

# Air

## Forecasts Calling for...

As part of its Air Awareness Program, the Division of Air Quality has expanded North Carolina's air quality forecasting program. Air quality forecasts for ozone are now available for seven metropolitan areas across the state. In 2003, DAQ added particle pollution to the air quality forecasts for the Charlotte metropolitan area. Today, air quality forecasts for particle pollution are available for six metro areas in North Carolina.

The purpose of the Air Awareness Program is to increase public awareness about air pollution, its causes and ways to prevent it. Both ozone and particle pollution can cause health problems, especially among high-risk groups. Air Quality's color-coded forecasts make it easy for people to know when they may want to consider limiting strenuous activities, as well as what they can do to reduce both ozone and particle pollution.

## Positively Electric

In October 2004, 50 new parking spaces were installed at a truck stop in Orange County. Why is that newsworthy? These weren't just any parking spaces – they were electrified parking spaces! Diesel trucks account for a lot of air pollution in the state, and not just when they are on the road. Truck drivers must rest 10 hours for every 11 they drive, and many drivers, understandably, want to be able to use the heater, air conditioner, phone and Internet during these hours. That means that many of drivers idle their trucks while they are parked at truck stops. The electrified truck stop in Mebane allows drivers access to all of what they need without idling their engines.

The project was made possible through a grant from the National Association of State Energy Offices. The Division of Air Quality administered the grant in North Carolina. This makes sense, since the new facility prevents about 2,732 tons of carbon dioxide, as well as several other pollutants, from going into the air each year. In addition, truckers save money on fuel.

*Clean Air Clair and the Clean Air Maniac are mascots for the N.C. Division of Air Quality's Air Awareness Program. N.C. Division of Air Quality.*



*This electrified truck stop helps reduce air pollution caused by idling. N.C. Division of Air Quality.*

*EQ facility the day after the incident. N.C. Division of Waste Management.*



# Fire

## On the Scene – The EQ Fire

Who gets called when there is a fire? The fire department, of course, but sometimes divisions in the Department of Environment and Natural Resources get called as well. Several received calls in October 2006 after an explosion at the Environmental Quality (EQ) chemical storage plant in Apex. The toxics branch of the Division of Air Quality, Division of Water Quality staff and the Division of Waste Management's Hazardous Waste Section all became involved in the incident.

The air toxics team had set up air quality monitors surrounding the scene by daybreak the morning after the fire. They also carried out a study on the possible deposition of pollutants on homes and businesses located near the plant.

Division of Water Quality staff arrived at the scene in the early morning hours following the explosion and fire. Though they were not allowed to get onto the property right away, they went to a creek downstream of the plant and immediately took samples to measure for metals, pesticides and other potentially harmful contaminants.

Once they were allowed on the scene, they took additional samples and had their first chance to examine the berms that the firemen and others had built around the site to trap firefighting water and prevent runoff into nearby storm drains. The water quality samples taken downstream of the site came back clean, thanks to the effective job that first responders did to prevent negative water quality impacts.

The Division of Waste Management's Hazardous Waste Section was involved with the EQ fire and its aftermath longer than any other division. It was this agency that investigated the facility and the incident and ultimately levied fines against the company in 2007. In response to the incident, Gov. Mike Easley appointed a Hazardous Materials Task Force that recommended legislation that was passed in June 2007. The Hazardous Waste Section immediately began implementing this legislation, which enhanced financial, information-sharing and technical regulatory requirements for commercial hazardous waste facilities.

*Evans Road fire, looking north, up Evans Road to Lake Phelps. This was the western boundary of the fire. Vince Carver, U.S. Fish and Wildlife.*



## The Evans Road Fire

You know something is amiss when people on North Carolina's coast are hoping for a hurricane. After fighting the Evans Road Fire for two weeks, however, the Division of Forest Resources' emergency response crews would have welcomed a tropical storm. "It's not that we want the damage from a strong tropical storm," said Brian Haines, division spokesperson, "but we could use the rain."

The fire was initially reported on June 1, 2008. A lightning strike had sparked the fire in Hyde County. Fueled by wind and exacerbated by the state's worst drought in recent history, the blaze quickly spread over 40,000 acres. The Division of Forest Resources was on the scene as soon as the fire was reported and worked for months to bring the blaze under control. Firefighters from across the country joined them, bringing bulldozers, helicopters and planes to help put out the fire.

The blaze on the ground was only part of the concern. The Division of Air Quality measured particle pollution levels that were 30 to 60 times higher than the air quality standard. Emergency dispatchers all the way in Raleigh were getting hundreds of calls from people concerned about the smoke. Code red air quality alerts were issued for the Triangle, and code orange alerts were issued as far west as Winston-Salem. The DAQ also began issuing air quality smoke forecasts for the coastal region for the first time. The blaze was 100 percent contained on Sept. 24, 2008.

# Water

## What's Your River Basin?

Everyone lives in a river basin, which is why it's a great concept with which to connect people to their natural environment. The N.C. Office of Environmental Education has been producing the Discover North Carolina's River Basins booklet since 2001. There are also brochures - one for each of the 17 basins in our state - that accompany the booklet. In 2007, a page was added to each of the river basin brochures letting folks know where they can hike, bike and paddle in each basin. This was done to expand the audience to whom the materials go, and also to help illustrate the importance of water quality and natural resources to the state's recreation economy.

You may have noticed river basin signs posted along highways in North Carolina. These were created through a partnership between the Office of Environmental Education and the N.C. Department of Transportation. Signs in each of the state's 17 river basins call attention to basin boundaries and promote stewardship of public waters.

## Improving Richland Creek

In 2006, Richland Creek in Haywood County was placed on North Carolina's list of impaired waters due to bacterial contamination more than 10 times the allowable water quality standard. The Division of Water Quality began working with the local government and community interest groups to locate the sources of contamination. Failing sewer lines and septic systems were identified and repaired, and a door-to-door survey revealed additional septic system failure as well as straight-piping violations.

Repairs were made, and cost-share programs were used to help low-income homeowners get financial assistance to make necessary fixes. As a result of more than 200 water samples taken, seven sewer leaks, four sewer overflows and 12 failing septic systems were identified and repaired; 18 gray water discharges were removed; and two farms implemented best management practices to reduce the bacterial impacts of their sites. Bacterial levels are now near compliance levels, and Richland Creek will soon be removed from the list of impaired waters.

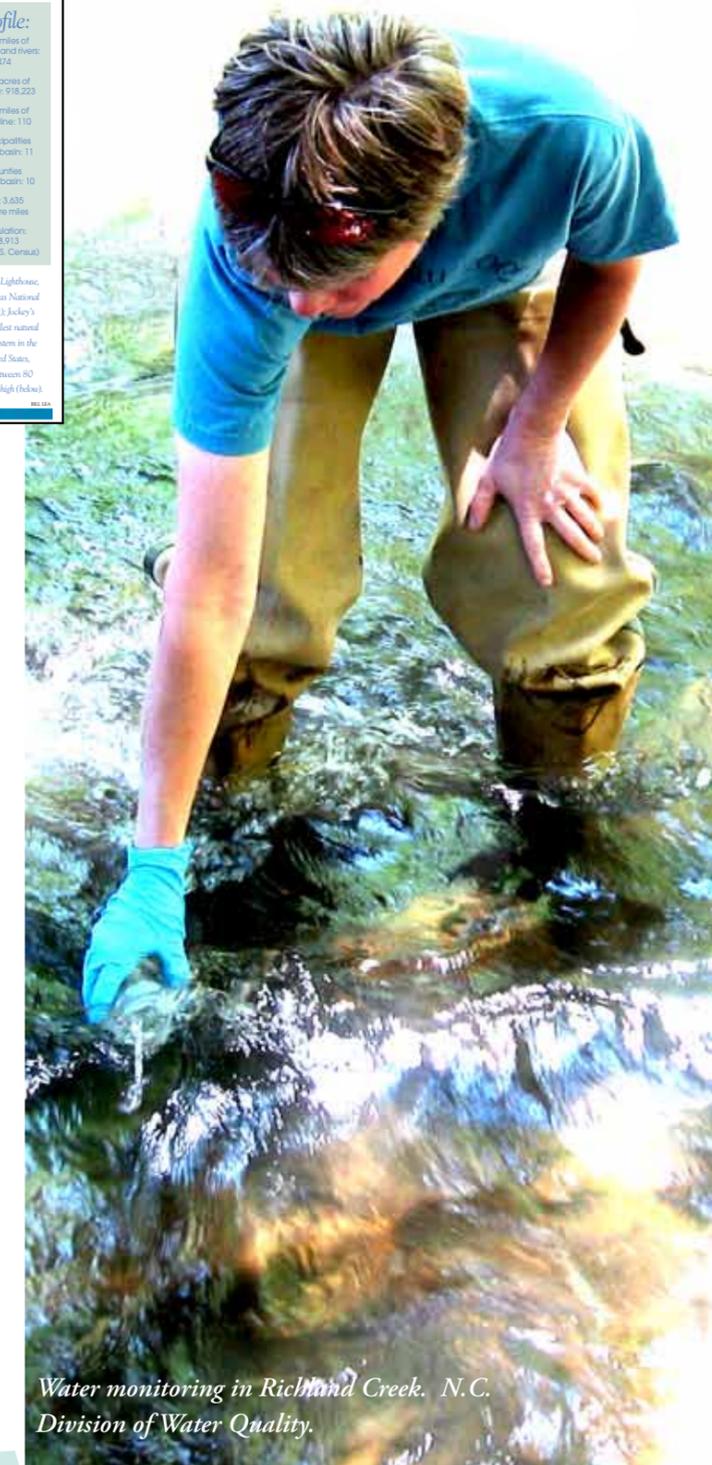
*The Office of Environmental Education's brochure for the Pasquotank River Basin.*

**PASQUOTANK RIVER BASIN**

What North Carolina river basin is 41 percent water, contains more national wildlife refuges than any other and has the fewest people? If you guessed the Pasquotank River Basin, you're right. But these facts probably escape the notice of the millions of visitors who flock to the basin's Outer Banks every year. They need only the region's reputation for unsurpassed beauty and rich natural heritage to entice them.

**profile:**  
Total miles of streams and rivers: 474  
Total acres of estuary: 918,223  
Total miles of coastline: 110  
Municipalities within basin: 11  
Counties within basin: 10  
Size: 2,635 square miles  
Population: 118,913 (2000 U.S. Census)

Roanoke Island Lighthouse, Cape Hatteras National Seashore Light, Jockey's Ridge, the nation's largest sand dune system in the eastern United States, fluctuates between 80 and 120 feet high (below).



*Water monitoring in Richland Creek. N.C. Division of Water Quality.*

# Animal, Vegetable Mineral

Animal, vegetable or mineral? All things are supposed to fit into one of these categories as a simple way to make sense of the world. Whether discovering new species, exploring the miles traveled by our produce or displaying the gems of North Carolina, the Department of Environment and Natural Resources is intimately familiar with all three categories.

## Animal

### Tracking Sea Turtles

North Carolina is fortunate in that five of the seven species of sea turtles visit our shores. The most common to nest on North Carolina's beaches is the loggerhead. All sea turtles are currently listed as either endangered or threatened under the Endangered Species Act, and several Department of Environment and Natural Resources agencies are working hard to study and protect these majestic creatures.

The N.C. Aquariums each run a sea turtle rehabilitation program where injured turtles found on the beach can be nursed back to health. In 2003, staff began tracking some of the loggerheads being released through the use of satellite transmitters. Satellite signaling devices are attached to the turtles' shells, which allow both scientists and the public to track their travels. A sea turtle's life is spent almost exclusively at sea, so satellite tracking technology allows humans to follow along on a journey that was once a complete mystery.



*A loggerhead sea turtle is released with a satellite-signaling device attached to its shell. N.C. Aquariums.*



*A loggerhead hatchling can fit in the palm of your hand.  
Photo by Claire Aubel, N.C. Aquariums.*

The only time adult sea turtles do spend time on the beach is when females crawl out of the water to lay their eggs during the summer months. Their foray toward and onto land can sometimes put them in harm's way. It is often the role of department divisions to try and strike a balance between natural resource preservation and economic needs. Issues surrounding sea turtles provide an excellent example of the work that goes toward finding such a balance.

The Division of Marine Fisheries hosted a sea turtle workshop in 2001 to promote an exchange of information regarding sea turtles and the hazards they face near shore. In the late 1990s, large numbers of sea turtle deaths caused the National Marine Fisheries Service to close Pamlico Sound to large-mesh gill net commercial fishing. Since that time, the DMF has worked to get permits that would allow fishermen to be able to continue their traditional shallow-water gill net fisheries while monitoring the turtle population. They have also been working with other groups in researching various fishing methods to find which are safest for turtles while still providing an efficient way of catching fish. The goal of the DMF is to protect both sea turtles and North Carolina fishermen.

### A Mosquito by Any Other Name...

Some folks would be offended to have a mosquito named after them, but not Dr. Bruce Harrison of the Division of Environmental Health. In 2007, he was honored for his many contributions toward understanding the mosquito genus *Anopheles* by having a species in this genus named after him, *Anopheles harrisoni*. That's not the first time, either. Dr. Harrison's name can be found on four species and one genus of mosquito and one species of chigger!

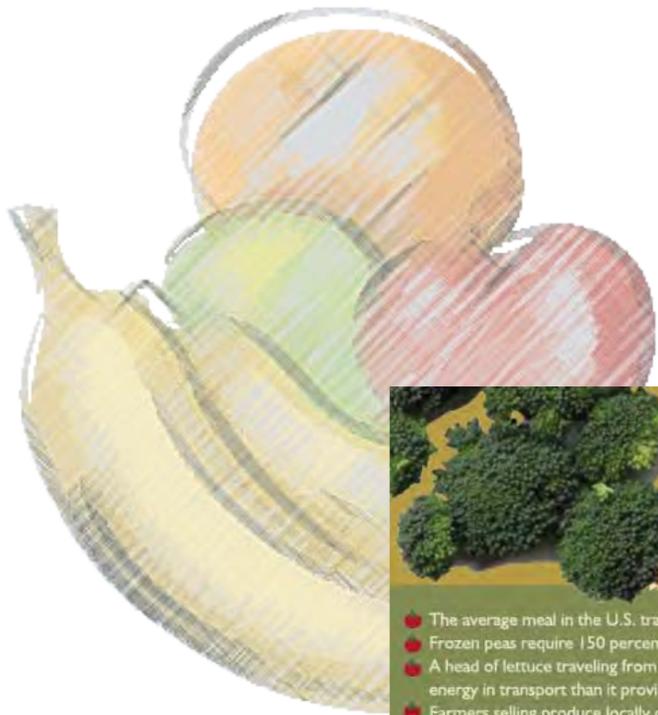
"For the last 43 years, I have worked on the prevention of human diseases that are transmitted by insects," said Harrison. "This vocation has been exhilarating as it allows me to travel, meet people, work outdoors and, last but not least, learn something new every day." Dr. Harrison has worked to improve the surveillance and control of mosquito- and tick-transmitted diseases in North Carolina. He assisted the Centers for Disease Control and Prevention with mosquito surveillance following Hurricane Katrina. "Bruce Harrison is one of the premier mosquito toxicologists in the world," said Dr. Charles Apperson, William Neal Reynolds Professor of Entomology at North Carolina State University. "He is a tremendous person and a valuable resource in the area of vector biology and management. We are very lucky to have him in North Carolina."

### A New Order

You have to look hard to find something only one-half inches long in the coastal rain forests of Southern Alaska and British Columbia, Canada. Rowland Shelley, curator of terrestrial invertebrates at the N.C. Museum of Natural Sciences, and his colleagues didn't just find something on an expedition funded by a grant from the National Geographic Society. They discovered a brand new order of millipede, the first for a millipede new to science since 1894!



*Millipede discovered by Rowland Shelley.  
Photo by Art Bogan, N.C. Museum of  
Natural Sciences*



# Vegetable

## Local Produce

The food we eat nourishes us and gives us energy to live. The food we eat also needs energy to be grown, raised transported and stored. Many factors play a part in determining the environmental consequences of food. One factor that can have quite an impact is where our food comes from. Was it raised locally, or did it travel great distances to reach our table?



*The Office of Environmental Education's produce postcard.*



The Office of Environmental Education developed local produce information postcards for distribution at farmers markets, local shops and other sites as part of its Informed Consumer Initiative. This initiative does not tell people what to buy or where to buy it, but rather highlights many of the issues surrounding our everyday actions and choices and the costs and benefits associated with them.

## Agriculture Cost Share

Nonpoint source pollution is the primary source of degradation of North Carolina's streams and rivers. Agricultural activities can be a major source of such pollution, which is why the Division of Soil and Water Conservation launched the Agriculture Cost Share Program in 1983. The program was originally piloted in a 16-county area, but due to the program's success has since been extended to all 100 counties in North Carolina.

Through the Agriculture Cost Share Program, participating farmers receive up to 75 percent of the average cost for installation of best management practices aimed at keeping valuable soil and nutrients on farmers' fields and out of waterways. These include projects such as sediment control basins, riparian buffers and stream restoration. Technical assistance is also provided. From 2001 through 2008, the Agriculture Cost Share Program has kept 1.9 million tons of topsoil and 13 million pounds of nutrients out of area waters.

*A field border (seen on the left-hand side of the photo) is one of the many sediment and nutrient management measures that farmers can use to protect water quality. N.C. Division of Soil and Water Conservation.*



# Mineral

## North Carolina Treasures

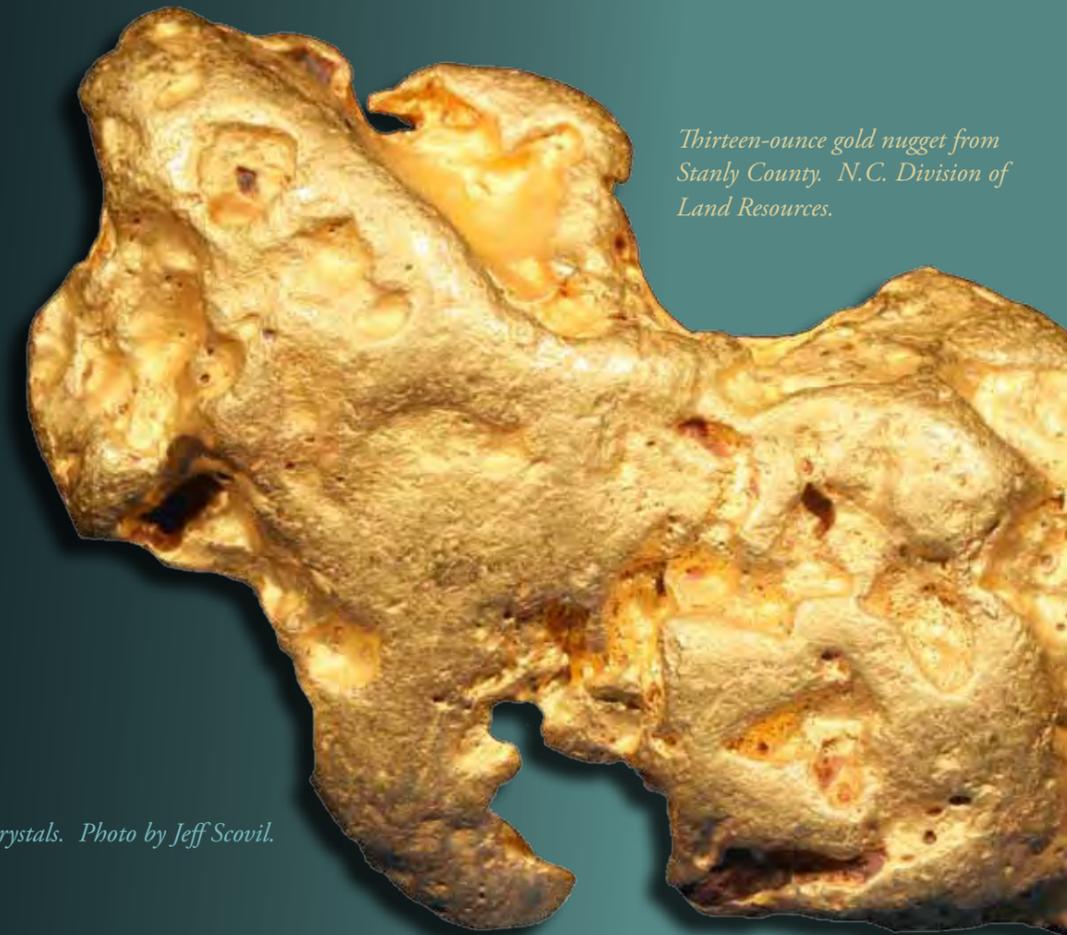
North Carolina's incredible geologic diversity has created spectacular treasures—emeralds, rubies, sapphires, gold and more—that were formed in darkness, underground, over millions of years. They are the history of the ground we walk on, Earth's original buried treasures.

With an unmatched eye for beauty and a remarkable knowledge of North Carolina geology, an anonymous collector amassed an amazing array of these gems and minerals. The collection comes from all over the state, many specimens from mines that no longer exist. In 2004, the N.C. Museum of Natural Sciences presented Treasures Unearthed, giving the public their first chance to view this stunning assortment—the largest collection of North Carolina's gems and minerals ever displayed.

This was the first exhibit to be completely created by museum staff, a process that involved building display cases, a recreated gold mine and a hands-on learning lab, as well as intricate detail work such as creating mounts for the various gems. They did such a fabulous job that, at the close of the exhibit, the owner was determined that his collection would be permanently housed at the museum. In 2006, the museum unveiled the permanent North Carolina Treasures Collection.



*Bright red rutile with tiny quartz crystals. Photo by Jeff Scovil.*



*Thirteen-ounce gold nugget from Stanly County. N.C. Division of Land Resources.*

# The Art of Natural Resource Conservation



North Carolina's incredible natural resources have been an inspiration to countless artists. Painters, photographers, sculptors — all have been moved to create art based on what they saw in the natural world across our state. The Department of Environment and Natural Resources seeks not only to highlight this art, but also to encourage its creation as well.



*Wood duck photo by Carmen Johnson. 2007 first place winner in aquarium photo competition.*

## Underwater Photo Contest

Each year the N.C. Aquariums highlight the state's aquatic diversity by hosting an underwater photo contest. Images can be submitted that were taken off of North Carolina's coast, within the state's freshwater system or at one of the three aquariums.



*Blackbar soldierfish photo by Chris Smith. 2007 first place winner in underwater photo contest.*

## Arbor Day Poster Contest

Every year the Division of Forest Resources, in partnership with the National Arbor Day Foundation, has hosted an Arbor Day Poster Contest for fifth grade students.

*Preston Willen of Fayetteville accepts his award as the North Carolina winner of the 2008 National Arbor Day Poster Contest.*



*The Schooling Spadefish sculpture greets visitors to the N.C. Aquarium at Pine Knoll Shores, N.C. Aquariums.*

## Schooling Spadefish

Sculptor David Turner's 15 Atlantic spadefish grace the outside of the N.C. Aquarium at Pine Knoll Shores. The sculpture is cast out of bronze and weighs 3,000 pounds.



*First place in Peaks, Valleys & Plains  
by Scott Hotaling.*

## **Wildlife in North Carolina Photo Competition**

In 2005, the N.C. Museum of Natural Sciences teamed up with the N.C. Wildlife Resources Commission to sponsor the inaugural Wildlife in North Carolina Photo Competition. Winning images were placed on exhibit at the museum.

*Honorable Mention in Youth Photographer  
13-17 category by Michael McCloy.*



*Stone that stands in an Empty Sky sculpture detail.  
N.C. Zoo photo.*

## **Zoo Art**

The N.C. Zoological Park has been committed to creating a climate that recognizes the potential for artists, art works and arts programming to enhance the zoo's vision. The zoo sees art as a "sensory bridge," connecting visitors to the zoo experience and expanding their appreciation and awareness of the natural environment.



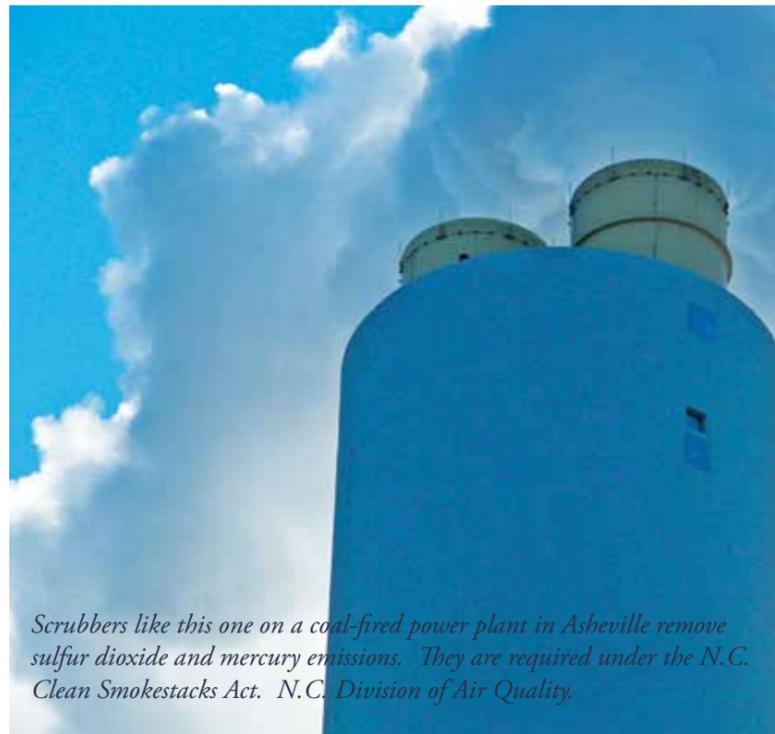
*Catamount bronze sculpture in the zoo's  
cypress swamp exhibit. N.C. Zoo photo.*





# And the Award Goes To...

Over the past eight years, Department of Environment and Natural Resources staff members and programs have been the recipients of numerous awards. Below are just a few of the highlights.



*Scrubbers like this one on a coal-fired power plant in Asheville remove sulfur dioxide and mercury emissions. They are required under the N.C. Clean Smokestacks Act. N.C. Division of Air Quality.*

## An Air of Excellence

In 2004, the Division of Air Quality staff accepted an Environmental Protection Agency Clean Air Excellence Award on behalf of North Carolina for the Clean Smokestacks Act. According to the EPA, this act serves as a nationwide model for controlling multiple air pollutants through a partnership of state, business and environmental groups.

The Clean Smokestacks Act was adopted in 2002. Under this legislation, coal-fired power plants must achieve a 77 percent reduction in nitrogen oxide emissions by 2009 and a 73 percent reduction in sulfur dioxide emissions by 2013. These reductions are meant to significantly reduce ozone, haze, fine particles and acid rain as well as help safeguard public health, improve visibility and protect the environment. At the time of its passage, the Clean Smokestacks Act went above and beyond the federal rules that only applied during the April through October ozone season and allowed utilities to buy or trade pollution credits from other states instead of cutting their own air pollution. North Carolina's act required utilities to cut their emissions year-round and did not allow pollution credit trading.

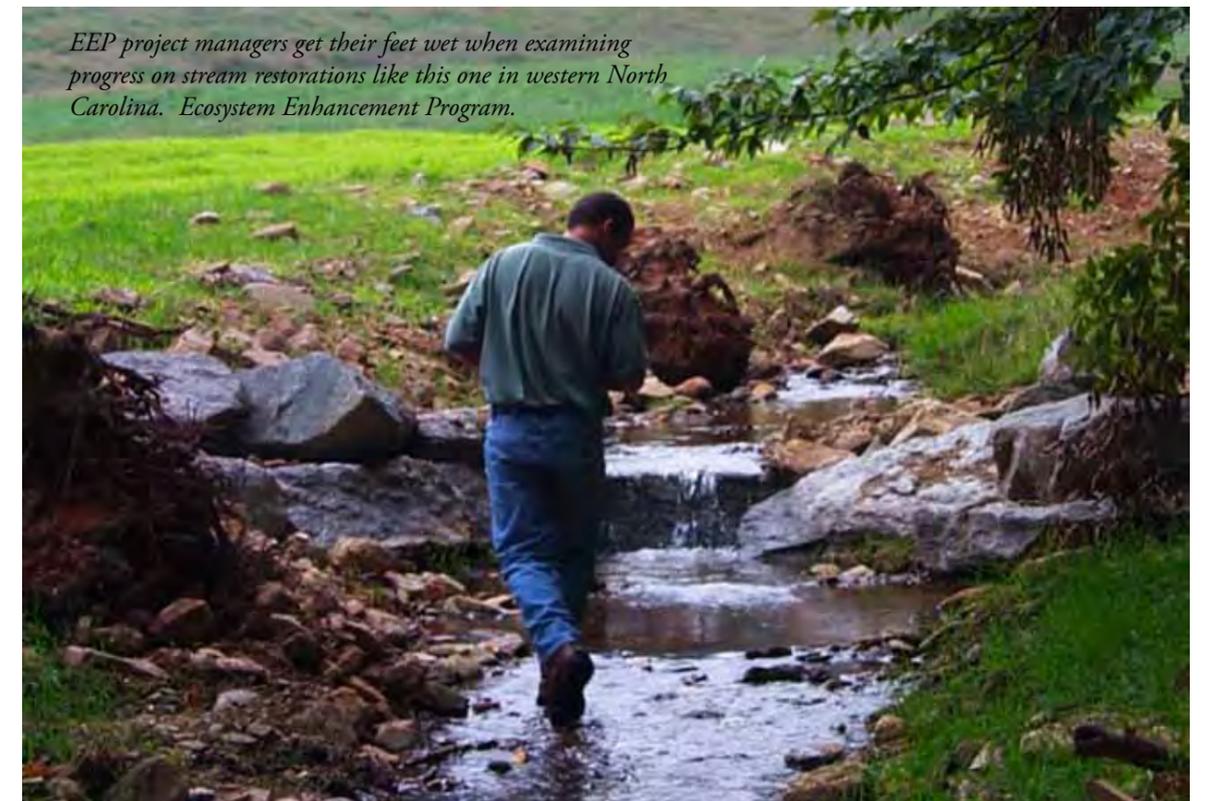
## SwEEPing Up the Awards

And the award goes to...the Ecosystem Enhancement Program! It seems to happen over and over again. The Ecosystem Enhancement Program, or EEP, officially began operations in 2003. Since then it has been the recipient of numerous prestigious awards. In both 2005 and 2007, EEP was designated as one of the 50 top new government initiatives in the United States by the Ash Institute for Democratic Governance and Innovation at Harvard's Kennedy School of Government. The Innovations in American Government Awards given by the Ash Institute are considered to be the "Oscars" of government awards. As the director of the awards program put it, "These 50 programs – which touch the lives of so many people across the street and around the world – offer a very compelling snapshot of what is right, good and uniquely innovative in American government at every level today."

The Ash Institute selected the 50 programs from more than 1,000 that applied. Programs were judged on the basis of creativity, effectiveness in achieving tangible results, significance in addressing important problems of public concern and promise in inspiring successful replication in other states. "We spent a lot of time as a staff discussing the best way to tell our story in a manner that would be readily understood by the selection committee," said Tad Boggs, EEP communications director. So, how did they distill the complexity of what EEP does on a daily basis into a simple explanation? "North Carolina's Ecosystem Enhancement Program addresses a problem familiar to every state in the nation: achieving responsible economic development while simultaneously restoring, enhancing and protecting the environment...North Carolina would make the state's environmental agency – not its transportation agency – the watchdog over offsetting the unavoidable environmental effects of new transportation infrastructure."

In 2005 EEP was recognized again for its innovation by the National Association of Environmental Professionals with its Environmental Excellence Award in Planning Integration. This award acknowledged EEP's plan to offset growth, development and loss of wildlife habitat in the Pasquotank River Basin. It was also in 2005 that the Council of State Governments recognized EEP through its Innovations Awards Program.

It was perhaps upon winning the title of Natural Resource Agency of the Year through the Governor's Conservation Achievement Awards in 2006, however, that the true meaning and impact of EEP's work was best expressed. T. Edward Nickens of the N.C. Wildlife Federation presented the award. In an effort to get to the heart of what EEP does, he put it this way. "When you stand at the confluence of the Uwharrie and the Little Uwharrie rivers in Randolph County, and the wild pink azaleas are in bloom, and white indigo flowers are open, and you reach down to touch a rare Carolina creekshell mussel, you are there because the Ecosystem Enhancement Program works."



*EEP project managers get their feet wet when examining progress on stream restorations like this one in western North Carolina. Ecosystem Enhancement Program.*

## On the Leading EDGE

In 2005, the Prairie Ridge Ecostation open-air classroom received the Triangle Business Journal's EDGE Award. Designed by architect Frank Harmon, the classroom was selected as the "project that best exemplifies environmental sensitivity." The 1,400 square foot structure was indeed built to have a minimal impact on the environment. The structural lumber used is what is known as parallel strand lumber, a composite of many smaller trees, which reduces impacts on old-growth forests. The concrete masonry units in the foundation are made from 100 percent recycled material. The building has a south-facing overhang to maximize sun exposure, a cistern that captures rainwater that is then used to flush toilets, and will soon be submitted for LEED certification. Quite edgy, indeed!

*Outdoor classroom at Prairie Ridge. Courtesy of Frank Harmon Architect, PA.*



## Safety is No Accident

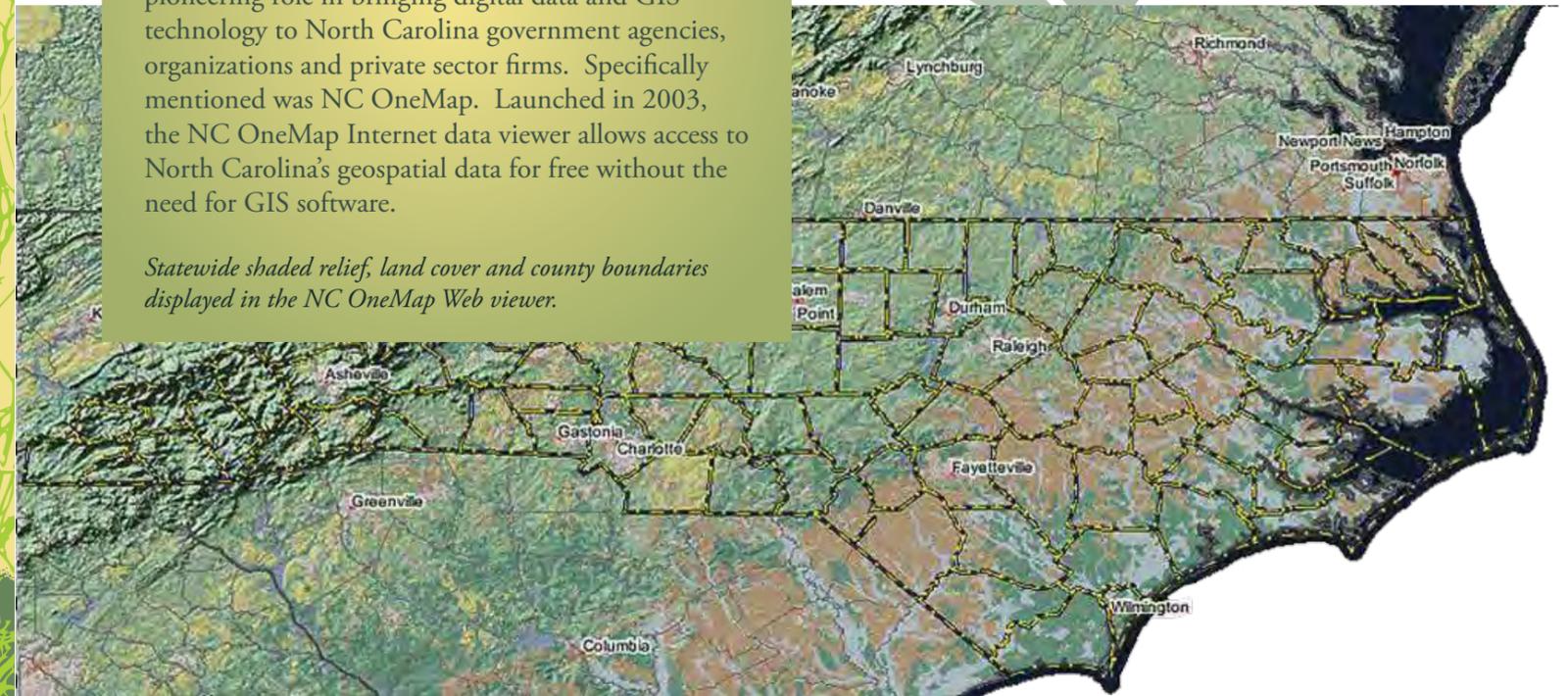
In August 2006, the Division of Waste Management became the first state agency to be honored by the N.C. Department of Labor's workplace safety program. The Carolina Star program reserves its Public Sector Star Worksite awards for those local governments and state agencies that have achieved outstanding safety performance and have shown a commitment to preventing workplace injuries. The Division of Waste Management has staff working in such areas as hazardous waste, Superfund and landfills, just to name a few, making workplace safety especially important to the division.



## It's Good to Have a Plan

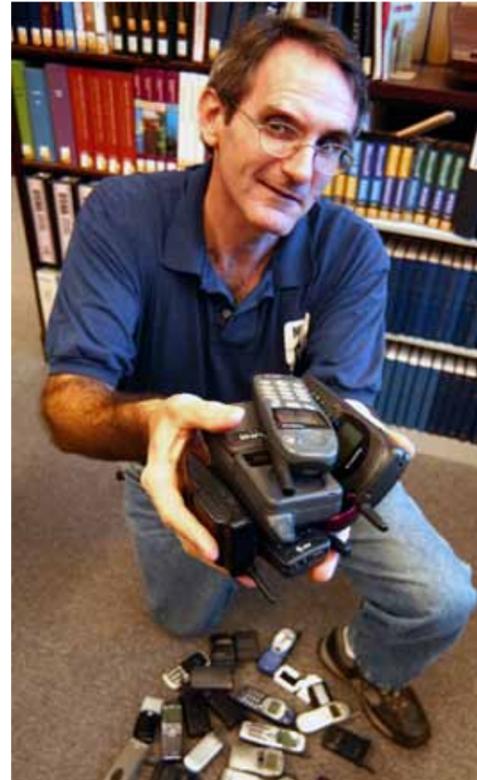
In 2006, the N.C. Chapter of the American Planning Association cited the Center for Geographic Information and Analysis' (CGIA) work in providing geographic information system (GIS) services as one of the top 10 planning events of the past 60 years. CGIA and the N.C. Geographic Information Coordinating Council were singled out for their pioneering role in bringing digital data and GIS technology to North Carolina government agencies, organizations and private sector firms. Specifically mentioned was NC OneMap. Launched in 2003, the NC OneMap Internet data viewer allows access to North Carolina's geospatial data for free without the need for GIS software.

*Statewide shaded relief, land cover and county boundaries displayed in the NC OneMap Web viewer.*



## A First in Sustainability

The State Energy Office and the N.C. Project Green program awarded the first State Government Sustainability Award in 2004 to the N.C. Zoological Park. The zoo had been involved in several programs since 1990 aimed at conserving energy, water, fuel and other resources. It was also the first North Carolina agency and the first zoo in the entire United States to develop a comprehensive environmental management system. The zoo has continued to win awards for its focus and effort toward sustainability. It has been an example and a leader with its programs in composting, integrated pest management, biodiesel and hybrid vehicles, constructed wetlands and solar energy.



*Bob Langston shows off some of the zoo's cell phone recycling efforts, one of many programs aimed at resource and energy conservation. N.C. Zoo photo.*