DISCOVER-AQ OUTLOOK -- September 26, 2013

Electrical issues delayed takeoff of the P-3B until after 11:30am today. However, two full circuits and an additional excursion to NW Harris Co. and Conroe were completed. Ozone rose highest N and NW of Houston as expected under S-SE winds w/ Jones Forest peaking at 101 ppbv 1-hr avg. The TCEQ forecast for today was Code Orange N-NW of Houston for ozone and Code Yellow PM$_{2.5}$.

Tomorrow (Friday) DISCOVER-AQ will fly what looks like its last full science flight of the campaign. Gulf moisture will begin to overspread the region, with more widespread cumulus cloud coverage expected. These clouds are not likely to affect any profiling, however. The sustained SE wind from the Gulf will bring in lower background pollution, thus TCEQ expects Code Yellow for ozone and Code Green for PM$_{2.5}$.

Saturday does not appear to be conducive to flying. Moisture will continue to stream from the Gulf, increasing cloud cover to a more broken or possibly overcast deck at times with afternoon rain showers expected as a cold front approaches from the NW.

Sunday will not be a good day to fly, either. The cold front will be draped through C. TX and shower and thunderstorm activity will increase through the day. Overcast skies are possible for much of the region. Sunday, though, may be a transit day, with the potential for investigating fire activity in the MS Valley. The forecast for that area is rainy and cloudy as well, and we will need to continue to monitor the likelihood for rain through the MS Valley to assess the ability to track fires there.
9/26/2013 Weather Briefing

Ryan Stauffer
Recommendations

• Friday: ** Likely Fly Day.** Large-scale flow from the Gulf will clean things out, but should be ok to fly with a cumulus field to watch develop during the day. Timing of return to deep Gulf moisture is slowing down though = good for later Friday

• Saturday: ** Likely NO Fly Day.** Cloud cover and some PM rain showers stream from Gulf with deep moisture flow ahead of cold front. *In case of emergency* Saturday can be put in our back pocket at this point

• Sunday: ** Likely NO Fly Day.** May be a transit day. Forecast looks unfavorable for fire sniffing with rain extending through MS valley all day. It will certainly not be good for a science flight here with widespread showers and t-storms
Yesterday at 17:40 CDT
Conroe:

- **THIS AFTERNOON**: Sunny
  - High: 95 °F
  - Low: 65 °F
- **TONIGHT**: Mostly Clear
  - 10%
- **FRIDAY**: Isolated Showers
  - High: 92 °F
  - Low: 73 °F
- **FRIDAY NIGHT**: Isolated Thunderstorms
  - High: 90 °F
  - Low: 74 °F
- **SATURDAY**: Chance Thunderstorms
  - High: 84 °F
  - Low: 67 °F
- **SATURDAY NIGHT**: Chance Thunderstorms
  - High: 85 °F
- **SUNDAY**: Chance Thunderstorms
  - High: 80 °F
  - Low: 77 °F
- **SUNDAY NIGHT**: Slight Chc Thunderstorms
  - 20%
- **MONDAY**: Sunny
  - High: 85 °F
  - Low: 72 °F

Houston Hobby:

- **THIS AFTERNOON**: Sunny
  - High: 93 °F
  - Low: 70 °F
- **TONIGHT**: Isolated Showers
  - 10%
- **FRIDAY**: Isolated Showers
  - High: 92 °F
  - Low: 76 °F
- **FRIDAY NIGHT**: Chance Thunderstorms
  - High: 89 °F
  - Low: 75 °F
- **SATURDAY**: Chance Thunderstorms
  - High: 84 °F
  - Low: 73 °F
- **SATURDAY NIGHT**: Chance Thunderstorms
  - 40%
- **SUNDAY**: Chance Thunderstorms
  - High: 83 °F
  - Low: 72 °F
- **SUNDAY NIGHT**: Chance Thunderstorms
  - 40%
- **MONDAY**: Sunny
  - High: 90 °F
  - Low: 72 °F

Galveston:

- **THIS AFTERNOON**: Sunny
  - High: 90 °F
  - Low: 78 °F
- **TONIGHT**: Isolated Showers
  - 10%
- **FRIDAY**: Isolated Showers
  - High: 87 °F
  - Low: 80 °F
- **FRIDAY NIGHT**: Chance Thunderstorms
  - High: 86 °F
  - Low: 80 °F
- **SATURDAY**: Chance Thunderstorms
  - High: 84 °F
  - Low: 77 °F
- **SATURDAY NIGHT**: Chance Thunderstorms
  - 40%
- **SUNDAY**: Chance Thunderstorms
  - High: 82 °F
  - Low: 77 °F
- **SUNDAY NIGHT**: Chance Thunderstorms
  - 40%
- **MONDAY**: Sunny
  - High: 82 °F
  - Low: 72 °F
Current Conditions

Conroe:
- Temperature: 88°F (31°C)
- Humidity: 48%
- Wind Speed: SE 6 mph
- Barometer: 29.92 in (1013.0 mb)
- Dewpoint: 69°F (19°C)
- Visibility: 10.00 mi
- Heat Index: 90°F (32°C)
- Last Update: 25 Sep 11:53 am CDT

Houston Hobby:
- Temperature: 88°F (31°C)
- Humidity: 43%
- Wind Speed: SE 10 mph
- Barometer: 29.91 in (1013.2 mb)
- Dewpoint: 63°F (17°C)
- Visibility: 10.00 mi
- Heat Index: 89°F (32°C)
- Last Update: 25 Sep 11:53 am CDT
Current Conditions

Galveston:

Far

85°F

29°C

Humidity 68%
Wind Speed SE 7 mph
Barometer 29.92 in (1013.1 mb)
Dewpoint 73°F (23°C)
Visibility 10.00 mi
Heat Index 92°F (33°C)

Last Update on 26 Sep 11:32 am CDT
Today: Another great day to fly. Started calm again but low pressure lifting north has turned winds to S-SE. A few PM cumulus expected with addition of some low level moisture.
Houston - 2013092612

Theta (K)

Altitude (km)

Mixing Ratio (ppbv) or 2*RH (%)
Tomorrow: Deeper Gulf moisture returns and will allow for a full cumulus field to develop under S-SE winds, may approach BKN around noon. Models have been slowing the frontal approach a bit, so at most an isolated shower is expected

12z Surface Forecast

1 PM CDT NAM
850mb RH
10 m winds 08-20 CDT Tomorrow

SE winds becoming stronger during the day will help usher in more moisture
Conroe
Today: Winds S-SE but clear skies
Tomorrow: Skies remain mostly clear, a bit stronger from the SE
Houston Hobby
Today: Clear and SE wind, dew pts creep up
Tomorrow: Winds stronger from SE, mostly clear
Galveston
Today: Clear
Tomorrow: Stronger SE winds again
Saturday: Deep Gulf moisture available and more widespread clouds and some afternoon showers expected. Doesn’t look as bad as previous days’ forecasts and in case of emergency and down day tomorrow, we may be able to get a couple circuits in prior to afternoon.

12z Surface Forecast

1 PM CDT NAM Precipitable Water
10 m winds 08-13 CDT Saturday

Front moving through western TX, noticeable in the wind shift. Winds here still from SE
Sunday: Cloud cover increases to BKN-OVC, widespread showers and storms line the cold front. Will keep an eye on the timing of the rain in MS valley for transit flight.
10 am Sunday, 6-hr previous precipitation. Sunday fire flight does not look good at this point
Conroe
Saturday: Steadily increasing clouds and shower threat
Sunday: Cloud cover and rain
Houston Hobby
Saturday: Steadily increasing clouds and shower threat
Sunday: Cloud cover and rain
Galveston
Saturday: Steadily increasing clouds and shower threat
Sunday: Cloud cover and rain, breezy
Tomorrow (Friday): GEOS-5 –

10 am

High Cloud Fraction

1 pm

Middle Cloud Fraction

4 pm

Low Cloud Fraction

7 pm

Low Cloud Fraction

High

Mid

Low
Saturday: GEOS-5 –

10 am

4 pm

7 pm

1 pm

High

Mid

Low
Sunday: GEOS-5 –

10 am

1 pm

4 pm

7 pm

High

Mid

Low
Summary

• Friday: Likely Fly Day. A bit cleaner and more widespread cumulus clouds may be a factor, but still a pretty good day to fly
• Saturday: Likely NO Fly Day. Cloud cover and some rain showers stream from Gulf with deep moisture flow ahead of cold front. *In case of emergency* Saturday can be put in our back pocket at this point
• Sunday: Likely NO Fly Day. May be a transit day. Forecast looks unfavorable for fire sniffing with rain extending through MS valley all day. It will certainly not be good for a science flight here with steady rain
DISCOVER-AQ Air Quality Outlook
September 26, 2013

Ken Pickering
Bryan Duncan
Hourly Ozone (airnowtech.org)**
September 2nd – 25th **EVERY 9th HOUR PLOTTED!!!!!

Hourly Ozone (ppb)

140
120
100
80
60
40
20
0

#1 #2 #3 #4 #5 #6 #7 #8

Houston Aldine C8/O3 - 44201/1 Hr/2
Houston Westhollow C410/O3 - 44201/1 Hr/1
Manvel Croix Park C84/O3 - 44201/1 Hr/1
Conroe Relocated C78/O3 - 44201/1 Hr/1
West Houston CS54/O3 - 44201/1 Hr/1
Galveston Airport C1034/O3 - 44201/1 Hr/1
Coastal Center C697/O3 - 44201/1 Hr/1
West Liberty C699/O3 - 44201/1 Hr/1
Clinton C403/O3 - 44201/1 Hr/3

Northwest Harris Co. C26/C110/C154/O3 - 44201/1 Hr/2
Houston Deer Park C35/O3 - 44201/1 Hr/1
Seabrook Friendship Park C45/O3 - 44201/1 Hr/1
Texas City C620/O3 - 44201/1 Hr/1
La Porte Sylvan Beach C556/O3 - 44201/1 Hr/1
Sugarland C696/O3 - 44201/1 Hr/1
Jones Forest C698/O3 - 44201/1 Hr/1
Channelview C15/O3 - 44201/1 Hr/3
Houston Texas Avenue C411/O3 - 44201/1 Hr/1 (Method: 047)
Hourly Ozone (airnowtech.org)

September 25th (Yesterday)

Highest ozone yesterday SE of Houston.

La Porte - Jones Forest ~ 90 ppbv
Hourly (8 Hr) Ozone (airnowtech.org)
September 25th (Yesterday)

1st time over 8-hour standard during mission.

La Porte - Jones Forest ~ 90 ppbv

Houston Aldine C8/O3 - 44201/1 Hr/2
Houston Westhollow C410/O3 - 44201/1 Hr/1
Manvel Croix Park C84/O3 - 44201/1 Hr/1
Conroe Relocated C78/O3 - 44201/1 Hr/1
West Houston C554/O3 - 44201/1 Hr/1
Galveston Airport C1034/O3 - 44201/1 Hr/1
Coastal Center C697/O3 - 44201/1 Hr/1
West Liberty C699/O3 - 44201/1 Hr/1
Clinton C403/O3 - 44201/1 Hr/3
Northwest Harris Co. C26/C110/C154/O3 - 44201/1 Hr/2
Houston Deer Park C35/O3 - 44201/1 Hr/1
Seabrook Friendship Park C45/O3 - 44201/1 Hr/1
Texas City C620/O3 - 44201/1 Hr/1
La Porte Sylvan Beach C556/O3 - 44201/1 Hr/1
Sugarland C696/O3 - 44201/1 Hr/1
Jones Forest C698/O3 - 44201/1 Hr/1
Channelview C15/O3 - 44201/1 Hr/3
Houston Texas Avenue C411/O3 - 44201/1 Hr/1 (Method: 047)
HNET

Ozone (ppbv)
TCEQ Air Quality Forecast:

Thursday:  Code Orange for Ozone – N and NW of city due to SE wind development during afternoon

Code Yellow for PM2.5 – some fire plumes may be passing over

Friday:  Code Yellow for Ozone -- N side of city with more flow off Gulf reducing background
Code Green for PM2.5
NOAA Experimental CMAQ Forecast for Today

3 PM

03 [ppb] at 1013 [hPa] Valid 20Z SEP 26 2013

5 PM

03 [ppb] at 1013 [hPa] Valid 22Z SEP 26 2013
TCEQ/Environ CAMx Forecast for today

Ozone
Best Case

Min(3,91) = 32.1, Max(100,41) = 101.8
Thu September 26 14:00 CST

5 PM
Ozone
Best Case

Min(9,95) = 31.4, Max(111,42) = 98.4
Thu September 26 16:00 CST

3 PM
NOAA Experim. CMAQ
CMAQ 20130927_14:00:00Z

CMAQ 20130927_17:00:00Z

CMAQ 20130927_19:00:00Z

CMAQ 20130927_22:00:00Z

Univ. of Houston
CMAQ
1.5 km
PBL Height
Texas 12km

Min(140,55) = 43.9, Max(31,36) = 3022.6

Fri September 27 16:00 CST
Hourly PM$_{2.5}$ (airnowtech.org)**

September 2$^{nd}$ – 25$^{th}$

**EVERY 9$^{th}$ HOUR PLOTTED!!!!!
Seabrook and Deer Park – will their data be made invalid as suggested by TCEQ?
Does DISCOVER-AQ data confirm these high values?
No obvious areas of high AOD.
Fires – some action in Texas now –

Need to keep an eye on this as GMAO forecast shows occasionally impacting Houston.
GEOS-5: 850 mb Biomass burning tracer for N. America

1pm Friday

850 mb Organic Carbon (ug/m3)
Fire pollution could periodically affect Houston boundary layer.