

DISCOVER-AQ OUTLOOK -- September 23, 2013

An attempt was made to get flights in today, but these plans were scrubbed due to the persistent low clouds from the near stationary low pressure system sitting offshore. Conditions were generally either broken or overcast at around 4500 ft, which precluded doing ascending or descending spirals. TCEQ forecast Code Yellow ozone for today to the S and SW of Houston.

We will likely have cloud issues again on Tuesday morning as the low pressure area still lurks offshore. The models suggest that the low will begin to move off to the northeast during the day tomorrow, taking much of the cloudiness with it. Conditions could be much better in the afternoon tomorrow than in the morning. We recommend attempting flights again tomorrow.

Wednesday looks like an excellent day to fly with the dominance of a ridge of high pressure and dry conditions. With light northerly winds carrying Houston emissions out over the Gulf in the AM, a sea breeze will likely recirculate these emissions back over Houston in the afternoon, leading to a convergence zone containing large amounts of pollutants. TCEQ is forecast a Code Orange ozone day on Wednesday. Thursday will see continuing good flying conditions in general, but the winds will turn to more southerly during the day, bringing more moisture into our region and possible more clouds. TCEQ continues the Code Orange ozone for Thursday. Possibly, more chance of clouds and showers on Friday, but we may be able to squeeze in another flight day.

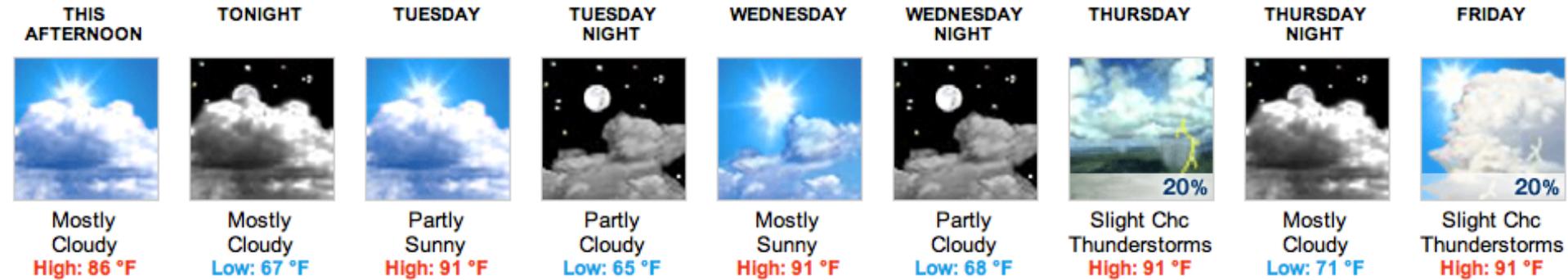
9/23/2013 Weather Briefing

Ryan Stauffer

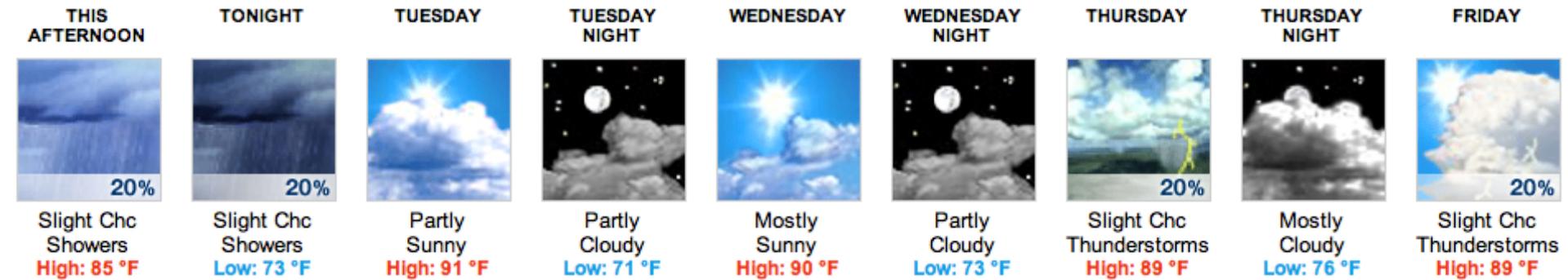
Recommendations

- Tuesday: **Likely Fly Day**. Still expect clouds to be a factor especially AM. Timing of Sfc Low exit is key
- Wednesday: **Likely Fly Day**. Upper level ridge in control and lighter background winds. Widespread clouds not a factor
- Thursday: **Likely Fly Day**. Cloud conditions look good for flight. Winds will veer to more S and will have to watch moisture advection ahead of front for Friday

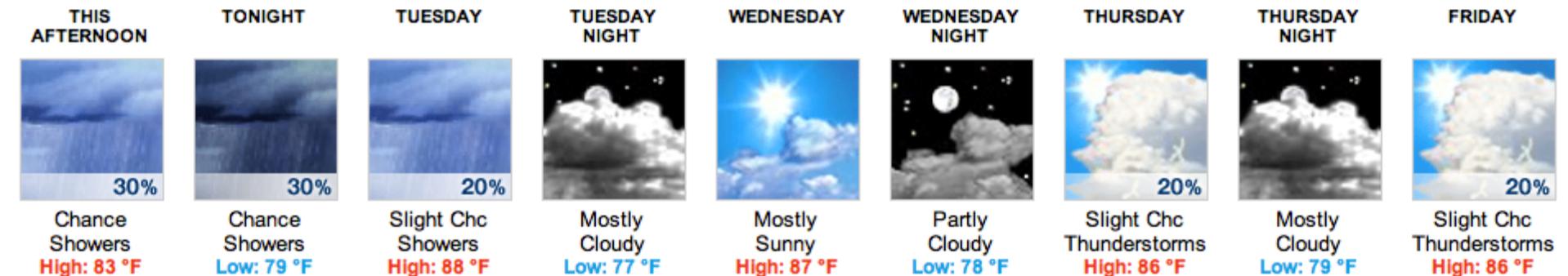
Conroe:



Houston Hobby:



Galveston:



Current Conditions

Galveston:

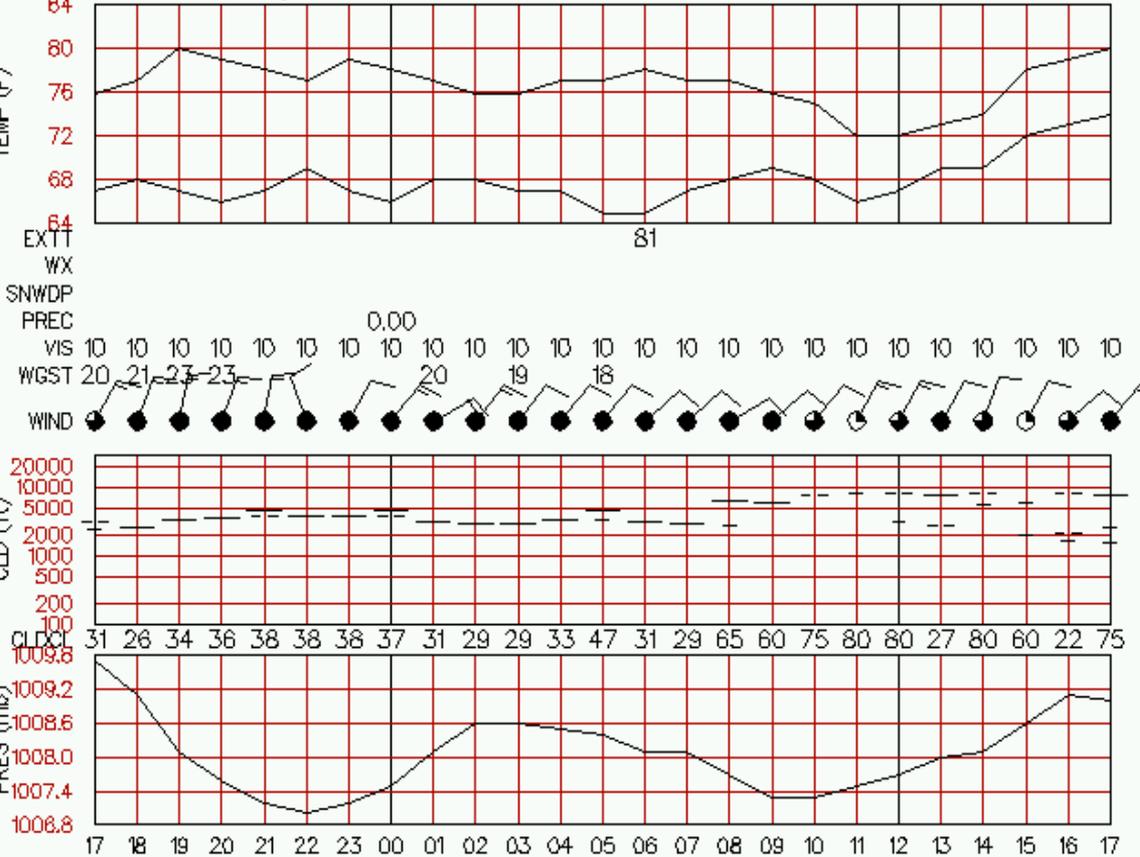


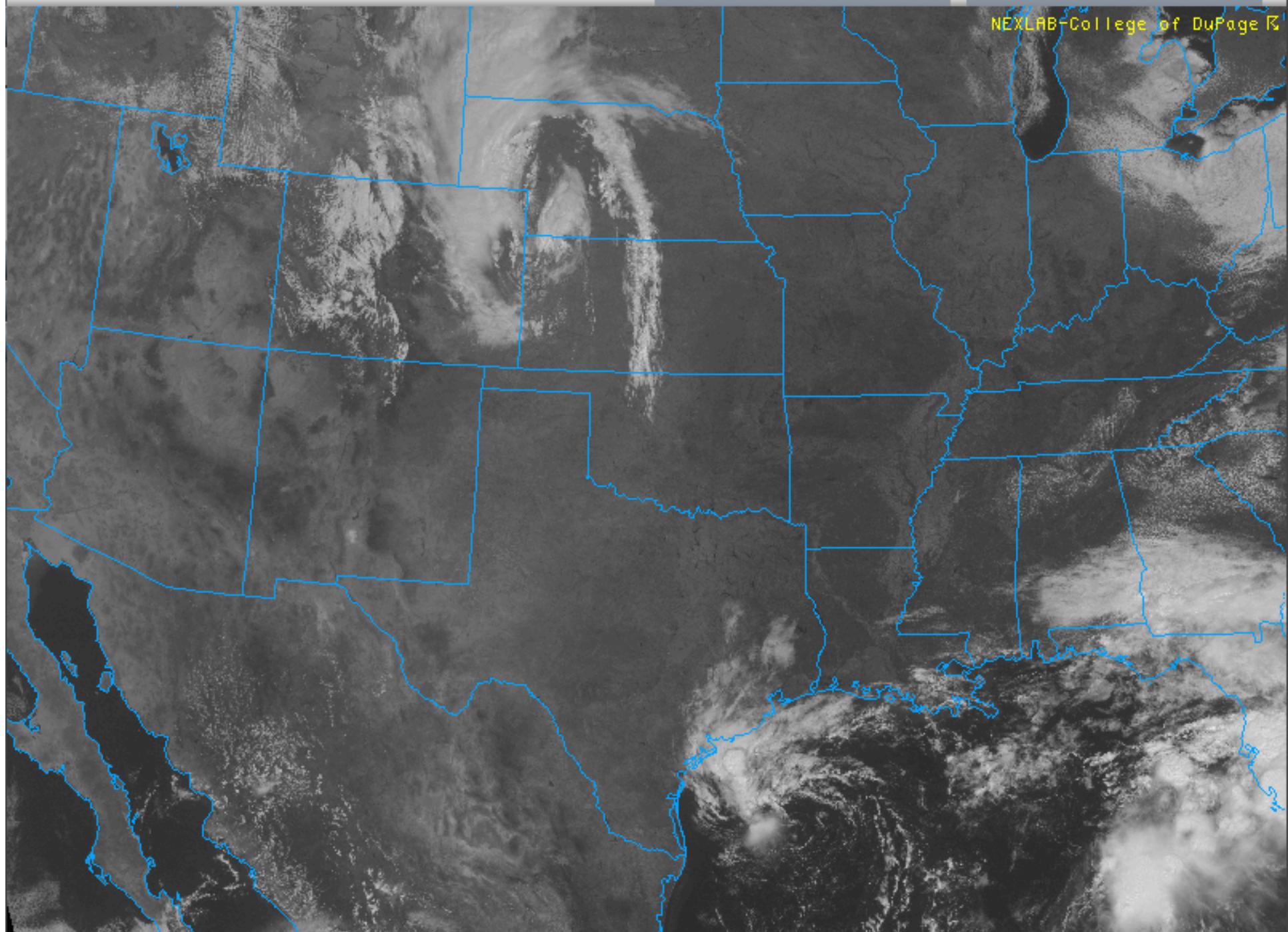
Overcast
80°F
27°C

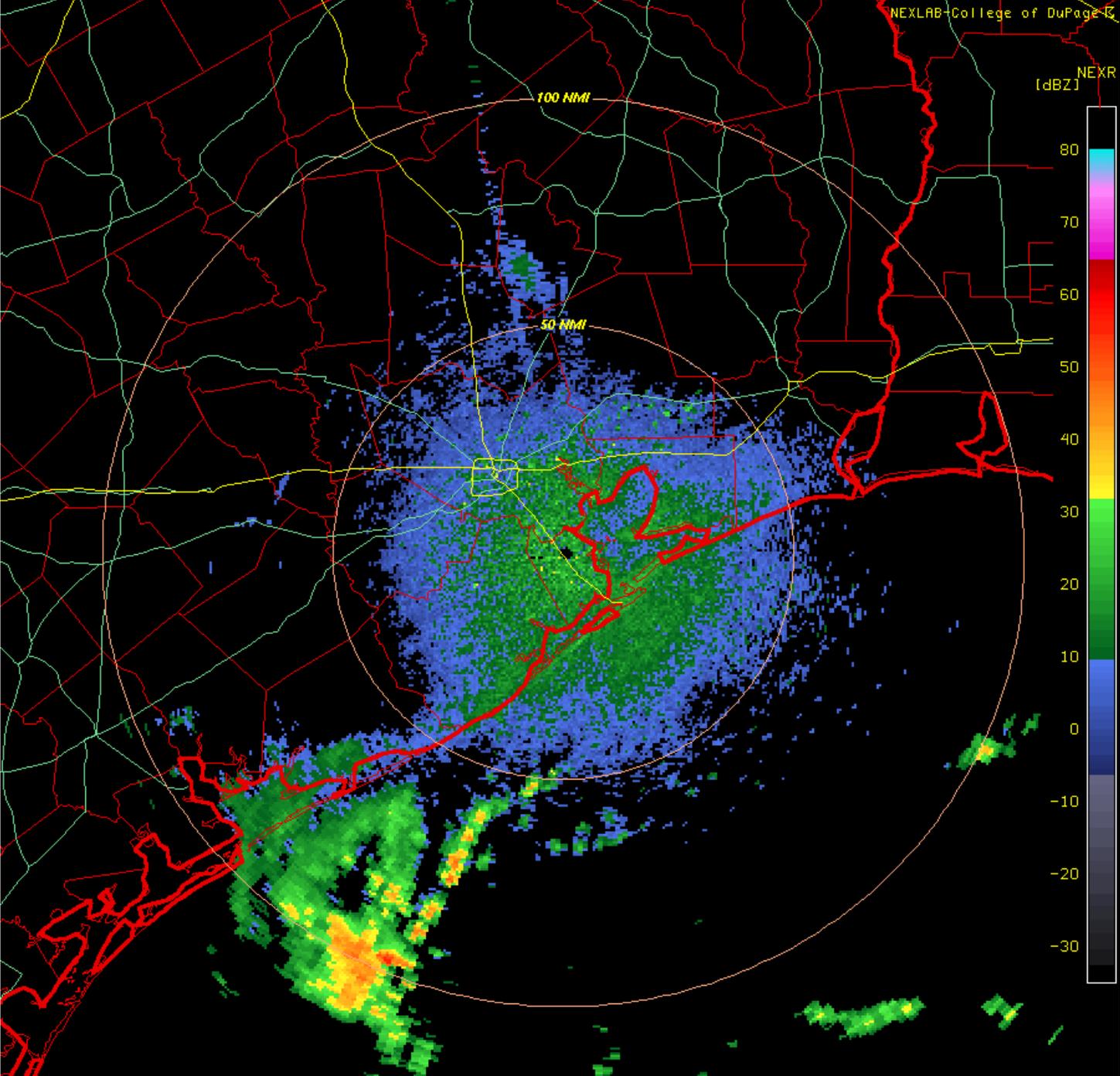
Humidity 82%
Wind Speed NE 15 mph
Barometer 29.80 in (1009.0 mb)
Dewpoint 74°F (23°C)
Visibility 10.00 mi
Heat Index 85°F (29°C)

Last Update on 23 Sep 11:52 am CDT

Meteogram for KGLS from 1700Z 22 SEP 13 to 1700Z 23 SEP 13

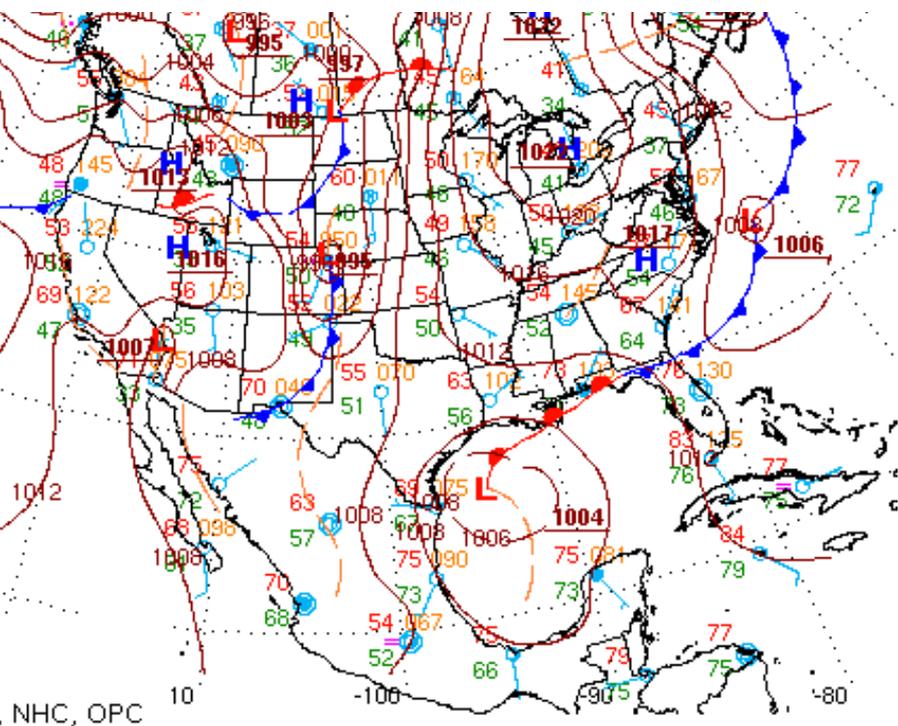




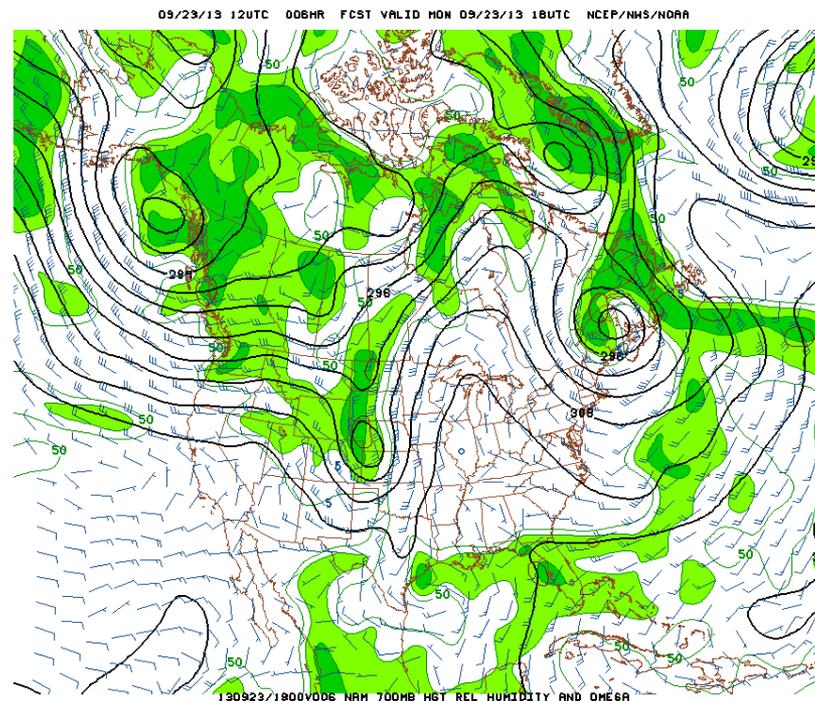


Today: Clouds slowly streamed back N late yesterday as moist 700mb dew points now essentially outline the DISCOVER-AQ domain. Clouds remain SCT-OVC w/ showers possible near the coast. Surface low expected to drift NE

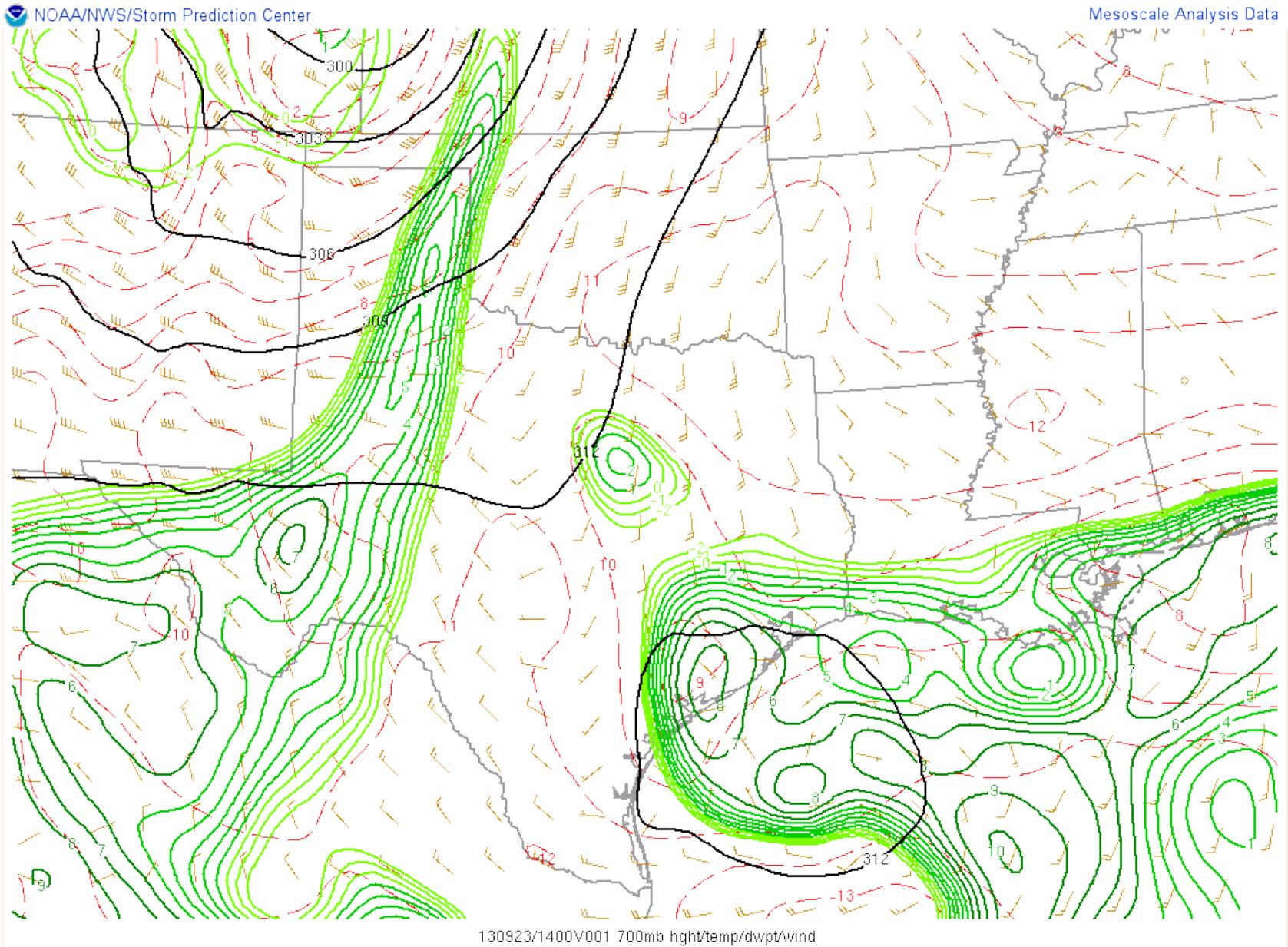
12z Surface Analysis



7 AM CDT NAM 700 mb RH

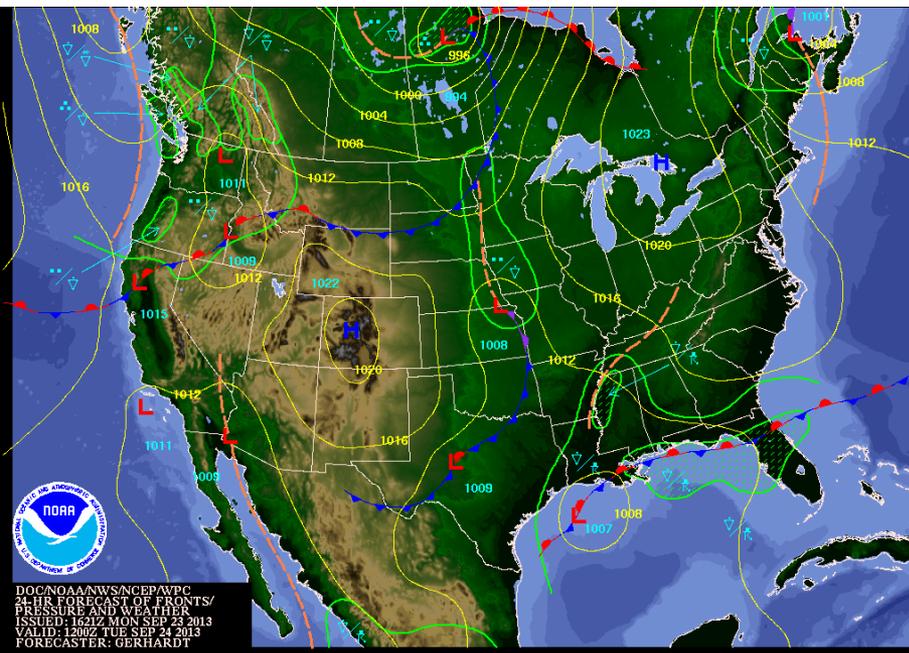


Today: 9am CDT 700mb dew point temperatures (green)

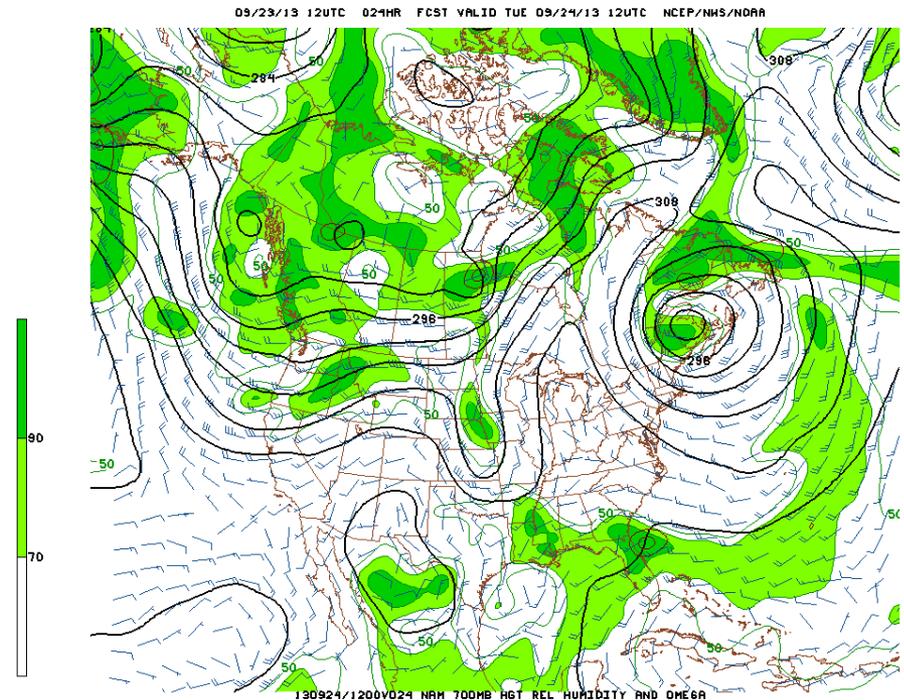


Tomorrow: Clouds and few showers (coast) slowly exit but some disagreement among models on timing of sfc low's departure. Probably see at least some low clouds through noon, perhaps more stubborn

12z Surface Forecast



7 AM CDT NAM 700 mb RH



10 m winds at 1 PM tomorrow

WRF 3-KM

Fcst: 36 h

Init: 06 UTC Mon 23 Sep 13

Valid: 18 UTC Tue 24 Sep 13 (13 CDT Tue 24 Sep 13)

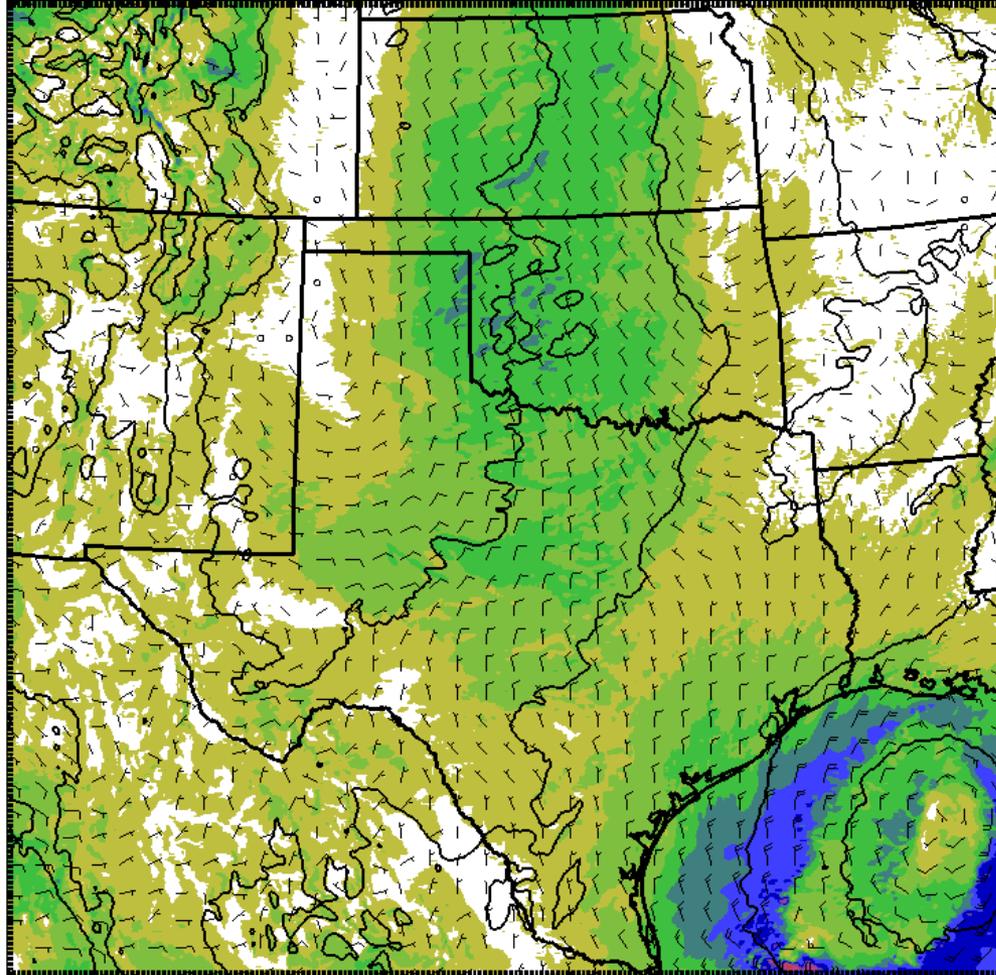
Sigma1 Windspeed (m/s)

Sea Level Pressure (hPa)

Wind at 10m (full barb = 10kts)

100 W

90 W



Winds N at ~10kts
and may relax a bit
toward evening as
the low pulls away

30 N

CONTOURS: UNITS=hPa LOW= 1008.0 HIGH= 1018.0 INTERVAL= 2.0000



Model Info: V3.3

No Cu YSU PBL Thompson Noah LSM 3.0 km, 37 levels, 18 sec
LW: RRTM SW: Dudhia DIFF: simple KM: 2D Smagor

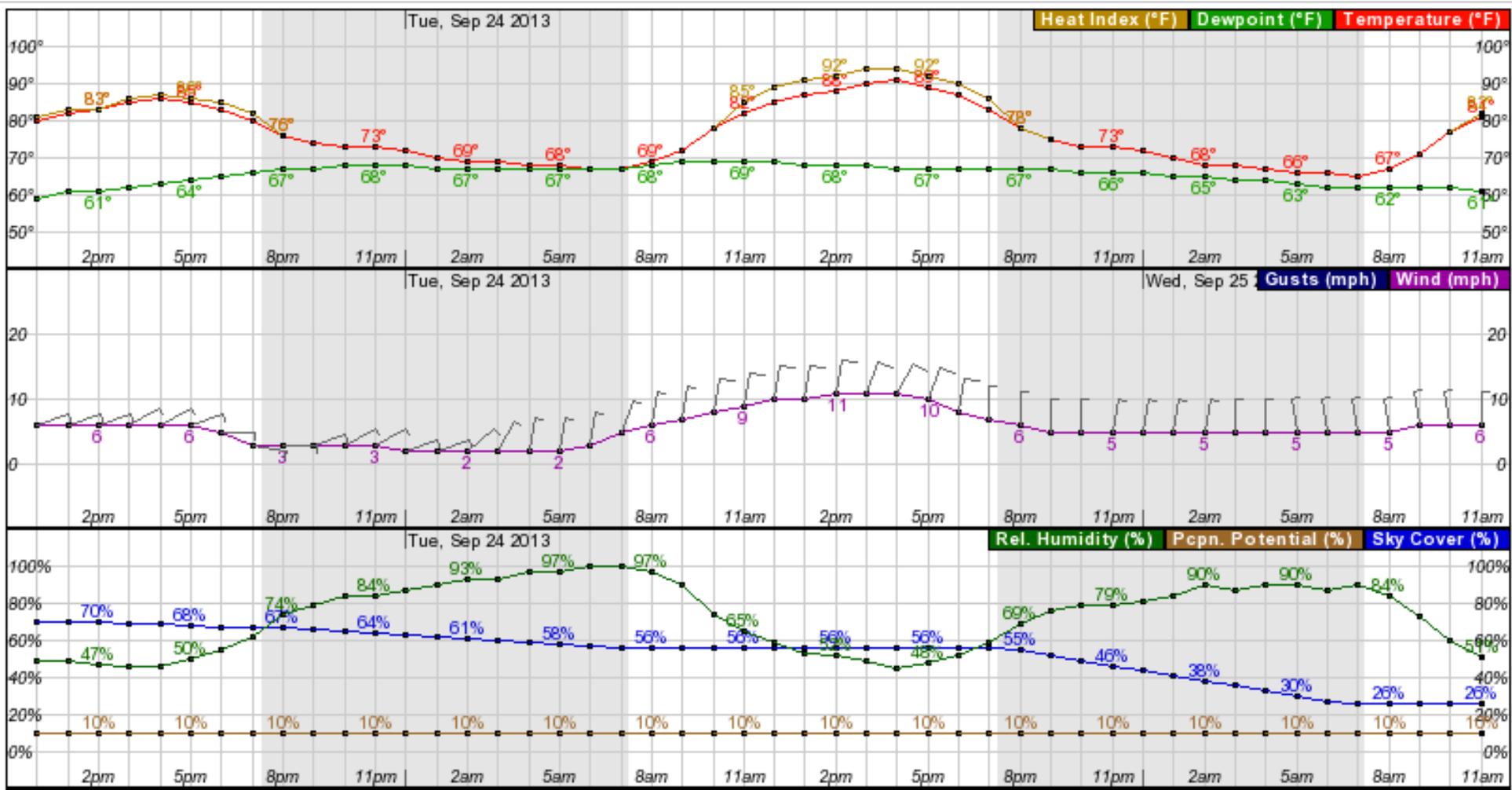
Conroe

Today: Mostly Cloudy

Tomorrow: Clearing dependent on low

Today →

Tomorrow →



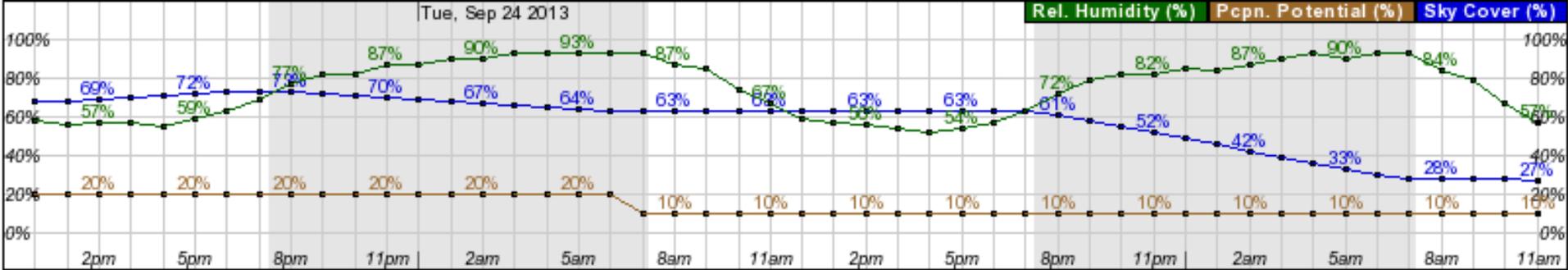
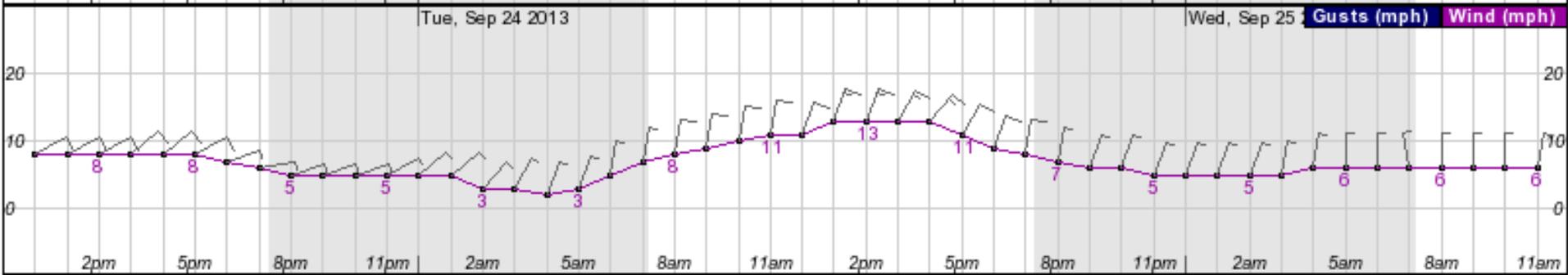
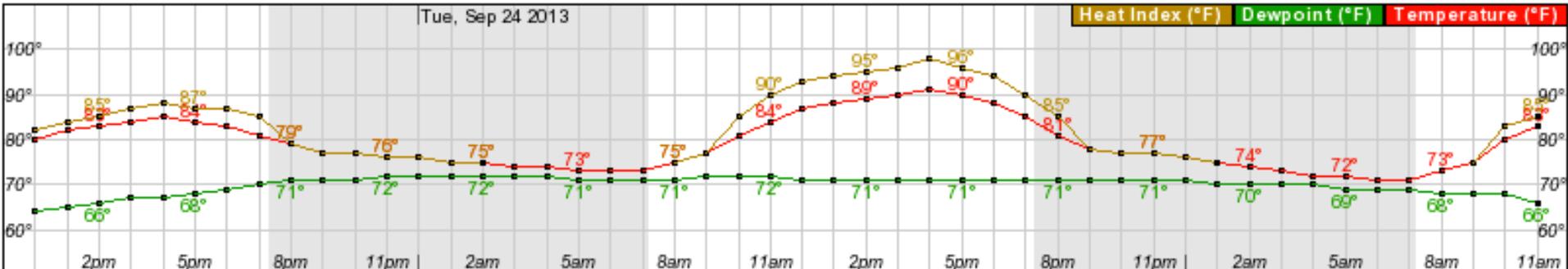
Houston Hobby

Today: Mostly Cloudy, possibly breezy tomorrow

Tomorrow: Clearing dependent on low

Today →

Tomorrow →



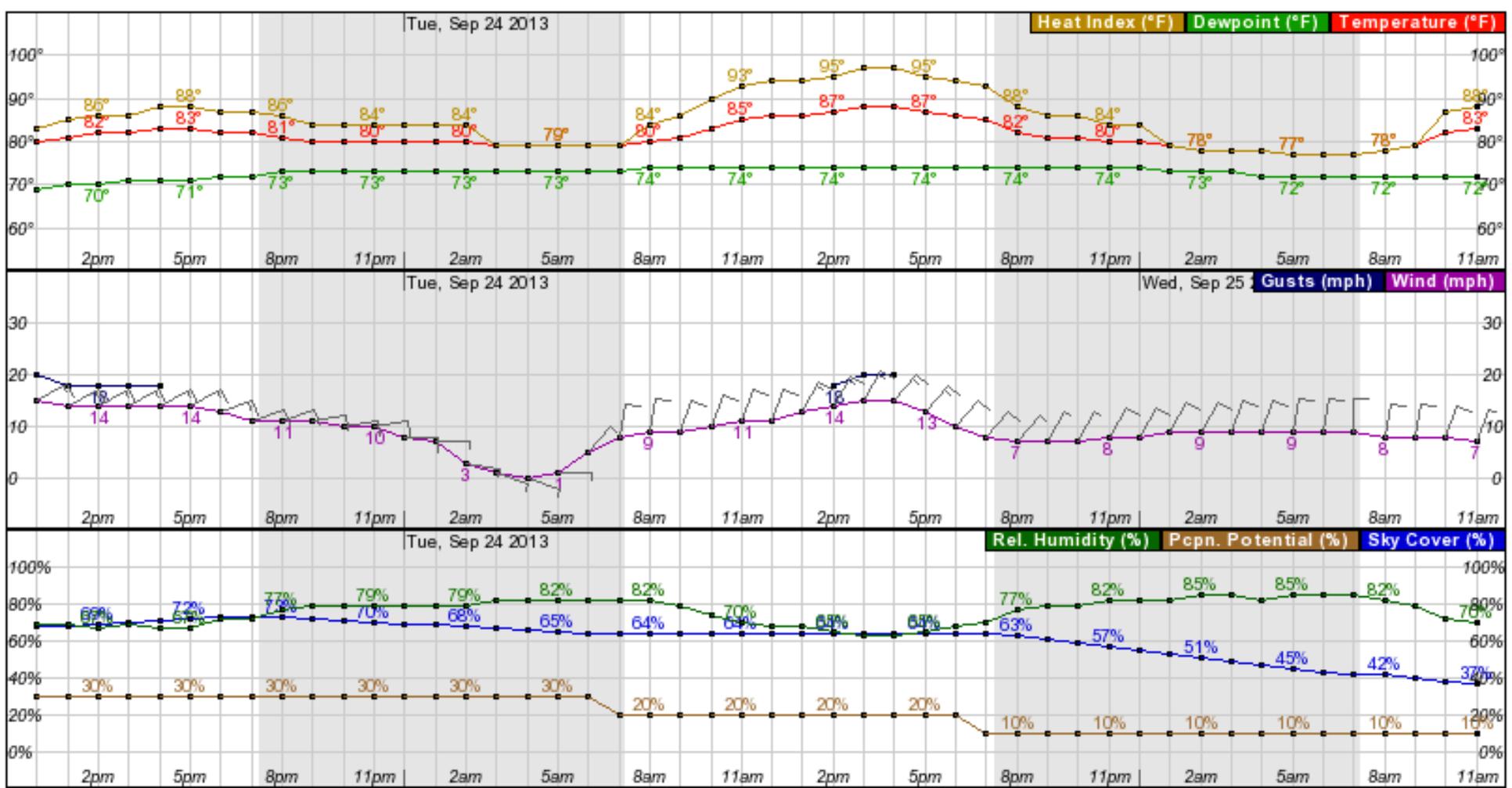
Galveston

Today: Clouds and breezy

Tomorrow: Clearing dependent on low

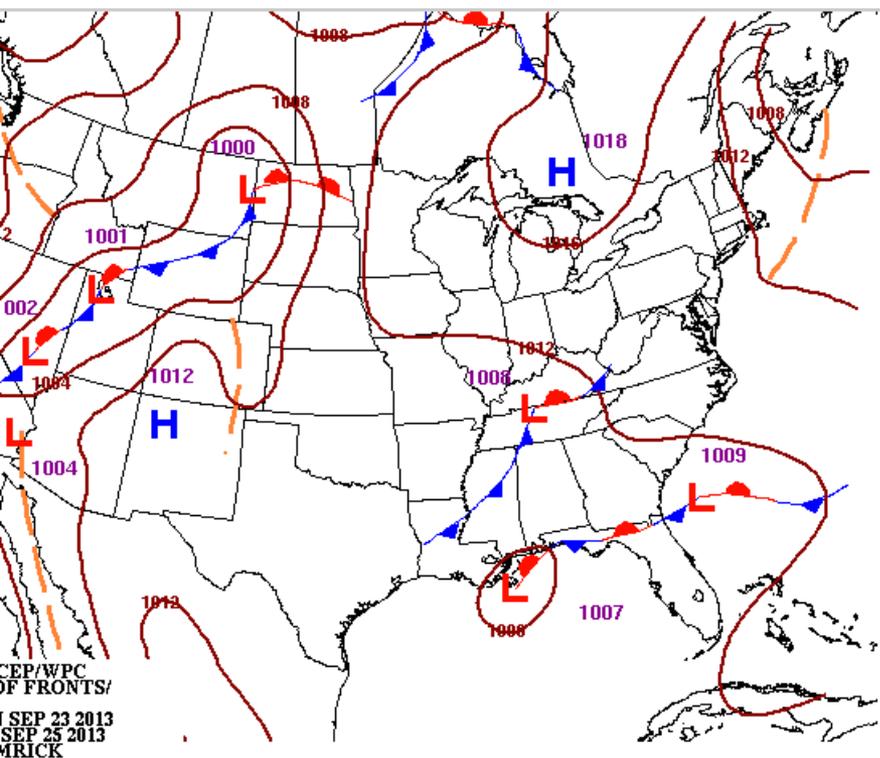
Today →

Tomorrow →

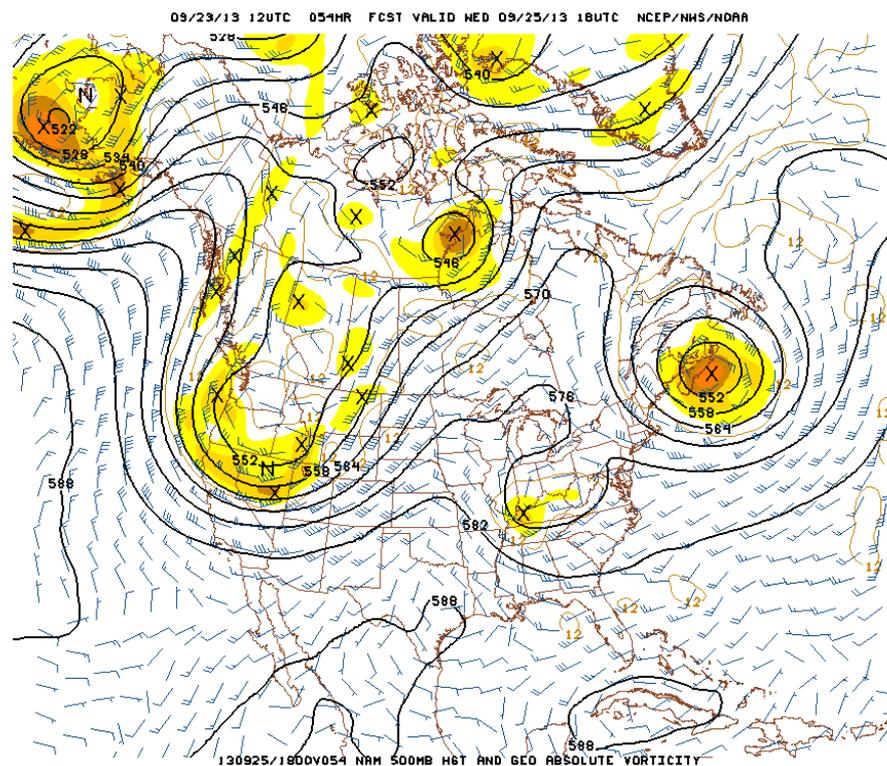


Wednesday: Upper level ridge moves over the region. N wind and subsidence with little to no cloud interference expected

12z Surface Forecast



1 PM CDT NAM 500 mb Ht/Vorticity



10 m winds at 1 PM Wednesday

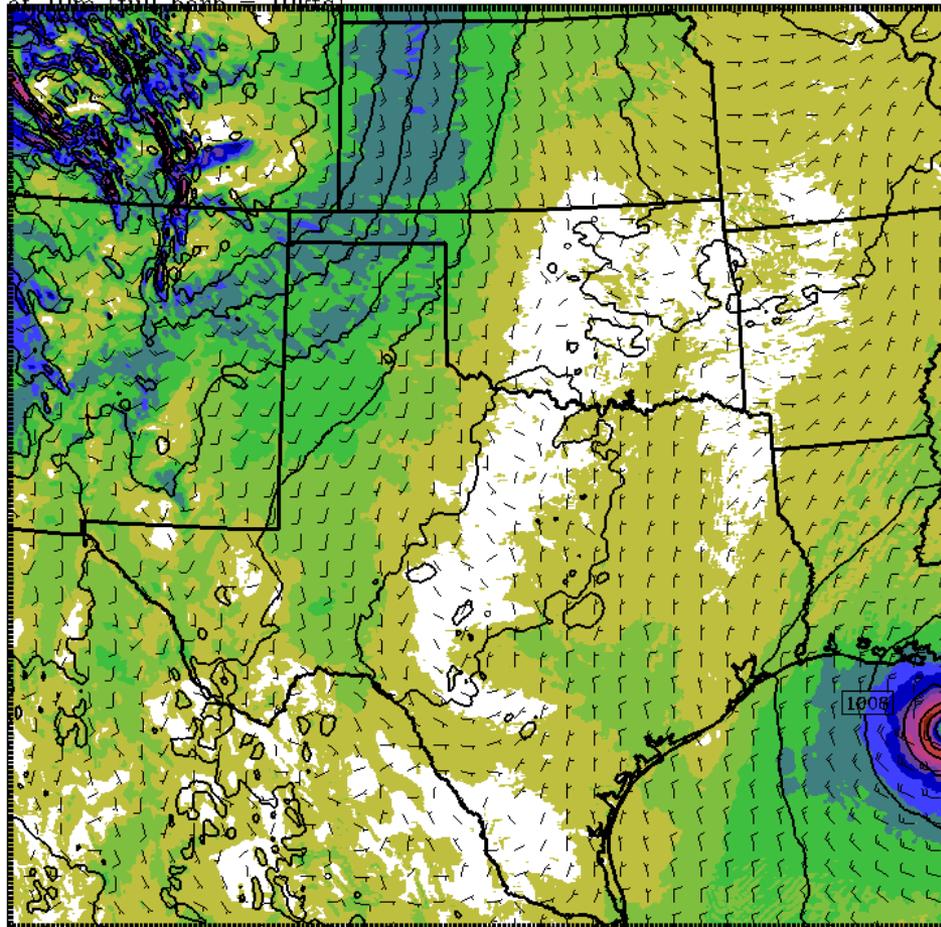
WRF 3-KM
Fest: 60 h

Init: 06 UTC Mon 23 Sep 13
Valid: 18 UTC Wed 25 Sep 13 (13 CDT Wed 25 Sep 13)

Signal Windspeed (m/s)
Sea Level Pressure (hPa)
Wind at 10m (full barb)

100 W

90 W



30 N

Potentially good set up for recirculation/mesoscale patterns to develop. Winds N @5kts and high temps near 90F

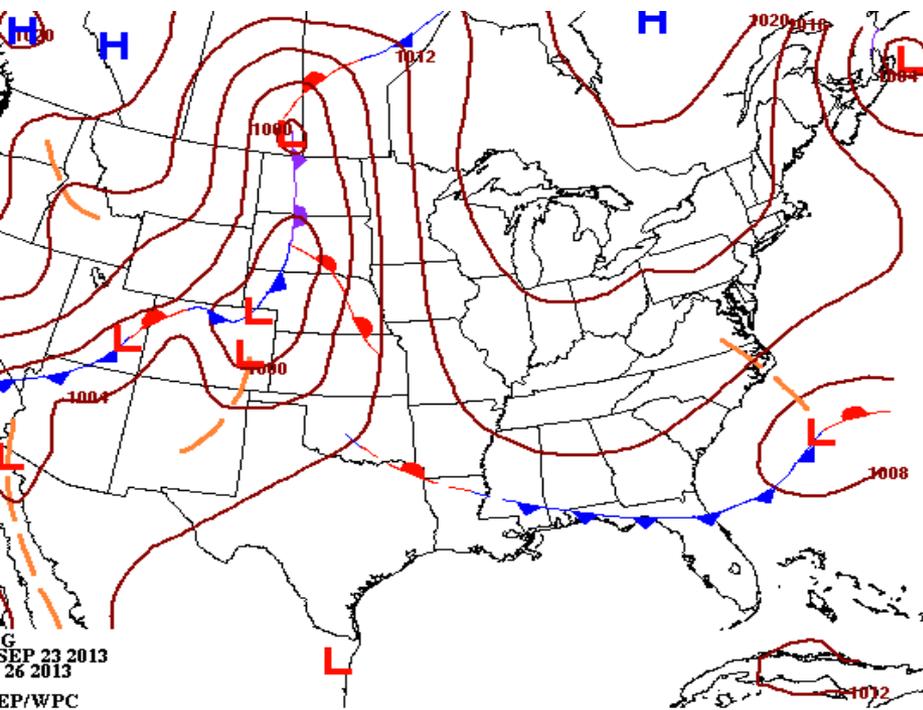
CONTOURS: UNITS=hPa LOW= 998.00 HIGH= 1014.0 INTERVAL= 2.0000

2 4 6 8 10 12 14 16 18 20 22 m s⁻¹

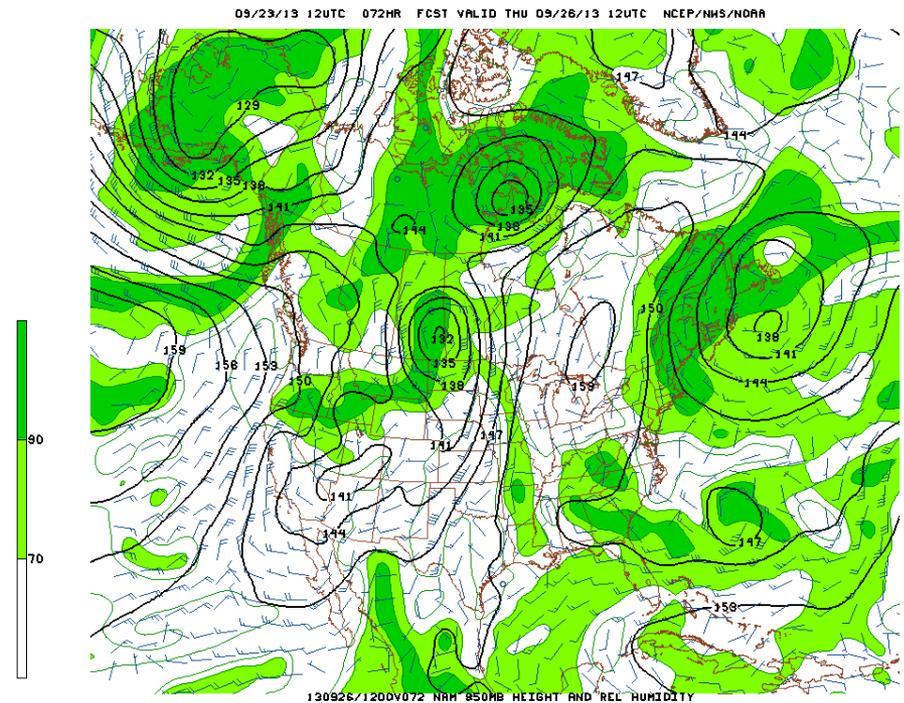
Model Info: V3.3 No Cu YSU PBL Thompson Noah LSM 3.0 km, 37 levels, 18 sec
LW: RRTM SW: Dudhia DIFF: simple KM: 2D Smagor

Thursday: Maybe some low stratus to start if onshore flow, mixing out by late morning. Cloud conditions still appear very favorable for flight

12z Surface Forecast



7 AM CDT NAM 850 mb RH



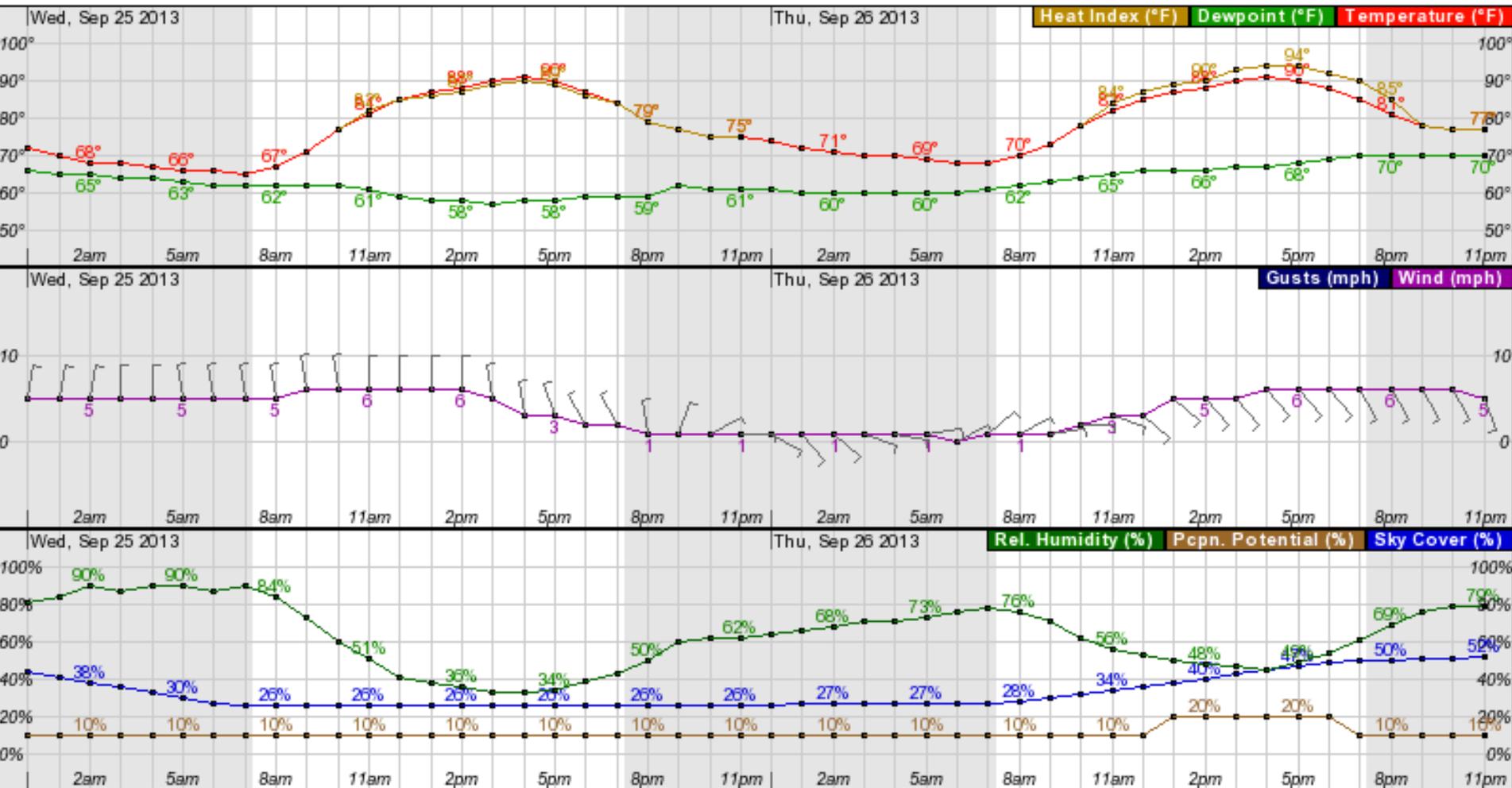
Conroe

Wednesday: Plentiful sunshine

Thursday: Few clouds may build

Wednesday →

Thursday →



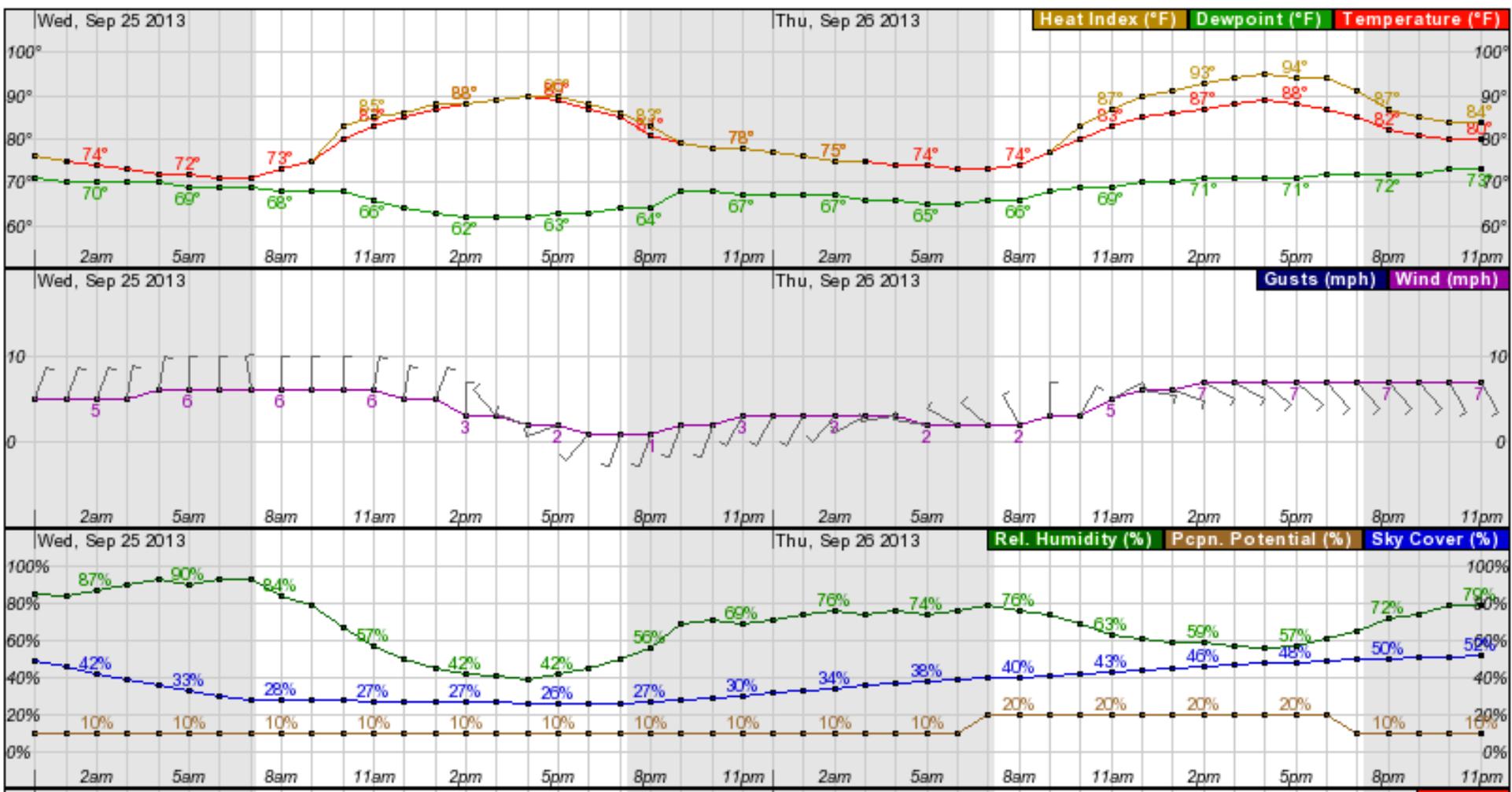
Houston Hobby

Wednesday: Sunny

Thursday: Few clouds

Wednesday →

Thursday →



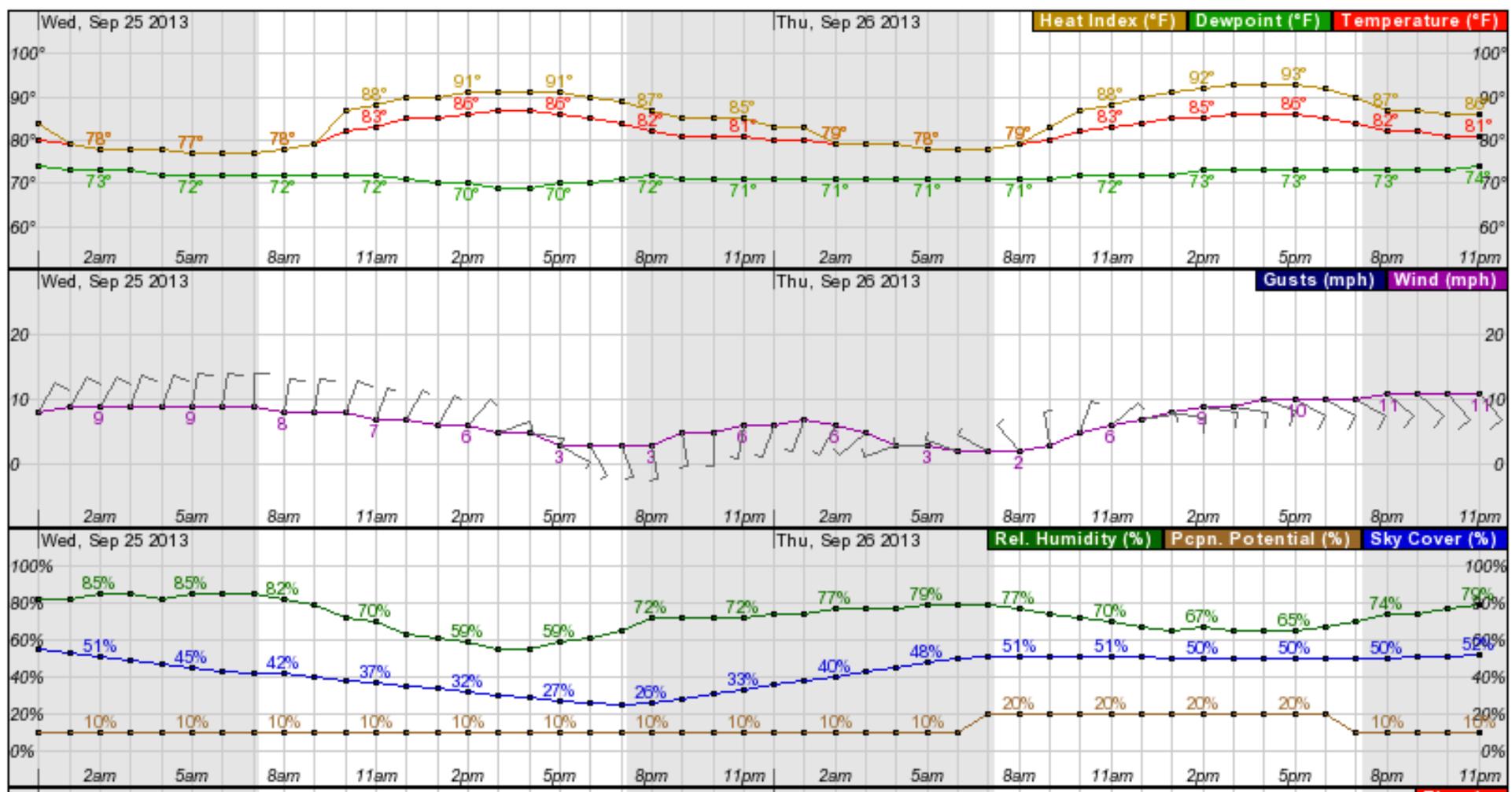
Galveston

Wednesday: Sunshine

Thursday: Some clouds possible as winds turn S

Wednesday →

Thursday →



Tomorrow (Tuesday): GEOS-5 – low clouds hang on, scattered by afternoon

10 am

1 pm

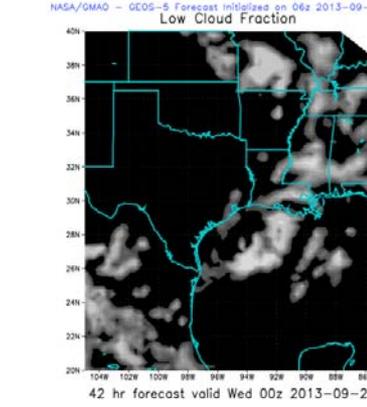
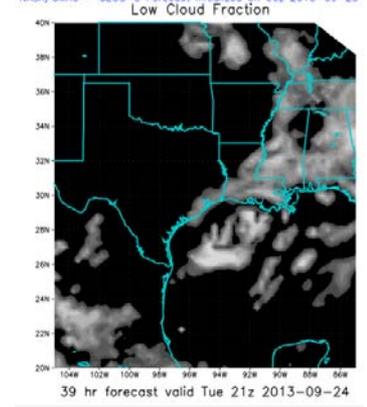
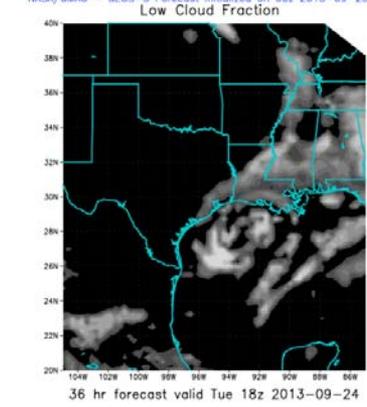
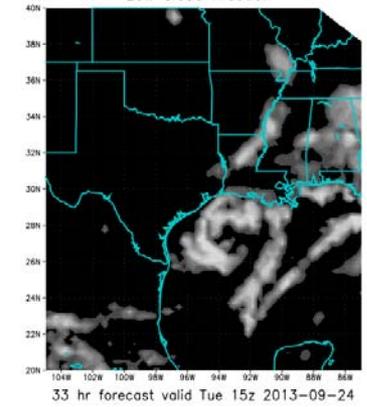
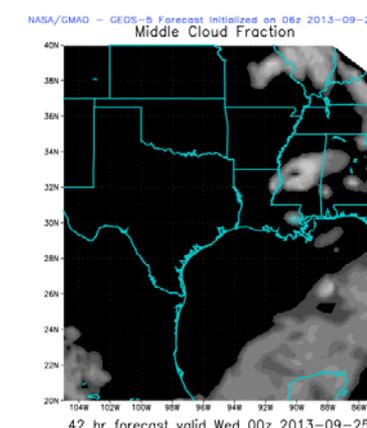
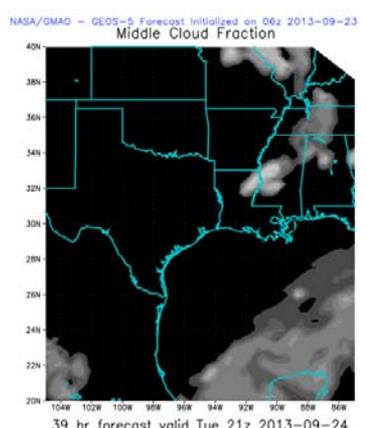
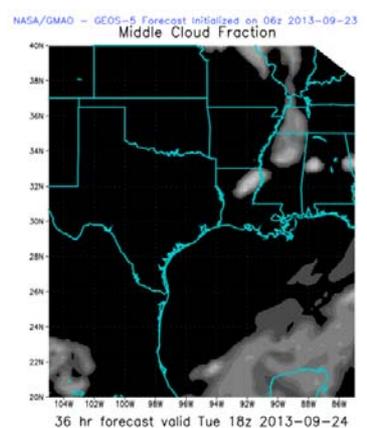
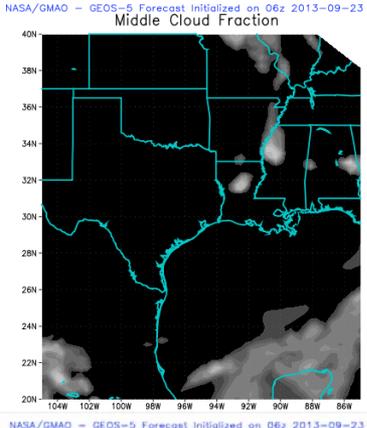
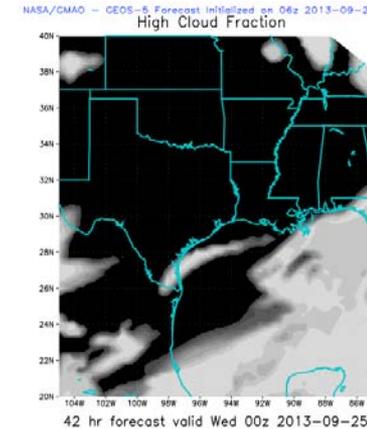
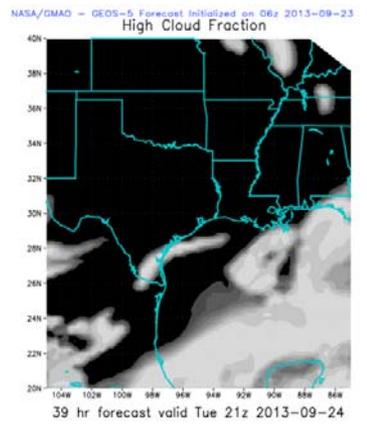
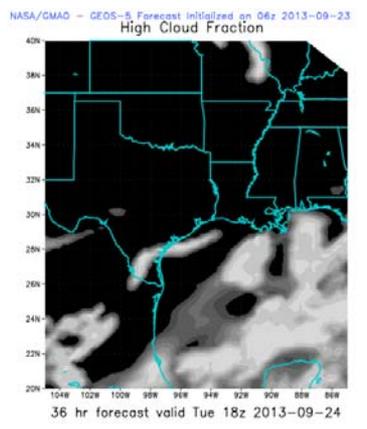
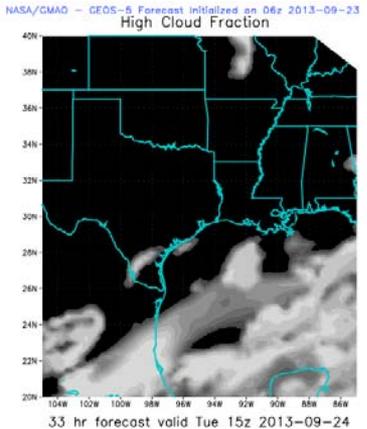
4 pm

7 pm

High

Mid

Low



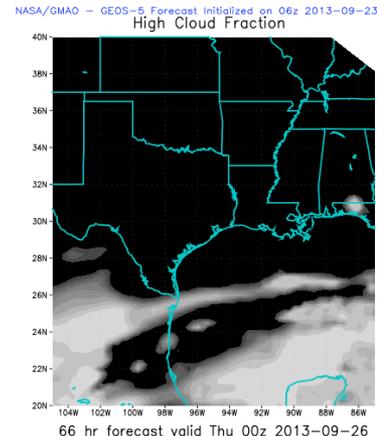
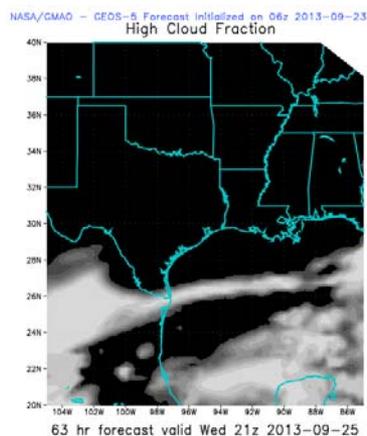
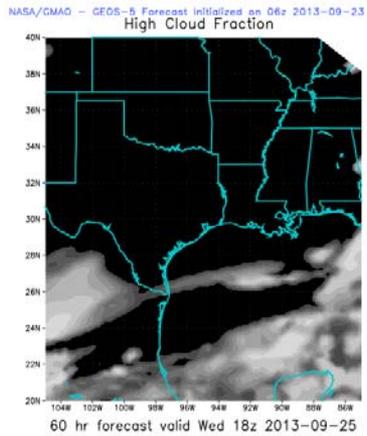
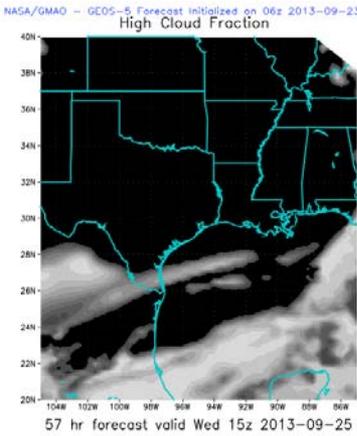
Wednesday: GEOS-5 – finally clear skies for the whole day

10 am

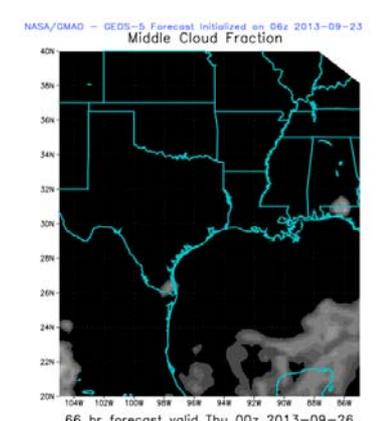
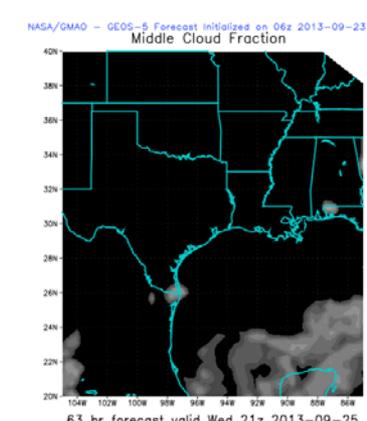
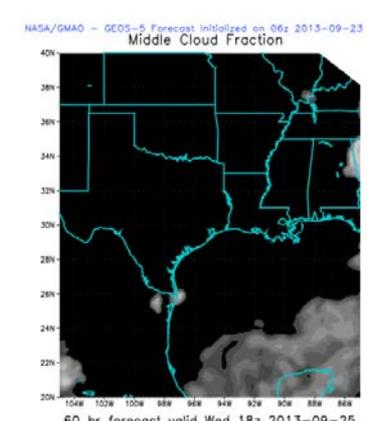
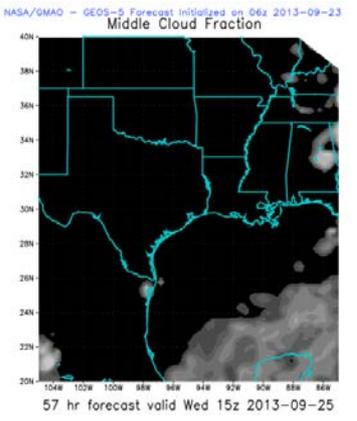
1 pm

4 pm

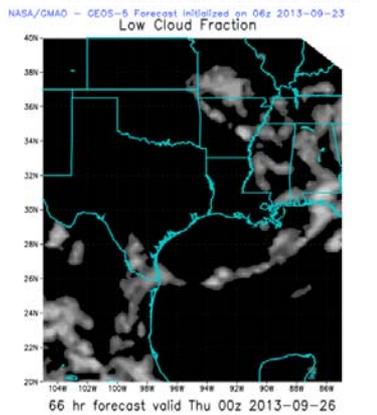
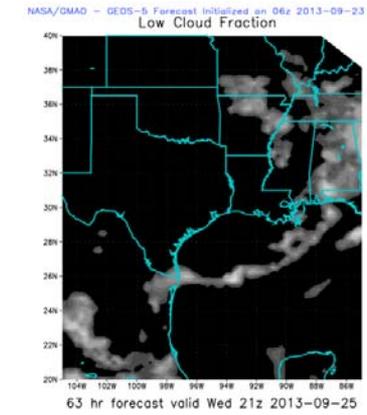
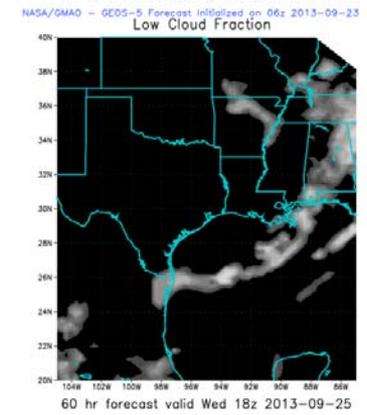
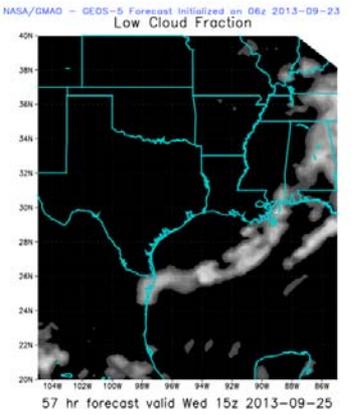
7 pm



High



Mid



Low

Recommendations

- Tuesday: **Likely Fly Day**. Still expect clouds to be a factor, speed of clearing a bit uncertain
- Wednesday: **Likely Fly Day**. Light background winds and few clouds should make for a good flight. Best bet for recirculation pattern
- Thursday: **Likely Fly Day**. Winds will shift during the day to S, but clouds don't appear to be a problem
- Flying Friday also looks probable, but will again be contending with clouds. Weekend not good with another cold frontal passage

DISCOVER-AQ Air Quality Outlook
September 23, 2013

Ken Pickering

Bryan Duncan

TCEQ AQ Forecast: *Things are looking up!*

Monday: Code Yellow – *Moderate* (O_3 : W & SW sides of Houston) 

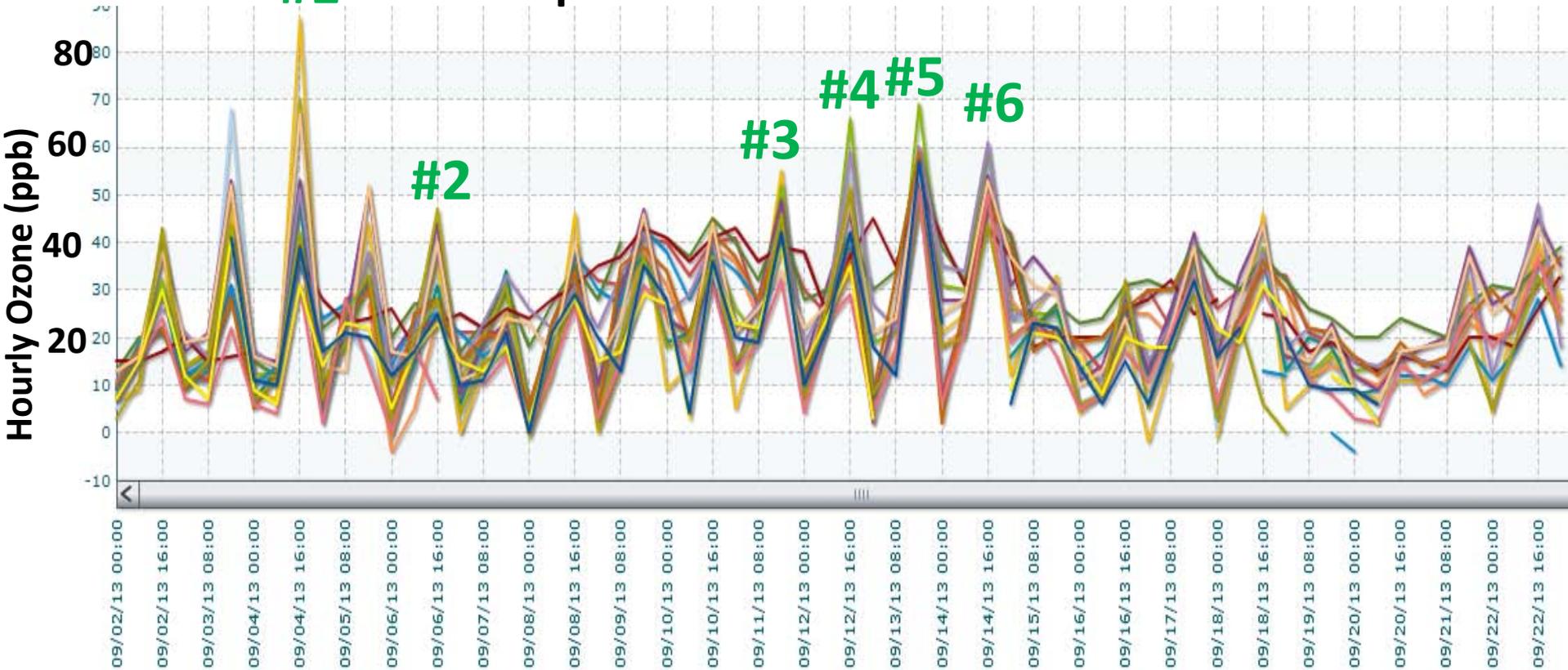
Tuesday: Code Yellow – *Moderate* (S & SW sides of Houston) 

Wednesday: Code Orange – *Unhealthy to Sensitive Groups* 
(S, SW, & W sides of Houston)

Thursday: Code Orange – *Unhealthy to Sensitive Groups* 

Hourly Ozone (airnowtech.org) **

September 2nd – 22nd ** EVERY 8th HOUR PLOTTED!!!!



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

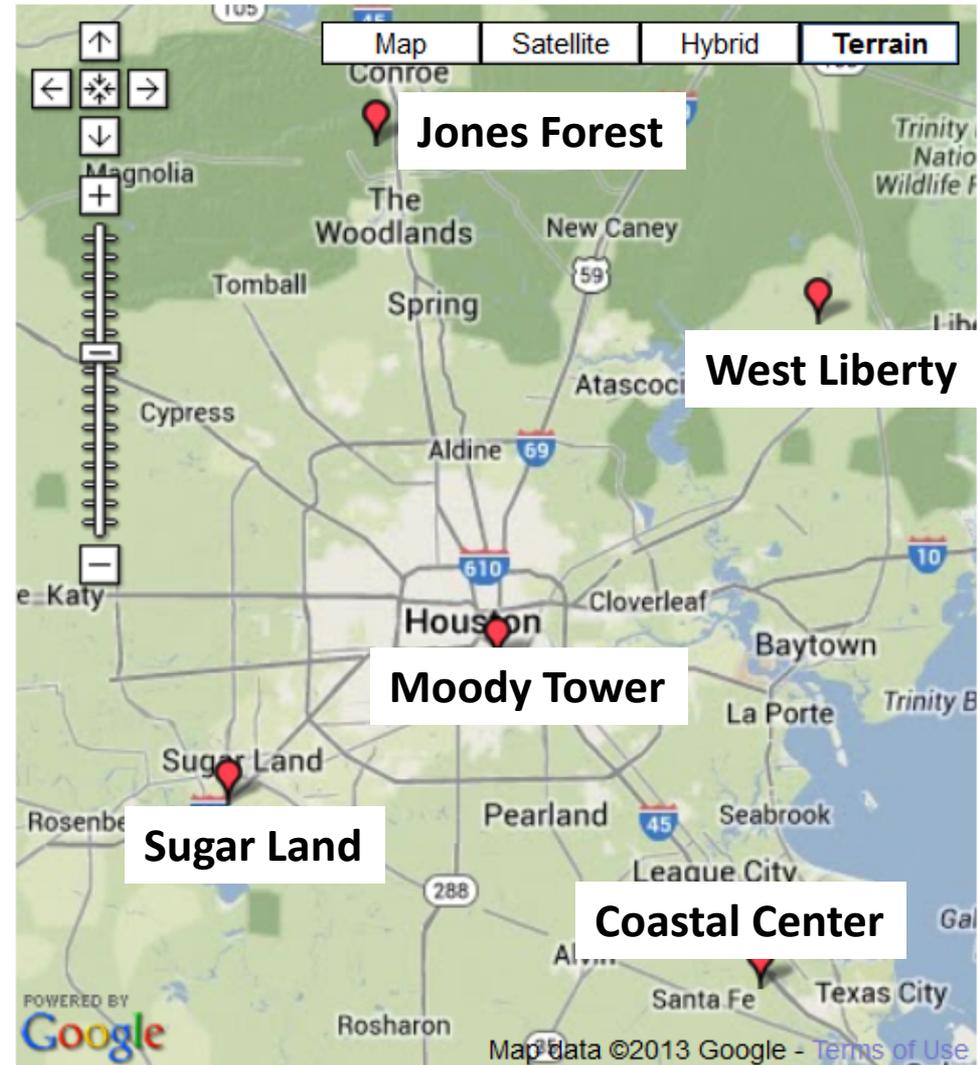
Houston - Network of Environmental Towers (H-NET)

Houston Network of Environmental Towers (H-NET) collect chemistry and meteorological measurements for air quality model applications in Houston Galveston Area. This web site provides real-time update of collected data, as well as historical data.

Currently, **five sites** have been set up in

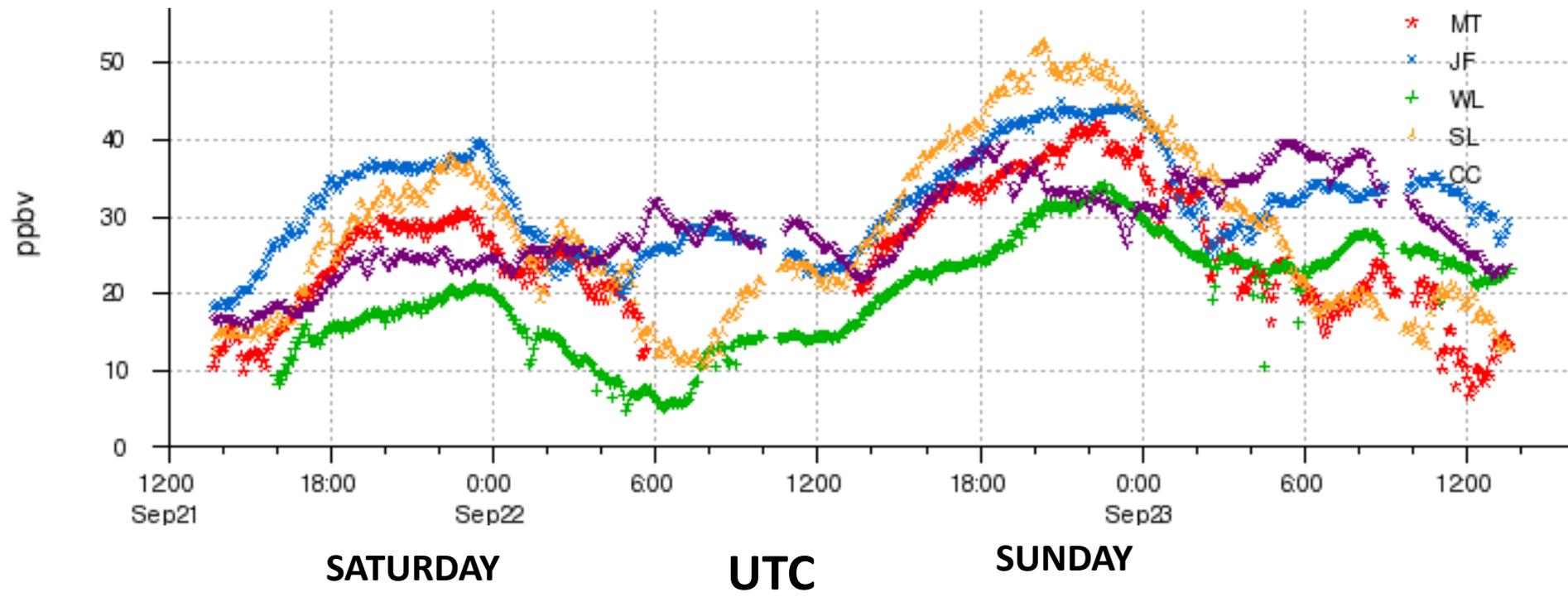
- UH - Main Campus (695)
- Jones State Forest (698)
- West Liberty Airport (699)
- UH - Sugar Land (696)
- UH - Coastal Center (697)

[More about this project.](#)



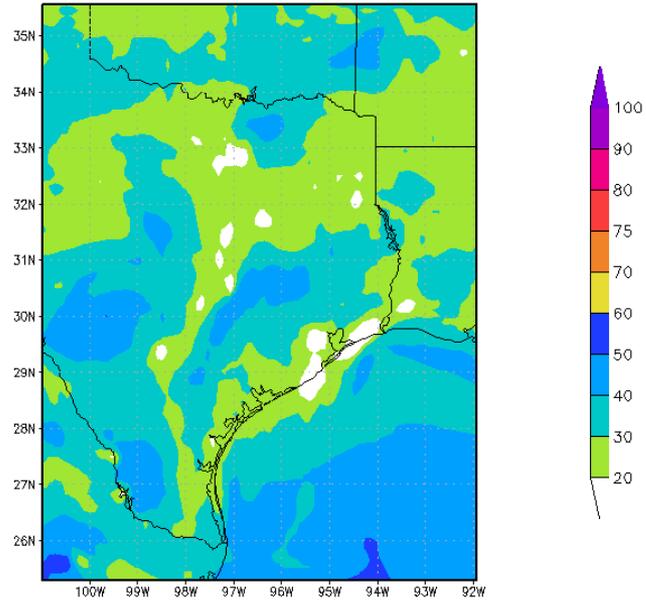
Ozone (ppbv)

NE flow : clean continental air



O3 [ppb] at 1013 [hPa] Valid 14Z SEP 24 2013

9 AM

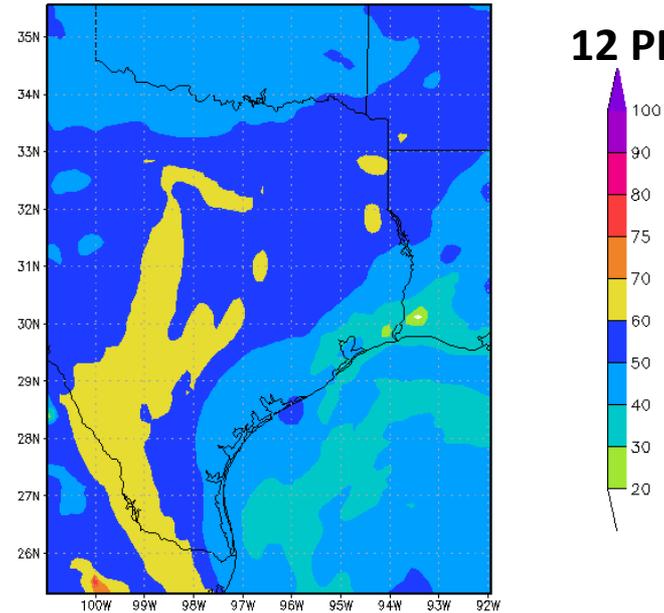


GRADS: COLA/IGES

O3 [ppb] at 1013 [hPa] Valid 17Z SEP 24 2013

12 PM

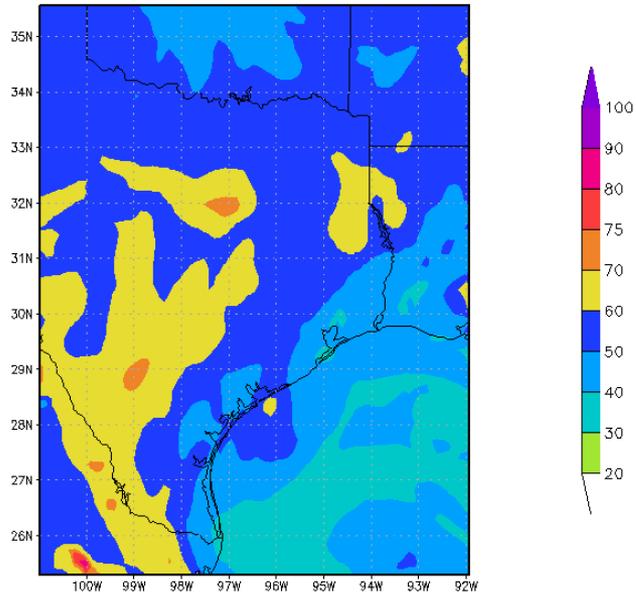
NOAA
Experim.
CMAQ



GRADS: COLA/IGES

O3 [ppb] at 1013 [hPa] Valid 19Z SEP 24 2013

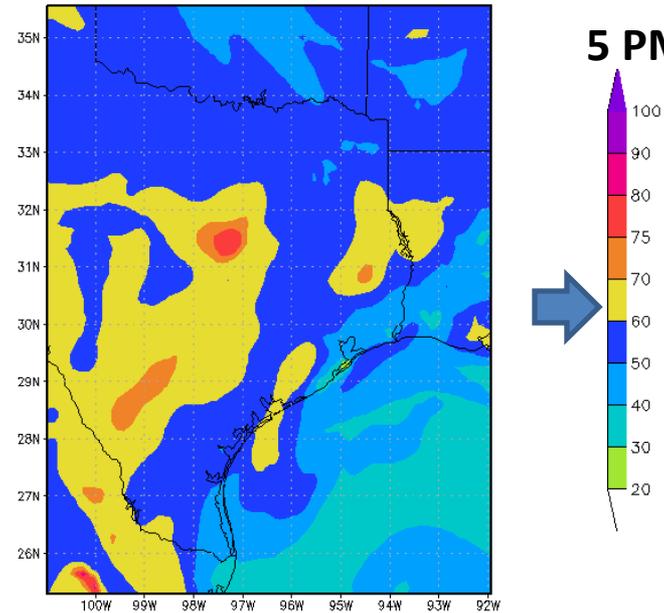
2 PM



GRADS: COLA/IGES

O3 [ppb] at 1013 [hPa] Valid 22Z SEP 24 2013

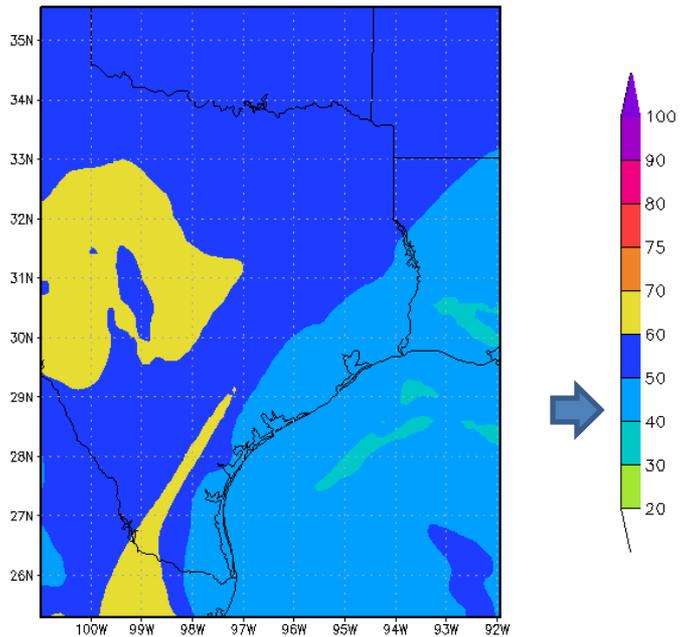
5 PM



GRADS: COLA/IGES

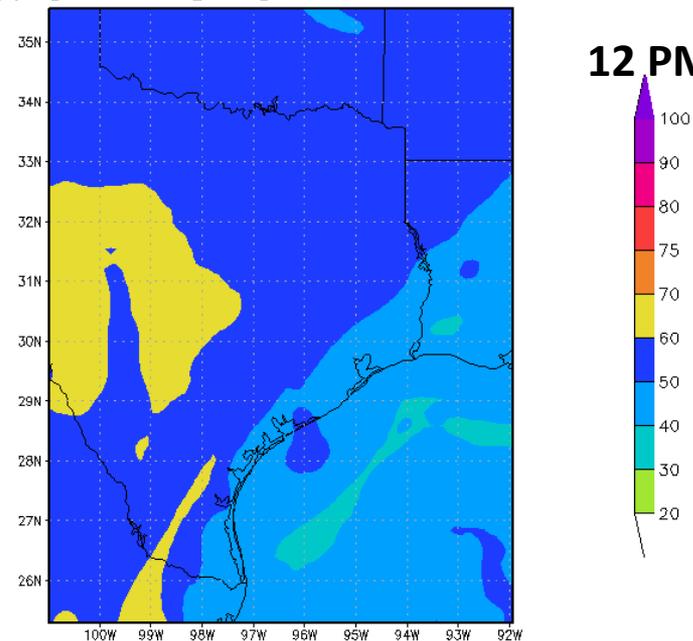
O3 [ppb] at 850 [hPa] Valid 14Z SEP 24 2013

9 AM



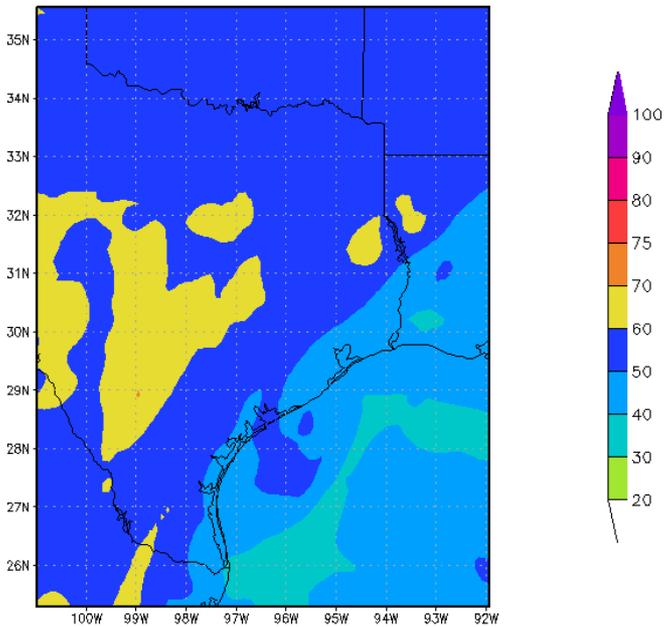
O3 [ppb] at 850 [hPa] Valid 17Z SEP 24 2013

12 PM



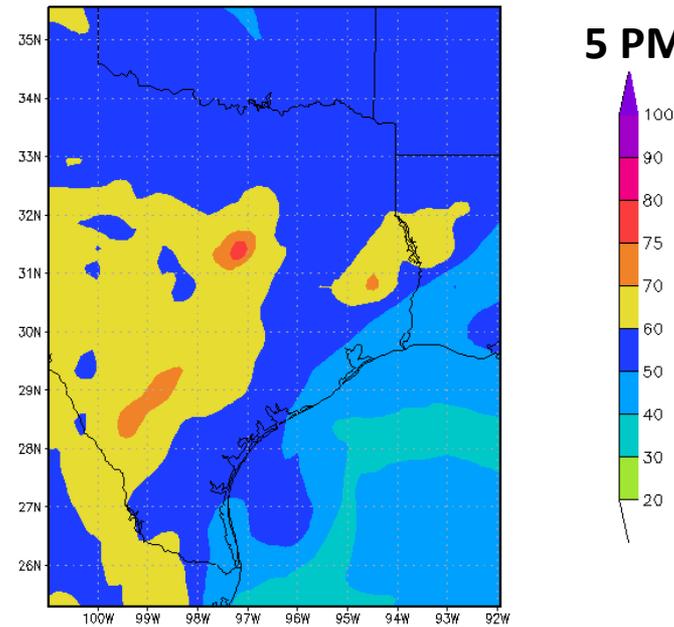
O3 [ppb] at 850 [hPa] Valid 19Z SEP 24 2013

2 PM



O3 [ppb] at 850 [hPa] Valid 22Z SEP 24 2013

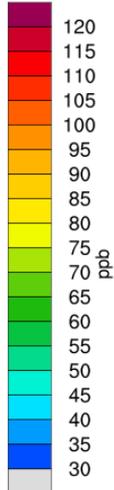
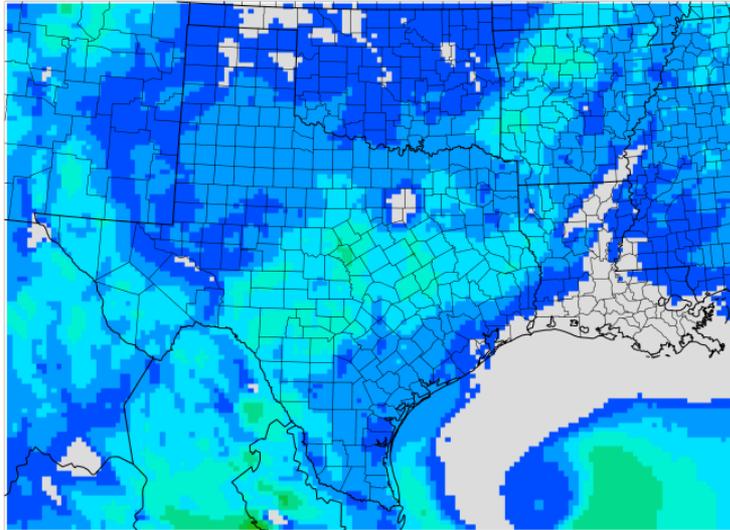
5 PM



9 AM

Ozone

Best Case



ENVIRON

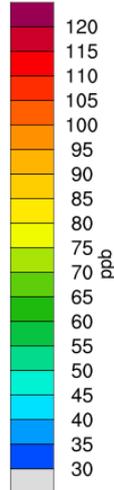
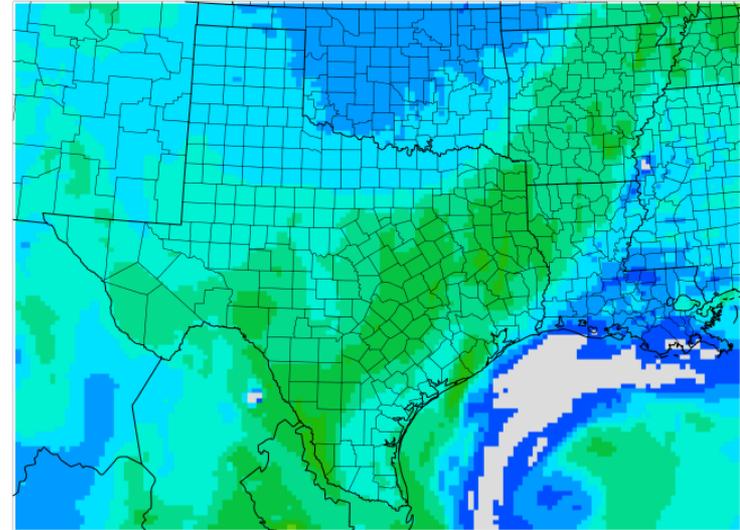
Min(8,63) = 15.8, Max(52,2) = 62.6

Tue September 24 08:00 CST

12 PM

Ozone

Best Case



ENVIRON

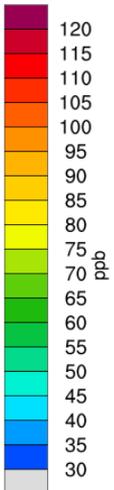
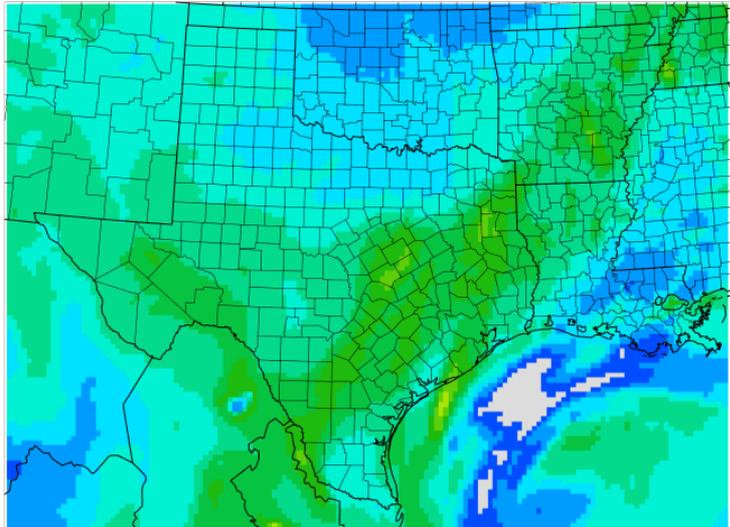
Min(50,29) = 14.5, Max(57,2) = 66.3

Tue September 24 11:00 CST

2 PM

Ozone

Best Case



ENVIRON

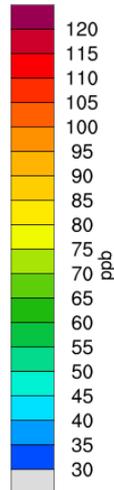
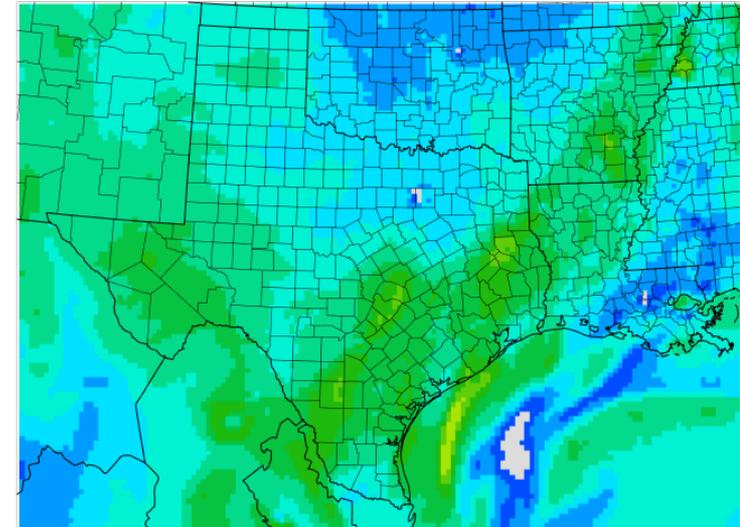
Min(106,29) = 24.3, Max(56,2) = 70.7

Tue September 24 13:00 CST

5 PM

Ozone

Best Case



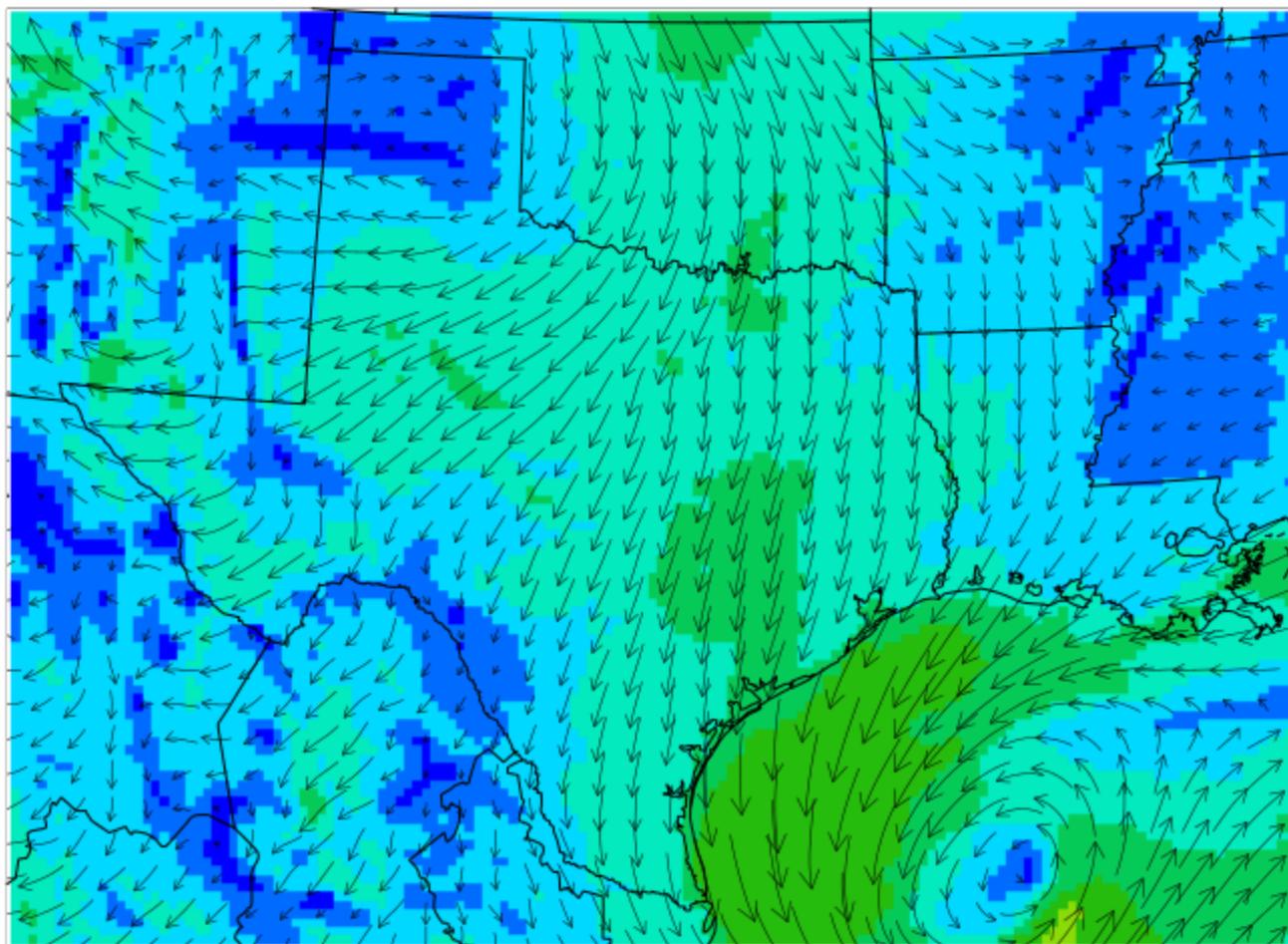
ENVIRON

Min(129,50) = 22.8, Max(90,23) = 72.8

Tue September 24 16:00 CST

10-m Winds

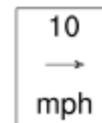
Texas 12km



 ENVIRON

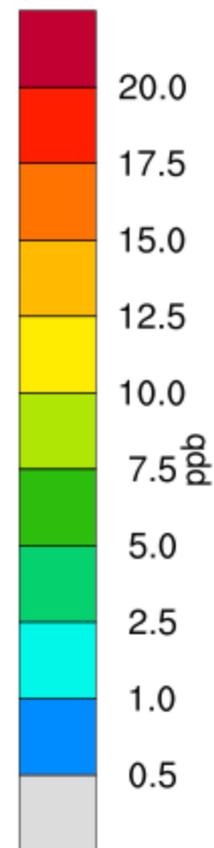
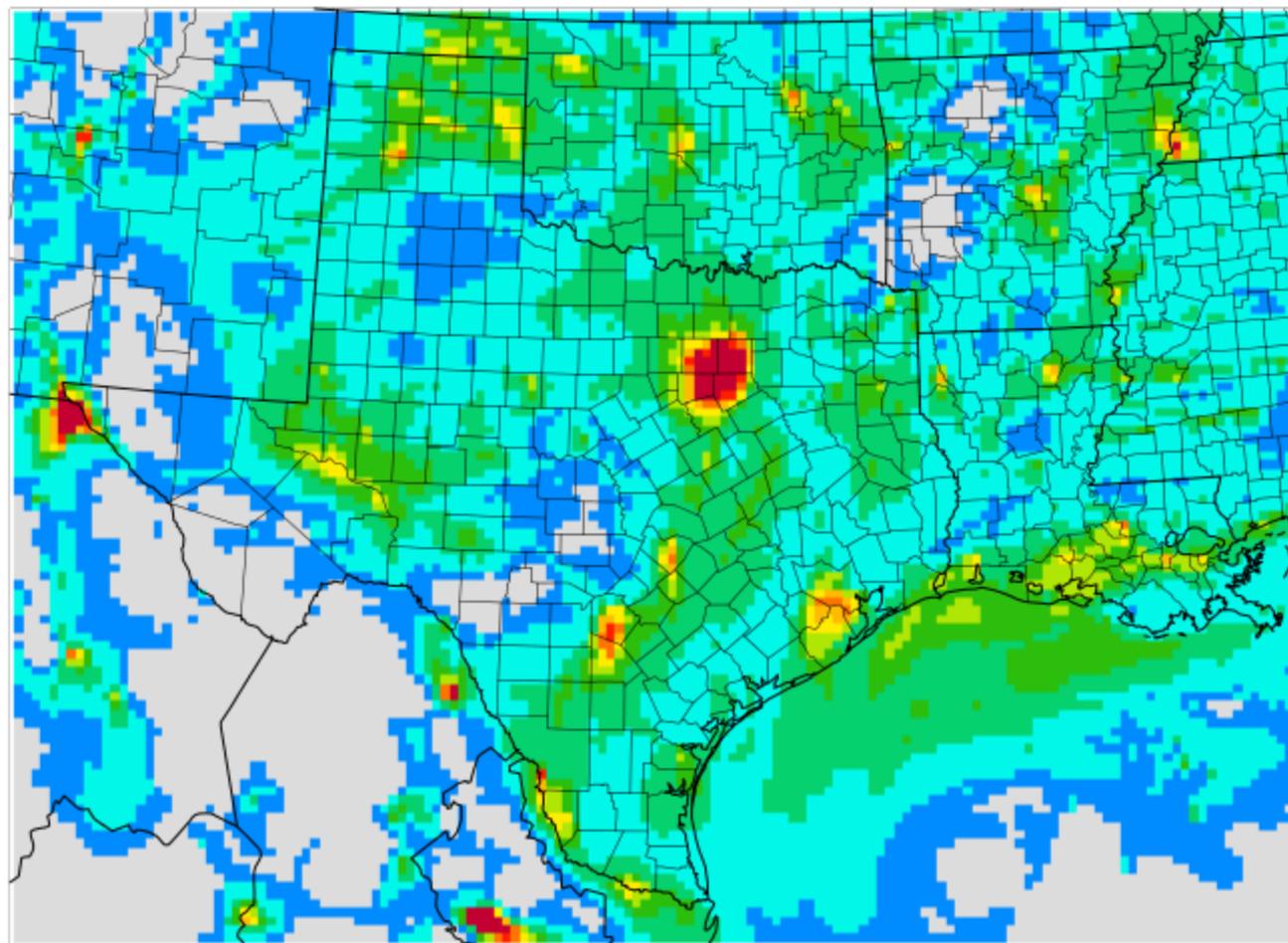
Min(7,93) = 0.0, Max(121,2) = 26.0

Tue September 24 11:00 CST



NOx

Best Case



 ENVIRON

Min(3,10) = 0.1, Max(55,4) = 70.9

Tue September 24 08:00 CST

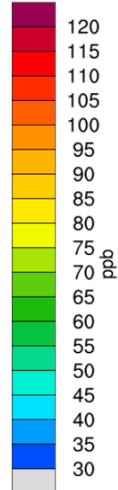
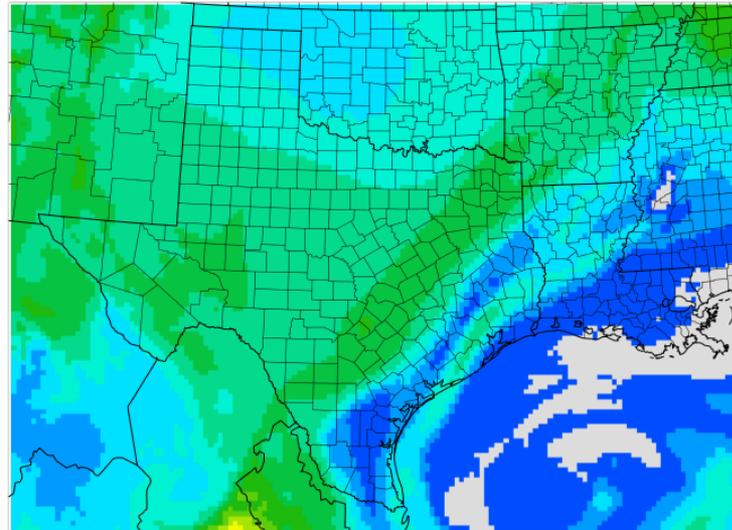
Ozone

Best Case: CAMx Layer 14

1.4 km

Ozone

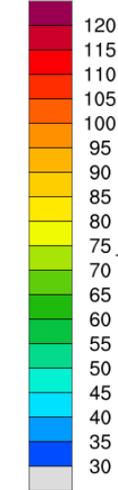
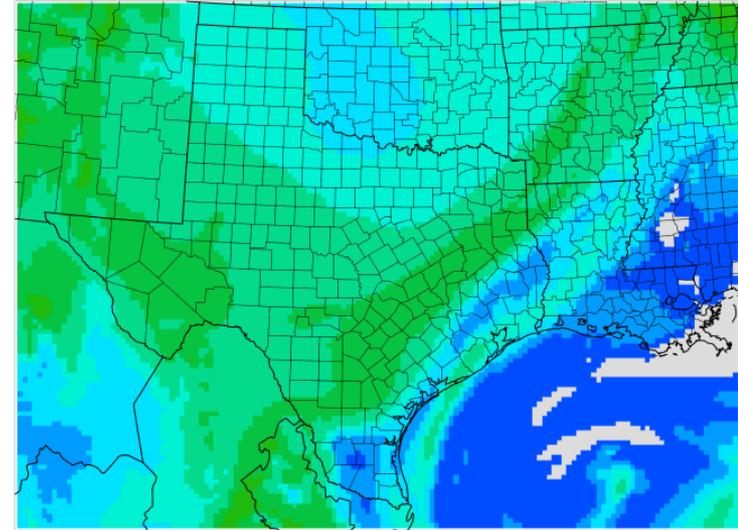
Best Case: CAMx Layer 14



ENVIRON

Min(134,70) = 27.6, Max(47,2) = 76.8

Tue September 24 08:00 CST



ENVIRON

Min(135,62) = 27.2, Max(18,102) = 64.7

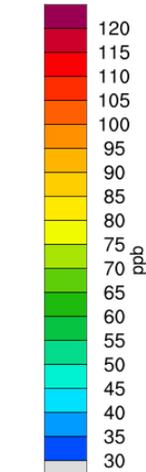
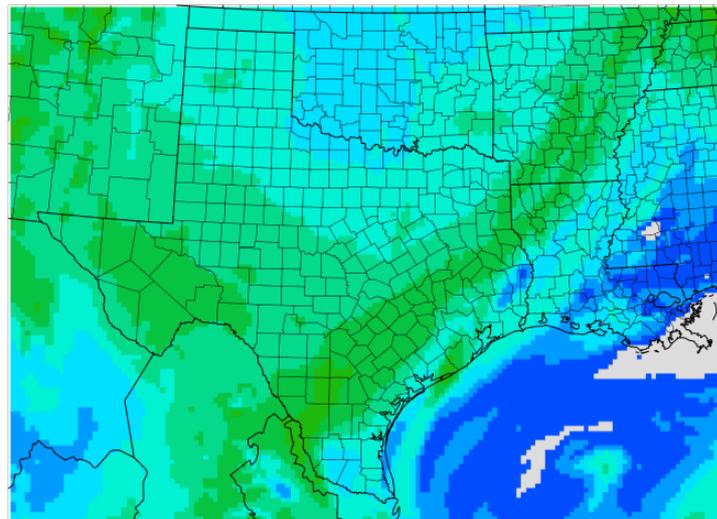
Tue September 24 11:00 CST

Ozone

Best Case: CAMx Layer 14

Ozone

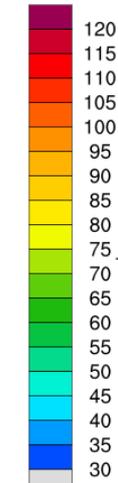
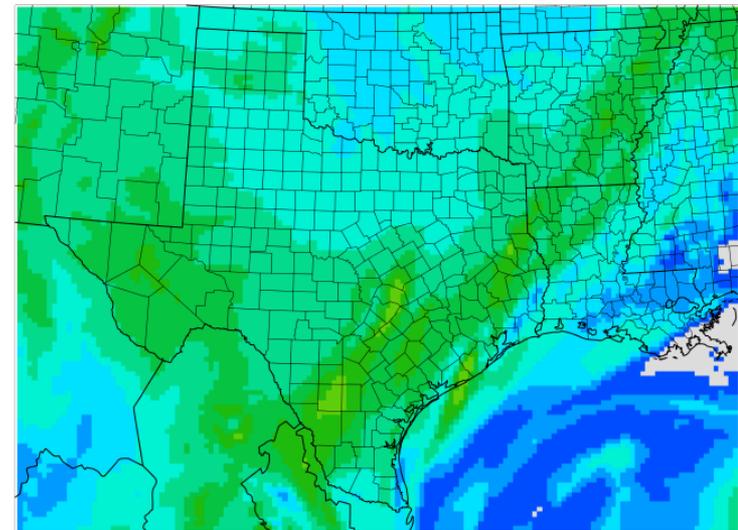
Best Case: CAMx Layer 14



ENVIRON

Min(135,62) = 26.6, Max(18,102) = 64.2

Tue September 24 13:00 CST



ENVIRON

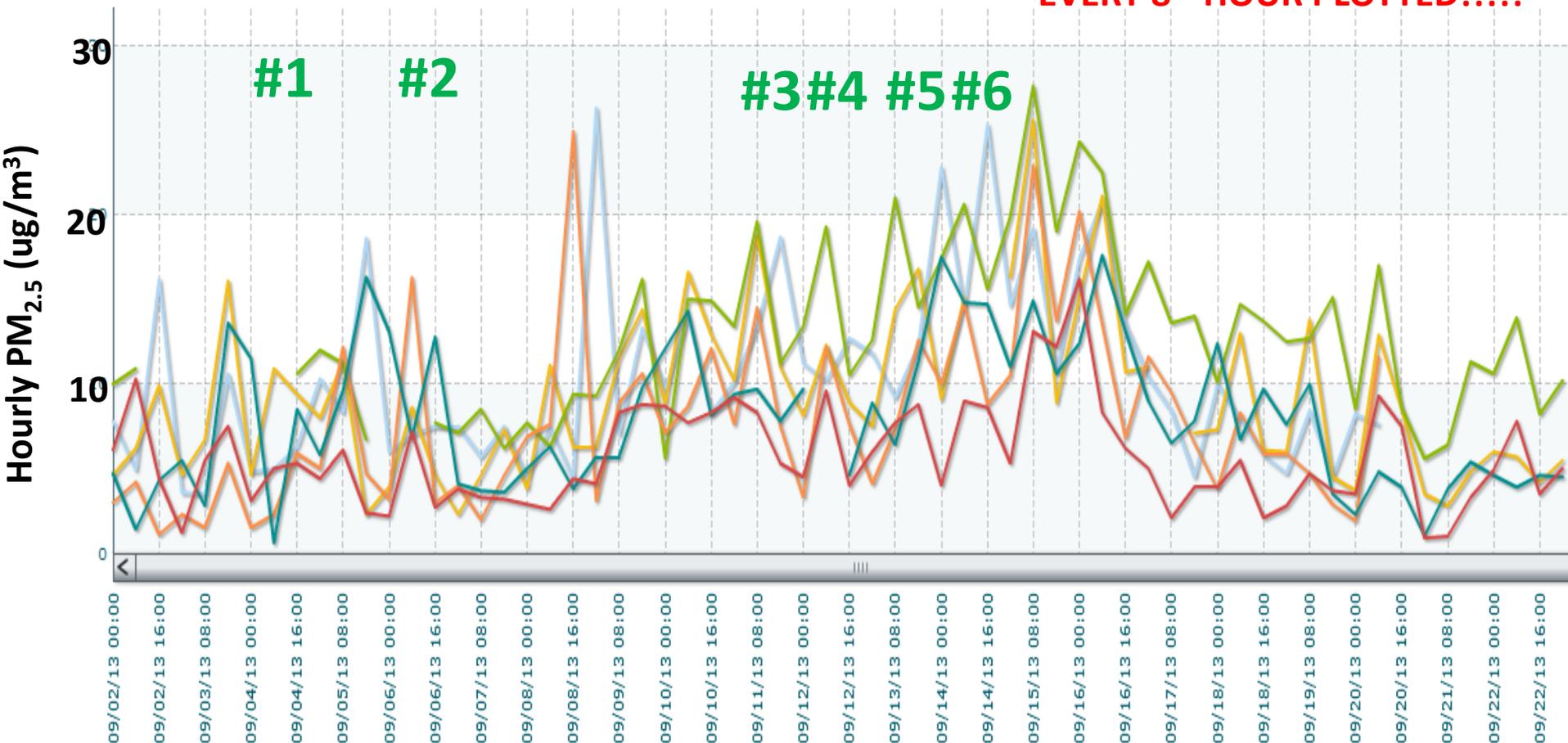
Min(146,58) = 26.9, Max(93,35) = 67.3

Tue September 24 16:00 CST

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

September 2nd – 22nd

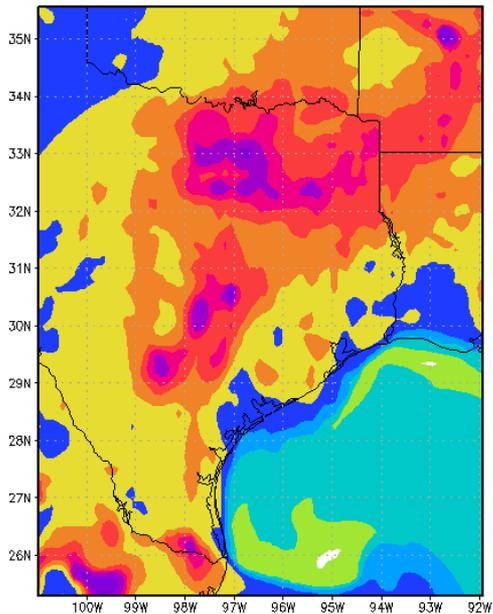
** EVERY 8th HOUR PLOTTED!!!!



- Houston Aldine C8/PM2.5-88502 - 88502/1 Hr/3
- Houston Deer Park C35/PM2.5-88502 - 88502/1 Hr/3
- Conroe Relocated C78/PM2.5-88502 - 88502/1 Hr/3
- Clinton C403/PM2.5-88502 - 88502/1 Hr/3
- Seabrook Friendship Park C45/PM2.5-88502 - 88502/1 Hr/3
- Galveston Airport C1034/PM2.5-88502 - 88502/1 Hr/3

(dev) sfc pm25 32H VALID 14Z 24 SEP2013 [$\mu\text{g}/\text{m}^3$]

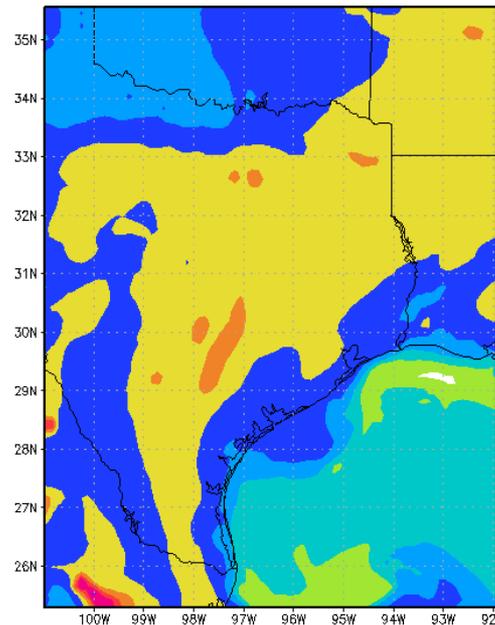
9 AM



NOAA
Experim.
CMAQ

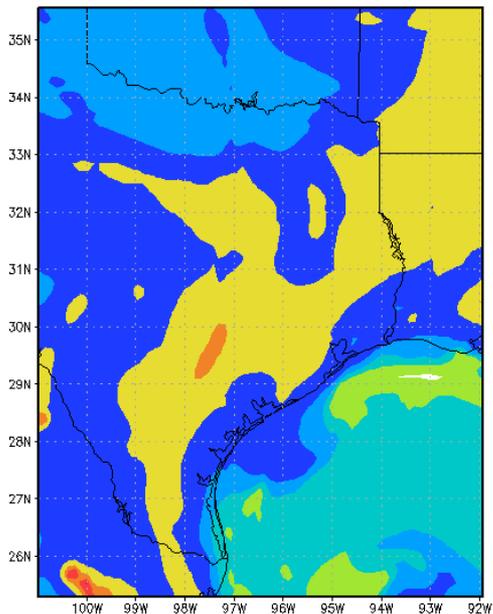
(dev) sfc pm25 35H VALID 17Z 24 SEP2013 [$\mu\text{g}/\text{m}^3$]

12 PM



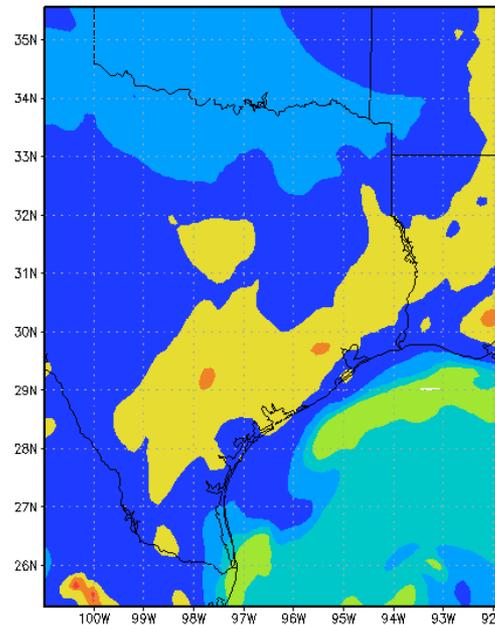
(dev) sfc pm25 37H VALID 19Z 24 SEP2013 [$\mu\text{g}/\text{m}^3$]

2 PM



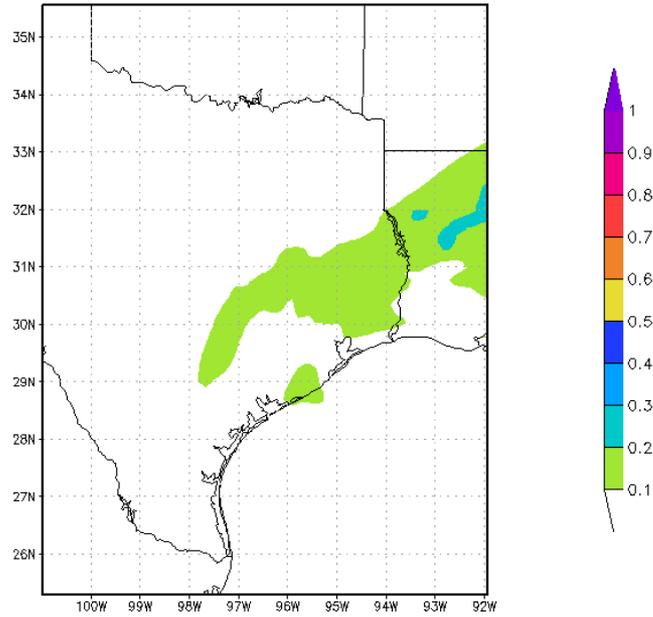
(dev) sfc pm25 40H VALID 22Z 24 SEP2013 [$\mu\text{g}/\text{m}^3$]

5 PM



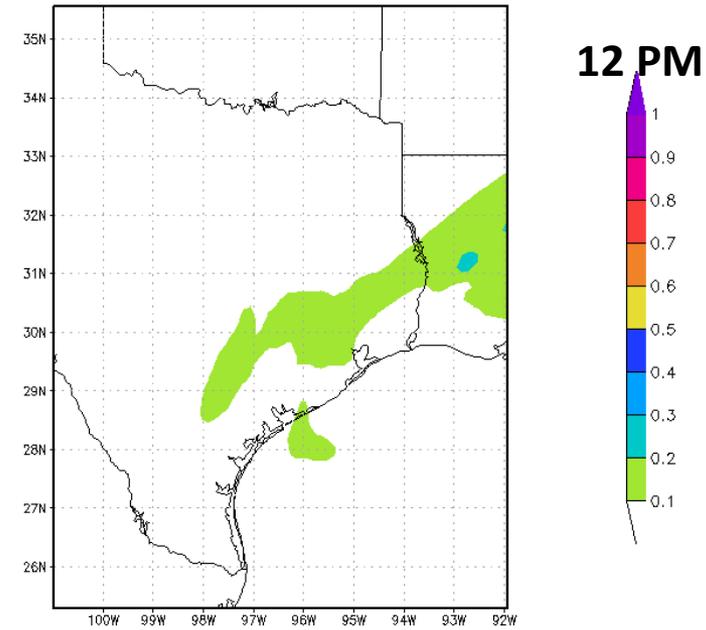
(dev) aot 32H VALID 14Z 24 SEP2013 [dimensionless]

9 AM



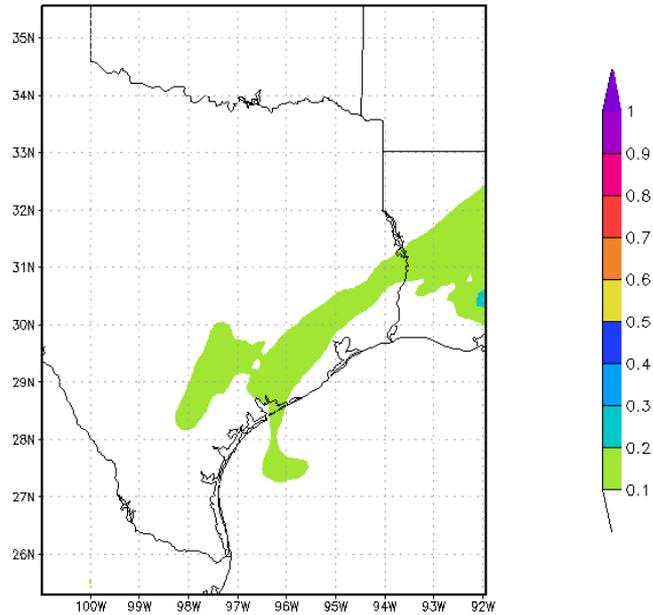
(dev) aot 35H VALID 17Z 24 SEP2013 [dimensionless]

12 PM



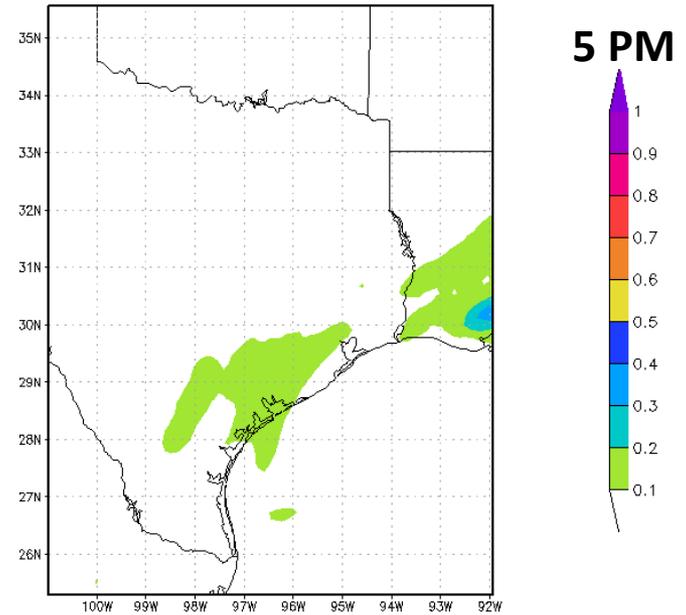
(dev) aot 37H VALID 19Z 24 SEP2013 [dimensionless]

2 PM



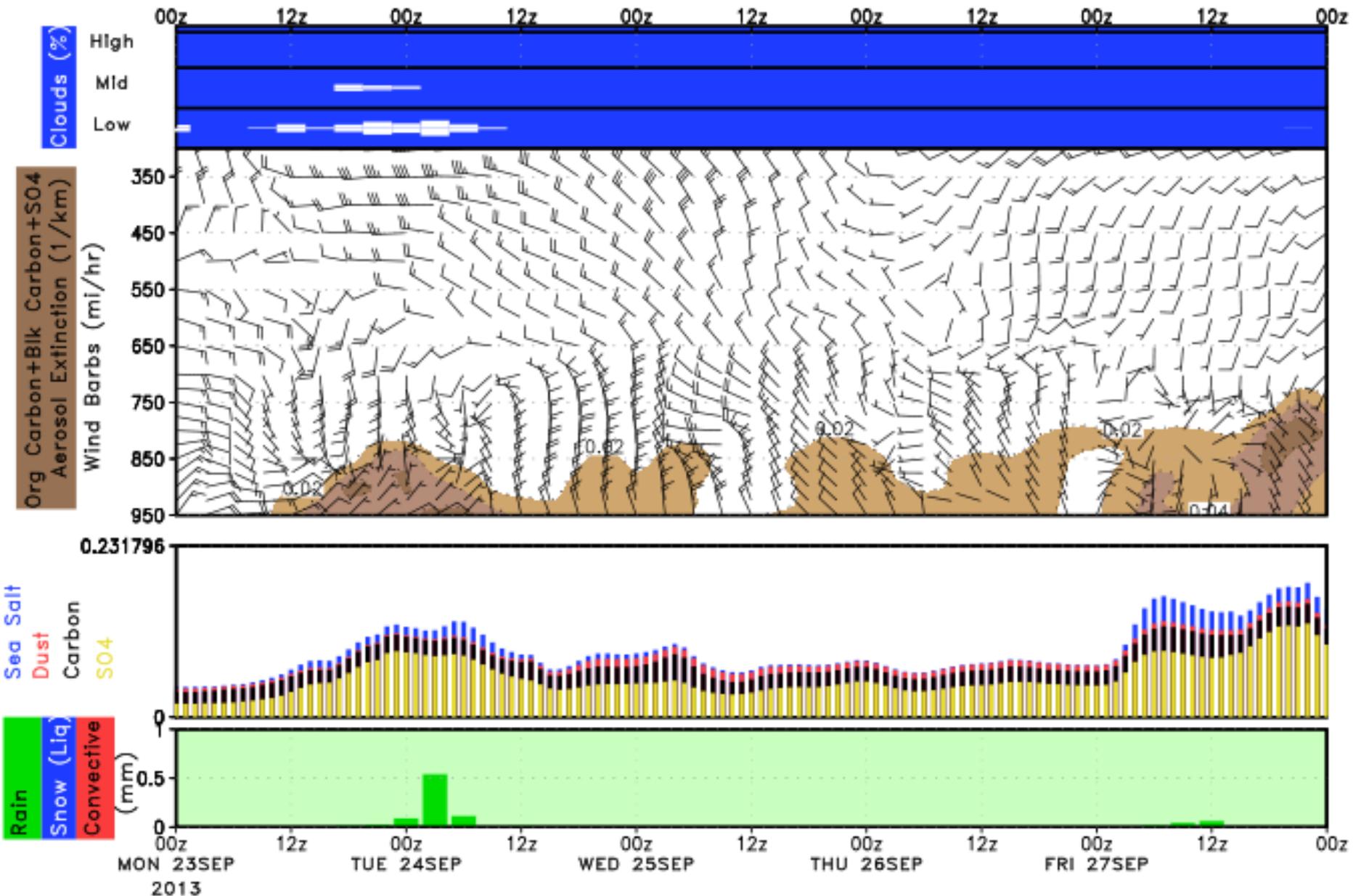
(dev) aot 40H VALID 22Z 24 SEP2013 [dimensionless]

5 PM



CONROE

Low AOD



GALVESTON

Low AOD

