Dean’s Message

I’m pleased to introduce the first issue of Bren News since I became dean of the Bren School in January. During the twelve years I spent as a next-door neighbor at the Marine Science Institute, I had the opportunity to collaborate with several Bren faculty and to help advise some Group Projects. So, I arrived here familiar with the school and comfortable in my “new” surroundings. And yet, I remain as impressed as any newcomer would be by this extraordinary school and the ongoing accomplishments of its faculty, students, alumni, and staff.

This issue is filled with ample evidence of how the Bren School makes an impact, how engaged it is with the world beyond our campus, and how interested those who seek solutions to real-world environmental problems are in partnering with the school.

Southern California Edison is one such partner; the utility recently presented a $500,000 gift to the school to enrich our academic programs and fund improvements to the Bren Hall Visitor Center that will transform it into a powerful venue for outreach and education.

This issue also highlights the faculty who have made the Bren School one of the top environmental economics programs in the nation and how their research helps to find innovative interdisciplinary solutions to a wide range of environmental challenges.

Part 2 of an article that opened in the previous issue of Bren News on page 7. It describes a variety of climate-change-related research—from species-migration modeling to water-energy studies to industrial ecology—being conducted by Bren faculty. On page 12, you can get caught up on a trio of important corporate gifts that will support Master’s Group Projects, a cornerstone of the Bren curriculum. Increasingly, visionary companies are seeing the value of Group Projects as a path to solutions for real environmental problems.

Finally, don’t miss the profile of alumnus Douglas Varchol (MESM 2006), who travels the world making environmental documentary films for the BBC and other outlets. He is the epitome of the Bren graduate: committed and working hard to make a difference.

Oh yes, as the “new guy” at Bren, I also received some attention in the form of an interview that begins on page 5. I hope it gives you a sense of why I’m so excited to be here—should the rest of the pieces in this edition somehow not do the trick.

—Steve Gaines

Commencement Set for June 11
9:00 a.m. in the Bren School Courtyard

This year’s commencement keynote speaker will be Angel Martinez, president & chief executive officer of Deckers Outdoor Corporation, a Bren School Corporate Partner. Offering five brands of footwear—Deckers, Ugg Australia, Teva, Simple Shoes, and Tsbo—Deckers is a hugely successful company that takes sustainability seriously. Mr. Martinez was born in Cuba and emigrated to the United States in 1958. He graduated from UC Davis, where he was an All-American in cross-country and track. For more on this year’s program please visit: www.bren.ucsb.edu/events/commencement_2010.htm

Noteworthy: Brengrass 2010 will provide music before and during the ceremony.
An Empowering $500,000 Gift
Southern California Edison supports academics and Visitor Center technology

Southern California Edison (SCE) has agreed to contribute a five-year, $500,000 gift to the Bren School to support programs and scholarship, and to transform the existing Bren Hall Visitor Center into a cutting-edge site for interactive education and community outreach.

The enhanced Visitor Center will showcase Bren Hall innovations and the shared commitment of the school and SCE to providing leadership in energy efficiency, environmental protection, resource conservation, and zero-net-energy building design and practices. The center will be renamed in recognition of SCE’s significant contributions to the Bren School.

“We are pleased to support the Bren School and equip the Visitor Center as a meeting place for discussions on energy efficiency and environmental protection,” said SCE President John Fielder, a UCSB alumnus.

“Southern California Edison has a long history of supporting the university and our Bren School,” said UCSB Chancellor Henry T. Yang. “This important contribution will enable the Bren School and the university to more effectively pursue their shared mission of addressing the critical issues of energy sustainability and resource productivity.”

Dean Steve Gaines added, “This gift is particularly welcome because it supports not only our pursuits in research, teaching, and student scholarship at the Bren School, but also the critical function of public education and outreach.”

For more information, please go to: www.bren.ucsb.edu/news/sce_500k.htm.

New Faculty Member Adds to Industrial Ecology Focus

Assistant Professor Sangwon Suh, a specialist in industrial ecology and life-cycle assessment (LCA), is the newest member of the Bren School faculty. Dr. Suh comes to Bren from the University of Minnesota, where he was hired as an assistant professor in 2005. He was also an associate research fellow at Leiden University in the Netherlands, where he received his PhD in 2004. He earned his BS and MS in Environmental Engineering from Ajou University in Korea.


“The Bren faculty members are some of the finest scholars internationally,” he says. “I am honored to join such a prestigious team, at one of the very few departments or colleges built completely around environmental issues. The various specializations at Bren are usually located in disparate departments, with no common platform, but the Bren School provides just that.”

He is also pleased to join assistant professor and LCA expert Roland Geyer. “This will allow us to build a strong team around the topic in a different way than I would in another department, where a single person would carry the entire load on the subject,” he says.

Dr. Suh began performing LCA work with iron and steel products in Korea in 1996 and 1997. He then moved on to methodological issues ranging from normalization and weighting to computational structure, database management and protocols, and other “behind the screen” elements that drive LCA tools and databases.

He has been a key integrator of “hybrid LCA methodology,” a merger of engineering data and national statistics data. “We always want detailed engineering data for hundreds of inputs from companies that supply materials to us for LCA studies,” he says. “But they’re not always available. So in many cases they’re left as data gaps. But we thought, ‘Why don’t we try to substitute the best available data out there as a proxy?’”

Dr. Suh, who plays guitar and cycles in his spare time, is looking forward to Santa Barbara’s moderate weather. “I visited in November,” he says. “There was heavy snow at the airport in Minneapolis, and when I arrived in Santa Barbara, people were playing beach volleyball. I thought, ‘This isn’t fair.’”
Incentivizing Solutions

Strength in environmental economics enhances Bren’s problem-solving mission

A new collaboration called the University of California Center for Energy and Environmental Economics (UCE3), emanates from the assertion that today’s policy challenges in energy or the environment require a deep understanding of energy, the environment, and economics.

Established in summer 2009 with financial support from the UC Office of the President, UCE3 draws on the strengths of the UC Energy Institute and the Bren School. Bren professor Charles Kolstad co-directs the new center in partnership with Severin Borenstein, professor at UC Berkeley’s Haas School of Business and director of the UC Energy Institute.

“This unique center, in combination with the wealth of UC energy- and environmental-research resources, will attract creative, innovative students and professors who truly want to be on the cutting edge in terms of finding answers to some of our most challenging environmental problems,” says Kolstad.

Understanding that it takes more than good science to drive sound environmental policy and that economics, with its extensive tools for measuring, understanding, and incentivizing behavior related to finite resources, can be an important ally, the founders of the Bren School developed strength in environmental economics.

Last January, Research Papers in Economics ranked UCSB third among all university environmental economics programs in the nation. Bren has clearly contributed to UCSB’s reputation. That is due in large part to the permanent faculty, which includes Kolstad, Gary Libecap, and Christopher Costello; affiliated faculty members from the UCSB Economics Department, Robert Deacon and Olivier Deschenes; and assistant professor of economics Paulina Oliva.

“The strength of environmental economics at UCSB is due in no small way to the farsightedness of the Bren faculty in supporting investment in this area of scholarship,” says Kolstad.

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Another partnership, the Economics and Environmental Science (EES) PhD emphasis, enables doctoral students to extend their deep knowledge in economics with an understanding and appreciation of the research questions and methods of a natural science that complements their economics research. By providing a PhD, plus advanced training in an area of environmental science, the EES emphasis distinguishes itself from virtually any other PhD program in environmental and resource economics in the nation.

Environmental economics at Bren has achieved its standing thanks to the work of (from left) Oliver Deschenes, Gary Libecap, Robert Deacon, Christopher Costello, and Charles Kolstad.

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Find out More

Economics and Environmental Science: www.bren.ucsb.edu/academics/ees.htm
UC Center for Energy and Environmental Econ. (UCE3): www.uce3.ucsb.edu

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Dozier Wins Research Award

Last October, Bren School professor and founding dean, Jeff Dozier, was awarded Microsoft Research’s 2nd Annual Jim Gray eScience Award.

The award, which includes a $20,000 cash component, recognizes innovators whose work has made an especially significant contribution to the field of data-intensive computing. It was established to honor the memory of one of Microsoft’s best-known researchers, Jim Gray, who went missing nearly three years ago while sailing to the Farallon Islands, near San Francisco. Gray specialized in analyzing very large data sets and helped build the WorldWide Telescope.

Microsoft Research said it selected Dozier for the award because his research epitomizes Gray’s legacy and vision for data-intensive computing and his understanding of the way science has to change. Dozier was specifically cited for his pioneering research on remote sensing, water resources, and climate change, and his contributions to integrating environmental science and computer science.

Read more: www.bren.ucsb.edu/news/dozier_gray.htm
Getting Together

Steve Gaines brings impressive experience and a focus on communication and collaboration to his new position at the Bren School

Steve Gaines began his tenure as the fourth dean of the Bren School on Jan. 1, 2010, the next step in a distinguished career at UCSB. He has been a member of the Department of Ecology, Evolution, and Marine Biology since 1994 and has spent the past decade directing the UCSB Marine Science Institute. He also served as acting vice chancellor for research and acting dean of the Division of Mathematical, Life, and Physical Sciences. His research focuses on marine ecology and conservation, sustainable fisheries, the design of marine reserves, and the impact of climate change on ocean ecosystems.

Dr. Gaines is married to Peggy Lubchenco, an award-winning science teacher. Together, they have two daughters, one a Stanford graduate and the other a senior at Brown University. In his free time, Dr. Gaines enjoys hiking, diving, “biking in a big way,” and the ongoing process of “replacing 80 zillion agapanthas” in his yard with “native, edible, or bizarre [but non-invasive] exotic plants.”

_Bren News_ caught up with the new dean just before he officially moved to Bren Hall. Below are excerpts from that conversation.

**Attractiveness of the Bren School**

The Bren School’s collaborative Group Project model for the master’s program and the range of disciplines involved are a perfect fit for where my own passions lie. I love the collaborative interface of science and policy and the focus on solutions.

For me, looking from the outside, a foundation of the success of the Bren School is that it was designed from the beginning to tackle the problem of connecting environmental science and management, as opposed to putting an umbrella over a group of people and programs that already existed. Now, that doesn’t mean you can’t do good work by putting an umbrella over things. But I think there’s a unique opportunity when you’re in the modern era, the scope of the challenges is clear, there is a range of things that need to be brought to bear on some of those challenges, and you can design something that, de novo, is innovative and would be hard to cobble together at another institution. That’s why I think Bren has been so successful.

**Quality in the Quantitative**

The Bren School gives students real strength in the quantitative skills needed for environmental problem-solving. I think students who complete this curriculum have an advantage over those who come out of other programs. Some students will undoubtedly be worried about the quantitative rigor of our program, but it is a huge benefit to them in the future. When I was in D.C. recently to give a talk, I met several former Bren students who work in various positions. I also talked with several of their employers, and they just raved about how effective Bren alumni were in their jobs. One big part of their enthusiasm was the core quantitative strengths they brought to problem solving. That’s a strong aspect of the program here and something we want to maintain.

**The Value of Not Knowing**

The most fun I have in academia is dealing with students. That’s true both in research and in the classroom. What I like most about science is that very early creative phase when you have a problem and you don’t yet have a clue what the answer will be. You’re bouncing ideas around and trying to come up with a possible solution. I have those moments all the time with students because they’re frequently coming up with new problems that no one has solved or maybe even thought much about.

A lot of grad students who come to interview me to work in my lab ask me what kind of projects I’m looking for students to do. And I say, “I’m not going to give you a project. To me, grad school is where you define your passion, and I’m going to help you do that.”

If you’re not excited when you don’t know the answer, you’re not going to go through all the drudge and hassle it takes to come up with creative solutions. You have to revel in that phase of unknowing. And that happens all the time with students as they develop their own intellectual personality and discover what their passion is in life and what big problems they’re going to solve.

**Teaching Collaboration**

The biggest advances in environmental issues in the past fifteen years have typically come from collaborations among people who bring different strengths to the table. The question is how to educate students so that they can effectively identify others who have complementary strengths and can also work well together in teams.

The whole education area is ripe for innovation and thinking about how we can develop students to become better collaborators and problem solvers in team settings. The Group Project model is a key step in this direction, and I think the Bren school can be an international leader in teaching collaboration.

**Interdisciplinary Communication**

Part of the success of any collaboration depends on effective communication and training across disciplines, and that’s one of the things that getting broad interdisciplinary training helps you do—acquire the language of the disciplines and approaches that others take, so that even if you don’t bring a particular discipline to the table, you can appreciate the contribution of whoever does bring it.

Communication is a problem across disciplines, particularly because people who work in a discipline hang out together and develop jargon. It’s more convenient within a discipline to come up with terms that capture complex ideas in a single word, but that jargon kills collaborations and diminishes the ability of science to play an effective role in policy and management.

The Bren School’s new dean, Steve Gaines
Cover Story

You need to be able to turn off the jargon, step back and say “Who’s your audience?” and translate your ideas and what’s important about them to an array of audiences.

A Question of Balance

How to balance the disciplinary and the interdisciplinary is an important question, and I don’t think we have the answer yet. But I like the Bren School approach. There is great value in having people be broadly trained as individuals, but some programs have gone too far in the way of giving students a little bit of everything. The Bren School doesn’t do that. It emphasizes competence in a core set of strongly related disciplines, with the expectation that students will specialize in some component of that core curriculum. It doesn’t try to cover everything you can imagine in environmental science and management. I think the real advances come when you combine your disciplinary strengths with a deep appreciation of the value that comes from working with others who complement your talents.

The PhD context

We should be looking for opportunities to offer collaborative training exercises for PhD students who are potentially going into academic careers. Traditionally, PhD programs have focused on training in the meat of the science a student is going to do. But in most programs, there is very little training in the vast amount of other things you’ll have to do to be successful in your career. Teaching is one example.

In the typical training, you become a TA, you’re thrown into a classroom, and you learn by doing. To some extent, that’s how training in collaborative work in the environmental sciences goes, too. But trial and error is a crazy way to learn. I’ve been involved in a number of collaborations without ever having any training on how to do it. Some were quite successful and others were not. There’s certainly no formula for it, but there are a lot of skills—communication, comfort in sharing ideas and data, a whole range of things like that—that can make more efficient collaborations possible and can jump-start students toward success. I think there are probably opportunities to build in some programmatic structure that will serve our PhD students in innovative ways.

Eco-Entrepreneurship

Eco-Entrepreneurship has me really excited. I don’t know of anything like it anywhere else in the country. It builds on the mix of Bren’s core strengths in environmental economics, corporate environmental management, and the other environmental sciences, and it integrates an understanding of the potential for market-based and business-oriented solutions as an important component in solving environmental problems. It’s new, it’s the right idea, and it has great potential in terms of outside funding. And there is clear interest among incoming students. The question as we go along is how to structure it so that it’s successful. We have to be careful because the goal is not to add more and more classes. Bren master’s students are already going through an intensive program, so that’s a challenge—to develop the curriculum so that you’re not adding an entire MBA onto the MESM program.

The Eco-E focus taps into the unique way that the UCSB Engineering program has had to deal with the fact that there is no business school here. I believe the challenge of not having a business school actually creates an opportunity to come up with something that is better suited to the kind of students we attract. At many other schools where you get this connection, there is both an MBA and some form of a master’s degree in environmental science. They’re two separate programs and you get two degrees. That’s not integrated training. We are creating a better model.

Environmental Justice

There are some interesting opportunities for building bridges with other programs on campus. One that came up during my interview process was environmental justice. As with environmental media, we have unique strength on campus, and the Bren School can play an important role in advancing it. There are a lot of people at UCSB who work in various aspects of the issue of environmental justice—in Sociology, Black Studies, Chicana and Chicano Studies, for example—but the focus is dispersed and there’s no real “home” for it. I’d like to see if we can nucleate some new activity in that area because it’s an incredibly important issue. It’s also an opportunity to grow not by adding space or faculty, but by developing an interesting new program from existing elements.

The Value of Previous Experience

MSI was interesting because it has no core faculty or students. Everyone is there because they want to be. The only way this model succeeds is if you’re able to pull the right people together to do something new and innovative that gets them out of their normal departmental walls. That fits right in with how the whole Bren School model works, so I’m kind of pre-adapted. I’ve had lots of experience thinking through this whole notion of collaborative models and what it takes to do them. I’ve lived that.

In administrative positions, you have resources, so you have to step back and identify where there are opportunities and good ideas worth investing in. I like to create a climate where people can think wildly and come up with really interesting ideas. And then I try to do my best to help make them happen. My prior positions helped me see how you do that within the administrative structure of a big institution—where the opportunities are, where the roadblocks are that you have to live with, where you can look to the campus for help, and where you have to go outside for the resources to do something.

Partnering Beyond Academia

I like the model of building pipelines between the university and outside groups like NGOs and businesses, who are effective at implementing things. That model is ripe for the Bren School.

If you do your research and then hand it off to an NGO in the policy arena, there’s a variety of things they can do. They’re also experts. If we didn’t have the Environmental Defense Fund and the Nature Conservancy as partners in the work we’ve been doing on sustainable fisheries, we would never have had the impact we’ve had. It’s exactly the same thing as interdisciplinary training in science. You can’t be fantastic at everything, so find partners who complement your strengths. You have to think about the whole process, things go in the normal way: everybody focuses on what they do well and then kind of magically assumes, “I’ve already solved that problem so why isn’t the world using it?” It’s just not going to happen that way.
Climate Pieces – Part 2

Bren School faculty members work to fill in the climate-change picture

The previous issue of Bren News (fall 2009) included the first part of an article describing Bren faculty members’ climate-change-related research. Here, Part 2 of the story introduces the climate-related work of six more Bren faculty members. The diversity of their efforts—in everything from Sierra lake ecology to industrial ecology to economics and the water-energy-policy nexus—reflects how broadly climate change affects natural and human systems, while demonstrating Bren faculty members’ important contributions in addressing what may be the single most important issue of our time.

The Value of Variability

As part of his interest in ecological responses to climate changes, Bren professor John Melack has collected long-term data from field measurements and observed how the data fluctuate during periods of change in precipitation or temperature.

"In that context, what’s long-term mean?" he says. "If you’re making measurements yourself, it’s limited by your career length, so the longest data sets I have are about thirty years at this point."

His studies have been conducted primarily in two places—Sequoia National Park, in the southern high Sierra; and Mono Lake, in the eastern Sierra.

Melack explains that the Sequoia studies are valuable in two ways. "The Sierra snowpack is a key element of the climate in California," he says. "Of course, the snowpack varies in terms of its water content—the ‘snow-water equivalence’—and changes in the amount of snowfall cause a change in the length of time the snow covers the ground and the length of the runoff period. In one of our studies, we have examined the importance of nitrogen in these systems and how its retention and loss is related to how long the snowpack lasts."

What he found “is that you actually get more loss, more export, and less retention of the nitrogen when there’s a longer snowpack. Conversely, in a shorter season, you get less nitrogen loss, more retention, and more growth.”

There are a couple of reasons for this. First, in years of greater snowpack, the growing season is shorter so plants have less time to take up nitrogen. And because Sierra soil is insulated by the snowpack and therefore doesn’t freeze, more snowpack means more time for microbes in the soil to decompose organic matter and for nitrogen to be converted to a soluble form under the pack. Then, the greater amount of water volume from the snowpack flushes out more nitrogen.

Melack cites this example not to indicate a desirable or undesirable effect of climate change, but rather, to demonstrate the particular contribution of such focused long-range studies. "If you look at the climate trajectories that are being predicted based on modeling of weather, you see that the snowpack in the Sierra will become less and there will be more rain," he says. "Even though the time-series data we have is not showing that trajectory in and of it-
self because there's a lot of variability with the data, it does show what happens under conditions that are predicted to become more common. So it’s an example of how you can use variability to interpret the potential impacts of trend-related changes."

The same principle applies in his work at Mono Lake. There, his data reflect measurements of how ions mix in the lakes—in other words, what comes into the lake and how the ions are stratified and how the mixing affects the phytoplankton.

"Depending on the snowpack run-off, the ecology of the lake changes," Melack says. Again, the importance of this research lies in how data reflecting year-to-year variability can be used to anticipate changes that may result from longer-term shifts in climate.

"The main message is that in trying to examine the potential effects of climate change, you need a whole suite of approaches," he says. "Long-term data show what may happen and can allow you to interpret some portions of the projected changes."

**The Industrial Equation**

Bren assistant professor Roland Geyer focuses on three areas of research: life-cycle assessment (LCA), which involves identifying and evaluating the potential environmental impacts of product systems throughout their life cycles; end-of-life strategies aimed at closing product and material cycles through such strategies as recycling and reuse; and reducing greenhouse gas emissions (GHGs). One new project related to AB 32, the California Global Warming Solutions Act of 2006, provides a natural integration of all three.

After AB 32 passed, the California Air Resources Board (CARB) developed a scoping plan to meet the mandate that California reduce its GHG emissions to 1990 levels by 2020. As part of the plan, the Department of Resources Recycling and Recovery (CalRecycle) is assessing the GHG benefits of an Extended Producer Responsibility (EPR) approach. EPR refers to processes by which manufacturers assume greater responsibility for the end-of-life fate of their products. The goal is to increase product reuse and material recycling, incorporate more recycled materials into products, and, when appropriate, redesign products to eliminate materials that create waste-disposal problems.

The goal, says Geyer, "is to calculate to what extent such strategies will reduce greenhouse gas emissions."

The two-year, $300,000 project has three parts. First Geyer and his colleague at UC Berkeley, Arpad Horvath, will combine input-output LCA and process-based LCA to create a state-of-the-art hybrid LCA platform for calculating the life-cycle GHG emissions of products. They will then prepare case studies for several sample products to understand the potential benefits of an EPR approach in terms of GHGs and other environmental impacts.

"We'll be looking for high-volume products that have problematic materials and substances, and potential in terms of implementing EPR strategies that would likely generate large GHG benefits," Geyer says.

In the third part of the project, the researchers will provide California-specific guidelines for determining if products with recycled content have reduced life-cycle GHGs in comparison to products not made with recycled materials.

"We're seeking to reduce waste-management problems while getting GHG benefits," Geyer says. "What we don't want to do is reduce GHGs and cause another problem, as with some biofuels, where you reduce GHGs somewhat but may end up with fuel-crop monocultures and biodiversity deserts."

A recognized expert in both LCA and end-of-life management, Geyer has also served as an LCA consultant to World-
of collaborators have spent the past several years developing software that does more by addressing two key problems of corridors. First, the land where corridors need to be established may not be available because of agriculture or other development. Second, a species may need to migrate up to 150 miles to reach suitable new range but may not be able to move quickly enough to keep up with climate change. It would be better if the species didn’t have to travel so far. The software Hannah has helped to develop offers a solution that may prevent it from having to.

As the screen animation continues, other areas of color appear to indicate locations of current protected areas. Using an optimizing algorithm intended to result in the least amount of new protected area necessary, the software then identifies sections of land close to a reserve that, if protected, would link a species’ current range to its future range while using much less land than corridors typically require.

“It doesn’t try to create a corridor; it adds area at the edge of existing parks,” Hannah says. “We use species models and conservation-planning software to decide where to put new protected areas in response to climate change. We know that most of the preserves are not in the right places because they were established before climate change was considered. This approach lets us answer the question, ‘If you did design for climate change, where would you put the protected areas?’”

Hannah and Bren professor of ecology Frank Davis have worked with teams from the South African National Biodiversity Institute and Australian National University to extend the software so that it accounts for such forces as fire and wind as agents affecting dispersal. A paper on this new model, called “Bio-Move,” is scheduled to be published in the journal Ecography this spring.

The Energy-Water Nexus

In the past two years, Bren professor Arturo Keller has worked with Bren master’s students on a pair of projects at the nexus of energy, water, and climate, with funding from the nonprofit Electric Power Research Institute (EPRI) and Southern California Edison. They have investigated how energy and water efficiency translate into savings of electricity needed to move water, natural gas used to heat it, the water itself, and associated greenhouse gases [GHGs].

“Energy is so strongly related to the carbon cycle,” Keller says. “The linkages between energy, water, and climate have become pretty obvious.”

In 2008-09, the first student group examined opportunities for energy savings in the residential sector, looking at such things as water-efficient showers and washers. “As you reduce the water needed, you also reduce the need for natural gas and electricity, and associated GHG emissions,” Keller explains. “It’s important to look at the whole system.”

For the 2009-10 academic year, students in a master’s Group Project focused on a commercial sector in California; hotels were chosen because of their substantial impact on state energy and water use. Working with Keller, Sarah Nichols, Isaac Pearlman, Gabriel Sampson, Jasmine Showers, and Randy Turner (all MESM 2010) conducted energy audits of three hotels—a newer hotel in Goleta, an older one in Santa Barbara, and a still-older property in Riverside.

Riverside was particularly interesting, Keller explains, because most of its water comes from northern California and has to be pumped over mountains, so any inefficiencies are magnified in the system. “If you lose a lot of water and if that water has a lot of ‘embedded energy’, you have a lot of energy lost and extra GHG emissions,” he says.

Santa Barbara’s water, on the other hand, is almost “energy-free,” according to Keller, because it flows downhill for the most part. “You have water treatment and wastewater treatment, and wastewater uses the most energy,” he says. “That’s important to know because any water you don’t put into the wastewater system reduces the energy implications of the system overall.”

The project is aimed at developing a rebate system to incentivize the required changes in behavior by addressing efficiencies in all the areas. “If you can structure rebates in a way that rewards for savings in energy, water, and GHGs, you can change behavior and give the government more bang for its buck,” Keller says, adding that addressing current economic realities is also part of the project’s scope. “Even if you can show that efficient washers save
Faculty Research

money, hotels may not have the money to invest right now. We’re trying to show them where the low-hanging fruit is to help them prioritize their investments as money becomes available.”

Keller says efficiencies in single hotels can be expanded to have a real impact. "One hotel doesn’t change much, but if you multiply what can be saved in a single hotel by all the hotels in California, it goes a long way," Keller says. "The idea is to influence policy makers so that they come back with rebate and incentive programs that help businesses make the necessary changes."

Science-Policy Synergy

Bren adjunct professor Robert Wilkinson also works at the water-energy-climate nexus, with a focus on linking water and energy science to policy, particularly by supporting government agencies as they seek solutions to their increasing energy- and water-related challenges.

"The question for me is how do we take good scientific information and good economic analysis and translate that into good policy to address the issue of climate change," he says.

Wilkinson has deep roots in such work. In the 1990s he coordinated the California component of the U.S. national assessment of the impacts of climate change for the U.S. Global Change Research Program. He also co-authored a roadmap for climate change research with the California Energy Commission’s Public Interest Energy Research Program, a major funder of climate research in California. He recently was named to a blue-ribbon panel for the Metropolitan Water District, the state’s largest, charged with developing a fifty-year future business plan for water in Southern California. And he is currently serving on the Water-Energy task force of the California Climate Action Team, formed as part of the implementation process for AB 32, California’s "Global Warming Solutions Act," which became law in 2006.

His wide-ranging research is always linked to policy. In one project, he developed the methodology for quantifying and understanding the energy embedded in water systems. It was used by the California Energy Commission to determine that 19 percent of the state’s electricity and one-third of its non-pow-er-plant natural gas goes to water.

"That was much higher than had been previously thought," he says, adding that the ability to quantify the energy and related emissions also made it possible to include water-use efficiency and water reuse as emission-reduction strategies in the scoping plan for AB 32.

Wilkinson also serves as a kind of relay station between science/academia and policy. On one side, he says, is "understanding the nature of the policy challenges that decision-makers in business and government agencies face, in order to help them make use of the available science." On the other is the academic view. "We ask, ‘Here is the nature of the policy challenges coming to us from the decision makers,’” he says, “so what do we in the academic community need to be doing in terms of the research agenda to provide them with the information to make sound policy decisions?”

Adjusting. Adapting. There’s a Difference

Much of the field of environmental economics deals with the motives and incentives that drive behavior related to the consumption of limited natural resources. Charles Kolstad, professor of environmental economics at the Bren School, is interested in how two closely related elements—uncertainty and learning—affect such motives.

Uncertainty is, as it sounds, a function of what is and is not known. With respect to climate change, Kolstad says, "People are unsure about how serious the problem is. They’re uncertain about its dimensions, the consequences of the change, the consequences of regulating emissions, and the natural science of the problem.”

Learning, not surprisingly, refers to acquiring knowledge that can displace uncertainty. "We’re becoming better informed about climate change over time," Kolstad says, adding, "The fundamental questions then become: when should you take action and how much? When do you know enough? In some cases, I can say that if I know I’ll have perfect information tomorrow, I should not do anything now. But we also know that if we wait too long on climate change, we can dig ourselves into a hole we can’t get out of. So there’s this tension that says basically: how should we regulate the precursors of climate change?"

Recently, Kolstad has been conducting research to determine who actually bears the cost of climate-change mitigation policy and, related to that, he says, "to measure the adaptation that occurs as countries experience climate change.”

He explains: "If it’s colder outside today, you put on a jacket and you’ve almost perfectly adapted to it. A farmer facing climate change can go to a seed catalog and buy a different seed and he will have partially adapted to the change. If you apply that logic to our entire society or economy, you can start to understand how we may or may not adapt to climate change by adjusting to the changes it brings, and where the costs are.”

Both adjusting and adapting are important but not the same. Kolstad gives the example of rising sea level. "Ultimately, Manhattan will be underwater, and ultimately, the financial district will move to Westchester County, and ultimately, everything will be fine [with respect to the financial district]. But the transition, the adjustment as sea level rises is going to be enormous. The adjustments are the most important in terms of damage. The same logic can be applied to ecosystem disruptions.”

Kolstad is also interested in the actual amount of economic "damage" incurred. "How do you measure what might hap-
“pen?” he says. His answer is to use real-world data to quantify the nature of the adjustments made as part of the climate-adaptation process.

He explains by way of an agricultural example: “If you’re a farmer expecting an average July but you get a heat wave, how much does that impact your output? Now suppose that the climate is actually changing. What’s going to happen is that heat waves will become more common. You’re going to think that July is the old average July, but now, more frequently, you’re going to get a heat wave and your profits will suffer. And after a while, you’ll realize that an average July might now be warmer than it used to be. So you’ll adjust to that, but in the meantime you’ll suffer a lot of cost and lost profit. So you start at the farm level and then work up to represent the entire agricultural sector.

“Knowing that for the whole economy is valuable. We’re proposing spending all this money to clean up our act, but what are we getting for it? Ultimately, you have to be able to point to significant damage that will occur if you don’t do anything about it. Based on that, you are then more than justified to take steps to control climate change.”

Since fall 2008, the Zurich Financial Services Distinguished Visitors Program on Climate Change has been extending the climate-change discussion at Bren by enabling the school to host three visitors each year for a period of several days to several weeks. The most recent visitor was Lynn Scarlett, who served both as Deputy Secretary and Acting Secretary at the U.S. Department of Interior under President George W. Bush.

During her two-week stay at Bren last fall, Scarlett taught a short course titled “Lands, Waters and Wildlife in a Changing Climate: Science, Policy and Management”; presented a public colloquium on climate change and cities; and met regularly with Bren students and faculty.

The Zurich Distinguished Visitors are having a particularly powerful and favorable influence on students. The short, intensive courses the visitors teach allow students to mix up their course work by delving deeply, if briefly, into a narrowly-focused subject. Further, having access to these thought and policy leaders can open new doors.

“It was amazing to have such personal access to someone with experience at the highest level of environmental management, not only during class time but one on one during office hours,” says first-year MESM student Jake MacArthur. “A lot of the topics she discussed were national issues that we all know about, and she was a key decision maker. That’s pretty unbelievable.

“We had an assignment to write a brief on a current adaptive-management issue,” he adds. “She thought my group’s brief was interesting and told us, ‘We need to get this on the desk of these people.’ She named several people, and she knew them all. ‘I felt empowered. I felt that I could personally impact something. And we ended up proposing a Group Project out of that.’

“It was great to get her experience and her perspective in high-level government service and to hear what went on behind the scenes in the Bush administration,” says Ariana Arcenas (MESM 2010). “She mentioned that when she went into government, she knew she might not agree with certain decisions, so she drew a line in the sand: as long as it could be backed up by science, she could go along with it. It was nice to see how she made a rational decision about that. She was good at bringing together the Bren idea, which I see as having passion for conservation tempered by realism and an ability to get things done.”

“I think the Distinguished Visitors program is one of the highlights of the MESM experience because of that access and the opportunity to learn from a practitioner,” adds MacArthur. “There’s value in having outsiders come to the school. It broadens our education, and most of us are going to be practitioners, so it’s good to learn from them.”
Gifts for Group Projects

Group Projects are an identity element of the Bren School. They serve as the master’s thesis while providing students with the opportunity to develop critical project-management skills, test the knowledge they have acquired as students, work effectively on a long-term collaboration, and make a difference in the real world while still at Bren.

Students do not receive pay for their work on the projects, which do, however, incur costs similar to those associated with any research effort. In the past several months, the Bren School has received contributions from the following companies, which have the vision to appreciate the value of Group Projects in solving environmental problems and training future environmental leaders.

“We are extremely grateful for these generous gifts in support of Group Projects,” says Bren School Dean Steve Gaines. “The projects are of fundamental importance to our students as they prepare for their professional lives, and this kind of support serves to make this extraordinary component of the Bren School program even stronger.”

The ACE Group: Innovation Rewarded

The ACE Group has made a $25,000 contribution to the Bren School to support master’s students’ Group Projects. The gift from ACE, one of the world’s leading global commercial-property and casualty insurance and reinsurance organizations, establishes the ACE Group Project Fund. When possible, it will be used to support projects that promote a healthy and sustainable environment and further reforestation projects and the conservation of land, water, and wildlife in the regions where ACE employees live and work. It will also support projects that contribute to initiatives intended to guide environmentally related risk-management decisions for the insurance industry and/or promote entrepreneurial ventures that address environmental problems while promoting economic sustainability.

“ACE’s commitment to addressing the serious issue of climate change includes reducing greenhouse gas emissions from our global operations, focusing a portion of our philanthropic support on environmental causes, and developing insurance products and services that help companies mitigate their environmental risks,” said Robert McCarty, senior vice president and regional executive officer of ACE USA’s western region. “We’re pleased to partner with the Bren School to pursue our mutual goals of fostering real-world research in the environmental arena.”

A certain amount of serendipity was involved in the gift finding its way to the Bren School. When ACE Group employee Joel Cesare, senior underwriter in the ACE Environmental Division, and his colleagues in the ACE Green L.A. Committee took first place in the company’s environmental innovation contest, they earned an award of $25,000 to direct at a nonprofit organization of their choice.

Cesare had been introduced to the Bren School by several Bren alumni. After he and his team won the ACE prize and visited the Bren School to learn more about it, he knew where he wanted the winnings to be directed.

“How many times do you get a large sum of money with the direction to benefit the environment in whatever way you choose?” Cesare says. “We wanted to seize the opportunity, we wanted to reflect the conservation initiative that’s prevalent in Southern California, we wanted to address the environmental impacts of cities and large corporations like ours, and we wanted to have as broad and lasting an impact as we could.”

Then he learned about the Bren School Group Projects. “It was amazing to see how far-reaching the projects were, that they addressed water-resource programs in Mexico, river-protection strategies in China and issues quantifying environmental impacts of multinational companies. We looked at how Bren students tackle these problems and the costs associated with a project and thought, ‘Wow, with $25,000, we could impact up to eight different projects all over the world.’ We thought this was a great thing to do, to put the money into the hands of graduate students who are dedicating their lives to finding the best ways to achieve a sustainable balance with our environment. I believe so much in what we donated our money to and am so proud of my company.”

Environ Foundation

The Bren School has been awarded a grant from The ENVIRON Foundation in the amount of $25,000 to support Group Projects. The ENVIRON Foundation was established to provide financial assistance to endeavors that benefit the environment.

ENVIRON is an international consultancy that works at the intersection of science, business, and policy to help clients resolve their most demanding environmental and human health issues. Funds from the ENVIRON Foundation grant will support Group Projects that address the protection of human health and the sustainability of the global environment, particularly as they relate to the impact of chemicals and the use of Earth’s natural resources. Projects may also be included that address the impacts of chemicals and nanotechnology on the environment and human health.

“The ENVIRON Foundation is particularly interested in supporting programs that will help inform the public-policy dialogue with sound science,” says Dr. George Linkletter, immediate past chair of the ENVIRON Foundation Committee. “The committee was therefore particularly interested in the emphasis that the Bren School Group Projects place on solving often technically complex environmental problems within the larger real-world context of identified societal needs and challenges.”
Family Memorial Gift Supports Students

On behalf of the Robert L. Boughton, Jr. Educational & Scholarship Fund, the widow and son of the late Robert L. Boughton have made a memorial gift that will provide $20,000 for student support. The gift, given by Sally Anne Boughton and Bob Boughton, will make possible one $10,000-plus fellowship and one $5,000-plus award to recruit outstanding master’s students to the Bren School. The gift also provides for two $1,000-plus Summer Internship Fellowships for current master’s students.

Bob Boughton is senior engineer in the Office of Pollution Prevention and Green Technology at the California EPA. He received his BA in chemistry at UC Irvine, then earned his MS in chemical engineering at UCSB before the Bren School was founded. He first learned about Bren after meeting with the environmental management group at Toyota in 2003 and says that he recalls being “very impressed with some of the recent Bren graduates there and hearing about Toyota’s support for Bren.”

Several years later, after being introduced to Bren assistant professor Roland Geyer and learning more about the program, Mr. Boughton became a strong advocate. Both he and Geyer are experts in life-cycle assessment (LCA), and in the Bren School, Mr. Boughton saw a chance to make a difference with a memorial gift from his family.

“My father thought everyone should have the opportunity to receive higher education, so when he passed away, Sally and I wanted to fulfill that ethic,” he says. “I wanted to support UC and the environmental field at the post-graduate level. The choice became easy once I saw how Bren melds environmental science, business, and policy to produce people who can navigate the corporate world.”

Recent Donors
The Bren School would like to thank the following for their recent gifts of support.

ACE USA
AECOM Government Services Inc.
Association of Environmental Professionals
Camille Bertolaet and Dennis Aigner
Joan and Jack Amon
Michelle Apodaca – Deckers
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Norman N. Brown
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Vickie and Mark Carlson
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Louisa and Stewart Cushman
Danvera Foundation
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Deckers Outdoor Corporation
Kelly and Charlie Eckberg
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Dani and Mel Willis
Yardi Systems, Inc.
Patrick A. Yellin
Lisa Youngworth
Margaret A. Zahiler
Zurich North America
Alumni News

2000
Jamie Goldstein (MESM) was recently named city manager for the City of Capitola. He was appointed to the position a little more than a year after becoming Capitola’s community development director.

2001
Gregory Simon (MESM 2001), Vicky Krikelas Simon (MESM 2002) and their family have relocated to Denver, where Gregory began a new position as assistant professor in the Department of Geography and Environmental Sciences at the University of Colorado, Denver. Vicky continues to telecommute as the outreach coordinator for NOAA Fisheries Service’s Northwest Fisheries Science Center in Seattle.

2002
Vicky Krikelas Simon (MESM; see Gregory Simon, 2001)

2006
In March, Amanda Cundiff (MESM 2006) was promoted to partnership coordinator for the California region of the U.S. Forest Service. She looks forward to using her new position to start conversations about broad issues, such as water, recreation, and connecting with urban kids, between the Forest Service and new, non-traditional friends and partners of the agency. To become one of the agency’s new friends, contact Amanda at: acundiff@fs.fed.us. Amanda’s new band (below), “The Extension Agents,” recently raised more than $4,200 at a benefit show for Haiti earthquake relief (extensionagents.com).

2007
Maria Mircheva (MESM) had her second child in August 2009, a baby boy named Max. The family (from left, below: Maria, Max, Sasha, and John) lives in South Lake Tahoe, where Maria leads a small nonprofit called the Sugar Pine Foundation. It is organizing plantings in Tahoe and Butte County this spring. This summer, Maria and John will be building a passive solar house in the Angora Fire burn area.

2008
Marion Wittmann (PhD) is a post-doctoral researcher with the UC Davis Tahoe Environmental Research Center. She conducts ecological research of an invasive bivalve, the Asian clam, which has recently invaded Lake Tahoe and is aggressively out-competing native species and altering sediment chemistry and water quality, which may open the door for other aquatic invasive species, such as the quagga mussel. Marion and her collaborators have found that laying large rubber mats over the clam beds (above) reduces the concentration of oxygen in the water to zero, killing all clams under the cover within approximately thirty days. The researchers will expand the experimental treatment this summer, covering one acre of lake bottom with the rubber sheets.

Max and Jennifer Miller DuBuisson (MESM 2008) were married on October 10, 2009 in a small ceremony at the Santa Barbara Courthouse gardens. Max and Jen met at the Bren School, and currently live in Redondo Beach, California. Max is working for the Climate Action Reserve, and Jennifer is employed at Mattel Inc.

2009
Heather Berkley (PhD) has accepted a job in the Biology Department at the University of the Incarnate Word in San Antonio, Texas. She is teaching two courses: Diversity of Life, and Anatomy & Physiology.

In November 2009 Damon Turney (PhD) began his first post-Bren job, working as a research scientist at Brookhaven National Laboratory, where he investigates life-cycle assessments of solar-energy technologies and leads laboratory investigations of recycling chemistries for retired or defective solar panels.
Shooting for Sustainability
Douglas Varchol’s documentary films bring hidden issues into focus

It can be tricky catching up with Douglas Varchol (MESM 2006), who says of his somewhat vagabond life, “Since I graduated from the Bren School, I haven’t lived anywhere for longer than ten weeks.”

That has everything to do with his work as a documentary filmmaker, which keeps him traveling constantly, with occasional stops at home bases in Los Angeles and Bangkok.

Since graduating from Bren, Varchol has been around the world “a couple of times” as part of what might be called his second career in film.

His first was writing feature films in Hollywood, where he might work with a producer for months only to see his project nixed. When a friend asked him to make a series of TV documentaries for a “Discovery Channel type of program,” he left Hollywood behind. “I segued from the 90-minute Hollywood screenplay to doing interviews on location,” he says. “I began to teach myself how to shoot. And now I’m producer, director, and camera guy.”

That means he also has to sell his ideas for his environmental films to funding agencies and media outlets.

“There’s a top tier of people who decide what films get made of the kind I do,” he says. “You’ve got to be right there on the front of the cutting edge. Now for instance, no one will pick up anything about climate change. It’s saturated. So we tend to look at the esoteric stuff. Generally, it’s the kind of under-the-radar material that CNN won’t do.”

The Bren School, and particularly the relationships Varchol has developed with Professor Oran Young and his colleagues in the Bren School’s Program on Governance for Sustainable Development, Durwood Zaelke and Matthew Stillwell, have been crucial in helping Varchol maintain his place on that leading edge.

At Bren orientation, Varchol met Young, who talked about the international governance work he was pursuing, often with Zaelke and Stillwell. “That international level of engagement—international politics, environmental law, and environmental policy—was really intriguing to me,” says Varchol, who, shortly after coming to Bren, accompanied Zaelke on a trip to a meeting of an international law organization in Morocco.

Since then, the filmmaker has continued to network with these experts on governance, policy, and international law, and because of Zaelke’s extensive work for the Montreal Protocol (which led to an international ban on ozone-depleting chlorofluorocarbons), Varchol says, “I became involved in developing media programs for ozone and other issues.”

Varchol was in Denmark for the Copenhagen Climate Summit and has developed a series of films for BBC World, to air in 2010. “They’re kind of post-Copenhagen, what do we do now sort of thing,” he says. “The focus will be on non-CO₂ fast-action solutions, such as cutting black carbon [a subject Zaelke has addressed recently]. I’m feeding into Durwood’s experience. Everyone has been focusing on CO₂, but it’s so politicized with big oil, coal, etc., so the question becomes, what else can I do? Durwood, Matthew, and Oran are at the cutting edge of all that, and I’m able to feed into it.”

Varchol took an unusual route to the Bren School (MESM 2006). He was shooting in India for a nonprofit group that works to preserve ancient Indian Sanskrit texts. When the next leg of the trip, to Saint Petersburg, Russia, was canceled, he came to Los Angeles and considered his options.

“I wanted to take two years off and kind of think about what I wanted to do next,” he says.

He had been accepted to the Bren School but was undecided whether to attend. Then he was offered a job filming the dating experiences of middle-aged women in Las Vegas for a reality show.

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“Not that the trials and tribulations of middle-aged women are not real and significant to them,” he says. “And it could be very interesting, but not for me in the style that would have been required by the production company.
So I said, ‘No, I can’t do it’ and I went to Bren instead.”

Since graduating, he has served as managing editor for the fall 2007 “Wired Science” series on PBS, but he has spent most of his time making films for the BBC’s “Earth Report” documentary series. Among them are Climate Fever, which investigates the spread of disease caused by factors resulting from climate change; Blast, the story of Filipino dynamite fisherman; Perfectly Cool, which looks at the phase-out of hydrochlorofluorocarbons (HCFCs), the Montreal Protocol, and the air-conditioning boom in China; and The New Ivory Wars, an examination of DNA-based technology that allows ivory to be traced to a specific elephant heard in Africa.

Varchol has just completed filming a new Earth Report about preserving biodiversity in Laos, which will be aired on BBC World News this spring.

Like other Bren alumni, who often must translate science for businesses and policy makers, Varchol makes films for a broad audience. “We’re not making technical pieces,” he says. “We’re making pieces that people will watch and then understand that there’s a real problem. The challenge is to make your message clear to the public and do it with scientific integrity.”

The productions are small and the obstacles many, but the reach of the BBC films is extensive. “BBC is broadcast around the world, and each film runs five to six times,” he explains, “so it’s really effective at getting the word out.”

Through all the stories he shoots, he maintains a heightened awareness of the people who are involved in and affected by the condition or process he is documenting.

“This is very much a people-oriented endeavor,” he says. “When you’re in developing countries, it’s important to help people feel comfortable. The whole business is to get inside wherever you are, and that happens when people talk.”

If people provide the best access to an issue, they are also the focal point of Varchol’s every effort as a filmmaker. “People are the reason I do this,” he says. “I’m trying to make stories that resonate for people.”

More on Varchol’s films: www.bren.ucsb.edu/varchol.htm