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NOAA Surveys Sinking Coastline

—By Nikki Case

NOAA studies indicate that land along the Gulf of Mexico could sink a foot over the next decade, with Louisiana losing about an acre of land every 24 minutes.

This rapid subsidence, a natural process of sediment compaction compounded by coastal construction and sub-surface withdrawal of water and oil, could result in the loss of valuable wetlands and make coastal residents more vulnerable to flooding from storms.

As part of a multi-faceted program to mitigate the problem, NOAA is working with coastal states on small- and large-scale wetlands restoration projects and is providing the expertise to determine the exact rates of subsidence along major highways that are prone to coastal flooding.

From June 11-20, a 10-member team of surveyors coordinated by NOAA's National Geodetic Survey and the NOAA-funded Louisiana Spatial Reference Center measured the elevations of Highway 23, the main hurricane evacuation route in Plaquemines Parish, La.

Preliminary results indicate the road and nearby levees are subsiding at the rate of six to 15 millimeters a year.

Located at the southeastern tip of Louisiana, Plaquemines Parish is home to only about 27,000 residents, but is a main transportation corridor for tremendous

Annual Fish Fry Draws 1,200 Employees and Friends of NOAA

*Juan Tricoche/DOC*

Commerce Secretary Don Evans (third from left) joins (left to right) NOAA Fisheries' Tanya Dobryzinski, Kitty Simonds, Executive Director of the Western Pacific Fishery Management Council, and NOAA Administrator Conrad C. Lautenbacher, Jr., at the annual NOAA Fish Fry, held June 18 in the cafeteria and adjoining courtyards of the Herbert C. Hoover Building in Washington, D.C.

Listening for Tornadoes

—By Barbara McGehan

Scientists at NOAA's Environmental Technology Laboratory in Boulder, Colo., have come up with a unique way of detecting tornadoes. They listen to the sounds the tornadoes make as they're forming, using an instrument that looks like a land-locked octopus.

"There is evidence that low-level, or infrasonic, sound can be a useful tool in improving tornado warnings," said Al Bedard, a physicist at the lab, who led a team that set up three listening sites in

Erie and Pueblo, Colo., and Goodland, Kan., this summer.

The low frequency sound tornadoes make when they are forming are too low for the human ear to pick up, but can be easily detected using his instruments, Bedard said.

The experimental network is able to pick up sound over long distances and will listen over Colorado, Kansas, southern Nebraska, southern Wyoming and part of Oklahoma, including areas of "tornado alley," so called because of the frequency of tornadoes there.

Ocean Service Volunteers Plant Bay Grasses

—By Glenda Tyson

On June 17, volunteers from NOAA's National Ocean Service waded through icy water up to their necks and stuck their hands in mud at Otter Point Creek, Md.

The 26 volunteers were planting underwater bay grasses to help restore the site's vital natural habitat, which is in the NOAA-state cooperative Chesapeake Bay National Estuarine Research Reserve, located 18 miles northeast of Baltimore, Md.

Underwater grasses are extremely important to the health and productivity of Chesapeake Bay and the many rivers and streams that feed it. Several varieties of grass provide food and habitat for adult species of fish, shellfish and waterfowl. Bay grasses also help keep water clean by trapping sediment and nutrients and by slowing down wave action, protecting shorelines from erosion.

There has been a sharp decline in the growth of grasses in Chesapeake Bay, mainly due to sediment and nitrogen pollution. The grasses need sunlight to grow and survive. Too much sediment from runoff and an excess of algae blooms block the sunlight they need to grow.

Alison Hammer, the physical scientist in the Ocean Service's Special Projects Office who last year originated the bay plantings, said, "Although most of the volunteers have backgrounds in science, many of their positions do not allow them to actually work in the field. This event gives folks a chance to get outside and do some hands-on field work, and it is a really nice change for them. The Chesapeake Bay is a local treasure

right in our backyard that needs our help."

Julia Brownlee, a geographic information system analyst for the Special Projects Office, is a biologist by training. "This is my second year participating and I enjoy having a chance to get out of the office and get my hands dirty," she said.

The Chesapeake Bay Foundation trained about 40 volunteers on how to grow a species of bay grass called wild celery in grow tanks in their NOAA offices in Silver Spring, Md. The volunteers planted seeds in the tanks in March of this year and grew them until the planting.

To plant the bay grass, volunteers dressed in old tennis shoes, old shorts, bathing suits and T-shirts walked out into the water in groups of three or four and carried small trays of the grass grown in the tanks. While one person held onto the tray, two volunteers separated the grasses into smaller clumps. Then using their hands, the volunteers cleared a shallow hole in the mud and placed that

grass into the spot and patted the grass into the sediment.

"Our wild celery was long and lush," said volunteer Amy Zimmerlin.

Despite less than perfect weather conditions, the NOAA group persevered in planting its own grasses, plus 30 or so additional trays provided by a local school.

"We more than doubled our participation this year," Hammer said. "Hopefully next year we can make this a NOAA-wide event."

Otter Point Creek is one of the last remaining expanses of freshwater tidal marsh in the upper Chesapeake Bay.

The site includes 672 acres of open water, tidal marshes, forested wetlands and upland hardwood forests surrounded by major highways, large residential communities and heavy commercial and industrial development.

Otter Point Creek winds through marsh and bottom land forest before flowing into the Bush River on the upper western shore of Chesapeake Bay. ☺



Alison Hammer/NOAA

Cory Riley and Maurice Crawford join other National Ocean Service volunteers June 17 planting grasses in Chesapeake Bay.



Jerry Slaff/NOAA

Shirley Cooper.

Shirley Cooper Is the Team Member of the Month

—By Dane Konop

Shirley Cooper is the first part-time temporary employee to be named NOAA Team Member of the Month.

Cooper is a secretary in the Office of International Affairs in Washington, D.C., with earlier assignments in the Office of Strategic Policy and Planning, the Assistant Secretary's and Deputy Under Secretary's offices and the Office of the Administrator.

"Although she sits outside my office, she's really our utility outfielder for everybody here," said International Affairs deputy director Thomas Laughlin. "She takes assignments from anybody. She organizes the work of the office. She jumps in wherever she's needed."

Cooper is fairly new to NOAA, having been hired through Integrity Business Solutions, Inc., in February 2002.

Laughlin said he is amazed at

how quickly Cooper has caught onto the job, considering she had never worked as a secretary before. Her relative lack of knowledge about NOAA hasn't hindered her either, according to Laughlin, particularly considering her assignments at NOAA headquarters.

"First of all, she's had a very steep learning curve," Laughlin said. "She's been in the Administrator's office, at the core, the center of things. Of course, you pick up things even faster there. She already had a good grounding and a network of people. If she doesn't know the technicalities of a particular task, she knows to whom to go."

Laughlin said Cooper easily fields the wide-ranging inquiries that come into the office and handles the myriad administrative details in the busy office.

He is impressed by her professionalism and her demeanor.

"She just knows what you want before you wanted it and hands it to you when you begin to ask for it," he said. "Her personality is so wonderful and supportive. [She's] always cheerful, positive and helpful. We're just very, very pleased to have her here. We consider ourselves very lucky."

Cooper did not start out to be a secretary.

After getting married, she moved from southern Maryland to Washington, where she studied computers at Capital Business School for three years before taking a job in finance at Guest Services International. She then worked for ten years for MCI Telecommunications.

Her assignments at Guest Services and MCI were many and varied.

"I relocated people. I did payroll. I did local and federal tax returns. I wired money when back in the day you had to wire money," Cooper said.

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Keith Konecnik/NOAA

Kimberly Blankenbeker.

Kim Blankenbeker Is the Employee of the Month

—By Crystal Straughn

The selection of Kimberly Blankenbeker as NOAA's Employee of the Month came as no surprise to her colleagues in the international division of NOAA Fisheries. Balloons, streamers and banners of congratulations adorn the walls and ceiling in her Silver Spring, Md., work area.

"Kim is extremely results-oriented and keeps at a task until it is finished," said Dean Swanson, her supervisor and chief of the division. "Her dedication is unparalleled. She's known for sending work-related e-mails in the middle of the night. One morning we all arrived at the office to find that Kim had pulled an all-nighter to prepare for a meeting," he said.

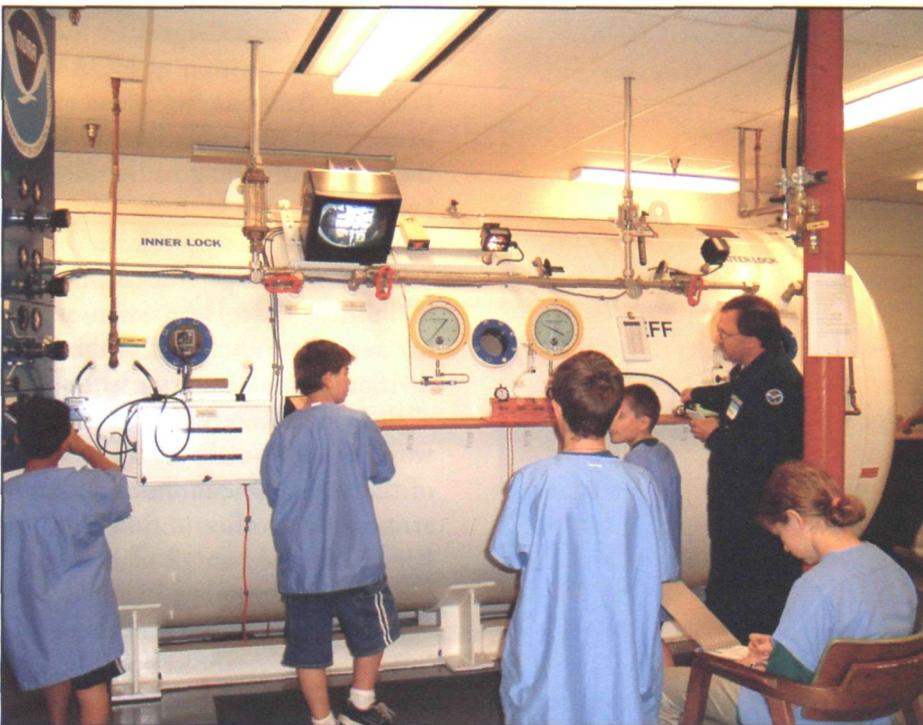
Swanson said Blankenbeker's interpersonal relationships, wit and charm serve the agency well during times of tough international negotiations. She often travels

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Focus On...



Jim Anderson/NOAA
Patrick A'Hearn, a research consultant at the NOAA-University of Washington joint institute in Seattle, shows science campers how to view phytoplankton collected in Lake Washington.



Janet Sears/NOAA
NOAA Diving Program director David Dinsmore supervises campers' simulation of the operation of a re-compression chamber at the NOAA Dive Center.

NOAA Science Camp

—By Janet Sears

NOAA needs a steady stream of new scientists, so NOAA staff in Seattle, Wash., decided to try to “grow” their own. From June 23-27, they held a “NOAA Science Camp” for middle-school-age children on the NOAA campus.

The goal was to teach the students about NOAA, the fun of science and how the work of NOAA scientists affects them.

Science camp was the idea of NOAA Corps Lt. Cdr. Thomas Callahan, the chief scientific support coordinator with the National Ocean Service's Office of Response and Restoration in Seattle. Callahan sent a proposal to NOAA Administrator Conrad C. Lautenbacher, Jr., who provided \$15,000 in a special outreach grant to fund two educational coordinators to plan the camp. They worked with middle school science teachers and NOAA staff to develop age-appropriate projects.

Science camp was free to the 100 children, ages 10-12, who attended on a first-come basis from middle schools in Seattle.

The kids were divided into five groups with color-coded T-shirts. Each group had a science teacher as counselor. More than 75 NOAA volunteers presented a wide range of hands-on activities that the teams rotated through.

The counselors and NOAA volunteers stressed the importance of scientific processes throughout the week.

Alaska Fisheries Science Center staff demonstrated sampling by
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massing different beans to represent various fish. The students saw that taking just one sample from the bean accumulation wasn't likely to give an accurate picture of the entire bean population, but that multiple samples provided a much better understanding.

David Dinsmore, director of the NOAA Diving Program, led students through a simulation of the re-compression chamber process. He divided them into two groups. One group crawled inside the chamber, and the other "operated" it based on Dinsmore's directions to guide the campers through each step.

"They all wanted to be the 'comm' talker on the phone," Dinsmore said. "We had to do a lottery to decide who'd do what, of the five different jobs on the outside."

At the National Marine Laboratory station, the children viewed

fish ear bones in frozen samples of sea lion feces through microscopes to determine what sea lions eat.

"Some drew pictures of the earbones," said Lynne Barre, a NOAA Fisheries marine mammal specialist at the lab.

The kids got to see what the scat looked like in the baggie and smell it," Barre said. "The first day, the sample was taken out of the freezer way too early and it was pretty smelly; but it was timed better after that."

For the camp finale, students worked as teams to build cardboard "NOAA research vessels" and complete a research cruise. Some vessels came complete with life rings, NOAA logos or zodiacs. The kids "boarded" their ships and maneuvered as a crew to various research stations where they were challenged to use what they learned during the week.

By that point the campers were getting a bit boisterous on a

beautiful summer day along the shore of Lake Washington. At the Pacific Marine Environmental Laboratory station the kids ran around using water spray bottles on each other instead of on the experiment.

"We were hoping they'd hit the rain gauge," said research consultant Sonya Noor. "We got all wet too. But it was fun."

"I don't know how it could be any more successful, with all three aspects—NOAA, the students and the teachers," said Ralph Hammersborg, a middle school teacher who helped plan the program and served as a camp counselor.

At the closing ceremony, attended by parents, students displayed a banner with their written comments on their camp experience that will be presented to Lautenbacher and received certificates of participation signed by the Administrator. ☺



Jim Andeson/NOAA

NOAA-University of Washington joint institute fellow Joseph Resing shows how to prepare filtered water samples from Lake Washington for viewing by microscope.



Janet Sears/NOAA

As a finale to their NOAA experience, science campers built cardboard replicas of NOAA research vessels. They then made "port calls" at various locations on the grounds of the Western Regional Center, where they identified marine mammals and fish, plotted oil spill movements and did other activities that challenged them to use what they had learned.

Tornadoes

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When a tornado is detected, the demonstration network will collect, process and post the tornado's infrasonic signal information on a Web site, which will be available to the National Weather Service offices in Boulder and Pueblo, Colo., and Goodland, Kan.

Larry Mooney, meteorologist-in-charge at the National Weather Service forecast office in Boulder, said, "The infrasonic network has the potential to detect very weak tornadoes that Doppler radar doesn't catch and may lead to earlier detection of the tornadoes that Doppler radar does spot."

In addition to using sound to pick up possible tornadoes, the NOAA scientists and forecasters will also test how the data will be displayed and how forecasters integrate the data into their forecasts.

Forecasters and researchers are optimistic about the usefulness of the system.

"We're excited about the possibility of it leading to improved tornado warnings," Mooney said.

Bedard said he has worked with sound and it's myriad uses "forever," but he first became aware of the potential use of low frequency sound in detecting tornadoes in 1995.

He and his team have listened to well over 100 tornadoes over the last eight years.

"We were testing an avalanche detection system for the state of Colorado Department of Transportation. We had decided to use severe weather to test the acoustic system and had just installed the instruments in a field near Greeley, Colo., when two hours later a tornado struck nearby and we recorded the sound."

While there was a lot of sound caused by the severe weather itself,

Bedard said, "as we listened, it became more and more clear that the vortex of the tornado was the source of the dominant sound."

Bedard said the research provides a new way of "hearing" low frequency sounds in the atmosphere.

"We're working on 0.5 to 10 Hz and that seems to be the key window in detecting this sound," he said.

Most of the sites in this summer's demonstration network are located in rural areas so the systems can be spread out.

The Erie listening site lies at the end of a gravel road on the other side of a chain link fence with a sign stating "U.S. Government." Beyond tall grass, down another road that is just two ruts in the ground, the site is surrounded by a chain link fence with pyramid-like wooden triangles on top designed to fragment the wind as it goes over the fence.

"The wind can roll up like a ribbon," Bedard said. "These wooden triangles break up the wind into smaller eddies, so we reduce wind noise and the instruments are protected."

Inside the fence, sitting in tall grass with a horse grazing nearby, lies one of the site's four systems that can pick up the sound of a tornado hundreds of miles away.

A complex infrasonic microphone sits on the ground, covered with a white dome that helps to protect the instruments from extreme temperatures.

Porous garden hoses attached to the instruments act as noise reducers, operating in rain and snow without affecting infrasonic signals. The long, tentacle-like hoses radiate out from the dome and are bent back toward the center so that the complete system covers a diameter of about 50 feet.

Since vegetation can further improve wind noise reduction, the researchers don't have to worry about cutting the grass.

"In Pueblo, we don't have a dome over the instruments; there's rattlesnakes there," Bedard said. At the Kansas site, we have rabbits and in Erie, we have mice."

Since infrasound is below the frequency that humans hear, Bedard translates the data into an *continued on page 7*



Wilfred VonDauster/NOAA

NOAA researcher Al Bedard inspects a listening device that can detect the low frequency sounds produced when tornadoes form.

Sinking Coast

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amounts of oil and gas.

Surrounded by the Gulf of Mexico on three sides and divided by 70 miles of the Mississippi River, the parish is a fishing paradise, but is also extremely susceptible to flooding.

Benny Rouselle, Plaquemines Parish president, said that knowing the true elevations of Highway 23 is fundamental for evacuation strategies. "We really appreciate the survey work that has been done in Plaquemines Parish," Rouselle said. "The information is very valuable in understanding where we stand today with the elevations of our levees and roadway systems."

To establish the true elevation of Highway 23, the surveyors used the National Water Level Observation Network station at Grand Isle, which is the only long-term tide and water level station in Louisiana, as the "point of departure." Run by NOAA's Center for Operational Oceanographic Products and Services, or CO-OPS for short, this station measures the water levels relative to a specific vertical datum.

The data from this station, which has been operating since 1947, allow for long-term sea level trends to be assessed and analyzed. Indirectly, the relative sea level trends reveal how fast land elevation moves relative to the water. True changes in elevations can be found by making survey ties between benchmarks at the Grand Isle tide station to the tide gauge and to the geodetic datum, then subtracting out the estimated rates of global sea level rise.

A network of benchmarks along Highway 23 was tied to the Grand Isle benchmark using Global Positioning System observations. After the data are processed, extremely accurate, real-time information on the elevation of

Highway 23 and the rate of its subsidence will be available.

"By knowing the water levels from coastal storm surge flooding and sea level rise, emergency managers can make better evacuation route decisions, thereby helping to save lives and protect property," said CO-OPS' coastal program manager Kristen Tronvig.

The CO-OPS water level stations will also be tied to GULF-NET, a state-wide network of GPS receivers operated by the Louisiana Spatial Reference Center. This relationship will be the foundation for the vertical reference network.

"It's a very good effort that we're matching the tidal water stations with the geodetic network," said Tim Osborn, manager for regional programs for NOAA in Louisiana. "The thing I like about tide stations is that they confirm what we see on land; the land is sinking relative to sea level. If you take the average relative mean sea level trends in southern Louisiana, the land drops an inch lower than the sea level every 30 months."

Today, Louisiana is losing the equivalent of one football field of land every 15 minutes. Roy Dokka, the director of Louisiana Spatial Reference Center, pointed out that with the estimates, simple calculation shows when parts of Plaquemines Parish are going to be at sea level.

"By putting this data in a reference frame," Dokka said, "you can compare present-day elevations with past elevations and calculate the rate of change. And some areas locally are sinking faster than others. You just want to make sure you are not on the wrong side of the road when flooding begins."

Other NOAA efforts contributing to the protection of southern Louisiana include a storm surge calculation system set up by NOAA's National Weather Service.

The Weather Service has been

using two new real-time water level stations in St. Charles Parish that CO-OPS established last year to help improve their storm surge models.

"In order to determine the typical impact of storms on coastal areas, it is vitally important to know how the land area is changing and to what extent, and depth, the water will cover the land," said Bill Proenza, director of the Weather Service southern region. "There can't be a more sobering view than standing on a levee in New Orleans and seeing that the water is actually above the city. This is even more pronounced in places like Plaquemines Parish." ☺

Tornadoes

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audible sound. Not surprisingly, he said tornadoes make a rumbling sound.

"We believe the sound is basic to the core of the tornado. The larger the core, the lower frequency the sound," he said.

This is not the freight train sound so frequently reported when a tornado hits. Infrasound occurs as the tornado is forming a vortex, before it has touched down, which makes this technology a useful tool in tornado detection.

"We estimate the cost of the hardware of a single infrasonic observing system as less than \$50,000," Bedard said. "Our vision is that these systems will be ideally located at Nexrad sites, making use of existing logistics and data transfer systems where possible."

"In 1998, the instruments here in Colorado picked up the sound of a tornado in Spenser, S.D., over 800 miles away," Bedard said. "We estimate that if the system had been in a hundred mile vicinity of the tornado, a warning time of about a half hour would have been possible." ☺

Cooper

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Her office experience paid off for her at NOAA, although she admits being a bit daunted at first.

"It was sort of weird," she said, "because I've never done this stuff before. I've never kept someone's calendar. But it's just flowing along fine now. I've picked it up. I've adapted. I've learned to do T&As and CAMS and you name it."

Despite her success in business and at NOAA, Cooper said, "I still don't know what it is I want to do when I grow up."

Divorced and with her daughter now grown, Cooper said she does have a general idea of what she wants to do, and it's her part-time working arrangement with NOAA that will allow her to do it.

"I'm a people person," she said. "I like to know that I've made people's lives a little easier."

A few years ago, Cooper began attending Jericho Christian Training College in Upper Marlboro, Md.

"Because I grew up in a Catholic School, I always felt the purpose was in me to pursue what it is that God wanted me to do," Cooper said.

Her NOAA job allows her to work part-time and attend classes part-time.

"I hope to finish next year. I have two more classes to take."

Although her divinity degree would qualify her to preach, she said she is more likely going to counsel senior citizens and children, possibly merging her ministry with nutrition counseling.

NOAA could lose Cooper at the end of the fiscal year.

"My assignment here ends in September. They're looking to hire somebody and I'm going to have to probably transfer," she said. After that, Cooper said, she's ready for "whatever happens." ☺

Blankenbeker

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abroad as a senior policy advisor to support development of international agreements to conserve many fish stocks, including tunas, swordfish, sharks and billfish, that are shared by a number of fishing nations.

Part of the U.S. delegation's job is to ensure conservation while also looking out for the rights of American fishermen in getting a fair share of the total catch each year.

As part of the official U.S. delegation to the International Commission for the Conservation of Atlantic Tunas, Blankenbeker serves as chair of a commission working group that aims to convince fishermen from non-member countries to comply with international conservation programs. Her work at the 2002 annual meeting helped the commission reach consensus on fishing quotas for all major species and apply new quota allocation criteria, which had been several years in development. She also serves as the executive secretary of a domestic advisory body that helps develop U.S. positions on commission issues.

Blankenbeker said she enjoys the camaraderie of working within the international sphere and finds her job to be intellectually stimulating, but also intense and tiring on occasion.

Having traveled abroad at least forty times, she said these meetings aren't about sightseeing trips to exotic locations. "The meetings can last up to 13 days, requiring around the clock attention if we want to meet our goals," she said. "Sometimes I seldom leave the hotel."

Blankenbeker works closely on helping the commission solve problems of illegal, unregulated and unreported fishing and other practices that make fisheries

management and conservation extremely difficult.

"These are cutting edge programs that really give teeth to commission agreements," she said.

Working internationally to solve shared fisheries management concerns is paying off, as evidenced by the rapid rebuilding of North Atlantic swordfish. Just three years into a 10-year rebuilding program, the stock is close to being fully rebuilt. The international reduction of swordfish catches worldwide was negotiated by the commission and could not have been achieved without the support of employees like Blankenbeker.

Blankenbeker earned her bachelor's degree from Indiana University, majoring in Spanish and public affairs, before studying abroad for a year in Spain and Holland. Her time in Europe provided the career direction she was looking for, as she went on to earn her master's degree in public administration from George Mason University in Washington, D.C., where she focused on international management in preparation for a career in public service.

A native of Jeffersonville, Indiana, Blankenbeker joined NOAA Fisheries in 1994 after completing a year-long internship with NASA. ☺

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