NOAA ARL Monthly Activity Report

May 2000

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Contents

Highlights

1. The Los Alamos Fires. ARL Headquarters staff were asked to provide a transport forecast for the Los Alamos fires by the New Mexico Dept. of Air Quality. In addition, ARL SORD (Las Vegas) staff responded to a request for support to DOE. Together, Headquarters and SORD provided weather information and transport/dispersion forecasts to DOE in Las Vegas for almost a week. Transport forecasts compared favorably with NOAA/NESDIS satellite images of the smoke plume.

Additional support was provided to the DOE Nevada Operations Office Emergency Operations Center (EOC). Forecast support included transport and dispersion projections for smoke and potential hazardous materials, aviation weather, surface wind conditions, fire weather issues, and extended forecasts for planning purposes. Initially, these meteorological services were provided at EOC Operational Support Briefings, at 0800, 1300, and 1600 PDT daily. As the fire became controlled in the Los Alamos area, the briefings were scaled down to one per day.

At the request of the Emergency Manager, Albuquerque, NM, the ARL/SORD Mobile Emergency Response Meteorological Team was deployed to the Los Alamos airport. This two-man team commenced upper-air (radiosonde) observations by 1400 PDT on May 16. These data, including winds aloft and humidity information, were immediately provided to the Southwest Fire Coordination Center (SFCC) in Albuquerque, to the Albuquerque National Weather Service (NWS) Forecast Office, to ARL-Silver Spring, and to the National Atmospheric Release Advisory Capability facility in Livermore, CA. Nineteen upper-air soundings were taken between May 16 and May 19. These data were vital to planning fire-fighting activities and to guarding the safety of field personnel.

The SORD mobile meteorological capability consists of three full Global Positioning System-based, upper-air sounding systems, PCs, and a portable meteorological tower. Because this equipment is used to support emergency operations, three GPS sounding units are always taken into the field to help ensure that critical meteorological data will be collected. This concept is based on operating wisdom accumulated from many years of experience. Overall, SORD support to the Los Alamos fire-fighting effort was a great success. (Darryl Randerson, 702 295 1231)

2. NATO/CCMS International Technical Meeting. The Millennium (24th) NATO/CCMS International Technical Meeting (ITM) on Air Pollution Modeling and Its Application, was held in Boulder, CO, during May 15-19, 2000. The ITM was jointly organized by the Danish Riso National Laboratory (Pilot Country); by the EPA National Exposure Research Laboratory (Host Country); and by the American Meteorological Society (Host Organization). The ITM was attended by 135 participants representing 30 countries from NATO Alliance, NATO Partner, and non-NATO countries. The session topics were: Role of Atmospheric Models in Air Pollution Policy and Abatement Strategies; Integrated Regional Modeling; Global and Long-Range Transport; Regional Air Pollution and Climate; New Developments; and Model Assessment and Verification. The conference chair was Frank Schiermeier of ASMD.

Invited papers were presented by P. Builtjes of The Netherlands (Major Twentieth Century Milestones in Air Pollution Modeling and Its Application); W. Klug of Germany (What Did We Learn From the ETEX Experiment?); and A. Venkatram of the United States (Challenges of Air Pollution Modeling and Its Application in the Next Millennium). In addition to the major sponsorship by the EPA, financial support was received from the Danish Riso National Laboratory, the NATO Committee on the Challenges of Modern Society, and EURASAP (European Association for the Science of Air Pollution). A special grant was given by NATO/CCMS to facilitate attendance of scientists from the central and eastern European partner countries. The next (25th) conference in this series will be held in 2001 in Belgium. (Frank Schiermeier, 919 541 4542)

Silver Spring

3. Lower Tropospheric Temperatures from Radiosondes and Satellites. Work began on a collaborative project to develop new lower-tropospheric temperature datasets from the Microwave Sounding Unit (MSU) satellite data. Frank Wentz, Matthias Schabel and Carl Mears, of Remote Sensing Systems, are developing two new temperature products, using different methods from those previously used by John Christy (Univ. of Alabama-Huntsville) and Roy Spencer (NASA Marshall Space Flight Center), pioneers in the use of MSU data for climate purposes. Recently identified problems with the Spencer/Christy retrievals have highlighted the need to have more than one research team examining the data and tackling the problems associated with creating a homogeneous time series from data from multiple satellites, each with different error characteristics.

The ARL role in this effort is identifying and providing suitable radiosonde data for comparison with the satellite products. Work to date has focused on identifying criteria for choosing radiosonde stations and periods of record that are free of artificial jumps associated with instrument changes. Our approach will be to develop several networks: a small one in which the data for each station will have been extensively scrutinized, and one or two larger ones, with greater spatial coverage. This effort will incorporate aspects of ongoing collaborative work with John Lanzante and Steve Klein (NOAA/GFDL) to distinguish real and artificial step-like changes in radiosonde temperature data using a combination of statistical techniques, station history information, and comparison of the data with indices of climate variability. (dian.gaffen@noaa.gov)

4. Impact of QBO, El Niño, and Sunspot Number on the 300 mb North Circumpolar Vortex. Based on 37 years of Free University of Berlin monthly polar stereographic maps, the 300 mb north circumpolar vortex (defined by mid-latitude jet-stream location) is significantly less displaced into the eastern hemisphere at the time of QBO 50 mb east-wind maximum, and tends to be contracted at this time as well. More impressive is the significant tendency for the vortex to be expanded at the time of Niño3 SST maximum, and contracted 3-4 seasons thereafter. As expected, this tendency is best expressed in the dateline (El Niño) hemisphere, resulting in anomalous displacement of the vortex further into the dateline hemisphere at the time of SST maximum. There is also a significant tendency for the vortex to be less displaced into the eastern hemisphere 1-2 seasons after Niño3 SST maximum, so that if El Niño and QBO east-wind maximum occur at nearly the same time, there is an anomalous displacement of the vortex toward the western hemisphere. Despite the relatively short record (only three full 11-year cycles), there is a significant tendency for the vortex to be contracted at the time of sunspot maximum, particularly in summer and autumn. Thus, the record-breaking vortex contraction of the last 2 years reflects in part the upcoming sunspot maximum. (Jim Angell, 301 713 0295, x127)

> *After 44 years of service to NOAA Air Resources Laboratory and its predecessor organizations, Dr. James K. Angell retired on April 30, 2000. A luncheon in his honor was held on May 25, 2000 at Mrs. K's Tollhouse restaurant in Silver Spring. Jim will be continuing to work under contract to ARL on studies of global temperature and ozone variations, volcanic and solar effects on climate, the polar vortex, and air stagnation.* (dian.gaffen@noaa.gov)

5. The Atmospheric Transport and Deposition of Toxic Substances. Work continues on modeling the atmospheric fate and transport of toxic pollutants, with emphasis on deposition to the Great Lakes. Additional sensitivity analyses continue to be conducted to evaluate the influence of uncertain model parameters. A set of two manuscripts on the dioxin modeling work, for journal submission, are almost completed. In addition, an extended abstract was submitted and accepted for presentation at the upcoming Dioxin 2000 conference. (mark.cohen@noaa.gov)

6. Operational Ozone Forecast. The experimental Hysplit/CB4 ozone forecast has been revised for the summer of 2000 and the new system is now operational (http://www.arl.noaa.gov/ready/ozone). Ozone concentrations are now forecast for a larger domain covering the entire eastern U.S. based upon a 50 km resolution emissions and concentration grid with three vertical layers. Emissions of VOC and NOx are based upon the 1995 OTAG inventory with a resolution of 12 km aggregated to the 50 km grid. Transport and dispersion is computed using HYSPLIT and meteorological fields from NCEP's Eta forecast model (resolution: 40 km, 3 hr, 25 hPa) based upon the 0000 UTC forecast. Pollutant particles are released each time step (usually 20 min) from every concentration grid cell with the mass of VOC and NOx corresponding to the cell's total area, point, and mobile emissions. Biogenic hydrocarbon emissions are added to each cell dominated by a forest land-use category based upon temperature and local solar insolation. Although the vertical depth of the concentration grid is fixed, particles disperse in response to the strength of the mixing and variations in the boundary layer depth. The concentration of each chemical species is calculated by dividing the sum of the particle masses by the volume of the corresponding concentration grid cell. The cell's time evolution of concentration is solved using the Carbon Bond IV mechanism of 92 reactions involving 38 species between each HYSPLIT advection-dispersion step. The resulting concentrations are then redistributed as a change in the mass of each particle within the cell. The approach is a hybrid Eulerian-Lagrangian system in that the pollutant transport and dispersion is computed in a Lagrangian framework while the concentrations are accumulated each time step on the Eulerian concentration grid. The chemistry is then solved independently for each concentration grid cell. An advantage of this approach over a full Eulerian solution is that resolution of the transport and dispersion calculation is independent of the chemistry computation. Hence the transport and dispersion, which is computationally less intensive, can be computed at the highest resolution, while the chemistry is solved on a coarser grid to improve computational efficiency. (roland.draxler@noaa.gov and Ariel Stein - ais5@psu.edu)

7. Comprehensive Test Ban Treaty Organization (CTBTO). An informal WMO/CTBTO sponsored test was conducted on 3-4 May between the CTBTO International Data Center and several RSMCs (Montreal, Washington, Toulouse, Bracknell, Tokyo, Melbourne). The purpose of which was to test the communications between the RSMCs and the CTBTO and to provide the CTBTO with sample meteorological products that they could use for monitoring treaty compliance. NCEP's SDM participated in the first part of the test on 3 May, which was conducted as a "normal" radiological release, while ARL participated in the second part, on 4 May, which assumed that a radiological detection (measurement) and required us to predict potential source locations for that event. In anticipation of the test, Hysplit was modified to permit a "backward" concentration simulation. However to maintain some theoretical consistency, horizontal dispersion was restricted in the "backward" mode and the simulation then provided maps of upwind trajectory probabilities after the pseudo-concentrations were normalized. Similar products were produced by Montreal and Tokyo. (roland.draxler@noaa.gov)

8. TOMS - HYSPLIT Interactive Link. In support of the dust storm research project, an interactive display program was developed to access TOMS Aerosol Index (AI) gridded files and Hysplit calculated concentration fields. The program reads the time header information from the Hysplit snapshot pollutant particle dump file. This time is then used to compute the TOMS AI file name (convention based upon date)

and then opens the file and displays a global map of TOMS AI with the satellite track to indicate which time slice is nearest to the time of the model computation. The display also shows all the Hysplit particle endpoint positions. The display can then be zoomed over the region of interest and the model particle positions can be spatially adjusted to match the TOMS AI pattern according to preset rules. The adjusted particle file can then be used to continue the Hysplit computation to the next TOMS image. (roland.draxler@noaa.gov)

9. RSMC Exercise with the CTBTO. The monthly Regional Specialized Meteorological Center (RSMC) exercise was initiated by the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) International Data Center (IDC) on May 3 to test the possibility of providing RSMC products to the IDC in the future. The test, as usual, involved a joint response between RSMCs Montreal, Washington (ARL and NWS/NCEP), and Melbourne, and involved a 2-day scenario. The test was successful. (glenn.rolph@noaa.gov)

10. TOPOFF. The FBI initiated a series of unannounced terrorist incident drills at three locations across the U.S. during May. ARL was alerted to two of them, Portsmouth, NH, and Washington, D.C., by NWS/NCEP's Senior Duty Meteorologist (SDM) over the weekend of May 20 and 21. ARL personnel responded after hours by providing updated transport and dispersions forecasts via it's READY web site to the SDM. (glenn.rolph@noaa.gov)

Boulder

11. SURFRAD. SURFRAD data are being used to evaluate CERES instrument on the new NASA EOS satellites. Measurements from the CERES instrument are used to infer the surface radiation budget. Because of delays in the launch of the EOS satellites over the past three years, NASA has decided to continue the program beyond the date initially planned. Initially, the program was planned to end after three years (i.e. very soon). (John Augustine, 303 497 6415)

12. Workshop in Jakarta, Indonesia. Gary Hodges, traveled to Jakarta, Indonesia the first week of May to conduct a workshop in the use of a handheld sunphotometer for weather service personnel from the Association of SouthEast Asian Nations (ASEAN). This instrument is used to measure aerosol optical thickness. The workshop was part of the Programme to Address Regional Transboundary Smoke (PARTS). Participating nations were Indonesia, Malaysia, Brunei, and Singapore. Data are now being sent to SRRB on a weekly basis, and are currently being archived on SRRB's computers. Researchers from Silver Spring are using these data for ground truthing satellite derived aerosol optical depth. (Gary Hodges, 303 497 6460)

13. Umkehr Ozone Profile. In an attempt to assess informational content of the Umkehr ozone profile retrieval algorithm, three retrieval methods have been compared. The TOAP99 (Total Ozone Adjusted a priori, 1999), FAP 10 (10-layer fixed a priori), and the FAP 5 (5-layer fixed a priori). The term "fixed" implies that the a priori first guess ozone profile varies with season and latitude but not with Dobson total ozone. The noise in the Umkehr retrieved ozone profile was found to be far greater than the year-to-year variability of the de-seasonalized time-series. Results of the analysis show that performance of all three algorithms were about the same within the uncertainty of the comparison. This could be due to errors in sonde, Umkehr, or intercomparison noise. It doesn't necessarily tell us that the retrievals from a well calibrated Umkehr instrument cannot be improved by designing a better algorithm.

To help decide which method is better, a theoretical study has been conducted. The test ozone profiles (monthly mean SAGE and co-located ozone-sonde data) were used to calculate theoretical Umkehr measurements using a state-of-the-art radiative transfer code. The retrieved ozone profiles (using three

methods) has been compared with test ozone profiles. The basic conclusion is that the results from all three are similar. The fact that all three algorithms give about the same answer means that double layer retrievals are very nearly algorithm independent. Finally, the deseasonalized correlation coefficients using FAP5 are .73, .97, .95, .82, and ,99 in layers 0+1 , 2+3, 4+5, 6+7, and 8+ respectively. These are good results for an instrument with an assumed noise of 3.2%. The results are expected to improve with lower assumed noise. The standard deviation of the synthetically retrieved profiles have yet to be compared with the standard deviation of real profiles to test if current operational estimates of noise are reasonable. The results of the theoretical study so far, suggest selection of the simplest algorithm for further use; that is the FAP5 algorithm (Irina Petropavlovskikh, 303-497-6279 and John DeLuisi, 303 497 6824)

Oak Ridge

14. Canaan Valley. Suites of both basic meteorological and AIRMoN-wet instrumentation have been in continuous operation at the Canaan Valley atmospheric deposition research and monitoring site since mid-May. Field measurements of pH and conductivity on rain samples have been conducted daily when precipitation amounts dictate. Preliminary results indicate high to moderate acidity in the precipitation samples. Also, meetings were held among NOAA/ARL staff to formulate science objectives for the upcoming fiscal year relating to atmospheric deposition of pollutants to the Canaan Valley region. In addition to the current AIRMoN deposition studies, further research and monitoring programs have been suggested. It is planned to upgrade the measurement program to a full energy balance operation, in the very near future. (vogel@atdd.noaa.gov, Hosker, Meyers, Hicks)

15. East Tennessee Ozone Study (ETOS). At the beginning of May, NOAA management informed ARL that there would be no additional funding provided for ETOS 2000. A request for discretionary funding allocation was not approved. This has forced a redesign and necessarily much smaller monitoring network for ETOS 2000. All sites scheduled for the eastern portion of the Great Smoky Mountains National Park (North Carolina side) and along the Tennessee Valley into the mid-Virginia Shenandoah Valley will be eliminated from this year's monitoring efforts. To reduce costs and yet maintain a limited but useful monitoring effort, ATDD will essentially re-instrument the 1999 monitoring sites with the addition of several new high altitude sites.

Three new sites will be added - Whitetop Mountain, Windrock Mountain, and Copper Hill. In cooperation with the EPA and U.S. Forest Service, ATDD will assume control of the Whitetop Mountain, VA site previously used for CASTNet. This site will anchor the northern East Tennessee Valley. As the TVA expands its green power program with a set of wind turbines located near ATDD's Buffalo Mtn. Site (ATDD's western high altitude site), ATDD will be provided a secured location to deploy a monitoring station. This site will provide key information on the Valley's predominate westerly to northwesterly winds, which appear to transport significant background ozone into the Valley. The Copper Hill site (located at the southeastern edge of the Tennessee Valley) will provide the third leg of the elevated monitoring sites. ATDD's network, coupled with both existing regulatory sites maintained by the State of Tennessee and the NPS, will provide a high resolution picture of ozone and meteorology in the East Tennessee Valley. (pendergrass@atdd.noaa.gov)

Full scale restoration of the East Tennessee Ozone Study meteorological and air quality network is ongoing. Ozone monitors were established at Oak Ridge, Sharp's Ridge (Knoxville), Walnut Mountain (LaFollette), Allardt, Spencer, Sweetwater, English Mountain, Buffalo Mountain, and Seymour, Tennessee. Meteorological sites were repaired and/or installed at Sharp's Ridge (Knoxville), Walnut

Mountain (LaFollette), Allardt, Spencer, English Mountain, Cove Mountain, Clingman's Dome, Buffalo Mountain, Walker Branch, and Lenoir City. The site at Scarboro (Oak Ridge) was relocated to Seymour, Tennessee. (birdwell@atdd.noaa.gov)

16. Mercury in the Arctic. May measurements at Barrow, Alaska, of reactive gaseous mercury, a species nearly absent in background air, showed strong increases during episodes of depleted elemental mercury vapor, reaching up to 1.0 ng-m^{-3}, the highest concentrations ever measured anywhere on the globe. Reactive gaseous mercury is rare in the atmosphere near the ground because it quickly deposits to most surfaces. The production of reactive gaseous mercury at Barrow is observed to be well correlated to levels of incoming solar ultraviolet radiation. Its lifetime in the air depends strongly on the level of atmospheric turbulence. Monthly measurements of mercury in snow from the clean-air sector have shown mercury concentrations to rise from undetectable amounts in the winter to about 70 ng-l^{-1} in May. Of this, 8-9 ng-l^{-1} is bioavailable, meaning that it is in a form that passes easily through cell membranes. These concentrations of bioavailable mercury in snow from the clean-air sector are the highest ever measured anywhere in the world. Mercury, like no other heavy metal toxin, is more bioavailable the lower the acidity of soil or water. The Barrow tundra is among Alaska's least acidic. (brooks@atdd.noaa.gov, Meyers, Lindberg-ORNL)

17. Upper atmosphere Refractive Turbulence Study. Turbulence data, measured *in situ* in the upper troposphere, continue to accumulate. Observations were taken during May over Britain in a project led by Dr. J. Whiteway of the University of Wales, Aberystwyth, primarily with UK funding. Previous measurements in Japan and Australia explored turbulent structure around jet cores. Gravity waves were the focus in Britain, propagating upward from the Welsh hills. The airplane complemented an upward-looking radar and rising balloons. The radar discerned the gravity waves, which often break at some point, producing turbulence. The airplane could remain at altitude for an extended period, sampling both turbulent and quiescent layers through which the radar and balloons penetrated. The U.S. DOD's interest was to expand its set of turbulence measurements from various parts of the world under a variety of conditions that produce turbulence near the tropopause. The instruments all appeared to function properly. A new ultra-fast temperature probe was flown, capable of sampling faster than 2 kHz. Other reconfigurations of the airplane required adaption of the processing software. This has progressed to providing realistic patterns of temperature and vertical motion. (dobosy@atdd.noaa.gov)

Research Triangle Park

18. Preliminary Evaluation of Models-3 CMAQ Using the Light Extinction Coefficient (b_{ext}). Ambient air concentrations of fine particulate matter continue to be a major concern because they have been linked to both detrimental health effects and visibility degradation. Accordingly, the Clean Air Act and 1990 Amendments called for an assessment of current and future regulations designed to protect human health and welfare. The most reliable tool for carrying out such assessments are air quality models such as EPA's new Community Multiscale Air Quality model (CMAQ), which simulates air concentrations and deposition of particulate matter (along with other pollutants), and visibility associated with specified levels of emissions. These simulations are then used by EPA Program Offices and research laboratories to support both regulatory assessment and scientific studies on a myriad of spatial and temporal scales.

This research has provided a preliminary evaluation of CMAQ using a suite of statistical techniques and the light-extinction coefficient (b_{ext}) as the evaluative parameter. The b_{ext} (units of $km^{!1}$) was selected as the evaluative parameter for several reasons. First, it serves well as a surrogate for fine particulate

matter ($PM_{2.5}$), for which little observational data exist. Second, the b_{ext} can also be used to characterize visibility through calculation of visual range v_r (km) using the Koschmieder equation. And finally, the b_{ext} has one of the most spatially and temporally comprehensive observational data sets available. Comparisons have been made between the actual b_{ext} observed at over 185 stations in the eastern half of the U.S. with those simulated by the model for a 5-day period from July 12-16, 1995. Initial results of the evaluation are encouraging as most simulated light-extinction coefficients are within a factor of two of the observed values and correlations between the two variables exceed 0.50. (Brian Eder, 919 541 3994)

19. Combining Air Pollution Models with Census Data for Human Exposure Studies. As part of the Models-3 program, the U.S. Census population data were applied to grid cells of 1.33 km, 4 km and 12 km centered on the city of Philadelphia, PA, to estimate population exposure to model-derived pollutant concentrations in each cell. Maps of census tracts and population data were obtained via the Internet. Grid maps applicable to Models-3 were generated by ARC/INFO and aligned to census tract maps. Using GIS procedures, population values were assigned to each overlaid grid cell, and as a first step, the variations of population between cells of different size were determined to find an optimum size for population exposure study. Preliminary results show 4-km cells with greater population discrimination in urban areas of Philadelphia than12-km cells, indicating a Models-3 output of concentrations on a 4-km grid would be more valuable for population exposure. Work continues on testing sensitivity of 1.33-km grid population values as compared to 4-km values. (Larry Truppi, 919 541 1340)

Idaho Falls

20. Central California Ozone Study (CCOS). After much planning and preparation, Jerry Crescenti, Shane Beard, and Tom Strong departed Idaho Falls on May 15 for California to deploy nine meteorological towers and an array of ground-based remote sensors consisting of a 915-MHZ radar wind profiler, a Doppler sodar and a radio acoustic sounding system (RASS). This four-month field study begins on June 1, 2000 and ends on September 30, 2000. Measurements include wind speed and wind direction, air temperature, and relative humidity. These data are recorded as 5-min averages and are now being transmitted to FRD several times per day via phone lines for quality control (QC) screening and distribution to CCOS principle investigators. The 915-MHZ radar wind profiler, radio acoustic sounding system (RASS), and Radian 600PA phased-array Doppler sodar was deployed on the Carizzo Plain (the middle of nowhere). Wind profiles acquired by the radar and sodar are being acquired as one-hour averages while temperature profiles obtained from the RASS are reported once per hour as 5-min averages. These data are also be transmitted to FRD for QC screening and availability to the CCOS community. (jerry.crescenti@noaa.gov, Randy Johnson, Shane Beard, and Tom Strong)

21. Vertical Transport and Mixing Experiment 2000 (VTMX-CBNP 2000). Preparation for the extensive VTMX-CBNP 2000 experiment in Salt Lake City is well underway. The current participation level calls for the involvement of nearly all FRD personnel.

Work has begun on bringing the real-time SF_6 analyzers out of cold standby mode for use this fall. In addition, work has begun to simplify the installation of the analyzers by making them lighter and more portable. Forty of the FRD SF_6 programmable samplers will be modified to accommodate capillary absorption tube samplers (CATS) to sample perflourocarbon tracers (PFTs) that will be used during VTMX. In conjunction with the preparation for this modification, the FRD office, laboratory, and warehouse were sampled for PFT contamination. It was discovered that the contamination level in some cases is 10,000 times background. We believe that we have discovered the sources of the contamination

and are working to eliminate them. (kirk.clawson@noaa.gov, Roger Carter, James Angell, and Randy Johnson)

22. Extreme Turbulence (ET) Probe. Under this project, we propose to develop and deploy an innovative Extreme Turbulence (ET) probe for acquiring surface-based turbulent heat and momentum flux in hurricane-force wind and rain conditions. Development of the ET Probe proposal requires fabrication of the probe housing and how it should be ported for optimum performance. During May, tooling was developed to manufacture the probe shells from fiber-composites.

The main design constraint is that a sufficient number of pressure ports must lie within about 60 degrees of the flow stagnation point to allow the computation of both the stagnation point's location and the dynamic pressure. There is, of course, also a desire to minimize costs by keeping the number of pressure sensors to a minimum. The chosen design calls for rings of pressure ports at three "latitudes" on the ET sphere. Within each ring, the ports would be spaced at 36 degree "longitude" intervals. (tim.crawford@noaa.gov, Jerry Crescenti, Randy Johnson, and Ron Dobosy)

23. Sagebrush Steppe Ecosystem Year-round Flux Site. Work continues on the flux site established to continuously measure year-round fluxes of carbon dioxide and water vapor on a sagebrush steppe ecosystem. The source of data spikes was discovered and programs were written to eliminate the errors. Next month a visit is planned from a botanist from Idaho State University who has been studying the productivity of the ecosystem. These data will be correlated with the fluxes obtained from the FRD eddy correlation system and the USDA Bowen Ratio system. (kirk.clawson@noaa.gov)

24. INEEL Mesoscale Modeling. Through much of May, semiautomated MM5 mesoscale forecasts of the INEEL region were run on the Compaq Alpha workstation at FRD. These were initialized from the 0600 UTC runs of the Eta model, available from the National Centers for Environmental Prediction (NCEP). It was noticed fairly quickly that the forecast afternoon winds near INEEL were frequently too light in comparison to the observations from FRD's tower network. This appears to be caused by the ground being too wet in the model. The high soil moisture reduces both the development of orographic winds and the downward mixing of momentum from aloft. In the MM5 configuration currently being used, the soil moisture is initialized from the Eta model's output. The Eta volumetric soil moisture in Southeast Idaho was ranging from 0.20-0.35 m^3m^{-3} in the top 10 cm, which is close to field capacity for many soils. Additional simulations were performed using the RUC (Rapid Update Cycle) model for initialization rather than the Eta model. The soil moisture in Southeast Idaho from the RUC was only about half of that from the Eta. Additional investigation showed that the Eta soil moisture was systematically higher than the RUC soil moisture throughout much of North America. So far, no explanation has been found for the large soil moisture differences between the RUC and Eta models. (richard.eckman@noaa.gov)

Las Vegas

25. Los Alamos Fire Support. In addition to the activities summarized under **"Highlights"** above, a new version of the WindTraj code was developed to ingest NWS data for all the States and generate trajectory forecasts using these observation data. A database of the Continental U.S. NWS reporting stations with their locations for use with the code was obtained. Sample products for the Los Alamos, NM, region were produced using ArcView. (Walt Schalk, 702 295 1262)

26. DOE Meteorological Coordinating Council (DMCC). A report on the Meteorological Topical Committee was prepared for publication in the DOE document, The Standards Forum, in June. This

report announces the approval of a new meteorological voluntary consensus standard (VCS), ANS/ANSI-3.11 (2000), entitled "American National Standard for Determining Meteorological Information at Nuclear Facilities". This new VCS was initiated in 1996 by a 30-member working group of subject matter experts in the atmospheric sciences as a comprehensive meteorological data monitoring standard under the auspices of the American Nuclear Society. With the commitment to use ANS-3.11, DOE meteorological programs will be based on a technical standard.

Much coordination and agenda development was necessary, in preparation for an OFCM-sponsored conference, organized by the Joint Action Group on Atmospheric Turbulence and Diffusion (D. Randerson, Chairman). The agenda was finalized and arrangements were made to support the June conference entitled "Workshop on Multi-scale Atmospheric Dispersion Modeling Within the Federal Community". (Darryl Randerson, 702 295 1231)