

Center for the Environment, Ecological Design, and Sustainability

Smith College



Annual Report

1 July 2013

Submitted by Andrew J. Guswa, Director

Executive Summary

2012-2013 saw the Center for the Environment, Ecological Design, and Sustainability (CEEDS) continue to impact Smith College in meaningful ways. 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 first cohort of Sustainable Food concentrators, supported faculty with our curricular enhancement grants, led Five College Students in an Environmental Leadership Workshop, and involved students in numerous integrative projects. The Ada and Archibald MacLeish Field Station continued to flourish, as we engaged students in new activities like maple sugaring, the planning and planting of an apple orchard, and the establishment of an American chestnut seed orchard. Operating expenses (including salaries and compensation) during 2012-2013 totaled \$289,000.

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, 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 the campus as a model
- 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: Clarissa Lyons '13, CEEDS intern, and Deborah Duncan '77, member of the Board of Directors for the S.D. Bechtel, Jr. Foundation, pose with the dedication plaque for the Bechtel Environmental Classroom. The plaque was designed and crafted by Clarissa.

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. Over the past year, we have updated our outcomes in response to feedback and suggestions from our alumnae Advisory Board. 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 the Center 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

With a welcoming space in Wright Hall, CEEDS is recognized as an important 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 2012-2013 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.

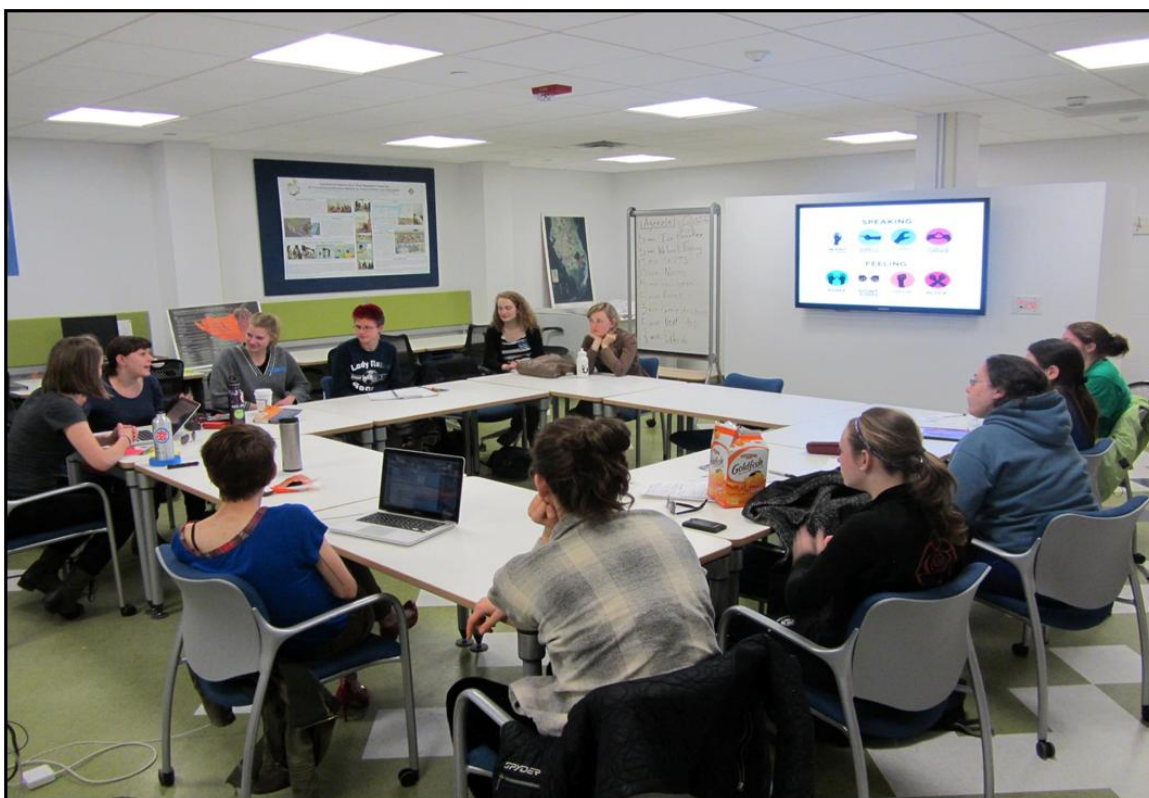


Figure 1: Students gather in CEEDS to discuss the Divest Smith campaign.

2.1 Personnel

As of 1 July 2013, Center 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 (see 5.1 below) and the Environmental Concentration (see 3.1 below). Table 1 provides a list of CEEDS staff and affiliated faculty. One notable change in our staffing line-up is that our Administrative Assistant Sarah Loomis left the College mid-year and we welcomed Sara Kirk as her replacement. The Center also relies on a close working relationship with Smith’s Environmental Sustainability Director, Deirdre Manning, whose office is located within CEEDS. During the 2012-13 year CEEDS supported ten student interns, some of whom worked at the MacLeish Field Station while others worked on campus and in the community.

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 Ann Leone, French and Landscape Studies Amy Rhodes, Geosciences Sharon Seelig, English L. David Smith, Biological Sciences and Env. Science and Policy</p>
<p>MacLeish Advisory Board</p>	<p>Amy Rhodes (Chair), Geosciences Jesse Bellemare, Biological Sciences Reid Bertone-Johnson, Field Station Manager and Landscape Studies 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 Joanne Benkley, CEEDS Barbara Brehm-Curtis, Exercise and Sport Studies Michelle Joffroy, Spanish and Portuguese Ann Leone, French and Landscape Studies Yoosun Park, School for Social Work Nola Reinhardt, Economics Paul Wetzel, CEEDS Andrew Guswa, Engineering</p>

2.2 Alumnae Advisory Board

To help guide CEEDS with respect to its mission and outcomes, we established an alumnae Advisory Board in 2012. Membership comprises:

Donna Attanasio '81, Partner, White & Case LLP

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

Leslie Carothers '64, Scholar-in-Residence at Pace Law School

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, Senior Energy Engineer at EMO Energy Solutions

Erinn McGurn '94, Founder and Executive Director of SCALEAfrica

Jan Van der Voort Portman '78, Trustee, The Nature Conservancy; Vice-Chair, Nature Conservancy of Montana

The Advisory Board had its second meeting with CEEDS staff and Environmental Fellows on Saturday, 4 May 2013. At this meeting, we introduced the Board to the Bechtel Environmental Classroom, and solicited input on values, assessment, and the big environmental issues of today. We heard the following in response to our question of "What are the big environmental challenges?"

- Climate change exacerbating all other environmental issues
- Water conservation and access
- Empowering and educating women for a healthier future
- Science literacy and biodiversity loss
- Environmental degradation as related to global poverty and public health

The staff, Environmental Fellows, and Advisory Board also reflected on assessment. Some of the feedback included:

- Difficulty in gathering qualitative and quantitative assessment data
- Brand CEEDS somehow so we are more visible on campus and with alumnae
- Idea of polls, entrance and exit knowledge of CEEDS

The Board is excited about the work of CEEDS and what the Center has to offer the community.



Figure 2: CEEDS was filled to capacity during reunion weekend when enthusiastic alumnae and their guests came to hear Andrew Guswa's talk "Quenching our Thirst: Sustainable Water Resources for a Changing World."

2.3 Fundraising and Alumnae Outreach

Throughout 2012-2013, 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 2012-13 include:

October 2012, "Smith by Design: Environment, Action, and Liberal Education," Women's Global Leadership Celebration, presentation by Andrew Guswa to Smith College alumnae and visitors on campus.

October 2012, Student poster session with Board of Trustees emeriti and President's Circle group. Posters included Alyssa Stanek '13, Coral Ed-Ventures Program; Sarah Tucker '13, Crab claw/cuticle strength; Kate Meyer (post-bac in mathematics), Hydrologic modeling for ecosystem services; Sophia Geller '13, Land-use history of the MacLeish Field Station; Lisbet Portman '13, Ward 3 designs; Clarissa Lyons '13, Fruit Orchard at MacLeish; Emily Barbour '14, Food preferences.

October 2012, Smith in the World Panel Presentations, Women's Global Leadership Celebration, to Smith College alumnae and visitors on campus.

Smith in the World: Panel II "From Mangroves to the Deep Sea: Environmental Education in San Pedro, Belize Community Service" by Kayla Clark '14.

Discussion Sessions and Presentations: Section 2 "Environmental Stewardship In and Out of the Classroom" by Associate Professor Amy Rhodes '91, Associate Professor Gary Lehring, Angela Oliverio '12, and current students Kayla Clark '14, Emma Kimata '14, Vannessa Louchart Bustamante '13, Laura Malecky '13, Emily Olmsted '14, Helen Smith '14, and Alyssa Stanek '13. Professor L. David Smith moderated.

November 2012, Presentation of CEEDS and our Environmental Concentration at the New England Deans' meeting, Smith College.

February 2013, Lunch with Susan Cohen and Paula Deitz to celebrate Smith's Landscape Studies Program.

April 2013, Lunch with Tim and Melissa Draper, in association with the Draper Business Plan Competition, Smith College.

May 2013, "Quenching our Thirst: Sustainable Water Resources for a Changing World," presentation by Andrew Guswa during Reunion Weekends (first and second), Smith College.

May 2013, CEEDS open house, Reunion Weekends (first and second), Smith College.

June 2013, "Women for the World: the Smith Design for Learning," presentation by Andrew Guswa at Smith alumnae gathering, Waccabuc, NY.

2.4 Grant Proposals and Gifts

In 2012-2013, CEEDS staff, in conjunction with Smith's Office of Development and Sponsored Research Office, submitted two grant proposals in support of our programs.

Title:	MRI Collaborative: Acquisition of Expanded Distributed Temperature Sensing Instrumentation to Serve Community Demand and Stimulate Undergraduate Discovery
Agency:	National Science Foundation
Amount:	\$250,123 (Smith portion)
Summary:	We propose to purchase three (3) new fiber-optic distributed temperature systems (DTS) to add to the instrument pool of the NSF-supported Centers for Transformative Environmental Monitoring Programs (CTEMPs) and to expand to Smith College with the goal of expanding research opportunities for undergraduate institutions. These instruments will also directly support field research by Smith faculty in ecology and geosciences. Opening research opportunities for faculty and students at Smith College, an undergraduate liberal arts institution specifically addresses the STEM goals of the NSF, attracting, training, and providing hands-on experience using transformative cutting-edge technologies to prepare the future leaders in sciences and engineering.
Status:	Pending

Title:	Center for the Environment, Ecological Design, and Sustainability
Agency:	Name withheld upon request
Amount:	\$200,000
Summary:	Support for operational and programmatic expenses of the Center for the Environment, Ecological Design, and Sustainability.
Status:	Funded; 1 June 2013–30 June 2015

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
\$20,000	Enhancement and support of operations.
\$10,000	Enhancement and support of operations.
\$100,000	Enhancement and support of operations.

3 Curricular Enhancement

3.1 Environmental Concentration: Sustainable Food

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 concentration is being run as a five-year, limited-term program, serving as a pilot project for future environmental concentrations on other topics. CEEDS graduated the first cohort of three seniors this spring. Currently, we have eight rising seniors and ten rising juniors enrolled. The interests of these students range from food production to food policy, and CEEDS continues to foster connections that allow students to engage in real world experiences.

3.1.1 Growing Collaborations

One local opportunity that is flourishing is the relationship with the non-profit organization, Grow Food Northampton (GFN). GFN is responsible for developing the Northampton Community Farm: a 121-acre parcel that includes community supported agriculture, 400 community garden plots, and grain fields. In response to a suggestion from the GFN leadership, students in the Sustainable Food capstone course investigated the feasibility and viability of an incubator farm on the GFN land in Florence, MA. A new off-campus work-study position with GFN was established and subsequently filled for the year by environmental concentrator Alana McGillis '15. Environmental concentrator Gayelan Tietje-Ulrich '13 also worked with GFN as an intern during the spring semester.

Strong ties were also forged with Glynwood, Inc., an organization based in Cold Spring, NY, whose mission is to save farming by strengthening farm communities and regional food systems. As a result of this new relationship, staff from Smith and faculty from the Culinary Institute of America, Vassar, and Williams Colleges planned an experiential fall weekend for their students. Paul Wetzel and six students joined their counterparts from the other institutions at Glynwood's 225-acre working farm for a weekend of activities that resulted in their gaining new perspectives on the benefits and challenges involved in creating and maintaining a healthy regional food system.

3.1.2 Courses for the Environmental Concentration

Concentration students may select from many food-related courses across the Five Colleges along with two required courses. For the first requirement, students can choose between 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 the Massachusetts Division of Ecological Restoration to a buyer for COSTCO Corporation. The 2012 line-up included one alumna, Diane Cornely '07, who spoke on her experiences as a senior analyst for sustainability for a large real estate holding company (see Table 2 for full speaker list). Thirty-five students enrolled in the class in Fall 2012.

Table 2: Speakers and their topics for ENV 100 (Fall 2012).

September 10	Introduction to class; Timothy Purinton , Director, Division of Ecological Restoration, Massachusetts Department of Fish and Game, Boston, MA <i>Ecological Restoration in Massachusetts</i>
September 17	Brian Donahue , Director, Environmental Studies Program, Brandeis University, Waltham, MA <i>Farms and Food: A Vision for New England</i>
September 24	Diana Cornely* , Senior Analyst, Jones Lang LaSalle, New York, NY <i>Sustainability in Corporate Real Estate</i>
October 1	Gidon Eshel , Bard Center Fellow, Bard College, Annandale-on-Hudson, NY <i>Environmental Desirability of Daily Choices: Myths vs. Facts, and the Paramount Importance of Calculating</i>
October 8	Fall break
October 15	Hugh Boyd , Principle Architect, Boyd Associates, Montclair, NJ <i>Experiences with Food</i>
October 22	Annette Higby , Policy Director, New England Farmers Union, Randolph, VT <i>What's New in the 2012 Farm Bill?</i>
October 29	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>
November 5	Paul Wetzel , Center for the Environment, Smith College <i>Supporting Communities and Conservation in the Bolivian Amazon</i>
November 12	Discussion of Speakers , Patterns and Threads
November 19	Mary Wagner , Associate Chief, U.S. Forest Service, Washington, D.C. <i>What's it like to work for the Forest Service?</i>

*Smith alumna

The second required course is a capstone for senior students which will be offered for the second time this fall. The Environmental Concentration Capstone, Topic: Sustainable Food (ENX 301) is designed to bring together students in the concentration to work on team-based projects related to sustainable food. Four students enrolled in the course this year. The class was a combination of food systems seminar and community service project with Grow Food Northampton (GFN). During their semester-long project, students considered all aspects of establishing an incubator farm at GFN, including need, competition, design, infrastructure, operation, financial requirements, value-added production facilities, and state and local regulations. Their research included a literature review as well as site visits

to regional incubator farms and personal interviews of farmers. The students presented their findings and recommendations to the Governing Board of GFN.

With the support of CEEDS and in collaboration with the Sherred Center for Teaching and Learning, Environmental Concentration adviser Lisa Armstrong and Andrew Guswa organized a series of teaching circle events to bring interested faculty together for a discussion of pedagogy and academic content related to our environmental concentration on sustainable food. The multi-disciplinary group included faculty from the study of women and gender, exercise and sports study, engineering, environmental science and policy, Spanish and Portuguese, economics, and CEEDS.

Students Get Outside: Maple Sugaring at MacLeish

In February, sixteen students braved the snowy terrain to help set taps in maple trees at the MacLeish Field Station. With the assistance of Don Reutner, professor emeritus from the Psychology Department, and his supplies, approximately 30 trees were tapped. Once the taps were set and the buckets hung, the sap had to be collected almost every day. The sap was stored in a holding tank and periodically collected by Harlan Bean, a local syrup producer, whose operation is located about two miles from the station. All told, Smith students and staff collected more than 675 gallons of maple sap between February 22nd and April 5th, 2013. That translates to nearly seventeen gallons of syrup. More than 40 students were involved during the two months of sap collection. CEEDS was highlighted on The Gate with a short video about the project: <http://www.smith.edu/video/maple-sugaring-macleish-station>. The maple syrup project was a sweet success that CEEDS plans to continue next year.



Figure 3: Students tap a maple tree at the MacLeish Field Station in February.

3.1.3 Sustainable Food Activities Outside the Classroom

Throughout the year, students and faculty participated in a number of food-related events that combined learning, networking, and a little fun, too. Paul Wetzel attended the Northeast Organic Farmers Association Winter meeting in January with student concentrators Maya Kutz and Amelia Burke (both class of 2015). The focus of the conference was information exchange in food production techniques and agricultural policy at the local and state levels. Along the same lines, two capstone students, Gayelan Tietje-Ulrich '13 and Claire Solomon '13 volunteered at Grow Food Northampton's Fall Festival where they helped introduce young children to farm animals and felt making. Both these events allowed participants to learn about sustainable food projects happening in the local area and provided opportunities for networking.

CEEDS continues to engage members of our community in thinking about food and where it comes from by providing them the opportunity to work with it directly. The now annual CEEDS cider pressing was a big hit again this year, with many of the CEEDS interns helping to make the day a success. We pressed 35 bushels of apples (donated by Clark Brothers Orchards, Ashfield) and drank freshly pressed cider with more than 800 people at this popular event. This spring, the MacLeish Field Station embarked on a maple sugaring project, and Joanne and Paul also took twelve students to a local sugar shack to experience the final steps of maple sugaring and sample the products in the process.

3.2 Curricular Enhancement Grants

Each year CEEDS invites proposals from faculty (and teams of faculty) for modification and enhancement of existing courses that will support the CEEDS mission. Over the past three academic years CEEDS has supported eighteen 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 2013-14, we are sponsoring four projects by faculty in biological sciences, English, and government. Descriptions of all of the projects funded so far are provided in Appendix A.

3.3 Environmental Monitoring

To support research in the environmental sciences and to 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. Currently, most of these efforts are based at the MacLeish Field Station, and we see opportunities to grow this program to include Smith's campus, among other areas.

Students See Multiple Perspectives: Curricular Enhancement Grants in Action



Figure 4: Jerusalem Global Engagement Seminar faculty and students meet with the mayor and city engineer of the Palestinian town of al-Ubadiya to discuss how the clean-up of the Kidron Valley could affect quality of life in their town.

3.4 Environmental Leadership Workshop

In January, Amherst, Smith, Mount Holyoke, and Hampshire Colleges organized a week-long Environmental Leadership Workshop with the intent of helping students in the Five Colleges see how to turn their ideas into action through panel discussion, lectures, field trips, and training sessions. The 28 students (nine from Smith) engaged in discussions with alumnae about their different career paths, worked to hone their skills for environmental advocacy, and engaged in role play to practice resolving environmental policy conflicts. Smith alumnae Ilona Johnson '06, Leslie Carothers '64, (both CEEDS advisory board members) and Francesca Grifo '81 shared their insights.

4 Integrative 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 Mill River, American chestnut restoration, Ward 3 in Northampton, and the invasive hemlock woolly adelgid. The skill of being able to communicate across disciplines is especially critical with respect to issues of sustainability, energy, and the environment. Therefore, a goal of the Center for the Environment is to find ways of modeling such interactions and bringing students into those opportunities.

4.1 Mill River

CEEDS has become the organizing force for Smith's research and curricular work related to the Mill River. From monitoring the flow of water over the dam to mitigating invasive species and proposing a multi-use greenway along the banks of the Mill River, Smith faculty and students use the river to gain understanding of and perspective on Smith's geographical and cultural context. Students have conducted independent research projects related to the distribution and dispersal of specific invasive plants, the mitigation of a variety of problematic invasive species, and the industrial history of the Mill River. Students and faculty also work in support of the Mill River Greenway Initiative, a multi-pronged collaborative effort to establish an ecological and recreational protected open space along the river from its mouth in Northampton to its headwaters in Goshen. Students are engaged with city and regional planners, citizen groups, non-profit environmental and planning organizations, and professional groups in an effort to establish the groundwork for the Mill River Greenway.

This year, Mara Keledei and Tam Nguyen (both AEMES, '16); and EJ Wald, Laila Phillips, Catherine Campbell-Orrrock, and Rebecca Wolfe (all STRIDE, '15) worked on two Mill River projects: 1) GIS parcel digitization and map production for the Williamsburg Greenway committee, and 2) sourcing content for the first in a series of Mill River Greenway interpretive brochures, which were completed, printed, and will be digitized and made more widely available via a link on the CEEDS website.

4.2 American Chestnut Restoration

CEEDS has long recognized that students will engage in conservation activities, especially at the field station, at different levels. Some students will be deeply engaged by developing and working on a summer-long independent project. Other students will participate in conservation activities for an afternoon. As part of the effort to provide a variety of entry points to conservation work for students, CEEDS and the College worked with The American Chestnut Foundation (TACF) to establish an American chestnut seed orchard. The purpose of the seed orchard is to grow up the last (5th) generation of 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, which may include blight resistance. New plantings in the seed orchard must be protected from herbivores and drought, and Paul Wetzel and Brian Clark of TACF worked with Greylin Neilson '14, Clarissa Lyons '13, and Emma Brown '13 to install an electric fence and plant

trees. Approximately 400 nuts or seedlings were planted this spring, and up to 3,000 additional trees will be planted over the next two years. Even as we work to establish our seed orchard, the first blight resistant chestnuts from other such orchards around the country are becoming available for planting in eastern forests. Paul Wetzel initiated an experiment to best determine how to introduce blight resistant chestnut trees into an existing forest. With the assistance of Greylin Nielsen '14, EJ Wald '15, and Michelle Jackson '15, experimental forest gaps of various sizes were cut in fifteen different places at the field station and on private land adjacent to the station and planted with 600 blight resistant (6th generation) nuts.

4.3 Ward 3

CEEDS and LSS interns worked with Reid Bertone-Johnson on producing a 'primer' for all the projects done in Ward 3 of Northampton thus far. The Landscape Studies class turned their attention this year to Lampron Park, Bridge Street Cemetery, and Bridge Street School in Ward 3. Students in LSS 250: Landscape and Narrative helped to conceive of better and more efficient uses of the school grounds and the adjacent Lampron Park during the spring semester. At the end of their project, students submitted their work to the Bridge Street School and the city of Northampton. The Bridge Street School plans to use some of the Smith student designs in an application for use of Community Preservation Act funds in August 2013.

4.4 Hemlock Woolly Adelgid

This year, Jenna Zukswert '13 completed her thesis titled: "Effects of Eastern Hemlock Removal on Nutrient Cycling and Forest Ecosystem Processes at the MacLeish Field Station, Whately, MA," and Theo Sweezey '14 completed a special studies titled: "Biogeochemistry of forest succession following logging of hemlock trees at the MacLeish Field Station." Camille Dwyer '14 provided research support. All three students co-authored abstracts with CEEDS faculty fellow Amy Rhodes for presentation at the American Geophysical Union and the Northeastern Geological Society of America conferences. Stephanie Acevedo '15 (AEMES) and Meredith Gallogly '12 presented a research poster at the Northeast Natural History Conference, which described their research with CEEDS faculty fellow Jesse Bellemare on forest floor animal communities in hemlock vs. deciduous forests at MacLeish. Jenna Zukswert also gave a presentation at the conference about her collaborative research with Jesse Bellemare. In terms of forest health, the hemlock woolly adelgid and hemlock scale insects, both exotics from Asia, have continued to spread in the hemlock forests at MacLeish during the past year. These insects were not abundant at the site prior to 2009-10. We are starting to see some signs of declining hemlock health, with some trees losing needles and showing thinner canopies.

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. During the 2012-2013 academic year, Reid Bertone-Johnson served as the Field Station Manager, and Amy Rhodes chaired the MacLeish Advisory Board (MAB). Most efforts this past year were directed towards the establishment of an organic apple orchard, developing an American chestnut seed orchard, and preparing for the final stages of the Living Building Challenge for the Bechtel Environmental Classroom.

5.1.1 Research and Teaching at the MacLeish Field Station during 2012-2013

This year the following courses used the field station:

- ARS/LSS 389: Broad Scale Design and Planning Studio
- AST 103: Sky & Telescope
- AST 111: Introduction to Astronomy
- AST 113: Telescopes and Techniques
- AST 228: Astrophysics I: Stars and Galaxies
- AST 337: Observational Techniques in Optical and Infrared Astronomy
- BIO 154/155: Biodiversity, Ecology, & Conservation
- BIO 363: Animal Behavior: Methods
- BIO 507: Seminar on Recent Advances and Current Problems in the Biological Sciences
- Conway School of Landscape Design
- ENG 135: Introduction to Creative Nonfiction: Writing about the Environment
- ENV 101: Environmental Integration I: Perspectives
- ENV 201/202: Environmental Integration II: Collecting and Analyzing Information
- ENV 312: Environmental Integration IV: Sustainable Solutions
- JUD 125/REL 225: Jewish Civilization: Topic: Environmentalism
- Liquid Futures
- LSS 250: Landscape Design Studio: Landscape & Narrative
- LSS 400: Landscape Design: Special Studies
- UMass EcoHydrology Class

More than 1,000 student visits occurred this year, with over 200 visits from faculty, staff, and community members. Students have engaged in research, used the site as inspiration, participated in site-specific design, gone on guided tours, and used the recreational trails.

Students continue to be actively engaged in ongoing research at MacLeish related to the hemlock woolly adelgid, groundwater quality, and precipitation throughfall. Over the course of this academic year, twenty classes visited MacLeish, many more than once. Additionally, the field station is increasingly being used by faculty from beyond Smith. Elizabeth Farnsworth from the Conway School of Landscape Design has begun to use MacLeish in her teaching. Doug Fraser from Sienna College continues to conduct a salamander study in collaboration with Jesse Bellemare, and David Boutt from UMASS is

collecting data from wells he installed last year in addition to studying the geology and hydrology of the field station at large. Artist in residence Dan Ladd is also working on installation pieces at the field station.

5.1.2 Mapping Support

Over the 2012-2013 academic year, Reid Bertone-Johnson met with Jon Caris on several occasions to discuss ways in which the Spatial Analysis Lab could help support the work of the field station. Drew Guswa, Amy Rhodes, Jesse Bellemare, Virginia Hayssen, Ninian Stein, and Jack Loveless have all participated in some such conversations. Jon Caris holds, maintains, and makes available to interested faculty and students all available GIS data for the MacLeish Field Station. He and his post baccalaureate assistant help faculty members and student researchers collect, rectify, map, and store data that they collect. Jon Caris has advised Reid Bertone-Johnson on equipment and software for use at the MacLeish Field Station. The SAL also works with faculty to incorporate GIS data from the Field Station into their lab and coursework.

5.1.3 Site Development and Maintenance

Trails

This past summer, Scott Johnson led a small but productive crew of CEEDS-funded summer interns in trail work at the field station. They built a new loop trail in the northeast corner of the property and connected it back to Poplar Hill Road to the west and the designated group campsite to the south. The trails were used heavily this past winter by people on snowshoes and cross-country skis. Seneca Gray '13 designed an entrance foot bridge that allows a woodland trail to connect the main parking lot just south of the gate to the Bechtel Environmental Classroom. The bridge, made of galvanized steel and black locust lumber, was installed this spring.



Figure 5: Seneca Gray '13 and the bridge she designed.

The Bechtel Environmental Classroom & Living Building Challenge

Construction of the Bechtel Environmental Classroom (BEC) was completed in July 2012, and it began to be used by members of our community immediately thereafter. The building's solar arrays produce more energy than the building uses on a regular basis, and we continue to track water consumption. The building functions well and continues to support a variety of activities at the MacLeish Field Station. The BEC is on its way to being certified as a Living Building.



Figure 6: The Bechtel Environmental Classroom, Spring 2013

Conservation Restriction

Smith partnered with the Kestrel Land Trust to put 190 of the 240 acres of MacLeish Field Station land in conservation. The approval process is nearly complete. Once approved, the restriction will permanently protect the land from development.

Apple Orchard

Clarissa Lyons '13 led a group of interns and special studies students in finalizing the design for the apple orchard. They selected eleven varieties and ordered a total of 57 trees with Smith's unique requirements in mind- no apples ripe before students return, pickable apples guaranteed for Mountain Day, CEEDS annual cider pressing, etc. Apple varieties include: Black Oxford, Freedom, Golden Russet, Goldrush, Jonagold, Liberty, Northern Spy, and Sweet 16. Two Asian pear varieties round out the collection: Olympic (Korean Giant) and Yoinashi. The soil was prepared and the trees were planted in April. The trees are all caged and protected from both mice and deer, and an irrigation system is in place. Summer interns EJ Wald '15 and Greylin Nielsen '14 will care for the orchard with periodic watering, mowing and the application of a kaolin clay slurry spray as necessary throughout the summer. The orchard will continue to provide opportunities for students to learn about holistic fruit production, fruit tree pruning, and orchard care. It will also act as a resource for potential student-led projects- from designing pollinating gardens to integrated pest management, and everything in between.



Figure 7: Students and staff plant the apple orchard.

5.2 Campus Sustainability

CEEDS continues 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 Green Team continued to use CEEDS for their bi-monthly meetings and utilized the space after hours every other week to offer students a fun "green" focused activity. Andrew Guswa and Joanne Benkley met with teachers from the Smith College Campus School and with Carol Berner and Susan Etheredge from the Education Department to discuss ways in which the Coral-Ed model may be implemented locally, with an emphasis on making our campus and its operations more sustainable and bringing those concepts and transformations into K-8 education. Additionally, Reid Bertone-Johnson and the student organization, Engineers for a Sustainable World, met with the Campus School teachers to discuss potential collaborative projects. Joanne Benkley worked with AEMES student Selene Chew '16 on engaging students in order to assess and increase usage of the online Energy Dashboard, which is managed by the OES.

In an effort to exemplify its values, CEEDS has committed to offsetting its carbon emissions for travel each year. This year, CEEDS purchased offsets equivalent to twelve metric tons from Terra Pass.

6 Communication and Collaboration

To help make connections, CEEDS coordinates and supports environmental events throughout the year. CEEDS is playing an ever increasing role in connecting students to both academic and co-curricular resources.

6.1 CEEDS Blog and other media

CEEDS has approximately 200 fans on Facebook (www.facebook.com/pages/Smith-College-Center-for-the-Environment-CEEDS/) and 313 people regularly follow our blog [CEEDS] (smithceeds.wordpress.com). Our blog has become an increasingly collaborative endeavor. Over the school year, interns Elizabeth Wright 'AC, Stephanie Cervantes '13, Renee Ricci '13, and Hannah Hurvitt '13 were the student writers behind the CEEDS blog. Environmental concentrator Eva MacNamara '13 contributed food-related posts as part of a special studies project. We are actively working 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. 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 a design edition of our [CEEDS] magazine at the end of the spring semester.

CEEDS manages an [ENVIRO]email listserv which provides current students (450+), alumnae (180+), and interested faculty/staff (60+) with information about events, internships, job opportunities, graduate schools, funding and more.

6.2 Events

6.2.1 Sustainable Food Events

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

- “Changing the Way We Eat”, a series of Ted Talks, screened at CEEDS during lunchtimes
- Wild Edibles Foraging walks with Blanche Derby, one each semester for a seasonal perspective and grounding in an ecological sense of place
- 2nd Annual Cider Pressing event
- A film screening and discussion of “Cracking the Codes: The System of Racial Inequity” together with the PVGrows Race and the Food System working group.
- CEEDS co-sponsored the lecture: Three Challenges in Food Ethics: Hunger, Obesity and Identity

6.2.2 Workshops and guest speakers

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 Conversation with Pablo Solon,” a dialogue with former Bolivian Ambassador to the United Nations

- Bill McKibben, “Jail Notes: The Fight for the Planet Starts to Quicken”
- Van Jones, “Rebuilding the Dream” lecture at Amherst College
- Screening and panel discussion of *Liquid Assets*, a documentary film about water infrastructure, with the Picker Engineering Program and Jim Laurila and the Boston Society of Civil Engineers
- “Where’s the Justice in That? Local Organizing Efforts in the Green Economy” with the sociology department
- A day-long workshop for the New England membership of the Consortium of Universities for the Advancement of Hydrologic Science, Inc.

Working across disciplines: Liquid Futures

CEEDS collaborated with the Landscape Studies program, the Architecture program, the Five College Women's Studies Research Center, the Miller Worley Center for the Environment at Mount Holyoke College, and many others to bring the global event, “Liquid Futures” to fruition. Smith College hosted the interdisciplinary panel discussion which utilized Skype and Waterwheel to bring together speakers and participants from The Netherlands, Italy, New York City, the Five Colleges, and the local region for a conversation about flooding and sustainable design solutions in a globalized setting. The panel was the on-campus culminating event for a special studies project by Stephanie Greene '15, Rosalie Smith '15, and Emma Camilleri '15J that was supervised by Ninette Rothmueller. Guest speakers included Gabriel Arboleda, architect and ethnoengineering expert; Anna Rita Emili, award-winning architect with Altro-Studio in Italy; Andy Fisk from the Connecticut River Watershed Council; Pieter Kromwijk, pioneer in sustainable architecture from the Netherlands; and Eve Mosher, artist and interventionist from New York City.



Figure 8: Liquid Futures participants interact with international presenters via Skype and Waterwheel.

6.3 Supporting Students and Student Organizations

This year, CEEDS worked with individual students and student organizations to co-host and support a variety of events. For example, CEEDS worked with Meghna Purkayastha to sponsor a talk by activist Maggie Chumbley titled “Plastic Pollution: Our Disposables and Ourselves” and hosted a dialogue run by Landscape Studies special studies students Ellena Baum '14 and Emily Dixon '15J, which had the goal of collectively brainstorming ways to integrate students and the MacLeish Field Station. Following Bill McKibben’s fall lecture, the Divest Smith campaign began to gain momentum. CEEDS provided space for students to gather every other week, and staff provided advice and support as they organized a campaign to get Smith to divest completely from the fossil fuel industry. CEEDS connected student Green Team members with local activists and helped facilitate the attendance of nearly 50 Smith students at the Stand Up for Climate Change Rally in Washington, D.C.



Figure 9: Green Team students joined local activists (including Denise Lello and L. David Smith) in protesting development of the Keystone XL pipeline at the Stand Up For Climate Change Rally in Washington, D.C.

CEEDS staff worked with and supported student members of the Green Team and House Sustainability Reps on Earth Week programming. This year's Earth Week included a screening of "A Fierce Green Fire;" bike rides led by Bike Kitchen members; tours of the Springfield Municipal Recycling Center, Smith's co-generation plant, and the green roof on Ford Hall; bike rides in Pedal People carts; tree planting - both on campus and at the field station; a raw food workshop; a music festival, and more. The Green Team also hosted an Environmental Justice Teach-In with speakers Majora Carter, Jan Dizard, Paul Wetzels, and students Siiri Bigalke '15 and Emma Wade '13. More than 100 students, faculty, staff, and community members participated in this March event.

Finally, the CEEDS/Botanic Garden summer intern position, associated with the Smith Community Garden, is entering into its third year. Student leaders of the Smith Community Garden, Claire Adams '16 and Isabel Cochran '15, worked with Gaby Immerman of the Botanic Garden and Joanne Benkley of CEEDS to develop the position. This summer, Claire will work to build educational programming around the Smith Community Garden and will support efforts at the Smith College Campus School Community Garden.



Figure 10: CEEDS/Community Garden intern Laura Sheys '13 with ripening tomatoes in the Smith Community Garden.

6.4 Stormwater Solutions

Drew Guswa worked with two students, Salma Bargach '14 and Natasha Krell '16, to investigate innovative stormwater management practices and strategies. The City of Northampton has an aging and underperforming infrastructure and is looking to make significant investments in the near future. In addition to studying stormwater management in general, Salma and Natasha worked with Doug McDonald (Northampton's stormwater coordinator) and Gary Hartwell and Charlie Conant (project managers at Smith) to explore how Smith can be part of the solution by implementing best practices in association with the upcoming renovation of Cutter-Ziskind. CEEDS also hosted a live webinar produced by the American Society of Civil Engineers on Low-Impact Development for these students plus engineering students working with the City of Northampton on a stormwater project through Design Clinic.

6.5 Five College Collaboration

Mellon Bridging Grant

Drew Guswa and Tim Farnham hosted a faculty development workshop associated with the Five College Mellon grant to bridge the liberal arts and professional programs. Faculty from UMass were brought together with those from the colleges with expertise in Water Resources, GIS, Climate Adaptation, Food and Agriculture, and Resource Policy. Drew and Tim are currently soliciting and evaluating proposals for team-teaching and cross-institutional collaboration.

Blue Sky Initiative

This past summer, Joanne and Drew convened the Five College Blue Sky Initiative *Food and Land Conservation* and *Water/Other* groups at CEEDS. Drew met with Beth Hooker, Jonathan Lash, Neal Abraham, and representatives from the other five colleges to continue conversation about the Blue Sky Initiative.

Appendix A

Curricular Enhancement Grants: Awardees and Projects to-date

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/CEEDS): 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.