NOAA Air Resources Laboratory
Quarterly Activity Report
FY2012 Quarter 1
(October – December, 2011)

Contents

DISPERSION AND BOUNDARY LAYER

1. Updates made to READY for the Fukishima Daiichi nuclear power plant accident

The Real-time Environmental Applications and Display sYstem (READY) web site now allows a user to run the HYSPLIT atmospheric dispersion model with a default source term, or one modified by the web user, for the Fukushima Daiichi nuclear power plant accident. http://ready.arl.noaa.gov/READY_fdnpp.php The user has the choice of viewing the dispersion model simulation results on a global 1 degree horizontal resolution concentration grid or a local scale (over Japan) 0.05 degree horizontal resolution concentration grid. After the procedure is run, a time-series plot of modeled concentrations at any location chosen by the user is displayed along with a three-dimensional plot showing the concentration at the receptor location on one axis versus the concentration contribution from each 6-hour source along the other axis. The user can then display a time-series plot, for that location, of air concentrations for each 6-hour emission period that contributed to that location for any chosen averaging period. Finally, a map of air concentrations can be created and displayed for the averaging period selected by the user.

The READY web site illustrates how ARL's techniques, described in a paper by Roland Draxler and Glenn Rolph titled: "Evaluation of the Transfer Coefficient Matrix (TCM) Approach to Model the Atmospheric Radionuclide Air Concentrations from Fukushima," can be used to quickly calculate pollutant plumes and the resulting air concentrations and depositions when the user is presented with changing source term information during an emergency event. By creating a new grid of "dispersion factors" every 6 hours during an event using a unit-less source term, air concentrations and depositions can easily be recalculated as more detailed source information becomes available. The impetus for the development of these products was generated in response to questions encountered in the federal response to the Fukushima disaster and the need to be better prepared for future foreign and domestic incidents. Glenn.Rolph@noaa.gov

2. DCNet

Atmospheric Turbulence and Diffusion Division (ATDD) researchers, Chris Vogel and Will Pendergrass prepared a manuscript describing the acquisition and analyses of mean vertical wind profiles from the DCNet station located on the rooftop of the Department of Energy's Headquarters building in Washington, DC. Additional measurements collected included mean and turbulence meteorological data from a tower 7 meters above the rooftop. A primary result of the study was that the measurements showed evidence of significant deviations from the relatively few existing parameterizations that describe wind profiles close to the top of urban canopies. The results are reported in a paper entitled Turbulent Wind Profiles in an Urban Roughness Sublayer that has been submitted for publication to the journal *Boundary-Layer Meteorology*. chris.vogel@noaa.gov, W. Pendergrass

3. Collaboration with Duke Energy

Work began on a real-time data display system for a tethersonde system. Tethersondes are cabled balloon systems which have instrument packages attached, and which can be raised or lowered to investigate meteorological quantities at particular heights. This will allow the measurement of vertical profiles of wind speed and direction, temperature and humidity, for field studies slated for spring of 2012. A self-contained laptop computer is being configured to acquire and display real-time tethersonde data with an additional option to allow these data to be displayed on the web. simone.klemenz@noaa.gov, E. Dumas, R. White, C. Vogel, W. Pendergrass

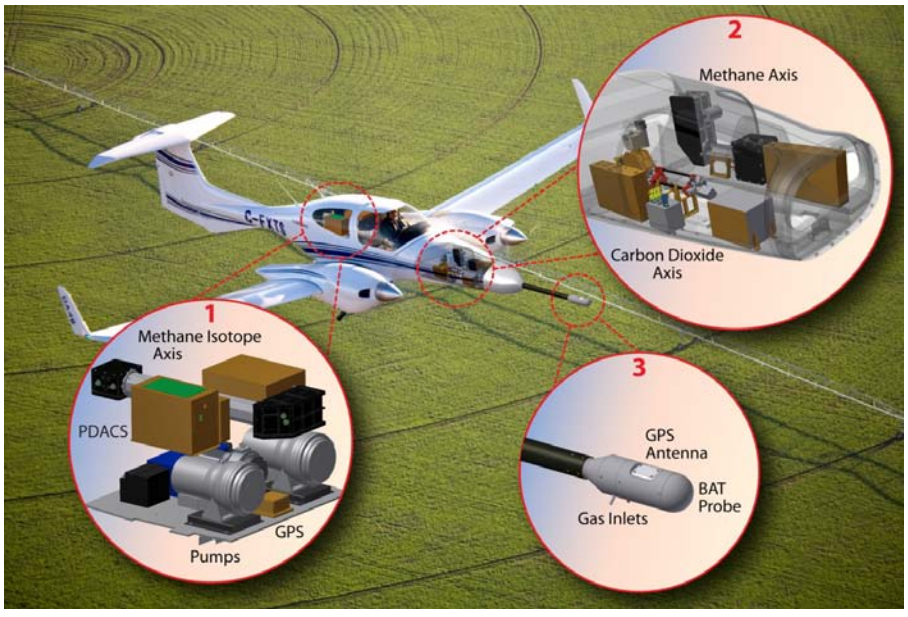
Analyses were conducted on high frequency wind data from the 2010 turbulent flow studies in the vicinity of the Ocotillo, (TX) wind turbine array. The focus was on determining the dominant scales of turbulence impacting the array. The three components of the wind as well as temperature were sampled continuously at 32 Hz over several months. The raw data were post processed and spectral analyses were employed to attempt to determine the dominant scales (from an energy perspective) within the flow. Particular attention was devoted to understanding the intricacies of wavelet analyses and their application in addressing evolving (i.e., non steady-state) turbulent flows. The results are to be presented at the American Meteorological Society's Annual Meeting in New Orleans, LA, on January 25, 2011. chris.vogel@noaa.gov, W. Pendergrass

D.L. Senn designed a lightweight tethersonde battery power supply for ozone sensors. It is designed to provide 12V at 400 mA for a minimum of two hours. A further design constraint is that the power supply and batteries cannot weigh more that 300 g. The design has not been prototyped, but is expected to weigh 120 g, and provide power for three hours. d.l.senn@noaa.gov, W. Pendergrass

D.L. Senn designed an AC backup power supply for a solar powered instrumentation installation at Ocotillo, TX. The system provides emergency backup in the event that a long series of overcast days depletes the charge in the sites' batteries. In such cases the AC power supply switches on to provide site power and slowly recharge the batteries. With adequate sunlight, the AC power is switched off. During normal operation, the system draws no AC power. d.l.senn@noaa.gov, W. Pendergrass

4. Best Aircraft Turbulence (BAT) Probe Collaboration with Harvard

ATDD worked with Harvard University's Anderson Group to develop a system to measure fluxes of methane isotopologues from an aircraft. The capability is part of the Flux Observations of Carbon from an Airborne Laboratory system being assembled by the Anderson Group and ATDD. The Anderson Group has plans to install their Integrated Cavity-Output Spectrometer system and ATDD's BAT probe on a light twin-engine DA-42 airplane operated by Aurora Flight Sciences, Inc. The system installation and preliminary flight testing is planned for early spring 2012. The BAT probe that will be installed has undergone characterization tests in the Massachusetts Institute of Technology's Wright Brothers Wind Tunnel. A proposal to the National Science Foundation for airborne measurement of methane isotopologues over Arctic-tundra lakes is in review. ed.Dumas@noaa.gov, R.J. Dobosy, D.L. Senn, C.B. Baker



5. Collaboration with NASA

An Interagency Nuclear Safety Review Panel-sponsored lessons-learned conference was held November 21-23, 2011, at Cape Canaveral, FL, to review the previous five-year safety review process for NASA's Mars Science Laboratory (MSL). ATDD's Will Pendergrass served as the chair of the Panel's Meteorology Working Group (MWG). The various subgroups presented an analysis of findings from the safety review and discussed a path forward for each group's support mission. A portion of Pendergrass' presentation discussed the MWG's use of the HYSPLIT model (version 4) to develop its safety evaluation. The primary discussion centered on re-evaluation of predicted Plutonium oxide particulate levels and population dose. The MWG path forward included maintaining the current model capability with HYSPLIT, coupling predicted dose levels with population densities to be supplied by the Biological Effects Working Group.

Based on his experience with the MSL Mission safety review, Pendergrass participated as the meteorological liaison for the various meteorological groups supporting the launch of the MSL spacecraft on November 25, 2011. While DOE's National Atmospheric Release Advisory Center maintained the direct atmospheric transport and dispersion for the MSL spacecraft launch, long range transport relied on integration of the HYSPLIT model and various NCEP forecast products. During the 24-hour period leading to the launch, Pendergrass reviewed possible accident scenarios, predicted population impacts, and provided insight to outcomes developed from the safety review. will.pendergrass@noaa.gov

6. High Performance Computing

Danny George, a graduate student at Boise State University, began his work on implementation of the Graphics Processing Unit (GPU) computing for HYSPLIT. Danny reported progress in identifying the sections of code where GPU computing would be of greatest benefit, but it was a slow process since many of the computations are done by subprograms. He anticipates having a more in-depth interim report on progress by mid-January. Dennis.Finn@noaa.gov

7. Tracer Data for the Dust Transport Research

The tracer datasets for the September field experiments of the dust transport research were reviewed. A final, quality-checked database for that period was provided to the collaborators: the Desert Research Institute and the Pacific Northwest National Laboratory. It isn't clear whether there will be a third set of field measurements to follow in 2012. Roger.Carter@noaa.gov

8. Extreme Turbulence (ET) Probe

A single ET probe was deployed in the Florida Keys from late August until mid November. While no hurricanes hit the Keys this season, there were periods of stronger winds. Based on experience in previous years, an additional solar panel had been added to the system. The panels were successful with the exception of when an extended period of cloudiness in October caused the batteries to go low. This led to a temporarily shut down of the system for part of a day. When the sun came out later in the day, the batteries were recharged enough to restart the system. This was the first time since the probe was deployed that the system shut down due to low power. The probe was retrieved by Field Research Division scientists in November.

Also, a prototype for an improved ET Probe data acquisition board was developed and successfully bench tested. It uses low cost, low power microcontrollers with integrated analog to digital converters. The prototype draws only 6 milliamps at 3 volts. This board could provide significant cost

and power savings for future ET Probes or possibly allow for redundant data acquisition subsystems. Richard.Eckman@noaa.gov

9. High Resolution Rapid Refresh (HRRR) Project

FRD scientists found that the HRRR model still systematically under-predicts wind speeds in Southeastern Idaho. FRD already performs Weather Research Forecasting (WRF) model runs locally, using a 4 km grid spacing, and these forecasts do not under-predict the wind speeds as much as the HRRR model. Given that the HRRR model is a version of the WRF model and is configured similarly to the local WRF runs at FRD, it is not entirely clear what is causing the under-predictions. Preliminary comparisons of the HRRR winds with the Wind Forecast Improvement Project (WFIP) observations in Texas suggest the model may be over-predicting the winds in that region. This suggests the model wind forecast skill varies substantially in different parts of the country. Richard.Eckman@noaa.gov

10. NOAA/DOE Wind Forecast Improvement Project

FRD scientists conducted two maintenance visits of the three Wind Forecast Improvement Project (WFIP) sites in Texas. There were some minor maintenance or communications issues to resolve but, overall, high-quality radar, sodar, and sonic data sets from all 3 sites were reliably retrieved and forwarded to the Earth System Research Laboratory on the requisite hourly basis throughout the quarter.

Also, initial steps were taken to collaborate with ATDD on their Duke Energy Ocotillo Wind Farm project in Texas for estimating hub height winds based upon surface fluxes. The FRD WFIP project area is a relatively short distance east of the Ocotillo Wind Farm and WFIP data could augment the database for that study. Sonic and sodar data sets for the WFIP Jayton site were provided to ATDD for processing. Results of this initial analysis were anticipated early in the next quarter and then additional data sets would follow. Dennis.Finn@noaa.gov

11. Experiment Support on the Nevada National Security Site (NNSS)

Special Operations and Research Division (SORD) scientists and technicians provided specific and specialized weather forecasts, surveillance, and data to Lawrence Livermore and Sandia National Laboratory scientists for a non-proliferation experiment conducted on the Nevada National Security Site. One data requirement was to obtain a vertical profile of the atmosphere using a GPS radiosonde. The balloon launch was conducted using SORD's mobile radiosonde capability where the balloon was inflated using a sheath similar to the NOAA National Severe Storms Laboratory's design. The radiosonde collected data up to a height slightly above 110,000 feet at about 6.9 millibars before the balloon burst. This is one of the highest launches using SORD's mobile system. Specific concerns during this experiment were high wind speeds and lightning. walter.w.schalk@noaa.gov

12. Consequence Assessment for the NNSS

SORD participated in a preparatory emergency response drill and a full scale emergency response exercise at the Nevada National Security Site (NNSS). SORD provided weather data and forecasts to be used in the simulated emergency event. In addition, consequence assessment plume projections were calculated, distributed, and explained to emergency response personnel. SORD also provided real weather updates and advice as the result of a fast moving front dropping into the area which brought very high winds and cooler temperatures. Winds shifted direction and within 30 minutes went from an average of 5 knots to 20 knots, and in another 5 hours peaked at 57.7 knots (66 mph) average wind speed with a 3 sec gust of 76.4 knots (88 mph). Average wind speeds in some locations

remained above 30 mph for 36 hours. The exercise was ended a little ahead of schedule for safety reasons due to the significant change in weather. walter.w.schalk@noaa.gov

13. SODAR Wind Profiling System
SORD received a new high quality SODAR Wind Profiling System in December. SORD will work with the vendor to install the system and receive training. The SODAR will be used to provide wind information for consequence assessment activities, and it is anticipated that it will become a part of future boundary layer studies on the Nevada National Security Site. walter.w.schalk@noaa.gov

AIR QUALITY

14. ARL Hosts the 3rd International Workshop on Air Quality Forecasting and Research
The ARL Air Quality team hosted the 3rd International Workshop on Air Quality Forecasting and Research (IWAQFR) from November 29-December 1, at the Bolger Conference Center in Potomac, Maryland. Roughly 103 scientists from 17 countries participated. The IWAQFR was organized by ARL's Pius Lee and Rick Saylor, with major contributions from Ariel Stein (ARL/ERT) and scientists from the Earth System Research Laboratory and National Weather Service. The IWAQFR is sponsored by Environment Canada (EC), NOAA, and the World Meteorological Organization. A meeting summary article is under preparation for publication. Pius.Lee@noaa.gov

15. Great Lakes Restoration Initiative (GLRI)
ARL completed work on the first year of a multi-year GLRI modeling project funded through an Interagency Agreement with the Environmental Protection Agency (EPA). In this first year, a base-case estimate of the amount and source-attribution for atmospheric mercury deposition to the Great Lakes and their watersheds was developed. The final report for this work is available at: http://www.arl.noaa.gov/documents/reports/GLRI_FY2010_Atmospheric_Mercury_Final_Report_2011_Dec_16.pdf A PowerPoint file containing all the figures and tables from the report is available at: http://www.arl.noaa.gov/documents/reports/Figures_Tables_GLRI_NOAA_Atmos_Mercury_Report_Dec_16_2011.pptx

Key features of this work include: (a) a combination of Lagrangian and Eulerian modeling frameworks that allowed computationally efficient simulations over local to global length scales; (b) individual estimates of Great Lakes impact for every inventoried mercury source; (c) utilization of an irregular receptor-oriented "grid" obviating the approximations involved in the post-process step of ascribing portions of regular-gridded deposition to receptors of interest. Illustrative examples were developed showing the dramatic differences in Great Lakes impacts from sources in different parts of the world; e.g., a typical coal-fired power plant near the Great Lakes was estimated to contribute more than 100x the mercury – for the same emissions – as a comparable facility in China. A key finding of this work is that regional, national, and global mercury emissions are all important contributors to mercury deposition in the Great Lakes Basin, with varying relative source attribution patterns. The largest U.S. contribution was for Lake Erie, representing approximately 50% of the modeled deposition. Country-specific estimates were also produced; e.g., total deposition to the Great Lakes basin from U.S. emissions was estimated to be approximately 3 times the deposition resulting from Chinese mercury emissions. Due to their relative proximity to the lakes, local and regional sources have disproportionately much greater atmospheric deposition contributions than their emissions, as a fraction of total global mercury emissions, would suggest. Despite numerous uncertainties in

model input data and other modeling aspects, the model results were found to be reasonably consistent with measurements in the Great Lakes region. The 2nd year of the multi-year project involves carrying out detailed sensitivity analyses to examine the influence of uncertainties. mark.cohen@noaa.gov

16. Collaboration with University of Maryland

In follow-up to the comparison study conducted August-September 2011, Winston Luke delivered a data set of ambient nitrogen oxide concentrations measured at the Beltsville, MD CASTNet (Clean Air Status and Trends Network) site, to scientists at the University of Maryland (UMD) and Los Gatos Research, Inc (LGR). The study was designed to compare ground-based measurements of NO_2 made with a prototype cavity ring down spectrometer from the UMD/LGR with chemiluminescence measurements made by ARL. The data will be used to assess the performance of the prototype device. Winston.Luke@noaa.gov

17. National Atmospheric Deposition Program

Steve Brooks coordinated with the National Atmosphere Deposition Program (NADP), the Atmospheric Integrated Research Monitoring Network (AIRMoN), and the Mercury Deposition Network (MDN) to conduct site inspections at the air quality monitoring site in Canaan Valley, WV. The site passed the inspections with no major problems identified. steve.brooks@noaa.gov

18. Reanalysis of the atmospheric mercury dataset from the initial GEOTRACES cruise

Steve Brooks worked with other collaborators on a re-analysis of the mercury datasets from the GEOTRACES study. GEOTRACES is an international program that includes NOAA and the National Science Foundation, of ocean cruises over several years to determine global ocean distributions of selected trace elements, including their concentration, chemical speciation, and physical form. These data are then use to evaluate the sources, sinks, and internal cycling of these species, and thereby characterize more completely marine physical, chemical and biological processes. ARL provided atmospheric mercury sensors and guidance to the first cruise that ended in November 2010. The mercury dataset showed gaseous elemental mercury averaging close to its southern hemispheric background of ~1.2 ng m-3, and reactive gaseous mercury averaging an unremarkable ~7 pg m-3 with unexplained episodic enhancements. While the mercury datasets from the first cruise were analyzed, they were only recently merged with other datasets of other groups and reanalyzed. An unexpected correlation between reactive gaseous mercury and functional chlorophyll has been revealed. Results suggest that either biological activity in the open ocean produces Hg(II), possibly from demeythlation processes, or, that the nutrient or upwelling conditions that promote biological activity are a source of reactive gaseous mercury precursors to the near-surface air. This appears to be a new, albeit unexplained, discovery. Steve.Brooks@noaa.gov

19. Ammonia Air-Surface Exchange Studies

ARL/ATDD began laboratory testing on its new ammonia analyzer, which uses cavity ring-down spectroscopy. After satisfactory laboratory testing, the analyzer will be deployed locally for extensive field testing to determine the best configuration for vertical gradient measurements.

In addition, ATDD began collaborations with scientists at the University of Illinois to develop a proposal to the National Science Foundation (NSF) for field experiments and modeling exercises to study ammonia emissions from fertilizer. latoya.myles@noaa.gov, S. Klemenz, and M.W. Heuer

CLIMATE

20. James Wang completes National Research Council (NRC) Senior Associateship
James Wang completed a one-year NRC Senior Associateship at ARL Headquarters. His research focused on understanding and constraining trends in tropical tropopause conditions, which has relevance for climate change detection, understanding stratospheric water vapor changes, and ozone chemistry. A manuscript reporting results will be submitted shortly to the Journal of Geophysical Research. He also began work on a study of the vertical profile of tropical temperature trends, motivated by a recent analysis suggesting that climate models may overestimate the vertical amplification of trends with height and thus climate sensitivity (associated with lapse rate feedback). James has accepted a position at NASA Goddard Space Flight Center to work on inverse modeling of the global carbon. Dian.Seidel@noaa.gov

21. Global Climate Observing System Reference Upper Air Network (GRUAN)
Dian Seidel (HQ) agreed to serve on the organizing committee for a June 2012 workshop to provide the scientific underpinnings of the eventual expansion of the Global Climate Observing System Reference Upper Air Network (GRUAN). GRUAN currently includes about a dozen stations, mainly in Northern Hemisphere mid-latitudes, concentrated in Europe. The complete network is envisioned to include about 30-40 stations, whose locations should be determined on the basis of both scientific and pragmatic considerations. The workshop will gather experts from across the spectrum of GRUAN data user groups to consolidate their requirements relevant research results. Dian.Seidel@noaa.gov

22. Climate Reference Networks (CRN and USRCRN)
ATDD conducted Regional Climate Reference Network (RCRN) annual site maintenance visits. Fences were installed at seven RCRN sites. Maintenance was also conducted at the Marshall, Colorado precipitation test site. An unscheduled maintenance visit to Tok Alaska was made to resolve issues with the methanol fuel cell. The problem was identified and the system was made fully operational. Annual maintenance was performed at all 17 Alabama RCRN sites. There was annual maintenance performed at CRN sites in FL, GA, SC, LA, MS, AL, AR.

Also, program updates were made to improve soil sensor measurements and also add five-minute measurements of additional variables at the CRN sites. These new versions are expected to be released in January. mark.e.hall@noaa.gov

Soil property data at the 115 USCRN sites are being processed and assessed by ATDD to evaluate the soil moisture and soil temperature measurements. Soil samples for the soil property data were collected during the site installations from March 2009 to August 2011 and have been analyzed by the US National Soil Survey Center (NSSC) in Lincoln, NE. For the purpose of the USCRN program, the important soil properties are: soil particle size, bulk density, water content at 33 kpa, and 1500 kpa, as well as cation exchange capacity, bases (Ca, Mg, Na & K), and pH. However, the datasets provided by NSSC have posed a challenge for ATDD to assess due to unnecessary space holders and different data formats for each of the files. tim.wilson@noaa.gov, E. Dumas

23. Collaboration with the University of Tennessee Space Institute
The University of Tennessee Space Institute (UTSI) Navajo aircraft was used to fly over the Crossville CRN site on October 6, 14, 21 and November 7 as part of the collaborative effort to collect measurements of surface temperature. The timing of each flight coincided with overpasses of the

TERRA and AQUA satellites. Data were prepared for presentation at the AGU meeting in December and for the upcoming AMS meeting in January.

In addition, the power system for the ground-based auxiliary tower was upgraded from one to three Sun Extender deep-cycle batteries wired in parallel to increase the capacity of the tower to operate during extended periods of low sunlight. A science meeting was held on November 16 to discuss future directions for the UTSI collaboration, including data reduction techniques and papers to be published as a result of the collaboration. ed.dumas@noaa.gov, P. Krishnan, J. Kochendorfer, T.P. Meyers, C.B. Baker

24. Surface Energy Budget Network (SEBN)

D. L. Senn provided a two-needle probe system for the SEBN site at Bondville, IL. The system consists of three two-needle probes from 30 East Sensors, one Campbell Scientific 23X data logger, and one ATDD Relay Board. The data logger and relay board were mounted in an enclosure. The probes were wired with the relay board switching the power for the probes heaters. The data collection program was downloaded to the data logger and the calibration constants for the probes used were entered into the program. The system was tested before being installed at the site. d.l.senn@noaa.gov

ARL 1st Quarter Publications

Published:

Krishnan, Praveena, Tilden P. Meyers, Russell L. Scott, Linda Kennedy, and Mark Heuer (2011) Energy exchange and evapotranspiration over two temperate semi-arid grasslands in North America. PUBLISHED ON-LINE: Agricultural and Forest Meteorology 10.1016/j.agrformet.2011.09.017.

Hicks, Bruce B., W. J. Callahan, W. R. Pendergrass III, and Ronald J. Dobosy (2011). Urban Turbulence in Space and in Time. PUBLISHED ON-LINE in the Journal of Applied Meteorology and Climatology, 10.1175/jamc-d-11-015.1.

Schmeltz, David, David C. Evers , Charles T. Driscoll, Richard Artz, Mark Cohen, David Gay, Richard Haeuber, David P. Krabbenhoft, Robert Mason, Kristi Morris, and James G. Wiener (2011) MercNet: a national monitoring network to assess responses to changing mercury emissions in the United States. Ecotoxicology Volume 20, Number 7, 1713-1725, DOI: 10.1007/s10646-011-0756-4

Rasmussen, Roy, Bruce Baker, John Kochendorfer, Tilden Meyers, Scott Landolt, Alexandre P. Fischer, Jenny Black, Julie Theriault, Paul Kucera, David Gochis, Craig Smith, Rodica Nitu, Mark Hall, Steve Cristanelli, and Ethan Gutmann (2011). The NOAA/FAA/NCAR Winter Precipitation Test Bed: How Well Are We Measuring Snow? PUBLISHED ON-LINE in the Bulletin of the American Meteorological Society. doi: 10.1175/BAMS-D-11-00052.1

Myles, LaToya, Mark W. Heuer, Tilden P. Meyers, Zakiya J. Hoyett (2011) A comparison of observed and parameterized SO2dry deposition over a grassy clearing in Duke Forest. PUBLISHED ON-LIN in Atmospheric Environment doi:10.1016/j.atmosenv.2011.11.059.

Tong, Daniel, Pius Lee, and Rick D. Saylor. New Directions: The need to develop process-based emission forecasting models. PUBLISHED ON-LINE in Atmospheric Environment 47, 560–561.

Xuhui Lee, Michael L. Goulden, David Y. Hollinger, Alan Barr, T. Andrew Black, Gil Bohrer, Rosvel Bracho, Bert Drake, Allen Goldstein, Lianhong Gu, Gabriel Katul, Thomas Kolb, Beverly E. Law, Hank Margolis, Tilden Meyers, Russell Monson, William Munger, Ram Oren, Kyaw Tha Paw U, Andrew D. Richardson, Hans Peter Schmid, Ralf Staebler, Steven Wofsy & Lei Zhao (2011). "Observed increase in local cooling effect of deforestation at higher latitudes." Nature 479(7373): 384-387.

Bing Chen, Ariel F. Stein, Nuria Castell, J.D. de la Rosa, A.M. Sanchez de la Campa, Yolanda Gonzalez-Castanedo, Roland R. Draxler. Modeling and surface observations of arsenic dispersion from a large Cu-smelter in southwestern Europe. PUBLISHED ON-LINE in Atmospheric Environment. doi:10.1016/j.atmosenv.2011.12.014.

Zhang, Yehui, Dian J. Seidel, Jean-Christophe Golaz, Clara Deser, Robert A. Tomas, 2011: Climatological Characteristics of Arctic and Antarctic Surface-Based Inversions. J. Climate, 24, 5167–5186.

Malm WC, Schichtel BA, Pitchford ML. 2011. Uncertainties in PM(2.5) Gravimetric and Speciation Measurements and What We Can Learn from Them. Journal of the Air & Waste Management Association 61(11):1131-1149. doi:10.1080/10473289.2011.603998

Conference Presentations

Rick Saylor attended the 30th Annual Conference of the American Association for Aerosol Research in Orlando, FL, from October 3-7. He co-chaired a platform session on Urban Aerosols and presented a paper entitled "Identifying the Causes of Seasonal Biases of PM2.5 Concentrations in CMAQ Simulations." The presentation summarized recent work by the ARL air quality modeling group designed to better understand the underlying reasons for biases observed in PM2.5 forecasts from the National Weather Service's National Air Quality Forecasting Capability (NAQFC). Rick.Saylor@noaa.gov

Pius Lee (HQ) and Rick Saylor (ATDD) co-chaired a Special Session on Air Quality Modeling Applications at the 10th Annual Community Modeling & Analysis System Conference in Chapel Hill, NC, on October 24, 2011. The Special Session was held in memory of Dr. Daewon Byun, former ARL Air Quality Group Leader, who passed away last February. Dr. Byun's wife attended the session and was presented with a commemorative plaque for the occasion. In addition, nine papers were presented at the meeting that were authored or co-authored by members of the ARL air quality group. Pius.Lee@noaa.gov

ATDD scientists gave several presentations at the 2011 Fall Meeting of the American Geophysical Union Meeting in San Francisco, CA, December 5-9, 2011. Bruce.Baker@noaa.gov

Members of the ARL Climate Variability and Change team presented several posters at the World Climate Research Programme (WCRP) Open Science Conference "Climate Research in Service to Society," October 24-28, 2011 in Denver. Dian.Seidel@noaa.gov

Awards, Honors, Recognition

Roger Carter (FRD) was awarded his 20-year service award in December.

Outreach

Steve Brooks (ATDD) and Steve Storck (NOAA Office of Education), prepared and delivered a series of activities and climate presentations at the annual meeting of the West Virginia Science Teachers Association, November 4-6. The theme was "Meeting the Challenges of Climate Change."

Ron Dobosy, Ed Dumas and Dave Senn (ATDD) continue to give support to Madelyn Fahhoum for her science fair project to compare the performance of different wind turbine blade configurations. She has built a small scale model of a wind turbine utilizing an electric motor and instrumentation to measure the power produced by the turbine. She has used the ATDD wind tunnel to provide a calibrated wind stream while simultaneously measuring the drag force on the wind turbine, and the power output produced by the electric motor to measure the efficiency of the turbine.

Jason Rich (FRD) responded to "Ask a Scientist". The answer will be published in the local newspaper.

Randy White (ATDD) met with a local Boy Scout troop at the ATDD facility on November 12. His presentation focused on atmospheric conditions such as temperature, rain, and severe weather. He introduced the troop to a number of wind and weather instruments used at the laboratory. Following the presentation, the troop members toured the facility. They saw a local sample installation of the Climate Reference Network (USCRN) similar to those installed by ATDD throughout the United States. The troop members receive a weather badge for participating in these activities.

Randy White also met with Mrs. Lesley Miller's sixth grade science class at Vine Middle School in Knoxville, TN. The students were studying the earth's atmosphere, including wind, oceans, and weather. The students were encouraged to participate in science projects as well as the upcoming Southern Appalachian Science and Engineering Fair (SASEF) on March 26-29, 2012.

LaToya Myles (ATDD) visited Maxwell Park Elementary School in Oakland, CA to talk with students about environmental science, her career, and NOAA. Some of the students had studied air quality and recently completed a simple experiment to measure particles in the air outside their classroom. They were eager to learn how NOAA scientists conduct air quality measurements. Her visit was a part of the Science, Engineering, and Math (SEM) Link Math and Science Career Academy's initiative to expose youth to the diversity of Science, Technology, Engineering and Mathematics (STEM) disciplines by providing opportunities for them to meet and interact with STEM professionals. SEM Link, Inc. is a tax-exempt nonprofit organization that promotes student achievement and career exploration in math and science for K-12 students by connecting them with individuals who have backgrounds in science, engineering and mathematics. LaToya is co-chair of the SEM Link's Advisory Board. She also shared resources with the students and teachers that NOAA produces to promote environmental literacy and increase awareness of its work nationwide.

Latoya Myles was also a featured speaker at Beyond Alcorn: An Educational Forum at Alcorn State University in Mississippi. The forum featured six speakers representing various science, technology, engineering, and mathematics (STEM) careers. Her slide presentation highlighted current air quality research areas at NOAA/ARL/ATDD as well as her professional journey from NOAA Graduate Sciences

fellow to her current position at ATDD. Students were particularly interested in learning how air quality is determined and what instruments are used to make different air chemistry measurements. Several students were familiar with NOAA's weather forecasting and hurricane work, but were unaware that NOAA was also involved in air chemistry research.