DISCOVER-AQ OUTLOOK -- September 14, 2013

Today: The P-3B and King Air flew today in the Houston region. The intermittent clouds and afternoon pop-up showers, enhanced by the nearby stalled cold front, were challenging for observing the high AOD levels (e.g., 0.3-0.6) over the entire area. The high AOD was associated with agricultural fires in SE and SC US that was pushed southward by the front. Interestingly, observed surface $PM_{2.5}$ levels were relatively low - <25 ug/m^3, though the high AOD was observed to be throughout most of the lowest several kilometers of the atmosphere. Ozone levels were moderate as in the previous two days.

Tomorrow's : Hard-down day.

Monday & beyond: Hurricane Ingrid in the Bay of Campeche may send tropical moisture toward the Houston area so clouds may be a concern.

9/14/2013 Weather Briefing

Clare Flynn
Ken Pickering

Conroe:

THIS AFTERNOON	TONIGHT	SUNDAY	SUNDAY NIGHT	MONDAY	MONDAY NIGHT	TUESDAY	TUESDAY NIGHT	WEDNESDAY
20%		20%	20%	30%	20%	20%	20%	30%
Slight Chc Thunderstorms	Partly Cloudy	Slight Chc Thunderstorms	Slight Chc Thunderstorms	Chance Thunderstorms	Slight Chc Thunderstorms	Slight Chc Thunderstorms	Slight Chc Thunderstorms	Chance Thunderstorms
High: 95 °F	Low: 70 °F	High: 93 °F	Low: 72 °F	High: 93 °F	Low: 73 °F	High: 93 °F	Low: 72 °F	High: 92 °F

Houston Hobby:

THIS AFTERNOON	TONIGHT	SUNDAY	SUNDAY NIGHT	MONDAY	MONDAY NIGHT	TUESDAY	TUESDAY NIGHT	WEDNESDAY
20%		30%	20%	30%	20%	30%	30%	30%
Slight Chc Thunderstorms	Partly Cloudy	Chance Thunderstorms	Slight Chc Thunderstorms	Chance Thunderstorms	Slight Chc Thunderstorms	Chance Thunderstorms	Chance Thunderstorms	Chance Thunderstorms
High: 93 °F	Low: 75 °F	High: 91 °F	Low: 77 °F	High: 92 °F	Low: 77 °F	High: 91 °F	Low: 76 °F	High: 90 °F

Galveston:

THIS AFTERNOON	TONIGHT	SUNDAY	SUNDAY NIGHT	MONDAY	MONDAY NIGHT	TUESDAY	TUESDAY NIGHT	WEDNESDAY
20%		30%	30%	40%	30%	30%	30%	30%
Slight Chc Thunderstorms	Partly Cloudy	Chance Thunderstorms	Chance Thunderstorms	Chance Thunderstorms	Chance Thunderstorms	Chance Thunderstorms	Chance Thunderstorms	Chance Thunderstorms
High: 89 °F	Low: 79 °F	High: 88 °F	Low: 81 °F	High: 89 °F	Low: 80 °F	High: 88 °F	Low: 79 °F	High: 87 °F

Current Conditions

Conroe:

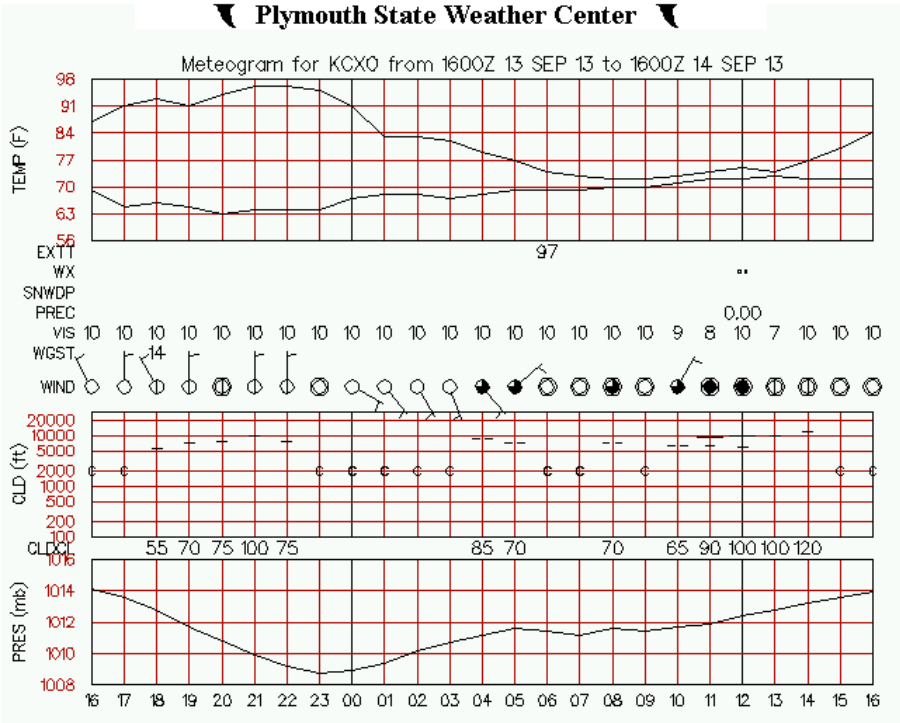
Fair

84°F

29°C

Humidity	67%
Wind Speed	Calm
Barometer	29.95 in (1013.9 mb)
Dewpoint	72°F (22°C)
Visibility	10.00 mi
Heat Index	90°F (32°C)

Last Update on 14 Sep 10:53 am CDT



Houston Hobby:

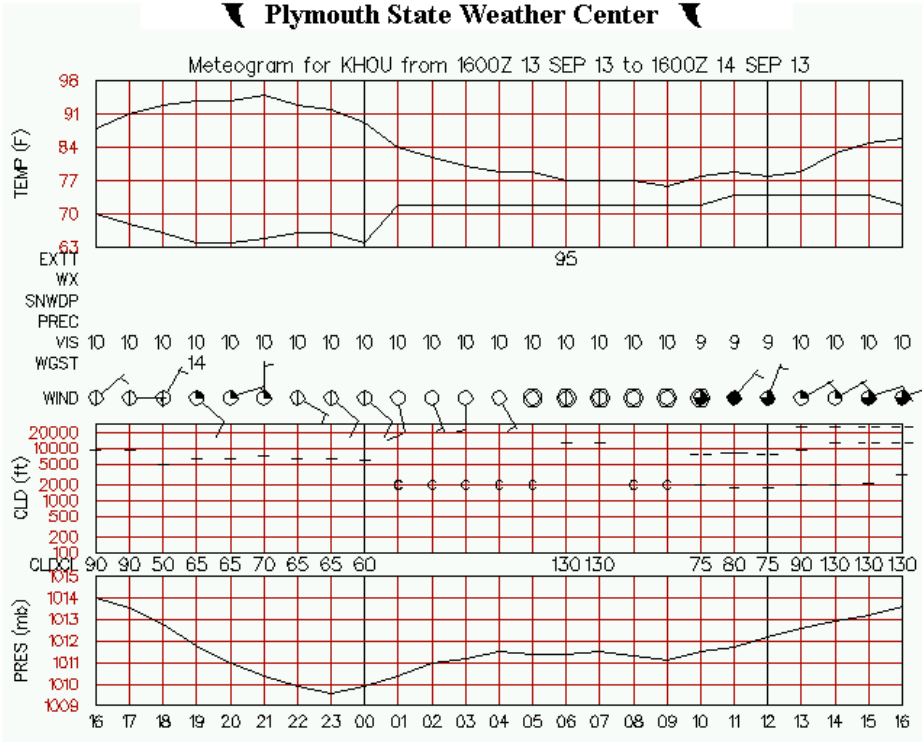
Mostly Cloudy

86°F

30°C

Humidity	63%
Wind Speed	E 7 mph
Barometer	29.92 in (1013.6 mb)
Dewpoint	72°F (22°C)
Visibility	10.00 mi
Heat Index	92°F (33°C)

Last Update on 14 Sep 10:53 am CDT



Current Conditions

Galveston:

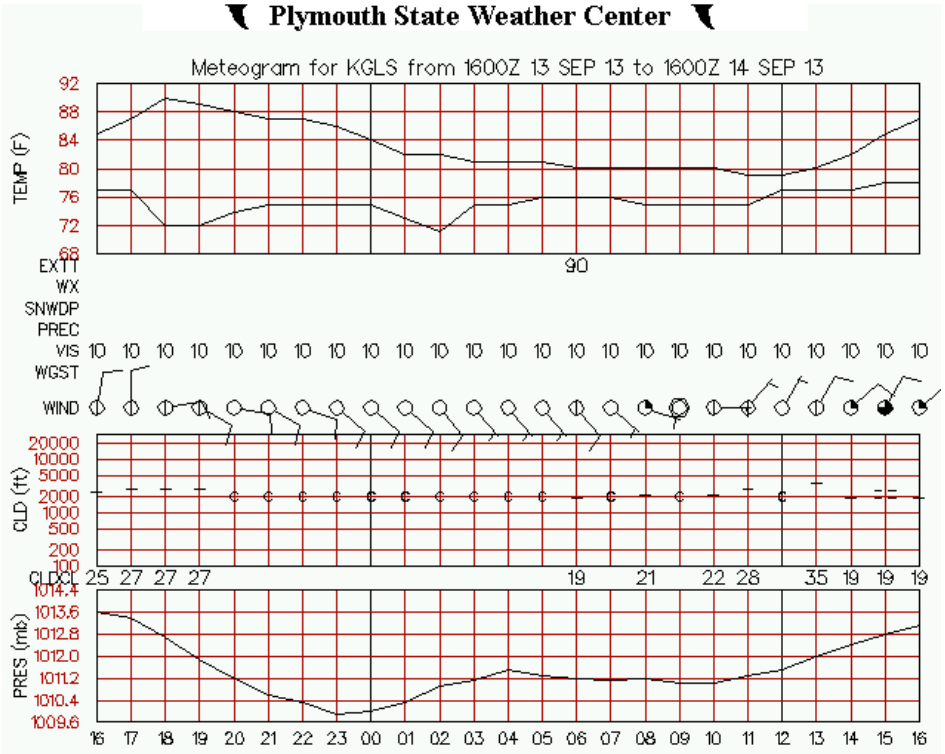
Partly Cloudy

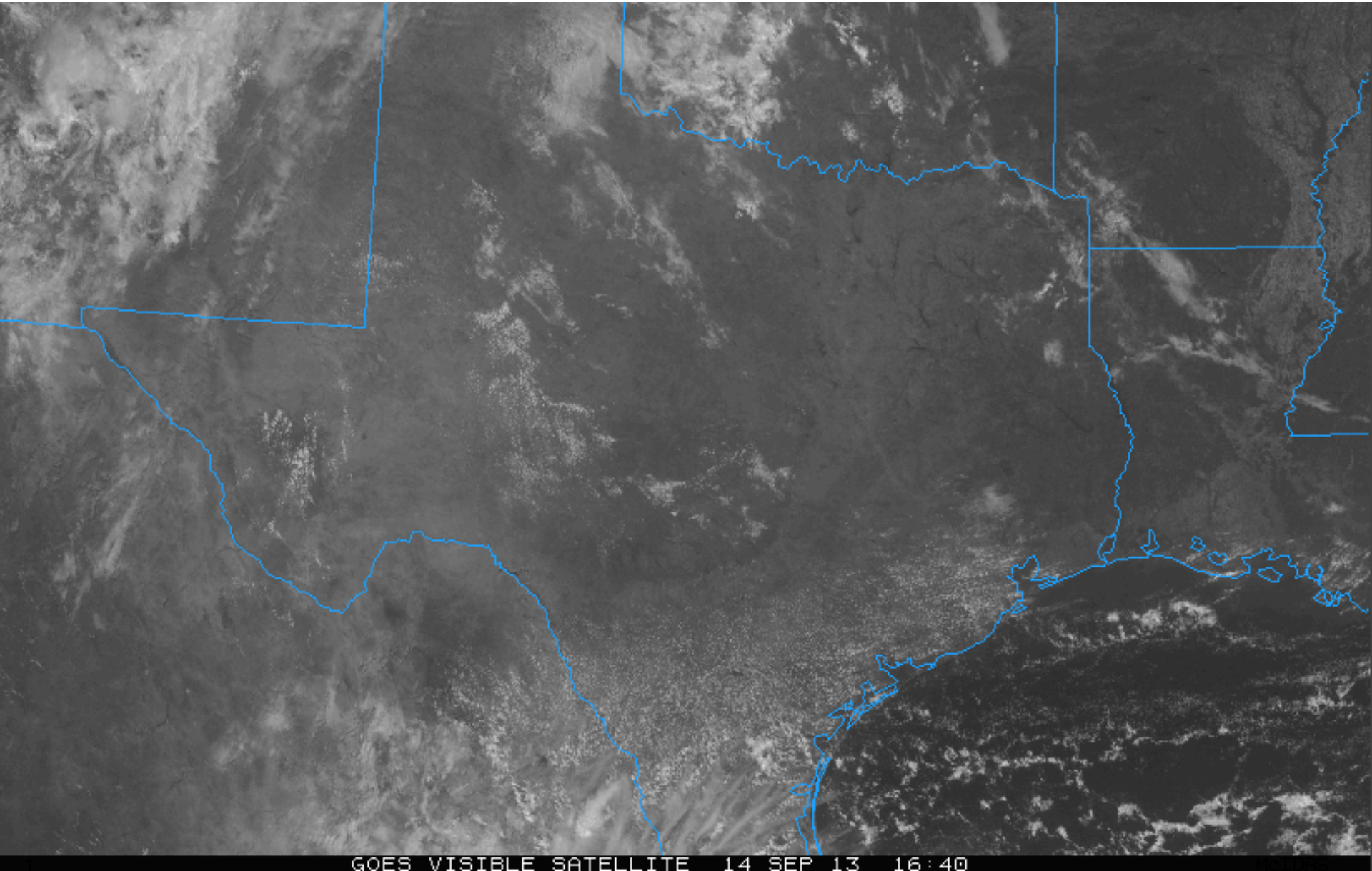
87°F

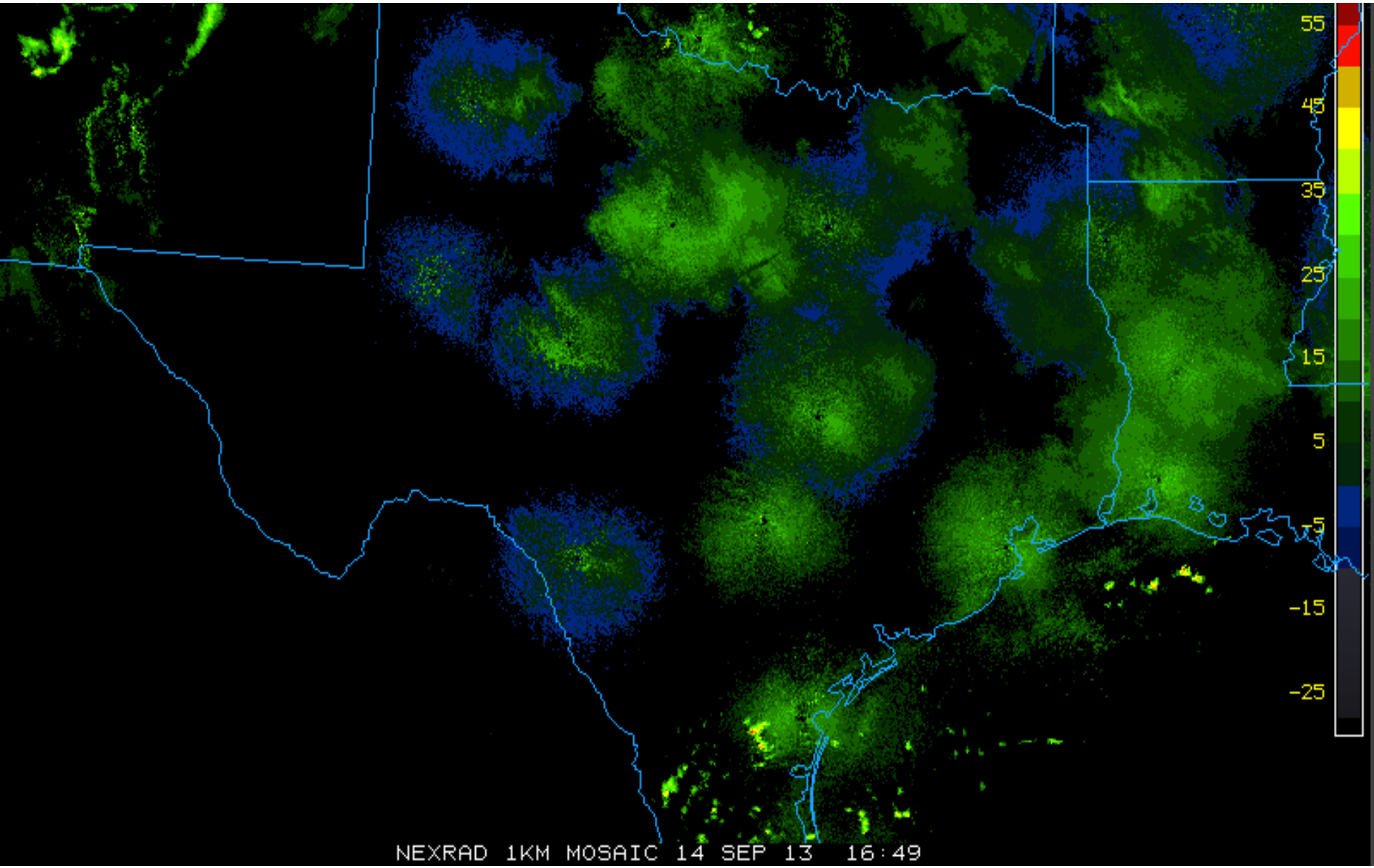
31°C

Humidity	70%
Wind Speed	E 13 mph
Barometer	29.92 in (1013.1 mb)
Dewpoint	76°F (24°C)
Visibility	10.00 mi
Heat Index	98°F (37°C)

Last Update on 14 Sep 11:52 am CDT




GOES VISIBLE SATELLITE 14 SEP 13 16:40


55
45
35
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5
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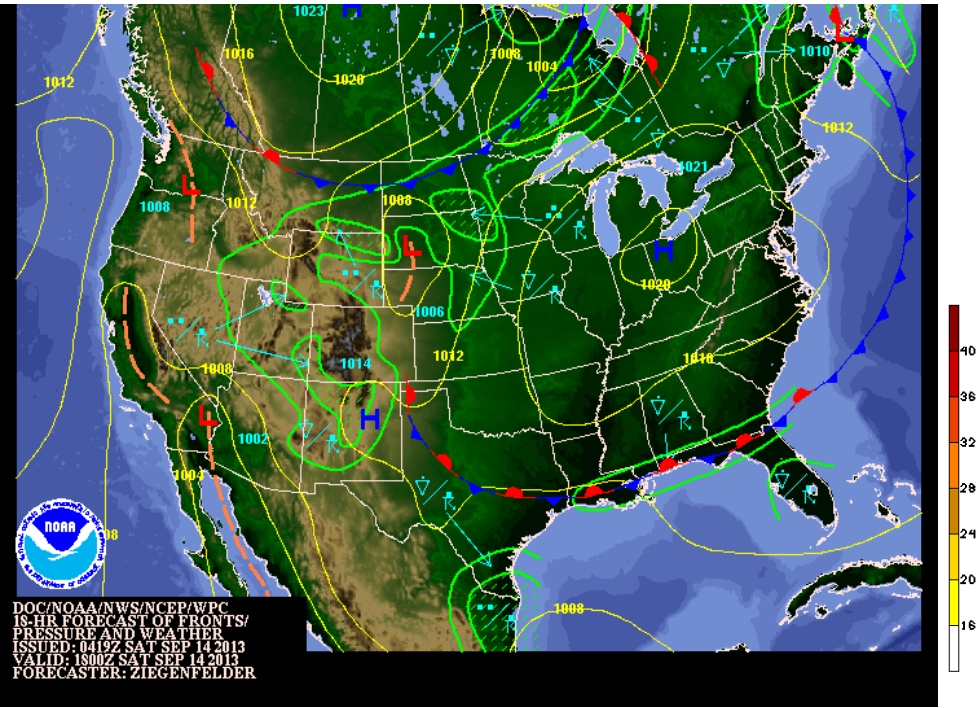
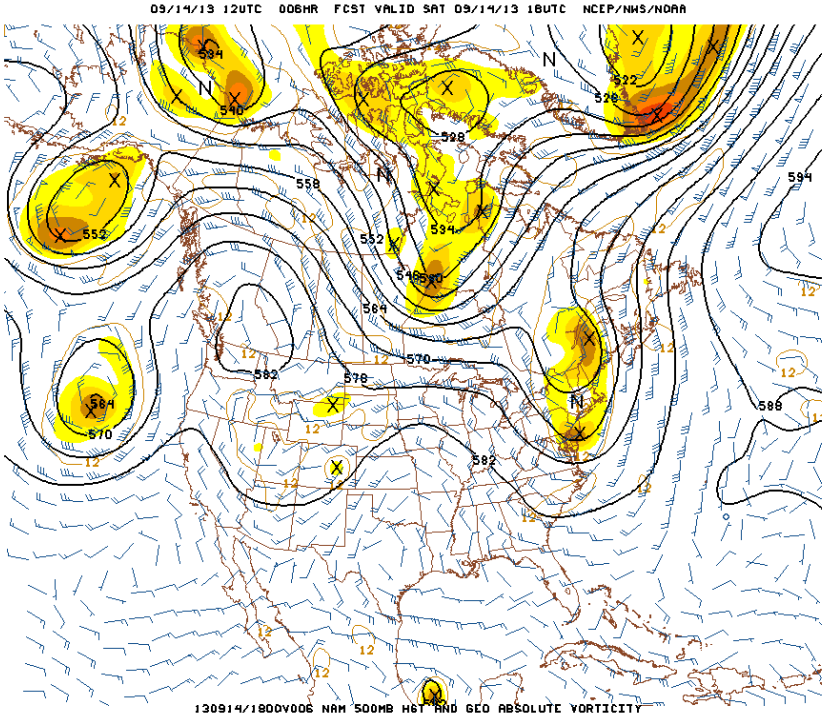
-25
NEXRAD 1KM MOSAIC 14 SEP 13 16:49

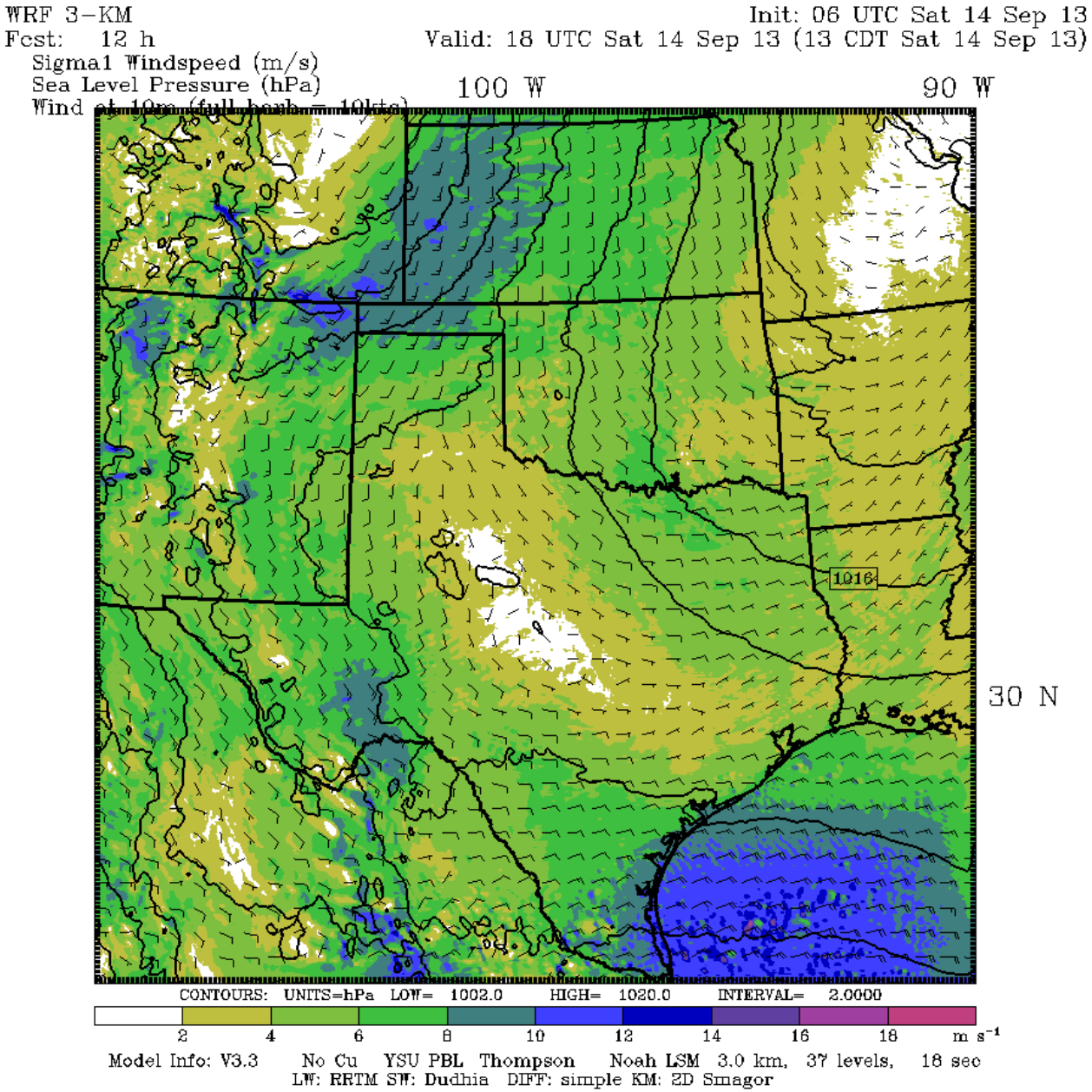
Today: Cold front moving slowly over the study region today. Eastern Texas under the influence of the upper level ridge, which should keep convection to a minimum. E/NE flow.

1 PM CDT
500 mb vorticity



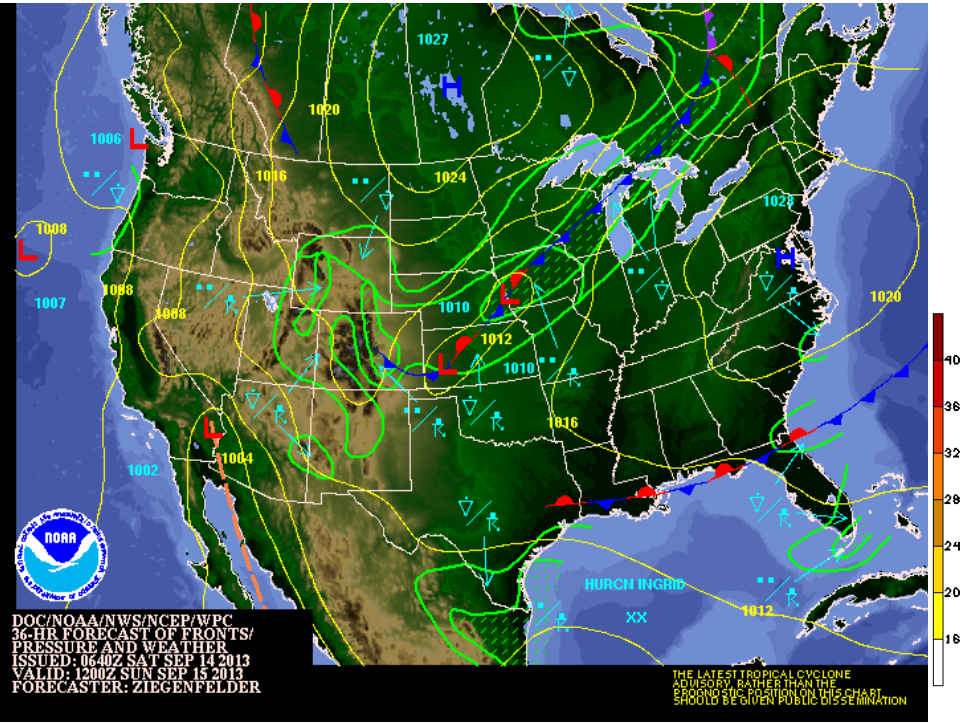


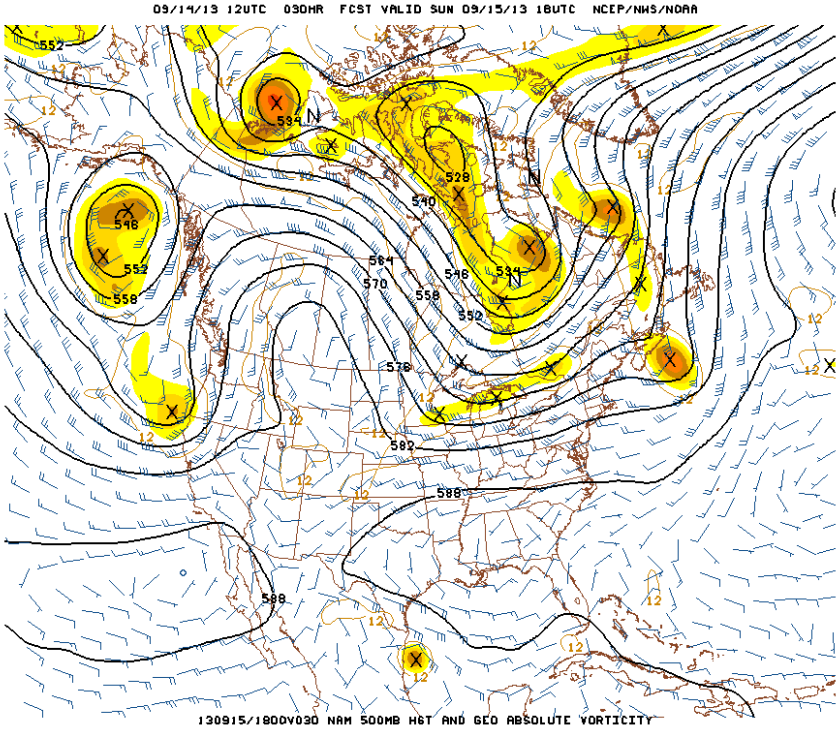
10 m winds at 1 PM today



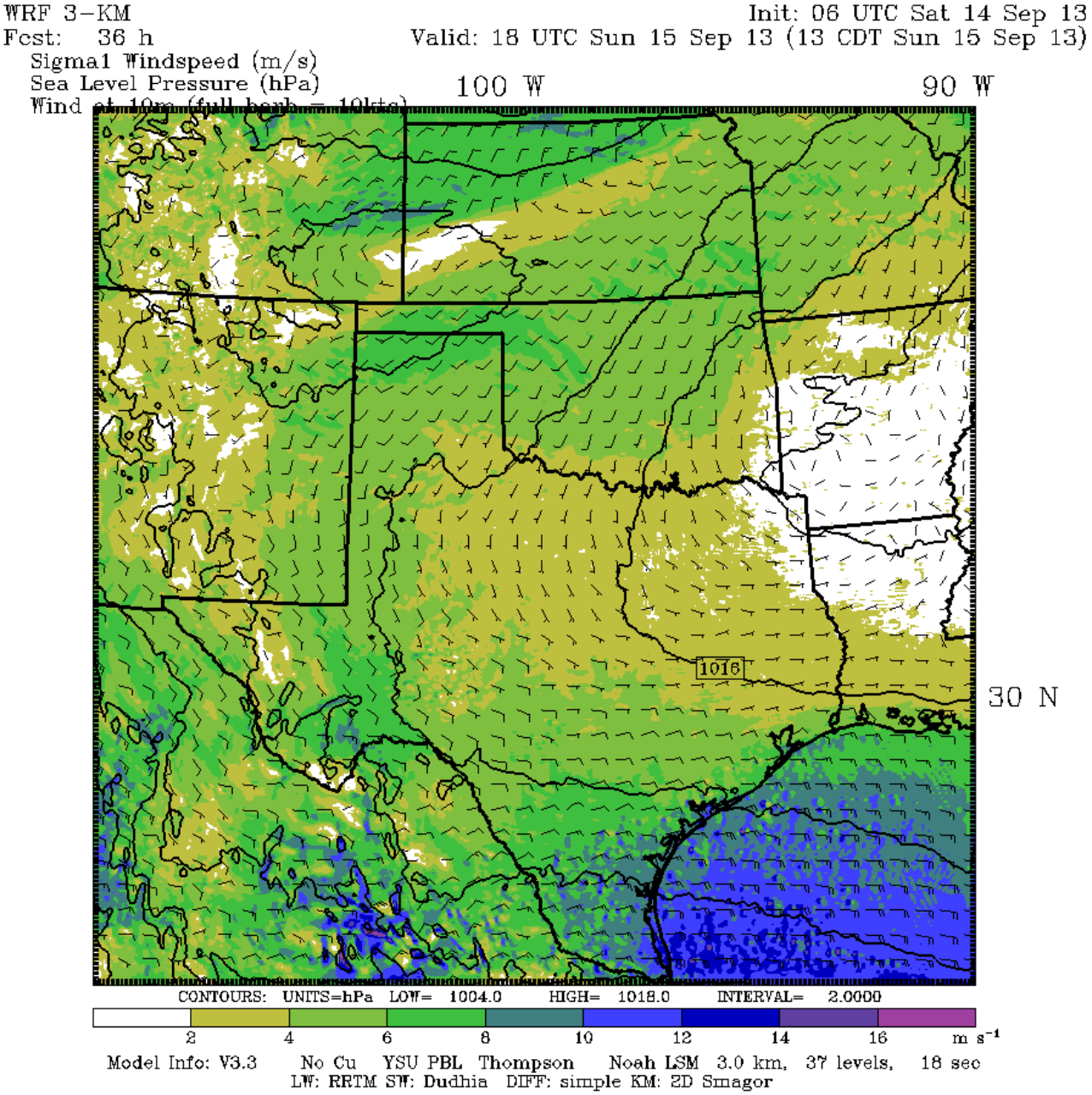
Tomorrow: Easterly flow. Region under the influence of the upper level ridge. Cold front moves E. Upper ridge should prevent some of the moisture from Ingrid from reaching our area, but enough will reach us for clouds to thicken.

1 PM CDT
500 mb vorticity





10 m winds at 1 PM tomorrow

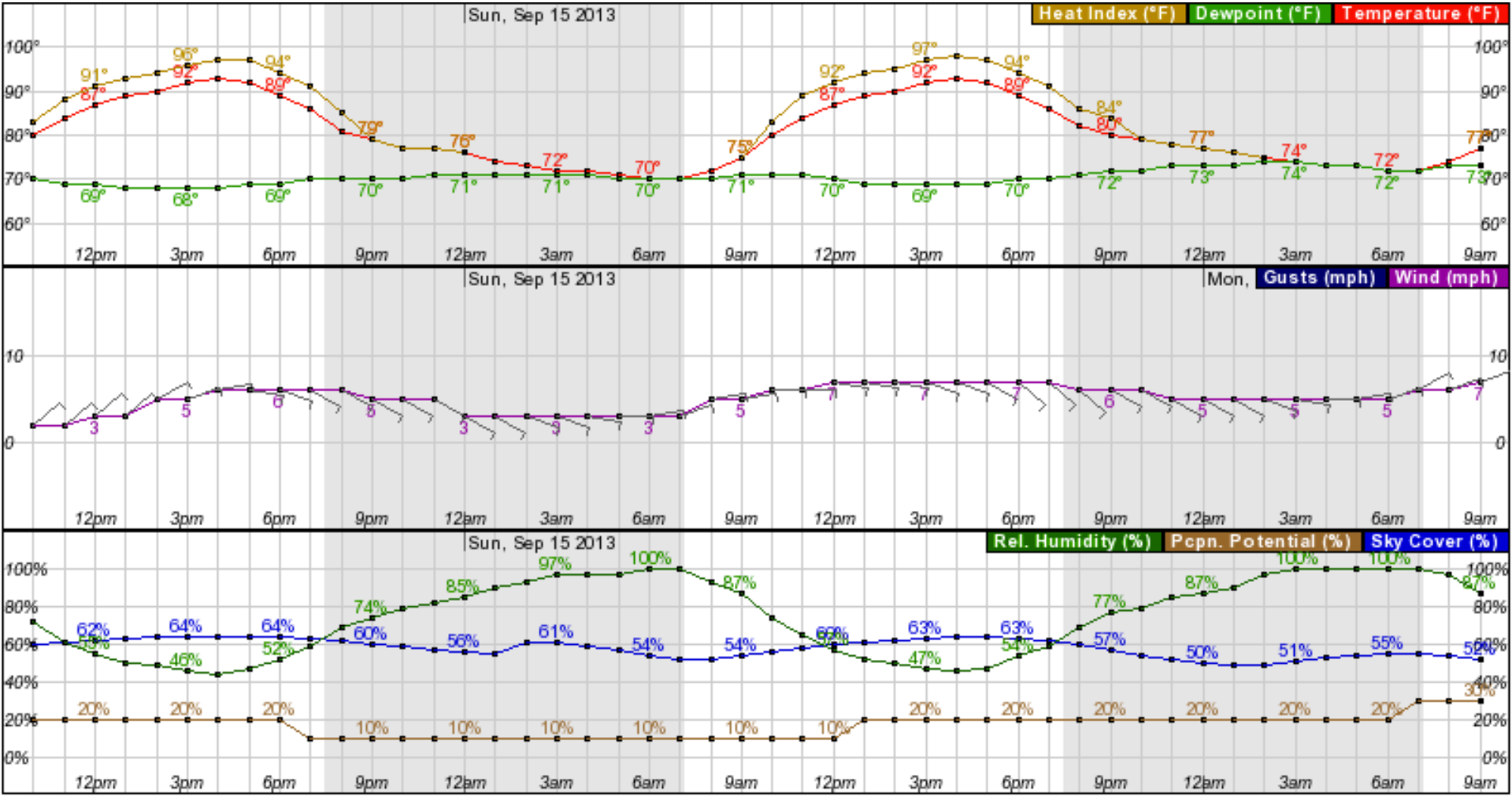


Conroe

Today: Partly cloudy

Tomorrow: Partly cloudy

Today→ **Tomorrow→**

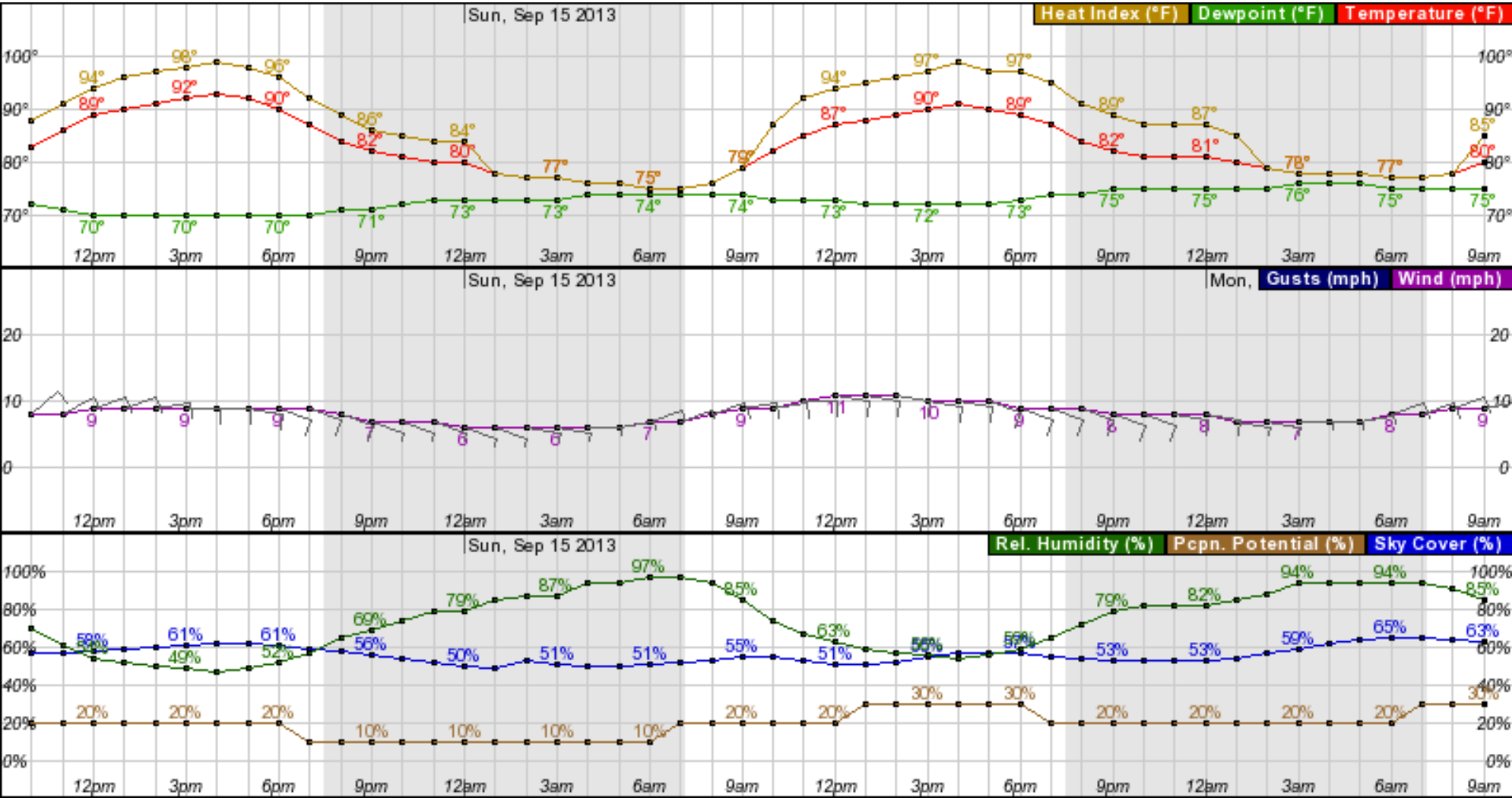


Houston Hobby

Today: Partly cloudy

Tomorrow: Partly cloudy

Today→ **Tomorrow→**

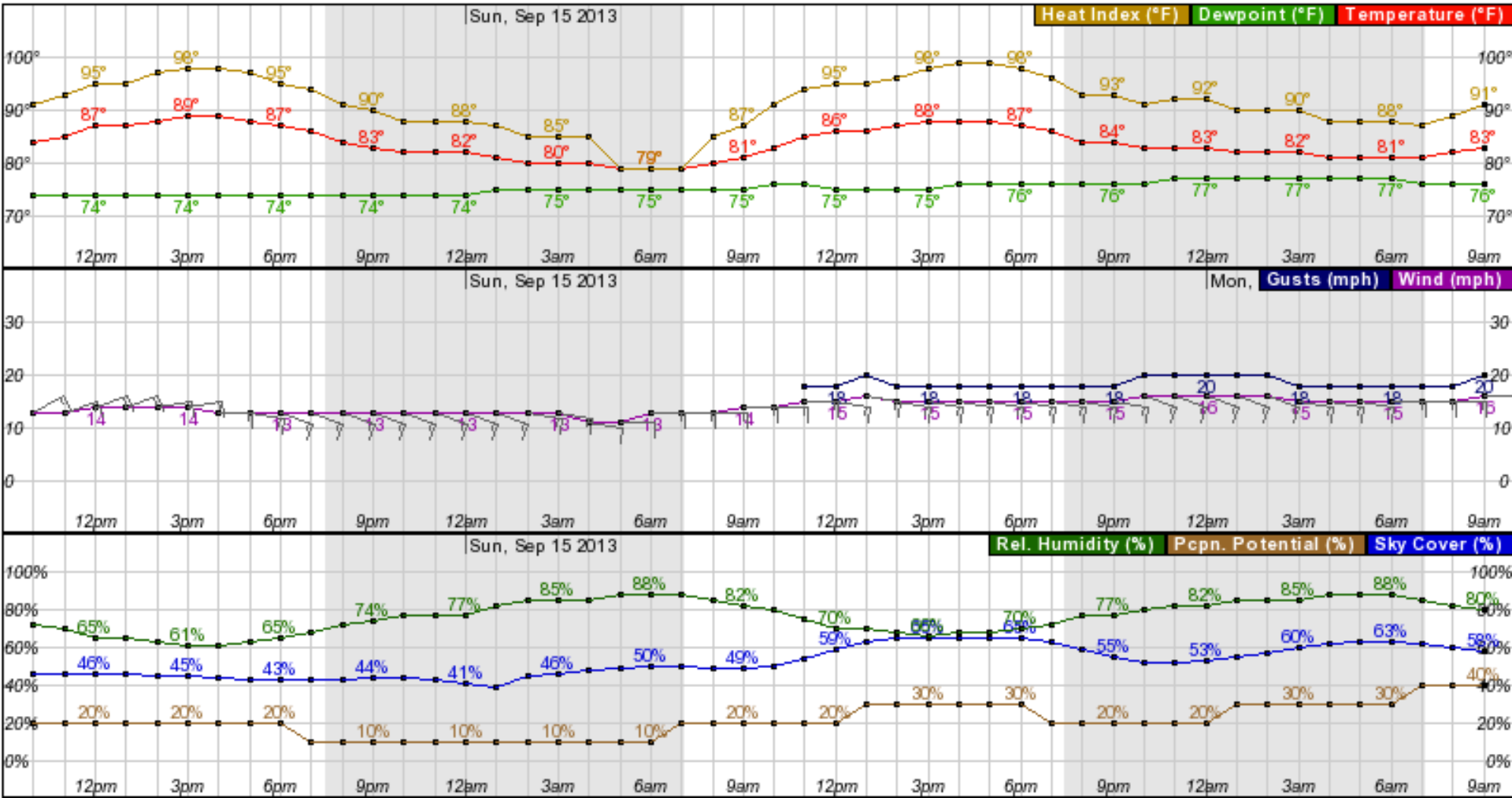


Galveston

Today: Partly cloudy

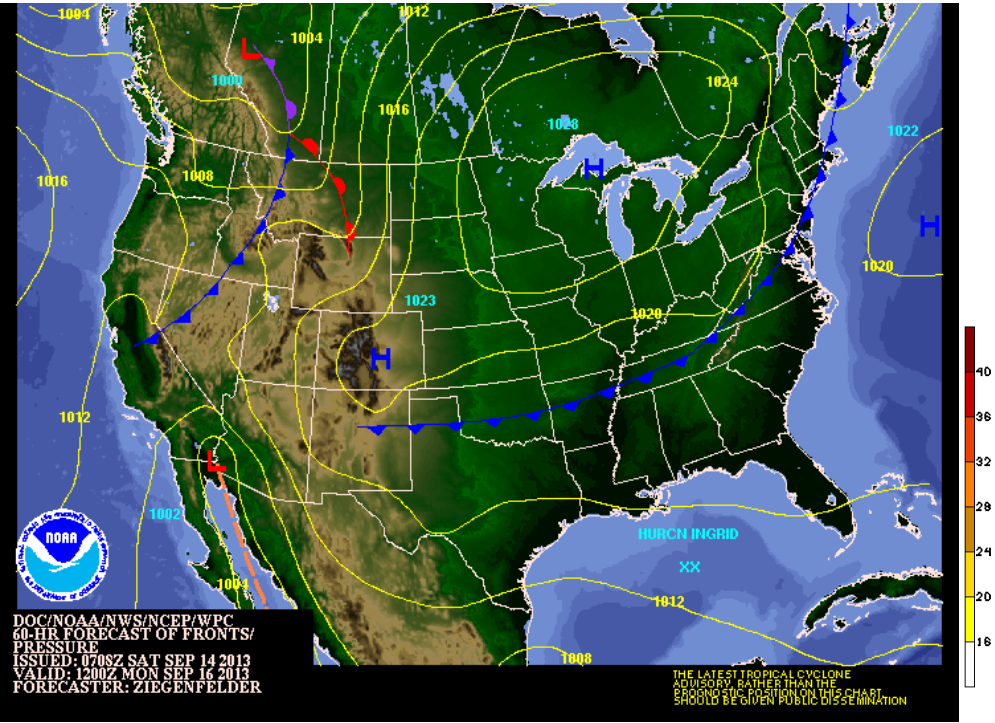
Tomorrow: Partly cloudy

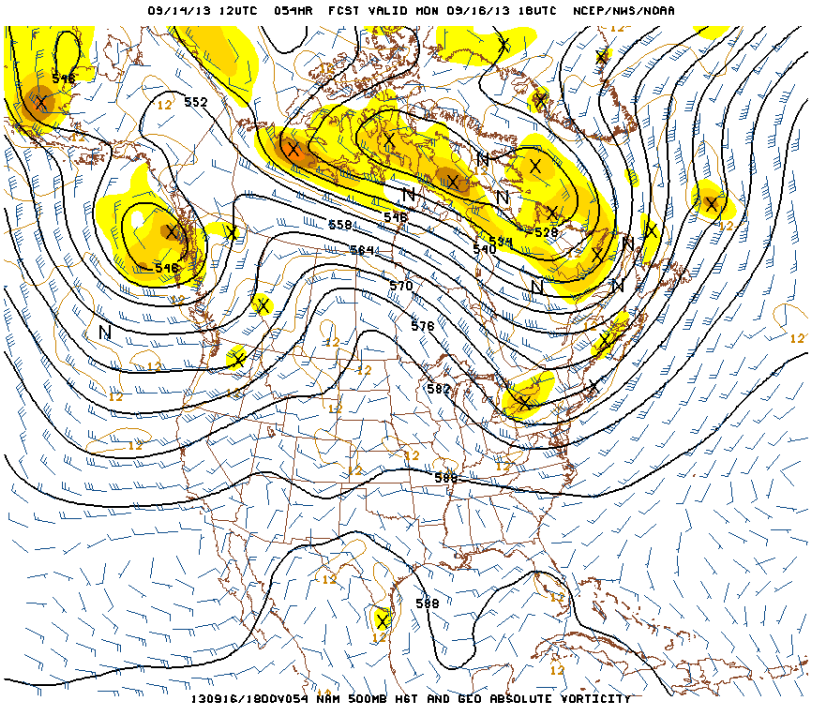
Today→ **Tomorrow→**



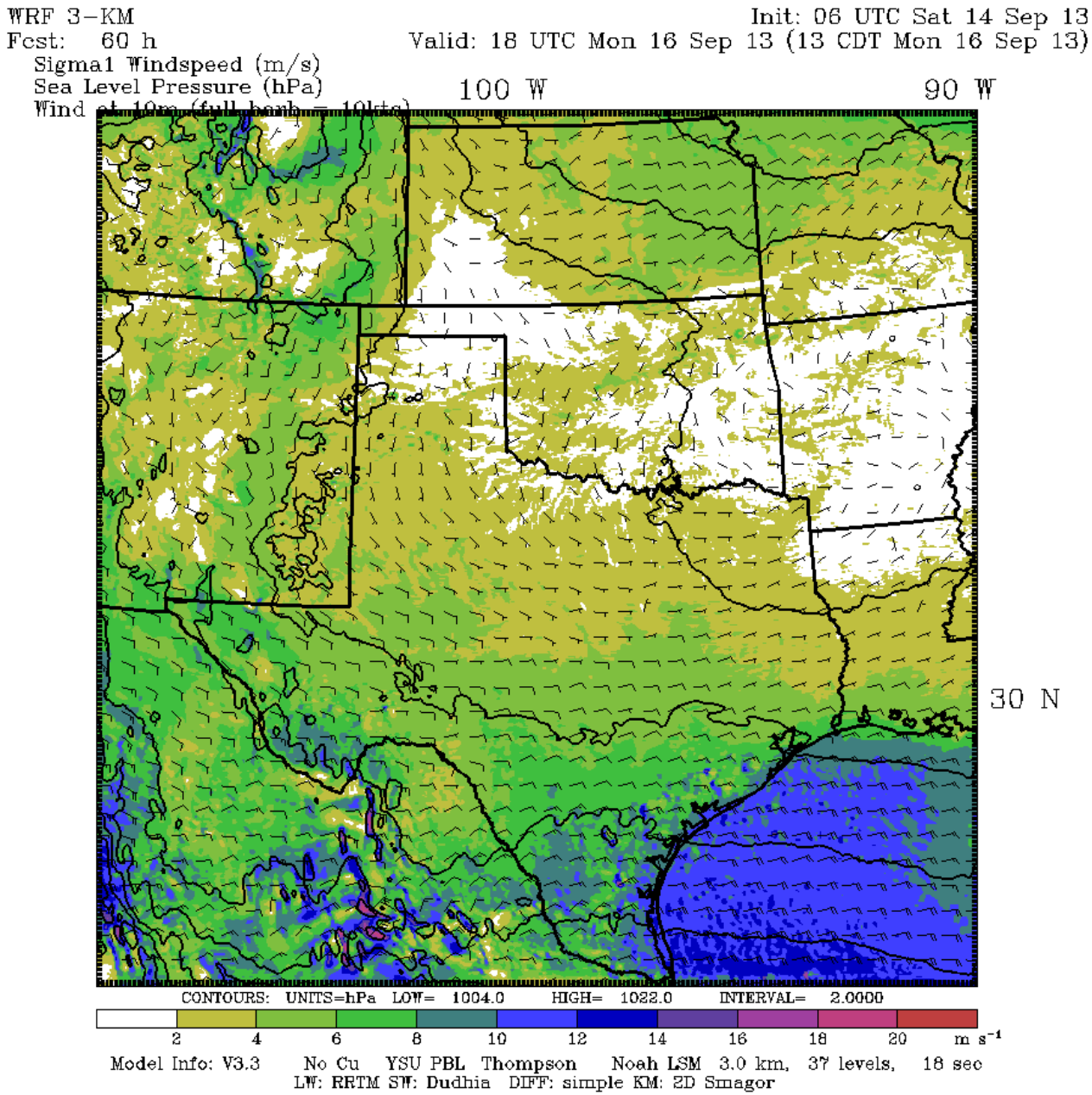
Monday: Region remains in E/NE flow regime under influence from the upper level ridge. Subsidence should again prevent some moisture from Ingrid from reaching us, but precipitation chances are ~20-30%; thickening of the cloud deck at most levels during day.

1 PM CDT
500 mb vorticity





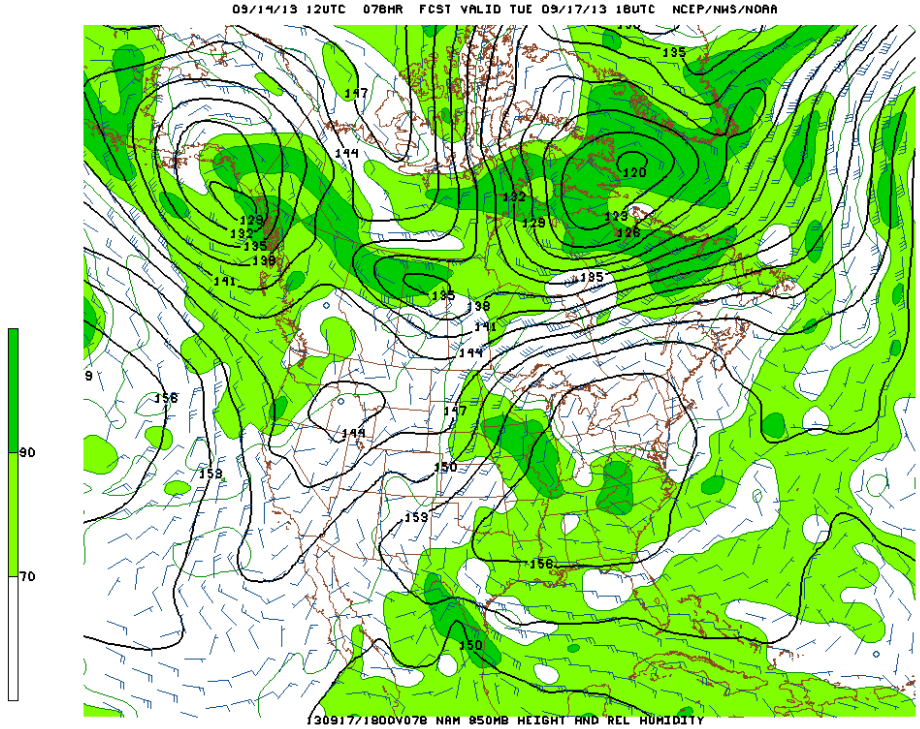
10 m winds at 1 PM Monday



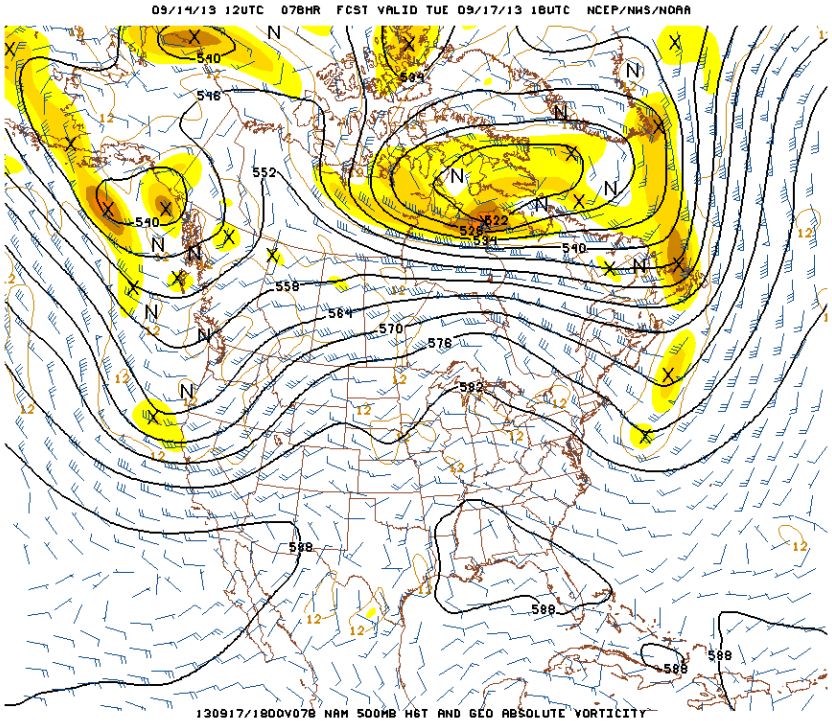
Tuesday: Upper level ridge remains in place. Higher moisture over study region, allowing clouds to remain.

1 PM CDT

850 mb RH



500 mb vorticity

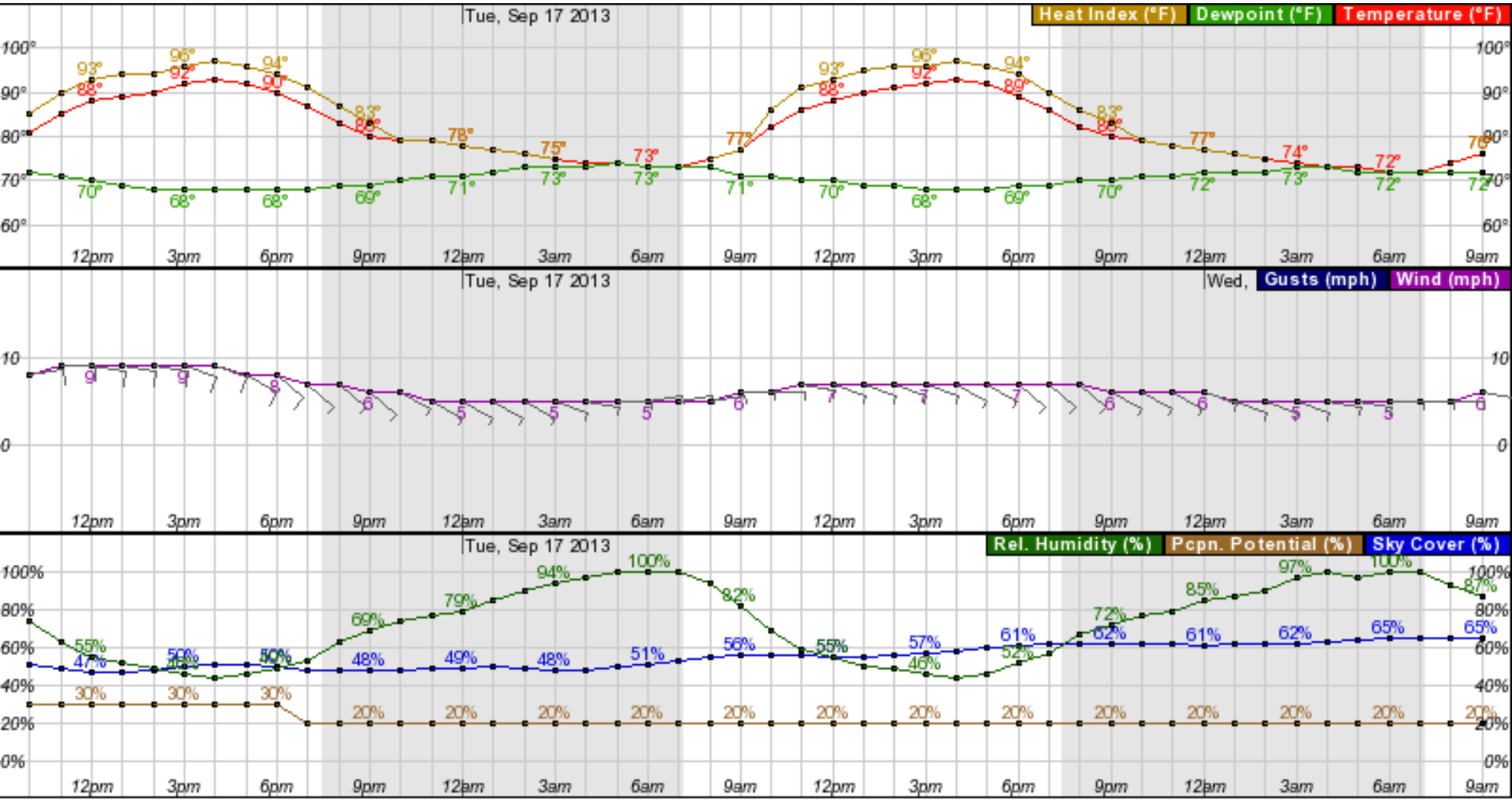


Conroe

Sunday: Mostly cloudy

Monday: Partly cloudy

Monday→ **Tuesday→**

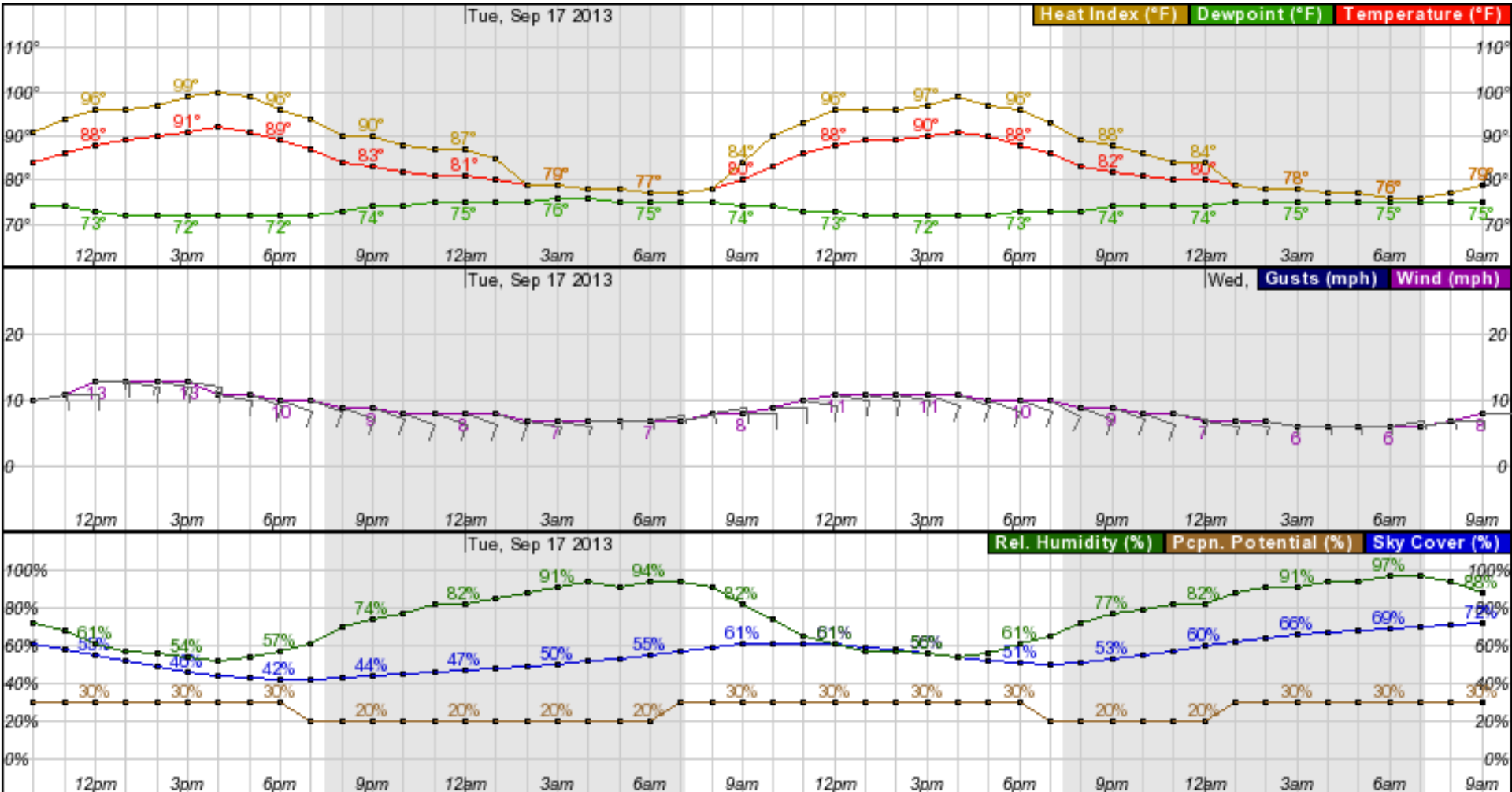


Houston Hobby

Sunday: Partly cloudy

Monday: Partly cloudy

Monday→ **Tuesday→**

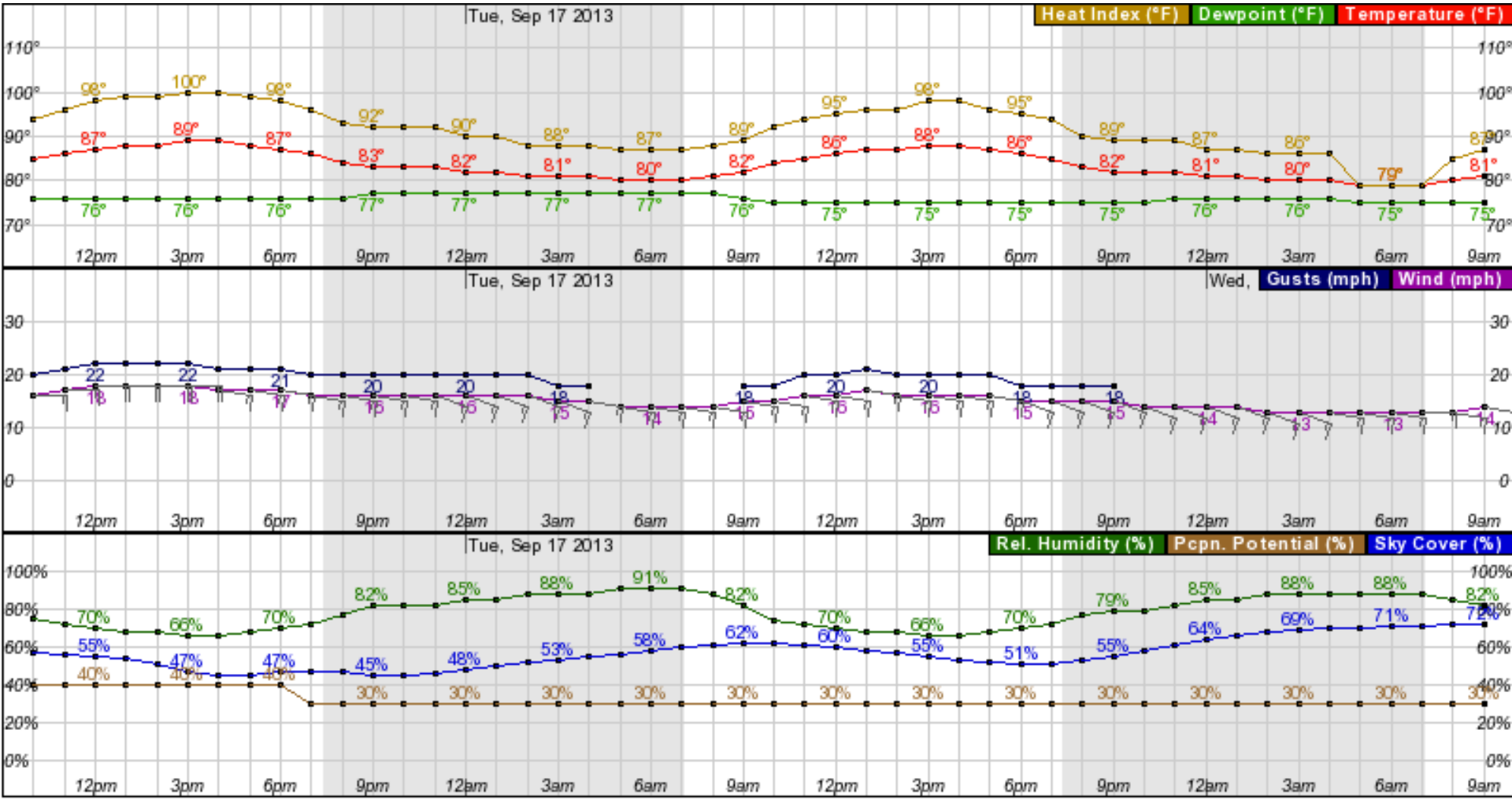


Galveston

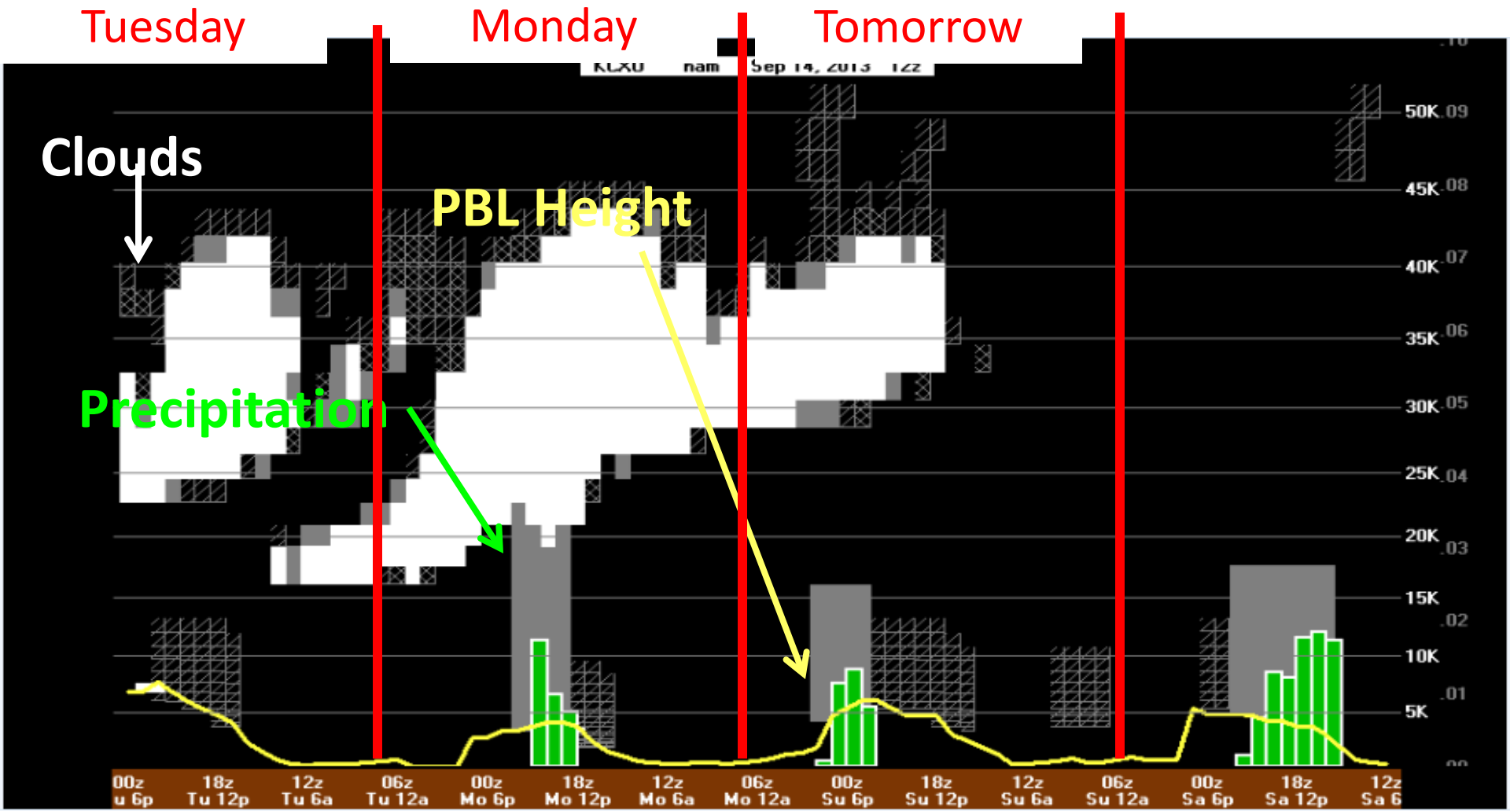
Sunday: Partly cloudy

Monday: Partly cloudy

Monday→ **Tuesday→**

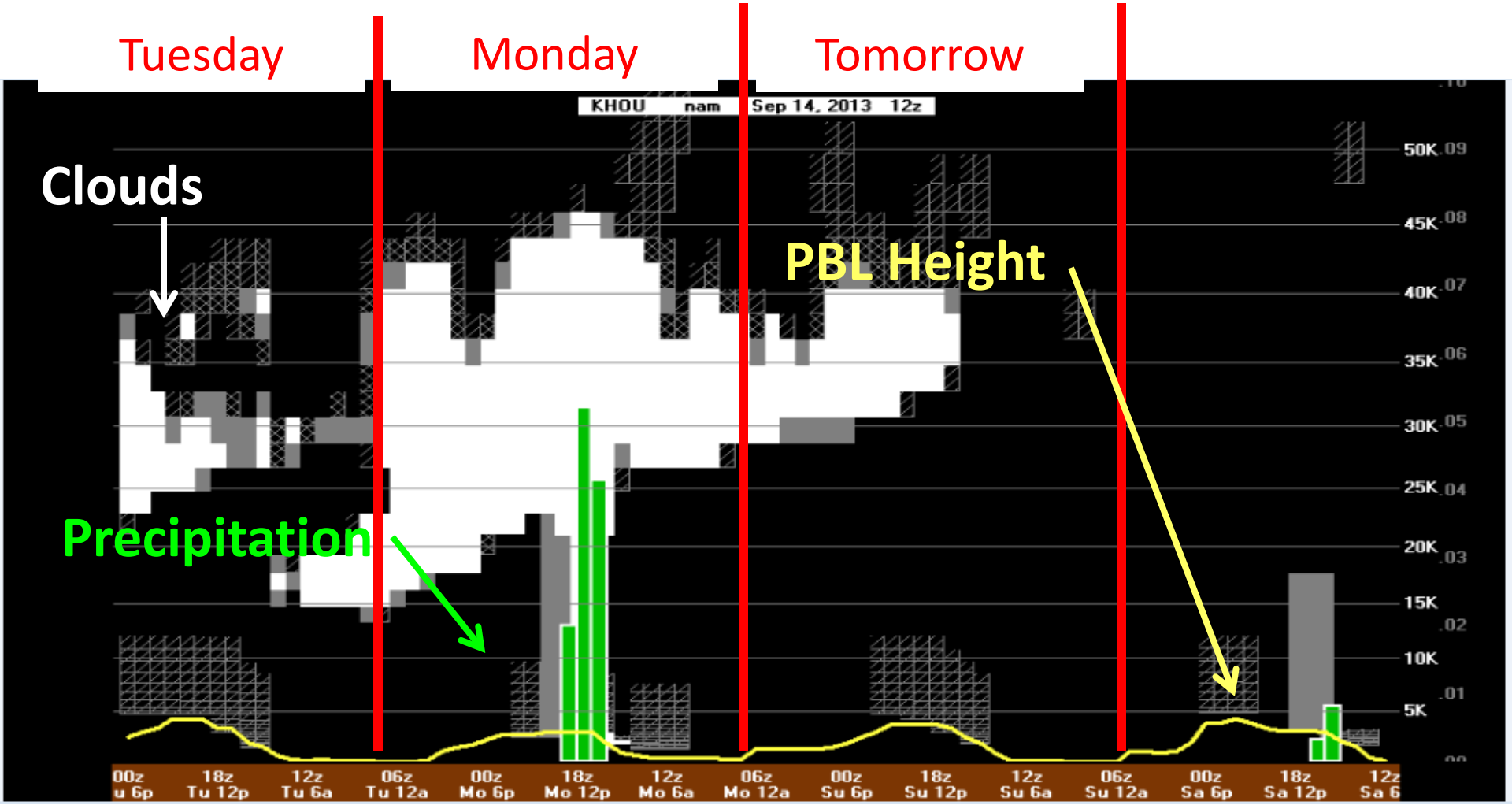


Conroe; BUFKIT – NAM (12 UTC 10 September)



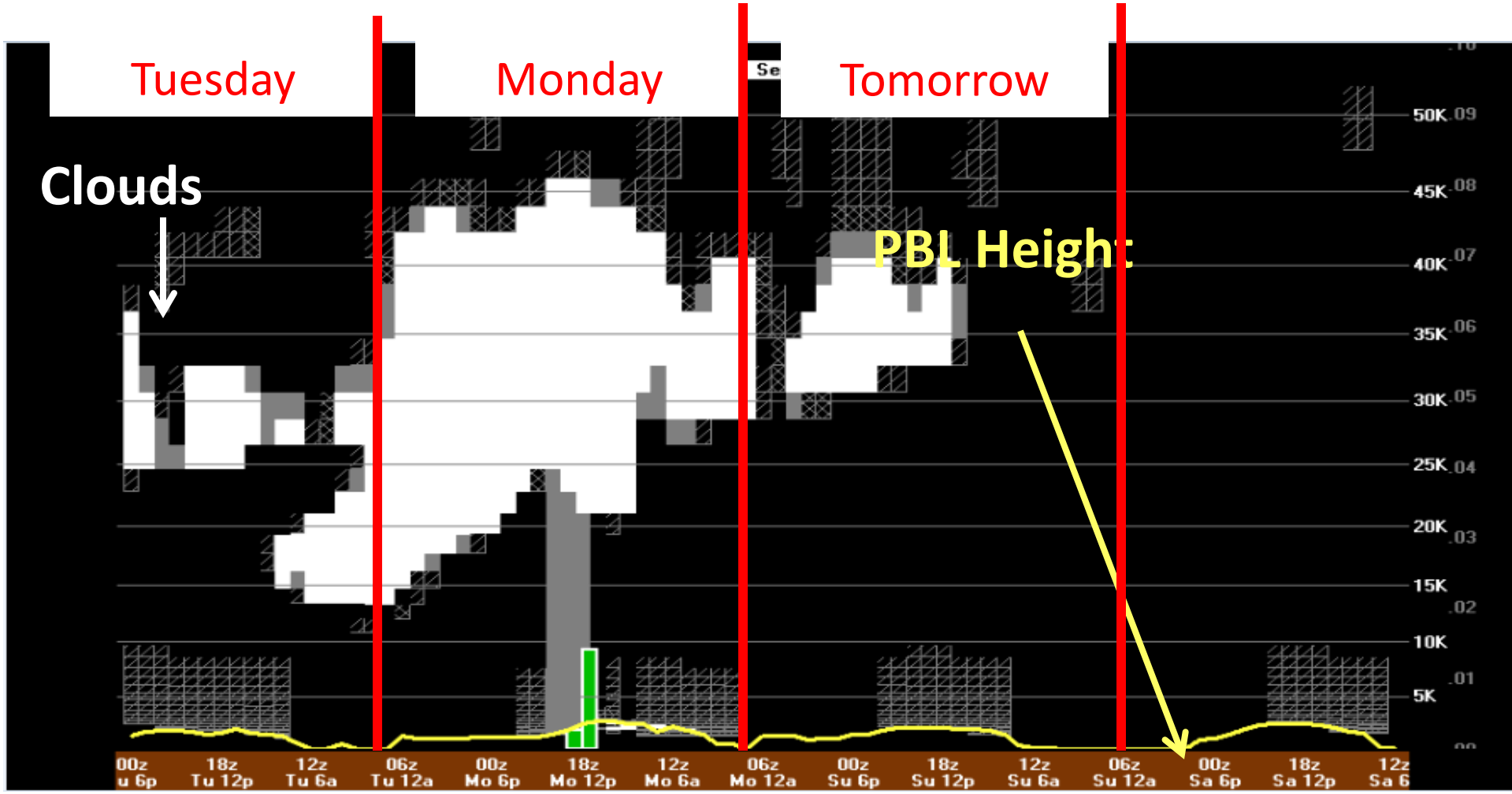
-Tomorrow: Low cloud and precipitation during afternoon
-Monday: Clouds and rain throughout the day
-Tuesday: High and low level clouds throughout the day

Houston Hobby; BUFKIT – NAM (12 UTC 10 September)



-Tomorrow: Low cloud during afternoon
-Monday: Thick clouds and precipitation during day
-Tuesday: High and low level clouds throughout the day

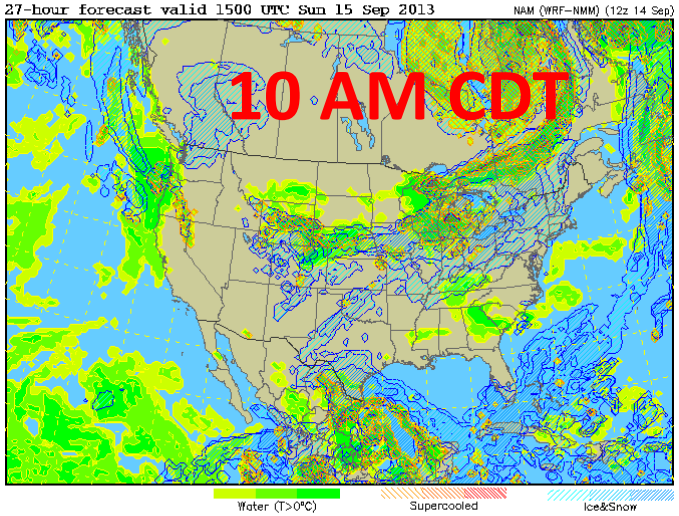
Galveston; BUFKIT – NAM (12 UTC 10 September)



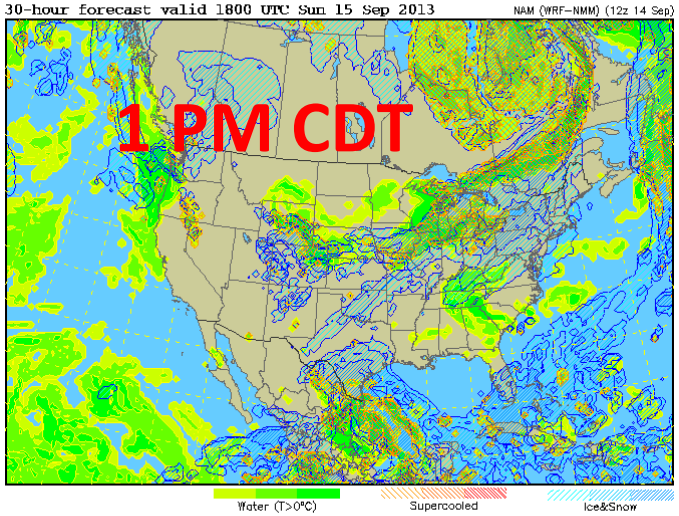
-Tomorrow: Scattered cloud throughout the day
-Monday: Thick cloud deck and some precipitation
-Tuesday: Scattered cloud throughout the day

Tomorrow: NAM – Cirrus all day

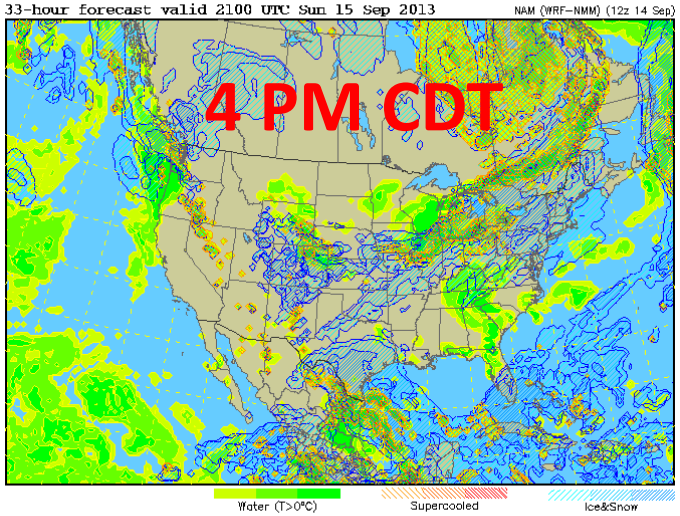
Integrated liquid and frozen hydrometeors (all levels)



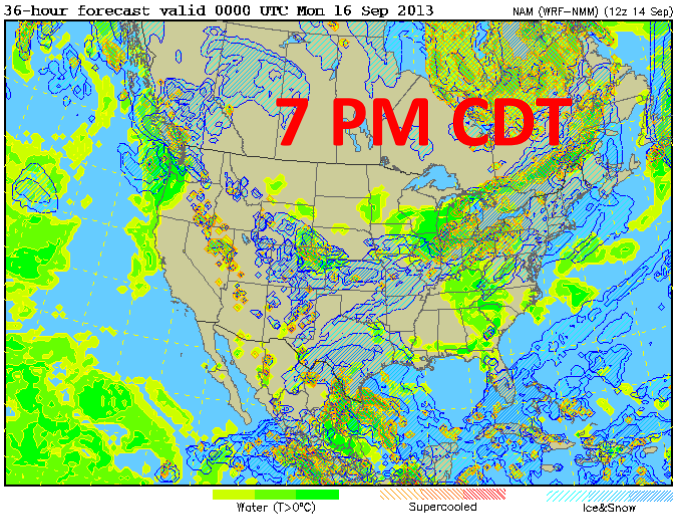
Integrated liquid and frozen hydrometeors (all levels)



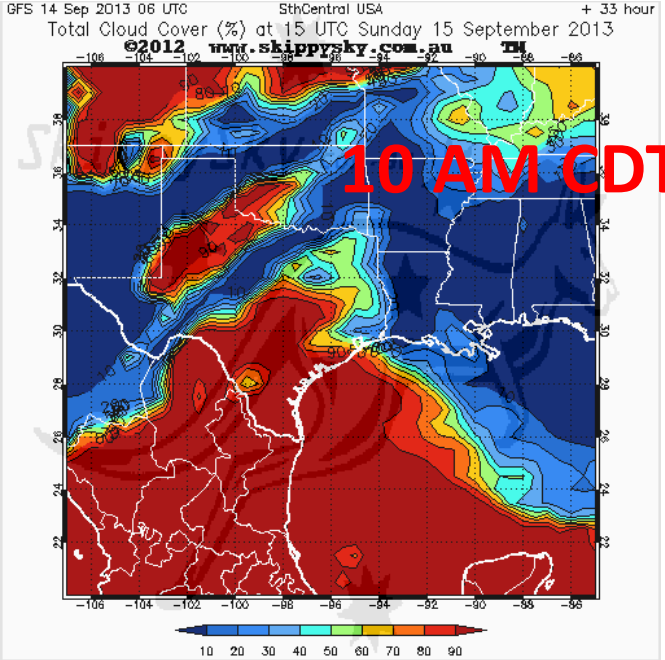
Integrated liquid and frozen hydrometeors (all levels)

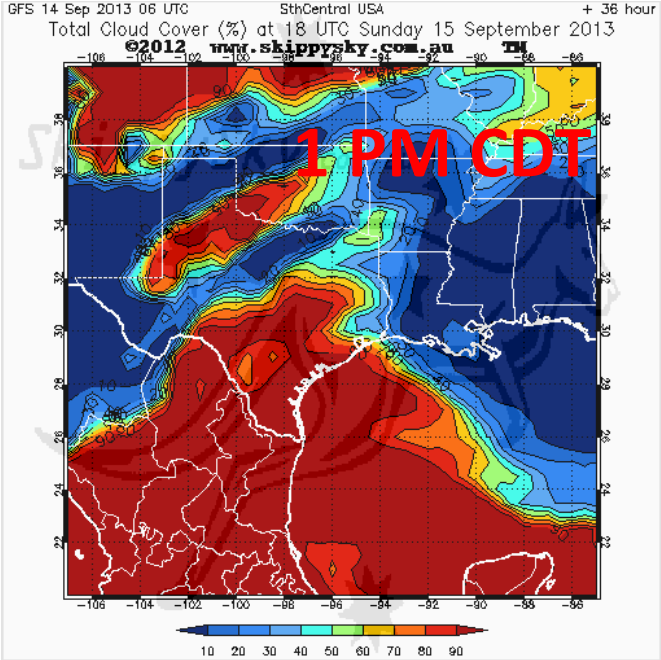


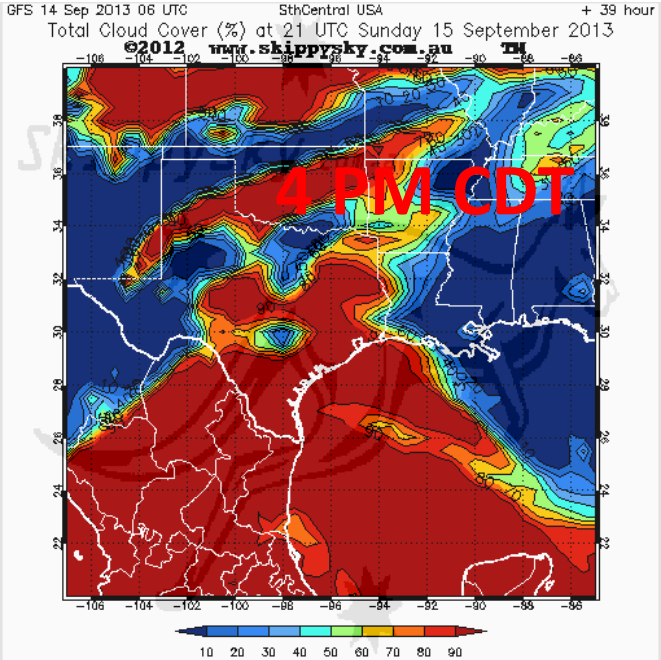
Integrated liquid and frozen hydrometeors (all levels)

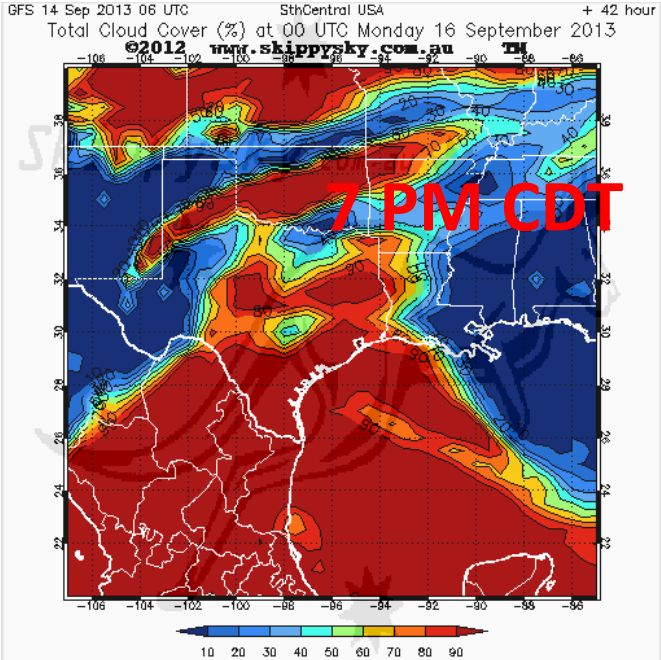


Tomorrow: GFS – Cloudy all day

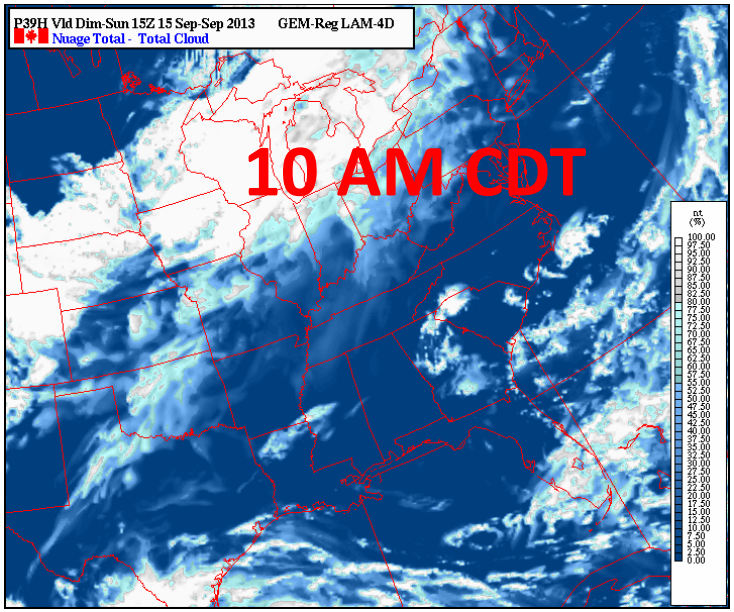


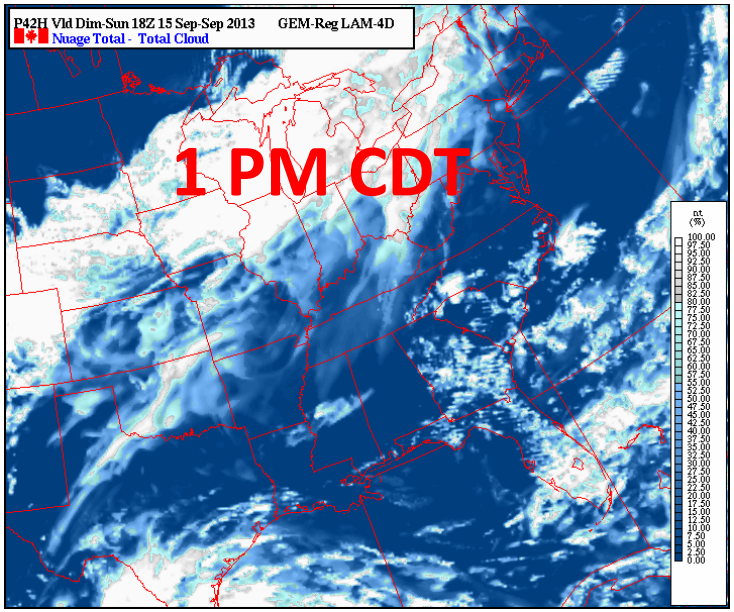


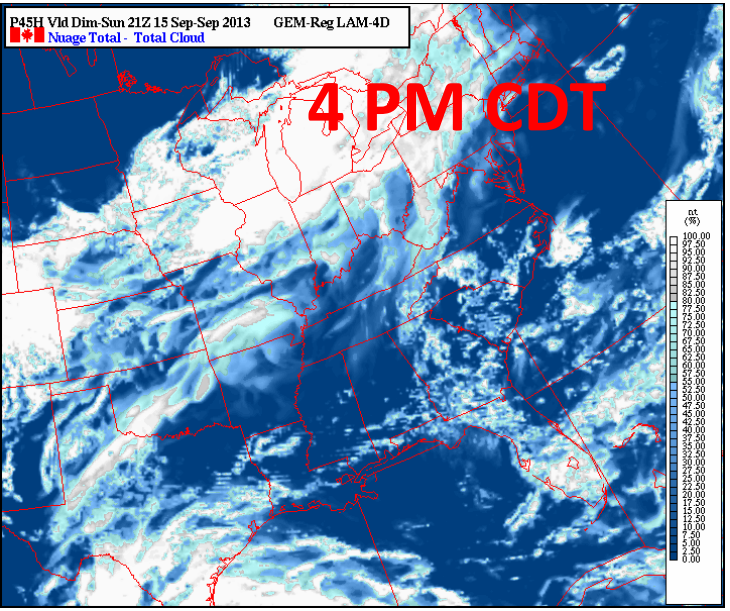


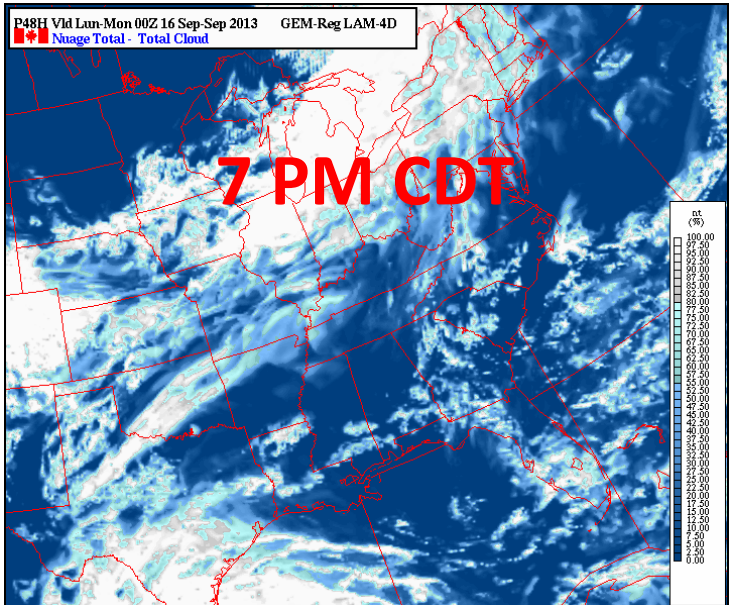


Tomorrow: Canadian – Cloudy all day





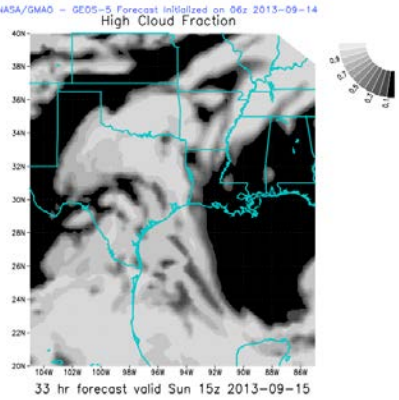


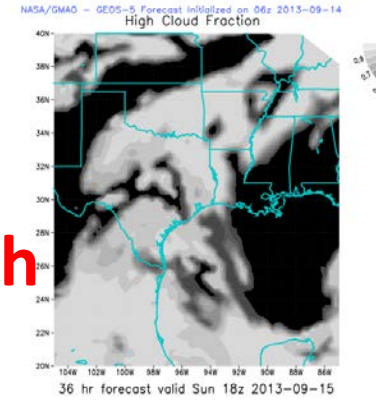


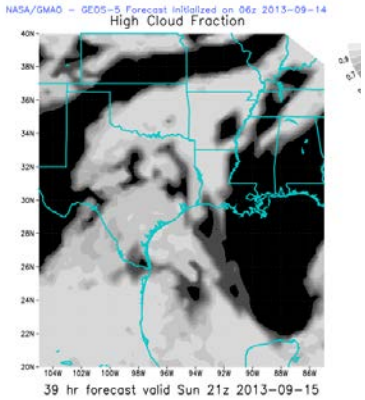
Tomorrow: GEOS-5 –High clouds all day, some low clouds by afternoon

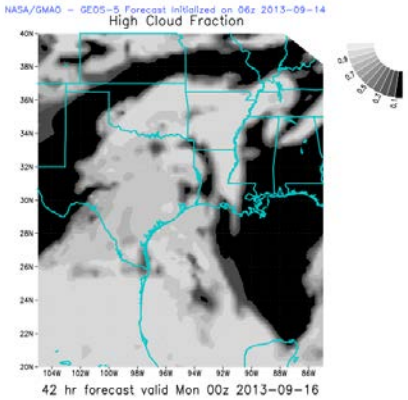
10 am **1 pm** **4 pm** **7 pm**

High

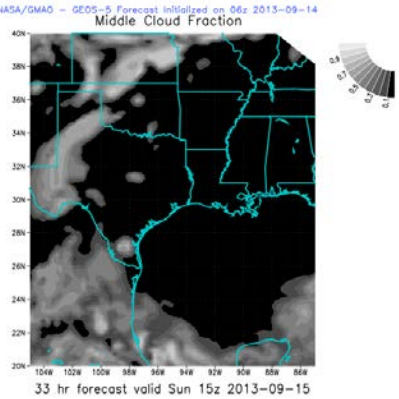


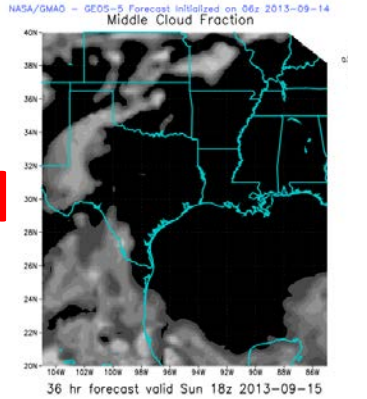


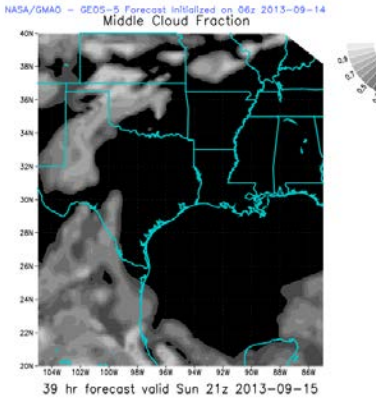


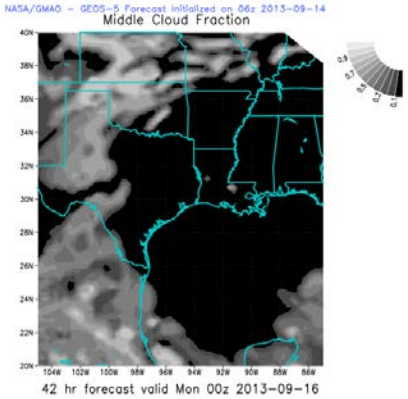


Mid

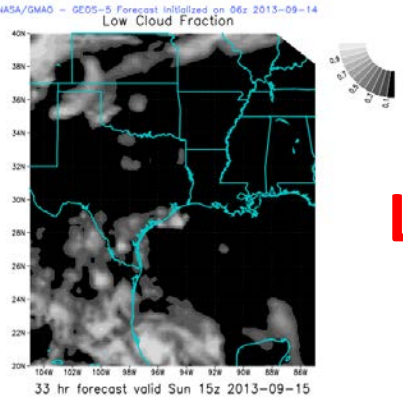


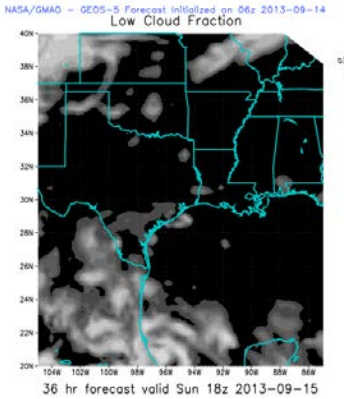


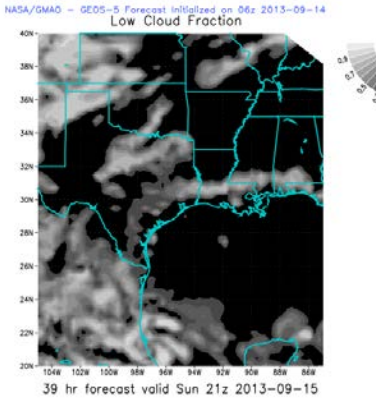


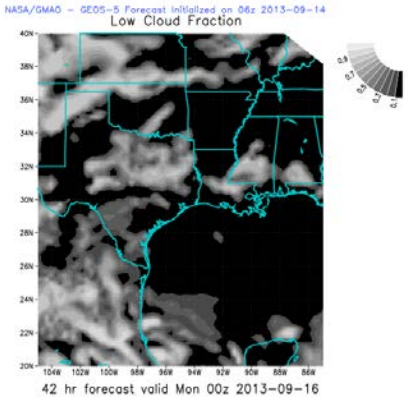


Low



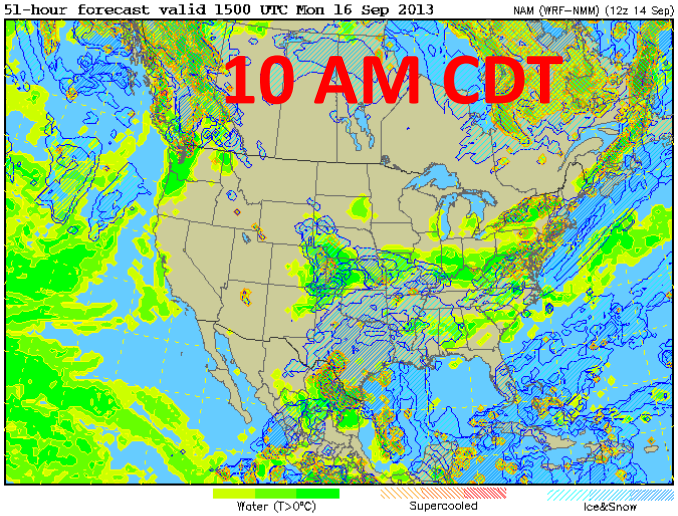




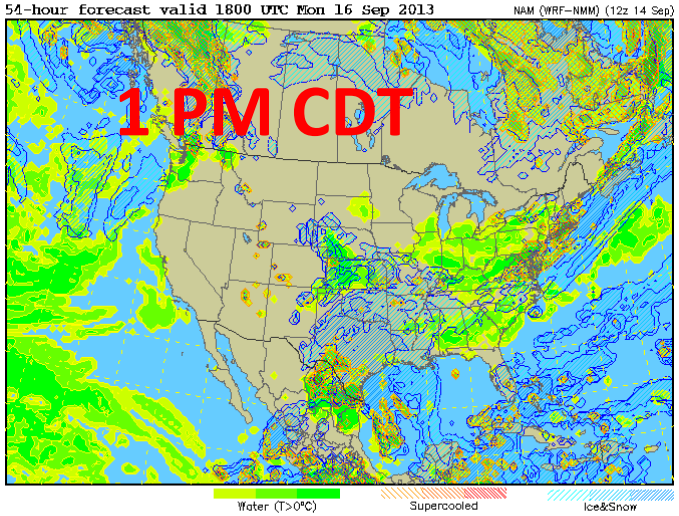


Monday: NAM – high level clouds through most of day

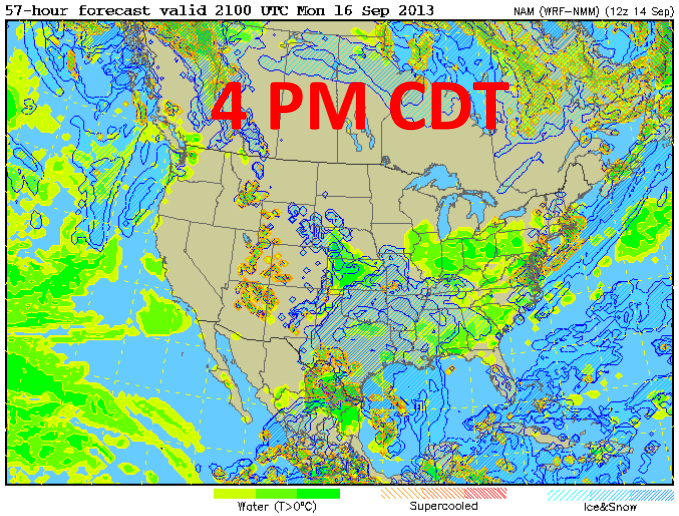
Integrated liquid and frozen hydrometeors (all levels)



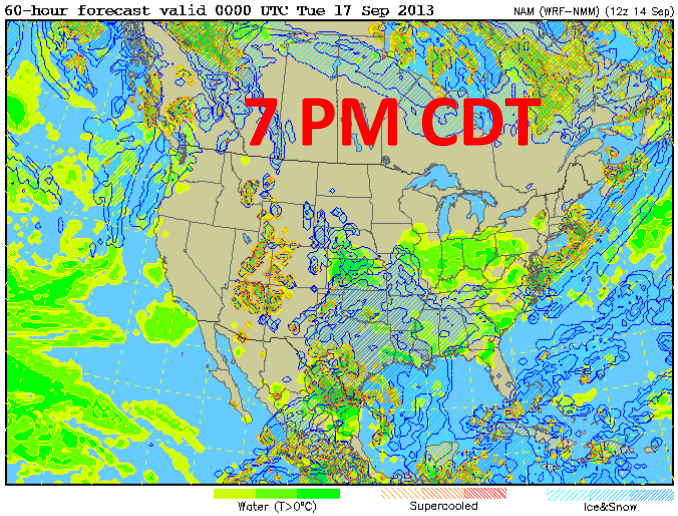
Integrated liquid and frozen hydrometeors (all levels)



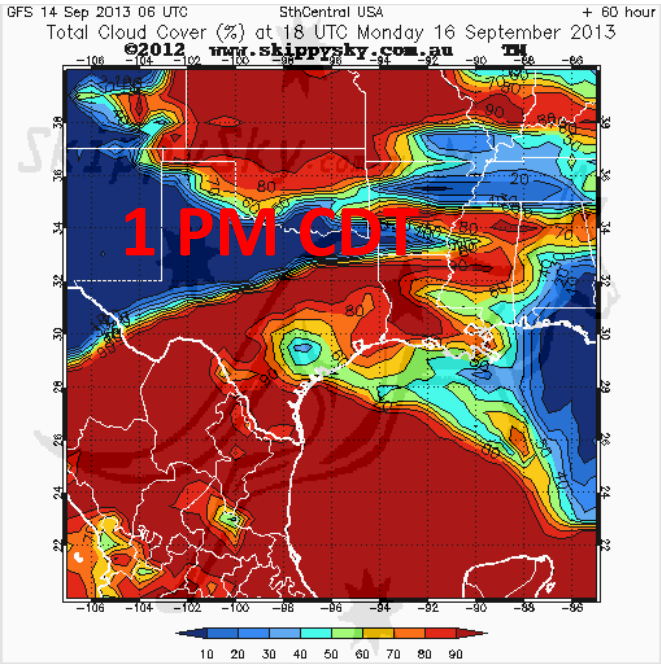
Integrated liquid and frozen hydrometeors (all levels)

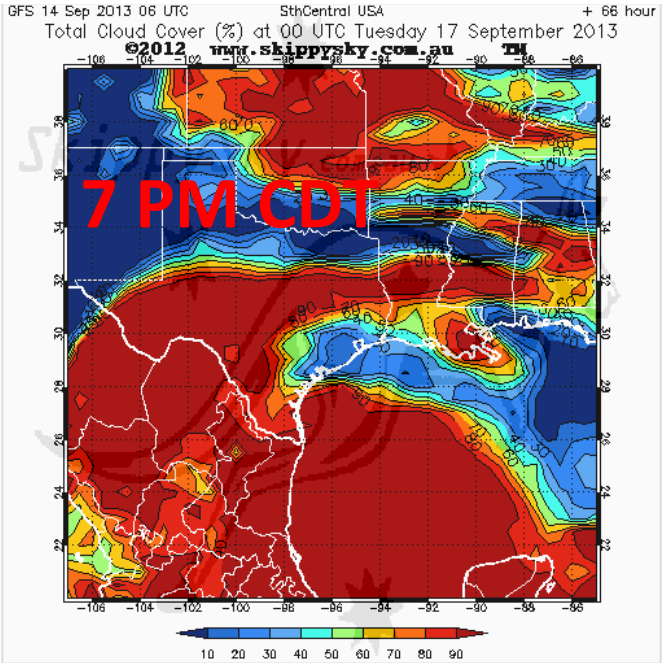


Integrated liquid and frozen hydrometeors (all levels)



Monday: GFS – Clouds throughout the day

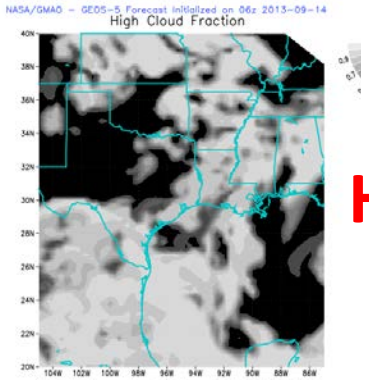


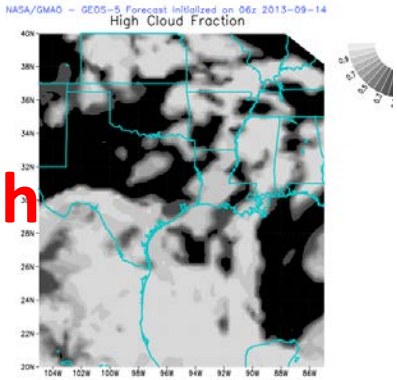


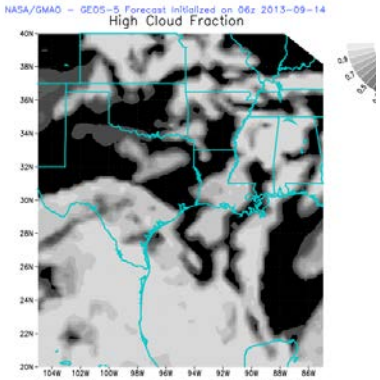
Monday: GEOS-5 –high level clouds throughout the day

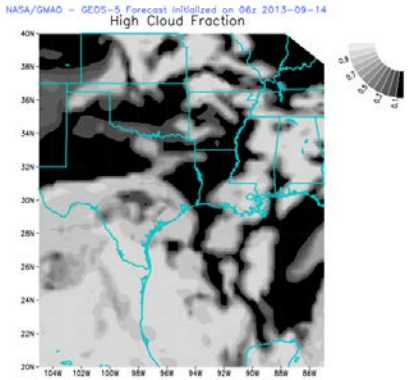
10 am **1 pm** **4 pm** **7 pm**

High

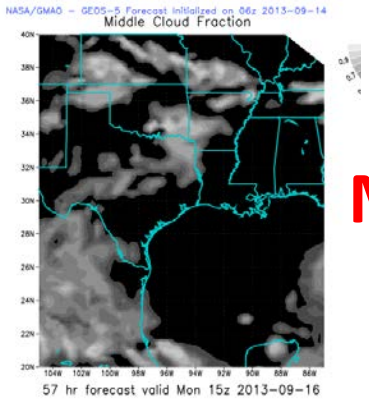


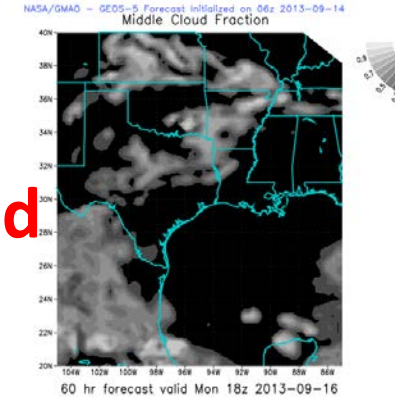


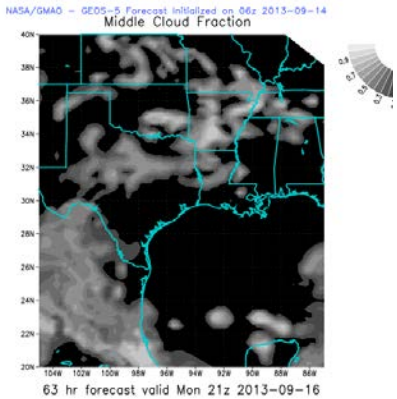


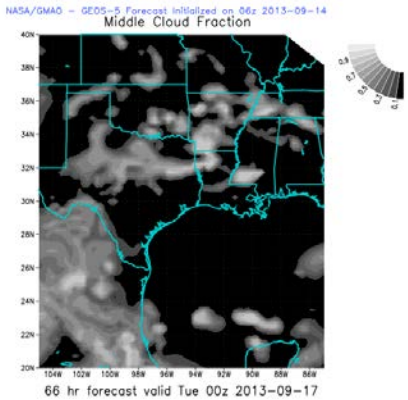


Mid

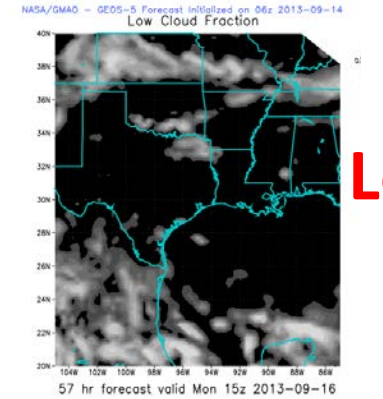


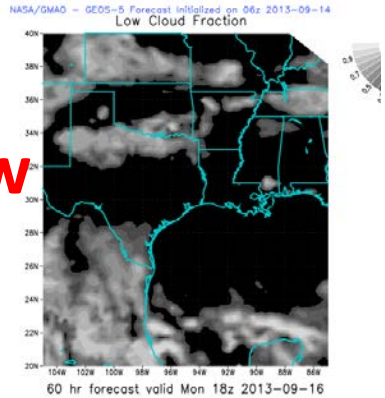


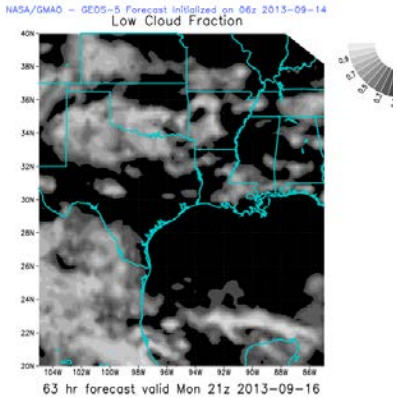


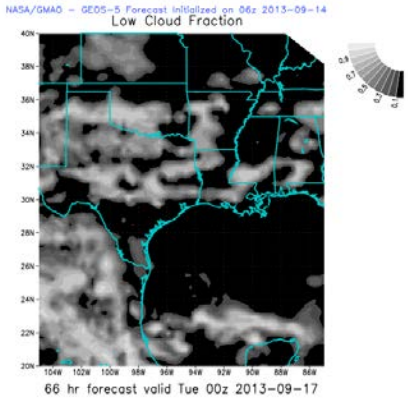


Low



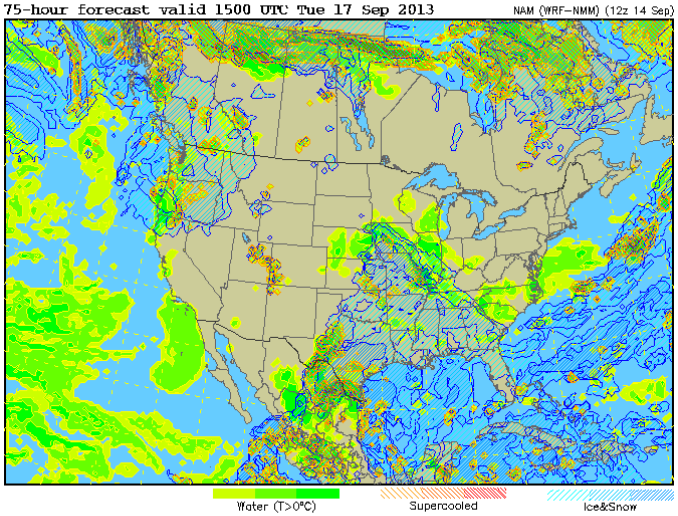




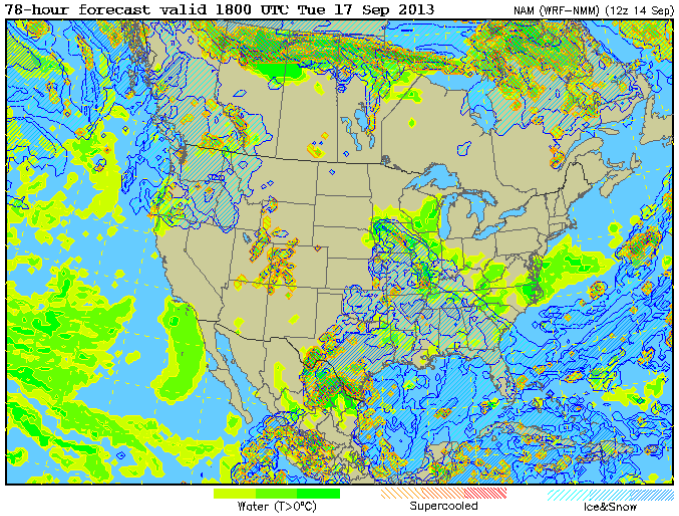


Tuesday: NAM – high level and low level clouds

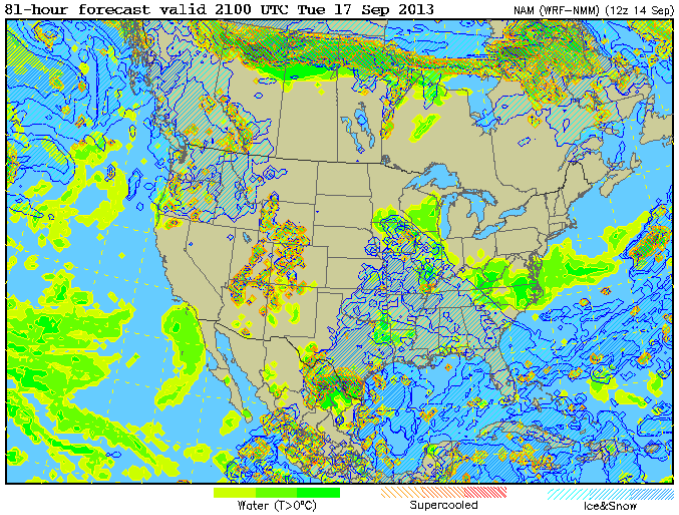
Integrated liquid and frozen hydrometeors (all levels)



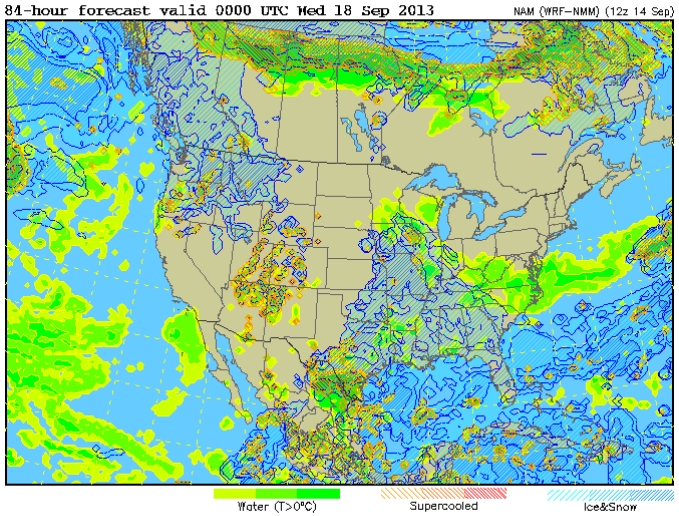
Integrated liquid and frozen hydrometeors (all levels)



Integrated liquid and frozen hydrometeors (all levels)

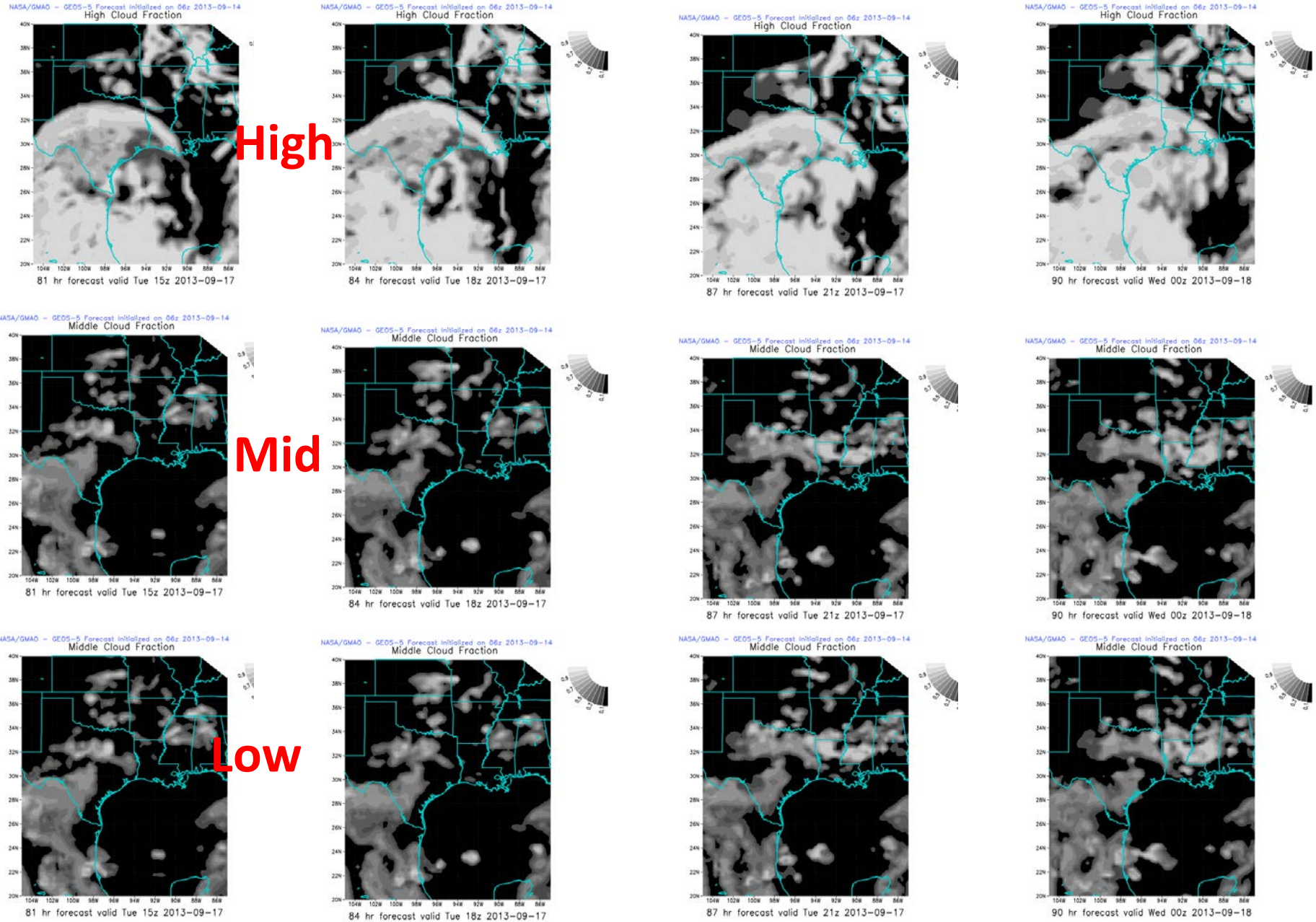


Integrated liquid and frozen hydrometeors (all levels)



Tuesday: GEOS-5 – high clouds throughout the day

10 am **1 pm** **4 pm** **7 pm**



Satellite
Terrain
Simple
Juarez
Texas
Austin
Louisiana
Chihuahua Municipality
San Antonio
Houston
Monterrey
Gulf of Mexico
Mexico
San Luis Potosi
Guadalajara
Mexico City
Merida
Belize
Guatemala
Guatemala
D
D
H
H
H
H
Mexico
500 km
Google
Map data ©2013 Google, INEGI, MapLink Imagery ©2013 TerraMetrics - Terms of Use

Recommendations

- Tomorrow: Down day
- Monday and Tuesday: No fly days. Thick cirrus deck over th study region; clouds at lower levels should also thicken throughout the day on both Monday and Tuesday. NWS forecaster predicts deep moisture column throughout the day on both days, though not enough for significant precipitation at this time.

DISCOVER-AQ Air Quality Outlook
September 14, 2013

Bryan Duncan

Mariel Friberg

Ken Pickering

Houston - Network of Environmental Towers (H-NET)

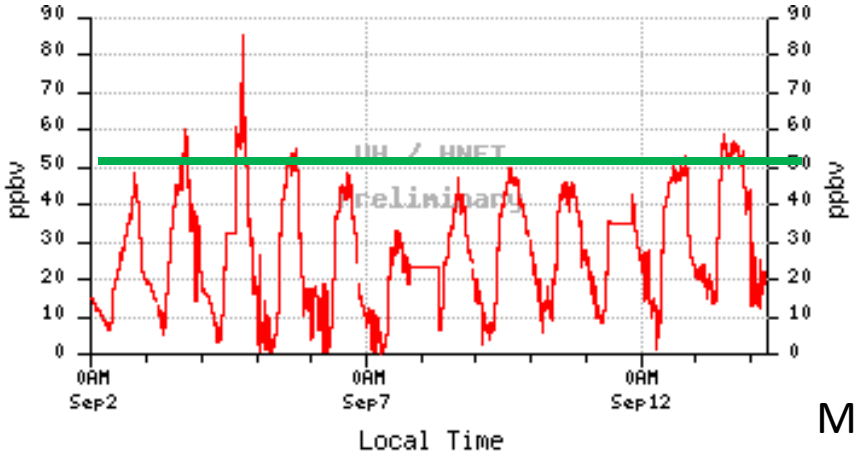
Houston Network of Environmental Towers (H-NET) collect chemistry and meteorological measurements for air quality model applications in Houston Galveston Area. This web site provides real-time update of collected data, as well as historical data.

Currently, five sites have been set up in

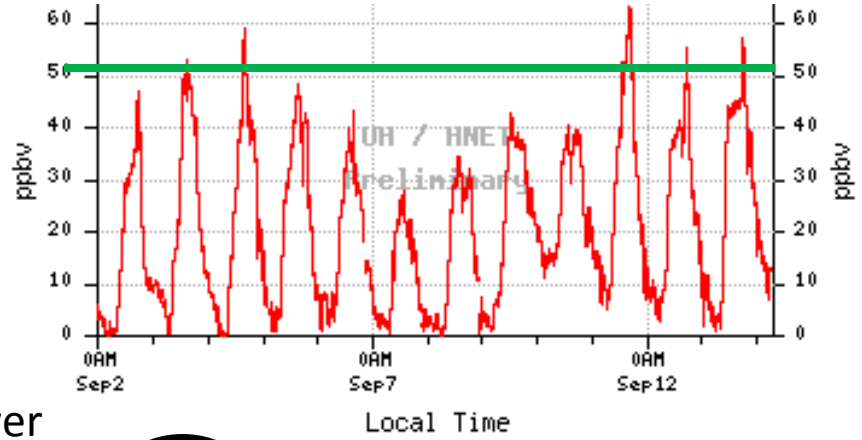
- UH - Main Campus (695)
- Jones State Forest (698)
- West Liberty Airport (699)
- UH - Sugar Land (696)
- UH - Coastal Center (697)

More about this project.

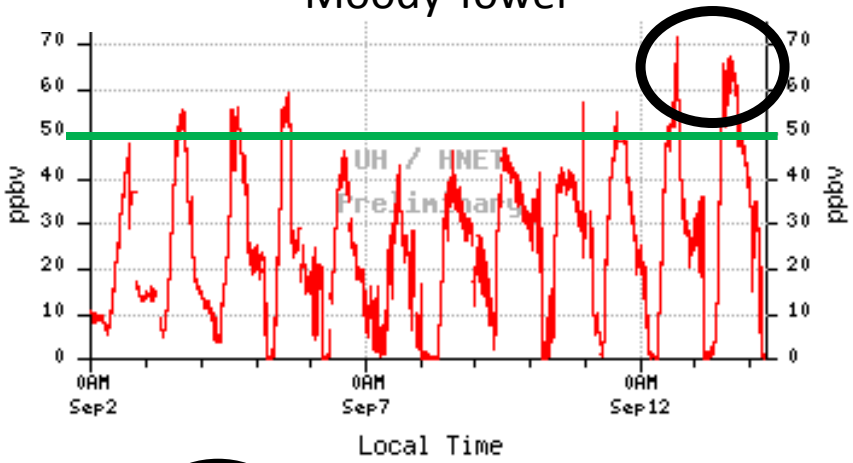
Jones Forest



West Liberty



Moody Tower

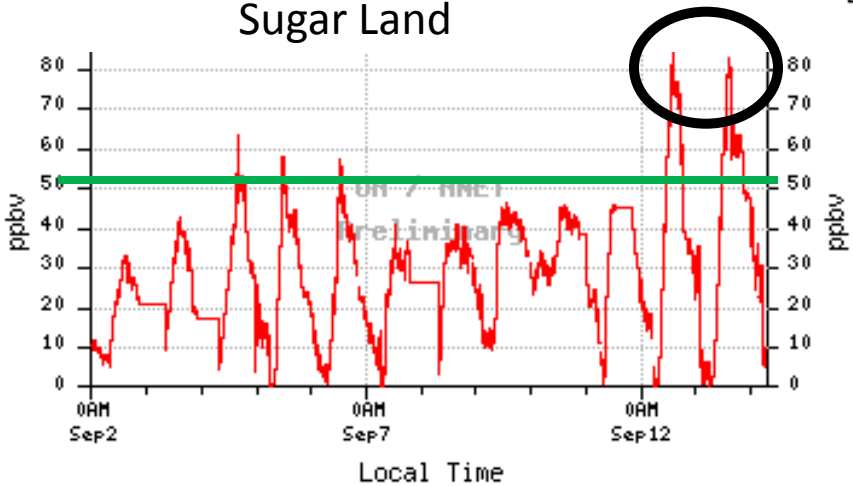


O_3 (ppbv) – 15 min avg
September 2nd – 13th

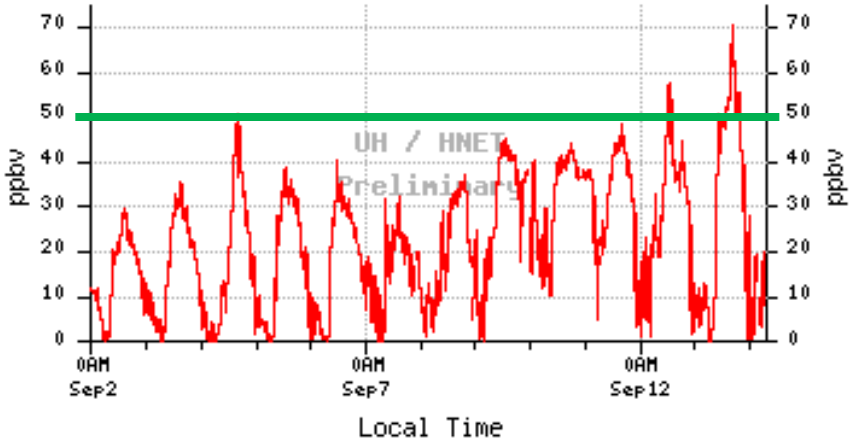
= 50 ppbv

Houston – Network of Environmental Towers (H-NET)

Sugar Land

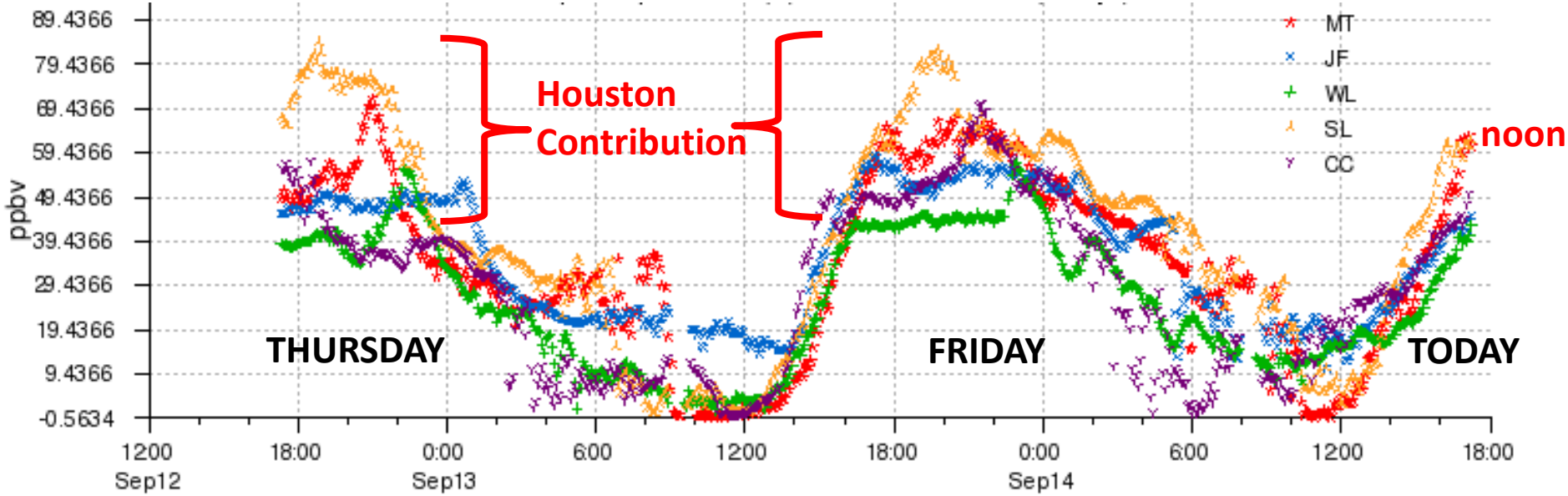


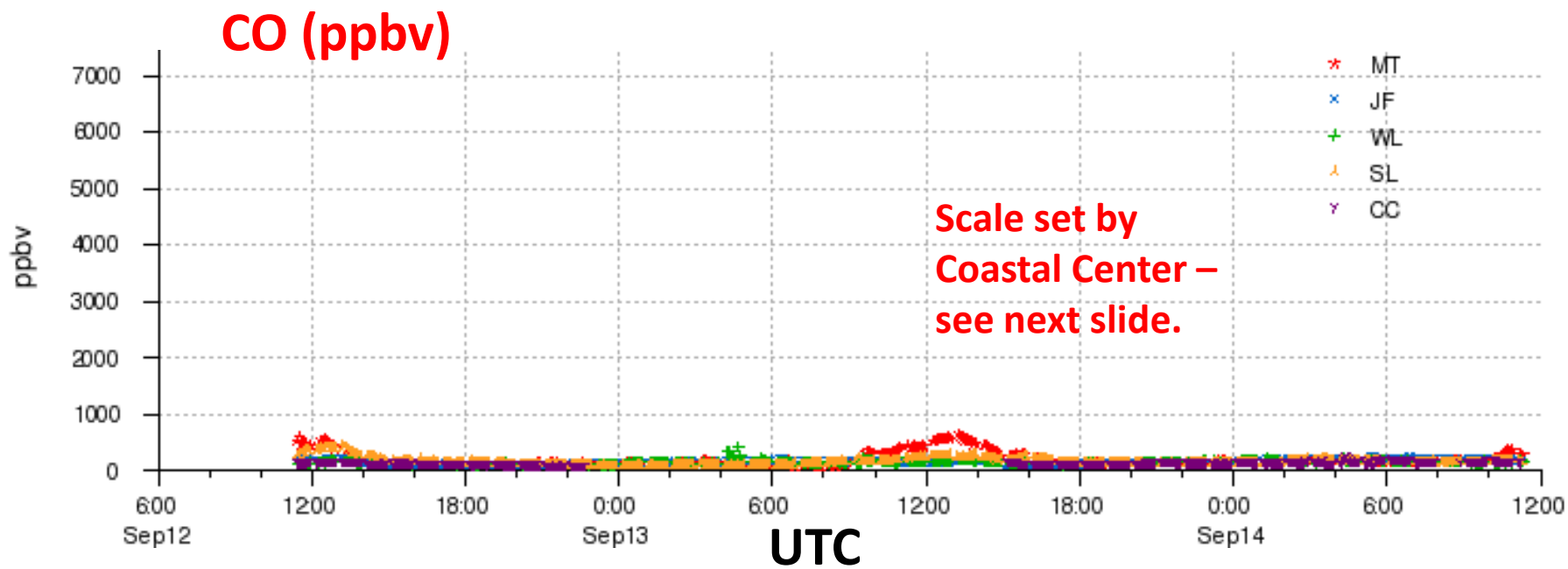
Coastal Center



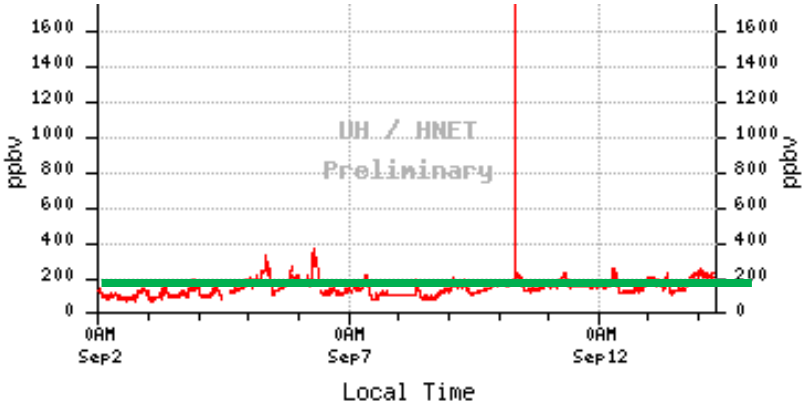
HNET

NE & E flow yesterday
Sugarland-West Liberty ~ 35-40 ppbv

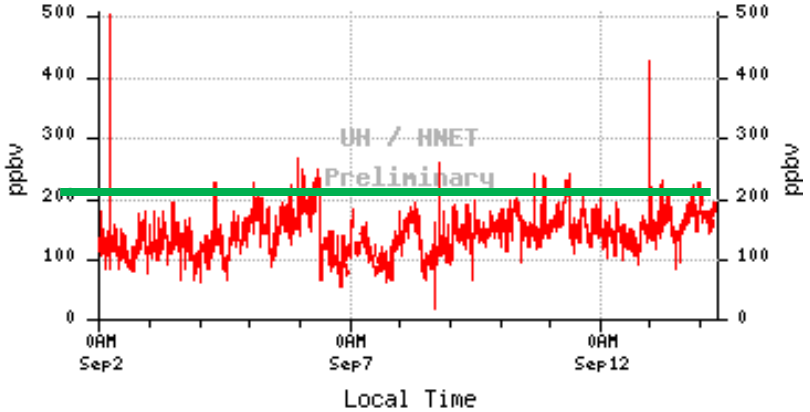




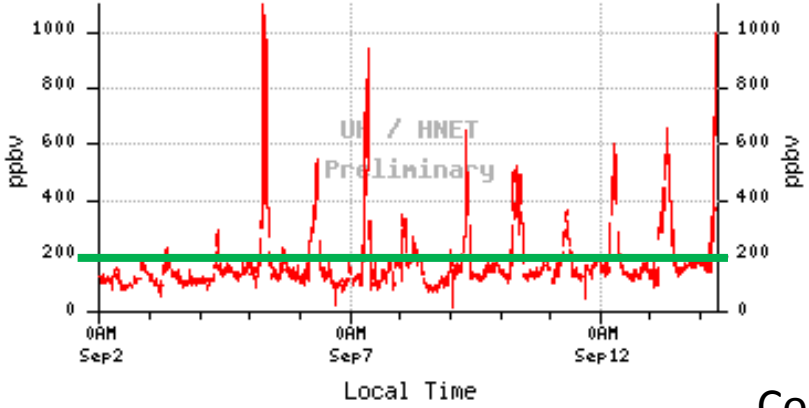
Jones Forest



West Liberty



Moody Tower



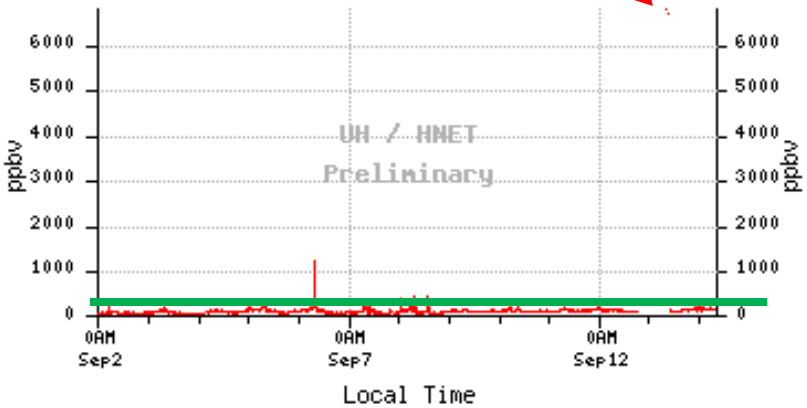
CO (ppbv) – 15 min avg
September 2nd – 13th

= 200 ppbv

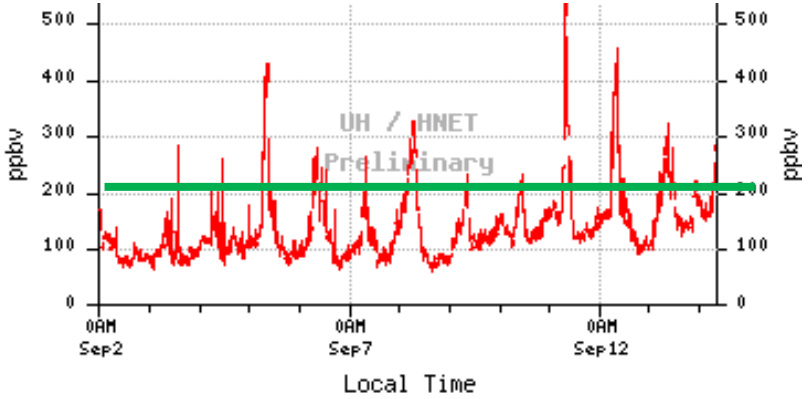
Houston – Network of Environmental Towers (H-NET)

Huh?

Coastal Center



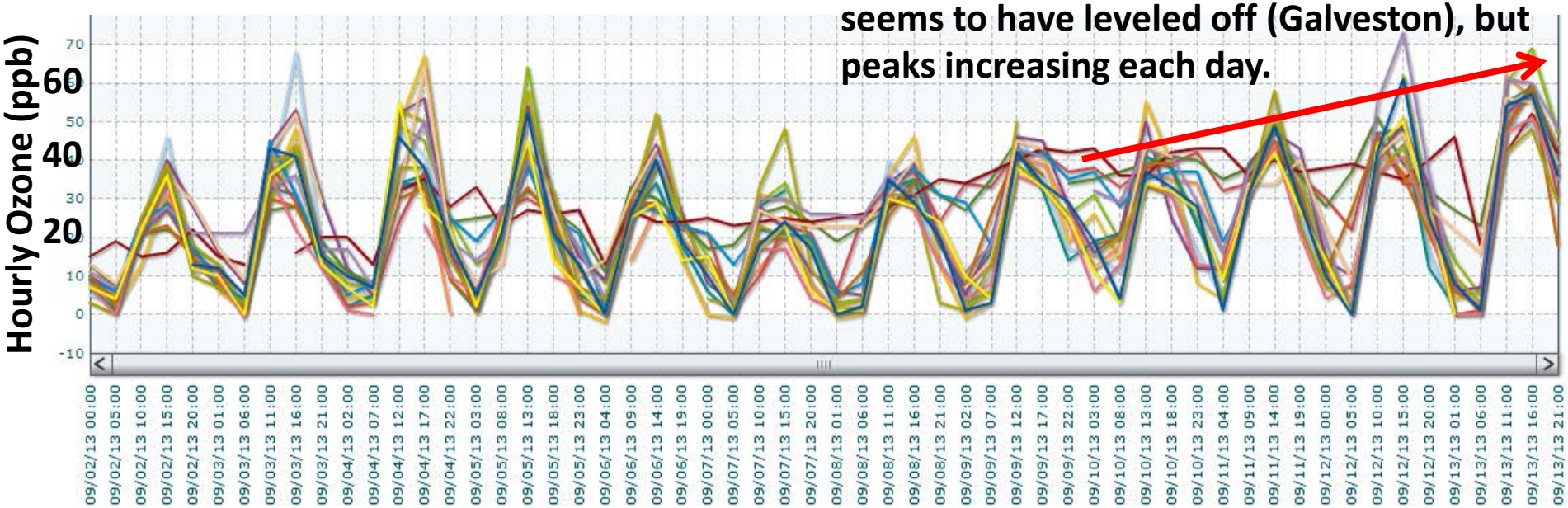
Sugar Land



Hourly Ozone (airnowtech.org)**

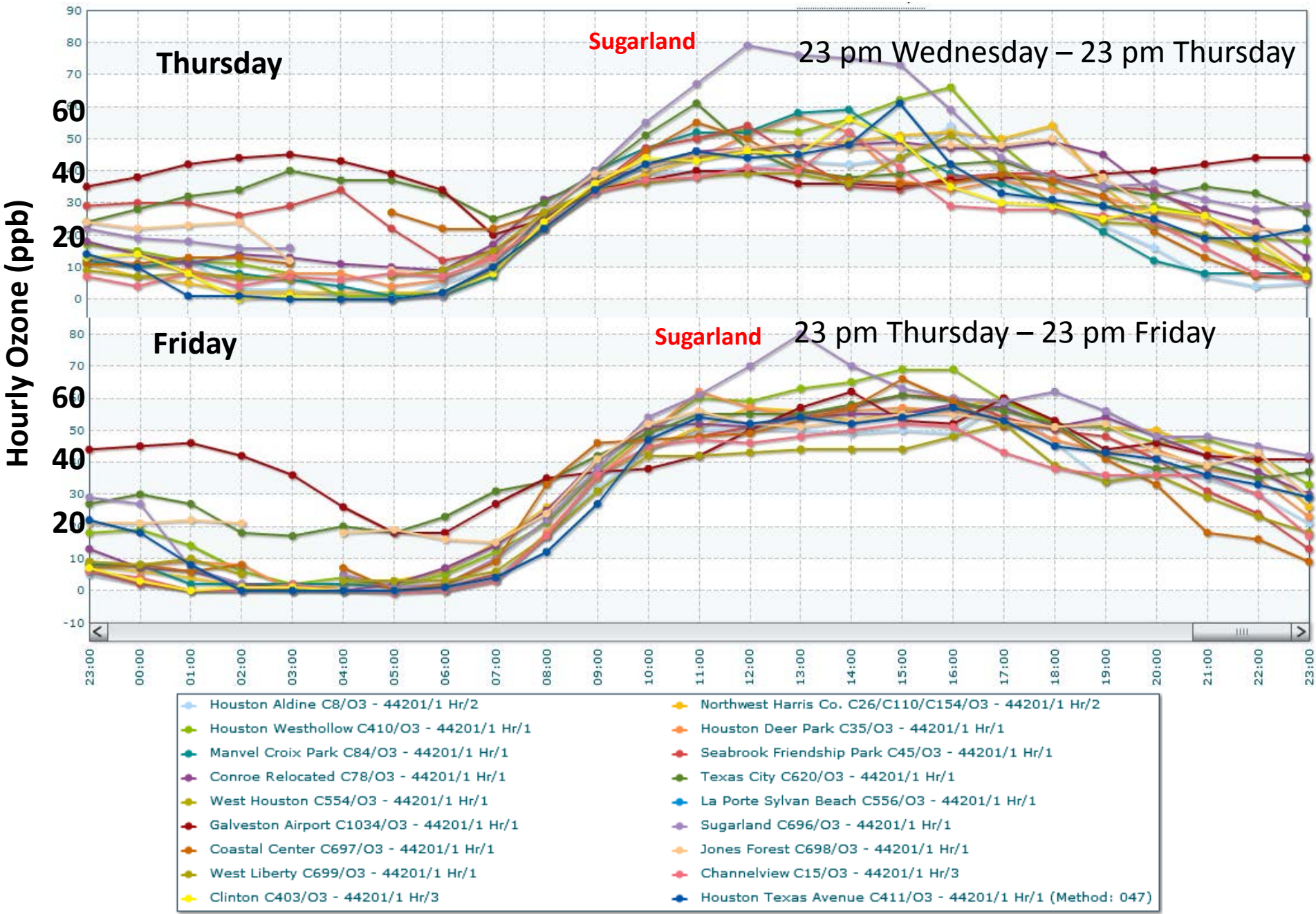
September 2nd – 13th ** EVERY 5th HOUR PLOTTED!!!!!

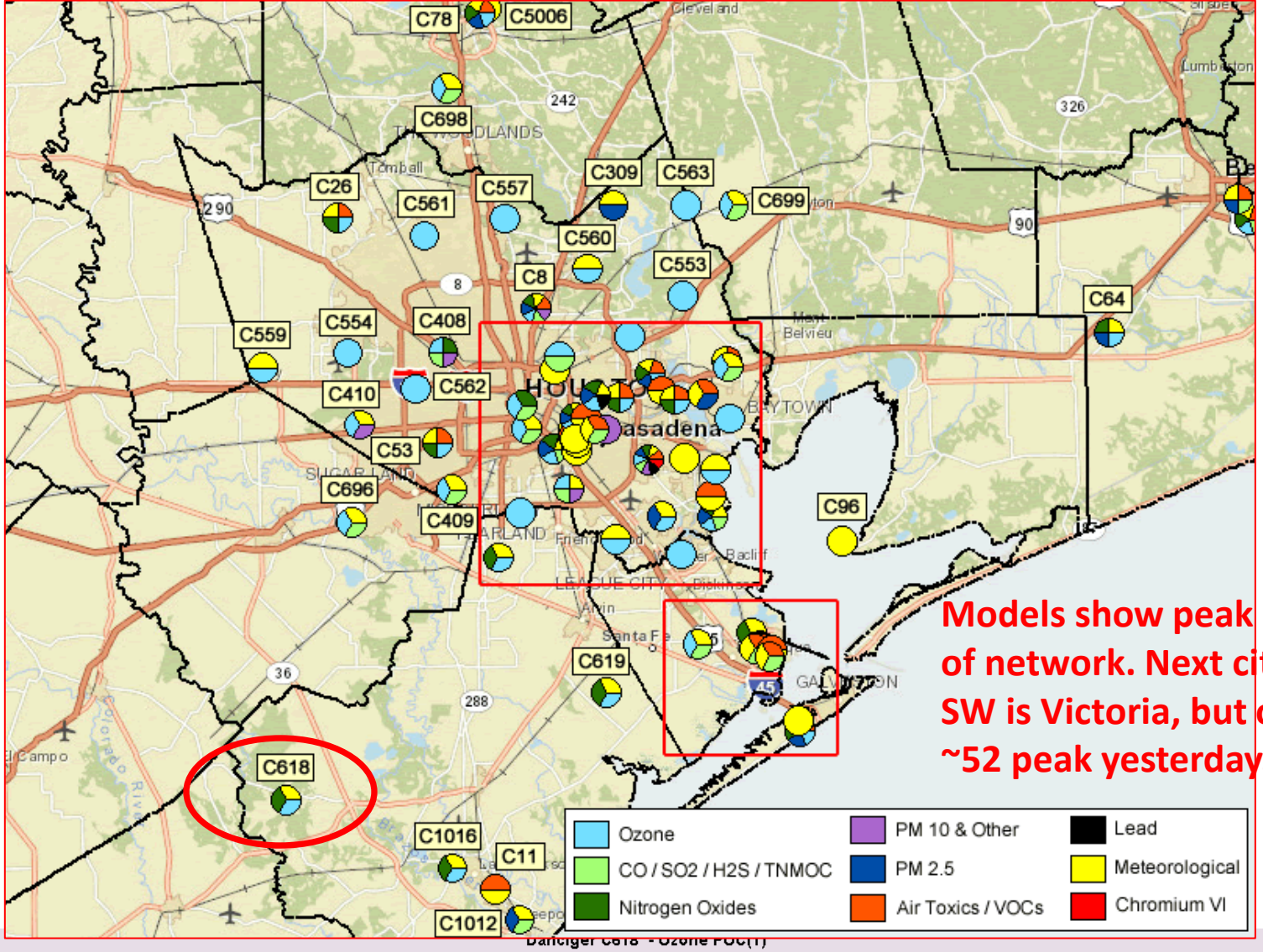
Recent growth in "background" ozone seems to have leveled off (Galveston), but peaks increasing each day.

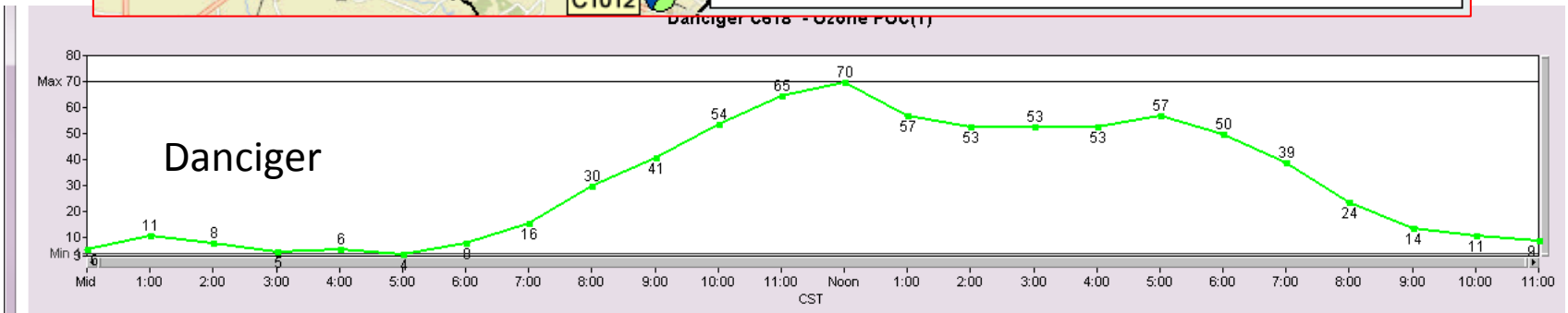


- Houston Aldine C8/O3 - 44201/1 Hr/2
- Houston Westhollow C410/O3 - 44201/1 Hr/1
- Manvel Croix Park C84/O3 - 44201/1 Hr/1
- Conroe Relocated C78/O3 - 44201/1 Hr/1
- West Houston C554/O3 - 44201/1 Hr/1
- Galveston Airport C1034/O3 - 44201/1 Hr/1
- Coastal Center C697/O3 - 44201/1 Hr/1
- West Liberty 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)




C78
C5006
C698
C26
C561
C557
C309
C563
C699
C560
C553
C8
C64
C559
C554
C408
C410
C562
C53
C696
C409
C96
C619
C618
C1016
C11
C1012
Models show peak outside of network. Next city to SW is Victoria, but ozone ~52 peak yesterday.
Ozone
CO / SO2 / H2S / TNMOC
Nitrogen Oxides
PM 10 & Other
PM 2.5
Air Toxics / VOCs
Lead
Meteorological
Chromium VI


Danciger
Max 70
Min 4
11
8
5
6
4
8
16
30
41
54
65
70
57
53
53
53
57
50
39
24
14
11
8
Mid
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
Noon
CST

TCEQ AQ Forecast (Ozone)

TODAY: Code Yellow

"Winds may be light enough and incoming background levels high enough for ozone to reach "Moderate" or possibly higher levels on the west and southwest side of the Houston area."

SUNDAY: Code Yellow

"If incoming background levels are high enough, winds may be light enough for ozone to reach "Moderate" levels on the west and northwest side of the Houston area."

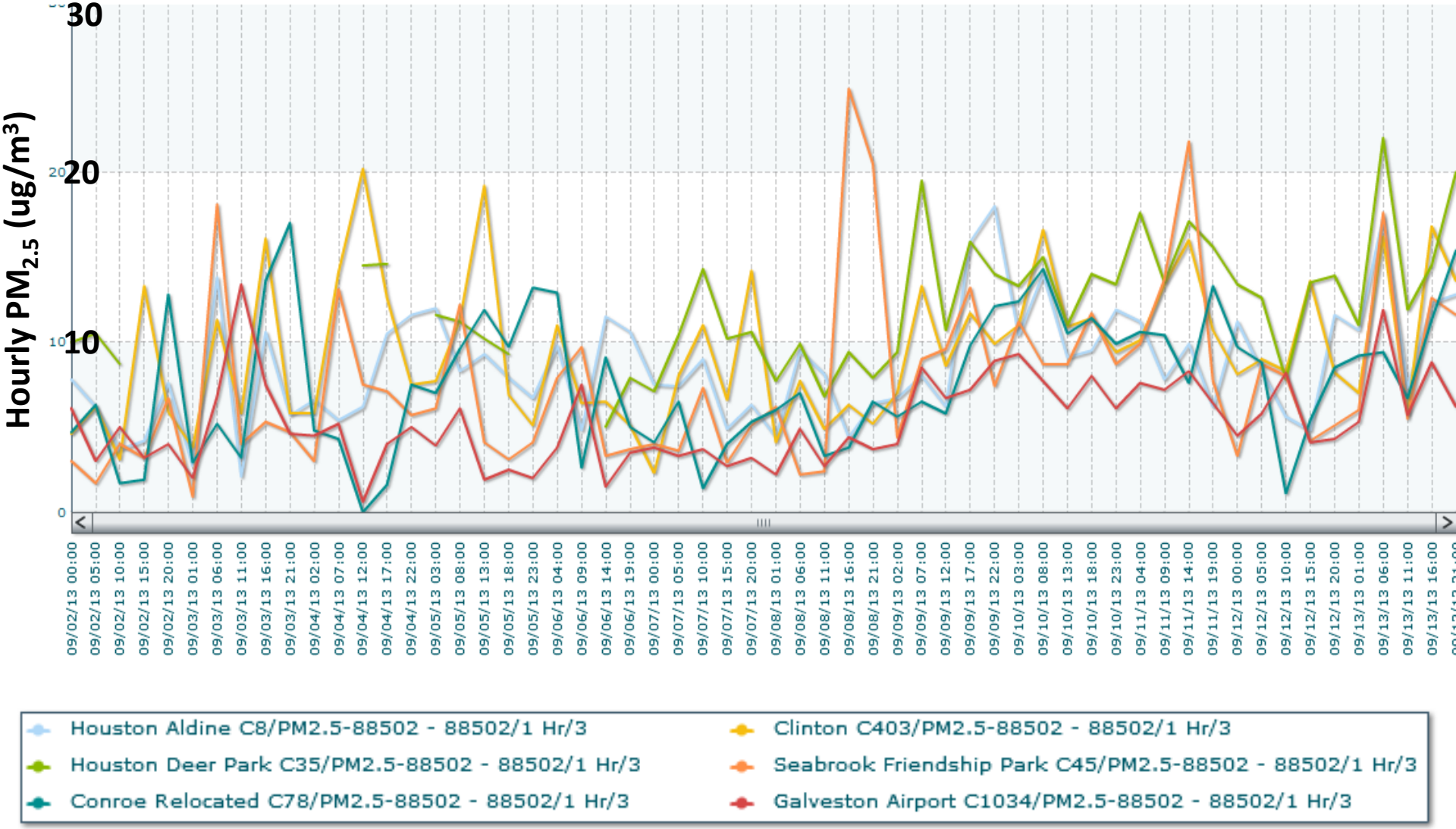
MONDAY-TUESDAY: Code Green – Good

PM2.5 will continue in the low end of the moderate range.

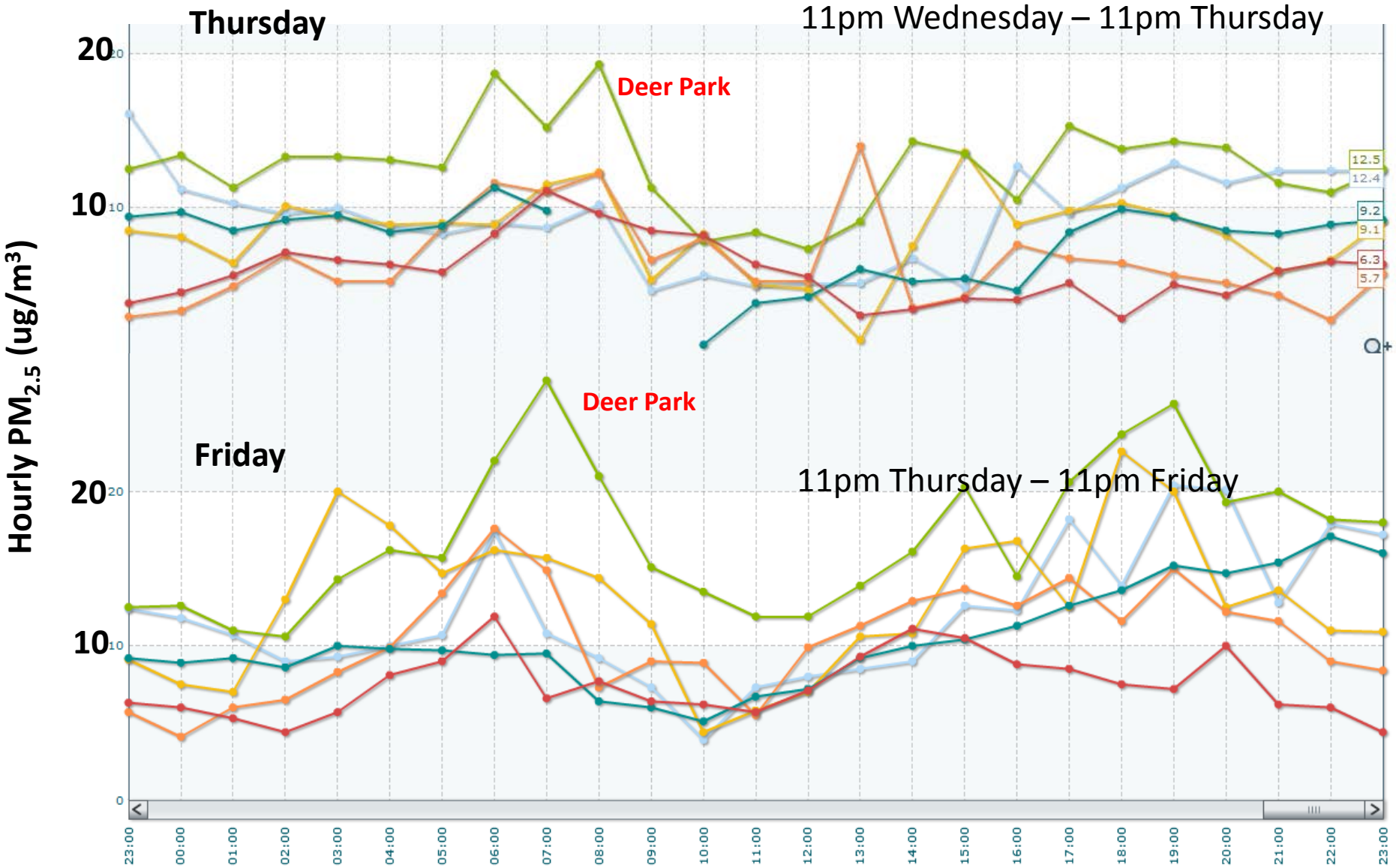
Hourly $PM_{2.5}$ (airnowtech.org)**

September 2nd – 13th

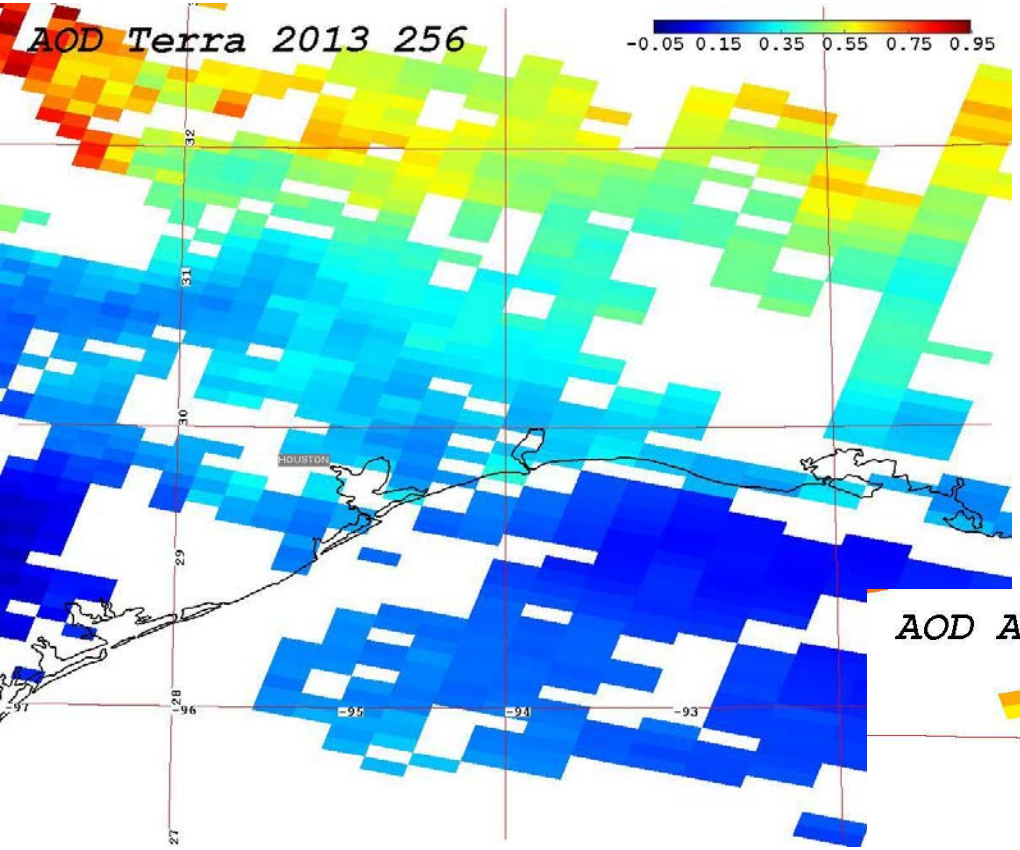
** EVERY 5th HOUR PLOTTED!!!!!



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

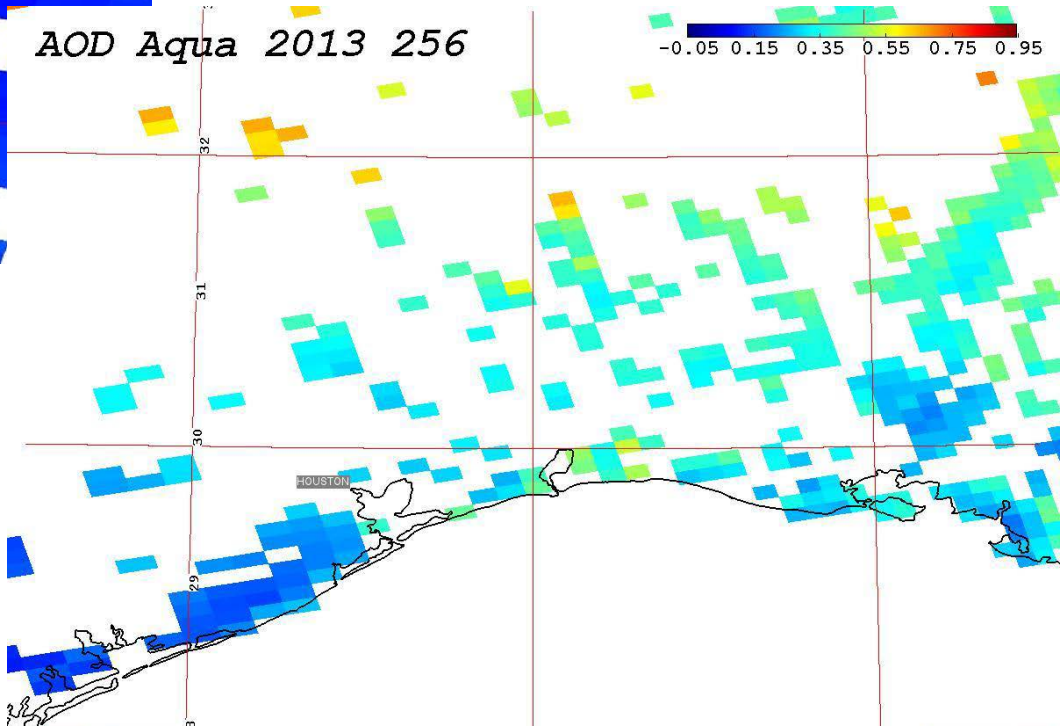


Terra AOD - Yesterday



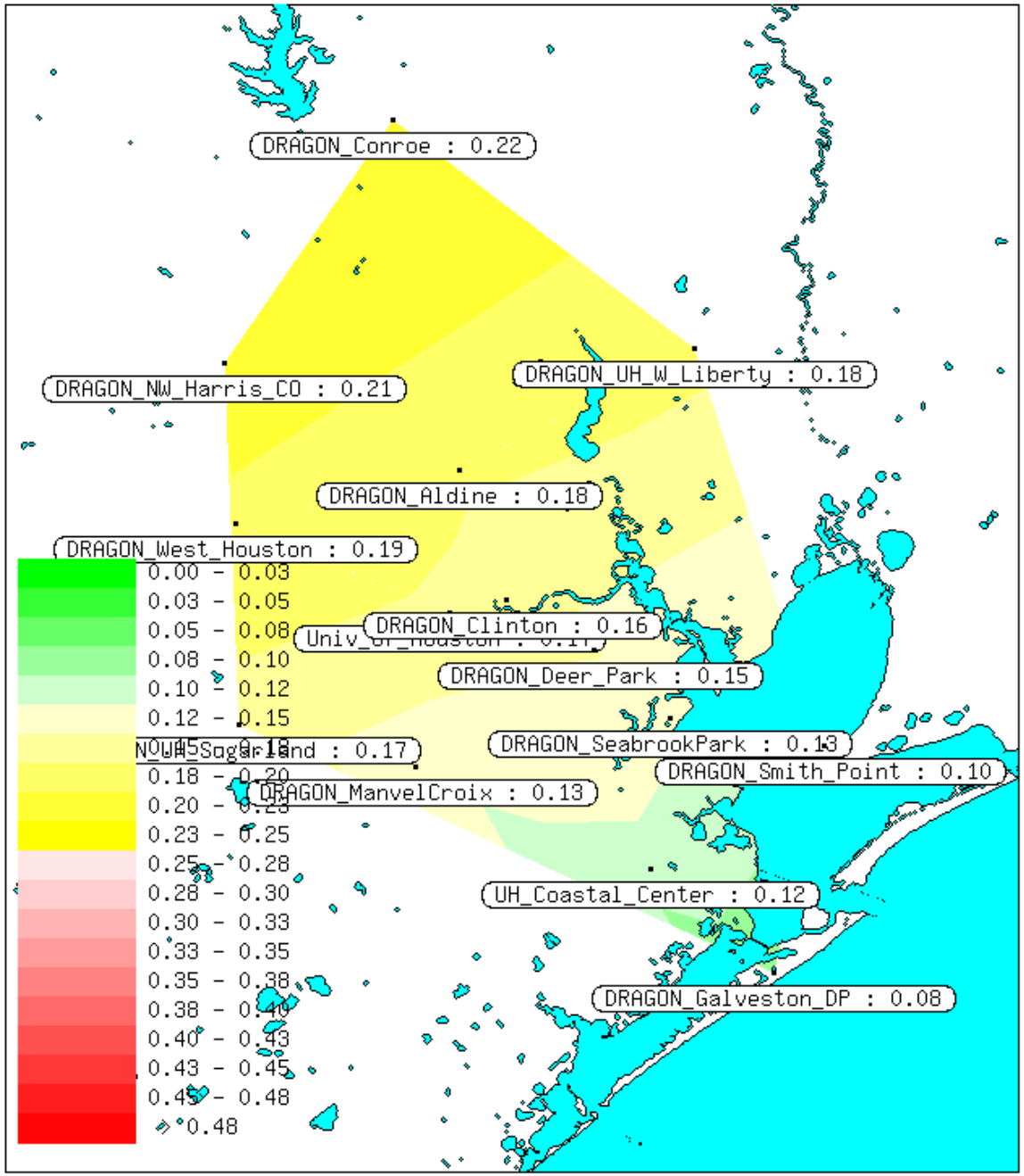
Agricultural fire plume

Aqua AOD - Yesterday



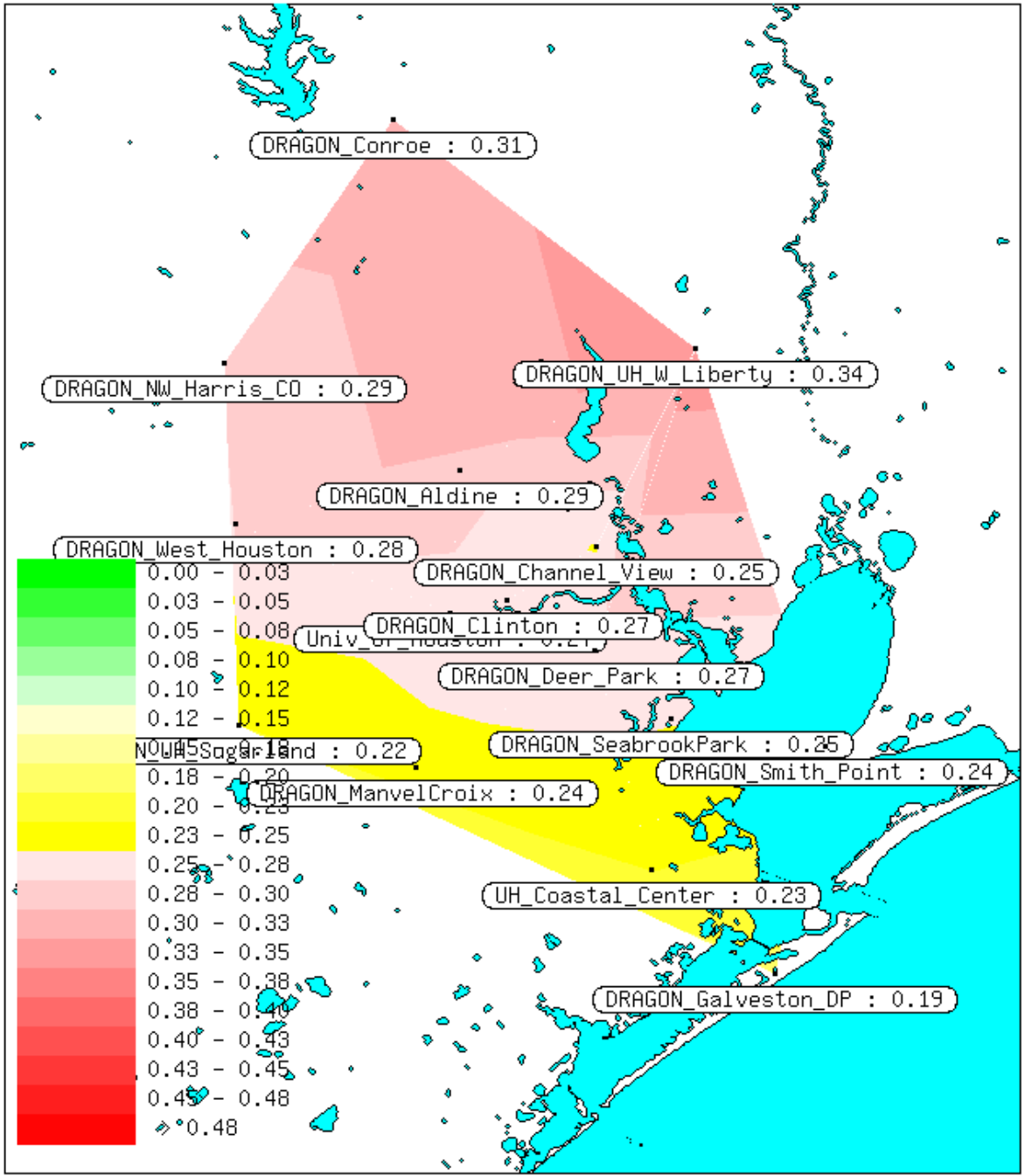
DRAGON : September 12th (Thursday) at Level 1.5

0.08-0.22



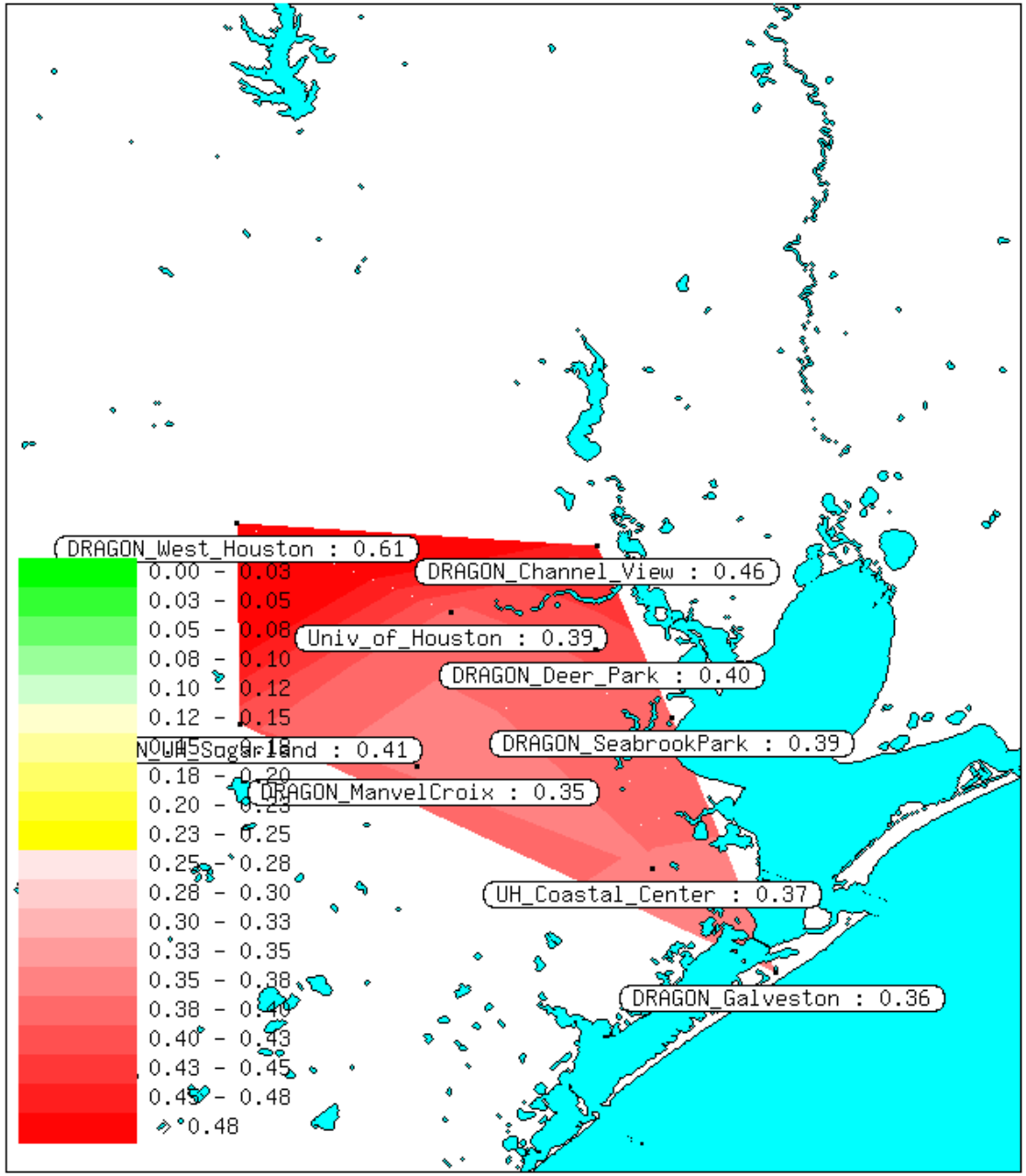
DRAGON : September 13th (Friday) at Level 1.5

0.19-0.34

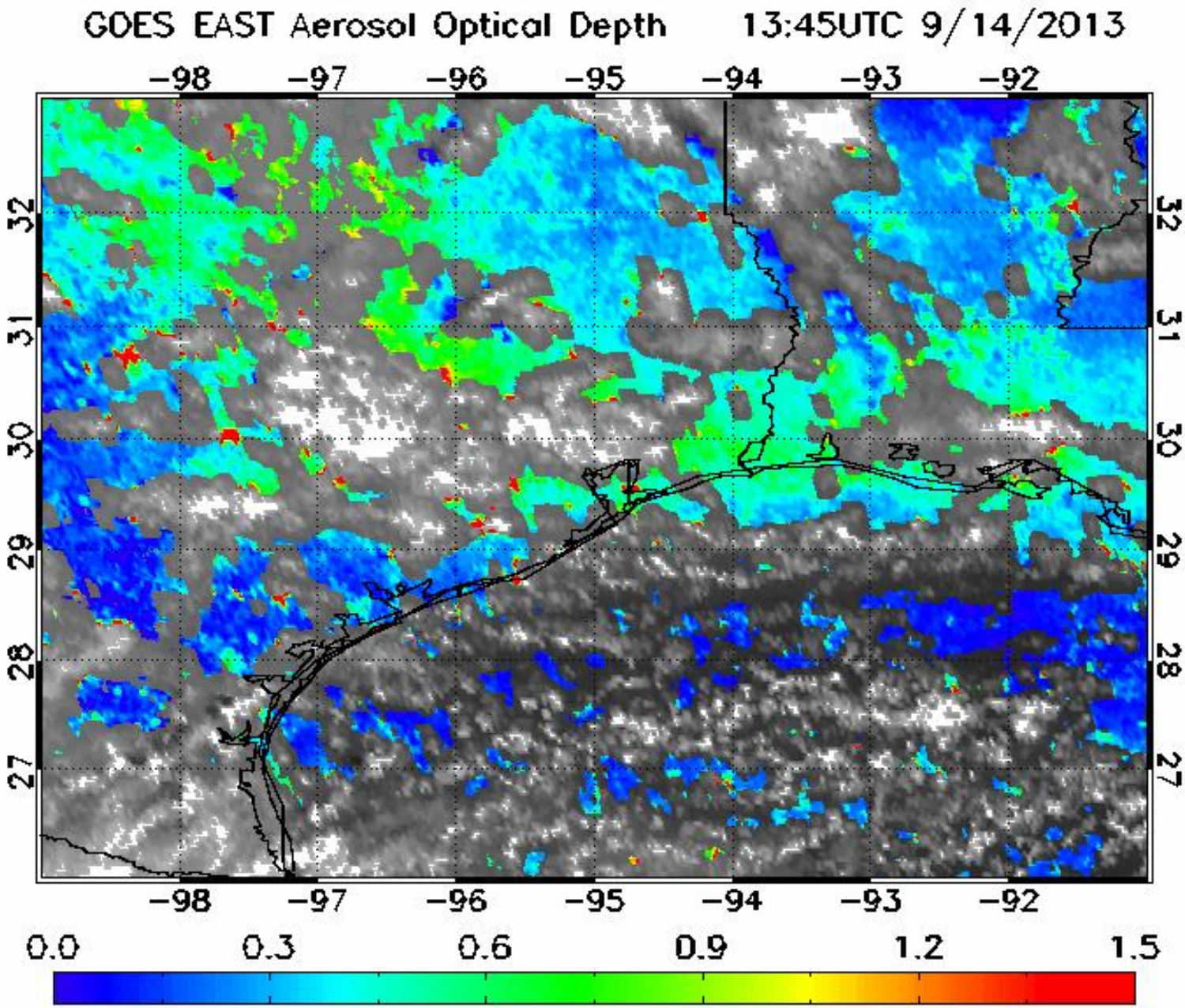


DRAGON : September 14th (Today) at Level 1.5

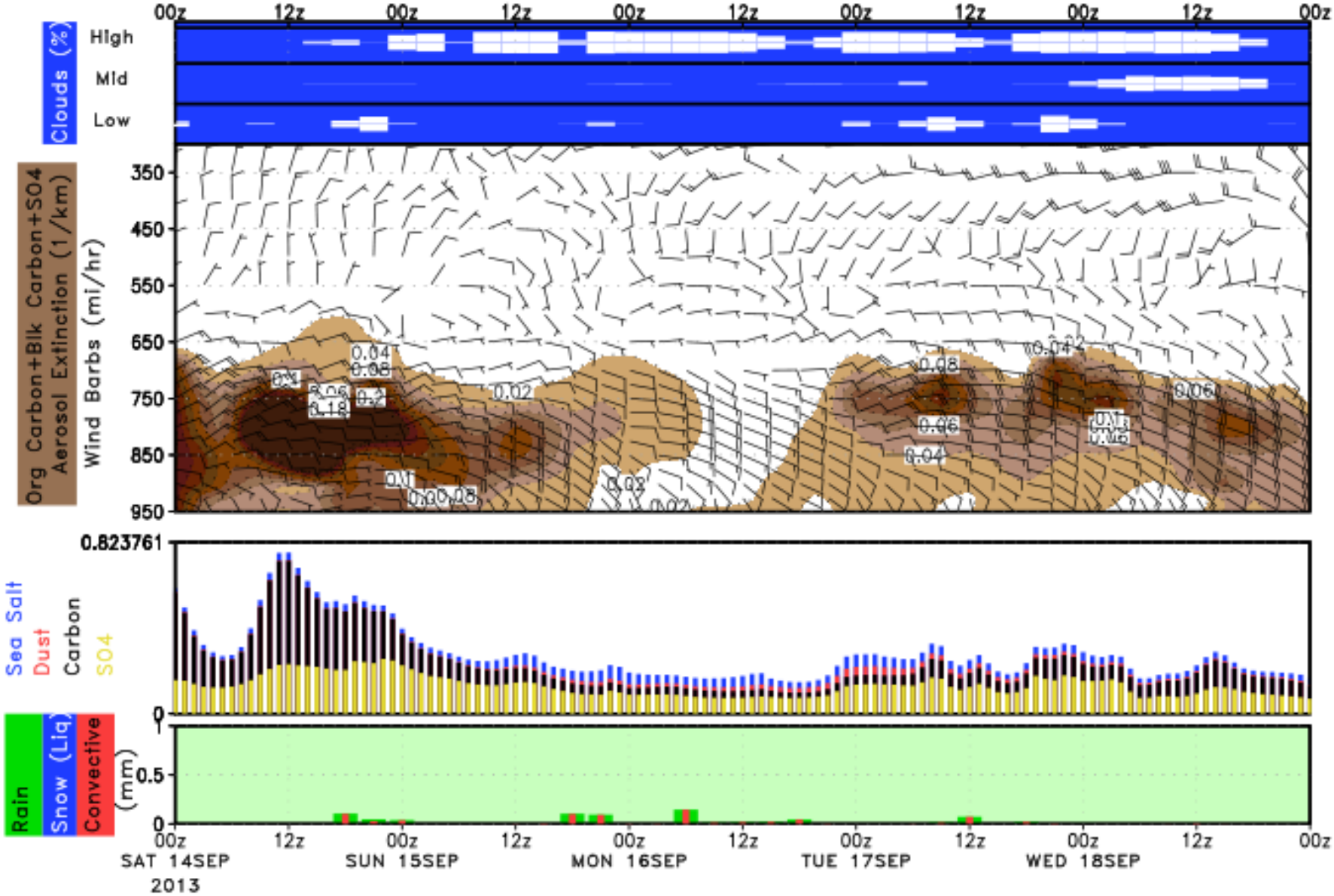
0.35-0.61



GOES AOD – 9:45 am Today

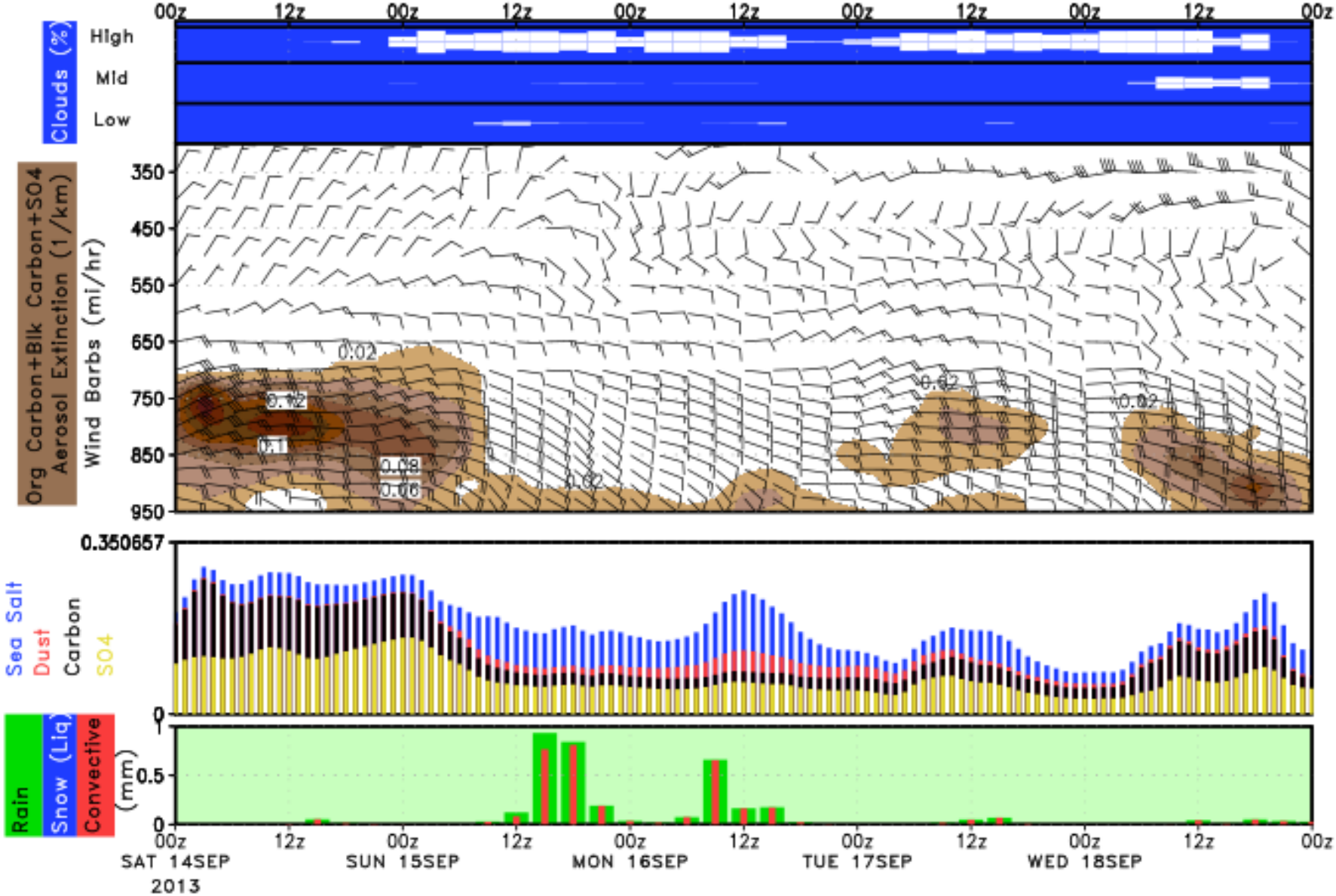


CONROE



LAT = 30.3 , LON = −95.4, Location = Conroe, Fcst_init = 20130914

GALVESTON



LAT = 29.2 , LON = −94.8, Location = Galveston, Fcst_init = 20130914