

## Aerosol Climate Research Featured in News Media

Aerosol-climate research being performed by Yun Qian, and a collaborator from ORNL, Dale Kaiser, was prominently featured in recent news media. This work was first highlighted by AGU and featured by *NewScientist* on December 14 as a leading news story in this issue. It was also featured by <http://www.elmediambient.net/noticias/not92596382.htm> and <http://noticias.uol.com.br/inovacao/ultimas/ult762u910.jhtm>. Yun and Dale determined a noticeable decline in the amount of sunshine reaching most of China, which is probably related to the effects of increased anthropogenic aerosol. The ramifications of this work are significant, as these conditions produce a cooling affect that influence water supplies, agricultural productivity, and human health.

## Visit to Aerodyne Research

Mike Holdren, Tony Wisbith, and Chet Spicer visited Aerodyne Research in January to discuss aerosol mass spectrometry results from joint work under a SERDP project dealing with emissions from munitions.

## DOE Atmospheric Science Program Strategic Planning Meeting

Rich Barchet, Chris Doran, Bob Hannigan, and Bill Pennell participated in a strategic planning meeting held

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### Newsletters Online

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Check out the latest edition of the Quarterly Newsletter of the ETV Advanced Monitoring Systems (AMS) Pilot, *The Monitor*, for additional information about EPA's Environmental Technology Verification Program and all 12 of its pilots on the World Wide Web at <http://www.epa.gov/etv> or you can go directly to the AMS pilot's information at [http://www.epa.gov/etv/07/07\\_main.htm](http://www.epa.gov/etv/07/07_main.htm).

January 7-8 at Lawrence Berkeley National Laboratory in Berkeley, California. Peter Lunn, ASP Program Manager, led the discussions of future field campaigns and the need for a larger aircraft to support ASP airborne research. Rich and Bob described features of aircraft at the Naval Research Laboratory and the Federal Aviation Administration that could possibly be used for this purpose.

## 10<sup>th</sup> U.S.-Japan Workshop on Global Climate Change: Climate and Water

Ruby Leung attended the 10th U.S.-Japan Workshop on Global Climate Change: Climate and Water from January 15-17 at the Beckman Center, Irvine, California. The workshop was held under the auspices of the U.S.-Japan Agreement on Cooperation in Research and Development in Science and Technology. Ruby was among 50 scientists (25 each from the U.S. and Japan) to participate in the workshop to explore the state of research and to identify areas for possible collaboration in the field of climate and water (see Presentations/Publications). She co-chaired a working group on "Applications of Climate Information to the Water Resource Sector."

## U.S. Environmental Protection Agency Workshop

Basil Coutant attended a U.S. EPA workshop on January 28 at Research Triangle Park, North Carolina. The workshop covered EPA's guidelines for uniform application of NOAA's Hybrid Single-Particle Lagrangian Integrated Trajectories (HYSPLIT) model and meteorological data handling in generating back trajectories. The HYSPLIT back trajectory model is a meteorological model for tracing air mass history, and is being used by EPA for locating pollution source regions in support of the particulate matter (PM) transport rule development.

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## **U.S. Environmental Protection Agency's 2003 National Air Quality Conference**

David Wendt and Steve Bortnick attended U.S. EPA's 2003 National Air Quality Conference from February 2-5 in San Antonio, Texas. At the conference they presented their work with U.S. EPA's Office of Air Quality Planning & Standards (OAQPS) and air quality stakeholders from Salt Lake City, Utah, and New York, New York. This work focuses on the development of statistical models to relate different measures of ambient particulate matter (PM<sub>2.5</sub>) for the purpose of near real-time public reporting of air quality within Metropolitan Statistical Areas (MSAs). They also met with stakeholders to begin plans for similar model development in other MSAs throughout the U.S.

## **Visit to PNNL by Dr. Hamish McGowan**

Dr. Hamish McGowan, Professor of Climatology in the Department of Geographical Sciences and Planning at the University of Queensland, in Brisbane, Australia, visited PNNL from February 3-19. He presented a seminar on February 13 entitled "Thermally Forced and Topographically Modified Airflow in Mountain and Desert Landscapes." Dave Whiteman was Hamish's host. Hamish completed several research papers while at PNNL and had fruitful technical discussions with PNNL boundary-layer meteorologists on inhomogeneous terrain meteorology and anti-wind systems during his stay.

## **AMS Short Course**

Dave Whiteman was an instructor at the American Meteorological Society's Short Course on Technical Writing of Scientific Publications and Proposals in Long Beach, California, on February 9. This short course, organized by Dr. Ed Andreas, was one of several courses taught during the weekend before the AMS's Annual Meeting. Although only 15 students attended, they gained useful information about writing scientific publications.

## **83rd AMS Annual Meeting**

Ruby Leung and Will Shaw attended the 83rd American Meteorological Society Annual Meeting in Long Beach, California, from February 10-13. Ruby gave two oral presentations at the 14th Symposium on Global Change and Climate Variations and the Symposium on Observing and Understanding the Variability of Water in Weather and Climate. Will presented three papers at the 12th Symposium on Meteorological Observations and Instrumentation. See Presentations/Publications.

## **ARM SGP Central Facility**

Chuck Long, Victor Morris, and Iliana Genkova traveled to the ARM SGP Central Facility from February 17-21 to deploy additional cloud-measuring instruments to be tested and assessed against the current instruments for the Cloudiness Inter-comparison Intensive Operational Period (IOP). Chuck installed a narrow field-of-view infrared thermometer (IRT) operated in scanning mode rather than in the fixed vertical orientation of the existing IRT and a second total sky imager (TSI) to work in tandem with the existing TSI to produce stereo, three-dimensional information about the clouds. Vic installed two additional microwave radiometers (MWR) to continuously scan in an orthogonal orientation to the existing MWR which operates in zenith line-of-sight mode. Iliana assisted Thierry Besnard of Universite du Maine, France in the installation of the Nephelo which uses a series of infrared detectors to yield estimates of fractional sky cover. They were accompanied by Joe Shaw of Montana State University and Ed Westwater of University of Colorado who installed an infrared cloud imager. The IOP will operate through mid-April.

## **Stefan Eisenbach's Visit to PNNL**

Stefan Eisenbach, a student visitor since September 2002, left PNNL to return to his studies at the University of Vienna, Austria, on February 20. Stefan and his fellow student, Mr. Bernhard Pospichal, worked with Dave Whiteman analyzing meteorological data on cold-air pools that formed in small basins in the Eastern Alps, using extensive data collected in an Austrian experiment that was run from October 2001 to June 2002. The student analyses covered basin outflows, turbulent erosion episodes, classification of cold pool events, inversion breakups and other topics. Special analyses were performed to determine differences in cold pool behavior in Austrian and western U.S. basins. The students presented a seminar on their work while at PNNL, and three papers on the results of their analyses have now been accepted for presentation at a Swiss Conference in May 2003 (see Presentations/Publications).

## **Joint Urban 2003 Field Study**

Will Shaw and Jerry Allwine traveled to Oklahoma City during the week of February 25 to survey potential instrumentation sites for the Joint Urban 2003 field study that will take place in July 2003. This field study involves numerous federal laboratories and universities in an investigation of atmospheric diffusion processes in an urban environment. PNNL will deploy a wind profiling radar, a sodar, and a variety of in situ instrumentation as part of this campaign.

## DOE Atmospheric Sciences Program Annual Meeting

Rich Barchet, Carl Berkowitz, Jim Cowin, Chris Doran, Jerome Fast, Bob Hannigan, John Hubbe, Bill Pennell, and Rahul Zaveri participated in the DOE Atmospheric Science Program Annual Meeting held March 4-5 in Orlando, Florida. Chris presented highlights of the work being done in the Environmental Meteorology Program; Rahul presented preliminary results from last summer's NAOPEX field study; and Carl described a future field study to investigate the "weekend effect" in the Los Angeles area. Rich, Carl, Chris, Bob, and Bill participated in a strategic planning session with Peter Lunn, ASP Program Manager, and colleagues from other labs in which future ASP field studies and program announcements were discussed. Rich and Bob described several large aircraft that could be used to support future ASP field campaigns.

### Invited Keynote Speaker: 2<sup>nd</sup> Workshop on Regional Climate Modeling of the Monsoon System

Ruby Leung was invited to participate at the 2nd Workshop on Regional Climate Modeling of the Monsoon System from March 4-6 at the Frontier Research System for Global Change (FRSGC), Yokohama, Japan. The workshop was co-sponsored by the GEWEX Asian Monsoon Experiment (GAME) International Science Panel and FRSGC to advance the understanding and prediction of precipitation and circulation systems of the monsoon. Ruby gave a keynote presentation on the use of the GAME Huahe Basin Experiment (HUBEX) data for evaluating land surface and regional climate models.

### Climate Change Prediction Program Meeting

Steve Ghan attended a Climate Change Prediction Program meeting from March 17-19 in Charleston, South Carolina. He presented a poster on the application of a subgrid orography scheme to the NCAR Community Climate System Model.

## Presentations/Publications

Belviso, S., C. Moulin, E. Chapman, E. Cosme, and K. Aranami

"A New, Satellite-Based Method for Estimating Global Oceanic DMS Concentrations and Its Application in a 3-D Atmospheric General Circulation Model." Chapter 15 in *Proceedings of the International Workshop on Emissions of Chemical Species and Aerosols into the Atmosphere*, C. Granier and J. Olivier, eds., Kluwer Publishing (in press).

Berkowitz, C. M., J. C. Doran, and S. R. Springston  
"Turbulent Transport of NO<sub>y</sub> and O<sub>3</sub> in the Atmospheric Boundary Layer." Presented at the DOE Atmospheric Sciences Program Annual Meeting, March 4-5, 2003, Orlando, Florida.

Clements, C. B., C. D. Whiteman, and J. D. Horel  
"Cold Air Pool Structure and Evolution in a Mountain Basin: Peter Sinks, Utah." *J. Appl. Meteor.* (in press).

Doran, J. C.  
"Some Highlights of the DOE's Environmental Meteorology Program (EMP) Research: Vertical Transfer and Mixing (VTMX)." Presented at the DOE Atmospheric Sciences Program Annual Meeting, March 4-5, 2003, Orlando, Florida.

Eisenbach, S., B. Pospichal, C. D. Whiteman, R. Steinacker, and M. Dorninger  
"Classification of Cold Pool Events in the Gstettneralm." To be presented at the International Conference on Alpine Meteorology and the Mesoscale Alpine Programme Meeting 2003, May 19-23, 2003, Brig, Switzerland.

Giorgi, F., X. Q. Bi, and Y. Qian  
"Direct Radiative Forcing and Regional Climate Effects of Anthropogenic Aerosols over East Asia: A Regional Coupled Climate-Chemistry/Aerosol Model Study." *J. Geophys. Res.* 107(D20):4439, doi: 10.1029/2001JD001066.

Giorgi, F., X. Q. Bi, and Y. Qian  
"Indirect Versus Direct Effects of Anthropogenic Sulfate on the Climate of East Asia as Simulated with a Regional Coupled Climate-Chemistry/Aerosol Model." *Climatic Change* (in press).

Kaiser, D. P., and Y. Qian  
"Decreasing Trends in Sunshine Duration over China for 1954–1998: Indication of Increased Haze Pollution?" *Geophys. Res. Letts.* 29(21):2042, doi: 10.1029/2002GL016057.

Kassianov E.  
"Stochastic Radiative Transfer in Multilayer Broken Clouds. Part I: Markovian Approach." *JQSRT*, 77:373-393.

Kassianov, E., T. Ackerman, R. Marchand, and M. Ovtchinnikov  
"Satellite Multiangle Cumulus Geometry Retrieval: Case Study." *J. Geophys. Res.* 108(D3):4117, doi: 10.1029/2002JD002350.

Kassianov E., T. Ackerman, R. Marchand, and M. Ovtchinnikov  
"Stochastic Radiative Transfer in Multilayer Broken Clouds. Part II: Validation Tests." *JQSRT*, 77:395-416.

Kassianov, E. I., and Y. L. Kogan  
"Spectral Dependence of Radiative Horizontal Transport in Stratocumulus Clouds and Its Effect on Near-IR Absorption." *J. Geophys. Res.* 107(D23):4712, doi: 10.1029/2002JD002103.

- Leung, L. R., Y. Qian, J. Han, and J. O. Roads  
 "Intercomparison of Global Reanalyses and Regional Simulations of Cold Season Water Budgets in the Western U.S." Presented at the Symposium on Observing and Understanding the Variability of Water in Weather and Climate, February 10-13, 2003, Long Beach, California.
- Leung, L. R., Y. Qian, W. Washington, J. Han, and J. O. Roads  
 "Mid-Century Ensemble Regional Climate Change Scenarios for the Western U.S." Presented at the Symposium on Observing and Understanding the Variability of Water in Weather and Climate, February 10-13, 2003, Long Beach, California.
- Leung, L. R., S. Waichler, M. S. Wigmosta, S. Zhong, X. Liang, and Y. Liu  
 "Evaluation of Land Surface and Regional Climate Simulations of the East Asian Summer Monsoon." Keynote presentation at the 2nd Workshop on Regional Climate Modeling of the Monsoon System, March 4-6, 2003, Yokohama, Japan.
- Leung, L. R., L. O. Mearns, F. Giorgi, and R.L. Wilby  
 "Regional Climate Research: Needs and Opportunities." *Bull. Amer. Meteorol. Soc.*, 84(1):89-95.
- Pospichal, B., S. Eisenbach, C. D. Whiteman, R. Steinacker, and M. Dorninger  
 "Observations of the Cold Air Outflow from a Basin Cold Pool through a Low Pass." To be presented at the International Conference on Alpine Meteorology and the Mesoscale Alpine Programme Meeting 2003, May 19-23, 2003, Brig, Switzerland.
- Revercomb H. E., D. D. Turner, D. C. Tobin, R. O. Knuteson, W. F. Feltz, J. C. Barnard, J. Bosenberg, S. A. Clough, D. Cook, R. Ferrare, J. M. Goldsmith, S. Gutman, R. N. Halthore, B. M. Lesht, J. C. Liljegren, H. Linne, J. J. Michalsky, V. R. Morris, W. Porch, S. Richardson, B. Schmid, M. E. Splitt, M. A. Van Hove, E. R. Westwater, and D. N. Whiteman  
 "The ARM Program's Water Vapor Intensive Observation Periods - Overview, Initial Accomplishments, and Future Challenges." *Bull. Amer. Meteorol. Soc.* 84(2):217-236.
- Shaw, W. J., and E. G. Chapman  
 "Observations of Temporal and Spatial Variability of Ozone during the Texas Air Quality Study 2000." In *Preprints, AMS 12th Symposium on Meteorological Observations and Instrumentation*, February 10-13, 2003, Long Beach, California.
- Shaw, W. J., L. S. Darby, and R. M. Banta  
 "A Comparison of Winds Measured by a 915 MHz Wind Profiling Radar and a Doppler Lidar." In *Preprints, AMS 12th Symposium on Meteorological Observations and Instrumentation*, February 10-13, 2003, Long Beach, California.
- Shaw, W. J., and M. A. LeMone  
 "Turbulence Dissipation Rate Measured by 915 MHz Wind Profiling Radars Compared with In-Situ Tower and Aircraft Data." In *Preprints, AMS 12th Symposium on Meteorological Observations and Instrumentation*, February 10-13, 2003, Long Beach, California.
- Spicer, C. W., C. M. Berkowitz, D. W. Joseph, J. D. Fast, J. C. Doran, and A. J. Savage  
 "Diurnal Changes in the Vertical Distribution of Trace Pollutants Over Phoenix." Presented at the 83rd AMS Annual Meeting, February 9-13, 2003, Long Beach, California.
- Qian, Y., L. R. Leung, S. J. Ghan, and F. Giorgi  
 "Regional Climate Effects of Aerosols over China: Modeling and Observation." *Tellus B* (in press).
- Wendt, D. A., S. M. Bortnick, D. A. Paul, and M. Morara  
 "Hierarchical Bayesian Probabilistic Modeling to Combine Information: Air Quality Monitoring and Dispersion Modeling Application." In *Proceedings from The Ohio Air Pollution Research Symposium*, October 25, 2002, Toledo, Ohio.
- Wendt, D. A., S. M. Bortnick, and H. L. Wiseman  
 "Describing the Relationship between Continuous TEOM Monitors and Federal Reference Method Monitors when Measuring PM2.5." Presented at U.S. EPA's 2003 National Air Quality Conference, February 2-5, 2003, San Antonio, Texas.
- Whiteman, C. D., B. Pospichal, S. Eisenbach, R. Steinacker, and M. Dorninger  
 "Temperature Inversion Breakup in the Gstettneralm, a Sinkhole in the Eastern Alps." To be presented at the International Conference on Alpine Meteorology and the Mesoscale Alpine Programme Meeting 2003, May 19-23, 2003, Brig, Switzerland.
- Whiteman, C. D.  
 "The Peer-Review Process for Journal Manuscripts and Scientific Proposals." Presented at the Short Course on Technical Writing of Scientific Publications and Proposals. 83rd Annual AMS Meeting, February 9-13, 2003, Long Beach, California.
- Zaveri, R. A., C. M. Berkowitz, and J. M. Hubbe  
 "Nighttime Aerosol-Oxidant Plume Experiment 2002: Preliminary Results." Poster presentation at the DOE Atmospheric Sciences Program Annual Meeting, March 4-5, 2003, Orlando, Florida.
- Zaveri, R. A. C. M. Berkowitz, L. I. Kleinman, S. R. Springston, P. V. Doskey, W. A. Lonneman, and C. W. Spicer  
 "Evaluation of Ozone Production Efficiency in an Urban Plume Using a Lagrangian Box Model." Oral presentation at the DOE Atmospheric Sciences Program Annual Meeting, March 4-5, 2003, Orlando, Florida.