The Goodwin-Niering Center for Conservation Biology and Environmental Studies

Reflection Papers for the Class of 2008

Christina Comfort
Save Our Seas, Kauai, Hawaii

I spent my summer working with Save Our Seas, an environmental non-profit organization based in Kauai, Hawaii. The organization's mission is to preserve, protect, and restore the health of our ocean ecosystems. Much of the focus of Save Our Seas' work centers on educating the youth through school programs and summer camps in Hawaii. Save Our Seas is also working to establish marine protected areas on Kauai and currently is planning to build a marine education center on the island. Other chapters in Australia and California also aim to educate the public, especially young people, about conserving our planet's oceans. Save Our Seas also helped to establish Reef Check International in 1997 and facilitated their first reef survey. Reef Check is now the largest reef monitoring program on the planet.

My responsibilities varied throughout the summer. When I first arrived, the top priority was to help coordinate and follow up on the 2007 International Clean Oceans Conference, featuring National Geographic Explorer-in-Residence Dr. Sylvia Earle and Dr. Gregor Hodgson, the founder of Reef Check International. However, as the summer developed, I focused on my independent field research project. Due to cancelled grants, my original expectation of working with scientists to research possible MPA locations was not an option.

Instead, my supervisor and I developed a study to compare a very detailed reef survey methodology with the "indicator species" methodology used by Reef Check International. My study site was at a heavily-used hotel beach along Hanalei Bay, on the north shore of the island, and the purpose of the study was investigate if there are any differences in the conclusions about the health of the reef because of the two types of surveys. A detailed set of surveys is required for establishing a marine protected area, and the study site at Hanalei Bay is one area under consideration. After completing a sufficient number of replicate surveys, I analyzed the data and found several important differences in the results. Reef Check data were not useful to gain an understanding of the ecosystem, especially in Hanalei Bay where many of the indicator species are not present at all. Reef Check is valuable to monitor changes over time especially at the substrate level, and, as a standardized method, it facilitates comparison between different sites. However, to gain an understanding of the dynamics of the ecosystem, Ocean Pulse was of much more value. This detailed survey showed the extent of herbivore overpopulation and grazed-down turf algae, whereas Reef Check only noted a lack of predators. For a survey within a short time frame, Ocean Pulse allowed me to gain a fairly thorough understanding of the diversity

within Hanalei Bay. Ocean Pulse is compatible with Reef Check, and the results were a useful expansion of what Reef Check produced.

At the same study site, I also carried out a rapid assessment of the inshore species distribution and substrate composition in a heavily tourist-impacted area and a nearby control area. This study gave some idea of the impact of constant use of the reef, especially with damaging activities such as reef walking and standing on the reef. I also answered questions for tourists and community members, trained interested individuals in Save Our Seas' survey methods, and wrote for Save Our Seas' magazine, the Coconut Wireless. Finally, I networked and participated with other organizations on the island, including Reef Check Hawaii, Surfrider Foundation, and the Monk Seal Conservation Hui.
Although my original plans did not turn out as expected, I still had the opportunity to work in the field. I did not have as much guidance as I had hoped for, and my work will most likely not be used towards establishing an MPA on Kauai. I did achieve a better understanding of the amount of research that is involved in making decisions about marine protected areas, and I also learned about controversies surrounding their establishment, such as recreational and commercial fishing interests, tourism, and enforcement issues.

Working with Save Our Seas was a very valuable learning experience, although in a different way than I expected. I decided to take this internship in order to learn more about the research involved in establishing marine protected areas and to contribute to that research. Instead, I ended up learning about the challenges that running a non-profit organization can present and the often-frustrating obstacles in the process of setting up environmental protection for an area. I also gained independence and confidence in the field.

For my senior integrative project I hope to focus on the biomedical compounds isolated from coral reef organisms and the sustainability issues associated with the production of medically useful drugs from these compounds. I want to compare methods of production of the compounds, such as tissue culture, chemical synthesis, aquaculture, and mariculture. I would like to investigate the issues of scientific use of marine protected areas and how severe the consequences can be for the ecosystem, since researchers often have to extract a large number of organisms to search for potentially useful compounds. I also hope to look into what sort of dialogue exists between conservation-oriented groups and biomedical field researchers.

My internship with Save Our Seas has prepared me for my senior integrative project by giving me a better understanding of the goals of several different environmental non-profits and an appreciation for how difficult it can be to convince a community or industry of the need to use resources sustainably. I now have more hands-on experience in the type of research that goes towards creating protected areas, even if my personal research project was not directly involved in a marine protected area initiative. I feel that I have a much better appreciation for the scale of the sustainability problem in the ocean, especially in terms of our fisheries, which will help me to understand similar problems associated with extractions of organisms that produce potentially useful compounds.

Cara Donovan

The Rainforest Education & Resource Centre, Manu, Peru

My internship took place at The Rainforest Education & Resource Centre (CREES); a non-profit organization in Peru which develops and implements education and research programs. These programs promote improved sustainable natural resource management practices and cooperative conservation strategies in tropical environments. CREES operates a research and education facility named the Manu Learning Centre (MLC) on a 600 hectare private reserve in the Manu Biosphere of Peru accommodating research, education and volunteer groups. The research center is unique in that it is located on land that was previously used for agricultural production of bananas, sugar cane and cacao. Different parts of the land are in different stages of recuperation, while some of the land is identified as primary rainforest. The research being done at the MLC is extremely valuable because over 40% of the Amazonian rainforest has already been destroyed, much of it for agricultural production. This gives us the opportunity to monitor the process of recuperation and the effects of deforestation on populations of flora and fauna. The center has a grid trail system overlapping different types of rainforest which makes it convenient to compare data collected from each type of rainforest. The grid is the only one of its kind at any research station in the rainforest.

Every volunteer at the center works on the seven ongoing projects as well as their own personal project. The six main projects include monitoring bird activity on the clay lick at dawn every morning. Most of the focus is on the blue-headed macaw, a bird which is in category 1 of the most endangered species in the world. Additionally, we made track traps on the trails every week and monitored them in order to measure the abundance of mammals in the recuperating forest. We smoothed out a total of 48 1m² sections on the trails out of mud and came back the next two days to see if any animal had walked on them. Mammal monitoring included direct mammal observations on the trails as well. There is a frog monitoring project and a biogarden and orchid garden. A new project that began during my internship is the botanical project. I was fortunate to be one of the few volunteers to serve as a “guinea pig” to assist in creating a protocol for monitoring recuperating forest structure. This included taking pictures of the forest canopy in different forest types in different stages of recuperation with a fisheye camera lens. We also created leaf traps to measure the mass of the leaf litter every 15 days. The third part of the botanical project was to monitor the phrenology of 100s of different species of trees every 15 days. This will be done for a number of years in order to observe long term trends and monitor forest recuperation. Finally, there is a separate project to teach the staff English, one which I was very involved in since I was the only volunteer during my stay that spoke Spanish.

Originally, I had planned to focus solely on The Biogarden and Reforestation Project. Instead, I participated in all activities and projects that the center is involved with. This greatly enhanced and diversified my learning experience as well as kept me from becoming bored of the same routine. Furthermore, almost every project at the center relates to the other projects in some way. For example, by studying and comparing the phrenology and biomass production of the different forest types found within the property, it can be possible to predict where it is more likely to find particular species of birds or mammals at certain parts of the year since they are constantly searching for food. Therefore, the mammal monitoring project relates to the botanical project. Furthermore, if we find over the long term that mammal tracks or direct mammal observation

rarely occurs on some of the trails, we may infer that that part of the forest is not recuperating well and not appealing to mammals.

My most substantial contribution to the center took place during the final two weeks of my internship. About a month before my arrival, a few volunteers had planted approximately 40 pihuayo palm saplings around the Mascoitania Creek. This is a highly impacted part of the forest since the land had previously been used to grow sugar cane. It is also in close proximity to the clay lick visited by the macaws, parrots and parakeets every morning. The original intention of the pihuayo palms was to provide a food source for these birds. However, the visiting botanist thought it was a poor choice since pihuayo is a domesticated plant and never found in the wild. Consequently, I removed the saplings and replanted them in the garden and closer to the grounds of the center. I was given the names of two other species of palms found in the rainforest to replace the pihuayos: *Euterpe precatoria* and *Iriartea deltoidea*. Both of these palms fruit all year round and could potentially attract a variety of mammals and birds. I planted about 200 palm saplings.

Additionally, I worked on improving the digital map of the center and its trails using ArcView GIS software. Another volunteer and I mapped out the streams, the lake, important landmarks, as well as the elevation of one of the trail grids. By creating a map of the elevation, the botanists could better understand and explain the forest structure. An area of land that has many hills and dips in elevation may also have a higher diversity of trees since there are a larger number of micro-habitats.

My senior project will have me continuing my work with the Reforestation Project, but on a different level. The area where the center is located is surrounded by slash and burn agriculture, illegal logging and cattle ranching. There is a lack of social projects addressing the problem in this area and no economic alternatives for the people who live there. For my senior project, I am putting together a road map for how the community can implement a reforestation project on deforested land that can also provide a source of income for locals by implementing useful tree species. I will also conduct research on how such a project could potentially obtain funds through carbon revenues. By researching case studies on how other reforestation projects have been funded for offsetting carbon, I hope to create guidelines for the MLC to work with the local community to start their own project. My internship prepared me for this senior project by providing me with valuable contacts and sources. For example, the botanist with whom I worked with has already suggested a number of potentially useful endemic tree species. I was also fortunate to live in the area and see first hand the issues and the obstacles facing the community of Salvación. This motivated me to choose a project that could potentially create a substantial positive impact for the environment and the community.

I am very grateful for having the experience to work with biologists, botanists and local Peruvians and learn from all different perspectives and backgrounds. This has also improved my Spanish language skills. It was physically and mentally challenging to live and work in the rainforest for 2 months and this repeatedly tested my limits. It gave me a greater respect for field work in the tropical rainforest after working for two months without hot water, refrigeration, and minimal electricity supplied in short bursts by a generator. The greatest challenge was maintaining motivation while struggling with mite infestations and giardia without being able to

escape for a few days of rest or comfort. It was also a challenge to put myself in danger everyday, especially after an encounter with an aggressive fer de lance while on the trails without a guide. Nevertheless, I feel that discomforts and illnesses were just as much a part of the learning experience as the internship itself.

Eliza Greenman
Norman Bird Sanctuary, Middletown, Rhode Island

This past summer I interned at a local non-profit organization called the Norman Bird Sanctuary. The Sanctuary is a 300+ acre wildlife area offering over seven miles of hiking trails that constitutes the largest area of preserved open space in Newport County. The Sanctuary is dedicated to providing quality environmental education programs for people of all ages. The Sanctuary also takes part in habitat restoration projects to benefit local species. There is a trailside museum on the property that features exhibits of local species and historic information about the local environment and heritage. The Sanctuary is also home to several animals that are used as educational teaching tools. The Sanctuary was established under the will of Mabel Norman Cerio in 1950. It operates as a private, non-profit organization.

My responsibilities at the Norman Bird Sanctuary varied immensely. I worked in the office virtually every day. I worked in the membership and development departments helping with filing, event planning and other activities. I worked in the trailside shop assisting people who visited the Sanctuary for walks and various other events. I also helped a lot with the administrative side of the summer camp which is held weekly at the Sanctuary.

I spent a good amount of time outdoors as well. I was a co-leader of a weekly program for pre-school age children and their parents. This program was challenging but very rewarding. It was really fun to work with young kids in the field. The interest and excitement of three year olds in nature is unparalleled. One would be surprised at how exciting frogs, or edible plants, or animal feces, are to a child! I really enjoyed this part of the internship. I love working with kids, especially outdoors, and it gave me the opportunity to view children and adults interacting with environment.

I led a variety of different educational programs throughout the summer. The Sanctuary organizes trips to the property for groups. A leader, usually a trained naturalist, takes them on a hike through the Sanctuary focusing on whatever their greatest interests are. Some groups want to go on challenging hikes up to the ridge, while some want to spend the whole time at the or catching butterflies. The programs were for all different age groups and all focused on different topics. This was an interesting experience in that I dealt with all different kinds of people and was able to observe first hand how they interact with nature. I was also a camp counselor for a few weeks as a substitute for the regular counselor. I was in charge of a group of ten five year olds from eight-thirty to three, each day. It was an excellent learning experience and a lot of fun.

I also developed a program on my own about the history of the land that makes up the Norman Bird Sanctuary, and about its benefactress. The land is one of very few surviving New England salt-water farms. The farmhouse that was occupied by generations of gentleman and tenant

farmers still stands on the property. The area was also a desirable attraction for painters and writers of the 18th and 19th century, such as the author Henry James and the painter John Le Farge. The last owner of the farm, Mabel Norman, deeded the property as a Sanctuary in her will. Her father had bought the farm as a summer home for his family around the turn of the century. After his death Mabel bought her siblings' inherited shares to the property. Mabel was a true steward and wanted to maintain a balance between the natural world and the humans who enjoyed it. In her will she left provisions for the founding of the Norman Bird Sanctuary, whose "primary object is to preserve this as a bird sanctuary for the protection of animals and birds and for the enjoyment of lovers of nature and the public generally." I researched the history of the property as well as Mabel's life and her goals. I developed an educational pamphlet about the farm and her life and then led a guided lecture/tour about Mabel's Farm.

The internship allowed me to participate in an organization devoted to community interaction, conservation and preservation. It gave me an insider's perspective on people's interaction with their local environment. I learned a lot about my local environment, history and heritage, and gained more knowledge as a naturalist. I experienced first hand the interaction between people and their local environment, specifically concerning environmental education opportunities, which prepared me excellently for my SIP. I achieved all of my objectives this summer, and more. One aspect of the internship that I did not anticipate was the knowledge I gained about the inner workings of a non-profit organization. The developmental side of an organization like the Norman Bird Sanctuary is extremely interesting and I am excited that I have seen how it works.

For my SIP I plan to explore nature as a theme in literature. My project will examine the works of both fiction and nonfiction writers whose literary projects show manifestations of the relationship between man and his environment. The books explore both the history of conservation and stewardship in the United States as well as nature as a theme, or a movement in works of fiction. I plan on completing this project as an Independent Study with George Willauer.

Kathryn Gutleber
E- The Environmental Magazine, Norwalk, Connecticut

For my internship during the summer of 2007, I worked with E- The Environmental Magazine. E magazine is a bimonthly publication that reports on a wide range of topics concerning the environment. Generating awareness of environmental issues and providing potential ways in which people can minimize their environmental impact are the primary objectives of E Magazine, as the staff recognizes the importance of the media in facilitating citizen consciousness and activism on environmental concerns that are impacting their livelihoods. The magazine has been in existence for 18 years, and throughout the years has won and been nominated for the Independent Press Awards 13 times. The E Magazine staff consists of six full-time and two part-time employees, in addition to the support of college interns. E Magazine is published by the nonprofit Earth Action Network, and states that it does not seek to promote a specific agenda other than covering the dynamic of an emerging environmental movement.

As an editorial intern, I was able to contribute toward writing various sections of the magazine. At first, these sections were limited to product reviews in the "Tools for Green Living" section and book reviews. After I worked on writing for these sections of the magazine, I was be able to work on larger writing projects for E Magazine, such as the "Currents" and "Commentary" sections. I also had the opportunity to write various side bar pieces for a feature story on green jobs for an upcoming issue. Working on larger writing projects allowed me to follow the formation of a story from start to finish by gathering information and interviews to revising the final piece. In addition, I also participated in research for the editorial staff, helped with fact-checking and proof-reading. I contributed story ideas and write commentary for "Our Planet," E Magazine's weekly online newsletter. Additionally, I participated in teleconferences, including one sponsored by the NRDC on clean coal. I also had the opportunity to represent the magazine in the Ecoliving Expedition at the Clearwater Festival music festival, where I experienced public outreach and education first hand. During my internship with E Magazine, I was supervised by the managing editor, Brita Belli, and the editor-in-chief, Jim Motavalli.

Upon reflecting on my internship, I believe that my original objectives of learning how environmental issues are communicated and represented in American media were for the most part fulfilled. While writing and researching for the magazine, not only did I learn to write in a style that captures the readers' attention, but I also learned how to bring forth issues that were of immediate concern to the average reader. For example, while writing an article on high speed ferries as an alternative method of transportation to cars, I began the piece with a scene of bumper to bumper traffic on the highway, something that many Americans experience everyday and would like to change. Drawing people in through the concerns of their everyday day lives, and then showing how their concerns are also connected to concerns for the environment is what makes for effective writing in environmental journalism. Writing with this strategy in mind also helped me to understand how environmental issues are represented and framed within environmental advocacy media, which was another one of my original objectives I met through the internship. However, I feel as though I understand much more how environmental issues are represented in a specific niche of American media (environmental journalism) and not the mainstream media as a whole, which is something I would have liked to have learned more about. But I do think that I could apply what I have learned about good environmental journalism through E Magazine to any type of journalism position I may hold in the future.

My internship was valuable to me as a learning experience because I was able to be exposed to many different aspects of environmental studies, some of which I didn't know much about before the internship. Learning about a great array of current environmental issues through directly researching and interviewing people made work exciting and stimulating. Working for E Magazine helped me to further my belief in the importance of communication (print, online, radio etc) in educating people on ways in which we can improve our relationship with the environment. However, it also made me realize that I am more of a person who would like to be taking action for the environment rather than be the person writing about the innovative solutions and strategies people are creating in order to bring the Earth into balance.

My internship prepared me for my senior integrative project in several ways. The first way working for E Magazine helped me to focus and develop my senior project was to give me experience in framing environmental issues in a way that recognizes the various interests of my

audience. Another way in which my internship prepared my for my senior integrative project was by giving me the opportunity to gain background information in socially and environmentally responsible investing while writing an article on jobs in the field of socially responsible investing.

My proposed senior integrative project is to create a marketing report on current and future environmental initiatives at Connecticut College, with emphasis on how the college can expand both its local and global environmental stewardship through socially responsible investment (the report will be targeted toward alumni and potential donors in the hopes that I will be able to create a socially responsible investment option for donations to the college). The report will serve as a form of communication that is designed to start a dialogue about the possibility of socially responsible investment for alumni and potential donors. The report will also aim to address the financial and moral concerns of a small liberal arts college, drawing on the strategies and experiences of similar institutions to provide relatable examples, and will be framed in a way that displays how it is possible for the financial stability and the social and environmental values of a small liberal arts college to benefit simultaneously.

Kelsey Jacobsen
Operation Wallacea, Hoga Island, Sulawesi, Indonesia

This summer I spent eight weeks in Indonesia with Operation Wallacea, a British organization which facilitates conservation-oriented marine and terrestrial research endeavors for PhD students, university students and volunteers in six locations around the world. The Indonesian marine operation, which is located on Hoga Island near Sulawesi, is sponsored by the World Bank and is located within the Wallacea Marine Protected Area, which was established by Operation Wallacea and one of the largest marine reserves in Indonesia.

My first two weeks were spent at the rainforest site on Buton Island getting to know the culture of the people I would be working with for the remainder of my internship. I participated in Jungle Training, an introduction to life in the rainforest. In week two, I changed my plans in order to participate in the Wakatobi Culture and Language course, in which we learned basic Indonesian, visited various villages and their leaders and participated in local crafts and cooking.

During my time on Hoga, I completed my PADI Divemaster training. As a divemaster trainee, I was considered part of the island staff and therefore participated in all of the staff activities, which included staff meetings, radio monitoring, leading dive boats and being on-call for the fast action response team for missing divers. Being a boat leader means taking attendance and air pressure measurements for each person, helping with gear transportation and assembly, making sure everyone gets safely into the water, and doing boat and dive briefings. A boat briefing points out emergency procedures and equipment onboard, and a dive briefing includes a general dive plan including maximum time and depth, direction, site-specific precautions and important hand signals.

In addition to these duties, I was also expected to complete academic and practical, in-water tasks. I studied for and passed exams on subjects such as dive physics and physiology, supervising certified and uncertified divers in the water, equipment, divemaster-conducted programs, decompression theory and the dive tables and wheel. As for the practical side of my training, I was required to act as an instructor's assistant in many training sessions for beginning dive students, and to lead dives, follow divers during led dives to correct problems with buoyancy, demonstrate thirteen skills underwater, conduct a mock scuba review session, swim, snorkel and tread water for specified times and distances, demonstrate proper rescue techniques, and perform a 'stress test' in which another diver and I traded equipment underwater while buddy breathing.

Coming into this internship, these were not the objectives that I planned to accomplish. The research assistant jobs that I had originally signed up for turned out to be very informal positions that wouldn't have offered a lot of experience or knowledge about the projects I would have helped with, so after participating in the compulsory Coral Reef Ecology course, I changed my schedule to divemaster training, an endeavor that I had given considered previously, but hadn't planned on completing so soon. Looking back on the experience, I am thrilled that I made the decision to switch. My original objectives about understanding the scientific intricacies of the coral reefs on Hoga and interacting with locals who I had assumed would be accessible were not met because of the nature of my potential duties as a research assistant, and the simple fact that there is no village on Hoga, and therefore very few locals to interact with. However, I did achieve many unplanned accomplishments.

Not everything that I was required to do for my training was easy, and there were times when I did not feel very confident about my progress as a potential divemaster. But this is what made the experience so rewarding in the end. When I hit a stumbling point, my instructor remained encouraging and I repeated the task until I had it mastered, which was very satisfying. When I moved on to taking a leadership role with students in the water, I was intimidated by having to demonstrate skills for them with instructor-quality ability, but I was congratulated for doing a good job each time. I was also put in some difficult leadership situations at the beginning of my training, in which I found myself on radio duty when emergencies on boats arose and I was left to coordinate emergency plans and mediate between boats. While it was very stressful at the time, I'm glad I was able to stay level-headed and work through these predicaments in order to make sure everyone ended up as safe and healthy as possible.

Overall, my experience in Indonesia has prepared me for my integrative project in an experiential rather than scholastic way. I was able to experience protected terrestrial and marine environments and a bit of the culture of the people who inhabit them. I saw some of the effects of the marine protected area (MPA), as well as some of the destructive fishing practices that it attempts to eliminate. I also got a down-to-earth look at the people who depend on these resources, a perspective that I believe is crucial when discussing implementation of protected areas that affect local lifestyle and livelihood. I plan to work from this vantage point in my senior integrative project, which will attempt to characterize an effective MPA by balancing the ecological and social influences they have in tropical developing countries.

Bianca Kissel
Cross Cultural Solutions, Hatun Sacha, Ayacucho, Peru

Ayacucho is a large city with 150,000 residents located in the Andes Mountains of Peru at an altitude of over 9000 ft. It is one of the poorest regions in Peru and 30% of the population lives in "extreme poverty." Because of the region's poverty, its rural location and a period in the 1980s dominated by terrorism the area receives few tourists. With few tourists I had the opportunity to immerse myself in the culture, the people and the problems in Ayacucho during my summer internship.

During my time in Peru and throughout my internship I had to adjust to the changing situations. I began my adventure working at a medical clinic where I hoped to learn about the major health issues in the region and then relate them to the corresponding environmental issues. I had planned to focus on water issues that affected people's health and the environment. But after my first week in Peru a national strike began that shut down the schools, the universities and the medical clinics for six weeks. This left me with little to do at the medical clinic but a lot of time to explore the environmental issues in the region. Environmentally, Ayacucho struggles with many complex issues. Beyond the center of town where the government cleans up the trash, most people just throw their trash down the mountain or burn it. The air is polluted from the trash fires and the old cars that don't have proper emissions controls. The rivers are covered in garbage and polluted with animal and human waste. But despite this mess, people in Ayacucho don't have enough money to be wasteful like we are in the United States. Everything is reused over and over again because it is too expensive to buy in excess. For this reason, per capita the people of Ayacucho produce much less trash than we do in the US but it just isn't managed properly.

In an attempt to remedy some of these issues I got involved with Red Ecologica Interinstitucional Hatun Sacha or simply Hatun Sacha which means "big tree" in Quechua (the indigenous language of the Andean people). Hatun Sacha is a non-profit organization funded by citizens of Quebec, Canada. The organization has two full time employees and a knowledgeable core group of volunteers who range from retired professors to current university students. The organization has limited funding and usually works within the public school system educating children about their environment and how they can protect it. Unfortunately, the schools were not in session because of the strike so we spent our time preparing for their return and working on other small projects such as hosting public talks about environmental issues, planting trees and evaluated the health of the main river in the city.

Every time we began a new project I was always hoping that we would reach a large audience and make a difference in the city. Instead I learned how ineffective Hatun Sacha is and how difficult it is to work with the people of Ayacucho. Hatun Sacha focuses on a small neighborhood called Picota where they hold regular talks or charlas that are usually cancelled because there is no audience. It seemed clear that we were targeting the wrong audience. These people do not have enough money to be wasteful and they did not have time to listen to us tell them about the world's environmental problems. You can't speak to them about walking instead of driving because they don't own cars and they can't afford to pay for a taxi. You can't talk to them about composting because the food and bones that are not eaten are fed to the dogs and the chickens. You can't tell them to not wash their clothes in the river because they have no running

water in their houses. You can't tell them to recycle because they reuse and reuse until there is nothing left. You can't tell them not to have open fires because they don't have money to buy wood to burn. You can't tell them to turn off the lights because they don't have them. So why in the world would you talk to them about being more environmentally concerned when they aren't the ones using up the environment? We are the ones who own cars, don't compost, don't recycle, don't reuse, burn fires because it smells good in our homes, waste water in everything we do, waste electricity and come up with a million other ways to uselessly consume.

Of everything I learned about the environmental issues in Ayacucho I would always return to the fact that the World's environmental issues aren't primarily caused by the citizens of Picota but by us who can afford to be wasteful. Of course there are still many things that could be done in Ayacucho to improve the environment Most of those actions begin with infrastructure changes that will make pursuits like recycling possible. But in seeing how the people of Picota live I have come to understand how much we can improve in the United States if we consumed less and utilized our infrastructure.

Despite many of Hatun Sacha's shortcomings as an organization I did get to work on one successful beginning. We planted over a thousand tree cuttings that will hopefully develop into successful saplings that can be planted throughout the city in the spring. The trees are a type of native perennial that do not require any pesticides or fertilizers and that produces small black fruit that can be used to make jam and wine. When the saplings are planted in the spring I hope they will be a benefit to the city and be an educational opportunity for the community.

I learned so much from my summer internship in Ayacucho not only about environmental issues but also about how environmental issues are handled in a South American country like Peru. Beyond my time formally spent in my internship I also got a glimpse into the Peruvian culture and an opportunity to learn about the society as a whole. It is this overall understanding of Peru that I hope to utilize in my Senior Integrative Project. My project will evaluate the health benefits of chewing coca leaves which are used widely in the Andean culture. It will also explore the misuse of coca to produce cocaine in Peru and how the cocaine industry is impacting the country environmentally, socially, economically, politically and internationally.

Jessica LeClair
Snowchange Cooperative, Bergeby Handel, Norway

"What will you write of us?" This is a simple question, a difficult question, an interesting question; it is a question posed many times by people that I encountered during the summer of 2007. It was during this time period that I had the opportunity to live and work among the people of Northern Norway. And to these people I owe many thanks. It was through their kindness and generosity that I was able to witness and participate in a total Arctic summer. The purpose of this experience was to complete an internship funded by the Goodwin-Niering Center for Conservation Biology and Environmental Studies - to observe first-hand climate change and their effects, if any, on traditional lifestyles, but by the end of the summer it had become that and much more.

Initially this summer employment was to be sponsored by the Snowchange Cooperative (Snowchange). Snowchange is an organization located in Finland which documents traditional knowledge in many regions of the Arctic in different capacities, one of which being the changing climate. The group was to investigate beginning activities in Nesseby Kommune, a small village of fewer than 800 inhabitants. Nesseby lies on the Varanger Peninsula and is situated on the north side of the Varangerfjord. 80-90% of the population is of Sámi origin and the principle occupations are state employment, reindeer herding, and fishing. The Sámi are the indigenous people of Northern Norway, Sweden, Finland, and parts of Western Russia.

Following discussions between community members and Snowchange personnel it was decided that it was in the best interest of all involved parties to forgo beginning work at this time. As a result my anticipated work duties for Snowchange were altered. The responsibilities that were cut in response to the decision were documentation of traditional knowledge of the Nesseby/Unjárga Sámi community, and assessment of traditional land use and ecosystem changes of the Varanger Peninsula. However, I was still to assist with the preparation and event undertakings of an international seminar about the polar fox, an endangered species in Scandinavia. I also provided Snowchange with daily weather observations, a compellation of personal experiences within the community and the environment, and a community profile. The goal of this work was to facilitate any future work that Snowchange might have with the community.

After the discussions the new aim of the internship became assisting Bergeby Handel, a “district” of Nesseby Kommune, by acting as a local community volunteer under the guidance of Vigdis Siri. Throughout the summer a wide variety of tasks were completed for many different people and organizations. Therefore internship responsibilities were diverse and numerous. A few of such responsibilities were to: assist in the creation and finalization of a salmon fishing exhibition at the Varanger Samiske Museum; help in a local tannery to prepare fish, moose and reindeer skins; paint a future duodji (Sámi handicraft) workshop; guard the stage at a local music festival; collect plants to be eaten and to be used to tan leather; assist a dog musher gathering and packaging materials for the dogs; aid farmers in sheep herding and the collection of hay; assist local fishermen; help with the setup for an International Indigenous Persons’ Day celebration; and digitally map a trail and points of interest for a sport organization.

Completion of these tasks and others not mentioned, alone would have provided a wealth of information to bring back to Connecticut College. However, as noted earlier this internship offered much more than expected. Nesseby lies at approximately 70˚N latitude and at this location summer is 24 hours of sunlight. Some say that day becomes night and night becomes day – and some days last forever. With this light there is time for much. So beyond my internship responsibilities there was time to explore, to talk, and most importantly to listen and to watch. The people I met shared their world; they shared observations, stories, and even jokes. They worked and they relaxed. They answered questions. And all the time they were teaching, whether they intended to or not.

The original force driving this internship was a desire to witness the effects of climate change on indigenous tribes in the Arctic. But as life in the Arctic and elsewhere is being forced to adapt to a changing natural world, so too was the scope of this internship. However, the changes made

were not negative. Through this internship I was able to come away with some understanding of a way of life that is much different from a typical life here in the northeast part of the United States, and in some ways very similar. While it would take many years, decades even, of year-round living in the Arctic to truly understand, what I saw will undeniably aid in the writing process of my Senior Integrated Project (SIP). Additionally, by having these different work experiences and learning to rely on the natural environment daily for many necessities, I believe I now have a better understanding of what I would like to do and not do in a post-college career. Until that time comes, my SIP will be conducted as an individual study consisting of a comparison of environmental impacts/concerns from 1988 until 2008 in the Arctic, specifically in Norway. Since 1988 there has been a rapid accumulation of information on climate change and its predicted effects on the Arctic, along with further information regarding other environmental issues. I would like to investigate how 20 years of research and findings have affected the environmental actions in Norway.

Lindsay Michel
Mashantucket Pequot Museum and Research Center, Connecticut

This past summer I interned at the Mashantucket Pequot Museum and Research Center. I worked in the historical research department. The historical research department uses a variety of old documents like war lists, land records, and censuses to create comprehensive databases and develop an understanding of Native American life throughout the past. These databases help other researchers when searching for information. The main database being compiled now is called People of Color and it allows researchers to type in family surnames to help find records associated with these families. There is a wealth of information hidden within documents that are spread all over the world and the research department's main goal is to compile this information to understand how Native American societies were living throughout history.

My internship responsibilities changed throughout the summer. I began transcribing old documents that would be entered into one of the databases for easy access in historical research. This helped me get acquainted with the handwriting and type of speech used in the eras that I would be researching. After this task I began looking through New London documents to find land-owning families of color that could be connected to either the Mohegan or Pequot Indian tribes. When I found two families, I began to trace their land ownership in New London and then later their connections to families on the Mohegan Reservation. I established connections through marriage and birth records, as well as, overseers' records. Once I was certain that these families originally from New London were living on Mohegan land, I began to reconstruct a reservation map from that time period using land records and an old book written by the tribe's sachem. This map helped situate these families on the land and provided the research department with a map not previously seen. In the middle of my research experience, I also helped with a Tribal Youth Camp. The activities of the camp involved archaeological digging, animal trapping, and nature and cultural walks. This camp helped me share some of the information I was learning through my research with Pequot Tribal Youth.

Although I felt that I had a valuable experience during my internship, I did not feel that my objectives were met. I intended to be outside mapping cultural resources with GPS to help

provide the tribe with a database and map of the reservation showing culturally sensitive sights to protect and manage. This job was supposed to provide me with background information about the uses and history of these cultural resources so I could make an educational booklet to be used at the reservation and in local educational settings. I do not feel that I gained the knowledge I set out to acquire. Working indoors in the research department provided me with an experience totally different from what I thought I would be doing and changed the entire spectrum of information that I learned. I did not learn enough about the cultural material to create an educational booklet about its uses and building process.

My internship was not what I was expecting and did not provide me with a lot of the information that I thought I would gain, but it was still a valuable learning experience. I improved upon my researching skills and learned new avenues for gaining valuable information. I learned how to search through land records and censuses and how to piece together these resources to form a comprehensive story. I was taught how to use the information in old land records to reconstruct area maps, which may be useful in many environmental jobs. This mapping project honed my problem solving skills because I had to piece together parcels of land from records that were often miscalculated and difficult to read.

Not many of the skills that I learned in my internship will help me with my original senior integrative project, but I can adjust my project to fit the training that I received this summer. I can now look through historical records to see how the land was being used in the past and I can create a series of land-use maps to show the changes in land use.

I am now planning on doing my senior integrative project here on the Connecticut College Campus. I hope to use some of my land records research combined with surveys of historic artifacts to trace colonial land ownership in the northern part of the Arboretum. I want to create a series of GIS maps that indicate tract ownership and distinguish stone-wall boundaries from interior farm walls and foundations. This project will make use of my new mapping and researching skills and will provide a valuable historical perspective on the land owned by the college.

Katherine Serafin
USGS Hurricane and Extreme Storm Impact Group, St. Petersburg, Florida

This summer I worked as a research assistant for the United States Geological Survey (USGS). The USGS is a multi-disciplinary science organization that focuses on biology, geography, geology, geospatial information and water. The USGS also studies how to protect our landscape and natural resources, and identify natural hazards that threaten the US population. More specifically, I worked with the Hurricane and Extreme Storm Impact Group in St. Petersburg, FL. The objective of this group is to investigate the causes and effects of coastal impacts due to hurricanes and storms. This is done in order to improve coastal change prediction and help plan infrastructures located away from hazardous areas. The investigations are done by collecting data through lidar surveys, oblique and aerial video photography and ground surveys.

As a research assistant, I was responsible for processing and analyzing a lidar survey documenting coastal change along Fire Island, NY. The Hurricane Impact Group uses an Experimental Advanced Airborne Research Laser (EAARL) to collect lidar surveys. EAARL is basically a scanning airborne laser that is put in a plane to survey the topography of beaches. Data is acquired prior to and after the storm in order to quantify amounts of coastal change. The data I used was collected in response to the April 2007 Nor'easter that struck the New England area. Using various computer programs, I processed and filtered out faulty points in the lidar data until it was clean enough to use. After the data was cleaned, the good points were used to find beach profiles. A beach profile is a cross-section taken perpendicular to a beach contour, usually including a dune or seawall and extending into the ocean. In order to measure erosion, I looked at change in dune elevation and shoreline position. A shoreline is the point on the profile where the ocean and the beach meet. If the shoreline position changed negatively, it would indicate erosion. However if it accreted and gained sand, the shoreline position would be positive. If the dune was eroded, the result would also be negative and positive for a gain in dune elevation.

After these preliminary steps, I spent the majority of my time working with MATLAB, a high-level technical computing language used for analysis and numerical computation. With MATLAB, I was able to locate the Fire Island shoreline and dune elevation in pre and post storm surveys, and finally write my own code to evaluate the coastal change of the area after the Nor'easter. At the end of the summer, I presented my findings to the group. I now will have a new appreciation for findings in science journal articles, as I understand the lengthy process one performs in order to analyze data.

My objective for the past summer was to gain as much knowledge as possible in the analysis of coastal change. I also wanted to learn more about nearshore morphodynamics and the beach response to storm systems. My internship with the USGS was an extremely valuable experience in helping me to meet these goals. I also was able to learn how to use different computer programs such as MATLAB, which will be beneficial for my honors study and future graduate studies.

My internship provided me with a unique opportunity that allowed me to participate in a hands on experience where I learned applications for future professional growth. I was also able to work with a great group of people who can serve as future contacts for my honors study and graduate school. Applications such as MATLAB will give me an advantage later, and I was able to see the meticulous process that comes with analyzing the data after it is collected. I also learned a copious amount through reading a graduate school text on coastal geomorphology, a diverse amount of journal articles, and one-on-one training with every group member.

Working with the USGS has prepared me for my thesis because I was given the opportunity to learn more about coastal geomorphology and the changes that occur on beaches. I also learned MATLAB can be a tool that will help to organize my data analysis. Finally, I was given some lidar data taken of the Connecticut coastline in 2000. If I can georeference some areas close enough to my profile measurements, I will be able to have more long-term data in analyzing the coastal change between the two beaches I am studying.

For my thesis, I plan to compare beach profiles on a constrained and unconstrained beach in Groton, CT. The natural, unconstrained beach is in Bluff Point State Park, a fully protected coastal reserve since 1975. Its partner, Groton Long Point is privately owned and developed, backed by a seawall. Both are on the Long Island Sound and receive the same kind of meteorological conditions including wind and fetch, which is the length of unobstructed sea surface upon which wind can generate waves. I will be collecting my own data. This study will focus on seasonal profile differences, as well as long-term profile change. Overall, I would like to examine how a seawall influences differences in beach profiles in order to evaluate how anthropogenic activities affect local beaches.

Gabe Sidman
Gettysburg National Military Park, Gettysburg, Pennsylvania

My internship was done last summer at Gettysburg National Military Park (GNMP) in Gettysburg, Pennsylvania. GNMP is a unit of the National Park Service (NPS), which is the branch of the Federal Government (within the Department of the Interior), charged with protecting nationally significant natural and cultural areas in the United States for the enjoyment of current and future generations. Each unit must be deemed significant by Congress to be included within the NPS. GNMP gained its significance from the pivotal Civil War battle that took place around the town of Gettysburg in 1863.

The division of the park I worked for this summer was Resource Management, which oversees the management of cultural and natural resources. I worked specifically with the Natural Resource Specialist, the Forestry Technician, and the Biological Technicians, who were the only staff within the park responsible for natural resource management. I participated in a variety of projects and tasks for the park in a quite informal setting. My only major project for the summer was continuing an Eastern Box Turtle inventory for the park's woodlots. I went out into the park's woodlots, set up transects in the woodlots using rough eye estimation (which were usually 5-15 square acres), and then searched each transect for turtles, which live in forest ecosystems. When turtles were located, they were marked with a unique number, measured, weighed, photographed, and marked by location with a GPS unit. At the end of the summer, I used the Geographic Information Systems (GIS) software ArcView to create maps utilizing the GPS locations of each turtle found in the park. I mapped the turtles against vegetation types and types of management action the park was taking in each woodlot. In addition to the box turtle project, I sampled water quality, completed vegetation surveys for forest health evaluations, marked park boundaries, and participated in various other small activities.

This internship did meet my original objectives for the most part. I believe the skills I learned and improved this summer will serve me well in future jobs, especially if I choose to continue with the NPS. I now know how faunal and floral inventories are conducted and how basic water quality testing is done, and I have an improved knowledge of GIS software. These are valuable skills in my field. I now have a good idea of how natural resource management is achieved within historical parks after observing and participating in the process for an entire summer. I understand one type of job that combines history and ecology— and the advantages and

disadvantages that go with having to consider both disciplines in one park. The internship also helped me realize what I do not want to do as a career, and what things I do not want to have to deal with in my future jobs. Still, learning what I do not want to do has been in some ways just as valuable as learning exactly what I do want to do. I realized that natural resource management in a park that has a historical mission can be very frustrating and that at least in this type of setting, history and ecology do not harmoniously mix, but clash in many instances.

The upside of the realization that ecological preservation and historical preservation often clash is that it will make for a more interesting SIP. I identified one major issue involving the different types of preservation goals at GNMP: this was the current GNMP General Management Plan, which has the goal of returning the natural landscape of the battle to how it appeared at the start of the battle in 1863. Since the park has not been closely managed since the battle, many areas that were historically grazing fields or crop land have grown up into forest habitat. The General Management Plan calls for removal of trees in such areas in order to return them to their "historical" state. In a few other areas, trees must be planted in order to restore historically wooded areas that have since been cleared to their natural states. The issue that many environmentalists and citizens in the area have with this plan is that these woodlots slated for removal have become some of the best habitat for woodland species in the area and are in many cases very biologically diverse areas (containing, for example, one area with a very high density of box turtles).

Others (including the park's public statements) say that the removal of trees will provide native grassland habitat, which is becoming increasingly rare in the eastern United States. This is seen as an ecological advantage— a way in which historical and ecological preservation can both be done in the same place at the same time.

This example of controversy involving both ecological and historical preservation will help me with my SIP and make it more interesting. In my project, I will highlight the ways in which parks accomplish both types of preservation simultaneously, and the difficulties that arise in balancing the two. I will utilize two parks as case studies: one being GNMP, which has a historical mission but still has many natural resources to protect, and the other will be Acadia National Park in Bar Harbor, Maine. Acadia is primarily an ecological park, but has historical resources that it protects. Hopefully I can obtain enough information from Acadia and perhaps other parks in the coming semester to make an interesting comparison to the vast knowledge I now have of Gettysburg.