WINTER 09

NATURAL RESOURCES AND ENVIRONMENT
UNIVERSITY OF MICHIGAN

Stewards

A magazine for alumni and friends of the School of Natural Resources and Environment

COURSE of ACTION

Arthur Hills

If not for a chance phone call, the genius of Hills (B.L.A. '62) as a legendary course designer may have gone undiscovered

PICTURED: THE GOLF CLUB OF GEORGIA – LAKESIDE (ATLANTA)

IN THE ZONE

SCAVIA'S MODELS BRINGING ATTENTION TO DEAD ZONES

SNRE CLASS ACTS

ERB@15

UNIVERSITY OF MICHIGAN

Lending a Helping Hand

When U-M Provost Terry Sullivan asked me this summer to serve as Acting Dean while Rosina Bierbaum helps lead the World Bank's report on Climate and Development, I considered the request a great honor. It is a privilege to be a part of the University of Michigan, and an even greater privilege to serve as Acting Dean over the coming year.

After three months on the job, it is clear that, "Acting" or not, there is serious business to occupy the school's leadership team, including Research Associate Dean Dan Brown and Academic Associate Dean Michael Moore. In these uncertain but exciting times, enhancing SNRE's reputation as a national leader in environmental research and education requires speed, deliberateness and precision. For the school and its leadership team, we have important challenges ahead.

There are a number of important tasks to accomplish during 2008-09, and certain topics I wish to bring more strongly into focus. SNRE has a substantial number of promotion cases to develop, including research scientists, assistant professors and associate professors. These entail much work for faculty committees as well as the Acting Dean. SNRE has two accredited programs that require re-accreditation. We have two faculty searches under way. Each of these is of the highest priority.

Less specific and urgent, but also of high priority, SNRE needs to respond to a collection of internal and external influences on how we view our immediate future. These include growth in enrollments that are most evident in a subset of our fields of study; questions of internal organizational structure and perceived hiring needs; the campus-wide cluster hire opportunities; and an evolving and expanding campus-wide embracing of sustainability. We must continue to grow our activities that engage others, whether intellectually through events in and around the Dana Building such as the Dean's Speaker Series, or more broadly through our interactions with alumni, donors and other school constituencies. Finally, I have a personal interest in how we might better capture and describe, and also enhance, our outreach efforts.

Our year is off to a good start. The recent accreditation review of our Landscape Architecture program engaged our students, alumni and faculty in showcasing the LA program's strengths; based on the oral report of the visiting team, our efforts were successful. We're adeptly juggling a complex docket of nine promotion cases, including the first research scientists under our new guidelines. In addition, we've initiated searches for faculty in both Landscape Architecture and the cutting-edge field at the nexus of water and energy. The SNRE executive committee and faculty recently have engaged in the important discussion of size and composition of the student body and the faculty – the first step in a much longer series of planning. SNRE's Visiting Committee met this fall and expressed its excitement over the school's activities as it looks forward to a more active role in enhancing the school's visibility and connections to industry. (See related story, page 27)

Perhaps the most important duty I'm fulfilling is to carry the SNRE banner as U-M reshapes its position academically and operationally in response to the growing recognition that sustainability requires the engagement of all of the University's expertise. The campus role that SNRE serves in promoting and linking environmental research and education grows almost daily, whether through contributions to the undergraduate-based Program in the Environment or our work at affiliated centers and institutes. Expanding and deepening this interconnectedness – to serve as "hub" or "crossroads" for the University – is a central part of SNRE's long-term strategy. We aspire to be the intellectual and academic leaders on campus when it comes to the environment and sustainability.

As an alumnus and supporter of the school, you have a vital role to play in achieving this aspiration. Your opinions are needed to ensure that this transformation is well conceived, constructed and communicated. That's why I so strongly urge you to make time to come to an alumni outreach event or an SNRE-sponsored event on campus. Doing so will give you a greater appreciation for the energy and ideas found today among our students, faculty and staff.

In my role as Acting Dean, one of my greatest joys has been increased contact with students and faculty colleagues. This year, SNRE welcomed its largest-ever incoming class: 147 new students, a number that has nearly doubled from two years ago. Applications, too, keep rising. We had 10 percent more in 2008 than 2007. The growth of our incoming class is a testament to the continued high reputation of our faculty and fields of study, as well as the appeal of environment-related employment.

The constant rush of new faces, tasks, challenges and decisions has been invigorating and, at times, exhausting. But I'm grateful every day for the opportunity to serve and help guide SNRE – even temporarily – through one of its most exciting eras ever.

David Allan (dallan@umich.edu)
Professor and Acting Dean
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ON LINE

Visit www.snre.umich.edu for additional stories and more information about some of the articles in this magazine. New content is added daily to keep you up to date with events and news about SNRE.

Stewards
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UNIVERSITY OF MICHIGAN

U-M study examines connection between 'Exurbs' and Climate Change

Through a detailed analysis of the science, policy and design of land use, researchers at the University of Michigan are examining how "exurban" areas outside of American's urban and suburban areas can absorb more carbon from the atmosphere.

The research could lead to changes in how developers, residents and even local planning boards think about land-cover management, the value of land and land-use policies. Ultimately, those discussions could lead to local decisions and rules, zoning policies, educational initiatives and design innovations that promote patterns of development and landscape design that increase absorption of carbon, which could slow climate change.

"Exurban residential development is widespread and constitutes one of the major forms of land-use and land-cover changes in the eastern U.S. and elsewhere," said Dan Brown, the project's lead researcher and a professor at the School of Natural Resources and Environment. "This sprawl has large impacts on vast landscapes, ecosystem services and quality of life of millions of people." Other SNRE researchers involved in the project are Joan Nassauer, a professor of Landscape Architecture, and Bill Currie, an associate professor of Terrestrial Ecosystems. Also involved are researchers from U-M's Center for the Study of Complex Systems and George Mason University's Department of Computational Social Science.

A MAJOR GAP IN CURRENT UNDERSTANDING EXISTS IN THE RELATIONSHIP BETWEEN EXURBAN DEVELOPMENT AND THE RESULTING EFFECTS ON THE LANDSCAPE-CARBON BALANCE. PRODUCTIVITY INCREASES ACROSS THE NORTHERN HEMISPHERE, AT LEAST PARTIALLY DRIVEN BY EXURBAN LAND-USE CHANGE, HAVE IMPORTANT IMPLICATIONS FOR CARBON BALANCE GLOBALLY AND FOR EFFORTS TO MANAGE LANDSCAPE-CARBON BALANCE TO MITIGATE CLIMATE CHANGE.

Exurban areas are often defined as low-density residential developments that exist beyond traditional urban and suburban areas, and which are often disconnected from urban services like sewer and water.

Researchers want to produce a clearer understanding of the relationships among carbon dynamics, land-management activities and market and non-market values of land-uses, and land-covers – with a focus on how carbon dynamics might respond to various management and policy options for land-cover management.

The results of this computational social-simulation model will be used to understand how the factors that influence decisions of individual developers and landowners ultimately drive land-use change, and how these interactions through the land market influence large-scale patterns of land value.

The National Science Foundation is funding the research with a $1.5 million award.

– Kevin Merrill

READ MORE:
snre.umich.edu/newsroom

Insects get their due in new book from SNRE/EEB professor

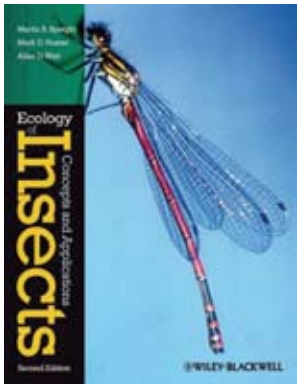
They may be small, but insect life is bountiful – representing nearly half of all biological diversity on the planet. The creatures get their due – and then some – in the second edition of ***Ecology of Insects: Concepts and Applications***. The book was co-written by Mark D. Hunter, a professor with joint appointments at the School of Natural Resources and Environment and the College of Literature, Science, and the Arts' Department of Ecology and Evolutionary Biology.

"This textbook strikes a balance between theory and practice and between pure and applied ecology," said Hunter, who co-authored the new edition with Martin R. Speight of the University of Oxford and Allan D. Watt of the Centre for Ecology and Hydrology, both based in the United Kingdom.

The 640-page book presents the basic themes of insect ecology as well as background in evolutionary ecology, population dynamics and environmental interactions. The authors subsequently apply these concepts to a number of issues such as climate change, the conservation of biodiversity, epidemiology and pest management.

"[Insects'] ecology is of crucial economic importance to our planet and therefore ourselves – as pests of our crops, vectors of diseases and as beneficial species in food webs, pollination and biological control," Hunter said.

Based upon a wealth of international teaching expertise, ***Ecology of Insects*** is aimed at undergraduate and postgraduate students taking courses in insect ecology and applied entomology, as well as wider degree programs in biology, general ecology, zoology, forestry and agriculture.



THE BOOK WAS FIRST PUBLISHED IN 1999. CHANGES BETWEEN EDITIONS INCLUDE NEW TOPICAL AREAS OF INSECT ECOLOGY AND GREATER COVERAGE OF PHYSIOLOGICAL, GENETIC, MOLECULAR AND ECOSYSTEM ASPECTS OF INSECT ECOLOGY. IT IS PUBLISHED BY WILEY-BLACKWELL AND IS AVAILABLE AT WWW.WILEY.COM.

Gov. Granholm recognizes SNRE faculty at U-M environmental conference

The dean of the School of Natural Resources and Environment and one of its professors were recognized Sept. 25 by Michigan Gov. Jennifer Granholm for their work on the Intergovernmental Panel on Climate Change, which shared in the 2007 Nobel Peace Prize. Rosina M. Bierbaum, SNRE dean and professor, led four U.S. delegations to IPCC plenary meetings in Shanghai, Montreal, Costa Rica and Mexico City, including the 2001 final Science Assessment approval. She coordinated the White House review of the 1995 and 2001 reports and served as an expert reviewer of the 2007 IPCC report. Maria Carmen Lemos, an SNRE associate professor, contributed to a chapter in the "Impacts, Adaptation and Vulnerability" volume of the 2007 IPCC report.

The IPCC, a global network of approximately 2,000 scientists, shared the 2007 Nobel Peace Prize with former Vice President Al Gore. According to the Nobel Peace Prize citation, the IPCC has produced scientific reports for two decades that have "created an ever-broader informed consensus about the connection between human activities and global warming."

Granholm visited campus to kick off a Michigan Law conference on the next president's environmental program by discussing Michigan's role in that program, especially in light of the state's recently passed renewable energy legislation. Later, she honored Bierbaum, Lemos and other U-M IPCC participants, including Henry Pollack, emeritus professor of geophysics, Department of Geological Sciences; Joyce Penner, Ralph J. Cicerone Distinguished Professor of Atmospheric Science, Department of Atmospheric, Oceanic and Space Sciences (AOSS); Natalia Andronova, research scientist, AOSS; and Detlaf Sprinz, visiting professor, Department of Political Science.

BIERBAUM (TOP) AND LEMOS WERE HONORED BY GRANHOLM (RIGHT).

– Lim Jones U-M Photo Services

Summit book offers adaptation roadmap for climate change

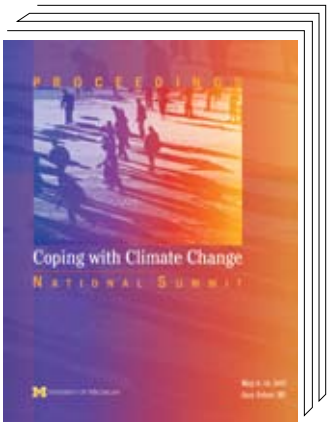
The University of Michigan, through its School of Natural Resources and Environment, has published the proceedings from SNRE's May 2007 National Summit on Coping with Climate Change. The event – the first of its kind in the nation – focused on helping the United States prepare for the impact of climate change.

Coping with Climate Change: National Summit Proceedings captures the ideas of top environmental leaders regarding national adaptation strategies to climate change. The 256-page book contains keynote speeches, transcripts of breakout sessions and panel discussions, and the candid and valuable insights from sector syntheses and scenario summaries. The book also includes an executive summary from SNRE Dean Rosina M. Bierbaum and a companion CD, which contains many Summit PowerPoint presentations and photos. More than 150 experts from academia, government, business and the nonprofit sector participated. External sponsorship came from Google Inc., the Gordon and Betty Moore Foundation, the Frey Foundation, the National Science Foundation and the U.S. Environmental Protection Agency.

"The material presented in the book and companion CD remains as fascinating and relevant today as it did during the Summit," Dean Bierbaum said. "Building on this work will be essential to preparing our nation to confront climate change."

It is available through amazon.com and www.islandpress.org. To order copies, visit snre.umich.edu/books.

READ MORE:
snre.umich.edu/climate_change



SNRE ORGANIZED THE MAY 8-10, 2007, SUMMIT AS THE UNIVERSITY'S COMMITMENT TO THE CLINTON GLOBAL INITIATIVE, A NON-PARTISAN EFFORT TO DEVISE AND IMPLEMENT SOLUTIONS TO WORLD CHALLENGES.

In The Zone

Scavia's models bringing attention to coastal dead zones

BY KEVIN MERRILL

Don Scavia never set out to give the Grim Reaper a run for his money.

But since Scavia's first Hypoxia Forecasts were released a few years ago, his name has become nearly synonymous in the national media with death – dead zones, to be exact. His annual predictions regarding the summer health of the Gulf of Mexico and the Chesapeake Bay have been discussed on National Public Radio and quoted in The Washington Post, The Times-Picayune, The St Louis Post-Dispatch, U.S. News & World Report, The Christian Science Monitor and Time magazine, among others.

"Any opportunity I get to talk about the causes of and solutions to dead zones, I take," said Scavia, a professor at the School of Natural Resources and Environment. "Unfortunately, the data aren't pretty and I expect the forecasts to get more grim."

His predictions will soon cover another iconic dead zone: Lake Erie.

Through two $2.5 million grants from the National Oceanic and Atmospheric Administration's (NOAA) Center for Sponsored Coastal Ocean Research, Scavia and fellow researchers are refining the Gulf and Chesapeake Bay models for other estuaries and Lake Erie. In these five-year studies, they are studying why dead zones occur in coastal and Great Lakes waters, how to detect the causes and how to stop the zones' spread before fishery and tourism industries suffer. Their research will also explore why Lake Erie dead zones have recently reappeared and expanded. In the 1960s and 1970s, the Erie dead zone was a key driver for enacting the Clean Water Act and stimulating the environmental movement, Scavia said.

Such research on a Great Lake is important to Scavia for another reason. He is director of Michigan Sea Grant, a joint program of the University of Michigan and Michigan State University housed at SNRE. It is part of the National Sea Grant College Program, a national network of 30 university-based programs in coastal states.

Dead zones are regions with very low or no oxygen, a scientific condition known as hypoxia. They form when decomposing organic matter produced by algae in the surface water uses oxygen faster than it can be resupplied. They form in the bottom waters of two-layer lakes and coastal oceans. These stratified layers, formed by warmer (in lakes) or fresher (in ocean) water layered on top of colder (in lakes) or colder and saltier (in ocean) water, prevent oxygen from the atmosphere getting to the deep water. "All animals that require oxygenated water are impacted by these low-oxygen conditions," Scavia said. "Those that can swim from the region will do so. Those that cannot will die."

The Chesapeake Bay, Gulf and Lake Erie dead zones form each spring as they stratify and as nitrogen and phosphorus from farm fertilizers, atmospheric deposition and wastewater treatment plants stimulate algae blooms. The zones dissipate each fall as changes in water currents and temperatures mix and re-aerate the water – only to return the next spring.

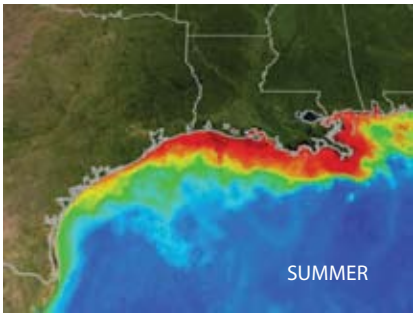
SUMMER WOES

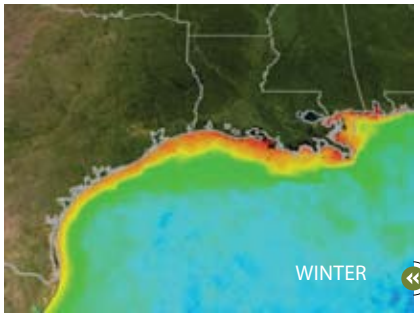
This summer, his models predicted that under certain conditions, both areas would have record-setting dead zones.

In the Chesapeake Bay Hypoxic Forecast, he predicted a hypoxic volume of 9.9 cubic kilometers (2.4 cubic miles), the sixth-highest on record. If the upper value of the forecast range of 12.3 cubic kilometers (3 cubic miles) was reached, it would have set a new record. The late July 2008 measured volume was 8.6 km^3, less than the prediction, but within the model's error bounds. The Bay stretches 200 miles from Maryland to Virginia, and supports thousands of species of plants, fish and animals. Its oxygen levels are critical in determining the health of its ecosystem.

DON SCAVIA (FAR RIGHT) WORKS WITH RESEARCH FELLOW YONG LIU (FAR LEFT) AND SNRE STUDENTS JAMES ROBERTS AND JULIE MIDA ON A LAB PROJECT INSIDE THE DANA BUILDING.

The news was as dire for the Gulf of Mexico, a possibility made worse by massive springtime flooding of cities and farms in the Mississippi River basin and increased corn production for ethanol. Scavia's Gulf Hypoxia Forecast called for a dead zone to





THESE IMAGES SHOW HOW OCEAN COLOR CHANGES FROM WINTER TO SUMMER IN THE GULF OF MEXICO. SUMMERTIME SATELLITE OBSERVATIONS OF OCEAN COLOR SHOW HIGHLY TURBID WATERS, WHICH MAY INCLUDE LARGE BLOOMS OF PHYTOPLANKTON EXTENDING FROM THE MOUTH OF THE MISSISSIPPI RIVER TO THE TEXAS COAST. WHEN THESE BLOOMS DIE AND SINK TO THE BOTTOM, BACTERIAL DECOMPOSITION STRIPS OXYGEN FROM THE SURROUNDING WATER, CREATING AN ENVIRONMENT VERY DIFFICULT FOR MARINE LIFE TO SURVIVE IN. REDS AND ORANGES REPRESENT HIGH CONCENTRATIONS OF PHYTOPLANKTON AND RIVER SEDIMENT. SOURCE: NASA

cover between 21,500 and 22,500 square kilometers (8,300-8,700 square miles) of bottom waters along the Louisiana-Texas coast. This year's observed hypoxic area was 20,720 square kilometers, the second largest on record. It would have been larger if Hurricane Dolly did not disrupt the system. "The growth of these dead zones is an ecological time bomb," Scavia said at the time. "Without determined local, regional and national efforts to control their causes, we are putting major fisheries at risk."

Scavia uses his Gulf and Chesapeake Bay (dead zones) model in two modes. The first is to produce scenarios that provide decision makers with assessments of what hypoxia might look like in the future under changes in nutrient loads. The second is to produce annual forecasts of summer hypoxia extent based on that year's spring nutrient loads. Those forecasts are based on the average January-May nitrogen loads for the Chesapeake Bay, and average May-June loads for the Mississippi River basin.

The primary data driving the models are nutrient loads determined by the U.S. Geological Survey. The Chesapeake Bay estimates are coordinated through the interagency Chesapeake Bay Program Office. Scavia calibrates the model and tests its accuracy with oxygen data collected by the Chesapeake Bay program and researchers funded by NOAA at the Louisiana Universities Marine Consortium. He started developing and refining the models while a NOAA scientist. Prior to joining SNRE in 2004, he was chief scientist of NOAA's National Ocean Service. There, he was responsible for the quality, integrity and responsiveness of NOS science programs, and for ensuring that NOS operations and resource management were based on solid science and technology. Before becoming the NOS chief scientist, he was director of the National Centers for Coastal Ocean Science and director of NOAA's Coastal Ocean Program.

"While at NOAA, I was searching for a 'sweet-spot' model, one that was based on basic biological and physical principles, but not so complex that it was hard to understand and justify," said Scavia, who earned his Ph.D. in environmental engineering from U-M in 1980. The model worked quite well for the Gulf, so he later expanded it to the Chesapeake Bay once he arrived at the University of Michigan, with help from Emily Kelly (M.S. '06), then an SNRE master's student.

Scavia has made extensive use of student talent inside the Dana Building. His funding has allowed him to hire graduate student research assistants and post-docs as well as some hourly employees. Kristina Donnelly, another master's student, used the model to compare the potential effects of phosphorus to nitrogen in Gulf hypoxia. Her efforts and contributions from Scavia led to publications in primary literature and have influenced policy makers in their development of nutrient reduction strategies. Research opportunities also extend to doctoral students Dan Rucinski and James Roberts, who are funded to work on the Lake Erie dead zone project, as are Nate Bosch and Jinny Han (both Ph.D. '07), two post-doc students.

DEATH FOR DEAD ZONES?

"Fixing the problem is both incredibly simple and amazingly complex," Scavia said. The "simple" solution – where the primary nutrients come from agricultural sources – is to keep the nitrogen and phosphorus on the land where it can do the most good and the least harm. They are the primary nutrients required by freshwater and marine algae. Generally, they act as fertilizers – more nutrients lead to more algae, and often to more organic matter that decomposes in the bottom waters. Most often, nitrogen matters most in marine environments, and phosphorus matters most in freshwater systems like Lake Erie.

The technologies and practices for achieving this "simple" solution – keeping these chemicals on the land – have been known for a long time: use only the amount of fertilizer needed to grow the crops and apply it when it is least likely to flush off the land; install vegetative buffers between the farm field and streams; and create, restore and protect wetlands that provide natural mechanisms to remove nutrients before they reach rivers, lakes and oceans.

"What makes this complex is that, while there are nominal programs for this in the most recent version of the Farm Bill, those programs are starved for funding to make room for ever-increasing subsidies for commodity crops like corn and soy beans, and by energy policies calling for more bio-fuels derived from these very same crops," he said.

READ MORE:
snre.umich.edu/profile/scavia

ZONE COVERAGE

A FEW OF THE PUBLICATIONS THAT HAVE FEATURED SCAVIA'S RESEARCH.

Made in the Shade

Research by SNRE's Perfecto examines coffee-growing practices and climate-change impacts

Chalk up another environmental benefit for shade-grown Latin American coffee: University of Michigan researchers say the technique will provide a buffer against the ravages of climate change in the coming decades.

Over the last three decades, many Latin American coffee farmers have abandoned traditional shade-growing techniques, in which the plants are grown beneath a diverse canopy of trees. In an effort to increase production, much of the acreage has been converted to "sun coffee," which involves thinning or removing the canopy.

Shade-grown farms boost biodiversity by providing a haven for birds and other animals. They also require far less synthetic fertilizer, pesticides and herbicides than sun-coffee plantations.

In the October edition of the journal *BioScience*, three U-M researchers say shade-growing also shields coffee plants during extreme weather events, such as droughts and severe storms. Climate models predict that extreme weather events will become increasingly common in the coming decades, as the levels of heat-trapping carbon dioxide gas continue to mount.

The U-M scientists warn Latin American farmers of the risks tied to "coffee-intensification programs" – a package of technologies that includes the thinning of canopies and the use of high-yield coffee strains that grow best in direct sunlight – and urge them to consider the greener alternative: shade-grown coffee.

– Photo by Shinsuke Uno

ABOVE: COFFEE BERRIES ON A BRANCH OF THE COFFEE BUSH, CHIAPAS, MEXICO. BELOW: SHADE COFFEE SYSTEM, WHERE THE ROWS OF COFFEE ARE VISIBLE UNDER THE SHADE OF MAINLY INGA TREES IN CHIAPAS, MEXICO.

"This is a warning against the continuation of this trend toward more intensive systems," said Ivette Perfecto, a professor at the School of Natural Resources and Environment and one of the authors. "Shaded coffee is ideal because it will buffer the system from climate change while protecting biodiversity." Perfecto has studied biodiversity in Latin American coffee plantations for 20 years.

The lead author of the *BioScience* paper is Brenda Lin, whose 2006 U-M doctoral dissertation examined microclimate variability under different shade conditions at Mexican coffee plantations. Lin is a Science and Technology Policy Fellow with the American Association for the Advancement of Science in Washington, D.C. The other article author is John Vandermeer of the U-M Department of Ecology and Evolutionary Biology.

The livelihoods of more than 100 million people worldwide are tied to coffee production. In Latin America, most coffee farms lack irrigation, instead relying solely on rainwater, which makes them especially vulnerable to drought and heat waves.

Shade trees help dampen the effects of drought and heat waves by maintaining a cool, moist microclimate beneath the canopy. The optimal temperature range for growing common Arabica coffee is 64 to 70 degrees Fahrenheit. Shade trees also act as windbreaks during storms and help reduce runoff and erosion. Lin's work in southern Mexico showed that shady farms have greater water availability than sunny farms, due in part to lower evaporation rates from the coffee plants and soils. More shade also reduced peak temperatures between 10 a.m. and 2 p.m., when southern Mexican coffee plants experience the greatest heat stress.

– Jim Erickson

– Photo by Brenda Lin

Awards honor student research

Nathan Engle and Christine Kirchhoff, two SNRE doctoral students, were among 20 young research scientists selected from an international pool of graduate students for funding to continue their work on climate change. Funding for the one-time, $15,000 scholarships came from former Vice President Al Gore, who is funding them with money from a Dan David Prize he won in May. The annual prizes promote scientific, technological and humanistic achievements.

Qing Tian, an SNRE doctoral candidate, received a NASA Earth and Science Fellowship and will use the funding to study China's Poyang Lake Region and how its rural poor are adapting to the changing environment. NASA selected Tian and other recipients after evaluating the scientific merit of their proposed research. The $30,000 fellowship covers a range of expenses, including travel and tuition, and can be extended for two years.

Elizabeth Nysson, a second-year master's student, received an award from Safari Club International Michigan Involvement Committee for her work on the migration of the pronghorn, an antelope-like animal native to the western United States. Her research is part of a team-based master's project focused on the animal's ancient migration route, which is experiencing fragmentation due to loss of open ranges and rural expansion.

Study examines links between pollution, student school performance

SNRE researchers are studying connections between air toxins and K-12 student performance in Michigan – and possibly whether air quality should be a factor when deciding where to build public schools. The study combines census, air quality and school district information to give a bird's-eye view of where schools, poverty and pollution intersect – kilometer by kilometer across the entire state. By using additional public data supplied by Detroit Public Schools, SNRE researchers are taking the study a step further: comparing student performance against environmental data.

"Currently, information about the effects of air toxics on Michigan's school-aged population is largely anecdotal," said Paul Mohai, an SNRE professor and the project's lead researcher. "We do not know whether schools in the state are located in areas that are more – or less – polluted than their surrounding communities. It is also uncertain which schools are most at risk from air-toxics exposure and whether such exposures are related to health outcomes, absenteeism, school performance and dropout rates."

Joining Mohai in coordinating the research is Byoung-Suk Kweon, a research investigator and adjunct assistant professor at SNRE.

The Kresge Foundation, based in Troy, Mich., is funding the $485,000, three-year study, which started this summer.

The researchers are looking for links between toxic air exposures and absenteeism, test scores, school dropout rates and health. A computer model will look for these links by creating a series of overlaid maps. A related project objective is to assist community organizations and nonprofit groups with policy recommendations to alleviate such risks. Potentially, the findings could be used to re-evaluate state and local policies that lead to the siting of new schools in areas with already high concentrations of pollution. At a minimum, the data-crunching and analysis will help identify schools requiring further investigation.

"It's safe to say this is a study that will look for associations," said Kweon. "We're not saying it's a core association, but it's a question worth exploring."

'Green' Economy color-blind?

A national survey wants to answer the question: Is the emerging "green" economy color-blind? Conducting the assessment of the green-jobs sector is the Multicultural Environmental Leadership Initiative (MELI) at the School of Natural Resources and Environment. The survey is looking at the supply-and-demand dynamics of the environmental labor force. First, it will examine the demand for green jobs, where will they be created and which companies will create them. Then, it will study the supply of minority workers by looking at how environmental justice groups identify, train and supply that segment of the workforce.

When complete, the analysis will be made available through a Web site. The site will make it easier to distribute information about the job market, environmental leadership issues, recruiting and hiring, which will be particularly helpful to companies and nonprofit organizations, said Dorceta E. Taylor, a professor at SNRE and director of MELI.

"From a national perspective, we do not know how the emergence of the new energy economy will reshape the labor market," Taylor said. "More importantly, we do not know how these employment shifts will affect traditionally underemployed populations." The project is funded by a $195,000 grant from the Ford Foundation.

Bunyan Bryant receives NAAEE Award

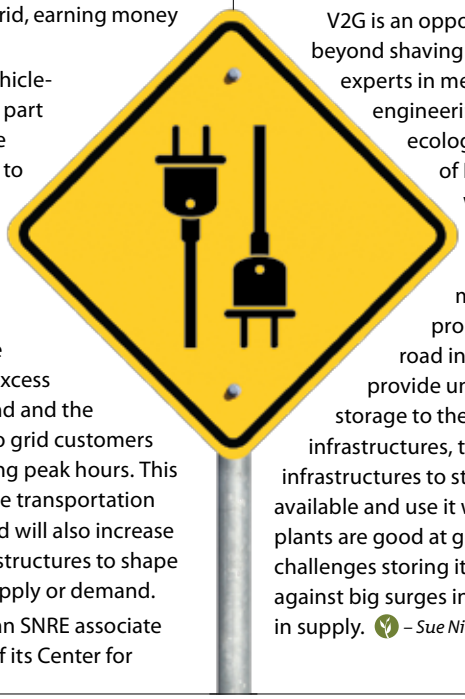
Professor Bunyan Bryant was honored in October with the "Outstanding Service to EE by an Individual at the Regional Level" by the North American Association for Environmental Education (NAAEE). The annual award recognizes individuals who have made a significant contribution to environmental education (EE) in an area of the person's country that extends beyond a local impact. Bryant, who teaches mostly in SNRE's Environmental Justice field of study, has helped hundreds of environmental educators develop a personal and professional philosophy on education's role in addressing society's most pressing environmental issues.

Two-Way Street

Scientists explore using electric cars for two-way power

Scientists at the University of Michigan, including two associated with SNRE, are using a $2 million grant from the National Science Foundation to explore plug-in hybrid electric vehicles (PHEV) that not only use grid electricity to meet their power needs, but return it to the grid, earning money for the owner.

The concept, called vehicle-to-grid (V2G) integration, is part of a larger effort to embrace large-scale changes needed to improve the sustainability and resilience of the transportation and electric power infrastructures. If V2G integration succeeds, it will enable the grid to use PHEV batteries for storing excess renewable energy from wind and the sun, releasing this energy to grid customers when needed, such as during peak hours. This will lead to more sustainable transportation and grid infrastructures, and will also increase the resilience of these infrastructures to shape changes in energy costs, supply or demand.



Gregory A. Keoleian, an SNRE associate professor and co-director of its Center for Sustainable Systems (CSS), is a co-principal investigator on the grant. Duncan Callaway, an assistant research scientist at CSS, is a participating investigator. Both contributed to proposal sections and will conduct specific research tasks.

V2G is an opportunity to look at vehicles beyond shaving miles per gallon. A team of experts in mechanical and power systems engineering, economics and industrial ecology will examine every aspect of PHEVs and how they interact with the electrical grid.

If PHEVs, which are anticipated to be on the market in 2010, fulfill their promise, millions could be on the road in coming decades. This could provide unprecedented shared battery storage to the grid and transportation infrastructures, thereby allowing these infrastructures to store renewable energy when available and use it when needed. Aging electric plants are good at generating power, but face challenges storing it and lack ways to buffer against big surges in demands or interruptions in supply. *– Sue Nichols*

Professor contributes to Blair climate report

An international group focused on climate change and former British Prime Minister Tony Blair co-released a global call to action – with help from SNRE Professor Andrew Hoffman.

Hoffman was one of 18 professionals from around the world who served on an expert committee advising both The °Climate Group and Blair, who co-released the June report in Tokyo titled "Breaking the Climate Deadlock: A Global Deal for Our Low Carbon Future." The °Climate Group approached Hoffman last fall and asked him to help preview drafts and participate in conference-call discussions regarding the report.

The report identifies the actions and questions that need to be resolved by political and business leaders over the next 18 months to achieve a successful outcome to the United Nations climate change negotiations in Copenhagen in December 2009. The report helped Blair make the case for action at the G8 Leaders' Summit in July.

Hoffman said the report's conclusions, while not breaking new scientific ground, are compiled in a concise and complete way. "It doesn't skirt any of the major issues before us while also helping to make the case for action to the leaders of the G8 countries," he said. "And having it delivered by someone as influential as Tony Blair, someone with 'convening' power, means that it will likely produce some kind of response."

– Blair photo: Remy Steinegger/Creative Commons

HOFFMAN (TOP) HELPED AUTHOR BLAIR'S REPORT FOR A G8 LEADERS' SUMMIT MEETING.

NSF funds research on plant defense

An SNRE researcher is using the common milkweed plant to study the connections between root systems and plant defenses and how humans may one day control those links.

The research is being conducted by professor Mark D. Hunter. The National Science Foundation is funding the work through a four-year, $650,000 grant. The research data will contribute to the understanding of how diverse plant species, from agricultural crops through forest trees, use root fungi in their defense strategies, Hunter said. Using the data, researchers may be able propose how to manipulate root fungi to protect plants important to humans or render defenseless those considered to be invasive pests.

The work builds on a common understanding of plant biology. All plants worldwide must defend themselves from being damaged by their enemies, including insects, deer and pathogens. These defenses range from the physical, such as thorns, spines and tough leaves, to chemical, such as cyanide and steroids. As plants try to defend themselves, most make use of nutrients provided to them by fungi (called mycorrhizae) that live in their roots.

In what is basically a barter system, plants provide the fungi with sugar while the fungi provide plants with minerals such as phosphorus and nitrogen.

The strength of plant defenses may vary with the amount of fungus in their roots and the identity of their fungal partners, but this has never been studied in detail, Hunter said. Using the common milkweed as a study plant, his research will explore how the strength of plant defense varies with the fungal colonization of roots.

SNRE Class Acts 2010–11

Four new master's students, representative of a great and diverse pool of incoming talent, talk about their fields of study and making an impact after graduation – and offering advice to President-elect Barack Obama.

MASTERS OF THE UNIVERSE: ABOVE, FROM LEFT, NEW STUDENTS MEGHAN HUTCHINS, ANDREW MACDONALD, SARAH SHAPIRO AND NATHAN SPRINGER.

The School of Natural Resources and Environment welcomed its largest-ever incoming class in September. More than 147 new master's and doctoral students chose to pursue their academic goals by studying in Ann Arbor. Interest in an education at SNRE is at an all-time high. The school received more than 500 applications this fall. Nearly a third of incoming SNRE students are pursuing two degrees through innovative and highly touted dual-degree programs with sister schools and colleges across campus. The new students increase to nearly 400 the number of graduate students enrolled at SNRE: 282 at the master's of science level, 36 at the master's of landscape architecture level; and 79 at the doctoral level.

The school's incoming class is as distinguished as ever, representing 28 states and nine countries. To give you a flavor for who they are and what is on their minds, *Stewards* selected four and asked them to introduce themselves.

CLASS ACTS

Sarah SHAPIRO / Age: 25

Hometown: New York, N.Y. (originally, Westchester, N.Y.)

SNRE degree sought: Dual degree (enrolled in the Erb program – earning both M.S. and M.B.A.)

Projected semester/year of graduation: 2011

Undergraduate degree: Cornell University (B.S. '05 College of Engineering, Earth and Atmospheric Sciences (focus in geosciences)

Stewards: How did you select Sustainable Systems as your field of study? What interests you most about it?

Shapiro: For the past three years, I worked on climate change adaptation issues at ICF International, an environmental consulting firm in Washington, D.C. There, I became more interested in the interconnectedness of environmental issues, renewable energy and corporate sustainability. At SNRE, I'm focusing on Sustainable Systems to investigate the relationships between these systems.

Stewards: Why did you choose SNRE? Now here, what are you looking forward to the most?

Shapiro: I chose SNRE because of its interdisciplinary study, real-world focus and its strong connection to the Ross School of Business. Michigan provides resources to dual-degree students in a way that no other school does. That really brought me to U-M. Now here, I'm really looking forward to applying my skills through my master's project.

Stewards: Once you graduate, where and how do you plan to make the most impact?

Shapiro: Once I graduate, I'm hoping to work on corporate sustainability issues in the private sector. I'd like to focus on corporate sustainability and renewable energy.

Stewards: What advice would you give to the U.S. president regarding energy and environmental policy?

Shapiro: Ha! Good question. I think the government needs to provide an incentive for private investment in renewable energy technologies and in increasing infrastructure capacity. In addition, the money generated from a carbon tax could be plugged back into the system as direct federal investmentinrenewable fuels and clean energy.

Nathan SPRINGER / Age: 30

Hometown: Portland, Ore.

SNRE degree sought: Dual degree (enrolled in the Erb program – earning both M.S. and M.B.A.). Also enrolled as part of SNRE's Peace Corps Fellows program

Projected semester/year of graduation: 2011

Undergraduate degree: Willamette University (B.A. '00), Environmental Science

Stewards: How did you select Environmental Policy and Planning as your field of study? What interests you most about it?

Springer: The exhilaration of leading Boy Scout outings in the majestic Pacific Northwest first inspired my passion to preserve natural places. I wanted to understand the inner workings of these natural areas and the realities that threatened them. After graduating from Willamette, I joined the Peace Corps and went to Paraguay to address actual environmental problems. When I met Paraguayans, they laughed at my environmental projects gleaned from textbooks. "How can we plant trees when we have to feed our families?" they said. It wasn't until I learned their language and hoed weeds in the fields beside farmers that I understood the connection between sustainability and livelihood. When I returned to the U.S., I moved to Los Angeles to help found a nonprofit organization. Environmental problems cross boundaries of economy and society. I believe we cannot succeed without recognizing the confluence of underlying connections. My passion is to be the bridge that promotes interaction across the boundaries and facilitates solutions that work.

Stewards: Why did you choose SNRE? Now here, what are you looking forward to the most?

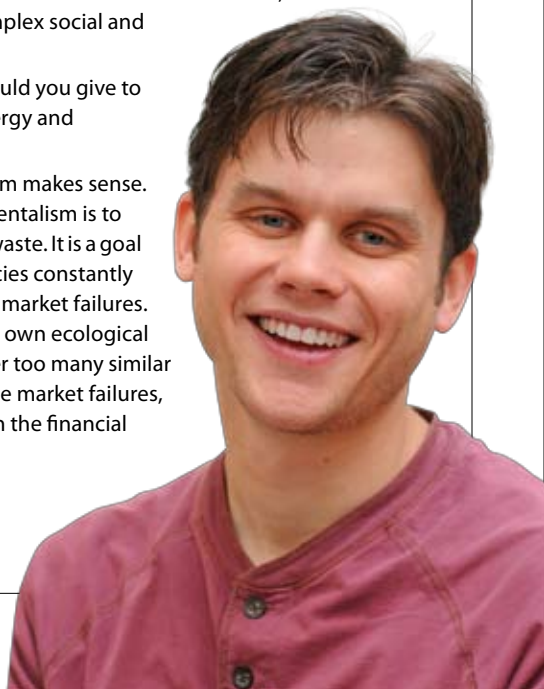
Springer: The challenge of climate change will require countless public and private sector approaches. I chose SNRE because it excels in teaching the interdisciplinary approach required for effective solutions to complex problems like global warming. Now that I am here, I am especially excited about the incredible experiences and personalities that my fellow students bring to the school and the environmental movement.

Stewards: Once you graduate, where and how do you plan to make the most impact?

Springer: I see my greatest potential in helping to create sustainable institutions and business practices. I bring experience bridging the boundaries between business, government and communities, which is essential to solving complex social and environmental problems.

Stewards: What advice would you give to the U.S. president regarding energy and environmental policy?

Springer: Environmentalism makes sense. The economic goal of environmentalism is to increase efficiency by reducing waste. It is a goal shared by business. Yet our policies constantly distort the market and reinforce market failures. The economy is undermining its own ecological foundation. We have passed over too many similar opportunities to correct these market failures, and the results are visible in the financial crisis and global warming.



Andrew MacDonald / Age: 22

Hometown: Minneapolis, Minn.
SNRE degree sought: M.S.
Projected semester/year of graduation: 2010
Undergraduate degree: University of Wisconsin – Madison (B.S. '08), political science and anthropology double major

Stewards: How did you select Conservation Biology as your field of study? What interests you most about it?

MacDonald: I came to Michigan with a strong background in the social sciences and I wanted, first and foremost, to strengthen my understanding and knowledge of the natural sciences. I value academic versatility and believe interdisciplinary training to be essential in the successful application of my academic pursuits to the environmental issues we face. I chose Conservation Biology not only for its strong grounding in the natural sciences but also for its broad focus and application. My interests are primarily in the application of a conservation ethic to agroecosystems.

Stewards: Why did you choose SNRE? Now here, what are you looking forward to the most?

MacDonald: I spoke with faculty and students from various institutions with which I was acquainted to get a sense for what was out there. The one program that consistently topped everyone's list was SNRE. I got a chance to visit the university and meet some faculty members before applying as well as at the Student Visit Day in the spring. It was an easy sell, with top-notch faculty in every area of study and seemingly limitless opportunities to pursue no matter what your interests. I most look forward to working with and learning from my adviser and fellow students.

Stewards: Once you graduate, where and how do you plan to make the most impact?

MacDonald: I believe education is the key to restoring and rebuilding our society in order to create a more environmentally and ecologically sustainable, just, equitable and peaceful tomorrow. I believe the greatest impact an individual can make is in the dissemination of knowledge, even on an individual-to-individual scale. No matter what direction I go, I plan to be an educator. Whether it's in the "marble halls" of academia, as a community organizer or as an environmental consultant, education will be a key component of my future work.

Stewards: What advice would you give to the U.S. president regarding energy and environmental policy?

MacDonald: I would first ask what kind of legacy he would like to leave for the future? Our current policies are robbing from the future and the "developing" world in order to maintain unsustainable habits of overconsumption. We need to start thinking outside of this paradigm. In short, the time for bold bipartisan action is now.

Meghan Hutchins / Age: 29

Hometown: Eau Claire, Wisc.
SNRE degree sought: M.S.
Projected semester/year of graduation: 2010
Undergraduate degree: University of Wisconsin – Eau Claire (B.S. '02), computer science

Stewards: How did you select Environmental Informatics as your field of study? What interests you most about it?

Hutchins: After working as a Web-based Java programmer for the past six years, I felt it was time for a change. I still enjoyed programming, but wanted to apply my technical skills to an area of study that I felt was truly important – the environment. My search for a degree program focused mainly on the integration of computer science with ecology. I was astonished to find that SNRE was the only school in the U.S. that offered such a program. What interests me most about the field of environmental informatics is that it is always evolving. New modeling techniques can give rise to new perspectives on how ecosystems work and may be able to predict how they change over time.

Stewards: Why did you choose SNRE? Now here, what are you looking forward to the most?

Hutchins: It is a unique program. It not only provides its students with a basis in ecology science, but also instruction pertaining to policy and decision-making strategies. There is a definite need for better communication and understanding between scientists and politicians. SNRE equips its students with this understanding and encourages communication across fields.

Stewards: Once you graduate, where and how do you plan to make the most impact?

Hutchins: I hope to be able to educate politicians, executives and the general public about the complexities of environmental problems and provide new insights using computer-based modeling and simulation. I believe the more educated our decision-makers and general public are, the better certainty there will be in mitigating or even resolving environmental issues.

Stewards: What advice would you give to the U.S. president regarding energy and environmental policy?

Hutchins: The president has a very difficult job, especially in light of all the other issues we face apart from energy and the environment. However, energy and environmental policy issues cannot be put on hold and action needs to be taken soon. My advice would be to listen to the scientists, economists, politicians and the public. Weigh the information carefully and consider the costs, benefits and consequences of each use-case scenario before making a decision. Finally, have one or more contingency plans in place just in case something should go wrong.

Arthur Hills COURS

BY **KEVIN MERRILL** | PHOTOS BY **DAVID BRENNER**

More than 40 years ago, Arthur Hills (B.L.A. '62) was running a landscape contracting business in his hometown of Toledo, Ohio, designing and installing mostly small-scale projects for homeowners and businesses. He grew up surrounded by the family's greenhouse business, so being around soil and plants felt natural. The skills he acquired as a landscape architect at the University of Michigan were beginning to pay off as his business grew. Then one day in 1965, a former contracting customer called and said he and fellow investors were building a golf course outside Toledo and would Hills like to design it? Hills confidently said yes.

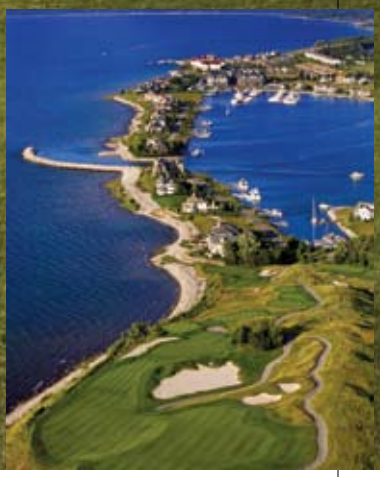
More than 200 new courses and 130 course renovations later, Arthur Hills/Steve Forrest and Associates is still receiving those types of phone calls. But now, they are likely to come from big-time investors outside the United States needing to raise the profile of a high-end development. To them and just about everyone else in the industry, an "Arthur Hills-Designed Course" is a gold standard, and getting that name attached to a project can help ensure its financial success. The company has more than 40 active projects under way worldwide. Hills, 78, credits his company's success as much to the experience and talent of his employees as to the professors and curriculum of the Landscape Architecture program. He earned his bachelor of landscape architecture degree while commuting and balancing duties as a father and business owner.

"I learned so much from that program. The knowledge I gained has served me as a basic tool for my entire career," Hills said this summer during an interview in one of the trailers parked behind a century-old Toledo farmhouse, which functions as headquarters for his world-renowned company. "When I got out of school, landscape architects were just really scrambling – or hoping – for recognition. Now, landscape architecture is recognized as a design skill. And I think that's valuable in terms of making *every* place one lives better. There wasn't as much awareness of that 50 years ago."

E of ACTION

Golf courses designed by Arthur Hills have earned a worldwide reputation for their beauty, playability and compatibility with the surrounding landscape. But if not for a chance phone call, Hills' genius as a course designer may have gone undiscovered.

ABOVE, HILLS' CATAWBA ISLAND COURSE OPENED IN 2008 IN PORT CLINTON, OHIO. BELOW: BAY HARBOR GOLF CLUB IN PETOSKEY, MICH., NOTED FOR ITS BEAUTIFUL VIEW.



Hills-designed courses today are mostly found in the United States, but increasingly they are in Portugal, Sweden, Norway, Russia, Morocco, the Caribbean and Mexico. In fact, half of his company's new-course business now comes from abroad. And the accolades keep building, whether from editors of *Golf*, *Golfweek*, *Golf Digest* or *Links*. For example, three Arthur Hills courses are among the top 100 best public courses as rated by *Golf* and four are rated as among the top 100 public access courses in the United States by *Golf Digest*.

"Art has done a wonderful job throughout his career of creating golf courses that have a tremendous balance, by making them playable for a large number of players while testing some of the best players in the game," said Bruce Charlton, president and chief design officer of Robert Trent Jones II, a golf course architectural firm in Palo Alto, Calif., and current president of the American Society of Golf Course Architects (ASGCA). "Art has a good sense of the visual side of golf course architecture, too. He has a nice sense of composition. I enjoy playing Art's courses. They hold your attention, you don't get bored on them and every one is different."

TOLEDO ROOTS

Working in soil runs in the Hills family. His family owned a greenhouse business in Toledo, the land under which stretched for a mile. Thirteen of those acres once were under glass – making the facility at the time the largest greenhouse in North America, Hills said. The family lost about half the land during the Great Depression, but kept enough to go on making a living selling vegetables and bushes to residents of Ohio and Michigan.

"I kind of thought that I would end up working in that business," Hills said.

To supplement his knowledge of plants and soils, he earned a degree in agriculture in 1953 from Michigan State University, where he also played on the varsity golf team. (He was on golf teams throughout high school; first in Toledo and later in Dexter, Mich., where his family moved after his sophomore year.)

After MSU and a stint in the U.S. Army, Hills returned to the family business, but discovered there wasn't enough room in it for him to grow professionally. So he started his own landscape contracting business. And in order to differentiate himself from

Arthur Hills

competitors, he decided to acquire skills as a landscape architect, which led him to enroll at the University of Michigan. The landscape architecture program, which is celebrating its 100th anniversary in 2009, was then part of the College of Architecture and Design; it joined the School of Natural Resources and Environment in 1965.

"The training I received really provided the tools I needed to do what I do. Without them, I think I would have been at a loss," Hills said.

One of his instructors was legendary LA professor Bill Johnson. "The guy was so good and such a great teacher. He imparted to all of us so much great information," Hills said. "He taught us some basics that are applicable, even today," Hills added, pulling from a nearby bookshelf a textbook he used in the early 1960s.

Going through the book's pages, he talks about "bubble diagrams", site and regional analysis, and site structure – terms familiar to any landscape architect. "We use these exact same concepts. We do this same thing today. It's valid. It's great stuff," Hills said excitedly.

"My intent in pursuing the degree was to design for homeowners and businesses. I really didn't know I was going to get into golf course design," Hills said. "I didn't go up there with that intention. I went up there with the intention of becoming a landscape architect. I knew I wanted to have additional skills beyond those required to be a landscape contractor."

With his degree in hand, he kept building his business through a combination of landscape architecture and landscape contracting services. Then, in 1965, came the phone call.

THE FIRST COURSE

The caller had hired Hills to install a residential project and acknowledged knowing nothing about golf course design.

"But we knew just enough to be one step ahead of him. We said we could design this golf course for you. And he said, okay. So he hired us. We may never have gotten started if it wasn't for that phone call." Two years later, Brandywine, the first Arthur Hills-designed golf course, opened in Maumee, Ohio. It's still testing golfers today.

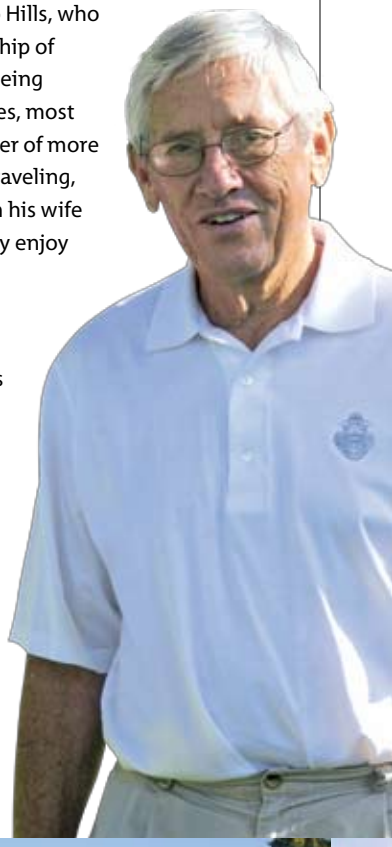
As a lifelong golfer, Hills had ideas about how to design a course, but no experience. "Honestly, I didn't even know why the people hired me," he said. "The course that resulted was pretty good, in part because I was able to hook up with an experienced and capable contractor. He interpreted my ideas to an advantage. If he hadn't been such an excellent contractor, I may not have gotten another job."

But in reality, Hills was confident and already looking ahead. Earlier that same year, he had placed a small listing in the Yellow Pages, advertising his company as golf course architects. "I thought it would be neat to do a golf course in the winter when I couldn't be doing landscape contracting," he said. Soon thereafter, Orchard Hills Country Club, a private course in the northwest Ohio town of Bryan, was looking to add nine holes to an existing nine-hole course – but without paying an expensive fee to a top-shelf designer. They found the ad in the Yellow Pages. Hills now had his second golf course design project.

Many courses soon followed. What began to distinguish a Hills course was the firm's ability to capture and elevate the vision of the developer/owner; to work cooperatively with contractors and local planning agencies; and to create beautiful and challenging landscapes upon which to play.

"Throughout his career, Art has displayed the unique ability to take some not good or great sites and make some remarkable golf courses," said fellow course designer Charlton.

The accolades are heart-warming to Hills, who served as the ASGCA's president. Ownership of the 15-employee company he started is being transitioned from Hills to other employees, most notably, Steve Forrest, his business partner of more than 30 years. Hills has been doing less traveling, and is looking forward to doing less. With his wife Mary, they raised eight children and today enjoy 21 grandchildren.

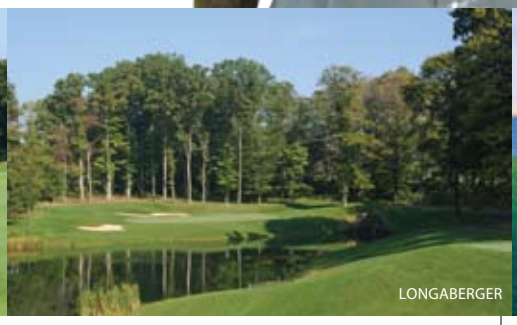


PROCESS AND PROFESSION

Despite advances in technology (Arthur Hills/Steve Forrest and Associates now does all final course design on computers), the initial approach has changed little since 1965. The difference is really in attending to details, Hills said, and the ability to reflect upon and learn from years of experience. "That, as much as anything, makes us better designers," he added. "You have more perspective. You understand the nuances and subtleties of every site better, such as topography, tree cover and wetlands."


OITAVOS DUNES GOLF CLUB (PORTUGAL)


LONGABERGER GOLF CLUB (HANOVER,OHIO)


LONGABERGER

HUNDREDS OF HILLS-DESIGNED COURSES PROVIDE SCENIC VIEWS AND CHALLENGING COURSE LAYOUTS ACROSS THE GLOBE.

The first thing company leaders do – very often with Hills leading the way – is meet with clients to better understand their vision and goals. A site visit soon follows as aerial photographs and topographic maps are compiled. The discussions initially center on the course in the larger framework (for example, whether it will be part of a conference center, hotel resort or residential development).

Golf course designs are more complicated today and not only because of heightened environmental concerns regarding runoff and wetlands. Increasingly, courses are part of larger developments that share boundaries with homes, conference centers and hotels. And so the modern golf course designer needs to be part community planner, engineer and developer.

"We feel that we do a better job by not saying to a potential client we can do this whole package. Because there are some really great firms around the country. They have little or no expertise in golf, and we have a like amount of expertise in terms of designing a resort. We don't get into the detailed planning of their part as they don't get into the detailed planning of our part."

Then, other broad contours of the site are considered, such as where the access routes are and where the clients want the course to begin and end (the so-called course corridor). Armed with this compilation of data and ideas, the team returns to Toledo and begins to sketch out the basic elements. "At this point, we're definitely thinking about the use of land forms, spacing, shaping and plant materials – all the things that go into landscape architecture," he said.

The result is a rough concept drawing, which is shared with the clients and course contractor. "We say, 'Okay, here's something that works. How does this work for you?' And so we start working from that. Usually, it's a back and forth among the interested parties. And we do that initially still with a pencil and paper. And then we convert it into a computer-aided design."

"We can do some pretty imaginative things with computers now. I can't, but the guys in the office can. They can draw pictures of proposed holes that are like a painting," he said. "They do them so well that you can't tell if it's a picture of an actual course or only proposed."

THE ENVIRONMENT

Environmental issues related to any development are of greater importance today than 50 years ago. The same is true for golf courses, and Hills is quick to defend their construction against critics who feel that anything but the natural use of a landscape is a degradation.

"If the land is going to be used other than in its natural state, I would say golf courses are stabilizing as to their impact on the acreage. They are often an oasis within a development," he said. "There's almost no erosion if it's carefully put together, such as through buffers along streams. And if properly constructed, fertilizers or pesticides are very carefully managed. That's not necessarily true on older courses. Granted, there is tree clearing on some sites, but it's pretty benign development compared to other developments."

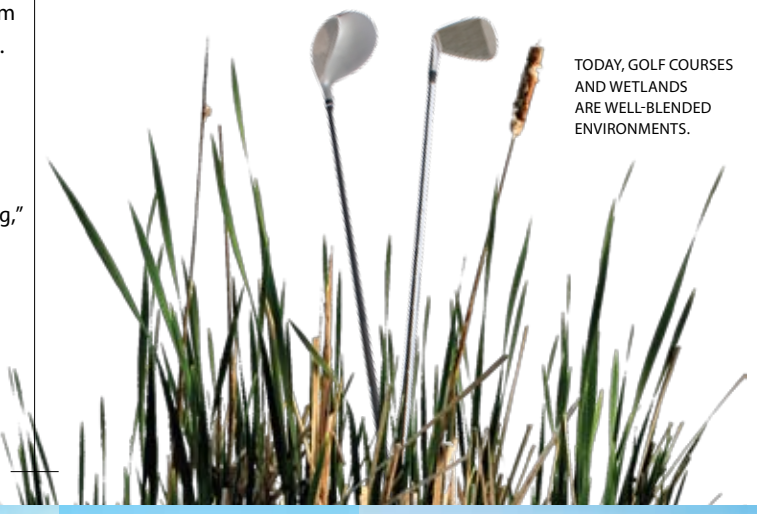
Nowhere is this emphasis on conservation more profound than in wetlands.

"When we started, they were not an issue. Now, they are very much preserved," Hills said. "Actually, it makes for better golf courses. It may take up more land but it's all to the good. It makes for a better golf course and better developments."

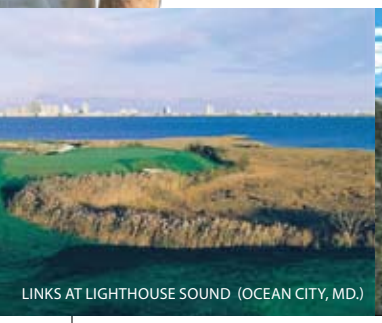
If you ask Hills which of his hundreds of courses is his favorite, he won't answer. "I would ask you, 'Do you have a favorite child? That's what I tell everybody," he said. His favorite non-Hills course is the Old Course at St. Andrews Links in Scotland, the home of golf.

His advice to current landscape architecture students? Learn as much as you can.

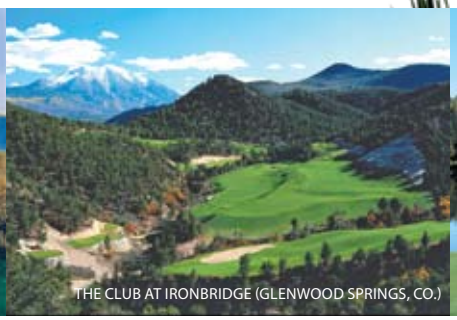
"I think landscape architecture is a wonderful career and a wonderful way to experience the world. It also gives you an awareness about many environmental issues," he said. "Our profession can have a greater impact on society, now more ever. I think there is more opportunity than ever."



TODAY, GOLF COURSES AND WETLANDS ARE WELL-BLENDED ENVIRONMENTS.



LINKS AT LIGHTHOUSE SOUND (OCEAN CITY, MD.)



THE CLUB AT IRONBRIDGE (GLENWOOD SPRINGS, CO.)

THE GOLF CLUB OF GEORGIA - LAKESIDE (ATLANTA, GA.)

EL CONQUISTADOR RESORT (PUERTO RICO)

ERB@15

BY **KEVIN MERRILL**

The Erb Institute for Global Sustainable Enterprise will graduate its 15th class this spring with plenty to celebrate along the way: more than 140 successful alumni, a largest-ever incoming class, three endowed professorships and a growing reputation as a national leader in research and outreach. And no one could be happier than Laura Rubin, the first graduate of the institute's dual-degree program.

FIRST GRAD

LAURA RUBIN, THE FIRST GRADUATE OF THE DUAL-DEGREE PROGRAM.

Rubin (M.S. '94, M.B.A. '95,) was so enthused by the dual-degree idea, first proposed in the early 1990s, that she enrolled voluntarily even before the ink was dry on the plan. She knew instinctively then what so many incoming Erb students now take for granted: the paths of business success and environmental stewardship are intertwined and must therefore be studied in tandem.

"I saw this big disconnect between where businesses were and where they needed to be," said Rubin, who, since 1998, has been executive director of the Ann Arbor-based Huron River Watershed Council. "I felt these two fields – business and the environment – had to come together. I believed then that if I could speak both of the languages, so to speak, I could have a leg up on solving the problems faced by each."

That, in fact, was the premise behind the program, started with talks between Dean Garry Brewer of the School of Natural Resources and Environment (SNRE) and Dean Joe White of the Business School. By 1992, the schools had jointly established the Corporate Environmental Management Program (CEMP). The dual-degree program was designed to award students a master of business administration and a master of science degree for completing three years of complementary coursework.

The program would be known as CEMP until 2005, when it was renamed the Erb Institute for Global Sustainable Enterprise MBA/MS Program. Also in 2005, the Frederick A. and Barbara M. Erb Environmental Management Institute was renamed the Erb Institute for Global Sustainable Enterprise. The Management Institute was established with a gift from the Erbs in 1996 to focus U-M's capabilities and resources around creating and supporting high-quality teaching and research in the field of environmental management.

Since its founding, the Erb Institute has been a leader in blending the study of business and environment science and policies – an approach to graduate education and research now flourishing

at campuses nationally. "Fifteen years ago, the concept of corporate environmental responsibility was still in its infancy. Now, corporations are beginning to weave sustainability into the very fabric of their operations and growth strategies," said Erb Institute Director Thomas P. Lyon. "Erb students and alumni are among the emerging business leaders that have helped bring about this change over the past decade and a half."

The Erb Institute now has nearly 75 students, about 30 of them new this fall; the rest are either in their second or third years of study.

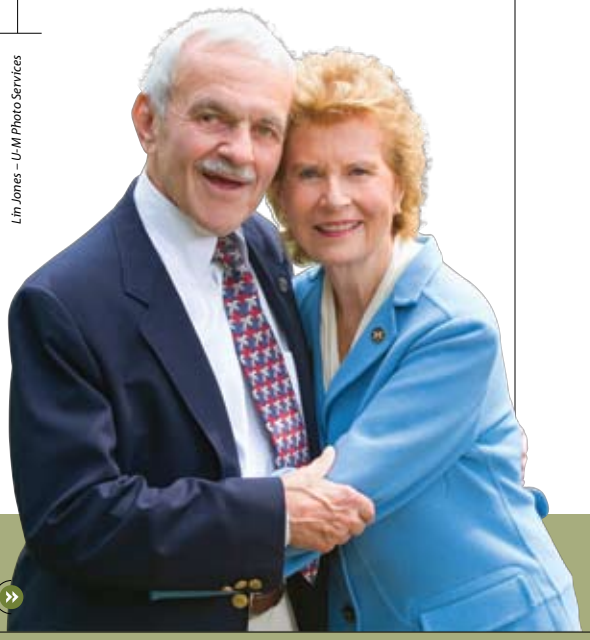
In addition to functioning as the glue between the schools' respective degree programs, the Erb Institute conducts professional education, academic outreach (from workshops and seminars to conferences) and scientific scholarship. Its programs focus on the environmental roles and relationships among businesses, governments and nonprofit organizations. An external advisory board aids in developing this strategic direction, which is carried out by a managing director (see related story on Rick Bunch on page 20) and Lyon, who holds a joint faculty appointment with SNRE and the Stephen M. Ross School of Business.

From its conception, the dual-degree program's goal was to equip leaders, executives and managers – whether in the private sector, at a public agency or an environmental nonprofit – with the skills and knowledge needed to create environmentally and economically sustainable organizations. But the evolution of a related institute with broader educational and outreach goals – what today is known as the Erb Institute – was scarcely envisioned as CEMP debuted and as Rubin stepped forward to become the poster child for sustainability education at the University of Michigan.

"I was very aggressive in telling the deans of my interest, and how I wanted to part of it. Even though the program was still taking shape, they agreed to start letting me take some courses," Rubin recalled.

Even as program details were being finalized, Rubin was already enrolled at SNRE (she started in the fall of 1992) and had spent 1992-93 taking only SNRE courses. Midway through her second and final year at SNRE, she started taking the business courses she knew would apply toward her M.B.A. She also fit in time to take the GMAT exam (a requirement for business-school entry). Even today, prospective Erb students must apply separately to each school.

In her final year (1994-95), Rubin was enrolled only in business classes. By the spring of 1995, she had earned both degrees – and had gone through two graduation ceremonies in six months: one for SNRE and another for the Business School. "I definitely felt like an oddball," she said. "I was constantly explaining to people what I was doing and why I was earning two degrees."



Lin Jones – U-M Photo Services

FREDERICK A. AND BARBARA M. ERB

ERB MILESTONES

1991-92: Talks begin between deans of the schools of Business and Natural Resources and Environment about the creation of a joint degree involving business and environmental studies

1994: The Corporate Environmental Management Program (CEMP) debuts; first class enters fall 1994. Advisory board formed to shape program's direction

1993: Stu Hart hired as CEMP's first director

1996: U-M establishes the Frederick A. and Barbara M. Erb Environmental Management Institute to "focus the capabilities and resources of the University to create and support high-quality teaching and research in the field of environmental management." The Erb Institute is made possible by a financial commitment of $5 million from the Erbs

1999: Fred and Barbara Erb pledge an additional $5 million to enhance the Erb Institute endowment

- Erb Institute sponsors world-class lecture series drawing 13 of the world's leading sustainability pioneers

2000: Holcim (US) Inc. pledges $2.5 million for joint professorship between the schools

- The Dow Chemical Co. pledges $2 million for joint professorship between the schools and $500,000 for what would become the Dana Building's Dow Commons

2001: Michigan named a top-tier school in 3rd WRI/TAI Beyond Grey Pinstripes report

2002: Andrew J. Horning (M.B.A. '00, M.S. '00) appointed managing director

2003: F. Brian Talbot named CEMP faculty co-director

- Faculty Executive Committee established to provide internal guidance to institute leaders
- Jo Ann and Stuart Nathan give $400,000 to enhance their scholarship endowment

2004: Andrew J. Hoffman appointed first Holcim professor

- Thomas P. Lyon appointed Dow Chemical Professor and Erb Institute Faculty Fellow

2005: Fred and Barbara Erb pledge an additional $10 million to enhance the Erb Institute endowment

- The Erb Institute is renamed the Frederick A. and Barbara M. Erb Institute for Global Sustainable Enterprise
- CEMP is renamed the Erb Institute for Global Sustainable Enterprise MBA/MS Program
- The Erb Institute launches Faculty Affiliates and Fellows Program to enhance interdisciplinary research at the University related to global sustainable enterprise
- Erb Institute launches post-doctoral fellows program
- Tom Gladwin, Hoffman and Lyon become institute co-directors

2006: Lyon appointed as director of the Erb Institute

- First Erb post-docs, Haitao Yin and Stephanie Bercels, are hired
- Institute hosts major conference in conjunction with Pew Center on Climate Change that results in book, ***Getting Ahead of the Curve: Corporate Strategies Addressing Climate Change***

2007: Incoming class increases 30 percent; 34 students begin their studies

- Upgraded Erb Web site attracts more than 2,000 visits per month
- Institute sponsors five active Faculty Fellowship research grants totaling more than $50,000

2008: Rick Bunch succeeds Horning as managing director

- Institute co-founds Alliance for Research on Corporate Sustainability (ARCS) with Darden, Harvard, Tuck, Duke and Ivey schools. Institute selected as host for first annual ARCS conference
- Institute launches Sustainable Enterprise in China program

At the time, the goals of CEMP fit perfectly with her own. A native of Chicago, Rubin went to Colorado College, where she did her graduate thesis in 1986-87 on a cost-benefit analysis of Great Lakes water diversion using an economic model. But it was her experience in the nonprofit world (before entering SNRE) that affirmed her belief that business acumen was largely missing when it came to building a nonprofit organization. After graduating from Colorado College, she had two job offers: one from Greenpeace running its then-new lobbying arm in Washington, D.C., and the other from Arthur Anderson in a program that groomed new hires to become certified public accounts and business consultants. She asked Arthur Anderson if she could delay her start date for nine months in order to work temporarily at Greenpeace. The accounting firm said no, and so she chose to go work full time in Washington, where she helped get the new organization established and eventually managed a staff of 30.

At Greenpeace, she was exposed to an array of environmental issues and challenges. "I really got to see a nonprofit up close," she said. Subsequently, she decided to pursue a master's degree in environmental-related studies, which led her to discover SNRE. Because of her early enthusiasm for the program, Rubin joined program leaders on early donor visits, where she talked about the program and served as an example of the type of students CEMP was created to attract.

Her trailblazing spirit has paid off with a job perfectly suited to her environmental and business interests. Founded in 1965, the Huron River Watershed Council is the first and oldest river protection group in Michigan. A public, nonprofit organization, it is a coalition of Huron Valley residents, businesses and local governments established under Michigan's Local River Management Act. Since its formation, it has grown to be a respected voice for protection of the Huron River and its tributary streams, lakes, wetlands and groundwater.

The organization has become a magnet for other SNRE alumni, including Kris Olsson (M.S. '90, '00), Cynthia Radcliffe (M.S. '93), Elizabeth Riggs (M.S. '99) and Paul Steen (M.S. '03, Ph.D. '08).

As executive director, she's able to blend her business-oriented skills in areas such as information technology, human resources, budgeting and planning with her knowledge and experience as an environmental policy maker and scientist. The combination allows her to move the organization financially and scientifically through its most challenging issues, such as advocating for clean water, recreational access and dam removal.

"It's a great meeting of skills," Rubin said. "The degree has allowed me to be a broad generalist in these different but complementary fields."

MANAGING ERB

Rick Bunch joined the Erb Institute for Global Sustainable Enterprise this summer as its newest managing director. He oversees the daily operations of the institute and supervises staff. He is no stranger to Erb, though. For several years, while at the World Resources Institute (WRI), he served on the Erb External Advisory Board. Bunch has more than 20 years of experience in sustainable business education, application and policy. He joins U-M from the Aspen Institute, where through its Business and Society Program, he launched a program for education and research on business-and-society topics in Chinese business schools. From 2003-05, he was executive director of the Bainbridge Graduate Institute near Seattle. From 1996 to 2003, he was WRI's business education director. He produced training conferences for business school faculty and program staff in North and Latin America and China. He also oversaw the development and publication of business-school curriculum, and launched and co-authored the Beyond Grey Pinstripes MBA program rankings.

Stewards: What attracted you to the position?

Bunch: I have worked in support of sustainable business education for almost 15 years, the bulk of that time in non-governmental organizations that support program development from outside the academy. Erb was the first, and still the best-resourced, program to reach a critical mass of professors, students, institutional support and funding that allows someone in my role to have an impact from a single-institution platform. It was a terrific opportunity to test my ideas and vision, and to have an impact from within the academy.

Stewards: How is the Erb Institute different from similar U.S. programs?

Bunch: There are other M.B.A./M.S. programs, but none offer nearly the level of integration and support that Erb has achieved with the Ross School of Business and the School of Natural Resources and Environment. Students in other dual-degree programs are pretty much on their own without access to the kind of staff support and dedicated professors that Erb and the schools offer. Perhaps the most critical difference, which is easy to miss when applicants compare program attributes, is that the Erb program has been around for 15 years and has 150 alumni. The importance of having a sizable network of fellow alumni to support each others' professional development and to share networks and opportunities cannot be overstated.

Stewards: What are the institute's short- and long-term challenges?

Bunch: We are experiencing a strong surge in enrollments and applications, with each successive entering class markedly larger. This is a great problem to have but it does strain our resources. We can't assume that the dual-degree program is the only way to satisfy the demand. We're discussing ways to offer more sustainability content to Ross students who don't need the SNRE degree to satisfy their intellectual development and achieve their career goals. By the same token, we want to support SNRE students who want to learn something more about business. It's also imperative that we develop executive programs, and we are looking seriously at ways to reach undergraduates as well.

The University of Michigan has a core of professors with sustainable business expertise unmatched by any other university. We have a responsibility, and an opportunity, to exercise global leadership in inquiry and outreach around sustainability. Pursuing all these opportunities requires us to mobilize greater resources than we have at our disposal today. Over the next eight months, we will engage our community and stakeholders in the development of a new five-year strategic plan. This process will be our primary vehicle for prioritizing our educational and outreach opportunities.

Class Notes SNRE

Rupert Cutler (B.S. '55) is chairman of the board of the Western Virginia Water Authority, a regional agency providing water and wastewater treatment for the city of Roanoke and Roanoke County, Va. Cutler has lived in Roanoke since 1990. He was the founding executive director of Virginia's Explore Park (an outdoor living history and environmental education facility) and the Western Virginia Land Trust. He was elected to a four-year term on Roanoke City Council (2002-06) and appointed by two Virginia governors to the board of trustees of the Virginia Outdoors Foundation, the state's conservation easement-holding agency. Earlier, Cutler was an assistant professor of resource development at Michigan State University; assistant secretary of agriculture in charge of the U.S. Forest Service and Soil Conservation Service; and president of Defenders of Wildlife.

Leon M. Carl (B.S. '74, M.S. '76, Ph.D. '80) was named the Midwest regional executive for the U.S. Geological Survey (USGS). In his new position, Carl is responsible for meeting the diverse research needs of USGS science and research partners housed in 11 science centers across three disciplines. He previously was director of the Great Lakes Science Center in Ann Arbor. He also serves in adjunct faculty positions at SNRE and Michigan State University. One of his first initiatives will be leading the Midwest region in exploring the effects of mining – both legacy and new – on the environment. That work will be one of the first tests of this new collaborative model. As part of his duties, Carl manages the 11 science centers; six Water Science Centers in Wisconsin, Illinois, Indiana, Michigan, Ohio and Kentucky; three biology centers; the Eastern Region Minerals Teams; and the Eastern Region Energy Team.

Ron Wilson (B.A. '75, M.S. '83) received the Distinguished Alumni Service Award from the University of Michigan Alumni Association at a Homecoming awards banquet in October. The group recognized Wilson for his leadership and tireless efforts on behalf of the University. For nearly 20 years, Wilson has been a leader in the U of M Club of Greater Lansing, which has been recognized repeatedly for its programming and support of the University. Wilson has been credited with helping to organize countless events.

Wilson has also been an enthusiastic recruiter of students to U-M. Concerned that Lansing School District students were not applying or being admitted to the University, he presented to the club an ambitious plan to increase area applications. To accomplish this goal, he arranged and chaperoned bus tours to bring classes of Lansing High School students to tour and learn about the campus. He also organized essay writing and financial aid workshops for interested students.

He is the director of development for EduGuide, a nonprofit organization whose mission is to get children into college.

Alison Kerester (M.S. '81) is the senior adviser for communications and public policy for the Gasification Technologies Council, a trade group based in Arlington, Va. GTC promotes a better understanding of the role gasification can play in providing the power, chemical and refining industries with economically competitive and environmentally conscious technology options to produce electricity, fuels and chemicals. Since graduating from SNRE, Kerester earned a law degree from Cleveland State University ('82) and then practiced law with the U.S. Environmental Protection Agency and two Washington, D.C., environmental law firms for 10 years. After leaving the practice of law, she worked on Capitol Hill in a policy role with the American Petroleum Institute and as the executive director of the Mickey Leland National Urban Air Toxic Research Center in Houston, Tex. She then was the government affairs director for the gasification business with Chevron and held a strategic marketing position with GE Energy after it acquired the gasification business from Chevron. She has testified numerous times before Congressional committees on health and energy issues.

Robert Gibbs (M.L.A. '84), founder of Gibbs Planning Group in Birmingham, Mich., again taught a summer course at Harvard University's Summer Graduate School of Design's Executive Education Program. The course was titled "New Urban and Smart Growth Retail Planning and Design Principles." In addition, he authored a chapter in two recent books: Neighborhood Retail, in Robert Gibbs' *Sustainable Urbanism*; and Urban Retail Planning Principles for Traditional Neighborhoods in an edited volume by Tigran Haas titled *New Urbanism and Beyond*. Meanwhile, the *Oakland (Mich.) Business Review* interviewed Gibbs in July about retail development in Michigan, the future of downtowns and the impact of gas prices.

Matt Pelkki (B.S.F. '85), a professor of forestry at the University of Arkansas at Monticello (UAM), was named the 2008 Communicator of the Year by the Arkansas Forestry Association. The award was presented Oct. 8 at the AFA annual meeting in Fort Smith. A member of the UAM faculty since 2001, Pelkki is the George H. Clippert Endowed Chair in the UAM forestry program. He earned master's and doctoral degrees from the University of Minnesota College of Food, Agricultural and Natural Resource Sciences.

Stephanie (Kopin) Jacob (B.S. '90) is a park naturalist with Prince George's County's Department of Parks and Recreation. Recently, she was featured in a story by *The Gazette*, a newspaper in suburban Washington, D.C., about a local frogwatching program. The efforts are part of Frogwatch USA, a joint effort started in 2002 by the

In Memoriam

Glenn Philip Bruneau (B.S.F. '41, M.S. '58), a passionate teacher and renowned wood technologist, died June 7. He was 88. He was born in Montreal, Wisc., and eventually found his way to Ann Arbor and the U-M, where he earned a bachelor's degree in forestry. He earned a master's degree in wood technology in 1958. Mr. Bruneau started working at the U-M Wood Technology Lab in the late 1940s, and stayed with SNR for the rest of his professional career. First, he ran the Wood Technology Lab and later became a lecturer and, eventually, an associate professor.

He taught Wood Science, Wood Finishing and Wood Identification, and spent summers teaching Surveying at Summer Camp at Golden Lake in northern Michigan. He was often called upon by industrial programs to consult on the qualities of various wood products. During the last few years of his career, he chaired SNR's undergraduate program. He retired in 1980.

G. Robinson (Bob) Gregory (B.S.F., M.S.F. '40), a longtime professor and respected natural resource economist, died Aug. 29, two days short of his 93rd birthday. He earned two degrees from the University of Michigan in 1940 and returned 12 years later to begin more than three decades of teaching and research at SNRE.

He became one of the first researchers to combine forestry and economics; in fact, his first U-M appointment was split between economics and SNR. By the time he retired in 1983, he had held for many years SNRE's endowed George Willis Pack Professorship of Natural Resource Economics. Mr. Gregory was a pioneer in the emerging field of forest economics. His theories about multiple use and natural resources policy greatly influenced forest management of public lands throughout Michigan and the United States. His book, *Forest Resource Economics* published in 1972, immediately became the best-selling forest economics textbook in English.

McClain B. "Mac" Smith, Jr. (M.F. '49, Ph.D. '80), former manager of Camp Filibert Roth, died Oct. 29. He was 86. Mr. Smith is remembered fondly as both camp manager and lecturer at Camp Roth, an educational and training facility the school once operated near Iron River, Mich. There, students were taught many facets of practical forestry. Mr. Smith accepted the post shortly after earning his Ph.D. in Natural Resources in 1980 from SNR. For the last 18 years of his working career, Mr. Smith was the executive director of the Michigan Forest Association. He retired from his MFA role in 2007 because of failing health. After earning his master's degree, Mr. Smith worked in Maryland, Mississippi and Louisiana – first for the U.S. Forest Service and then as a logger. He spent nine years with the U.S. Forest Service. He returned to Ann Arbor to work in a family business. Shortly after its sale, Mr. Smith began contemplating earning a doctorate, which led him to enroll again at SNR.

Class Notes

– By Christopher Anderson – The Gazette

NATURALIST STEPHANIE JACOB (RIGHT) AND VOLUNTEER MIKE QUINLAN AT PATUXENT RIVER PARK.

National Wildlife Federation and the U.S. Geological Survey. Jacob leads the Patuxent River Park survey. "My classwork and experiences at Michigan are what allow me to work in this fantastic field. As a park naturalist, I have the opportunity to teach all ages about the wonders of the natural world and to pass on a respect and reason to care for it every day," she says. "I have had so many opportunities to educate people about frogs and the environment through the Frogwatch frog calling surveys." The organizations are trying to study and draw attention to declining amphibian populations. One program goal is to encourage volunteers to track frog populations in their own neighborhoods.

Janine Bologna Velasco (M.S. '93), assistant director for human capital management in the U.S. Department of the Interior's Bureau of Land Management, was one of 10 federal employees to receive a 59th annual Arthur S. Flemming Award, which honors individuals with three-to-15 years of exemplary public service. The awards are presented by George Washington University. The awards were established in 1948 in honor of Arthur Flemming's commitment to public service throughout his career, which spanned seven decades and 11 presidencies. Based in the BLM's Washington, D.C., office, Velasco has led the bureau's efforts in strategic planning and budgeting, program evaluations and organizational management. In 2006, she was selected to take on the challenges of workforce management. With about 35 percent of the agency's workforce eligible for retirement within a few years, the BLM recognized the urgent need for an executive who understood natural resource challenges and could transform the workforce.

JANINE VELASCO WITH GWU PRESIDENT STEVEN KNAPP AT THE JUNE AWARDS EVENT.

Andrew Fahlund (M.S. '97) is vice president for conservation at American Rivers, an NGO based in Washington, D.C. Working with a staff of more than 30, his department is responsible for developing and implementing innovative policy and science tools to protect and restore targeted rivers and watersheds. Recently, he was a session panelist at the Society of Environmental Journalists'

annual conference in Roanoke, Va. His current focus is on helping human and natural communities adapt to a changing climate. He currently serves as the co-chair of the Clean Water Network's Global Warming working group. Before becoming vice president, Fahlund directed the American Rivers Dam Reform Program, which focuses on reforming the hydropower industry, changing federal dam operations and removing small dams that no longer

ANDREW FAHLUND NEAR THE FORTHALIFAX DAM ON THE SEBASTICOOK RIVER IN MAINE. THE DAM IS NOW BEING REMOVED, IN PART BECAUSE OF EFFORTS OF AMERICAN RIVERS.

serve a purpose. Between 1999 and 2000, he served as chair of the Hydropower Reform Coalition, a consortium of 125 conservation and recreation groups involved in restoring rivers through the licensing of hydropower dams.

John Watson (M.S. '97, M.B.A. '97) is founder of Aventouras, a company offering active trips that connect guests to landscapes and communities in Latin America. Based in Evergreen, Colo., the company develops and runs trips with partner companies and local guides in Costa Rica, Belize, Guatemala, Ecuador, Galapagos and Peru. He started Aventouras in 2005 and took about a year to establish its foundations, find partners in destination countries to work with and refine trip itineraries. His goal was to create a company that would use tourism to help conservation and sustainability efforts across Latin America. Aventouras combines the popular destinations of each country (such as Machu Picchu in Peru) with off-the-beaten path locations where guests get a better feel for the region. (More info: www.aventouras.com)

JOHN WATSON SCALES A CANYON IN ECUADOR, ONE OF THE STOPS HIS COMPANY MAKES AS PART OF ITS LATIN AMERICAN TOURS. ABOVE: THE LATEST BROCHURE FROM AVENTOURAS.

Moushumi Chaudhury (M.S. '99) is at the Center for International Forestry Research, Indonesia. Since graduating, she has worked with the United Nations Development Programme, Food and Agriculture Organization of the United Nations and International Centre for Integrated Mountain Development. She recently received her Ph.D. in development studies from the University of Sussex, U.K. She continues to enjoy her work in international development and environment issues bridging research and policy.

Jess Buff (M.S. '00) and **Denise Mortimer (M.S. '01)** are thrilled to announce the birth of their son, Kai, on May 13. Kai joins his "big" sister, Phoebe, who is 20 months old. They live in Takoma Park, Md.

Andrea (Firman) Stay (B.S. '02) is executive director of the Eaton (Eaton County, Mich.) Conservation District. She previously served in AmeriCorps and as a statewide Emerald Ash Borer outreach coordinator at the Ingham (Ingham County, Mich.) Conservation District.

Larissa Hotra (M.S. '04) is a Peace Fellow for The Advocacy Project, working with Survivor Corps (formerly the Landmine Survivors Network) in El Salvador. She is using information communication technology (such as blogs, videos, Web sites and social networking tools like Facebook) to increase awareness of the organization. Follow her blog at advocacynet.org/blogs/index.php?blog=131.

Share your news

Please keep us in mind when it's time to share news about your new positions or achievements with fellow alumni. We also welcome photos (preferably color). Send your information to Erin Longchari, assistant director of development and alumni relations, either via email (erinla@umich.edu) or through regular mail. The address – in case you've forgotten – is SNRE, Dana Building, 440 Church St., Ann Arbor, MI, 48109-1041. We're looking forward to hearing from you and spreading your good news.

Inside Dana

SNRE has a quarterly email newsletter for alumni and friends: "Inside Dana." It shares news from our faculty and students; dates and times of upcoming events; and success stories of fellow alumni. If you want to subscribe, please contact Sarah Jarzembowski in the school's Office of Development and Alumni Relations at 734.763.1577 or sejar@umich.edu.

READ MORE: snre.umich.edu/alumni

Words of Wisdom

Do you have "Words of Wisdom" to share with current and prospective SNRE students? The school wants to share this wisdom through its Web site and in a future issue of *Stewards*. If you are willing, please send suggestions. Here are some examples: What would you do differently if you had the chance? What events should students be sure to attend? What's one thing a student definitely needs to do while at SNRE? Which student group do you wish you had joined or started? Send your name, year of graduation and current job title and employer. Send your wisdom to Kim LeClair, student services specialist, at kleclair@umich.edu.

SEND YOUR E-MAIL: kleclair@umich.edu

Click ... and network

To better serve alumni (and current students), the SNRE Career Services Office operates eRecruiter, an online career services portal. Alumni can use the site to create a job-search agent to receive customized job postings, view a career events calendar and create a profile in order to search other registered alumni for networking opportunities. They also can register to serve as career mentors to current students. Employers use the site to post jobs and internships, search resumes and set up on-campus visits. To register, email snre.erecruiter@umich.edu and request a username and password. Specify your first, last and maiden name (if applicable) and UM uniqname or student ID number. In one or two business days, you will receive an email with your log-in username and password.

READ MORE: erecruiter.snre.umich.edu

HOT-BREWED Stewardship

BY KEVIN MERRILL

Not often do you encounter a high-powered corporate attorney saying a course in ornithology enriched his professional life. Then again, not every attorney has the environmental background and commitment to stewardship as David Landau (B.S. '80).

Today, Landau has a lot of stewardship responsibilities – and a long title to prove it – at Starbucks Coffee Company. As the company's senior vice president, deputy general counsel and chief compliance officer, Landau heads up the company's intellectual property function, its Business Ethics and Compliance office and manages the operations of the Law and Corporate Affairs Department. The department has more than 50 lawyers and 110 other legal professionals and staff, and his duties range from protecting Starbucks' brands globally and budgeting and strategic planning, to helping the company live up to its legal responsibilities and ethical aspirations.

He joined the company in 1994 as its fourth lawyer – a year in which the company had 425 locations and wasn't yet operating in Ann Arbor, let alone Michigan. Today, the $9.4 billion company has more than 170,000 employees and more than 16,500 stores in the U.S. and 45 countries worldwide.

Landau said the principles of stewardship and conservation he learned as an undergraduate continue to guide his decision-making as a corporate executive. In fact, the values learned in the Dana Building are inextricably woven into his own core values. Those same values, he said, are shared by his employer, which is one of the reasons he enjoys working at Starbucks.

"I believe the notions of stewardship, social responsibility and the interdependence of systems apply to our business just as strongly as they apply to the health of ecosystems or management of a natural resource," he said. "Stewardship implies management of a resource for the long term, rather than exploitation for short-term gain. We recognize that if we're in it for the long term, which we are, then we have to cultivate, nurture and develop a sustainable approach to managing our critical resources. For us, that's our people, our coffee, our brand and our relationships with our customers."

He is particularly proud of Starbucks' origin country sustainability model – Coffee and Farmers Equity Program – which provides incentives for farmers to use sustainable growing practices and to invest in their communities. The program is having a positive impact on those communities' societies and environments, he said.

Landau, 50, was raised in Shaker Heights, Ohio, near Cleveland. He always had interests in science, environmental issues and the law but wasn't sure how to integrate them. He began his undergraduate studies at Indiana University looking to do just that, but the fit wasn't right. He eventually left Bloomington, traveled abroad and then reapplied to Cornell and the University of Michigan.

Coming to Ann Arbor proved a great fit academically and socially. "The intellectual environment at the school produced rich discussion around policy issues that, interestingly enough, seem to be re-emerging today," he said, citing such discussions then around energy, conservation and the pressure on natural systems and resources. "What's interesting to me even now is how cyclical – emergent and resurgent – some of these topics are."

While at U-M, he was particularly interested in environmental policy and analytics, and believed then that environmental economics was an applicable paradigm for business. His interest in policy took him to the Great Lakes Basin Commission to research and edit a series of technical abstracts as part of a study on the impact of regional energy development in the Great Lakes watershed. He recalls the ornithology course not so much for its content – exploring birds and their environment – but rather its extensive field research component and how that time outdoors forged in him an appreciation for the complexities and connectedness of systems in nature.

He was recruited for Starbucks by a former colleague who had started the company's law department. The newness of the company meant Landau could work on a wider range of legal issues and help shape the company's culture. "The great part of my job is that I don't have to spend a lot of energy convincing people of the value of stewardship and social responsibility," he said. "If they don't get it already, I can connect a few dots and they quickly comprehend the interrelationships between the quality of our products, the engagement of our people, our reputation in the community and the economic health of our company. So I get to spend my time finding ways to facilitate that understanding and helping us do a better job of being stewards of these resources."

LANDAU INSIDE THE COMPANY'S HEADQUARTERS. HIS FAVORITE STARBUCKS DRINK: DOUBLE SHORT AMERICANO … WITH ROOM FOR CREAM.

– Photo courtesy of Starbucks

SNRE CAMPFIRE

They came, They sawed, They celebrated.

The annual fall SNRE Campfire brought together current students and alumni at Saginaw Forest for an evening of food, fun and memories. The Oct. 3 event, which featured such traditional fun as log-cutting, pumpkin carving and wader-racing, coincided with University of Michigan Homecoming festivities. This year, the University welcomed home members of the Class of 1958. Six members of the SNRE class were on hand to join in the celebrations at Saginaw Forest. Several '58 class members and other SNRE alumni took time for a postcard-like photo op along the shore of Third Sister Lake. Pictured left to right are: Donald Pallin (B.S. '58, M.F. '60), James Olsen (B.S. '58, M.F. '62) Charles Van Sickle (B.S. '58), David Sharer (B.S.F. '53) and Robert Farmer (B.S.F. '53, M.F. '58, Ph.D. '62).

Engineering + Environment converge

BY PAUL GARGARO

First-of-its-kind dual degree sets sights on sustainability

"WHEN MICHIGAN ANNOUNCED THIS PROGRAM, IT WAS THE PERFECT FIT," SAID NOLAN ORFIELD.

Seven graduate students made history this fall as the inaugural scholars in a path-breaking graduate curriculum at the University of Michigan that blends engineering and sustainability studies.

The Engineering Sustainable Systems (ESS) program, the nation's first such dual-degree master's, provides the next generation of engineers with the tools they will need to integrate principles of energy, water or manufacturing sustainability into their work. This means civil and environmental engineers who are better prepared to minimize the watershed impact of a new road; chemical engineers who can create the most environmentally friendly biofuels; and mechanical engineers equipped to develop cost-effective, green manufacturing processes. Students will graduate with a master of science in engineering from the College of Engineering and a master of science from the School of Natural Resources and Environment.

READ MORE:
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"I had been looking at schools around the country to study the environment and sustainability with an engineering perspective," said ESS student Nolan Orfield, who graduated from the University of Notre Dame in 2003 with a degree in mechanical engineering. "When Michigan announced this program, it was the perfect fit."

The Chrysler Foundation, Ford Motor Company Fund and SNRE Dean Rosina M. Bierbaum – through The Gordon and Betty Moore Foundation – provided initial support for the program, including fellowships. ESS joins a list of related donor-funded programs that have placed Michigan at the forefront of sustainability teaching and research. These include:

• The Erb Institute for Global Sustainable Enterprise, a dual-degree M.S./M.B.A. program between SNRE and the Stephen M. Ross School of Business that is named for its founding supporters, Fred (B.B.A. '47) and Barbara Erb. The Erb Institute promotes education, research and outreach initiatives at the intersection of business, the environment and sustainability.

• The Graham Environmental Sustainability Institute (GESI), launched during The Michigan Difference campaign with a leadership gift from Donald (B.S. EIE '55, M.S.E. '56) and Ingrid (B.S. DES '57) Graham and matching funds from the U-M provost's office, to promote multidisciplinary research and education across the University. GESI encourages collaborative research and teaching on sustainability of about 300 U-M faculty across eight schools and multiple centers and institutes.

• The Center for Sustainable Systems, housed in SNRE and supported with lead gifts from Peter M. Wege (HLLD '07) to advance sustainability concepts, including product life-cycle analysis, through interdisciplinary research and education.

The ESS program expands the pipeline of innovators to meet the future's most pressing sustainability issues. The College of Engineering and SNRE expect increasingly larger classes in the years ahead.

"I believe that sustainability is the most important issue business will face in the 21st century," said Ford Motor Co. Executive Chairman Bill Ford, who delivered SNRE's 7th Annual Peter M. Wege Lecture on Sustainability in November 2007. "I look at this not just as a challenge, but as an incredible opportunity. If I were in school today, I would pursue a degree in Engineering Sustainable Systems. It builds on the great work being done in engineering and natural resources at the University of Michigan, and it addresses the central challenge of our times."

Visiting Committee Expands to Aid SNRE

As part of a plan to accelerate SNRE's growth, membership on the school's Visiting Committee has increased. The committee's three new members bring to 10 the number of alumni and other engaged supporters sharing advice and strategic insight with the dean and school's other leadership.

Visiting Committee members meet and talk throughout the year, serving without pay while helping SNRE expand its visibility and impact on campus, across the nation and around the world. "The School of Natural Resources and Environment is blessed to have so many accomplished alumni and supporters willing to donate their time and energy," said J. David Allan, acting dean of the school. "We welcome their contributions and are thankful for their commitments to our students and faculty."

The new members are:

Geri Eileen Unger (B.S. '77) is director of education at the Cleveland Botanical Garden, where she manages a staff of 15. She is also responsible for development of after-school programs for science enrichment. In addition, she is the liaison with Cleveland Metropolitan School District's Science, Technology Engineering and Mathematics initiative. Previously, she was with the Chicago Zoological Society and New England Aquarium, where she served in a variety of positions. She received a master's of science in 1984 from Hebrew University and is ABD from Tufts University in the field of urban and environmental policy.

Stephen O. Simmons (B.S. '67; B.S.F. '69) provides strategic and operational advice to a business in the construction quality-assurance market. He has taken the firm to profitability and increased market share while elevating the business to a leader in its field. He spent much of his career as an environmental consultant for large engineering companies conducting environmental impact studies of energy and natural resources development projects. He has managed contaminated site restoration under federal and state programs, including the U.S. Environmental Protection Agency's Superfund program. He later worked with site owners involved in contaminated site restoration to negotiate clean-up strategies with U.S. EPA and the U.S. Department of Justice, saving site owners' substantial investments.

Jeffrey Wyner (B.S. '74) has more than 20 years of commercial real estate experience. Until recently, he oversaw a $500 million portfolio of commercial real estate debt investments for ACA Capital, an asset management firm with approximately $12 billion under management. Prior employment includes Lehman Brothers' global real estate group and a private company owning real estate where he was a corporate director and president. Currently, he is a board member of the Gowanus Canal Development Corporation in Brooklyn, N.Y., which is overseeing redevelopment of an industrial brownfield area being rezoned for mixed uses. He also has a master's degree in landscape architecture from the SUNY College of Environmental Science and an M.B.A. from The Wharton School, University of Pennsylvania.

Other Visiting Committee members:

William H. Banzhaf (B.S.F. '67) is president of the Sustainable Forestry Initiative Inc., whose board and staff oversee and implement the Sustainable Forestry Initiative Standard, the most widely used forest certification standard in North America.

Martin (Marty) D. Cargas (B.S. '81) is vice president-government affairs for Anheuser-Busch International, Inc., the international beer subsidiary of Anheuser-Busch Companies.

Lisa Delplace (M.L.A. '88) is a principal at Oehme van Sweden & Associates, a Washington, D.C.-based landscape architecture firm she joined in 1988.

Peter C. Mertz (B.S.F. '74; M.B.A. '81 Business School) is chief executive officer of Global Forest Partners LP, where he is also the company's chief investment officer and chairman of its investment committee.

READ MORE:
snre.umich.edu/visiting_committee

Mark A. Retzloff (B.S. '70) is a 38-year veteran of the natural and organic food industry. He is president and chief organic officer of Aurora Organic Dairy, which he co-founded in 1991.

Mark Van Putten (LAW J.D. '82) has 25 years of experience in environmental policymaking and nonprofit management at the international, national, regional and local level. He is the founder and president of ConservationStrategy LLC, an environmental strategy and organizational development consulting.

Mark Zankel (M.S. '94) is the deputy state director for the New Hampshire Chapter of The Nature Conservancy.

Annual Campaign

The 2008 Annual Fund Campaign for the School of Natural Resources and Environment is under way. Each fall, the school begins a year-long drive to seek support from alumni and other SNRE friends. The support helps SNRE maintain its national leadership role in the fields of environmental education and research. This year's campaign has three goals:

- Provide scholarship support at the time of admission to 30 percent of the incoming class – and to increase that percentage in subsequent years. To do that, SNRE needs to raise $780,000 each year.
- Raise $150,000 annually for master's project funding. These projects focus the substantial capabilities of our students and faculty on problems faced by real-world clients.
- Increase doctoral funding. SNRE wants to provide these students an additional $4,000 for research pursuits pre- and post-candidacy.

If you haven't received your Annual Campaign material, or if you have a question about matching gifts, planned giving or other giving-related issues, please contact the SNRE Office of Development and Alumni Relations at 734.615.0270.

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Stewards NETWORK

JUST BEING SOCIAL

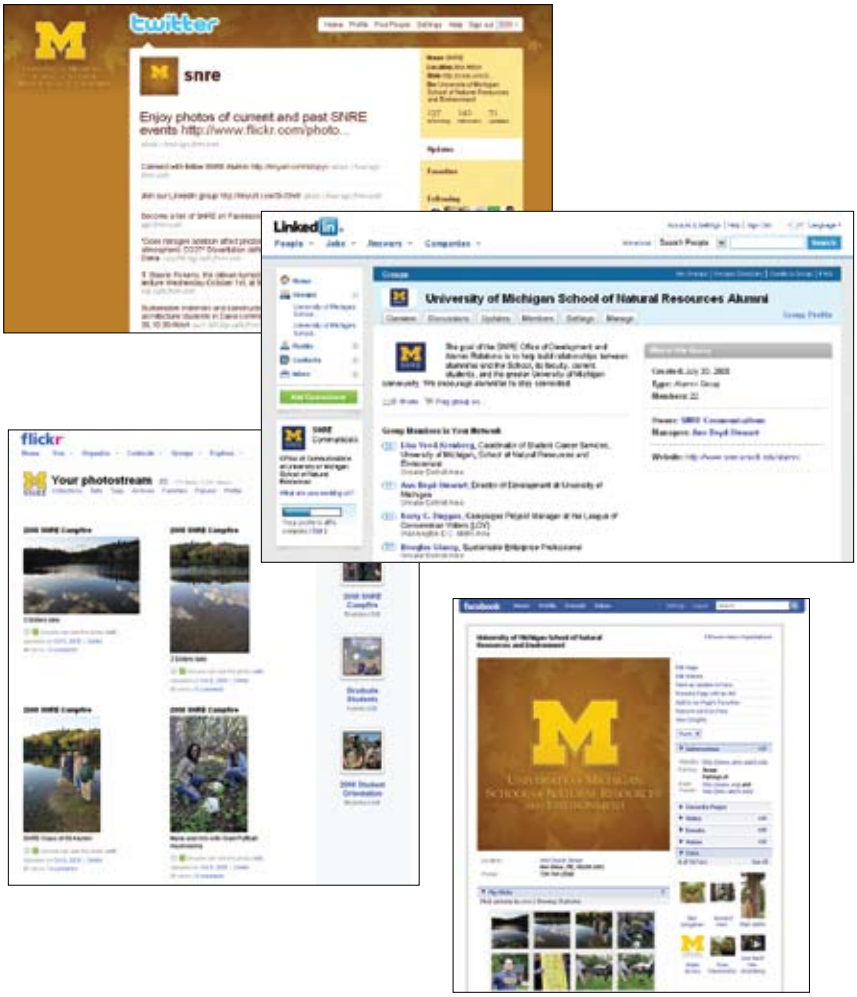
To strengthen connections with and among alumni, the School of Natural Resources and Environment this fall established a presence on leading social networking Web sites. In general, social networking sites focus on building online communities of people who share interests and activities; in SNRE's case, sharing what's going on with alumni and the school. By establishing a presence on these and other sites in the future, SNRE is making it easier to stay connected and informed. Here's a brief description of each site:

Twitter is real-time short messaging service that allows people to follow the sources most relevant to them and access information as it happens.

LinkedIn is an online network of more than 25 million professionals sharing profiles and connections on an invitation-only basis.

Facebook is a social utility that helps people communicate more efficiently with their friends, family and co-workers.

FlickR is an online photo management and sharing application.



MORE INFORMATION:
snre.umich.edu/social_networking

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