

Center for the Environment, Ecological Design, and Sustainability

Smith College

Annual Report

August 2016

Submitted by Robert M. Newton, Director



Executive Summary

The Center for the Environment, Ecological Design, and Sustainability (CEEDS) prepares all Smith students to lead on issues of environment and sustainability. In 2015-16, Smith College received \$1.2 million in endowment support for CEEDS, further solidifying its role in the education of our students. Heading into the 2016-17 academic year, we will welcome back students who have never known a Smith without the environmental concentrations or the Bechtel Environmental Classroom. All of the CEEDS programs continue to grow and develop, engaging more and more students and faculty from across a wide range of disciplines. The 2015-16 year saw the initiation of an Arts Afield program, a collaboration between CEEDS and Athletics for the management of the low-ropes challenge course at the MacLeish Field Station, updated environmental monitoring, innovative curricular enhancements across campus, numerous field trips for students and faculty, and opportunities to engage with environmental leaders through a range of workshops and colloquia. We also welcomed to Smith Alexander Barron, assistant professor in the Environmental Science and Policy Program, and Ellen Harter Wall to a limited-term position as Communications Coordinator for CEEDS, the Office of Campus Sustainability and the Study Group on Climate Change.

Regular operating expenses (including all salaries and compensation) during 2015-2016, totaled \$337,813 and CEEDS had an additional expenditure of \$70,137 of one-time funds.

1 Mission and Outcomes

Building on a strong tradition of women's leadership at Smith, the Center for the Environment, Ecological Design, and Sustainability (CEEDS) brings together faculty, staff, and students from the natural sciences, social sciences and history, humanities, and engineering to address environmental questions and challenges. Our mission is *to graduate women who excel at integrating knowledge to support environmental decisions and actions*. This mission, and CEEDS itself, is intended to complement and enhance the wide range of curricular pathways that students can choose to study the environment at Smith. CEEDS is about linking knowledge across the liberal arts and critically applying this knowledge to real-world solutions.

In pursuit of these goals, the activities of the Center are directed toward:

- Enhancing the curriculum
- Sponsoring integrative environmental projects
- Using our campus as a model of sustainability
- Integrating environmental resources and information

Sections 3 through 6 of this report are organized according to these categories.

As CEEDS is driven by educational outcomes, our activities focus on maximizing the impact of the Center in accomplishing our mission. Through the programs, activities, and collaborations facilitated and supported by the Center, we intend that Smith students who engage with CEEDS will:

Make Connections

Students bring together knowledge and data from different fields within the unifying context of the environment.

See Multiple Perspectives

Students learn to see environmental issues from multiple perspectives by interacting with faculty, staff, alumnae, other students, and community members with different backgrounds, experiences, and knowledge.

Get Outside

Students learn from the communities and built and natural landscapes in which they live and study.

Take Action

Students take on environmental projects inside and outside of the curriculum and draw upon their liberal arts education in pursuit of these projects.

Communicate Effectively

Students develop skills in listening to and communicating with others to facilitate decisions and action.

Build Meaningful Careers

Students find meaningful internships and employment in environmental fields over a range of sectors (graduate school, business, non-profit, government).

Additionally, as a result of the Center's existence:

Faculty are Supported

Members of the faculty use CEEDS as a resource to support and enhance their teaching and scholarship.

Alumnae Connect

Smith alumnae connect with the college, current students, and each other to share knowledge, experiences and expertise related to the environment and sustainability.

Smith Gains Recognition

Smith enhances its reputation as a model of environmental sustainability, as a place for students to live sustainably, and as one of the best places to study the environment.

Smith Evolves

Innovative ideas that prove successful within CEEDS are adopted and implemented throughout the college.

2 Growth and Development

CEEDS is recognized as an important resource for collaboration and the place to come for information about the environment at Smith. CEEDS staff members connect students, faculty, and visitors to environmental organizations in our community and resources related to the curriculum, projects, operations and facilities at Smith. This centralization is of great value to our community and helps to reinforce Smith's commitment to the environment and sustainability.

The role of CEEDS in the education of Smith students continues to grow and develop. During the 2015-2016 year, CEEDS interacted with thousands of people—from students and faculty to community members and local leaders. Our energies were directed toward increasing our visibility and connections on campus and within the greater Five College area. To this end, the year saw collaborations deepen with a number of Smith offices and programs, several local non-profit organizations, and members of the Five College consortium—Amherst, Hampshire, Mount Holyoke, and UMass-Amherst.



Students, staff and visiting environmental fellows with the many boxes of apples they gleaned for a Springfield soup kitchen with local organization Rachel's Table.

2.1 Personnel

As of July 1, 2016, the CEEDS staff comprises the director, assistant director, field station manager, environmental research coordinator, communications coordinator, and administrative assistant. Environmental Fellows, appointed from the Smith College faculty, provide strategic guidance to the director and staff. Separate advisory boards exist to set policy and make decisions related to the MacLeish Field Station and the environmental

concentrations. During the fall, CEEDS partnered with the Institute for Training and Development to host an international environmental fellow from Peru (see box below). CEEDS also supported 9 student interns who engaged in a variety of projects both on- and off-campus. Table 1 provides a list of CEEDS staff and affiliated faculty.

Table 1: CEEDS staff and affiliated faculty, 2015-16.

<p>Staff Director Assistant Director Field Station Manager Env. Research Coordinator Communications Coordinator Administrative Assistant</p>	<p>Robert Newton Joanne Benkley Reid Bertone-Johnson Paul Wetzel Ellen Harter Wall Johanna Walter</p>
<p>Environmental Fellows</p>	<p>Jesse Bellemare, Biological Sciences, Environmental Science and Policy (ENV), Landscape Studies (LSS) Daniel Gardner, History Ann Leone, French and Landscape Studies (LSS) James Lowenthal, Astronomy Amy Rhodes, Geosciences, ENV L. David Smith, Biological Sciences , ENV</p>
<p>MacLeish Advisory Board</p>	<p>Amy Rhodes (Chair), Geosciences, ENV Jesse Bellemare, Biological Sciences, ENV, LSS Reid Bertone-Johnson, CEEDS, LSS Scott Johnson, Athletics Robert Newton, CEEDS, <i>ex officio</i></p>
<p>Advisory Board for Environmental Concentration: Sustainable Food (EFX)</p>	<p>Elisabeth Armstrong, Study of Women and Gender Joanne Benkley, CEEDS Barbara Brehm-Curtis, Exercise and Sport Studies Michelle Joffroy, Spanish and Portuguese Ann Leone, French, LSS Robert Newton, Geosciences, CEEDS, ENV Nancy Sternbach, Spanish and Portuguese Paul Wetzel, CEEDS</p>

Advisory Board for Environmental Concentration: Climate Change (ECX)	Jesse Bellemare, Biological Sciences, ENV, LSS Joanne Benkley, CEEDS Elliot Fratkin, Anthropology, ENV Nathanael Fortune, Physics Daniel Gardner, History Alice Hearst, Government Danielle Ignace, Biological Sciences, ENV James Lowenthal, Astronomy Robert Newton, CEEDS, Geosciences, ENV Amy Rhodes, Geosciences, ENV Susan Sayre, Economics, ENV Gregory White, Government, ENV
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2.2 Alumnae Advisory Board

The CEEDS Alumnae Advisory Board shares their professional expertise and insights with CEEDS staff and Environmental Fellows and in turn shares our mission and successes with alumnae and external audiences. Membership comprises:

Donna Attanasio '81, Senior Advisor for Energy Law Programs, the George Washington University Law School

Katherine Borgen '64, Board Chair of Rachel's Network; Trustee Emerita, The Nature Conservancy (CO); Director, Borgen Family Foundation; Director, Walking Mountains Science Center

Leslie Carothers '64, Visiting Scholar at the Environmental Law Institute; member, Board of Directors of the Center for Climate and Energy Solutions

Aimée Christensen '91, Founder and Executive Director, Sun Valley Institute; Founder and CEO, Christensen Global Strategies

Iлона Johnson '06, Mechanical Design Engineer, GHT Limited

Erinn McGurn '94, Co-founder and Executive Director of SCALEAfrica; Owner/Principal of SCALEStudio; member, Board of Directors of the Alumnae Association of Smith College; member, STEM Advisory Board for the Partnership for After School Education (PASE)

Jan Van der Voort Portman '78, Trustee, The Nature Conservancy of Montana; Rare and ArtWorks, Cincinnati; Honorary Life Trustee, The Nature Conservancy of Ohio

The advisory board met in October 2015 and connected again via a Google Hangout conference call in June 2016 to discuss the ongoing work and goals of CEEDS. The next in-person meeting with the Board is scheduled for October 2016.

CEEDS Hosts Environmental Fellow

CEEDS sponsored its first international professional environmental fellow, Lucia Delbene, this fall through the Institute for Training and Development (ITD). The program is sponsored by the U.S. State Department's Bureau of Education and Cultural Affairs and brings emerging environmental sustainability professional leaders from Mexico, Peru, and Uruguay to the United States for intensive fellowships designed to broaden their professional expertise.

A young biologist from Uruguay, Lucia runs a gender, ecology and sustainability program there that aims to explore how women are linked to the environment and affected by its destruction. She is working to gather information for a book on this topic. During her three weeks at CEEDS, Lucia conducted research in the archives, attended several classes and seminars (both at Smith and UMASS) and participated in a number of CEEDS events. Near the end of her time on campus, she gave a lunchtime talk titled "Ecofeminism in Latin America," which was attended by more than 50 students interested in learning about the intersections inherent in the topic of ecofeminism. It was a pleasure to welcome Lucia to CEEDS and learn from her perspective on environmental issues.



Lucia talks about ecofeminism with an overflow audience in CEEDS.

2.3 Grant Proposals, Gifts, and Fundraising

In 2015-2016, the Center for the Environment, Ecological Design, and Sustainability received a number of gifts and commitments from alumnae and friends. Gifts greater than \$1,000 include:

Pledge/Gift amount	Donor	Intent
\$1 million	Mary Wilson '69	Endowment
\$200,000	Name withheld upon request	Endowment
\$20,000	Katherine Sharp Borgen	Current use
\$10,000	Andreas Foundation	Current use
\$10,000	Schwab Fund for Charitable Giving	Current use
\$2,000	Donna Attanasio	Current use
\$1,000	William Portman	Current use

Three Questions for Marcia MacHarg, Smith College Board of Trustees member and CEEDS donor



Former Director Andrew Guswa and Marcia in CEEDS.

Q: How did you become involved with CEEDS?

A: When I was exploring ways to support Smith's mission, I learned about CEEDS and was immediately attracted by the cross-pollination of ideas it promotes. Everyone I met—staff, faculty, and especially students—were so passionate about CEEDS that I became just as passionate. Helping put CEEDS on a firm financial footing for the future was a happy fit for me.

Q: You're currently a member of the Study Group on Climate Change, which is looking at how Smith can respond to global climate change. What can you share with us about the committee's work?

A: I've come to see that addressing climate change and sustainability is one of the most complex issues facing the college now and in the future. It's like a million-piece jigsaw puzzle. But with the sheer talent, dedication, time commitment and know-how of the members of the Study Group, and the help of the wider Smith community, we're putting the pieces of the puzzle together. We'll have a report for President and the Board of Trustees by the end of 2016.

Q: What have you enjoyed most about working on the committee?

A: I love working with such a really smart group of people with various strengths, perspectives and histories. It's been particularly great to work with the students—they're so accomplished! This spring, Professor Camille Ottombre-Washington's ENV 201/202 class led workshops to gauge the priorities and concerns of the Smith community with regard to climate change. They then presented their findings to the committee and submitted a 100+ page report!

3 Enhance the Curriculum

3.1 Environmental Concentrations

CEEDS offers two environmental concentrations that provide a framework for students to integrate their academic and experiential learning around cross-disciplinary environmental topics: climate change and sustainable food. Each concentration comprises four components: a gateway course, core courses selected from across the five colleges in consultation with a faculty advisor, two practical experiences, and a project-based capstone course. In 2015-16, 28 students were affiliated with our environmental concentrations in sustainable food and climate change.

3.1.1 Gateway Courses

Students choose between two gateway courses that present environmental issues from a range of perspectives: LSS 100 Landscape, Environment, and Design; and ENV 100 Environment and Sustainability: Notes from the Field. ENV 100 is a course organized by CEEDS staff that exposes students to real-world practitioners in a broad range of environmental fields.

This year, speakers in ENV 100 ranged from a local architect discussing energy efficient buildings to an agricultural specialist describing why local food matters. Two alumna spoke to the class: artist Jill Metcoff '69 showed and interpreted her photographs of prairie fires in the Midwest; Molly Sauvain '11, the Education Coordinator at the Food Bank of Western Massachusetts, spoke on food security and the right to food for all people. The class also took a field trip to the Northampton water treatment plant for an informative tour of their operations. Appendix A provides a complete list of the 2015-2016 ENV 100 and LSS 100 speakers and their lecture titles.

3.1.2 Capstone Project: Sustainable Food

The goal of the sustainable food capstone class is to provide students with the experience of working together on a real project. The class of seniors work with a "client" gathering information, conducting surveys, creating maps, and eventually making recommendations. Throughout the semester, students apply the knowledge and skills they have learned during their time at Smith toward their particular project. Invariably, they also learn a tremendous amount about teamwork, communication, project management, and meeting a common goal.

This year, the capstone class investigated the methods of processing organic materials—food scraps, paper products, landscape trimmings and compostable eating-ware—for the college. These valuable resources are currently either composted off campus or incinerated. The investigation focused specifically on aerobic and anaerobic waste digesters. The students

determined the appropriate size of commercially available units needed, estimated economic returns and projected how much each system would reduce the college's carbon footprint. The class also considered the educational benefits of each system and conducted a short survey of faculty asking if they would use either digester as a teaching tool. The students felt that processing organic waste on campus would make available an important teaching tool and result in valuable products that could then be used on campus.



This winter juniors and seniors went on a mini-retreat with staff from CEEDS and the Wurtele Center for Work and Life to reflect on their experiences within the concentrations.

Aerobic digestion provided a simple, on-site, relatively low cost method of processing organic material with the benefit of producing compost for the campus grounds. Processing Smith's organic materials with an anaerobic digester had the benefit of producing both energy and compost fertilizer. The students estimated that an anaerobic digester would produce 0.3% of the college's energy needs, saving \$10,140 or 0.2% of the annual energy costs. However, Smith's waste stream was not large enough to support an anaerobic digester year round. Anaerobic digestion was only feasible for the college with collaboration in a regional facility. Even though such a facility could not be located on campus, the capstone students recommended that the college investigate joining a regional anaerobic digester project as the best way to convert organic materials into fuel and fertilizer.

Like last year's capstone class, the students felt that one of the primary goals of the college is to educate students in sustainable life practices. The advantage of having a digester on campus was that students could see the connection between organic waste from dining services, composting food scraps and fertilizer on the grounds. It is another example of

working toward a legacy at Smith that is enhanced by using the campus as a classroom and teaching students how to steward the resources that sustain them.

3.1.3 Linking Academics and Action

An integral part of the concentrations are the practical experiences students complete. This year our students took part in internships with twelve organizations, including the Global Institute for Water, Environment and Health in Geneva, Switzerland; Noho'ana Farm in Waikapū, Maui; the Community Harvest Project in North Grafton, MA; and the Sachamama Center for Biocultural Regeneration in Peru. Their projects included:

- conducting research on the scientific water monitoring systems in Jordan in order to help that country plan climate resilient solutions to evolving water scarcity issues
- learning and teaching native Hawaiian cultivation methods in a community-based cultural agriculture program
- helping run a sustainable farm dedicated to providing fresh produce to the Worcester Food Bank
- working with Kechwa and Peruvian engineers, scientists and community members to recreate perennially fertile soil by building biochar ovens and studying the microorganisms in the soil

Making Connections

Jade Chihara '17 interned at Noho'ana Farm in Waikapū, Hawai'i, where she learned to care for the land and plant and harvest taro using native Hawai'ian cultivation methods. She also worked with community members in the farm's cultural agricultural program.

This past summer, while working on my home island of Maui, I was enlightened by the many great things Hōkūao Pellegrino (Farm owner and cultural specialist) taught me as we worked to restore ancient lo'i kalo (taro patches) and to 'learn by teaching' Hawaiian youth through cultural education.

A recurring theme in our conversations was the centrality of water in our lives. The phrase "Ola i ka wai" (water is life) was printed on each kid's shirt, and the term "wai" has duality in its meaning. "Wai" can mean water, but when it becomes "waiwai", the term means "abundant water" and also means "wealth." This connection to water, life and wealth was extremely important to grasp because commercialization of resources has become a prominent issue among farmers. Historically, the use of water was privatized for use by sugarcane plantations—in part because the economy of the Hawaiian Kingdom was heavily controlled by the sugar industry in the late 1800's. Though many of the plantations are no longer active, the water is still being diverted and has not been restored to the main river or watershed. Farming is a cultural tradition for Hawaiians; the removal of water from their lives interferes with their rights to live, farm, and practice their culture.

Bringing back traditional farming practices is a way for Hawaiians to restore their culture. Hōkūao is doing it in his neighborhood, but he's also a leader beyond his own community and beyond this generation. He has restored a way of life to Native Hawai'ian communities and turned students like myself into eager learners about the place we live in. -Jade Chihara



Children work together to plant lo'i kalo (taro).

Taking Action

Eliza Mongeau '16 worked as an intern at Book and Plow Farm in Amherst, Massachusetts. While there, she experienced all that is involved with running a vegetable farm. Her daily work included planting, weeding, harvesting, washing, and more.

When I first arrived at Book and Plow in early June, I wasn't sure what to expect. Of course I had heard that farming was hard work and, when I interviewed for the internship, I was warned about how demanding it would be. I took these warnings seriously but, in typical young adult fashion, I was too head strong to consider I might not be up for it.

I wasn't surprised by the difficulty of the work as much as I was surprised by the constant need to repeat tasks. Farming is about growing and every time you look around after completing a task, the tomatoes are ready to be latticed again and the onions that you weeded last week are so overgrown you're not sure if there are actually onions in there.

My second week at the farm I woke up to a dark sky full of ominous clouds. I biked to work despite the impending rainstorm and by the time I arrived it was a full-on down pour. I thought, "Surely, we're not going to be working outside in this." That was my first lesson in what soon came to be an important part of the summer. Farming doesn't stop...the work on a farm is never done.

From my first day on the farm to my last, I learned so many things. Not just about the process of growing food, but also about the machinery, the land and the importance of community. Having the opportunity to watch something I planted be transferred to the field, be cared for, and then harvested and packed made me appreciate the food I eat so much more.

-Eliza Mongeau



The Book and Plow crew in action. Eliza (in pink) is in the center.

3.2 Events and Workshops

3.2.1 Concentration Events

To complement our environmental concentrations, CEEDS hosts or co-sponsors events related to the topics of sustainable food and climate change, and also helps support and promote such events within the Five College Consortium. Examples from this academic year include:

- A lecture: “This Changes Everything: Capitalism VS Climate” by Naomi Klein, held at Mount Holyoke College. CEEDS collaborated with ENV to bring students, faculty and staff to the event.
- A gleaning field trip in collaboration with local organization Rachel’s Table for the third year in a row.
- A lecture: “A Glimpse Into the Future of Energy” by Sally Benson, a globally renowned climate scientist on the faculty at Stanford University and member of the 2007 Nobel Peace Prize-winning Intergovernmental Panel on Climate Change. This fall semester lecture was part of the Climate Change series. These events, organized with the intention of engaging the campus community on the topic of climate change in the run-up to the COP21 meeting in Paris, France, in December, were a collaboration between CEEDS, the Lewis Global Studies Center, French Studies, the Environmental Science and Policy and Landscape Studies programs, and the Department of Economics.
- A lecture: “Climate Change, Conflict, and Migration: The Intersection” by Christian Parenti, professor at New York University, contributing editor to *The Nation* and author of *Tropic of Chaos: Climate Change and the New Geography of Violence*. He spoke about how climate change intensifies conflicts, resource scarcity and the refugee crises. This was a part of our Climate Café Series, a series of weekly events and conversations during the spring semester aimed at continuing the conversation about climate change following COP21. Topics in the series ranged from global to national to regional to local/hyperlocal in their focus, with some “open” Cafes sprinkled throughout to allow for fluid conversation. This series was sponsored by CEEDS in partnership with Divest Smith College, 5 College Scopes, the Environmental Science and Policy program, Engineers for a Sustainable World-Smith Chapter, and the Study Group on Climate Change.
- A documentary screening and panel discussion: “Out Here: A Queer Farmer Film Project” with film director and farmer Jonah Mossberg '07; farmer Danielle Smith, of Wild Rose Farm, Easthampton; farm manager Aaron Drysdale of Greenfield Community Farm/Just Roots, Greenfield; Stina Soderling '06; and moderator Emmett Wald '15.
- Two field trips open to all students to local sugar houses to take a break from campus, learn about this sweet New England tradition and enjoy breakfast together.
- A performance of “Dr. Keeling’s Curve” a one-man play performed by environmental activist, journalist and author George Shea. This event was part of the Climate Café Series and was additionally supported by the English, American Studies and Theatre departments.

3.2.2 Other Events, Lectures, and Field Trips

CEEDS also hosts or cohosts numerous engaging speakers and events during the year. Some examples from 2015-16 include:

- A lecture: “Cultural Heritage and the Wonders of Waste” with Robin Nagle, Clinical Associate Professor of Anthropology and Environmental Studies at New York University, held in collaboration with the philosophy department.
- A lunchtime presentation “Rainforest Conservation: Practical Approaches from Chucanti, A Cloud Forest in Panama” with Guido C. Berguido, Certified Interpretive Guide through the National Association for Interpretation (NAI) in the U.S., held in collaboration with the psychology department.
- A lunchtime conversation for staff and faculty “What Makes a Sustainable Library?” hosted by CEEDS in collaboration with members of the Neilson Library programming sustainability subcommittee and the design firm Shepley Bulfinch.
- A workshop “Media Advocacy for Campaigns” led by Alyssa Johnson-Kurts '18J, Media Lead for the SustainUS U.S. Youth delegation to COP21 and the Communications Director for Rights & Democracy—a Vermont-based group organizing to address climate change and promote workers' rights.
- A lecture: “Design for the Just City” with Toni L. Griffin, founder of New York-based Urban Planning for the American City, held in collaboration with the Design Thinking Initiative.
- Documentary and discussion: “Re-Weaving the Web: Amazonian Dark Earth” with Fredrique Apffel-Marglin, Director of the Sachamama Center for Biocultural Regeneration, Brazil.
- An afternoon with “The National Water Dance” six site-specific movement installations across the MacLeish Field Station. The event culminated in a unified dance and a group effort to restore the natural world by planting an important riparian zone and support local artists. The event featured new works by Sofia Engelman, Kate Seethaler, Kelly Silliman, Susan Waltner, and Whitney Wilson.

3.2.3 Interterm Workshops

On January 19 to 21, Joanne Benkley and Paul Wetzel led an interterm food preservation class aimed at teaching participants the practical skills needed to preserve the abundance of the summer harvest for the cold winter months. This year sixteen students and staff learned how to make and can applesauce and jam. The group also canned pears, made dried apple rings and learned how to blanch and package vegetables for freezing.



We also have fun while we work! Some of the “Putting Food By” class participants ham it up with their finished products.

3.3 Curricular Enhancement Grants

Each year CEEDS invites proposals from faculty for modifications and enhancements of existing courses that are congruent with the CEEDS mission. Over the past six academic years, CEEDS has supported thirty-eight faculty members from across all academic divisions as they have enhanced their courses to enable their students to engage with the environment in new and innovative ways. For 2016-17, we are sponsoring five projects by faculty from environmental science and policy, history, engineering, and Spanish and Portuguese. Appendix B provides descriptions of all of the projects funded to date.

Three Questions for Leslie Carothers, CEEDS Advisory Board Member and Donor

Q: You've worked as an environmentalist since 1970, holding positions as a lawyer and an executive in business, non-profits and government. What is one of the most interesting projects you've worked on?



A. I have worked on so many interesting projects that it is hard to choose. In the 1970s, I worked on the initiation and legal defense of the program at the federal Environmental Protection Agency to begin removing lead from gasoline. More recently, I've been working with a team at the Environmental Law Institute to design workshops that explore the ethics of communicating scientific uncertainty on environmental issues in the professions of science, law and journalism.

Q. Do you see intersections between what you've done in your career and what CEEDS is doing at Smith?

A. Absolutely! CEEDS helps develop environmental leadership by giving students the opportunity to enjoy the natural environment and to learn why and how to protect it. Working on projects as teams is also a prerequisite for activism and leadership. I worry that many potential leaders are spending too much

time looking at screens and not enough time outdoors and working with other people to advance their ideas. I agree with Gloria Steinem that effective activism requires direct personal connections and demands more than writing a statement and pressing "send." CEEDS helps facilitate those skills in students.

Q. You've served on a number of boards and in a variety of environment-related roles throughout your career. What is one thing you see as being unique or particularly important in the work that CEEDS does?

A. I've been intrigued by the Center's role as a catalyst for greater integration of environmental thinking into many other disciplines in the college. I think the environmental movement needs to do better in engaging others. For this reason, I directed my 50th reunion contribution to fund the Center's curricular enhancement grant program. The program supports faculty across the college who are interested in integrating environmental issues into their courses.

Connections are Made: Curricular Enhancement Grants in Action

Professors Reyes Lazaro (Spanish and Portuguese), Denise McKahn (Engineering) and Cristina Suarez (Chemistry) worked to bring students in two very different courses together through a common and shared "environmental" project: the famous "tilting against the windmills" episode narrated in Chapter VIII of Cervantes' *Don Quixote*, one of the most influential works of literature in the entire Spanish literary canon. Their goals

were to introduce students to a more complete environmental story of where and how we get our electricity, challenge them to step outside of their comfort zones, and model the complementary nature of the liberal arts curriculum.

The core of the project consisted of paired in-class readings and material for CLT 204/SPN 356: Spanish Literature of the 17th century and CHM346: Environmental Analytical Chemistry.



Students learn firsthand about wind energy.

These separate components came together later in the semester during a joint community meeting in which representatives of a wind farm generation company (the chemistry students) presented a proposed wind generation project to the “historic” inhabitants of one of the 17th century Spanish villages (Spanish literature students) described in Cervantes’ novel. Given that *Don Quixote* can be read as a denunciation of the massive implementation of new models of windmills in 17th century Spain, the interaction engendered a rich conversation about the wind industry. Students discussed and debated the costs and benefits of environmental technology, and shared concerns typical of those that arise when significant change is proposed in any community.

Following the meeting, the classes came together to learn how modern wind turbines function and examine the similarities with historic windmills. The two

classes then went on a field trip to visit a wind turbine in nearby Charlemont, MA. While there, they had the opportunity to contrast the experience of living next to modern wind turbines with the experience expressed in *Don Quixote*. Lively discussions about politics, governance, economics and environmental impact ensued. Everyone benefitted from an introduction to the behind-the-scenes engineering components of wind energy generation.

Curricular Enhancement Grants in Action

Geosciences Professor Jack Loveless modified his GEO/ENV 150: Modeling Our World: An Introduction to Geographic Information Systems course to integrate a more inclusive geoscience, environmental science and policy perspective. He also developed new case studies to enable students to explore a range of data types and model how GIS technology can be used to solve a variety of real-world problems.

The fall 2015 semester-long group projects (see list below), carried out in partnership with local non-profit conservation organizations Mass Audubon and the Kestrel Land Trust, successfully enhanced student learning. In evaluating the course, one student said, "I really enjoyed being able to work with a community partner and I hope that more classes at Smith can include this aspect of learning. I found that it really motivated me, more than grades ever could, to do a good job."



Students present their method for identifying hemlock trees using aerial photos.

In carrying out their projects, students met key goals of CEEDS. *Students made connections* between seemingly disparate topics by applying their technical GIS skills to solve real-world problems posed by the community organizations. *Students took action* by learning about project goals from their partners, but then independently collecting data, designing methods of analysis, and orchestrating effective means of presenting their findings to the community partner and, in some cases, to a public audience on the web. *People interacted* in the frequent in-person and virtual meetings between students and community partners. Several student groups also conducted ad hoc interviews with visitors to the conservation areas in order to refine the students' data collection schemes. In all cases, the student groups' final products provided concrete value to the community partners.

The class projects included:

- An automated method for identifying the proportion of hemlock trees from aerial photos
- An interactive walking tour through the Arcadia Wildlife Sanctuary
- An analysis of the proportion of Kestrel Land Trust property holdings on which hunting would be legal under state law
- An interactive tour of the Mount Holyoke Range and surrounding conservation areas
- A detailed trail map of the Sawmill Hills Conservation Area in Florence, MA

3.4 Environmental Monitoring

To support research and understanding in the environmental sciences and improve quantitative literacy among all students at Smith College, the Center supports an environmental monitoring program. Quantitative data on the environments around Smith are made available to faculty and students for use in courses and projects. At the MacLeish Field Station, we continuously measure precipitation, temperature, atmospheric pressure, relative humidity, wind speed and direction, solar radiation, soil temperature and moisture. The Center also published its third Annual Weather Report from the MacLeish Field Station for calendar year 2015.

Communicating Effectively: Annual Weather Reports

The weather stations at MacLeish measure the weather every second, average that information every 10 minutes, and record it. Each year CEEDS staff take that data and use it to produce an annual weather report which includes highs and lows and general trends. This year Environmental Monitoring Intern Molly Day '19, did the work of calculating the report statistics and creating the monthly summaries.

Variable	2013	2014	2015
Highest Temperature (°C)	34.9 (July 17 th)	31.6 (July 23 rd)	33.3 (Sep. 8 th)
Lowest Temperature (°C)	-20.2 (Jan. 24 th)	-21.4 (Jan. 6 th)	-22.5 (Feb. 16 th)
Greatest Maximum Rain Event (mm)	85.1 (July 23 rd)	92.7 (Aug. 13 th)	113.8 (Sep. 30 th)
Annual Precipitation (mm)	1305.2	1348.1	1306
Growing Season (days)	188	184	175
First Autumn Freeze Date	October 26 th	October 19 th	October 17 th
Last Spring Freeze Date	April 21 st	April 18 th	April 25 th

A few weather highlights are listed above; to view or download the full weather reports, please visit our website: http://www.smith.edu/ceeds/macleish_monitoring.php.



Students enjoy a beautiful Mountain Day at the Ada and Archibald MacLeish Field Station.

4 Supporting Projects

One of the key activities for the Center is the sponsorship of integrative environmental projects in which students, faculty and staff work together toward solutions to environmental challenges. Currently, students are working on local projects related to the American chestnut restoration, sustainable watersheds and waterways, and the invasive hemlock woolly adelgid.

4.1 Sustainable Watersheds and Waterways

During 2015-16, CEEDS continued to support a range of projects related to sustainable watersheds and waterways, which initially began with the generous support from the Stephen Bechtel Fund. With our support, Professors Carol Berner and Al Rudnitsky from the Department of Education and Child Study collaborated with four Smith students and a team of local K-3 teachers to advance scientific inquiry in classrooms, using water on the school grounds as a source of investigation and inspiration. Eleven teachers from three local schools invested over 100 hours in a series of five professional development workshops, kicked off by a late summer field trip tracking water downstream from MacLeish Field Station. Outcomes included learning from and about water in natural and built landscapes; making connections between Smith College, local public schools and municipal water resources; and developing successful strategies to engage teachers and children in inquiry-based learning. The group has already made plans to build on its collaborations with local teachers during the 2016-17 academic year. Visit the [Water Inquiry blog](#) for more information about project goals, questions and findings.



Water Inquiry teachers make observations at the Botanic Garden pool.

CEEDS also supported a different project to remove sediment from Paradise Pond using an experimental sediment sluicing technique. A group of five students worked with Professor Robert Newton (geosciences) and Marney Pratt (lab instructor, biological sciences), together with Gary Hartwell (Facilities Management) to collect baseline data from the pond and downstream locations on the Mill River as part of the initial monitoring phase of the experiment.

Sediment sluicing flushes sediment downstream in a way that more closely mimics the natural system in contrast to past dredging practices that removed sediment from the pond and created sediment “starved” conditions downstream. Data collected by the students was presented at the first annual Paradise Pond Symposium, held at the Smith College Conference Center on April 8, 2016, and attended by faculty, students, and representatives from both local and state regulatory agencies. The experimental moving and flushing of sediment will begin in July of 2016.



Maya Domeshek '18 takes a discharge measurement downstream from Paradise Pond.

4.2 American Chestnut Restoration

To engage students with concepts of conservation and restoration, CEEDS has collaborated with The American Chestnut Foundation for the past four years to establish an American chestnut seed orchard at the MacLeish Field Station. The purpose of the seed orchard is to grow up the last (5th) generation of cross-bred chestnuts to produce blight-resistant hybrid nuts. The resulting 6th-generation hybrid trees will have 94% American chestnut genes and 6% Chinese chestnut genes. This year, about 1,100 American chestnut hybrid nuts were planted in the seed orchard by 35 students, staff and volunteers, filling out the remaining space in the orchard. Planting chestnuts was an official senior week activity. Students got outside, learned about the chestnut story, engaged in a major conservation effort and had fun. The nuts that were planted will be allowed to grow for three years before they are intentionally exposed to the fungal blight. The 3,000 trees in the orchard will eventually be reduced to 20 individuals. Those trees will be allowed to grow and thrive at MacLeish to produce blight resistant nuts that will be planted throughout the region.



The fully planted American Chestnut seed orchard at MacLeish.

4.3 Hemlock Woolly Adelgid

Research on hemlock forest ecosystems at the MacLeish Field Station continues as a collaboration among the Bellemare (biological sciences), Ignace (biological sciences), and Rhodes (geosciences) labs at Smith College. Hemlock is unique among forest trees in the region, as it creates a dense evergreen canopy and can grow from seed in its own shade, creating a positive feedback loop favoring hemlock dominance of many forest sites over decades or centuries. Hemlock forests in the region are currently under threat from two invading exotic insects: the hemlock woolly adelgid and elongate hemlock scale. In coming decades it is expected that this important tree species will fade from its dominant role in southern New England forests, or even become locally extinct, as a result of insect-caused mortality and decline.

The dense canopy of forests dominated by hemlock tend to be cool and moist. They also tend to develop a deep layer of partially decomposed organic material on the soil surface. These unique characteristics make hemlock forests important for many plants and animals that require cool, shady conditions, and also allow hemlock forests to store large quantities of organic carbon in the forest floor as a carbon "sink"—carbon that might otherwise be fully decomposed and respired back to the atmosphere as carbon dioxide. With the decline of hemlock there is concern that biodiversity will be impacted as the plant and animal species dependent on hemlock habitats are lost, and that carbon

might be released from these ecosystems as decomposition rates increase when the forest floor becomes warmer and more exposed.

Both the hemlock woolly adelgid and elongate hemlock scale pest insects have been detected on trees at the MacLeish Field Station since around 2010, although we have not yet seen widespread mortality of hemlock trees. Rather, trees appear to be hovering in an intermediate state of moderate to poor health, with some needle loss and reduced growth rates compared to pre-2010 levels. Beginning in 2009-2010, we established study plots in hemlock forests at MacLeish to monitor ecosystem processes and investigate how plant and animal communities might change as the forests shift from evergreen hemlock canopies to replacement by deciduous trees, such as black birch. In the past year we have focused in particular on the carbon content of forest soils, comparing the hemlock forests to nearby examples of deciduous forest that are similar to what might develop after hemlocks decline. We have found that hemlock forest soils do indeed have significantly higher carbon content than that seen in deciduous forest areas, suggesting that organic carbon is cycled more quickly and does not build up in deciduous areas to the same extent as seen in hemlock ecosystems. Consistent with these results, the Ignace lab has also measured soil respiration rates in the differing forest types at MacLeish to gauge levels of carbon dioxide being released from the soil and found that respiration rates are often higher in deciduous forest plots. This suggests that a net release of carbon from the ecosystem is possible as hemlocks continue to decline in the future.

A number of Smith students have been engaged with research in the hemlock forests at MacLeish during the past year. This work has included an honors thesis by Elizabeth Besozzi '16 focusing on forest floor animal ecology, and a joint project by two students from the AEMES program, Lisa Utzig '18 and Sam Goss '18, focusing on forest floor carbon dynamics. Work from the past year has been shared as research posters at the annual Celebrating Collaborations event on campus in April, and two Smith students, Elizabeth Besozzi '16 and Michelle Jackson '15, are taking presentations based on MacLeish data to the Ecological Society of America meeting in Fort Lauderdale, Florida in August. In addition, several of the research plots established for the hemlock ecosystem study have been incorporated into introductory biology labs and independent student projects for the Plant Ecology course.

5 Campus as a Model

5.1 Ada and Archibald MacLeish Field Station

The Ada and Archibald MacLeish Field Station has grown to be a 260-acre patchwork of forest and farmland located in West Whately, MA. It continues to provide opportunities for faculty and students to pursue environmental research, outdoor education and low-impact recreation. [See 6.4 for more information on outdoor education]. Two hundred and ten acres of the field station are permanently protected from development via conservation restrictions donated by Smith College to the Kestrel Land Trust.

The field station now includes a student-designed fruit orchard, a restoration chestnut orchard affiliated with the American Chestnut Foundation, a low ropes challenge course, four miles of student-designed and built trails, the ever popular student-designed fire pit, and a newly installed permeable paver parking lot, designed by Laura Krok-Horton '17 and installed by the MacLeish student intern crew the summer of 2016.

This year was the year of the retreat. Approximately 30 groups held retreats or workshops in the Bechtel Environmental Classroom. All told, more than 1,800 total visits to the field station by students, faculty, staff, and non-Smith affiliated community members were recorded in 2015-16. At least eleven classes from Smith, two classes from UMass, and one each from Mt. Holyoke and Holyoke Community College visited as a part of their course work. More than 300 people made use of the challenge course, hundreds more engaged in research, used the site as inspiration, participated in site-specific design, went on guided tours, and used the recreational trails. Appendix C lists all of the courses at Smith that used the field station this year, groups that toured the field station and all of the retreats and workshops held at the field station in 2015-16.

5.2 The Mandelle Experiment

This year saw the creation of a field laboratory on campus that will be used to evaluate the potential for permeable pavement to reduce stormwater runoff and increase groundwater recharge. The project, begun as a collaboration between CEEDS, the Environmental Science and Policy program (ES&P), the Office of Campus Sustainability and Facilities Management, resulted in the construction of a fully instrumented parking lot with both standard and permeable pavement sections.

This project is a prime example of how we can use our campus as a living lab. The monitoring equipment and collected data are available for classes interested in evaluating questions concerning the use of permeable pavement, including:

- Will permeable pavement work on campus where much of the area is underlain by low permeability lake sediments from Glacial Lake Hitchcock?
- Will permeable pavement work during the winter when the ground is frozen?
- Will permeable pavement make it easier for contaminants, such as road salt and oil from vehicles, to enter the groundwater system?
- Will the pavement need to be cleaned to keep it from becoming clogged?

To help answer the first question, students in GEO 251: Geomorphology collected data on the infiltration capacity of the unconsolidated geologic materials exposed during construction of the parking lot. A future class will evaluate the infiltration performance of the system relative to the measured infiltration capacity to determine if permeable pavement will work in other areas of campus.



Tessa McGann '16 measures infiltration capacity during a geoscience class at the Mandelle site.

Results of this experiment have the potential to influence policy decisions beyond campus. The city of Northampton is looking for ways to reduce stormwater runoff and has introduced a fee system that taxes properties based on the percentage of impermeable surfaces. The use of permeable pavement in parking lots across the city would reduce stormwater runoff and fees for property owners.

In addition, permeable pavement is not currently approved for use in primary recharge areas near municipal wells anywhere in the state because of fears that it could increase the vulnerability to contamination. The Mandelle field laboratory, designed in collaboration with Smith's Center for Aqueous Biogeochemistry Research, includes a series of observation wells and lysimeters (devices for collecting water in the unsaturated zone) that can be used to collect water samples for chemical analysis. The system was specifically designed so that a wide range of potential contaminants can be measured in order to evaluate the risk of groundwater contamination.

Construction of the lot was completed in April of 2016, and preliminary results show that the permeable pavement is very effective at reducing runoff and increasing infiltration of high quality water into the groundwater system. Final installations of monitoring equipment will be completed during the summer of 2016 so that faculty in ES&P, chemistry and geosciences can use the Mandelle lab in their classes in the coming academic year.



The Mandelle parking lot during a rain event in May. The permeable side (right) completely absorbed all the rain falling during this event. (Photo by Peter Gagnon, Facilities Management)

6 Communication and Collaboration

6.1 CEEDS Blog and Other Media

CEEDS has more than 500 followers on Facebook (www.facebook.com/pages/Smith-College-Center-for-the-Environment-CEEDS/) and our posts can reach as many as 2,000 people. We now have 262 followers on Twitter (@SmithCEEDS) and we continue to tweet about our accomplishments, our events, and related news items. We also started posting on Instagram (smith_ceeds). We post stories throughout the year on our blog [CEEDS] (smithceeds.wordpress.com) which are shared to our followers on our other social media platforms. We continue to encourage students and faculty engaged in environmental work of all sorts, both on- and off-campus, to use our social media connections as a means of sharing their experiences with the larger Smith community. With the help of student interns, CEEDS manages an email ListServ [ENVIRO], which provides current students (580+), alumnae (380+), and interested faculty/staff (80+) with information about events, internships, job opportunities, graduate schools, funding and more. This year Brittany Bennett '16 and Liz Nagy '18 worked as CEEDS interns to support our outreach and communication efforts. In March we hired Ellen Harter Wall into a limited-term communications coordinator position, shared with the Study Group on Climate Change and the Office of Campus Sustainability and Space Planning.

6.2 Supporting Students and Student Organizations

This year, CEEDS worked with individual students and student organizations to cohost and support a variety of events. CEEDS continued to provide support and a meeting and event space for the Bike Kitchen, Community Garden, Divest Smith College, Eco-Reps, Engineers for a Sustainable World, Five-College Scopes, and Green Team. Joanne worked closely with student leaders in Divest Smith College and Five-College Scopes to write mini-grants to Second Nature as part of the New England Sustainability Forum. She then acted as adviser to

both groups, providing support and advice as needed throughout the academic year. CEEDS and Divest collaborated on bringing speakers to campus who addressed the intersections between climate change and social and environmental justice. CEEDS, together with the Study Group on Climate Change, also helped Divest organize a divestment forum this spring aimed at engaging faculty and staff in the conversation.

CEEDS and the botanic garden again supported an intern to work in the Smith Community Garden as summer manager in 2016. In addition to caring for the annuals and perennials in the garden, student Danielle Jacques '16 hosted regular work parties, designed and painted garden signs, laid down mulch and blogged for CEEDS. Her work on campus led her to a paid internship position with Keep Farming Northampton.

Joanne acted as adviser to Bike Kitchen and worked with student leader Samantha Behrens to strengthen the organization. This included strategizing on development and membership retention, student engagement and updating the Bike Kitchen Cookbook. One specific outcome of the collaboration was four workshops offered in the fall semester on a variety of topics, including bike safety and bike maintenance.

6.3 Spatial Analysis Lab

The Spatial Analysis Lab is a campus-wide resource that supports the use of geographic information systems (GIS) and various forms of spatial analysis in research and courses. As nearly all environmental issues involve a geographic component, the resources of the SAL are integral to the work of CEEDS. The SAL curates and disseminates GIS data and teaches Geospatial Positioning Systems (GPS) and GIS skills to Smith faculty, staff and students. For example, students have used Trimble GPS units to map data on the American chestnut and fruit tree groves at MacLeish, to map the movement of local invasive plant species and to continue work on ongoing projects along the Mill River. This spring, with SAL staff support, CEEDS interns have been working to create a story map for work at the field station using ArcGIS Online. Faculty and students are also working with SAL staff to gather research data using drones. SAL staff played an essential role in helping collect and analyze drone imagery for the creation of Digital Elevation Models (DEMs) for the Paradise Pond sluicing project (See following image). Availability of GPS and the support and expertise that the SAL provides for collecting and managing data remains invaluable to the work of CEEDS and its community partners.



Drone image of sediment-filled Paradise Pond bottom exposed during a partial drawdown in September 2015. (See Section 4.1 for more on the Paradise Pond sluicing project)

During 2015-16, CEEDS again financially supported the post-baccalaureate position in the SAL. This staff position benefits faculty and students across the divisions and, in addition to class and research support, allows the SAL to offer workshops and timely opportunities for the Smith community to engage with real-world issues, such as helping map damage in the aftermath of earthquakes in Ecuador and Japan.

6.4 Outdoor Education

The challenge course at the MacLeish Field Station continues to host many new groups of people for experiential outdoor education. In fact, demand has exceeded our ability to facilitate all of the interested groups and, over the past year, we worked with athletics to move coordination of challenge course use from CEEDS to the Outdoor Adventure Program. Sara Dorsey was hired by the Outdoor Adventure Program in the fall of 2015 to oversee use of the course; even so, she was forced to turn away more groups than she could accommodate. We continue to work with athletics on a plan to complement our many volunteer staff facilitators with trained student leaders who can be hired to facilitate groups on the course throughout the year.



Students in the “Adventures at MacLeish” First-year Orientation group work together to balance on the Whale Watch element.

In addition to the challenge course, many students in exercise and sports studies courses took advantage of the “Outdoor Sampler” class and a class in primitive wilderness skills, both of which met frequently at MacLeish. Students used the fire pit, trails and both the group and remote campsites as part of these classes.

6.5 Arts at MacLeish

New artistic endeavors took place and took hold at the MacLeish Field Station this year. Whitney Wilson, dance MFA student, organized an afternoon of site-specific, water-themed choreographed dance as part of the National Water Dance. The [National Water Dance](#) is an initiative to heighten awareness about our water issues and concerns around the nation and to take action through the arts. Whitney chose the MacLeish Field Station for her performance site because, as she noted, the site itself is already addressing many of the issues around our water and taking steps towards healing our planet.

Arts Afield is a new initiative to formalize and encourage work in the arts and humanities at the field station. Faculty and staff from the departments of psychology, art, English, landscape studies, environmental science and policy, and French have met regularly over the past two years to create a program that can foster this connection. This fall members of the group worked with CEEDS to host an EcoPoetry workshop at MacLeish with local poet Margaret Babbott. The indoor/outdoor writing workshop was informed by Pablo Neruda’s *Book of Questions*. This spring, MacLeish interns worked with the Arts Afield group to establish ten long term reflection plots at the field station and, with support from the SAL, have begun a Story Map about the sites using ArcGIS Online.



Student sketching during the Eco-Poetry workshop at MacLeish.

6.6 Research at the Field Station

In addition to the long-term studies of the restoration of the American chestnut (Section 4.2) and the decline of the Eastern hemlock forest (Section 4.3), Niveen Ismail (engineering) has begun a program conducting water quality tests along a small stream at the field station. She and her students are currently focused on quantifying *E. coli* levels and zooplankton assemblages in a stream potentially impacted by fecal inputs from grazing cattle.

Researchers from the UMass Department of Geosciences continue to monitor two United States Geological Survey (USGS) wells and maintain several different research projects connected to the wells. David Bout and his doctoral student, Amy Hudson, assist Steve Mabee, State Geologist and Director of the Massachusetts Geological Survey, in recording temperature, water level and specific ion and isotope concentrations in both wells as part of a long-term regional climate change study.

Adam Rosenblatt, a Postdoctoral Associate at Yale University's Climate and Energy Institute, installed temporary cages around some of the site's goldenrod as part of a regional experiment that he is conducting. Evan Grant and Sean Sterrett, from the U.S. Geological Survey, Patuxent Wildlife Research Center, Silvio. O. Conte Anadromous Fish Laboratory, in Turners Falls, MA, are conducting a study on the effects of freezing soil on salamander populations at the MacLeish Field Station.

6.7 Support of Campus Initiatives

CEEDS sponsored an open forum on November 5 for the Smith community to discuss the importance of sustainability in design considerations for the renovation of Neilson Library. CEEDS staff serve on the Study Group on Climate Change (SGCC) and the center actively supports SGCC activities.

In fiscal year 2013, in an effort to exemplify its values and in keeping with the college's commitment to become carbon neutral by 2030, CEEDS committed to offsetting its carbon emissions for travel each year. This year, CEEDS purchased offsets equivalent to five metric tons from Terra Pass.

Appendix A

ENV 100 Speakers

ENV 100

September 14	Jim Barry , Regional Coordinator, Green Communities Division, Springfield, MA <i>Environment and Sustainability: The Role of Government</i>
September 1	Rebeka Novak , Pretreatment Coordinator, Northampton, MA <i>City of Northampton Wastewater Treatment Plant Field Trip</i>
September 28	Jill Metcoff* , Artist, Spring Green, WI <i>Integrating Art and Conservation: Creating the Book "Firelines"</i>
October 5	Molly Sauvain* , Education Coordinator, The Food Bank of Western Massachusetts, Hatfield, MA <i>The Right to Food and Food Security in Western Massachusetts</i>
October 12	Fall Break
October 19	Philip Warburg , Author, Newton, MA <i>Bucking Political Stereotypes: A New England Environmental Advocate Looks at Wind Power's Ascent in the American Heartland</i>
October 26	Marc Sternick , Vice President and Senior Architect, Springfield, MA <i>Building Our Future: The State of the Art of Energy Efficient Building Practices</i>
November 2	Andy Pressman , Agricultural Specialist, Jaffrey, NH <i>Why Local Food Matters</i>
November 9	Ross Hackerson , Owner, Gray Dog's Farm Meat CSA, Huntington, MA <i>People, Planet and Profits: Making a Difference and Making Ends Meet on a Small Sustainable Animal Farm</i>
November 16	Robin MacEwan , Senior Associate, Environmental Services, Northampton, MA <i>Let the Water Flow! Aquatic Restoration One Damn Dam at a Time</i>
November 23	Kirk Maasch , Faculty, University of Maine, Orono, ME <i>Northern New England Climate: Past, Present, and Future</i>

*Smith alumna

LSS 100

January 25	Steven Moga , Landscape Studies Program, Smith College <i>Introduction to Landscape Studies</i>
February 1	The Mitia S. Sawhill Lecture Fund presents: Michael Marcotrigiano , Director, Botanic Garden, Smith College, <i>Shaping Plants that Shape the Landscape</i>
February 8	Janet Milne , Professor of Law, Director, Environmental Tax Policy Institute, Vermont Law School <i>A Legal Stroll Through the Rugged Climate Change Landscape</i>
February 15	Hiba Bou Akar , Assistant Professor of Urban Planning and Middle Eastern Studies, Hampshire College <i>Planning for the War Yet to Come</i>
February 22	Joseph Heathcott , Associate President of Urban Studies, The New School, New York, NY <i>Remaking Paris: Design and the Post-Industrial Imaginary in the City of Light</i>
February 29	Barbara Kellum , Professor, Art Department, Smith College <i>Luxury: Ancient Roman Gardens</i>
March 7	The Mitia S. Sawhill Lecture Fund presents: James Wescoat , Aga Khan Professor, Department of Architecture, M.I.T., Cambridge, MA <i>Poetics of Gardens and Landscapes in Early Mughal India</i>
March 21	Leigh Graham , Urban Studies and Planning, John Jay College of Criminal Justice, CUNY, New York, NY <i>The Impact of Superstorm Sandy on Public Housing Political Participation in Rockaway, Queens.</i>
March 28	Heide Gilpin , Chair of Architectural Studies, Amherst College <i>Designing Movement: Landscape Performance</i>
April 4	Max Page , MS Design Program Director, Director of Historic Preservation Initiatives, Department of Architecture, UMass, Amherst <i>Building Politics in the City: Remembering and Forgetting Mussolini and Fascism in Contemporary Rome</i>
April 11	Signe Nielsen , FASLA, Principal, Mathews Nielsen <i>The Garden: Yesterday, Today, and Tomorrow</i>
April 18	Jane Hutton , Assistant Professor, Department of Landscape Architecture, Graduate School of Design, Harvard University <i>Reciprocal Landscapes: Cases in Material Movements</i>
April 25	LSS 100 Annual lecture in honor of John Burk- Emeritus, Biological Sciences: Reid Bertone-Johnson , Field Station Manager, Lecturer, Landscape Studies, Smith College <i>New Perspectives and Dynamic Landscapes</i>

Appendix B

Curricular Enhancement Grants: Awardees and Projects to-date

2016-2017

Alexander Barron (ENV): ENV 201/202: Researching Environmental Problems

Adapt the curriculum and materials to cover important methodological concepts and draw links to policy. Develop core lab exercises to include off campus, real-world problems that can then translate into individual projects in a service learning setting with local partners.

Sarah Hines (HIST/LALS): FYS: The World Water Crisis

Develop a new course that takes an interdisciplinary and historical case-study approach to begin to answer the question of why 1 billion people today lack access to safe and reliable drinking water and the implications of addressing the crisis. Develop independent research projects to engage students with local water initiatives in order to facilitate an understanding of the land, water supply issues and local Western Massachusetts histories.

Niveen Ismail (EGR): EGR 390: Contaminant Fate and Removal in Aquatic Systems

Modify the curriculum and materials to explore contaminant fate and transport in aquatic systems in a more hands-on manner. Expand the number of discussion-based class sessions through integration of relevant case studies and peer-reviewed literature in addition to including a semester-long independent group project.

Michelle Joffroy (SPP/LALS): FYS: Vida y Tierra: Land and the Ecological Imagination in U.S. Latin@ Literature

Develop a new course focused on the ecological imagination in literature. Work with students and local organization *Casa Latina* to develop a series of local Latin@ land narratives with the goal of developing digital narratives to be used in a story mapping project. One ultimate goal of the story mapping will be to create a community resource that could be used in local community building and cultural memory preservation projects.

Nancy Sternbach (SPP): SPN 245: Topics in Latin America and Penninsular Studies: Buen Provencho: Food and the Spanish-speaking world

Modify the curriculum by incorporating even more environmental concepts. Deepen student connections with farm workers and whole, unprocessed food by visiting a local farm and participating in at least one harvesting activity.

2015-2016

Andrew Guswa (EGR): EGR 100: Engineering for Everyone

Adapt the curriculum and materials to center on water. Develop a course in which students can engage in critical analysis of historical and contemporary water issues and infrastructure in California and western Massachusetts in order to gain an understanding of the technical, environmental, economic, political, legal and cultural influences and constraints on engineering works.

Reyes Lázaro (SPP), **Denise McKahn** (EGR), and **Cristina Suárez** (CHM): CHM 346: Environmental Analytical Chemistry; CLT 204/SPN 356: Writings and Rewritings:

Queering “Don Quixote”; EGR 388: Photovoltaic and Fuel Cell System Design; and EGR 390: Thermodynamics II.

Develop curriculum and materials for the courses that will provide a framework for formal dialogue in which chemists and engineers can engage literary scholars on the impact of technology on the environment and society and vice versa.

Jack Loveless (GEO): GEO/ENV 150: Modeling Our World: An Introduction to Geographic Information Systems

Transition project topics in the course to have a geoscience, environmental science and/or policy focus with a real-world application. Change the structure of the final project to emphasize the practical nature of GIS and spatial analysis in a service learning setting with a local partner.

Malcolm McNee (SPP): POR 220: Topics in Portuguese and Brazilian Literature and Culture: Topic: Contemporary Cityscapes: Mapping Brazilian Culture onto an Urban Grid
Modify course by developing two multi-modal components: on drought conditions and the water crisis in São Paulo and infrastructure development in Rio de Janeiro in preparation for hosting the 2016 Olympic Games. The components would then be explored through a number of themes.

2014-2015

Michael J.F. Barresi (BIO) and Amy L. Rhodes (GEO): BIO 159Y: From Environment to Embryo: An Interdisciplinary Research Course and GEO 301: Aqueous Geochemistry
Cooperatively develop curriculum and materials that are designed to investigate the potential environmental impacts of hydraulic fracturing (fracking) of the Marcellus Shale for natural gas extraction, an environmental research question that has high relevance to the scientific community and society.

Judith Keyler-Mayer (GER): GER 250: Advanced Intermediate German to The Environmental Culture of Germany

Redesign the course in order to foreground Germany’s deep-rooted engagement with environmental issues. Develop student understanding of German environmental discourse by examining and discussing literary and journalistic texts in German while also developing a basis for comparative studies through trips to the MacLeish Field Station.

(Chris) Jan Vriezen (BIO) and Chris White-Ziegler (BIO): BIO 205 Microbiology
Modify the lab curriculum and materials. Instead of teaching a testable environmental microbiological hypothesis using a standard set of lab-strains, use “real unknown” isolates from soils obtained by students at a variety of MacLeish Field Station sites which will allow for the study of different biotopes and comparison of bacteriocin producing bacteria.

Sarah Moore (EGR): EGR 110 Fundamental Engineering Principles

Enhance the course by developing a semester-long team project interwoven with the MacLeish Field Station.

2013-14

Jesse Bellemare (BIO): BIO 115 Biodiversity, Ecology, and Conservation Lab

Develop a formal manual that will, 1) increase focus on applied conservation issues with an eye toward integrating science and policy; 2) make extensive use of the MacLeish Field Station and the Bechtel classroom; and 3) enhance the emphasis on original, student-led research.

Naila Moreira (ENG): ENG 118: Water: Science and Politics

Develop a unit on sustainable water infrastructure to enhance science writing by introducing experiential information through physical interaction and observation. Encourage a project-based learning approach through engaging with the environment within a unit on flooding.

Paulette Peckol (BIO): BIO 268/269 Marine Ecology and Lab

Modify the course to include a unit that engages students in thinking about complex fisheries considerations through direct experience with different types of mariculture facilities in Maine. Develop internship partnership with the facilities to enable Smith students to continue to learn about environmentally sound, sustainable practices of small-scale, open- and closed-mariculture facilities.

Gregory White (GOV): GOV 242 International Political Economy

Significantly modify the course to incorporate environmental issues and analysis directly and systematically with a focus on five issue areas: development, oil, food, consumption, and climate change.

2012-13

Carole Learned-Miller (EDC): EDC 345 Elementary Science & Math Teaching Methods

Develop curriculum to teach students science and math through outdoor experiments and projects. Encourage a project-based learning approach through engaging with the environment.

L. David Smith (BIO) and **Katherine Schneider** (ART): BIO 261 Invertebrate Diversity Laboratory, ARS 163 Drawing I, ARS 362 Painting II

Create an interdisciplinary study of invertebrates by bringing students and faculty together to share their perspectives and knowledge. Collaborate to paint and develop informational signage to place near the Burton lobby aquarium.

Annaliese Beery (PSY): NSC 315 Neuroendocrinology Laboratory, PSY192 Research Methods in Psychology

Bring students to the MacLeish Field Station to study and sample animal behavior. Engage students in thinking about how environment and life history affect hormones.

Justin Cammy (JUD): JUD 125/REL 225 Jewish Civilization: Topic: Environmentalism

Teach a course on Judaism and environmentalism which explores environmental ideas, imperatives and philosophical problems posed by the Torah, Talmud, medieval philosophers and mystics connecting these problems to present day.

Justin Cammy (JUD): GES 103 Global Engagement Seminar: Jerusalem

Bring students in Jerusalem to connect with Professor Laster, who will give a tour through

areas—urban centers, desert wilderness and across political boundaries of conflict—to study water.

2011-12

James Middlebrook (ART): ARS 386 Topics in Architecture

Develop interpretive signage about sustainable systems to be used at MacLeish Field Station and the Bechtel Environmental Classroom. Organize a field trip, open to all Smith faculty and students, to a certified Living Building.

Michelle Joffroy (SPP): SPN 372 Women, Environmental Justice and Social Action

Connect students to community-based projects in Worcester, Holyoke, and Boston where they will utilize case studies from on-going gender-based, environmental justice campaigns.

Reid Bertone-Johnson (LSS/CEEDS): LSS 250 Landscape and Narrative

Design projects in Ward 3 building on the previously conducted Rapid Ethnographic Assessment Procedure (REAP). Develop interpretative signs for the Bechtel Environmental Classroom.

Sara Pruss (GEO): GEO 108 Oceanography Discussion sections/lab

Develop curriculum and materials related to the earthquake and tsunami in Japan. Organize an oceanographic cruise class trip which is open to all Smith faculty and students.

2010-11

Jesse Bellemare (BIO) and **Katherine Halvorsen** (MTH): BIO 364/365 Plant Ecology and Lab, MTH 245 Practice of Statistics

Reciprocal learning: connecting real life ecology-based research design and analysis for biology and statistics students.

Daniel Gardner (HST/EAS): EAS 220 Environment and Society in Contemporary China
Develop a course that will enable students to view the society, politics and economy of today's China through the lens of environmental concerns.

Virginia Hayssen (BIO) and **Jon Caris** (ENV): BIO 272/273 Vertebrate Biology and Lab, BIO 362/363 Animal Behavior: Methods

Modify labs for both courses to include collecting actual data at the MacLeish Field Station in order to enhance ecological literacy and skill in using GIS technology. Over time this would also result in maps of the vertebrate ecology of the MacLeish Field Station.

Virginia Hayssen (BIO) and **James Middlebrook** (ARH): ARS 283 Introduction to Architecture: Site and Space, BIO 272/273 Vertebrate Biology and Lab

Collaborative project between a vertebrate biology class and an architecture studio designing and constructing viable birdhouse houses for MacLeish Field Station.

Reid Bertone-Johnson (LSS): LSS 250/255/389 All Landscape Studies studios

Engage students in a community participation design/planning scenario in Northampton.

Denise McKahn (EGR): EGR 388 Photovoltaic and Fuel Cell System Design

Engage students in designing a photovoltaic system for the MacLeish Field Station.

Paul Newlin (PPL): PPL 222 US Environmental History and Policy

Enhance understanding of the power structure at play in environmental case studies through the use of power maps.

Paulette Peckol (BIO): BIO 268/269 Marine Ecology and Lab

Foster educational skills and marine environmental literacy through project collaboration with an Easthampton High School class.

Candice Salyers (DAN): DAN 252 Intermediate Dance Composition

Incorporate interdisciplinary perspectives on the meaning of ecology and the space, design, movement and living components of MacLeish Field Station into a substantial site-specific performance project.

Appendix C

Courses that Visited the Field Station

Smith College

ARS 173 Cross-disciplinary Foundations
AST 103 Sky and Telescopes
BIO 154/155 Conservation Biology
BIO 205 Microbiology Laboratory
EGR 390 Advanced Topics in Engineering- Water Quality Engineering
ENG 118 Water, Science & Politics
ENV 101 Environmental Integration I: Perspectives
ENV 201/202 Environmental Integration II: Collecting and Analyzing Information
ESS 940 Outdoor Sampler
ESS 940 Wilderness Skills
FYS 103 Geology in the Field

Other Institutions

ARCH 520 Building Physics I- UMass
Art-Hist 118 History/Architecture & Built Environment- UMass
Bio 103 Conservation Biology- Holyoke Community College

Retreats and Workshops in the Bechtel Environmental Classroom

Smith College

Biological Sciences Department
Community Service Board, Jandon Center for Community Engagement
Development Office, Gifts and Records Team
Educational Technology Services (ETS)
Information Technology Services (ITS)
ITS- Media Production
Center for Media Production (CMP)
Campus School Staff
Meridians Program
Smith College Board of Trustees
Kahn Liberal Arts Institute, "PLAY" Project Fellows
Picker Engineering Program
Design Thinking Initiative
College Relations
Government Department
CEEDS Advisory Board
Morrow House
Parson's House
Frisbee Team
Eco-Poetry Workshop
Biomimicry Workshop

Other Organizations

American Chestnut Foundation, Regional Chapter
Center for Ecological Technology Eco-Fellows
Five College Writing Retreats (x7)
Institute for Training and Development (ITD)
Mt. Holyoke Library and IT (LITS)
Mt. Holyoke LITS Leadership
SPARCnet Salamander Symposium, USGS/Silvio O. Conte Wildlife Service

Tours of the Bechtel Environmental Classroom/MacLeish Field Station

Bruner/Cott Architects and Planners, Cambridge, Mass
Dartmouth College class
Eaglebrook Academy's Global Day (annual)
Family Weekend (annual)
Hampshire Regional High School (annual)
Environmental Sustainability Professionals Program, Institute for Training and Development
Liz Moule with the Development Office
Natalie West with the Development Office
Northampton High School - environmental science class
Smith College Board of Trustees
Smith College Campus School, 5th Grade Class
Smith College Class of '56
Smith College Class of '61 (and one class member from '41)
Smith College Library staff
The Conway School of Landscape Design
Vermont Green Building Network
Wright Builders, Inc., Northampton, MA

Cover photo: Students in the “Adventures at MacLeish” First-Year Orientation group take a break in the trees at the challenge course.