



The Goodwin-Niering Center for the Environment

Senior Integrative Project Abstracts for the Class of 2011

Sarah Berkley

Recognizing Environmental Justice in History: Resistance and Agency in the Cross Bronx Expressway and the Memphis Sanitation Workers' Strike

The term environmental justice did not become a part of academic discourse until the 1970s; however, the facts of environmental injustice predate the concept. Minority and low-income communities have historically borne a disproportionate burden of the environmental harm associated with economic progress while reaping few of the benefits. The history of the building of the Cross Bronx Expressway from 1948 to 1972 and the Memphis Sanitation Workers' Strike of 1968 both involve what today can be labeled an environmental justice struggle in response to environmental injustices. Under the radar of the mainly white environmental movement, African Americans and others made strides to combat the harm to their communities and to the environment they encountered. Environmental injustice has been built into the laws of the federal government, and it has funded projects that perpetuate environmental injustice; therefore, the federal government of the United States has been a perpetrator of environmental injustice. Economic hardship, segregation, suburbanization, the construction of highways, urban renewal, and the desire to achieve growth at any cost have laid the groundwork for the environmental injustices of today. During the Memphis Sanitation Workers' Strike, the civil rights struggle was seen as entirely separate from the mainstream environmental movement that was active during the same time; however, the two movements share common goals and could have benefitted from working together to achieve these goals. Transparency and community participation in government are essential to environmental justice. In order to achieve environmental justice, a city street needs to be seen as just as important to preserve as a mountaintop.

Catharine Brookes

Waste-d: Redefining Waste through Material Life Cycles

In contrast to what a society deems as waste reveals what a society deems as valuable. Thus, culturally constructed definitions of waste have come to define material value and shape public policy in America's post-industrial society. Waste, as defined by the United States Environmental Protection Agency, classifies everything from food scraps, product packaging, furniture, and clothing as non-hazardous municipal solid waste (MSW). Given this broad definition, the United States ranks fourth among Organization of Economic Cooperation and Development countries for MSW generation intensity (measured by kg/capita). Furthermore, in 2008, the U.S. disposed over 50 percent of its MSW in landfills. Our primary solution for waste raises its own set of environmental concerns. Yet, these problems pale in comparison to the environmental costs associated with the extraction and manufacturing of virgin materials. Therefore, new policy, directed at waste reduction and material re-use is critical to tackling this multi-dimensional problem. One such policy that brings about the optimal level of waste generation is Design for the Environment (DfE). Design for the Environment holds manufacturers responsible for the postconsumer phase of the product's life. As a result, the manufacturer becomes a stakeholder in recycling markets, which encourages

product design that considers material flows and production methods that are cognizant of environmental health.

Nita Contreras

Fighting River Pollution through the Understanding of Hindu Goddesses: An analytical look at river myths and rituals to understand pollution issues and solutions

Focusing on the importance of water in Hindu traditions, my SIP examines water as it is deified and ritualized in both historical and present times in India. The focus of the project studies two of the most well known rivers in India, the Yamuna and Ganges, and fleshes out their religious qualities, rituals and presence in daily life. In determining the pervasive role river goddesses and their waters play in India, a comparison is made between the qualities these deities exemplify and the seemingly contrasting qualities that water pollution insinuates. As water quality has become an increasingly prevalent and internationally recognized problem, the SIP closes by looking at attempts to rectify these differences in order to solve the environmental and health issues water pollution presents in a manner that reaches the most people - through religion.

Flora Drury

Barriers to Community Wind Power Development in the US: Looking to Europe for Solutions

Community wind power projects are those financed, at least partially, through investments made by members of the local community. Local ownership of wind power provides financial, technical, and social benefits to the local community that is not offered by corporate-owned wind power. There is also a higher rate of public acceptance of wind projects that are locally-owned. In 2007, only 2% of the wind power capacity in the US was produced by community-owned infrastructure, while in Denmark 84% of wind power projects are community-owned. The purpose of this study was to highlight the barriers standing in the way of community wind development in the US and to look for solutions to these barriers in countries where community wind is more prevalent. Denmark and the UK have solved the financial, technical, regulatory, and cultural barriers that are standing in the way of community wind development in the US. Demand barriers exist in the US due to the lack of a stable and predictable market for wind power. Feed-in laws and national renewable portfolio standards have solved these barriers in Denmark and the UK. Financial barriers in the US result from the tax-based nature of the national incentives for wind power development which are designed to benefit large corporations and are difficult for community wind projects to realize. Historic and current financial incentives for wind power in Denmark and the UK have encouraged the development of community wind power projects by providing subsidies and grants specifically for this type of development. The regulatory barriers that exist in the US which make it difficult for community wind projects to connect to the electricity grid have been solved in Denmark with standardized interconnection laws. Finally, the fact that community wind development is not a social norm has acted as a barrier to its development in the US, however, the implementation of initiatives in the UK designed to provide guidance, support, and knowledge to communities attempting to establish wind power projects solve this cultural barrier. The US should replicate the past and present solutions to the barriers blocking community wind development that exist in Denmark and the UK so that the benefits associated with community wind development can be realized by those bearing the negative effects of wind development.

Janan Evans-Wilent

**Vocalizations Associated with Pectoral Fin Contact in Bottlenose Dolphins
(*Tursiops truncatus*)**

Pectoral fin contact in bottlenose dolphins is a form of tactile communication. Acoustic communication associated with pectoral fin contact is an additional level of communication that may change or enhance the tactile message between two individuals. In this study, we examine the types of vocalizations associated with pectoral fin contact in captive bottlenose dolphins (*Tursiops truncatus*). I examined 746 pectoral fin contact events from 2006-2009, and analyzed acoustic data using Raven acoustic software. The vocalizations associated with pectoral fin contact were whistles (WHS), click trains (ECC), overlap of whistles and click trains (WHS/ECC), and no vocalizations. The types of vocalizations during pectoral fin contact were compared for type of pectoral fin contact, vocalizer sex, how the contact is solicited, gender pair, and different individual vocalizers. Additional analyses of whistle parameters were also completed. Overall, vocalizations differed significantly for vocalizer role, vocalizer role as initiator, and individual vocalizers. Initiators and rubbers whistled more frequently, and receivers and rubbees clicked and used blended vocalizations more frequently. All except one adult female only whistled, while males were more vocal and used the different vocalization types more frequently. These results suggest that whistles may be used as a way to initiate pectoral fin contact or show preference for a particular partner, while click trains may be used to show disinterest in pectoral fin contact or to indicate the end of the contact. Examining vocalizations in conjunction with tactile contact may be useful for analyzing dolphin social alliances and social preferences for various individuals within a population.

Chris Haight

Bisphenol A: Plastic Toxin or Harmless Additive?

Bisphenol-A or BPA is a potentially hazardous chemical that humans and the environment are exposed to regularly. BPA has been used in the production of plastics since the 1940s, mainly in the making of polycarbonate plastics and epoxy resins. These two products are commonly used in food and beverage containers or packaging. BPA leaches out of these products in small quantities and can get into the environment and into humans. There have been many different studies done on the health risk and safety of BPA use. There are government studies that use standardized assessments which follow very strict guidelines that have largely found BPA use to be safe at common exposure levels. There are also independent studies which do not follow standardized guidelines and are largely done under academic setting that have expressed concern for BPA use. They found developmental, reproductive, and behavioral effects in labs studies using low doses of BPA. The government authorities over BPA are the Food and Drug Administration and the Environmental Protection Agency. These agencies are currently not taking action to regulate BPA. State and foreign legislation is on the rise as eight states as well as Canada, and the European Union have banned BPA use in children's products. Even a federal ban, the BPA Free Kids Act, was proposed to congress in 2009. Also retailers such as Wal-Mart and others have stopped selling children's products with BPA. There are still many issues associated with BPA assessment specifically regarding the differences between standardized tests and non-standardized tests which disagree on the safety and health effects of BPA at different doses. Legislation is also slowly on the rise and government authorities are showing some recognition of concern. More studies on the effects of BPA need to be done and federal legislation needs to be passed. Regulation of BPA would be a good first step in assessment and regulation of other potentially hazardous chemicals.

Kristiane Huber

Standing on Solid Ground: Respecting Cultural Rights in Climate Displacement

The small South Pacific island nation, Tuvalu, is facing the most dramatic consequences of climate change already forcing the indigenous population to employ climate adaptation. With an average elevation of only 1 meter above sea level, Tuvalu will be submerged by 2100 and will be uninhabitable in a matter of decades according to climate change projections. The vulnerability of the world's indigenous groups in the face of climate change is dramatic because of their reliance on land and climate for food, livelihood, identity and culture. Indigenous peoples' rights to their land and culture are established in the United Nations Declaration on Human Rights and the UN Declaration on the Rights of Indigenous People.

The paper analyzes two resettlement case studies, the Nam Theun II dam in the Lao People's Democratic Republic and the Song Bung 4 Dam in Vietnam evaluating the resettlement plans and their consideration of cultural human rights. The two projects had the goal of poverty alleviation and energy generation for their respective countries; however the prospective reservoir sites were indigenous territory. The project developers (local power companies, foreign power companies and international monetary organizations) laid out resettlement plans with the goal of easing the resettlement. In both cases there was little government protection of the displaced people, social and environmental impact assessments of the project and resettlement were not comprehensive, resettlement areas were inferior to original sites, economic and social integration programs were required and compensation was inadequate.

The same evaluation criteria then applied to climate change displacement in the Carteret Islands in Papua New Guinea and for Newtok, Alaska in the United. Tulele Peisa, a grassroots non-governmental organization was formed to raise money, educate Carteret Islanders about climate change and organize resettlement to Bougainville. The Yup'ik people living in Newtok, Alaska obtained a new site less vulnerable to climate change called Nelson Island and have planned the resettlement using traditional forms of decision making.

Tuvaluans may be able to move to Fiji or New Zealand and retain much of their culture. There must be meetings held with Tuvaluans to explain the effects of climate change, resettlement options, and to start planning. The consultation process can build on the already existing National Adaptation Programme of Action and can be funded by the same organization, the Global Environment Facility. In the new location, Tuvaluans will require economic and social integration programs and continued economic compensation in their resettlement area. Further studies in resettlement planning are required as more populated areas like Vietnam and Bangladesh face impending climate migrants crises.

Fiona Jensen

Wilderness Management: a Comparative Study of the Chilean National Forest Corporation and the United States Forest Service

The use of wilderness land has shown a cyclical pattern in both the United States and Chile. The pattern always starts with "discovery" and exploration. Extensive exploration brings a more civilized element to wilderness which often invites large scale recreational use of wilderness; making wilderness increasingly accessible to the average person. Both the United States and Chile have chosen to employ a Forest Service type system to protect valued areas of wilderness due to their aesthetic, cultural, or material value. The United States Forest Service (USFS) and the Chilean National Forest Corporation (CONAF) are strikingly similar in structure and stated purpose, but the similarities end there. The two agencies operate in wildly different circumstances and face different challenges. The differences of the two systems are even more evident in their efficacy. In the United States the long established national forest system protects the

designated lands while enforcing environmental regulation but in Chile few of the regulations are actually implemented and many of the natural resources that are supposed to be conserved are simply exploited. The differences between the two systems are the result of differing resource availability and differing cultural values about wilderness.

Christopher Krupenye

Reasoning about Communication by Rhesus Macaques (*Macaca mulatta*)

Primates are recognized for their exceptional social and cognitive complexity, the two factors underlain by their heightened social-cognitive abilities. Paramount among these abilities is the capacity to reason about the mental states of others, referred to as theory of mind or mental state attribution. The most sophisticated incidence of theory of mind is found in human beings and it is this cognitive trait which sets our species apart from all others and has permitted the development of culture and societies of unrivaled complexity. Yet research suggests that some primates are equipped with primitive forms of theory of mind and can reason about certain mental states in others, such as knowledge, ignorance, seeing, and hearing. However, the prevalence of these abilities among primates and the underlying cognitive abilities are poorly understood as is the extent to which theory of mind permeates other domains of cognition, like communication. This final consideration is of particular interest because it has the potential to impact our understanding of modality of intelligence, cognitive flexibility, and cognitive evolution as well as the mental faculties underlying social behavior. Apart from evidence that primates may comprehend intention to communicate, there has been minimal inquiry into the involvement of mental state attribution in the context of communication. The present study aims to examine a specific aspect of this issue in more detail: namely, reasoning about communication by primates. Rhesus macaques were tested for their understanding of the necessary and differential role of social agents in communicative exchanges, understanding which is foundational for any richer ability to reason about communication. Results suggest that rhesus macaques may understand this crucial role of social agents, encouraging further exploration of this topic.

Eric LeFlore

Wildlife Conservation in East and Southern Africa: A Historical and Comparative Assessment of the National Park Model

Wildlife populations have been severely impacted because of market hunting. In the British colonies, fees, quotas, and reserves were established in an attempt to maintain population levels so hunters could continue to harvest game. The national park model is a standard conservation method that is utilized around the world to protect natural landscapes and biodiversity. In this paper I investigate the history of hunting in the East and Southern Africa as well as the history of the national park model. I focus on two parks: Yellowstone National Park in the United States of America and Serengeti National Park in Tanzania. I also explore the ecological and social impacts of national parks in the savannas of East and Southern Africa. Lastly, I propose potential alternatives to the standard national park model, alternatives that incorporate local people into the conservation efforts.

Scott Siedor

Case Study: The “Preserve” The 5th Amendment, Regulatory Takings and Eminent Domain

The importance of this clearly outlined is stated in a 2001 Environmental Review Team Report on the 1,002 acre property in Old Saybrook, Essex and Westbrook, CT which states that, “As suburban sprawl continues to fragment Connecticut’s forests, significantly large properties like the Preserve, which are vital to preserve diverse and abundant wildlife populations, are becoming scarce”. With developer, River Sound LLC, unable to move forward with their proposed development plans on the property due to an adverse impact to the wetlands habitat, I analyzed the Takings Clause of the 5th Amendment to determine whether River Sound had a legitimate regulatory takings claim; and furthermore, why the State chose not to utilize their police power of eminent domain to physically take the property for fair market value. Following multiple interviews with local environmental lawyers, homeowners, environmental interest groups, the State Attorney General’s office, as well as researching relevant case law and newspaper articles on the issue, I was able to formulate a solid legal analysis of “The Preserve”. I argue that River Sound cannot make a legitimate regulatory takings claim. Additionally, I argue that the State has been apprehensive to bring an eminent domain case against River Sound due to the risk involved in allowing the court system to determine a fair market value for the property. In conclusion, I recommend that the two sides negotiate a price for the purchase of the property. This would allow River Sound to generate a revenue stream on the original purchase while finally allowing the State to preserve the property as open space.