HRD Begins Field Program with Missions into Tropical Storm/Hurricane Arthur

AOML’s Hurricane Research Division (HRD) began its 2014 Hurricane Field Program with a dozen scientists and student interns deploying from Miami to MacDill Air Force Base in Tampa, Florida, as Arthur became the first named storm of the Atlantic hurricane season on July 1st.

While Arthur may have proven a headache for some planning Independence Day festivities, the storm provided NOAA an early opportunity to verify that all instruments aboard its Hurricane Hunter aircraft were functioning as expected.

Arthur began as a tropical depression that formed off the east coast of Florida on June 30th. The following day the system reached tropical-storm status and began drifting to the north-northeast.

HRD scientists flew aboard NOAA’s P3 aircraft for tail Doppler radar missions on July 2nd-3rd as Tropical Storm Arthur was strengthening. They also participated in four missions of NOAA’s Gulfstream-IV jet aircraft remotely, providing the flight plans and processing radar and sonde data. Radar/sonde analyses and accompanying observations were created and transmitted to NOAA’s Environmental Modeling Center in real time. There were a handful of challenges to work through in these first flights, with issues of radar operation and communication of file scripts resolved mid-flight.

The P-3 aircraft flew rotated figure-4 patterns with a circumnavigation pattern each day, providing excellent azimuthal coverage of Arthur’s kinematic and thermodynamic fields. HRD researchers observed a significant evolution of the system from a tilted vortex with a broad shield of heavy precipitation and convection to a more aligned vortex and spiral bands with embedded deep convection.

Tropical Storm Arthur became a hurricane on July 3rd and continued strengthening as it approached the North Carolina coastline, coming ashore at Shackleford Banks late in the evening of July 3rd as a category-2 hurricane with 100 mph winds.

Arthur caused widespread flooding and damage along the North Carolina’s Outer Banks before sweeping up the eastern seaboard, pelting coastal communities as far north as Maine with blustery winds and heavy rain. Arthur then passed over the Canadian Maritimes, making landfall in Nova Scotia on July 5th as a post-tropical storm with 70 mph sustained winds.
On August 7th, NOAA’s seasonal hurricane outlook team issued an updated prediction for Atlantic basin hurricane activity, increasing the likelihood for a below-normal season (see table at right). The new outlook is based upon current observations and predictions of large-scale climate factors that are known to influence seasonal hurricane activity and on results from climate models that directly predict seasonal hurricane activity.

In May, NOAA’s pre-seasonal outlook called for a 50 percent chance of a below-normal season, a 40 percent chance of a near-normal season, and a 10 percent chance for an above-normal season. The August outlook predicts a 70 percent chance of a below-normal season, a 25 percent chance of a near-normal season, and a nominal 5 percent chance for an above-normal season. The increased likelihood for a below normal season reflects the development of several environmental factors that suppress tropical cyclone formation.

As of August 7th when the updated outlook was issued, two named storms—Arthur and Bertha—have formed, both of which reached hurricane strength. Two more named storms—Cristobal and Dolly—one of which reached hurricane strength, have also formed as of this writing. Therefore, for the remainder of the season, which ends November 30th, an additional 3-8 named storms are anticipated, 0-3 of which are expected to reach hurricane strength and 0-2 of which are expected to become major hurricanes.

In spite of the forecast for a less active hurricane season, coastal residents and communities in areas at risk from landfalling storms are urged to remain vigilant in monitoring the tropics and to have preparedness measures and action plans in place. Below-average seasons can still produce hurricane disasters.

Residents of Miami, Florida, need only to recall 1992, a below-average year which produced seven named storms, with only four reaching hurricane strength. In that year, Hurricane Andrew was the sole storm to reach major hurricane strength and produced extensive devastation throughout South Florida.

NOAA’s outlooks provide a general guide to the expected overall activity during hurricane season; they do not predict how many storms will make landfall or imply levels of activity for any particular region.

The outlooks are an official product of NOAA’s Climate Prediction Center, produced in collaboration with the National Hurricane Center and AOML’s Hurricane Research Division (HRD). Stanley Goldenberg, an HRD meteorologist, has been a member of the seasonal hurricane outlook team since its inception in 1998.

Environmental factors impacting the 2014 Atlantic hurricane season that generally suppress tropical cyclone development include:

• Atmospheric conditions—strong vertical wind shear, a weaker West African monsoon, and the combination of increased atmospheric stability and sinking motion. These conditions mean fewer tropical systems are spawned off the African coast, and those that do form are less likely to become hurricanes. These conditions are stronger than originally predicted in May and are expected to last from August through October, the peak months of the hurricane season.

• Oceanic conditions—below-average sea surface temperatures across the tropical Atlantic, which are exceptionally cool relative to the remainder of the global tropics. This cooling is even stronger than models predicted in May and is expected to persist through the remainder of the hurricane season.

• El Niño—El Niño conditions (i.e., the warming of equatorial waters in the Pacific Ocean) are still likely to develop, suppressing storm development by increasing vertical wind shear, stability, and sinking motion in the atmosphere.
AOML’s Physical Oceanography Division (PhOD) held its monthly breakfast social on Friday, August 22nd, for staff and invited guests to gather in an informal setting, mingle, and chat about division happenings and research. The August social coincided with Dr. Bob Atlas’ ninth anniversary as the director of AOML, and the division used the opportunity to thank Bob for his leadership and support of early career scientists and scientific staff. Bob was presented with a book entitled *FitzRoy: The Remarkable Story of Darwin’s Captain and the Invention of the Weather Forecast* (by John and Mary Gribbin) that was signed by everyone in PhOD.

Before his selection as the new AOML director in 2005, Bob worked for many years at NASA, serving as the Chief Meteorologist for the Goddard Space Flight Center and as the Head of the NASA Data Assimilation Office. His AOML predecessor was Dr. Kristina Katsaros, who retired in 2003. Congratulations to Bob for nine successful years at the helm.

Bob Atlas with Shaun Dolk, Renellys Perez, and Gustavo Goni of PhOD after being presented with a gift in honor of his nine years as AOML director.
New Wave of Technology Premieres to Improve Forecasts

The 2014 hurricane season will provide an opportunity to test some of the most advanced and innovative technologies, including unmanned hurricane hunter aircraft and sea gliders, which will help scientists better observe and, eventually, better predict a storm’s future activity.

Scientists at AOML are at the forefront of hurricane research to improve track and intensity forecasts. Every hurricane season they fly into storms, pour over observations and models, and consider new technological developments for how to enhance NOAA’s observing capabilities.

NOAA’s Aircraft Operations Center maintains two P-3 Orion aircraft and a Gulfstream-IV jet for hurricane observations. To collect data, NOAA’s hurricane researchers fly aboard these aircraft into and around the periphery of storms. A primary tool they use for measuring the hurricane environment is the dropsonde, a lightweight cylindrical tube equipped with a parachute and global positioning system technology. Dropsondes transmit their position every half second as they drift through a storm. These mini-weather stations are deployed from the belly of the aircraft and fall towards the ocean, sending data such as pressure, temperature, wind speed, wind direction, and moisture to scientists aboard the hurricane hunter aircraft.

While dropsondes are an excellent tool for measuring a storm’s atmospheric environment, their spatial coverage is limited. Dropsondes essentially obtain vertical profiles of a storm at discrete points. Other instruments on the aircraft measure storm properties at altitudes as great as 60,000 feet. However, NOAA’s hurricane hunter aircraft are unable to fly below 5,000 feet due to the extreme turbulence occurring between the ocean and atmosphere. This leaves a gap in the opportunity to collect potentially important data from the lowest part of the storm, which may be essential to increasing the understanding of intensity change.

Post-Hurricane Sandy federal funding, the Disaster Relief Appropriations Act of 2013, provided NOAA with the opportunity to test new technology in hopes of better understanding and evaluating storm physics that drive intensity change. An unmanned weather drone, called the Coyote, will do just that. The Navy originally designed the Coyote for maritime surveillance. NOAA plans to transition this unique platform into a “smart sonde” that can be used for hurricane science. During the 2014 hurricane season, the Small Unmanned Aircraft Vehicle Experiment will test the capability of the Coyote in storms, observing how well it handles severe winds and the harsh hurricane environment.

Scientists will deploy the seven pound unmanned aircraft from the P-3 Orion in the same way as the dropsondes. However, instead of drifting downward towards the ocean surface, the Coyote will open its six-foot wingspan and fly through the storm. It can be controlled from miles away but will typically be piloted by scientists onboard the P-3s. Its relative lightweight design requires the Coyote to fly with the wind currents, but it will be directed up, down, and sideways to navigate specific flight patterns to measure the inner core and lowest altitudes of the storm.

Hurricanes are fueled by warm ocean water, and vital information needed to better understand and predict intensity change may rest close to the sea surface where manned aircraft cannot fly and the dropsondes only pass through for a few seconds. With its ability to fly for two hours in this region, the Coyote provides the opportunity for much more complete data collection, in comparison to the traditional dropsonde.

The traditional dropsonde itself will also receive an upgrade for the 2014 season with the addition of a sensor to measure sea surface temperature at splashdown. This additional last data point will provide a critical piece of information at the air-sea interface, the environment where energy transfer occurs and is most challenging to observe in a hurricane environment.

The 2014 season will also feature two sea gliders, remotely operated profiling instruments that dive below the ocean surface and then resurface to transmit observations of temperature and salinity. AOML is testing two ocean gliders in critical hurricane regions of the Caribbean north and south of Puerto Rico. The gliders were deployed in July and will be recovered at the end of hurricane season. The gliders will profile the upper ocean about 10 times daily, diving to a depth of 1,000 meters and collecting data as they ascend.

In addition to these new technologies, the Disaster Relief Appropriations Act of 2013 also provided funding to assess the impact of these and other data in hurricane forecast models. AOML will make use of its Observing System Simulation Experiment expertise to evaluate how such ocean observations can best improve hurricane forecasts of track and intensity change.
Researchers with AOML’s Physical Oceanography Division (PhOD) and the University of Miami’s Cooperative Institute for Marine and Atmospheric Studies (CIMAS) successfully deployed two underwater gliders in the coastal waters of Puerto Rico during the week of July 13th—one in the Caribbean Sea and the other in the tropical North Atlantic Ocean. These new observational platforms are the foundation of a multi-institutional project, *Sustained and Targeted Ocean Observations with Underwater Gliders*, led by Dr. Gustavo Goni of PhOD and funded through the Disaster Relief Appropriations Act of 2013.

The gliders will traverse their respective regions for the remainder of the Atlantic hurricane season (see map, upper right), gathering temperature and salinity observations as they dive and ascend through the upper 1000 meters of the ocean. When the gliders reach the ocean surface at the end of each dive cycle, their data are transmitted in real-time to the Global Telecommunications System for use by scientists worldwide.

The thermal structure of the upper ocean in the Caribbean Sea and tropical North Atlantic has been linked to the rapid intensification of tropical cyclones and to seasonal Atlantic hurricane activity. Observations obtained in these data-sparse regions will help improve tropical cyclone seasonal and intensity forecasts.

“The goal of the research is to see how these unmanned tools can help us to gather unique observations to initialize and evaluate ocean models used for hurricane prediction,” said Dr. Sang-Ki Lee, a CIMAS project scientist. “This experiment will also help assess the impact of these types of ocean observations in hurricane forecasts using observing system simulation experiments.”

The gliders were deployed with the help of scientists and students from the University of Puerto Rico at Mayaguez, who are partners in the project, along with researchers from the Maritime Authority of the Dominican Republic. The university contributed its research vessel, *La Sultana*, for the deployments.

Francis Bringas, Grant Rawson, and Kyle Seaton, all personnel with PhOD, underwent training for how to pilot and refurbish the gliders before their deployment in Puerto Rico. With support from NOAA’s National Data Buoy Center, they can steer the gliders remotely by using computers.

By August, after a month of continuous observations, the gliders had generated 1000 temperature and salinity observations. Several tens of these profiles were collected during the passage of Hurricane Bertha south of Puerto Rico.

Recovery of the gliders is expected to occur in mid November, at locations close to where they were deployed. Upon their recovery, it is anticipated they will have gathered and transmitted approximately 3500 temperature and salinity profiles. A second deployment of the underwater gliders is currently planned for January or February 2015.

The glider observations are also being used as a component of the hurricane field program of AOML’s Hurricane Research Division. Data gathered from the gliders will enable scientists to better evaluate existing ocean models, leading to a greater understanding of the role the ocean plays in the formation and intensification of tropical cyclones.

The project is a partnership between AOML, NOAA’s National Data Buoy Center, NOAA’s Environmental Modeling Center, CIMAS, the University of Puerto Rico Mayaguez, and the Maritime National Authority of the Dominican Republic.

More information about the locations of the gliders, their data, and a summary of project objectives can be found at http://www.aoml.noaa.gov/phod/goos/gliders/index.php.
Panelists Discuss Impact of Rising Seas on South Florida Coastal Community

On Thursday, July 31st, Dr. Renellys Perez, a CIMAS scientist with AOML’s Physical Oceanography Division, gave a presentation on sea level rise during a panel discussion entitled The Future of Fort Lauderdale: Protecting our Paradise Against Rising Seas and Stronger Storms.

The event was hosted by the Broward chapter of the New Leaders Council, the South Florida chapter of the U.S. Green Building Council, and the law firm of Becker and Poliakoff for the young professional community of Broward County to foster a discussion on the impacts of sea-level rise.

The other two panelists, Dr. Jennifer Jurado, the Director of the Natural Resources Planning and Management Division for Broward County, and Mr. Asi Cymbal, the President of Cymbal Development, gave presentations on South Florida’s regional vulnerability to sea level rise and how local agencies and developers are responding.

Fort Lauderdale Mayor Jack Seiler gave a forward-thinking introduction aimed at moving past debate and towards taking action to protect South Florida from rising sea levels. Mr. David Fleshler, an environmental reporter for the Sun Sentinel newspaper, skillfully moderated the discussion.

Highlights included a discussion of Broward County’s Integrated Water Resource Plan, which is currently preparing for a 9- to 24-inch rise in sea level for Fort Lauderdale by 2060. The panel discussed how new land-use maps will need to show areas that are vulnerable to a 2-foot sea level rise, and how future land-use decisions must account for this amount of sea level rise. Participants discussed plans that are underway to mitigate saltwater intrusion into South Florida’s fresh water supply and the impact of sea level rise on South Florida’s drainage and canal systems.

The panel explained how local developers now consider sea-level rise when planning for new developments, but look to local and state governments to set higher regulations.

AOML coral researcher Jim Hendee visited the Little Cayman Research Centre (LCRC) in the Cayman Islands on July 21-26th to serve as a lecturer for the Research Experience for Undergraduates program funded by the National Science Foundation. The program paired students with mentors for an intensive, 8-week course of study focused on coral reef biodiversity and resilience. Jim led a skills session on the Coral Reef Early Warning System (CREWS) network and ecological forecasting. He also helped design a new “dashboard” for the online display of data from the Little Cayman CREWS station, as well as aided efforts to repair a malfunctioning instrument on the Little Cayman CREWS station (see photos at right).

Together with Dr. Karsten Shein of NOAA’s National Climatic Data Center and LCRC director Dr. Carrie Manfrino, Jim further helped develop an initiative, the Research Collaborative Network, to expand AOML’s cooperative efforts with the LCRC in the future, particularly the participation of scientists with AOML’s Ocean Chemistry and Ecosystems Division in the LCRC’s 2015 session of the Research Experience for Undergraduates program.
New Tools Bring Ecosystem Benefits to the Forefront of Decision Making

The Marine and Estuarine Goal Setting for South Florida (MARES) project, led by AOML’s Cooperative Institute researchers at the University of Miami, continues to increase awareness of and appreciation for the value of coastal marine ecosystems and their impacts upon human society.

From 2009 through 2013, NOAA’s National Centers for Coastal Ocean Science funded MARES with the goal of creating a consensus-based process for managing South Florida’s coastal marine environments. MARES is unique in that it was among the first major efforts to include human benefits in a systematic framework to enable integrated ecosystem-based management.

The MARES approach embodied NOAA’s effort to serve as the nation’s environmental intelligence agency by providing actionable information from science-based models to support environmentally-sensitive decisions made every day by individuals, communities, and governments.

“NOAA took a leadership role in funding the MARES project, and it is a step in the right direction,” said Eric Millibrandt, director of the Marine Laboratory at Sanibel. “I’ve used the concepts provided by MARES to help colleagues and non-technical individuals to better understand the ecosystem and its preservation.”

When natural resource managers make decisions, they must consider both the needs of the environment, as well as human population requirements and perspectives. This integrated approach is necessary to sustain a physically and economically balanced and healthy ecosystem. Coastal populations rely on and interact with their unique marine and estuarine flora and fauna on a daily basis.

In the last century, increased population, coastal development, climate change, and sea-level rise have damaged South Florida’s marine environment. As these changes continue, the long-term status of South Florida’s ecosystems and valuable resources will continue degrading. The coastal habitat is crucial to the regional economy, which relies on ocean-related jobs such as fishing and tourism.

Since healthy ecosystems are needed for economic survival, the interactions between Florida’s population and its ecosystems are important and can be used to guide management decisions regarding South Florida’s coastal ecosystems.

Typically, research and management on marine ecosystems have focused primarily upon the negative impacts humans have on the environment. MARES investigators realized that for citizens to embrace marine policy, it was essential they understand not only the variety of pressures on the system, but the benefits they derive from it and their role within it.

Over 50 researchers, managers, and stakeholders collaborated to understand and document cause-and-effect relationships and the societal benefits of South Florida’s coastal marine environments. By studying coastal waters in the Florida Keys and Dry Tortugas, southeast Florida coast, and Southwest Florida Shelf, MARES was able to reach a consensus as to which regulating processes were most significant and which key characteristics must be sustained. The MARES team published their findings in a special issue of the journal Ecological Indicators (volume 44) entitled Tools to support ecosystem-based management of South Florida’s coastal resources.

The tools developed by MARES are currently being used in community planning projects to show the existing status of the marine environment and to incorporate human benefits in ecosystem management. One of the most popular MARES products used by resource managers is the conceptual diagram designed for the Southwest Florida Shelf, southeast Florida coast (see example above), and the Dry Tortugas/Florida Keys.

Additionally, NOAA’s National Marine Sanctuaries are evolving to include the MARES conceptual model framework in their guidelines. Sanctuaries’ Condition Reports currently provide a summary of resources in the sanctuaries, pressures on those resources, the current condition and trends, and management responses to the pressures that threaten the integrity of the marine environment.

Specifically, the current Condition Reports include information on the status and trends of water quality, habitat, living resources and maritime archaeological resources, and the human activities that affect them. Future reports will be based on the MARES DPSER (Driver,Pressure, State, Ecosystem Services, Response) model to clearly document ecosystem benefits to the public.

“MARES products and tools helped show us we need to integrate ecosystem services into our next generation of Condition Reports,” said Bob Leeworthy, chief economist for NOAA’s Office of National Marine Sanctuaries. “These Next Generation Condition Reports will emphasize the value of services provided by ecosystems, all as a result of the MARES project.”

www.aoml.noaa.gov/keynotes/
AOML Salutes its 2014 Summer Interns

As the school year drew to a close this past May/June, AOML began welcoming a talented group of summer interns to its ranks. In the weeks that followed, they worked alongside mentors with the Office of the Director, Computer Networks and Services Division, and the three science divisions at AOML—Ocean Chemistry and Ecosystems, Hurricane Research, and Physical Oceanography.

AOML’s industrious summer interns assisted with field sampling activities, performed research, and tended to a wide variety of technical tasks in support of the laboratory’s science programs. They also had the chance to learn more about federal scientific careers through their interaction with AOML researchers and other staff members.

AOML is proud of their accomplishments and of the dedication shown by the employees who mentored them (see table at bottom right for a list of AOML’s 2014 summer interns and their mentors). All interns became a valuable addition to their respective science teams, and it is hoped their time at AOML was memorable. A synopsis of some of AOML’s summer interns’ activities appears on this and the following page.

Four interns worked with AOML’s Hurricane Research Division (HRD) this summer to learn more about the structure and dynamics of tropical cyclones. In addition to participating in hurricane hunter aircraft missions into Tropical Storm Arthur, they also performed the following research:

Robert Nystrom, NOAA Hollings Scholar, investigated storm-relative correlation structures in ensembles of idealized hurricane simulations.

Joseph Patton, NOAA Hollings Scholar, studied the extratropical transition of Hurricane Sandy using HEDAS analyses.

Kelly Nuñez, NOAA Education Partnership Program Scholar, worked with data from the NOAA P-3 flight into Hurricane Felix that was aborted due to turbulence.

Michael Maier-Gerber from the Institute for Meteorology and Climate Research at Karlsruhe Institute of Technology in Karlsruhe, Germany, examined the structure and evolution of Hurricane Ingrid (2013) to better understand how Ingrid was able to intensify under the influence of sustained shear.

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<td>Erica Rule</td>
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<td>Yunyeol Lee</td>
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<td>Palmetto Senior High School</td>
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<td>MAST Academy</td>
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<td>Michael Maier-Gerber</td>
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<td>Karlsruhe Institute of Technology, Karlsruhe,</td>
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<td>Trina Malone</td>
<td>Chris Sinigalliano and Maribeth Gidley</td>
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<td>Coral Reef Senior High School</td>
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<td>Michelle Mestres</td>
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<td>Camila Mirow</td>
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<td>Miami Lakes Educational Center</td>
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<td>University of Puerto Rico Mayaguez</td>
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<td>Robert Nystrom, NOAA Hollings Scholar</td>
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<td>University of Illinois at Urbana-Champaign</td>
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<td>Joseph Patton, NOAA Hollings Scholar</td>
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<td>University of Oklahoma</td>
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<td>Mishelle Rodriguez</td>
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<td>Lindsay Roupe, Mentoring Physical Oceanography</td>
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<td>Women to Increase Retention (MPOWIR)</td>
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<td>Arturo Toro</td>
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<td>MAST Academy</td>
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<td>Ryan Winslow</td>
<td>Molly Baringer</td>
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<td>MAST Academy</td>
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**PhOD Summer Interns Study Buoyancy and Density Effects in a Fish Tank**

Three interns from the nearby MAST Academy joined Physical Oceanography Division (PhOD) scientists this summer to learn about some of the research that is being conducted by the Division. Michelle Mestres worked with Gustavo Goni and Libby Johns to learn about the emerging field of underwater glider technology. Ryan Winslow worked with Molly Baringer to examine ways in which data from the Repeat Hydrography Program can be used to study heat content in the ocean, and Arturo Toro assisted the engineering group with a variety of ongoing projects.

In addition to these assignments, the three interns also worked with Renellys Perez and Libby Johns to develop a hands-on outreach demonstration experiment to illustrate some of the effects of changing salinity on density and the buoyancy of objects (Fig. 1). Thanks are due to Andy Stefanick for assisting with the set-up of the experiment and to Grant Rawson for filming the experiment.

For the demonstration, the interns divided a rectangular fish tank into two halves using a plexiglass panel with closed stoppers in holes near the top and bottom. One half was filled with room temperature salt water, while the other half was filled with warm fresh water. They dropped objects of varying densities into the divided tank to observe which would float and which would sink. For example, a small flask filled with fresh water sank to the bottom. A balloon filled with warm fresh water (lighter) and red food coloring was placed gently into the tank and held near the bottom. When the balloon was popped in the lower layer, the colored water mixed with the surrounding salt water, becoming brackish, and rose part way toward the surface, finally settling at the saltwater-freshwater interface (Fig. 3).

In future repetitions of these experiments, more precise measurements of the temperature and salinity of the water could be made, allowing for a better means of calculating the density differences between the water in the tank and in the various objects used. The effects of the weight of the objects (jars, balloons, etc.) and any air that was contained within them could also be better accounted for in the buoyancy experiments.

This experiment will be useful as an outreach tool to help visiting K-12 students learn about such topics in physical oceanography as the Atlantic Meridional Overturning Circulation, the Mediterranean Sea outflow, and how floats, drifters, and gliders use density and buoyancy to determine their positions in the water column.

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**OCED Summer Interns Sample Florida Keys for Contaminants**

Researchers with AOML’s Environmental Microbiology Program and several student interns conducted a three-day survey of microbial contamination at recreational beaches throughout the Florida Keys National Marine Sanctuary in July. Under the direction of Drs. Chris Sinigalliano and Mariabeth Gidley, Alex de la Cova, Trina Malone, Danny Morales, and Mishelle Rodriguez measured fecal indicator bacteria, microbial source tracking markers, pathogens, and other microbial contaminants in the sand, seaweed wrack, and nearshore waters of beaches from Key Largo to Key West.

**AOML Hollings Scholar Wins Top Honor**

NOAA Hollings Scholar Daniel Coleman, who interned with Dr. Lew Gramer of AOML’s Ocean Chemistry and Ecosystems Division, won a Best Poster award in July at NOAA’s Education and Science Symposium. The poster, *Summer cold-water anomalies on the Florida Reef Tract: Ecologically-significant upwelling*, explored the periodic summer upwelling events that occur in the northern portion of the Florida reef tract from March through July; the research will likely become part of a paper submitted for publication by Gramer and academic collaborators in a peer-reviewed journal during the upcoming academic year.

Dan is currently an undergraduate student at the Department of Earth and Environmental Sciences of Tulane University in New Orleans, Louisiana.
Lieutenant Commander Ariel Troisi of the Argentine Hydrographic Office (SHN), visited AOML on Wednesday, August 27th. During his visit, he met with science and science support personnel with the Physical Oceanography Division that are currently working on Meridional Overturning Circulation projects in which NOAA and the SHN are partnering, such as the southwestern Atlantic array (SAM) and the XBT transect AX18, which travels from Cape Town, South Africa to Buenos Aires, Argentina. Discussions were held on how to enhance the partnership between the two agencies with the arrival of a new oceanographic ship in Argentina.

Dr. Chris Meinen of PhOD meets with Argentine visitor LCDR Ariel Troisi.
Farewell

Kevin Helmle, a Cooperative Institute associate scientist with AOML’s Ocean Chemistry and Ecosystems Division, resigned in August to accept a position as a chemistry teacher at the Chaminade-Madonna College Preparatory School in Miami. During his five years at AOML, Kevin’s research focused on studying the annual density banding in coral skeletons to obtain information about the impact of environmental factors such as water temperature, water chemistry, and exposure to light on coral communities. Similar to the rings on tree trunks, the density banding provides a record of the climatic changes that have contributed to coral growth and calcification rates.

Forde Interview Archived at Library of Congress

The HistoryMakers video archival project, a 15-year effort to document the challenges, achievements, and culture of African Americans from all walks of life, was formally accepted by the U.S. Library of Congress in July to become a permanent addition to its repository. AOML oceanographer Evan Forde was invited to participate in The HistoryMakers project in 2013; Evan’s interview focuses on his contributions to several scientific disciplines, some of the pioneering aspects of his career, and his outreach efforts devoted to science education.

Congratulations

Shaun Dolk, a Cooperative Institute research associate with AOML’s Physical Oceanography Division, was named NOAA’s Team Member of the Month for July 2014. Shaun manages the operations center of NOAA’s Global Drifter Program, a key component of the Global Ocean Observing System, located at AOML. He was recognized for his professionalism, commitment to excellence, and enthusiasm for his work. Shaun was also recognized for his many outreach efforts, including support of NOAA’s “Adopt a Drifter” program which helps school children learn about the ocean by adopting and tracking their very own drifting buoy.

Pamela Fletcher, a Florida Sea Grant liaison at AOML with the Ocean Chemistry and Ecosystems Division, earned her doctoral degree in July from the Soil and Water Science Department of the University of Florida. Pamela’s thesis, Using participatory decision support to improve coral reef management, included research results obtained from her involvement with several NOAA-funded projects, including the Marine and Estuarine Goal Setting for South Florida (MARES) project and the coral reef and marine resource managers climate information needs assessment.

Welcome Aboard

Neville Cohen joined AOML’s Computer Networks and Services Division (CNSD) in August as an associate with the University of Miami’s Cooperative Institute for Marine and Atmospheric Studies. Neville will work with CNSD staff to assist with printing and printer issues, computer hardware/software upgrades, various types of user account issues, VTC setup, and other audiovisual duties. He previously worked with CNSD and AOML’s Office of the Director from 1999 to 2010.

Dr. Steven Diaz joined AOML’s Hurricane Research Division in August as a senior research associate with the University of Miami’s Cooperative Institute for Marine and Atmospheric Studies. Steven will work with HRD’s modeling group on the next generation Hurricane Weather Research and Forecasting (HWRF) system funded by NOAA’s Impact Weather Prediction Project. He holds a Ph.D. in aerospace engineering from the Florida Institute of Technology.

Dr. Jili Dong joined AOML’s Physical Oceanography Division (PhOD) in July as a post-doctoral associate with the University of Miami’s Cooperative Institute for Marine and Atmospheric Studies. Jili will work with Dr. Sang-Ki Lee to configure the HWRF (Hurricane Weather Research and Forecasting) modeling system to perform impact simulations using underwater glider data. After this, he will spend the remainder of his first year with AOML working at NOAA’s Environmental Modeling Center in College Park, Maryland. Jili holds a Ph.D. from the University of Oklahoma’s School of Meteorology. His work is one of several components of the two-year project “Sustained and Targeted Ocean Observations for Improving Atlantic Cyclone Intensity and Hurricane Seasonal Forecasts” led by Gustavo Goni of PhOD.

Lauren Valentino joined AOML’s Ocean Chemistry and Ecosystems Division in July as a research associate with the University of Miami’s Cooperative Institute for Marine and Atmospheric Studies. Lauren will work with Derek Manzello on a project to measure coral growth and bioerosion rates, as well as carbonate chemistry dynamics, of reefs in Miami-Dade and Broward counties. She recently obtained her M.S. from the Department of Biology at California State University in Northridge; her thesis explored the impact of ocean acidification on the boring bivalve Lithophaga in Moorea, French Polynesia.
Recent Publications (AOML authors are denoted by bolded capital letters)


