



Symposium on Integrative Conservation

Tate Student Center 480 and 481

February 7, 2014

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Welcome to the first annual Symposium on Integrative Conservation (SIC). SIC is organized and hosted by the graduate students of the Integrative Conservation (ICON) Ph.D. Program at the University of Georgia (UGA). The main goal of SIC is to cultivate interactions between cohorts of students scattered across campus in multiple departments and to promote continued dialogue throughout their tenure in the program. An equally important objective of SIC is to facilitate interaction with the broader academic community at UGA. The ICON program seeks to train future scholars capable of engaging with a diversity of people working both in research and practice on the most pressing social and environmental challenges. To effectively do this, it is necessary to encounter the insights, perspectives, and methodologies of multiple disciplines as part of the educational experience. SIC is intended to enhance these aspects of the ICON Ph.D. Program by providing a space for the exchange of ideas between students and faculty interested in integrative research and practice.

For our first symposium, we have two morning sessions and two afternoon sessions followed by an hour-long, moderated discussion forum (details below). Over the course of the day, we will hear from 21 presenters, all students of the ICON Ph.D. Program, which is now only in its third year. The presentation topics range from examining the politics of genetically modified crops to investigations of human-environment interactions affecting gopher tortoises and terrapins to the political ecology of soil. The presentations include research sites extending from the state of Georgia to countries as distant as Costa Rica, Chile, Kenya, and Indonesia. We appreciate your attendance, and we hope you find SIC to be an intellectually stimulating and exciting experience.

Schedule

8:30AM – 9:00AM	Greeting and Coffee	Tate Center 481
9:00AM – 9:15AM	Introduction – Dr. Pete Brosius	Tate Center 480
9:15AM – 10:30AM	Session 1	Tate Center 480
	<i>Lowery Parker</i> Governing Life: Engaging the politics of genetically modified crops in Kenya	
	<i>Dean Hardy</i> Examining Social and Biophysical Vulnerabilities to Sea Level Rise on the Georgia Coast	
	<i>Walker DePuy</i> Lessons for Integrative Conservation from a Participatory CIFOR Project	
	<i>Jennifer DeMoss</i> Emotional Landscapes and Senses of Place in the Nature Connection Movement	
	<i>Alana Shaw</i> With a Love for the Land: Iñupiaq Subsistence and the ‘Politics of Nature’ at the Heart of Environmental Injustice in the Alaskan Arctic	
10:30AM – 10:45AM	Coffee Break	Tate Center 481

10:45AM – 12:00PM Session 2 Tate Center 480

Rachel L. Bormann

The Future Status of the Gopher Tortoise - Fundamentally Linked with the Private Landowners in its Range

Brian Crawford

When Drivers and Terrapins Collide: Integrative Conservation of Diamondback Terrapins (*Malaclemys terrapin*) on the Jekyll Island Causeway

Tara Gancos Crawford

Framing the Socio-Ecological Decision Context of Public Alligator Harvest Programs in the Southeastern United States

Rachel Guy

Assessing the Socio-Ecological Resilience of a Salt Marsh Estuarine Fishery to the Effects of Sea Level Rise

Emily Horton

Socio-Ecological Dimensions of Small-scale Fisheries Governance in a Brazilian Marine Extractive Reserve

12:00PM – 1:45PM Lunch Break Downtown or Campus

1:45PM – 2:45PM Session 3 Tate Center 480

Richard Vercoe

Hot Potato: Conserving the “Agri-Culture” of Chiloé’s Potatoes, People, and Ecology

Ryan Unks

Linking Pastoralism and Landscape Ecology in Laikipia, Kenya

Shannon Bonney

The Use of a Stream-Aquifer Model (SAM 2) and an Endangered Mussel Damage Function in Order to Recommend Ground Water Valuation and Policy Changes for Future Irrigation Reduction Auctions in the Lower Flint River Basin, Georgia, United States

Jonathan P. K. Hallemeier

Durable Social Landscapes: Widening the Lens on Social Change in Participatory Natural Resource Management

2:45PM – 3:00PM Coffee Break Tate Center 481

3:00PM – 3:45PM Session 4 Tate Center 480

Steve Padgett-Vasquez

Hosting a Google MapUp in Bellbird Biological Corridor of Costa Rica

Jennifer Bloodgood

Evaluation of the Nutritional Status of Rehabilitated Green Sea Turtles (*Chelonia mydas*)

Jessica Chappell

Determining Stream Connectivity in El Yunque National Forest, Puerto Rico

Katherine Brownson

Pronounced Progress in La Plata? A Critical Assessment of Integrative Water Resource Management in La Plata Basin

Caitlin Mertzluft

Jumping the Species Barrier: Zoonoses as Both a Public Health and Conservation Issue

Amy C. Nichols

Public Understandings of Hazardous Weather

Levi Van Sant

Towards a Renewed Political Ecology of Soil: Science, Race, and Governance in the 1971 Charleston County (SC) Soil Survey

3:45PM – 4:00PM Coffee Break Tate Center 481

4:00PM – 5:00PM Forum on Integrative Conservation Tate Center 480

Noting Common Challenges in Practicing Integrative Research and Brainstorming Creative Ways Forward

4:00PM – 4:10PM Introduction to Forum

4:10PM – 4:40PM Small group discussions

4:40PM – 5:00PM Synthesis

5:00PM – 7:00PM Reception Tate Center 481

Abstracts

SESSION 1

9:15AM – 10:30AM

GOVERNING LIFE: ENGAGING THE POLITICS OF GENETICALLY MODIFIED CROPS IN KENYA

Lowery Parker

Department of Geography, University of Georgia

There is an increasing push from promoters of genetically modified (GM) crops to end the debate over their safety and get on with the business of developing and marketing GM products. GM seed developers and their supporters are now declaring a scientific “consensus” regarding the safety of GMOs in terms of human and environmental health. This is paralleled by a “consensus” in the development industry that GM crops are necessary weapons in the fight against hunger. Yet, these narratives are being opposed in scientific communities and political arenas around the world. Many countries are in the process of creating laws to regulate GMOs in line with international agreements, but are finding regulatory measures insufficient to address social and ethical aspects of GM technology.

In 2012, for example, the President of Kenya called for a complete ban on the import and consumption of GMOs until the country could certify their safety. This ban has mobilized heavy resistance from pro-GM groups as investment in African agriculture reaches an all-time high. These groups include transnational corporations, philanthropic foundations, state-based development organizations, and “local” scientists seeking to promote a consensus regarding the essential role of agricultural biotechnology in development. This paper will draw on insights from Marxist critiques of political economy and Gramscian notes on science, politics, and hegemony to investigate the modes of power that position GM crops as common sense solutions to hunger, including the technical processes of risk assessment and the production of scientific knowledge that foreclose political action opposing GMOs.

EXAMINING SOCIAL AND BIOPHYSICAL VULNERABILITIES TO SEA LEVEL RISE ON THE GEORGIA COAST

Dean Hardy

Department of Geography, University of Georgia

Current estimates suggest that we are already committed to >1.3 meters of future sea-level rise (SLR) from past greenhouse gas emissions and that global sea level will rise at least one meter by 2100. In the contiguous U.S., there are nearly two million houses and more than 3.7 million residents located less than one meter above the current high tide; and in Georgia, there are nearly 16,000 houses and over 28,000 residents in this zone directly exposed to the hazard of SLR (Climate Central 2012). To date, the majority of studies assessing SLR effects on coastal communities and ecosystems have focused on quantitative modeling of the *biophysical* vulnerability of wetlands and coastal properties to increased flooding and inundation, while too often assessing the social aspects only through useful, but limited economic cost-benefit analyses. Within human geography, however, many scholars have highlighted the importance of the social, political, and ecological environments, i.e. the situated context, in shaping *social* vulnerability to environmental hazards, but social scientists have only just begun to explore the issue of social vulnerability to SLR. However, scholars in these fields have not yet adequately investigated spatiotemporal overlaps in social and biophysical vulnerabilities to SLR, nor how social-ecological linkages contribute to their mutual production. This paper examines the spatial correlations in modeled outputs of social vulnerability and topographic vulnerability to inundation from SLR, but it also suggests that pairing geospatial analyses with ethnographic inquiry will lead to a better understanding of the role of social-ecological linkages in producing vulnerability.

LESSONS FOR INTEGRATIVE CONSERVATION FROM A PARTICIPATORY CIFOR PROJECT

Walker DePuy

Department of Anthropology, University of Georgia

From May to December 2013, I participated in a pilot CIFOR research project entitled, “Participatory Measurement, Reporting, and Verification (MRV): Addressing the Scales.” This project was designed to investigate enabling conditions for a national carbon MRV system in Indonesia to be enacted with participation from local communities and across local-to-national governance scales. Such “PMRV” schemes are still largely theoretical; however, the hurdles to their implementation are varied and numerous. These hurdles also differ depending on location. With this in mind, mixed methods (surveys, focus group discussions, key informant interviews, and participatory mapping) were deployed across three sites (Central Java, West Kalimantan, and Papua provinces) to interrogate their capacity and potential for PMRV activities.

Attentive to multiple scales, respectful of context and local conditions, reflexive in approach, and adaptive in design, I would argue the purpose, design, conduct, analysis, and outcome of this research offer valuable insights for the still-evolving field of Integrative conservation and its goals of advancing conservation science/practice, bridging the theory/action of diverse researchers and practitioners, and communicating such work strategically to a wide variety of audiences. I present here lessons learned, difficulties and complexities encountered, and areas for further exploration regarding the CIFOR project mentioned above and such emerging integrative research.

EMOTIONAL LANDSCAPES AND SENSES OF PLACE IN THE NATURE CONNECTION MOVEMENT

Jennifer DeMoss

Department of Anthropology, University of Georgia

Over the last few decades, scholars have recognized the growing alienation of North Americans from nature. People are migrating to urban areas; outdoor recreation has declined; and human experiences in nature are increasingly rare (Miller 2005). Nabhan and St. Antoine (1993) argue that this trend is leading to the “extinction of experience” (239). Environmental educators try to counter environmental alienation by cultivating emotional attachments and knowledge that lead to senses of place and, presumably, responsible environmental behavior (Ardoin 2006). Members of an environmental social movement called the Nature Connection Movement (NCM) claim that their experiential education methods can help participants connect with local nature. My research will explore the practices and ideologies of natural resource conservation on local landscapes within an NCM organization in Heathcote, Ontario. This project contributes to ethnoecology literature on the connections between environmental experience and worldviews, and supports educational and social movement theory on perceptual transformations within informal environmental education communities. I will use a combination of sensory ethnography and geography methods to answer my questions with a sample of child and adult NCM participants in Heathcote. Through participant observation, interviews, mapping exercises, and video ethnography, I will explore environmental worldviews and activities, emotional connections to local landscapes, and the creation of embodied senses of place.

Resources

Ardoin, N. M. (2006). Toward an Interdisciplinary Understanding of Place: Lessons for Environmental Education. *Canadian Journal of Environmental Education* 11, 112-126.

Miller, J. (2005). Biodiversity Conservation and the extinction of experience. *TRENDS in Ecology and Evolution* 20(8), 430-434.

Nabhan, G. & Antoine, S. (1993). *The Biophilia Hypothesis*. Washington, D.C.: Island Press.

WITH A LOVE FOR THE LAND: IÑUPIAQ SUBSISTENCE AND THE ‘POLITICS OF NATURE’ AT THE HEART OF ENVIRONMENTAL INJUSTICE IN THE ALASKAN ARCTIC

Alana Shaw

Department of Geography, University of Georgia

The Native village of Wainwright, Alaska is poised to become the geographic epicenter of the nation’s controversial offshore drilling program in the Arctic. With a tentative agreement already brokered with Shell Oil to act as the land

base for its pioneering drilling efforts, Wainwright leaders have begun careful deliberations regarding their community's future in the context of these impending changes. Of particular concern is how village residents can partake in the substantial economic growth promised by this development without compromising the traditional practices and Iñupiat values that have long sustained their subsistence lifestyles.

This presentation highlights the use of photo-elicitation interviews as an alternative research method. This technique was employed in Wainwright in order to both document contemporary subsistence practices as well as to explore how the Iñupiat know and relate to the natural world around them in ways that have fundamentally informed this unique mode of life.

The theoretical impetus for this research comes from two areas of scholarly interest: the notion of nature as a social construct and the environmental justice concept of cultural 'misrecognition.' Here it is argued that an unwillingness to consider the distinctive worldviews that support indigenous understandings of nature constitutes a profound form of environmental racism. This project therefore contends that if a changing Arctic is ever to be managed in a socially just manner that adequately represents the interests and concerns of the Iñupiat, decision-makers must engage with the cultural differences obscured by the current 'politics of nature.'

SESSION 2

10:45AM – 12:00PM

THE FUTURE STATUS OF THE GOPHER TORTOISE - FUNDAMENTALLY LINKED WITH THE PRIVATE LANDOWNERS IN ITS RANGE

Rachel L. Bormann

Warnell School of Forestry and Natural Resources, University of Georgia

The gopher tortoise (*Gopherus polyphemus*) is a candidate for federal listing and a keystone species throughout its range in the southeastern U.S. The gopher tortoise's range is limited by its habitat needs of well-drained, sandy soils to allow burrowing, an abundance of herbaceous ground cover for food, and a generally open canopy and sparse shrub cover. Within Georgia, most of this ideal tortoise range is located on state and privately-owned lands and their habitat typically requires active management involving fire or other thinning of shrub and hardwood cover and may or may not be consistent with current ownership's land objectives. The goal is to identify consistent goals between the gopher tortoise habitat and landowners, and how to best get these landowner's involved. From there we need to connect these landowners to provide habitat not just for a few individual tortoises but for connected populations throughout southern Georgia.

WHEN DRIVERS AND TERRAPINS COLLIDE: INTEGRATIVE CONSERVATION OF DIAMONDBACK TERRAPINS (*MALACLEMYS TERRAPIN*) ON THE JEKYLL ISLAND CAUSEWAY

Brian A. Crawford¹, John C. Maerz¹, Neelam C. Poudyal¹, Clint T. Moore¹, Nik Heynen², Nathan P. Nibbelink¹, & Terry M. Norton²

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²*Department of Geography, University of Georgia*

³*Georgia Sea Turtle Center, Jekyll Island, GA*

Conservation management of human-wildlife conflicts should be ecologically sustainable and socially acceptable. Roads are a pervasive anthropogenic threat to diamondback terrapins (*Malaclemys terrapin*) across the majority of their range. For example, 100-400 female terrapins are killed annually just on the 6-mile causeway to Jekyll Island, GA. Beginning in 2009, researchers at the University of Georgia and Georgia Sea Turtle Center collaborated to conduct a two-phase conservation initiative to reduce road effects on terrapin populations while also considering the attitudes of humans using the Jekyll Causeway. In Phase 1, we estimated rates of road mortality, as well as nest predation by raccoons, and these threats were predicted to cause modest to severe population declines. We identified that terrapin emergence on roads is temporally and spatially predictable, creating an opportunity for targeted management actions. In Phase 2, we surveyed Jekyll patrons in order to rank proposed management actions by overall public acceptability and identify conflicting attitudes among stakeholder groups. We found strong support

for actions that did not impact causeway aesthetics or speed limits. Patrons had highly conflicting, but mostly negative, attitudes toward strategies involving raccoon removal. We will use these findings to improve communication and buy-in among stakeholders. Beginning in 2013, we have deployed and are in the process of testing acceptable strategies, including flashing warning signage, short fencing, and roadside vegetation removal. If found effective, these management tools can be adapted to mitigate road threats throughout the terrapin's range, and for other at-risk wildlife.

FRAMING THE SOCIO-ECOLOGICAL DECISION CONTEXT OF PUBLIC ALLIGATOR HARVEST PROGRAMS IN THE SOUTHEASTERN UNITED STATES

Tara Gancos Crawford and Dr. Clint Moore

Warnell School of Forestry & Natural Resources, University of Georgia and the USGS Cooperative Fish and Wildlife Research Unit

The American alligator (*Alligator mississippiensis*) is an iconic symbol of the southeastern United States and as a large-bodied prehistoric reptilian predator and contemporary game species, its conservation is representative of both universal and unique challenges in wildlife management. After surviving for tens of millions of years, alligator abundances dwindled in the middle part of the last century due to commercial over-exploitation and habitat degradation caused by expanding coastal human populations. Since their recovery from near extinction, they have reestablished themselves as an ecological nexus in southeastern wetlands and an object ascribed with varied cultural values. The alligator is the linchpin in a complex social-ecological system shaped by interrelated earth and human histories and constituent feedbacks. In this talk, I will present preliminary understanding of the pluralistic nature of human-alligator associations as they currently exist and evolve in relation to public alligator harvest programs in Georgia, Florida, South Carolina and Alabama. Insights regarding the intermingling of wildlife, culture, politics and geographic, ecological and anthropogenic landscapes will be discussed, specifically in relation to the structured decision making process recently initiated by the authors of this presentation and the four states listed above. Additionally, I will touch on how deeper understanding of the connections between space, time, people and alligators edify different sources of uncertainty; uncertainties that are common in wildlife management and confound our efforts to evaluate the tradeoffs inherent in managing a species that is simultaneously revered, pursued, and feared by society.

ASSESSING THE SOCIO-ECOLOGICAL RESILIENCE OF A SALT MARSH ESTUARINE FISHERY TO THE EFFECTS OF SEA LEVEL RISE

Rachel K. Guy

Warnell School of Forestry & Natural Resources, University of Georgia

Sea levels are projected to rise 0.5 m - 2 m over the next century. The magnitude of the impact inundation will have on coastal ecosystems and their provided services is currently unknown. Salt marsh dominated estuaries are thought to be particularly vulnerable to sea level rise. A prevalent ecological theory proposes that highly productive salt marshes provide critical nursery habitat to a variety of fish and decapod crustaceans. Many of these species are exploited by commercial and recreational fisheries. Thus, there may be thresholds at which a decline in salt marsh triggers a decrease in exploited fish populations. Compounding this threat are the challenges in governing sustainable fisheries, given management reliance on fisheries dependent data, provided by the fishers themselves. In the estuarine fisheries managed in Georgia, non-commercial fishermen, while under creel limits, are under no obligation to share the records of their catch with the managing agency. Given the heterogeneity in the non-commercial fisher population, the catches that are reported may be only represent one type of user, skewing the data which managers use to set regulations. The objectives of this research are to (i.) describe the relationships of estuarine-dependent species with salt marsh landscape characteristics; (ii.) project the changes to suitable habitat for these species under alternative futures of sea level rise; (iii.) characterize the fisher population in terms of their willingness to share catch data; (iv.) and determine how changes in accessibility to the fishery due to sea level rise may change fisher behavior.

SOCIO-ECOLOGICAL DIMENSIONS OF SMALL-SCALE FISHERIES GOVERNANCE IN A BRAZILIAN MARINE EXTRACTIVE RESERVE

Emily Horton

Department of Anthropology, University of Georgia

In recent decades, dramatic declines in fisheries have occurred around the globe. Small-scale fisheries are of special significance, considering they provision over half of the world's wild-caught seafood, employ the majority of its fishers, and are often promoted as a sustainable alternative to large-scale industrial fisheries (Shester and Micheli, 2011). Marine Extractive Reserves (MERs) are a new type of Marine Protected Area in Brazil (da Silva, 2004) and represent the most significant effort by the government to protect common property resources of small-scale fishers (de Moura et al., 2009). An underlying assumption of the MER framework is that introduced governance shifts can lead to a win-win scenario, whereby the livelihoods and cultures of traditional people are safeguarded *and* natural resources are conserved (de Moura et al., 2009). While scholars have illuminated seemingly favorable elements of the MER framework, they are still evaluating MER ability, as promoted, to achieve win-win objectives. Broadly, the proposed research aims to increase understanding on the performance of Cururupu Marine Extractive Reserve, located in northeastern Brazil. Specifically, I will perform a multi-level institutional analysis that gives attention to power dynamics, to ask how governance, knowledge, and political economic processes contribute to or constrain the reserve's ability to meet its objectives. Through increased understanding of MER performance, this research is expected to generate insight capable of informing more effective and equitable policy regarding sustainable governance of small-scale fisheries.

References

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- da Silva, P.P. (2004). From common property to co-management: lessons from Brazil's first maritime extractive reserve. *Marine Policy* 28(5), 419-428.
- de Moura, R.L., Minte-Vera, C.V., Curado, I.B., Francini-Filho, R.B., Rodrigues, H.D.C.L., Dutra, G.F., Alves, D.C., & Souto, F.J.B. (2009). Challenges and Prospects of Fisheries Co-Management under a Marine Extractive Reserve Framework in Northeastern Brazil. *Coastal Management* 37(6), 617-632.

SESSION 3

1:45PM – 2:45PM

HOT POTATO: CONSERVING THE “AGRI-CULTURE” OF CHILOÉ’S POTATOES, PEOPLE, AND ECOLOGY

Richard Vercoe

Department of Geography, University of Georgia

This presentation is intended to introduce my proposed dissertation research on the Globally Important Agricultural Heritage System (GIAHS) program, the Chiloé Project. The UN-Food and Agriculture Organization created the GIAHS program to protect heritage food systems as reserves of crop genetic diversity and as models of long-term sustainability in socio-ecological systems. Worldwide, traditional agrarian systems, or heritage systems, feed billions of people and maintain global agricultural biodiversity, resilient ecosystems, and valuable agricultural knowledge. Aggressive international and state-level investment in industrial agro-export strategies in developing regions threatens many traditional agrarian systems that have sustained local communities for thousands of years. The GIAHS projects are attempting to curb the abandonment of vital agricultural ecosystems and cultural traditions by recognizing and supporting semi-autonomous food production systems that have evolved from highly complex and resilient human-environment interaction over thousands of years. I propose to conduct a critical analysis of the Chiloé Project in southern Chile to better understand the cultural and agroecological implications of sustainable conservation initiatives for improving local and regional well-being while meeting international germplasm interests. This research is intended to provide critical yet applicable analyses for use in the local conservation of agricultural knowledge and genetic biodiversity as well as developing more cooperative agroecological conservation models.

LINKING PASTORALISM AND LANDSCAPE ECOLOGY IN LAIKIPIA, KENYA

Ryan Unks

Warnell School of Forestry and Natural Resources, University of Georgia

In Laikipia, Kenya, as in many other areas in east Africa, changes have occurred over the past century that have directly impacted pastoralist access to land in addition to affecting how strategic seasonal grazing access is secured and regulated. Changes that influence pastoralist herders' abilities to track seasonally variable resources within semi-arid environments are known to have dramatic livelihood impacts, but few studies have linked these social impacts of fragmentation to ecological dynamics at the landscape scale. Currently, the predominant international NGO approach to enhancing wildlife habitat on pastoralist land in Laikipia involves encouraging communities to enter into conservation agreements where livestock-excluded conservation areas are created in exchange for infrastructure and services. However, numerous other changes in customary institutions and herding practices also frequently occur that may have implications for livelihoods and ecological dynamics. This proposed PhD dissertation research will focus on ecological and social dynamics in Mukogodo Maasai pastoralist communities and will explore: spatial relationships of changes in plant community composition in relation to changes in grazing practices, the social and institutional factors that mediate these relationships over time at different spatial scales, and the implications of interrelated changes in social and ecological dynamics for livelihoods, sustainability, and novel natural resource management regimes. I propose an examination of the impacts of these transitions in historical context with a multi-scalar approach that employs landscape ecology and institutional analysis frameworks, and discuss preliminary research on the ecological and social impacts of shifts in grazing management institutions. Focus group discussions and surveys are being carried out with the aim of understanding social changes, ecological changes, and barriers to sustainability from herder's perspectives. Recent changes in herding practices are currently being explored using spatial analysis of survey data, with the intention of comparison to land-cover change vegetation analysis using remotely-sensed images. Preliminary results support the need for a more robust consideration of pastoralist practices and ecological knowledge in conservation endeavors not only in order to improve social outcomes, but to enhance landscape scale wildlife conservation.

THE USE OF A STREAM-AQUIFER MODEL (SAM 2) AND AN ENDANGERED MUSSEL DAMAGE FUNCTION IN ORDER TO RECOMMEND GROUND WATER VALUATION AND POLICY CHANGES FOR FUTURE IRRIGATION REDUCTION AUCTIONS IN THE LOWER FLINT RIVER BASIN, GEORGIA, UNITED STATES

Shannon N. Bonney, Carrie K. Jensen¹, J.D. Mullen², John Dowd³, Catherine S. Bartenstein, and Kelly A. Robinson

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²*Department of Agricultural and Applied Economics, The University of Georgia*

³*Department of Geology, The University of Georgia*

Although the United States possesses the greatest diversity of mussels in the world, many species are in decline and have been federally listed under the Endangered Species Act or are already extinct. In the Apalachicola-Chattahoochee-Flint (ACF) River Basin that extends through southwest Georgia and into Alabama and Florida, three species are now extinct, seven are endangered, and six more are considered threatened. Low stream flows are highly correlated with mussel mortality, especially among the rare and largely endangered species. Given the occurrence of drought in southwest Georgia, along with already reduced stream levels from ground water pumping for irrigation, estimates show the probability of mussel extinction is eight times more likely under the current flow regime than the historic regime. Inclusion of ground water in future Irrigation Reduction Auctions (IRAs) could be a positive step toward providing for in-stream flow requirements of endangered mussels during droughts in the Lower Flint River Basin, Georgia. However, in order to accurately value the benefit of forgoing ground water-based irrigation, a number of factors must be addressed. The primary purpose of this paper is to use stream-aquifer interactions, represented by the SAM2 stream-aquifer model, and mussel biology, via an endangered mussel damage function, to determine a spatially-differentiated fair market value to pay farmers to suspend ground water pumping during droughts. An additional purpose is to propose policy changes to the IRAs that will increase their efficiency in terms of money spent by the Georgia Environmental Protection Division per gains to endangered mussel populations.

DURABLE SOCIAL LANDSCAPES: WIDENING THE LENS ON SOCIAL CHANGE IN PARTICIPATORY NATURAL RESOURCE MANAGEMENT

Jonathan P. K. Hallemeier

Department of Anthropology, University of Georgia

Public participation in natural resource management (NRM) is meant to empower communities, make use of local knowledge, and result in more sustainable, equitable, and legitimate decisions. While participation is now widely practiced in NRM, it often fails to meet these goals. Informal aspects of governance, such as perceptions of trust and legitimacy among stakeholders and managers, greatly influence success and failure. Research has examined how such perceptions facilitate or hinder participatory initiatives and how participation can be structured to foster these informal elements. Current literature often does not study these perceptions as rooted in and influenced by a larger social landscape that may not be susceptible to significant transformation within participatory decision-making processes. My dissertation research will investigate how perceptions of trust and legitimacy in NRM decision-making relate to broader social variables and how these perceptions express themselves and change within the context of a management plan revision for the Nantahala-Pisgah National Forests in western North Carolina. Building on current projects in the region, I will sustain and expand interview and data collection during the next three years of the Forest Service plan revision, acquiring a rich, longitudinal data set. This research will contribute to understandings of the dynamics of the informal, social aspects of participatory natural resource governance which underlie success in achieving the goals of participation.

SESSION 4

3:00PM – 3:45PM

HOSTING A GOOGLE MAPUP IN BELLBIRD BIOLOGICAL CORRIDOR OF COSTA RICA

Steve Padgett-Vasquez

Department of Geography, University of Georgia

Millions of tourists visit Costa Rica every year. The Internet has made it easy for tourists to find information about attractions, lodging, and other services. Tourists also have the power to influence the future of small business based on their reviews. Negative reviews may prompt a small business owner to address an issue. Positive reviews may attract more tourists. However, not all tourist related services can be found online. Many small businesses do not have the human resources or capital to have a web presence. Google MapUp is one way many small businesses can start having a web presence with no financial cost to their income. Google Map maker allows users to add and update geographic information in Google Maps and Google Earth. After updates have been reviewed, they appear online for anyone to see. A MapUp is an event where a group of people improve places that they know. I plan to host a Google MapUp in the Bellbird Biological Corridor of Costa Rica with the hopes that it would help increase rural and agricultural tourism in the region.

EVALUATION OF THE NUTRITIONAL STATUS OF REHABILITATED GREEN SEA TURTLES (CHELONIA MYDAS)

Jennifer Bloodgood

Warnell School of Forestry and Natural Resources, University of Georgia

Great efforts are being undertaken to study and conserve endangered green sea turtle populations, often resulting in animals being placed under human care where our understanding of the dietary requirements for this species are poorly understood. The lack of understanding about nutrition can significantly impact the recovery process of injured or diseased green turtles that are rescued and brought into rehabilitation facilities since proper nutrition is key to recovery. High protein/calorie food items and tube feeding formulas are often selected early in the rehabilitation process to combat poor appetite and emaciation; however, this may result in other gastrointestinal issues and eventual obesity. The goal of this project is to monitor the nutritional status of stranded green turtles throughout the rehabilitation process and to compare plasma biomarkers in rehabilitated animals to those in healthy free-ranging green turtles in order to make dietary modifications and develop new gel-based diets that will enhance the recovery process of green turtles managed under human care.

DETERMINING STREAM CONNECTIVITY IN EL YUNQUE NATIONAL FOREST, PUERTO RICO

Jessica C. Chappell and Cathy M. Pringle
Odum School of Ecology, University of Georgia

Water from the streams that drain El Yunque National Forest is in high demand for human consumption. A 2004 water budget estimated that 70% of water runoff in El Yunque is diverted, allowing only 30% to flow to the ocean. A withdrawal rate this high is potentially unsustainable for animals living within the streams; however, a decrease in human water demand is unlikely as Puerto Rico has one of the densest populations worldwide. As water is removed, connectivity of the streams to the ocean is drastically reduced. This negatively impacts migratory organisms which depend on the stream's connection to the ocean to complete their life cycle. These organisms include native shrimps, which have been found to provide essential ecosystem services. Due to the shrimps' dependence on the connectivity of streams to the ocean, shrimp survival can be incorporated into an index of connectivity. This project plans to further refine and develop a preexisting connectivity index for El Yunque which utilizes shrimp survival. Additionally, a connectivity index will be determined per stream for each month within El Yunque as connectivity varies through time. Examining shrimp survival may also allow further insights into shrimp population dynamics such as where sources and sinks exist. Identifying the location of barriers within the streams would also assist in determining which shrimp populations may be sources.

PRONOUNCED PROGRESS IN LA PLATA? A CRITICAL ASSESSMENT OF INTEGRATIVE WATER RESOURCE MANAGEMENT IN LA PLATA BASIN

Katie Brownson
Odum School of Ecology, University of Georgia

Freshwater ecosystems are threatened by the impacts and demands of a rapidly growing industrialized society. While demands on our freshwater ecosystems are increasing, freshwater supply is becoming more unpredictable due to the impacts of climate change and variability. Increased water demand combined with an unpredictable water supply is resulting in a dual environmental and human rights crisis, especially in the developing world. While freshwater biodiversity is declining even more rapidly than terrestrial biodiversity, according to UNICEF and the WHO (2012), 783 million people worldwide do not have reliable access to potable water and 2.5 billion people live without basic sanitation. Integrated Water Resource Management (IWRM) is being promoted by the United Nations as an institutional framework for addressing the complex socioecological dynamics inherent to freshwater resource management. IWRM has been praised for its participatory and holistic approach to water management, balancing social water access needs with the prevention of environmental deterioration. However, others question whether its implementation is achievable in the developing world due to the substantial economic, institutional and infrastructural investments required. IWRM has not conclusively demonstrated that it can achieve effective water governance in the developing world, so more thorough, context-dependent analyses are needed. This presentation will assess the viability of IWRM implementation in La Plata Basin, South America. Challenges in implementing the integrative framework will be identified and recommendations will be made for future applications of IWRM in the region.

JUMPING THE SPECIES BARRIER: ZOOZOSES AS BOTH A PUBLIC HEALTH AND CONSERVATION ISSUE

Caitlin Mertzlufft
Department of Geography, University of Georgia

Zoonotic diseases, or those that are transferable between humans and animals, comprise 75% of newly emerging infectious disease among humans. Of the 1,461 diseases that are currently attributable to humans, 60% are known to infect other species. Given our ever growing population, and both the corresponding increase in livestock population to support consumption demands and the increased contact between human settlements and wilderness as cities expand, the risk for new infections is expected to rise. I seek to quantify how anthropogenic land use and landscape changes affect zoonotic disease incidence and prevalence among humans, domestic animals, and wildlife. I am also

interested in the perception of zoonotic disease occurrence and transmission, and in understanding the role of this perception as both a barrier and incentive to conservation practices.

PUBLIC UNDERSTANDINGS OF HAZARDOUS WEATHER

Amy C. Nichols

Department of Geography, University of Georgia

Work at the intersection of weather and society has been dominated by a “deficit model” approach and claims that better communicating uncertainty, improving forecasts and warnings, and educating the public will solve the problems of losses to weather extremes. At the same time, some studies have recognized the role of experience, beliefs, and “myths” in response to hazardous weather. These findings point to problems in the assumption of a deficit model and suggest that a reconceptualization in approaches to issues in the social science of weather is needed that considers public understandings of the weather that is informed by but not determined by scientific information alone. This presentation, informed by research on public understandings of climate change and air quality, considers a new approach to weather and society that starts from lay knowledge of weather rather than the scientific information.

TOWARDS A RENEWED POLITICAL ECOLOGY OF SOIL: SCIENCE, RACE, AND GOVERNANCE IN THE 1971 CHARLESTON COUNTY (SC) SOIL SURVEY

Levi Van Sant

Department of Geography, University of Georgia

In March of 1971 the USDA published an 82-page soil survey of Charleston County, South Carolina. This exhaustive document was the result of nearly a decade of collaborative work between the USDA's Soil Conservation Service, Forest Service, and the South Carolina Agricultural Experiment Station. At the time, the South Carolina Lowcountry—the coastal region centered on the port city of Charleston—was one of the world's leading producers of fresh tomatoes. Scientists from the nearby USDA truck crop experiment station provided the knowledge that fortified the increasingly centralized and capital-intensive monocropping of tomatoes, while DiMare Fresh - an enormous, vertically-integrated produce firm - extended loans to growers and offered them the only pathway to market.

This paper uses the 1971 soil survey to accomplish two tasks. First, it highlights the racially "color-blind" knowledges and capitalist logics that inform the survey in order to refocus broader political-ecological analysis on the politics of soil. Second, it examines the ways that the soil survey inscribed the logics of colonial capitalism into the Lowcountry agrarian landscape. Most broadly, this paper argues that governance is not only a political economic project but also a racial one.

FORUM ON INTEGRATIVE CONSERVATION

4:00PM – 5:00PM

NOTING COMMON CHALLENGES IN PRACTICING INTEGRATIVE RESEARCH AND BRAINSTORMING CREATIVE WAYS FORWARD

One of the goals of the ICON program is to maintain inter- and intra-cohort relationships to foster greater collaboration and understanding between integrative researchers. This Forum directly addresses this goal by asking participants to identify and share challenges they have come across in attempting to practice integrative research (from framing problems to implementing research and beyond) and explore potential ways of addressing these challenges. This Forum will provide time for reflection on the symposium's presentations as well as constructive collaboration about what it means to “be integrative.”

4:00 – 4:10	Introduction to Forum Break up into groups
4:10 – 4:40	Small group discussions (led by moderators)
4:40 – 5:00	Synthesis (all participants)

Goal:

Reflect on projects underway in the ICON program and engage in a larger discussion of what it means to do integrative work with faculty and other researchers.

Purpose of small groups:

Depending on the number of participants, we will divide up into (up to four) small groups to allow for greater participation. The main purpose of moderators is to ensure that as many voices as possible are given the opportunity to be heard. Each group will be composed of one faculty moderator, one student recorder, and a diverse group of participants (comprising different cohorts, disciplines, etc). Each group will address the same topic and then briefly present the results of their discussion (common themes, creative ideas, etc.) in the synthesis portion of the Forum.

Intended products:

- 1.) Collaborative discussion.
- 2.) Synthesis document. Student representatives will record the small group discussions and transcribe them for later incorporation into a document reflecting the results of collaborative discussion. This document is intended to provide benchmark data for progress in the ICON program as well as suggest creative ways of addressing challenges of integrative research. Possible modes of dissemination include the CICR newsletter, posting on the online forum, or use in future ICON classes.

Acknowledgements

We express our gratitude to Dr. Pete Brosius for agreeing to give the welcome speech. We also thank the Discussion Forum moderators and the faculty volunteering to give presentation feedback throughout the day for their willingness to participate in the Symposium. We would especially like to thank all of the committees for their dedication to organizing the first symposium and for setting an amazing precedent for future symposia organized by ICON graduate students. We want to sincerely thank Katherine Brownson's mother, Dianne Ricker, and aunt, Sue Wood, for offering to cater our reception on a limited budget. And finally, though definitely not least, we thank Morgan Nolan from the Warnell School for lending us audio-visual equipment and donating her time to film the presentations.

Discussion Forum Moderators

Dean Laurie Fowler Odum School of Ecology
Dr. Nathan Nibbelink Warnell School of Forestry & Natural Resources
Dr. Julie Velásquez-Runk Department of Anthropology
Dr. Meredith Welch-Devine Graduate School & Center for Integrative Conservation Research

Presentation Feedback Volunteers

Dean Laurie Fowler Odum School of Ecology
Dr. Jeffrey Hepinstall-Cymerman Warnell School of Forestry & Natural Resources
Dr. Marguerite Madden Department of Geography
Dr. Jennifer Rice Department of Geography
Dr. John Schelhas U.S. Forest Service
Dr. Meredith Welch-Devine Graduate School & Center for Integrative Conservation Research

SIC Committees

Co-chairs..... Dean Hardy, Lowery Parker
Program Committee..... Amy Nichols, Caitlin Mertzluft
Audio-Visual Committee Emily Horton, Katherine Brownson, Joy Ganguly, Levi Van Sant
Feedback Committee Richard Vercoe (chair), Jon Hallemeier
Culinary Logistics Committee Katherine Brownson, Jennifer DeMoss
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Publicity Committee Elizabeth Guinnessy, Steve Padgett-Vasquez
Souvenir Committee Jennifer Bloodgood, Jessica Chappell