DISCOVER-AQ OUTLOOK -- September 26, 2013

Electrical issues delayed takeoff of the P-3B until after 11:30am today. However, two full circuits and an additional excursion to NW Harris Co. and Conroe were completed. Ozone rose highest N and NW of Houston as expected under S-SE winds w/ Jones Forest peaking at 101 ppbv 1-hr avg. The TCEQ forecast for today was Code Orange N-NW of Houston for ozone and Code Yellow $PM_{2.5}$.

Tomorrow (Friday) DISCOVER-AQ will fly what looks like its last full science flight of the campaign. Gulf moisture will begin to overspread the region, with more widespread cumulus cloud coverage expected. These clouds are not likely to affect any profiling, however. The sustained SE wind from the Gulf will bring in lower background pollution, thus TCEQ expects Code Yellow for ozone and Code Green for $PM_{2.5}$.

Saturday does not appear to be conducive to flying. Moisture will continue to stream from the Gulf, increasing cloud cover to a more broken or possibly overcast deck at times with afternoon rain showers expected as a cold front approaches from the NW.

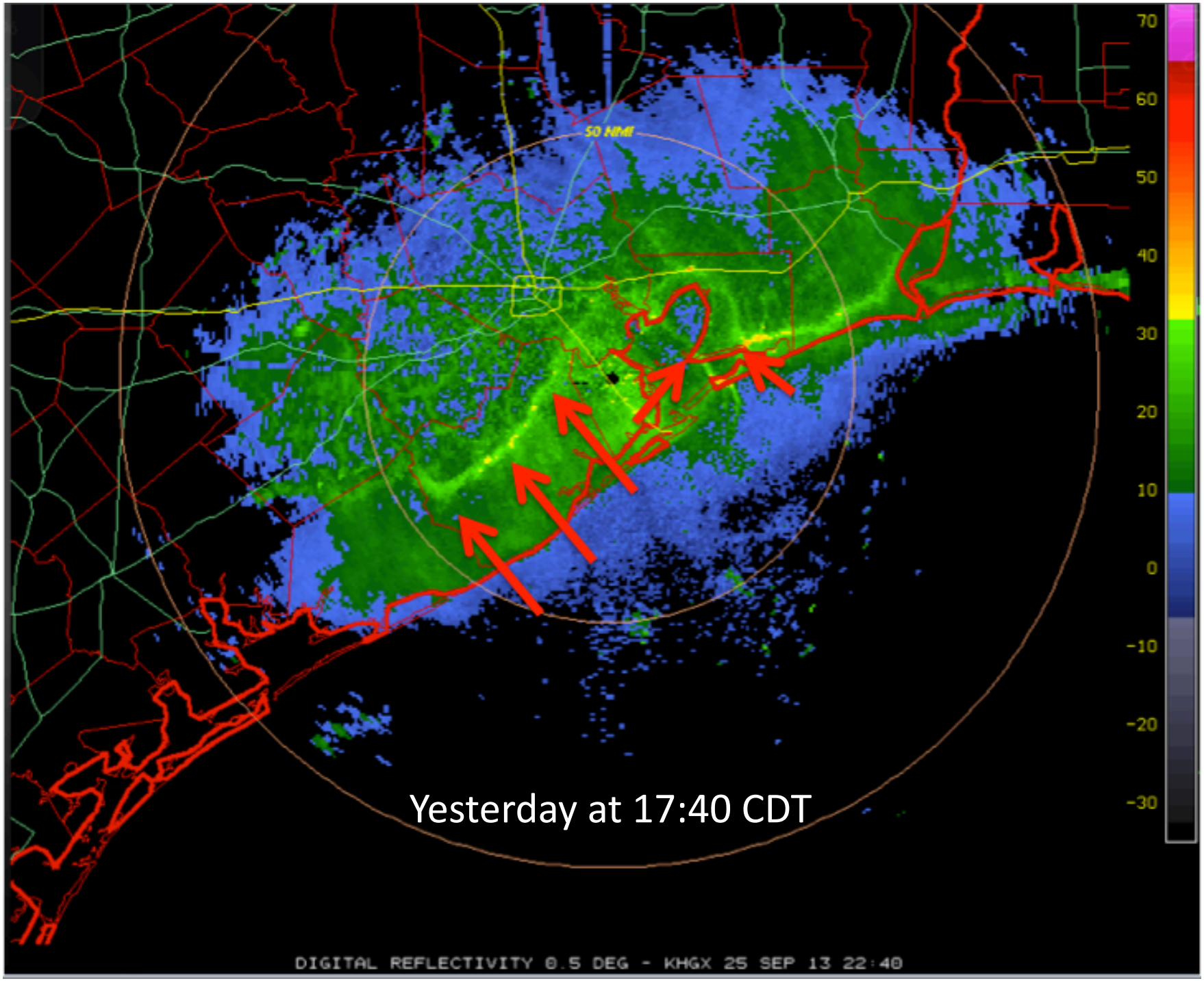
Sunday will not be a good day to fly, either. The cold front will be draped through C. TX and shower and thunderstorm activity will increase through the day. Overcast skies are possible for much of the region. Sunday, though, may be a transit day, with the potential for investigating fire activity in the MS Valley. The forecast for that area is rainy and cloudy as well, and we will need to continue to monitor the likelihood for rain through the MS Valley to assess the ability to track fires there.

9/26/2013 Weather Briefing

Ryan Stauffer

Recommendations

- Friday: Likely Fly Day. Large-scale flow from the Gulf will clean things out, but should be ok to fly with a cumulus field to watch develop during the day. Timing of return to deep Gulf moisture is slowing down though = good for later Friday
- Saturday: Likely NO Fly Day. Cloud cover and some PM rain showers stream from Gulf with deep moisture flow ahead of cold front. *In case of emergency* Saturday can be put in our back pocket at this point
- Sunday: Likely NO Fly Day. May be a transit day. Forecast looks unfavorable for fire sniffing with rain extending through MS valley all day. It will certainly not be good for a science flight here with widespread showers and t-storms


70
60
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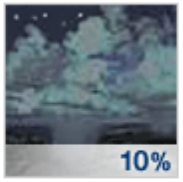
50 NMI
Yesterday at 17:40 CDT
DIGITAL REFLECTIVITY 0.5 DEG - KHGX 25 SEP 13 22:40

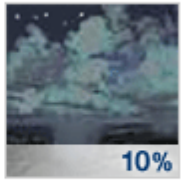
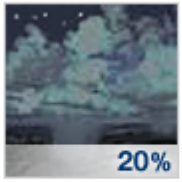
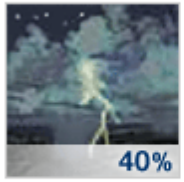
Conroe:

THIS AFTERNOON	TONIGHT	FRIDAY	FRIDAY NIGHT	SATURDAY	SATURDAY NIGHT	SUNDAY	SUNDAY NIGHT	MONDAY
		10%	 10%	30%	30%	50%	50%	20%
Sunny	Mostly Clear	Isolated Showers	Isolated Showers	Chance Thunderstorms	Chance Thunderstorms	Chance Thunderstorms	Chance Thunderstorms	Slight Chc Thunderstorms
High: 95 °F	Low: 65 °F	High: 92 °F	Low: 73 °F	High: 90 °F	Low: 74 °F	High: 84 °F	Low: 67 °F	High: 85 °F

Houston Hobby:

THIS AFTERNOON	TONIGHT	FRIDAY	FRIDAY NIGHT	SATURDAY	SATURDAY NIGHT	SUNDAY	SUNDAY NIGHT	MONDAY
	10%	10%	10%	30%	30%	40%	40%	30%
Sunny	Isolated Showers	Isolated Showers	Isolated Showers	Chance Thunderstorms	Chance Thunderstorms	Chance Thunderstorms	Chance Thunderstorms	Chance Thunderstorms
High: 93 °F	Low: 70 °F	High: 92 °F	Low: 76 °F	High: 89 °F	Low: 75 °F	High: 84 °F	Low: 73 °F	High: 83 °F

Galveston:

THIS AFTERNOON	TONIGHT	FRIDAY	FRIDAY NIGHT	SATURDAY	SATURDAY NIGHT	SUNDAY	SUNDAY NIGHT	MONDAY
	 10%	10%	 20%	30%	20%	40%	 40%	30%
Sunny	Isolated Showers	Isolated Showers	Isolated Showers	Chance Thunderstorms	Slight Chc Thunderstorms	Chance Thunderstorms	Chance Thunderstorms	Chance Thunderstorms
High: 90 °F	Low: 78 °F	High: 87 °F	Low: 80 °F	High: 86 °F	Low: 80 °F	High: 84 °F	Low: 77 °F	High: 82 °F

Current Conditions

Conroe:

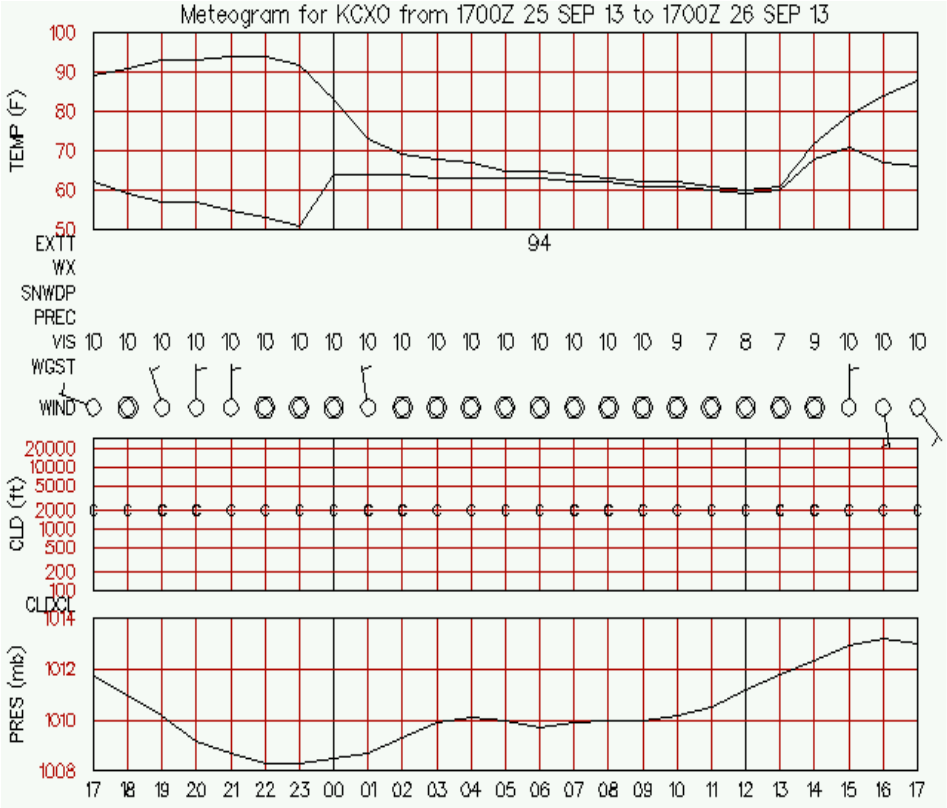
Fair

88°F

31°C

Humidity	48%
Wind Speed	SE 6 mph
Barometer	29.92 in (1013.0 mb)
Dewpoint	66°F (19°C)
Visibility	10.00 mi
Heat Index	90°F (32°C)

Last Update on 26 Sep 11:53 am CDT



Houston Hobby:

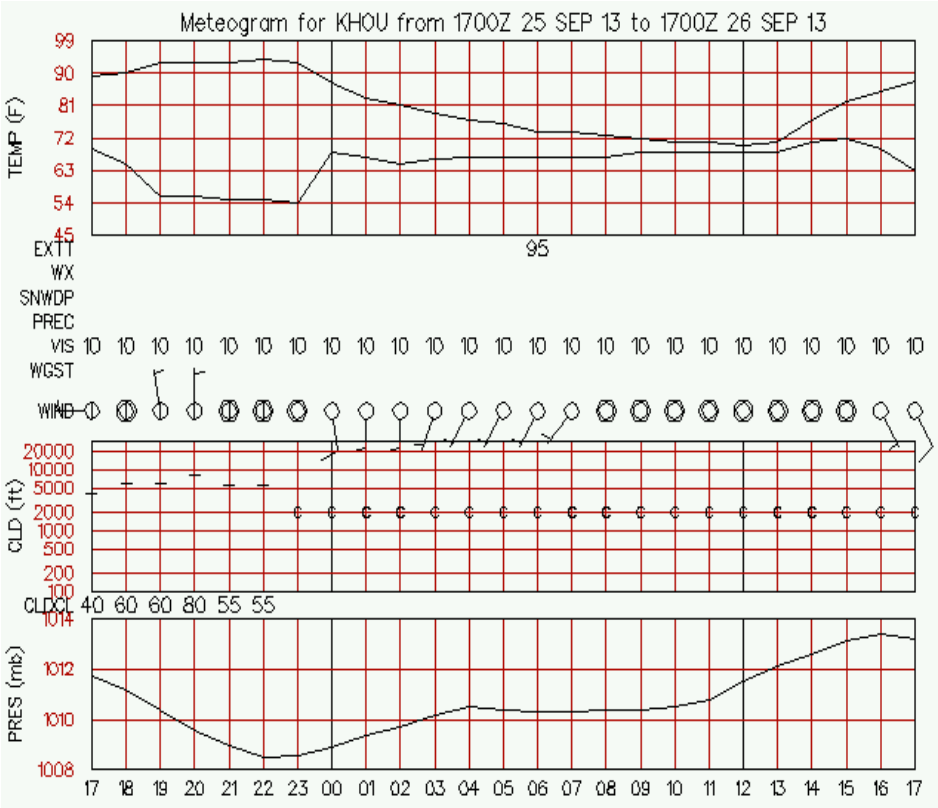
Fair

88°F

31°C

Humidity	43%
Wind Speed	SE 10 mph
Barometer	29.91 in (1013.2 mb)
Dewpoint	63°F (17°C)
Visibility	10.00 mi
Heat Index	89°F (32°C)

Last Update on 26 Sep 11:53 am CDT



Current Conditions

Galveston:

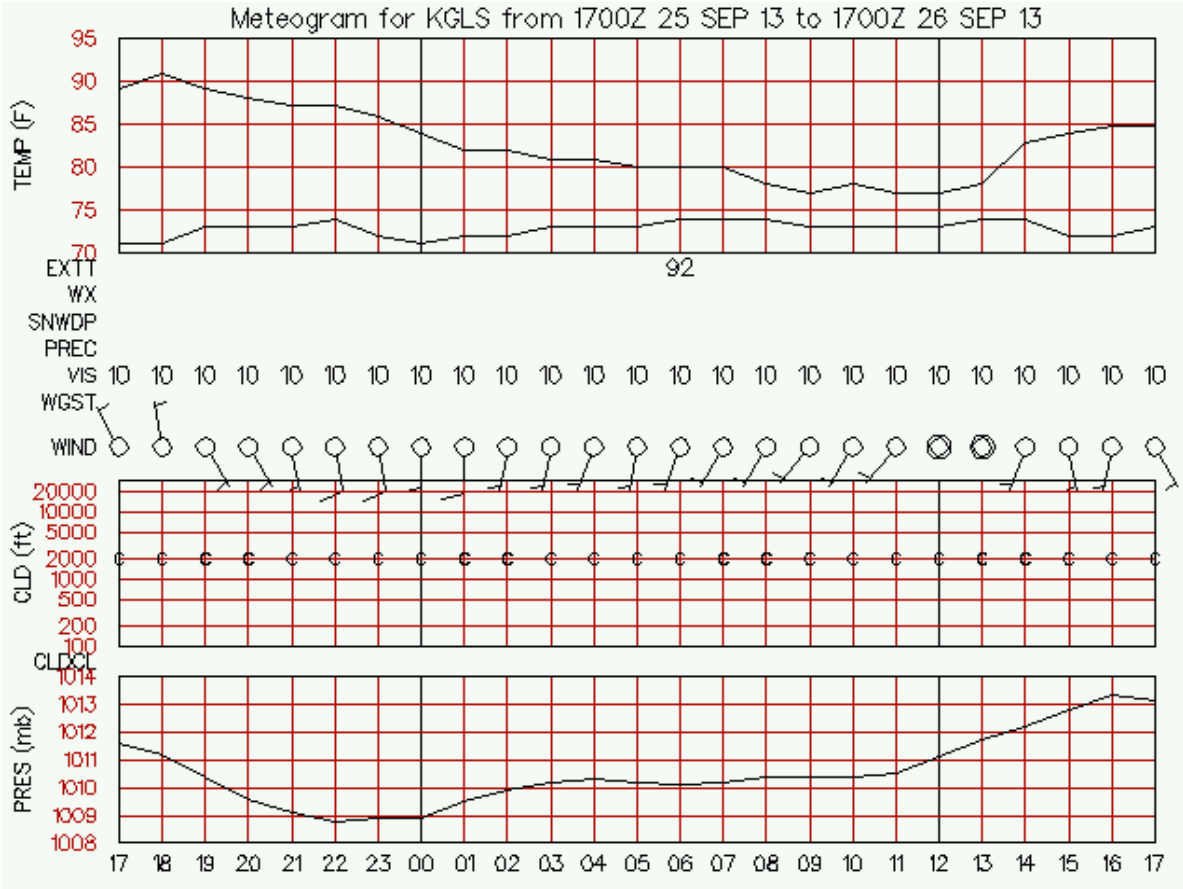
Fair

85°F

29°C

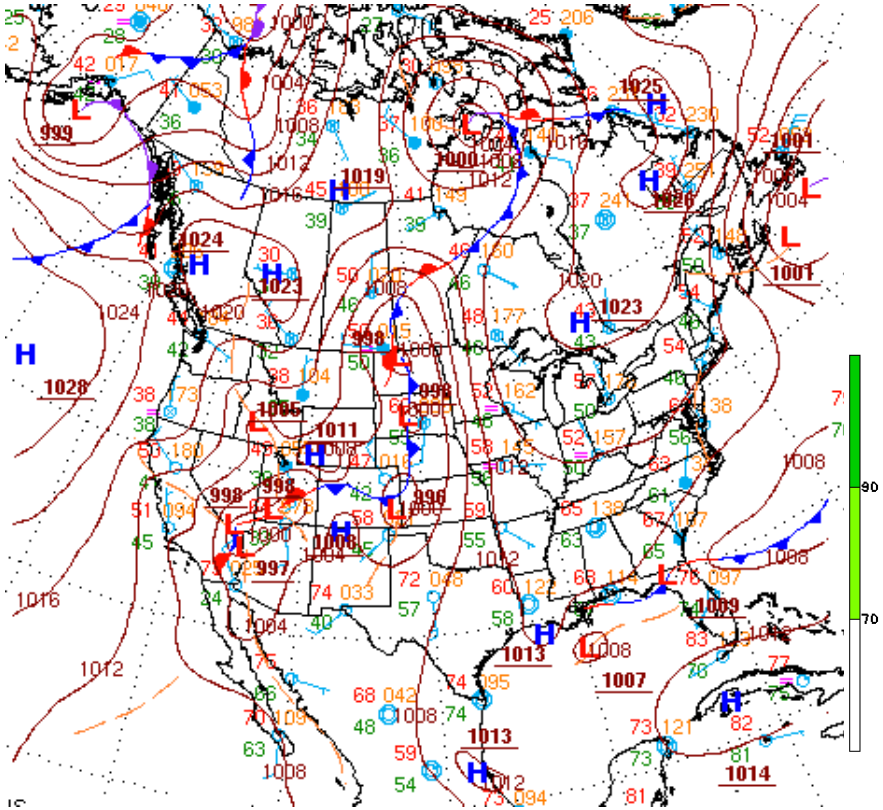
Humidity	68%
Wind Speed	SE 7 mph
Barometer	29.92 in (1013.1 mb)
Dewpoint	73°F (23°C)
Visibility	10.00 mi
Heat Index	92°F (33°C)

Last Update on 26 Sep 11:52 am CDT

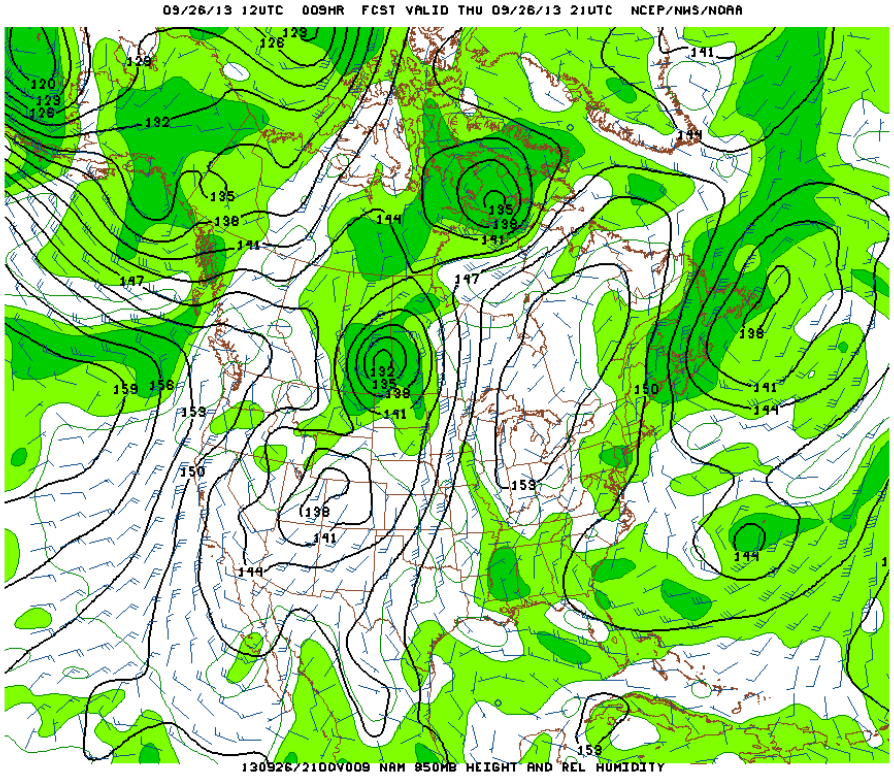


Today: Another great day to fly. Started calm again but low pressure lifting north has turned winds to S-SE. A few PM cumulus expected with addition of some low level moisture

12z Surface Analysis



4 PM CDT NAM
850 mb RH



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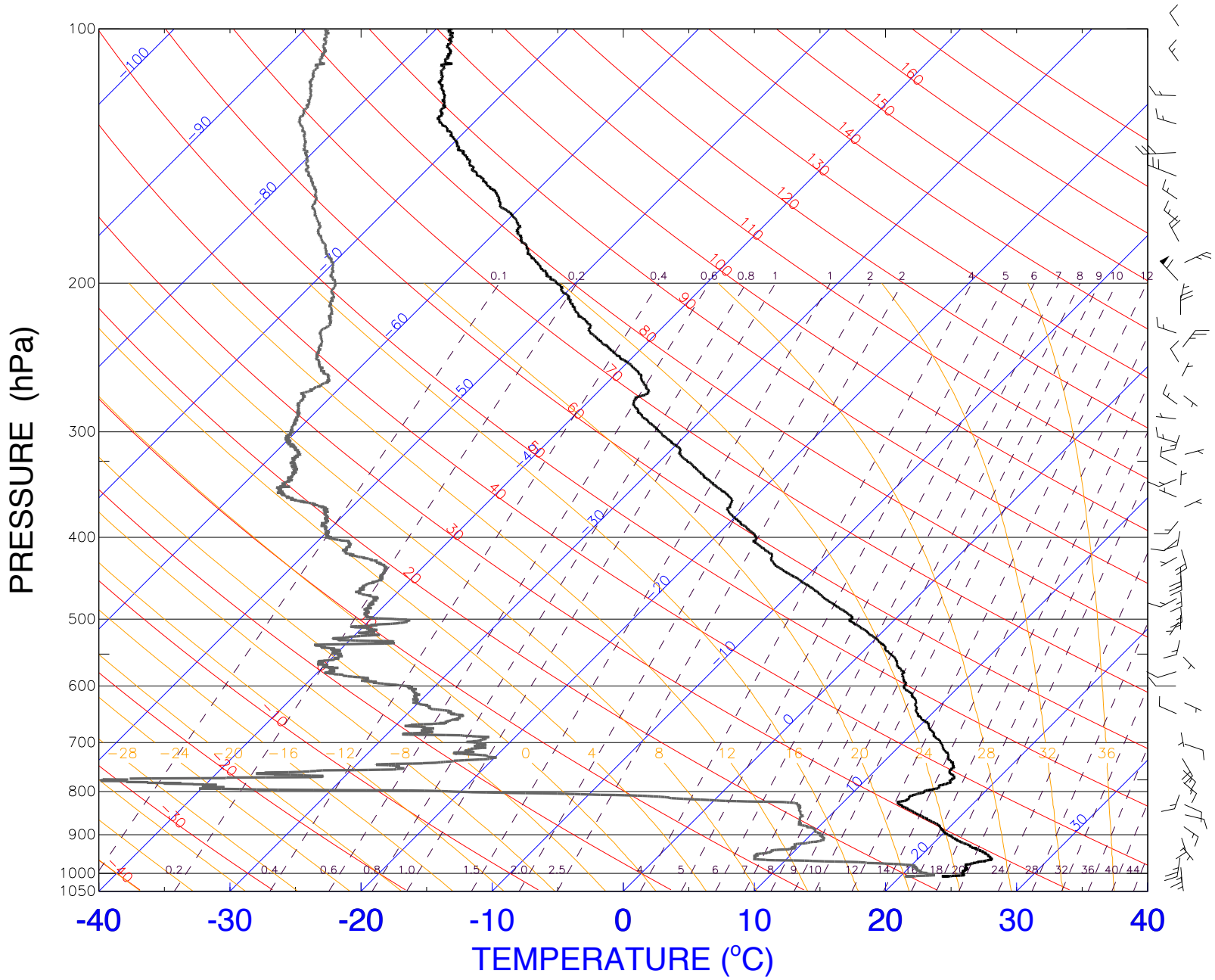
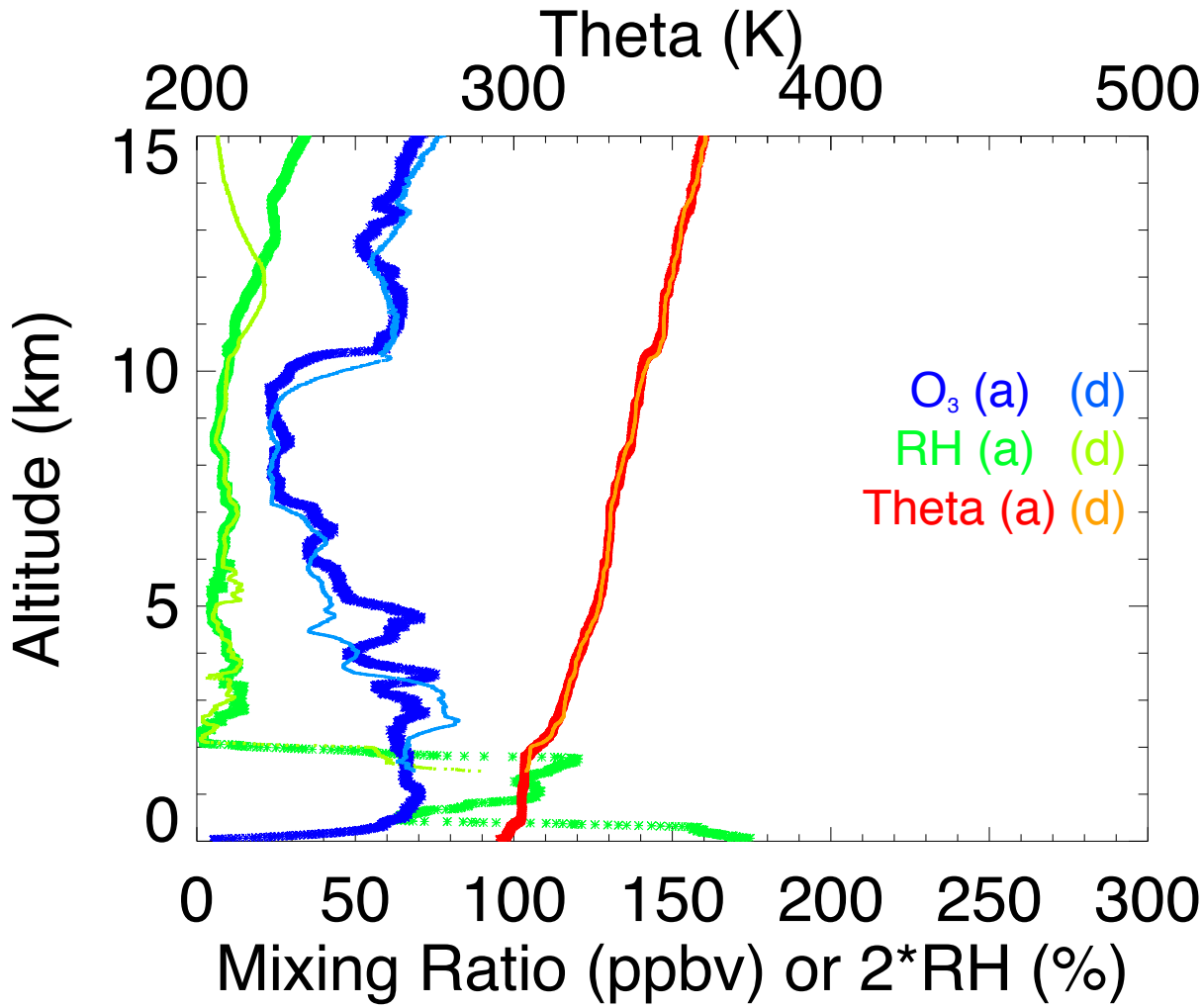
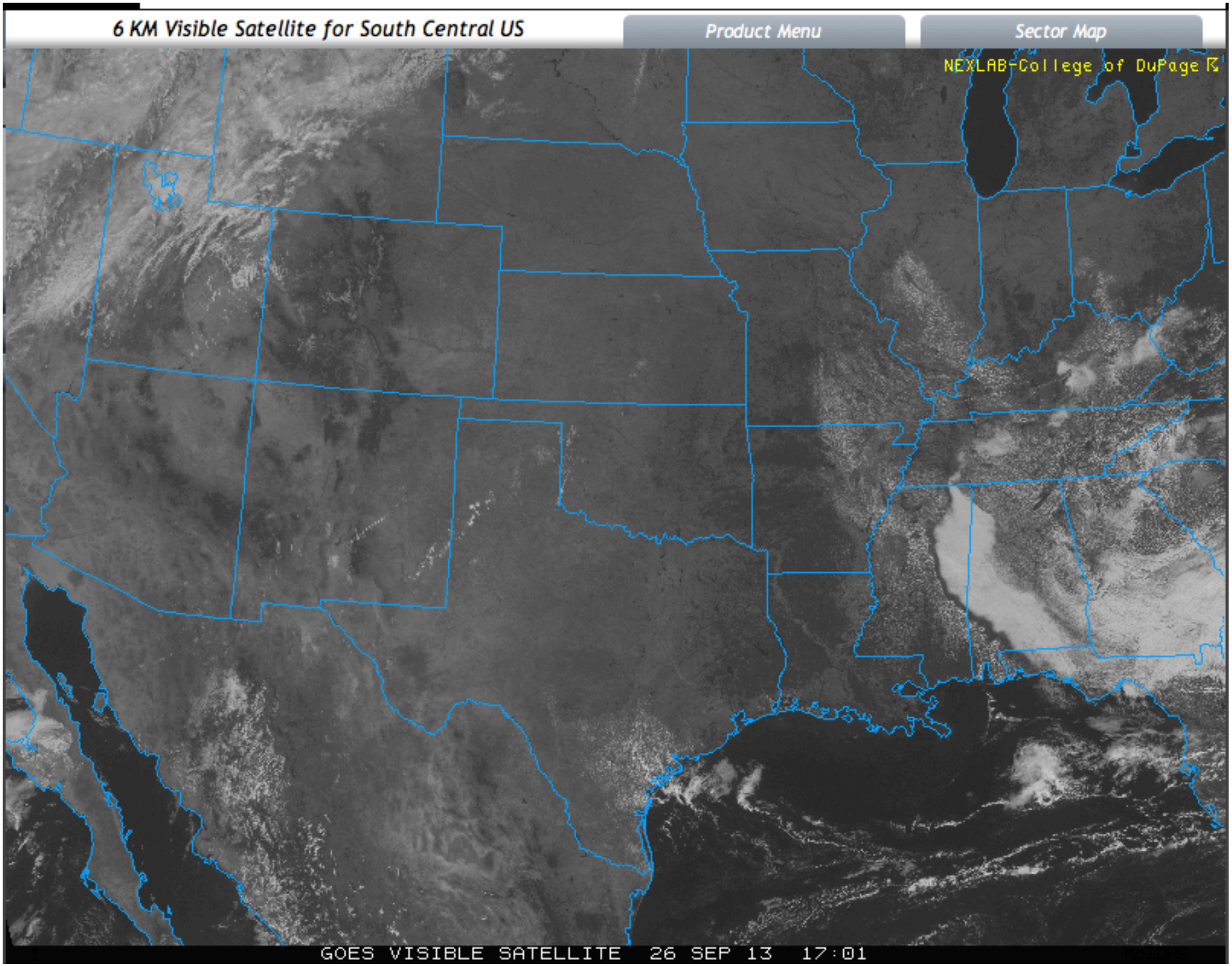
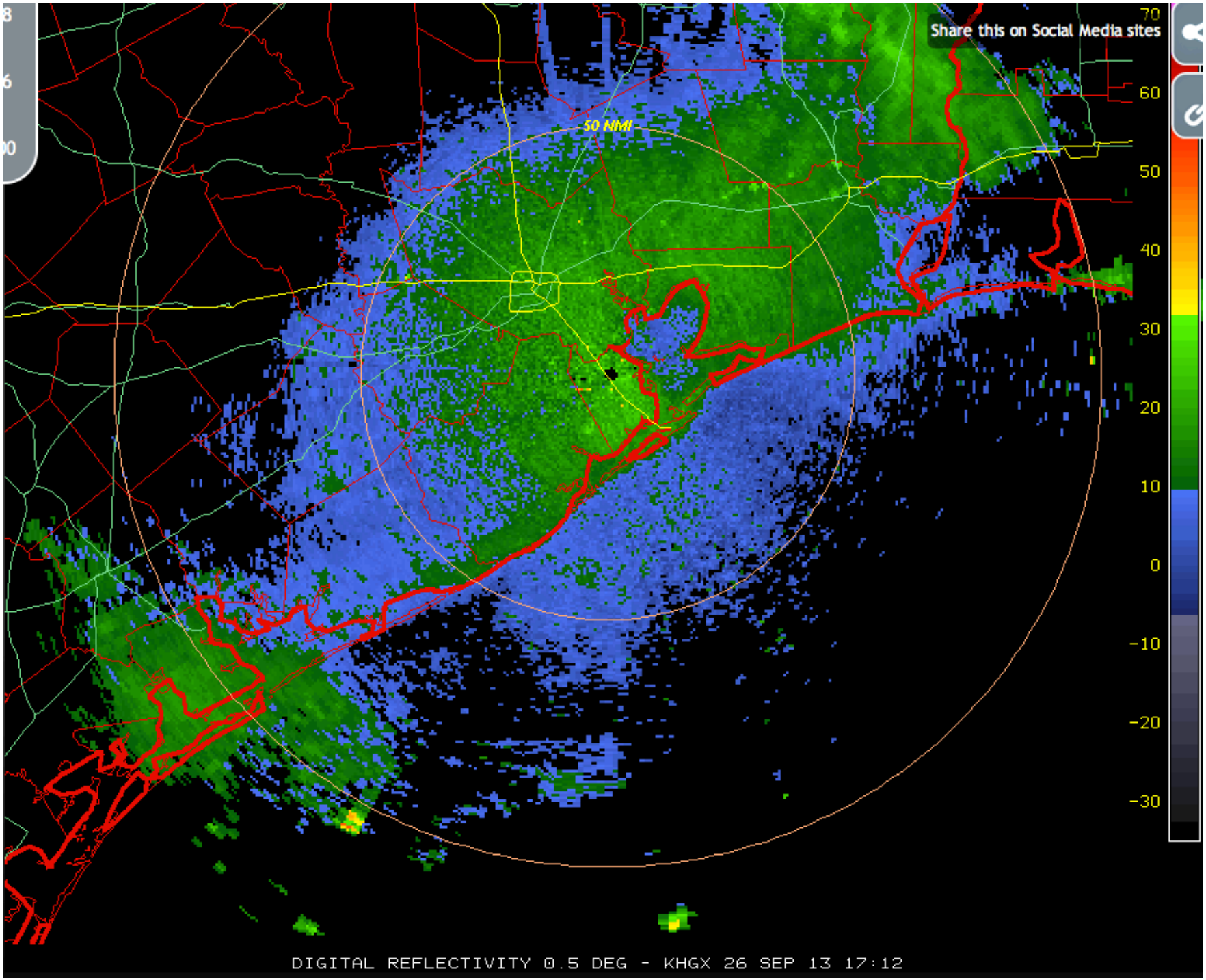


Houston - 2013092612




6 KM Visible Satellite for South Central US
Product Menu
Sector Map
NEXLAB-College of DuPage
GOES VISIBLE SATELLITE 26 SEP 13 17:01


Share this on Social Media sites
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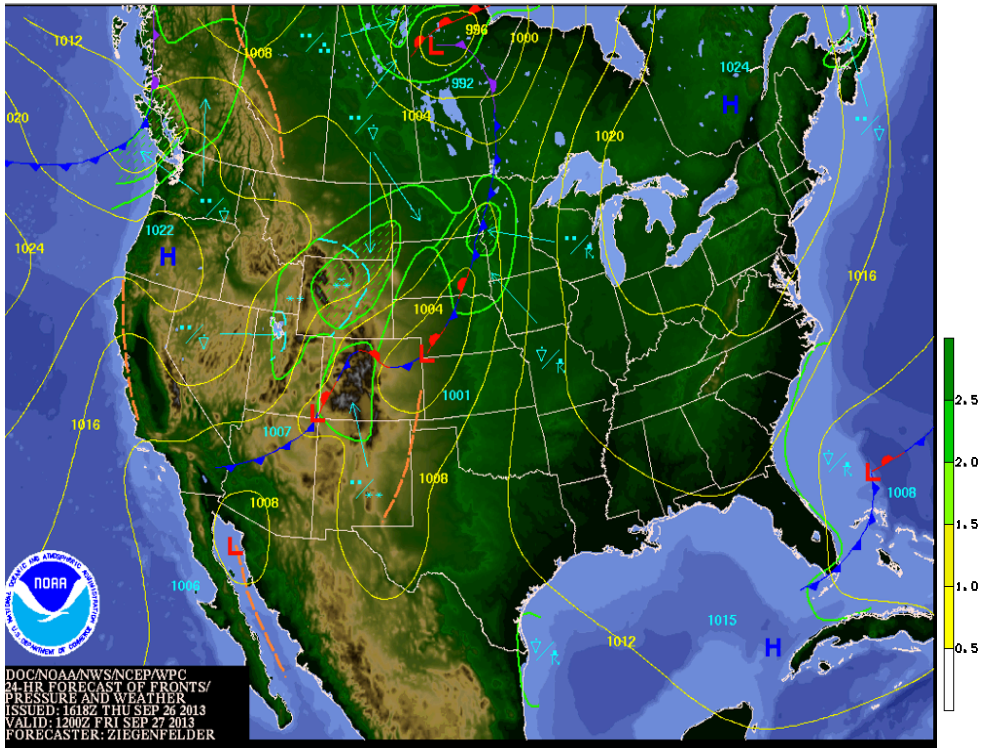
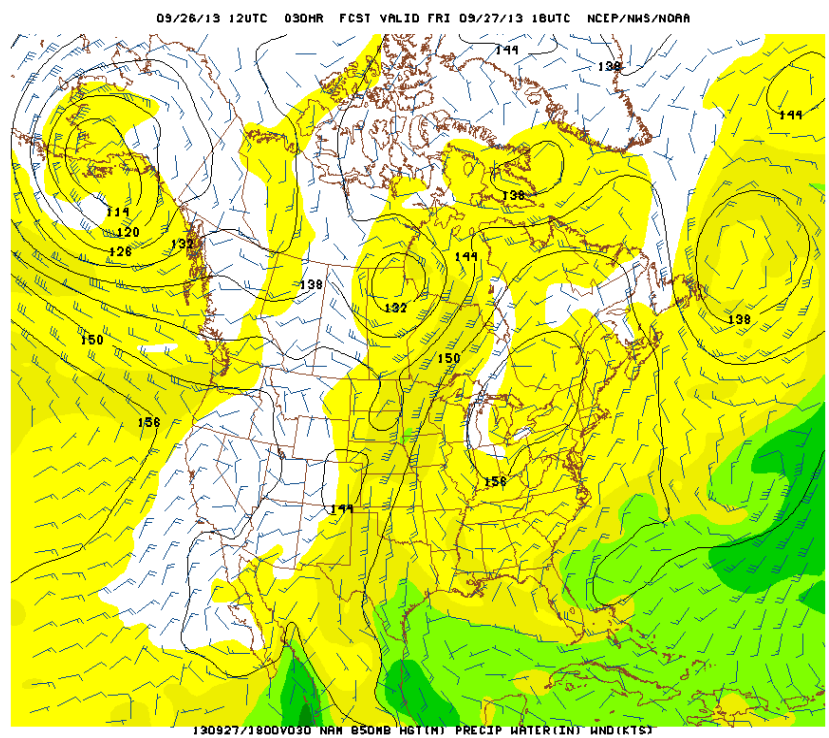
DIGITAL REFLECTIVITY 0.5 DEG - KHGX 26 SEP 13 17:12

Tomorrow: Deeper Gulf moisture returns and will allow for a full cumulus field to develop under S-SE winds, may approach BKN around noon. Models have been slowing the frontal approach a bit, so at most an isolated shower is expected

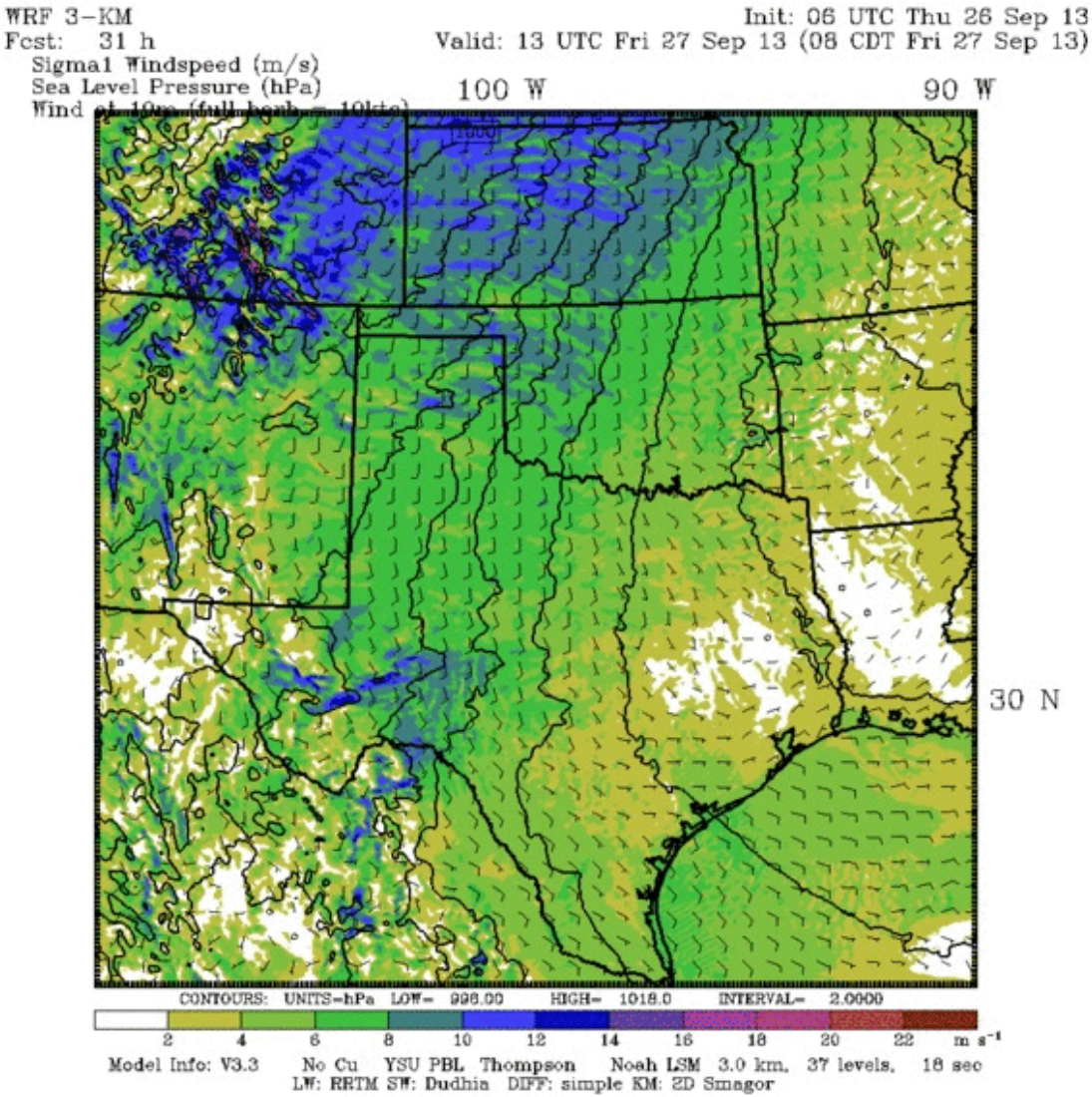
12z Surface Forecast



1 PM CDT NAM
850mb RH



10 m winds 08-20 CDT Tomorrow



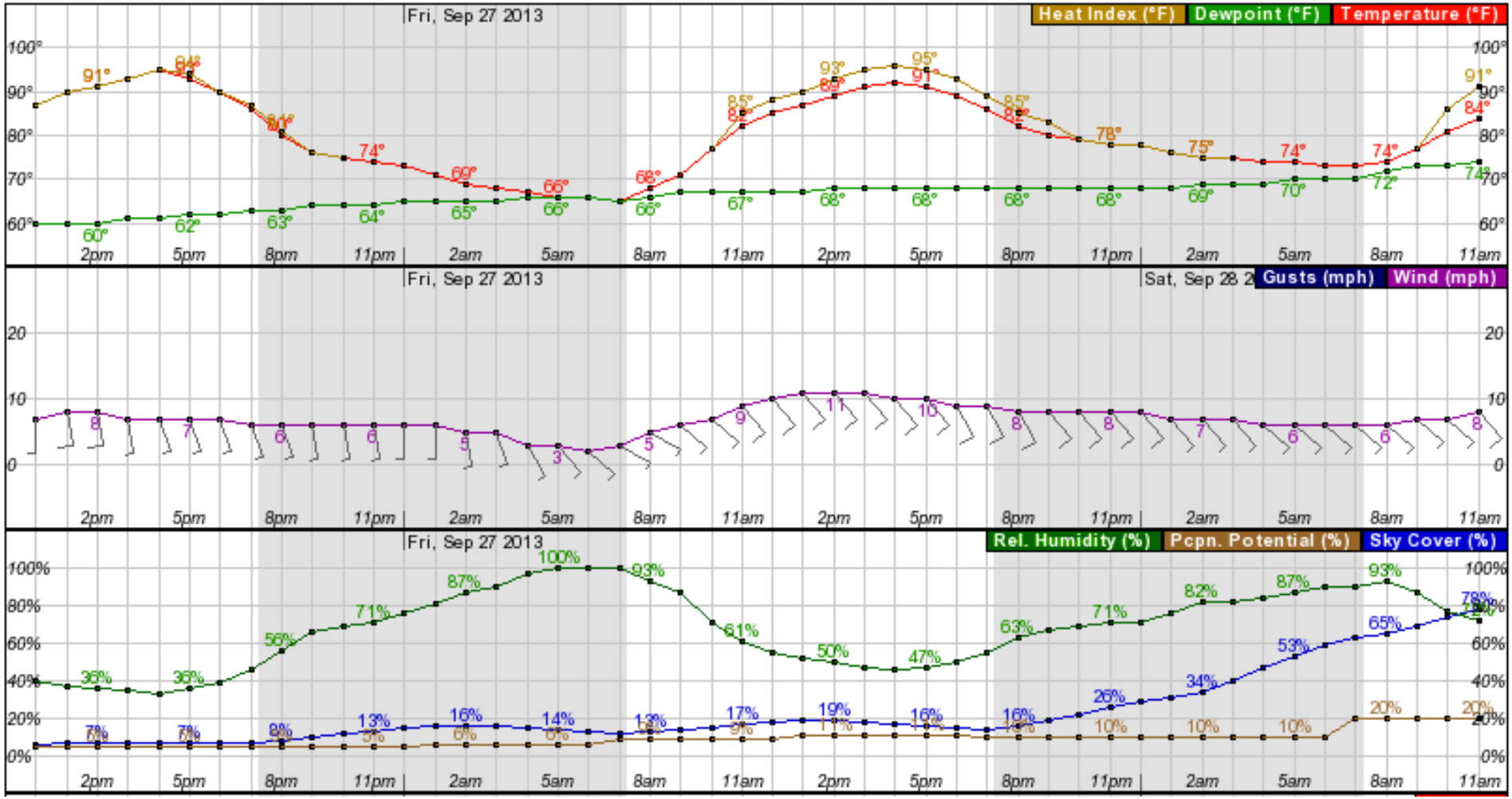
SE winds becoming stronger during the day will help usher in more moisture

Conroe

Today: Winds S-SE but clear skies

Tomorrow: Skies remain mostly clear, a bit stronger from the SE

Today→ **Tomorrow→**

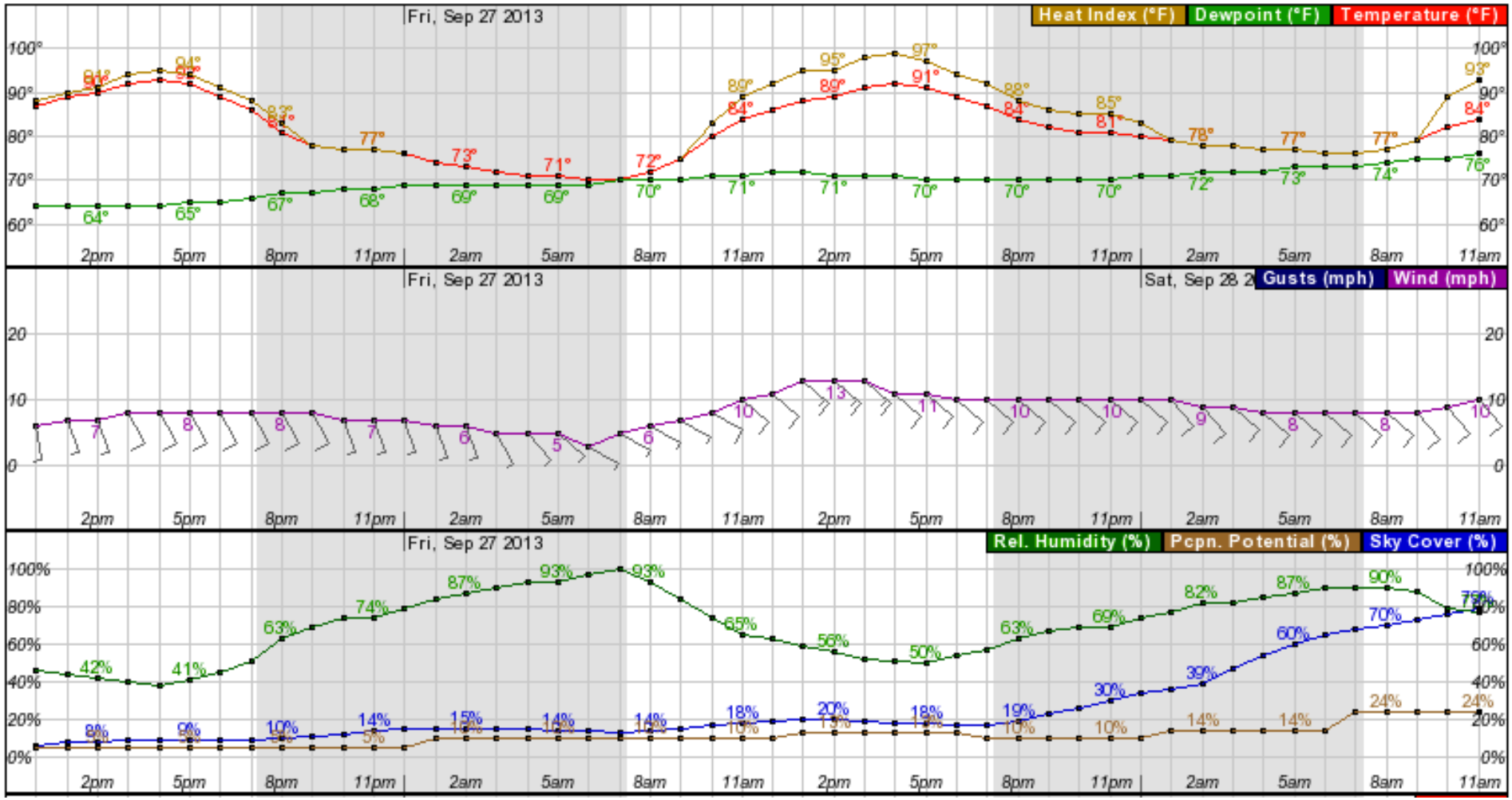


Houston Hobby

Today: Clear and SE wind, dew pts creep up

Tomorrow: Winds stronger from SE, mostly clear

Today→ **Tomorrow→**

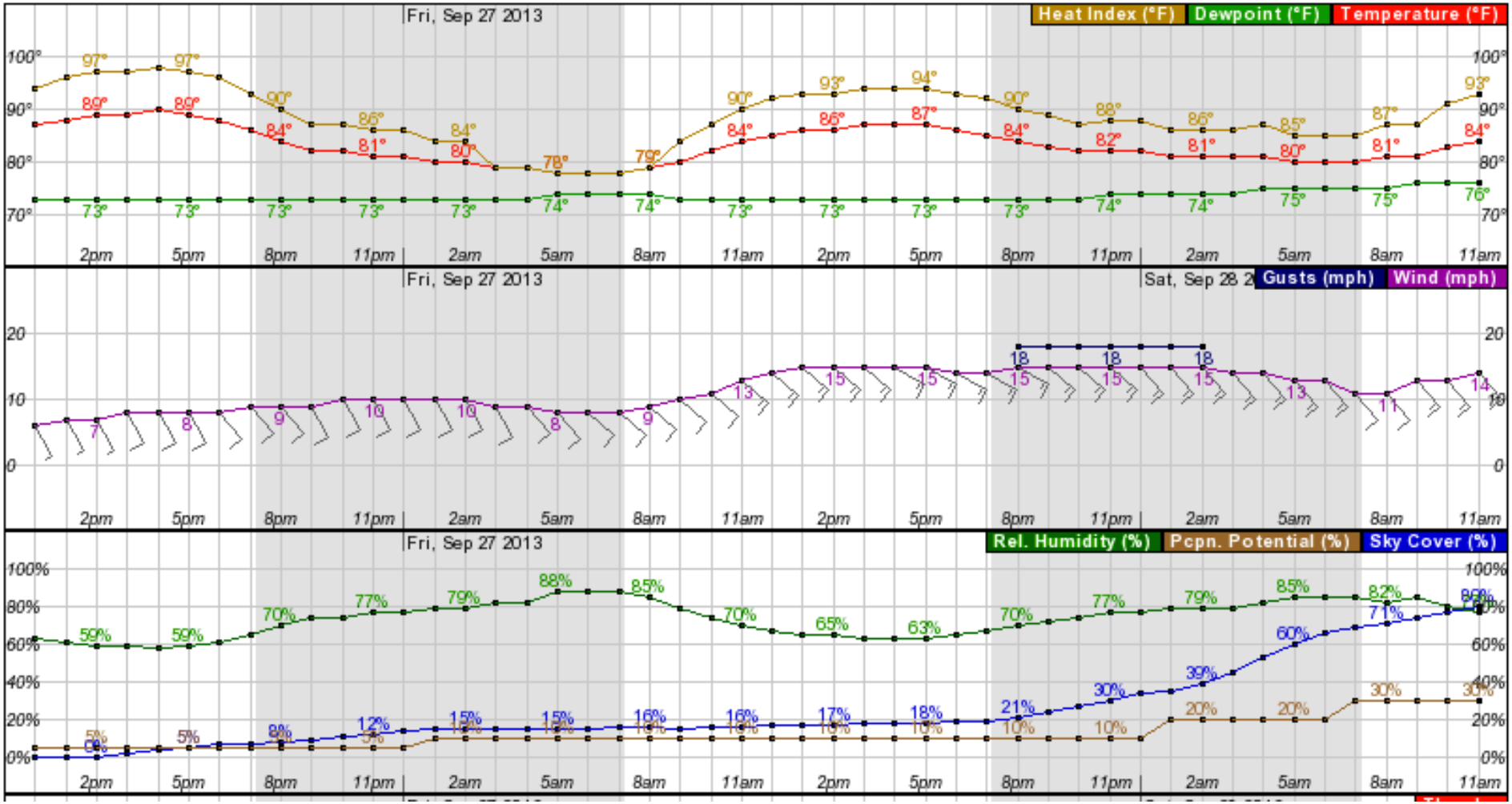


Galveston

Today: Clear

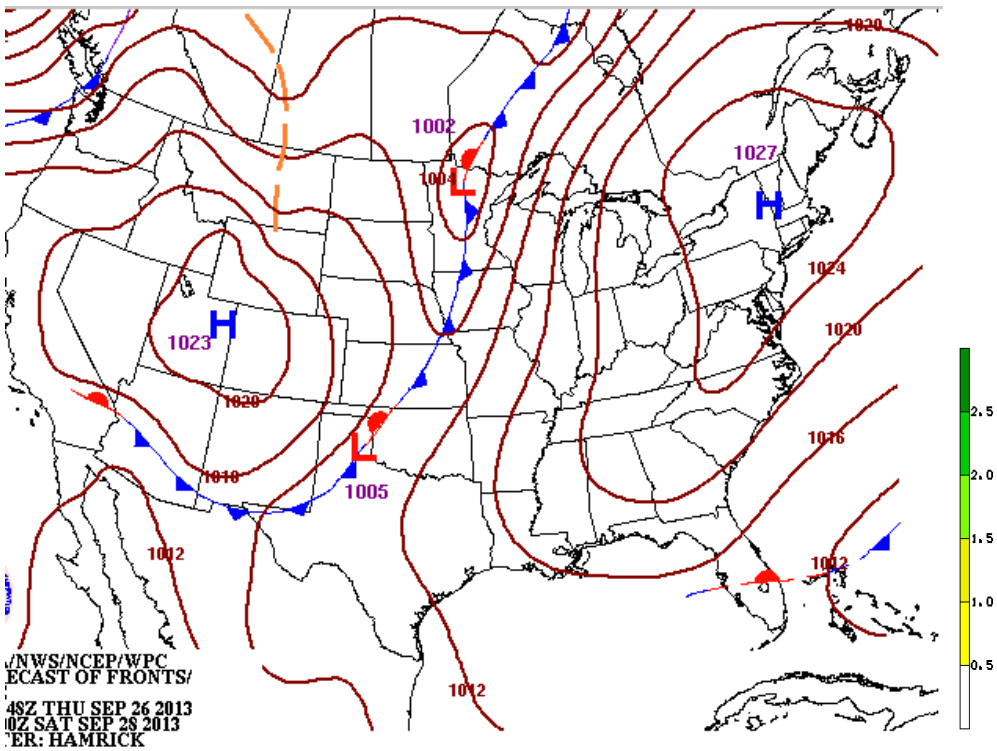
Tomorrow: Stronger SE winds again

Today→ **Tomorrow→**

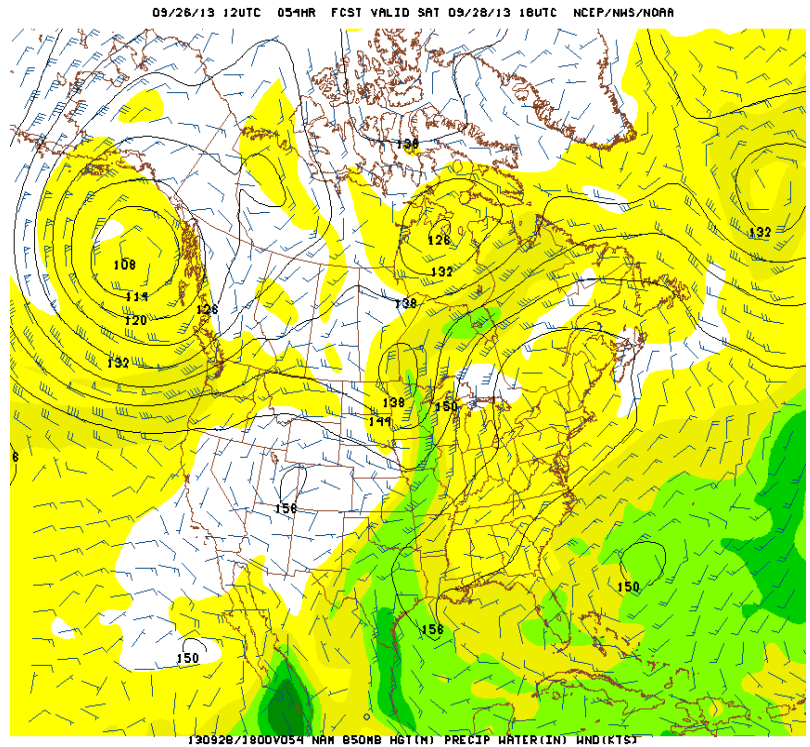


Saturday: Deep Gulf moisture available and more widespread clouds and some afternoon showers expected. Doesn't look as bad as previous days' forecasts and in case of emergency and down day tomorrow, we may be able to get a couple circuits in prior to afternoon

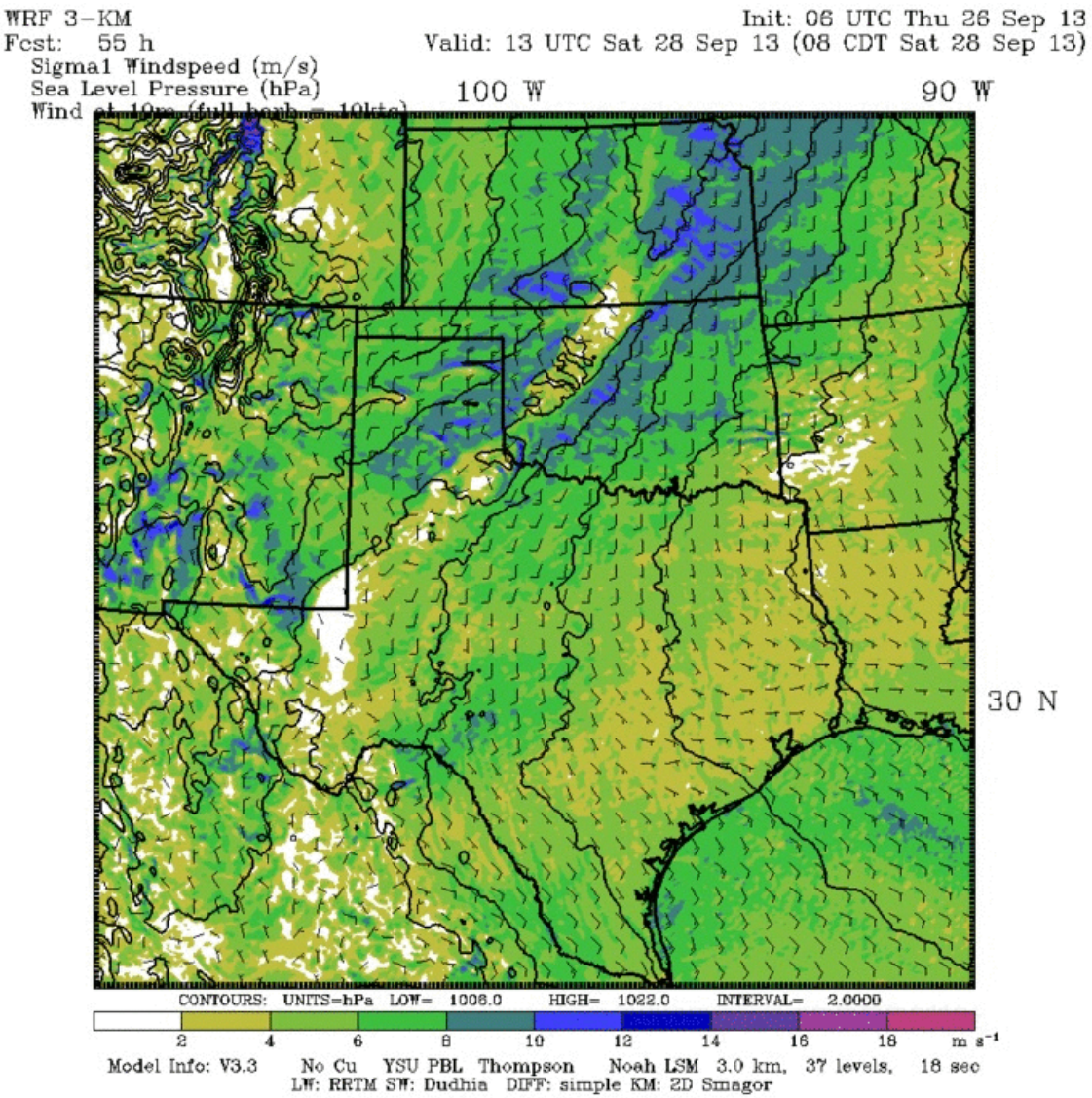
12z Surface Forecast



1 PM CDT NAM
Precipitable Water



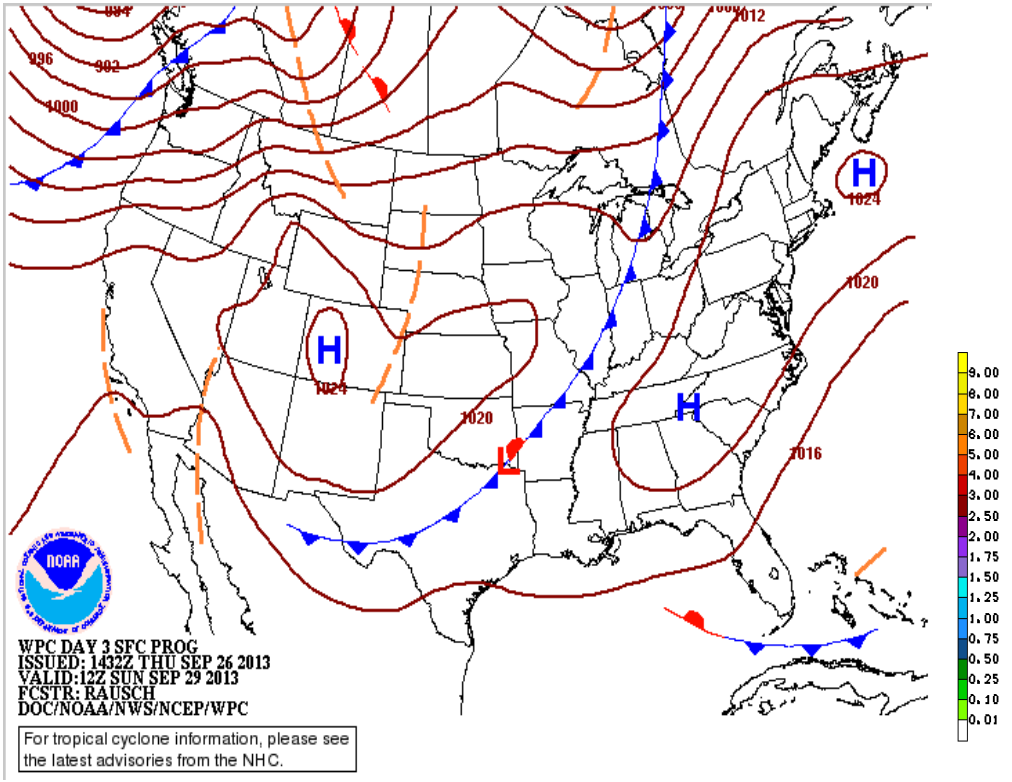
10 m winds 08-13 CDT Saturday



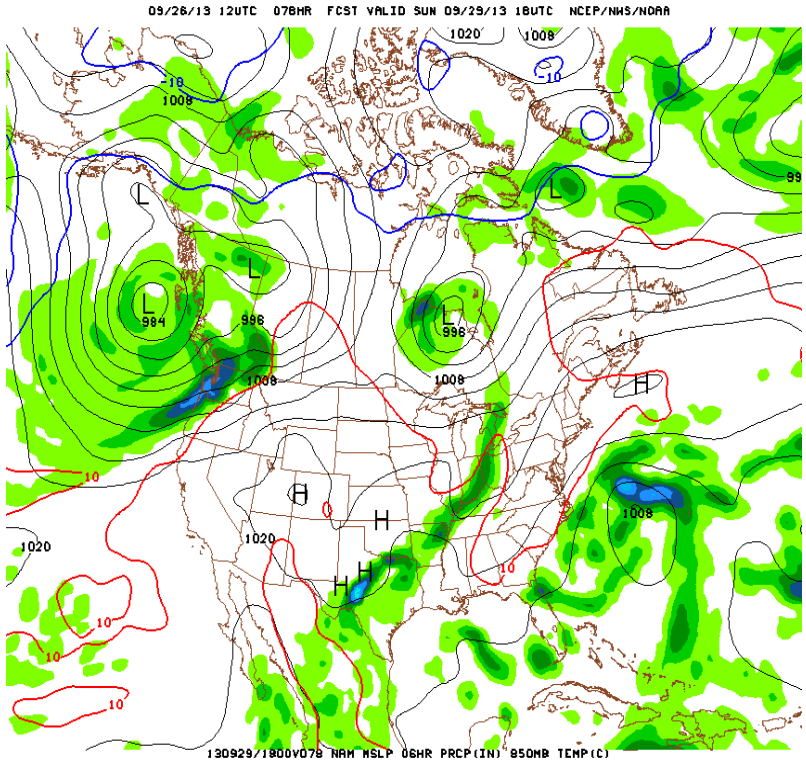
Front moving through western TX, noticeable in the wind shift. Winds here still from SE

Sunday: Cloud cover increases to BKN-OVC, widespread showers and storms line the cold front. Will keep an eye on the timing of the rain in MS valley for transit flight

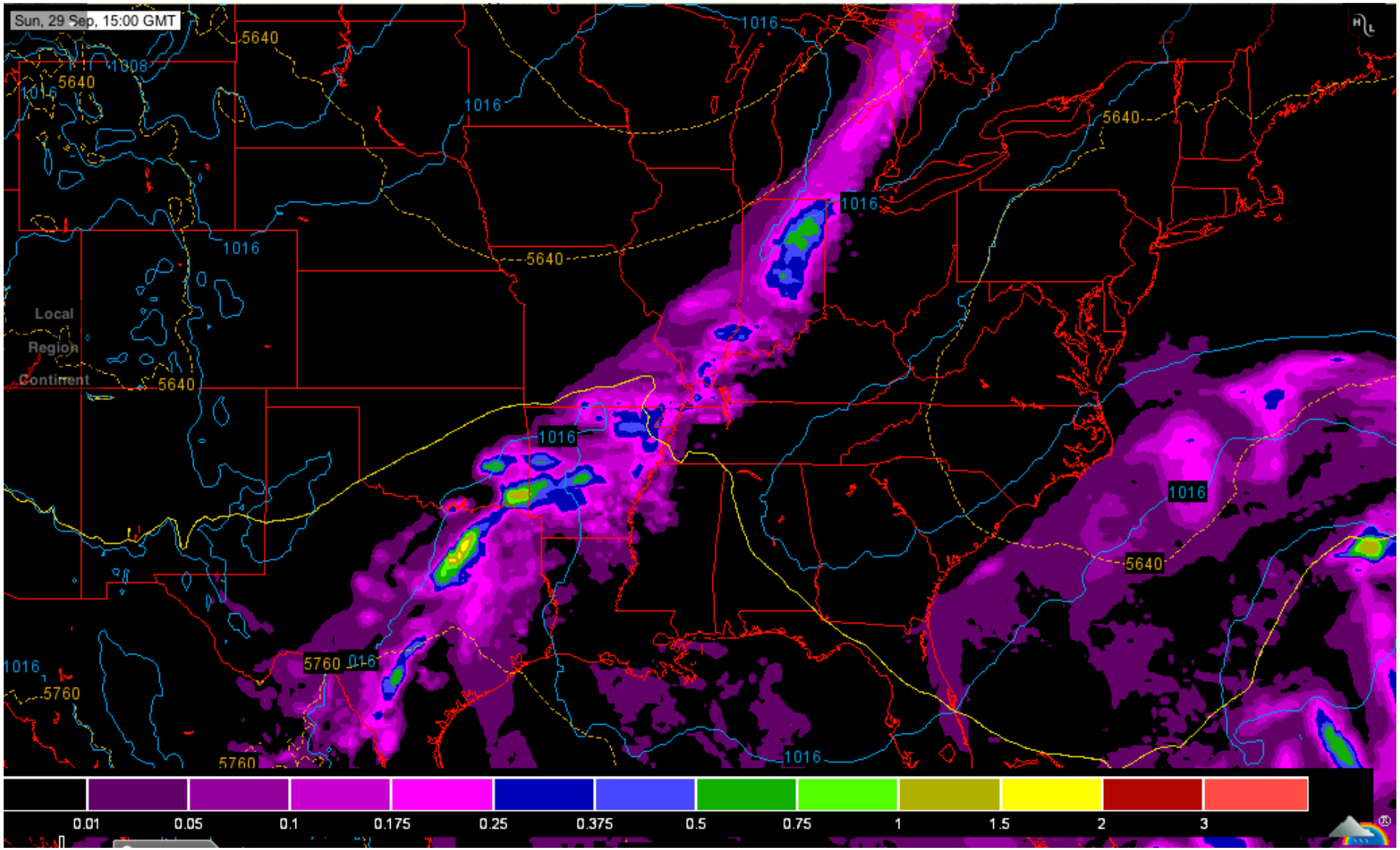
12z Surface Forecast



1PM CDT NAM
Scf Pressure/6-hr Precip



10 am Sunday, 6-hr previous precipitation. Sunday fire flight does not look good at this point

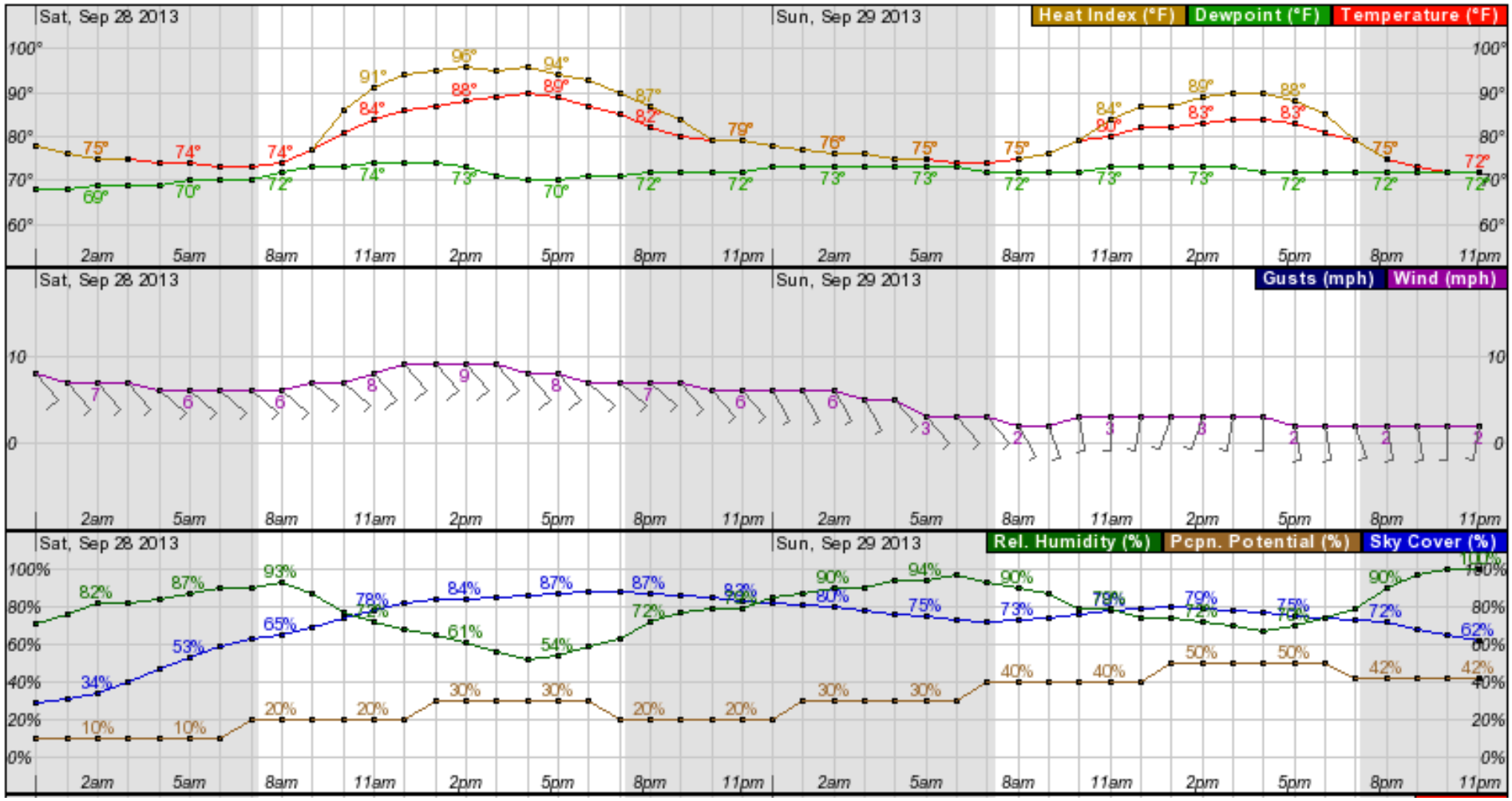


Conroe

Saturday: Steadily increasing clouds and shower threat

Sunday: Cloud cover and rain

Saturday→ **Sunday→**

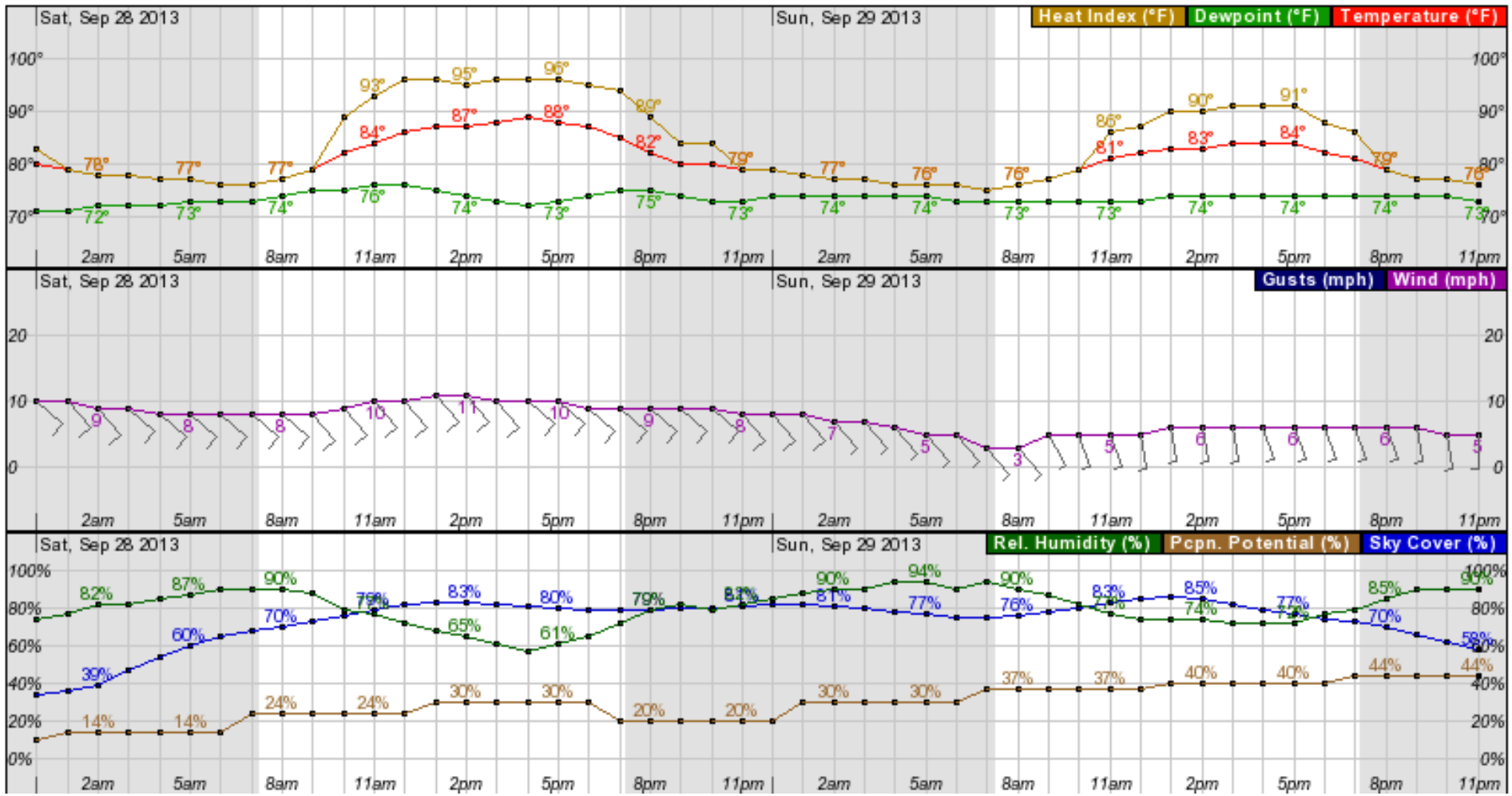


Houston Hobby

Saturday: Steadily increasing clouds and shower threat

Sunday: Cloud cover and rain

Saturday→ **Sunday→**

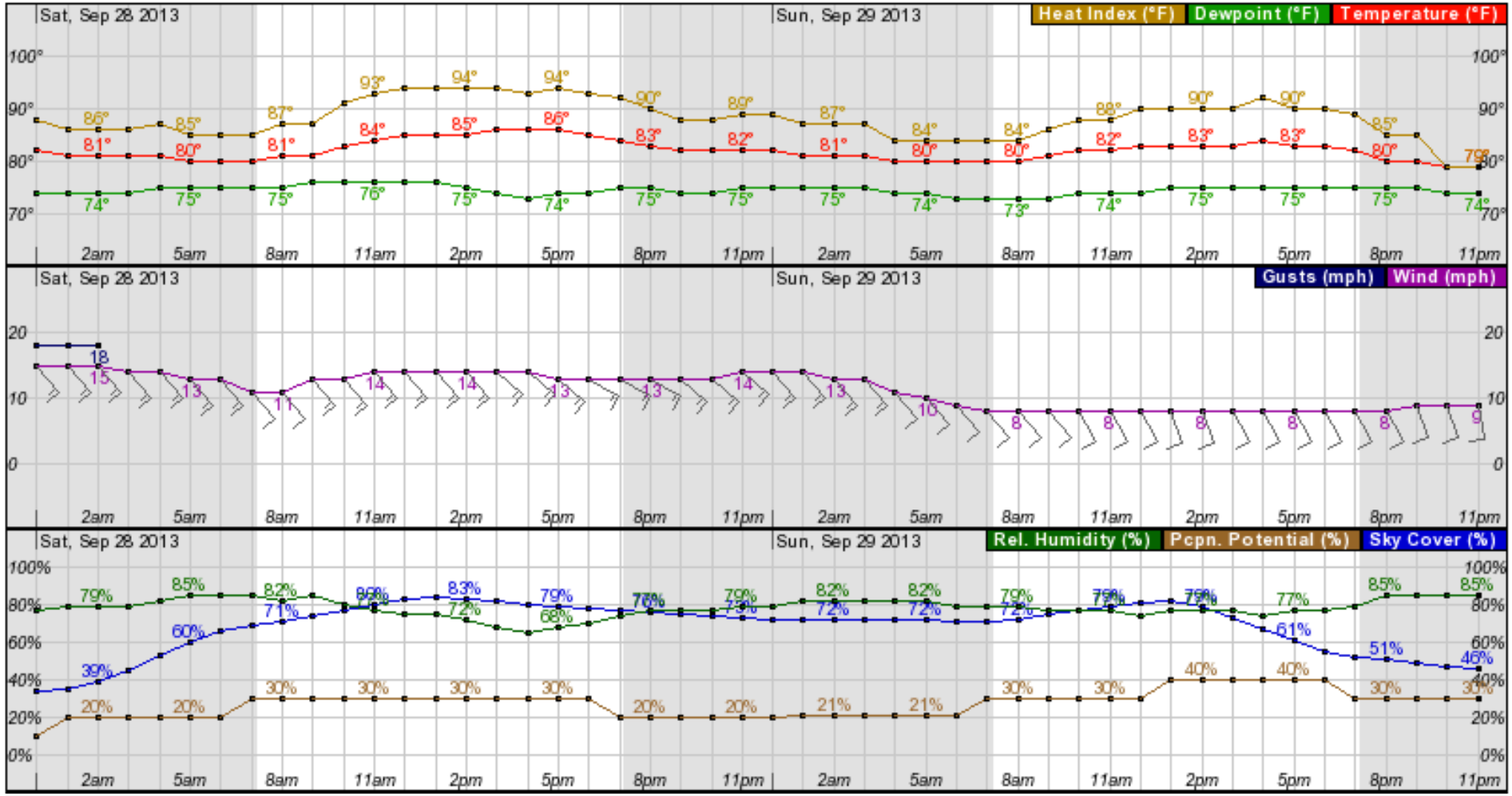


Galveston

Saturday: Steadily increasing clouds and shower threat

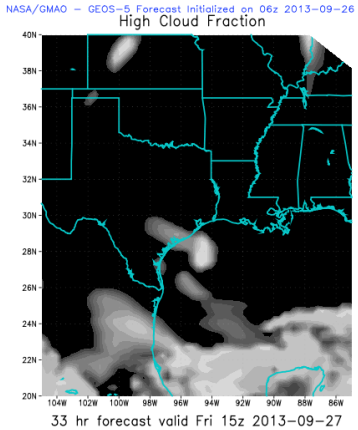
Sunday: Cloud cover and rain, breezy

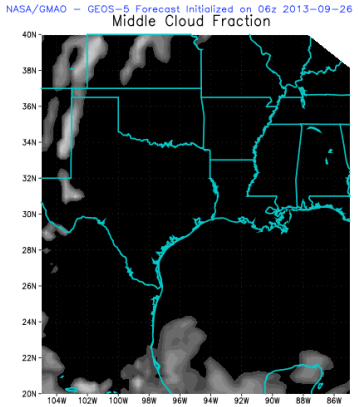
Saturday→ **Sunday→**

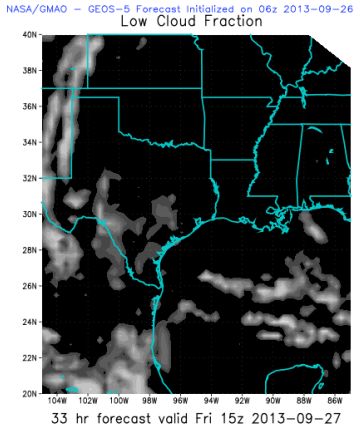


Tomorrow (Friday): GEOS-5 –

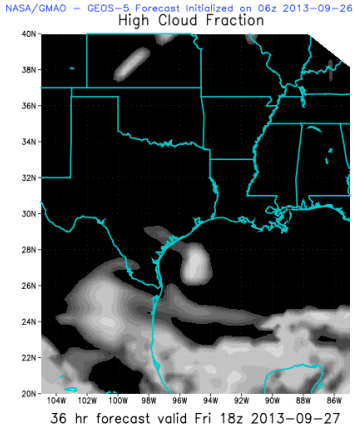
10 am

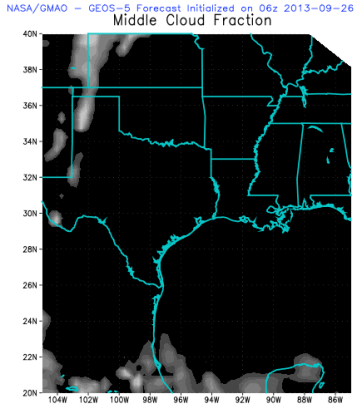


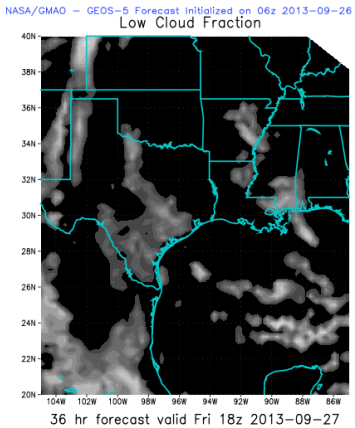




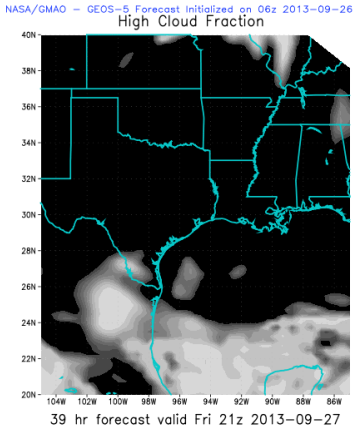
1 pm

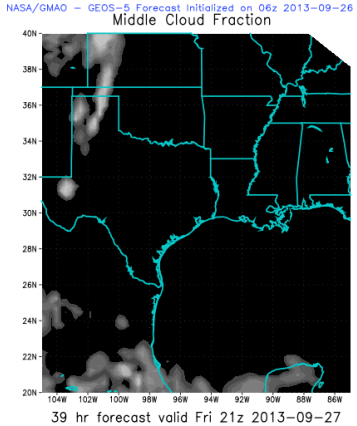


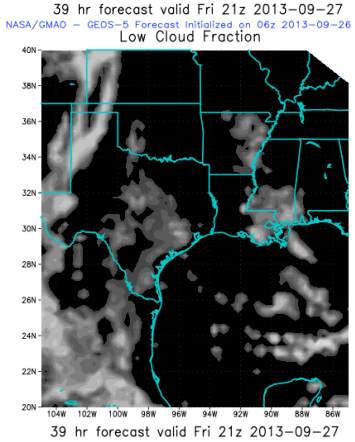




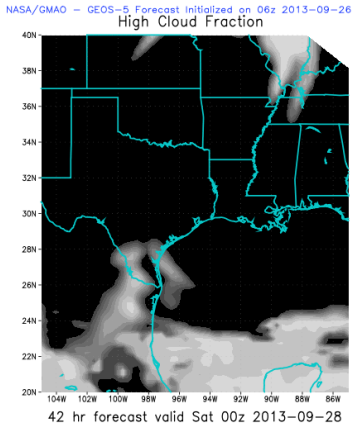
4 pm



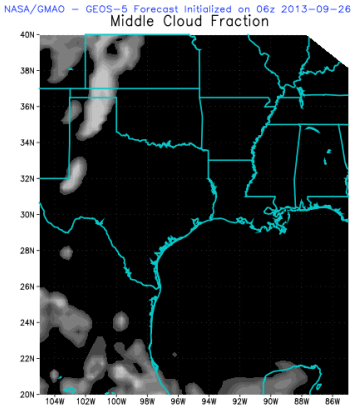




7 pm



High



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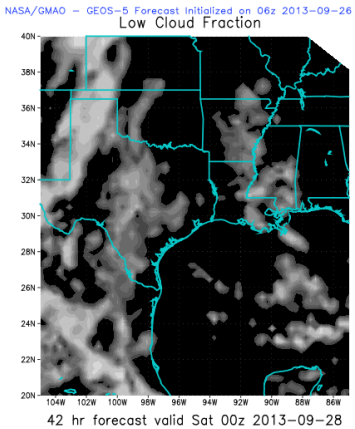
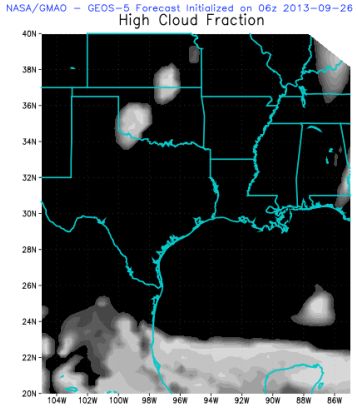
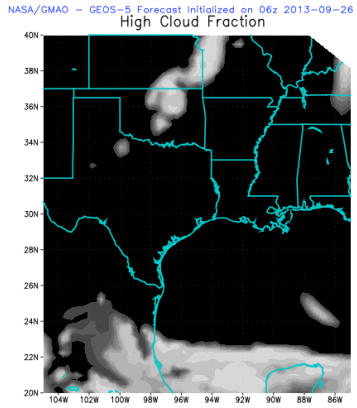
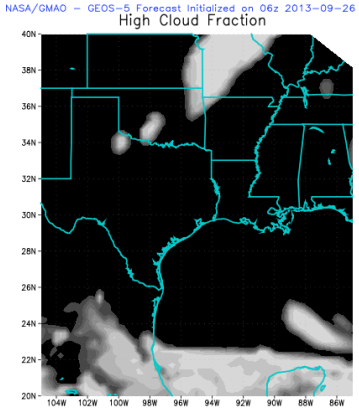
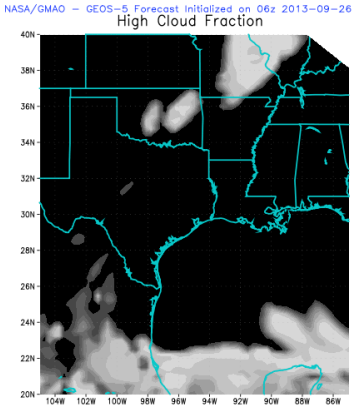
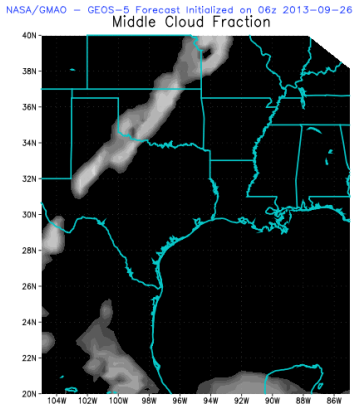
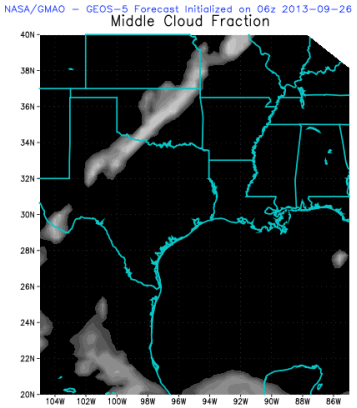
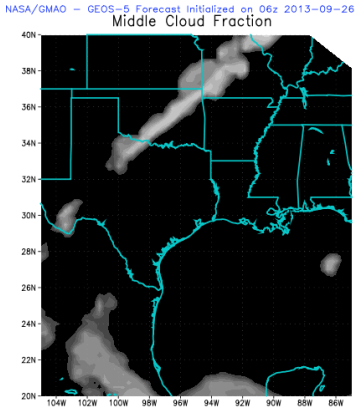
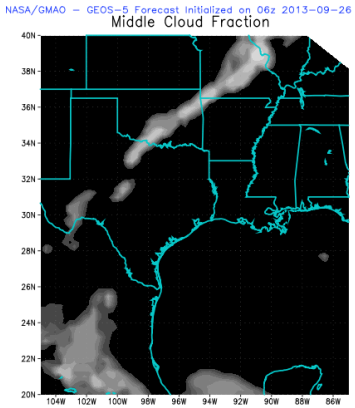
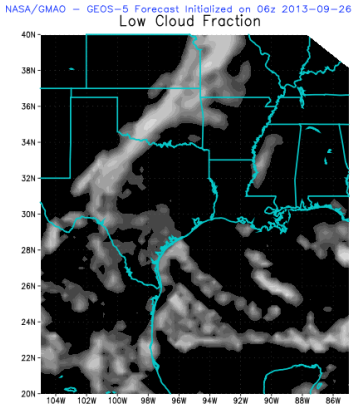
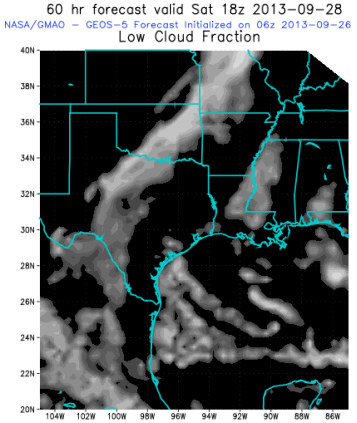
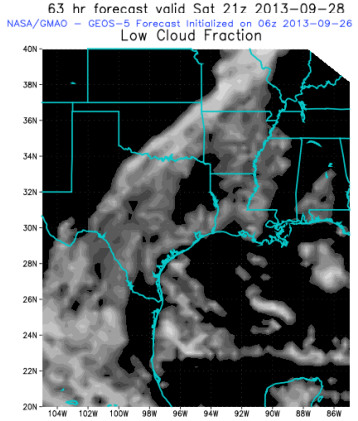
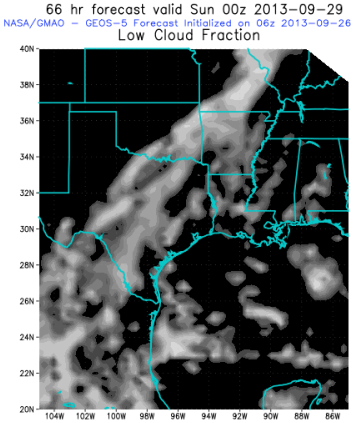


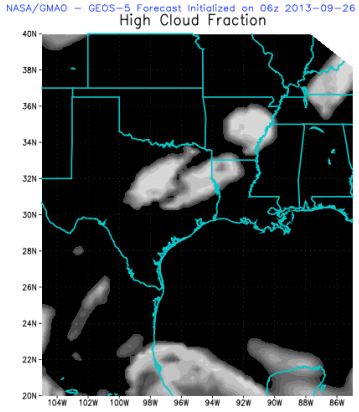
Low

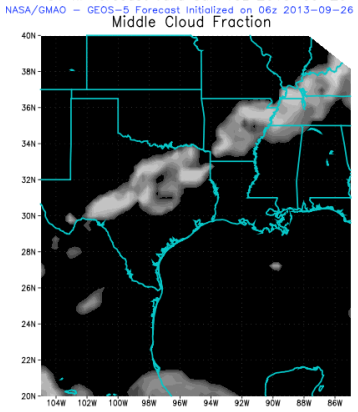
Saturday: GEOS-5 –

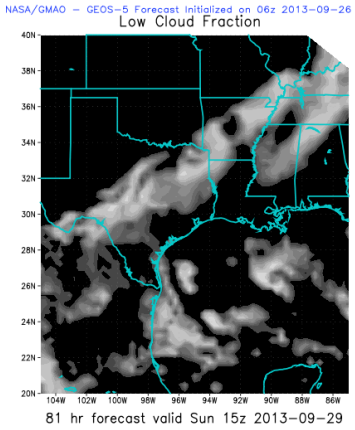
10 am	1 pm	4 pm	7 pm	
				**High**
				**Mid**
				**Low**

Sunday: GEOS-5 –

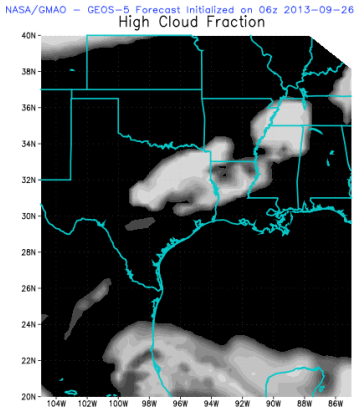
10 am

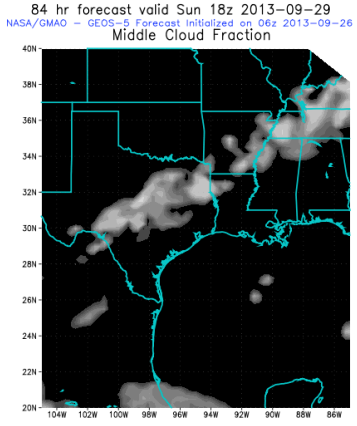


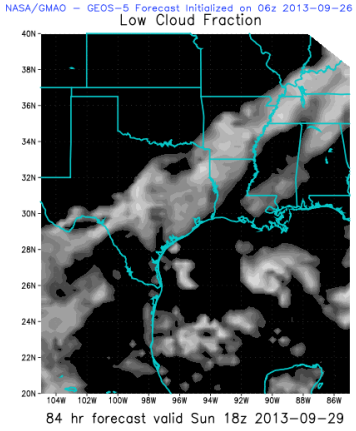




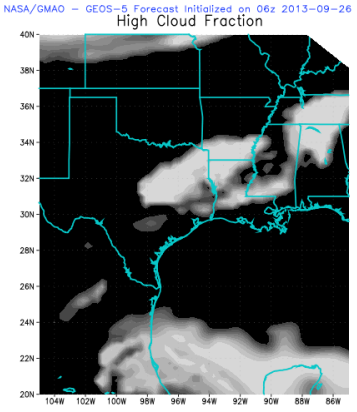
1 pm

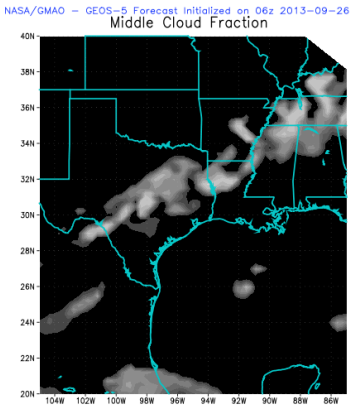


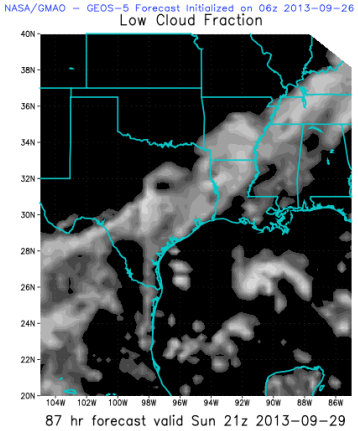




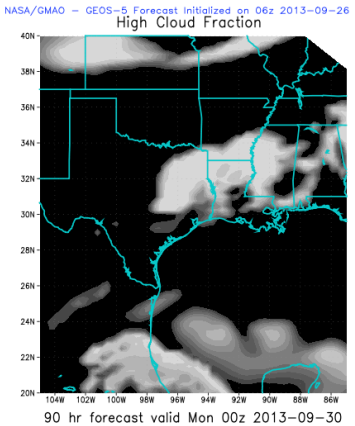
4 pm



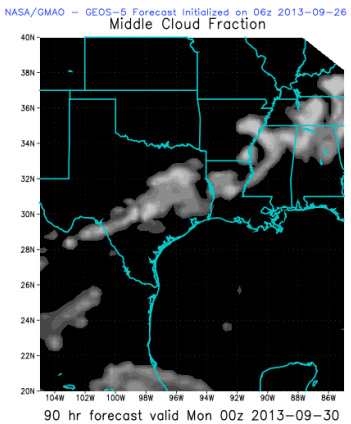




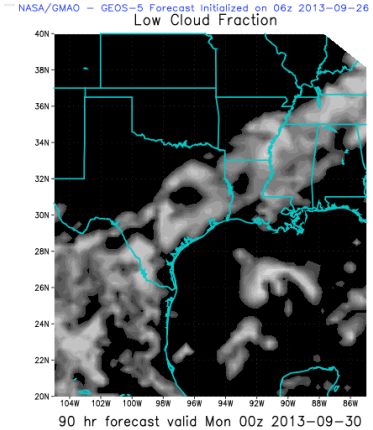
7 pm



High



Mid



Low

Summary

- Friday: Likely Fly Day. A bit cleaner and more widespread cumulus clouds may be a factor, but still a pretty good day to fly
- Saturday: Likely NO Fly Day. Cloud cover and some rain showers stream from Gulf with deep moisture flow ahead of cold front. *In case of emergency* Saturday can be put in our back pocket at this point
- Sunday: Likely NO Fly Day. May be a transit day. Forecast looks unfavorable for fire sniffing with rain extending through MS valley all day. It will certainly not be good for a science flight here with steady rain

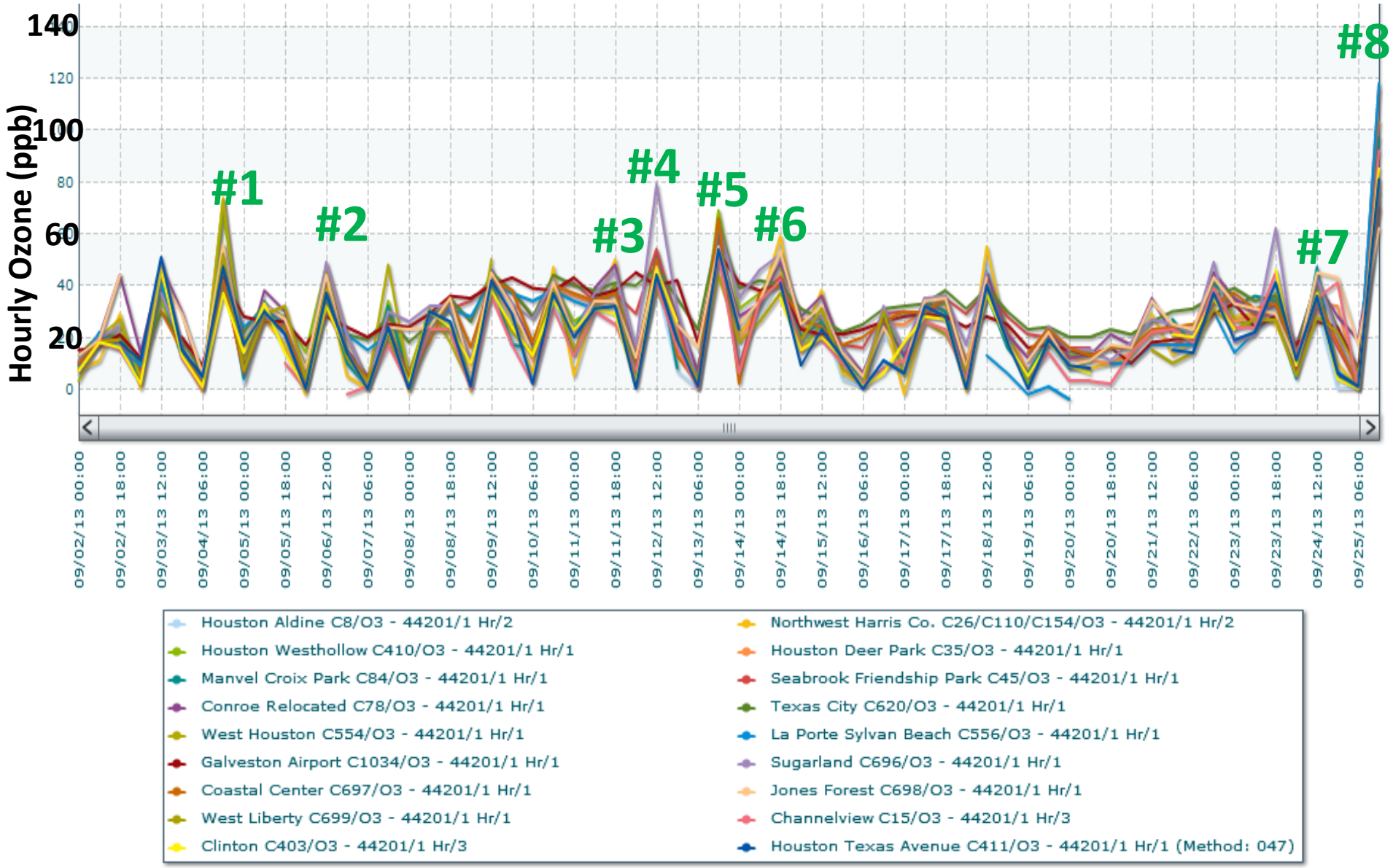
DISCOVER-AQ Air Quality Outlook
September 26, 2013

Ken Pickering

Bryan Duncan

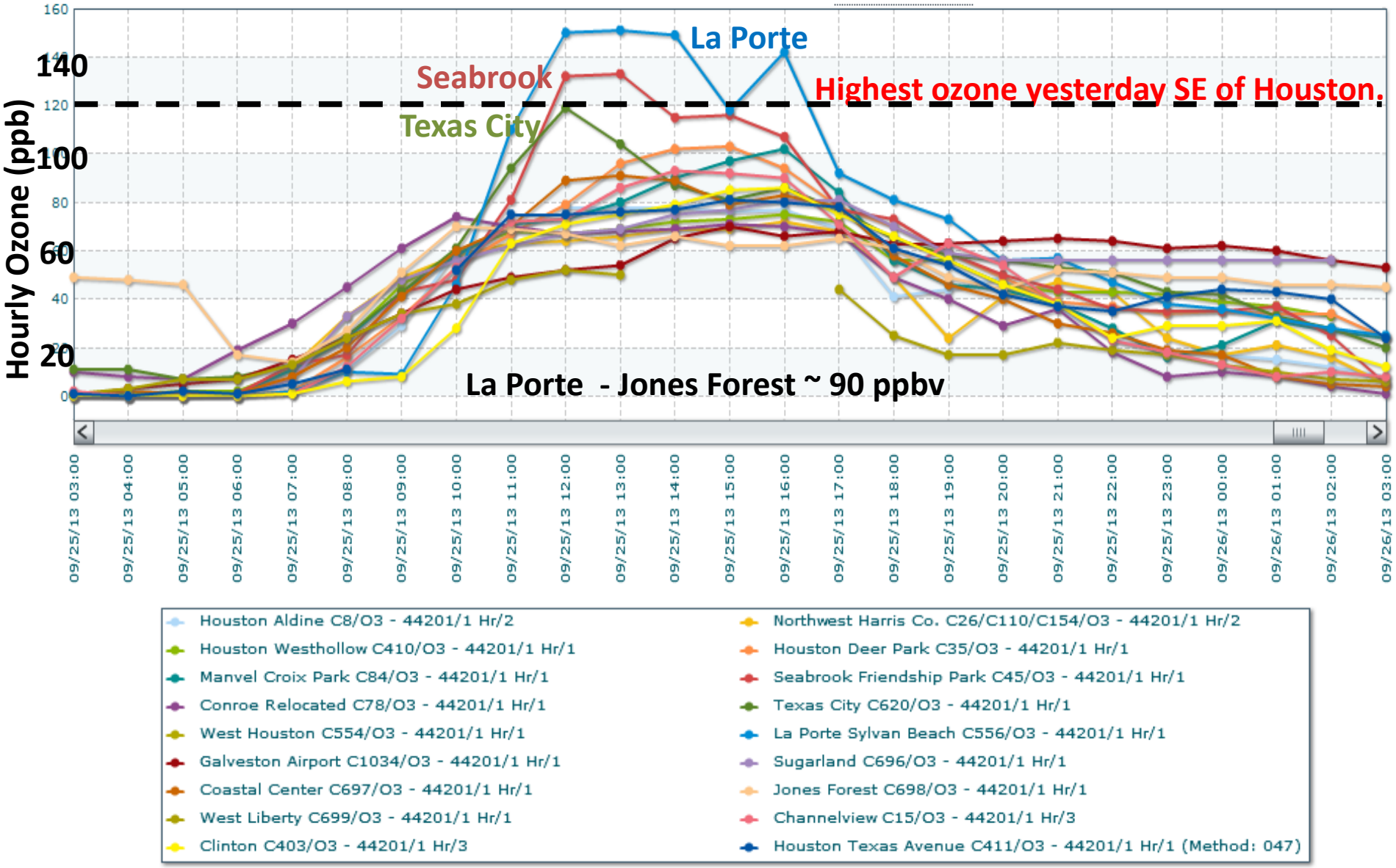
Hourly Ozone (airnowtech.org)**

September 2nd – 25th ** EVERY 9th HOUR PLOTTED!!!!!



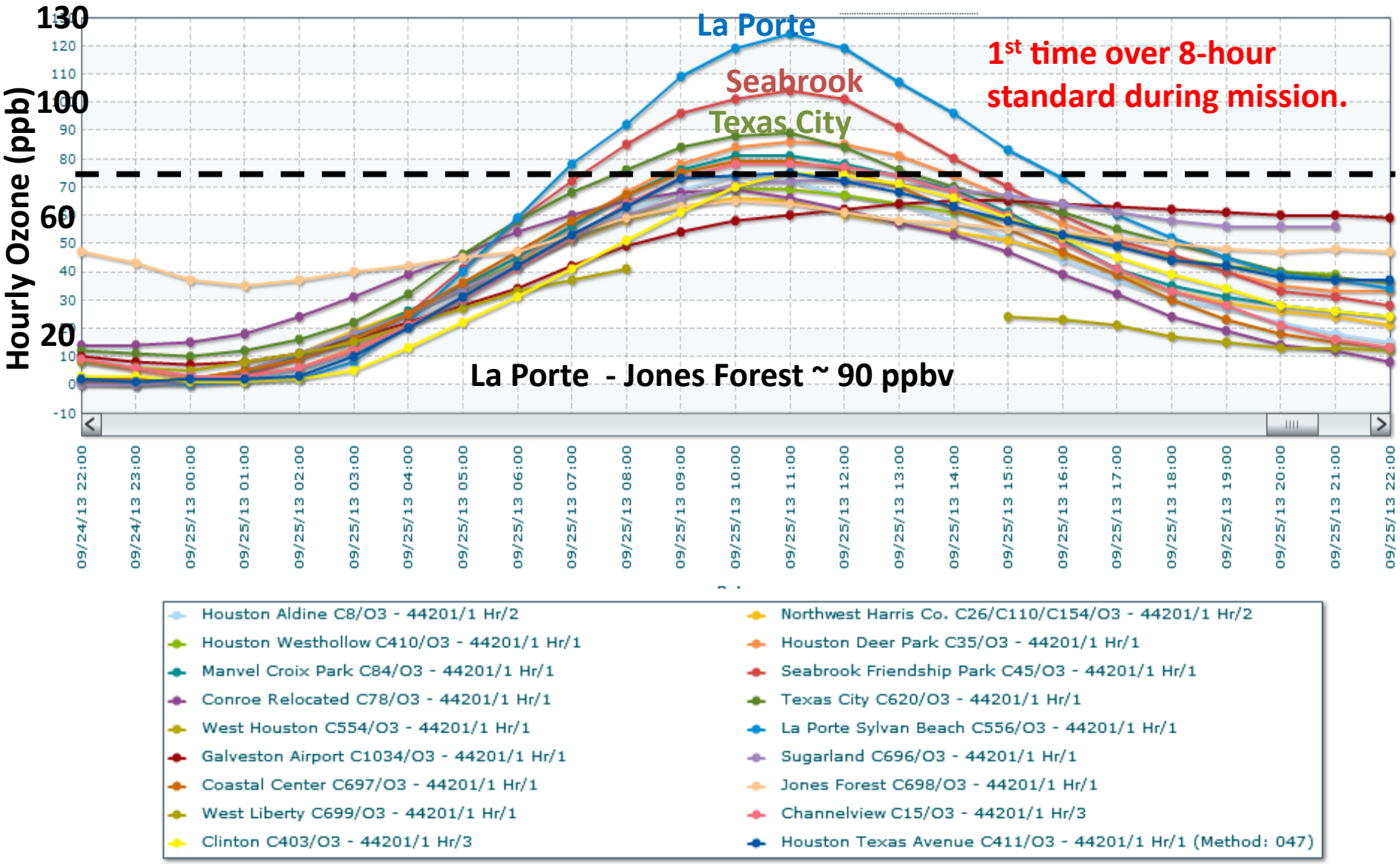
Hourly Ozone (airnowtech.org)

September 25th (Yesterday)



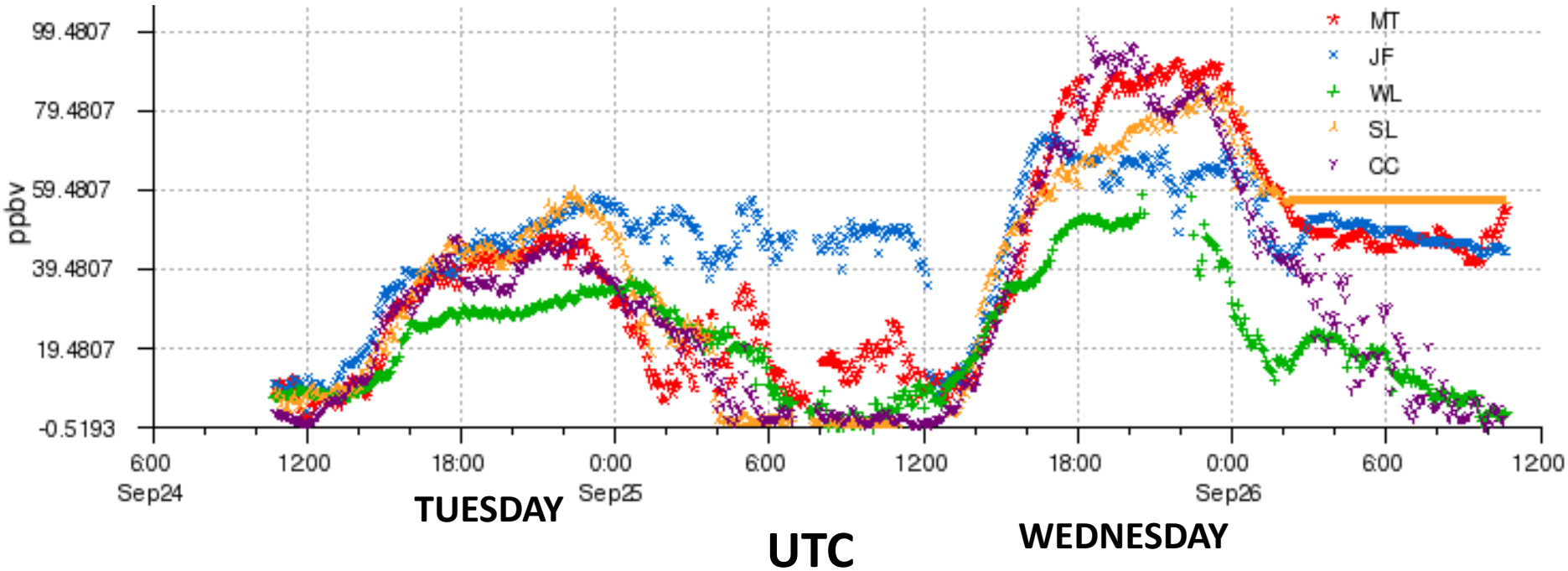
Hourly (8 Hr) Ozone (airnowtech.org)

September 25th (Yesterday)



HNET

Ozone (ppbv)



TCEQ Air Quality Forecast:

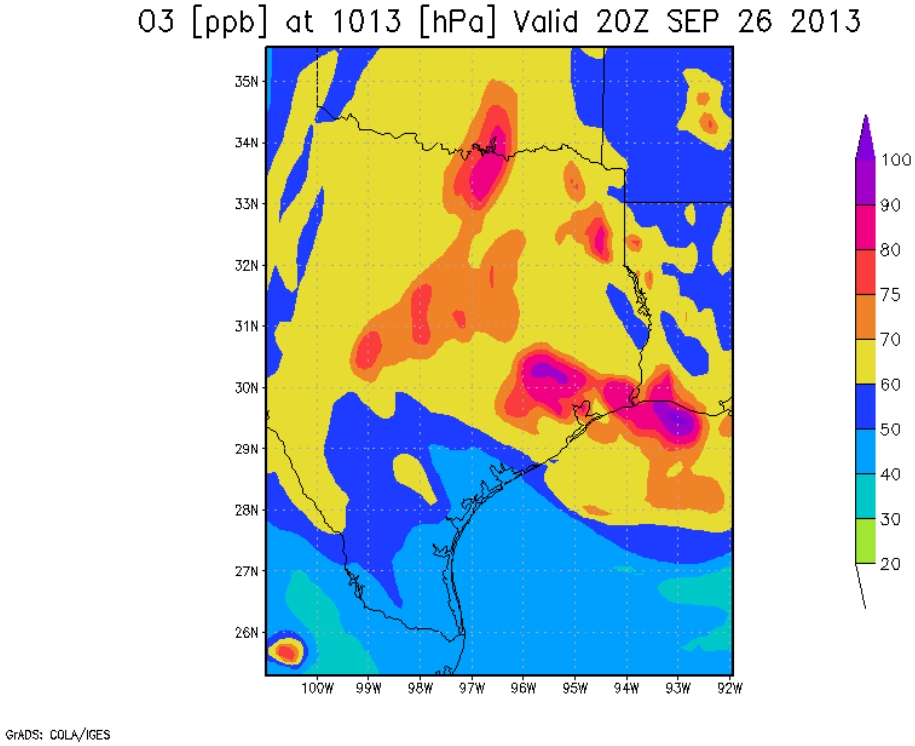
Thursday: Code Orange for Ozone – N and NW of city due to SE wind development during afternoon

Code Yellow for PM2.5 – some fire plumes may be passing over

Friday: Code Yellow for Ozone -- N side of city with more flow off Gulf reducing background

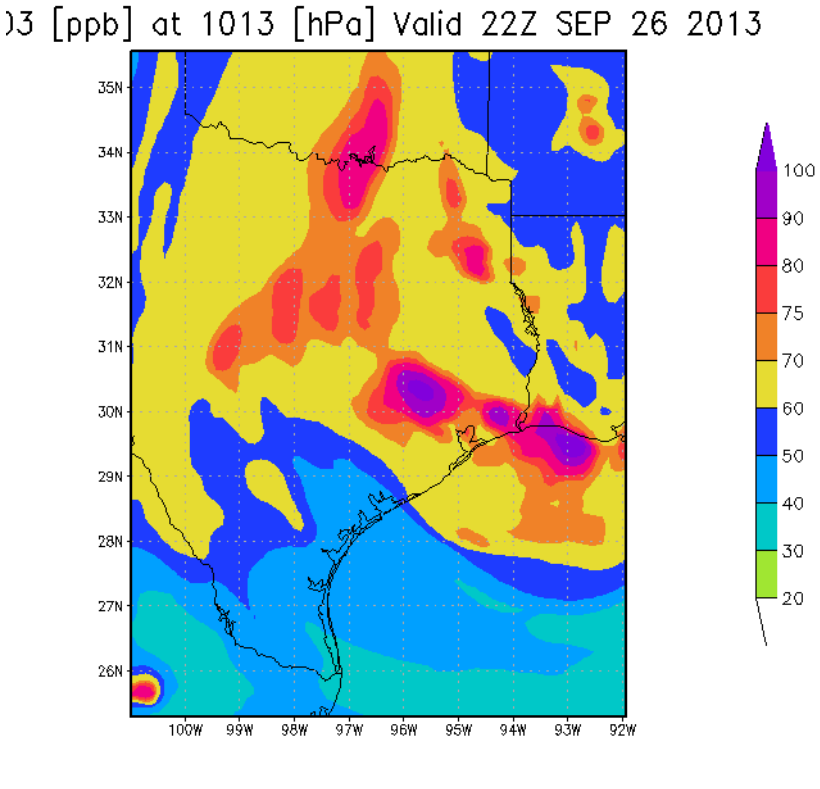
Code Green for PM2.5

NOAA Experimental CMAQ Forecast for Today

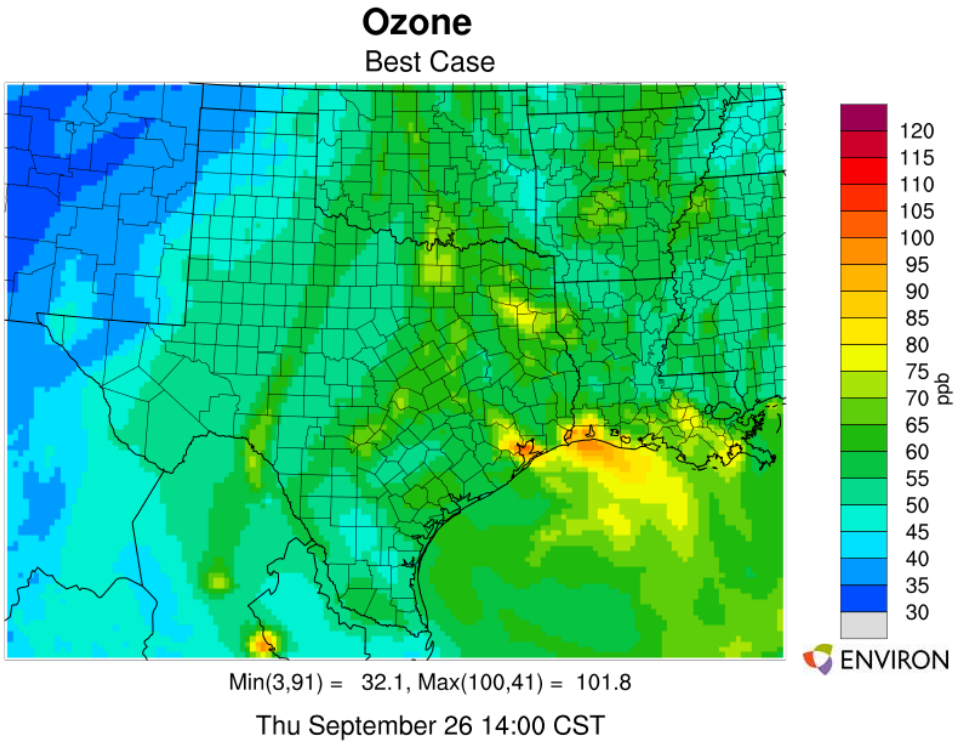


3 PM

5 PM

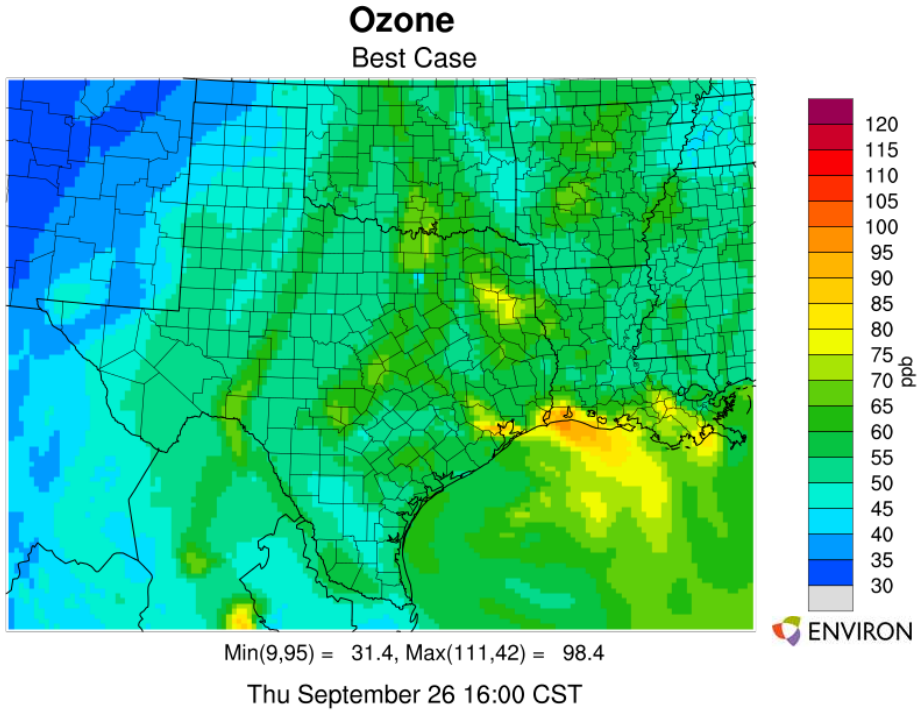


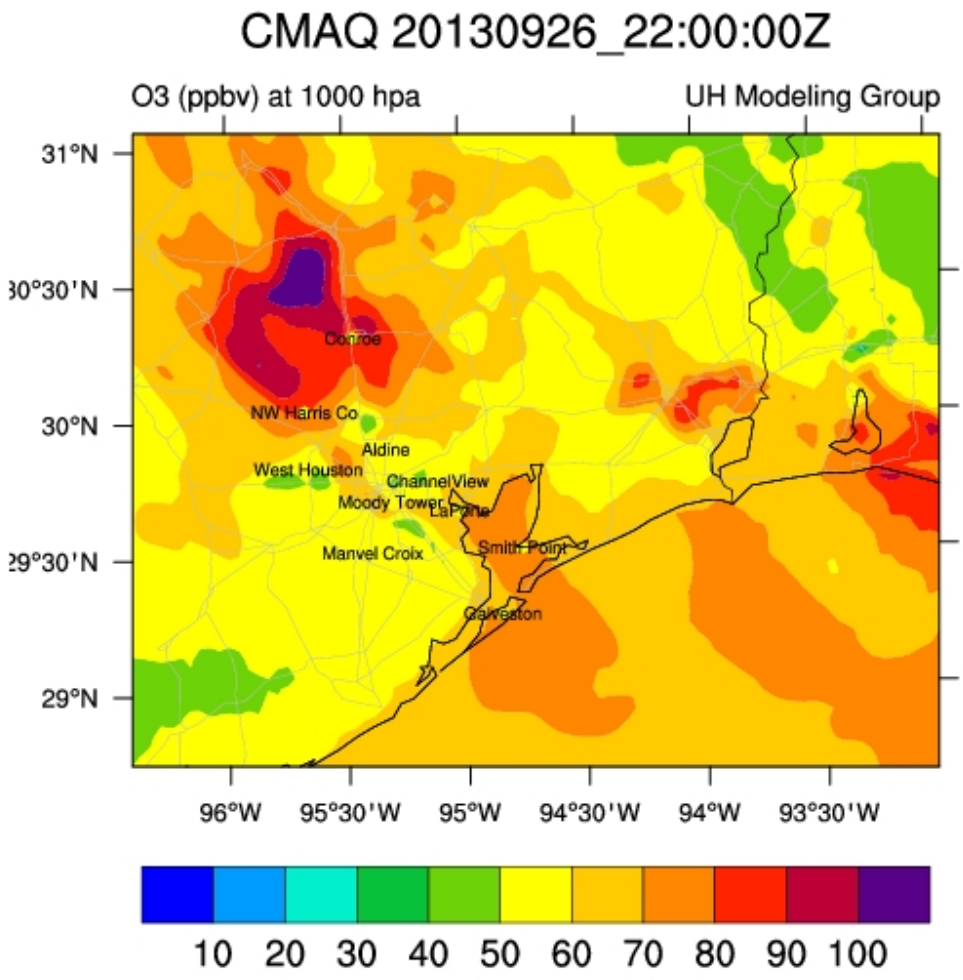
TCEQ/Environ CAMx
Forecast for today



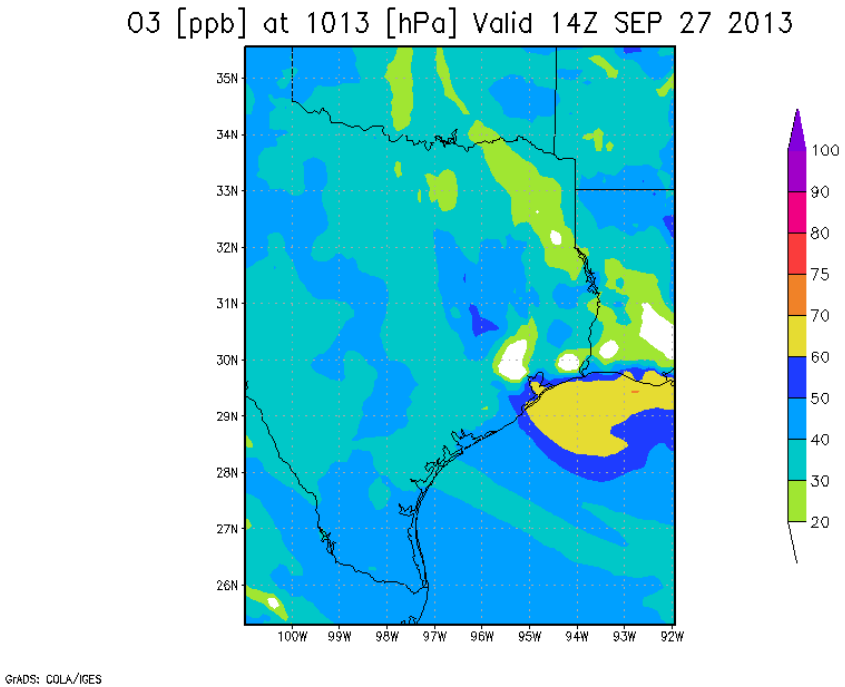
3 PM

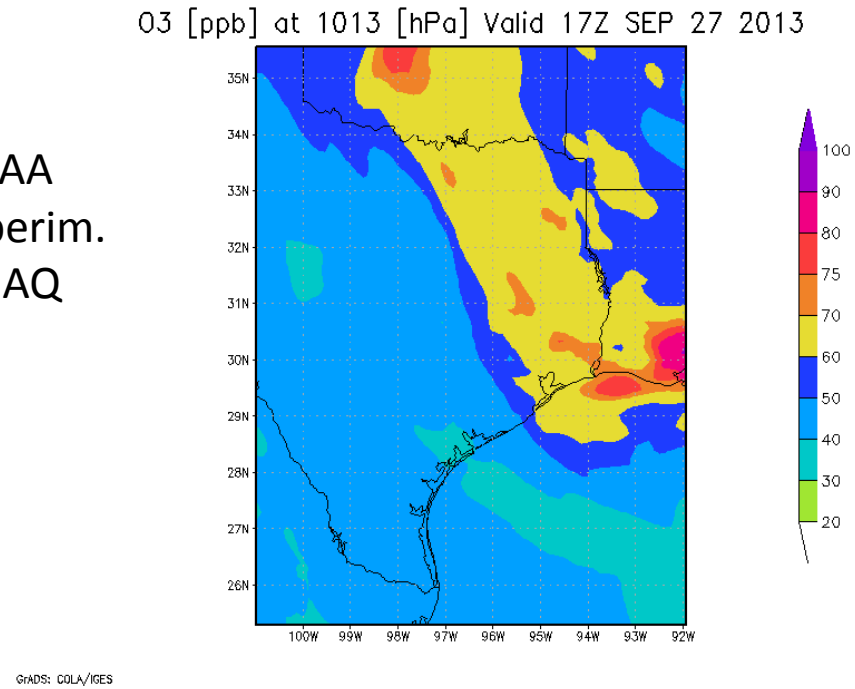
5 PM

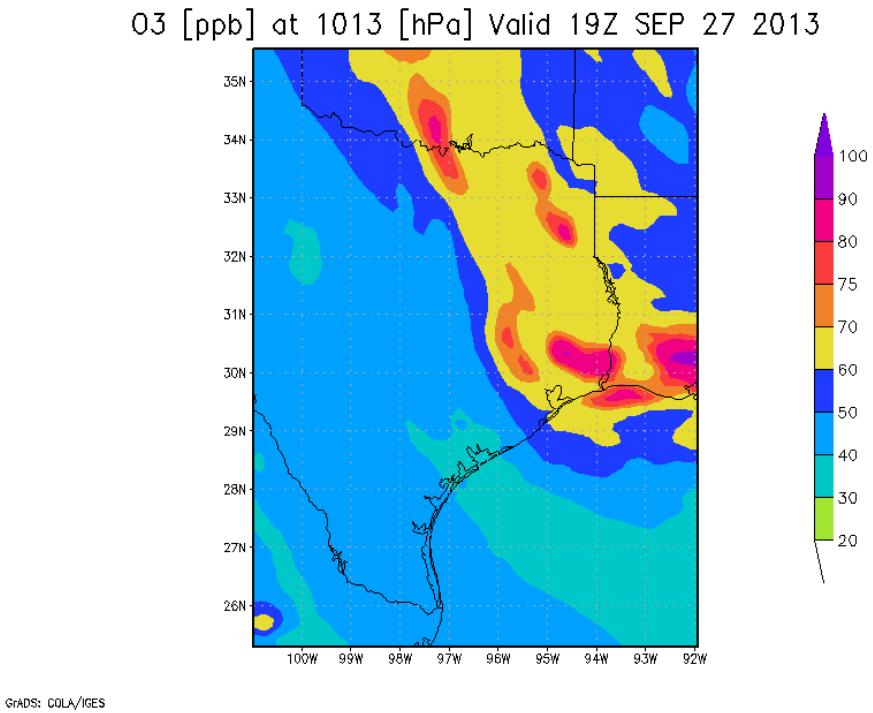


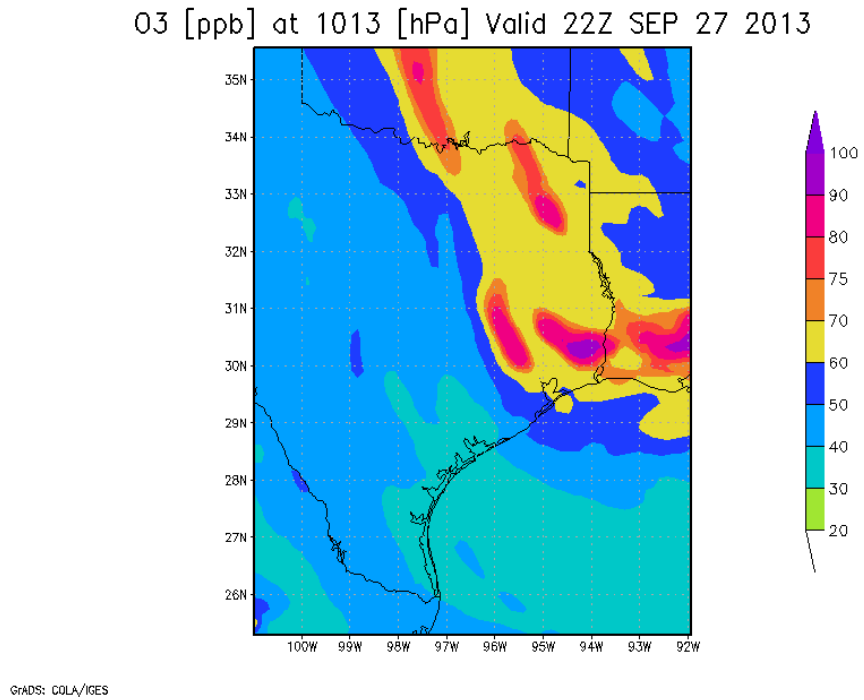

CMAQ 20130926_22:00:00Z
O3 (ppbv) at 1000 hpa
UH Modeling Group
31°N
30°30'N
30°N
29°30'N
29°N
96°W
95°30'W
95°W
94°30'W
94°W
93°30'W
Conroe
NW Harris Co
Aldine
West Houston
ChannelView
Moody Tower
LaPorte
Manvel Croix
Smith Point
Galveston
10
20
30
40
50
60
70
80
90
100

NOAA
Experim.
CMAQ



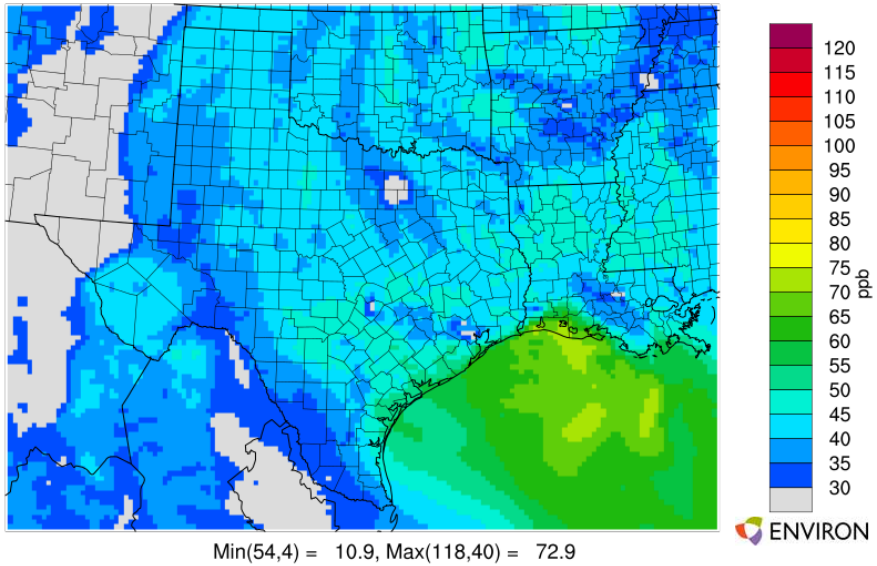






CAMx

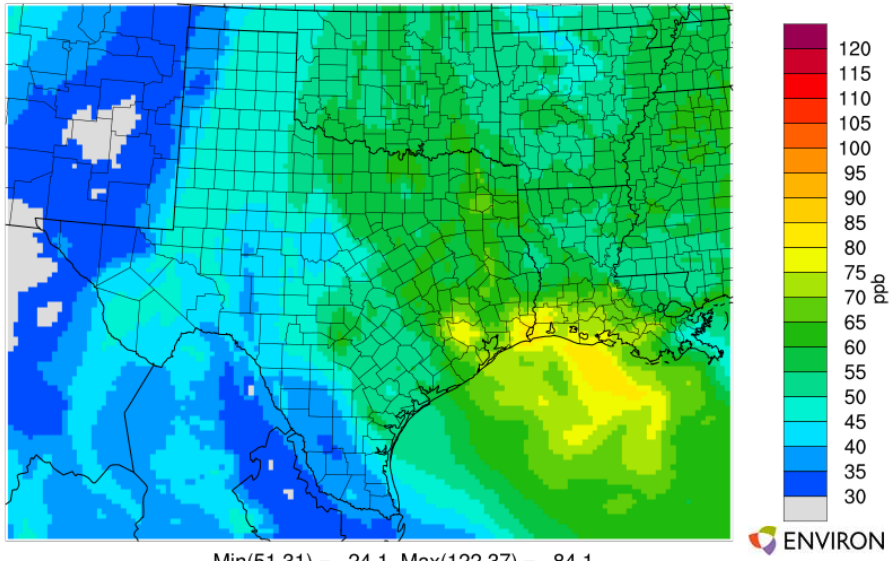
Ozone
Best Case



Min(54,4) = 10.9, Max(118,40) = 72.9

Fri September 27 08:00 CST

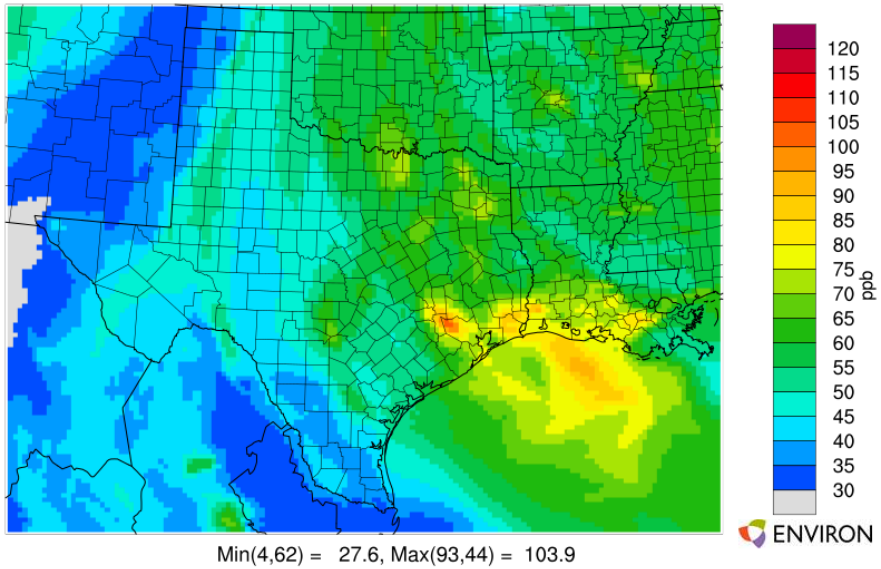
Ozone
Best Case



Min(51,31) = 24.1, Max(122,37) = 84.1

Fri September 27 11:00 CST

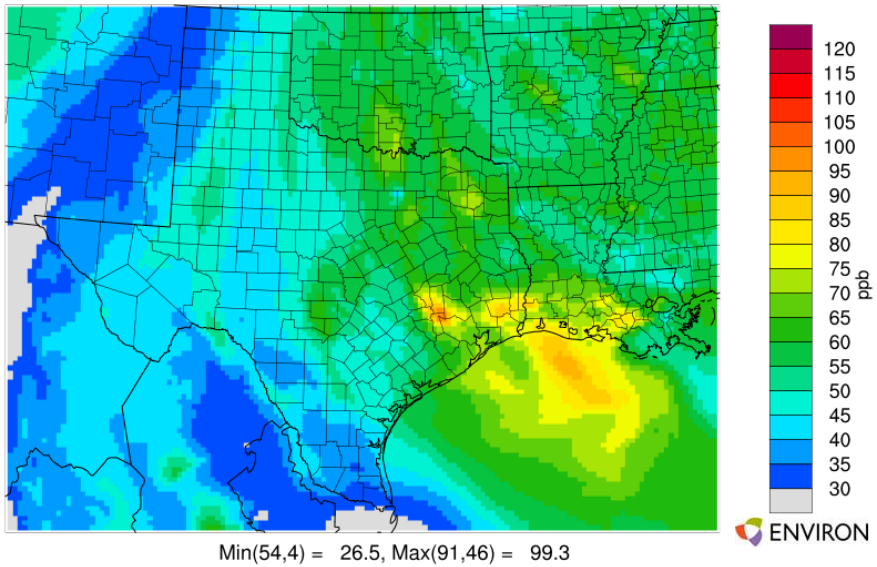
Ozone
Best Case



Min(4,62) = 27.6, Max(93,44) = 103.9

Fri September 27 14:00 CST

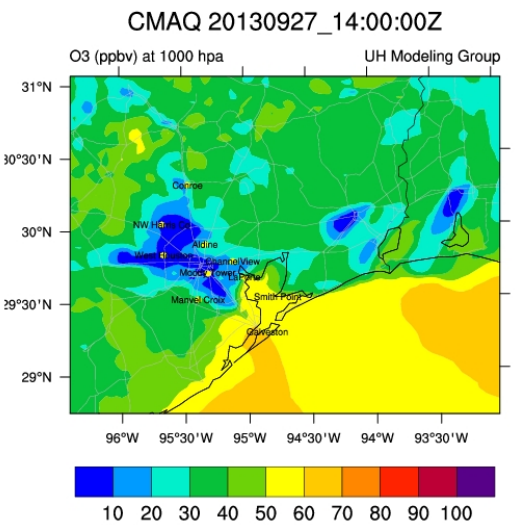
Ozone
Best Case

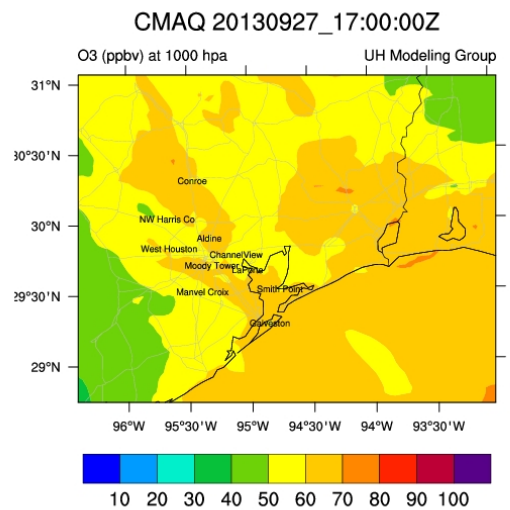


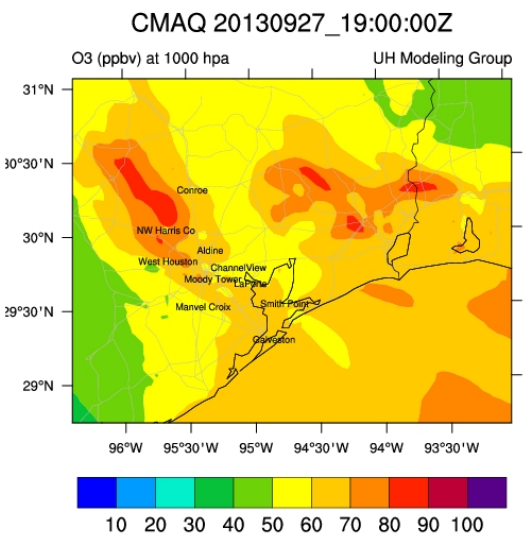
Min(54,4) = 26.5, Max(91,46) = 99.3

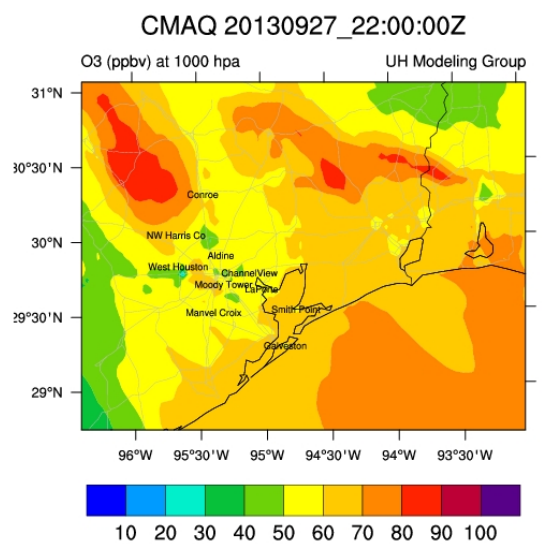
Fri September 27 16:00 CST

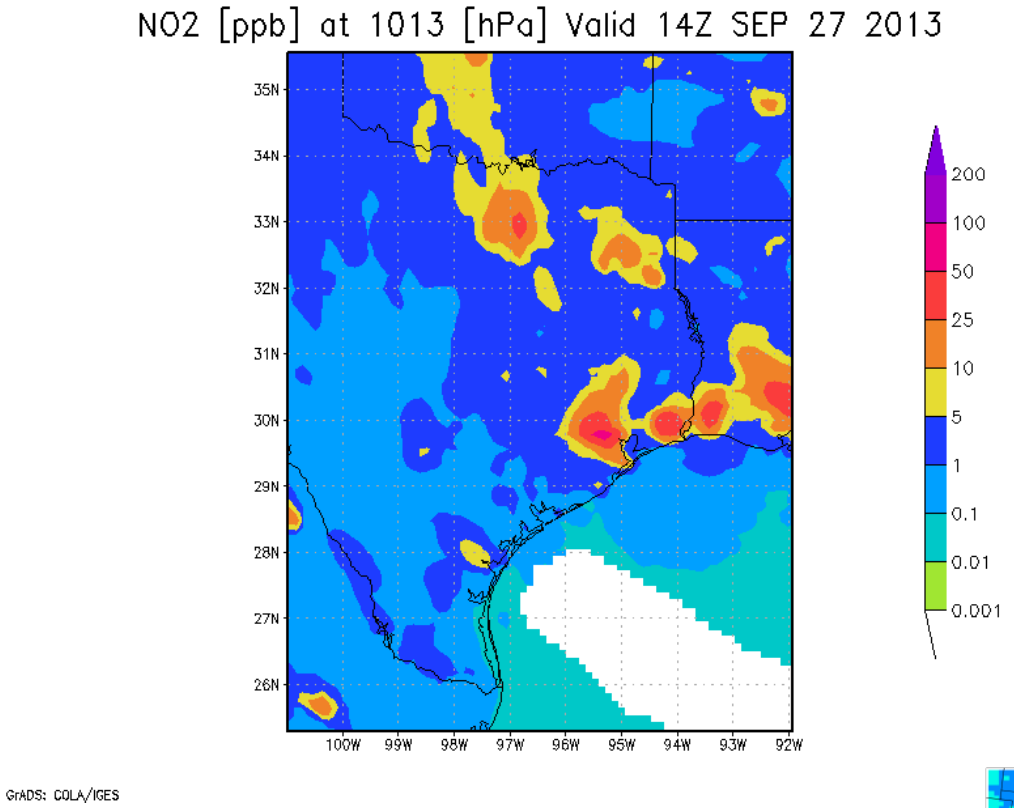
Univ. of Houston CMAQ





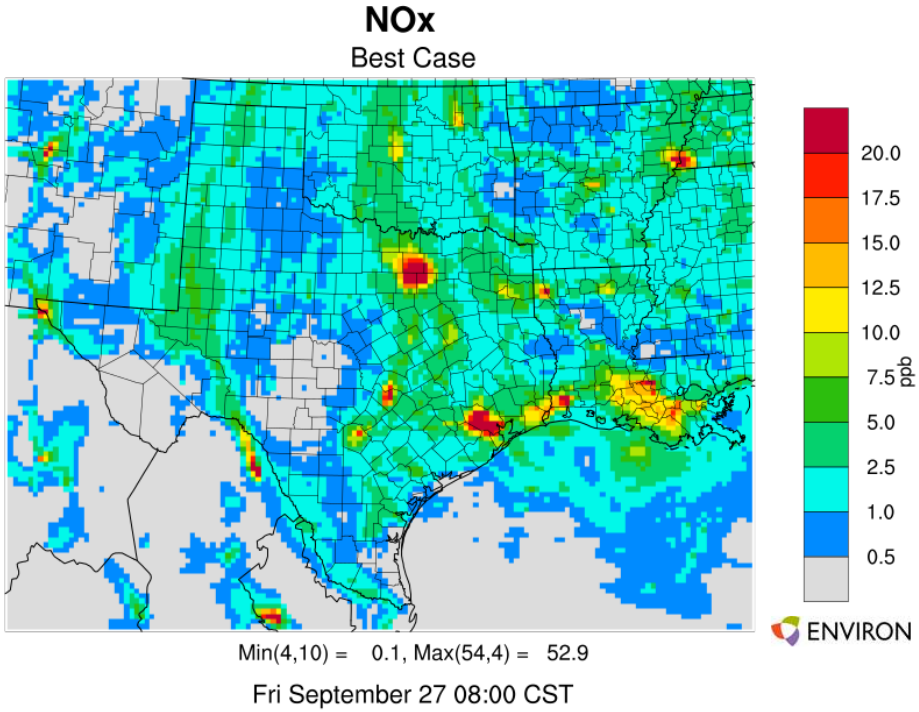




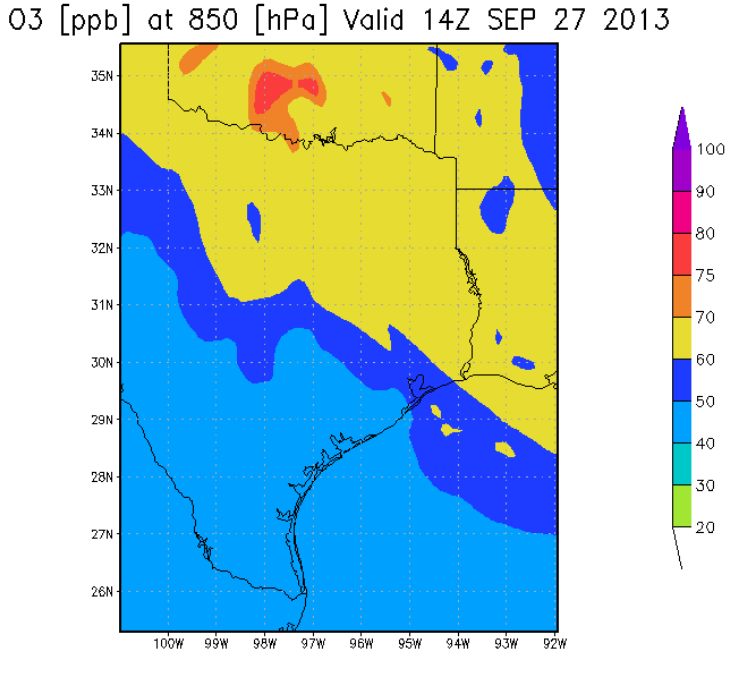


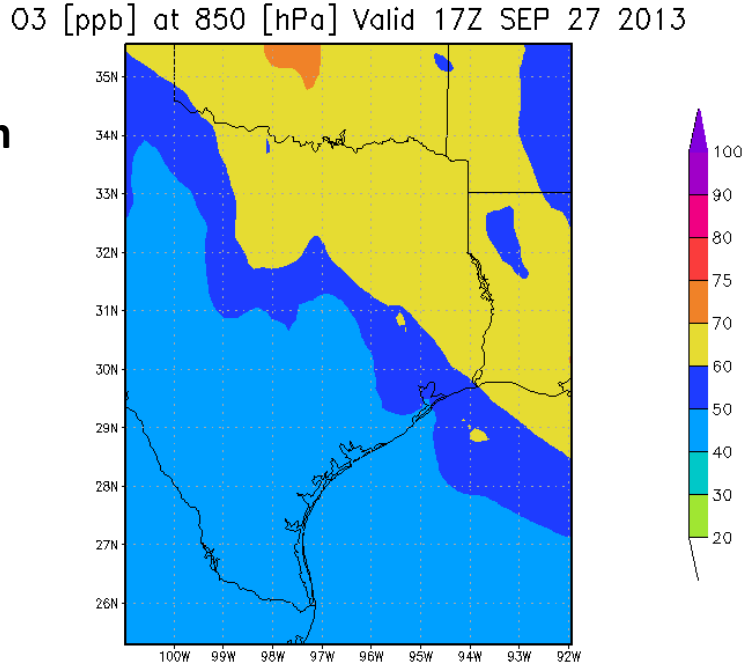
NOAA CMAQ
9 AM

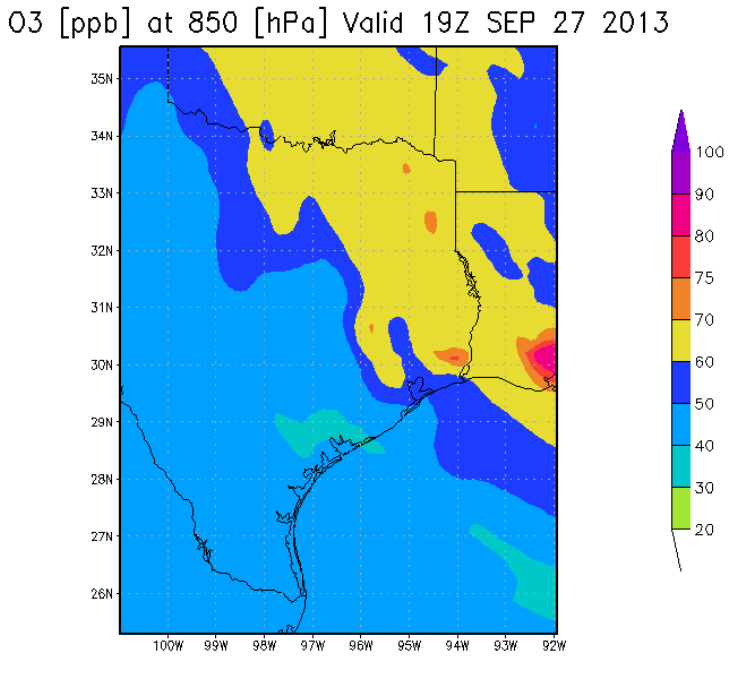
CAMx
9 AM

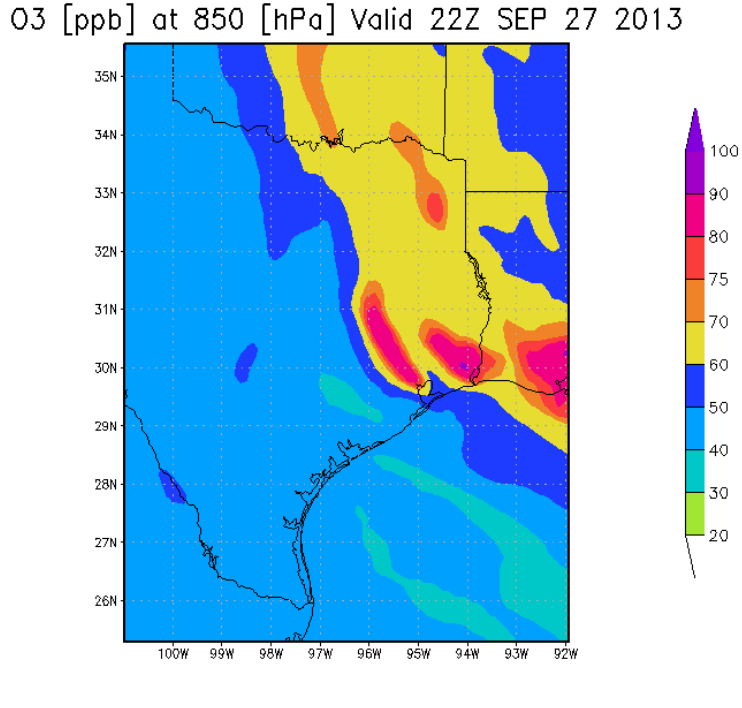


1.5 km

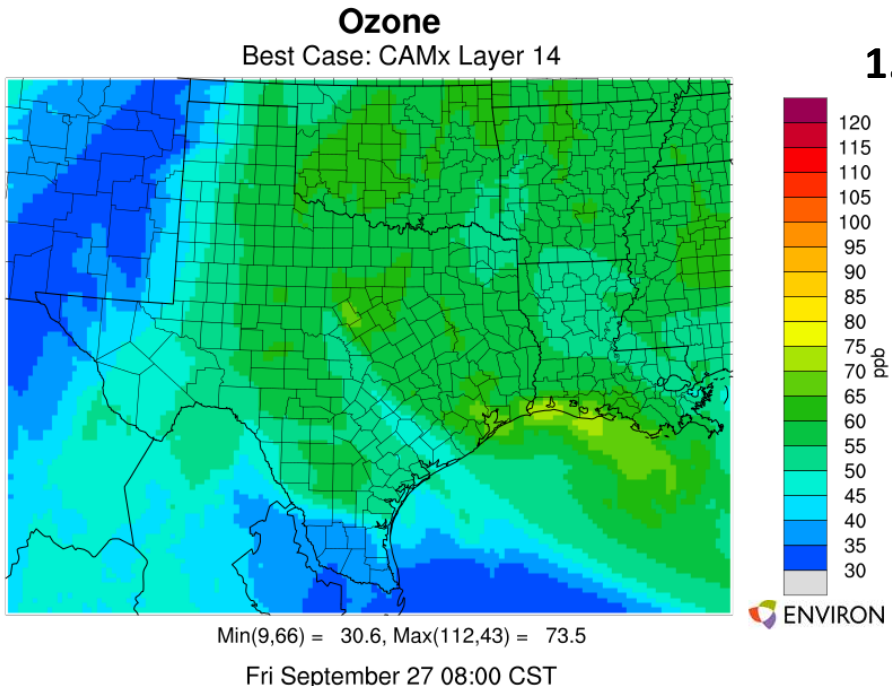

O3 [ppb] at 850 [hPa] Valid 14Z SEP 27 2013
35N
34N
33N
32N
31N
30N
29N
28N
27N
26N
100W 99W 98W 97W 96W 95W 94W 93W 92W
100
90
80
75
70
60
50
40
30
20
GrADS: COLA/IGES

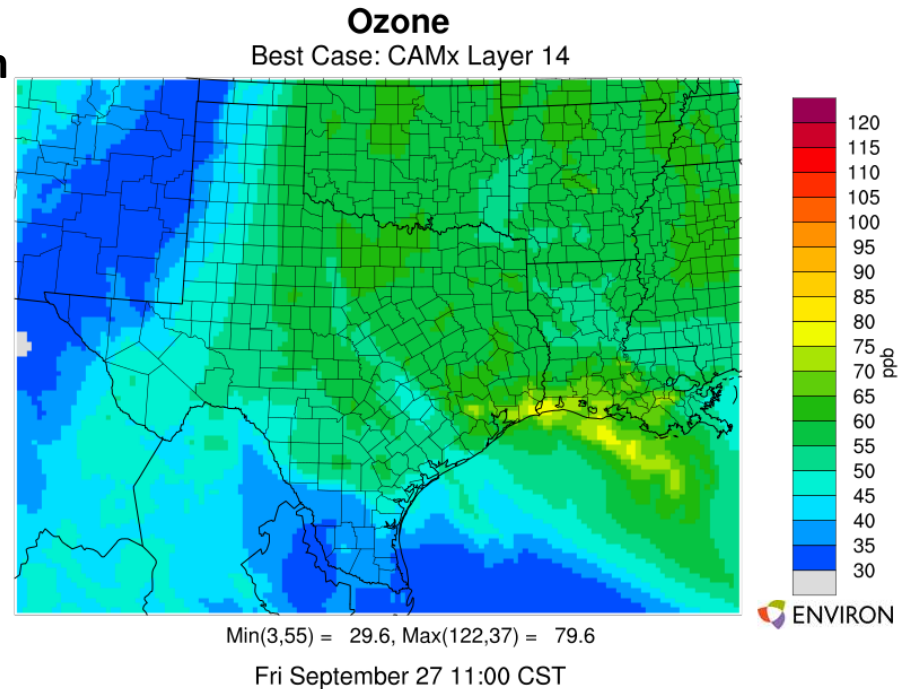

O3 [ppb] at 850 [hPa] Valid 17Z SEP 27 2013
35N
34N
33N
32N
31N
30N
29N
28N
27N
26N
100W 99W 98W 97W 96W 95W 94W 93W 92W
100
90
80
75
70
60
50
40
30
20

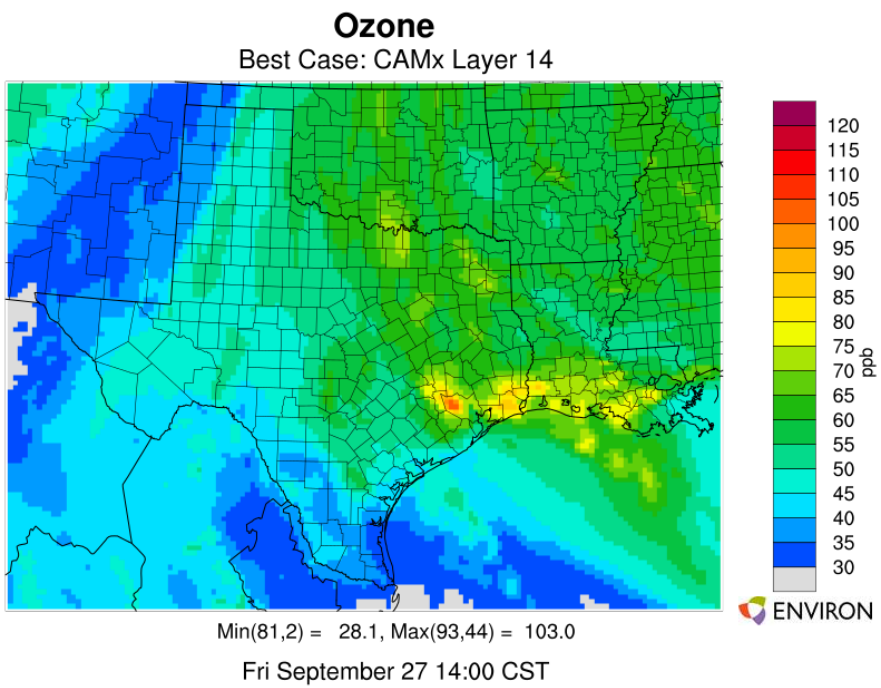

O3 [ppb] at 850 [hPa] Valid 19Z SEP 27 2013
35N
34N
33N
32N
31N
30N
29N
28N
27N
26N
100W 99W 98W 97W 96W 95W 94W 93W 92W
100
90
80
75
70
60
50
40
30
20
GrADS: COLA/IGES

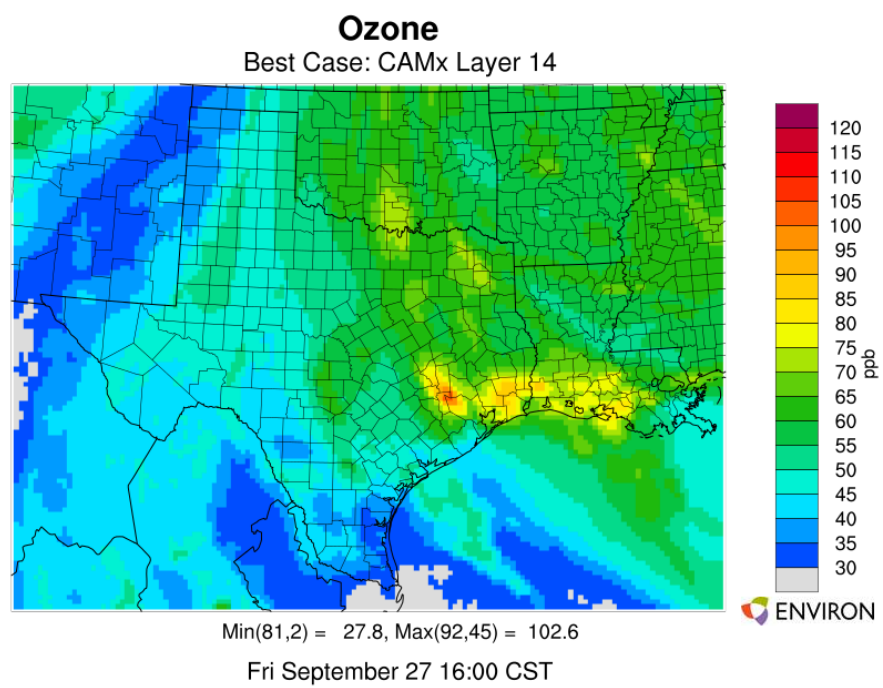

O3 [ppb] at 850 [hPa] Valid 22Z SEP 27 2013
35N
34N
33N
32N
31N
30N
29N
28N
27N
26N
100W 99W 98W 97W 96W 95W 94W 93W 92W
100
90
80
75
70
60
50
40
30
20
GrADS: COLA/IGES

1.2 km


Ozone
Best Case: CAMx Layer 14
120
115
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
ppb
ENVIRON
Min(9,66) = 30.6, Max(112,43) = 73.5
Fri September 27 08:00 CST

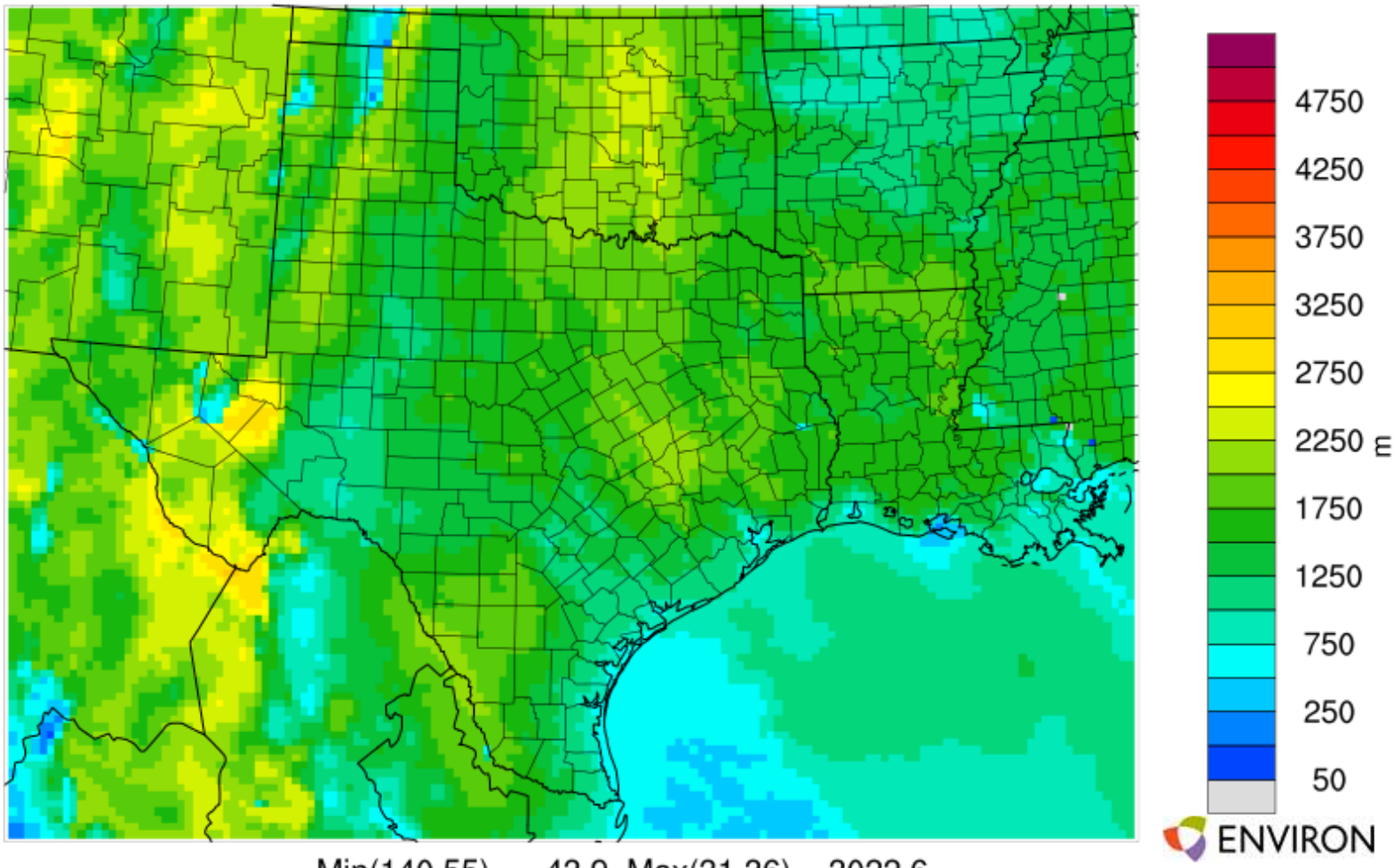

Ozone
Best Case: CAMx Layer 14
120
115
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
ppb
ENVIRON
Min(3,55) = 29.6, Max(122,37) = 79.6
Fri September 27 11:00 CST


Ozone
Best Case: CAMx Layer 14
120
115
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
ppb
ENVIRON
Min(81,2) = 28.1, Max(93,44) = 103.0
Fri September 27 14:00 CST


Ozone
Best Case: CAMx Layer 14
120
115
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
ppb
ENVIRON
Min(81,2) = 27.8, Max(92,45) = 102.6
Fri September 27 16:00 CST

PBL Height

Texas 12km



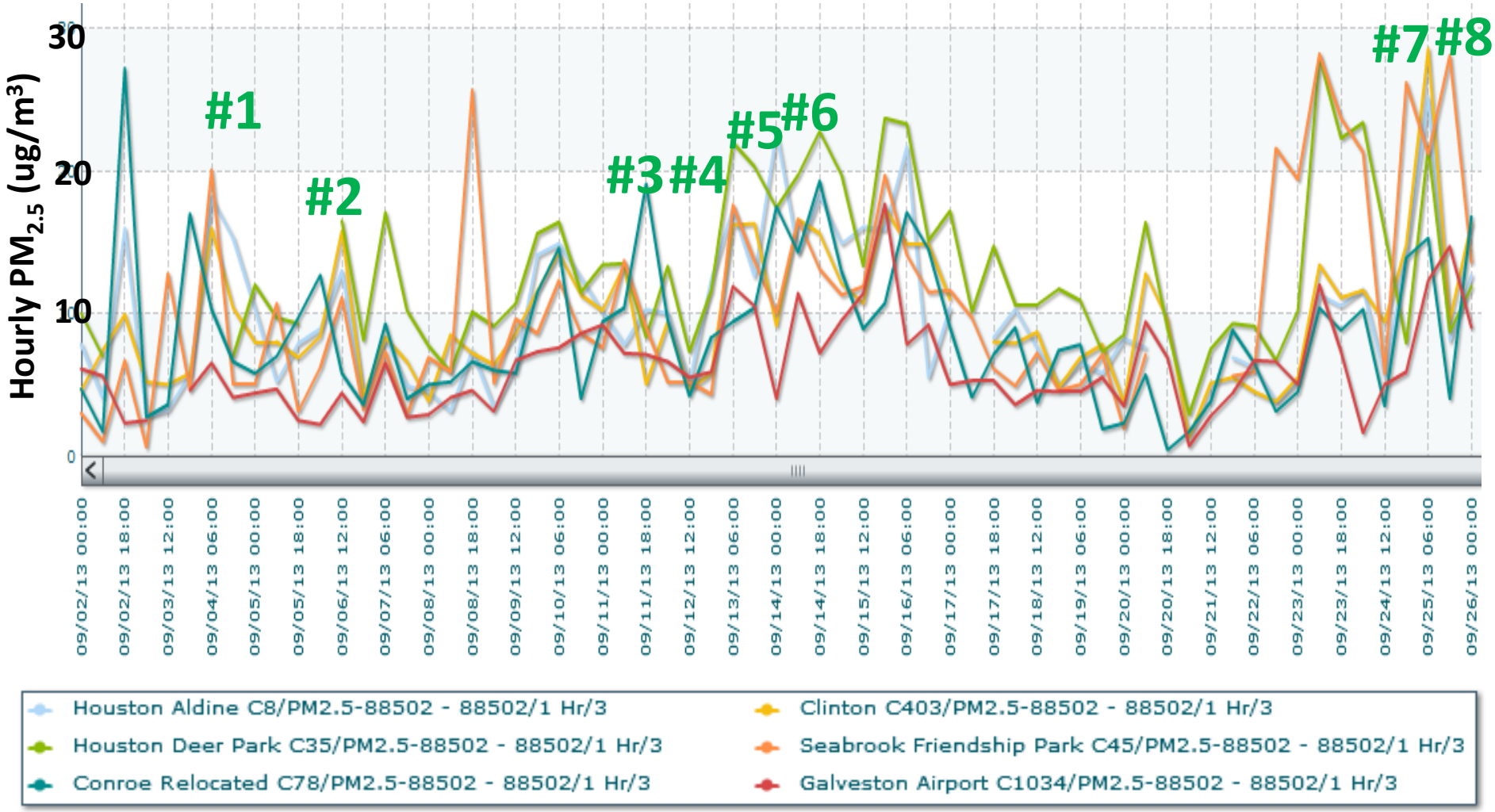
Min(140,55) = 43.9, Max(31,36) = 3022.6

Fri September 27 16:00 CST

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

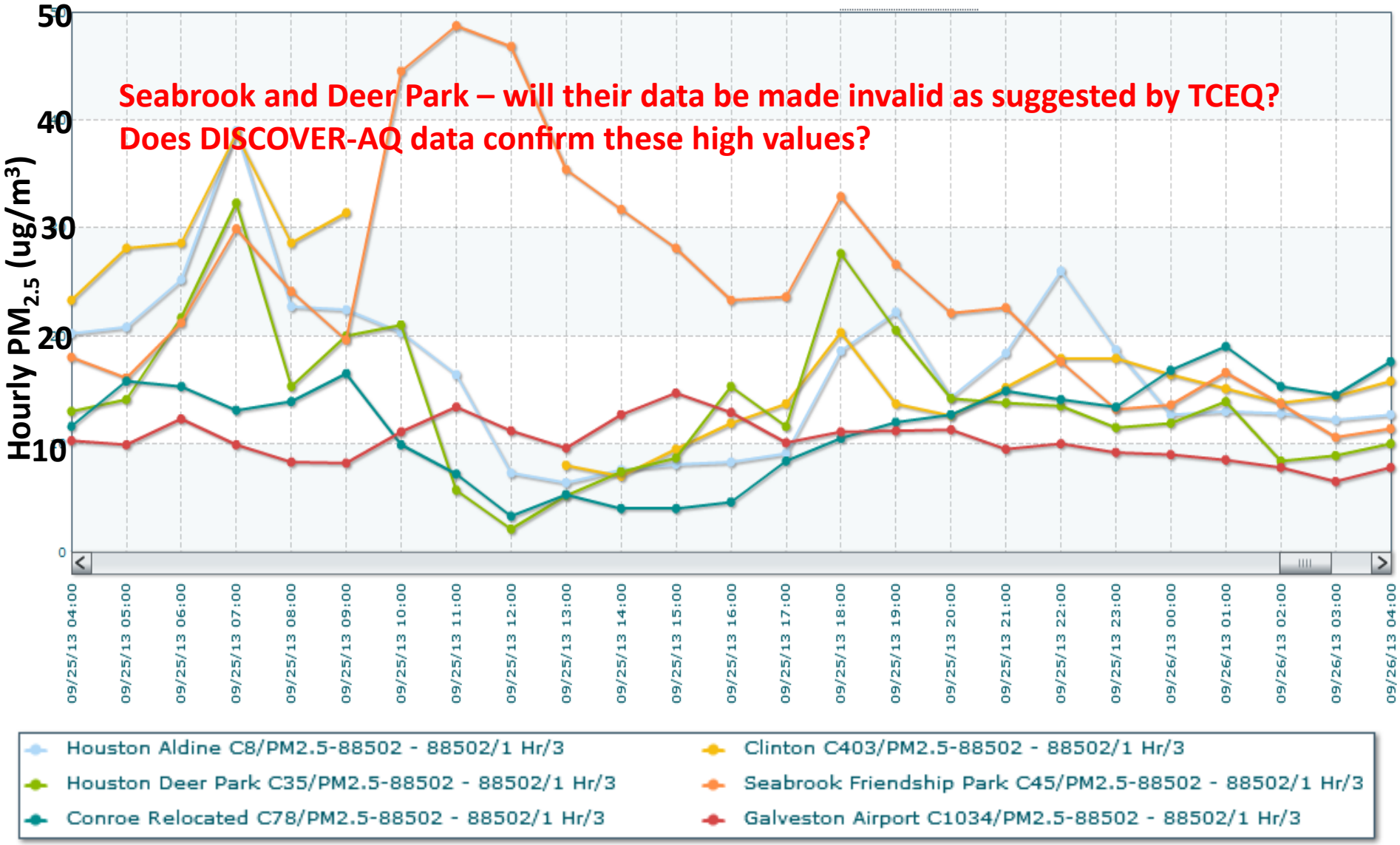
September 2nd – 25th

** EVERY 9th HOUR PLOTTED!!!!!



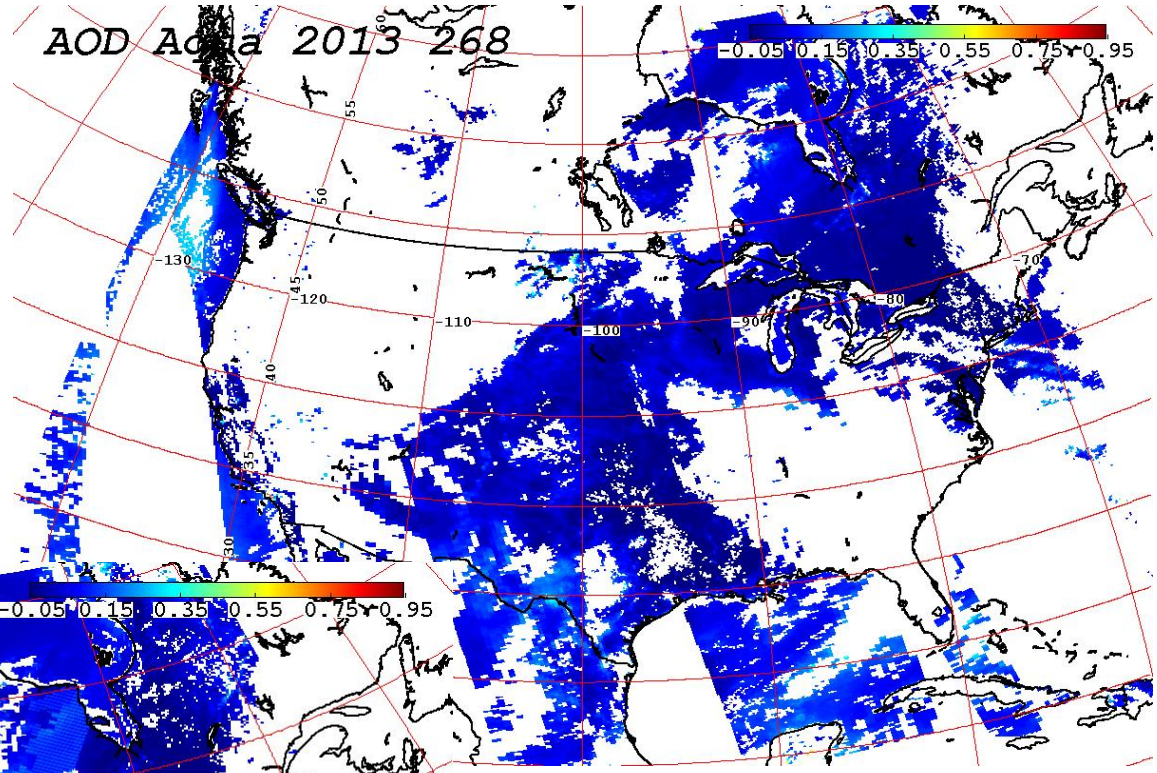
Hourly $PM_{2.5}$ (airnowtech.org)

September 25th

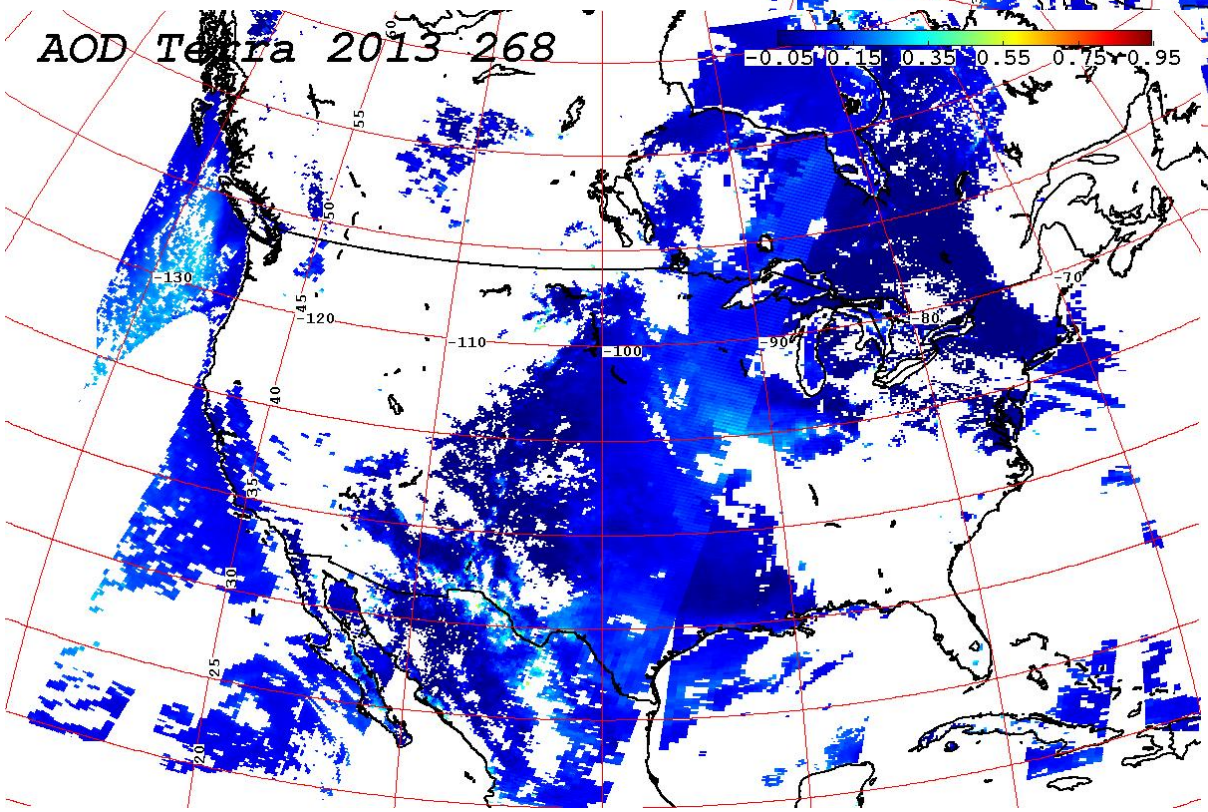


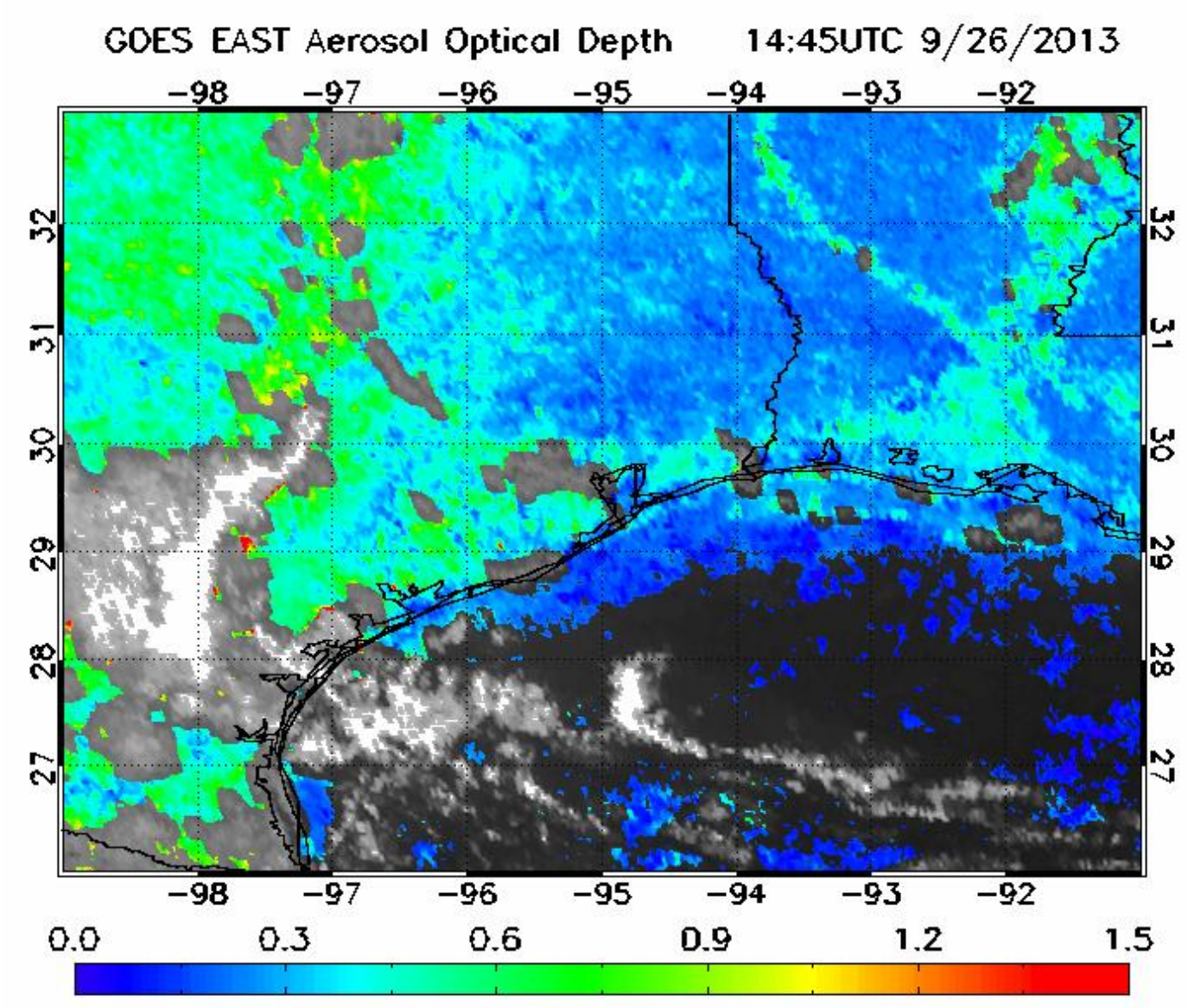
No obvious areas of high AOD.

AQUA AOD - yesterday



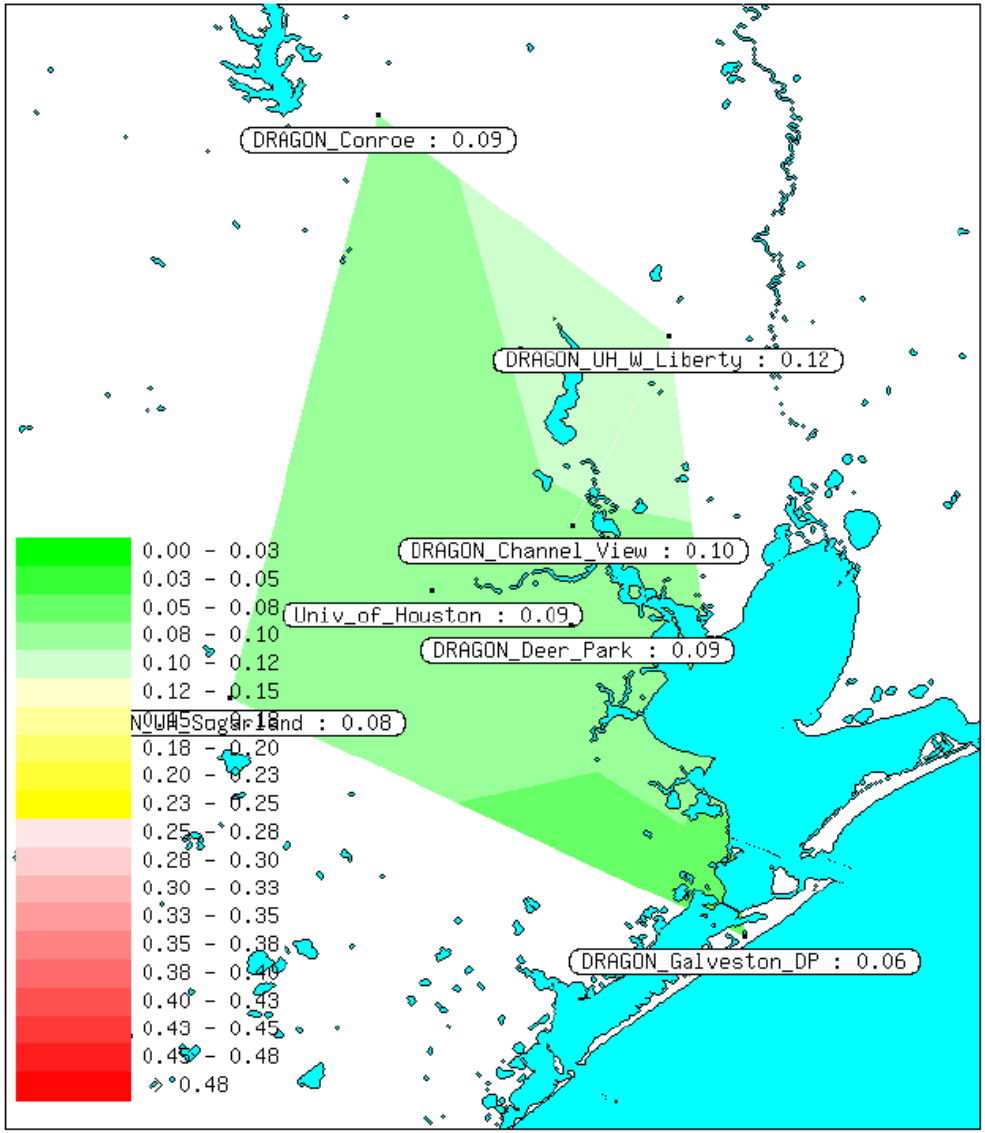
TERRA AOD - yesterday



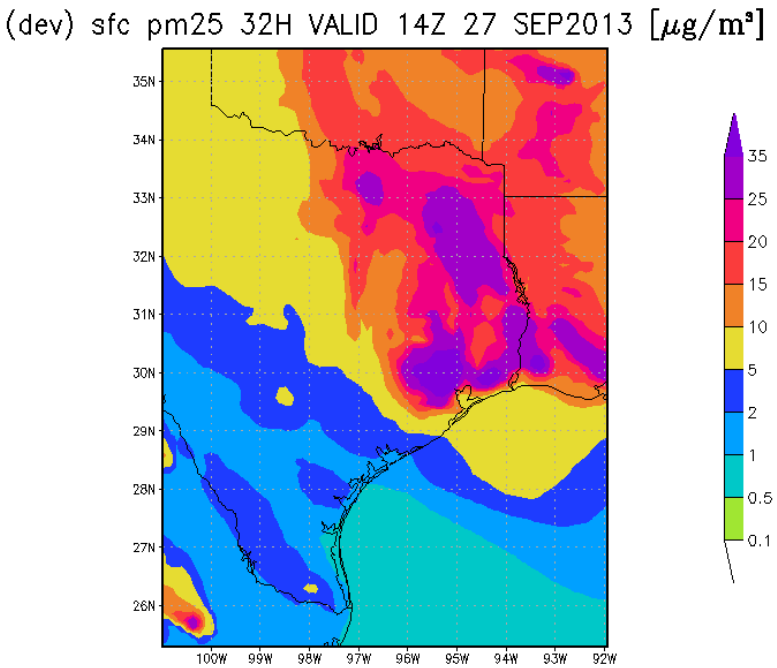

GOES EAST Aerosol Optical Depth
14:45UTC 9/26/2013
−98
−97
−96
−95
−94
−93
−92
32
31
30
29
28
27
0.0
0.3
0.6
0.9
1.2
1.5

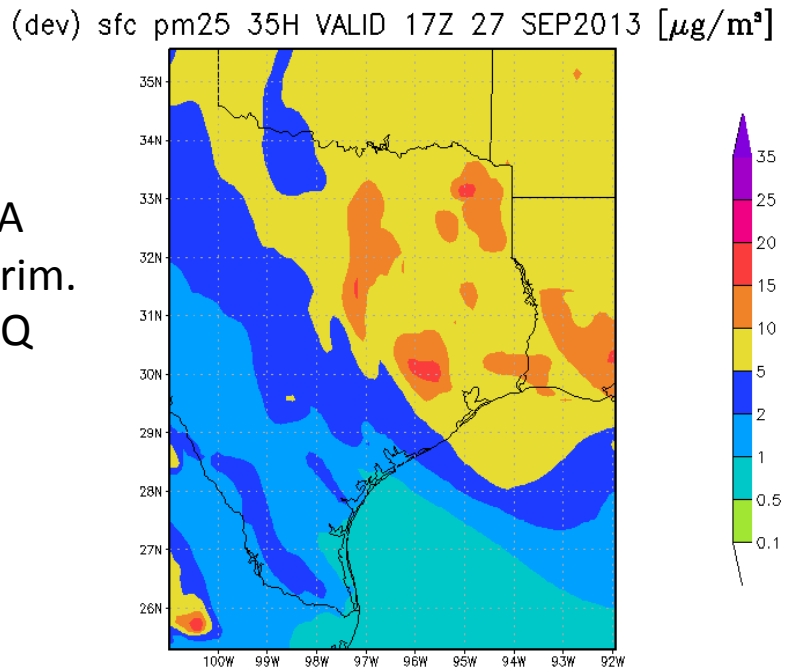
2013/SEP/26 : Daily average AOT Level 1.5, 8 sites

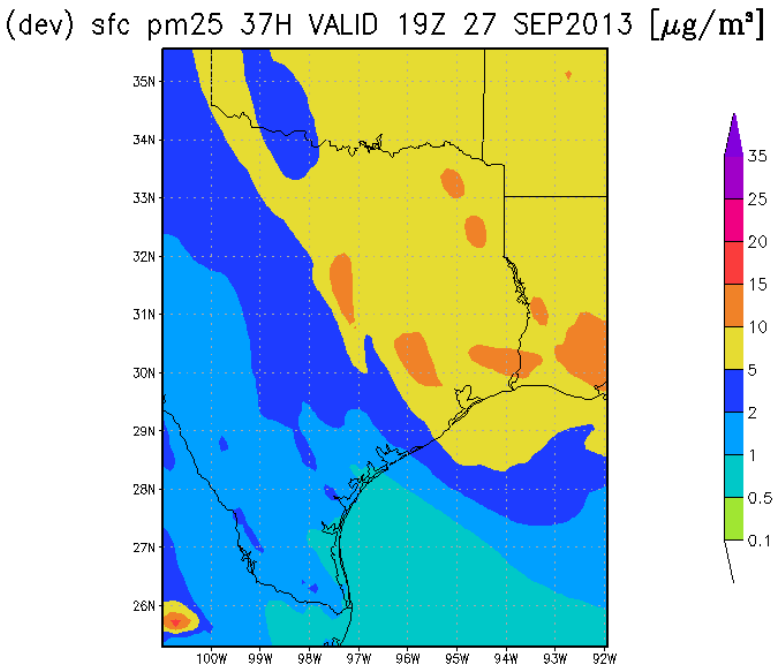
(N 30.5000, W 96.0000) (N 30.5000, W 94.5000)

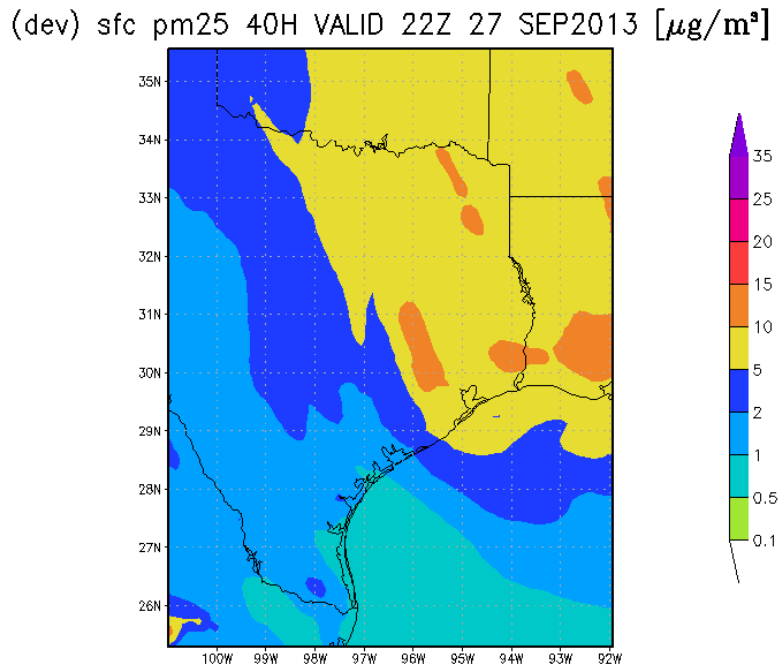


NOAA
Experim.
CMAQ

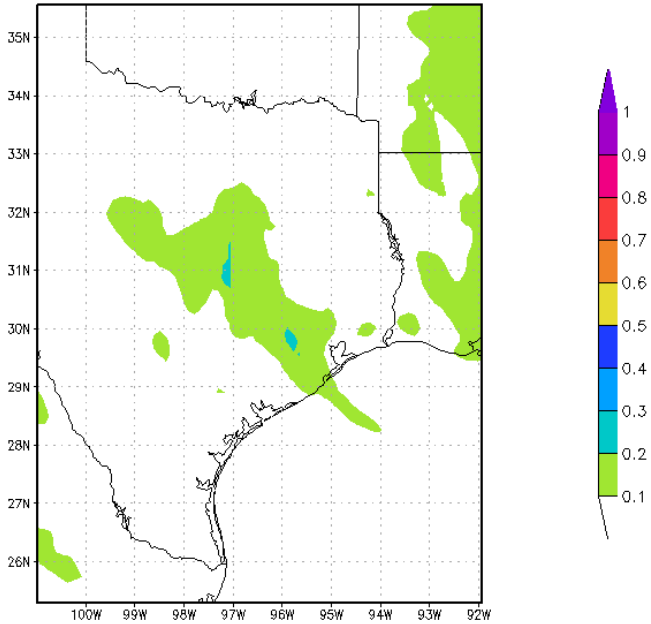




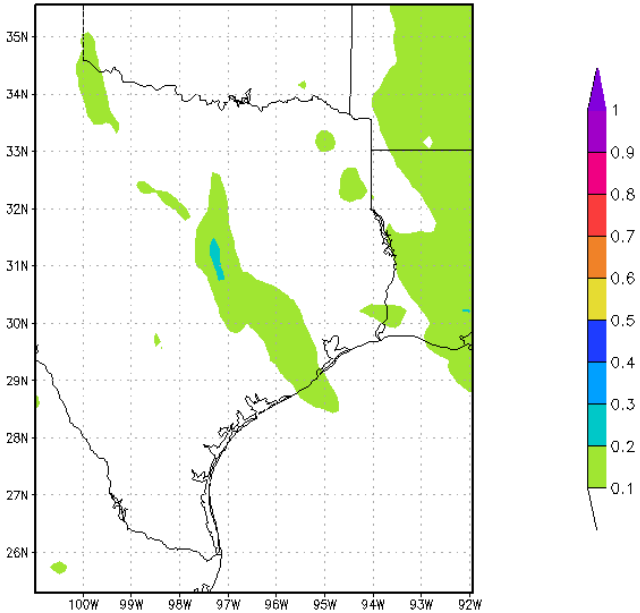




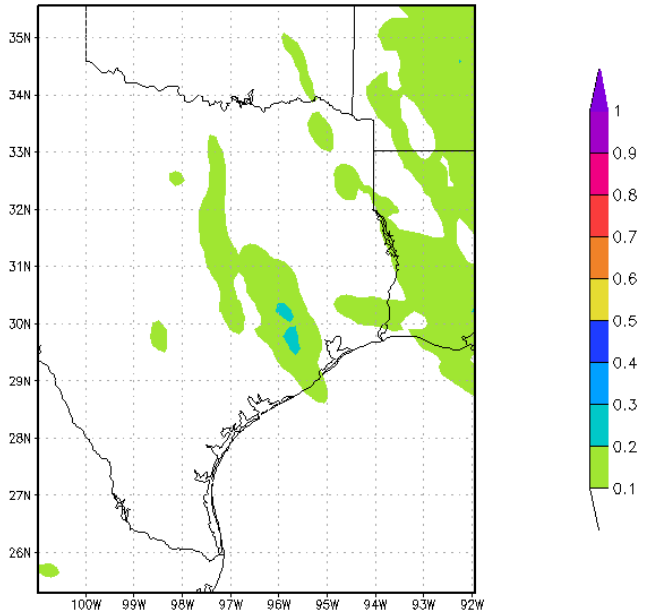
(dev) aot 32H VALID 14Z 27 SEP2013 [dimensionless]



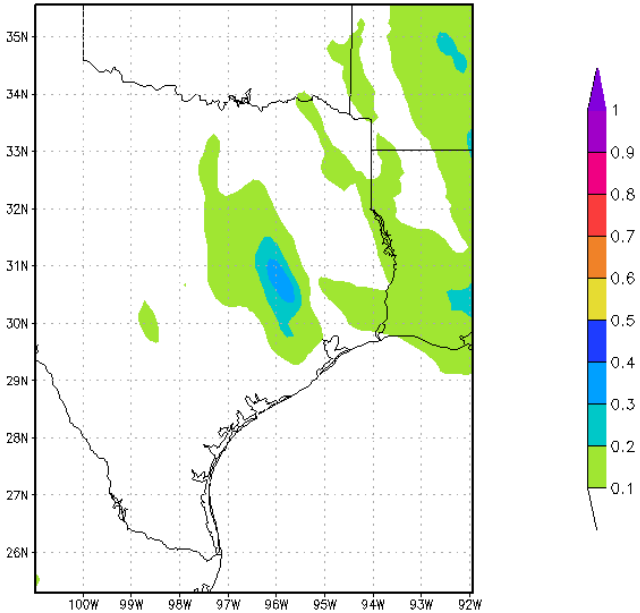
(dev) aot 35H VALID 17Z 27 SEP2013 [dimensionless]



(dev) aot 37H VALID 19Z 27 SEP2013 [dimensionless]

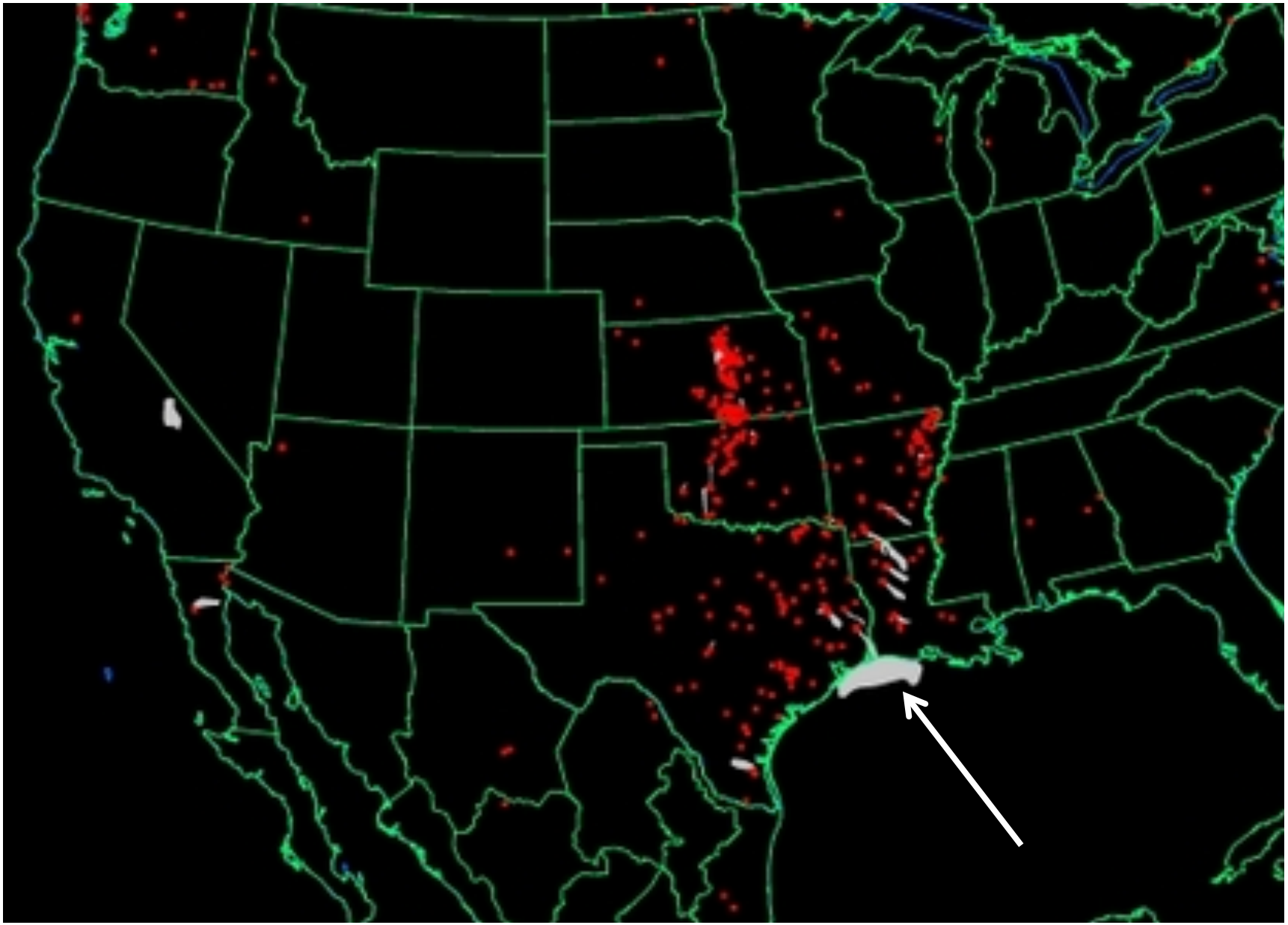


(dev) aot 40H VALID 22Z 27 SEP2013 [dimensionless]

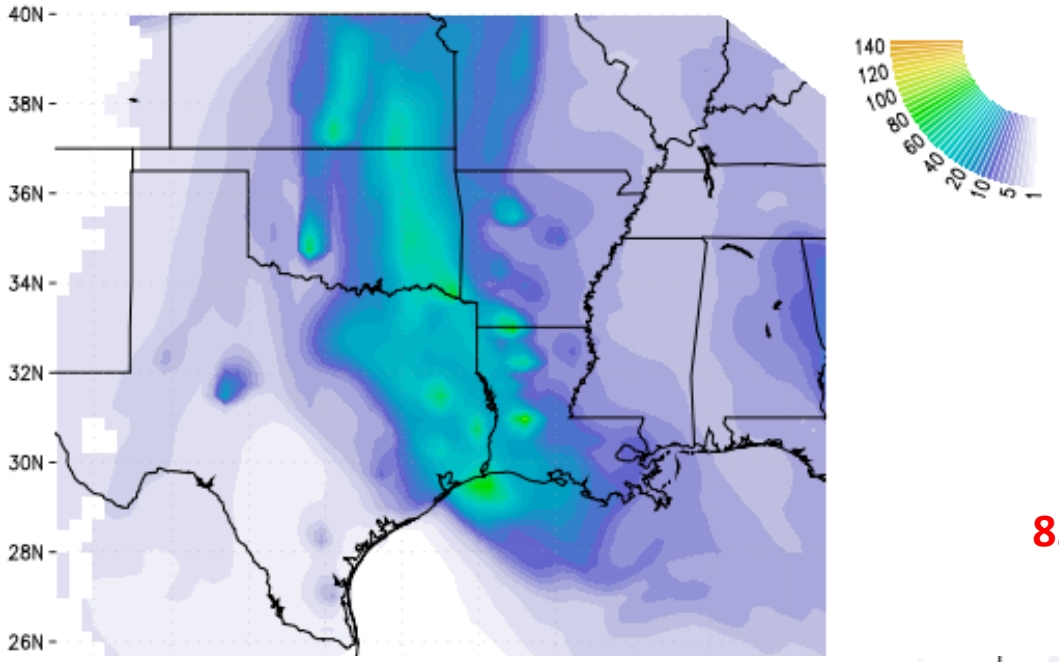


Fires – some action in Texas now –

Need to keep an eye on this as GMAO forecast shows occasionally impacting Houston.

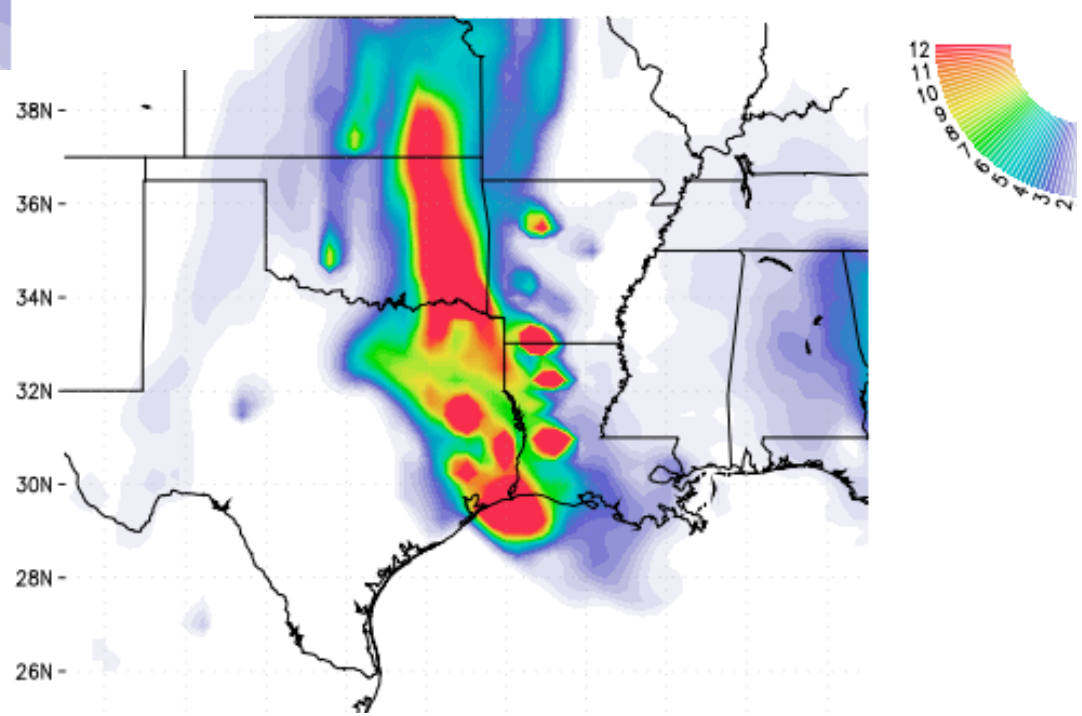


GEOS-5: 850 mb Biomass burning tracer for N. America



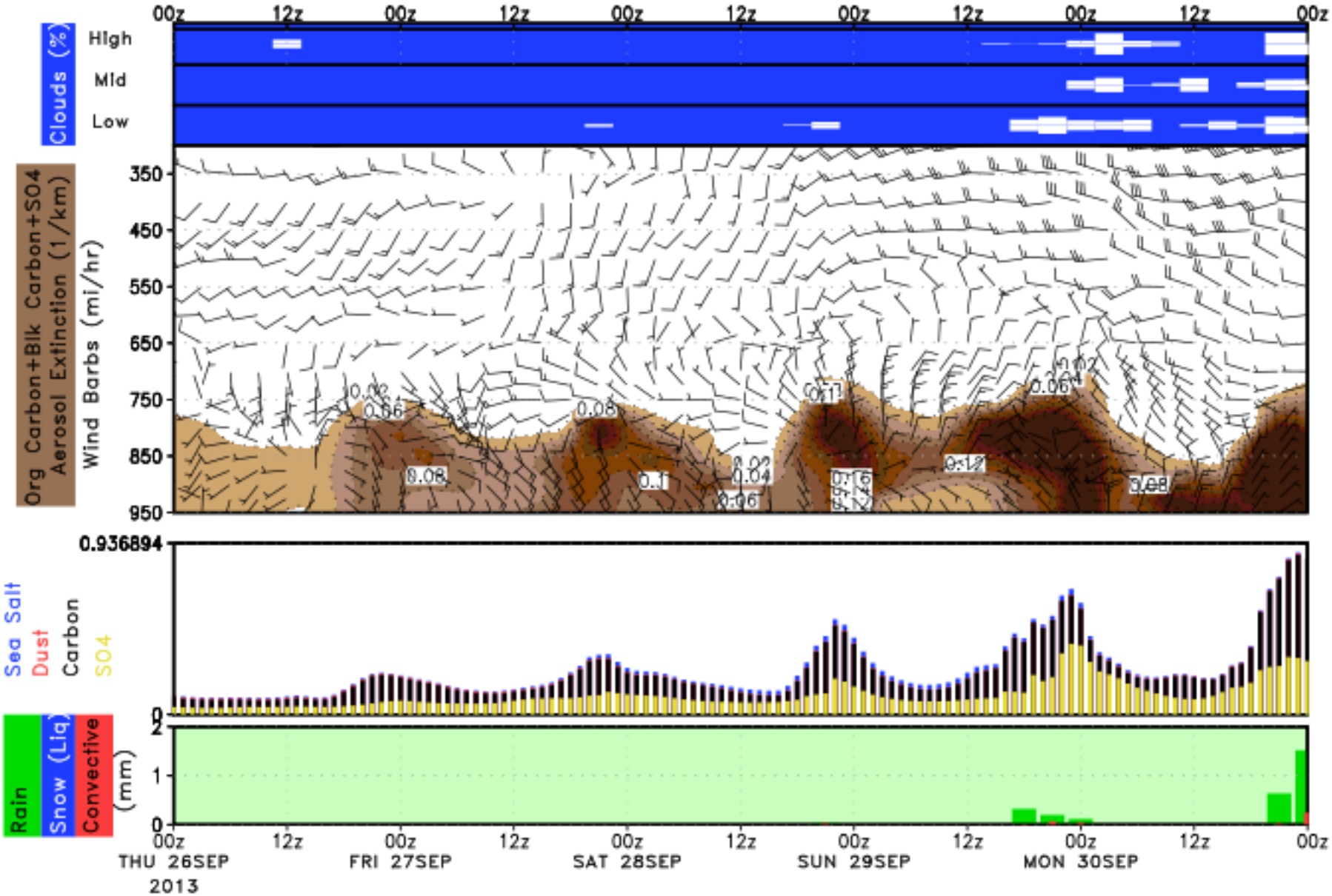
1pm Friday

850 mb Organic Carbon (ug/m3)

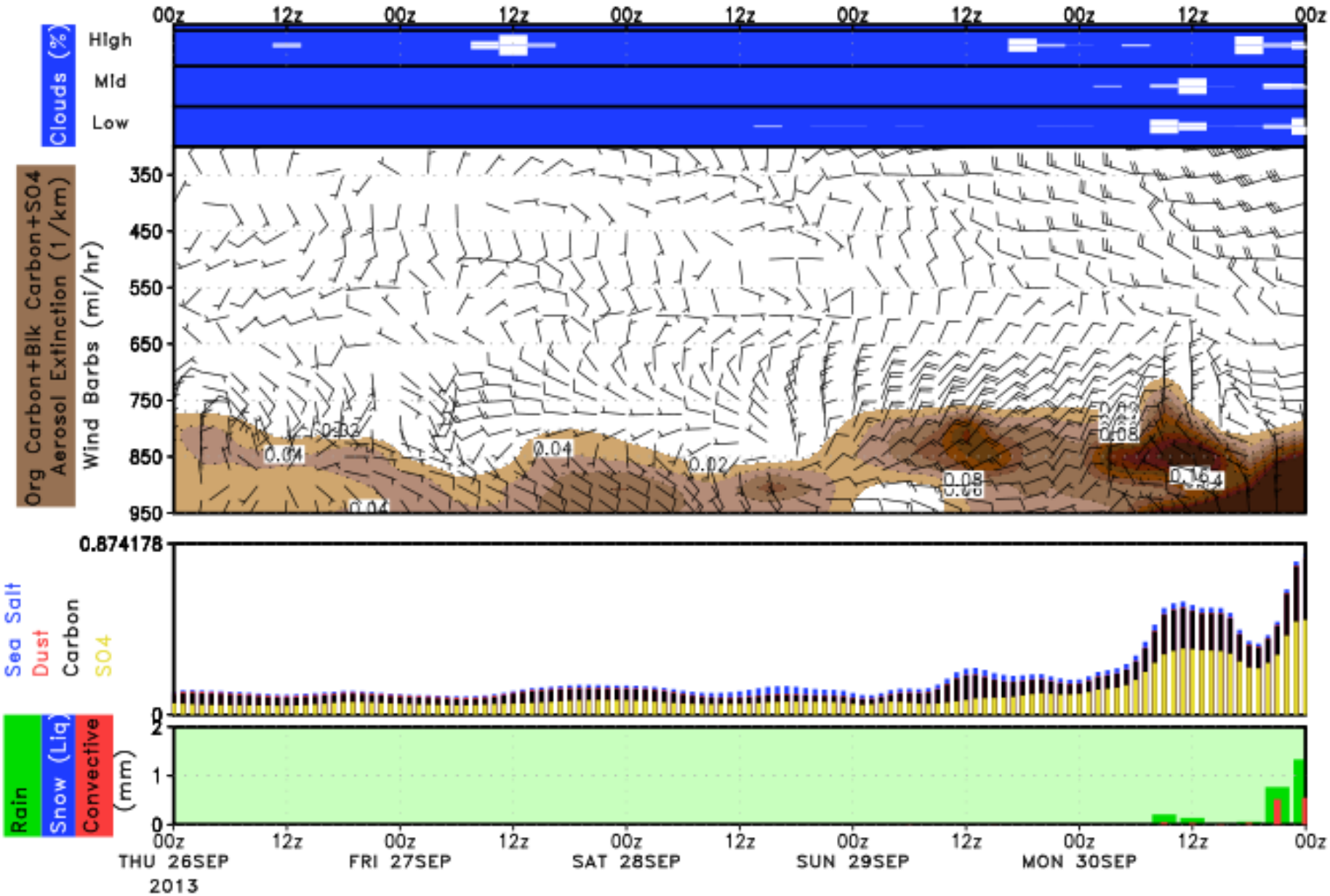


CONROE

Fire pollution could periodically affect Houston boundary layer.



GALVESTON


Clouds (%)
High
Mid
Low
Org Carbon+Blk Carbon+SO4
Aerosol Extinction (1/km)
Wind Barbs (mi/hr)
350
450
550
650
750
850
950
0.874178
Sea Salt
Dust
Carbon
SO4
Rain
Snow (Liq)
Convective
(mm)
00z
12z
THU 26SEP
2013
FRI 27SEP
SAT 28SEP
SUN 29SEP
MON 30SEP