

DISCOVER-AQ Outlook - Sept. 5, 2013

Regional-scale winds were mostly easterly today with sea breeze development. For example, wind shift at La Porte at around 3 PM. Thunderstorms developed over downtown Houston and to the northeast in mid afternoon and moved to the west. AOD showed strong gradient from the coast up to Conroe.

We will be under a similar pattern for the next few days. Tomorrow should be similar to today with partly cloudy skies with isolated thunderstorms and sea breeze development. The easterly wave entering Mexico should not induce high cloudiness this far north. Saturday should see more clouds as a short wave trough comes around the major ridge into eastern TX. Less cloudiness expected on Sunday.

Air quality for ozone is expected to be moderate for the period from today through Sunday. Maximum ozone will likely occur on the northwest side of Houston. Aerosol optical depth may become less on Friday and Saturday in the easterly flow.

9/5/2013 4:00PM Weather Update

Chris Loughner

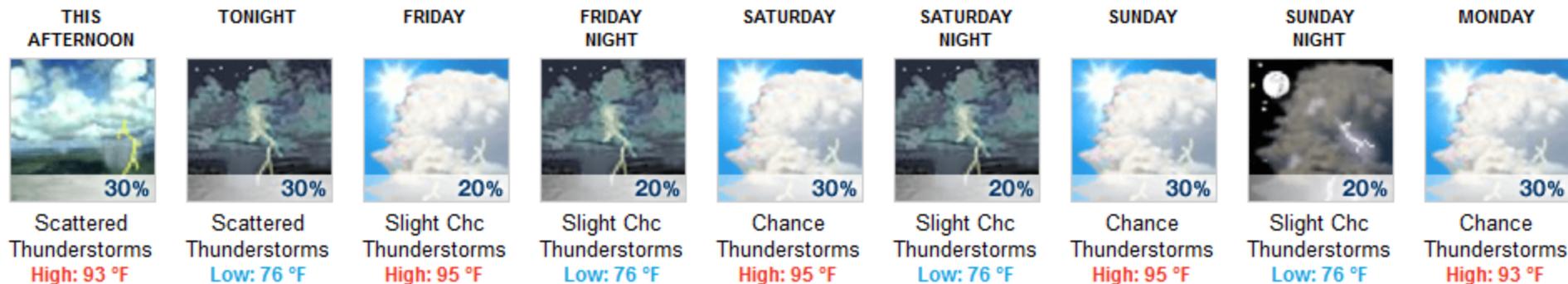
Ken Pickering

Bob Chatfield

Conroe:



Houston Hobby:



Galveston:



Current Conditions

Conroe:



Partly Cloudy
93°F
 34°C

Humidity 46%
 Wind Speed N 8 mph
 Barometer 30.02 in (1016.3 mb)
 Dewpoint 69°F (21°C)
 Visibility 10.00 mi
 Heat Index 98°F (37°C)
 Last Update on 5 Sep 2:53 pm CDT

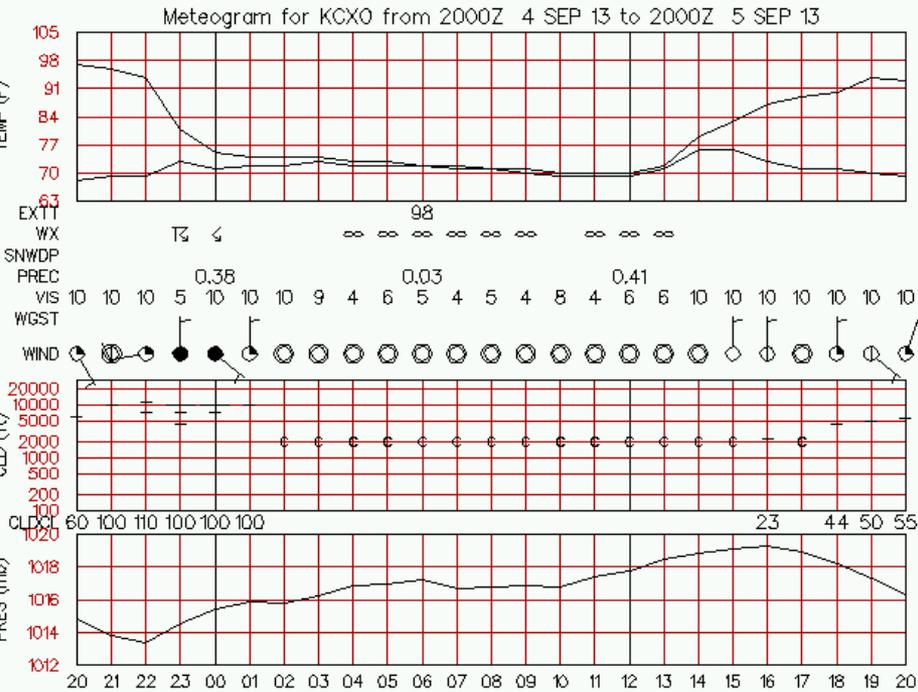
Houston Hobby:



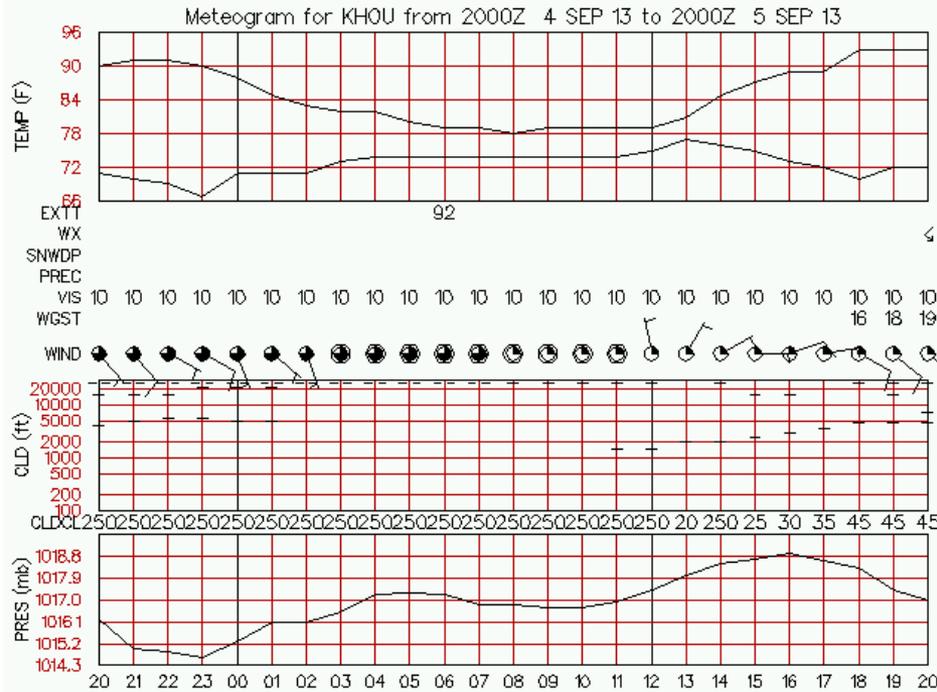
Thunderstorm
93°F
 34°C

Humidity 50%
 Wind Speed SE 15 G 22 mph
 Barometer 30.02 in (1017.0 mb)
 Dewpoint 72°F (22°C)
 Visibility 10.00 mi
 Heat Index 101°F (38°C)
 Last Update on 5 Sep 2:53 pm CDT

▼ Plymouth State Weather Center ▼



▼ Plymouth State Weather Center ▼



Current Conditions

Galveston:

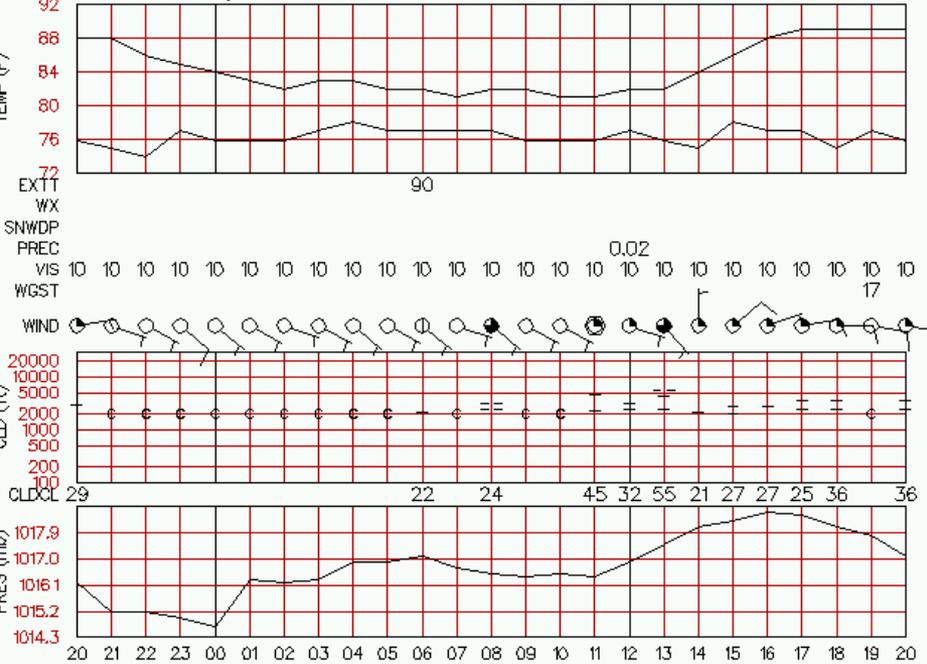


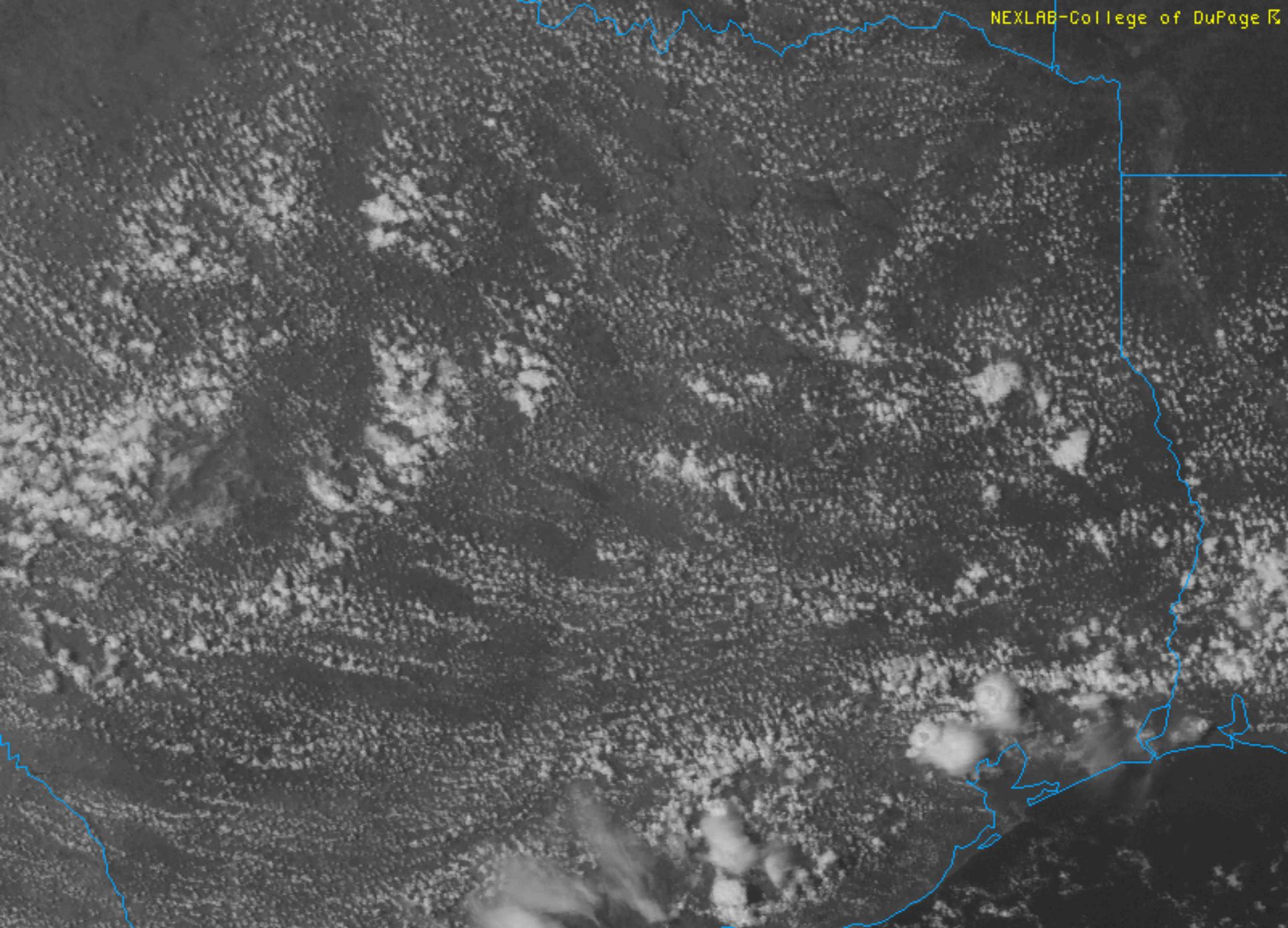
Partly Cloudy
89°F
32°C

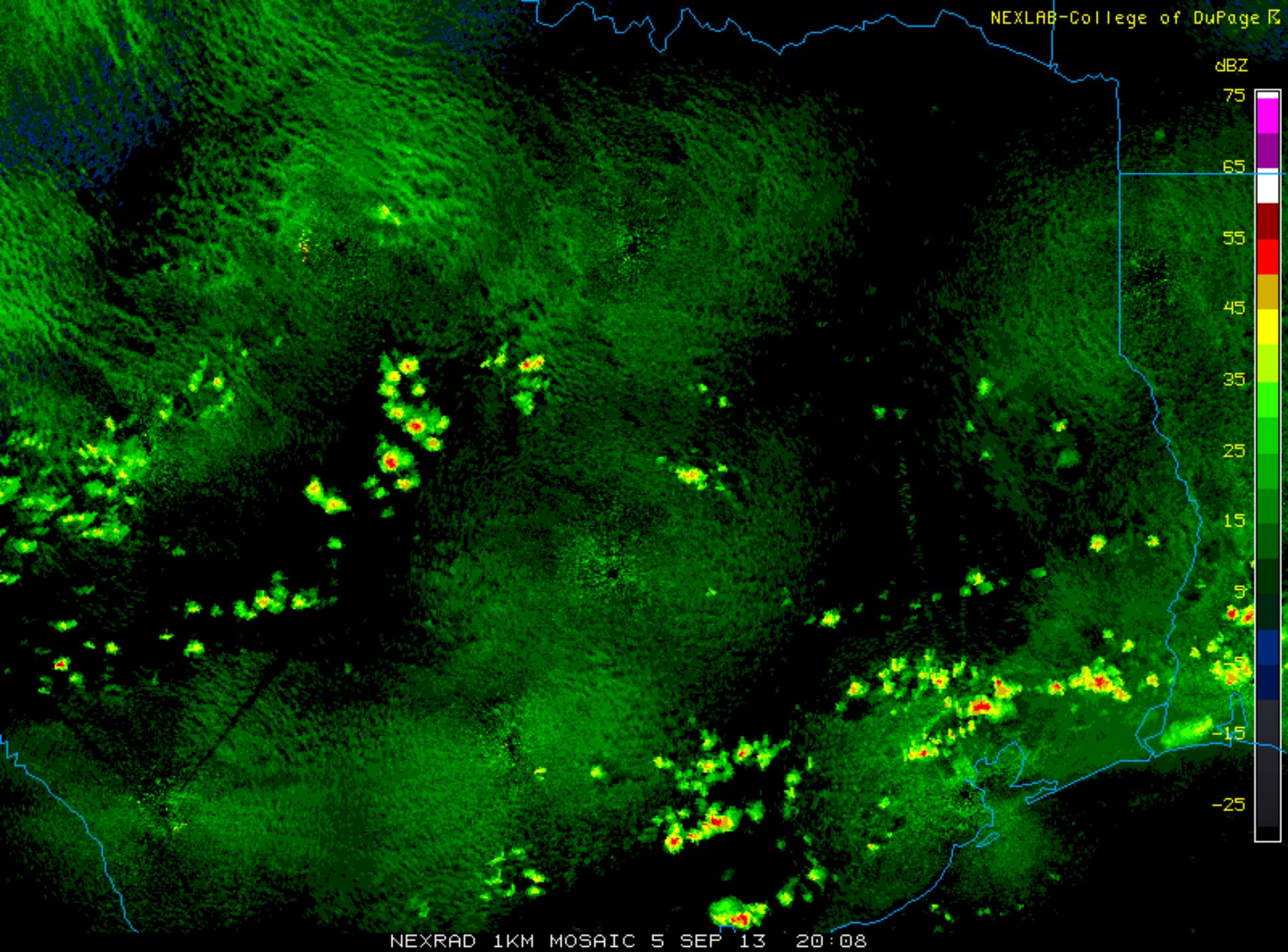
Humidity 65%
Wind Speed E 10 mph
Barometer 30.04 in (1017.1 mb)
Dewpoint 76°F (24°C)
Visibility 10.00 mi
Heat Index 100°F (38°C)
Last Update on 5 Sep 2:52 pm CDT

▼ Plymouth State Weather Center ▼

Meteorgram for KGLS from 2000Z 4 SEP 13 to 2000Z 5 SEP 13

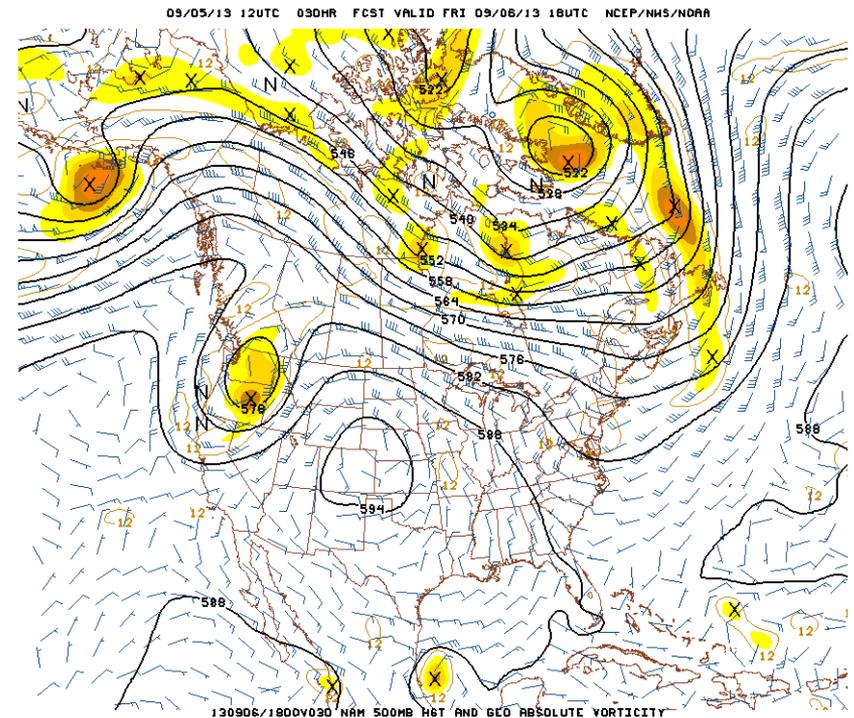
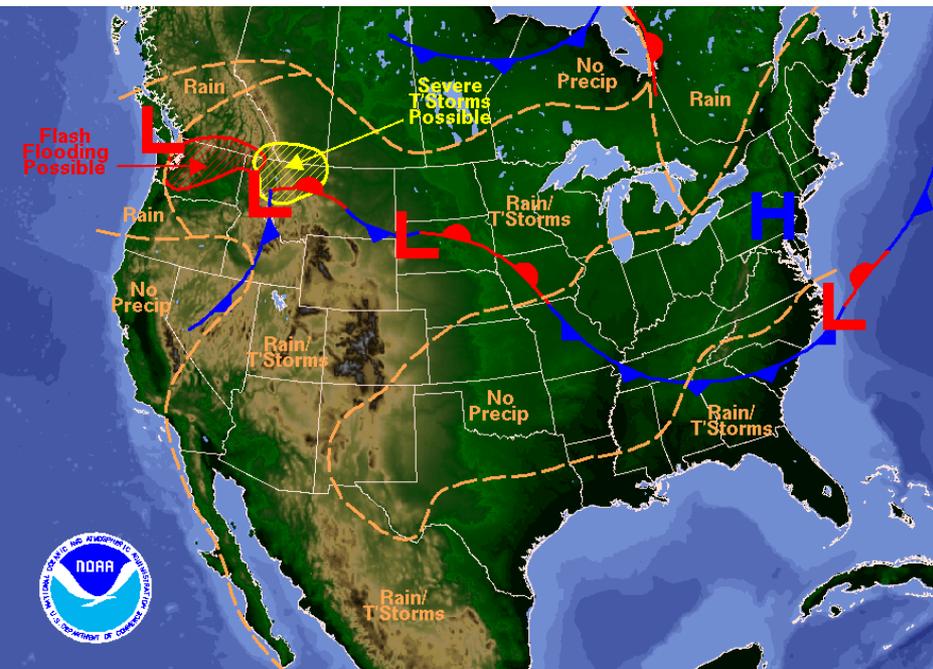






Tomorrow: Weak easterly winds changing to southeasterly as sea breeze develops. Mid and upper atmosphere a little drier than today. Cirrus associated with tropical wave to our south should stay south of our region.

1 PM CDT
500 mb vorticity



10 m winds at 1 PM tomorrow

WRF 3-KM

Fcst: 30 h

Sigma1 Windspeed (m/s)

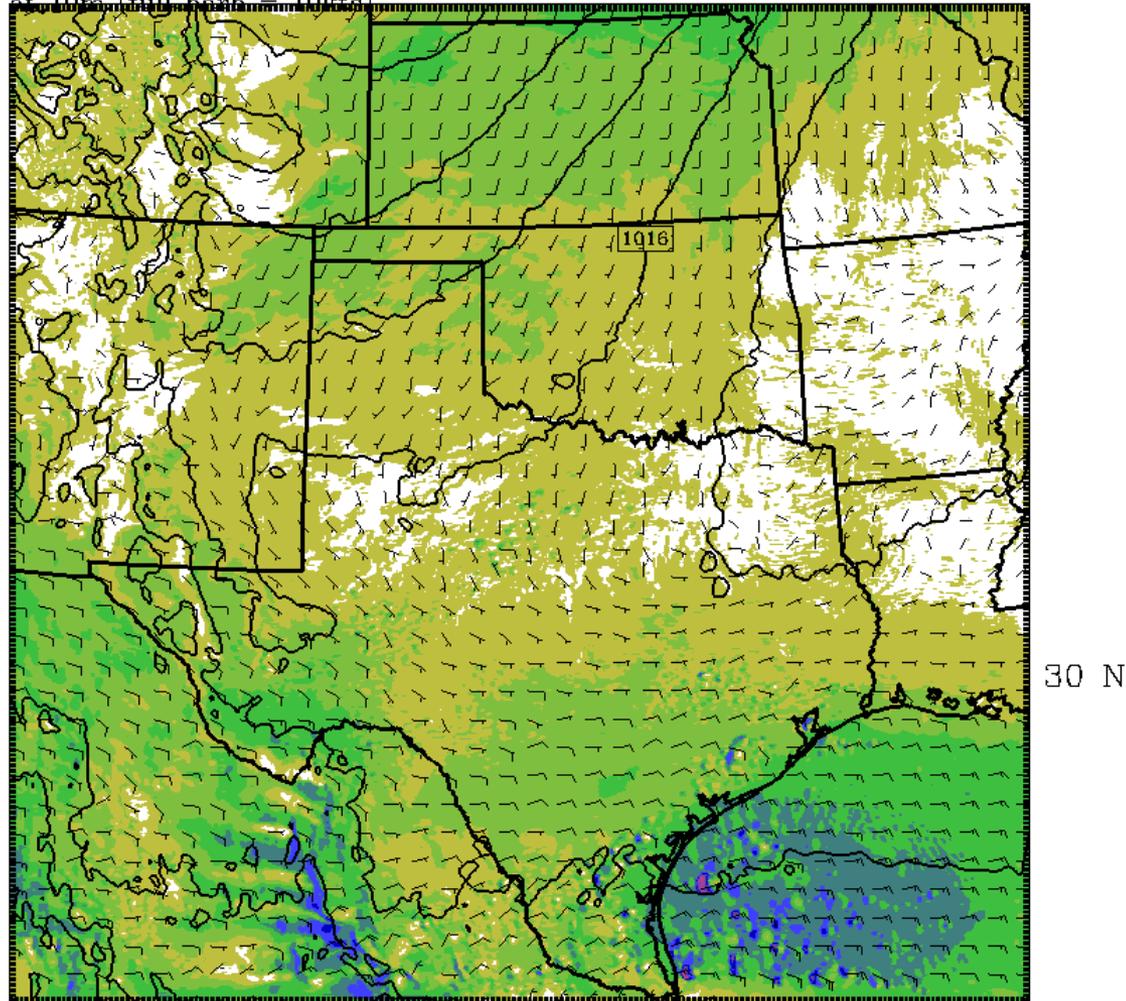
Sea Level Pressure (hPa)

Wind at 10m (full hour = 1016)

Init: 12 UTC Thu 05 Sep 13
Valid: 18 UTC Fri 06 Sep 13 (13 CDT Fri 06 Sep 13)

100 W

90 W



CONTOURS: UNITS=hPa LOW= 1010.0 HIGH= 1018.0 INTERVAL= 2.0000

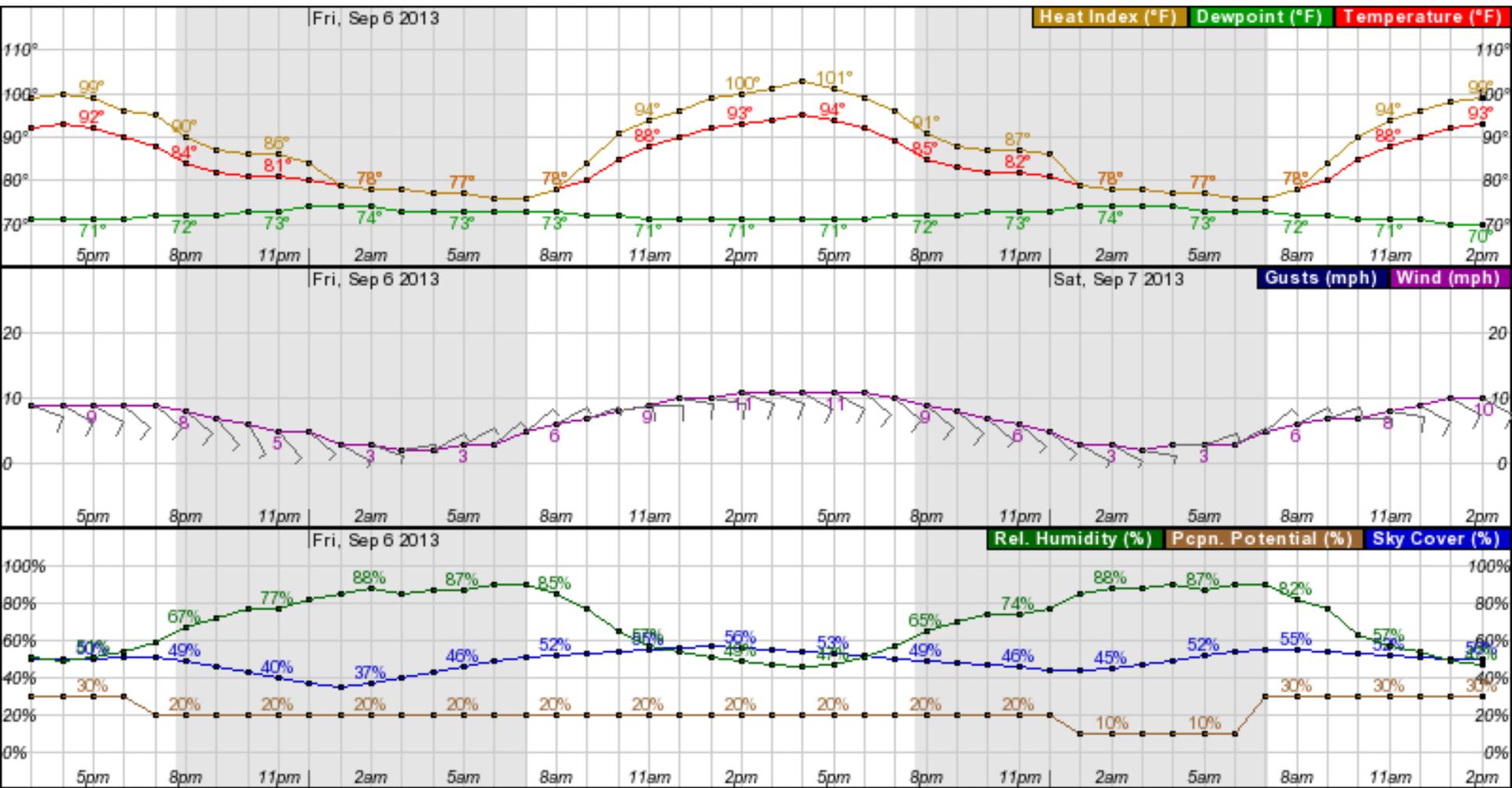


Model Info: V3.3 No Cu YSU PBL Thompson Noah LSM 3.0 km, 37 levels, 18 sec
LW: RRTM SW: Dudhia DIFF: simple KM: ED Smagor

Houston Hobby

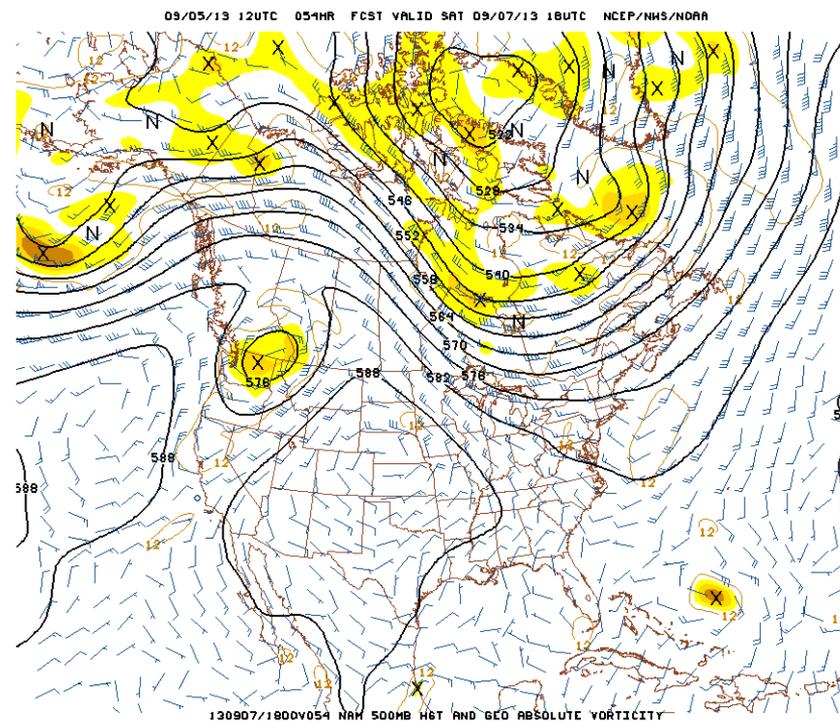
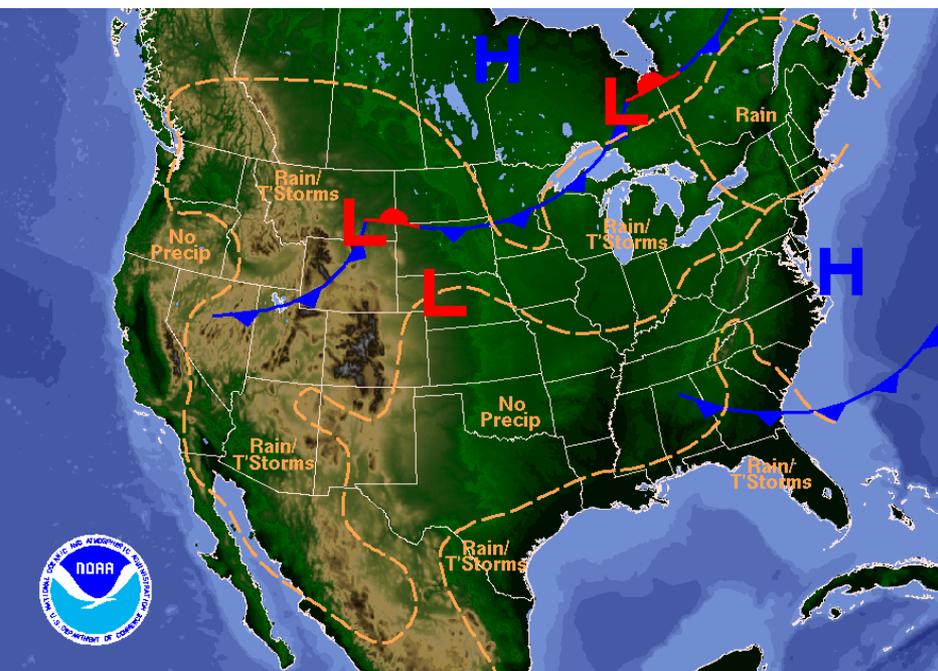
Tomorrow: Cloud cover around 50%

Today → Tomorrow →



Saturday: Shortwave trough moving into East Texas will bring in more moisture.

1 PM CDT
500 mb vorticity



10 m winds at 1 PM Saturday

WRF 3-KM

Fcst: 54 h

Sigma1 Windspeed (m/s)

Sea Level Pressure (hPa)

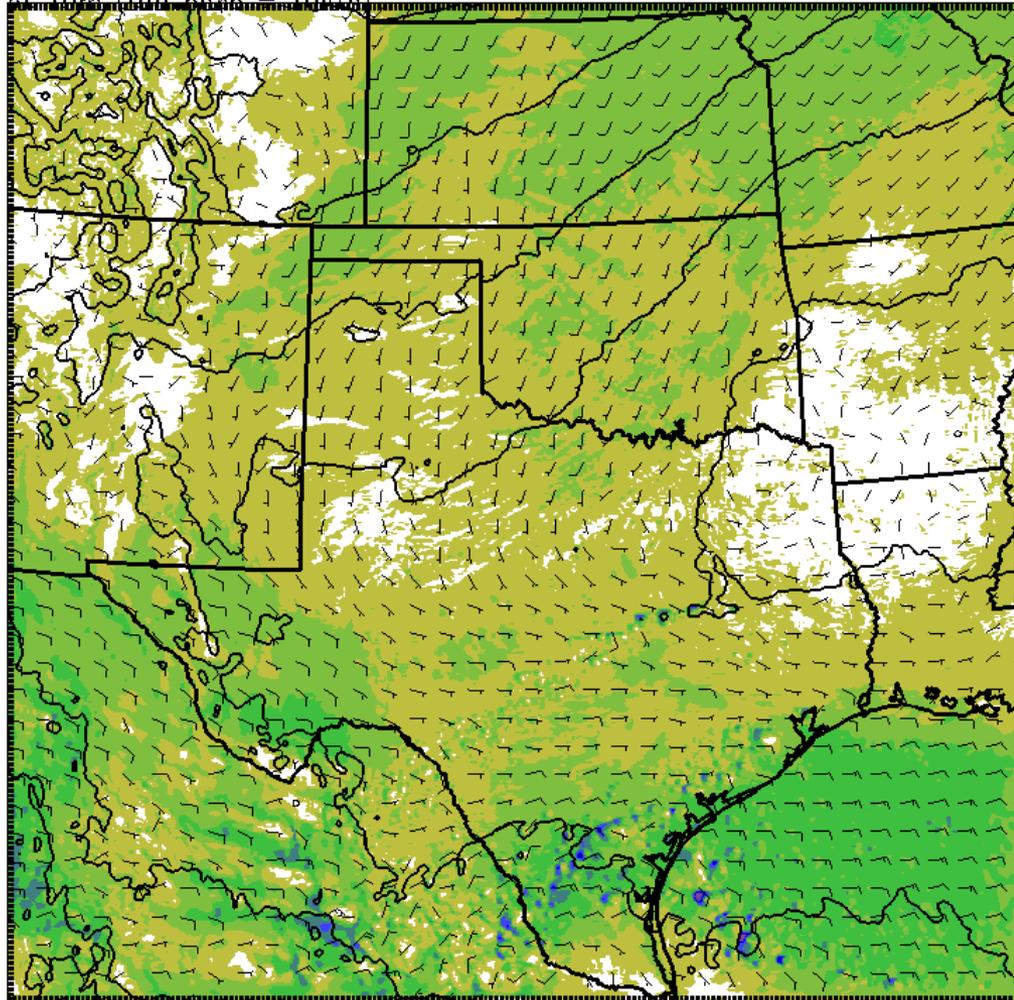
Wind at 10m (full barb = 10kts)

Init: 12 UTC Thu 05 Sep 13

Valid: 18 UTC Sat 07 Sep 13 (13 CDT Sat 07 Sep 13)

100 W

90 W



30 N

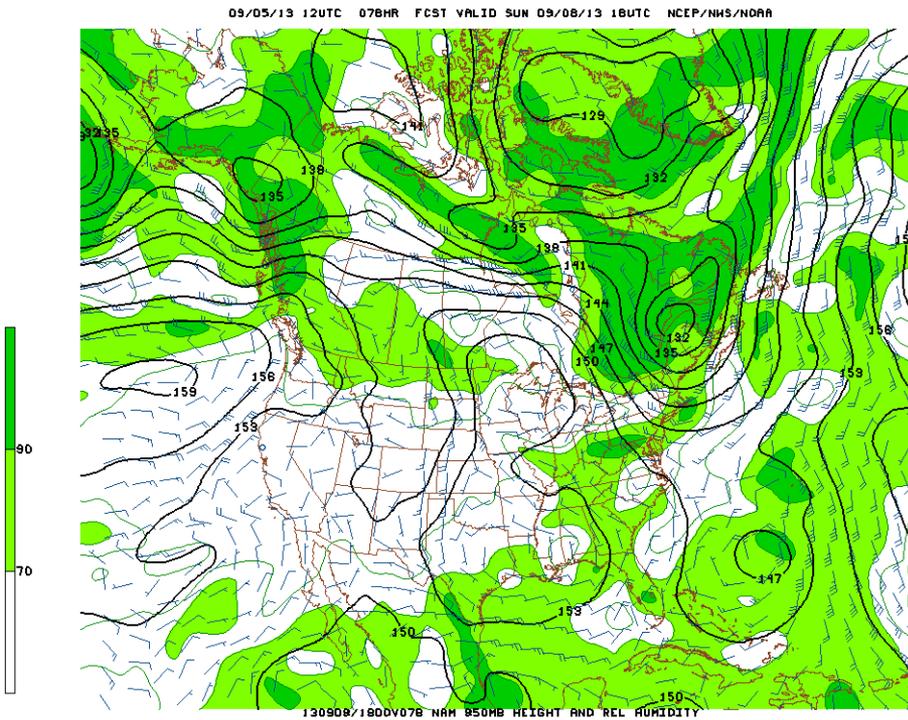
CONTOURS: UNITS=hPa LOW= 1008.0 HIGH= 1016.0 INTERVAL= 2.0000



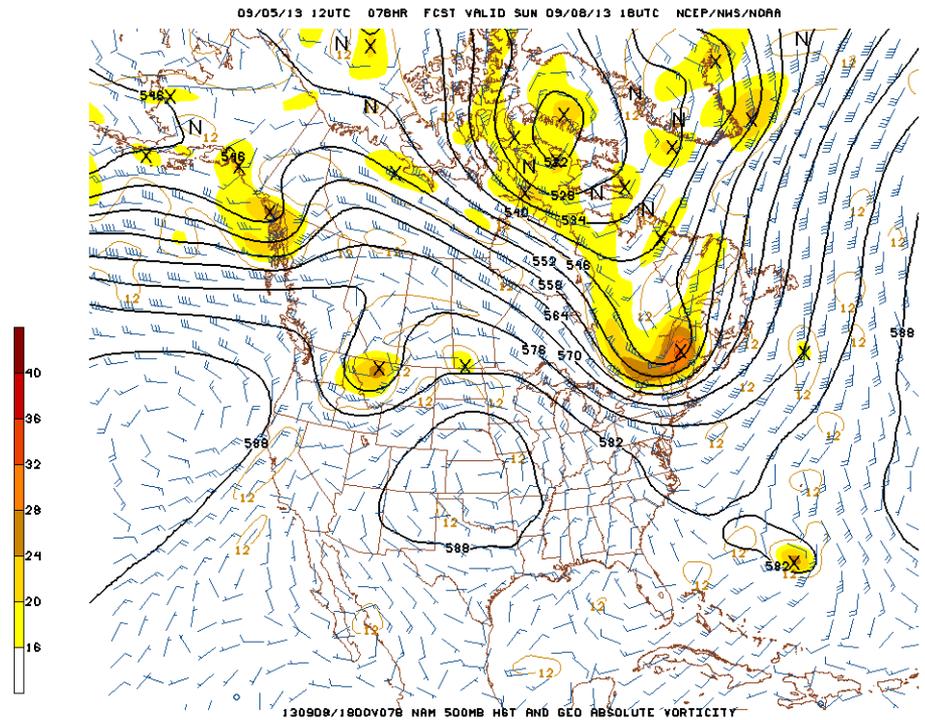
Model Info: V3.3 No Cu YSU PBL Thompson Noah LSM 3.0 km, 37 levels, 18 sec
LW: RRTM SW: Dudhia DIFF: simple KM: ED Smagor

Sunday: More drying in the mid and upper levels.

1 PM CDT
850 mb RH



500 mb vorticity



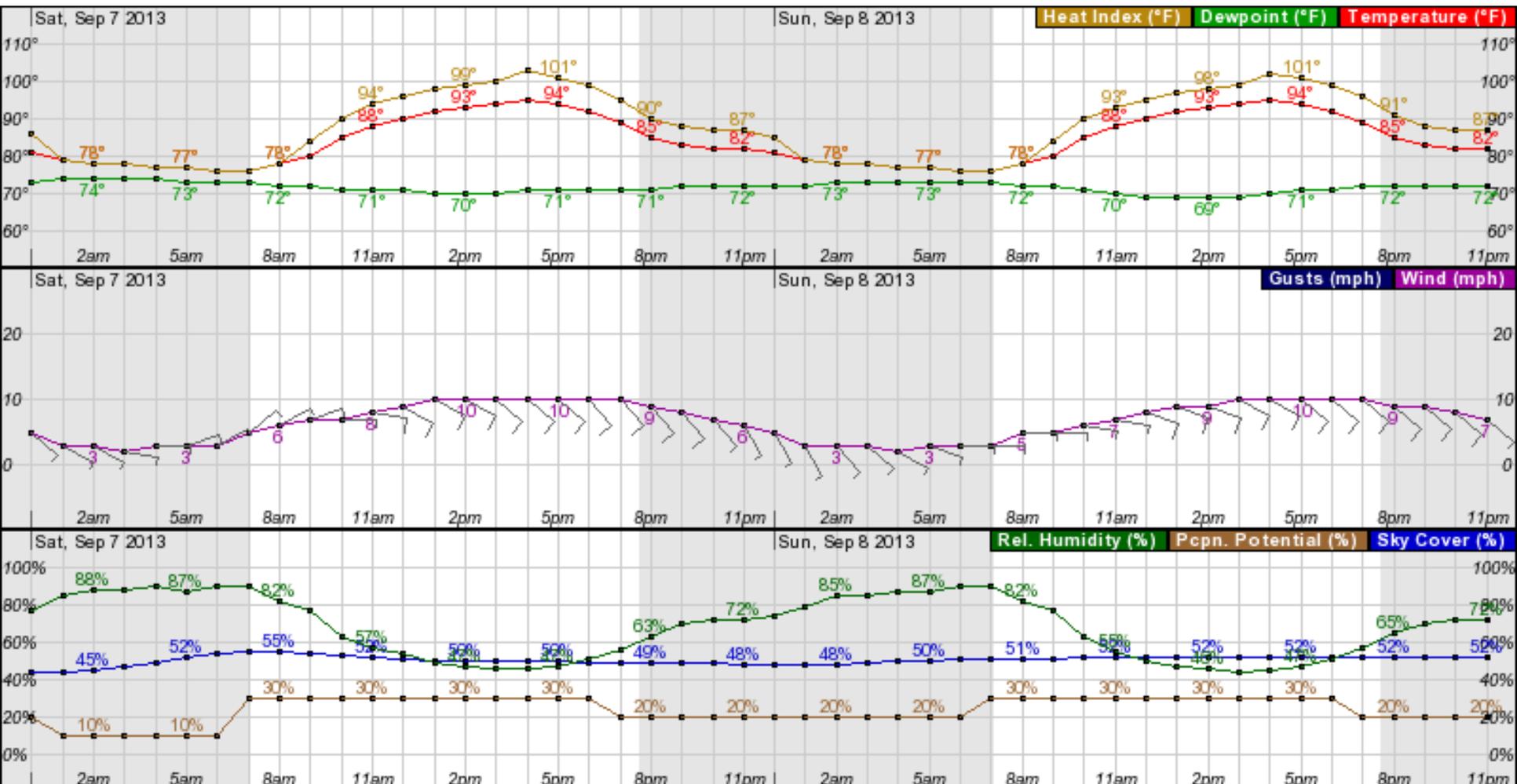
Houston Hobby

Saturday: Cloud cover around 50%

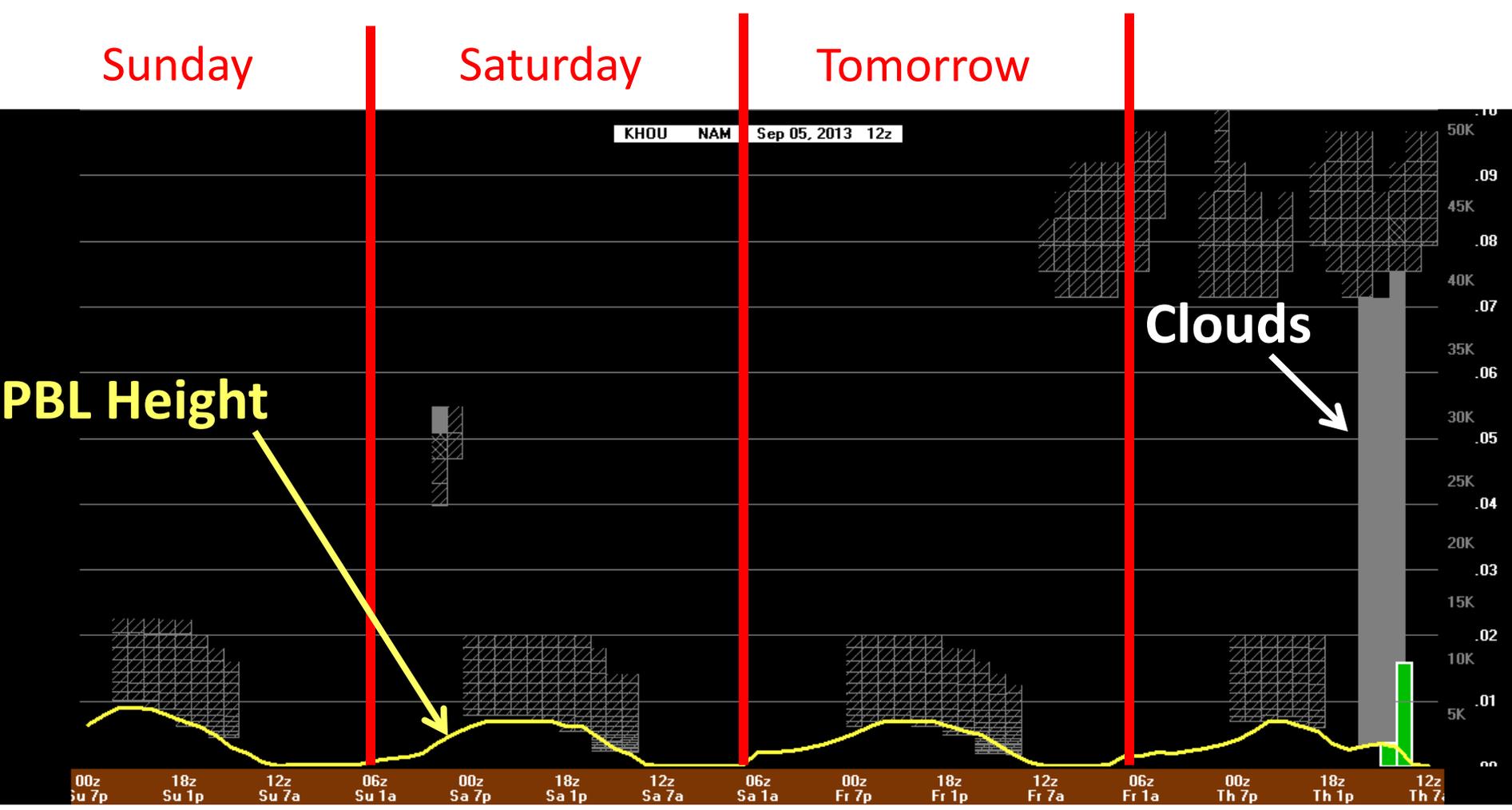
Sunday: Cloud cover around 50%

Saturday →

Sunday →



Houston Hobby; BUFKIT – NAM (12 UTC 5 September)

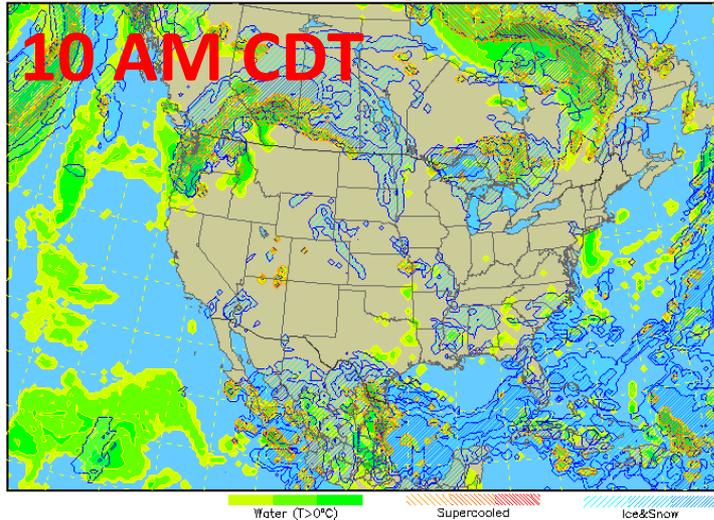


- Tomorrow: Partly cloudy.
- Saturday: Partly cloudy.
- Sunday: Partly cloudy.

Tomorrow: NAM – low level clouds

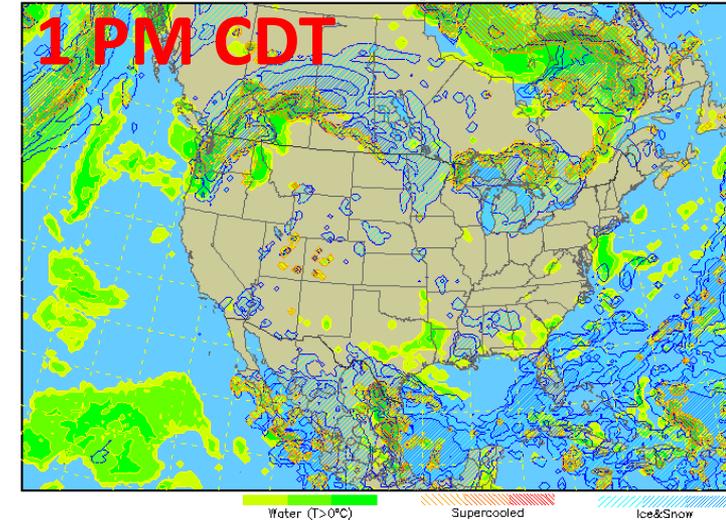
Integrated liquid and frozen hydrometeors (all levels)

27-hour forecast valid 1500 UTC Fri 06 Sep 2013 NAM (WRF-NMM) (12z 05 Sep)



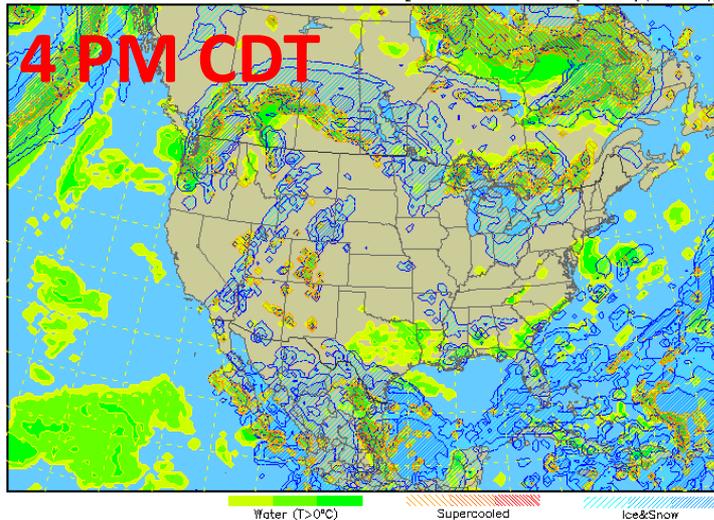
Integrated liquid and frozen hydrometeors (all levels)

30-hour forecast valid 1800 UTC Fri 06 Sep 2013 NAM (WRF-NMM) (12z 05 Sep)



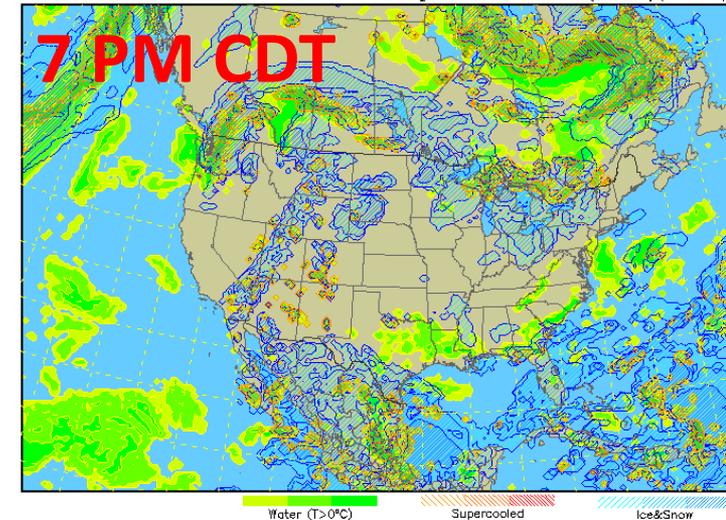
Integrated liquid and frozen hydrometeors (all levels)

33-hour forecast valid 2100 UTC Fri 06 Sep 2013 NAM (WRF-NMM) (12z 05 Sep)



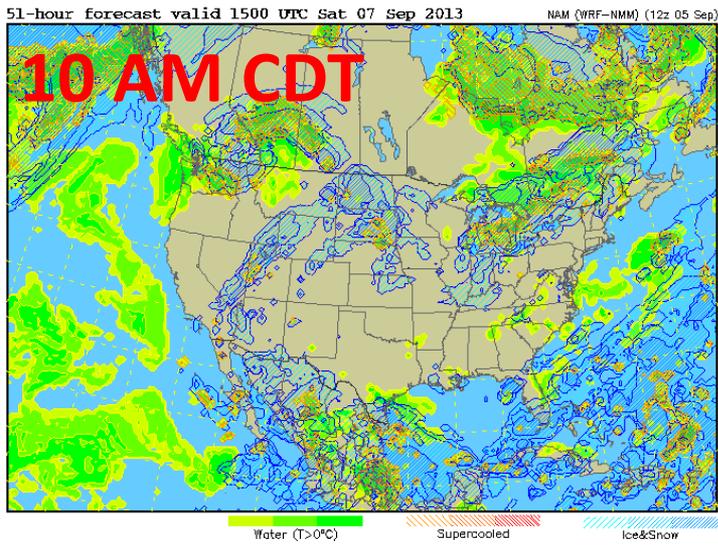
Integrated liquid and frozen hydrometeors (all levels)

36-hour forecast valid 0000 UTC Sat 07 Sep 2013 NAM (WRF-NMM) (12z 05 Sep)

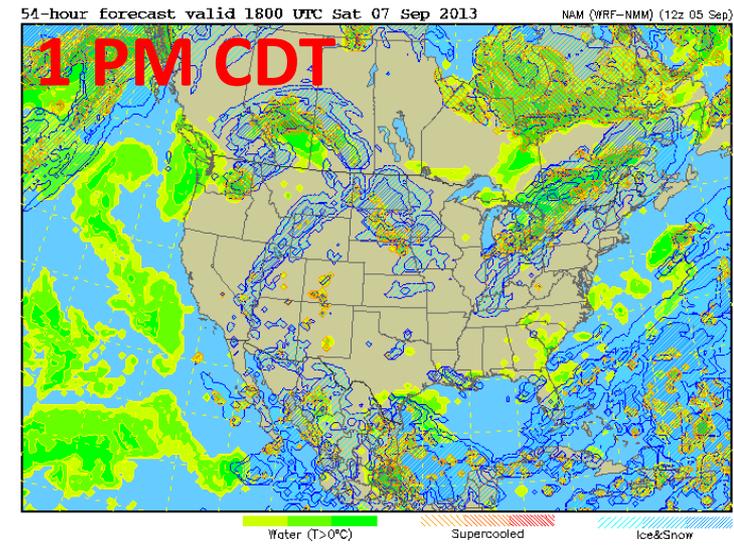


Saturday: NAM – a few low and high level clouds in the afternoon

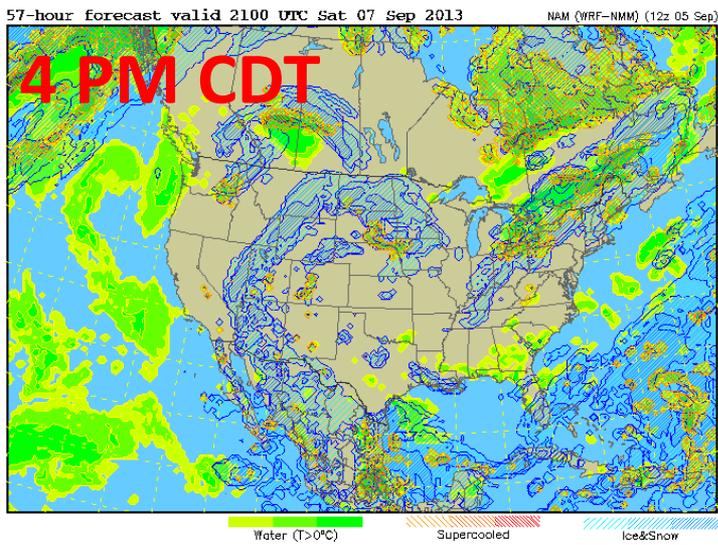
Integrated liquid and frozen hydrometeors (all levels)



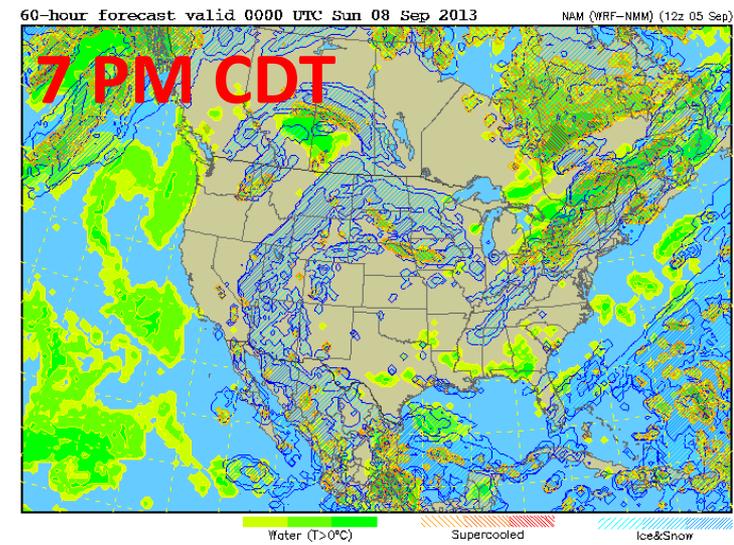
Integrated liquid and frozen hydrometeors (all levels)



Integrated liquid and frozen hydrometeors (all levels)



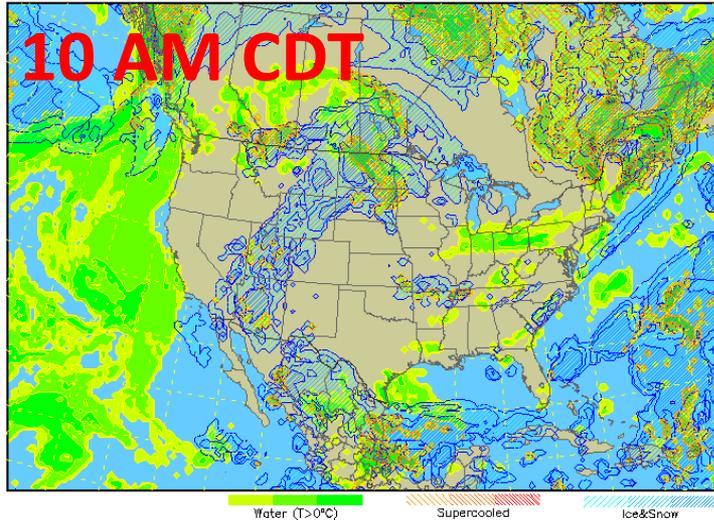
Integrated liquid and frozen hydrometeors (all levels)



Sunday: NAM – clear; low level clouds north and south of our region

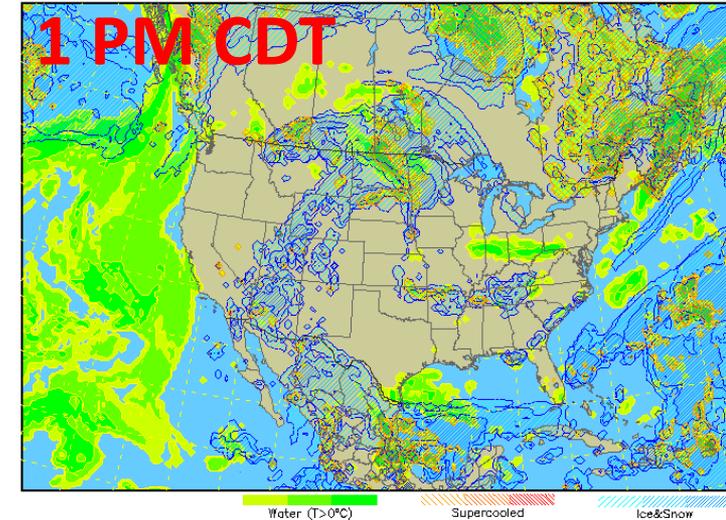
Integrated liquid and frozen hydrometeors (all levels)

75-hour forecast valid 1500 UTC Sun 08 Sep 2013 NAM (WRF-NMM) (12z 05 Sep)



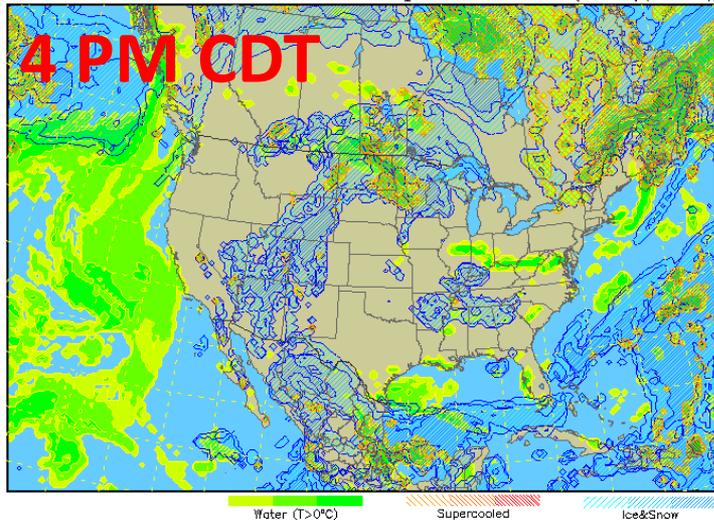
Integrated liquid and frozen hydrometeors (all levels)

78-hour forecast valid 1800 UTC Sun 08 Sep 2013 NAM (WRF-NMM) (12z 05 Sep)



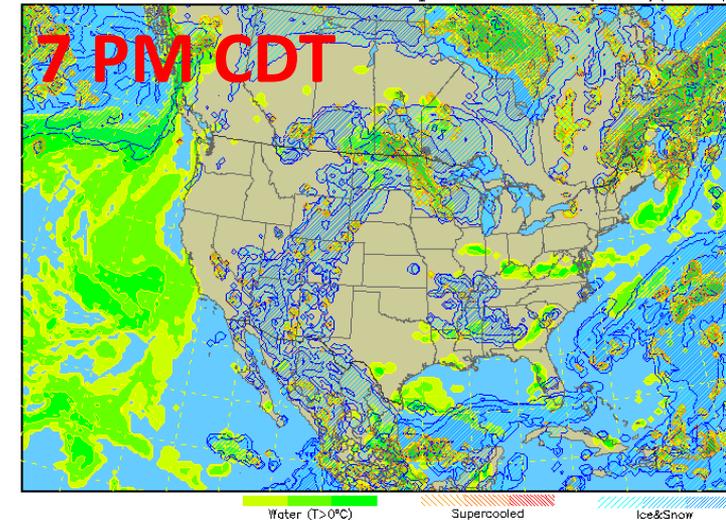
Integrated liquid and frozen hydrometeors (all levels)

81-hour forecast valid 2100 UTC Sun 08 Sep 2013 NAM (WRF-NMM) (12z 05 Sep)



Integrated liquid and frozen hydrometeors (all levels)

84-hour forecast valid 0000 UTC Mon 09 Sep 2013 NAM (WRF-NMM) (12z 05 Sep)



Recommendations

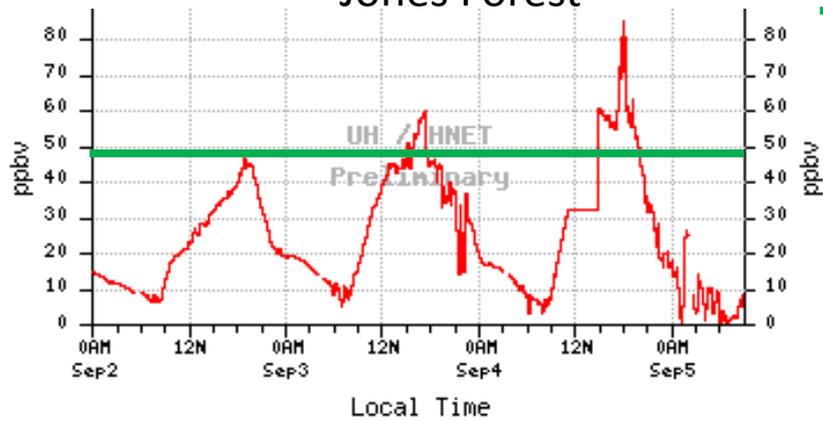
- Tomorrow: Possible flight day.
- Saturday: Cloudier due to shortwave trough moving into Texas.
- Sunday: Possible flight day.

DISCOVER-AQ Air Quality Outlook
Sept. 5, 2013

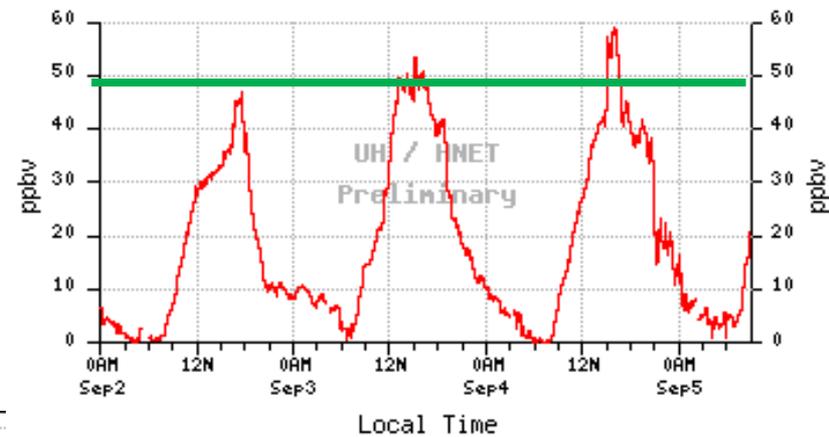
Ken Pickering

Bob Chatfield

Jones Forest

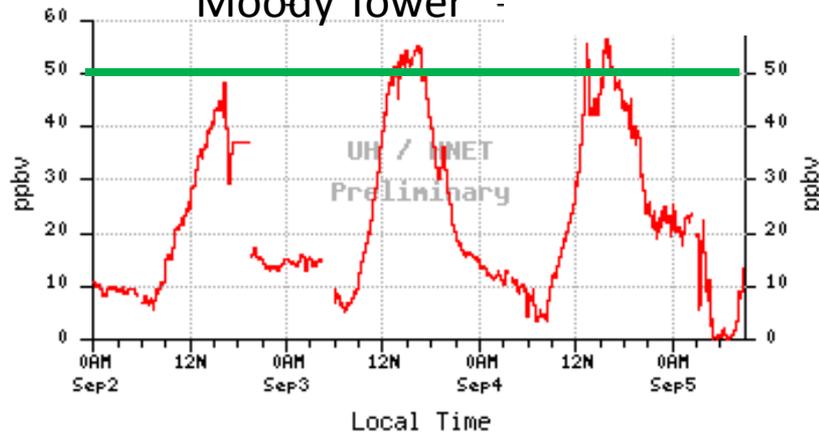


West Liberty



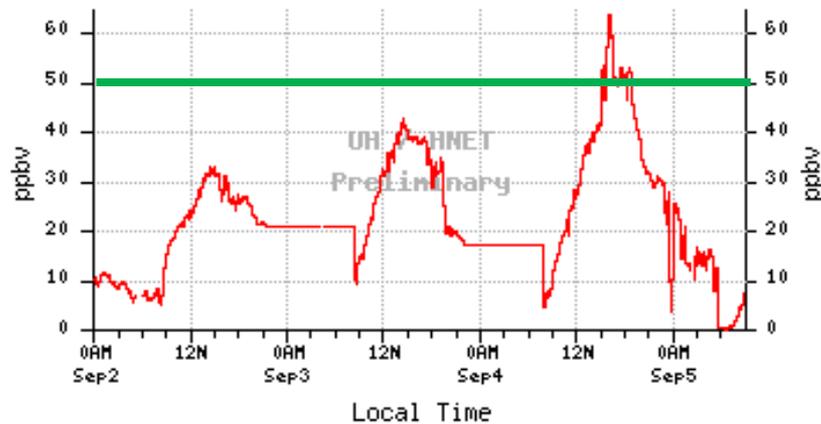
Ozone (ppbv)
Sep. 2nd – Sept. 5th

Moody Tower

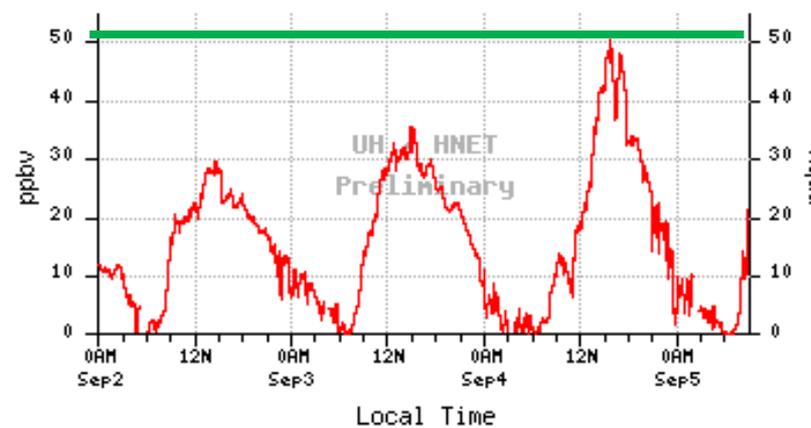


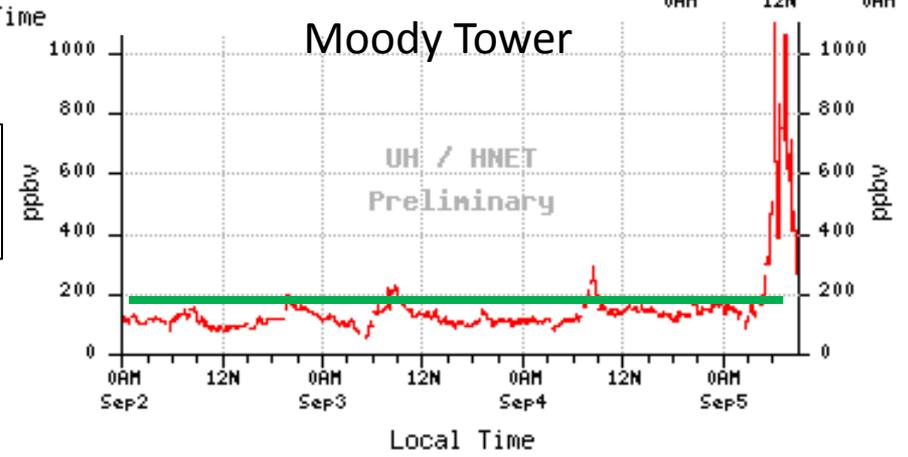
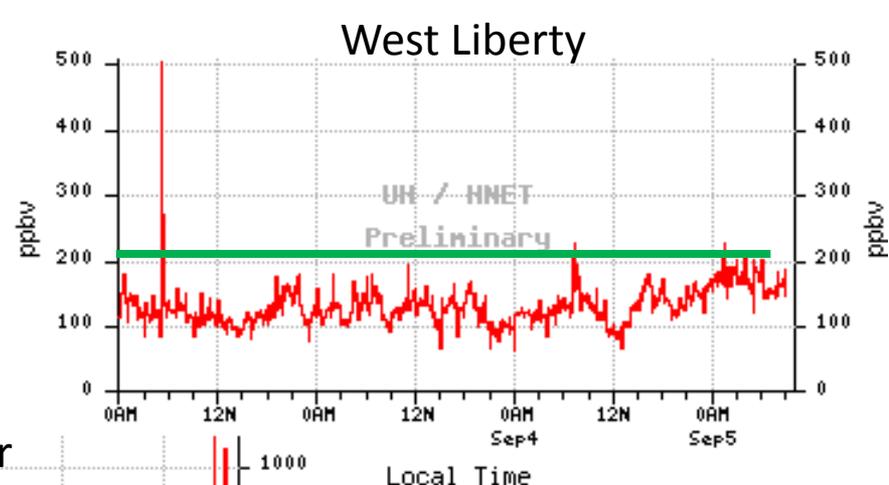
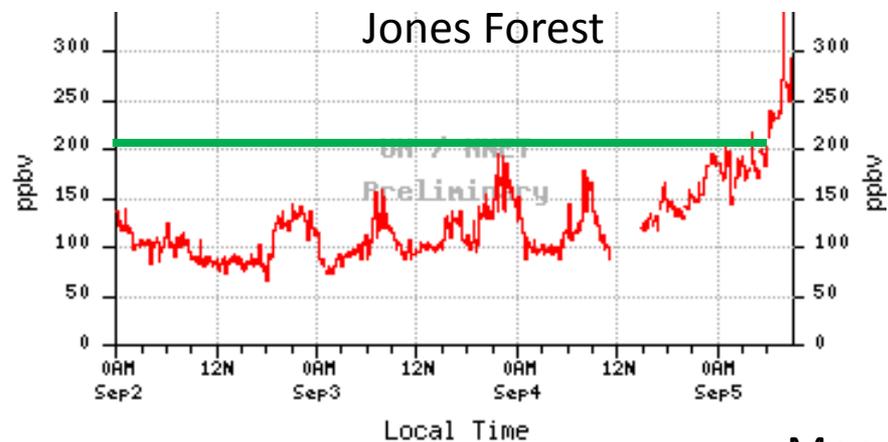
**Houston – Network of
Environmental Towers
(H-NET)**

Sugar Land

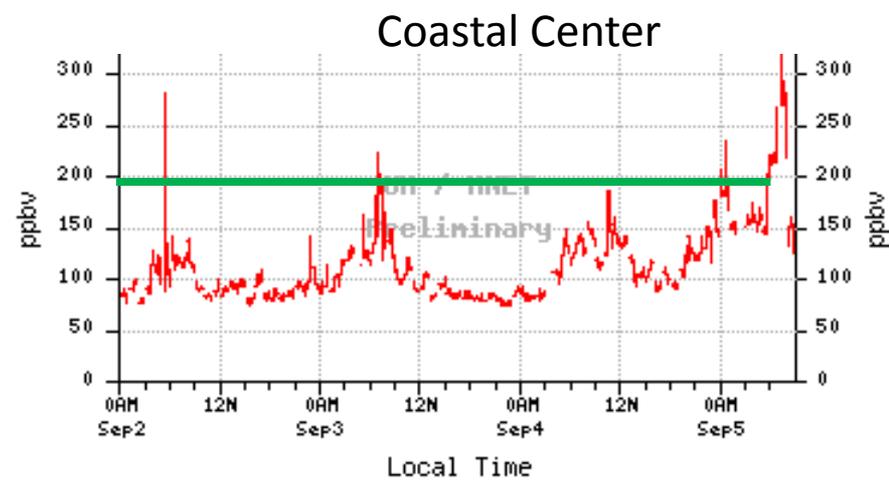
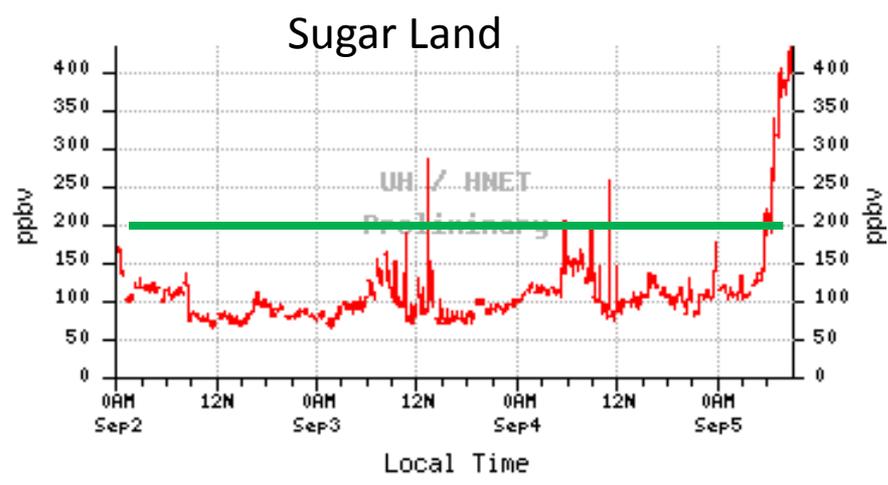


Coastal Center

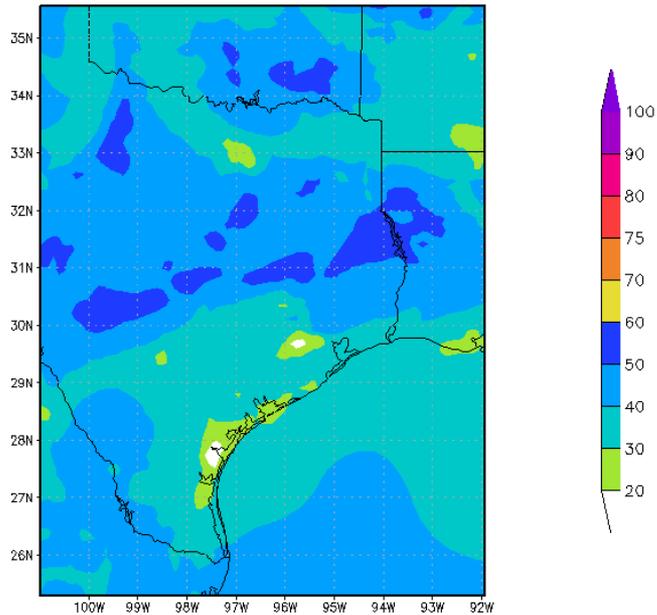




Houston – Network of Environmental Towers (H-NET)

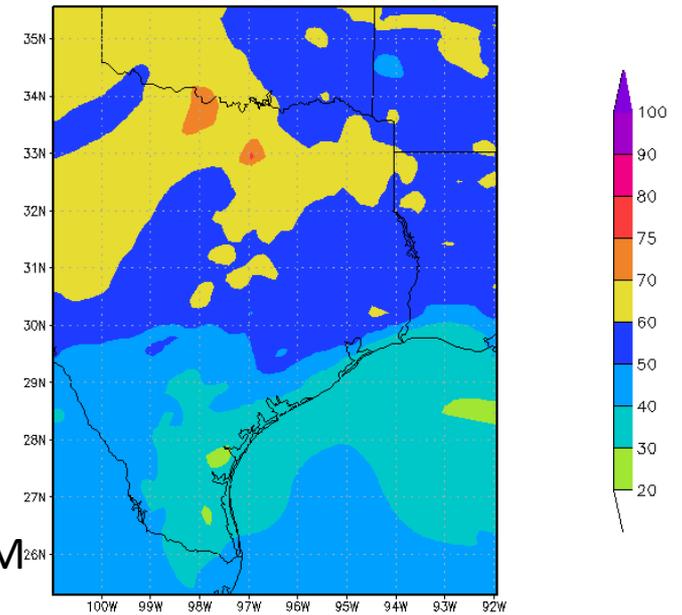


O3 [ppb] at 1013 [hPa] Valid 14Z SEP 06 2013



9 AM

O3 [ppb] at 1013 [hPa] Valid 17Z SEP 06 2013



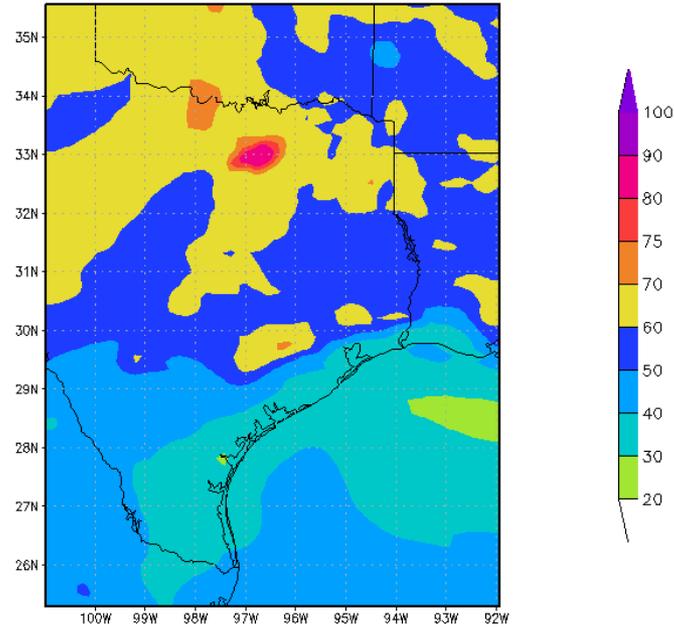
12 PM

NOAA/ARL
Experim.
CMAQ

GRADS: COLA/IGES

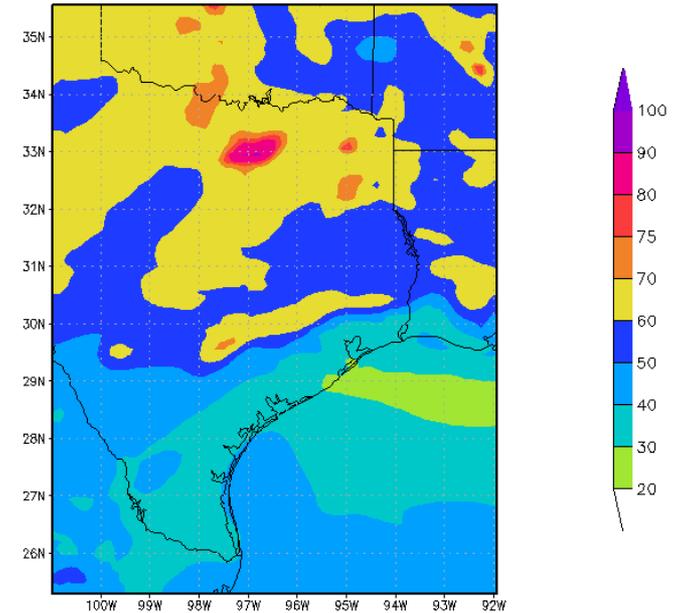
GRADS: COLA/IGES

O3 [ppb] at 1013 [hPa] Valid 19Z SEP 06 2013



2 PM

O3 [ppb] at 1013 [hPa] Valid 22Z SEP 06 2013

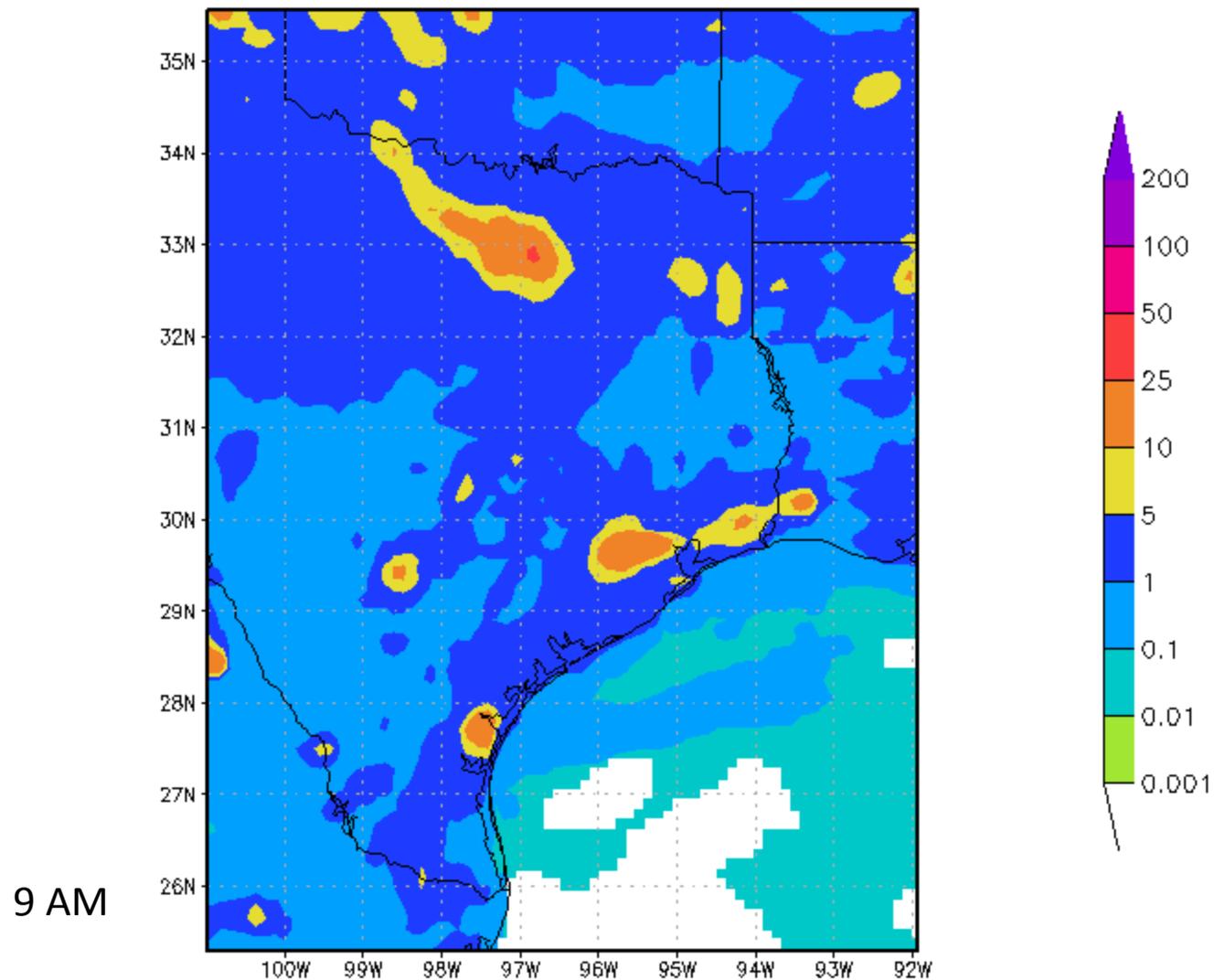


5 PM

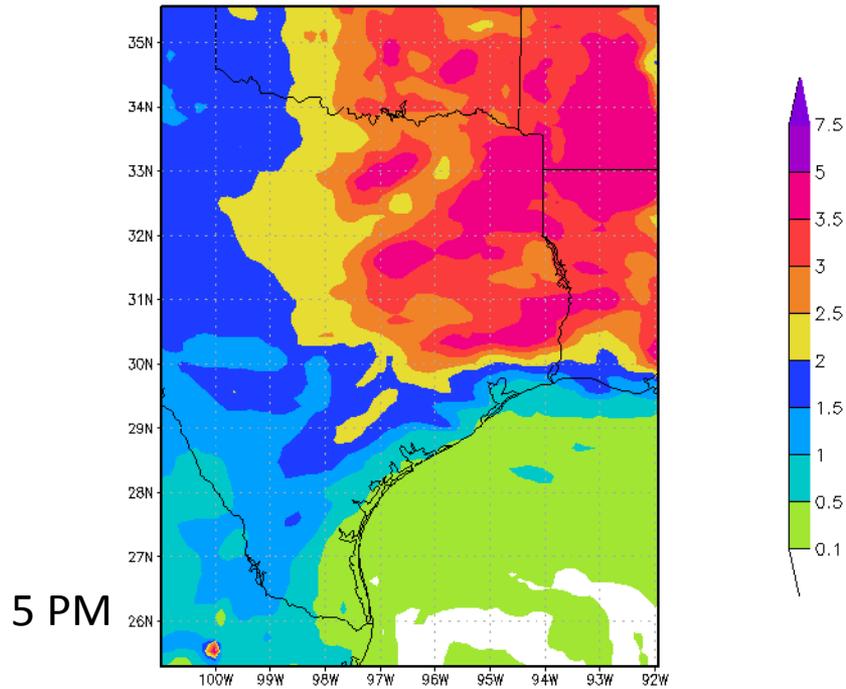
GRADS: COLA/IGES

GRADS: COLA/IGES

NO2 [ppb] at 1013 [hPa] Valid 14Z SEP 06 2013

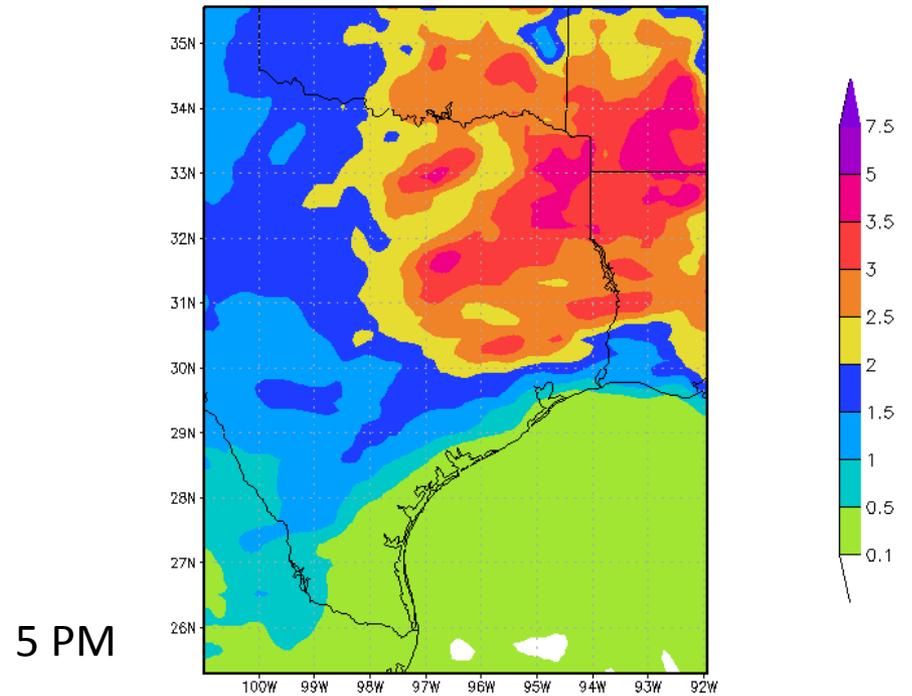


FORM [ppb] at 1013 [hPa] Valid 22Z SEP 06 2013



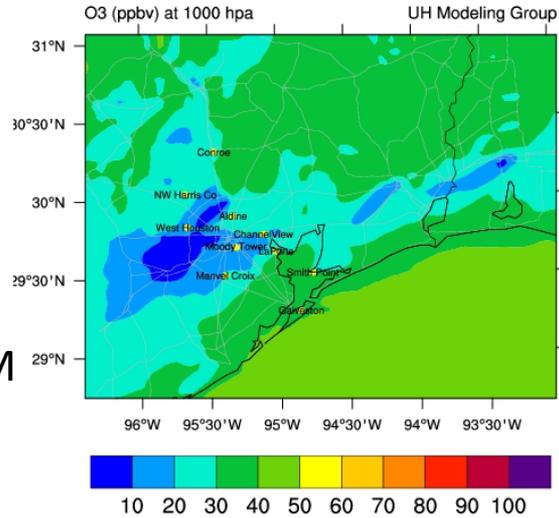
GrADS: COLA/IGES

λ [ppb] at 850 [hPa] Valid 22Z SEP 06 2013

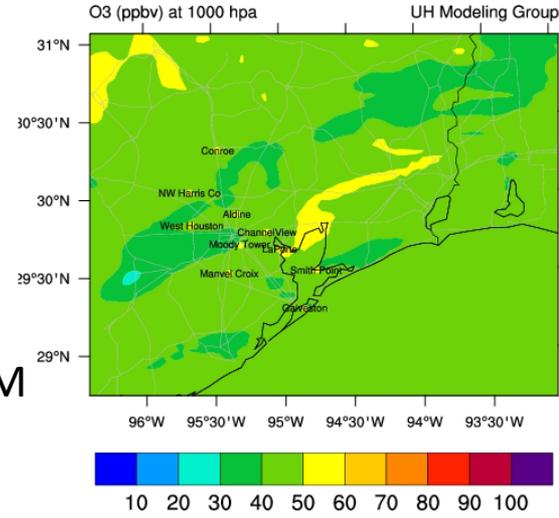


GrADS: COLA/IGES

CMAQ 20130906_14:00:00Z

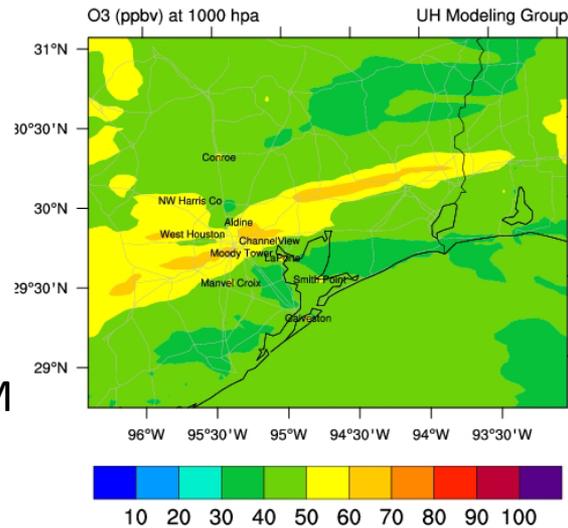


CMAQ 20130906_17:00:00Z

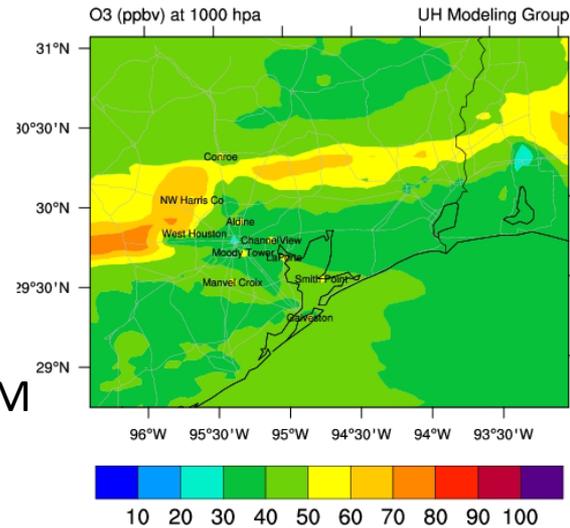


Univ. of Houston CMAQ

CMAQ 20130906_19:00:00Z

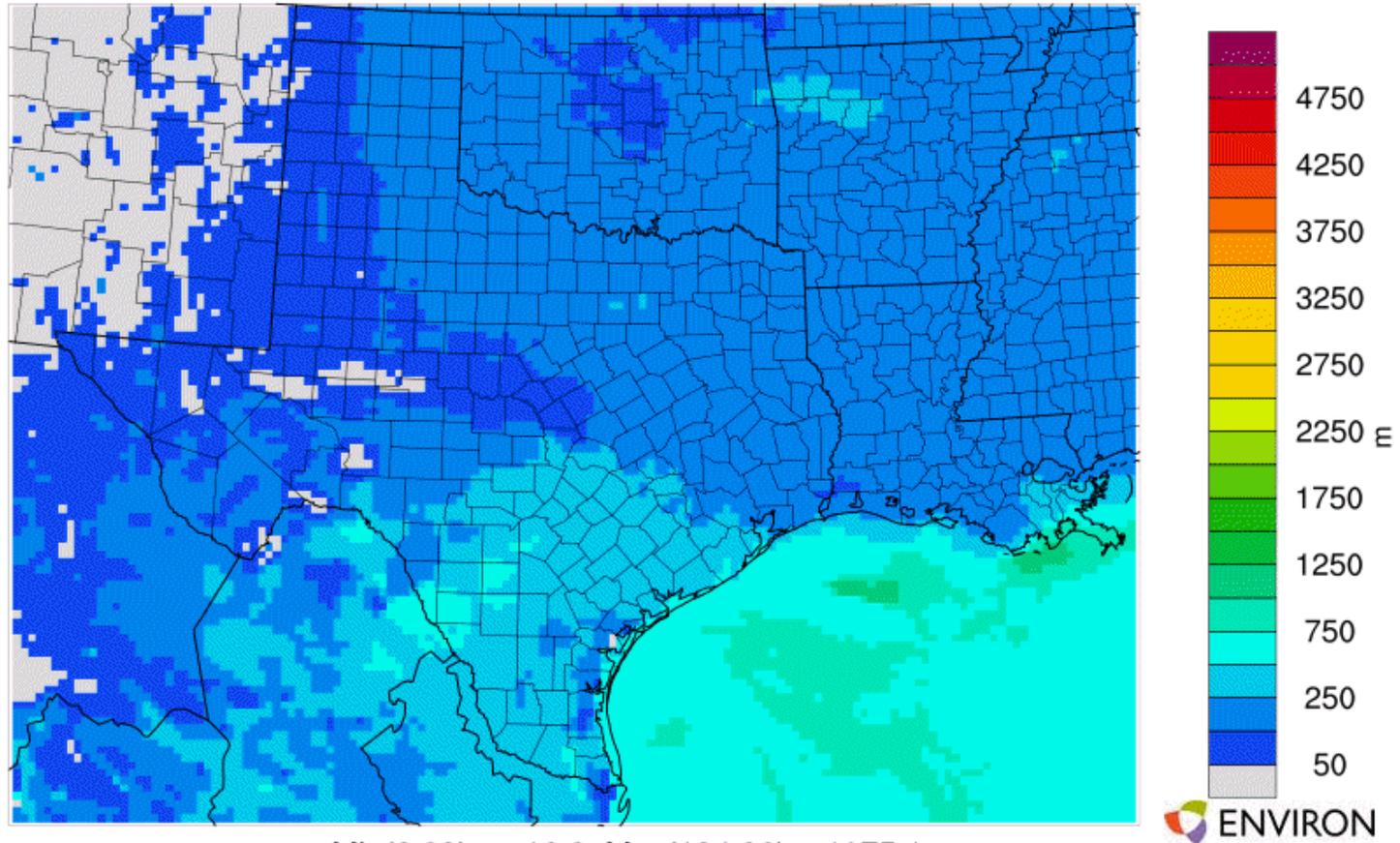


CMAQ 20130906_22:00:00Z



PBL Height

Texas 12km



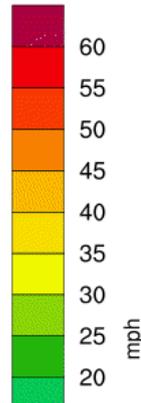
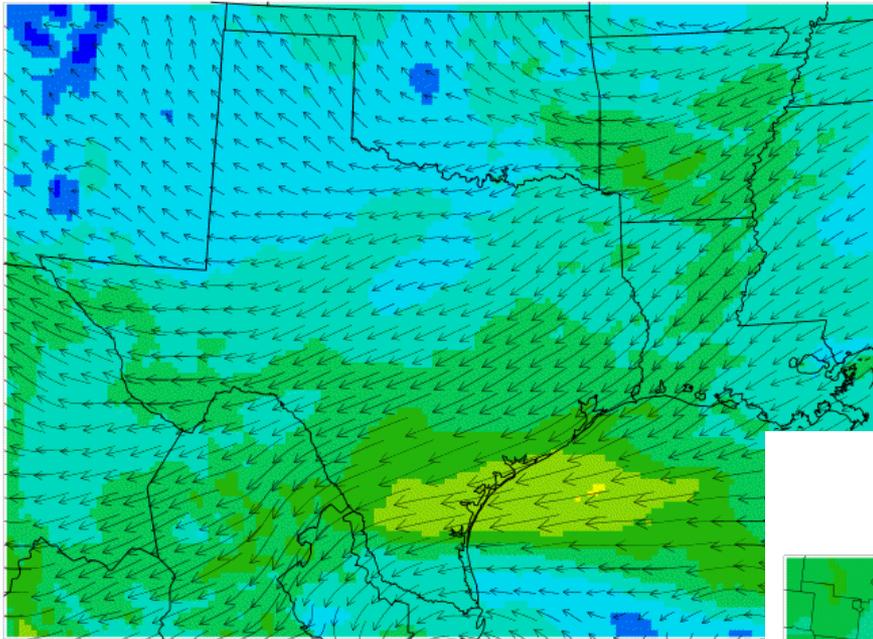
Min(2,93) = 16.2, Max(134,36) = 1075.1

Fri September 6 08:00 CST

2500-m PBL develops by noon on NW side of Houston; much shallower near coast

CAMx Layer 14 Winds

Texas 12km



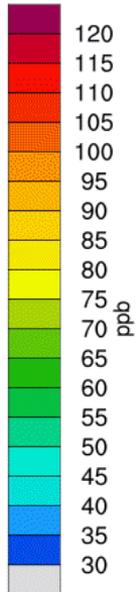
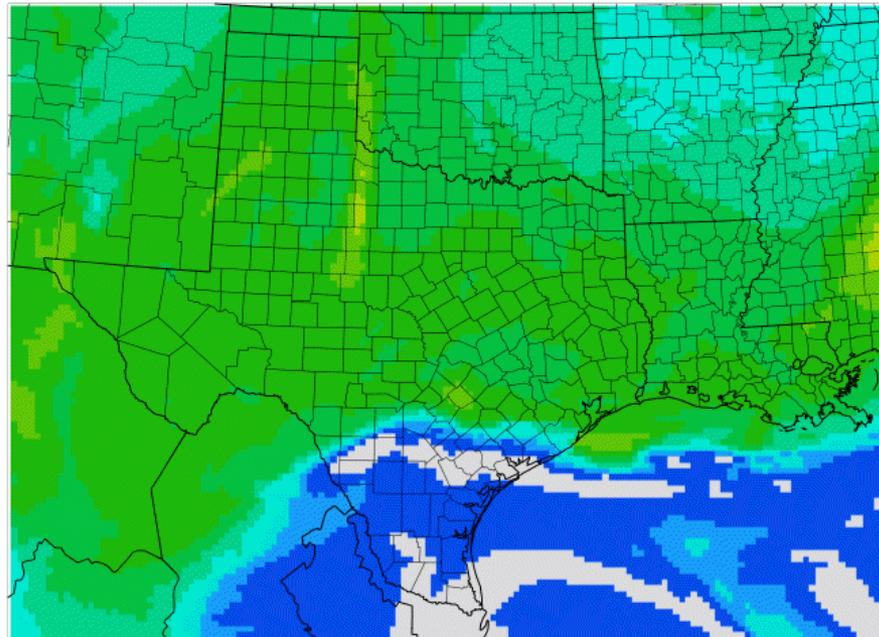
** TCEQ: WRF/CAMx Model suggests low ozone production in diluted plume*

Min(11,109) = 0.3, Max(101,26) = 30.4

Fri September 6 08:00 CST

Ozone

Best Case: CAMx Layer 14

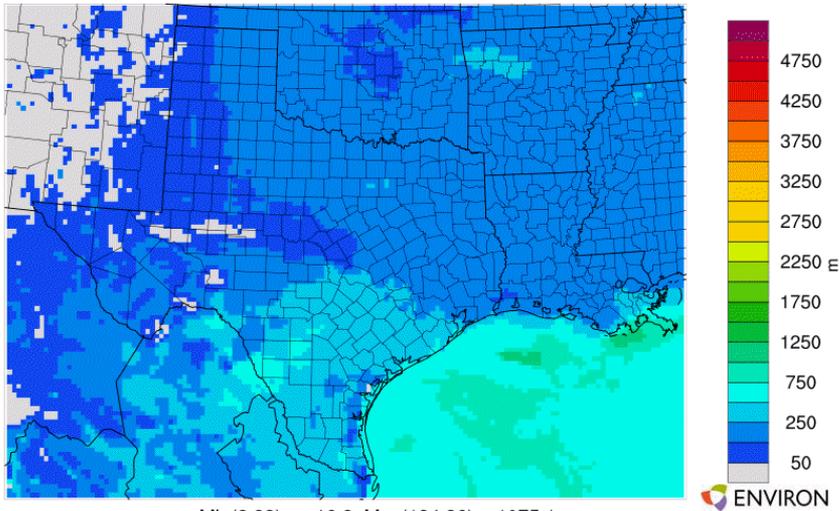


Min(81,8) = 24.5, Max(148,68) = 71.8

Fri September 6 08:00 CST

PBL Height

Texas 12km



Min(2,93) = 16.2, Max(134,36) = 1075.1

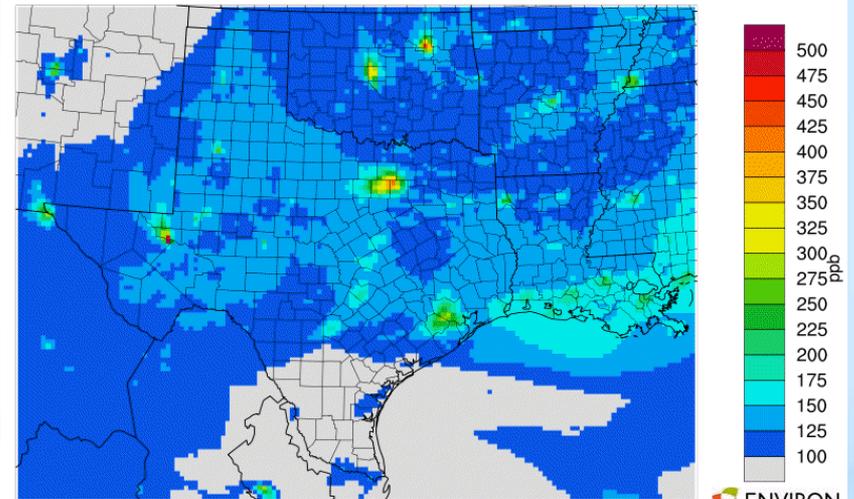
Fri September 6 08:00 CST

Near Surface Analyses

Rapid low-altitude transport
off the coast

CO

Best Case

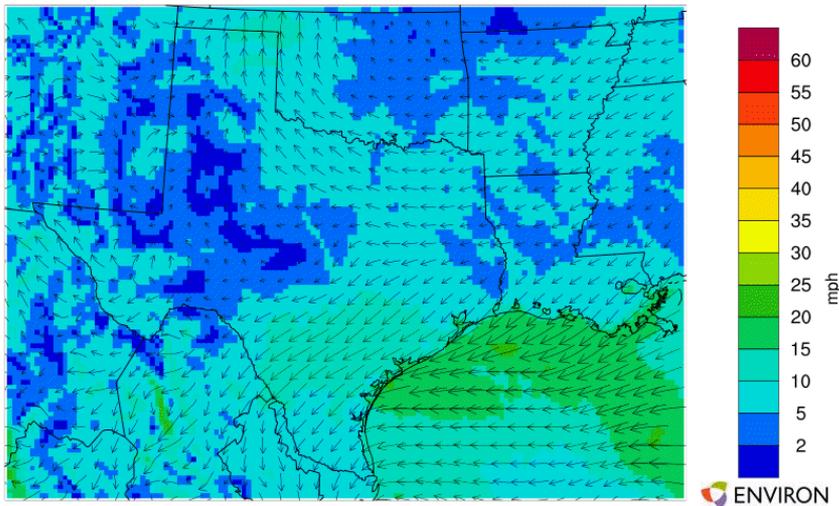


Min(37,109) = 81.5, Max(34,58) = 829.8

Fri September 6 08:00 CST

10-m Winds

Texas 12km



Min(31,58) = 0.0, Max(35,22) = 24.1

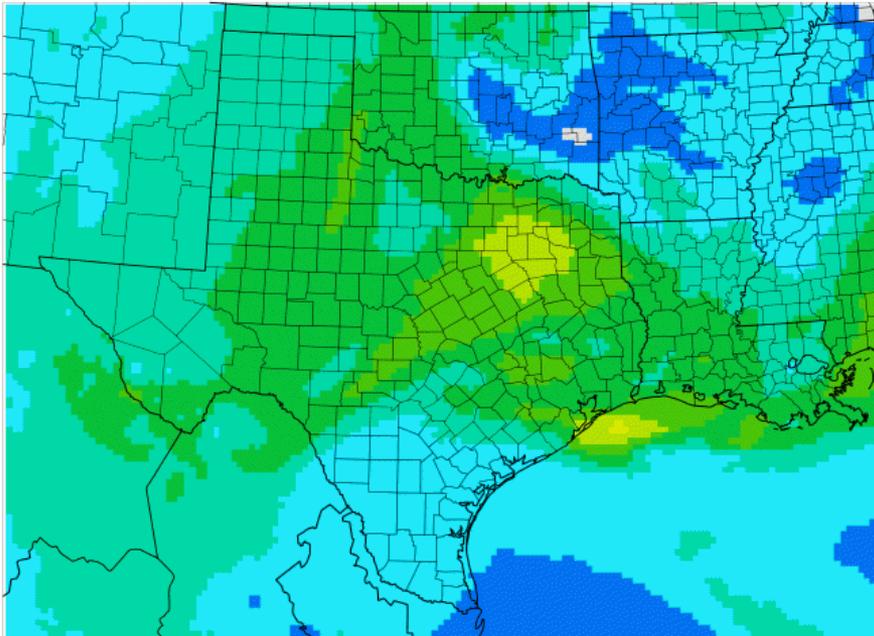
Fri September 6 08:00 CST

10
→
mph

* *TCEQ: WRF Model suggests strong winds enough dilute Houston plume but some Louisiana VOCs offshore, affecting Galveston*

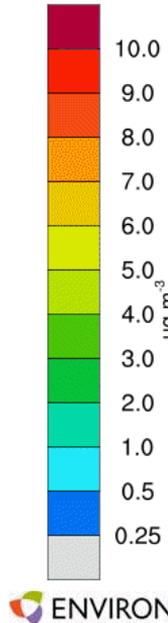
Formaldehyde

Best Case: CAMx Layer 14



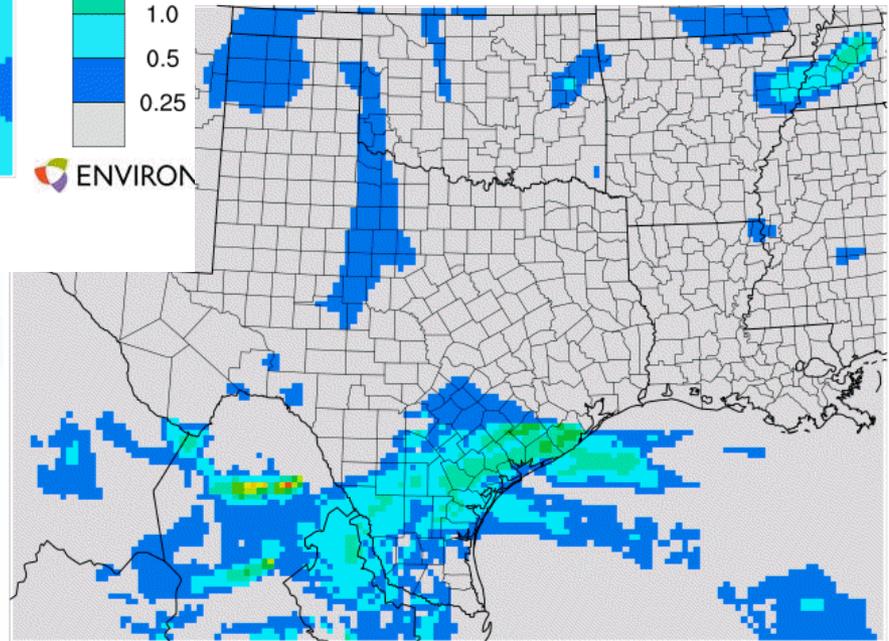
Min(146,109) = 0.2, Max(105,37) = 5.1

Fri September 6 08:00 CST



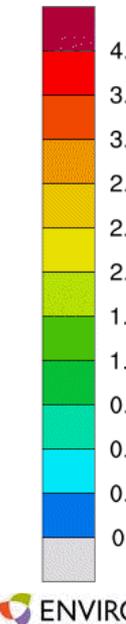
NO₂

Best Case: CAMx Layer 14



Min(109,103) = 0.0, Max(48,28) = 3.5

Fri September 6 08:00 CST



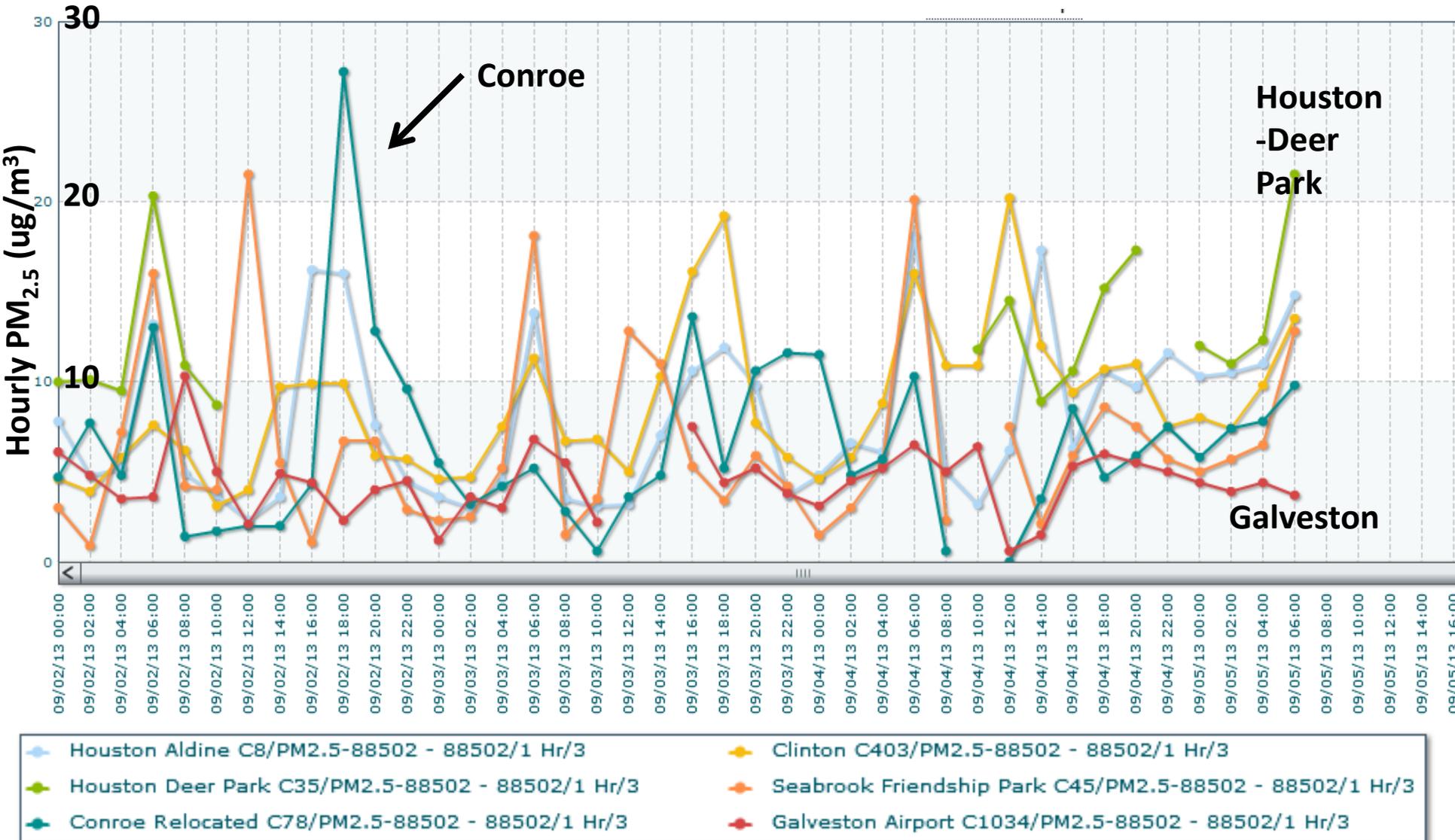


Moderate surface ozone levels (Code Yellow) expected
Thurs., Fri., Sat., Sun.

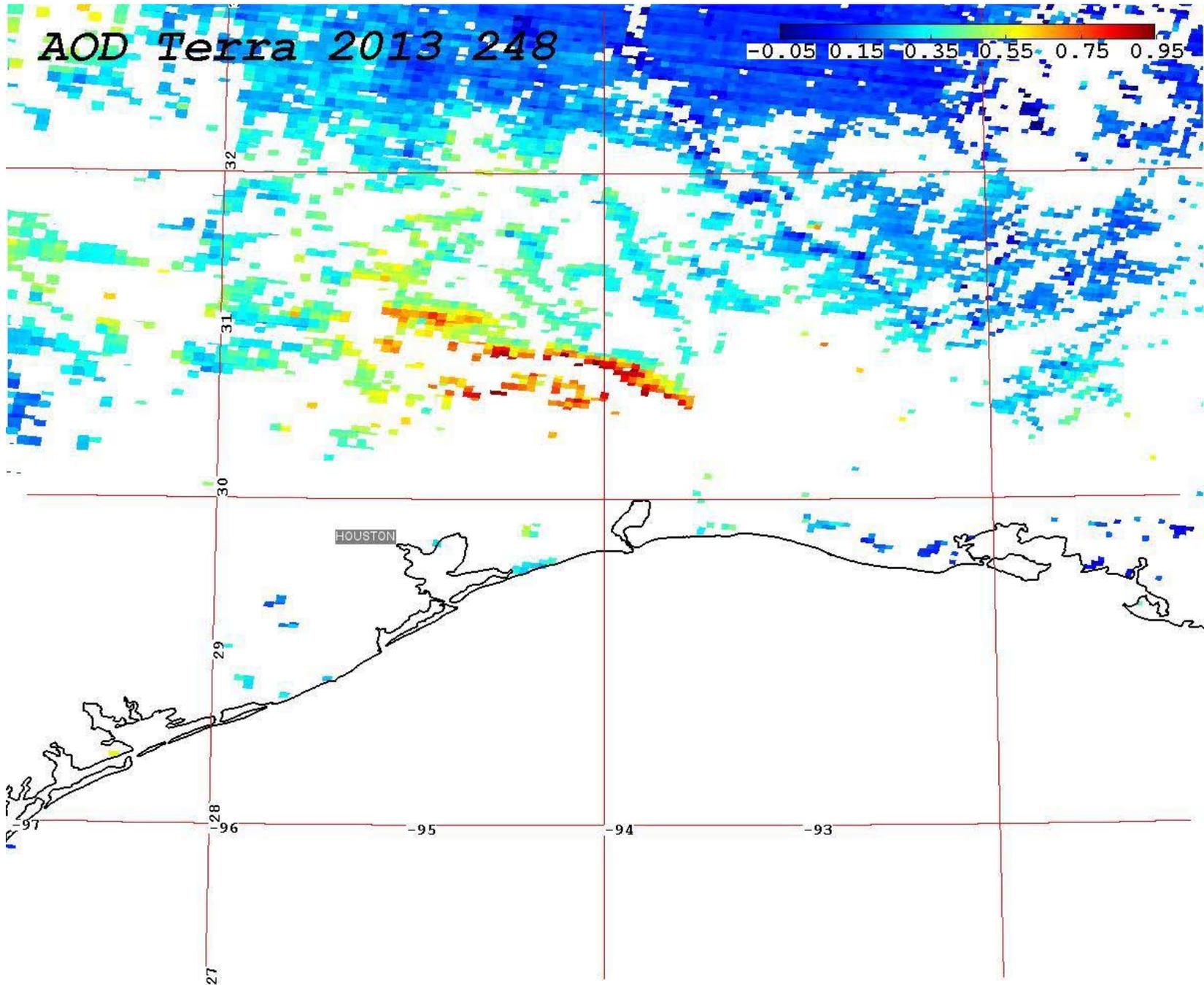
Maximum values expected to the northwest of the city due to combination
of easterly large-scale flow and southeasterly sea breeze

Hourly PM_{2.5} (airnowtech.org)

Monday – Thursday morning (6am)

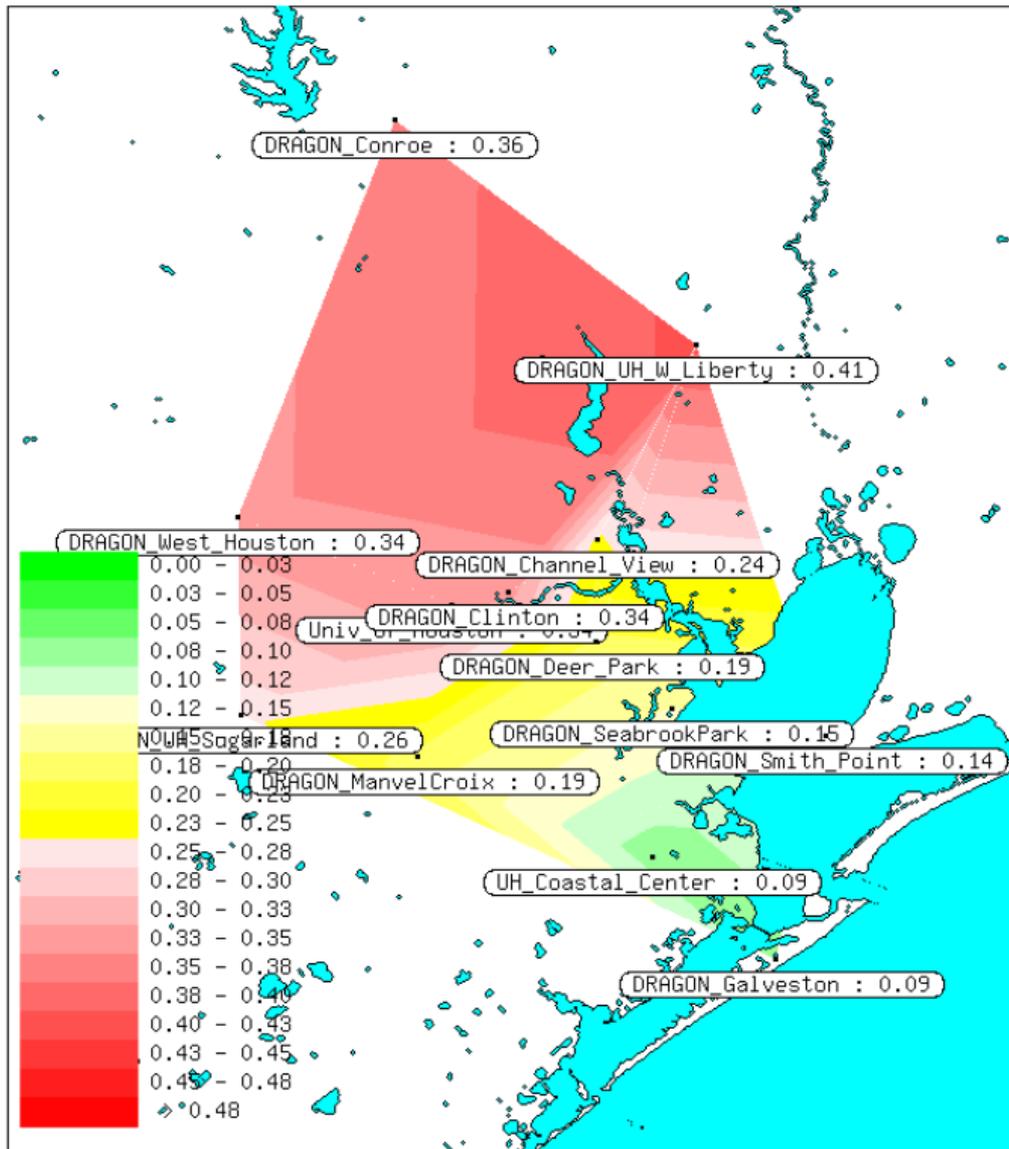


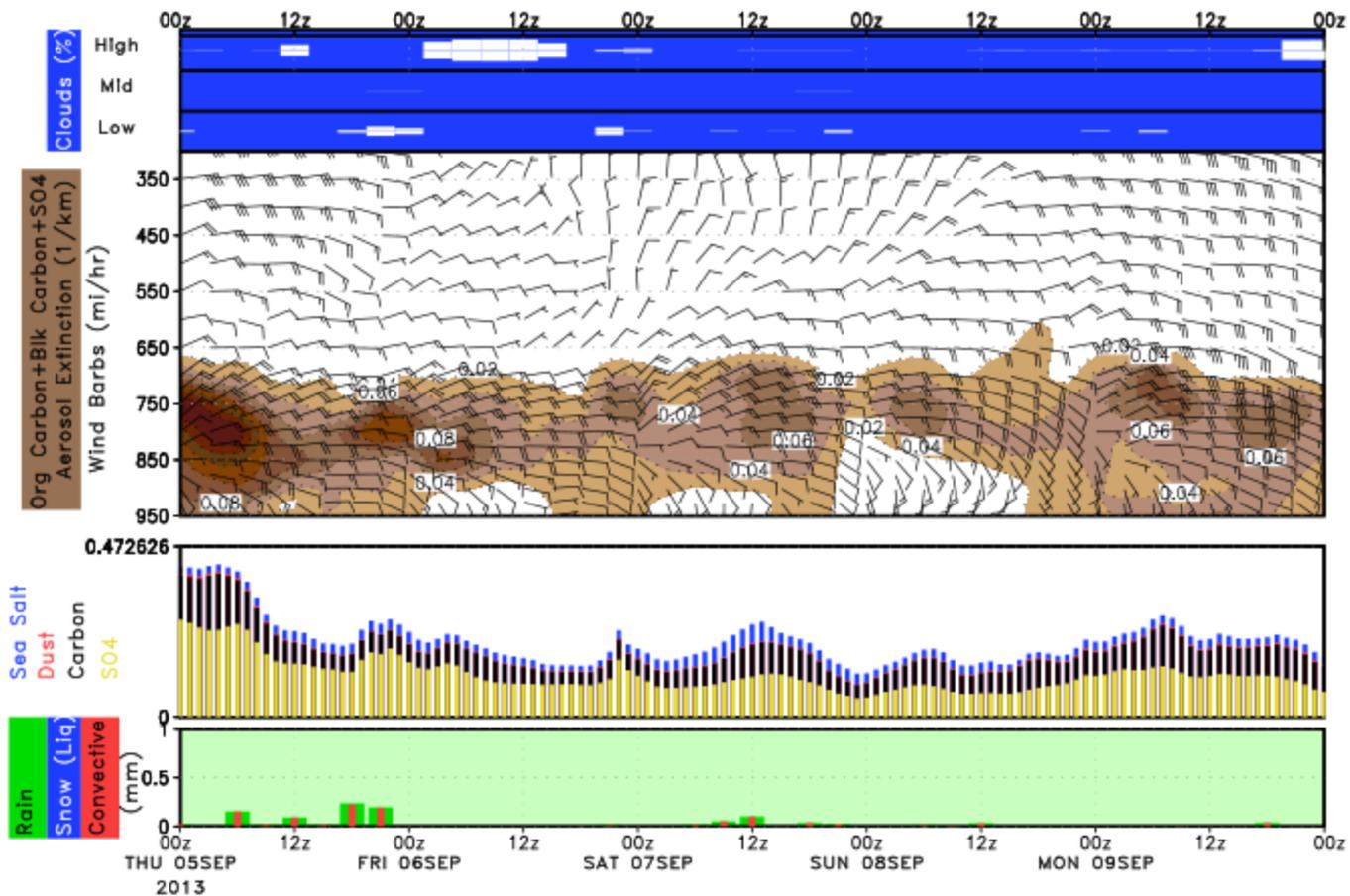
AOD Terra 2013 248



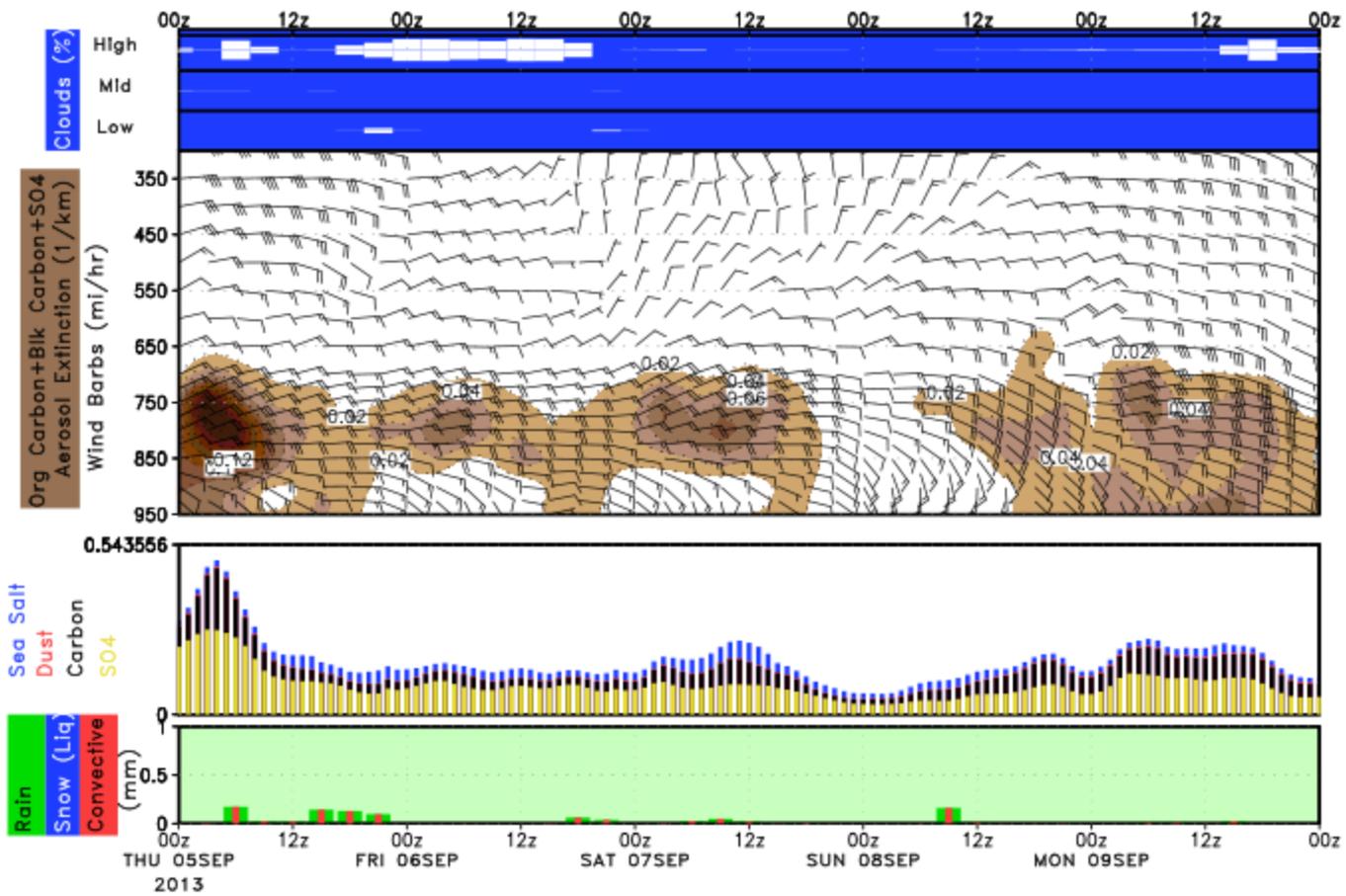
(N 30.5000, W 96.0000)

(N 30.5000, W 94.5000)



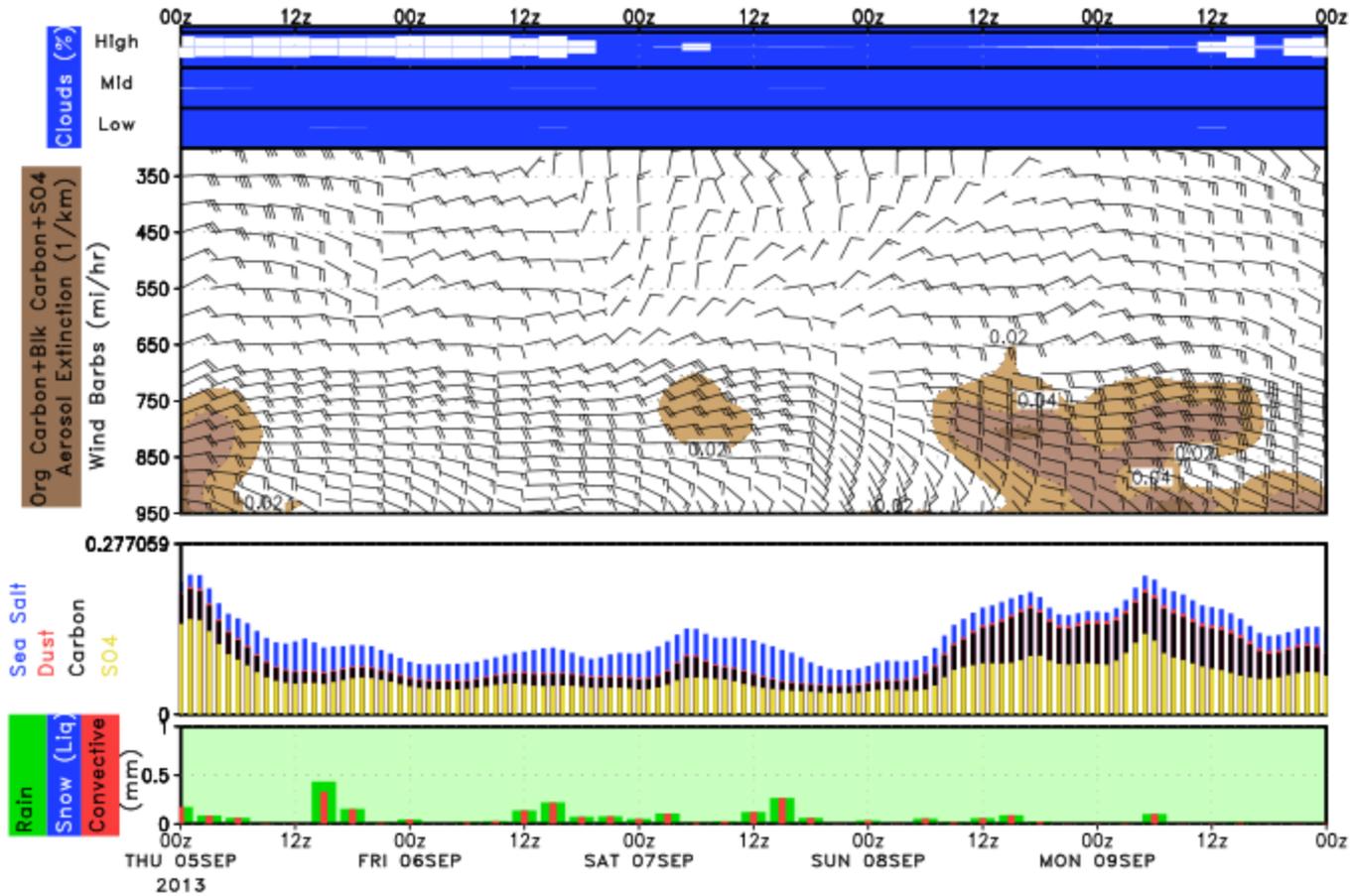


LAT = 30.3 , LON = -95.4, Location = Conroe, Fcst_init = 20130905



LAT = 29.8 , LON = -95.657, Location = WestHouston, Fcst_Init = 20130905

GEOS-5 Aerosol Forecast



LAT = 29.2 , LON = -94.8, Location = Galveston, Fcst_init = 20130905