



NOAA ARL Monthly Activity Report



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Highlights

1. ARL Hosts International Emergency Response Meeting. This meeting was held in Washington, DC, 10-14 September 2001. Several issues were clarified and some modifications were proposed to the Manual on the Global Data Processing System and related documentation, regarding the provision of emergency response support by the WMO Regional Specialized Meteorology Centers (RSMCs). To improve the collective ability

of all RSMCs to respond to large-scale dispersion emergencies, and to fulfil the operational requirements specified in the operating plans, participants considered a number of proposals and recommendations and agreed on areas of action to enhance the system.

RSMCs with the capability for running finer scale models for various localities within their regional area, and with the functionality to handle air-borne viruses and other pollutants, were invited to explore development and application of such models and to report on the results of such activities. For other non-nuclear emergencies, the participants considered and agreed that there was a need for default sources in the absence of actual incident information and standard products. The participants addressed issues to ensure products are refined and fully standardized, to help ensure rapid response, and that the system responsiveness continues to develop through use of new technologies. All RSMCs are to develop standards for a password protected web site providing protected access to products and updates to them.

To further cooperation with the Comprehensive Test Ban Treaty Office in Vienna, it was suggested that an inter-comparison activity be conducted and an outline for cooperation standards be developed next year, with an informal exercise in the second half of the year. For subsequent years, a more regular and more automated exercises are assumed.

With regard to using atmospheric transport modeling for the prediction of volcanic ash for public safety, the public product typically includes information such as when the leading edge of the ash will reach a given location, and whether the ash is reaching the ground. It was also demonstrated, for a limited scale, that transport models using the tools of movable mesoscale model products can contribute to assuring public health safety. RSMCs with the operational capability to do so should consider this development and application of such models to respond to the volcanic gas aspects of eruptions.

The use of a common experimental database and meteorology to establish performance standards for atmospheric environmental emergency response models was agreed to and the RSMCs will participate in such a model evaluation exercise. (roland.draxler@noaa.gov)

2. ARL Awards Made for 2000. Roger Carter received the award for ARL paper of the year for his paper on “Emergency response transport forecasting using historical wind field pattern matching,” appearing in the *Journal of Applied Meteorology*, **39**, 446-462. R. E. Keislar was a co-author of the paper.

Maureen McMahon received the ARL Accomplishment Award for her consistently excellent performance and especially her willingness to work on matters of new laboratory responsibility related to the new Fiscal Management Center structure, well outside the scope of her normal responsibilities.

Silver Spring

3. Impact of Anomalous Radiosonde-Station Temperature Trends. If 11 tropical stations with anomalous trends (as determined from 2 standard errors of regression) are excluded from a 63-station radiosonde network, the result is a change from significant cooling to significant warming in the tropical high troposphere during 1958-2000. The new data set then indicates that in the tropics the warming at the surface and in the high troposphere become similar. In addition, the exclusion results in a significant change from the tropical surface warming relative to the troposphere, to the tropical troposphere warming relative to the surface, during the 42-year interval. Globally, the exclusion results in a significant change from surface warming relative to troposphere, to equal warming of surface and troposphere (by 0.10K/decade), during 1958-2000. For the second half of this period (1979-2000), exclusion of the 11 tropical stations results in little change in the

amount by which the surface warming exceeds the tropospheric warming in tropics and globe (0.12K/decade after exclusion), implying that most of the data problems at the 11 stations occur before 1979. During 1979-2000, the difference between surface and tropospheric warming is indicated to be significant in Northern Hemisphere and globe, and the change from 1958-2000 to 1979-2000 in this difference is indicated to be significant in tropics, Northern Hemisphere and globe. (Jim Angell, 301 713 0295, x127)

Boulder

4. SURFRAD. SURFRAD data are being used to validate NASA EOS satellite data. During September, a progress report was submitted to NASA, describing the previous year's accomplishments. The objective of this investigation is to use SURFRAD network data and special research-supporting ancillary measurements and analyses to provide validation information for the three CERES-equipped EOS satellites, TRMM, Terra, and Aqua. Reported on were the conversion of the clear-sky identification program to SRRB Unix systems, improvement of the Total Sky Imager (TSI) data access system, improvement of the surge protection system for the TSIs at SURFRAD stations, improvement of the interpolated soundings at SURFRAD stations, methods of analysis for SURFRAD MFRSR data, and summaries of manuscripts submitted for publication. (John Augustine, 303 497 6415)

5. Atmospheric Modeling of Radiation Experiment (AMORE). Work continues on the AMORE data archive. The archive is a joint project of the USDA UV-B Monitoring Program at Colorado State University (CSU) and the Natural Resource Ecology Laboratory (NREL) and the Surface Radiation Research Branch at NOAA/ARL. Some of the instrumental data requires processing with C and Perl programs to convert to erythema; SRRB/ARL/NOAA is working on these programs. (John DeLuisi, 303 497 6824)

6. BSRN - Baseline Surface Radiation Network. A sampling of one year of ARM data from the SGP site was submitted to the BSRN archive in Zurich, Switzerland. These files were formatted using the new Perl-based software and data base system that was developed for, and successfully applied to SURFRAD. The submission includes sounding data taken daily at the SGP site. The BSRN representatives have been slow to respond on the acceptability of the submitted data, so no other ARM data have been submitted. (John Augustine, 303 497 6415)

7. Central UV Calibration Facility (CUCF). The Central UV Calibration Facility (CUCF) has three reference broadband radiometers that are used to calibrate other radiometers from several U.S. Agencies with UV monitoring and research programs. The CUCF performs annual characterization tests of the reference radiometers to assess the radiometers stability and performance. These characterization tests include a check for changes in the spectral response, cosine response, and absolute response. The absolute response changed by -0.59%, -0.12%, and 0.11% between the May 2000 and September 2001 for the three reference UVB radiometers. The annual characterization tests are in addition to annual calibration against a reference high-performance spectroradiometer. The spectral response has been measured in December 1997, May 2000 and October 2001. No significant change in the shape of the spectral response has occurred within the

uncertainties of the measurements, but the centroid has slightly shifted to longer wavelengths by 0.1, 0.1, and 0.2 nm each year for the three reference radiometers.

The cosine response has been measured in December 1997, May 2000, August 2000, September 2001. No significant change in the cosine response has occurred within the measurement uncertainties for the three characterizations. (Kathy Lantz, 303 497 7280; Patrick Disterhoft, 303 497 6355)

Oak Ridge

8. Terrestrial Carbon Program. Synthesis studies on energy and carbon fluxes at all FLUXNET sites continued, focusing on the Bowen ratio and on the diurnal patterns of fluxes across ecosystems and climates. Eddy-covariance data and canopy-model (CANOAK) simulations from Walker Branch were presented in Baltimore, MD to a group simulating carbon and energy fluxes for Walker Branch. New sensors for temperature and relative humidity were calibrated and installed at Walker Branch, after a positive bias was discovered in the old relative humidity sensor. (wilson@atdd.noaa.gov)

9. Urban Dispersion. A progress report of data reduction from the Long-EZ was given at the VTMX workshop in Salt Lake City, UT. Turbulence data were presented for the October 25 and the October 26 intensive campaigns. Initial comparisons between the Long-EZ data and model results from Jerome Fast of PNL and Bob Banta of NOAA/ETL are presently being initiated. Initial results from analyses of surface pressure perturbations were also presented. (dumas@atdd.noaa.gov, Dobosy@atdd.noaa.gov, nappo@atdd.noaa.gov)

10. Urban Dispersion – Highways. Considerable time was spent in collecting the material and preparing the viewgraphs for oral presentation and discussion of the paper titled. The paper “Turbulence and Dispersion Modeling near Highways” was prepared for presentation at the Transport Air Pollution Symposium (TAPS), September 17-19, in Boulder, CO. The symposium became a casualty of the tower attacks on September 11, so the paper could not be presented. (rao@atdd.noaa.gov)

After discussion with R. L. Gunter of ATDD, it was decided to combine her poster paper (also to be presented at TAPS) with the above paper to prepare a single, detailed manuscript for submission to *Atmos. Environ.* The draft manuscript (titled the same as shown above) was completed by the end of September and copies were provided to co-authors (Gunter, White, Hosker) for review and comment. (rao@atdd.noaa.gov)

11. Coastal Dispersion – Chesapeake Bay. A Chesapeake Bay weather model data meeting was held in Alexandria, VA, on September 11, 2001. ATDD presented the results of the distributed soil moisture network, the flux towers, and the Twin Otter aircraft flux measurements from July 2001. Soil moisture was most dependent on the quantity of clay in the soil layers. During this period (July 2001) of near-normal rainfall, it was determined that rainwater percolated very rapidly through sandy layers and was accumulated predominately within the clay layers. Therefore soil moisture at the surface was not strongly correlated to rainfall events but showed a stronger correlation to soil type regardless of surface cover (i.e. forest, brush, grass, corn, soybeans). For estimates of surface soil moisture for input to the RAMS model, a survey of surface soil types surrounding the Chesapeake Bay is likely to be of greater value than a distributed network of soil moisture sensors.

The flux towers at Point Lookout (lower Chesapeake Bay) and Patuxent River (mature corn field) showed the dramatic differences in nearby environments. At Point Lookout diurnal variations in air temperature, sensible, and latent heat were virtually absent, with the majority of solar input going directly to heating the Bay water. The opposite was true at Patuxent River, where latent heat (evapotranspiration) closely followed solar input.

A comparison of evapotranspiration rate to plant density showed that mature corn plants were each transpiring about 0.9 liters of water per day.

A quick look at the near-surface winds and fluxes measured from the Twin Otter aircraft during the Chesapeake Bay Study was also presented. As expected, internal flows (sea breezes) of various strengths,

directions, and scales were observed and could be roughly correlated to the shape of the local coast and the local sensible heat fluxes. (brooks@atdd.noaa.gov, McMillen, Meyers, Eckstein)

12. Coastal Dispersion – Cape Canaveral. RAMS/HYPACT predictions of plume paths were quite a bit off for most tests. RAMS surface wind field output seems to have caused the trajectory errors. Two reports are to be prepared: 1) concentration data analysis and the time-space distributions, along with analysis procedures including software 2) the HYPACT evaluation report. Resulting from these tests, there is now some skepticism about near-field dispersion model forecasts based on primitive equation mesoscale models. These have a very difficult time matching plume directions due to their inability to simulate the de-coupling of the surface flow from the flow aloft in complex coastal settings or in nocturnal drainage flow conditions. It also seems that Lagrangian particle models may not be as successful in modeling a large buoyant cloud (such as rocket exhaust plume) as they are in modeling the neutrally buoyant tracer from a point source as in the recent coastal dispersion studies in which ATDD has participated. (rao@atdd.noaa.gov)

13. Canaan Valley. Installation of the energy balance system at the Canaan Valley Air Quality Research site is to be completed soon. This will complement the existing NOAA AIRMON measurements of wet and dry deposition. Also monitored are ozone concentration, soil behavior, and standard meteorological parameters. Data on nitrogen deposition through wet means are currently being analyzed, and modeling studies into the origin of air masses affecting the Canaan Valley region are continuing. Sites are being evaluated for the deployment of instruments for SURFRAD and the Climate Reference Network. (vogel@atdd.noaa.gov, Meyers, and Hall)

14. Climate Reference Network. The data logger programs were modified to add “last 5 minute” averages of the three temperatures to the data output stream. A complete data logger calibration procedure and system was developed to verify the manufacturer’s calibrations and certify the data loggers for CRN field use. Site documentation was developed to record serial numbers, GOES transmitter channels, and calibration information. A dedicated computer was set up to keep all this information in one location on the ATDD LAN; the computer has dual RAID 1 drives to guard against a disk failure. A wiring diagram was drafted to document the wind tunnel motor speed control box which automates the anemometer calibration process, based on ASTM standard practice. A new honeycomb was mounted in the ATDD wind tunnel to improve test section flow uniformity. Nine additional Kipp and Zonen pyranometers were calibrated. A significant amount of time was spent analyzing data to finally conclude that based on extensive data analysis, it was found absolutely essential that the three Eppley precision standard pyranometers be completely dry (no dew) when calibrating the K&Z sensors. This can be accomplished by wiping the sensors each morning or by aspirating them. Eppley can provide aspirated holders for their sensors, and these should probably be purchased. We finished calibrating and assembling the components for ten stations for comparison testing in Bondville IL, and installed them there, complete except for the rain gauges, which are expected to arrive later in the month. Problems with the thermistor temperature sensors were again quickly identified. The three sensors on each station sometimes read the same and sometimes not. Extensive work was done to determine the exact problem, which seems to be moisture related. We completed an Integrated Safety Management plan for a permanent test site at ATDD, and arranged for dig permits. A back hoe was then rented to train ATDD field engineers in its safe use, so that they can carry out site preparations if local contractors are unavailable. A permanent CRN test site was installed in the side yard at ATDD including both Geonor and Eco Harmony rain gauges. A Geonor rain gauge calibration program was developed to determine equation coefficients for each sensor. Once again we found a problem with the temperature measurements, as at Bondville; we thought we had fixed it by bypassing the cable connectors on the shell of the solar radiation shield. However, there is a terminal strip inside the solar radiation shields that also seems to suffer from a moisture “bridging” problem. We are now bypassing it as well. Actually, it appears the sensors have both a moisture sensitivity problem and a non-linearity problem at very high and very low temperatures. We therefore ordered three new temperature probes that use a 1000 ohm platinum resistance thermometer (PRT) instead of a thermistor; the probe housing fits nicely into the MetOne

solar radiation shields. Specifications indicate the PRTs are interchangeable to 0.05°C, exhibit excellent linearity, and are slightly cheaper than the thermistor units. Testing is planned during October. We prepared a new data logger program for the ATDD test station to include the tipping bucket data. We also adjusted the program to use Campbell's P27 command for the Geonor. If successful, this will allow three independent vibrating wire transducers to be used in each Geonor gauge, providing independent measurements of rainfall, in case of problems with any individual sensor. The low-pass filter circuit developed by NCAR appears to have decreased the noise in the Geonor signal considerably, and we may be able to decrease the threshold for recording rain. (hall@atdd.noaa.gov, Black, French, Auble, Meyers, Hosker, Mayhew, Brewer, Randolph, Conger)

15. Dynamical/Photochemical Modeling. Multiple LESchem simulations of the 2-hour midday convective boundary layer (CBL) were run with the RAMS soil and radiation models activated to simulate more realistically the boundary layer's midday thermal and dynamical characteristics by including water vapor effects. The soil moisture content and the soil temperature profile were varied in each simulation. Boundary layer growth was reduced ~30% compared to an earlier dry atmosphere simulation where the soil model was inactivated. Due to these positive results and the minimal impact on computing time, future LESchem model runs will likely utilize both the radiation and soil models as part of the coupled simulations. (Decker, Herwehe)

Modeling studies continue on determining the feasibility of utilizing the NCAR TUV model to supply time-varying photolysis rate constants (J values), in addition to supplying height-dependent J values, for use in the coupled LESchem model. Currently, the chemistry solver in LESchem is only able to handle a single time set of J values and scales those values according to the ratio of the current solar zenith angle with the solar zenith angle at local solar noon. By reading TUV-generated height-dependent and time-varying J values, into LESchem, we expect improvements in the accuracy of the photolysis reactions over those computed using simple zenith angle scaling from a single photolysis rate set. (decker@atdd.noaa.gov, Herwehe)

The model is proving to be of interest in studies of air toxics. During September, Jason Ching (NOAA/ARL/ASMD, EPA) visited ATDD, in preparation for the 10th International Symposium on Transport and Air Pollution that was to be held in Boulder, Colorado, on September 17 - 19, 2001 (the symposium was subsequently canceled after the Sep. 11 terrorist attacks). During his visit, several coupled LESchem simulations related to air toxics were completed. Toxic emissions from mobile and stationary sources were confined to the line-area source regions, with nitric oxide (NO) and isoprene (ISOP) being emitted uniformly from the entire domain bottom surface. The first 2-h toxics simulation emitted only formaldehyde (HCHO) from the line-area source regions, somewhat arbitrarily specified at twenty times the source strength of the background ISOP emission rate. To aid in the analysis of the simulation output, programs were written to compute horizontally-averaged mixing ratio profile statistics for 3 km by 3 km areas, consisting of the four "rural" corners in the domain (the background average), straddling the highway and the north-south edges of the domain center (the highway average), and centered over the urban area (the urban average). As expected, the first toxics run showed that the HCHO was most concentrated and had the greatest variation over the urban area source. (herwehe@atdd.noaa.gov)

16. GEWEX/GCIP. A Linux-based computer system was installed at the Fort Peck, MT GEWEX site. A new IRGA was also installed, along with a more powerful cell phone, and a digital camera. The Linux system has since proved reliable and robust. The Kermit communications protocol allows fast and accurate transfer of both flux data and digital image files. (dumas@atdd.noaa.gov, Meyers)

17. Mercury in the Arctic. Initial instrumentation to monitor atmospheric gaseous elemental mercury was delivered to Lavrentiya, Russia where measurements will begin this Fall. The instrumentation is now housed in a refurbished laboratory structure just outside of Lavrentiya that is owned and managed by the Chukotka Science Support Group. (brooks@atdd.noaa.gov)

Peak total mercury levels in the Barrow snowpack during springtime 2001 were well below those of 2000. The peak value in 2001 was about 55 ng/l, compared with 95 ng/l for spring 2000. Coupled with a lesser total snowpack mass in 2001, this result shows the 2001 springtime deposition to be approximately half that for 2000. (brooks@atdd.noaa.gov)

18. Office of Naval Research Extreme Turbulence Probe. Work has led to a successful preliminary road test. The results verify proper pneumatic connection among sensors and proper delivery of the signal from the sensors through the amplifiers to the A/D converters. The software properly captures and logs these signals, both in their entirety and as selected for wind calculation. Several internal changes to the software have made the code more resilient and easier to follow for maintenance and expansion. Importantly, proper performance of the complex task of channel selection for winds each 20 ms has been demonstrated. Code to compute winds has been written and awaits a preliminary calibration of the sensors for its testing. The current version post-processes winds. It's single computation thread sometimes misses messages from the data system when wind processing is added. A multi-threaded version is being developed. (dobosy@atdd.noaa.gov and Auble)



Research Triangle Park

19. CMAQ Model Development and Evaluation for Semivolatiles.

Development and evaluation of a semivolatile partitioning model for inclusion in CMAQ has been completed and two summary manuscripts have been submitted to ES&T for publication. Initial development and testing focused on atrazine, one of the most widely used current-use herbicides in the United States. Model chemistry and deposition were modified, and a gas-to-particle partitioning algorithm was added to accommodate semivolatile chemical behavior. The atrazine simulation period spanned April 1 to July 18 of 1995 for a domain encompassing the eastern two-thirds of the U.S. and Southern Canada. Initial model results appear to agree with current published theory regarding atrazine behavior in the atmosphere. Gaseous atrazine usually dominates atmospheric concentrations, but particulate form can surpass gas forms under favorable atmospheric and emission conditions. Model results for atmospheric concentration and wet deposition were evaluated against field observations taken along the Mississippi River and the shores of Lake Michigan. Model results agree within 10% of published annual atmospheric load estimates for Lake Michigan during 1995, but comparisons with individual 7- and 30-day observed air and rainfall concentrations yield order-of-magnitude differences. In particular, ambient gas-phase concentrations tend to be overpredicted by the model. Uncertainty in short-term predictions of air and rainfall concentrations appear to derive primarily from estimated emissions and precipitation. Emissions inventories and models continue to improve, but significant improvement in mesoscale rainfall predictions are likely to be more difficult to achieve. These results suggest that the current model configuration is adequate for seasonal and longer-term atrazine fate and transport prediction, but reliable 7 to 30 days predictions remain to be established. The semivolatile option will be included in the next public release of CMAQ. The initial semivolatile model is now being expanded to address the regional fate and transport of other classes of toxics such as dioxins. (Ellen Cooter, 919 541 1334)

20. Instrumented Version of CMAQ. An instrumented version of the Community Multi-scale Air Quality (CMAQ) model was developed to study details of the sulfur budget. This model version, referred to as the CMAQ sulfate tracking model, tracks sulfate production from the gas-phase and the five aqueous-phase chemical reactions, as well as contributions from direct emissions and initial and boundary conditions. In order to track contributions from each of these pathways, new species were added to represent the mass contributed from each pathway. Each of these new species is advected, diffused, processed through clouds, and deposited (both wet and dry) individually. The CMAQ sulfate tracking model has been a

valuable tool in examining the nonlinearities in the production of sulfate and the nonlinear response between sulfate and SO₂ reductions. (Shawn Roselle, 919 541 7699, and Robin L. Dennis, 919 541 2870)

Idaho Falls

21. CASES-99. As mentioned in the related Oak Ridge report, postprocessing of the LongEZ data from CASES-99 was completed in September. This effort took longer than anticipated because of various timing errors that were present in the raw data. The completed data set has been sent to UCAR in Boulder for inclusion in the CASES-99 archives. (richard.eckman@noaa.gov)

22. Hurricane Balloon. On September 20, 2001, we performed a launch and recovery of the hurricane balloon from our facility in Idaho Falls. The launch was made to test under actual operating conditions the following balloon functions:

- P Satellite Communications
- P Altitude Control
- P Balloon Termination and Recovery Operations

The balloon was launched at 11:15 a.m. from the parking lot of our facility. After the balloon launch, we tracked the balloon with a ground vehicle and an aircraft. The redundancy was to ensure that we did not lose track of the expensive balloon and payload. Although we have had extensive lab experience over the past two months, this was the first time the new balloon design with satellite telephone communications was flown. The FAA was notified well in advance of the launch and kept informed of the balloon position and altitude throughout the two-hour flight. After tracking the balloon for about 1.5 hours, map plots indicated that the best chance to recover the balloon and payload would be to terminate the flight near Parker, Idaho. As the balloon approached our recovery vehicle, the command was given to cut down the balloon. The balloon required about five minutes to release the lift gas and come to a soft landing in a nearby field where we recovered it without incident.

Prior to making our first launch, we have also been conducting failure mode tests. We have done over 330 tests to ensure that the balloon cuts down under the following conditions:

- P Satellite communications failure
- P Transponder microprocessor failure
- P Power failure
- P Connector or wiring failure
- P Exceeding max altitude failure
- P GPS position failure

All failure testing resulted in balloon cut down without any exception (100 % successful testing).

23. Air-Sea Exchange – CBLAST-Low. Effort this month focused on careful post-processing of the 52 hours of data collected during this summer's pilot study on air-sea exchange in Martha's Vineyard. The post processing algorithms are used to create the final data set which will be disseminated to project PI's. Key elements of the processing routines include replacing the raw GPS data with differentially corrected velocities and positions, blending low frequency velocities and attitudes (from GPS) with higher frequency components from accelerometers, correcting temperature measurements for dynamic heating of the element, calculating winds based on the raw pressure measurements, and careful quality control checks. With the upgrades to the LongEZ data system hardware and software, this data set does not contain many of the timing errors and missing data points that plagued the system in previous experiments. Likewise, much of the post processing

effort is being spent on careful calibrations to remove residuals in the wind calculations resulting from dynamic aircraft maneuvers. While this has little effect on the resultant mean wind, it is critical in determining the flux in gusty conditions. (jeff.french@noaa.gov, Jerry Crescenti, Timothy Crawford)

24. Installations on the NOAA P-3s. As the 2001 hurricane season comes to an end, engineers at AOC are beginning work on the installation for the BAT probe and accompanying data system on both NOAA P3 aircraft. P3 #43 will be going in for maintenance over the winter, during which time cables will be run for the system. Planning at this stage is critical as once the aircraft is put back together, we will be unable to change the cabling. Discussion with AOC personnel focused on the placement of the four GPS antennae that will be used by the TANS-vector to retrieve aircraft attitude. FRD personnel are in the processing of putting together a block diagram outlining the space, power, and cable requirements for the entire system. Work on the pressure port hemispheres is also nearing completion. We are awaiting guidance from AOC regarding the placement of the pressure ports (based on aircraft attitude at typical flight speeds). Work also continues on assembly and testing of the data system. (jeff.french@noaa.gov, Timothy Crawford)

25. Urban Dispersion – URBAN/VTMX 2000. The VTMX experimenters group sponsored a progress and informational meeting this month, which marks one year since the field deployment for the study began. Kirk Clawson presented the progress FRD has made on the project to date, indicating that all data had been analyzed and delivered to the archive, save for the sonic anemometer data. Data delivered to the archive include the SF₆ release, SF₆ bag samples, SF₆ real-time mobile analyzers, radar profiler, SODAR, and surface met station data. Some funding remains from the project to begin a final data report, and pending FY02 funds are expected to enable us to complete the report. These funds will also provide support for planning the next URBAN experiment to be conducted in 2003, probably in Oklahoma City. (akirk.clawson@noaa.gov)

26. GAUNTLET Dispersion Study Completed. AFTAC 2001 was an SF₆ tracer study conducted in April of this year at the Dugway Proving Ground using three mobile SF₆ analyzers at distances up to 80 km from the release site. This month the final report was completed, reviewed for ARL publication as a NOAA Technical Memorandum, printed, and distributed to the sponsor. A data CD-ROM was also distributed with the printed report. This concludes the AFTAC 2001 project, also known as GAUNTLET. (kirk.clawson@noaa.gov and staff)

27. Idaho Emergency Operations Center (EOC). FRD staff responded to the activation of the Emergency Operations Center (EOC) after the terrorist attacks on New York City and Washington, D. C on September 11, 2001. The INEEL was placed on a heightened level of security. (jerry.crescenti@noaa.gov, Jeff French, and Neil Hukari).

28. INEEL Network. The Department of Energy's INEEL network was shut down for several days during September after hundreds of computers were infected by the Code Red II virus. Because FRD's network is a sub-node on the larger INEEL network, we were also shut down and without internet access for over a week. All systems had to be scanned for infection before being brought on-line. No viruses were found on FRD computers and we were allowed back on-line. Because of this incident we are now investigating alternative approaches for accessing the internet. (brad.reese@noaa.gov)

Las Vegas

29. Cloud-to-Ground (CG) Lightning Study. There were two significant thunderstorm days on the Nevada Test Site (NTS) during September. Advantage was taken of this additional data to add several more cases to the 2001 data base we used to calculate the separation distances between consecutive CG flashes. The additional data only shortened the average separation distance by 0.1 mile. (Darryl Randerson, 702 295 1231)

30. Air Quality Forecasting Preparations in Nevada (CIASTA). NV-RAMS ran to completion and generated graphics 27 of 30 days (90%) in September. RAMS ran to completion on the University of Nevada-Las Vegas (UNLV) computer system 28 of 30 days (93%). Two lost days of graphics were due to data download failure at SORD. The remaining no data/incomplete RAMS run was due to initialization data download problems. The time was changed for automated model data download from UNLV to SORD for graphics generation to 0440 to allow use of RAMS data for sub-critical experiment support. Data are continuing to be renamed and saved daily, and backed up to CD weekly. (Walt Schalk, 702 295 1262)

31. Local Climatic Change. The first phase of a project for utilizing the morning radiosonde at DRA for prediction of maximum temperatures on the NTS has been completed. The initial approach uses the highest correlated predictor for each station by month. The most frequently picked predictors are the 500 mb height and the 850 mb temperature. Most of the time conditions are dry and sunny in the desert, which makes the chosen predictors seem to be reasonable choices. The initial tests of the prediction scheme in September showed good results with the predicted temperatures, generally being within 1 or 2^oF of the actual maximums. The next approach to improving this technique will involve using overlapping months to smooth the transition from one month to the next. (Doug Soule', 702 295 1266)