Highlights

- Not so hot today , better tomorrow.
- SOS P-3 flies north to clear weather. Caribou stays put.
- SOS Air Force all up tomorrow.

Inside

- Friday's Science Team Meeting summary.
- Get your red hot T-shirts before they run out.
- Anything I can help you with. Leaving Nashville

The Daily Plan-it

The SOS Field Study Newsletter
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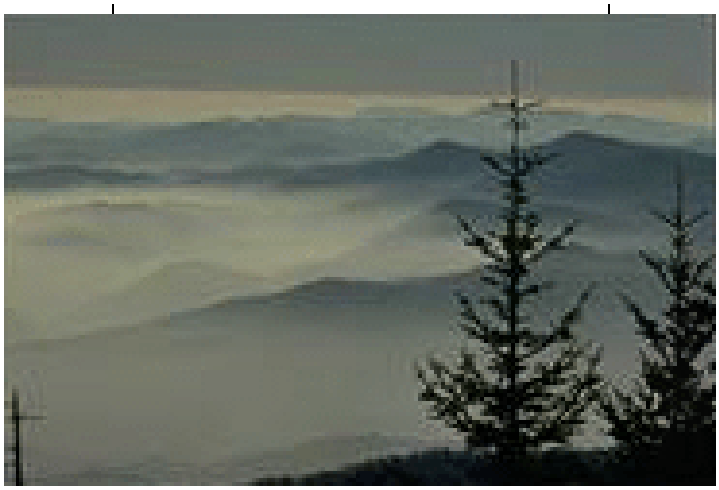
SOUTHERN OXIDANTS STUDY

Interesting items from around the SOS world

Not so hot!

Not so hot is a good way to describe today's weather in that it's cooler than its been in some time, it's raining which makes it not so hot for flying in the Nashville area today, and, after this cold front passes, it should be both cooler and dryer for the next several days.



Today's rain may should clear off later in the day–if the front keeps moving, that is. Yesterday, the highly esteemed **Norris-Coleman-Myers UAH Weather Team** believed there was a reasonable expectation of clearing on Sunday afternoon, but thought that the cold front may stall out over or just to the south of Nashville as the high pressure system slips off more to the east than southeast. If this happens, then all clearing bets are off today.

Nevertheless, things should be on the up-tick as the week wears on. The **Darby-McNider NOAA-ETL/UAH Weather Team** give their personal seal of approval to improving weather.

SOS Airforce Schedule

It is nicer to the north, so the **P-3** will conduct its "tour de power plants" today in Indiana and Kentucky. The **Caribou**, however, believing that discretion is the better part of valor, will stay put on this rainy Nashville Sunday afternoon.

The **WP-3D Orion** departed BNA today at 12:15 PM CDT for a 7-hour flight entailing a series of power plant characterization studies looking–potentially–at the emissions of the Clifty, Gibson, Paradise, Johnsonville and Cumberland power plant plumes. The targets of choice are the Gibson and Paradise plants with the others representing potential "fall back" options. Each characterization will entail a series of progressively longer crosswind transects downwind of these plants following one or two upwind transects to characterize background conditions.

Tomorrow's **P-3** flight plan calls for a detailed characterization of the TVA Cumberland and Johnsonville power plant plumes in coordination with both the **Caribou** and the **Bell 205**. The **P-3** will depart BNA at about 12:00 noon CDT and head west at 10000 ft AGL while performing initial instrument calibrations. Descending to 1500 ft AGL the **P-3** will fly progressively longer crosswind transects–separated by 15 km–upwind and downwind of the TVA Cumberland steam plant extending to the Tennessee-Alabama state line. At various times during this mission the P-3 will ascend to above the PBL. Depending on time remaining, the P-3 will repeat every other leg beginning at about 5:00 PM and returning to BNA at approximately 7:30 PM CDT.

Tomorrow's **Caribou** flight plan calls for a sequence of ever-enlarging crosswind transects following the TVA Cumberland and Johnsonville Power Plant plumes, at a separation of about 8 nautical miles (n mi.). Transect legs will vary from 30 to 50 n mi.. long with the first crosswind leg to be

flown ~4 n mi. upwind of the Cumberland plant. As always, precise pattern orientation will depend on wind direction. The anticipated 4-hour flight will begin at 1:00 PM LDT and conclude at 5:00 PM. Nominal altitude during the flight will be 10500 ft MSL.

The TVA **Bell 205** will be shuttling to Dickson Municipal Airport this evening. Although a flight is anticipated, no flight plan has yet been filed.

Science Team Summary

By Fred Fehsenfeld & Jim Meagher

A science team meeting was held Friday evening (July 9, 1999) at 8:00 PM. Representatives of the various aircraft discussed the missions that had been flown and the outlook for fights during the final week of the study. In addition, short presentations of some of the more interesting data that had been acquired in earlier flights were presented.

David Parrish described measurements of O_3, CO_2, and NO_Y that were collected on the July 4th P-3 flight. These fast response measurements illustrated several important features of the chemical evolution of the plumes with the CO_2 being used as a semi-conservative tracer.

Next Paul Goldan described measurements of isoprene and the oxidation products of isoprene, methyl vinyl ketone and methacroline. Of particular interest was the persistence of reasonably large concentrations of isoprene observed during this flight after dark. Presumably this isoprene would be transported elsewhere and be available to help fuel the photochemistry the following day.

Next, Roger Tanner and Bob Imhoff presented the data reduction protocol used to reduce the measurements made on the helicopter and some interesting observations that were made on July 8.

The aircraft presentations were concluded by a presentation of measurements that were made on the ETL Caribou on July 8. In the course of flying a series of grid patterns over Nashville, the lidar aboard the Caribou detected elevated levels (>120 ppbv) during the flight. The highest levels were seen over northwestern Nashville. In the discussion period that followed, it was also noted that O_3 levels in excess of 120 ppbv averaged over a one hour period were also observed during that day at the SOS sampling site on the Polk Building.

In addition to the presentations of the aircraft results, short presentations were also made by Eric Williams and Tilden Myers. Eric presented O_3, SO_2, NO and NO_2 measurements made over an eight day period at Cornelia Fort. The data showed the progressive buildup of O_3, during the high-pressure period that dominated the meteorology in this region in early July. In addition, Eric expanded the results to show a brief periods during July 6 and July 7 when the plumes from one of the power plants in the region was detected at the site. The July 6th event happened when the plume from the Cumberland plant passed over Nashville. The plume identification was suggested based on measurements made from the helicopter. The July 7th event began with a change in wind direction that brought the plume from the Gallatin plant over the site. This change in wind direction was accompanied by increased levels of O_3 and NO_2 with the telltale SO_2 tracer of the power plant plume.

Finally, Tilden briefly described the surface exchange measurements at the sites that had been set up by NOAA ARL. These measurements promise to greatly increase our ability to quantify biosphere-atmosphere exchange as a function of land-use in the study region during this period.

TVA Helicopter Returns

Two days in Muscle Shoals, Alabama–the Garden Spot of the mid-South–seemed to do the trick for the TVA **Bell 205** Helicopter. It's ready to come back to Dickson to participate in the final week of the SOS field study.

Based on tomorrow's flight plans, it appears that the helicopter will return to Dickson this evening to initiate the pre-flight warm up for a mission tomorrow.

SOS T-shirts going like hotcakes

There's been quite a run on Large-sized T-shirts, so if you are of that particular persuasion see Bill as soon as possible or you'll be stuck with a M or XL. All Bill needs are your name, e-mail address, and phone & FAX numbers.

Leaving Music City

"As the days dwindle down to a precious few…" With profound apologies to Kurt Weill's "September Song," each of us should be looking with mixed emotions to the end of the 1999 SOS Nashville Air Quality Study. Happy to be going home after a long and arduous six (or more) weeks but somewhat saddened as we will be leaving many new and old friends.

In any case, if there's anything that I can do to help you pack, ship, or clean, please give me a call. I'll be here at

least through Monday, July 19th, so please let me know if I can help.

Thoughts for the Day

"Not to perambulate the corridors in the hours of repose in the boots of ascension."

-Sign in Austrian ski hotel

"When passenger of foot heave in sight, tootle the horn. Trumpet him melodiously at first, but if he still obstacles your passage then tootle him with vigor."

-From a brochure of Tokyo car rental firm.