

DISCOVER-AQ OUTLOOK -- September 13, 2013

Today: The P-3B and King Air flew today in the Houston region under typical fair weather conditions – fair weather Cu in the afternoon. Mid-level clouds interfered with the flight today for the northern portion of the area in the morning. There has been a modest buildup of ozone over the last few days, possibly peaking today under Code Orange. Highest values should be to the south and west (e.g., Sugarland) of the city.

Tomorrow's forecast is highly uncertain concerning clouds (i.e., the models diverge), but potentially interesting with pollution from agricultural fires in the south central US possibly reaching Houston at low altitudes. Ozone is expected to be lower than today, but PM could be higher.

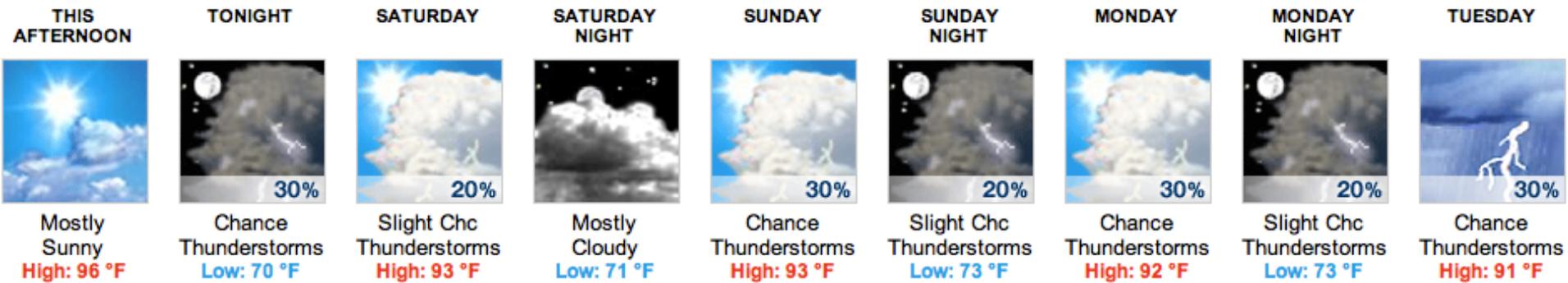
Sunday & beyond: TS Ingrid in the Bay of Campeche will likely send tropical moisture toward the Houston area. The models diverge on the development and path of Ingrid, but there will be the prospect of clouds and maybe some precipitation. Extensive high cloud should be over the area on Sunday and beyond.

9/13/2013 Weather Briefing

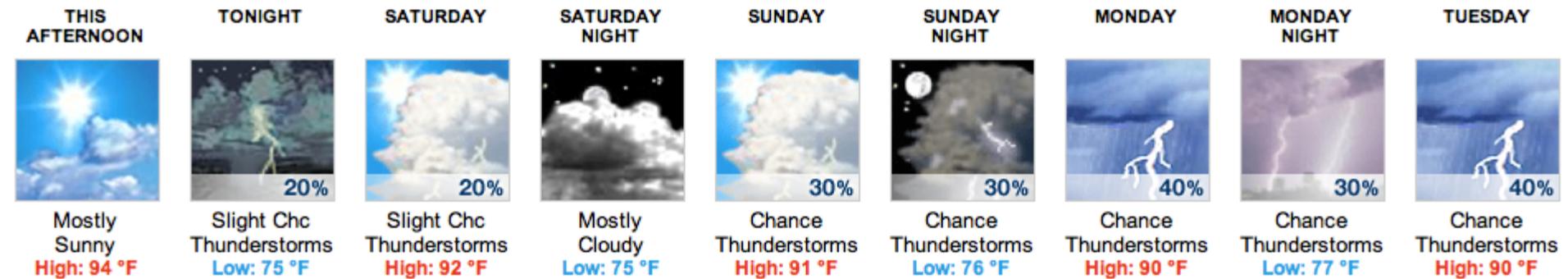
Clare Flynn

Ken Pickering

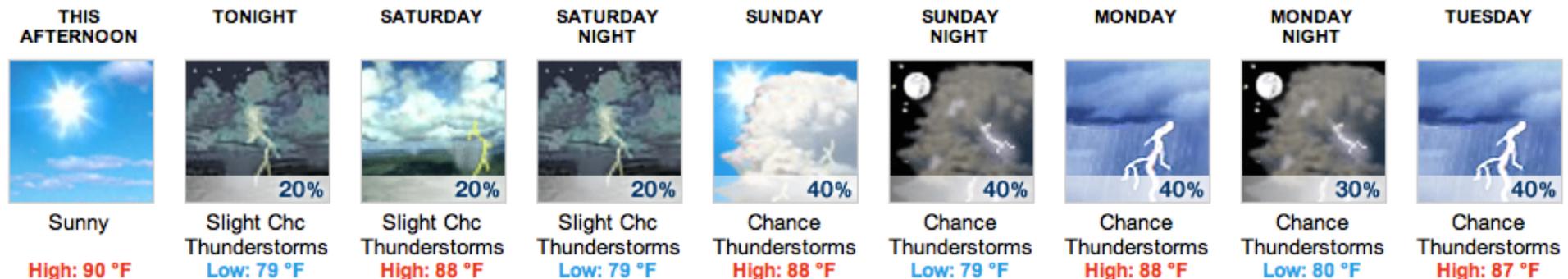
Conroe:



Houston Hobby:



Galveston:



Current Conditions

Galveston:



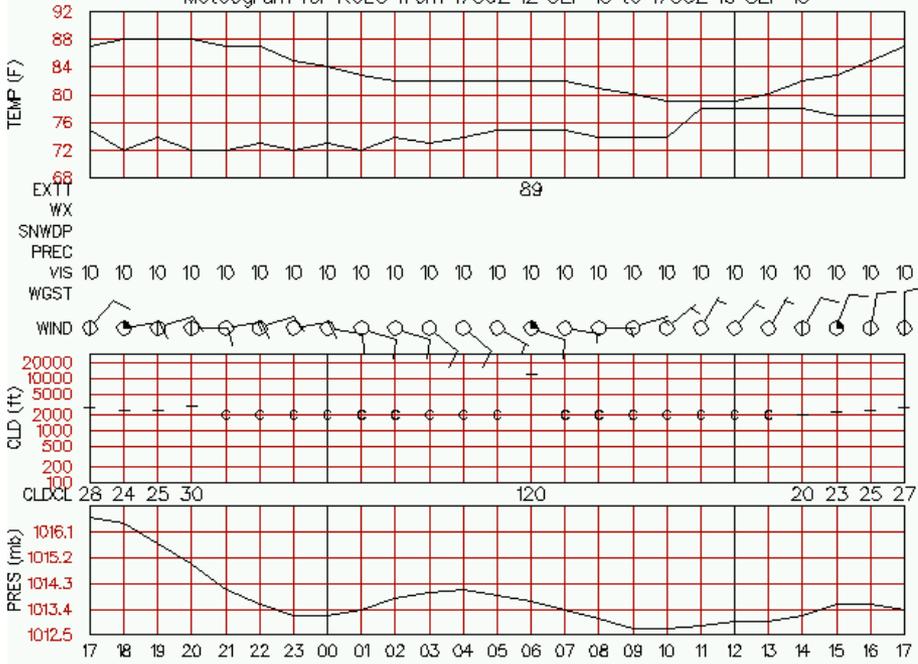
A Few Clouds
87°F
31°C

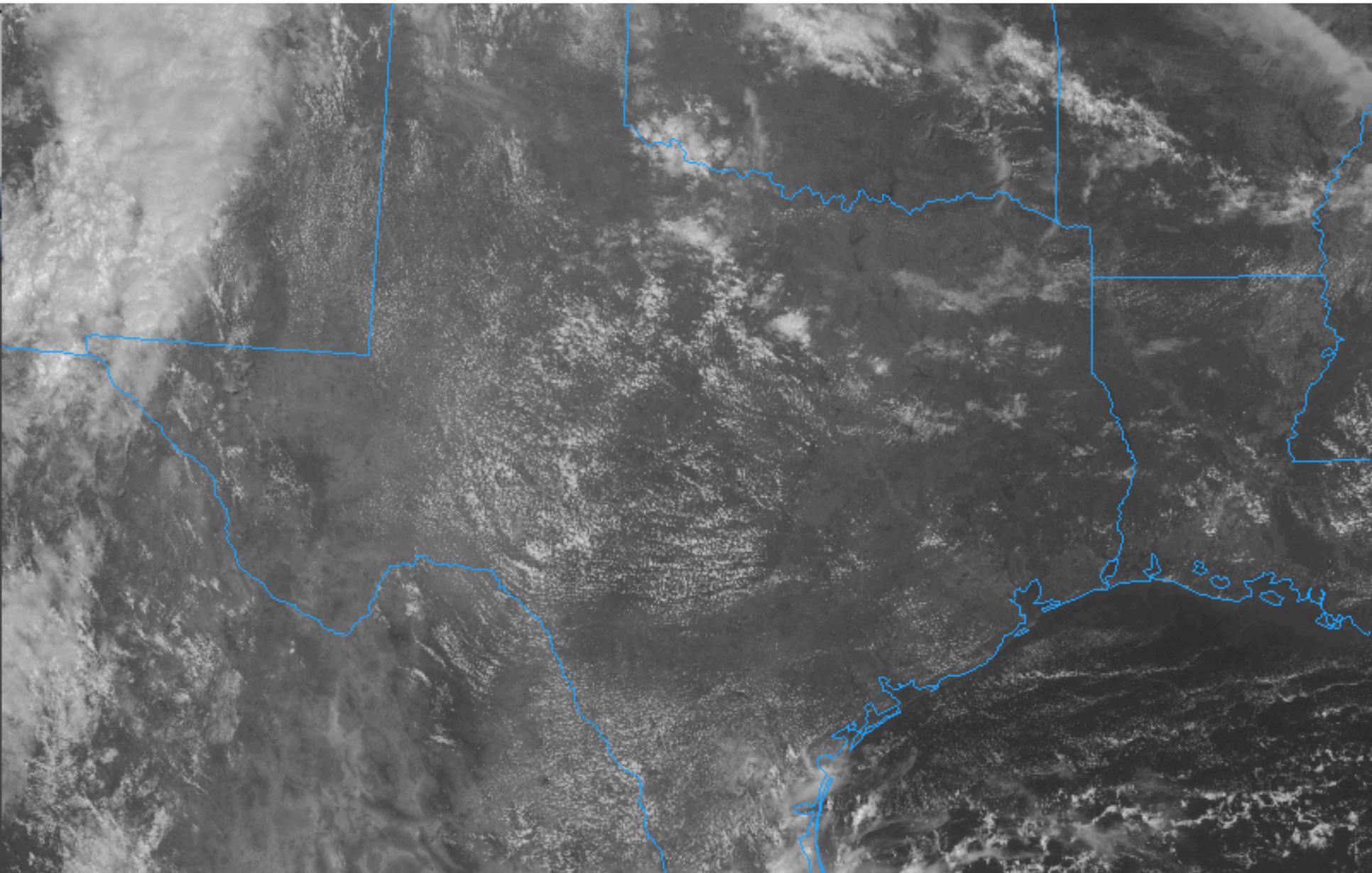
Humidity 72%
Wind Speed N 13 mph
Barometer 29.93 in (1013.4 mb)
Dewpoint 77°F (25°C)
Visibility 10.00 mi
Heat Index 99°F (37°C)

Last Update on 13 Sep 11:52 am CDT

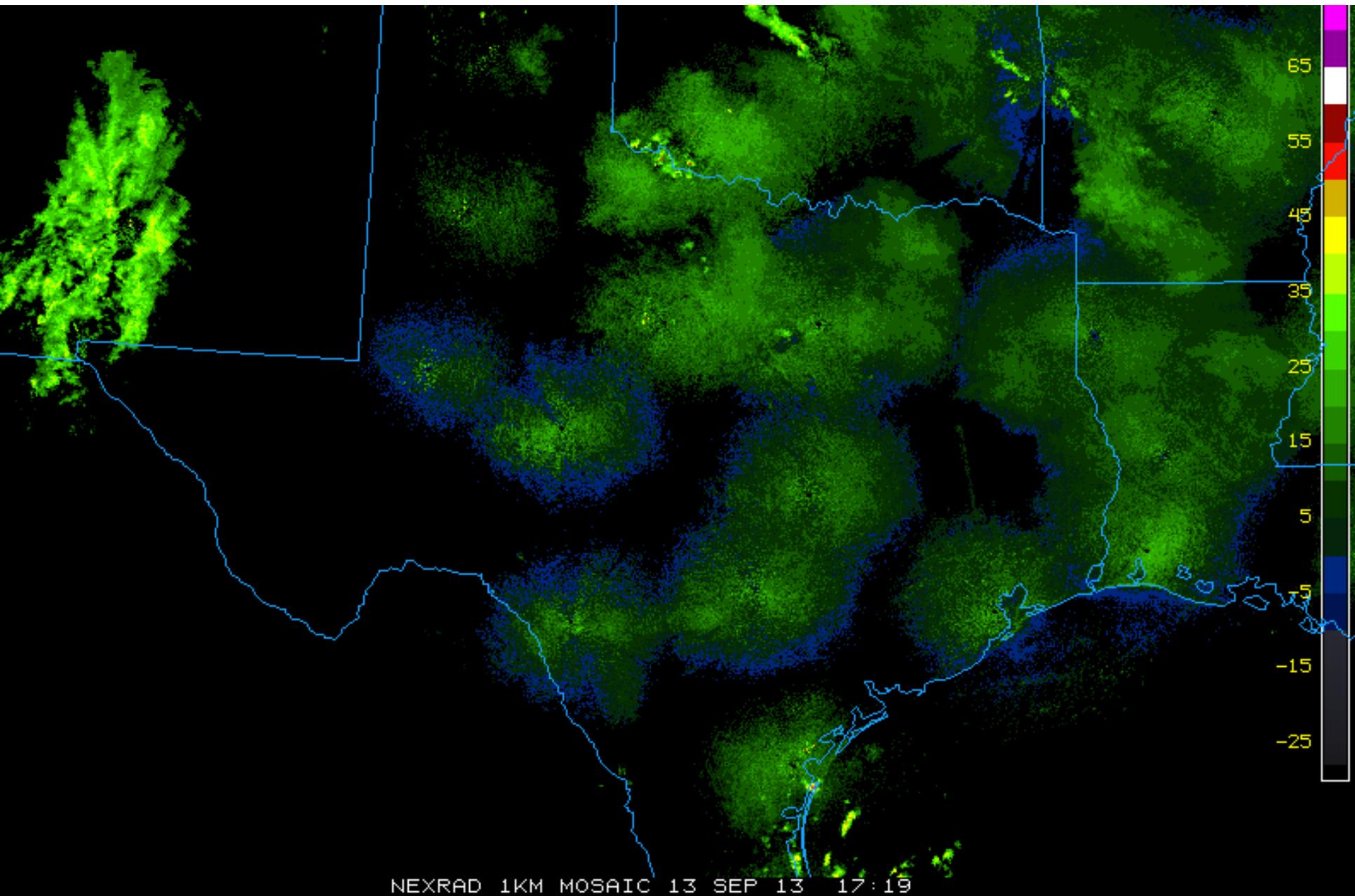
▼ Plymouth State Weather Center ▼

Meteogram for KGLS from 1700Z 12 SEP 13 to 1700Z 13 SEP 13





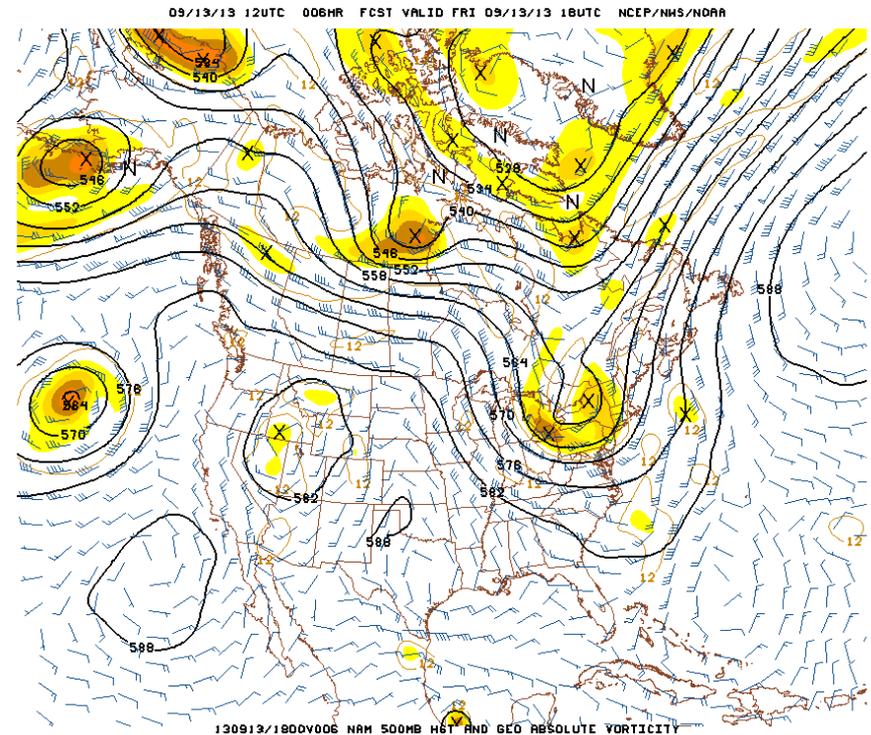
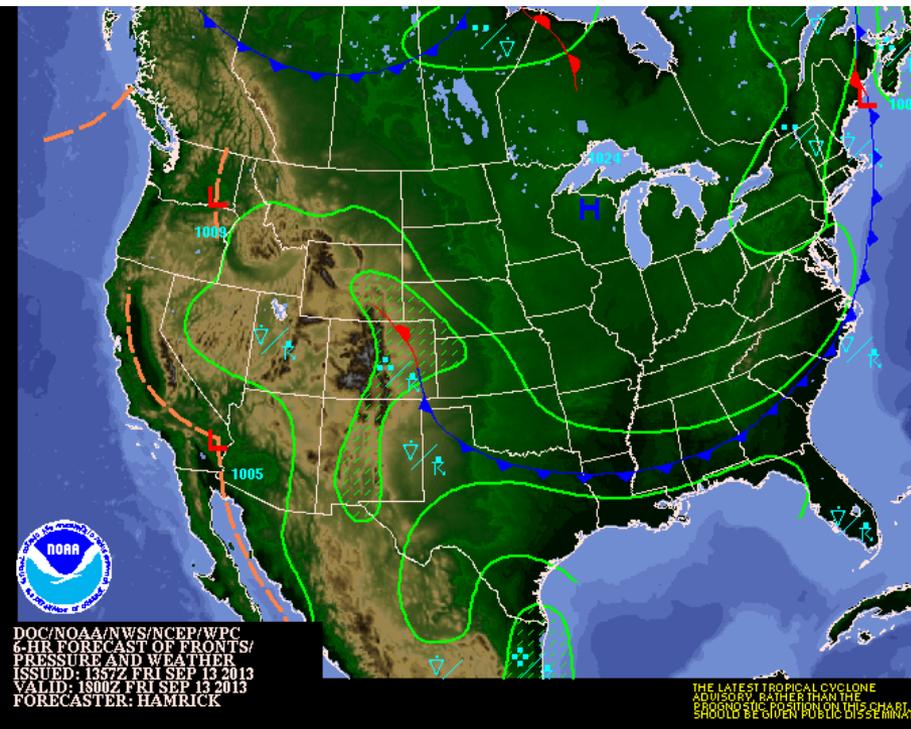
GOES VISIBLE SATELLITE 13 SEP 13 17:15



NEXRAD 1KM MOSAIC 13 SEP 13 17:19

Today: Northeasterly flow as backdoor cold front slips into the study region. Conditions today should remain mainly cloudy and dry until evening.

1 PM CDT
500 mb vorticity



10 m winds at 1 PM today

WRF 3-KM

Fcst: 12 h

Signal Windspeed (m/s)

Sea Level Pressure (hPa)

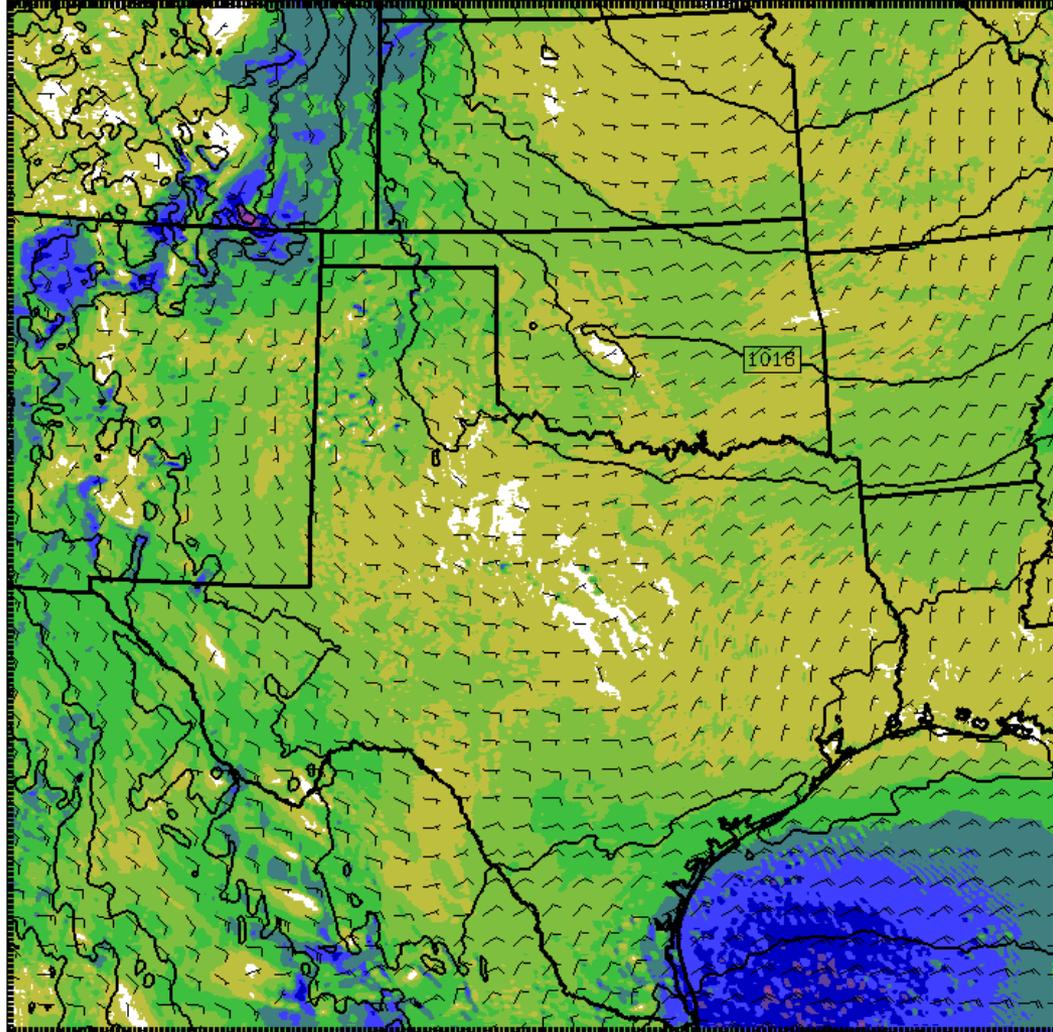
Wind at 10m (full barb = 10kts)

Init: 06 UTC Fri 13 Sep 13

Valid: 18 UTC Fri 13 Sep 13 (13 CDT Fri 13 Sep 13)

100 W

90 W



30 N

CONTOURS: UNITS=hPa LOW= 1004.0 HIGH= 1020.0 INTERVAL= 2.0000

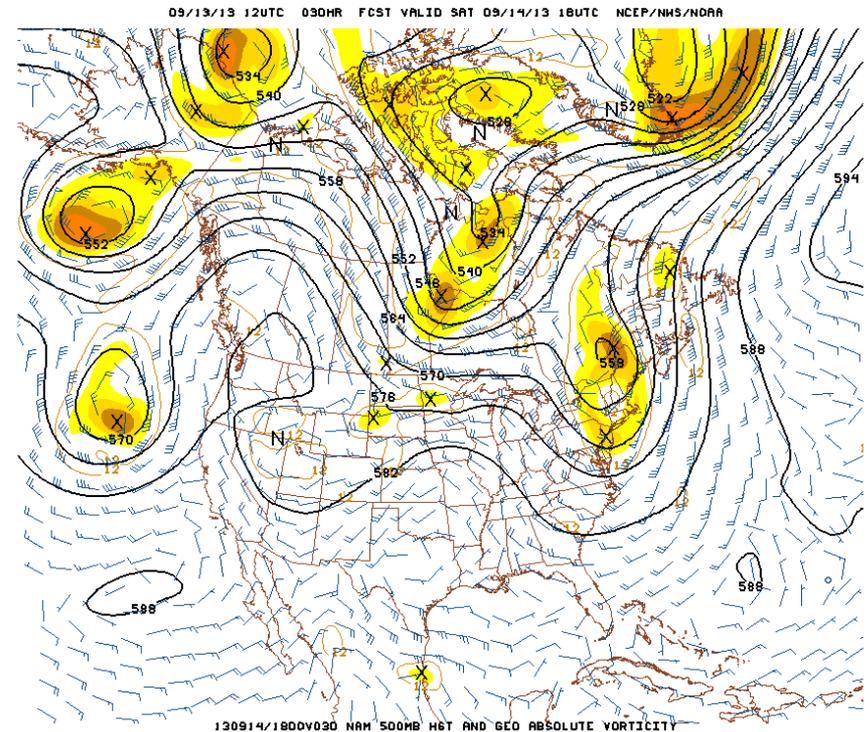
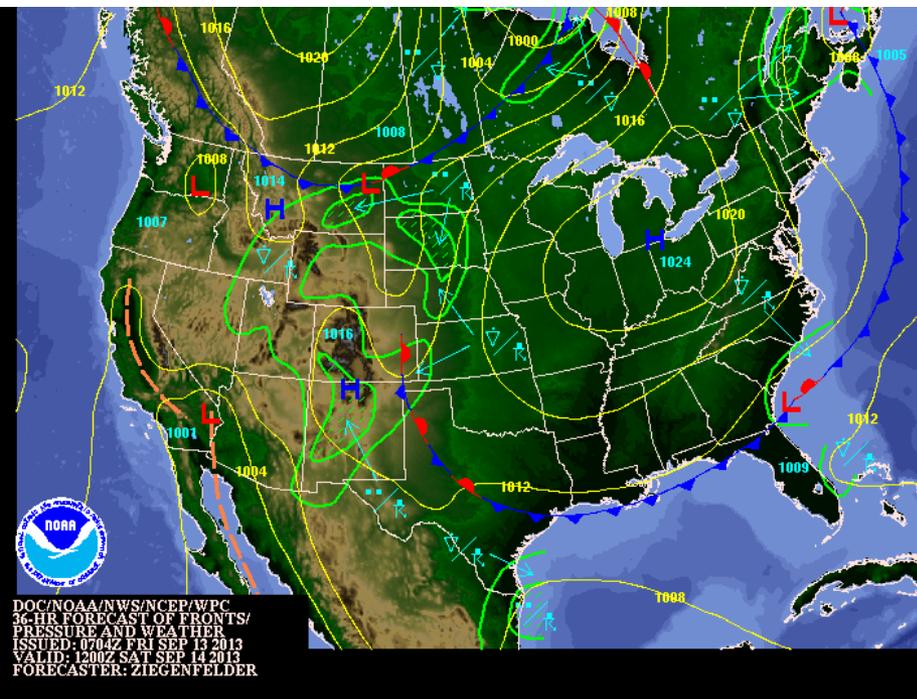


Model Info: V3.3

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

Tomorrow: Cold front over central Texas, as a trough builds to our west. However, conditions should remain fairly dry throughout the day; broken cirrus (<50%) should be the only cloud type. Northeasterly flow.

1 PM CDT
500 mb vorticity



10 m winds at 1 PM tomorrow

WRF 3-KM

Init: 06 UTC Fri 13 Sep 13

Fcst: 36 h

Valid: 18 UTC Sat 14 Sep 13 (13 CDT Sat 14 Sep 13)

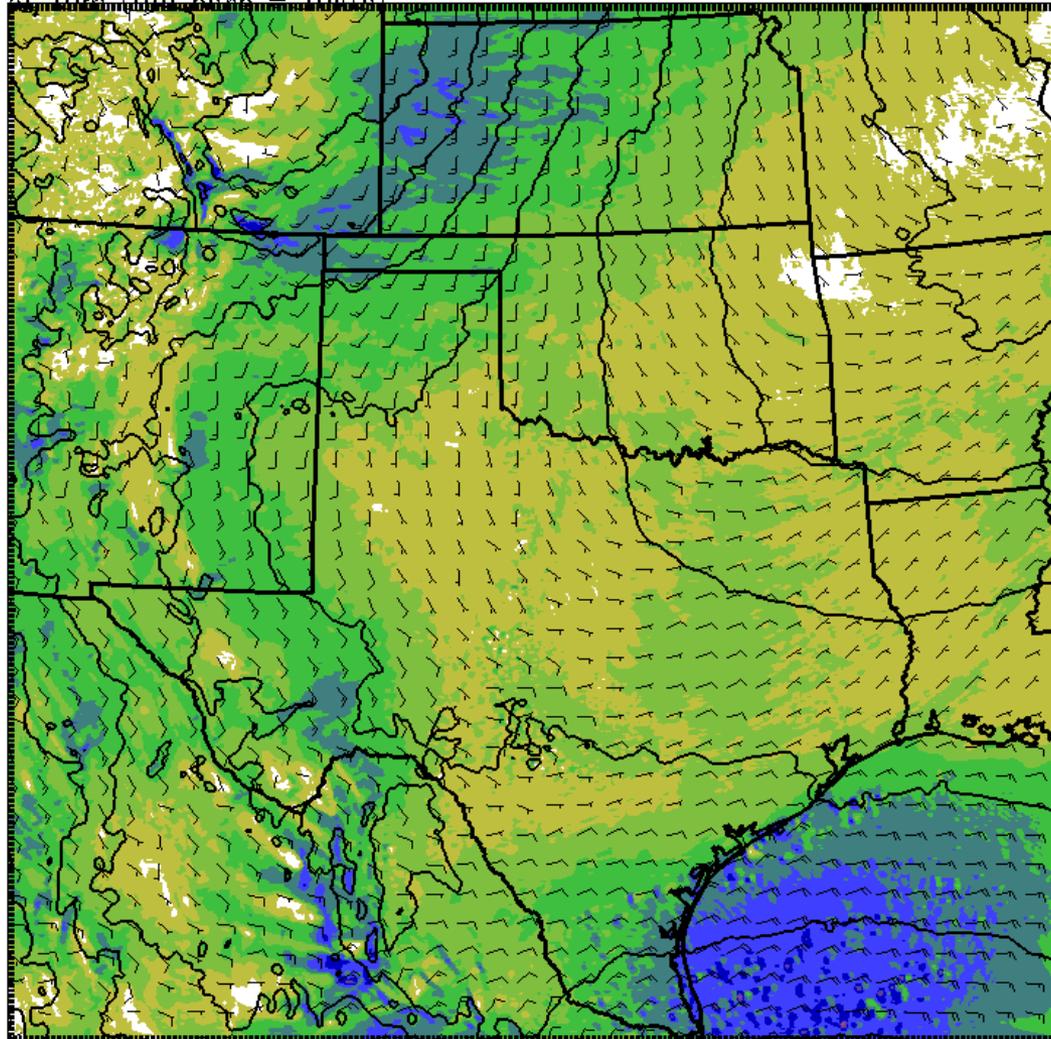
Sigma1 Windspeed (m/s)

Sea Level Pressure (hPa)

Wind at 10m (full barb, 10kts)

100 W

90 W



30 N

CONTOURS: UNITS=hPa LOW= 1002.0 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

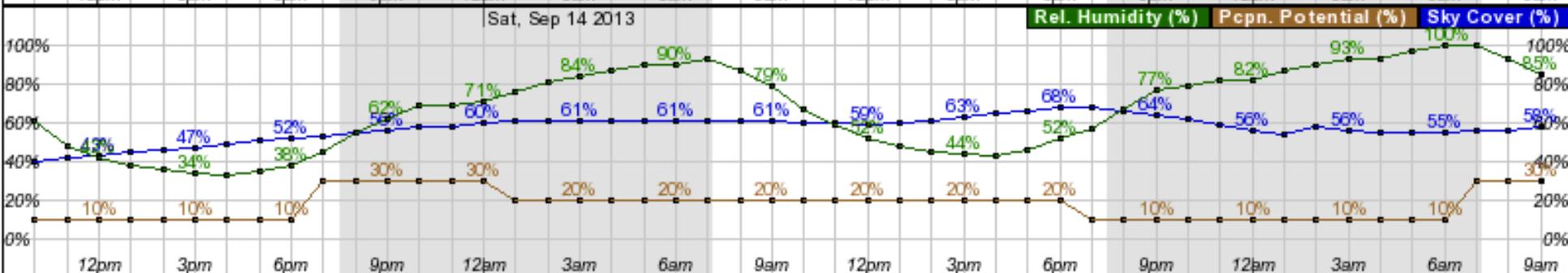
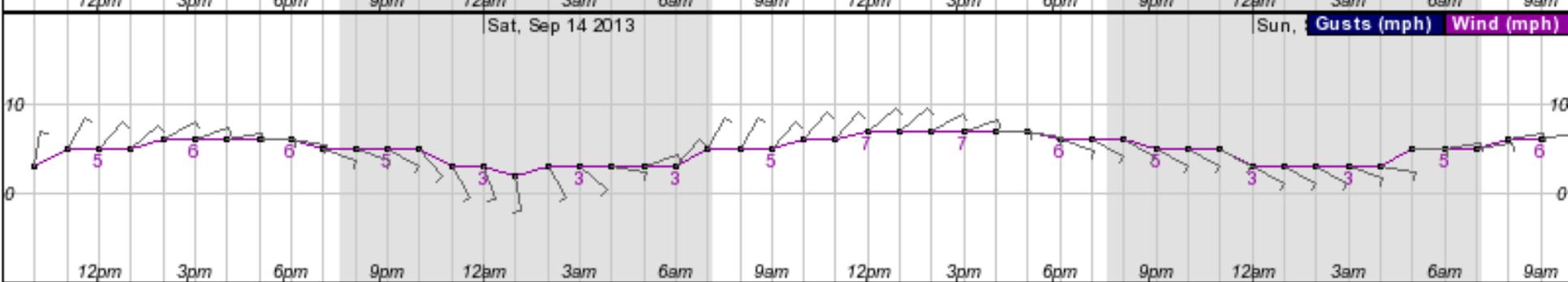
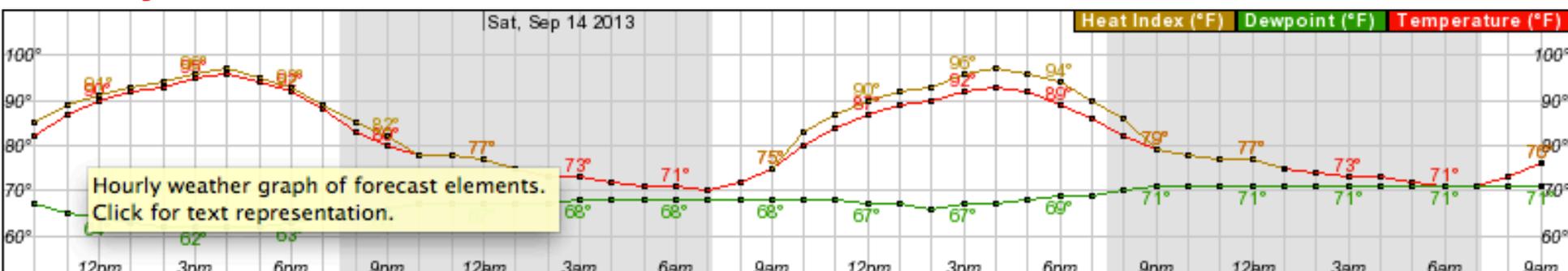
Conroe

Today: Partly cloudy

Tomorrow: Partly cloudy

Today →

Tomorrow →



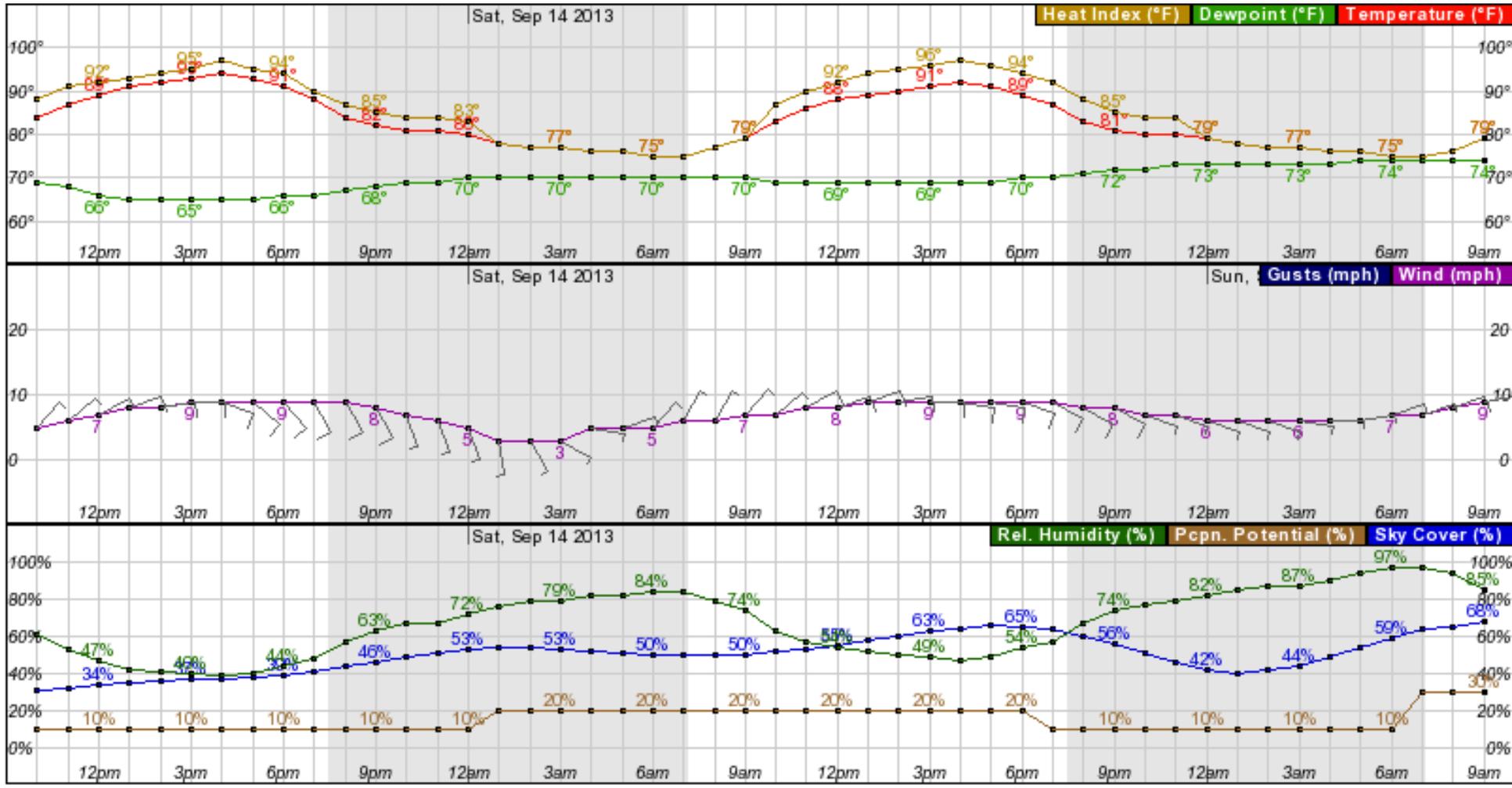
Houston Hobby

Today: Partly cloudy

Tomorrow: Partly cloudy

Today →

Tomorrow →



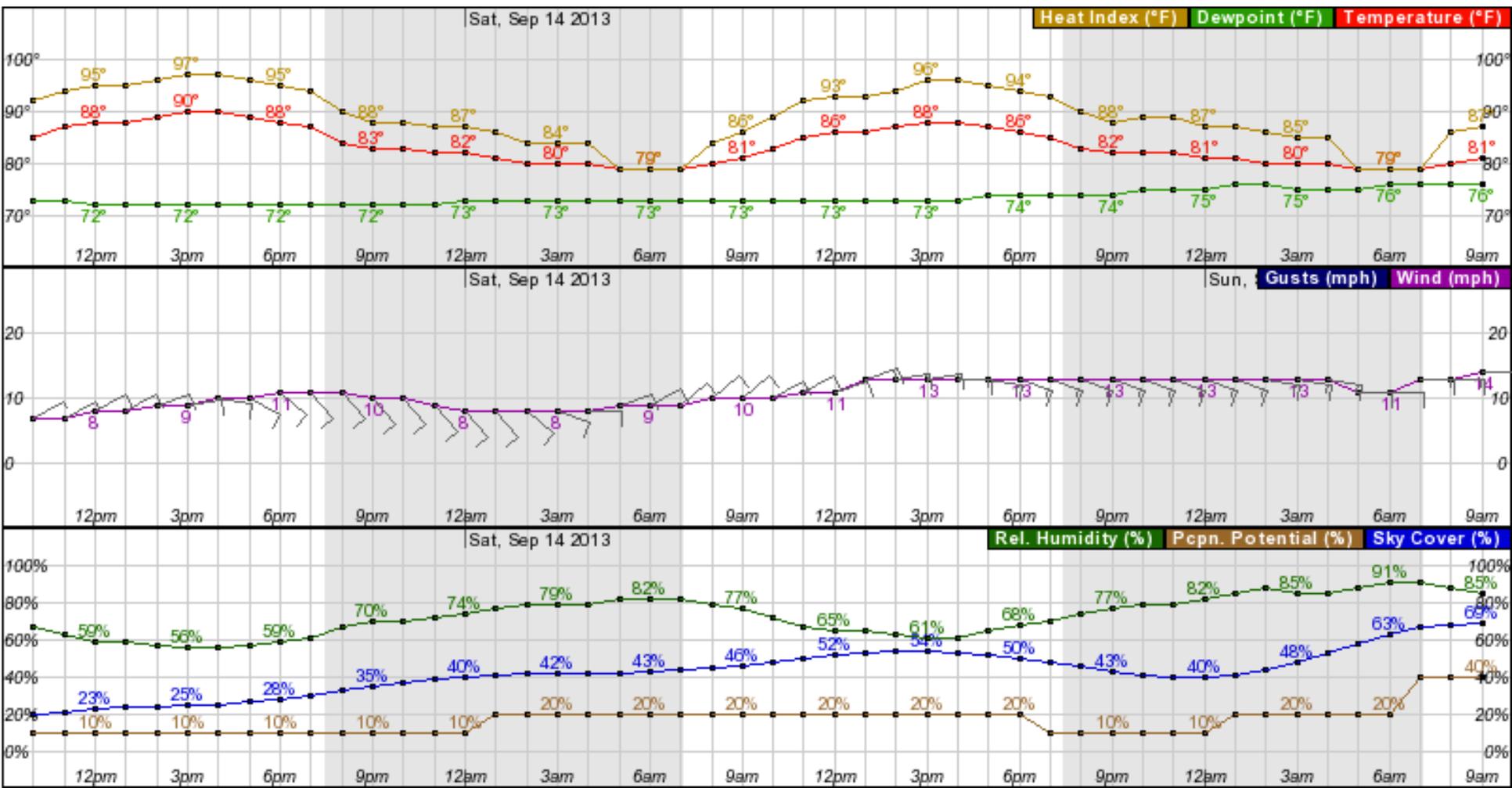
Galveston

Today: Partly cloudy

Tomorrow: Partly cloudy

Today →

Tomorrow →



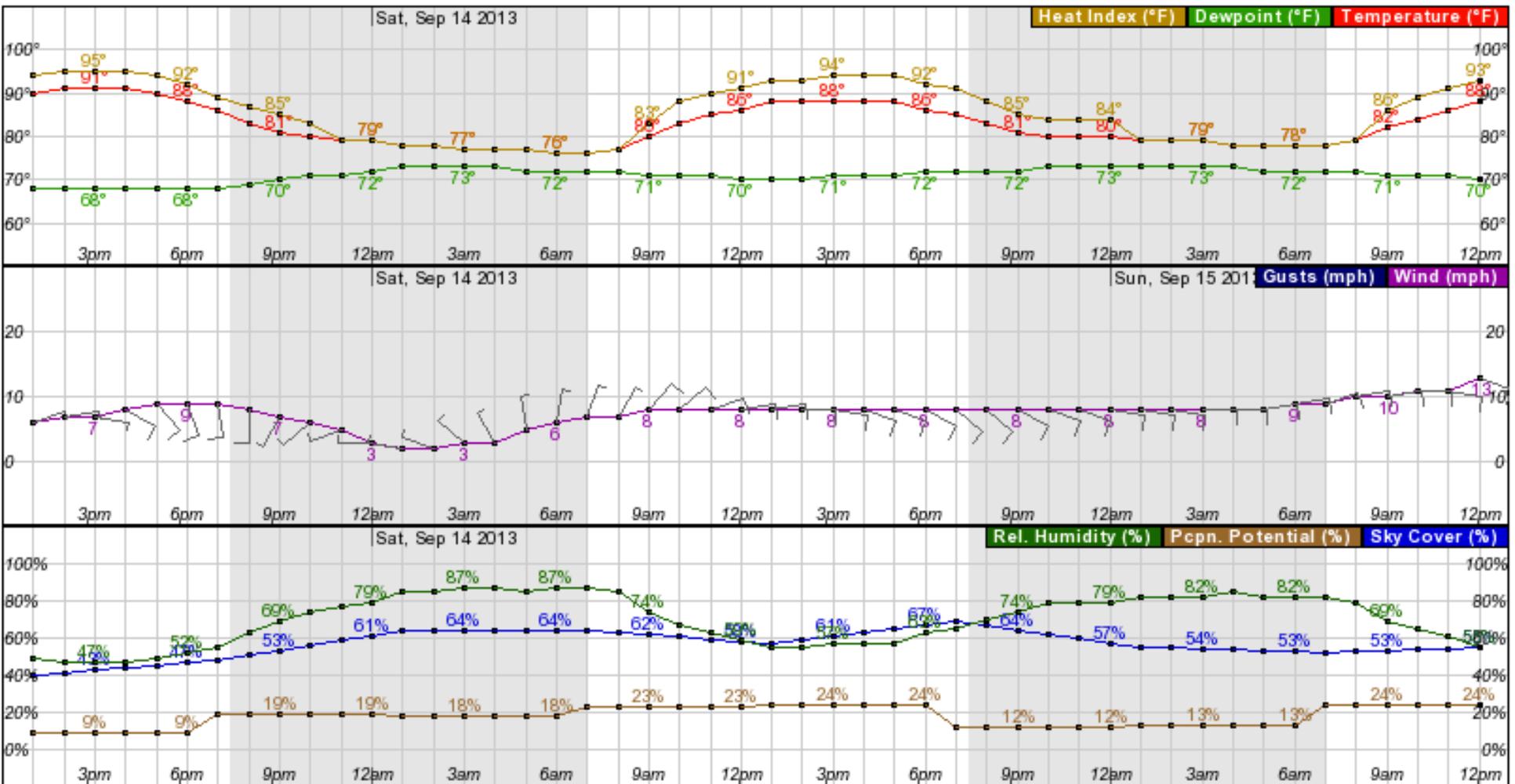
Port Arthur

Today: Partly cloudy

Tomorrow: Partly cloudy

Today →

Tomorrow →



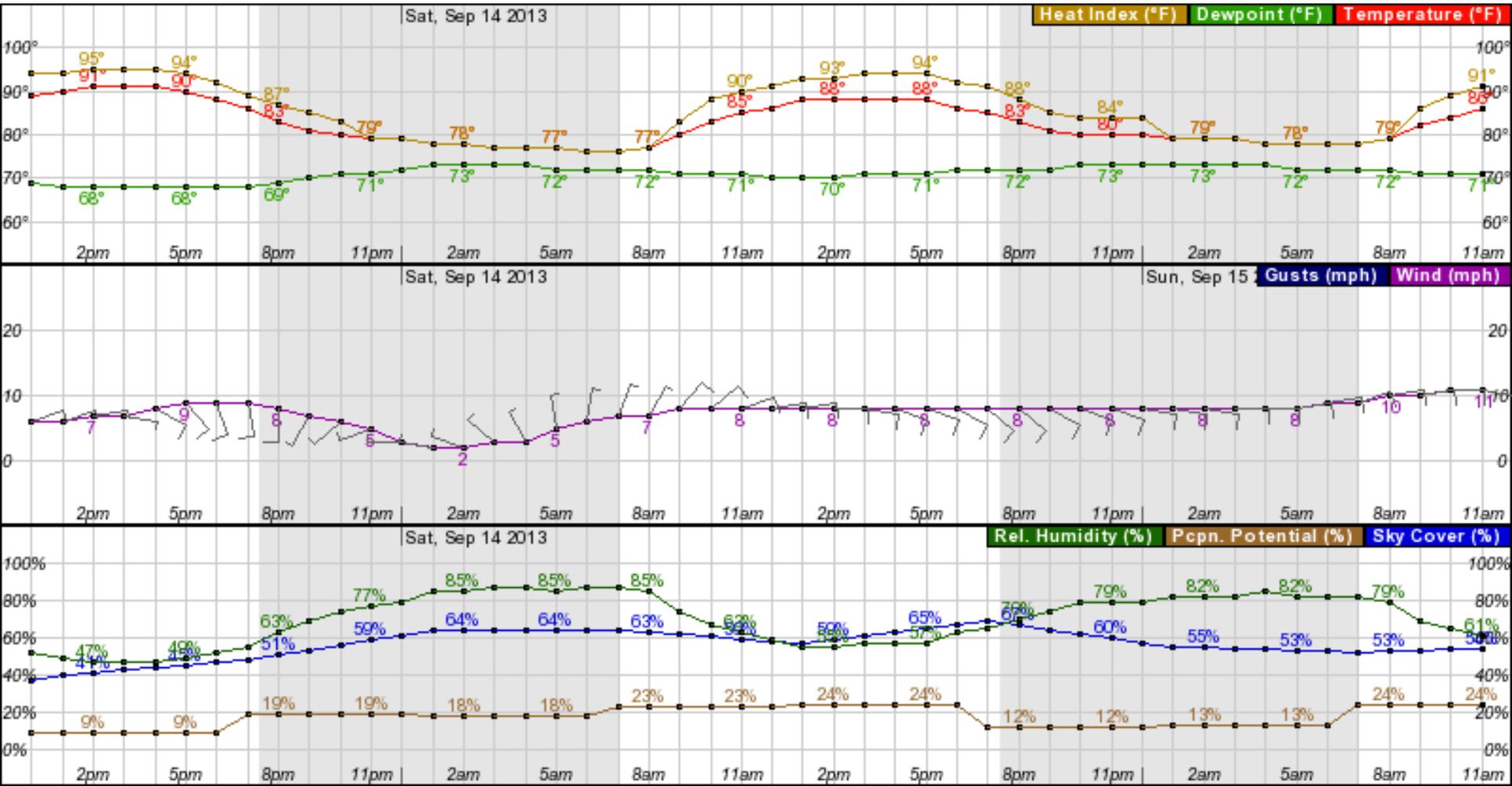
Lake Charles

Today: Partly cloudy

Tomorrow: Mostly cloudy

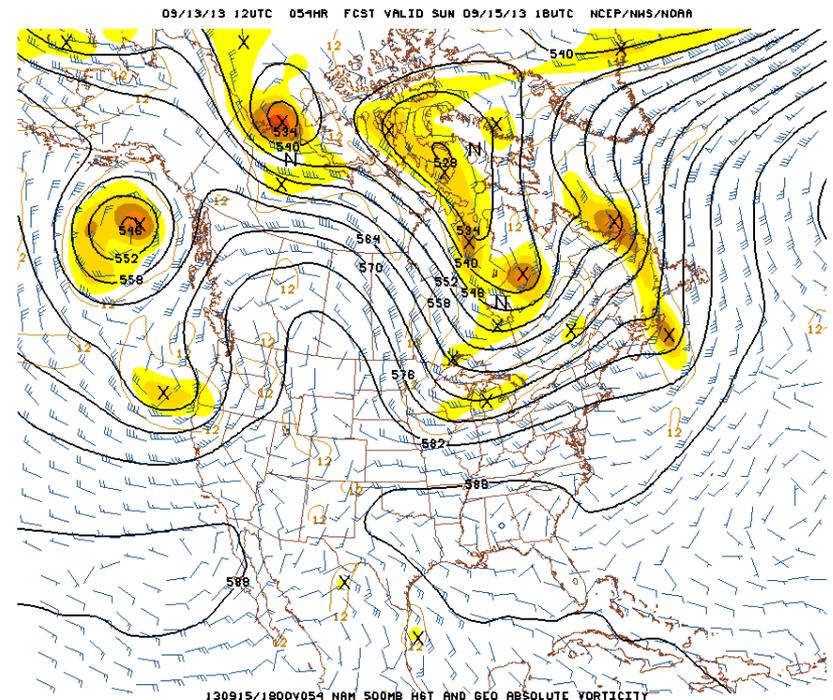
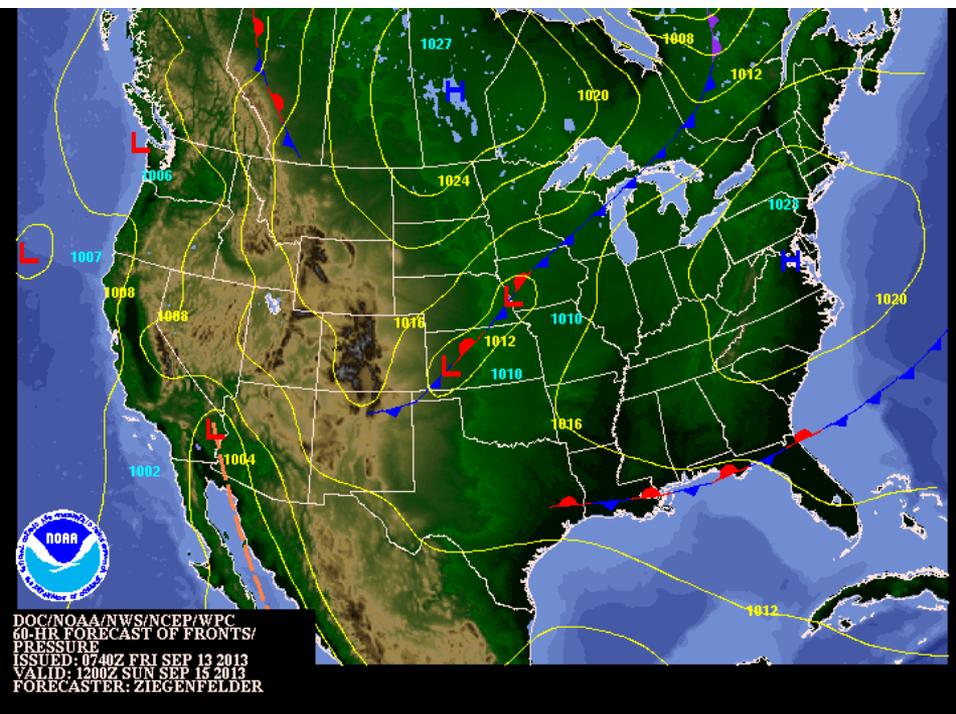
Today →

Tomorrow →



Sunday: Front passes through the region as an upper ridge builds into the region. E/SE flow. However, more moisture from the Gulf begins to stream into region. Cirrus deck should thicken; low clouds and precip. not forecasted.

1 PM CDT
500 mb vorticity



10 m winds at 1 PM Sunday

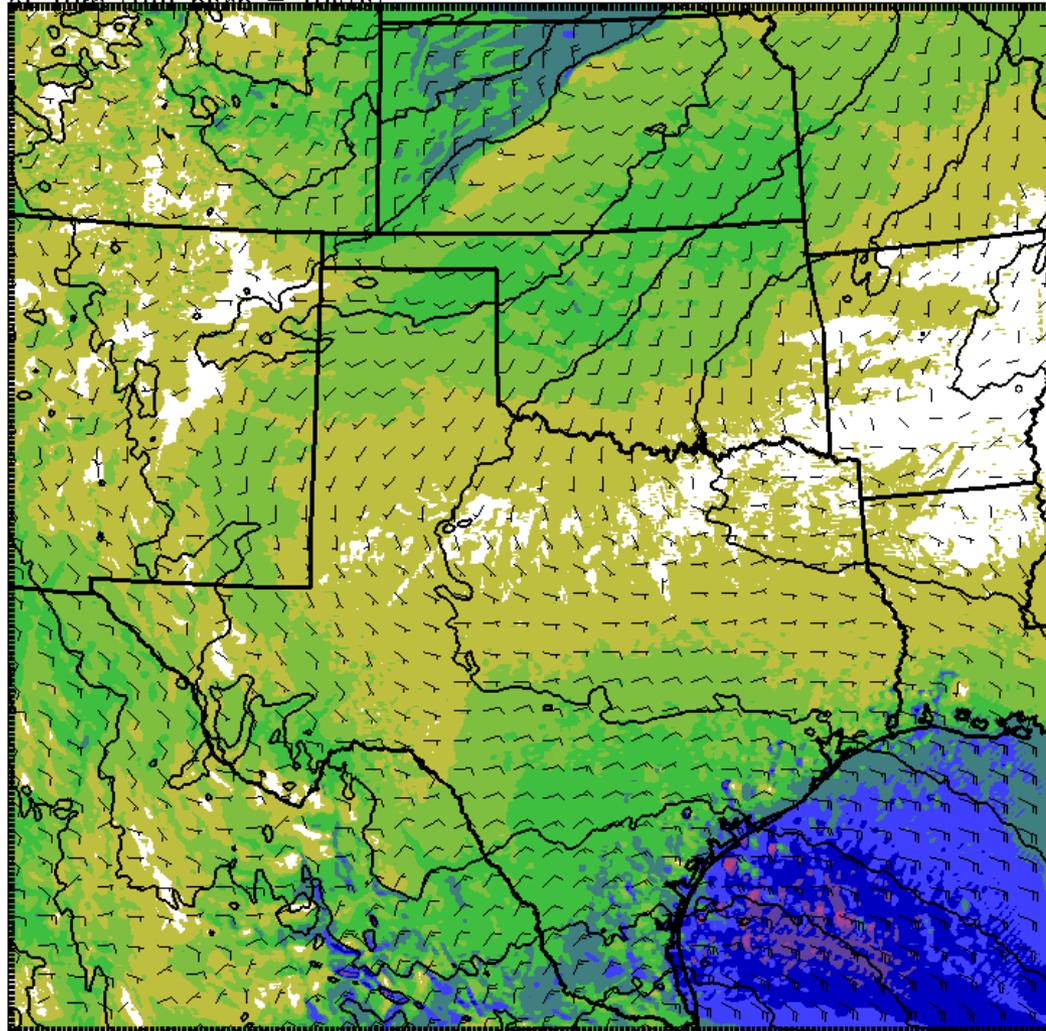
WRF 3-KM
Fest: 60 h

Valid: 18 UTC Sun 15 Sep 13 (13 CDT Sun 15 Sep 13)
Init: 06 UTC Fri 13 Sep 13

Sigma1 Windspeed (m/s)
Sea Level Pressure (hPa)
Wind at 10m (full barb = 10kts)

100 W

90 W



30 N

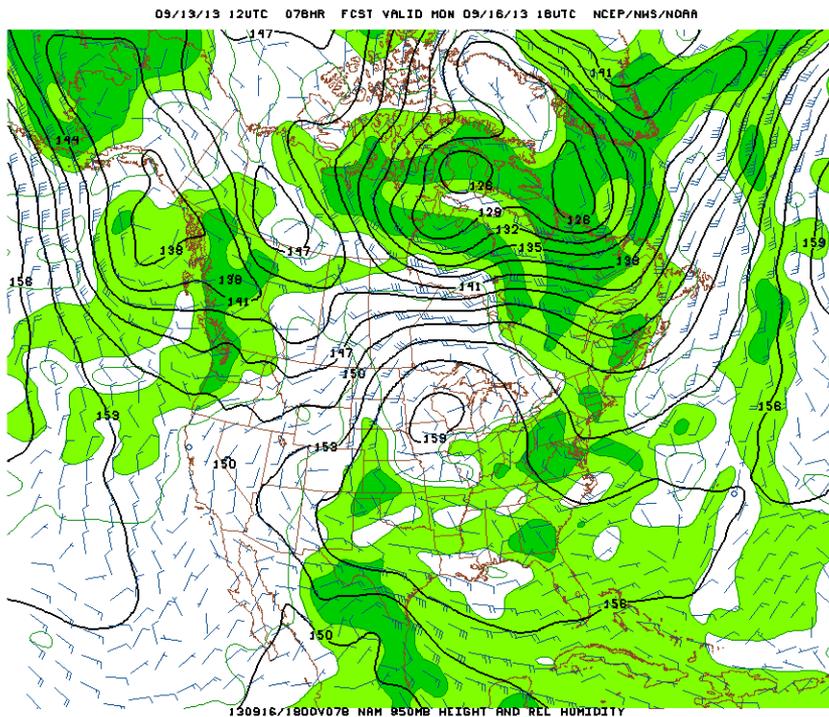
CONTOURS: UNITS=hPa LOW= 1004.0 HIGH= 1018.0 INTERVAL= 2.0000



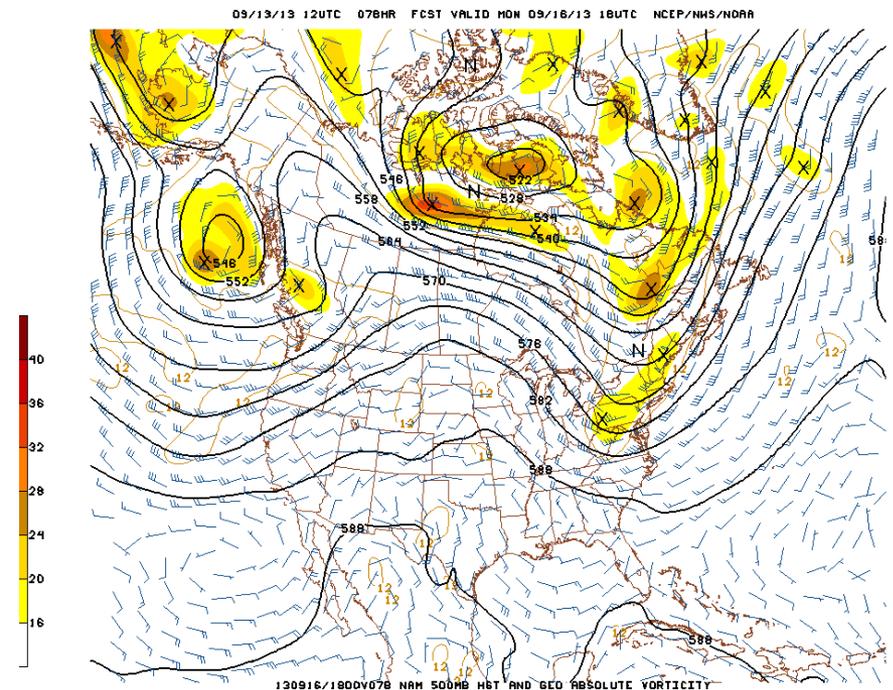
Model Info: V3.3 No Cu YSU PBL Thompson Noah LSM 3.0 km, 37 levels, 18 sec
LW: RRTM SW: Dudhia DIFF: simple KM: ED Smagor

Monday: Region under influence of upper ridge, but also tropical moisture streaming from TC Ingrid. Ingrid may make landfall in norther Mexico/deep S Texas sometime Monday. Should bring moisture and cloud to the study region.

1 PM CDT
850 mb RH



500 mb vorticity



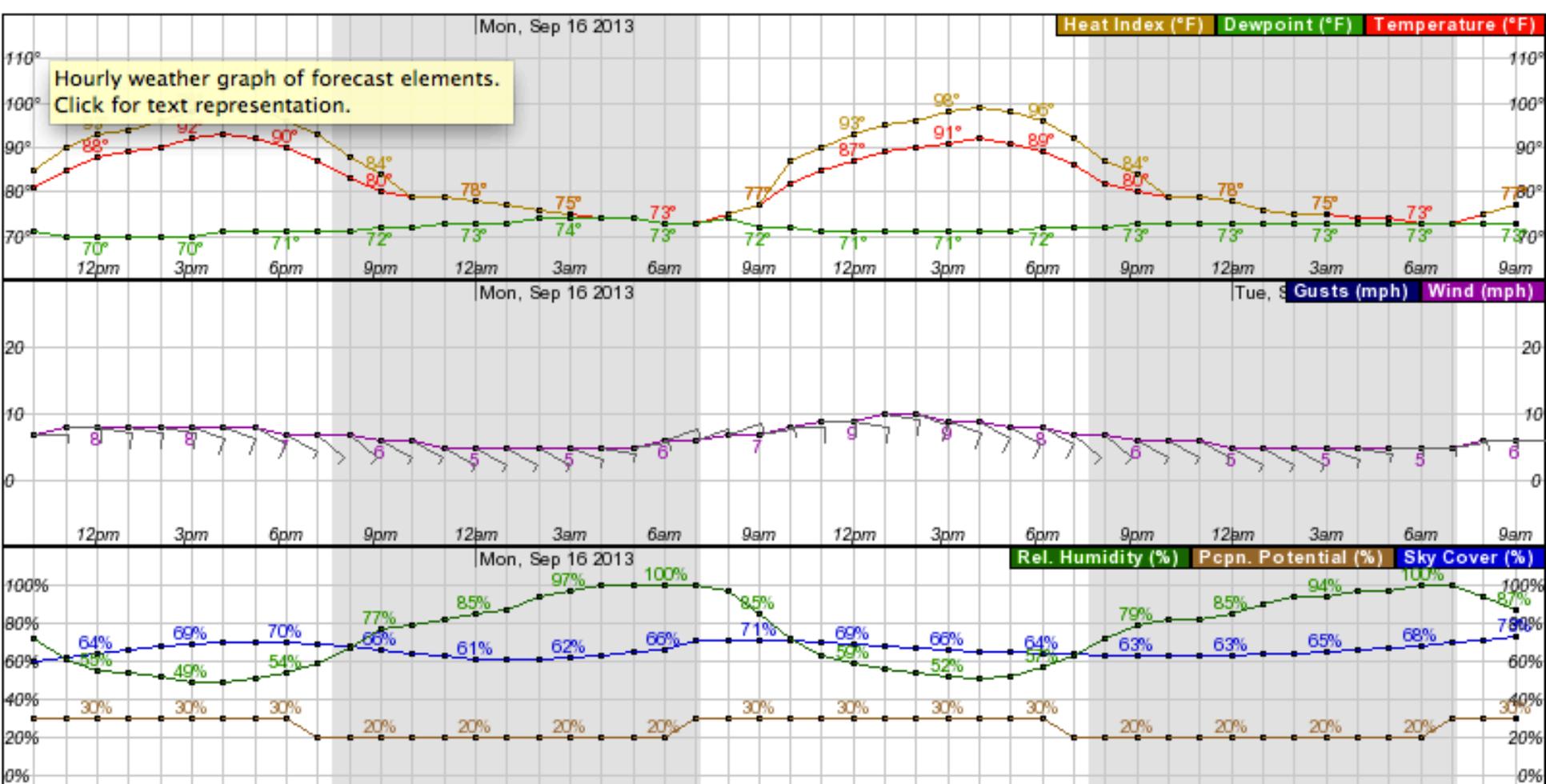
Conroe

Sunday: Mostly cloudy

Monday: Partly cloudy

Sunday →

Monday →



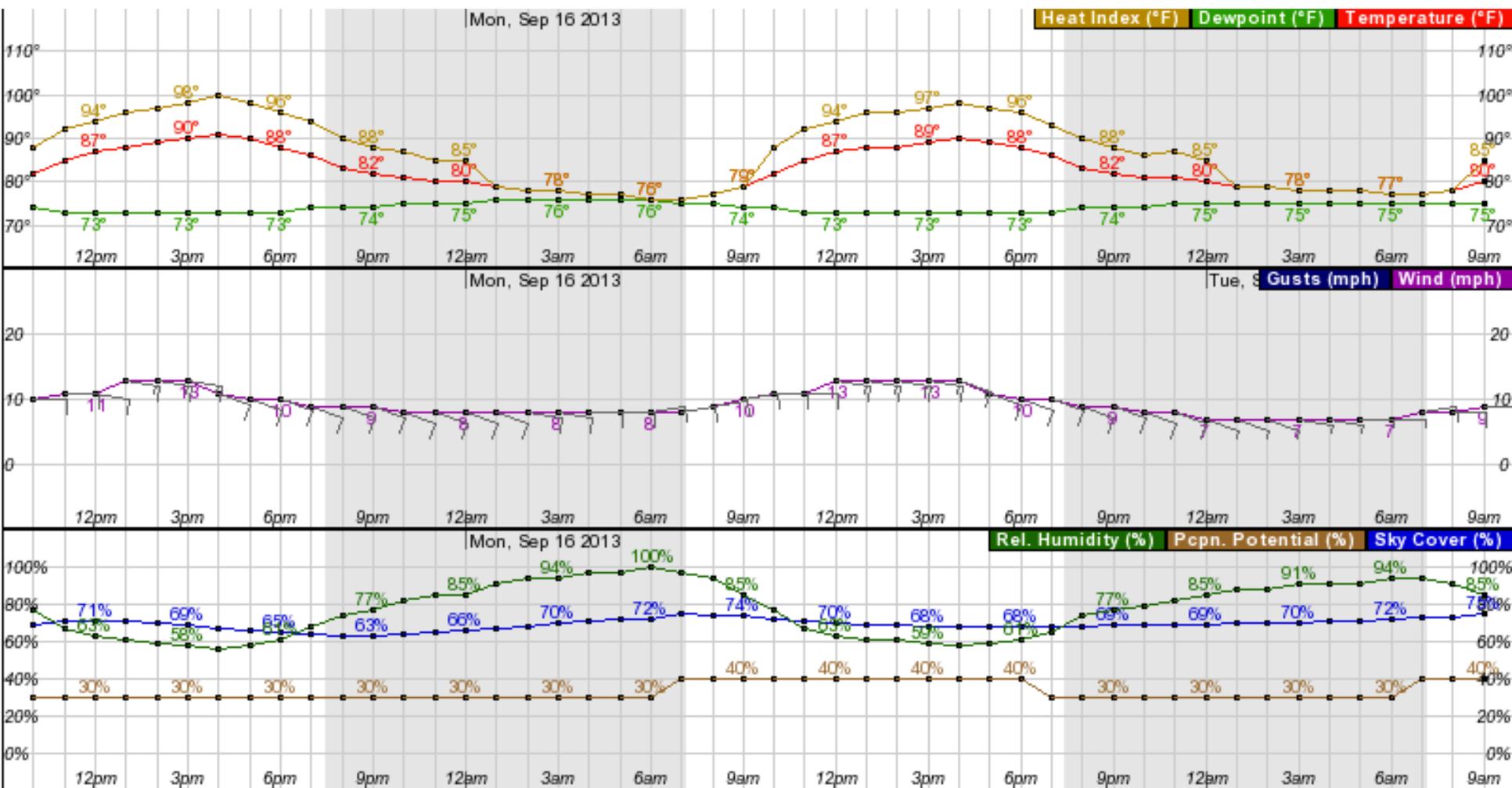
Houston Hobby

Sunday: Partly cloudy

Monday: Partly cloudy

Sunday →

Monday →



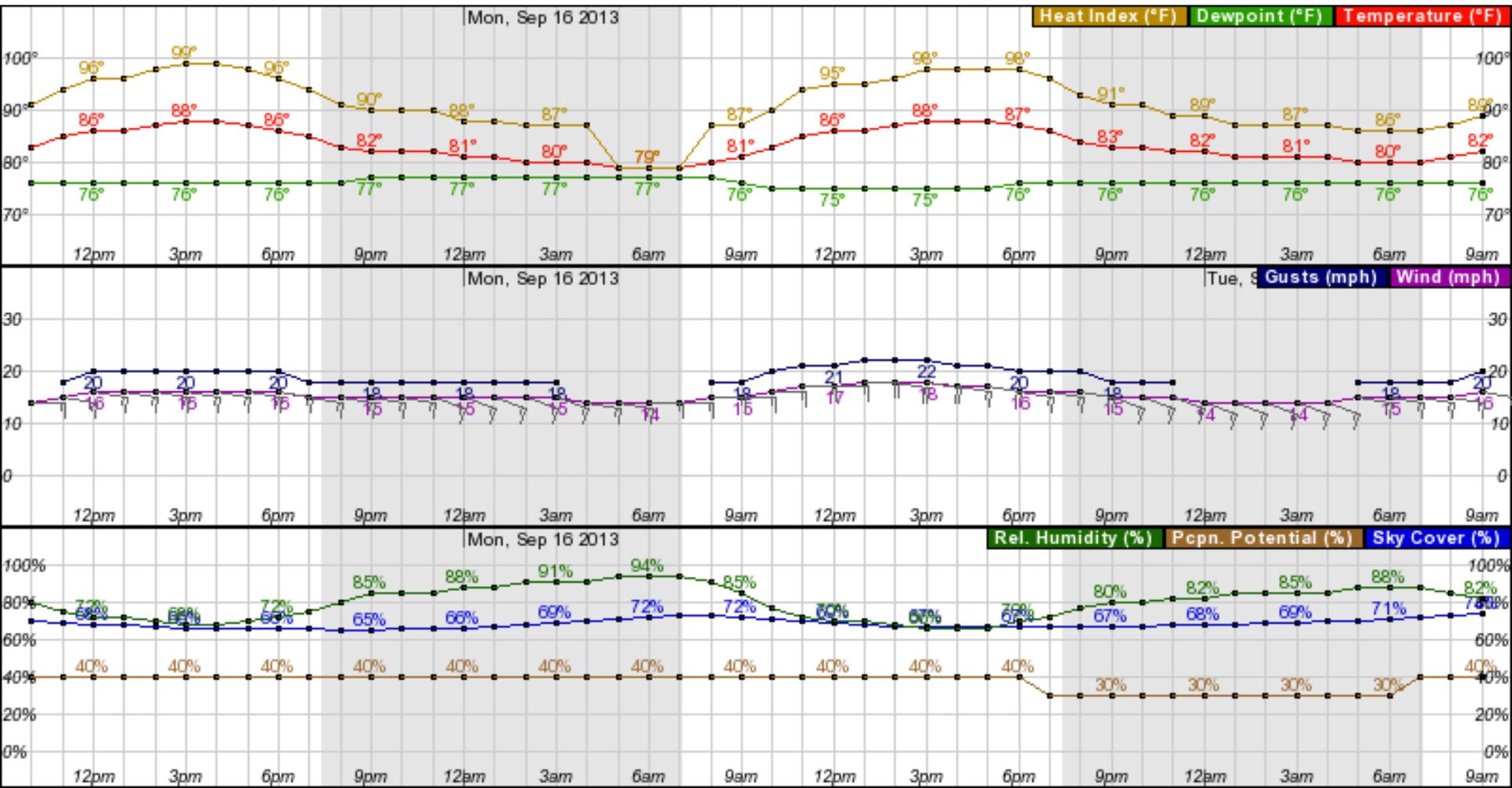
Galveston

Sunday: Partly cloudy

Monday: Mostly cloudy

Sunday →

Monday →



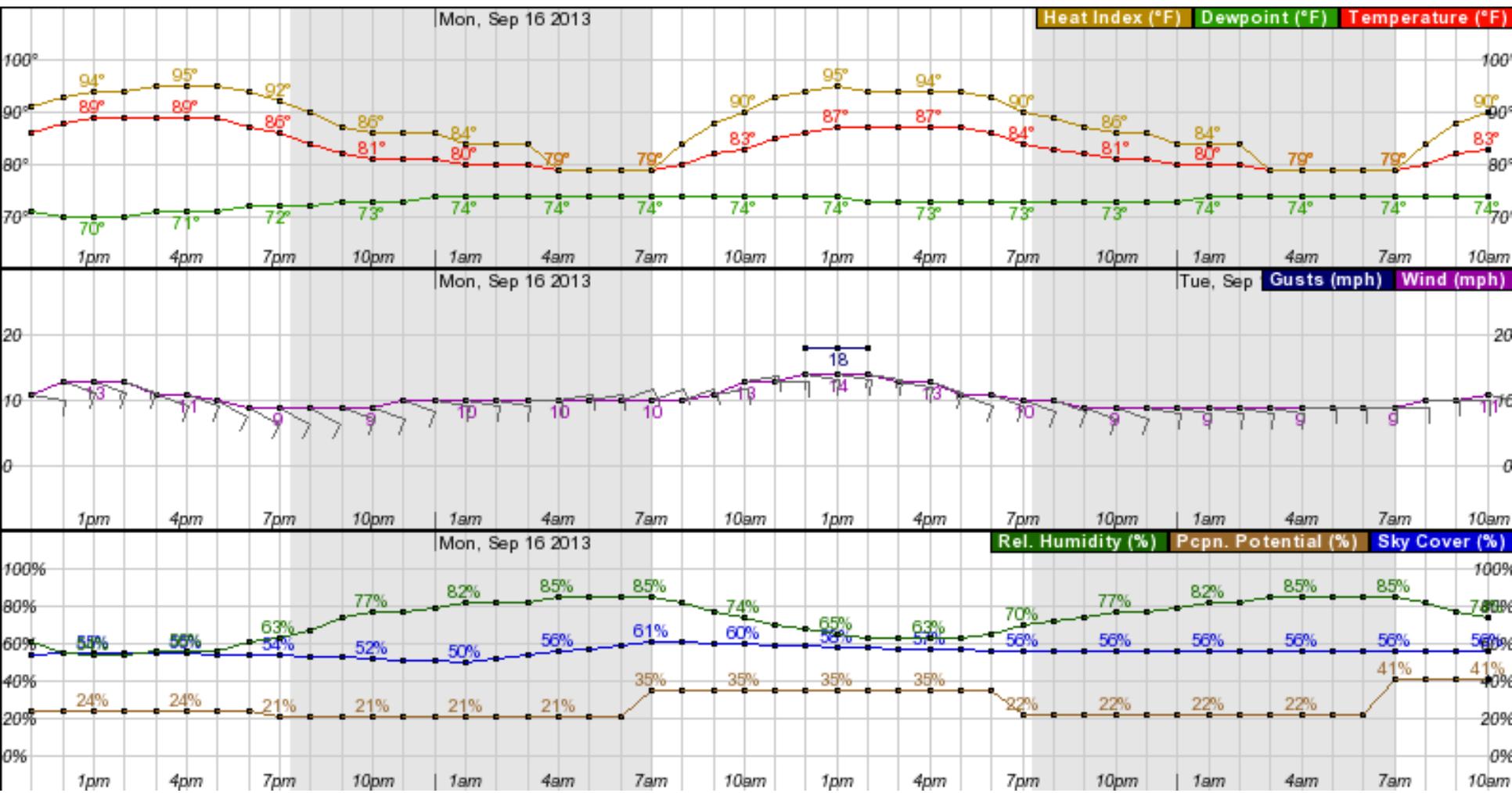
Port Arthur:

Sunday: Partly cloudy

Monday: Mostly cloudy

Sunday →

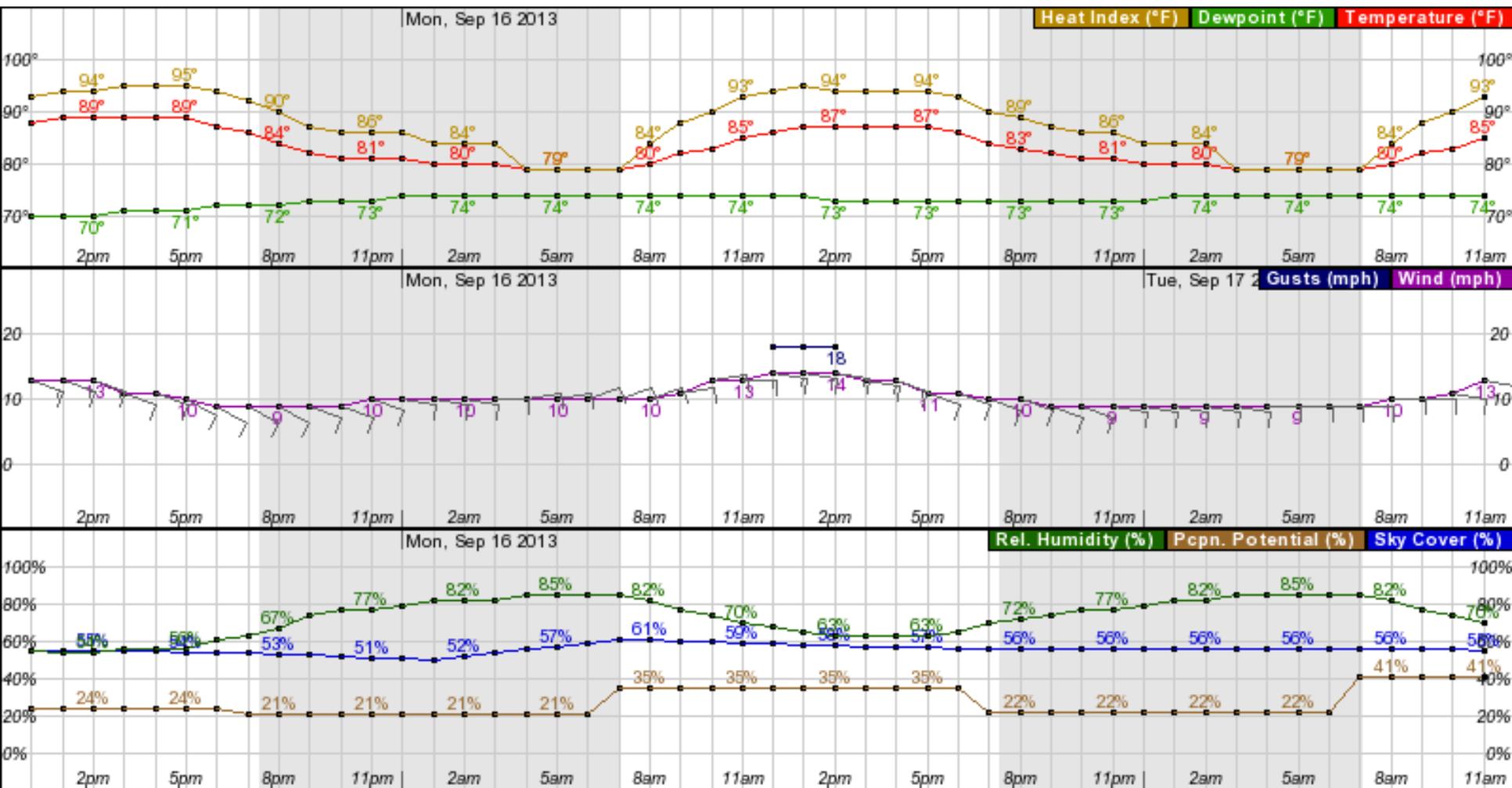
Monday →



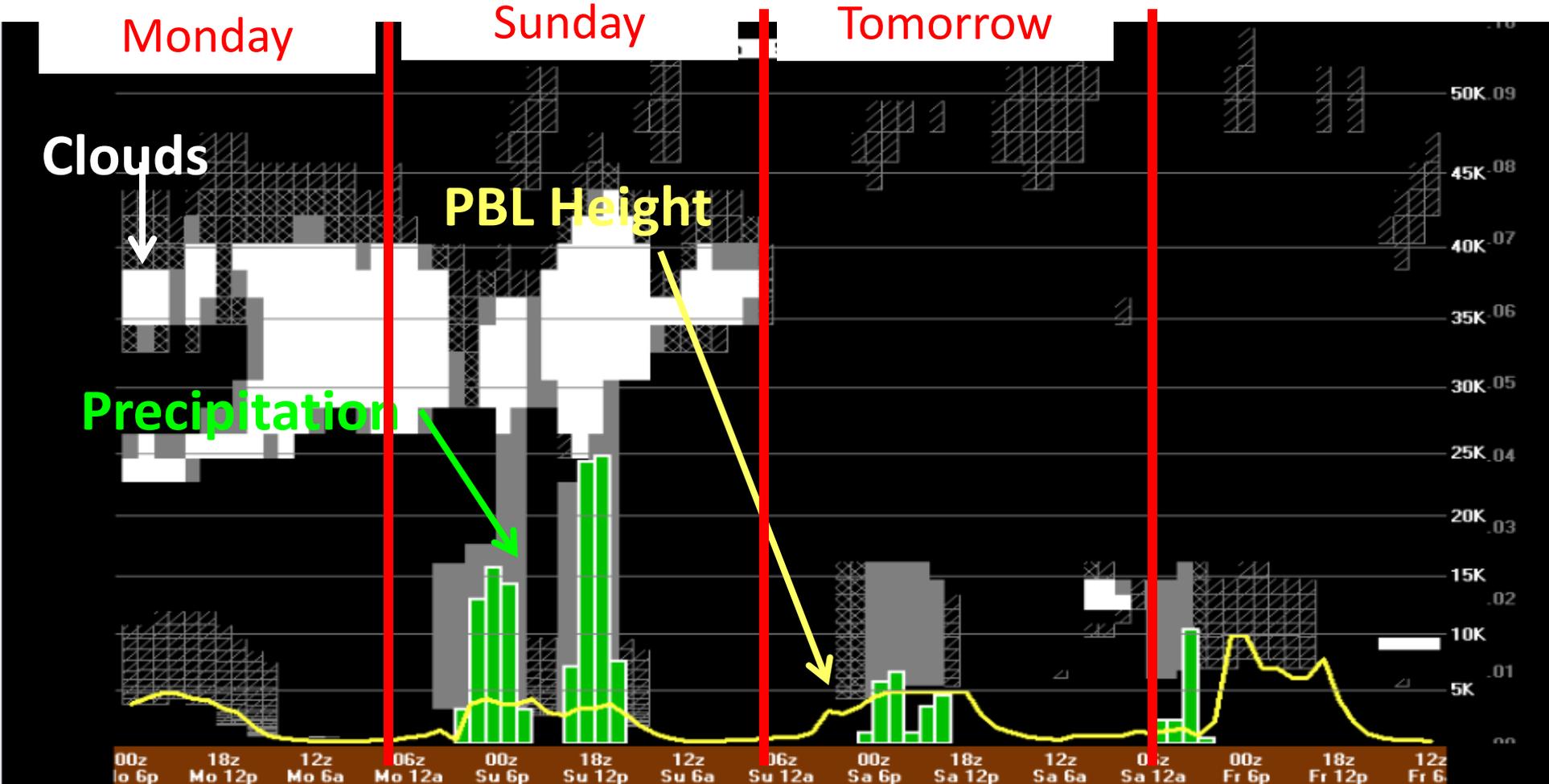
Lake Charles:
Sunday: Partly cloudy
Monday: Mostly cloudy

Sunday →

Monday →

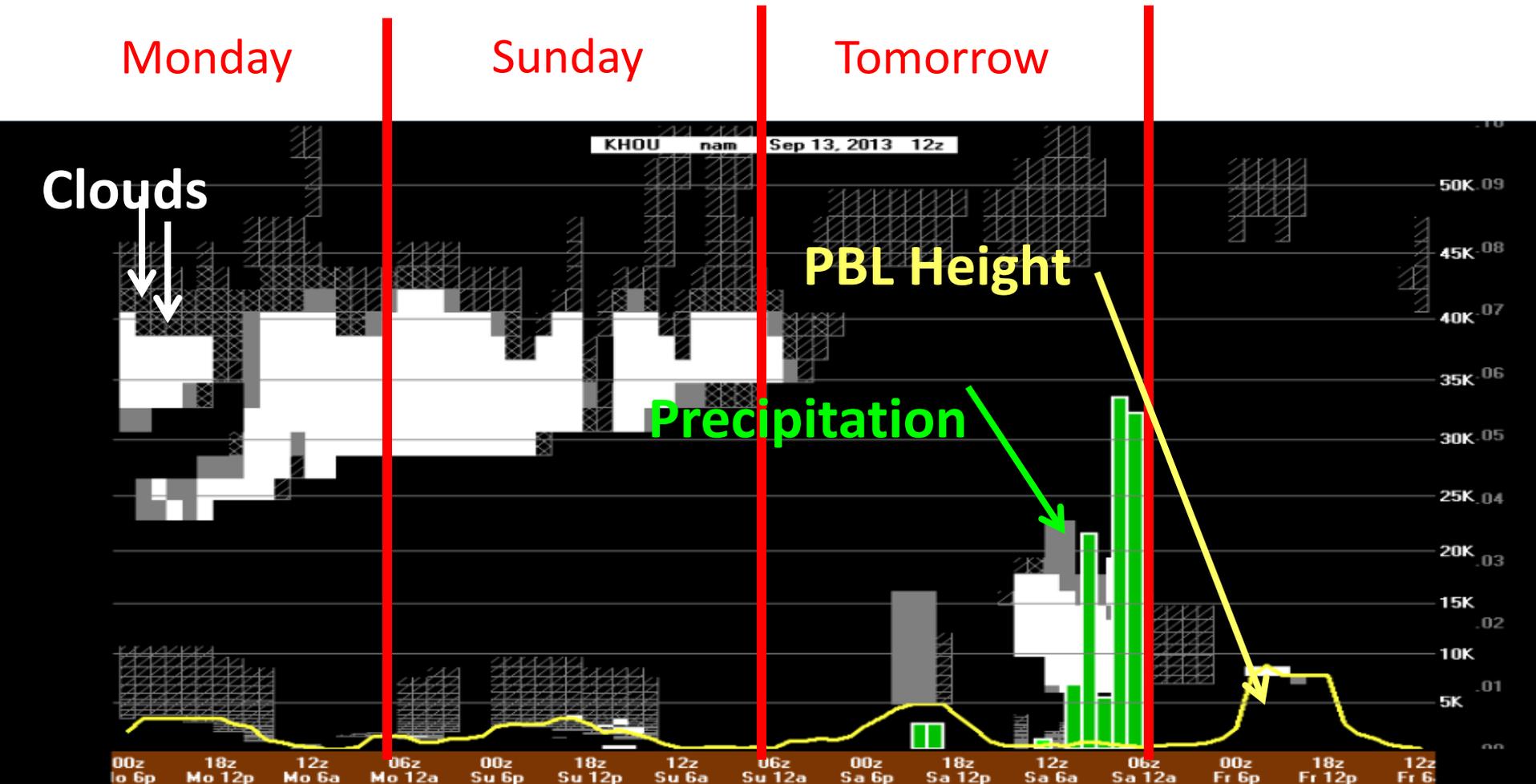


Conroe; BUFKIT – NAM (12 UTC 10 September)



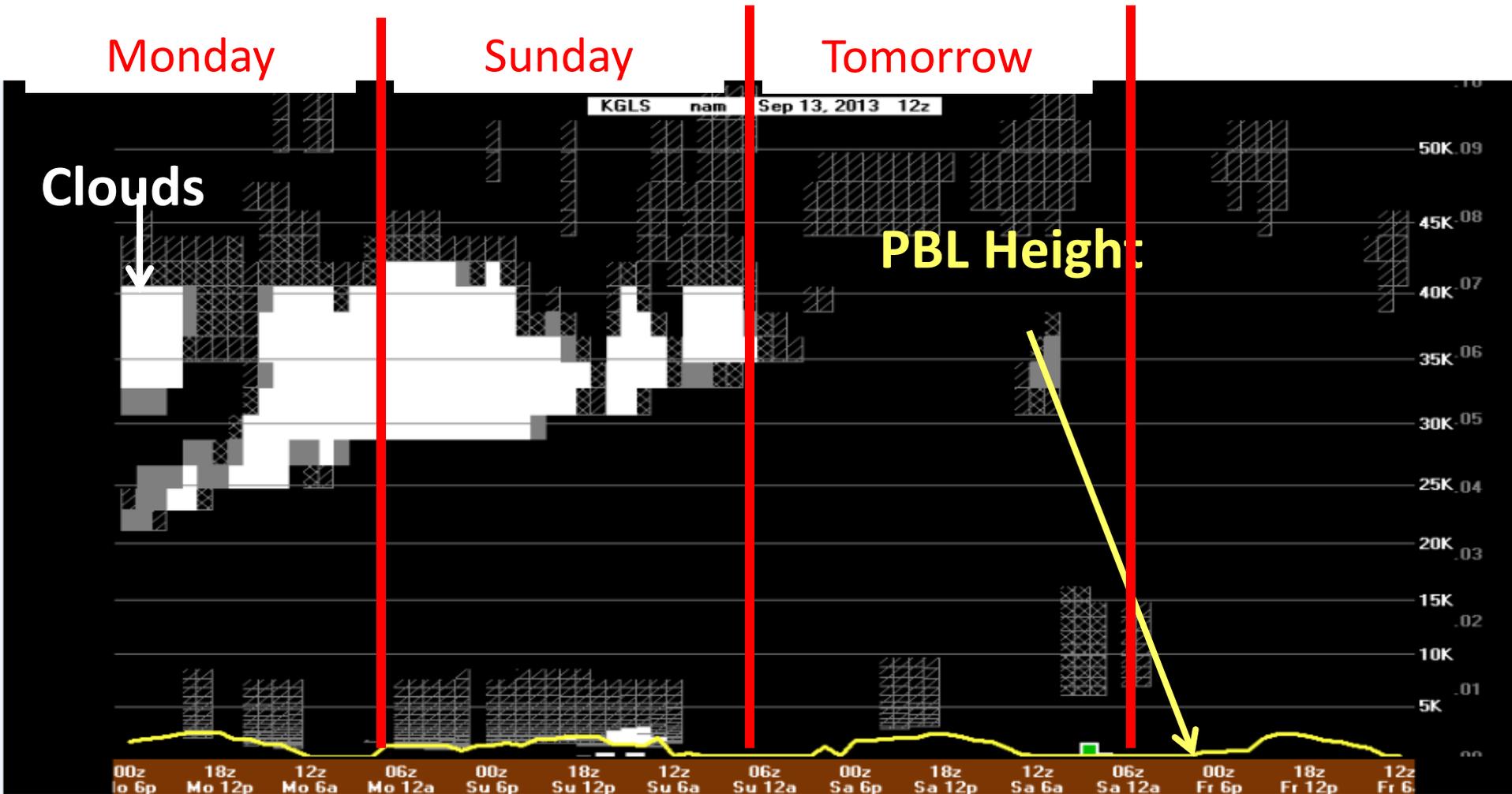
- Tomorrow: Low cloud and precipitation during afternoon
- Sunday: Clouds and rain throughout the day
- Monday: High and low level clouds throughout the day

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



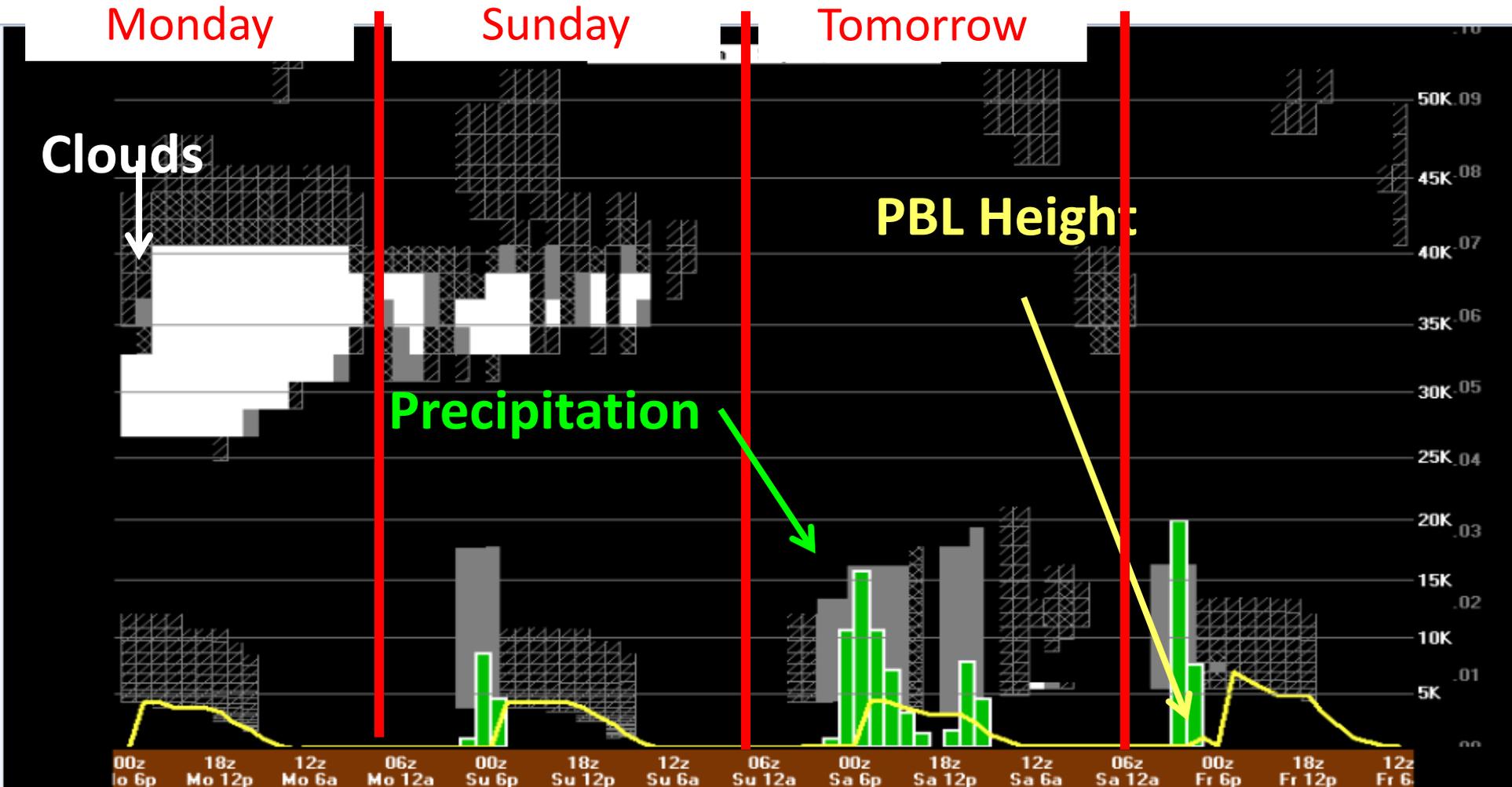
- Tomorrow: Low cloud and precipitation during morning and afternoon
- Sunday: Scattered Cu and high cloud throughout the day
- Monday: Same as Sunday

Galveston; BUFKIT – NAM (12 UTC 10 September)



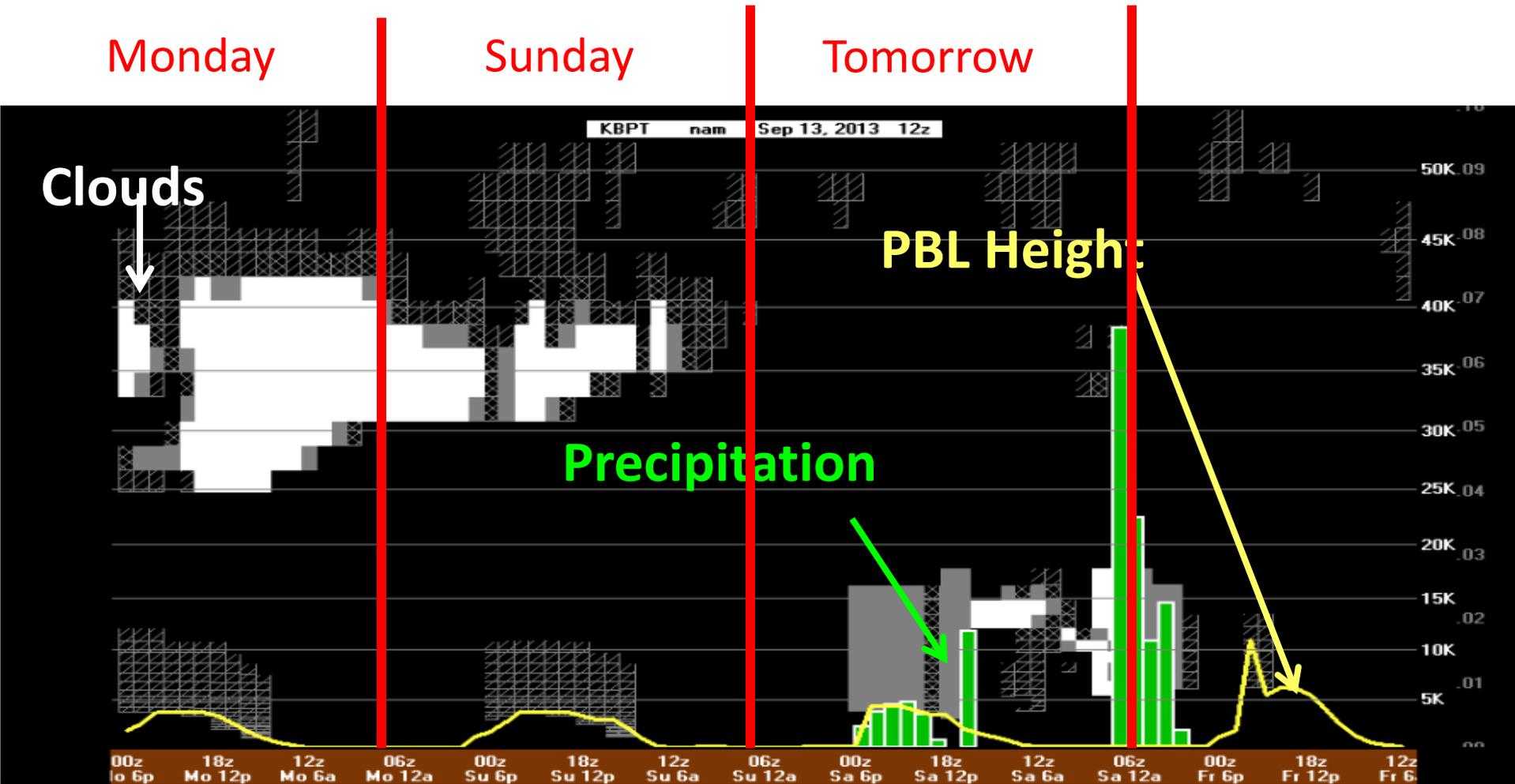
- Tomorrow: Scattered cloud throughout the day
- Sunday: Scattered Cu and high cloud
- Monday: Same as Sunday

Lake Charles; BUFKIT – NAM (12 UTC 10 September)



- Tomorrow: Low cloud and precipitation through most of day
- Sunday: Precipitation and scattered high cloud throughout day
- Monday: Scattered Cu and high cloud

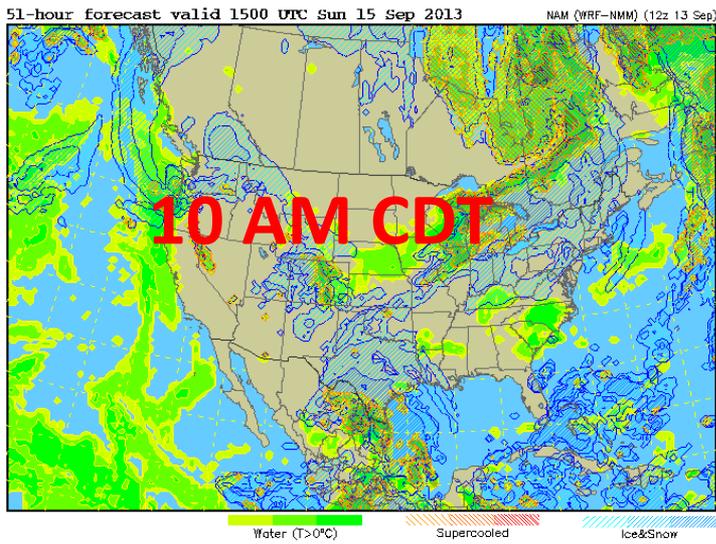
Beaumont; BUFKIT – NAM (12 UTC 10 September)



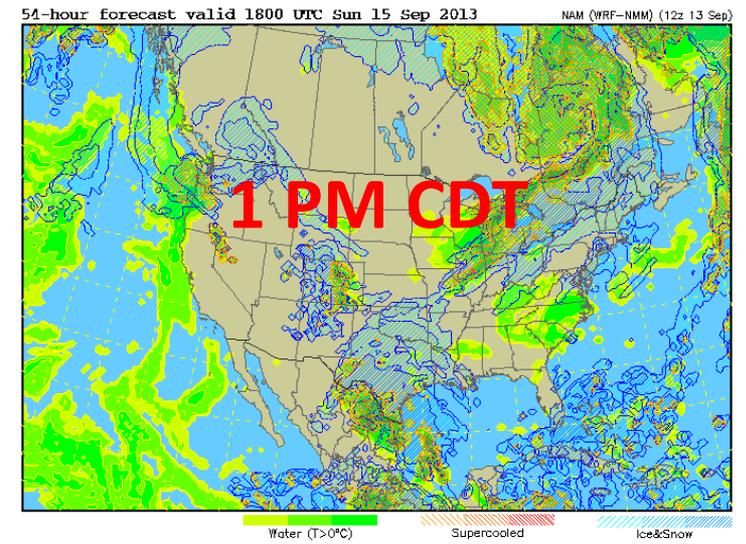
- Tomorrow: Low cloud and precipitation through most of day
- Sunday: Scattered Cu and high cloud
- Monday: Scattered Cu and high cloud

Tomorrow: NAM – Cirrus all day; some low cloud during afternoon.

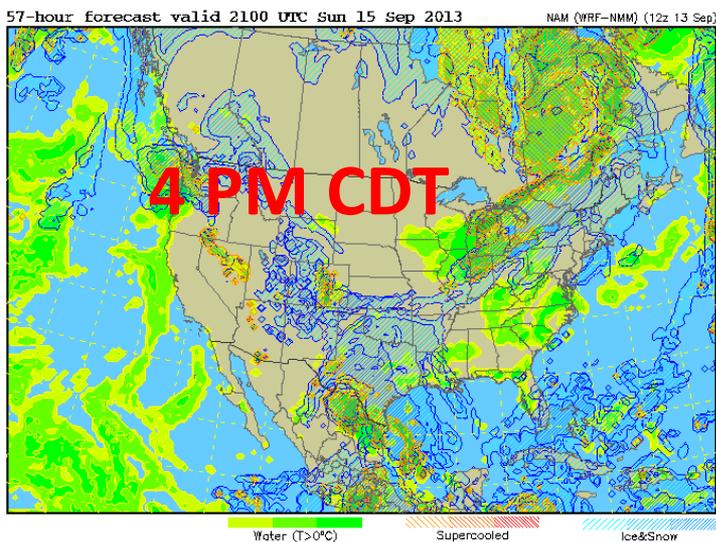
Integrated liquid and frozen hydrometeors (all levels)



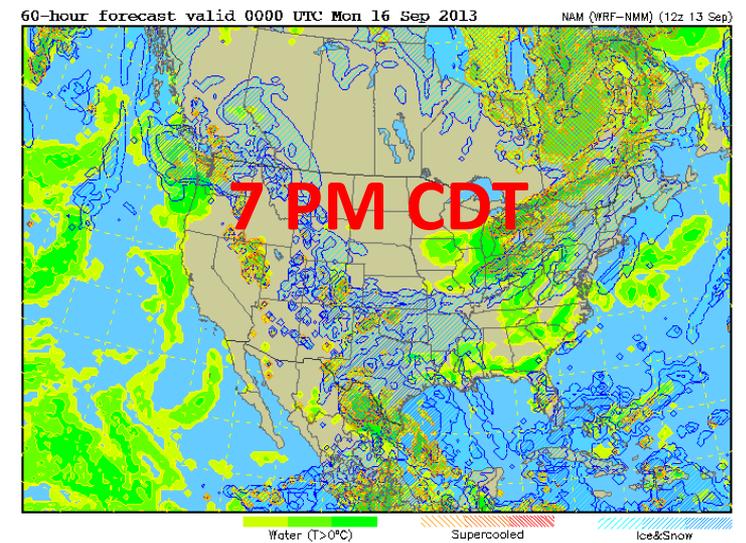
Integrated liquid and frozen hydrometeors (all levels)



Integrated liquid and frozen hydrometeors (all levels)

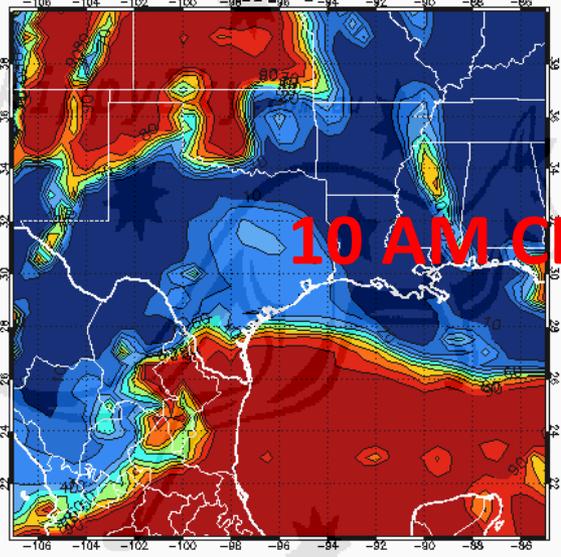


Integrated liquid and frozen hydrometeors (all levels)



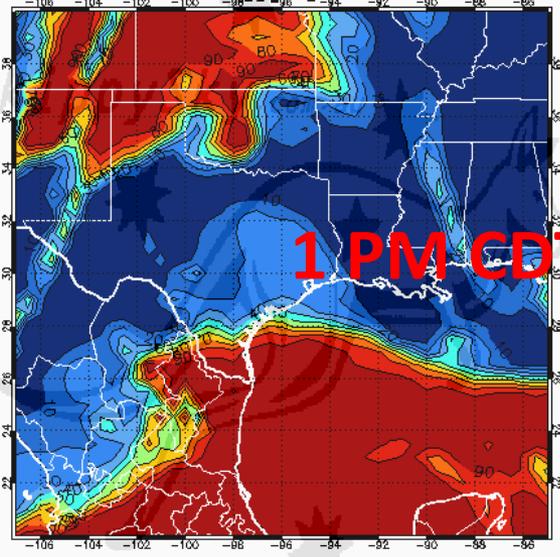
Tomorrow: GFS – Partly cloudy all day; heavy cloud cover hangs off until late in day.

GFS 13 Sep 2013 06 UTC SthCentral USA + 33 hour
Total Cloud Cover (%) at 15 UTC Saturday 14 September 2013
©2012 www.shippysky.com.au TM



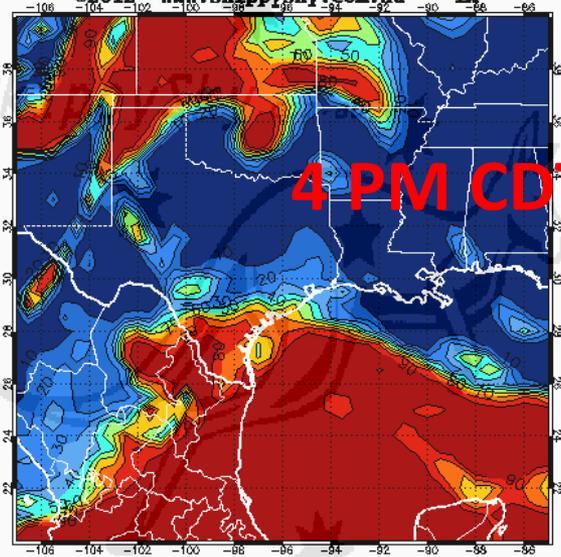
10 AM CDT

GFS 13 Sep 2013 06 UTC SthCentral USA + 36 hour
Total Cloud Cover (%) at 18 UTC Saturday 14 September 2013
©2012 www.shippysky.com.au TM



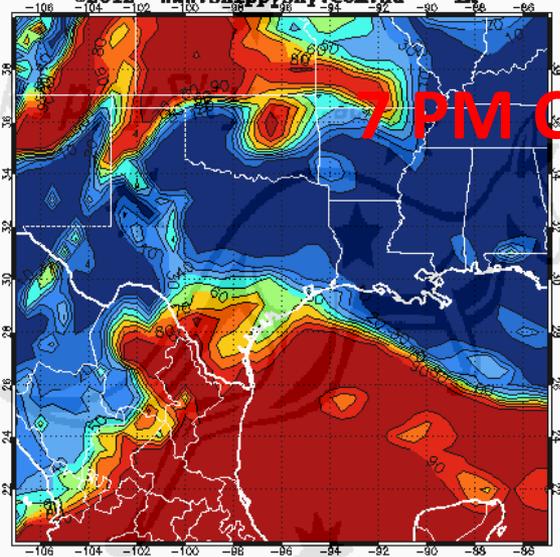
1 PM CDT

GFS 13 Sep 2013 06 UTC SthCentral USA + 39 hour
Total Cloud Cover (%) at 21 UTC Saturday 14 September 2013
©2012 www.shippysky.com.au TM



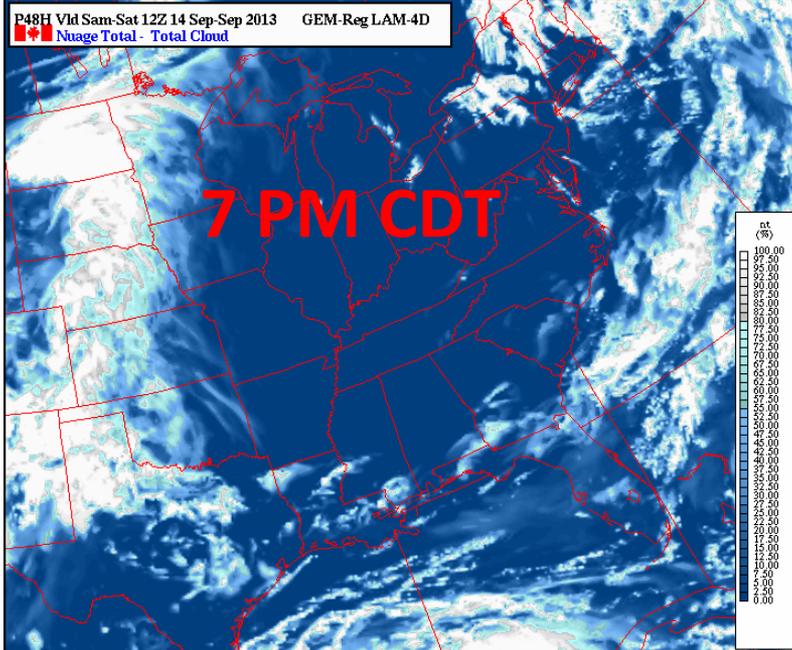
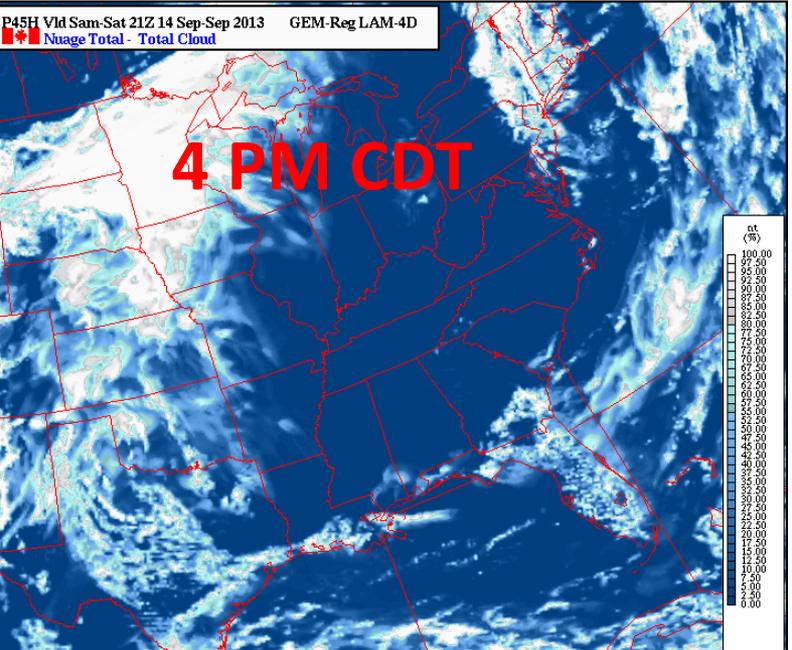
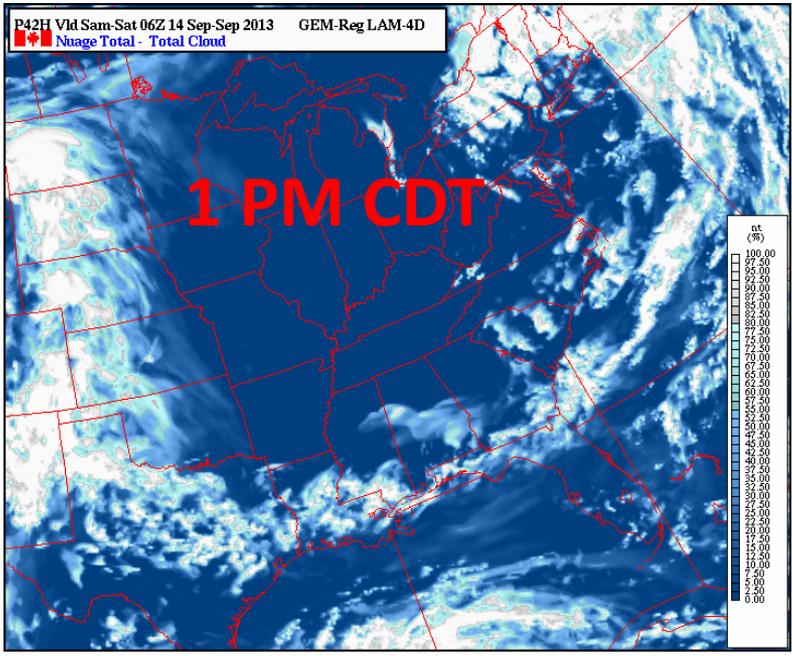
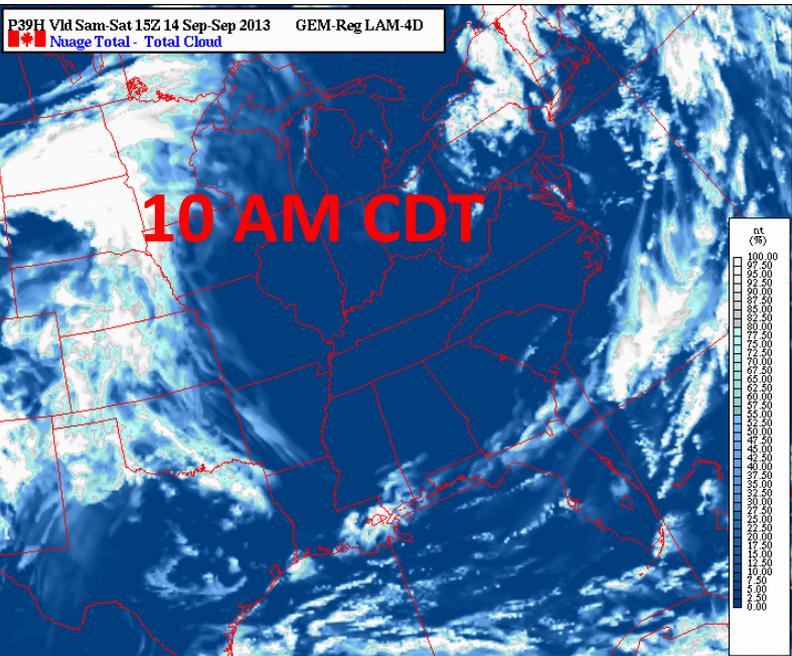
4 PM CDT

GFS 13 Sep 2013 06 UTC SthCentral USA + 42 hour
Total Cloud Cover (%) at 00 UTC Sunday 15 September 2013
©2012 www.shippysky.com.au TM



7 PM CDT

Tomorrow: Canadian - Clouds hang off the study region



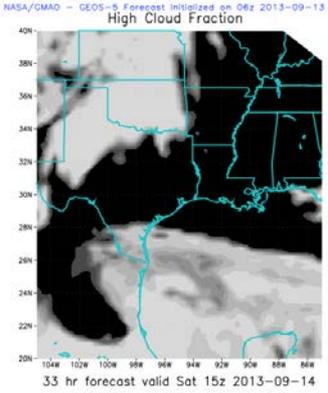
Tomorrow: GEOS-5 –Some low cloud builds into region by late in the day.

10 am

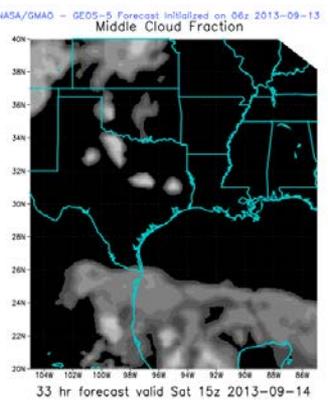
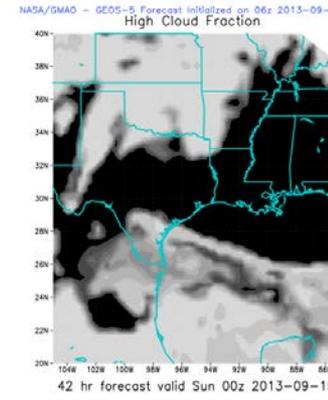
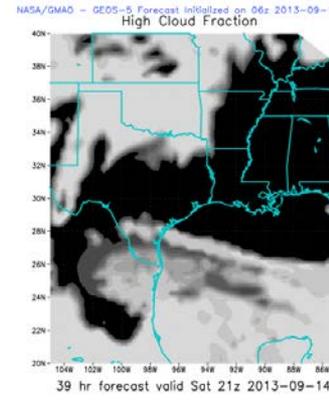
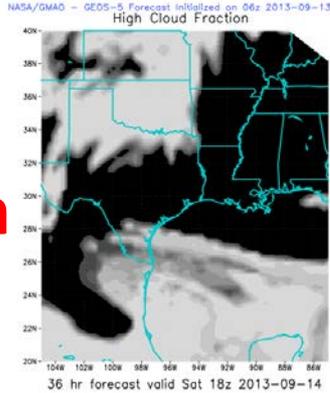
1 pm

4 pm

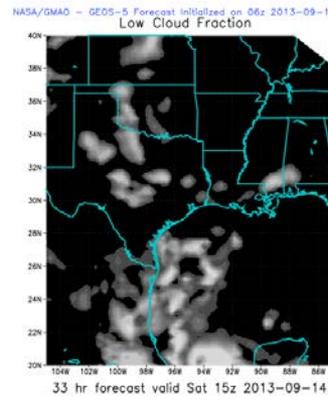
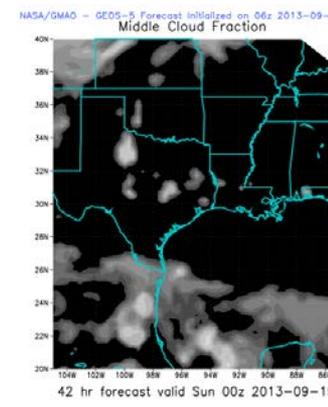
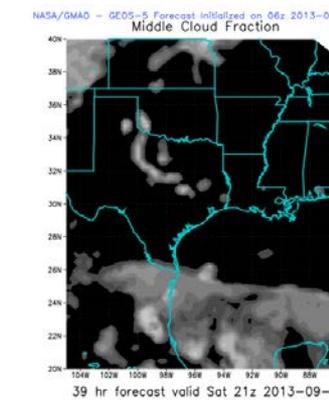
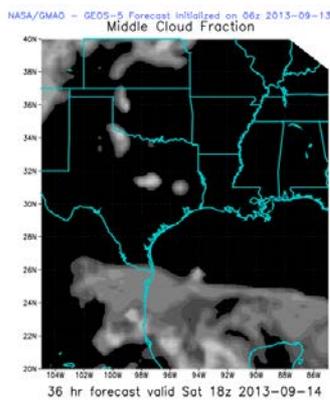
7 pm



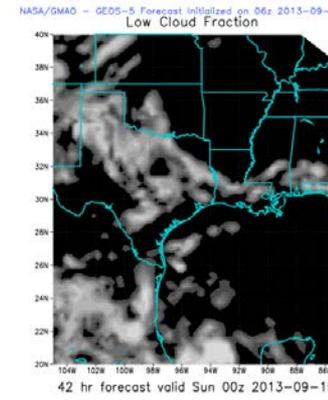
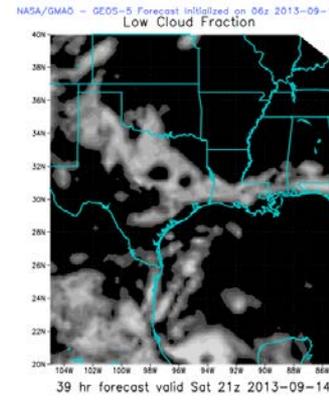
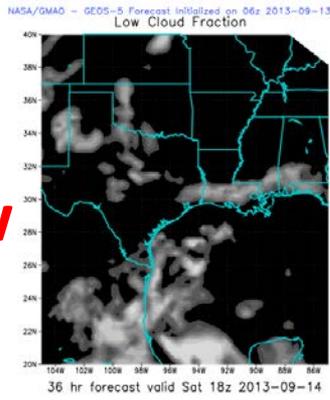
High



Mid



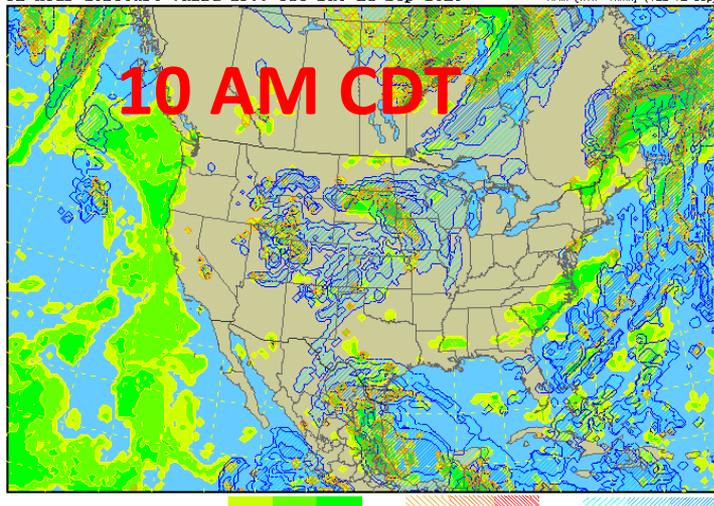
Low



Sunday: NAM – high level clouds through most of day

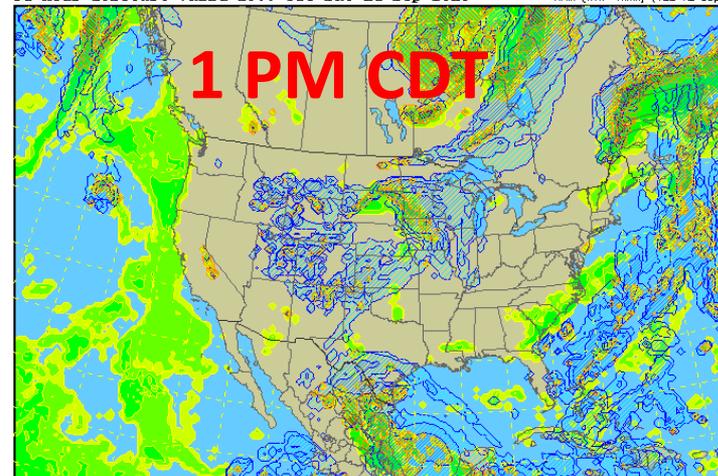
Integrated liquid and frozen hydrometeors (all levels)

51-hour forecast valid 1500 UTC Sat 14 Sep 2013 NAM (WRF-NMM) (12z 12 Sep)



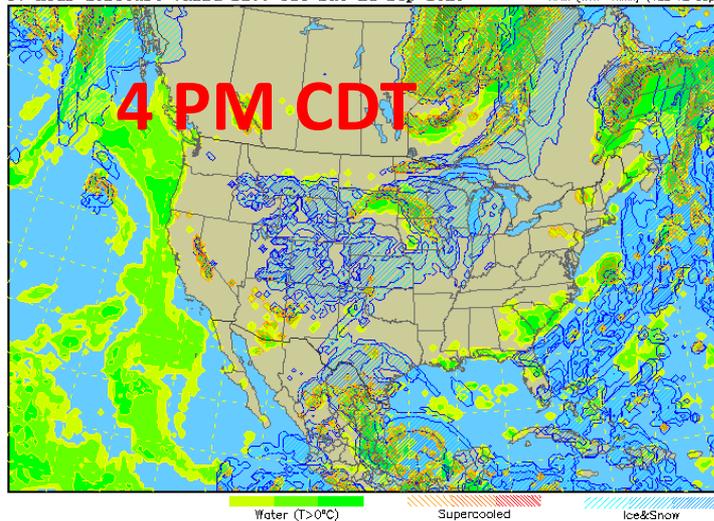
Integrated liquid and frozen hydrometeors (all levels)

51-hour forecast valid 1800 UTC Sat 14 Sep 2013 NAM (WRF-NMM) (12z 12 Sep)



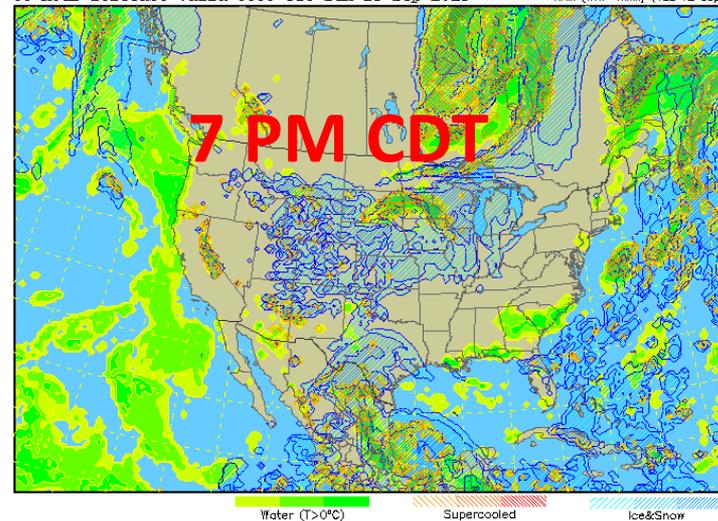
Integrated liquid and frozen hydrometeors (all levels)

57-hour forecast valid 2100 UTC Sat 14 Sep 2013 NAM (WRF-NMM) (12z 12 Sep)

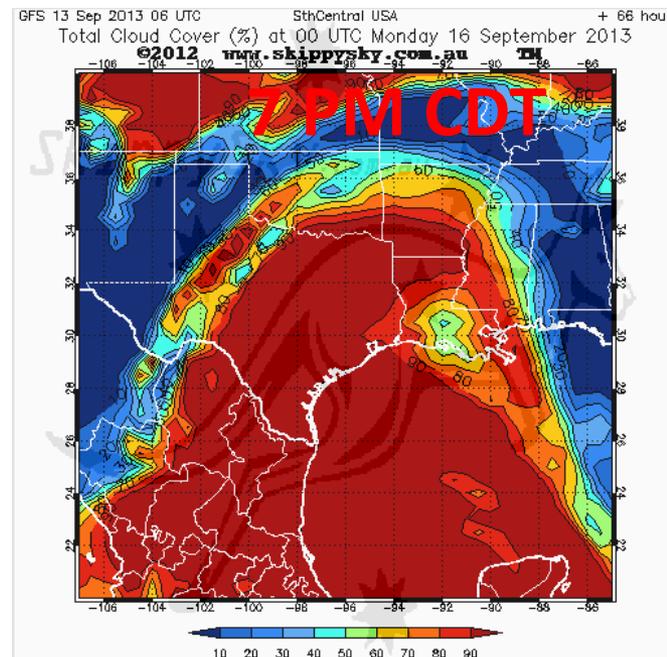
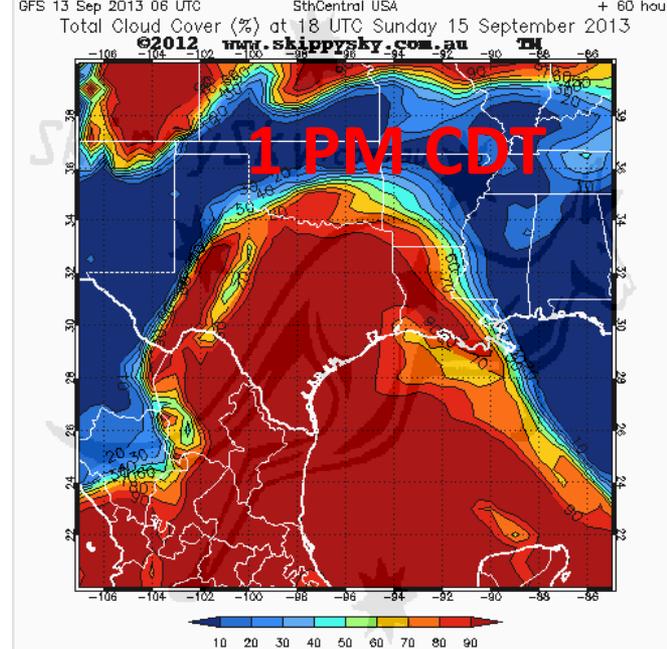


Integrated liquid and frozen hydrometeors (all levels)

60-hour forecast valid 0000 UTC Sun 15 Sep 2013 NAM (WRF-NMM) (12z 12 Sep)



Sunday: GFS – Clouds throughout the day



Sunday: GEOS-5 –high level clouds; low level clouds build in by late in the day.

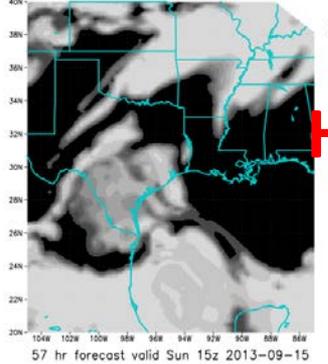
10 am

1 pm

4 pm

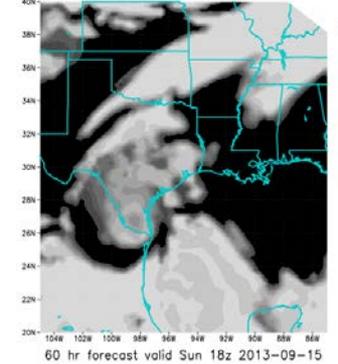
7 pm

NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
High Cloud Fraction

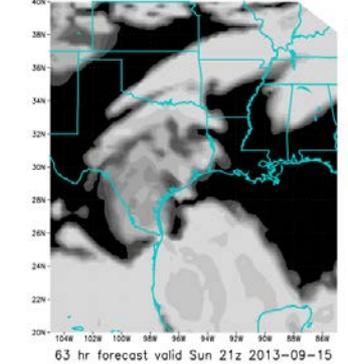


High

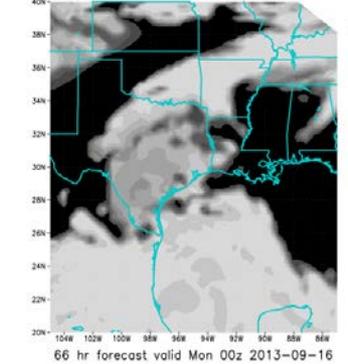
NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
High Cloud Fraction



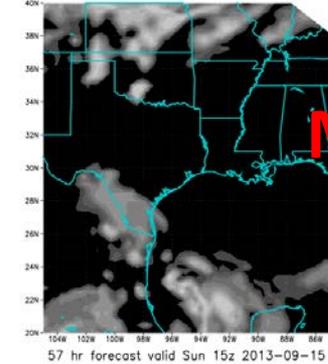
NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
High Cloud Fraction



NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
High Cloud Fraction

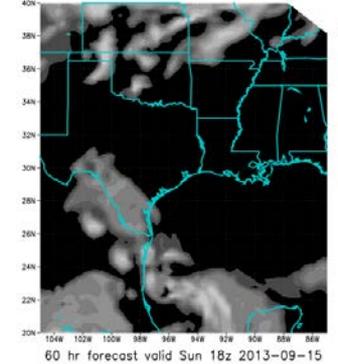


NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
Middle Cloud Fraction

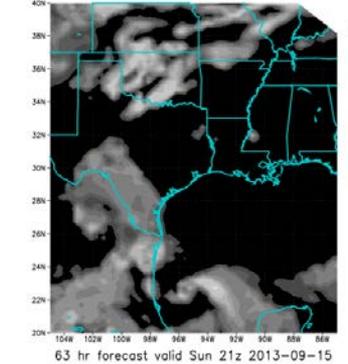


Mid

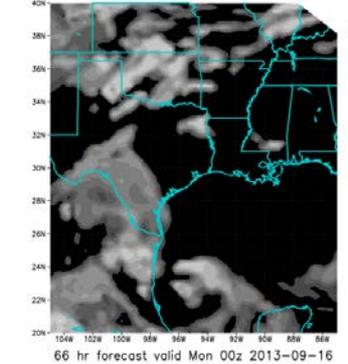
NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
Middle Cloud Fraction



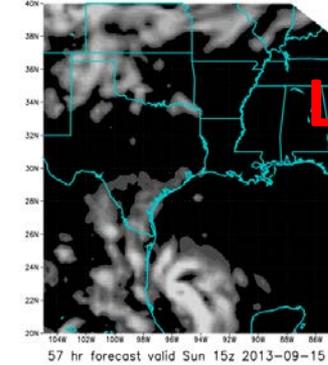
NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
Middle Cloud Fraction



NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
Middle Cloud Fraction

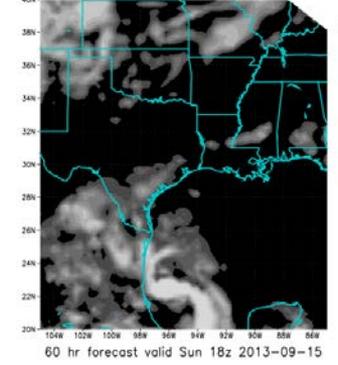


NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
Low Cloud Fraction

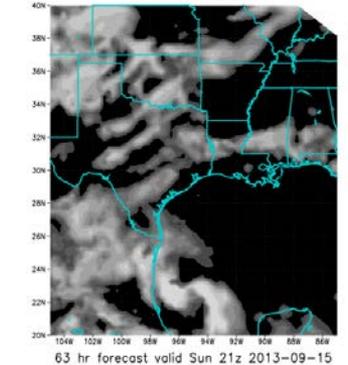


Low

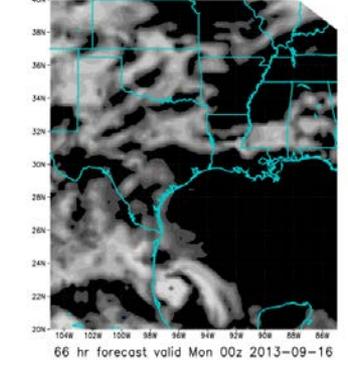
NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
Low Cloud Fraction



NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
Low Cloud Fraction

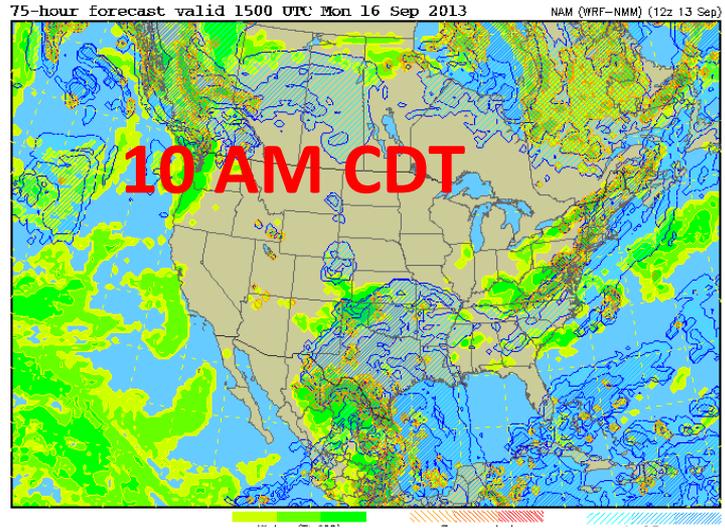


NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
Low Cloud Fraction

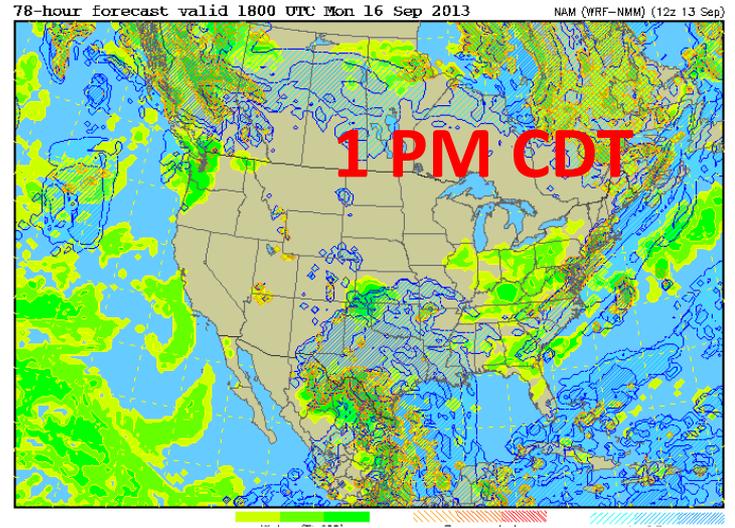


Monday: NAM – high level and low level clouds

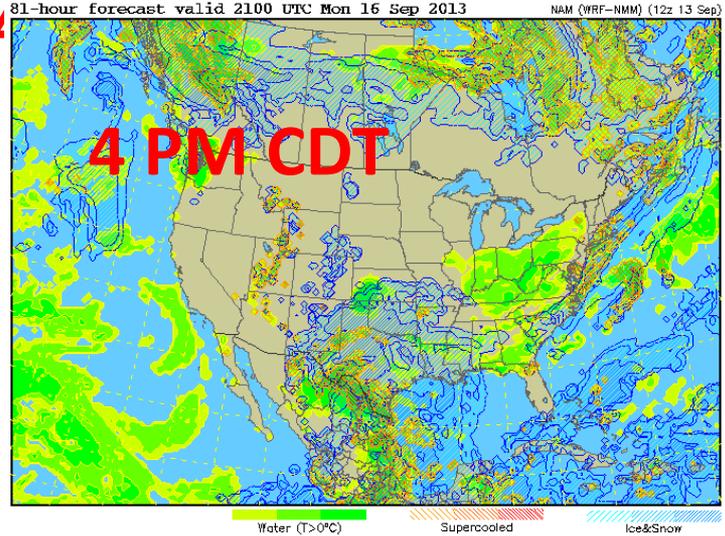
Integrated liquid and frozen hydrometeors (all levels)



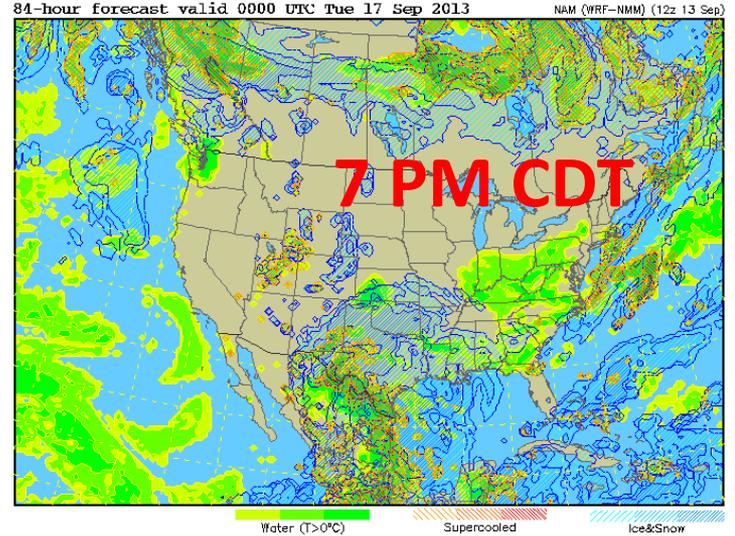
Integrated liquid and frozen hydrometeors (all levels)



Integrated liquid and frozen hydrometeors (all levels)



Integrated liquid and frozen hydrometeors (all levels)



Monday: GEOS-5 – high and mid clouds throughout the day

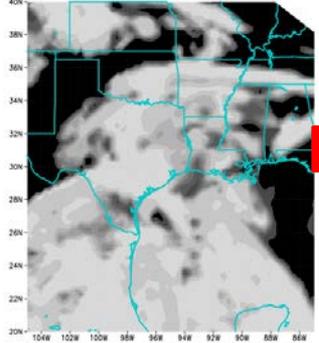
10 am

1 pm

4 pm

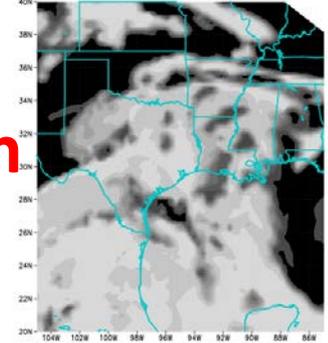
7 pm

NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
High Cloud Fraction



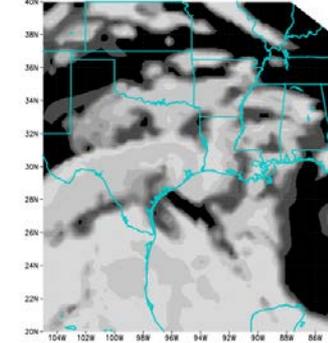
81 hr forecast valid Mon 15z 2013-09-16

NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
High Cloud Fraction



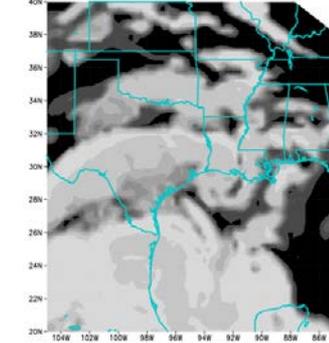
84 hr forecast valid Mon 18z 2013-09-16

NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
High Cloud Fraction



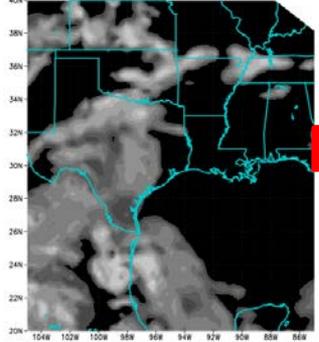
87 hr forecast valid Mon 21z 2013-09-16

NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
High Cloud Fraction



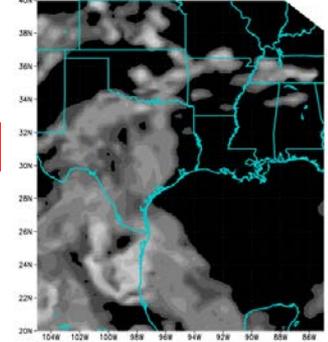
90 hr forecast valid Tue 00z 2013-09-17

NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
Middle Cloud Fraction



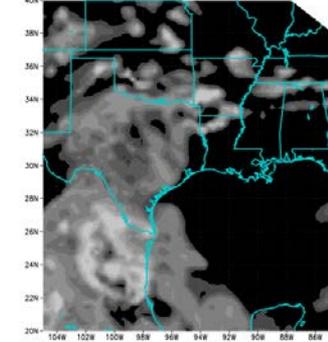
81 hr forecast valid Mon 15z 2013-09-16

NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
Middle Cloud Fraction



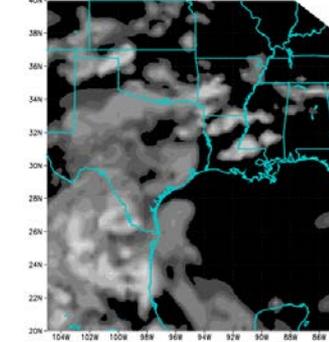
84 hr forecast valid Mon 18z 2013-09-16

NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
Middle Cloud Fraction



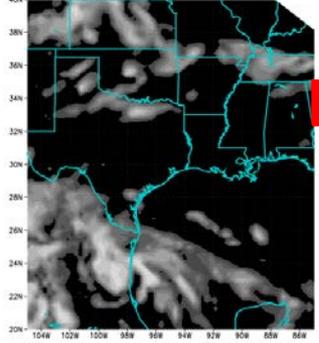
87 hr forecast valid Mon 21z 2013-09-16

NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
Middle Cloud Fraction



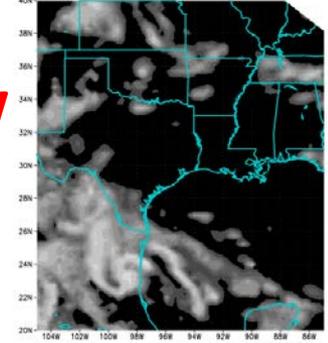
90 hr forecast valid Tue 00z 2013-09-17

NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
Low Cloud Fraction



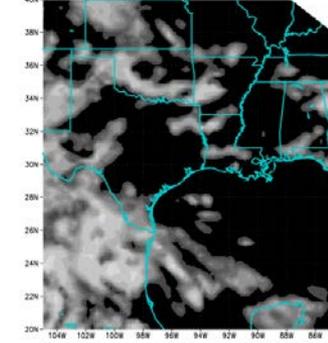
81 hr forecast valid Mon 15z 2013-09-16

NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
Low Cloud Fraction



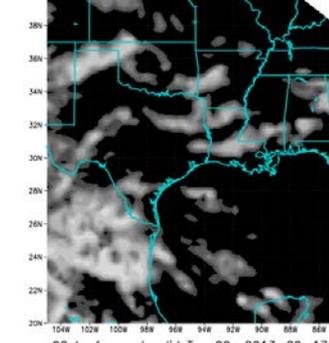
84 hr forecast valid Mon 18z 2013-09-16

NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
Low Cloud Fraction



87 hr forecast valid Mon 21z 2013-09-16

NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
Low Cloud Fraction



90 hr forecast valid Tue 00z 2013-09-17



Recommendations

- Tomorrow: Good day to fly for both P3B and King Air. NWS forecasts some cirrus over Houston area, coasts are clearer.
- Sunday: Cirrus deck over Houston thickens; coast remains less cloudy than Houston. Houston area likely to be in poor condition for a flight, but coastal conditions may permit King Air flight.

DISCOVER-AQ Air Quality Outlook

September 13, 2013

Bryan Duncan

Mariel Friberg

Ken Pickering

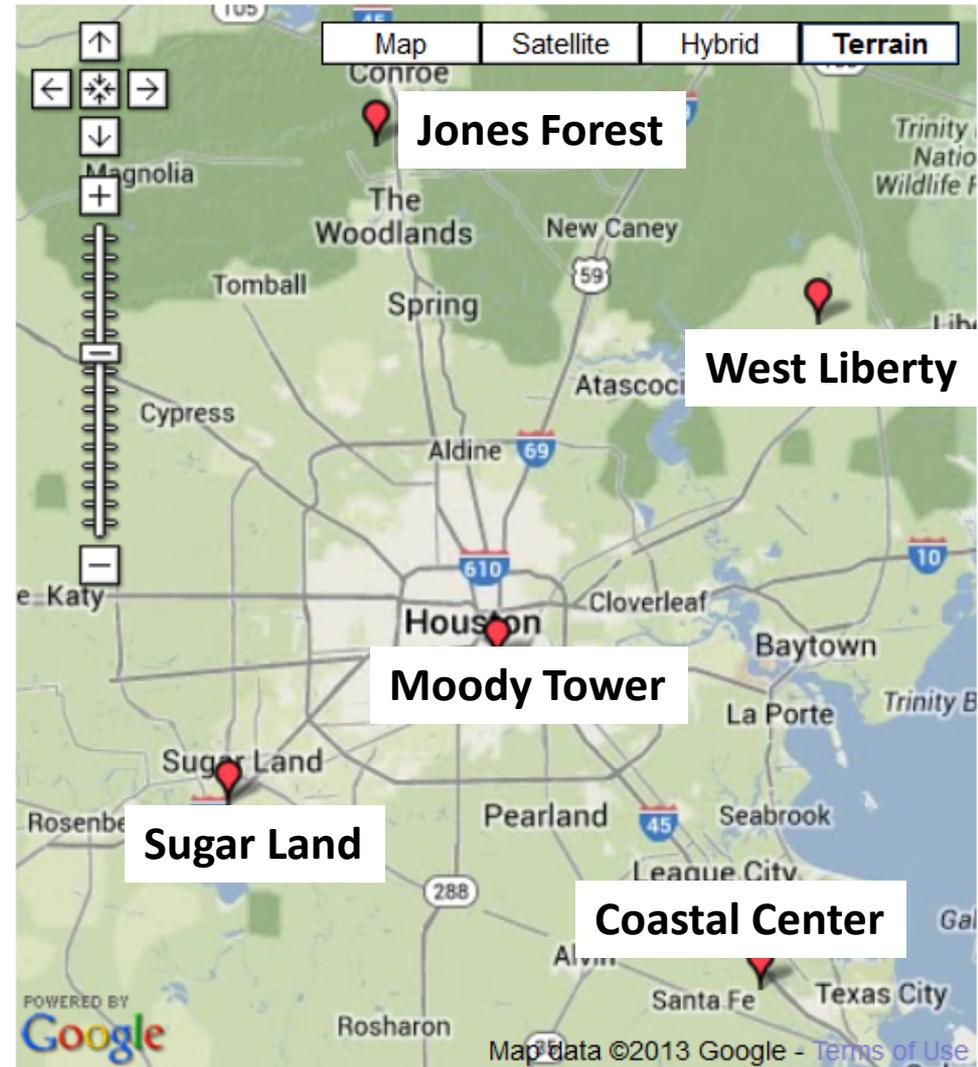
Houston - Network of Environmental Towers (H-NET)

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.

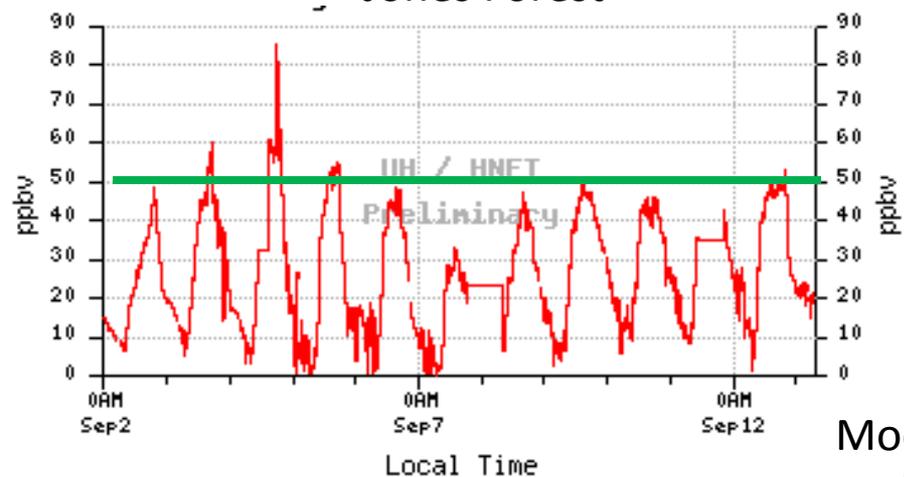
Currently, **five sites** have been set up in

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

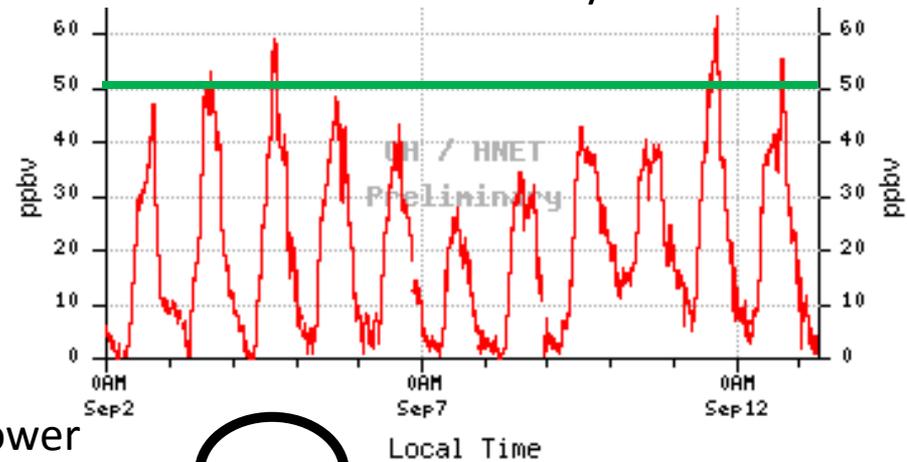
[More about this project.](#)



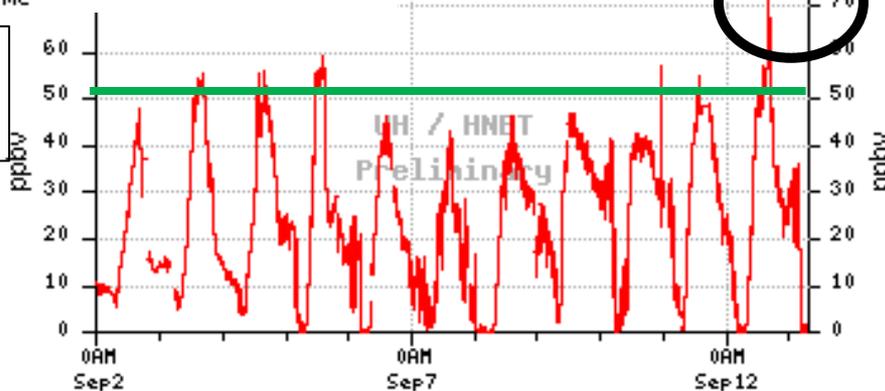
Jones Forest



West Liberty



Moody Tower



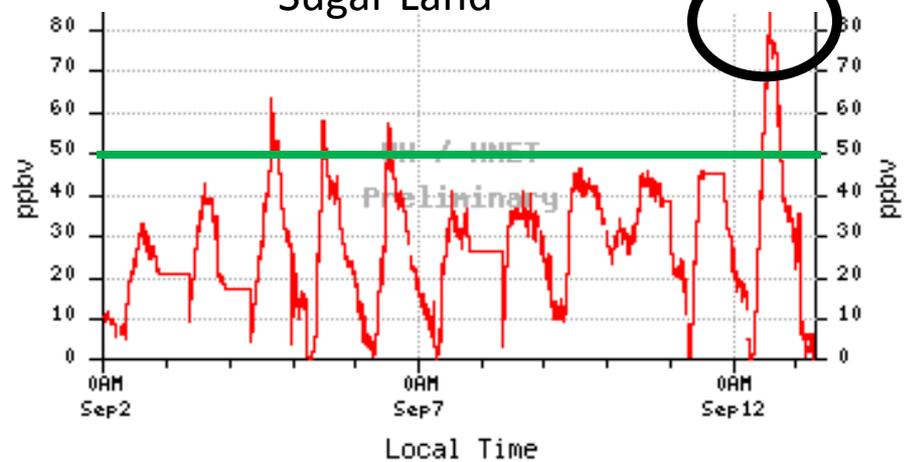
Local Time

O₃ (ppbv) – 15 min avg
September 2nd – 12th

— = 50 ppbv

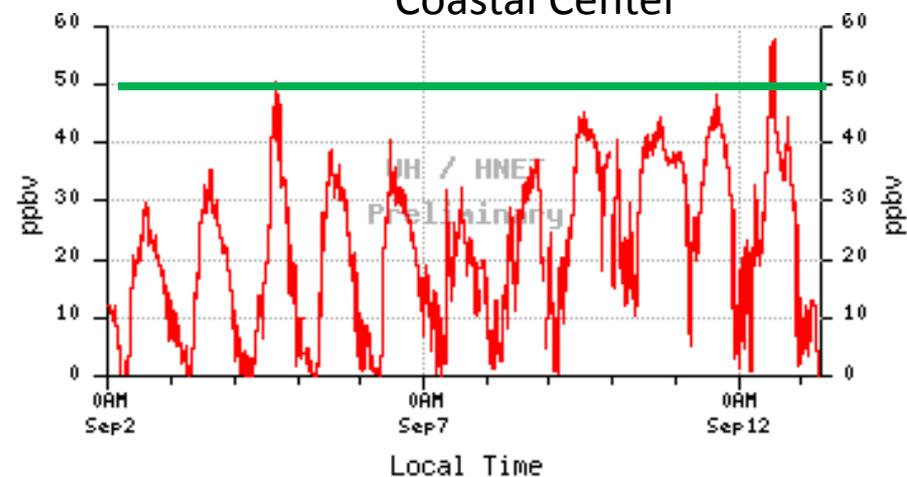
**Houston – Network of
 Environmental Towers
 (H-NET)**

Sugar Land



Local Time

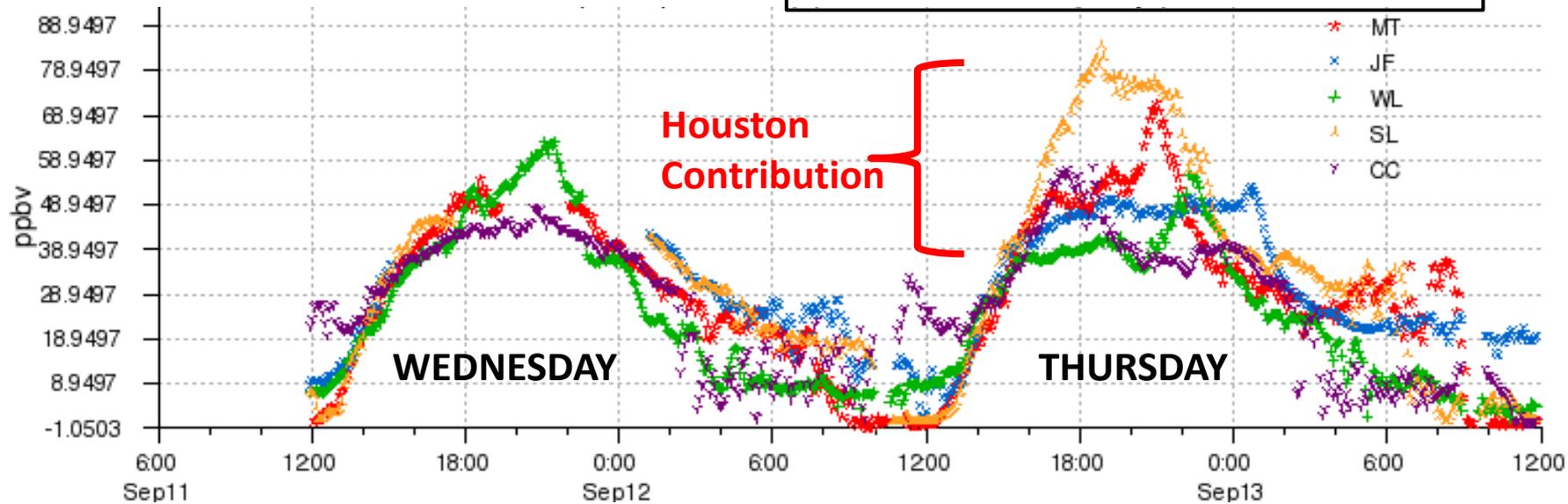
Coastal Center



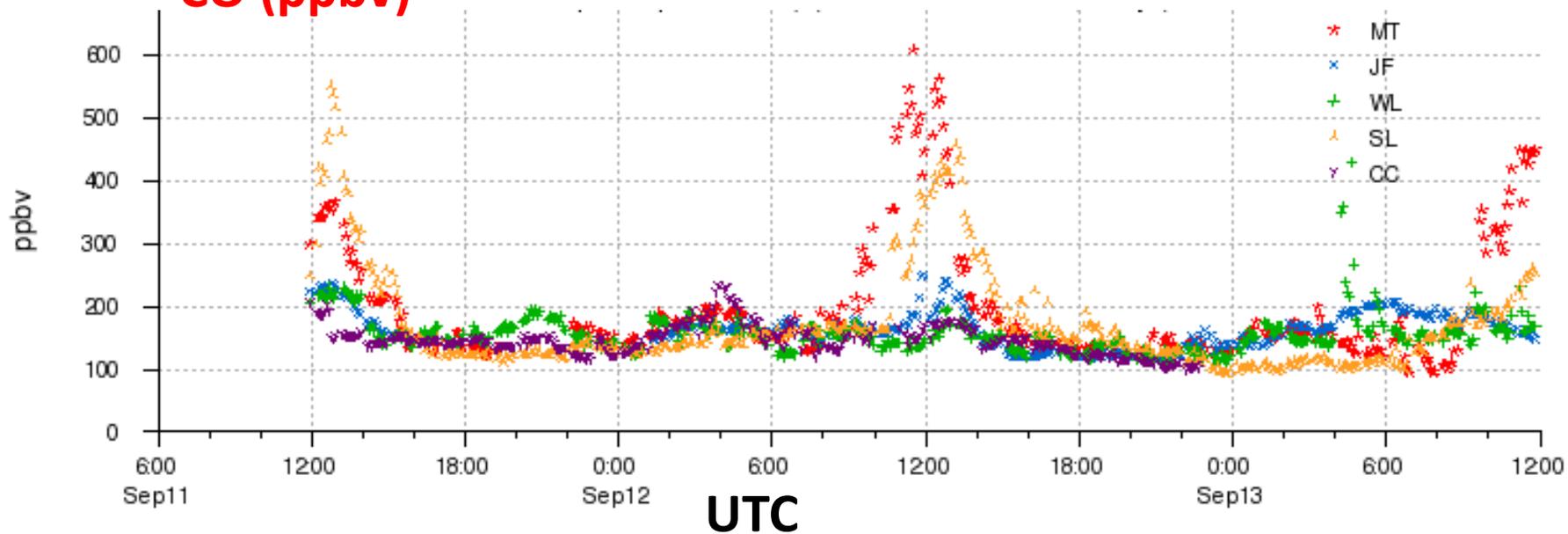
Local Time

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

Ozone (ppbv)

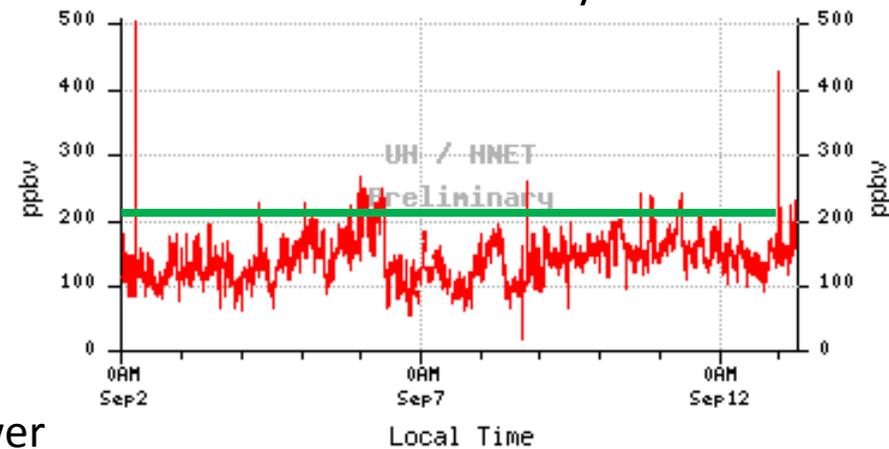
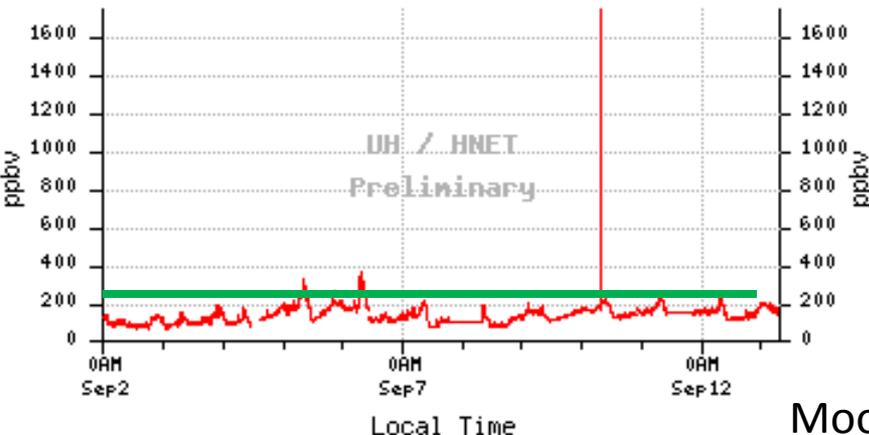


CO (ppbv)



Jones Forest

West Liberty

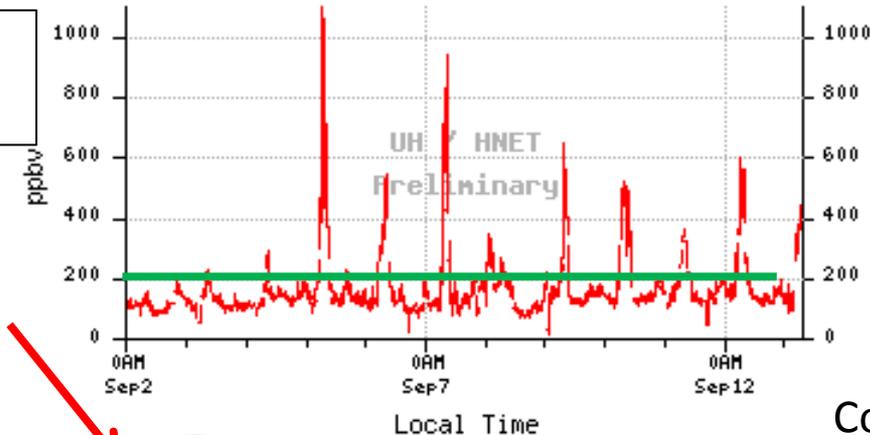


Moody Tower

CO (ppbv) – 15 min avg
September 2nd – 12th

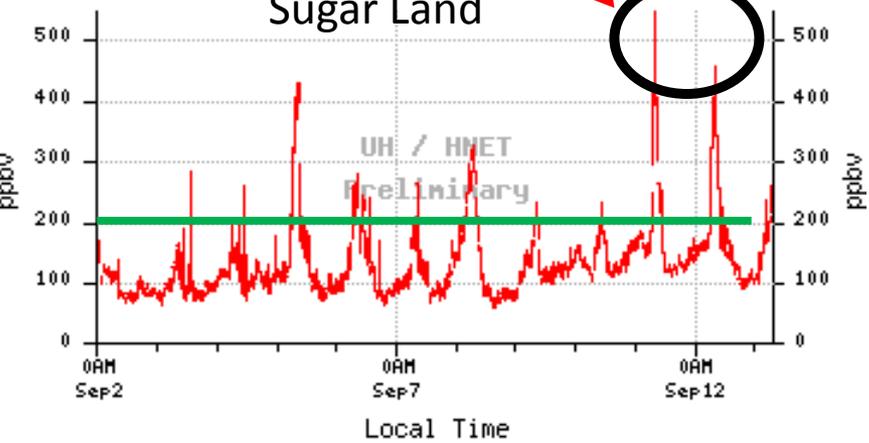
———— = 200 ppbv

Downwind of Houston

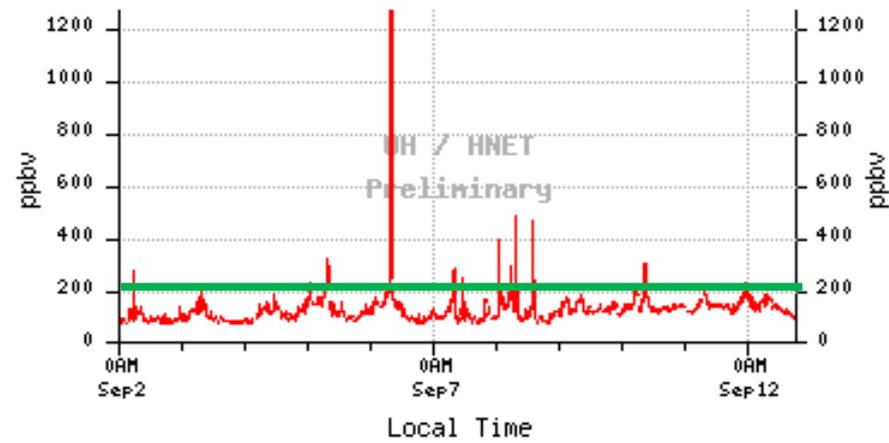


Houston – Network of Environmental Towers (H-NET)

Sugar Land

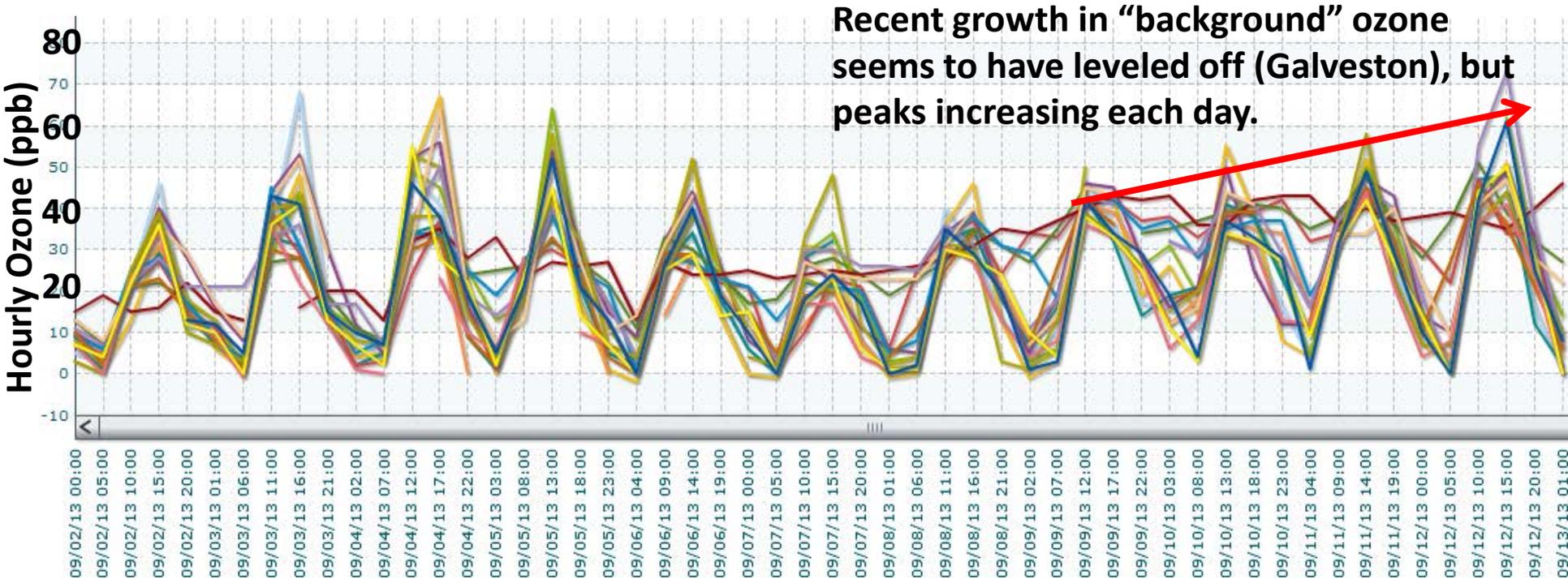


Coastal Center



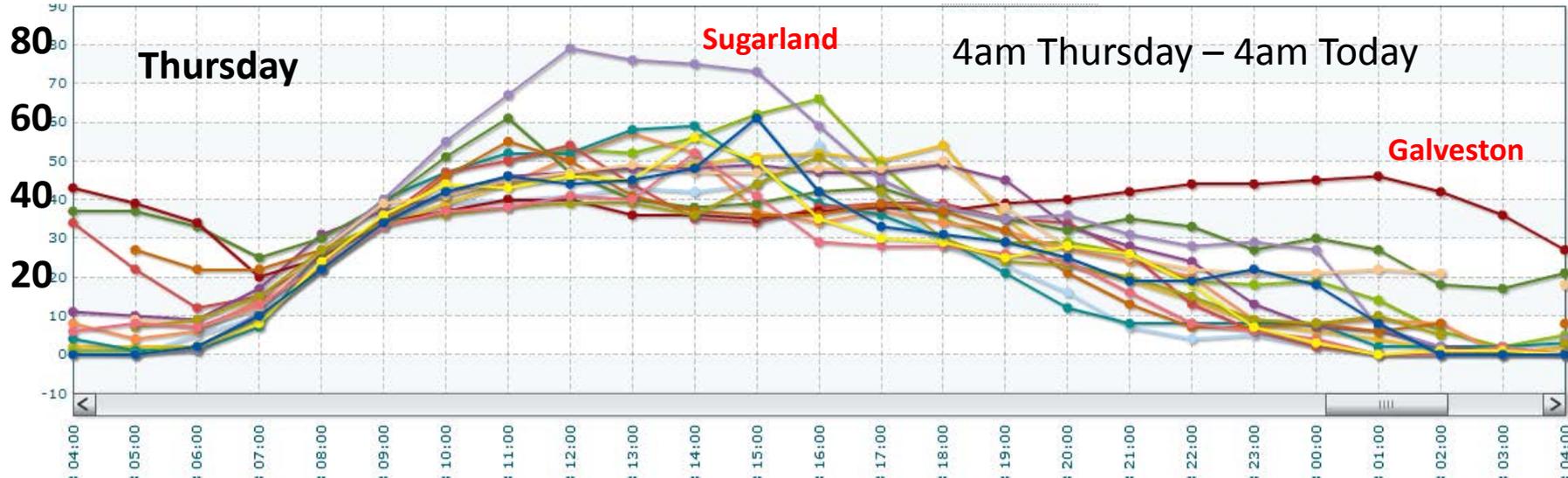
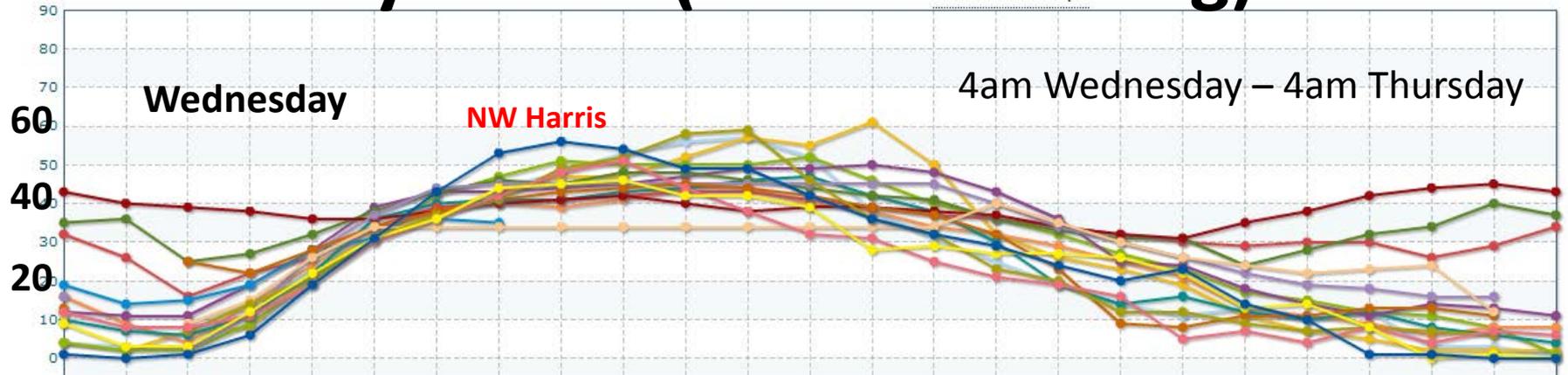
Hourly Ozone (airnowtech.org)**

September 2nd – 12th ** EVERY 5th 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) |

Hourly Ozone (airnowtech.org)



- | | |
|---|---|
| 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) |

TCEQ AQ Forecast (Ozone)

TODAY: Code Orange - Unhealthy for Sensitive Groups

“Winds may be light enough and incoming background levels high enough for ozone levels to reach "Unhealthy for Sensitive Groups" on the west and southwest side of the Houston area.”

SATURDAY: 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

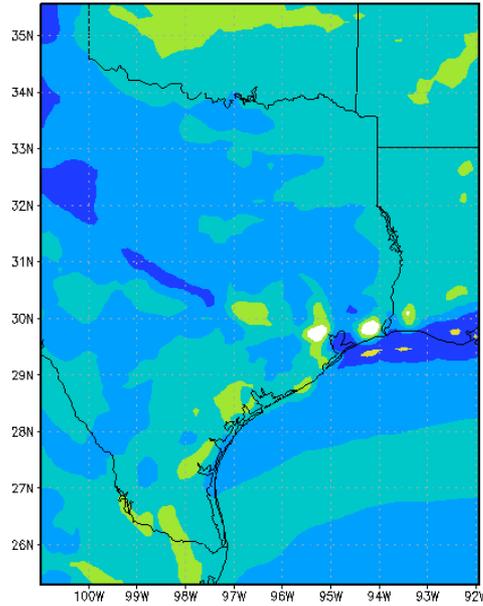
PM2.5 will continue in the low end of the moderate range.

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

1013 hPa

O3 [ppb] at 1013 [hPa] Valid 17Z SEP 14 2013

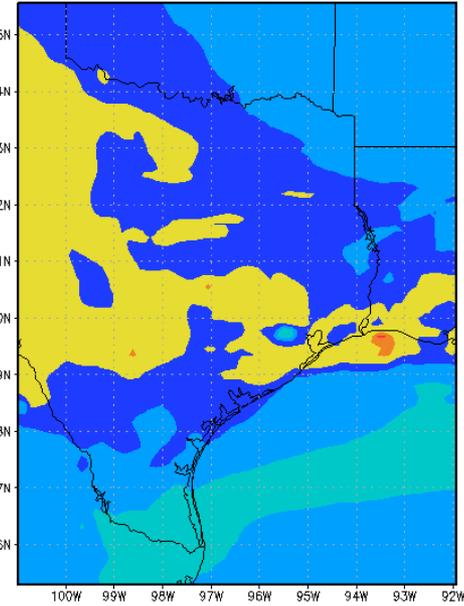
9 am



noon

**NOAA
Experim.
CMAQ

Surface
Ozone**

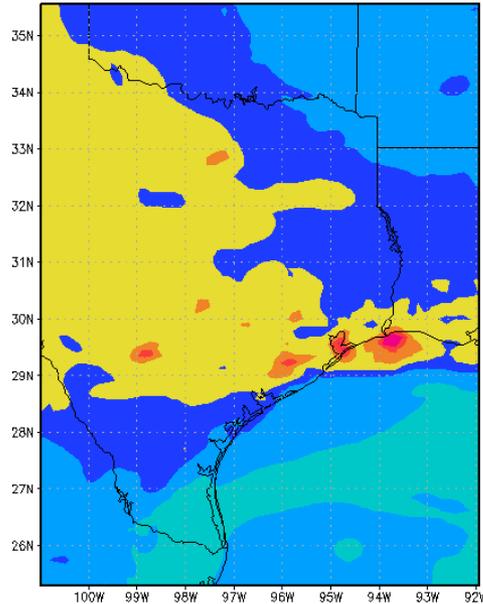


GRADS: COLA/IGES

GRADS: COLA/IGES

O3 [ppb] at 1013 [hPa] Valid 19Z SEP 14 2013

2 pm

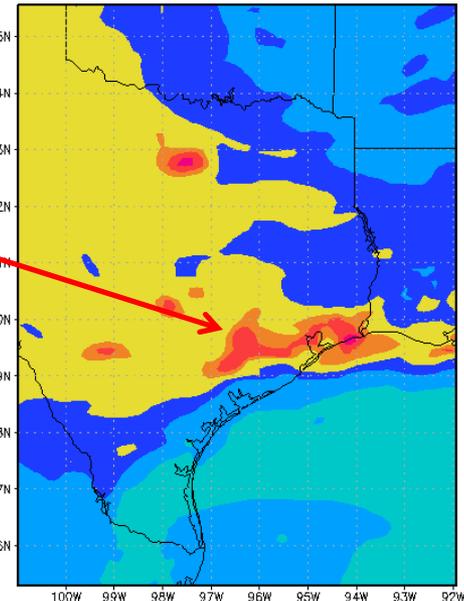


O3 [ppb] at 1013 [hPa] Valid 22Z SEP 14 2013

5 pm

Plume W

SATURDAY

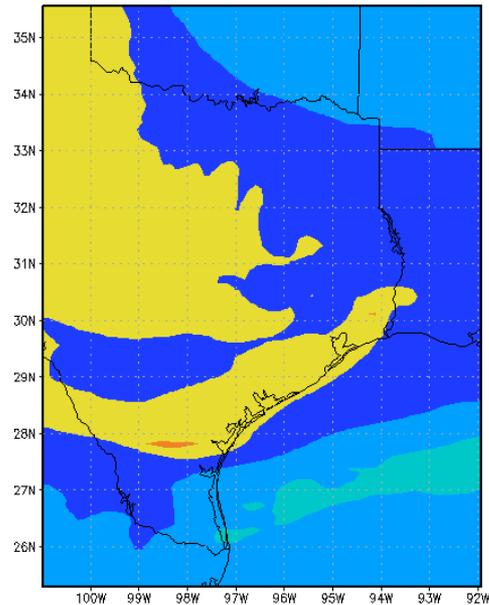


GRADS: COLA/IGES

GRADS: COLA/IGES

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

9 am



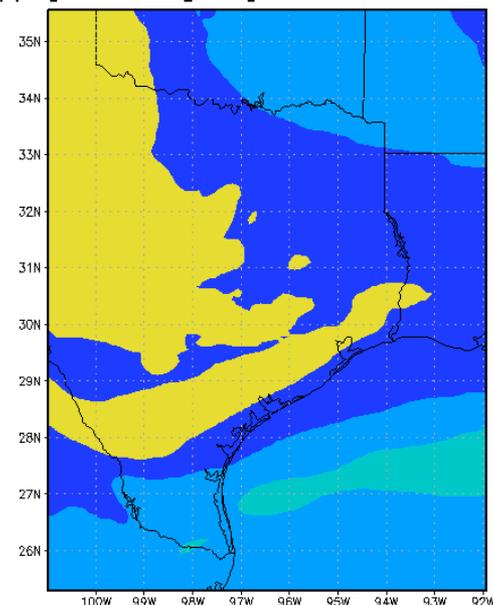
850 hPa

noon

NOAA
Experim.
CMAQ

1.5 Km
Ozone

O3 [ppb] at 850 [hPa] Valid 17Z SEP 14 2013

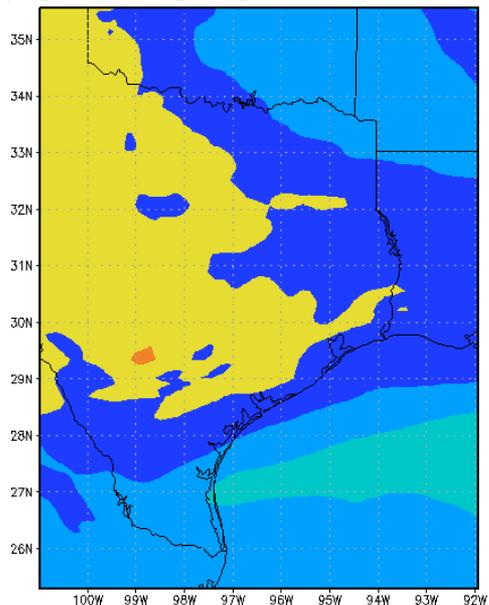


GRADS: COLA/IGES

GRADS: COLA/IGES

O3 [ppb] at 850 [hPa] Valid 19Z SEP 14 2013

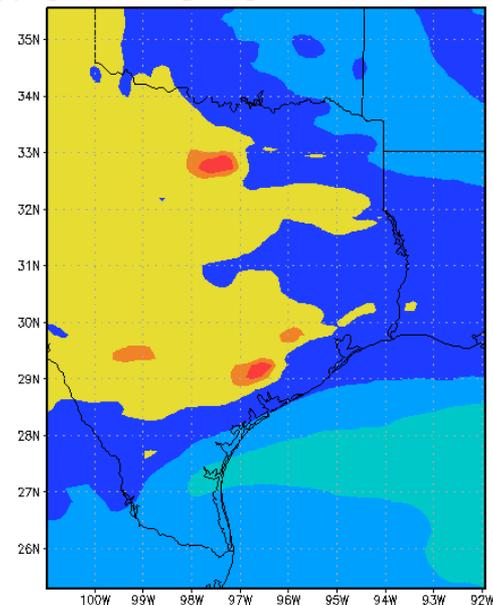
2 pm



O3 [ppb] at 850 [hPa] Valid 22Z SEP 14 2013

5 pm

SATURDAY



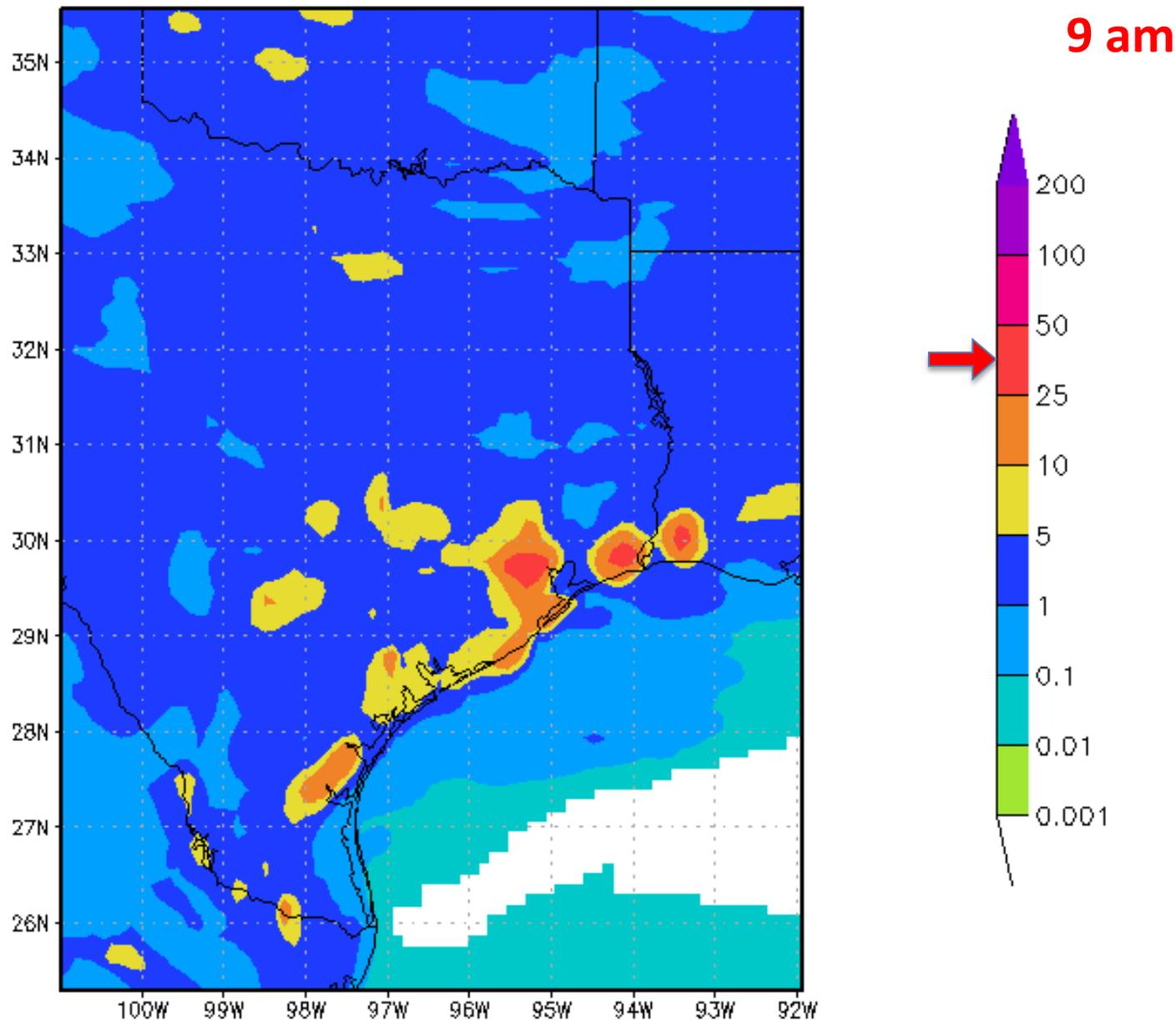
GRADS: COLA/IGES

GRADS: COLA/IGES

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

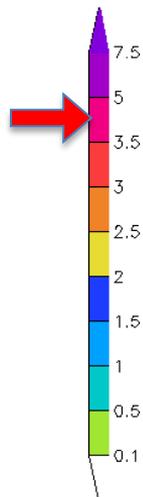
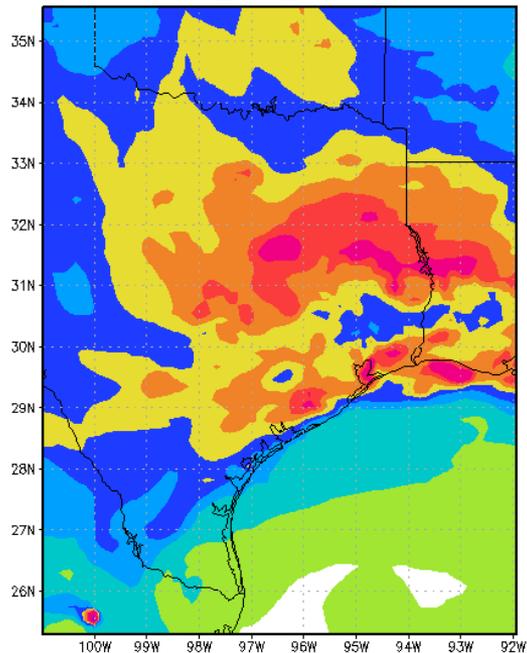
NOAA Experm.
CMAQ Model
Surface NO2

SATURDAY



FORM [ppb] at 1013 [hPa] Valid 19Z SEP 14 2013

2 pm

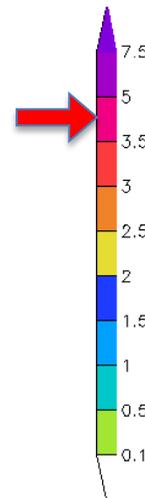
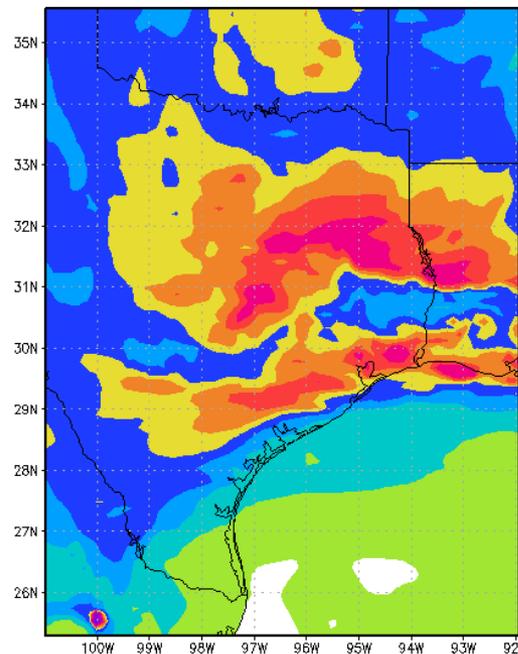


SATURDAY

NOAA Experm. CMAQ Model
Surface Formaldehyde

FORM [ppb] at 1013 [hPa] Valid 22Z SEP 14 2013

5 pm



NE & E flow allowing high HCHO over
Houston.

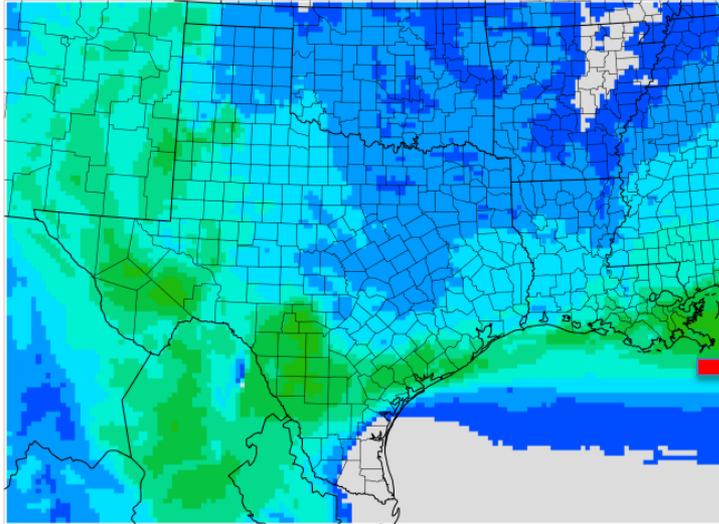
9 am

Ozone
Best Case

SATURDAY

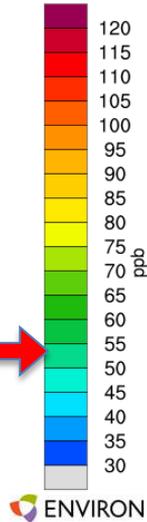
Ozone
Best Case

noon

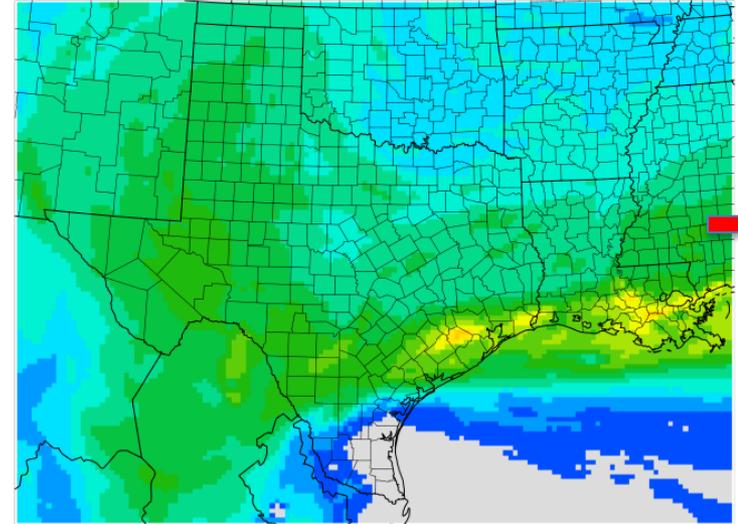


Min(79,20) = 22.5, Max(62,43) = 63.6

Sat September 14 09:00 CST

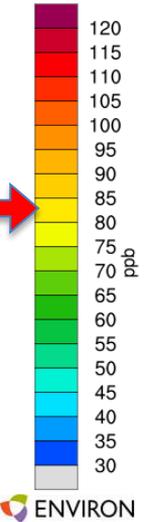


ENVIRON



Min(55,4) = 5.2, Max(94,41) = 87.6

Sat September 14 12:00 CST



ENVIRON

CAMx Model

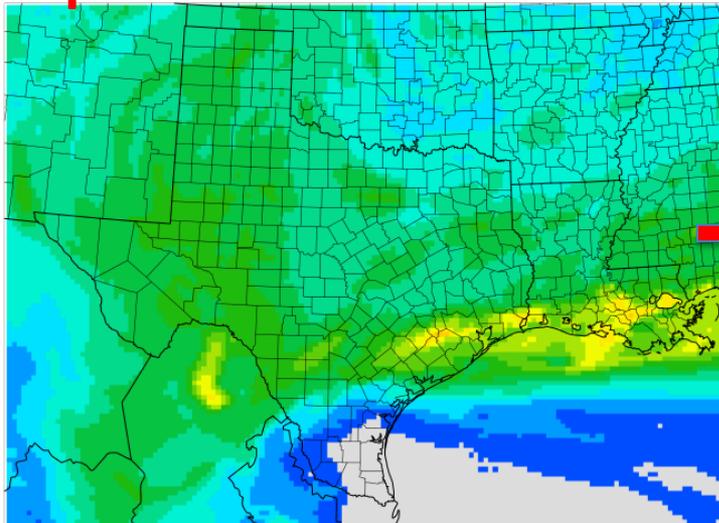
Surface Ozone

2 pm

Ozone
Best Case

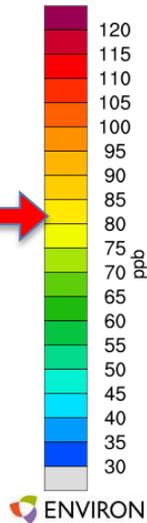
Ozone
Best Case

5 pm

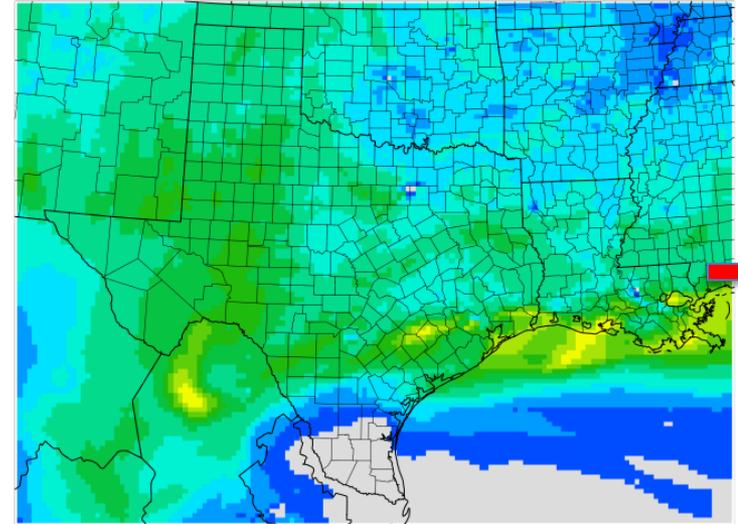


Min(78,18) = 23.8, Max(90,41) = 88.8

Sat September 14 14:00 CST

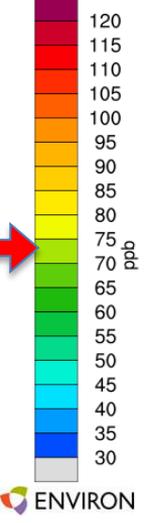


ENVIRON



Min(82,71) = 14.2, Max(123,43) = 79.9

Sat September 14 17:00 CST



ENVIRON

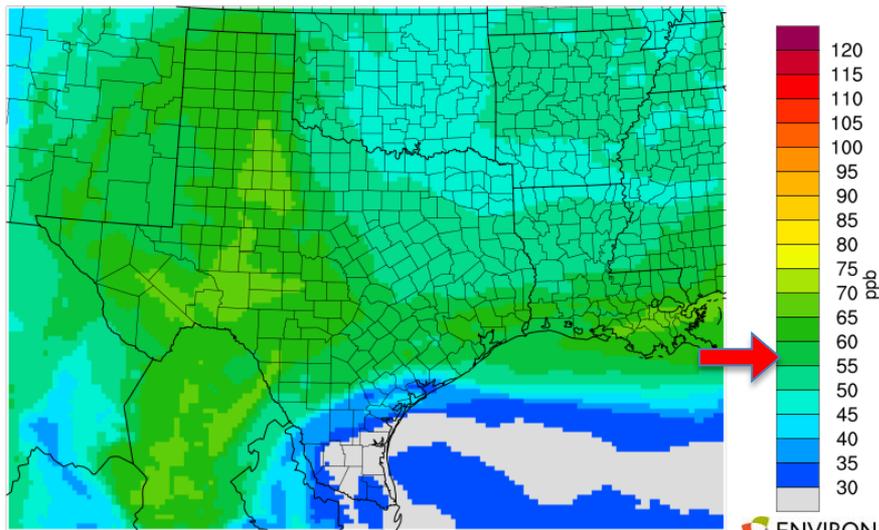
9 am

Ozone
Best Case: CAMx Layer 14

SATURDAY

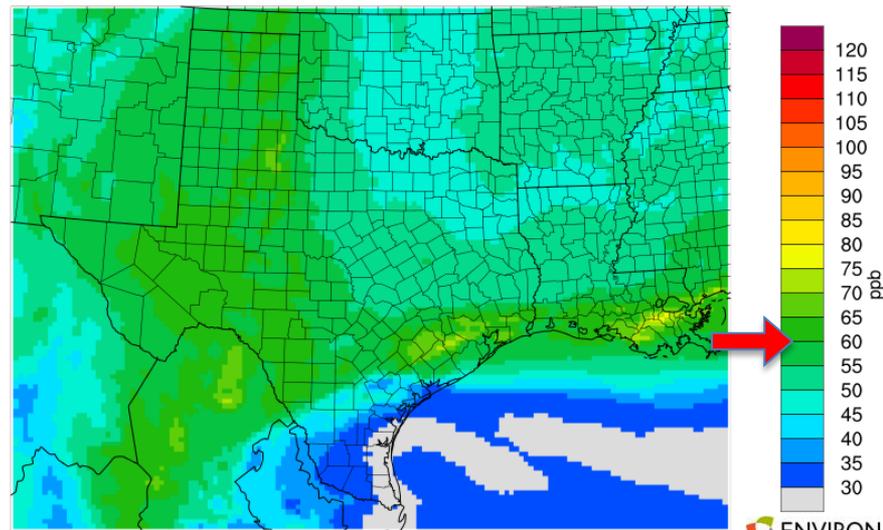
Ozone
Best Case: CAMx Layer 14

noon



Min(80,22) = 25.9, Max(36,18) = 69.9

Sat September 14 09:00 CST



Min(80,22) = 25.7, Max(133,45) = 79.7

Sat September 14 12:00 CST

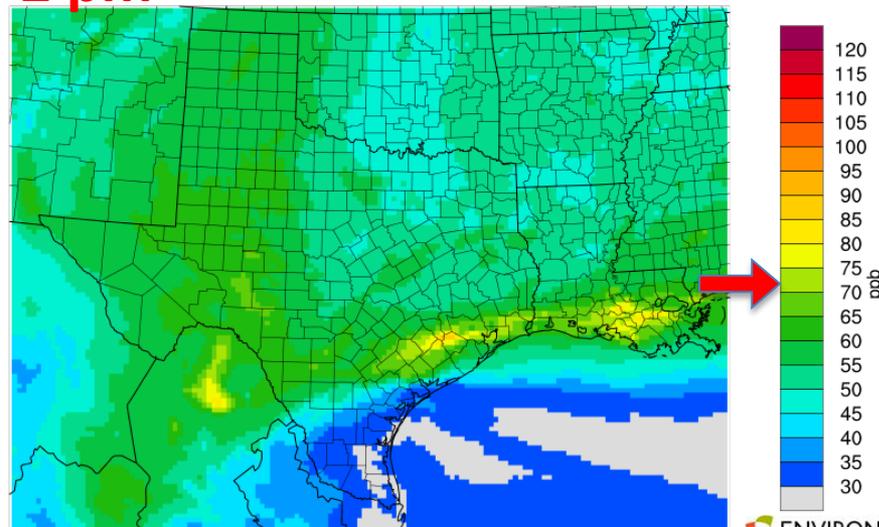
CAMx Model 1.2 km Ozone

2 pm

Ozone
Best Case: CAMx Layer 14

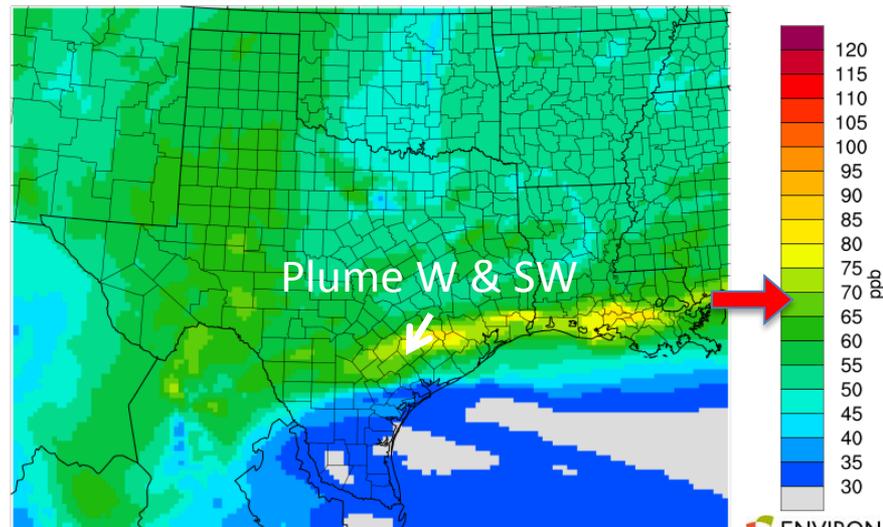
Ozone
Best Case: CAMx Layer 14

5 pm



Min(119,19) = 25.7, Max(92,41) = 87.7

Sat September 14 14:00 CST



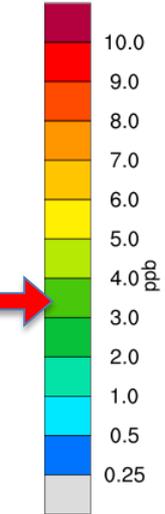
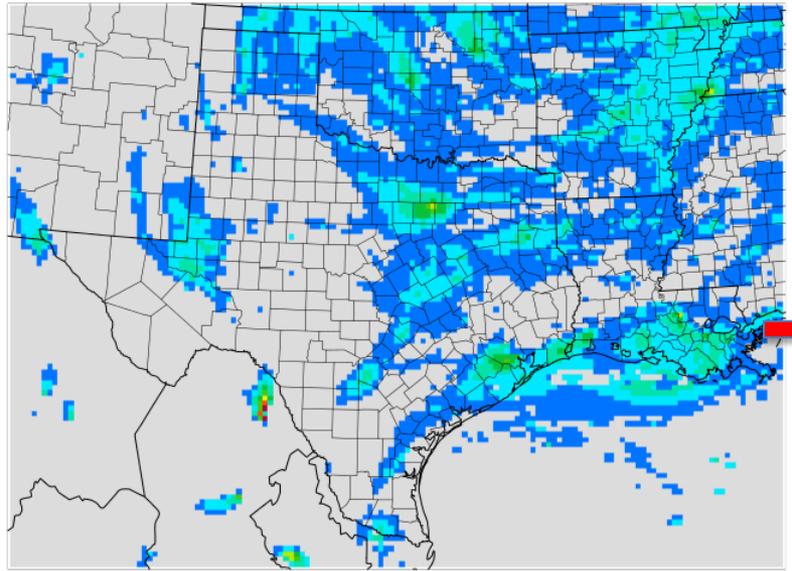
Min(118,21) = 26.0, Max(128,45) = 85.0

Sat September 14 17:00 CST

NO 9 am
Best Case

SATURDAY

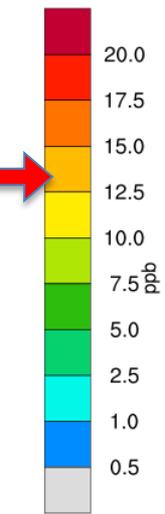
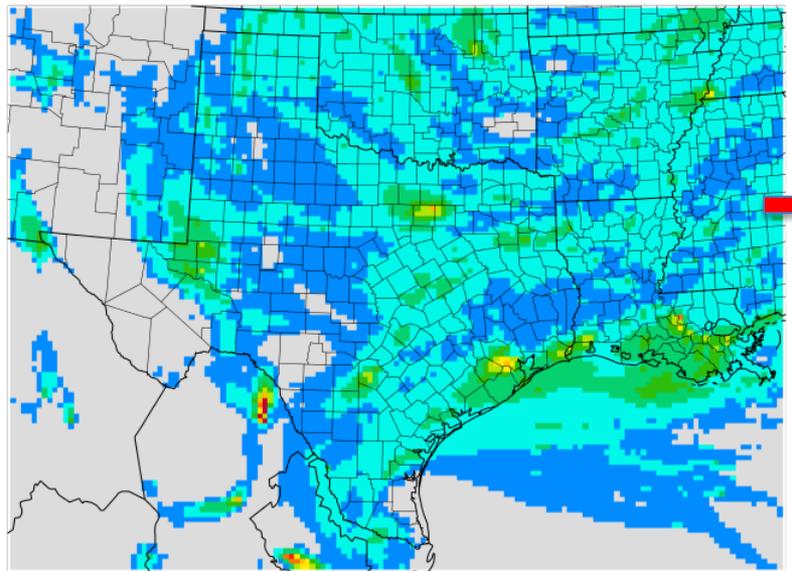
CAMx Surface NO and NOx



Min(117,4) = 0.0, Max(50,30) = 18.2
Sat September 14 09:00 CST

ENVIRON

NOx 9 am
Best Case

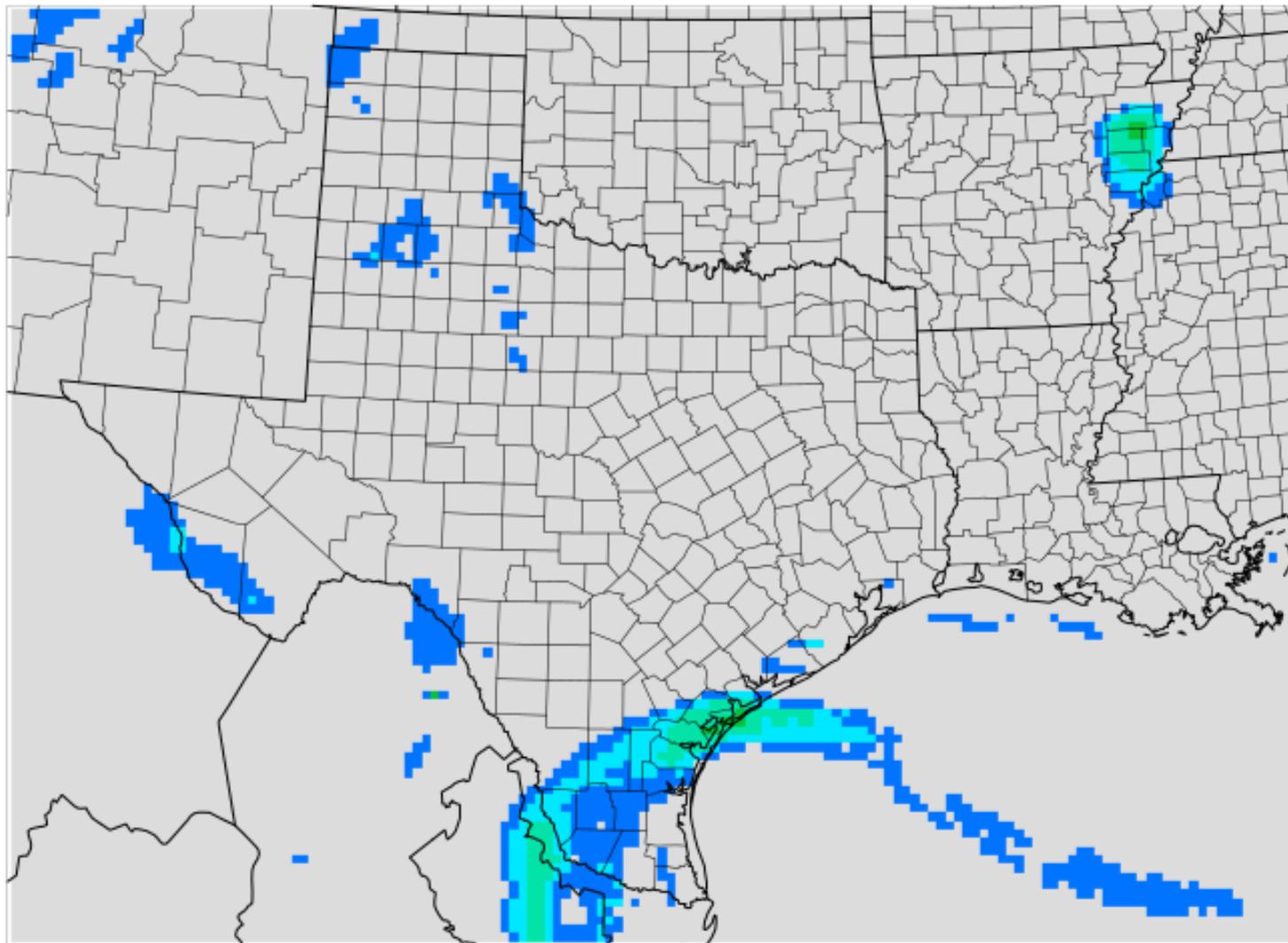


Min(6,15) = 0.0, Max(50,30) = 48.9
Sat September 14 09:00 CST

ENVIRON

NO₂

Best Case: CAMx Layer 14



Min(132,107) = 0.0, Max(84,27) = 0.9

Sat September 14 09:00 CST

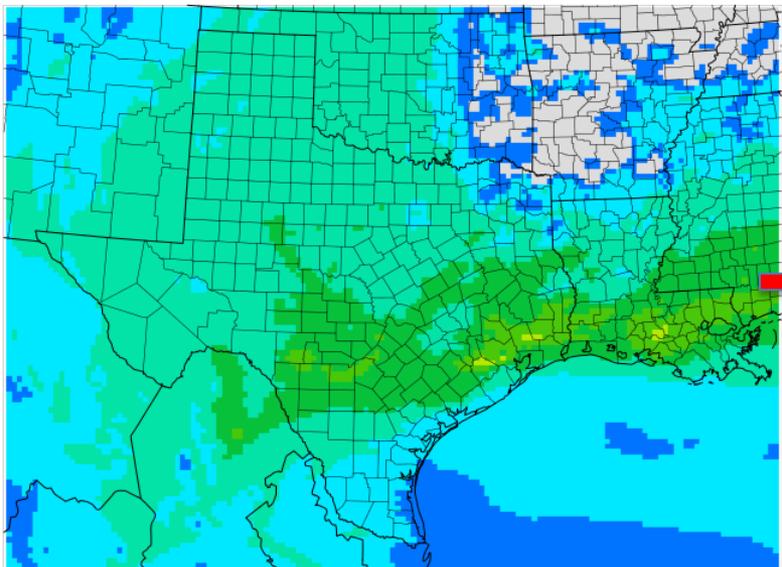
9 am



Formaldehyde

Best Case: CAMx Layer 14

2 pm



Min(129,106) = 0.0, Max(126,47) = 4.5

Sat September 14 14:00 CST



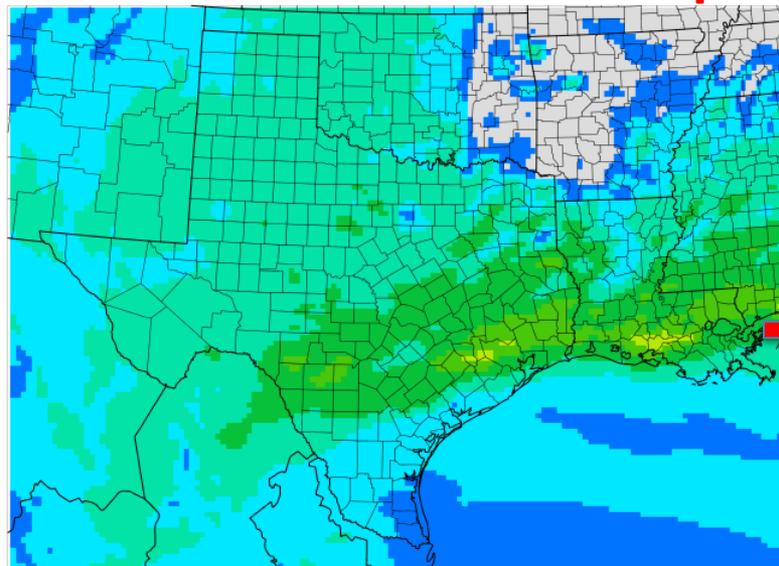
SATURDAY

CAMx Model Formaldehyde 1.2 km (Layer 14)

Formaldehyde

Best Case: CAMx Layer 14

5 pm



Min(111,86) = 0.0, Max(91,42) = 4.6

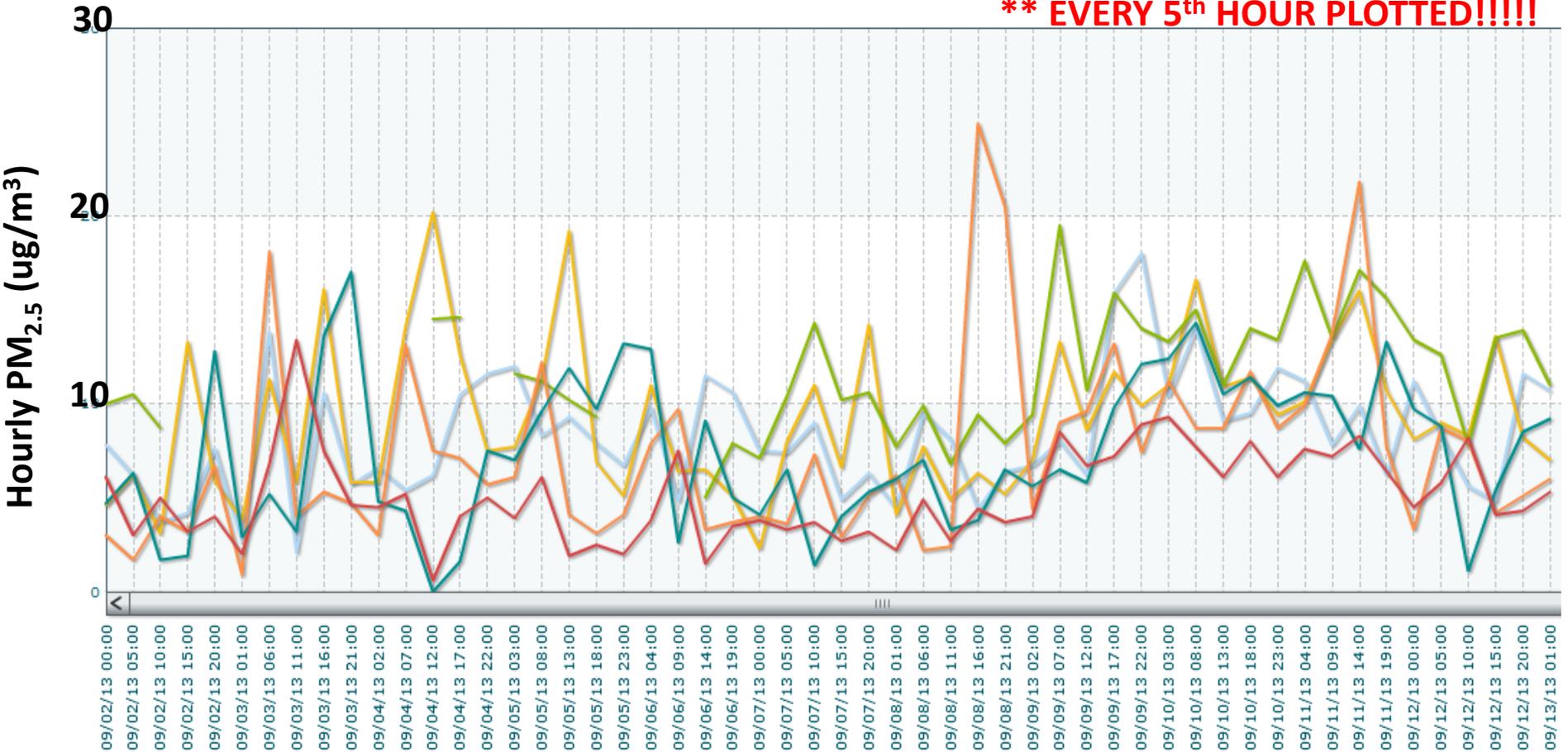
Sat September 14 17:00 CST



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

September 2nd – 12th

** EVERY 5th HOUR PLOTTED!!!!



Houston Aldine C8/PM_{2.5}-88502 - 88502/1 Hr/3

Houston Deer Park C35/PM_{2.5}-88502 - 88502/1 Hr/3

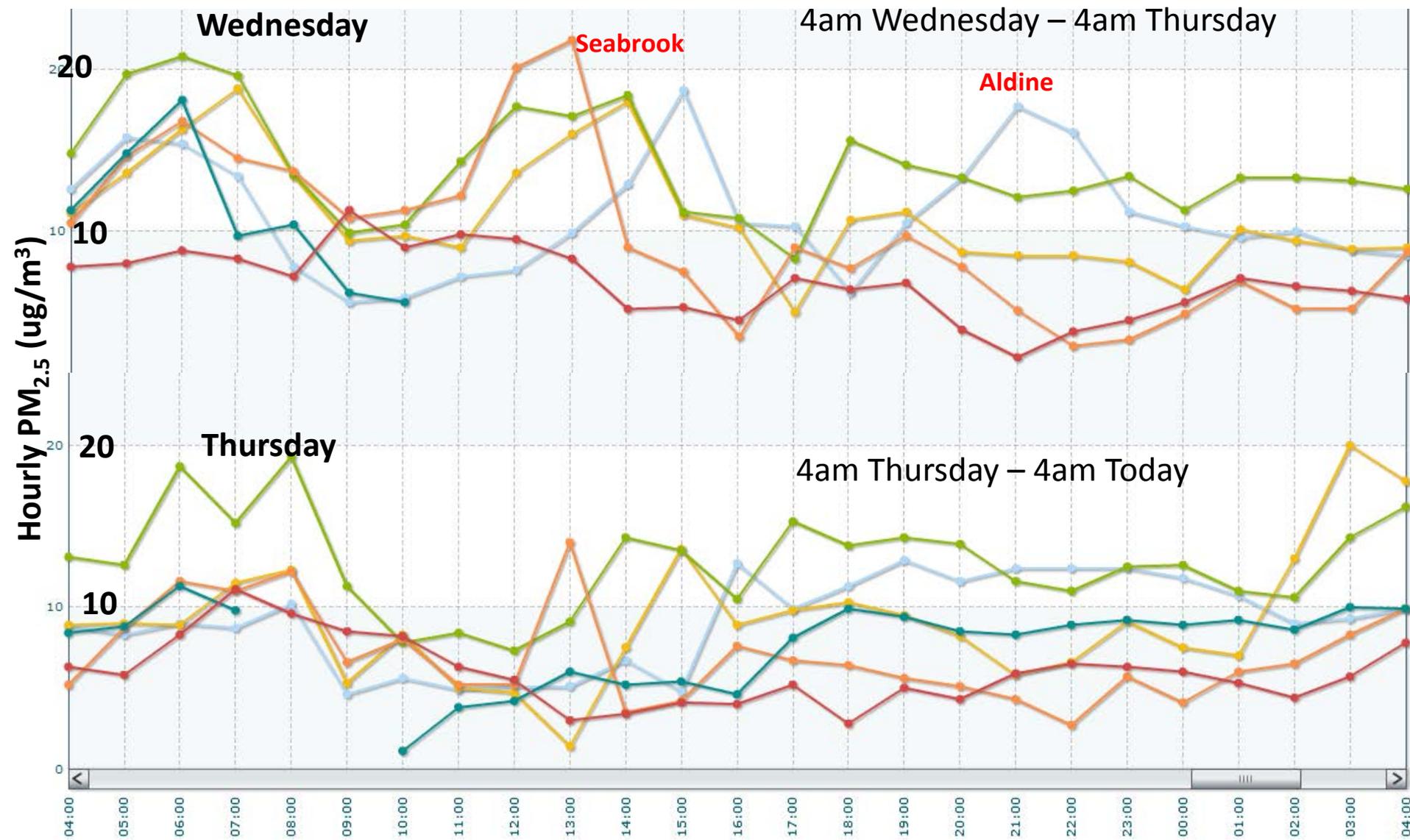
Conroe Relocated C78/PM_{2.5}-88502 - 88502/1 Hr/3

Clinton C403/PM_{2.5}-88502 - 88502/1 Hr/3

Seabrook Friendship Park C45/PM_{2.5}-88502 - 88502/1 Hr/3

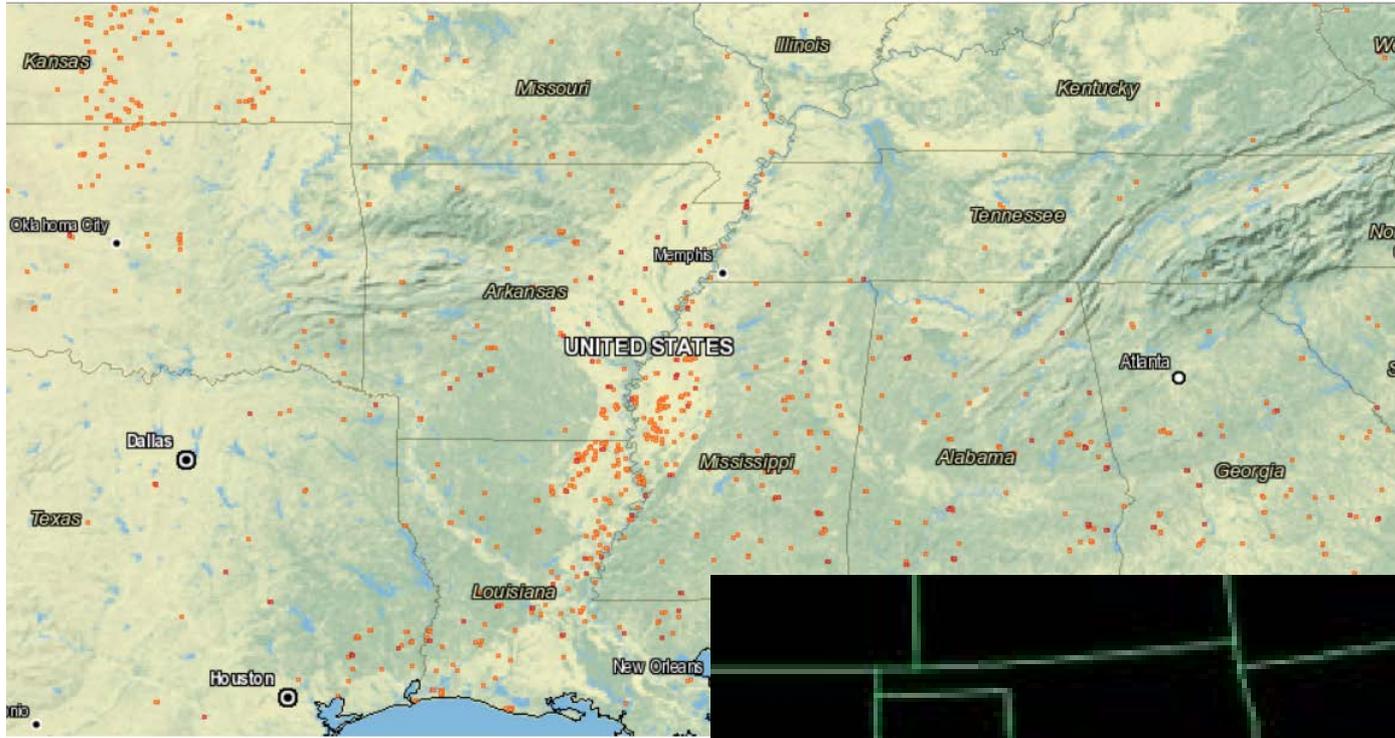
Galveston Airport C1034/PM_{2.5}-88502 - 88502/1 Hr/3

Hourly PM_{2.5} (airnowtech.org)



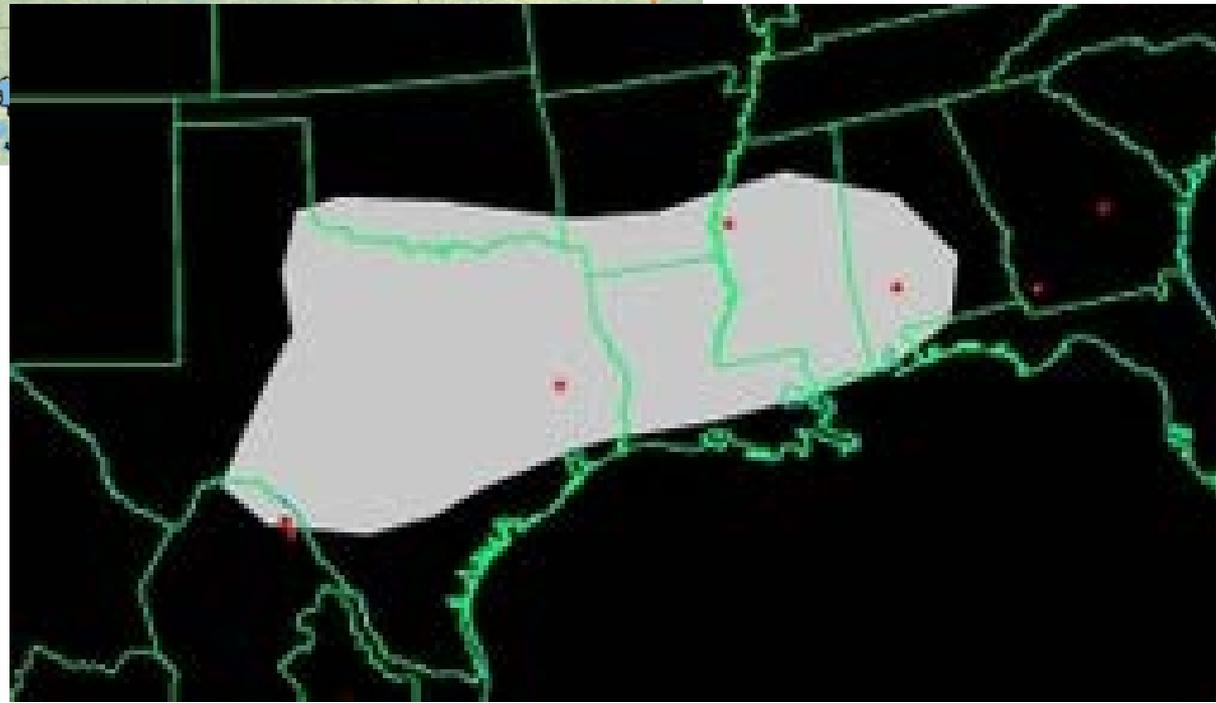
- Houston Aldine C8/PM2.5-88502 - 88502/1 Hr/3
- Houston Deer Park C35/PM2.5-88502 - 88502/1 Hr/3
- Conroe Relocated C78/PM2.5-88502 - 88502/1 Hr/3
- Clinton C403/PM2.5-88502 - 88502/1 Hr/3
- Seabrook Friendship Park C45/PM2.5-88502 - 88502/1 Hr/3
- Galveston Airport C1034/PM2.5-88502 - 88502/1 Hr/3

Fire Map (September 2-12)

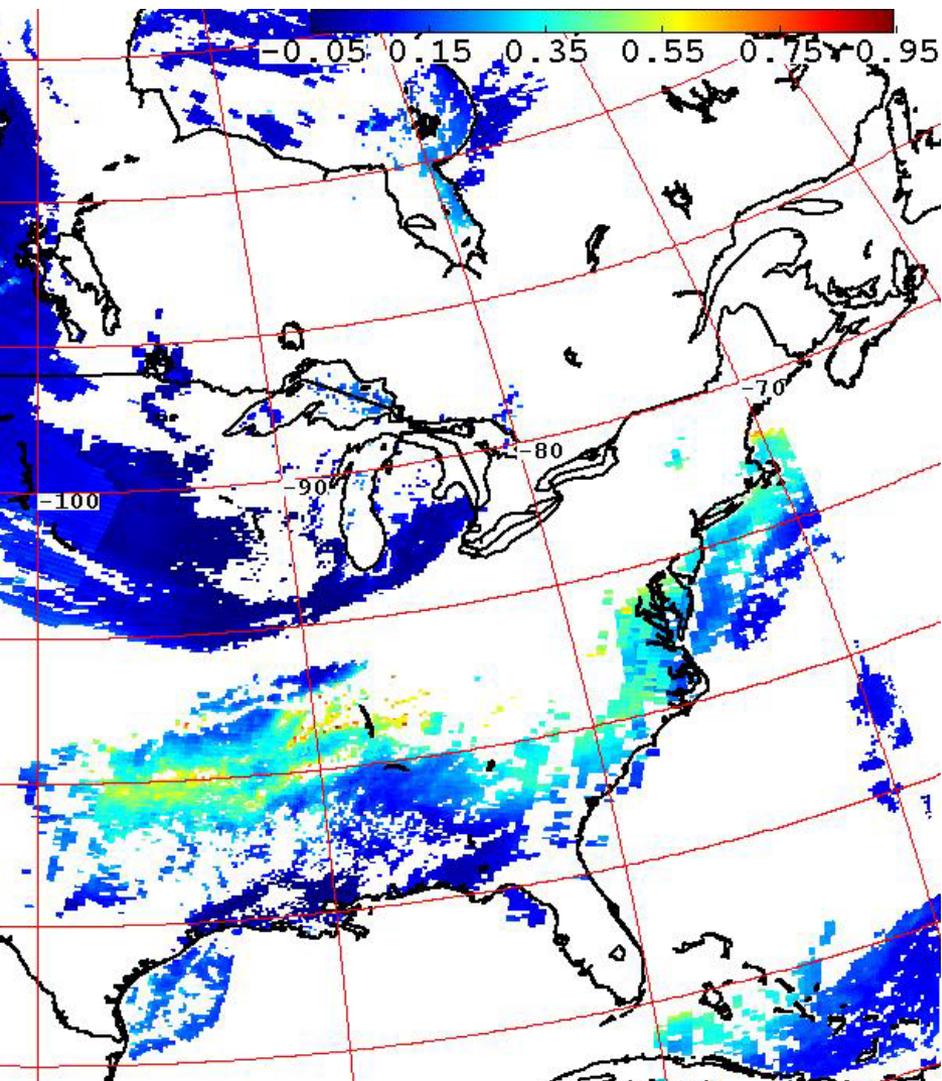


Agricultural fires

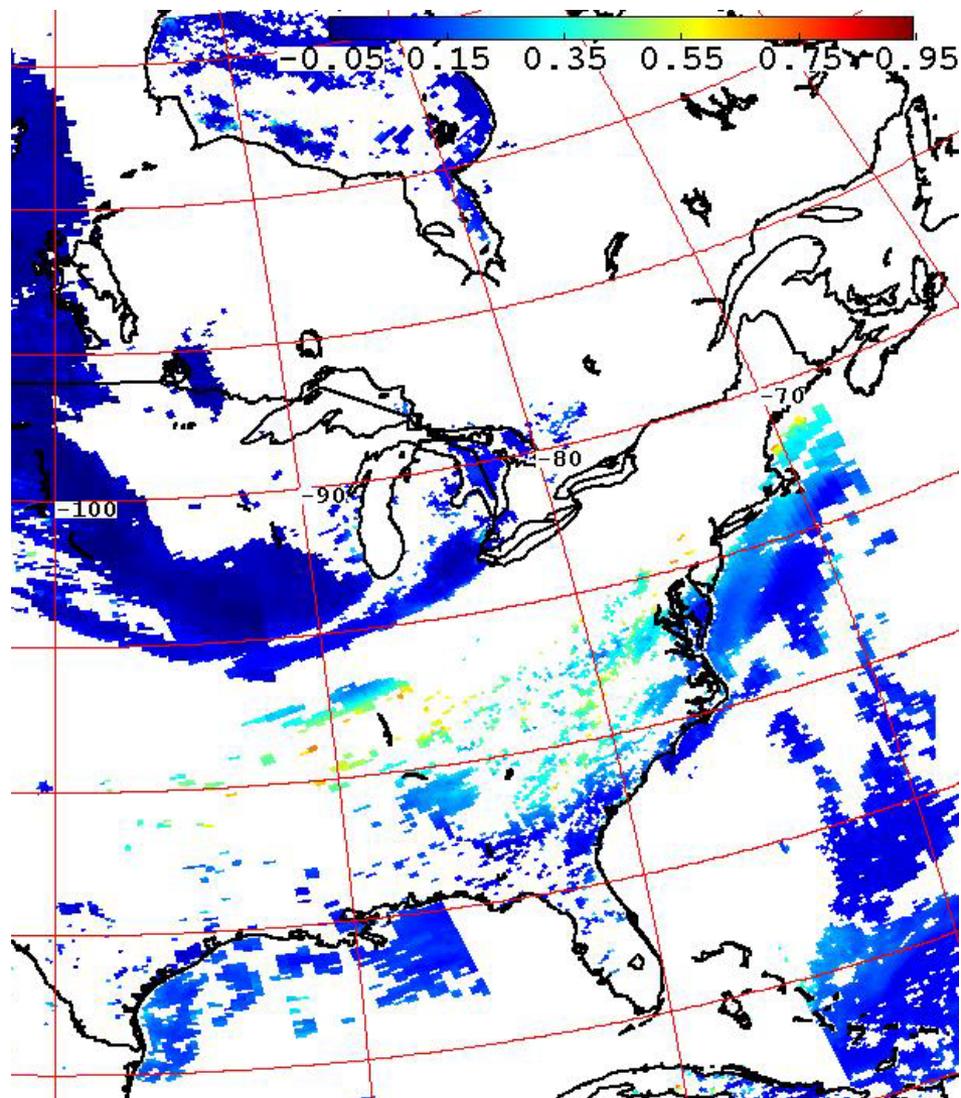
Hazard Map



Terra AOD - Yesterday

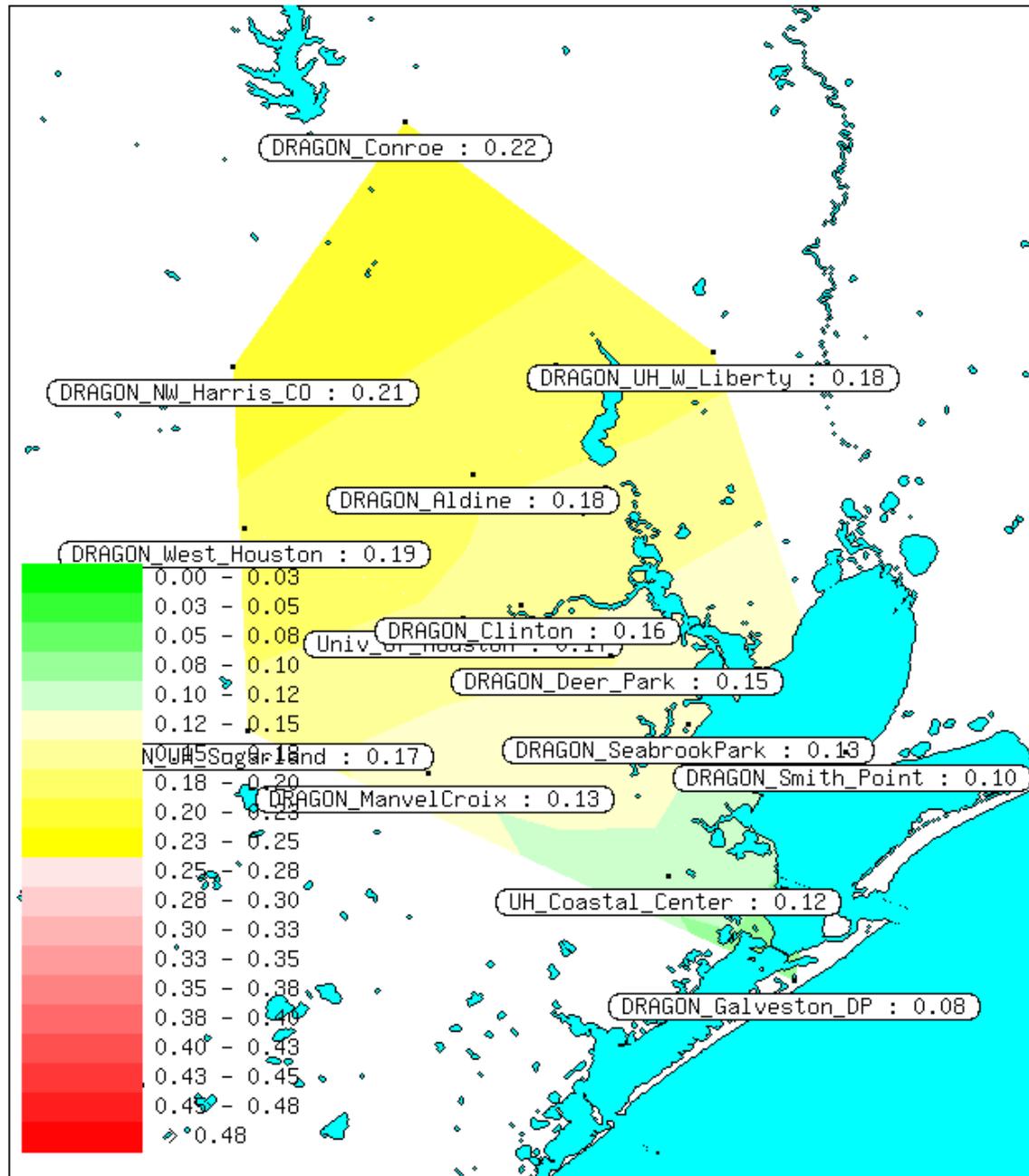


Aqua AOD - Yesterday



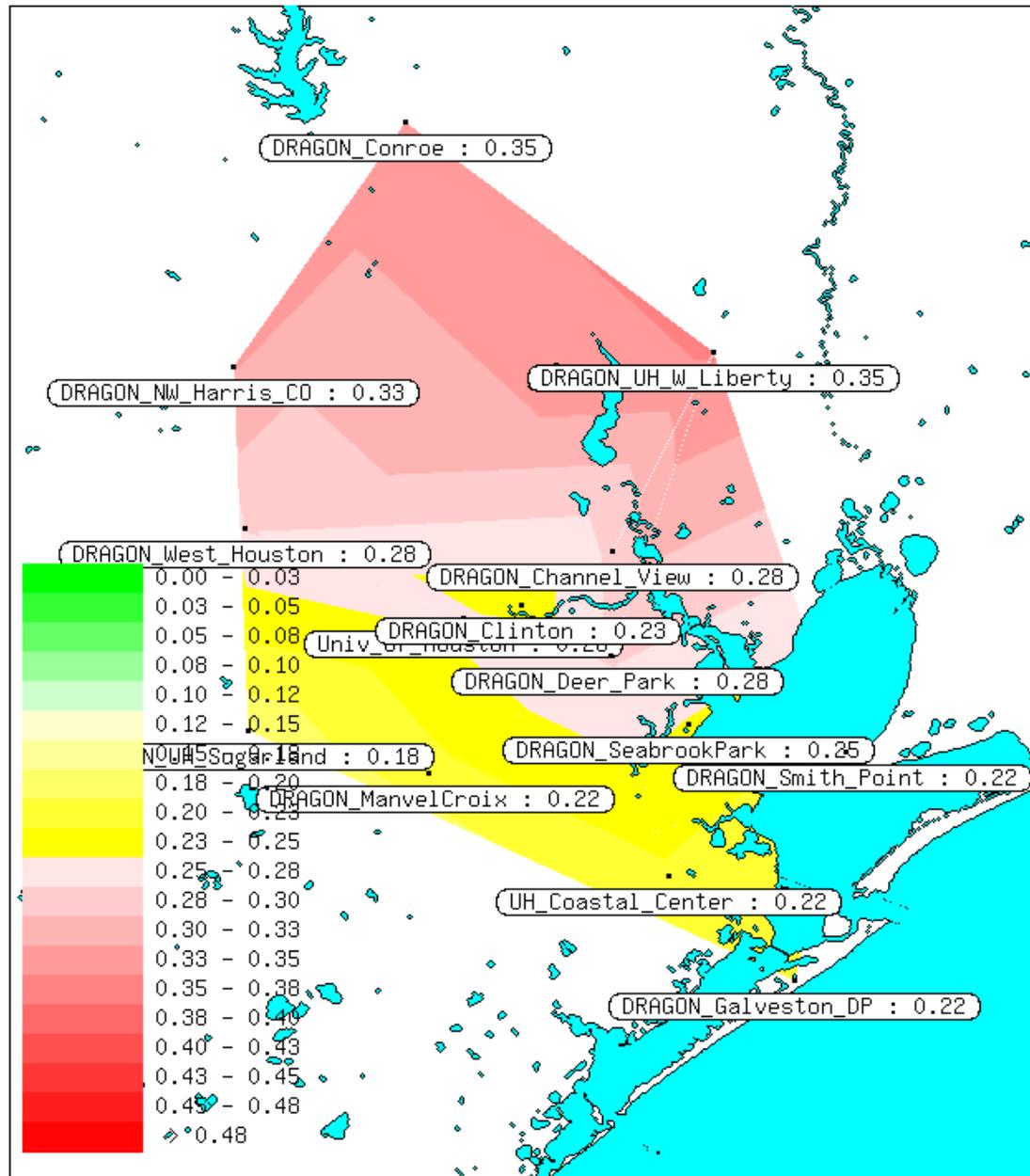
DRAGON : September 12th (Wednesday) at Level 1.5

0.08-0.22



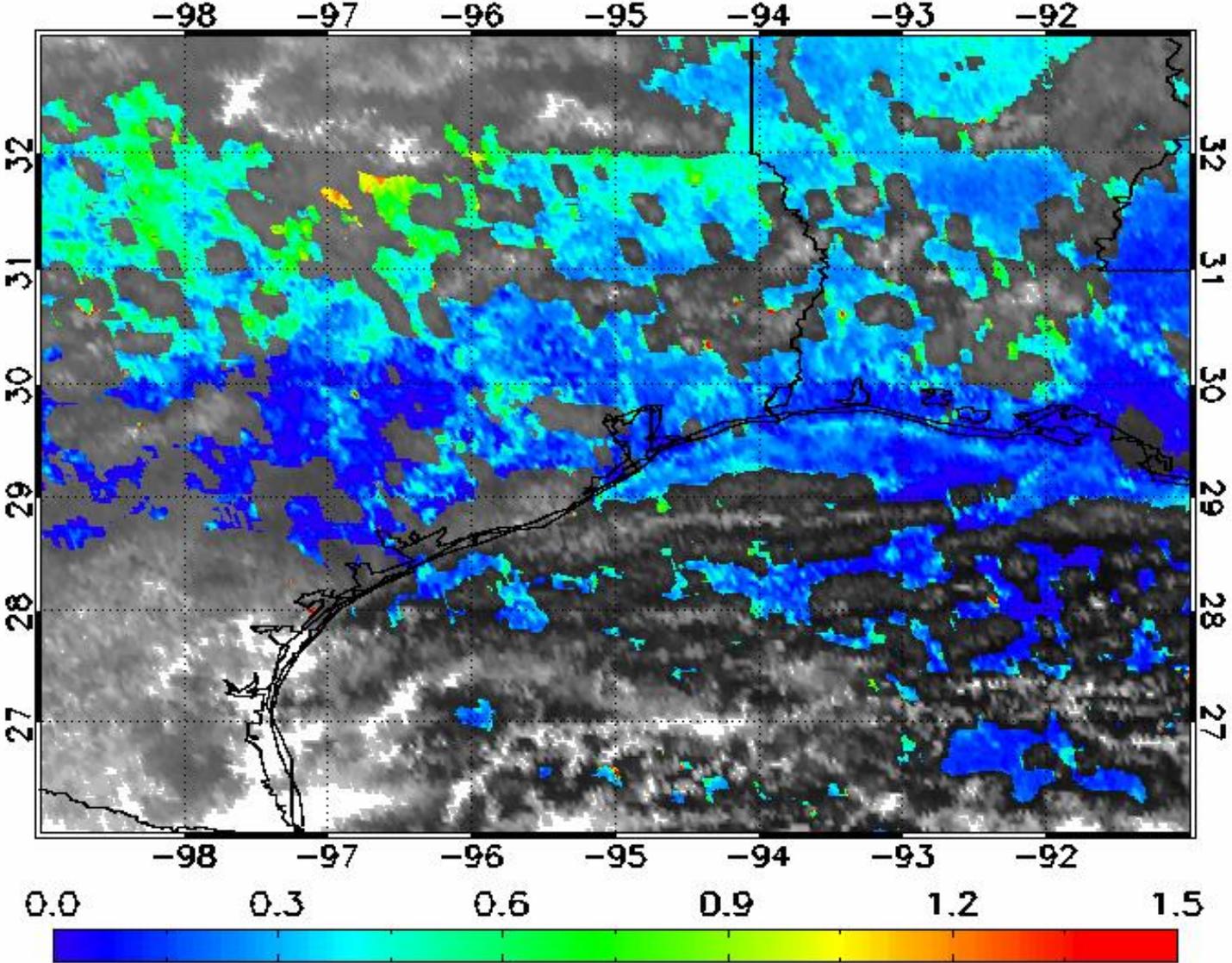
DRAGON : September 13th (Today) at Level 1.5

0.18-0.33



GOES AOD – 11:15 am Today

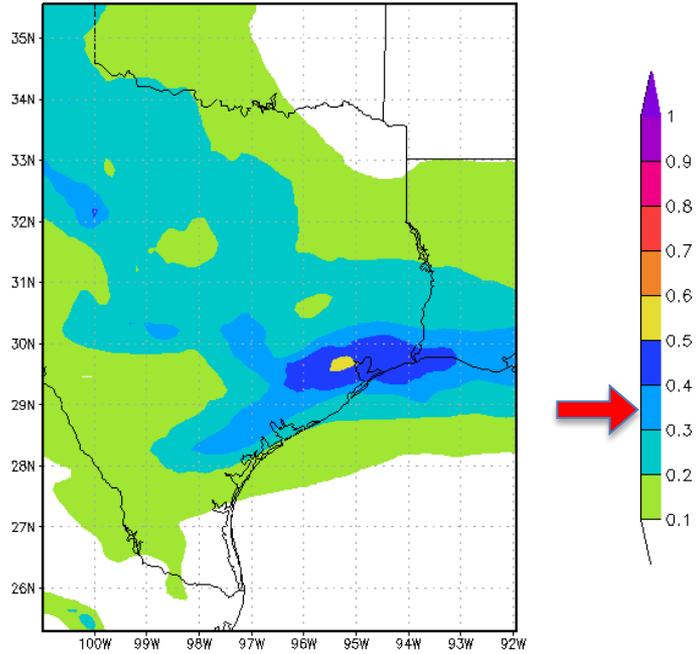
GOES EAST Aerosol Optical Depth 16:15UTC 9/13/2013



**Stupid
Clouds**

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

2 pm

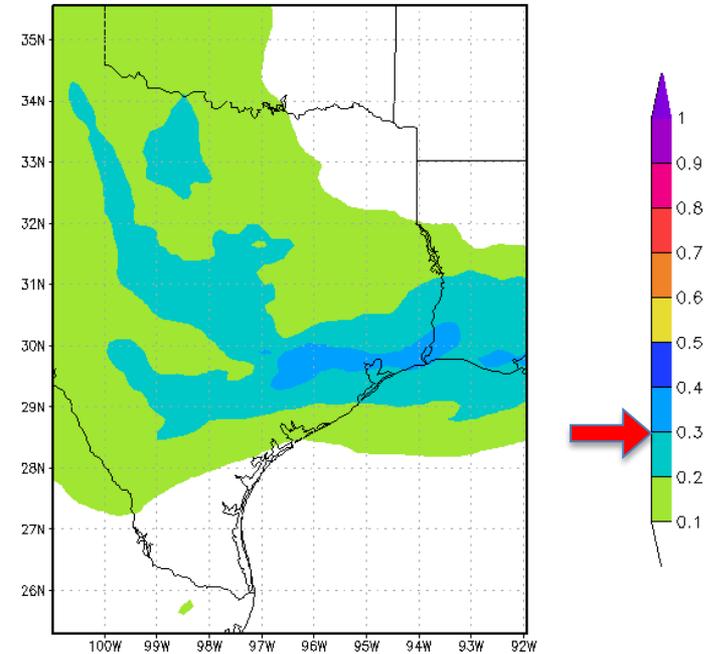


SATURDAY

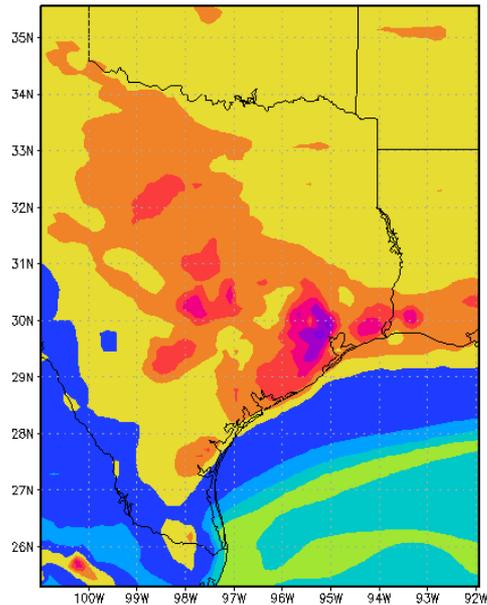
NOAA Experimental CMAQ AOT

(dev) aot 40H VALID 22Z 14 SEP2013 [dimensionless]

5 pm



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

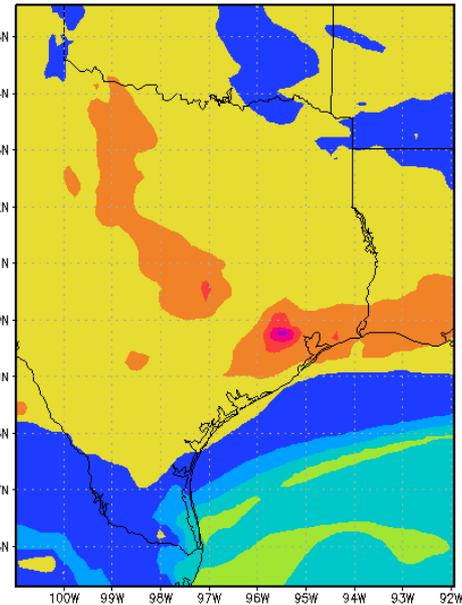


SATURDAY

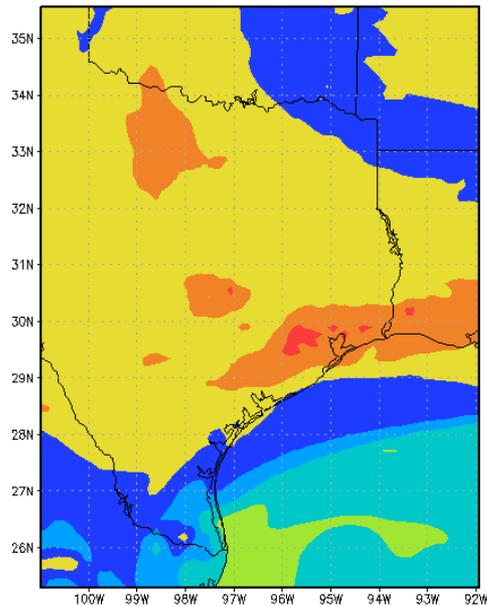
**NOAA
Experimental
CMAQ Surface
Pm 2.5**

(dev) sfc pm25 35H VALID 17Z 14 SEP2013 [$\mu\text{g}/\text{m}^3$]

noon

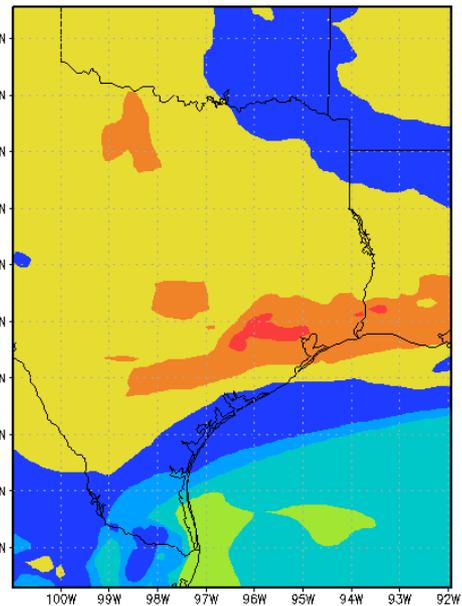


2 pm (dev) sfc pm25 37H VALID 19Z 14 SEP2013 [$\mu\text{g}/\text{m}^3$]

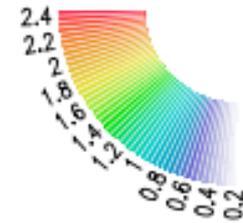
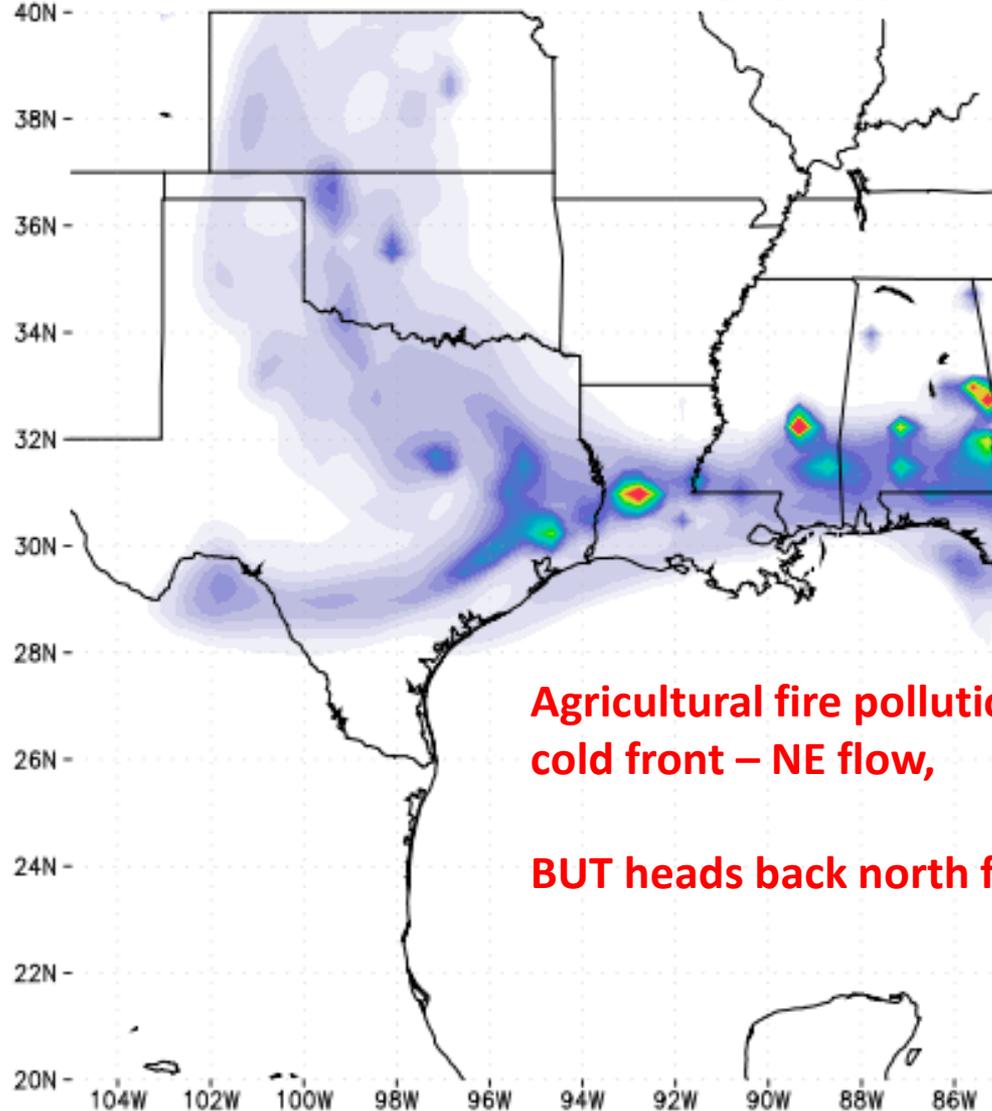


(dev) sfc pm25 40H VALID 22Z 14 SEP2013 [$\mu\text{g}/\text{m}^3$]

5 pm



NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13
850 hPa Black Carbon [$\mu\text{g}/\text{kg}$]



1pm Saturday

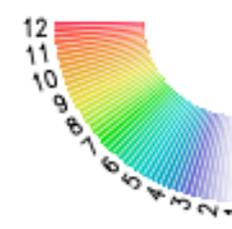
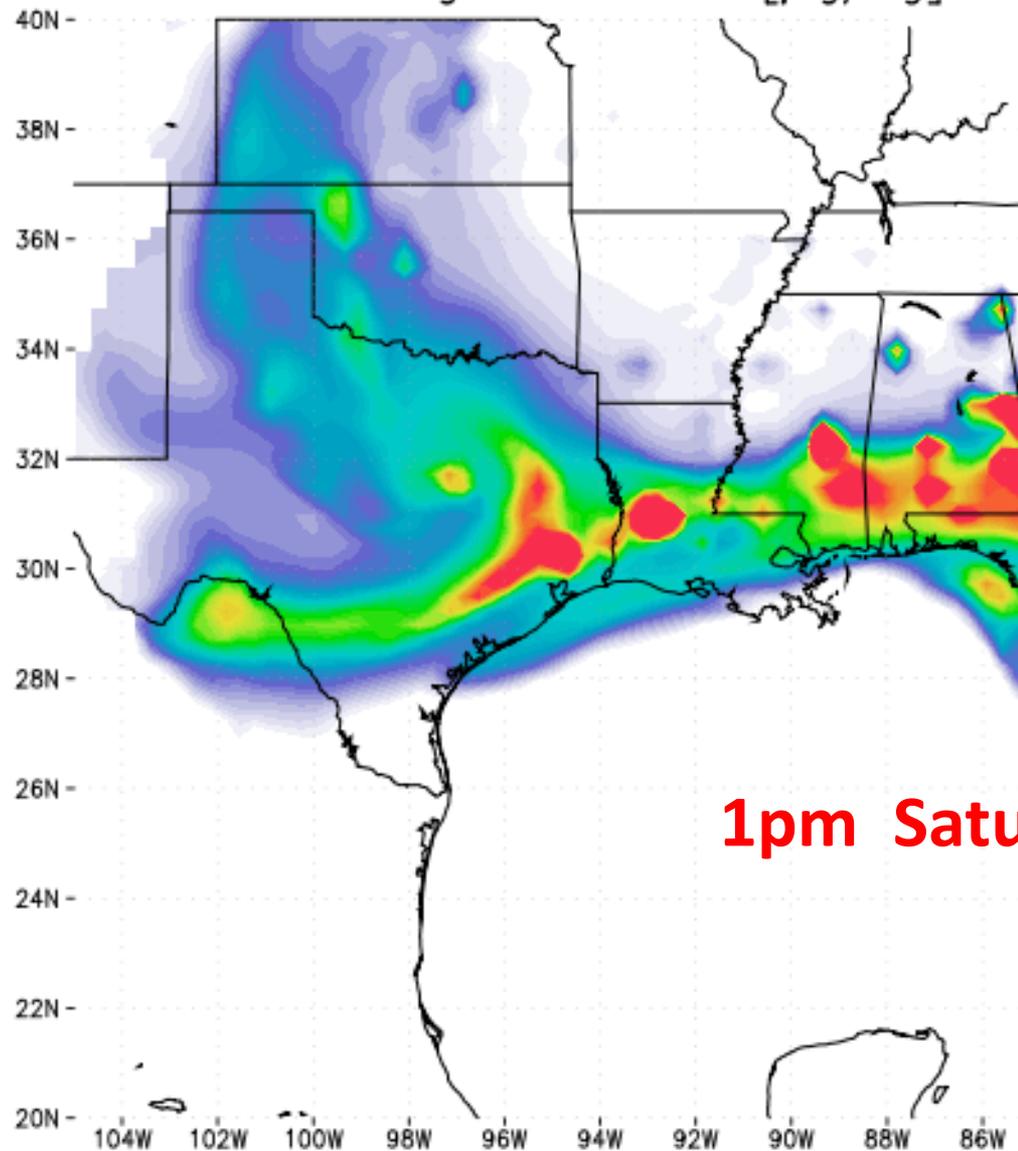
**Agricultural fire pollution pushed to south by
cold front – NE flow,**

BUT heads back north for Sunday – E flow.

Valid: Sat 18z 2013-09-14 ($\tau = 36$)

NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13

850 hPa Organic Carbon [$\mu\text{g}/\text{kg}$]

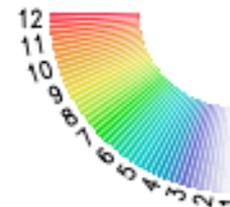
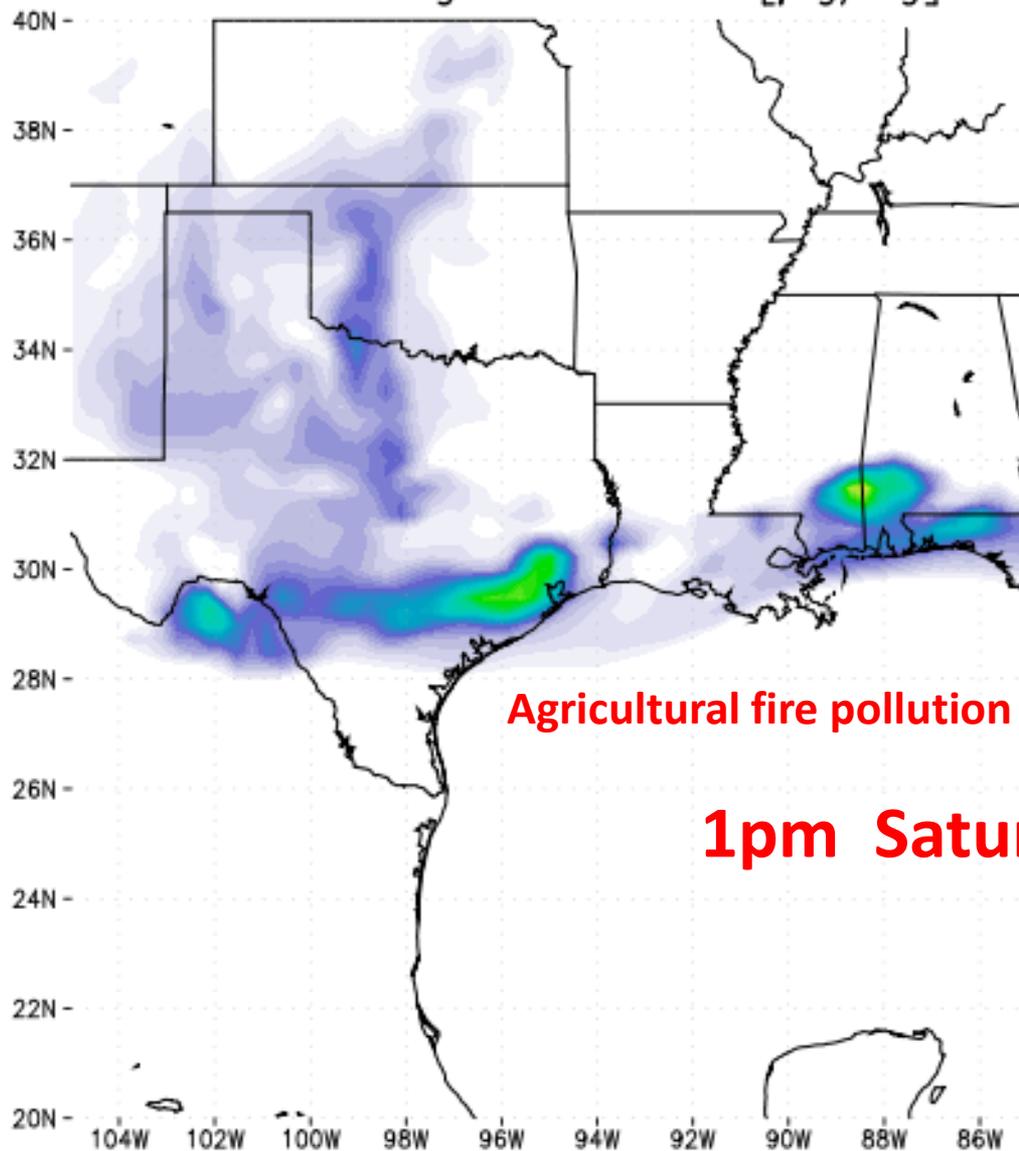


1pm Saturday

Valid: Sat 18z 2013-09-14 ($\tau = 36$)

NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13

700 hPa Organic Carbon [$\mu\text{g}/\text{kg}$]

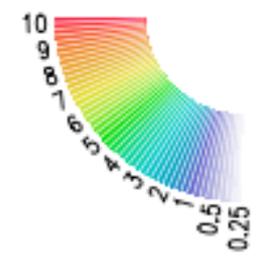
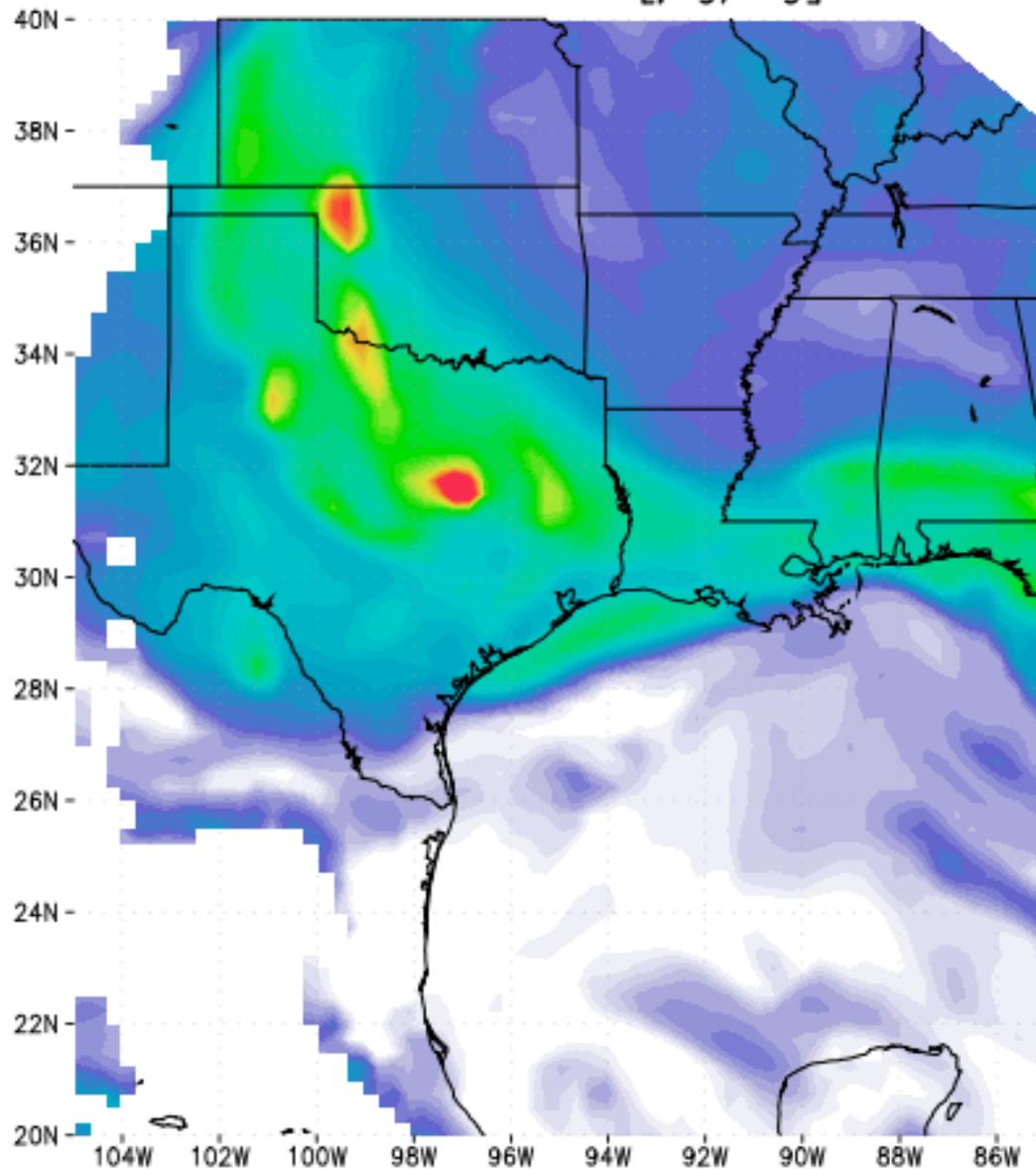


Agricultural fire pollution at low altitudes.

1pm Saturday

Valid: Sat 18z 2013-09-14 ($\tau = 36$)

NASA/GMAO - GEOS-5 Forecast Initialized on 06z 2013-09-13
850 hPa S04 [$\mu\text{g}/\text{kg}$]

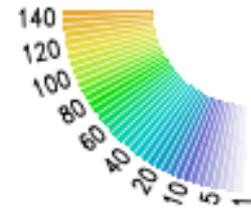
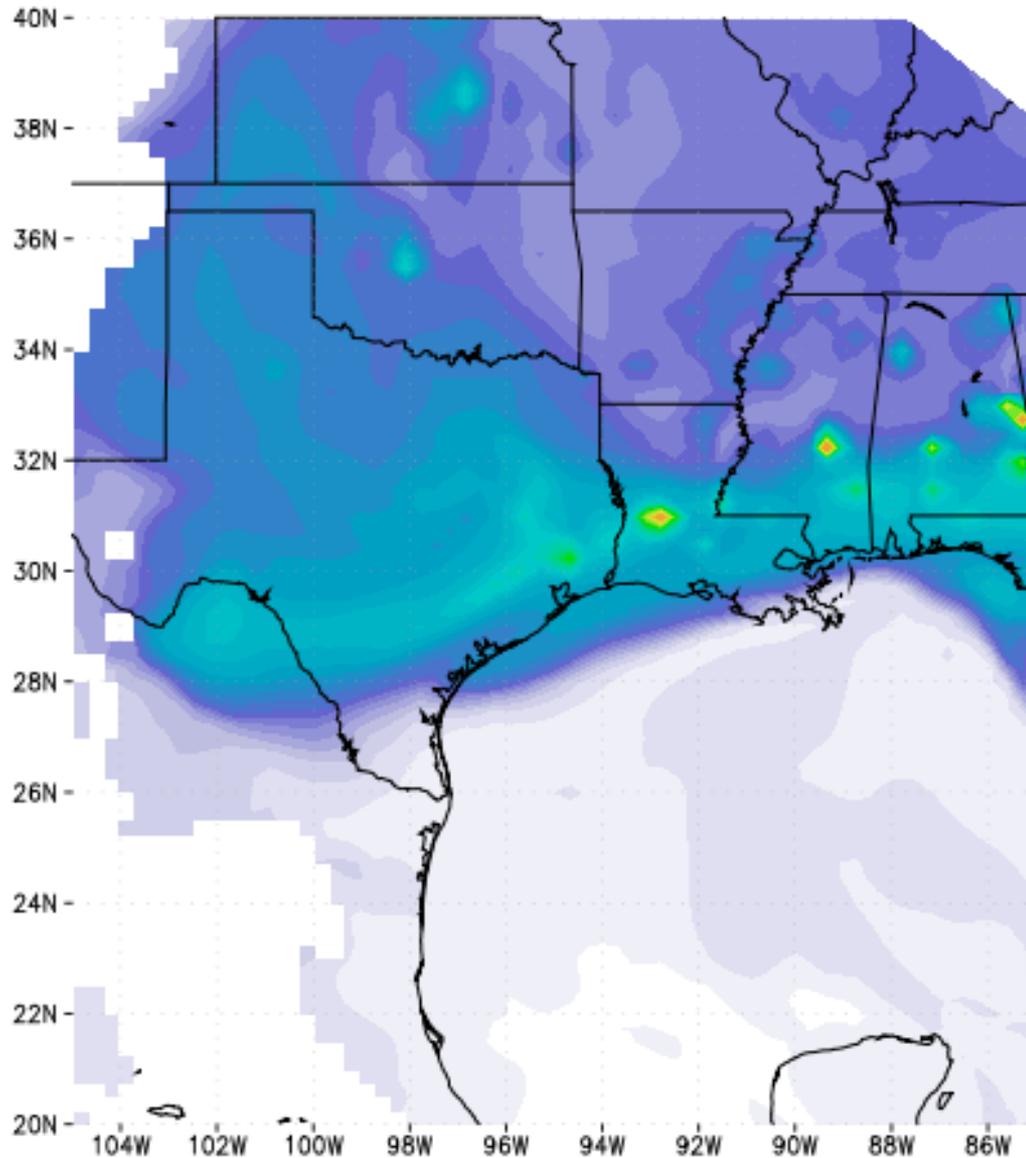


1pm Saturday

Valid: Sat 18z 2013-09-14 ($\tau = 36$)

NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-13

850 hPa CO BB N. Amer. PPBV

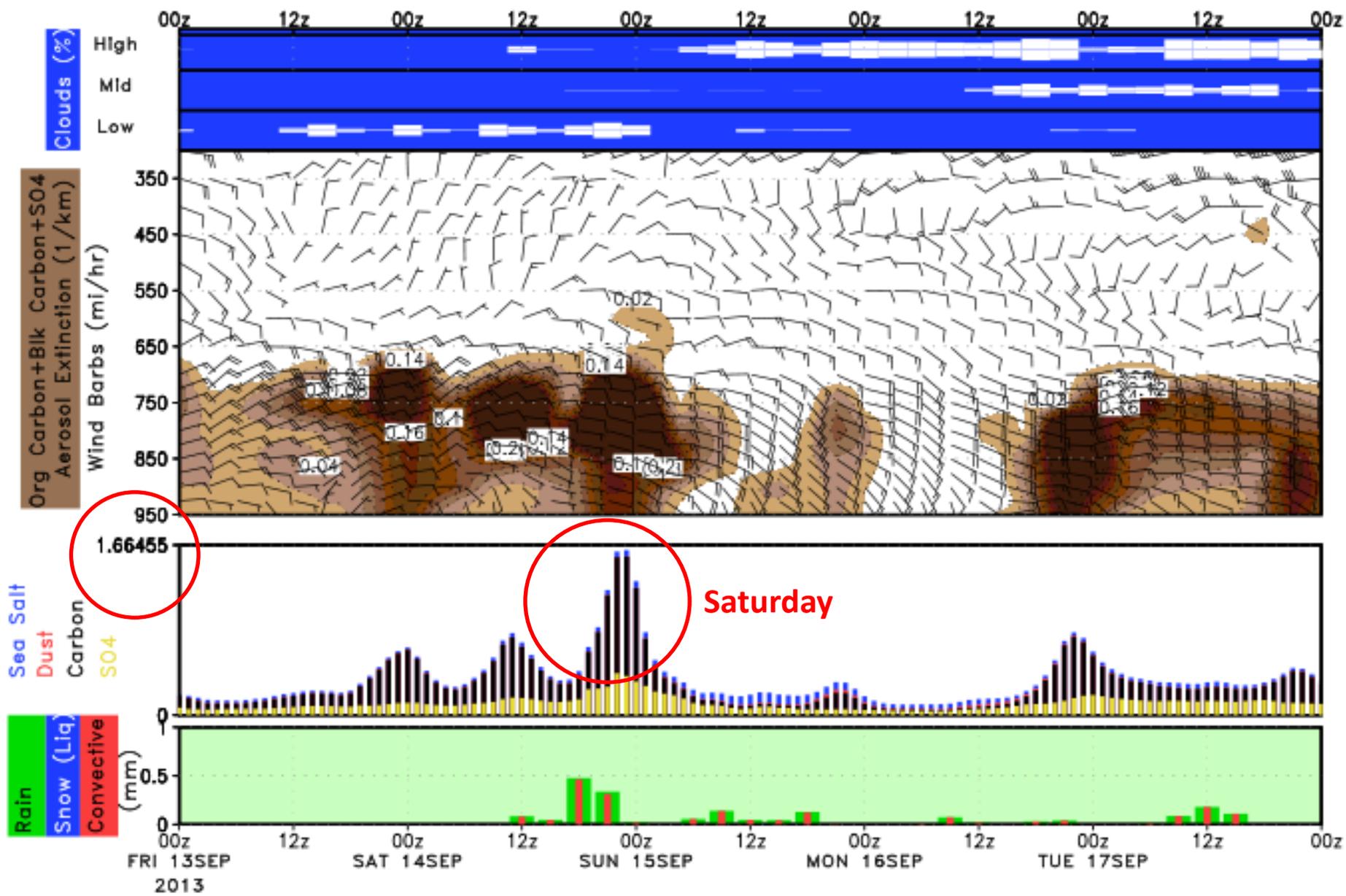


**20-80 ppbv CO
from agricultural
fires**

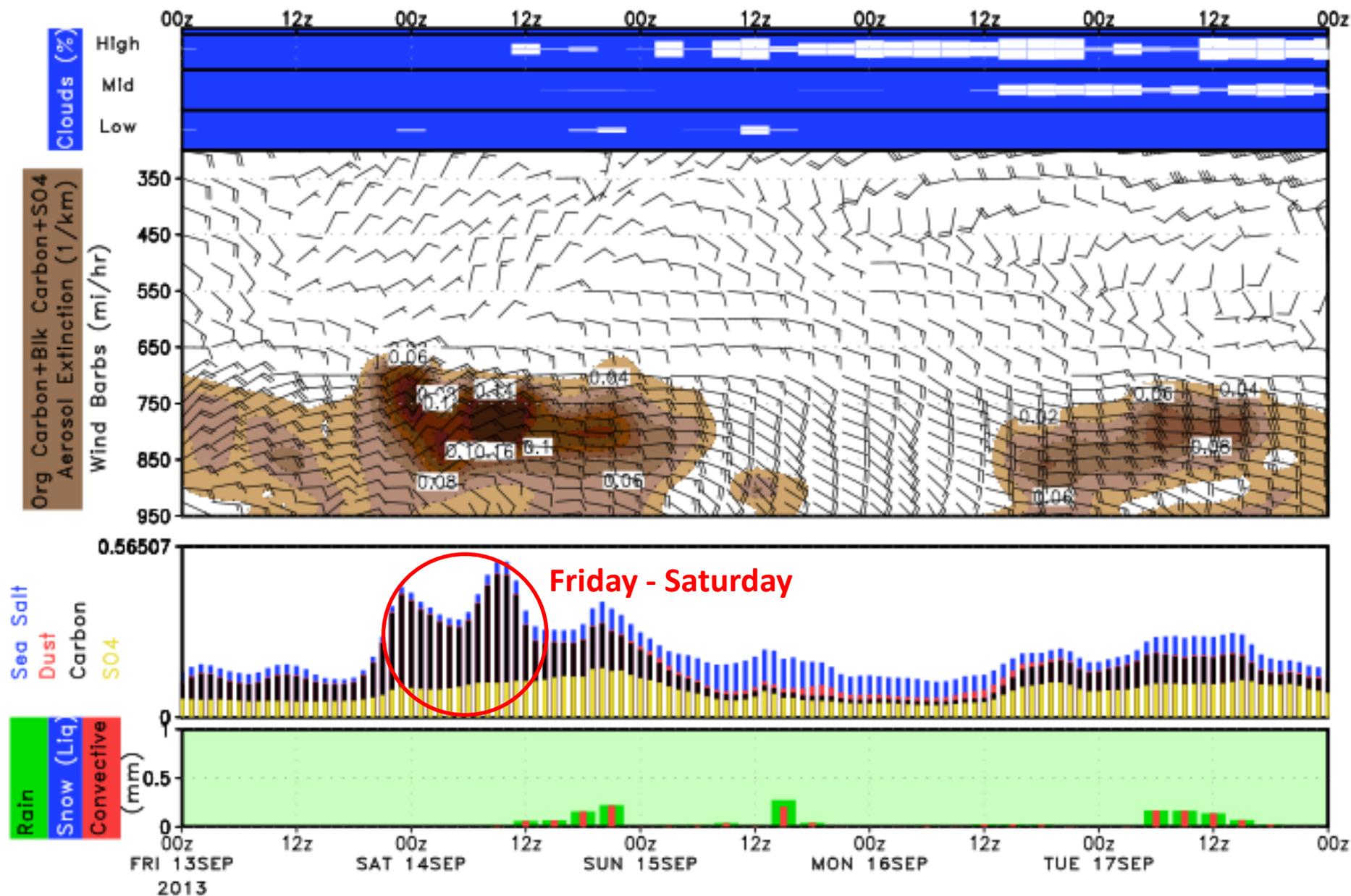
1pm Saturday

Valid: Sat 18z 2013-09-14 ($\tau = 36$)

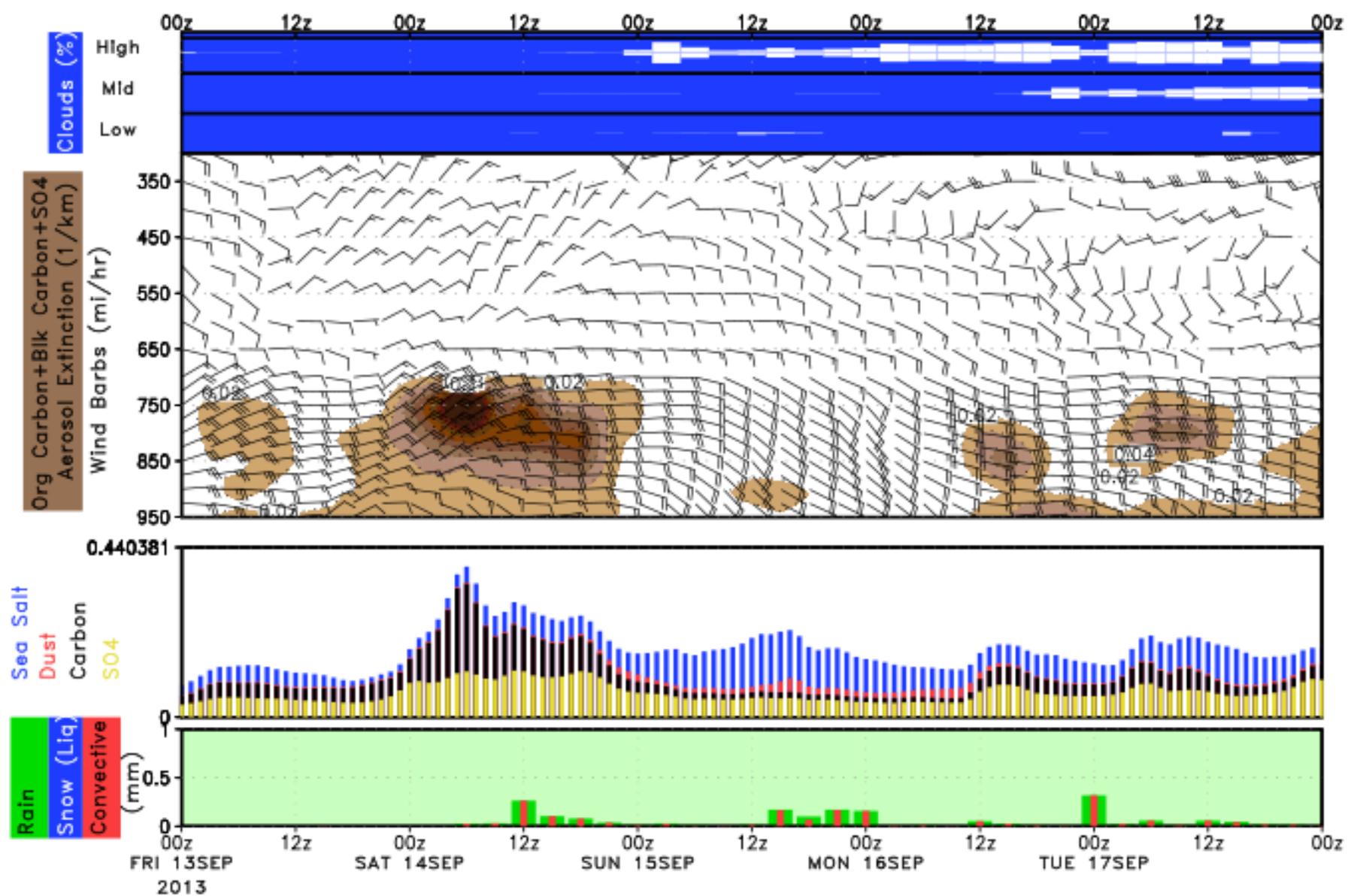
CONROE



MOODY TOWER

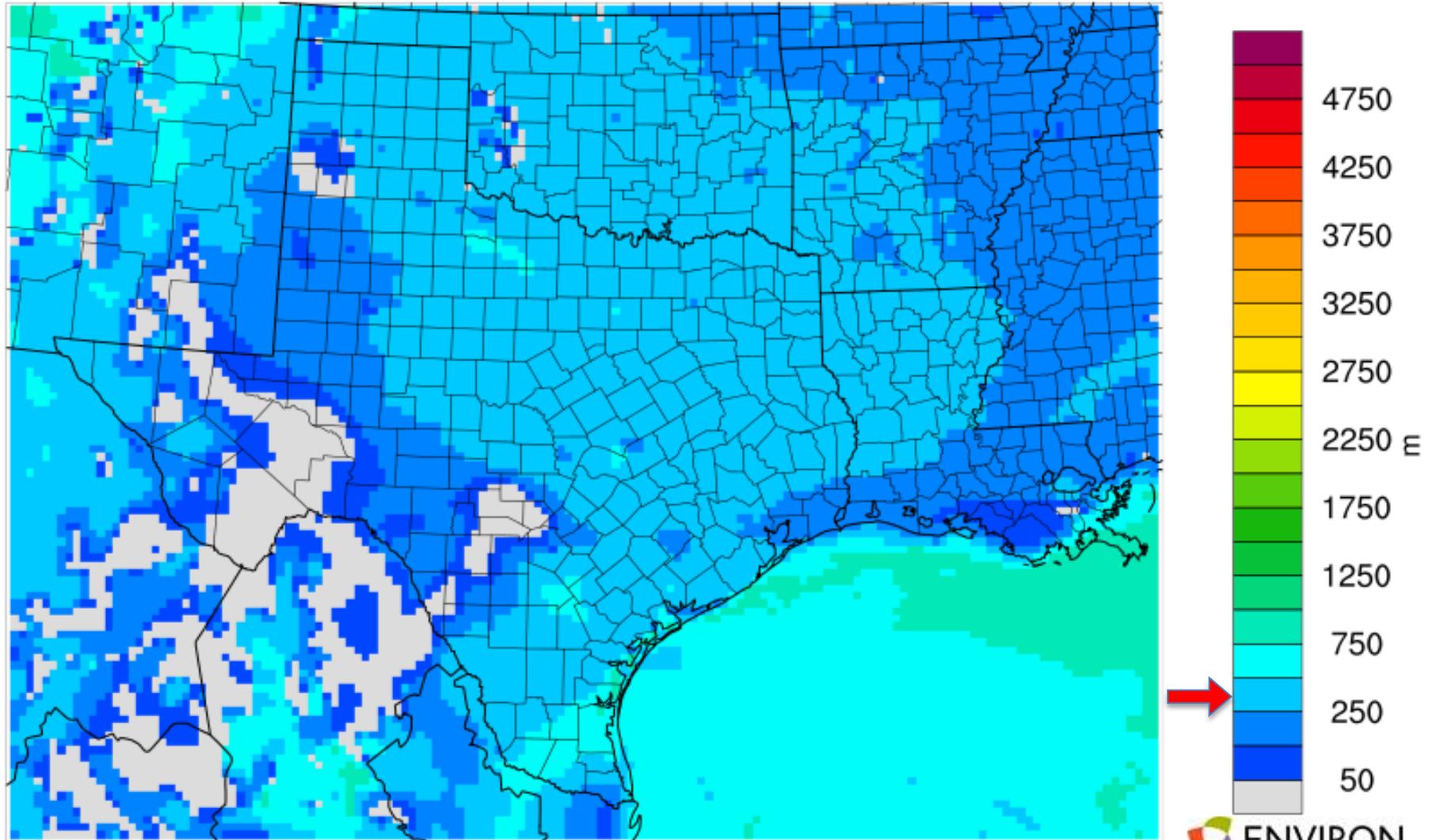


GALVESTON



PBL Height

Texas 12km

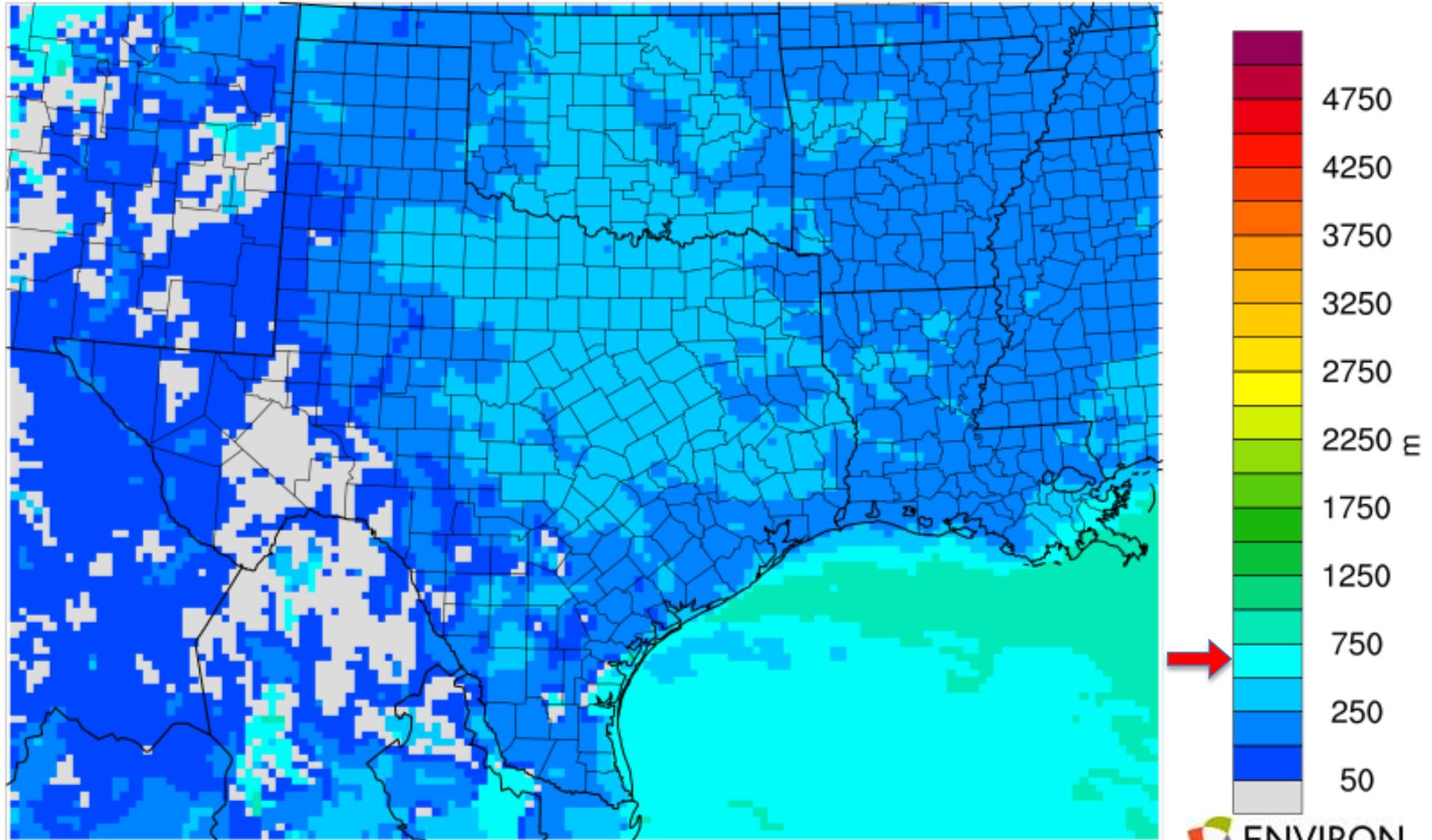


Min(7,7) = 15.7, Max(136,30) = 949.2

Sat September 14 06:00 CST

PBL Height

Texas 12km



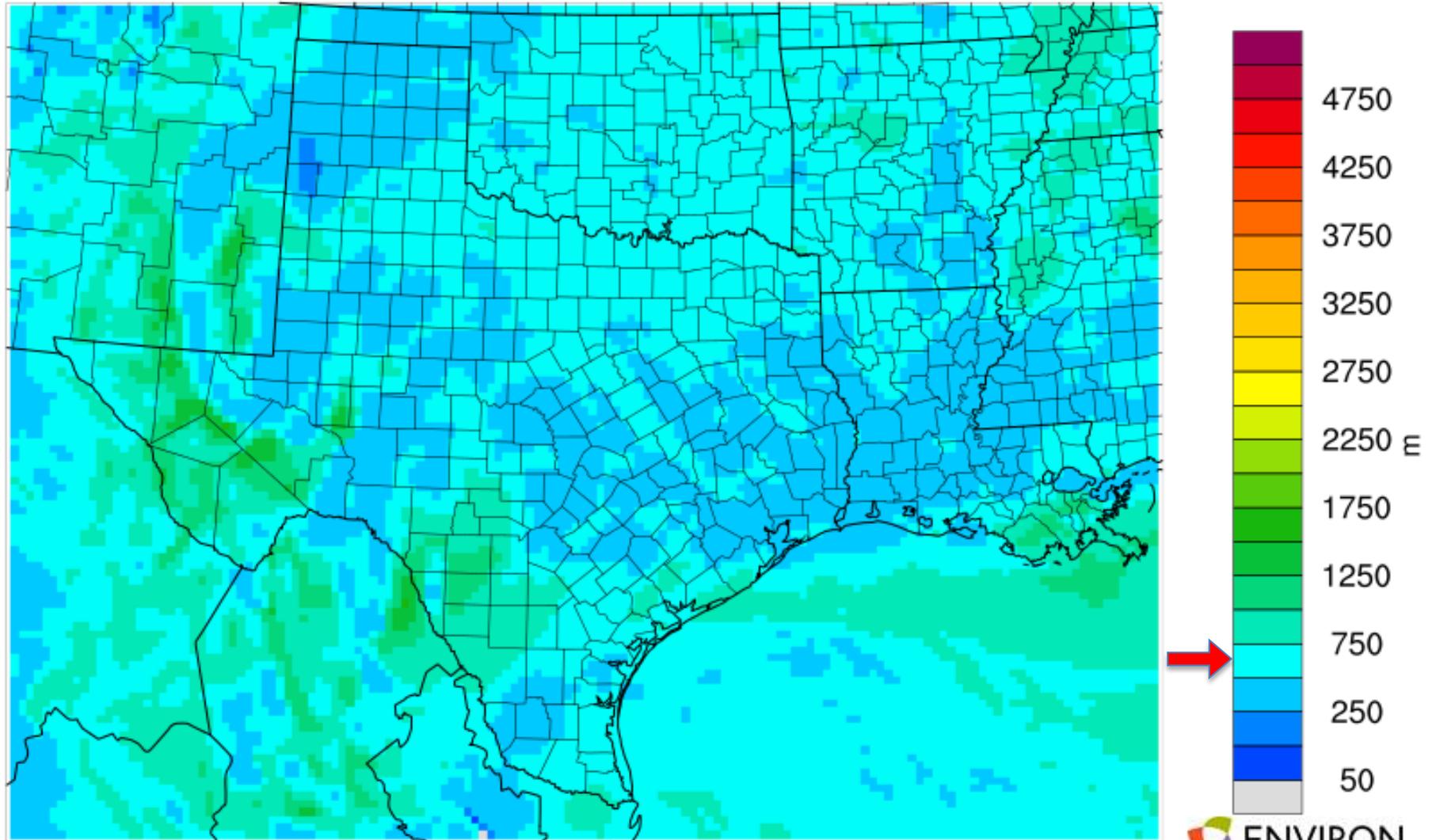
Min(37,20) = 16.4, Max(141,37) = 974.9

Sat September 14 08:00 CST



PBL Height

Texas 12km

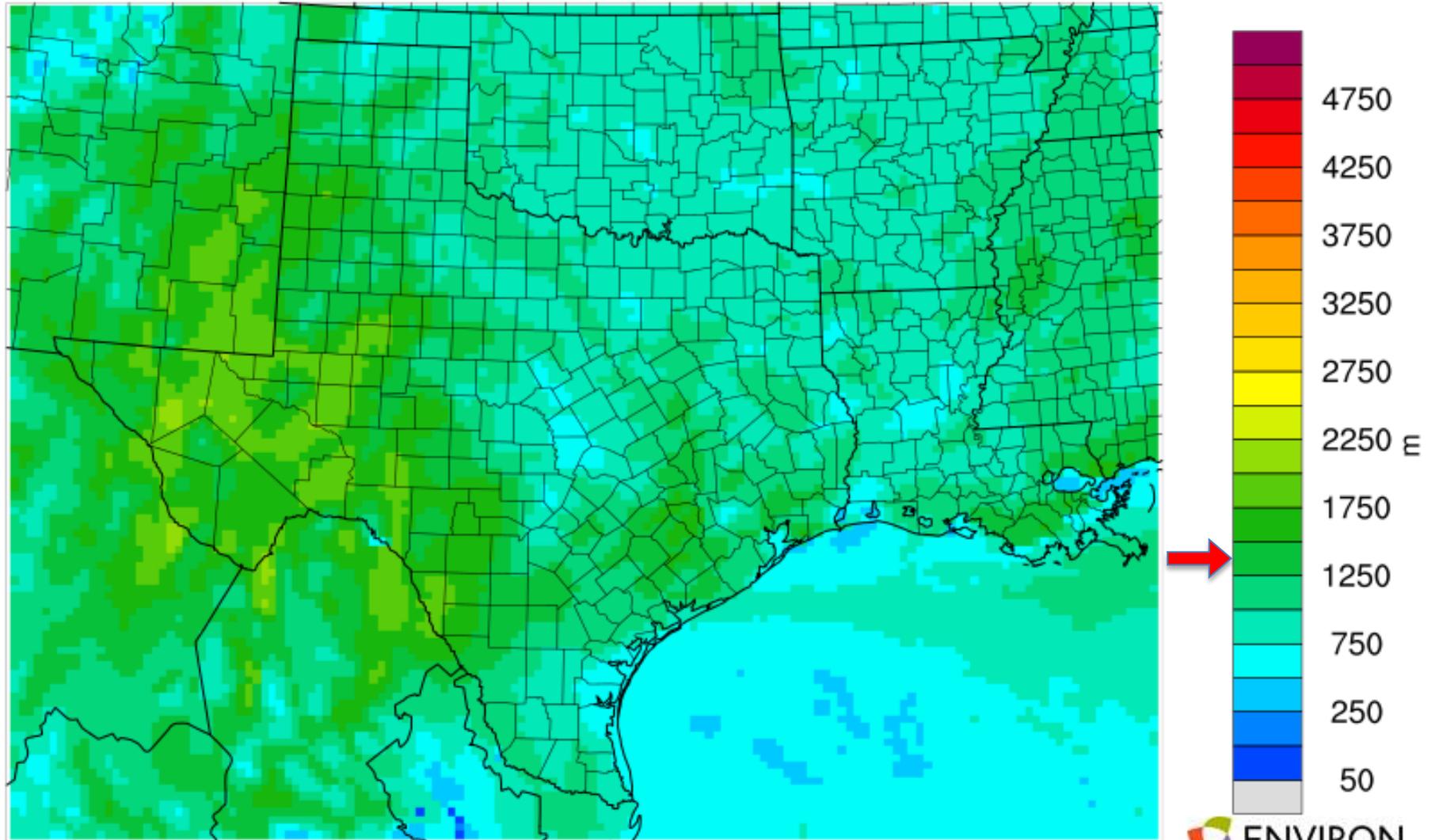


Min(62,2) = 25.8, Max(29,55) = 1517.6

Sat September 14 10:00 CST

PBL Height

Texas 12km



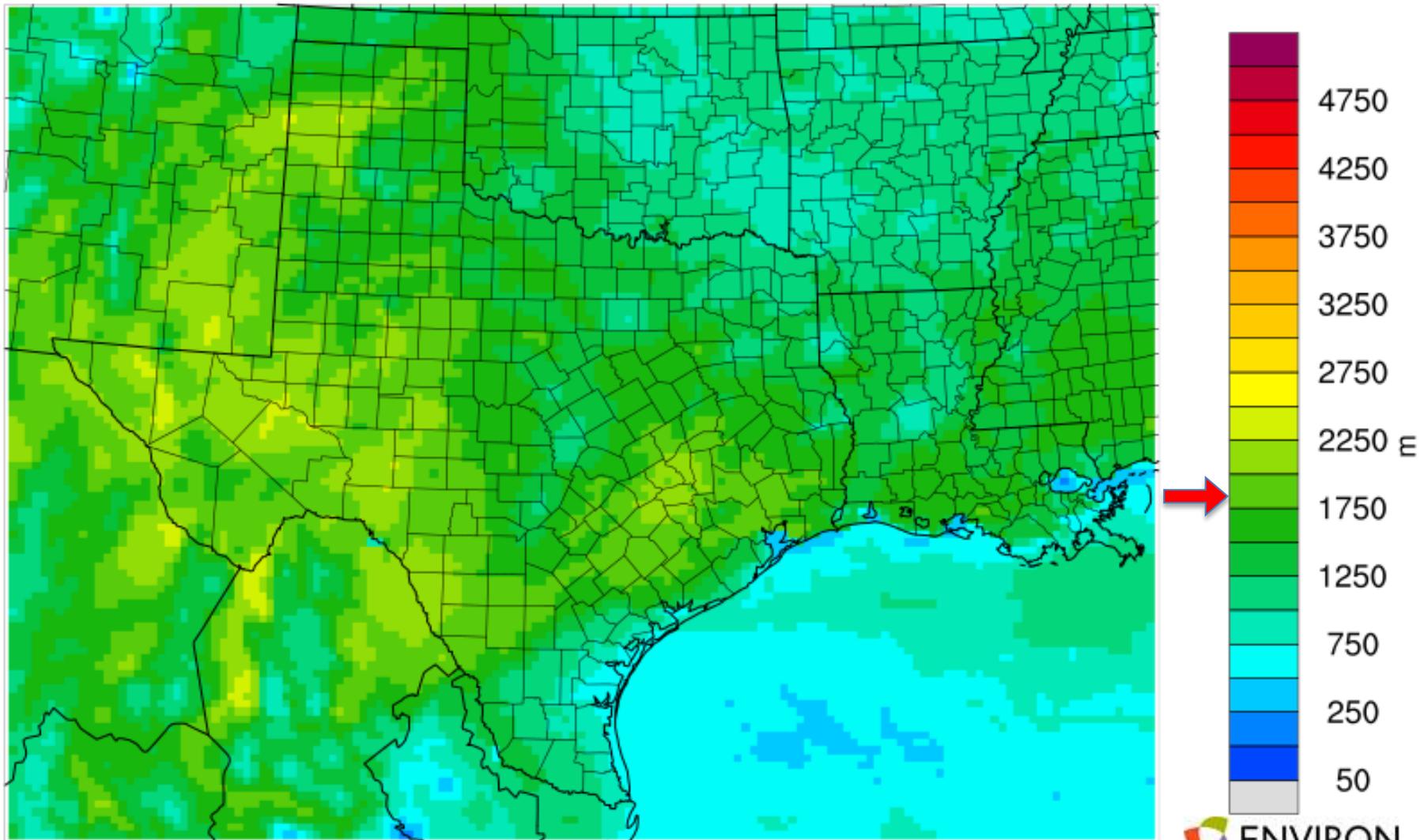
Min(54,5) = 52.0, Max(22,40) = 2174.6

Sat September 14 12:00 CST



PBL Height

Texas 12km

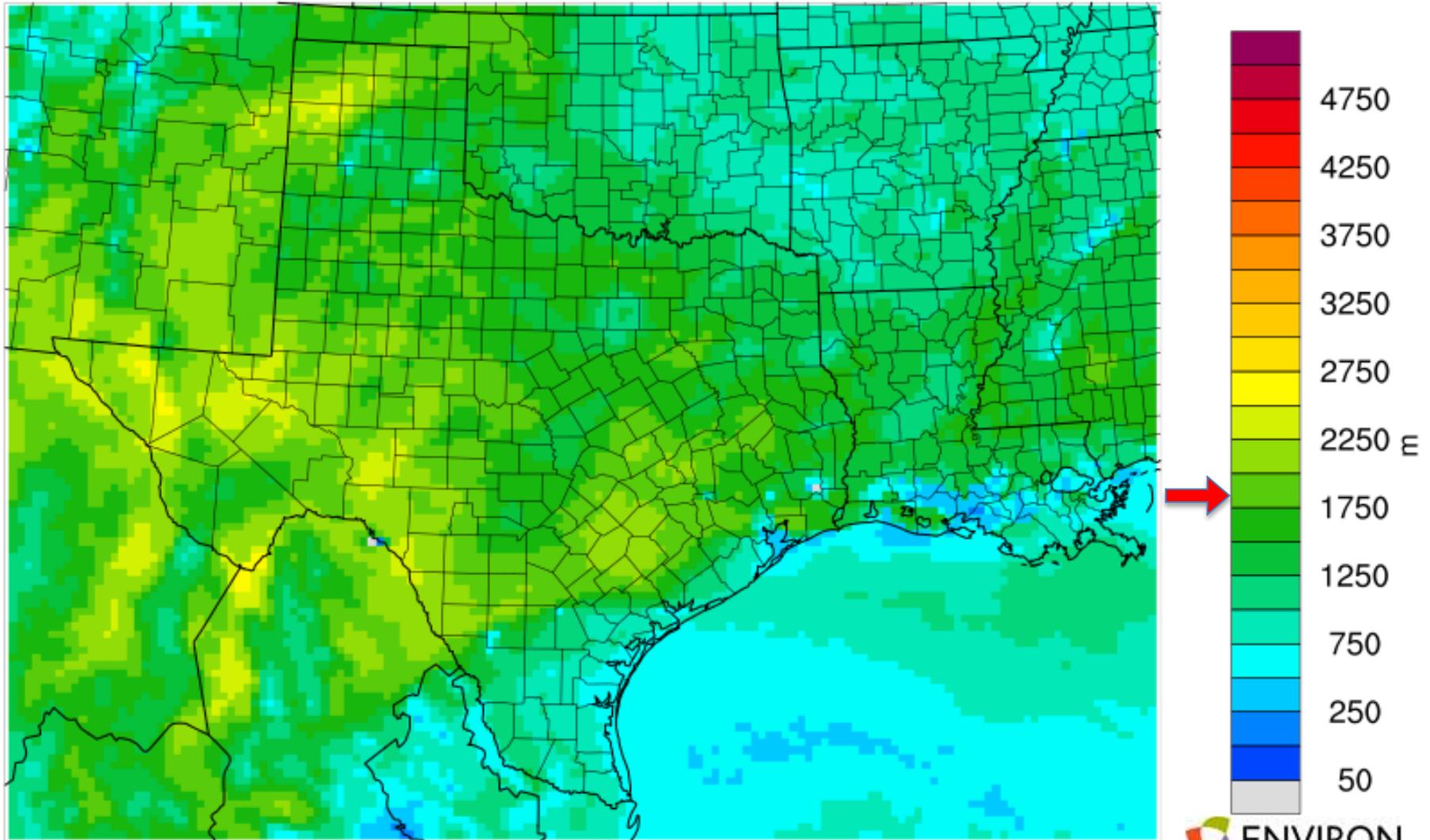


Min(52,2) = 169.6, Max(34,37) = 2469.0

Sat September 14 14:00 CST

PBL Height

Texas 12km

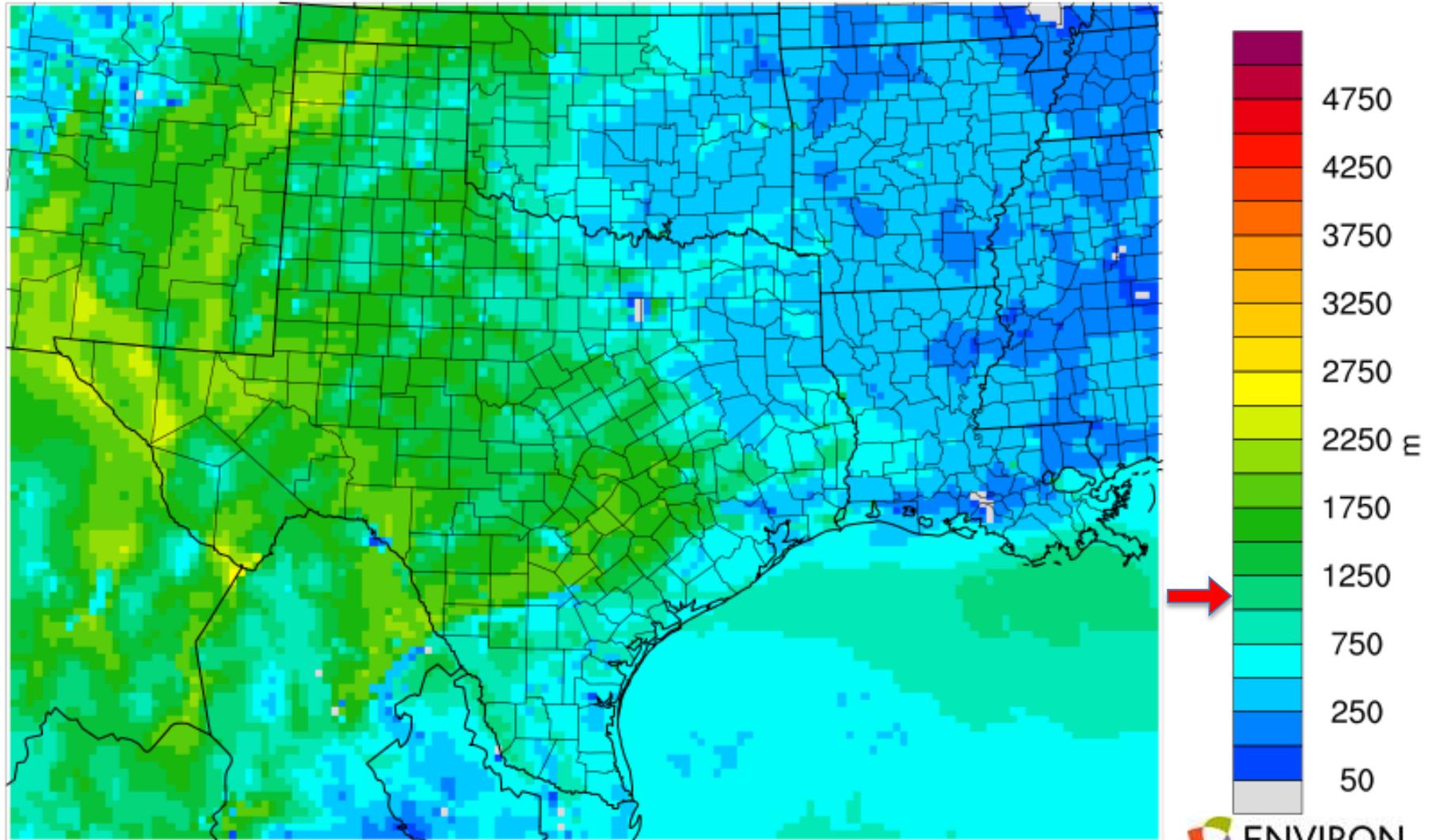


Min(105,47) = 32.6, Max(34,37) = 2630.4

Sat September 14 16:00 CST

PBL Height

Texas 12km



Min(136,107) = 16.4, Max(31,36) = 2515.8

Sat September 14 18:00 CST