

Keynotes

July-August 2005

Atlantic Oceanographic and Meteorological Laboratory

Volume 9, Number 4

Dr. Robert Atlas Selected as New Director of AOML

Dr. Robert M. Atlas, Chief Meteorologist with NASA's Goddard Space Flight Center in Greenbelt, Maryland, has been selected by NOAA's Office of Oceanic and Atmospheric Research to become the new director of AOML. The announcement of Atlas' selection was made public on June 29th. He inherits the post from former AOML director Dr. Kristina Katsaros, who retired from federal service in September 2003.

Atlas received a Ph.D. in meteorology and oceanography from New York University in 1976. He was a National Research Council Research Associate at NASA's Goddard Institute for Space Studies in New York, as well as the chief consulting meteorologist with the ABC television network, before joining NASA as a research scientist in 1978.

During his years with NASA, Atlas was a principal investigator on numerous studies aimed at advancing the understanding of air-sea-land interactions through the use of satellite observations. He was the first researcher to demonstrate the beneficial impact of quantitative satellite data on weather prediction, for both satellite temperature soundings and surface winds. Atlas headed NASA's Data Assimilation Office (1998-2003) before being named Chief Meteorologist. He is currently studying the formation, movement, and intensification of hurricanes with the aid of computer models and satellite observations.

Atlas is expected to assume directorship of AOML in the latter part of August.

With the announcement of a permanent new Director for AOML, Peter Ortner and Judith Gray, both of whom have served as the AOML Acting Director, will be changing hats once again. Ortner will return to the Ocean Chemistry Division and, at the request of Dr. Atlas, the new AOML Director, continue on as AOML's Chief Scientist. Gray will return to her position as the AOML Deputy Director.

Ortner and Gray expressed their confidence that AOML's staff would give Dr. Atlas the same wonderful support and cooperation that has consistently been given to them over the last two years. They are both proud of the Laboratory's accomplishments and of the AOML they bequeath to their successor:

- an AOML with excellent morale and performance;
- an AOML with high visibility and vocal stakeholders;
- an AOML with outstanding infrastructure and computing;
- an AOML research portfolio full of opportunity whose present and future are being integrated into NOAA's strategic five-year and 20-year research plans, as well as the PPBES (planning, programming, budgeting, and execution system) process; and most importantly,
- an AOML with a sense of shared responsibility and communality, of an AOML family.

"Dr. Atlas will have our full and enthusiastic support as he assumes the Directorship of the Laboratory," state Ortner and Gray.



Peter Ortner



Judith Gray

AOML Leadership Through the Years

Dr. Harris Stewart, 1966-1978	Dr. Peter Ortner, 2003-2004 (Acting)
Dr. Donald Hansen, 1978-1980 (Acting)	Ms. Judith Gray, 2004-2005 (Acting)
Dr. Hugo Bezdek, 1980-1997	Dr. Robert Atlas, 2005-Present
Dr. Kristina Katsaros, 1997-2003	



AOML is a research laboratory of NOAA's Office of Oceanic and Atmospheric Research located on Virginia Key in Miami, Florida



Hurricane Preparedness and Recovery Coordination Team

AOML's Hurricane Preparedness and Recovery Plan for 2005 (available on the AOML Intranet) provides a course of action to prepare the facility for severe weather should a tropical storm or hurricane threaten south Florida. The Coordination Team is responsible for carrying out all operational aspects of the Plan during preparatory and recovery phases for their respective group. Team members include:

Computer Networks and Services

- Robert Kohler
- Thomas Heeb

Hurricane Research Division

- Neal Dorst
- Peter Dodge (alternate)
- Joseph Griffin (alternate)

Ocean Chemistry Division

- Thomas Carsey
- Jules Craynock
- Michael Shoemaker
- Joseph Bishop (alternate)

Office of the Director

- Bob Atlas
- Gregory Banes
- Judith Gray
- Scott Stolz
- Manuel Fraga (alternate)

Physical Oceanography Division

- Yeun-Ho Daneshzadeh
- Craig Engler
- Robert Roddy
- Alberto Mestas-Nuñez
- David Bitterman (alternate)
- Lewis Gramer (alternate)



Updated Outlook Calls for Record Number of Storms

NOAA issued an updated outlook for the Atlantic hurricane season on August 2nd, reaffirming its pre-season forecast that 2005 would be an active year and increasing the number of tropical storms projected to develop. Hurricane specialists are now predicting an additional 11 to 14 tropical storms could potentially form before the season ends on November 30th. Seven to nine of these tropical storms are expected to become hurricanes, while three to five are expected to become major hurricanes (winds above 110 mph). This outlook reflects NOAA's highest confidence level (95-100%) for an above-normal hurricane season since its outlooks began in August 1998.



The increased amount of storm activity is attributed to oceanic and atmospheric conditions that favor hurricane development. Above-average sea surface temperatures, coupled with low vertical wind shear, produced seven named storms in the months of June and July, including two major hurricanes (Dennis and Emily). With the combination of warm ocean temperatures and low wind shear expected to continue, forecasters believe the majority of the season's storms will occur in the August-October time frame, the climatological peak of the season. A predicted total of 18-21 tropical storms, nine to 11 hurricanes, and five to seven major hurricanes could make 2005 one of the most active hurricane seasons on record.

An additional factor contributing to this year's busy hurricane season is the ongoing active phase of the Atlantic multi-decadal signal, which began in 1995. Since 1995, all but two hurricane seasons have featured above normal levels of storm activity. The years 1997 and 2002 were influenced by El Niño events, which tend to reduce hurricane formation. The 2005 season is the ninth above-normal hurricane season out of last 11 seasons.

The Atlantic hurricane outlook is a joint endeavor of hurricane scientists with NOAA's Climate Prediction Center, National Hurricane Center, and AOML's Hurricane Research Division (Stanley Goldenberg and Christopher Landsea). Coastal residents in hurricane-prone areas are urged to prepare.

IFEX Zeroes in on Hurricane Intensity Change

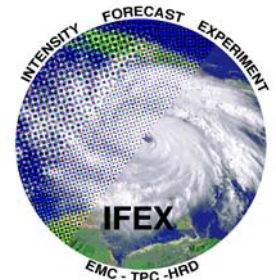
Scientists with AOML's Hurricane Research Division (HRD) are focusing their efforts during this summer's hurricane field program on advancing the knowledge and prediction of hurricane intensity change. In July, HRD began working in partnership with NOAA's Environmental Modeling and Tropical Prediction Centers to conduct the Intensity Forecasting Experiment (IFEX).

The five-year IFEX effort will gather data from all stages of the hurricane life cycle, from formation and early organization, to peak intensity, to landfall and/or decay over the open ocean. These data should yield many new insights and assist researchers in improving forecast models, particularly the next-generation Hurricane Weather Research and Forecasting model, expected to become operational in 2007.

The majority of hurricane research flights over the past 25 years have been largely centered on mature and landfalling storms. IFEX represents a new approach. By studying the entire hurricane life cycle, researchers hope to develop a better grasp of the hurricane's internal processes and how hurricanes interact with the environment. Such advancements in understanding will lead to more accurate intensity forecasts.

Several flight experiments are planned during the 2005 season that address various aspects of the hurricane life cycle, including experiments to (1) investigate how tropical disturbances develop into tropical depressions with closed circulation systems, (2) observe intensity and structural changes in mature hurricanes, (3) study a storm as it decays over cold water, (4) test improved sampling methods in the hurricane environment, and (5) measure the structural changes that accompany hurricanes at landfall.

Understanding hurricane intensification, particularly the phenomenon of rapid intensification in which minimal category 1 or 2 storms quickly transform into destructive category 4 or 5 storms, is one of the challenges researchers face in developing skilled and accurate forecast technologies. IFEX represents an ambitious effort to tackle this challenge.



July-August 2005*
Informal Research Reports

July 21

**The Gulf Stream at 68°W:
What Can We Learn By
Reanalyzing Older Data Sets
Using Modern Methods?**

Dr. Christopher Meinen
Physical Oceanography Division

August 3

**Tropical Cyclone Air-Sea
Potpourri: Some Fresh
Smelling Interactive
Research**

Dr. Joseph Cione
Hurricane Research Division

August 18

**Preliminary Estimates of
the Time-Variant Heat
Budget in the Tropical
Atlantic**

Dr. Claudia Schmid
Physical Oceanography Division

August 23

**Eddies in the Tropical
Atlantic: Lagrangian
Observations of Near-
Surface Dispersion**

Dr. Rick Lumpkin
Physical Oceanography Division

August 30

**Influences of the Atlantic
Warm Pool on Rainfall
and Hurricanes**

Dr. Chunzai Wang
Physical Oceanography Division

*Presentations are held in the first-floor conference room.

Impressions of Three Chinas

Peter Black, Hurricane Research Division

On March 17th, I embarked upon a visit to Macao, China to attend the World Meteorological Organization's (WMO) International Workshop on Tropical Cyclone Landfall Processes at the invitation of the Chinese government and the WMO as one of two U.S. representatives. I was also invited by the Shanghai Typhoon Institute to present two lectures there following the Macao workshop.

My trip took me first to Hong Kong where I observed a vibrant city in transition. As in the past, Hong Kong still gave the impression of being the New York City or Paris of Asia, but gone were the construction cranes and buildings in various stages of assembly. Hong Kong is a completed city, one in which the banking and economic centers appear to be diminishing, although it has become a center for tropical meteorology due to the Hong Kong Observatory and Hong Kong Polytechnic University.

Traveling on to Macao, I observed an entirely different type of community. Macao is a gambling mecca. It emerged from one-family control into a cosmopolitan city with the emphasis on building newer, bigger casinos, Las Vegas style. The pace of life is slower and less crowded than in Hong Kong and the people are friendlier. The streets and many restaurants all had Portuguese names, although few people in Macao speak Portuguese.

The WMO workshop was hosted by the Macao Meteorological Bureau during the week of March 21st. One particularly interesting series of presentations discussed efforts to establish a mobile tower and radar observing facility for landfalling typhoons, which seemed to emulate landfall observational efforts in the United States. In fact, a key recommendation was to establish a landfalling observational program in China.

Following the Macao workshop, I traveled to Shanghai where I observed a third China, the epicenter of an ongoing Chinese economic revolution. Shanghai is an incredibly dynamic city with constant activity both day and night. People move about in a crush of cars, trucks, bicycles, rickshaws, and on foot. New buildings abound everywhere with 24-hour construction. A tour of a local weather office, staffed by hundreds of forecasters, underscored the impact that a landfalling typhoon in Shanghai would bear upon the entire Chinese economy.

From insights into China's colonial past manifested in two very different ways in Hong Kong and Macao, to its present surge forward in tropical cyclone research and forecasting, and culminating with a view of China's new economy in Shanghai, the whole experience was extremely rewarding and presented unique insights into three Chinas.

Peter Ortner, AOML's Chief Scientist, toured China with his family from July 13 to August 2, visiting and lecturing at Beijing Normal University, the Xiamen University Key Laboratory for Marine Environmental Science, the South China Sea Research Center, and the Marine and Tropical Meteorology Center in Guangzhou. A high point of the trip was a three-day workshop about the South China Sea held in Guilin and organized by Dr. Dongxiao Wang, who worked at AOML for several months earlier in the year as a visiting scientist. The workshop was also attended by Drs. Jia-Zhong Zhang and Chunzai Wang of AOML, who were accompanied in China by their families. Following the workshop,

attendees all went on a boat trip down the beautiful Li River, considered to have some of the most beautiful scenery in the world and the subject of enumerable paintings.



Peter Black with Chinese colleagues in Shanghai with the Jin Mao building, fourth tallest in the world, in the background.



Peter Ortner and his family on the Li River in China.

Recent Publications*

ENFIELD, D.B., and S.-K. LEE, 2005: The heat balance of the western hemisphere warm pool. *Journal of Climate*, 18(14):2662-2681.

GOODWIN, K.D., R. Tokarczyk, F.C. Stephens, and E.S. Saltzman, 2005: Description of toluene inhibition of methyl bromide biodegradation in seawater and isolation of a marine toluene oxidizer that degrades methyl bromide. *Applied and Environmental Microbiology*, 71(7):3495-3503.

Hu, C., J.R. Nelson, E. JOHNS, Z. Chen, R.H. Weisberg, and F.E. Muller-Karger, 2005: Mississippi River water in the Florida Straits and in the Gulf Stream off Georgia in summer 2004. *Geophysical Research Letters*, 32(14):L14606, doi:10.1029/2005GL022942.

Hu, C., F.E. Muller-Karger, C. Taylor, K.L. Carder, C.R. KELBLE, E. JOHNS, and C.A. Heil, 2005: Red tide detection and tracing using MODIS fluorescence data: A regional example in southwest Florida coastal waters. *Remote Sensing of Environment*, 97(3):311-321.

McNeil, C., D. Katz, R. WANNINKHOF, and B. Johnson, 2005: Continuous shipboard sampling of gas tension, oxygen, and nitrogen. *Deep-Sea Research, Part 1*, 52(9):1767-1785.

Moore, C.N.K., C.S. MEINEN, M.O. BARINGER, I. Bang, R. Rhodes, C.N. Barron, and F. Bub, 2005: Cross validating ocean prediction and monitoring systems. *EOS, Transactions, American Geophysical Union*, 86(29):269, 272-273.

PALMER, D.R., and P.A. Rona, 2005: Acoustic imaging of deep ocean hydrothermal flows. In *Sounds in the Sea: From Ocean Acoustics to Acoustical Oceanography*, H. Medwin (ed.). Cambridge University Press, 551-563.

PELTOLA, E., R. WANNINKHOF, R. Feely, R. CASTLE, D. Greeley, J.-Z. ZHANG, F. Millero, N. Gruber, J. Bullister, and T. Graham, 2005: Inorganic carbon, nutrient, and oxygen data from the R/V *Ronald H. Brown* Repeat Hydrography Cruise in the Atlantic Ocean: CLIVAR CO₂ section A16N_2003a (4 June-11 August 2003), A. Kozyr (ed.). Oak Ridge National Laboratory, ORNL/CDIAC-149, NDP-085, 36 pp.

PENG, T.-H., 2005: Anthropogenic CO₂ in the ocean. *Scientia Marina*, 69(suppl. 1):85-96.

*Names of AOML authors appear in capital letters.

Irene Provides Opportunity to Study Effects of the Saharan Air Layer

Tropical Storm Irene provided scientists with AOML's Hurricane Research Division (HRD) an opportunity to learn more about how the Saharan Air Layer impacts tropical cyclone development. As the newly formed Irene churned in the central Atlantic on August 7-8, two Saharan Air Layer Experiment (SALEX) missions were completed from aboard NOAA's Gulfstream-IV high altitude jet. Global Positioning System (GPS) dropsondes launched from the Gulfstream-IV sampled the dry, dusty, mineral-laden air surrounding Irene.

Scientists aboard the SALEX flights obtained samples of Saharan air that were approximately 30-50% drier than the typical tropical atmosphere and reported large amounts of visible Saharan dust. The data they gathered about the Saharan Air Layer were obtained almost 2,000-3,000 miles west of its origin, confirming the extremely long-lived nature of this phenomenon. The Saharan Air Layer forms over the arid regions of the Sahara Desert, often extending upwards to almost 20,000 feet. The well mixed layer of extremely warm, dry, stable air treks westward across the African continent, emerging from the coast to continue its airborne migration across the Atlantic Ocean.

While the Saharan Air Layer has been studied for decades, its impact upon tropical cyclones is still being investigated. However, it has been demonstrated that the Saharan Air Layer can inhibit and/or suppress the development of tropical cyclones in the Atlantic. The SALEX effort seeks to improve the understanding of how the Saharan Air Layer's dry air, mid-level easterly jet, and suspended mineral dust affect tropical cyclone intensity change.

"Those were a couple of very exciting flights and it was great to have our hard work translate into an actual dedicated mission," said Jason Dunion, HRD lead project scientist about the first SALEX missions ever conducted. Additional SALEX missions will be undertaken during the 2005 hurricane season and again during the 2006 season. The data collected from Irene will be incorporated into forecast models with the hope that they will help improve intensity forecasts.

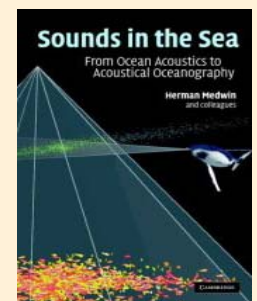


Lead project scientist Jason Dunion (third from the right) in Barbados with the Gulfstream-IV science and flight crews after successfully completing the inaugural SALEX missions.

Dr. David Palmer, a physicist with AOML's Ocean Chemistry Division, is a contributing author of a new undergraduate textbook published by Cambridge University Press entitled *Sounds in the Sea: From Ocean Acoustics to Acoustical Oceanography*. The textbook is intended to serve as a resource for students studying ocean acoustics for the physical and biological ocean sciences, as well as a reference for researchers and professionals.

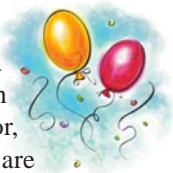
The first nine chapters, devoted to the fundamentals of how detailed characteristics of physical and biological structures and processes at sea are determined, were written by the senior author, Professor Herman Medwin. The next 15 chapters are devoted to applications of the fundamentals and were written either by the originator(s) of the application or by someone who is considered to have made a significant contribution to it. Applications range from fisheries acoustics to climate studies.

This format was chosen with the hope it would convey to students some of the excitement and adventure associated with acoustical oceanography. Palmer's chapter, co-authored with Dr. Peter Rona of Rutgers University, is devoted to acoustical imaging of plumes in the deep ocean (see citation in left-hand column).



Stork Accumulates Frequent Flyer Miles

Ramon Hurlockdick, a computer programmer with the Office of the Director, and his wife Francisca, are the proud parents of their first child, a son, David, born July 8, 2005 at 1:00 p.m. David and his parents are all doing well.



Christopher Landsea, a meteorologist with the Hurricane Research Division, and his wife Donna are the parents of a new baby girl, Elena Elizabeth Landsea. Elena was born on July 24, 2005 near 11:50 p.m. and weighed in at 7 lbs. 7 oz. Mom, Dad, baby Elena, and big brother Mitchell are all happy and doing well.

Joseph Cione, a meteorologist with the Hurricane Research Division, and his wife Pamela are the parents of a new baby girl, Cirin Emma Cione. Cirin was born on August 8, 2005 at 2:49 a.m. and weighed in at 6 lbs. 13 oz. Baby Cirin, her parents, and big brother Jaxon are all happy and doing well.

Welcome Aboard

Bachir Annane joined the staff of the Hurricane Research Division in July as a CIMAS Senior Research Associate. Bashir will work with Dr. Mark Powell in performing analyses on the State of Florida hurricane loss projection model, as well as assist other HRD staff members with modeling issues. He holds a Masters degree in applied mathematics from the University of Central Florida and a Masters degree in meteorology from Florida State University.

Congratulations

Silvia Garzoli, Director of AOML's Physical Oceanography Division, and Elizabeth Johns, an oceanographer with the Physical Oceanography Division, were recently profiled in a special issue of the journal *Oceanography* (volume 18, number 1). Garzoli and Johns were among more than 150 women oceanographers whose lives, careers, and accomplishments were highlighted. Their biographical sketches discuss how they came to choose their careers, the challenges encountered in balancing career objectives with personal lives, the most rewarding aspects of being a scientist, their research interests, and how working conditions and career opportunities for women have changed over the years.

Craig Engler, a physical scientist with AOML's Physical Oceanography Division, recently took to the water with his "Castaways Against Cancer" teammates to raise money for the American Cancer Society. Their 150-mile long kayaking trip from Key Biscayne to Key West, Florida began on July 9th and was successfully completed on July 15th. Since 2000, the Castaways Against Cancer have raised more than \$70,000 in paddling for a cure. Craig has been a member of the team since 2003. For additional information, visit the Castaways Against Cancer web site at www.castawaysagainstcancer.com.



Craig Engler (right) and his "Castaways Against Cancer" teammates in Key West, Florida, after completing a 150-mile kayaking trip in support of the American Cancer Society.

AOML welcomed a large number of students interns to its ranks during the summer to assist scientific and technical staff, learn new skills, and participate in research projects. Interns performed a broad range of tasks in support of AOML's three science divisions (Hurricane Research [HRD], Ocean Chemistry [OCD], Physical Oceanography [PhOD]), its Computer Networks and Services Division [CNSD], and the Office of the Director [OD]. As summer draws to an end, AOML commends its interns for their contributions and congratulates them on their exceptional work performance. Here is a roster of AOML's 2005 student interns and their AOML mentors:

Guy Cascella, University of Miami-RSMAS	Joe Cione (HRD)
Christopher Chow, MAST Academy	Charlie Fischer (OCD)
Meredith Chow, MAST Academy	Joe Bishop (OCD)
Ramin Daneshzadeh, Cyprus Bay High School	Joe Bishop (OCD)/Alejandra Lorenzo (CNSD)
Dorianne David, University of Puerto Rico	Jason Dunion (HRD)
Jeremy Fowers, MAST Academy	Joe Bishop (OCD)
Andrew Hagen, Pennsylvania State University	Chris Landsea (HRD)
David Kofron, University of Miami-RSMAS	Sim Aberson (HRD)
Debbie Mercado, University of Puerto Rico	Jason Dunion (HRD)
Anisa Quintana, American High School	Alejandra Lorenzo (CNSD)
Bryan Ramirez, Southwest High School	Alejandra Lorenzo (CNSD)
Isha Renta, Howard University	Mark Powell/Joe Cione (HRD)
Alexander Robel, MAST Academy	David Enfield (PhOD)
Rosa Saavedra, MAST Academy	Erica Rule (OD)/Neal Dorst (HRD)
Kevin Sanjurjo, MAST Academy	Kelly Goodwin (OCD)
Daniel Stern, Cornell University/University of Miami-RSMAS	Sim Aberson (HRD)
David Tan, MAST Academy	Kelly Goodwin (OCD)
Cathryn Westra, MAST Academy	Joe Bishop (OCD)
Latricia White, Pennsylvania State University	Sim Aberson (HRD)
Lenworth Woolcock, Florida International University	Chris Landsea (HRD)

Fall 2005

RSMAS Shuttle Schedule

AUGUST 24-DECEMBER 2, 2005
(MONDAY THROUGH FRIDAY)

Viscaya
Station to
RSMAS:

8:15 AM
8:45 AM
3:50 PM

RSMAS
to Viscaya
Station:

8:30 AM
3:30 PM
5:30 PM

Travel

Peter Black attended a CBLAST (Coupled Boundary Layer Air-Sea Transfer) meeting at Keesler Air Force Base in Biloxi, Mississippi on July 8-10, 2005.

Peter Ortner and Jia-Zhong Zhang presented seminars and participated in discussions about future science collaborations at several universities and institutes throughout China as invited guests of the Xiamen University during July 13-August 2, 2005.

Catherine Steward attended the Federally Employed Women's 36th National Training Program in Reno, Nevada on July 18-22, 2005.

Judith Gray attended a NOAA Senior Research Council meeting in Muskegon, Michigan on July 20-21, 2005. She also attended a joint SEACOOS/SECOORA (Southeast Atlantic Coastal Ocean Observing System/Southeast Coastal Ocean Observations Regional Association) workshop in Jacksonville, Florida on July 25-28, 2005.

Mark Powell attended a meeting of the Florida Commission on Hurricane Loss Projection Methodology in Tallahassee, Florida on July 26-27, 2005.

Silvia Garzoli attended a Science Advisory Committee meeting of the Inter-American Institute for Climate Change Research in Sao Paulo, Brazil on July 26-28, 2005.

Chunzai Wang attended and was an invited speaker at the International Association of Meteorology and Atmospheric Science in Beijing, China on August 2-11, 2005.

Jules Craynock, John Halas, Jeffrey Judas, and Hector Casanova installed the moorings for a new Coral Reef Early Warning System (CREWS) site in La Parguera, Puerto Rico on August 8-12, 2005.

Carlisle Thacker attended a Hybrid Coordinate Ocean Model (HYCOM) meeting at the Stennis Space Center in Slidell, Louisiana on August 28-31, 2005.

Happy Fourth of July!



photos by Neal Dorst

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 – Judy Gray
Publishing Editor/Writer – Gail Derr

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