

Record Heat Wave Slams Southwest

—By Jim Teet

A record-setting heat wave settled in across the U.S. Southwest July 10 and stayed until a late summer monsoon season arrived to provide relief 12 days later.

The heat most affected people who had no air conditioning, such as low-income elderly and the homeless. People who work outdoors also faced problems from long-term heat exposure, since overnight temperatures provided little opportunity to recover.

Extreme heat was blamed for at least 30 deaths throughout the region, although this figure was expected to rise as autopsies continue to confirm causes of death. Persistent heat heavily stressed cooling equipment throughout the region, including an overnight cooler failure at a Phoenix, Ariz., shelter that killed 28 dogs.

Meteorologists at NOAA National Weather Service forecast offices in the western region forecast the heat wave and anticipated long-term effects several days before it arrived. The Phoenix forecast office issued a special weather statement July 8 informing the public that hot weather would continue through the next week, with temperatures expected to top 115 degrees. The statement was forwarded by the Arizona Department of Health to all Phoenix metropolitan hospitals to help staffs prepare for higher heat—
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NOAA Launches Fisheries Ship *Henry B. Bigelow*

—By Jeanne G. Kouhestani

Sandwiched between Tropical Storm Cindy and Hurricane Dennis, the launch of the NOAA Ship *Henry B. Bigelow* was executed flawlessly July 8 with the single swing of a champagne bottle and a momentous sideways slide into the Escatawpa River at Moss Point, Miss.

Henry B. Bigelow's descent from shore to river, accompanied by onlookers' cheers and a Navy band, created an enormous swell of water that threatened to soak anyone too near the river bank. Mixed in with the cheers were sighs of relief as the

ship popped back up from its deep sideways roll.

Henry B. Bigelow, the second of four planned 208-foot fisheries survey vessels of the same design, will be homeported in New England once construction is completed and it becomes operational in 2006.

The ship was named by a team of students from Winnacunnet High School in Hampton, N.H., through NOAA's first ship-naming contest.

The launch and christening at the VT Halter Marine Inc. shipyard—
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Ray Broussard for NOAA

The new NOAA Ship *Henry B. Bigelow* is launched July 8 at the VT Halter Marine Inc. shipyard in Moss Point, Miss.

Great Lakes Environmental Research Laboratory Scientists Mentor Students

—By Sarah Van't Hof

Forget about bagging groceries and scooping ice cream. Instead of going out for the more traditional form of high school student summer employment, two bright and enthusiastic Ann Arbor (Mich.) public school students are adding extra pairs of hands to research projects at NOAA's Great Lakes Environmental Research Laboratory in Ann Arbor.

The students are working this summer with NOAA biologist Tom Nalepa and ecologist Margaret Lansing through the Ann Arbor school system's Partners for Excellence Program, which offers local high school students a chance to experience science in action by participating in various laboratory research projects.

"It's a chance for students considering science careers to

explore and experience real world applications," said Nalepa, the coordinator for the laboratory's end of the partnership.

Nalepa reviews applications and conducts student interviews based on the applicant pool he receives from the Ann Arbor school system. Two students are selected and paired with participating laboratory scientists based on mutual scientific interests.

"The selection process can be difficult," Lansing said. "Each year the applicant pool is so exceptional. It can be a painful elimination process on our part."

Nalepa's research focuses on long term trends in communities of benthic, or bottom dwelling, plants and animals and their interactions with the upper food web, as well as the role of benthic invertebrates in cycling nutrients and contaminants. His recent work has focused on the zebra mussel and the impact of this aquatic invader on the Great Lakes ecosystem.

This summer, Nalepa is mentoring Evie Covés-Datson, a junior from Ann Arbor's Pioneer High School whose interest in zebra mussels began at a young age. "On a sixth grade schooner cruise on Lake Michigan we got to see zebra mussels and we heard about their environmental impacts," Covés-Datson said. She said she also encouraged her peers to get involved in invasive species prevention and control efforts while in a speech class at school.

Covés-Datson is helping sort Great Lakes benthic samples and



Sarah Van't Hof/NOAA

Student Evie Covés-Datson helps NOAA biologist Tom Nalepa sort and clean Lake Erie zebra mussel samples.

recording measurements of zebra mussel and quagga mussel shells. She said examining all those bottom-dwelling critters has been a thought inspiring experience for her and has caused her to consider the vastness of the Great Lakes aquatic communities. "I guess I didn't realize all the different things that live on the bottom of the Great Lakes," she said. "It's a little weird wondering what else might be down there."

Lansing is the field program coordinator for the International Field Years on Lake Erie, a large-scale, multi-agency research program. She also serves as a liaison between GLERL and other agency researchers, technicians and research vessel staff, helping to coordinate the science and logistics of the research cruises. This summer Lansing is mentor to Huron High sophomore Vinayak Nikam and finds his vitality and inquisitive nature to be "energizing."

Nikam is helping out on the database for the International Field Years on Lake Erie, entering operation logs into an electronic file that will aid scientists when

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Sarah Van't Hof/NOAA

Student Vinayak Nikam helps NOAA ecologist Margaret Lansing measure organic carbon in lake sediments.



Mark Bushnell/NOAA

Karen Grissom.

Karen Grissom Is the Team Member of the Month

—By Glenda Powell

August Team Member of the Month Karen Grissom plays a pivotal role in moving NOAA one step closer to achieving its goal of creating a Global Earth Observation System of Systems. As an oceanographic engineer for the National Ocean Service's Center for Operational Oceanographic Products and Services in Chesapeake, Va., Grissom evaluates and tests new ocean monitoring technologies.

Grissom, a west coast native with a Bachelors of Science in oceanography from the University of Washington, started with NOAA as an intern in January 2002 and is currently a contractor. Her long list of duties now includes transitioning new or developing technologies, along with test and evaluation, test design, implementation and data analysis.

She also troubleshoots operational problems.

"What we find in operational oceanography is there are a lot of

sensors and systems that have certain specifications which do not meet real world applications," Grissom said. "For example, some sensors are put under water to take measurements, but after a week of being under water they become fouled down with marine debris. So companies create new technologies to address this problem. My job is to test and evaluate these new technologies; [it's] somewhere between research and operations."

Currently, Grissom is helping NOAA transition to operational status a high-frequency radar system called the Coastal Ocean Dynamic Application Radar, which can measure surface currents without having to submerge a cable into the water. This eliminates the problem of marine contamination that is frequent with traditional marine measurement instruments.

CODAR is not only useful to the scientific community but can also be a big help to coastal managers, government agencies and recreational boaters.

Coastal managers and oil spill response units can use the surface current measurements to determine in which directions and how quickly pollution will spread.

These measurements can also assist fisheries managers in locating the best area to release fish larva to achieve an optimal growing environment.

Recreational fishers and boaters can use the measurements to find the best fishing spots and to figure out how fast currents are moving and in which direction.

Speaking of NOAA's plan to create a Global Earth Observation System of Systems, Grissom said, "This technology has a lot of potential and will be instrumental in linking up all of the various ocean monitoring systems around the world."

Grissom demonstrated the value
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Michael S. Gallagher/NOAA

Erick Long.

Erick Long Is the August Employee of the Month

—By Jeanne G. Kouhestani

From an early age, Employee of the Month Erick Long has used initiative and determination to make his way in the world, traits that have served him well as a skilled fisherman aboard the NOAA Ship *Miller Freeman*.

Long learned to be resourceful at a young age. At 16 he began working to support himself, finding odd jobs that paid minimum wage. At 18 he decided to "strike it rich" fishing in Alaska, working odd jobs across the country to finance his trip to Dutch Harbor. Once in Alaska, he hired onto a factory trawler in the Bering Sea, but soon realized he wasn't going to get rich doing that type of work. He quit and spent the next year working on a dairy farm in New York.

His next stop was a distribution center for a national auto retail and service store, where he quickly climbed the ranks. He became the lead man, supervising seven em-
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Focus On...

Students Participate in Summer Weather Research



James G. LaDue/NOAA

Dan McCarthy (left), science operations officer at the NOAA Storm Prediction Center in Norman, Okla., leads a map discussion for summer students at the National Weather Center.



James G. LaDue/NOAA

Kate Horgan, a student researcher from North Carolina State University, introduces herself at a welcoming picnic.

—By Keli Tarp

Instead of spending their summer lounging by the pool, waiting tables or mowing lawns, 13 students from colleges and universities around the country are working side-by-side with leading NOAA and University of Oklahoma scientists on weather research projects at the National Weather Center in Norman, Okla.

The center includes five NOAA offices and a dozen other state and University of Oklahoma agencies and organizations involved in weather research, forecasting, education and support.

Sponsored by the National Science Foundation and the Department of Energy, the undergraduate students were paired for 10 weeks beginning in May with the nation's top weather researchers and forecasters from NOAA and the University of Oklahoma to conduct research on a variety of topics including severe weather, tornadoes, numerical weather prediction models and climatology.

Students prepared and presented papers reporting the results of their research and supplemented the experience with tours, field trips and lectures, all designed to help determine whether they want to pursue a career in research.

The students' projects ranged from constructing a high-resolution network of rain gauges to studying the variability in radar reflectivity for low altitude clouds to analyzing three-dimensional lightning maps of electrical charges in a supercell thunderstorm.

"The program has opened my eyes to a possible future in research that I never considered before," said Brandon Miller, an earth and atmospheric sciences major at the Georgia Institute of Technology. "It's a great experience that I could not get anywhere else."

Julie Phillipson, a senior meteo-
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 rology major at the University of Northern Colorado said, "The program has provided me with the opportunity to take a hands-on approach to studying meteorology, above and beyond what could be taught in the classroom. It's a great chance for students to try out research and to get an idea of what to expect when starting graduate school."

Kate Horgan, a meteorology major at North Carolina State University in Raleigh, is creating a climatology of elevated convection that produces severe weather for forecasters to use. "[The program] gives students a chance to experience a full-time research career as well as presenting other career options, seminars, tours and a fantastic network of people that we could only experience in Norman," Horgan said.

The students' mentors, who are leading scientists in the field of meteorology, are from several of the organizations that make up the National Weather Center, including NOAA's National Severe Storms Laboratory, Storm Predic-



James G. LaDue/NOAA

Students Julie Phillipson from the University of Northern Colorado and Aaron Botnick from the University of Louisiana analyze weather maps in a severe weather forecasting workshop.

tion Center, Warning Decision Training Branch and the National Weather Service forecast office in Norman, as well as the University of Oklahoma's School of Meteorology, Cooperative Institute for Mesoscale Meteorological Studies and the Center for Analysis and Prediction of Storms.

Harold Brooks, a research meteorologist at the National

Severe Storms Laboratory and a veteran mentor, said, "We get students who are gifted academically and enthusiastic and willing to do new things so that we can involve them in important current research. It gives us a chance to mold the way they think about research and we hope to influence the way they do the work the rest of their career. Plus, they're a lot of fun to have around."

"[The program] is a win-win situation," said mentor, David Andra, science operations officer at the National Weather Service forecast office in Norman. "It allows our office to accomplish more applied research while at the same time it allows a student to gain insight into what it's like to work as a scientist in an operational organization. It allows students to make valuable contributions to their profession much earlier than would otherwise occur."

Participants in the program were chosen from about 100 applicants in the fields of meteorology, atmospheric science, physics, engineering, chemistry, mathematics, computer science, physical geography and other disciplines. ☺



James G. LaDue/NOAA

Students (left to right) Renee Curry (U. of Okla.), Angie Fritz (Valparaiso U.) and Ariel Cohen (Ohio State U.) study weather maps depicting a severe weather scenario.

Henry B. Bigelow

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yard marked the second major milestone in *Henry B. Bigelow's* construction. Last year's keel laying was the first.

Speakers at the event included NOAA Administrator Vice Adm. Conrad C. Lautenbacher, Jr., U.S. Navy (ret.), Rep. Gene Taylor of Mississippi, Frederick Bigelow, Jr., grandson of the ship's namesake, and James Coburn, CEO of Vision Technology Systems, parent company of VT Halter Marine. Butch King, CEO of VT Halter Marine, was event host and master of ceremonies.

The ceremony was followed by a reception at nearby Pelican's Landing

"Maintaining and rebuilding fisheries stocks depends directly on the quality and quantity of scientific data," Lautenbacher said. "Without this important

data, we cannot effectively protect and restore our nation's fisheries. Effectively managing our living marine resources can only be accomplished by bringing more ships on line like this one."

Like its sister ship, the NOAA Ship *Oscar Dyson*, *Henry B. Bigelow* is among the most technologically advanced fisheries survey ships in the world, with a low acoustic signature that will enable scientists to study fish without altering their behavior.

The ship is named after the late Henry Bryant Bigelow, a renowned

oceanographer who worked as a researcher, instructor and professor of zoology at Harvard University from 1906 to 1962. He was also a founder of Woods Hole Oceanographic Institution in 1931. Bigelow transformed the Gulf of Maine from a scientific unknown to one of the most thoroughly studied bodies of water in the world and developed the interdisciplinary, ecosystem-oriented approach that characterizes modern oceanography.

Several grandchildren of Bigelow attended the ceremony.



Ray Broussard for NOAA
Approximately 350 dignitaries, government officials and invited guests attended a ceremony to christen the new NOAA Ship *Henry B. Bigelow* prior to its launch.

Frederick Bigelow, Jr., told a story about his grandfather's gift of a fishing rod to him when he was a young boy. The new gear not only replaced his cotton hand lines and bamboo rods, it fired his imagination as to what prize marine animals he'd be able to catch and discover. "[It] made me realize that much is possible when you have the right tools at your disposal," he said.

"The Bigelow family wishes Godspeed to all those who will sail on the *Henry B. Bigelow*. Through your enthusiasm, dedication and

passion for scholarly excellence in the ocean sciences, you honor our grandfather and his undying belief in the value of rigorous investigation through first-hand field work. But I must say that he might have been rather put off by all this fuss today were he present. He was, after all, much more interested in providing a fertile environment in the classroom, in the laboratory, or out at sea than in erecting monuments to himself," Bigelow said.

"So think of this vessel as your opportunity to address the ocean's unanswered questions, which is just as he would have wanted it. This is your new fishing rod, which we hope you can use to make a difference too. May your imagination take you far, and may the *Henry B. Bigelow* always sail where the fish are biting."

Prior to the launch, Winnacunnet High School teacher Catherine Silver christened the

ship with a single swing of a champagne bottle. Silver was designated the ship's "Matron of Honor" by ship sponsor Kathleen Gregg, wife of Sen. Judd Gregg of New Hampshire, who was unable to attend.

"I was terrified the bottle wouldn't break," Silver said. "I think this was probably one of the most exciting moments of my life. It also touched me to learn of the tradition that the person who christens the ship gives it her spirit, which will always remain a part of the ship." ☺

Great Lakes

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referencing past cruise activities and ship whereabouts. He is also freeze drying sediment cores for PCB analysis and assists in preparing core samples for organic carbon analysis.

"I applied for the program because I want to learn about what scientists do and how they do it," Nikam said. "I also wanted to learn more in depth about Great Lakes issues."

The Ann Arbor school system launched Partners for Excellence in 1985 and encourages Ann Arbor businesses and organizations to create multiple job and volunteer opportunities for students to augment the typical classroom setting. The Great Lakes Environmental Research Laboratory's involvement in the program has enabled the students to get hands-on experience in a professional setting while exploring Great Lakes science and career opportunities.

The six-week, half-time program targets students who are considering careers in science. Since GLERL joined the Partners for Excellence program in 1987, student interns have assisted in various projects including chemical experiments, marine instrumentation work and the Coastwatch program. Nalepa said he is eager to participate in the program because of the confidence it instills in young people and the motivation it gives them to become successful, life-long learners. Because the program puts the students' interests to use, Nalepa and Lansing said it ends up being a positive experience for both the student and supervisor.

"This experience has definitely given me a taste of the real world," Covés-Datson said, "I can really appreciate what adults do all day." ☺

Heat Wave

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related patient cases.

Phoenix reached a record high for July 17 of 116 degrees, but remained several degrees short of an all-time mark.

Based on the NOAA forecast, local newspapers and television and radio stations alerted their audiences and provided precautions and treatment measures. Agencies involved with the elderly regularly checked on their clients in person and by telephone to make sure they were aware of any issues. Shelters opened their doors during the days

to provide shade for the homeless, and public safety officials handed out

water to

people on the streets. Despite setting more than 200 individual daily and all-time temperature records during this period, most meteorologists in the region considered the extreme heat to be only slightly warmer than normal.

Andy Bailey, warning coordination meteorologist for the Las Vegas, Nev., weather forecast office, explained, "While our heat wave was likely the most extreme Las Vegas has ever seen, it was only a few degrees higher than our typical summer."

Long-established temperature records in Arizona were tied or bettered. Las Vegas tied its 1942 all-time high of 117 degrees on July 19 and also set a new mark at four consecutive days at or above 115 degrees. Tucson, Ariz., tied a 1987 record of 39 consecutive days at 100 degrees or higher July 22.

Tucson forecast office meteorologist in charge Glen Sampson noted that his office began tracking the

consecutive-day pace about halfway to the 39-day record point. "By day 35, everyone in Tucson knew we were approaching [the] all-time record," Sampson reported. "The temperature [finally] stayed below 100 degrees on July 23."

Bailey was impressed by how far Las Vegas surpassed its low- and average-temperature daily records. "We broke our all-time highest minimum temperature by three degrees and the record average temperature by four degrees," Bailey said. "To break these all-time records by that much is truly astounding."

Between June 29 and July 22,

"While our heat wave was likely the most extreme Las Vegas has ever seen, it was only a few degrees higher than our typical summer," said warning coordination meteorologist Andy Bailey.

the Phoenix forecast office issued eight separate heat advisories, three excessive

heat watches and three excessive heat warnings. Even when records weren't being set, overall temperatures throughout the region remained above normal.

The Las Vegas forecast office issued excessive heat warnings 10 consecutive days during the July heat. Bailey said his staff worked very closely with the media to get the message out to the public. He provided interviews to media from all over the country and said he felt media response to National Weather Service products was the best he had ever seen. "People in the desert Southwest kind of take the heat in stride," Bailey said.

Phoenix meteorologist in charge Anton Haffer echoed this general opinion. "Most of us are acclimated and can deal with the heat by limiting our exposure and enjoying our air-conditioned homes. We must take care of the population at risk here. Those folks who have no choice. They have to be out in the heat." ☺

Long

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employees for a couple of years until he became homesick and returned to his family in South Carolina.

Unable to find fulfilling work in South Carolina and interested in going back to sea, Long traveled to Seattle, Wash., on the recommendation of a friend who worked on *Miller Freeman*. Long took a job as a casual laborer aboard the ship for about a month during *Miller Freeman's* winter dockside repair period. As a result of his hard work and dedication, he was offered a job as an ordinary fisherman in January 2003.

When *Miller Freeman's* chief boatswain left the ship for a long-term training assignment this past winter, others in the deck department needed to fill the gap.

"Erick quietly and effortlessly assumed a leadership position," said Cdr. John Herring, one of two rotating commanding officers of the ship. "During a research trawling cruise, his fishing watch was praised by the chief scientist for his technical competence and good humor.

"During last winter's in-port period, in the absence of the acting chief boatswain, Erick took the initiative to learn the administrative tasks necessary to keep the department functioning. He did a great job," Herring said.

Besides being a vital member of the deck department, Long is contributing to the ship's mission in other ways. For the past year he has been a NOAA working diver and member of the ship's dive team. He is the ship's primary rescue boat coxswain and is actively training more junior crew members.

"Erick's thinking is that this ship is much more than a job. It is more than a means of earning a living. Erick's view of this ship is as an

extended family," said Cdr. Michael Gallagher, the ship's other commanding officer. "He derives satisfaction and pride from his individual accomplishments. But most important, he is just as proud of the accomplishments of the ship. His attitude towards the ship is infectious and motivates the entire crew. His pride is garnered on an icy deck in the storm-tossed darkness of the Bering Sea. Only his shipmates are there to witness his accomplishments, yet he is compelled to perform."

Indeed, Gallagher's view jibes with what Long considers the most rewarding part of his job. "It's the people," Long said. "It can be like a big family with a whole mess of crazy cousins and uncles. That to me is the most important thing being as remote as we are."

Gallagher recalled an incident that exemplifies Long's character. "Recently he and I dove on the ship to install a transducer. The installation was necessary for the ship to perform its mission. Several times during the dive I doubted the installation could be physically accomplished. It was really a job that needed to be done in a shipyard, requiring a lot of time and money. Erick had no such thoughts," Gallagher said. "He was focused on getting the job done. With clever use of leverage and pure, brute strength, he wrangled the transducer into place and allowed us to complete the installation. His performance that day amazed me. He wouldn't let the ship sit ineffectual and idle if he could help it."

"This has been a good thing for me so far," Long said. "It has presented countless opportunities for me to advance in my chosen career. I am proud to be a crew member on *Miller Freeman*. It is not perfect, but it has much in the way of personality, and that's what counts." ☺

Grissom

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of a portable current radar system called a "quick response estuarine buoy" at the first "Safe Sanctuaries 2005" emergency response drill in the Florida Keys National Marine Sanctuary in April. Real-time data from the system were displayed on the CO-OPS Web site for emergency response support. NOAA scientists expect this technology will improve drift trajectory, helping to fine tune and validate NOAA's Office of Response and Restoration trajectory models.

Currently, NOAA has two operating CODAR systems—a permanent system in the Chesapeake Bay, with data going directly to Grissom in her office, and a mobile system that is now in Cook Inlet, Alaska, supporting tidal current surveys. The data from the mobile unit go to the National Current Observation Center in Silver Spring, Md. Eventually, Grissom will transition the data from the unit in the Chesapeake Bay to go to the center in Silver Spring as well.

"I like the variety of my work," Grissom said. "It's a pleasant mix of project management, data analysis, fieldwork and office work. I also enjoy the autonomy." ☺

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