

DISCOVER-AQ OUTLOOK - Sept. 8, 2013

Generally easterly and southeasterly flow continued over the area today with scattered thunderstorms.

Tomorrow looks similar to today with scattered thunderstorms and considerable cloudiness. Ozone levels are still expected to be relatively low, although somewhat larger than over the weekend. Maxima expected to the west and northwest of Houston. Aerosol content still will remain relatively clean with considerable sea salt contribution in the southeastern portion of our region of interest.

A drying trend should be evident Tuesday and Wednesday with thunderstorms more confined to offshore and to the south and west of Houston. Considerable cloudiness still on Tuesday, but become less so on Wednesday. It appears that Wednesday will likely be a decent day to fly.

Looking farther ahead, conditions continue to improve Thursday and Friday as a ridge will extend from the upper Midwest down through Texas. Dry conditions with minimal cloudiness and storms are expected.

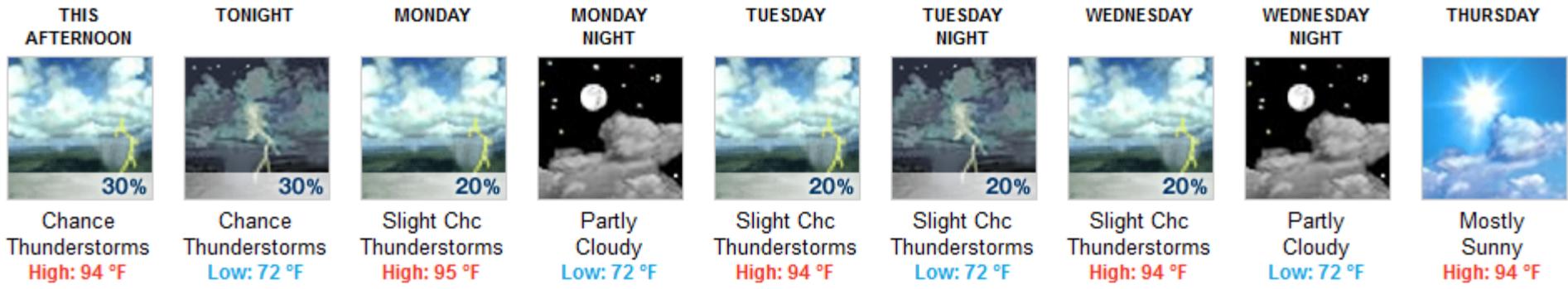
9/8/2013 4:00 PM Update Weather Briefing

Chris Loughner

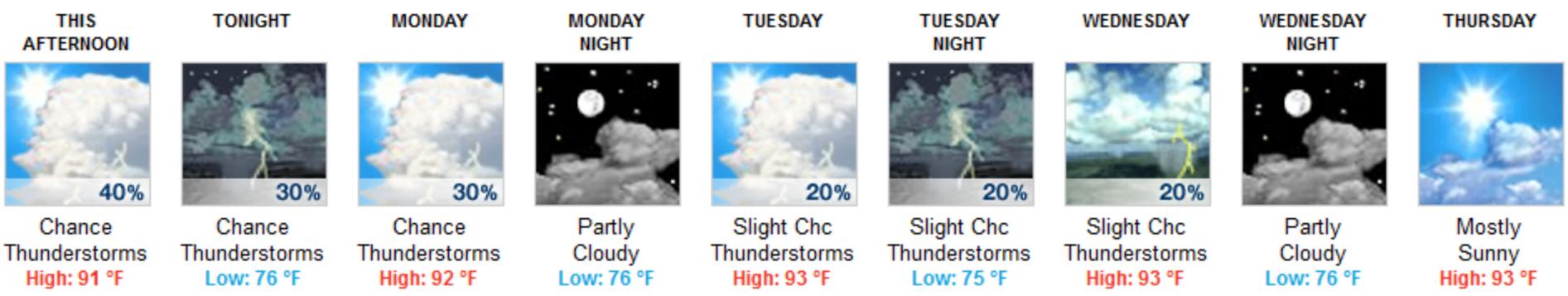
Ken Pickering

Bob Chatfield

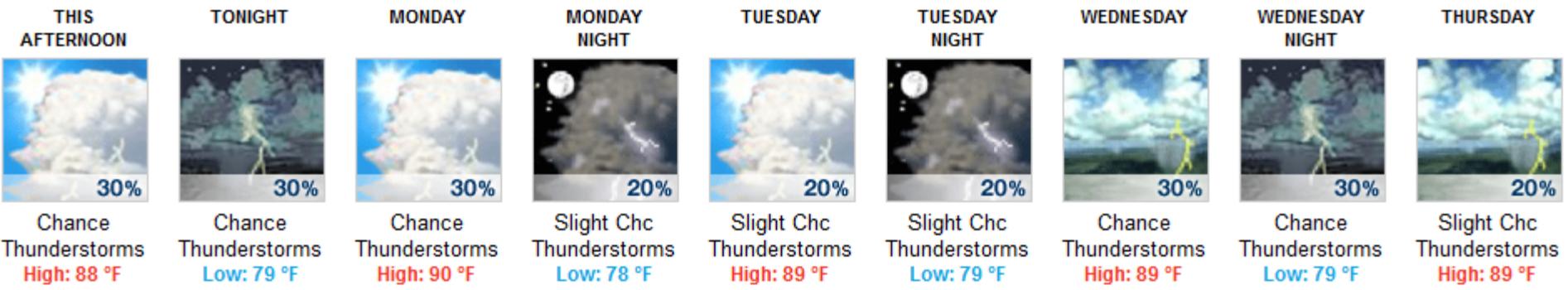
Conroe:



Houston Hobby:



Galveston:



Current Conditions

Conroe:



Partly Cloudy
91°F
 33°C

Humidity 52%
 Wind Speed S 12 G 16 mph
 Barometer 29.93 in (1013.0 mb)
 Dewpoint 71°F (22°C)
 Visibility 10.00 mi
 Heat Index 98°F (37°C)
 Last Update on 8 Sep 2:53 pm CDT

Houston Hobby:

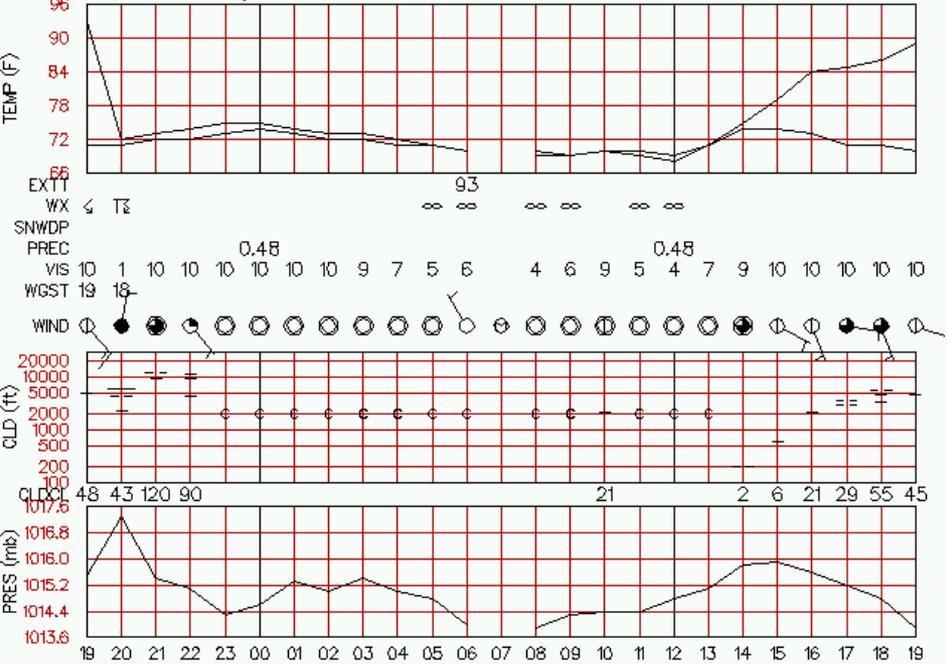


Mostly Cloudy
90°F
 32°C

Humidity 50%
 Wind Speed SE 12 mph
 Barometer 29.93 in (1013.8 mb)
 Dewpoint 69°F (21°C)
 Visibility 10.00 mi
 Heat Index 95°F (35°C)
 Last Update on 8 Sep 2:53 pm CDT

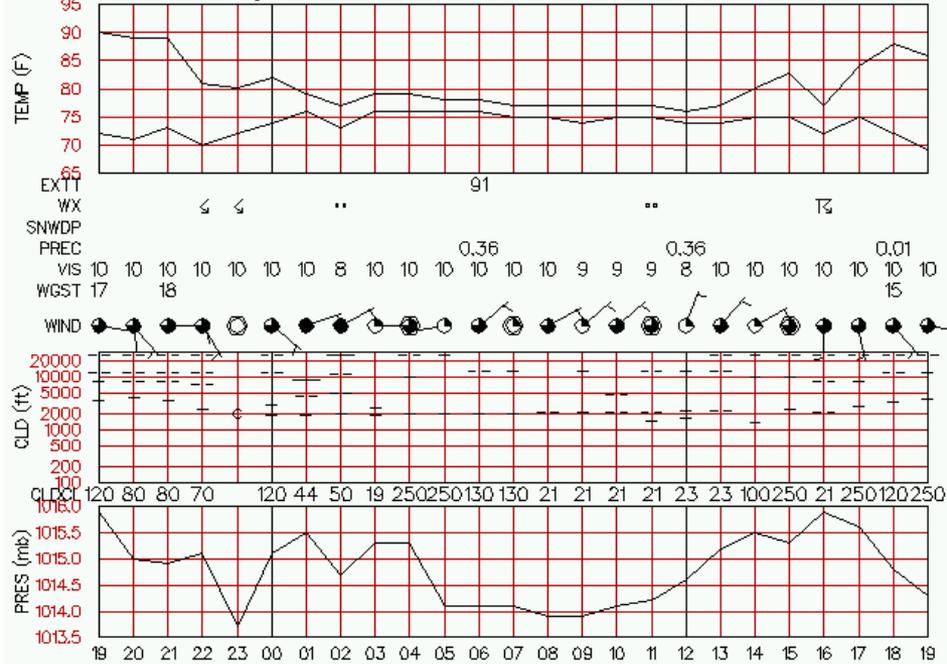
▼ Plymouth State Weather Center ▼

Meteogram for KCXO from 1900Z 7 SEP 13 to 1900Z 8 SEP 13



▼ Plymouth State Weather Center ▼

Meteogram for KHOU from 1900Z 7 SEP 13 to 1900Z 8 SEP 13



Current Conditions

Galveston:



A Few Clouds

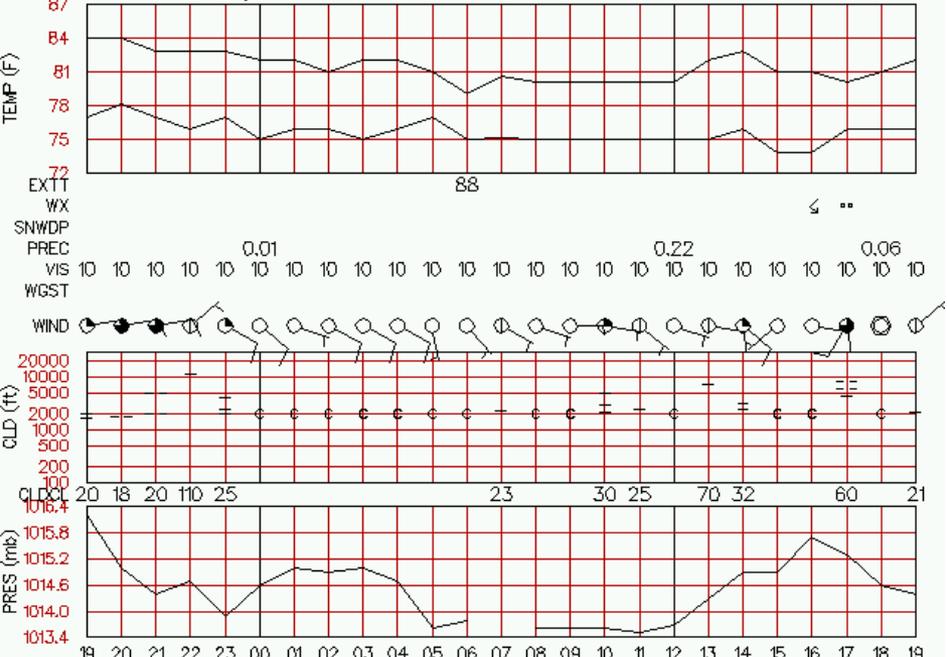
84°F
29°C

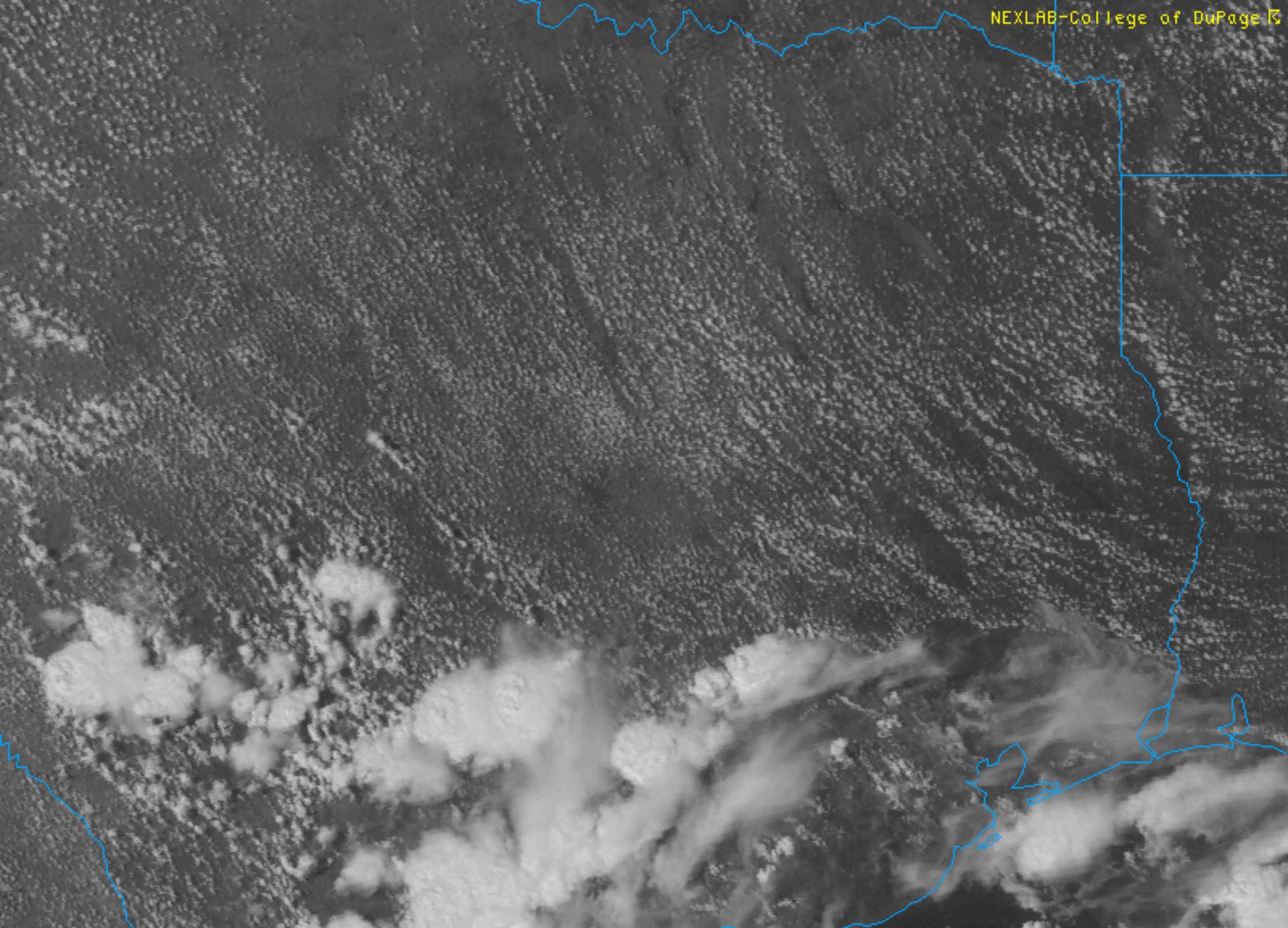
Humidity 74%
Wind Speed SE 6 mph
Barometer 29.94 in (1013.9 mb)
Dewpoint 75°F (24°C)
Visibility 10.00 mi
Heat Index 92°F (33°C)

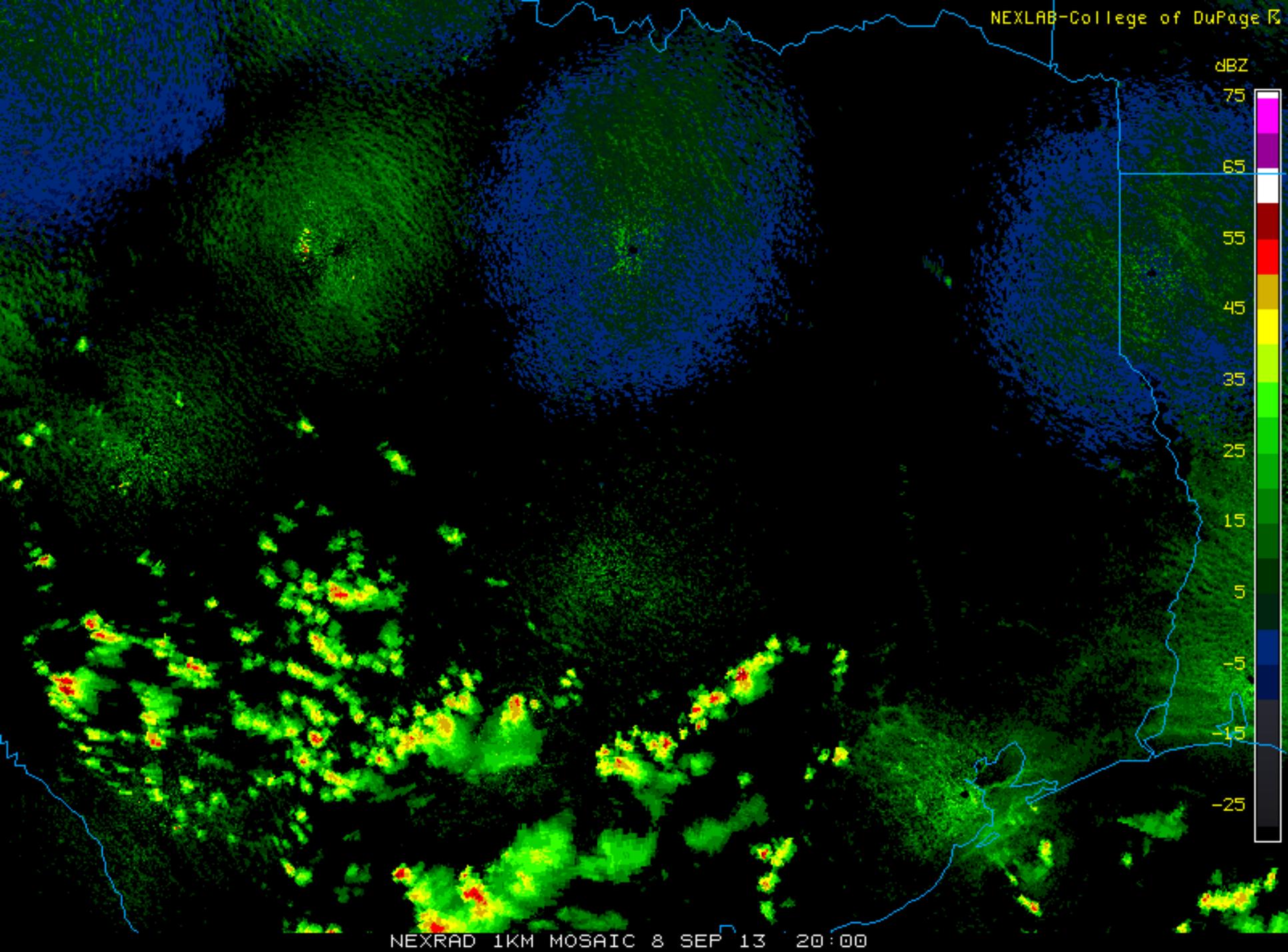
Last Update on 8 Sep 2:52 pm CDT

▼ Plymouth State Weather Center ▼

Meteogram for KGLS from 1900Z 7 SEP 13 to 1900Z 8 SEP 13



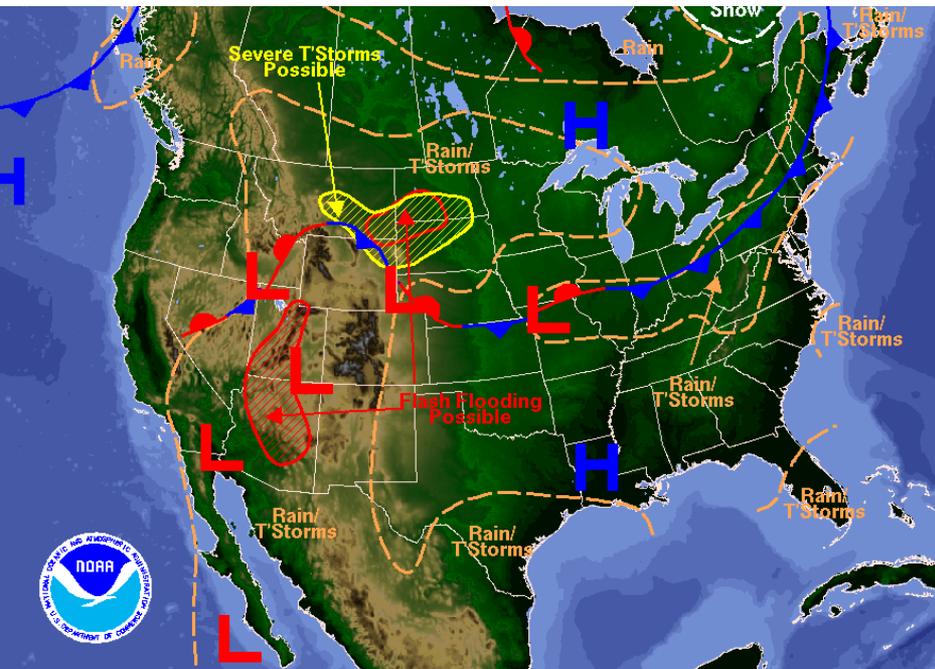




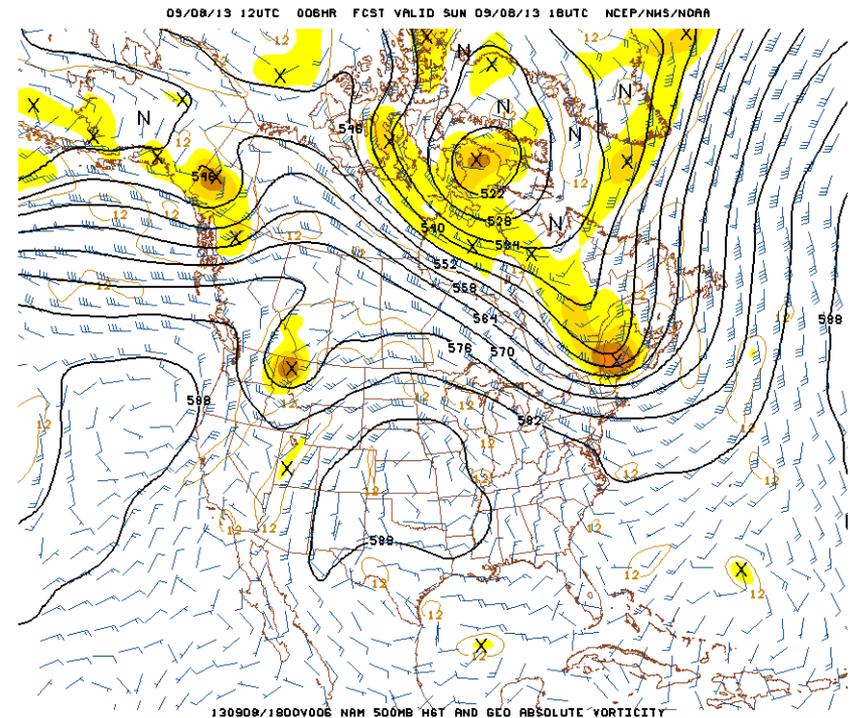
dBZ
75
65
55
45
35
25
15
5
-5
-15
-25

Today: Scattered thunderstorms and southeasterly winds.

1 PM CDT
500 mb vorticity

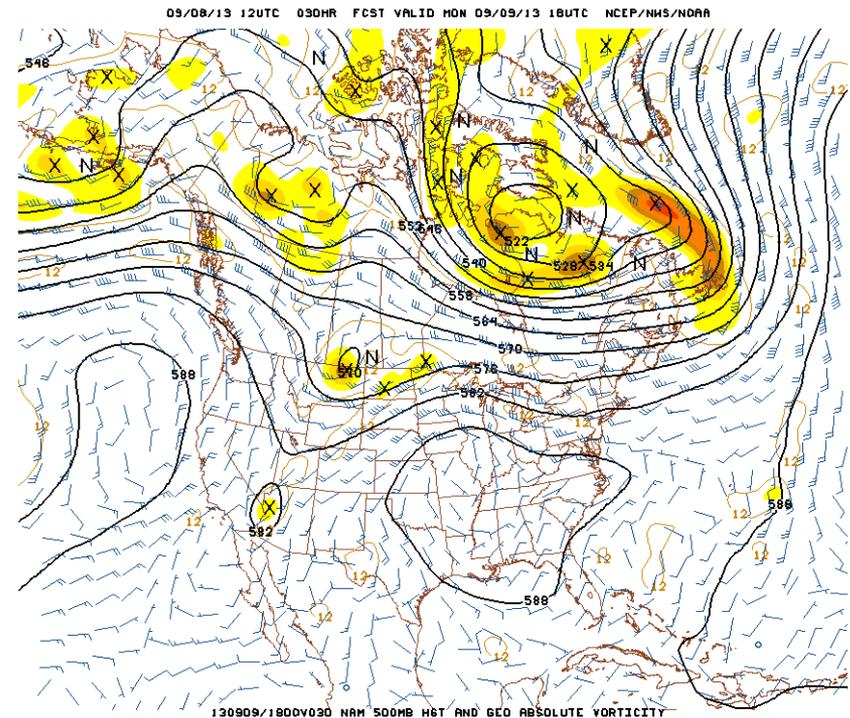
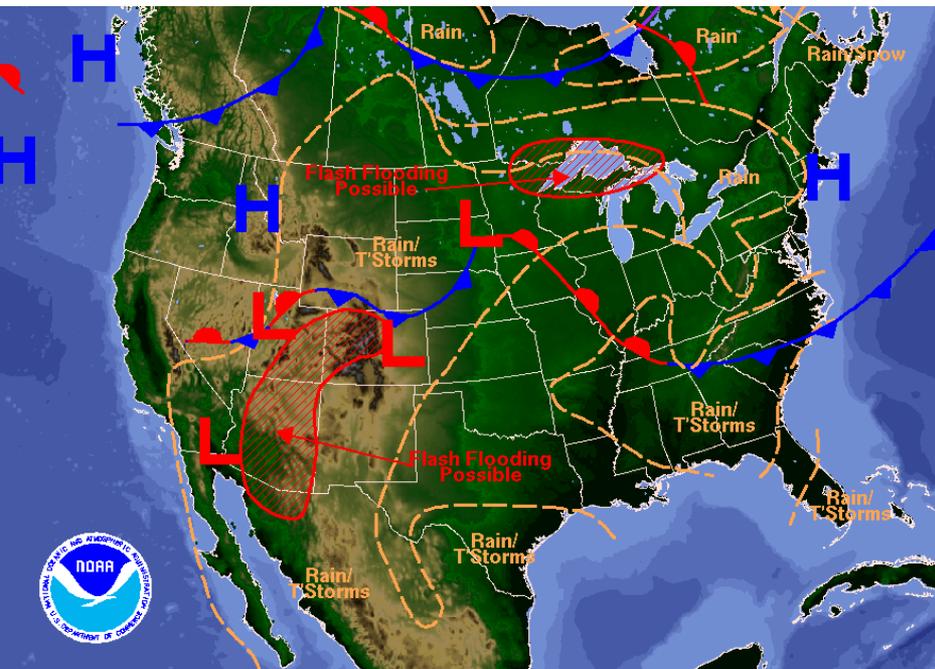


Weather Forecast for Sun, Sep 08, 2013, issued 4:20 AM EDT
DOC/NOAA/NWS/NCEP/Weather Prediction Center
Prepared by Fanning based on WPC, SPC and NHC forecasts



Tomorrow: Scattered thunderstorms and southeasterly winds.

1 PM CDT
500 mb vorticity



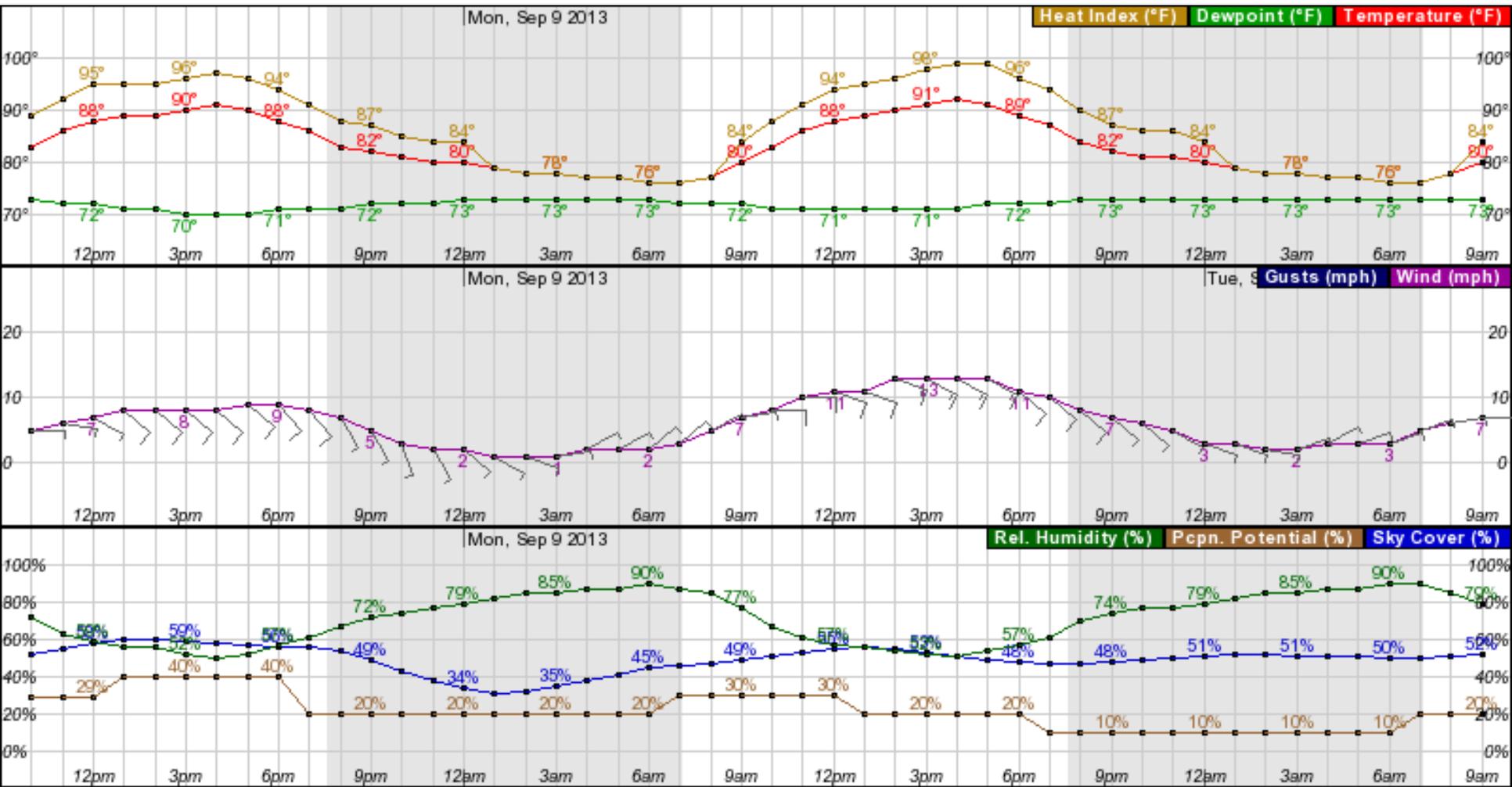
Houston Hobby

Today: Mostly cloudy

Tomorrow: Cloud cover around 50%

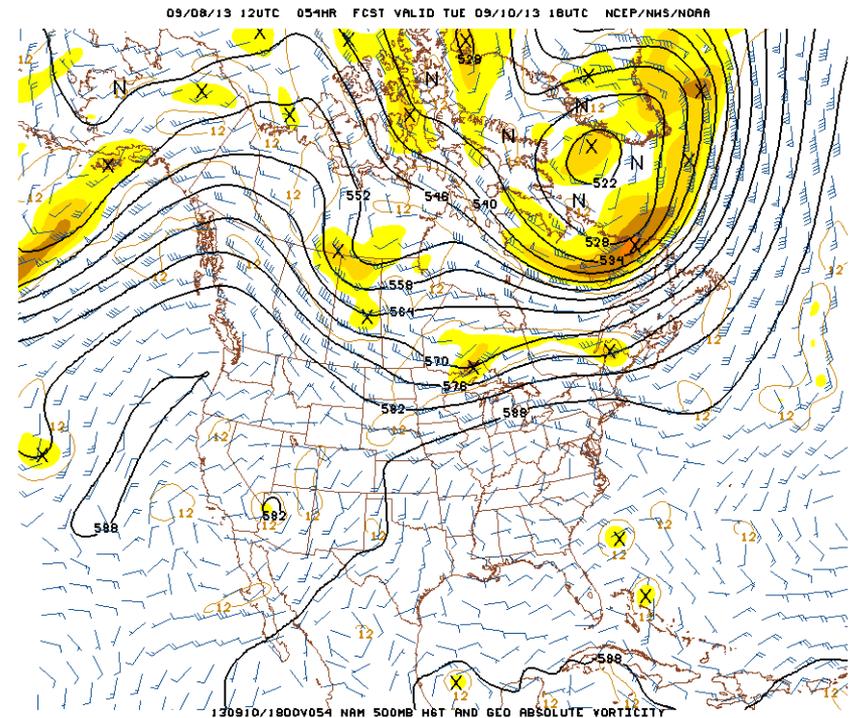
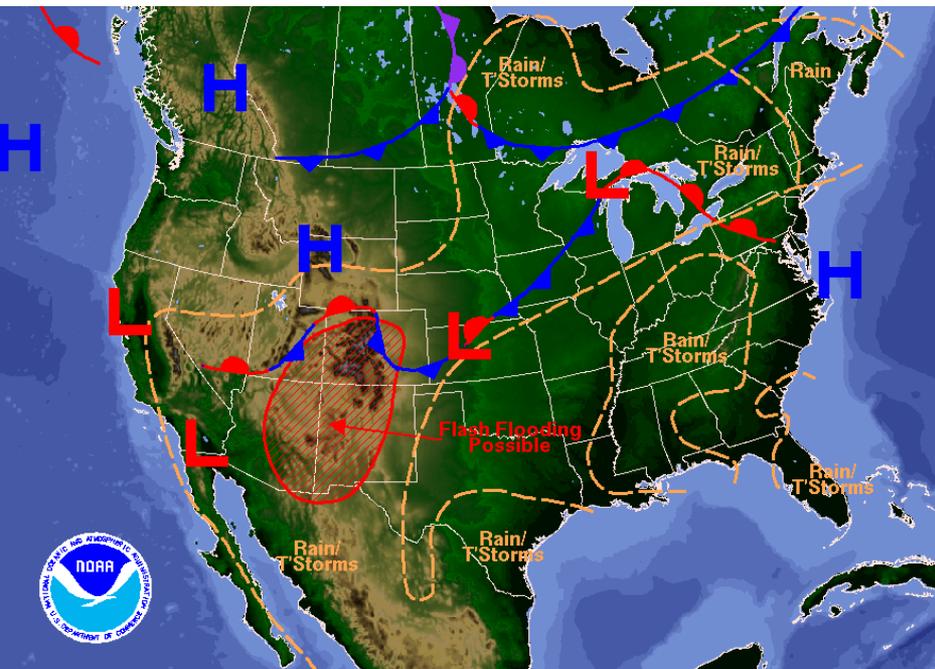
Today →

Tomorrow →



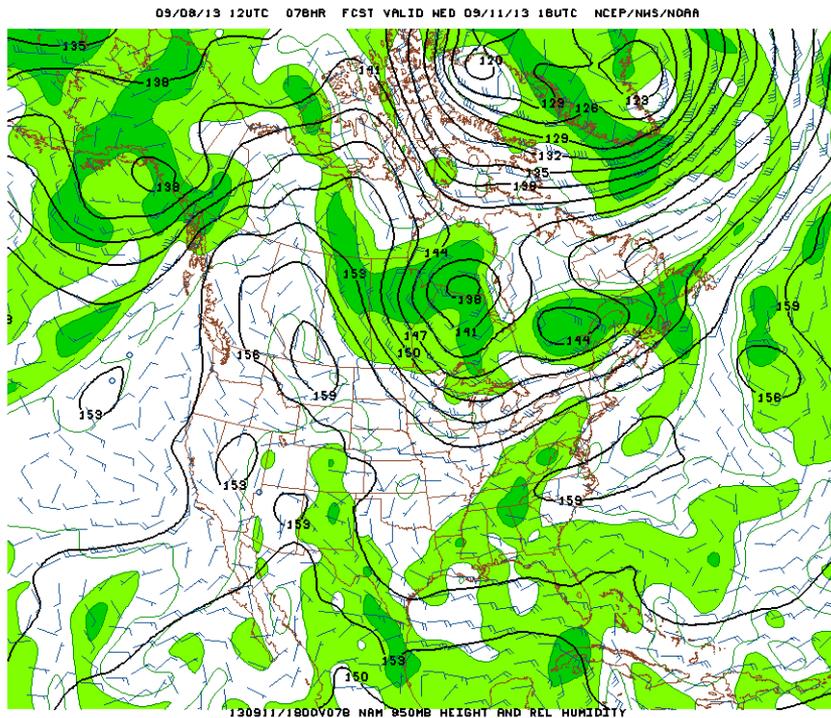
Tuesday: Scattered thunderstorms along the coast and west of our region; southeasterly winds.

1 PM CDT
500 mb vorticity

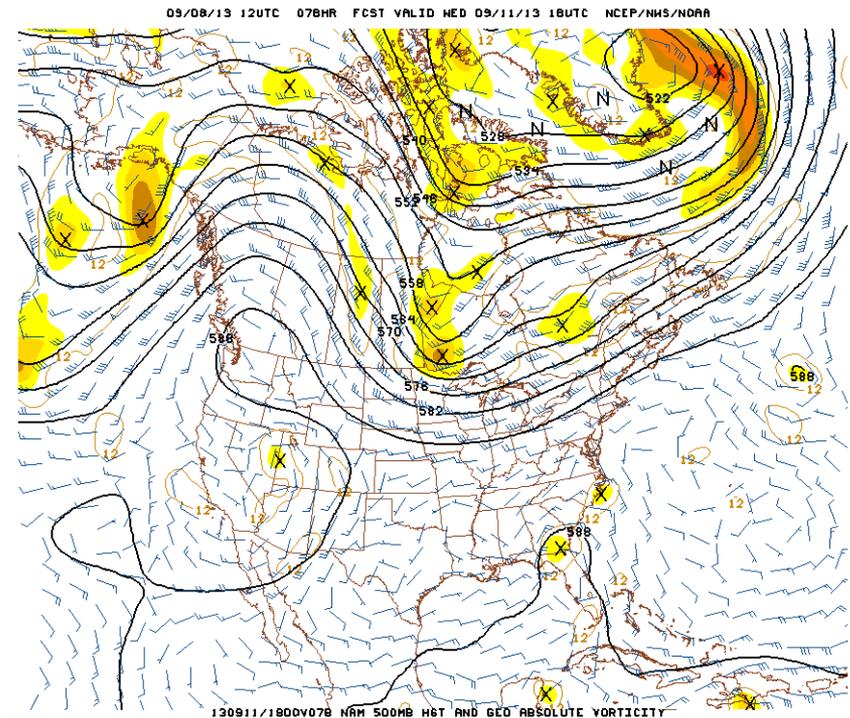


Wednesday: Scattered thunderstorms along the coast;
upper level ridge in the Pacific Northwest moves eastward.

1 PM CDT
850 mb RH



500 mb vorticity



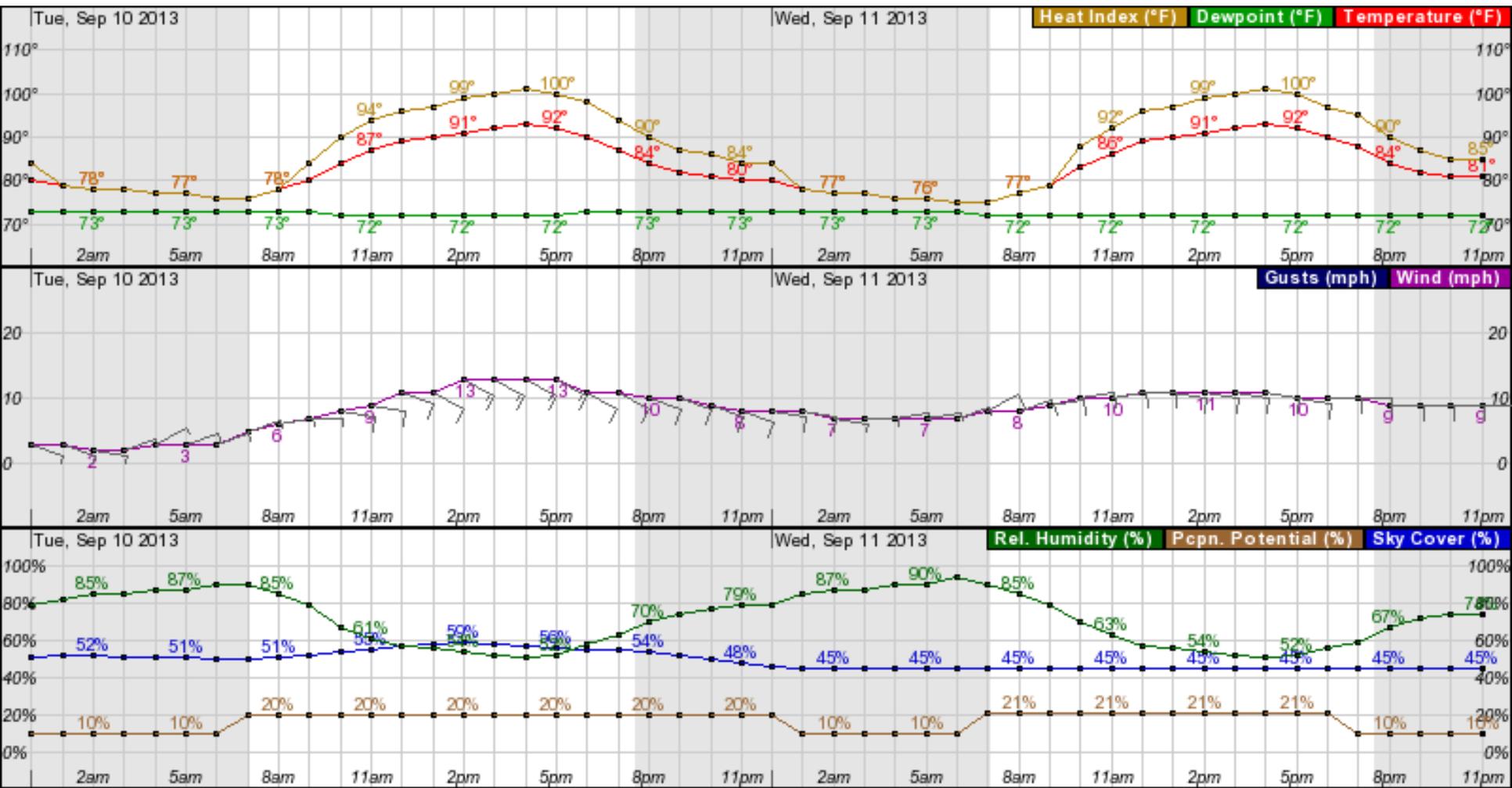
Houston Hobby

Tuesday: Mostly cloudy

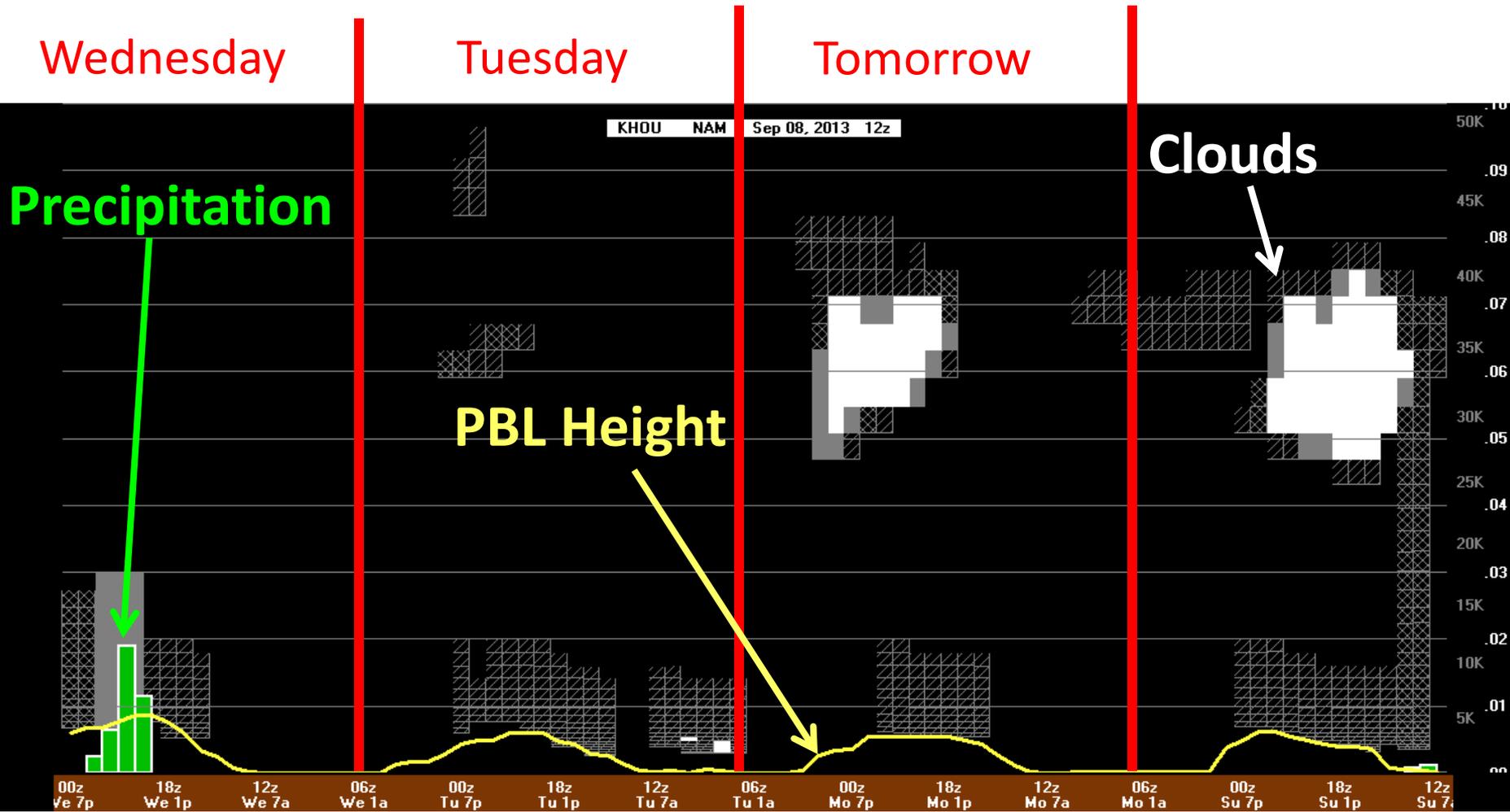
Wednesday: Partly cloudy

Tuesday →

Wednesday →



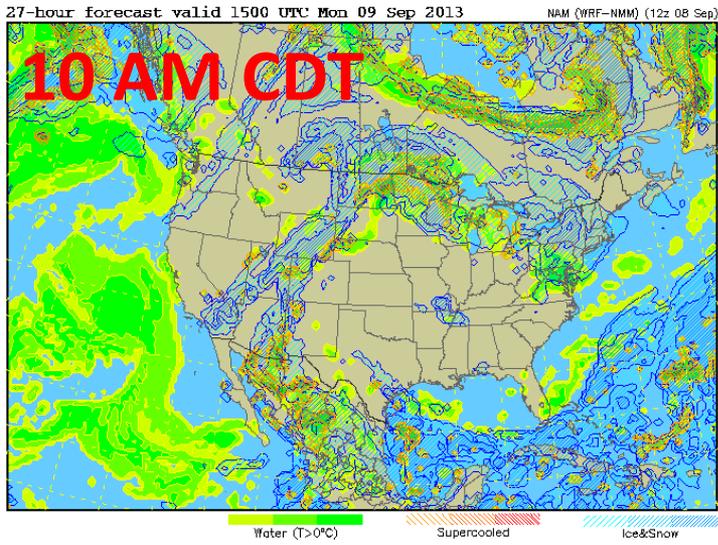
Houston Hobby; BUFKIT – NAM (12 UTC 8 September)



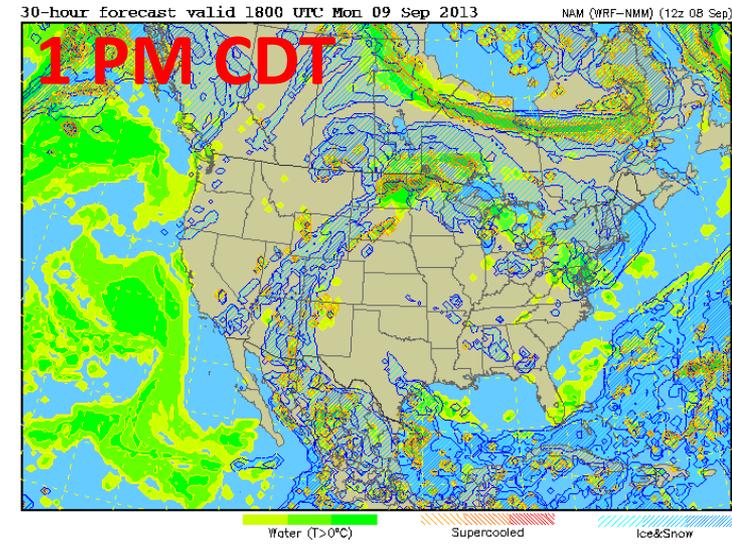
- Tomorrow: Mostly cloudy.
- Tuesday: Partly cloudy.
- Wednesday: Mostly cloudy in the afternoon.

Tomorrow: NAM – high level clouds; low level clouds south and west of our region

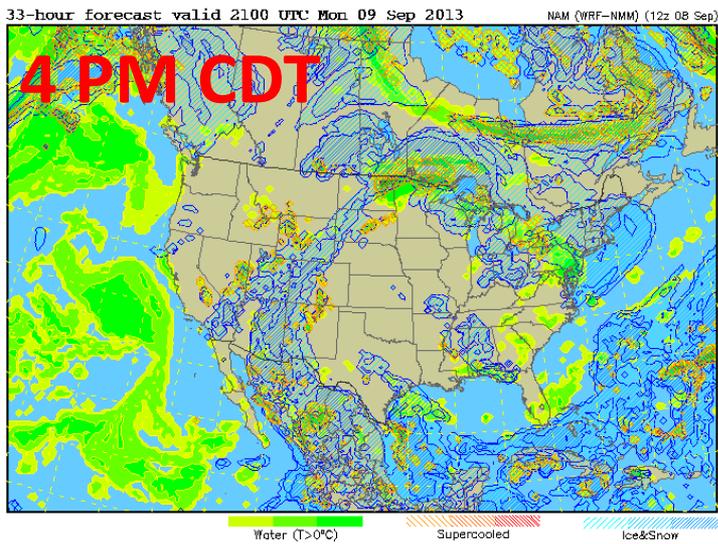
Integrated liquid and frozen hydrometeors (all levels)



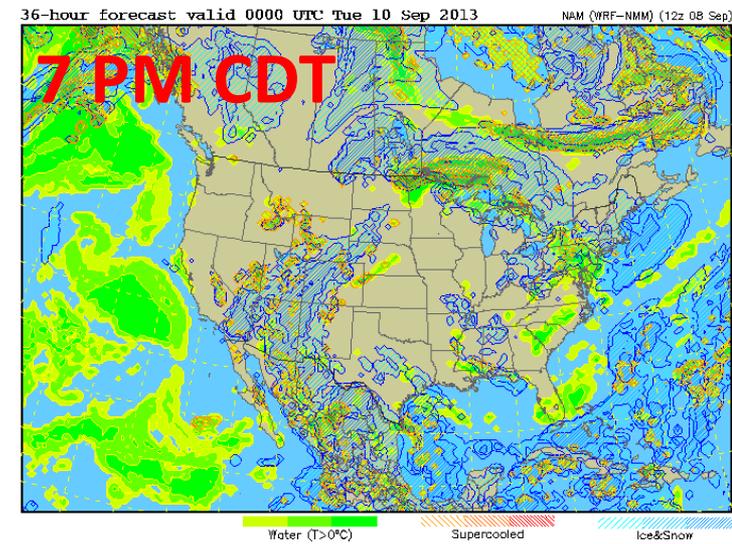
Integrated liquid and frozen hydrometeors (all levels)



Integrated liquid and frozen hydrometeors (all levels)

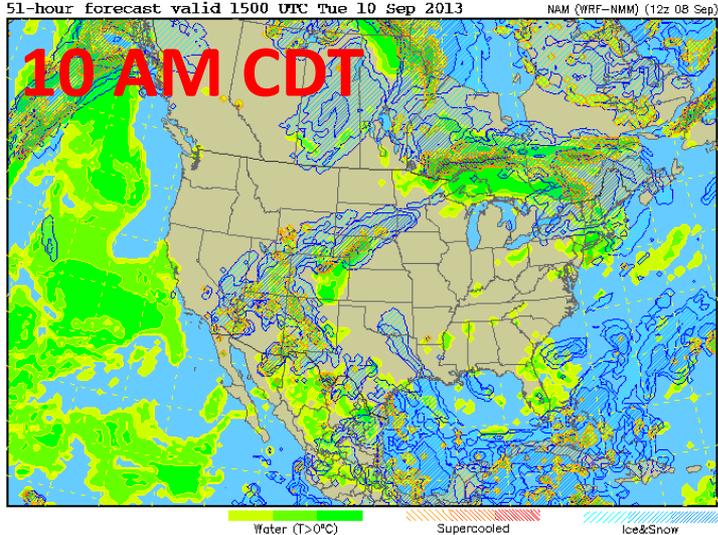


Integrated liquid and frozen hydrometeors (all levels)

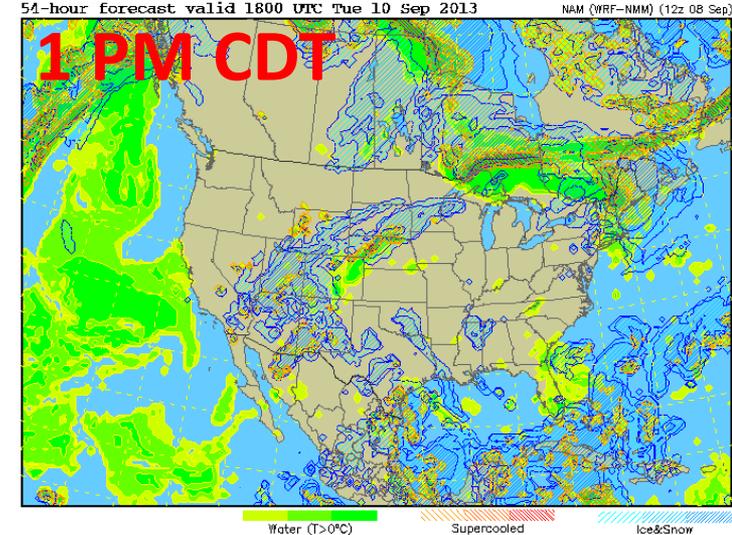


Tuesday: NAM – high level clouds; low level clouds south and west of our region

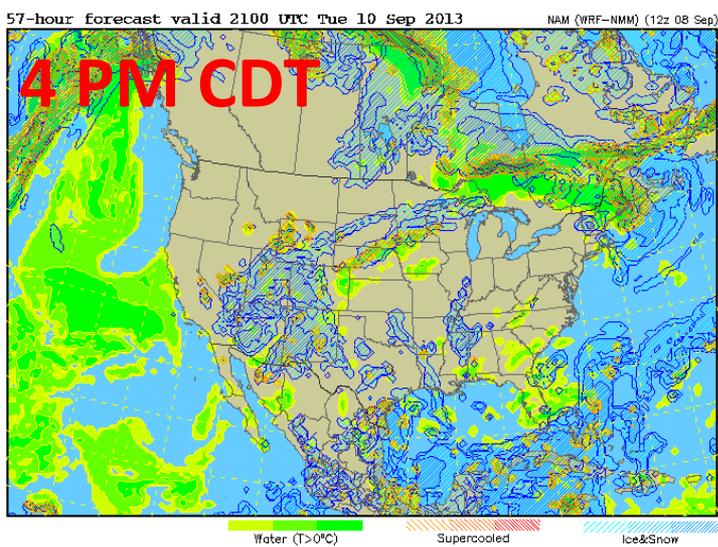
Integrated liquid and frozen hydrometeors (all levels)



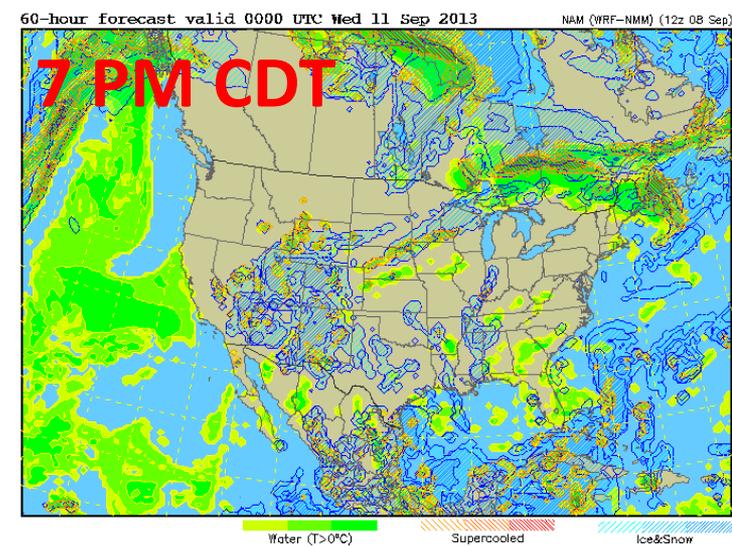
Integrated liquid and frozen hydrometeors (all levels)



Integrated liquid and frozen hydrometeors (all levels)

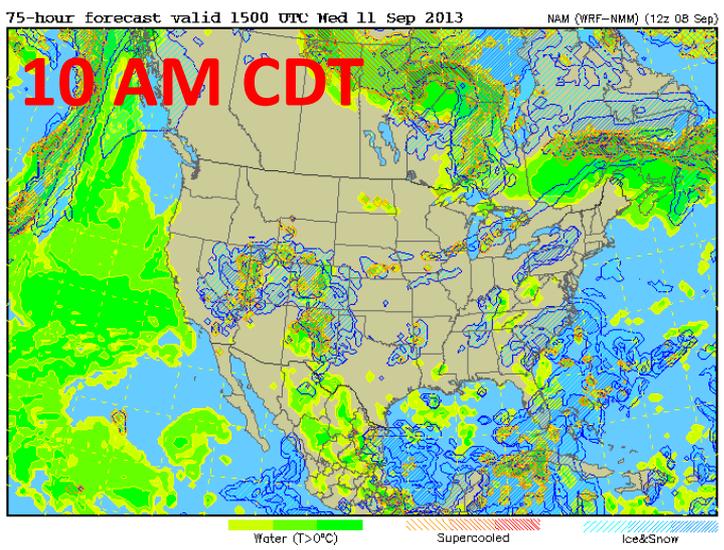


Integrated liquid and frozen hydrometeors (all levels)

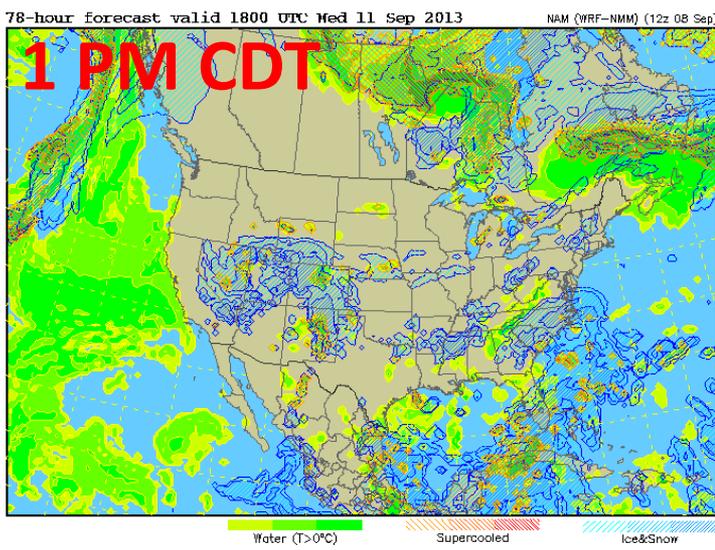


Wednesday: NAM – mid level clouds in the evening

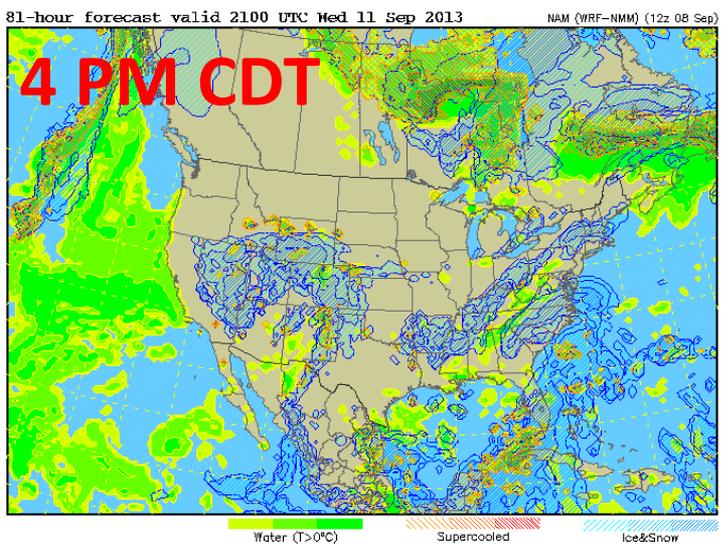
Integrated liquid and frozen hydrometeors (all levels)



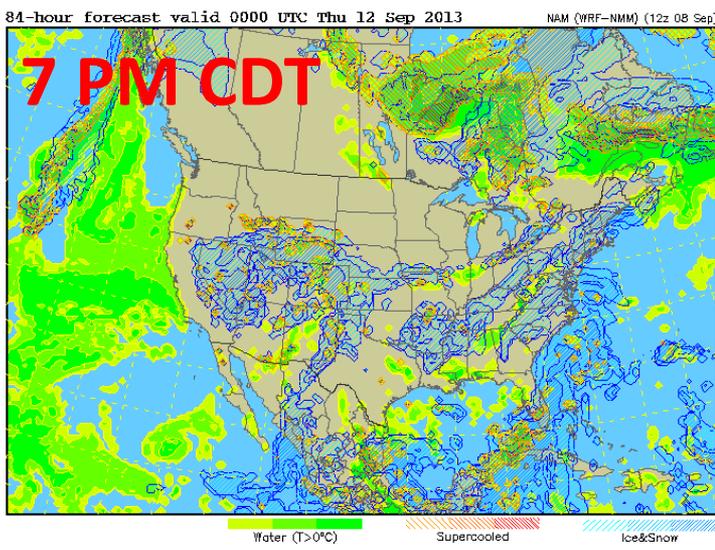
Integrated liquid and frozen hydrometeors (all levels)



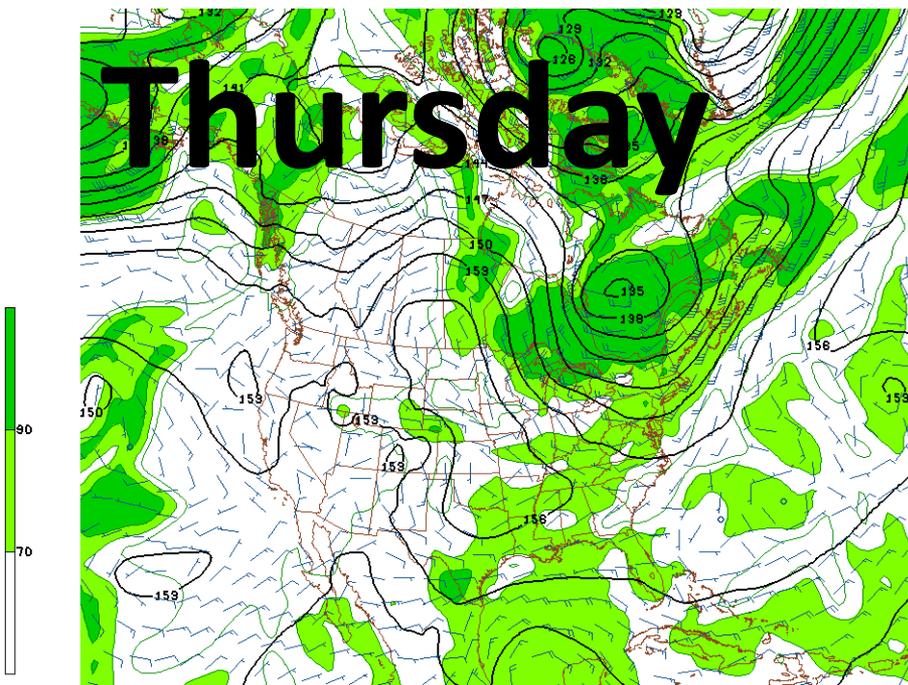
Integrated liquid and frozen hydrometeors (all levels)



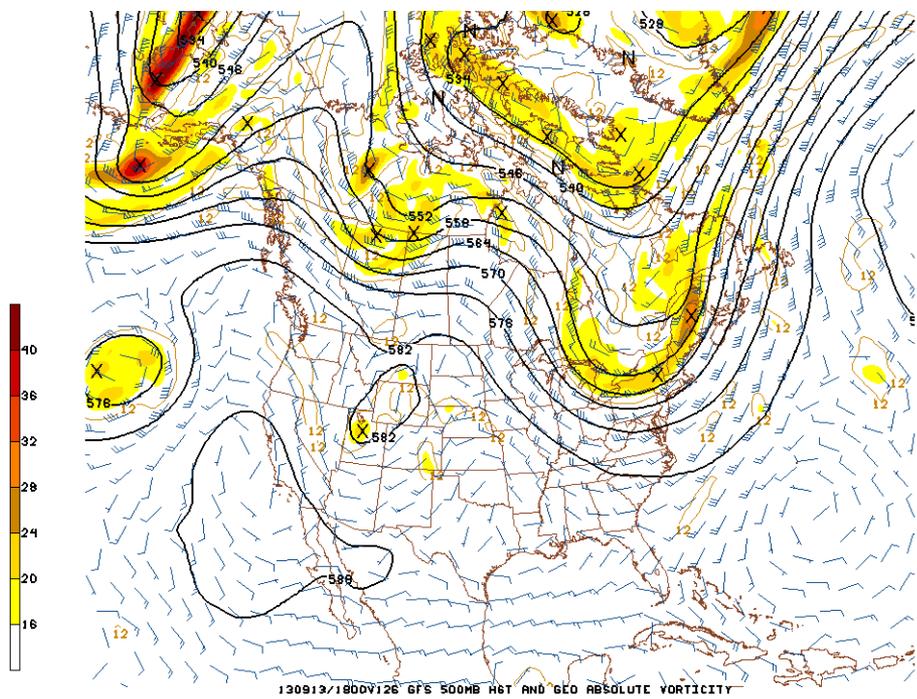
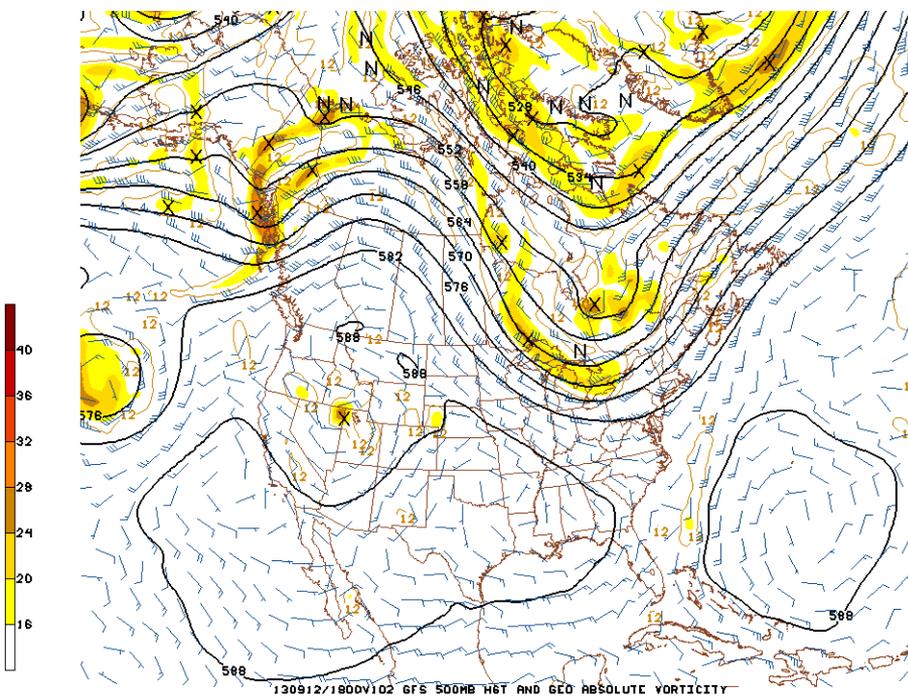
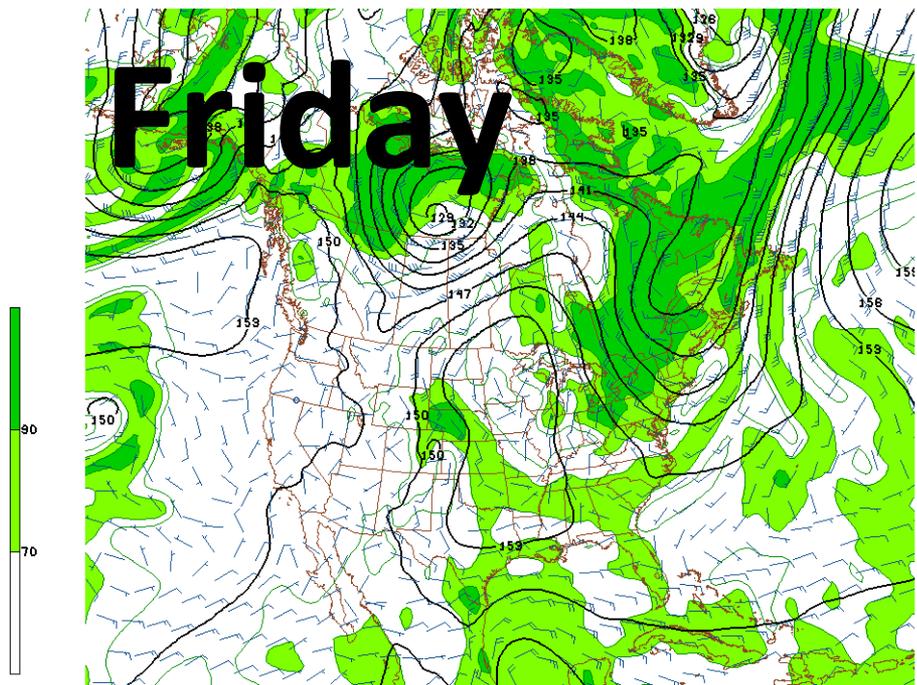
Integrated liquid and frozen hydrometeors (all levels)



Thursday



Friday



Recommendations

- Tomorrow: Similar day to today. Mostly cloudy and scattered thunderstorms.
- Tuesday: Possible flight day. Conditions improving. Thunderstorms along the coast.
- Wednesday: Possible flight day. Conditions continue to improve. Thunderstorms along the coast mainly south and west of our area.
- Thursday and Friday: Shaping up to be good fly days with a large ridge over Texas.

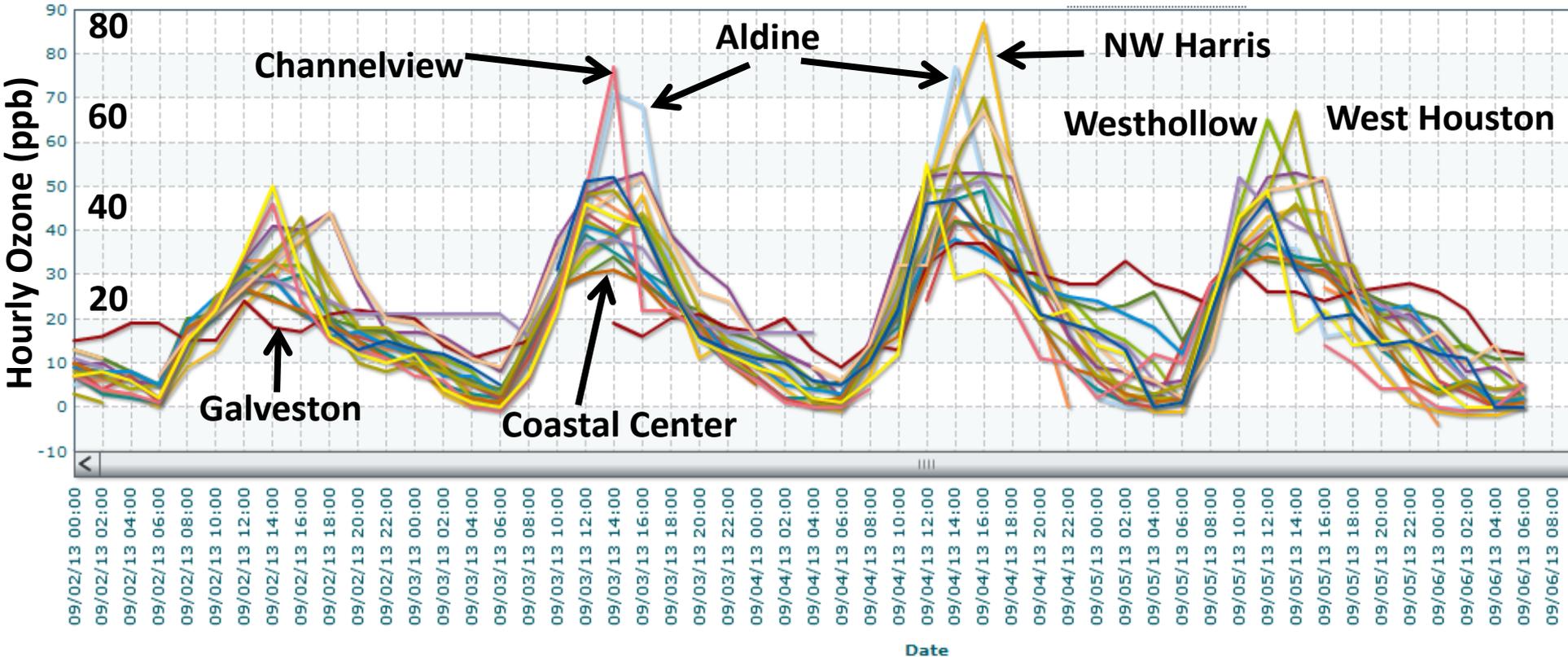
DISCOVER-AQ Air Quality Outlook
September 8, 2013

Ken Pickering

Bob Chatfield

Hourly Ozone (airnowtech.org)

Monday – Friday morning (6 am)



- | Date | |
|---|---|
| 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) |

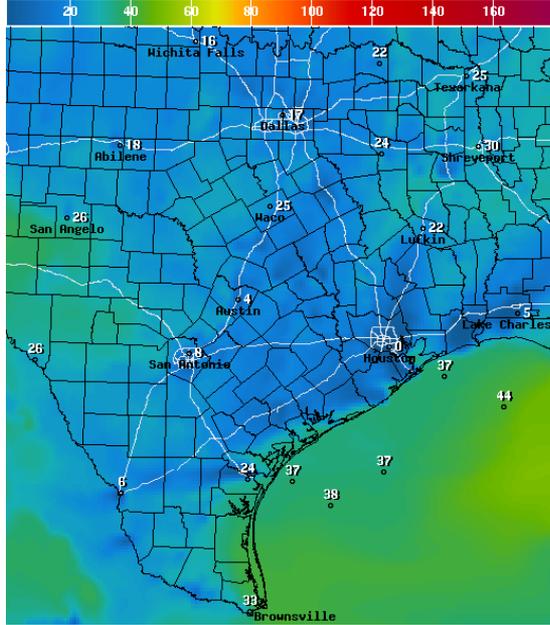
Surface Ozone – Maximum 1-hr average

Friday, September 6, 2013

West Houston	56 ppbv	3 PM
NW Harris Co.	52	2 PM
Westhollow	48	Noon
Conroe	46	Noon
Manvel Croix	38	10 AM

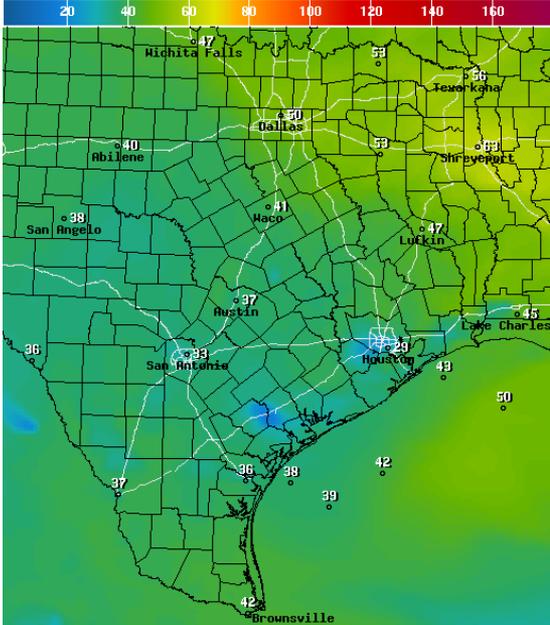
Saturday, September 7, 2013

West Houston	48	3 PM
NW Harris Co.	37	Noon
Westhollow	37	11 AM
Conroe	31	1 PM
Manvel Croix	34	4 PM
Deer Park	29	Noon
Galveston	28	1 PM
Channelview	25	11 AM

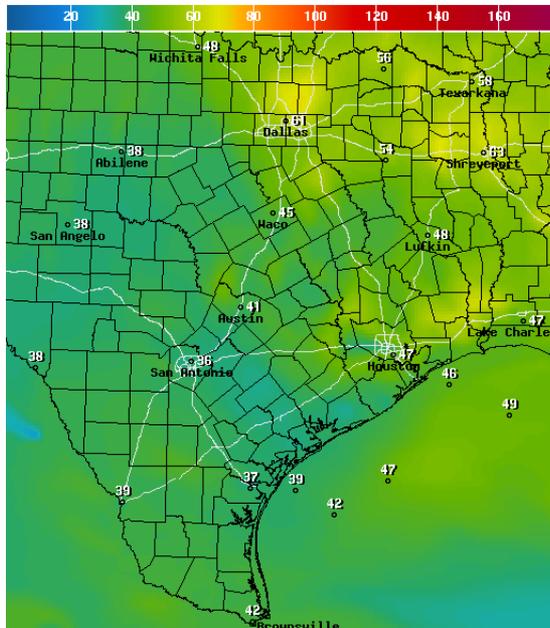


1Hr Avg Ozone Concentration(PPB) Ending Mon Sep 09 2013 9AM EDT
 (Mon Sep 09 2013 132)
 National Digital Guidance Database
 12z model run Graphic created-Sep 08 11:15AM EDT

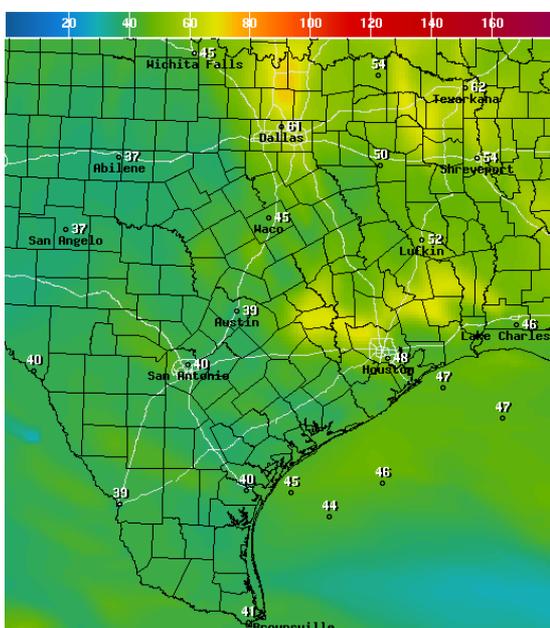
NOAA Operational CMAQ



1Hr Avg Ozone Concentration(PPB) Ending Mon Sep 09 2013 12PM EDT
 (Mon Sep 09 2013 162)
 National Digital Guidance Database
 12z model run Graphic created-Sep 08 11:15AM EDT



1Hr Avg Ozone Concentration(PPB) Ending Mon Sep 09 2013 2PM EDT
 (Mon Sep 09 2013 182)
 National Digital Guidance Database
 12z model run Graphic created-Sep 08 11:15AM EDT



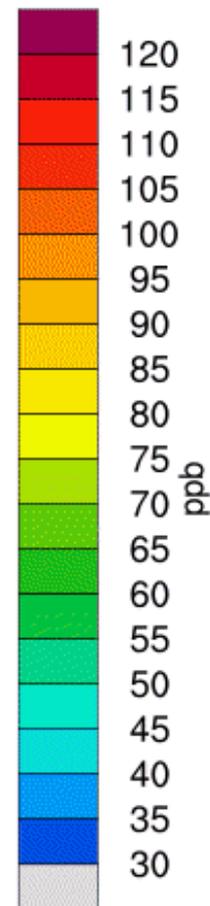
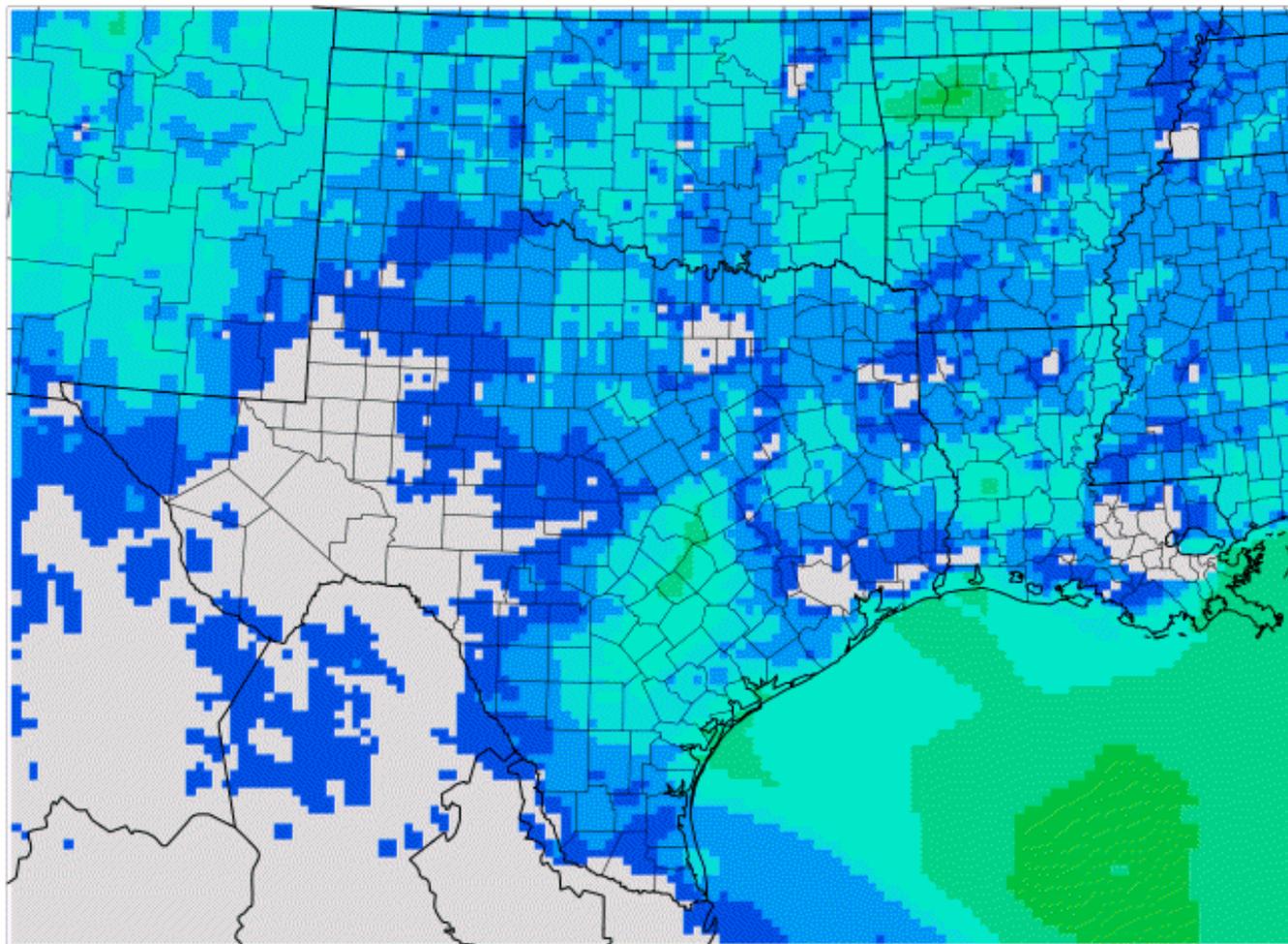
1Hr Avg Ozone Concentration(PPB) Ending Mon Sep 09 2013 5PM EDT
 (Mon Sep 09 2013 212)
 National Digital Guidance Database
 12z model run Graphic created-Sep 08 11:16AM EDT

Ozone

Best Case

Surface

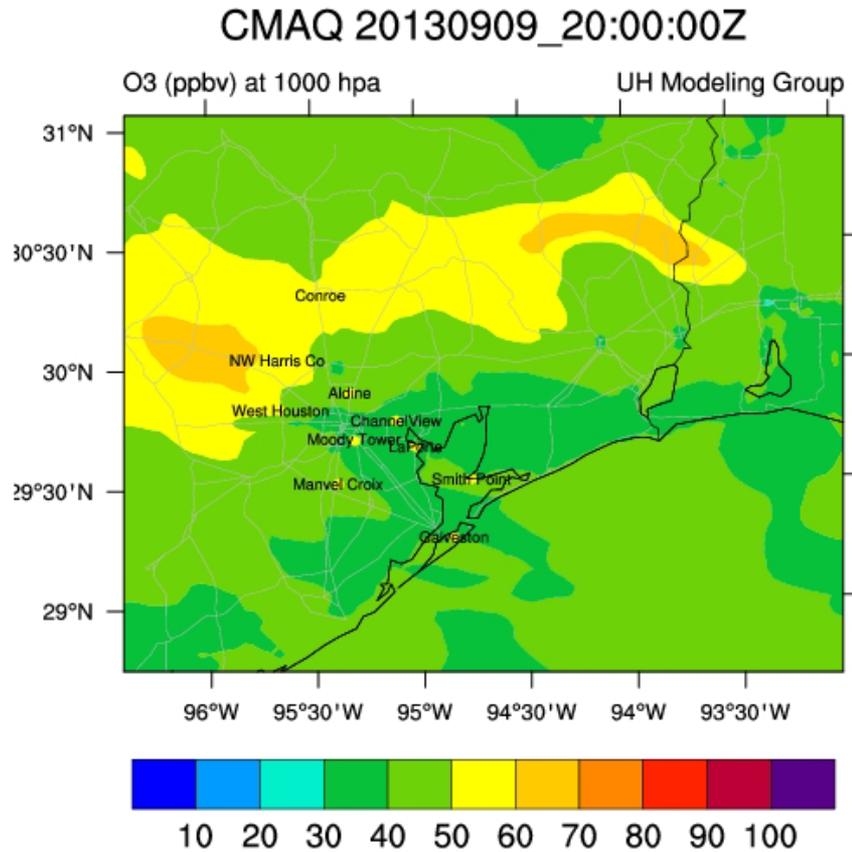
CAMx



Min(55,4) = 0.2, Max(128,16) = 56.3

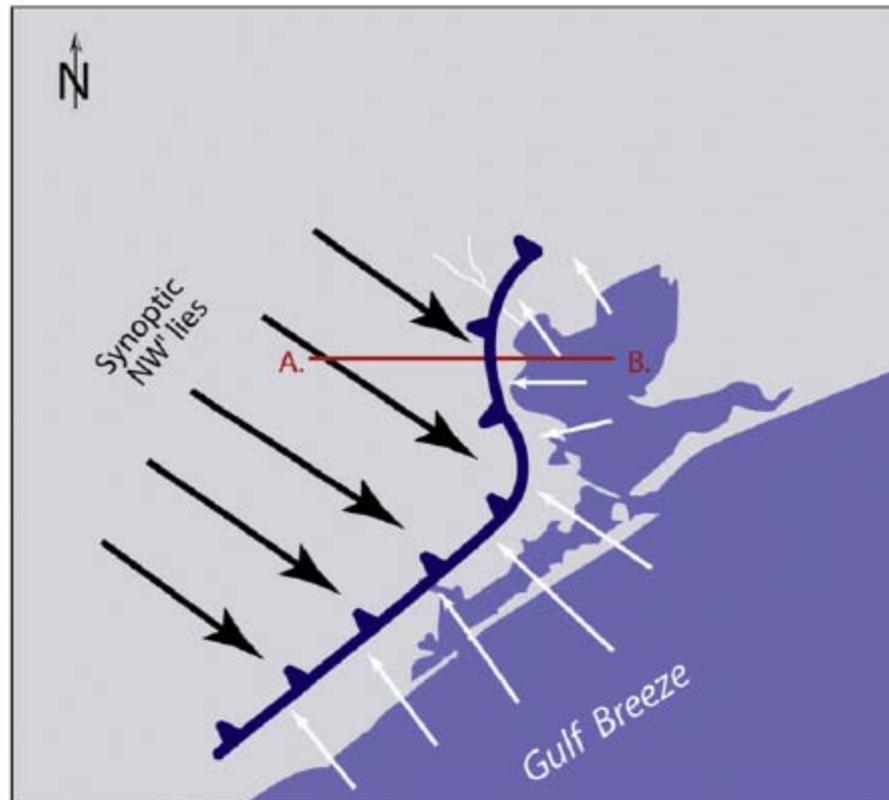
Mon September 9 06:00 CST

University of Houston CMAQ



How do we get high Ozone in Houston?

One scenario is light northwesterly flow behind a cold front. Sea breeze develops by late morning along coast and moves inland and creates a zone of stagnation in high emission region near the sea breeze front. Recirculation of morning emissions back to the city in the afternoon also occurs.

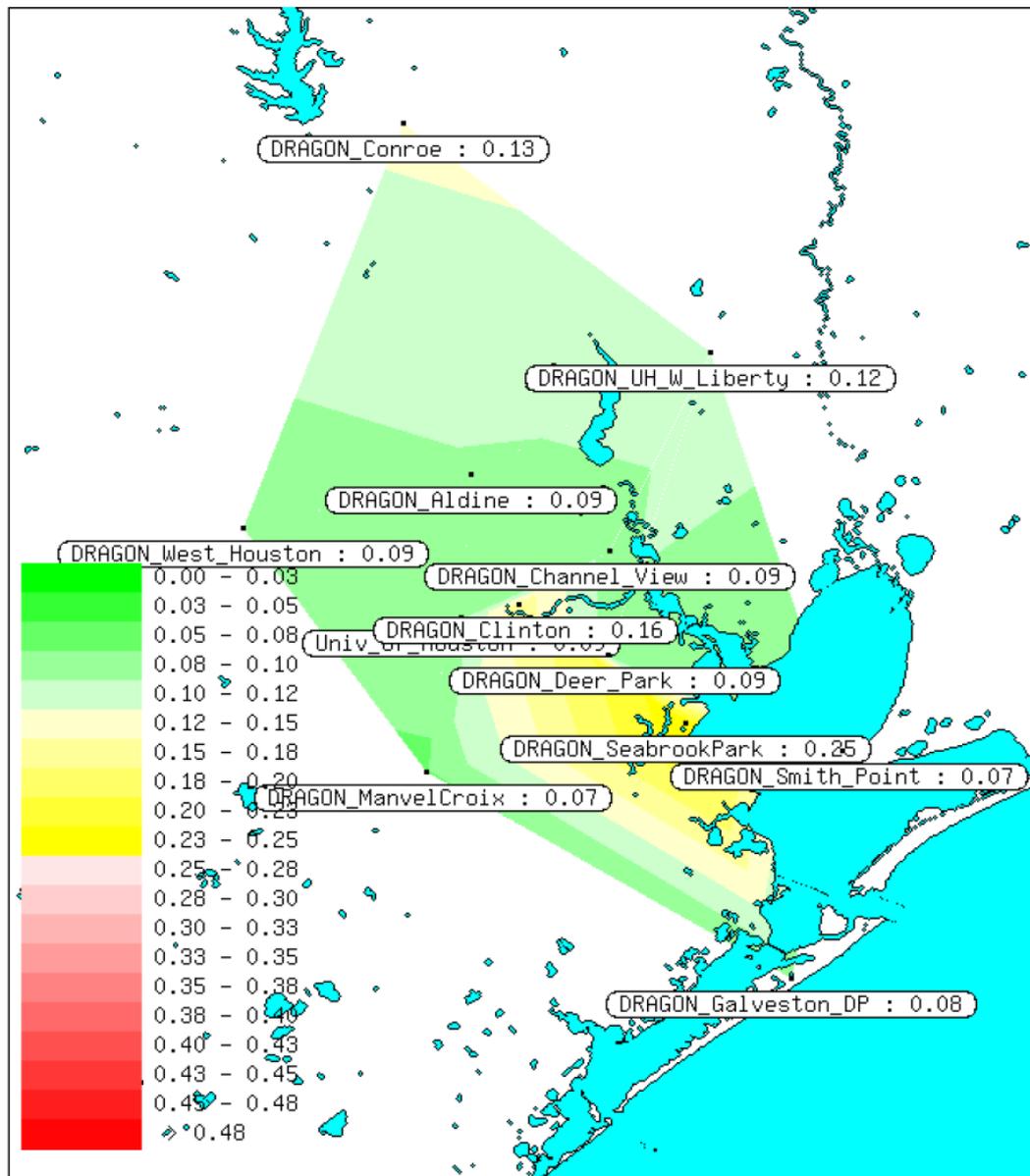


We still remain in summer mode with no cold fronts

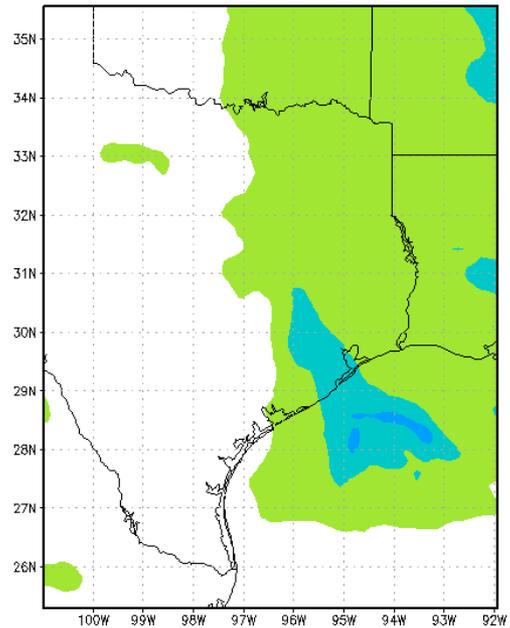
Banta et al., 2011

(N 30.5000, W 96.0000)

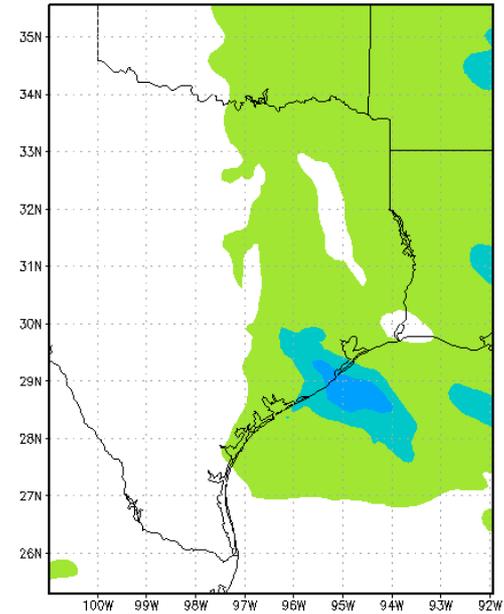
(N 30.5000, W 94.5000)



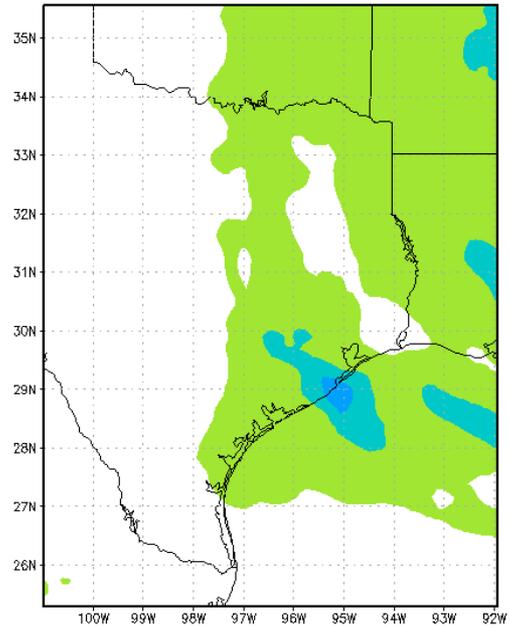
(dev) aot 32H VALID 14Z 09 SEP2013 [dimensionless]



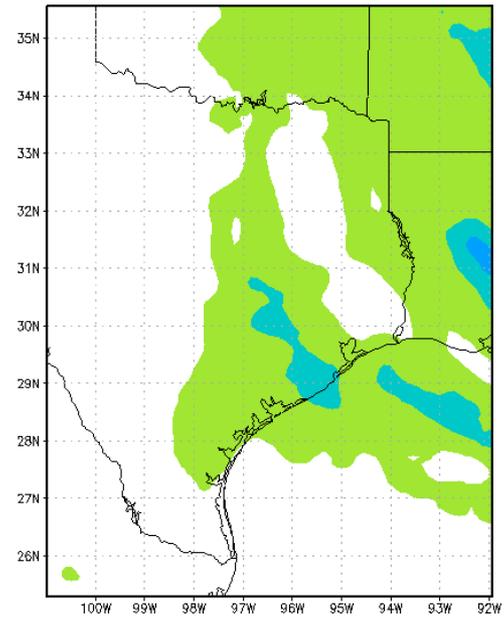
(dev) aot 35H VALID 17Z 09 SEP2013 [dimensionless]



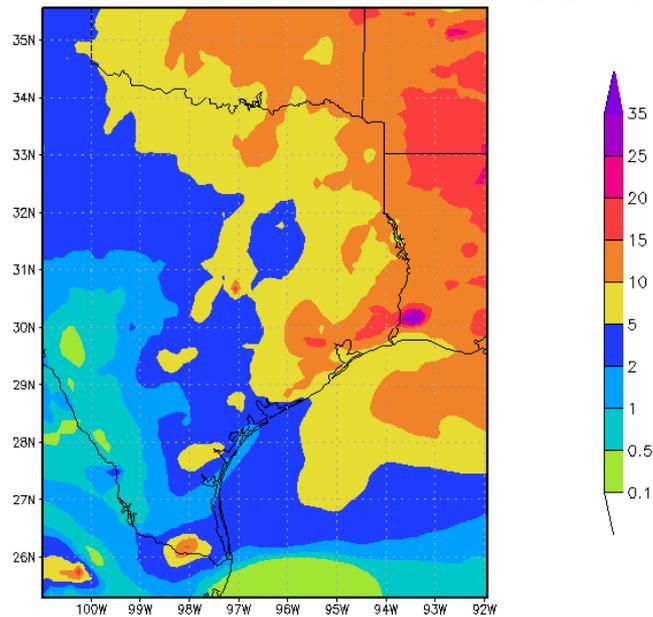
(dev) aot 37H VALID 19Z 09 SEP2013 [dimensionless]



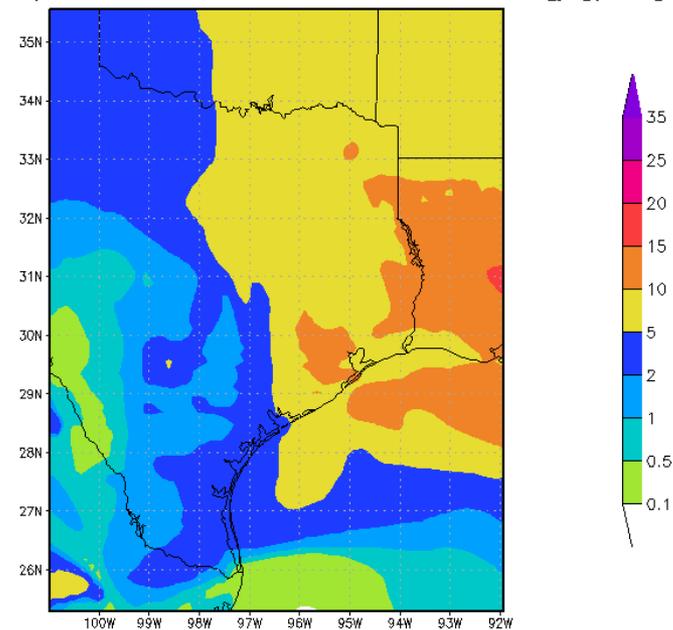
(dev) aot 40H VALID 22Z 09 SEP2013 [dimensionless]



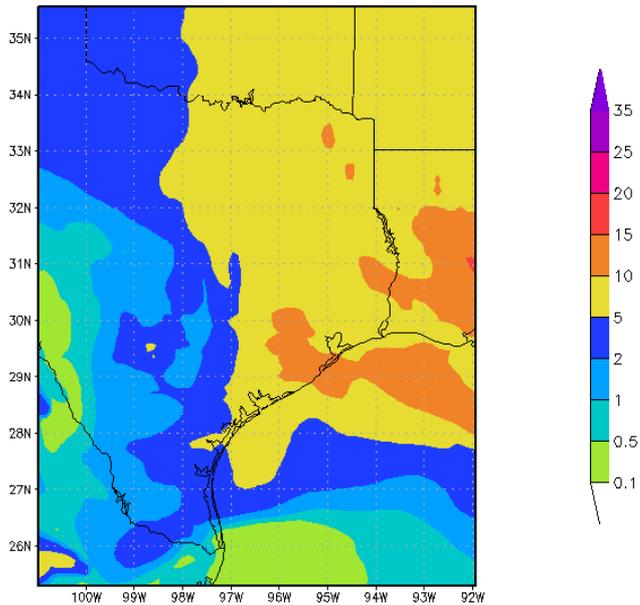
(dev) sfc pm25 32H VALID 14Z 09 SEP2013 [$\mu\text{g}/\text{m}^3$]



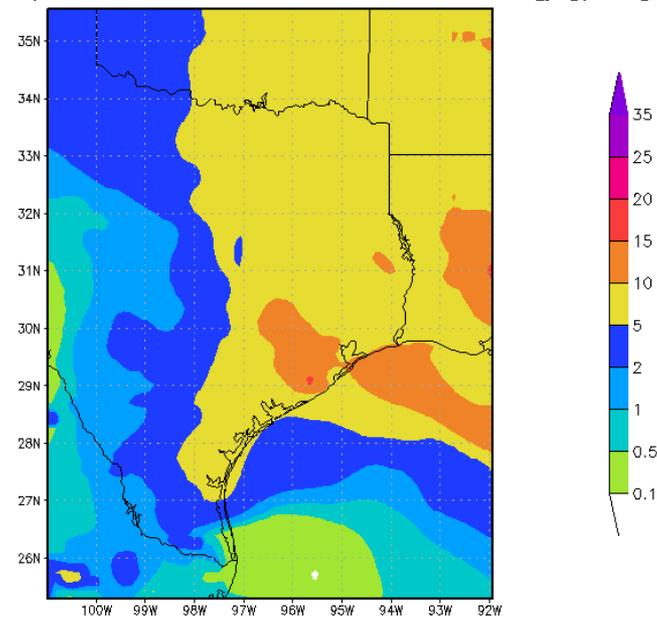
(dev) sfc pm25 35H VALID 17Z 09 SEP2013 [$\mu\text{g}/\text{m}^3$]



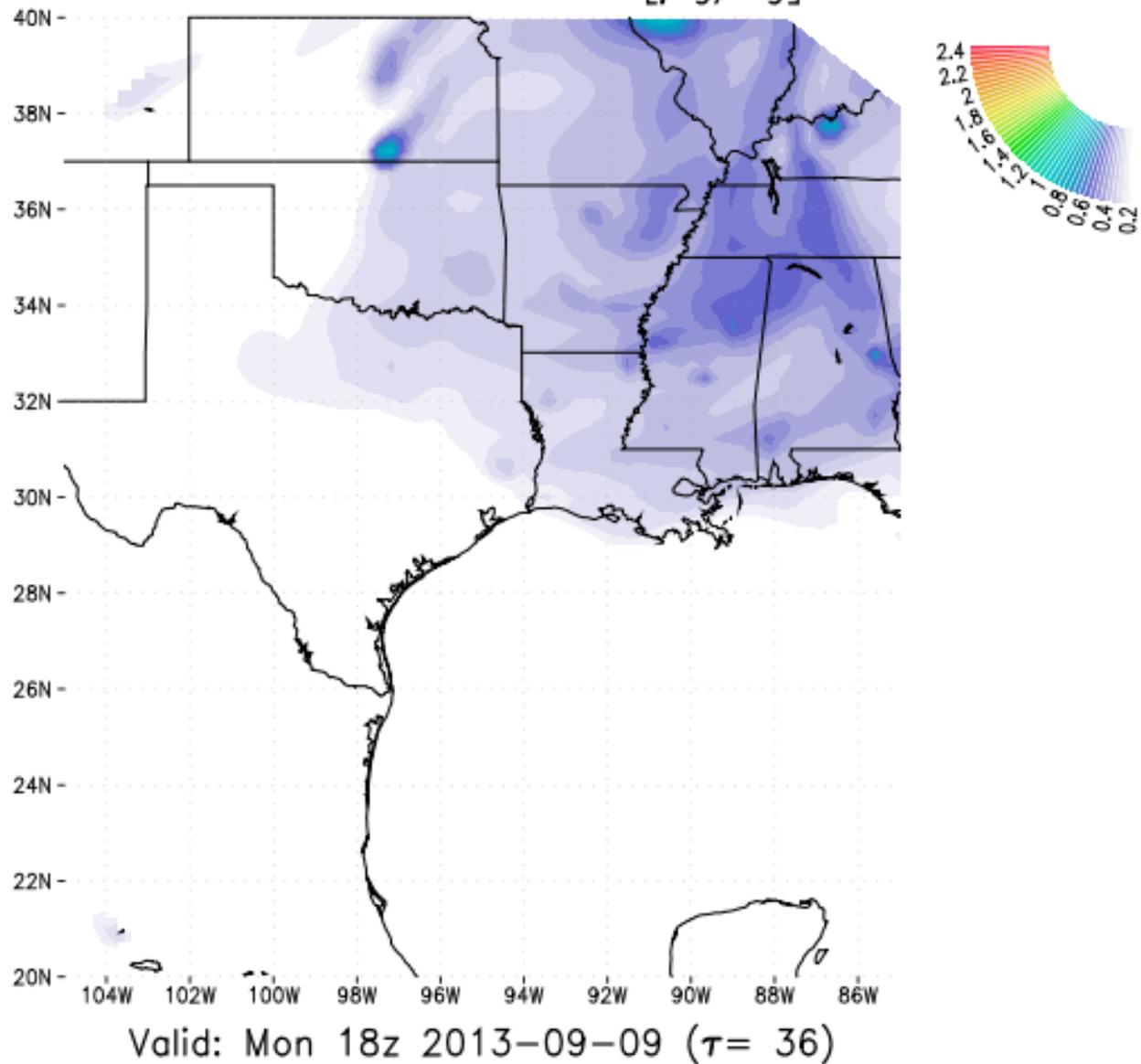
(dev) sfc pm25 37H VALID 19Z 09 SEP2013 [$\mu\text{g}/\text{m}^3$]



(dev) sfc pm25 40H VALID 22Z 09 SEP2013 [$\mu\text{g}/\text{m}^3$]

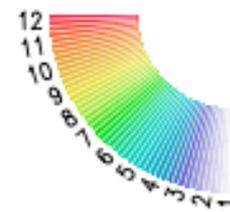
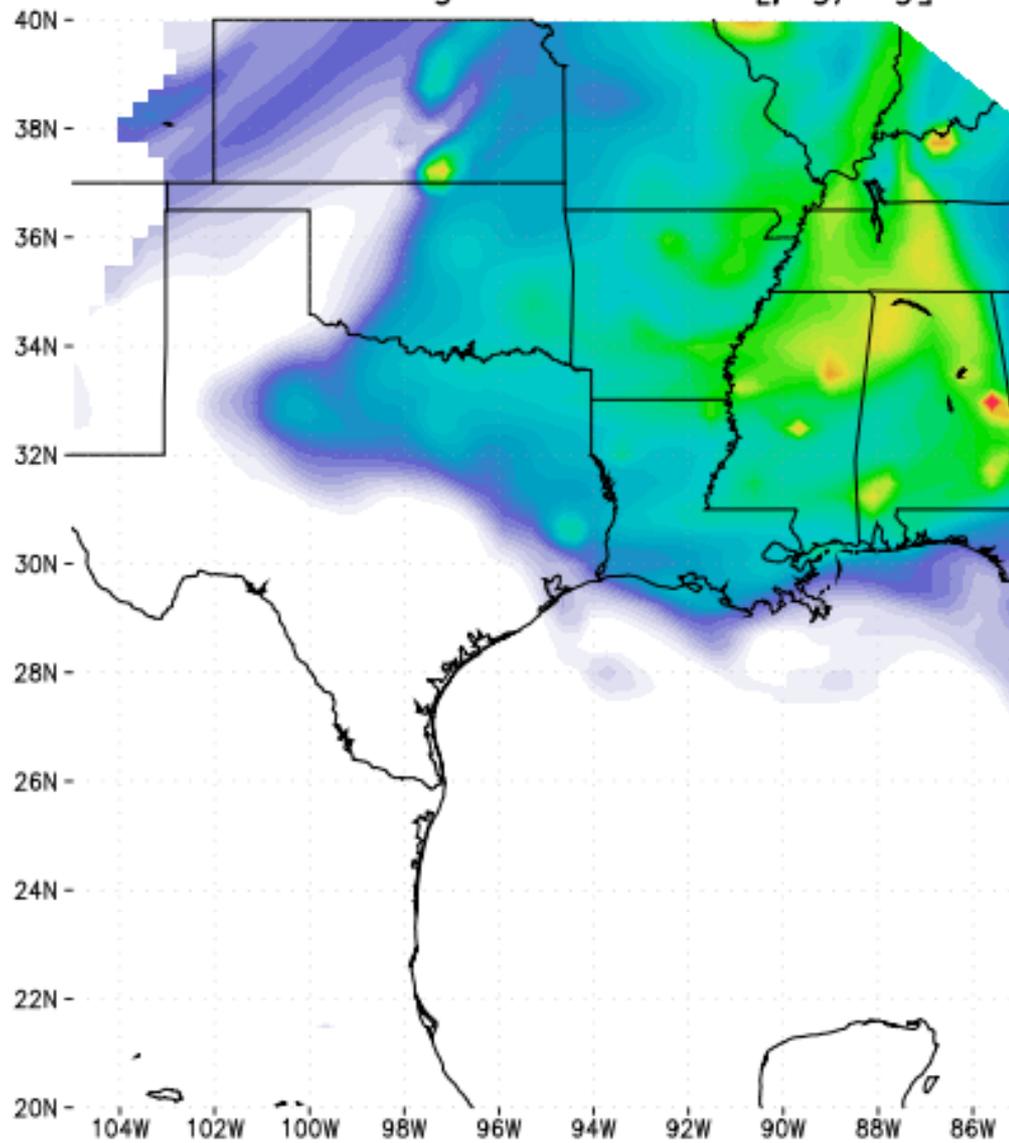


NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-08
850 hPa Black Carbon [$\mu\text{g}/\text{kg}$]



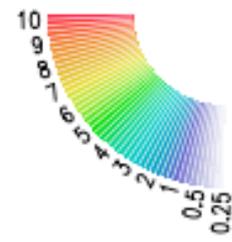
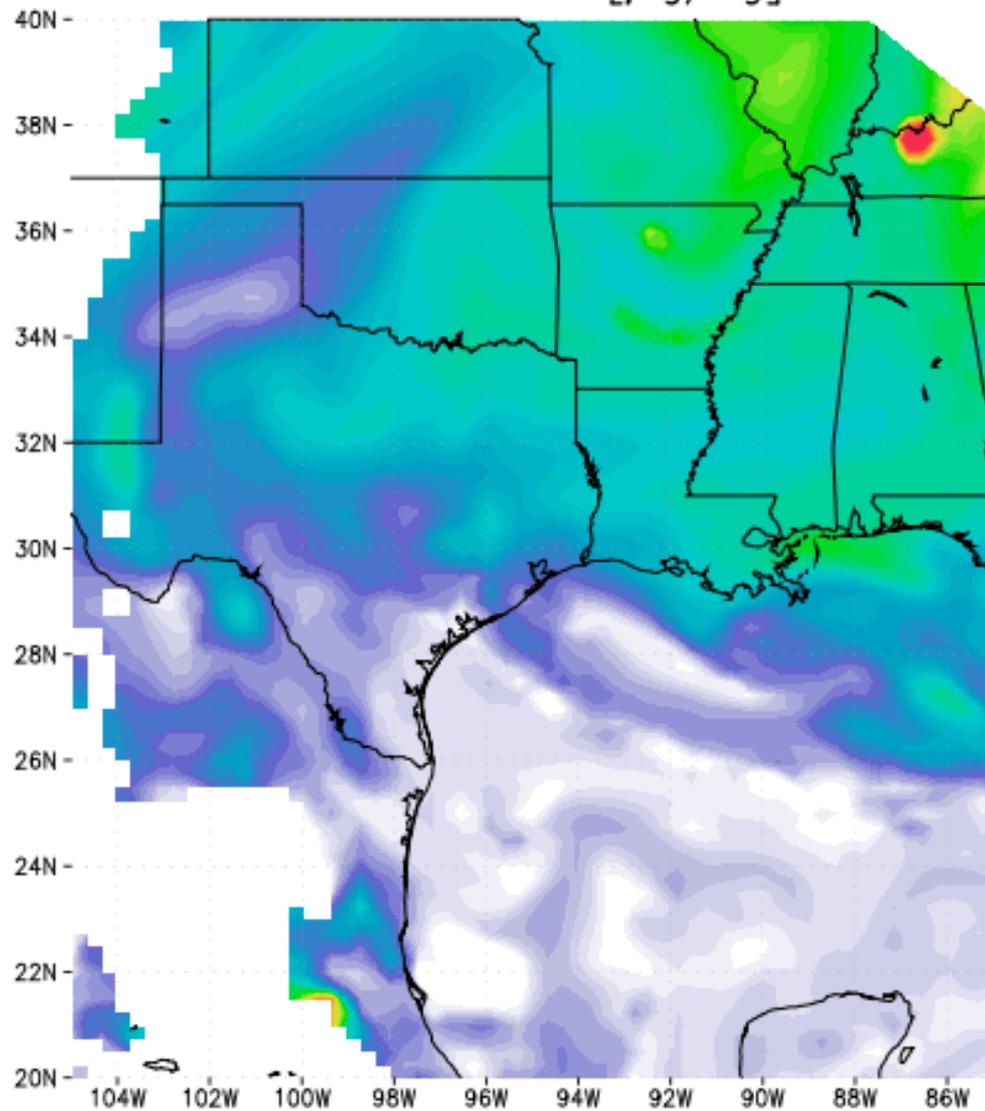
NASA/GMAO – GEOS-5 Forecast Initialized on 06z 2013-09-08

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

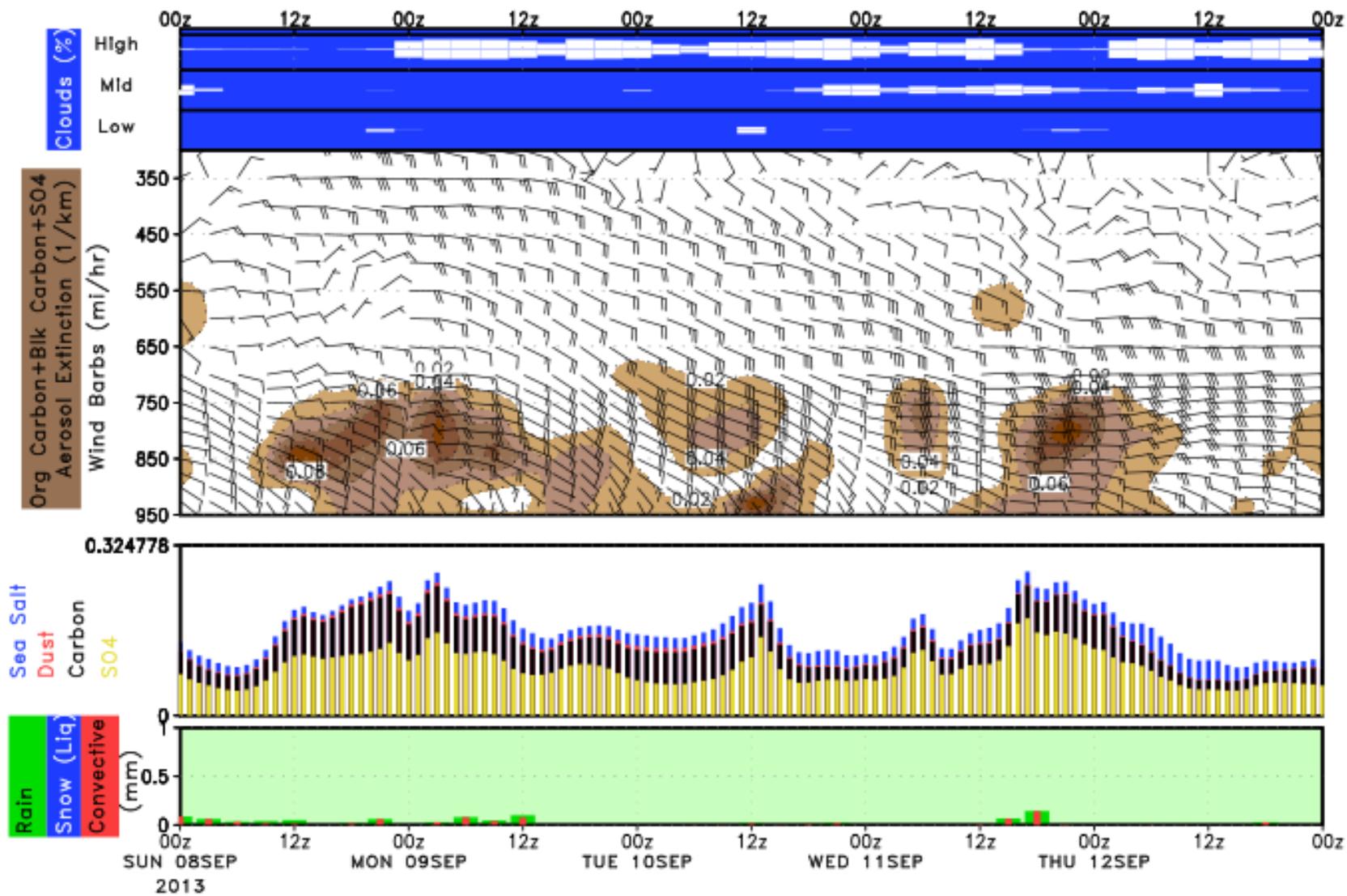


Valid: Mon 18z 2013-09-09 ($\tau = 36$)

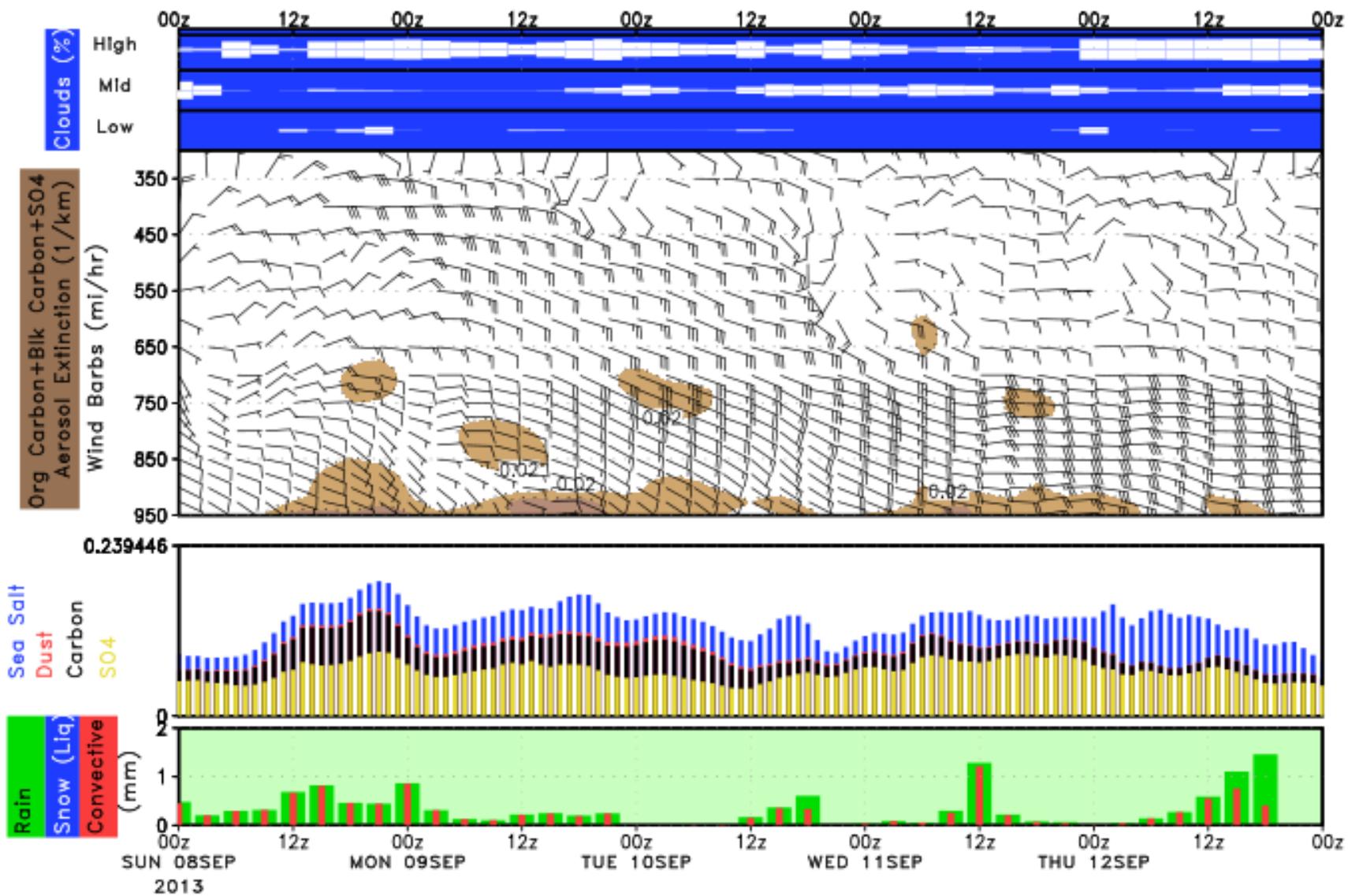
NASA/GMAO - GEOS-5 Forecast Initialized on 06z 2013-09-08
850 hPa S04 [$\mu\text{g}/\text{kg}$]



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



LAT = 30.3 , LON = -95.4, Location = Conroe, Fcst_init = 20130908



LAT = 29.2 , LON = -94.8, Location = Galveston, Fcst_init = 20130908