



## Changing of the Guard

# François Morel Steps Down as PEI Director; Stephen Pacala Takes the Helm

By Simon Levin, George M. Moffett Professor of Biology, Professor of Ecology and Evolutionary Biology

*[Editor's Note: On July 1, 2006, François M. M. Morel, Blanke Professor of Geosciences, stepped down as director of PEI and Stephen M. Pacala, professor of ecology and evolutionary biology (EEB), assumed leadership of the institute. Morel had been the director since 1998. He will continue to serve as professor of geosciences and as director of the Center for Environmental Bioinorganic Chemistry (CEBIC).]*

When PEI began in 1994, it was understood that it would be built in three phases: science, technology, and society. The strength of the science base at Princeton was obvious, but it was also agreed that once the science base was in place, PEI would turn immediately to the other key pieces of the puzzle: engineering, the social sciences, and the humanities.

As it turned out, our first core hire, François Morel, was a brilliant choice in terms of our ability to realize this ambitious agenda much more rapidly. Hiring François was viewed universally as a coup because of his brilliant scientific reputation. The added bonus was that we quickly learned that François was a Renaissance man, with deep interests in literature and the arts (he later became chair of the editorial board of the Princeton University Press), drawn to Princeton because of the potential for a complete environmental program, carefully balanced with essential doses of science, engineering, policy, and values. This made it easy and comforting, when my own term as the first director of PEI ended, to turn the reins over to François, since I could imagine no

one better to help realize the goals we had set out and to take PEI to the next level.

These optimistic expectations still underestimated what François was able to accomplish as director. François was a natural leader, deeply committed to PEI, who built the endowment, broadened the scope, and strengthened both the research and the



François M. M. Morel



Stephen W. Pacala

teaching components. He attracted major National Science Foundation (NSF) funding to create CEBIC, PEI's first interdisciplinary research center, and used it as a model to encourage others to create complementary centers within PEI. With Michael Celia, professor and chair of civil and environmental engineering (CEE), and Bess Ward, William J. Sinclair Professor of Geosciences and director of the Program in Environmental Studies, he initiated a redesign of PEI's core course curriculum, including the addition of labs, which led to a quadrupling of enrollment and a qualitative increase in certificate students. He also established several diverse initiatives that helped create an identity for PEI, including establishing the

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PEI-Princeton University Press Lecture Series, acquiring gifts that established the PEI Environmental Economist Visiting Fellows and Barron visiting professorship, and for promoting new space for PEI. Most importantly, he earned the respect of everyone—staff, faculty, administrators, alumni, friends, and funding agencies. PEI today bears the clear imprint of François’s energy, dedication, and dreams.

As François steps aside, PEI is fortunate that his successor is another inspired and inspiring visionary, another broad thinker drawn to Princeton because of its strengths not only in natural science, but also in engineering, social sciences, and the humanities. Steve Pacala and I have been collaborators for 15 years and our simultaneous arrival at Princeton involved a mutual decision that there was nowhere better to build an interdisciplinary research initiative in environmental sciences. Steve is a highly innovative and original scientist, whose work on forest models is the benchmark for scores of other efforts. His

*“As François steps aside. PEI is fortunate that his successor is another inspired and inspiring visionary”*

interests, however, go far beyond that work and touch every area of ecology and evolution with a seamless mix of deep mathematical theory and definitive empirical work.

Moreover, Steve has committed most of his research efforts over the last several years to addressing one of the greatest threats to humanity’s survival, global climate change. This led him to co-establish two major research centers within PEI, the Carbon Mitigation Initiative and the Carbon Modeling Consortium (now known collectively as the Cooperative Institute for Climate Science), and to build partnerships with corporate and political leaders alike. Steve brings passion and vision to PEI, engendering confidence that the momentum François Morel generated will continue and that PEI will achieve its original vision as a unique blend of natural and social science, technology, and values.

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## ENV’s Distinctive Living Lab Teaching Model Thrives at PEI

Funding from the Dean of the College and the Council on Science and Technology supports a number of programs under the PEI umbrella. In the two years since the grants were first awarded, the funding has enabled development of the Living Lab Teaching Model within the ENV Studies Program, aided ENV outreach efforts, and supported PEI’s undergraduate summer intern program. The grants—\$150,000 to be spent over a three-year period—cover core courses and the summer program.

The Living Lab Teaching Model was developed in 2004 by Dr. Eileen Zerba, ENV lab instructor, and Lars Hedin, professor of ecology and environmental biology (EEB), with funding from a Sophomore Initiative Grant (Dean of the College) and a Course Enhancement Grant (Council on Science and Technology). PEI provides additional support for this program during the academic year.

According to Hedin, “In this program we offer students a new model for learning environmental science. This model relies not only on the classroom, but also on first-hand experiences with real-life environmental problems and the ecosystems that they affect.”

As Zerba explains, the Living Lab Teaching Model consists of a lab component as part of PEI’s core ENV 201 and 202 courses, and a summer internship program. Because of the experiential learning nature of the model, both lecture and lab provide an opportunity for Princeton undergraduate students to develop an appreciation for the interrelatedness of science and the social, political, and economic aspects of their lives. Undergraduate students learn how to apply analytic tools to address problems in local communities, larger regional areas, and beyond. The undergraduates consider solutions to significant environmental problems and learn the value of interdisciplinary investigations and gain an appreciation for the perspectives that shape environmental leadership.

In the Living Lab Teaching Model, ENV inquiry-based labs and summer undergraduate research

focus on an interdisciplinary project-oriented long-term study of local environmental issues related to the health and conservation of New Jersey freshwater systems and associated land areas. It links ENV labs to the University's Community-Based Learning Initiative (CBLI). CBLI has as its goal outreach by Princeton students within the University and in surrounding communities.

"The Living Lab Teaching Model is focused

students realize the importance of these issues during their Princeton years. Whether they pursue careers in the environment after graduation or not, our hope is that these experiences will encourage students to become role models for their communities and society as a whole," she says.

The Living Lab Teaching Model is funded by the University in an amount that is "very large for an undergraduate course," observes Zerba. The



ENV students use kayaks to study the water quality of Lake Carnegie. (Photo courtesy of Eileen Zerba.)

on environmental change, in particular how land-use change (urbanization, agriculture, and loss of wetlands) affects the biological and physical aspects of freshwater systems, and how these changes in turn impact environmental policy. By learning about local environmental problems and making concrete recommendations to the affected communities, students know their work is making a real contribution, which is very rewarding for them," explains Zerba.

While much of the research is conducted over the summer, PEI continues to support the interns so that they may continue their research during the academic year.

"Some of the students become very attached to their summer projects and want to continue their research during the academic year," says Zerba. "Some have worked on their projects continuously from freshman to senior year, and ultimately many of these interns will draw on their research for their ENV certificates or senior thesis."

The goal of the ENV program, says Zerba, is to create leaders in environmental science and teach students the vital importance of environmental stewardship. "The Living Lab Teaching Model helps

## PEI Outreach

### Living Lab Interns Map Lake Carnegie

On mornings during the summer of 2006, Dr. Eileen Zerba and PEI undergraduate summer interns **Caroline Brody '08** and **Ryan McCabe '07**, loaded kayaks and lab equipment into a van and drove to Lake Carnegie. Their mission as Living Lab Teaching Model interns was to collect data that will be vital to the ongoing research of the ENV program during the academic year. They traveled the length of the lake in kayaks several times a week over an eight-week period to map it, measure its depth with sonar and GPS units, and assess the health of the water by taking samples.

In addition to supporting their own ENV certificate research projects and enhancing ENV courses, the data they collect will support ENV outreach efforts which include sharing student discoveries with local communities in order to help address local environment problems.

funding reflects, she says, "how vigorously the University supports undergraduate programs."

For more information about the Environmental Studies Program and the Living Lab Teaching Model, visit <http://web.princeton.edu/sites/pei/env3/index.html>.

## PEI Collaborates with D&R Greenway Land Trust

# Partnership with Land Preservation Group Benefits Town and Gown

The relationship between town and gown gained new strength this past spring, thanks to a series of cooperative efforts forged between PEI and D&R Greenway Land Trust, a non-profit organization based in Princeton. The two groups have joined forces to increase local environmental awareness and advance their common interests. These include environmental protection, education, land preservation and stewardship, and community service in support of environmental education.

In the spring of 2006, PEI Associate Director Katharine Burks Hackett '79 met with Linda Mead,



Johnson Education Center, headquarters of D&R Greenway Land Trust. (Photo courtesy of Valerie Ford)

D&R Greenway Land Trust's executive director, Jim Amon, director of stewardship, and Sophie Glover '87, director of philanthropic support, to discuss ways the organizations could work together. As a result, PEI agreed to sponsor two of D&R Greenway's educational programs in 2006 and provide support for a summer internship in land preservation and stewardship. More joint programs are under consideration.

According to Burks Hackett, with funding from

PEI, D&R Greenway will now be able to offer a more attractive eight-week summer internship opportunity to Princeton students. Called the Upmeyer Internship in Land Preservation and Stewardship, it is open to students enrolled in ENV and other Princeton students with an interest in land conservation and preservation and land-use issues.

As Burks Hackett explains, student participation in this type of learning experience resonates with the University-wide concept of Community Based Learning Initiatives (CBLI). CBLI requires Princeton undergraduates to find ways to enhance their own learning while giving back to the community.

During the summer of 2006, EEB major Michael Duane '07 became the first Princeton undergraduate to benefit from the newly funded internship. His project focused on invasive plant eradication.

Burks Hackett believes the collaboration with D&R Greenway is a logical move for PEI. "We are able to give back to the community and enhance our students' educational experience as a result of this relationship. It is vital for the University, through PEI, to work with local environmental leaders in an effort to further our collective interests in the environment. D&R Greenway Land Trust is an excellent match."

In May 2006, the first event sponsored by the new partners was held. That meeting, "Partners in Preservation," introduced the Johnson Education Center to members of New Jersey's other leading conservation groups. The featured speaker was David Wilcove, a member of PEI's associated faculty and an EEB professor. He delivered the keynote lecture, "Assessing Conservation Progress and Determining Acquisition and Management Priorities for Species Conservation: A Case Study from Central Florida," was based on the work he has done with the Nature Conservancy and Will R. Turner, a former PEI research associate.

As a follow-up to the May conference, PEI co-sponsored its second event with the D&R Greenway Land Trust in October. The focus of the meeting, entitled "Global Warming and Community Ecology," was on land preservation and global warming. PEI Director Stephen W. Pacala, professor of ecology and evolutionary biology (EEB) and an authority on global warming, was the featured speaker. The program was held October 4 at 7 p.m. at D&R Greenway Land Trust's new headquarters, the Johnson Education Center, located on Rosedale Road in Princeton.

## David Wilcove Plans to Increase Number and Variety of ENV Courses

# PEI Names New Director of the Program in Environmental Studies

**D**avid Wilcove, professor of ecology and evolutionary biology and public affairs, was appointed PEI's new director of undergraduate environmental studies in August 2006. He replaces Professor Bess Ward, who became chair of the geosciences department in September. Wilcove earned his Ph.D. in biology from Princeton in 1985 and



David Wilcove

joined the faculty in 2001. Prior to his faculty position, he was senior ecologist with Environmental Defense for 10 years. *PEI News* spoke to Professor Wilcove about the ENV Program and his vision for its future.

**PEI:** How would you characterize the current state of the ENV program?

**DW:** Looking at the ENV program, I am struck by two things. One is the growing interest among undergrads in environmental issues. The second is the relatively small number of seniors per year completing the certificate program.

The core interest in the environment among undergrads is there. We need to make them aware of the program and the range of courses we offer and get them excited about completing the certificate requirements.

**PEI:** What type of student is currently drawn to ENV 201 and 202?

**DW:** Right now we serve two constituencies. One consists of students who are deeply interested in environmental issues. We want to build on their interest and encourage them to get the certificate, to undertake interesting research projects, and to pursue exciting internship and career opportunities. Students in the other group take one or two ENV courses in order to fulfill a distribution requirement.

They are at least mildly interested in environmental issues. We want to give these students the knowledge and skills they will need to be informed citizens when they leave the University. In short, we want to make the environment an important part of their lives. Along the way, we may even turn a few of them into serious students of environmental science and issues.

**PEI:** How do you plan to increase enrollment in the ENV program?

**DW:** We need to offer more courses focused on environmental issues. I would like to develop some courses that are more experiential in nature and give students opportunities to solve real-world problems. We also need to find a better way to get the word out about our program. We think we offer some exciting courses, internships, and other opportunities, and we want more students to know about us.

Within the past year we have reached a tipping point in terms of public perception of global climate change. Other issues that our students may be hearing about include energy policy, the collapse of the world's fisheries, suburban sprawl, and declines in wildlife populations. They may be seeing some of these issues play out in their own neighborhoods. All of this might inspire more students to take ENV courses.

The ENV program has seen a fair amount of growth in the last few years. When I came to Princeton five years ago there were less than 70 students enrolled in each of our two core courses, ENV 201 and ENV 202; last year we had about 95 in each. I am encouraged by this, but still not satisfied.

**PEI:** What is your long-term vision for the ENV program?

**DW:** I would like to see virtually every student at the University take at least one course in environmental studies during his or her time at Princeton. And I would like to see a significant increase in the number of students who go on to complete the ENV certificate. I am convinced that environmental issues will be at the top of the national and international agenda in the coming decades. Issues such as energy security, public health and disease epidemics, food safety, and famine are going to be with us for a long time to come. Thus, I would like to see all of our students take at least one environmental studies course as part of their liberal arts education.

# Princeton Water Watch: Cleaning Our Water

Julia Osellame '09

Do you like clean water?" I asked fellow Princeton students as they entered their dining hall a week after the fall semester began. "Of course," they answered. But I wanted them to go one step further and agree to join Princeton University Water Watch. By joining, Princeton students would work to ensure the clean water everyone wants and deserves.

Princeton Water Watch is one chapter of a joint project between Americorps and New Jersey Community Water Watch, a public-interest research group that monitors water pollution, educates students and homeowners, and coordinates volunteer-led clean-ups to pick up trash in the Princeton watershed. The University chapter conducts research, monitors water, organizes clean-ups, and educates the University community in addition to local high school, middle school, and elementary school students about water quality and conservation. PEI supports the campus chapter of Water Watch through guidance and logistical assistance provided by PEI Outreach Coordinator Anne Catena.

My interviews were part of the fall '05 and '06 recruiting effort organized by Lexi Gelperin, Water Watch's campus coordinator.

An integral part of the organization is the water-monitoring research team headed by Alistair Boettiger '07. In conjunction with an initiative to monitor New Jersey's water quality, this team has been conducting water-quality tests on Lake Carnegie

*Water Watch is not just about science—it's also about increasing awareness... "Princeton in the Planet's Service."*

for three years. The data collected through Water Watch's efforts may be useful to the University in planning future construction adjacent to natural streams and may benefit the crew teams that practice on the lake year-round.

The 2005 Assessment of Lake Carnegie, a report issued in January 2006 by the water-monitoring team shows "moderate total pollution levels" in the lake water. It revealed that the lake suffers from excess

nitrogen which in turn, stimulates the growth of bacteria and algae. Pollution stems from a variety of sources. The nitrogen-containing uric acid of goose droppings heightens pathogenic fecal coliform levels. Runoff and non-point source pollution from the University and surrounding Princeton watershed also contribute to elevated levels. Escalating the problem is the lake's lack of natural barriers.

The news is not all bad, however. The water-monitoring program has yielded promising news: at some points during the year bacteria concentrations were reported at levels that would make swimming permissible and some pollution-sensitive invertebrates, like scud, were found.

But Water Watch is not just about science—it's also about increasing awareness. Among the promotional events it hosted in the last academic year were



Cold weather doesn't prevent water-monitoring volunteers from collecting data at Lake Carnegie.

a performance by the band Guster as a part of their "Campus Consciousness Tour" and production of an environmental "Geo-pardy" game held in the Frist Campus Center and open to all students. The theme Water Watch created for these events was "Princeton in the Planet's Service."

Continuing this mantra in the current academic year, the goal includes advocating cooperation between students and community members. The hope is that clean-ups, community outreach, educational lessons, and stream monitoring programs will turn into active stewardship and encourage a positive perception of New Jersey's land and water.

Water Watch needs volunteers and donations. For more information contact Julia Osellame at [Osellame@princeton.edu](mailto:Osellame@princeton.edu). Weekly meetings are held Mondays at 8 pm in Guyot 126B.

# PEI Research and Center News

PEI's interdisciplinary research program is presently focused chiefly in the sciences and organized through its five centers. Beginning with this issue, *PEI News* will provide updates from the centers.

## Center for Biocomplexity (CBC)

**Joshua Weitz** has accepted a faculty position in the School of Biology at the Georgia Institute of Technology, effective January 2007, where he will study the evolutionary ecology of microbial and viral communities and problems in biological networks.

**Maja Schluter** joined the Center in January 2006 with a Marie Curie International Fellowship. Her work will focus on the social-ecological system of water use in Central Asia's Amudarya river basin.

**Frederic Bartumeus** joined the Center in May 2006 on a post-doctoral fellowship. His research is in limnology and theoretical ecology and uses complex system approaches to understand animal movement and dispersal.

**Susanne Menden-Deuer** arrived in May from the University of Washington, with a German DFG Fellowship. Menden-Deuer combines theoretical and experimental approaches to studying the dynamics of marine ecosystems.

**Ford Ballantyne** arrived in late 2005, and is embedded in work on ecological stoichiometry.

## Center for Environmental Bioinorganic Chemistry (CEBIC)

The Center for Environmental Bioinorganic Chemistry provided eight undergraduate research fellowships and sponsored two professors from Middlesex County College in research labs during the summer of 2006. PEI and CEBIC also supported professional development for 20 middle school science teachers focusing on the Global Ocean and Chemistry & Our Senses.

## The Cooperative Institute for Climate Sciences (CICS)

**Yi Huang**, a fourth year graduate student in the Atmospheric and Oceanic Sciences Program, who has been supported by CICS during the past two years, has been awarded a NASA Earth Systems Science Fellowship for his project "*Diagnostic investigation of satellite-observed and model-simulated spectral longwave radiances: Spectral signature of external (natural, anthropogenic) climate forcings and internal variability*" for the 2006-07 academic year.

During the summer of 2006, the CICS sponsored a two-week Weather and Climate summer institute for 21 teachers from eight NJ school districts to further their understanding of atmospheric processes and to learn methods to teach about weather and climate.

For more information about PEI's centers, please go to PEI's website, <http://web.princeton.edu/>

[sites/pei/](http://web.princeton.edu/sites/pei/) or click on the links:

Center for Biocomplexity (CBC), <http://www.eeb.princeton.edu/%7Esimon/cbc/cbc.html>, Center for Environmental Bioinorganic Chemistry (CEBIC), <http://www.princeton.edu/~cebic/>, The Cooperative Institute for Climate Sciences (CICS), <http://web.princeton.edu/sites/cics/>, the Carbon Mitigation Initiative (CMI) <http://www.princeton.edu/%7Ecmi/>, and the Energy Group <http://www.princeton.edu/~energy/>.



Princeton Environmental Institute, University Center for Human Values and Program in Science, Technology, and Environmental Policy present

## Food, Ethics and the Environment

with Marion Nestle, Michael Pollan, Eric Schlosser, Peter Singer and others

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## Five Students Receive Awards at PEI's 2006 Class Day Celebration

Each spring on Class Day, PEI confers awards and prizes to environmental studies certificate (ENV) students and other Princeton undergraduates whose achievements have been outstanding. The 2006 prize and award recipients are listed below.



Stroh Thesis Prize winner Karen Wolfgang (left), with Professor Bess Ward.

### **The Peter W. Stroh '51 Environmental Senior Thesis Prize**

Karen Wolfgang '06, Anthropology. Advisor: Alan Mann. (*Re) Learning Indi-*

*geneity: Transforming Nativeness and Reclaiming Experience through Education in Place.*

Honorable Mention: Michael Gotlieb '06, Civil and Environmental Engineering. Advisor: Jim Smith. *Mississippi River Delta Splays: Controlled Flooding as a Means of Flood Control.*

### **Environmental Studies Thesis Prize**

Karis Gong '06, Woodrow Wilson School. Advisor: Anne Marie Slaughter. *Exporting Sustainability.*

Honorable Mention: Kathryn Fiorella '06, Ecology and Evolutionary Biology. Advisor: Claire Kremen. *Reserve Site Selection: A Case Study of Madagascar.*

### **Environmental Leadership Prize**

Erica Lee '06, Philosophy. Advisor:

Michael Smith. *Moral Obligations are Conceptually Overriding.*

### **Becky Colvin '95 Field Research Award**

This annual award is supported by a grant that provides funds for environmental field research projects for the senior thesis. The fund was established by Dr. and Mrs. Robert Colvin in memory of their daughter, Becky Colvin '95.

Co-recipients: Meha Jain '07, Ecology and Evolutionary Biology. Advisor: Dan Rubenstein. Planned Project: *A Study of the Effects of Cattle Grazing on Wild Ass Populations in Laikipia, Kenya.* Aliya Sanders '07, Ecology and Evolutionary Biology. Advisor: Lars Hedin. Planned Project: *To Research Ways to Protect and Maximize the Growth of Endemic Vegetation in the Fynbos Biome in South Africa.*



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