

Volunteers Spread Marine Conservation Message

—By Jim Milbury

On the first Earth Day, April 22, 1970, Bruce Monroe was a business executive who spent the day picking up trash at the beach at the behest of his wife, Corinne, instead of sitting behind a desk at his office.

"I was very busy, and I normally worked weekends," Bruce Monroe recalled. "But I remember I took the day off to be part of this whole

new environmental movement."

Over the years, the Monroes remained committed to helping the environment.

For Earth Day 2004, the Monroes spent the day at the Aquarium of the Pacific in Long Beach, Calif., helping NOAA enhance the public's awareness and understanding of marine resources and environmental laws, particularly as they relate to seals, sea lions, dolphins and other federally protected marine mammals.

The Monroes and four other volunteers are the founding members of the Conservation Education Corps, a new outreach and education team started this past year by the southwest enforcement division of the NOAA Fisheries Office for Law Enforcement in Long Beach, Calif.

"There are approximately 1,000 miles of coastline in California, and many of those miles are heavily populated with people and marine mammals," said Michael
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NOAA Researchers Produce Laser Sharp Views of Monterey Bay

—By Sarah Marquis

Thanks to the Remote Sensing Division of NOAA's National Geodetic Survey, researchers have a view of the Monterey Bay National Marine Sanctuary shoreline as it's never been seen before.

Flying in NOAA's Cessna Citation II twin-jet aircraft in mid-April, Remote Sensing Division pilots and sanctuary researchers used laser technology to produce colorful, three-dimensional, digital elevation models of the Monterey Bay coastline at Elkhorn Slough and Big Sur.

"We hope to use the data to document coastal erosion and development, track watershed issues and make better management decisions," said William Douros, superintendent of the Monterey Bay National Marine Sanctuary. "Merged with data gathered by remotely operated and manned submersibles, the images can be combined to produce the first-ever digital, full-dimensional models of the entire Monterey Bay National Marine Sanctuary environment."

A laser-scanning LIDAR, short for light detecting and ranging, was mounted underneath one side of the Citation II. Images produced by the LIDAR indicate the heights of trees, hills, buildings and
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Jim Milbury/NOAA

NOAA Conservation Education Corps volunteer Corinne Monroe (left) points out the types of fish found off the coast of California to a young visitor at the Aquarium of the Pacific in Long Beach, Calif., during this year's Earth Day celebration.

Turtle Poaching Convictions in Guam Are a First

—By Wende Goo

This month, four men will be sentenced in U.S. District Court in Hagatna, Guam, after pleading guilty to sea turtle poaching—the first successful prosecutions for the unlawful taking of turtles from the waters around Guam.

Although turtles have traditionally been killed for food in Guam and elsewhere, all sea turtles in U.S. and territorial waters have been protected for over 30 years under the Endangered Species Act.

The convictions were the result of cooperative action by the NOAA Fisheries Office for Law Enforcement and the U.S. Coast Guard, U.S. Navy, the Office of the U.S. Attorney, the Guam Department of Agriculture and the Maritime Inderdiction Task Force of the Guam Customs and Quarantine

Agency.

“In my mind, we’re all on the same team,” said Al Samuels, the NOAA Fisheries special agent who arrested the four. “We’re all trying to protect the resources of the people of Guam.”

Biologists from the Guam Department of Agriculture estimate less than 50 breeding pairs of green sea turtles are left in the waters off Guam.

Acting on an anonymous tip in January, Guam Department of Agriculture conservation officers observed three men on a 14-foot boat in waters near Rizal Beach in Agat, Guam, harassing a sea turtle. When the men came ashore, the conservation officers discovered two captured juvenile green turtles in their boat. Biologists from the Guam Department of Agriculture examined the turtles and judged them to be in good enough condition to release them back into the water.

The three poachers were held overnight at the police station in Hagatna, then arrested by Samuels

and charged with federal violations of the Endangered Species Act the next day.

Less than two weeks after the arrest of the three men, another man was arrested for violating the Endangered Species Act when he shot a green sea turtle in the neck while spearfishing at night in Agat. After spearing and retrieving the still-living turtle, he tied its flippers with wire and left it in his boat while he re-entered the water to continue spearfishing. But his boat drifted away, forcing him to swim to shore, where he breached the outer perimeter of the U.S. Navy base on Guam. While being questioned by Navy security officers, his boat was retrieved with the live sea turtle still inside. Biologists from the Guam Department of Agriculture aboard the Coast Guard cutter *Galveston Island* examined the turtle, determined that the spear wound in its neck was superficial and released the turtle back into the water.

Conservation officers say the recent successful prosecutions for turtle poaching complement their frequent presentations at schools and appearances on local television and radio to explain why sea turtles are endangered.

“The eight officers we have on staff cannot watch everything,” said Guam conservation officer Roland Delfin. “There is a lot of poaching going on. Now they know they can’t get away with it.”

“This sends a message to people that they will be arrested and prosecuted at the highest levels if caught poaching turtles,” Samuels said.

This past October, NOAA provided \$85,000 to the Guam Maritime Inderdiction Task Force to increase enforcement of federal fisheries regulations at sea and on land, one of 23 such joint enforcement agreements with states and territories. ♻️



Shawn Wusstig/Guam DOA

Conservation officers examine a spear wound in the neck of an endangered sea turtle caught by a poacher in Guam, before releasing it relatively unharmed.



Wilfred VonDauster/NOAA

Katy Stewart.

Katy Stewart Is the May Employee of the Month

—By Carol Knight

One statement by Katy Stewart helps explain why she is being honored as the May NOAA Employee of the Month.

“I love people,” she said.

The nomination for the honor submitted by Stewart’s colleagues at the Mountain Administrative Support Center in Boulder, Colo., cites her delivery of “front-line customer service,” her keen organizational skills and flexibility on the job, and her ability to work on many projects simultaneously.

Stewart said she believes her abilities in all of these areas stem from, or are enhanced by, her regard for others and her well-developed people skills.

Particularly in providing service—to her boss, her colleagues, customers at NOAA’s David Skaggs Research Center, VIP visitors and the public—Stewart’s philosophy is based on her Christian belief that “we are called to be servants.” She said the key to good service is to consider carefully what an individual needs and to see the “larger

picture” to figure out how best to meet those needs.

“We all work for NOAA,” Stewart said, and each employee should explore “how we can participate in the big picture [of NOAA’s mission]” and not just the narrow descriptions of our own job duties.

Stewart put that philosophy into practice when she was helping out at a NOAA Research exhibit at an American Meteorological Society meeting. She met scientists from her home country of Peru and invited them to Boulder to view and learn more about the research of NOAA’s laboratories there. They came. And when they did, she helped to make sure their visit was a fulfilling one, personally and scientifically, speaking to them in their native language and guiding them around the area to see the sites on the weekend.

Stewart’s organizational prowess—the ease with which she’s able to work on multiple projects at one time and to keep her boss, Mountain Administrative Center Director Susan Sutherland, on track with many tasks as well—stem from being a working mother of three, she said, as well as early secretarial training her father insisted she take before enrolling at Denver University. The key, Stewart said, is in setting priorities, but also being flexible as things pile up and stress levels rise.

“When you are dealing with people all the time,” she said, “you have to be organized because you never know what the next call will bring.”

Before coming to NOAA, Stewart worked for 14 years at the Boulder County Social Services Office, where she honed her ability to keep a lot of balls in the air at once and to provide strong support to the clients. It was at Social Services that Stewart helped clients

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Joan Reed/NOAA

Clay Davenport.

Clay Davenport Is the Team Member of the Month

—By John Leslie

Clay Davenport, NOAA’s May Team Member of the Month, just can’t seem to fit enough number-crunching into his day.

Davenport is a software contractor with I.M. Systems Group, Inc., working in the Office of Research and Applications at NOAA’s Satellites and Information Service in Camp Springs, Md., where he’s busy honing a sophisticated system that estimates rainfall from space.

In his spare time, Davenport is also one of the nation’s leading baseball statisticians, writing for “Baseballprospectus.com,” the online version of the annual publication of the same name, which he helped start nine years ago.

He’ll tell you that keeping tabs on baseball and rainfall numbers have a common thread.

“The biggest similarity between handling the two types of statistics is that they each involve making forecasts that are there for everyone to see, and you end up being wrong a lot,” Davenport said. “You

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Focus On...

Restoring Fort McHenry's Wetlands

—By Jennifer Koss and Kristen Tronvig



Cheryl Oliver/NOAA

Volunteers plant native marsh grasses on the edge of the Fort McHenry wetlands at the mouth of the Patapsco River in the harbor of Baltimore, Md.



Cheryl Oliver/NOAA

Rollie Schmitt (left), director of the NOAA Fisheries Office of Habitat Conservation, and John Oliver, deputy assistant administrator for NOAA Fisheries, clean debris from the marsh.

On April 17, approximately 80 NOAA staff, family members and friends spent the day ankle-deep in mud in the Baltimore, Md., harbor, removing debris and planting native vegetation in the ten-acre marsh adjacent to Fort McHenry, whose 1814 defense inspired Francis Scott Key's "Star Spangled Banner."

This is the fifth year NOAA staff have participated in the annual Fort McHenry wetland restoration day, which showcases the expertise of NOAA, the National Aquarium in Baltimore and other partners.

"This project is a good example of NOAA pulling together and operating outside the bounds of our line offices," said NOAA Administrator Conrad C. Lautenbacher, Jr, who participated in the clean-up and planting for the third year in a row.

Wetlands such as the Fort McHenry marsh act as nurseries for fish and crustaceans and as feeding grounds for birds. They also filter *continued on page 5*



Cheryl Oliver/NOAA

Peg Brady, NOAA restoration matrix coordinator, digs deep to find the right boot.

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pollutants, store nutrients and serve as natural buffers to destructive floods and waves.

The fort's wetlands were constructed in 1982 to mitigate the excavation of a highway tunnel under the harbor.

Originally, three small culverts that were cut through the riprap encircling the marsh allowed the waters from the adjacent harbor to flood the marsh during high tides. But the culverts silted in, cutting off this necessary tidal exchange and degrading the marsh. The marsh was also invaded by non-native plant species and littered with trash from Baltimore's inner harbor.

NOAA's first involvement in the restoration of Fort McHenry's wetlands was through a Community-based Restoration Program grant for \$25,000 awarded in 1998 to purchase plants, tools and materials. The grant also helped create the National Aquarium Conservation Team, a group of aquarium staff and volunteers

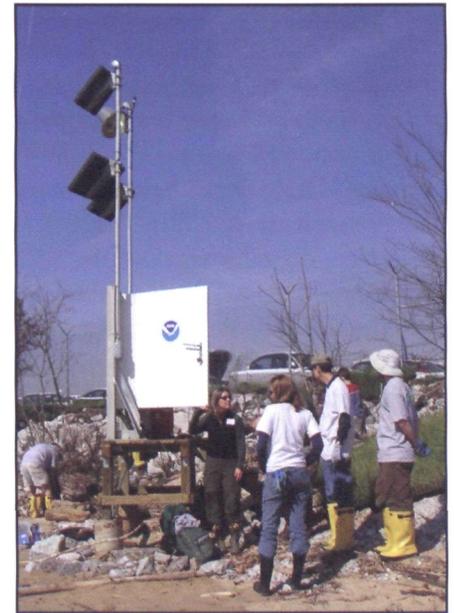
dedicated to fostering community responsibility and participation in the preservation and restoration of the Chesapeake Bay by providing educational and action opportunities.

But despite considerable efforts to remove debris and invasive species and plant native vegetation, the fort's wetlands were still not functioning naturally, making it necessary to re-engineer the marsh.

To guide the redesign of the marsh, NOAA's National Geodetic Survey made a precise survey of the site to provide existing elevations of the marshland in a digital model. By knowing the baseline elevations, the engineering contractor could determine how much earth to grade or add in key areas to create tidal sloughs in the marsh.

NOAA's Center for Operational Oceanographic Products and Services analyzed water levels observed at the fort dating back to 1902 to determine how conditions have changed over time.

NOAA's Remote Sensing Division also surveyed the site from a



Jennifer Koss/NOAA

Kristin Tronvig (left) of NOAA CO-OPS explains the workings of the NOAA tide gauge station at Fort McHenry to restoration volunteers.

NOAA Citation II aircraft using a laser-scanning LIDAR, short for light detecting and ranging, which can very precisely measure shoreline erosion, sea level inundation and the loss of wetland habitat.

Because wetland vegetation is sensitive to how long and how often it is inundated, Baltimore Aquarium biologists can use this information to determine where to plant marsh vegetation and monitor changing conditions at the site.

This spring, workers breached the riprap at two locations and excavated a network of primary and secondary creeks to allow water to ebb and flow from the site unobstructed. They also removed invasive stands of the common reed *Phragmites australis*.

After construction was completed, NOAA CO-OPS engineers installed a tide station at the edge of the wetlands to monitor the changing water levels.

Since the Fort McHenry wetlands were reconstructed, juvenile fish have been seen in the marsh foraging for food—an encouraging sign of recovery. ☺



Cheryl Oliver/NOAA

NOAA volunteers remove trash from the Fort McHenry wetlands in preparation for planting native species.

LIDAR

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shorelines to within a few centimeters of accuracy. During the same flights, NOAA researchers also used a digital camera to collect high-resolution digital images of the terrain

“The LIDAR and digital camera were used simultaneously during the flights,” said Lt. Cdr. Matt Pickett, one of the pilots for the project. “Since they are both digital sensors, it is relatively easy to combine the data. What you get basically is a centimeter-level-accurate, three-dimensional picture or image. You can then put your cursor on any pixel and get the latitude, longitude and height of that object.”

“The remote sensing project is a pilot program to monitor the coast and shoreline, assessing changes that are taking place over time,” Douros said. “With this information, we can evaluate whether changes are due to natural conditions and, if due to man-made circumstances, what we can do to help reduce or mitigate those consequences.”

The recent LIDAR mapping project was designed to introduce sanctuary research scientists and managers to available technologies.

“This aerial mapping demonstration project with the national marine sanctuaries is the first time our two programs have worked together on a research project,” said Cdr. Brian Taggart, chief of the Remote Sensing Division. “Digital data can be used for coastal planning, research, emergency response and coastal erosion studies. We believe this type of information can be helpful for sanctuary scientists around the country.”

“Resource managers and research scientists in the sanctuary program have real-world applications and real-world management questions

that need to be answered,” said Pickett, who is a former manager of the Channel Islands marine sanctuary and brought knowledge of both NOAA programs to the project.

“We hope to bring new technology and data to help them make better resource management decisions.”

To map the sanctuary coast, NOAA’s Cessna Citation flew three two-and-one-half-hour missions.

“We traveled back and forth in a grid, idling at about 150 knots at 4,000 feet to cover the maximum amount of area and get maximum resolution from the sensors,” Pickett said. “Using a jet gives us the versatility of operating from low level for high-resolution mapping or up to 40,000 feet for wide-area mapping.”

The aircraft flew above the area and shot lasers at 50,000 pulses per second. The information was entered into a computer, which color-coded images that could be adjusted to show deep blue for sea level, green for lowland, yellow for upland and red for high hills and tall buildings.

During the project, one

researcher’s seat on NOAA’s Citation II jet was awarded to a Monterey-area educator for a unique opportunity.

Jill Zande, an educator from Monterey Peninsula College and outreach director at the Marine Advanced Technology Education Center in Monterey, Calif., flew with the LIDAR researchers in NOAA’s “Teacher in the Air” program, which gives educators hands-on research experience aboard a NOAA aircraft.

“It’s one thing to view the final images created from the LIDAR data,” Zande said, “but quite another to see first-hand how the technology works and how the LIDAR and [global positioning system] information come together to create the final product,” she said. “The flight itself also gave me a tremendous appreciation for the knowledge and skills of the pilots, engineers and researchers involved with the project. With this knowledge, I can help students to see how what they learn in the classroom can be applied in the real world.” ☺



Kip Evans for NOAA

Researchers aboard NOAA's Cessna Citation II twin-jet aircraft used LIDAR to map the coastline of the Monterey Bay National Marine Sanctuary in April.

Volunteers

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Gonzales, the division's special agent in charge. "There is significant opportunity for humans to have a negative impact on the animals, even though most are done unintentionally."

Interactions between marine mammals and humans often occur when people flock to beaches in the spring and early summer. This is also when harbor seals are giving birth, or pupping, on the beach, sometimes attracting unneeded human attention.

After giving birth, a mother seal will forage for food in the ocean and leave the pup alone on the beach away from ocean predators. Humans who come across the small, cuddly animal may think it has been abandoned and feel compelled to "rescue" it. But moving the pup can break the bond with its mother and require that it be placed in a rehabilitation center to survive.

People who interact with marine mammals, even unwittingly or with the best intentions, are breaking the law under the Marine Mammal Protection Act and are subject to fines up to \$12,000 and a one-year jail sentence.

Since there are only 18 NOAA Fisheries officers to enforce the law along the entire California coast, educating the public is very important.

"We could go out and write tickets in a traditional law enforcement manner. But to be effective, we would need law enforcement officers practically elbow to elbow along the coastline," Gonzales said. "It's much better to go out and interact with people in venues where they are more apt to listen and we can provide information that will reduce the likelihood of future harmful interactions."

Gonzales turned to the division's

outreach coordinator, Rick Hawkins, to develop and implement a volunteer program for education and outreach in schools and at public events.

"Volunteers were always on our mind," Hawkins said. "Every time I did a public event, people would ask if we had a volunteer program because they liked our mission and they realized there is not enough of us out there to be a deterrent and to do public education and outreach."

Since this was the first time that the Office for Law Enforcement had attempted to incorporate volunteers into its program, Hawkins sought assistance across the Pacific from the Hawaiian Island Humpback Whale National Marine Sanctuary, which uses volunteers extensively for education and outreach.

"When I was looking to find subject matter experts and information on how to develop a program, I called the marine sanctuary in Maui," Hawkins said. "They offered me some very valuable input and turned me on to the Retired and Senior Volunteer Program."

The program, called RSVP for short, is part of Senior Corps, a national network of programs that offer Americans over the age of 55 the opportunity to use their life experiences and education in voluntary public service.

In Long Beach alone, headquarters for the southwest region, there are over 700 RSVP volunteers working in 200 different organizations.

Gayle Ehrenberg, who coordinates RSVP volunteers in Long Beach, was so impressed with the NOAA mission that she became a Conservation Education Corps volunteer herself.

"I love the ocean and anything to do with animals, mammals, ocean life, and I thought it was a

neat cause and a way to get involved," Ehrenberg said. "It's new having people out there to protect and promote marine life and the environment and work with regulations and laws and teaching."

Becoming a Conservation Education Corps volunteer is not easy. Hawkins provides a rigorous week of training that includes laws and regulations, marine mammal behavior, NOAA policy and public relations.

After successfully completing the course, the first six Conservation Education Corps volunteers received a special uniform and a certificate at a graduation ceremony this past December. Five other volunteers have been selected, with their training expected to begin this summer after Hawkins returns to NOAA from active duty in the Coast Guard Reserve.

The next step for the Conservation Education Corps program will be to incorporate their activity into the formal curriculum of the Long Beach School District for elementary school children.

Hawkins has also received requests for information from other NOAA Fisheries law enforcement offices in Hawaii, Florida and Washington that are interested in starting their own volunteer programs.

"Ultimately we hope this will be adopted nationally," Gonzales said. "The volunteers' work is just tremendous."

"We want the Conservation Education Corps to be replicated in other locations so there can be multiple activities going on educating the public all along our coasts about environmental stewardship," Bruce Monroe said. "The ocean is so vast, so unknown to most, that unless we interpret the need for conserving the ocean, they're not going to recognize there is such a need. We're anxious to do our part." ☺

Davenport

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learn to develop a thick skin.”

But whether tracking rainfall or baseball statistics, Davenport is at the top of his game.

In 2000, the Hampton Roads, Va., native developed the Hydro-Estimator, a set of computer programs designed to analyze satellite imagery to estimate precipitation in real time. The main use for the Hydro-Estimator has been in flash flood situations, where water from pounding rain storms can quickly swell up and trigger localized flooding.

Each year in America, floods claim more lives and cause more property damage than any other type of severe weather. Most of the flood-related tragedies have their beginnings in remote, mountainous areas, where rain gauge and radar data are scarce.

Before 2000, estimates of rainfall from satellite observations—also known as satellite-based quantitative precipitation estimates, or QPEs—were produced using a tool called the Interactive Flash Flood Analyzer.

“The problem with this technique, Davenport said, “was that it was manual, which limited the number, coverage and the timeliness of satellite QPEs the forecasters could produce.”

Another drawback, Davenport said, was that it took an analyst up to 15 minutes to make a rainfall estimate for one storm system.

“On a day when multiple storms were active, that meant some [storm] systems had to be skipped, because the forecaster had to focus on the most important storm and ignore the rest,” Davenport said.

While the Hydro-Estimator still takes about 15 minutes to estimate rainfall from a storm, it provides an estimate for every visible storm system, meaning severe weather

warnings can be issued for each system.

“The [Hydro-Estimator] effect wasn’t so much on the timeliness, as it was on the scale of coverage,” Davenport said. “Using the Hydro-Estimator also leaves the forecasters free to study the meteorology of the event, and not have their time consumed by the drudgery of the Interactive Flash Flood Analyzer. It means that forecasters have been able to issue more warnings and provide more detail in those warnings.”

After ravaging floods from Hurricane Mitch left thousands dead throughout Central America in 1998, Davenport participated in a project to devise a way to transfer satellite data-receiving technology and rainfall estimation techniques to Central American scientists.

As the project progressed, Davenport worked with a visiting scientist from Costa Rica to install the Hydro-Estimator code on a machine in Costa Rica that is available for use in neighboring countries. Recently, he also worked with the Office of International Activities of NOAA’s National Weather Service and its Mexican counterpart.

Thanks to the Hydro-Estimator, Davenport said, “we are now capable of producing rainfall estimates for every system visible from satellite, which allows it to be used for other purposes in the United States and around the world, for example, drought monitoring in Africa, forest fire protection in Brazil and landslide studies in Venezuela.”

With baseball statistics, Davenport said his speciality is adjusting the figures to compare players between different leagues, such as estimating how well a player would do in the major leagues based on his minor league performance.

He hopes estimating rainfall, one day, will be as clear cut. ☺

Stewart

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become more self-sufficient and where the lesson was reinforced that a person can’t function very well without being well organized.

In nominating her for the Employee of the Month award, Stewart’s fellow employees also highlighted her work with the diversity councils at the Mountain Administrative Support Center and NOAA Research’s Boulder laboratories, emphasizing her ability to relate to and easily interact with people of different backgrounds and abilities. Her own diverse background fosters these abilities.

Stewart was raised in a mining town high in the western Andes, the daughter of an American man who worked for the intelligence service in World War II and a Peruvian woman of both European and indigenous descent. She said meeting people literally from every continent in the world in La Oroya “made me realize how important diversity is.”

The point of diversity, she said, is “valuing people for what they bring to the table.” If you are open to diverse outlooks and backgrounds, she said, you will benefit by learning new, possibly better ways of doing business. ☺

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