NOAA ARL Monthly Activity Report

July 2001

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Contents

Highlights

1. HIGHLIGHT – Canaan Valley. Meetings were held among ATDD staff concerning an upgrade to the Canaan Valley Air Quality Research and Monitoring Station to include a surface energy balance instrument suite and a relaxed eddy accumulation system. Further, modeling strategies using RAMS were discussed. Also, a presentation concerning the atmospheric deposition of pollutants to the Mid-Atlantic Highlands was given

to members of the University of Maryland Water Resource Leadership Initiative at Blackwater Falls State Park, WV. (vogel@atdd.noaa.gov, Meyers, Pendergrass, Herwehe, Hall)

2. HIGHLIGHT – Chemical Weather Forecasting. A project is running during the summer 2001 period to prototype and test the ability of existing numerical meteorological and air quality modeling systems to perform short-term (24-36 h) forecasts of daily maximum 1-h and 8-h ozone concentrations over the eastern United States. This prototyping project is in advance of NOAA's plans for developing an operational system for chemical weather forecasting later in the decade. Two systems are being run this summer. At NOAA's Forecast Systems Laboratory (FSL), chemistry capability has been added online in the MM5 meteorological model. Forecasts are being made on a 27-km resolution grid over the eastern US. At MCNC/Environmental Programs, with support from NOAA/ARL and others, the MM5/SMOKE/MAQSIP-RT system runs separate, but loosely-coupled, meteorological, emissions, and air quality models. Forecasts are made on a 45-km resolution eastern US grid, two 15-km, and at least two 5-km resolution nested grids over focus areas of interest. Target areas for ozone forecasts this summer will be Houston, TX and Charlotte, NC metro areas, Boston-New Hampshire corridor, and east Tennessee (ETOS area). Development of a model evaluation protocol for chemical weather forecasts, and evaluation of the forecast skill of these modeling systems will be performed by ARL/RTP over the next year. It is anticipated that additional forecasting exercises will be conducted using these and possibly other systems in FY-2002. (Ken Schere, 919 541 3795)

Silver Spring

3. AIRMoN Program Update. Several changes have been made to the AIRMoN-wet deposition measurement program over the past few months. The Still Pond site in southeastern Delaware came on-line in May as scheduled and in conjunction with the commencement of ammonia deposition research in Delmarva watersheds. We continue to work with the State of Maryland Department of Natural Resources to establish an urban site near Fort Meade, Maryland. Additional discussions are underway to add stations near impacted regions in southeastern Pennsylvania, the Shenandoah Valley of Virginia, and in southeastern Virginia. (richard.artz@noaa.gov)

Yankee Environmental Systems has succeeded in winning support for their Phase II proposal to modernize aging precipitation chemistry collection equipment. If the project is successful, we will have a tested and operational collector in the field within the next two years. The project officially commences in September, 2001. (richard.artz@noaa.gov)

4. Diffusion Experiment DATEM Project. The "Data Archive of Tracer Experiments and Meteorology" (DATEM) is in its final stages. The scope of the project was to archive the data from all of the long-range tracer experiments that were conducted by ARL over the last 25 years in a common format, including the meteorological fields from the NCEP re-analysis. The emissions, air concentration measurements, meteorological data, and statistical analysis software would be made available on CD-ROM to the dispersion modeling community. Data from the Long-Range Experiment of 1974, the Oklahoma City PFT demonstration, ACURATE, CAPTEX., and ANATEX have been prepared. A statistical program, using conventional accepted model evaluation methods has been completed. The program evaluates scatter, bias, spatial structure, and cumulative distributions of the measurements and model predictions. A normalized ranking factor was developed to provide a single model performance evaluation point. A "beta" version will be distributed to a few groups at the end of the month for evaluation. (roland.draxler@noaa.gov and Nick Heffter)

5. Radiosonde Atmospheric Temperature Products for Assessing Climate (RATPAC). Work is in progress to evaluate "first differencing" as a technique for producing adjusted global and regional radiosonde temperature time series. We are currently testing the first difference method on actual radiosonde data and on grid point data from the reanalysis project. Preliminary results indicate that use of this method may introduce random errors in trends whose size is in some cases significant in comparison with the trends themselves. Refinements in the technique which are now under investigation may mitigate these errors. The results of this work will be used to choose a method with which to construct an improved radiosonde temperature time series. (melissa.free@noaa.gov)

6. READY Updates. A new section of "Source Attribution Methods" has been added to the READY Air Quality section. It includes background information and links to two new products:

A) A Source/receptor matrix - the calculation is now performed with sources at every 1 degree over the eastern half of the United States using the HYSPLIT dispersion model and the current Eta meteorological forecast.

B) The HYSPLIT dispersion-trajectory model in "backwards" mode - In a 3D particle model the dispersion process is represented by a turbulent component added to the calculation and therefore it is computationally attractive because the advection process is fully reversible. The trajectory equation can be correctly integrated in either direction. However, the interpretation of the output is a bit more complex because dispersion is an irreversible process.

For further details on these two products see the Air Quality section of READY and the following links...
http://www.arl.noaa.gov/ready/attribute.html
http://www.arl.noaa.gov/ss/transport/matrix.html

Two additional options are now available to HYSPLIT trajectory users that allow them to enter, modify or replot their trajectories or flight paths.

A) User-entered trajectory - A user can enter a "trajectory" or flight path into a web-based form and READY will plot the trajectory or flight path on a map. In addition, by choosing a meteorological dataset that corresponds to the time of the user-entered trajectory, a user can display a cross-section of some three-dimensional meteorological (forecast or archived) fields along the trajectory or flight path.

B) Modify a trajectory - A user can "modify" a trajectory or flight path that has already been created by entering the job ID number that was assigned by READY when a trajectory was computed or when a flight path was entered by a user (see number A above). READY will then plot the user-modified trajectory or flight path on a map and they will have the option to plot a cross-section of several three-dimensional meteorological fields along the trajectory or flight path.

Boulder

7. SURFRAD. The ARL developed Total Sky Imager (TSI) was presented at a NOAA sponsored workshop in Seattle on the subject of long term climate observations. TSI is now employed at every SURFRAD station. A time-lapse movie of sky images and cloud fraction was shown. Because the TSI is so new and SURFRAD has been successfully operating them for only one year or less, some further field tests were recommended to assess the suitability of the TSI for long-term cloud fraction observations. One of the recommendations was a proposal by Gary Hodges of SRRB to run a comparison of the TSI with visual

observations made by Air Force weather observers located at military air bases. Initial contact has been made with Air Force weather officials; however, a TSI is needed. The Air Force has been considering eliminating visual observations of cloud cover and will be considering automated methods for such observations. (John DeLuisi, 303 497 6824)

Lightning strikes at Penn State on July 1, and at Table Mt., Fort Peck, and Desert Rock over the weekend on July 6-8, knocked out many pieces of equipment and instruments. All stations were back up by July 25.

After solving many compatibility problems with the clear-sky-identification (clear-id) program's application to SURFRAD data, we successfully ran that software on long-term SURFRAD data from late 1996 to the present. The processed clear-id data files were transferred SRRB's anonymous ftp site directory at ftp://ftp.srrb.noaa.gov/pub/clearid. The data will be downloaded to the EOS validation web site for general distribution. (John Augustine, 303 497 6415)

8. Baseline Surface Radiation Network (BSRN). SURFRAD data have been successfully submitted to the BSRN archive, for 1995, 1996, 1997, and 1998. Besides the radiometer data, the nearest soundings to Table Mountain and Bondville were also submitted with the data. Although we interpolate radiosonde-type soundings at 0000 and 1200 UTC from the national network data, the BSRN managers are reluctant to accept the interpolated soundings. They will only accept actual soundings that are within 100 km of the BSRN station. (John Augustine 303 4976415)

9. Atmospheric Modeling of Radiation Experiment (AMORE). The Central UV Calibration Facility (CUCF) closed out the SRRB's AMORE radiation measurement and modeling experiment with post calibrations of the participating spectroradiometers. The final calibrations were performed over a three day period during the last week of July and first week of August. The participating instruments and owners were:

Owner	Instrument	Permanent location
EPA	Brewer 101	Table Mtn-Boulder, CO
EPA	Brewer 146	Mountain Research Station-Niwot Ridge, CO
SUNY/CSU/USDA	U111	Table Mtn-Boulder, CO
Yankee/CSU	RSS 5101	Currently at Table Mtn
Smithsonian	UH	Table Mtn-Boulder, CO
New Zealand	UV5	David Skaggs Research Bldg-CO

Instruments other than those permanently located at the Table Mountain Test Facility that participated in AMORE were kindly donated by Kipp & Zonen and EKO Instruments. Both of these companies contributed two broadband instruments for the experiment. Kipp and Zonen contributed a broadband with an erythemal response function and one with a UV-A response. Whereas EKO donated broadband radiometers with an erythemal and UV-B response.

Another very interesting fact about two of the participating instruments is that the two Brewers were displaced latitudinally by approximately 25 miles, but were displaced vertically by 4000 feet. This should provide some interesting data for the radiation transfer community. (Kathy Lantz, 303 497 7280; Patrick Disterhoft, 303 497 6355)

10. Computer News. Chris Cornwall attended the 2nd annual OAR WebShop in Boulder July 30 - August 1, 2001. Around 50 web content providers, system administrators and scientists attended from many of the

OAR labs. Another WebShop will be held around this time next year. Anyone interested in attending or being a part of future discussions should contact Allison Soussi-Tanani at OAR HQ. Two other ARL personnel attended the meeting: Glenn Rolph from HQ and James Sanders from SORD. (Chris Cornwall,303-497-7316)

Oak Ridge

11. Urban Dispersion. Quality control is progressing on the spatial distributions of turbulence taken from the Long-EZ research airplane during the Salt Lake City experiment of October 2000. Radio-frequency interference during communications caused small, but evident, anomalies which must be individually treated because of the variety of their form. We have identified 25 October as a particularly interesting day for analysis because of the strength of the wind and turbulence in the southern end of the valley. (dobosy@atdd.noaa.gov, Dumas)

12. Climate Reference Network. July was a busy month for the CRN effort. Data acquisition programs were modified to allow operation of three independent solar radiation shields, and the third shield was installed at each site in North Carolina. Each shield has its own temperature sensor, and the data stream includes the fan tachometer output from each shield, to verify fan rotation speed is OK. The solar radiation sensor was relocated to the same boom as the anemometer, at a height of 1.5 m above ground, to facilitate weekly inspection and cleaning. The computer-controlled test procedure for the wind tunnel calibration of anemometers was completed. This should greatly facilitate anemometer calibration, as well as providing uniformly high data quality. Initial testing of the Apogee IR surface temperature sensors was performed using the liquid surface in one of the high-accuracy calibration baths as a surface of known temperature. A second bath was used as a heating/cooling source for the sensor body, to investigate the effect of the likely differences between the sensor body and surface temperatures. The calibration procedure for these IR sensors will be refined on the basis of this work. An enclosure was equipped with a Campbell 23X data logger, GOES transmitter, and antenna, and sent to John Augustine at ARL's Solar Radiation Research Branch in Boulder, for testing for radio interference at the Table Mountain site. A complete data logger enclosure and a complete battery enclosure were assembled to serve as guides for mass production. Templates for drilling and mounting the sub-assemblies were prepared, and the sub-assemblies were developed, with check-off lists for quality assurance. Nine new Kipp and Zonen (K&Z) silicon pyranometers were calibrated outdoors against three Eppley precision pyranometers, which are being used as the reference set for the CRN. Data were taken beginning July 31 and extending into August. From these data, calibration factors will be determined for the K&Z sensors. A Geonor precipitation gauge was received from NCAR, installed at ATDD's temporary test site, and used to fix a problem observed with the data at the two NC sites. The Geonor gauge at the Bondville IL site appears to be working; the data are being collected by the Illinois State Water Survey (ISWS). A second Geonor gauge was obtained by the ISWS from NCAR and added to the Bondville study; a data logger program to add the second gauge to our data logger at Bondville was written and sent to the ISWS. Precipitation gauge quotations were obtained from several manufacturers so that a procurement requisition could be prepared, and test reports on precipitation gauges were obtained and studied. A demonstration was provided to ATDD of a new siphon-controlled tipping bucket precipitation gauge that avoids many of the problems usually associated with tipping bucket gauges; this device might make a good secondary gauge for the CRN sites. Testing is planned. Components of all sizes and shapes continued to arrive from their vendors; we now have a considerable storage area in use at ORAU's Scarboro facility. (hosker@atdd.noaa.gov, Meyers, Hall, Black, French, Matt, Conger, Brewer, Ludwig, Auble, Shifflett)

13. Twin Otter Chesapeake Bay Study. During July 15-31, the NOAA Twin Otter flew eight flights in

support of the Chesapeake Bay Study partially funded by the Defense Threat Reduction Agency (DTRA). The flight tracks were along both the eastern and western shores of the lower Chesapeake Bay; flight levels were 200 ft AGL. The flights tracks along the western shore allowed for coordinated measurement with two of the surface energy flux stations (Pt Lookout, and Patuxent Naval Air Station). A third flux station was installed on the University of Virginia's new research tower east of Charlottesville, above a forest typical of the western portion of the study area. In addition, 20 soil moisture profile sites were installed east and west of the Bay. The aircraft was instrumented to measure the state variables , ozone , CO_2, and water vapor. In addition, the mobile flux platform was installed so that fast response measurements of temperature, pressure, ozone, CO_2 and water vapor could be recorded for calculation of heat, momentum and ozone fluxes. High-quality wind speeds and direction were also calculated. The data will be utilized in DTRA's current and future generation mesoscale wind field models, and to evaluate the importance of spatial variability of fluxes in the Chesapeake watershed. (mcmillen@atdd.noaa.gov, Gunter, Meyers, Brooks, Martins, Eckstein)

14. Dynamical/Photochemical Modeling. The recent high-resolution simulation still covers a 10 km × 10 km × 4 km domain (about 870,000 grid points) and employs the condensed isoprene photochemical mechanism (45 trace gases with 77 kinetic and 15 photolysis reactions). Meteorological and trace gas statistics were computed and plotted. Preliminary analysis of these results revealed that doubling the grid resolution produced a more realistic vertical velocity variance, smaller kinematic heat flux at the surface, and more extreme minimum/maximum values for most trace gas mixing ratios, along with larger mixing ratio gradients near the surface for species directly affected by either the emissions or dry deposition. (herwehe@atdd.noaa.gov)

Sunrise-to-sunset simulations with LESchem were run with a passive scalar emitted from the surface to test atmospheric dynamics over a larger portion of the diurnal cycle. Atmospheric conditions for the first simulation were quiescent with no mean wind, uniform surface heating, and soil moisture content increasing with depth from 0.4 at the surface to 0.6 at 0.5 m beneath the surface. The convective boundary layer (CBL), z_i, for this case was too deep for a forested region in south-central Tennessee in the summertime. A first attempt to correct for the deep CBL was to introduce a mean u-component wind of 5 m s^{-1} to try to redistribute the convective thermals throughout the grid domain. Results were unfavorable as the CBL continued to deepen to depths not observed in this region. The next parameter examined was the soil moisture content profile. By increasing the soil moisture content, leaving everything else the same as in the previous simulation, we expected more incoming radiation would be converted to latent heat through evaporation, thereby reducing the strength of the convective eddies and decreasing the CBL depth. Therefore, the moisture content in the four layers closest to the surface was increased by 50% from 0.4 to 0.6. This time the nocturnal boundary layer persisted well into the middle of the day and only a weak CBL developed as too much sensible heat was converted to latent heat from evaporation, inhibiting the development of convective eddies. The dynamics generated by RAMS Version 3b appear to be quite sensitive to the soil moisture content. (Decker, herwehe@atdd.noaa.gov)

15. East Tennessee Ozone Study (ETOS). Data collection flights have continued in July for the ETOS 2001 flight campaign. Two flights were made in July, with ozone data collected on July 3 and July 12, 2001. As in June of this year, ozone concentrations were fairly low compared to those found in previous airborne campaigns. An upward looking PAR sensor and a downward looking Ocean Optics spectrometer were added to the aircraft, and data were collected on July 12. Passes over downtown Knoxville, the UT agricultural farm, the Walker Branch tower, and several areas of pine beetle-devastated pine were made. The data are presently being analyzed. (dumas@atdd.noaa.gov, Martins, Pendergrass)

A briefing was provided for Dr. Ron Townsend, President of ORAU, and his staff. Dr. Townsend seemed quite excited about the ETOS program and its potential expansion to other locations along the southern and central Appalachian mountains, and expressed interest in assisting this effort. (pendergrass@atdd.noaa.gov, Hosker)

16. Extreme Turbulence Probe. Software to compute the three components of turbulent wind has been written for the Extreme Turbulence Sphere. Pressure and temperature data are used from a subset of the sensors, selected fifty times per second to align with the wind. The selection procedure was reported last month. The next step is to arrange the overall program to allow the winds to be calculated in real time. (dobosy@atdd.noaa.gov)

17. Coastal Dispersion. The hourly wind data during the tracer tests were manually written on data sheets for selected meteorological towers (out of a subset of 39 towers within the common dispersion grid at Cape Canaveral). The eight selected towers were those that measured the winds which influenced the ground-level tracer dispersion. (rao@atdd.noaa.gov)

Research Triangle Park

18. Ozone Damage to Plants. ASMD staff met with Dr. Howard Neufeld (Appalachian State University) and Dr. Alan Davison (University of Newcastle, UK) who are studying ozone damage to coneflower plants in the Great Smokey Mountains National Park. We discussed possible linkages between our work on modeling ozone deposition using the Multilayer Biochemical Model (MLBC) and their need to understand more about ozone and light profiles within the canopy. We visited two of their field sites, Clingman's Dome and Purchase, that have meteorological towers on site or nearby to examine the feasibility of using the tower data as input to MLBC. As part of the collaborative effort with Dr. Neufeld and Dr. Davison, we anticipate collecting a more extensive suite of meteorological observations next summer. (Donna Schwede and Peter Finkelstein, 919 541 3255)

19. Completion of a Reverse Gridding Utility for the Model-3 System. The spatial allocation of emission-related data to grid cells is computationally one of the most time-consuming aspects of processing emission data for air quality modeling. In the Models-3 air quality modeling framework, spatial allocation is accomplished with a Geographic Information System (GIS). Typically, when data are provided by political units, such as by state or county, the state and county identifier codes are removed as part of the "gridding" process. This is normally not a problem, because gridded emission and modeled air quality concentration data are evaluated on the basis of the grid cells. However until recently, it has not been impossible to "reverse allocate" the data to geographic units without the use of a GIS by skilled parties. To address this problem, a generic "reverse-gridding" utility has been created for the Models-3 system. The utility is written in Fortran and can be used either independently from or within the Models-3 system. The reverse gridding utility accepts gridded emission data in the format used by the Models-3 system, and produces either ASCII or NetCDF I/O API formatted files of emission data by state or county. This is accomplished by using the ASCII spatial surrogate files prepared as part of the emission data gridding. The reverse gridding utility may be extended for use with other geographic areas, such as hydrological units (drainage basins), which could aid multi-media modeling applications of nutrient deposition. After additional testing, the reverse gridding utility will be released in September 2001 as a patch to the Models-3 Version 4.1 release via the Models-3 web page (http://www.epa.gov/asmdnerl/models3/). (benjey.william@epa.gov)

Idaho Falls

20. CBLAST-Low. The Coupled Boundary Layer Air-Sea Transfer light wind (CBLAST-Low) pilot study is well underway off the south coast of Martha's Vineyard, Massachusetts. The LongEZ research aircraft has flown 11 missions (~ 26 hours) to date and flights will continue until August 8. The objective of CBLAST-Low is to examine air-sea transfer processes under very light wind (< 3 m s^{-1}) regimes. These processes are not well understood and are inadequately modeled.

So far, all sensors and electronics have worked exceptionally well. A number of significant improvements have been made since the last air-sea interaction study (the Shoaling Waves Experiment or SHOWEX) which was conducted on the Outer Banks of North Carolina in November 1999. Aircraft and ground station global positioning systems (GPS) have been upgraded from a single frequency to a dual frequency system. This allows greater precision in determining aircraft position. The new fast ultra sensitive temperature (FUST) probe has been incorporated into the turbulence sensor system. This sensor will be able to resolve very fast, small scale turbulent fluctuations. A new fast response (12 KHz) laser has replaced a slower (2 KHz) laser altimeter. This laser, in conjunction with two other 2-KHz lasers are used to determine sea surface wave properties (e.g., slope, phase, height) greater than 1 m in length. A fourth laser has been incorporated into the array at a 15 degree angle from the vertical. This so-called "glint" laser will be used to look at wave slopes when the ocean surface becomes smooth. (jerry.crescenti@noaa.gov, Jeff French, and Tim Crawford)

21. CBLAST-Hurricane. Work continues on the development of an instrument package that will be used to measure fluxes in the lowest levels of the atmosphere in hurricanes from NOAA's P3 aircraft. As part of a joint project, including 2 NOAA labs, NASA and 3 research institutes, we will install a system to measure three dimensional wind velocity, temperature, and water vapor. The P3 system is similar to that currently being used on the LongEZ. Assembly of the data acquisition system has already begun. Crucial hardware for mounting the BAT probe, GPS antennas and other instruments were shipped to AOC where aircraft engineers will begin modifications necessary to accommodate the new package. Installation of the hardware components is expected to be finished on one of the P3s this fall, with the second P3 being completed next spring. This should allow for ample time before flight testing during the 2002 hurricane season. (jeff.french@noaa.gov, Tim Crawford)

22. Tracer Studies, 2001. Post-processing of the data collected while in the field at Dugway Proving Ground, Utah, (DPG) in April has been completed. A total of 7 tests were conducted during the deployment. Each test consisted of a 4-hour release of SF_6 tracer into the mobile 70-ft tall Dugway stack, with a simultaneous real time sampling of the resultant SF_6 plume.

Plume sampling usually continued up to 4 hours after the release had ended. The plume was sampled with three mobile real-time sampling units that traversed the plume along established routes at increasing distances. When the sampler operator determined that the plume had been crossed, plume width, maximum concentration, and location of the maximum concentration were subsequently quantified and relayed for review by the FRD and AFTAC test controllers. An example analyzer output is shown.

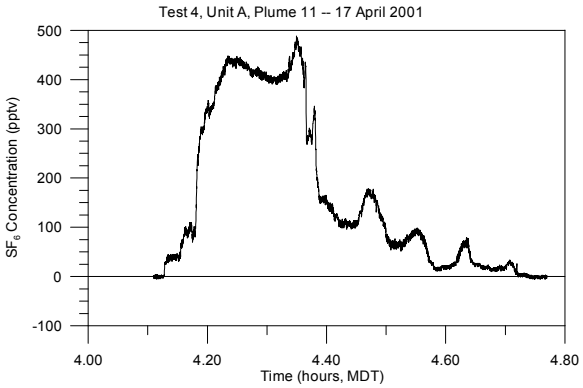

Figure 1. Trace of SF_6 for plume traverse number 11 during GAUNTLET Test 4, obtained by mobile real-time SF_6 Sampling Unit A.

A total of 247 sampling traverses were made by the three mobile units. Ninety-three of these traverses resulted in null passes where no SF_6 was detected. The remaining 154 traverses yielded measurable SF_6 plume concentrations. Sampling Unit A made a total of 116 traverses, Unit B made a total of 58 traverses, and Unit C made 73 total traverses in only 5 tests. Unit B made considerably less traverses that the other units because 1), the roads were much rougher, which required the SUV driver to travel slowly in order to maintain vehicle control, and 2) the route was not perpendicular to the average SF_6 plume, which resulted in longer travel distances. (kirk.clawson@noaa.gov, Roger Carter, Neil Hukari, Shane Beard and staff)

23. Tracer Technology. The new version of the Automated Tracer Gas Analysis System (ATGAS) has undergone initial testing this month. A test version of the software is operational, allowing all of the components to be operated and tested. We have verified that it can detect SF_6 at similar levels to the old system. The new system is about 70% smaller than the old system and should be about 30% faster once tuning is complete. It should be easier to use and offer more flexibility. The smaller size will make transporting of the analysis capability to field locations much easier and more cost effective. (roger.carter@noaa.gov, Debbie Lacroix, Shane Beard)

24. Hurricane Balloon. On July 10, 2001, a meeting was held in Jacksonville, Florida, to discuss safety issues concerning the flight of our hurricane balloon and the NASA Aerosonde in hurricanes. The meeting was held with the NASA Aerosonde group, Aerosonde Company personnel, NOAA AOML/HRD, NOAA AOC, the USAF 53rd Weather Reconnaissance Squadron (Hurricane Hunters), and NOAA ARL/FRD. Although not official yet, listed below are the items discussed in the meeting that are specific to the hurricane balloon that the AOC and the 53rd Weather Reconnaissance Squadron would require prior to the first balloon launch into a hurricane.

- A fail-safe termination valve on the balloon. If power, connection, communications, or the processor fail the balloon flight will terminate by releasing the lift gas. A normally open valve will need to be used. Some change in software and hardware will be needed.

- CARCAH will have final decision on starting and terminating any balloon flight and will be kept informed of balloon status at all times by a NOAA/UH person.

- A maximum altitude balloon termination. If the balloon exceeds a preset altitude, the lift gas release valve will open, terminating the balloon flight.

- Termination validation or statistics showing reliability of termination under processor failure, communications failure, maximum altitude exceeded, or operator commanded cut- down. The hurricane balloon needs to send back a message confirming balloon termination. This cannot be guaranteed because a processor failure or communication failure could possibly stop this. We are presently gathering data on the reliability of the communications.

- Reliability data of the balloon in a hurricane or other severe weather conditions.

We will not be sending balloons into hurricanes until we have convinced them that it is safe. (randy.johnson@noaa.gov, Roger Carter, Shane Beard)

25. CASES-99. Work has now started on completing the postprocessing of the LongEZ data collected during CASES-99. The first step was to recompute the differentially corrected aircraft position and velocity data using a program called flykin. The differential corrections were originally computed using another

program called c3nav, but flykin produces better results. For example, the aircraft vertical velocities contain some residual noise that increases the vertical velocity's standard deviation by about 8 cm/s. In flykin, the residual noise increases the standard deviation by only 1-2 cm/s. Keeping the noise to a minimum is particularly important for CASES-99, because the data were collected in the nighttime boundary layer when the turbulence is relatively light. (richard.eckman@noaa.gov)

26. Range Fires. It's that time of year again. A range fire occurred 36 miles west of Idaho Falls near Middle Butte on the southeastern corner of the INEEL. The blaze started about 2:30 p.m. on Sunday, July 8, 2001. Fortunately, the fire was contained to an area of about 120 acres. In response to this fire, the Emergency Operations Center (EOC) was activated. Jerry Crescenti and Brad Reese responded to the EOC activation and provided real-time meteorological support. The NOAA support team kept a close eye on a cluster of thunderstorms south of the INEEL which posed a threat to the fire because of strong outflow winds that would help spread the blaze. (jerry.crescenti@noaa.gov, Brad Reese)

27. INELVIZ Training. A training course for INELVIZ users was held on July 24. This course, on the use and operation of the INELVIZ system, is conducted periodically for new users and current users who would like a refresher course. Brad Reese discussed the use and operation of the system, Roger Carter talked about potential problems and how to deal with them, and Jerry Sagendorf presented a description of the model and how it works. (brad.reese@noaa.gov, Roger Carter)

Las Vegas

28. CIASTA – Mesoscale Modeling. NV-RAMS ran to completion and generated graphics 18 of 31 days (58%) in July. RAMS ran to completion on the University of Nevada-Las Vegas (UNLV) computer system 20 of 31 days (64%). Four lost days of graphics and two lost data days were due to computer failure at Special Operations and Research Division (SORD). Two lost data days were due to no initialization data from Headquarters (HQ) due to HQ computer difficulties. Two lost data days were presumed to be a result of congestion on the UNLV computer system not allowing RAMS to complete. Five lost data days were due to model set-up but primarily due to monsoonal moisture in the domain, causing the model microphysics to use more compute time than was allotted. Several adjustments were made to the input parameters to solve this problem. Currently, the solution has been to use the full microphysics package, initialize RAMS with the 03Z ETA data, run for 31 hours, and begin the data download and processing prior to 10 p.m. This last step, requiring only one processor, allows us to maximize the usage time of 12 processors at UNLV for actual RAMS run time after 10 p.m. Data are continuing to be renamed and saved daily, and backed up to CD weekly. (Walt Schalk, 702 295 1262)

29. Climatology Studies. A study of maximum temperatures in southern Nevada has been expanded to include all of the mandatory level raob data from the morning 12Z sounding. The parameters include Heights/Pressure(sfc level), Temperature, Dew Point, Wind Direction, Wind Speed, and Dew Point Depression. Linear least squares fits were done for all levels and parameters for each month utilizing the Maximum Temperatures from the Well 5B location in Frenchman Flat. The merged radiosonde and maximum temperature data cover an 11-year period. Tables of mean absolute errors were constructed for all levels, parameters, and months to help delineate the most prominent parameters. Initial tests show that using the single best fitting parameter for each month to make maximum temperature predictions gives about as good results as trying to use multiple parameters for the predictions. This technique will be tried for other locations on the NTS in the future to help determine if using the morning sounding for maximum temperature predictions is a significant help for the Forecaster. (Doug Soule', 702 295 1266)