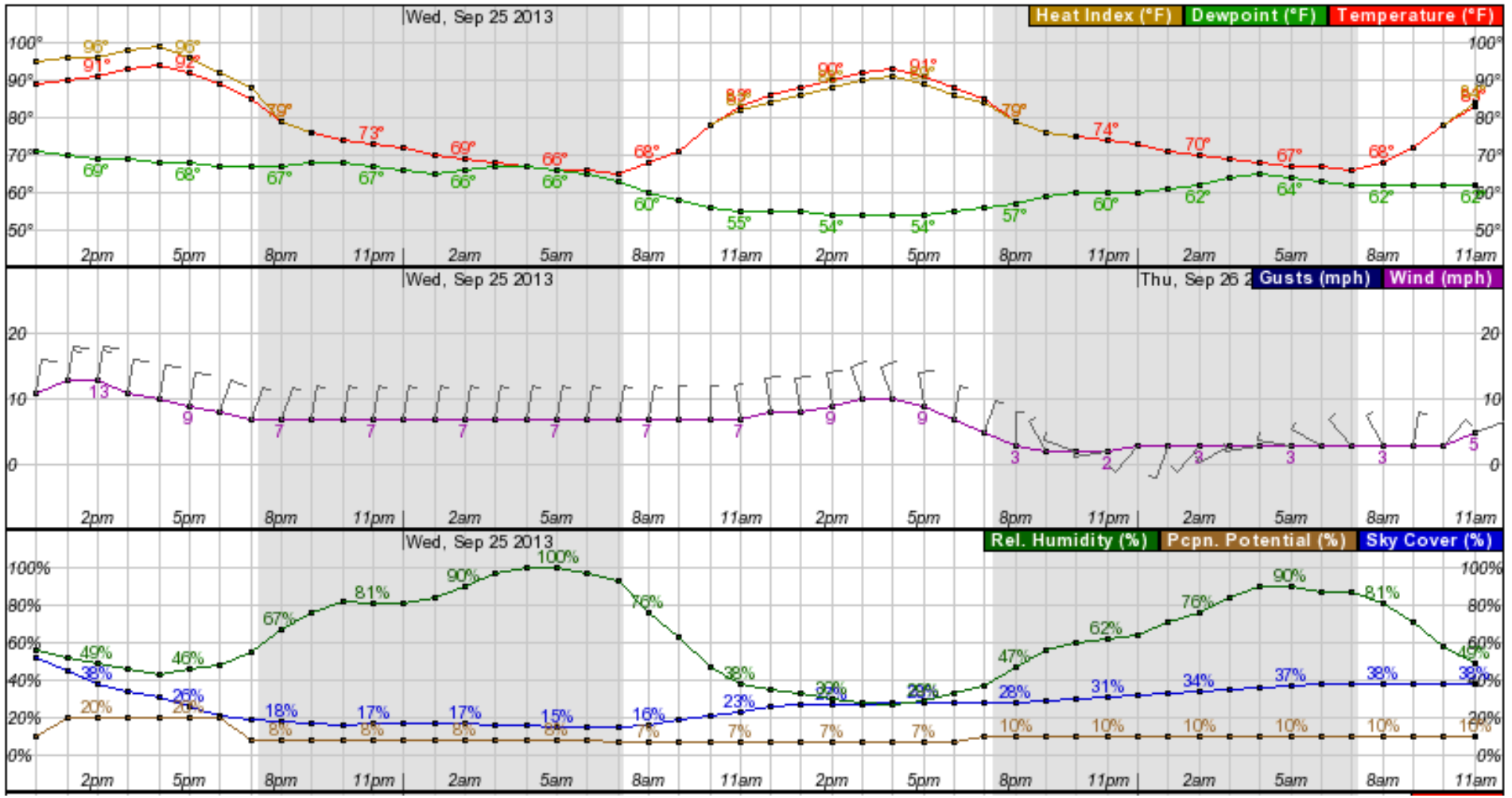
Tomorrow: Sunshine, N wind

Today→ **Tomorrow→**



Houston Hobby
Today: Decreasing clouds
Tomorrow: Sunny

Today→ **Tomorrow→**

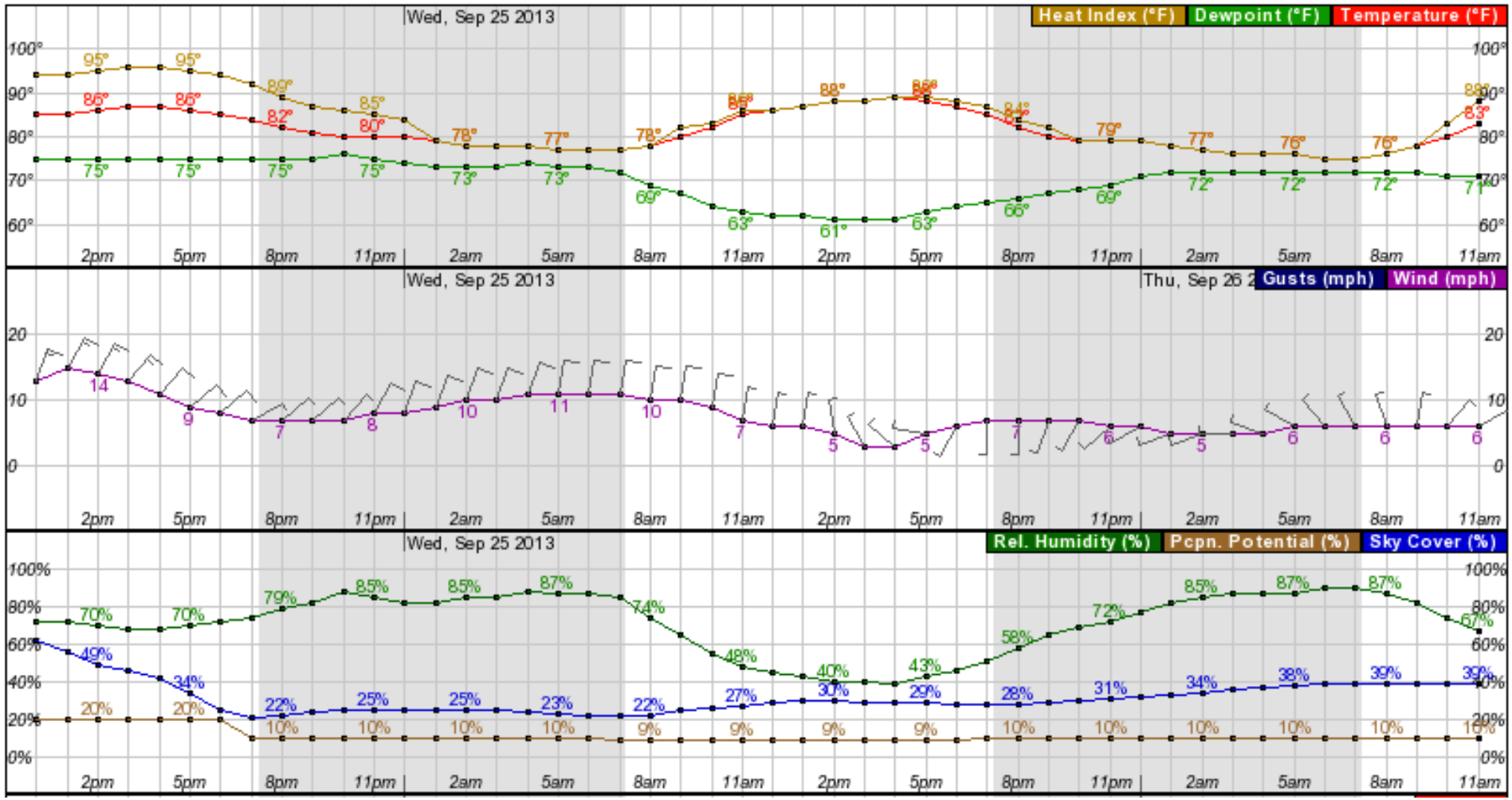


Galveston

Today: Clouds decrease quickly in the afternoon

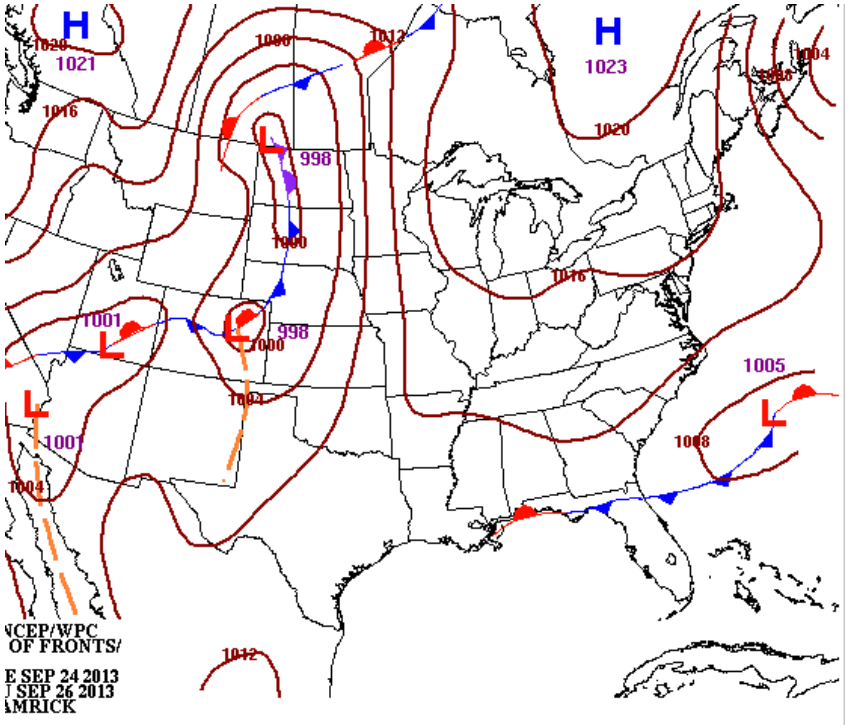
Tomorrow: Sunny, Gulf breeze?

Today→ **Tomorrow→**

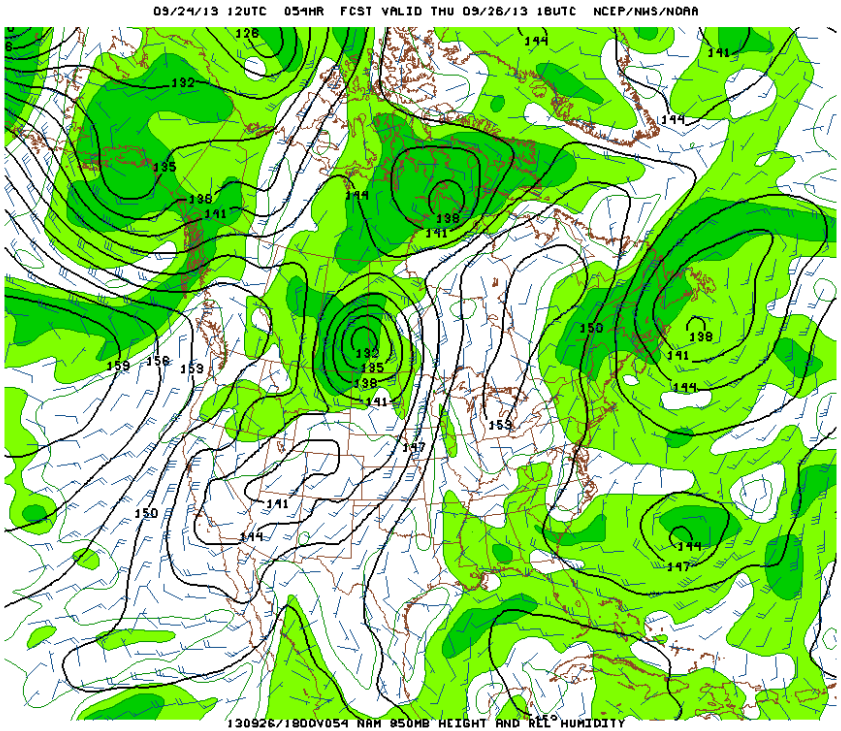


Thursday: Morning should start much like Wednesday (calm) until surface winds shift to SE. Deeper layer winds don't respond until later, so still not big concern for widespread showers and clouds

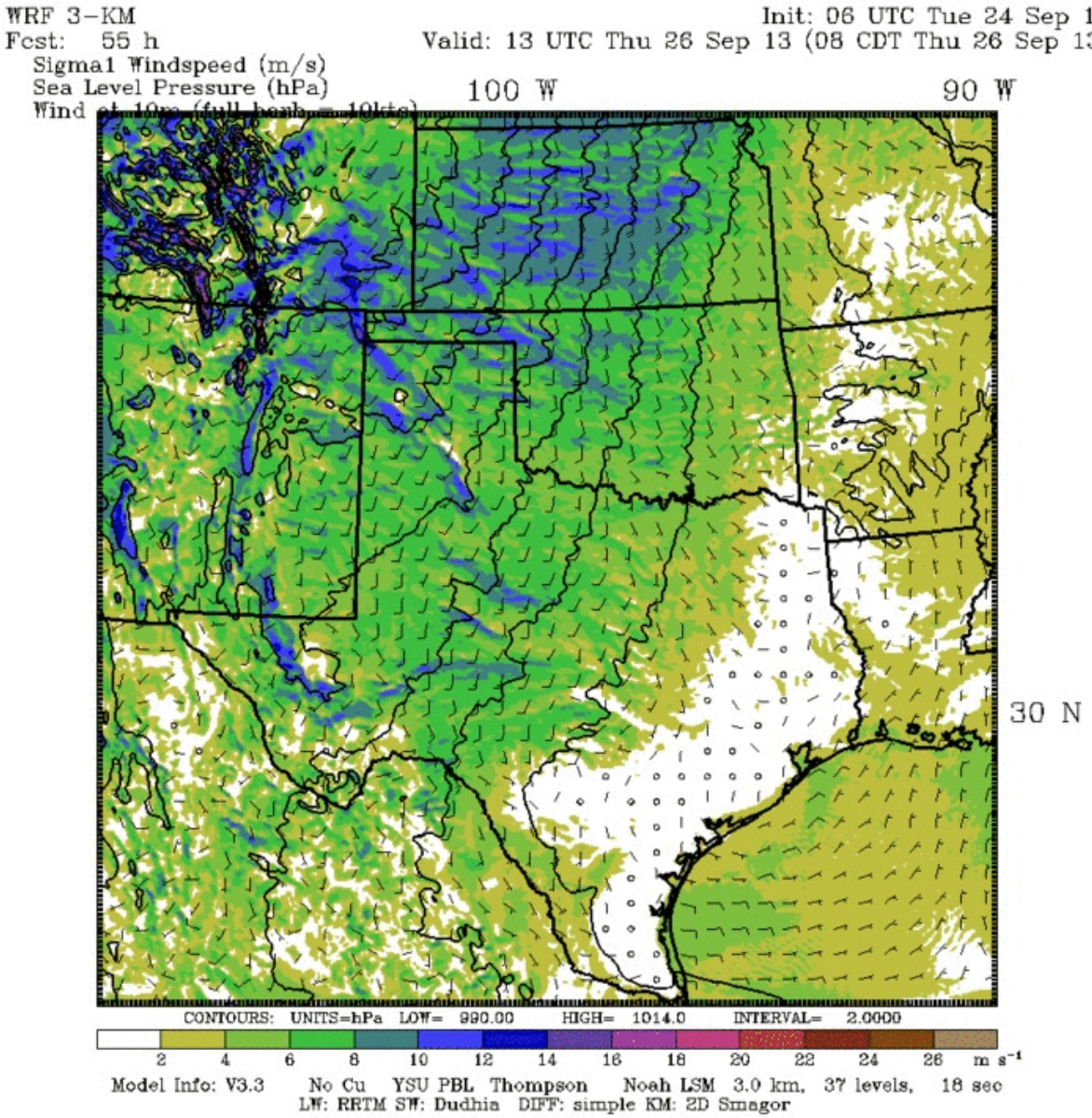
12z Surface Forecast



1 PM CDT NAM
850mb RH



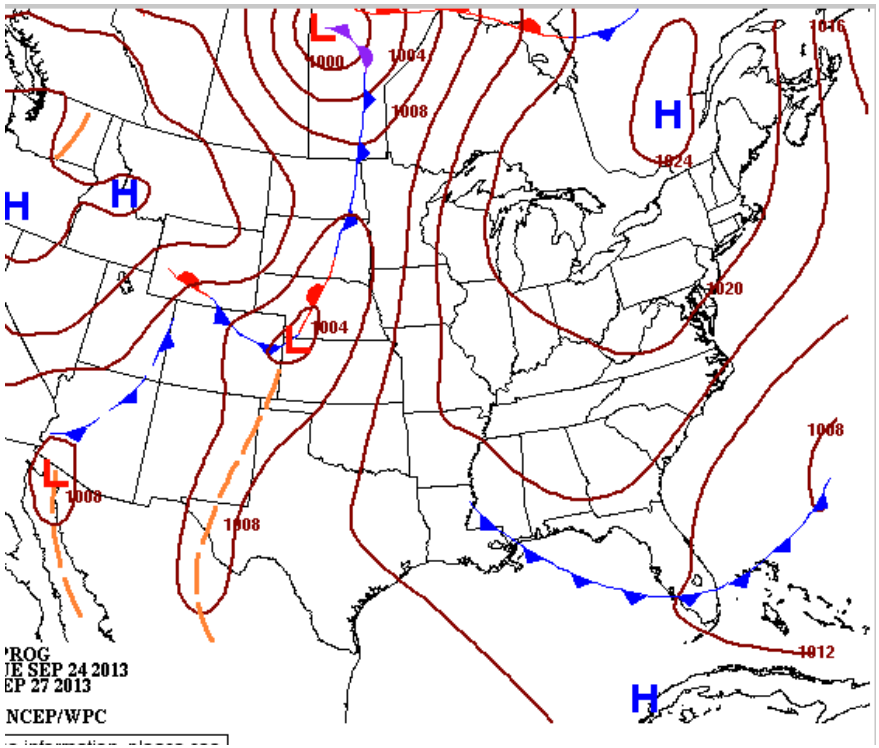
10 m winds 08-13 CDT Thursday



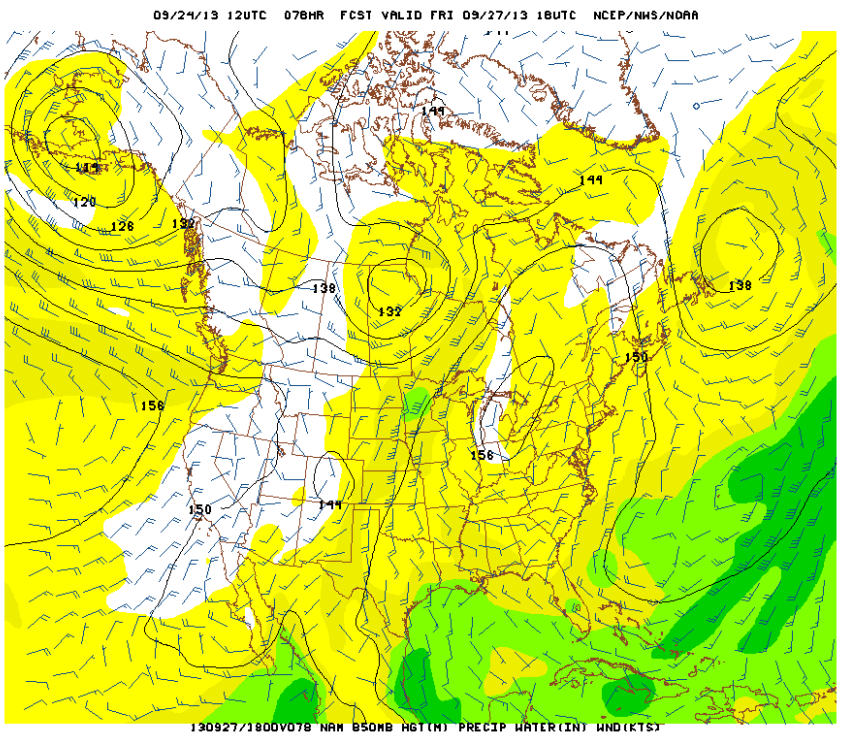
Light winds in the morning will shift to S as low slowly approaches

Friday: Cold front moves closer to region. Not yet concerned about widespread precip event, but moisture availability from Gulf will yield clouds and at least a few showers

12z Surface Forecast



1PM CDT NAM
Precipitable Water

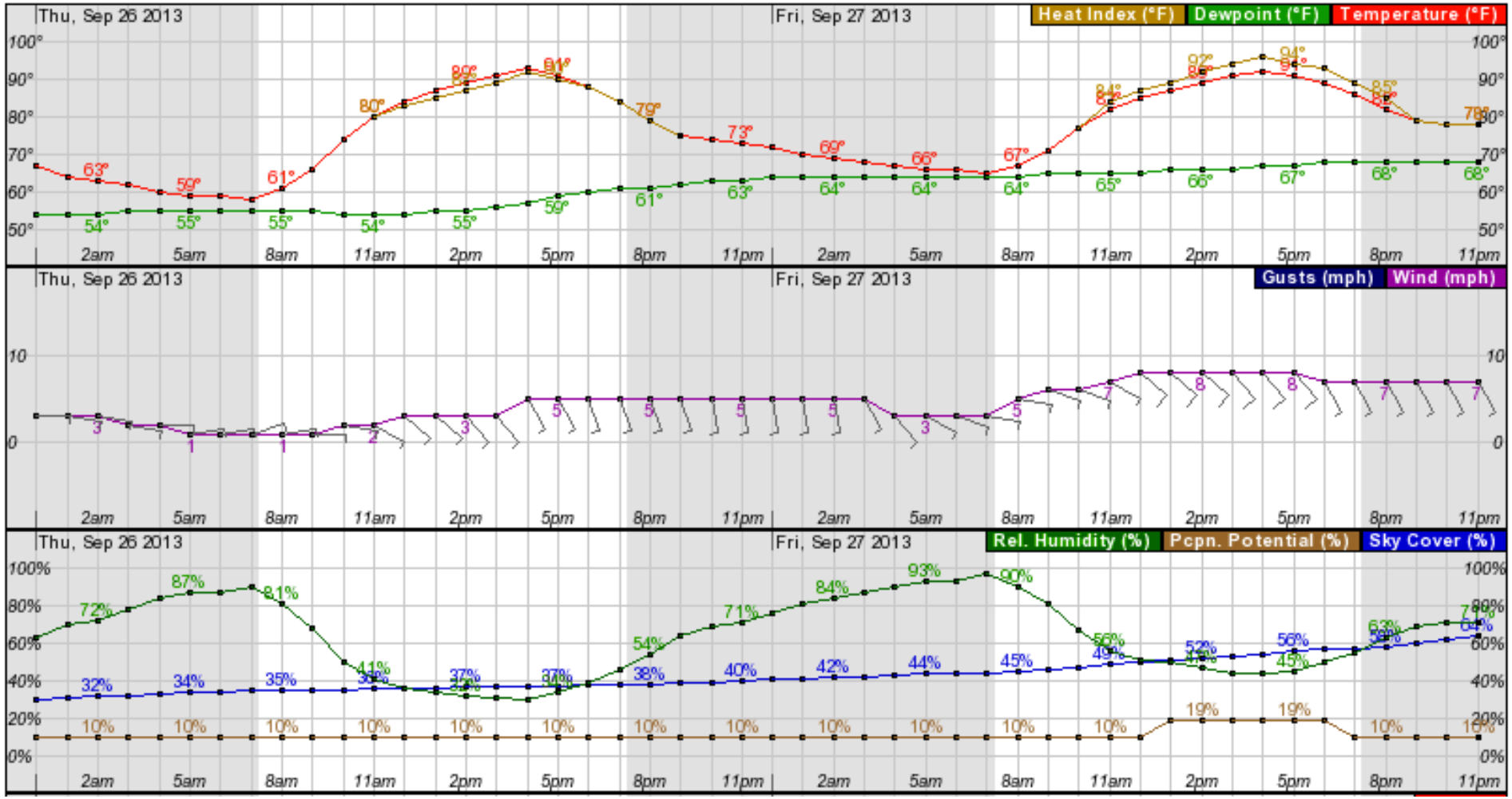


Conroe

Thursday: Less clouds in the north, wind shift

Friday: Clouds building, slight chc showers

Thursday→ **Friday→**

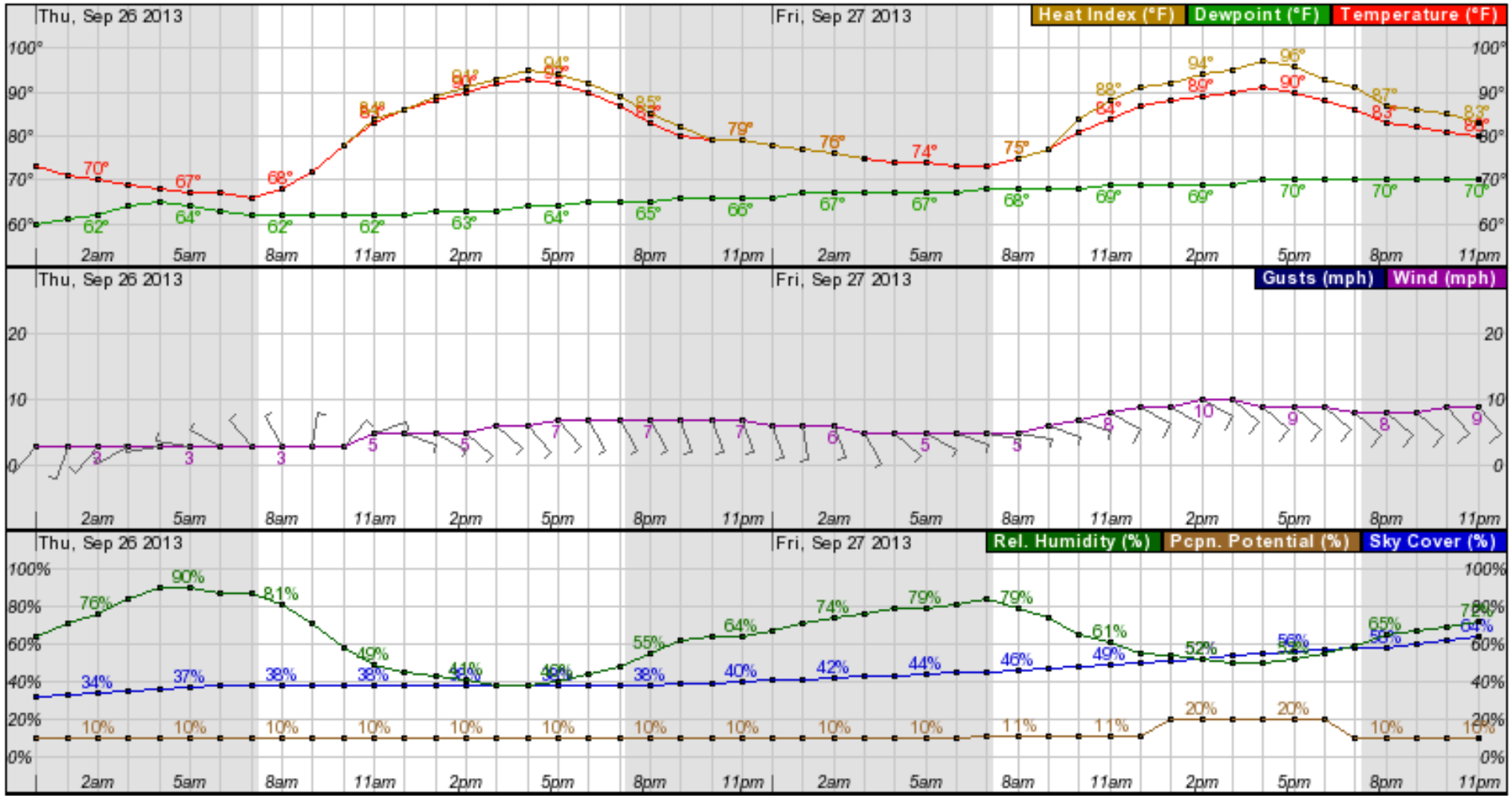


Houston Hobby

Thursday: Winds veer and some scattered clouds

Friday: Clouds increase and maybe a shower

Thursday→ **Friday→**

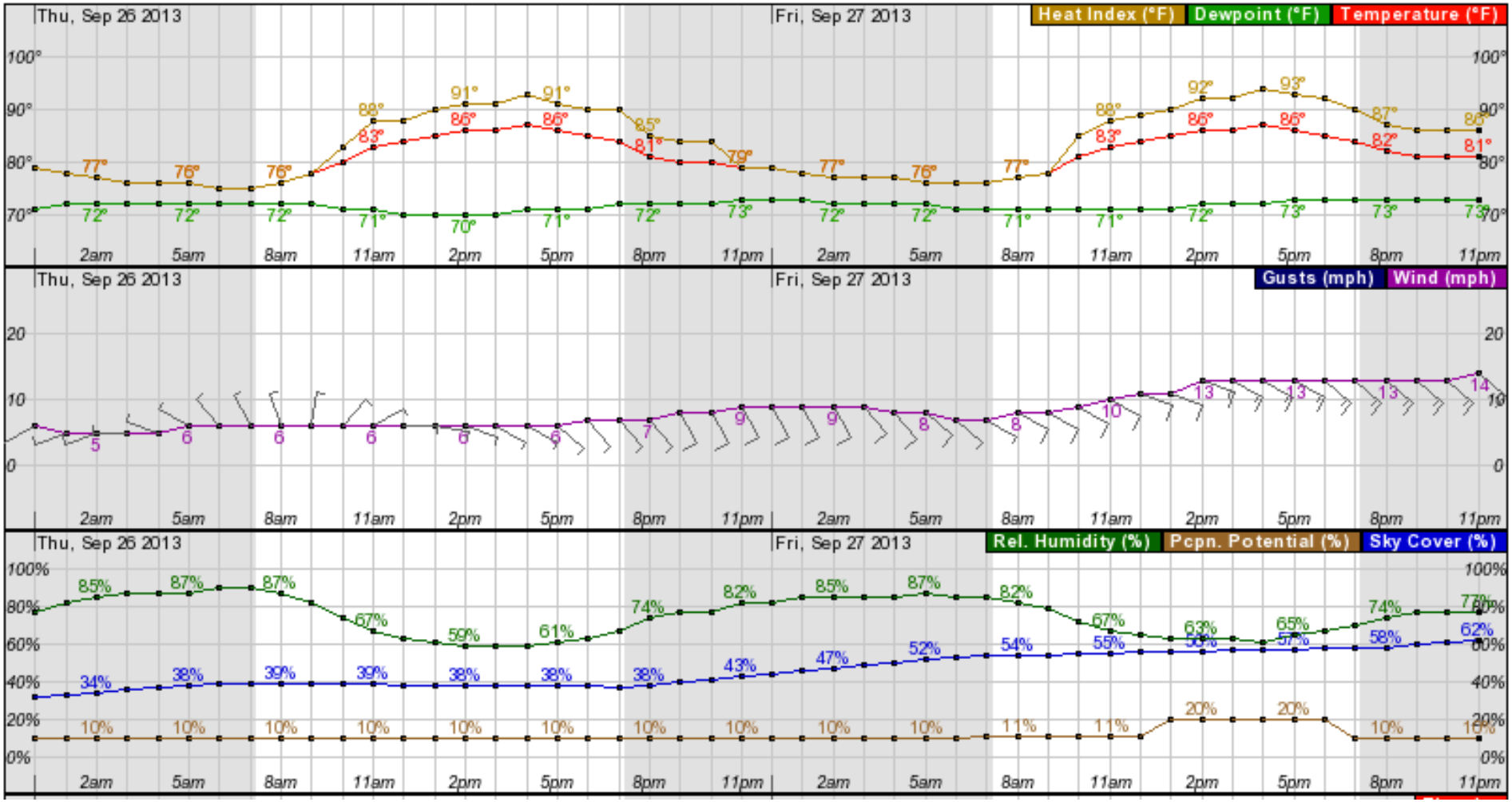


Galveston

Thursday: Mostly sunny, winds shift SE

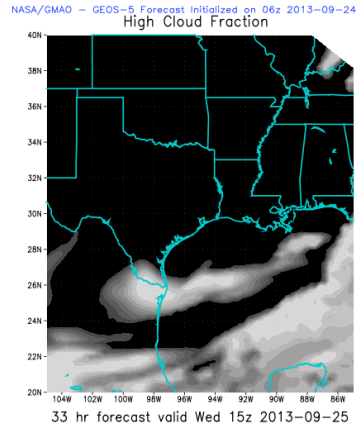
Friday: Clouds build in, chance of showers

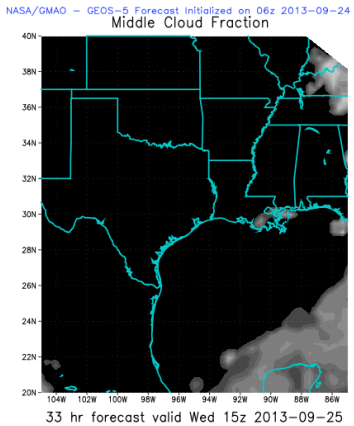
Thursday→ **Friday→**

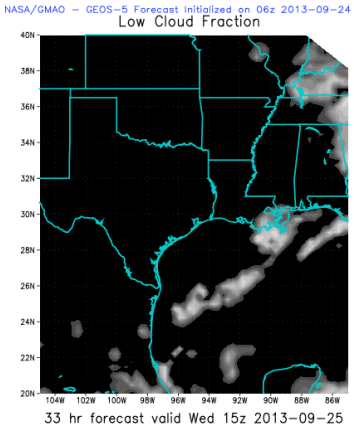


Tomorrow (Wednesday): GEOS-5 – plenty of sun

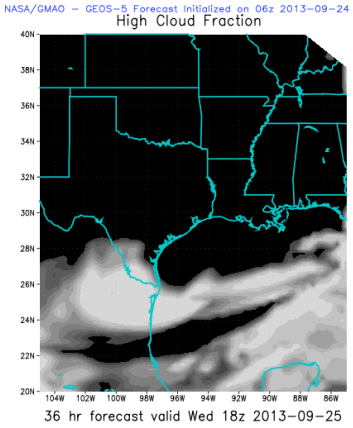
10 am

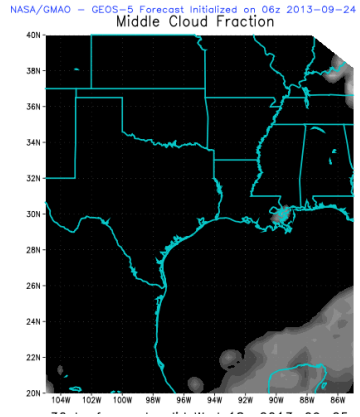


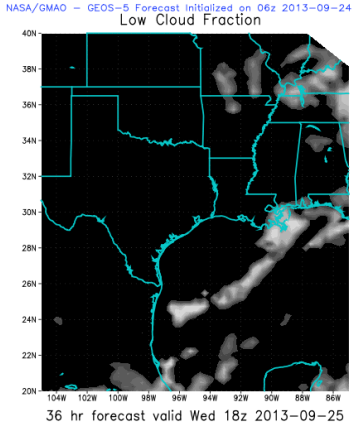




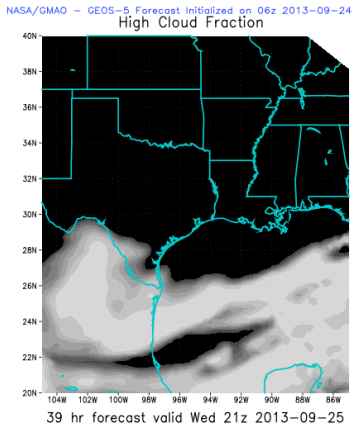
1 pm

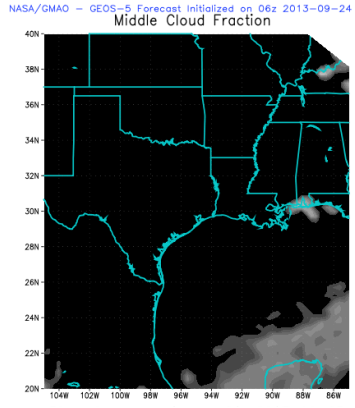


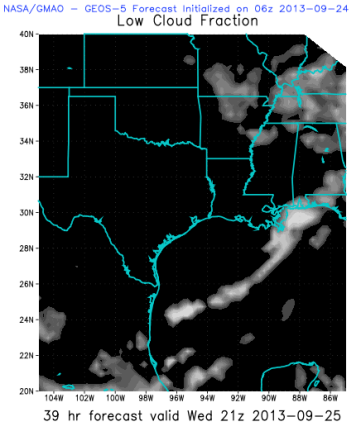




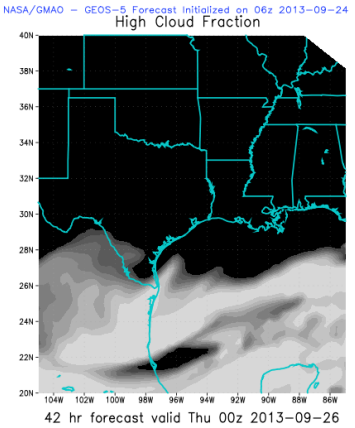
4 pm

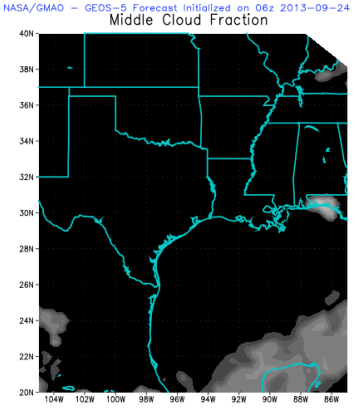


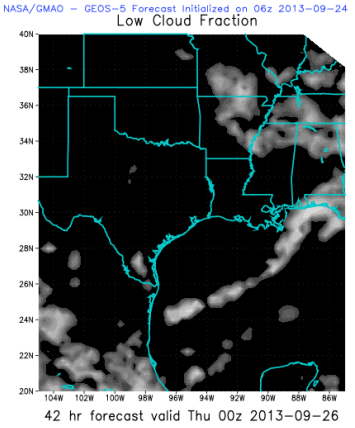




7 pm





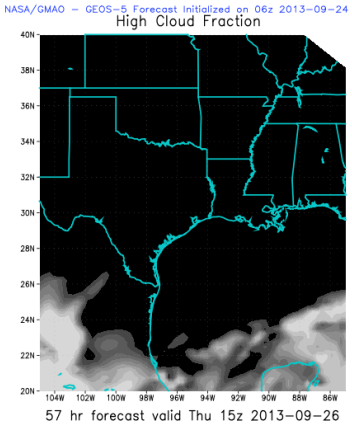
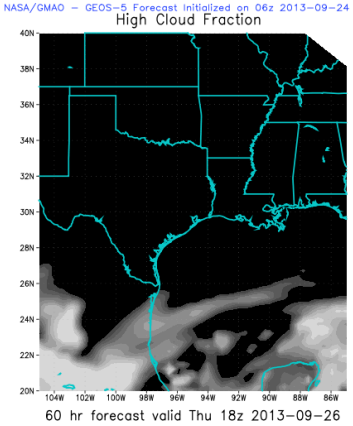
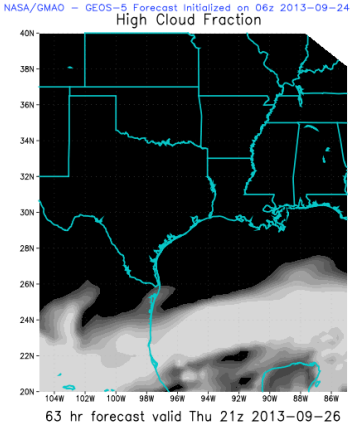
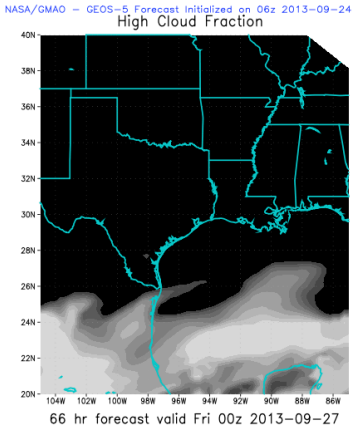
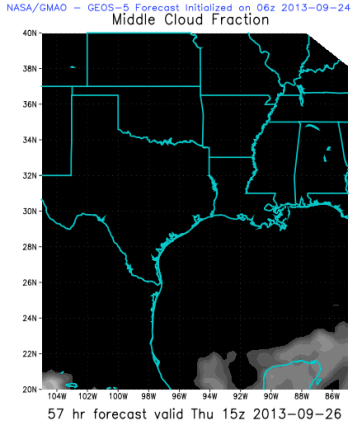
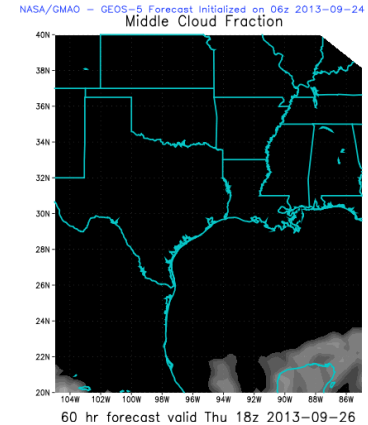
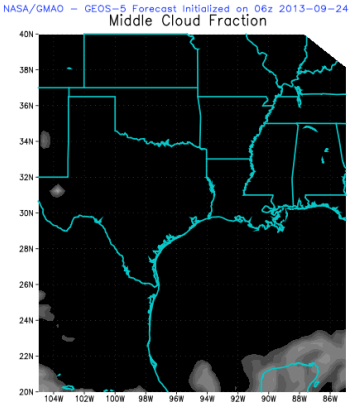
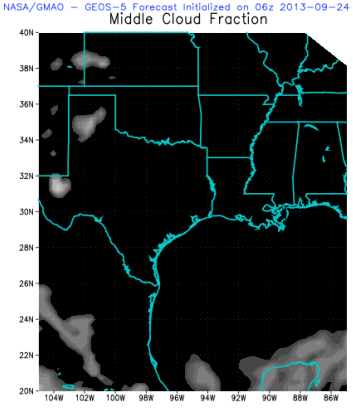
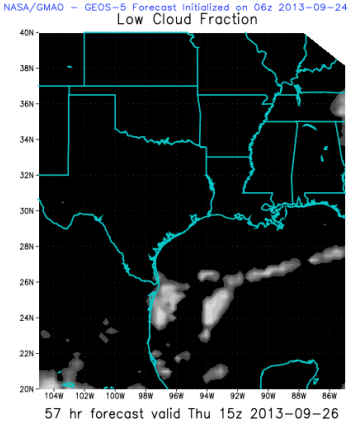
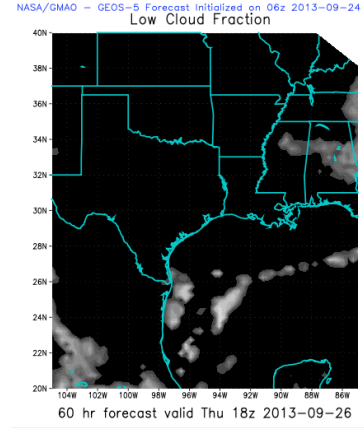
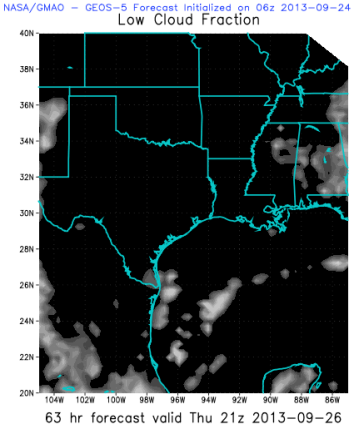
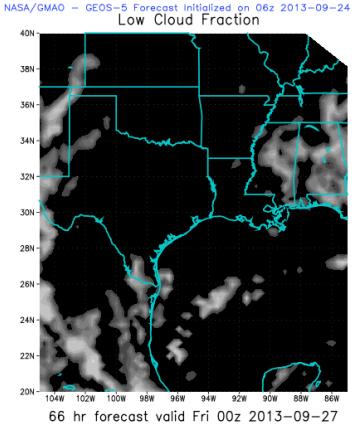


High

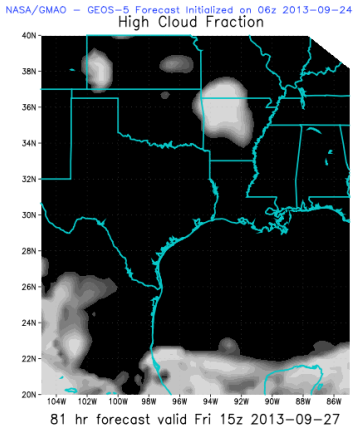
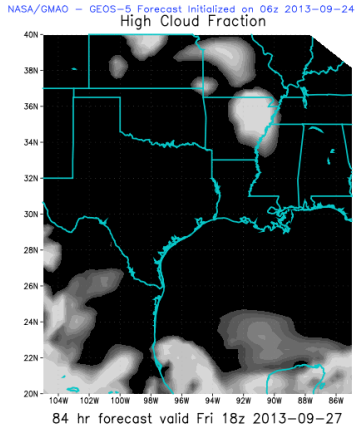
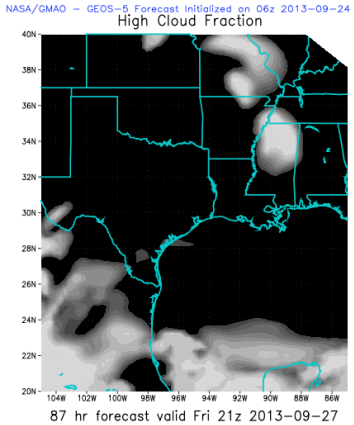
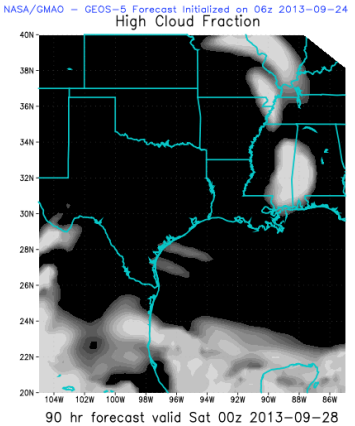
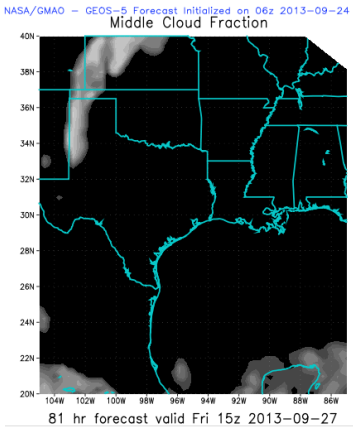
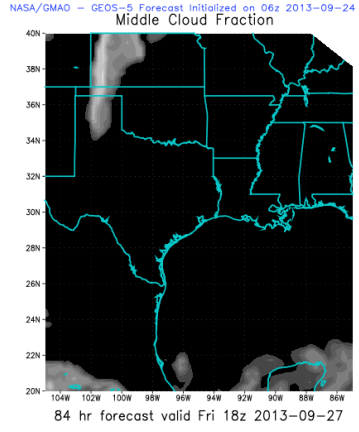
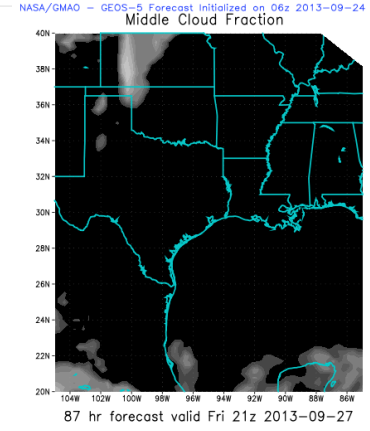
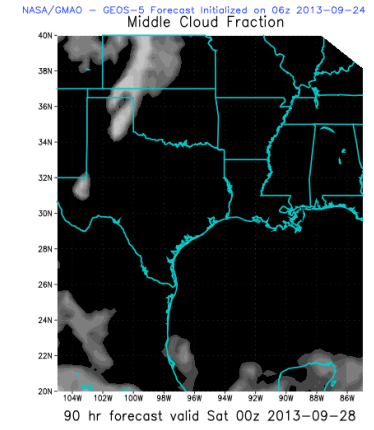
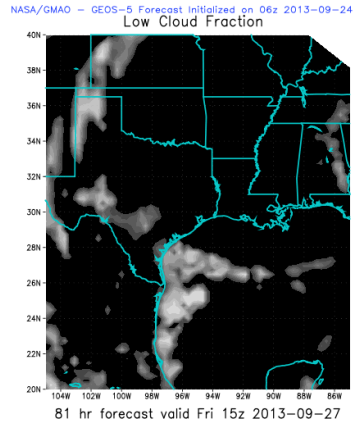
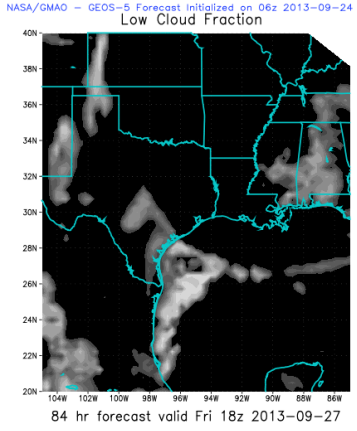
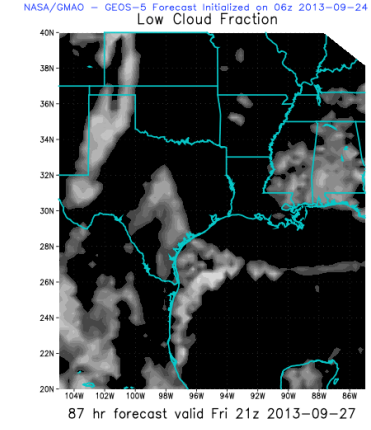
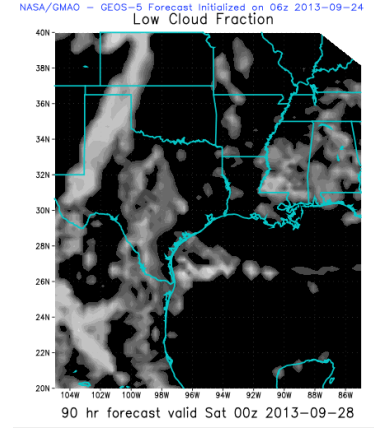
Mid

Low

Thursday: GEOS-5 – model shows no clouds, but expect some cumulus to develop

10 am	1 pm	4 pm	7 pm	
				**High**
				**Mid**
				**Low**

Friday: GEOS-5 – watch for potential for some building cloud cover, especially PM

10 am	1 pm	4 pm	7 pm	
				**High**
				**Mid**
				**Low**

Summary

- Wednesday: Likely Fly Day. Probably best day we've had all month. Few clouds, potential Gulf breeze
- Thursday: Likely Fly Day. Starts like Wed. morning, winds begin shifting SE. Cumulus likely PM
- Friday: Likely Fly Day. Watching for deeper moisture advection. Looking like at least some PM clouds and maybe a shower
- Sat/Sun: Cold front passes Sat night, heavy rain

DISCOVER-AQ Air Quality Outlook
September 24, 2013

Ken Pickering

Bryan Duncan

TCEQ Air Quality Forecast

Tuesday: Code Yellow for Ozone – S side of city – light northerly winds
Code Yellow for PM2.5 – increased continental background

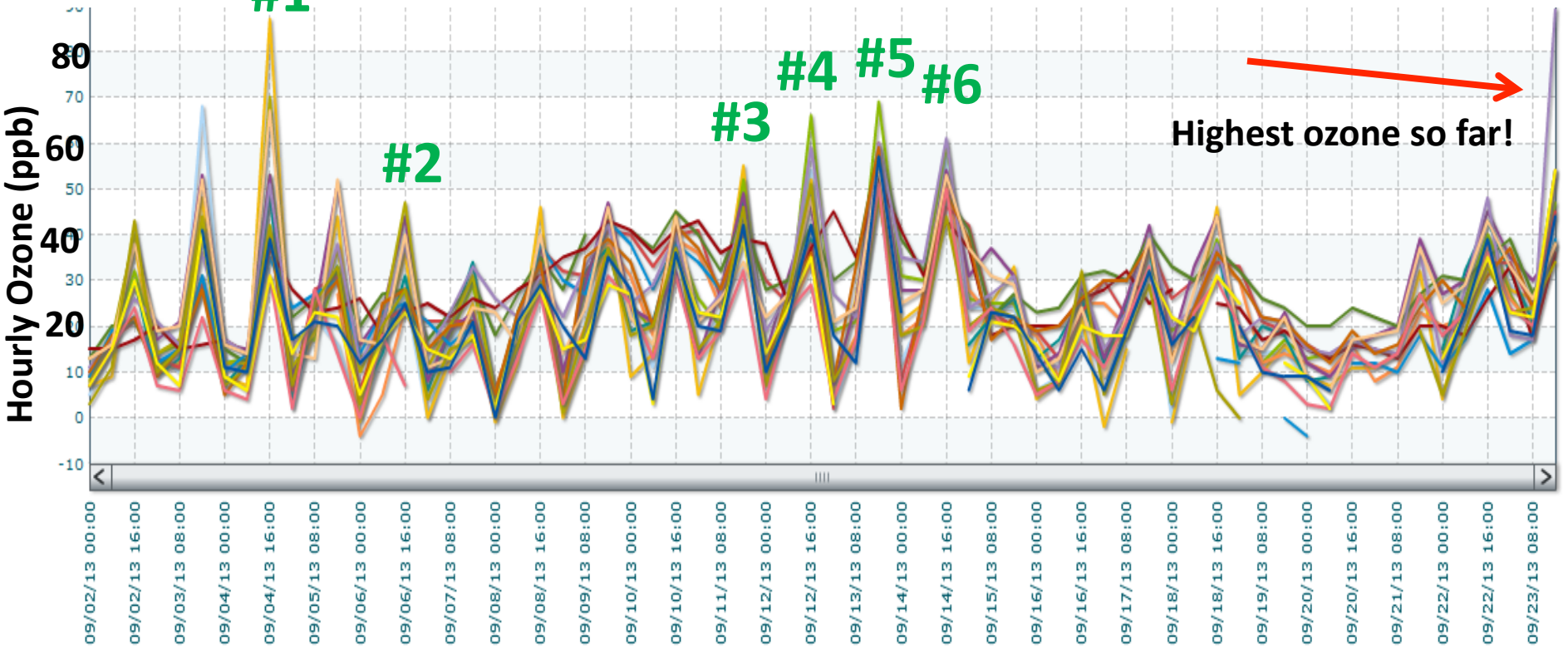
Wednesday: Code Orange for Ozone – S and SW of city
Code Yellow for PM2.5

Thursday: Code Orange for Ozone – W, NW, N of city
Code Yellow for PM2.5

Friday: Code Orange for Ozone
Code Yellow for PM2.5

Hourly Ozone (airnowtech.org)**

September 2nd – 23rd ** EVERY 8th HOUR PLOTTED!!!!!

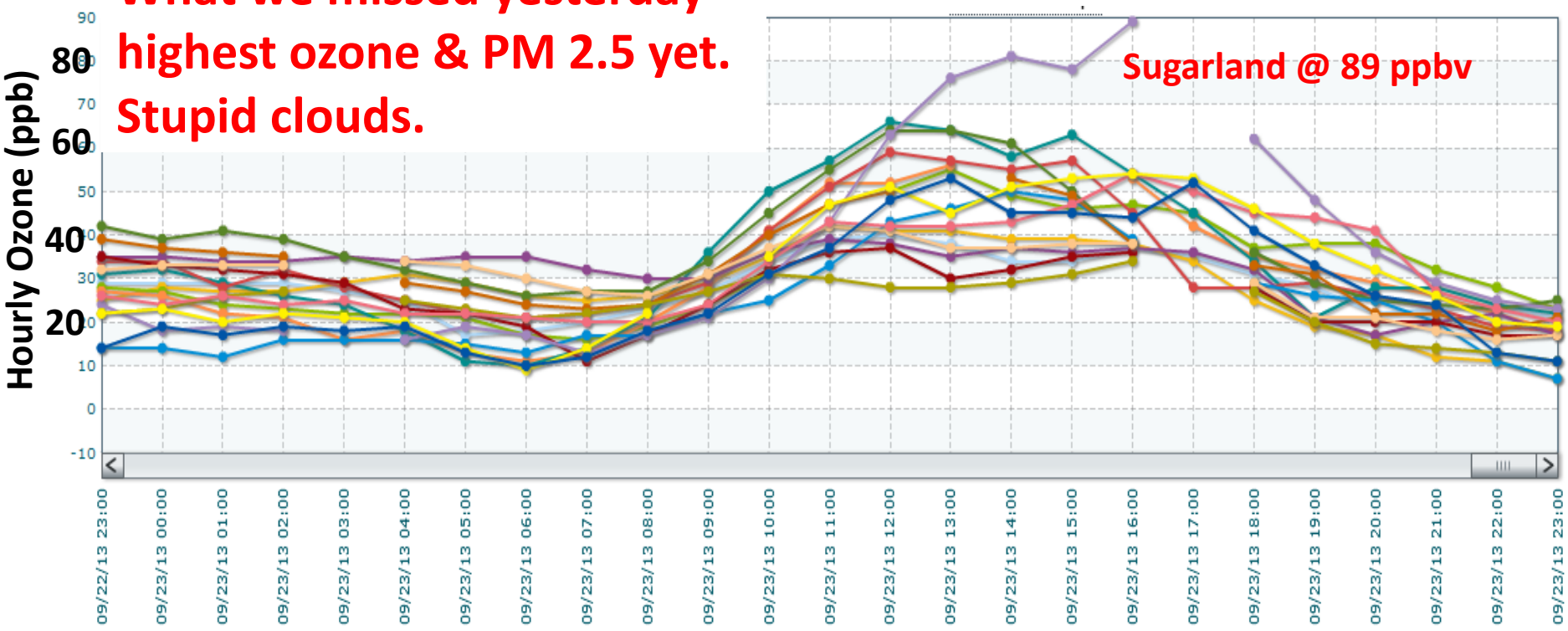


- Houston Aldine C8/O3 - 44201/1 Hr/2
- Houston Westhollow C410/O3 - 44201/1 Hr/1
- Manvel Croix Park C84/O3 - 44201/1 Hr/1
- Conroe Relocated C78/O3 - 44201/1 Hr/1
- West Houston C554/O3 - 44201/1 Hr/1
- Galveston Airport C1034/O3 - 44201/1 Hr/1
- Coastal Center C697/O3 - 44201/1 Hr/1
- West Liberty C699/O3 - 44201/1 Hr/1
- Clinton C403/O3 - 44201/1 Hr/3
- Northwest Harris Co. C26/C110/C154/O3 - 44201/1 Hr/2
- Houston Deer Park C35/O3 - 44201/1 Hr/1
- Seabrook Friendship Park C45/O3 - 44201/1 Hr/1
- Texas City C620/O3 - 44201/1 Hr/1
- La Porte Sylvan Beach C556/O3 - 44201/1 Hr/1
- Sugarland C696/O3 - 44201/1 Hr/1
- Jones Forest C698/O3 - 44201/1 Hr/1
- Channelview C15/O3 - 44201/1 Hr/3
- Houston Texas Avenue C411/O3 - 44201/1 Hr/1 (Method: 047)

Hourly Ozone (airnowtech.org)

September 23rd

What we missed yesterday – highest ozone & PM 2.5 yet. Stupid clouds.

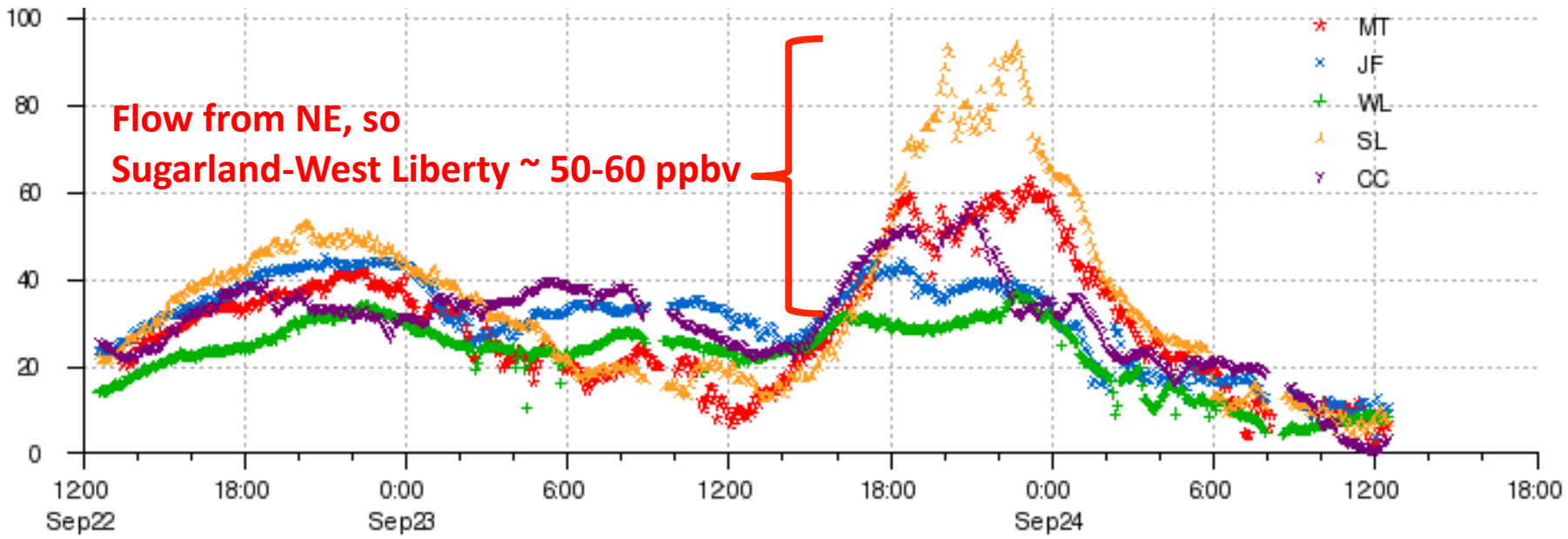


- Houston Aldine C8/O3 - 44201/1 Hr/2
- Houston Westhollow C410/O3 - 44201/1 Hr/1
- Manvel Croix Park C84/O3 - 44201/1 Hr/1
- Conroe Relocated C78/O3 - 44201/1 Hr/1
- West Houston C554/O3 - 44201/1 Hr/1
- Galveston Airport C1034/O3 - 44201/1 Hr/1
- Coastal Center C697/O3 - 44201/1 Hr/1
- West Liberty C699/O3 - 44201/1 Hr/1
- Clinton C403/O3 - 44201/1 Hr/3
- Northwest Harris Co. C26/C110/C154/O3 - 44201/1 Hr/2
- Houston Deer Park C35/O3 - 44201/1 Hr/1
- Seabrook Friendship Park C45/O3 - 44201/1 Hr/1
- Texas City C620/O3 - 44201/1 Hr/1
- La Porte Sylvan Beach C556/O3 - 44201/1 Hr/1
- Sugarland C696/O3 - 44201/1 Hr/1
- Jones Forest C698/O3 - 44201/1 Hr/1
- Channelview C15/O3 - 44201/1 Hr/3
- Houston Texas Avenue C411/O3 - 44201/1 Hr/1 (Method: 047)

HNET

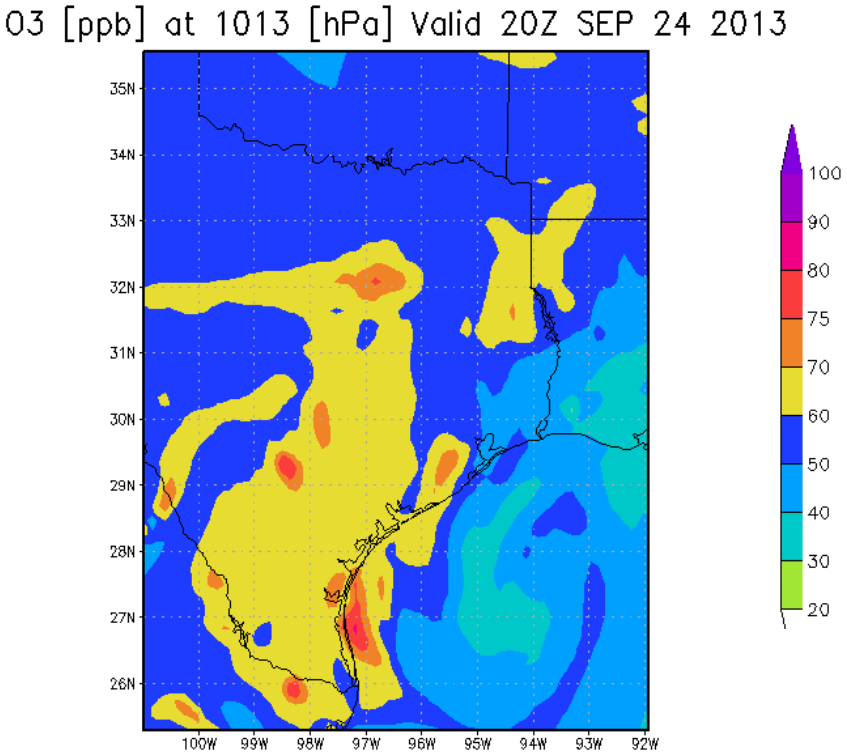
Ozone (ppbv)

Quick & dirty estimate of net ozone produced.



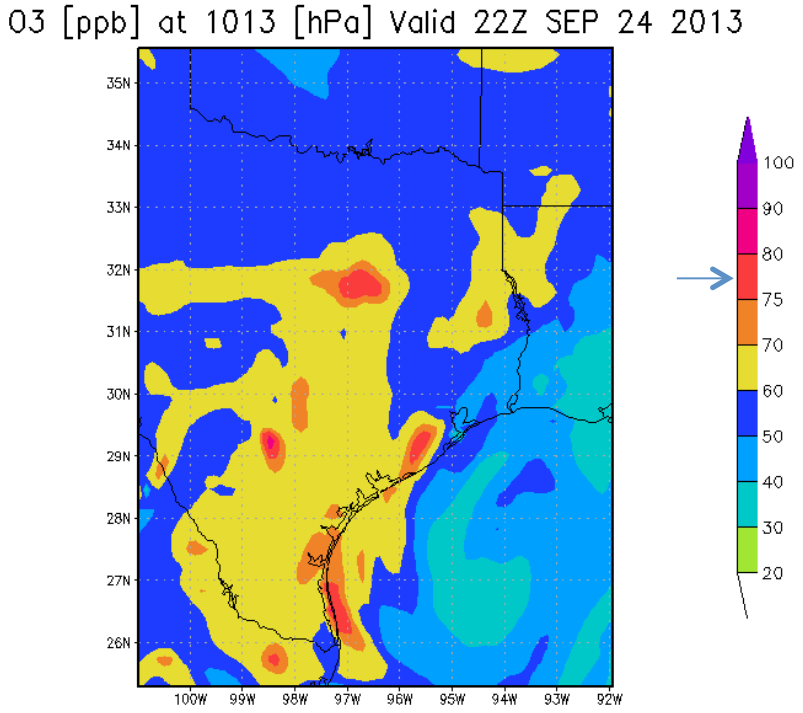
SUNDAY **UTC** **MONDAY**

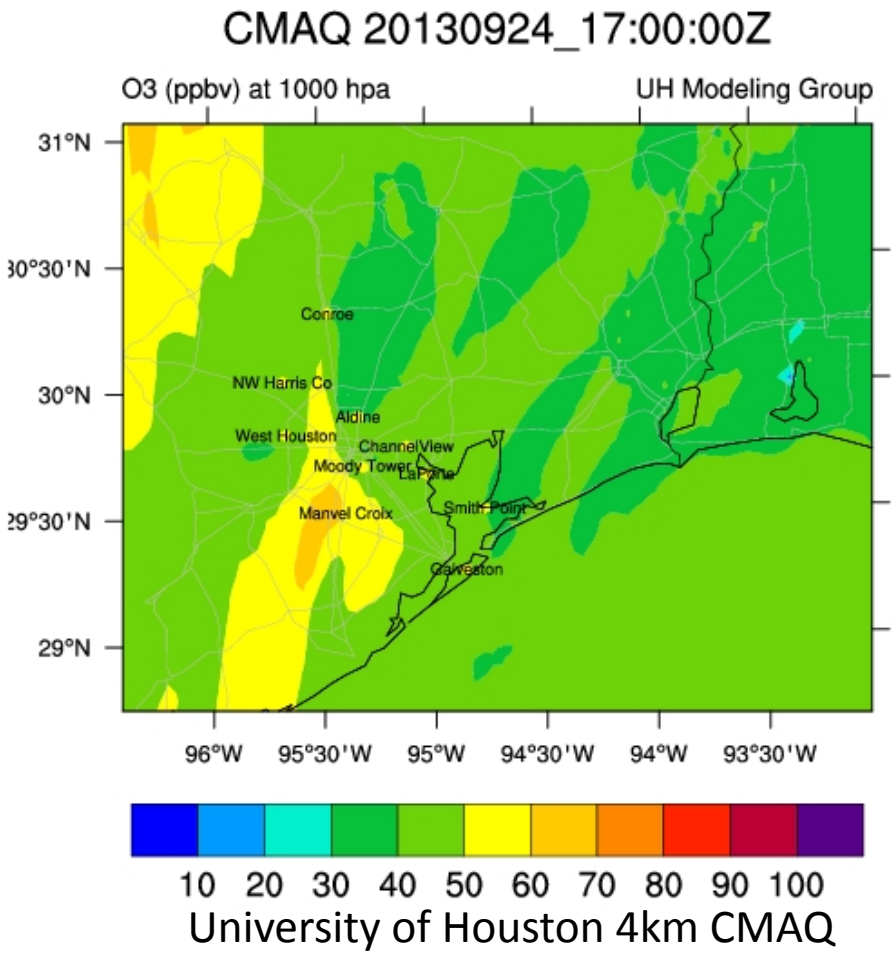
NOAA Experimental CMAQ Forecast for Today



3 PM

5 PM

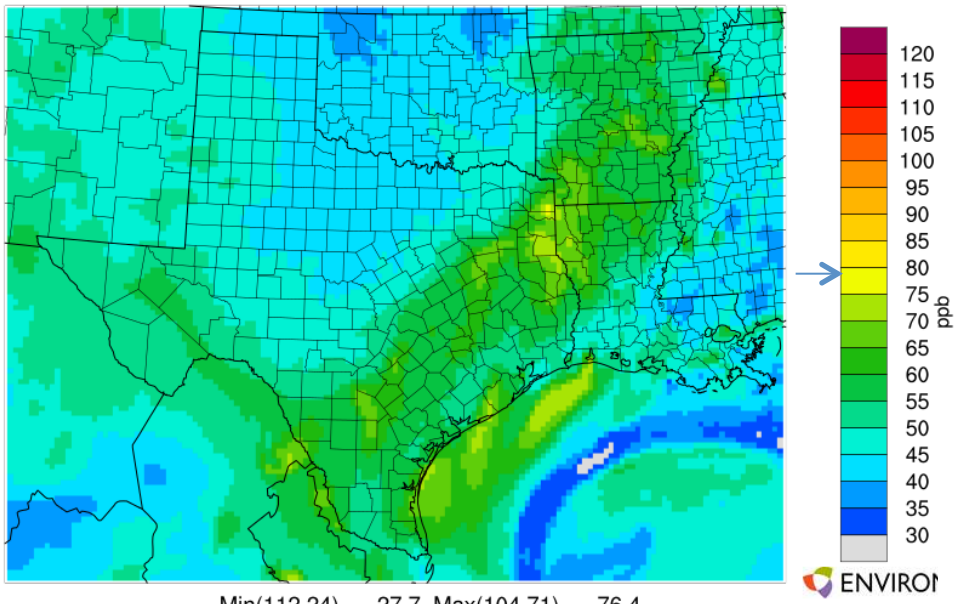



CMAQ 20130924_17:00:00Z
O3 (ppbv) at 1000 hpa
UH Modeling Group
31°N
30°30'N
30°N
29°30'N
29°N
96°W
95°30'W
95°W
94°30'W
94°W
93°30'W
Conroe
NW Harris Co
Aldine
West Houston
ChannelView
Moody Tower
LaPorte
Smith Point
Manvel Croix
Galveston
10 20 30 40 50 60 70 80 90 100
University of Houston 4km CMAQ

TCEQ/Environ CAMx Forecast for Today

3 PM

Ozone
Best Case

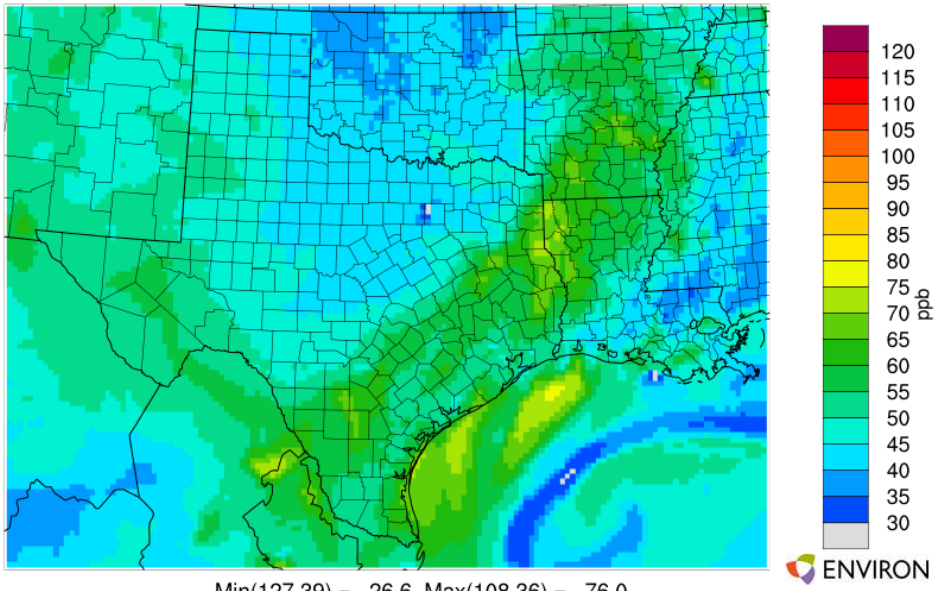


Min(112,24) = 27.7, Max(104,71) = 76.4

Tue September 24 14:00 CST

5 PM

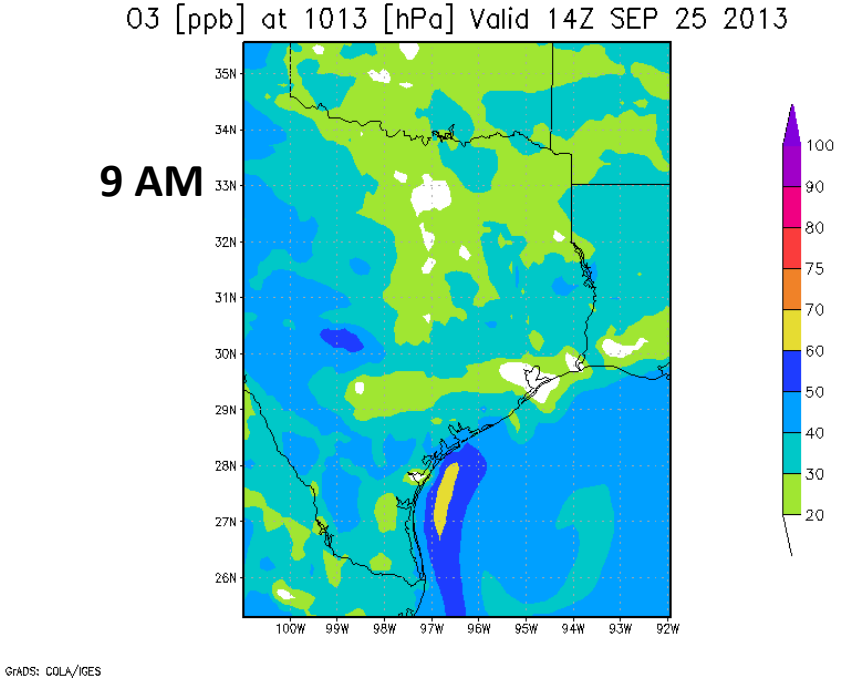
Ozone
Best Case



Min(127,39) = 26.6, Max(108,36) = 76.0

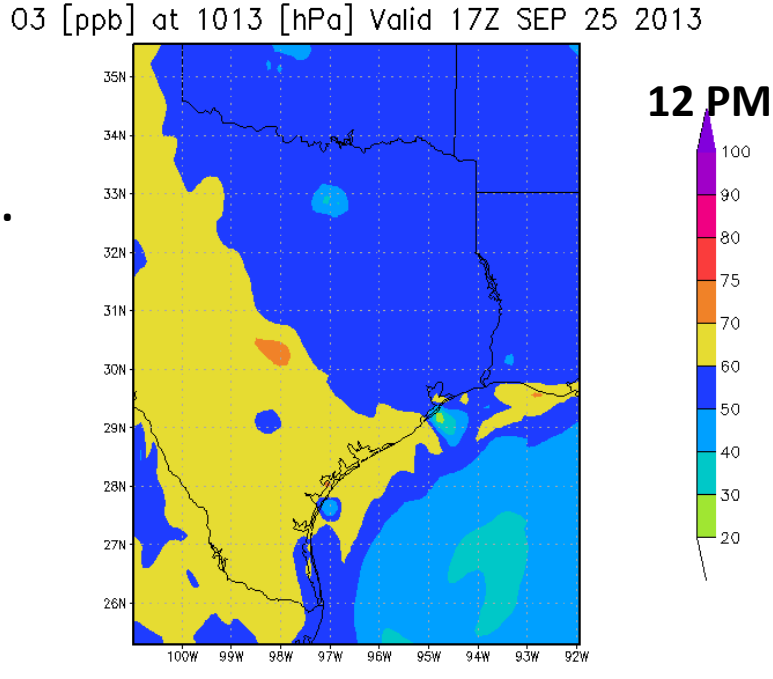
Tue September 24 16:00 CST

9 AM

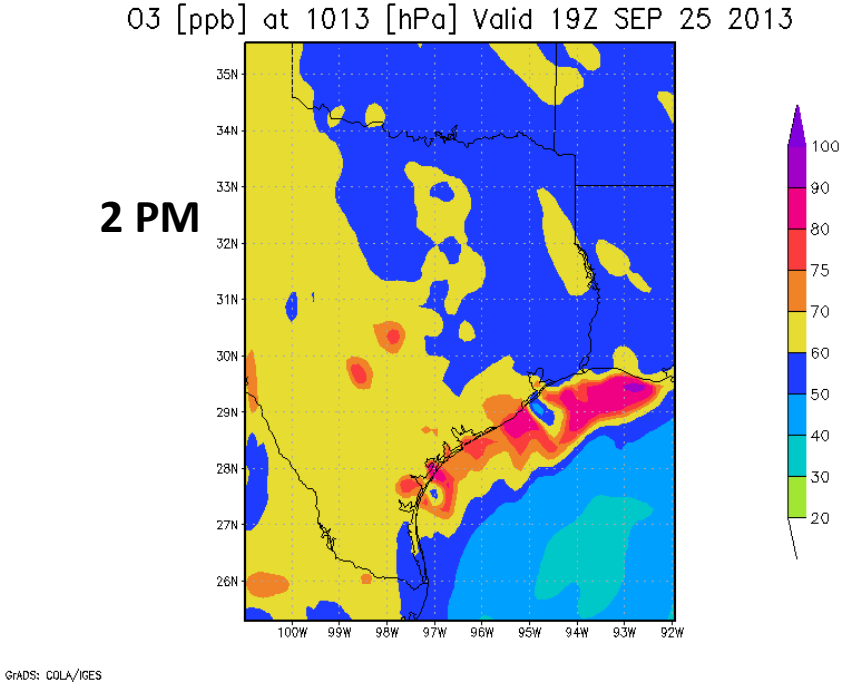


NOAA Experim. CMAQ

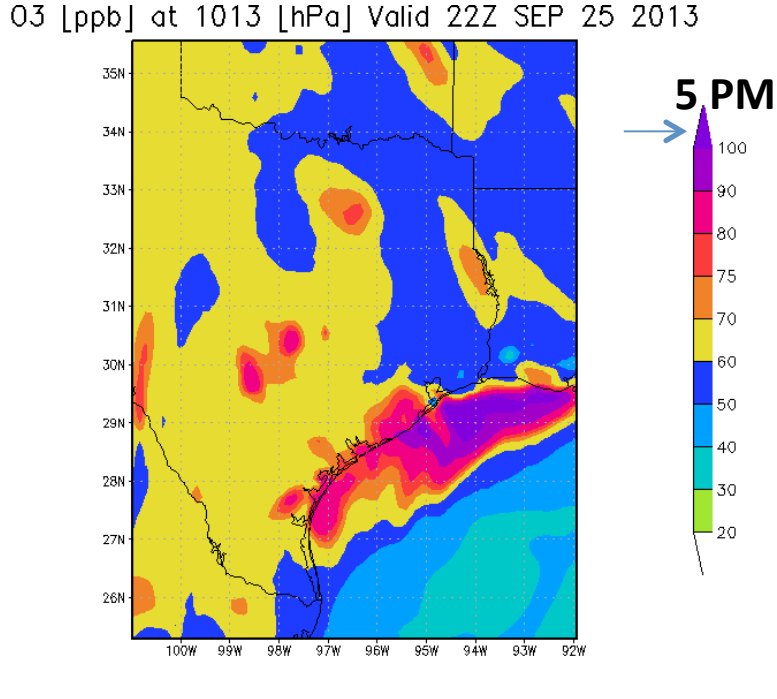
12 PM

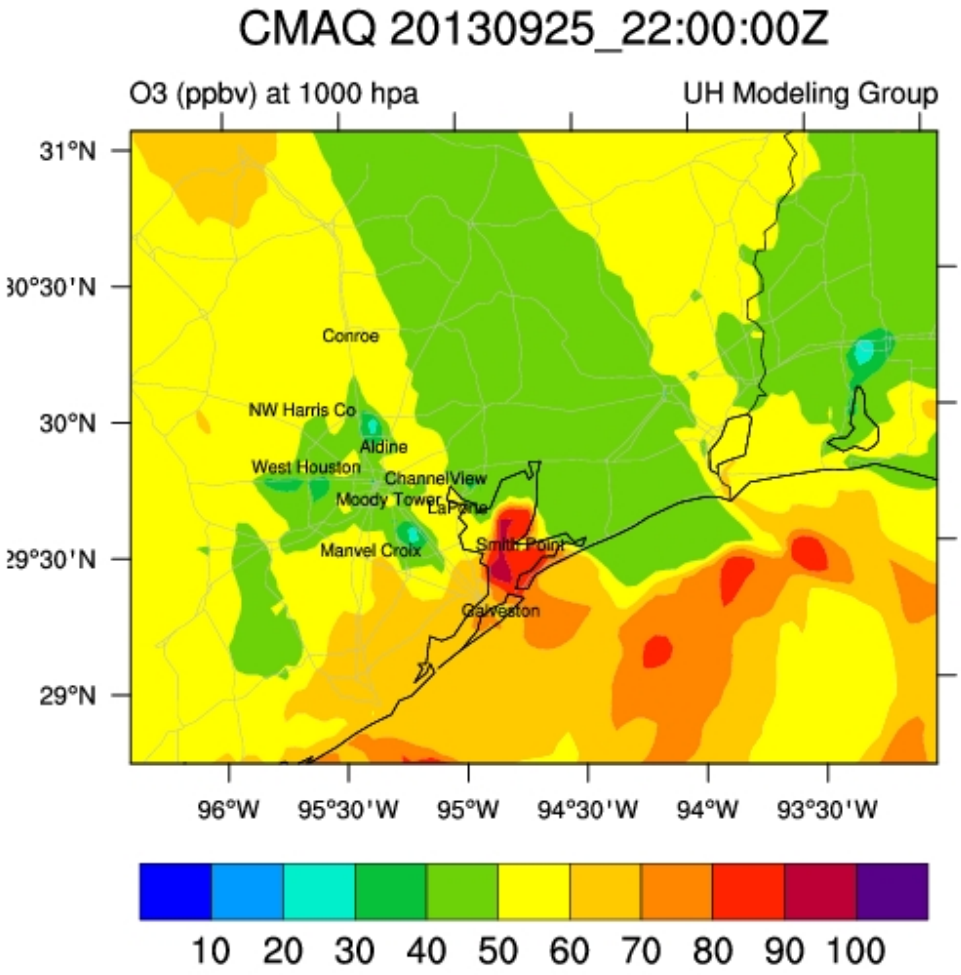


2 PM



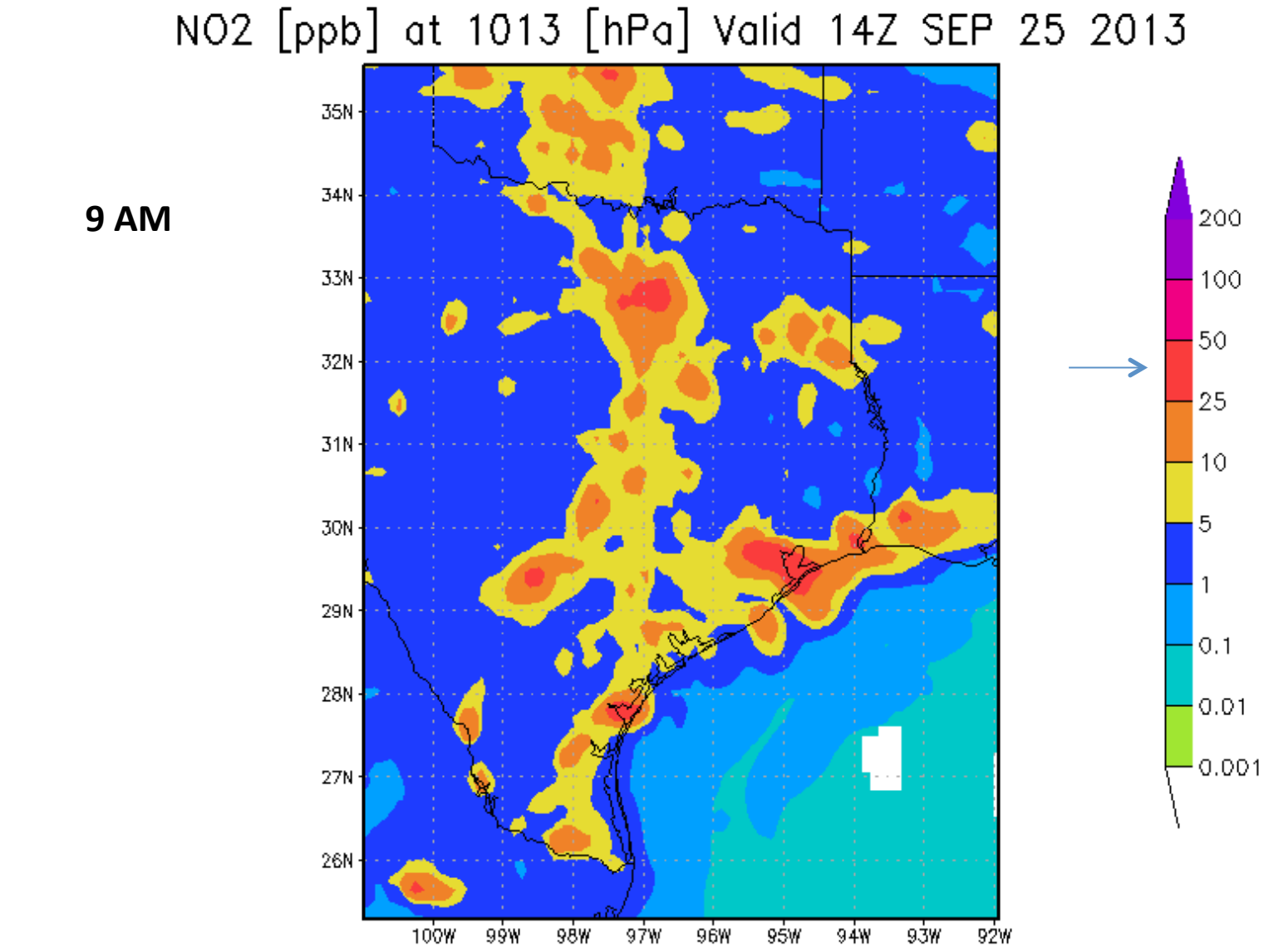
5 PM



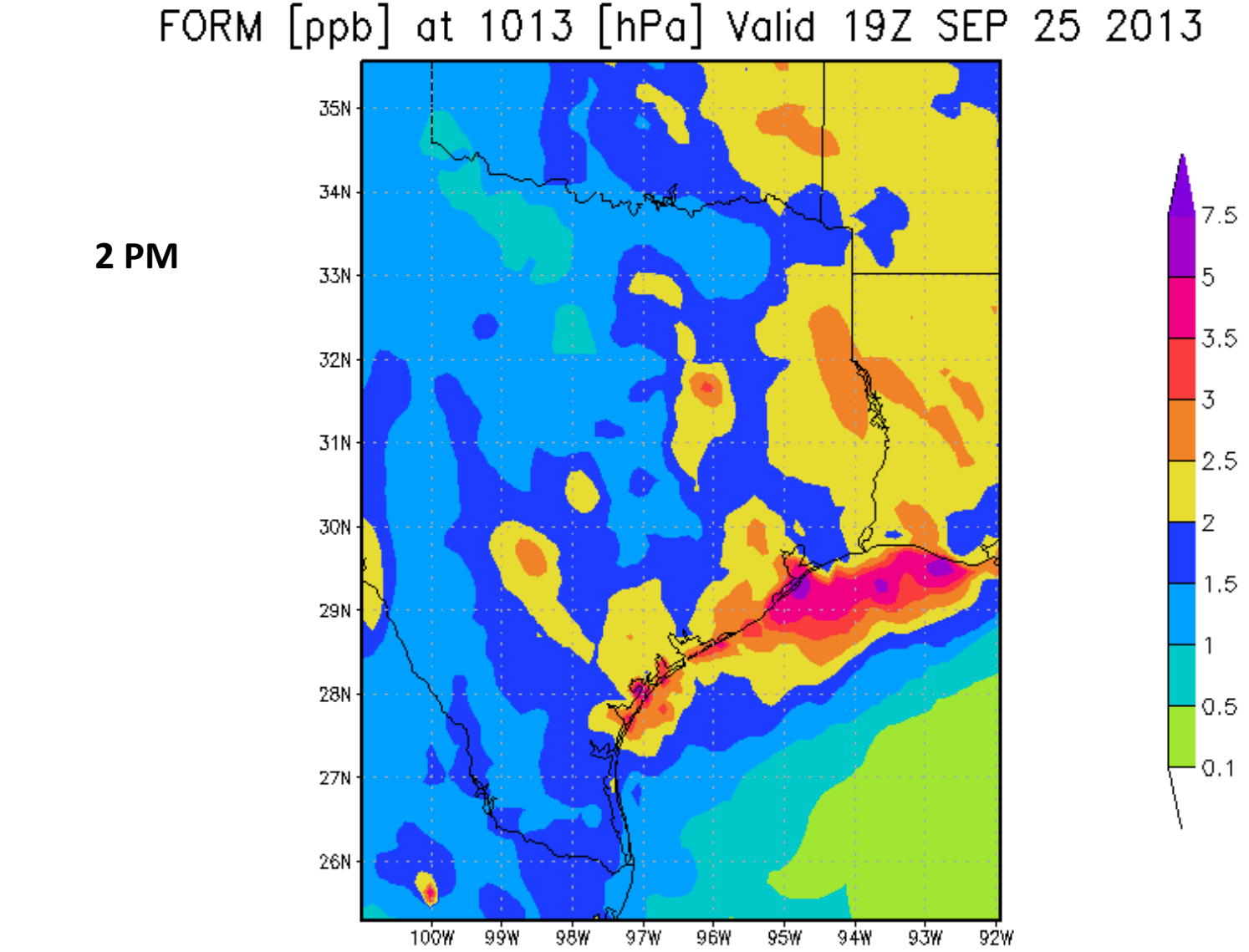


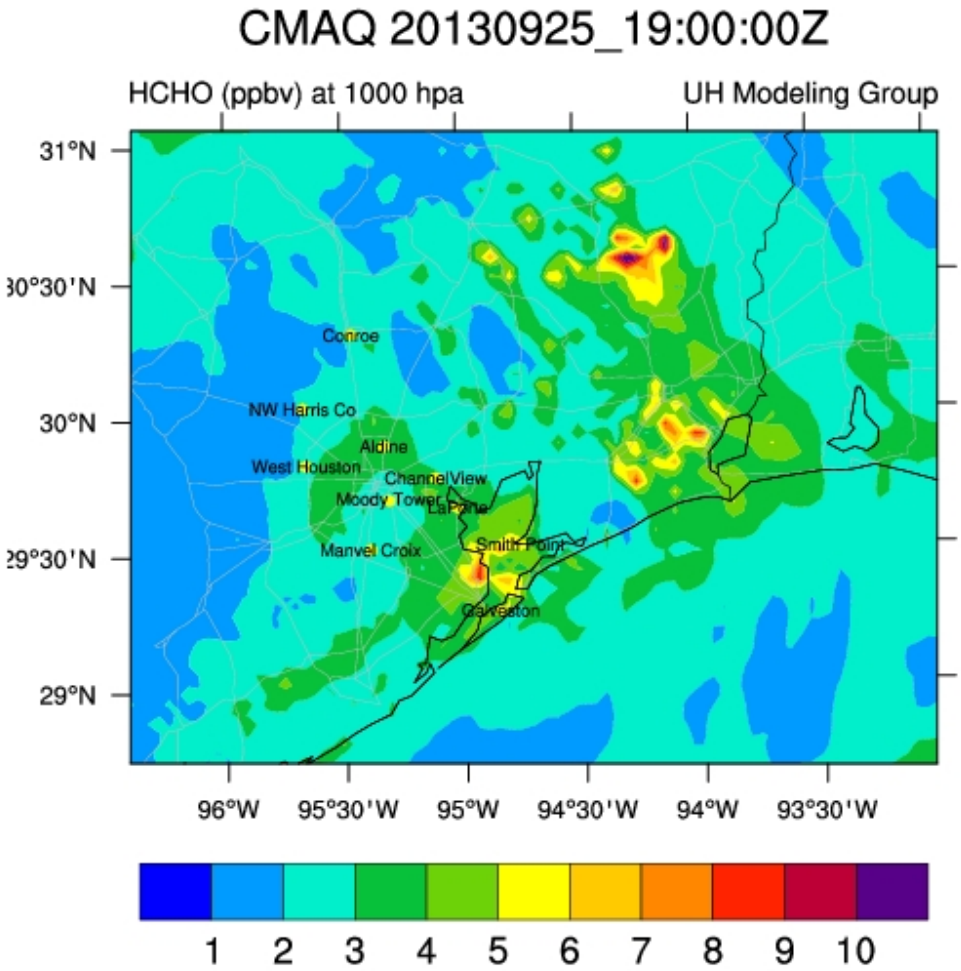
University of Houston 4km CMAQ

9 AM


NO2 [ppb] at 1013 [hPa] Valid 14Z SEP 25 2013
35N
34N
33N
32N
31N
30N
29N
28N
27N
26N
100W
99W
98W
97W
96W
95W
94W
93W
92W
200
100
50
25
10
5
1
0.1
0.01
0.001
GrADS: COLA/IGES

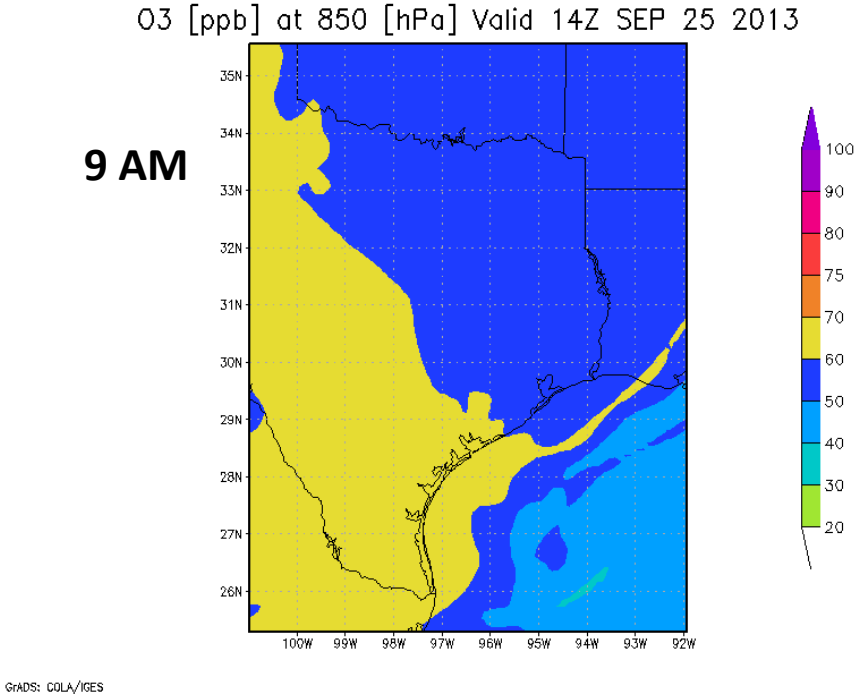
2 PM


FORM [ppb] at 1013 [hPa] Valid 19Z SEP 25 2013
35N
34N
33N
32N
31N
30N
29N
28N
27N
26N
100W
99W
98W
97W
96W
95W
94W
93W
92W
7.5
5
3.5
3
2.5
2
1.5
1
0.5
0.1
GrADS: COLA/IGES

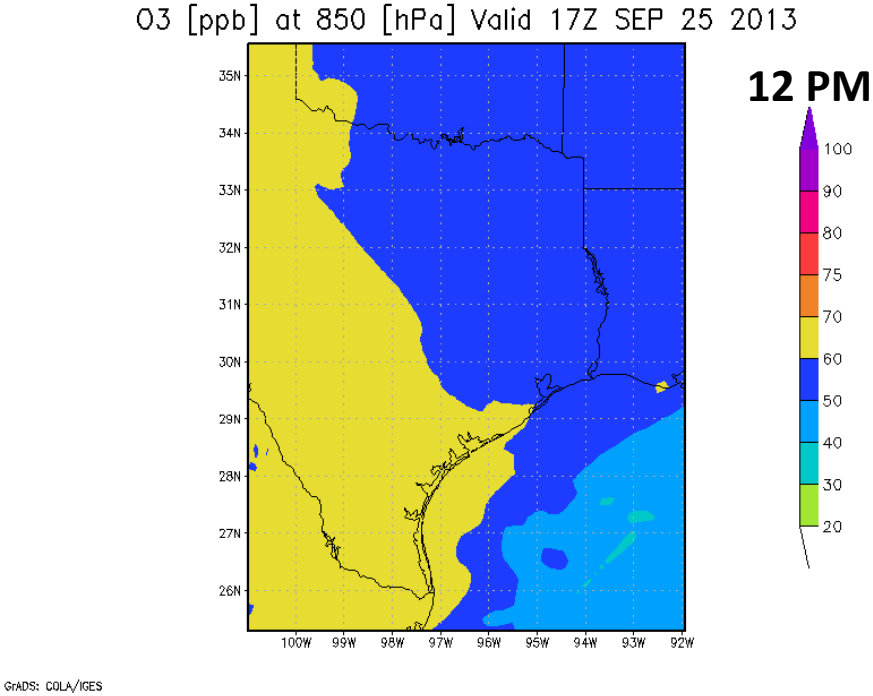


University of Houston 4km CMAQ

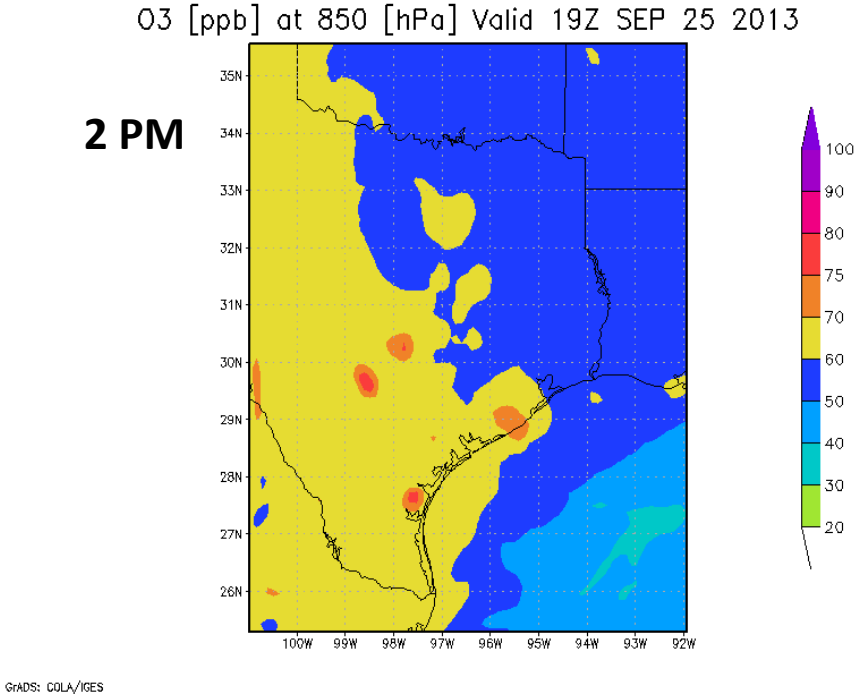
9 AM



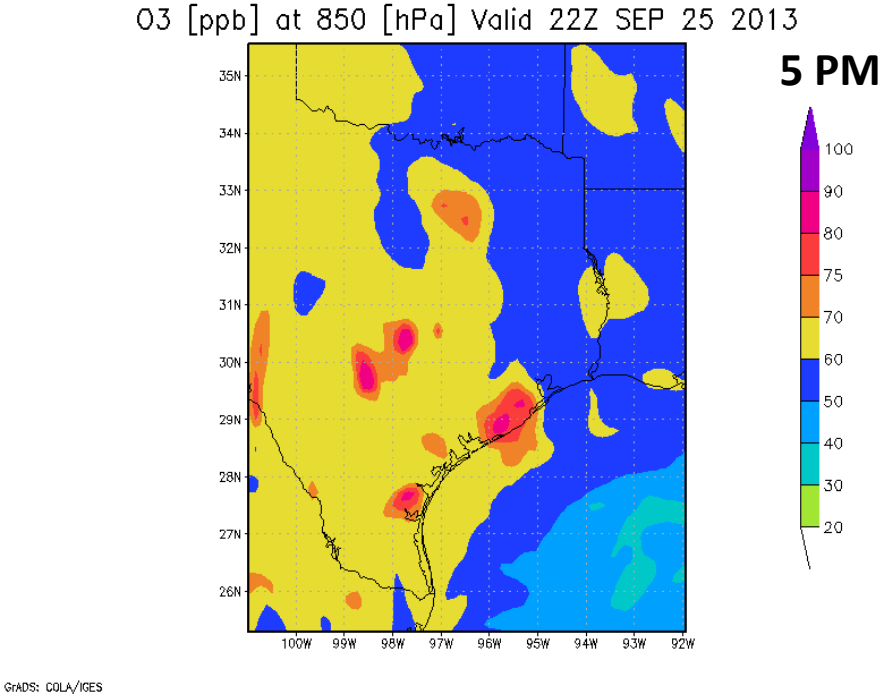
12 PM



2 PM

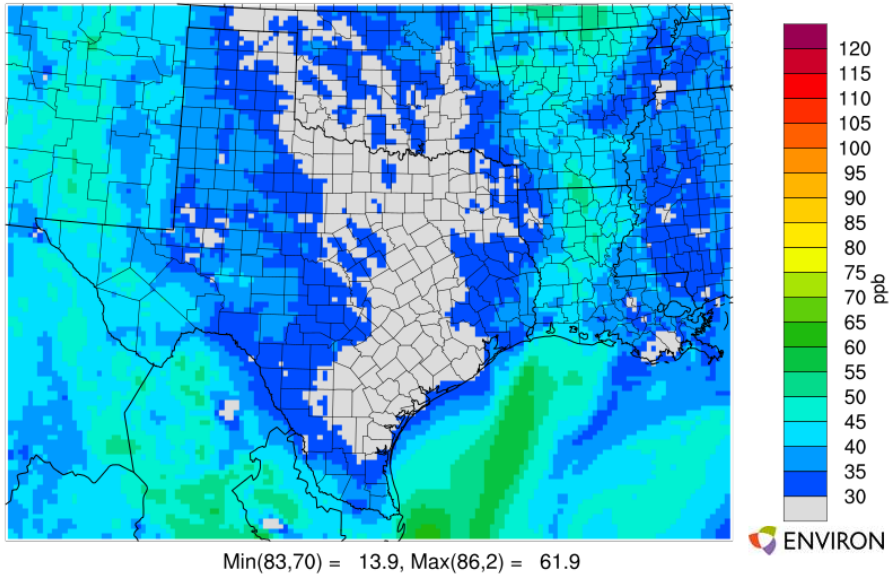


5 PM



Ozone **9 AM**

Best Case

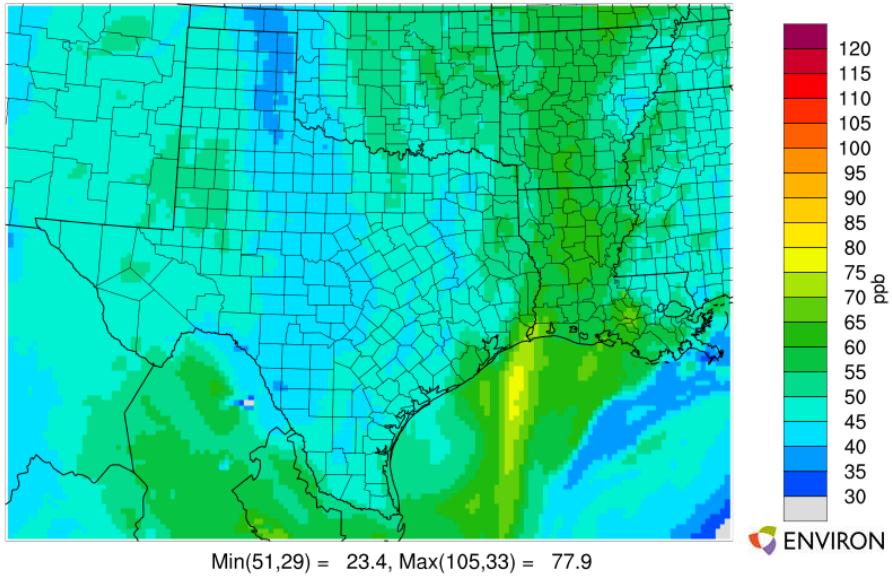


Min(83,70) = 13.9, Max(86,2) = 61.9

Wed September 25 08:00 CST

Ozone **12 PM**

Best Case

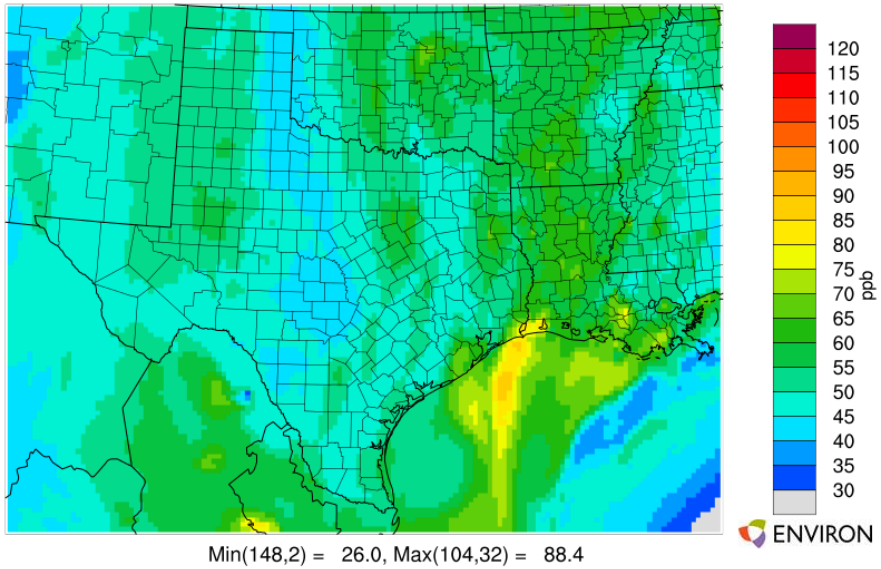


Min(51,29) = 23.4, Max(105,33) = 77.9

Wed September 25 11:00 CST

Ozone **2 PM**

Best Case

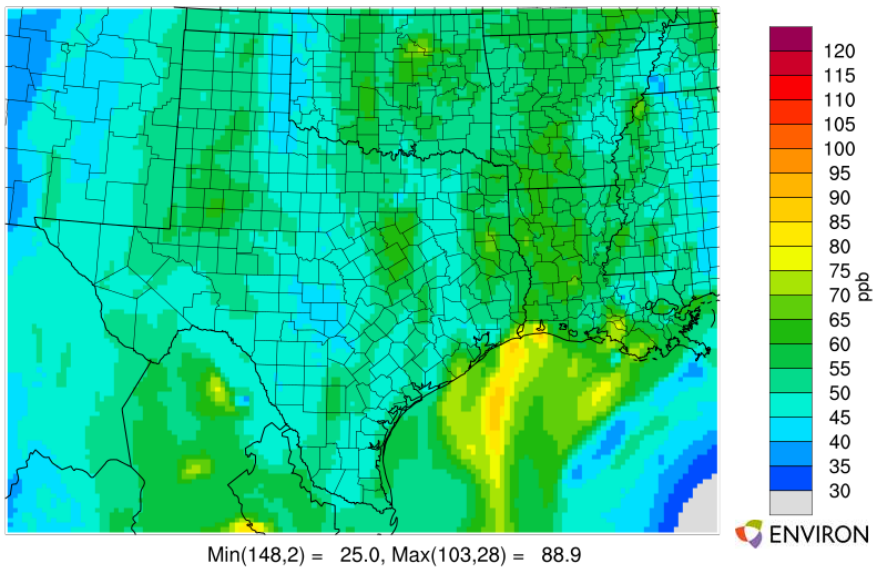


Min(148,2) = 26.0, Max(104,32) = 88.4

Wed September 25 13:00 CST

Ozone **5 PM**

Best Case

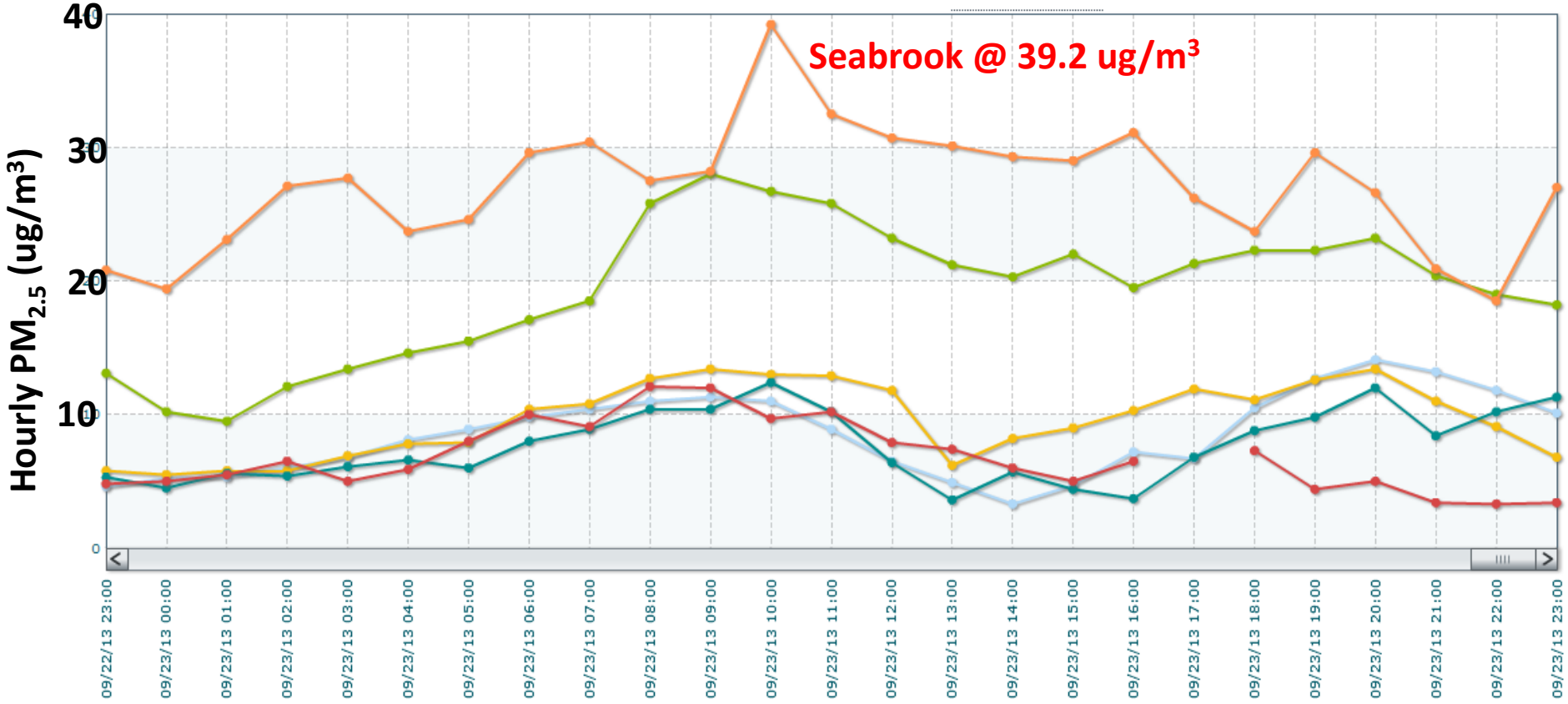


Min(148,2) = 25.0, Max(103,28) = 88.9

Wed September 25 16:00 CST

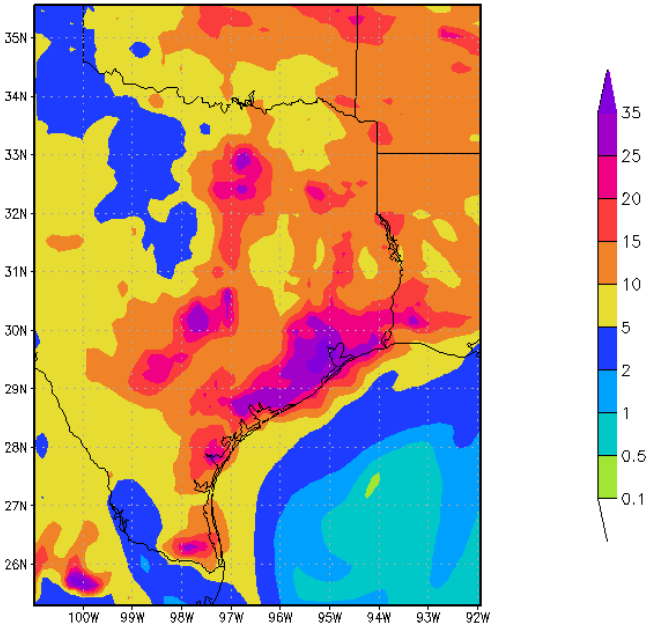
Hourly $PM_{2.5}$ (airnowtech.org)**

September 23rd



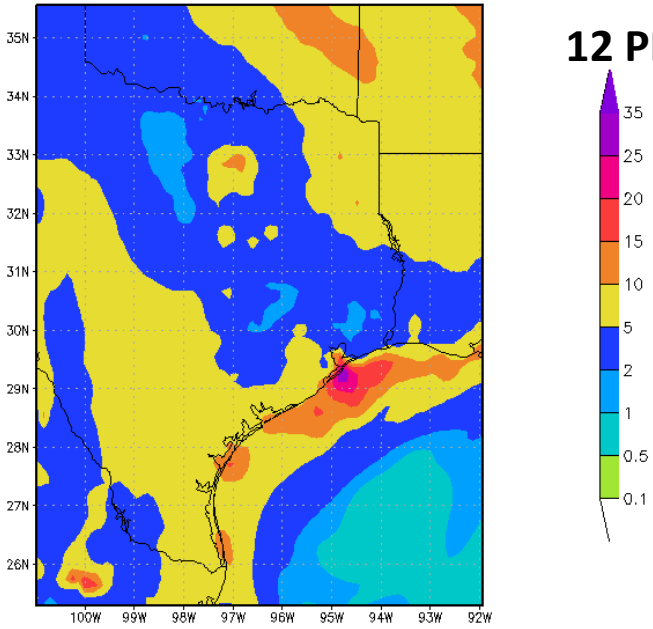
(dev) sfc pm25 32H VALID 14Z 25 SEP2013 [$\mu g/m^3$]

9 AM



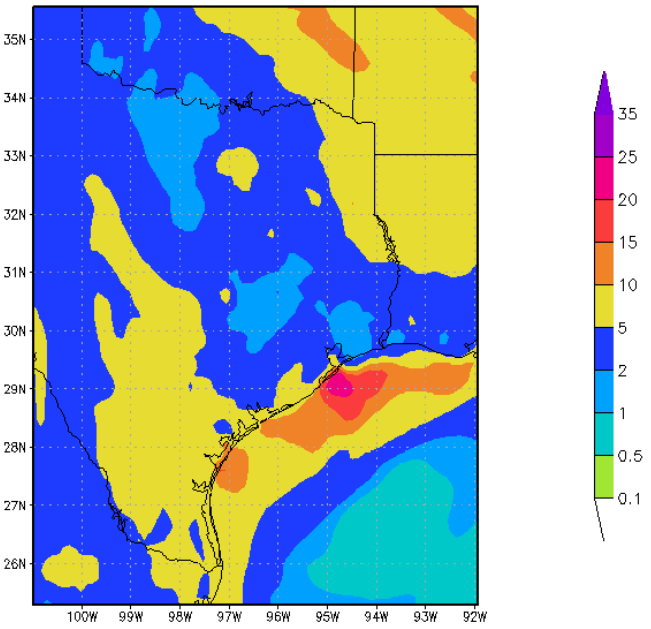
(dev) sfc pm25 35H VALID 17Z 25 SEP2013 [$\mu g/m^3$]

12 PM



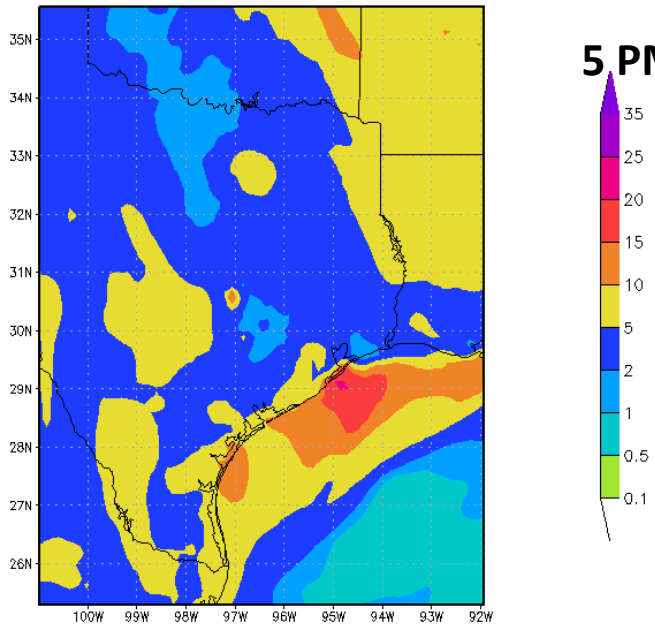
(dev) sfc pm25 37H VALID 19Z 25 SEP2013 [$\mu g/m^3$]

2 PM

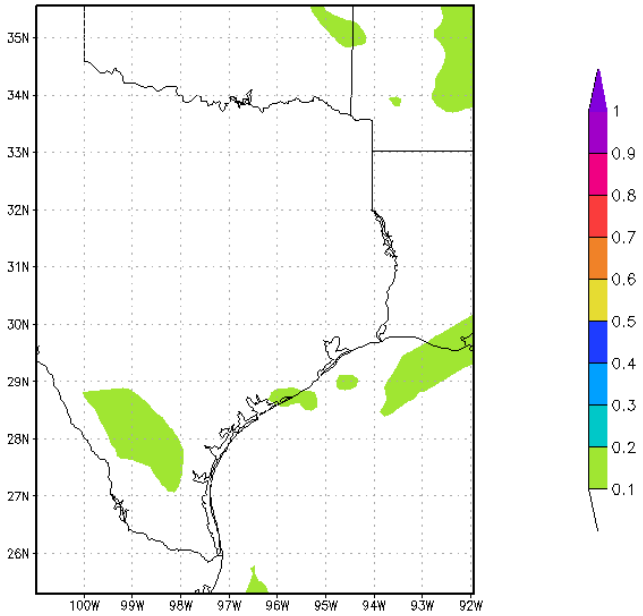


(dev) sfc pm25 40H VALID 22Z 25 SEP2013 [$\mu g/m^3$]

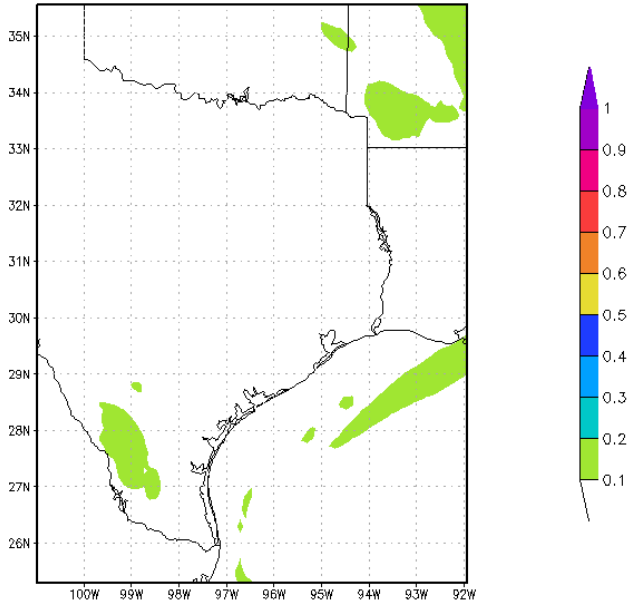
5 PM



(dev) aot 32H VALID 14Z 25 SEP2013 [dimensionless]



(dev) aot 35H VALID 17Z 25 SEP2013 [dimensionless]



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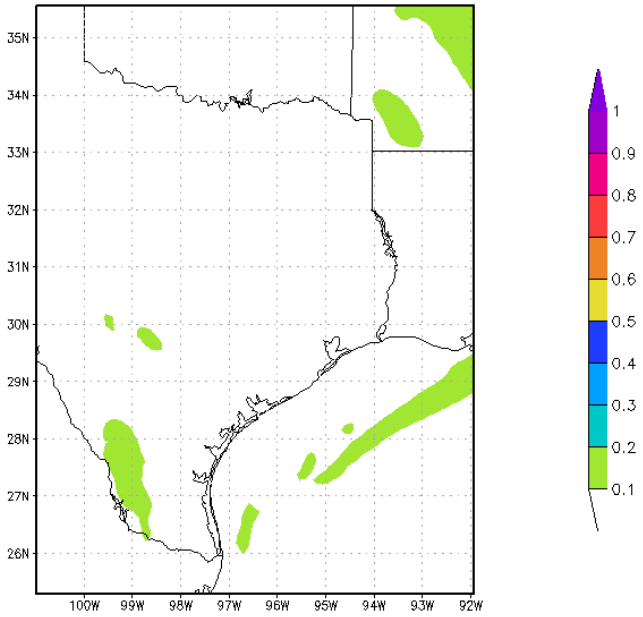

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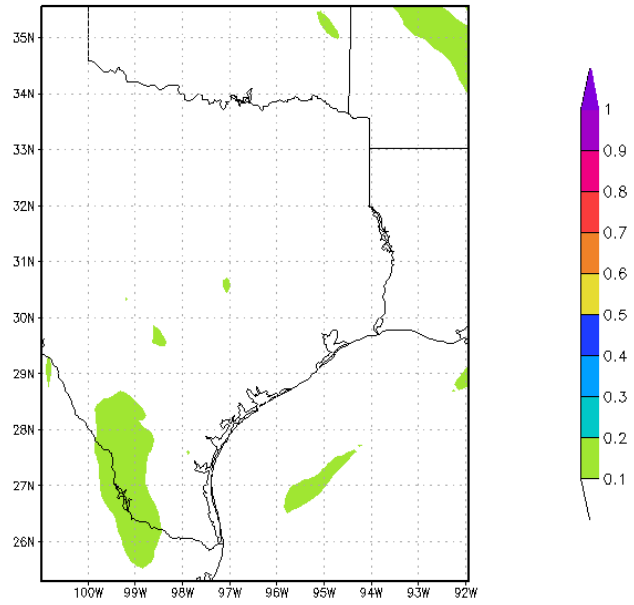
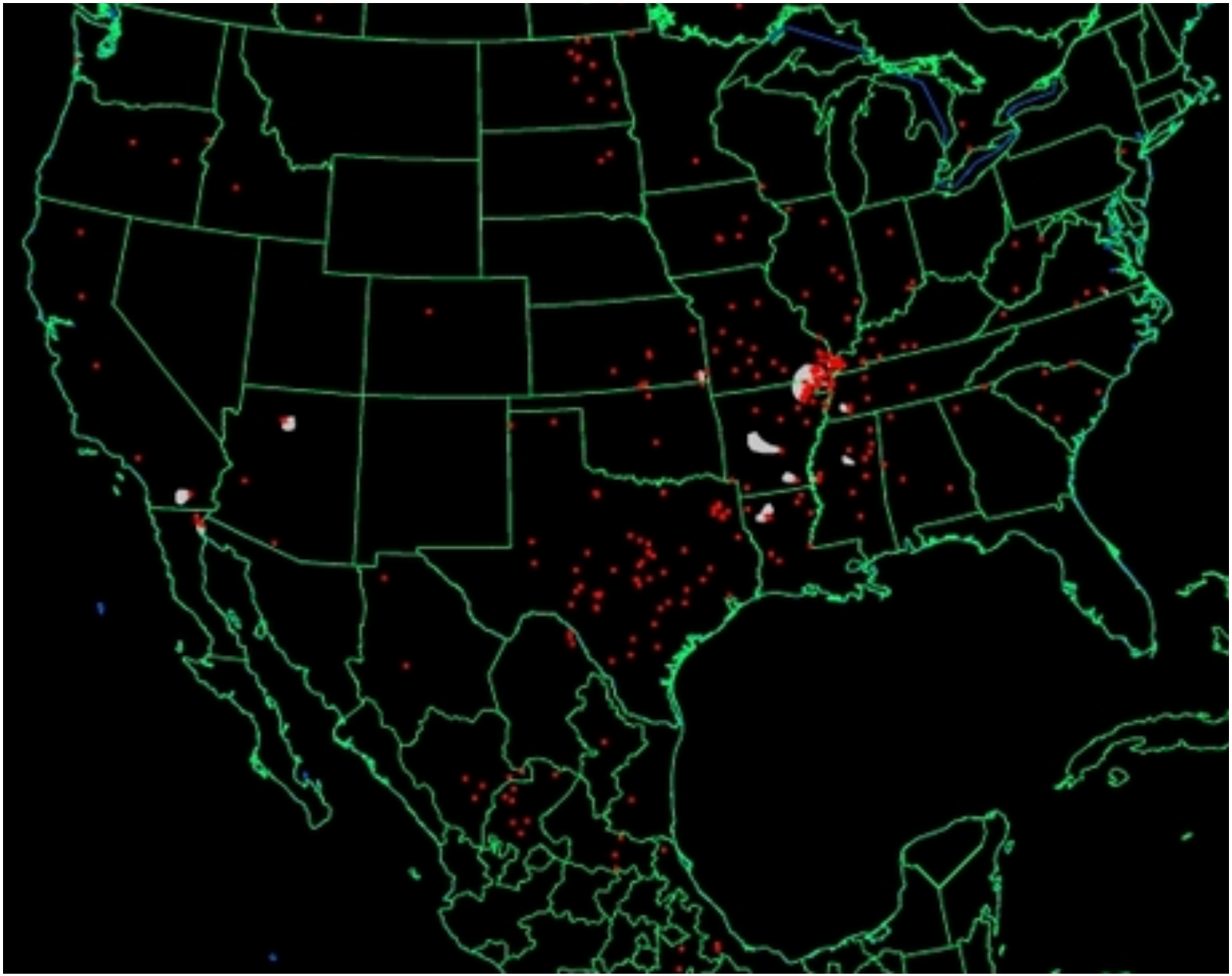
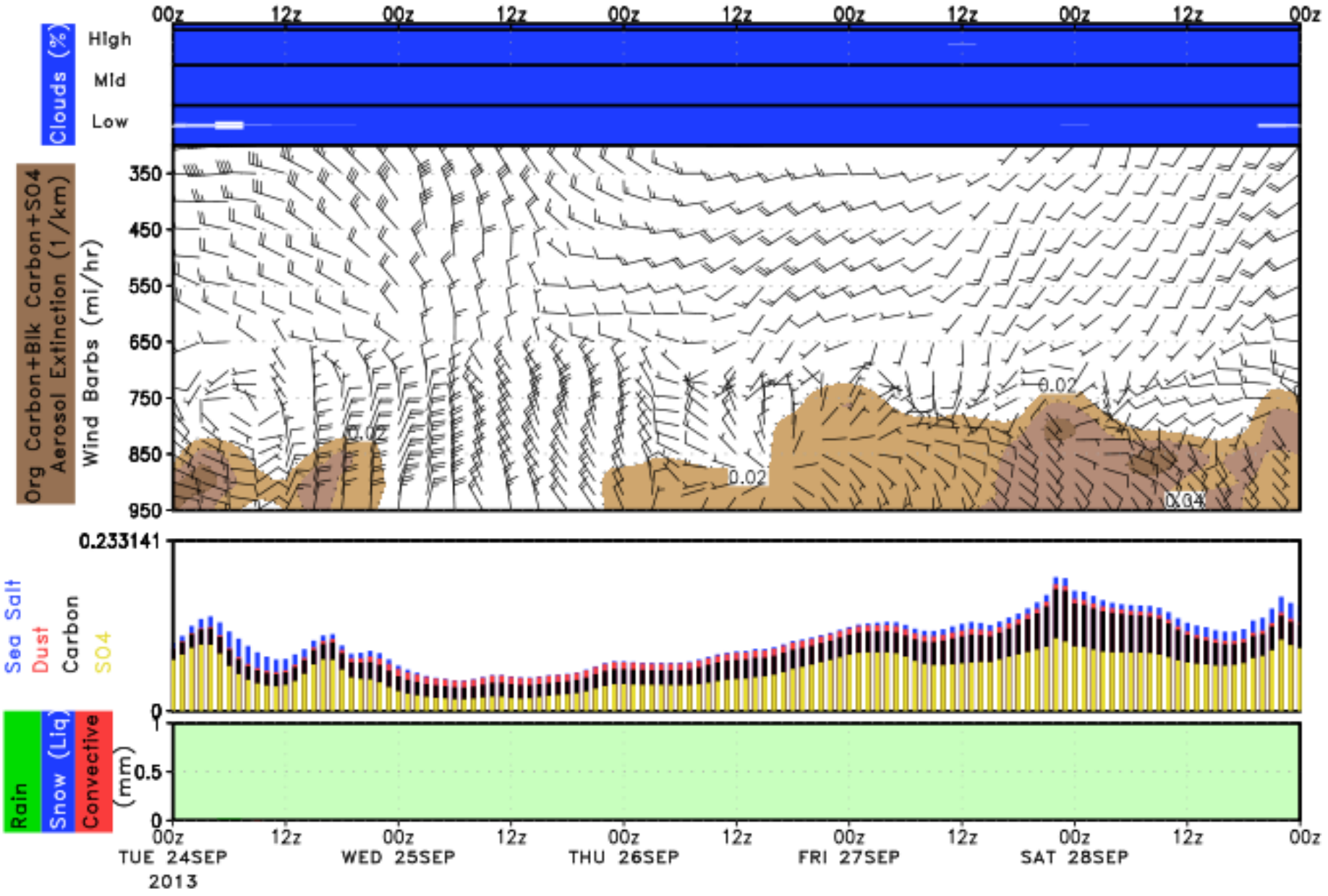


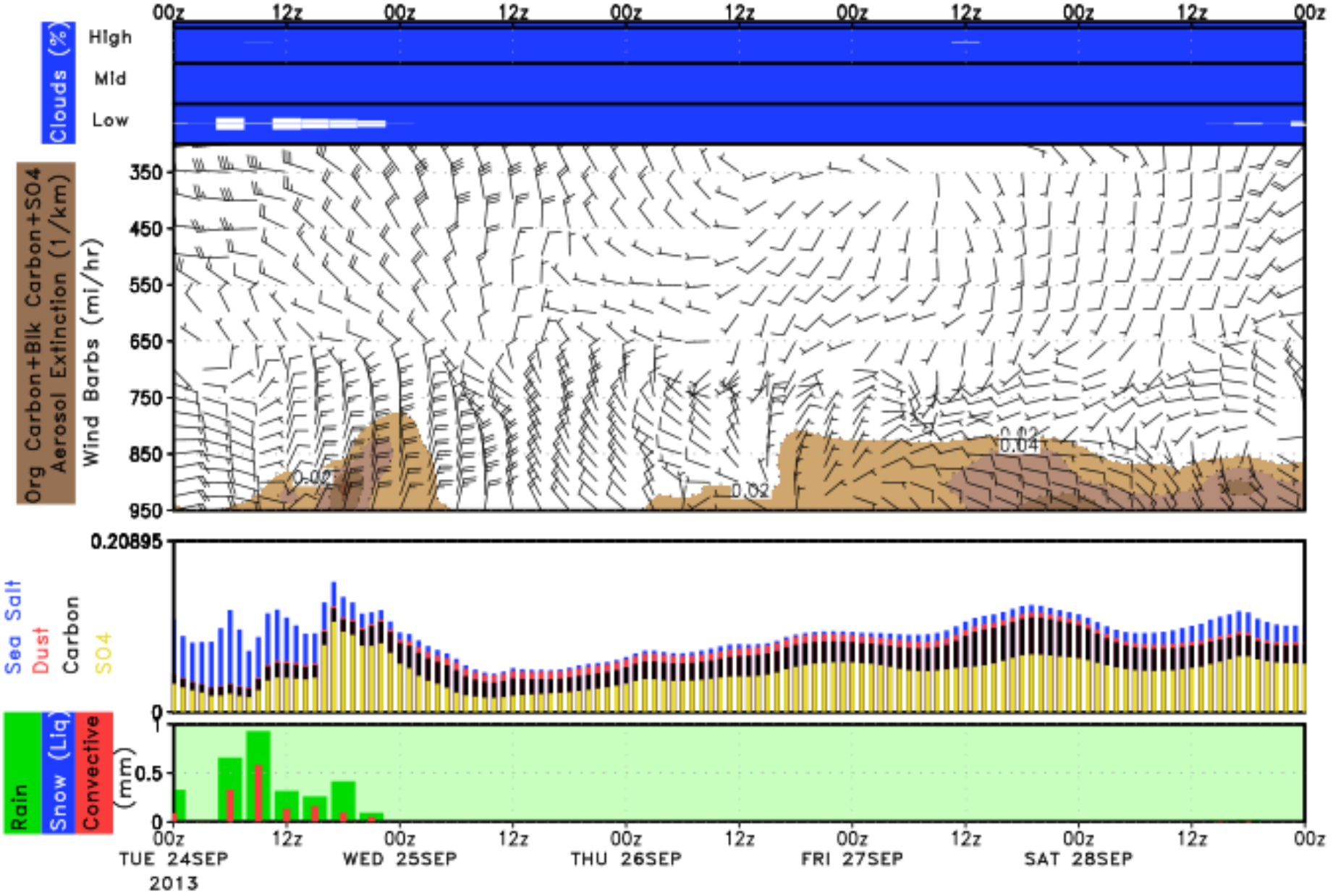
Agricultural fires have started again!



CONROE

Low AOD



GALVESTON

Low AOD