

**Center for the Environment, Ecological Design, and Sustainability**

**Smith College**



**Annual Report**

**1 July 2012**

**Submitted by Andrew J. Guswa, Director**

## Executive Summary

2011-2012 saw the Center for the Environment, Ecological Design, and Sustainability continue to grow 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 admitted the first cohort of Sustainable Food concentrators, facilitated the construction of the Bechtel Environmental Classroom at the Ada and Archibald Field Station, supported faculty with our curricular enhancement grants, led Smith in the Five College Blue Skies Initiative, and continued to engage students in numerous integrative projects. We established our inaugural Advisory Board and continued to share the vision for CEEDS with faculty, staff, students, alumnae, and potential partners and supporters.

### 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.

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

**Connections are made**

Seemingly disparate knowledge is brought together within the unifying context of the environment.

**Students take action**

Smith students are empowered and enabled to take on environmental projects inside and outside of the curriculum and to bring their liberal arts learning to bear in pursuit of these projects.

**People interact**

Students, faculty, staff, alumnae, employers, and community members, who might not otherwise have crossed paths, interact and share knowledge and experiences related to the environment.

**Faculty members feel supported**

Members of the faculty recognize the Center as an organization that helps them achieve their goals with greater ease.

**Students get outside**

Students are mindful of the communities and urban and natural landscapes of the Pioneer Valley, our New England setting, and beyond.

**Graduates get jobs**

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

**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 is known**

Smith grows 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.

**Experiences stick**

Student and alumnae thoughts, decisions, and actions throughout their lives reflect environmental experiences and learning at Smith.

## 2 Growth and Development

With an established space in Wright Hall, CEEDS is becoming recognized as 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 make clear Smith's commitment to the environment and sustainability.

During the 2011-2012 year CEEDS worked with over six hundred new faces – from students and faculty to community members and local leaders. Our energies were directed towards increasing our visibility on campus and within the greater Five College area. To this end, the year saw collaborations develop with members of the Five College consortium – Hampshire, Amherst, UMASS-Amherst, and Mount Holyoke and several local non-profit organizations.



Figure 1: Students gather at CEEDS for an event which explored the environmental impacts of the coffee industry.

## 2.1 Personnel

As of 1 July 2012, the staff of the Center comprise the Director, Program Coordinator, 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. 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 2011-12 year CEEDS engaged with fifteen student interns. Five of these women worked directly for CEEDS, and the others worked with the Office of Sustainability and the Environmental Science and Policy Program.

## 2.2 Advisory Board

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

Donna Attanasio '81, Partner, White & Case LLP

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

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

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

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 first meeting with CEEDS staff and Environmental Fellows on Saturday, 7 May. At this meeting, we introduced the Board to our programs, showed them Wright Hall and the MacLeish Field Station, and solicited input on skills and outcomes. In response to our question of "What skills and knowledge do you regularly draw upon in your work?", we heard the following:

Content knowledge (i.e. competence in your field) was taken as a given; what sets people apart are skills related to:

- working collaboratively as a member of a team
- communicating with stakeholders with different backgrounds, perspectives, and motives
- critical and analytical thinking
- integrative thinking; synthesis

Table 1: Staff and faculty affiliated with the Center for the Environment, Ecological Design and Sustainability.

	<b>As of 1 July 2012</b>
<b>Staff</b>	
Director	Andrew Guswa
Program Coordinator	Joanne Benkley
Field Station Manager	Reid Bertone-Johnson
Env. Research Coordinator	Paul Wetzel
Administrative Assistant	Sarah Loomis
<b>Environmental Fellows</b>	Jesse Bellemare, Biological Sciences Ann Leone, French and Landscape Studies Amy Rhodes, Geosciences Sharon Seelig, English David Smith, Biological Sciences and Env. Science and Policy
<b>MacLeish Advisory Board</b>	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>
<b>Advisory Board for Environmental Concentration: Sustainable Food</b>	Nina Antonetti, Landscape Studies Elisabeth Armstrong, Study of Women and Gender Ann Leone, French and Landscape Studies Michelle Joffroy, Spanish and Portuguese Nola Reinhardt, Economics Yoosun Park, School for Social Work Paul Wetzel, CEEDS Andrew Guswa, Engineering

The staff, Environmental Fellows, and Advisory Board also reflected on and reacted to our outcomes. Some of the feedback included:

- overall, the outcomes look good
- add communication skills more explicitly
- add an outcome related to CEEDS having an effect on Smith culture
- strengthen and tighten some of the language

Over the coming year, we will revise and update our outcomes in response to this feedback.

### **2.3 Fundraising and Alumnae Outreach**

Throughout 2011-2012, the Center Director, CEEDS staff, and the Environmental Fellows worked closely with the Office of Development and the Alumnae Association to share the mission and potential of CEEDS with alumnae and potential donors.

Specific events for 2011-12 include:

September 2011, Reid Bertone-Johnson, Professor Ann Leone, and President Carol Christ, Smith Alumnae luncheon in New York City hosted by the Development Office.

October 2011, “Quenching our Thirst: Sustainable Water Resources for a Changing World,” Smith in the City, presentation by Andrew Guswa to Smith College alumnae in New York, NY.

December 2011, “Quenching our Thirst: Sustainable Water Resources for a Changing World,” presentation by Andrew Guswa to Smith College alumnae in San Francisco, CA.

March 2012, “Quenching our Thirst: Sustainable Water Resources for a Changing World,” presentation by Andrew Guswa to Smith College alumnae in Woodside, CA.

May 2012, Alumnae College, “Can the Everglades and Sugar Farming Co-Exist?” Presentation by Paul Wetzel at Smith College on May 19<sup>th</sup> and at two sessions May 25<sup>th</sup>.

May 2012, Commencement Weekend, CEEDS staff spoke about CEEDS programming with a special focus on the Bechtel Environmental Classroom and the Ada and Archibald MacLeish Field Station.

May 2012, Reunion Weekend, CEEDS staff presented on CEEDS programming with a special focus on the Environmental Concentration in Sustainable Food.

May 2012, Reunion Weekend, Paul Wetzel presented to the Class of 1997 about CEEDS and the Environmental Concentration in Sustainable Food.

June 2012, “Integrating Knowledge for Practical Problem Solving” presentation by Paul Wetzel to Smith College Alumnae Club of Maine.

## 2.4 Grant Proposals and Gifts

In 2011-2012, CEEDS staff, in conjunction with Smith's Office of Development and Sponsored Research Office, submitted a number of grant proposals for external funding. Each is summarized briefly here.

Title:	MRI Collaborative: Acquisition of Expanded Distributed Temperature Sensing Instrumentation to Serve Community Demand and Stimulate Undergraduate Discovery
Agency:	National Science Foundation
Amount:	\$225,031 (Smith portion)
Summary:	For two years, the NSF-supported Centers for Transformative Environmental Monitoring Programs (CTEMPs) community instrument program has supported 29 projects that addressed the spatio-temporal distribution of snow, fish, soil water, primates, atmospheric turbulence, glacial melt waters, ocean mixing, volcanology, and the temperature profile of the earth's surface. Based upon these successful studies and scientific interest in distributed temperature sensing, we propose to expand our instrument pool by 30% and to engage a primarily undergraduate institution, Smith College, in the education and training of young scientists and potential graduate students. Specifically, we propose to purchase three (3) new fiber -optic distributed temperature systems (DTS) to add to the instrument pool available to the environmental science community. Two instruments will be purchased and housed at Smith College, which will also offer summer training programs that include undergraduate students and educators from both Smith College and regional institutions in fiber-optic sensing. Smith College will receive at least 25% of the instrument time available each year on these machines. The remainder of the instrument time will be available to the wider scientific community and administered through the CTEMPs office at the University of Nevada, Reno.
Status:	Not Funded

Title:	Stormwater Outfall Assessment for The Mill River
Agency:	Environmental Protection Agency
Amount:	\$8,000 (Smith portion)
Summary:	This grant to the Environmental Protection Agency proposes to map all outfalls into the Mill River as well as tributaries that flow into the river in the project area, and assess general stream bank condition. The development of outfall mitigation plans and a benthic organism survey were also proposed. Money was written into grant to support a Smith College



engineering design clinic team and two students to work on the stream assessment for two semesters.

Status: Pending

Title: Stormwater Outfall Assessment for The Mill River

Agency: Massachusetts Department of Environmental Protection 604b program

Amount: \$9700 (Smith portion)

Summary: This grant to the Massachusetts Department of Environmental Protection proposes to map all outfalls into the Mill River as well as tributaries that flow into the river in the project area, and assess general stream bank condition. The development of outfall mitigation plans and a benthic organism survey were also proposed.

Status: Pending

Title: Environment and Sustainability Across the Five Colleges: Making Connections and Enriching the Curriculum

Agency: Andrew W. Mellon Foundation via Five Colleges, Inc.

Amount: \$99,000

Summary: Through this pilot program, we propose to link together more seamlessly the curricula, departments, and programs related to the study of the environment and sustainability across the four liberal arts colleges and the university. Specifically, we seek to build bridges between environmental programs at the four undergraduate colleges with three professional master's degree programs at UMass Amherst, namely Sustainability Science, Environmental Conservation, and Landscape Architecture and Regional Planning. Our activities will include (1) offering workshops and seminars for faculty development with respect to curricular integration and innovation, (2) facilitating the co-teaching of master's-level courses by liberal arts college faculty and UMass faculty, (3) supporting and mentoring master's student teaching assistants for upper-level environmental courses at the four colleges, and (4) providing funds for additional course development and enhancement in response to gaps and opportunities identified through our interactions.

Status: Funded; 1 May 2012 – 30 June 2014

Title:	Center for the Environment, Ecological Design and Sustainability
Agency:	Name withheld upon request
Amount:	\$100,000
Summary:	One-year of support for operational expenses of the Center for the Environment, Ecological Design and Sustainability.
Status:	Funded; 1 July 2012 – 30 June 2013

Title:	A Return to Paradise: Removing Invasive Plants to Reclaim the Smith College Waterfront
Agency:	National Fish and Wildlife Foundation
Amount:	\$32,686
Summary:	Partnering with city and community organizations, undergraduates will map, inventory, and remove invasives from the campus waterfront and will develop educational materials for the broader community.
Status:	Not funded

Title:	Developing a Regional Center for American Chestnut Conservation (pre-proposal)
Agency:	National Fish and Wildlife Foundation
Amount:	\$22,451
Summary:	In partnership with the MA/RI chapter of the American Chestnut Foundation, Smith College proposes to plant an American chestnut seed orchard that will produce blight resistant American chestnut seeds.
Status:	Pending

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
\$1,375,000	Endowment support for Field Station Manager (this support came via a gift to Landscape Studies).
\$25,000	Enhancement of operations for 2012-13.
\$10,000	Establishment of a native apple orchard at the Ada and Archibald MacLeish Field Station.

## **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 four-year, limited-term program, serving as a pilot project for future environmental concentrations on other topics. CEEDS admitted the first cohort of fifteen students this past fall and will be admitting more sophomores and juniors this coming year. Interest in the concentration is high among a very enthusiastic group of students. The interests of these students range from food production to food policy, and CEEDS continues to create opportunities that allow students to engage in real world experiences.

#### **3.1.1 Growing Collaborations**

One promising local opportunity under exploration is the development of an institutional 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 a community supported agricultural operation, 400 community garden plots, and grain fields. The relationship between the two organizations started this spring when Emma Brown ('13) was hired to develop the connection between the College and GFN. Two summer internships were also created with GFN in the areas of food production and non-profit organization operations, the latter to be filled this summer by Tia Novak ('13).

#### **3.1.2 Launch of Courses for the Environmental Concentration**

Concentration students may select from many food-related courses across the Five Colleges, but two required courses directly support the concentration. Environment and Sustainability: Notes from the Field (ENV 100) is a gateway course that each year exposes students to a series of real world practitioners in environmental fields. This year, speakers presented on topics ranging from farm production and food and health policy to bat ecology and the global carbon cycle (see Table 2). Thirty-five students enrolled in the class in Fall 2011 and twenty-five students are enrolled for Fall 2012.

The second offering is a capstone for senior students which will be offered for the first 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.

### **Working across disciplines: Art major Anna Burke '12 explores draft horse power**

Even students not officially enrolled in the concentration are working with members of CEEDS staff to study food related topics that interest them. Senior art major Anna Burke ('12) took the newly offered *Environment and Sustainability: Notes from the Field (ENV 100)* in the fall. She writes, "This lecture series has given me the confidence to pursue, as Heather Darby [a speaker in the class] would perhaps be glad to know, my dream. I have always wanted to farm and work with animals, and as I grew more aware of the food crisis, I wanted to do something about it." In the spring semester Anna enrolled in a special studies project with Paul Wetzel in which she compared farming with mechanical means versus horse traction. Anna's independent study provides an example of how CEEDS is able to help students link their interests across disciplines.



Figure 2: Anna Burke at Blue Star Equiculture, a local draft horse rescue where she worked as an intern.

Table 2: Speakers and their topics for ENV 100 (Fall 2011).

<b>September 12</b>	Introduction to class; <b>Philip Korman</b> , Director, Community Involved in Sustaining Agriculture South Deerfield <i>The Challenges and Joys of Scaling up the Local Food System</i>
<b>September 19</b>	<b>Heather Darby</b> , Agronomist and Nutrient Management Specialist, University of Vermont Extension, St. Albans <i>The state of farm communities and regional food systems in Vermont</i>
<b>September 26</b>	<b>Alyssa Bennett*</b> , Wildlife Technician for the Vermont Fish and Wildlife Department, Rutland <i>Where Have all the Bats Gone? Current research on the deadly White-nose Syndrome</i>
<b>October 3</b>	<b>Aimée Christensen*</b> , Founder and CEO of Christensen Global Strategies, Ketchum, ID <i>What do we value and what it means for our economy and for each of us</i>
<b>October 10</b>	Fall break
<b>October 17</b>	<b>William Sobczak</b> , Associate Professor, Biology Department, College of the Holy Cross, Worcester <i>Role of Freshwater Ecosystems in the Global Carbon Cycle and Changing Arctic</i>
<b>October 24</b>	<b>Yoosun Park</b> , Associate Professor, School for Social Work, Smith College <i>Neighbourhood immigrant acculturation and diet among ethnic groups</i>
<b>November 7</b>	<b>Paul Wetzel</b> , Center for the Environment, Smith College <i>The Challenge of Restoring the Florida Everglades</i>
<b>November 14</b>	<b>Leslie Sarasin*</b> , President & Chief Executive Officer, Food Marketing Institute, Washington, D.C. <i>The role of the Food Marketing Institute in the development of national food policy</i>
<b>November 21</b>	Patterns and Threads/Wrap up

\*Smith alumna

### 3.1.3 Sustainable Food Activities Outside the Classroom

Students participated in a number of food-related events that combined learning, networking, and a little fun, too. Two food concentrators attended the Northeast Organic Farmers Association Winter meeting held in Worcester. The conference focused on information exchange in food production techniques and agricultural policy at the local and state levels. Along the same lines, three concentration students and two Smith alumnae attended the “Fast Talk About Food” event sponsored by PV Grows Higher Education Working Group. This networking event allowed participants to learn about sustainable food projects happening in the local area. CEEDS was represented by Drew Guswa and Paul Wetzel at the January day-long Smith-Oxfam “World Hunger: Causes and Interventions” event as panelists in a discussion of the causes of world hunger. Their presentations focused on food production and distribution on a global scale.

This spring, CEEDS hosted local edibles expert, Mira Nussbaum for a foraging walk around campus. This event gave new meaning to “eating locally” and is an example of programming that supports the curricular work of our Environmental Concentration.

Finally, what better way to think about food and where it comes from than to work with it? In mid-October, CEEDS hosted an apple cider making event on Chapin Lawn. We pressed nearly fifty bushels of apples (donated by Clark Brothers Orchards, Ashfield) and drank freshly pressed cider with an estimated 300 people.

### **People Interact: J-Term Canning Class**

During January inter-term, Paul Wetzel, Joanne Benkley, Sarah Loomis of CEEDS, and Caroline Moore (ITS) conducted a canning and food preservation class. Nine students attended the experiential class. The class canned 26 quarts of applesauce, dried a quarter bushel of apples, made 4 pints of blackberry jam, 9 quarts of marmalade, squash butter, and 8 quarts of vegetable stock. At the end of the class students were charged with keeping their new skills sharp and to teach at least two other people how to can and preserve food.



Figure 3: J-term canning class with the fruits of their labor.

## **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—to graduate women who excel at integrating knowledge across disciplines in support of environmental decisions and actions. Over the past two academic years CEEDS has supported eighteen faculty 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. Said Justin

Cammy, a recent faculty recipient in the Jewish Studies program, “thanks for your work in really supporting faculty like me who aren't trained in these areas to take risks in including such important material in our syllabi.” For 2012-13, we are sponsoring projects in psychology, Jewish studies, education, English, and a collaborative project between biology and art.

### **Students Get Outside: Curricular Enhancement Grants in Action**

Sara Pruss, assistant professor of geosciences, was the recipient of a 2011 Curricular Enhancement Grant which she used to develop her curriculum around the 2011 earthquake and tsunami in Japan. Students studied the underlying geology of the disaster; the local and global economic consequences; the environmental effects, including those caused by the Fukushima nuclear crisis; the societal and human impacts; and the specific effect the events had on the United States. Professor Pruss was also awarded funds for an oceanographic cruise in Fishers Island Sound for her GEO 108 class. This fieldtrip enabled students and others in the Smith Community the opportunity to put theory into practice – they collected data on water temperature, salinity, oxygen, and brought plankton back to their Smith lab to analyze. As one student reported of her time aboard, “it was the most fun I have had in a long time.”

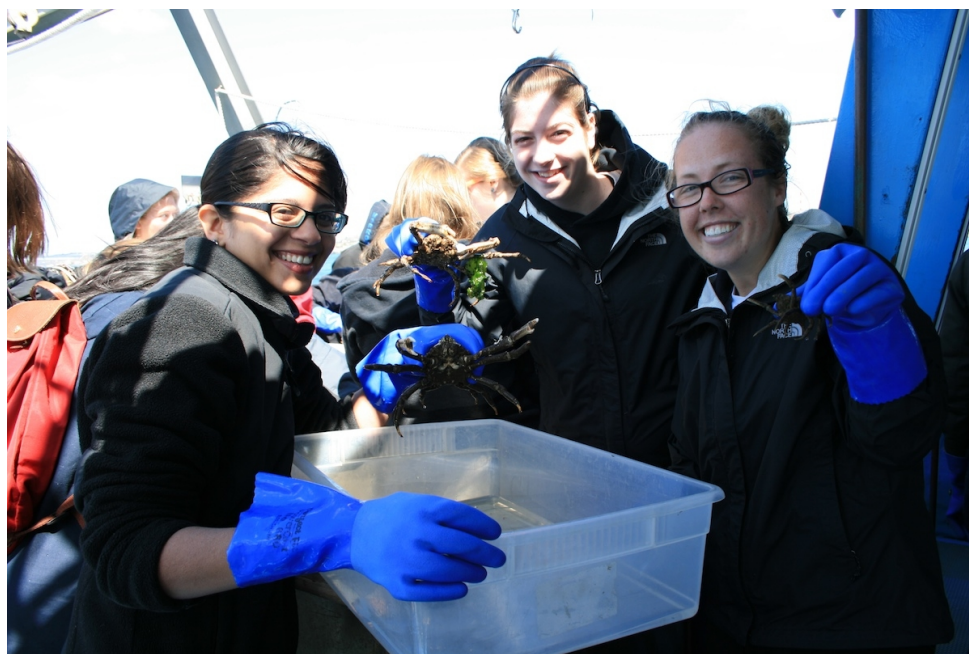


Figure 4: Students in GEO 108 gather flora and fauna on an oceanographic cruise.

Descriptions of all of the projects funded in 2011-2012 are provided in Appendix A. In addition to these grants, Reid Bertone-Johnson and Paul Wetzel also supported student projects in Environmental Integration II: Collecting and Analyzing Information (ENV 201) and Environmental Integration IV: Sustainable Solutions (ENV 312), two core courses for the new Environmental Science and Policy major.

### **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.

The weather station at the Ada and Archibald MacLeish Field Station continues to record the unusual weather patterns experienced in the region this year. Real time weather measurements, including atmospheric pressure, temperature, relative humidity, solar radiation, and wind speed and direction are available online (<http://macleish.smith.edu>) and weather data are available on the CEEDS website. These data continue to support student and faculty projects.

## **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 projects such as the Mill River Greenway Initiative, the American Chestnut Restoration Project, Ecosystem Services and Hydrologic Modeling, and research related to the hemlock woolly adelgid (see below). As the Center grows, we would like to expand our offerings to include an internal grant program for integrative environmental projects. These projects would be solution focused, engaging faculty and students from across disciplines to address environmental challenges. The grant program would facilitate this engagement by providing seed funding for collaborative multidisciplinary projects. 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. These projects would provide one means of achieving this goal.

### **4.1 Mill River Greenway Initiative**

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. Specific projects related to the Mill River include:



- STRIDE students, Emily Wald ('15) and Laila Phillips ('15) together with Reid Bertone-Johnson assisted with preparation for a Boston Society of Landscape Architecture (BSLA) Mill River Greenway design charrette by creating the GIS maps used by the event attendees.
- A collaboration with the Smith College Kahn Liberal Arts Institute offered a two-day workshop which considered the Mill River from the liberal arts perspective. Participants included over twenty faculty, staff, community members and students. (see figure 5).



Figure 5: Making Connections – Mill River short-term Kahn project.

## 4.2 American Chestnut

The restoration of an American Chestnut hybrid into the eastern forests is one of the most compelling conservation efforts currently underway with a goal of nothing less than the reestablishment of this culturally and ecologically important tree as a dominant species. Therefore, it is fitting that the American Chestnut story be used at Smith as an educational opportunity and as a way to involve students in a major conservation effort. This year, three students were involved in the baseline data collection for a research project that will investigate the best methods of establishing blight resistant trees into natural forests. This project will be carried forward with blight resistant trees as they become available. Smith College is also in the process of establishing a chestnut seed orchard at MacLeish Field Station. In time, this orchard will produce blight resistant seeds that will be planted throughout the region. Design and construction will be carried out by students this summer.

## 4.3 Hemlock Woolly Adelgid

The hemlock woolly adelgid, an invasive pest, is steadily destroying the native hemlock forests throughout New England. The pest recently arrived in western Massachusetts and at the MacLeish Field Station. Jesse Bellemare (biological sciences) and Amy Rhodes (geosciences) have engaged multiple students in course projects and summer research to better understand the effects and impacts of this landscape transformation. Questions include: What are the differences in soil pH and nutrient cycling beneath hemlock and deciduous stands? What vertebrates (e.g., salamanders) and invertebrates are found in the leaf litter under each forest type? What trees may grow up in the gaps created by the anticipated hemlock die-off? Such work enables students to connect fundamental scientific

research to a current environmental management challenge. During the summer of 2012, professors Rhodes and Bellemare are continuing their work with Smith students, two of whom are funded by the Center for the Environment.

#### **4.4 Ecosystem Services and Hydrologic Modeling**

Over the past decade, the concept of ecosystem services has emerged as a way of characterizing the value of natural ecosystems and processes to human society. With respect to fresh water, such services include the value of wetlands in mitigating floods, the value of buffer strips in filtering nutrients, the value of forests in providing steady streamflows throughout the year, and the intrinsic and aesthetic values of lakes, streams, and other water bodies. Drew Guswa and his students are collaborating with the Natural Capital project – a joint venture among the Nature Conservancy, World Wildlife Fund, Stanford University, and the University of Minnesota – to develop and improve hydrologic models to inform decision-making within the framework of ecosystem services.

## **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 2011-2012 academic year, Reid Bertone-Johnson served as the Field Station Manager, and Drew Guswa chaired the MacLeish Advisory Board (MAB). Amy Rhodes will serve as chair of the MAB for the 2012-2013 academic year. Most efforts this past year were directed towards construction of the new Bechtel Environmental Classroom.

#### **5.1.1 Research and Teaching at the MacLeish Field Station during 2011-2012**

This year the following courses have used the field station:

- ARC 135: Introduction to Archaeology
- ARS 386: Topics in Architecture
- ARS 400: Special Studies in Studio Art: Site Specific Installation
- ARS 400: Special Studies in Architecture: Pavilion Design
- AST 113: Telescopes and Techniques
- AST 102: Sky & Time
- AST 103: Sky & Telescope
- AST 111: Introduction to Astronomy
- AST 228: Astrophysics I: Stars & Galaxies
- BIO 154/155: Biodiversity, Ecology, & Conservation
- BIO 272: Vertebrate Biology
- BIO 364/365: Plant Ecology
- DAN 521: Choreography and the Creative Process
- EGR315: Ecohydrology
- ENV 201: Environmental Integration II: Collecting & Analyzing Information
- ENV 312: Environmental Integration IV: Sustainable Solutions

- ESS 940: Introduction to Wilderness Skills
- LSS 250: Landscape Design Studio: Landscape & Narrative
- LSS 255: Landscape Design Studio: Art & Ecology
- LSS 400: Special Studies in Landscape Studies: Orchard Design
- MATH 245: Introduction to the Practice of Statistics

More than two hundred students have visited the site - many on more than one occasion. Students have engaged in research, used the site as inspiration, participated in site-specific design, gone on guided tours, and used the recreational trails. More than seventy-five students visited the field station on Mountain Day, for a day of relaxation, hiking and tree climbing.

Students are actively engaged in research at MacLeish related to the hemlock woolly adelgid, groundwater quality, precipitation throughfall, the mitigation of invasive species such as multiflora rose and oriental bittersweet, and historic property use and ownership of the lands currently held by Smith. Faculty from the department of dance have used MacLeish as an inspirational and performance space for their courses, and studio art students are currently working on outdoor installation pieces in collaboration with a faculty member from the art department. Over the course of this academic year, nineteen classes visited MacLeish, many more than once. Additionally, the field station is increasingly being used by faculty from beyond Smith. Doug Fraser from Sienna College is conducting a salamander study in collaboration with Jesse Bellemare, and David Boutt from UMASS recently installed two deep monitoring wells to better understand groundwater recharge.

In addition to fieldwork at MacLeish, Meredith Gallogly ('12), conducted a deep-records search using primary resources available only at the Franklin County Registry of Deeds in Greenfield, Massachusetts, to develop an annotated timeline of ownership for the field station property from current day back to the late 1600s. She will continue her work this summer as part of her SURF internship with Jesse Bellemare.

## **5.1.2 Site Development and Maintenance**

### **Trails**

Work that began during the summer of 2010 to develop a system of trails for the field station continues. Last summer, Scott Johnson oversaw the construction of 1.5 miles of new trails at MacLeish, including a loop around the vernal pool at the base of the Western slope and the construction of three foot bridges. The trails have already been used by researchers, faculty, classes of students and neighbors. This summer, SURF students engaged in work at the field station are also contributing to the development of the site by assisting with trail construction. Scott Johnson anticipates that the SURF interns will complete an additional 1.5-2 miles of trail, completing the trails on the eastern slope of the property. The Whately Conservation Commission also approved the construction of a new pedestrian bridge along a trail designed by students in Reid Bertone-Johnson's LSS 250: Landscape & Narrative in the fall of 2011. SURF interns will construct the new bridge this summer in conjunction with other trail development work.

## The Bechtel Environmental Classroom & Living Building Challenge

Smith students are engaged in the development of the Ada and Archibald MacLeish Field Station as a resource for the entire Smith College community. This year, students from landscape studies, architecture, and engineering have completed designs for new recreational trails, interpretive signage, a solar-powered electric fence, and a pavilion. Students have also worked with CEEDS staff and associated faculty to implement these designs and develop a vision for the field station as a whole. Students were also members of the Architect Selection Committee and Programming Committee for the new Bechtel Environmental Classroom (BEC), construction of which is near completion.

The BEC is designed to be one of the “greenest” buildings in the United States. It will use a 10kW solar array to generate more energy than it uses on an annual basis, and Smith students and the building’s designers have vetted all of its building materials to ensure that they are the most sustainably sourced materials available. The BEC is registered in the Living Building Challenge, a green-building standard overseen by the Living Futures Institute. CEEDS anticipates that the building will be certified as a “Living Building” in late 2013 or early 2014. It will most likely be the first such certified building in Massachusetts and one of only a handful in the world.



Figure 6: The Bechtel Environmental Classroom, May 2012



Figure 7: The Bechtel Environmental Classroom, June 2012

**5.1.3 Students In Action**

**Conservation Restriction**

With the support of Reid Bertone-Johnson, four students in ENV 312: Environmental Integration IV: Sustainable Solutions completed a report and presentation making the case for placing 220 acres of the field station in permanent protection. We are hopeful that Smith can lead the way for other landowners in the watershed to consider conservation restrictions (i.e. the sale or donation of development rights, while retaining private ownership for agriculture and forestry) and sustainable management planning for their own properties. The permanent protection of these lands would contribute significantly to one of the largest contiguous areas of natural protected land in western Massachusetts.

Working with Denise McKahn from the Picker Engineering Program, Xizhu Zhao ('12), designed a solar electric fence as a special studies project. Xizhu, together with engineering lab supervisor, Sue Froelich, and Meghan Mussehl ('13J), installed her solar fence charger, which successfully kept the cows out of the BEC construction site.



Figure 8: Students in Action – Xizhu Zhao ('12) works with Engineering Lab Supervisor, Sue Froelich, and Meghan Mussehl ('13).

**Orchard Design**

Tia Novak ('13) designed a fruit orchard for the Northwest field at MacLeish, construction of which will begin this summer thanks to the generous support of President Carol T. Christ. The orchard is designed to include six varieties of apples in three plots, and will be located along the new service and handicap accessible drive to the BEC.

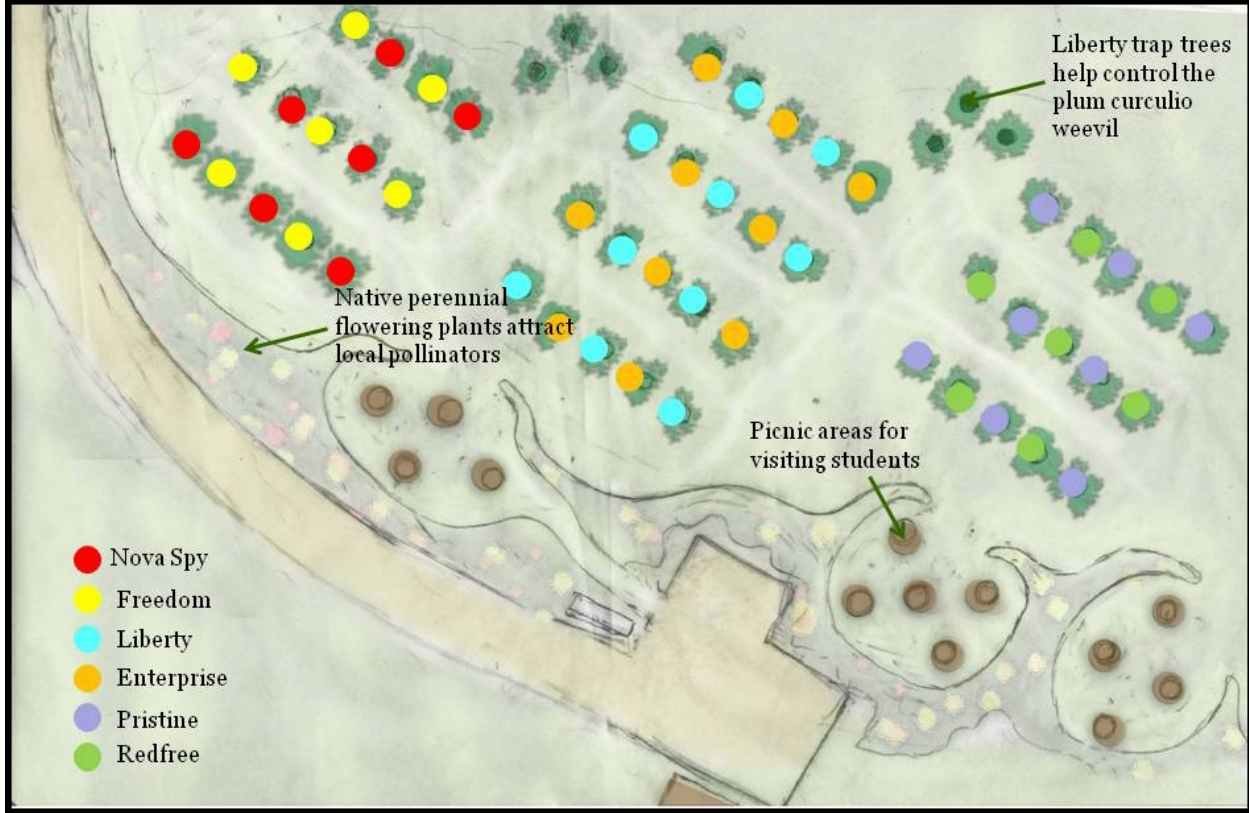


Figure 9: Orchard design by Tia Novak ('13).

#### **5.1.4 Mapping Support**

Images are now stored in LUNA and all other documents and data are now available to interested member of the Smith Community via a Moodle site. Student interns collected GPS data to map some of the interior stone walls to the benefit of our own maps and Jesse Bellemare's research on land-use history and pasture abandonment at the field station. This work was also supported by the Spatial Analysis Lab (SAL). Reid Bertone-Johnson has continued to develop maps for internal and external use, for research, and for recreation. Reid also maintains up-to-date GIS data on the GIS server made available to CEEDS by Jon Caris in the SAL.

#### **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 the Smit's operations and to facilitate faculty and student research collaborations that further the mission of OES.

In late 2011, the presidents of the five colleges launched the Blue Sky Initiative, issuing a call for new sustainability ideas that span the curricular and co-curricular lives of students and the administrative and operational activities on each of the campuses, among the campuses, and in the region. In collaboration with the Office of Environmental Sustainability, Joanne Benkley led the Blue Sky Initiative at Smith and invited faculty, staff, and students to share ideas during a series of facilitated meetings, to submit ideas via email, and to share them via a website. Thirty-nine faculty, staff and students participated in five different meetings held during late January and early February, and over one hundred ideas were generated.

The Blue Sky Initiative enabled CEEDS to engage members of our campus community in making connections between their classroom work and their personal interests, between their jobs and the goals of the College, and between the College and the larger surrounding communities; in empowering them to take action and bring their curricular/work experiences to bear in pursuit of a common goal; and in encouraging people to interact and share knowledge about sustainability. Over the next year, the Blue Sky Initiative will progress from a generative exercise to a collaborative implementation effort.

### **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 reached 100 fans on Facebook ([www.facebook.com/pages/Smith-College-Center-for-the-Environment-CEEDS/](http://www.facebook.com/pages/Smith-College-Center-for-the-Environment-CEEDS/)) and 56 people are regularly following our blog [CEEDS] ([smithceeds.wordpress.com](http://smithceeds.wordpress.com)). Our blog has become an increasingly collaborative endeavor. Over the school year, interns Angela Magyari ('14), Nicole Downer ('14), and Jessamine Finch ('12) were the student writers behind the CEEDS blog. Angela and Nicole

wrote a series focusing on the outcomes of CEEDS' Curricular Enhancement Grants, and kept busy exploring Smith's operational initiatives and compiling their findings into educational pamphlets. They focused on Smith's expanding compost program, landscape management initiatives, and recycling projects. Jessa wrote about the field station and the construction of the BEC. This summer, blog contributors include Laura Sheys ('13), the Botanic Garden and CEEDS Community Garden intern, students participating in the Coral Ed-Ventures program in Belize, and Siiri Bigalke ('15) who will be blogging for us about her experiences in Brazil at the Rio+20 United Nations' conference on sustainable development. 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. CEEDS interns Angela and Nicole finished work on our new magazine [CEEDS] which will be published virtually each semester. CEEDS' first issue focused on the topic of sustainable food.

## **6.2 Events**

### **6.2.1 Talk-back Teas**

Giving the Smith tradition of serving afternoon tea a modern twist, CEEDS began offering "Talk-back Teas," following key events happening on the campus. Moderated by faculty and staff, these discussions provided students the opportunity to reflect on the event. Smith community members brought their reactions, impressions, or questions and were encouraged to push the issues further and engage with material in a deeper way than what a presentation could perhaps offer. This year CEEDS offered Talk-back Teas after the following events:

- Evelyn Fox-Keller, Professor Emeritus of the History & Philosophy of Science at the Massachusetts Institute of Technology lecture "Rationality and Fear."  
Moderator: Lisa Armstrong, Study of Women and Gender
- Otelia Crowell Day speaker, Harriet Washington  
Moderator: Sarah Loomis, CEEDS Staff
- Smith-Oxfam "World Hunger: Causes and Interventions"  
Moderator: Lisa Armstrong, Study of Women and Gender
- Artist Christo, "Reimagining the Riverscape"  
Moderator: Reid Bertone-Johnson, Landscape Studies

### **6.2.2 Turning Your Grand Plans Into Reality Workshop Series**

CEEDS hosted a workshop series, "Making your Grand Ideas a Reality," which connected students to local entrepreneurs with a sustainability focus. In March, William Siff of Goldthread Apothecary spoke with students about the role local agriculture plays within the healthcare movement. Later in the month, members of the Pedal People, a bike-powered trash removal service, came to speak with students about running a cooperatively managed business. The format of these workshops enabled students to actively engage with the challenges of putting theory into practice. Students brought their ideas to the presentations and received feedback and guidance on ways to implement their own initiatives.



### 6.3 Supporting Students and Student Organizations

This year, CEEDS worked with individual students and student organizations to co-host and support variety of events. CEEDS worked with Theresa Helke ('12), Fiona Druge ('14), and Noga Heyman (Hampshire College) as they organized a series of energy panel discussions, with one panel event on each of the five college campuses. CEEDS co-sponsored a discussion on oil, which brought together over seventy students, faculty and staff from across the five colleges.

CEEDS staff also supported Ali Zipparo ('11) and the Student Government Association (SGA) in planning and executing activities around National Food Day. Ali and members of the SGA organized a farmer's market on Chapin lawn and held two food-focused panel discussions that explored the local food movement and Smith's purchasing practices.



Figure 10: Food Day participants, including students from the Smith Community Garden.

CEEDS staff worked closely with student members of the Green Team and Sustainability Reps on Earth Week programming. Earth Week included multiple activities related to sustainability and culminated with an Earth Day Carnival, which featured local musicians, a “trashion” fashion show, clothing swap, and local food vendors.

CEEDS staff facilitated student participation in the C2C conference at Bard College (Aiyi Zhang, '15) and the National Council for Science and the Environment's 12th National conference in Washington, D.C., on Science, Policy and the Environment: Environment and Security (Joanna Winkler, '12 and Ngozika Onuzo, '12). Ngozika also attended Rio+20 in June with the support of our partner, Climate Wise Women.

This spring Joanne Benkley hosted a Patagonia internship Info Session with alumna Maggie McCaffrey, ('10) – CEEDS hosted eight students and two staff interested in hearing more

about the opportunity to volunteer with the Argentine NGP Fundacion Patagonia Natural from Maggie. It was a great opportunity for students to hear from an alum about how she connected a potential position with funding sources on campus for a successful experience which still informs her work.

Finally, the CEEDS/Botanic Garden summer intern position is entering into its second year. Student leaders of the Smith Community Garden Angela Oliverio ('12), Dylan Farrell ('12), and Laura Sheys ('13) worked with Gaby Immerman of the Botanic Garden and Joanne Benkley and Sarah Loomis of CEEDS to develop the position. This summer's intern, Laura Sheys ('13), will work to build educational programming around the Smith Community Garden.

#### **6.4 Five College Faculty Development Workshop**

Sponsored by a grant to the Five Colleges from the Andrew W. Mellon Foundation, CEEDS hosted a faculty development workshop on bridging liberal arts and professional programs related to the environment and sustainability. Eighteen attendees from across the five institutions had a great visit to the Ada and Archibald MacLeish Field Station and many productive conversations over a day and a half. Discussion topics included:

- Potential opportunities for accelerated or streamlined opportunities for students from the four liberal arts colleges to pursue professional programs at the University of Massachusetts.
- Break-out discussions on the virtues and challenges of project-based learning, including the value of teamwork, the motivation of a higher level of accountability for community-based projects, and the resource intensity of these efforts.
- Co-teaching: professional students at the University assisting with liberal arts courses and liberal arts faculty contributing to master's-level courses.
- January Leadership Workshop: to be hosted at Amherst College this week-long workshop will bring together fifty students from across the five colleges to interact with each other and with environmental practitioners from the area.

## **Appendix A**

### **2011-12 Curricular Enhancement Grants: Awardees and Projects**

**James Middlebrook** (ART) Develop interpretive signage about sustainable systems to be used at MacLeish Field Station and the Bechtel Environmental Classroom. Organize a field trip to a current “Living Building” open to all Smith faculty and students.

**Gaby Immerman** (BIO) Removal of invasive Norway maples from Area D along the Mill River and use of the downed trees in a population study.

**Michelle Joffroy** (SPP) 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) 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) Develop curriculum and materials related to earthquake and Tsunami in Japan. Organize an oceanographic cruise class trip which is open to all Smith faculty and students.