**Today:** The P-3B and King Air flew today in the Houston region. The intermittent clouds and afternoon pop-up showers, enhanced by the nearby stalled cold front, were challenging for observing the high AOD levels (e.g., 0.3-0.6) over the entire area. The high AOD was associated with agricultural fires in SE and SC US that was pushed southward by the front. Interestingly, observed surface PM$_{2.5}$ levels were relatively low - <25 ug/m$^3$, though the high AOD was observed to be throughout most of the lowest several kilometers of the atmosphere. Ozone levels were moderate as in the previous two days.

**Tomorrow’s:** Hard-down day.

**Monday & beyond:** Hurricane Ingrid in the Bay of Campeche may send tropical moisture toward the Houston area so clouds may be a concern.
9/14/2013 Weather Briefing

Clare Flynn
Ken Pickering
Current Conditions

Conroe:
- Temperature: 84°F (29°C)
- Humidity: 67%
- Wind Speed: Calm
- Barometer: 29.95 in (1013.9 mb)
- Dewpoint: 72°F (22°C)
- Visibility: 10.00 mi
- Heat Index: 90°F (32°C)
- Last Update on 14 Sep 10:53 am CDT

Houston Hobby:
- Temperature: 86°F (30°C)
- Humidity: 63%
- Wind Speed: E 7 mph
- Barometer: 29.92 in (1013.6 mb)
- Dewpoint: 72°F (22°C)
- Visibility: 10.00 mi
- Heat Index: 92°F (33°C)
- Last Update on 14 Sep 10:53 am CDT
Current Conditions

Galveston:

Partly Cloudy

87°F
31°C

Humidity: 70%
Wind Speed: E 13 mph
Barometer: 29.92 in (1013.1 mb)
Dewpoint: 76°F (24°C)
Visibility: 10.00 mi
Heat Index: 98°F (37°C)

Last Update on 14 Sep 11:52 am CDT
Today: Cold front moving slowly over the study region today. Eastern Texas under the influence of the upper level ridge, which should keep convection to a minimum. E/NE flow.

1 PM CDT
500 mb vorticity
Tomorrow: Easterly flow. Region under the influence of the upper level ridge. Cold front moves E. Upper ridge should prevent some of the moisture from Ingrid from reaching our area, but enough will reach us for clouds to thicken.

1 PM CDT
500 mb vorticity
10 m winds at 1 PM tomorrow

WRF 3-KM
Forecast: 36 h
Valid: 18 UTC Sun 15 Sep 13

100 W

90 W

CONTURS: UNITS-hPa LOW- 1004.0 HIGH- 1012.0 INTERVAL- 2.0000

Model Info: V3.3
No Cu
YSU PBL
Thompson
Noah LSM 3.0 km, 37 levels, 18 sec
LW: HRTM STY: Dudhia
DDF: simple KM: ED Simagor
Conroe
Today: Partly cloudy
Tomorrow: Partly cloudy
Houston Hobby
Today: Partly cloudy
Tomorrow: Partly cloudy
Galveston
Today: Partly cloudy
Tomorrow: Partly cloudy
Monday: Region remains in E/NE flow regime under influence from the upper level ridge. Subsidence should again prevent some moisture from Ingrid from reaching us, but precipitation chances are ~20-30%; thickening of the cloud deck at most levels during day.

1 PM CDT
500 mb vorticity
10 m winds at 1 PM Monday
Tuesday: Upper level ridge remains in place. Higher moisture over study region, allowing clouds to remain.

1 PM CDT
850 mb RH

500 mb vorticity
Conroe

Sunday: Mostly cloudy
Monday: Partly cloudy
Houston Hobby
Sunday: Partly cloudy
Monday: Partly cloudy
Galveston
Sunday: Partly cloudy
Monday: Partly cloudy
- Tomorrow: Low cloud and precipitation during afternoon
- Monday: Clouds and rain throughout the day
- Tuesday: High and low level clouds throughout the day
-Tomorrow: Low cloud during afternoon
-Monday: Thick clouds and precipitation during day
-Tuesday: High and low level clouds throughout the day
-Tomorrow: Scattered cloud throughout the day

-Monday: Thick cloud deck and some precipitation

-Tuesday: Scattered cloud throughout the day
Tomorrow: NAM – Cirrus all day

Integrated liquid and frozen hydrometeors (all levels)

10 AM CDT

4 PM CDT

1 PM CDT

7 PM CDT
Tomorrow: GFS – Cloudy all day

10 AM CDT

4 PM CDT

1 PM CDT

7 PM CDT
Tomorrow: Canadian – Cloudy all day
Tomorrow: GEOS-5 – High clouds all day, some low clouds by afternoon

10 am

1 pm

4 pm

7 pm
Monday: NAM – high level clouds through most of day

Integrated liquid and frozen hydrometeors (all levels)

10 AM CDT

1 PM CDT

4 PM CDT

7 PM CDT
Monday: GFS – Clouds throughout the day
Monday: GEOS-5 – high level clouds throughout the day

10 am

10 am: High cloud fraction

High level clouds expected throughout the day at 10 am.

1 pm

1 pm: High cloud fraction

High level clouds expected throughout the day at 1 pm.

4 pm

4 pm: High cloud fraction

High level clouds expected throughout the day at 4 pm.

7 pm

7 pm: High cloud fraction

High level clouds expected throughout the day at 7 pm.
Tuesday: NAM – high level and low level clouds

Integrated liquid and frozen hydrometeors (all levels)
75-hour forecast valid 1500 UTC Tue 17 Sep 2013

Integrated liquid and frozen hydrometeors (all levels)
81-hour forecast valid 2100 UTC Tue 17 Sep 2013

Integrated liquid and frozen hydrometeors (all levels)
78-hour forecast valid 1800 UTC Tue 17 Sep 2013

Integrated liquid and frozen hydrometeors (all levels)
88-hour forecast valid 0000 UTC Wed 18 Sep 2013
Tuesday: GEOS-5 – high clouds throughout the day

10 am  

1 pm  

4 pm  

7 pm  

High

Mid

Low
Recommendations

• Tomorrow: Down day

• Monday and Tuesday: No fly days. Thick cirrus deck over the study region; clouds at lower levels should also thicken throughout the day on both Monday and Tuesday. NWS forecaster predicts deep moisture column throughout the day on both days, though not enough for significant precipitation at this time.
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.
O$_3$ (ppbv) – 15 min avg
September 2nd – 13th

= 50 ppbv

Houston – Network of Environmental Towers (H-NET)
NE & E flow yesterday
Sugarland-West Liberty ~ 35-40 ppbv

HNET

Ozone (ppbv)

CO (ppbv)

Scale set by Coastal Center – see next slide.
CO (ppbv) – 15 min avg
September 2nd – 13th

= 200 ppbv

Houston – Network of Environmental Towers (H-NET)

Huh?

Sugar Land

Moody Tower

West Liberty

Coastal Center
Hourly Ozone (airnowtech.org)**
September 2\(^{nd}\) – 13\(^{th}\) ** EVERY 5\(^{th}\) HOUR PLOTTED!!!!!

Recent growth in “background” ozone seems to have leveled off (Galveston), but peaks increasing each day.
Models show peak outside of network. Next city to SW is Victoria, but ozone ~52 peak yesterday.
TCEQ AQ Forecast (Ozone)

**TODAY:**  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.
Hourly PM$_{2.5}$ (airnowtech.org)**

September 2$^\text{nd}$ – 13$^\text{th}$

** EVERY 5$^\text{th}$ HOUR PLOTTED!!!!!
Hourly PM$_{2.5}$ (airnowtech.org)

Thursday

11pm Wednesday – 11pm Thursday

Friday

11pm Thursday – 11pm Friday

Deer Park
Terra AOD - Yesterday

Aqua AOD - Yesterday

Agricultural fire plume
DRAGON: September 12th (Thursday) at Level 1.5

0.08-0.22
DRAGON: September 13th (Friday) at Level 1.5

0.19-0.34
DRAGON: September 14th (Today) at Level 1.5

0.35-0.61
GOES AOD – 9:45 am Today
LAT = 30.3, LON = -95.4, Location = Conroe, Fcst_init = 20130914