

Stewards

Spring 2007



School of Natural Resources and Environment

UNIVERSITY OF MICHIGAN

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Please **use the enclosed envelope** to help students and faculty become the environmental leaders of today and tomorrow.

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To read additional information on most of the articles in the News and Faculty Research sections as well as the complete Honor Roll of Donors, visit www.snre.umich.edu/Stewards2007

(Front cover) Spring trail leading to the Empire Bluffs overlook in the Sleeping Bear Dunes National Lakeshore, Empire, Michigan
(Back cover) Lake Michigan at sunset near Grand Traverse Lighthouse, Northport, Michigan
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We are working to shape the national debate on climate change

and how best to solve this looming crisis and educate students who individually and as a critical mass will lead principled, pragmatic and dramatic change.

My reappointment as dean came with the charge to advance global change teaching and research at the University of Michigan. We are tackling these issues at home and around the globe. As you will read on page 2, the School of Natural Resources and Environment has stepped up and is hosting the First National Summit on Coping with Climate Change.

At the summit, we aim to facilitate the development of adaptation options that will help build resiliency into our natural and built systems. Invited experts will identify adaptation needs in four critical areas and develop action options for governments, industries and communities. We are proud to be initiating this critical conversation.

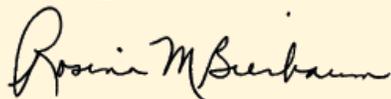
We also have recalibrated our master's degree programs and now offer our students nine specialized fields of study and an unprecedented number of dual-degree options. You can read about dual-degree programs on page 8 and learn more about the fields of study at www.snre.umich.edu. I am happy to report applications are up significantly. We are attracting a previously untapped pool of engineers and computer scientists who will further enrich our already strong and professionally diverse student body.

In the research arena, the story *In Search of Solutions: Untangling the Web of Human and Natural Systems* (see page 6) provides a glimpse of our faculty's efforts to identify ways to simultaneously solve increasingly interconnected environmental problems and avoid creating new ones.

With the recent release of the Intergovernmental Panel on Climate Change report, *Climate Change 2007*, and the United Nations Foundation and Sigma Xi report, *Confronting Climate Change: Avoiding the Unmanageable and Managing the Unavoidable*, the immediacy of the problem and the courses of action are clear.

As co-chair of the United Nation's Scientific Expert Group on Climate Change and Sustainable Development (www.unfoundation.org/SEG/), my charge was to offer a simple yet substantial roadmap for reducing the risks of climate change. In the report and in testimony before the United Nations and the U.S. Congress, we spelled out necessary actions on mitigation and adaptation. And we conclude: "There is no time for delay."

In closing, I want to draw your attention to the new name on the masthead of this magazine. We chose *Stewards* to reflect the deep values of our community and honor our foresters who so ably charted the path we follow today. Enjoy!



Rosina M. Bierbaum

Dean and Professor, School of Natural Resources and Environment



School to Host First National Summit on Coping with Climate Change

In its leadership role as the hub for environmental research and teaching at the University of Michigan, the School of Natural Resources and Environment is hosting a three-day summit – the first of its kind in the nation – focused on helping the United States prepare for the future impacts of climate change and handling the ongoing alterations in temperature, precipitation, sea level rise and species range.

Invited experts to the National Summit on Coping with Climate Change, May 8-10, 2007, will identify adaptation needs in four critical areas: public health, energy industry, water quality and fisheries. Experts will develop cross-cutting options for actions that can be taken in anticipation of changes at the local, state and national levels to help prepare cities, counties and states as well as government, business and industry.

Participants will focus on how different kinds of organizations can anticipate and adapt to near- and long-term change. They also will identify a research agenda for government and academia.

Dean Rosina M. Bierbaum announced the summit as the University's commitment to the Clinton Global Initiative, a non-partisan effort to devise and implement solutions to world challenges. "It is urgent we initiate this conversation with key stakeholders to examine what management, technology and policy options can help agencies and organizations deal with changes in average conditions, as well as prepare for increases in extreme events, such as floods and droughts," says Bierbaum, the former director for environment at the White House Science Office.

Faculty representatives from the School of Natural Resources and Environment, Public Health, Engineering, Erb Institute for Global Sustainable Enterprise, Graham Environmental Sustainability Institute and Michigan Memorial Phoenix Energy Institute have worked with national and international experts to develop the agenda.

External sponsorship has come from Google, the Gordon and Betty Moore Foundation of San Francisco, the Frey Foundation of Grand Rapids, Michigan, the National Science Foundation and the U.S. Environmental Protection Agency.

Plenary sessions on May 8 and 10 are open to the public. Wednesday, May 9, will be a working session for the 125 experts from the United States and other countries who have been invited to attend. The summit is being held on campus.

For more information, visit www.snre.umich.edu/climate_change or e-mail Andrew Fotinos at afotinos@umich.edu



Students Query U.S. Senate Candidates

A month before the midterm elections in November 2006, students participated in the time-honored process of questioning political candidates on issues of the day.

Michigan Television and Michigan Radio partnered with three schools to produce the

one-hour PBS television special, Michigan 2006: The Senate Race. Students from the Schools of Natural Resources and Environment, Public Policy, and Literature, Science and the Arts held separate caucuses to develop questions. Two students from each school were selected to serve as panelists and ask questions on topics ranging from environmental policy and federal student loan programs to the war in Iraq. Kerry Duggan, MS '06, and Doug Glancy, who will be a spring 2007 graduate, represented Natural Resources and Environment.

Republican Michael Bouchard, Oakland County Sheriff and incumbent Democratic U.S. Senator Debbie Stabenow each spent 30 minutes with panelists in front of a live student audience at the Gerald R. Ford School of Public Policy in Weill Hall. The program was aired numerous times on PBS stations around the state of Michigan.

New Fellows/USA Program

A newly established Fellows/USA graduate studies program at the University of Michigan will enable returning Peace

Corps volunteers to pursue a master's degree in Natural Resources and Environment and apply the knowledge and skills they developed during their service to their studies.

"The new Fellows/USA program will enable us to better promote the school's graduate-education opportunities to volunteers and to attract more of these highly motivated individuals who are dedicated to social justice. We also believe the Fellows will enrich the formal and informal learning experiences of their classmates," says Associate Dean Jim Diana. To qualify for financial aid awards in the Fellows/USA program, applicants must have completed their Peace Corps service and meet University admission requirements.



School Receives \$1.1 Million in Fellowships

The University of Michigan was selected for two major fellowship programs that provide more than \$1.1 million in research support for students pursuing environmental-related studies.

In December 2005, the Alcoa Foundation named the University as the sole North American academic partner for its six-year Conservation and Sustainability Fellowship Program. Through the Alcoa award, Michigan receives \$844,000 to support six two-year post-doctoral fellows conducting research on sustainable-energy technology. Geoff Lewis, Hilary Grimes-Casey and Hyung-Ju Kim are the University's first Alcoa Academic Fellows.

Professor Greg Keoleian, co-director of the Center for Sustainable Systems, and Professor Tom Lyon, director of the Erb Institute for Global Sustainable Enterprise, lead the new fellowship program with an interdisciplinary group of faculty.

Graduate students pursuing careers in land, water or biodiversity conservation will receive more than \$300,000 in support following the

School of Natural Resources and Environment's selection again this year by the Doris Duke Charitable Foundation to host its prestigious Doris Duke Conservation Fellows Program.

The school has participated in the environmental fellowship program for eight consecutive years. Steven L. Yaffee, professor of natural resources and environmental policy and the Theodore Roosevelt Professor of Ecosystem Management, administers the program on behalf of the school. He expects five or six Doris Duke fellows to be selected for each of the next two years. Each fellow receives tuition support and summer internship funding.

Guest Speakers Enrich Educational Environment

Experts in sustainability, ecology, environmental justice, landscape architecture, public health and business delivered guest lectures as part of the 2006-07 Dean's Speaker Series.

Martin Cargas, for example, a 1981 graduate of the school and vice president of government affairs for Anheuser-Busch International Inc., discussed *Beer and the Environment: How Anheuser-Busch Advances Environmental Stewardship*.

Other speakers included:

- **Dirk Wascher**, senior researcher and Landscape Europe network coordinator for Alterra-Green World Research in The Netherlands, delivered the JJR Lecture.
- **Sir John Browne**, group chief executive of BP Global, delivered the 6th Annual Peter M. Wege Lecture.
- **Majora Carter**, executive director of the Sustainable South Bronx, delivered the Martin Luther King Jr. Day Lecture.
- **Kenneth Helphand**, professor of landscape architecture at the University of Oregon, delivered the Whittemore Lecture.
- **Rita Colwell**, chair of Canon U.S. Life Sciences and distinguished professor at the University of Maryland and The Johns Hopkins University.
- **Peter Gleick**, president and co-founder of Pacific Institute for Studies in Development, Environment and Security.

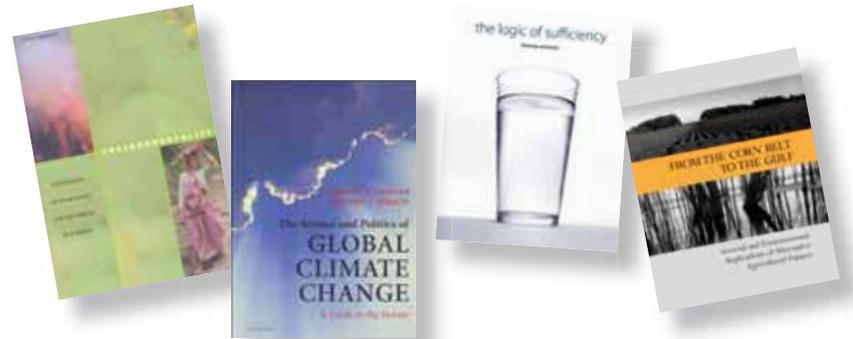


(Above) Martin Cargas, Anheuser-Busch

Dean Represents School as Global Change Expert

At the request of Robert Redford and Salt Lake City Mayor Rocky Anderson, co-hosts of the second annual Sundance Summit on climate protection, Dean Rosina M. Bierbaum delivered the keynote science briefing to several dozen of the nation's mayors. To date, 413 mayors have agreed to reduce greenhouse gas emissions and meet the Kyoto Protocol target of seven percent below 1990 levels. She also delivered the keynote briefing at the 2005 summit, at which many mayors agreed to reduce emissions on the spot.

The Sundance Summit, which was held in November 2006, is just one of many major addresses Bierbaum delivers each year on global change, representing both the University and the school at national and international gatherings. Venues have included the Aspen Ideas Festival, United States Association for Energy Economics, National Leadership Summits for a Sustainable America and the Chicago Investors' Summit.



New Books in Print

Environmentality: Technologies of Government and the Making of Subjects

By Arun Agrawal

(Duke University Press)

In the 1900s, villagers in the Indian Himalayas protested against government efforts to protect the environment by setting forest fires. Today, they attempt to protect forests through their own community-based groups. What explains the change? This book provides the answer.

The Science and Politics of Global Climate Change

By Andrew E. Dessler and Edward A. Parson

(Cambridge University Press)

How do scientific and policy debates work? The authors summarize present knowledge and uncertainty about climate change and discuss available policy options. Accessible to college-educated general readers, this book makes sense of the climate change debate.

The Logic of Sufficiency

By Thomas Princen

(The MIT Press)

Princen offers a new social organizing principle called Sufficiency, which means seeking just enough when more is possible. The principle embodies social restraint and is sensitive to environmental risks, and it addresses decision making when, under ordinary circumstances, it would be easier to evade responsibility for such risks.

From the Corn Belt to the Gulf: Societal and Environmental Implications of Alternative Agricultural Futures

By Joan Iverson Nassauer, Mary V. Santelmann and Donald Scavia, editors

(RFF Press-Resources for the Future)

This book presents innovative, integrated assessments of the agriculture and ecological systems in the Mississippi River Basin along with studies of local Iowa agricultural watersheds. Learn how agricultural policies have contributed to current environmental conditions and how new policies may lead to more promising outcomes.

news

Collaborative Land Planning Touted

A student team delivered its research findings on collaborative planning for state trust lands to the Western States Land Commissioners Association last July.

The team of eight current and former graduate students, advised by Professor Steven Yaffee, interviewed participants in eight case studies across seven Western states to identify and analyze the benefits, costs, challenges and lessons learned from their collaborative planning efforts. The research study was done as a team master's project and resulted in a report titled, "Building Trust: Lessons from Collaborative Planning on State Trust Lands."

"Our team identified a set of best practices that provides a road map for those interested in a collaborative process in the future," says Lisa Spalding, a member of the team. The report addresses each phase of the process from deciding when to collaborate to setting up a successful process, creating a decision-making structure and implementing agreements.



Sustainability Institute Launched

The University of Michigan has expanded its global footprint as an academic leader in environmental sustainability through the launch of the \$10.5 million Graham Environmental Sustainability Institute, a recently established University-wide organization to encourage synergy and facilitate multi-disciplinary research and teaching on sustainability.

The institute, under the interim direction of Brian Talbot, professor of business administration and operations management, focuses on five crucial areas of sustainability: energy, freshwater systems, human health and its link to the changing environment, global change and biodiversity, and infrastructure and manufacturing systems. Sustainability is

defined as meeting the needs of the present without compromising the environment for future generations.

Current research activity involves more than 300 faculty members from seven schools and more than 25 specialty centers and institutes. Campus-wide, there are more than 390 sustainability-related courses and approximately \$30 million annually in sponsored research. Rosina Bierbaum heads the Deans' Council, the faculty leadership team that advises the institute, located in the Dana Building.

About half the funding will provide faculty research support for preparation of major collaborative grant applications. The funds also will be used to encourage both undergraduate and graduate studies in sustainability with new fellowships and internships, and to create integrated graduate degree programs and courses among the schools and colleges now engaged in sustainability studies. Awards made to Natural Resources and Environment faculty and students in 2006-07 totaled \$1.46 million.

The establishment of the Graham Institute was made possible by a \$5.25 million expendable gift from the



Graham Foundation, a philanthropic organization established by Donald Graham, BSE '55, MSE '56, and his wife Ingrid, and \$5.25 million in funding from the University's Office of the Provost. Inspiration for the institute came from Graham's father, Sam, who was a professor in the former School of Forestry and a pioneer in what is now called environmental sustainability.

New Approach for Landscape Architects

A new, integrated approach for teaching site engineering to landscape-architecture students is being pioneered at the school. Professor MaryCarol R. Hunter (pictured above, center) presented her innovative teaching methodology in June 2006 at an international conference for

landscape-architecture educators after introducing it into her site-engineering course the previous winter term.

"Traditionally, the component parts of landscape architecture – art, ecology and engineering – have been taught as separate, isolated subjects," Hunter explains. "I believe you have to view them as part of an interconnected system and bring them together by teaching each component in the context of the others." Applying her integrated approach to site-engineering coursework enables landscape-architecture students to learn how to develop the engineering for their own creative designs.

Welcome!

Three new professors joined the faculty last year. (Above left to right) Beth Diamond, a landscape architect specializing in history and design theory, came from California Polytechnic State University in Pomona. MaryCarol R. Hunter, a landscape architect specializing in ecological design, came from the University of Georgia in Athens. Her husband, Mark D. Hunter, also came from the University of Georgia. He is a terrestrial ecologist and has a joint appointment with the College of Literature, Science and the Arts' Department of Ecology and Evolutionary Biology. The threesome pose behind an interpretive sculpture by Brian Laskowski, a landscape-architecture student.

THE MICHIGAN DIFFERENCE

Bryant Contributes to Environmental Justice Institute



Professor Bunyan Bryant has devoted his career to environmental justice and social activism. Now he has taken an important step to ensure his legacy is passed on to a new generation of scholars by donating \$100,000 to the Bunyan Bryant Scholarship

Fund in Environmental Justice.

Bryant's gift, which is part of the University's \$2.5 billion Michigan Difference campaign, will assist students who are conducting research, organizing conferences and disseminating information to communities and policy-makers on environmental-justice issues. "Today's environmental crises demand that we as a nation become more visionary," Bryant says. "If we fail to plan, we will blunder into the future with a host of environmental problems."

Bryant is coordinator of the environmental-justice field of study. He also is the founder and director of the Environmental Justice Initiative, a program that helps formulate environmental-justice policies at the local and national levels. "Bunyan's gift extends his significant scholar-activist contributions and expands opportunities for students to work on-the-ground in communities near and far," says Dean Rosina M. Bierbaum.

Last October Bryant received national recognition as an educator, social activist and pioneer in the environmental-justice movement. The Deep South Center for Environmental Justice at Dillard University presented him with the Damu Smith Power-of-One Environmental Justice Award during a national symposium in New Orleans. His efforts helped promote former President Bill Clinton's signing of Environmental Justice Executive Order 12898, which required all federal agencies to design and implement programs to address environmental-justice concerns. "Recognition of this kind of work comes only a few times during a person's career, so I was very touched," Bryant says.

Pallin Scholarship Fund Established



As a non-resident who enrolled at the University of Michigan in the 1950s to study forestry, Donald A. Pallin, BS '58, MF '60, knows all too well the financial hardship endured by students who must pay higher out-of-state tuition. In December, he and his wife, Nancy L. Pallin, made a bequest to the

University's capital campaign to establish the Pallin Scholarship Fund.

The fund will support scholarships for graduate or doctoral student candidates who are non-Michigan residents and encourage them to study, research and advance the principles of sustained multiple use in the management of the Earth's renewable terrestrial and aquatic resources. This is the Pallin's second gift to the University. Three years ago, they established a charitable remainder trust endowing the Pallin Fellowship for graduate students studying multiple use resource management.

"We are adding more people to the world, and at some point we will reach a limit," says Donald Pallin, who retired in 1996 as vice president and general manager of the International Division of Delta and Pine Land Co., a commercial producer of cotton planting seed. "We need to do our best to manage our renewable natural resources, so we can ensure their future viability while producing all the things people need to live a decent life."

The gift honors the memory of his father, Leonard A. Pallin, AB '45, who loved the University of Michigan and wanted his sons to get their educations there. "We feel a deep attachment to this great University and want to see its excellence continue," Pallin says. "I received an education that served me well, so the School of Natural Resources and Environment is where I want to concentrate my giving."

In Search of Solutions:

BY CYNTHIA SHAW

Halfway around the globe, where flooding threatens the lives and livelihoods of Chinese residents, scholars and their students are working not just to understand the situation but also to remedy it.

Poyang Lake is in the Central Yangtze Basin downstream from the Three Gorges Dam, a \$25 billion project that is one of the largest hydroelectric dams in the world. Dan Brown, a geographer, and colleagues at the School of Natural Resources and Environment and Jiangxi Normal University are studying how residents' land-use decisions affect their vulnerability to flood hazards. "We hope what we find will be useful to formulating policies in this area," Brown says. "We also hope to extrapolate solutions for widespread application and offer methods for addressing similar problems that will be useful to others."

Some would call this a tall order. Natural resources and environment professors call it grappling with the complex web of environmental change-related challenges that result when humans interact with nature.

Coupled human and natural systems, or socio-ecological systems, refers to an integrative approach to understanding these interactions in a scientific and holistic way. Work in this area began more than 50 years

ago. But never before has the inquiry been more urgent or required more multidisciplinary collaboration. It is not enough to understand the science of a particular resource. Today problem-solvers must deeply appreciate the role humans and societies play in causing and responding to environmental change.

Questions abound at the intersection of land, resources and the built environment; human health and the environment; freshwater resources, estuaries and the coastal environment; and environmental services and valuation. Research in this area has become a priority for the National Oceanic and Atmospheric Administration, the National Institutes of Health and the National Science Foundation, which has established a standing program on Coupled Natural and Human Systems. Brown, who uses computer modeling to link human decision making in a particular locale with the natural environment of the region, is one of many researchers at the school working in this critical area.

As the new associate dean for research, Brown will tell you the school is ideally suited to respond to this directive because of its culture of collaboration. It is the only school in the nation that has scholars from 18 disciplines representing the natural sciences, social sciences and design working together under one roof. "Faculty members at the school tend to think about questions that are more integrative," he adds. "Rather than work on our own theoretical developments in our own disciplines, we tend to look more broadly." The approach is working. For fiscal 2006,

Untangling the Web of Human and Natural Systems

research awards totaled nearly \$15 million, with many faculty members working in the arena of coupled human and natural systems.

Brown's project in China is one of several the school has in progress. Highlighting the activities of a handful of others only hints at the range of research in this area. Ivette Perfecto and John Vandermeer, both trained as ecologists, work at the intersection of environmental science, human health and economics. They focus on the global coffee industry, specifically shade-grown fair trade coffee, and study the consequences to biodiversity when regional and global changes are made in coffee production processes. "We want to advance the practical knowledge growers need to make decisions that enable them to propel the

"We are well-balanced in the social and natural sciences and we have landscape design. This mix of disciplines is one of our calling cards... it sets us apart from our competitors."

coffee industry toward sustainability," Perfecto says. "We also hope to contribute to the basic sciences of biodiversity and spatial ecology."

Joan Nassauer, a landscape ecologist and professor of landscape architecture, works to explore how cultural and ecological systems can be complementary in landscape planning and ecological design. Nassauer's research uses social science and action-design techniques to offer new approaches that respect cultural values as a foundation for achieving ecological benefits. She advocates engagement between natural science and design disciplines, and says "enormous ecological and public benefits could accrue if ecology and design actively inform and change each other. The challenge," she adds, "is to redirect existing systems approaches to seek new synergies."

Dean Bavington specializes in fisheries management and studies the history of attempts to domesticate marine environments. In his research, he combines natural science expertise in fisheries with the social science perspective of environmental philosophy and history. "I look at

when, why and how human and natural resources become constituted as manageable objects," explains the assistant professor and Michigan Society Fellow. "My postdoctoral research is focused on exploring the history of managerial approaches to human and non-human environments and offering sustainable alternatives."

Geography, ecology, landscape architecture, fisheries and philosophy – what's missing is a research example involving a policy expert. Enter Arun Agrawal. He studies the politics of international development and environmental conservation. Agrawal works with colleagues at Indiana University, and is in the process of transferring the International Forestry Resources and Institutions program, a global network of research centers that study sustainable forest governance, from Indiana to the University of Michigan. "Our database contains information on local governance related to more than 350 forests," he says, "and has been used by scholars, researchers and others interested in policy-making related to community-based and decentralized forest governance."

Brown will tell you these people and others – professors of economics, education, psychology, public policy and resource management – choose to work at the school because of its multidisciplinary culture. "We self-select," he says. "We choose to come here because we want this environment."

"We are well-balanced in the social and natural sciences and we have landscape design," he adds. "This mix of disciplines is one of our calling cards. It is one of our unique characteristics; it sets us apart from our competitors. And it's why, when it comes to this national mandate to advance research involving the coupling of human and natural systems, we're among the best." 



Dan Brown and his collaborators at Jiangxi Normal University conducted a survey of households in Jiangxi Province to understand how residents make their livings and use the land around Poyang Lake (far left). He stands outside a county government office in June 2006 (above) where the team obtained permission to administer the survey.

DUALDEGREE DUALDEGREE

Students Prepare for Environmental Leadership

Current students are earning dual degrees in the following areas:
Anthropology / Business / Chinese Studies
Ecology and Evolutionary Biology / Economics
Education / Engineering / Law
Public Health / Public Policy / Russian and
East European Studies / Sociology
Statistics / Urban Planning

BY CLAUDIA CAPOS

Alissa Kendall, Mark Shahinian, John Gearen, Nate Engle, Menan Jangu and Suzanne Perry have different educational backgrounds, research interests and career aspirations. Yet all six students share one thing in common: They are augmenting their master's or doctoral programs at the School of Natural Resources and Environment with graduate studies at one of the University of Michigan's 18 other schools and colleges.

This ability to offer students the opportunity to pursue dual degrees at Michigan's other world-class schools, colleges and even specific academic departments is a distinguishing feature of the master's and doctoral programs and also a competitive advantage. No other environmental graduate school in the nation has this breadth of offerings. With a dual degree, students can better prepare themselves as future leaders in their chosen fields.

"I saw the school's dual-degree program as a way to broaden my engineering education and to open doors of opportunity at the intersection of engineering know-how and environmental tools and disciplines," says Alissa Kendall, a 2007 PhD candidate whose research combines civil engineering with industrial ecology in the quest to identify new "greener" building materials for concrete infrastructures. After graduation, Kendall plans to pursue a research position or academic appointment in the fields of renewable energy and transportation.

Mark Shahinian believes his four-year dual degree in law and natural resources and environment will provide greater flexibility when making career choices. "A dual degree gives me the benefits of both worlds and the freedom to do a lot of different things," he explains. "I get the hard applicable skills of Law School and the deep background in an environmental field that interests me, namely, renewable energy."

Shahinian, a 2008 MS and JD candidate, chose Michigan because of its top rankings in law, engineering and business. "Renewable energy is a complex field that touches on diverse areas," he says. "Through the School of Natural Resources and Environment, I am able to draw on resources in a number of key disciplines." CONTINUED ON PAGE 9



(Above right) Menan Jangu with traditional healing practitioner in Mwanza, Tanzania.

HONOR ROLL OF DONORS

Each year the School of Natural Resources and Environment receives financial contributions from generous alumni, friends, foundations and corporations. We thank all those who, through their gifts, provide vital support to students, faculty and programs and enhance the school's reputation as a preeminent leader in environmental education. This Honor Roll of Donors represents gifts above \$100 received between July 1, 2005 and December 31, 2006.

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All careers are evolving in ways that increasingly reward graduates capable of spanning and integrating multiple disciplines, observes Thomas Gladwin, the Max McGraw Professor of Sustainable Enterprise and associate director of the Frederick A. and Barbara M. Erb Institute for Global Sustainable Enterprise. The Erb Institute is a partnership between the School of Natural Resources and Environment and the Ross School of Business, and its dual-degree program is the model on which all others are based. Currently, 52 students are pursuing degrees in business and natural resources and environment.

“The world is changing so fast that the tool kits of yesterday are no longer adequate for handling modern problems,” Gladwin adds. “This growing complexity is driving the need for systemic thinking across disciplinary boundaries.” Dual degrees, he says, fulfill that need by providing a “very efficient educational process” for acquiring a whole new set of multiple intelligences and a “transdisciplinary” competency. “The entire world is waking up to the necessity of preparing new minds to find sustainable solutions to our increasingly complex, interdependent and turbulent global problems.”

“Through the dual-degree program, I am able to address regional issues from an interdisciplinary perspective that combines history, culture, economics and politics.”

John Gearen, Nate Engle, Menan Jangu and Suzanne Perry are four of those “new minds.” Gearen, a second-year Erb student, works at the intersection of business and the environment. With Gladwin and a team of master’s students, he has made recommendations to Ford Motor Company on ways the automaker can create mobility services for people in highly populated, overly congested areas within environmental constraints.

Engle, a 2007 dual-degree master’s candidate, is working closely with Professor Maria Lemos to analyze the adaptive capacity to climate change of water-management systems in Brazil in hopes of helping that country respond more effectively to flooding and drought. “I’m a great fan of dual degrees,” says Engle. He initially applied only to Natural Resources and Environment but later, in his first year, decided to pursue a second degree at the Gerald R. Ford School of Public Policy. “It’s great to get two different frameworks for thinking about environmental and societal problems.”

Menan Jangu, a 2010 PhD candidate, has combined a degree in natural resources with one in anthropology. He is studying the human health implications of ecological changes occurring in the Lake Victoria basin, bordered

by Tanzania, Kenya and Uganda. He also is assessing the response to disease outbreaks by both biomedical facilities and traditional healing practitioners. “I found a faculty member, Professor Rebecca Hardin, who is interested in my line of research,” says Jangu, a native of Tanzania. “Through the dual-degree program, I am able to address regional issues from an interdisciplinary perspective that combines history, culture, economics and politics.” He also is working on a graduate certificate at the Center for Afroamerican and African Studies.

Suzanne Perry, who will graduate in 2007 with a master’s degree in natural resources and environment and a master’s degree in public health, has tapped both schools in her effort to assess and communicate the health risks present in St. Bernard Parish following a major oil spill after Hurricane Katrina. Inspired by work on the importance of nearby nature to human well-being done by her adviser, Professor Rachel Kaplan (see page 13), Perry is pursuing independent research on the therapeutic benefit of exposure to natural settings for the elderly.

“My dual degree is giving me a background in environmental psychology and ecology as well as an understanding of how to evaluate the effectiveness of such a program,” she says. Perry’s dream one day is to open her own respite-care facility that integrates the natural environment with nursing care. Thanks to her dual degree, that dream is well within reach. 

For more information on dual-degree programs:
www.snre.umich.edu/degree_programs/dual_degree.php

For more information on the Erb Institute for Global Sustainable Enterprise:
www.erb.umich.edu



(Top right) Nate Engle on top of the newly completed Castanhão dam in the Baixo Jaguaribe River Basin, Ceará State, Brazil. (Bottom right) Suzanne Perry with residents in the Wellness Garden at Glacier Hills Retirement Community, Ann Arbor, Michigan.

Lifetimes of

“There are many joys associated with being dean of the School of Natural Resources and Environment,” says Rosina M. Bierbaum. “One of them, clearly, is honoring those who have devoted their lives to educating the next generation of environmental leaders and advancing new knowledge so we can achieve a sustainable world.

“We saluted two such individuals this summer: Terry J. Brown and Burton V. Barnes,” she says. “Join me in extending the celebration.”



BY NANCY DAVIS

In celebration: Stacey Ebbs, MLA '99, embraces Terry Brown (below) after paying tribute to her former professor; Brown and his wife, Janice (above right) are all smiles. Burt Barnes (both, far right) leads a field trip for former students during his retirement festivities.



THEY CAME BY THE HUNDREDS to fill the Dana Building’s auditorium on Saturday, May 20, 2006. Esteemed college professors, landscape architects in private practice and designers of public spaces all came to pay tribute to the man who made them think, laugh and strive for excellence. Some were moved to tears as they spoke of the impact that retiring Landscape Architecture Professor Terry Brown had on their lives – both while they attended the University of Michigan and every day since.

Others were all smiles, recalling Brown’s direct way with words and love of a good beer. Professor Emeritus Ken Polakowski, close personal friend and colleague, served as emcee for the evening. Six of Brown’s former students spoke at the surprise celebration that brought people from both coasts and points in between to honor their mentor and friend. A light moment among many was when the students recounted – in unison – Brown’s major principle

for site engineering: “*Water always runs downhill.*”

“Terry has had a long and fierce following of former students – academics and scholars all over the world – who are utterly devoted to him,” said Joan Nassauer, professor of landscape architecture. These legions of students and colleagues recognize Brown’s contributions to the profession and to their own lives, she added.

A Night Full of Surprises

It was indeed a surprise party for Brown and his wife Janice. As they entered the packed auditorium, recognizing faces from the past and present, their joy was evident. Accompanied by son Jason, daughter Allison, and grandchildren Dominic, Zachary and Cameron, they soon received another surprise – the news that money had been raised for a scholarship in their names – the Terry J. and Janice A. Brown Scholarship in

Stewardship

Landscape Architecture. The scholarship name is fitting, as some say the couple has become a dynamic force of nature, moving and interacting with grace and love for one another and for life in general.

His Legacy Goes On

In 1998, Brown received the Council of Educators Award of Distinction for Long-term Accomplishments in Landscape Architecture. “When you ask me what I think my legacy will be, it’s my students,” he says. “Just look at what they’ve done.

“It became clear to me during the party that my legacy will live on well past my lifetime. What I always tried to do is prepare my students, give them a foundation,” he adds. “It was up to them to build the rooms on that foundation and be stewards of the environment. I’m so proud of them.”

BURT V. BARNES is one of the preeminent forest ecologists of the world. And what do his former students – all 6,000+ of them – remember most about their time spent with him? He sure can sing a show tune and he isn’t above eating a little dirt.

In his forest ecology courses, he would routinely break into renditions of “You Gotta Know the Territory” from *The Music Man* to



Circle of Support Is Essential to School

The recently retired Burton V. Barnes and Terry J. Brown are two shining stars in the constellation that is the faculty of the School of Natural Resources and Environment. Over the years, their expertise and reputations drew countless students to the school, all eager to learn from these masters.

It is because of the faculty that the school is able to attract its top students. "An investment like endowed professorships are used to attract and retain outstanding professors," says Ann Boyd-Stewart, director of development and alumni relations. "Completing the circle, scholarships, fellowships and awards are instrumental in attracting the most promising students."

Boyd-Stewart says there are subtle but important distinctions between the kinds of financial support given to students. Scholarships are used to attract students and help defray the cost of tuition. They are based on academic promise, need or a personal characteristic.

Awards provide financial assistance to graduate students and are given based on achievements, generally after they have finished some or all of their academic programs.

Fellowships are financial awards given in support of an individual's scholarly endeavor. Typically fellowship aid is not used for tuition expenses and may include other forms of remuneration for such needs as travel and loan repayment plans.

The need for awards for students and faculty has never been more important, says Dean Rosina M. Bierbaum. "In the final two years of The Michigan Difference campaign, the school will focus its effort on student and faculty support," she says.

"Student support is a wonderful way of extending a hand to rising young stars and relieving some of the burden of their educational expenses," Bierbaum adds. "Equally essential are endowed professorships. Our faculty are the lifeblood of our school."

Scholarships named for Terry J. Brown and Burton V. Barnes have been established to assist students and honor the professors. For more information, contact Ann Boyd-Stewart at aboyst@umich.edu or send your contribution in the enclosed envelope.



drive home the point that entire ecosystems must be considered first when identifying and studying plants. And if the singing didn't get their attention, a handful of dirt sure did.

Barnes wasn't above demonstrating that muck was made up entirely of organic material that is perfectly safe to ingest – and ingest it he did.

Barnes retired in June 2006 after 42 years as a forest and landscape ecology educator. He came to the University of Michigan in 1949 to study in the Department of Forestry and Conservation and went on to earn three degrees, culminating in a PhD in Forest Botany in 1959.

Burt's BioStation Bash

B.V.B., as he is called, welcomed his former students to a weekend of field trips at the University of Michigan Biological Station to celebrate his retirement. "I know of no one who has made a larger impact on the teaching of forest ecology. He is a teacher, scholar and intellectual leader of the highest order," remarks Bruce Dancik, a professor at the University of Alberta and director of the Devonian Botanic Garden.

But Barnes reminded everyone his students had an equally profound effect on the teacher.

"You students taught me to have concern for all students," he said. "You've made this school strong and given me the strength to go on, which I will."

Barnes is a pioneer of the landscape ecosystem concept in land classification and mapping and has applied this approach to ecosystems and plant species around the world.

"Our faculty are the lifeblood of our school," Bierbaum adds.

He is credited with discovering the world's largest organism – a trembling aspen clone – and was instrumental in the recovery of Michigan's population of the Kirtland's Warbler. His undergraduate and graduate courses in forest ecology, landscape ecology, natural history and, of course, identification of woody plants have set many ecologists on their professional paths.

To honor Barnes' contributions and continue his legacy, a scholarship has been established in his name. "Burt is part of the reason I became interested in the field as an undergraduate," says Don Zak, a professor of terrestrial ecosystems. "I picked up a textbook he had written and thought 'This is cool stuff.' It was the spark that impacted the rest of my life." **M**



Kaplan and De Young: Urban Nature

To maintain the vitality and appeal of urban areas and to promote the well-being and enjoyment of the people who live there, communities should incorporate bits of nearby nature into their mosaic of public and private spaces, say Professors Rachel Kaplan and Raymond De Young.

“Density need not preclude open spaces, and nature settings can be located in many spaces that need not compete with development,” adds Kaplan. However, proper planning, strong community commitment and regular maintenance are all required to ensure that the nearby natural environment succeeds in enhancing a city’s attractiveness as well as the pleasure and safety of its residents.

These are among the themes in a report, *Nearby Nature in the City: Preserving and Enhancing Livability*, written by Kaplan, De Young, and their collaborator, J. Eric Ivancich. Through many photographs and short descriptions, they suggest numerous ways to incorporate nature into urban areas, even as development fills in remaining vacant land.

While Ann Arbor provided the inspiration for the work, the authors have found that the report speaks to the needs of many communities. To reach the targeted groups – planners, developers, citizen organizations, business owners, residents and anyone else who cares about or has a role in creating livable places – they emphasize the opportunities and approaches rather than the research literature.

“The demonstrated contribution of nature to our physical and mental health makes it crucial that we all have frequent and ready access to it,” the researchers conclude. “Tree towns are about beauty, and much more.”

For more information: rkaplan@umich.edu and rdeyoung@umich.edu



(Left) Examples of urban landscaping in downtown Ann Arbor: Downtown Home & Garden, First United Methodist Church of Ann Arbor and the Ann Arbor Public Library.

Hoffman: Business

Firms that incorporate climate change into their core business strategies will be in the best position to take advantage of emerging opportunities and gain competitive advantage in a changing market environment, says Professor Andrew Hoffman. In a recent report prepared for the Pew Center on Global Climate Change, he identifies three key drivers – new regulations, rising energy prices and growing investor interest – that will hasten the transformation to a carbon-constrained world.

“The prospect of greenhouse-gas controls is already altering existing markets and creating new ones, thereby changing the business environment,” says Hoffman. “All companies will be affected to varying degrees.”

The report, “Getting Ahead of the Curve: Corporate Strategies that Address Climate Change,” is based on a survey of 31 companies and in-depth case studies of six leading multinational corporations: Alcoa, Cinergy (now merged with Duke Energy), DuPont, Shell, Swiss Re and Whirlpool. It outlines eight steps companies can follow to develop a climate-related strategy. These include measuring greenhouse-gas emissions, gauging the impact of climate change on operations and sales, evaluating options for reducing emissions, setting goals and developing financial support for climate programs.

Hoffman, who also is a professor of business and associate director of the Erb Institute for Global Sustainable Enterprise, reports nearly all the firms surveyed agree that government regulation is imminent, probably before 2015.

“These companies believe a proactive approach is necessary to prepare for the coming market transformation, and that doing nothing means missing myriad near-term financial opportunities and setting themselves up for long-term political, operational and financial challenges,” he says.

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Zint: K-12 Education Through the efforts of Professor Michaela Zint and her master's-degree students, kindergarten through 12th grade teachers in Michigan and surrounding states now have a comprehensive new collection of education tools and resources to use for teaching children about the value of the Great Lakes and its fishery resources. Working with education specialists and a core group of K-12 educators, the team has developed the "Teachers' Corner" for the newly revamped TEACH, a Web site hosted and maintained by the Great Lakes Commission through the Great Lakes Information Network.

The new section of the Web site at www.great-lakes.net/teach/teachers/ makes instructional kits, sample lesson plans, reviews of curricular materials and online discussions easily available to teachers, and provides links to other online background information about the Great Lakes.

TEACH, an acronym for The Education And Curriculum Homesite, also features education-related news, a "Great Lakes Vault of Knowledge," a calendar of events and K-12 mini-lessons on Great Lakes history, culture, environment, geography, pollution and career options.

"Past studies have told us K-12 educators want to teach their students about the Great Lakes but are not aware of relevant teaching materials that also can help them meet state educational standards," says Zint, who holds a joint appointment at Natural Resources and Environment and the School of Education. The Web site's comprehensive new content will go a long way toward raising awareness, she adds.

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Keoleian: Sustainable Systems

Researchers from the School of Natural Resources and Environment, the College of Engineering and the Transportation Research Institute are spearheading a \$1.9 million research project designed to help policy-makers better understand and predict the impact of proposed greenhouse gas-reduction policies on the automotive industry.

The five-year initiative, funded by the National Science Foundation's MUSES (Materials Use: Science, Engineering and Society) program, will culminate with the development of an analytical tool called a computational automotive policy analysis software program, or CAPA. Researchers from four other major universities also are involved in the joint effort.

The research team, which includes Professor Gregory Keoleian, will evaluate how the effectiveness of government policies is constrained by producer incentives, consumer preferences and technological limitations. In order to predict any unintended consequences, the team will have to integrate models of market decisions and technological performance with life-cycle assessment and materials-flow analysis.

Keoleian, the coordinator for the sustainable systems field of study and co-director of the Center for Sustainable Systems, also is the project director for another NSF MUSES grant of \$1.6 million to study sustainable concrete infrastructure materials and systems. Professors Gloria Helfand and Jonathan Bulkley are co-investigators.

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Scavia: Great Lakes Increases in federal funding and agency support for public education, scientific studies and intervention programs promise to further the preservation and restoration of the Great Lakes. This is good news to the faculty and students at the School of Natural Resources and Environment.

“Public understanding of the Great Lakes is essential to ensure long-term protection of these invaluable natural resources,” says Donald Scavia, professor of natural resources and environment and director of Michigan Sea Grant.

In January 2006, the National Science Foundation and the National Sea Grant Program awarded the University a \$2.5 million grant to establish a Center for Ocean Science Education Excellence for the Great Lakes. Over the next five years, the new program will integrate efforts of seven Great Lakes Sea Grant programs to create synergies between Great Lakes research and primary and secondary education throughout the basin. This spring, the EPA awarded Scavia and his research team – Mike Wiley, Thomas Johengen, David Jude and Sara Adlerstein – a \$2.5 million grant to track ecosystem changes in all five Great Lakes over the next five years.

In October 2006, a five-year study was initiated to examine why “dead zones” have returned to Lake Erie and to develop recommendations for alleviating the problem. The collaborative effort is similar to a second five-year study, now in its second year, that focuses on nutrient pollution and dead zones in marine systems. These efforts are funded by two grants from the National Oceanic and Atmospheric Administration’s Center for Sponsored Coastal Ocean Research totaling \$4.7 million. Scavia is principal investigator on all four grants.

Following introduction in April 2006 of a multi-billion-dollar, bipartisan bill to clean up the Great Lakes, Scavia urged Congress to adopt priorities that include stopping the introduction of invasive species, restoring near-shore ecosystems and reducing non-point-source pollution. In his testimony, he cautioned that the Great Lakes may soon reach an ecological “tipping point” unless immediate remedial steps are taken.

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Mohai: Environmental Justice A study co-authored by Professors Paul Mohai and Robin Saha, PhD '02, of the University of Montana reveals a disproportionately high number of minorities and poor people reside in neighborhoods near toxic waste facilities. Their findings shed new light on the results of previous national studies that report mostly occupational variables – rather than racial factors – are significant predictors of the location of environmentally hazardous sites.

“Such conclusions (from previous national studies) might suggest that the disproportionate presence of hazardous waste facilities near minority communities is due to the tendency for those facilities to be concentrated near industrial labor pools,” says Mohai. “This is not consistent with our results, which indicate the traditional approach (to assessing the distribution of environmental hazards) has largely camouflaged racial and economic disparities that are much larger than previously reported.” Their findings appeared in an article in the May 2006 issue of *Demography*.

In their study, they reassess national data on the locations of 608 hazardous waste treatment, storage and disposal facilities, and examine how the demographic characteristics change around these sites when newer methods, which better match where hazardous sites are located and where people live, are used to analyze population disparities. They find that within a one-mile radius, the percentages of African Americans and Hispanics in a neighborhood become highly statistically significant predictors of where hazardous waste facilities are located, even when controlling for the socioeconomic characteristics of the neighborhoods, such as mean household income, mean property values and percentage employed in blue collar jobs. Similar results are obtained using a three-mile radius. “This suggests that other factors associated with race, such as racial targeting or housing discrimination, may be linked to the location of these facilities,” Mohai concludes.

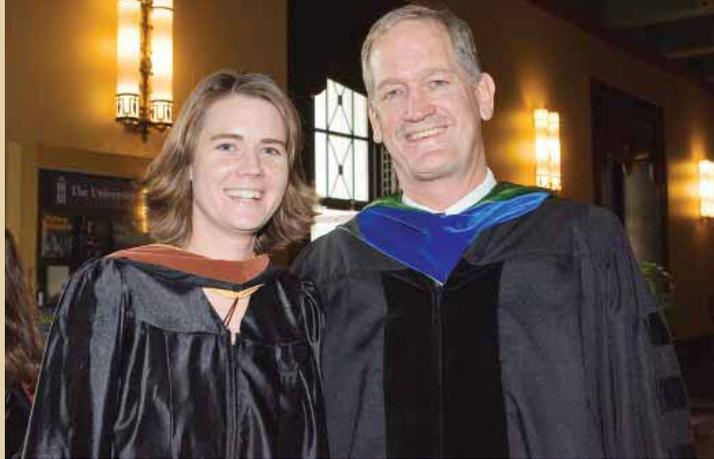
For more information: pmohai@umich.edu

Ten ways you know you are in the School of Natural Resources and Environment

By Kat Ridolfi, Class of 2006



1. You see professors riding their bike to school even if it's snowing outside. Global warming does NOT discriminate between seasons.
2. People drink coffee out of mason jars.
3. You are a Landscape Architecture student who spends most nights sleeping in the studio and you wake up every morning with a T-square etched into your cheek.
4. You are expected to show up at parties with your own mug for beer. Please, plastic is SO unsustainable.
5. You incorporate Latin names and scientific jargon into everyday speech like it's normal. Just to illustrate, I was volunteering for the Huron River Watershed Council, teaching middle school students about watershed health and how macroinvertebrates are good indicators of water quality. One student pointed to a critter and asked what it was, and I quickly answered, oh that's part of the order Megaloptera, genus *Corydalus*. The kid just looked at me like I was crazy. I had to go look in a book to find the common name: dobsonfly.
6. You spend 10 minutes trying to find a trash can in Dana because they are outnumbered by recycling bins 4 to 1.
7. When it rains, you no longer worry about the fact that you don't have an umbrella. Instead, you think about how the altered hydrology brought about by impervious surfaces, dams and the loss of wetlands and riparian habitat is affecting storm-water management and water quality.



(Above) All in the family: Jim Diana, associate dean for academic programs, poses with his daughter, Christine, who graduated in April 2006 with an MS in natural resources and environment. Diana's son, Matt, earned his BS from the school in 1999 and his MS in 2002.

8. You have a poster on your office door that says: "Fish Worship: Is it wrong?"
9. You attend potlucks at least twice a week where there is twice as much vegetarian and vegan food than meat, and it is preferable for dishes to be non-dairy, wheat-free and organic.
10. And last, you know you are a SNeRd (as we affectionately call ourselves) because you find yourself at restaurants asking whether the lettuce in your salad is shade grown, fair trade, organic and harvested using a solar-powered tractor.

Kat Ridolfi, who graduated April 29, 2006 with an MS in natural resources and environment, recounted this list as part of her graduation speech.

We Remember

Janice L. Fenske, MS '83

After a long, courageous battle with cancer, Janice L. Fenske died on March 10, 2005. Born on August 1, 1954, in Grand Rapids, Michigan, she received her BS in zoology from Michigan State and her MS in natural resources from the University of Michigan. In 1978 she accepted a position from the Michigan Department of Natural Resources as a fisheries technician, and in 1983 was promoted to a fisheries biologist.

During her 27 years of service, her accomplishments were numerous and her mentoring was invaluable to a generation

of fisheries professionals. She received numerous awards, including the Fisheries Division's Chief's Award, two Top Fin awards, the Michigan Council of Trout Unlimited's Order of the Hexagenia Award and the 2004 Justin W. Leonard Award of Excellence for outstanding professional achievement from the Michigan Chapter of the American Fisheries Society. She was particularly proud of her long association with the American Fisheries Society, which she joined in 1979.

Jan was the first female fisheries biologist and district fisheries biologist in Michigan.

She proudly blazed the trail for others to follow. In what was then considered a "man's division," she succeeded in surmounting the obstacles thrown her way. Her commitment to aquatic resource management was unquestionable. Her ability to face and resolve tough issues, and especially her strength and courage, were unsurpassed.

She and her husband, Kelley Smith, MS '85, PhD '93, worked tirelessly for the protection of aquatic resources in Michigan. Kelley continues today as the chief of the Michigan Department of Natural Resources Fisheries

Division. "I remember Jan as an exceptional student who completed her master's thesis with minimal supervision," recalls Jim Diana, associate dean for academic programs. "She probably had the fewest corrections or drafts of any of my students."

"The school should be proud of her accomplishments in the regulation of small-scale hydroelectric dams and in the management of fishery resources between the Michigan DNR and Native American tribes in the state," he adds.

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Photographers Dave Brenner, Dan Brown, Steve Dolan, J. Eric Ivancich, Steve Kuzma Photography, Stephen Layton, Todd Marsee, Michigan Television, National Oceanic & Atmospheric Administration, Terry W. Phipps, Ken Scott, Tingting Zhao, UM Photo Services: Scott Galvin and Martin Vloet

Printer University Lithoprinters

Printed using soy ink on paper that contains post-consumer waste fiber and is manufactured with wind power.

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*includes gender identity and gender expression

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Dioxin! is a 15-foot art installation created by students in Professor Beth Diamond's History and Theory of Landscape Design class to activate a public space – the University's central campus – and bring awareness to environmental issues through landscape interventions.

Upcoming Event

coping with climate change

**National Summit
May 8-10, 2007**

How should the United States prepare for the likely long-term effects of global warming? What should the nation do to handle the changes happening today? Public health, energy, water quality and fisheries, along with a cross-cutting discussion of adaptation opportunities, will be the focus of the First National Summit on Coping with Climate Change.

Plenary sessions May 8 and 10 are open to the public. For more information, see page 2.



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