

### SEMINAR AT PNNL

Dave Whiteman presented a seminar at PNNL on January 3 summarizing cold air pool development and occurrence of extreme low temperature minimums in an isolated limestone sinkhole in Utah's Bear Mountains. On calm nights the sinkhole topography eliminates the complicating role of large-scale temperature advection, allowing the analyses to focus on the relative roles of turbulent and radiative flux divergences. Because downslope flows become very weak after the initial inversion buildup period, turbulence levels become negligible and the cooling during the remainder of the night appears to be driven primarily by radiative fluxes. The isolated basin setting makes the investigations a useful adjunct to ongoing VTMX investigations of cold pools in the topographically complicated Salt Lake Valley and are providing valuable information on the relative roles of different physical processes that lead to very stable atmospheres.

### VISIT TO DR. DOUW STEYN OF THE UNIVERSITY OF BRITISH COLUMBIA

Dave Whiteman visited Dr. Douw Steyn and his colleagues and students at the University of British Columbia (UBC) in Vancouver, Canada, from January 7-8. He presented a seminar on the development and evolution of downslope flows in the Salt Lake Valley during DOE's

VTMX field program. While at UBC, Dave learned of their ongoing research in complex terrain meteorology, which includes laboratory tank and lidar field studies of slope flows, studies of mixed-layer depths in complicated terrain, and research on along-valley mass fluxes observed with lidar in Austria's Wipp Valley.

### STEPHAN DE WEKKER VISITS PNNL

Mr. Stephan de Wekker visited PNNL from January 10-11 to work with Shiyuan Zhong and Jerome Fast on a joint project dealing with turbulence parameterizations and flow modeling in Switzerland's Riviera Valley. The extensive data set from the Riviera Valley is one of the most complete data sets available for model testing. Stephan is a Ph.D. student at UBC. His advisor is Dr. Douw Steyn.

### FOURTH CONFERENCE ON ATMOSPHERIC CHEMISTRY

Jerome Fast, Carl Berkowitz, and Chris Doran attended the Fourth Conference on Atmospheric Chemistry in Orlando, Florida, from January 13-17. Jerome presented material on ACP's participation in the 1999 NE-OPS field campaign, Chris Doran presented an overview of the recent ACP morning transition experiment in Phoenix during June of 2001, and Carl Berkowitz made three presentations based on observations made from the Phoenix 2001 and the 2000 TexAQS field campaigns. See Presentations/Publications.

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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).

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#### DOE ATMOSPHERIC SCIENCE PROGRAM STRATEGIC PLANNING GROUP MEETING

Rich Barchet, Carl Berkowitz, Chris Doran, and Bob Hannigan met from January 14-15 in Orlando, Florida, with the DOE Atmospheric Science Program Strategic Planning Group led by Peter Lunn, Program Manager. Central topics of discussion included field studies for FY 2002-2004 and the need for a larger aircraft with which to conduct airborne atmospheric research.

#### 82ND AMERICAN METEOROLOGICAL SOCIETY MEETING

Ruby Leung attended the 82nd American Meteorological Society meeting from January 13-17 in Orlando, Florida. She chaired a session on regional climate modeling and presented two papers at the Global Change and Climate Variations Symposium and Environmental Applications Symposium (see Presentations/Publications).

#### SLOPE FLOW WORKSHOP

Dave Whiteman and Shiyuan Zhong attended a Slope Flow Workshop hosted by Dr. Larry Mahrt at Oregon State University on January 20. They each gave an invited presentation and learned of the ongoing work of Dr. Mahrt and his students and colleagues. Other DOE VTMX scientists, Eric Skyllingstad and Greg Poulos, also attended the workshop and gave presentations. There may be future opportunities to work collaboratively with other workshop participants on research of joint interest in the Pacific Northwest. Participants of this workshop are now facetiously referring to the group as the "Northwest Slope Flow Society!"

#### DOE PHASE II SBIR

Nels Laulainen met with Kevin Yu of Physical Optics Corporation in Torrance, California, on January 22 to discuss progress on a DOE Phase II SBIR project on the development of a surface optical reflectance measurement (SORM) technique that has great application potential for solar radiometry. It is expected that a SORM-type device can be tested in a PNNL MFRSR (Multi-Filter Rotating Shadowband Radiometer) head later this year.

#### PNW2001 DATA WORKSHOP

A workshop reviewing data collected during the Pacific Northwest 2001 air quality field study was held January 31 and February 1, 2002, at PNNL in Richland, Washington. Participants included Len Barrie, Rich Barchet, Jim Cowin, Jerome Fast, Brad Fritz, John Hubbe, Tom Jobson, Alex Laskin, and Nels Laulainen (PNNL); Dave Covert and Rob Elleman (U-WA); Hal Westberg, Brian Lamb, and Joe Vaughan (WSU), Rob Wilson (EPA Region 10); and Bruce Thomson (Environment Canada). Flight profiles and meteorology for five flights made during the field study were reviewed. Analyses of canister samples of VOCs collected at surface sites and aloft were compared to real-time PTR-MS observation aloft. Relationship between VOCs and other trace gas and aerosol measurements clearly indicated the contribution of the Seattle/Tacoma/Olympia urban area to the ambient oxidant and aerosol burden downwind. Data are being prepared for the NARSTO data archive

#### DARWIN, AUSTRALIA

Victor Morris traveled to Darwin, Australia, from February 21 through March 11 to complete the installation of the microwave water radiometer, ceilometer, upwelling and downwelling shortwave and longwave radiometers, and meteorological instruments at the Atmospheric Radiation Measurement (ARM) Program's TWP ARCS-3 site.

#### MEXICO CITY

On March 4 Jerome Fast gave an invited talk entitled "Observations and Model Simulations of the Boundary Layer in Mexico City During the IMADA-AVER Field Campaign" for staff in the Atmospheric Chemistry Division of NCAR on DOE's research related to Mexico City. NCAR is resubmitting a proposal for a mega-city air quality project that will include a field campaign in Mexico City in the spring of 2004. Jerome met with several scientists to provide background information for NCAR scientists.

DOE'S ATMOSPHERIC SCIENCE PROGRAM  
SCIENCE TEAM MEETING

Rich Barchet, Len Barrie, Carl Berkowitz, Jim Cowin, Chris Doran, Jerome Fast, Tom Jobson, Shawn Kathman, Bill Pennell, Will Shaw, Chet Spicer, and Rahul Zaveri attended an Atmospheric Science Program (ASP) Science Team meeting in Albuquerque, New Mexico, from March 19-21. Some presented findings from their recent research (see Presentations/Publications). Chet gave a presentation on a proposed SERDP project titled "Observing and Predicting Emission Rates, Transport, Transformation and Fate of Air Pollutants Associated with DOD Activities Worldwide." During evening sessions Rich Barchet, Len Barrie, Carl Berkowitz and Bill Pennell also met with Peter Lunn and the multi-laboratory ASP Strategic Planning Group to discuss the desired performance characteristics of a new aircraft to support ASP airborne research and to finalize key sections of the soon-to-be-released ASP Strategic Plan.

COORDINATION AND LOGISTICS  
PLANNING MEETING

Carl Berkowitz and Rahul Zaveri participated in the Coordination and Logistics Planning Meeting from March 27-28 held at the University of New Hampshire, Durham, for the upcoming summer New England Air Quality Study (AIRMAP 2002). The key topics of discussion centered on the Summer 2002 field campaign, with plans calling for the G-1 aircraft to make a series of flights downwind of Boston, and to include flyovers of the NOAA Research Vessel "Ron Brown." PNNL's scientific interest in this study focuses on chemical processes within the nighttime plume coming from the greater Boston area. Carl gave an overview of the PNNL plans for this campaign. They made a brief presentation describing PNNL's Nighttime Aerosol Oxidant Plume Experiment (NAOPEX) field campaign and met with folks from NOAA Aeronomy Lab, PMEL, ETL, Harvard, and the University of New Hampshire to coordinate NAOPEX with the AIRMAP campaign.

BOOK PUBLISHED

Chet Spicer, Syd Gordon, Tom Kelly, and Mike Holdren of Battelle's Atmospheric Science and Applied Technology Department, together with former Battelle staff member R. Mukund of General Electric, have published a book titled *Hazardous Air Pollutant Handbook: Measurements, Properties, and Fate in Ambient Air*. Hardcover: 240 pages; Lewis Publishers,

Inc.; ISBN: 1566705711; 1st edition (April 5, 2002). Details are available at: <http://www.amazon.com/exec/obidos/ASIN/1566705711/qid%3D1018384651/ref%3Dsr%5F11%5F0%5F1/104-0565410-1238324>.

**Presentations/Publications**

- Barnard, J. C., and D. M. Powell. "A Comparison Between Modeled and Measured Clear Sky Radiative Shortwave Fluxes in Arctic Environments - with Special Emphasis on Diffuse Radiation." *J. Geophys. Res.* (in press).
- Disselkamp, R. S., L. A. Barrie, S. Shutthanandan, T. A. Cahill, and S. S. Cliff. "Size-Segregated Multi-Elemental Aerosol Analysis at Williams Tower During Texas 2000 Air Quality Study." Oral presentation given as part of the 2002 American Meteorological Society (AMS) Annual Meeting, January 16, 2002, Orlando, Florida.
- Doran, J. C., and S. Zhong. "Comments on 'Atmospheric Disturbances Caused by Human Modification of Landscape.'" *Bull. Amer. Meteor. Soc.* 83:277-279.
- Fast, J. D., R. A. Zaveri, X. Bian, E. G. Chapman, and R. C. Easter. "The Effect of Regional-Scale Transport on Oxidants in the Vicinity of Philadelphia During the 1999 NE-OPS Field Campaign." *J. Geophys. Res.* (in press).
- Leung, L. R., Y. Qian, and X. Bian. "Long-Term Regional Climate Simulations Driven by Two Global Reanalyses and a GCM for the Western U.S." In *Preprints, 13th Symposium on Global Change and Climate Variations*, January 13-17, 2002, Orlando, Florida, pp. 65-67.
- Leung, L. R., M. S. Wigmosta, and L. W. Vail. "Use of Seasonal Climate Forecasts for Water Resources Management in the Tennessee River." In *Preprints, Third Symposium on Environmental Applications*, January 13-17, 2002, Orlando, Florida, pp. 210-214.
- Mikheev, V. B., P. M. Irving, N. S. Laulainen, S. E. Barlow, and V. V. Pervukhin. "Laboratory Measurement of Water Nucleation Using a Laminar Flow Tube Reactor." *J. Chem. Phys.* (in press).
- Stewart, J. Q., C. D. Whiteman, W. J. Steenburgh, and X. Bian. "A Climatological Study of Thermally Driven Wind Systems of the U.S. Intermountain West." *Bull. Amer. Meteor. Soc.* (in press).
- Whiteman, C. D. "Katabatic Flows on a Low-Angle Slope in Utah's Salt Lake Valley." Presented at the University of British Columbia, Department of Earth and Ocean Sciences Seminar Series, January 8, 2002, Vancouver, Canada.

Whiteman, C. D., S. Zhong, and T. Haiden. "Recent Observations of Downslope Flows on a Low-Angle Slope near Salt Lake City, Utah." Invited presentation at the Slope Flow Workshop, January 20, 2002, Corvallis, Oregon.

Zhong, S., J. D. Fast, and C. D. Whiteman. "How Well Can We Simulate Drainage Flows in a Realistic Setting?" Invited presentation at the Slope Flow Workshop, January 20, 2002, Corvallis, Oregon.

The following presentations were made at the Fourth Conference on Atmospheric Chemistry in Orlando, Florida, from January 13-17, 2002:

Berkowitz, C. M., R. A. Zaveri, C. W. Spicer, P. Doskey, and J. Weinstein-Lloyd. "Ozone Production Efficiency at the Williams Tower."

Berkowitz, C. M., S. Springston, J. C. Doran, and J. D. Fast. "Vertical Mixing and Chemistry Over an Arid Urban Site: First Results from Aircraft Observations Made During the Phoenix Sunrise Campaign."

Berkowitz, C. M., J. Stutz, C. W. Spicer, J. C. Doran, J. D. Fast, and S. Wong. "Vertical Mixing and Chemistry Over an Arid Urban Site: First Results from Skyscraper Observations Made During the Phoenix Sunrise Campaign."

Doran, J. C., C. M. Berkowitz, and J. D. Fast. "The Phoenix 2001 Field Campaign: Evolution of Oxidants During the Morning Transition Period."

Fast, J. D. "The Relative Role of Local and Regional-Scale Processes on Ozone in Philadelphia."

The following presentations were made at the Atmospheric Sciences Program Science Team Meeting, March 19-21, 2002, Albuquerque, New Mexico (presenter underlined):

Doran, J. C. "Overview of Phoenix 2001 Study."

Barrie, L. A., B. T. Jobson, and W. R. Barchet. "Highlights of the Pacific Northwest 2001 (PNW2001) Aircraft Campaign."

Fast, J. D. "The Effect of Mesoscale Models at Sub-Kilometer Grid Spacing and Implications for Air Quality Modeling for Urban Valleys."

Shaw, W. J. "Vertical Mixing in the Afternoon Transitional Boundary Layer."

Fast, J. D. "Local and Regional-Scale Processes on Ozone in Philadelphia During the 1999 NE-OPS Field Campaign."

Barchet, W. R. "Airborne Research Platform Functionality."

Zaveri, R. A. "Blimps as Research Platforms."

Berkowitz, C. M., and P. H. Daum. "NAOPEX and NEAQS/AIRMAP 2002/2004."

The following articles were published by Battelle Columbus staff and EPA colleagues in the first quarter:

Bortnick, S., B. Coutant, and T. Hanley. "Public Reporting of an Air Quality Index Using Continuous PM<sub>2.5</sub> Monitoring Data." *Environmental Manager* (March), pp. 27-33.

Bortnick, S., S. Eberly, and B. Coutant. "Using Continuous PM<sub>2.5</sub> Monitoring Data to Report an Air Quality Index." *J. Air & Waste Manage. Assoc.* 52:104-112.

Bortnick, S., and S. Stetzer. "Sampling Frequency Guidance for Ambient Air Toxics Monitoring." *J. Air and Waste Manage. Assoc.* (in press)

Bortnick, S., and S. Stetzer. "Sources of Variability in Ambient Air Toxics Monitoring Data." *Atmos. Environ.* 36:1783-1791