



DC-AMS Newsletter



DC-AMS APRIL Meeting

Dr. Robert Corell, director of the Arctic Climate Impact Assessment; and Dr. Johannes Loschnigg, US House Committee on Science, will speak in April. The date and location are still being negotiated. Check our web site !

<http://www.dc-ams.org>

Chair's Corner

By Jason Samenow

I am very excited about our meeting in April, for which we will shortly announce the time and place. Dr. Robert Corell, who was recently profiled on *60 Minutes* for his work on the Arctic Climate Impact Assessment, and Dr. Johannes Loschnigg, staff member of the House Science Committee, will give science and policy perspectives on the theme: "The Arctic is Melting: Does Congress Care?"

*Commentary: What is WAS*IS?*

Too often, many meteorologists operate in a black box -- and their products are devoid of clear social relevance and application. To shift this paradigm in our community, NCAR's Societal Impacts Group and the U.S. Weather Research Program established the "Weather and Society Integrated Studies" Program (WAS*IS). WAS*IS aims to better integrate weather and social science to empower practitioners, researchers, and stakeholders to forge new relationships, and to use new tools for more effective socio-economic applications and evaluations of weather products.

I was fortunate enough to be selected to participate in this program, and to have attended

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two workshops at NCAR in Boulder while working on a group project. This has been an enriching experience. I have learned from, and engaged in stimulating discussions about decision analysis and support, economics, vulnerability assessments, GIS applications, survey methods, and communicating uncertainty. My group project, which involves using thermal and demographic data to conduct a spatial assessment of vulnerability to excessive heat, shows promising results.

Hurricane Katrina was a humbling reminder that bridging the gap between weather and its societal impacts remains a key challenge for our community. Our forecasts and products may be good, but only have real value if they are developed cooperatively with user input,

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Ground Broken for new NOAA Center for Weather & Climate Prediction

COLLEGE PARK, MD - The U.S. General Services Administration (GSA), in partnership with the National Oceanic and Atmospheric Administration (NOAA), broke ground today for the new Center for Weather and Climate Prediction. Opus East, L.L.C., of Rockville, Maryland, will design, construct and own the building and lease it to the GSA. Hellmuth, Obata + Kassabaum, Inc. is the lead designer and interior architect. Opus arranged a long-term ground lease with the University of Maryland for the development. The 268,762 square-foot office and research complex will become the new home for NOAA's Satellite and Information Service (*aka* NESDIS), Air Resources Laboratory, and the National Centers for Environmental Prediction. Some 800 people will work in the facility.

Virtually all the meteorological data collected globally will arrive at NOAA's Center for Weather and Climate Prediction. Scientists will generate a wide variety of atmospheric and oceanic forecasts and products using numerical weather and climate prediction models. "Our vision is clear: To create a new state-of-the-art facility for NOAA employees that enhances our ability to understand and meet global atmospheric challenges of today. Our goal is to accelerate new science and technology into operations, improve forecast performance, and better serve the American public," said Conrad C. Lautenbacher, Ph.D., NOAA Administrator.

This structure has been designed to provide a state-of-the-art facility that reflects NOAA's mission "to understand and predict changes in the Earth's environment, and conserve and manage coastal and marine resources, to meet our nation's economic, social and environmental needs." It includes its "green roof" and rainwater waterfall, and both the site and building will achieve the U.S. Green Building Council LEED Silver Certification. An employee-friendly building that brings the natural settings into everyone's office will be equally inviting to visitors. The facility will be completed in late fall 2007, with full occupancy in February 2008.

DC-AMS Newsletter

is the organ of the Washington, DC Chapter of the American Meteorological Society, an autonomous local chapter of the national AMS. Membership is open to everyone interested in the atmospheric and related sciences. . Dues are \$15 per year, \$ 25 for 2 years, or \$ 35 for 3 years. There is a lower educational rate for teachers and students at \$10 per year. The Chapter year runs from September 2005 to August 2006. Please print the membership form from the website:

<http://www.dc-ams.org>

And mail in your form and payment to: DC / AMS, P.O. Box 13557, Silver Spring, MD 20911-3557.

Winter Season Summary

National Climatic Data Center, Asheville, NC

In the three-month season from December 2005 to February 2006, temperatures were much above average, making the winter the 5th warmest on record for the nation. A record warm January dominated the winter average.

Extremely dry conditions occurred in the central and southern Plains and the Southwest. As of March 6, Phoenix had reached 140 days without measurable rainfall, surpassing the previous record of 101 days. Tulsa, Oklahoma, had its driest winter since records began in 1888, with just 1.6 inches of precipitation in the three months. Moderate-to-extreme drought (as defined by the Palmer Drought Index) affected about 25 percent of the lower 48 U.S. states.

But the Far West and Northwest were wetter than average. The snow pack there is now 150 percent of normal, while in the Southwest the snow pack is less than 50 percent of normal. Flagstaff, Ariz. has received 1.6 in. of snow until March 1, whereas the normal amount is 72.5 in.

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(Winter Season Summary, Continued from page 2)

Precipitation was nearly average for the 48 states of the contiguous US, taken together. For the last 12 months, the pattern has been mixed. Some 22 states have seen wetter conditions than normal, including two record wet states in New England; fourteen states have been much drier than normal, including Arkansas which has had a record dry 12 months.

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appropriately targeted, effectively communicated, and then, heeded and utilized.

If working at the interface between weather and societal impacts appeals to you, I encourage you to learn about the WAS*IS program and ways you can get involved. Contact me, or see: http://www.rap.ucar.edu/was_is/.

I'd like to thank our Vice Chair, Bryon Lawrence, and Treasurer Mark Gunzelman for doing a wonderful job in organizing our March meeting at the U.S. Naval Observatory (USNO). It was a very special evening. We had exclusive access to the 26" and 12" telescopes, library and the Master Clock, accompanied by three outstanding Naval Observatory staff volunteers who offered exceptionally rich commentary on these facilities. Cheers,

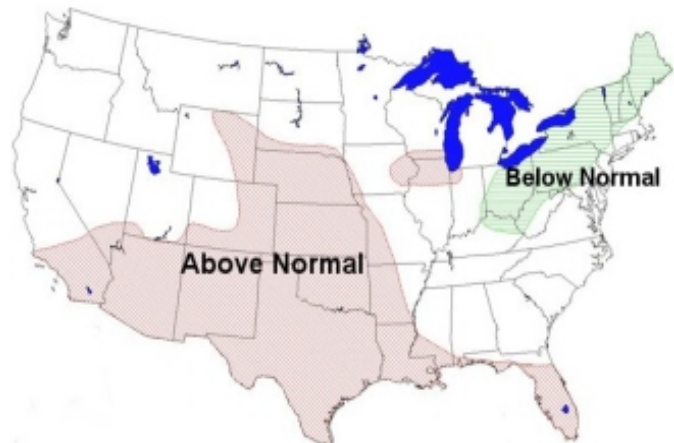
Jason

New Members wanted !

Air Quality Public Advisory Committee

The Air Quality Public Advisory Committee (AQPAC) advises the Metropolitan Washington Air Quality Committee on public air quality education and outreach, and provides input into Washington area air quality planning. AQPAC's membership includes organizations representing geographic communities across the Metropolitan Washington region. AQPAC has several membership openings to represent the residents of rural Virginia, urban Virginia, rural Maryland, and the District of Columbia, plus representatives from a business and an environmental or health organization. If you are interested in local air quality and want to have a voice in local policy, we are interested in you. Visit at: <http://www.mwcog.org/environment/committee/>, look for AQPAC ... To apply, please contact the AQPAC Chair, Jill Engel-Cox, at jengcl1@umbc.edu.

**Seasonal Wildland Fire Potential Outlook
February - June, 2006**



JOBS

Lead Engineer -- WeatherBug

Are you ready to work for the #1 Daily News and Information Site and the #6 Internet site in the country? WeatherBug® owns and operates the world's largest proprietary weather network with over 8,000 WeatherBug Tracking Stations and 1,000+ weather cameras strategically placed at schools and public safety facilities throughout the nation. WeatherBug data is used by over 80 million consumers daily, both online and on-air, to help plan the day ahead, protect communities and educate our children. WeatherBug has grown leaps and bounds over the last several years with over 220 employees today and still growing! WeatherBug turned profitable in 2001 and our revenue grew every year since.

Job Responsibilities include: C/C++ experience for 6 years; C# experience for 4 years, including .NET Win-Forms and WebForms; Java experience for 4 years; JS experience for 4 years; Windows experience for 8 years; Linux experience for 2 years; databases such as SQL Server, Oracle, or DB2 experience for 4 years; strong object-oriented analysis, design and programming skills; experience using modern development processes and developing through the complete Software Development Cycle; experience converting functional requirements into technical requirements; studying state-of-the-art development tools, programming techniques, and computing equipment; participating in educational opportunities; reading professional publications; maintaining personal networks; participating in professional organizations. WeatherBug offers a competitive benefits package, including medical, dental, vision, and life insurance, and fund-matching retirement savings plan. Forward resume via email to careers@aws.com. No phone calls, please. Cover letters should include career objectives, experience, and salary requirements.

DC-AMS hears NOAA's Chief, Admiral Lautenbacher

February 27, 2006

The DC-AMS meeting began with a light lunch. At 12:20 PM Vice Chairperson Bryon Lawrence started the business meeting by asking for volunteers to help judge the local and regional science fairs. He encouraged the members to check the schedule of science fairs, and contact Nancy Lee to sign up. Mr. Lawrence then announced the upcoming meeting at the United States Naval Observatory (USNO) on the evening of Wednesday, March 8. Lastly, he announced that T-Shirts and mugs are for sale and that soon membership renewals and merchandise could be purchased directly from the DC-AMS website.

Chairperson Jason Samenow reiterated the need for volunteers to help judge science fairs. He then discussed the chapter's involvement in the upcoming Washington Academy of Sciences (WAS) symposium. Mr. Samenow then introduced the guest speaker, NOAA Administrator, Vice Admiral Conrad C. Lautenbacher, Jr., U.S. Navy (Retired).

Vice Admiral Lautenbacher posed the question, Why is the National Oceanic and Atmospheric Administration (NOAA) a good idea? He answered that the Earth is a very complex system. The ocean and the atmosphere are closely coupled, each part greatly influencing the other part. With the right facilities and talent to study the ocean, atmosphere, and climate, NOAA produces weather forecasts, climate outlooks, and monitors changes in the ocean such as El Nino. NOAA has a key role in monitoring the oceans and the atmosphere for the public and policy makers.

To study this complex system, the United States and its international partners in the weather and ocean services have launched the Global Earth Observation System of Systems (GEOSS), as a vehicle to integrate observations and data. The goal of GEOSS is to increase the understanding of Earth and how it works. An intergovernmental group of 60 member nations was formed to focus on challenges facing the global environment and to share observations and scientific data that will benefit humanity. The first session of the Group on Earth Observations (GEO-1) was held in May 2005 in Geneva. It drafted a 10-year plan to guide the work of GEO. The United States Group on Earth Observations (USGEO) is focusing on understanding the effects of the environment on human health and well-being, reducing the loss of life and property from disasters, improving weather forecasts,

managing energy and protecting water resources, understanding climate change, supporting sustainable agriculture and forestry, and protecting the world's oceans.

Admiral Lautenbacher said NOAA responded to



Hurricane Katrina as "one NOAA." Several NOAA agencies combined their efforts to forecast the weather, assess wetlands and other environments from the air and from ships, re-open ship channel operations, and respond to oil and chemical spills. In addition to this, NOAA took samples of water quality and biological samples to ensure the safety of fish along the Gulf of Mexico Coast. Vice Admiral Lautenbacher lauded the forecasters at the Hurricane Center, the Lower Mississippi River Forecast Center (LMRFC) and the National Weather Service Weather Forecast Offices for producing timely and accurate forecasts, and for interacting well with the media to convey the grave dangers the hurricane posed.

Lautenbacher discussed science in the media, adding that NOAA does not promote policies which would squelch science and free thinking. NOAA does have a press policy with the purpose of providing protection for the scientist and protection for the agency. Scientists are not discouraged from discussing their views and ideas. However, when NOAA scientists speak on behalf of NOAA on scientific issues, the scientists are expected to abide with the NOAA press policy. This allows NOAA to take a uniform stand on environmental issues. According to Lautenbacher, the real issue is internal feuding between the meteorologists, climatologists and physicists within NOAA on issues such as a possible link between global warming and stronger hurricanes. This feuding does not help NOAA's cause. More tolerance of ideas between these groups will benefit NOAA's mission and allow it to take a more unified stand on environmental issues.

Federal Budget cuts at agencies like the FAA lead NOAA to become more involved in aviation forecasting and water resources management, and new "Tiger teams" assist in that.

References: <http://www.epa.gov/geoss/>

WMO Statement on Tropical Cyclones and Climate Change

February 2006 — STATEMENT
World Meteorological Organization — Geneva

We consider that the following conclusions of Henderson-Sellers *et al* (1998) remain valid:

- Current knowledge and available techniques are not able to provide robust quantitative indications of potential changes in tropical cyclone frequency;
- The modest available evidence points to an expectation of little or no change in global frequency. Regional and local frequencies could change substantially in either direction, because of the dependence of cyclone genesis and track on other phenomena (ENSO) that are not yet predictable;
- The rapid increase of economic damage and disruption by tropical cyclones has been caused, to a large extent, by increasing coastal populations, by increasing insured values in coastal areas and, perhaps, a rising sensitivity of modern societies to disruptions of infrastructure.

However, further elaboration is required on the conclusions by Henderson-Sellers *et al.* relating to changes in cyclone intensity. Whilst there is substantial debate on this topic, we consider that the following statements can be made:

- No single high impact tropical cyclone event of 2004 and 2005 can be directly attributed to global warming, though there may be an impact on the group as a whole;
- Emanuel (2005) has produced evidence for a substantial increase in the power of tropical cyclones (denoted by the integral of the cube of the maximum winds over time) during the last 50 years. This result is supported by the findings of Webster *et al* (2005) that there has been a substantial global increase (nearly 100%) in the proportion of the most severe tropical cyclones (category 4 and 5 on the Saffir-Simpson scale), from the period from 1970 to 1995, which has been accompanied by a similar decrease in weaker systems.
- The research community is deeply divided over whether the results of these studies are due to problems in the tropical cyclone data base.
- Precisely, the historical record of tropical cyclone tracks and intensities is a byproduct of real-time operations. Thus its accuracy and completeness changes through the record as a result of the continuous changes and improvements in data density and quality, changes in satellite remote sensing

retrieval and dissemination, and changes in training. In particular a step-function change in methodologies for determination of satellite intensity occurred with the introduction of geosynchronous satellites in the mid to late 1970's.

- The division in the community on the Webster *et al* and on the Emanuel papers is not as to whether Global Warming can cause a trend in tropical cyclone intensities. Rather it is on whether such a signal can be detected in the historical data base. Also it can be difficult to isolate the forced response of the climate system in the presence of substantial decadal and multi-decadal natural variability, such as the Atlantic Multi-decadal Oscillation.
- Whilst the existence of a large multi-decadal oscillation in Atlantic tropical cyclones is still generally accepted, some scientists believe that a trend towards more intense cyclones is emerging. This is a hotly debated area for which we can provide no definitive conclusion. There is no evidence for a decreasing trend in cyclone intensities.

Besides the above comments on tropical cyclone intensity, based on the published literature it is appropriate to make additional statements:

- The geographical extents of the existing regions of cyclogenesis and the existing regions affected by tropical cyclones still are not expected to change significantly. However, superimposed on the multi-decadal fluctuations, inter-annual variations such as the El Niño-Southern Oscillation (ENSO) are a major influence on cyclone development and the subsequent paths in most parts of the world. There is no consensus among current climate models regarding how ENSO variability may change in the future, although any such changes in ENSO would be expected to alter Tropical Cyclones regionally.
- In the context of changing regions of cyclogenesis, we note the debate concerning the hurricane-like system in the South Atlantic, but consider no conclusions can be based on a single system.
- A robust result in model simulations of tropical cyclones in a warmer climate is that there will be an increase in precipitation associated with these systems (for example, Knutson and Tuleya, 2004). The mechanism is simply that as the water vapor content of the tropical atmosphere increases, the moisture convergence for a given amount of

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[\(Tropical Cyclones & Climate Change, Cont. from p 6\)](#)

dynamical convergence is enhanced. This should increase rainfall rates in systems (tropical cyclones) where moisture convergence is an important component of the water vapor budget. To date no observational evidence has been found to support this conclusion; so no quantitative estimate can be given for the anticipated rainfall increase without further research.

- While demographic trends are the dominant cause of increasing damage by tropical cyclones, any significant trends in storm activity would compound such trends in damage.
- Projected rises in global sea level are a cause for concern in the context of society's vulnerability to tropical cyclones. In particular for the major cyclone disasters in history the primary cause of death has been salt-water flooding associated with storm surge.
- Because of the problems of the tropical cyclone databases utilized for studies on trends in these extreme events, there is an immediate need to

conduct an in-depth storm-by-storm reanalysis of tropical cyclones in all basins. Currently, a reanalysis is underway only for the Atlantic basin.

- The research issues discussed here are in a fluid state and subject of current investigation. The causes and attribution of the events of 2004-2005 will be discussed and argued in the refereed scientific literature. Prior to this, it is not possible to make any authoritative comment.

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[DC-AMS visited the US Naval Observatory](#)

The 8 March 2006 meeting of the DC Chapter of the AMS was held at the US Naval Observatory (USNO), Washington, DC. Our hosts for the evening were CDR Mark Gunzelman, Bob Freeman, Mike Angle, and Naval Observatory Public Affairs Officer Geoff Chester. Following a Social Hour and a short business meeting, members and guests embarked on tours of the Library, Master Clock, and 26-inch and 12-inch Refractor Telescopes. (Much more detail and photos of the Observatory are seen on the USNO web page, <http://www.usno.navy.mil>)

Founded in 1830 as the Depot of Charts and Instruments, the Naval Observatory is one of the oldest scientific agencies in the country. One of its first tasks was the calibration of ship's chronometers, which was accomplished by timing the transit of stars across the meridian. In 1855 the astronomical and nautical almanacs were started.

The U.S. Naval Observatory performs an essential scientific role for the United States, and the Navy. Its mission includes Astrometry (determining positions and motions of the Earth,

Sun, Moon, planets, and celestial objects), determining precise time, measuring the Earth's rotation, and maintaining the Master Clock for the United States. Observatory astronomers conduct research necessary to improve these mission goals. This astronomical and timing data, essential for accurate navigation and the support of communications on Earth and in Space, is vital to the Department of Defense. It is also used extensively by the government and the public at large.

We were lucky to have a mostly clear night so we were able to view Saturn and 5 of its moons through the 26-inch refracting telescope. What an amazing sight! This telescope has a rich history. Completed in 1873 at a cost of \$50,000, it was the largest refracting telescope in the world. It was from this site, in 1877, that astronomer Asaph Hall discovered the two moons of Mars, Phobos and Deimos, with the "Great Equatorial Telescope", bringing the attention of the world to the USNO.

The move to the Observatory's present site in 1893 allowed the 26-inch lens to be re-mounted in a new dome. This design incorporated a rising floor to facilitate access to the eyepiece;

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this floor is still the largest elevator in the city!

Today, the telescope is used on every clear night to measure double stars. Visual observations by astronomers using micrometers have been replaced by electronic imaging techniques. By taking very short exposures with a camera having a Charge-Coupled Device (CCD), astronomers can use the blurring effect of Earth's atmosphere to their advantage to measure the separations and position angles of the two stars in double stars. The technique, known as "speckle interferometry" is ideally suited to the 125 year-old optics of the great telescope and relatively unaffected by the urban location of the Observatory. Several thousand stars are measured annually, and such observations, added to the visual observations over a century, add up to the most concise double star catalog in the world.

The telescope is also used to measure the positions of the moons of the outer planets to help refine their orbital parameters. These data are vital in planning missions to such distant worlds.

We next viewed our own planet's moon through the 12-inch refracting telescope. Made in 1892, it was used in the early 20th Century for double star measurements and astrometry of plforecast anetary moons and asteroids. Several asteroids were discovered with this venerable telescope.

In 1957 this telescope was removed and replaced by a specialized camera which recorded the precise position of the Moon against the background stars. These data were used to refine the Moon's orbit for the first lunar exploratory missions and the Apollo

program. They were also used to relate the time-scale measured by the Earth's rotation to that measured by atomic clocks.

We next took a brief tour of the Library, which contains some extremely rare books, including originals by Kepler, Boyle, Newton, and Galileo.

The final treat of the evening was a visit to the Master Clock. By a Department of Defense directive, the Naval Observatory maintains the reference standard for Precise Time and Time Interval, and has developed the world's most accurate atomic clock system. Modern navigation systems depend on the availability and synchronization of highly accurate clocks. This holds for ground-based systems such as LORAN-C, as well as for the satellite-based NAVSTAR Global Positioning System (GPS). The Master Clock is the time and frequency standard for all of these systems.

The atomic clock timescale of the Observatory is based on an ensemble of 50 cesium-beam frequency standards and a dozen hydrogen masers. Frequency data from this ensemble steer the frequency of another such maser, designated Master Clock 2, until its time equals the average of the ensemble, thereby providing the physical realization of this "paper timescale."

Portable atomic clocks have been transported on aircraft in order to synchronize time at Naval Bases around the world with the Master Clock. Time synchronization with the Master Clock is now carried out through the use of atomic clocks on satellites, such as the GPS satellites. USNO Coordinated Universal Time is usually kept within 10 nanoseconds of UTC.

- - *Recording Secretary, Lauraleen O'Connor*

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