

Officials Break Ground on Largest Southern California Restoration Project

—By Jim Milbury

On Oct. 6, state and federal officials kicked off the largest wetland restoration project in the history of southern California with a groundbreaking ceremony at the Bolsa Chica Ecological Reserve near Huntington Beach, Calif.

The event marked the beginning of a three-year, \$100-million effort to return a 1,000-acre industrial oil field to its original condition as a wetland habitat for waterfowl, fish and other marine animals.

Overseen by NOAA and other agencies from the state and federal government, the restoration will require the removal of over 18 miles of oil pipeline, the elimination of 64 oil wells, the removal of nearly three million cubic yards of dredge material and the construction of a bridge over a tidal canal along the Pacific Coast Highway. The canal will connect Bolsa Chica with the Pacific Ocean, allowing the cleansing action of tidal ebb and flow to reinvigorate the wetlands.

“We are here to break ground on the restoration of the Bolsa Chica wetlands,” said California Lt. Gov. Cruz Bustamante, “and there is only one thing that needs to be said: It’s about time!”

No one in the audience could agree more with Bustamante’s
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Navigation Response Teams Survey Hurricane Damage

—By Glenda Powell

On a mid-September morning in Port Canaveral, Fla., a soft breeze rustles the few remaining leaves of a palm tree ravaged by Hurricane Ivan. People scour the streets searching through debris, salvaging what is left of their belongings.

Ominous clouds overpower the struggling sun, foreshadowing the arrival of more severe weather to this already battered region. On the water, several cargo ships are anchored, unable to move safely in the debris-strewn waterway or unload their goods.

Two trucks, one hauling a 30-foot boat on a trailer, pull up to a boat ramp in the port. Three people exit the vehicles and launch the boat. The fate of millions of dollars of floating cargo lies in the hands of the trio, members of NOAA’s Navigation Response Team 2. Their job: survey the port for changes on

the sea bottom or submerged obstructions that might interfere with or endanger maritime navigation.

NRT 2 is one of six mobile emergency response teams equipped and trained to survey



Robert Ramsey/NOAA

NOAA Navigation Response Team 2 leader David Elliott retrieves a side-scan sonar towfish after sweeping the inner harbor of Fort Pierce, Fla., for obstructions and other dangers to navigation following Hurricane Jeanne.

ports and near-shore waterways anywhere in the U.S. immediately
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Bolsa Chica

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remarks than NOAA biologist Robert Hoffman, who began his efforts to protect and restore this valuable marine habitat nearly 30 years ago.

When Hoffman joined NOAA in 1975, land developers were intent on building thousands of homes atop Bolsa Chica, one of the last major wetland areas in southern California.

"They wanted to fill it in and put homes in there," Hoffman said. "But that quickly went nowhere fast, because it wasn't only the agencies, it was the environmental groups that were up in arms over that kind of thing."

And for good reason.

Tidal wetlands are essential to the survival of many marine species and waterfowl. These marshy areas that exist between the land and the ocean are often referred to as "nurseries of the sea." They provide spawning and feeding areas along with protection for young marine

animals as they grow and adapt to an ocean environment.

Coastal wetlands are also one of the most productive ecosystems on Earth. They improve water quality by trapping sediments and provide nutrients for a wide variety of plants and animals.

Over the years, California has lost approximately 90 percent of its wetlands, primarily to land development. Today, only about 300 acres of the Bolsa Chica wetlands remain of the original 10,000 acres of tidal wetlands that once existed along 16 miles of coastline that now include some of California's most expensive real estate.

The approximately 1,000 acres now planned for restoration have been degraded and damaged over a long history of human impact. Relatives of the Shoshone Indians first inhabited the wetlands 8,000 years ago. In the early 1800s, the wetlands became a ranch, called Bolsa Chica, Spanish for "little pocket," where cattle roamed freely. In 1895, a gun club bought
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National Severe Storms Laboratory Celebrates 40th

—By Keli Tarp

It was 1964. The Beatles burst onto the scene with the help of Ed Sullivan, the Cold War nightmare "Dr. Strangelove" was a hit movie, people were driving the new Mustang and in Norman, Okla., a group of researchers started an organization that would forever change severe weather forecasting in the U.S. and around the world—the National Severe Storms Laboratory.

On Oct. 15 and 16, current and former Severe Storms Lab employees and friends gathered in Norman to celebrate the accomplishments and history of the lab during the past 40 years. Events included school group tours, invited talks, a dinner and a public open house.

"NSSL has significantly contributed to saving lives," said lab director James Kimpel. "Severe weather, tornadoes, of course, and I think some of the tools and the science that NSSL produced over its 40 years are really core to the reduction in lives lost because of modern forecasting and warning techniques."

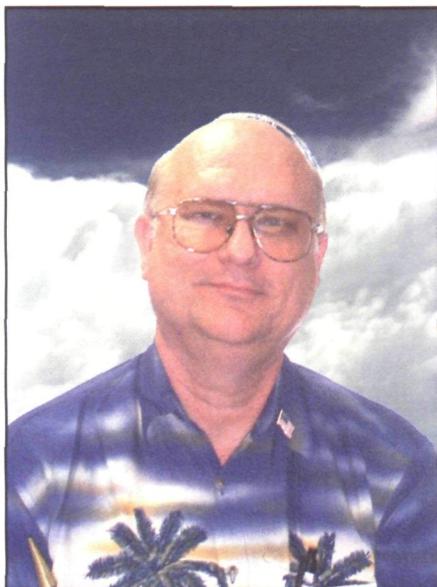
One of the lab's initial tasks was to maximize the use of the WSR-57 surveillance radar for forecasting by the U.S. Weather Bureau, forerunner of the National Weather Service. From that research to the development of NEXRAD, the common name for operational WSR-88D Doppler radar, and now dual polarization and phased array radar, NSSL continues to push advancements in weather research and technology.

Even Hollywood took notice of the lab's storm chasing and tornado research, tapping into the public's
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Jim Milbury/NOAA

NOAA biologist Robert Hoffman (far right) and representatives of other federal and state agencies gather to break ground on the Bolsa Chica wetlands restoration, the largest in southern California history.



Paul Leighton/NOAA

Neal Dorst.

Neal Dorst Is the NOAA Employee of the Month

—By Jana Goldman

To become a meteorologist, Employee of the Month Neal Dorst first had to become an artist. Although he earned a bachelor's degree in meteorology in 1977, Dorst returned to school to earn a bachelor's in fine arts to land a job at NOAA's Atlantic Oceanographic and Meteorological Laboratory in Miami, Fla., one of the 12 research laboratories of NOAA's Office of Oceanic and Atmospheric Research.

"There was a hiring freeze," Dorst explained, "but I was able to come in under a student co-op program as a scientific illustrator in 1979."

Dorst eventually got to use his meteorology degree, but has also since become AOML's "chief cook and bottle-washer," as he fondly referred to the scope of his activities. Data manager, tape librarian and archivist for the Hurricane Research Division's analog, digital and film data are just some of his duties.

In AOML's basement rest thousands of feet of 16- and 35-mm film from early hurricane flights that began in 1956. "There's a tremendous body of research there, but in a form that's difficult to use," Dorst said.

Dorst obtained a grant from the Climate Database Modernization Program of NOAA's National Climatic Data Center in Asheville, N.C., to save these data in an electronic form, which will make it easier to use for researchers and also preserve valuable and irreplaceable historical footage.

When there are hurricane warnings, Dorst not only is concerned about his personal property, but the data sitting in the laboratory's basement. "We're in a flood area, so I just seal it up and hope for the best," he said.

Dorst admits that flying into hurricanes was a big motivation for becoming a meteorologist at AOML. His first flight was into 1983's Hurricane Alicia, the first hurricane to make landfall in the U.S. since 1980 and still one of the costliest in Texas history. "It was a night flight into what was then a tropical storm," he recalled. "So I couldn't see a thing out of the window. I spent most of the flight running fore and aft in the P3 just to change the tapes we were recording the radar data on. Later I got to go on a day flight into Alicia and finally saw a hurricane eye from the inside."

Since 1983, he's flown into or around 22 hurricanes with 167 eye penetrations and flown into 12 other tropical cyclones.

Dorst said that when people learn he has flown through hurricanes they often ask about the danger. "I tell them I run a greater risk driving on I-95 than flying through hurricanes," he said. "If I didn't have the utmost confidence in the aircrews at the Aircraft
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Rose Hampton

Danny Hampton.

Danny Hampton Is the Team Member of the Month

—By Marcie Katcher

Finding key transmission sites, donating transmitters and maintaining sites for NOAA All Hazards Weather Radio are a top priority for November Team Member of the Month Danny Hampton, a weather radio maintenance contractor in central North Carolina.

Blind from birth, Hampton may be soft spoken, but his passion and commitment burn bright, allowing him to defy any obstacle. He jokes that the only thing he cannot do well is solder. "My technical staff helps me with that," he said.

Last winter, a weather radio transmitter that Hampton had installed in Garner, N.C., and was in the process of donating to the state was damaged by a 200-pound chunk of ice that fell off a television antenna 1,000 feet above it, rendering it silent.

The transmitter, installed on a platform 1,250 feet above the ground, made it possible for
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Focus On...

Restoring an Arm of Delaware Bay

—By Stephanie L. Hunt

After more than 80 years of blockage, a river in Reading, Pa., is now two steps closer to returning to its natural free-flowing



Peter Poncheri/Reading Public Museum

This small dam on Wyomissing Creek in Reading, Pa., was removed so that alewife and shad can return to spawning grounds in the creek's upper reaches.

form.

On Oct. 18, with a rippling creek backdrop, NOAA staff and members of partner organizations gathered to celebrate the removal of two small dams and the subsequent restoration of Wyomissing Creek at the site of the Reading Public Museum.

“Even small dams can prevent fish from reaching upstream spawning grounds,” said Craig Woolcott, restoration ecologist with the NOAA Community-based Restoration Program. “If they are unable to reach their spawning grounds, then populations of anadromous fish, like

alewife and shad, disappear.”

The town of Reading sits 110 miles from the ocean, but the anadromous fish that use Wyomissing Creek require both salt and fresh water for life. These fish travel along small freshwater tributaries to reach spawning grounds. Their newly hatched young use the upper reaches of the rivers as nursery areas before returning to the ocean to complete their life cycles.

By removing dams and providing fish passage at dams that cannot be removed, fish will be able to swim from the Delaware estuary all the way to Wyomissing Creek in Reading, a swim that has been blocked for generations.

Jed Brown, the Delaware River fisheries coordinator for the U.S. Fish and Wildlife Service, said he expects the restoration should be complete by 2006. “When this happens,” he said, “we’ll have American shad moving up the river.”

The dams on Wyomissing Creek were built in the 1920s to create reflection pools and waterfalls on the museum property. Scientists didn’t understand then the ecological implications of dams and river blockages. But science has progressed. Today, with bulldozers and dynamite, NOAA and its federal and local partners are tearing down dams, block by block.

In recent years, as silt built up behind the dams and large numbers of geese populated the area, water in the Wyomissing impoundments turned dirty and stagnant.

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Stephanie L. Hunt/NOAA

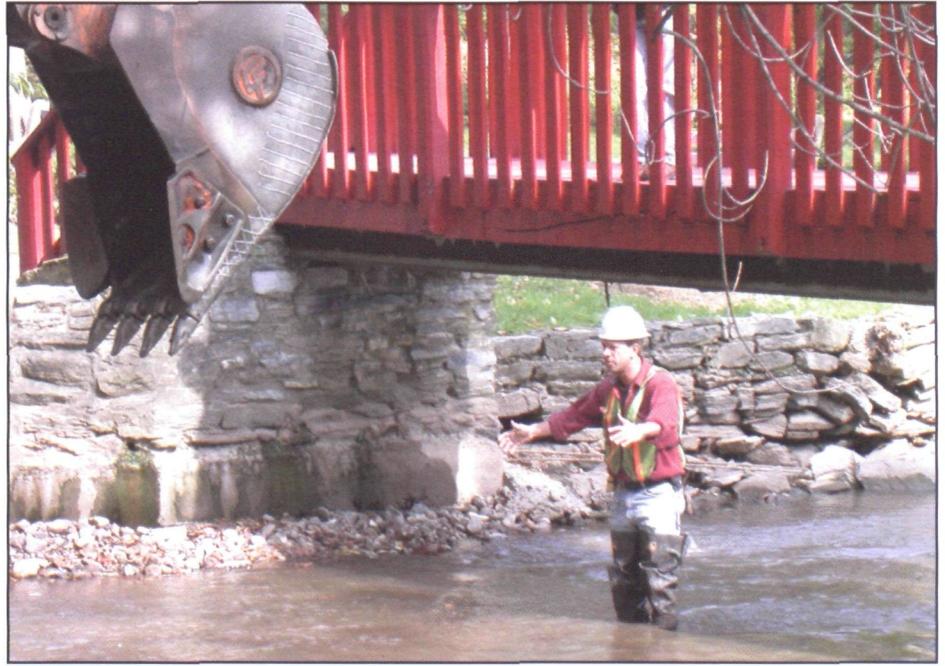
After the dam's removal, a bulldozer works midstream, pushing sand and rocks to the edge of the creek to re-center the channel and smooth out the stream banks.

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To improve fish passage and to revitalize a public area that was once an historical focal point for the Reading Public Museum, the NOAA Community-based Restoration Program provided \$50,000 last year to help fund the Wyomissing Creek restoration project.

Wrecking machines arrived on site in early September. Only five weeks later, little trace of the two dams remained. Just upstream from the site of the dedication ceremony, a bulldozer still sat in the heart of the stream. The operator swung the bucket from side to side, pushing sand and rocks to the edge of the creek to re-center the channel and enhance the stream banks. Engineers strategically placed large boulders midstream to create riffles and built stone structures at the stream's edge for fish resting habitat.

The benefits of this restoration project go beyond fish passage. In the project's next phase, native species will be planted to create a



Stephanie L. Hunt/NOAA

An engineer directs the bulldozer operator to place a large boulder midstream to create natural riffles which oxygenate the water and create additional fish habitat.

riparian forest buffer along the stream banks. The buffer will provide shade to help regulate water temperature and improve water quality by reducing sediment runoff.

During the ceremony at the site,

Tim Keeney, assistant secretary of commerce for oceans and atmosphere, lauded community efforts. "We can't accomplish the goals of this program without [non-governmental organizations], communities, volunteers and educators that are so critically important to restoration efforts."

Removing the dams at the museum allows Wyomissing Creek to flow steadily down its 30-mile path to the bay. However, just a few miles upstream of the project site, anadromous fish face two more obstacles: the Mohton and McCrea Dams. Ann Mills, executive vice president of American Rivers, said she has her sights set on those dams so that Wyomissing Creek can become "one of nature's greatest works of art, an unobstructed free-flowing stream."

"We've ended a chapter with the completion of this project, but the story is far from complete," Woolcott said. "With more than 75,000 large dams and thousands more small dams blocking rivers throughout the United States, we still have a lot of work to do." 🐟



Stephanie L. Hunt/NOAA

The restored winding shape of Wyomissing Creek provides resting areas on the edge of the creek for migrating fish.

Bolsa Chica

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Bolsa Chica and turned it into a hunting site for waterfowl. The club caused significant damage to the marshes by blocking the ocean entrance, eliminating tidal flow and draining the water from the majority of the wetlands.

In the 1920's, just as the gun club was about to close, oil was discovered at Bolsa Chica and production wells began appearing everywhere.

And while the immediate impact of the oil drilling continued to damage the wetlands, it was this strike that eventually saved Bolsa Chica from further commercial development.

As Bolsa Chica continued to produce oil, posh housing developments sprouted up nearby in Huntington Harbor and Newport Beach, eliminating healthy wetlands. Then in the 1970's, a land developer purchased 2,000 acres at Bolsa Chica for \$20 million to build approximately 11,000 homes on one of the last undeveloped stretches of beachfront in exclusive Orange County.

"The reason the Bolsa Chica stayed around so long and was free from development was because it was a functioning oil field," said Shirley Dettloff, former mayor of Huntington Beach and one of the founders of Amigos de Bolsa Chica, a grassroots organization to save the wetlands. "And though oil can be detrimental to a wetlands system, in this case it really was responsible for saving the wetlands."

In the 1970's, the public's attitude towards preserving the environment began to gain momentum. Legislation such as the state Coastal Act and the federal Coastal Zone Management Act was passed that made it more difficult for wetlands to be destroyed without the approval of state and

federal agencies.

The new legislation provided environmentalists the ability to file lawsuits to stop development of the remaining wetlands. But for 20 years a solution to litigate or otherwise resolve the competing interests remained illusive.

In the 1990s, neither landowner nor environmentalists were pleased with the stalemate. The owner was out millions of dollars for the land that couldn't be developed, and the environmentalists had only kept construction of homes from occurring with little hope of retaining or restoring the wetland areas.

"Something needed to be done to resolve the issue," Hoffman said. "One idea was to purchase the land from the developer. The problem was where do you come up with the money to buy it?"

The answer lay just north of Bolsa Chica in Los Angeles and Long Beach, one of the busiest port complexes in the world.

The ports are constantly constructing new shipping terminals and storage facilities to enhance their ability to receive and ship cargo. This development impacts marine resources and the habitat within the port area. Regulations may allow this negative impact to occur if an environmentally similar area is restored directly by the developer or through the purchase of "mitigation credits."

So Hoffman, along with Jack Fancher of the U.S. Fish and Wildlife Service and Jim Trout from the California State Lands Commission, helped craft an agreement with the two ports that exchanged future mitigation credits for \$79 million. The agreement allowed the federal government to purchase the Bolsa Chica wetlands in 1995.

In 1996, a Bolsa Chica restoration committee was formed that included members of the eight state and federal agencies with a stake in the restoration, including

Hoffman.

"Every wetland restoration has its own problems, but this one was the worst," Hoffman said. "It's got every problem known to man other than having nuclear waste on it."

But the results should be well worth the effort.

"Right now the wetlands that need to be restored are high and dry," Hoffman said. "The goal is to return it back to a fully functional wetland with a full tidal system associated with much of it. Once tidal influence is restored, almost immediately you will have 30 species of fish return, some of which are of direct commercial or recreational importance.

"So what we're expecting and what we've seen in other wetland restoration projects are large populations of halibut established," Hoffman said. "They will likely do well, spend their first year in the wetlands and go back into the ocean to continue their life cycle."

Those who have been involved since the beginning to save the wetlands say there is now a sense of fulfillment. "I think we reached our goal," Dettloff said. "There are not many environmentalists who can say we worked hard for something that then became a reality."

"The only reason this thing worked was because of the people that were involved," Hoffman said. "The Jack Fanchers, the Jim Trouts, the Shirley Dettloffs. None of us individually could have done this project. It has just been a unique combination of people, and without that combination, it never would have happened."

"Today marks the end of a lengthy, tedious process to save and acquire this critical habitat and the beginning of a new era of rebirth," Bustamante said at the groundbreaking. "To everyone, all of you here, who have played a role in bringing us to this day, congratulations, and let's keep working!"

Navigation

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following a maritime accident or a major storm like Hurricane Ivan.

"We are frequently called to perform these surveys because we can respond quickly, usually within hours," said David Elliott, team leader for NRT 2.

The Port Canaveral survey was one of dozens of hazardous obstruction surveys carried out by the navigation response teams throughout the southern United States this hurricane season.

"This is one of the meanest seasons we have ever had," said Elliott, who has worked on NRTs for 28 years. "We have had hurricanes that were rougher, but generally we talk about one response a season, maybe two. This is incredible."

"Surveying Port Canaveral took about 10 hours because it has a longer entrance and a longer canal," Elliot said. "Something smaller like Fort Pierce in West Palm Beach took us about four or five hours."

NRTs may also need to call in the help of other NOAA offices, including the NOAA Ocean Service's Center for Operational Oceanographic Products and Services, which provides tide and water level information.

During the Port Canaveral survey, NRT 2 found a new 30-foot shoal at the entrance of the port's canal. "We were able to identify the obstruction, and the Coast Guard directed boats around the shoal until it could be fixed," Elliott said.

NRTs frequently work around the clock, as they did during this hurricane season, leaving their families and belongings behind.

"The biggest challenge we face when conducting a survey is lodging," said NRT 1 team leader Mark McMann, who invited his

teammates to stay with him when Ivan ruined their homes.

Elliott was without power at his residence for more than a week. "During Hurricane Frances a tree fell on my house and we lost our electricity," Elliott said. "I had to leave to conduct surveys, and my family was left in the dark until I came back about a week later. A team member helped me cut the tree off of the house." Just a few days later, Elliott left to conduct surveys following Hurricane Ivan.

NRTs receive much support from other parts of NOAA to complete their missions. When Kathryn Simmons, team leader for NRT 3, flew into Florida from Washington state to assist NRT 5 during Hurricane Ivan, she said NOAA Fisheries provided office space and technical support, while the Ocean Service's National Geodetic Survey provided a liaison between the team and the Florida Emergency Operations Center.

"We had a great support system," Simmons said. "It was a true team effort with all of the line offices working together to achieve a common goal."

The National Geodetic Survey also coordinated police escorts for the team through Alabama and Mississippi. "These escorts proved extremely valuable when it came time to buy gasoline for our vehicles," Simmons said. "In Florida, they took us to their own service depots for gasoline. And in Alabama, we were able to move to the front of a four-hour waiting line for gas."

Even though the "meanest" hurricane season in memory got a bit kinder after Hurricane Jeanne, the navigation response teams remain on alert. "We are only half way through the hurricane season," Elliott said. "We never know when we will get a call or when another hurricane will strike, but we will be ready to assist when needed."

Severe Storms Lab

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fascination with tornados.

"The 1996 movie 'Twister' was written about the Severe Storms Lab and work we had done in the early 1980s with the University of Oklahoma putting TOTO, an instrumented 55-gallon drum, in the path of a tornado from the back of a pickup truck," said NSSL Deputy Director Kevin Kelleher. "Of course it was embellished with Hollywood kinds of things, but the underlying premise was the work and research that the lab had done."

NSSL's greatest asset has always been its people and a clear focus on its mission.

"I was in Connecticut before I came here," said Edwin Kessler, founding director of NSSL who served until 1986. "My friends in Connecticut would say, 'You're going to Oklahoma? Why? Where's that?' I said, look, you may not know it, but to be the director of the National Severe Storms Laboratory, the national center of severe storms research, no meteorologist could aspire to more than that."

"Over the past two decades, being a scientist at the laboratory has allowed me to do research and help others to do research that has not only increased scientific knowledge but has improved forecasting," said Dave Rust, chief of the lab's Forecast Research and Development Division.

"This is the place that I think anybody would want to be if they did severe storms work," said Terry Schuur, research meteorologist with the Cooperative Institute for Mesoscale Meteorological Studies working at the lab. "I think it's a tremendous opportunity because I work with some of the best people in the field and frankly I can't think of any place I'd rather be working."

Dorst

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Operations Center, I wouldn't be doing this."

Thousands of people are familiar with Dorst's work, even though they don't know who he is. As the webmaster for the Hurricane Research Division's tropical cyclone "frequently asked questions" page written by NOAA hurricane scientists Chris Landsea and Stan Goldenberg, Dorst organizes, formats and updates a great deal of the material and even writes some of the answers in addition to creating some of the illustrations.

"Chris [Landsea] started the page when he was a doctoral student to explain some of his work," Dorst said. "Then it just grew."

Each season, new questions and answers appear. These are drawn from the questions Dorst and others are asked repeatedly. He has even gone back and rewritten some of the answers.

"Some of the original answers were rather technical, which is as they should have been, because it wasn't really designed for a general audience," he said.

But as more and more people began using the Web and looking to the FAQ page for answers, Dorst and the authors began to "retrofit" the questions to meet the demand of students and the general public.

"Neal has done a fantastic job in putting together the FAQ page in a way that helps the public better understand these storms," Landsea said.

That art degree is also still in use. A painting of his, "Hurricane Andrew," is displayed outside the laboratory's library.

Dorst has spent his entire 25-year career at AOML. "I'm quite happy here. I wouldn't be doing this if I didn't find it fascinating," he said. ▬

Hampton

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NOAA Weather Radio broadcasts to reach counties in the Raleigh-Durham area, including tornado-prone Johnston and Wayne Counties, which had previously been out of reach of the signal.

"From a maintenance perspective, the Garner site required a special skill set to work on a platform over 1,200 feet above ground level," said Ron Simpson, a Weather Service electronic systems analyst in Raleigh. "When you're at the base of the tower and look up at the tiny platform, knowing you have to climb forty feet to the small elevator that will tow you skyward, it's a chilling experience."

"I knew severe storms were threatening the area the next day, and I was determined to make sure the transmitter was operational," Hampton said. "We have people in our community that totally rely on that NOAA transmitter. I was determined to make sure it worked."

"By the time I contacted Danny about the damaged transmitter, he was already on his way to solve the problem," Simpson said. "He and his helpers had ascended the tower and retrieved the damaged transmitter. My expectation was it would take a few weeks to repair. Transporting goods and services was extremely slow, so getting new parts to repair any transmitter would be difficult. With another storm approaching, I was very concerned about the situation. Once I contacted Danny, 'mission impossible' became 'mission possible.'"

Hampton had salvaged parts from another transmitter and started the process of unsoldering wires and components. The next step was to bend and hammer twisted pieces of metal to rebuild and realign the transmitter.

"The damage was sheer carnage. But after working all night, I was able to get the transmitter back up the 1,250-foot platform before the severe weather hit the next afternoon," Hampton said. "People always question how a blind person can service such a high installation. My answer is simple. I just do not look down."

His wife Rose reads the schematic diagrams in the technical manuals while Hampton memorizes specific information needed to repair and align the equipment.

"I can tell you how each part of the circuitry operates in the equipment that I maintain. I have to memorize where the parts and adjustments are on the circuit boards within the equipment so that I can properly maintain it without sighted help," he said. "Life has taught me three important lessons: Never give up, cultivate patience and give back to your community."

"Danny is the best example of the phrase 'service before self,'" Simpson said. "His dedication to the mission of the National Weather Service is a shining example to us all."

"Whenever NOAA All Hazards Weather Radio saves a life, it makes all my efforts worthwhile," Hampton said. ☺

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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

National Oceanic and Atmospheric Administration

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