

ENERGY AND RESOURCES GROUP

COMMENCEMENT | SPRING 2020

University of California, Berkeley

CONGRATULATIONS ERG GRADUATES!



Doctors of Philosophy: Richard Barnes, Ian Bolliger, Frank Errickson, Jess Joan Goddard, Patricia Hidalgo-Gonzalez, Christopher Hyun, Vero Jacome, Niklas Lollo, Laura Burbank Schewel, Alana Bowen Siegner

Master's Degrees: Kelsey Alford-Jones, Ella Belfer, Jess Carney, Jack Chang, Nick Clarke, Micah Elias, Taryn Fransen, Nancy Freitas, Hilary Henry, Jessica Katz, Margaret McCall, Jenny Rempel, Jesse Strecker, Elif Tasar, Tzipora Wagner, Rachel Ward, Cody Warner, Marshall Worsham

Energy and Resources Undergraduate Minor - Applied Mathematics: Isabel Audrey Honda, Roya Brach Safaeinili. **Chemical Engineering:** Allison Pearson. **Computer Science:**

Audrey Ku. **Energy Engineering:** Serena Patel. **Environmental Economics & Policy:** Gillian Miles, Nicholai Pran, Gary Root. **Environmental Sciences:** Sang Hyun Ma. **Sustainable Environmental Design:** Emma Tracy.

Sustainability Minor - Environmental Earth Science: Marco Perez. **Molecular & Cell Biology:** Monica Martinez.



ERG PHD RECIPIENTS



RICHARD BARNES

DISSERTATION: ALGORITHMS FOR, AND APPLICATIONS OF, GLOBAL TERRAIN ANALYSIS

When I describe ERG to others, I tell them that it's a "choose your own adventure" PhD: some programs try to shape you, while ERG provides a framework for shaping yourself. For me, it's been an adventure that's spanned the campus and several other institutions. Each journey away ended with walking into the kitchen to find people discussing the topics that brought me to ERG in the first place: the intersection of science, policy, and social justice.

I'm thankful for all the excellent folks--students, faculty, and staff--I've had the privilege to learn from and collaborate with while at ERG (shout out to John and Kay!), as well as the opportunities to hang out while camping, playing games, baking, and exploring the Bay. I'm also grateful for support from my family and friends, even as we weathered some unexpected challenges together.

Moving forward, I'm deciding between a few different research positions at the borderlands between algorithms and society.

IAN BOLLIGER

DISSERTATION: MONITORING AND PROJECTING THE IMPACTS OF CLIMATE CHANGE WITH EMERGING ENVIRONMENTAL DATASETS AND MACHINE LEARNING

This PhD experience has been an incredibly challenging but fun ride, with a very odd finish. Thank you to the entire ERG community for support, inspiration, friendship, and mentorship over the past six years. Ordinarily, I'd probably say it feels like only yesterday when this journey began...but the world as it existed at that point feels so far away! If anything, ERG has helped me better cope with unknowns, and I feel especially grateful for that training as we all struggle to adapt to the fluid impact of this pandemic. The challenge of building a more sustainable and just society will take on new contexts and require new tactics as the globe adjusts to a (hopefully) post-pandemic world.

I can imagine no better group to take on this evolving challenge than the ERGies I've been fortunate enough to call colleagues and friends over the past years. I'm comforted knowing that I'll be working in the East Bay and will be able to continue to be involved with this community in the years ahead. Thanks to all of you and I will miss you all dearly, though I know that we will remain in touch. Good luck to everyone!



ERG PHD RECIPIENTS



FRANK ERRICKSON

DISSERTATION: THE JOINT EFFECT OF UNCERTAINTY AND INEQUALITY ON GLOBAL CLIMATE POLICY

I never thought an academic program could mean so much to me. ERG and the people that make it up are a constant source of inspiration (especially when focusing on the “just” part of our mission) and the program has given me lifelong friends and colleagues. You have all helped shape the type of research I carry out and the type of researcher I aspire to be. So thank you to all the students, staff, faculty, and everyone else that makes up this wonderful community for your help and guidance along the way. I am forever grateful. And a special thank you to my advisor, David Anthoff, for his infinite patience, unconditional support, and a never-ending excitement for the work we are so fortunate to do.

In the fall I will be starting a postdoctoral position at the Center for Policy Research on Energy and the Environment at Princeton University. Though graduating is bittersweet, I consider myself so lucky to be an ERGie for life.

JESS JOAN GODDARD

DISSERTATION: MEASURING DRINKING WATER AFFORDABILITY AND SUSTAINABILITY

“A journey of the soul” (as a wise ERGie informed me upon my admission to the PhD) as much as an intellectual quest, my time at ERG was filled with the stuff of growth—personal and intellectual challenge, adventures abroad and in nature, and the hard work of doing academic research that finds use in addressing a slice of the problems we face today. I am so humbled by the incredible community of advisors, mentors, peers, friends and family that helped me make my dream of being an ERGie a reality. I love you all!

Thank you ERG and Berkeley for letting me live as a thinker and creator without too many compromises. Despite the challenging times we are in, this community still drives me to demand nothing short of transformative change toward a more sustainable and just world. Congrats everyone!



ERG PHD RECIPIENTS



PATRICIA HIDALGO-GONZALEZ

DISSERTATION: LEARNING AND CONTROL SYSTEMS FOR THE INTEGRATION OF RENEWABLE ENERGY INTO GRIDS OF THE FUTURE

Mamá, thanks for the access to quality education. Thanks to you, I can graduate as a Doctor! I am also immensely grateful to Dan Kammen who believed in me as an undergraduate, and has strongly supported me academically and personally. Thanks, Duncan Callaway; I enjoyed our research conversations and how you kept me on my toes. Claire Tomlin, it was a wonderful gift to be one of your advisees. I feel so much gratitude for your mentorship, stimulating intellectual conversations, and support during difficult times. Kay Burns and Isha Ray, I will be forever grateful for your support when I needed it the most.

Thank you ERGies for your support, mentorship and friendship. Thanks, Josiah Johnston and Juan Pablo Carvallo, for working together. Rodrigo Henriquez-Auba, thanks for being my partner in crime! Roel Dobbe and Julia Szinai, I've enjoyed our work together and look forward to more.

Alex Keller, thank you for your support during the Ph.D., it meant a lot to me and I look forward to more good times. Laurel Selvig, thank you for your love and support at the end of this journey. I am so excited to go into the next adventure with you! To Margaret, Carmen, Dani Inostroza, Eliacim, Dani González, Anna Matsokina, Nikky, Pancho, Pame, Mandi, Millie and Jesse, and my families: thank you for supporting me. It takes a village! Claire, Dan and Duncan, you set the bar high! I'll always think of you to get inspiration as a professor at UC San Diego!

CHRISTOPHER HYUN

DISSERTATION: SHIT, NOW WHAT? OVERCOMING THE STRUGGLES OF HISTORY, INEQUITY, INFRASTRUCTURE, AND CAPACITY TO ACHIEVE SANITATION FOR ALL

I'm the second person in my family to pursue a PhD. The first was my sister's husband's sister—extended, but very much family. A poet, she helped me with my ERG application. When I got accepted, my sister and her husband invited me to live with them. My nephew let me use his room. He was 3 at the time. He just turned 10 this year. A lot has happened since I joined ERG over 6 years ago. The Annual Bollywood dancing at the ERG Talent Show. Receiving the Spherical Cow award at our Master's graduation (when Andie made me cry for being gay, or was it the other way around). Following valvemmen on bikes in Bangalore. My first first-author peer-reviewed paper.



For my academic achievements, I owe all to my advisors: Alison Post, Kara Nelson, Charisma Acey, Alastair Iles, and of course Isha Ray (who will never get rid of me). To my co-authors/buddies: Anustubh, Tanu, Sharada, Swati, Will, Yoshika, Zach, and my friends and colleagues in India. I also owe so much to the utterly unique ERG community of students, alumni, faculty, and staff. (I'm looking at you, Kay and Megan.) The life that I started in the Bay Area would be unimaginable without my ERG cohort, Newbies2013 (a.k.a. "the best cohort"), along with the laughing, fighting, knowing looks, and deep support. Our journey continues! And finally my partner, who I met during my first year at ERG. He's my significant othERGie. (He loved Spherical Cow problems more than I did!) My family and his have been a source of strength and joy these past 6+ years. (Love you, Mama P!) Thank you ERG for existing, for your purposeful attempts at doing good during dark times. I will continue to strive to do the same.

ERG PHD RECIPIENTS



VERONICA ISABEL JACOME

DISSERTATION: PRESUMPTIONS AND PRECARIETY: PROBING ELECTRICITY INFRASTRUCTURE

I have always said ERG chose me, I didn't choose it. I say that because I never thought I wanted to go through a PhD, never thought a program could sustain the multitudes so many of us contain. At ERG, we are physicists, engineers, farmers, environmentalists, economists, educators, anthropologists, philosophers, dancers, artists – often all at once. I couldn't imagine another program to explore the complexities life has to offer, to stretch its breadth. I owe my own exploration to my ERG advisor Isha Ray. I can't thank her enough for teaching me how to be a stronger writer and researcher, and to be confident when I showed strength. Thank you for all our conversations, for everything really.

To my family Olga, Marc, Gabe, Dan, Peggy, Amy, Charlie, Louie, Vinny, and Belle, to those in Venezuela, Tanzania, France and beyond, to Gene Rochlin – my kindred spirit – to my amazing cohort, to the incredible Kay, to Dan and Duncan (and again Isha), to my friends in every cohort, and of course, to Derek, thank you for being there for me when I was sick. When I was sad. When I was happy. Thank you for all of it.

NIKLAS LOLLO

DISSERTATION: INSIDE OUT: THE POWER IN DATA-CENTRIC PRIVATE GOVERNANCE

When I applied to ERG, I thought it was a place to go get something, like a taqueria that served PhDs. What I learned during these past five years is that ERG is an altogether more subtle and encompassing encounter. ERG happens upon you suddenly, before slowly moving through you, enveloping you, extending you, compressing you. Then, one morning, five years later, you wonder: what me, what ERG? (Shout-out John Cage)



For the last year or so, I've spilled much brain ink, but little actual ink in writing appreciation cards to each individual in ERG. Sometimes I content myself with simply having felt the gratitude, but letting go has never been easy. I think I'll be grieving the loss of ERG in my life for some time. It's just sad to lose the day-to-day comforts of the coffee and the monitors and the books and the reading room and the friends.

But this sadness is mixed with pride, nostalgia, and joy. ERG has given me so much, and the friendships, connections, memories, and sensibilities I've developed will last a lifetime. While Dan may have been referring to what results from shockingly high rates of ERGie incest when he said "our product is people", I do feel like I've become an ERGie. And I'm damn proud of that.

At the end of the encounter, I realize more than ever that ERG provides an ethic, not a path. It's a long, hard lesson in braving uncertainty to better the world. And I can think of nothing better than to deepen that lesson by meditating for a good, long while.

But never mind this talk-dust. Just know this: I care about you, and don't be a stranger. I hope we meet again soon at a real taqueria.

ERG PHD RECIPIENTS



LAURA BURBANK SCHEWEL

DISSERTATION: TRANSPORTATION BEHAVIORAL DATA AND CLIMATE CHANGE

I started at ERG in 2009 as an MS/PhD student. In 2012 I started a company based on my initial research based on the need for clearer behavioral data to foster the adoption of EVs. For 1-2 years, I was both a student and working full time then I went into a bit of hibernation on the PhD front. In 2019, I decide to make the final push and complete my dissertation, with the same focus on transportation behavioral data but applying these new data collection techniques to a much broader array of transportation challenges including freight and land use.

Deepest thanks to my friends, classmates, advisors, committee (Lee Schipper, Dan Kammen, Betty Deakin, Duncan Callaway), and collaborators. There are too many to name in 250 words! I am especially grateful to the ERG leadership who allowed me (and encouraged me!) to complete my PhD in such a non-traditional manner. ERGies are the

best group of people I've ever been part of. It has been a joy and a privilege. After graduation, I will continue to run my company, StreetLight Data. Our mission is to help transportation industry reduce vehicle-miles travelled in petroleum-powered vehicles by providing new data and analytic tools.

ALANA BOWEN SIEGNER

DISSERTATION: GROWING ENVIRONMENTAL LITERACY: ON SMALL-SCALE FARMS, IN THE URBAN AGROECOSYSTEM, AND IN SCHOOL GARDEN CLASSROOMS

"Say that your main crop is the forest that you did not plant, that you will not live to harvest." ERG has taught me to invest in the millennium, as Wendell Berry puts it, to consider all the facts and work tirelessly to build a better world for people and planet, and then make time to laugh and find joy with friends in nature. I came to ERG pledging in my application essay to build a "climate farm school" for young people to learn about the intersection of climate change and food production. After diving into countless projects, topics, and intellectual journeys over the past six years, from the tiny house project to urban agroecology, I am leaving with the same goal. While I am not sure where my immediate next steps will take me, I am committed to the long-term goal of establishing a farm-based education center focused on climate change and climate justice, uniting my passions for farming and educating. I look forward to the ERGies and ERG-like thinkers I might meet and collaborate with along the way. Thanks to my wonderful dissertation committee: Alastair Iles, Charisma Acey, and Isha Ray for their unwavering support and faith in my research. And my deepest gratitude to my parents, my twin sister, and my partner, who are all my closest teammates and cheerleaders in building the better world that ERGies know is out there.



ERGIES



ERGIES



ERG MASTER'S DEGREES

KELSEY ALFORD-JONES

PROJECT: EXPLORING LINKAGES BETWEEN DEVELOPMENT FINANCE AND CONFLICT OVER HYDROPOWER IN GUATEMALA'S INDIGENOUS HIGHLANDS

These two years have been a time of rich personal growth. Like many before me, I arrived unsure of where my path would lead. ERG provided a welcoming and supportive home base, as well as diverse opportunities for intellectual exploration. All the while, my fellow cohort members have been mentors, teachers, friends, outdoor activity buddies, and a treasured source of comic relief.

I am grateful to be a part of the ERG community, and want to thank Kay, Isha and Dan for ongoing support. Thank you also to Alex, and to my family—whose roots in California beckoned me westward, and whose love for the natural world inspired my own.



ELLA BELFER

PROJECT: ASSESSING TRANSITIONS IN OVERLYING RIGHTS TO CALIFORNIA'S GROUNDWATER BASINS

We could hardly have wished for a more eventful two years: our time as a cohort started in the haze of the 2018 wild-fire season and ended in the midst of the coronavirus pandemic. In times that underscore the importance of generosity, community and a fierce commitment to justice and sustainability, I'm incredibly grateful to have spent two incredibly wonderful, challenging, and formative years at ERG.

It's been a pleasure to be part of a community that is not only incredibly intelligent, but also generous and unfailingly curious. I'm thankful for the ERGies I've lived with, taught with, learned from and laughed with over the past two years. Thank you to ERG's faculty and staff for your advocacy, care and encouragement, and to Isha, Rachel and Michael for your thoughtful advice and guidance.

To my wonderful cohort: thank you for being so much more than colleagues over the past two years. Thank you for your deep commitment to caring and supporting each other, for nurturing a cooperative, capacious learning environment, and for (literally and figuratively) getting me up a mountain or two. From our first week conversations about imposter syndrome to the strange art of Zoom happy hours, I could not have asked for a better cohort to learn and grow with. To the generous, thoughtful and sunny Jenny: I couldn't have dreamed of a better researching partner-in-crime! Finally, thank you to my family and friends, whose unwavering support has been instrumental along every step of the way.

ERG MASTER'S DEGREES



JESS CARNEY

PROJECT: INTEGRATING FUEL-BASED END USES INTO A CLEAN ELECTRIC SYSTEM: QUANTIFYING THE TRADE OFF BETWEEN ELECTRIFICATION AND ELECTRICALLY SYNTHESIZED FUELS

ERG is special because of the community surrounding it - thank you to everyone for making it such a great experience.

JACK CHANG

PROJECT: HYDROGEN'S POTENTIAL ROLE IN CALIFORNIA'S ZERO EMISSIONS FUTURE

Thank you for seeing something in my humble application and inviting me into the family. I'm still doing my best to live up to that invitation. Thank you for allowing me the freedom to explore, fail, become someone else and then become myself again.



ERG MASTER'S DEGREES



NICK CLARKE

PROJECT : A DISCRETE-EVENT SIMULATOR TO DETERMINE IF PUBLIC TRANSIT BUSES GO BATTERY ELECTRIC TODAY

I can't quite believe it is all over so quickly! Like my previous stint in academia, I feel as though I've merely completed the prerequisite reading to a much longer and deeper project. ERG gave me exactly what I came for; the ability to dive headlong into topics and material that left me swimming in very deep waters. I often felt as though I had no business being in the classes I attended, but was able to sneak in through the back door by waving my ERG credentials. This afforded me such opportunity that I otherwise would not had. I'm excited to keep swimming in these deep waters on the other side of graduation, with a large circle of new friends and relationships to help me along the way.

MICAH ELIAS

PROJECT: PAYMENT FOR WATERSHED ECOSYSTEM SERVICES: EFFECTIVENESS, EFFICIENCY, AND EQUITY

I can't think of a better place to have spent the last two years, surrounded by a supportive and inspiring group of people of which I am proud to be a part. Although academic achievements often feel intangible, the relationships built so far at ERG are a constant and present reminder how lucky I am to call ERG home. From the steadfast support in every way from Kay and Megan, to the academic support from the professors we are lucky to have in our corner, and most importantly the love and care from fellow students, ERG constantly reminds me how blessed I am. I am glad to be on the PhD journey with so many of my cohort members I look forward to continuing my journey here at ERG!



ERG MASTER'S DEGREES



NANCY FREITAS

PROJECT: ARCTIC LAKE EMISSIONS IN A WARMING WORLD

The past two years have been exactly what I anticipated from a graduate program and also unlike anything I could have imagined. I took engaging courses, was asked challenging questions, and was surrounded by people who were both inspiring and hugely intellectual. What I didn't predict was that it would be the interactions with other ERGies that would teach me the most about sustainability, social justice, and the sheer importance of interdisciplinary work in this complex world.

To my cohort — you all have pushed me to think more deeply as a scientist and as a human being. I am continually grateful for the conversations we have over hikes, lunches, happy hours, workouts, and travel to field sites. Thank you for entertaining my complaints about sub-90F weather and early morning classes, and for always diving headfirst into my latest science communication activity. I am so proud of what we've accomplished and cannot imagine having done it alongside any other group of goofy, brilliant people.

Thank you to Margaret Torn, Rachel Porras, and Kay Burns for your continual guidance, patience, and mentorship. Your kindness was especially instrumental in helping me push through this past year. And a huge thank you to my parents who always encouraged me to believe that Berkeley was a place I could strive to be. You have been my most honest critics and biggest supporters, and I wouldn't be here without you.

JESSICA KATZ

PROJECT: SITING RENEWABLE ENERGY IN A CHANGING CLIMATE: A REIMAGINING OF BLM'S SOLAR ENERGY ZONES

I came to ERG seeking a new lease on life, and ERG delivered. I finish my Master's both as a more analytically-equipped and ethical researcher and a more informed citizen. I am immensely grateful to be part of the community of lifelong ERGies, a singularly diverse, inquisitive, kind, and fun group of individuals.

Special thanks to Kay and Megan for all they do to make our lives as graduate students easier; to Emma Tome, Jose Daniel Lara, and Jaquelin Cochran for getting me in the door; to my faculty mentors, especially Dr. Margaret Torn, Dr. Lara Kueppers, and Dr. Duncan Callaway; and to the Kueppers Lab Group, which welcomed me in all of my ecological ignorance and taught me about forests and modeling. Big shoutout to the Newbies 2017 for setting such a splendid example, both individually and collectively. Most of all, thank you to the astounding group of rockstars that is my cohort. I can't imagine a group with whom I'd rather weather a disaster--be it wildfire smoke, power outages, or a viral pandemic--than you all!



ERG MASTER'S DEGREES



JENNY REMPEL

PROJECT: SURFACING OVERLYING RIGHTS: ASSESSING TRANSITIONS IN OVERLYING RIGHTS TO CALIFORNIA'S GROUNDWATER BASINS

In the midst of a global pandemic, somehow graduation is here. Thank you to my fellow twobie flock for entering into study together, not just during late-night problem sets, but on walks, over board games, at happy hours, and on trips. For your welcoming embrace and insights, thank you to 'senior' ERGies and especially my WG+ community. Thank you to Kay and Megan for keeping me and all of ERG afloat. Thank you to Isha Ray for your critical questions, excellent feedback, and advice at many junctures. Thank you to Rachel Morello-Frosch, WESS, and the SHE Lab for your rooted support and sage research suggestions. Thank you to Michael Mascarenhas and the CEJ Lab for making spaces to learn, laugh, and break bread together. Thank you to Mom, Dad, Annee, and Kevin for your love and encouragement. For so many bizarre and joyful diversions along the way, thank you Sprucies. To the waters, lands, communities, and dear friends in the San Joaquin Valley, thank you for continuing to ground and inspire me. Lastly, thank you, ERG, for always welcoming optimists and dissidents, for sitting with us in this state of becoming, for creating a spaciousness that allows me to envision other worlds in this world.

TZIPORA WAGNER

PROJECT: THE ROLE OF STAKEHOLDER NETWORKS IN URBAN WATER SYSTEM INNOVATION

ERG has been such an amazing place for me to learn and grow. It's challenged my assumptions and my worldview, completely altered my life path, and introduced me to some of the most brilliant, kind, motivated people. I'm so looking forward to continuing my academic career here, and feel very lucky to be able to spend another few years with this inspiring community.

I'm endlessly grateful to my friends and family, and especially my parents, sister, and brother, who have been nothing but supportive and encouraging through all the twists and turns of this journey. Thanks to all the ERG faculty and staff, and especially to Isha Ray and Kara Nelson for the support, patience, and guidance.



Finally, thanks and congratulations to my amazing cohort. We've weathered some crazy times together: a historically destructive wildfire season, public safety power shutoffs, and a global pandemic, to name a few. I feel so honored and lucky to have done this thing with you all. Thanks for the feedback, the support, the encouragement, the laughs, and the joy. It's been (and will continue to be) such a pleasure to know you.

ERG MASTER'S DEGREES



RACHEL WARD

PROJECT: TROPICAL FORESTS AND THE ALLOCATION OF CARBON TO REPRODUCTION

I don't think I've ever walked into a group of people and felt so comfortable so quickly; this cohort feels much more like family than colleagues. Outside of school I've seen their kindness and compassion as we've weathered wind, fire, and COVID storms; inside ERG I've seen their genius, and been more grateful than I can say for their support. Although the ERG journey isn't over for me, at this juncture, I'm feeling grateful for the chance to pivot into a new field with such a community as this one, and even more aware of all the things I have yet to learn. I think Nancy Freitas said it best - fail early, fail often, fail gloriously. These two years have been full of small failures - hours fighting with R, and python, and statistics - and yet that's made them all the more valuable. Here's to hoping we all keep diving into new (interdisciplinary) waters, confront our failures with humility, and press on.

CODY WARNER

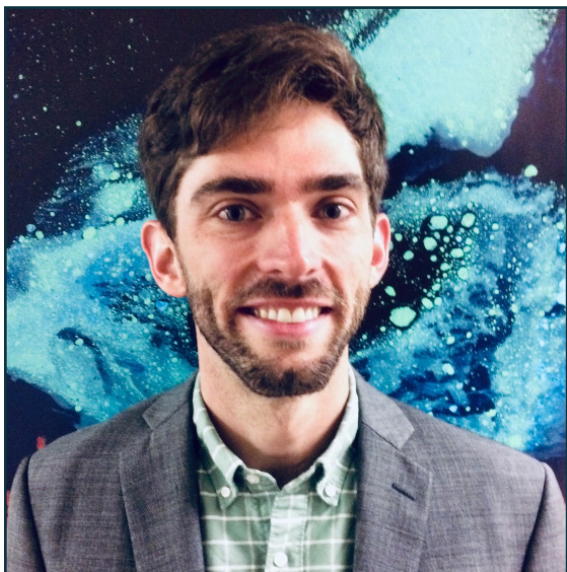
PROJECT: LIGHTS OFF IN SAN DIEGO COUNTY: THE EFFECT OF UTILITY DE-ENERGIZATION EVENTS ON HOUSEHOLD ELECTRIFICATION

I came to ERG with an intellectual journey in mind. When I arrived here, it wasn't perfectly clear what that journey would look like. I thought, "how can I possibly squeeze every bit of intellectual growth out of these few short years?" Now I know, however, that my time at ERG marks just the beginning of this intellectual journey. Over the past two years, mentors and friends have opened new doors for me and inspired me to study energy and environmental topics I care deeply about. ERG is the beginning of my lifelong intellectual journey in energy and natural resources.

I am extremely fortunate and indebted to many who have made this journey possible. Thank you to my parents, Cathie and Chris Warner, and my brother, Christopher, for supporting me from day one. Thank you to my partner, Helen, for making weekend coffee-shop study sessions the most fun and inspiring. Thank you to my mentors at LBL, Jo Seel and Andrew Mills, for providing me with an amazing research environment and teaching me how to think beyond techno-economic analyses. Thank you to my advisors at ERG and ARE, David Anthoff, Duncan Callaway, and Jim Sallee, for their thoughtful guidance. Lastly, thank you to my mentors who helped prepare me for a career in research, Dave Sunding and Ahmad Faruqui.



ERG MASTER'S DEGREES



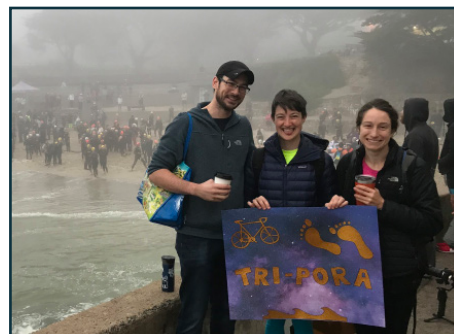
MARSHALL WORSHAM

PROJECT: A REMOTE SENSING METHOD FOR DETECTING AGENTS OF FOREST DISTURBANCE

When Lara Kueppers asked in my admissions interview why I was interested in ERG, I answered something like: “I’m hoping to make a big change.” I wanted to take my training in political history and philosophy and my humanist’s disposition and, through some sort of alchemy, become a scientist. I suspected that ERG was a place where I could do that—maybe the only place in the world that would entertain the idea, let alone support me in such a fraught expedition. With gratitude, I report that ERG has been exactly that place.

ERG has opened up unknown reaches of my brain and filled them with differential equations. It’s awakened an appetite for research and, happily, declined to sate it. It’s broken down most of my assumptions about natural resources and built my thinking back up with a deeper sensitivity for the human beings who need them. It turns out that looking after Earth is also looking after her people.

On whom: To my bold, courageous, curious, and selfless cohort, who have opened up unknown reaches of my heart, thanks. Thanks also to my generous instructors and mentors, especially Lara Kueppers, Siamak Khorram, Dan Kamen, Isha Ray, and Kay Burns, who haven’t flinched in the many moments when this learning process has corrected my excesses. Thanks to my parents, Mark and Lori, and my brother, John Michael, for their love and friendship. Above all, thanks to Caro for her confidence in me and for her patience and endurance—words that don’t begin to account for what she’s given up and been willing to go along with.



ERGIES



ERGIES



AWARDS & FELLOWSHIPS

ACM/SIGHPC Intel Computational Data Science Fellowship Valeri Vasquez	Hellman Foundation Fellowship Yoshika Crider
American Geophysical Union Cryosphere Innovation Award Richard Barnes	Human Rights Center Fellowship Kelsey Alford Jones
American Geophysical Union Outstanding Student Presentation Award Richard Barnes	IIS Simpson Research Fellowship in International and Comparative Studies Sophie Major
Berkeley Institute for Data Science Fellowship Richard Barnes, Valeri Vasquez	Innovation at the Nexus of Food, Energy, and Water Systems Taryn Fransen, Anaya Hall, Seigi Karasaki
Berkeley Multi-Year Fellowship Jess Carney, Jenny Rempel	National Science and Engineering Research Council Postgraduate Scholarship - Doctoral Salma Elmallah
Canadian Studies Hildebrand Research Fellowship Sophie Major	National Science Foundation Graduate Research Fellowship Program Anna Brockway, Yoshika Crider, John Dees, Bodie Cabiyo, Eli Lazarus, Jonathan Lee, Gordon Bauer, Nancy Freitas, Samira Siddique, Catherine Ledna, Ella Belfer, Elif Tasar
Center for Chinese Studies Pamela and Kenneth Fong Graduate Student Fellowship Yoshika Crider	Peter Lyman Graduate Fellowship Anushah Hossain
Classics Departmental Fellowship Veronica Jacome	Public Policy Departmental Fellowship Margaret McCall
Data Sciences for the 21st Century (DS421) Adam Hanbury-Brown, Anaya Hall, Jenny Rempel, Lisa Rennels, Elif Tasar, Rachel Ward	Rising Stars in Electrical Engineering and Computer Sciences Patricia Hidalgo-Gonzalez
Dissertation Year Fellowship Chris Hyun	Rocca Dissertation Research Fellowship Veronica Jacome
Foreign Language and Area Studies Fellowship Gauthami Penakalapati	Siebel Scholar Patricia Hidalgo-Gonzalez
Founder Region Fellowship Laney Siegner	Swift International Research Fund Michelle Sims
Fulbright Foundation Fellowship Cristina Crespo, Seigi Karasaki	UCOP Bonnie Reiss Carbon Neutrality Initiative Student Fellowship Anaya Hall
Gates Millennium Scholar Hilary Yu	
Graduate Opportunity Program Edem Yevo	



REMEMBERING JACK HOLLANDER



ERG emeritus professor Jack M. Hollander passed away on November 10, 2019 at age 92. An original ERGie in spirit, he was a professor in ERG from 1980-83.

The New York Times obituary, November 24, 2019:

HOLLANDER—Jack M., well-known nuclear scientist, died peacefully at his Berkeley, California home on November 10, 2019. He was 92. Jack Hollander will be remembered for a long and distinguished career in nuclear- structure physics, energy, environmental research, and academic administration. Born in Youngstown, Ohio on April 13, 1927, Dr. Hollander authored over 100 publications and 20 books, including his popular memoir, “My Lunch with

(B.S. Chemistry, 1948) The University of California, Berkeley (Ph.D. in Nuclear Chemistry, 1951) and recipient of two Guggenheim fellowships, Dr. Hollander co- founded the environmental research program at The Lawrence Berkeley Laboratory (1968) and became the Director of its Energy and Environment Division (1973-1976). In Washington, he directed the National Academy of Science CONAES energy study (1976-1978). In Berkeley, he became the first Director of the University of California’s Energy Institute (1979-1983) and co-founder of the American Council for an Energy-Efficient Economy. In Stockholm, he served as Chairman of the Beijer Institute of Energy and Human Ecology (1976-1988). Dr. Hollander was founding editor of the international book series Annual Review of Energy (1976-1992) and served as Vice-President for Research and Graduate Studies at The Ohio State University (1983-1989). Preceded in death by his stepdaughter, Jennifer Polk, Dr. Jack Hollander is survived by his wife, Sharon Mann, three children, Judy, Jeffrey and Allan Hollander, stepson Andrew Polk, and six grandchildren.



ERG ALUMNI NEWS 2019-20



Congratulations ERG graduates 2020!

We are excited to have new alumni join the network. ERGAN is here to keep ERGies connected post-graduation through in-person gatherings, intellectual networking, social media, alumni spotlights, and more. For example, one of the colloquia last December featured an alumni panel on “Achieving Liveable, Equitable, Sustainable Communities. It was followed by an off-campus mingling event for ERG students, staff, faculty, affiliates, and alumni. In September, a group of ERGies congregated in the Marin Headlands for a hike on the Miwok to Wolf Ridge to Coastal Trail to Rodeo Beach for lunch. ERGie doggies rounded out the bunch. An ERGie contingent (code name: “The Spherical Cows”) even participated in Climate Ride in June. They rode close to 300 miles along the Central California coast to raise money for climate protection, education, and adaptation organizations. We hope to continue seeing alumni, new and old, at activities such as these in the future.

In March 2020, ERGAN transitioned to a new board. We are still learning our new roles and responsibilities, but are eager to take the reins and build upon the solid foundation left behind by the previous board. While the coronavirus pandemic prevents us from gathering in person, we will focus on keeping our online resources robust. You can stay in touch through our newsletter, the ERGies.org website, LinkedIn, Facebook, and by following our Twitter list. We also hope to host several online intellectual networking opportunities in the coming months. Lastly, the next Big Event (ERGie Reunion) is coming up in the spring of 2021 and we are already starting to plan for it now. If you’re interested in helping pull this event together, please let us know.

Thanks for your engagement and support. We’re looking forward to a great year ahead with all of you!

- The ERGAN Board

ALUMNI PROFILES CAN BE FOUND AT ERG.BERKELEY.EDU AND ERGIES.ORG

ALUMNI SOCIAL MEDIA: [WWW.FACEBOOK.COM/GROUPS/ERGALUMNINETWORK/](https://www.facebook.com/groups/ergalumninetwork/)
AND [WWW.LINKEDIN.COM/GROUPS/13613627/](https://www.linkedin.com/groups/13613627/)

LETTER FROM THE ERG CHAIR

UNIVERSITY OF CALIFORNIA, BERKELEY

BERKELEY • DAVIS • IRVINE • LOS ANGELES • MERCED • RIVERSIDE • SAN DIEGO • SAN FRANCISCO



SANTA BARBARA • SANTA CRUZ

Dear ERG Community,

As we come to 'graduation' 2020, to say this year has been unusual is the understatement of all understatements. In a moment where nobody is unscathed, ERG Graduation (which is postponed until August, or whenever we can conduct an in-person celebration) both seems a small loss, and a massive missed-opportunity to appreciate how unique the ERG Community is. The delight in anticipating and watching our Masters Students' clever and heartfelt introductions of each other would have been a healthy antidote for the physical distancing we are now experiencing. We will also miss the chance to celebrate in person our extraordinary group of undergraduate ERG minors.

Still, this has been a hugely important year for ERG. First, we have a record (I cannot presently use the adjective 'huge' without unpleasant associations) number of PhD graduates: amazing scholars who are entering the professional world at one of the most challenging times on record. Thankfully for all of us, the range of ecological, energy, economics, engineering, ethics and egalitarian work they are pursuing is desperately needed. To all of them our thanks, congratulations, and wishes for continued community and collaboration.

Second, we have wonderful news to report. Lara Kueppers is now a *tenured* member of the faculty and Associate Professor. Bravo! Other core faculty have received important promotions as well. Margaret Torn is now a full Adjunct Professor. Isha Ray is now both full Professor, and was appointed Rausser College of Natural Resources Associate Dean of Equity and Inclusion.

Third, we are adding new faculty. We can now announce with excitement that Assistant Professor Youjin Chung (currently in the School of Geography at Clark University), a scholar of the relationship between development, gender and the intersectionality of agrarian and ecological change, will be joining the faculty in a 50/50 appointment between ERG and the Society and Environment Division of ESPM. Please join us in welcoming her to the community!

We are also thrilled to announce that ERG PhD Andrew Jones is joining our faculty as an Assistant Adjunct Professor. Andy is currently, and will remain, a Research Scientist in the Climate and Ecosystem Sciences Division at Lawrence Berkeley National Laboratory where he leads the Earth Systems and Society Program Domain.

We are also delighted that we will soon conduct a *second* joint search with ESPM as part of a cluster hire of *five* new faculty positions in Climate Equity and Environmental Justice. This is a major opportunity for ERG to expand the faculty, and to do so both as part of a large cross-campus initiative, but also in an area core to our interests. We will need your help in outreach to potential candidates.

In part due to ERG, UC Berkeley is again ranked #1 globally in environmental science (we are the only public university in the top 5). Funding remains the huge cloud over our heads, with the depths of the COVID-19 depression still to be felt. We need your help in finding creative and generous new ways to sustain and nurture ERG.

The ERG students, ERGAN alumni, friends and family, and Megan Amaral and Kay Burns, with a great team of student interns, continue to keep ERG vibrant and functioning despite the upheavals we are likely to be in for some time.

With all hopeful COVID-19 resilience and recovery thoughts,

A handwritten signature in black ink that reads "Daniel M. Kammen". The signature is written in a cursive, slightly slanted style.

Professor Dan Kammen, Chair
Energy and Resources Group

ERG FACULTY NEWS 2019-20



DAVID ANTHOFF ASSISTANT PROFESSOR

During the last year, David Anthoff once again taught a course on Climate Change Economics and the ERG Master's Seminar. His research focuses on climate policy, and how the tools of economics can be used to design climate policy design. He builds integrated assessment models of climate change, and asks how distributional equity considerations can be incorporated into cost-benefit analysis of climate policies. His lab continues to grow and is now composed of a healthy number of ERG Master's and PhD students and postdocs.

DUNCAN CALLAWAY ASSOCIATE PROFESSOR

Duncan's highlights for the year were a field trip to Tanzania, continuing to teach fun courses on the grid and data science, and cheerleading his graduate students to produce some important work on decentralization and power system dynamics.



JOHN HARTE PROFESSOR OF THE GRADUATE SCHOOL



It was 50 years ago, while a faculty member in the physics department at Yale, that I left my career in theoretical physics for ecology and environmental science and policy. Denied tenure in physics at Yale as a result, and deemed a troublemaker, I came to Berkeley the year ERG was launched. Back then, huge events such as major lethal air pollution episodes, massive oil spills, the death of birds from DDT, and of course the 1973 oil embargo were game changers, awakening some of us to the realization that Earth needed to be moved, immediately, to intensive care. We thought then that the right research, the right courses, the right students, would set things right.

100 years ago, when another huge event, the 1918-19 pandemic, ended there was jubilation. This year, when social togethering returns, we too will want to rejoice. But it will seem hollow, for we will still have global climate disruption, plastic waste, toxics, extinction, the threat of new pandemics, and, at least for a while, Trump. Graduating students: 50 years from now, what will you have to say?

DAN KAMMEN PROFESSOR AND CHAIR

Aside from sheltering in place, Dan has been active on projects linking climate change-CPVID19 and machine learning. He recently spoke at (online) conferences at MIT, ClimateChange AI, UC Berkeley's OLLI Lifelong Learning, Berkeley Conversations, Fossil Free California, the Caltech Innovation Dialog, Data for Progress, and on the national steering committee and as the California organizer of the SolveClimateby2030.org campaign. All of these talks are available on the rael.berkeley.edu website. He has been on CNN, in The Guardian, The New York Times, and in The San Francisco Chronicle, discussing lessons from CPVID for climate and clean energy.

With a group of colleagues, he released in March the the Green Stimulus Plan for the US Economy, which has been covered extensively in the national and international media. Kammen and colleagues at Tsinghua University have recently published a series of papers on the dynamics of COVID-19 at the city level, and have built dynamical systems models of COVID-19 in Africa and Asia. Recently, Kammen was elected to the American Academy of Arts & Sciences.



ERG FACULTY NEWS 2019-20

CATHY KOSHLAND VICE-CHANCELLOR, UNDERGRADUATE EDUCATION

As Vice Chancellor for Undergraduate Education, Cathy leads the campus efforts for innovation and change to implement the vision for a discovery based undergraduate experience. She convenes the Council of College Deans and works closely with many other units to implement the vision. Other dimensions of her work include guiding new ventures for campus through Summer Sessions, Study Abroad, OLLI; supporting the Arts and Design Initiative; working to integrate technology into teaching with RTL (research teaching and learning through technology and faculty development) supporting advising initiatives and the new student systems implementation project. She welcomes the chance to mentor ERG students and thoroughly enjoyed her work with Bodie and Anushah. Cathy is delighted to have her seven grandchildren in the Bay Area, and enjoys the Open Field Farm in Petaluma - an organic biodynamic on-farm pickup CSA - that her daughter Sarah (Cal '99) runs with her husband, Seth. Maggie (Cal '02) and Will (Cal'02) live in San Mateo; Maggie works for IDEO. Jake (Cal MBA '19) works at Clorox and he and Claire recently moved to San Francisco.

LARA KUEPPERS ASSOCIATE PROFESSOR



Lara Kueppers received tenure this year, and celebrated with ERG on Zoom and with her family in person (complete with cake and champagne courtesy of ERG Chair Dan Kammen). She continues to teach ER102, including a video lecture on the Susceptible-Infectious-Recovered model of infectious disease transmission through a population, which is particularly relevant to interpreting the news during a pandemic! Her research continues to focus on the vulnerability and resilience of ecosystems to shifts in climate, including shifting drought and fire regimes, in California, the Rocky Mountains and the tropics. Field and lab activities are proving a challenge for 2020, and conferences are cancelled or virtual, so Lara is focusing her work with students and postdocs on data analysis and curation, as well as computational modeling and writing.

ISHA RAY PROFESSOR

Isha Ray continued her teaching and research on water and sanitation in India, China and California, though for the moment all fieldwork plans are at a standstill. She is serving as a member of the Gender Working Group for UNESCO's World Water Assessment Program 2020. She will start her tenure as the Associate Dean for Equity and Inclusion for the Rausser College of Natural Resources in July.



MARGARET TORN ADJUNCT PROFESSOR



Margaret Torn studies the global carbon cycle and how climate change affects land ecosystems. She usually spends summer above the Arctic circle in Alaska, measuring greenhouse gas (CO₂, CH₄) emissions from thawing permafrost. This year she will tend to her backyard garden and reduce her carbon footprint by avoiding airplane travel. She is proud to be part of a research team showing how the U.S. can reach zero net CO₂ emissions to the atmosphere by 2050 at reasonable cost. At ERG, Margaret taught the Master's Seminar for the graduating class—who are all amazing. Margaret heads the Biosphere-Atmosphere Interactions program at Berkeley Lab and leads the AmeriFlux network of 490 sites measuring ecosystem fluxes across the Americas. She is also the President-Elect of the Biogeosciences section of the American Geophysical Union.

ERGIES



Make a Gift to ERG!

Please consider making a donation to ERG's research, teaching, policy influence, and scholar-activism for a sustainable environment and just society. Donations make a huge difference in our students' ability to bring their research to a world much in need of it. To give, contact our office, visit our website, or do it from your chair by typing this address into your phone's browser now:

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