

## **DISCOVER-AQ Houston – Outlook    September 3, 2013**

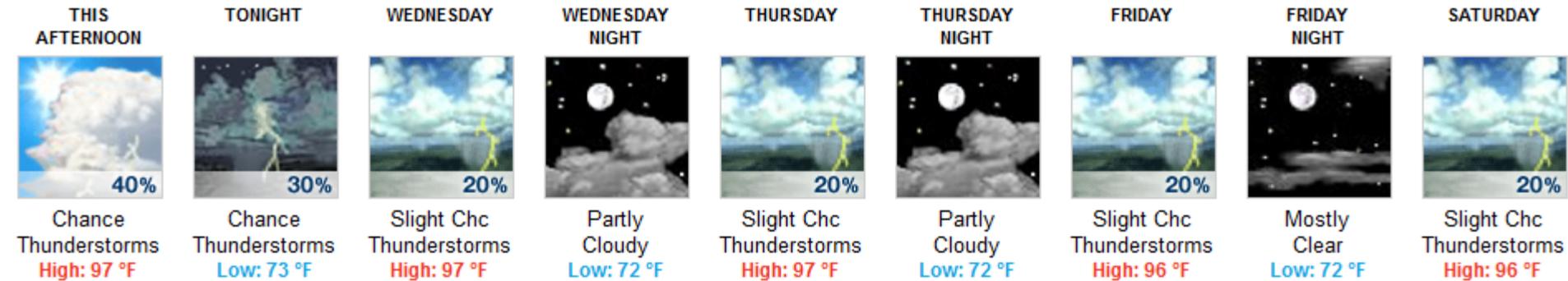
Hot and humid conditions with light winds are persistent over the Houston area for the foreseeable future. The main differences from day-to-day are the direction from which the large-scale flow is coming from and the strength of the sea breeze. Upper-level disturbances may affect the cloud amount and the chances for thunderstorms on a given day.

Low-level large-scale flow is expected from the east tomorrow. However, a sea breeze will still likely develop in the afternoon, acting to strengthen the on-shore flow. Ozone maxima are expected to the west and southwest of Houston as a result. Cloud cover will be <30% during the early to mid morning, increasing to near 50% by 2 PM and possibly exceeding 50% between 2 and 5 PM. Clearing will occur behind the sea breeze front. Some chance of scattered thunderstorms exists.

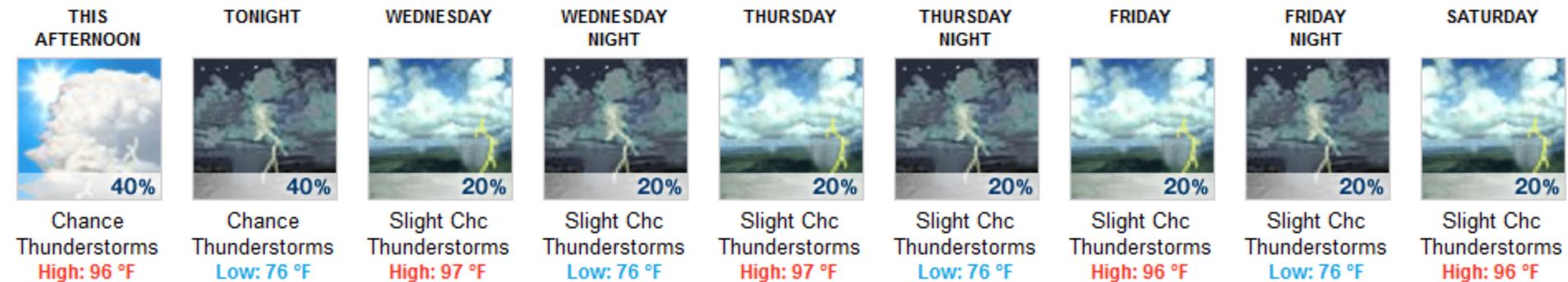
Ozone will be the greatest along the coast in the morning with maxima moving to over the city by midday and moving farther to the west as the afternoon proceeds.

For Thursday we expect similar conditions to Wednesday with the exception of possibly more upper level clouds due the easterly wave in the Gulf south of the Houston area. Friday, the wave may produce precipitation along the coast, but this is uncertain at this point. Otherwise, Friday may be acceptable for a flight day.

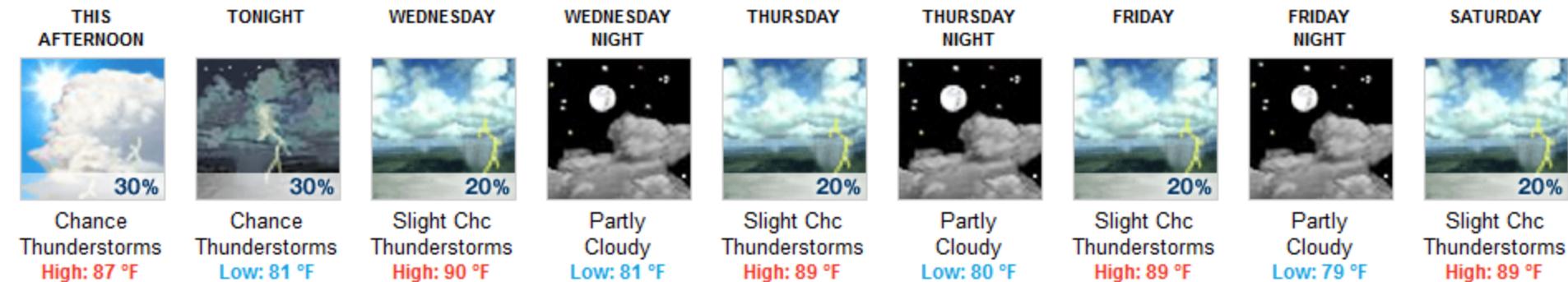
# Conroe:



# Houston Hobby:



# Galveston:



# Current Conditions

## Conroe:



Thunderstorm  
**90°F**  
 32°C

Humidity 54%  
 Wind Speed E 6 mph  
 Barometer 29.91 in (1012.6 mb)  
 Dewpoint 71°F (22°C)  
 Visibility 10.00 mi  
 Heat Index 96°F (36°C)  
 Last Update on 3 Sep 2:53 pm CDT

## Houston Hobby:

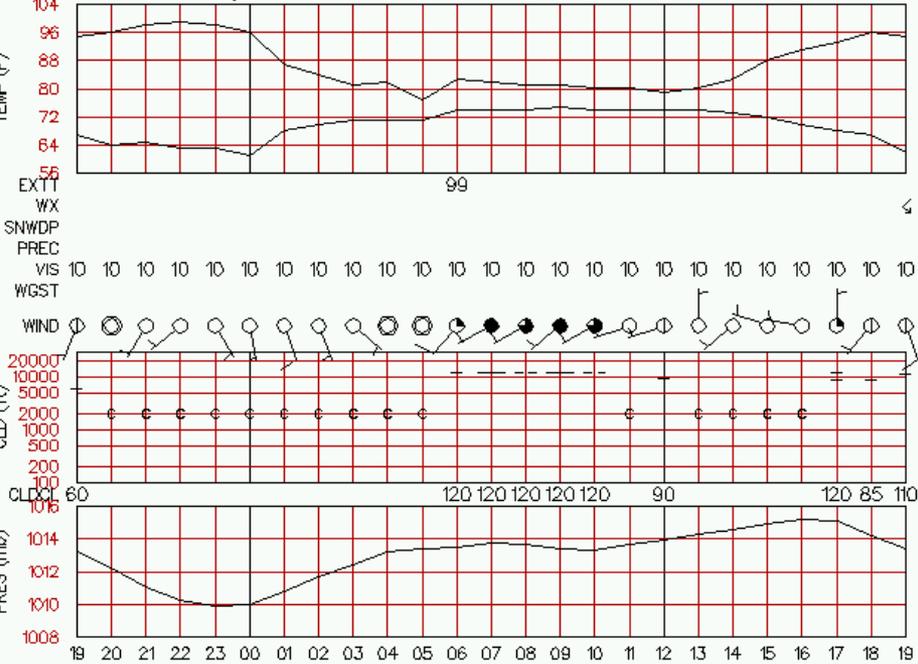


Partly Cloudy  
**95°F**  
 35°C

Humidity 44%  
 Wind Speed Calm  
 Barometer 29.91 in (1013.2 mb)  
 Dewpoint 70°F (21°C)  
 Visibility 10.00 mi  
 Heat Index 101°F (38°C)  
 Last Update on 3 Sep 2:53 pm CDT

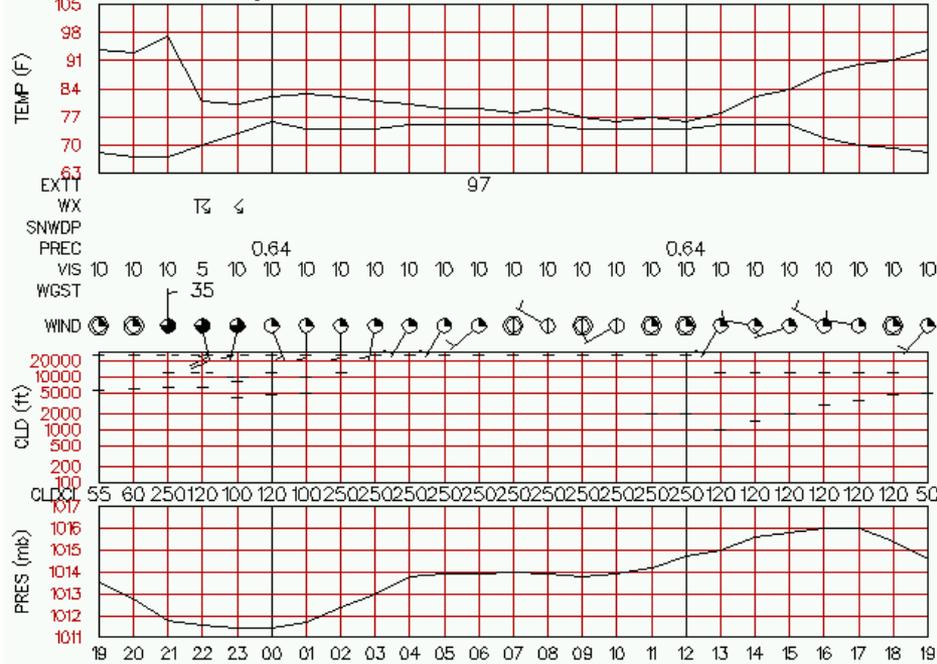
### ▼ Plymouth State Weather Center ▼

Meteogram for KCXO from 1900Z 2 SEP 13 to 1900Z 3 SEP 13



### ▼ Plymouth State Weather Center ▼

Meteogram for KHOU from 1900Z 2 SEP 13 to 1900Z 3 SEP 13



# Current Conditions

## Galveston:

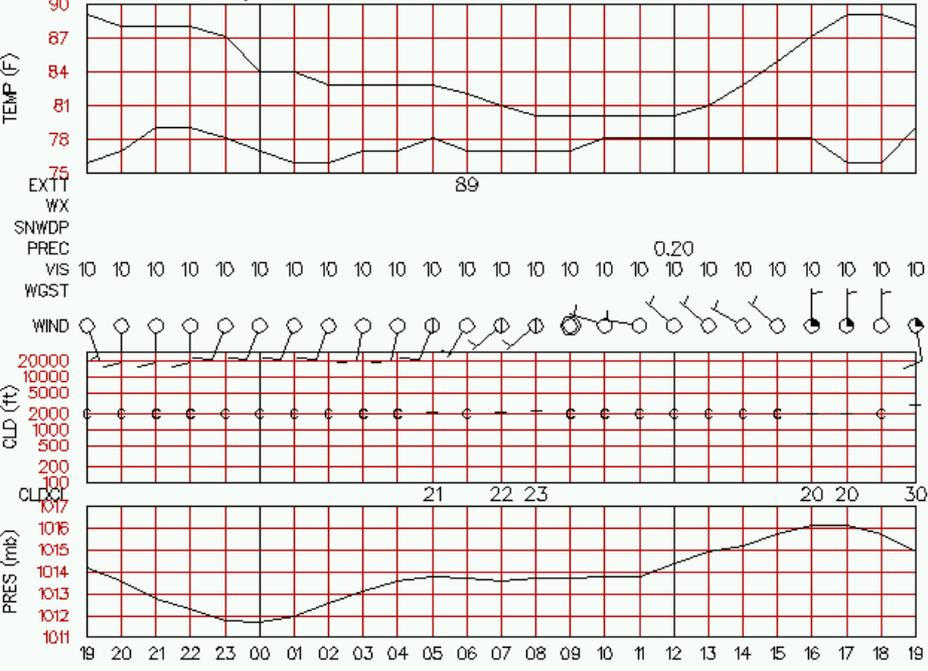


Partly Cloudy  
**88°F**  
 31°C

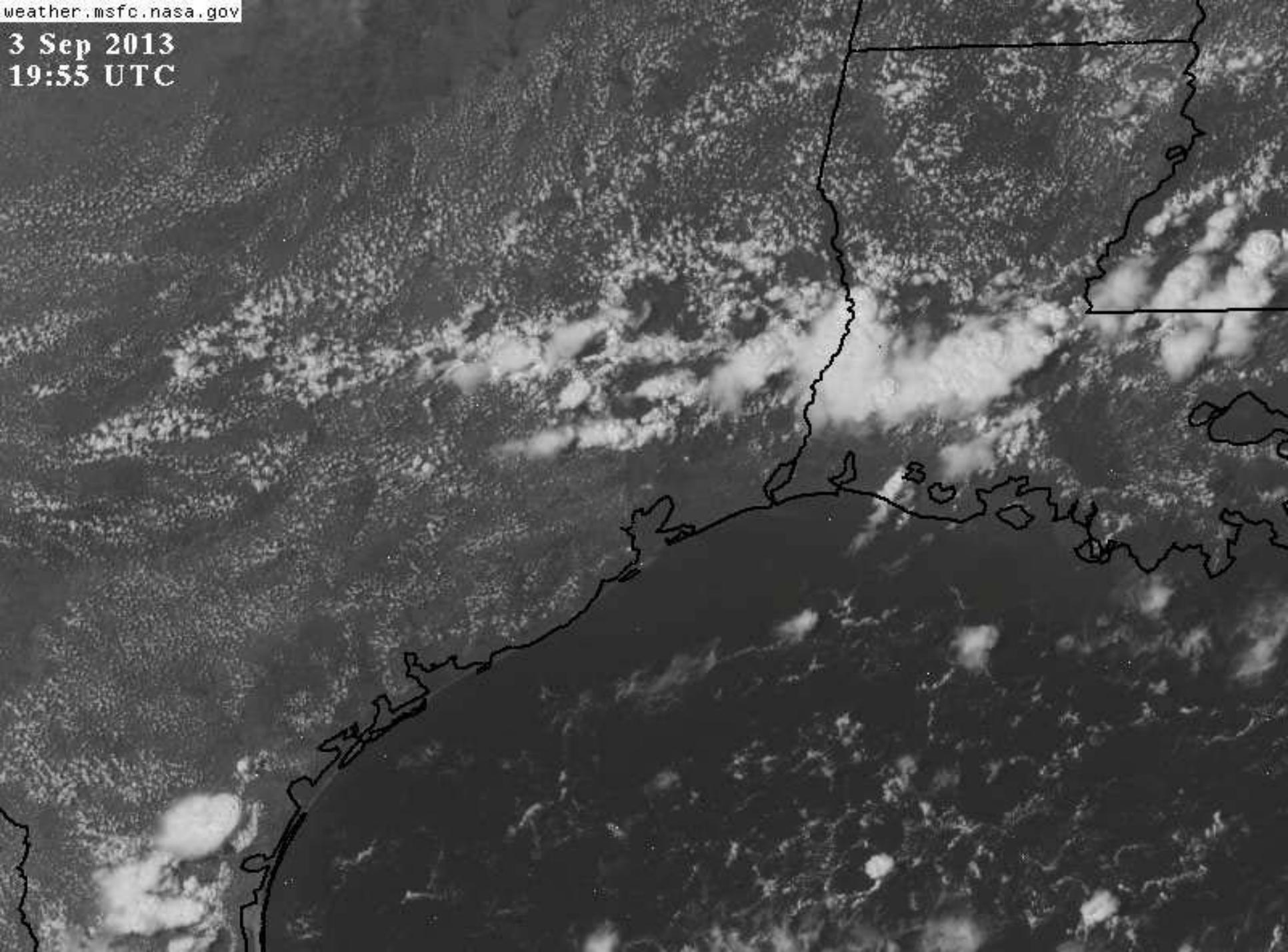
Humidity 70%  
 Wind Speed S 12 mph  
 Barometer 29.94 in (1013.9 mb)  
 Dewpoint 77°F (25°C)  
 Visibility 10.00 mi  
 Heat Index 100°F (38°C)  
 Last Update on 3 Sep 2:52 pm CDT

### Plymouth State Weather Center

Meteogram for KGLS from 1900Z 2 SEP 13 to 1900Z 3 SEP 13

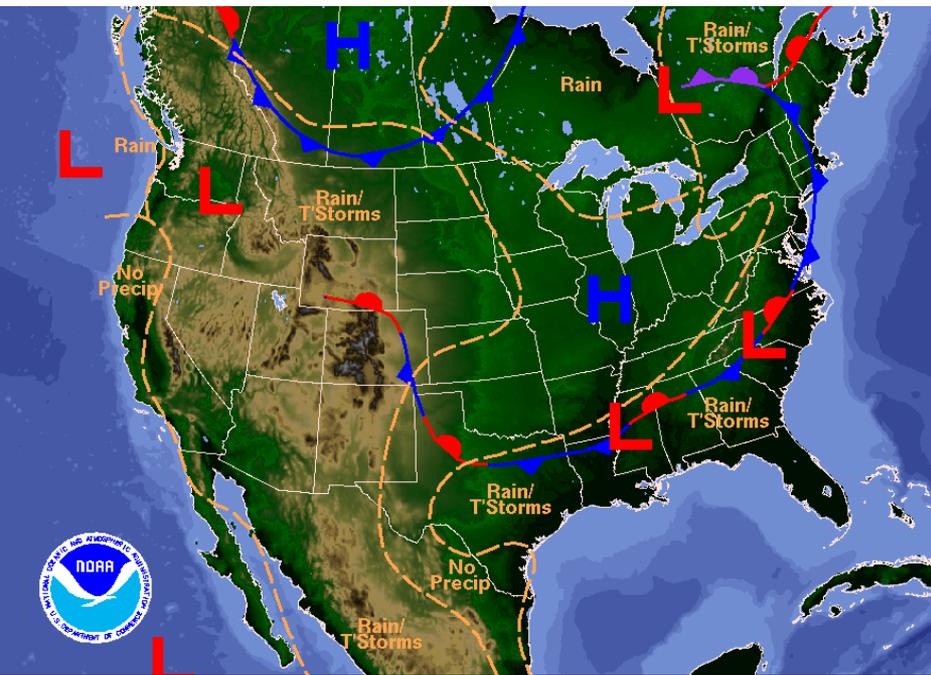


3 Sep 2013  
19:55 UTC

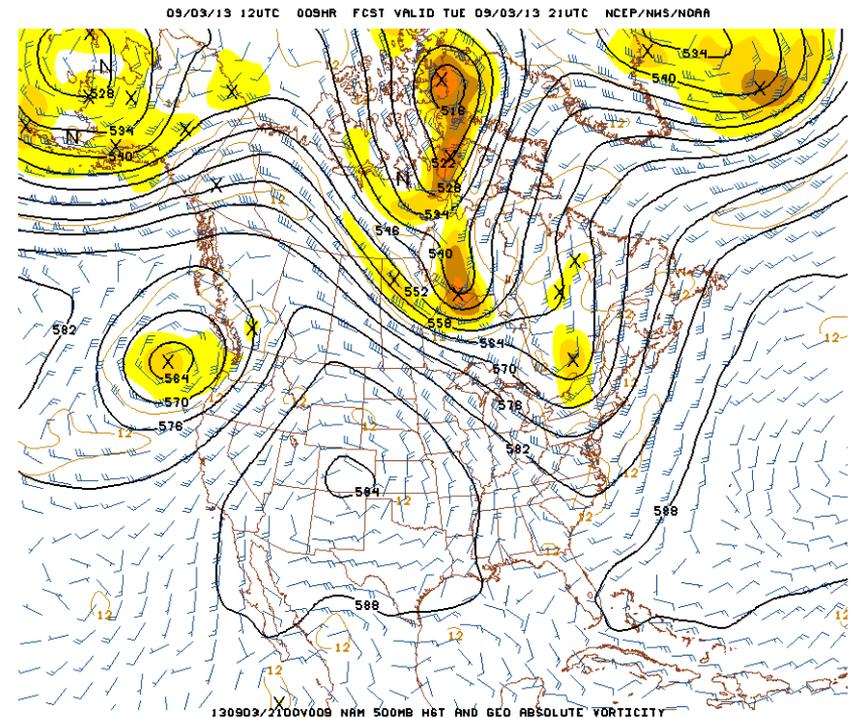


Today: Cold front to the north and sea breeze in our area will produce scattered thunderstorms

2 PM CDT  
500 mb vorticity

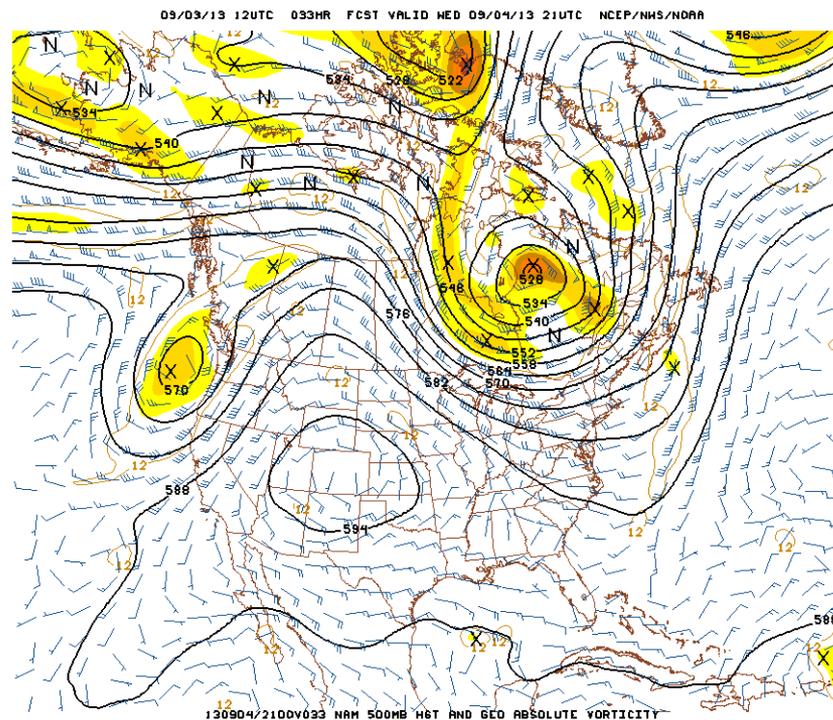
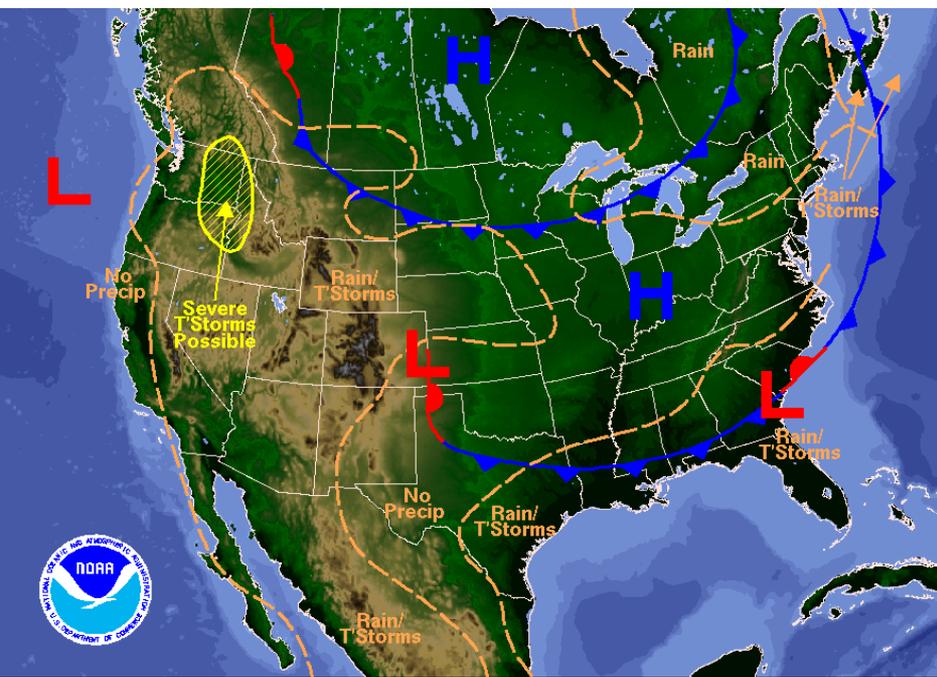


Weather Forecast for Tue, Sep 03, 2013, issued 3:10 AM EDT  
DOC/NOAA/NWS/NCEP/Weather Prediction Center  
Prepared by McCreynolds based on WPC, SPC and NHC forecasts



Tomorrow: Isolated thunderstorm possible. Descending dry air prevents widespread thunderstorms.

2 PM CDT  
500 mb vorticity

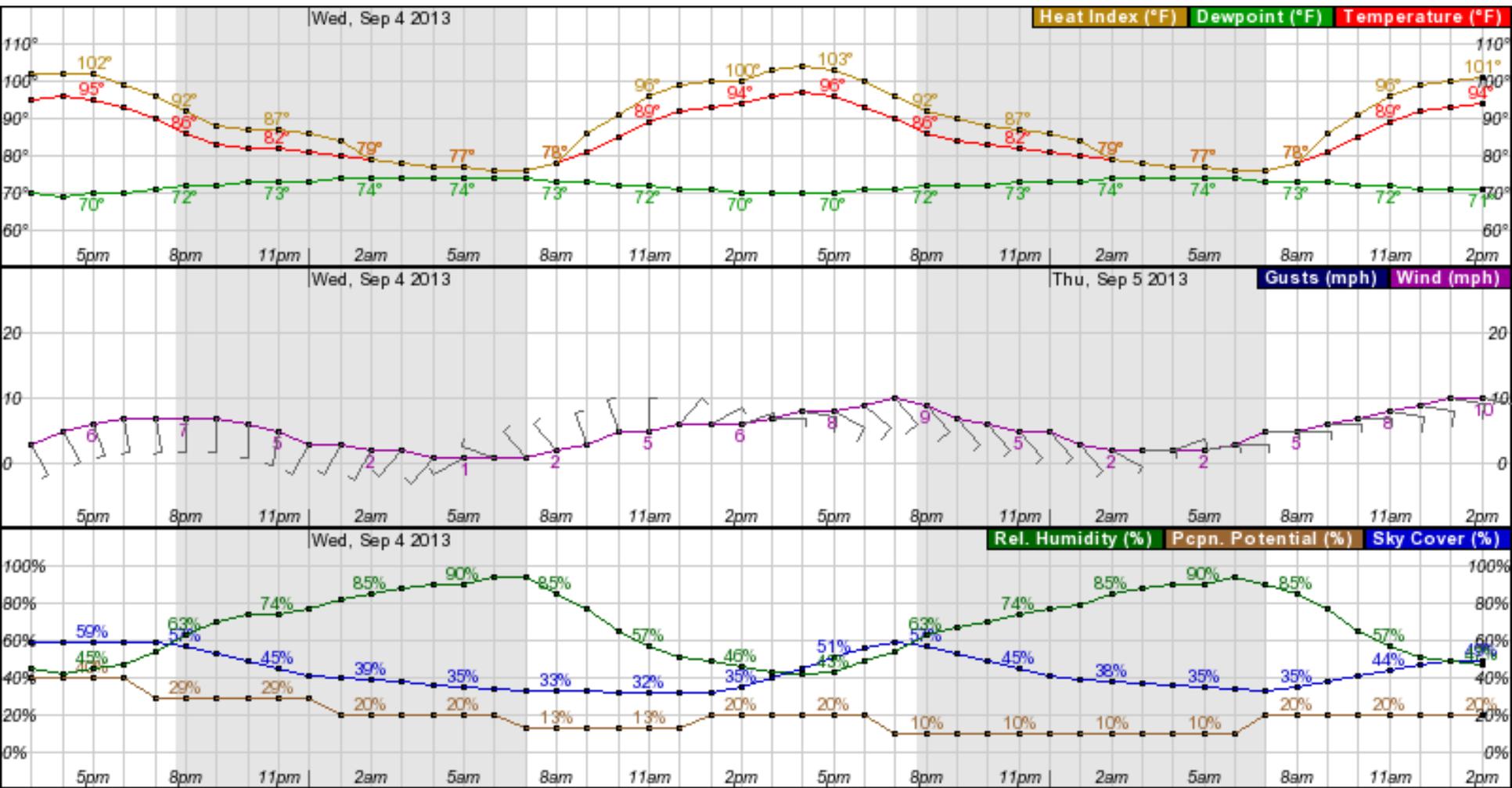


# Houston Hobby

Today: Mostly cloudy

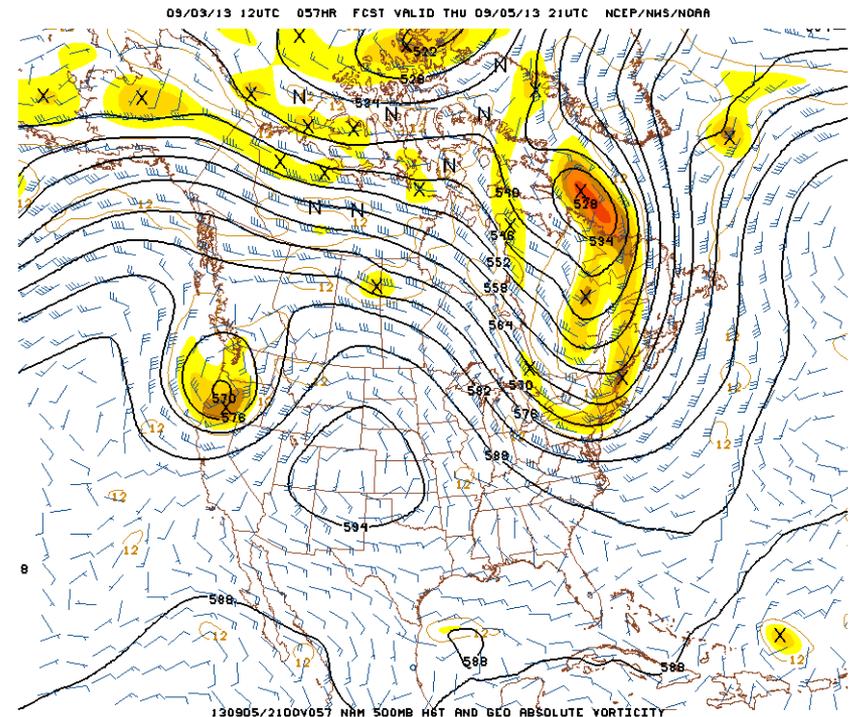
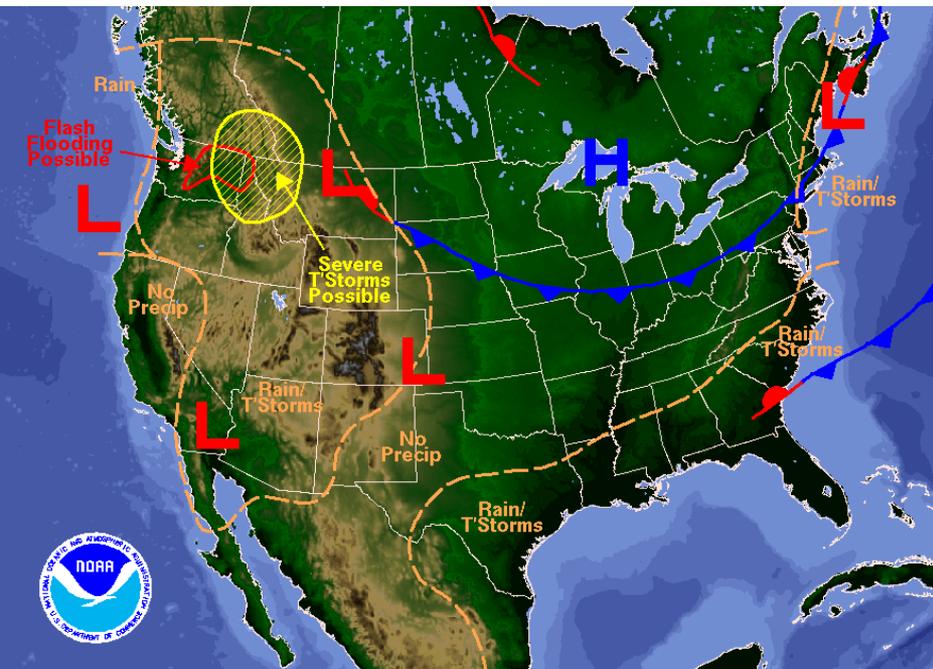
Tomorrow: Partly cloudy

Today → Tomorrow →



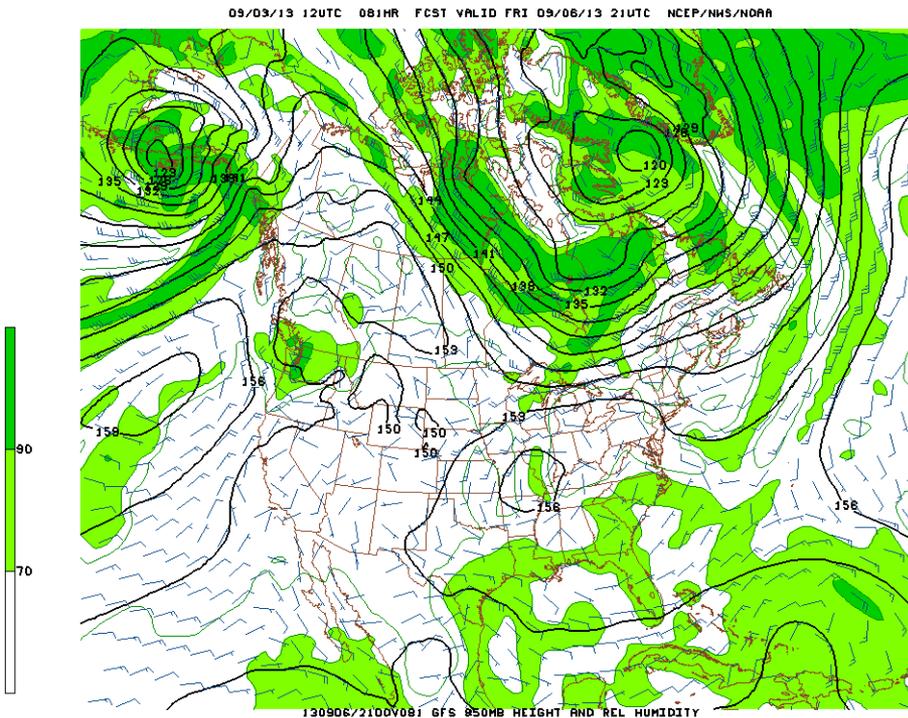
Thursday: Light winds, fair-weather cu, chance of isolated thunderstorms

2 PM CDT  
500 mb vorticity

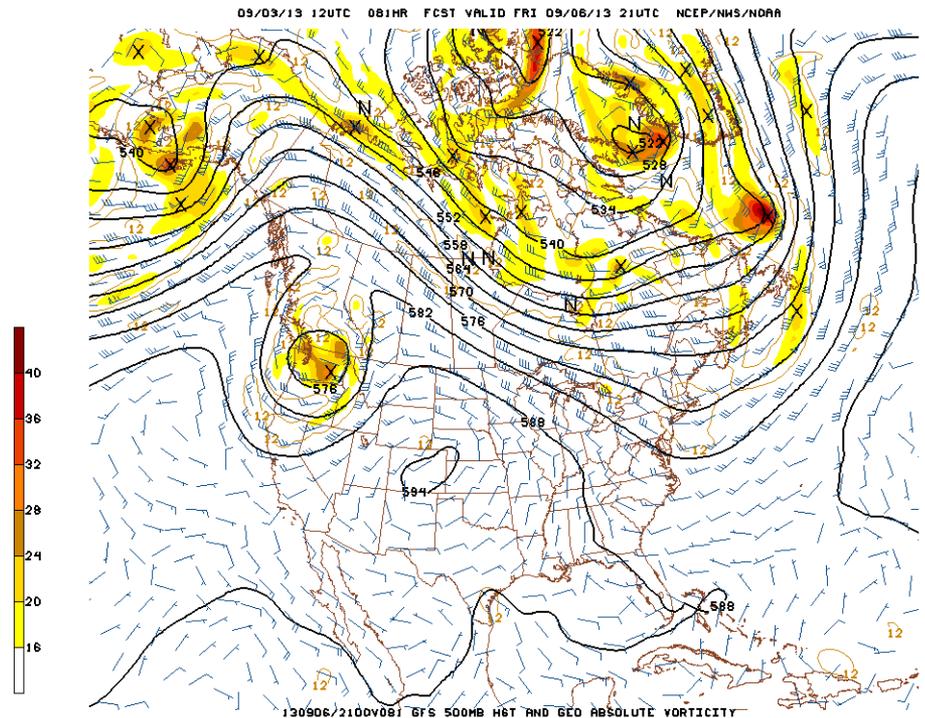


Friday: Weak winds, scattered clouds, chance of isolated thunderstorm.

2 PM CDT  
850 mb RH



500 mb vorticity

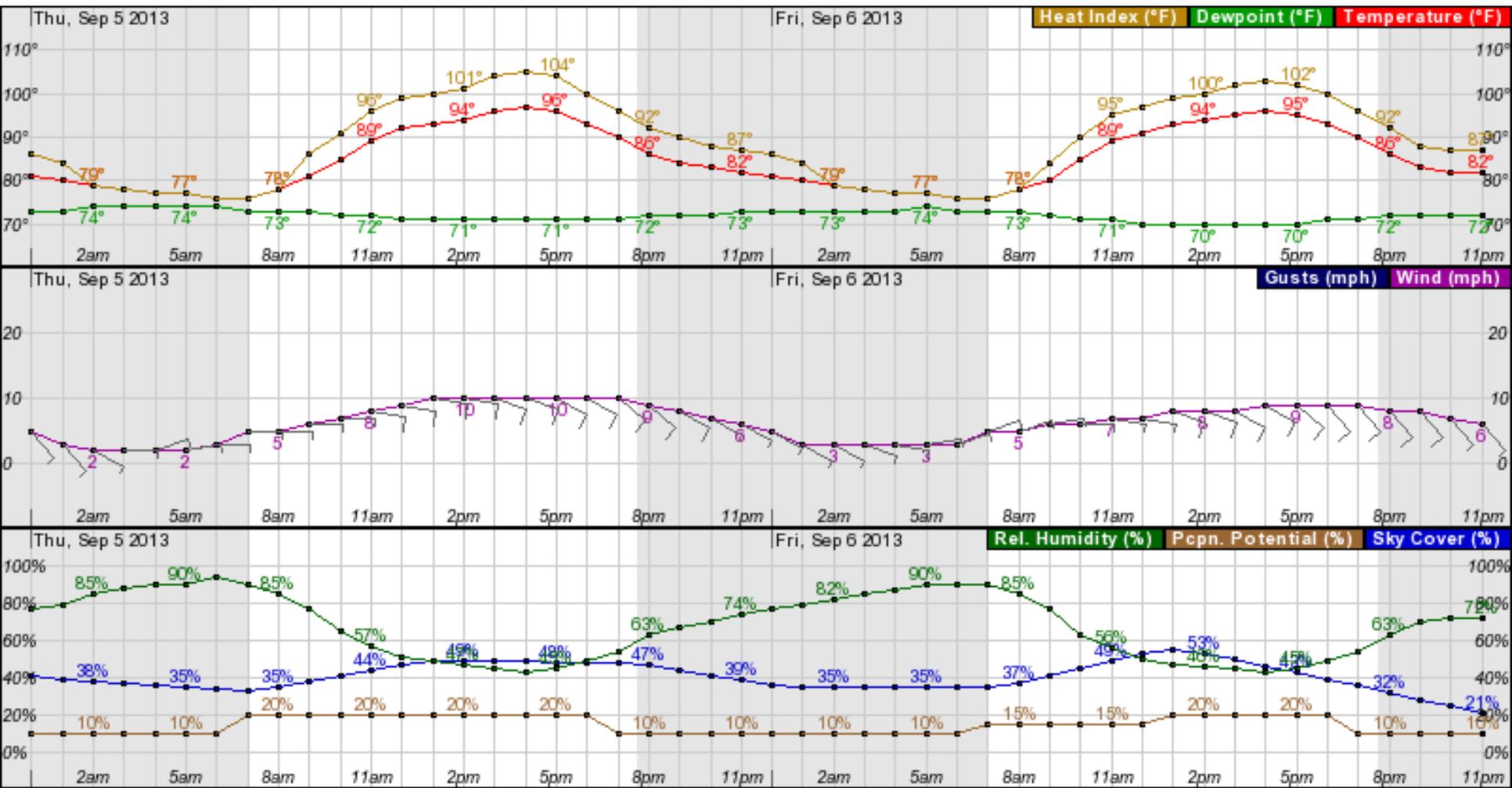


# Houston Hobby

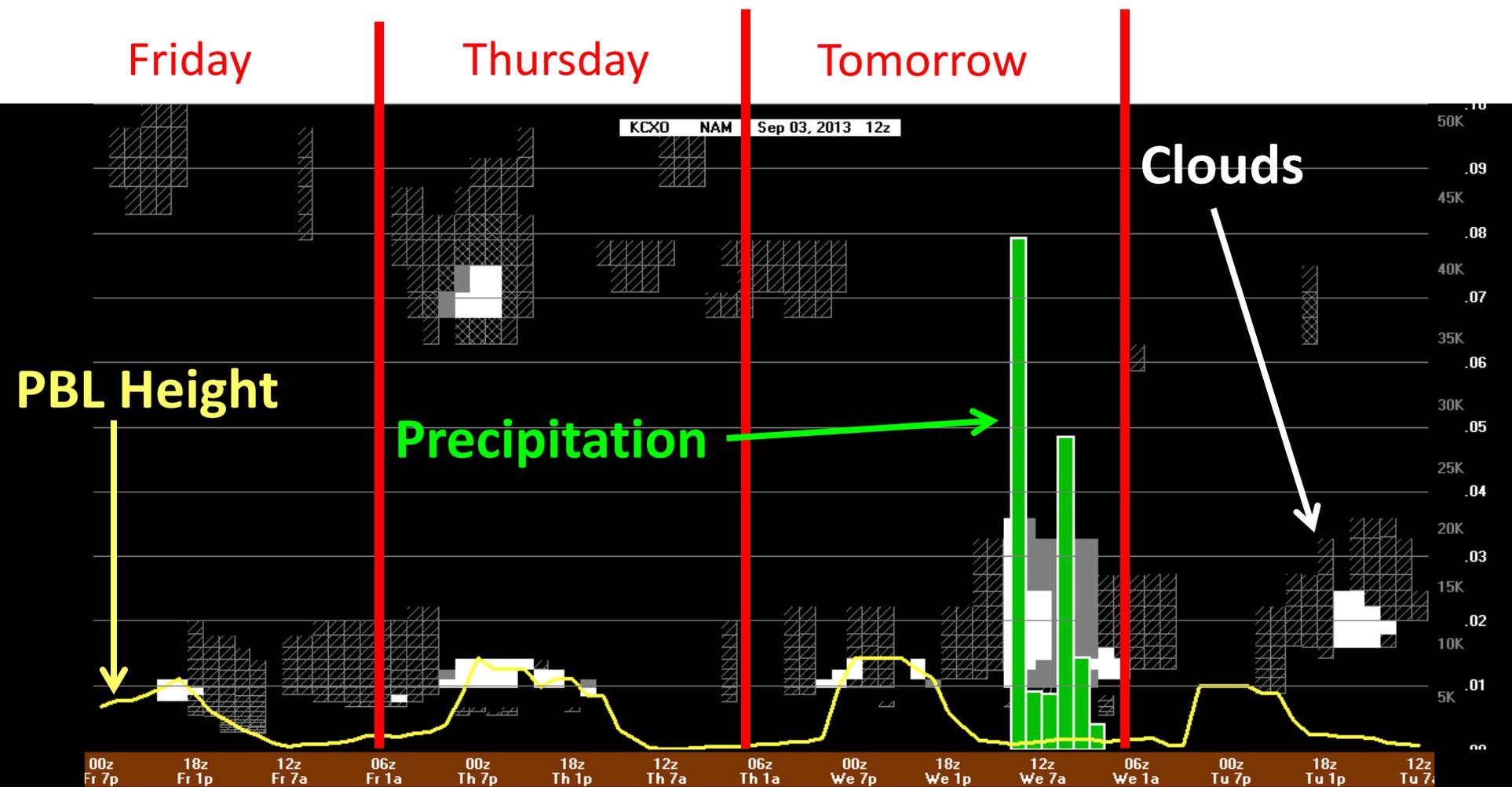
Thursday: Partly cloudy  
Friday: Partly cloudy

Thursday →

Friday →

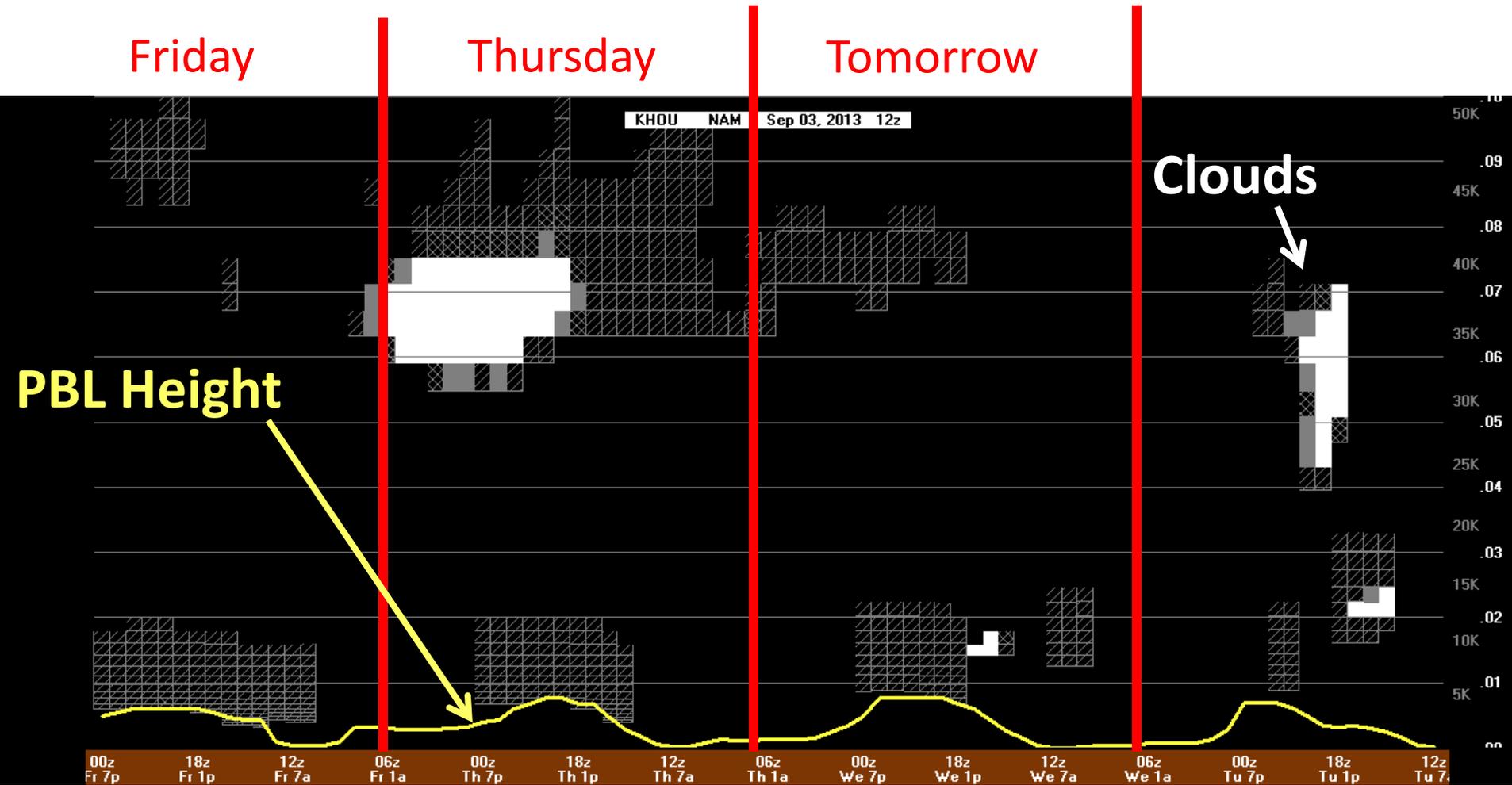


# Conroe; BUFKIT – NAM (12 UTC 3 September)



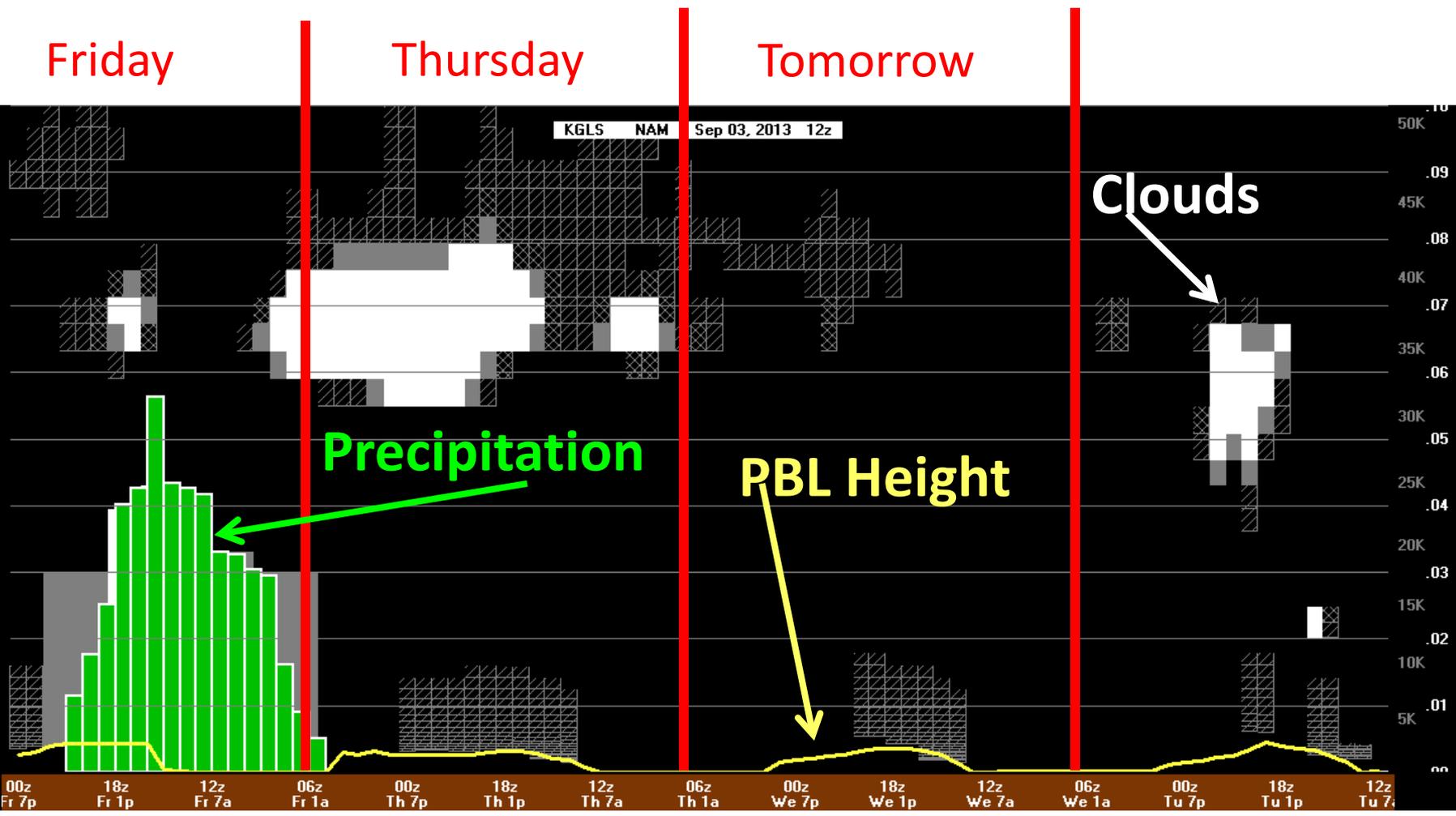
- Tomorrow: Partly cloudy.
- Thursday: Mostly cloudy.
- Friday: Partly cloudy.

# Houston Hobby; BUFKIT – NAM (12 UTC 3 September)



- Tomorrow: Partly cloudy.
- Thursday: Mostly cloudy.
- Friday: Partly cloudy

# Galveston; BUFKIT – NAM (12 UTC 3 September)



- Tomorrow: Partly cloudy.
- Thursday: Mostly cloudy.
- Friday: Thunderstorms

# Recommendations

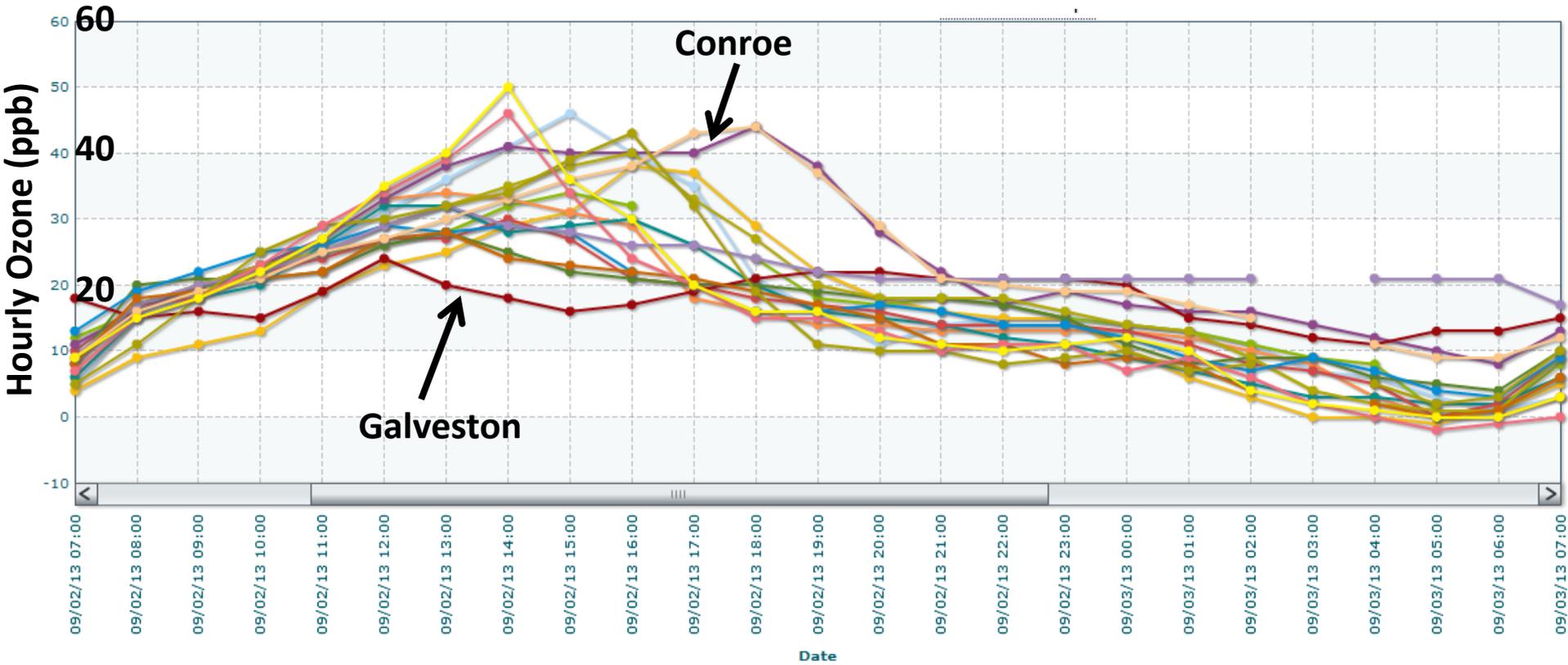
- Wednesday: Looks okay to fly. Mostly sunny in early to mid AM; clouds increasing through 2 PM and then cloud coverage may exceed 50% until the sea breeze front passes through by 5 PM.
- Thursday: Similar to Wednesday, but with more high level clouds
- Friday: Chance of precipitation near the coastline, but otherwise likely OK

# **DISCOVER-AQ Air Quality Outlook**

**Sept. 3, 2013**

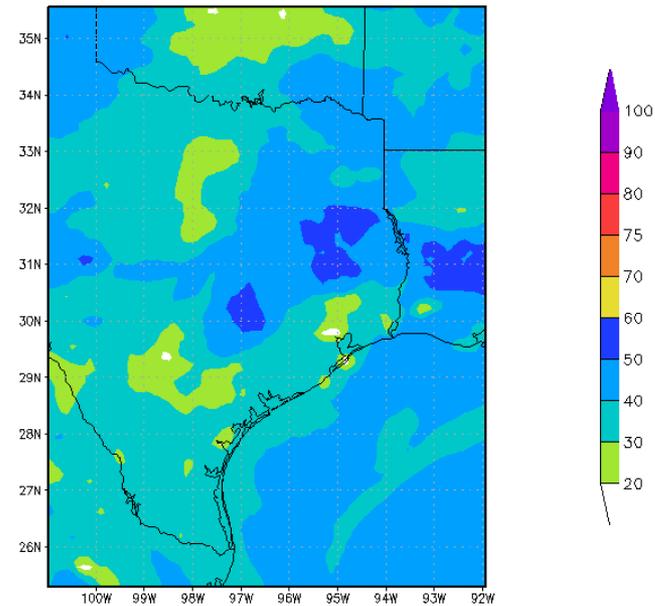
# Hourly Ozone (airnowtech.org)

## 7 am Monday – 7 am Tuesday



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

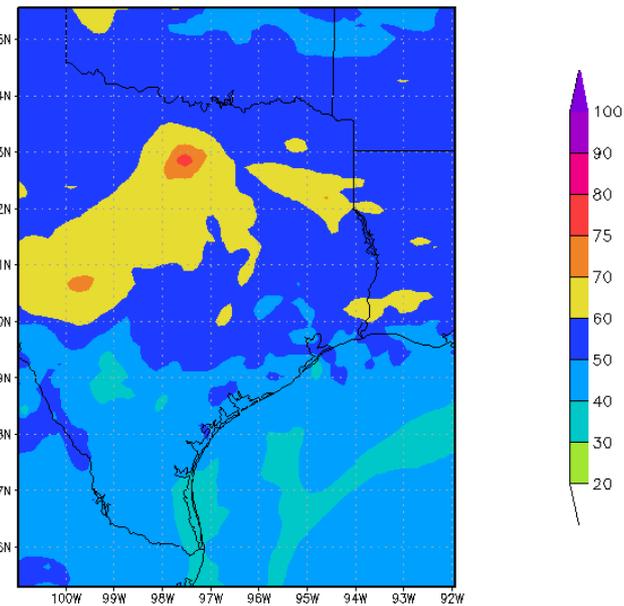
O3 [ppb] at 1013 [hPa] Valid 14Z SEP 04 2013



GRADS: COLA/IGES

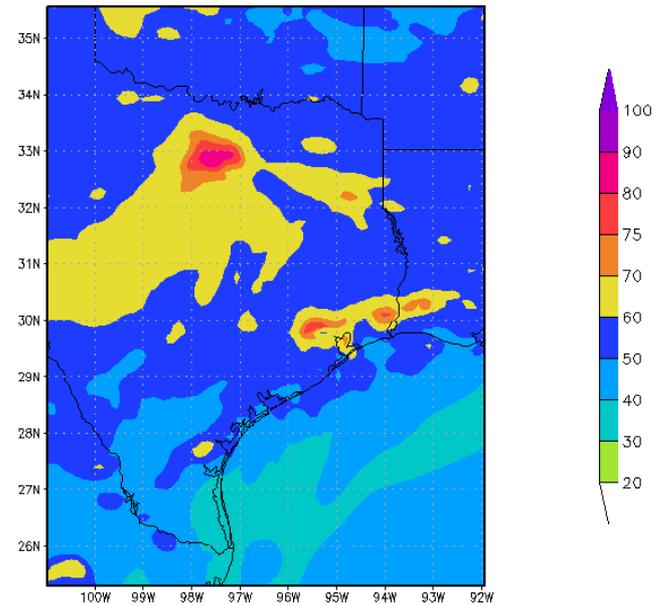
O3 [ppb] at 1013 [hPa] Valid 17Z SEP 04 2013

**NOAA/ARL  
Exper.  
CMAQ**



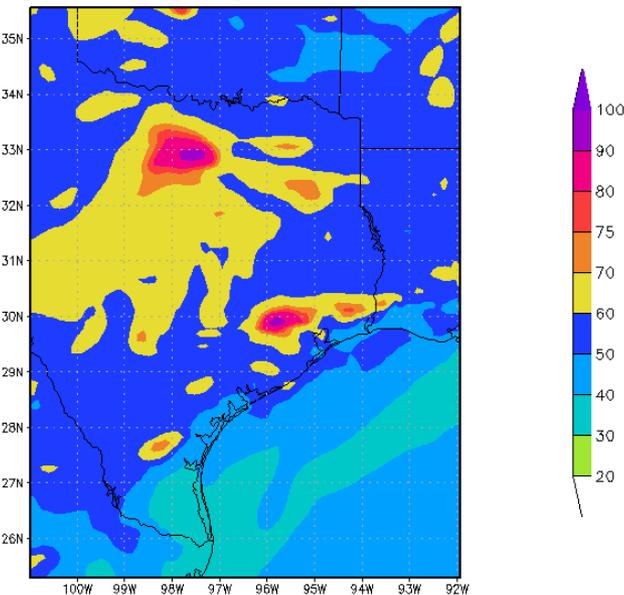
GRADS: COLA/IGES

O3 [ppb] at 1013 [hPa] Valid 19Z SEP 04 2013



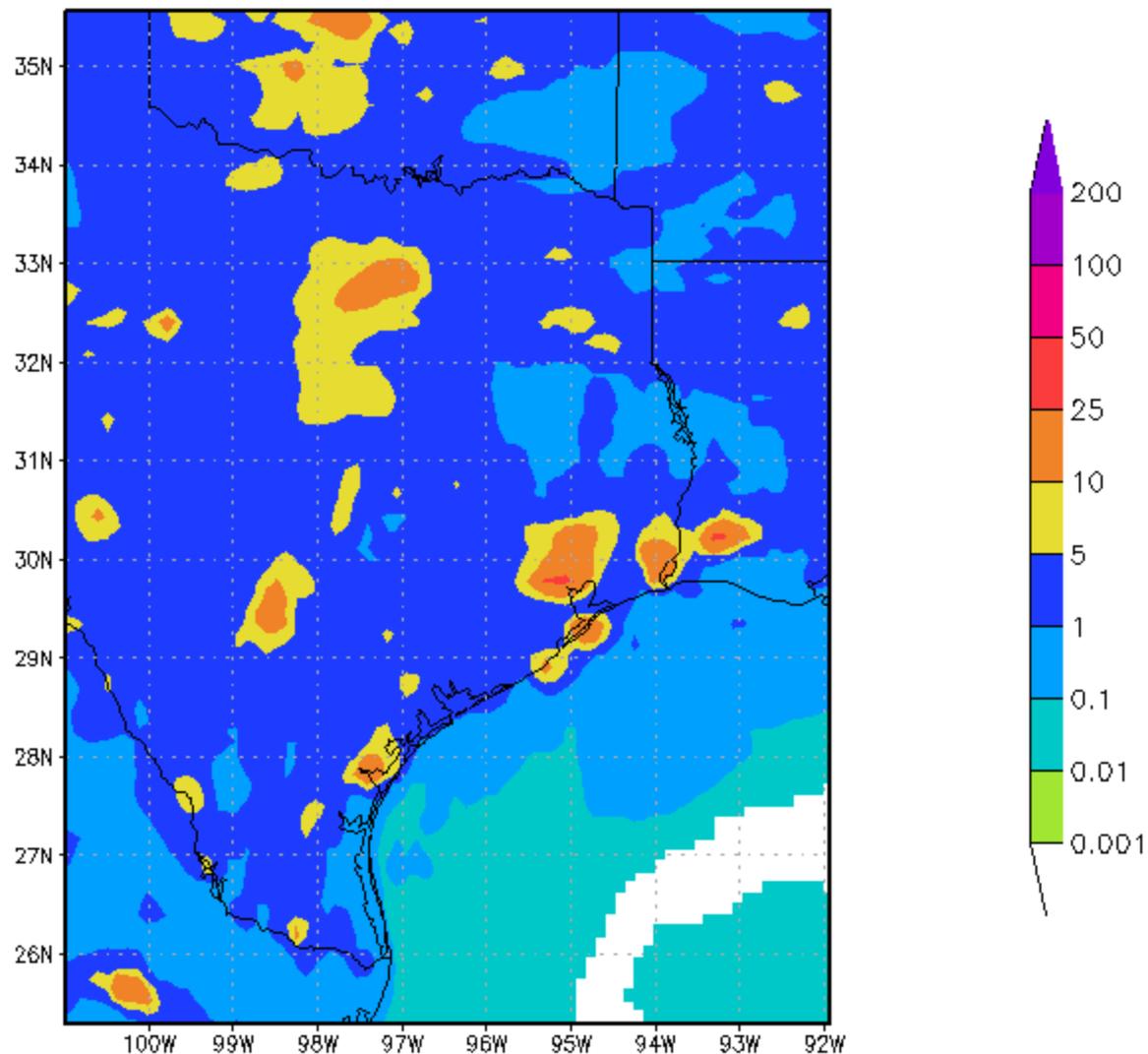
GRADS: COLA/IGES

O3 [ppb] at 1013 [hPa] Valid 22Z SEP 04 2013

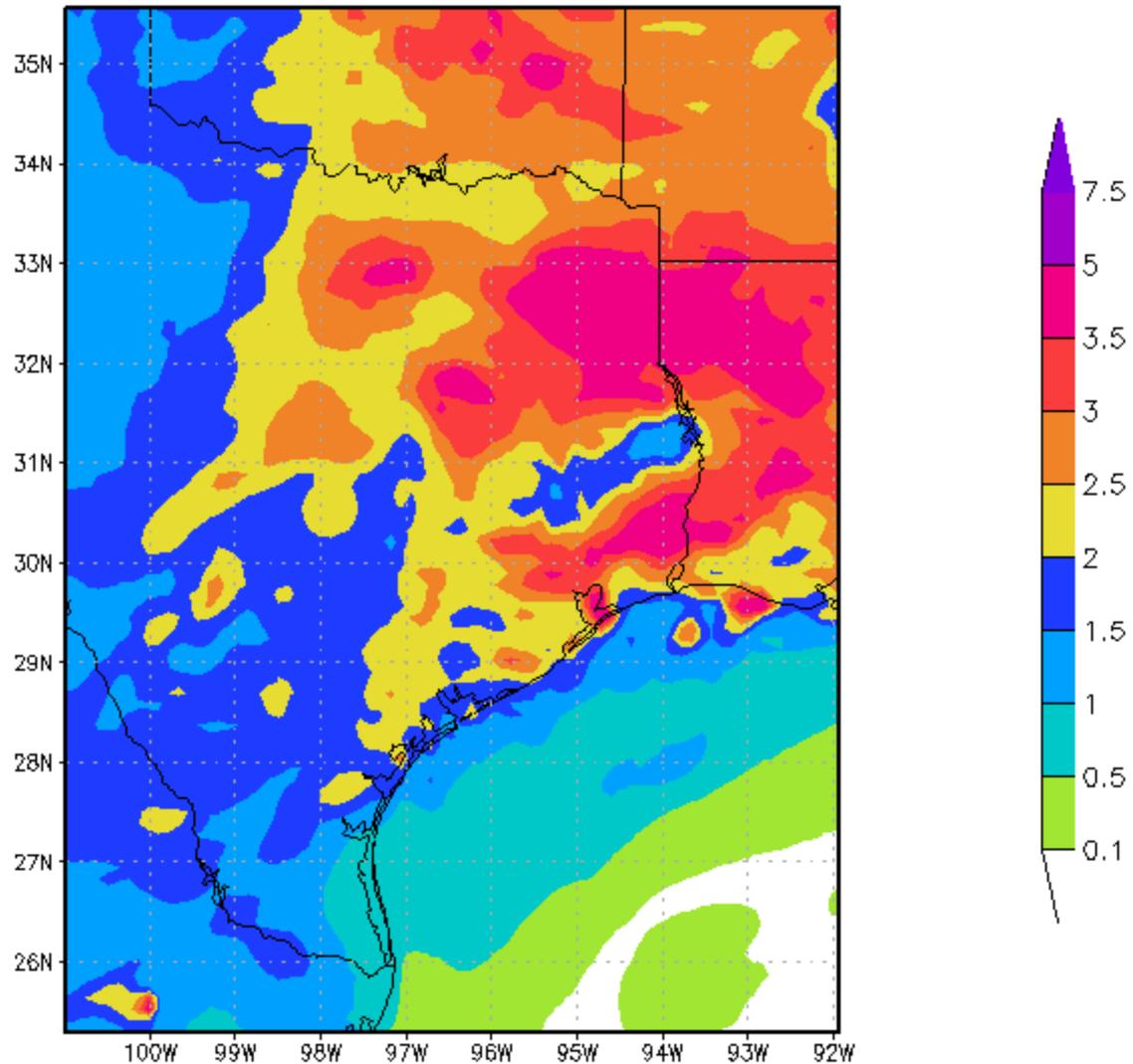


GRADS: COLA/IGES

# NO2 [ppb] at 1013 [hPa] Valid 14Z SEP 04 2013

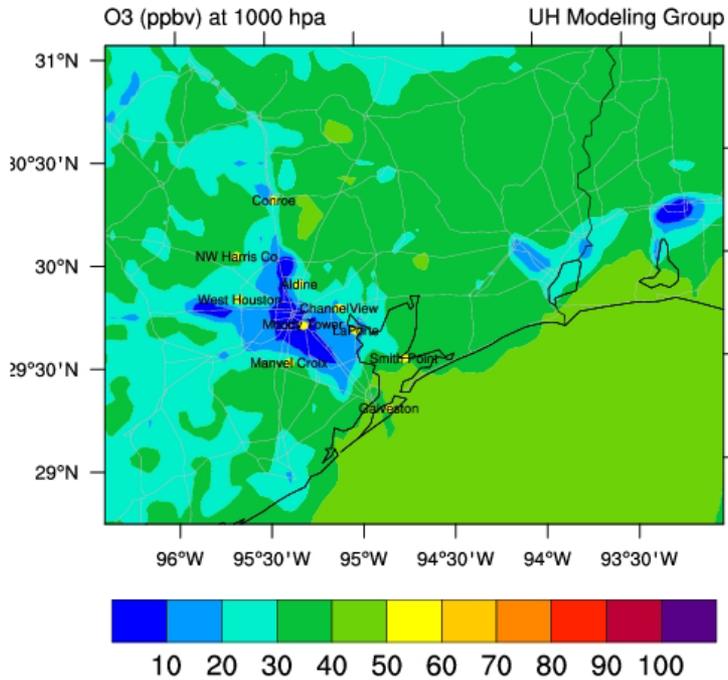


# FORM [ppb] at 1013 [hPa] Valid 19Z SEP 04 2013

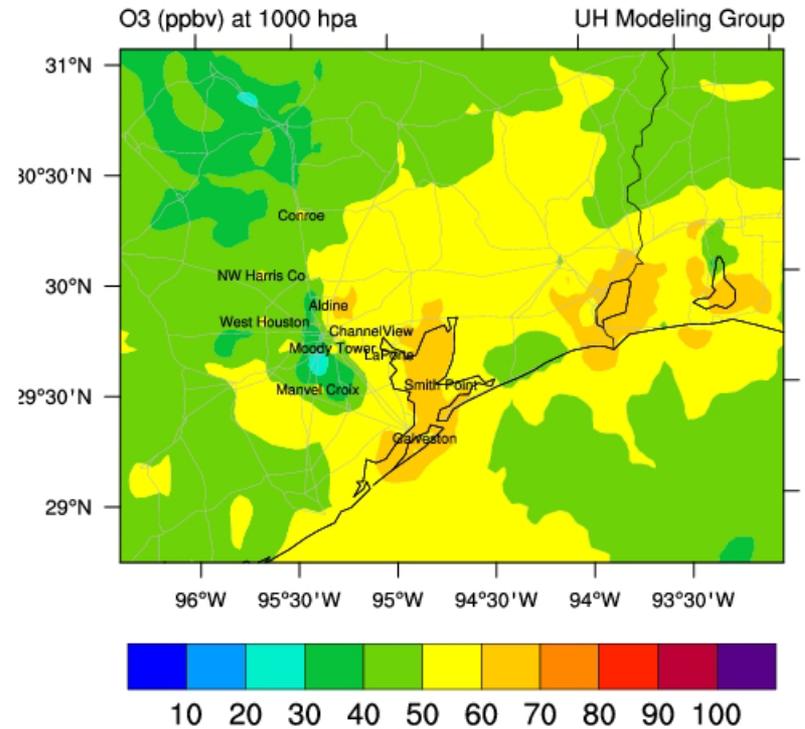


# University of Houston CMAQ

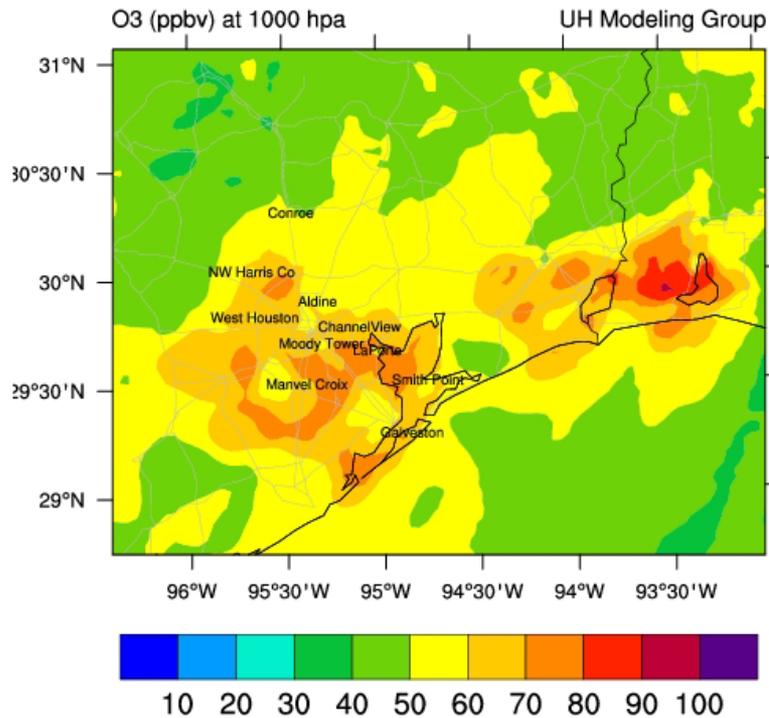
CMAQ 20130904\_14:00:00Z



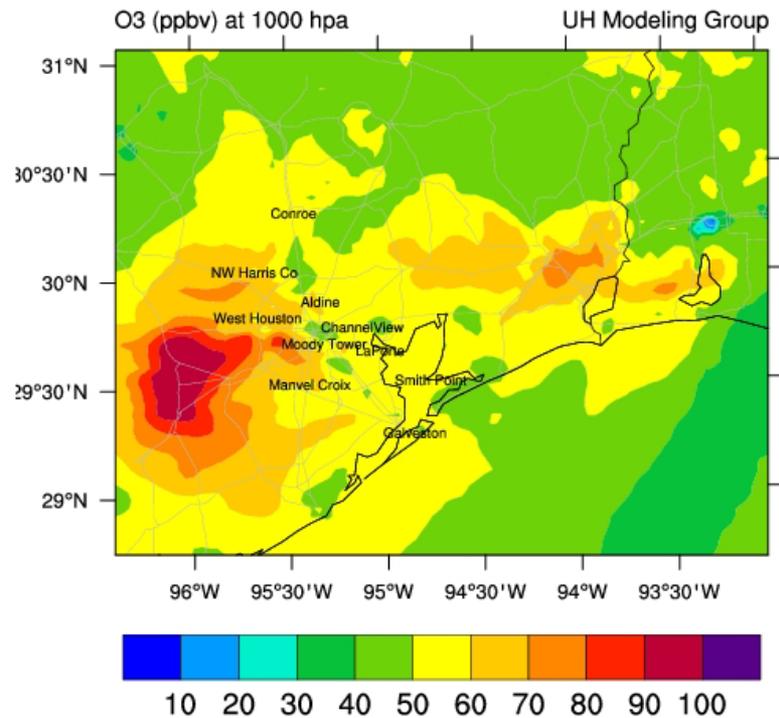
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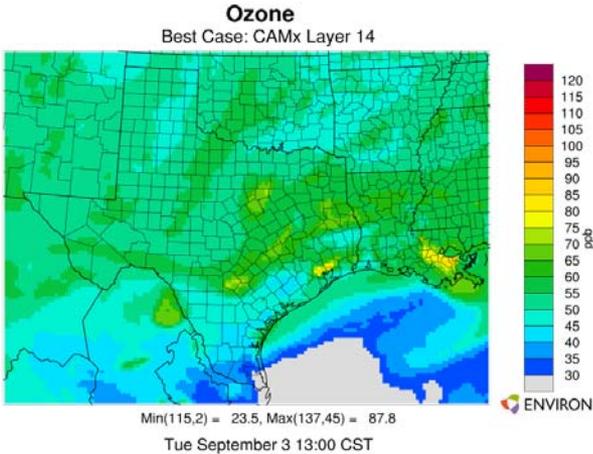
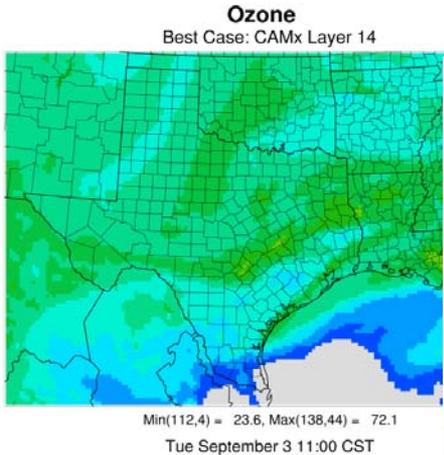
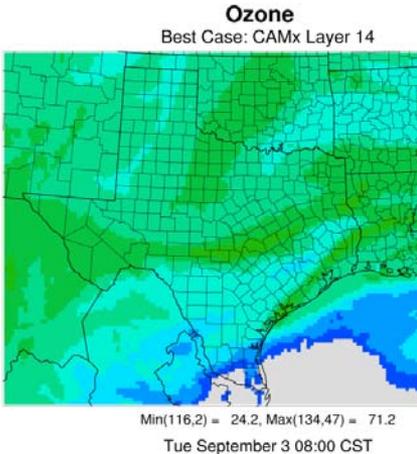
CMAQ 20130904\_19:00:00Z



CMAQ 20130904\_22:00:00Z



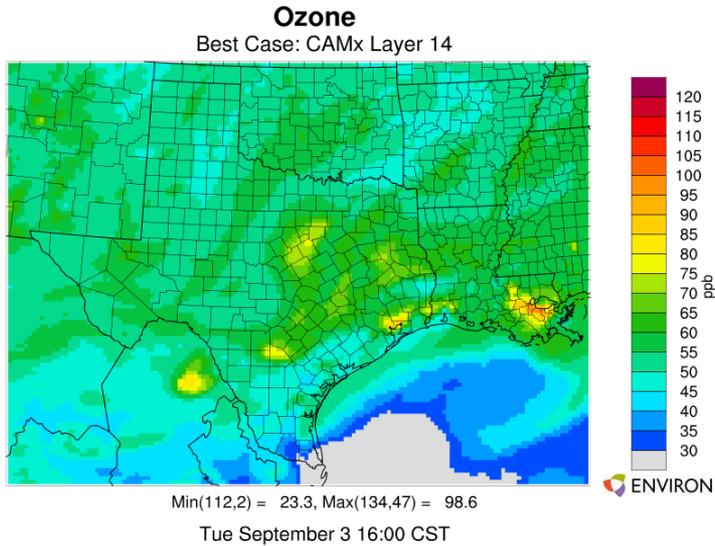
# TCEQ/Environ CAMx model



9 CDT

12 CDT

14 CDT



*WRF Model suggests late onshore push,  
so smaller O<sub>3</sub> production*

17 CDT

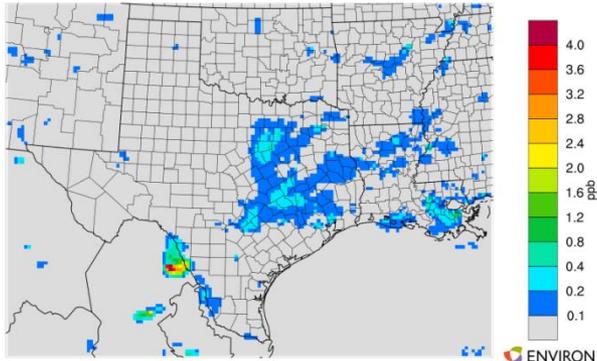


*NO<sub>x</sub> is ventilated by ENE winds; VOC's including isoprene are high as they move in from forested source*



**NO<sub>2</sub>**

Best Case: CAMx Layer 14

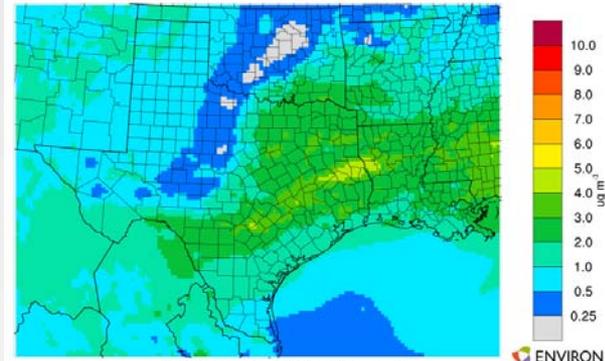


Min(112,11) = 0.0, Max(51,29) = 9.4

Tue September 3 11:00 CST

**Formaldehyde**

Best Case: CAMx Layer 14

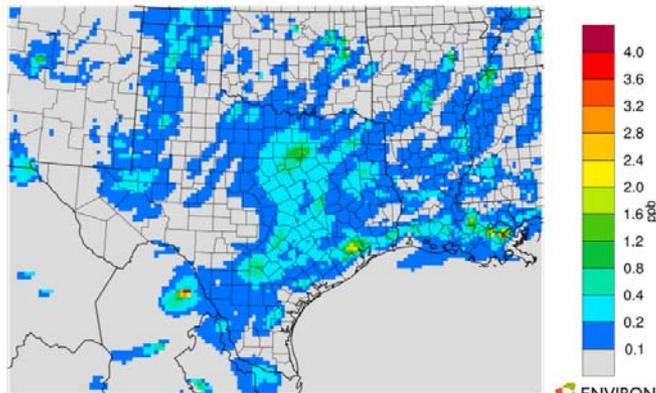


Min(81,95) = 0.2, Max(146,63) = 4.8

Tue September 3 11:00 CST

**NO<sub>2</sub>**

Best Case: CAMx Layer 14

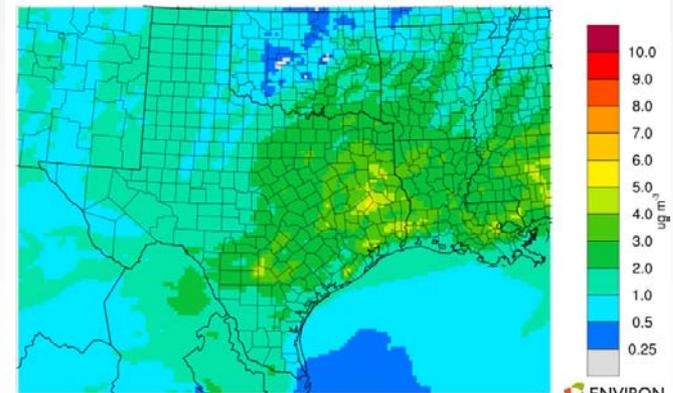


Min(74,94) = 0.0, Max(51,30) = 8.6

Tue September 3 16:00 CST

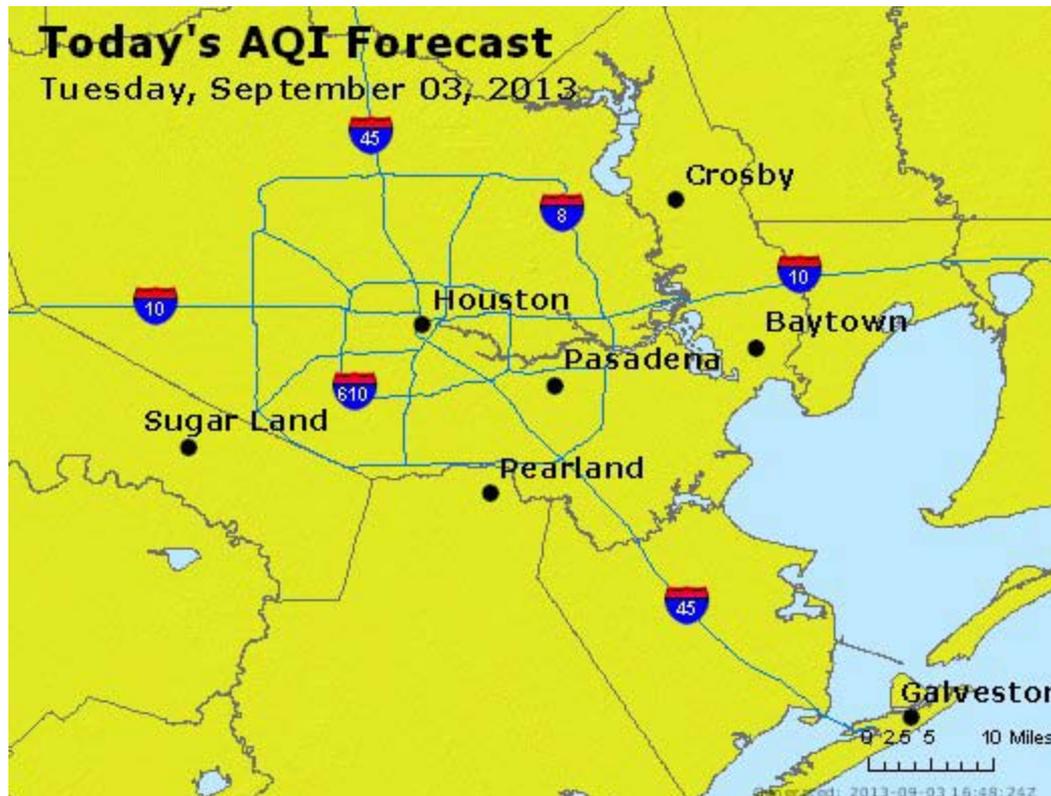
**Formaldehyde**

Best Case: CAMx Layer 14



Min(81,90) = 0.1, Max(99,55) = 5.4

Tue September 3 16:00 CST



**Most likely areas with Moderate Ozone (Code Yellow):**

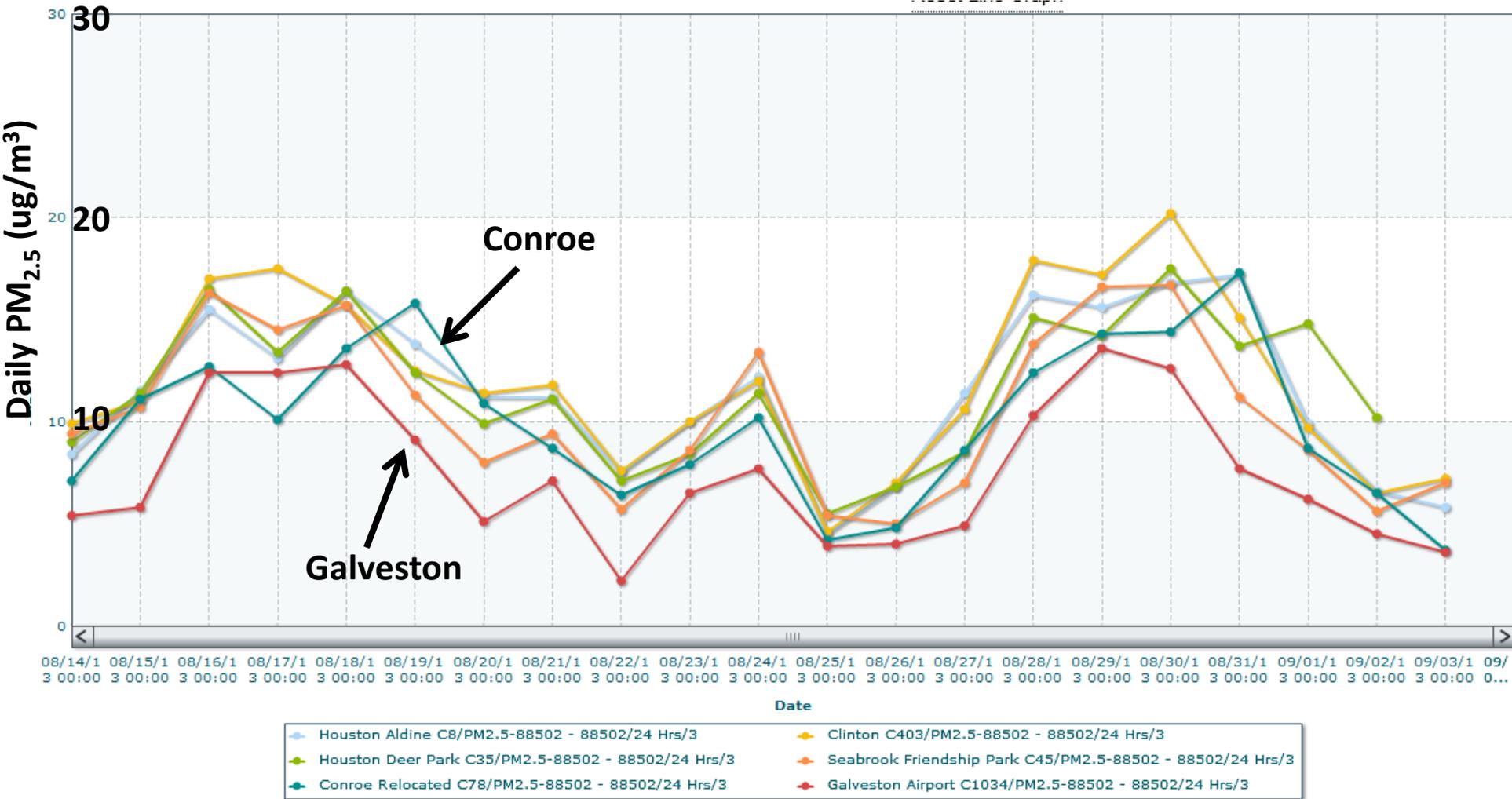
**Today - E and NE side of Houston due to generally southwesterly flow**

**Tomorrow – S, SW and W side of Houston due to more easterly flow**

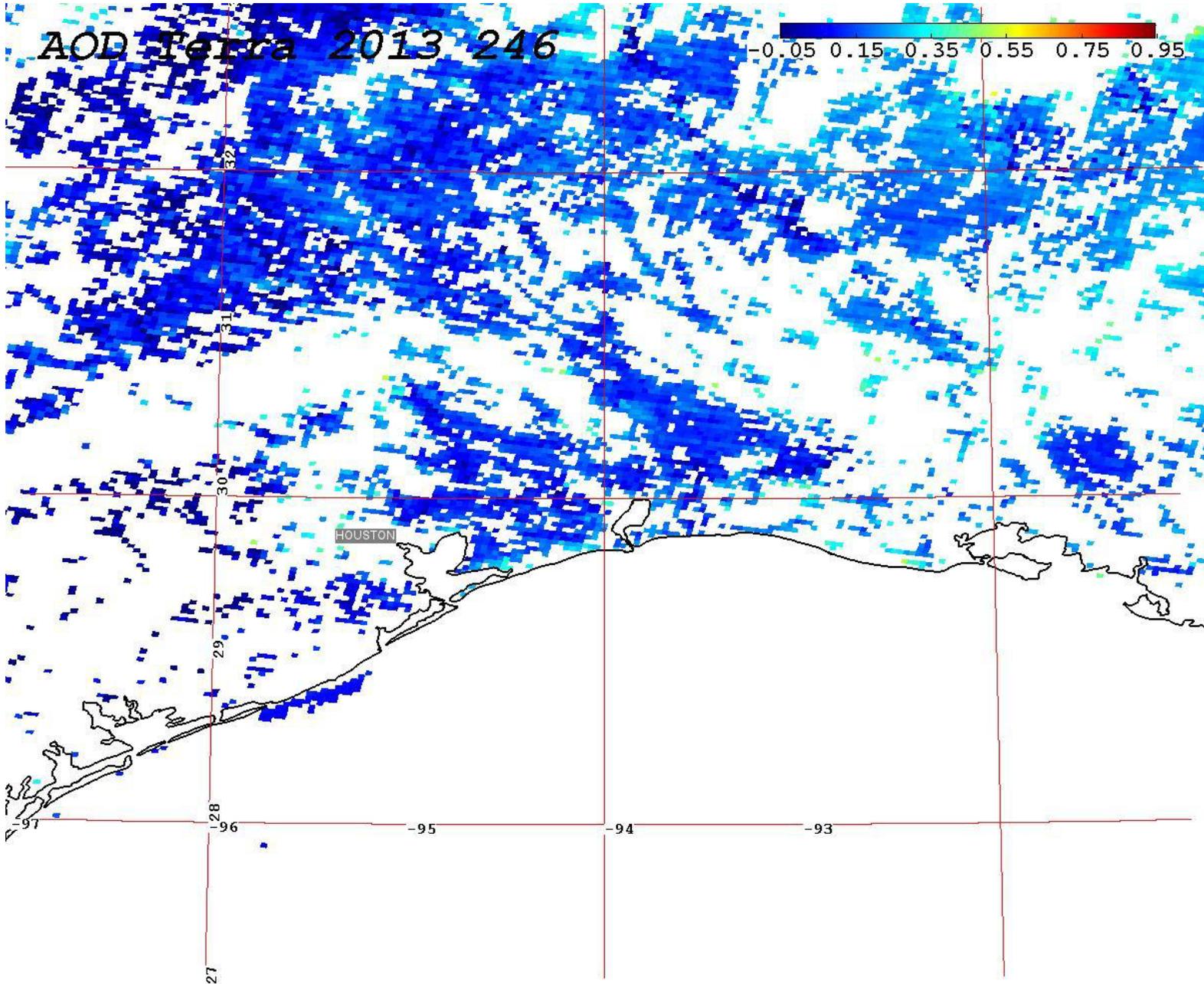
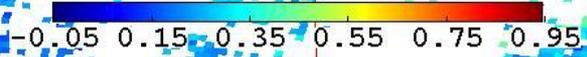
**Thursday and Friday – similar to Wednesday**

# Daily PM<sub>2.5</sub> (airnowtech.org)

August 14 – September 3



AOD Terra 2013 246



ASO4J [ $\mu\text{g}/\text{m}^3$ ] at 1013 [hPa] Valid 22Z SEP 04 2013

