Going Global: International Internships

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Dean’s Message

As this issue of Bren News was being prepared, California was experiencing an especially warm, dry winter. In Santa Barbara, we had summer temperatures in February, while the Sierra Nevada mountains had a fraction of their usual snowpack.

There’s no way to know if our balmy winter was a weather anomaly or a climate change canary, but warm January days inevitably lead to thoughts about the kind of altered climate that may lie in our future should atmospheric concentrations of greenhouse gases continue to increase.

Amid uncertainty — such as how much and how quickly temperatures will rise — lies the certainty that climate change is occurring and will increasingly create impacts that require solutions. Formulating those solutions – which are necessarily multidisciplinary — requires new knowledge and innovations, as well as people who speak the languages of science, management, economics, law, business, and policy. Bren School faculty and students do.

In this issue, you’ll meet people from the Bren School community who are generating and sharing the knowledge that is needed to address a range of environmental challenges, nearly all of which are somehow linked to climate change.

Our newest professor is ecologist David Tilman (opposite), the world’s most widely cited environmental scientist. His current research focuses on ways to use biodiversity as a tool for biofuel production and climate stabilization through carbon sequestration. Adjunct faculty member Robert Wilkinson (p. 5) is noted for his important advisory work, particularly to policy makers, at the intersection of energy, water, and climate change. Professor Bruce Kendall (p. 6) is a quantitative ecologist whose models integrate large amounts of field data to aid resource managers in developing strategies for addressing issues, climate change among them, affecting plant and animal populations. And we highlight a highly ranked journal focusing on resource economics, which was co-founded and is co-edited by Professor Charles Kolstad (p. 6).

On page 10, you’ll meet several Bren School master’s students who traveled to international internships last summer, working on projects in unfamiliar settings that required them to be smart, resourceful, self-motivated, and resilient.

Finally, on page 8, we share how the newest master’s specialization, Energy and Climate, reflects the Bren School’s interdisciplinary focus and foundation.
“I find I’m smiling a lot,” said David Tilman while taking in the ocean view from his office on a warm February day. One of the world’s most distinguished ecologists and its most cited environmental scientist, Tilman arrived at Bren Hall in January as the newest Bren School professor. He was happy to be back in Santa Barbara.

“I spent two fabulous sabbaticals at NCEAS [the National Center for Ecological Analysis and Synthesis], and I came to Bren last year,” he said. “I greatly enjoyed the master’s students I taught. They’re an amazing group, with great enthusiasm, intellect, and desire to go out and do good for the world and the environment. It was fun to be part of that and to interact with some faculty around research questions.”

He said that the “biggest excitement” for him and the three PhD students and two postdocs who came with him from the University of Minnesota is being part of a new and different intellectual group.

“The Bren School faculty is very strong in both classic ecology and applied environmental sciences, and they are new people for me with new ideas,” he said. “I study biodiversity, but I’ve found that intellectual diversity is an incredibly important part of the creative process. I have come to anticipate with a lot of joy what happens when I start partnering with new people and we attack a question from our different perspectives. This feels like a second career.”

While in residence here for the winter quarter (he’ll be back again next winter), he was hoping to begin a new collaborative project focusing on sustainability and ocean aquaculture.

“I’ve long been interested in the environmental impacts of expanding human demand for food and energy, but I have never dealt with seafood, and fish is a large part of the animal protein diet for people around the world,” he says.

Tilman began his career as a PhD student studying the impacts of agricultural runoff on phytoplankton in Lake Michigan, and the Environmental Protection Agency was soon using his model to inform its regulations limiting nutrient levels in the Great Lakes.

He has pursued the application side of science ever since, saying, “When I come up with a result, I try to make sure I can communicate it to people who might find it useful. That’s one reason I give a lot of the talks I give.”

He is, as he puts it, “busy on the policy side,” having testified before several committees in both the U.S. House of Representatives and the Senate. He has presented to President Obama’s staff in the White House Office of Science and Technology Policy and served on numerous science advisory bodies for the National Academy of Science and the National Research Council. He was invited by the Obama administration to serve on two different panels that advise the Presidents’ Committee of Advisors on Science and Technology.

His research continues to build on issues of biodiversity.

“Everything in my life sort of grows out of some simple ideas,” he says. “It’s amazing how when you pursue ideas and keep broadening your perspective, interesting things come up.”

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**New Locker Makes Surfers Happy**

A grand opening was held on January 11 for the new Bren School surfboard and wet suit storage locker and changing room behind Bren Hall, created as a gift from the MESM Class of 2011. The event was attended by class co-chair Michaela Clemence, who, with co-chair Justin Derby, worked closely with their class to collect funds for a gift that will enhance the Bren School for years to come. Also on hand were staff members and student surfers hoping to win (by lottery) one of the 17 surfboard slots. The storage space — which measures roughly 6 feet by 15 feet and is fitted with hooks and hangers for wet suits, racks for surfboard storage, and an outdoor shower — has been seeing heavy use during a run of good surf following the facility’s opening. Thanks, Class of 2011!
Faculty and Staff News

Professor Gary Libecap spent the 2010-2011 academic year as the esteemed Pitt Professor of American History and Institutions at Cambridge University in England. Every four years the position goes to a distinguished American economist who studies some facet of American institutions. Two Nobel Prize winners have preceded Libecap, whose work on property rights and the interface of the law and economic behavior qualified him.

"It was an over-the-top honor; I was totally stunned," he says, adding, "It was an amazing year."

During his time at Cambridge, Libecap taught natural resource economics to graduate students and American economic history to undergraduates, while living in an elegant centuries-old flat that evoked the Old World at every turn.

"You're at a university that's almost nine hundred years old, giving lectures in buildings that date to the sixteenth century, and you're coming from California, where nothing is that old," says Libecap, who occasionally wore traditional robes (above). "We pride ourselves on being at the forefront of innovation and new ways of doing things, while Cambridge prides itself on the test of time. It couldn't have been more different."

Bren School associate professor Christina (Naomi) Tague is part of a team of researchers embarking on a five-year NSF-funded collaboration to better understand carbon-nitrogen-water interactions at the regional scale and in the context of climate change.

Their first task is to integrate several state-of-the-art modeling protocols into a single platform called BioEarth, which is intended to support decision makers as they seek strategies for managing natural and agricultural resources amid changing climatic conditions.

Tague is one of seven co-principal investigators from six institutions working on the project, each a lead developer or user of one of the modeling frameworks. For the past several years, Tague has been directing the evolution of RHESSys, a GIS-based hydrology and biogeochemical modeling program that simulates the cycling of, and interactions among, carbon, water, and nutrients in watersheds.

"If all the models are running together in a system, we will be able to look at the many land-use planning scenarios and determine, say, which forest management practices worsen the situation and which practices improve it," Tague says.

Sage Davis was hired in January as the new Bren School Building Manager. Davis, who has a BSc in mechanical engineering and a professional certification in project management from UCSB, brings a wealth of experience in engineering and construction to his new position at the Bren School. He worked in technical and engineering support at Santa Barbara Automation and served as Lead Design and Manufacturing Engineer with Gyrex Corp.

For the two years prior to arriving at Bren Hall, he worked for Ohannessian Construction, serving as assistant project manager on a three-year project that incorporated numerous green building technologies.

The building manager holds an important position at Bren Hall, as he has responsibility not only for routine building maintenance, but also for maintaining a link with UCSB facilities and the UCSB Sustainability Office to monitor and maintain the many sustainability features that have earned Bren Hall two LEED Platinum certifications.

This is also Davis’s seventh year as co-coordinator of the Santa Barbara Green Car Show, held in conjunction with the city’s Earth Day celebration in April.

Assistant Dean Bryant Wieneke represented the Bren School at “Job Creation Day,” an event hosted by Rep. Lois Capps last October in Washington, D.C. The Central Coast congresswoman invited 31 area constituents to join her and high-level officials from the Small Business Administration, the Department of Education, the Business Council for Sustainable Energy, and the Center for American Progress to discuss job-creation opportunities and obstacles.

Minority Leader Nancy Pelosi, Minority Whip Steny Hoyer, and Rep. Rosa DeLauro joined the discussion, as did Gene Sperling, Director of the National Economic Council, and Melody Barnes, President Obama’s Domestic Policy Advisor.

"I was impressed that the President’s key economic advisor and other government leaders joined us, were willing to listen, and were so engaged in the process," says Wieneke. "It was valuable to have a voice in this exchange of opinions and ideas and important that the Bren School be seen as a contributor to growth and innovation."

Wieneke said that he found a clear consensus among the people he met that “the next wave of job creation in the U.S. is going to come from clean energy.”
Bren School adjunct professor Robert Wilkinson has a good amount of natural science in his academic background, but when it came time to earn his PhD, he chose political science, for one reason. “I became more and more concerned that, in many cases, we have good science and good economic analysis, and yet we’re making poor decisions,” he says. “I thought, Why is that? That led me to get into the policy realm to try to figure out ways to improve the outcome of these policy decisions.”

Recently, he has focused on developing methodologies to quantify the energy it takes to extract, move, treat, and use water; the water required by energy systems; and the greenhouse gas emissions (GHGs) related to those processes. Largely as a result of that work, he now spends a lot of time in Sacramento, Washington, D.C., and overseas, advising government agencies and others on energy-water policy. His new book, The Water-Energy Nexus in the American West (Edgar Elgar Publishing), is co-edited with Douglas S. Kenney, a University of Colorado law professor.

Wilkinson is especially interested in the potential of rain water, reclaimed/recycled water, and conserved (unused) water, describing them as “major sources of water in California that require far less energy and contribute far fewer GHGs than some we are currently using or are planning to use.”

But to meaningfully reduce GHGs generated by the water system requires the ability to quantify energy-intensity and emissions levels in order to establish a baseline. About a decade ago, Wilkinson got to work on the task. “We knew that we used a fair bit of energy to run our water systems, but nobody had quantified how much,” he says. “There wasn’t even a consistent methodological approach, so I set out to do the measurements and try to understand what was going on.

“I developed what became a generally accepted methodology for consistently measuring all the energy inputs at every step in the water-supply-and-use system, from pumping water out of the ground or from a surface water source, to moving and treating it, collecting and treating waste water, and even reusing water, as we do here at Bren Hall. It works for any water source and any system anywhere.”

Using his methodology, the California Energy Commission estimated that about 19 percent of the state’s electricity and 30 percent of its non-power-plant natural gas are used by the state’s water system.

“Those are significant numbers, and much bigger than people had generally realized,” Wilkinson says, adding that further analysis for the state Public Utilities Commission indicates that the amounts may be even larger.

The methodology also sheds new light on accepted views. For instance, conventional wisdom holds that fresh water obtained through ocean desalination is the most energy-intensive water of all, Wilkinson explains. “But, in fact, the energy intensity of water we pump long distances and over mountains can be equal to or in excess of what’s required for ocean desalination.”

Wilkinson explains that energy-intensive water evolved in an era where we were not thinking about climate change. “When we built infrastructure for water half a century ago, energy was not thought of as a significant limiting factor,” he says. “Oil was inexpensive and there was the expectation that it would stay that way. Nuclear energy, it was thought, would be ‘too cheap to meter’. So using large amounts of electricity to pump water over mountain ranges seemed reasonable.

But now, energy use and climate implications have a major effect on how we design both water and energy systems. Quantifying the energy intensity of the water system [and the GHGs resulting from it] allows us to calculate how much a specific action can reduce emissions. “It means that re-landscaping an area or changing the plumbing or capturing rain water is actually not just a water measure; it’s a water measure that has energy and climate implications, along with some other environmental benefits,” he says.

Seen in that light, activities that may not be worth doing only for the water savings may be more attractive, because they save energy and money, cut emissions, create jobs, and reduce pressure on stressed ecosystems.

“Our energy and water systems were designed using concepts, technology, and scientific understanding from roughly a hundred years ago,” he says. “We have a centralized grid to deliver power. We built dams on rivers. Those things worked, but with significant impacts. I think there’s every reason to believe we’ll have a different kind of infrastructure in the future. It will be more resilient and robust, less costly, less centralized, and have far less environmental impact, because we’ll be able to use resources much more efficiently, reuse resources, and capture resources locally rather than having to import them.”

Developing a reliable way for measuring the carbon footprint of water will remain one of Wilkinson’s major contributions to that effort.

Securing water takes energy. Robert Wilkinson’s methodology shows how much.

Title: Parsing the Energy-Water Equation
Mention a phrase like “environmental sustainability,” “habitat conservation,” or “species diversity,” and many people think immediately of pristine nature — beautiful places and the creatures that inhabit them. Bren professor Bruce Kendall thinks of those things, too, but as a quantitative ecologist, he also thinks about, well, math.

Population dynamics are his métier, and his math-intensive work involves modeling and analyzing data on abundance (the number of individuals in a population) and demographics (birth and death rates). He seeks to understand factors that cause populations to change over time, to predict the extinction risk of rare species, and to identify patterns of individual growth in changing environments and how they affect population growth rates. He then applies the science of population ecology to the conservation of rare species and to managing populations of harvested species.

For one project, he studied an endangered plant that was present in several Midwest prairie grassland reserves, which were managed in various ways but not specifically to protect that species. (Management priorities focused on controlling invasive brush and deer.) Kendall used years of data to construct population models that “allowed us to determine that reducing deer activity and controlling brush has a big positive effect on the plant’s ability to survive.”

The study results have informed management practices since then. “Models synthesize large amounts of data so that we can draw clear inferences and patterns of causality that you couldn’t get just by looking at the raw data,” he explains.

Kendall has also worked with Bren School professors Steve Gaines and Chris Costello, and others to assess populations of valuable marine species such as rockfish, urchins, and lobster. Adults of these species don’t move much, so scientists study highly mobile larvae to understand population dynamics. That usually involves estimating the number of larvae and then applying a diffusion model to determine where the adults will be. Larvae, however, are dispersed not by diffusion, but by constantly changing eddies and currents, and diffusion models don’t account for the irregular and unpredictable dispersal that results.

The researchers wanted to know how much dispersal and variation the currents create, and what their implications are for fisheries managers. Kendall worked on models to answer those questions. “It was also a great example of an interdisciplinary collaboration,” Kendall says. “It involved economics, fisheries management, ecology, and oceanography — and applying it all to the policy process.”

Bruce Kendall turns masses of data into models that inform decision-making

Bruce Kendall’s models give meaning to data.

Economics Journal Has Impact

Since its founding in 2007, The Review of Environmental Economics and Policy has become one of the world’s leading economics journals, thanks in large part to Bren School economics professor Charles Kolstad, who co-founded the journal and is its current editor. It is one of two journals of the Association of Environmental and Resources Economists (AERE).

The Review has gained success not only by finding a new and important niche, but also by establishing an editorial policy that insists authors employ style and language that are comprehensible to non-academics. That makes the journal useful to readers in government and industry, university students, and others.

“Accessibility is important,” says Kolstad. “We want it to be read and used by people outside of academia, which is why we include almost no math.”

The formula has worked. The first year that the quarterly journal was eligible for ranking was 2010, when it had an “impact” rating of No. 7 among all of the approximately three hundred economics journals, and No. 2 out of roughly sixty journals of environmental studies.

Kolstad developed the journal with economists (and co-editors) Carlo Carraro of the University of Venice (Italy), and Robert Stavins of Harvard University. “We created it as a bridge between economics and policy, which are frequently separated,” he says. “It seemed there was a missing place for a lot of good work at the nexus of environmental policy and economics that the academic journals didn’t want.”

Kolstad says that having a third co-editor, former Massachusetts Institute of Technology professor A. Denny Ellerman, now based in Italy at the European University Institute in Florence, ensures the journal has “sufficient international focus.”
Racing for Renewables
A Chinese economist’s take on the competition in clean energy

Junjie Zhang is an assistant professor of environmental economics at UC San Diego who spent the fall 2011 quarter at the Bren School as part of the UC Center for Energy and Environmental Economics (UCE3) faculty fellows program. With a physical presence at UC Berkeley, UCE3 functions as a hub of research excellence in energy and environmental economics. Professor Zhang’s expertise lies in the role of carbon markets in renewable energy (RE) in China. Bren News sat down with him during his stay at Bren Hall.

BN: What’s behind China’s boom in renewable energy?
JZ: Several things. One is electricity consumption, which in China is growing by roughly 10 percent per year. Between 70 and 80 percent of China’s electricity comes from coal-fired power plants. China is hungry for electricity and has abundant coal, but because coal is dirty, it can’t be the energy future. So China is looking for alternatives. In this context, developing renewable energy becomes a national strategy for diversifying our energy portfolio and stabilizing energy supply.

BN: Is renewable energy seen as an important element of China’s modernizing economy?
JZ: Right now, China is the “world factory.” It makes everything. But that also puts us at the bottom of the value chain. You can’t make a lot of money at that, and it’s pollution-intensive. So, especially during the financial crisis, when there has been a big drop in overseas demand for Chinese-made products, China realized that this pattern of growth — making shoes and exporting to other countries — can’t continue. So there are two big contexts: one is the need for energy and the environmental challenge of securing it, and the other is the need for economic growth. The solution is to upgrade the industrial structure; China regards the renewable-energy industry as a promising engine of future growth.

BN: How important is renewable energy in China’s environmental policy?
JZ: Coal-fired power plants create greenhouse gases and sulfur dioxide, of which China is the world’s largest emitter. In 2007, the World Bank estimated that pollution costs China $100 billion per year. It’s a serious problem. At the Copenhagen Climate Change Conference in 2009, China pledged a 40- to 45-percent reduction in carbon intensity, tied to GDP, by 2020. But as GDP rises, that percentage-of-GDP decrease will likely mean increased total emissions. I see it as a first step between doing nothing and having a concrete cap on carbon. Renewable energy is a big part of achieving the goal.

BN: Doesn’t China provide a lot more support to the RE industry than the U.S. does?
JZ: A Pew Foundation study ranked China first in RE investment, Germany second, and the U.S. third. In 2005, the Chinese government passed an RE law making a long-term commitment, and specific numbers were then included in the next Five Year Plan. This tells the world and investors, “We’re serious about this. We’ll provide you a very stable policy environment.” That is in stark contrast to the U.S. Here, the tax incentive for RE has to be debated every year or two in Congress, which creates huge uncertainty for investors. You need some money to make the U.S. competitive, and a bright spot here is that you still have the most venture capital in the world, but it is still small compared to the funds available to the government of a nation. And if there is no commitment to renewable energy and no clear policy, there is no way the private sector will invest to the level necessary.

BN: Should the policy for reducing greenhouse gas emissions be cap and trade, a carbon tax, or something else?
JZ: I’m pro-market, and from that perspective, the most important thing is to create a stable environment through legislation. I don’t care if it’s a carbon tax or cap and trade; those are secondary issues. The first issue is to internalize the total environmental cost, health cost, and climate change cost of coal-fired power plants and impose a price on it. If business knows what the game is, they’ll figure ways to work it out, and the market will sort out the best technologies.

BN: Do you have any concerns about large government subsidies?
JZ: Subsidies are costly and they create inefficiencies. We rely on them because everybody hates a tax. The best policy is to tax the dirty industry. Figure out the emissions caused by generating one megawatt of electricity, and put a price on them. It’s transparent and clean. Your emissions are the same as mine, and we pay the same price. That will fix the problem.
The 7th Concern

Energy and Climate: multidisciplinary facets of the newest master’s specialization

Two years ago, the Bren School added the Energy and Climate specialization to complement the other six areas of focus in the master’s curriculum. The approach to structuring the new specialization and presenting coursework within it reflects the school’s multidisciplinary, solution-focused orientation and builds on the strengths of the faculty.

“Energy and climate are two sides of the same coin, since nearly all greenhouse gas [GHG] emissions come from burning fossil fuels,” says Professor Charles Kolstad, who co-teaches the keystone course, “The Economics and Science of Climate Change” within the specialization. “They are intimately connected, so it’s logical to tie them together.”

“We didn’t create the specialization because climate change was the topic du jour,” says Associate Professor Naomi Tague, who advises students in the specialization and teaches the science side of the course with Kolstad. “We asked, ‘What are the particular skillsets we can offer, given our faculty’s strengths.’

“What’s unique about our program is the focus on solutions,” Tague adds. “We’re not working at a theoretical, global scale, asking philosophically why we should mitigate climate change. We’re saying that if you want to mitigate climate change, how are you going to do it — practically, in the real world?

“A lot of similar programs are more about understanding the motivations for a big policy fix like the Kyoto Protocol,” she adds. “But we’re solution-centered. We ask, ‘How do we reduce the amount of energy we use?’”

Assistant Professor Sangwon Suh is a specialization advisor who adds the perspectives of industrial ecology and life cycle assessment (LCA). “The specialization is unique in combining natural science, economics, and management of GHGs and energy by business operations; plus, there is a policy component,” he says. “My end is more focused on the private sector: I instruct students on how to measure a carbon footprint and how the private sector can use that process for decision-making and management.”

But students in the Energy and Climate specialization go much deeper than learning a process, Suh explains.

“From the private-sector point of view, you find that consultants in carbon footprinting, one of the most rapidly expanding areas these days, speak very well about how to conduct the process. But if you ask them deeper questions, for instance, about how greenhouse gases interact with atmospheric water, they don’t know. Most practitioners’ knowledge about the function of climate is about an inch deep. We bring in the foundation, the fundamental insights on which carbon footprinting efforts need to stand.”

Tague’s strength in modeling watershed systems also deepens the solutions focus of the specialization.

“To come up with strategies, you need estimates of how things will change,” she explains. “The primary way is through modeling. In some of my work, we’re studying how water availability in the Sierras would change given a two-degree warming. We’re modeling where and how quickly large-scale forest dieback might occur with increasing temperature, and testing management strategies for those conditions as we go. I’m not modeling climate change, but rather, an impact of climate change, which fits the Bren emphasis on solutions.

“We could build a whole specialization just on climate physics, but we don’t do that,” she adds. “We provide a foundation for understanding the basic physics around climate change, but we’re not training people to be climate modelers. We’re training them to use the information modelers provide in adaptive or mitigational strategies.

“We think not only about mitigation, but also about the effects of climate change and how we adapt to them.”
Students

MESM on the Hardwood

Growing up in Bozeman, Montana, Kirsten Tilleman developed a strong appreciation for the natural world. Growing up to be more than six feet tall, she developed into a highly recruited collegiate basketball player. Now, she is combining her talent on the court with her passion for the environment in her dual role as a first-year MESM student and a valuable forward for the UCSB women’s basketball team. As Bren News went to press, she had just been named MVP of the Big West tournament.

Tilleman did her undergraduate work in the College of Forestry at Oregon State University in Corvallis, pursuing a cross-disciplinary honors curriculum that combined studies in forestry with environmentally oriented courses in philosophy and sociology. After two years, circumstances led Tilleman, several of her teammates, and an assistant coach to look for opportunities elsewhere. She graduated in three years and, with two more years of eligibility, enrolled at Bren interested in acquiring an interdisciplinary understanding of natural systems and, in particular, “the human aspects — how we view the environment and ourselves in relation to it, why we have those views, how they inform our decisions, and the consequences of them.”

At Bren, where she intends to specialize in Conservation Planning and, possibly, Economics and Politics of the Environment, she has again taken up the challenge of being a student-athlete.

“One of the great things about playing basketball at UCSB is that I don’t have to work to avoid having it negatively impact the rest of my life.” Rather, she says, “It’s a positive supplement to my Bren studies. My coach supports me on and off the court, and Bren does, too. I’m able to work with the two aspects of my schedule so that I can give my best to both.”

Putting the Social (Media) in Science

PhD student Lindsey Peavey used web-based crowdfunding to support her sea turtle research

When second-year Bren School PhD student Lindsey Peavey needed funds to conduct open-ocean research for her PhD dissertation on olive ridley sea turtles, she didn’t go to the traditional sources. Rather, she tapped into the growing world of crowdfunding.

The concept involves a process similar to one charities and nonprofits use: seeking many donations of all sizes rather than a big chunk of money from a single source. It can be effective for smaller, focused projects.

Peavey and each of the other 48 scientists who participated in the “SciFund Challenge” developed a multimedia online fundraising campaign, including a short video about their project and a written narrative explaining why they needed support. Together, they ran a 45-day campaign on RocketHub, a web platform that hosts crowdfunding efforts. Individuals could go to the SciFund page, find a project of interest, and donate directly to the scientist.

“It’s an innovative way for the public to support the science they deem important,” says Peavey, whose $3,243 total was 30 percent more than her goal. “I don’t think it will replace traditional science funding, but it’s a great source of supplemental funding, as well as an outreach tool.”

The scientists used e-mail, Facebook, Twitter, and blogs to drive people to sites promoting research about a variety of topics, from Amazon crayfish and ancient Roman DNA to stress as a factor in genetic mutation. Participating in SciFund forced the researchers to speak in plain language about their research to engage broad audiences. Collectively, they raised more than $76,000 from 1,440 contributors and garnered a good deal of media coverage, including an article in The New York Times.

“I find it amazing that, with few exceptions, those who did well were those who consistently reached out to larger audiences,” says Jai Ranganathan, an ecologist at UCSB’s National Center for Ecological Analysis and Synthesis (NCEAS) who worked with NCEAS post-doctoral researcher and USCB alumnus Jarrett Byrnes to create the SciFund Challenge. “Crowdfunding creates the incentives in science for doing that, rewarding precisely the behavior that is required for scientists to effectively reach audiences with their science message. It could be the secret ingredient that shifts the culture of science in the direction of engagement.”

Going Global

International internships open a world of experience for Bren master’s students

Most Bren School master’s students spend the summer between their first and second year performing internships for a variety of companies, government agencies, NGOs, and other entities. Every year, some of those internships lead students beyond the United States. Here, we catch up with students from the Class of 2012, who recount their experiences in the Dominican Republic, New Zealand, Chile, and England.

Reef Work in the DR

Before coming to the Bren School, Danni Storz had applied for a number of marine-mammal-related internships and had been accepted to none. “They are highly competitive because, basically, everyone wants to play with dolphins,” she says. “Regardless of my extensive experience working with marine mammals in various settings, I wasn’t successful in obtaining a single internship.”

When it came time to find a summer 2011 internship, she applied for the same kind of positions again, but this time, “with Bren on my resumé and the professional training and personal marketing this program has provided, I was accepted for three of the four marine-mammal internships I applied for.”

But she chose instead to work for Reef Check in the Dominican Republic, she explains, “because I knew I wanted to go international, and even though I had marine-mammal opportunities, I thought coral reef restoration would allow me to expand my resumé and marketability, as well as explore other opportunities in ocean conservation.”

During her ten-week stay in the DR, she worked with Acropora coral, an important reef habitat provider that is so endangered, a reserve is not enough for it to recover. She wrote a project proposal to the Ministry of Environment, worked on installing the infrastructure for an ocean coral nursery, and gathered and segmented corals from existing gardens and transplanted them into the newly established nursery.

Storz also developed a training program modeled on the protocol of the Eco-diver course that Reef Check International uses to train volunteers to assess reef health, so that the all-volunteer coral garden project would be sustainable. Additionally, she developed a protocol for monitoring coral bleaching, so that bleaching-resistant genotypes can be identified and introduced to promote diversity in the restoration garden.

Her “wonderful experience” included an infusion of local culture. “It was the Caribbean but richly Latin, complete with merengue, salsa, and bachata — the dance in the DR,” she says. “We went out dancing a lot!”

Note to the DR-bound Brennie: prepare to dress up at night. Storz packed for a summer of outdoor living and says, “I looked like a California hippie, while the locals were dressed to the nines. When my fiancé came to visit, I had him bring me some appropriate outfits.”

Kiwi Water Issues

Kevin Huniu knows first-hand how hard it can be to get the internship you want — and that sticking with it pays off.

With New Zealand his preferred destination, he says, “I sent out more than a hundred e-mails and talked to everyone on campus who might be able to help me, but I turned up only fluffy internships you had to pay for.”

He eventually found the website of the Land Care Institute, and from there was referred to a project leader at the National Institute of Water and Atmospheric Research (NIWA), the equivalent of NOAA in the U.S. Several e-mails later, a project leader wrote him back, saying, “I’ve got something for you.”

Huniu was stationed in the city of Hamilton, where he lived in a hostel, chopped wood in exchange for staying at a co-worker’s place, and had a room of his own in another flat. He saw much of the North Island during his three-and-a-half month stay, which he paid for with funds from a Boughton Award at Bren.

He was assigned to the Aquatic Pollution Group, which is working to address the environmental impacts of intensive dairy farming, particularly nutrient loading in rivers. The group is developing advanced pond systems that capture and treat dairy-shed wastewater effluent and produce methane for energy generation. Huniu spent a lot of time monitoring projects and collecting field data and says the internship “fit perfectly” with his double Bren specialization in Water Resource Management and...
Pollution Prevention and Remediation.

"I just tried to help out wherever I could," he says, adding that he took his Bren School training with him.

"Bren introduced me to the concepts that I'd need to learn to practice out in the field, and to the multiple elements — scientific, political, and economic — of environmental problems. They're so intrinsically linked. We had to collect the scientific data to prove our point to the politicians, so that they'd provide the subsidies to build these systems."

On the Road in Chile

Sometimes, everything lines up right. Jennifer Price and Marisa Villarreal were fortunate that the Wildlife Conservation Society (WCS), client for their Master’s Group Project on the bioeconomics of aquaculture in southern Chile, also provided funds to travel to Chile for internships.

Price and Villarreal spent last summer working in Chile, couch-surfing, traveling (mostly by bus) to gather information and perspectives from stakeholders, and interacting with fellow group members Willow Battista, John Ellis, Kelsey Jacobsen, and Lindsey Kaplan, who came for a shorter time. They visited eight cities, from Santiago in the north to Punta Arenas and the Patagonia region, at the bottom of the continent.

“We went to get a comprehensive idea of the industry and the experts in it, who are spread out all over,” says Villarreal. “We met with people from labor, tourism, government, artisanal fishing communities, and conservation groups.”

“WCS gave us a list of stakeholders, and then we set up meetings, all in Spanish,” says Price, noting that they sometimes struggled with Chilean Spanish, which has a lot of slang and is spoken quickly and with an accent that was unfamiliar to them.

“The days were a hodgepodge,” says Villarreal. “We stayed in places for a week and spent a lot of time orienting ourselves: finding bus routes and directions and making sure we didn’t miss anyone.”

“We felt pressure to impress our client and make a difference,” adds Price. “Talking to people who were impacted by aquaculture inspired us to do our best so we’d have a Group Project that would be useful to our client and the region. It was an amazing experience.”

“It was interesting and a little exhausting, and so valuable for our project,” says Villarreal.

“I don’t think we could have done the same project without the trip,” adds Price.

“A year ago, Patagonia wasn’t on my radar as a place to go to, but I was blown away and would highly recommend going there.”

London: Trial by Fire

Joel Cesare returned from his summer internship in Great Britain with a message for Bren students: “You can learn anything you have to.”

He had to learn plenty during his ten weeks at Dalen Strategies, a startup green-building consultancy in London. The unpaid position came with an iPhone, a laptop, an "Oyster Pass" for public transportation in the city — and all the responsibilities of a project manager.

Before Cesare arrived, Dalen had won an important job for a high-profile client that wanted LEED Gold certification for a new building.

“There are not many LEED Accredited project,” says Villarreal.

“...and so valuable for our project,” says Villarreal.

“I don’t think we could have done the same project without the trip,” adds Price.

“A year ago, Patagonia wasn’t on my radar as a place to go to, but I was blown away and would highly recommend going there.”

MESMs on the Road

Here are some other students who spent time abroad this past summer.

Marina Feraud spent a month in Lake Tahoe and another in the Lake Baikal watershed in Mongolia and Russia as part of her work with the Tahoe-Baikal Institute Summer Exchange Program.

Kurt Heinze was in Geneva, Switzerland, for three months with the Environmental and Natural Resource Programme at the International Centre for Trade and Sustainable Development.

Andy Prosser went tropical for two months, working with the Coral Reef Advisory Group in Pago Pago, American Samoa.

Ariadne Reynolds spent eight weeks as an aquaculture intern at the Cape Eleuthera Institute in the Bahamas.

Harry Vickers worked for WHEB Partners in London, Europe’s largest clean-tech venture capital fund, and spent time with the Yawanawa tribe in the Brazilian Amazon.

Lindsey Kaplan monitored wildlife in South Africa’s Kruger National Park, and later joined her Group Project team in Chile.

Edward Walsh completed a twelve-week internship in the Chemicals Branch of the UN Environment Programme in Geneva, Switzerland.

Qiong Wu spent eleven weeks with the Green Economy Initiative for the Economics and Trade Branch of the UN Environmental Programme, also in Geneva.

Kevin Huniu’s internship took him to New Zealand beauty spots, like the roaring Waikatu River.

Stakeholder boat (clockwise from front right): Marisa Villarreal, Jennifer Price, their translator, and leaders of an indigenous community motor up an inlet on Chiloé Island, off the coast of southern Chile.
Students

“Stoving” in Peru

Engineers Without Borders students complete a project in a high-mountain village

Bren School students in the UCSB chapter of Engineers Without Borders (EWB) have made multiple visits to Araypallpa since 2004, when EWB launched a water-filtration project in the Peruvian village. In the past year and a half, five Bren students — Fernando Accame, Joel Cesare, Marina Feraud, Greg Soulages, and Alex Silvester — (all MESM 2012) have played key roles in another Araypallpa project, this time to build improved cooking stoves. The traditional Araypallpa kitchen has small windows and no chimney, and the inefficient wood-burning mud stove belches smoke. Working in collaboration, Silvester (the team’s stove design manager), Cesare (the Peru project manager), Accame, Feraud, Soulages, and UCSB engineering students developed a prototype of an improved stove based on the community’s needs. They then built one in a Goleta backyard, complete with their own handmade bricks and mud mortar.

Their intention was to test the stove in Peru last September, when they, along with other UCSB EWB students and their professional mentor and stove expert, Dr. Charlie Sellers, would spend two and a half weeks in Peru. But they had to redirect their efforts when they discovered that the village, which is located near Cuzco at an elevation of nearly 11,000 feet, had already received new stoves from the Peruvian government as part of a nationwide program. Shifting their focus, the students were able to meet with government officials at a stove building and testing facility in Lima and then travel to Araypallpa on a new mission, to evaluate how the new stoves were being built and used.

That meant spending a lot of time “stoving” — or cooking with villagers while assessing whether they were using the stove correctly or had any questions or complaints. The team produced a video of best practices starring the community members so that knowledge could be shared among them.

“The cool thing about EWB is that Engineers Without Borders students complete a project in a high-mountain village,” says Cesare, whose Bren specialization is Economics and Politics of the Environment. “I am a LEED AP, so I was brought in as ‘the U.S. expert on LEED.’ The architect and the engineer wanted my recommendations for achieving LEED Gold, but I had never been on a design team in my life. It was trial by fire, but that was my boss’s management style; he wanted employees who were entrepreneurial and took the initiative.”

Cesare says his Bren training helped. “It gave me the confidence to be able to tackle any kind of challenge I came across. I was brought in as an expert, and with my experience in research and being conversant in multiple disciplines, I was able to work my butt off and become that expert. It was intimidating, but by the end, I had a pretty good feel for working with a construction team and LEED.”

He stayed with classmate Harry Vickers’ parents, and says he got a kick out of being “a thirty-year-old having to explain to Harry’s mom why I was out late the night before or why my attire might not be appropriate for a certain meeting.” (Vickers also served an internship in his native London.) “It was amazing to gain environmental-business experience outside the U.S.,” Cesare says. “Companies in Europe are forward thinking, and they can clearly thrive within cap-and-trade regulations. They don’t see it as a hindrance; they see it as necessary. A company like mine exists and employs multiple people because of the system.”
New Corporate Partners

Corporate Partners invest in corporate sustainability and the development of Bren students as future leaders in the field of environmental science and management.

Raney Associates
Environmental and Energy Policy Consulting

Raney Associates: The Santa Barbara–based company provides consulting and dialogue facilitation in environmental and energy policy. A primary focus of the firm’s recent efforts has been developing collaborations among industry, municipalities, and utilities in the interest of bringing better information and refined strategy to the process of identifying markets for advanced-technology vehicles and the development of infrastructure to support them.

For more about the Bren School Corporate Partners Program or to download a pdf summary (right) of the program, visit us on the web at: www.bren.ucsb.edu/supporting/corporate_giving.html

EWB continued from page 12

it requires you to go through a rigorous engineering approach to a project so that funds aren’t wasted and you go into a community with a plan that has been thought through,” says Cesare. “It trains students like us to be better professionals. It was rewarding helping people who wanted our help, and a unique experience to live among people who live off their land.”

“It was a great opportunity to learn about the new stoves and work with the community to ensure that they were using them correctly and liked cooking with them,” says Silvester. “It reminded me of my Peace Corps experience — working with a community to solve problems together.”

EWB strives to ensure that its projects fit into local culture. In Araypallpa, guinea pig, known as cuy, is a delicacy. But it is apparently a little more difficult to cook in the new stove, so when one villager figured out a good method, the team added her “recipe” to the best-practices video — an ancient tradition updated for the benefit of all.

More on the web at: www.ewb-ucsb.org/peru-project

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1998
Daniel Wilson (MESM), owner and founder of Wilson Environmental Contracting, Inc., and the recipient of 13 professional awards, married in 2009 and became a father to a son in October 2011.

2000
Chris Coburn (MESM) and his wife, Nicole, welcomed twin boys, Andrew and Bennett, into the world on January 29, 2012.

Robin Cathcart (MESM) gave birth to a daughter, Skye Catalina, last June. Robin has been working at the University of Edinburgh, managing the UK Carbon Capture and Storage (CCS) Community network for nearly two years. She lives in Scotland with her husband, Simon, their 5-year-old son, Marius, and now little Skye.

2002
Last November, Mark Kram (PhD), founder and CTO of Santa Barbara—based Groundswell Technologies Inc., won the 2011 Technology Award from the National Ground Water Association. He, Groundswell, and Bren Corporate Partner Trifecta GS were also covered in a Jan. 31 article on the Forbes website titled “Environmental Security: Sensing the World in 4-D.” (http://onforb.es/A65mzd)

2003
Bryan Henson (MESM) was promoted to president of Allen Associates, the Santa Barbara area’s leading green building company. Bryan reports, “I will be at the helm of this 35-year-old company as we transition ownership from Dennis Allen (chair of the Bren School Dean’s Council) to the employees through an employee stock ownership program.”

2004
Erin (Darling) Bibeau (MESM) relocated to Ft. Collins, Colorado, in 2010 with her husband and is working as an environmental scientist for Golder Associates, a global company providing consulting, design, and construction services in earth, environment, and related areas of energy. Erin also has a photography business based around portrait, event, and landscape photography (www.erinbibeau.com).

2005
Rachel (Gore) Schohn (MESM) presented the results of a sustainability brand audit conducted at Pureology’s (a L’Oreal brand) annual press conference in New York City. Rachel, who works in a product marketing role at PE International, discussed the positive results of a life cycle assessment comparing new shampoo and conditioner bottles to old ones. Rachel lives in Boston with her husband and two children, Nathaniel, 6, and Juliet, 3.

Christopher Taylor (MESM) runs his own Sacramento-based company, Sovereign Harmony, providing small-business owners with what he refers to as “conscious business advising.” He has managed more than two dozen LEED projects and has provided extensive LEED instruction and training to building professionals. His work with Sovereign Harmony is based on the view that ever-increasing transparency, environmental awareness, and social connectivity are transforming the small-business economy.

Kristina (Estudillo) Tierney (MESM) and her husband welcomed their second child, Austin James Tierney, on June 4, 2011. In December, Kristina left the Marin County Planning Department to join Environmental Science Associates as a Senior Associate. Her new coworkers include Claire Myers (MESM 2008) and Justin Gragg (MESM 2000).

2006

Carissa Klein (MESM) and her husband, Travis, welcomed their first child, a girl named Stevie Joy Klein, who arrived on Sept. 25, 2011.

2007
Gabriel Brown and his wife, Kristin, are living in San Mateo, California, where Gabe is a manager at SolarCity and works with fellow Bren alum Mike Casterline (MESM 2003). “My role straddles the lines of science, finance, and policy,” he says. “I find that I refer to my holistic Bren education on a daily basis!”

Nick Kordesch (MESM) reports that the company he works for, Scientific Certification Systems, located in Emeryville, California, “continues to hire Bren students like crazy.” Five other Bren alumni currently work for the sustainability consulting firm. They are: Keith Killpack (MESM 2007); Alicia Godlove (MESM 2009), and Rori Cowan, Julie Holst, and Matt Valdin (all MESM 2010).

Hannah (Muller) Masterjohn (MESM) and her husband, Tim, welcomed identical twin daughters, Liah and Stella, on August 27, 2011 (pictured in their Halloween sushi costumes, top of next page). The family relocated to upstate New York, and Hannah left her position at...

2008

By mid-May, Anne Middleton (MESM) expects to be permanently based in the African nation of Cameroon as Environment and Community Relations Manager for Taylor Guitars, based in El Cajon, California. She helps the company define and implement environmental and social standards, and comply with timber trade laws, such as the Lacey Act, for their ebony-wood-harvesting operation in Cameroon.

Lara Polansky (MESM) co-chaired the U.S. Forest Service National Sustainable Operations Summit, held February 14-16 in Sacramento. The nearly sixty speakers (presenting in-person and virtually) included Bren associate professor Roland Geyer as well as Bren alumni Amanda Cundiff (MESM 2008) and Joshua Simmons (MESM 2006). See more at: http://1.usa.gov/oz4xpV.

2009

In January, Heather Lahr (MESM) began a new job as Regional Energy/Climate Planner for the San Diego Association of Governments (SANDAG). She works on energy-efficiency programs, electric-vehicle planning, and coordinating with local jurisdictions and San Diego Gas & Electric on energy and climate programs in the region.

2010

In January, Allison Fish (MESM) began a new job as an environmental scientist for the California Department of Pesticide Regulation in Sacramento. She is working in the School Integrated Pest Management (IPM) program, which promotes and facilitates the adoption of IPM programs in school districts throughout California.

Last October, Allison King (MESM) began a new job as Regional Energy/Climate Planner for the San Diego Association of Governments (SANDAG). She works on energy-efficiency programs, electric-vehicle planning, and coordinating with local jurisdictions and San Diego Gas & Electric on energy and climate programs in the region.

Man with a Plan

As Capitola’s city manager, Jamie Goldstein uses all of his Bren-acquired skills

Jamie Goldstein discusses policy at a meeting he attended while working for the Santa Barbara County Redevelopment Agency.

As the city manager of the coastal town of Capitola, just south of Santa Cruz, Jamie Goldstein (MESM 2000) has what may be the ultimate interdisciplinary job. From fixing potholes to pension reform and wetland restoration, he oversees the day-to-day operations of a city he describes as “definitely more environmentally focused than most,” adding, “Capitola has a long history of being at the forefront of environmental policy. It was one of the first jurisdictions to implement a ban on polystyrene, and it deeply weighs the pros and cons of any development project.”

But Goldstein has to bridge disciplines in areas far beyond the environment.

“In this position you’re faced with advocacy groups on all sides of every issue,” he says. “It’s always put in this Bren context of, OK, having no polystyrene in the ocean is clearly the best for the environment, but that being said, what are the legal, fiscal, and practical matters associated with implementing a ban? That’s what the Bren School is all about, focusing on the true cost of regulation and strategizing on how best to get there given the political, legal, and fiscal frameworks in which we have to operate.”

The range of issues he addresses includes anything and everything related to implementing policy, which is set by the city council and presents Goldstein with a highly varied diet of challenges.

“Every day looks incredibly different,” he says. “I need to understand a legal brief so well that I can argue it on an equal footing with attorneys. But at the same time, I have to meet with sustainability activists and understand where they’re trying to go, and then turn around and meet with my financial team when they tell me that the sales tax figures

see Goldstein on page 16
aren't coming in as projected and ask me how we're going to adjust the budget. It never feels like Ground Hog Day."

The challenging and, occasionally, frustrating job has him tapping into his Bren training every day.

"All the skills I use rely on what I learned while getting my degree at Bren," he says, "the legal training I got from seminars and classes, the discussions that forced me to argue a point articulately, the business classes where I learned to jockey a spreadsheet, the economics, understanding the environmental implications of decisions, and the broader understanding of all of those in a social context — that broad-based training has helped me a lot."

A self-described "failed engineer," Goldstein ended up majoring in atmospheric science at UC Davis, then worked for the Tahoe Conservancy before enrolling at Bren.

After graduating, he joined several other Bren alumni at Solimar Research Group. He focused on land-use issues in the Lake Tahoe basin and salmon recovery in the Pacific Northwest, providing a research context for studies intended to inform state and local policy decisions.

After about a year, he accepted a position in the Santa Barbara County Redevelopment Agency and, after an agency reorganization, ended up running it. But with most of his family in Northern California, he and his wife, Amy, eventually decided to look for opportunities up the coast.

"When you're leaving Santa Barbara, there are not a whole lot of places you want to go," he says.

He focused his search around Santa Cruz, and in 2008 accepted a job as the community development director in Capitola. When the city manager retired a year later, the city council asked if he'd be interested in moving into that appointed position. "After a lot of thought," he says, "I decided to put my hat into the ring, and I've been the city manager ever since."

Battered by opinions from every side of an issue, as city manager, Goldstein has to find the middle ground, particularly if he wants to keep a job he likes despite its challenges, saying, "I'll stay as long as they'll have me."

"One of the things I've noticed is that, as the country becomes more politically polarized, in this job I'm actively forced into the middle," he says. "Because I work for a board of politically elected officials who come from the left and the right, I need to be conversant in arguments from both sides. I have to think about how my most conservative member and most liberal member will interpret an issue. What are their arguments, and what's going to sway their decision-making? If you only understand one side of an issue, you're going to be an eighteen-month manager. There will be a change politically, and you'll be too affiliated with one side.

"I entered public service because I wanted to make a positive difference, and I believe passionately that this is a field where you can effect change," he adds. "It is not a city manager's role to adopt a particular policy; that is left to city councils. A manager's role is to recommend an action, and the best, most effective recommendations are those made using the best science, with a clear understanding of the fiscal and legal framework surrounding that policy. That's what keeps me interested and excited."