AOML Keynotes

Miami, Florida

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Here are several important web sites to assist in becoming familiar with security procedures put into place by the newly formed Department of Homeland Security, Department of Commerce, NOAA, and AOML in the event of an emergency situation:

Department of Homeland Security
http://www.whitehouse.gov/homeland

Department of Commerce Office of Security
http://www.osec.doc.gov/osy/

NOAA Homeland Security
http://www.emergency.noaa.gov

AOML Phased Security Plan
http://nuwave/intrapdf/phased_security_plan.pdf

AOML Occupant Emergency Plan
http://nuwave/intrapdf/OEP.pdf

Emergency Preparedness Guides
http://www.opm.gov/emergency/

Administrative Professionals Day
April 23, 2003

AOML and CIMAS Jointly Celebrate Anniversaries

AOML and the University of Miami's Cooperative Institute for Marine and Atmospheric Studies (CIMAS) jointly celebrated their anniversaries on February 19, 2003 with a series of presentations and poster sessions. Guests from various NOAA line offices, university collaborators, and retired colleagues joined AOML and CIMAS employees for a day to reflect upon how their organizations have evolved over the past 30 and 25 years, respectively, and where the next several decades may take them.

Director Kristina Katsaros addresses guests in the AOML lobby during the morning session of the joint AOML/CIMAS anniversary activities on February 19, 2003.

The festivities began with a morning session at AOML. Laboratory Director Kristina Katsaros was joined by Division Directors Silvia Garzoli, Frank Marks, and Peter Ortner as each provided insight on the latest AOML research accomplishments and plans for the development of future programs. A poster session followed to highlight current AOML projects.

Silvia Garzoli, Director of AOML's Physical Oceanography Division, addressed the topic of climate research at AOML, which currently focuses on heat transfer processes in the subtropical and tropical Atlantic Ocean and Intra-Americas Sea (Caribbean and Gulf of Mexico). AOML scientists are analyzing the relationship between the variability of these processes and the climate, particularly rainfall, in surrounding continental regions including the southern United States. Garzoli stated that AOML's long-standing partnerships with NOAA's Pacific Marine Environmental Laboratory, Environmental Technology Laboratory, and Climate Modeling and Diagnostics Laboratory in monitoring and analyzing the ocean as both a source and sink for carbon dioxide would continue.

The strong emphasis on technology transfer through the U.S. Weather Research Program's Joint Hurricane Testbed project was discussed by Frank Marks, Director of AOML's Hurricane Research Division. Marks stated that future research programs would focus largely on hurricane intensity and precipitation and build upon the success of AOML's interdisciplinary approach to conducting research, *e.g.,* the analysis of seasonal and decadal levels of hurricane activity and their connection to ocean-related, large-scale phenomena such as El Niño and the North Atlantic Oscillation. *(continued on page 2)*

(continued from page 1)

He stated that small scale studies would include the effects of local warm ocean eddies on hurricane intensity, with emphasis on improving the 24-48 hour forecasts.

Peter Ortner, Director of AOML's Ocean Chemistry Division, spoke of AOML's desire to expand the Coral Reef Early Warning System (CREWS) network to include monitoring stations near Puerto Rico, the Hawaiian Islands, and American Samoa. Technology is under development at AOML to add sensors to the CREWS network that utilize DNA to identify waterborne bacteria and other substances in the vicinity of coral communities. Ortner stated that AOML's regional involvement in the Comprehensive Everglades Restoration Program, in particular, monitoring and analysis of Florida Bay, would gain greater importance as the program progressed from its research to implementation stage.

As the most southeastern laboratory of NOAA's Office of Oceanic and Atmospheric Research, it is both an opportunity and responsibility for AOML to represent NOAA's research interests in the Atlantic, Caribbean, and Gulf of Mexico. AOML looks forward to developing new programs in these regions.

CIMAS continued the festivities by hosting an afternoon session at the University of Miami's Rosenstiel School campus. A panel of former CIMAS directors and current researchers gathered for an anniversary roundtable discussion to reminisce about the past 25 years, review current research accomplishments, and formulate visions for future programs.

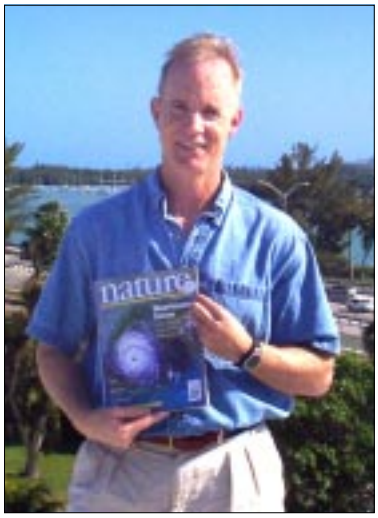
An evening outdoor dinner reception held on the grounds of AOML followed. Above the strains of a steel drum band, plenty of lively discussions and theorizing could be heard, the camaraderie that has been the foundation for the very successful collaboration between AOML and CIMAS researchers.

(edited from NOAA Hot Items entry for March 3, 2003, Erica Van Coverden, contact [http://hotitems.oar.noaa.gov])

Research Advances Understanding of Hurricane Dynamics

Scientists from AOML's Hurricane Research Division (HRD) and their colleagues have moved one step closer to understanding hurricane dynamics with a recent breakthrough description of a storm's vertical wind speed structure and its relation to the tumultuous ocean surface below the storm. This new characterization, published in the March 20 issue of the journal *Nature,** could affect numerous computer models used to predict hurricane motion, intensity, and the associated waves and storm surge that can be devastating to coastal communities.

The discovery was made possible because of new data collected from probes deployed during NOAA's hurricane field experiments and U.S. Air Force reconnaissance missions. The probes, Global Positioning System (GPS) dropwindsondes, provide information about the force the wind exerts on the sea surface. This information was previously difficult to measure and thus was extrapolated from much weaker storms, a calculation now determined to be an overestimation by the research team. The data from the GPS dropwindsondes became available due to the pioneering efforts of James Franklin of the National Hurricane Center and Michael Black of HRD, who led efforts to have NOAA and the Air Force routinely deploy these probes on hurricane missions and who provided a quality-controlled set of dropsonde observations for use in this study.



Mark Powell holds the March 20th issue of the journal *Nature*, which features a graphic from his article on the cover.

The team was headed by Mark Powell, a research meteorologist with HRD, and co-authors Peter Vickery of the University of Western Ontario and Timothy Reinhold of Clemson University. "This has been kind of a 'Holy Grail' for scientists interested in air-sea interaction in hurricanes, as well as engineers interested in the design of ocean structures," said Powell. "The GPS sondes have provided measurements to help settle this problem in the open ocean. We'll have to launch many more sondes near the coast to see if the results also apply there."

The finding is significant as it helps determine how the wind acts on the ocean surface to create waves and storm surge, and is also related to the amount of energy supplied from the ocean to the storm in the form of heat and moisture. The formulation that describes this energy is employed in applications such as:

- Forecasting the intensity and track of tropical cyclones in numerical weather models;
- Determining surface wind speeds from hurricane research aircraft;
- Describing the geographic distribution of the most extreme winds in a hurricane;
- Creating models for building design and determining insurance rates.

"There have been impressive strides taken in the quality of tropical cyclone track predictions over the last 10 years, mainly due to improved dynamical models. However, there appears to be little new skill in predicting storm intensity changes," said Isaac Ginis, a professor at the University of Rhode Island's Graduate School of Oceanography. "In light of the fundamental role the air-sea interaction processes play in supplying energy to the tropical cyclone, this discovery seems to be one of the most promising for major improvements in tropical cyclone intensity forecasting."

Ashan Kareem, the Robert M. Moran professor of the University of Notre Dame's NatHaz Modeling Laboratory, said the findings of Powell and his colleagues reveal the "complexities underlying air-sea interaction with emphasis on the surface drag" and that they "will have a profound influence on the characterization of the wind field over the ocean."

*Powell, M.D., P.J. Vickery, and T.A. Reinhold, 2003: Reduced drag coefficient for high wind speeds in tropical cyclones. *Nature*, 422:279-283.

MAST Academy Wins Marine Science Regional Competition

Students from the Maritime and Science Technology High School (MAST Academy) on Virginia Key won the 2003 Florida regional competition of the National Ocean Sciences Bowl (NOSB) held in Miami on February 23rd. MAST Academy's winning team will join 24 other high school teams in La Jolla, California for the national level NOSB competition on April 25-28.

Nine AOML staff members helped make the competition a success by volunteering as moderators, rules and science judges, and time and score keepers. Preparation included memorization of game rules, practice competition rounds, and hours of question review for scientific validity and content. They also assisted in the writing of team challenge questions used in all of the regional competitions.

The NOSB is organized and managed by the Consortium for Oceanographic Research and Education (CORE) to increase knowledge of the oceans on the part of high school students and their teachers and parents. The University of Miami's Rosenstiel School and Harbor Branch Oceanographic Institute organized the Florida regional competition.

Marks Becomes Hurricane Research Division Director

Frank Marks, Acting Director of AOML's Hurricane Research Division (HRD), accepted full directorship of the Division in February 2003. He succeeds Hugh Willoughby in the position, who retired from federal service in July 2002.

Marks began working for HRD as a research meteorologist in 1980. Over the years, his studies have focused on radar remote sensing (ground-based, airborne, and spaceborne) of tropical cyclones and mesoscale convective systems. Other research interests have included development of tropical cyclone algorithms for use with land-based Doppler radars. He has participated in more than 145 research missions into tropical cyclones, including over 390 penetrations of hurricane eyewalls, through HRD's annual hurricane field program of data collection in support of analytical and theoretical studies of hurricanes. "We are excited to have Frank's professionalism, scientific expertise, and leadership guiding HRD's success for years to come," said Judy Gray, AOML Deputy Director.

Marks was elected a Fellow of the American Meteorological Society in 2000. In 1997, he earned a Department of Commerce Silver Medal for his performance as the research mission manager during the procurement of NOAA's Gulfstream-IV high altitude jet. He was also a member of HRD's Department of Commerce Gold Medal awarded to the Division for their performance during Hurricane Andrew in 1992.

Close-Up Students Visit AOML

Students from Hialeah High School visited AOML on March 21st to discuss their trip to Washington, D.C. during February as participants of the Close-Up Program. Close-Up engages high school students in an intensive, week-long civics education journey that takes them behind the scenes to witness government in action. Trip highlights included visits to national monuments and museums, meetings with state and local representatives, and debate sessions with students from across the country. With the assistance of Alejandra Lorenzo, a computer specialist with AOML's Computer Networks and Services Division and an alumni of Hialeah High, funds secured from NOAA's Office of Equal Employment Opportunity made the much anticipated trip possible.

Hialeah High School students Beth Walker, history teacher Catherine Palmore, Zareda Nicieza, Carolina Granada, AOML's Alejandra Lorenzo, and Francisco Ferio.

Spring Luncheon

Southeast Fisheries Science Center + AOML

April 25, 2003
SEFSC Grounds
1:00 p.m.

Bring a dish to share with others

For more info contact:
Erica Van Coverden
(305) 361-4541 or
Erica.Van.Coverden@noaa.gov

Forde Speaks at National Science Teacher Convention

AOML oceanographer Evan Forde was an invited guest lecturer at the convention of the National Science Teachers Association held in Philadephia, Pennsylvania on March 28th. Forde's seminar focused on how satellite sensors have assisted meteorologists in detecting oceanic areas favorable for tropical storm development. His presentation was one of eight seminars designed to convey information about cutting edge research in science and technology. Over 14,000 science teachers of all grade levels attended the annual event.

Farewell

Noel Charles, a student assistant with the Hurricane Research Division, departed AOML in February after six years of employment to accept a support technical engineer position with a local Miami-based computer company.

Lt. Joseph Pica, Associate Director, departed AOML on February 28 after a two year tour of duty in Miami to become the Executive Officer aboard the NOAA Ship *Gordon Gunter* based in Pascagoula, Mississippi.

Join Team AOML

Miami Corporate Run

May 8, 2003
Bayfront Park
6:45 p.m.

Contact:
Chuck Featherstone
(305) 361-4401 or
Charles.Featherstone@noaa.gov

Congratulations

Robert Molinari, NOAA senior scientist with the Physical Oceanography Division, is the recipient of a NOAA FY-2003 Administrator's Award for his leadership in building partnerships among nations and a diverse set of agencies and organizations to develop a global ocean observing system for climate and marine prediction services. He was also acknowledged for research that has advanced the understanding of the Atlantic Ocean's role in global climate balances. Molinari's efforts over the past five years have resulted in a holistic approach to ocean observing activities and global coordination of oceanographic sensor development and deployment, data management, and data dissemination. His research on the Deep Western Boundary Current documented the speed of the Atlantic meridional overturning circulation as being considerably faster than previously thought. This finding has had important implications in studies of the Atlantic Ocean's ability to transport heat and assimilate atmospheric gases such as carbon dioxide.

Sim Aberson, a meteorologist with the Hurricane Research Division, is the recipient of a FY-2003 Employee of the Year Award from NOAA's Office of Oceanic and Atmospheric Research. Aberson received the award for his personal and professional leadership in promoting science and for research that has resulted in significant improvement of tropical cyclone track forecasts. Aberson has worked to bring science to a broader audience for the past several years by serving as a member of the American Meteorological Society's Board on Women and Minorities and the NOAA Diversity Council. His research to pinpoint regions in the atmosphere likely to impact track forecasts led him to design operational synoptic surveillance missions into the environments of tropical storms and cyclones that have improved model track forecasts by an average of nearly 25% during hurricane watch and warning periods. These improvements have aided forecasters and hurricane specialists more accurately warn coastal populations of approaching storms.

Alberto Mestas-Nuñez, a CIMAS assistant scientist with the Physical Oceanography Division, was named Research Team Member of the Month for February 2003 by NOAA's Office of Oceanic and Atmospheric Research. Mestas-Nuñez was recognized for his enthusiasm, initiative, and cooperative attitude, as well as for the thoroughness and accuracy of his research. His publications and many presentations before scientific audiences are helping AOML gain a solid reputation for cutting edge research in the area of ocean-atmosphere climate interactions. Mestas-Nuñez has been an active CIMAS investigator collaborating with AOML scientists since 1997.

AOML's 30-year old street sign facing the Rickenbacker Causeway was spruced up this past February with the addition of Department of Commerce and NOAA colorized emblems to improve its aesthetic appeal and visibility.

Travel

Christopher Landsea attended the Second International Symposium on Tropical Cyclones in Havana, Cuba on March 3-7, 2003. He attended the Bahamas Weather Conference in Nassau, Bahamas on April 1-4, 2003.

Robert Molinari attended the Fifth International ARGO Science Team Meeting in Hangzhou, China on March 4-6, 2003.

Mark Powell participated in the Army Corps of Engineers Advanced Circulation (ADCIRC) Review Panel in New Orleans, Louisiana on March 5-7, 2003.

Rik Wanninkhof was the invited guest speaker at the Surface Ocean Lower Atmosphere Study (SOLAS) Gax Exchange Workshop in The Netherlands on March 11-17, 2003.

Silvia Garzoli attended the SAC (Satelite de Aplicaciones Cientificas) Aquarius Science Team First Meeting in Mar del Plata, Argentina on March 18-20, 2003.

Jules Craynock, Michael Shoemaker, Louis Florit, Skeet Perry, and Clarke Jeffris performed maintenance on a Coral Reef Early Warning System (CREWS) station located on Salt River Bay, St. Croix, U.S. Virgin Islands on March 24-28, 2003.

Kristina Katsaros attended the European Geophysical Society-American Geophysical Union-European Union of Geosciences (EGS-AGU-EUG) Joint Assembly in Nice, France on April 6-11, 2003.

David Enfield attended a regional climate outlook forum and helped to train meteorologists in the use of prediction software in Tegucigalpa, Hondorus, on April 6-9, 2003.

Gustavo Goni attended and made an invited presentation at the Global Sea Level Observing System (GLOSS) meeting in Valparaiso, Chile on April 11-18, 2003.

Peter Ortner, Christopher Kelble, and Dawn-Marie Boyer attended the Joint Conference on the Science and Restoration of the Greater Everglades and Florida Bay Ecosystem in Tampa, Florida on April 13-18, 2003.

Ooyama Retires

Katsuyuki Ooyama, a meteorologist with the Hurricane Research Division, retired on March 28, 2003 after a distinguished science career spanning more than 50 years. His pioneering research of tropical cyclone dynamics influenced an entire younger generation of scientists studying cyclogenesis.

Ooyama began his career as a meteorologist with the Meteorological Agency of Japan in 1951 after earning a B.S. degree in physics from the University of Tokyo. He attended New York University (NYU) from 1955-1958 where he earned both a M.S. degree and a Ph.D. in meteorology. From 1958 to 1973, he worked for NYU's Department of Meteorology and Oceanography as a research scientist studying infrared remote sensing of ozone, and as an assistant, associate, and full-fledged professor of meteorology specializing in the study of tropical cyclones and the theory of cumulus parameterization.

Ooyama departed NYU in 1973 to work for the National Center for Atmospheric Research as a scientist. In the summer of 1974, he participated in the international GATE experiment (Global Atmospheric Research Program's [GARP] Atlantic Tropical Experiment) where he analyzed data collected from a wide array of observing systems. GATE attempted to provide a means for estimating the effects of smaller tropical weather systems on the large-scale circulation and facilitate the development of numerical modeling and prediction methods. Many contemporary studies in tropical meteorology are still influenced by GATE's insights and results.

In 1980, Ooyama accepted a position with AOML's Hurricane Research Division as a senior research scientist. During the years Ooyama worked with the Hurricane Research Division, he studied a variety of basic problems related to tropical cyclones, particularly the application of advanced numerical methods for three-dimensional modeling. He published three landmark papers on these numerical modeling efforts that earned him three NOAA distinguished authorship awards, and which served as basic reading for a whole new generation of tropical cyclone modelers.

His development of the scale-controlled objective analysis method based on B-splines served as the basis for many numerical applications developed at HRD, *e.g.,* the barotropic tropical cyclone track model (VICBAR), the hurricane spline analysis used in the Hurricane Wind Analysis System (H*WIND), and a non-hydrostatic model used by many colleagues. Ooyama's scientific legacy to the hurricane community through these developments and his interactions with numerous colleagues will have a long-lasting impact.

In 2001, he retired from federal service but continued working with HRD as a part-time research scientist through the University of Miami's Cooperative Institute for Marine and Atmospheric Studies. Among his many accolades are the American Meteorological Society's Meisinger Award of 1968 for "the successful generation of a simulated tropical hurricane by an electronic computer," and the Meteorological Society of Japan's Fugiwara Award of 1971 for tropical cyclone research. Ooyama is also an honorary member of the Meteorological Society of Japan and a Fellow of the American Meteorological Society.

Congratulations to Katsuyuki Ooyama, or "Vic" as he is more popularly known, for his valuable contributions in advancing the theory and modeling of tropical cyclones and for his many years of service to NOAA. Best wishes for a well-deserved retirement.

Keynotes is published bi-monthly by the Atlantic Oceanographic and Meteorological Laboratory. Contributions and/or comments are welcome and may be submitted via email (Gail.Derr@noaa.gov), fax (305) 361-4449, or mailing address: NOAA/AOML, *Keynotes*, 4301 Rickenbacker Causeway, Miami, FL 33149.

Editor – Kristina Katsaros

Writer/Publishing Editor – Gail Derr

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