

ERG *Newsletter*

Energy and Resources Group

University of California, Berkeley

Commencement 2011 Edition

Friday, May 17, 2011, 10 A.M., Alumni House

Commencement Speaker: Peter Hayes

Peter Hayes, is Director, Nautilus Institute and Professor, Royal Melbourne Institute of Technology. He works at the nexus of security, environment and energy policy problems. Best known for cooperative engagement strategies in North Korea, he has developed techniques at Nautilus Institute for seeking near-term solutions to global security and sustainability problems and applied them in East Asia, Australia, and South Asia. Peter has worked for many international organizations including UN Development Programme, Asian Development Bank, and Global Environment Facility.

He was founding director of the Environment Liaison Centre in Kenya in 1975. He has traveled, lived, and worked in Asia, North America, Europe and Africa. He has visited North Korea seven times. He received the MacArthur Fellowship (2000) “for combining rigorous multidisciplinary training and technological knowledge with cultural sensitivity, policy acumen, and diplomatic skills...including non-governmental diplomacy of the highest order;” the Gleitsman Award (2001) for “exceptional achievement of people who have initiated social change;” and the Global Korea Award (2001) for “individuals or groups who have made significant contribution to cross-cultural understanding, global education, and well-being of Korean people around the world.” He was born in Melbourne Australia; today he is a dual national of Australia and the United States. He is married with two children. He graduated from ERG, UC Berkeley in 1989. He is on the editorial board of Pacific Focus, North Korea Review, and Global Asia. His publications are found at <http://www.nautilus.org/about/staff/peter-hayes/peter.html/>.



PhD Recipients

Anand Gopal

I came to ERG to get a Ph.D. and in the bargain met some of my best friends, realized that people at the World Bank and IMF are not really that smart, and, was shocked to learn that biking 10 miles a week does not justify describing yourself as an avid biker on your resume. Not a day goes by when I am not amazed by the skills, dedication, kindness and drive of my fellow ERGies and I am fortunate not just to have met them but to have the opportunity to work with them for the rest of my career.

Like many ERGies, my first two years were



a dizzying journey of excitement, discovery, confusion, panic and the eventual acceptance that I can only write one dissertation. My dissertation ambitions were gradually pared down from one that was going to bring modern energy services to all of the world's poor to assessing the lifecycle carbon content of sugarcane ethanol in India, Indonesia and Brazil, which my committee tells me is worthy of a Ph.D.

I am extremely grateful to my faculty advisors Dan Kammen, Mike O'Hare, Bob Dibble, Severin Borenstein, Arne Jacobson and the late Alex Farrell for their patience, trust in my ability, mentoring and numerous insightful ideas. My ERG colleagues contributed even more to improving the quality of my work through their hard questions, ideas to improve my papers and insightful feedback at Ph.D. seminars. My ERG life has been so much easier and so much

PhD Recipients continued:

more fun because of Bette, Jane, Lee, Donna and Sandra and it saddens me that the campus administration is treating all staff as if they are disposable. Above all, I'd like to thank my closest friends and family, especially my wife Elizabeth and my parents for supporting me through the long and uncertain journey that grad school is.



Barbara Haya

I started my PhD with a big question: how can industrialized countries support low-carbon development in developing countries effectively and without causing harm? I ended up documenting a

huge scam. Industrialized countries, that have accepted carbon emissions caps under international agreements, are allowed to partially meet their caps by buying carbon credits from projects outside of their borders, like from wind and hydropower projects in India, where I did my research. I documented that many of these projects do not actually reduce emissions. My work points to the need for industrialized countries to reduce emissions at home where emissions are the greatest, while also directly supporting emissions reductions in developing countries, rather than relying on dubious carbon markets.

I feel incredibly lucky to have spent these years learning from, being influenced by, and making life-long friends with a truly amazing group of individuals at ERG. This is a group of people that share a deep concern for protecting nature and social justice, and are putting their incredible talents towards this.

Derek Lemoine

ERG is a mysterious black box: it gathers a faint signal, adds dimensions of noise, and outputs a more robust signal that somehow points to two dimensions and all dimensions at once. It is a community with wide-ranging interests united by practical motivations. It is a training device for finding an interesting question, figuring out which field is the needed method, and following through to an answer. But most of all, ERG is an experiment in academic self-determinism. It opens doors around campus and permits new intel-



lectual combinations, with the student able to decide whether and how far to access any of them. At their best, our dissertations could pass a committee in three departments but would never have occurred to us were we actually in any of those departments. By providing intellectual space and opportunity, ERG's paths provide unlimited upside as well as the individual responsibility to realize it. By forgoing a standardized label, we force ourselves to actualize the value of inherent interdisciplinarity and to become comfortable categorizing ourselves more generally as thinkers and problem-solvers.

I owe special thanks to a few people. First, my family---David, Brenda, and Nathan--- trusted in any unfamiliar path. They taught me to watch, listen, and question, and to treat mastery and knowledge as a function of effort and desire rather than of a credential's gloss. Next, my committee members each proved invaluable in their own way. Dan Kammen does not let details block vision and is remarkably unconstrained by past templates. Christian Traeger is a wonderful collaborator, a true friend, and generous with his time, code, and ideas. Larry Karp, one of the best people to think through any problem with, worked with me in an early leap of faith and later opened professional doors. Every conversation with Mike O'Hare bounces across his range of knowledge and interests: from garbage contracts in New Jersey to the true reason planes fly to negotiating for squirrels to, maybe, the topic ostensibly at hand. Finally, two other members of the Berkeley community, Severin Borenstein and Max Auffhammer, always offered time they may not have had and need not have provided. Several unique collections of people have also made the last years special. The ERG faculty inevitably offers diverse perspectives, the staff builds then greases every wheel, the students support each other in life, and the Dragons provide the highlight of every week. Alex dictated never to interrupt yourself and always to search for the hardest challenge, while John discourses on what is best in life. Zoe has her schlag, but Christian lives through wolf naps and nighttime trail runs. And flitting through the background, Fritz dons a different disguise for each of his projects. Many times I longed to slow time so as to savor the stage of life and appreciate the openness of the future. At the same time, the unfurling of paths powers its own pull forward. At least, by the time we get there, the next stage almost feels natural.



Amber Kerr

When I joined ERG in Fall 2003, I had a tendency to lie awake at night wondering how to use my training in plant ecology to make the world a better place. I had come to the right place: soon I was drawn into the ERG tradition of combining natural

science with policy-relevant fieldwork in the developing world.

The topic of agroforestry (growing trees together with crops) provided a perfect opportunity to merge my ecological and practical ambitions. I wanted to know whether agroforestry could help farmers in sub-Saharan Africa adapt to climate change, but I was stymied by the logistics: all the climate manipulation experiments I'd heard about involved million-dollar NSF grants. An epiphany came one afternoon in my advisor's office: "Instead of CO₂ or temperature," she said, "why don't you try something more manageable, and manipulate rainfall?"

Thus my low-tech, high-sweat dissertation was born. I spent two years in Malawi in collaboration with the World Agroforestry Centre (ICRAF), studying how drought affects nitrogen-fixing *Gliricidia* and *Tephrosia* trees, which are used for soil fertility restoration. With local help, I designed and built thirty-six rain exclusion shelters – simple but effective, and (I hope) a template for future climate experiments in Africa. My conclusions: under drought, these trees can be vulnerable as seedlings, but when well-established can thrive and may even help protect maize (the staple crop) from disastrously low yields.

As I finish my thesis, the next chapter in my life is enticingly open: Research? Teaching? Policy? Hopefully, all three. My deepest satisfaction is sharing my enthusiasm for the natural world, and exploring our interdependency with it.

Throughout this adventure I have been sustained by my remarkable brothers and parents; my inspiring grandmother, whom I miss greatly; and my wonderful boyfriend Jeremy, for whose patience and love I am immensely lucky. I owe my academic progress to the dedicated mentorship of my dissertation chair Margaret Torn, my academic advisor John Harte, and my supervisor at ICRAF Malawi, Festus Akinnifesi. Heartfelt thanks to my fellow Harte Lab members, and to my Malawian colleagues and field assistants – ziko-mo kwambiri. To my many dear friends at ERG, I

say: once an ERGie, always an ERGie!

Zack Norwood

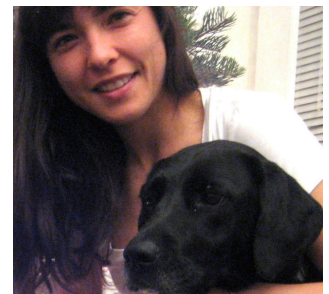
ERG has given me confidence that good things still exist in academia. My graduate student career at Berkeley has been long and varied, moving between three departments in two schools, and two national labs, but always tied to the exciting work and people of ERG. It started in 2005 at the Renewable and Appropriate Energy Laboratory when I was invited to give a presentation about driving a vegetable oil powered school bus between San Francisco and Costa Rica. For the next couple of years I attended every one of those RAEL meetings to soak up the diversity of ideas and interests. It was in those meetings that I realized that the narrow focus of traditional engineering wasn't for me. Apparently Berkeley Engineering agreed, as I was pushed out of one department, found a temporary home in another, and finally made my way to ERG in 2008 while concurrently completing a degree in mechanical engineering.

I remember fondly the days when ethanol was the buzz in ERG, and then how quickly it fell out of favor. Engaging in activism against the administrative bloat and the continued mismanagement of California public education has been both rewarding and saddening. Through all the excitement I was able to create a coherent dissertation entitled "A better steam engine: Designing a distributed concentrating solar combined heat and power system" while collaborating with great people on all sorts of other projects from municipal waste disposal to combined heat and power at the Sierra Nevada bottling plant. ERG has been fun times, a place for unbridled curiosity, and I will always remember my tenure here.



Gabrielle Wong-Parodi

Like many of you, I clearly remember receiving a phone call from Professor Dick Norgaard informing me that I had been accepted to ERG. I was at work at the time, and I remember jumping up and down for at least 30 seconds and then quickly rushing down the hall to tell my super-



PhD Recipients continued:

visor that I would be leaving at the end of August. A day or two later, after the news had thoroughly sunk in, I felt both excited and a bit anxious. Getting into ERG was a dream come true and while I understood the mechanics of what graduate school would involve, I had no clear idea of exactly what challenges and opportunities lay ahead.

Graduate school is challenging; there's no doubt about it. From the coursework to the successful execution of a thesis, and everything in between – there were times when I felt totally overwhelmed and wondered if it would ever end. Yet, there were moments, especially when I was out in Wyoming interviewing folks for my thesis, when I felt so incredibly blessed that being a student was my job. How many people get to do what we do? Everyday, we get to think creatively about solutions for problems that we find both interesting and important.

I feel so fortunate that I've had the opportunity to spend the last six years immersed in the rich intellectual community that is ERG. I know that I'll be able to draw upon the community as I go forward in my professional pursuits. Next year, I'll be a post-doctoral fellow in the Department of Engineering and Public Policy at the Climate and Energy Decision Making Center at Carnegie Mellon University. I'll be working on projects related to the application of social psychological methods to understanding how to effectively communicate with the public on energy-related problems.

Isha – for your grace, wit, and skillful guidance I want to thank you from the bottom of my heart. I also want to thank Alex Farrell, whose memory I will always hold on to closely and dearly. Thank you Sam, Derek, Sintana, Brett, Will, Fritz, Naim, Andrew, and Kevin. For your unconditional love and support, thank you Mom, Dad, Michael, Dina, Tiffany, Lia, Tracy, and Alex. And of course, I want to give a warm thanks to ERG faculty, staff and students.



Masters Recipients

Nate Aden

The ERG Masters program is well described as “drinking from a fire hose”. At the same time that professors impart multiple disciplines and data sets, fellow students provide inspiration through local activism, starting their own companies, and publishing new findings and approaches. One of the great things about ERG is that the mix of energy, resource, and climate research is grounded in a rich community of current and former ERGies. I came to ERG while working on China energy issues at Lawrence Berkeley Lab. My goal was to gather knowledge, tools, and collaborations to broaden my understanding of international energy use and climate impacts. During the past two years I have attained these goals while becoming involved in a range of energy, climate, and development projects. At this point it's not exactly clear how my various new interests and abilities will coalesce into my eventual ERG PhD, but understanding interrelationships is part of the essence of being an ERGie.

Prior to ERG I lived and worked in China and Southeast Asia for more than ten years. The challenge of incorporating development into global responses to climate change is one of my central research areas, especially as applied in Asia. Two of my favorite projects at ERG have been lifecycle assessment of China's electricity system under a global 450 ppm carbon dioxide scenario and an economic and policy-based feasibility assessment of using thin-film photovoltaics to provide backup electricity generation in India. I'm looking forward to more stimulating projects and conversations on the road to the PhD.

Audrey Barrett

My time at ERG, focusing on the nexus of public health and climate policies, has been a wonderful whirlwind tour! I feel grateful to have been a part of both the 2011 and 2012 Masters cohorts and think that the largest reward for grinding through problem sets about spherical cows, writing weekly reflections on all things academic, and attempting to truly understand what it means to be interdisciplinary has been getting to know my fellow ERGies - well. Late night badminton games in Barrows, weekend ski trips, potlucks, day hikes and interesting conversations in the “terrible-awesome room” brought life to my ERG experience. Not to mention the weekly discussions with

our dedicated and friendly ERG staff over the health of the ecosystem inside Dan Kammen's fish tank...and then my weekly walk over to Dick Norgaard's office to ask his opinion on how the world really works.

After three years of graduate studies at UC Berkeley, completing both a Masters of Public Health and a M.S. in Energy and Resources, I know that I am better equipped to call attention to the right kinds of questions when designing regulations and making policy decisions. I've truly enjoyed the flexibility that ERG granted me to continue my research with Tom McKone on the population health impacts of alternative fuels and the dynamic environment of ERG that afforded me the opportunity to jump from public health research to cap-and-trade program design to discussions on sustainable fishing, community participation, floating cities and the role of religion. I'd like to thank my family and friends for supporting me and listening to me say how busy I've been these past three years and everyone at ERG for your involvement in educating me on so much more than what's inside the classroom. As a Texan and an ERGie, I hope to continue my pursuit of effective communication on caring for our environment and the creatures that populate it.

Kristin Brainerd

I cannot begin to express my thanks to ERG. They let me, the most hated of all species - a lawyer - into this fabulous program. A couple of years ago, I decided to shift from environmental law to policy. While few people questioned my move away from practicing law, several wondered about my choice to become, once again, a grad student. I have to admit, there have been moments when I have questioned it myself - most notably while walking to 8a.m. classes and struggling with a certain spherical cow (my last problem sets dated back to high school). But on the whole, the experience has been so great, there is no question in my mind that it was the right choice. I have learned a tremendous amount. More importantly, I have had the chance to be a part of the incredible community that is ERG. I am regularly amazed by my classmates - for their breadth and depth of knowledge, as well as for what generous and caring people they are. I am also deeply indebted to the ERG faculty and staff for their time, encouragement and support (even, and perhaps especially, when it felt least deserved). I am proud to have (mostly) tackled that cow, and above all - and though it took some time to do it without



ERG women's potluck. laughing - I am very proud to call myself an "ERGie."

Jason Burwen

I joined ERG fairly unexpectedly. I had just returned to the Goldman School of Public Policy from Ghana, where I had run myself ragged on a randomized-control trial of an improved cookstove program. Dan Kammen was serving as my master's project advisor at the time; after presenting my preliminary findings, I was surprised to receive an email from him: "why are you not staying here for a PhD?!" I explained I was not focused in a particular discipline; this, I was told, was not a problem. And so, instead of continuing on in International and Area Studies as planned, I took to Energy and Resources Group "unofficially" in my first year, gradually showing my face around the department while applying to join officially. (Thank goodness I was accepted.)

I am honored that this community has accepted me as a belated addition, and I've learned so much from even the single year I've gotten to call myself one amongst you all. Conversations with other ERGies have been the intellectual highlights of my time here, much of which was otherwise spent crunching data, pushing through writer's block, and keeping up with classes. I am especially happy to have had the opportunity to work on cutting-edge energy policy during my ERG-sponsored internship at the California Public Utilities Commission. While I may not yet know how I will integrate my interests in low-carbon transition, international development, and econometrics, ERG has given me an interdisciplinary swiss-army knife, the confidence to use it, and a group of like-minded scholar-practitioners-ninjas with whom to trade tactics. For that, I am immensely grateful.

Christa Dion Chavez

When I first stumbled upon the ERG website,

Masters Recipients continued:

I remember thinking that it was so incredible that I would never be admitted in a million years. Still, I took a chance and applied anyway. Now, for the past two years I have woken up every morning thinking, “Wow, I can’t believe I’m living in California and attending UC Berkeley!” I come from a small town in southeastern New Mexico. I have a B.S. in Bioenvironmental Sciences from Texas A&M University. After my B.S., I went back home to work and save money for graduate school. I ended up working for a contractor to the Department of Energy which manages a nuclear waste repository in New Mexico. After 2 years, I quit my job and here I am.

It has been a bit rough deciding what I want to do, but I finally decided to focus on sustainable consumption and production (Thanks Erica and Mike Wilson). It is easy to point the finger at unscrupulous corporations, dirty oil companies, and corrupt politicians for the world’s problems. However, it is important to remember that our everyday actions have an impact on the rest of the world. Each of us has the ability to make a difference simply through the way we choose to live our lives.

Finally, I would just like to say that I couldn’t have asked for a more extraordinary group of people to work with. Thank you to all ERGies (including staff and faculty) for being such amazing human beings! I couldn’t have made it through without you. Thanks to all of my professors. Shout out to my Hillegass housemates. Last but not least, thank you to my amazing family for raising me and supporting me. I love you and I wouldn’t be here without you!



Andrew Crane-Droesch

I came to ERG from the Energy and Environment Group at UNDP, where I managed the GEF-funded Community-Based Adaptation Project. Grad school was a chance to be able to delve more deeply and substantively into environment and development

issues, particularly with regard to the intersections of climate change and severe poverty. I’ve focused on soil carbon and agricultural development in east Africa, and I look forward to starting applied research in (both!) soil biogeochemistry and development economics as I start the ERG PhD.

I’ve learned a lot in the past two years. Being thrown together with an incredibly diverse and talented group of people has widened my perspectives, while grounding me as I have focused on building depth in specific areas. While my conceptualization of the types of problems that I want to solve has not changed since I’ve been at ERG, my lens for approaching them has sharpened. I’ve learned a ton from faculty at ERG. But by far, my best and most important teachers have been fellow students. I look forward to being there for you all if I ever get a chance. Lastly, I want to thank my fiancée Amanda for all of her support – putting up with me when things get stressful, and helping me remember that there is a world outside of the bubble of my own research. Which is why I am at ERG in the first place.

Taylor Keep

I decided to come to ERG when, after two years as a sustainable building design consultant, I learned that my own ecological footprint was dominated by the food I was eating. Shocked and embarrassed that I had never thought much about food before, I suddenly realized that my mechanically engineered approach was generally inadequate for the complex resource challenges around me. I wanted to design more enjoyable and lower energy places to live and work, but I knew I needed a more complete and ERGish way of thinking about sustainability in buildings. Since coming to ERG, I have stepped back and looked beyond buildings to the resource systems that support them. In partnership with the EMAC lab group, the LBL, and the controls group in the mechanical engineering department, I have explored how buildings can improve, rather than simply exploit, the reliability and sustainability of the electricity grid. I now think of sustainable design as both using less and doing more. I look forward to helping the building industry do more for people and the electricity grid in my post-ERG years.

Over the past two years, I enjoyed watching birds for the first time, I taught my first math class (hopefully not my last), I discovered the beautiful complexity of the electricity grid, and I fell in love

with Jane Jacobs. I skied and camped and kayaked and canoed and biked and picnicked. I had an authentic Indian feast, real Mexican chocolate, and discussed integrity openly over a home-cooked meal. Through it all, I loved being a part of ERG and being loved by its generous community. Thanks to everyone for teaching me so much and for making these past two years so wonderful.

Ana Mileva

I have finally found an intellectual home in ERG. I came to ERG from a social science and economics background via the Goldman School of Public Policy to move into fields such as engineering and operations research. Only at ERG could this transition be not only possible, but also welcomed and encouraged. Here, the experience of those of us who did not take a straight intellectual and academic path is appreciated and valued. ERG has fostered my interest in all aspects of renewable energy policy, but what's more, learning about and from the diverse work of my classmates and the faculty here has been rewarding and enriching.

It is the ERG community – the students, faculty, and staff – that has made my time here an even more special experience. I feel privileged to be part of such an extraordinary group of people. Rarely can one find such a combination of smarts, hard work, fun, and genuine kindness. Thank you, ERG.

Erica Newman

When I left my second graduate program to pursue my love of bird watching through a career in field ornithology, I thought I was done with school, and that I would never talk shop with physicists or economists again. Meeting John Harte made me change my mind. I worked for a number of years in the critically endangered Longleaf Pine savanna ecosystem in North Carolina documenting declining bird populations and learning the on-the-ground basics of prescribed fire as a restoration tool in fire-dependent ecosystems. When I realized that successful conservation efforts only happen within a matrix of science, culture, and economics, I came to back to school to study with John.

I never imagined that there was a place like ERG, where I could meet other students who were using interdisciplinary methods to solve large and immediate problems with rigor and optimism. The conversations I have had in ERG, the friendships I made



John Harte, Erica Newman, and Kristin Brainerd mountain climbing near RMBL.

here, and the research I could only do in this context have changed my life for the better.

I owe a lot of thanks to John Harte, my co-advisor Max Moritz in the Department of Environmental Science, Policy, and Management, and the amazing ERG faculty, students, and staff. Our graduating masters cohort is full of talented and wonderful people, and though those of us continuing with the PhD will miss them, I can't wait to see what they do after graduation.

In my masters project, I used species distribution modeling tools in combination with spatially explicit, fine-scale climate data to capture the “climatic niche” of California wildfire activity, based on 50 years of data and approximately 10,000 recorded wildfires. This is a first step in understanding how the frequency, intensity, and location of wildfire will change with a warmer climate and changing precipitation patterns. Generally, dryer futures may bring more fire to coastal and Northern California, while wetter futures may lead to fire invading deserts where plants have not evolved with this disturbance. I plan to devote the rest of my dissertation to studying how wildfires are changing the carbon balance of California forests, chaparral scrublands, savannas and deserts, and how fire disturbances in combination with invasive vegetation are affecting the biodiversity and ecological integrity of these systems.

Hazel Onsrud

I came to ERG to learn how to make more people smile. Although I may have spent more time trying to accomplish this through awkward attempts at mischiefousness, I really came here to explore issues of scale, because I had hopes of increasing the scope of similar transformative actions. Here I had the opportunity to learn how a variety of disciplines are striving to create delight, and the complexities of that goal in the context of our common problems of climate change,



ERGies at Google.

Masters Recipients continued:

health, and equity. Despite these real challenges, I'm still hopeful that sustainable community development is possible, and I'm excited to apply the varied tools of that trade.

That said, I'm also a little sad to leave. My time at ERG has reinforced my belief that stories can relate real needs and facilitate change and that dialog can help enable such actions. I feel that I have a better understanding of how designs can utilize appropriate geometries to celebrate our diversity and creatively organize unique actors under common influences. In the past few years I have come to truly believe that certain information and infrastructure can support interactions which can foster alternative values, support social change and, perhaps, help to create a "better" world. Thank you for helping me to remember why societies, despite our failings, have some features worth cultivating: we do love, surprise, and laugh...and our creations can be beautiful.

More important than ERG as an institution was the ability of the ERGies I met to make this a place and a community. Over the past two years, I've enjoyed the camaraderie of some of the most genuinely interesting and caring folks I know. Thank you my dear friends and graceful teachers... I am honored to have had this opportunity to know you, and I am ever so grateful that you took the time to make me grin.

Autumn Petros-Good

Autumn Petros-Good is an engineer interested in designing and planning for the coming changes in the energy industry. For her master's project, she worked with The Nature Conservancy to identify areas of California that can produce enough solar power to meet our current energy targets, while minimizing the impact on ecosystems. She found that, with careful

planning, it is possible to generate the required electricity from solar power, and at the same time preserve vulnerable desert lands. She is currently beginning her ERG PhD work on modeling electricity storage. In particular, she is interested in determining the extent to which storage technologies can reduce the adverse impacts of variability associated with intermittent solar and wind generation. In between classes and research at Berkeley, Autumn spent much of her free time playing Frisbee for the Cal Women's Ultimate Frisbee team. She received her B.S. in Engineering from Harvey Mudd College in 2009, where she founded a chapter of Engineers for a Sustainable World, and traveled to a Kenyan village to develop a water purification system. Originally from Colorado Springs, CO, some of Autumn's favorite recreational activities in addition to ultimate Frisbee include running, hip-hop dancing, and hiking. She also likes to write poetry, play the piano, and code.

Jalel Sager

Ten years after graduating from New York University in a humanities-oriented interdisciplinary program I came to ERG for two reasons: to establish a better foundation for my work on climate change adaptation and regional resilience, and to satisfy an old dream—born in a college class on quantum physics and philosophy—of working in science. After seven years spent working as a freelance writer and three as the director of the non-profit Vietnam Green Building Council, returning to Berkeley, and jumping into a program that encourages both quantitative and qualitative views of ecological/societal issues, was bracing and inspiring.

The quality of people here at ERG has been a revelation. I am lucky to have spent the last two years among them, and I am eagerly looking forward to the

next few. My friends and colleagues in ERG have continually challenged and supported me in my work, and I have found this to be the greatest resource of graduate school. ERG's faculty all provide unique and satisfying models of how to create a strong research career and at the same time contribute to the active life of society, and I am grateful for all they have taught me. Finally, ERG's staff also reflects its talented, generous nature, and, though saddened to see three of its members leave this spring, I am happy to have had the chance to get to know them. In short, I doubt there are very many programs that combine such versatility, rigor, and community—ERG is a place and state of mind that deserves both attention and cultivation.

Laura Schewel

Organized in the ever-relevant Captain Planet framework:

EARTH: ERG has brought me a greater understanding of and love for this planet than I ever had. From ER 102 problem sets, to masters seminar, to hikes in Marin, connecting with ERGies means connecting with nature.

WIND: Wind is motion, which reminds me of transportation. At ERG, I've explored the American car culture, one of the most environmentally damaging features of modern civilization. My master's project explored the history of the goods movement sector: how do goods get to the stores? And how do we get goods from the store to our homes? And why does it take such an obscene amount of energy to do so?

WATER: Box models. If you have to ask, you're not an ERGie.

FIRE: The most interesting part of ecology, as anyone who hangs out with Erica knows.

HEART: The core of ERG. My classmates and professors have inspired me not with their intelligence (though it is profound), but with their will to hope, and to dedicate themselves fully and even joyfully to this great environmental challenge. It is not easy to wake up and confront the scope of climate change head on each day. But through my time with ERGies, especially the members of my cohort, I have gained the skills, the friends, and the drive to keep going. I am honored and grateful to be a part of this community. Onwards, planetees!

And thanks, always and most of all, to my parents.

Rebekah Shirley

I came to the Energy and Resources Group to

learn at the most dynamic energy network in academia today, but I could have never predicted the leaps and bounds by which ERG would surpass that expectation. I remember during my first week here two years ago feeling overwhelmed by the floodgates of knowledge that had been unleashed over me. Over the course of my time here that once intimidating torrent of learnedness has come to be a true source of inspiration. ERG is so much more than the classes I thought I came here to take - it is a community, almost a living thing, a unique way of thinking, of seeing below the surface of a problem and constructing opinions, asking questions, a way of developing arguments. It is a curiosity that never tires, a graceful wisdom, an enigmatic place and people, like nothing I have ever come across before. I am beholden to the Admissions gods above for the opportunity to have experienced such a thing. Constantly amazed by the achievements of my cohort, I feel blessed knowing that every day I get to share laughs and good times with people who are indeed changing the world. Hailing from the West Indies and with environmental science as my background, I've fostered a strong interest in the plight of island nations and the role that energy plays in their development. I hope one day to contribute to this field by learning about the barriers and solutions related to integrating renewable energy resources into small grid systems and with the good people of ERG behind me, I have never been more confident in my own abilities to make that difference. For this alone I am forever grateful. Here's to the wonderful staff, faculty and students that are the pulse of this beautiful thing.



Cookout at Point Reyes.

Froylan E. Sifuentes

At ERG, I have not only found an environment that cherishes learning, exploring new ideas, and implementing solutions but that foments compassion and friendship. I have made new life-long friends,

Masters Recipients continued:

become more versed in the language of electric grid system operators, and challenged myself to come up with solutions to problems that are indeed very hard. ERG is not only filled with people of the highest intellectual caliber but also with a heart of gold. Whether I was trying to solve some problems in control theory, trying to find a summer research opportunity in China, or improving an essay for an NSF application, I always found someone at ERG that I could approach with a question, and they always had the time to share their knowledge and experience with me. Coming to ERG is one of the best decisions I have taken and I am sure that it will open many more doors to many more adventures.



ERGies at Halloween.

Christopher Williams

Call me an optimist, but I believe the ecological and resources problems of our time are due mainly to ignorance and social dislocation - if only we knew what the likely consequences of our current actions were for ourselves and our loved ones, we would make more sustainable choices. As a law student I have taken this belief mechanistically, long assuming that so long as the rules of our society and markets were manipulated to give consumers and citizens the “right” signals, people would respond appropriately. At ERG I have been brought to the understanding that designing magnificent social rules is simply not sufficient. Rather, the most critical determinant of our future is skilled and inspirational communicators; people who are not only designing solutions but also working on the means to adapt them to local contexts

and to disseminate them effectively. I have never been so downright awed as when I consider the immense brain power of my fellow ERGies. But even more powerful and inspiring is how truly awesome ERGies are as advocates for their ideas and as communicators who are tuned-in to the needs and desires of their audience. Studying the continued destruction of the planet can be a total bummer and it’s hard not to get lost in the barriers and dismayed at the complexity. When my glass has been half-emptied more than a few times over the last two years, it has without fail been one of my classmates to bring me back with a hearty mix of inspiring words and critical input. The biggest lesson that I take from ERG is the power of this kind of compassionate but critical communication. In my own research on the development of energy efficiency reform programs in China’s urban buildings, I must constantly remind myself to strive to balance the critical voice with the compassionate, and my own perspective with the aspirations of the migrant construction worker, the elderly resident, the local official, the business entrepreneur and the global citizen. We must not search for only the answers to our own questions; we must also be attuned to where, how, and if those answers respond to the needs of others.

Being in ERG has truly been a life changing experience. Undertaking both a law degree and my ERG MA at the same time has been intense and very rewarding and I am so thankful for the opportunity to have been able to study at ERG. Words cannot sufficiently express my gratitude to my professors, the upperclassmen and women, and my classmates for their kindness and patience with me as their student.

Maggie Witt

My journey at ERG started on a Saturday morning as I moped in bed with a cold, a fever, and a sinking feeling that I may not be admitted to ERG—my top choice for graduate school. At 9:00 AM, my cell phone rang. “A 510 number,” I thought, “that’s strange...” So, of course, I let it go to voicemail. Moments later, I listened to the message: “Hi Maggie. This is Dick Norgaard from the Energy and Resources Group...” My stomach dropped and my face flushed with excitement. I couldn’t believe it—I was in! I hopped out of bed, squealed, and jumped up and down with such delight that I must have drowned my cold with a rush of adrenaline and joy. I called Dick back to accept and exclaimed with enthusiasm, “You just made my year!” He laughed, and in a moment, I was

part of an exceptional graduate program; I was an ERGie. It is one of the best days that I can remember.

Today, two years later, I can honestly say that ERG has achieved the impossible; it has managed to exceed the expectations that made me jump up and down with excitement that Saturday morning. ERG has given me the opportunity to study what interests me, transportation and climate change, without losing sight of the interconnectedness of environmental issues. In addition to researching transportation policies via my graduate student researcher position and taking courses in City and Regional Planning, I also learned how to perform a life cycle assessment, estimate the volume of the campanile, and evaluate water pump technologies for rural villages. In other departments, this diversity would make me stand out, but at ERG, it is par for the course, which is exactly how I like it!

While I have learned so much in the classroom, the most influential lessons have come from my experiences with fellow ERGies, faculty, mentors, and researchers. I am indebted to my friends and teachers for helping me succeed and for inspiring with their exceptionalness to do more and venture beyond my comfort zone. Furthermore, I feel extremely fortunate to have met so many others who, like me, are motivated by a passion to contribute in a way that somehow leaves this world a better place than it was when we arrived. I look forward to continuing to work toward this goal alongside my fellow ERGies.



Faculty

Daniel Farber

ERG's faculty continued our tradition of public service. Dan Kammen was away for much of the year heading the World Bank's renewable energy effort. Dick Norgaard also assumed an important new position as the head of the scientific advisory board for the California Delta.

The annual ERG lecturer, Bob Epstein, addressed the interplay between politics and climate policy. If there's one thing we've learned in the past two years, it's that the merits of a policy issue are far from being the only driver of outcomes!

I've agreed to remain as chair of ERG for an additional year. ERG is one of the jewels in Berkeley's crown, and it was a great honor when the faculty asked me to stay an extra year.

Duncan Callaway

Duncan Callaway attended his first ERG graduation and hopes he never has to miss one again, ever. He taught a course on energy efficiency in buildings and co-taught the first power engineering class offered out of the electrical engineering department in three decades (n.b., ERG has had one for the last decade). He continued publishing on topics of electricity demand response and vehicle electrification, and started a few new research projects on identifying energy efficiency opportunities in building energy management systems. A couple of highlights include winning a research grant from the CPUC with partners SolarCity and Tesla Motors to develop a distributed electricity storage system, and a trip to Beijing where he visited the power engineering department at Tsinghua University, with 100 faculty!

Daniel Kammen

Since October, 2010 Daniel Kammen has been serving as the Chief Technical Specialist for Renewable Energy and Energy Efficiency, "the clean energy czar," at the World Bank, in Washington, DC. During this time he has been overseeing and advising the portfolio of RE and EE projects, which constitute about 60% (~ \$4 billion/year) of the World Bank Group's energy lending. Specific focal areas of Kammen's efforts have been the scale-up of the energy efficiency portfolio, the coordination of regional grid and power pools to promote energy access and clean energy generation, and the coordination of new efficient mass transit and electric vehicle integration issues. In addition, Kammen serves for the IPCC as a Coordinating Lead Author Special Report on Renewable Energy. This year he participated in a campaign to evaluate alternatives to proposed coal plant in Malaysian Borneo, that led to the Prime Minister canceling the plant in favor of a basket of low-carbon technologies.

Richard Norgaard

In addition to responding to the budget-driven changes at the university, this past academic year for me has been special because I have taken on the task of chairing the State of California's Delta Independent Science Board. California is once again trying

Faculty continued:

to resolve how to deliver water from the north of the state where most of the precipitation falls to the south where the most productive agriculture and majority of the population resides while protecting the environment in the process. The Sacramento - San Joaquin Delta is a critical juncture in the exchange, where the transfers take place and the environmental stresses are concentrated. The Delta Independent Science Board is “where the politics of California water hit the fan of science,” so it is an interesting, if messy, place to see how well science can inform policy. I am also serving on the 5th Assessment of the Intergovernmental Panel on Climate Change and various other international activities that have taken me to Europe many times, China, Korea, and to Brazil in September. For some reason I seem to be writing more reports and fewer journal articles, but I look forward to reflecting on these experiences as an academic soon.

Margaret Torn

Margaret Torn is Adjunct Professor in Energy and Resources and co-heads the Climate and Carbon Sciences Program at Berkeley Lab, where she studies climate change and terrestrial ecosystems. Her students work in Africa, North America, and Europe, on topics as varied as microbial enzymes on soil mineral surfaces and the value of conserving water to conserve energy. In Spring 2010, she got to know the first year ERGies by teaching ER102, Quantitative Analysis of Global Environmental Problems. She helped launch the National Soil Carbon Network and gave invited talks in France, Switzerland, and the United States on a new understanding of soil carbon cycling. Margaret is currently engrossed in planning a large new field project on ecosystem feedbacks to climate change in the Arctic and can't wait to visit possible field sites this summer.



News, Honors, and Awards

National Science Foundation Graduate Research Fellowship Recipients

2010: Zoe Chafe, Jalel Sager, and Laura Schewel

2011: Luke Dodds, Erica Newman,
Cleo Woelfle-Erskine, and Froylan Sifuentes

Derek Lemoine published in the Journal of Climate on developing probability distributions for climate change, in the Journal of Geophysical Research on estimating feedbacks from paleoclimatic data, and in Environmental Science and Technology on the greenhouse gas implications of bioenergy pathways. He also produced working papers on building tipping points into integrated assessment models and on developing policy portfolios of emission reductions, low-carbon research and development, and negative emission technology deployment.

Derek accepted the position of assistant professor in the Department of Economics at the University of Arizona.

Current ERG doctoral candidate **Carla Peterman** was appointed for a five-year term by Governor Jerry Brown in January 2011 to the California Energy Commission. The Energy Commission is the state's primary energy planning and policy agency. She fills the Public Member position on the five-member Commission where four of the five members by law are required to have professional training in specific areas - engineering or physical science, environmental protection, economics, and law. Commissioner Peterman currently presides over the Energy Commission's Renewables Committee, is the Associate Member on the Electricity and Natural Gas Committee, and represents the Commission and state on a variety of west-wide energy planning initiatives.

Zack Subin has continued working on improving representations of lakes, wetlands, and methane emissions in global climate models, with particular application to Arctic feedbacks to climate change. He has a paper in press on ecosystem feedbacks to climate change in CA and has recently submitted two papers on lake modeling and the effects of lakes on high-latitude climate. This year, he will be attempting to develop an improved representation of peatlands to understand potential CO₂ and CH₄ emissions from these areas as the Arctic warms.

Alums

Doron Amiran (MA, 1991) has been working with colleagues in Bolivia and Brazil in his capacity as Development Director for Conservation Strategy Fund, a Sebastopol-based non-profit that uses economic tools to promote conservation worldwide. Doron's recent travels have seen him motoring in a dugout up the Beni River in Bolivia, scouting the villages that have established thriving eco-tourist enterprises where a reservoir that would have flooded their homelands was not built, and getting body-painted by the elders of the Suruí people in the Brazilian Amazon. Doron would love to connect with any Ergies who are working on tropical conservation issues!

Renata Andrade (PhD 2006) is coordinating a research network group on Biofuels and Climate Change Governance at the Universidade Católica de Brasília, won in partnership with the Instituto Salvia a prize from the HSBC Solidarity Institute in Brazil for a one-year project called ACLIMAR: planting trees to harvest water: help to improve climate change adaptation initiatives in periurban water scarce watershed in Brasília, she is now a member of the technical Board of the Paranoá Lake Watershed, and going for the third year sub award on biofuels from EBI.

Sam Arons (MS 2007) recently piloted an internal employee energy-saving competition at Google, achieving 10.3% plug-load savings over the 4-week competition. This greatly exceeded our 5% goal!

Karen Plaut Berger (MS 1995)

Karen joined the University of Rochester as a lecturer in Earth and Environmental Sciences. Her teaching portfolio includes courses on energy, hydrology, sustainable systems, and introductory environmental science.

Carter Brooks (MS 2005)

Since receiving my Master of Science degree from ERG, and inserting myself in the ERG community as self-proclaimed Artist-in-Residence, I have co-founded a company—Climate Earth, www.climateearth.com—that, counts among its clients: PG&E, Webcor Builders, US Concrete, and others.

I've also been humbled that recent students have competed in vicious competitions of RoShamBo for the right to officially read my masters paper, lead-

ing me to create a blog for it at www.cryfortheice.com. I have also been curating a blog of climate related videos and quotes at www.climatecrisis.com. I continue to melt ice as art, to surprisingly enthusiastic reception. www.carterbrooks.com/ice

Ken Conca (PhD 1992)

After seventeen years on the faculty at the University of Maryland, Ken Conca has moved to American University to direct the Global Environmental Politics program in the School of International Service. The program offers Masters degrees in Global Environmental Policy and in Natural Resources and Sustainable Development, the latter a joint degree program with the UN-sponsored University of Peace in Costa Rica. Ken is also associate editor of the journal *Global Environmental Politics* and a member of the UN Environment Program's Expert Advisory Group on Environment, Conflict, and Peacebuilding.

Francisco Dóñez (PhD 2008) continues to work at the U.S. Environmental Protection Agency, Region 9, in the Southern California Field Office in downtown Los Angeles, focusing on diesel pollution in the goods movement and logistics industries. (A proud bicycle+train commuter, he had a perfect safety record until a recent embarrassing parking lot wipeout.) In the time freed up by the completion of his dissertation, he has also started work as a Visiting Instructor at Pitzer College. He and Devanie spend the rest of their time chasing former ERG babies Patrick (8) and Kate (5), and enjoying their new home in Claremont.

Rafael Friedmann (PhD 1997) continues to live in Oakland and work at PG&E's energy efficiency program evaluation to provide feedback to improve these efforts. Main focus is on programs addressing the needs of industrial customers. He has been invited to give talks to policymakers, entrepreneurs, and academics on Integrated Demand-Side-Management in Chile and to visiting Chinese delegations. He provides feedback to evaluation research in Canada.

Matthias Fripp and Kamal Kapadia (PhD 2008) are proud new parents to a boy, Jehan Kapadia Fripp, born 1/11/11. He is a little tyke but packs in many ergs of energy!

Patrick Gonzalez (PhD 1997)

In 2010, the U.S. National Park Service hired

Alumni continued:



ERGiE Halloween.

Patrick as climate change scientist. As the agency lead for climate change science, he conducts applied research on impacts, adaptation, vulnerability, and forest carbon to help staff integrate climate change into resource management. Patrick provides scientific assistance to the 394 units of the National Park Service from headquarters in Washington, DC.

Andy Gunther (MS 1982, PhD 1987) has been selected to serve as the Executive Coordinator for the Bay Area Ecosystems Climate Change Consortium (www.baeccc.org). He will be responsible for assisting this multi-jurisdictional consortium identify scientific studies required for climate change adaptation planning related to ecosystem change, and for coordinating the ongoing work of multiple agencies and organizations taking action to prepare for the impacts of climate change on Bay Area ecosystems. Andy, the Executive Director of the Center for Ecosystem Management and Restoration in Oakland, is also serving his second term as a member of the Board of Directors of the Union of Concerned Scientists.

Garvin Heath (PhD 2006) added another member to the clan: Sila, now 1 yr old. She joins Aden, nearing 4 yrs old. The family is enjoying living in Boulder, where Tania is Assistant Professor at CU Boulder in Economics. Garvin is very happy at NREL leading environmental impact analysis work, mainly through life cycle assessment. (see http://www.nrel.gov/analysis/sustain_lcah.html, for instance.) If you are in town, come say hi or give a talk at NREL – we love maintaining ERG connections here in the beautiful Rockies!

Jennifer Holthaus (MA 1998)

My husband, Chester, and I had a baby boy named Ren, born on April 11, 2010. I continue to work for Winrock International, telecommuting from San Mateo (Winrock is based in Washington DC).

Nicholas Martin (MS 1999)

Nicholas is Chief Technical Officer for the American Carbon Registry, part of the non-profit Winrock International. His main responsibilities are drafting new carbon offset protocols, screening projects, and tracking offset policy (particularly California these days). ACR is working on a broad range of protocols including forestry, REDD+, agriculture, clean energy, oil & gas sector, carbon capture & storage, and others. While no longer based in Berkeley, Nick has been in California often of late to meet with the Air Resources Board and other partners on AB32 cap-and-trade implementation. He lives in Saint Paul, Minnesota with wife Rachel, daughter Frances (6) and son Earl (4).

Lisa Micheli (PhD 2000)

Last year I was appointed Executive Director of the Pepperwood Foundation, which manages the 3200-acre Pepperwood Preserve and just opened a new research and education facility called the Dwight Center for Conservation Science on-site. We are based in the Mayacamas Mountains of NE Sonoma County. Anyone looking for upland research sites or a rustic location (with modern meeting facilities) for a workshop or retreat should let me know! Email: lmicheli@pepperwoodpreserve.org, phone: 707-591-9310, web: www.pepperwoodpreserve.org.

Greg Nemet (PhD 2007) is spending the first half of 2011 as a visiting scholar at the Harvard Kennedy School. I head back to teach at U. Wisconsin in late summer.

Sergio Pacca (PhD 2003)

Last month I became an Associate Professor at the University of Sao Paulo (USP) in Brazil, and I am advising students in the graduate energy program and teaching in the undergraduate environmental management program of USP.

Deepak Rajagopal (PhD 2009)

It is almost a year since I joined the UCLA Institute of the Environment and Sustainability (IoES) as an Assistant professor last summer. The IoES is an interdisciplinary unit, which brings together faculty and researchers from a variety of different units on campus to conduct research and teaching on topics relating to energy, water, environment and sustainability. We offer an undergraduate major and minor in Environ-

mental Science. I am excited to be offering a course of Energy, Environment and Development, which is inspired by ER100. We hope to have a graduate program soon.

Jesse Ribot (PhD 1990) is teaching in Geography at the University of Illinois, where I also direct the campus-wide Social Dimensions of Environmental Policy (SDEP) Initiative (see <http://www.beckman.illinois.edu/strategic/sdep.aspx>). In collaboration with the Council for the Development of Science Research in Africa (CODESRIA) and the International Union for the Conservation of Nature (IUCN), SDEP has just launched a 10-country comparative research program on the democracy effects of Reduced Emissions from Deforestation and Degradation (REDD) programs. Most important, however, I just established a film web page. Please take a look www.doublebladedaxe.com. I have been making educational films on the local social effects of forestry interventions.

Carina Bracer Romero (MA 2004) is treasuring her time with her new son Diego Ricardo, born in January 2011. She is on leave from Climate Focus where she has been for over two years consulting on forest policy and climate change in tropical countries- a.k.a REDD. She has been in the Washington DC area for 5 years, and enjoys keeping in touch with ERG buddies.

Michael Shepard, (MA 1985) continues to promote best practices in energy efficiency with utilities, corporate energy managers, and anyone else who will listen. He is President of E Source, a firm in Boulder, Colorado he co-founded with Amory Lovins and fellow ERGie James Newcomb back when many of this year's graduates were in diapers. One of his current areas of focus is helping utilities use geodemographic segmentation and data mining to identify and target those customers most likely to participate in energy efficiency programs.

Thomas Sikor (PhD 1999) is about to publish a book on 'Forests and People: Property, Governance, and Human Rights' with Resources for the Future/Earthscan. The volume originates from a workshop Thomas and Johannes Stahl organized at Berkeley in May 2009. Thomas notes: "What better location could we have chosen for a workshop on forest rights? Berkeley stands for an exceptional tradition of engaged public scholarship on the relations between forests and

people."

Susan (Kulakowski) Vargas (MS 1997)

My husband and I welcomed our first child into the world last June. Her name is Julia Elena and she's a delight!

Erika Walther (MA 2001)

After 11 years working in the energy efficiency industry, Erika is going back to school. This time she'll be earning an M.S. in Conservation Biology at San Francisco State University, studying the transmission of avian malaria in California songbirds.

Karin Warren (PhD 1998) is serving as Chair of Environmental Studies and Science at Randolph College, a small liberal arts college in Central Virginia. It's been a busy year as we've been working on our college's climate action plan, expanding our organic garden and permaculture program (including ducks, chickens, an orchard, and an apiary), and developing a minor program in Sustainability. I'm continuing to give talks throughout the community on climate change and energy policy, and volunteering on the City's Natural Resources Advisory Committee. If you attend the annual conferences for AASHE or AESS, please look for me, I always love a chance to talk with a fellow ERGie!

Maggie Winslow (PhD 2002) is now the interim academic dean at Presidio Graduate School in SF.

Victoria and Neil Ziemba (MS 1988) have moved to the North Coast of California. Neil has taken a position with PG&E as Principal Remediation Project Manager for the decommissioning of the Humboldt Bay Power Plant, while Jelehla continues her work as an independent technical and academic editor, and graphic designer.





PHOTO: ZOE CHAFE

Congratulations Masters Class 2011!

From left to right (back row): Andrew Crane-Droesch, Taylor Keep, Audrey Barrett, Jason Burwen, Kristin Brainerd, Erica Newman, Christopher Williams, Nate Aden, Froylan Sifuentes, Jalel Sager.
(Front row): Autumn Petros-Good, Hazel Onsrud, Ana Mileva, Christa Chavez, Laura Schewel, Rebekah Shirley, Maggie Witt.

The Energy and Resources Group's (ERG) mission is research and education for a sustainable environment and a just society. Established as an academic degree-granting program at UC Berkeley in 1973, ERG has become a unique interdisciplinary community of graduate students, core faculty, and over 100 affiliates and researchers from across the campus.

ERG produces cutting edge research to inform scientific, policy, and business communities. ERG is an intellectual hub for research on clean energy, climate science, ecosystems and biodiversity, energy systems, international development, technology and society, and water policy.

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