Will Plants Move Fast Enough to Keep up with CLIMATE CHANGE? page 2
Working to Slow the Frightful Pace of Extinction
Marine Lab’s Karen and Scott Eckert Make it Their Personal Mission to Take Sea Turtle Conservation to the Local Level
As the climate began warming and glaciers from Earth’s last ice age began melting, evidence suggests that North American temperate zone plants huddling in the relative warmth further south began a northward migration to gain ground lost during the big chill. With plants now poised to begin another mass movement in response to human-induced global warming, will the past repeat itself?

Nicholas School researchers James Clark and Gabriel Katul, who have both studied in different ways how seeds and pollen spread to new territory, were asked to do what trained scientists hate: speculate. Will plants be able to move fast enough to keep up with the contemporary climate changes that already appear to be causing Alaskan permafrost to melt? And how will trees and other plant life adapt to other alterations suggested by the latest computer predictions, including intensification of extreme events such as longer droughts, heavier rainfall and amplification of both minimum and maximum air temperature.

Clark, the H.L. Blomquist Professor of Biology, is an ecologist at both the Nicholas School and the biology department who studies how global change affects forests and grasslands. Looking back in time, he has enlisted genetic information as well as ancient sediments to make some surprising deductions about plant responses to ancient climates. He and his research group also use seed traps and mathematical modeling to meticulously trace how contemporary seeds are spread about by the wind.

Assessments that he and associates have made of post-Ice Age plant responses are “incredibly important, because they are our only previous experience with rapid global warming,” he says. “At the end of the Ice Age things warmed up pretty quick.” Then growing cautious, he adds: “But it’s not as rapid as we’re seeing today. The danger is to try and take our understanding of that experience and drop it down in 2050.”

Katul, a Nicholas School professor of hydrology and micrometeorology mechanics, studies seed and pollen propagation as an extension of his physics and mathematics oriented interest in mass, momentum, and energy exchange between the land surface and the atmosphere.

He doesn’t claim Clark’s biological expertise to predict how plants might react to changing climatic conditions. But, by collecting wind-borne seeds on a tower near the Duke campus in collaboration with life scientists, Katul has helped develop some unique mathematical models that seem to emulate actual observations of how high and how far seeds can be boosted by winds at various heights in forest canopies and, by extension, how fast and distant they could spread.

He and collaborators envision a future in which the movement of seeds and other biological material could be reliably
computer-simulated from very short time and distance scales to very long ones over many years. “The question is can we really unfold all this complexity in a computer?” he asks. “With time, I think the answer will be yes.”

Climates have warmed and cooled many times in the past. But the difference now is the presence of elevated amounts of atmospheric carbon dioxide caused by human activities. Colorless, odorless CO₂ is emitted every time one of the large varieties of carbon-containing fuels—from paper trash to gasoline to natural gas to coal—is burned. The gas also is released when land-clearing activities turn growing vegetation into rotting biomass.

Scientists suspect that by 2050, atmospheric carbon dioxide levels will be double what they were before the industrial age. Because these growing volumes of CO₂ serve to trap extra heat, computer models suggest the climate will appreciably warm by a process known as the greenhouse effect.

Are those computerized climate models accurate reflections of reality? Ask Gabriele Hegerl, a Nicholas School associate research professor who analyzes climate trends. “I look at the climate model simulations over the 20th century and see if those reproduce what we observe,” she says. “They do work very well for temperature. There is a strong greenhouse gas signal. It’s definitely reflected in the surface temperature data.

“Most places you would expect an increase in heavy rainfall,” she adds. “When you have higher temperatures there is more water vapor in the atmosphere. On the other hand, you may also get an increase in drought. A higher temperature makes for dryer soils when there is a similar amount of rainfall.”

The last global warming period, which Clark and collaborators have studied with the aid of fossil and DNA data, began about 10,000 years ago when the massive North American glaciers extending as far south as present-day Pennsylvania and Ohio began melting because of other-than-human causes.

Evidence from fossilized plant pollens, which scientists call paleo data, suggests that “tree populations migrated very rapidly when the climate changed at the end of the last ice age,” Clark says. One estimated rate was 200 meters a year. “But when we started working with data from real trees—how fast they grow, how many seeds they produce, how far those seeds are dispersed—we just couldn’t come up with rates as fast as interpreted from the paleo record,” he recalled.

So Clark and colleagues began looking at DNA evidence, not prehistoric but rather modern DNA extracted from trees now living throughout the regions that would have been crossed by any such ancient migration. “Based on that, we started to think: ‘What if the trees didn’t have to come from that far south?’ ” he recalls. “What if they were already a lot further north than the fossil record could tell us?” So we came up with a hypothesis for what we would

James Clark (upper right) and Gabriel Katul (upper left) at the Duke FACE site have both studied how seeds and pollen spread to new territory. Photos by Jim Wallace
expect to find in the DNA if the trees were already further north,” he continues. “And that’s what we’ve found so far in every species we’ve looked at.”

A research paper Clark coauthored for the September 2005 issue of the journal *Ecology* used leaf DNA to suggest that red maples and American beech could have lived in small numbers much closer to the ice sheets than fossil evidence would reveal. The first author of the *Ecology* paper was Jason McLachlan, a postgraduate research associate of Clark’s who has expertise in molecular analysis. The third author was Paul Manos, a Duke associate professor of biology who is an expert in molecular systematics. Additional studies find similar evidence for a number of other species, Clark says.

By analyzing how inherited genetic sequences now vary from tree to tree, he and his colleagues found they could map prehistoric movements of those sequences from small founding colonies perhaps as near to the ice sheets as what is now Kentucky and Tennessee. At those closer distances, the scientists estimated that trees could have migrated from south to north at less than 100 meters a year.

That rate is consistent with mathematical models Clark has created based on studying the dispersal of seeds and pollen by living trees. But the *Ecology* paper also notes that, if true, such “past migration rates were substantially lower than the rates that will be needed to track 21st century warming.”

Clark spends much of his time in the woods, some at research sites as close as the Nicholas School-administered Duke Forest and some further west at an experimental forest in North Carolina’s mountains. “For about 14 years we’ve been looking at seed dispersal to hundreds of seed traps in different locations where we’ve mapped all the trees,” he says. “We know where the parents are, and we look at where seeds fall. That gives us a very good estimate of how much seed is being produced by trees of different sizes and different ages, and how far they move.

“We can only say with a certain probability that this seed came from this tree,” he notes. However, “if you are collecting hundreds of thousands of seeds, then those probabilistic statements become very powerful.” But he is quick to caution that “long-distance dispersal is something that nobody can measure. It’s not something that you can see happen.” The movement of a seed over extreme distances, as opposed to the distance between tree and a collection basket, “depends on extreme events like hurricanes and tornadoes, events we can’t predict,” he says.

Other equally unpredictable factors include a bird gobbling up a seed and flying away with it before depositing it on the ground in bodily wastes. “A lot of species produce fruits essentially for that purpose as best we can tell. That would give it a boost in distance,” he says. “Seeds also get stuck on animals, humans and vehicles. That’s another way for seeds to get around rapidly.”

But past patterns “really don’t answer the question of how far seeds will move in the future,” he says. “Will species be able to migrate to areas where they don’t now exist, but where they would have to be able to move because the future climate would require it? Do plants living further north live there because they can tolerate colder winters, or shorter summers, or a shorter growing season? Or is it something very different, like the kinds of soils there? It can be very difficult to say why species live where they do.”

In contemporary North Carolina, he notes that certain tree types like pines will colonize rapidly in abandoned disturbed areas such as old farm fields. But pines tend to be followed by species such as beeches that prefer living in the shade of the trees that grew up earlier. This shade preference introduces a lag factor: pines have to form a canopy before beeches will grow underneath them.

“In Duke Forest, you’ll only see small beech trees in the understory of the established forest that grew up after farmlands were abandoned,” he says. “It’s been almost a century and the beeches are not reproductively active yet. Yet we’re looking at doubling CO$_2$ in a period of decades. Species like beech could really be in trouble.”

Furthermore, “if it gets more arid, as some climate models forecast, I don’t have a real prediction for what these forests will look like,” he says. “And it’s not just a question of whether specific plant species will move fast enough to keep up with climate change. It’s about how various species will interact as well. You also have diseases and pathogens and pollinators. How would pollinators be affected by warmer conditions, for example? Insects are very sensitive to weather and the climate.”

Katul assesses the seed migration question with a focus on the mathematics of biological transport phenomena. He uses all that is known about computer-assessable principles of physics to try predicting how far winds could be expected to dislodge and transport seeds of different weights through and beyond a forest’s complex canopy of leaves.

“As you try to model seed dispersal you encounter an age-old problem, which is the issue of turbulence,” he says. “Turbulence is perhaps the last frontier of classical mechanics. How do you come up with mathematical models that capture the essential features? I’m trying to model a phenomenon that occurs in fractions of a second, like a gust. But I want to know the implications of that gust on a time scale of 50 years.”

“This is one of the reasons why propagation distances of seeds and pollens often
employed average wind speed data with little regard to the role of turbulent eddies in the seed and pollen uplifting processes and subsequent long-distance transport," he says.

A centerpiece of his approach was a paper in the July 2002 issue of the journal *Nature*, entitled "Mechanisms of Long-Distance Dispersal of Seeds by Wind," in which Katul joined forces with Israeli biologist Ran Nathan, four members of Princeton’s department of ecology and evolutionary biology, Nicholas School ecology professor Ram Oren and Duke climate modeler and professor Roni Avissar, W.H. Gardner Professor and chair of the civil and environmental engineering department at the Pratt School of Engineering.

That paper, first-authored by Nathan, noted that "long-distance (seed) dispersal is central to species expansion following climate change," but added that "the current paradigm is that the frequency and spatial extent of long-distance dispersal events are extremely difficult to predict." Actually, suggested the authors, applying their mechanistic modeling method to real experimental information can "provide accurate probabilistic descriptions of long-distance dispersal of seeds by wind."

That paper "tried to establish a framework that demonstrates that seed dispersal is not voodoo magic," Katul says. "If you know the statistics of the wind, if you know something about seed dislodging mechanisms and tree canopy morphology you can make some intelligent guesses about how far the seeds will go."

The laboratory for this and similar work is a 150-foot tower in Duke Forest that Katul uses to study the interaction of atmospheric processes with the environment. He and his collaborators festooned all altitudes of the tower with 102 hanging laundry baskets that served as traps for windblown seeds.

"We concluded that by setting up seed traps on the tower, we would be able to better resolve the properties of seed dispersal than with traps located on the ground, which is what is typically done," he says.

The tower also was rigged with wind speed measuring anemometers, and another anemometer was attached to a mobile van with a telescoping arm that could travel to other parts of the study area. Those aided Princeton’s Horn, who had developed a device to selectively release tagged seeds whenever wind speeds were high. "The idea was that if we really wanted to see how far seeds can go under strong winds, we’d like to drop seeds in those winds," Katul recalls.

A technician collected and processed almost 5,000 seeds overall from five different species—loblolly pine, poplar, sweetgum, American hornbeam and white ash—collected during the autumn of the year 2000. By having a good idea of where the seeds were released, and knowing where they were trapped on the tower, the researchers found that the degree of wind turbulence in tree canopies plays a key role in seed dispersal.

Seeds caught in the calmer regions lower in a canopy tended to travel shorter distances. Conversely, long-distance travelers tend to get caught in stronger turbulences "that rapidly increase with increasing height," the *Nature* paper said.

Adding biology to the physics, the paper also noted that while lighter seeds tend to be the furthest uplifted and dispersed, those also may be "less likely to germinate and survive seedling competition, making long-distance colonization more difficult."

In an another study published in June 2005 in the *Proceedings of the National Academy of Sciences*, Nathan and Katul draw from the same tower experiments to suggest that seeds within tree canopies get the best wind boosts when there are fewer leaves.

"This may account for the tendency of many temperate tree species to restrict seed release to either early spring on late fall," they wrote.

In a March 2005 paper in the research journal *Diversity and Distributions*, Nathan, Katul, Avissar, Horn and others proposed that biophysically based computer models could be made reliable enough to track the movement of seeds and other biological objects just like a camera traced the quirky pirouettes of an airborne feather at the beginning of the movie *Forrest Gump*.

Such models "can effectively incorporate key elements of aerial transport processes at scales ranging from a few centimeters and fractions of seconds, to hundreds of kilometers and decades," the authors wrote.

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web sites to note

James Clark bio
www.nicholas.duke.edu/people/faculty/clark.html

Clark lab site
www.biology.duke.edu/clarklab/

Gabriel Katul bio
www.nicholas.duke.edu/people/faculty/katul.html

Gabriele Hegerl bio
www.nicholas.duke.edu/people/faculty/hegerl.html
More than 400 scientists, policymakers and corporate and environmental leaders gathered at Duke University for the inaugural summit of the Nicholas Institute for Environmental Policy Solutions, Sept. 20–22.

"The most important word in the institute’s name is ‘Solutions,’” Tim Profeta, director of the institute, told participants and guests at the summit’s Wednesday evening gala at Cameron Indoor Stadium.

"The environmental challenges facing society are great, but so, too, are the opportunities for solving them,” Profeta emphasized.

Designed to have a global reach, the Nicholas Institute unites the broad resources of the Nicholas School and the Duke University community with the expertise of partners in industry, government and environmental organizations. Its mission is to provide decision makers with independent, science-driven policy analysis and to break down the political barriers to environmental progress by fostering open, ongoing dialogue between stakeholders on all sides of the issues.

One of the summit’s highlights was the presentation of results from a new national poll, commissioned by the institute, that examined how voters’ environmental views affect—or don’t affect—their voting decisions.

Among other things, the poll found that although 79 percent of all voters support “stronger national standards to protect our land, water and air,” only 22 percent said environmental concerns played a major role in their recent voting.

Panelists at the summit joined with pollsters to discuss reasons for this discrepancy and how the survey’s findings can serve as a road map for the institute in its efforts to build consensus on environmental issues. (See related story, page 8.)

The need for consensus, collaboration and action on environmental issues was a recurring theme among summit speakers.

Summit Speakers Focus on Need for **Consensus, Collaboration and Action on Environmental Issues**

**q&a**

During the Environmental Summit, Tim Profeta, Nicholas Institute director, William Reilly, senior advisor, and Peter Nicholas, whose gift inspired the creation of the institute, talked about how it was formed, why we need the institute and what it will do next. Their comments are below:

**Q:** I understand the original idea for institute was yours, I was curious about your inspiration.

**Peter Nicholas:** You really have to draw on a long history here to fully understand it and to appreciate that a lot of people here at Duke thought very hard about this, and when we got to the point that we had some good understanding and agreement, it became very clear that the way to do it was to create the institute. … It was not just waking up one night and saying, ‘Let’s have an institute.’

We all kind of gelled around the idea of creating something outside of the Nicholas School, yet a part of it. Something that drew on the strengths of the Nicholas School, and yet expressed those resources in a way that maybe might have been counterintuitive to the traditional academic process of creating and transmitting knowledge. …

I think we discovered that we were beginning to talk about an organization that was going to bring science into the real world for the purposes of affecting change, for using that knowledge. … It was going to be more about outreach, it was going to be more about advocacy; but not advocacy in terms of going out and railing on something, more in terms of advocating the use of science more thoughtfully and the creation of alternative ways of thinking about solving problems. And it took several iterations over a several year period of time, to figure out exactly how to do that.
In the summit’s opening keynote address Tuesday evening, Richard Osborne, group vice president for public and regulatory policy at Duke Energy, told a capacity crowd in Love Auditorium that “addressing climate change is a business imperative.”

Industry “must engage” with scientists and policymakers to work toward a “coordinated federal approach for reducing greenhouse gas emissions from all sectors of the economy,” he said, noting that in the absence of federal action, seven states have now developed their own climate change policies.

“This patchwork approach will create state-by-state chaos,” Osborne warned, “and it will have economic consequences.”

Industry–university initiatives such as the new Climate Change Policy Partnership, a collaboration between Duke Energy and three Duke University environmental units—the Nicholas Institute, the Nicholas School and the Center on Global Change—can help fill the policy void and guide federal policymakers toward practical, effective solutions, he said. (See related story, page 45.)

Wednesday’s keynote speakers at Geneen Auditorium in the Fuqua School of Business echoed Osborne’s call to action.

Russell Train, chairman emeritus of the World Wildlife Fund and former administrator of the U.S. Environmental Protection Agency under Presidents Richard Nixon and Gerald Ford, said, “It will be vital to engage as many constituencies as possible in an open, collaborative process of developing policy” if we hope to address the environmental challenges facing America today.

He chided the current White House for its failure to promote an open dialogue on global climate change and other key issues. “Cooperative private action.” Train stressed, “is not a replacement for firm government leadership.”

Jared Diamond, professor of geography at UCLA and the Pulitzer Prize–winning author of Guns, Germs and Steel: The Fate of Human Societies, said that finding solutions to the problems facing society today “will require detailed scientific information.” The Nicholas Institute can help address this need by providing unbiased, timely analysis on key environmental issues, not only at the federal level but for individual states as well, he said.

Throughout the day Wednesday, scientists, policy analysts and corporate leaders took part in sessions in which they identified and prioritized key ecological and economic challenges facing society in six critical areas: energy, global climate change, environmental health, water quality, the health of oceans, and the health of forests and wildlife habitats.
The afternoon’s presentations concluded with a plenary panel, “The Corporate Role in Environmental Stewardship.” James E. Rogers, president and chief executive officer of Cinergy, and Linda J. Fisher, vice president and chief sustainability officer at DuPont, discussed changing attitudes toward stewardship in the corporate world and what their companies are doing to reduce their environmental footprints.

—Tim Lucas, Nicholas School

You can still participate in the Nicholas Institute’s Environmental Summit

It’s not too late. You can still hear the keynote speakers and sit in on the panels of the Institute’s inaugural Environmental Summit. Just put www.nicholas.duke.edu/summitcast into your Web browser and click on the videos you want to view.

Q&A

fundamentally remake those debates. There are many issues facing the world right now where we are not on a sustainable path, and where we may soon bump up against the limitations of our resources, be they water or energy or habitat. We must find a way to reframe these questions in a way that make our decisionmakers understand the inevitability of our need to address them, and that shows that there are ways forward that can fit within the evolution of our economy and society.

Q: Will you talk about the importance of the advisory board and what role it will play in the institute?

William Reilly: The advisory board will help bring the key stakeholders and the constituencies into the conversation . . . . We really want to make sure that the most innovative and energetic and resourceful private enterprises see merit in what the institute is doing.

Q: What is your reaction to the Institute’s Environmental Summit?

Peter Nicholas: From the minute I got on campus I had a palpable sense that this was going to be great, but you don’t know. But having been through the morning session, and now the first two keynotes, and seeing the crowd, the audience, who they are, and what their views of this, people nabbing me, giving me their cards. It has been wonderful, it really has been wonderful. . . . Everyone gets what this is all about. They aren’t coming here scratching their heads, wondering what this is all about.

survey:

Eight-in-10 Americans say they support pro-environmental policies, but a new national survey by the Nicholas Institute for Environmental Policy Solutions finds their support often stops short of the ballot box. The survey suggests opportunities for how to address this disconnect.

“These results are a wake-up call, but they also represent an important opportunity,” said Tim Profeta, director of the Nicholas Institute. “They help us understand what we need to do to build public consensus and break down barriers to environmental progress. This is central to the mission of the Nicholas Institute.”

The survey’s findings were announced by Profeta at a press briefing at the U.S. Senate on the opening day of the institute’s inaugural environmental summit in September. Profeta was joined by U.S. Sen. Joseph Lieberman (D-Conn.), U.S. Sen. John McCain (R-Ariz.), William K. Reilly,
former EPA head and chair of the advisory board of the Nicholas Institute, and Peter Nicholas, chairman of Boston Scientific. Profeta, Reilly and the pollsters also presented the findings of the survey during the summit in Durham.

The survey of 800 registered voters found that 79 percent favored “stronger national standards to protect our land, air and water,” with 40 percent strongly supporting it.

But only 22 percent said environmental concerns have played a major role in determining whom they voted for in recent federal, state or local elections.

Even among self-described environmentalists, only 39 percent could recall an election in which a candidate’s environmental stance was among the two or three most important reasons why they voted for or against him or her.

“There is a clear disconnect here,” Reilly said. “Seventy-four percent of Republicans and 85 percent of Democrats say they support stronger environmental standards. Yet, when it comes time to vote, they rank the environment low on their list of priorities.”

In focus groups, the environment ranked last out of nine issues tested, both as a vote qualifier and in terms of expressed personal importance to voters. The nine issues, in order of their expressed importance, were: the economy and jobs; health care; Iraq; Social Security; terrorism; education; moral values; taxes; and the environment. Only 10 percent of voters identified the environment as one of their top concerns, compared to 34 percent for the economy and jobs.

The research was conducted for the Nicholas Institute by Hart Associates and Public Opinion Strategies. The organization surveyed 800 registered voters nationwide and conducted focus groups of voters in Columbus, Ohio, and Knoxville, Tenn. The survey results have a margin of error of plus or minus 3.46 percent.

To read the white paper on the survey and the five reasons pollsters identified for the disconnect, click on www.nicholas.duke.edu/institute/projects.html.

The issue of trust—or lack of it—appeared to play a role in many voters’ ambivalent attitudes toward environmental problems. Only 19 percent said there are “a lot” of trustworthy sources of information on environmental issues, while another 40 percent said there are “likely some trustworthy sources.”

Voters generally viewed universities and research institutes as the most credible sources of information and the least likely to have hidden agendas or special interests.
Biologist James S. Clark Elected to American Academy of Arts and Sciences

James S. Clark, H.L. Blomquist Professor of Biology at the Nicholas School, has been elected a Fellow of the American Academy of Arts and Sciences. Clark, an expert on how global changes affects forests and grasslands, was one of 196 scientists, scholars, artists, statesmen and entrepreneurs elected as Fellows this year.

The American Academy of Arts and Sciences is an independent policy research center that conducts interdisciplinary studies on science and international security, social policy, education and the humanities. Founded in 1780 by John Adams, James Bowdoin, John Hancock and other scholar-patriots, it has elected as Fellows "the finest minds and most influential leaders of each succeeding generation."

Last year, Stuart L. Pimm, Doris Duke Professor of Conservation Ecology at the Nicholas School, was elected a Fellow.

Clark is widely cited for his research on biodiversity, global change ecology, global climate change, earth surface processes and terrestrial ecosystems. Recent studies of his refute the widely held theory that trees can "relocate" quickly in response to sudden climate change (see related story, page 2). Other recent studies of his have suggested that droughts like the Great Dust Bowl of the 1930s may have occurred more frequently and lasted longer in prehistoric times.

Clark has authored more than 100 peer-reviewed articles and is the recipient of numerous research awards, including the Ecological Society of America’s William Skinner Cooper Award in 1988 and its George Mercer Award in 1991.
Construction has begun on the Duke University Marine Laboratory’s new $2.2 million Ocean Science Teaching Center. “We’re well on our way to making this long-needed facility a reality for our students, faculty and community,” says Michael K. Orbach, director of the Marine Lab and professor of the practice in marine affairs and policy. “We signed a contract with the builder, Joyce & Associates of Carteret County, and work already has begun at the site.”

Construction should be completed by late spring of 2006, Orbach says. The 5,600-square-foot center, to be located at the point of Pivers Island, will be the first new academic building constructed on the Beaufort campus in 30 years and the Marine Lab’s first totally “green” building. Thanks to a grant from the Wallace Genetic Foundation, it has been designed to the highest standards for energy and environmental efficiency adopted by the U.S. Green Building Council.

When completed, it will greatly expand the Marine Lab’s teaching capacity and enhance its capabilities for public outreach and education. The center will house a teaching laboratory; a televideo-capable lecture hall for team teaching and distance education; interpretive educational displays; and spaces for social interactions, exhibits of marine art, and community outreach.

“We’ve just received a three-year, $160,000 grant from the National Science Foundation to outfit these areas with the latest teaching and research technologies, including a state-of-the-art televideo system for distance education,” Orbach says.

Joseph S. Ramus, research professor of biological oceanography, is the principal investigator on the NSF grant. The new center also has received its first gift of marine art, to be displayed in the commons area looking out over the Rachel Carson Estuarine Research Reserve. Michael W. Peelle T’96 has donated a free-standing bronze sculpture, Amongst the Coral, created by his grandfather, the noted Hungarian-born impressionist George Gach. The four-and-a-half-foot-tall sculpture depicts fish in a coral reef environment. Peelle spent a semester at the Marine Lab in 1994. Gach was one of the 20th century’s most prolific artists. He created more than 1,400 bronze sculptures and 997 paintings between 1952 and 1996. His work is displayed in museums, private collections and galleries worldwide.

The new Ocean Science Teaching Center will be named in honor of Randall Repass, chairman of West Marine Inc. of Watsonville, Calif., and his wife, Sally-Christine Rodgers, pending approval of the Duke University Board of Trustees. Last year, Repass and Rodgers gave $2.3 million to the Nicholas School to help fund the center and create a new University Professorship in Marine Conservation Technology at the Marine Lab.

In accordance with LEED (Leadership in Energy and Environmental Design) standards, the center will incorporate green technologies such as solar and geothermal energy, and sustainable materials such as bamboo paneling and concrete made from fly ash.

—Tim Lucas, Nicholas School
More than 100 college students from North, Central and South America took part in the 2005 Student Conference on Conservation Science, held for the first time this spring at Duke University.

The conference aimed to overcome the geographic and economic barriers that separate students to create a hemisphere-wide network of future conservation scientists, said Luke Dollar, a doctoral student at Nicholas School who spearheaded the event.

"We brought together Americas’ next generation of environmental leaders to share our findings, broaden our horizons and form professional friendships that can lead to future collaborations."

The Nicholas School hosted and co-sponsored the event. Sponsorships by the Occidental Petroleum Corp. funded full scholarships that enabled students from Ecuador, Peru, Brazil, Mexico, Costa Rica and other developing countries to attend and present at the conference, and the Ford Foundation provided travel funds.

Presentation topics included forest fragmentation, endangered and threatened species, invasive species, coral reef conservation, marine fisheries, remote sensing technologies and conservation policy and management.

In addition to student presentations, the conference featured lectures by five of conservation science’s biggest names: Paul Ehrlich, director of Stanford University’s Center for Conservation Biology; Stuart L. Pimm, Doris Duke Professor of Conservation Ecology at the Nicholas School; Daniel Simberloff, director of the University of Tennessee’s Institute for Biological Invasions; John Terborgh, James B. Duke Professor of Environmental Science at the Nicholas School and director of Duke’s Center for Tropical Conservation; and David Wilcove, professor of ecology and evolutionary biology at Princeton University.

Plans are under way to bring the conference to Duke again in March 2006. Check out www.nicholas.duke.edu/sccs for more information.

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**in brief**

**Nicholas School’s Pimm and Salzman Participate in Symposium Honoring Science’s 125th Anniversary**

Two faculty members at the Nicholas School took part in a high-profile symposium on the future of science, organized by the American Association for the Advancement of Science (AAAS) to celebrate the 125th anniversary of Science magazine, which AAAS publishes.

The symposium, “An Examination of the Unknowns that Will Drive Science in the Future,” was held in July at AAAS headquarters in Washington, D.C. Stuart L. Pimm, Doris Duke Professor of Conservation Ecology, and James Salzman, professor of environmental law and policy, took part in a panel discussion on sustainable development. They were among only a dozen or so researchers nationwide who were asked to participate in the symposium, which featured panel discussions on the nature of the cosmos; memories, consciousness and human life; and genes, proteins and disease.

**Article by Lincoln Pratson Reprinted in Special Issue of Scientific American**

An article by Nicholas School faculty member Lincoln F. Pratson, associate professor of sedimentary geology, was reprinted this summer in a special issue of the popular science magazine Scientific American called “Our Ever Changing World.”

The article, “Panoramas of the Seafloor,” was one of 12 articles about earth sciences that were chosen by the magazine’s editors for the special issue because of outstanding content and continuing popularity with magazine readers. Originally published in June 1997, the article details the use of modern sonar technologies to map the U.S. continental margins, and to reveal the varied scenery that’s usually hidden underwater. William F. Haxby, a research scientist at Columbia University’s Lamont-Doherty Earth Observatory, was co-author.

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**Nature Paper by Schlesinger Named One of Environmental Science’s Most Influential Articles**

A Nature article on carbon sequestration by William H. Schlesinger, dean of the Nicholas School and James B. Duke Professor of Biogeochemistry, has been named one of the most influential papers in the field of environmental sciences.

According to Essential Science Indicators, an online tracking database of scientific literature, Schlesinger’s article, “Limited Carbon Storage in Soil and Litter of Experimental Forest Plots Under Increased Atmospheric CO2,” has been cited 81 times since its publication on May 24, 2001.

That places it in the top 1 percent of all peer-reviewed studies in its field. John Lichter, assistant professor of biology and environmental studies at Bowdoin College, was co-author. Their article, considered a seminal work in the study of carbon sequestration, was the first to call into question the role of forest soils as long-term carbon sinks.
Eight students at the Nicholas School have been named 2005-2006 Doris Duke Conservation Fellows.

Doris Duke Conservation Fellowships are awarded to graduate students who show outstanding promise as future leaders in nonprofit or governmental conservation in the United States. To date, fellowships have been awarded to 64 Nicholas School students who are pursuing Master of Environmental Management or Master of Forestry degrees. Selected by the school, fellows receive up to $30,000 to support tuition, a public sector domestic conservation internship, and educational loan repayment for fellows who pursue nonprofit or public sector conservation careers.

Created in 1996, the Doris Duke Charitable Foundation, based in New York City, seeks to improve the quality of people’s lives by preserving natural environments, nurturing the arts, seeking cures for disease and helping to protect children from abuse and neglect.

This year’s fellows are listed here along with their program of study at the Nicholas School and their internship organization.

—Katherine Jennrich MEM’07

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<th>Number</th>
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<td>Analie Barnett</td>
<td>conservation science and policy; Conservation Trust for North Carolina.</td>
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<td>Sarah Borchelt</td>
<td>coastal environmental management; NOAA Coastal Services Center (South Carolina).</td>
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<td>Holly Fling</td>
<td>environmental economics and policy; U.S. Geological Survey (Florida).</td>
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<td>Liz Forward</td>
<td>conservation science and policy; collaborative project between the Sonoran Institute, the Wildlife Conservation Society, Montana State University, the Wildlife Conservation Society and the Gallatin County Planning Department (Montana).</td>
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<td>Jordan Golinkoff</td>
<td>conservation science and policy and forest resource management; Garcia River Forest (California).</td>
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<td>Regan Lyons</td>
<td>ecosystems science and management; Wildlife Conservation Society (Montana).</td>
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<td>Becca Madsen</td>
<td>environmental economics and policy; Environmental Defense (North Carolina).</td>
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<td>John Tynan</td>
<td>environmental health and security; Friends of the Reedy River (South Carolina).</td>
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Nicholas School Web Site Wins National Gold Medal


Two gold medals, one silver and three bronze were awarded out of 110 entries. Cited were Scottee Cantrell, Nicholas School assistant dean for marketing and communications, Amy Chapman Braun, designer, Stephanie Thirolle, Webmaster, and Lacey Chylack, designer. Braun, who is now with the Nicholas School, and Chylack both worked for Duke Health System’s Office of Creative Services at the time the site was created.

The Council for the Advancement and Support of Education is the international association of professionals who advance educational institutions.
Nicholas School Purchases Renewable Energy Certificates to Offset Use of Fossil Fuels

To demonstrate its commitment to environmental stewardship, the Nicholas School has purchased $19,718 of renewable energy certificates to offset its use of electricity generated from fossil fuels.

"Buying these certificates is a way of putting our money where our mouth is," says William H. Schlesinger, dean of the Nicholas School. "It ensures that the energy our school takes from the national power grid to run classrooms, labs and offices is being replaced with an equivalent amount of clean, renewable energy."

The school bought the certificates this summer from Gray County Wind Farm, the largest wind farm in Kansas.

Renewable energy certificates are credits that individuals, institutions or businesses can buy to compensate for the amount of nonrenewable, greenhouse gas-emitting fossil fuels they burn in their vehicles, homes, offices or other facilities.

Buying the certificates helps subsidize the cost for a wind farm, solar farm or other renewable energy producer to generate an equivalent amount of clean energy and put it back into the national power grid, Schlesinger explains. But you’re not buying the energy itself; you’re buying the attributes of the energy.

"The certificates represent the desirable environmental outcomes, such as reduced carbon dioxide emissions, that are achieved when the energy is produced using renewable energy sources instead of fossil fuels," he explains.

"It sounds complex," he admits, "but the bottom line for most energy users is pretty simple: Buying these certificates is an easy way to offset the amount of greenhouse gas emissions their energy use has caused."

The Nicholas School’s purchase of the wind power certificates compensates for the estimated amount of electricity used last year at the school’s facilities in Durham and at the Duke University Marine Laboratory in Beaufort, N.C.

"All told, we’re offsetting about 16.5 million pounds of carbon dioxide emissions," says Becca Ryals, a second-year Master of Environmental Management student who worked with school administrators, staff members and student groups to spearhead the purchase. "That’s equivalent to taking about 1,500 gas-powered cars off the road for a year."

Ryals says the idea to buy the certificates grew, in part, out of Nicholas School students’ involvement in the Duke University Greening Initiative (DUGI), a project aimed at enhancing environmental sustainability campuswide. After conducting a survey this summer that showed 92 percent of Nicholas School students supported the purchase of renewable energy certificates from the school’s discretionary fund, Ryals and other students from DUGI, the Nicholas School Student Advisory Committee and the Energy Club met with Schlesinger and school staff members to suggest the purchase.
SPECIAL AWARDS
Recognize 2005 Grads

Virlis L. Fischer Award—Goes to the graduating professional degree student with the highest academic achievement. Given by Bernice Fisher in memory of her husband.
Recipient: Sarah Chamberlin

Sara LaBoskey Award—Given in recognition of personal integrity and academic excellence.
Recipient: Caroline Elisabeth Paulsen
Hometown: Charlotte, N.C.; Major: A.B. Environmental Sciences and Policy, and Spanish Studies; Activities at Duke: Women’s Club Lacrosse, Project WILD backpacking organization, Kappa Alpha Theta, waitress at Blue Corn Café; Awards/Honors: Magna Cum Laude; Post-Graduation Destination: “I’ll be working with Dr. Marie Lynn Miranda’s group as a research technician with Children’s Environmental Health Institute (CEHI) at the Nicholas School”; Future Goals: “In March or April, after concluding my time with CEHI, I will begin doing research in Nicaragua with Jeffrey McCrary, an adjunct professor with Virginia Tech, studying an invasive fish species in Lake Atoya.”

Estwing Award—Given in recognition of outstanding achievement in the earth and ocean sciences.
Recipient: Sarah Elizabeth Ogburn
Hometown: Louisville, Ky.; Major: B.S. Earth and Ocean Sciences, and B.A. Biological Anthropology and Anatomy; Activities at Duke: Co-manager of student-run Duke Coffeehouse; spent a summer in South Africa on paleoanthropological dig; Awards/Honors: Phi Beta Kappa, Phi Eta Sigma, Dean’s list each semester; Post-Graduation Destination: “Taking time off from school to work, but looking into the Peace Corps (specifically their master’s International Program). I’m also working for EOS in the rock lab preparing samples.”;

Future Goals: “I’m interested in environmental geology, specifically helping communities prepare, predict and cope with natural disasters and other issues relating to the earth and oceans, i.e. clean drinking water, safe air. I’m really just very interested in helping people.”

U.S. Forest Service Science Award—Given annually to students who have demonstrated outstanding achievements in mathematics and science.
Recipient: William Leonard Reynolds
Hometown: Culpeper, Va.; Major: B.S. Environmental Science and Policy, and B.S. Earth and Ocean Sciences; Awards/Honors: Stanback Internship with N.C. WARN (Waste Awareness and Reduction Network); Activities at Duke: ski team, summer in Beaufort, semester in Australia; Post-Graduation Destination: “I’ll be moving to Seattle, Wash., to work in the environmental field while deciding exactly what I want to pursue.”; Future Goals: “I would like to enter into the technical side of environmental management and planning, possibly environmental or civil engineering with a focus on sustainability.”

Thomas V. Laska Memorial Award—Given by the Earth and Ocean Sciences faculty to the most outstanding senior major.
Recipient: David Andrew Lewis
Hometown: Gettysburg, Pa.; Major: B.S. Earth and Ocean Sciences, and Public Policy Studies; Activities at Duke: research intern, Program for the Study of Developed Shorelines; volunteer, Durham City Parks; peer tutor; associate editor, Duke Chronicle; IM Softball Champs 2003; student assistant manager, Duke varsity football team; Awards/Honors: Benensen Award in the Arts; Graduation with Distinction; Post-Graduation Destination: “Summer in Northern Ireland, backpacking, hiking and research in collaboration with Dr. Orrin Pilkey. In the fall, I will work for the Southern Environmental Law Center as a GIS associate.”; Future Goals: “I am interested in pursuing a degree and a career in either land-use/transportation policy or energy geology. Through a combination of research and advocacy, I would like to work towards applying alternative energies towards reducing landscape pressures. I’m also interested in coastal geology and development policy.”
Nicholas School environmental scientists are amassing large overlays of Geographical Information System (GIS) data for a Web site that public health and environmental experts will use to assess effects of Hurricane Katrina in New Orleans and elsewhere in the stricken Gulf region.

That information includes “flooded areas, the locations of medical facilities, police stations, fire stations and industrial facilities, warehouses that might be flooded out, agricultural operations, refineries and oil pipelines, among other things,” said project leader Marie Lynn Miranda.

“There’s just layer upon layer of different kinds of data that, when geographically correlated, could aid assessment of hazards and the process of recovery,” she said.

Miranda, associate research professor, is a principal investigator and does GIS mapping for mercury at Duke’s Superfund Basic Research Center. She also directs the Children’s Environmental Health Initiative, which uses GIS technology to help authorities evaluate childhood exposures to various contaminants in North Carolina.

The Katrina data are being integrated by Miranda’s GIS programmer, Duke alumna Sharon Edwards.

GIS technology combines various kinds of maps, satellite images and other information to provide investigators insights and connections that might not be recognized if the components were considered separately. Another advantage is that the information is all spatially referenced, meaning that all the information is connected to a particular geographic location.

Miranda’s involvement resulted from a conference call with officials at the National Institute of Environmental Health Sciences (NIEHS) in Research Triangle Park, who are creating the Web site as part of its initial response to a national effort to assess the large array of potential toxic contaminants in the floodwaters.

Among the layers of relevant data, said Richard Di Giulio, professor of environmental toxicology, “are effects that might be associated with oil refinery petrochemicals—compounds like hydrocarbons for which cancer is sometimes a major, long-term health hazard.” Di Giulio directs Duke’s Superfund Basic Research Center.

“Pesticide chemical companies down there, depending on what they make, could be sources of potent neurotoxins and neurodevelopmental toxins,” Di Giulio said. “There could also be concerns about radioactive materials and chemicals from flooded hospitals.”

Di Giulio enlisted Miranda and her colleagues following conference calls involving all 20 university-based Superfund Centers, which do basic research into the effects and detection of toxic chemicals covered by the federal Superfund Act in coordination with the NIEHS.

“Dr. Miranda is organizing non-confidential information that’s already out there on the Web or through other kinds of data sources,” said Bill Suk, who directs NIEHS’s Superfund Basic Research Program as well as its Center for Risk and Integrative Sciences.

“It’s an incredible amount of data that’s coming in,” Suk added. “All the data is already out there, but it’s never been put together and integrated in this way. So this is a resource that is very valuable.”

Researchers from Columbia University, the University of Kentucky, San Diego State University and the Research Triangle Institute have all sent layers to be added to

From left to right Ship Island, Miss.: Undeveloped barrier island in the Gulf Island National Seashore; Gulfport, Miss.: Debris consisting of kraft paper, shipping containers and building material; Bay St. Louis, Miss.: A destroyed train trestle crossing St. Louis Bay; Waveland, Miss.: The steeple of a church is all that remains; Bay St. Louis, Miss.: Concrete foundations and some pilings is all that remains of these houses; Ship Island, Miss.: Undeveloped barrier island in the Gulf Island National Seashore

photos by Andrea S. Coburn MEM’93, PSDS

Nicholas School Researchers Amass GIS Data to Aid Analysis of Katrina’s Health, Environmental Effects
the GIS project being compiled at Duke.

After the overlaid GIS information is made interactive with help from a supercomputer at San Diego State University, the data will be used in the field to aid environmental and health investigators, Suk said.

For example, Suk said he understood that the Centers for Disease Control is attempting to analyze health data on people from the area who have been scattered through various refuge centers in Texas. “The GIS system that we’re developing should help explain what they might have been exposed to,” he added.

“If we could backtrack and develop a listing of those people, where they lived and what they were potentially exposed to, then we can start developing some long-range research projects that could fully evaluate whether or not there are going to be any potential health consequences down the road.” Suk said.

—Monte Basgall, Duke News & Communications

When the winds of Hurricane Katrina had barely died down, the Nicholas School’s Andrew S. Coburn chartered a plane and flew over devastated portions of Alabama and Mississippi, taking hundreds of digital photos. Coburn MEM’93, associate director of the Duke University Program for the Study of Developed Shorelines (PSDS), traveled to the Gulf Coast with Robert S. Young PhD’95, an associate professor of geology at Western Carolina University.

The photos show entire neighborhoods of houses that have been stripped to their foundations. A bridge that has been reduced to a series of pylons jutting from the water, without a roadbed. Cars piled up like toys. Trees denuded of leaves. Highways choked with sand. And occasionally, entire stretches in which buildings survived, seemingly unscathed.

According to Coburn, it was critically important to get the photographs as soon as possible after the storm. “Impacts are ephemeral, and we feel it is critical to have a permanent record of what actually occurred on the ground,” he said. “We try to get out and document post-storm impacts before people go in and start cleaning up and putting things back the way they were.”

The photos propelled Coburn and Young into the pages of the New York Times, Washington Post, Chicago Sun-Times, Houston Chronicle, and numerous broadcast programs, and Coburn was featured as Tar Heel of the Week in a Raleigh News and Observer story that focused largely on the Katrina photographs.

Coburn and his colleagues will use the images to assess patterns of property damage, identify beach and shoreline impacts and monitor what happens to a beach and shoreline during the months and years after the storm. While the photos document horrific destruction, one thing Coburn looks for is those places where little damage occurred. One of his aims is to discover what might be protecting some parts of the developed coastline from hurricanes’ effects.

The PSDS was established by Orrin H. Pilkey, James B. Duke Professor Emeritus of Geology, who serves as its director.

—Lisa M. Dellwo
Emily Klein Appointed as Nicholas School’s Senior Associate Dean

Emily M. Klein, Lee Hill Snowden Professor of geology, has been named senior associate dean of the Nicholas School.

Klein’s responsibilities will include directing the Nicholas School’s undergraduate initiatives and overseeing the design and construction of the new building that will house both the school and the Nicholas Institute for Environmental Policy Solutions.

“Faculty, students and staff all know and respect Emily for her exemplary work to understand the geochemistry of the oceanic crust, her longtime interest in improving undergraduate teaching at Duke, and her participation in many Nicholas School activities,” said Dean William H. Schlesinger.

Klein joined Duke University in 1989 as assistant professor of geology after completing her doctoral studies at Lamont-Doherty Geological Observatory of Columbia University. She also holds a Master of Science degree in geology from Columbia, and a Bachelor of Arts in English from Barnard College.

She was promoted to the rank of associate professor of geology at the Nicholas School in 1996, and full professor in 2005. She assumed additional responsibilities as the director of undergraduate programs in 2004. Earlier this year, she was named Lee Hill Snowden Professor, Bass Society of Fellows.

A prolific and widely cited author on the geochemistry of ocean ridge basalts, Klein is the recipient of numerous professional awards and honors, including a National Science Foundation Young Investigator Award and the F.W. Clarke Medal from the Geochemical Society.

“There’s so much going on in the Nicholas School right now,” Klein said. “The new focus on energy and the environment, planning a new green building, working to develop a synergistic relationship between the school and the new Nicholas Institute—all of these open up new avenues, and I’m thrilled to be a part of it.”
The Duke Marine Lab’s head cook, Sylvester “Sly” Murray, received Duke’s highest employee honor, the Presidential Award. He was one of four Duke employees cited by President Richard H. Brodhead earlier this year and presented a plaque and a check for $1,000.

“The Presidential Awards celebrate a handful of employees whose service shows in the highest degree the qualities Duke values in all employees,” Brodhead said.

Here is Murray’s story:

While on vacation in Mexico, Dominick Brugnolotti stopped by a bank in Cozumel wearing his Duke Marine Lab t-shirt. The bank’s vice president, a Duke alumnus, spotted the t-shirt and asked, “Do you know Sly?”

Sly would be Sylvester “Sly” Murray, the head cook at Duke’s Marine Lab in Beaufort, N.C., and if it’s stretching the truth to say he’s world-famous, it is true that he’s well known for making the lives of Marine Lab employees and visitors better, one meal at a time. This year Duke recognized his contributions by conferring on him the Presidential Award. Brugnolotti, assistant director of auxiliary services on the Beaufort campus, was among those who nominated Murray for Duke’s highest award.

“He’s an institution here,” Brugnolotti said.

Murray, who has lived all his life on the eastern shore of North Carolina, said the international community of visitors at the Marine Lab has kept him there for the past 30 years.

He started work at the Marine Lab part-time while he took classes at a community college. Through interacting with the international students and researchers, he said, “All of a sudden, I was in a mixed–culture situation where I was involved with people from all over the world, I was seeing things from another point of view, experiencing how other people think and live their lives. I knew there was a chance to learn and grow from that. It made a big impact on me when I was 18.”

Murray’s first position at the lab was in housekeeping, but when the dining hall opened full-time, the head cook needed an assistant. Murray, who had worked in restaurants in high school, was offered the job.

“It was the last thing I thought I’d be doing after high school,” he said. But he was a quick study, and learned how to take over any task from the cook, who had health problems. The first time the cook wasn’t able to make it in, staff and students stopped by the dining hall, offering to help.

“I thought, ‘Nobody thinks I can do this.’ They were looking at a kid alone in the cafeteria, and they were worried about me,” Murray said. “I love challenges, so as soon as it turned into that, I snapped to it.”

The lasagna dinner he fixed turned out just fine, and his culinary career was launched.

Over the years, the challenges kept coming. Murray might have only 13 people to cook for at one meal and 130 the next. At times, he has had the kitchen polished down and was on his way out the door when he received word that a tour group of 70 would arrive for dinner in 20 minutes.

“That’s one of the things I’ve always loved about my job,” he said. “I never really know how the day is going to unfold.”

Murray researches recipes for vegetarians and adjusts his baking to accommodate vegans. He has taken courses at different culinary schools and said he has learned from every chef who has passed through his kitchen. Dietary needs, culinary styles and available ingredients change continuously.

“A doctor never stops learning new things,” he said. “I approach cooking the same way. I don’t look at it as a job; I see it as taking care of people.”

One of his co-workers estimated that Murray has cooked 38,800–some-odd meals over the past 30 years. He takes it as a point of pride to cook a meal that will take the stress off students and researchers at the end of the day.

When he’s not in the kitchen, Murray is penning short stories and novels. His cookbook, Home Boy Cookbook, has sold more than 10,000 copies.

Receiving the Presidential Award won’t change the way Murray does his work. “The award is motivation to keep on doing what I do, day in and day out,” he said.

—From Duke News & Communications reports
The six species of sea turtles that call the turquoise waters of the Caribbean Sea home have survived disasters, plagues and predators for more than 100 million years.

Endowed with natural armor, long lifespans, and hydrodynamic bodies capable of swimming long stretches, they've been able to outdistance, out-dive or simply outlast the dangers nature's dished out. They even survived the extinction of the dinosaurs 65 million years ago.

But now, there's widespread concern that the combined pressures of poaching, fisheries by-catch, habitat destruction and other modern human activities may do what asteroids and hurricanes couldn't. Populations of loggerhead, leatherback, hawksbill, Kemp's ridley, olive ridley and green sea turtles have declined sharply since World War II. All six species are now classified as endangered by the IUCN World Conservation Union.

Three of them—the hawksbill, Kemp's ridley and leatherback—are critically endangered. According to IUCN criteria, species are classified as endangered if they have declined by at least 50 percent over the last three generations. Critically endangered species must have declined by at least 80 percent.

"It would be a tragedy for these species to have come safely through the eons only to succumb on our watch to dangers that are almost entirely manageable," says Karen L. Eckert, assistant research scientist at the Nicholas School and an internationally recognized expert on marine turtle conservation policy.

Since 1989, Eckert has served as executive director of the Wider Caribbean Sea Turtle Conservation Network (WIDECAST), the world's oldest, largest and most active regional sea turtle research and conservation network, now based at the Duke University Marine Laboratory in Beaufort, N.C.

"On some beaches where thousands of sea turtles once crawled ashore to nest, we now count them in the hundreds, the dozens, or less," she says. "We have not only watched their numbers decline, but also their geographic range. Hundreds of beaches that once supported sea turtle nesting no longer do."

The situation is grave, Eckert stresses, but it's far from hopeless.

After years of decline, some of the Caribbean's turtle colonies are beginning to rebound. Two of the most successful recoveries are taking place on the islands of Antigua and Trinidad, where government agencies, beachfront property owners, fishermen and other local stakeholders have worked together with WIDECAST to develop policies and practices that protect the turtles while respecting the rights and unique cultures of the islands' human residents.

"Like politics, all conservation is local,” Eckert says. "We can prevent the extinction of these six species if we stop pointing the finger of blame at local residents engaged in outdated hunting or land-use practices, and extend them a hand instead, so they become part of a more sustainable landscape."

"You can’t manage turtles in isolation from their environment," agrees Eckert’s husband, Scott A. Eckert, also an assistant research scientist at the Nicholas School. "Sea turtle conservation is equally about preserving coastal habitats and empowering the people who live there."

For nearly 25 years, the Eckerts have dedicated their careers to doing precisely that. Working amid overflowing piles of papers and e-mails in their book-lined offices on the first floor of the Marine Laboratory, they strive to protect the turtles that inhabit the Caribbean’s turquoise waters.

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Lab’s Bookhout Building, they coordinate WIDECAST’s research, training and conservation initiatives in 45 countries and territories in the Caribbean and parts of Central and South America.

Scott, a conservation biologist widely cited for his pioneering research on turtle ecology, physiology and microelectronic tracking technologies, is WIDECAST’s director of science.

“One of the biggest challenges for scientists and policymakers alike,” he says, “is that sea turtles don’t recognize national borders. They recognize nesting beaches and foraging grounds. Their migrations can zigzag back and forth through international waters to beaches and coastal waters in dozens of countries,” each with its own conservation and enforcement policies, its own economic context, and its own cultural attitudes about sea turtle management, including turtle-meat consumption.

“The trick is to come up with a cohesive regionwide approach that can be individualized to address site-specific circumstances and cultures,” he says. "The strength of WIDECAST is that by working through a network of local partners and field coordinators in each country and territory, we can do this much better than a centralized bureaucracy ever could."

More than a dozen Nicholas School doctoral and Master of Environment Management students currently work with The Eckerts on WIDECAST projects. Hundreds more have benefited from their experience and expertise through the graduate and undergraduate classes they teach at the Marine Lab.

“Scott and Karen are superb teachers. They bring to the classroom a wonderful combination of good science, good policy and very strong community involvement,” says Michael K. Orbach, director of the Marine Lab and professor of the practice of marine affairs and policy. "Students really pick up on this. They come away with a deeper understanding that this is the best way to do conservation.”

The Eckerts operate WIDECAST on a modest annual budget of less than $500,000, which they raise themselves, in addition to fulfilling their other teaching, advising and research responsibilities at the Nicholas School.

Their limited financial resources belie the big impact their volunteer network has had on sea turtle conservation in the region.

WIDECAST was chartered in 1981 by one of Karen’s most important early mentors, environmentalist Milton Kaufmann of the conservation group Monitor International. The fledgling network soon became a partner organization of the United Nations Environment Programme. At the time, few nations in the Caribbean region had active programs for sea turtle management or conservation, and virtually all were hamstrung by a weak and largely obsolete regulatory framework.

Today, Karen notes with pride, every country in the region is part of the WIDECAST network. Most have active management programs that focus on at least one important turtle nesting or foraging ground, and more than half of them have enacted short- or long-term moratoria on turtle harvests while turtle population assessments are undertaken. As a result, the Caribbean is the only region on Earth where endangered turtle populations are once again rising.

“A big part of our success, I think, is that we train our network’s country coordinators and volunteers in scientific methodology and provide them with accurate, up-to-date management information they can use to develop..."
conservation programs geared to local circumstances,” she says. “We don’t do the work for them, we enable them to do it for themselves.”

In the past five years, local WIDECAST partner organizations have trained more than 1,000 conservation professionals, including marine park managers, community leaders, fisheries and wildlife officers, and local biologists.

Members of the network meet annually to set priorities, evaluate existing programs, learn about the latest science, and launch new collaborations.

By design, WIDECAST doesn’t advocate for specific government programs or policies. “We’re an independent, nonpolitical organization,” Scott says emphatically. “We advise governments about the feasibility and scientific validity of proposed management or conservation policies. We take a stand, but we leave the more strident advocacy to organizations designed for that purpose.”

One of WIDECAST’s many successes has been on Antigua, a reef-ringed speck of land in the Leeward Islands that is home to one of the region’s best-studied colonies of critically endangered hawksbill turtles.

In Antigua and elsewhere, hawksbills have been decimated by poaching—their shells once were highly prized for making “tortoiseshell” jewelry—and by the degradation or loss of offshore coral reefs and beachfront nesting habitats.

Working with local landowners on an offshore islet, WIDECAST developed the Jumby Bay Hawksbill Project to monitor the nation’s largest hawksbill breeding colony. The science and conservation program has yielded a wealth of data that is helping islanders reverse the colony’s decline.

“In addition to quantifying aspects of basic nesting biology, such as nest site selection, clutch frequency, and average size of the gravid females, the project offers a unique model of sustainable conservation supported entirely by local landowners,” Scott says. “Through it, we’ve been able to pioneer habitat restoration techniques, long-term studies of recruitment and survivorship, and investigations into the genetic relationships between this small colony and others in the region.”

This information is now being used to develop hawksbill management practices on a regional scale, he says.

In Trinidad, WIDECAST is working closely with government, fishermen and tourism operators to develop management programs that protect the world’s second largest nesting colony of leatherback turtles. Not so long ago, egg-laden females that crawled ashore on the island’s beaches were shot for sport. Today local village-based groups manage and protect the colony as an eco-tourism asset.

“Tour guiding and data collection now provide significant income and permanent employment for community entrepreneurs and youth,” Scott says. “You can make a very persuasive case for conservation by showing that you can earn more money from protecting turtles than from eating them.”

“The idea,” says Karen, “is to help...
communities, and indeed nations, strengthen and diversify their economies to the point where a villager can afford to watch 100 pounds of turtle meat swim away.”

Their grassroots approach to conservation has been a hallmark of the Eckerts’ careers since their days as undergraduates at tiny Principia College in Elsah, Ill., in the late 1970s.

“It seeps into your view of yourself—the idea that you can bring about real change and have a meaningful impact,” Karen says. After graduating with a degree in biology in 1980, she accepted a job with the Georgia Sea Turtle Cooperative as field director of a loggerhead sea turtle monitoring project on Georgia’s Little Cumberland Island.

Scott, who had graduated the year before, also as a biologist, was working in Seattle as a film chemist at a large, movie-processing laboratory. He jumped at the chance to join Karen in Georgia, and the seeds of their future careers and lives were sown.

“We agreed that living on an isolated barrier island and working in all kinds of weather 10 hours a night, seven days a week for five months at a time, was a wonderful way to start a marriage,” Karen recalls with a laugh. “We were paid a combined annual income of $1,500 and thought we’d died and gone to heaven.”

Their monitoring program on Little Cumberland Island soon caught the attention of federal authorities, who hired them to initiate a similar research project in the U.S. Virgin Islands, where a leatherback sea turtle nesting beach was slated for development as a marina. Through meticulous monitoring, the Eckerts were able to show that the beach supported the largest colony of leatherback turtles under U.S. jurisdiction. Plans for the marina were cancelled, and the area became a National Wildlife Refuge—the first one ever designated for sea turtles by the U.S. Congress.

Over the years, the Eckerts have pursued each new job and degree with equal passion and commitment. They both hold doctorates in zoology from the University of Georgia, where Karen also completed a Certificate in International Policy.

In 1989, Karen agreed to take over the reins of Milton Kaufmann’s grassroots consortium, WIDECAST, even though its assets totaled only $744.17. “It was,” she recalls, with obvious pleasure, “an offer I couldn’t refuse.”

In 2002, a second irresistible offer brought the Eckerts to the Nicholas School from San Diego, where they had moved so Scott could pursue his research on diving vertebrates at the Scripps Institution of Oceanography.

“We were looking for a chance to work together more, and to incorporate the WIDECAST portfolio into a university’s teaching and research curriculum, preferably in an area where our son could grow up close to nature,” Scott says. “The Marine Lab was a perfect fit. We already had colleagues here who we respected a lot.”

WIDECAST’s big challenge in coming years, the Eckerts say, will be to expand its grassroots conservation efforts to protect coral reefs and other offshore habitats.

Leatherback turtles (Dermochelys coriacea) are the largest, deepest diving, and widest ranging of the sea turtles. Adult males can grow up to eight feet in length and 2,000 pounds. Leatherbacks have a black, leathery, ridged carapace and disproportionately long front flippers. Jellyfish are their dietary staple. These ancient giants range into subarctic waters, but always return to the tropics to nest.

Loggerhead turtles (Caretta caretta) can grow to 400 pounds, with shell lengths of four feet or more. They have reddish-brown shells, broad heads and powerful jaws. Their diet consists of marine bottom-dwellers, such as conch, crabs and jellyfish. If you’ve ever witnessed a sea turtle nesting in the U.S., you probably were watching a loggerhead.

Olive ridley turtles (Lepidochelys olivacea) are named for the color of their shells. They rarely exceed two- and-a-half feet long and 110 pounds. Found in coastal waters, they feed on crabs, shrimp, jellyfish and, according to some reports, algae. They are the most abundant sea turtle in the world, but very rare in the Caribbean Sea.
where turtles forage for food. Loss of these areas is a growing problem, and some Caribbean countries have the highest rate of living coral loss in the world.

Protecting these reefs and foraging grounds isn’t going to be easy. Karen says, but then, nothing worth doing ever is.

"The most serious threat to sea turtles, or any other species, is the notion that we don’t have to work—really work—for their survival," she says. "It’s easy to believe that someone else, with more money, or more time, or better expertise, will somehow slow the frightful pace of extinction. But it doesn’t work that way. In the end, we all have to act as if the survival of our planet depends on us, because it really does."

Tim Lucas is the Nicholas School’s national media relations and marketing specialist.

Witnessing the Leatherback’s Ancient Ritual on the Shores of Trinidad
by Michael Tennesen

A group of biologists huddles under a quarter moon on the eastern shore of Trinidad watching the crashing surf. Out of the white froth, a large dark form appears. Enter the leatherback, the most ancient of living sea turtles, a creature that is older than the dinosaurs. Scott Eckert, a biologist with the Nicholas School, and a group of volunteers stare back in amazement.

Tonight’s visitor at Matura beach weighs about 800 pounds. More than 2,000 leatherbacks lay eggs on this beach each year, making it one of the largest nesting colonies in the world. This prehistoric animal picks a spot on the beach and digs its nest. Soon the animal is laying its eggs, about 70 to 90 in all, each the size of a cue ball. While laying these eggs, the animal goes into a trance, and Eckert uses this opportunity to tag, measure, and record the animal’s vital statistics.

Eckert and his wife, Karen, have been studying these animals since the early 1980s. They are assisted by Nature Seekers from Matura, who guard the beaches from poachers and serve as ecotourism guides, as well as Earthwatch volunteers who come here from the States to contribute to Eckert’s work. Duty for all begins each evening around 8:30 p.m. and lasts until 3 to 5:30 in the morning.

Work like this throughout the Caribbean has lead to a decline in poaching and significant signs of recovery in all sea turtle species in the region. But this is not the case everywhere. Populations in the Pacific have plummeted. “If things continue like this in the future, we are looking at extinction of the Pacific leatherback in the next 10 years,” says Eckert.

So the biologist, who also is the director of science for the Wider Caribbean Sea Turtle Conservation Network (WIDECAST), works to spread sea turtle awareness throughout the Caribbean while trying to uncover the leatherback’s secrets.

The leatherback sea turtle is the largest of all turtles. Adult males may weigh up to 2,000 pounds. The Eckerts first looked at this giant off Saint Croix in the Virgin Islands in the early 1980s to study its diving behavior. They recorded one animal diving below 3,330 feet. Among the world’s air-breathing divers, only the elephant seal, and the sperm whale dive deeper. Their lungs collapse on these deep dives, forcing the animal to get their oxygen from stores in the blood and muscle.

Leatherbacks prey on jellyfish. “It’s the perfect Atkins Diet, almost all protein,” says Eckert. They find the majority of that food at depths exceeding 1,800 feet. Leatherbacks not only go deep, but long. Eckert attached satellite-tracking instruments to the turtles and followed one animal that left Trinidad and traveled all the way to the mid-north Atlantic and back down to the northwest corner of Africa.

Says Eckert, “They have a tear-drop shaped body—the perfect hydrodynamic form—and long powerful fins. It takes only a little bit more energy for them to swim than it takes to sit still.”

In Trinidad, Nature Seekers, which got going in 1990, has largely stopped all the poaching of leatherbacks on the beach of Matura—a big problem in the past. Dennis Sammy, the manager of Nature Seekers and country coordinator for WIDECAST, thinks some of the effectiveness of the group has come from the fact that Nature Seekers are members of the community. “If you harm the sea turtles, we know where you live, and we know where to send the police,” he says.

But these days, Nature Seekers spend most of its time guiding ecotourists rather than calling the police. On a Saturday night, sightseeing buses arrive with up to 150 tourists to witness the turtles. Though some of the tourists are western vacationers, the majority are local residents who will take home an appreciation of these turtles to their neighbors.

Some of the Matura’s tour guides are former poachers or from poaching families. Eckert thinks that’s smart. “The more you involve poachers and the sons and daughters of former poachers, the more you undermine the future of poaching.”

With Trinidad’s leatherback sea turtle population on the rise, the method is apparently working.

Freelancer Michael Tennesen of California, who was a Nicholas Environmental Media Fellow (www.nicholas.duke.edu/media/pastfellows.html), visited Scott Eckert in Trinidad earlier this year.

web sites to note

Wider Caribbean Sea Turtle Conservation Network  www.widecast.org
Karen Eckert’s bio  www.nicholas.duke.edu/people/faculty/eckertk.html
Scott Eckert’s bio  www.nicholas.duke.edu/people/faculty/eckerts.html
Facing heavy course loads and career development concerns, many professional degree students barely find time to sleep, much less volunteer. But up to a quarter of Nicholas School students have made time to connect with the Durham community through the Duke Environmental Leadership (DEL) Community Outreach Program.

By Jean Lynch MEM’06

The kindergartners in Jamie Barnhill’s classroom were in high spirits, and the silent cheer their teacher asked for was anything but silent. Who could blame them? They were five years old, it was a sunny day, and two enthusiastic graduate students had just stopped by to talk with them about turtles, jellyfish and spiders. There also may have been the hint of a game of make-believe in the air, too.

A Nicholas School student would feel right at home in this classroom. Mr. Barnhill and his charges had festooned it with artifacts from nature and projects explaining how they work. Elk skulls and paper fishes, tadpoles and insects adorned the walls, and a science center explained the parts of a spider. “What is a flower?” “What is a bird?”

Colleen Kenney and Sarah Borchelt, first-year MEM candidates, were regular volunteers at this classroom at Durham’s Forest View Elementary School. Previously, they had talked about butterflies with the children and paper cutouts still decorated the room, providing a reminder of the lesson. Today, Kenney announces, they would talk about land and sea turtles and their associated food webs.

A voice broke in over the intercom: “Boys and girls, we will be having a fire drill in just a few minutes. Remember that we always ask you to leave the classroom quietly and behave as though there might be a real fire.” They did exit quietly, inspired by Mr. Barnhill’s request to file out “as silently as a box turtle swimming in a pond at night.”

The outreach program is administered by the Nicholas School’s DEL program. Deb Hall MEM’00, runs it with the help of student assistants in three Durham elementary schools—E.K. Powe, Forest View, and C.C. Spaulding. Involvement ranges from one-time special projects to regular student visits to the classrooms of interested teachers, depending on the wishes of the partner school and the availability of Nicholas School volunteers.

While Hall has the job of developing relationships with schools in the community, it fell to Vanessa Jordan, the program assistant and an MEM candidate, to recruit the 2004–2005 volunteers and match them with appropriate assignments. On Jordan’s watch, at least 50 MEM candidates managed to find time to teach environmental science in the community. About 20 students volunteered on a regular weekly or biweekly basis, and dozens of others were involved in occasional or one-time teaching events such as Arbor Day and Earth Day celebrations or Family Science Night at E.K. Powe. Some students took on an entire classroom, while some work with a few students or with one student at a time. Jordan volunteered regularly and can’t say enough good things about the program and the volunteers: “The commitment the volunteers showed was amazing. The greatest thing about the program is that both the school kids and the Nicholas School students benefit tremendously from it. We all learn from each other.”

Hall concurs. “It’s inspiring to see so many busy students contributing their time and energy to the community. These students not only cultivate their own communication skills, they enrich and expand the learning opportunities for the next generation of environmental professionals.”
After the fire drill, the children were eager to talk turtles. About a dozen of them raised their hands when asked if they’d seen live turtles before, so Sarah Borchelt and Colleen Kenney both introduced new turtle facts and solicited memories the children had of things they’d learned in the past. The class discussed sea turtles and box turtles: where box turtles got their name (it refers to their boxlike shell, into which they can retract their entire head and limbs), what types of water the different turtles are found in, what they like to eat, and some differences in anatomy, such as the shape of their feet or flippers.

“How long do turtles live?” Borchelt asked. After an initial suggestion of 500 years, the children’s guesses dropped sharply to four years and then varied wildly until Kenney and Borchelt revealed that the actual age span was 60 to 130 years. Despite their initial high guess, a “Wo-o-o-ow” issued from the crowd, signaling that the children were impressed.

“Who here can tell me what a food chain is?” asked Colleen. A little boy named Nicolo responded as if he’d been prepped ahead of time: “It’s about what turtles can eat and what they can’t eat. And what’s healthy for them and what’s not healthy for them.” “That is a great answer,” Kenney said. Later, she offered good-naturedly, “Sometimes I think they already know everything and they’re just humoring us.”

But Nicolo had experience with sea turtles because his family had been involved in a turtle nesting program on Bald Head Island. Rest assured, the children were learning. “What do box turtles eat?” Kenney and Borchelt asked. The children’s answer: Carrots and bread. What would they eat if there were no people around? Crickets! Yes. Cobras! Probably not. What about sea turtles? Seaweed. Jellyfish. Good. Sea turtles have special salt-extracting glands that allow them to drink lots of sea water. Can we do that? Noooo! Can box turtles? Noooo!

Once everyone was up to date with turtle diets, it was time for a game.

“Do you all want to play?” Borchelt asked. “YEAAAAHHH!” the kindergartners exclaimed. “Okay,” she continued. “The game we’re going to play will help explain food chains.” “YAY!”

In the first game, half of the children would play the parts of the box turtle food chain. The rest of the class would repeat the game with sea turtles, so that everyone would have a chance to play. Kenney and Borchelt helped the children form a circle and draped a picture of a box turtle around the neck of a boy named Jaquez. More pictures were handed out, representing worms, plants, water, soil, insects, spiders, and more turtles. Jaquez the turtle chose to eat a worm, so a string was stretched between the turtle and the worm. The worm decided to burrow in the soil, so the string was extended to the child playing soil, and eventually weaved back and forth across the circle, connecting the plants, insects, water, and spiders.

When the string had connected everyone in the chain, Kenny directed the children’s attention to the lesson. “Let’s look at how connected you all are. What will happen if I take someone out of there? What part of the chain should we take out?” The children decided to take out the spiders and insects. All spiders and insects dropped their strings, and the turtles had lost a vital part of their world.

In the second game, Hahaie, in purple headband, purple ponytail holder, purple striped shirt, and black and yellow cross-trainers, portrayed a sea turtle. Her classmates played more sea turtles and their related food and habitat, including crabs, seaweed, ocean, and jellyfish.

When the first links in the sea turtle food chain had been broken, Borchelt asked, “What happens to the turtles now?” The kindergartners responded, “They can’t eat!” The children returned to their seats on the floor, cheering when told they could keep the critter pictures around their necks. A crab named Amelia scuttled, still in character, to the piece of tape that labeled her seat on the floor. When asked what had happened to the turtles in the game, she responded that turtles can’t survive without food: “If the food is healthy to the turtle and he can’t eat it, that’s not healthy.” Plastic bags are another problem, one of the boys noted with some prompting, because they can be mistaken for jellyfish.

“What are some other things that make life hard for sea turtles?” Kenney asked. “Take ten seconds to put on your thinking caps.” Amelia raised her hand, but forgot what she had intended to say. Nicolo, remembering his work with turtle hatchlings, explained that newborn turtles always walk toward bright light, and that you have to be careful about lights that are on when turtles are hatching. He also had a recommendation for car drivers who encounter newly hatched turtles in their path: “When you see a turtle while you’re driving in the car,” he exclaimed, “Jump out of the car and tell the turtle to stop!” Or, Kenney gently offered, you can stop your car and let the turtle keep going. Other suggestions: Don’t leave litter at the beach, pack it out or put it in trash cans. Another student offered a more difficult plan, to find seaweed and put it in the water for the turtles to eat. Borchelt nodded. “There are some ways we can help make sure that turtles have food to eat.”

These types of discussion are one of Vanessa Jordan’s favorite parts of volunteering. “It’s really rewarding to see the kids’ faces light up when they speak about conservation,” she says. “They get very excited when they find out they can help.”

When the lesson, game, and discussion were over, it was time for a big thank-you to Kenney and Borchelt. After hugs and good-byes until next time, they returned to the Duke campus and their coursework.

For information about this and other projects of the DEL Community Outreach program, call 919-613-8082 or e-mail del@nicholas.duke.edu.

Jean Lynch MEM’06 was the Nicholas School Student Communications Assistant in 2004-2005.
I dabbled in natural history in high school, but it was during my formative undergraduate years at Dartmouth that I discovered the excitement of a career in environmental science. No doubt, working closely to analyze New England’s rain chemistry with my undergraduate mentor, Bill Reiners, made a huge difference in my decision to go to graduate school in ecology. But I was in classes with dozens of students who chose other careers. Where are they now?

Many students at Duke, like those at Dartmouth, have an interest in ecology, but are unlikely to choose an environmental field as their primary life pursuit. Most of my classmates from 30 years ago are now lawyers, doctors and investment managers, and I can only hope they carry some memory of what we learned about the basic principles underlying the function of natural ecosystems and our planet. Watching the political mood of the country with respect to the environment, I fear that too few of our educated citizenship share that knowledge. For the sake of our planet, we must do better—at Duke, at Dartmouth, and at all colleges and universities across the nation—to educate our students about the environment.

Duke students will be leaders of the next generation, and my fondest hope is that we can populate the halls of the corporate and government world with those who understand some of the basic principles of ecology and earth science. At the Nicholas School, we are committed to undergraduate education. Since 1995, the school has offered several majors for students in Trinity College—currently an A.B. and a B.S. in environmental science and policy and an A.B. and B.S. in earth and ocean sciences. Each year, we teach about 800 undergraduates, roughly 12 percent of the students on campus. This is a good start, but we must do more to reach students across campus. In our new strategic plan, we have undertaken a renewed commitment to undergraduate teaching and outreach. We want to double our undergraduate enrollments during the next few years.

One exciting new program for undergraduates is a Certificate in Energy and the Environment, to complement the similar certificate we recently began to offer for our professional degree (MEM) students. Many students realize that the competition between finite energy resources and steadily increasing demand is among the most pressing issues confronting our world, and that how we exploit energy resources often has huge impacts on our environment. We expect this certificate to be of interest not only to our environment and earth science majors, but also to undergraduates majoring in social sciences, such as public policy and economics, because the energy system is so pervasive in its impact. This exciting new focal area within the Nicholas School was made possible by the vision of the Gendell family, whose generous gift will add new faculty positions in energy studies and support a host of teaching and outreach activities. (See story, page 40.)

One of the great resources of the Nicholas School and Duke University is the Marine Laboratory on the coast in Beaufort, N.C. The lab offers a year-round curriculum for undergraduate and graduate students, as well as a full range of research, residential, and teaching facilities, including the oceanographic ship, the R/V Cape Hatteras. Nowhere is the undergraduate experience more real than at the Marine Lab, where students opt to spend a semester living, working, and studying in small, focused groups, and to gain hands-on research experience through studies of sea turtle reproduction or the mating systems of blue crabs. Some laboratories are held at night, so that students can sample when the tides are right and the seasons are best. In my years as a faculty member in the Biology Department, every undergraduate I advised who went to the Marine Lab thought it was the best part of her undergraduate experience. While Marine Lab semesters are open to all undergraduates, regardless of major, we are currently working to strengthen this rich opportunity for undergraduate engineering students by offering a semester geared toward their particular interests and skills, including research projects involving the remote sensing and sonar tagging of marine life.

I am a big advocate of the class field trip, but unfortunately, given the rapid daily pace of life on campus, field trips have nearly disappeared from the curriculum of the modern university. A bonding between student and nature and lifelong friendships amongst students are forged by a long day in the field and an evening by the campfire. Currently, geologists within the Nicholas School offer popular field trips to Hawaii, Yellowstone, and Florida coral reefs. In addition, the school’s energy field trip during fall break brings students to the oil fields and refineries of Houston to see how the nation’s energy is supplied. We want to extend such field experiences to include a wider range of environmental sciences, and hope to compensate the faculty for the extra time that this activity requires.

Undergraduate teaching and outreach will factor importantly in the new strategic plan for the Nicholas School. The generous gift from the Gendell family will play a key role in energizing our program, which can now reach out to a wider population of undergraduate students. Certainly, we’ll need additional new resources to expand our undergraduate teaching and activities throughout the school. But look to our exciting new programs to ensure that our nation’s environment will be in the hands of future leaders well equipped to maintain its health.
Presentations and Conferences


Michael Lavine, professor of statistics and decision sciences, and M. Susan Lozier, professor of physical oceanography, were invited to present their collaborative work, “Detecting Climate Change in the Ocean,” at the Eighth Workshop on Case Studies in Bayesian Statistics at Carnegie Mellon University, Pittsburgh, Pa., in September.

Marie Lynn Miranda, associate research professor and director, Children’s Environmental Health Initiative, was one of several area scientists to participate in a town meeting on Environmental and Neurodevelopmental Disorders Over the Lifespan. The meeting, sponsored by the National Institute of Environmental Health Sciences and held in Research Triangle Park, opened the 22nd International Neurotoxicology Conference. Miranda presented and discussed research on lead mapping.

A. Brad Murray, associate professor of geomorphology and coastal processes, gave an invited talk in April at the European Geosciences Union meeting in Vienna, Austria, “Bedform Pattern Evolution in Two Horizontal Dimensions: Extreme Wavelength Increases with Mixed Grain Sizes.”

Daphne Pee, MEM’03; Lindsay Fullencamp, MEM’03; and Heidi Recksie MEM/MPP’97. Pee chaired the symposium “Assessing Marine Protected Areas and Networks,” and Recksie chaired “Social Science Methods for Marine Protected Areas: An Overview for MPA Managers and Staff.”

Daniel D. Richter Jr., professor of soils and forest ecology, attended the 2005 Goldschmidt Conference on Geochemistry and Mineralogy in Moscow, Idaho, to give an invited talk, “Rhizosphere Iron–Redox Cycling: Electron Transfer Reactions that Drive Mineral Weathering,” with Nicholas School graduate Ryan L. Fimmen PhD’04 and Bowdoin College professor Dharni Vasudevan.

James Salzman, professor of environmental law and policy, was the lunch speaker at Rocky Mountain Mineral Law Foundation’s biennial institute for natural resource law professors in Santa Fe, N.M. in June. He presented “Creating Markets for Ecosystem Services.”

At a May workshop co-sponsored by Stanford University, The Nature Conservancy and World Wildlife Fund, Salzman presented “Conservation Incentives that Work for People on the Land,” about the promise and peril of ecosystem service payments.

William H. Schlesinger, James B. Duke Professor of biogeochemistry and dean of the Nicholas School, participated in the NC Environmental Defense forum “Horizons 2100: A Vision for the Future.” The forum was held in three different locations: Raleigh, Charlotte and Asheville, N.C., during April and May.

In March, Schlesinger testified in hearings before the N.C. Senate Agriculture, Environment and Natural Resources Committee on the subject of global climate change in North Carolina. Also in March, Schlesinger participated in the conference “One North Carolina Naturally,” held at the Raleigh Conference and Convention Center.

Martin D. Smith, assistant professor of environmental economics, had a busy spring and summer on the conference circuit. In April, he presented “A Spatial Bioeconomic Model of Nutrient Pollution” for the 3rd Workshop on Spatial–Dynamic Models of Economics and Ecosystems held at the Abdus Salam International Centre for Theoretical Physics, in Trieste, Italy. Also that month, Smith and Stephen Toth Professor of Marine Biology Larry B. Crowder gave an invited presentation, “Valuing Ecosystem Services with Fishery Rents: A Lumped–Parameter Approach to Hypoxia in the Neuse River Estuary,” for the National Science Foundation–Environmental Protection Agency Biocomplexity Workshop in Santa Fe, N.M. Later in May, Smith and Crowder presented this work to the 2005 Forum of the North American Association of Fisheries Economists in Vancouver, B.C., Canada, where Smith also made another presentation on “A Hierarchical Bayes Approach to Discrete Choice Fisheries Modeling” with J. Zhang MEM’03 et al.


Jonathan B. Wiener, professor of law and of environmental policy, presented “Precaution in the U.S. and Europe” for the conference Better Regulation: The European Union (EU) and the Transatlantic Dialogue. This conference, co-sponsored by the European Policy Centre, the European Commission, and the U.S. Mission to the EU, was held in Brussels, Belgium, in March.

In April, Wiener was at the Yale School of Forestry and Environmental Studies in New Haven, Conn., where he presented “Beyond Kyoto: Moving Climate Change Policy Forward,” and, in June, he gave the keynote address, “Hormesis and Regulation,” to the Fourth Annual...
International Conference on Hormesis at University of Massachusetts, Amherst.

### In Print

Recent publications by Nicholas School faculty or staff

**Lori Snyder Bennear**, assistant professor of environmental economics and policy

**Lisa M. Cambpell**, Rachel Carson Assistant Professor of Marine Affairs and Policy
- “Overcoming Obstacles to Interdisciplinary Research,” *Conservation Biology*, 2005

**James S. Clark**, H.L. Blomquist Professor of Biology
- “Fire Cycles in North American Interior Grasslands and Their Relation to Prairie Drought,” *Proceedings of the National Academy of Sciences*, June 2005 (coauthor)

**Michael S. Coyne**, research scientist
- “Population Characteristics of Kemp’s Ridley Sea Turtles in Nearshore Waters of the Upper Texas and Louisiana Coasts,” *Chelonian Conservation and Biology*, 2005 (coauthor)
- “Predicted Sex Ratio of Juvenile Kemp’s Ridley Sea Turtles Captured Near Steinhatchee, Florida,” *Copeia*, 2005 (coauthor)

**Kevin T. Craig**, assistant research scientist
- “Declining Threshold for Hypoxia in the Gulf of Mexico,” *Environmental Science & Technology*, 2005 (coauthor w/ C.A. Stow and S.S. Qian)

**Thomas Crowley**, Nicholas Professor of Earth Systems Science
- “Raising the Ante on the Climate Debate,” *EOS Forum*, July 12, 2005

**Richard T. Di Giulio**, professor of environmental toxicology, and director, Duke Superfund Basic Research Center
- “Assessment of the Phototoxicity of Weathered Alaska North Slope Crude Oil to Juvenile Pink Salmon,” *Chemosphere*, 2005 (coauthor w/ M. Rau PhD’05 et al.)
- “A Non–Destructive Technique to Measure Cytochrome P4501A Enzyme Activity in Living Embryos of the Estuarine Fish (*Fundulus heteroclitus*),” *Techniques in Aquatic Toxicology*, 2005 (coauthor w/ D.M. Wassenberg PhD’05 et al.)

**Patrick N. Halpin**, Gabel Associate Professor of the Practice of Geospatial Analysis
- “Patterns of Watershed Urbanization and Impacts on Water Quality 1,” *Journal of the American Water Resources Association*, 2005 (coauthor w/ M. V. Carle and C. A. Stow)

**Gabriele Hegerl**, associate research professor
- “Warming the World’s Oceans,” *Science*, July 8, 2005 (coauthor)

**David E. Hinton**, Nicholas Professor of Environmental Quality
- “Metabolic Change in Japanese Medaka (*Oryzias latipes*) During Embryogenesis and Hypoxia as Determined by in Vivo31P NMR,” *Comparative Biochemistry and Physiology Part C: Toxicology & Pharmacology*, February 2005 (coauthor)

**K. David Hyrenbach**, research scientist
- “Do the Largest Reserves Protect Whales or Whalers? Science, Jan. 28, 2005 (coauthor)

**Robert B. Jackson**, professor of environmental sciences and biology

**Gabriel G. Katul**, professor of hydrology and micrometeorology
- “Mechanistic Analytical Models for Long-Distance Seed Dispersal by Wind,” *The American Naturalist*, 2005 (lead author w/ M. Siqueira PhD’02 et al.)
- “Foliage Shedding in Deciduous Forests Lifts up Long-Distance Seed Dispersal by Wind,” *Proceedings of the National Academy of Sciences*, 2005 (coauthor)

**Emily M. Klein**, Lee Hill Snowdon Professor of Geology
- “Counter–Rotating Microplates at the Galapagos Triple Junction,” *Nature*, February 2005 (lead author)

**Randall A. Kramer**, professor of resource and environmental economies

**M. Susan Lozier**, professor of physical oceanography
- “The Effect of Advection on the Nutrient Reservoir in the North Atlantic Subtropical Gyre,” *Nature*, Sept. 29,
2005 (coauthor w/ Jaime Palter and R. T. Barber)
Orrin H. Pilkey, James B. Duke Professor Emeritus of Geology
• “Beach Awash with Politics,” Geotimes, July 2005
Stuart L. Pimm, Doris Duke Professor of Conservation Ecology
• “Sustaining the Variety of Life,” Scientific American, special issue, September 2005 (w/ C. Jenkins)
Andrew J. Read, Rachel Carson Associate Professor of Marine Conservation Biology,
• “North Atlantic Right Whales in Crisis,” Science, July 2005 (coauthor)
• “Effects of Fine Scale Oceanographic Features on the Distribution and Movements of Harbor Porpoises (Phocoena phocoena) in the Bay of Fundy,” Marine Ecology Progress Series, 2005 (coauthor w/ D. Johnston and A. Westgate)
• “Effects of Fishing on Long-lived Marine Organisms,” Marine Conservation Biology: The Science of Maintaining the Sea’s Biodiversity (chapter), 2005 (coauthor w/ L.B. Crowder et al.)
• “Prey Detection by Bottlenose Dolphins (Tursiops truncatus): An Experimental Test of the Passive Listening Hypothesis,” Animal Behavior, 2005 (coauthor)
Kenneth H. Reckhow, professor of water resources, and chair, Division of Environmental Sciences and Policy
Curtis J. Richardson, professor of resource ecology
• “The Restoration Potential of the Mesopotamian Marshes of Iraq,” Science, February 2005 (lead author)
• “Spatial Variability of Soil Properties in Created, Restored, and Paired Natural Wetlands,” Journal of the Soil Science Society of America, 2005 (coauthor w/ G. Bruland PhD’04)
James Salzman, professor of law and Nicholas Institute professor of environmental policy
William H. Schlesinger, James B. Duke Professor of Biogeochemistry and dean, Nicholas School
• “Soil Carbon Sequestration and Turnover in a Pine Forest After Six Years of Atmospheric CO2 Enrichment,” Ecology, 2005 (coauthor)
Martin D. Smith, assistant professor of environmental economics
• “State Dependence and Heterogeneity in Fishing Location Choice,” Journal of Environmental Economics and Management, 2005
John Terborgh, James B. Duke Professor of Environmental Science
• “The Effects of Herbivore Density on Soil Nutrients and Tree Growth in Tropical Forest Fragments,” Ecology, 2005 (coauthor w/ K. Feeley PhD’05)
Dean L. Urban, associate professor of landscape ecology
• “Modeling Ecological Processes Across Scales,” Ecology, 2005

Memberships, Appointments and Awards
Richard T. Di Giulio, professor of environmental toxicology, and director, Duke Superfund Basic Research Center, has assumed the role of director for Duke University’s Center for the Comparative Biology of Vulnerable Populations following the departure of its original director, Dr. David Schwartz. Schwartz left Duke University Medical Center in May to direct the National Institute of Environmental Health and Safety (NIEHS) in Research Triangle Park, N.C. The center provides support and pilot funding in three research areas: neurobiology and neurodevelopmental disease, pulmonary biology and disease, and environmental health policy. It maintains four research support core facilities and a community outreach and education program. The center is comprised of 37 investigators from the Nicholas School, the Duke University Medical Center, Trinity College of Arts and Sciences, the School of Law, and the University of North Carolina.

Di Giulio also is a member of the Committee on Assessment of the Health Implications of Exposure to Dioxin, organized by the National Research Council. The committee, which began its work in October 2004, is reviewing the EPA’s risk assessment of dioxin and anticipates a report on its findings in December 2005.

He also has been a member of the Computational Toxicology Committee of the EPA’s Board of Scientific Counselors since December 2004. This committee provides external oversight for EPA’s newest research center, the Center for Computational Toxicology.

Gabriele Hegerl, associate research professor, Division of Earth and Ocean Sciences, was appointed to the scientific advisory board for the Alfred Wegener Center for Climate and Global Change, in May. The WegCenter is an interdisciplinary, internationally oriented research center of the University of Graz (UniGraz), Austria, started in December 2004. It brings together research teams and scientists from fields such as geophysics, climatology, economics, and geography, with an overall aim to become a national and international center of excellence for research in the fields of climate and global change.

In March, Michael K. Orbach, professor of the practice of marine affairs and policy and director, Duke University Marine Laboratory, accepted an award on behalf of the Surfrider Foundation for the NOAA “NGO of the Year” at a ceremony on Capitol Hill. In attendance were N.C. Congressman Walter B. Jones Jr. and NOAA representative Admiral Conrad Lautenbacker. Orbach is serving a second term as chairman of the Surfrider
Faculty & Staff Notes

Foundation’s Board of Directors. The foundation is an international environmental advocacy organization devoted to the protection of beaches, waves and coastal water quality around the world. Nicholas School graduate Chad Nelsen, MEM’94, is its environmental director.

Grants
Grants of $50,000 or more awarded to faculty in the past six months


David J. Erickson, adjunct professor of computational biogeochemistry, National Aeronautics and Space Administration (NASA), $87,790, “Constraining the CO2 Missing Sink.” Duration: 2005-08.


K. David Hyrenbach, research scientist, Coastal Systems Science and Policy Division, subcontract from the University of Washington, $118,362, Bering Sea Ecosystem Study. Duration: 2005-08.

Gabriel G. Katul, professor of hydrology and micrometeorology subcontract from Indiana University, $308,879, “Scaling up of Carbon Exchange Dynamics from AmeriFlux Sites to a Super-Region in the Eastern United States.” Duration: 2005-06.


James F. Reynolds, professor and director of the National Phytotron, subcontract from the University of Georgia, $101,046, “Using Microbial Indicator Species to Distinguish Shifting Contributions from Soil Organic.” Duration: 2005-06.


—Compiled by Donna Picard, Nicholas School communications assistant
Talk to Meredith Wingate’s colleagues, and they’ll tell you that she’s smart. Creative. A quick thinker. Diplomatic. Enthusiastic. And, almost inevitably, they’ll say that she’s got energy. Inevitably, because the 1998 MEM works in the energy field.

Specifically, Wingate works in renewable energy policy as director of clean energy design and implementation at the Center for Resource Solutions (CRS), a San Francisco nonprofit. Established in 1997, CRS operates across the United States and in countries like China, assisting local and regional governments, other nonprofits, and corporations (including utilities) as they adopt programs for using renewable energy.

Wingate is involved in activities ranging from writing “best practice” handbooks for regulators to advising government officials who might be inadvertently writing rules that hinder progress on the renewables front. But her main focus these days is facilitating the creation of renewable trading markets across the country.

“Traditionally, there have been physical barriers to renewables entering the market,” Wingate says. “If the wind is here, but the load is over there, what do you do? If you can generate wind power at night but the demand for power is in the daytime, how do you deal with this?”

How you deal with it is to create a market—somewhat like a stock exchange—in which companies who create renewable energy can sell certificates to other companies or individuals who want to offset their use of traditionally generated power.

Such trading of renewables has existed for at least a half-dozen years, assisted by the Center for Resource Solutions’ Green-e program, a voluntary certification program that verifies that energy was created using renewable resources such as wind, solar, biomass, geothermal, or small hydro. Green-e, which Wingate directed from 1999 to 2002, is the standard the federal government uses in its renewable energy procurement and was the standard used when Pacific Gas and Electric purchased enough renewable energy certificates to offset all of San Francisco’s electricity use on United Nations World Environment Day on June 3.

What Wingate is doing now is helping regional renewable markets develop an infrastructure for third-party authentication of trades. “It’s like the New York Stock Exchange,” says Brad Crabtree, director of the Powering the Plains Project, an energy and agriculture policy program of the Great Plains Institute in Minneapolis, Minn. “If you buy 100 shares of IBM, you never doubt those shares exist. This implicit trust allows the market to flourish. We are trying to create this trust so that our renewable market can flourish.”

Wingate is providing technical expertise as Powering the Plains works with regional utilities to create the Midwest Renewable Energy Tracking System (MRETS). Currently, a working group of stakeholders is creating the rules for tracking
and authenticating renewable certificate transactions. Wingate advises the group on issues from the large and complex—how do you account for certificates when you have a company that generates both renewable and fossil fuel energy—to the nitty gritty, like how you generate the serial numbers for renewable certificates.

Wingate brings to the project a deep knowledge of what other regions have done in similar situations, and Crabtree says that the MRETS project is ahead of schedule in part because she has prevented them from reinventing the wheel, making mistakes that others had already made and solved.

“Only a handful of people in the country know as much as she does about renewable energy markets,” says Crabtree.

For two years, Wingate took this knowledge to China, where she worked on a program for the Center for Resource Solutions that assisted the Chinese equivalent of the Environmental Protection Agency in the development of renewable energy policies. She traveled to the country five times, staying for several weeks at a time, advising the Chinese on policies that support new renewable development and informing them of renewable successes and failures in other countries. It was “fascinating, interesting and also grueling,” Wingate says, recalling daily meetings that would start at 8:30 a.m. and end with a formal banquet at 9 p.m. Although it was a challenge dealing with people who had little experience with markets and pricing—because the Chinese government has historically set the price for everything—Wingate is cautiously optimistic on the subject of China and renewables, particularly in light of its recent passage of the landmark Chinese Renewable Energy Promotion Law.

The arrival of daughter Madeline in 2004 brought Wingate back to the domestic renewable energy arena. She is married to Brad Drda, an expert with a San Francisco solid waste and recycling company, whom she met when she was in the same field. “Love at the dump,” she says jokingly.

She came to Duke after receiving her bachelor’s degree at the University of Colorado and spending five years in the waste industry in San Francisco. Wingate reports that Duke supplied her with key knowledge in international policy and climate change, and that the ability to distill a lot of information into a three-page paper is a Duke-taught skill that she uses continually.

One classmate who has stayed in touch remembers her as a “diplomatic and forceful” person who “doesn’t apologize for what she believes in.” Duke Forest Program Coordinator Richard Broadwell MEM’00 says, “She is fully invested in her beliefs as an environmentalist. She biked to school, she recycled and she composted.”

After receiving her Master of Environmental Management degree, she returned to the Bay Area and a job at San Francisco Recycling and Disposal, then worked in air quality compliance for the Port of Oakland before hiring on at the newly created Center for Resource Solutions. Jan Hamrin, the president and founder of CRS, liked Wingate’s enthusiasm and her policy background, and believed that those qualities would serve her well as she learned about the energy field on the job. Hamrin says, “She has an innate policy sense that guides her, an ability to analyze issues and negotiate between different interest groups.”

For Wingate, it has been a revelation and a pleasure working for an organization in which the entire workforce has a vested interest in the outcome of their projects and a shared set of values. She bikes to work most days and loves the beauty, progressiveness and cultural diversity of San Francisco, although “the cost of living is a challenge and public schools will be an issue.”

Now, Wingate plans to stay with energy. “It’s a fascinating field. It couldn’t be more timely. Renewable energy is such an important element of our environmental future.”

Lately, Wingate has been thinking a lot about the intersection of the markets in renewable energy and in carbon. As large electricity users look to reduce their carbon footprint, many of them are interested in buying renewable energy certificates in part because of their carbon reduction value.

But, Wingate says, some rules are hampering this extension of the renewable market; for instance, in traditional cap-and-trade regimes, allowances are given to polluters. “If you’re a wind developer that brings 1,000 megawatts of new wind power online,” she says, “that’s 1,000 megawatts less that is needed from existing electricity generators. Cap-and-trade programs are designed to reward polluters when emissions are reduced under the cap. This seems like a reasonable starting point, but in practice it rewards the polluters for the emission reduction activities of clean energy generators—the coal plant gets surplus allowances it can sell but the wind plant gets nothing because it didn’t have allowances in the first place.” The federal sulfur dioxide trading program is set up this way, and, Wingate says, “it’s an unfortunate precedent. We’re trying to get it right for carbon.”

There’s no reason to believe that they won’t “get it right” if Wingate is involved. After all, as her colleagues say, she’s smart. Creative. A quick thinker. Diplomatic. Enthusiastic. And she’s got the energy.

Lisa M. Dellwo is a freelance writer in Durham.

web sites to note

Center for Resource Solutions
www.resource-solutions.org

Green-e Renewable Electricity Certification Program
www.green-e.org
If you are asking for a raise without a promotion, keep in mind that you are unlikely to garner more than 3 to 5 percent of your current salary. If you have taken on additional responsibilities, your job description may be completely outdated.

Think ahead and arrange a meeting with your supervisor prior to your annual review. Bring an updated job description and a list of accomplishments to the meeting, along with a reasonable salary request. You can research salaries by looking at professional society statistics and job advertisements. Ask your boss for a decision within 2 to 3 weeks, and never use ultimatums.

If your request is turned down, find out what you need to do to get a raise in the future. You may need to add some skills to your portfolio or network more within the organization so that your work is more visible. If you decide to search for another job, keep in mind that you should evaluate the total compensation package—including medical benefits, retirement plan, onsite health club or day care. Your current position may be offering you more value than you realize.

Kirchof recommends the book *Dynamite Salary Negotiations* by Ron and Caryl Krannich, PhDs. And as always, feel free to contact the Office of Career Services for advice, at 919-613-8016.
Bruce Bandorick MEM’90 formed Thunder Basin Environmental Consulting Inc. (TBEC) in 1993 and provided environmental compliance services to the oil and gas industry of Wyoming and the Rocky Mountain Region. In 2000, Bruce moved TBEC to Buffalo, Wyo., to be closer to the coal-bed methane (CBM) production fields. TBEC and associates have perfected and patented a new method for treatment of CBM discharge water to remove barium and reduce alkalinity and bicarbonate. Bruce presented the CleanSweep-barium invention to the Strategic Research Institute’s Fifth Annual Conference. TBEC’s Web site is at www.tbeconline.com.

Matthew Durnin MEM’90 received his doctorate from the University of California-Berkeley in wildland resource science, with a concentration in wildlife ecology in 2004. He and his wife, Stephanie Hallford, have returned to China, where Matt has studied wild giant pandas for many years, so Matt can work with the California Academy of Science as their mammalogist on a project in the Gaoligongshan area of Yunnan Province.

Katie Peichel ML’90 is an assistant member of the Division of Human Biology at Fred Hutchinson Cancer Research Center in Seattle, Wash. Katie recently developed an innovative model system for her studies of human genetics, the stickleback fish. The stickleback model helps address one of the big challenges for disease research: how to sift through volumes of human genetic differences to identify genes that define particular traits, such as susceptibility to cancer and other diseases.

Jeff Corser MEM’91 left Tennessee to work for the New York Natural Heritage Program as a zoologist. Based in Albany, this organization combines thorough field inventories, scientific analyses, expert interpretation and the most comprehensive database on New York’s distinctive biodiversity to deliver the highest quality information for natural resources planning, protection, and management.

Brent Fewell MEM’91 has been appointed as deputy assistant administrator for water at the U.S. Environmental Protection Agency. Brent has been serving as senior adviser since September 2004 when he joined the agency. Brent currently resides in Potomac, Md., with his wife and their two daughters.

The Forest Landowners Association announced the selection of Guy T. Vise III MF’91 as the recipient of its 2005 Young Forest Landowner of the Year Award. The award is given annually to a young landowner who has made significant contributions to his or her generation’s understanding and appreciation of forestry and land ownership.

Michael Deane MEM’92 was named director of government affairs for Monteco Holdings Ltd. and its affiliate, the Stormceptor Group, in March. In this capacity, Michael has opened a Washington, D.C., office for Monteco, a Toronto-based holding company specializing in identifying and nurturing innovative early-growth stage engineering technologies and manufacturing businesses. Stormceptor is a state-of-the-art system for the interception and storage of urban pollutants from storm water flows.

Rikki Grober-Dunsmore MEM’92 accepted the position of nation’s ecologist for the National Marine Protected Areas (MPA) Center, tasked with designing a network of marine protected areas for the nation. The MPA Center’s mission is to facilitate the effective use of science, technology, training, and information in the planning, management, and evaluation of the nation’s system of marine protected areas.

Wallace “J.” Nichols MEM’92, director of the Blue Ocean Institute’s Pacific Ocean Region, oversees Blue Ocean Institute’s SafeSeas Program, which is focused on making the oceans safe for migratory species like sea turtles, sea birds and marine mammals. J. also is spearheading the Ocean Revolution, a program that inspires and networks the next generation of ocean conservation leaders. His work was featured in the cover story of the Nov. 5 edition of Time for Kids magazine. The story, “Turning the Tide for Sea Turtles,” examined a program in Mexico that is succeeding in increasing the population of olive ridley sea turtles.

Elizabeth Gibbs MEM’91 Named Tar Heel of the Week

Elizabeth Gibbs MEM’91 was named Tar Heel of the Week by the Raleigh News & Observer, which featured her work as manager of the Durham Farmers’ Market in an Aug. 7, 2005, article. Gibbs is credited with the rapid growth of the 7-year-old market and cites her education at Duke for “planting the seeds for her deep commitment to sustainable agriculture.” A passionate advocate of buying locally and sustainably grown food, Gibbs juggles her farmer’s market work with her new job as educational programs coordinator for the Carolina Farm Stewardship Association. “Luckily, the two jobs mesh well most of the time,” she reports.

She urges current and former Nicholas School students to take notice of the connection between agriculture and environmental stewardship. “Our agricultural practices have an enormous impact on the environment,” Gibbs says. “Food is not something that we can choose to do without, like we can give up smoking or not buy excess stuff. But agriculture needs to provide sufficient food for the population without destroying the land that the food is being taken from. That seems like such an obvious thing.”
Karen (Hopkins) Young MEM’93 and her husband, Michael, welcomed their first child, Macy, into the world on Feb. 25, 2005. Karen is the director of the Casco Bay Estuary Project, one of the 28 U.S. EPA National Estuary Programs nationwide, in Portland, Maine.

Jim Blose MEM’94 has relocated from Durham to Asheville, N.C. Jim is now working for Equinox Environmental Consultation and Design Inc., which facilitates resource conservation and sustainable development by servicing private, public and nonprofit interests with quality environmental planning and design.

Michael Andreu MF’95 testified in support of a bill to garner legislative support for the research efforts of the Forest Systems and Bio–Energy (FSB) program. The bill was introduced to the Washington State Senate Natural Resources, Ocean & Recreation Committee in February 2005. Michael is currently a PhD candidate at the College of Forest Resources, University of Washington.

Alumni Council member Michael W. Pentony E’87, MEM’96 was a recipient of a 2004 National Oceanic & Atmospheric Administration (NOAA) Honor Award. He was recognized, along with a co–winner, for devising solutions to the unique challenges associated with the development and implementation of the Skate Fishery Management Plan. Mike is a senior fishery policy analyst at the Sustainable Fisheries Division–Northeast Regulatory Office for NOAA in Gloucester, Mass.

Norio Saito MEM’96 has returned to Tokyo, Japan, to work for Japan Bank for International Cooperation (JBIC) after being posted at Bangkok, Thailand, for three years as a representative at JBIC Bangkok Office. His current position is deputy director, Division 2 of Development Assistance Department I, which is responsible for development assistance to Indonesia. Norio says that Indonesia still needs assistance in various fields, from better governance and human resource development to better infrastructure and recovery from the tsunami, so he makes frequent business trips to Indonesia. He also shares another piece of news: his wife, Yuki, and he had their first baby girl, Saki, in October 2004.

Michael Dunn MEM’97 and his wife, Theresa Skowron Dunn, announce the birth of their daughter, Mary Michael Cecilia Dunn, on April 28, 2005. Mary Michael is their first child. Michael is a senior environmental manager for the Indiana Department of Environmental Management.

After having received his PhD from the University of Rhode Island, Jeff Hollister MEM’97 has taken a position with the National Ecological Observatory Network (NEON) in Washington, D.C. Sponsored by the National Science Foundation, NEON enables studies on major environmental challenges at regional to continental scales. Scientists and engineers will use NEON to conduct real–time ecological studies spanning all levels of biological organization and temporal and geographical scales.

Rosana Abedin MEM’98 has taken a position with Booz Allen & Hamilton Inc. in McLean, Va. The global strategy and technology consulting firm provides services to major international corporations and government clients around the world.

Jim Reilly MEM’98, most recently legislative adviser on environment and energy matters for Sen. Thomas Carper, D-Del., has not only moved off Capitol Hill, he’s working for another country. Jim is now senior energy and environment adviser at the British Embassy in Washington. “The focus currently is on climate change, but there’s a long list of issues that the two governments will be talking about,” he says. A Wilmington, Del., native, Jim was formerly an aide to the Senate Commerce Oceans and Fisheries Subcommittee.

Scott Babcock MEM’99 and his wife, Kelly, are the proud parents of a baby daughter, Claire Jessica, born Jan. 3, 2005.

We’d love to see you again at the Nicholas School! The Duke Environmental Leadership (DEL) Program of the Nicholas School provides unique opportunities for environmental professionals to hone their environmental management skills, network with others in the field and stay on top of new developments. Opportunities are available through both our Continuing and Executive Education Program and the DEL-Master of Environmental Management degree program. The DEL-MEM is a great choice for working environmental professionals who want to continue to work while pursuing a degree from Duke University.
Jon Gelbard MEM’99 has established Conservation Value, a not-for-profit, nonpartisan organization to increase public awareness of and access to practical environmental solutions. Through its Web site at www.conservationvalue.org, the organization will connect people, companies and government officials with information about steps that they can take to improve their finances, health and quality of life while also benefiting the environment.

Noriko Shoji MEM’99 has been named as coordinator for NOAA’s Pacific Islands Region, based in Honolulu, Hawaii. The Pacific Islands Region (PIR) supports Hawaii and the U.S.-affiliated Pacific Islands. One of the most important functions of PIR is to maintain effective communications and coordinate closely in the many related programs that the NOAA Fisheries Pacific Islands Fisheries Science Center and PIR share in this geographical area.

Kevin Wheeler MEM’99 has moved to Providence, R.I., where he is now working for Brown University as director of federal affairs in the Public Affairs and University Relations Office.

Xavier Grau MEM’00 has accepted a position with Inter-American Development Bank. Xavier will be working in the Bank’s Guyana office for the next three years. The IDB is the main source of multilateral financing for economic, social and institutional development projects as well as trade and regional integration programs in Latin America and the Caribbean.

Shane Staten MEM’01 recently started working as an environmental scientist and wetland biologist for Terra Technologies Inc., in St. Louis, Mo. The company specializes in using biotechnical engineering solutions for erosion control and stream stability problems. Shane is providing assistance on environmental permitting projects including wetland assessments and delineations, stream system jurisdictional assessments, and construction oversight on bioengineering and wetland restoration projects.

Bonnie Millar MEM’02 has accepted the position of planning and stewardship coordinator with the Carolina Mountain Land Conservancy in Hendersonville, N.C. Bonnie will monitor all of the Conservancy’s protected properties and prepare conservation plans for the Upper Broad River and French Broad River headwaters.

John Terborgh MEM’02 is an ecotourism specialist for The Nature Conservancy in its Arlington, Va., office. John works with organizations, communities, the private sector and protected area managers around the world to advance tourism that minimizes environmental impacts, incorporates ecologically sensitive architecture and land use design, and offers local people opportunities for compatible economic development.

Mike Dechter MEM’03 has moved from Washington, D.C. to New Mexico to work as a National Environmental Policy Act coordinator for the Forest Service on the Santa Fe National Forest. The Santa Fe National Forest covers 1.6 million acres in the heart of north-central New Mexico that includes a dormant volcano with a 15-mile-wide crater (Valles Caldera National Preserve).

Heather Jacobs MEM’00, Paddles the Tar River

This April, Heather Jacobs MEM’00 spent two weeks paddling the length of the Tar River by canoe in order to increase public awareness of the river’s importance to eastern North Carolina. Jacobs, the Pamlico–Tar Riverkeeper since 2003, traveled the 140 miles with Kevin DeBruhl, a Sierra Club member from Rocky Mount. Along the way, they organized educational programs and trash pickups. On the last leg of the trip, a flotilla of 40 canoes and kayaks joined Jacobs and DeBruhl, traveling to Washington, N.C., where the first Festival for Clean Water was held to coincide with their arrival. The Paddle for Clean Water was widely reported in the regional media and may become an annual event. Heather is employed by the Pamlico–Tar River Foundation, a local nonprofit organization whose mission is to protect and improve the Tar–Pamlico river, its estuaries and watershed.

For more information on upcoming short courses, our NEPA Certificate Program, DEL-MEM, and other new and exciting programs, please visit our Web site at www.nicholas.duke.edu/del or call 919-613-8082.

Certificate in the National Environmental Policy Act

Environmental professionals can earn a Certificate in NEPA from Duke University by successfully completing a series of required and elective courses and a brief research assignment. Duke’s NEPA courses and Certificate Program are co-sponsored by the Council on Environmental Quality, Executive Office of the President.

Nicholas School alumni receive a 10 percent discount on all short courses.

*Special 25 percent discount available for early registrants from nonprofits and municipal governments, and for students and Duke alumni!

Upcoming Short Courses

- Implementation of the National Environmental Policy Act  
  Dec. 5–9, 2005  Register by Nov. 10
- Environmental Communication for Behavior Change - ONLINE  
  Jan. 17 – Feb. 24, 2006  Register by Dec. 23
- Accomplishing Community Environmental Goals on Capitol Hill*  
  April 10-12, 2006  Register by March 20
- The Law of NEPA  
  May 17-19, 2006  Register by April 25
Julie Bloss Kelsey MEM ’03 and her husband, John, are pleased to announce the arrival of Michael Joseph Kelsey. Michael was born on April 7, 2005 (his Daddy’s birthday) and joins big brother Mark, 4. The family resides in Germantown, Md.

David Kaplan MEM’04 is working with the Charles River Watershed Association in Waltham, Mass. One of the country’s first watershed organizations, CRWA was formed in 1965 in response to public concern about the declining condition of the Charles. Initiatives over the last three decades have dramatically improved the quality of water in the watershed.

Dylan Fuge MEM/JD’05 has accepted an associate’s position with the law firm of Robinson & Cole LLP in Hartford, Conn.

Andy Hecht MEM/JD’05 and his wife, Ashley G’02, and son, Errol, are moving to New York where Andy will join the law firm of Simpson Thacher & Bartlett as an associate.

Johanna Jobin MEM’05, EE Certificate’05 is working as a management consultant for Camp Dresser & McKee Inc. in Cambridge, Mass. CDM is a consulting, engineering, construction, and operations firm delivering service to public and private clients worldwide since 1947.

PRIZIM Inc. selected Alexis Kingham MEM/MF’05 as senior environmental researcher in their Maryland office. PRIZIM is a management consulting firm specializing in long- and short-term environmental, health, safety and energy issue solutions for its clients.

Liv Kirk MEM’05, EE Certificate’05, was chosen by General Electric Co. as a leadership fellow and began work in the company’s Schenectady, N.Y., headquarters in September 2005.

Kelly Kunert MEM’05 has accepted a position with the U.S. Environmental Protection Agency in Washington, D.C., as an environmental protection specialist.

John Peng MEM’05 and his wife, Eunice, are relocating to Michigan where John will be working for the Ford Motor Co.

Environmental Services, Inc. has engaged Hillary (Geiser) Sherrill MEM’05 as a field scientist. Hillary and husband, Joshua Sherrill, are living in Fernandina Beach, Fla.

Jeff Smith MEM’05 is with the National Marine Fisheries Service in Silver Spring, Md. He is working in the Office of Habitat Conservation, which interacts with the NOAA Fisheries Regional Offices, to manage, conserve and enhance habitats for fishery resources, protected species and other living marine resources.

Adam Spiller MEM’05 and wife, Marie, are staying in the Research Triangle. Adam is working for KCI Technologies Inc., as an environmental scientist in Raleigh.

Anna Stark MEM’05 has joined Booz Allen Hamilton as a consultant.

Another alumna at the EPA is Katie Wolff MEM’05. Katie is working in the Office of Water as an intern.

Deaths

W. N. “Hank” Haynes MF’49, on Feb. 17.
Edward Earl Jones, T’49, MF’50, on March 24.
John R. Warner T’46, MF’49, PhD’53, on March 31.
George L. Follett Sr. MF’51, on July 11.
John A. Haislet MF’51, on May 24.
Edward Polaski Jr. MF’69, on Feb. 18.
Walter Daryn Watkins T’93, on March 4.
Stanley Martin Boyer MEM/MBA’99, on April 27.
Jean Lauer MEM’00, on March 28, after a six-and-a-half-year battle with brain cancer. If you would like to send a note to her parents, contact fellow alumna Kim Goodman at kgoodman@tetontel.com for their address.

What’s Your News?

New job? New baby? Professional honor? Recent wedding? Your classmates want to know! Send your news (and photos) to:

Jeanine Holland
Associate Director of Development for Alumni Affairs and Outreach Programs
Nicholas School of the Environment and Earth Sciences
Duke University • Box 90328 • Durham, NC 27708-0328
Fax: 919-613-8077 • E-mail: jholland@duke.edu
Jeanine Holland to Manage the Nicholas School’s Alumni Affairs and Outreach Programs

Jeanine Holland has joined the Nicholas School as associate director of development for alumni affairs and outreach programs. She will plan and manage events for alumni and other school friends, such as Field Day and Nicholas Experience trips for gift club members. Additionally, she will manage the Alumni Council and oversee the alumni awards nomination process. Holland plans to keep alumni connected to the Nicholas School through these activities and by fostering networking between alumni and current students.

Before joining the Nicholas School, Holland was assistant director for development and reunions at the Duke Law School and program coordinator for Perkins Library. Holland replaced Krista Bofill, who is now associate director of development for leadership gifts and the annual fund.

Charlotte Clark Receives Charles A. Dukes Award

Charlotte Reeves Clark T’79, MEM ’83, was presented the 2005 Charles A. Dukes Award for Outstanding Volunteer Service to Duke University by President Richard H. Brodhead at the Volunteer Leadership Conference this fall. The award annually recognizes devoted volunteers who continually strive to promote the Duke tradition of excellence to its students, alumni and the community beyond.

Clark has volunteered and assumed leadership roles on several Duke committees, including the Women’s Athletic Scholarship Committee, the School of the Environment Alumni Council, the Annual Fund Reunion Leadership Committee, and, for five consecutive years, the Duke Alumni Association Board of Directors.

Director of Alumni Admissions Carole LeVine says, “Charlotte is the type of alum that makes you proud to be associated with Duke. She is ‘True Blue’ and is willing to serve Duke in just about any way.”

Following nearly 20 years in the work force after receiving her degree, first conducting air pollution regulatory work for the U.S. Environmental Protection Agency, then as the director of the Nicholas School’s former Office of Continuing and Executive Education—Clark is once again back in school. She is in her third year as a full-time doctoral candidate in the Nicholas School’s Environmental Sciences and Policy division researching environmental education as it pertains to decision-making by the general public on issues of environmentally related behavior.

Between her volunteer activities, her work and student experience, she has been involved in many facets of the university, particularly regarding outreach and public education.

Her adviser, Norman L. Christensen, professor of ecology and founding dean of the Nicholas School, says, “There is no person I know more committed to Duke and the Nicholas School.”

‘Home’ Renovations Complete

Nicholas School alumni have a newly renovated home page of your own!

• submit and read class notes
• update your contact information
• read up on alumni and faculty news
• find schedules for Field Day and other events
• purchase Nicholas School merchandise
• respond to alumni-only survey questions

Check out your new home page at www.nicholas.duke.edu/people/alumni.
"Take a look around you and see how important energy is in our environment."

Jeffrey Gendell did just that, and in May it led him and his wife, Martha, to make a $2.15 million gift to support an expanded curriculum in energy studies at the Nicholas School.

The gift will total $2.9 million when matching funds are included, and will support two new full-time faculty positions in the school’s Energy and Environment program. It also will endow initiatives including an energy research fund, a speakers’ series, a visiting executives program, and a general fund to support energy innovation.

“Energy is one of the most complex and important issues influencing the future of the environment,” Gendell says. “Energy issues have been facing our society for the last 20 years, and it’s going to take a lot of time and effort to figure out how to solve this problem—it won’t be solved overnight. The most important thing is to put together a program that really contributes to both teaching students and solving the problems.”

Jeff Gendell first became involved with the Nicholas School as plans were under way for a Nicholas Leadership Forum on energy in March 2004. “Creating a Sustainable Energy Future,” brought together more than 300 leaders from industry, government, academia and nonprofit agencies to discuss the future of hydrocarbon-based energy. He served on the forum’s advisory committee and helped recruit several of the corporate participants.

Using the success of the forum as a springboard, the Nicholas School launched a Certificate in Energy and Environment in fall 2004 that enabled graduate students in the Master of Environmental Management (MEM) and Master of Forestry (MF) programs to take a series of courses that gave them special expertise in the subject. Eight students earned a certificate in May 2005 (see related story, page 41); several more took classes in the program. This year, a dozen students are working toward a certificate.

A new concentration: a broad understanding

Work is under way to make the program a full-fledged Energy and Environment concentration in the graduate professional program—making it the eighth track available to MEM students at Duke—and to extend it to undergraduates. The concentration will give students a broad understanding of the science and technology of energy, the environmental impacts of energy, and the economic, policy and legal structures that govern the way we use and create energy. Classes will cover topics such as supply and demand for energy in the modern world; resource options, from conventional fuels to renewable and alternative energy sources; environmental impacts of different forms of energy; and the design of optimal policies and regulations to protect the environment while supplying energy to society.

While a number of other universities offer advanced degrees in energy, the graduates of those programs by and large pursue technical or academic careers. By contrast, the Nicholas School’s program aims to prepare students to become leaders and innovators in industry, government and nonprofit agencies with an interest in energy.

The new concentration will tap into faculty expertise at the Nicholas School, the Nicholas Institute for Environmental Policy Solutions and across Duke’s campus to provide students with an intensive two-year course of interdisciplinary study with a practical, real-world perspective. The Energy and Environment Program has the potential to become the most interdisciplinary of the concentrations offered to MEM and MF students, encompassing physical science, economics and policy, and reaching out to the Duke Law School, the Fuqua
School of Business, the Terry Sanford Institute of Public Policy and the Pratt School of Engineering. For undergraduates, efforts have begun to create 100–level courses in energy and to develop a formal academic track focusing on energy and the environment.

Gendell, who graduated from Duke University with a degree in economics in 1981, is a general partner of Tontine Associates LLC, an investment firm based in Greenwich, Conn. He and his wife have made gifts to the university for years—among them, the moderns that enable students camping in Krzyzewskiville (the tent village that pops up for weeks before each big Blue Devil basketball game) to stay connected to their schoolwork— but he was looking for an opportunity to make a bigger impact.

“We tend to donate things to people where there’s not a natural constituency to donate,” he says. “For example, many Master of the Environment Management degree graduates don’t make enough money to give large gifts to the school. Plus, while many law and business schools draw corporations to interview and talk with students and provide financial support, environmental programs have a more difficult time, because they inherently are advocates, and they kind of scare away corporations.”

In these challenges, Gendell saw an opportunity.

‘Attack energy from all sides’

“I think it’s very important that you look at energy from the environmental angle,” he says. “A lot of other schools approach energy from the perspective of environmental engineers or petroleum engineers, which is very applicable and important. Business schools and law schools approach energy from their angles. But very few places attack energy from all sides, and I think one thing that’s missing in this country is that people aren’t looking at environmental issues from all sides. The Nicholas School has the opportunity to create a forum where students can get a well-rounded view of energy and the environment.

“Supporting an initiative such as the Nicholas School’s Energy and Environment Program will help foster future leadership and innovation to meet these challenges by training students to think broadly and strategically about energy policy, management, and research,” he continues. “As someone who studies the energy industry for a living, I am acutely aware of the profound challenges society faces in finding safe, reliable sources of energy for the future.”

The Gendells’ gift will support two full-time faculty positions: the Gendell Family Professorship, to recruit an established expert in the energy field to help quickly take the program to the next level, and the Gendell Family Associate Professorship, for an up-and-coming junior faculty member in the field. It also will lay the foundation for endowment funds to support energy research, the speakers’ series, a visiting executives program, and energy innovation projects by faculty and students.

“The speakers’ series is a great way for alumni and others in the energy field to get involved, to volunteer to come in and talk to students about current topics in the environment, about their career paths, and to share their perspective. The most important thing we need to do now is to get students involved in this program on both the graduate and undergraduate level, and the best way to do that is to show them what we can offer them.”

Gendell is particularly excited about the potential to bring this perspective to Duke undergraduates in the future. “Undergraduates will be able to come out of this program, then go out and get professional degrees in law, engineering, business and public policy so they can apply their environmental expertise to a specific area, he said.”

Energy and Environment Experience Boosts Students’ Careers

From the popularity of an original short course on energy and the environment, to a seminar on clean electricity from sustainable energy technologies, student interest has been the driving force behind the creation of the Nicholas School Energy and Environment Program.

Recently, two of the first graduates of the Energy and Environment Certificate Program shared their thoughts on the importance of this program and its value as they launch their careers.

Lena Hansen MEM’05 was the first student to earn an Energy and Environment Certificate to complement her Master of Environment Management concentration in environmental economics and policy. She was a key organizer of the Nicholas Leadership Forum “Creating a Sustainable Energy Future,” the March 2004 event that kicked off the creation of the Energy and Environment program, and created a seminar on renewable energy.

“I came into the Nicholas School planning to do urban design and smart growth,” she says. “My first semester, I took an air quality class that touched on energy issues, and it piqued my interest. Then I had the opportunity to take Simon Rich’s class. It was fantastic, particularly because the teacher was a practitioner in the field and had a lot of real world experience, so he could make the problems much more real.”

(Simon Rich, Nicholas School Board of Visitors chair and a former energy executive, started the course in Spring 2003. See Dukenvironment story at www.nicholas.duke.edu/dukenvironment/sp03/log-ceo.html.)

By the time she had helped design the energy forum, Hansen’s interest in a career in the energy field was cemented.

“Energy is such a huge, pervasive problem. It’s very multidisciplinary, and very few schools have tackled it from a multidisciplinary perspective. Duke is one of the first to do that, and that’s really exciting. Because of the nature of the Nicholas School and the resources available across the Duke campus in business, law, policy and engineering, this school really is well placed to address this issue.”
Lena Hansen now works at the Rocky Mountain Institute (RMI), a nonprofit organization based in Snowmass, Colo., that conducts research and consulting projects on sustainability issues. She interned in RMI’s Hawaii office last year as part of the Stanback Internship Program, then joined the energy team in Snowmass after graduating. Hansen’s main focus is on electric utility policy and helping companies understand how to integrate renewable energy into their systems. Last year, she helped RMI write a book, *Winning the Oil End Game*, on how the United States can profitably substantially decrease or eliminate its consumption of oil in the next 20 years.

Scott Weaver completed the Energy and Environment Certificate Program with the program’s first class in May 2005, also graduating with an MEM with a concentration in environmental economics and policy.

“I always saw myself working in an industry such as energy, and I had a particular interest in the environmental side of energy production,” he says. “When the certificate program came up, I thought it was a good opportunity for me to get some background and have something on my resume related to the energy sector. Last summer, I interned as a strategic policy analyst at American Electric Power (AEP), and I found that the Energy and Environment curriculum supplemented what I learned there.”

Last fall, through the Energy and Environment Certificate Program’s course in hydrocarbon production and policy, Weaver took part in a field trip to Houston, the epicenter of the world’s energy industry. Students spent four days touring oil refineries and chemical plants and peppering plant managers with questions about their operations. “AEP is a large electric power producer, so this trip gave me a chance to see the oil and gas side of energy production.”

Following graduation Weaver was hired back by AEP as a full-time strategic policy analyst in their Columbus, Ohio, headquarters. He is responsible for running AEP’s environmental compliance optimization model, which shows how the company can best meet environmental requirements, and for providing analysis surrounding current environmental issues that face AEP and the energy industry. His boss, Bruce H. Braine, participated in the Nicholas Leadership Forum last year.

Though the Energy and Environment Certificate Program, Weaver says he learned a lot about the industry and its environmental implications. “The general knowledge I picked up in the program will definitely help me professionally. I’m a step ahead of what they’d expect out of most people coming into this type of position, as far as my knowledge of the energy industry.”

—Laura Ertel

Laura Ertel is a freelance writer based in Durham, N.C.
LaDane Williamson, a member of the Coastal Management Advisory Board and the Cape Fear Capital Area Government, was very involved with environmental protection while serving in those roles. In those roles, she was mindful of environmental issues. As a child growing up in Shallotte and Ocean Isle Beach on the coast of North Carolina, she used to accompany her father, a successful land developer as well as a six-term state senator, on long car trips to meet with the men who were clearing streams and taking care of his land.

By the time Williamson had her own children in the 1970s, she was mindful of the connection between the environment and what we eat, and how that can impact our health. In those days, organic and natural foods weren’t as readily available as they are today, so Williamson prepared her own baby foods. In fact—she laughs as she remembers—for her oldest son’s first birthday, she refused to serve him chocolate, instead baking him a cake made with carob!

As she began her own career in land management and land development, Williamson remained acutely aware of environmental issues. She served as mayor of Ocean Isle Beach for 14 years, and as a member of the Coastal Management Advisory Board and the Cape Fear Capital Area Government. In those roles, she was very involved with environmental protection as it relates to development issues such as waste management and water quality and their effect on communities, as well as preserving coastal resources and protecting environmental health.

She was so well known in this field that, in the late 1980s, she was even asked to debate coastal issues with renowned Duke Geology Professor Orrin Pilkey live on “The Today Show.” With Jane Pauley as her witness, Williamson recalls, the two had a lively debate, and she was able to get Pilkey to agree publicly with several of her points.

Williamson is owner of the LaDane Williamson Company, a diversified land development, golf management and real estate sales firm with operations in North Carolina, South Carolina and New York. A graduate of Duke University, she has remained involved with her alma mater over the years, attending basketball games as a season ticket holder and serving on the Nicholas School’s Board of Visitors from 1996 to 2002. She is a member of the James B. Duke Society, which recognizes individuals who have supported the university with $100,000 or more in gifts.

After years of thinking about the best way for her to contribute to the Nicholas School, Williamson recently decided to make a gift to support academic and research programs at the school. Proceeds from her gift resulted in a $2 million unrestricted endowment, including $500,000 in matching funds, which will provide support for student scholarships and fellowships, classroom and field instruction, facility upgrades, technology acquisition, faculty research and other critical needs at the school.

In recognition of the gift, the Nicholas School plans to name its Environmental Health Wing in Williamson’s honor—a fitting tribute to a woman who cares so much about environmental health. “As we have become more knowledgeable, we have also become more aware of how environmental issues affect our health and our welfare,” she says. “Over the years, we have developed a greater understanding of how certain decisions impact other systems—water contamination, garbage disposal locations, mold, radioactivity, lead in paint, all make a difference. When I became familiar with the Nicholas School, I was impressed at how committed it was to broadly addressing environmental health issues.”

The school’s suggestion that Williamson designate her gift as unrestricted support, rather than toward a specific program or purpose, appealed to the business woman’s instincts. “I like the idea of having a fund that good-thinking people can use to further enhance the direction that the school has taken,” Williamson says. “I hope that it will be used in ways that allow more people to become knowledgeable about, and aware of, different environmental issues.”

“This is the kind of gift that deans dream of getting,” said William H. Schlesinger, dean of the Nicholas School. “It gives the school great flexibility to address the most pressing needs of our students and faculty, and it enhances our ability to strengthen and diversify our academic and research resources in response to, and anticipation of, changing environmental priorities. It truly is a far-sighted gift.”

Williamson spent two years as New York State Finance Chair for the Democratic Party, helping to get Hillary Clinton elected to the Senate. Today, she splits her time between homes in Ocean Isle Beach, New York City, and northern Durham. She travels frequently, most recently to Aspen to vacation with her daughter, who is a graduate student at the Nicholas School. Williamson also has two grown sons.

In the years to come, countless students and faculty members will benefit from Williamson’s generosity. And when she visits the LaDane Williamson Environmental Health Wing, there will be a celebration.

Carob cake, anyone?

Laura Ertel is a freelance writer based in Durham, N.C.
New Endowments* Established During 2005-2006 Fiscal Year

Angle-Trustin Family Fund
Established: 2005
By: Marcia A. Angle M’81, H’84 and Mark S. Trustin
Purpose: Provides unrestricted support for the Nicholas School.

Ned and Nina Bonnie Fund
Established: 2005
By: Robert F. Bonnie F’94
Purpose: Provides unrestricted support for the Nicholas School.

Kathleen Clay Farland Fund
Established: 2005
By: Melanie Taylor P’05 in honor of her daughter, Kathleen Clay Farland T’05 (Environmental Science and Policy)
Purpose: Provides unrestricted support for the Marine Lab with preference to defraying costs of study abroad field trips.

Friends of the Earth Fund
Established: 2005
By: Dan F. Gabel T’60, P’02
Purpose: Provides fellowships to Nicholas School students with a preference given to students who are associated with Friends of the Earth International or students with an interest in creative environmental advocacy.

Pricey Taylor Harrison Fund
Established: 2005
By: Melanie Taylor P’05 in honor of her sister, Pricey Taylor Harrison T’80
Purpose: Provides unrestricted support to the Program for the study of Developed Shorelines.

Leister Family Nicholas School Fund
Established: 2005
By: Susan Elliot T’74 and Craig D. Leister L’74
Purpose: Provides unrestricted support for the Nicholas School.

Leister Family Marine Lab Fund
Established: 2005
By: Susan Elliot T’74 and Craig D. Leister L’74
Purpose: Provides unrestricted support for the Marine Lab.

Summer Legislative Fellowship Fund
Established: 2005
By: An anonymous donor
Purpose: Provides fellowships to Nicholas School students who have secured a summer internship with the legislative branch of the United States federal government.

*See stories on the Gendell Family and LaDane Williamson gifts on pages 40 and 43.
Duke Energy has pledged $2.5 million to Duke University to support the Climate Change Policy Partnership—a new industry-university collaboration that will develop policies to address the problems of global climate change, Duke University President Richard H. Brodhead announced this fall.

The new partnership will pool the expertise of The Nicholas School, the Nicholas Institute for Environmental Policy Solutions, The Center on Global Change and Duke Energy, as well as other corporate and academic partners from across the Southeast, Brodhead said.

Duke Energy’s gift will come in two segments: $1.5 million to fund Phase I of the partnership, expected to be completed by January 2007; and an additional $1 million to fund Phase II, which depends on the successful completion of the first phase and the recruitment of other corporate partners.

During the partnership’s first phase, researchers will assess the environmental and economic costs and benefits of federal policy options for addressing emissions of carbon dioxide and other greenhouse gases, which most scientists view as a cause of global warming.

These policies include market-based cap-and-trade programs and a nationwide tax on the carbon content of fossil fuels. Cap-and-trade programs are those that set overall authorized caps on emissions for sources and allow the buying and selling of those emissions authorizations. Researchers at the Nicholas Institute will lead these initiatives.

Researchers at the Center on Global Change will assess the potential for using carbon sequestration to store atmospheric carbon dioxide in forests, soils or underground reservoirs.

The Climate Change Policy Partnership will fund more than 30 Duke Energy Research Fellowships for graduate students from Duke and other North Carolina universities to work with researchers on these projects.

Partners will share findings with government, corporate and environmental leaders nationwide, including the North Carolina Climate Change Task Force.

“In the absence of mandatory federal policy, many corporations and state governments are moving forward with their own climate change initiatives, and corporations face questions every day, including those involving long-lived investments, with little understanding on how the country will proceed on this issue,” said Paul M. Anderson, chairman of the board and chief executive officer of Duke Energy, which is a founding participant in the Nicholas Institute.

“A cohesive approach, informed by sound science and economics, is needed to align these efforts,” Anderson said.

“Duke Energy and Duke University share a common conviction that the purpose of this partnership must be to apply, not merely accrue, knowledge,” said William H. Schlesinger, dean of the Nicholas School. “Providing decision makers with factual, timely counsel, free of political spin, is critical.”

Much of the data used by researchers in the Climate Change Policy Partnership will be specific to North Carolina, but their reports and research findings will have broad applicability to policy considerations at all levels of government.

“Collectively, we have access to decades of data from field studies in North Carolina. This is a remarkable resource for creating the kind of detailed, data-rich scientific model that will be a useful forecasting tool—not only for decision makers here but also in similar states and regions nationwide,” said Robert B. Jackson, professor of biology and environmental sciences and director of Duke’s Center on Global Change.

Tim Profeta, director of the Nicholas Institute, said, “I cannot think of a better founding participant in the Nicholas Institute than Duke Energy. The leadership shown by Duke Energy and Paul Anderson on global warming is laudable, and we look forward to helping the company decipher the best ways to tackle this generation’s greatest environmental challenge.”

As the partnership expands and recruits more academic and corporate participants, researchers will begin studies of the carbon-reducing potential of other options such as renewable energy and enhanced vehicle fuel efficiency technologies.

“By expanding the scope of the Climate Change Policy Partnership, we bring more partners to the table and gain a broader perspective of the challenge and opportunities ahead,” said Richard J. Osborne, group vice president of public and regulatory policy at Duke Energy.

“We are eager for other partners to join us in this endeavor, particularly those involved in agriculture, forest products, energy and transportation,” Osborne said. “A viable policy to address global climate change must encourage reduced carbon emissions from all sources and segments of our economy, not just a few.”
We also recognize those dual gift club members who are Environmental Pacesetters. • Their consecutive giving years are noted in parentheses after their name.

The Nicholas School of the Environment and Earth Sciences wishes to thank all of the alumni, parents and friends who generously contributed to the Nicholas School, Duke Marine Laboratory and Earth and Ocean Sciences/Geology Annual Funds. Your ongoing support plays a vital role in the continuing success of our students, faculty and school programs. This list recognizes gifts received for the Annual Fund from July 1, 2004 through June 30, 2005.

We recognize those dual gift club members who are Environmental Pacesetters. • Their consecutive giving years are noted in parentheses after their name.
Young Alumni Members of the Korstan/Pease/Berry Societies
Phyllis Grant Dermer F01 (4)
Samuel D. Hummel, Jr. T03 (3)
Andrew J. LoSchiaovo F02 (4)
Matthew W. Phillip F01 (2)
Evie T. Tashie F01

Graduating Class of 2005 Gift
Joshua W. Allen-Dicker T05
Thomas Paul Augspurger F89 G05 G08
Daniel Avisar T05
Dominique D. Bailey T05
Cheyenne M. Beach T05
Janeil M. Belle T05
Joey B. Beshock T05
Johanna A. Bishoff T05
Irene C. Blat T05
George M. Woodwell T06 G06 GHON'94 (2)
Katharine Woodwell T06 (2)

If you have any questions regarding corrections by calling Carol Dahm at 919-613-8001 or by e-mail to cdahm@duke.edu. The Nicholas School is extremely grateful for your continued support.

In order to conserve paper and resources, the Nicholas School lists gifts qualifying for Gift Club status only. All gifts are deeply appreciated.

We have made every effort to ensure the accuracy of our Honor Roll lists. We regret any errors or omissions that may have occurred and ask that you contact us regarding corrections by calling Carol Dahm at 919-613-8001 or by e-mail to cdahm@duke.edu. The Nicholas School is extremely grateful for your continued support.

$500 to $999
Charles D. Amsler T80 (22)
Margaret O. Leary Amsler (6)
Robert Ryoichi Ando E73 (9)
Rosanna Ando (9)
Elaine K. Barber (2)
John Barber (16)
Mary Margaret Barber T74 (16)
Richard T. Barber (2)
Jeffrey W. Bartels T79 (7)
Margaret R. Bartels (7)
Eric B. Bass T78 M83 (4)
Katherine M. Bass T79 M83 (4)
Pamela C. Beall W72 (6)
George M. Benda T53 (6)
Rosemarie E. Benda (6)
Bradley Berndt (6)
Peter Berndt (2)
Susan M. Berndt (2)
Brent F. Blackwell T64 (9)
Teresa S. Blackwell W70 (2)
Jean Dennis Bliss (2)
Verna Fairbanks Bliss T44 F49 (27)
Mary M. Borden W55 (4)
Edwin B. Borden, Jr. (4)
David M. Bradford F66 (25)
Jean E. Bradford (2)
Philip L. Brewer T58 (6)
Florence J. Brinkous (9)
John R. Brinkous (9)
Andrew Shawhan Burnett F85
Kevin Lawrence Call T77 (15)
Kathryn Ash Carlson F92 (12)
Robert Jeffrey Chandler T84
Anne Fahing Choate T95
David Walter Choate F94
Allan C. Church
Jane E. Church
B. Jefferson Clark E78 B84 (11)
Charlotte R. Clark T79 F83 G06 (21)
Melinda Ann Cohen P09
Carol Schendler Cowell

Edward D. Cowell, Jr. T56 (21)
Elizabeth Pennington Cowie T86 (4)
James Judson Cowie T (4)
T. Spencer Crowley, III T96 (3)
Marie Anne Scheller Daniels W54 (7)
Eugene D. Daniels (4)
Bonnie Ann Dauerman T91 (3)
John Frederick Dauerman M96 T90 (3)
Alexander Thayer Davison T49 F50 (28)
Mary Clive Davison N47 (13)
Emma S. De Castro T79 (8)
Gertrude T. Deyle
Robert Eaton De Deyle F77
Anne C. Dowling T92
Clifford S. Duke G96 G85 (3)
Matthew R. Eggers T96 (3)
Joyce Essel (8)
Robert W. Estill (8)
Gilmer C. Ewing T76 (10)
Shauna Tilly Farmer T86 M90 (10)
Thomas Hackney R. Farmer T85 M90 (10)
Gloria Farrar
Michael C. Farrar (3)
William T. Freeman T50 (2)
Julie McAllister Friedman (2)
Kenneth H. Friedman T82 (3)
Charles L. Gallegos T73 (9)
David W. Geerd (F) (9)
Jody Rae Hepp Geerd (9)
Alberto Goetzl F79
Cyrus L. Gray III T62
Malinda Edwards Gray W63
Wendy A. Hamilton T93 (8)
Diane J. Hardy W67 (15)
Robert G. Hardy T66 (15)
Constance Mackey-Harley W49 G54 (14)
Eugene L. Harley M57 (14)
Elizabeth P. Heim T06
Hal S. Hemme T72
Derek B. Hess T92
David E. Hinton (2)
Judith J. Hinton
Theresa Rose Holdcraft
Heather L. Johnson T91 (2)
Korond C. Kaltenborn T76 (6)
Anthony J. Karas B97 (9)
Herbert D. Kerman H49 H43 T38 M42
Ruth Rice Kerman W39 (3)
Susan S. Kilham G71 (21)
Barbara Gosford Kinder W46 (10)
William Tupper Kinder
Paul F. Krueger T76 (6)
Trudy K. Krueger T06
Joseph Murphy Landings T84 (7)
Katherine D. Landings T83 (7)
Hattie W. Lee
James E. Lee T51 F52 (4)
Christine N. Lyon *
Robert B. Lyon, Jr. G74 (3)
Mark A. McCormack T70 (6)
Jeffrey J. McCoskey E37 (7)
Joan C. McCulla W53 (5)
William L. McCulla, Jr. (4)
Charlene R. Melbane (2)
Giles Yanee McManey T51 M54 (2)
Elizabeth Ellen Merritt G84 (7)
Elizabeth R. Myers T76
Walter G. Nelson, Jr. T72 G78 (20)
D. Kerry Nickerson (2)
Lynn P. Nickerson T75
James R. Nicol T79 F82 (2)
Lisa K. Nicol F83 (2)
William Roy Nifong T89 L00 (4)
Nancy Noonan (17)
Patrick F. Noonan (17)
Kathryn Jean O'Hara T82 (5)
Thomas J. O'Hara
Billy B. Olive E48 (17)
Helen Eve Olive
Linda Marie Palumbo T87 (13)
Kim Parker
Charles H. Parker, Jr. T77 (2)
Frank Caldwell Patton III T82 (11)
Gregory Bruce Paxton
Almuth F. Payne
Brian R. Payne F62 (32)
Elizabeth D. Pelosi E78 (3)
Robert A. Peloso
Jack B. Perkins E94
Nancy R. Perkins F97 T93 (2)
Jennifer Jay Peters F88
Sheila Glenn Pev G41
Daniel Cole Popovics T88 (9)
Joan Bresman Popovics T88 (12)
Robin L. Puckett W60
Scott C. Puckett
E. J. Puzak (9)
John C. Puzak G74 (9)
Merry G. Rabb T77 G80 G80 (4)
Robert D. Rabb (4)
Kenneth H. Reckhow (3)
Ellen Reckhow (3)
Jeanine D. Reese
Mitchell Crawford Reese T73
Scott F. Rehmus T92 (12)
Wingfield E. Rehmus M96 (8)
Susan L. Reiser T81 (10)
Edward M. Riegel T77 (18)
Phyllis Joan Smith Riegel
Annette B. Satterfield W64
Rose Morstan Saye *
Clifford L. Sayre, Jr. E47 (15)
Shelley Schultz
Thomas A. Schultz (2)
Elizabeth T. Schwarz T87
Catherine H. Sheafor T88 (12)
Douglas Houston Shearof T88 (12)
Brian M. Shivers T02 T00 (2)
Debra Jones Shivers
Martha R. Thayer (3)
Richard E. Thayer (2)
James M. Thurber T69 (8)
Van Bosworth T77
Alan Ru Weisskopf T94 (5)
Leslie Weisskopf T94 (5)
Lynne D. Werner T78
George M. Woodwell T56 G56 GHON'94 (2)
Katharine Woodwell T52 (2)
Christopher A. Daniels E98 B05
Sarah L. Daniels T00 F05
Nicole G. Desrosiers T05
Luke Jay Dollar T95 G90 G09
Natalia E. Dorfman T05
Alvada S. Drevon T05
Paris B. Edwards T05 T05
Lisa B. Engler F05
Amanda M. Fairley T05
Rongrong Fan T05
Maura M. Farver T05
Gordon R. Feighner F05
Robert D. Ferguson T96 B05
Patrick A. Flight T05
Dylan M. Fuge L05 F05
Jacob R. Gillen T05
Julie A. Griffin T05
Charles T. Hagan N05
Ian C. Han T05
Andrew A. Hecht L05 F05
Adam D. Hommer-Henner T05
Timothy J. Hyer T06 T05
Alexis Kingham F05
Whitney E. Kirk F05
Paul A. Klener F01 G08 G05
Kelly S. Kuner F05
David A. Lewis T05
Carson W. Maxted F05
Jeffrey A. Miller T05
Molly C. Nichollon T05
Kim Noel T05
Anjali S. Patel T05
Caroline Paulsen T05
Mary C. Peavy T05
Margaret E. Peloso T05
John Peng F04 F05
Channa L. Pickett T05 T06
Francesca M. Pignataro T05
James T. Pineda T05
Alexa Ramirez T05
Julie L. Reber T05
Robin F. Roark T05
Katherine Robinson T05
Alexandra C. Russell T05
Colleen M. Schilly T05
Peter R. Shults T05
Sean Timpane E05
Edward W. Williamson T05
Mamie W. Wise T05
Audrey T. Yoest T05

* Deceased

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The Nicholas School operates on a budget of close to $39 million annually. Revenues to operate the school derive from restricted sources, such as research grants and income from restricted endowments, and from unrestricted sources, such as tuition and overhead charged to research grants (Figure 1). A substantial fraction of the school’s unrestricted revenue derives from MEM tuition, and is therefore subject to year-to-year fluctuations based on enrollment. The school also receives a payment from Trinity College to cover the costs of undergraduate instruction, based on a formula that is driven by enrollment numbers. The Annual Fund, which provides 2 percent of revenues, is an additional important source of unrestricted funding, which is largely used to provide financial aid and special academic programs to all Nicholas School students. Revenues from endowments established to provide financial aid, largely to MEM students, have increased consistently over the past six years, so that the provision of financial aid has been a declining demand on unrestricted school funds.

School expenses (Figure 2) are dominated by the direct costs of research and by instructional expenses, largely faculty salaries. A major challenge in budgeting for the Nicholas School is that a large fraction of its expense is allocated to attract the best faculty and hence the best students. Of course, faculty numbers are relatively constant from year to year, while a large fraction of the school’s unrestricted revenue is derived from MEM students, who show elastic demand relative to tuition increases. Approximately 22 percent of the revenue from MEM students is returned to students in the form of financial aid. Approximately 12 percent of school expense is payment for university-supplied services, including police protection, library collections, bus transportation, etc.
Mark your calendar for the following dates and monitor our Web site at www.nicholas.duke.edu for additional events.

Feb. 3, 2006
Duke/Yale Career Fair
Washington, D.C.
Kellogg Conference Hotel
at Gallaudet University
Nicholas Alumni Reception to follow
Contact: Glenda Lee, 919-613-8079 or gslee@duke.edu

March 14-16, 2006
Student Conference on Conservation Science
Nicholas School, LSRC
Contact: Luke Dollar, 919-613-8147 or luke@duke.edu

April 6, 2006
Henry J. Oosting Memorial Lecture
Monica Turner, University of Wisconsin
Location TBD
Contact: Emily Bernhardt, 919-660-7318 or ebernhar@duke.edu

April 6-7, 2006
Master’s Project Symposium
MEM and MF candidates
master’s projects presentations
Von Canon Rooms, Bryan Center,
Durham Campus
Contact: Erika Lovelace, 919-613-8070 or envadm@nicholas.duke.edu

April 6-8, 2006
Spring Board of Visitors Meeting
Nicholas School, LSRC
Contact: Jeanine Holland, 919-613-8039 or jholland@duke.edu

April 7, 2006
Spring Student Banquet
Location TBD
Contact: Nancy Kelly, 919-613-8090 or nkelly@duke.edu

April 9-12, 2006
American Association for Petroleum Geologists Annual Conference
“Perfecting the Search: Delivering on Promises”
George R. Brown Convention Center,
Houston, Texas
Contact: AAPG Convention Dept., 888-945-2274 ext. 617 or convene@aapg.org

April 14-15, 2006
Alumni Council Meeting
Nicholas School, LSRC
Contact: Jeanine Holland, 919-613-8039 or jholland@duke.edu

April 22, 2006
Speaker Presentation for Reunion Weekend
Love Auditorium, LSRC
Contact: Jeanine Holland, 919-613-8039 or jholland@duke.edu

Field Day
Couch Farm Site in Duke Forest
Contact: Jeanine Holland, 919-613-8039 or jholland@duke.edu

April 27-28, 2006
Marine Lab Master’s Project Symposium
MEM candidates, Coastal Environmental Management program, master’s project presentations
Duke University Marine Lab
Contact: Belinda Williford, 252-504-7508 or bbw@duke.edu

April 27-29, 2006
Marine Lab Advisory Board Meeting
Duke University Marine Lab
Contact: Jeanine Holland, 919-613-8039 or jholland@duke.edu

The Nicholas Experience at the Duke Marine Lab
Duke University Marine Lab
Contact: Jeanine Holland, 919-613-8039 or jholland@duke.edu

May 13, 2006
Nicholas School Recognition Ceremony for graduate and professional degree candidates
Nicholas School, LSRC Courtyard
Contact: Enrollment Services, 919-613-8070 or envadm@duke.edu

May 14, 2006
Duke University Commencement Exercises
Wallace Wade Stadium
Duke University
Contact: Enrollment Services, 919-613-8070 or envadm@duke.edu

Summer 2006
Ocean Science Teaching Center Dedication
Duke University Marine Lab
Contact: Jeanine Holland, 919-613-8039 or jholland@duke.edu
earthfile.org radio files
60-second environmental news features from the Nicholas School. Produced and voiced by Emmy-nominated news anchor Ann Kellan, the spots feature interviews with some of the world's top environmental experts

Just put earthfile.org into your Web browser.