



NOAA Air Resources Laboratory Quarterly Activity Report



(April 2008 – June 2008)

Contents

Highlights

1. *USDA Ammonia Flux Experiment*
2. *IMPROVE Project – Ammonium Nitrate*

Air Resources Laboratory - Headquarters

3. *Historical Climatology Network Modernization (HCN-M)*
4. *Workshop on Future Directions in Science and Security*
5. *Columbia University Lecture*
6. *Stratospheric Temperature Trends Study*
7. *GCOS Reference Upper-Air Network*
8. *Manuscripts*

Atmospheric Turbulence and Diffusion Division

9. *U.S. Climate Reference Network*

Field Research Division

10. *Fast Response Analyzer Data System Upgrade*
11. *Low Cost Tracer Detector*
12. *EPA Roadway Toxics Tracer Study*
13. *INL Weather Page*

Special Operations and Research Division

14. *EPA's Particulate Matter (PM) Integrated Science Assessment*
15. *Consequence Assessment*
16. *Federal Emergency Response Organization Support*
17. *DOE Meteorological Coordinating Council (DMCC)*
18. *Air Permit Modeling*
19. *GoogleEarth*
20. *Test-Readiness/Sub-Critical Tests*
21. *ARL Directors' Meeting*

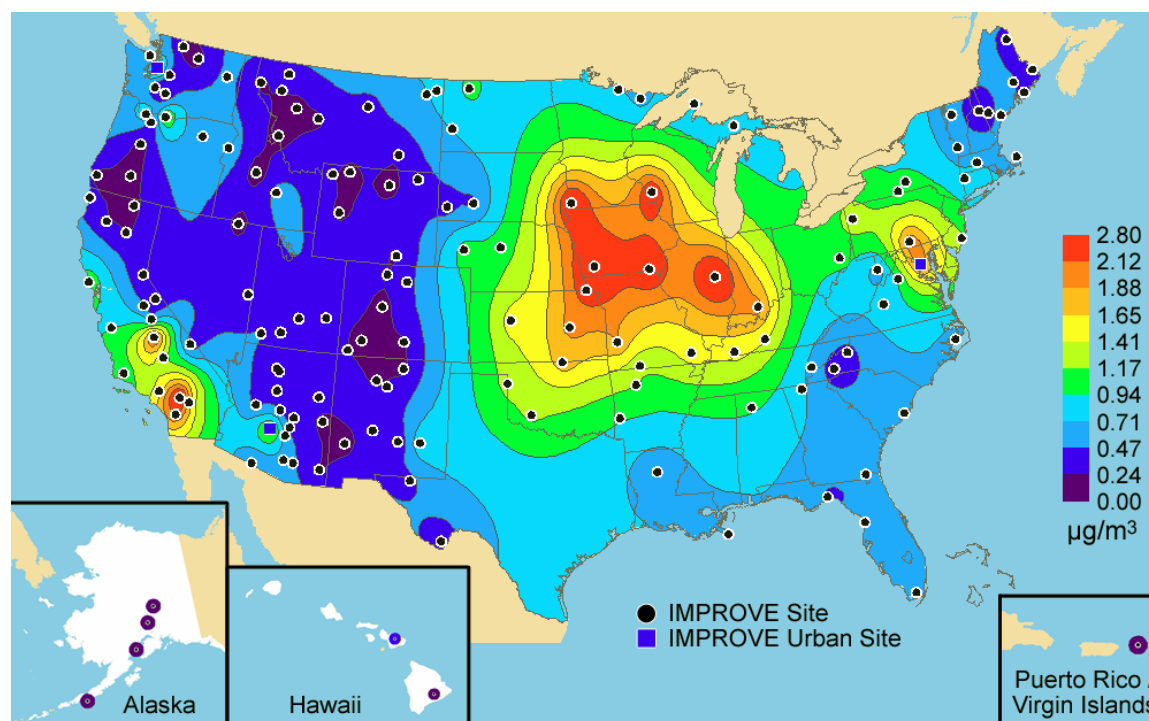
Highlights

1. *USDA Ammonia Flux Experiment.* The final phase of the U.S. Department of Agriculture (USDA) Ammonia Flux Experiment was conducted from June 23 to July 2, 2008 at the Blackwood Division of Duke Forest, NC. The experiment was a joint effort among North Carolina State University, U.S. EPA, and NOAA. Participants from ATDD included Tilden Meyers, LaToya Myles, Simone Klemenz, and Mark Heuer. In addition, a NOAA EPP Undergraduate Scholar, Zakiya Hoyett, used this experiment as her summer internship experience.

The sampling site at Blackwood Division was rolling grassland surrounded by a predominately pine and hardwood forest. The site was co-located with a U.S. Climate Reference Network (USCRN) station ([NC Durham 11 W](#)) and with on-going Duke University research.

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2. IMPROVE Project – Ammonium Nitrate. A paper titled “Characterization of the Winter Midwestern Particulate Nitrate Bulge” was presented at the Air and Waste Management Association’s Aerosol and Atmospheric Optics Conference in Moab, UT April 29 – May 2, 2008. The paper showed that ammonium nitrate is the dominate aerosol species and the primary contributor to regional haze in the winter over a multi-state region centered on Iowa (see figure below). Prior to the expansion of the IMPROVE (Interagency Monitoring Of Protected Visual Environments) particle speciation network a few years ago to rural locations in the Midwestern U.S., particulate nitrate was thought to be a major contributor to ambient aerosol only in California. The likely cause of the Midwestern winter nitrate is the high regional emissions of ammonia associated with agriculture, especially confined animal feeding operations. marc.pitchford@noaa.gov



Air Resources Laboratory – Headquarters

3. Historical Climatology Network Modernization (HCN-M). The modernization program for the Historical Climatology Network (HCN-M) is identifying sites for its first deployment. Mark Hall, lead engineer for the CRN and HCN-M technical team attended a meeting in Cincinnati, OH in early April to discuss the site survey process. Information at that meeting was used by State climatologists to formulate the site survey procedures and criteria.

At this time, several candidate sites have been surveyed and a total of nine sites have been selected through a voting process established with the National Weather Service, the National Environmental

Satellite Data and Information Service, and the Office of Atmospheric Research (OAR). Rick Artz serves as the OAR voting member. ARL/ATDD installation teams are scheduled to be in the field by the end of September to commence installation at the selected sites. richard.artz@noaa.gov

4. *Workshop on Future Directions in Science and Security.* Dian Seidel participated in a multi-disciplinary workshop on April 9 at the National Academies addressing the future of science and security. The workshop was co-sponsored by the Academies' Committee on Scientific Communication and National Security and by the Project on National Security Reform, a non-partisan initiative designed to improve the U.S. Government's ability to effectively provide for the nation's security in the 21st Century. The focus of the day was an effort to forecast significant scientific and technological developments over the next 50 years that could have implications for U.S. national security. dian.seidel@noaa.gov

5. *Columbia University Lecture.* Dian Seidel presented a lecture on "Observed Recent Tropopause Changes and Relation to Tropical Widening" to students and faculty in the Joint Program in Applied Mathematics and Earth & Environmental Sciences at Columbia University on April 24, 2008. dian.seidel@noaa.gov

6. *Stratospheric Temperature Trends Study.* A multi-year assessment of observed trends in stratospheric temperature, sponsored by the Stratospheric Processes and their Role in Climate (SPARC) program, has resulted in a review paper, recently submitted to *J. Geophys. Res.* This collaborative effort involved colleagues from France, U.K., U.S., Japan, and Germany, and NOAA scientists from the Air Resources Laboratory, Geophysical Fluid Dynamics Laboratory, and the National Weather Service. Radiosonde datasets from ARL figure prominently in the intercomparison of trends and time series from a variety of observing systems. (Randel, W.J., K.P. Shine, J. Austin, J. Barnett, C. Claud, N.P. Gillett., P. Keckhut, U. Langematz, R. Lin, C. Long, C. Mears, A. Miller, J. Nash, D.J. Seidel, D.W.J. Thompson, F. Wu and S. Yoden, An update of observed stratospheric temperature trends. Submitted to *J. Geophys. Res.*) dian.seidel@noaa.gov

7. *GCOS Reference Upper-Air Network.* Following the February 2008 workshop on the Global Climate Observing System (GCOS) Reference Upper-Air Network (GRUAN) and the establishment of the Lindenberg (Germany) Observatory as the GRUAN Lead Centre, several GRUAN milestones have been achieved. New terms of reference have been written for the GRUAN oversight body, the Working Group on Atmospheric Reference Observations under the GCOS Atmospheric Observing Panel for Climate. Dian Seidel has been asked to serve on the working group. In addition, a paper has been submitted to the Bulletin of the American Meteorological Society describing the rationale and plans for GRUAN to a general audience. (Seidel, D. J., F. H. Berger, H. Diamond, J. Dykema, D. Goodrich, F. Immler, W. Murray, T. Peterson, D. Sisterson, M. Sommer, P. Thorne, H. Vömel, J. Wang, Reference upper-air observations for climate: Rationale, progress, and plans. Submitted to *Bull. Amer. Meteorol. Soc.*) dian.seidel@noaa.gov

8. *Manuscripts.* A paper comparing the effect of volcanic eruptions on temperatures in GCMs (general circulation models) and radiosonde observations by Melissa Free and John Lanzante was submitted to the Journal of Climate in April.

A revised draft of a paper entitled “Ground-based observations of slowdown in ozone decline and onset of ozone increase” by Jim Angell and Melissa Free was submitted for internal review. melissa.free@noaa.gov

Atmospheric Turbulence and Diffusion Division

9. U.S. Climate Reference Network. The Climate Reference Network’s (CRN) deployment in the continental US is nearing completion on schedule. Sites were installed during this third quarter (Q3) at Fallbrook, CA; Bodega, CA; Williams, AZ and Denio NV. The final four will be installed next quarter, in Montana, North Dakota, Oregon, and California, a total of 114 CRN sites. During Q3, 16 sites were visited for annual maintenance. This includes making photographs, checking calibration, updating software, and replacing instruments. Equipment was also removed from the National Weather Service’s two testbed sites at Johnstown, PA and Sterling, VA. Expansion of nearby airports required this removal. The sites had served to test and evaluate new precipitation gauges, wind shields, and other sensor configurations.

Plans to extend the U.S. Climate Reference Network (USCRN) to Alaska occupied NOAA's Alaska Climate Reference Network Workshop, May 21-23, 2008, in Anchorage. NOAA's National Climatic Data Center (NCDC) was the convener, in partnership with the Alaska-Region Headquarters of NOAA's National Weather Service (NWS). Will Pendergrass and Mark Hall attended along with other key stakeholders, including NWS units in Alaska, National Park Service, Environmental Protection Agency, U.S. Department of Agriculture, and the U.S. Geological Survey, as well as representatives from the Alaska State Climatologist, Alaska State Government, and Alaska-Native Organizations. The plan envisions 29 CRN sites in Alaska in the next few years. The workshop addressed the unique challenges for the USCRN program regarding site survey, power availability, data transmission, logistics, maintenance, project resources, snowfall measurements and cold region observing methodologies. Since the meeting, the Sand Point, AK site was surveyed and approved for installation sometime in the fall of 2008. tilden.meyers@noaa.gov

Field Research Division

10. Fast Response Analyzer Data System Upgrade. Completion of the data system upgrade is nearly complete with only labeling of the switches and connectors on the enclosures remaining. The systems have been assembled with new circuit boards and microcontrollers installed in the enclosure. Firmware has been installed, CompactFlash cards installed and tested, electronics and firmware debugged, and documentation for the system has been written. The labeling should be complete the end of this month and the data systems installed on the analyzers in preparation for the upcoming EPA project. roger.carter@noaa.gov, Randy Johnson, and Shane Beard

11. Low Cost Tracer Detector. A production version of the “X6” low cost detector has been completed and tested. Performance is similar to the experimental prototype, but not as good as was hoped. Current efforts are focusing on a design for circuit boards and field deployable enclosures and on power supplies for the detector. However, design of a complete analyzer has been stalled while waiting for components. Two analyzer designs are under consideration. One is to use a semipermeable membrane to reduce oxygen and water concentrations in the sample stream. However, the semipermeable membrane that was promised to arrive in mid May has not arrived yet.

It is now promised to arrive in early July. If the membrane does not work adequately, the second option is to use a more complicated hydrogen/oxygen reaction followed by a dryer to reduce the oxygen in the sample stream. Hopefully, testing will begin soon on the membrane option. roger.carter@noaa.gov, Randy Johnson, and Shane Beard

12. EPA Roadway Toxics Tracer Study. Discussions on the EPA Roadway Toxics Tracer Study with our colleagues in our sister division, Atmospheric Sciences and Modeling Division have been occurring on a bi-weekly basis this quarter. After much discussion about the unsuitability of the proposed Las Vegas test site for conducting a useful atmospheric tracer experiment, we proposed that the study be conducted here in Idaho near our office facility. We proposed using baled straw to construct a cheap imitation sound barrier from which we could then determine the dispersion characteristics. The data would be used to improve roadway dispersion modeling in AERMOD. The proposal was accepted and we are making plans to conduct the experiment at the INL sometime this coming autumn. However, planning and design work have taken a slow-track until the funding proposal actually arrives from EPA kirk.clawson@noaa.gov and Richard Eckman.

Work is underway on preparing the bag sampler tracer analysis facility for the pending roadway study. So far this has primarily involved the conditioning and tuning of the gas chromatographs for sulfur hexafluoride analysis, evaluating instrument limits of detection, checking for and replacing leaky bags as needed, and checking for degraded tubing. An inventory of calibration gases has been completed and inventories of other long lead time supplies that will be needed for the project are in process. dennis.finn@noaa.gov, Roger Carter, and Jason Rich

13. INL Weather Page. In-house testing of the new INL Weather Hazards Alert system has just about been completed. The new alert system will display the weather hazard on our NOAA/INL Weather Center (NIWC) home page in RSS format. It will also send an email to INL emergency planners, managers, and site workers of any potential weather hazard. The weather hazard will be designated as a statement or alert which is analogous to the NWS watch or warning. Implementation of the new system should begin in early July. jason.rich@noaa.gov and Neil Hukari

Special Operations and Research Division

14. EPA's Particulate Matter (PM) Integrated Science Assessment. Marc Pitchford participated in EPA's Particulate Matter (PM) Integrated Science Assessment (IAS) Authors Workshop at Research Triangle Park, NC (June 16-17), where a summary of a draft chapter on visibility effects of PM was presented. Completion of the PM IAS (12/09) is the first major milestone in the 5-year review process for the National Ambient Air Quality Standard (NAAQS). Urban visibility is being considered as the basis for a new secondary (welfare-based) PM NAAQS. marc.pitchford@noaa.gov

15. Consequence Assessment Continued training on the Department of Energy (DOE), National Nuclear Security Administration (NNSA), National Security Technologies, LLC, consequence assessment procedures and methods for the Nevada Site Office (NSO) and Nevada Test Site (NTS). The training included radiological and chemical scenarios that require event classification, protective action recommendations, dispersion model predictions, and graphical product development for

health physicists, industrial hygienists, incident commanders, safety advisors, and emergency managers. Participation in the emergency response quarterly drill presented an assessment on training to date. In addition, participation in meetings, tabletop drills, and venue-specific drills continue preparation for acceptance of complete responsibility in the fall. walter.w.schalk@noaa.gov

16. Federal Emergency Response Organization Support. Walt Schalk attended the Federal Radiological Monitoring and Assessment Center (FRMAC) Operations Working Group meeting at the Las Vegas Environmental Protection Agency (EPA) office. The meeting discussed issues pertaining to the FRMAC Operations Manuals that characterize the phases during a national response event. NOAA's role is to provide meteorological support and dispersion calculations. walter.w.schalk@noaa.gov

17. DOE Meteorological Coordinating Council (DMCC). Walt Schalk planned and chaired the DMCC meeting held during the DOE Emergency Management Issues/Special Interest Group meeting in Reston, VA on March 10-12. Walt led the meeting and presented "The DOE Meteorological Coordinating Council Perspective on the Application to Meteorological Software of DOE's Software Quality Assurance (SQA) Requirements." Operational meteorology issues and standards were discussed. walter.w.schalk@noaa.gov

18. Air Permit Modeling. Work continues on the air permit modeling support to National Nuclear Security Administration for the NTS. The atmospheric dispersion modeling system, AERMOD, was run with PM₁₀, SO₂, CO, NO_x, and VOC NTS source terms. Work is beginning on the Open Burn/Open detonation Model (OBODM). Meteorological inputs are being developed and requests for NTS source term information have been issued. Coordination with NSTec personnel continues. kip.smith@noaa.gov

19. GoogleEarth. The beta version of the capability to display the SORD MEteorological Data Acquisition Mesonet (MEDA) wind data on Google Earth continues to run. Comments and feedback are being collected for updates. james.sanders@noaa.gov

20. Test-Readiness/Sub-Critical Tests. A final planning meeting was held, and exercise weather graphics were generated to support the Under Ground Nuclear Testing Tabletop Exercise held in June. UGT Support Staff attended the exercise. walter.w.schalk@noaa.gov

21. ARL Directors' Meeting. A meeting of ARL Directors was hosted by SORD, on April 22-23. The directors and deputies discussed research priorities and approaches to increase collaboration among divisions. walter.w.schalk@noaa.gov