Highlights

- Saturday G-1 flight successful and interesting.
- G-1 & Caribou to fly on Monday.
- Feeling special? How about specialty meetings?

Inside

- Looking for *ad hoc* journalists & reporters.
- A taste of Dickson, Tennessee?
- Sub Depot - Where the elite meet to eat.

The Daily Plan-it

The SOS Field Study Newsletter
Volume 1 • Issue 5
June 20, 1999

SOUTHERN OXIDANTS STUDY

News to use from around the SOS world!

G-1 Flight - Saturday, June 19

By Carl Berkowitz

Under the pilotship of "Awesome" Bob Hannigan, the DOE Gulfstream (G-1) aircraft made a two-hour flight around the Nashville metropolitan area Saturday afternoon (3 to 5PM, CDT). The flight objectives were to test the altitude sensitivity of instruments and to evaluate the composition of the Nashville urban plume. The circular pattern at 3 altitudes requested by scientists necessitated 'hands on' flying rather than use of the autopilot system by Bob and co-pilot Mike Warren. The PNNL pilots were up to the task, laying out consecutive circles centered on Nashville International Airport at 2000, 2700 and 3200 ft msl that looked to be drawn with a draftsman's compass.

A strong signal of the urban plume was detected north-northwest of the city (between clock points 10:00 and 12:00), fully consistent with the earlier plume forecasts issued by Dick McNider and Benjie Norris. The SOS meteorological team had forecast southerly flow associated with a large anticyclone over the eastern U.S., and these conditions did develop, along with scattered clouds associated with the influx of moisture from the south. Conditions became IFR at 6,000 ft msl, limiting the ceiling of two profiles made at the start and end of the mission.

Flight scientists reported relatively calm conditions at the post-flight debriefing, suggesting that Saturday's cloud cover stopped, or greatly reduced, afternoon mixing. Consistent with this idea was John Hubbe's observation that although the potential temperature was uniform at all altitudes (suggesting the remnant of an actively mixing layer), ozone was more discontinuous. John also commented that ozone seen while flying through the urban plume had well defined tails, looking Gaussian in shape. Downwind ozone was generally 10 to 15 ppb greater than upwind. A similar, though somewhat weaker pattern was noted by Stephen Springston in the NOy observations (downwind values of order _ to 1 ppb greater than upwind), and in nitric acid measurements made by Bob Plastridge. A first look at the PAN observations from both the API/Mass spectrometer, and an on-board GC, appeared to show a stronger signal downwind relative to upwind, although Chet Spicer and Daniela Zedda were still converting the volts to ppb Sunday morning.

Monday G-1 & Caribou Flight

The Department of Energy **Grumman Gulfstream G-1** and the National Oceanic & Atmospheric Administration **DeHavilland Caribou** are planning flights on Monday afternoon, June 21, 1999.

The G-1 team will be reducing and checking yesterday's flight data today (Sunday) and preparing for the second flight on Monday. The second flight will entail a series of cross-wind transects (perpendicular to flow) at two altitudes beginning upwind of Nashville, crossing over the Nashville urban core, and continuing downwind at 10 mile intervals. The scientific objectives of this flight are related to the interesting results obtained during the SOS '95 study showing that NO_X ($NO+NO_2$) reactivity may be much greater than previously thought, and is a follow-up to the work presented by Linda Nunnermacker and friends in her article published in the JGR issue dedicated to the SOS '95 campaign.

The objective of the June 21 (Monday) **Gulfstream G-1** flight is to sample downwind of Nashville at two altitudes. Very light winds from the east are forecast for this period. Because the winds are expected to be light, we may reduce transect intervals to 5 miles rather than the 10 mile intervals described below.

The G-1 proposes to depart from BNA between 2:00 and 3:00 PM CDT and proceed to about 15 miles upwind/due east of BNA. The G-1 will spiral down from 10000 ft MSL to the minimum safe altitude. Upon completing the spiral, the G-1 will make a 40 mile long transect 10 miles upwind of BNA along a north-south direction at 4000 ft MSL. It will then make a second transect at 4000 ft MSL 10 miles to the west (directly over downtown Nashville), a third transect 10 miles downwind (west) of Nashville, 20 miles, 30 miles and 40 miles downwind, followed by a downwind profile. The aircraft will then repeat the 40 mile downwind transect at an altitude of 1600 ft MSL, repeat the 30 mile downwind transect at this same

altitude, and continue working its way back until it is again 10 miles upwind of Nashville. A final spiral will be made 15 miles upwind of BNA after which the aircraft will return to BNA.

The **DeHavilland Caribou** will be arriving from Detroit in transit to Nashville's John Tune Airport in the late afternoon of Monday June 21st. The Caribou is scheduled to arrive in the Nashville area about 5:00 PM CDT. The Caribou proposes to fly a north to south transect over downtown Nashville at about 10000 ft MSL proceeding to a point southeast of Franklin TN. Maintaining altitude, it will then proceed to a point just southwest of the Lebanon airport and turn west for an east to west Transect over downtown Nashville to a point east of Charlotte TN before proceeding to John Tune Airport

Specialty Groups & Meetings

By Fred Fehsenfeld

For those who have visited the participant list on the SOS website, you have probably been impressed to find that there are over 150 participants in the 1999 Nashville study. This large group provides the scientific depth and breath required for a comprehensive investigation of the processes that control the formation and dissemination of ozone and fine particles in the atmosphere. However, the group is too large and diverse to meet together and effectively exchange ideas concerning the emerging findings. To help promote better exchange of new information, the Science Team has suggested that a series of specialty groups be identified. These groups would, presumably, be sufficiently focused and limited in scope that problems and findings of mutual interest could be identified and discussed in depth.

We have tentatively identified the following groups: (1) aircraft studies, (2) boundary layer dynamics, (3) VOC measurements, (4) reactive nitrogen measurements (NO, NO_2, PAN, organic nitrates, nitric acid, NO_y etc.), (5) odd-hydrogen (including H_2O_2) measurements, (6) aerosol measurements, (7) long path measurements (lidar and DOAS). Other groups may be constituted during the course of the study.

Several of the groups, identified above, were established in planning the study and have already defined an initial agenda for their part of the study. Clearly, the primary aim of these groups is to find (and find cures) for their measurement problems. However, the individuals in these groups are also immediately aware how the distribution of compounds they are measuring here in Nashville this year compare with similar results they have found at variety of locations around the world. These differences and similarities form a framework and perspective to begin to analyze and interpret the results from the Nashville 1999 Study. As the study proceeds, we expect that two or more of the groups will want to meet jointly to "compare notes".

Each of the groups has a leader that will be responsible for informing the members of group meetings and leading the discussions of that group. The group leader or designate will also serve as a member of the science team. We presume that these groups will report interesting observation that can be shared among all the participant of the study through the SOS website, in joint group gatherings, and by the science team members. We hope that this will serve to bring everyone who is participating in the study into a closer working relation to the goals of the study. We also expect that these groups and their leader will promote the reporting of the study findings at workshops, scientific conferences, and journal articles.

Desperately Seeking Stories!

Thanks to the many of you that have expressed an interest in the Daily Plan-It and its slightly scientifically sacrilegious & humorous stories. While we have many more stories to go, I'd like to impress upon you the need for throwing in your two-cents worth! What we need here is **real** human interest stuff.

I would really like a story on **"Cherokee" the Cornelia Fort dog**, for example. And restaurant reviews are always welcomed. Remember, we have a digital camera–well, Cathy Burgdorf has one anyway–so if you promise to take good care of it… Who knows what trouble you might get into.

A Taste of Dickson

Well, Steve Bertman volunteered to write a restaurant review for Dickson but as of press time it hadn't yet appeared. So, until further notice, my advice is avoid Dickson entirely. You might be able to scrounge a few morsels from Ken Olszyna's fridge, but he's very protective of his high-carbohydrate, barley and hop based beverages.

So today's restaurant review will look at one of my favorite haunts, the **Sub Depot**. It should be remembered that I don't eat here by choice so much as by *desperation*. It's close, inexpensive, and conveniently located (Elm Hill & Donelson Parkway near **Ruby Tuesday**) between the Gassaway Building and my hotel (Best Suites). The Sub Depot gets two out of five stars. The subs **are** pretty good, too, after all. I "heart"…ily recommend the 7" turkey sub with no cheese or mayo with extra onions, mushrooms, green peppers, and tomatoes. Combine that with a bag of Wow! Potato chips, pickle spear, and a Crystal Lite lemonade and you've really got something! Oh, how the mighty have been laid low!! ★★