The P-3B did not fly today because of electrical problems. The King Air flew the morning flight, but was substantially hampered by clouds. A broken to sometimes overcast deck of cumulus formed during mid-morning and led to a weakening of ozone production compared with yesterday. The outlook was for not much improvement until late afternoon. Therefore, the King Air’s second flight of the day was cancelled.

The forecast question for Saturday, Sunday, and Monday is whether or not smoke plumes from fires can be sampled in the Mississippi Valley on the return to the East Coast. The cold front now well to our west will be approaching tomorrow, but cloud cover in the MS Valley (Arkansas, southern Missouri) will be less than 30%, allowing remote sensing of fire plumes. However, a rapid increase in cloudiness will occur on Sat. night as the front approaches and Sunday will be mostly overcast with rain in that region. New fires in that region are unlikely due to the rain, but some aged smoke may still remain in that area. The front will likely stall just east of our main area of interest and low clouds will still be likely on Monday as a weak low forms along the front over Louisiana/Mississippi.

The King Air will likely fly home on Saturday, but without viewing this hotbed of fire activity. The P-3B will likely transit home on Sunday, but the exact route, as it relates to fires, is yet to be determined.
9/27/2013 Weather Briefing

Ryan Stauffer
Ken Pickering
Recommendations

- **Saturday**: Plentiful fires are likely in the MS Valley ahead of the cold front that is approaching from the west. Cloud cover should be in the 20-30% range in that region. Airborne remote sensing possible.

- **Sunday**: Frontal system moves in early on Sunday to the MS Valley, accompanied by large increase in cloudiness and likely rain. Fires unlikely. Aged smoke possible.

- **Monday**: Frontal system stalls over and just E of area of interest, keeping significant cloudiness over the region and chance of showers. Fires unlikely due to wet vegetation.
Current Conditions

Conroe:

Houston Hobby:
Current Conditions

Galveston:

Plymouth State Weather Center

Meteogram for KGLS from 1600Z 26 SEP 13 to 1600Z 27 SEP 13

TEMP (°F)

WS
WS GT

CLD (ft)

PRES (mb)
Today: Low level moisture is streaming from the Gulf under SE winds. Cumulus deck was formed quickly and covers most of the area with BKN-OVC skies. May have to watch potential for some mid-afternoon clearing.

12z Surface Analysis

4 PM CDT NAM
850 mb RH
MS Valley Forecast: Saturday-Sunday-Monday

Sikeston, MO

Memphis, TN
### Sikeston:

<table>
<thead>
<tr>
<th></th>
<th>TODAY</th>
<th>TONIGHT</th>
<th>SATURDAY</th>
<th>SATURDAY NIGHT</th>
<th>SUNDAY</th>
<th>SUNDAY NIGHT</th>
<th>MONDAY</th>
<th>MONDAY NIGHT</th>
<th>TUESDAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weather</td>
<td>Sunny</td>
<td>Mostly Clear</td>
<td>Sunny</td>
<td>Chance Showers</td>
<td>Showers Likely</td>
<td>Storms</td>
<td>Showers Likely</td>
<td>Slight Chc</td>
<td>Partly Cloudy</td>
</tr>
<tr>
<td>High</td>
<td>84 °F</td>
<td>Low: 59 °F</td>
<td>High: 84 °F</td>
<td>Low: 64 °F</td>
<td>High: 76 °F</td>
<td>High: 80 °F</td>
<td>Low: 56 °F</td>
<td>High: 83 °F</td>
<td>Low: 59 °F</td>
</tr>
<tr>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Memphis:

<table>
<thead>
<tr>
<th></th>
<th>TODAY</th>
<th>TONIGHT</th>
<th>SATURDAY</th>
<th>SATURDAY NIGHT</th>
<th>SUNDAY</th>
<th>SUNDAY NIGHT</th>
<th>MONDAY</th>
<th>MONDAY NIGHT</th>
<th>TUESDAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weather</td>
<td>Sunny</td>
<td>Mostly Clear</td>
<td>Sunny</td>
<td>Slight Chc</td>
<td>Showers Likely</td>
<td>Thunderstorms</td>
<td>Chance Storms</td>
<td>Chance Storms</td>
<td>Slight Chc</td>
</tr>
<tr>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Tomorrow: Front approaches Houston area with thicker cloud cover and some showers. MS Valley will be mostly clear ahead of the frontal system and more removed from the flow of Gulf Moisture

12z Surface Forecast

1 PM CDT NAM
850mb RH
Sikeston
Today: Mostly clear, light ESE wind
Tomorrow: Wind shift to S and a few more clouds
Memphis

Today: SE wind and mostly clear skies
Tomorrow: Winds more SSW, maybe few more clouds
Sunday: Front draped across C. TX through the MS Valley, widespread showers and OVC conditions along the front. Expecting 0.5” + of rain in MS Valley

12z Surface Forecast

7 AM CDT NAM
Sfc Pressure/6-hr Precip
Monday: Front stalls and weak wave of low pressure forms along front bringing continued showers and cloudy conditions (sound familiar?)

12z Surface Forecast

1PM CDT NAM Scf Pressure/6-hr Precip
Sikeston
Sunday: Good chance of showers and t-storms, overcast
Monday: Front stalls a bit? Unsettled, clouds, few showers
Memphis
Sunday: Overcast with rain and t-storms
Monday: Clouds and showers hang around
Tomorrow (Saturday): GEOS-5 – BKN to OVC most of the day here, clearer MS Valley

10 am  Low
1 pm   Mid
4 pm  High
7 pm

Low
Mid
High
Sunday: GEOS-5 – Rain and often OVC both here and MS Valley

10 am

1 pm

4 pm

7 pm

Low

High

Mid

Low
Monday: GEOS-5 – Front hangs around, clouds still a problem

10 am

81 hr forecast valid Mon 15z 2013-09-30
Low Cloud Fraction

1 pm

84 hr forecast valid Mon 18z 2013-09-30
High Cloud Fraction

4 pm

87 hr forecast valid Mon 21z 2013-09-30
High Cloud Fraction

7 pm

90 hr forecast valid Tue 00z 2013-10-01
Low Cloud Fraction
Summary

- **Saturday**: Plentiful fires are likely in the MS Valley ahead of the cold front that is approaching from the west. Cloud cover should be in the 20-30% range in that region. Airborne remote sensing possible.
- **Sunday**: Frontal system moves in early on Sunday to the MS Valley, accompanied by large increase in cloudiness and likely rain. Fires unlikely. Aged smoke possible.
- **Monday**: Frontal system stalls over and just E of area of interest, keeping significant cloudiness over the region and chance of showers. Fires unlikely due to wet vegetation.
DISCOVER-AQ Air Quality Outlook
September 27, 2013

Ken Pickering
Bryan Duncan
Hourly Ozone (airnowtech.org) **

September 2\textsuperscript{nd} – 26\textsuperscript{th} ** EVERY 9\textsuperscript{th} HOUR PLOTTED!!!!!

Hourly Ozone (ppb)

- #1
- #2
- #3
- #4
- #5
- #6
- #7
- #8
- #9

Legend:
- 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)
Ozone levels stayed high overnight at many sites. Mechanical vertical mixing?
Lots of interesting heterogeneity! Background levels very high in some spots to begin day.
Houston Clean Air Network
http://houstoncleanairnetwork.com

Ozone

Yesterday @ 3:10 pm
Hourly (8 Hr) Ozone (airnowtech.org)
September 26th (Yesterday)

W. Liberty – clean continental air?

Hourly Ozone (ppb)
100
70
40
10
0

La Porte
Jones Forest
Conroe
Galveston

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)
Interestingly, highest ozone yesterday at Jones Forest (on tower & north of Houston) and lowest at West Liberty (northeast of Houston).

Wind direction the same at all stations though during day.

Wind speed very low at night.
TCEQ Air Quality Forecast:

Friday: Code **Yellow** for Ozone – cleaner background air coming off Gulf; less stagnant conditions

Code **Green** for PM2.5

Sat., Sun., Mon.: Code **Green** for Ozone and PM2.5
Hourly PM$_{2.5}$ (airnowtech.org)**

September 2$^{nd}$ – 26$^{th}$

** EVERY 9$^{th}$ HOUR PLOTTED!!!!!
Seabrook and Deer Park – will their data be made invalid as suggested by TCEQ? Conroe and Aldine high too though.
Fires – will the rain put them out for Sunday’s transit flight? If not, will it be too cloudy?
No obvious areas of high AOD despite fires.
GEOS-5 Forecast

Valid: Sat 18z 2013-09-28 (τ = 36)

Valid: Sun 18z 2013-09-29 (τ = 60)

Valid: Mon 18z 2013-09-30 (τ = 84)
SUMMARY

CMAQ and CAMx show max O3 today to the NW of Houston

Plentiful fires going in MS Valley today, especially Arkansas!

GEOS-5 model suggests organic carbon still remains in MS Valley on Sunday afternoon despite rain.