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AOML Keynotes

ATLANTIC OCEANOGRAPHIC AND METEOROLOGICAL LABORATORY

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

ABIISS Shuttle System Successfully Transmits First Data from the Abyss

The first phase of a deep-water test of ABIISS, a revolutionary new system developed at AOML to autonomously retrieve data from subsurface moored instruments, was successfully completed in November.

One of the major challenges facing the oceanographic community is the difficulty in maintaining long-term ocean measurement systems in an era of reduced research vessel availability. On November 6, 2015, staff from AOML's Physical Oceanography Division (PhOD) celebrated a great success in one method to address this challenge when the first "data pod" from the Adaptable Bottom Instrument Information Shuttle System, ABIISS, surfaced and transmitted its data.

The ABIISS package is designed to inexpensively move data from bottom-mounted oceanographic measurement systems to the surface and back to land via satellite. Presently, data from most subsurface moored instruments must be collected via research vessels, stretching NOAA resources. ABIISS aims to reduce these ship expenses by enabling longer deployments of moored instruments, simultaneously requiring fewer visits by research ships yet getting critical climate measurements back to land promptly.

An ABIISS data pod surfaces to transmit its data via satellite during an earlier test.

Staff from the Physical Oceanography Division's Instrumentation Group—Tom Sevilla, Pedro Pena, Ulises Rivero, and Grant Rawson—and Dr. Chris Meinen alongside the ABIISS package prior to its deep-water deployment in October 2015.

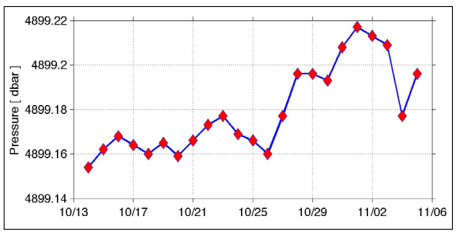
ABIISS has been under development at AOML for several years with the aid of funding from the Assistant Administrator's Discretionary Fund of NOAA's Office of Oceanic and Atmospheric Research, NOAA's Climate Program Office, and AOML. The present prototype was deployed in 4500+ meters of water in October 2015, representing its first test in true deep-ocean conditions.

The ABIISS system was mated with a pressure-equipped Inverted Echo Sounder (PIES) for an 18-month deployment alongside one of the existing PIES moorings that regularly provides data as part of the long-term AOML Western Boundary Time Series project.

Moving forward, over the next 16 months the ABIISS system will release three more expendable data pods that will float to the ocean surface at preprogrammed times and transmit their data from the PIES to land via the Iridium satellite network. After the final data pod has been released in November 2016, the ABIISS control system and its mated PIES will be recovered in early 2017 for future use.

Once prototype testing has been completed, the ABIISS system will benefit many projects based on deep ocean moored instruments, not just those using PIES moorings. As an example, an earlier test demonstrated the ability to mate the ABIISS system with a bottom moored acoustic Doppler current profiler; other instruments could be similarly adapted to work with ABIISS. AOML's Western Boundary Time Series and Southwest Atlantic MOC projects are just two long-term ocean observing studies that can benefit from the ABIISS.

The development of ABIISS at AOML has been led by Ulises Rivero, together with Pedro Pena, Grant Rawson, Andy Stefanick, and Tom Sevilla of PhOD's Instrumentation Group. Drs. Chris Meinen and Silvia Garzoli have also aided the group by supplying science and development ideas.



Time series of bottom pressure data collected by the PIES mooring mated with ABIISS. These data were transmitted to AOML via satellite on November 6, 2015 after the first of four data pods was released and floated to the ocean surface.

Atlantic and Pacific Hurricane Seasons End; Both Impacted by El Niño

The Atlantic, as well as eastern and central Pacific, hurricane seasons officially ended on November 30th. As predicted by NOAA's team of hurricane specialists, the Atlantic season remained below normal, while the eastern and central Pacific seasons were above normal with both regions shattering their all-time records.

Overall, the Atlantic hurricane season produced 11 named storms, including four hurricanes (Danny, Fred, Joaquin, and Kate), two of which, Danny and Joaquin, became major hurricanes. Although no hurricanes made landfall in the US this year, two tropical storms, Ana and Bill, struck the northeastern coast of South Carolina and Texas, respectively. Ana caused minor wind damage, beach erosion, and one direct death in North Carolina, while Bill produced heavy rain and flooding as it moved across eastern Texas and Oklahoma.

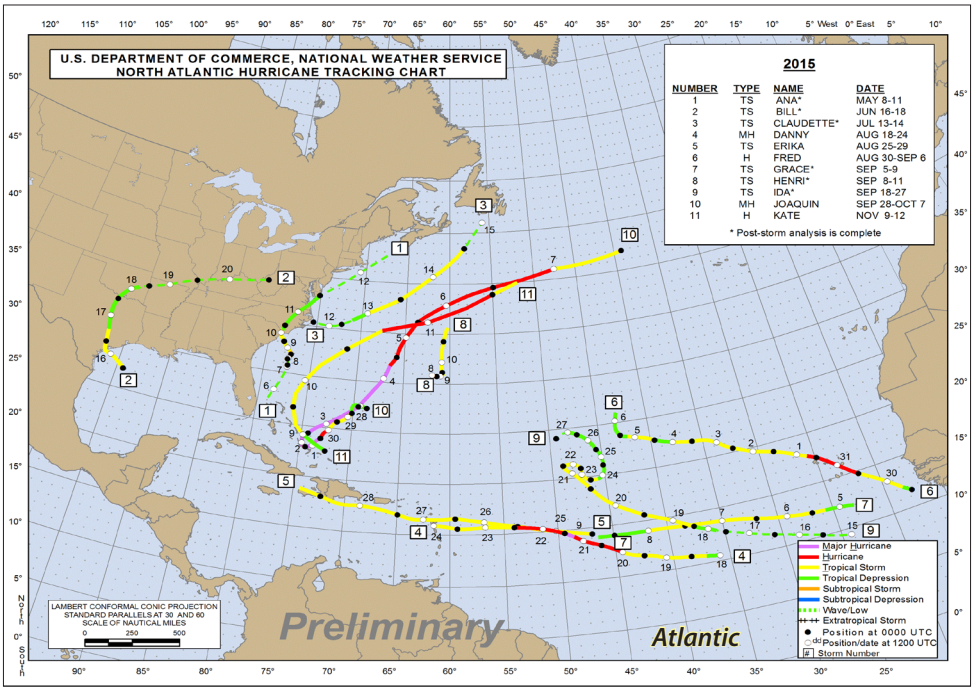
Additionally, Hurricane Joaquin became the first category-4 hurricane since 1866 to impact the Bahamas. The powerful storm caused extensive damage and was responsible for the sinking of *El Faro,* a US cargo ship, and the death of its 33 crew members.

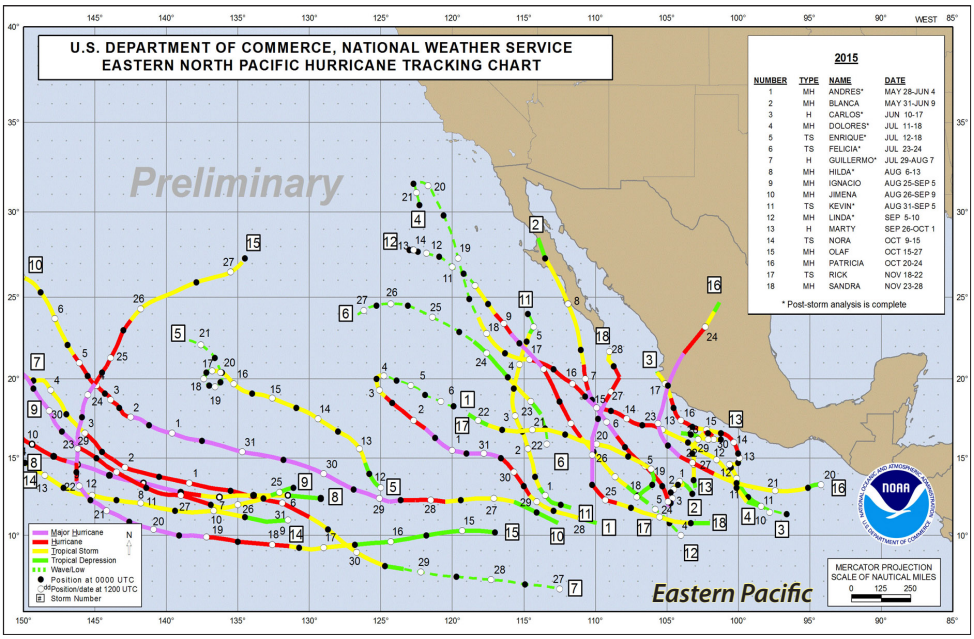
NOAA scientists credit El Niño as the leading climate factor influencing both the Atlantic and Pacific seasons this year. According to Dr. Gerry Bell, lead seasonal hurricane forecaster at NOAA's Climate Prediction Center, "El Niño produces a sea-saw effect, suppressing the Atlantic season while strengthening the eastern and central Pacific hurricane seasons. El Niño intensified into a strong event during the summer and significantly impacted all three hurricane seasons during their peak months."

El Niño suppressed the Atlantic season by producing strong vertical wind shear combined with increased atmospheric stability, stronger sinking motion, and drier air across the tropical Atlantic, all of which made it difficult for tropical storms and hurricanes to form and strengthen. However, El Niño fueled the eastern and central Pacific seasons this year with the weakest vertical wind shear on record.

The eastern Pacific saw 18 named storms, including 13 hurricanes, nine of which became major. The 2015 season marked the first year since reliable record-keeping began in 1971 that the eastern Pacific generated nine major hurricanes. Hurricane Patricia became the strongest hurricane on record for the Western Hemisphere with maximum wind speeds of 200 miles per hour and a barometric pressure of 879 millibars. Hurricane Sandra, which formed near the end of the season, became the strongest hurricane in the eastern Pacific so late in the year, with maximum sustained winds of 145 miles per hour.

The central Pacific shattered its records as well, with 14 named storms, including eight hurricanes, five of which became major hurricanes. It was also the region's most active season since reliable record-keeping began in 1971. In late August, three major hurricanes (Ignacio, Kilo, and Jimena) simultaneously churned in the central Pacific, marking the first occurrence for such an event.





Comparison of the 2015 Atlantic (top) and eastern Pacific (bottom) hurricane seasons. A strong El Niño in the tropical Pacific lead to greater vertical wind shear, increased atmospheric stability, and drier air across the tropical Atlantic, while the eastern Pacific experienced warmer than average sea surface temperatures and the weakest level of vertical wind shear ever recorded for the region. These climatic conditions resulted in the Atlantic having a below-normal season with 11 named storms and four hurricanes, while the eastern Pacific had an above-average season with 18 named storms and 13 hurricanes.

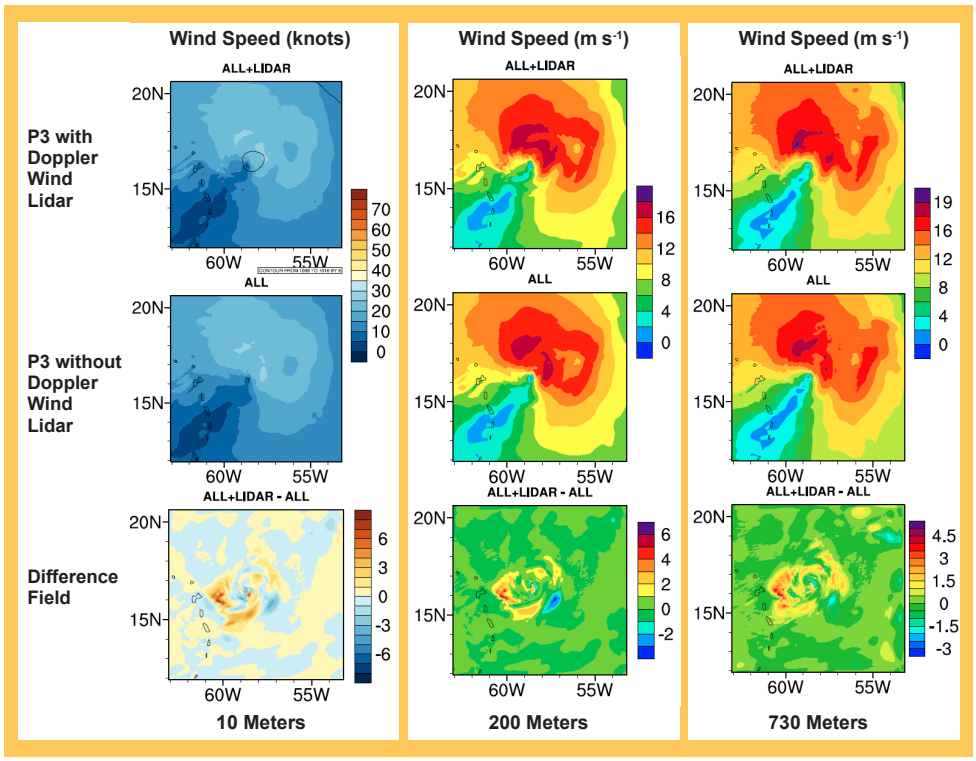
Article adapted from the NOAA web site (www.noaa.gov)

Hurricane Field Program Accomplishes Milestones in Spite of Quiet Season

Although the 2015 Atlantic hurricane season was quiet by most measures, NOAA's annual Hurricane Field Program, led by AOML's Hurricane Research Division (HRD), entailed plenty of activity and produced several milestones. HRD scientists participated in 30 research, reconnaissance, and surveillance flights, either onboard NOAA hurricane hunter aircraft or remotely from the ground. In addition, HRD scientists teamed up with NASA to remotely operate the Global Hawk unmanned aerial surveillance aircraft in conducting high-altitude research of several hurricanes.

In all, HRD scientists investigated seven tropical cyclones in the Atlantic, as well as several in the eastern and central Pacific, including Hurricane Patricia. Patricia now holds the record for being the strongest tropical cyclone observed in the Western Hemisphere to date, with winds at their peak intensity close to 200 mph.

As a part of NOAA's Sensing Hazards with Operational Unmanned Technology (SHOUT) project, data from the Global Hawk were ingested into an operational hurricane model for the first time. Additionally, two underwater gliders operated by researchers with AOML's Physical Oceanography Division collected information on the sea's reaction to the passing of Tropical Storm Erika. These data will enhance understanding of the role of the upper atmosphere and ocean in hurricane dynamics and are anticipated to lead to improved intensity forecast models.

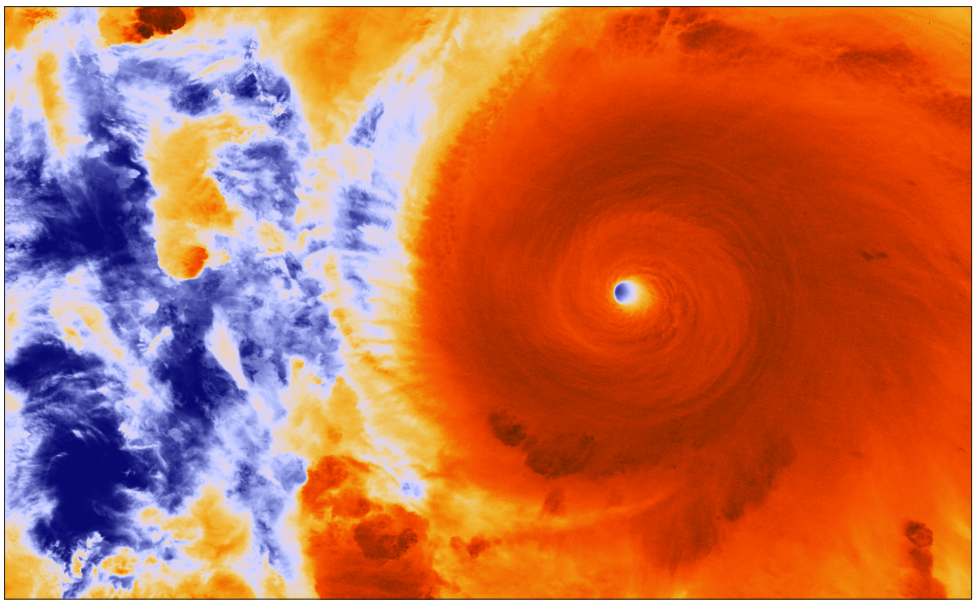


Analysis of the difference Doppler wind lidar measurements made on data from Tropical Storm Erika that were incorporated into computer models from NOAA's P3 hurricane hunter aircraft. The first row shows all the data obtained in Erika, including the lidar measurements, while the second row shows a similar analysis without the lidar data. The third shows the difference between the two.

Among the experiments carried out, a number used the tail Doppler radar on NOAA's hurricane hunter aircraft to examine the three-dimensional wind fields of the tropical systems investigated. These data were transmitted in real-time and incorporated into NOAA's operational Hurricane Weather Research and Forecasting model. Additionally, lower fuselage radar images were transmitted for the first time to show the large-scale structure of the storms. In preparation for next year's effort to assimilate tail Doppler radar data from NOAA's Gulfstream-IV jet into the operational computer models, extensive testing of that system was also carried out in the 2015 season.

During other flights, a new instrument, the Doppler Wind Lidar (DWL), was used for the first time in a hurricane. This device returned wind measurements in regions where there was no rain. Traditional Doppler radar requires water droplets to provide targets for estimating the wind velocity, but the DWL can operate in clear-air, providing measurements over a greater area within the hurricane inner core (see image above).

Special emphasis was placed this year on gathering wind shear information in and around tropical systems. A strong El Niño year such as this one often produces enhanced vertical wind shear over the western Atlantic, suppressing tropical storm formation. Examining research data from the Hurricane Danny flights may offer new insights into how wind shear affects hurricane development.



Satellite image of Hurricane Patricia off the coast of Mexico on October 23rd. In the span of 30 hours, Patricia rapidly intensified from a tropical storm with 65 mph winds into a major hurricane with maximum sustained winds near 200 mph, becoming the strongest tropical cyclone observed in the Western Hemisphere to date.

Crucial Mooring Turn-around Completed during South Atlantic Research Cruise

Mr. Ulises Rivero, the chief engineer in AOML's Physical Oceanography Division Instrumentation Group, joined with partners from the University of Sao Paulo, Brazil, on a recent cruise to recover, refurbish, and redeploy a crucial moored instrument in the NOAA-funded Southwest Atlantic MOC (SAM) array at 34.5ºS in the South Atlantic.

The SAM project is a key component of the NOAA strategy to measure variations in the Meridional Overturning Circulation (MOC) in the Atlantic. The array measures the western boundary components of the MOC, and it also represents the cornerstone of the developing international program to measure the basinwide MOC transports across 34.5ºS, which is known as the South Atlantic MOC Basin-wide Array or SAMBA.

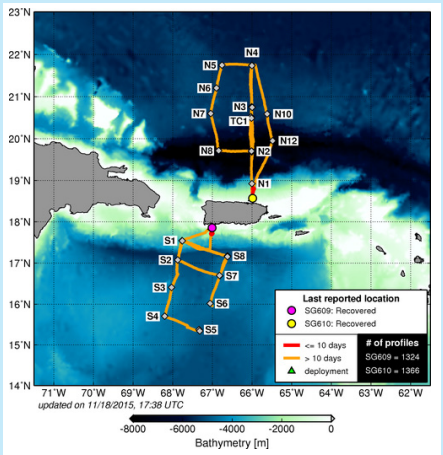
The November 8-12, 2015 cruise represented a critical operation for both the NOAA SAM project and the affiliated Brazilian project. Several of the moored instruments in the joint array were nearing the end of their battery life and were at risk of loss. However, the primary vessel planned for the major joint research cruise had broken down and was unavailable to recover these instruments.

Science party from the November 2015 cruise aboard the Brazilian research vessel *Alpha Delphini.* From left to right: Francisco Vicentini, Wilson Natal, Ulises Rivero of AOML, Luiz Mariano, and Carlos Franca.

The strong international collaborative group that forms the backbone of the SAMBA program worked together to find an alternate vessel to perform the mooring operations, which were absolutely necessary before the batteries failed. The captain and crew of the Brazilian research vessel *Alpha Delphini* sailed their small ship farther offshore than they normally do, helping Mr. Rivero and the Brazilian science team successfully turn-around the key NOAA mooring. In doing so, 4 years of hourly measurements were recovered. Two important Brazilian moored instruments were also successfully recovered.

The new NOAA pressure-equipped inverted echo sounder (PIES) mooring deployed during the cruise will now make hourly measurements for the next 4 years, continuing a time series that has already reached 6 years since the SAM array was first deployed in March 2009.

NOAA's contribution to this effort is funded by the NOAA Climate Program Office/Climate Observations Division and by the AOML.



Underwater Gliders Complete Third Mission

AOML's third underwater glider mission ended in November with the successful recovery of the two gliders from the North Atlantic and Caribbean Sea. Recovery operations were conducted from aboard the RV *La Sultana*, a research vessel of the University of Puerto Rico at Mayaguez (UPRM). Gustavo Goni, an oceanographer at AOML and co-principal investigator for the project, was part of the field team, along with Julio Morel and Luis Pomales of UPRM, with support from Grant Rawson, Ricardo Domingues, and Francis Bringas of AOML who remotely piloted the gliders during their recovery.

The third mission began in July during the Atlantic hurricane season to study the ocean's role in tropical cyclone development and intensification. In August as Tropical Storm Erika passed through the Caribbean, the gliders documented Erika's interaction with the upper ocean. The data gathered were assimilated into real-time hurricane forecast models and will improve understanding of the ocean's response to the passage of tropical systems, ultimately leading to better ocean models that are used in hurricane forecasts.

During their five-month deployment, the gliders gathered more than 3000 temperature, salinity, oxygen, and current velocity profiles to the north and south of Puerto Rico, respectively (see map at left). All data collected were disseminated in real-time through the Global Telecommunication System. The data were also made available on the AOML glider website at www.aoml.noaa.gov/phod/goos/gliders/.

The recovered gliders are currently undergoing refurbishment in preparation for their February 2016 mission to study the Atlantic warm pool region in the Caribbean.

***Top left:* One of AOML's two underwater gliders aboard the RV *La Sultana*. *Bottom left:* Track of the regions traversed in the North Atlantic and Caribbean Sea by AOML's two underwater gliders during their third mission from July 15-November 18, 2015.**

NOAA Researchers Address International Audience in Havana, Cuba

Ryan Smith, an oceanographer with AOML's Physical Oceanography Division, along with researchers from NOAA's Southeast Fisheries Science Center (SEFSC) in Miami—John Lamkin, Trika Gerard, Estrella Malca, Sarah Privoznik, Aras Zygas, Leif Rasmuson, and Kathryn Shulzitski—presented preliminary results from a collaborative NOAA research cruise at the 10th Congress on Marine Science (MarCuba 2015) held in Havana, Cuba on November 16-20, 2015.

The oceanographic survey was conducted aboard the NOAA Ship *Nancy Foster* from mid April to early June 2015 across portions of the northern Caribbean, southern Gulf of Mexico, and the Florida Straits. Over the past 10 years, in a cross-line-office partnership, researchers from the two Miami NOAA labs (Libby Johns and Ryan Smith from AOML; John Lamkin and Trika Gerard from SEFSC) have conducted multiple interdisciplinary cruises focused on fisheries oceanography across the Intra-Americas Sea region. In 2015, the NOAA-led cruise also included international scientific collaborators from Cuba, Mexico, Spain, and Jamaica.

The first half of the survey focused on the Virgin Islands coastal shelf ecosystem in the northeastern Caribbean. Data collected are providing insight into the processes that drive spawning aggregations of economically important reef fish species in the region and enhancing understanding of the spatial variation in the supply of settlement-stage fishes between managed and non-managed areas of the coastal shelf.

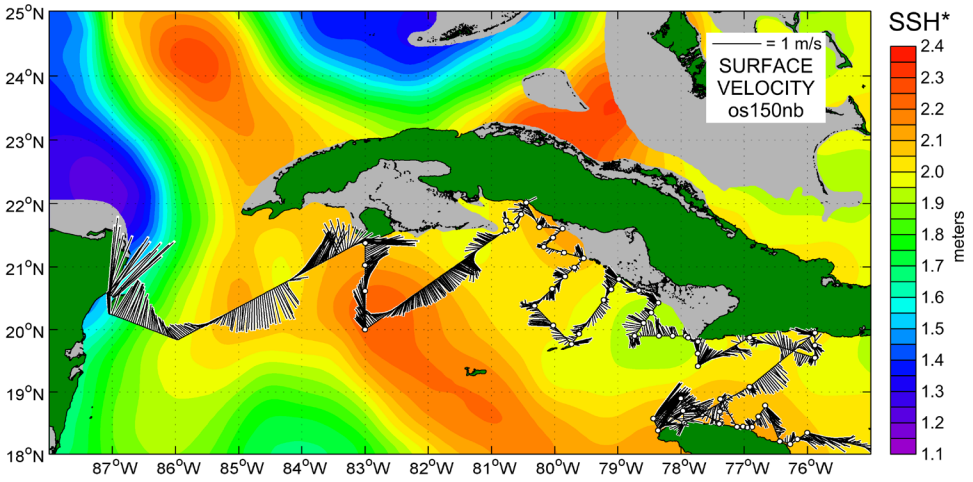
Following work in the Virgin Islands, the cruise track extended westward across the northern Caribbean into the waters surrounding Cuba. With Cuban participants aboard, the biological focus for the second half of the cruise shifted from larval reef fish to larval Atlantic bluefin tuna. The measurements and samples collected during this portion of the survey are providing species abundance and distribution data, and are helping to improve tuna stock assessments for the western Caribbean Sea and Gulf of Mexico. The results are also being used to further develop a regional larval habitat model for Atlantic bluefin tuna.

The preliminary physical and biological findings from the survey were discussed during a special session on Intra-Americas Sea connectivity at the MarCuba 2015 conference. NOAA scientists presented an analysis of the regional ocean circulation at the time of the cruise using shipboard, satellite, and drifter data, as well as presentations on the measured spatial distribution and abundance of several economically important pelagic and reef-associated species prevalent across the Intra-Americas Sea region (talks focused on tunas, billfish, parrotfish, and lobster).

The special session was followed by an informal discussion among conference participants regarding areas for possible collaboration in relation to the group's upcoming 2016 interdisciplinary oceanographic survey.

Surface Circulation across the Northwestern Caribbean Sea

from altimetry and shipboard current velocity measurements: April 26 - May 5, 2015



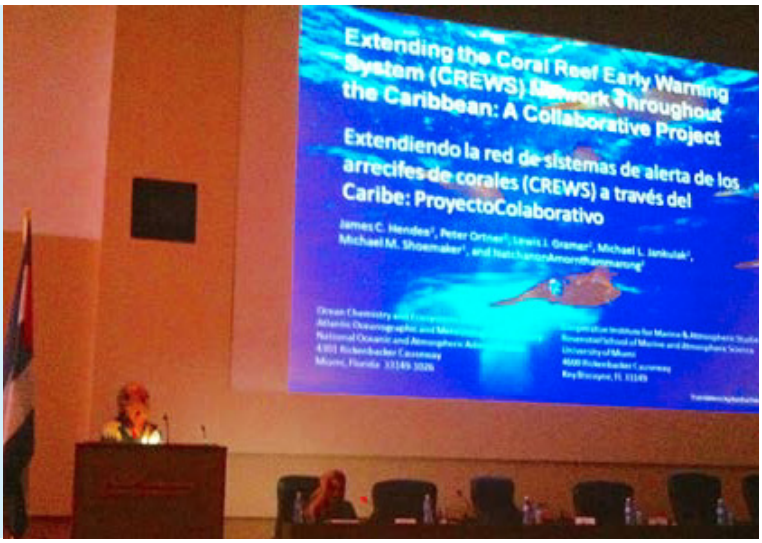
* May 1, 2015. 10-day Sea Surface Height (SSH) composite above mean geoid, grid resolution: 0.2° x 0.2°

Coastwatch Caribbean Regional Node (NOAA/AOML)

A 10-day composite of sea surface height measurements, overlaid with surface current velocity vectors from hull-mounted acoustic Doppler current profiler measurements, for April 26-May 5, 2015. Velocity vectors are show in black along the NOAA Ship *Nancy Foster* NF-15-02/03 cruise track for the period. Over the western portion of the map, mesoscale eddy circulation and dominant current systems (Yucatan, Loop, and Florida) are prevalent, while surface conditions offshore southeastern Cuba are characterized by a lower velocity, small-scale eddy circulation.

The National Oceanographic Committee of Cuba hosted the 10th Congress on Marine Science, MarCuba 2015, in Havana on November 16-20, 2015. AOML delegates included Jim Hendee and Ryan Smith, along with several attendees from NOAA's Southeast Fisheries Science Center and the University of Miami's Cooperative Institute for Marine and Atmospheric Studies (CIMAS).

AOML coral researcher Jim Hendee's presentation elaborated on the joint efforts of NOAA, CIMAS, and the Caribbean Community Climate Change Centre to install Coral Reef Early Warning System (CREWS) buoys throughout the Caribbean. Mention was also made of a historic agreement reached by NOAA and Cuba to implement a new virtual station at the Guanahacabibes Sanctuary in southwest Cuba.



AOML coral researcher Dr. Jim Hendee at the MarCuba 2015 Symposium in Havana, Cuba.

In November, Mike Jankulak and Mike Shoemaker with AOML's Coral Health and Monitoring Program (CHAMP) visited Belize to repair and update two environmental monitoring buoys of the Caribbean Community Climate Change Centre (CCCCC). The CCCCC is collaborating with AOML's CHAMP researchers to develop a network of Coral Reef Early Warning System (CREWS) buoys throughout the Caribbean. New sensors and electronics for the Calabash Caye buoy were installed in cooperation with the University of Belize, and new programming developed and tested at AOML was uploaded. The second buoy at South Water Caye, part of a collaboration with the Belize Fisheries Department, was visited for a few hours during which power was restored and a major communications fault diagnosed and corrected.

Sam Novello, Albert Jones, and Mike Shoemaker of AOML (seated in boat) work to repair and update the South Water Caye environmental monitoring buoy in Belize.

Joe Cione, a meteorologist with AOML's Hurricane Research Division, received a Department of Commerce Silver Medal at a recent awards ceremony in Washington, DC. Joe, along with Erica Rule, AOML's director of communications, were members of a team that included colleagues from NOAA's Office of Marine and Aviation Operations recognized for their efforts to successfully execute the first-ever launch of an Unmanned Aircraft System (UAS) from a manned aircraft into a major hurricane. During the 2014 Atlantic hurricane season, the team twice deployed a Coyote UAS into Hurricane Edouard from a NOAA P3 hurricane hunter aircraft. Data from the Coyote hold the potential to yield new insights into how tropical cyclones intensify.

Joe Cione of AOML (center, holding award) surrounded by some of his Silver Medal team members and NOAA Administrator Dr. Kathryn Sullivan (far right).

AOML hosted its fifth annual health fair on November 20th for NOAA's Miami federal employees. Representatives from federal employee health care providers were onsite for private consultations and to assist staff with questions, concerns, and information about their plans. Free health care screenings for blood pressure, blood glucose, cholesterol, body mass analysis, and weight were provided by Baptist Health South Florida, while staff from CVS Pharmacy assisted with flu, shingles, and pneumonia immunizations. Attendees were also treated to free Yoga and Zumba demonstrations. Thanks to Howard Friedman and Evan Forde for organizing the event, providing NOAA's Miami federal employees with a convenient means for obtaining the latest information about their health care benefits.

Attendees at AOML's fifth annual health fair received free diagnostic tests provided by staff with Baptist Health South Florida.

A typhoon symposium and tutorial session on NOAA's high-resolution Hurricane Weather Research and Forecast (HWRF) modeling system was held in Nanjing, China from November 30-December 2. More than 90 scientists and students from across China participated in the event, attending lectures presented by speakers with AOML's Hurricane Research Division, NOAA's Environmental Modeling Center, the Developmental Testbed Center of the National Center for Atmospheric Research, and other groups. Lectures covered all aspects of the HWRF model, including dynamics, physics, nesting, moving algorithms, multi-storm capacity, ocean coupling, initialization, data assimilation, post processing, and vortex tracking.

Tutorial speakers included (left to right): Xuejin Zhang (AOML), Vijay Tallapragada (NOAA-Environmental Modeling Center), Lianshou Chen (Chinese Academy of Meteorological Sciences), Xiaolei Zou (University of Maryland), and Yuqing Wang (University of Hawaii).

AOML Celebrates Staff Accomplishments

AOML's Office of the Director hosted an awards ceremony on December 4th to celebrate the accomplishments of staff. Dr. Bob Atlas, director of AOML, had the pleasure of presenting certificates of appreciation and federal year-in-service awards to close to 60 individuals who were recognized for their outstanding achievements and dedicated service to the federal government.

Below are the individuals who received certificates of appreciation in recognition of their exceptional work efforts, followed by those who received federal year-in-service awards.

Paul Leighton—For technical expertise and professionalism that contributed significantly to the successful transition of hurricane research products to the operations of the hurricane specialists at the National Hurricane Center.

Pamela Fletcher—In recognition of long-term efforts to advance understanding of South Florida's marine ecosystem, as well as increase awareness of the need for environmental stewardship and conservation, through skilled communications.

Pedro Pena, Grant Rawson, Ulises Rivero, Thomas Sevilla, and Andrew Stefanick—For efforts to support cost-effective and timely sustained ocean observations, and in celebration of the recent successful test of the ABIISS system in deep ocean conditions.

Evan Forde (left) celebrates 40 years of service as a federal employee with AOML director and deputy director Drs. Bob Atlas and Molly Baringer.

George Halliwell, Matthieu Le Henaff, and Michael Mehari—For creating the first Observing System Simulation Experiment (OSSE) system for ocean observations, using the system to examine the impact of airborne observations on hurricane forecasting efforts and providing an invaluable tool to assess future observing strategies.

Manuel Fraga, Cameron Lambert, and Juan Martinez—For numerous accomplishments outside of normal duties that have greatly increased safety, utility, and efficiency at AOML, while saving tens of thousands of dollars in contracting costs.

Nina Liebig—In recognition of dedicated service to AOML by providing support for multiple functions such as purchase cardholder, contracting officer representative, contracting officer, administrative officer and, specifically, your efforts in shepherding AOML's stellar budget process, while simultaneously fostering an environment of stewardship, camaraderie, and excellence.

Drs. Bob Atlas and Molly Baringer recognize Pamela Fletcher (center) for her long-term efforts to advance understanding of South Florida's marine ecosystem.

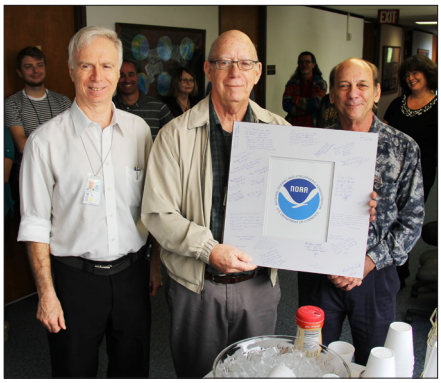
Federal Year-In-Service Awards	
10 Years	Ruth Almonte Kelly Goodwin George Halliwell Rick Lumpkin Christopher Meinen Robert Rogers Jia-Zhong Zhang
15 Years	Charles Featherstone Ramon Hurlockdick Erica Rule Ryan Smith Chunzai Wang
20 Years	Molly Baringer Joseph Bishop Joseph Cione John McKeever
25 Years	Robert Castle Jay Harris Thomas Heeb James Hendee Ulises Rivero Rik Wanninkhof
30 Years	Sim Aberson William Barry Michael Black James Farrington John Gamache Paul Leighton Alejandra Lorenzo
35 Years	Robert Black Thomas Carsey Peter Dodge Neal Dorst Charles Fischer Nancy Griffin Frank Marks Mayra Pazos Carla Stephens
40 Years	Evan Forde Betty Huss
55 Years	Howard Friedman

Celebrating 15 years of federal service from left to right (holding certificates): Chunzai Wang, Ryan Smith, Ramon Hurlockdick, and Erica Rule, along with Drs. Bob Atlas (center) and Molly Baringer (right).

Happy Holidays 2015

AOML hosted its annual holiday party on Friday, December 11th. Staff, friends, and family gathered to enjoy an afternoon of fun and good cheer, complete with turkey dinner, desserts and goodies, music, singing, dancing, and an array of raffle prizes. Thanks are due to Lindsey Visser and Erica Rule (top photo) of AOML's Buoys and Gulls group for organizing the happy event.

Farewell



AOML director Dr. Bob Atlas, Tom Carsey, and Jim Hendee, OCED director.

Dr. Tom Carsey, a research chemist and the deputy director of AOML's Ocean Chemistry and Ecosystems Division (OCED), retired in December after 37 years of federal service. Tom began his federal career in 1978 with the National Institute for Occupational Safety and Health. He transferred to AOML in 1986 to change the focus of his research from indoor air quality to environmental air and water quality.

As a member of OCED's science team, Tom sailed the world's oceans in support of programs such as INDOEX (Indian Ocean Experiment), ACE-1 (Southern Hemisphere Marine Aerosol Characterization Experiment), RITS (Radiatively Important Trace Species), and OACES (Ocean Atmosphere Carbon Exchange Studies), among others. More recently, he has been a co-principal investigator of the Florida Area Coastal Environment (FACE) program aimed at better understanding the many controlling oceanographic and coastal environmental factors that influence Florida public health and coastal biota.

In 2004, Tom became the deputy director of OCED, acquiring a broad assortment of administrative and managerial duties in support of the division. Since then he has handled fiscal, funding, and personnel issues on a daily basis, alongside his scientific duties.

Best wishes to Tom for a well-deserved retirement to focus on family and friends, and new hobbies and projects.

Dr. Eric Uhlhorn, a meteorologist with AOML's Hurricane Research Division, resigned in November to accept a position with AIR Worldwide in Boston, Massachusetts. During Eric's 17 years at AOML, he performed research to improve surface wind speed estimates in tropical cyclones using data from the stepped frequency microwave radiometer (SFMR) on NOAA's hurricane hunter aircraft. This research led to the adoption of the SFMR as the standard for surface wind observations from all hurricane reconnaissance aircraft. For his efforts, Eric and his collaborators were awarded the American Meteorological Society's Banner I. Miller Award and a Department of Commerce Bronze Medal in 2008, as well as an American Meteorological Society Special Award in 2010. Eric also led research using upper ocean observations collected during hurricane research flights to better understand ocean impacts on hurricane intensity change and to improve their prediction using coupled numerical models, such as the operational HWRF model. Additionally, Eric was also instrumental in developing an approach to estimate the inherent uncertainty in observing hurricane intensity from aircraft observations, such as the SFMR, that greatly benefited forecasters at the National Hurricane Center in interpreting aircraft data.

Congratulations

Dr. Ruben van Hooidonk, a University of Miami Cooperative Institute researcher with AOML's Ocean Chemistry and Ecosystems Division, received a Sustainability Award from the Netherland-America Foundation (NAF) in November. Ruben was recognized by the NAF for being an alumnus of the NAF's Fulbright Fellowship Program and for his dedication to the field of sustainability through research on coral reef ecosystems. The NAF seeks to keep the bonds between the Netherlands and the US strong through a cultural exchange in the arts, sciences, education, business, and public affairs. Ruben received the award at the prestigious Peter Stuyvesant Ball at the Plaza Hotel in New York City. The black-tie event is hosted annually in support of the NAF and was attended by Her Royal Highness Princess Margriet of the Netherlands and her husband, Professor Pieter van Vollenhoven, both of whom are patrons of the NAF.

Dr. Ruben van Hooidonk of AOML (left) receives a Sustainability Award from Marnix Fruitema, Vice President of Royal Dutch Airlines, the official airline of the NAF.

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Recent Publications *(AOML authors are denoted by bolded capital letters)*

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