



The Goodwin-Niering Center for Conservation Biology and Environmental Studies



Senior Integrative Project Abstracts for the Class of 2009

Sarah Ayres

Fishing for Solutions: A Study of Community Based Fisheries Management and its Implementation in the Gulf of Maine

New England has a long-standing history of commercial fishing. However today, many of the fishing industries are near collapse as a result of overfishing and economic shortfalls. The lobster and groundfish industries are prime examples of fishing industries in trouble, and form the center focus of the discussion. This paper contrasts the current method of fisheries management on the East coast of the United States with an alternative approach known as community based fisheries management (CBFM). It begins with a reflection of the 1992 cod moratorium imposed in Newfoundland, Canada. This closure had devastating effects for the groundfishermen, and exposes the problems of failed management. After listing common characteristics, four examples of successful CBFM projects in the U.S. are described. Next the problems facing the lobster and groundfishing industries are explained, including reasons why CBFM is not widely employed in the U.S. The paper ends with recommendations for a future of successful community managed fisheries.

Rebecca Beachell

The Yellow River Seaward Flows: China's Sorrow and the Self-censorship of Chinese ENGOS

The cost of the blossoming economy in China has been devastating environmental damage. With a decentralized government with limited resources, China's government found that social organizations could take over many of the traditional roles of the state, especially in terms of social and professional services. Environmental NGOs in particular take over the roles of pollution monitor and environmental educator that the government does not have the resources to take on for itself. However, environmental groups have been careful to not overstep their political boundaries and have exercised a great deal of self-censorship. ENGOS have learned what activities are politically "safe" and tend to stay within the boundaries they have drawn for themselves rather than the larger area the state has allowed. Why have environmental social organizations limited themselves beyond what the law allows? This study first provides background by examining the water pollution problem, focusing on the Yellow River, and the laws that allow the development of ENGOS in China. Using this information and the case study of Green Camel Bell, an environmental non-governmental organization in Lanzhou, this study argues that environmental social organizations in China limit themselves beyond what the

government theory allows and forwards two possible reasons. First, the uncertainty in a political sphere without definitive rule of law, wherein flowerings of independence allowed by the government have been followed with major crackdowns, has produced an apolitical and tentative social environment. Second, the political opportunity structure is not in fact as broad as it appears in the national legislation.

Tyler Dunham

Environmental Marketing Strategy: A Story of GE, BP, and Walmart

The unique relationship between the environment and the business world has always been evolving. Within the last two decades, corporations have seen a new market of consumers who are increasingly concerned with the state of the environment and willing to support corporations that address environmental issues. Three brands—GE, BP, and Walmart—are studied in this report that have shown varied commitment to the environment, and are assessed based on marketing strategy briefly contextualized against their corporate implications. A content analysis of five major magazine publications and several television commercials are analyzed that provide both qualitative and quantitative findings about the relationship between environmental issues and marketing strategy for the three case study brands. Major conclusions of the study show that there is a significant difference between how each brand responds to environmental issues. From marketing claims to lobby efforts, corporate investment to selling green products, each company demonstrates a unique commitment that is judged against its marketing strategy. Other major conclusions include an examination of the effort to increase sales of green products versus improving purchasing behavior and the opportunity to truly profit from environmental sustainability.

Hans Eysenbach

Debating the Future of Agriculture: An Environmental Perspective on Lessons and Applications from Opposing Schools

Humanity's relationship with food, though often not thought of in this way, provides one of the most direct links to the natural environment that we have. In the process of food production, humans clear cut, flatten, degrade, simplify and exhaust the natural resources that have been so delicately maintaining the biodiversified ecosystems in which we live. The quest to feed the ever increasing human population has driven the need for constant agricultural innovations. From breeding for greater yield and seed size to irrigation, fertilization and mechanization of labor, agriculture has achieved greater and greater efficiencies. It has become so efficient, some argue, that we have achieved the full genetic potential for productivity in most crops (Brown 2004, 61). This efficiency, however, has come at a greater and greater price to the environment under the current agricultural model. This paper will discuss two drastically different agricultural schools, one ancient and the other cutting edge: organic and genetically modified (GM). Through an analysis of how either approach addresses the problems with the current global model of conventional agriculture namely, its reliance on synthetic inputs, degradation and loss of soils,

inability to increase yield and grave climate change vulnerabilities. By exploring the potential environmental benefits of each it will be determined that sustainable agriculture can take instruction from both techniques which some say are diametrically opposed. This paper will show that GM can be organic in a meaningful way and that GM does not necessarily destroy the essence of organic agriculture.

Richard Hederstrom

Traditional Native American and British Herbal Medicine: A Discussion of Similarities and an Analysis of British Remedies Collected by the Ethnomedica Project

The Ethnomedica database at Kew Royal Botanic Gardens contains a high number and variety of detailed records of herbal remedies that have been collected through interviews and used historically throughout Britain. The first part of my study is an analysis of patterns in remedies from the database in the following categories: contributor age group, contributor gender, counties remedies were used in, sources of remedy knowledge, body systems treated by remedies, remedy application, remedy uses, plant species used in remedies, plant parts used in remedies, and years remedies were last used. I found significant patterns in nearly all categories, and insights into the nature of traditional British herbal medicine were provided by these analyses. I also conducted a comparative study of herbal remedies from Native American tribes and the British population. I found that a number of plants used to treat conditions in Britain have also been recorded as treatments for the very same conditions among one or a number of Native American tribes. I provide a list of these similar remedies and explore possible origins of these similarities. In-depth research of specific plant distribution histories and the interaction of British colonists with specific tribes is necessary to determine with more certainty if these remedies were developed independently or learned from one culture by the other.

Maya Jacobs

A Comparative Analysis of the Origins of Renewable Energy in Brazil and Argentina

Climate change is very real in Argentina and Brazil. Both of these countries have experienced effects such as extreme flooding and devastating droughts. Both of these countries are also rapidly developing nations who are presently contributing to CO₂ emissions but historically have not. However, whereas Brazil is becoming self sufficient in the energy sector by using sugarcane based ethanol and has become a world leader in renewable energy, Argentina runs on natural gas and has made relatively little progress on the renewable energy front. Brazil has been so successful that the majority of vehicles used in Brazil even run on ethanol or a combination of ethanol and gasoline and Argentina is running out of energy due to dwindling natural gas reserves. Why has Brazil made so much progress in the development of renewable energies while Argentina has remained at a standstill? There are three hypotheses that can explain this variation in success stories. The first is that climate change perceptions are greater in Brazil than in Argentina. This means that climate change has hit Brazil harder and the public is more aware

of these effects. The second hypothesis relates to the timing of the energy crisis in each country. Brazil went through an energy crisis much earlier than Argentina, which led them to make the switch to renewable energy. The third hypothesis explains that political leaders in Brazil have supported the switch in energy while Argentine leaders have been against it and even denied the existence of an energy crisis altogether. After researching and evaluating these three hypotheses, I determined that the energy crisis was the driving force behind the switch to renewable energy in Brazil. Continuation was made possible through the support from political leaders and the strong domestic effects of climate change accelerated the process. Political leadership and climate change are not adequate hypotheses on their own. Judging from the past and the Brazilian case, it would be quite plausible that Argentina will switch to renewable energy with time. The energy crisis will hopefully be the economic boost Argentina needs to move into a greener energy sector.

Frank Jeffrey Nemec
A Contemporary Philosophical Debate Over Wilderness

This paper focuses on the current philosophical debate over the ramifications of wilderness. Defined by the Wilderness Act of 1964, wilderness is “a place where the earth and its community of life are untrammelled by man, where man is a visitor who does not remain.”¹ The paper, shaped around an article by philosopher Wayne Ouderkirk, traces the history of wilderness and its two distinct philosophical perspectives. On one hand, philosopher J. Baird Callicott and historian William Cronon seek out society’s similarities with the wild natural world in order to envision a more sustainable civilization. On the other hand, philosopher Holmes Rolston III cautions that our differences with wilderness continue to offer clearer direction in creating a more harmonious coexistence with the natural world. Ouderkirk believes we need a wilderness philosophy that incorporates both society’s similarities and differences with wild nature but we’re left in a middling ground with little direction on how to better move forward. The goal of the paper is to offer a plan in embracing a more encompassing wilderness philosophy.

Katherine Sacca
A GIS analysis of deforestation and population in Malawi between 1990 and 2000

This paper examines the correlation between the rate and distribution of deforestation between 1990 and 2000 with socioeconomic variables in Malawi from the same time period. Malawi, the 6th poorest country in the world in 2001 (Kamanga 2008) has been increasing in population at a rate of about 3 percent per annum (NSO 2008). Deforestation in Malawi has also been increasing at a rate of approximately 0.25 percent per annum; 2.4% over the study period of ten years. Poverty and small scale agriculture are main aggregators of deforestation in Malawi, as 63 percent of the country lives below the poverty line (NSO 2000) and more than 80 percent of the population relies on agriculture for a living (Kamanga 2008). A GIS analysis of the difference between the Normalized Difference Vegetation Index (NDVI) of 1990 LANDSAT TM satellite images and 2000 LANDSAT ETM+ satellite images was undertaken to determine the percent of

¹ Wilderness Act of 1964 (16 U.S.C. 1131-1136, 78 Stat. 890) cited in Robert D. Taskey, “Wilderness” *Environmental Encyclopedia* 3rd Edition, Vol. 2, ed. Marci Bartman et. all, (Gale Group, 2003) 1511.

land deforested in each of Malawi's 28 districts. Change in population size and density/distribution, the percent of people reliance on firewood as a main source of energy for cooking, and the percent of people living below the poverty line were all compared to deforestation on the district level. No significant correlations were found but a marginally significant negative relationship between percent of people living below the poverty line in a given district and the amount of deforestation between 1990 and 2000 was discovered. There was almost no correlation between change in population factors (size and density) over time and percent of land deforested in each district. Based on observations of the distribution of deforestation, it can be hypothesized that deforestation in Malawi is generally small-scale economic development or agricultural land conversion. Further studies should be conducted to determine the nature of the relationship between economic development and deforestation. Further studies on a smaller scale (village or city level) should be conducted to determine the relationship between deforestation and population factors on the local level.

Michael Seager

Talking about Deforestation: Examining Participatory Democracy Using Argentina's Law of the Forests as a Case Study

In November 2007, Argentina passed a federal law intended to promote the sustainable management of its forest resources. The law declared that each province should consult its citizenry over the course of one year to divide its forest land into three categories: preservation land, land for sustainable development projects, and land open to any development projects. Through a close examination of this participatory process in Salta, Argentina and a thorough investigation into the theory of participatory democracy, this paper will explain why participatory democracy is an appropriate model for addressing environmental or natural resource policy making. Furthermore, it will propose five necessary conditions that must be present in order for an experiment with participatory democracy to be successful and inclusive of all sectors of society. It will then examine the participatory process in Salta to determine whether or not its experiment with participatory democracy was a success or failure.

Jamey Smith

***Jatropha curcas L.* as a Potential Model for the Ecologically Sustainable Production of Biofuels**

Within the past several decades, the vast majority of the developed world has established some level of biofuel blending targets for reasons associated with national energy security as well as climate change. However, it has become clear in recent years that the term "renewable" is not synonymous with "sustainable" in relation to the production of biofuels. Specifically, the impact biofuel production has on ecological health, both globally and locally in the areas in which the feedstocks are grown, is not unambiguous. This paper analyzed four current (first-generation) biofuel feedstocks – corn, sugarcane, soy, and oil palm – to determine their level of ecological sustainability. The five criteria used in the analysis were derived from the Roundtable on Sustainable Biofuels' first draft ("Version Zero") relating to sustainability of biofuel production: 1) Greenhouse gas reduction from fuel life-cycle analysis, 2) greenhouse gas reductions related to land-clearing carbon debts, 3) habitat and biodiversity loss from feedstock cultivation, 4) soil

and water conservation and 5) invasion potential. It then introduced a potential second-generation feedstock, *Jatropha curcas L.* (jatropha) and analyzed its ecological sustainability potential in three production scenarios: Small-scale cultivation, unrestricted (in relation to land cleared for cultivation) large-scale cultivation, and restricted large-scale cultivation. None of the first-generation feedstocks analyzed are produced in an ecologically sustainable fashion. *Jatropha* showed large potential for ecologically sustainable production in both the small-scale and restricted large-scale scenarios should further R&D take place and if proper incentives and restrictions are established at domestic and international levels.

Andrew Watts

Community Conservation in African Wildlife Policy: A Comparative Study of Contrasting Implementation Policies in Kenya and Zimbabwe

The tale of African wildlife conservation policy, much like that of African history in general, is inextricably linked to the ever-evolving Western conceptualization of the African continent. Despite historical fallacies and realities on the ground, Western conservationists have traditionally been concerned with preserving African wildlife at all costs, including at the expense of the African people. The community conservation narrative emerged in response to these failing conservation policies and, for the first time, appreciated the critical importance of Africans in African wildlife conservation. Community conservation recognizes the moral and practical realities, which necessitate the engagement and empowerment of local communities in decisions regarding local natural resources, including wildlife. Despite the widespread support and popularity these policies receive, debate continues as to how individual conservation organizations might best implement community conservation programs. This paper will examine two such implementation strategies- Protected Area Outreach and Community-Based Conservation- as they are practiced in Kenya and Zimbabwe respectively. Ultimately this paper will assess each implementation method and determine the overall success of each program using a community conservation rubric and will posit recommendations as to how wildlife conservation and community conservation policies might best be employed in Africa.

Samantha Wright

An Analysis of Coastal Protection Structures: A GIS Based Approach

This paper examines the effects that coastal protection structures have on short and long-term erosion. The New Jersey shore and Galveston Island, Texas were used as case studies. Historical aerial photographs were analyzed through GIS to trace the shorelines over time of three sites on the Jersey shore and the pre and post- Hurricane Ike shoreline in Galveston, TX. Erosion rates were calculated and compared for the beach areas fortified by different methods of coastal protection. The long-term (1920-1962) erosion rates for the site (Sea Isle City, NJ) with the groin field were -0.80 m/yr. updrift of groin field, -0.79 m/yr. within the groin field, and -1.79 m/yr downdrift. The long-term erosion rate for the site (Longport, NJ) with groins and a seawall was -1.14 m/yr. These erosion rates were compared to a long-term natural erosion rate of -0.28 m/yr. The short-term distance of shoreline retreat along Galveston Island due to Hurricane Ike were -35.20 m (seawall and groin field), -16.52 m (seawall), -75.22 m (geotextile tubes); compared to

the natural (no coastal protection structures) shoreline retreat distance of -80.06 m. Data shows that coastal protection structures cause increased rates of erosion in the long-term. In a short-term storm event a seawall and groin field set a limit for the amount of erosion that can occur, but that almost entire beach eroded away. Geotextile tubes appeared to have no demonstrable influence on erosion rates compared to unarmored sections of the shoreline in short-term storm events. This study is important because coastal erosion is causing major problems worldwide. Many communities try to defend their development from the erosional forces of the ocean by using engineered intervention in the form of coastal protection structures without considering the potential consequences.