



The Goodwin-Niering Center for Conservation Biology and Environmental Studies



Reflection Papers for the Class of 2007

Noah Fralich
Wuppertal Institute, Berlin, Germany

This summer I worked for the Wuppertal Institute for Climate, Environment and Energy in Berlin, Germany. The Wuppertal Institute is primarily focused on environmental policy research, which they conduct at the request of governments, businesses and other for- and non-profit organizations. They routinely conduct their work with other non-profit organizations such as the Heinrich Böll Foundation, Greenpeace, and the World Wildlife Fund. Where I worked, however, was slightly different in that the Berlin Office is a satellite office whose purpose is to bring the work of the Wuppertal Institute closer to the German Federal Government and to serve as a lobbying force. The Berlin Office is fairly small relative to the main office in Wuppertal, Germany. The office consists of the director, Hermann E. Ott, and five other co-workers. All of them work on their own various projects ranging from topics related to the Kyoto Protocol to environmental fair trade issues. In late May there had been a week of meetings in Bonn, Germany about the Kyoto Protocol, for which there were both national position papers that had been submitted to the overseeing body as well as post-conference reports about the progress that had been made and the renewed opinions of the various member states who participated. This led into my first project, which I worked on together with one of the other interns working there at the same time.

Our job was to read both of these sets of materials and compile the commonalities into a table for quick reference. There were position briefs that had been submitted by participating parties before and after the conference about the Kyoto Protocol, which I and another intern had been assigned to read. The briefs were dense and, rather than spend time reading them himself, my boss had us bring together their contents into a form that he could easily reference. He wanted the summaries because he was eventually going to use them when meeting with government officials to discuss the conference and advise those officials.

This gave me a good opportunity to see exactly what the language of environmental policy sounded like and also to get a better idea for what topics are of current interest both to the German Government as well as to my boss and the institute. It turns out that the language of politics is extremely dense and it's hard to separate out the issues from the formality, which can be frustrating and also time consuming. Of course this is the point of the internship, I feel; that is to say that it gave me the chance to reevaluate the direction my studies might go and to reassess what my interests really are.

My second and essentially my main project involved research on the contemporary literature pertaining to the correlations between the effectiveness of implementation of environmental policy and levels of democracy. This topic was both extremely theoretical as well as highly practical and, most importantly, very relevant to today's political atmosphere, at least in Europe.

I worked on this project for approximately four weeks, spending time both in the office and at the library, where I reviewed journal articles, scholarly books and online publications. Once I thought I had reached the end of my research (and my internship was coming to an end) I started putting the pieces together into a single paper with summaries of various authors' findings, analyses of theses, and my own personal opinions based on what I had learned. The paper ended up about twenty pages long and spanning some fifteen sources. Though the more I read and learned, the more it became apparent that this project would only be capable of scratching the surface of the issues. By the end of the project, it had become clear that there were a great diversity of opinions regarding the topic. However, to break the debate down into salient general opinions, there were those who advocated more direct and participatory democratic forms as the solution to lagging environmental policy. The other side of the debate held a more technocratic view for the solution, proposing more centralized scientifically informed legislative processes and decreased access by the layperson, or lobbyist. Both sides, in my view, offered positives and negatives to the debate and neither side can clearly claim to have a perfect solution, but rather valuable insights into various facets of the theoretical and practical debate.

This project I found to be an amazing experience on a topic that I didn't even know I was interested in. It is something that I could see myself continuing in my senior project in some fashion or another. As far as the internship goes, I think it was exactly what an internship experience should be. There were parts of it that were eye opening in both positive and negative ways; there were parts that reaffirmed some of my interests in environmental politics, but there were parts that helped me to consider redirecting myself in a slightly different direction. It gave me a great exposure to the office working environment as well as exposing me to a very professional atmosphere in general. I think if I had to draw a line in the sand, I don't think I could see myself working in exactly that field, rather I'd sooner be more product oriented, such as working for a wind energy development firm. I felt that working on policy wouldn't give me a real sense of accomplishment or that I had truly produced anything fruitful. On the whole though, the internship was everything I could have hoped it would be and I am exceedingly glad that I had the opportunity to experience all that environmental policy research in Germany's capital could give me.

As I look forward to my senior integrative project with my internship in the rearview mirror, I consider my general impressions of the nature of policy work. Rather than go further down that road, my senior project will focus more closely on a specific area of environmental policy that also overlaps into industry, namely the wind power industry. I plan to examine the development of the wind energy industry in Germany with respect to two important milestones in German environmental policy: the passing of the Renewable Energy Sources Act in 2000 and the ratification of the Kyoto Protocol. The project will draw on my exposure to policy work, while at the same time tap into my interests in wind power. It's difficult to say at this point, how much of the contents of my research from my internship will make its way into my senior integrative project, other than perhaps in a theoretical introductory paragraph, but the skills I learned from

working at the Wuppertal Institute will doubtlessly inform my work and my thinking throughout the semester.

David Hecht

Atrium Environmental and Safety Services, Reston, Virginia

During the summer of 2006, I worked for Atrium Environmental and Safety Services of Reston, Virginia. Atrium provides practical and cost effective solutions to a wide array of environmental and safety problems. Atrium successfully supports industrial clients, commercial property owners, construction and engineering companies, academic institutions, municipal governments, public utilities clients, and government agencies. Throughout my internship I worked under Vic D'Amato who was the head CIH (Certified Industrial Hygienist) and conducted most of Atrium's fieldwork. A brief description of duties that I performed included: writing reports, doing field analysis, creating presentations for current clients and conducting statistical analysis.

During my internship I worked on three main projects. The first project I was significantly involved in was testing for Legionella contamination at a federal facility in Washington DC. During this project I went to the federal facility and conducted a visual walkthrough to try to discover all possible contamination sites and then conducted sampling of those potential contamination sites. In addition, I sat in on meetings with various federal officials and learned a great deal about how the government copes with potential environmental safety issues and how we had to address this incident since it had become public. This project gave me a new-found understanding of how the federal government worked and how the process can be vastly different than dealing with a private entity.

The second project I worked on was indoor air quality testing at a hospital in Virginia. During this project, I conducted a wide array of testing of indoor air quality and possible mold contamination at the site. During this experience I learned how to operate indoor/outdoor air monitoring equipment, how to identify potential mold contamination sites and did a lot of reading on the health affects of mold. At the end of the project I wrote the final report and it was submitted to the client with recommendations for remediation and decreasing overall exposure.

Although I did a lot of fieldwork, I also spent a lot of time in the office doing statistical analysis. The third project I was involved in was conducting analysis on welding exposure data for an upcoming court case. During this project I looked at thousands of pieces of data and conducted a wide array of statistical analyses that attempted to identify whether a particular plaintiff's exposure to manganese during welding operations was significant enough to cause Parkinson like symptoms. This was a very interesting experience because I had to do a lot of background reading on the subject, familiarize myself with very technical literature and fully understand many federal OSHA regulations. Although the process was laborious, I learned a lot about occupational safety, federal regulations, and how to conduct complicated statistical analyses of data. In addition it provided me with an opportunity to improve my research skills before doing my senior integrative project.

My learning objectives for the past summer were to learn about how government and business deal with health and environmental issues. My internship experience with Atrium Environmental and Safety Services was an extremely valuable experience and helped me meet these objectives. I learned how to conduct sampling on a wide array of environmental and safety issues and how to write technical as well as less complicated project reports. During this internship I learned a completely different way to write and this may be the most valuable lesson of the summer. As a government major I did not have any experience with technical writing and experience with it during the internship will be very useful in the future.

During the fall semester I will be completing a senior integrative project on nuclear power in the United States, specifically, how the federal government could provide incentives for energy companies to build nuclear plants and help reduce carbon emissions. Although my internship was not in that area it did provide me with a set of skills that I will use as I complete my project. I will be writing on a very technical subject, so my experience this summer in explaining complex government regulations and safety and environment issues will be useful in explaining many of the intricate issues (regulatory and safety) that are associated with nuclear power plant development. In addition I learned how to search many government databases and this will be useful when I have to investigate many of the regulations that govern the nuclear industry during the research process of my independent study.

Saraswati Jayanthi

Connecticut College, Freshwater Ecology Laboratory, Newfoundland, Canada

For my internship this summer I worked for Dr. Peter Siver as a research assistant in the Connecticut College Freshwater Ecology Lab. The focus of the lab research was the use of siliceous microscopic algae, such as chrysophytes and diatoms, as biological indicators of environmental change in freshwater ecosystems. For the past nine years, lakes along the Eastern Seaboard have been sampled by the Freshwater Ecology Lab and their sediment and water have been analyzed for chemical, physical, and biological variation due to acid deposition and changes in land use.

This summer, the lab group traveled to Newfoundland to sample approximately 32 lakes on the southeastern and central coast of the province. The areas sampled were locally known as the Avalonia region, the Irish Coast, and Terra Nova National Park. I found the sampling trip to be the most exhilarating part of the summer because this was my first trip to the province. The landscape of Central Newfoundland is a vibrant and lush forest-green countryside covered with native purple larkspur. When driving down the main highway to the sampling sites, I was always in awe of how pristine the land was. The landscape was a welcome change from suburban Connecticut.

The environment of each lake was thoroughly assessed through water, sediment, and periphyton collection. The duties for the sampling of each lake were shared and rotated at each sampling site. One of my primary responsibilities involved extracting sediment and periphyton from the tops of rocks and on the underside of aquatic vascular plants. Periphyton is a mix of algae and heterotrophic microorganisms that are bound together and live on top of a variety of substrates in

freshwater and marine ecosystems. To the untrained eye, periphyton is simply considered slime, when it is in fact a tiny world brimming with life that gives insight into the health of an aquatic ecosystem. These samples were then prepared and analyzed later to determine the relative abundance of microscopic flora in the water body. I catalogued a variety of macrophytes to aid in understanding the local flora, and participated in taking cores of the sediment layers from the bottom of the lakes. The process for taking cores involved lowering a heavy instrument consisting of a plastic tube and a metal plunger from the canoe into the water. When the corer feels the bottom of the plastic tube hit the lake bottom, he or she releases a metal messenger that travels down the rope line and hits the top of the plunger, forcing it to cap the top of the tube. The water and sediment column (known as a core) is now suspended in the plastic tube, and is cut into 1 cm segments using an extruder. Each cm of sediment represents a block of years in the life of the lake. After the segments of sediment are processed and prepared on slides, I am able to examine the slides and quantify inferentially how the lake's environment has changed over time. Other responsibilities consisted of using the Hydrolab to test the water for dissolved oxygen, chlorophyll content, pH, and conductivity at different depths; and collecting water from the lake which would be used for further testing back at the lab.

Going out in the canoe was my favorite part of sampling, because it is always cooler being in the middle of a lake than ashore on a hot summer day. I got the best view of the lake's profile from the canoe, because I could see where all the animal habitats, lake zones, and buildings on shore were. The lakes tested on this sampling trip included a variety of different types of freshwater lake environments. For some of the study sites, the watershed was the size of multiple football fields. For others, the watershed was the size of a small classroom. I learned a great deal about how land topography can dramatically change water movement on such a small area of land, and how slight changes in the surrounding environment can inversely affect the sanctity of a lake's water. The sampling trip also helped me meet an assortment of people in Newfoundland. The people I encountered were extremely kind, helpful, and fascinating people. Many people would come up to us inquiring about our research, and often would give us historical insight into the lake we were sampling. One man actually told us about logging patterns of the forest surrounding a lake in the Avalonia region that I am analyzing as part of my thesis.

Before and after the sampling trip, the rest of the summer consisted of collecting samples from Connecticut lakes for the Department of Environmental Protection. Starting last year and ending next summer, the study involves our lab compiling data from 60 lakes scattered across the state. Each year, twenty lakes are picked from the sixty by a random number generator. Before the Newfoundland trip, the lab collected spring lake data from the twenty lakes assigned this year. After the trip, we collected the summer lake data from the same twenty lakes. It was an extremely physically intensive summer, when most days we left at seven in the morning and did not return to lab until six in the evening. The sampling days were adventurous; the lab went out regardless of the weather. On one of the most beautiful days, it started to rain buckets in a complete downpour. Unwilling to go back, we took the core amidst the wind, lightning and thunder. When we had treacherous sampling days like that, it only strengthened our resolve and gave us a feeling of invincibility.

About one day a week we stayed in the lab, and during that time we processed the water, periphyton, and sediment samples for both Newfoundland and Connecticut. I was responsible for

digesting the periphyton and sediment for slide preparation. The periphyton and sediment were digested with acid so that all the organic material would be removed, with only the siliceous scales of chrysophytes and diatoms remaining. The samples were then prepared as slides, so that different species of chrysophytes and diatoms could be counted. A portion of the sediment was also dried and ground up into a fine powder. The process of grinding involved all of the student workers sitting with a mortar and pestle for eight hours a day. The powder could then be tested to determine the age of the sediment, which would aid in inferring the age of the lake. The water was tested for a variety of measurements including chlorophyll content, cation content, pH, absorbance, and color. For example, pH shows the lake's level of acidity, chlorophyll shows the concentration of algae within the water body, and absorbance the amount of the light being absorbed into the water column. All of these measurements combined and calibrated give insight into a lake's properties and overall health.

For my thesis I will be using some of the data collected this summer to investigate how certain anthropogenic activities can have adverse effects on lake environments. The study will focus primarily on five different lakes along the same climatic gradient. The study includes one lake in Cape Cod, one in Maine, one in Nova Scotia, and one in Newfoundland. Each lake has been disturbed by a type of human interference, including acid rain, deforestation, road construction, and increased residential development. I hope to investigate how these factors have affected the lake's physiological, biological, and chemical properties using paleolimnological inference models of algal habitats. My work will include determining the chrysophyte species' distribution on slides of different depths of the sediment core. Due to the sensitivity of many species of chrysophytes to slight environmental change, I will be able to infer how a lake's chemical properties have changed over an extended period of time. When looking at a lake impacted negatively by humans, the inferential modeling will show what the lake's environment was like before and after the event. If the data show environmental change due to human interference, I hope to use historical data in conjunction with data on a lake's current environment to determine if it is capable of recovery. I hope that my research will be of service to the lab, emphasizing the importance of proper lake management to ensure the health and viability of all freshwater ecosystems.

Rebecca Mason
Garden Harvest, Baltimore County, Maryland

Garden Harvest is a non-profit, sustainable and organic farm located in Baltimore County, Maryland. Its mission is to provide poor and hungry people with nutritious organic food without harming the environment. In addition to donating all goods and produce harvested on the farm to shelters and organizations who feed many of the hungry citizens of Baltimore City, Garden Harvest also is dedicated to spreading information about the importance of sustainable farming.

My internship responsibilities varied from day to day. As an organization run mainly by volunteers, there were many things that needed to be done; yet not always enough people to do all these tasks. I was in charge of feeding and caring for animals every day, ear tagging animals and sending in registrations to the necessary associations, deciding when to move animals to a new field depending on land and vegetation conditions. Additionally I would lead volunteer

groups of adults and children, from 1 person to 120 people, to carry out tasks such as planting, seeding, mulching, and harvesting while trying to impart some knowledge about sustainable and organic farming. After my first couple weeks working I started to give some ideas to my supervisor about how I thought things could run more smoothly and efficiently. She was open to my suggestions and so I began to work on ways to make Garden Harvest better known in order to increase volunteers and donations. I came up with ways to update the website and make it more accessible. I also found groups such as local 4H clubs that could help with a newsletter and animal caring throughout the year so that there would be less stress on the two permanent individuals. I worked on creating a guidebook/handbook for future interns and apprentices with advice about animals, volunteers, and things to look out for like poison ivy, and other information that I thought would be useful. I updated the adopt-an-animal program expanding it to include all animals, and I wrote up biographies and took pictures of each animal. I also wrote down information such as ages and parents of animals to make things easier when it was time to breed, show, or donate. I really took on many responsibilities as time went on and so near the end of my internship I worked to prepare the farm for the fall and developed a strategy for Garden Harvest to continue to reach its goals and achieve its mission.

One of my main objectives was to help this organization and its cause in any way I could in order to help it fulfill its mission. I feel I definitely played a large role in all that took place on the farm this summer. I had hoped to be able to advance the education program at Garden Harvest and while I didn't exactly achieve my goal of creating an educational outline or pamphlet, I did get a chance to teach volunteers myself. I think I helped bring Garden Harvest up to the point where its next step could be to develop its education program. There were just too many other, more important tasks that needed to be done such as fulfilling grant requirements, bringing documents up to date, learning about animals and their role in sustainable living, and figuring out a method to get dependable volunteers to help maintain the farm, all while growing sufficient and nutritious food to donate to food shelters around the state!

I learned so much while at my internship and much of it I think I will be able to put to use for my senior project. I learned a lot about the use of animals, specifically goats, sheep, pigs and chickens in tending to the land and vegetation. I also learned about how non-profit organizations work and what needs to be done to keep things going. One other thing that I learned a lot about and which I would like to incorporate into my research is the benefits of goats on a farm. Not only are they easier on the environment than cows because they don't tear up the land in their fields, but they need less food and can produce almost the same amount of milk as cows. Additionally, goat's milk is very nutritious and important for many people. Because it has such little lactose in it, most cow's lactose intolerant people have no problem digesting goat's milk. This played a large role in the goat's milk production at Garden Harvest because studies have found that a greater percentage of lactose intolerant people are of African-American descent. The shelters that Garden Harvest donates milk, eggs, and produce to are in Baltimore City where the homeless and hungry population is largely African-American.

For my senior project I would like to research and interview a variety of organic and sustainable farmers, from local family farms to some of the bigger, well known producers of sustainable produce and organic products in the US. I would like to compile information about these farmers' procedures, consumers, daily life, and their view on being a small farmer in the present

day inundated with competition from huge farms that can produce tons of food at a very low cost. I hope to sort the responses and create a presentation, paper or pamphlet for either farmers considering adapting sustainable and organic techniques or consumers looking to see why there is such a huge movement to go organic.

My experiences this summer led me into teaching both farmers and consumers about the organic and sustainable methods used on the farm at Garden Harvest and, in finding out about other farms, I hope to learn for myself about more environmentally conscious techniques. The more I can understand and experience the benefits of sustainable farming, the better chance I will have of instructing and convincing others. If enough producers and consumers became passionate and interested in the future wellbeing of the environment and the human race, there would be enough power and perseverance to switch to an alternate food production system for the country. If North America sets an example and succeeds, perhaps many other nations will emulate and reap the benefits of a healthier, happier, and sustainable country.

Christine Monahan
ONG Azafady, Fort Dauphin, Madagascar

I have spent the past two months interning for ONG Azafady, a Malagasy nongovernmental organization based in Fort Dauphin, Madagascar. ONG Azafady is supported by a British charity of the same name. ONG Azafady is dedicated to the sustainable development of the southeastern Anosy region of Madagascar. Its interns, volunteers and staff work directly with communities and other grass roots organization. It is a nonprofit organization maintained through donations, grants and volunteer work.

ONG Azafady divides its attention and resources among three main areas: the environment, sustainable livelihoods, and health and sanitation. It is necessary to address all three of these areas to make significant progress. The environmental division focuses its work on improving the urban environment of Fort Dauphin and on improving conservation in the region. Both goals involve environmental education. The health and sanitation department has three main projects: health education; a mobile doctor, paid by ONG Azafady, who visits villages throughout the region; and sanitation and water infrastructure improvement. Sustainable livelihoods are defined as activities by which individual members of a given society obtain the food they and their families need to survive. ONG Azafady's program focuses on building people's capacities in regards to agricultural and other income-generating activities through education and training.

As an intern with Azafady, I was expected to spend at least some time working on all of these projects, with the exception of the mobile doctor. I also was given time to do work on my own personal project, which for me was research for my senior integrative project. Because an outbreak of typhoid among the group with whom I was working delayed our trip to our last location, combined with my early departure, I was not able to participate in the main part of our health and sanitation work which was to be digging wells and latrines in the village of Tsanariha. Nonetheless I was able to work on a number of projects in the other areas. My work included, but was not limited to, constructing home vegetable gardens for families and teaching them how to properly care for them, building more fuel efficient clay stoves, cleaning beach front land and

replanting it with fast growing trees that would hinder erosion, collecting assorted seeds to be replanted in ONG Azafady's tree nursery, teaching environmental and English classes to local children, mapping the location of endangered trees in rainforests around Ste Luce and editing a satellite map of Fort Dauphin with GIS technology for use by an American organization which is trying to install wind turbines in the area. We also spent about two weeks (interspersed with other work) building a school in the village of Hovatraha. Although such work does not fall directly under the mission of ONG Azafady, the organization had been given a grant which asked it to specifically build a school so an exception was made.

My work with ONG Azafady very much helped me achieve my objectives for a summer internship and was a significant learning experience. Over the past three years of study focused on International Relations at Connecticut College, I have come to realize how important it is to have first hand knowledge of whatever situation you are dealing with if you want to manage it properly. Early economic development was run by people who expected post-colonial countries and peoples to function the same way the western world had. This resulted in many failed policies. At a precarious time like this, when the developing world is desperate to catch up but it is unclear just how much old-fashioned development the environment can continue to support, we cannot afford more mistakes. By working in Madagascar this summer I was able to see the first hand problems of development. I have a better understanding of why it is often so hard to make progress in the developing world. I have learned about the problems both local people and NGOs encounter. For example, deforestation is a huge problem in Madagascar. Consequently the government has put in place new laws to protect forests from slash and burn agriculture. People do not have an alternative energy source though, so they simply deforest unprotected areas more quickly. ONG Azafady tries to ameliorate the situation by introducing clay stoves to improve fuel efficiency. The stoves are effective but they are fragile and will crack if they are not allowed to set and dry for two weeks after being made. Sadly, many people cannot afford to not use one of their stoves for two weeks and will use it before they should, resulting in broken stoves which are not as efficient. I also learned of the importance of a strong infrastructure to sustainable development. In a country like Madagascar, where the infrastructure is minimal, an organization like ONG Azafady must survive with power outages, unclean water and supplies not arriving on time, if at all. Also, simply working in a tropical environment is risky to people's health and this can affect work. As I mentioned before, everyone in my group contracted typhoid right before we were meant to start working on constructing wells and latrines. Although most people were not very sick, had we gone out to the bush we could have contaminated the water supply we were making for the local communities and subsequently caused many deaths. All of these are issues that can be easily forgotten when sitting comfortably at home in the western world wondering why the developing world cannot seem to sort itself out.

The focus of my senior integrative project is on the concept of sustainable mining. In short, I want to determine what conditions are necessary for a country to properly manage its natural resources, and specifically for sustainable mining to actually be successful, if at all possible. My study will be limited to developing countries and mineral mining rather than oil mining. I will apply the conclusions of my analysis to Madagascar, where a large-scale mining project is just beginning. I want to be able to predict how successful the mining project will be in regards to sustainability and make recommendations for how it can be improved. Since I was living and working in the area where the mine is to be built, my internship allowed me to focus on the

mining project from different perspectives. ONG Azafady was able to provide me with important documents published by and about the mining company, QMM, and its project. Also, by working on conservation projects in forests that could be destroyed for mining purposes if they are not properly maintained and simply talking to local people and hearing their perspectives, I was able to get a more personal view of the situation. Overall I think my internship has opened up my eyes and prepared me well to start tackling the issue of resource extraction and sustainable mining in the developing world.

Jesse Taylor-Waldman
The Nature Conservancy, Vermont

The Nature Conservancy (TNC) is a land trust organization founded in 1951 in the United States, and is the largest conservation organization in the world. To date, TNC has nearly one million members, with chapters in every state and 30 countries worldwide. Its basic mission is to preserve the animals, plants, natural communities and general biodiversity of life by protecting the lands and waters they need to survive. TNC is different from most other conservation organizations in that they acquire and manage their own preserves. They base their decisions on pertinent scientific data. The Vermont chapter of TNC was started in 1960, and it has assisted in the protection of over 167,000 acres of some of the state's most ecologically significant natural areas. Their priorities are guided by a rigorous ecological inventory prepared by the Vermont Nongame and Natural Heritage Program, which gathers and analyzes information about Vermont's rare animals, plants, and natural communities.

My position with TNC was working as a River Continuity Technician along the West River in southern Vermont. I was responsible for surveying road-stream crossings throughout the West River Watershed in support of a project to assess the status of river continuity in the Connecticut River Watershed. Geomorphologic and wildlife data were collected at each site using two different field survey forms, one from Vermont and one from Massachusetts. Measurements were taken of the physical structures (culverts and bridges) as well as the channel width of the stream or river. Observations were also made in regard to visible signs of wildlife, and whether or not the site itself seemed as though it would create impediments to fish and wildlife passage.

Beyond the field work and data collecting, another aspect of my internship responsibility involved managing these data and communicating our findings with TNC staff. After all of the field work had been completed, the Vermont data forms were entered into an online database maintained by the Vermont Department of Environmental Conservation. This information will now be used to prioritize projects to restore river processes and passage for fish and wildlife, and also to pinpoint areas where bridge or culvert repairs are most needed. I was working with three other interns and we had the opportunity to meet with TNC staff at the end of the summer and give them input about the project. We shared our thoughts on the design of the project, the content of the data forms, and gave suggestions for future changes to river continuity projects.

With respect to my original objectives, I feel that they have mostly been met. Through my internship, I gained knowledge and experience in hydrology and geomorphology, although I did not learn as much about aquatic ecology as I had hoped. I also learned the field methods required

of a river continuity technician and successfully practiced these skills throughout the internship. My internship helped me meet my objective of learning more about how a conservation group such as TNC operates. I got an inside look at how the elements of field work, data collection, coordination with state agencies, and project management all tied in to create a successful and meaningful project. Working with TNC has provided me with a practical understanding of how preservation of waterways occurs in the real world.

I've always felt that hands-on learning experiences are among the most valuable forms of education, and after completing my internship, I can see that this is true. I learned a great deal about hydrology, the importance of river continuity, and how an organization like TNC constructs and conducts a conservation project. It was also a valuable learning experience in that my internship allowed me to apply what I have learned academically in a real-world situation.

In addition to helping me prepare for my senior integrative project, I think that working with TNC meshed perfectly with my academic interests. As an environmental studies major on the social science track, land conservation that is aimed at protecting biodiversity encompasses many of the different scientific topics and political issues that I have studied in my major. My internship has prepared me for my senior project by giving me a look at the role that conservation organizations play in protecting land and waterways from environmental degradation. Working with TNC, I now have a better understanding of how all of the different components of a conservation organization come together to enact environmental protection.

For my senior integrative project, I plan to investigate the role that non-governmental organizations play in land conservation, both historically and at present. In particular, I want to focus my research on three of the largest and most well known environmental conservation organizations: the Nature Conservancy, the Sierra Club, and the World Wildlife Fund. I want to compare the approaches taken by these organizations, and analyze the success of each with respect to its mission. The Nature Conservancy, for example, has concentrated a large part of their efforts toward gaining corporate sponsorship to support their activities, whereas the Sierra Club has taken a more political approach to bringing about environmental protection. I plan to analyze these different approaches and compare and contrast their relative advantages and disadvantages.

Jennifer Vasquez
Montefiore Hospital, Bronx, New York

This summer I worked at the lead program, which is run by Montefiore Hospital in the Bronx. The Lead Poisoning Prevention Program addresses all aspects of childhood lead poisoning from diagnosis and treatment to education and research. Their mission is to treat lead-poisoned children and their families and to educate families at risk, other medical providers and local, state and national legislators and policy makers.

I worked alongside Dr. Morri Markowitz and Dr. John Rosen who are two of the leading researchers on childhood lead poisoning. I helped run a lead clinic where many disadvantaged families go to learn about the effects of lead poisoning and about what can be done to help

prevent any more exposure to this toxin. Many of these families are not able to pay for the visit to the hospital and many do not have insurance to cover their child's treatment. However, the lead program does not turn down any families that need to get treated. A lot of the families that went to the lead clinic did not speak any English and I helped translate for the families and the doctors. I also worked alongside an environmental coordinator, Mary Martinez, whose responsibilities were to test lead dust in houses and report housing violations to the Department of Health in New York. I helped teach these families the dangers of lead, where lead is usually found and how to prevent an intoxicated child from continuing to be exposed.

Originally it was my understanding that I was going to work alongside environmental coordinators planning a new program that was supposed to take place this summer educating parents and their children about lead and teaching them how to test for lead in their homes. Unfortunately, the grant for this program did not go through so we were not able to visit with the families in Brooklyn educating parents on how they can test for lead in the home. However, the program should be up and running this fall.

Although I did not do what I originally planned, I was still able to interact with parents and children and teach them the hazards of lead and how to prevent it. I was not able to show parents how to test for lead dust in the home, but I did learn how to do it myself. I also helped in the lead clinic, which ran weekly, and I was able to see all the work that is done for each family that is exposed to lead in the Bronx and Westchester.

My internship was a great learning experience. I knew that lead poisoning was still a problem, but I did not know that there were still thousands of children being intoxicated. I also went into this internship thinking that I knew a lot on this topic, but I soon began to realize that there is so much to know and learn and while my knowledge of the subject really expanded, I definitely know that there is a lot out there still for me to learn. This internship really helped me realize that I truly want to work with environmental toxins with a special focus on how they affect children.

My internship helped expand my knowledge of lead poisoning, which will greatly help me with my senior integrative project. My honors study involves lead poisoning in zebra fish and I am using these fish as a proposed model for humans. This internship allowed me to see how lead actually affects humans greatly aiding me with my senior integrative project. My internship also gave me a better idea on what the focus of my honors study should be; a lot of the patients that went to the lead clinic were pregnant mothers. I learned that lead stored in a pregnant mother is passed to the fetus. As a result I want to focus on the survivability and the hatchability of the zebra fish eggs after the adult zebra fish are exposed to lead.

My original plan for my honors study was to test the hypothesis that magnesium ions added to zebra fish tanks reverse and prevent lead poisoning in zebra fish, which is proposed as a model for both lead poisoning and magnesium actions in humans. However, after my internship experience I am planning to add another variable to my study. Many studies show that calcium is a competitive inhibitor of lead: whenever a family went to the lead clinic one of the main points that we wanted to get across to them was that the child needed to consume plenty of calcium in order to help eliminate lead from his/her body. Because calcium has been studied extensively, it is the element that is currently used in order to compete with lead. However it is not efficient,

since using this element may increase the absorption of lead from the gut. While using this calcium for chelation may be lifesaving, a lot of the drugs that use this element generally have a transient effect on blood lead levels. Within days to weeks of completion of treatment the blood lead levels will begin to increase, presumably as it is released from bone.

While the benefits of magnesium in terms of preventing and treating heart disease, controlling high blood pressure, limiting complications of congestive heart failure, preventing diabetes complications, easing muscle cramps, aches and pains etc., have been acknowledged, little is known about the benefits of magnesium in eliminating heavy metal poisoning, in particular lead poisoning, from organisms. I believe that magnesium is a better competitive inhibitor of lead in the body and causes fewer complications in eliminating lead. Therefore, my honors study will compare the effects of calcium and the effects of magnesium on zebra fish and will look at which element is more successful at eliminating lead from the fish. This will change my hypothesis to: magnesium ions added to zebra fish tanks are better at reversing and preventing lead poisoning in zebra fish than calcium ions added to zebra fish tanks.