



# NOAA ARL Monthly Activity Report



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**Air Resources Laboratory**

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## Highlight

**1. Alaskan Students in Snow Sampling Program.** During March, personnel from ARL/ATDD and from EPA's International Programs Office met at the Barrow, Alaska, High School to begin a school-based program of snow sample collection for heavy metals analysis. High school students at Barrow, Alaska, and Lavrentiya, Russia, will receive instructions and sampling materials, and will collect and ship snow samples. The effort will be supplemented by exchanges of students and teachers between the two towns along with school visits by researchers from NOAA and EPA. S. B. Brooks, NOAA ATDD, is scheduled to begin with Barrow High School students in May, with sampling to start in October. ([brooks@atdd.noaa.gov](mailto:brooks@atdd.noaa.gov).)

## Silver Spring

**2. Umkehr Ozone Data Updated.** Umkehr ozone data have been updated from 1992 (when there was a change in the Umkehr inversion algorithm) to 1998 or 1999 (selected stations are still data-embargoed for 1999). This completes the update of global Dobson and Brewer total ozone and Umkehr data, the latter by far the most time consuming. In the case of the Umkehr data, seasonal and annual ozone anomalies (in percent) have been obtained for the 32-48 km layer (high stratosphere), 24-32 km layer (middle stratosphere), 16-24 km layer (low stratosphere), and 0-16 km layer (a rough representation of the troposphere). Based on the average of the ozone anomalies for the 20 Umkehr stations with reliable data (13 in the north temperate zone, 3 in the tropics, and 4 in the south temperate zone), the ozone trend during 1968-1990 was -1.2%/decade in the high stratosphere, -0.7%/decade in the middle stratosphere, -3.4%/decade in the low stratosphere, and 5.8%/decade in the "troposphere". Because of the impact of volcanic dust on Umkehr measurements, data from 1982, 1983 and 1984 were not used in this evaluation (El Chichon erupted in 1982), and the trend was not extended through the time of the Pinatubo eruption in 1991. Omitting the data for 1991, 1992 and 1993 because of the Pinatubo eruption, the updated data for the 5-year period 1994-1998 indicate a very slight tendency for a stratospheric increase in ozone and tropospheric decrease in ozone. This suggestion of a trend reversal is intriguing in view of the evidence for a peaking of stratospheric chlorine amount, but of course a longer record, and careful comparison with ozonesonde results (to be carried out next), is required before these findings can be considered meaningful. (Jim Angell, 301 713 0295, x127)

**3. AIRMoN Program Update.** Several changes have been made to the AIRMoN-wet deposition measurement program over the past few months. The Oxford, Ohio station remains closed and will likely remain that way due to insufficient funds to continue the operation. The Canaan Valley site is up and running (both wet and dry deposition) and a site at Trap Pond in southeastern Delaware is scheduled to come on-line in May. Both of these stations will be used to address nutrient issues affecting the Chesapeake Bay. A new urban site near Fort Meade, Maryland, will probably be set up soon, in collaboration with the State of Maryland Department of Natural Resources. ([richard.artz@noaa.gov](mailto:richard.artz@noaa.gov))

**4. National Atmospheric Deposition Program.** Following the fall Technical Meeting of the National Atmospheric Deposition Program, a call for papers was made for a special issue of Atmospheric Environment. At present, nine papers are under review and several additional papers are expected to be submitted. Editors for this special issue of the journal will be Van C. Bowersox with the Illinois State Water Survey, and Richard Artz. The issue will likely

be released early in 2002. The focus of the issue will be on changes in nutrient deposition and associated environmental effects resulting from the 1990 Clean Air Act Amendments. ([richard.artz@noaa.gov](mailto:richard.artz@noaa.gov))

**5. Support for the IJC's International Air Quality Advisory Board.** The International Joint Commission publishes their Priorities Report every two years, focusing on the work of the various Boards of the Commission. ARL is providing input, especially regarding modeling studies of dioxin and atrazine affecting the Great Lakes. Finally, assistance has been given to the Board in the design of a mercury symposium to be held in connection with the IJC's Biennial Meeting being held this September in Montreal. ([mark.cohen@noaa.gov](mailto:mark.cohen@noaa.gov))

**6. Florida Aerator Contamination Incident.** A paper was prepared with officials from the Duval County FL Health Department dealing with the serious water contamination problem reported in an earlier monthly report (August 2000). The paper is being submitted to OpFlow, a journal dealing specifically with water supply systems. ([mark.cohen@noaa.gov](mailto:mark.cohen@noaa.gov))

**7. Trajectory Model Ensembles.** In an attempt to quantify the methodology used to develop an ensemble dispersion prediction for the Kilauea volcanic plume, the Hysplit ensemble model was used to simulate daily average air concentrations for the three month ANATEX experimental period. The standard configuration of 27 ensemble members was run and predictions made for all sampling stations. About 5000 data points were available for analysis. A program was developed to determine the probability level of each measurement within the predicted ensemble. The result is the distribution of the ensemble predictions. Further analysis is required. ([roland.draxler@noaa.gov](mailto:roland.draxler@noaa.gov))

**8. Use of Re-Analysis Data.** Work is underway to make the entire CDC re-analysis archive available through READY for transport and dispersion calculations. Limitations to simple implementation are the large size of the archive and its format. A program was created to convert the files into the format required for READY and HYSPLIT. A one month (Jan 1987) sample CDC global re-analysis file has been placed on READY for testing.

The 46 months of meteorological re-analysis data that correspond with periods of experimental tracer studies have been placed on the ARL web server and are available through READY for model simulations or other analysis. Additional disk drives are on order to handle the additional data requirements. Current work is focused on standardizing the experimental data format. ([roland.draxler@noaa.gov](mailto:roland.draxler@noaa.gov))

**9. NESDIS GDIN Project.** As part of the Global Disaster Information Network (GDIN), NESDIS will be providing automated forest fire smoke products. ARL will supply the smoke dispersion forecast component. HYSPLIT has been installed on a test LINUX machine at WWB. NESDIS will be providing us with automated fire location files, which we will use to initialize the dispersion forecast. Future updates to the system will include observed aerosol densities to correct the forecast initialization field. ([roland.draxler@noaa.gov](mailto:roland.draxler@noaa.gov))

## **Boulder**

**10. SURFRAD.** All SURFRAD data from the beginning of the network to the present have been submitted to the BSRN Archive in Zurich, Switzerland. This is a milestone that has been a long time coming. It is a result of about a year of work to develop a general program that automatically formats monthly files of SURFRAD data, which includes the nearest radiosonde data for 0000 and 1200 UTC, in the BSRN format. Data for an entire month are accessed from the SURFRAD data base, reoriented in time to accommodate the difference in the BSRN and SURFRAD data conventions, and written to the BSRN files. (John Augustine, 303 497 6415)

**11. DOE's Atmospheric Radiation Measurement (ARM).** The submission of historical and current Surface Radiation Research Branch (SRRB) SURFRAD and Atmospheric Radiation Program (ARM) data to the Baseline Surface Radiation Network (BSRN) will be completed in the first half of 2001. Once current, data will then be submitted on a monthly basis. There are currently five ARM sites, and six SURFRAD sites being prepared for the BSRN archives. Gary Hodges has been designated the Deputy Site Scientist for all the ARM and SURFRAD sites being submitted, and all BSRN submission questions should be directed to him. (Gary Hodges, 303 497 6460)

Chris Cornwall attended the Department of Energy's Atmospheric Radiation Measurement (ARM) Science Team Meeting in Atlanta, Georgia, March 19 - 22. He presented a poster, coauthored by Gary Hodges, on the use of MFRSR data to fill in solar radiometer data gaps caused by tracker failure. Topics of the meeting included the future of the ARM program, pyrgeometer measurements, diffuse solar radiation, and a proposed transportable ARM facility under development. (Chris Cornwall, 303 497 7316)

**12. Central UV Calibration Facility (CCF).** The CCF has produced a tabulation of erythema calibration factors for the USDA broadband network. These factors, which are a function of solar zenith angle and total ozone, were released to Colorado State University to begin applying them to their solar UV broadband radiometer data. (Kathleen Lantz, 303 497 7280)

In anticipation of the new NIST irradiance scale for Traveling Primary Standards of Irradiance, the CCF is working on upgrading its Irradiance Scale Transfer System. The new NIST scale will change slightly with lowered uncertainties, especially in the near IR range. The changes the CCF is making to its system will also lower the uncertainties in the transfer of the NIST irradiance scale. (Patrick Disterhoft, 303 497 6355)

The CCF is gearing up for the June solar UV radiation experiment to be held at its Table Mountain Test Facility, just north of Boulder, CO. The experiment will require that all participants fully characterize their instruments before and after deployment. The CCF will provide calibrations to all spectroradiometers at the beginning and end of the experiment to bracket the solar data. (John DeLuisi, 303 497 6824 and Patrick Disterhoft, 303 497 6355)

**13. EPA Brewer Network.** First phase quality control work of EPA's Brewer network data was completed and reported to EPA. The Brewer data were compared with estimations of clear sky irradiance using radiative transfer model calculations. Total ozone estimates for the calculations were obtained from the TOMS satellite data archive for each Brewer station. A rough estimate of a systematic bias between the Brewer observations and the radiative transfer calculations ranged between 5 and 20 percent; the calculated values being higher than the observed values. This difference is similar to the results of a previous investigation in which NASA TOMS estimations of surface UV were compared against measurements obtained by SURFRAD's UV radiometers. These results were reported at the European Geophysical Union conference, April 2000. The comparison yielded systematic differences in the range of 15 to 18 percent with error bars of only a few percent. A similar difference was also seen by the Canadians with their Brewer at Toronto. Because the satellite estimations are based on a measurement of total ozone and radiative transfer calculations, similar to the present EPA investigation, we became concerned about the cause. Accordingly, we decided to conduct a carefully controlled experiment this June at SRRB's Table Mountain Test Facility to determine the accuracy with which we can model surface UV as measured by a suite of different radiometers at the Facility. (John DeLuisi, 303 497 6824)

**14. Sunrise/Sunset/Solar Position Calculator.** New sunrise/sunset/solar position calculators were published on the front page of the SRRB web site. Since then they have received much attention from OAR, NOAA, and the Associated Press. NOAA made our solar calculators front page news on their main web site and put links

to them on other NOAA web sites. Feedback from all over the world has been complimentary. (John Augustine, 303 497 6415)

**15. UV Irradiance at Poker Flat Research Range.** Observations of UV irradiance to both horizontal and vertical surfaces were made at Poker Flat Research Range in Alaska during a 10-day campaign in late March. Traditionally, UV is measured incident to a horizontal, upward-looking surface. In many cases, especially in regions of low sun angle or in the presence of snow cover, UV levels reaching a vertical surface may be higher. These higher levels to a vertical surface are significant for many biological effects studies, including eye disorders commonly experienced at higher latitudes. (Elizabeth Weatherhead, 303 497 6653 and Amy Stevermer, 303 497 6417)

**16. NPOESS.** Dr. Petropavlovskikh was invited to serve as an advisor to the NESDIS NPOESS Integrated Program Office (IPO) Ozone Operation Algorithm Team (OOAT). She will take part in development, deployment and testing of the Ozone Mapping and Profiling Suite (OMPS). An OMPS instrument is being built to support NOAA's services to monitor vertical and horizontal distribution of ozone in the Earth's atmosphere as part of the NPOESS network. (Irina Petropavlovskikh, 303 497 6279)

## **Oak Ridge**

**17. Terrestrial Carbon Program.** New radiation instrumentation has been installed on the AMERIFLUX tower at the Walker Branch Watershed field site to measure the short- and longwave components of radiation, both upwelling and downwelling, above the forest. ([wilson@atdd.noaa.gov](mailto:wilson@atdd.noaa.gov))

On March 27, ATDD and ORNL staff visited the proposed new tower site intended to replicate the Walker Branch Facility to mitigate the impacts of the Spallation Neutron Source. The "footprints" of the new tower, guying arrangements, and building were marked. Power and phone access were established. ([hosker@atdd.noaa.gov](mailto:hosker@atdd.noaa.gov), Wilson, Meyers, Hall, White)

**18. Climate Reference Network.** Planning and design work continued on the new Climate Reference Network. Final budget estimates were completed. Quotations for hardware purchases were requested from many vendors. Contacts were made at several proposed sites, and the Site Information Handbook was finalized for distribution to potential site operators. ([hosker@atdd.noaa.gov](mailto:hosker@atdd.noaa.gov), Meyers, Hall, Conger, Shifflett, Hill)

**19. Washington DC Turbulence Studies.** Wind and turbulence data taken in Washington DC during 2000 have been finalized and sent to DTRA. Work will now begin on the data set from 2001, taken during the Presidential Inauguration. ([gunter@atdd.noaa.gov](mailto:gunter@atdd.noaa.gov))

A U.S. city is being sought for an urban transport and dispersion study during 2003. Because of their physical characteristics, Phoenix, AZ and Oklahoma City, OK were selected for investigation. ATDD staff have been discussing requirements and support possibilities with faculty of the University of Oklahoma in Norman. An on-site meeting with University, State, and City officials is planned for Oklahoma City in mid-May. ([hosker@atdd.noaa.gov](mailto:hosker@atdd.noaa.gov))

**20. Collaboration with the Federal Highway Administration.** The results of turbulence measurements in vehicle wakes and near highways are to be presented in two papers at the Tenth Symposium on Transport and Air Pollution in Boulder, Colorado, September 2001 – "An Analysis of Mean Flow Vectors within Vehicle Wakes Using Data from a Towed Array of 3-D Sonic Anemometers," by R. L. Gunter, R. P. Hosker, and J. R.

White; and “Turbulence and Dispersion Modeling Near Highways,” by K.S. Rao and R.L. Gunter. ([gunter@atdd.noaa.gov](mailto:gunter@atdd.noaa.gov), Rao)

**21. Italian National Research Council Sky Arrow.** Mobile Flux Platform (MFP) equipment was installed in the IATA-CNR Sky Arrow at the aircraft factory of *Iniziativa Industriali Italiane* (3I) in Monterotondo (Rome), Italy. One item remains. A LiCor 7500 CO<sub>2</sub>/H<sub>2</sub>O analyzer will replace the ATDD IRGA of the original design upon delivery of the LI 7500 some time after April 12, 2001. Performance tests followed installation. Satisfactory results were obtained with an auxiliary power source providing a constant 12 VDC. The aircraft, however, provides power to the MFP from an engine-driven generator, with no battery. As the engine speed falls below 3000 RPM, MFP performance degrades due to voltage drop. Since any changes to the aircraft’s power system are complicated by recertification requirements, the MFP’s power-input module is being redesigned. Modifications will widen the acceptable range of input voltage and provide filtering to permit satisfactory operation in the aircraft. ([dumas@atdd.noaa.gov](mailto:dumas@atdd.noaa.gov)).

**22. Mercury in the Arctic.** In three field campaigns during March, ARL/ATDD scientists made remarkable strides in understanding the nature of atmospheric mercury deposition in the Arctic. Reactive gaseous mercury (RGM) has been found to be the primary player. Continuous measurements showed concentrations of total particulate mercury (TPM) in air near the ground to be an order of magnitude less than those of RGM. In addition, our March aircraft profile flights at Barrow showed that RGM production is limited to the boundary layer. Concentrations of RGM above the boundary layer are an order of magnitude smaller. Finally, we obtained the first-ever measurements in near-real time of the air-surface exchange of RGM, using a Relaxed Eddy Accumulation System (REA). The system contains a commercially available control and switching module to operate coupled annular denuder RGM samplers. The flux values obtained 3 m above the Barrow snowpack consistently show a deposition of RGM to the snow surface in late March and early April 2001. The derived dry deposition velocity is within expected values for RGM. All other measured parameters also support predicted results. ([brooks@atdd.noaa.gov](mailto:brooks@atdd.noaa.gov); Meyers; Lindberg-ORNL; Goodsite-National Environmental Research Institute of Denmark)

**23. NASA Land Surface Hydrology.** Evidence of hydration of the atmospheric mixed layer over Oklahoma, as seen from two flux airplanes, was presented at a workshop in Boulder CO. The divergence of moisture flux through the daytime mixed layer, and the related change in water content were examined for two days from July 1997. Flux divergence was sufficient to account for most of the hydration of the mixed layer until about local noon. After noon, flux divergence was near zero on both days, while hydration responded differently on each day. Planned examination of other cases from the Southern Great Plains Experiment of 1997 will test the persistence of this pattern. ([dobosy@atdd.noaa.gov](mailto:dobosy@atdd.noaa.gov))

**24. Coastal Dispersion.** The MVP Steering Committee (consisting of MVP Principal Investigators) has decided to make the MVP Data Archive available to outside researchers on an “as requested” basis. Anonymous FTP sessions are still not allowed, so these new users will be issued individual user IDs and passwords as was done previously. Two new researchers from George Mason University were added to the Authorized MVP User List in March, bringing the total number of authorized MVP Data Archive users to 32. ([herwehe@atdd.noaa.gov](mailto:herwehe@atdd.noaa.gov))

**25. US-Russia Atmospheric Mercury Study.** An agreement was reached, signed, and funded with the Chukotka Science Support Group, based in Provideniya and Lavrentiya, to establish a mercury monitoring site in Lavrentiya. This study has received letters of support from the Governor of the Chukotka Autonomous Region and the Far East Branch of the Russian Academy of Sciences. ([brooks@atdd.noaa.gov](mailto:brooks@atdd.noaa.gov) and the NOAA Arctic Research Office)

**26. Recognition in Oak Ridge.** On March 19, ATDD received a Historic Preservation Award from the Environmental Quality Advisory Board of the City of Oak Ridge for preservation of the ATDD main building, which dates to the early days of the Manhattan Project. Credit for the preservation of the appearance and charm of this old structure must be shared. DOE and NOAA provided funding over several years for necessary renovations. NOAA and ORAU architects and engineers found solutions that preserved the character of the building while improving its wiring, roofing, energy efficiency, and appearance. ([hosker@atdd.noaa.gov](mailto:hosker@atdd.noaa.gov))

### **Research Triangle Park**

**27. Models-3 Framework Version 4.1 Completed.** Development is complete on the framework version of the Models-3 Air Quality Modeling System (Version 4.1) for Sun UNIX platforms. Distribution tapes of the system are being made, with the first copies being available about April 30 from the Atmospheric Sciences Modeling Division. A Personal Computer NT version to be available from the National Technical Information Service will be completed during May. Specifics on availability will be available on the Division Internet site (<http://www.epa.gov/asmdnerl/>). Version 4.1 of the Models-3 air quality modeling framework includes significant updates to the Community Air Quality Modeling (CMAQ) portion of Models-3, including improved horizontal dispersion algorithms, corrections to the aerosol code, and a faster solver for the Carbon Bond 4 chemical mechanism. Major changes have occurred in the emission modeling component of Models-3. The Models-3 Emission Processing and Projection System (MEPPS) has been replaced with the much faster and more disk space efficient Sparse Matrix Operator Kernel Emission (SMOKE) modeling system. The SMOKE was originally developed under a Cooperative Research Grant between the Division and the North Carolina Supercomputing Center (also known as MCNC). The MCNC has maintained and expanded SMOKE capabilities partly with Division sponsorship (<http://envpro.ncsc.org/products/smoke/>). The SMOKE has capabilities to apply controls, projections and other adjustments to emission data for repetitive modeling of emission scenarios, with a minimum of repetition of computational steps because of its matrix architecture. In addition, a SMOKE Tool is provided with Models-3 to assist in preparation of SMOKE input files, including a modeling grid, gridded spatial surrogate data, emission inventory data, and files to provide SMOKE with control and projection information. The next revision of Models-3, planned for November 2001, will be migrated to an entirely new Java-based framework (developed for the Multimedia Integrated Modeling System). (William Benjey [NERL], 919 541 0821)

**28. Development of the AERMOD Dispersion Model.** After lengthy peer review and public scrutiny, the recently developed the AMS/EPA Regulatory Model Improvement Committee (AERMOD) dispersion model is nearing approval by the U.S. EPA for routine use in environmental impact and risk assessment analyses. AERMOD is a near-field, steady-state plume model that considers the vertical inhomogeneity of meteorology and dispersion rates within the boundary layer, the simple interactions of plume and complex terrain with the use of the dividing streamline concept, and the enhancement of turbulence and dispersion in urban areas based on associated urban heat flux. Perhaps most importantly is the model's depiction of the dispersion in convective boundary layers based on extensive literature involving fluid modeling, field studies, and numerical modeling over the past few decades. AERMOD development continues with the very recent addition of algorithms for simulating the influence of obstacles (e.g., buildings) on plume rise and plume dispersion within the obstacle wake. These downwash algorithms find their basis in the PRIME downwash model currently included in the approved and commonly used Industrial Source Complex dispersion model. Testing and evaluation of the AERMOD/PRIME approach is expected in the next few months. (Steve Perry, 919 541 1341)

**29. *Expanding Your Horizons – Exposing Girls to Science and Scientists.*** Tanya Otte and Sharon LeDuc represented the ASMD at the Expanding Your Horizons (EYH) Conference on the campus of North Carolina State University. EYH is a national program that holds more than 100 local conferences annually, generally on the campuses of colleges and universities. At this EYH, more than 500 seventh-grade girls were encouraged to consider careers in science, mathematics, and engineering through hands-on workshops led by local women scientists. Ms. Otte and Dr. LeDuc team-led two “Weather Jeopardy” workshops for 10-20 girls. The workshop was modeled after the “Jeopardy” television show, but all of the categories for the questions were related to weather. Ms. Otte wrote the questions, and Dr. LeDuc designed the HTML software that was used for the game. In each game, the girls were split into three groups. In the two main rounds, no points were subtracted for “wrong” answers. There were no “double jeopardy” questions, but the final question allowed each team to wager up to the number of points they had. One of our goals was to expose the girls to weather concepts in a non-threatening manner. The girls all had fun in the games. It was exciting to watch the teamwork develop among groups of girls who had not necessarily met before our workshop.

This is the fifth year Ms. Otte and Dr. LeDuc have each participated in EYH and the second year they have team-led “Weather Jeopardy”. Copies of the HTML “Jeopardy” software can be made available upon request; it can be easily adapted for other outreach activities. For more information on EYH, go to <http://www.expandingyourhorizons.org>. (Tanya L. Otte, 919 541 7533, Sharon K. LeDuc, 919 541 1335)

## **Idaho Falls**

**30. *Airborne Turbulence Sensors.*** Work continues on data system upgrades both for the LongEZ system and for the system to be installed on the NOAA P3s in 2002. The re-design, assembly, and testing of two turbulence-system auxiliary boxes is completed. One box is required for each system and houses the power distribution circuit, signal conditioning, and A/D converter boards for 16 channels. The box also supplies an interface to the probe electronics located in the nose of the aircraft. The boxes interface to the data system computer through one parallel and multiple serial ports. The data system consists of a micro-box industrial-type PC chassis housing a 600-MHZ Celeron processor on a single-board computer. This system was chosen for both size and ruggedness. ([jeff.french@noaa.gov](mailto:jeff.french@noaa.gov))

**31. *Hurricane Balloon.*** The developmental hurricane balloon is capable of adjusting altitude by pumping air into or releasing ballast air from the pressurized ballast section of the balloon. In past testing we have measured the pumping rate and increase in balloon density as a function of balloon pressure and pump voltage. The release rate is not only dependent on the diameter of the ballast release hose, it is also dependent on the length of the hose and any restriction caused by hose connectors, bends or by the release pinch valve. Having a prototype transponder with a fully functional relief valve and a final hose routing configuration, we have been able to make lab measurements on the increase in lift as a function of time and pressure during ballast air releases. The release rate as a function of time shows quite a bit of noise caused by slight air currents and temperature changes in the inflation area during measurements and the fact that it is a derivative of the total balloon weight as a function of time. This release rate information will be used by the balloon microcontroller and the operator to calculate valve open time as a function of the balloon superpressure and the amount of lift correction needed. ([randy.johnson@noaa.gov](mailto:randy.johnson@noaa.gov))

**32. *Dugway Tracer Study (GAUNTLET).*** The preparations for GAUNTLET are complete. The program will support the efforts of the military in advancing transport and dispersion technology. Deployment to Dugway, UT, is scheduled to begin on the 2<sup>nd</sup> of April and will continue for three and one-half weeks. The SF<sub>6</sub> release mechanism has been refurbished and built onto a two-axle trailer for mobility. This will permit rapid redeployment of the mechanism, should meteorological conditions dictate such a move. Training of the



participating FRD staff on the use of the mobile analyzers has been completed and the mobile SF<sub>6</sub> analyzers have been installed in three vehicles. The analyzers continue to perform well with the newly installed tritium detectors. New calibration procedures have been developed for the analyzers that ensure greater confidence in the data quality assurance. As a given test proceeds, and multiple single concentration calibrations of the instrument are performed, the percentage of recovery is determined. When the recovery is outside a ±20% limit, the analyzer is placed offline and a new complete calibration is conducted. ([kirk.clawson@noaa.gov](mailto:kirk.clawson@noaa.gov), Roger Carter and staff)

**33. *Urban Dispersion.*** VTMX-URBAN 2000. Efforts to analyze the SF<sub>6</sub> bag samplers and mobile analyzer data obtained in the recent Salt Lake City study continue. The bag sampler locations have been checked for accuracy and location descriptions have been updated. The SF<sub>6</sub> bag sample analysis has now been completed and the data have passed the laboratory quality control tests. The data have been sorted by sampler location and the corrected longitude and latitude added. Time history plots for each location are being generated. ([kirk.clawson@noaa.gov](mailto:kirk.clawson@noaa.gov), Neil Hukari, Roger Carter, Debbie Lacroix)

**34. *Coastal Dispersion.*** Significant progress was made in processing aircraft data from MVP Session 4 at Vandenberg Air Force Base. The raw data files from this experiment contain timing errors introduced by the data acquisition software. A set of programs has been developed to correct the majority of these errors. Some of the GPS attitude angle data cannot be recovered, but fortunately this mainly affects the high-frequency end of the angle spectra. The aircraft motion at these higher frequencies is determined from accelerometer data, and not from the GPS angles. ([richard.eckman@noaa.gov](mailto:richard.eckman@noaa.gov))

**35. *NRC Post-Doc.*** A National Research Council (NRC) postdoctoral invitation has been extended to Tamara Grimmert (University of California at San Diego) to work at FRD. Tammy is a mechanical engineering student who will work with Jerry Crescenti on air-sea interaction research using the Long-EZ data from [WAPEX](#), [SHOWEX](#), and [CBLAST-Low](#). Tammy is expected to finish her Ph.D. work in late June and will be reporting to FRD by early July. ([jerry.crescenti@noaa.gov](mailto:jerry.crescenti@noaa.gov))

**36. *INEEL Meteorological Support.*** A controversy erupted at INEEL on 22 March when seismic alarms were set off at one of the facilities. The alarms were set off not by an earthquake, but by the detonation of a large quantity of plastic explosive by INEEL security personnel. A similar detonation had taken place on the previous day, but without incident. FRD has been asked to investigate the meteorology on each day to determine why the sound propagation differed. On the 21<sup>st</sup>, a well-mixed layer was present up to about 600 m AGL. This temperature structure tended to favor upward refraction of sound waves. On the 22<sup>nd</sup>, the lower atmosphere was more stably stratified, favoring the ducting of sound near the ground. ([richard.eckman@noaa.gov](mailto:richard.eckman@noaa.gov))

In early March, a meeting was held with county commissioners in Jackson, Wyoming, to discuss plans to install a nuclear radiation monitoring station in Jackson. This activity is partly in response to publicity by an environmental group called Keep Yellowstone Nuclear Free (KYNF), which has been making accusations about INEEL contaminating the Jackson area. A KYNF representative at the meeting made a demonstration of turbulent diffusion using an aerosol can, which showed conclusively that the plume concentration really does decrease as you move away from the source. Ironically, this undermined the KYNF claim that nuclear material from INEEL was somehow accumulating in Jackson even though it could not be detected closer to the source. An FRD representative was at the meeting to answer any questions related to transport and diffusion. ([richard.eckman@noaa.gov](mailto:richard.eckman@noaa.gov))

**37. *Columbia River Gorge Study.*** FRD personnel have become involved in the Columbia River Gorge Visibility and Air Quality Study by presenting a white paper outlining the usefulness of airborne in situ measurements to that project. The aim is to modify the original study plan presented at a workshop earlier this month. Highlighting any aircraft study would be the measurements of particulate concentration and bulk aerosol optical properties in combination with boundary layer flow structure in and around the Gorge. ([jeff.french@noaa.gov](mailto:jeff.french@noaa.gov), Kirk Clawson)

**38. *Educational Outreach.*** Jerry Crescenti was one of several volunteer judges for this year's Science Fair at Sunnyside Elementary School in Idaho Falls. The fair was an all-day affair on March 30. Various presentations were made by students from kindergarten through sixth grade.

In addition to the science fair, Jerry Crescenti also gave a talk to Linda Mabe's Spectrum class, also at Sunnyside Elementary School. Jerry talked about various meteorology instruments and brought in various sensors for a "show and tell" presentation. He conducted several simple experiments with the children including measuring relative humidity using a sling psychrometer.

([jerry.crescenti@noaa.gov](mailto:jerry.crescenti@noaa.gov))

## **Las Vegas**

**39. *Cloud to Ground Lightning Project.*** New lightning detection equipment, computers, and software have been installed. Comprehensive training was provided to SORD professional and technical personnel. All forecasters were trained on the use of the new software and computer systems. The new system is being evaluated and tested for acceptance. (Staff)

**40. *DOE Meteorological Coordinating Council (DMCC).*** Work was completed on the draft report on the DOE contribution to the Office of the Federal Coordinator for Meteorology Annual Federal Plan for Meteorological Services and Supporting Research, FY 2002. Updates from nine DOE field offices were received, with input to the new document. (Darryl Randerson, 702 295 1231)