

Center for the Environment, Ecological Design, and Sustainability

Smith College

Annual Report

1 August 2014

Submitted by Andrew J. Guswa, Director



Executive Summary

The Center for the Environment, Ecological Design, and Sustainability (CEEDS) prepares Smith students to lead on issues of environment and sustainability. In 2013-14, our presence was felt across campus, and our space in Wright Hall was kept busy hosting student groups, offering events, and acting as the educational entry point for those interested in the environment. We graduated the second cohort of Sustainable Food concentrators, supported faculty with our curricular enhancement grants, successfully completed the Living Building Challenge for the Bechtel Environmental Classroom, engaged in conversations around fossil fuel divestment, and involved students in numerous integrative projects. The Ada and Archibald MacLeish Field Station continued to flourish, and we continued to expand our collaborations with Smith and the environmental community. Operating expenses (including salaries and compensation) during 2013-2014 totaled \$331,859 with an additional \$165,665 spent on limited-term projects.

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 with details on specific activities.

Cover photo: Five College students at the January 2014 Environmental Leadership in the 21st Century workshop, sitting in the Bechtel Environmental Classroom. The Classroom was certified as the world's fifth Living Building this year.

Ultimately, CEEDS is driven by educational outcomes rather than activities; that is, we choose to focus on the impact of the Center rather than the efforts. 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.

During the 2013-2014 year CEEDS interacted with thousands of people – from students and faculty to community members and local leaders. Our energies were directed towards 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.



Image 2: Students enjoying cider on Mountain Day at the MacLeish Field Station in Dan Ladd's tree grafting installation.

2.1 Personnel

As of 1 July 2014, the CEEDS staff comprises the Director, Assistant Director, Field Station Manager, Environmental Research Coordinator, and Administrative Assistant. Environmental Fellows, appointed from the Smith College faculty, provide strategic guidance to the director and staff and actively advance CEEDS programs. Separate advisory boards exist to set policy and make decisions related to the MacLeish Field Station and the Environmental Concentrations. Table 1 provides a list of CEEDS staff and affiliated faculty.

This year we added an Advisory Board for our new Environmental Concentration: Climate Change, to be launched in fall 2014. During 2013-14, CEEDS supported eleven student interns who engaged in a variety of projects both on and off campus.

Table 1: CEEDS staff and affiliated faculty

<p>Staff Director Assistant Director Field Station Manager Env. Research Coordinator Administrative Assistant</p>	<p>Andrew Guswa Joanne Benkley Reid Bertone-Johnson Paul Wetzel Sara Kirk</p>
<p>Environmental Fellows</p>	<p>Jesse Bellemare, Biological Sciences, Env. Science and Policy (ES&P) Ann Leone, French and Landscape Studies (LSS) James Lowenthal, Astronomy Amy Rhodes, Geosciences, ES&P Sharon Seelig, English L. David Smith, Biological Sciences , ES&P</p>
<p>MacLeish Advisory Board</p>	<p>Amy Rhodes (Chair), Geosciences, ES&P Jesse Bellemare, Biological Sciences, ES&P, LSS Reid Bertone-Johnson, Field Station Manager, LSS Scott Johnson, Athletics Andrew Guswa, <i>ex officio</i></p>
<p>Advisory Board for Environmental Concentration: Sustainable Food</p>	<p>Elisabeth Armstrong, Study of Women and Gender Barbara Brehm-Curtis, Exercise and Sport Studies Michelle Joffroy, Spanish and Portuguese Ann Leone, French, LSS Nola Reinhardt, Economics Paul Wetzel, CEEDS Andrew Guswa, Engineering, ES&P, LSS</p>

Advisory Board for Environmental Concentration: Climate Change	<p>Jesse Bellemare, Biological Sciences, ES&P, LSS</p> <p>Elliot Fratkin, Anthropology, ES&P</p> <p>Nathanael Fortune, Physics</p> <p>Daniel Gardner, History</p> <p>Andrew Guswa, Engineering, ES&P, LSS</p> <p>Alice Hearst, Government</p> <p>Danielle Ignace, Biological Sciences, ES&P</p> <p>James Lowenthal, Astronomy</p> <p>Denise McKahn, Engineering</p> <p>Robert Newton, Geosciences, ES&P</p> <p>Amy Rhodes, Geosciences, ES&P</p> <p>Susan Sayre, Economics, ES&P</p> <p>Elizabeth Spelman, Philosophy</p> <p>Gregory White, Government, ES&P</p>
---	--

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 at The George Washington University Law School

Katherine Borgen '64, Board Chair of Rachel's Network; Trustee, The Nature Conservancy (CO)

Leslie Carothers '64, Scholar-in-Residence at Pace Law School, member of the Board of Directors of the Center for Climate and Energy Solutions

Aimée Christensen '91, Founder and CEO of Christensen Global Strategies

Deborah Duncan '77, Executive Vice President and Chief Financial Officer of the Fremont Group; Smith College Trustee

Ilona Johnson '06, Associate Energy Engineer at Lilker EMO Energy Solutions

Erinn McGurn '94, Founder and Executive Director of SCALEAfrica

Jan Van der Voort Portman '78, Trustee, The Nature Conservancy of Montana; Trustee, Rare

The Advisory Board had its third annual meeting with CEEDS staff and Environmental Fellows on Saturday, 3 May 2014. We started the day off with an informal discussion about current environmental issues over lunch with President McCartney. We then learned from Erinn McGurn and Aimée Christensen about their work and discussed ways to

- Engage Smith Alumnae in CEEDS mission
- Engage students in short term intensive/immersion projects

- Create ways for alumnae to interact with students
- Benchmark CEEDS against comparable programs at other institutions.

2.3 Fundraising and Alumnae Outreach

Throughout 2013-2014, the Center Director, CEEDS staff, and the Environmental Fellows worked closely with Environmental Science and Policy, Landscape Studies, and the Office of Development and the Alumnae Association to share the mission and potential of environmental programs at Smith with alumnae, friends, and potential donors.

Specific events for 2013-14 include:

December 2013, Drew Guswa and Debbie Duncan '77 met with Susan Harvey of the S.D. Bechtel, Jr. Foundation to share highlights from CEEDS and to thank the foundation for their continued support of Smith College.

From 5-18 January 2014, Drew joined eight Smith alumnae for a cruise through the Panama Canal. In addition to sharing stories of Smith, Drew gave two lectures: "Quenching our Thirst: Sustainable Water Resources for a Changing World" and "What is the Value of Nature: Natural Capital and Ecosystem Services."

In February, Drew filmed a video segment for Scholars in Studio to share his interest in water with alumnae and other audiences: <http://www.smith.edu/scholars-in-studio>

In March, Drew met with Joan Lane '49 (former chair of the Board of Trustees) in Palo Alto, CA to share highlights from CEEDS and Smith.

From 10-12 April, CEEDS engaged with alumnae through the revived Spectrum program. On Thursday, CEEDS hosted the alumnae for dinner. Drew, Joanne, Ann Leone, and Amy Rhodes attended, and Drew gave remarks highlighting the vision and achievements of CEEDS. Paul, Joanne, and two graduating concentrators hosted an event focused on sustainable food for Spectrum participants.

In May, as part of second reunion weekend, Drew led members of the class of 1979 on the Hidden Mill River walk.

In May, Drew also spoke at the Class of 1969 dinner and shared environment and sustainability highlights from Smith.

2.4 Grant Proposals and Gifts

In 2013-2014, CEEDS staff, in conjunction with Smith's Office of Development and Sponsored Research Office, submitted two grant proposals in support of our programs.

Title:	Director's Grant, Smith College, Center for the Environment, Ecological Design, and Sustainability
Agency:	Stephen Bechtel Fund
Amount:	\$200,000
Summary:	Support for operational and programmatic expenses of the Center for the Environment, Ecological Design, and Sustainability.
Status:	Funded

Title:	Environmental Leadership Project: Innovative Management of Sediment in Paradise Pond
Agency:	The Henry David Thoreau Foundation
Amount:	\$34,992
Summary:	Eight students from Smith College will develop their environmental leadership capacity by working alongside faculty and staff to develop innovative methods for managing the sediments that accumulate behind small dams. During an intensive 10-week program over the summer of 2015, these students will monitor and analyze a range of controlled experiments that attempt to flush sediment through the dam that creates Paradise Pond on the Mill River. Throughout these tests, and in the months leading up, the students and faculty will meet with staff from Facilities Management, environmental regulators, and other stakeholders in the community to align priorities and design effective experiments. Educational outcomes will be assessed through meaningful reflections.
Status:	Not funded

In addition to the grant proposals, the Center for the Environment, Ecological Design, and Sustainability also received the following gifts and commitments from alumnae and friends.

Amount	Intent
\$200	Enhancement and support of operations.
\$1,000	Enhancement and support of operations.
\$1,000	Enhancement and support of operations.
\$3,000	Enhancement and support of operations.
\$5,000	Challenge Course funding.
\$25,000	Enhancement and support of operations.
\$35,000	Enhancement and support of operations.
\$250,000	Leslie Carothers 1964 Endowed Fund for Environmentally Focused Curricular Enhancement

3 Curricular Enhancement

3.1 Environmental Concentrations

Smith College has developed concentrations in an effort to give students a way to organize a combination of intellectual and practical experiences around an area of interest. By declaring a concentration, students receive focused advising to help them design a program in their area of interest. In 2011, the Center for the Environment implemented the Environmental Concentration, focusing on the topic of sustainable food. This year, CEEDS proposed a second topic on Climate Change to be offered concurrently. The concentrations each comprise four components: a gateway course, an academic core, practicum experiences and a capstone. CEEDS continues to foster connections that allow students to engage in real world experiences through these two concentrations.

3.1.1 Gateway and Core Courses

Concentrators enroll in a gateway course, four core courses, and a capstone course. The gateway course presents environmental issues from a range of perspectives. Core courses are chosen from across the Five Colleges in consultation with an academic advisor. The capstone course requires students to work as a team and bring their knowledge together to address an environmental project in our community. For the gateway course, students choose between two lecture series: LSS 100, Landscape, Environment, and Design and ENV 100, Environment and Sustainability: Notes from the Field. ENV 100 is a newer course that exposes students to real world practitioners in environmental fields. Speakers in the lecture series range from the director of local business Real Pickles to a buyer for COSTCO Corporation. The 2013 line-up included one alumna, Margaret Williams '89, who spoke about her work as Managing Director of the World Wildlife Fund's Arctic Program. See Appendix A for a list of the 2013-2014 ENV 100 and LSS 100 speakers and their lecture titles.

3.1.2 Capstone Project: Sustainable Food

This year's Concentration capstone class worked with Keep Farming Northampton, a not-for-profit citizens group focused on strengthening the local farming economy by increasing access to and use of locally grown food. Students in the capstone class synthesized data from surveys of farmers, consumers, restaurateurs, and institutions, and developed a series of recommendations intended to increase local food use in Northampton. These recommendations include:

- Establishment of a permanent farmer's market
- Development of a commercial food-processing facility
- Additional marketing of local food and the development of a Pioneer Valley brand
- Creation of a mobile marketplace application to improve information coordination among restaurateurs, institutions, and farmers.

Students in the class presented their findings to the Northampton Agricultural Commission, Northampton City officials, and the Smith community. Four students were so engaged by this work that they established an independent research project for the spring semester and worked with Northampton's Director of Planning and Sustainability on the possibility of establishing a permanent farmer's market.



Image 3: Julia Jones '14 discusses the data collection process during an on-campus presentation of the capstone project.

3.1.3 Linking Academics and Action

An integral part of the concentrations are the internships that the students take on. This year our students took part in internships with thirteen different organizations, from the Massachusetts Farm to School Project in Amherst, MA to Common Capital in Holyoke, MA to Yerba Buena in Jamaica. Their work encompassed everything from food justice to building markets for livestock sales to providing educational outreach to field work and beekeeping. See the boxes below for more about the experiences of two of our students.

Taking Action: Emma Ulriksen '14

Emma Ulriksen '14 worked for Smith College Dining Services as a Local Food Intern. Emma worked on education and outreach for Dining Services with regards to the local food being purchased and served on campus. She redesigned the office's website to increase visibility of sustainability efforts, including adding language about their commitment to using local foods and creating stand alone "Local and Sustainable Foods" and "Where Your Food is Sourced" pages. Emma also created signs in the Dining Halls to better promote the local products being served and the current sustainable food initiatives underway (e.g. fair trade coffee, local yogurt, cage-free eggs, organic granola, etc.). Emma attended the Real Food Challenge conference to gather ideas about how Smith Dining Services might achieve its goal of increasing the amount of locally sourced, sustainably produced food it uses.



Image 4: The webpage Emma helped create during her time as a Local Food Intern.

Taking Action: Amelia Burke '15

Amelia Burke '15 interned for the Africa Centre for Holistic Management in Zimbabwe, which works with local communities to develop and implement grazing and management plans for communally grazed livestock. The goal is to increase soil fertility and crop yields and to restore watersheds. Amelia worked for both the fundraising department and with the training programs to help develop a plan to create a cattle market within the communities so they have greater power in butchering and selling their cattle.

“Working with ACHM hugely altered my thinking on the role of livestock in environmental degradation and convinced me of their potential in brittle environments as agents of land restoration. I became convinced of the importance of grasslands and rangelands in carbon sequestration and slowing the effects of climate change, and in proper land management's ability to lessen the effect of drought and flooding... I had been taught that desertification was largely irreversible, the product of various factors, and expensive and time-consuming to reverse. I have found, in fact, that this is not the case, at least in some environments, and that with concentrated effort and the right incentives it can be dramatically reversed. Many of the concepts I've studied in various classes have, of course, aided me in my work here, and I often find myself able to form a more complex and complete opinion based on the amalgamation of coursework and practical experiences.”



Image 5: Amelia Burke enjoying a meal of sadza (thick maize porridge) and Kapenta/Matemba fish from the Dim in Zimbabwe.

3.2 Events and Workshops

3.2.1 Concentration Events

To complement our Environmental Concentration, CEEDS hosted many events and field trips that related to sustainable food this year. A few examples are:

- Paul Wetzel and sustainable food concentrator Jacqueline Maasch '15 accompanied the marine ecology class to the Darling Marine Center, University of Maine. The trip, supported by a CEEDS curricular enhancement grant, included a visit to an oyster farm.
- Joanne and Paul led a field trip to Amherst College's Book and Plow Farm. Students EJ Wald '15, Julia Jones '14, and Alex Grubb '15 were joined by prospective concentrator Windy Kelley AC'15. Students heard about produce processing, seasonal extension and cover cropping.
- Joanne led a gleaned field trip in collaboration with Jessica Harwood of the organization Rachel's Table. Joanne and Sara were joined by students Emily Barbour '14, Julia Whiting '14, Emily Volkmann '16, and Lujun Jian '17 for a trip to two farms in Amherst, MA where they picked kale, sorted onions, and gathered sweet potatoes missed by the mechanical harvester.
- Paul attended the Northeast Organic Farmers Association Winter meeting held in Worcester with Maya Kutz '15, a sustainable food concentrator and Josephine (Blythe) Coleman-Mumford '17. This conference focused on information exchange in food production techniques and agricultural policy at the local and state levels.

3.2.2 Other Events, Lectures, and Field Trips

CEEDS hosted or co-hosted several engaging speakers and events this year, and also helped support and promote guests who spoke on other campuses in the Five College Consortium. Examples include:

- A discussion of potential graduate programs with David Hassenzahl from Chatham University.
- An info session with Dana Hunt, assistant professor of microbial ecology at Duke University's Nicholas School of the Environment co-hosted by CEEDS, the Five College Coastal and Marine Sciences Program, and the Environmental Science and Policy program .
- The Global Salon "Finding a Safe Place to Squat: Inadequate Sanitation Infrastructure as a Major Engineering, Social and Health Problem for Children in Developing Countries" with Clair Null, '01, assistant professor of global health at Emory University, coordinated with the Lewis Global Studies Center.
- A lecture: China's Environmental Challenges: Water, Waste, and Watts presented by Darrin Magee, professor, Environmental Studies Program, Hobart and William Smith Colleges. The talk was sponsored by CEEDS with support from the Five College Center for East Asian Studies and the National Committee on U.S.-China Relations Public Intellectuals Program (PIP), which is funded by the Henry Luce and C.V. Starr Foundations
- Slow Flowers: The Resurgence of Sustainable Cut Flowers for Domestic Markets, a lunch bag with Rachel Lord, Alaska Flowers.

- “Earth’s Turn,” a five-week film series organized in partnership with Climate Action Now and Smith’s Sustainability Representatives that featured a variety of environmental documentaries focused on climate change.
- “The Sixth Extinction: An Unnatural History,” a lecture with author and writer Elizabeth Kolbert about her book of the same name.

3.2.3 Interterm Workshops

This past January, CEEDS offered three different workshops during interterm: an environmental leadership workshop, a preserving and canning class, and a landscape interpretation class.

Joanne Benkley led the Five College Environmental Leadership in the 21st Century Workshop, which was held in the Bechtel Environmental Classroom at the MacLeish Field Station January 6-8, 2014. The three day workshop engaged nineteen Five College students in a variety of exercises designed to empower participants for a lifetime of meaningful and effective environmental action. The workshop wrapped up with "From Earth Day to Tomorrow: Environmentalism in the Digital Century," a public lecture by Denis Hayes, coordinator of the first Earth Day, founder of the Earth Day Network, and president and CEO of the Bullitt Foundation. The workshop facilitated meaningful connections among participants, alumnae, real world experiences, and CEEDS. This collaborative workshop was supported by the Five Colleges, the Thoreau Foundation and Smith's Centers for Leadership and Engagement (CEEDS, the Wurtele Center for Work and Life, and the Center for Community Collaboration).

Paul Wetzal led an interterm food preservation class January 13-15th aimed at teaching students the practical skills needed to preserve the abundance of the summer harvest for the cold months of winter. Eleven students learned how to make and can applesauce, jelly, and jam. Students also made fruit leather and dried apple rings and learned how to blanch vegetables in preparation for freezing.

During that same week, nine students from Smith, Mt. Holyoke, and Amherst College participated in the Landscape Interpretation class that took place at MacLeish and in the Bechtel Environmental Classroom. Reid Bertone-Johnson and Carol Berner (from Education and Child Study) facilitated the course. Local naturalist and Smith alum, Laurie Sanders '88, joined the group on Monday for an introduction to the New England forest. Jesse Bellemare from the biological sciences department, took the class on a field trip to East Whately and on a walk around MacLeish to better understand its connection to the cultural history of the 18th and 19th centuries. Amy Rhodes provided an introduction to geology and worked with the class on determining the relative ages of the two dominant types of rock in the bedrock of MacLeish. Finally, Maggie Lind, from the Smith College Museum of Art, worked with students on ways in which they can help visitors interpret what they see in the landscape.

In addition to the interterm courses offered by CEEDS staff, the Center also helped support After the Storm: Exploring Sustainability, Climate Change, and Water Quality from Environmental Design and Psychological Perspectives, a week-long course taught by Robert Ryan, professor of landscape architecture and regional planning at the University of Massachusetts, Amherst and Michele Wick, lecturer and research associate in the Smith College psychology department.



Image 6: Students learn to interpret the landscape with Amy Rhodes at the field station in January 2014.

3.3 Curricular Enhancement Grants

Each year CEEDS invites proposals from faculty (and teams of faculty) for modifications and enhancements of existing courses that are congruent with the CEEDS mission. Over the past four academic years CEEDS has supported twenty 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 2014-15, we are sponsoring three projects by faculty in biological sciences, German, and geological sciences. Descriptions of all of the projects funded thus far are provided in Appendix B.

Students Get Outside: Curricular Enhancement Grants in Action

This fall, students in the introductory English course ENG 118: Water - Science and Politics have been interacting with the local landscape more closely than ever as a result of a CEEDS Curricular Enhancement Grant awarded to their instructor, Naila Moreira. Students in the class hone their science writing skills in the context of global water and water resource issues. This year, using equipment and flow meters provided by CEEDS and the Picker Engineering Program, students ventured into the Mill River downstream of Paradise Pond to measure the river's discharge. They then compared their measurements of the day's discharge to official and historic data. The project culminated in a lab report on flood recurrence intervals in the context of Mill River and Northampton history. Students in the class also visited the MacLeish Field Station to observe both Northampton's water supply reservoir and the field station's sustainable zero-water infrastructure, including its composting toilets. They later incorporated information from the field trip into research papers on sustainable infrastructure for water-scarce countries.



Image 7: Two ENG 118 students measuring the Mill River.

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, and soil moisture. We see opportunities to grow this program to include Smith's campus and Paradise Pond.

Additionally, last September the College was awarded a National Science Foundation grant to purchase two field deployable Distributed Temperature Systems (DTS). These instruments use fiber-optic cables to measure temperature every 25 cm every minute for up to 8 km. The cables can be put in streams, buried in the ground, placed in tree canopies, located in buildings, or towed through the ocean from a boat. The instruments will be part of a lease program called CTEMPs, based at the University of Nevada—Reno, that facilitates sharing of the research instruments. Several fiber-optic cables will be deployed at the MacLeish Field Station over the coming year, allowing undergraduate students to be introduced to this novel monitoring technology.



Image 8: The meteorological tower at the MacLeish Field Station.

4 Integrative Projects and Research

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 American Chestnut Restoration

To engage students with concepts of conservation and restoration, CEEDS collaborated with The American Chestnut Foundation (TACF) 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 American chestnut hybrid nuts. These 6th generation hybrid trees will have 94% American chestnut genes and 6% Chinese chestnut genes. This year, approximately 1200 additional American chestnut hybrid nuts were planted in the seed orchard. Ten students spent a total of 30 hours assisting Paul Wetzel and two members of The American Chestnut Foundation, Brian Clark and Denis Melican. Additional nuts will be planted next year as they become available from the breeding orchards in the region. The nuts that were planted will be allowed to grow for three years before they are intentionally exposed to the fungal blight. Of the 1200, we expect approximately 20 trees to show resistance and be allowed to grow to maturity. The nuts those blight resistant trees produce will then be distributed throughout the Northeast.

Paul also planted blight resistant Chestnut hybrid nuts in gaps created in the forest canopy last spring and has been monitoring their progress. These nuts were planted to determine how best to reintroduce blight resistant chestnuts into a canopied forest. The 15 gaps were created in a variety of locations around the Field Station and in sizes that range from about 3 to 20 meters in diameter. Over 500 blight resistant chestnuts were planted in the gaps and will be monitored over the next ten years.



Image 9: Students help plant American chestnut seeds in the MacLeish orchard.

4.2 Sustainable Watersheds and Waterways

Resources from the Stephen Bechtel Fund enabled CEEDS to initiate a series of ventures under the heading Women for the World: Sustainable Watersheds and Waterways. These efforts included collaboration with Smith's Picker Engineering Program to develop and support a senior design project on green stormwater infrastructure along the Mill River, which cuts through the Smith campus. That project also included the design of a rain garden associated with the renovation of the Cutter-Ziskind student house on campus. The rain garden will be constructed this summer. Funds were also used to support faculty and students in Smith's education department to connect the work of CEEDS with teachers and curricula in local K-5 schools. This collaboration resulted in the creation of "Investigating Local Water," an inquiry framework for teachers. Next year, the Sustainable Watersheds initiative will also support Smith faculty and students working with staff in Facilities Management to evaluate the efficacy of and design best practices for the flushing of sediments through the sluice gate in the dam that creates Paradise Pond.

4.3 Hemlock Woolly Adelgid

Jesse Bellemare and Amy Rhodes continue to research the effects of exotic hemlock woolly adelgid and hemlock scale insects in hemlock forests at the MacLeish Field Station. The spread of these invasive insects threatens the survival of the foundation species, eastern hemlock (*Tsuga canadensis*).

With co-authors (Jesse Bellemare, Amy Rhodes, Theo Sweezey '14, Stephanie Acevedo '15, Meredith Gallogly '12, and Rebecca Taylor '16), Jenna Zukswert '13 wrote a research article on how forest ecosystems might change as this important tree species is lost to salvage logging and invasive insects. The paper, titled "Forest Community Structure Differs, but not Ecosystem Processes, 25 Years after Eastern Hemlock Removal in an Accidental Experiment", appeared in a special issue of the Southeastern Naturalist focused on hemlock research in the Eastern U.S. Jenna also authored a research poster of the same title, co-authored with Jesse and Amy, for the Ecological Society of America's annual meeting this August in California. In terms of forest health, their research has shown significantly greater depth of the forest floor soil organic layer between evergreen hemlock vs. deciduous tree dominated research plots, suggesting greater carbon storage in hemlock-dominated forests. Similarly, they found higher densities of forest floor micro-arthropods (e.g., mites, collembolans) in research plots with hemlock, possibly linked to the thicker organic horizon and more stable understory environment below evergreen canopy. However, no major differences in nitrogen cycling were detected between the two forest types, except evidence that short-term pulses (2+ years) of increased nitrogen cycling might occur immediately following tree death. The results indicate substantial changes in forest floor structure and microarthropod communities are likely with the loss of hemlock, but there is less evidence for long-term changes in key ecosystem processes, like nitrogen cycling, except within the first few years following hemlock decline.



Image 10: The white woolly balls on the underside of this hemlock branch are adelgid egg masses - the most distinctive and visible part of their life cycle.

5 Campus as a Model

5.1 Ada and Archibald MacLeish Field Station

The Ada and Archibald MacLeish Field Station is a 240-acre patchwork of forest and farmland located in West Whately, MA that provides opportunities for faculty and students to pursue environmental research, outdoor education, and low-impact recreation. In addition to supporting class visits and field research, efforts were directed towards the completion of the Living Building Challenge certification, which was achieved in February 2014, nurturing the fruit orchard, continued support of the American Chestnut Project, and increasing educational and interpretational signage. CEEDS, along with Smith College, also partnered with the Kestrel Land Trust to formally place 190 of the Field Station's 240 acres into permanent land conservation. CEEDS also designed and made preparations for the new Challenge Course that will be built at the field station. See 6.4 for more information on outdoor education.

More than 1,400 total visits to the field station by students, faculty, staff, and non-Smith affiliated community members were recorded this year. Students have engaged in research, used the site as inspiration, participated in site-specific design, gone on guided tours, and used the recreational trails. Appendix C lists all of the courses that used the field station this year.

5.2 Campus Sustainability

CEEDS continued to work with Deirdre Manning, Director of the Office of Environmental Sustainability (OES), to develop programs and projects that link the Center with Smith's operations and to facilitate faculty and student research collaborations that further the mission of the OES. The College continues to improve its metering of energy and water usage in the residential houses and campus buildings, and works to integrate the data into an online educational Energy Dashboard. CEEDS also supported the students who designed the Cutter-Ziskind rain garden as a more sustainable solution for stormwater and runoff (see 4.2 for more information).

This year the College received a two-year grant from the Henry P. Kendall Foundation to bolster sustainability efforts in the Dining Services department. The grant will support the ongoing efforts of Smith College Dining Services to develop sustainable, local and healthy food practices. CEEDS is working with Director Kathy Zieja to realize the goals and objectives of the grant in a number of ways.

CEEDS has also been in conversation with Facilities Management regarding the efficient and effective use of College vehicles. CEEDS offsets its carbon emissions for travel each year, and this year CEEDS purchased offsets equivalent to eleven metric tons from Terra Pass.

6 Communication and Collaboration

6.1 CEEDS Blog and Other Media

CEEDS has approximately 300 fans on Facebook (www.facebook.com/pages/Smith-College-Center-for-the-Environment-CEEDS/). This year we began to establish a presence on Twitter (@SmithCEEDS), and have 125 followers to date. We have tweeted about our accomplishments, highlighted environmental accomplishments by women during Women's History Month, and even tweeted aerial photos of campus taken by CEEDS staff from a kite. 313 people regularly follow our blog [CEEDS] (smithceeds.wordpress.com), which has become an increasingly collaborative endeavor. See below for a snippet from a student blogging about her internship at the MacLeish Field Station. We 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. Additionally, CEEDS is utilizing Issuu (<http://issuu.com/mylibrary>), an online publishing platform to make educational resources with a sustainability focus available to the Smith community. With the help of our interns, we published an edition of our [CEEDS] magazine at the end of the spring semester titled Impact(ed). Read this year's publication: http://issuu.com/smithcollegeceeds/docs/ceeds_impacted_spring_2014_issuu_f. CEEDS manages the email ListServ [ENVIRO], which provides current students (450+), alumnae (300+), and interested faculty/staff (80+) with information about events, internships, job opportunities, graduate schools, funding and more.

Connections are Made: Students Share Their Stories Through our Blog

Ellena Baum '14 worked as an intern at the MacLeish Field Station this past year. Much of her work involved the fruit orchard and imagining ways in which a permaculture component could be incorporated. Here, in her own words, are some things she chronicled for us on our blog.

“I have been fascinated by edible forest gardens since I participated in an immersion permaculture course in 2009, the year before I started my first year at Smith. I was exposed to edible forest gardens as a way to conceptualize integrated and cohesive systems of growing food. Forest gardens mimic a structure of a forest to maximize yields for human food production. They allow inter-species interactions across several different vertical layers of growth. ...Over the last four years I have worked in different capacities to introduce educational edible forest gardens to Smith College, through STRIDE work and special studies projects. Now, as a CEEDS intern, I am excited to incorporate these integrated systems of growing food into ongoing research at the MacLeish Field Station. This year we are beginning to collaborate with Wellesley College as part of a temperate edible forest garden research network. We will be incorporating underutilized groundcover and perennial plant species into integrated food-producing systems. Be sure to check back to learn more about how we will be working with Wellesley and other collaborators on our edible forest garden research here at Smith!”

6.2 Supporting Students and Student Organizations

This year, CEEDS worked with individual students and student organizations to co-host and support a variety of events. CEEDS continued to provide support and a meeting and event space for the Green Team, Divest Smith College, and Engineers for a Sustainable World. CEEDS also hosted the Sustainability Representatives meetings, and this year Sara provided essential planning and event support for Earth Week, which included food, workshops, crafting, dance, a campus-wide free box, and much more. CEEDS also worked closely with the Divest Smith College organization this year. During the fall semester, CEEDS began an all-campus series of conversations on fossil fuel divestment titled “Fossil Fuel Divestment: Good for Smith and the World?” The President’s Office then hosted a springtime panel event on the topic. All of the events were attended by students, staff, and faculty members. Divest Smith College successfully got a motion on the Student Government ballot, and the student body overwhelmingly passed a referendum in support of the College divesting fully from the fossil fuel industry.

CEEDS and the Botanic Garden again supported an intern to work in the Smith Community Garden as Summer Manager. In addition to blogging for CEEDS, student Junzhou Liu '17 has hosted Friday afternoon work parties and early morning Wake Up in the Garden, has run a weekly farm stand near Chapin House, and has created educational pamphlets about the garden.

6.3 Spatial Analysis Lab

The most significant update on collaborations between CEEDS and the Spatial Analysis Lab (SAL) is that of the creation of the Small Airborne Objects Protocol (SAO). Paul Voss, Jon Caris, Bob Newton, and Reid Bertone-Johnson worked with Five College Risk Management and Smith's Institutional Chemical Hygiene Committee (ICHC) to create a protocol that the College has now adopted. The SAO Protocol is the result of an extensive review process involving researchers and administrators from Smith College, Jasper Ridge (Stanford), Harvard Forest, Boston University, University of Michigan, and Penn State University. Both Jasper Ridge and Harvard Forest are actively working to adopt this new universal safety code.

In addition, the SAL continues to maintain and make available to Smith faculty, staff, and students, the original Geographic Information Systems (GIS) data created by and for the Smith Community. SAL staff are also developing training modules for use by CEEDS interns and students, faculty, and staff involved in research at the field station. Availability of Geospatial Positioning Systems (GPS) and the expertise to manage data provided by the SAL remains invaluable to the work of the field station.

6.4 Outdoor Education

A new Challenge Course will support leadership development and outdoor adventure activities at MacLeish for a broad spectrum of the Smith College community. Residential Life, Student Engagement, Summer at Smith, Athletics, and many departments, orgs, and programs will use the new challenge course to strengthen communications, resolve conflict, build leadership skills, and to simply enjoy themselves at the field station. The fun will begin in the fall of 2014.

A committee that included Reid Bertone-Johnson, Amy Rhodes, Scott Johnson, Ally Einbinder, Tamra Bates, Hannah Durrant, Eric Hamako, and EJ Wald '15 selected High 5 Adventure as the design/installation vendor for the Challenge Course, which was built in July 2014. The Challenge Course will have a series of low ropes obstacles that must be navigated by team members working together.

6.5 Five College Collaboration

In 2013-2014, two representatives from each of the Five Colleges met approximately monthly to coordinate activities and initiatives related to environment and sustainability, with particular attention to the Sustainability Studies certificate, the Five College Mellon Bridging Grant, and Blue Sky initiatives. Drew chaired these meetings.

From 22-23 May 2014, a number of Smith faculty attended a Five College faculty development workshop on environment and sustainability at Hampshire College in connection with the Mellon Grant to bridge the liberal arts and professional programs. Smith faculty Dan Gardner and Michele Wick received grants for courses to be offered in 2014-15.

6.6 Research Collaborations

Sixteen researchers and interested stakeholders attended the first annual MacLeish Users Group meeting in April. Those present represented three colleges/universities and six separate research projects that include use of the Ada & Archibald MacLeish Field Station. Smith College researchers continue to study the long term potential impact of the decline in

health of the Eastern Hemlock forest at the field station. Amy Rhodes and her lab have on-going geoscience research studies monitoring groundwater chemistry differences and changes over time within different plots with specific vegetative diversity. Jesse Bellemare and his lab are using dendrochronology (tree-core dating) to help piece together the connections between landscape/land use change and the cultural history of the site. Meg Thacher and James Lowenthal from the astronomy department use the site regularly with their classes and have begun to record the brightness/darkness of the night sky for long-term monitoring. Paul Wetzel from CEEDS is working with The American Chestnut Foundation in their Restoration Chestnut Seed Orchard and on a study of blight-resistant chestnuts naturalized in 15 canopy-gap plots dispersed throughout the forest at MacLeish.

At the MacLeish Field Station, 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.

In addition to these on-going projects, Paul Voss from engineering and Danielle Ignace from biology have proposed new work at MacLeish that we anticipate to begin late this summer or early in the fall. Paul Voss will make use of Smith's new Small Airborne Objects Protocol to use part of the field station as a test-flight zone for newly designed R/C airplanes and quadcopter drones. Jon Caris, from the Spatial Analysis Lab, and Paul Voss have agreed to use these new drones to assist researchers at MacLeish in gathering data useful to their studies.

Appendix A

ENV 100 Speakers and LSS 100 Speakers

ENV 100

September 9	Paul Wetzel , Environmental Research Coordinator, CEEDS, Smith College, Northampton, MA <i>Introduction to class; Restoring the Everglades: Is it Possible?</i>
September 16	Danielle McKahn* , Pioneer Valley Planning Commission, Springfield, MA <i>Land Use Planning, Smart Growth and Vibrant Downtowns</i>
September 23	Wendy Tremayne , Author, Truth or Consequences, NM <i>The Good Life Lab: Radical Experiments in Hands-On Living</i>
September 30	James Antal , United Church of Christ Conference Minister and President, Framingham, MA <i>Provoking Climate Leadership –With Everyone Living at the Same Address – 400 ppm CO₂ – Leadership Opportunities Abound</i>
October 7	Margaret Williams* , Director, Arctic Program, World Wildlife Fund, Anchorage, AK <i>Conservation at the Top of the World: Lessons Learned from Working in Arctic Conservation</i>
October 14	Fall Break
October 21	Sheri Flies , Assistant General Merchandise Manager Corporate Foods, COSTCO Wholesale Corporation, Issaquah, WA <i>Costco's Evolving Sourcing Practices–How Market Based Solutions Address Poverty and Malnutrition</i>
October 28	Clive Lipchin , Director, Arava Institute's Center for Transboundary Water Management, Israel <i>Transboundary Water Management in the Middle East: Research and Dual Narratives</i>
November 4	Dan Rosenberg , Founder of Real Pickles, Greenfield, MA <i>Making Locally-Grown, Solar-Powered Pickles in the Pioneer Valley</i>
November 11	Kelly Erwin , Director, Massachusetts Farm to School Project, Amherst, MA <i>How the Bad Food at a School Food Trade Show Changed My Life</i>
November 18	Erik Zettler , Professor of Oceanography, Sea Education Research, Woods Hole, MA <i>Plastic in our oceans: How bad is it?</i>
November 25	Discussion of Speakers , Patterns and Threads

*Smith alumna

LSS 100

January 27	Reid Bertone-Johnson , Landscape Studies and Smith's MacLeish Field Station Manager <i>Landscape perspectives: Seeing Through the Trees</i>
February 3	Ethan Carr , Landscape Architecture and Regional Planning, University of Massachusetts <i>Olmsted, Richardson, Van Rensselaer: Origins of Modern Theory and Practice in Landscape Architecture</i>
February 10	Anne Whiston Spirn , Landscape Architecture and Planning, M.I.T. <i>The Eye Is A Door: Landscape, Photography, and The Art of Discovery</i>
February 17	The Mitia Sawhill Lecture Mark Mack , UCLA and practicing architect <i>Easy Living or How a Smithie Changed the Course of Modern Architecture in California</i>
February 24	Elisabeth Hamin , Landscape Architecture and Regional Planning, University of Massachusetts <i>Cities and Climate Change: Building Resilience by Stealth or by Spotlight</i>
March 3	Jennifer Masters , MLA, MEd Associate, Dodson & Flinker, Inc. <i>Learning to Look: What Designers Do. What Students Need to Know</i>
March 10	Lecture in honor of John Burk , Professor Emeritus of Biological Sciences Sonja Duempelmann , Graduate School of Design, Harvard University <i>From Airfields to Green Fields: A Genealogy of Airport Landscape</i>
March 24	Marcus de la Fleur , Landscape Architect & Principal at de la Fleur LLC, Chicago <i>Fix it! Resilience, Durability and Creativity</i>
March 31	Fernando Armstrong-Fumero , Anthropology, Smith College <i>The Agricultural Landscape as Intangible Heritage, or, How I Stopped Worrying and Learned to Love the Destruction of Archaeological Sites (sort of)</i>
April 7	Randolph Hester , Landscape Architect and Professor Emeritus, UC Berkley <i>I Will Save a Species and/or Culture from Extinction</i>
April 14	Andrea Olsen , Professor of Dance and Environmental Studies, Middlebury College <i>Designing Space with the Body in Mind</i>
April 21	Julian Agyeman , Urban and Environmental Policy and Planning, Tufts University <i>Just Sustainabilities: Re-imagining e/quality, Living Within Limits</i>
April 28	Logan Werschky* , Special Advisor to NYC's Chief Analytics Officer, Mayor's Office of Data Analytics <i>Pioneers in Civic Data: Breaking into the Open (Data) and Other Lessons on Approaching a New Frontier</i>

*Smith alumna

Appendix B

Curricular Enhancement Grants: Awardees and Projects to-date

2014-2015 Curricular Enhancement Grants: Awardees and Projects

Michael J.F. Barresi (BIO) and Amy L. Rhodes (GEO): BIO 159Y and GEO 301

Cooperatively develop curriculum and materials for BIO 159Y–From Environment to Embryo: An Interdisciplinary Research Course and GEO 301- Aqueous geochemistry 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: The Environmental Culture of Germany

Redesign GER 250 – Advanced Intermediate German into GER 250 – The Environmental Culture of Germany 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 Vriezen (BIO) and Chris White-Ziegler (BIO): BIO 205

Modify BIO 205 – Microbiology 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.

2013-14 Curricular Enhancement Grants: Awardees and Projects

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 towards 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 Curricular Enhancement Grants: Awardees and Projects

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) & **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 from urban centers through desert wilderness and across political boundaries of conflict, studying water.

2011-12 Curricular Enhancement Grants: Awardees and Projects

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 Curricular Enhancement Grants: Awardees and Projects

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
Ecological literacy and GIS: mapping 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 & 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 in 2013-14

ARS173 - Cross-Disciplinary Foundations: 3D and Time-Based
ARS285 - Introduction to Architecture
AST113 - Telescopes and Techniques
BIO155 - Biodiversity, Ecology, and Conservation
BIO365 - Plant Ecology
BIO371 - Microbial Diversity
BIO400 - Special Studies in Biology - Vernal Pools
Campus School 2nd graders
Campus School 6th graders
EGR100 - Engineering for Everyone
EGR315 - Eco Hydrology
ENG118 - Colloquia in Writing: Water: Science and Politics
ENG135 - Introduction to Writing Creative Nonfiction: Writing about Place and Travel
ENV202 - Environmental Integration II: Collecting and Analyzing Information
FYS103 - Geology in the Field
GCC Green Building Technologies
GCC Solar Design & Installation
GEO102 - Exploring the Local Geologic Landscape
J-term Environmental Leadership in the 21st Century
J-term Landscape Interpretation
Mt Holyoke Intro to Environmental Science
MTH220 - Introduction to Probability and Statistics
UMass Graduate Architecture Studio