



The Goodwin-Niering Center for Conservation Biology and Environmental Studies



Reflection Papers for the Class of 2005

Marcie A. Berry
South Carolina Aquarium, Charleston, South Carolina

The South Carolina Aquarium, located in Charleston, is a self-supporting educational institution committed to providing a way in which to experience aquatic environments. They place a great deal of emphasis on research, education, and conservation. Their values include integrity, teamwork, and excellence. The majority of the exhibits and featured animals are native to South Carolina and are actually collected by aquarium staff, with the exception of the changing exhibit, which currently features the Amazon until the winter of 2005. The South Carolina aquarium also houses a number of rehabilitated animals that were found injured and will never be able to live on their own in the wild. The Sustainable Seafood Program and the Sea Turtle Rehabilitation Program are two of the South Carolina Aquarium's distinguished programs. The Sustainable Seafood Program works with local seafood restaurants that agree not to serve certain seafood, such as shark and Chilean sea bass, due to their status in the wild, and promotes the sale of locally caught seafood. The Sea Turtle Rehabilitation Program houses sick and injured sea turtles, nurses them back to health, and then releases them back into the ocean. Both of these programs have been incredibly successful.

As an education intern I had many different responsibilities. I spent the majority of my time learning about the exhibits and animals, and doing daily programs which involved handling live animals and speaking to large audiences. I also spent a much of my time walking around among the aquarium guests carrying a live animal, answering questions and telling them various facts about the animal. In order to do this I was trained to work with different animals, such as snakes, alligators, and birds (a red tailed hawk and a blue and gold macaw). At the beginning of the summer one of the extra projects I worked on was putting together what the South Carolina Aquarium calls a "cart program" about the Sea Turtle Rehabilitation Program. This cart program was basically a portable exhibit that could be taken out for a few hours during the day, and then put away. I made some panels showing before and after pictures of sea turtles, and other displays to teach people the importance of sea turtles and how to keep our beaches and oceans safe and clean for them. Other responsibilities included attending weekly meetings and lectures, assisting with special events, answering "question cards", updating species sheets on the computer, writing a new section of and editing the volunteer training manual, and making calls to various outside organizations inviting them to participate in special days at the aquarium. Question cards are used when an aquarium staff member cannot answer a question that a guest may have. These cards are paper postcards that the guest can write their question on and put their address on the other side. When their question gets answered, it will be mailed to them! The last project I spent considerable time working on was identifying and cataloging a large shell collection that had recently been donated to the aquarium. I also contributed ideas for exhibiting the collection.

As an education intern, my responsibilities did not include husbandry (taking care of animals), which I am very much interested in. So, every Wednesday became my “husbandry day” and my responsibilities on this day involved working with the rehabilitation sea turtles. Sometimes I would help with medical examinations and cleaning, but most of the time it was my job to feed all six of these turtles. I would prepare the food (squid, salmon, capelin and mackerel), and give them their medications and vitamins. If any of the tanks needed to be hydro cleaned or backwashed, I would do that as well. One day I was able to help prepare and feed the birds at the aquarium, and another day some of the husbandry staff took me out collecting with them. We went into the marshes and onto a beach and did some seining, which was a really fun experience. We caught four sting rays!

My internship with the South Carolina Aquarium was incredibly valuable as a learning experience. For the most part, my objectives for this internship were met. I definitely learned a great deal about the conservation of marine environments and how/why the general public needs to be educated on these topics. I feel comfortable with this knowledge so that I can pass it on to others. In order to do the daily programs in front of large audiences I had to learn about the animals, exhibits, and environments I would be talking about, in addition to become comfortable speaking in front of so many people! I feel especially happy about gaining this public speaking experience. I am definitely more confident talking in front of a large group of people now than I ever was before. I was able to gain a fair amount of experience working with animals, especially animals that I never thought I would work with; however, I wish I could have done more on the husbandry end of things. Nevertheless, I certainly feel as though I had a rewarding experience with the South Carolina Aquarium and it gave me insight into what I may, or may not, want to do once I graduate from college! In addition to being at the aquarium, simply being in Charleston was a learning experience. I had never been there before, and it was great to see another part of the country that has outstanding environmental resources and is a place I might want to spend more time in after I graduate.

This fall semester I will be doing an independent study on certain aspects of the Cape Wind Project, which is a project that plans to build a large wind farm in Nantucket Sound, just off the coast of Cape Cod. This project has been in the works for about three years and there has been much controversy over the negative and positive impacts this wind farm may or may not have. For my study I would like to look closely at the environmental impacts that this wind farm may have for the Cape, Martha’s Vineyard and Nantucket, particularly on the fish stocks and how it may affect the commercial fishing industry both positively and negatively. I hypothesize that while construction of this wind farm is occurring, there will be significant disturbance of the sea floor and the fauna that live there. This damage, however, would only be semi-permanent because after a while, the structure that the wind farm provides underwater will serve as an artificial reef to many ocean creatures, such as fish and invertebrates. Other wind farms in Europe have seen their wind turbines used as artificial reefs. Using data and information from these wind farms as well as information on artificial reefs in general, I can prove that the Cape Wind Project will have similar results. In addition, I would like to give some insight into the potentials of wind energy as clean energy and the details of the Cape Wind Farm itself, including size and materials used.

Allen Bunting
Penobscot Bay Press, Blue Hill, Maine

This past summer I interned at a Penobscot Bay Press, a community information service that publishes three weekly newspapers: *Island Ad-vantage*, *Castine Patriot*, and *The Weekly Packet*. Penobscot Bay Press is a small company in Maine that provides local news, updates, and events to the coastal towns of Castine, Penobscot, Stonington, Deer Isle, Isle au Haut, Blue Hill, Brooklin, Brooksville, Sedgwick, and Surry.

My duties as intern were divided between the Blue Hill office, where I assisted in the duties of ad representative, and the Stonington office, where I aided in the design and layout of advertisements and the production of the three papers. As an ad representative, I secured ads from new businesses, researched new and potential advertisers, and created insertion orders for the production of the ads. I also gathered lists of potential advertisers for the newspapers' special and seasonal inserts.

The Stonington office of Penobscot Bay Press is the production office, so my duties there were solely computer oriented. While in this office, I assisted the production manager in designing, setting, and modifying the advertisements from week to week. I immediately learned how to use the Quark Xpress and Adobe Photoshop graphic design programs on Macintosh. A few weeks into my internship, I was asked to join the production manager during production day. I was both nervous and excited about this increased responsibility because production is my favorite aspect of advertising and I wanted to do it right.

My original objective of gaining experience in all aspects of advertising was met on my first day of working for Penobscot Bay Press when I was put in charge of every aspect of a walking map of Blue Hill businesses and attractions that the Blue Hill Peninsula Chamber of Commerce asked Penobscot Bay Press to compile. This was perfect immediate exposure to every aspect of production. This was a non-funded project, so I began by asking local businesses for sponsorships, donations, and/or an advertisement in the brochure. I then designed a creative and easy-to-follow map of downtown Blue Hill with numbers referring to each corresponding business. During the production of the brochure, I designed all of the ads for the brochure and the layout of the brochure itself. This was a great project because I learned immediately that I do not enjoy the selling and representative aspect of advertising, but I LOVE working on the production of ads.

Working for Penobscot Bay Press was such a great learning experience. I feel so lucky to have been able to intern for such a friendly company in one of the most beautiful areas of our country, northern coastal Maine. I am now comfortable with the different computer programs generally used in ad creation. I can now use this knowledge to facilitate the completion of my senior integrative project.

I am excited to design and produce a series of pamphlets for my senior integrative project meant to "re-educate" the American consumer. I plan to address consumer issues such as nutrition, cleaning supplies, clothing, infant goods, alternative power, and waste. This series of pamphlets can then be used to inform people about the wide range of environmentally conscious products that are accessible today. I hope to distribute these brochures around campus and to New London and surrounding area businesses, such as Muddy Waters Gourmet Coffee House and ShopRite. I often use the example of someone going to the store to buy a bottle of laundry detergent. When

looking at the different bottles of detergent, this person is more likely to pick up a bottle of TIDE than choose a bottle of the eco-conscious BRAND X. People know TIDE, they recognize the bottle, the colors, and the logo, making them more comfortable in choosing it. I want to change this and I think change begins with familiarizing consumers to the variety of eco-conscious products in the market, such as natural beauty products, natural cotton diapers, and chemical-free cleaning supplies. This is my vision, for my senior integrative project and beyond, and my internship with Penobscot Bay Press played a very important part in exposing me to what goes into effective advertising.

Betsy Ginn

City of New York Department of Parks and Recreation and Natural Resources Group

This past summer I completed an internship with the City of New York Department of Parks and Recreation, specifically with the Natural Resources Group (NRG). NRG is a division of Parks that was added in 1984, which is responsible for parks restoration and monitoring, natural area preservation, natural resource management, and natural area acquisition within the five boroughs of New York City. Over the past 20 years, NRG has restored thousands of acres of misused and degraded wetlands, forests and meadows in the city, into thriving ecosystems that support a variety of wildlife and keep New York City clean and healthy.

I spent the majority of my internship working on the Forever Wild Initiative, a New York State funded grant program designed to preserve natural areas within New York City. There are currently 48 Forever Wild sites in all five boroughs, totaling about 8,200 acres of natural woodlands, wetlands, and meadows. Some parks, like the Shooters Island Preserve in Staten Island, have only a few Forever Wild acres, 26, while others like the Pelham Bay Park Preserves in the Bronx, have over 1,400 acres of natural area. Natural areas is very important for New York City. They support wildlife, particularly nesting birds like egrets and herons. They also prevent erosion, filter groundwater, (especially the wetlands around Jamaica Bay in Queens and Brooklyn), and provide open space for passive recreation like birding and hiking.

The Forever Wild initiative was first funded in 2001 and it has provided signs for the sites and has paid for guard rails to be put around natural areas that were mistreated by ATV use and other inappropriate actions. Unfortunately the program lacked public awareness and attention. Very few residents knew about it and signs within the sites were not informative, resulting in an ineffective initiative that was doing little to help preserve natural areas. Therefore, the focus of this summer and the upcoming year is a revamping and revitalization of Forever Wild. There are many parts to this renewal, including designing and implementing new and more informative signs; redoing the website and making it more accessible to users; and designing and putting up ads on city buses and bus shelters. The goal is to encourage increased passive use of sites and to inform the city of the program and its importance. My responsibilities were almost exclusively within this publicity campaign. I wrote descriptions, found photos and trail maps for almost all sites for the website, added input to the new signs and bus ads, and negotiated all contracts for the ads with printers and agencies to post and maintain the ads. From doing these jobs, I was able to learn more about the parks and their importance to the city, make important contacts within the department, and develop business and negotiating skills.

When I first started the internship, I was unsure of what I was going to do, which let me be very open about it and what was to come. Because of the small size of NRG, I was given a lot of responsibility quickly and was able to be independent with my work. This was frustrating at times, but helped me strengthen my ability to initiate work and complete projects on my own.

In addition to my work on Forever Wild, I was able to observe the workings of a government agency and help out in other areas. Because all of NRG's projects are grant-funded, I helped proof many restoration grants, which enabled me to see important components of good grant-writing skills and its value in this field. I was also able to see that working in a government agency can be, on the down side, bureaucratic, complicated, and long-winded. However, it has many strengths with a strong network and many never-ending resources.

One goal that I set before starting my internship was to learn about the importance of the environment in a city, which was obvious from day one. The daily use of New York City Parks is enormous, and the size of the system over 29,000 acres, adds to the importance to New Yorkers and the wildlife within. New Yorkers need parks not only for a retreat from the city, but also as a filter for water, and a way to keep the city cooler in the summer. I was also able to see the city's reaction to environmental problems. NRG is able to restore degraded areas, and Forever Wild is able to preserve those areas and emphasize their importance in order to prevent future misuse.

This year, I will be writing an environmental studies honors thesis with Professor Pam Hine. I will be examining environmental education in urban and low-income areas, and its importance and effects on residents. There is a growing problem today of excessive pollution in poor areas, making them harmful to live in. Residents have few if any resources to clean up the neighborhoods, and often don't even know that there is a problem. I will research how environmental education changes perspectives of residents in low-income neighborhoods, and try to determine if there is an affect on urban action. I will look at different forms of environmental education, both traditional and non-traditional, such as education in schools and camps, urban and environmental restoration, outings to natural areas outside of the neighborhood, and environmental advertising such as that by Forever Wild, and will try to figure out which make the most impact on low-income, urban neighborhoods. I will focus my study on urban gardening, such as the Green Corps and the Cleveland Learning Garden in Cleveland, Ohio, and GreenThumb in New York City.

My internship has helped me prepare for this thesis by observing first hand the importance of parks in all parts of the city. I didn't expect the summer to help me tremendously on my research, as my internship one year ago with urban gardening in Cleveland gave me a lot of background. This internship, however, provided important resources and contacts within the parks system, which will help me achieve my thesis goals.

Genevieve Godfrey
Mote Marine Laboratory Dolphin and Whale Hospital, Sarasota, Florida.

My internship was spent at the Mote Marine Laboratory Dolphin and Whale Hospital located in Sarasota, Florida. While Mote Marine Laboratory started forty years ago, the dolphin and whale hospital is a newer edition to the well-known research facility and aquarium, and was initiated in 1994. The hospital is made up of a small staff supported by many volunteers with two 50,000 gallon tanks and one 200,000 lagoon. The dolphin and whale hospital also cares for adult sea turtles that come in under the sea turtle conservation program. Both the sea turtle and dolphin and whale hospital provide critical and chronic care for stranded animals with the ultimate goal of returning the animals into the wild. Whether the animal survives or not, the hospital seeks to expand its knowledge on the biology and veterinary care for each animal it takes on. This extends beyond the animal's time spent at the hospital; all released dolphins and whales are tracked for a period of time after release to follow up on their health and increase knowledge of their biology.

My internship duties consisted primarily of animal care responsibilities including food preparation and feeding, and facility and water quality maintenance. Most days were spent handling a lot of dead fish and scrubbing tanks. Duties also included animal handling and restraint for veterinary procedures, and assistance with data entry and any current projects or animal releases. While I was there these projects included preparing the sea turtle rehabilitation facility to be torn down for reconstruction, assisting in the establishment of a docent program, and the preliminary research for a study on the environmental enrichment in two of the chronic care patients. This study would specifically look at the use of enrichment devices or toys within the tank. I also assisted in many miscellaneous tasks as needed, including hurricane preparation and building enrichment devices. All interns were also required to complete an independent project. My project consisted of studying resting behavior in the current dolphin patients. Due to the nature of the internship, I worked around 70 hours a week, including a night shift.

Most of my original objectives were met. I had, however, hoped to gain raw data for my senior integrative project by using data from the study on enrichment devices. Due to time constraints, however, this project did not make it beyond the preliminary stage. I did however gain a good base of knowledge for preparing and completing this project through assisting in the preliminary research and by discussing of the ultimate goals for the study.

I gained extensive experience in the field of animal care as well as an understanding of all hurdles that come along with any marine facility, especially one that cares for marine mammals. I gained direction in how I want to spend my future and especially how I do not want to spend it. I learned volumes of information on sea turtle and dolphin biology and all of the anthropogenic hazards facing these species. I was especially impressed by the level of human ignorance and how this jeopardizes wildlife rehabilitation and conservation.

The experience and knowledge I gained through my internship will provide me with a foundation for my senior integrative project. Because I participated in the preliminary phases of the study on enrichment behavior I will be better prepared to initiate my own research with Mystic Aquarium. I also gained extensive information into what goes on behind the scenes in rehabilitation and captive animal facilities and how this would affect my research. Thanks to my internship I possess a good background in captive marine mammal behavior and how trained animals can differ from rehabilitation animals.

For my senior project I will work on and honors thesis at Mystic Aquarium. I will study a young female harbor porpoise at the facility that has been declared unreleasable, investigating techniques of integrating enrichment into her surroundings as well as the best method of acclimating her to captivity and training her in husbandry behaviors. I hope to look at the change in behavior in the harbor porpoise as enrichment and training are added to her environment and how these changes will affect her over a longer period of time.

Cameron W. Hewitt
Wood River Land Trust, Ketchum, Idaho

I wasn't entirely unprepared for the west. I've driven through it as a child, camped with my father in the dripping forests of the Pacific Northwest and in the barren grandeur of the Anasazi ruins at Chaco Canyon in New Mexico and in my early teens mountain biked the Colorado Rockies. Still, I couldn't help but be awed by the mountains, the high eternal sage desert, and the sheer amount of space in Idaho. I got my first taste of it driving across the plains of Nebraska and Wyoming, but I rolled into my apartment in Hailey in the dead of night and so was largely ignorant of my surroundings until early the next morning. However, upon stepping onto my porch with the dawn of my first day and surveying the surrounding mountains, I quickly realized that this might well be the best place in the world.

From June until August of last summer, I interned for the Wood River Land Trust in the little town of Hailey, Idaho. Hailey is about ten miles down the Wood River Valley from Ketchum (which is home, oddly, to the likes of Bruce Willis, Tom Hanks, and John Kerry), and just up the valley from the even smaller town of Bellevue. An hour's climb to the top of Della Mountain next to the house I shared on Willow St. provides the essential broad strokes of the landscape. Della itself is steep and covered in sage like all the mountains in the immediate vicinity of Hailey. From its summit, a look to the north reveals the snowcapped peaks of the Boulder, Pioneer, and White Cloud mountains. Behind these, rising in jagged spires, are the imposing Sawtooths, the namesake of the surrounding Sawtooth Natural Recreation Area. To the south, the sage mountains gradually diminish until they are subsumed by the high sage desert stretching out of sight to the Snake River and beyond. Directly below, seemingly at my feet, winds the Big Wood River, loosely surrounded by the sparse civilization of Hailey and Bellevue.

As an organization, the Wood River Land Trust is dedicated to the preservation and stewardship of land in the Wood River Valley, as well as several parcels across the rugged Trail Creek Pass on the banks of the neighboring Big Lost River and to the north along the swifter Salmon. Their vision is largely congruent with that of most of the residents of the valley; to preserve open space for the sake of people and wildlife alike. Indeed, a key tenet of their mission is to maintain traditional human land uses; hunting, fishing, hiking, etc. (even, in some cases, grazing and off-roading). This willingness to compromise and work with landowners and sportsmen on their own terms is essential in a state where even citizens whose families long ago packed up and moved to Boise pride themselves on the rugged independence of their ranching heritage. The isolated ranching lifestyle is so entrenched that many of the local ranchers still scornfully refer to East coast transplants as "from-aways" twenty or thirty years after their arrival in Idaho. I'm not

going to lie, given that I couldn't figure out a way to mount a gun rack in my Subaru, I at least tried to keep my Mass. license plates as dusty as possible so a casual observer might think the red lettering denoted California (which itself is only marginally more respectable than the East).

The internship itself consisted of a wide variety of tasks, from the mundane to the challenging. I was technically a stewardship intern which meant that I assisted Kate, the Stewardship Coordinator, in monitoring and maintaining the property which we either owned or had easements on. In practical terms, this entailed a lot of weeding, herbicide spraying (the voracious spread of noxious weeds is one of the biggest problems currently facing the west), and dismantling barbed wire fence to ensure the unobstructed passage of game animals. We also used a camera, compass, and GPS unit to establish maps and photopoints of these properties. This documentation is essential should questions ever arise regarding compliance with the easement or the management strategy. Several recent court cases brought by land trusts against non-compliant landowners have foundered due to inadequate documentation.

In addition to outdoor work, I also spent a good deal of time working with Matt, the other intern, to write up baseline documentation for a recently acquired piece of land in Bellevue. Finally, I was given the opportunity to work largely independently on trying to coalesce support among other Idaho land trusts for a badly needed piece of new tax legislation. In addition to all of these "official" responsibilities, I often found myself up on the roof with a bucket of paint or in a tree with a chainsaw trying to take down a stubbornly hanging branch (in retrospect it was a serious mistake to let my boss know that I had once spent a summer painting houses as all painting projects instantly fell to me).

My senior project, which I will be completing during spring semester, will focus on the rift between environmentalism and the "ranching lifestyle" that is so prevalent in the American west. On the surface, this divide is simple; ranchers/farmers feel that environmentalism is a threat to their way of life, perpetrated by an uncaring and intrusive government and by well-meaning idiots from back east. For their part, many environmentalists feel that ranching, particularly on public lands, is a fundamentally untenable enterprise, and a serious threat to an increasingly fragile environment. To an extent, this rift gets at the traditional political divide between liberals and conservatives, as well as a uniquely American brand of anti-government paranoia that is still alive and well in rural areas all over the country. In many ways what is referred to by its proponents as the "ranching lifestyle" is a crystallization of the rugged individualism that is a key facet of the American ethos as a whole (yet, paradoxically, ranching and farming are two of the most heavily subsidized industries in America). Yet, as the population steadily increases and environmental damage mounts, it is becoming apparent that this individualism must compromise. Hopefully, my project will expose the terms of this debate, as well as postulate some compromises between ranchers and environmentalists (or, at least, some workable strategies for environmentalists in the west).

Ultimately, my goals in heading to Idaho were three fold. First, I wanted to learn how citizens are able to effect positive environmental change, specifically regarding land conservation. Land is the most elemental of human resources, yet conservation efforts inevitably raise issues of freedom and private property that get at the heart of the American ethos (hark, is that an SIP in the making?). Secondly, I wanted to get a feel for the west, in anticipation of a probable

migration there after I graduate. Third, I wanted to spend as much time in the mountains as possible.

I am happy to report that all of these goals were met. Everyone at the land trust went out of their way to ensure that I experienced all facets of conservation work, from field work to PR, to closed door strategy sessions and board meetings. For this and many other things I owe them a tremendous debt of gratitude. As far as the other goals, I did indeed spend a good deal of time in the mountains on foot, bike, and jeep, and I will undoubtedly return to the west at some point after graduation. All in all, it was a fantastic summer, and I sincerely thank everyone at Conn who helped me make it out there.

Rory Jose

Department of Marine Resources, West Boothbay Harbor, Maine

During the summer I interned with the Department of Marine Resources (DMR) for the state of Maine. Throughout the summer I worked with Carl Wilson who is the chief lobster biologist for the State. I was responsible for data collection on commercial lobster boats off the coast of Monhegan Island. In June Carl and I traveled once a week to Monhegan where the fishing industry makes up 80% of the income for the local fishermen and their families. There are eleven lobstermen on the Island, and they all assisted Carl in his research of the lobster stock depletion. Monhegan is New England's only area with a closed season for lobstering. Thus, there is no fishing in the summer months. The lobster fishery is closely linked with the social and economic prosperity of coastal Maine and New England. In Maine 62.4 million pounds of lobsters valued at \$208 million were landed in 2002. Though, over the past 10 years there has been slow depletion of the lobsters off the coast of Maine. Therefore, it is important to understand and solve the issue of the lobster depletion.

Before I arrived at DMR, Carl had received a grant for research to study the relationship between traps, effort and fishing mortality in the Maine lobster fishery. The relationship between the number of traps and fishing mortality is poorly understood. For example, it is impossible to estimate the magnitude of the reduction of traps needed for biological effectiveness prior to the completion of management actions. The consequences of not knowing this relationship include failure to attain biological goals, increased disruption to historical fishing practices and a false sense of accomplishment by management. Carl proposed tests of the basic assumptions in the models used to evaluate fishing mortality by investigating trap capacity, interference between traps and effects of removing legal lobsters from the fishery.

During the month of June Carl and I did sea sampling on the local lobster boats with the Island fishermen. Surrounding the Island there were three squares of traps in the Monhegan Lobster Conservation Area. Each experimental area had a different density of traps. We went out to Monhegan a total of six times. Each day we traveled to the Island and tagged the lobsters with a different color band. Thus, the next time we went out to the Island we could count the recaptures. In addition, I entered all the important information of each lobster caught for the day into a Thistle Marine computer. This device saves the data including the location of each trap using GPS. At the end of the day the computer is connected to the internet and all the days catch is transferred to DMR on the mainland.

In addition to data collection on commercial lobster boats, I entered data in MS Access and MS Excel. The data collected and recorded was analyzed using statistical methods. This was an area in which I had no previous experience. Carl and the other staff in my office were extremely patient, and I quickly started to understand how to navigate through these programs. The computer software allowed us to summarize the data in graphs and pivot tables. The experiments in June were the beginning phase of a test for the much larger project that will start on Monhegan in the late fall.

In addition to data collection and sea sampling I went to numerous meetings throughout the state with Carl and participated in discussions on new laws and policies for ground fishing in certain areas off the Maine coast. Many of the fishermen, scientists, and politicians want to revive the ground fishing industry in certain zones throughout the state. The meetings I attended were extremely interesting because scientists at the national and state level, and the Commissioner of Fisheries were working together to figure out long term solutions for the fishing industry.

My internship this summer offered me a professional working experience that I would have never received working at a normal summer job. Additionally, I was able to explore and use the resources, at DMR for my own interests. I did many different tasks at the Department for Marine Resources, and by the last day I felt like I made a contribution toward solving a problem of the Maine fisheries by assisting Carl and other staff at the Department.

I have not completely decided on my senior project, but over the summer I came up with an idea about doing an independent study in the spring researching and writing a paper about the lobster stock depletion. I want to compare the mainland laws and regulations with Monhegan Island. In addition I want discuss the fishing methods of each area. Finally, I want to discuss fishing policies on an international basis and how international law could affect the local fishing areas of Maine.

Sarah Lumnah

Charles River Watershed Association, Waltham, Massachusetts

The Charles River Watershed Association (CRWA) was formed in 1965 in response to public concern about the declining condition of the Charles. Since its earliest days of advocacy, CRWA has figured prominently in major clean-up and watershed protection efforts, working with government officials and citizen groups from 35 Massachusetts watershed towns from Hopkinton to Boston. Initiatives over the last three decades have dramatically improved the quality of water in the watershed and approaches to water resource management. CRWA focuses on developing a sound, science-based understanding of interactions in the watershed; defining long-term, cutting-edge solutions to watershed problems; promoting sustainable watershed management practices with government agencies and private entities; and advocating protection, revitalization, and expansion of public parklands along the Charles.¹

¹ Charles River Watershed Association. "About us." <http://www.crwa.org/index.html?wavestop.html&0>

My main responsibilities at CRWA included tasks such as laboratory analysis, data tabulation, assistance with mailings, volunteer coordination, Web site maintenance, sample bottle washing and delivery and membership management. I spent much of my time creating new Web pages and updating the CRWA Web site. To help CRWA increase their communication with the press, I developed a media list and a press kit. To create the media list I had to learn how to use Microsoft Access, and then create a new database with up-to-date contact information from the surrounding media outlets. In the press kit, I included copies of current newspaper and magazine articles highlighting CRWA's work, updated biographies of CRWA staff and their contact information, a brief description of the organization, an explanation of watersheds and a list of the board of directors. All of this information is now available to be used by reporters who would like to write about CRWA, but are not entirely familiar with the organization. To create this kit, I contacted numerous environmental nonprofit organizations and requested copies of their press kits to be used as models for CRWA's.

I also served as CRWA's Membership Manager for six weeks while their current manager was on vacation. For this position, I processed membership donations, updated membership data tables and sent correspondence to donors. Yet, my favorite task at CRWA was updating their Web site. In order to promote a book about the Charles River, I wrote a review, scanned pictures of the text, highlighted some excerpts, and added the book to CRWA's PayPal account.

Overall, my experience at CRWA gave me a basic understanding of how a non-profit environmental organization functions. I gained substantial experience with membership management and Web site maintenance, both of which are essential components of a successful non-profit organization. One highly valuable aspect of my internship was simply the discovery of how quickly I am able to become comfortable using new computer programs. Before this summer, I never would have guessed that I would be updating Web sites and creating Microsoft Access queries.

My internship was also an important learning experience because I was able to see how difficult it can be to work for an under-funded nonprofit. This summer every employee was forced to take a six-week furlough (basically an unpaid vacation) because of the organization's major funding shortages. Such problems are commonplace in many environmental nonprofits, and it was eye opening for me to see firsthand how such funding shortages affect employees. Before I decide to continue to work in the nonprofit sector I will have to decide if I am willing to subject myself to the possibility of such financial instability.

One of my main objectives for selecting CRWA as my employer this summer was that I believed that I would be able to contribute to one of their newsletters. Unfortunately, because of unplanned for financial cutbacks, the newsletter was put on hold while CRWA's employees focused their collective energies on more pressing issues, such as current environmental lawsuits and the monthly monitoring of the Charles River. Therefore, when their Membership Manager was forced to take a six-week furlough, I was asked to undertake the dual roles of public relations assistant and membership manager instead of my original plan to serve as a reporting or editing assistant. I would have preferred to write for their newsletter, but I still enjoyed editing and creating new Web pages for their Web site. To my surprise, I found Web site design to be an interesting outlet for my creativity and writing ability.

My internship opened up many different modes of thinking about environmental change and sustainability, and I believe that these ideas will be useful to me when I begin my Senior Integrative Project (SIP). I recently spoke with Professor Rivkin about the possibility of focusing my SIP on the subject of sustainability. To incorporate my English major into my SIP, I would like to read literary works by Thoreau and Silko and apply their views of sustainability to the Connecticut College campus. This semester I will continue to research more environmental authors, and, through meetings with the director of Physical Plant and the Sustainability Director, Matt Turcotte, begin mapping out Conn's environmental sustainability.

Caitlin McIntosh
Rochester Equine Clinic, Rochester, New Hampshire

For the first half of the summer, I conducted organic research under the direction of Professor Timo Ovaska here at Connecticut College. The mission of the Ovaska lab is to investigate biologically active and potentially important medicinal compounds which contain the 5-7-6-3 or other similar phorbol type skeletons. Because of the recent developments in green chemistry, this summer, I chose to try and discover the most environmentally friendly way of completing a specific reaction. My six weeks of research with Dr. Ovaska were very productive, and my research mainly focused on the applications of microwave technology to the cyclization/Claisen rearrangement reaction on a particular substrate. The substrate which I am currently researching, prostrostratin, happens to be biologically active showing anti-HIV and AIDS potential.

My research results from this summer will be published in the journal '*Synlet and Synthesis*' in about a month. The manuscript has already been accepted, and will be published in the next issue of the journal. It was very exciting for me this summer working in Dr. Ovaska's lab because I was able to get a large amount of research done in a fairly short period of time. I discovered that the cyclization/Claisen reaction I was testing can be done neat (without solvent) in the microwave, providing a promising direction for this reaction in a pharmaceutical setting due to its green applications. The catalytic amount of methyl lithium which is used is easily separated from the product and the product from the neat reaction is quite easy to purify with a reduced amount of waste.

For the second half of my summer, I worked at Rochester Equine Clinic in Rochester, NH. Rochester is a private veterinary medical and surgical hospital for equine medicine. The facilities include a full surgical suite, radiology lab, exercise pool, neonatal unit, radio isotopic scan unit and space for 33 horses at a time with 3 isolation stalls. There are 4 senior staff doctors (2 surgeons, 1 ambulatory, 1 internal medicine) and 4 interns (recent DVM graduates) with whom I worked with closely this summer. The mission of the hospital is to provide exceptional care to referral cases as well as provide an ambulatory practice in the surrounding 50-mile radius.

During my time at Rochester I was directly responsible to the intern on call for the day, and assisted with many procedures and cases. While working as an extern, I dispensed and administered IM, IV, PO, and SQ medications. I performed TPR, colic and visual checks on patients. I held and restrained horses for bandage changes, radiographs, nasogastric intubation and many other procedures. I scrubbed horses for surgery and monitored fluid and suction

during surgery. I jogged and lunged horses for lameness evaluations. I was on call for emergencies and also performed midnight treatments. The coolest thing I got to do was place an IV catheter (jugular catheter). I really enjoyed working at Rochester, and I plan to go back next summer and work as a technician. While the work took a lot of time (about 10-12 hrs per day), it was very rewarding and exciting to be part of a hospital where I felt I was truly making a contribution to the quality of care our patients received.

For both of my internships, I feel that my objectives were met quite well. I was able to gain experience in two areas of science that I feel are equally important, and in doing so, gained some further understanding of how I will combine them in my senior integrative project. I plan to research invasive plant species which are poisonous to cattle and horses, specifically to look at the biochemical effects on the animal exposed. I am still planning to complete my project second semester, and I was able to do more research on my topics and narrow my project down to 10 plants. While working at Rochester, I was able to get a hold of a book '*A guide to plant poisoning of animals in North America*' by Anthony Knight and Richard Walter. This book has proven very valuable, and because of it, I have been able to choose 10 plants which are listed as noxious and invasive in at least 4 states and are also poisonous to cattle and horses. The coolest thing for me was learning that the structures of three of the poisonous amines in one of the toxic plants are very similar to the chemistry I have been studying with Professor Ovaska.

I plan to focus on two of the plants I have identified as noxious and invasive and go into depth researching the bio-chemical effects of their toxic chemicals inside the bodies of both horses and cattle. My research will mostly be literature review and hopefully I will be able to find a few case studies through the veterinary contacts that I have made this past summer. In this way, I can use the knowledge of both the biology (equine) and chemistry (organic) I have gained this past summer to explain how these invasive species can pose a major threat to cattle and horses in the United States. I would like to also investigate the most common allergic reactions / poisonings to plants in New England and perhaps provide a list to the Arboretum staff that they can give out to people creating pasture sites. This would help aid in educating the public on the threats of plants such as foxglove and delphiniums.

Keiko Nishimoto
Philmont Scout Ranch, Cimmaron, New Mexico

This summer I worked for Philmont Scout Ranch, a high adventure base operated by the Boy Scouts of America and located in the southern Rockies of New Mexico. Each summer, the ranch hosts 21,500 scouts who backpack for 5 days to 3 weeks at a time. During their treks in the backcountry, scouts participate in programs designed to stimulate personal growth and to teach them about conservation. Scouts are trained in the Leave No Trace ethic and practice low-impact camping while they are in the backcountry. Each group of scouts is required to participate in a three-hour conservation project at one of six locations on the ranch which is designed to teach them the importance of giving back and taking care of the land they use. In addition to the 137,000 acres that comprise Philmont, the ranch also has three staffed locations in an area of the Valle Vidal Unit of the Carson National Forest which adjoins the ranch. Philmont

has been leasing this land since the early 1990's, when a number of program itineraries were developed by Philmont's logistical staff to incorporate hiking time within the national forest.

For my internship, I worked with one of the conservation projects. My project was located in the Valle Vidal, at Philmont's Seally Canyon location. As part of the agreement between Philmont and the Carson National Forest that allows the Boy Scouts to use the land without monetary compensation, the scouts who hike through the Valle are required to complete their three hours of conservation within the national forest. The six Philmont staff located at my camp lived on federal land and worked with members of the Forest Service to designate projects for the scouts to work on. Each of us was also responsible for working with and supervising the scouts during their projects. Most of the groups we worked with spent about four days backpacking through the Valle Vidal.

Initially, I had planned to work with the fire rehabilitation effort that was started on the ranch after the Ponil Complex Fire of 2002 that heavily damaged areas of the Valle Vidal and northern Philmont. However, because we worked within the jurisdiction of the National Forest Service, our projects were chosen and supervised by Forest Service staff. Although the Valle projects in 2003 focused on fire rehabilitation, the Forest Service's focus shifted this year to watershed management and erosion control, so I wound up working mostly with projects unrelated to the fires. In that sense, my original objective to study the fire rehabilitation methods at Philmont was not met. However, because we were directly responsible to the Forest Service and not to Philmont's conservation department, I was able to work with Forest Service staff and to learn about the methods of and policies concerning conservation in the national forests. In this sense, I believe my summer was more productive than it might have been if I had worked exclusively with Philmont's conservation department at a location on the ranch.

I am still uncertain about what aspects of environmental science I am most interested in, but I have a very specific interest in Philmont and the Valle Vidal and how the land there is used and cared for. I believe my internship was a fairly valuable educational experience because it gave me the opportunity to learn more about land management in the Carson National Forest. Working in the Valle, I became necessarily engaged in the politics governing land management there and in the rest of our national forests. Observing first hand how one area of a national forest is used has forced me to consider issues I had effectively ignored until the start of this summer. Because I could see what kinds of environmental impacts policies have had in the Valle, a number of discrepancies in the way the land is managed were brought to my attention, and it is one of these discrepancies that I would like to write about for my senior integrative project. Specifically, one of the focuses of the Valle since the land was given to the Bureau of Land Management by the Pennzoil Corporation in 1982 has been to protect the wildlife that lives there. However, the Valle is a multiple-use area, which means that among other things, the area is used for grazing and recreation and is leased by Philmont for use by the Boy Scouts. Now, proposals have been submitted for drilling in areas of the Valle, and there is no policy that protects wildlife against these plans.

My goal for the summer was to learn more about fire rehabilitation at Philmont and to focus my senior integrative project on the environmental soundness of Philmont's policies. Since my internship dealt with something other than fire ecology, my idea for a project has changed

significantly. My internship was most helpful in preparing me to do a senior integrative project in that it enabled me to focus my environmental interests enough to choose something specific to write about. Also, it provided me with the opportunity to experience first-hand the controversy surrounding the issue of drilling in the Valle, and to better understand why so many people feel it is vital to protect lands there.

For my senior integrative project, I am writing a paper about the policies governing land management in the National Forests. I will be writing about the National Forest system itself and the principle of multiple-use areas, then focus specifically on what policies will influence the proposed drilling in the Valle Vidal. It is a subject that has been surrounded by much controversy since the El Paso Corporation first submitted the proposal to drill for coal bed methane on 40,000 of the 100,000 acres of the Valle Vidal. Although the Valle Vidal is a multiple-use area, drilling could have major impacts on the ecology of the area and has attracted criticism from the public. I would like to produce a paper on not only the policies involved in the issues, but what kind of influence private companies and citizens can have on the decision-making process.

Amy Phelan

U.S. Army Corps of Engineers, Concord, Massachusetts

My most vivid memory from this summer was when I entered a room full of environmental consultants and watched their reaction. A low murmur was heard and I caught one person saying, “here come the regulators.” When I first arrived at the U.S. Army Corps of Engineers I didn’t quite understand what it meant to work in the regulatory department. I knew it was related to something about the environment but my actual role in the internship still seemed very vague to me. However by the end of the summer I learned what it meant to be a regulator; they taught me so many skills that could not be fully understood in a classroom.

Each day I commuted up to the New England division of the U.S. Army Corps of Engineers (ACOE) in Concord, Massachusetts. The people I worked with explained to me that ACOE are trying to achieve environmental sustainability, to seek balance between human development activities and natural systems, to build a greater understanding of the environment to help protect and enhance it, and to understand the human impact on the environment. During the summer I leaned and fully grasped the environmental principles of the ACOE.

During the summer I provided assistance to the environmental resource section (ERS) in the regulatory department. I worked side by side with brilliant wetland scientists. Because of the Clean Water Act in 1972, the Corps has the authority over dredging and filling in the “waters of the United States” including some wetlands. This has given the Corps the role to decide what areas are qualified for protection as wetlands. My role this summer was to watch and learn how the people I worked with decided whether to grant, deny, or set conditions on wetland permits. For example, if a person has built property on a wetland they have to get a permit. Depending on the size, impact, and location there could be special conditions set forth such as rebuilding another wetland in a new location. This is called compensatory mitigation. Ideally avoidance of wetlands would be the best solution, if that cannot occur there should be minimization on

wetlands and if that cannot occur compensatory mitigation will be set up. I learned the threshold that determined what kind of action should take place at each level. During the summer I got to travel all of New England (in a nifty government vehicle), going to different wetland locations. We reviewed monitoring reports of mitigation sites to see if they were successful and determined the level of functionality of the wetland. At the wetland location we identified many of the wetland or non-wetland trees, shrub, vines, observed the hydrology, and finally collected a soil sample. Part of the time during my internship I was in the office analyzing the data to see if any new improvements were needed at that site. The Corps has been doing long term analysis on wetland mitigation and though this internship I saw a small glimpse of what they do.

During this internship I learned several things from the Corps. First, I learned how to collect, analyze, integrate, and report social and ecological data in order to critically understand and evaluate environmental problems. Secondly I learned specific ecological field study methods such as micro- and macrohabitat analysis, biotic sampling and analysis, fauna and flora identification, biodiversity monitoring, population analysis and climate analysis. The third thing I learned during this experience was how to transfer information acquired during the fieldwork to the office. I gathered the data but also I learned how to analyze it back at the office. This internship provided me an excellent opportunity to meet many knowledgeable people in the environmental field. I made many good connections with the people, which will hopefully last into the future.

This internship had a great impact on me. I learned so much. I came out of there having a strong understanding of wetlands, Clean Water Act section 404b, how permits are given to people and how they are regulated. I had the opportunity of a lifetime. I had the opportunity to work with people who are extremely knowledgeable and were completely willing to share their knowledge with me. I worked closely with four wetland scientists and they just showed me so much. But I also got to meet and work with other people in the department. One person took me out to a future dredging project just outside of New Bedford and showed me something very new and exciting to me. My internship was extremely hands on. They wanted me to analyze a situation and make decisions. I now have some great contacts back at the ACOE. They accepted me into their family and it made the internship so enjoyable.

With the concepts and independence that I learned this summer I know I am ready to tackle my senior integrative project. For the next two semesters I will be working with Professor Small and Glenn Dreyer on my senior thesis on prescribed burns of pitch pine/ scrub oak communities in the Connecticut region. I will examine the southern New England pitch pine community. I will review the impacts of geology, agriculture and human development on pitch pines. The pitch pine/ scrub oak community has become very rare in this region due to the lack of fires that helped the reproduction of pitch pines. Different places such as Hopeville Pond Natural Area Reserve have done some land management activities such as prescribed burns to maintain the community. During the summer I worked with Professor Small collecting data from this reserve. She has been working on this project for the past three years. Now I will go back and analyze the regrowth of this community and how it has changed. The skills I learned this summer will be applied to a different environmental community. My internship rejuvenated my love for the environment and I know I am ready to take the next step to complete the certificate program.

Lauren Richter**Food and Agriculture Organization of the United Nations, Rome, Italy**

I completed my CCBES internship at the Food and Agriculture Organization of the United Nations in Rome. The Food and Agriculture Organization (FAO) contributes to global efforts to ameliorate hunger through four central approaches: providing information, sharing policy expertise, providing a meeting place for nations, and bringing knowledge to the field (www.fao.org). International organizations of this type play a unique and valuable role in that they attempt to bridge academic and/or research spheres with political spheres by analyzing global trends in environmental resources and recommending policy based on these trends. FAO is composed of eight departments: Technical Cooperation, Sustainable Development, Agriculture, Economic and Social, Fisheries, Forestry, General Affairs and Information, and Administration and Finance.

As a volunteer at FAO I interned in the Social and Economic Department for an agricultural economist. I worked for the editor of the department's flagship publication *The State of Food and Agriculture* (SOFA); this year's edition posed the question: can biotechnology meet the needs of the poor? As the 2003-2004 SOFA was published in May of 2004, my boss assigned me the task of engaging in follow-up research on current studies on the use of biotechnology in developing countries. Essentially my job was to compile a database of recent economic research on genetically modified crops using the FAO agricultural library.

My learning objectives included gaining expertise in a specific aspect of the environment and working on a social change issue in a professional atmosphere. Both of these objectives were met through my internship at FAO, as my summer assignment focused specifically on current global uses of biotechnology. Interestingly enough, the more I learned about biotechnology the more complex the issue became, as global issues of this nature have ramifications in multiple realms. Perhaps it was the interdisciplinary nature of my summer research which proved the most challenging and exciting aspect of the internship.

My internship at FAO was an incredible learning experience on a number of levels. As a sociology major it was interesting to work in the unfamiliar field of agricultural economics. Learning about a discipline by working with professionals in the field was, in some respects, more valuable than studying economics in a classroom. Researching genetically modified organisms for an economist was fascinating as it entailed a wide spectrum of disciplines, ranging from biology to philosophy. My supervisor was specifically interested in the most recent economic studies on GM crops, however with such an issue one cannot escape the wide environmental and social implications of this new technology. One unique advantage of volunteering in a large international organization was the wide array of disciplines being applied to the problem of global hunger. In addition to my research, I had access to various seminars and conferences held at FAO during the summer. Two events in particular were the First World Organic Seed Conference, and an economic and social department seminar on biotechnology. I attended the Organic Seed Conference from July 5-7 where I was exposed to a variety of issues related to organic seed. The most interesting part of the conference was a panel discussion on the co-existence of GM and organic seed, which brought together panelists including a

representative from Monsanto, a conventional seed breeder, an organic farmer from Sri Lanka, and a scientist from the Netherlands to name a few. The panelist I found most intriguing was the representative of the International Federation of Organic Agriculture Movements from Uganda. His background was in both chemistry and development studies and his comments on the panel were particularly interesting to me – as he spoke of the wide spectrum of approaches to this issue and the manner through which one’s discipline will affect one’s opinion on this matter.

Working with and being engaged in research pertaining to economic analysis provided me with an opportunity to see the application of economic theory to real world issues. As my knowledge of the role of economics in assessing and prescribing actions for resource use grew, I better understood the challenges facing human resource management and the manner through which relationships with the environment could be improved through more “environmentally conscious” economic approaches. During the summer I came across a handful of papers citing inadequacies in current economic methodologies being applied to environmental resources and in particular the evaluation of GM crops. Certainly I came across a wide spectrum of material both for and against various applications of biotechnology and specifically genetic modification in my research, and typically one could guess the position of the article or paper just by looking at the source (ex. Greenpeace vs. Monsanto). The research I came across which has influenced my senior integrative project the most, are those papers by economists themselves criticizing the methodologies used by their peers in evaluating environmental resources. In addition, I spoke with a number of individuals in the Economic and Social department about their thoughts on the question of economic growth and the environment, which directly influenced the direction of my SIP.

For my senior integrative project I would like to address two perhaps related issues: namely the question of economic growth and environmental sustainability and/ or the question of economic valuations of the environment. Is sustainable development a matter of appropriate economic valuations of the environment? What could an “appropriate” valuation of an environmental “resource” look like? What values are taken into consideration? What is the relationship between values and incentives?

Emily Weidner

Smithsonian Tropical Research Institute, Barro Colorado Island, Ancon, Panama

After a semester of study and travel in Panama with the School for International Training I stayed abroad in Panama and headed to an island in the Panama Canal. This land between boundaries claimed neither by Central or South America’s landmasses, was Barro Colorado Island (BCI), a Smithsonian Research Station. Officially land owned by the government of Panama, BCI is managed by the US. After falling into the hands of the US during their administration of the former Canal Zone, a research station was positioned on BCI in the 1920s and later became an official research station of the Smithsonian Tropical Research Institute (STRI), a branch of the Smithsonian Institution. Through its research facilities STRI has provided a ‘unique opportunity for long-term ecological studies in the tropics, [and use of research facilities] used extensively by some 600 visiting scientists from academic and research institutions in the United States and around the world.’ Toady with research stations throughout

Panama, STRI offers research facilities to staff scientists, fellows, and visitors to achieve their research objectives and to increase our understanding of tropical ecosystems.

To improve my own understanding of tropical ecosystems, I interned on Barro Colorado Island as a lowly (but excited and appreciative) research assistant to Jason Watkins, a PhD mycology student in the Plant Biology department of the University of Georgia studying under Steve Hubble. Jason was gathering data for his dissertation and hoped to explore a relatively unstudied topic, the diversity of oomycete fungi in the tropics and their effect as pathogens on tree seedlings. He hypothesized that the oomycete diversity was very high in the tropics (nearly that of the tropical tree species) and that oomycetes acted as pathogens to tree seedlings. He identified two ways an oomycete acted as a pathogen: as a very common oomycete that acted as a general pathogen to the seedlings of many different tree species, or as a less common oomycete that acted as a pathogen to the seedlings of only one tree species. For this first type he expected to find them all over the forest because the species they are pathogen to are located all over the forest. For the second type of oomycete (that acts as pathogen to only one tree species) he hypothesized that the oomycetes' location would be directly related to the location of the tree species it was pathogen to. In other words, Jason expected to find these oomycetes only in soils near the tree it would act as pathogen to. This expectation is based on the assumption that the concentration of seedlings is highest near the parent tree.

My tasks included helping to set up and complete experiments; collect samples and data for experiments; and organize the data in a computer database. More specifically, I researched information on tropical tree species with desired characteristics needed for an experiment; collected soil samples around an array of tree species; and helped to design, develop, and set up both greenhouse and field experiments looking at the pathogenicity of oomycete fungi on different tree species.

My original objectives were to experience a new environment and to become familiar with its ecology through a research experience. My internship experience at BCI definitely helped me meet these objectives. On a nearly daily schedule I would tuck my pant legs into my socks, dress myself with clunky rubber boots, and head into the rainforest with a curious mind eager to find the day's new sight or smell or species identified. Truly it was a lesson in tropical biology every time we headed to the field to work.

In addition to skills and information learned from the field and lab work during my internship, I was able to gain much more. Exposed to a unique community of leading tropical researchers, I was able to inquire about and witness firsthand a diverse set of studies being conducted on the island. A lecture on current tropical biology research held twice a week by current STRI researchers and guests bolstered my understanding of tropical ecosystems and of scientific research in general. The overall internship experience gave me a good sense of what research in tropical biology is like. It also gave me insight on what my core interests are and helped to point me in a more decisive direction for graduate study.

In addition to doing my internship with STRI, I was able to pursue lingering interests from my semester abroad in Panama. After doing an independent project looking at the Naso community perceptions of a proposed hydroelectric project in western Panama during the spring semester,

the summer abroad provided an opportunity to keep up to date on the issue and maintain a working relationship with people directly connected with the situation. I plan on doing my honors thesis on the relationship between changing land use and struggles for cultural survival seen specifically in two indigenous communities in Panama affected by hydroelectric projects. I was able to spend several weeks with one of these communities, the Naso, during my semester abroad, and the summer internship in Panama allowed me to further my research about the hydroelectric project and the community's response. In addition, my work through the Smithsonian on BCI has helped me better understand the ecology of the tropical forest which is of great importance to understanding land use in the tropics, which will be a central topic to my thesis. These experiences and skills gained during my summer abroad doing my CCBES internship will prove to be helpful and relevant to my thesis studies.

My senior thesis will look at two Panamanian case studies: the Naso facing the Bonyic hydroelectric project, and the Kuna's response to the Bayano project. I will focus on exploring connections between changes in land use (and environment), and struggles for cultural survival. Looking at both the Naso and Kuna cases of imposed hydroelectric projects on their traditional lands, there are many similarities: the imposition of the project by non-community members, lack of community involvement in the implementation process, the absence of environmental and social factors in the decision-making process, the actualization of (or potential for) great environmental harm, the subsequence of (or potential for) changed land use and resource availability, and an internal conflict and struggle for cultural integrity and survival. Although the actual projects differ in size and in the year they were started, these common threads can still provide opportunity for a discussion of the processes that stem from the implementation of the project toward a changing land use and resource base, and then to a struggle for cultural survival. More specifically, I will look at the change in land use and environment, and its relationship to change in culture. Then I will identify this change in culture and its relationship to trends toward cultural instability and struggle for survival. I will be able to make conclusions about what this discussion of changing land use means for the Kuna in their current struggle for cultural survival and what it means for the future of the Naso people and their cultural integrity.

Katherine Williams

Williams-Mystic Maritime Studies Program, Mystic, Connecticut

This summer, I conducted independent research on the Hurricane of 1938 at Mystic Seaport through the Williams-Mystic Program. Williams-Mystic is a semester-long intensive program in Maritime Studies, where students complete independent research in history, literature, policy and science while living at an amazing museum that brings a seaport town of 1876 to life every day.

My internship responsibilities were diverse. Most of my time was spent doing independent history research on the 1938 Hurricane, with focusing on the events as they unfolded at Watch Hill. While I had initially hoped to do scientific research on Napatree Point, the section of Watch Hill most affected by the Hurricane, it was not feasible due to time constraints. In addition to my individual research, I assisted Nicole Dobroski, a graduate student studying the distribution of the Asian Shore Crab, *Hemigrapsus sanguineus*. I also volunteered at several events at Mystic Seaport, including the Sea Music Festival, which included many examples of

whaling ballads and an opportunity to understand the ways in which whaling ballads connect to environmentalist views of cetaceans. Finally, one day a week was spent working on wooden boat construction to help make a new research vessel for the Williams-Mystic program.

While I was able to do more preparatory research on *Moby-Dick* than I had originally planned, my research on the Hurricane of 1938 was not extremely successful. Without the scientific data that I had hoped to gather, my historical research was unable to uncover any new information that had not been discussed in R.A. Scotti's new book *Sudden Sea*. However, my research served to help me realize how difficult and taxing independent research can be, and how important it is to have adequate time for reflection before attempting to write an effective research paper.

My ancillary research, which I had only envisioned being a small portion of my summer responsibilities, became more important and time-consuming as the summer wore on. I was able to read and examine several logs from whaling voyages of the *Charles W. Morgan*, the only surviving wooden whale ship, which was built in New Bedford at the same time as the *Acushnet*, the vessel on which Melville made his whaling voyage. These logs enabled me to examine a whaling voyage from many different perspectives, and to begin to define the differences between the voyage of the *Pequod*, the whaling ship in *Moby-Dick*, and a typical whaling voyage.

Finally, I was able to participate in several special events at the Seaport that allowed me a greater comprehension of the complexities of maritime life. The Small Boat Festival gave me an opportunity to row a whaleboat for two miles, not an uncommon distance for whalers to row a captured whale back to the ship. While we did not tow a whale at this event, it still gave me an appreciation of the magnitude of a whaling sailor's responsibilities. The Sea Music Festival allowed me an opportunity to examine part of the breadth and depth of sea music, including the ballads of whalers from many different communities. I was able to continue the research begun at Sea Music Festival by attending Dog Watch, a part of the Seaports' demonstration schedule. On board whaling ships, the crew was divided into watches, and each watch was responsible for running the ship in alternating four-hour shifts, under the command of a mate. In order to vary the schedule so that the same sailors did not always have the midnight-4am watch, a generous captain would "dog" the watches, and by dividing the 4pm-8pm watch into two two-hour watches, the sailors who had been on the midnight-4am shift were now on the 4-8am shift. During dogwatch, few sailors would sleep, as they would have to be at work in two hours, so the steward would often prepare a special meal while the sailors indulged in crafts, storytelling, and music. It was during these times that the sailors would write in their logs, which is a main source of information about not only whaling ballads, but also the life of a whaler. I was also able to gain a better understanding of *Moby-Dick* by attending the annual reading of *Moby-Dick*, where for twenty-four hours volunteers read the work on board the *Charles W. Morgan*. This event gave me a unique opportunity to engage with the work on an aural level, as well as a period for reflection on the complexities and diverse nature of the work.

This internship has been invaluable for preparing me for my senior thesis research. After experiencing several difficulties in completing this summer research, I have been able to identify several problem areas that I will be able to avoid in completing my senior thesis research. In addition, I have gained important experience in tracking down rare sources, which will be

invaluable as I attempt to find copies of several 19th Century naturalist works. But perhaps most importantly, my ancillary experiences at the Seaport have enabled me to personalize the experience of *Moby-Dick* by better understanding the context of whaling.

My senior thesis research is to examine *Moby-Dick* as a proto-environmentalist work. By proto-environmentalist, I mean that the work displays many characteristics in common with later environmental works, both literary and otherwise, but is not of itself advocating an environmental perspective. Many critics have noted the several passages of natural history that are in the work, and indicated that they do not appear to fit with the rest of the work. In addition, many of these passages would be classified by today's standards as plagiarism, but there are subtle changes between the original sources and what Melville writes in his work. By examining these changes, and the interaction of the natural history passages with the rest of the work, I hope to demonstrate that Melville was advocating a particular environmentalist philosophy that has since been echoed in many poems, songs, stories and other works that explicitly deal with protecting whales. While I am not sure that I can accurately claim that Melville's writing is environmentalist in its own right, I do believe that there is significant material to prove that it has influenced later environmentalist writings and is therefore, proto-environmentalist.