SCHOOL OF THE ENVIRONMENT
RESEARCH DAY
APRIL 17, 2019

PRESENTERS

KATE NEVILLE
Assistant Professor, Department of Political Science, and School of the Environment, University of Toronto.

*Fractious Fuels: The Politics of Energy Production for a Low-Carbon Future*

A global dependence on fossil fuels is wreaking havoc with the planet by disrupting biophysical and social systems. In our enthusiasm for reducing carbon emissions, we often turn to technology as the solution, reasoning that if we could just switch energy supplies from carbon intensive to carbon neutral sources, and capture carbon from the atmosphere on a big enough scale, we’d be able to deal with the crises. Further, some scholars and practitioners suggest that a transition away from fossil fuels will not only address the climate challenge but will also lead to social transformation. Imagine distributed energy production at household and neighbourhood scales, through wind turbines and solar panels and biofuels. Envision the replacement of corporate-dominated extractive industries by cooperatives and locally controlled production systems. But our experiences with renewable and alternative energy sources suggest the need for extreme caution. Through case studies of biofuels and fracking, this talk underscores that the urgency of climate change demands a radical rethinking of both our energy systems and also of our social systems. Kate Neville is an Assistant Professor at the University of Toronto, cross-appointed to the Department of Political Science and the School of the Environment.

Session 1: Communities and their Well-being

JOAQUIN BARDALLO BANDERA
Ph.D. Candidate (ABD), Department of Political Science and the School of the Environment.

*Natural Resource Exploitation and Abundance and the Linkages with Social Well-Being Regimes: An Analysis of (Broken) Dreams in Latin America*

The objective of my research is to examine the relationship between booms in natural resource extraction and the improvement in social well-being in Latin America. More specifically, my work will attempt to better understand the relationship between natural resource revenue and abundance and the extent to which social well-being has been promoted, protected or violated by public policy in Latin America. I am seeking to understand how regimes with distinct ideological orientations invested revenues from natural resource extraction during a period of rise in commodity prices. The focus of my research will be on the extent to which the political position of government policies influenced the variance in social well-being during a period when there were abundant resources and an important increase in resource revenue to improve social welfare.

ESTHER LAMBERT
Ph.D. Candidate, Department of Geography and Planning and the School of the Environment.

*Exploring the Full Spectrum of Social Protection Actors/Providers After an Extreme Weather Event: The Case of Tropical Storm Erika in Dominica*

Integration of the fields of social protection (SP), climate change adaptation (CCA), and disaster risk reduction (DRR) has been embraced as conceptually sound; however, more work is needed to better assess the impact of SP programmes and socially-conscious climate disaster programmes on livelihood resilience. More specifically, the role of informal SP systems or networks and support systems amongst family and friends has been largely overlooked within the SP/CCA/DRR discourse. To begin this conversation, however, the full range of informal social protection instruments for use in DRR for CCA needs to be acknowledged within the current SP/CCA/DRR integration discourse. Most of the scholarly work on the role of SP programmes in the context of climate shocks are centered around formal SP and heavily focused on rural communities in South Asia and Sub-Saharan Africa, leaving much room for investigation into Caribbean Small Island Developing States (SIDS) like Dominica, whose residents suffered devastating impacts from Tropical Storm Erika in 2015. This presentation identifies a wide range of social protection arrangements at work for a sample of 191 households in four Dominican communities severely impacted. While formal social protection played a significant role, effective, long-term recovery depends on a thoughtful coordination of formal and informal social protection arrangement, strengthening existing social networks and trust relations, and an avoidance of duplicated efforts.
Session 2: Experiencing the Environment

COSMIN MARMUREANU
Ph.D. Candidate, Ontario Institute for Studies in Education and the School of the Environment.

Examining the Relationship Between Vegetation and Student Achievement

Previous studies have shown there is a correlation between higher student achievement and larger amounts of vegetation even when other confounding factors have been taken into consideration. I hope to establish causation by using a panel design study that looks at student achievement before and after an ice storm that wiped out a large percentage of vegetation in the city of Toronto. To do this I will collect satellite imagery from the summer before and after the ice storm, in order to compare tree loss. Then, I will use student level report cards, and other achievement data, to see if those students who attend schools in areas with the largest amount of vegetation loss experience a decrease in achievement.

MEAGHAN WEATHERDON
Ph.D. Candidate, Department for the Study of Religion and the School of the Environment.

Mapping the Land on Foot: Walking as a Performative and Embodied Cartography in the Journey of Nishiyuu

Geographic myths and technologies give form and meaning to Canada as a colonial country. Yet, Indigenous Nations continue to deploy a variety of spatial strategies of their own making to contest ongoing colonialism. This paper posits that walking the land within the Journey of Nishiyuu can be understood as an embodied and processual cartography that actively contests Canada’s colonial geographic imagination. I suggest that by walking the land the Nishiyuu, youth transcend social boundaries to establish links of affinity between disparate groups of peoples, ultimately to produce a geography of resistance against settler indifference. Furthermore, such an embodied and process-ual cartography also actively challenges divisions between nature and culture, sacred and secular, in order to assert an Indigenous sense of place within the public sphere.

Session 3: Pollution and its Consequences

JON OBNAMIA
Ph.D. Candidate, Department of Chemical Engineering and Applied Chemistry and the School of the Environment.

Life Cycle Greenhouse Gas Emissions of Biofuels: An Engineering and Policy Perspective

Biofuels have the potential to reduce the greenhouse gas (GHG) emissions compared to conventional fuels. However, to realize actual environmental benefits, a quantitative approach to estimate GHG emissions of biofuels over its life cycle is necessary. About 80 percent of the life cycle GHG emissions of conventional fuels are from its combustion since it releases carbon that had been geologically removed from the atmosphere for millions of years. For biofuels made from biomass, combustion CO₂ is negat-ed because of the equivalent uptake of atmospheric CO₂ during biomass growth. A life cycle approach shows that other stages in a biofuel’s life cycle can contribute significantly to its overall GHG footprint, and thus help determine where improvements can be made. In this presentation, Jon will give an overview of life cycle assessment of aviation biofuels and provide a case study on potential Canadian aviation biofuel pathways.

ARIOLA VISHA
Ph.D. Candidate, Department of Department of Physical and Environmental Science, UTSC, and the School of the Environment.

Assessment of the Integrity of Fish Communities in the Great Lakes Area: A Bayesian Perspective

Legacy contaminants, mercury (THg), and PCBs are of a particular concern in the Great Lakes. Persistent contamination over the years has posed constraints on the placement of consumption advisories in highly prized sport fish. Fish are useful ecosystem health indicators in aquatic environments. This study examines the spatio-temporal trends of mercury and PCBs in 11 fish species across all of the Canadian Great Lakes. Dynamic Linear Models (DLMs) were used in the first half of the study to detect trends in long-term fish contaminant records. In the second half of the analysis, a hierarchical bayesian modeling framework was applied to detect the temporal THg and PCB trends in fish, while accounting for location variability (inshore and offshore locations), areas of concern, and the impact of invasive species on fish contamination trends. The novel modeling framework presented in my study can be used to elucidate a wide range of environmental problems such as predicting liver tumour occurrences in fish communities, and HAB (harmful algal bloom) formations in different locations around the Great Lakes.
CHELSEA M. ROCHMAN
Assistant Professor, Ecology and Evolutionary Biology, University of Toronto.

The Effects of Plastics in our Aquatic Environment

Plastic pollution is reported in freshwater and marine habitats globally. Hundreds of species, across multiple trophic levels, are contaminated with plastic, and effects have been demonstrated across several levels of biological organization. Using recent insights, this presentation will discuss the sources, fate, and impacts of plastic in aquatic ecosystems. Chelsea Rochman is a trained Ecologist with emphases in Marine Ecology, Ecotoxicology, and Environmental Chemistry. She is interested in the side-effects of industrialization on the environment and its inhabitants. Her broader research interests regard the ecological effects of anthropogenic contaminants on wildlife and human resources (e.g. water, seafood). More specifically, her current focus is the implications of the infiltration of plastic debris into aquatic habitats. In addition to her academic research, Chelsea participates in policy meetings and working groups to translate scientific research beyond academia.