



DAILY BAMS



2009 Annual Meeting

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“Totally Relevant” Urban Theme Underscores AMS’s Role in a Changing World

AMS President Walt Dabberdt explained to *BAMS* news editor Rachel Thomas-Medwid the thinking behind this year’s meeting on “Urban Weather and Climate: Now and the Future.”

BAMS: How did urban weather come to be the theme of the meeting?

WD: Many things atmospheric and related are changing in ways that are very significant. Climate is changing, and climate concerns are increasing not only among scientists but also among the general public and our political leadership. At the same time, populations are growing and shifting in ways not seen in the past. In the scientific realm, numerical prediction models are improving in many

ways; for example, data assimilation schemes are making better use of observations, realistic land surface characterization is becoming a reality and improving model performance, and spatial resolution in the models is approaching the significant scales seen in the real

atmosphere. And the Earth’s surface is changing, too, with deforestation, “aridization,” construction of buildings, and paved areas. On the technology side, both terrestrial- and satellite-based observing systems have capabilities not envisioned a decade or two ago.

In spite of—or maybe it’s

because of—these changes, the gap between scientific and technological potential and societal needs is widening. Nowhere is this disconnect greater and more pressing than in the cities. With three-fourths of the U.S. population living in cities—and now half of the world’s population—I felt



Walt Dabberdt

that the time was right to focus on the challenges of urban weather and climate, both now and in the future.

BAMS: What were some other ideas and how did you end up picking this one for Phoenix?

WD: Perhaps the most rewarding aspect of serving as

AMS president is the privilege and responsibility of choosing a theme that several thousand of your colleagues will find relevant, important, and challenging. A few ideas that initially came to my mind included the pressing needs related to the prediction of high-impact weather in all its many manifestations; the unmet societal, environmental, and business needs and their related applications and solutions; climate change, prediction, mitigation, and adaptation; and the promise of technology as a tool for building better models, providing improved access to data and data products, and making improved and more useful measurements and observations. But then I came to the realization that the urban theme

“I felt that the time was right to focus on the challenges of urban weather and climate, both now and in the future.”

embodies all these while also providing a practical and well-focused convergence. Oh, and it probably also had something to do with the fact that I’ve worked in different areas of urban meteorological and air quality research off and on for most of my career.

BAMS: How is this meeting particularly timely or relevant?

WD: Ultimately, science, education, research, operations, and applications are

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Creatures Great and Small Descend on WeatherFest

The animal kingdom comes to the Annual Meeting this year as SeaWorld San Diego’s display at today’s WeatherFest will feature live animals. An American alligator, Magellanic penguins, an armadillo, and a Sonoran desert tortoise are all scheduled to make an appearance as part of a presentation on how animals are affected by—and adapt to—extreme weather and a changing climate.

Free of charge and open to the public, WeatherFest will feature more than 60 exhibitors from around the country with interactive weather-related displays that are both instructive and fun. WeatherFest will be held from 12:00 until 4:00 p.m. in the North Ballroom C/D at the Phoenix Convention Center.

Many of the exhibits will feature hands-on experiments. Youngsters (as well as the young at heart) can make cloud charts, create an isotherm map, generate lightning, make their own water cycle, contribute a

square to a weather quilt, throw water balloons at a rain gauge, and test the effects of atmospheric pressure on various objects. Other demonstrations will teach about sun safety, the



urban heat island effect, satellites, raindrop formation, solar radiation, and weather forecasting. Various precipitation gauges and weather-measurement devices will be on display. There will also be numerous interactive computer exhibits.

Those who like a little chal-

lenging competition can visit Professor Weather and play “Jetparody,” the weather and safety game; compete for prizes at the “Wheel of Science”; and test their safety knowledge with “Leon the Lightning Safety Game.” A scavenger hunt and raffles will reward lucky winners with great prizes throughout the afternoon.

WeatherFest also offers visitors the opportunity to meet and chat with television meteorologists, as local television stations KNXV, KPHO, and KPNK will all be represented. AccuWeather and The National Weather Service will also be on hand with games, displays, and more fun.

Students thinking about a job in meteorology, oceanography, or related fields can obtain information on career opportunities and scholarships, and the AMS booth will offer applications for undergraduate scholarships and graduate fellowships, as well as other resources for career-minded students.



Visitors will find out how the vast Tonopah water storage site can largely be monitored remotely.

Today’s Tonopah Bus Tour Tracks the Water of the Future

In rapidly growing Phoenix, the land blossoms with roads, housing developments, and skyscrapers. But 40 miles to the west the desert still looks like a desert—except for a 500-acre spread of shimmering geometrical ponds along a lonely stretch of the Hayden Rhodes Aqueduct.

Today, AMS meeting attendees are visiting this unlikely oasis, called the

Tonopah Desert Recharge Project, not to see how this water will make the desert bloom, exactly, but instead for a guided tour about how this water will disappear into the ground and make the aquifer bloom.

The owner and operator of the facility, the Central Arizona Project (CAP), hopes this new facility and

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Newest Honorary Members Have Been Pillars of Worldwide Science

The careers of the newest honorary members of the AMS—Guri Marchuk and John Zillman—demonstrate the importance of international exchange and cooperation in the sciences.

Zillman's dedication to the international scientific scene is already well known to AMS members. As director of the Australian Bureau of Meteorology from 1978 to 2003 and president of the World Meteorological Organization from 1995 to 2003, he has been a frequent and popular speaker at AMS meetings and other forums in this country for many years.

Zillman's preparation for a long period of international leadership actually began as a cadet with the Bureau of Meteorology in 1957; he rose through forecasting duties to a supervisory role in the agency's synoptic research branch before he had actually finished

his bachelor's degree from the University of Queensland in 1970, let alone his Ph.D. from the University of Wisconsin (in 1972).

Zillman's long tenure on the WMO's Executive Council was highlighted by his defense of free and unrestricted international exchange of meteorological data. This was a time when political and budgetary pressures mounted on various national meteorological services, especially in Europe, causing a push toward commercialization of the national services.

At the same time, the 1980s and 1990s also featured the rise of climate change as a critical international scientific issue. Zillman became one of the spokesmen for governmental action on this issue and a key defender of the deliberations of the Intergovernmental Panel on Climate Change, both within Australia and around the world.

"One of the most important challenges we face is that of using science wisely and objectively to inform public policy," Zillman wrote in an Australian publication a few years ago. His efforts for recognition of the importance of scientific

infrastructure globally have extended beyond meteorology. For instance, in a 2005 radio editorial he argued that "a far greater commitment to the oceans is needed from all countries, and especially from maritime nations like Australia."

In awarding him the 2005 IMO Prize, the WMO noted Zillman's "outstanding role in the strengthening of international cooperation in Earth system science."



John Zillman

Zillman's commitment to sciences in the public sphere is mirrored by Marchuk's prominence and versatility, which peaked administratively during his tenure as president of the USSR Academy of Sciences (1986–1991) and as the founder and director of that academy's Institute of Computational Mathematics. In this capacity he facilitated numerous international scientific exchanges. The worldwide pervasiveness of his research, conducted behind the Iron Curtain, also exemplifies how Marchuk transcended political boundaries.

Marchuk, like many budding Soviet physicists of his generation, began his training as a military weather forecaster during World War II. I.I. Karol,

a fellow student at the wartime Leningrad State University, remembers that the future leader of the Soviet science establishment was already "sociable and exceptionally industrious... a ring leader at student parties and dances." After the war, he proceeded in geophysics, with a doctoral thesis on "Dynamics of large-scale fields of meteorological elements in the baroclinic atmosphere."

Rather than continue in meteorology, however, in the 1950s Marchuk took on the challenge of pioneering the theoretical and technical basis for the nascent Soviet nuclear energy program. His successful leadership in nuclear research earned him the Lenin Prize in 1961. Thereafter, Marchuk refocused on the computational problems of solving the equations of geophysical systems, producing a startling series of mathematical advances that have permeated numerous fields.

His wizardry at mathematical shortcuts is frequently acknowledged in the rise of atmospheric modeling. Marchuk introduced to meteorology and oceanography ways to handle computations by decomposing

equations physically and geometrically. He seemingly based his influential insights on computation of radiative gradients on the way physicists model neutron transport—not a surprise from a leader in nuclear engineering. Marchuk's work enhanced the meteorologist's toolbox for initialization and data assimilation as well as for retracing pollution back to its sources.

His books span an impressive range: from numerical methods of designing nuclear reactors, to *Adjoint Equations and Perturbation Algorithms in Nonlinear Problems* to *Dynamics of Ocean Tides* and *Monte Carlo Methods in Atmospheric Optics*. As if this were not enough versatility, Marchuk's modeling expertise is influential in studies of the spread of diseases and immunological response.

Marchuk's international renown is indicated by honorary doctorates from universities as far-flung as Kolkata and Houston and awards such as the Vilhelm Bjerknes Medal of the European Geophysical Union and the Order of the Commander of Knights of the French Legion of Honor.



Guri Marchuk



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Water for Phoenix Stored in Desert

*Tonopah
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the seven smaller ones built since 1996 will help ensure a sustainable future for the fastest-growing region of the United States. Serving a growing desert population, CAP maintains 300 miles of aqueducts, tunnels, and pipelines that carry 1.5 million acre-feet of Colorado River water from Lake Havasu.

CAP intends to use the basins at Tonopah to store two million acre-feet of water under the desert within 20 years, making this Arizona's largest recharge facility. By spreading Colorado River water into 19 basins totaling 200 acres, engineers allow the precious fluid to seep into the ground—a "rainy day" fund that's not for rainy days.

Highly permeable soil is par-

ticularly important in recharge facilities that involve spreading water across the ground or in pools (in cases where an aquifer is shielded by an impermeable layer, a shaft or well is often necessary for artificial recharge). In this regard, this area of the Tonopah desert is a suitable location with layers of naturally occurring silt, sand, and gravel of varying textures and stratification. Groundwater at the site is about 150 m below the surface. Groundwater supplies about 40 percent of Arizona's current water usage.

While water supply is an acute issue here in Phoenix, groundwater recharge programs are in use across the country, including in relatively wet places like New York, Virginia, and Florida. These projects have



The Tonopah recharge facility takes advantage of the porous ground of the west Salt River Valley basin

their historical roots in similar water engineering efforts undertaken 1,700 years ago in the ancient Persian Empire.

AMS attendees who are interested in the escalating water demands of the urbanizing Southwest will have plenty of presentations to look forward to this week at the 23rd Conference on Hydrology. The Phoenix program is highlighted by a

panel discussion on "Water in the West", Tuesday at 11:00 a.m. in room 121A, with speakers from Arizona, Colorado, and California.

If you are interested in the guided Tonopah tour, which begins at 11:00 a.m., ask for tickets at the meeting registration desk. A limited number (\$35 each) were still available as of press time.

Annual Review Reflects on 2008 and Looks Forward

The Annual Review and Fellows Award Meeting (5:00 p.m.; room 130) is an opportunity for both recognizing past accomplishments and setting goals for future endeavors. To begin the meeting, 2008 AMS President Walt Dabberdt will reflect on his year before he passes the torch to 2009 President Thomas Karl.

Some of Dabberdt's goals that he outlined last year in New Orleans were to increase the multidisciplinary and interdisciplinarity of AMS activities and membership; foster greater inclusiveness within AMS and outreach beyond the Society; and solidify AMS's financial reserves. "We are making great strides in membership and outreach, while also carefully monitoring our financial portfolio in the face of a very challenging economic environment," comments Walt. "I look forward to reporting on the past year at Sunday's Annual Review."

After Dabberdt's opening remarks, there will be the presentation of the 28 new Fellows, followed by annual reports from the chairs of the Society's commissioners, including Secretary-Treasurer Richard D. Rosen; Professional Affairs Commission, John R. Toohey-Morales; Education and Human Resources Commission, Julie A. Winkler; Publications Commission, David P. Jor-

gensen; Scientific and Technological Activities Commission, Roger M. Wakimoto; Planning Commission, Robert J. Serafin; Weather and Climate Enterprise Commission, Elbert W. Friday; and AMS 21st Century Campaign, Susan K. Avery.

television forecaster.

"There are several key issues I want to bring before the AMS," notes Karl. "And I want to continue the efforts of Rick [Anthes, 2007 president] and Walt to increase membership and deliver an online updated Compendium of Meteorology to our members."

Karl plans to examine what kind of services AMS members value most strongly through a survey. "I am looking forward to working with the members to help ensure we focus on activities that the membership values the most," Karl adds.

In conclusion, election results will be presented, with the announcement of Margaret (Peggy) LeMone from NCAR as incoming president-elect.



Tom Karl



Margaret Lemone

With his professional background, Karl brings to his upcoming presidency an understanding of the diverse reasons AMS members are active in the Society. Before becoming director of the National Climatic

Data Center, Karl had a background in weather forecasting and a brief stint as a radio/



Set Your Alarm For...

MONDAY

Presidential Forum

8:30 – 10:15 am, Ballroom ABC

Is the quadruple convergence of urbanization, population growth, climate change, and coastalization a perfect storm? These and other important urban issues that until recently have received only cursory attention will be explored during the opening plenary session of the 89th Annual Meeting.

Sunday Highlights

First Time Attendee Briefing

3:00 – 4:00 pm, Rm. 130

Does browsing the meeting program make it seem like there's too much to do in too little time? The Briefing for First Time Attendees provides an overview of the annual meeting and suggestions on how to get the most out of their time. AMS Past President Walt Lyons and Ken Heideman, director of publications, will discuss the programs, special events, exhibits, and services. All

attendees and exhibitors are welcome to attend.

Student Conference and Chapter Poster Session

5:30 – 7:00 pm, Exhibit Hall 5

This poster session will feature the work of creative and energetic college students from around the country participating in this week's Student Conference. AMS Local Chapter posters will also be available for viewing, featuring the accomplishments of members

like you making science a part of their communities.

Welcome Reception

6:00 – 7:00 pm, Exhibit Hall 5

Everyone is invited to attend the reception honoring the newly elected Fellows immediately following the 89th Annual Review and Fellows Awards. The reception will be held in conjunction with the Student Conference and Local Chapter Poster Sessions. All are encouraged to attend.

Why We're Focusing This Week on Urban Challenges

Walt Dabberdt
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about people, improving their lives, and understanding their environment. With most of the United States and also the world now living in the cities (and many of the rest supporting the food, fuel, and sheltering needs of those in the cities), I think the urban theme is totally relevant to the AMS. And Phoenix will be the first of our 89 Annual Meetings with an urban focus.

BAMS: What do you find most interesting about the meeting this year?

WD: Many things about the Annual Meeting are interesting and critical to its success. The dedication and commitment of the member-volunteers and the AMS staff are exceptional. Without them, there would not be an Annual Meeting as we know it. I'd like to think that I've always known and appreciated it, but the truth of the matter

is that seeing the process from the inside has given me an even greater appreciation of their efforts. I also found it 'interesting'—unsettling may be a better word—that ours will be the first conference in a totally new Phoenix Convention Center. I'm a lot more relaxed than I was a year ago, when I was wondering and hoping that we would not be dealing with wet paint, no lights, unfinished communications systems, and the like (we won't).

BAMS: What are you most looking forward to attending?

WD: Actually, I'd like to clone myself so that I could attend all of the technical sessions and conferences and go to all the town hall and committee meetings—and still have time to hit the gym in the morning. An added bonus is that I get to see so many long time friends and colleagues, meet new ones, and learn from all of them.

BOOK LAUNCH PARTY

Exhibit Hall Opening Reception
Monday Night, 5:30 p.m.
AMS Book Booth

Atmospheric science authors, editors, and readers alike, join us in celebrating our newest titles!

The Forgiving Air: Understanding Environmental Change, 2nd ed.
by Richard Somerville

Synoptic-Dynamic Meteorology and Weather Analysis and Forecasting: A Tribute to Fred Sanders (Monograph Vol. 33, No. 55)
Lance F. Bosart and Howard B. Bluestein, Eds.

AMS BOOKS
RESEARCH APPLICATIONS HISTORY

Exhibitors of the 89th AMS Annual Meeting

The AMS Annual Meeting is the host to the largest exhibit in the atmospheric, oceanic, and related sciences anywhere. Exhibitors come from the United States and abroad with over 100 organizations showcasing a wide range of products, publications,

and services. Listed below are exhibitors for the 89th Annual Meeting of the AMS. Don't miss the opportunity to browse the exhibit floor and learn what these organizations have to offer you!

| Exhibit Show Hours | |
|--------------------|----------------------|
| Monday | 5:30–7:30 P.M. |
| Tuesday | 11:00 A.M.–6:00 P.M. |
| Wednesday | 11:00 A.M.–6:30 P.M. |
| Thursday | 11:00 A.M.–4:00 P.M. |

| | <u>Booth</u> | | <u>Booth</u> |
|--|--------------|---|--------------|
| AAI Corporation | 707 | Leosphere | 128 |
| Aanderaa Data Instruments | 235 | LI-COR Biosciences | 244 |
| ABB, Analytical | 525 | Lockheed Martin | 201 |
| Accu Weather, Inc. | 535 | Logotronic, Inc. | 236 |
| ADSS, Inc. (formally ADA Tech.) | 816 | Met One Instruments, Inc. | 703 |
| Advanced Designs Corporation | 100 | Metek (GmbH) | 120 |
| AER, Inc. | 710 | Microcom Design, Inc. | 540 |
| Air Force Weather | 238 | Midland Radio Corporation | 135 |
| All Weather, Inc. | 441 | MODEM | 717 |
| American Meteorological Society Publications | 811 | NASA Science Mission Directorate | 136 |
| Asheville Area Chamber of Commerce | 134 | National Center for Atmospheric Research | 613 |
| ASLI—Atmospheric Science Librarians International | 809 | National Research Council of the National Academies | 722 |
| Ball Aerospace & Technologies Corporation | 229 | National Science Foundation (NSF) | 310 |
| Baron Services | 111 | National Oceanic and Atmospheric Administration (NOAA) | 401 |
| Belfort Instrument Company | 628 | Navy Meteorology and Oceanography Command | 601 |
| Bristol Industrial Research Association | 116 | NOAA Center for Atmospheric Sciences at Howard University and NOAA-CREST | 804 |
| Boeing Company | 117 | Nortel Government Solutions | 708 |
| CA DWR | 437 | Northern Video Graphics, Inc. | 346 |
| Cambridge University Press | 803 | Northrop Grumman | 219 |
| Campbell Scientific, Inc. | 627 | NovaLynx Corporation | 713 |
| Center for Disease Control & Prevention | 536 | NPOESS/Northrop Grumman | 125 |
| Climatronics Corporation | 701 | ProQuest/MGA | 807 |
| Coastal Environmental Systems | 427 | Proton Energy Systems, Inc. | 341 |
| COMET (A Part of UCAR) | 609 | Radiometrics Corporation | 731 |
| Davis Instruments Corporation | 334 | Raytheon Company | 101 |
| Design Analysis Associates | 124 | Remtech, Inc. | 800 |
| DeTect | 826 | RM Young Company | 529 |
| DOE/ARM Program | 517 | SAGIM S.A. | 720 |
| DOE Global Change Education Program | 440 | Satel-West | 336 |
| Droplet Measurement Technologies | 817 | Science Applications International Corporation (SAIC) | 511 |
| EKO Instruments Co., Ltd. | 335 | Scintec AG | 329 |
| Enterprise Electronics Corporation | 418 | SeaSpace Corporation | 534 |
| ESRI | 716 | Sonalysts, Inc. | 523 |
| Geonor, Inc. | 434 | Springer | 805 |
| Gill Instruments Ltd | 106 | STG, Inc. | 709 |
| Global Imaging, Inc. | 605 | Sutron Corporation | 704 |
| Global Science & Tech, Inc. | 102 | Techsense Solutions Sdn Bhd | 822 |
| GRAW Radiosondes GmbH & Co | 234 | Tower Systems, Inc. | 802 |
| Hach Environmental | 436 | UNIDATA | 616 |
| Harris Corporation | 311 | Unisys Corporation | 110 |
| High Sierra Electronics | 830 | UCAR EO | 623 |
| HMEI, Association of Hydro-Meteorological Equipment Industry | 812 | UCAR, Office of Programs | 617 |
| I. M. Systems Group, Inc. | 537 | University of Oklahoma | 721 |
| IBL Software Engineering | 236 | University of Wisconsin—Madison, Space Science & Engineering Center | 435 |
| INSITU Inc. | 447 | Vaisala, Inc. | 301 |
| International Environmental Data Rescue Organization | 819 | Weather Decision Technologies, Inc. | 727 |
| International Met Systems | 312 | WeatherBug® | 241 |
| IPS Meteostar, Inc. | 700 | Wiley-Blackwell | 801 |
| ITT | 411 | Wyle Information Systems | 211 |
| Japan Meteorological Business Support Center | 541 | Yankee Environmental Systems, Inc. | 126 |
| JENOPTIK Laser, Optik, Systeme GmbH | 622 | | |
| Kipp & Zonen | 726 | | |

The Daily BAMS is funded in part by the exhibitors of the 89th Annual Meeting.