

Scientists Launch Balloons to Improve Storm Forecasts

—By Keli Tarp

Day and night from May 9 through June 20, a team of fourteen researchers and university students has been scrambling to get in position to launch weather balloons beneath storms in central Oklahoma. The goal of the Thunderstorm Electrification and Lightning Experiment, or TELEX for short, is to use lightning observations from instruments on the balloons to improve forecasts and warnings of hazardous weather.

Each day in the TELEX field program, scientists from NOAA's National Severe Storms Laboratory and researchers and students from the University of Oklahoma in Norman, set out in search of a severe storm with an armada of cars and a field command van that can receive the balloon signals.

By combining and coordinating their resources, the scientists were able to gather data on the storms using a variety of

sensors, including weather balloons, Doppler weather radar with polarimetric technology, mobile Doppler radars and a lightning mapping network.

The broad objective of TELEX is to learn how lightning and other electrical storm properties are dependent on storm structure, updrafts and precipitation. This year is the second of two sequential spring field programs.

"We want to relate the electrical structure of storms to the production of lightning—especially positive ground flashes—and their relationship to severe weather," said



Jame L. Murnan/NOAA

NOAA and university scientists prepare to launch a yellow tarp-covered balloon carrying meteorological instruments into a thunderstorm.

Don MacGorman, a lightning and storm electricity researcher from *continued on page 7*

NOAA Commissions Ship *Nancy Foster*

—By Jeanne G. Kouhestani

Under a beautiful, sunny sky in Charleston, S.C., a former Navy ship officially became part of the NOAA fleet in a traditional ceremony that also paid tribute to a much-beloved NOAA scientist and leader.

On May 10, the NOAA Ship *Nancy Foster* was officially commissioned into service. The former Navy yard torpedo test craft, which was transferred to NOAA in 2001, began operations last year after being converted for coastal oceanographic research. The original plan to commission the ship in September 2003 was scrapped when Hurricane Isabel paid the East Coast an unwelcome visit.

Homeported in Charleston, S.C., *Nancy Foster* conducts research along the Atlantic and Gulf coasts, primarily in support of the National Marine Sanctuary and National Sea Grant programs.

A commissioning ceremony—steeped in tradition and maritime history—marks a significant event in the life of a government ship.

"At the commissioning ceremony, the government official who took receipt of the ship from the builder transfers responsibility of the vessel to the first master or commanding officer," said Rear Adm. Nicholas Prael, deputy director of NOAA's Marine and Aviation Operations and the NOAA Corps. "The new command then orders a watch to be set and a *continued on page 6*

NOAA, California Scientists Use Phantom to Study Channel Islands Sanctuary Fish

—By Mary Patyten

Flying 70 feet below the sea surface off the coast of southern California in mid-May, the Phantom remotely operated vehicle was relaying live video back to biologists aboard the NOAA research vessel *Shearwater* when a ghostly image came into focus on the monitor. Jagged rocks thrust up toward the sea surface, draped in finely webbed fishing nets, like a graceful stage set for some underwater drama.

With the nudge of a joystick, the ROV pilot aboard *Shearwater* used thrusters to steer the Phantom away from the menacing webbing.

The lost and abandoned netting would continue to catch fish, which was not good news for struggling bottom fish populations. But on that particular day in May, the nets would not catch the little ROV, which had a big job to do—scan the depths of the new Channel Islands marine reserves, the largest system of reserves off the West Coast, to measure how fish populations were responding to their new sanctuaries.

Over time, monitoring fish populations there may provide evidence of whether bottom-dwelling species such as rockfish, lingcod and abalone can take advantage of the no-fishing zones to repopulate areas outside marine protected areas.

“Using the Phantom, we can identify where fish live, survey those areas and identify changes in the numbers of fish over time,” said Konstantin Karpov, the California Department of Fish and Game senior marine biologist heading up the survey. “This is really something that has not been possible before.”

The cruise specialized in innovation, from the use of a remotely operated vehicle to count fish to the remarkable collaboration between federal, private, academic and state agencies in search of better methods to collect the scientific data that are vital to fishery managers and biologists trying to preserve and enhance California’s marine resources.

It all began in September 2003, when Sarah Fangman, NOAA’s research program coordinator for the Channel Islands National Marine Sanctuary, was approached by Karpov’s ROV group about surveying the new marine protected areas from the NOAA research vessel *Shearwater*.

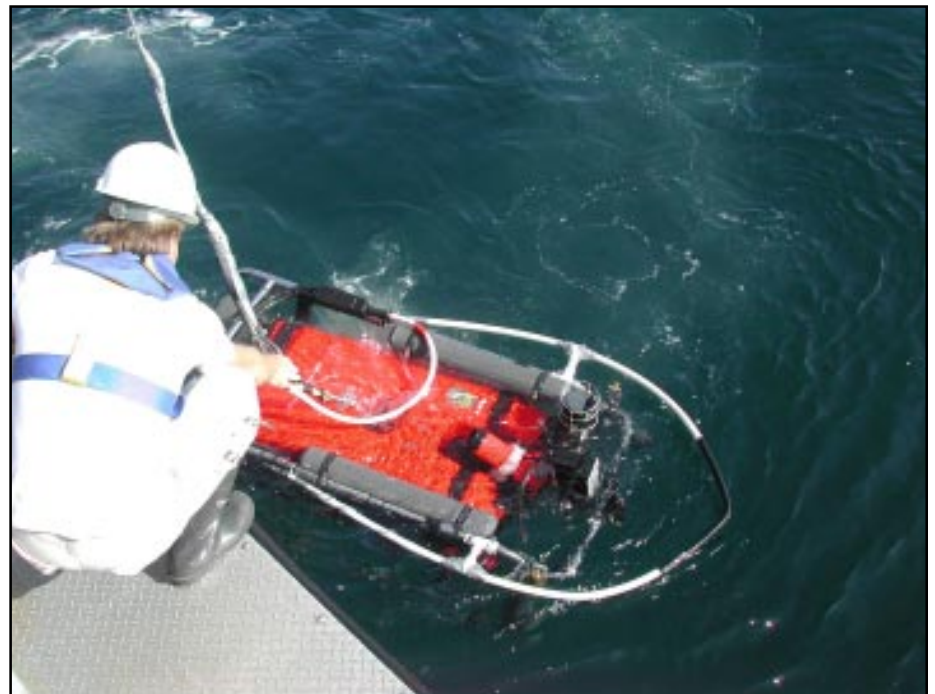
“We were happy to participate,” Fangman said. “This group proposed doing work we want to see done. By collaborating with people

who have the equipment and the expertise, we can all accomplish our goals.”

The survey sites lay off Santa Rosa Island, Santa Cruz Island and the smaller Anacapa Island in southern California. The team had also planned to visit San Miguel Island, the most northwesterly island in the chain. But rough weather precluded any surveying, with 50-mph winds buffeting them in the “protected” lee of the island.

The cruise exceeded everyone’s expectations. In just four days, the team surveyed for 16 linear kilometers within six sites despite the blustery weather, proof of the rapid synergy between NOAA vessel captains and the ROV crew and the refinement and improvement of ROV survey methods.

Likely survey sites were chosen by first consulting side-scan and multibeam sonar maps that showed the topography of the sea floor. Precise two- to three-kilometer paths, called transects, were *continued on page 7*



David Jeffrey/Deep Ocean Engineering
Scientists from NOAA and the California Department of Fish and Game launch a Phantom remotely operated vehicle from the NOAA research vessel *Shearwater* to survey fish in marine protected areas off the Channel Islands.



Lynn Takata/NOAA

Laura Letson.

Laura Letson Is the Team Member of the Month for June

—By Ben Sherman

Laura Letson has quickly made a reputation in NOAA's National Ocean Service as a person who knows how to get things done. It is just that attribute which brings her this month's recognition as NOAA's June Team Member of the Month.

In the short time that Letson has worked at the Ocean Service's Center for Coastal Monitoring and Assessment in Silver Spring, Md., the management and staff there said she has had a tremendous, positive impact on the center's mission and has made a significant impression with her dedication and responsiveness.

As the center's program support specialist, Letson works closely with center management in everything from detailed program planning to developing informational briefings for NOAA senior management, responding to questions from Capitol Hill, and helping formulate a non-point

source pollution strategy.

"Laura is an important part of our team," said Russell Callender, who nominated her for NOAA recognition. "She brings a strong work ethic, teamwork and customer service orientation to everything that she does and is becoming well known in the Ocean Service for her ability to get things done quickly and efficiently."

One of Letson's more recent and notable contributions was her leadership and initiative in completing the final crucial steps in moving the Operational Gulf of Mexico Harmful Algal Bloom Forecast System from the research realm to a soon-to-be operational product. When it becomes available later this year, it will represent a major step in NOAA's goal of creating an operational algal bloom forecast system.

Largely on her own initiative, Letson actively engaged senior staff and office management in three Ocean Service program offices—the National Centers for Coastal Ocean Science, the Coastal Services Center and the Center for Operational Oceanographic Products and Services—to finalize discussions and make the decisions needed to make the harmful algal bloom forecast product operational. Under considerable time pressure, she was able to reach consensus among the offices and accurately represent the concerns of NOAA senior management.

"All the briefings, all the paperwork, all the approvals—she got it all done," said Richard Stumpf, the lead scientist for the harmful algal bloom forecasting project. "The success of the project required getting these things done so we could determine budgets, staffing, the details necessary to move forward. Laura was instrumental in making that happen."

Letson grew up in Kentucky,
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Lori Bast/NOAA

Linda Baldwin.

Linda Baldwin Is the Employee of the Month for June

—By Lori Bast

It didn't surprise employees at NOAA's Aircraft Operations Center in Tampa, Fla., when they heard that Linda Baldwin, a purchasing agent at the center, was chosen as June's Employee of the Month.

"Linda personifies excellence in the spirit of teamwork with her dedication to the AOC mission," said Julie Robertson, chief of the center's Resource Management Section.

The Aircraft Operations Center is a team effort of civilians and NOAA Corps officers who support the aircraft that fly in support of NOAA's mission. NOAA's aircraft operate throughout the United States and around the world, sometimes making procurement a real challenge.

Lt. Devin Brakob, an aircraft navigator, works with Baldwin regularly preparing requisitions and contracts for flight training.
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Focus On...

Mentoring Future Marine Scientists in Alaska

—By Neal Muirhead

If you live in southeast Alaska, you experience the marine environment up close—exploring a rocky beach at low tide or passing within splashing distance of a group of whales.

If you're a NOAA employee at the Alaska Fisheries Science Center's Auke Bay Laboratory in Juneau, chances are you've also gathered around the laboratory's "touch tanks" with a group of excited kindergartners, or helped a high school student conduct marine research as part of a science project.

During May, more than 1,300 students, teachers and parents



Cedar Stark/NOAA

A student examines a young red king crab in the Auke Bay Laboratory's touch tank.



Cedar Stark/NOAA

A teacher helps Juneau-area kindergarten students compare the textures of sea stars during Alaska Sea Week at the NOAA Fisheries Auke Bay Lab.

visited the Auke Bay Laboratory as part of Alaska Sea Week. Every year during the week, the laboratory presents a marine science curriculum for students in kindergarten and sixth grade.

This year as in years past, NOAA employees helped kindergarten students identify marine animals in the lab's saltwater aquaria then led them to touch tanks, where the students could carefully handle a small crab or compare the textures of various sea stars.

Sixth grade students worked with NOAA scientists on various research activities, such as creating an oil spill in a small pan replete with a simulated gravel beach or modeling fisheries by-catch using candy to represent different fish species.

Auke Bay Laboratory staff helped develop the first Sea Week program in 1969 and has provided programs each year for southeast Alaska students. The program began as a volunteer effort among Juneau-area parents. With funding from Alaska Sea Grant, Sea Week was further developed in the Juneau School District in the mid-1970s.

Stephanie Hoag, the district's curriculum coordinator, said Sea Week is a valuable part of the district's science curriculum, offering students one-on-one mentoring by local experts. "It seems like the staff [at Auke Bay Laboratory] always bend over backwards to provide lots of projects," she said. "This is one of the best opportunities the district offers."

Hoag said that virtually all kindergarten students enrolled in the district and many of the middle school students visit Auke Bay Laboratory as part of Sea Week. Private school classes and home-schooled students, along with parents and teachers, also partici-

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pate in the program.

Dugan Greenwell, a contract employee at Auke Bay, said it was fun seeing the kids handling the creatures in the touch tanks. "I was working next door and could hear how excited they were." Greenwell said his own Sea Week experience as a student helped him develop an early interest in commercial fishing and marine science.

The laboratory's marine education outreach also includes high school students. During March, NOAA scientists worked with students as part of the Southeast Alaska Regional Science Fair. Student projects often focus on marine science, and laboratory scientists are routinely asked to serve as mentors.

Bonita Nelson, a fisheries biologist at Auke Bay who has helped organize the science fair for several years, said employees from the lab are not only mentors but make up more than a third of the fair's judges. "It's important for students to get a handle on what



Bonita Nelson/NOAA

NOAA fisheries biologist Ron Heintz shows a high school student how to grind king salmon into fish food for a project on how diet affects the ability of salmon to withstand environmental stress. Salmon that were fed a fish diet used less oxygen and performed better than those fed a chicken diet.

marine science is," she said. "We want them to say, 'Oh my gosh, look at the expertise that's available here.'"

For 2004, seven of the top nine

projects were mentored by NOAA scientists from Auke Bay Laboratory. Several of the students went on to compete in an international science fair. One student won a \$36,000 scholarship. In 2002, a student mentored by one of the lab's scientists published the results of her research in a professional journal. She has since been accepted to Yale and credits her science fair experience and subsequent publication with helping her gain admission and scholarships.

"I wanted to work at Auke Bay since I was a kid, and coming here just increased my interest in marine biology," said Chris Kondzela, a NOAA geneticist at Auke Bay who visited the laboratory as a student during Sea Week and again while working on a high school science project. Kondzela said the laboratory's marine education outreach "let's people know we're here."

"One of the best parts of the job is seeing the kids have fun," Hoag said. ☺



Cedar Stark/NOAA

Sixth-grade students create a small oil spill to observe how oil and water interact, then study the effects of the oil on a simulated gravel beach.

Nancy Foster

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logbook to be struck, both of which will be in effect until the vessel is decommissioned. During the commissioning ceremony, the ensign [U.S. flag], jack and commissioning pennant are hoisted simultaneously. Until the vessel is decommissioned, it will never be without a person in command.”

The *Foster* commissioning included a series of steps in which orders were passed down the chain of command.

With Lt. Cdr. Ralph Rogers, executive officer of *Nancy Foster*, serving as emcee, NOAA Administrator Conrad C. Lautenbacher, Jr., began the ceremony by directing that the ship be placed in commission. Prahm then directed *Foster's* commanding officer, Cmdr. Fred Rossmann, to commission the ship. Rossmann read his orders, then directed Rogers, the ship's executive officer, to place NOAA Ship *Nancy Foster* in commission.

Once the flags were raised, Ens. Amy Daniel entered into the deck log that the ship was commissioned, and was ordered to set the first watch. She then directed Able Body Seaman Jessie Byrd to take his station at the gangway, thereby setting the watch.

A color guard, the National Anthem, the invocation and benediction, speeches and a presentation of gifts added both grace and solemnity to the occasion.

The ceremony was particularly poignant for the colleagues and friends of Nancy Foster, who died in 2000. Foster served as a scientist and senior manager for NOAA Fisheries and NOAA's National Ocean Service from 1977 until her death. She is credited with being a pioneer in the conservation of marine ecosystems and in understanding the need to consider the interdependent role played by

marine organisms.

“She was a true pioneer for NOAA and a great mentor for many of us who were fortunate enough to work with her,” Prahm said. “She was also a very strong supporter of the NOAA Corps and the NOAA fleet. Indeed, her support of the fleet was so tremendous that it is both natural and fitting that she is the first woman to have a NOAA ship named in her honor.”

Brenda Jans, who was Foster's special assistant from 1994 until Foster's death, attended the ceremony to pay homage to her friend and mentor. “When Adm. Lautenbacher said in his remarks that Nancy was an outstanding leader, chills went through me,” Jans said. “She was unique and so well loved by employees in Fisheries and NOS that I think the commissioning of the vessel in her name was a fitting tribute for her.

“She didn't like for a big fuss to be made over her,” Jans added, “but I think she would have been bowled over by that level of tribute. Though we as her colleagues and people up the line thought so highly of her, I don't think she would have ever imagined a NOAA vessel would be named for her.”

The NOAA Ship *Nancy Foster* was involved with the rescue of two stranded fishermen off the U.S. Virgin Islands in February. According to Jans, “Nancy would have loved that, knowing that a ship bearing her name had been responsible for helping others. She would have been particularly proud to be associated with this ship, as she was so devoted to the coast and the habitat and living marine resources.”

“NOAA is a better place because of Dr. Nancy Foster,” said Usha Varanasi, director of the Northwest Fisheries Science Center, who was also a friend and colleague of Foster. “Nancy believed strongly in

diversity and practiced what she preached, continually recognizing and supporting qualified women and minorities on all rungs of the organization's ladder. Even though we came from very different backgrounds, I found a kindred spirit in Nancy that I will always cherish,” said Varanasi, who traveled from Seattle, Wash., to attend the commissioning ceremony.

Nancy Foster is the fifth former Navy ship to be commissioned into the NOAA fleet. Because they are much newer than the ships they have replaced, the converted Navy ships have reduced the average age of the fleet.

“Replacing [the NOAA Ship *Ferrel* with *Nancy Foster* was an important step in renewing the NOAA fleet,” Lautenbacher said. “We still have a long way to go to get our fleet age down to where it should be, but we've developed a 10-year fleet plan that charts a way to get there. It's critical to NOAA to have a technologically capable fleet of ships to collect the data we need to make important decisions affecting our nation's economic security.”

At the commissioning, Prahm thanked the officers and crew of *Nancy Foster*, particularly commanding officer Rossmann, for their efforts in bringing the ship successfully on line after its conversion to conduct research. Many of the crew came from *Ferrel*, which was decommissioned in 2002.

The NOAA Ship *Nancy Foster* has already helped provide hands-on research experience to teachers through NOAA's Teacher at Sea Program. Four teachers sailed aboard *Foster* last year, another sailed in February and more will sail this upcoming year.

“By participating in this outstanding program, *Nancy Foster* will help carry on the tradition of her namesake—mentoring those who serve with her,” Prahm said. ☺

TELEX

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the Severe Storms Lab who is leading the team with David Rust, chief of the lab's Forecast Research and Development Division, and Terry Schuur, a research meteorologist with the Cooperative Institute for Mesoscale Meteorological Studies at the University of Oklahoma who works at the lab.

To determine a storm's electrical structure, TELEX researchers intercept thunderstorms and launch weather balloons with electric field meters and radiosondes attached. These instruments record data from inside the storm, including temperature, pressure, humidity, wind speed and direction and the total electric field as well as the balloon's location. All of these data are collected in the Severe Storms Lab's mobile laboratory. This electric field profile can provide scientists with information about how a storm becomes electrified and about the forces responsible for lightning.

The TELEX team is also taking advantage of new sensors now used routinely by the Severe Storms Lab. One is the KOUN radar in Norman, a NEXRAD Doppler weather radar modified with polarimetric technology to provide more information about the types of cloud and precipitation particles.

"We are collecting information on the microphysical structure of storms to help us better understand how storms become electrified," Schuur said. "This information has been lacking in most previous studies."

Another new sensor, the Oklahoma Lightning Mapping Array, or OK-LMA for short, is a network of ten stations in central Oklahoma that continuously maps the structure of all types of lightning in three dimensions out to a range of 75 kilometers and in two-dimen-

sions out to a range of 200 kilometers.

University of Oklahoma meteorologist Mike Biggerstaf is leading a team using two five-centimeter mobile radars to gather additional data near storms. Biggerstaf said the Shared Mobile Atmospheric Research and Teaching Radars, or SMART-Radars for short, provide detailed measurements of the three-dimensional winds in thunderstorms every two to three minutes.

The TELEX team also plans to map airflow patterns responsible for the generation and distribution of electrical charges within clouds in a way that may allow them to relate lightning activity to circulations within the clouds.

In 2003, the team launched fourteen balloons into nine storms on seven missions. Two of the storms were mesoscale convective systems, a specific target of TELEX. National Severe Storms Laboratory scientists spent the fall and winter analyzing the processed data.

Already this year, the project has been very productive. "It has been the most successful year ever for ballooning in severe storms," Rust said. He credits improvements in the instruments they're using, such as radiosondes with GPS tracking ability and high-resolution electric field meters that allow more accurate determinations of the electrical structure inside storms.

Mother Nature has helped as well, providing the necessary types of thunderstorm to sample. "We've gotten our instruments into supercell storms, which have not been internally sampled very much at all previously," Rust added.

TELEX is funded partly by the National Science Foundation. Other participants in the project include the New Mexico Institute of Mining and Technology, Texas A&M University and the University of Washington. ☺

Channel Islands

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mapped for each ROV run, as the survey team prepared to launch the submersible.

NOAA ship captains Luman Moody and Terence Shinn were crucial components of the team, working in shifts to keep the ship positioned over the ROV as the submersible ran precise transects over the sea floor—not an easy job when contending with ocean currents, crab pots and shifting winds.

"The people really make the project," said Dirk Rosen, vice president of special projects with Deep Ocean Engineering. "These folks are so attuned to what they're doing. They're performing cutting edge science in this tight-knit team."

Rosen began working with Karpov's ROV team about 10 years ago. Inspired by the promise and challenges presented by California's new marine protected areas, he launched a non-profit organization called the Marine Applied Research and Exploration group, or MARE for short, to help fund and support efforts to obtain baseline data.

Watching the video monitors during the May cruise, Rosen said he felt the wonder of exploration, seeing animals at depths beyond the normal limits of safe scuba diving.

"It's fascinating that we're now able to quantify what we're seeing in a very useful manner," he said.

Future plans for the ROV team include expanding their sampling to all five of the Channel Islands.

"If the weather gods allow, we want to survey San Miguel Island on our next cruise," Karpov said.

Shearwater is scheduled to ferry the researchers to the islands again later this year, from Sept. 7-21, and for four yet-unscheduled weeks in 2005. ☺

Baldwin

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"I'll do a three-source request and place it in Linda's box," Brakob said. "Within one to two days, she's completed the research and a purchase order has been awarded. When payment is due, Linda walks the invoice over to my office, where we review it together before sending it off for payment."

"Seeing a plan come together, producing an end product or service and going that extra mile to assist people is what I like best about my job," Baldwin said. "I know when I go to someone for assistance and that person does a little extra for me, it makes me feel special. So I try to remember that during my day-to-day interaction with everyone."

For almost 22 years, Baldwin served her country in the Army before retiring from active duty. Her civilian career took her to Bay Pines VA Medical Center and the U.S. Special Operations Command before coming to NOAA in December of 2001.

With her her husband currently in Iraq as a government contractor and her daughter serving there with the Air Force, Baldwin is the primary care giver for her granddaughter. She said she is looking forward to her daughter's return home so they can take some time off and travel together.

In her spare time, Baldwin is working on her bachelor of science degree in business management, with a goal of becoming a contracting officer. Baldwin also volunteers in her community. "I am a member of a nonprofit organization that strives to improve and assist the low-income communities in Tampa," she said.

Baldwin's purchasing expertise has been instrumental in improving the safety of NOAA's flight crews through the acquisition of the

absolute latest in technology, including personal locator beacons that can transmit the exact location of a survivor of a downed plane within minutes of activation.

Baldwin worked with the manufacturer and center's aviation safety group to complete the purchase of the personal locator beacons and deliver them ahead of schedule. Due largely to Baldwin's expertise in the acquisition process, the NOAA Aircraft Operations Center became the first government agency to issue the beacons.

Her colleagues and supervisors say that her purchasing skills and keen understanding of the needs of the center are of such high caliber that she makes the task seem effortless. She anticipates potential problems, often solving the problems independently while continually keeping other purchasing agents in the loop.

She also takes initiative in working ahead, dogging the receipt of supplies and services in order to facilitate the de-obligation of funds no longer needed on purchase orders, which saved over \$100,000 this fiscal year alone.

Baldwin took the lead in establishing the Commerce Standard Acquisition and Reporting System at the Aircraft Operations Center and was directly responsible for the center being the first field office to implement the system.

Baldwin came to the rescue of the center's G-IV jet maintenance crew twice during its last deployment with after-hours emergency parts procurement. She demonstrated a willingness and commitment to the success of the mission, playing a critical role in keeping the aircraft mission-ready.

"I like working here because of our mission," Baldwin said. "I smile when I'm watching the news or some program and see the NOAA symbol and know I'm a part of that team." ☺

Letson

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graduating Phi Beta Kappa from the University of Kentucky with a degree in biology.

After graduation, she worked as a zookeeper, a volunteer sea turtle biologist, an Alzheimer's disease researcher and as an environmental scientist and noise specialist for the Florida Department of Transportation. She next attended graduate school at the Yale University School of Forestry and Environmental Studies, where she received her masters degree in environmental management, completing her studies in only one year. She then came to Washington, D.C., as a Knauss Sea Grant fellow, working for NOAA's Office of Coastal and Resource Management.

In 2003, she accepted a contract position in the Ocean Service's Senior Scientist Office, before joining the Center for Coastal Monitoring and Assessment.

"I appreciate the recognition the office is giving me for the work I am doing," Letson said. "I am excited to see the project move closer to an operational status. It has been beneficial to the Ocean Service, and I have benefitted personally from what I have learned." ☺

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Address comments to:

Editor, NOAA Report
1315 East-West Highway
SSMC3, room 10853
Silver Spring, MD 20910
301-713-9042

Email: dane.konop@noaa.gov

NOAA Report Online: <http://www.publicaffairs.noaa.gov/nr>

Jordan St. John, director, OPCIA

Dane Konop, editor