

CONNECTICUT COLLEGE



Goodwin-Niering Center for the Environment

Class of 2013
Internship Reflection Papers

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Introduction

The Goodwin-Niering Center for the Environment at Connecticut College offers a certificate program that was developed to enrich the undergraduate experience with a concentration on environmental issues. Open to any major, it is particularly appealing to students who wish to blend their interest in the environment with a non-science major. With the help of a faculty advisor, students customize a curriculum including course work, seminars, and a conference.

During the summer following their junior year, students participate in highly structured internships, increasing the depth of their knowledge and commitment to the environment. These are professional level opportunities for students with career goals that include environmental policy, planning, law, economics, and education. The program enhances the effectiveness of internships by integrating them into the students' educational programs. The purpose of the internship is to offer students experiences that have a positive impact on their intellectual, professional and personal development through exposure to work environments that they might not otherwise encounter as an undergraduate. Students are offered access to stimulating ideas and people in their field of study and given substantive, meaningful work to do that will assist them in achieving their goals. On their return to college in the fall, they refine the relationship between their summer experiences and their senior integrative project.

In the summer of 2012, the twelfth class of certificate students participated in a wide variety of internships. After returning to college in the fall the students wrote internship reflection papers detailing their experiences. The papers were edited for purposes of clarity and consistency and compiled into this volume for the class of 2013.

More information on the certificate program can be found on the Center's web site at: <http://goodwin-nieringcenter.conncoll.edu>.

Rebecca Conner
Biological Sciences major and Anthropology minor
Barrow Arctic Science Consortium, Barrow, AK

My internship took place in Barrow, Alaska, the northern most point of Alaska and the largest of the Northern slope whaling villages where I worked with Barrow Arctic Science Consortium (BASC). BASC is a community based organization dedicated to bringing scientific and local communities closer together on the Northern Slope in Alaska and Chukotka, Russia, through providing logistical support for research and educational activities in these geographical areas. The organization is funded by National Science Foundation (NSF) grants and was created by Dr. Glenn Sheehan and Richard Glenn in 1996.

As an intern for BASC my responsibilities were two-fold. First, I worked in the organization's outreach program bringing local children (ages 5-15) from the Barrow City Summer Program to different scientific research sites twice a week, where the children learned about the work being done by the researchers on the Northern Slope. I also helped researchers provide public presentations and interviews on the local (and only) radio station on the Northern Slope, KBRW, to continue scientific outreach to the local community.

Second, I worked with BASC to complete my research for my Senior Integrative Project (SIP). This included working with Dr. Anne Jensen, a local archaeologist. We looked at faunal material from an archaeological dig completed in the early 1990s at Point Franklin, a former Iñupiat settlement on the Northern slope. Specifically, I studied two midden, (i.e. trash) cores of the site, cataloging the faunal bones found in these cores, along with any interesting modifications made to the faunal material. I also recorded the core level at which the faunal material was found. Most of the faunal material was caribou, ring seal, bearded seal, walrus, and bowhead whale as these animals are staples in the Iñupiat diet. I also participated in an archaeological dig at Point Barrow, rescuing human burial remains from an eroding slope. To complement my archaeological research, I interviewed Iñupiat members of the community of Barrow about current and past whaling techniques as well as climate change and the extraction of oil on the Northern slope. Lastly, I attended many local events such as the Nalukataq, a Spring festival put on by whaling crews to celebrate the end of a successful Spring whaling season while feeding the people of the village.

My original objectives in doing this internship were to become a good liaison between groups, learn independent research skills and to obtain enough data from my research to write a publishable paper. My work with the summer program was successful in continuing to bridge the gap between the scientific community and the local community. I easily accomplished the second two objectives as I worked hard to interview local community members and catalog faunal bone data with little to no guidance. I learned how difficult it is to gain an entire communities trust after they've been taken advantage of repeatedly. I began by focusing on the elders of the community but many wouldn't talk to me because conflicts with Green Peace over whale hunting rights were still fresh in their mind and to them, as a white foreigner, I represented Green Peace. When I tried to talk to younger

generations many still wouldn't talk to me because a recent New York Times article criticizing whale hunting on the Northern Slope was fresh in their minds and once again, they saw me as someone they could not trust. Those who provided an interview, after I worked hard to gain their trust, gave me the best insight into my research. They helped me to understand how integral whaling is to the life of the community and how climate change and western influence are threatening the ability to continue this practice. I feel that I learned a lot from the experience in terms of time management and gaining the trust of community members. With the late realization that my research would take much longer than planned came a shortage of data needed in order to write a publishable paper. My hope is to return to Barrow in early January to continue the cataloging and interviewing processes for a more comprehensive data set and understanding for my paper.

My internship definitely helped to prepare me for my Senior Integrative Project (SIP) by solidifying my original project ideas. I now have the majority of the raw data that I will use in my paper, gathered through the interviews and the faunal data. I also have a deeper understanding of life as a whaling community on the Northern slope and how it has been affected by many modern issues. My SIP will examine indigenous resource management and how it is adversely affected by climate change and Western economic influence. For my case study, my focus will remain on the Northern slope, specifically Barrow and Point Franklin, Alaska. My project will explore whaling on the Northern slope and how it has changed over time in terms of technology, culture, and conservation due to climate change and Western influence such as tourism, oil exploitation, and the formation of native corporations. My interviews provide insight on how whaling has changed over time and my hope is that my data from cataloging will provide similar insight. I will be using other texts, scientific articles, etc., to further investigate my thesis. The Northern slope is living proof that indigenous communities in the modern world can continue to be sustainable in the acquisition of natural resources. My hope is to find a way for indigenous resource conservation to continue to be successful after dealing with the threats previously mentioned, and to find common ground that can be applied to other indigenous societies around the world that are facing similar issues.

Rhea Corson-Higgs
Environmental Studies major and Dance minor
Earth Island Institute; New Leaders Initiative, Berkeley, CA

Earth Island Institute's New Leaders Initiative, launched in 2000, is one of the organization's 120+ individual projects promoting environmental conservation, preservation and restoration. The New Leaders Initiative "identifies, cultivates, honors and sustains emerging, young environmental leaders through strategic support and mentoring, networking opportunities and high visibility opportunities...The Brower Youth Awards (BYA) is the premier awards program honoring young environmental leaders. Each year, NLI recognizes six bold leaders between the ages of 13-22 for their contributions on behalf of the planet." ¹ The New Leaders Initiative also provides ongoing mentoring to young leaders and helps connect them with contacts and resources with which they can continue to develop their leadership, advocacy and project management skills.

I served as an intern at BYA during the summer of 2012. I spent three days a week in the office at the Brower Center and two at an organization called Summer of Solutions (SoS), a social, environmental justice and advocacy non-profit project that is the primary program of Grand Aspirations. It was founded in 2008 in the Twin Cities of Minnesota, by a past BYA winner with the goal of building youth leadership in the green economy. The program is run by and for, young people to build just, sustainable and prosperous communities in locations across the country. It seeks to: 1) help the participants in the program develop as leaders in the green economy; and 2) co-create projects and initiatives that are sustained beyond the summer².

Our diverse group was comprised of youth and college students, ages 16-23, from the East Coast as well as the West and in particular, Oakland, CA and its Fruitvale community. Our non-hierarchical organizational structure centered on collaboration and consensus and was based on a culture of mutual respect and recognition of an invaluable variance in life experiences and perspectives. We created a work environment of motivation and diligence, but were very intentional about scheduling breaks for stretching, energizing, and lunch during which we collectively cooked and cleaned, engaged in discussion and simply enjoyed each other's company. We also created a culture of minimal use of computers and technology, focusing instead on discussion, group brainstorming and moderated meetings with rotating responsibilities.

The work of SoS Oakland this summer included three main projects: 1) a partnership with an Oakland-based startup that has developed a unique model for community-owned solar projects; 2) renovation of a house into a youth community center, beginning the process of creating a safe space for youth in the area; and 3) running a free summer camp for low-income minority youth (ages 5-13) in the Fruitvale neighborhood. I worked primarily at summer camp through which staff sought to educate and empower Oakland youth in environmental and social advocacy. This work is critical in an area plagued by violence,

¹ Anisha Desai, Director of Brower New Leaders. Description of Internship. April 2012.

² Grand Aspirations: Summer of Solutions. Current Programs. Summer 2012.

<<http://grandaspirations.org/summer/current-programs/>>

lack of access to basic resources, healthy food, or quality education, as well as high rates of police violence and poor race relations. I served as a key staff member and coordinator for camp; organizing and leading workshops and activities, setting up and cleaning up the space, providing information for the parents, etc. The camp workshops (led by community members, camp staff that included parents and me) ranged from Aztec dancing to urban gardening. We planted two large plots with fresh fruits, vegetables and herbs, which the campers were able to tend and harvest. We also offered a nutrition workshop, dance and poetry among others. My experience with SoS this summer helped me to develop leadership, mediation and community-engagement skills.

My tasks at Earth Island included: 1) researching the current work of the past Brower Youth Award Winners and updating their bios; 2) organizing the Brower Youth Awards Ideas Festival (including brainstorming format and agenda, contacting panelists, booking date and venue); 3) providing support for an event on Food Waste, specifically helping to research a venue and conducting food-donation outreach; 4) researching entertainment options for the 2012 Brower Youth Awards Ceremony; 5) identifying possible contacts to fill current gaps in the BYA applicant pool; 6) conducting phone calls to BYA runners-up in which I offered feedback and followed-up with emails and resources; 7) inventory of the current BYA website with notes and suggestions for re-design. My projects at the Earth Island office exposed me to the inspirational work of young environmental activists around the country. I also developed skills in organizing and promoting events and connecting with various constituencies via email and phone correspondence.

I learned much about my own hopes and needs in a work environment through my contrasting experiences at SoS and the Earth Island office. I deepened my understanding of the need to balance office work with active community engagement, collaboration and hands-on projects. Although I valued my time at Earth Island, I felt stifled by the lack of clear ACTIVE-ism in the culture there and the emphasis on computer and phone work that kept people glued to their office chairs and disconnected from their immediate environment. I found ways of protecting my own well-being by taking walks, enjoying lunch breaks, and drinking lots of water. Still, I found it alarming that in an organization dedicated to environmental protection, the majority of staff seemed disconnected from their own bodies and well-being. In my opinion, effective advocacy work for the environment or other people is futile when one's own physical or mental wellbeing are not taken care of well.

My internship experience this summer prepared me for my Honors Thesis and Senior Integrative Project by exposing me to youth environmental activism around the country. My grassroots work at SoS centered on a youth-led approach to education and activism in the process of community engagement around issues that are directly relevant to them. We engaged community members to take action on pertinent issues, a model for how I believe environmental education and education in general should be—that is, active, participatory, dialogic, relevant and utilizing diversity as an educational tool. My Honors Thesis will investigate high school environmental education and natural science curricula in New London, Connecticut. I will examine contents, relevance, methodology, engagement and level of interest as well as preparedness for engagement in environmental activism and policy-making upon high school graduation. I will then construct an environmental curriculum that might be more relevant to inner-city youth in order to effectively integrate environmental justice education into New London's public schools.

Rebecca Horan
Environmental Studies major
University of Maine Forest Bio-Products Research Institute, Orono, ME

The Goodwin-Niering Center for the Environment has been an important part of my academic experience at Connecticut College because my involvement with the center has allowed me to expand the scope of my academic work by supplementing my Environmental Studies as a Social Science degree with more natural science work, in addition to connecting me with likeminded students, staff and faculty members. From my first course in freshman year, Energy and the Environment, my interest in the study and protection of the environment has grown and developed through my interdisciplinary course work, participation in student organizations, summer internships and semester in Madagascar. I hope to use all of this knowledge to address important issues facing the earth and society, with a strong knowledge of science as well as an understanding of policy structures.

The National Science Foundation (NSF) is an excellent source of funding and related resources for students and professionals conducting or seeking scientific research projects. I applied to several programs within the NSF's Research Experiences for Undergraduates (REUs) database during the spring of my junior year. The application process and the projects themselves are more structured than other students may experience with their self-defined Career Enhancing Life Skills (CELS) internships, but the NSF REUs are generally funded beyond what CELS can provide to students and also offer great opportunities for personal and professional development in scientific research.

Based on my interest in forest conservation from my studies in Madagascar, I accepted a position with the University of Maine Forest Bioproducts Research Institute (FBRI) and was assigned a research project related to FBRI's work and my academic background. FBRI's mission is to reduce reliance on fossil fuels, while propelling Maine's forestry industry forward by developing innovative products from wood and forest biomass. Their efforts combine academic research from University of Maine faculty members with companies invested in commercial development of forest bioproducts in order to effectively grow the industry.

The ten week program focused on undergraduate student development through independent research projects in addition to research ethics seminars and weekly lectures related to the work being conducted through FBRI. The aim was to encourage students to explore career paths and graduate programs related to forest bioproduct development in order for the industry to continue to grow with upcoming scientists. During the first nine weeks of the program, I worked with my two mentors to develop a formal research proposal before delving into my project which culminated in a journal article documenting the work I conducted. My personal project concerned social Life Cycle Assessment, which is a relatively undeveloped area of sustainability study. I spent much of my time gathering information from the limited sources available and developing my own methodology in order to apply my work to the study of the social sustainability of Twin Rivers Paper Company's operations. Beyond review of the literature, I also conducted many interviews with different

stakeholders related to the paper industry and Twin Rivers Paper Company and generated a company-wide social sustainability survey. The tenth, and final, week of the program was spent visiting different forest industry related sites in Concepción, Chile, where we also held our research symposium to present our summer projects. To provide a brief overview of my work, I included the abstract from my report:

The pulp and paper industry has held an important place in the United States since the late 19th century. However, international competition with newer equipment, cheaper labor and more lenient standards have created challenges for the industry in the U.S in recent decades. Changing and developing better business practices that will prove to be more sustainable for the environment, the local population and the fiscal security of companies is necessary for the industry to compete. This study investigates the social impacts of

Twin Rivers Paper Company's paper mill process in Madawaska, Maine to provide insight to its social sustainability, in addition to developing and testing the efficacy of a social Life Cycle Assessment (LCA) methodology. Data accessibility limited the scope of results generated in the study, but a combination of qualitative, semi-qualitative, and quantitative data were used to evaluate the company's performance and identify the capability of the developed approach to be applied to the pulp and paper industry.

The study predominantly consisted of a literature review of social LCAs, a series of interviews with individuals who are well-acquainted with the pulp and paper industry and/or the history of Twin Rivers, and an assessment of a social sustainability survey that was distributed to a sample population of Twin Rivers' employees. Evaluation of the results determines that Twin Rivers is doing comparatively well and their success can be attributed to the company's efforts to streamline operations and invest in innovation. Potential improvement opportunities include increased company-employee communication, training and efforts to raise morale given the perception of job insecurity. Present company performance in relation to social impacts on the workforce and local community was well evaluated, but lack of data limited application of quantitative assessment methodologies. Further work in social LCA could draw information from corporate social responsibility and sustainability reporting in an effort to create a more feasible decision making methodology for sustainable development.

Through this NSF program, I gained excellent experience in conducting independent research, including proposing a project, problem solving, technical writing and professionally presenting. I was working with a University of Maine faculty member and a graduate student and was able to learn a lot about how graduate school differs from undergrad in terms of the mentor-student relationship, application process and the need for strong work ethic to work consistently and independently.

I primarily applied to NSF REUs in the categories of Ocean, Earth, and Biological Sciences. I was pleased with the results of my application process and was able to select a program based on my interest in the program specifics, location and dates. If I were to do the process again, I would ask each program that accepted me the specific details of the research project to which I was assigned. Some did provide adequate detail but unfortunately my program had yet to select projects and I may have gone with another program had I known. While I did develop important scientific research

skills, I was still working in the social sciences, as I have in the past, as opposed to learning more about field or lab-based biology. My focus on forest conservation developed during my semester in Madagascar and continued during my summer in Maine. However, I decided to pursue an aquatic research project with the Coast Guard Academy for my senior year because I felt the need to develop my ecological field studies skills. I will be testing the water quality of the Poquetanuck Cove, a brackish water cove of the Thames River, through benthic invertebrate, dissolved oxygen, and salinity sampling. The Poquetanuck Cove, based on prior studies, remains one of the few remaining areas of well-preserved estuarial habitat for species in the Thames River. I will be following this work with a study of the human impacts on the habitat quality of the cove as a result of increased commercial development in the area. My findings will then be presented to the Eastern Connecticut Conservation District to contribute to their efforts to determine the areas of focus in their conservation action plan for the Poquetanuck Cove.

Katherine E. Lynch
Government and Environmental Studies majors
Denison Pequotsepos Nature Center, Mystic, CT

During summer 2012, I completed an internship at the Denison Pequotsepos Nature Center (DPNC) in Mystic, Connecticut under the supervision of Connecticut College alumna Margaret Jones. The mission of the DPNC is, “to inspire and nurture appreciation and scientific understanding of the natural world and foster a personal environmental ethic” through a combined wildlife sanctuary, natural history museum and educational facility. Recently, the DPNC initiated a land acquisition of Coogan Farm, the last remaining historical farmland in Mystic. This important property abuts the Nature Center, Avalonia Land Conservancy property and much of Mystic Village.

As a recently begun project, it requires the development of decision-making materials related to the sustainable development of the area. This is to bring about a relationship with the parcel by the surrounding community to garner public support, both in terms of appreciation and monetary-backing. The successful conservation of Coogan Farm relies on a combination of an appreciation of the aesthetic or scenic beauty and an understanding of local ecology as well as community use and recreational fitness, with an overarching goal of promoting environmental stewardship through enablement of a close community relationship with the land.

As an intern for the summer, I came to appreciate the synthesis of the environmental, political, and social concerns that can compound local issues. The campaign, aided by the Trusts for Public Lands, will enter its Public Campaign phase this coming Fall. This comes off the heels of a private campaign in which I played a consistent role in the facilitation and generation of ideas related to garnering interesting, educating potential donors and promoting the land during the public campaign.

My internship responsibilities included shadowing Maggie Jones, DPNC Executive Director, for several site-tours to understand how best to disseminate information about the property while leading a tour. I eventually led many of the weekly walks on my own and presented the property to people of various levels of interest and disposable income brackets. The thirty-four acre property is teeming with vibrant New England wildlife and it was a treat to get to explore and share my ever-growing knowledge of the eighty bird species, two cows roaming the property, and discuss the habitat sensitivity of seven particular specimens with members of the Greater Mystic community. Of the many people associated with the campaign, I was fortunate to interact directly on the land parcel nearly every day of my summer.

In addition to leading site walks, I along with Maggie and other committee members took “exploration days” to unearth some new aspects of the property several times a month. We discovered the 1640s well-spring and homestead, the original farm quarry and several orchards which boast heirloom variety apples and pears. It was an unexpected adventure each time we tramped through the bracken. Additional duties included some light landscaping work related to

taming invasive species, facilitating mailings and tending to responses for fundraising events, and serving as educational guides at the fundraising events. I also served on the Honorary Coogan Farm Committee where I participated in the development of land-use proposals, presentation of educational materials and learning about the fickleness of small-town politics.

The original objectives that I held for the internship were admittedly very broad in scope. I am thankful that I was able to become *very* confident in my understanding and application of a smaller body of knowledge and use it to my best ability; namely history of the farm, study of invasive and native plants, habitat sensitivity and land development methods for the property in helping move the campaign forward. One objective that fell by the wayside was the active development of trails based on GIS mapping projections. When I began my internship the campaign was in its infancy and the property was still under real estate contract and could not truly be modified until 2013. This meant that projections of trails based on GIS mapping was premature until the land was purchased, at which time it could be put into action. Additionally, much of the clearing and path opening had been contracted to a large landscaping company. However, I was able to take new GIS points with DPNC equipment related to the “discoveries” of the homesteads and the well-springs, etc., that I will incorporate into the deliverable of my SIP (discussed below).

As an internship it was an eye-opening experience to participate in a local issue that although it has a prima facie value to the community in its mission, could be destroyed by small-town politics. I learned that non-profit work; as morally correct as it may appear, treads often a frustrating and bureaucratic road that requires the appeasement of many personalities and special interests. That being said, the DPNC is unfailing in their commitment to the preservation of the land and its future purpose as a greenway for the Greater Mystic area. I am in awe that they were able to raise over \$1.3 million in the short-term and wish them the best in raising the complete \$3.5 million for this important project that connects Mystic history and environmental coastal integrity.

The practical application of land management and the development of conserved land for sustainable use will be the basis of study for my Senior Integrative Project, to be completed Fall 2012 under the direction of Professor Rachel Spicer. Using the materials I generated for my internship, I will be using Coogan Farm to understand effective application of land management and multi-use land application. As the Coogan Farm project is in its infancy, the stages of monitoring and management will focus less on overuse solutions, and more on a proactive land ethics approach against overuse and toward sustainable interaction with the parcel.

Additional features to be assessed will broadly include taxonomic groups, plant and animal groups, and varying soil compositions. Understanding existing conditions facilitates their incorporation in sustainable uses that are both protective of the environment, and fulfill the needs of the community in a way that fosters stewardship of the local environment. The campaign emphasized the “greenway” that the land acquisition could provide between Mystic Village, the Mystic Aquarium, Mystic Seaport, and suburban neighborhoods abutting the parcel. My SIP will culminate in the development of a deliverable land-management proposal that identifies key features of the property,

relative depth of environmental research associated with those features, and how the integration of this property into the community is a key to the preservation of Mystic character, and the greater good of environmental stewardship.

Clare Murphy-Hagan
Physics major and Mathematics minor
Colorado State University, Fort Collins, CO

Balancing a stadia rod with one hand, holding a clipboard with the other and squatting in a couple feet of water, I “will” the level bubble into the “good” zone, while Heidi adjusts the rod on the bank and juggles measuring tapes. This is just a snapshot of a typical day in “the office” for my summer internship. My internship was conducted with Heidi Klingel, a Forest Service geologist and masters student at Colorado State University. Working closely with her and at times with her project supervisor, Dan Cenderelli, a geomorphologist/hydrologist from the Rocky Mountain Research Station in Fort Collins, Colorado, I spent the summer assisting in the collection of data for her thesis on aquatic organism passage in National Forests.

About two decades ago the US Forest Service recognized the need to address diminishing fish populations nationwide. The truncation of habitat by road crossings was identified as a major inhibitor of the ability for fish to thrive in riparian areas in National Forests. Aided by the Federal Highways Program, more than 1,000 miles of riparian habitat have been restored as a result of Aquatic Organism Passage (AOP) structures since 2006.¹ Prior to the birth of AOP, when forest roads were built, undersized pipes were embedded to convey the water beneath the road. The tendency to use pipes versus constructing bridges is both cost and convenience driven. Bridges are both more expensive than pipes and require more regulations and criteria to be followed. The under-sizing and steep gradient of these pipes provided a hydraulically pressurized system, conveying water through the pipe at faster velocities than are normally found in the natural system. These velocities proved adverse and at times fatal for native fish species attempting to travel upstream or downstream through the crossing. In addition to the adverse velocities, the hydraulics of the smaller pipes were such that water shot out of the pipe with forceful velocities, much like a hose or faucet, resulting in scouring of the bed below the pipe outlet. The outcome of the constant scour was an increase of distance between the pipe’s bottom and the water surface forming a perched outlet. These perched outlets further prevented fish passage, much like a dam blocks upstream fish migration in a river.

Once these crossings were identified as barriers, the Forest Service went about seeking a solution. The result was the design and implementation of AOP structures, constructed to mimic the natural channel within an enlarged culvert. The main hypothesis behind these designs is that if the crossing both looks and acts like the natural channel, then passage should be as feasible as if there was no existing crossing. Once these crossings began to be implemented nationwide, the need to assess their effectiveness became a necessity. Dan Cenderelli along with Bob Gubernick and Mark Weinhold, have been developing a national protocol to be used in monitoring the physical effectiveness of AOP

¹"Aquatic Organism Passage Program Overview." *United States Department of Agriculture Forest Service*. N.p., n.d. Web. 01 Sept. 2012.
<http://www.fs.fed.us/restoration/Aquatic_Organism_Passage/overview.shtml>.

structures.² Heidi's role is to aid in the testing and refining of the protocol in National Forests across the country, in conjunction with using the data for her Master's thesis. The protocol at this time has two levels. Level I is designed to take 3 to 4 hours for potentially more frequent and less in depth monitoring. Level II can take anywhere from 4 to 6 days and includes meticulous measurements of the channel both at the culvert and upstream and downstream from the crossing. In short, data is collected at the culvert as well as at an identified representative reach and compared, in order to assess whether the culvert crossing reacts in a similar manner to the natural channel.

Since my internship was much more than a 9 to 5 day job, my responsibilities ranged over a variety of technical and domestic tasks. Out-of-the-field tasks included driving and navigation, charging batteries and caring for equipment, cooking and cleaning, and general trip planning and packing. In the field, responsibilities included all elements of data collection for the protocol. The Level I and II protocols called for the following measurements: long profile, width measurements, cross sections, pebble counts, photos and sketches. In addition, the channel was flagged and marked. Measurements required the operation off a Total Station, pounding rebar, hanging levels, setting up fiberglass tapes, measuring rock axes, using a stadia rod, using a laser level, and lots of bushwhacking.

My summer internship was a valuable learning experience, providing me with contacts, tools and analytical skills that will aid in conducting my senior integrative project this spring. Through working closely with Forest Service employees, I was exposed to a great deal of knowledge and hands-on experience in field research. My supervisor valued my opinion in interpreting geologic features, as well as making decisions in the field. I felt like an essential part of the whole process, whose questions and comments were both welcomed and encouraged. My supervisor also went out of her way to make sure I comprehended the information and took my critiques into consideration regarding the protocol. All in all I did not end the summer feeling that I was a mere field assistant, rather a valued contributor to the research.

For my senior integrative project I plan on doing a spring independent study with Professor Thompson, examining how culverts modify the environment and truncate fish habitat. The study will include a small-scale modeling experiment in the flume lab, connected with comparative analysis at a couple of field sites. I intend to look at a few different culvert structures and how their implementation alter the geomorphology of the stream, creating adverse conditions for fish passage through the culverts. With the knowledge I have gleaned this summer and through my center coursework, I feel confident that my study will be informative and enjoyable.

² Cenderelli, D; Gubernick, B; Weinhold, M. National Forest Service. "DRAFT—AOP Effectiveness Monitoring: Pilot Field Measurement Descriptions." As of March 2011. Currently under revision.

Raymond Palmer
International Relations major
Shaxi Low Carbon Community Center, Yunnan, China

All it took was an e-mail to an alumna suggested by Career Enhancing Life Skills (CELS). I was in Beijing at the time struggling to juggle class, social life, my homesickness-turned-midlife-crisis, an honors thesis application and an internship search; add communicating in a foreign language and being stared at on a daily basis to that and you had me: a country boy desperately struggling to keep his calm during his first time studying abroad – in one of the biggest and most polluted cities in the world. In a country where “Guanxi” (connections) rule with absolute power, a newbie foreigner like me had little luck in finding - much less settling on – an internship in Beijing. The bigger problem was that none of the positions within environmental organizations seemed interesting or relevant to what I wanted to do. They were: office assistant, translator, assets manager... the list worked better than bedtime tea at putting me to sleep.

And then, I started talking with that alumna.

She worked at the Shaxi Low Carbon Community Center (SLCCC) in Yunnan, China; a foreign-funded NGO working to spread sustainable development in a rural valley in Yunnan. Back in the days, the valley prospered as a stopping point for the caravan trade between China and Tibet. However since the Communist revolution in 1949, the trade stopped, leaving the valley and trade dormant. In the ‘90s the Swiss Agency for Development and Cooperation established SLCCC to restore the rich cultural heritages in the valley and has been funding SLCCC’s operations ever since. Most of the work at the organization centers around architectural restorations, however the larger goal is to put in place sustainable development: the first of its kind to be jump-started in a not-yet-developed corner of the world rather than already developed or developing places. Her story immediately captivated me; and the next thing I knew, I was discussing coming over. She kindly talked to her interested boss and helped me set up an internship opportunity there: this was my first success with “Guanxi” (connections) too.

My job title was “Shaxi Environmental Research Associate Intern” and I was to research the environmental conditions in the valley and come up with ways to improve it. When I got there, however, I got a more detailed job description: a) to help create and launch eco-tourism in the form of sustainable home-stays in the valley, b) tourism capacity-building for the community (teaching English) and c) researching the water/environmental conditions of the valley. To add to this, I was assigned to live with eight local families in the valley who were more than eager to house their first foreigner. What a perfect job description for me! Although extremely nervous of being useless because of my limited Chinese, I was ready to tackle the summer ahead of me.

But like anything, after the initial excitement you soon find some roadblocks. Communicating with my colleagues and collaborating with them was the hardest part; save my boss nobody spoke English. It was up to me to explain to them all the wonderful (or peculiar) ideas I had. During office meetings, which usually happened when our electricity went out, I was with my notepad frantically

scribbling words and ideas (with my colleagues' help), that I didn't understand. When I wrote anything that was to be shared with my colleagues, I needed to translate them ASAP or else our meetings would be unproductive. When we disagreed, I stubbornly had to get my point across even if that meant marching to the computer to pull up Google translate – and talking through the dialogue box.

I learned so much during my two-and-a-half months there. Lots of personal reflection (whether I like this kind of job, where my life is headed, etc.), communicating in Mandarin in a workplace and observing all of the small cues that made me realize this was a Non-Governmental Organization (NGO), all added valuable experience to my life and to my Senior Integrative Project (SIP – in my case an honors thesis). One morning for example, I found all of my colleagues frantically cleaning up the office: there had been a leadership change in the locality and the communist leader was to visit that day. A dirty office might raise suspicion and upbraiding and could lead to loss of support. New ideas that I never would have thought of came up at the office, on the plank of wood by the window that served as a desk.

Having lived the rural life in China, I can appreciate what the hidden majority of the Chinese actually go through, although the cities are dazzling and concentrated with money. China as a country has a long way to go to bring prosperity to its people. Their infrastructure is basic, sanitation is not good and the few local communist members forsook their Buddhist religion to join the party – taking one for the team. The best part of all of this, though? Now I have a village full of grandmas, grandpas, aunties, uncles, brothers, sisters and friends who are waiting to see my future bride! They put a smile on my face on rainy days, no matter how hard their lives were.

My thesis will focus on the relationship between the Chinese government and its emerging civil society. I am concentrating on water-related issues because China is having a major drought now and this has resulted in popular uprisings and an increasingly severe scrutiny of the leadership. Then, in the realm of water management, what power does civil society have? What challenges does the government face? Do they work well together? Working at SLCCC, I realized that NGOs are not as flashy as many may think. There are severe restrictions on what they can do, how they can go about it, who is there and being able to give that communist leader the best grade of tea, or not, may mean the difference between existing, or not. So, what exactly is the power relationship between them? That's what I'll be investigating. My experiences in the mountains of Yunnan will be an invaluable starting point.

Wynndee Reese

Anthropology major and Traditional Medicine & Biomedicine in Africa minor (*self designed*)
World Camp, Inc., Malawi

During the summer of 2012 I interned with World Camp, Inc. in Malawi. World Camp was started in 2000 by a group of students from University of North Carolina at Chapel Hill, whose passion and beliefs were that they could build an international non-profit to “demonstrate how peer education could reinforce active learning by, and among, young people.” They traveled all over southern Africa, ending in Malawi where they tested a curriculum they had developed to combat the spread of HIV/AIDS in twenty-one primary schools. Today, World Camp provides comprehensive health and environmental education to students and teachers in Malawi, India and Honduras. World Camp focuses on HIV transmission and prevention, its stigma, living positively with AIDS, deforestation, erosion, climate change, alternative energies, gender equality and empowerment.

My summer service internship with World Camp included several responsibilities related to health education and environmental education. I completed an independent project with The Mchezi Community Based Organization (CBO) where I worked with a group of volunteers for their Home Based Care Program, acting as a research liaison. I researched illnesses and diseases by examining their prevalence and means of contraction, along with other factors for a particular illness or disease. After acquiring the information, I worked closely with the CBO director to translate and explain the information to volunteers. The volunteers also told me about their experiences as caretakers and the different illnesses with which they have come into contact. While working with the CBO, I also volunteered with one of their community partners, the Chifundo Private Clinic. While at the clinic, I learned about Malawi medicinal practices, whether traditional or bio-medically derived. I worked closely with the clinic’s doctor and pharmacist to better understand their practices and their patients’ needs. In addition to my clinic experience, I volunteered with the Nutrition Program at Duang Luke Hospital. This program aims to lower the number of malnourished youth, from birth to age five. This opportunity included providing food to families, weighing and measuring youth and encouraging mothers to keep their children in the program. Through the joint World Camp and Mchezi CBO initiative, I worked with Macoma Full Primary School’s World Camp Club where we discussed issues of environmental degradation and planted trees in the community.

World Camp realizes the importance of environmental education in schools and the effects it can have on the surrounding community. In an effort to increase the sustainability of World Camp’s Environmental Education Curriculum, we did environmental education workshops with teachers to familiarize them with the curriculum so they could continue to teach it in the local schools. The teacher workshops consisted of us teaching the teachers the environmental based curriculum intended for the students. The curriculum covered the topics of deforestation, effects of erosion, climate change and alternative energy source. The last component of my internship experience was teaching 6th, 7th and 8th graders from four different Malawian villages. Within each village we completed four to five day-long camps on topics of health, creative writing, environmental education

and empowerment. Since HIV contraction is quite prevalent in the rural areas, we also facilitated conversation with both students and parents, to combat the stigma attached to being HIV positive.

My internship was an invaluable learning experience. By having the opportunity to go abroad for my internship I was able gain a better understanding of what it means to be a part of a community. While working in the villages of Malawi, the sense of open communication and commitment to helping others was always present. Community members always asked, “what can we do,” rather than, “what can I do,” to better a situation. I was able to facilitate discussions about environmental degradation and also to address the impact of stigma and misinformation on the Malawi government’s efforts in trying to eradicate HIV. My internship greatly prepared me for my Senior Integrated Project (SIP) because I was able to teach Environmental Science and be an active part of making World Camp’s Environmental Science curriculum more sustainable. My SIP will focus on the importance and implementation of environmental education. I will look specifically at the delivery, impact and community response associated with environmental education programs. I also hope to further explore the connection between caring for the environment and caring for oneself.

Mark Roberto
History major
Conservation Law Foundation, Boston, MA

This summer I interned with the Conservation Law Foundation (CLF), a non-profit environmental law firm based in Boston, Massachusetts. CLF's tagline is "For a thriving New England" and since 1966 they have been committed to actively protecting New England's environment and creating healthy communities. CLF uses the law, science and market-based solutions in order to find pragmatic and inventive solutions to environmental problems. They have five regional offices located in Maine, Massachusetts, New Hampshire, Rhode Island and Vermont, each confronting the environmental issues of their states as well as regional work. In order to protect the environment and create a healthy New England, CLF works within five focus areas: Clean Energy & Climate Change, Ocean Conservation, Healthy Forests, Clean Water and Healthy Communities & Environmental Justice. Over the years CLF has helped to stop off-shore drilling at George's Bank, clean up the terribly polluted Boston Harbor and to establish lead paint laws all "For a thriving New England."

In 2016, CLF will celebrate their 50th anniversary as an organization. This summer I worked as a history/general intern, specifically working on the CLF2016 History Project. The goal of this project was to compile a 50-year history of CLF and its many success stories that will be shared during their anniversary. I had a variety of responsibilities and tasks throughout the summer which were both engaging and challenging. One of my most demanding tasks was to create a timeline of CLF's major environmental success stories beginning in 1966 all the way up through the present. This project went through many draft stages and was circulated to senior staff for feedback, additions and corrections. Once completed, the timeline contained over 100 events.

My other major task was working in CLF's archives. This involved identifying, organizing, and sorting their archival documents as well as creating a readily available and easy to navigate CLF2016 section with all relevant documents for the anniversary including a, "CLF Gems" box containing documents of particular interest. My other tasks included the creation of a Boston Harbor storyboard used to tell the story of CLF's work in Boston Harbor to the general public in a clear, effective and easy-to-understand way. Other tasks included a writing piece on the future of the environmental movement, research and comparison of other Boston-based environmental advocacy groups and a summary of CLF's prioritization inventory.

During the course of my internship I was able to meet my learning objectives for the summer and have a valuable and educational experience. My first objective was to do archival work and spend time with historical documents. My other objectives were to piece together a history and tell the story of CLF as an organization as well work on my writing skills. I gained valuable experience through my work in the archives and with press material and learned effective and efficient use of the archive. I was also able to sit down with CLF employees and make use of the institutional memory; gaining an appreciation of the human aspect of constructing a history.

My Senior Integrative Project will involve working in Linda Lear's collection of Rachel Carson's original documents from the writing of *Silent Spring*. Lear is an alumna of the College and donated the documents to our Special Collections and Archive after she completed an extensive biography of Rachel Carson. The collection contains Carson's notes, research, and letters from the writing of *Silent Spring* as well as press and agricultural publications from the 1950's. This year celebrates the 50th anniversary of Rachel Carson's pioneering book which transformed the environmental movement in a monumental way. I will transition from the Conservation Law Foundation's 50th anniversary to working with the 50th anniversary of Rachel Carson's *Silent Spring*, exploring why the book was so powerful, with special attention on Carson's appeal to the emotions of the reader and her subjective style of prose, which was able to resonate with so many.

Mitchell Serota
Biological Sciences major and Chemistry minor
University of Florida “The Croc Docs,” Fort Lauderdale, FL

This summer I interned with the Florida Amphibian and Reptile Research Team, a group of researchers associated with the University of Florida. The primary goal of this initiative is to work cooperatively with other agencies to develop long-term, science-based and GIS/GPS-integrated research, monitoring, modeling and education programs to support ecological restoration and management in South Florida.

As an intern, I was involved in several different projects. I conducted research for the “Everglades Invasive Reptile and Amphibian Monitoring Program” and the “Monitoring American Alligators and American Crocodiles as Indicators of Everglades Restoration” project.

South Florida’s subtropical climate and mosaic of natural, agricultural and urban habitats make the region extremely vulnerable to biological invasions. Burmese pythons, Tegus lizards, Nile monitors and Cuban tree frogs are just a few of the invasive species wreaking havoc on the everglades ecosystem. In order to understand the effect of further invasions on the ecosystem, my research team developed, “The Everglades Invasive Reptile and Amphibian Monitoring Program” (EIRAMP). EIRAMP is a baseline study that will be used comparatively in the future when another introduced species start spreading in the everglades ecosystem. Several nights a week, visual and vocal surveys of amphibians, reptiles, and mammals were conducted on standard canals, levees and roads. Routes were set up in the Everglades Wildlife Management Area, Everglades National Park, Big Cypress National Preserve, Arthur R. Marshall Loxahatchee National Wildlife Refuge and many more. In addition to EIRAMP, I was involved in a radio telemetry study of the Argentine black and white Tegus.

In a full day, I would find the exact location of five Tegus. This data will aid in determining the range and habitat selection of the Argentine black and white Tegus. A full understanding of an introduced species’ ecology in its foreign environment is crucial to developing future management programs. About twice a month I also participated in a survey of Oustalet’s chameleons in an avocado orchard near Everglades National Park. This organism was recently introduced from South America to south Florida. In fact, this species of chameleon has yet to be documented in literature as an introduced species. At sunset, I would go to the avocado orchard with a team of researchers to count, measure and remove the animals. Lastly, I conducted several necropsies of different invasive species. Necropsies are essential in understanding species ecology because you can analyze gut contents to understand what was eaten in the environment. For example, from this data we were able to determine that Tegus were primarily eating eggs, which is troublesome for many native bird and reptile species.

The American crocodile was declared endangered in 1975 and although the population has significantly recovered and was reclassified as threatened in 2007, it continues to face issues related to habitat loss from development and effects of altered freshwater flow into estuaries. Through “Monitoring American Alligators and American Crocodile as Indicators of Everglades Restoration,” I surveyed crocodile nesting areas and tagged crocodile hatchlings. During the afternoon with a team of researchers I would check crocodile nesting areas for any activity. If activity was observed, we would return after sunset to capture crocodile hatchlings and tag them.

The original objectives of my internship were definitely met. I gained invaluable field experience. I worked in a very difficult environment. The weather was constantly hot and humid, unless it was pouring rain. On top of that, the mosquitoes were relentless. If you had a single part of your body exposed it would be completely covered in mosquitoes. I also made fantastic connections that will surely be useful to me in the future. In the wildlife ecology/conservation world, who you know makes all the difference. As in many professions, employers are only willing to trust people if they know someone who has previously worked with them.

I learned an immense amount from my position this summer. More importantly though is that I was put out of my comfort zone. Because of this experience I am certainly most at ease when working with mammals and birds. In addition, I am most comfortable in temperate ecosystems. By the end of the summer I really learned to love reptiles, amphibians and the scorching heat of South Florida.

| For my senior integrative project I will be conducting ornithological research in the Connecticut College Arboretum. I will be comparing the abundance and diversity of birds between a meadow and a recently restored meadow during fall migration. These meadows are prime habitat for bird migration stopovers. Stopover sites are crucial in conservation biology because they serve as refueling locations and are integral to the success of any migration. Migratory birds lose a significant amount of fat during migration, so it is important that they have quality habitat readily available to replenish their fat stores. In the past, conservation has focused primarily on breeding areas and wintering sites of migratory birds.

My internship over the summer prepared me for the extensive fieldwork that I will be doing this semester. However, my internship really taught me how to organize and store data. Perhaps the most under-rated part of research is organization. Organization saves hours upon hours of future agony. With the start of research this semester, I will have a better idea how to correctly organize all of my data sheets and important information.

Seana Siekman
Biological Sciences major
Provincetown Center for Coastal Studies, Provincetown, MA

I interned at the Provincetown Center for Coastal Studies (PCCS) in Provincetown, Massachusetts. PCCS is a non-profit organization that is working to preserve coastal and marine ecosystems. There are three main facets to the work conducted by the organization including research in the field, promoting stewardship of the environment and providing influential input for policy decisions, as well as providing educational materials and activities to encourage responsible use and conservation of marine resources. Research is the largest component of the organization and they are best known for their marine mammal work, including the rescue of entangled animals in the region. Other areas of research include coastal geology and seafloor mapping, water quality monitoring, fisheries and policy work.

This past summer I worked at PCCS as a marine policy intern. My work consisted of several different components including fieldwork, lab work, research and article writing along with a bit of educational and promotional work. The main project that I was involved with was a beach-monitoring program that was taking place because the town began mechanically raking several beaches to benefit the tourism industry in Provincetown this summer. We were monitoring the impact of the raking to see if there were any implications, either positive or negative on the ecosystem to determine if the practice should be continued in the future. This project consisted of collecting data and samples on a variety of factors including the wrack (seaweed) line, the compaction and temperature of the sand, bacteria samples of both the sand and water and invertebrate samples. The samples were then processed in the lab, in which I played a large role as well. I also took part in a water quality-monitoring program several times in Nantucket Sound. Samples were collected bi-weekly; eight stations were visited and a variety of water samples were collected at each site. The processing of the samples will take place throughout the winter.

On the policy side, I researched the Massachusetts Ocean Management Plan and the Cape Cod Ocean Management plan and composed an article exploring the two pieces of legislation and their implications for stakeholders. The goal of the article was to present the main facets of the legislation in a manner that could be understood by all and it will be published in the Center's quarterly publication this year. Similarly, I compiled notes from an aquaculture conference that was hosted by PCCS earlier in the spring, for use in a full report that is underway. Aquaculture has a lot of potential in the Cape region and it is important for fishermen and local citizens to understand both the positive and negative sides of increasing the number of aquaculture sites. Although the various projects I worked on all had, or will have, separate final products, the combination of work that I was doing highlighted how interconnected all facets of coastal studies are. All of the projects I worked on are still ongoing, but I gained a greater understanding of how the state of the beaches can have a big impact on the water quality and vice versa and these factors are highly influential on policy initiatives and decisions, subsequently impacting important economic sectors such as tourism and fishing.

My internship was definitely a great learning opportunity and many of my original learning objectives, such as exploring various areas within the environmental field were met. Given that I was working at a small non-profit that is strapped for resources, they were very excited to have another set of capable hands around. Because of this I was given quite a bit of responsibility and allowed to be very involved in all aspects of the projects on which I was working. My experience interpreting environmental legislation and expressing the important points in a manner that was easy to understand was hugely beneficial. I had never fully read and attempted to understand a specific piece of policy before and I realized how inaccessible legislation is for many of the people that it really impacts. PCCS contributed a lot of research and feedback during the drafting of this legislation, attempting to ensure that regulations have a strong scientific backing. It also became clear that economics are a big inhibiting factor in passing environmental policy initiatives because there tends to be greater concern about the financial situation than the environmental one. I also learned a lot about the challenges faced by a non-profit, largely surrounding funding and the frustrations associated with attempting to secure grants.

Moving forward, my Senior Integrated Project (SIP) does not focus on coastal issues, but does incorporate the policy analysis experience I gained through my internship. I am going to explore the ways in which corporate social responsibility (CSR) can help to bring about environmental justice. Focusing on the electronics industry, I will look at the environmental harm caused by electronic devices from the manufacturing stage to the disposal stage. Using Apple as a case study, I will explore what CSR measures have been taken and where there is room for improvement. I will also consider existing regulations that address these problems, in particular the Basel Convention and why it is failing to control E-waste. The internship experience that will be the most beneficial to my SIP is my work on environmental management plans. As I consider what still needs to be done to eliminate the environmental injustice issues associated with all of the technology used in the north, one factor that I will need to understand is the existing policy and why it has not minimized the problem that it is designed to address.

