



Greetings from the Director

A Tale of Two Environments

“It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity.” Charles Dickens, 1859

I am feeling very conflicted these days as the Director of the Environmental Studies and Sciences Program. By any measure, the ESS Program has never been stronger, and yet the national prospects for environmental progress have never seemed gloomier.

On the best of times front, we are now officially the Environmental Studies and Sciences Program with separate Environmental Studies and Environmental Science majors. We have 51 Environmental Studies majors and 18 Environmental Science majors. We have a talented and committed set of ESS professors: Karen Kellogg, Nurcan Atalan Helicke, A.J. Schneller, Kurt Smemo, Anne Ernst, Tom Hart (GIS), and 55 ESS-affiliated faculty from 13 departments. Our majors are doing incredibly cool and creative research projects, internships, and study abroad experiences (see below).

Longtime ESS faculty member Karen Kellogg has returned from the Dean’s Office. Her sunny and pragmatic look on life are a welcome addition to the first floor of Dana. We are also fortunate to offer a new class Environmental Planning taught by Todd Fabozzi, Director of Sustainability at the Capital District Regional Planning Commission, and a member of the Saratoga Springs Planning Board.

ESS continues to strengthen its already strong curriculum. Environmental Studies majors will have a new Social Science Research Design and Methods class to teach students how to conduct community-based research in preparation for Capstone. Environmental Science majors will have a new 205/206 sequence (exact course numbers TBD): Kurt Smemo will offer Ecosystem Science and the Analysis of Forested

Landscapes, and Karen Kellogg will offer Environmental Engineering and the Science of Sustainability.

ESS majors will have three new study abroad options: the Center for Ecological Living & Learning program in Iceland; the IES Abroad program in Freiburg, Germany focused on Environmental Studies & Sustainability; and the Frontiers Abroad program in New Zealand, for a grand total of 17 different ESS approved study abroad programs in 23 different countries.

On the worst of times front, President Donald Trump has promised to cancel Obama’s Clean Power Plan and withdraw from the historic Paris Climate Accord. His appointees include Oklahoma Attorney General Scott Pruitt, a leading EPA critic, to serve as the Administrator of the EPA; and Myron Ebell, the Director of the Center for Energy and Environment at the industry-funded Competitive Enterprise Institute to head the EPA Transition team. Rex Tillerson, the former Exxon CEO, was appointed as Secretary of State. His other appointees have lifetime League of Conservation Voter scores of 7, 5, 7 and 3—out of a possible high score of 100. Prospects for a Congressional check on the Trump Administration seem minimal. The House of Representatives has 241 Republicans and 194 Democrats. The Senate has 52 Republicans and 48 Democrats. The Trump Supreme Court appointee, Neil Gorsuch, while evidently a major fly fisherman, is a big question mark for the environment.

Given the gloomy national news, I asked various ESS faculty a simple question: what does the Trump Presidency mean for Environmental Studies and Sciences students and the Program in general? Their full answers follow and are as diverse as their professional and idiosyncratic personalities. However, they hit on certain themes. We have seen similar assaults on our environmental laws and progress in the past. These challenges have to be met with advocates with

strong communication, critical analysis, and interdisciplinary thinking skills. Ironically, prospects for employment in the environmental field have never been rosier. Our work, as students, professors, and citizens, is more important now than ever.

- Bob Turner

The ESS Faculty on the Implications of the Trump Presidency

Karen Kellogg

Strong networks are going to be even more essential – networks for sharing advice and wisdom, for advocacy, for internship and job placement, and for camaraderie. We have always valued our ESS community, which includes everyone who receives this newsletter, and we will lean on that community even more in the coming years.

Based on numerous conversations with alums and other contacts in environmental organizations, we anticipate that the job market will be robust outside of the government sector. In the non-profit world, for example, financial support is growing as people anticipate changes that will come with the new administration. In addition, the skills we have always emphasized in ESS – strong communication skills, deep critical analysis and practical problem solving, and interdisciplinary thinking – will continue to serve our students well.

There is little doubt that the coming years will challenge us to be even more effective in our personal and professional interactions, and the reality is that we need to reflect on the lessons learned from this election process. We need to better understand the multiple perspectives that influence environmental decision-making, and we need to think more creatively about the language we use and the partnerships we form to get to a particular end. While the next several years will surely be difficult, we will be reminded of the true value of environmental regulation and conservation, and this will serve us well in the longer run.

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Greetings from the Director (continued)

Kurt Smemo

Fear not. We have been here before. Despite many well-founded and very real concerns over how the new administration will view the environment and established environmental regulations and protections, this is not new territory. Members of the scientific community, environmental professionals, and concerned citizens have waged the battle of environmental stewardship in the face of government apathy relative to economic concerns at least once a decade. Nevertheless, significant progress in terms of environmental health and policy has been made over the last 40 years and will continue to be made as long as long as we foster an educated and principled generation of environmentally aware citizens. If government is not the environmental watchdog, the private sector (NGOs and not-for-profit groups) will fill the vacuum left behind. For this reason, pursuing higher education in an environmental field is even more important today than it was on November 7th. Personally, I woke up on November 9th full of concern, but also resolve, knowing that what I do is more important than I realized and our ESS majors will help personify the public system of checks and balances that have long shaped the political, social, and cultural trends in this nation. We will make it through this, and probably learn a lot along the way.

Michael Marx

In his landmark essay “Thinking Like A Mountain,” Aldo Leopold recalls a moment of conversion from hunter to conservationist. It’s a moment that serves us well to recall as the Trump administration is poised to assume power. With such rabid anti-environmentalists and climate-change doubters, if not deniers, the new administration looks like it will be a grim period for Environmental Studies and Science students of all ages.

Just like Leopold and his hunting buddies, I imagine Trump and his appointees “pumping lead” into our fragile environment, “with more excitement than accuracy.” Policies and protections of the past may be dismantled. Conservation and Sustainability for the future may be discarded.

Leopold reached the dying mother wolf just “in time to watch a fierce green fire dying in her eyes.” The wolf died, but the fierce green fire still rages. Studying Environmental Studies and Sciences has never been more important than it is now. We need knowledgeable and informed citizens, researchers, and workers—people who recognizes the connectedness of all things, who cherish the earth, and who “think like a mountain”—to challenge the policies of the new administration and to keep the fierce

green fire alive. We need environmentally educated individuals who can hold our leaders accountable for their actions. We need knowledgeable people who can join with business leaders to show them that the triple bottom line of Sustainability makes sense—and dollars, too—for businesses and industries throughout the world. And we need people who care about the environment and can share their passion with others, young generations and old.

Leopold concludes, “We all strive for safety, prosperity, comfort, long life, and dullness.” The next four years will definitely not be dull. They probably won’t offer much comfort, either. But we must strive on in our study of the environment, whether through the social sciences, the natural sciences, or the humanities. It may not be easy, and it may be dispiriting at times, but if not now, when? After all we have only one earth.

Rik Scarce

Political history teaches us how important environmental activism is when times look bleakest. When Richard Nixon was elected in 1968, who would have guessed he would sign almost every landmark piece of environmental legislation now on the books? He did so because of the environmental movement. The movement stopped Ronald Reagan from selling off public lands, as his Secretary of the Interior wanted to do. It prompted George H.W. Bush to pledge that there would be “no net loss” of wetlands. Today, the momentum behind sustainability is tremendous. People understand, even if presidents do not—and sometimes presidents are made to understand by the people.

Nurcan Atalan Helicke

This is a beginning, not the end. The end is forgetting who we are, letting the institutions that have provided environmental, legal, social, psychological, constitutional protection for all of us erode, being frustrated and angry all the time that we don’t have energy to do good deeds, and falling into hopelessness. We are all powerful in our own ways. Let’s keep dedicating our energy to at least one environmental and/or social justice issue in the next four years. Every day, every week, every month and every year, we will see that we are not alone and we are achieving progress. And a note for 2017: I hope your new year will be healthier and happier than your previous year.

A.J. Schneller

During the last month I’ve had in-person, lengthy and meaningful conversations with attorneys and conservation directors at a variety of civil society organizations, some of whom are the most prominent thorns in the poised to be effective environmental advocates, as modeled by our nation’s civil

sides of industry and federal agency decision makers. I value their experiences and insights now, more than ever, on the upcoming four years, not just because we’ve sent them Skidmore students as interns, but because I believe that we need ESS majors to stand society. The battles ahead will require an active and engaged citizenry who have the skills and self-efficacy to successfully pressure state and federal decision makers to protect human and environmental health. It’s worked before - the environmental assaults during the Bush Administration were formidable - but so were the inspirational efforts of elected officials, community members, and civil society. During the next four years we’ll most certainly see renewed efforts to expand mining, grazing, logging, drilling, and all manner of resource extraction. While we really have no idea the extent to which bedrock environmental legislation can and will be altered during the Trump Administration, rest assured that we’ll always be a nation of laws. Best case scenario, administration and industry reps that work to undermine protections for our environment and social services will be no more effective than a clown car full of ill-informed bumbles. And hey! We might even inspire some great new punk rock a la Ronald Reagan’s presidency!

Judy Halstead

I’d say reality based-decision making, critical thinking, and a solid understanding of what constitutes reliable data (or information) are all more important than ever. More than ever, those of us concerned with the fate of other humans, the environment and the world in general need to, not only personally embrace decision making based on reliable data, also mentor other people we encounter personally as well as professionally to make both personal and political decisions on reliable data/information. Young folks should choose their career paths to maximize the impact they can have on getting others to care about making decision based on good information.

Anne Ernst

I have been thinking about this a lot, especially as I prepare another semester of ES 100 with a very different approach. I have been reminding my (depressed) students that, in practical terms, there has always been a lot of growth in environmental fields during a Republican administration outside of government jobs. I also have been reminding students of the importance of having well-trained, knowledgeable people in the field who understand multiple perspectives that influence environmental decisions and who can communicate effectively. It’s more important now than ever.

Faculty Profile: Karen Kellogg



Long-term Skidmore faculty Karen Kellogg is excited to return to teaching after 3 years of working in the Dean of the Faculty's office. As Associate Dean of the Faculty for Infrastructure, Sustainability, and Civic Engagement, Karen focused on planning the Center for Integrated Sciences as well as other related endeavors. Since 2000, she has worked for the Skidmore

Environmental Studies and Sciences Program, conducting aquatic ecology research and inspiring students to bridge the gap between science and engineering.

Karen's love of the environment began early. As a very young child, she would frequently take solitary hikes and spend time appreciating nature. In college, Karen studied Industrial Engineering, earning a B.S. from the University of Iowa, and post-graduation, she enrolled in courses in Ecology and Organismal biology at University of Colorado, Boulder. After taking Biology and Ecology courses for fun, she decided to pursue this passion and studied Ecology with a concentration in Conservation Biology at Pennsylvania State University, earning a Ph.D.

As a result of her unique background, Karen integrates the fields of Ecology and Engineering to answer crucial questions about sustainability and renewable technology. Recently, she conducted a study with a Skidmore student, where they analyzed the effectiveness

of small hydroelectric power plants as a renewable energy source. Other research questions focus on analyses of current renewable technology capacities, the sustainability of these technologies, and the process of transitioning from fossil fuels to these technologies.

In addition, Karen has also investigated freshwater ecology. With field sites ranging from Lake Malawi, Africa to lakes and rivers in West Virginia, she has studied the ecology and evolution of diverse fish communities. Her research highlights the vulnerability of these aquatic ecosystems to environmental stressors, such as invasive species and deforestation, as well as the ecological significance of these communities. Currently, she is investigating the impacts of anthropogenic stressors on fish visual environments.

Karen is working to develop a new set of courses for the Environmental Studies and Sciences Program at Skidmore. This past fall, she taught 'Renewable Energy Systems and Sustainable Solutions', which focused on all of the major renewable energy technologies and the role they can play in reducing reliance on fossil fuel energy. This spring, Karen is teaching 'Environmental Engineering and the Science of Sustainability', a required course for students in the Environmental Science major. In this course, students learn to apply ecological concepts to the design of closed-loop sustainable systems, including biofabrication or using living machines for waste water treatment.

Karen says "We are in a really exciting moment in the program, and it is so fun to be back with Nurcan, A.J., Kurt, Bob, and Anne [her colleagues in the Environmental Studies and Sciences Program]. What a great group of people, and the students are just inspiring." She is looking forward to contributing her interdisciplinary knowledge of both engineering and ecology, which are crucial topics to consider in our quest to mitigate anthropogenic climate change and maintain healthy ecosystems.

- Jamila Roth '17

Faculty Highlights

ESS faculty had another incredible year! Assistant Professor **Nurcan Atalan-Helicke** introduced a special issue of the Journal of Environmental Studies and Sciences in September and December 2015. In January 2016, she co-organized a workshop with Dr. Gerry Marten (U Hawaii) at the annual conference of the Food-Energy-Water Nexus called "Strengthening American Food System Resilience". She presented research at the University of Arizona Center for Middle Eastern Studies in March 2016, and again at Silver Bay YMCA in August 2016. In May and June 2016, Nurcan traveled to Israel (pictured below) as part of the Faculty Fellowship Summer Institute, a group that links scholars from diverse disciplines to universities and colleges in Israel to initiate exchange and collaborations. In August 2016, she presented research at the annual meeting of the International Rural Sociology Association in Toronto, Canada.



Assistant Professor **Kurt Smemo** co-authored a paper in FEMS Microbiology Ecology last year, entitled "Mycorrhizal fungal communities respond to experimental elevation of soil pH and P availability in temperate hardwoods." He also co-authored a paper in Plant and Soil, entitled "Phylogenetically structured traits in root systems influence arbuscular mycorrhizal colonization in woody angiosperms." In December, he gave an invited lecture at the Ecosystems Center at the Marine Biological Laboratory in Woods Hole, MA, entitled "Reassessing nutrient limitation and microbial community dynamics in

acidic eastern hardwood forests." Along with 4 Skidmore undergrads, Kurt initiated two new research projects: one looking at the relationship between tree species distributions and carbon cycling in the Adirondacks, and the other examining factors controlling nutrient inputs to regional lakes.

Associate Professor **Karen Kellogg** and Peter Leipzig-Scott's ('09, featured on p.7) paper "The influence of turbidity on prey consumption in the tessellated darter *Etheostoma olmstedii*" was accepted for publication in the journal Transactions of the American Fisheries Society. Karen continues to serve as Director of Sustainability (see p.4) and received the Distinguished Faculty Service Award at Skidmore.

Visiting Assistant Professor **A.J. Schneller** and 3 capstone students are researching proactive municipality actions in relation to the proposed Pilgrim Pipeline, a crude oil rail line that would run through the Hudson Valley. He is also working with 2 capstone students to evaluate place-based environmental education and art curriculum about ecological restoration of the Hudson River, Native Americans, culture, and commerce. Last year, students in AJ's ES 352D Environmental Education class took two professional Environmental Education certification courses. Professionals from the NYS Dept of Environmental Conservation came to campus to offer this nationally recognized training, and will be back this Spring 2017 to offer two more certification training sessions.



Community Outreach

Civic engagement is a cornerstone of nearly every class offered through the ESS Program, from ES 105 students collecting water quality data to help guide watershed management of Loughberry Lake to senior capstone collaborations with local community groups. Below are a few recent examples of student outreach.

Dr. Nurcan Atalan-Helicke's students in ES224 Political Ecology worked with Sustainable Saratoga on a service-learning project focused on affordable housing. They conducted surveys of 120 residents of Saratoga Springs on perceptions about affordable housing, then presented their findings to local policy makers at a Dec 6 City Council meeting. They also developed a social media campaign on affordable housing and a brochure and map on closing the recycling/donation loop in Saratoga Springs. Two students also worked on a civic engagement project, Project Pericles, developing a proposal for involving students in affordable housing and writing a letter to an elected official.



This past fall, ESS students **Sarah Lasky '17** and **Christina Battiste '17** published a full-page color Op-ed in the Sunday Schenectady Gazette. Their piece "Other states should follow New York's lead and ban fracking", pictured at right, was written as part of Visiting Assistant Professor A.J. Schneller's US Public Lands and Oceans course and is available online at <http://tinyurl.com/frackingSkidmore>.

AJ's students published 17 Letters to the Editor in local and national newspapers regarding the benefits of school gardens, the dangers of concentrated animal feeding operations, expanding wilderness protections for the Adirondack Park, upholding protections for endangered species, and promoting the positive outcomes of experiential environmental education.



Sustainability Initiatives

Princeton Review Rating: Princeton Review gave Skidmore a 94 out of 100 in its green rating and included Skidmore in its Guide to Green Schools. Skidmore received high marks for factors such as our student-led programs to the Campus Sustainability Plan to the College's commitment to local foods.

Sustainability Annual Report Release: The Campus Sustainability Subcommittee of the Institutional Policy and Planning Committee (IPPC) released its Campus Sustainability Plan 2015-2016 Annual Report. The annual report summarizes the efforts and achievements from the past year and evaluates the College's progress toward each of our sustainability goals in our five focus areas: Energy, Food, Waste, Lands and Grounds, and Engagement. In addition, the report articulates future steps that will help the College make additional progress towards achieving our goals. The annual reports, in combination with the Campus Sustainability Plan, help tell a comprehensive story of our sustainability efforts. Download the current report by visiting the sustainability webpage.

Geothermal expansion: Skidmore completed the construction of its third district geothermal bore field. This geothermal system will support the heating and cooling needs of several buildings on campus, including the new Center for Integrated Sciences. This project will allow the College to heat and cool over 50% of campus square footage with geothermal energy.



REV CC participation: Thanks in part to Skidmore's innovations in renewable energy, the College is serving as a guide and resource for other institutions in New York State. Named this year as a leader—the highest membership level—in New York State's REV Campus Challenge program, the college is formally recognized on the NYS Energy Research and Development website.

Compost expansion: Skidmore's student-managed composting program, which began in 2011 and now collects food scraps from the Northwoods and Sussman student apartment villages, has turned more than 45,000 pounds of waste into compost for the Skidmore Community Garden. The program expanded to an off-campus site last fall and takes manure from the college stables, grounds-keeping debris, and dining services' coffee grounds to supply compost for campus grounds.



Compost manager Maya Cohn '17 turns compost at the new large-scale composting site.

Tree Campus USA certification: Skidmore has earned membership in the Arbor Day Foundation's Tree Campus USA initiative. This recognition was based on Skidmore's fostering of healthy forests by managing its campus trees effectively and engaging in outreach with the Skidmore and Saratoga community. Skidmore also hosted the 2016 New York State Urban Forestry Council's ReLeaf Conference where summer North Woods Stewards **Sana Bando '17** and **Yesenia Olivares '18** led participants on tours and invited conference attendees to participate in a service project to remove burning bush from one area of the forest.

Sustainable Food update: The Sustainable Food Internship program, a collaboration between ESS, Dining Services, and the Sustainability Office, continues to support the College's sustainable food goals. Fall interns **Greta Binzen '19**, **Gabi Mascarin '18**, and **Manuela Tauscher '17** completed the 2016 Sustainable Food Report and visited Tiashoke Farm in Buskirk NY, a local dairy farm and food distributor. Sustainable Dining Wednesdays, a new weekly effort led by students **Bryn Sarnier '18** and **Carolyn Koestner '18**, helped the College develop more sustainable menu items and increase awareness of sustainable food systems in the Dining Hall.



Student Awards and Accomplishments

This past summer, 16 ESS students successfully competed for funding for internships and research. Nine students got funding from various groups and programs on campus, three students got funding to do research either with Skidmore faculty or with faculty at affiliated NY6 schools, and four others got competitive summer funding from outside groups, including the National Science Foundation, the Doris Duke Conservation Scholars Program, and the Quebec-Labrador Foundation. Projects ranged from local environmental work in Albany and Greenwich to education and conservation in Ethiopia and Madagascar.

Many other ESS students worked in internships – both paid and unpaid, during the school year or over the summer, for college credit or just for the experience. Over 70% of ESS students do an internship while they are at Skidmore.

ESS Summer Internship Award Winners

Christina Battiste '17, Environmental Studies major

Christina worked as an environmental education intern at the Albany Pine Bush in Albany NY. She prepared materials and led education programs, including one she designed herself. She also worked with bird banding, pond monitoring, seed collection, trail work, and invasive species removal. Her experience gave her valuable insight into an organization working to preserve and educate others about the environment.



Ben Curell '18, Environmental Science major

Ben was awarded ESSIA funding to work as a GIS intern for the Planning Department of Cumberland RI. He updated the zoning and parcel changes and created trail maps for the town. He also helped to create Cumberland's first solar ordinance. His work gave him insight into how a municipal government regulates the development of its land and the various tools used to implement these regulations.



Amanda Greenlee '17, Environmental Studies major



Amanda interned at Comfort Food Community, a nonprofit based in Greenwich NY. CFC's mission is to alleviate food insecurity in the greater Greenwich area. CFC operates two food pantries, a community garden, and a backpack program that

sends food home with school kids over the weekend. Amanda helped with these programs, and also gleaned extra produce from local farms to distribute to those in need throughout Washington County.

Skidmore SEE-Beyond Award Winner

Miary Rasoanaivo '18, Environmental Science major

Miary won Skidmore's SEE-Beyond grant to work at the network for Managed Resources and Protected Areas (MRPA) in Antananarivo, Madagascar, a project funded by the UN Development Program. He studied the potential impacts of climate change on ecosystems and human populations in the Boeny Region along the western coast. He also worked to enhance the small-scale fishing sector as a sustainable source of income for local populations.



Skidmore SGA Responsible Citizenship Internship Award (RCIA) Winners

Helen Mebrate '16, Environmental Studies major

Helen taught environmental science at the SOS Gmeiner School Hawassa in Ethiopia, the school she attended when she was growing up. She collaborated with other teachers to identify and develop skills for young girls to pursue science in college.



Skidmore Summer Funded Internship Awards Program (SSFIAP)

Chris Malvicini '17, Environmental Studies major

Chris researched disease in giant clam populations and their interactions with local fish species at the Marine Science Institute of



the University of the Philippines, near where he grew up. Chris designed his own methods for lab and field analyses, and then got to SCUBA-dive and free dive to collect data. He also assisted in conducting community trainings in giant clam restocking and propagation of corals.

Rafaela Iturralde '18, Environmental Studies major



Rafa worked at Fundar Galapagos, an organization founded by natives of the Galapagos and Ecuadorean citizens to promote sustainable development. She worked on an ecological reserve located in an agricultural region of Santa Cruz Island. The reserve serves as an example of responsible agriculture, using alternative techniques of cultivation of crops in coexistence with native and endemic species. She also helped with environmental education and did an independent research project on perceptions of sustainable development by island natives.

Student Awards and Accomplishments (continued)

CDC Summer Internship Award Winners

Isabel Blumenthall '19, Environmental Studies major



Isabel worked for the Dickenson College Farm, learning about food sustainability. She worked as a farmhand to weed, harvest, transplant, and trellis crops. She also assisted with livestock, irrigation, and composting. Working in the fields, Isabel gained an appreciation for the processes of agriculture, and inspired her to continue working in the field of food sustainability.

Olivia Golden '18, Environmental Studies major



Olivia interned at two community gardens. At Radix Ecological Sustainability Center, Olivia did garden maintenance, worked with livestock, and helped with their Farm Share program. At Roots and Widsom, she helped high school students manage a CSA and Farm Stand, coordinated volunteers, wrote newsletters, and did garden maintenance. Both internships gave Olivia the opportunity to understand how non-profit organizations operation. She gained experience working with community members and learned a lot about sustainable agriculture and food waste.

The National Science Foundation (NSF) Research Experience for Undergraduates (REU) program offers competitive summer research opportunities for students across the country. **Lauren Sidor '17** won an REU award to study marine and fisheries sciences at the University of Massachusetts Dartmouth Graduate School for Marine Science and

Technology. Lauren worked with her mentor to develop modified fishing gear and then test differences in catch and in fish behavior between the standard gear and the modified gear. She also attended bi-weekly meetings on literature, communicating science to the public, and statistical analysis.



Jamila Roth '17 won funding from the NY6 Liberal Arts Consortium to do research on aquatic ecology for the past 2 summers. She worked with Professor Meghan Brown at Hobart and William Smith Colleges, studying invasive species in the Finger Lakes of Central NY. She researched the use of light-based traps for detecting and collecting the invasive Bloody Red Shrimp, conducting both lab and field experiments to test their efficacy. Jamila found that these traps offer a promising monitoring strategy that may be superior to traditional collection methods.



Last summer, **Tracey Wingate '18** started her first year of the 2-year Doris Duke Conservation Scholars program at Northern Arizona University. For the first half of the summer, Tracey traveled with other Scholars around the southwest and learned about regional conservation issues, including the impact of an invasive species on riparian ecosystems and tensions surrounding water rights. During the second half of the summer, she worked with an organization called Sky Island Alliance, a binational organization that works to protect and restore biodiversity in the southwestern US and northwestern Mexico. She worked on a habitat restoration project, planting native plant species to support pollinator populations in disturbed areas. Tracey will finish up the second half of this 2-year program this coming summer, when she hopes to work on sustainable agriculture.



The Quebec-Labrador Foundation is an environmental NGO that works to advance community-based conservation and the stewardship of natural resources and cultural heritage. Through a partnership between Skidmore and a local funder with close ties to QLF, several Skidmore students are funded every summer to work for QLF on a variety of conservation issues. ESS students **Jack Curry '18** and **Patricia McGuire '17** were last summer's recipients.

Jack worked with 7 other students from the U.S. and Canada, doing census work for the provincial government of Newfoundland and Labrador regarding populations of endangered piping plovers.



They travelled around the province as well as Quebec, conducting workshops for children on environmental stewardship. They also led a marine debris program, organizing beach clean-ups with local communities.

Patricia worked as a Global Leadership Network Intern, doing communications work to prepare documents for a conference held in Spain this past fall. The event brought together alumni from the organization to discuss community-based approaches to environmental conservation and biodiversity protection that engage local residents, organizations, and governments.



Student Awards and Accomplishments (continued)

Every summer, Skidmore's Faculty Student Summer Research (FSSR) Program provides students with a unique opportunity to spend part of the summer working with faculty on original research.

Last summer, Environmental Science students **Dan Casarella '18** and **Jen Cristiano '18** started a multiyear study on forested ecosystems with Assistant



Professor Kurt Smemo. Soils can store atmospheric carbon as organic matter, and some forests accumulate more soil organic material than others. Dan and Jen want to figure out why. Over the summer, they worked with Dr. Smemo and Skidmore's GIS Center to identify potential Adirondack study sites, and collected data from 24 experimental plots in the Tongue Mountain Range near Lake George. This spring, they will resume their research, and continue their work through their senior Capstone project. Check out their terrifying encounter with Bigfoot over the summer: <https://www.youtube.com/watch?v=JlnAq-WPQqg>

Bella Bennett '17 attended the national Geological Society of America conference in Denver, Colorado this past September, presenting research she conducted in New Zealand the previous spring during a semester with Frontiers Abroad. Her research focused on the Historic Kaharoa volcanic eruption within the Taupo Volcanic Zone on New Zealand's North Island. She created a model of the volcanic ash plume caused by the eruption, and then assessed whether the plume could have been seen by voyaging Polynesians. Over 7,000 geologists attended the national conference, including Geosciences Professor Kyle Nichols, who lent Bella moral support during her presentation. Her official abstract is published at:

<https://gsa.confex.com/gsa/2016AM/webprogram/Paper284698.html>



Bella poses with the Colorado Convention Center mascot, a blue bear. Her model is shown below.



With help from several donor opportunities at Skidmore (including SGA's Academic Pursuit Award, the Opportunity Funds grant from the Office of the Dean of Students, and the Susan Hirsch Schwartz Award of the CDC), **Rafaela Iturralde '18** attended two international conferences: the UN COP 21 Conference on Climate Change in Paris during December 2015 and the UN Conference on Housing and Sustainable – Habitat III in her home country of Ecuador during October 2016. Nearly a year after the Paris Agreement, Habitat III sets a New Urban Agenda for member countries of the UN to develop their cities in a more compact, sustainable way. Topics included addressing food insecurity in growing urban areas, developing cities that are resilient to natural disasters and climate change, and including poor people in urban development goals to create social cohesion in cities. These international summits will mark history for decades to come, and Rafa's opportunity to attend these summits and network have helped her realize the importance of hands-on experience going forward.

Alumni Spotlight



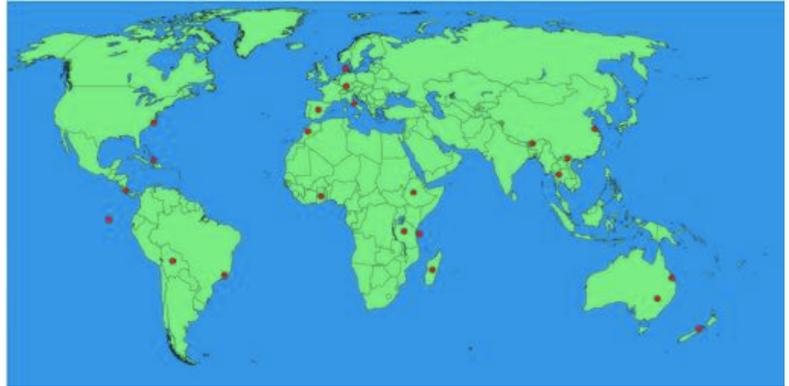
Peter Leipzig-Scott '09 is working towards his Ph.D. in Ecology at Colorado State University. His research focuses on how narratives can be used to effectively communicate ecology, and how climate change influences plant-pollinator phenologies. In addition to his research, he also works with the US Geological Survey, studying ecosystem subsidies and contaminant flux. As an ESS student, Peter did his capstone research on Japanese knotweed, an aggressive invader of riparian habitats. He received his MSc in Ecology from Colorado State, working with Dr. Ruth Huffbauer to study the ecosystem impacts of an invasive plant, *Verbascum thapsus*. Prior to starting graduate school, Peter worked as a conservation and land management intern for BML in Tuscon AZ, and then as a community organizer for Clean Water Action in Fort Collins, CO. His broad background prepared him well for his current research, and he hopes to continue doing research after he completes his graduate work.



Laura Mindlin '15 is the newly appointed Edible Campus Coordinator at UNC Chapel Hill, running a program through the North Carolina Botanical Garden that promotes edible and sustainable landscapes and garden beds across campus. Laura was involved in food systems and land management throughout her time at Skidmore and post graduation. As an ESS student, Laura worked for the Sustainability Office, facilitating local food options for the Dining Hall and helping manage the North Woods as a North Woods Steward. She also interned at American Farmland Trust, working on initiatives to protect farmland in New York. Since graduation, Laura has worked on several food and land-management projects, including studying permaculture in Costa Rica and working as a food systems consultant to bring more local food into NY State Universities. Her position at UNC provides a great way for her to bring together her training and experience.

Study Abroad

Skidmore ESS students spanned the globe this past year, studying in 23 different countries on 6 continents. While Denmark, Costa Rica, and Australia remained the most popular countries, students also studied in many other countries, including Brazil, China, and Tanzania. Studying abroad or off campus in a domestic program enhances an education in environmental studies and sciences by providing a global view of environmental issues. Students return with new adventures and experiences, adding an international perspective to their studies after they return.



ESS students studied around the globe last year, covering 6 continents. Each red dot shows where at least 1 ESS student spent a semester or summer this past year.



Ben Curell '18 measures trees in the wet Sclerophyll forest of North Queensland, Australia.



Amanda Greenlee '17 studied in Vietnam, Bolivia, and Morocco (shown above) on the SIT International Honors Program focused on climate change.



Lauren Sidor '17 hangs out with a giant tortoise on the Galapagos Islands, Ecuador..



Andy Frank '17 hikes up a streamside trail in Thailand.



Bella Bennett '17 (2nd from right) conducts field research in New Zealand.



Colleen Sullivan '17 dives for data off Little Cayman Island in the Caribbean.



Students gathered for our annual fall ESS Study Abroad Picnic. We welcomed back our ESS students who studied abroad or off campus last year, and they had the chance to talk to interested first- and second-year students about their programs and experiences.



Julia Cavicchi '18 stands under a banner of prayer flags in Bhutan on the SFS Program called Himalayan Environment and Society in Transition.



ESS Keynote Lecture: Dr Jennifer Jacquet. Guilt, Shame, and Climate Change

How can we use shame to address climate change? This was the question posed by Dr. Jennifer Jacquet, the ESS keynote speaker this past October. Dr. Jacquet is an Assistant Professor at New York University where she studies large-scale cooperation dilemmas, particularly the role of social approval in encouraging cooperation.

Dr. Jacquet distinguished shame from guilt. Guilt is a feeling that can be productive for individual change, but groups (such as governments or corporations) don't have feelings, so they need to be motivated differently. Shame campaigns can be effective. For instance, when PR giant Edelman was exposed in 2014 for representing climate deniers, the company immediately dropped those clients. A similar campaign was used to stop Barclay's Bank from funding mountain-top removal. However, shame can be an unpredictable tool, and too much shame can make entities withdraw and act in accordance with their reputations.

How can shame be used to address the growing issue of climate change? The Paris Agreement, the UN's agreement to reduce global carbon emissions that was negotiated by 195 nations, has been called a "name and shame" campaign. The UN didn't have the political capital to pass a legally-binding document, but by naming countries that are not meeting their lowered emissions standards, they encourage these countries to comply. This proved very effective in the time leading up to the Paris Agreement negotiations, when many countries developed national plans in order to avoid being called out during the conference as not cooperating. However, when you take away the shame, you often take away the incentive. Dr. Jacquet reminded us that, for climate, we need to decide what is "shame worthy." Attention is finite, and we need to decide where we will point the spotlight. Shame requires a vigilant society in order to be most effective.

Dr. Jacquet spoke in the Tang Museum as part of their "A More Perfect Union" series, which ran during Fall 2016 to address the role that politics and policies play in the state of the Union.

Before her public lecture, Dr. Jacquet met with 14 ESS majors and minors. She led a discussion on her essay "Human Error: Survivor Guilt in the Anthropocene" (<http://www.laphamsquarterly.org/disaster/human-error>) and talked about career paths and grad school options with students, and then they led her on a tour of campus and the North Woods.



Shadow Conservation of Church Forests in South Gondar, Ethiopia

Pete Scull and Peter Klepeis, colleagues from the Geography Department at Colgate University, spoke on campus last fall about a unique interdisciplinary research project on the church forests of Ethiopia, where adherence to the beliefs and practices surrounding one of the world's oldest forms of Christianity has led to the conservation of small islands of biodiversity in an almost totally deforested landscape.

The Colgate team covered two major areas of research: a quantitative assessment of these forests and qualitative evaluation of the religious influences protecting the forests. The first part of their work relies on GIS analysis to evaluate how many forests there are, how they vary spatially, and how they are changing over time. They found that the forests are very small (average size 5.2 ha), and the smaller the forest, the more degraded the canopy and the more isolated the forest tends to be. In essence, these are highly vulnerable forest fragments.

The other part of the research involves on-the-ground work, talking to locals and looking at old photographs. In Ethiopia, the forest itself is not sacred, but rather the space within, and the closer you get to the center, the more sacred the space becomes. External pressures on the forests are growing, including a need for fuel wood, agricultural land, and growing population and affluence in the area. However, strong religious pressures, particularly the religious tradition to be buried in a forest, have helped to limit the loss of these forest fragments.

Drs. Scull and Klepeis were invited to Skidmore by Professor Eliza Kent, chair of Skidmore's Religious Studies Department, who teaches Religion and Ecology, a popular course for ESS majors. Dr. Kent collaborates with Drs. Scull and Klepeis and studies the religious traditions surrounding these forests. She gave a related talk last fall called "Accidental Environmentalists: Sacred Groves and Forest Conservation in Ethiopia."



Field Trips: Experiential Learning

Every year, ESS students have the opportunity to deepen and enhance their classroom studies with hands-on field trips. Some field trips are organized within classes (for instance, ES 105 students spend over half of their labs out in the field) while others are open to any interested student. Below are highlights from some recent field trips that our ESS students went on during the past fall.

Spruce Mountain, Adirondacks

Last September, ESS coordinator Anne Ernst organized a group hike up Spruce Mountain, a 2100-foot peak located in nearby Corinth, by the foothills of the Adirondacks. The top of Spruce Mountain boasts a 73-foot tall fire tower, which offers a 360 degree view of the foliage. Some folks climbed the tower, while others caught their breath at the base, watching the clouds roll in. Despite the pouring rain on the trip down, everyone felt energized and accomplished with the hike and view. We were all happy to warm up post-hike at a local pizza joint. A fun Friday for ESS students and faculty alike!



Microhydro plant, Chittenden Falls

This past October, Associate Professor Karen Kellogg brought her students to the microhydro plant in Chittenden Falls for ES 252D Energy Systems and Sustainable Solutions. The scenic falls, located on Kinderhook Creek in Columbia County, will generate up to 18% of Skidmore's electricity. Skidmore partnered with Gravity Renewables, a Colorado-based company that owns and operates small hydroelectric dams across the US. Omay Elphick '93, director of project development at Gravity Renewables, gave the ES 252D students the history of the falls and led them on a behind-the-scenes tour of the plant. Students left the field trip with a clearer

understanding of alternate energy sources.



Huntington Wildlife Forest, Adirondacks

This past September, Assistant Professor Kurt Smemo led a joint weekend field trip for his students in ES 205 Conservation and Use of Forested Landscapes. They traveled to Newcomb NY in the High Peaks of the Adirondacks with Kim Marsella's Scribner Seminar "Adirondacks: Forever Wild?", and stayed overnight in cabins at SUNY ESF's Newcomb campus on the shores of Arbutus Lake. ES 205 students got hands-on experience learning about forested watershed measurements and budgets, impacts of past land-use history in the Adirondacks, the structure of old growth forests, and current and past forest management efforts in the Adirondacks. They joined the freshmen in the Scribner Seminar in a hike up to the Goodnow Mountain lookout tower.



Senior Capstone Projects 2016

Charles Lovejoy and Una Semar

Lead-Contaminated Soils in Saratoga Springs and Hormone-Stimulated Phytoextraction as a Potential Solution

Lead-contaminated soils are pervasive in many urban settings. We tested lead concentrations in home-garden soils of Saratoga Springs residents, and found significant lead contamination in over half of the gardens. In the lab, we analyzed the effect of various hormone treatments on the ability of sunflowers to phytoextract lead. Sunflowers treated with strigolactone had significantly elevated concentrations of lead in their tissues compared to the other hormone treatments and control group.

Kyle Downey, Sam Holmberg, and Michaela Kerxhalli-Kleinfield Tackling the Challenge of Smarter Energy Design

Traditional power generation and distribution via the macrogrid is outdated, inefficient, and susceptible to outages from natural disasters. Microgrids are localized grid systems capable of producing energy using small-scale sources. We analyzed microgrid development across NY State. Functionality, reliability, and cost-effective design were more important to participating communities than environmental considerations. Obstacles include financial and technological challenges along with lack of coordination and prior experience.

Julia Boyer, Kaelen Clark, and Grant Bean Forest fragmentation, ecosystem function, and community values within complex social and natural landscapes

We assessed how community perceptions and adjacent land uses affect the functioning of forest fragments and their edges. Edge effects persisted beyond 50m into the fragment. Community members of Saratoga were concerned about protecting fragments for their ecosystem services, but were unclear on who has the power to protect them. We suggest that conservation of these fragments must be considered both a natural and social landscape issue.

Clarivel Gonzales, Carolyn Lois, and Helen Mebrate Seed Saving and Exchange Networks: Seed Libraries and Food System Resilience

We examined how seed libraries contribute to regional crop-species diversity and provide food-system resilience against drought, disease, and other negative impacts of climate change. We surveyed seed library coordinators from around the country and measured the proliferation of regionally adapted seeds. Seed libraries have increased nearly 300% since 2013. They enhance biodiversity and crop resilience, and reconnect people to their food source.

Ben Freiberg, Nicolas Graver, and Kat Klammer Nitrogen and sediment dynamics in wetlands and streams along an urbanization gradient within the Lake Lonely watershed

The ability of wetlands to sequester or convert reactive nitrogen is an important control of anthropogenic nutrient inputs. We observed cool weather nitrous oxide flux, denitrification potential, nitrogen mineralization rates, and sediment patterns within two New York wetland streams. The size of sediments and thus availability of denitrifying bacteria may determine rates of microbial nitrate processing within wetland streams.



The 2017 ESS Capstone class jumps for joy at the start of their year-long research projects.

Rachel Dyckman, Olivia Gramprrie, and Alyssa Hagerbrant Got Local? Want Local? Consumer Marketing Analysis of Local Food

Local food (food grown within a region) is a growing environmental movement, and large food retailers are trying to capitalize on this trend. Retailers use food labels to capture consumer interest in local food. We evaluated local food availability in several cities within the Capital Region of New York State, and assessed how stores label and advertise local food. The majority of consumers will pay more for a local product, but availability and labeling vary widely among retailers.

Caroline Hobbs, Colton MacKay, Emily Mangan, and Christine Munsteri Public Perception of Crude Oil Transport via Rail in Saratoga County

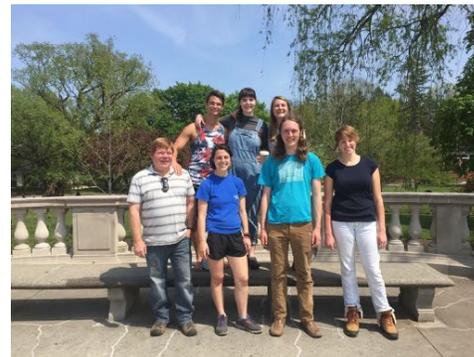
Crude oil transport via rail has increased drastically over the past six years due to increased oil production in the Bakken Shale. Communities near rail lines experience heightened risk from its transport. We assessed public perception of risk regarding crude oil transport via rail in Saratoga County NY using surveys, semi-structured interviews, and GIS mapping. The data give us a better understanding of the general awareness of crude by rail transport and future needs of Saratoga County.

Katie Cuthbert, Emma Ottenheimer, and Kylie Rosabal Environmental Education and Interpretive Trailblazing at Saratoga Independent School

We worked at the Saratoga Independent School to develop an afterschool environmental club. We constructed an interpretive nature trail on school property that included stations, lessons, and activity suggestions for future use. Lessons focused on place-based education, nearby nature, and experiential learning. We conducted interviews and focus groups with students, teachers, and parents, and measured environmental knowledge, behavior, and attitudes with a control and treatment group.

Celeste Calderon, Brian Fredericks, and Olivia McKee Seeking Sovereignty: Migrant Farmworker Wellbeing in the New York Capital Region

The US economy has relied on migrant labor since inception, particularly in agriculture, but little research exists on migrant farm workers. We conducted 45 interviews with migrant farm workers, employers, and service providers in the Capital Region of NY State. Migrant farm workers in this region face food sovereignty barriers. They employ methods of resilience and cultural preservation through backyard/small-scale agriculture, use of local services, and connections with a growing migrant community.



The 2016 Environmental Science students take advantage of a beautiful spring day for a study break in Congress Park with Capstone advisor Dr. Kurt Smemo.

ESS in Action



This past September, ESS Keynote Speaker Dr. Jennifer Jacquet came to campus to talk about the power of shame in addressing climate change. In advance of her talk, she met with students to talk about career paths (left) and then they led her on a tour of campus (right).



Dan Caserella '18 (above) worked with Assistant Professor Kurt Smemo and Connor Christoffersen '18 (below) measuring carbon storage in forests.



ESS students and faculty took a fall hike up Spruce Mountain in Corinth NY, followed by a pizza dinner at a nearby restaurant (above and right).



ES 105 students explore Loughberry Lake (above) and its tributaries (below) to determine the status of the watershed.



Skidmore's Sustainable Food Interns have increased the offerings of sustainable food items in the Dining Hall.



Compost Managers Tracey Wingate '18 (pictured above) and Maya Cohn '17 were trained to use a tractor this past fall in order to turn compost at the new large-scale compost facility near the Skidmore Stables.



Students from ES 252D Energy Systems and Sustainable Solutions check out the microhydro plant in Chittenden Falls (left), where Skidmore gets close to 18% of its electricity.