

Keynotes

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Atlantic Oceanographic and Meteorological Laboratory

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"Living in a coastal state means having a plan for each and every hurricane season. Review or complete emergency plans now, before a storm threatens. Planning and preparation are the key to storm survival and recovery."

VADM Conrad C. Lautenbacher, Jr.
NOAA Administrator and
Under Secretary of Commerce
for Oceans and Atmosphere

"Americans in hurricane-prone states must get serious and be prepared. Government—even with the Federal, tribal, state, and local governments working perfectly in sync—is not the entire answer. Everyone is part of the emergency management process. We must continue to develop a culture of preparedness in America in which every American takes personal responsibility for his or her own emergency preparedness."

David Paulison, Administrator
Federal Emergency
Management Agency

2008 Atlantic Storm Names

Arthur	Hanna	Omar
Bertha	Ike	Paloma
Cristobal	Josephine	Rene
Dolly	Kyle	Sally
Edouard	Laura	Teddy
Fay	Marco	Vicky
Gustav	Nana	Wilfred

NOAA Releases 2008 Atlantic Hurricane Seasonal Outlook

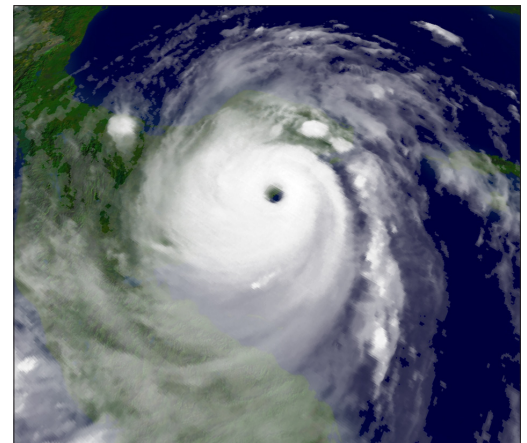
Coastal communities were urged to prepare for the upcoming hurricane season as NOAA released its 2008 hurricane seasonal outlook for the Atlantic basin on May 22nd. Speaking at a press conference held at MacDill Air Force Base in Tampa, Florida, home to NOAA's fleet of hurricane hunter aircraft, Dr. Gerry Bell, lead scientist of NOAA's seasonal outlook team, stated that a 90% probability existed that 2008 would be marked by normal or above normal levels of storm activity, with only a 10% chance of below-normal activity. An above-normal season is most likely (65% chance), but there is also a 25% chance of a near-normal season.

The outlook predicts a 60-70% chance of the following ranges of activity during the six-month long Atlantic hurricane season, which stretches from June 1st to November 30th. Accumulated cycle energy (ACE), a measure of the overall activity of the season that takes into account strength and duration of the storms and hurricanes, is expected to be between 100-210% of the median (see graphic on page 2). The outlook also anticipates that 12-16 named storms will form, with six to nine predicted to develop into hurricanes, and with two to five hurricanes strengthening into major hurricanes (sustained wind speeds above

110 mph; categories 3, 4, and 5 on the Saffir-Simpson scale). An average season produces 11 named storms, six hurricanes, and two major hurricanes.

NOAA cautions that the outlook provides the public with only a general guide to the expected overall activity for the upcoming hurricane season. It is not a seasonal hurricane landfall forecast, and it does not imply levels of activity for any particular region. Therefore, residents, businesses, and government agencies in coastal and near-coastal regions should prepare for every hurricane season regardless of the seasonal outlook.

Climatic factors contributing to the normal to above-normal forecast include the ongoing active phase of the Atlantic multi-decadal signal, which is believed to have increased the overall amount of hurricane activity since 1995, and warmer than normal sea surface temperatures in the eastern tropical Atlantic Ocean. Additional climatic factors that could impact the 2008 season are atmospheric circulation patterns over the Atlantic hurricane basin (such as reduced vertical wind shear) associated (*continued on page 2*)



GOES-12 satellite image of powerful Hurricane Dean making landfall along the the Yucatan Peninsula on August 21, 2007. Dean became the first category 5 Atlantic hurricane to make landfall since Hurricane Andrew devastated south Florida in 1992.

AOML Director Bob Atlas joined Florida State Congresswoman Ileana Ros-Lehtinen and Bill Read, new director of NOAA's National Hurricane Center, in Key Largo, Florida, on June 2nd to participate in a Hurricane Awareness Summit. The event brought together citizens, community activists, and emergency management personnel, as well as Federal, state, and local officials, to discuss the 2008 hurricane season and hurricane preparedness efforts. Atlas fielded questions from the audience and spoke of recent advances in hurricane research aimed at providing the public with more accurate forecasts.



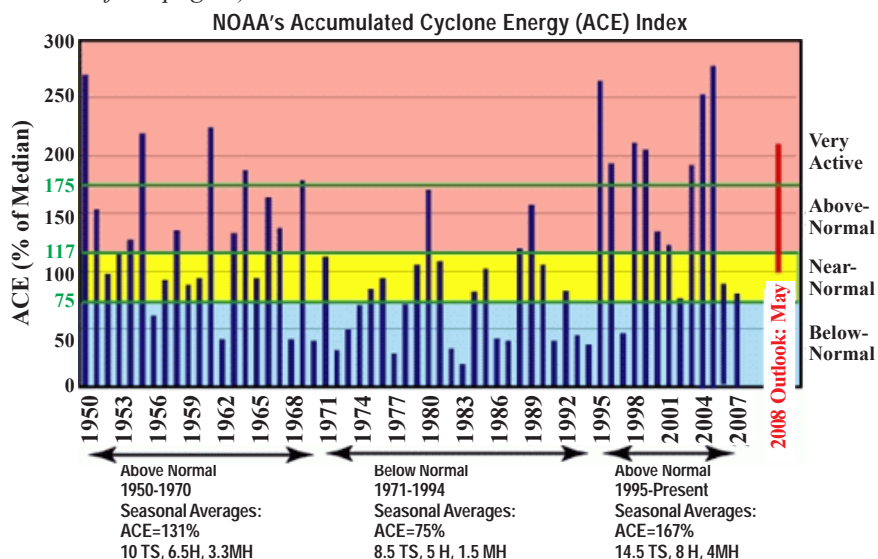
Congresswoman Ileana Ros-Lehtinen (center) kicks off the second annual Hurricane Awareness Summit in Key Largo, Florida on June 2nd.



AOML Director Bob Atlas (center) answers questions from the audience about research efforts to improve hurricane forecasts.

Atlas also joined Florida State Congresswoman Debbie Wasserman Schultz on May 29th for the third annual Hurricane Preparedness Expo held at the Broward County Emergency Operations Center. Atlas spoke of NOAA's efforts to improve forecasts, as well as the importance of properly preparing for the season.

(continued from page 1)



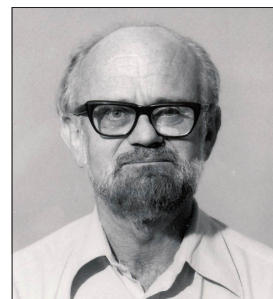
NOAA's 2008 Atlantic hurricane season outlook indicates a 60-70% chance that the ACE range will be 100 -210% of the median. The outlook mainly reflects the ongoing active Atlantic hurricane era that began in 1995 and a possible La Niña-related reduction in vertical wind shear.

with lingering La Niña conditions. While it is possible that La Niña might transition to neutral conditions during the hurricane season, the patterns of tropical convection and winds attributed to both La Niña and neutral conditions have historically been associated with an increased number of Atlantic hurricanes.

The majority of storm activity typically occurs from August to October, the peak months of the Atlantic hurricane season. NOAA will issue an updated forecast in early August. The 2008 seasonal outlook team consists of scientists with NOAA's Climate Prediction Center, National Hurricane Center, and Hurricane Research Division (HRD) of AOML. Stanley Goldenberg, a meteorologist with HRD, has been a part of the outlook team since it began in 1998.

In Memoriam

Feodor Ostapoff, former director of AOML's Sea-Air Interaction Laboratory (SAIL), passed away at his home in Vero Beach, Florida on June 2nd from an apparent heart attack. He was 83 years old. Ostapoff was one of a group of scientists that relocated to Miami from Washington, D.C. in 1968 with Dr. Harris B. Stewart, Jr., AOML's founder and first director. He was part of the original senior leadership at AOML that worked with Stewart to establish the Laboratory and develop its research focus. He served for almost 20 years as the director of SAIL and retired from Federal service in 1985. Ostapoff is survived by Jutta, his wife of 56 years, his son Michael, daughter Tanja, and several grandchildren.



James Trout, a former supervisory meteorologist with AOML's Hurricane Research Division (HRD), passed away at his home in La Mesa, California on May 27th after a long battle with Parkinson's disease. He was 74 years old. During his many years at AOML, Trout managed the fiscal, administrative, and personnel needs of HRD, as well as contributed to early hurricane modeling studies. His skill and knowledge of computer programming led to him serving as AOML's first information technology officer where he excelled at developing AOML's computing resources. He retired in 1989 and eventually relocated to California. Trout is survived by his wife Ruth, children Eric and Tere, and son-in-law Jonathan.



Dr. Alexander "Sandy" MacDonald, Deputy Assistant Administrator for NOAA's Office of Oceanic and Atmospheric Research (OAR) and Director of OAR's Earth System Research Laboratory (ESRL) in Boulder, Colorado, visited AOML on June 19-20th. Dr. MacDonald presented a seminar, "Ideas for Improving Hurricane Forecasts," to discuss collaborative opportunities for hurricane research between ESRL and AOML's Hurricane Research Division (HRD).



MacDonald addresses a full house as he presents his seminar at NOAA's Miami Regional Library at AOML on June 19th.

Dr. MacDonald met with HRD's modeling group to review the progress made between ESRL's Global Systems Division and HRD on developing a high resolution hurricane model and its data assimilation capabilities. The collaboration between ESRL's Physical Sciences Division and HRD to improve the representation of sea spray processes in hurricane models was also discussed.

Additionally, Dr. MacDonald met with researchers from HRD and the University of Miami's Rosenstiel School who will be participating in this summer's Wisdom balloon demonstration project. Wisdom balloons are a new tool developed to improve track and intensity forecasts. As they drift, the balloons release small instrument packages that provide forecasters with a steady stream of temperature, wind, and pressure data. The balloons will be deployed into the surrounding environment of weather systems that have the potential to develop into tropical cyclones.

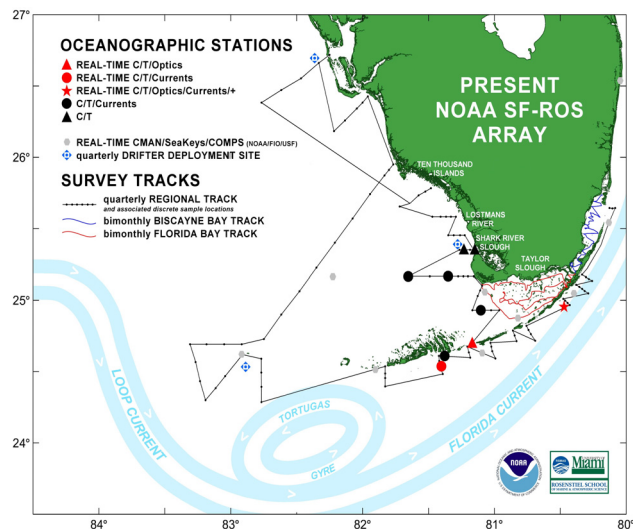
South Florida Coastal Monitoring Reflects Decreased Rainfall

AOML researchers conducted the latest in a series of cruises to sample the south Florida coastal ecosystem this past May as part of the NOAA-U.S Army Corps of Engineers (USACE) funded South Florida Ecosystem Restoration Program (SFERP). Initial data indicate that salinity values are high due to the regional drought and the resulting significant decrease in runoff.

Salinity levels are normally elevated during the dry season but this year, due to the 2007-2008 La Niña, conditions are drier than normal. The highest salinities are in the north-central basin of Florida Bay, due to its relative isolation from the other areas of Florida Bay and minimal direct freshwater runoff. High salinity has been associated with seagrass die-offs in the past, and is, possibly, detrimental to the biota that use Florida Bay as a nursery (e.g., pink shrimp, lobster, snapper, and grouper).

The sampling program began in 1995, and is more recently known as the South Florida Regional Observing System (SF-ROS). Maintaining this 12-year time series is critical to understanding the regional oceanographic conditions and their natural and anthropogenic variability. Temperature, salinity, chlorophyll, light transmittance, nutrients, and currents are all observed from a small research vessel, the R/V *Virginia Key*, and from the larger R/V *F.G. Walton Smith* operated by the University of Miami. Cruises are currently conducted on a quarterly basis. Partners include the USACE, the South Florida Water Management District, and Dr. Vassiliki Kourafalou of the University of Miami, who conducts HYCOM numerical modeling of the region.

Long-term sampling of environments such as south Florida's coastal ecosystem is critical for assessing and predicting impacts of natural and anthropogenic changes on important commercial and recreational habitats and species. By monitoring parameters like salinity and chlorophyll-a, user groups such as coastal managers are better able to determine how to plan for anticipated changes due to the Everglades Restoration effort.



Configuration of the South Florida Regional Observing System (SF-ROS). Shown are moored instrument locations, satellite-tracked surface drifter deployment sites, and cruise tracks for quarterly and bimonthly interdisciplinary surveys of Florida Bay and Biscayne Bay. The time series of regional observations has been nearly continuous since 1995.



Staff from the South Florida Marine Ecosystem Project and Environmental Protection Agency are working together to produce an ecological synthesis book on the south Florida marine ecosystem. The book will summarize scientific studies spanning the past decade in an easy-to-read format that incorporates graphs, images, and conceptual diagrams to improve understanding for the non-technical audience. Over 100 authors are expected to contribute to the book's content which includes, but is not limited to, seagrasses, corals, socio-economic factors, water quality, and physical oceanographic studies. The book should be completed and available some time in mid-2009 through a variety of south Florida outlets including AOML. Pamela Fletcher, outreach coordinator with the Florida Sea Grant program, is co-editing the book.

Individuals participating in a week-long water quality training course offered this past April by the University of Florida's Tropical Research and Education Center spent a day at AOML as part of their curriculum. The course was conducted to familiarize participants with water regulations, as well as with water monitoring and sampling techniques. Their visit to AOML was facilitated by Pamela Fletcher, a training instructor for the program and also an outreach coordinator with the Florida Sea Grant's South Florida Marine Ecosystem Project.



David Wanless (center) provides a demonstration of water monitoring procedures in AOML's Environmental Microbiology Laboratory.

AOML scientists provided participants with information on water quality issues related to the marine environment, as well as monitoring activities and methodologies. Dr. John Proni, Director of the AOML's Ocean Chemistry Division, spoke of the Laboratory's water quality monitoring efforts at several wastewater outfall sites in south Florida through the auspices of the Florida Area Coastal Environment program.

Lewis Gramer with NOAA/AOML's Integrated Coral Observing Network team presented participants with an overview of NOAA's Coral Health and Monitoring program that supports coral reef ecosystems by monitoring environmental conditions at coral reef sites. Dave Wanless of AOML's Environmental Microbiology Laboratory gave a synopsis of the volunteer beach monitoring program, as well as a tour of the laboratory and hands-on demonstration.

ICON Stations Show Near Perfect Operational Record

Mike Jankulak, Ocean Chemistry Division

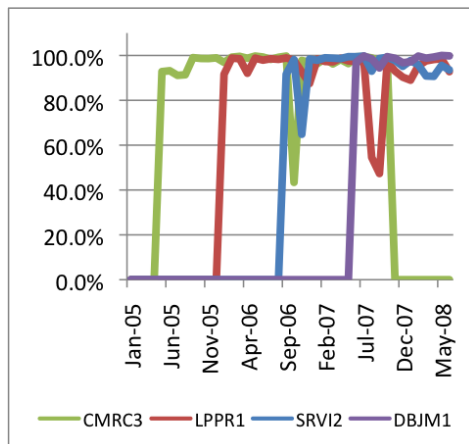
AOML scientists with the Integrated Coral Observing Network/Coral Reef Early Warning System (ICON/CREWS) design, deploy, and monitor data from specialized instrument pylons located at four reef locations (Lee Stocking Island, Bahamas; La Parguera, Puerto Rico; Salt River Bay, St. Croix, U.S. Virgin Islands; and Discovery Bay, Jamaica). These pylons collect data in situ on the atmospheric and physical water properties that are known to impact coral reefs, such as air temperature, wind speed, sea temperature, ultraviolet light, and carbon dioxide. Data from the stations are transmitted hourly by satellite to appear in near real-time reports on the ICON web site (www.coral.noaa.gov), and are redundantly written to backup memory modules local to each station.

As part of the ongoing data quality control efforts for ICON/CREWS data generated from the four stations, researchers retrieve local data from each station's memory module whenever a site visit is made. This practice allows recovery of data that may not have been fully reported by satellite transmissions, possibly due to inclement weather conditions at the time of transmission or due to transmitter equipment failure. For example, during a recent visit to the St. Croix station, the team restored 141 missing records for the time frame from March 12, 2008 through June 18, 2008. Both the raw and quality-controlled data are archived and transmitted to NOAA's Coral Reef Information System (CoRIS), along with relevant metadata.

Metrics relating to station "uptimes" have been assessed in two ways: one that considers the percentage of time a station was successfully transmitting, and a second method that ignores the transmitter and considers only whether the station was operational and writing data to its memory module. Lifetime values for the first metric (transmission uptimes) range from 93% to 98%. A month-by-month graph of transmission uptimes (above right) clearly shows the most significant downtimes; these include impacts from Hurricane Dean, as well as failures not tied to any known event. The team is pleased to announce that lifetime values for the second metric (station uptimes) are close to 100% for all four stations (see table below).



ICON/CREWS station located in Salt River Bay, St. Croix, U.S. Virgin Islands.



Graph illustrating month-by-month transmission up- and down-times for the four ICON/CREWS stations.

Transmission up-times for ICON/CREWS stations over their entire lifetime.				
Station Name	Location	Station Life Span	Transmission Uptime (%)	Station Uptime (%)
CMRC3	Lee Stocking Island, Bahamas	30 months	95.7	99.3
LPPR1	La Parguera, Puerto Rico	30 months	93.0	99.3
SRV12	Salt River, St. Croix, U.S. VI	22 months	95.3	99.6
DBMJ1	Discovery Bay, Jamaica	13 months	98.4	98.9

Carrie Wolfe of the Southern California Marine Institute recently visited the *Polynesia* of Polynesia Lines on behalf of the NOAA/AOML Ship of Opportunity Program (SOOP). The *Polynesia* is a long-standing member of SOOP with two generations of *Polynesias* having deployed expendable bathythermographs (XBTs) between Oakland, California and Tahiti from 1998-2006. They have also deployed 115 surface drifters since 2001 and continue to do so.



Captain Antonio Cruz Jr. accepts a plaque from Carrie Wolfe in recognition of the *Polynesia's* long-term contributions to the Ship of Opportunity Program.

During the visit, Carrie loaded a cluster of four drifters from four manufacturers aboard the *Polynesia* for deployment at a single location, and reviewed deployment instructions with the Captain and Chief Mate. Carrie also presented a plaque to Captain Antonio Cruz, Jr. and his crew in recognition of their invaluable and substantial contributions to SOOP.

Carrie has worked with SOOP since 1998 and is currently responsible for overseeing operations on five ships. She trains the crews, provides equipment, and helps develop hardware and software for the program. She also provides AOML with ship support for XBTs and drifters.

SOOP is supported by both the World Meteorological Organization and Intergovernmental Oceanographic Commission. NOAA/AOML is its main contributor and plays a role in the acquisition, deployment, and data transmission of 90% of the approximate 25,000 XBTs deployed annually to obtain temperature profiles of the sea surface down to a depth of 800 m. Information about SOOP can be found at www.aoml.noaa.gov/phod/goos/.

New Book Highlights Russian Underwater Acoustics

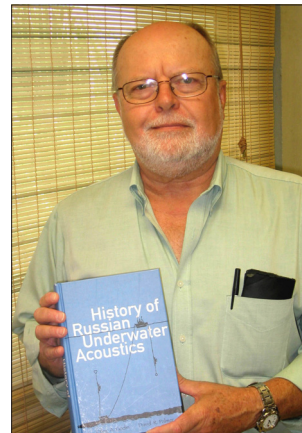
David Palmer, a physicist with AOML's Ocean Chemistry Division, along with Oleg Godin of the University of Colorado's Cooperative Institute for Research in Environmental Sciences, are the editors of a new book, *History of Russian Underwater Acoustics*, published this past February by World Scientific Publishing Company. The book project began because of the U.S. Office of Naval Research's interest in translating *A History of Russian Hydroacoustics: Articles, Essays, and Reminiscences*, which was published in St. Petersburg, Russia in 1999 to commemorate the 300th anniversary of the Russian Navy.

There were several challenges in working with the Russian book, however. For example, many of the articles would have been of little interest to U.S. readers. In addition, the word "hydroacoustics" in Russia refers to the engineering aspects of underwater acoustics, i.e., the design of specific systems and their use by the Russian Navy. The editors wanted to include a review of Russian underwater acoustics as a scientific discipline. As a consequence, a number of articles were eliminated and NOAA contracted with leading researchers in Russia to write review articles on various aspects of underwater acoustics: propagation, signal processing, scattering, noise, and dolphin acoustics.

The book describes the history and development of underwater acoustics in the former Soviet Union and, later, in Russia through the use of first-person accounts. It provides a detailed description of how the field of underwater acoustics was impacted by World Wars I and II, the Cold War, government bureaucracy (both positively and negatively), and the economic collapse of the Soviet Union. Most importantly, however, it describes the dedicated efforts and contributions of a large number of individuals, including some of the greatest scientific minds of the 20th century.

Due to national security concerns, much of the research and development effort in underwater acoustics was classified during the Cold War, both in the Soviet Union and the United States. The book presents the first declassified accounts of the development of numerous hydroacoustic systems by individuals having first-hand knowledge of the development efforts.

While innovative techniques and new applications for underwater acoustics in Russia and the former Soviet Union occurred more or less in isolation from the West, many similar capabilities were nevertheless achieved through the use of different technical means. It is hoped that by making this detailed historical review of Russian and Soviet efforts accessible to the underwater acoustics community at large that promising ideas and approaches heretofore unknown to western scientists might be considered and pursued.



Dr. David Palmer



Photo courtesy of Fabián Vázquez Romañá

A large component of scientists from AOML, particularly the Hurricane Research Division (HRD), participated in the American Meteorological Society's 28th Conference on Hurricanes and Tropical Meteorology in Orlando, Florida on April 28-May 2, 2008. Of the approximate 600 papers and posters presented at the meeting, roughly two-thirds (~400) were about hurricanes. HRD and AOML scientists were lead authors or co-authors on 55 presentations, and an additional 90 presentations used data sets collected by HRD or AOML, comprising almost 36% of the total hurricane presentations. HRD scientists also chaired seven sessions.

Farewell

Jessica Redman, a CIMAS research associate with AOML's Physical Oceanography Division, resigned in May after seven years with the Division's Drifter Data Assembly Center. Redman was responsible for processing and quality controlling data obtained from drifting buoys deployed globally. She recently obtained a master's degree in marine affairs from the University of Miami's Rosenstiel School. Redman will be working aboard a ship in Alaska for two months and then plans on doing a bit of traveling.

Welcome Aboard

Dr. Tania Casal joined the staff of AOML's Physical Oceanography Division in June as a CIMAS post-doctoral associate. Casal recently obtained a Ph.D. in physical oceanography from the University of Miami's Rosenstiel School where she conducted research on the Agulhas Current in the Indian Ocean. She will work with Dr. Molly Baringer to improve understanding of water mass transformations in the Southern Ocean and analyze data collected as part of the CLIVAR CO₂/Repeat Hydrography Program.

NOAA Corps officer LTJG Lecia Salerno joined the staff of AOML's Ocean Chemistry Division in May. Salerno will assist with diving operations for the Division and work with Jules Craynock to learn the duties and responsibilities of becoming a unit diving supervisor. Salerno was previously assigned to the NOAA Ship *Nancy Foster* where she served as the Navigation Officer and also as a working diver. She holds a degree in marine science from Coastal Carolina University.

Reef Fest

...Raising money and awareness for coral reef conservation through music concerts in south Florida and other locales...

www.reeffest.org

www.myspace.com/reeffest

Congratulations

Rigoberto Garcia, a CIMAS research associate with AOML's Physical Oceanography Division, became a United States citizen on May 30th. Garcia is originally from Cuba and has lived in the U.S. for the past eight years.

Eric Uhlhorn of AOML's Hurricane Research Division (HRD) was recently named a recipient of the American Meteorological Society's (AMS) Banner I. Miller Award for his contribution to the science of hurricane and tropical weather forecasting. Uhlhorn, along with several co-authors, received the award for their article entitled *Hurricane surface wind measurements from an operational stepped frequency microwave radiometer*, which was published in the journal *Monthly Weather Review* in September 2007. The award was presented at the 28th AMS Conference on Hurricanes and Tropical Meteorology held recently in Orlando, Florida.

Co-authors include Peter Black, formerly of HRD and now a distinguished visiting scientist at AOML and a researcher with the Naval Research Laboratory in Monterey, California, James Franklin of NOAA's National Hurricane Center, Mark Goodberlet of ProSensing, Jim Carswell of Remote Sensing Solutions, and Alan Goldstein of NOAA's Aircraft Operations Center.

Uhlhorn, E.W., P.G. Black, J.L. Franklin, M. Goodberlet, J. Carswell, and A.S. Goldstein, 2007: Hurricane surface wind measurements from an operational stepped-frequency microwave radiometer. *Monthly Weather Review*, 135(9):3070-3085.

The article marks the latest major milestone in hurricane inner core observations. The state-of-the-art stepped-frequency microwave radiometer (SFMR) onboard NOAA's research aircraft represents a significant advancement in the remote measurement of hurricane near-surface wind speeds. This instrument was also recently installed on the Air Force Reserve Command's entire fleet of hurricane reconnaissance aircraft. In the coming months, it will provide forecasters with a more accurate view of the strength and extent of the damaging winds that impact coastal communities during landfalling storms.



Eric Uhlhorn, Peter Black, and James Franklin, recipients of the American Meteorological Society's 2008 Banner I. Miller Award for their contribution to the science of hurricane and tropical weather forecasting published in a journal with international circulation during the last 48 months.



A group of pilots and navigators from NOAA's Aircraft Operations Center in Tampa, Florida visited AOML on May 21st to become better acquainted with the research they help support. AOML Director Bob Atlas welcomed the group to the Laboratory and expressed appreciation for their contributions. In the coming months, this group will work closely with AOML scientists to obtain remotely-sensed observations from the inner core of tropical cyclones and the surrounding environment. A tour of the facility was provided by Evan Forde of AOML's Office of the Director.

Travel

Mark Powell made two presentations at the headquarters for State Farm Insurance Company in Bloomington, Illinois on May 5, 2008.

Silvia Garzoli attended a meeting of the Science Advisory Committee of the Inter-American Institute for Global Change Research in Toronto, Canada on May 6-9, 2008.

Joseph Cione and Nancy Ash visited Barbados and Trinidad-Tobago on May 12-16, 2008 to discuss plans for unmanned aerial systems (UAS) deployments as part of the UAS Hurricane Demonstration Project.

Stanley Goldenberg and Frank Marks were invited speakers at the 2008 Governor's Hurricane Conference in Ft. Lauderdale, Florida on May 14, 2008.

Mayra Pazos attended the 12th meeting of the International South Atlantic Buoy Program (ISABP) in Rio de Janeiro, Brazil on May 28-29, 2008 and was appointed the ISABP Program Coordinator.

Bob Atlas participated in hurricane preparedness conferences in Ft. Lauderdale and Key Largo, Florida on May 29th and June 2, 2008. He also attended an OAR Senior Research Council meeting in Newport, Oregon on June 9-10, 2008 and the International Laser Radar Conference in Boulder, Colorado on June 22-27, 2008.

Guilherme Castelao and Gustavo Goni attended the 2nd Joint GOSUD/SAMOS (Global Ocean Surface Underway Data/Shipboard Automated Meteorological and Oceanographic System) meeting in Seattle, Washington on June 10-12, 2008.

Chunzai Wang was an invited speaker at the Variability of the Global Atmospheric Circulation during the Past 100 Years Workshop in Monte Verita, Switzerland on June 15-20, 2008.

James Hendee, Michael Jankulak, and Derek Manzello performed maintenance on the Integrated Coral Observing Network (ICON) station in St. Croix, U.S. Virgin Islands on June 16-20, 2008.

Denis Pierrot and Rik Wanninkhof attended a CARINA (Carbon Dioxide in the Atlantic Ocean) meeting in Paris, France on June 18-19, 2008.

Recent Publications*

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HENDEE, J.C., L. GRAMER, D. MANZELLO, and **M. JANKULAK**, 2008: Integrating near real-time data for coral reef ecological forecasting. *Proceedings of the Gulf and Caribbean Fisheries Institute*, 59:525-528.

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MUNOZ, E., A.J. Busalacchi, S. Nigam, and A. Ruiz-Barradas, 2008: Winter and summer structure of the Caribbean low-level jet. *Journal of Climate*, 21(6):1260-1276.

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Palmer, C.J., T.D. Bonilla, J.A. Bonilla, S. Elmir, **K.D. GOODWIN**, H.M. Solo-Gabriele, and A. Abdelzaher, 2008: Future of microbial ocean water quality monitoring. In *Oceans and Human Health: Risk and Remedies from the Seas*, P.J. Walsh, S.L. Smith, W.H. Gerwick, H. Solo-Gabriele, and L.E. Fleming (eds.). Elsevier Science Publishers, New York, 405-429.

POWELL, M.D., and T.A. Reinhold, 2008: Reply. *Bulletin of the American Meteorological Society*, 89(2):221-223.

WANG, C., S.-K. LEE, and **D.B. ENFIELD**, 2008: Atlantic warm pool acting as a link between Atlantic multidecadal oscillation and Atlantic tropical cyclone activity. *Geochemistry Geophysics Geosystems*, 9:Q05V03, doi:10.1029/2007GC001809.

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*Names of AOML authors are in blue capital letters.

Keynotes is published bi-monthly by the Atlantic Oceanographic and Meteorological Laboratory to promote the research activities and accomplishments of staff members. Contributions 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).

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