

## Highlights

- Weather Report - Mostly Cloudy with Rain
- DC-3/Lidar Update
- TexAQS Airforce - G-1 & Electra Fly North Today

## Inside

- Ground Intercomparison Update
- Trooper of the Day - Ken Rozacky
- Thoughts for the Day

# The Daily Plan-It

The TexAQS 2000  
Field Study Newsletter  
Issue 26  
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## Unsettled Weather Continues

### Weather Forecast

John Nielsen-Gammon provided today's weather forecast. Morning background ozone levels at Galveston Airport are 33 ppbv from 6 to 7 AM but substantially lower inland.

Even with yesterday's unsettled conditions, maximum surface levels of hourly ozone were substantially greater than the two previous days. Maximum levels occurred east-northeast of downtown Houston near the western portion of the ship channel - at North Wayside (104 ppbv) from 1 to 2 PM and Houston East and Clinton (100 ppbv) from noon to 1 PM. For the third consecutive day, no Houston area monitoring recorded a preliminary hourly average in excess of 120 ppbv. In the Houston area, the preliminary hourly maximum for Thursday was 72 ppbv and 57 ppbv on Friday.

Southerly flows will continue to bring moisture, clouds and a substantial chance of showers in the Houston area - the National Weather Service says 30% but

TexAQS 2000's own John Nielsen-Gammon says it should be more like 40-50%.

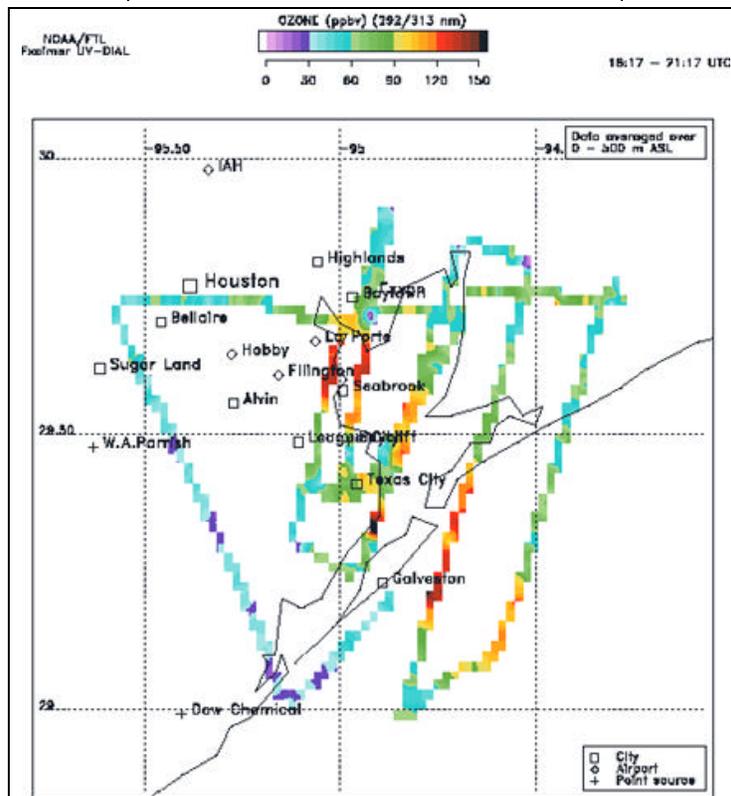
As for tomorrow, the probability of precipitation should decrease this evening and throughout Monday. However, the relatively high precipitable water content of the atmosphere makes isolated showers possible tomorrow, too. The winds

will remain from the south and should remain light. There is a reasonable expectation of a land breeze/sea breeze recirculation for Tuesday.

The next meteorology/aircraft planning briefing will be 7:30 AM tomorrow morning (Monday, August 11).

### DC-3/Lidar Report

On Wednesday, August 30<sup>th</sup>, the DC-3 flew a 6-hour mission in the afternoon and early evening over the Houston metro area and Galveston Bay. On that day, a flow reversal occurred. The Ellington wind profiler showed light offshore winds from the northwest in the morning followed by a few hours of stagnant conditions before the bay/sea breeze developed around mid-afternoon resulting in a southeasterly flow. During the early part of the flight the lidar on the DC-3 detected patches of high ozone concentrations over Galveston Bay and the Gulf southeast of Galveston Island (see **Figure 1**). These 'ozone puddles' were confined to the lowest 500



**Figure 1. Ozone concentration along the DC-3 flight track averaged vertically between the surface and 500 m above ground for the first 3 hours of the flight.**

meters of the atmosphere. Ozone values ranged from 90 to 120 ppbv compared to regional background values of 50 to 60 ppbv. Given the northwesterly surface flow in the morning, these patches of high ozone suggest transport of emissions from the ship channel and Texas City areas out over Galveston Bay and the Gulf. When the bay/sea breeze developed these patches of pollution were likely transported back towards the Houston metro/ship channel area adding to the pollution that had formed during mid-day.

Towards the end of the flight the DC-3 flew several east-to-west transects over Galveston Bay and the Houston metro area with the southernmost flight leg near Texas City and the northernmost transect over the ship channel. This portion of the flight was designed to specifically look at the 3-dimensional distribution of ozone and aerosol near the bay/sea breeze front. **Figure 2** shows the ozone cross section along an east-to-west flight leg a few kilometers south of Ellington Field. The ozone cross section extends from the surface to about 2500 m above ground and is approximately 50 km long. Peak ozone values in the pollution bubble approach 200 ppbv. Over Galveston Bay high ozone values are only found in the lowest few hundred meters while over land this ozone "bubble" extends up to 1500 m above ground at its eastern edge and up to 2000 m at its western edge. Also noteworthy is the sharp gradient at the eastern edge of the ozone bubble (changing about 100 ppbv over a few kilometers) while the transition to cleaner air is more gradual at the western edge. Data from the transects flown over LaPorte

and ship channel areas show a similar distribution of ozone, but the concentrations are even higher with

## Electra N308D

Yesterday, the Electra did not conduct a research flight but did participate in the ground intercomparison.

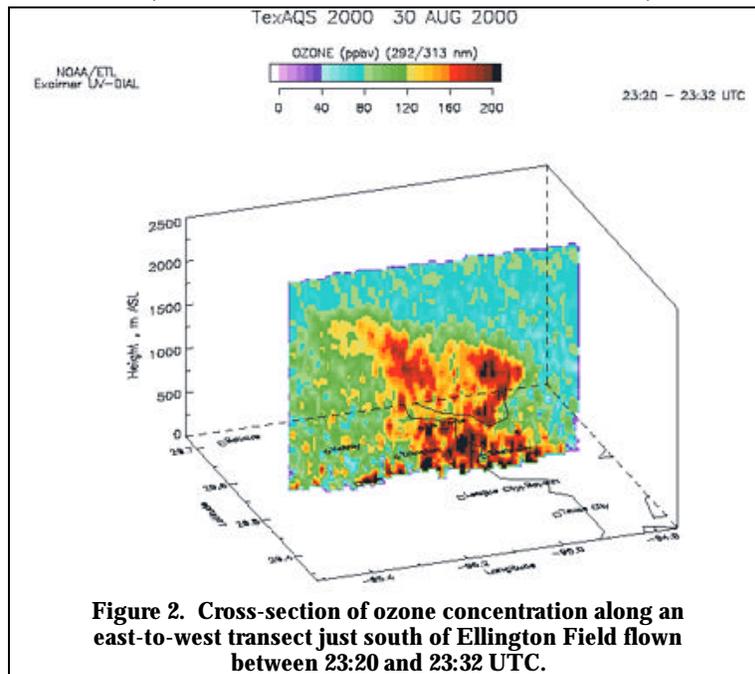
Today, the Electra will conduct a power plant plume characterization study flight between Dallas/Fort Worth and Austin. With an estimated takeoff of 11 AM, the Electra will fly to the Austin area and begin a series of parallel east-to-west oriented transects upwind (south), over and downwind (north) of several power plants. The Electra will fly at a nominal altitude of 1500 to 2000 feet msl with brief calibrations to 10 to 12k feet and excursions to probe the height of boundary layer. A total flight time of approximately 6 hours is anticipated with a return to Ellington at 5 PM.

There is a potential for an Electra flight tomorrow but, as of this writing, no specific plans have been made.

## G-1 N701BN

The G-1 did not fly yesterday but, rather, participated in the ground intercomparison study.

The G-1 will fly north of the Houston area to study emissions from the Alcoa aluminum plant northwest of College Station. The G-1 will takeoff from Ellington at 1 PM CDT. Following a flight to the Alcoa plant area, the G-1 will fly a series of parallel east-to-west oriented transects upwind (south), over and downwind (north) of the plant. Per usual, the G-1 will fly at a nominal altitude of 1500 to 2000 feet msl with brief excursions to probe the height of boundary layer. A total flight



**Figure 2. Cross-section of ozone concentration along an east-to-west transect just south of Ellington Field flown between 23:20 and 23:32 UTC.**

peak values in excess of 200 ppbv. This is in agreement with surface measurements at LaPorte where short-term ozone concentrations of more than 210 ppbv were recorded.

## Ground Intercomparison

The Electra/G-1 intercomparison meeting on Friday evening at 5:30 PM suggested that - since the *in situ* measurement aircraft (Electra, G-1, and Twin Otter) were not flying on Saturday - that we could benefit from the exchange of standards.

According to Ken Rozacky, each of these aircraft analyzed intercomparison standards for nitric oxide, nitrogen dioxide, ozone, sulfur dioxide, formaldehyde and carbon monoxide.

The results of these intercomparisons - along with earlier airborne intercomparisons and "missed approaches" over LaPorte - will allow the TexAQS aircraft to better understand the underlying data quality (precision and accuracy) and, thereby, better qualify their results and conclusions.

time of 3 hours is anticipated with a return to Ellington at 4 PM.

There is a potential for a G-1 flight tomorrow but, as of this writing, no specific plans have been made.

#### DC-3 N56KS

The DC-3 will not fly today but will be ready on Monday, weather permitting.

#### Twin Otter N153BU

Yesterday, the Twin Otter did not conduct a research flight but did participate in the ground intercomparison with the Electra and G-1.

The Twin Otter will not fly today but is available for a flight tomorrow if weather permits.

#### Trooper of the Day

TNRCC's Ken Rozacky bags the coveted Trooper of the Day Award today for his yeoman efforts during the ground intercomparison yesterday. We have all learned to rely on Ken and his compassionate and helpful ways. For all this, and more, we thank you, Ken



#### Upcoming Events

**End-of-study-barbeque** - Tomorrow (Monday, September 11<sup>th</sup>) from 5 to 10:30 PM at Nassau Bay City Park. Hot grills, plates, cups & utensils will be provided but you will need to bring your own food & drink. Spirits are permitted - assuming you're of legal age - but **no glass** is allowed in the park. Stop by the CapRock for directions.

**Computer Network Termination** - Monday, September 18<sup>th</sup>. The offices at LaPorte and Ellington Field will have internet and printing access through the 18<sup>th</sup>. After that, Cathy's packing it up and going home!

**Daily Meteorological and Aircraft Planning Meetings** - 7:30 AM and 1:00 PM (Ellington CapRock Building, Conference Room).

**Dr. Peter Daum** - Speaks at the University of Houston-Clear Lake at Noon on Wednesday, September 13<sup>th</sup>, in Room1438 of the Bayou Building.

**Aerosol Group Meeting** - 1:00 PM at the University of Houston-Clear Lake on Wednesday, September 13<sup>th</sup>, in Room1438 of the Bayou Building.

**LaPorte Team Meeting** - 2:00 PM at the University of Houston-Clear Lake on Wednesday, September 13<sup>th</sup>, in Room1438 of the Bayou Building.

#### Thoughts for the Day

"When I am working on a problem I never think about beauty. I only think about how to solve the problem. But when I have finished, if the solution is not beautiful, I know it is wrong."

-Buckminster Fuller

"I don't want to achieve immortality through my work; I want to achieve immortality through not dying."

-Woody Allen (1935-)

"Men and nations behave wisely once they have exhausted all the other alternatives."

-Abba Eban