

Happy Holidays!

Here are a few holiday events happening at AOML:

Tree Trimming and Lobby Decorating/ Holiday Cookie Contest

December 6

Join coworkers in the lobby between 10:00 a.m. and noon to help decorate AOML for the holidays and trim a tree

Bake a batch of your favorite holiday cookies for the judges to sample



Holiday Party

December 13

Sing, dance, eat, and be merry at AOML's annual holiday party (more details on last page)

HRD Completes Hurricane Field Program

AOML's Hurricane Research Division (HRD) conducted its annual hurricane field program of reconnaissance missions into developing tropical storms and cyclones from August 15-October 15, 2002. Data gathered from the missions aboard NOAA's WP-3D aircraft and Gulfstream-IV jet support analytical and theoretical studies of hurricanes aimed at improving understanding of the structure and behavior of hurricanes. Here are a few accomplishments from the 2002 field program.

- First complete mapping of both the upper ocean's temperature and current field and three-dimensional structure of a hurricane simultaneously. The Hurricane Air-Sea Interaction

(HAIRSIN) experiment was supported by HRD in collaboration with the University of Miami. The University component of HAIRSIN was funded by the National Science Foundation, primarily for the purchase of airborne expendable bathythermographs (AXBT), current profilers (AXCP), and conductivity, temperature, and depth profilers (AXCTD). A set of pre-storm ocean survey flights was conducted in



Satellite image of Hurricane Lili approaching the Louisiana coastline on October 2, 2002.

the western Caribbean Sea and southern Gulf of Mexico to study the salient conditions of the undisturbed ocean ahead of the passage of Hurricanes Isidore and Lili. These flights were followed by in-storm missions into these storms, regularly sampling the ocean and atmosphere to help understand the crucial feedback between the air and sea that can result in significant changes in the intensity of tropical cyclones. A post-storm ocean survey was also performed over the areas that these storms traversed to study the effect on the upper ocean imposed by the strong wind forcing of the hurricane. The data collected from the series of HAIRSIN flights in Isidore and Lily will undoubtedly lead to new insights into the role of air-sea interaction in hurricane intensity change.

- Successful test year in support of the Office of Naval Research's Coupled Boundary Layer Air-Sea Transfer (CBLAST) experiment. CBLAST is a five-year program to measure, analyze, understand, and parameterize air-sea fluxes in the tropical cyclone environment. The WP-3D aircraft conducted test and research missions in Tropical Storms Edouard and Hanna and in Hurricanes Isidore and Lili. New instruments that provided direct, remotely-sensed, and high-quality video data of the air-sea interface were (*continued on page 2*)

Hurricane Season Ends!

The Atlantic hurricane season, strongly influenced by an El Niño event occurring in the equatorial Pacific Ocean, ended quietly on November 30th. As forecasted by NOAA, the six-month long season was marked by normal to below normal levels of storm activity.

NOAA's team of hurricane experts from the Climate Prediction Center, Hurricane Research Division (of AOML), and National Hurricane Center correctly predicted that climate conditions, particularly the El Niño, would reduce the overall amount of storm genesis. Their official forecast, issued in August 2002, called for seven to ten tropical storms, with four to six storms developing into hurricanes, and one to three storms being classified as major (category 3 or higher on the Saffir-Simpson scale).

The 2002 hurricane season produced 12 named storms, four of which became hurricanes, with two, Lili and Isidore, being classified as major. Eight storms (Tropical Storms Bertha, Edouard, Fay and Hanna and Hurricanes Gustav, Isidore, Kyle, and Lili) impacted coastal areas of the United States, resulting in nine deaths and about \$900 million in damages.

Hurricane Lili, which came ashore at Vermillion Bay, Louisiana on October 3rd, became the first landfalling hurricane to strike the United States since the 1999 hurricane season.

(continued from page 1)

installed on the WP-3Ds by engineers at NOAA's Aircraft Operation Center (AOC) and tested on these research flights conducted jointly by HRD, AOC, and NOAA's National Environmental Satellite, Data, and Information Service. The measurements provided high-resolution data of the upper layers of the ocean, sea state, and atmospheric boundary layer. Data collected from the CBLAST missions are being used to gain insights into the processes occurring at the air-sea interface, which are crucial to understanding hurricane intensity change. Modifications to the flight plans are being made for the full CBLAST experiments in 2003 and 2004 based on our experience in the CBLAST test year of 2002.

• Continued support of the multi-agency United States Weather Research Program (USWRP). Much of HRD's 2002 field campaign was focused on the problem of hurricane intensity change, an area that currently has little forecast skill but great potential for improvement in the near future. Also, HRD assisted in the coordination of university-funded and other governmental agencies' deployment of mobile observational platforms in support of the Hurricanes at Landfall (HAL) component of the USWRP. HRD conducted landfall flights in Tropical Storm Isidore and Hurricane Lily in support of HAL and provided real-time observations to the National Hurricane Center of NOAA.

Energy Conservation Project Begins at AOML

Over the next several months, AOML will be collaborating with Florida Power and Light (FPL) to reduce costs associated with energy consumption. Through an energy conservation project negotiated with FPL, AOML's failing 18 year-old air conditioning system will be replaced. Additional conservation measures will also be undertaken, as described below. These measures are the result of an energy conservation audit and feasibility study conducted by FPL.

- *Lighting retrofit:* Existing lighting fixtures will be replaced with more energy efficient fixtures.
- *Thermal storage system:* Ice created and stored during evening hours will be used during peak daytime hours to cool the air circulating throughout the facility. The peak electrical load shifted from daytime hours to evening hours will enable AOML to benefit from lower electrical rates.
- *CO₂ demand controlled ventilation:* The amount of outside air introduced into the facility will be modulated by the number of occupants to maintain permissible CO₂ levels. This process will lower the amount of warm air entering the facility which must be cooled before circulating.

Through an area-wide GSA agreement, FPL will finance and complete all recommended energy conservation measures at AOML. Savings generated as a result of these energy conservation measures will be used to reimburse FPL for the majority of the project costs over the next ten years.

This project serves as an example of NOAA's leadership role in promoting energy conservation and in seeking innovative alternatives to complete capital improvements. It meets the goals of Executive Order 13123 and the Energy Policy Act of 1992 that directs federal building managers to reduce energy consumption. Ultimately, it provides AOML with a much needed energy efficient air conditioning system and promotes a better working environment for its employees.

AOML Workday at Crandon Park

*Help remove exotic, invasive
plants from Bear Cut
Preserve and refinish a
trail through the hammock*

December 7, 2002

9:00 a.m.-12 noon

**Meet at the Nature Center
inside Crandon Park**

**Contact Chris Landsea
for more info**

**(305-361-4357 or
Chris.Landsea@noaa.gov)**

Tentative Schedule for Completion of Energy Conservation Project

Nov. 21-26, 2002	Delivery of trailers and lighting equipment
Dec. 2-19, 2002	Lighting retrofit (2 p.m. to midnight, Monday-Thursday)
Dec. 2-20, 2002	Installation of concrete slab for new air conditioning system
Dec. 18-20, 2002	Removal of trailers and lighting recyclables
Jan. 6-31, 2003	Installation of new, energy-efficient air conditioning system
Feb. 1-28, 2003	Testing of new air conditioning system
Mar. 1, 2003	Commissioning of new air conditioning system

Travels through China

Tsung-Hung Peng, Ocean Chemistry Division

I visited China on October 18-25, 2002 to attend the North Pacific Marine Science Organization's 11th annual international meeting (PICES XI) in Qingdao, a major center for oceanographic research. In addition to participating in PICES XI, I presented a seminar at one of China's foremost oceanographic institutes, the Ocean University of China in Qingdao (OUCQ). To facilitate cooperation and exchange of research ideas between AOML and OUCQ, I was honored to be appointed by Dr. Guan Huashi, University president of OUCQ, as a visiting professor for the next three years. I look forward to working closely with students and scientists of this prestigious oceanographic university. I also presented a seminar at the Institute of Oceanology, Chinese Academy of Sciences, in Qingdao.

After the PICES XI meeting in Qingdao, I was invited to give two seminars at the College of Oceanography and Environmental Science of Xiamen University in Xiamen, China. Xiamen is the southern center for oceanographic research in China. Their CO₂ research group has been invited to participate in the international collaborative effort to build a better underway pCO₂ system for carbon cycle research spearheaded by a workshop organized and hosted by Rik Wanninkhof of AOML's Ocean Chemistry Division.



The Ocean Chemistry Division's atmospheric chemistry bow tower is currently being repaired and repainted for future deployments aboard the NOAA Ship *Ronald H. Brown*. Pictured above, Lloyd Moore, a physical science technician with OCD, applies a special epoxy undercoating to the tower base.

Willoughby Retires

Hugh Willoughby, research meteorologist and former director of AOML's Hurricane Research Division, retired on November 29, 2002 after 32 years of federal service. Willoughby began his career with NOAA in 1975. Before joining NOAA, he served as a commissioned officer in the U.S. Navy, where he performed the duties of a flight meteorologist with the Airborne Early Warning Squadron ONE. He also served on the faculty of the Naval Academy, where he taught meteorology, oceanography, geology, and computer science to midshipmen.



Willoughby received a B.S. degree in geophysics-geochemistry from the University of Arizona, a Master's degree in meteorology from the Naval Postgraduate School, and a doctoral degree in atmospheric science from the University of Miami. His research included the use of instrumented aircraft to study hurricanes and theoretical work on tropical cyclone motion and intensification. Among his most well-known accomplishments is the analysis of contracting eyewalls and their relationship to hurricane intensification. Since 1970, he has flown on over 400 penetrations into the eyes of hurricanes and typhoons on research and reconnaissance flights.

Dr. Willoughby joins the staff of Florida International University as a professor of their International Hurricane Center. He will continue collaborating with the Hurricane Research Division on several of the Division's ongoing projects. Friends and colleagues will celebrate his years with NOAA in conjunction with the AOML holiday party.

Welcome Aboard

Richard Lumpkin joins the staff of the Physical Oceanography Division as a CIMAS Assistant Scientist. Lumpkin received his Ph.D. from the University of Hawaii in 1998 and completed a post-doctoral position at the Laboratoire de Physique des Océans in Plouzané, France during 1998-2000. He served as a member of the research faculty of Florida State University in Tallahassee, Florida until his arrival at AOML. Lumpkin's research interests include pathways and mechanisms of the global thermohaline circulation, interannual to decadal variations in the ocean climate, and Lagrangian observations of oceanic flow from mesoscale to basin-scale.

Farewell

Joaquin Trinanes, a CIMAS Assistant Scientist and Acting CoastWatch Operations Manager with the Physical Oceanography Division, departed AOML on November 27th after two years of employment to return to his native Spain. Best of luck to Joaquin for his continued success.

HAPPY HALLOWEEN...



AOML celebrated Halloween with its combination Oktoberfest/Halloween party, Oktoberween, followed by a costume contest on October 31st. Pictured above are the 2002 contestants (left to right): Roberta Lusic, Peter Ortner, Ulyses Rivero (and Mom), Molly Baringer, Neal Dorst, Wilma Jeffris, and Armando Cuervo.



Diversity Luncheon: Hispanic Heritage

AOML hosted a diversity luncheon on November 8, 2002 to celebrate Hispanic Heritage month. Plenty of food, good cheer, a bit of salsa music, and dancing helped make for a lively event (photographs courtesy of Armando Cuervo).

Travel

David Enfield attended the ERFEN (Estudio Regional del Fenomeno El Niño) Regional Climate Outlook Forum in Guayaquil, Ecuador on November 11-15, 2002.

Chunzai Wang attended the Hadley Circulation: Present, Past, and Future Conference in Honolulu, Hawaii on November 12-15, 2002.

Jason Dunion and Christopher Meinen attended the African Monsoon Multidisciplinary Analyses (AMMA) meeting in Baltimore, Maryland on November 13-15, 2002.

Yeun-Ho Daneshzadeh, Christopher Meinen, Mayra Pazos, and Jessica Redman attended the World Ocean Circulation Experiment (WOCE) Conference in San Antonio, Texas on November 18-22, 2002.

Michael Black, Robert Black, and Frank Marks attended the Convection and Moisture Experiment (CAMEX) Workshop in Huntsville, Alabama on November 20-22, 2002.

Kristina Katsaros and Robert Molinari attended a meeting of the Climate Variability (CLIVAR) Atlantic Implementation Panel in Chicago, Illinois on November 25-26, 2002.

Silvia Garzoli, David Enfield, and Rik Wanninkhof attended the Planning Workshop for Scientists and Stakeholders sponsored by the U.S. Climate Change Science Program in Washington, D.C. on December 2-5, 2002.

Frank Marks and Eric Uhlhorn attended the Fifth International Workshop on Tropical Cyclones (IWTC-V) in Cairns, Australia on December 3-12, 2002.

Rik Wanninkhof, Chunzai Wang, and Shari Yvon-Lewis attended the American Geophysical Union's Fall Meeting in San Francisco, California on December 6-10, 2002.



AOML
Holiday Party
December 13, 2002

Lobby - 1:00 p.m.

Bring your favorite dish or dessert to share with others

Music performed by AOML's Holiday Ensemble

Raffle Drawing with Door Prizes

Price: \$6.00
(includes turkey, salmon, ham, and drinks)

Contact Erica Van Coverden or Alejandra Lorenzo for more information
(305-361-4541 or 305-361-4404)

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**HAPPY
NEW
YEAR!**

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