



School of the Environment  
**UNIVERSITY OF TORONTO**



# 2012 ANNUAL REPORT



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**Douglas Macdonald**, Senior Lecturer, Environment  
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**Brad Bass**,  
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**Satyendar Bhavsar**,  
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# Message from the Director

BY DONALD JACKSON,  
Interim Director, School of the Environment.

Welcome to the new School of the Environment! During recent years the Centre for Environment, the Faculty of Arts and Science and our many cognate departments inside and outside the Faculty have been considering ways to further strengthen and deliver on the University's commitment to high quality teaching and research in the broad field of environment. As a result of these extensive discussions, the School of the Environment was determined to provide the best opportunity to deliver on these challenges and officially started July 1, 2012. The School provides an opportunity to build on our existing strengths, enhance our connections inside and outside the University, and to engage in new challenges.

As part of the discussions around the future of the Centre/School, our undergraduate programs were a focal point for discussion given the many students taught within our courses and programs, and the ever increasing interest in environmental issues shown by our diverse undergraduate population. Several years ago, our **major in Environmental Studies** was retooled and has proven to be very popular – in fact, so popular that we have significant challenges in accommodating all the students interested in taking our courses. The School and associated units have been working diligently since last spring to further enhance this program, increase student opportunities and experiences, and to broaden our connections with other departments. In parallel, we have been working to develop a **new and improved Environmental Science major** to offer our students an exciting program that will involve active participation by the many science departments within Arts and Science. Given the phenomenal strength in research and teaching in the environment available here, we see wonderful opportunities to integrate and highlight them in delivering these high quality programs.

The University and Faculty have a goal to engage our students in **international courses and experiences** in order to broaden their education, experiences, and to better prepare them for careers which are increasingly international in nature. This past year, our students were fortunate to capitalize on opportunities such as our inter-national exchange program with the National University of Singapore, our existing field course that examines natural and social science issues of the Andes, Amazon and Galápagos (*see page 12*), and a new course on scarce resource of water offered this past summer at The Hebrew University of Jerusalem (*see page 10*). We also have two new courses in development for this coming year – a course examining marine and desert systems in Israel and a field course in Australia. Several of our students also include inter-national components to their independent research projects and professional internships (*see page 13*). As our students are extensively involved in research, teaching, and volunteer activities in the Greater Toronto Area, these international options provide valuable experience in understanding global problems, alternative solutions and cultural perspectives.

Our graduate programs remain an active area of collaboration across the University (*see page 15*). Given the inter-disciplinary



nature of our collaborative programs in Environmental Studies and in Environment & Health, we draw students from diverse areas such as Physics to Philosophy and Public Health to Chemical Engineering, thereby providing them with a forum to learn from one another, to recognize different perspectives on issues, and the nuances associated with language and concepts in these various disciplines. As part of the new School's mandate, we will be working towards developing additional independent graduate programs to enhance the offerings available to potential students.

The School's **Professional Development and Distance Education Programs** continue to grow and extend both their scope and influence (*see pages 18-22*). Amongst others, new initiatives giving workshops in water finance and sustainable information technology have been offered and well received. The Distance Education program includes students from many areas of the world and provides a convenient means of upgrading their educational background to meet their changing employment responsibilities and interests. I would like to thank the many individuals who contribute their time in serving on the Environmental Finance Advisory Committee and participation in the workshops as it is a critical component of the success of these endeavours.

During the last year we lost several significant contributors from our ranks. The loss of **Professor Rodney White** (*see page 28*) was unexpected and felt given his considerable involvement in environmental research, teaching, and administration, and in leading earlier initiatives that ultimately led to the current School of the Environment. More recently he had been the Academic Advisor for Professional Development in the Centre. The very large crowd attending his funeral clearly demonstrated the impact Rodney had on many. We also bid "farewell" to **Professor Phil Byer** and **Dr. Beth Savan** due to retirement this year and **Professor Kundan Kumar** who moved from his joint position in Geography and the Centre to one in the Faculty of Forestry (*see page 29*). Although their positions and titles may have changed, all remain involved with environmental endeavours inside and outside the University.

I would also like to thank the many contributors to the Centre's and School's success. The faculty, staff and students have been wonderful in their support, ideas and initiatives. Ultimately we all benefit from the strong collegial environment you demonstrate. As well, I would like to thank the many individuals and organizations who have supported us financially. The Canadian Friends of the Hebrew University provided generous support enabling our students to take the water course in Jerusalem, the new Skip Willis Undergraduate Scholarship, and generous contributions to the Peter John Hare Memorial Scholarship in Environment and the Jane Goodall Scholarship. We are also pleased to announce the new Catherine J. Riggall Award for Contributions to Sustainability that the School will administer. Everyone's generosity in time, effort and financial support is appreciated greatly and I look forward to working with you again this year.

# Tracking the fate of metals in Toronto roadside gardens and in Ross Lake near Flin Flon mine

BY CLARE WISEMAN AND MIRIAM DIAMOND



R. Leisner

Professor Clare Wiseman at a roadside garden at U of T's downtown Toronto campus, used in her study to assess metal uptake in garden plants close to traffic.

## From exhaust pipes to plants: the fate of trace metal emissions in roadside gardens in Toronto

A research study led by Professor Clare Wiseman (see page 33) of the School of the Environment is assessing the fate of traffic-related trace metal emissions and their uptake by plants grown in Toronto. The goal is to elucidate how soil trace metal behavior and bioaccessibility are influenced by stabilization processes, as determined by primary physicochemical soil parameters and changing field conditions over time. A wide range of trace metals are being examined, ranging from lead, copper and nickel to the lesser known elements strontium and cerium. The ultimate aim is to assess the hazard potential of gardening in close proximity to traffic and provide a better knowledge basis for more informed decision-making in the establishment of community gardens in Toronto.

Since 2010, Dr. Wiseman has cultivated common garden plants such as oregano and eggplant at four locations with predicted variable traffic metal inputs: two locations on U of T's downtown campus (on the Galbraith Building's rooftop and at the corner of St. George St. and Hoskin Ave.) and two in the west end of Toronto. To control for pre-existing soil contamination and assess the effects of soil ageing on metal bioaccessibility over time, the top 30 cm of soil at the St. George site was replaced with a triple mix soil.

Analyses of road dust, plant tissue and soil samples collected during the 2010 growing season have yielded several important results. First, non-exhaust traffic emissions, due to the erosion of automotive components, may be an important source of metal contaminants in the roadside environment. Second, metal concentrations in plants grown in a high traffic location were significantly higher than in plants grown in a residential location with a low volume of traffic. Also, metal uptake by plants in newer soils in medium traffic was found to be higher than those in older soils in higher traffic, because trace elements are likely to be more bioaccessible in newer soils.

The results also demonstrate that the risks posed to urban gardeners through the consumption of cultivated plants in soils contaminated with moderate levels of metal contaminants generally fall within acceptable limits.

The next phase will continue to explore current trends, as well as examine the role of mineralogical controls on the fate of metals from soil to plants.

For more information, please contact Dr. Clare Wiseman at [clare.wiseman@utoronto.ca](mailto:clare.wiseman@utoronto.ca).

## Assessing metal dynamics and ecotoxicity in Ross Lake near Flin Flon's copper and zinc mine

Professor Miriam Diamond (see pages 34 and 35), of the Department of Earth Sciences, and her lab are working in collaboration with Hudson Bay Mining and Smelting Co. Ltd. (HBMS) on a three-year project administered by the School of the Environment. The project assesses metal dynamics and ecotoxicity in Ross Lake, located in Flin Flon, Manitoba.

Ross Lake has received zinc enriched mine tailing effluents for over 50 years. Due to resuspension of sediments, the lake is a source of zinc to downstream waterbodies. In this project, the general model of metal speciation and fate developed in Dr. Diamond's lab has been adapted to assess metal dynamics and metal ecotoxicity in Ross Lake as part of the nearby mine's closure plan. (Although the mine is not closing, government regulations demand that they develop a closure plan.) In addition to modelling, M.A.Sc. student Sumera Yacoob (Dept. of Chemical Engineering and Applied Chemistry) has visited Ross Lake twice to take measurements of metals, in collaboration with Professor Celine Gueguen of Trent University, which are used to evaluate the model.

Work done on the project by Ms. Yacoob has yielded unexpected results so far and suggest that levels of copper, rather than zinc, would be toxic to animals. She is now wrapping up the work with an expected end-date in fall 2012.

For more information, please contact Dr. Miriam Diamond at [miriam.diamond@utoronto.ca](mailto:miriam.diamond@utoronto.ca) or Sumera Yacoob at [sumera.yacoob@utoronto.ca](mailto:sumera.yacoob@utoronto.ca).

M.A.Sc. student Sumera Yacoob works with Ray Tardiff (standing, from Hudson Bay Mining and Smelting Co.) to deploy passive samplers to assess ecotoxicity of Ross Lake.



E. Goosey

# Assessing contaminants in Ontario fish, related human exposures, and the effects of cooking

BY SATYENDRA BHAVSAR AND DONALD JACKSON

## Research with MOE monitors contaminants in fish in Great Lakes Areas of Concern

**Professor Donald Jackson** (Dept. of Ecology and Evolutionary Biology and Interim Director, School of the Environment; *see page 31*) has an active collaboration with the Ontario Ministry of the Environment (MOE), including **Dr. Satyendra Bhavsar** (Research Scientist, MOE; and Adjunct Professor, School of the Environment), on projects related to contaminants in fish.

Many areas in Ontario underwent environmental degradation over the past century resulting in their being classified or “listed” as significant Areas of Concern by the International Joint Commission. Considerable efforts have been underway to rehabilitate these areas in order to “delist” them. Environmental degradation included contamination by persistent organic chemicals (e.g. PCBs) or mercury which accumulate in fish, resulting in their being considered too contaminated for human consumption. Having recognized the problems related to these contaminants, many were banned or highly restricted. Although this has reduced their addition to the lakes, their persistent nature leads to their longevity.

The work with MOE capitalizes on their extensive monitoring of fish contaminants. One of the projects determines whether these regulatory changes have improved the condition of fish in the Toronto and St. Lawrence River Areas of Concern to levels necessary to meet the objectives for delisting them. Given that levels of these contaminants vary in response to fish size, age, and diet, along with many other environmental conditions, the relationships often present difficult statistical challenges in assessing. Another project addresses these issues in order to better determine the temporal and spatial trends in fish contaminants.

*For more information, please email [don.jackson@utoronto.ca](mailto:don.jackson@utoronto.ca).*

## Human exposure to PFCs in Ontario fish

In a project funded by Health Canada, **Dr. Satyendra Bhavsar** and colleagues from U of T, MOE, and Health Canada are researching human exposure to perfluorinated compounds (PFCs) in Ontario fish caught near point sources and the effects of cooking.

PFCs are a family of fluorine-containing chemicals with unique properties to make materials stain and stick resistant. They have been used in a wide array of consumer products (including Teflon and Scotchguard) as grease and water repellents and are incredibly resistant to breakdown. Studies have shown that Canadians are exposed to PFCs which accumulate in the body. One of the major routes of exposure is via contaminated food, such as fish. In this study, fish are caught in locations near major industrial facilities, a former PFC spill site, and major sewage treatment plants in Ontario and are currently being analyzed for PFC content.

## Cooking fish found ineffective in reducing our exposure to PFCs

Cooking fish has been found to be an effective method of reducing exposure to many organic chemicals, such as polychlorinated biphenyls (PCBs), in fish. There is a lack, however, of information on the effects of cooking on levels of PFCs. As part of the above



**Dr. Satyendra Bhavsar** (Research Scientist, Ontario Ministry of the Environment and Adjunct Professor, School of the Environment) prepares Ontario fish for analysis of PFC content.

S. Bhavsar

study led by Dr. Bhavsar, four fish species samples (Chinook Salmon, Common SCrp, Lake Trout and Walleye) from four locations in Ontario were subjected to three different cooking methods (baking, broiling and frying) and analyzed for PFC content before and after cooking. Perfluorooctane sulfonate (PFOS) was found as the dominant PFC, with levels more than an order of magnitude higher than those reported for fish from grocery stores in Canada, Spain, and China. Although concentrations of PFOS in fish fillets generally increase after cooking due to loss of fish moisture, amounts of PFOS largely remain unchanged. The study concludes that cooking is generally not an effective approach to reduce exposures to PFCs, especially PFOS, from fish consumption.

## Large strategic network developed: NSERC Canadian Network for Aquatic Ecosystem Services

Ecosystem services represent the goods and services that nature provides and are valued by us (e.g. pollination by insects, flood control and nutrient cycling by wetlands). During the past year, **Professor Donald Jackson** (Ecology and Evolutionary Biology and Interim Director, School of the Environment; *see page 31*) has led the development of a large strategic network called the NSERC Canadian Network for Aquatic Ecosystem Services which involves 30 researchers from eleven universities and many governmental, industrial and non-governmental organizations. Two meetings related to the development and external review of the Network were held at U of T this past year.

If funded by NSERC and the partner organizations, the 5-year Network would be hosted and managed by U of T. It would focus on northern wetlands, forest-aquatic systems, and quantitative approaches to assessing aquatic ecosystem conditions. It would address many important issues related to the essential functioning of wetlands, streams/rivers, and lakes in Canada.

# Studying Canadian environmental policy on climate change, transportation, & the oil and gas industry

BY DOUGLAS MACDONALD

The following current and recently completed projects on environmental policy are led by Dr. Douglas Macdonald, Senior Lecturer at the School of the Environment (see page 31). For more information, please contact him at [douglas.macdonald@utoronto.ca](mailto:douglas.macdonald@utoronto.ca).

## Allocating Canadian GHG emission reductions amongst sources and provinces

This three-year project is funded by SSHRC and studies the allocation of Canadian greenhouse gas emission (GHG) reductions amongst sources and provinces, learning from the European Union (EU) and Germany. The project is a collaboration with researchers at the Technische Universität Darmstadt in Germany and Wageningen Universiteit in The Netherlands and addresses the inability of Canadian federal and provincial governments to reach agreement on one national climate-change program, including allocation of cost amongst sources and provinces, in comparison to success in developing such programs in Germany and the EU.

Because it is a true collective-action problem, effective climate policy requires agreement amongst participating jurisdictions, globally and in federated systems, respecting the share of the total cost to be assumed by each. In Canada, this is complicated because provinces like Alberta and Saskatchewan, with fossil-fuel dependent economies, are being asked to pay a much higher price for effective action than others. The project addresses this challenge which is one of the most significant barriers to effective national policy.

To date, reviews of secondary literature and case-study research using primary documents have been done. Interviews with government officials in six Canadian provinces and the Government of Canada, Germany and the EU, and a survey of Canadian climate professionals have been completed. A preliminary report was discussed at workshops in Edmonton, Ottawa and Halifax in 2011. A number of academic conference papers have also been presented. The final project report will be presented to Canadian governments in 2012 and other academic publications are planned.

## Governance innovation and the transition to a low-carbon economy

Dr. Macdonald also received funding from Carbon Management Canada for a two-year project to study innovation in governance practices to address climate change and accelerate the transition towards a low carbon Canada. It is done jointly with **Professors James Meadowcroft** and **Glen Toner** (School of Policy Studies, Carleton University) and graduate students from both universities.

The research led by Dr. Macdonald examines distribution potentially associated with climate change policies, such as inequitable effects imposed upon the poor by a carbon tax. The focus is on regional/intergovernmental, industrial, and social dimensions of climate-related political conflict in Canada. The Carleton portion of the project examines institutional innovations for climate governance in order to understand lessons which might be applied in Canada. Three conference papers were presented in the spring of 2012. Research will continue and further academic publications and a report to governments will be generated in 2013.



*Dr. Doug Macdonald, Senior Lecturer at the School of the Environment, addresses an audience at a seminar presentation.*

## Policy instrument choices influencing sustainable transportation in Toronto

This recently completed project was part of a SSHRC-funded project led by **Professor Jean Mercier** with co-investigator **Professor Mario Carrier** (both from Université Laval) to look at factors influencing urban transportation policy. At U of T, Dr. Macdonald worked with Ph.D. candidates **Amir Ganjavie** (then Geography) and **Scott Sams** (Political Science) to examine policy instrument decisions made by the City of Toronto and the Governments of Ontario and Canada which were intended to shift transportation toward sustainability.

The purpose was to identify the most important policy instrument decisions which may explain the current transportation mix and to gain understanding of how and why they were made. The Laval team is amalgamating the Toronto case findings with those of Seattle, Boston and Montréal to provide a generalized understanding of transportation policy decision-making. The Toronto team will publish results of the Toronto study independently. (*See page 28 for an article on Professor Mercier's visit to U of T in 2011.*)

## The oil and gas industry and Canada's climate change policy

This recently completed SSHRC-funded project examined the recent lobbying history of the oil and gas industry and the varying degree of influence it has had on Canadian federal government climate change policy decisions.

The oil and gas industry's close engagement with the evolution of Canadian environmental policy has resulted in both wins and losses for the sector. The 1995 decision to rely solely on voluntary action was a boon to an industry. On the other hand, lobbyists were powerless to prevent the 2002 ratification of the Kyoto Protocol.

A conference paper was delivered by Dr. Macdonald at the annual meeting of the Canadian Environmental Studies Association in Montreal in 2010. A peer-reviewed article on sources of the agency and structural power of the industry is planned for 2012.

# New partnership with Toronto cycling community hopes to encourage more cycling

BY LAKE SAGARIS

With a partnership development grant from the SSHRC, a new two-year project **Toronto Cycling Think (and Do Tank** (or TCT2) combines expert practitioners and academics to address an important gap in knowledge about building more sustainable cities: how experience from the behavioural change field (applied to building occupants) can be transferred to the field of active transportation. The project's goal is to encourage more people to cycle as their primary means of transportation, particularly over the short distances.

Although effective, even world leaders The Netherlands and Denmark are increasingly pressed to reach the targets they have set, to meet greenhouse gas emission, health, and other crucial policy goals. This challenge is even more apparent in transitioning cities such as Toronto. Although cycling's share of short daily trips has grown, differences by ward reveal that behavioural factors are crucial, if Toronto



is to cash in on the economic, public health, air quality and other benefits.

With this initiative, **Dr. Beth Savan** (see page 29), Senior Lecturer Emerita at the

School of Environment and former Director of the U of T Sustainability Office (see page 24), has built a coalition to map cycling patterns, explore economic benefits and to bring together literature from both environmental psychology and active transportation to develop integrated tools for increasing cycle use in daily transport.

Partners include global experts 8-80 Cities, retail pioneers Curbside Cycling/ Fourth Floor Distribution, media innovators Dandyhorse and Spacing magazines, Toronto Centre for Active Transport, Evergreen Brickworks and ING Bank. The team includes award-winning author and (cycling-) inclusive urban planning expert **Lake Sagaris** and **Toby Bowers** from U of T's Bikechain. They will mentor a team of students, communicating results in relevant journals, conferences and media.

*For more information, please contact Lake Sagaris at [lsagaris@yahoo.com](mailto:lsagaris@yahoo.com) or Beth Savan at [b.savan@utoronto.ca](mailto:b.savan@utoronto.ca).*

## Research Day

*Annual event showcases research of the School's faculty and students*

The following presentations were made at Research Day, held on April 18 2012, during Earth Week. The annual event showcases research done by some of the School of the Environment's faculty and students.

**CHRISTIAN ABIZAID**, Assistant Professor, Department of Geography and School of the Environment. ***Rainforest Livelihoods in the Peruvian Amazon: Lessons for Conservation, Development, and Environmental Change Adaptation.*** In this presentation, Dr. Abizaid provided an overview of some of his ongoing research on traditional forest livelihoods in the Peruvian Amazon. In particular, he talked about two projects that explore the links between rural livelihoods, biodiversity conservation, and environmental change adaptation. (Also see p. 30.)

**GABRIEL EIDELMAN**, Ph.D. candidate, Department of Political Science and School of the Environment. ***Arrested Development: The Politics of the Toronto Waterfront, 1960-2000.*** From 1960-2000, at least three wide-ranging redevelopment plans for the Toronto waterfront were devised, each only partially implemented. This presentation focussed on one key factor that paralyzed waterfront revitalization during this period: the fragmentation of waterfront land ownership — and specifically, public land ownership — across the central waterfront.

**JUSTIN MOK**, Ph.D. candidate, Department of East Asian Studies and School of the Environment. ***Exploring the Relationship Between Humans and the Environment in Modern China.*** This presentation discussed the importance of Sun Yat-sen's (1866-1925) views of the relationship between humans and the environment, which emphasizes



the concern for people's lives expressed in his well-known Three Principles of the People.

**CLARE WISEMAN**, Assistant Professor, School of the Environment. ***The Dirt on Our Dirt: How Gardening in Toronto May or May Not Be Hazardous to Your Health.*** Dr. Wiseman presented some preliminary results on her research which examines the fate of metal(loid) emissions from traffic-related activity in roadside environments and their uptake by cultivated plants in Toronto. (Also see pages 2 and 33).

# Graduate Students' Research

*The School of the Environment is pleased to have students enrolled in its collaborative graduate programs in Environmental Studies and Environment & Health who are conducting interesting and important research. Pages 6-9 contain condensed abstracts of theses or research papers of 2011-12 alumni and listings of research topics of 2011-12 new and continuing students.*

## Environmental Studies Program (noted below as ES)

### 2011-12 Ph.D. Alumni

**NILIMA GANDHI**, Ph.D., November 2011, Chemical Engineering/ES; supervisor: Miriam Diamond, Earth Sciences. *Improvements in Hazard and Life Cycle Impact Assessment Method for Metals in Freshwaters: Addressing Issues of Metal Speciation, Fate, Exposure and Ecotoxicity.* Methods of chemical hazard ranking and toxic impact assessment estimate fate and toxicity assuming the chemical exists in dissolved and particulate phases and, for metals, that all dissolved species are equally bioavailable. However, this introduces a significant error in the estimates of hazard ranking. This thesis develops a new method that introduces Bioavailability Factor (BF) to the calculation of Comparative Toxicity Potentials (CTPs) for hazard ranking of chemicals, also known as Characterization Factors for use in Life Cycle Impact Assessment. This method was applied to assess the implications of choosing characteristics by calculating BFs and CTPs of several cationic metals using 12 European and 24 Canadian ecoregions. The new method was also used to estimate critical loads of metals to surface aquatic systems.

**RALUCA ELLIS**, Ph.D., November 2011, Chemistry/ES; supervisor: Jennifer Murphy, Chemistry. *Using High Resolution Measurements and Models to Investigate the Behaviour of Atmospheric Ammonia.* Atmospheric ammonia contributes to a number of environmental problems, but many questions regarding the behaviour of ammonia in the atmosphere remain. This study investigated the gas-particle partitioning of ammonia, the surface-atmosphere exchange, and compares measurements with an online chemical transport model and offline thermodynamic models. The ammonia time response was found to be slower at lower mixing ratios, and when the ambient relative humidity is high. Results suggest a coupling between gas-particle and surface-atmosphere equilibria whereby a large atmospheric condensation sink induces emission of ammonia from the surface. A fully coupled bi-directional flux parameterization in chemical transport models is believed to be necessary to accurately predict atmospheric ammonia.

**ANGELA LODER**, Ph.D., November 2011, Geography/ES; supervisors: Ted Relph, Social Sciences, UTSC; and Sarah Wakefield, Geography. *Greening the City: Exploring Health, Well-Being, Green Roofs, and the Perception of Nature in the Workplace.* This five-paper thesis explores office workers' perceptions of green roofs and how this influences their health/well-being in Toronto and Chicago. It examines the underlying paradigms and world-views of major research programs that look at the human relationship to nature and health/well-being. A comparative analysis of the implementation of green roof policies demonstrates the importance of 'selling' green roofs by linking them to larger environmental programs and of the municipal power structure that influences how and if environmental programs are implemented. The thesis also examines the awareness, attitudes, and feelings towards green roofs by office workers, through interviews and a large survey.

**TAJINDER SINGH BHATIA**, Ph.D., March 2012, Forestry/ES; supervisor: Shashi Kant, Forestry. *Economic Analyses of World's Carbon Markets.* Forestry activities play a crucial role in climate change mitigation. To make carbon credits generated from such activities a tradable commodity, it is important to analyze the price dynamics of carbon markets. This dissertation contains three essays that examine issues confronting world's carbon markets. It first investigates cointegration

of carbon markets using Johansen maximum likelihood procedure. Because all carbon markets of the world are not integrated, the possibilities of arbitrage across world's markets may be limited, and carbon trading may be globally inefficient. The second essay evaluates various econometric models for predicting price volatility in the carbon markets and compares markets with different volatilities. The last essay focuses on agent based models that incorporate interactions of heterogeneous entities which possess considerably higher forecasting capabilities than the traditional econometric models.

### 2011-12 Masters Alumni

**DOUGLAS CREIGHTON**, M.F.C., June 2012, Forestry/ES supervisor: Andy Kenney, Forestry. *The Certification Market: The Role of Consumers for its Expansion into the Wood Products Market.* This paper analyzes end-user consumer demand for forest certified products within the multi-certified North American market. It specifically analyzes the current market for forest certification, including analysis of the drivers of forest certification and why there have been limited resources aimed at creating greater consumer awareness for certified products. It discusses the importance of end-user consumer demand for certification and the barriers that exist in creating end-user consumer demand for certified products, with specific attention to areas with multiple certifications. It concludes that multiple certification system barrier is minimized if forest certification is a hybrid system where forest certification is competitive among landowners and monopolized for consumers.

**TROY DIXON**, M.A., November 2011, Political Science/ES; supervisor: Victor Falkenheim, Political Science. *"Commercial Experimentation", the Precautionary Principle & Comparative Approaches to Synthetic Chemicals Regulation: A Political "Roadmap" to Achieving Preventative Health in Canada.* This paper looks at institutional conditions that can affect precautionary outcomes to a pending health crisis, in particular the recent escalation in diagnoses of long-term chronic illness related to unregulated synthetic chemicals. Based on an enforceable precautionary mandate, the European Union has recently introduced an unprecedented preventative health program that is meant to properly track, test and restrictively screen chemicals. This paper seeks to understand how a similar program may be attained in Canada and argues that outcomes may be effected by the manner in which electoral systems partition power among political parties, and the degree to which health and environmental regulators are afforded a broad public mandate.

**KRISTINA DJOKIC**, M.Ed., June 2012, Adult Education & Community Development (OISE/UT)/ES; supervisor: Jennifer Sumner, OISE/UT. *Transformations for Sustainability.* This paper discusses three dimensions in which transformations can be used to create a more sustainable world. First, a discussion on "big picture" transformations suggest how changes in education and pedagogical mechanisms can augment problem solving, assessment, analysis and decision making. Second, organizational transformation is explored, as institutions and corporations form the majority of the culture where people work and exist. Finally, personal transformations are discussed. The call sustainability poses to humanity requires us to sense our inter-connectedness with all life; recognize the predicament our future is in and without hesitation act in accordance with living principles.



K. Wong

**Doctoral candidate Amy Mui (Geography and Environmental Studies collaborative program) measures hyperspectral reflectance in a lacustrine wetland in Algonquin Park for her research examining the habitat of Blanding's turtle using a remote sensing and GIS approach to habitat suitability modeling.**

Transformations occurring simultaneously on these three levels evolve people, the built environment, culture and society; building healthier work environments and economies that serve humanity – which facilitates our inevitable position as stewards of the environment.

**DOUG DUCKWORTH, M.Sc.Pl., Planning (Geography)/ES; supervisor: Paul Hess, Geography. *Garages Facing Other Garages: Downtown Revitalization and Automobile Parking in St. Louis City.*** Off-street parking is seen as important for St. Louis' economic development. However, conflict arises when parking supply exceeds demand and the cost of parking declines. Falling parking prices compel users towards the automobile. Because transportation alternatives are desired by downtown residents, this study recommends that they be supported over auto-oriented transportation options. The desire to combat decline with off-street parking also undermines downtown's residential development goals. This study recommends that the government raise the parking tax, establish a parking permitting system, ban the demolition of heritage for parking, unbundle parking from loft development, and consider purchasing or expropriating under capacity facilities.

**ASHLEIGH INGLE, M.Sc., November 2011, Physics/ES; supervisor: Paul Kushner, Physics. *Representing the Heterogeneity of the Boreal Forest.*** The leaf area index (LAI) refers to the one-sided leaf area present per unit ground surface area. This thesis analyses the differences in products that determine LAI to determine whether these differences are significant and if so, if they can be reconciled. Products such as Community Land Model (CLM-SP, of the National Center for Atmospheric Research) and the Satellite pour l'observation de la terre VEGETATION (SPOT-VGT) are compared. These products formalize and quantify concepts of ecological climatology, in order to understand how natural and human changes in vegetation affect climate. With higher resolution data sets that better represent the true heterogeneity of global vegetation coverage, Earth system modelling can move further towards a predictive science of the biosphere.

**JESSICA LEMIEUX, M.A., November 2011, Political Science/ES; supervisor: Victor Falkenheim, Political Science. *Social Movement or Alternative Lifestyles? An Evaluation of Transition Towns from a Sociological Perspective.*** The Transition Towns movement, started in the UK, brought the promise of community support, ecological sustainability, alternatives to capitalism, and a more sustainable future. This paper evaluates how this relatively new environmental movement fits into social movement discourse. The literature was explored, as well as the results of a survey sent to various Southern Ontario Transition initiatives to determine their motivations, goals and visions. It

hypothesises that the movement represents a new social movement that focuses on identity, a positive and bright future for coming generations, and respect for the earth, as well as the cross-cutting demographics, making its initiatives unique. Its success will be based on its ability to develop strong leaders and networks within its community.

**JOHN MAIORANO, M.Ed., June 2012, Sociology in Education (OISE/UT)/ ES. Supervisor: Beth Savan, Environment. *Barriers to Energy Efficiency Projects and the Uptake of Green Revolving Funds in Canadian Universities.*** Using interviews with senior administrators, this paper investigates the barriers to the implementation of energy efficiency projects in fifteen Canadian universities including access to capital, bounded rationality, hidden costs, imperfect information and split incentives. Although respondents agree on average that revolving funds are an effective method to address capital funding constraints, only four universities in Canada are known to be currently implementing them. Although all universities are implementing energy efficiency projects, the process to implement them, and the resources and funding available to do so vary. Small and mid-size universities strongly agreed that revolving funds may be an effective method to implement energy conservation projects; large universities on average did not agree.

**KAORUKO NITOHBE, M.A., November 2011, Political Science/ ES; supervisor: Ryan Balot, Political Science. *The Articulation of Environmentalism in Third World: A Case Study of Forest Management Governance in Uganda, Africa.*** The globalization of environmentalism has brought changes both to international politics and national policy. This paper analyses how environmentalism in the Third World has been articulated, especially in what sense policies are rationalized. It focusses on forestry management in Africa and examines advantages and disadvantages of the current global forestry regime. Africa has the highest deforestation rate in the world, in part because African countries do not have the financial capacity to implement anti-deforestation policies in addition to food security and poverty eradication initiatives. The case of Ugandan forest management will show that a neo-liberal environmental regime brought a radical change in its forest management structure and a means of economic development.

**JESSICA SPINA, M.A., November 2011, Political Science/ES; supervisor: Ryan Balot, Political Science. *Cracked Corn: Examining the Political Popularity of First Generation Ethanol as both an Outcome and an Indication of the Interconnections between Agriculture and Energy Policies in America.*** Ethanol is viewed as a possible means of decreasing America's reliance on foreign countries for a steady supply of fuel and a means of continuing to provide massive federal support for farming incomes. However, belief in the utility of ethanol has allowed policy makers to largely ignore its potential to cause negative outcomes for the environment and some segments of society. This paper recommends that any future energy policies must include a sincere focus on reducing demand and enhancing energy conservation. Additionally, it is critical to have a solid understanding of how and why some policies become interconnected in order to more clearly comprehend whether or not those connections have positive or negative consequences.

**DANIEL SUAREZ, M.A., November 2011, Geography/ES; supervisor: Scott Prudham, Geography/Environment. *Rearticulating Nature: Ecosystem Services in British Columbia and the UN Convention on Biological Diversity.*** This paper applies mixed ethnographic methods at field sites in British Columbia and the United Nations to explore the spread and uptake of the "ecosystem services" idea in different institutions of environmental governance. It explores intensifying efforts by ecosystem services proponents to rearticulate the living environment. The process of 'discursive refraction' is discussed, arguing that ecosystem services appear differently to the disparate practitioners interpreting, responding to, and beginning to use them. It concludes that the discourse of ecosystem services remains a locus of ongoing contestation, which complicates the relationship between what its proponents intend for it, and its ideological, institutional, and ecological consequences.

*Continued on page 8...*

Continued from page 7.

**ANNE VALLENTIN**, M.Ed., June 2012, Adult Education & Community Dev. (OISE/UT)/ES; supervisor: Jennifer Sumner, OISE/UT. **Coming to the Table: Learning Care for the Land.** Some policy advisors are pointing to a return to small scale, labour intensive modes of agroecological food production as a way to feed the growing population and decrease environmental impacts of conventional, industrialized agriculture. Canada has a growing number of people, with no farming background, who want small scale farms, employing labour and knowledge intensive forms of organic/agroecological practices which require a deep understanding of the particular region and necessitates holistic and transformative learning. This study found that the new farmer internship program offered at the Everdale Organic Farm and Environmental Learning Centre provides a positive and transformative learning experience.

**JASON VANSACK**, M.Ed., June 2012, Adult Education & Community Development (OISE/UT)/ES; supervisor: Jennifer Sumner, OISE/UT. **Promoting Sustainability along the North Shore of Lake Superior through Public Education and Outreach.** Lake Superior is the largest freshwater lake in the world by surface area. Despite its pristine state in comparison to the other four Great Lakes, the basin is under stress due to the spread of toxic chemicals, aquatic invasive species, degradation of fish and wildlife habitat, and pollution from municipal sources. This paper addresses why Lake Superior's north shore has sustained so much environmental damage over the last century, the finite natural resources that have been extracted and degraded, the types of persistent toxic chemicals that have been released, and what can be done to promote sustainability along the north shore through public education and outreach initiatives.

## New & Continuing

The following students were enrolled in the School's collaborative graduate program in Environmental Studies (ES) in 2011-12 and may continue or convocate in 2012-13.

### Ph.D. Students

**Ramsey Rasheed Affifi**, Ph.D., Adult Education & Community Development (OISE/UT)/ES; supervisor: Eric Bredo, OISE/UT. *Ecologizing education research.*

**Simon Appolloni**, Ph.D., Religion/ES; supervisor: Stephen Scharper, Anthropology UTM/Environment. *An exploration of Christian thinkers embracing new science to generate an environmental & liberationist ethic.*

**Graham Carey**, Ph.D., Electrical and Computer Engineering/ES; supervisor: Edward Sargent, ECE. *Colloidal quantum dot photovoltaics.*



**Smita Kothari**, Ph.D. candidate in Religion and Environmental Studies collaborative program, presents a seminar on her ethnographic study that explores notions of charity and meditation practices through a case study of the sect of Jainism. (See page 25 for a brief abstract.)

**Aurel Cristian Ches**, Ph.D., Geography UTSC/ES; supervisor: William Gough, Physical and Environmental Sciences, UTSC. *Top-down and bottom-up climate change policy in Canada.*

**Gabriel Eidelman**, Ph.D., Political Science/ES; supervisor: Richard Stren, Political Science. *Landlocked: Politics, property, and the Toronto waterfront, 1960-2000.*

**Beth Jean Evans**, Ph.D., Political Science/ES; supervisor: Steven Bernstein, Political Science. *Sustainable development aspect of the Clean Development Mechanism.*

**Muhammad Ferhan**, Ph.D., Forestry/ES; supervisor: Mohini Sain, Forestry. *Enzymatic treatment of lignin, bark or lignin based polyurethane foam.*

**Columba Gonzalez**, Ph.D., Anthropology/ES; supervisor: Hilary Cunningham, Anthropology. *Political ecology analysis in El Vizcaino biosphere reserve in Baja California, Mexico.*

**Mark Hathaway**, Ph.D., Adult Education & Community Dev. (OISE/UT)/ES; supervisor: S. Scharper, Anthropology UTM/Environment. *Ecological worldviews education and action for sustainability: transformative learning initiatives.*

**Shaik Hossain**, Ph.D., Forestry/ES; supervisor: John Caspersen, Forestry. *Branch and crown dynamics in tolerant hardwood forests.*

**David Houle**, Ph.D., Political Science/ES; supervisor: Grace Skogstad, Political Science. *Climate change policy in Canadian provinces in a context of multi-level & regional governances.*

**Andrew Kett**, Ph.D., Adult Education & Community Dev. (OISE/UT)/ES; supervisor: J. Gary Knowles, OISE/UT. *Environmental education and the workplace.*

**Smita Kothari**, Ph.D., Religion/ES; supervisors: C. Emmrich, Religion; S. Scharper, Anthropology UTM/Env. *Dana and Dhyana in Jaina Yoga: Preksha Meditation and the Terapantha.*

**Zen Mariani**, Ph.D., Physics/ES; supervisor: Kimberley Strong, Physics. *High-Arctic radiation and trace-gas variability from infrared emission measurements.*

**Joseph Mendonca**, Ph.D., Physics/ES; supervisor: Kimberley Strong, Physics. *Exchange of carbon between the earth's surface and the atmosphere.*

**Justin Mok**, Ph.D., East Asian Studies/ES; supervisor: Richard Guiso, East Asian Studies. *The relationship between humans & the environment in Chinese history.*

**Kate Moss**, Ph.D., OISE/UT Curriculum, Teaching & Learning/ES; supervisor: Dennis Thiessen, OISE/UT. *Comparative education for sustainability: Canada, Lithuania and Sweden.*

**Amy Bliss Mui**, Ph.D., Geography/ES; supervisor: Yuhong He, Geography. *Examination of Blanding's turtle habitat using a remote sensing & GIS approach to habitat suitability modeling.*

**Peter Ralevic**, Ph.D., Forestry/ES; supervisor: Tat Smith, Forestry. *Greenhouse gas mitigation potential and cost-competitiveness of forest bioenergy systems in Ontario.*

**Renata Ramasra**, Ph.D., Geography/ES; supervisor: Thembela Kepe, Geography. *Governance challenges associated with forestry based carbon finance projects.*

**Keven Roy**, Ph.D., Physics/ES; supervisor: Richard Peltier, Physics. *Impact of continental ice sheet on the rotational state of the earth.*

**Javad Sameni**, Ph.D., Forestry/ES; supervisor: Mohini Sain, Forestry. *Investigation of the bonding mechanism of modified lignin on lignocellulosic fibers.*

**Jennifer Weaver**, Ph.D., Geography UTM/ES; supervisors: Tenley Conway, Geography, UTM; Marie-Josée Fortin, Ecology & Evol. Biology. *Invasive species distribution: scale, sample selection bias, transferability and prediction.*

**Cynthia Whaley**, Ph.D., Physics/ES; supervisor: Kimberley Strong, Physics. *Interpreting the trace gas time series of the Toronto Atmospheric Observatory.*

**Heather Wheeler**, Ph.D., Cell and Systems Biology/ES; supervisor: Malcolm Campbell, CSB. *Development of the plant secondary cell wall and potential application in the production of sustainable biofuels.*

**Rachel York-Bridgers**, Ph.D., OISE/UT Curriculum Studies & Teacher Development/ES; supervisor: John Wallace, OISE/UT. *Eco-literacies & media: process, student engagement.*

**Xianming Zhang**, Ph.D., Chemistry/ES; supervisor: Frank Wania, Physical & Environmental Sci., UTSC. *Passive air samplers for semivolatile organic compounds.*

### Masters Students

**Maryam Adrangi**, M.Ed., Adult Education & Community Development/ES; supervisor: Angela Miles, OISE/UT. *Militarization, environment, and education.*

**Mato Baricevic**, M.I., Information/ES; supervisor: Douglas Macdonald, Environment. *Poverty, vulnerability and climate change in Ethiopia.*

**Taylor Binnington**, M.Sc., Geography/ES; supervisor: Danny Harvey, Geography. *Reliability in wind farm planning.*

**Dennis Braun**, M.B.A., Management/ES. *Reducing business costs while improving environmental performance through better management of energy, water and waste.*

**Bryan Dale**, M.A., Geography/ES; supervisor: Scott Prudham, Geography/Environment. *La Via Campesina and the political ecology of climate justice.*

**Beth Denaburg**, M.A., Geography/ES; supervisor: Lino Grima, Geography. *The water-energy nexus and virtual water trade.*

**Nicole Desaulnier**, M.I.St., Information/ES; supervisor: Matt Ratto, Information. *Assessment of environmental alternatives.*

**Martyn Forde**, M.A., Geography/ES; supervisor: Danny Harvey, Geog. *Renewable energy for the tourism sector of small island developing states.*

**Joel Fridman**, M.A., Geography/ES; supervisor: Harriet Friedmann, Geography. *Food system and governance in the City of Toronto.*

**Jonathan Fung**, M.Sc., Geography/ES; supervisor: Jing Chen, Geography. *Atmospheric inversion of the global surface carbon flux, distributions of U.S. crop production and consumption.*

**Jessica Gibson**, M.A., Adult Education & Community Dev. (OISE/UT)/ES; supervisor: J. Sumner, OISE/UT. *How food can be used as a tool for personal and community transformation.*

**Brian Harding**, M.I., Information/ES; supervisor: Sara Grimes, Information. *Knowledge practices in quantificatory technologies and techniques.*

**Matt James Hodgson**, M.A., History and Philosophy of Science and Technology/ES. *How scientific theory-construction and modelling impact social values.*

**William Kurth**, M.Ed., Adult Ed. & Community Dev. (OISE/UT)/ES; supervisor: Jack Quarter, OISE/UT. *Influence of social economy on environmental corporate social responsibility.*

**R. Brandon Law**, M.Sc.Pl., Planning (Geography)/ES. *Regional green economic development.*

**Sean Lemon**, M.Sc.Pl., Geography/ES.

*Provincial energy policies regarding renewable energy, smart grid technology, GHG emissions.*

**Michael Modeste**, M.A.Ed., Adult Education & Community Development (OISE/UT)/ES; supervisor: J. Quarter, OISE/UT. *Socially responsible investment in a pension plan.*

**Livio Nichilo**, M.Eng., Mechanical and Industrial Eng./ES; supervisor: Kim Pressnail, Civil Eng.

*International development of building integrated photovoltaic: application in the City of Toronto.*

**Harleen Panesar**, M.Sc.Pl., Planning (Geog.)/ES. *Aboriginal consultation processes in the context of environmental resource management.*

**Leopoldo Rocca**, M.F.C., Forestry/ES. *Environmental impact of a model of forest management.*

**Nazmus Saadat**, M.Sc.F., Forestry/ES; supervisor: Paul Cooper, Forestry. *Factors affecting distribution of borate to protect building envelope components from biodegradation.*

**Ramona Sansait**, M.I., Information/ES; supervisor: Matt Ratto, Information. *Incorporating traditional ecological knowledge in information literacy instruction.*

**Helen Sereda**, M.F.C., Forestry/ES; supervisor: Sandy Smith, Forestry.

**Vishma Lisa Singh**, M.Eng., Chemical Eng./ES; supervisor: Timothy Bender, Chemical Eng. *Air quality in natural environments and engineered processes of treatment.*

**Sivajanani Sivarajah**, M.F.C., Forestry/ES. *Watersheds and ecological dynamics.*

**Aleksandra Szafliavska**, M.F.C., Forestry/ES.

**Matt Thiel**, M.F.C., Forestry/ES. *The balance between social, economic and biophysical factors, and their proper management.*

**Daniel Traynor**, M.A., English/ES; supervisor: Stanka Radovic, English. *Imagining cities with*



Rachel York-Bridgers

**Harleen Panesar**, Planning and Environmental Studies Masters student and teaching assistant, introduces herself to students in undergraduate course ENV 100 Introduction to Environmental Studies.

*nature: an experiential study in working towards urban sustainability.*

**Daniel Vandervoort**, M.A., Adult Education & Community Dev. (OISE/UT)/ES; supervisor: Roxanna Ng, OISE/UT. *Social organization of ecological agriculture knowledge.*

**Stephanie Vanthof**, M.Sc., Geography/ES; supervisor: Danny Harvey, Geography. *Energy management.*

**Gary Siu Yip**, M.B.A., Management/ES. *The effects of businesses on marine ecosystems.*

## Environment & Health Program

### 2011-12 Alumni

The following alumni convocated in 2011-12 from the School's collaborative graduate program in Environment and Health (E&H).

#### Practicum/Coursework Programs:

**Garthika Navaranjan**, M.P.H., Public Health/E&H. Practicum in Epidemiology.

**Iffath Syed**, M.H.Sc., Public Health/E&H. Practicum in Occupational and Environmental Health.

**Michael Weisbrot**, M.P.H., Public Health/E&H. Practicum in occupational and Environmental Health.

#### Research Programs:

**Andrew Thomas**, M.P.H., Public Health/E&H; supervisor: Frances Silverman, Medicine. **Cardio-respiratory Health Effects from Exposure to Volatile Organic Compounds.** This study measures the ambient exposure concentrations of volatile organic compounds (VOCs) in controlled human exposure studies in order to understand whether filtered air exposure (with 0.45µg/m<sup>3</sup> total VOC concentration) and medical air exposure (with no VOCs) are both adequate controls for the fine concentrated ambient particle (CAP) and coarse CAP exposures. When CAP mass concentrations are included, the resulting increases in inflammatory cells and blood pressure could have drastic implications for susceptible populations. Low level exposures to VOCs could exacerbate asthma symptoms and also existing cardiovascular disease. These findings have significant public health implications, as many of the VOCs measured in this study have been completely banned from production and usage, yet are still present at ambient concentrations which may cause adverse health effects.

### New & Continuing

The following students were enrolled in the School's collaborative program in Environment and Health (E&H) in 2011-12 and may continue or convocate in 2012-13.

#### Practicum/Coursework Programs:

**Emily Groot**, M.P.H., Public Health/E&H. Practicum in Social and Behavioural Health Sciences.

**Morris Komakech**, M.P.H., Public Health/E&H. Practicum in Social and Behavioural Health Sciences.

#### Research Programs:

**Dolon Chakravarty**, Ph.D., Public Health/E&H; supervisors: Blake Poland and Donald Cole, Public Health. *Environmental contaminants and effects on women's health.*

**Melanie Fortune**, M.P.H., Public Health/E&H; supervisor: Shelley Harris, Public Health. *Effects of climate change and air pollution on health.*

**Gillian Lee**, M.A., Geography/E&H; supervisor: Dana Wilson, Geography. *Crime youth health and well-being in the Region of Peel.*

**Hiren Mehta**, M.Eng., Chemical Engineering/E&H. *Adverse health impacts of industrial substances on communities.*

**Renata Musa**, M.P.H., Public Health/E&H; supervisor: Shelley Harris, Public Health. *Environmental challenges of cancer.*

**Benita Tam**, Ph.D., Geography/E&H; supervisor: William Gough, Physical and Environmental Sciences, UT Scarborough. *The effects of weather and climate variability on the well-being of a rural and urban aboriginal group in Ontario.*

# Message from the Undergraduate Coordinator

BY KAREN ING

### FOR MORE INFORMATION:

[www.environment.utoronto.ca](http://www.environment.utoronto.ca)  
or David Powell,  
Undergraduate Student Advisor,  
416-946-8100, [david.powell@utoronto.ca](mailto:david.powell@utoronto.ca)

The School of the Environment's undergraduate programs continue to experience healthy enrollments, as evidenced by the 572 students in our core programs, 239 in our collaborative programs and over 2,800 students taking our courses last year. But we are not resting on our laurels and continue to work to find ways to enhance the undergraduate experience.

One of our priorities this past year and this year has been the ongoing participation in the Faculty of Arts and Science's wide review of its various environmental offerings which includes a careful review of the School's two core programs. It is hoped that these modified and improved programs will launch in September 2013, derived from the coordination of the existing strong research and teaching capacity within the Faculty's environment related units.

We are also working to enhance the student experience by increasing **international educational opportunities**, such as our continued joint minor collaborations with the *National University of Singapore* and the *ENV 395Y Special Topics Field Course in the Andes, Western Amazonia and the Galápagos* offered with the Study Abroad Program at Woodsworth College. In June 2012, an unprecedented 32 students spent approximately five weeks exploring and learning firsthand the conservation challenges in this area. (See page 12.)

We also sent 28 students to study water sharing issues in the Middle East during an intensive 10 day course held at the *Rothberg International School at the Hebrew University of Jerusalem* in July 2012. (See article below.) We are working with Rothberg to develop a field course exploring the unique seas and arid ecosystems in the summer of 2013.

Closer to home, experiential senior courses are always a priority in our undergraduate programs. Many of our senior students conducted both group based research and independent research



projects, as well as professional internship opportunities. (See page 13.)

We also thank donors for supporting our students with scholarships, such as the new **Jane Joy Memorial Scholarship for Excellence in Environmental Sustainability**, established by members of the U of T Women's Association. (See page 14.)

As interest in our programs and offerings continue to grow, I want to express my thanks to all members of the School's collective community for their efforts and commitment to ensure we continue to deliver and offer a superior undergraduate experience despite growing resource challenges. Thank you all!

*Karen Ing is also Senior Lecturer at the School of the Environment. (See page 30.)*

## Students travel to Israel to study water conflict resolution Inaugural offering of special course at The Hebrew University of Jerusalem

BY CARLY DALTON

*Carly Dalton was one of 28 students who participated in the inaugural offering of the course "Transboundary Water Conflict Resolution: The Israeli-Arab Case". This specially designed course for University of Toronto students was offered through the Rothberg International School at The Hebrew University of Jerusalem in July 2012. This opportunity was only made possible through generous support from The Canadian Friends of the Hebrew University (CFHU) and the Centre for International Experience (CIE) at U of T.*

The beauty of Israel cannot be captured by a simple photo. This unique and breathtaking country can only be understood after one is immersed in its culture. This 10 day course examined the ongoing transboundary water disputes between Israel and its Arab neighbours, and how the agricultural, industrial, environmental and urban sectors in Israel are constantly competing for access to this finite resource. From both the Israeli and Palestinian perspectives, students were exposed to the environmental, political and social issues contributing to the water crisis, as well as possible solutions.

After a fieldtrip to the Jordan River, students understood the seriousness of the environmental impacts like pollution due to the uncontrolled management of water resources. I did not fully grasp

the importance of this conflict until I interacted with residents who have been dealing with these issues their whole lives. Students who toured Bethlehem and Hebron could see the problems of water scarcity with the hundreds of water storage tanks built amongst the rooftops of Palestinian homes due to their unequal access to the water supply.

Because of the generous support provided by CFHU and CIE, most students were able to have an opportunity to travel around Israel. After visiting some areas such as Jerusalem, Tel Aviv, Tiberius, Sea of Galilee, Cesarea, the Dead Sea and EinGedi, I can honestly say that I will definitely return.

*Carly Dalton is a third year Bachelor's student, majoring in Environmental Studies and Anthropology.*



*The Dead Sea, a salt lake bordering Jordan, Israel and the West Bank.*

M. Sejjid

# Undergraduate Programs

For more information, please visit [www.environment.utoronto.ca](http://www.environment.utoronto.ca).

## Core Programs:

The School of the Environment offers two core interdisciplinary undergraduate program streams, each as a major and minor:

1. Environment and Science (B.Sc.)
2. Environmental Studies (B.A.)

## Collaborative Programs:

The following collaborative programs combine the School's interdisciplinary core with a set of discipline-specific courses:

### Specialist Programs:

1. Environmental Chemistry (B.Sc., with the Department of Chemistry)
2. Environmental Geosciences (B.Sc., with the Dept. of Earth Sciences)
3. Environment and Health (B.Sc., with the Human Biology Program)
4. Environment and Toxicology (B.Sc., with the Department of Pharmacology and Toxicology)

### Major Programs:

1. Environmental Ethics (B.A., with the Department of Philosophy)
2. Environmental Geosciences (B.Sc., with the Dept. of Earth Sciences)
3. Environment and Health (B.Sc., with the Human Biology Program)

### Minor Programs:

1. Environmental Ethics (B.A., with the Department of Philosophy)
2. Environment and Behaviour (B.Sc., with the Department of Psychology)
3. Environment and Energy (B.Sc., with the Department of Geography)

## Directed Minors:

The following directed minor programs are offered by other departments and are for students interested in acquiring a limited body of knowledge in a specific discipline.

1. Environmental Anthropology (B.A.)
2. Environmental Biology (B.Sc.)
3. Environmental Chemistry (B.Sc.)
4. Environmental Economics (B.A.)
5. Environmental Geography (B.A.)
6. Environmental Geosciences (B.Sc.)
7. Geographic Information Systems (B.A.)
8. Life and Environmental Physics (B.Sc.)
9. Physical and Environmental Geography (B.Sc.)

# Undergraduate Courses

2012-13 School of the Environment undergraduate offerings and instructors are subject to change. For profiles of faculty and 2011-13 Instructors and Sessional Lecturers, see pages 30-37.

- ENV 100H Introduction to Environmental Studies (*Stephen Scharper, Anthropology UTM/Environment*)
- SII 199H(F) Debating and Understanding Current Environmental Issues (*Faculty of Arts and Sciences (FAS) first-year seminar course; Karen Ing, Environment*)
- SII 199H(S) Sustainable and Just Futures: Environmental Politics in an Age of Global Warming \* (*FAS first-year seminar course*)
- ENV 200H Assessing Global Change: Science and the Environment (*Karen Ing*)
- ENV 221H Multidisciplinary Perspectives on Environment (*Karen Ing*)
- ENV 222H Interdisciplinary Environmental Studies (*Simon Appolloni*)
- ENV 223H Fundamental Environmental Skills (*Adam Martin*)
- ENV 234H Environmental Biology (*Hélène Cyr, Ecology & Evolutionary Biology*)
- ENV 235H Physics and Chemistry of the Evolving Earth (*Bernd Milkereit, Physics*)
- JGE 236H Human Interactions with the Environment (*Miriam Diamond, Earth Sci.*)
- ENV 299Y Research Opportunity Program \*
- ENV 307H Urban Sustainability (*David Sider, sessional*)
- ENV 315H Chemical Analysis of Environmental Samples (*Michael Gorton, Earth Sci.*)
- ENV 320H National Environmental Policy (*David Pond, sessional*)
- JGE 321H Multicultural Perspectives on Environmental Management (*Joint with Geography; Christian Abizaid, Geography/Environment*)
- ENV 322H International Environmental Policy (*Erich Vogt, sessional*)
- ENV 323H Ontario Environmental Policy (*Russ Houldin, sessional*)
- JGE 331H Resource and Environmental Theory (*joint with Geography; instructor TBA*)
- ENV 333H Ecological Worldviews (*Mark Hathaway*)
- ENV 334H Environmental Biology: Applied Ecology (*New in 2012-13; Hélène Cyr, Ecology & Evolutionary Biology*)
- ENV 335H Environmental Design (*Sheila Waite-Chuah, sessional*)
- ENV 336H Ecology in Human Dominated Landscapes \*
- ENV 341H Environment and Human Health (*Clare Wiseman, Environment*)
- ENV 346H Terrestrial Energy Systems (*Bryan Karney, Civil Engineering*)
- ENV 347H The Power of Economic Ideas (*Russ Houldin, sessional*)
- ENV 350H Energy Policy and Environment (*Keith Stewart, sessional*)
- ENV 395Y Special Topics Field Course. Ecology and Conservation in the Amazon, Galápagos, and Andes (*See article on page 12; Barbara Murck and Monika Havelka, Geography, UTM*)
- ENV 399Y Independent Experiential Study Project \*
- ENV 421H Environmental Research (*See article on page 13; David Sider, sessional*)
- ENV 422H Environmental Law (*Paul Muldoon, sessional*)
- ENV 430H Environment and Health of Vulnerable Populations \*
- ENV 431H Urban Sustainability and Ecological Technology \*
- ENV 440H Professional Experience Course (*See article on page 13; D. Sider, sessional*)
- ENV 451H Current Environmental Debates (*Erich Vogt, sessional*)
- JEH 455H Current Issues in Environment and Health (*Ron Wilson, Human Biology Program, New College*)
- ENV 481H Special Topics in the Environment I \*
- ENV 482H Special Topics in the Environment II \*
- ENV 492/3H Independent Studies Project (*See list of 2011-12 projects on page 13; staff*)

# Students explore Ecuador & Galápagos

## *Undergraduates study ecology and conservation in summer field course*

BY BARBARA MURCK AND MONIKA HAVELKA

### Ecology and Conservation in the Andes, Western Amazonia and the Galápagos

#### ENV 395Y Special Topics Field Course

[https://www.summerabroad.utoronto.ca/index.php/general/Summer 2012](https://www.summerabroad.utoronto.ca/index.php/general/Summer%202012) Instructors: Barbara Murck and Monika Havelka, Senior Lecturers, Dept. of Geography, U of T Mississauga (see pages 35-36).

“We don’t need to go to lectures, we’re living it.” Cali – one of the fantastic students from the University of Toronto Ecuador 2012 Summer Abroad course – said this while we were hiking up the volcano Bartolomé in the Galápagos Islands, and it quickly became the quote of the month.

Very few students (and very few faculty, let’s be honest) get the opportunity to visit the Galápagos, the Andes, or the Amazon. We were lucky enough to visit all three during this field course. The trip was amazing – life-changing – for all of us, in so many ways. Swimming with sharks, sea lions, and penguins in Galápagos; bird- and butterfly-watching in the cloud forest; seeing scarlet macaws flying above the rainforest canopy from a walkway 60m above the forest floor; experiencing close-up encounters with rainforest animals such as tapirs, caiman, giant armadillos, and pygmy marmosets; and hiking up the highest mountain near the equator (Volcán Chimborazo) were some of our personal highlights. And we got to visit the conservation icon Lonesome George – the last giant tortoise from the Pinta Island subspecies – one week before he died.

The trip was physically and mentally intense, and the ground we covered – both literally and academically – was impressive. We froze in our parkas at 5300m altitude in the Andes. We sweated and slipped through mud avoiding wandering spiders and conga ants in the Amazon. We soaked up sun and salt and faced hammerhead sharks while snorkeling in the Pacific Ocean at the Galápagos.

Academically the breadth of the course was just as significant. With four core instructors – two of us from U of T and our Ecuadorean co-instructors, **Jaime Guerra** and **Diego Quiroga** – we covered a wide range of topics, including the geology of the Andes and the Galápagos; patterns of diversity, distribution, and adaptations of biota in Ecuador; the history of human habitation and

*Students bird watching in the Maquipicuna cloud forest, Ecuador.*



Nicole Reed



Arienne Bohmert; Esteban Suarez-Melo

*LEFT: Course Instructor Dr. Monika Havelka in the Maquipicuna cloud forest in Ecuador. RIGHT: Students on a canopy walkway high in the rainforest at Tiputini Biodiversity Station in the Amazon.*

contemporary issues affecting conservation goals and indigenous peoples; and economic development in Ecuador, including ecotourism, fisheries, and oil exploration. These core concepts were supplemented by guest lectures from researchers working on flightless cormorants, primates, bats, and a high-profile camera trap project sponsored by National Geographic. We heard from the director of the Yasuní-ITT initiative, an innovative proposal to earn carbon credits by leaving a portion of their significant oil reserves in the Amazon unexploited and underground. We visited a lab where scientists are investigating and combatting illegal shark finning using genetic testing. We also benefitted greatly from the extensive field expertise of our local guides in the national parks of Ecuador.

For the instructors, there were many “small” moments that drove home the educational value of field experiences. It’s one thing to hear about trade winds and the Intertropical Convergence Zone in a classroom in Toronto. Monitoring the wind and checking the cloud cover every morning in the Galápagos brings a whole different level of understanding. Walking upright in a lava tunnel on Floreana Island and measuring thick sequences of pyroclastics in the Andes demonstrate the power of geologic processes in a very immediate and physical way. The opportunity to develop and test hypotheses on topics ranging from the effect of human presence on bird calls in the forest to a double-blind clinical trial of a natural remedy derived from rainforest plants teaches students how we “do” science in a way that cannot be experienced in a classroom.

This was an unforgettable experience that we shared with our 32 wonderful students. We arrived as strangers and left as a cohesive group bound by a set of incredible memories and experiences. Although we can’t get all U of T students to the Andes, the Amazon, or the Galápagos, we can make an effort to ensure that they go outside – preferably a little bit out of their comfort zone. Ultimately, as Cali said, if we want lectures to be meaningful then we need to get away from the lecture hall sometimes, and into an environment where it all comes together and makes sense.

*For more information, please contact the instructors at [barbara.murck@utoronto.ca](mailto:barbara.murck@utoronto.ca) or [monika.havelka@utoronto.ca](mailto:monika.havelka@utoronto.ca).*

# The impacts of Toronto's budget cuts

## Undergraduate course provides group research experience on topical issues

BY DAVID SIDER

**ENV 421H Environmental Research**  
2011-13 Instructor: David Sider, Sessional Lecturer (see p. 36); david.sider@utoronto.ca.

In 2011-12, senior undergraduate students in ENV 421 undertook four projects on a topical issue in Toronto: the environmental and social impacts of proposed cuts to the 2012 municipal budget under the current Mayor Ford administration. Nineteen students worked in four small groups to look at the impacts of potential budget cuts on green spaces, urban planning, air quality and human health in Toronto. Groups did background literature and internet searches, and carried out primary research in the form of in-depth interviews, surveys, and use of documents such as City of Toronto policy statements and consultant reports.

The research produced important and insightful findings. The green spaces group carried out interviews with urban forestry experts, community garden advocates, environmental education professionals and several City Councillors. Those interviewed emphasized the many benefits

that green spaces provide to residents, including ecological services, educational opportunities, community building, and physical health benefits. The students determined that budget cuts to parks and green spaces would result in a tangible reduction in these benefits and recommended a more integrated and holistic approach to city planning to ensure the long-term viability of green spaces.

The urban planning research group focused on the implications of the proposed cuts for the built environment and public transit. Interviews were conducted with environmental planners, transportation experts, academics and others. With regards to the built environment, the students determined that there was a potential risk of termination or scaling down of incentive programs for green roof initiatives. Transit fare increases along with service reductions along some bus routes were found to be detrimental, whereas the planned expansion of light rail transit was deemed positive.

The urban air quality research group found that cancellation of funding to the

Toronto Environment Office and Toronto Atmospheric Fund, for instance, would prove harmful to air quality and likely affect lower-income neighbourhoods disproportionately. Results of an online survey used to assess the knowledge and views of Torontonians about air quality matters in the city show support for environmental programs and opposition to cuts.

The human health research group examined the impacts of proposed cuts in the areas of social housing and student nutrition programs, carrying out interviews with staff from related agencies, Toronto government employees and researchers. Students determined that a sell-off of stand-alone housing stock that was being considered to partially address city revenue shortfalls was inappropriate. They also found that more resources, not less, are needed to ensure that students have access to adequate nutrition and that the current system of patchwork programs, often initiated by communities, needs to evolve to a more coordinated policy approach to better address poverty in Canada.

## Independent research projects & professional experience

### ENV 440H Professional Experience Course

2011-13 Instructor: David Sider, Sessional Instructor (see page 36). This course provides an opportunity for students to gain practical work experience in the environmental field through placements with various organizations and agencies working on a wide range of activities, including carrying out research, administering projects, doing public education, networking, writing proposals and organizing conferences. The course has an academic component as well that is geared towards reflection on the placement experiences of students from a broader perspective. Together, the practical and academic dimensions of the course are intended to help prepare students for careers in the environmental field.

The Fall 2011 class had a total of 43 students, approximately half of which completed their placements during the preceding summer and half during the fall term. Most placements were in Toronto or the Greater Toronto Area; others were in Ottawa, Bangladesh, Barbados and the Republic of Korea. Placements were with a diverse spectrum of organizations in the environmental field, including government agencies (e.g. City of Toronto, Environment Canada), non-profits (e.g. Ontario Clean Air Alliance, Toronto Environmental Alliance), the private sector, U of T units (e.g. Sustainability Office), and international organizations (e.g. United Nations Environment Programme).

### ENV 492/493H Professional Experience Course

The following students completed Independent Study Project courses (ENV 492 and/or ENV 493) in 2011-12.

**Margarita Dertkina**, ENV493H. Fourth year Bachelor's student. Major in Equity Studies; minors in Environmental Studies, English. Supervisor: Doug Macdonald, School of the Environment. *Natural Resource Management in Thailand.*

**Annette Gagliano**, ENV 492H/493H. Hons. B.Sc. alumna, June 2012. Major in Human Biology, minors in Environmental Studies, French as a Second Language. Supervisor: Beth Savan, School of the Environment. *Pilot Study Pre-implementation: Eco-Friendly Laboratory Practices.*

**Ana Rebeca Gonzalez**, ENV 492H/493H. Hons. B.Sc. alumna, June 2012. Majors in Environment & Society, Psychology; minor in Environmental Geography. Supervisor: Beth Savan, School of the Environment. *Understanding Institutional Waste Generation and Management.*

**Siobhan Maclean**, ENV 492H. Hons. B.A. alumna, June 2012. Majors in Anthropology, Semiotics & Communication Theory. Supervisor: Stephen Scharper, Anthropology UTM/School of the Environment. *Environmental Perspectives: Consumer trends and Community Initiatives.*

**Indra Noyes**, ENV 492H. Hons. B.A. alumna, June 2012. Majors in Psychology, Arts; Minor: Environmental Studies. Supr: S. Wakefield, Geography. *Food Systems: Logistics of Ontario Supply Chains.*

**Adam Rennie**, ENV 493H. B.A. alumnus, November 2011. Major in Environment & Society. Supervisor: Karen Ing, School of the Environment. *Challenges to Providing K-12 Experiential Environmental Education in the Greater Toronto Area.*

# Undergraduate Students' Awards

## FOR MORE INFORMATION:

www.environment.utoronto.ca or contact David Powell, 416-946-8100, david.powell@utoronto.ca

### Congratulations to the latest recipients of the following School of the Environment undergraduate awards.

(n.b.: Environmental Policy & Practice and Environment & Society programs indicated are no longer offered and have been replaced by the Environmental Studies program.)

**Frances L. Allen Scholarship:** This is awarded to outstanding second or third-year students in a School of the Environment specialist or double major program. The recipient was **Zachary Finewax** (Environmental Chemistry).

**Chachra Family Scholarship in Environment and Science:** This is awarded to students enrolled in a School of the Environment B.Sc. specialist or major program. The recipient was **Carolyn Franklin** (Environment and Science).

**Dr. Stanley Allan Cord Scholarship in Environmental Studies:** Awarded to School of the Environment students in their third or fourth year. The recipient was **Jessica Elders** (Environmental Ethics).

**Jane Goodall scholarship:** Awarded to one or more outstanding undergraduate students enrolled in a School of the Environment program. Preference is given to students studying environment and development. The recipient, awarded at a presentation in April 2012 (see p. 23), was **Brina McMillan** (Environmental Policy & Practice).

**Peter John Hare Memorial Scholarship in Environment:** This is awarded to students in a School of the Environment specialist or major program. The recipient was **Eleni Taye** (Environment and Science).

**Robert Hunter Scholarships:** These are awarded to outstanding School of the Environment students in memory of Robert Hunter, journalist and co-founder of Greenpeace. The recipients, recognized at the 2012 Hunter Memorial Lecture (see page 26), were **Shannon Lem** (Environmental Policy and Practice), **Jean Paulyn Liu** (Earth Systems: Physics and Environment), **Harleen Panesar** (Environmental Studies), and **Holly Vaughan** (Environmental Policy and Practice).



**TOP:** Left to right: **Bobbi and Emily Hunter** with Hunter scholarship recipients **Harleen Panesar**, and **Holly Vaughan** at the Hunter Memorial Lecture. (See this page for other recipients.)

**BOTTOM:** Pimlott award and scholarship recipients at the Pimlott lecture, left to right: **Stuart Livingstone**, **Holly Vaughan**, **Harleen Panesar**, **Anna Agosta G'Meiner**, **Eleni Taye**, **Tegan Hansen-Hoedeman**, **Leila Panjvani**, and **Jennifer Robinson**, joined by presenters **Monte Hummel** and **Stephen Scharper** (back row). (See this page for other recipients.)

**Douglas Pimlott Awards and Scholarships:** Awarded to School of the Environment students with excellent levels of academic achievement and a commitment to social involvement in environmental issues. The recipients, recognized at the 2012 Pimlott Lecture (see page 26), were:

**Pimlott Award:** **Anna Agosta G'Meiner** (Environmental Policy & Practice), **Stuart Livingstone** (Environment & Science), **Kevin Moraes** (Environmental Policy & Practice), **Ben Normand** (Environmental Policy & Practice), **Leila Panjavi** (Environmental Policy & Practice), **Jennifer Robinson** (Environment & Science), **Eleni Taye** (Environment & Science), and **Cathy (Xiaoxu) Zhao** (Environmental Policy & Practice).

**Pimlott Entrance Scholarship:** **Tegan Hansen-Hoedeman** (Environmental Studies).

**Pimlott Graduating Scholarship:** **Zannah Matson** (Environment & Society), **Harleen Panesar** (Environmental Studies), and **Holly Vaughan** (Environmental Policy and Practice).

**Kathryn S. Rolph Scholarship:** Awarded to outstanding School of Environment students who have achieved a high mark in a specific course on environmental issues. The recipient was **Ben Normand** (Environmental Policy & Practice).

**Sidney and Lucille Silver Scholarship:** This is awarded to an outstanding third-year student in a School of the Environment or Geography specialist or double major program. The recipient was **Lisa Ann Ohberg** (Environment and Resource Management).

**School of the Environment Undergraduate Student Award:** Awarded to a School of the Environment student and is based on financial need and academic achievement. The recipient was **Trudy Ledsham** (Environmental Studies).

## Inaugural presentation of the Jane Joy Memorial Scholarship for Excellence in Environmental Sustainability

Created with a donation by the University of Toronto Women's Association (UTWA), this new undergraduate scholarship is awarded to a student specializing or majoring in Environmental Science at the School of the Environment. Consideration will be given to students who have demonstrated involvement in sustainability issues. The inaugural scholarship was presented by **Donald Jackson**, the School's Interim Director, at the UTWA Annual General Meeting in March 2012, to **Jennifer Robinson** (Hons. B.Sc. alumna 2012; majors in Environment & Science, and Zoology; minor in French as a Second Language).



M. Heilm

# Collaborative Graduate Programs

## Graduate Program Director:

**DONALD JACKSON**, Interim Director, School of the Environment

The School of the Environment offers two collaborative programs of study at the Masters and Doctoral level: 1) Environmental Studies, and 2) Environment and Health (*see article below*). Students who are admitted to a “home” unit apply to the collaborative program and pursue course work and research in environmental areas. Through these programs, students have the opportunity to pursue interdisciplinary, graduate education while building on their own disciplinary grounding.

## Environmental Studies Collaborative Program

One of the compelling strengths of this program is the interdisciplinary environment in which teaching and research is conducted. In this program, students are both able to specialize in an area of environmental research and gain exposure to a wide range of intellectual and methodological disciplines focused on environmental issues.

The Environmental Studies program currently has students from across the disciplinary spectrum. Collaborating units and programs include: Adult Education and Community Development program (OISE/UT), Anthropology, Chemical Engineering and Applied Chemistry, Chemistry, Ecology and Evolutionary Biology, Economics, Earth Sciences, Forestry, Geography, Information, Management, Philosophy, Physics, Program in Planning (Geography), Political Science, Religion, Sociology, Sociology in Education program (OISE/UT), and Women and Gender Studies.

Students may also be admitted from other units on an individual basis. For example, this past year, we welcomed new students from such diverse home units as Cell and Systems Biology, Electrical and Computer Engineering, and English. We also currently have students also enrolled in Chemical Engineering, East Asian Studies, History and Philosophy of Science and Technology, Mechanical and Industrial Engineering, and Social Work, and have a recent alumna who was also enrolled in South Asian Studies.

## FOR MORE INFORMATION:

[www.environment.utoronto.ca](http://www.environment.utoronto.ca)  
or Pavel Pripa, Graduate Student Advisor,  
416-978-3475, [pavel.pripa@utoronto.ca](mailto:pavel.pripa@utoronto.ca)

Program requirements vary with each home unit or program. Along with a core course in Environmental Decision Making (ENV 1001H), students are typically required to take an elective course and conduct research on an environmental topic which also fulfills the requirements of their home unit (i.e. thesis or research paper). Non-thesis Masters students are required to also complete an internship and Doctoral students are also required to present a seminar on their research.

In 2011-12, the School of the Environment was pleased to have *19 alumni graduate from one of its collaborative programs (4 Ph.D. and 15 Masters)*. The School also welcomed 30 new students (7 Ph.D. and 23 Masters), bringing the total number students enrolled last year to 86 (33 Ph.D. and 53 Masters). (*See pages 6-9 for abstracts of alumni theses and papers and for continuing students' research topics.*)

At the School of the Environment, it is our mission to leverage this university's great intellectual might to produce truly interdisciplinary scholars with the interest and ability to understand, protect and enhance the environment.

## FAS review graduate programs

With the establishment of the new School of the Environment, a wider range of expertise are brought together from across all the disciplines in the Faculty of Arts and Science (FAS). Similar to undergraduate programs, several units within FAS have strengths in environmental graduate teaching and research. The FAS Dean's office will establish a program committee during this year to develop proposal(s) for new graduate programs in environment.

## Environment and Health Collaborative Program

BY CLARE WISEMAN

The collaborative graduate program in Environment and Health is offered by the School of the Environment, in conjunction with the graduate degree programs of Geography, Medical Science, Public Health, Planning (Geography) and Women and Gender Studies.

The program provides an interdisciplinary perspective to the field of environment and health for students interested in studying how various chemical, biological and radiological exposures in the indoor and outdoor environments can affect the health of individuals and communities, as well as

the social, policy and ethical dimensions of environment and health issues.

The public Environment and Health Seminar Series and core course (ENV 4001H), usually offered in the Spring term, seeks to bring in top academics and experts from a wide range of fields, backgrounds and affiliations to present their research and introduce students to a variety of interdisciplinary perspectives, methods and concepts. Topics which were discussed as part of last year's series, for instance, ranged from how air pollution impacts the respiratory health of urban cyclists to the role of environmental factors

in contributing to increased rates of obesity among children. (*See page 27 for a full listing and condensed abstracts of last year's seminars.*)

Current and past students of the program have contributed greatly to the field of environment and health, researching a broad range of highly pertinent and interesting topics. (*See page 9 for more on research conducted by 2011-12 alumni and continuing students.*)

*Dr. Clare Wiseman is Assistant Professor and Coordinator of the Environment & Health Program (see p. 33).*

# Graduate Faculty

The following individuals currently have graduate faculty appointments at the School of the Environment. Membership is subject to change. For information on appointments and student supervision, please contact Pavel Pripa at [pavel.pripa@utoronto.ca](mailto:pavel.pripa@utoronto.ca).

## Full Members

Jonathan Abbatt, *Chemistry*  
 Grant Allen, *Chemical Eng. & Applied Chemistry*  
 Robert Andrews, *Civil Engineering*  
 George Arhonditsis, *Physical & Environmental Sciences, UT Scarborough (UTSC)*  
 Spencer Barrett, *Ecology & Evolutionary Biology*  
 Steven Bernstein, *Political Science*  
 Alana Boland, *Geography*  
 Michael Bunce, *Social Sciences, UTSC*  
 Jing Chen, *Geography*  
 Tenley Conway, *Geography, UT Mississauga*  
 Paul Corey, *Public Health*  
 Sharon Cowling, *Earth Sciences*  
 Hilary Cunningham, *Anthropology*  
 Amrita Danieri, *Geography*  
 George Dei, *OISE/UT Leadership, Higher and Adult Education*  
 Donald Dewees, *Economics*  
 Miriam Diamond, *Earth Sciences*  
 Maria Ditrich, *Physical & Environ. Sci., UTSC*  
 Birsen Donmez, *Mechanical and Industrial Eng.*  
 Steve Easterbrook, *Computer Science*  
 Elizabeth Edwards, *Chemical Engineering & Applied Chemistry*  
 Mark Engstrom, *Ecology & Evol. Biology/ROM*  
 Greg Evans, *Chemical Eng. & Applied Chemistry*  
 Nick Eyles, *Phys. & Environ. Sci., UTSC*  
 Roberta Fulthorpe, *Physical & Env. Sci., UTSC*  
 William Gough, *Phys. & Env. Sci., UTSC*  
 Mart Gross, *Ecology & Evolutionary Biology*  
 L. Danny Harvey, *Geography*  
 D. Linn Holness, *Public Health*  
 Ken Howard, *Physical & Env. Sci., UTSC*  
 Donald Jackson, *Ecology & Evolutionary Biology*  
 Charles Jia, *Chemical Eng. & Applied Chemistry*  
 Shashi Kant, *Forestry*  
 Bryan Karney, *Civil Engineering*  
 Chris Kennedy, *Civil Engineering*  
 J. Gary Knowles, *OISE/UT Leadership, Higher and Adult Education*  
 Scott Mabury, *Chemistry*  
 Laurel MacDowell, *History, UT Mississauga*  
 Virginia Maclaren, *Geography*  
 Heather MacLean, *Civil Engineering*  
 Jay Malcolm, *Forestry*  
 David Martell, *Forestry*  
 Patricia McCarney, *Political Science*  
 Andrew Miall, *Earth Sciences*  
 Eric Miller, *Civil Engineering*  
 Carl Mitchell, *Physical & Envir. Sciences, UTSC*  
 G.W. Kent Moore, *Physics, UT Mississauga*  
 D. Scott Munro, *Geography, UT Mississauga*  
 Jennifer Murphy, *Chemistry*  
 Michelle Murphy, *History*  
 Blake Poland, *Public Health*  
 Anthony Price, *Physical & Environ. Sci., UTSC*  
 W. Scott Prudham, *Geography/Environment*  
 Douglas Reeve, *Chemical Eng. & Applied Chem.*  
 Helen Rodd, *Ecology & Evolutionary Biology*

Rowan Sage, *Ecology & Evolutionary Biology*  
 Mohini Sain, *Forestry*  
 K. Richard Sandbrook, *Political Science*  
 Andrea Sass-Kortsak, *Public Health*  
 Lawrence Sawchuk, *Social Sciences, UTSC*  
 Stephen Scharper, *Anthropology, UT Mississauga/Environment*  
 Barbara Sherwood Lollar, *Earth Sciences*  
 Krystyna Sieciechowicz, *Anthropology*  
 Frances Silverman, *Medicine*  
 André Simpson, *Physical & Environ. Sci., UTSC*  
 Myrna Simpson, *Physical & Environ. Sci., UTSC*  
 Grace Skogstad, *Social Sciences, UTSC*  
 C. Tattersall Smith, *Forestry*  
 Sandy Smith, *Forestry*  
 Mark Stabile, *Management; Public Policy & Governance*  
 Ingrid Leman Stefanovic, *Philosophy*  
 Kimberly Strong, *Physics*  
 Susan Tarlo, *Medicine*  
 Ross Upshur, *Medical Science*  
 Willem Vanderburg, *Civil Engineering/Environment*  
 Sarah Wakefield, *Geography*  
 Denis Walsh, *Philosophy*  
 Frank Wania, *Physical & Environ. Sci., UTSC*  
 Peter Wells, *Pharmacy*  
 Kathi Wilson, *Geography, UT Mississauga*

## Associate Members

Christian Abizaid, *Geography/Environment*  
 Nathan Basiliko, *Geography, UT Mississauga*  
 Kerry Bowman, *Bioethics*  
 Andrew Green, *Law*  
 A.P. (Lino) Grima, *Geography*  
 Paul Helm, *Ont. Ministry of the Environment*  
 H. Roland Hosein, *Public Health*  
 Marney Isaac, *Physical & Environ. Sci., UTSC*  
 Andy Kenney, *Forestry*  
 Douglas Macdonald, *Environment*  
 Barbara Murck, *Geography, UT Mississauga*  
 Dennis O'Hara, *St. Michael's College*  
 Matthew Ratto, *Information*  
 Beth Savan, *Environment*  
 Helene Wagner, *Ecology & Evolutionary Biology*  
 Clare Wiseman, *Environment*  
 Cindy Woodland, *Pharmacology*

## Members Emeriti

Paul Aird, *Forestry*  
 Terry Blake, *Forestry*  
 Frances Burton, *Social Sciences, UTSC*  
 Philip Byer, *Civil Engineering*  
 Catherine Chalin, *Public Health*  
 Frank Cunningham, *Philosophy*  
 Brian Greenwood, *Physical & Env. Sci., UTSC*  
 William Michelson, *Sociology*  
 R.E. (Ted) Munn, *Environment*  
 Edmund O'Sullivan, *OISE/UT Leadership, Higher and Adult Education*  
 Henry Regier, *Environment*  
 D.N. Roy, *Forestry*  
 Richard Stren, *Political Science*  
 Wayne Sumner, *Philosophy*  
 Joseph Whitney, *Geography*  
 Dudley Williams, *Physical & Env. Sci., UTSC*  
 G. Ronald Williams, *Biochemistry*

# Graduate Courses

2012-13 School of the Environment graduate course offerings and instructors indicated are subject to change. For profiles of faculty and 2011-13 Instructors and Sessional Lecturers, please see pages 30-37.

For more information, please visit [www.environment.utoronto.ca](http://www.environment.utoronto.ca) or contact Pavel Pripa, [pavel.pripa@utoronto.ca](mailto:pavel.pripa@utoronto.ca).

## Core Courses

ENV 1001H Environmental Decision Making (*D. Pond, sessional*)  
 ENV 4001H Seminars in Environment and Health (*C. Wiseman, Environment*)

## Other Courses

ENV 1002H Environmental Policy\*  
 ENV 1004H Urban Sustainability and Ecological Technology\*  
 ENV 1005H Business and Environmental Politics\*  
 ENV 1008H Worldviews and Ecology (*S. Scharper, Anthropology UTM/Environment*)  
 ENV 1444H Capitalist Nature (*W.S. Prudham, Geography/Environment*)  
 ENV 1701H Environmental Law (*P. Muldoon, sessional*)  
 ENV 1703H Water Resources Management and Policy (*A.P. Grima, Geography; retired*)  
 ENV 1704H Environmental Risk Analysis and Management (*C. Ollson, sessional*)  
 ENV 1707H Environmental Finance and Sustainable Investing (*J. Ambachtsheer, S. McGeachie, sessionals*)  
 JEI 1901H Technology, Society and Environment\*  
 JEI 1902H Technology, Society and Environment II\*  
 JGE 1212H Fate of Contaminants in the Environment (*M. Diamond, Earth Sciences*)  
 JPV 1201H Politics, Bureaucracy and the Environment\*  
 JGE 1413H Environmental Assessment (*S. Wakefield, Geography*)  
 JGE 1420H Urban Waste Management: An International Perspective\*  
 JGE 1609H Cities, Industry and the Environment\*  
 ENV 2000H Independent Study  
 ENV 2002H Special Topics: Environmental Studies  
 JVP 2147H Environmental Philosophy\*  
 JNC 2503H Environmental Pathways\*  
 ENV 3000H Special Topics: Environment and Health  
 ENV 4002H The Environment and Health of Vulnerable Populations \*

\* Not offered in 2012-13

# Graduate Students' Awards



**LEFT:** Labatt Graduate Fellowship recipients from left: Kai Sheffield, Peter Ralevic, Heather Wheeler with the School's Interim Director Donald Jackson. (Absent: Sean Lemon.) **RIGHT:** Alexander B. Leman Award recipient Harleen Panesar with Michael Leman (left) and Donald Jackson.

**Congratulations to the latest recipients of School of the Environment graduate awards, mostly presented at Research Day on April 18, 2012 (see page 5).**

## John Brown Prize

This prize was established in memory of the late John R. Brown, Professor of Environmental Health and Medicine. This year's recipients were **Solmaz Tabtabaei** (Ph.D. candidate, Chemical Engineering and Environmental Studies collaborative program), researching the production of biodiesel and high quality protein products, and **Heather Wheeler** (Ph.D. candidate, Cell and Systems Biology, and Environmental Studies xprogram), studying the plant secondary wall and potential applications towards developing sustainable biofuels.

## GreenSaver Fairweather Award

This award was established in memory of Alastair Fairweather, a member of the Board of Directors of GreenSaver. This year's recipient was **Xianming Zhang** (Ph.D. candidate, Chemistry and Environmental Studies collaborative program), studying organic contaminants using passive air sampling and modeling approach.

## Eric Krause Graduate Fellowship

This fellowship is in memory of the late Eric Krause, a U of T Masters graduate of Geography and Environmental Studies. Presented at the Eric Krause Memorial Lecture in March 2012 (see page 26), this year's recipients were **Taylor Bennington** (M.Sc. student, Geography and Environmental Studies collaborative program), researching wind energy and wind farm siting, and **Sean Lemon** (M.Sc.Pl. student, Program in Planning and Environmental

Studies collaborative program), studying climate change, renewable energy integration and energy policy.

## Arthur and Sonia Labatt Fellowships

These fellowships were established through a generous donation from Arthur and Sonia Labatt. This year's recipients were **Sean Lemon** (see Krause award above); **Peter Ralevic** (Ph.D. Candidate, Forestry and Environmental Studies program); **Kai Sheffield** (J.D. student, Law/Environmental Studies certificate program); and **Heather Wheeler** (see Brown Prize above).

## George Burwash Langford Prize

This prize is awarded to a School of the Environment graduate student who best combines excellence in research and contribution to the work of the School. This year's recipient was **Mark Hathaway**, Ph.D. candidate, Adult Education and Community Development program (OISE/UT) and

## FOR MORE INFORMATION:

[www.environment.utoronto.ca](http://www.environment.utoronto.ca)  
Pavel Pripa, Graduate Student Advisor,  
416-978-3475, [pavel.pripa@utoronto.ca](mailto:pavel.pripa@utoronto.ca)

Environmental Studies collaborative program. His doctoral research is on ecological worldviews, transformative learning, and engagement for sustainability.

## Alexander B. Leman Award

This inaugural award was established in memory of Alexander B. Leman, an architect and urban planner. This year, it was presented by **Michael Leman**, Alexander's brother, to **Harleen Panesar**, a M.Sc.Pl. student in Planning program (Geography) and Environmental Studies program. Her research focuses on the City of Toronto's Statement of Commitment to Aboriginal Communities in Toronto.

**LEFT:** Eric Krause Graduate Fellowship recipient Sean Lemon and the School's Interim Director Donald Jackson. **RIGHT:** George Langford Prize recipient Mark Hathaway and Donald Jackson.



Krause: E. del Junco

# Online Distance Education Programs

### FOR MORE INFORMATION:

<http://learn.environment.utoronto.ca>  
or contact Donna Workman, Manager, Program and Partnership  
Development, 416-978-7077, [d.workman@utoronto.ca](mailto:d.workman@utoronto.ca)

The School of the Environment offers unique completely online distance learning courses and certificate programs. The applied and professional programs are developed in collaboration with industry experts and taught by leading industry practitioners ensuring current and leading edge knowledge and skills. Courses are developed for mid-career professionals and entrepreneurs who need to enhance their expertise, internationally educated professionals augmenting credentials for the Canadian context and recent college and university graduates seeking to advance their careers.

Graduates of the certificate programs may be eligible to apply for the Environmental Professional in Training designation, EPT, under ECO Canada's national certification program for Canadian environmental professionals.

## Programs and Course Offerings

Course offerings and Fall 2012 instructors indicated are subject to change. Please visit the website for updates. For profiles of 2011-12 and Fall 2012 course instructors, please see page 37.

### Certificate in Environmental Management

Environmental management includes impact assessment, and also involves other strategies and tools, such as adaptive management, risk assessment, environmental site audits, assessments, remediation and conflict resolution. The objectives of this program are to develop an understanding of environmental management and to provide insight into the systems approach which can be employed to mitigate a wide range of environmental problems. Grounded in a holistic approach to sustainable development, it aims to develop strategic and inclusive solutions to resource and management case studies. It also covers the complexity of risk management in addressing health, economics and conservation.

- CEM 400 Fundamentals of Environmental Management
- CEM 401 Urban Water Issues
- CEM 402 Strategies in Environmental Management
- CEM 403 Environmental Risk Assessment
- CEM 404 Environment and Human Health (*Lucy Sportza*)
- CEM 405 Global Environmental Change and Human Health
- CEM 406 Climate Change and Human Health

### Certificate in GIS for Environmental Management

Environmental Geographic Information System (GIS) describes the use of geo-spatial management methodology and tools in order to assist in developing an environmental management strategy. As GIS applications reach a broader audience, and the utilization of GIS spreads into new industries every day, the demand within the private and public sectors continues to grow. GIS has become a primary means of communicating spatial information in a multitude of settings in environmental applications. The objectives of this program are to build a foundation for understanding of GIS and Remote Sensing theory and techniques, and develop GIS software skills to solve practical tasks related to environmental management.

- GEM 400 Introduction to GIS for Environmental Management (*Michael Govorov*)
- GEM 401 Advanced GIS for Environmental Management (*Michael Govorov*)
- GEM 402 Geospatial Technologies for Environmental Mapping with GIS
- GEM 403 Environmental Remote Sensing
- GEM 404 GIS Modeling for Environmental Applications

### Certificate in Renewable Energy

Renewable energy is becoming one of the fastest growing industries in the face of the current environmental crisis, resulting from dependence on fossil fuels and unprecedented global rate of development. In this program students will explore historical and current perspectives on forms of renewable energy, their current usage in developed and developing nations, drivers in forming markets, and political will. The interdisciplinary approach challenges students to pursue an interdisciplinary view of the impact of renewable energy on the current global energy picture. It aims to develop strategic, consensual, and inclusive solutions to the renewable energy and environmental management case studies.

- CRE 400 Principles of Renewable Energy (*Lucy Sportza*)
- CRE 401 Biofuels
- CRE 402 Wind Energy
- CRE 403 Urban Energy Systems (*Bob Baser*)
- CRE 404 Solar Energy (**New course in Fall 2012; Anna Moser**)

### Certificate in Carbon Finance

This certificate provides a thorough grounding in a new field which aims to help society meet its need to reduce greenhouse gases (GHGs) as rapidly as possible. "Carbon" is the short form used to refer to all the GHGs targeted by the Kyoto Protocol. Carbon Finance is a subfield within the broader subject of Environmental Finance which itself is the assessment of the ability of market instruments to achieve various environmental objectives such as clean air and water, effective solid waste management, the remediation of contaminated land, the preservation of biodiversity, and the stabilization of the climate through GHG reduction.

- ECF 400 Environmental Finance (*Oliver Bussler*)
- ECF 401 Carbon Finance
- ECF 402 Environmental Finance Case Study: European Union Emissions Trading System
- ECF 403 GHG Reporting and Accounting

### Certificate in Water Resource Management

Renewable water resources at both the global and local levels will undergo marked changes in our lifetime. Population growth in urban centres, climate change and an increasingly dependent energy infrastructure on water creates a dynamic and challenging context for ensuring adequate financing and responsible development for use of water. This new certificate program aims to increase participants' "water IQ", as well as provide a basis for learning about current and emerging water issues at the global, regional and local scale.

- WRM 400 Water Resource Management (*Lucy Sportza*)
- CEM 401 Urban Water Issues
- CEM 405 Global Environmental Change and Human Health
- CRE 400 Principles of Renewable Energy (*Lucy Sportza*)
- GEM 400 Intro to GIS for Environmental Management (*Michael Govorov*)

# Environmental Finance Advisory Committee

*The School of the Environment is pleased to have members of the business community serve on its Environmental Finance Advisory Committee (and former Carbon Finance and Water Finance subcommittees to 2011-12). They plan professional events and courses (see pages 21-22) designed to promote dialogue on leading edge initiatives relating to environmental business risks and opportunities. Meetings and events are managed by Donna Workman, Manager, Program and Partnership Development; for more information, please contact her at [d.workman.utoronto.ca](mailto:d.workman.utoronto.ca), 416-978-7077 or visit [learn.environment.utoronto.ca](http://learn.environment.utoronto.ca).*



## In Memoriam: Rodney White

The School of the Environment mourns the loss of Professor Emeritus Rodney White who passed away on July 5, 2012 after a brief illness. He was Director of the former Institute for Environmental Studies (IES) from 1994 to 2005 and helped found the Centre for Environment (CFE) in 2005, which has since evolved to become the School of the Environment. While Director of IES, Dr. White co-taught a graduate course on Environmental Finance and was instrumental in starting the distance education program and the environmental finance professional development program. After ending his term as IES Director, he continued to serve as CFE's Academic Advisor for professional development programs. *(Please see page 28 for more on Rodney White.)*



Mercer

### Jane Ambachtsheer

**Partner, Mercer Investment Consulting**  
Ms. Ambachtsheer leads Mercer's global responsible investment business, and consults to North American and international investors. She is Adjunct Professor at the School of Environment where she co-teaches a graduate course on Environmental Finance and Sustainable Investing. She is a global advisor to the Carbon Disclosure Project.



Macleod Dixon LLP

### Elisabeth (Lisa) DeMarco

**Partner, Norton Rose Canada LLP**  
Ms. DeMarco is a Partner in Norton Rose Canada's Energy, Renewables & Global Climate Change practice groups. She is recognized by Chambers Global, Lexpert and International Who's Who as a leading lawyer in Climate Change Law, Energy Law, and Environmental Law, respectively. She is an appointed member of the Ontario Clean Energy Task Force.



Bennett Jones LLP

### Michael R. Barrett

**Partner, Corporate, Bennett Jones LLP**  
Mr. Barrett is a corporate lawyer, specializing in clean energy and clean technology matters. He works with domestic and international clients, including leading power developers and participants in the environmental commodities market.



J. Desjardins

### Julie M. Desjardins

**Chartered Accountant and Consultant**  
Ms. Desjardins is a chartered accountant and a consultant in performance measurement and business reporting. She advises on sustainability matters, has authored/co-authored a number of publications and is a member of numerous national and international committees. She is on the boards of Transparency International Canada and Social Investment Organization.



Investeco Capital

### Alex Chamberlain

**Managing Partner, Investeco Capital**  
Investeco Capital Corporation is a private equity investment firm that invests in companies specializing in renewable energy, water technologies, sustainable agriculture, and clean technologies. Prior to joining Investeco, Mr. Chamberlain practiced law at Smith Lyons (now Gowlings) and worked at PricewaterhouseCoopers Securities Inc.



K. Freek

### Kerry Freek

**Editor, Water Canada Magazine** *(Water Finance to 2011-12)*  
Ms. Freek is the editor of *Water Canada*, the only national magazine dedicated to water quality and stewardship in Canada. She is an advisor to the Canadian Water Summit and sits on several committees across the water sector. She has participated in journalist delegations in Sweden and Israel to learn about bioenergy, water technology, and renewable energy.



M. Clamen

### Murray Clamen

*(Water Finance to 2011-12)*  
**Former Secretary, Canadian Section of the International Joint Commission (IJC).**  
For 30 years, Dr. Clamen has been at the forefront of transboundary water resources management working in a multidisciplinary environment at the Canada-U.S. IJC. He has led and participated in numerous water resource studies and assessments, and for 12 years was Secretary of IJC's Canadian Section.



McMillan LLP

### Barbara Hendrickson

**Counsel, Miller Titerle LLP**  
Prior to joining Miller Titerle LLP, Ms. Hendrickson was a partner at McMillan LLP where she founded its Emissions Trading and Climate Change Group. She regularly publishes in the climate change area and is co-authoring a book on emission trading. LawDay identified her as one of Canada's leading lawyers in environmental law and climate change.

*Continued on page 20 ....*

Continued from page 19.



Torys LLP

**Patricia A. Koval**  
Partner, Torys LLP

Ms. Koval's practice focuses on corporate and securities law, in particular corporate finance, mergers and acquisitions, infrastructure, and investment funds. She has considerable experience in designing financial products, incl. carbon funds and related products, and in emissions trading. She is Co-Chair of Torys' Climate Change and Emissions Trading Group.



S. Pasternack

**Scott Pasternack** *(Water Finance to 2011-12)*  
Solicitor, Legal Services Div., City of Toronto

At the City of Toronto, Mr. Pasternack's docket includes environmental matters. He previously worked for the City as Manager, Corporate Issues; as Council Liaison; and as Supervisor for Policy Development, Toronto Environment Office. He is a U.S.-trained lawyer, clerked for a federal judge, and practised with a focus on environmental and energy law.



S. Labatt

**Sonia Labatt**

For her doctoral research at the University of Toronto, Dr. Labatt examined corporate response patterns to environmental issues. She co-authored (with Rodney White) two books titled *Environmental Finance* and *Carbon Finance: The Financial Implications of Climate Change*. In 2011, she and her husband Arthur received honorary Doctor of Law degrees from the University of Toronto.



S. Reichenbach

**Stefan Reichenbach**  
Global Head of Strategy & Growth Initiatives, Commodities, Thomson Reuters

Mr. Reichenbach leads strategy and growth initiatives for Thomson Reuters Commodities. He is responsible for mergers and acquisitions, strategic planning, customer insight and product inception. Prior to this, he built a profitable carbon information business for Reuters.



http://actualmedia.ca

**Todd Latham**

President, Actual Media Inc.

Mr. Latham is a media entrepreneur with over 23 years of experience in B2B marketing and communications, with broad industry knowledge and an extensive international network in the environment, infrastructure and government sectors. Actual Media is a publishing, research and design company that publishes *ReNew Canada* and *Water Canada*.



K. Sullivan

**Katie Sullivan** *(Carbon Finance to 2011-12)*  
Director, North American Policy & Climate Finance, IETA

Ms. Sullivan co-leads the International Emissions Trading Association's efforts to enhance members' ability to engage in constructive climate policy dialogue, while also contributing to international policy work on innovative economic instruments and risk-sharing mechanisms to combat climate change.



D. Mahony

**Dennis Mahony** *(Water Finance to 2011-12)*  
Partner, Torys LLP

Mr. Mahony is the head of Torys' Environmental, Health and Safety Practice Group, and Co-Chair of Torys' interdisciplinary Climate Change and Emissions Trading Practice. He is a certified Specialist in Environmental Law, recognized as one of Canada's leading practitioners, and is a past recipient of the Lexpert award for Canada's Top 40 Lawyers Under 40.



I. Stefanovic

**Ingrid L. Stefanovic** *(Water Finance to 2011-12)*  
Professor, Department of Philosophy, U of T

Dr. Stefanovic was Director of the Centre for Environment, 2005-10. She serves as Senior Scholar, Center for Humans and Nature, and as Academic Fellow, Potomac Institute for Policy Studies. She researches perceptions of space and how values and attitudes affect decision making, and co-edited *The Natural City: Re-Envisioning the Built Environment* (2012).



S. McGeachie

**Susan McGeachie** *Committee Chair*  
Market Leader, Climate Change and Sustainability Services, Ernst & Young

Ms. McGeachie advises companies on managing risks associated with environmental, social and governance issues, and developing governance and management models. An Adjunct Professor, School of the Environment, she co-teaches a graduate course on Environmental Finance & Sustainable Investing.



Bennett Jones LLP

**Gray Taylor**  
Partner, Bennett Jones LLP

Mr. Taylor is the co-leader of Bennett Jones' climate change and emission trading practice group. He focuses on emissions trading transactions, corporate governance and climate change and sustainability business issues. He is a director and Canadian Co-Chair of the International Emissions Trading Association.



F. Mirza

**Faisal Mirza** *(Water Finance to 2011-12)*  
Director of Operations, Climate Change Infrastructure Corp.

Prior to joining Climate Change Infrastructure, Mr. Mirza was a consulting engineer for Earth Tech (now AECOM) where he designed, modelled and project-managed the construction of water resource systems for clients across North America and West Africa. He managed Earth Tech's offices in Nigeria for 13 months.



CCI

**William (Bill) Tharp**  
CEO, Climate Change Infrastructure

Climate Change Infrastructure is a leading asset management service provider focused on the low-carbon, water constrained, alternative energy and efficiency marketplace. Mr. Tharp has extensive hands-on and director experience in asset management, merchant banking and direct investment to numerous companies, associations and think-tanks in this field.

# Professional workshops and seminars

*Presented in collaboration with leading businesses and organizations*

## Water Finance

**Workshop; September 20-21, 2011**

The School of the Environment's Professional Development Program introduced a new Water Finance Executive Development Program with a two-day workshop held in September, 2011. Intended for professionals who work indirectly and directly with the water industry, the workshop aimed to enable them to understand, frame and act on the issues of water's financial value, scarcity and quality within fragmented and localized markets. It looked at water issues ranging from policy and regulation aimed at conservation and protecting, to strategies that address markets and investments, links to energy costs, and ecosystem health.

Speakers included representatives from the University of Toronto; Brock University; Fogler Rubinoff LLP; Torys LLP; United Nations University Institute for Water, Environment & Health; the City of Toronto; Ontario Clean Water Agency; International Institute for Sustainable Development; and Climate Change Infrastructure Corporation. A Certificate of Completion in Water Finance was also offered for those who attended the workshop and successfully completing a take-home final exam.

A workshop titled "**How Blue is Your Bottom Line?**" was also held September 18-19 2012 at the University of Toronto, organized by the School of the Environment in collaboration with Water Canada magazine and Tangerine Tango.

**LEFT:** At the Water Finance workshop in September 2011, Hank Venema (Director, International Institute for Sustainable Development's Water Innovation Centre and Sustainable Natural Resources Management Program) speaks about the water-carbon-energy-food nexus.

**RIGHT:** Blair Feltmate (Associate Professor, University of Waterloo) presents a seminar on the Climate Change Adaptation Project in Canada.



As part of the Sustainability Bootcamp for Business Leaders, participants and instructors work in groups to put together mock presentations selling value of sustainability to investors.

## The Climate Change Adaptation Project

**Seminar; November 17, 2011**

The Climate Change Adaptation Project (Canada) is led by **Dr. Blair Feltmate** (Associate Professor, Faculty of Environment, and Director of the Sustainability Practice Program, University of Waterloo) with the key purpose of identifying a short list of priority actions that Canada should embrace to adapt to climate change. This list was determined by considering the impacts of climate change on business sectors, ecosystems and human well-being.



### FOR MORE INFORMATION:

<http://learn.environment.utoronto.ca>  
or contact Donna Workman, Manager,  
Program & Partnership Development,  
416-978-7077, [d.workman@utoronto.ca](mailto:d.workman@utoronto.ca)

Approximately 80 Canadian leaders – drawn from business, government, NGOs, legal community, First Nations and academe – were involved in determining the list.

In this presentation, Dr. Feltmate discussed the impacts of climate change, and corresponding adaptation actions to be taken in response to impacts, in reference to the following priority areas: city infrastructure, biodiversity, First Nations, agriculture, freshwater resources, and property and casualty insurance. The means to turn the project's recommendations into action within Canada were discussed, as was as receptivity to the project in the U.S. For more information, please visit [www.adaptnowcanada.com/](http://www.adaptnowcanada.com/).

## Sustainability Boot Camp for Business Leaders

**Workshop; February 22, 2012**

Presented by Leapfrog Sustainability with the former Centre for Environment, Canadian Business for Social Responsibility, Partners in Project Green, Sustainability Learning Centre,

*Continued on page 22....*



**LEFT:** At the Sustainable IT workshop in May 2012, workshop chair Michael O'Neil (Chief Content Officer at IT in Canada) and presenter Frances Edmonds (HP Canada's Sustainability Program Director).

**RIGHT:** At the GHG Quantifier preparation course in May 2012, Bryan Conacher (Director of business development for Ledcor Renew and lead instructor for the Canadian Standards Association's GHG courses), discusses the reduction of GHGs in existing buildings.



E. del Jurco

*Continued from page 21.*

*Toronto Sustainability Speakers Series, MaRS, Bullfrog Power and CanadianManufacturing.com.*

Business leaders from industries such as manufacturing, retail and resources gathered for an intensive one-day sustainability workshop. It covered topics such as how sustainability drives competitive performance, financial returns themes and steps and strategies for planning and implementing a sustainability strategy. Also discussed was the leader's role in making sustainability sustainable, making employees the life force of your sustainability strategy, and ensuring capacity and credibility through governance and reporting. A panel featuring executives from Domtar, Sears Canada and Powersmiths International Corp. shared wins and challenges of leading with sustainability. Updates were provided on green supply chains, efficient packaging, financial drivers and consumer pressure.

Delegates put their learning to the test in the afternoon with a team competition. Choosing one of three sustainable companies (Herman Miller, Danone, and Teck Resources), each group prepared mock presentations to potential investors, highlighting their companies' sustainability goals, progress and value.

*-- Lisa Wichmann, Canadianmanufacturing.com*

## **GHG Inventory, Accounting and Reporting Certificate Course; May 1-4, 2012**

*Presented in collaboration with HRCarbon.*

One of the challenges organizations will face is how to determine the competency and credentials of staff and/or consultants engaged to compile greenhouse gas (GHG) inventories or provide GHG professional services. A Certified GHG Quantifier Professional mitigates these concerns by engaging professionals who have earned a personnel certification to a program that has been developed through an impartial, independent and industry-supported process, which thereby validate that an individual has the appropriate knowledge, skills and competencies.

In May 2012, the School of the Environment partnered with HRCarbon to offer a course designed to prepare students to undertake the globally recognized Canadian Standards Association's (CSA) GHG Inventory Quantifier Certification examination that will demonstrate competence to develop, quantify, assess and report GHG inventories. CSA Standards is a leading North American developer of standards, codes and personnel certification programs. This program is the latest in CSA's services providing professional credentials in the emerging carbon management market.

The School of the Environment, in collaboration with the CSA Group, plans on offering the course again in Toronto (January 2013), and for the first time in Vancouver (Oct 31-Nov 2, 2012), and in Montreal and Mexico in 2013.

## **Sustainable Information Technology Workshop; May 8-9, 2012**

*Presented in collaboration with IT in Canada.*

Designed to help participants design or refine the practise of sustainable IT operations, this workshop was organized around case study exercises exploring challenges in the deployment of green IT or in the use of IT to achieve sustainability outcomes. The goal was not so much to 'teach' green IT, but rather to provide the context and additional content needed to help in decision making around sustainability strategy.

Topics presented and discussed included history and current dialogue on sustainable IT topics, data centre and desktop efficiency activities, distributed device power management, rationalization and management of printer fleets (steps that can be taken to reduce printer footprint, energy and paper), e-waste management, virtual travel options, facilities management options, and tools used to estimate an organization's GHG emissions. Other topics that provided background for the scenario exercises completed by the participants included building management for carbon footprint reduction and the application of IT in Smart Grid for greater power reliability and energy conservation.

## **Carbon Economy Summit Workshop; June 6, 2012**

<http://www.carboneconomysummit.ca/>

*Presented by CanadianManufacturing.com, in partnership with the former Centre for Environment, International Emissions Trading Association, Leapfrog Sustainability, Bullfrogpowered, Sustainability Learning Centre, Cascades, Greening Greater Toronto, and GTAA Partners in Project Green.*

The Carbon Economy Summit was a forum for business, environmental and government leaders focused on environmental, financial and risk management performance in the low-carbon era. It drew more than 200 sustainability professionals, service providers, consultants, supply chain and manufacturing executives. Speakers shared ideas on climate change preparedness, energy conservation and sustainable communication.

# Jane Goodall Institute

*Partnership with the School provides various learning opportunities for students*

BY SARA HSIAO

This past year has seen many exciting developments for the Jane Goodall Institute of Canada (JGI), with the expansion of our conservation and education programs and the broadening reach of our public engagement efforts. Our continued partnership with the School of the Environment has been part of this growth, including the recruitment of two students who participated in the first field research internships with JGI Canada.

JGI welcomed a special guest to Ontario in the fall of 2011 – **Dr. Peter Apell**, Field Programs Manager of JGI in Uganda. In addition to presenting a seminar on wildlife and community centred conservation research as part of the Environment Seminar Series (*see page 25*), Dr. Apell also engaged various audiences at the Royal Ontario Museum, at a JGI photography exhibit, and our partners at the Canadian International Development Agency during his visit. At these venues, he talked about our programs on chimpanzee conservation and the impact of the bushmeat trade.

Dr. Jane Goodall also made stops all across the country over the past year, speaking to audiences across British Columbia, Alberta, and Ontario, and sharing her story through the acclaimed documentary *Jane's Journey*. While promoting teacher champions and the role of youth leaders, Dr. Goodall also spoke to many teachers and students during her Canada tours, inspiring youth and adults alike to take concrete action that makes sustainable positive change. In the spring



*Dr. Jane Goodall is greeted by students at David Suzuki Secondary School in Brampton, Ontario before giving a lecture to students from ten different schools in the York Region district.*

of 2012 at David Suzuki Secondary School in Brampton, she gave a lecture to students from ten different schools in the York Region district, followed by workshop for interested students.

In April 2012, Don Jackson, Interim Director of the School of the Environment, presented this year's Jane Goodall Scholarship to **Brina McMillan**, a Bachelor's student majoring in Environmental Policy and Practice, and International Development Studies, at the annual Environment and Development seminar co-presented by the former Centre for Environment and JGI. The event featured a lecture by **Dr. Kerry Bowman** (Ethicist, Joint Centre for Bioethics, U of T; and Clinical Ethicist, Mount Sinai Hospital) on community health and conservation in the Eastern Democratic Republic of Congo.

Our connection to the University is strengthening each year, with students and faculty getting involved with many of our programs. This year we recruited two students who completed three-month field internships in Uganda this past summer. **Emma Cancelliere** (third year Bachelor's student, Biological Anthropology

*Dr. Peter Apell, Field Programs Manager in JGI Uganda, speaks about wildlife and community centred conservation research in the former Centre for Environment's seminar series.*

Specialist) and **Mark McKay** (Master of Forest Conservation student, Faculty of Forestry) participated in JGI Canada's first field internship opportunity, assisting with a science-based assessment of our conservation and development initiatives in western Uganda. The data collected by these students will play a large role in ensuring our programs have the most positive impacts possible, and that our programs are reaching their objectives.

JGI also looks forward to having a new work study student **Michelle Mockus** (fourth year student, Environmental Studies and Psychology) work with our education team in the fall of 2012.

In September 2012, we welcome Dr. Goodall back to Toronto for another series of events. On September 18 2012, Dr. Goodall gave a lecture in the Snider Lecture Series at U of T Mississauga.

*Sara Hsiao is Program Co-ordinator, Conservation & Education at JGI Canada.*

**FOR MORE INFORMATION & VOLUNTEER OPPORTUNITIES:**

[www.janegoodall.ca](http://www.janegoodall.ca);  
416-978-3711; [info@janegoodall.ca](mailto:info@janegoodall.ca)

# U of T Sustainability Office

*Sustainability initiatives in all aspects of campus life continue to flourish*

BY TYLER HUNT

The University of Toronto Sustainability Office reflects on a year of exciting changes, meaningful collaborations, and successful projects both new and established.

We say farewell to our inaugural Sustainability Director, **Dr. Beth Savan**, who was responsible for establishing the Sustainability Office in 2004. A Senior Lecturer Emerita at the School of the Environment and Research Associate at the Cities Centre, Dr. Savan will pursue exciting research projects on urban cycling and revolving funds at Ontario institutions. She will be missed! (*See page 5 for a description of her cycling project at the School; see page 29 for some words spoken at Beth's retirement.*)

In other important news, WE HAVE MOVED! The Sustainability Office has left its long-time home in the South Borden Building to work alongside Facilities and Services on the fourth floor of 255 McCaul Street (south of College Street).

The Sustainability Office continues to establish strong collaborations with partners on campus, and in the last year has watched those partners achieve exceptional results. School of the Environment students have contributed to research on greening laboratory, course and office practices, improving waste diversion in cafeterias, and developing rainwater harvesting systems on rooftops. The student-led **Public Water Initiative (PWI)** inspired U of T's St. George campus to promote public water by going bottled water free in the fall of 2011. PWI's partnership with Ancillary Services and the Sustainability Office also helped to form **On Tap**, a group dedicated to encouraging public water sustainability, education and access. The Sustainability Office partnered with the Cities Centre to facilitate the hugely successful **Sustainability Symposium**, which gathered over 80 faculty, staff, and students to discuss the University's role to further sustainable progress and develop a sustainable vision. A multi-disciplinary subcommittee of the **St. George Sustainability Advisory Committee**, composed of over 30 faculty, staff and students, authored a report recommending more aggressive energy efficiency standards and integrated design processes for new university buildings (<http://uoft.me/efficientbuildings>). **Bikechain**, U of T's free bike repair, rental and education facility, has experienced exceptional growth since its inception in 2005 and has helped over 11,000 students to date. Bikechain will move to a larger, more accessible space in the North Borden building, at Spadina Ave and Bancroft Avenue. to accommodate its growing demands.

The Sustainability Office has also made significant progress toward its goals by engaging in the following initiatives:  
**Green Ambassadors:** A growing team of 35 staff from 19 different units who are passionate about sustainability and work to promote environmentally-friendly practices in their offices. Ambassadors are becoming more and more proactive, and the program is evolving to encourage more "home-brewed" activities and peer-to-peer help. If you are interested, please join! (<http://uoft.me/greenambassadors>)  
**Green Courses:** This program recognizes instructors who adopt



Sustainability Office

*The Sustainability Office partnered with the Cities Centre to organize a Sustainability Symposium at Hart House in June 2012, with over 80 faculty, staff, and students gathering to discuss the University's role to further sustainable progress and develop a sustainable vision.*

paper-saving practices such as double-siding documents and posting their lecture slides in as compact a form as possible. Over 200 courses have been certified to date across the three campuses. (<http://uoft.me/greencourses>)

**Rewire:** Running for its seventh year, the Rewire program has continued to encourage students in residence to change behaviours and reduce their energy consumption. Undergoing some major development over the summer, the new program will be piloted in three residences this coming year.

**Energy and Resource Management Fund:** This fund provides funding support to empower faculty, staff and students to initiate major energy and water conserving retrofits, such as high efficiency window film and occupancy-sensor controls for lights. (<http://uoft.me/ermfund>)

**Paper Cuts:** Encouraged by the Sustainability Office in recent years, U of T staff all across campus are ordering fewer unnecessary phonebooks and, as a result, deliveries have significantly dropped from 6500 to 1300 books since 2006 — a reduction of 80% of paper! Email Sandy at [sandra.levere@utoronto.ca](mailto:sandra.levere@utoronto.ca) if you think your unit can reduce or cancel phonebook deliveries.

In a year when the St. George campus reached an impressive waste diversion rate of 68.2%, the Sustainability Office also pursued waste reduction initiatives to encourage the reuse of items on and off campus. The Office's **Spring Swap** event had students, staff and faculty donate their gently used items, with nearly 200 kg of items picked up for reuse by others in the campus community. Also, **Trash Nothing** (St. George) is an informal online group of 542 members dedicated to sharing reused items amongst the campus community.

In the coming year, the Office will continue to work toward lasting solutions that integrate sustainability into our procedures and practices. Stay informed of upcoming opportunities by visiting the Sustainability Office online at <http://sustainability.utoronto.ca> where Listserv, Twitter, Facebook and Tumblr details can also be found.

*Tyler Hunt is a Project Coordinator at the Sustainability Office.*

## FOR MORE INFORMATION:

<http://sustainability.utoronto.ca>  
 tel: 416-978-6792; email: [sustainability@utoronto.ca](mailto:sustainability@utoronto.ca)

# Environment Seminar Series

The following seminars were presented in this series in 2011-12. Condensed presenters' abstracts are included below.

**PETER APPELL**, Field Programmes Manager, Jane Goodall Institute Uganda. **Riparian Corridors: Wildlife and Community Centred Conservation Research Opportunities.** The Jane Goodall Institute (JGI) supports wildlife research, education and conservation with the aim of promoting action to improve the environment for people and wildlife alike. This seminar highlighted the Sustainable Livelihoods Project in western Uganda, which works to restore regional forests and waterways, improve local livelihoods and promote environmental education and sustainable resource management. It takes a holistic approach to conservation and development in an area inhabited by a significant population of chimpanzees, and where forest conservation is being attempted. (See page 23 for more on JGI.)

**JOSEPHINE ARCHBOLD**, Environmental Health Research Consultant, Healthy Public Policy Department, Toronto Public Health. **Do the Health Benefits of Growing Your Own Food Offset the Risks of Urban Soil Contaminants?** Urban agriculture can enhance food security, encourage physical activity, connect communities, and provide low cost, nutritious, culturally appropriate food to vulnerable communities. However, urban lands can have an industrial past and potential soil contamination. This seminar discussed an evidence-based soil assessment guide developed by Toronto Public Health which provides instructions on sampling and testing of urban soils, interpreting the results, and applying appropriate risk management measures. The guide was developed to encourage community engagement and incorporates a holistic risk/benefit approach to addressing soil contamination.

**KATHLEEN COOPER**, Senior Researcher, Canadian Environmental Law Association. **Early Exposures to Hazardous Chemicals/Pollution and Associations with Chronic Disease: A Scoping Review.** Biomonitoring data indicate population-wide exposure to multiple contaminants, with levels higher in children and generally highest in breast-fed infants, with unknown consequences. This seminar discusses a report that reviews evidence for associations between early environmental exposures and later life chronic disease for a large number of substances including air contaminants, lead, pesticides, and persistent organic pollutants including brominated flame retardants, phthalates and bisphenol A.

**SMITA KOTHARI**, Ph.D. candidate, Dept. of Religion and Environmental Studies collaborative program, U of Toronto. **Ahimsa and the "Science" of Living: The Jain Path to Environmental Well-Being.** Drawing on ethnographic analysis of the Rajasthan, India based contemporary Jain sect known as the Terapantha and textual analysis of the sect's writings, this seminar argues that their path may have an impact on tackling social and environmental issues. The cultural translation of Jaina Yoga within the Terapantha community may serve as an effective case study of an emerging global discourse on environmentalism that exports religious concepts from the developing world. In the Terapantha community, ecological awareness is created by practices of meditation, everyday morality, and principles of well-being.

**TODD LATHAM**, Publisher and CEO, Actual Media Inc. **Antarctica 2041: The Quest to Save Earth's Last Wilderness.** Todd Latham was asked to join Robert Kennedy Jr. and his organization, 2041.com, on an expedition to Antarctica in 2011. He was part of a team of six Canadians tasked with helping prepare a report, for the 2012 Earth Summit, on environmental conditions of a particular research station. This seminar examined the environmental and political conditions of the continent as well as the stunning landscape and wildlife. What Antarctica and the Arctic may be like in 2041, when the treaty protecting the Antarctic comes up for renewal, was also discussed. (Todd Latham is a member of the School's Environmental Finance Advisory Committee; see page 20.)

**JEAN MERCIER**, Professor, Political Science Department, Université Laval. **Upstream and Downstream of Policy Instruments for Sustainable Urban Transportation.** While greenhouse gas (GHG) reduction has been realized in industry and energy production, at least in relative terms, transportation GHG continues to grow unabated. This seminar discussed the characteristics of cities that have bucked some of the worldwide trends and successfully presented citizens with a wider choice of quality transportation alternatives to the automobile. Sociological, economic and political profiles of the cities, as well as the type of policy tools used, were highlighted. Common patterns amongst the cities and their applicability were discussed. (Visiting Professor in Fall 2011; see page 28.)

**ANDREW MIALL**, Professor, Dept. of Earth Sciences, U of Toronto. **Environmental Management of the Alberta Oil Sands: New Federal and Provincial Initiatives.** Pollutants from the Alberta oil sands may be responsible for deformities in the freshwater fish



Mark Winfield presents a seminar on the conclusions from his new book "Blue-Green Province: The Environment and the Political Economy of Ontario".

population and for unusual cancers in the First Nations population downstream from the area. Studies conducted in 2010 by a federal Oil Sands Advisory Panel and the Royal Society of Canada concluded that existing regulation and management methods were inadequate and that more extensive scientific monitoring of the industry was required. Building on these earlier studies, an Alberta Environmental Monitoring Panel delivered a report with twenty recommendations in 2011. This presentation outlined the scientific basis for the environmental concerns, and the methods being proposed for their resolution.

**MARK WINFIELD**, Associate Professor, Faculty of Environmental Studies, York University. **Blue-Green Province: The Environment and the Political Economy of Ontario.** Dr. Winfield presented conclusions from his new UBC Press book which explores the evolution of environmental policy in Ontario, with a focus on the period between 1971 and 2011. It places the province's approach to environmental matters in the context of the changes in Ontario's environment, economy and society. Attention is given to the influence of public concern for the environment on public policy, the impact of changes about the role of the province state and the relationship between economic development and environmental sustainability and the role of structural changes in the provincial economy.

Coordinated by Donna Workman,  
Manager, Program & Partnership Development

**FOR MORE INFORMATION:**  
[www.environment.utoronto.ca/Events.aspx](http://www.environment.utoronto.ca/Events.aspx)  
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# Memorial Lectures

The following Memorial Lectures were presented in the Spring term of 2012 in conjunction with special student awards and scholarships. For photos and details of awards presented, please see pages 14 and 17. For more information, please contact Donna Workman, Manager, Program and Partnership Development, at [d.workman@utoronto.ca](mailto:d.workman@utoronto.ca).

## Robert Hunter Memorial Lecture

*This annual lecture is held in memory of the late **Bob Hunter**, co-founder of Greenpeace and former Ecology Specialist at CityTV.*

**DAVID PHOTIADIS**, Sustainability Analyst, The Delphi Group. ***Finding Climate Change Successes Amidst Growing Stagnation.***

In 2012, it is clear that the climate change movement is well behind the expectations and aspirations of just 4 years ago. In this age of government austerity, diminished public pressure, and the still bitter taste of corporate greed highlighted in the Occupy Movement, it can be difficult for climate change practitioners to remain positive. Can the climate change movement reverse this trend of stagnation? In response to growing pessimism, this lecture demonstrated examples of successful responses to the climate challenge and the underlying characteristics that have enabled success in the public, private, and NGO sectors. It also explored how these successful initiatives can provide direction for future climate progress.

## Eric Krause Memorial Lecture

*This annual lecture is held in memory of **Eric Krause**, a U of T undergraduate and graduate alumnus in Geography and Environmental Studies and former environmental planner at the City of Toronto.*

**GLENN MILLER**, Vice President, Education & Research, Canadian Urban Institute.

***Building and Connecting the Four Pillars of Sustainability.*** This lecture examined the concept of sustainability from a planning and development perspective, focusing on the benefits of distinguishing between sustainable buildings, sustainable neighbourhoods and sustainable cities. With every increase in scale comes an increased level of complexity. If the common goal is to find ways to engage more people and organizations in the identification and implementation of sustainable solutions, this presentation argued that the ability to accurately describe the challenge will be increasingly important. If it is done correctly, the term “sustainability” will retain or possibly regain its currency.

## Douglas Pimlott Memorial Lecture

*This annual lecture is held in memory of **Dr. Douglas Pimlott**, first Director of the former Environmental Studies Program, Innis College.*

**TIMOTHY GRAY**, Program Director, Ivey Foundation. ***What Canada’s Forest Battles Can Tell Us About Resolving Conflict.***

Canada’s forests have boiled with social, political and economic conflict since the 1980s. Road blockades, legal disputes and marketplace action sought to change society’s view of the value of forests. Now almost 30 years later a coast-to-coast truce has been called by the forest industry and environmentalists in the hopes that it can lead to a future where more forest is protected and the industry can also return to profitability. This talk explored the history, actors and power wielded in forest conflicts and examined how it led to the Canadian Boreal Forest Agreement, the world’s largest conservation accord. It also reflected on why it took so long to get here and how these lessons can be applied to other critical economic and ecological issues.

# Environmental Career Day

*An annual spring event for all university and community college students*

BY DAVID POWELL

The School of the Environment is pleased to present the annual Environmental Career Day, open to all registered university and community college students at U of T and elsewhere.

The 2012 event was held in early March at Hart House’s Great Hall and was organized in collaboration with the Toronto Undergraduate Geography Society, the Forestry Union of Students, and the Environmental Students’ Union. The day included a career expo with exhibitors from government, consulting firms, non-governmental organizations, and graduate programs at U of T, providing students with information, career advice and potential career, job and volunteer opportunities.

The day also included presentations by speakers from various sectors in the environmental field. They discussed and answered questions about their jobs and the key next steps before and after graduation. The speakers included U of T alumna **Josephine Archbold**, Intrinsik Environmental Services, Inc.; **Ray Clement**, Ontario Ministry of the Environment; **Angela Bischoff**, Ontario Clean Air Alliance; **Alex Gill**, Ontario Environmental Industry Association; and **Glen Matadeen**, U of T Career Centre.

*David Powell is the School’s Undergraduate Student Advisor and Placement Coordinator. For more information, please email him at [david.powell@utoronto.ca](mailto:david.powell@utoronto.ca).*



*Seated on the right, Pavel Pripa (School of the Environment) and Julie Quenneville (U of T Scarborough’s Dept. of Physical and Environmental Sciences), advise a student on collaborative graduate environmental programs and Scarborough’s Master of Environmental Science Program.*

# Environment & Health Seminar Series

The following seminars were presented in this series in 2011-12. Condensed presenters' abstracts are included below.

**KATHLEEN COOPER**, Senior Researcher, Canadian Environmental Law Association. **Obesogens and Child Health.** Causes of obesity among children may be far more complex than excess food intake and inadequate physical activity. Early life exposure to obesogenic chemicals has been found to be a contributing factor with serious implications for chronic conditions and diseases. These development challenges may be found with exposure in the womb and also exposure to chemicals in the environment, which act at very low levels of exposure. This presentation reviewed the evidence for obesogenic risk of exposures to chemicals including bisphenol A, phthalates, organotins, PBDEs and other persistent organic pollutants. Policy implications were also discussed.

**MIRIAM DIAMOND**, Professor, Dept. of Earth Sciences, U of Toronto. **The Flame Retardant Story: Diabolical Plots and Remarkable Actors.** This is a complex story filled with intrigue and fueled by fire and money. An array of flame retardants is available, but organohalogenated compounds, known for their environmental persistence and toxicity, are also widely used in consumer products such as furniture and electronics. The most widely used are polybrominated biphenyl ethers (PBDEs) which are now banned. One PBDE replacement, PentaBDE that was added to flexible foam, is now being found in the environment and us with concentrations rising at an alarming rate.

**JASON GILLILAND**, Director, Human Environments Analysis Laboratory and Assoc. Professor of Geography, U. of Western Ontario. **Children's Health and the Environment: How Community Design Can Make a Difference.** A growing body of research suggests that how we have been building our communities over the past few decades may be at least partly to blame for rising rates of children's health problems, such as obesity, physical inactivity, respiratory problems, and mental health issues. Using evidence from several multidisciplinary projects he has undertaken with children in Southwestern Ontario, this talk explored how aspects of community design can contribute to children's health and quality of life.

**PAUL HELM**, Senior Research Scientist, Environmental Monitoring & Reporting Branch, Ontario Ministry of the Environment. **Tracking Chemicals of Emerging Concern in the Great Lakes.** While significant progress has been made in reducing inputs and concentrations of past-use industrial and



**Heather Manson of Public Health Ontario (PHO) gives a seminar on a PHO and Cancer Care Ontario report with recommendations for chronic disease prevention.**

agricultural contaminants, the presence of many current-use chemicals (pharmaceuticals, flame retardants, and perfluorinated chemicals) at low concentrations has gained attention and generated concern. This talk highlighted studies which improve our knowledge of what contaminants are found in the Great Lakes region, provide a better understanding of the pathways of entry into the lakes, and highlight the variety of tools used to monitor chemical occurrence and movement. (Dr. Helm is now Adjunct Professor at the School of the Environment.)

**EVA LIGETI**, Executive Director, Clean Air Partnership. **Climate Change and Human Health: What Does Celine Dion Have to Say About That?** "Barbra Streisand told Diane Sawyer that we're in a global warming crisis, and we can expect more and more intense storms, droughts and dust bowls. But before they act, weather experts say they're still waiting to hear from Celine Dion." - Jay Leno. Canada is among the richest, most technologically sophisticated, highly educated societies. We undeniably have robust, albeit increasingly stressed, health and local government sectors. Many of the most serious impacts of climate change will fall to these two sectors to mitigate. This seminar explored the connections between local decisions and public health in building climate resilience.

**HEATHER MANSON**, Director, Health Promotion, Chronic Disease and Injury Prevention, Public Health Ontario (PHO). **Changing the Risk Landscape for Chronic Disease Prevention.** The four most prevalent chronic diseases (cancer, cardiovascular disease, diabetes, and respiratory disease)

account for the majority of deaths and a significant proportion of healthcare spending in Ontario. This seminar discussed a report which was developed by PHO and Cancer Care Ontario and contains 21 recommendations addressing the four major risk factors that account for the majority of chronic disease in Ontario: tobacco use, alcohol use, physical inactivity, and unhealthy eating. In addition, recommendations are made for overall system level change and to address health inequity. Read the report at [www.oahpp.ca/takingaction](http://www.oahpp.ca/takingaction).

**RON PLAIN**, Member, Aamjiwnaang First Nation. **Dream Catcher? Where the Industrial Nightmares Fall.** Legend has it that the Dream Catcher, when hung over a bed, catches dreams and nightmares. Dreams flow through the webbing and nightmares get caught up at the centre. The companies of Sarnia's Chemical Valley have woven a Dream Catcher the size of Turtle Island and the centre, where the industrial nightmares fall, is Aamjiwnaang. Aamjiwnaang has been called "the most polluted spot in North America" by National Geographic and "the most polluted spot in Canada" by the World Health Organization. This presentation guided the audience through the Dream Catcher, from fracking to the Oil Sands, and how the extraction of petrochemicals end up in the 63 refineries that surround Aamjiwnaang.

**SCOTT WEICHTHAL**, Epidemiologist, Air Health Effects Science Division, Health Canada. **Traffic-Related Air Pollution and Acute Changes in Heart Rate Variability and Respiratory Function in Urban Cyclists.** This seminar outlined a study that examined the relationship between traffic pollution and acute changes in heart rate variability in 42 healthy adults who cycled for one hour on high and low traffic routes as well as indoors. Health measures were collected before and after 1-4 hours after the start of cycling. Spirometry and exhaled nitric oxide measures were also collected. Ultrafine particles, particulate matter (PM2.5), black carbon, and volatile organic compounds ambient nitrogen dioxide and ozone levels were measured along the routes. Findings suggest that short-term exposures to traffic pollution may contribute to altered autonomic modulation of the heart in the hours immediately after cycling.

Coordinated by Professor Clare Wiseman (see page 33).

**FOR MORE INFORMATION:**  
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# In memoriam: Rodney White

*Co-founder of the former Centre for Environment will be greatly missed*

BY IAN BURTON

Vigorous and active professionally; always engaged in caring deeply for his loving family and greatly appreciated by his many colleagues, students and friends, esteemed Professor Emeritus Rodney White died peacefully July 5, 2012 after a short illness.

Rodney was educated at the Universities of Oxford, Pennsylvania State, and Bristol. Arriving at the University of Toronto in 1974, Rodney quickly established himself as an internationally renowned authority in transdisciplinary and international research. This included a diverse range of topics in urban and environmental infrastructure and management, adaptation to climate change and environmental liability and the insurance industry.

Later in his career he collaborated with others in research and teaching on risk analysis and environmental finance, and helped in the founding of the Centre for Environment in 2005, which has since



become the School of the Environment. He undertook field work in Africa, China and Vietnam and had wide international experience. He was Professor of Geography from 1974, and served for 10 years (until

2005) as Director of the former Institute for Environmental Studies (IES). In this role he had a reputation as a leader with a heart: always clear headed, focused, a good listener, attentive, brilliant with an elegant simplicity and with a deep concern and understanding for his students. A prolific author of books and scholarly papers, he leaves a strong and enduring legacy both within and well beyond the university community.

His family and the School of the Environment hope to establishment a scholarship in his name. Donations may be made at [donate.utoronto.ca/environment](http://donate.utoronto.ca/environment). (Please select Rodney White scholarship.)

*Ian Burton is Professor Emeritus, Department of Geography, and former IES Director (1979-84).*

## Visiting Professors

*Jean Mercier from Université Laval and Yujun Li from CASS Beijing*

BY JEAN MERCIER AND YUJUN LI

The School of the Environment is pleased to welcome Visiting Professors from other Universities to provide an opportunity for a reciprocal sharing of expertise and to encourage future collaborations.

### VISIT OF JEAN MERCIER (Fall 2011)

Professor, Département de science politique, Université Laval, Québec (<http://www.pol.ulaval.ca/?pid=230>)

My visit was arranged through Dr. Doug Macdonald (*see page 31*) with whom I've worked on different projects, the current one comparing urban transportation policy in the city of Toronto with other transit cities of the Americas (*see page 4*). During my visit, I made a presentation in the Environment Seminar Series (*see page 25*) and spoke about "transit cities" which have been successful in sustainable urban transportation and the policy tools which they used to attain their goals. I also participated in Dr. Macdonald's graduate course on environmental policy (ENV 1002) and worked on an article on policy instrument choice with Ph.D. candidate David Houle (Political Science and Environment).

I also enjoyed participating in other seminars, presentations and discussions on Canadian climate change policy, notably with a visiting member of the European parliament and Professor Eric Miller (Civil Engineering and then Director, Cities Centre).



Political Science, Laval U., and Y. Li

### VISIT OF YUJUN LI (August, 2012 to July, 2013)

Associate Professor and Director, Dept. of Environmental Economics and Management, Chinese Academy of Social Sciences, Beijing.

During my year at the School, I will focus my studies on Canadian environmental policy and Toronto municipal waste management. I am planning on participating in courses on Canadian environmental politics and in sustainable research projects with U of T colleagues.

My main research interests are in environmental policy, sustainable development, municipal solid waste management, environmental management, impact assessment, and standards. My projects include a study of socialized institution of solid waste management in urban areas of China, a social evaluation on municipal solid waste classification in Beijing, and a comparative study of solid waste management policy between China and Japan.

*For more information, contact Ms. Li at [jenny9166@hotmail.com](mailto:jenny9166@hotmail.com).*

# Saying “goodbye” to our faculty

*The careers of Phil Byer, Beth Savan and Kundan Kumar are celebrated*

BY INGRID LEMAN STEFANOVIC, VIRGINIA MACLAREN AND DONALD JACKSON

In 2011-12, we said “goodbye” to and celebrated the careers of three faculty members of the former Centre for Environment who retired or moved elsewhere – Phil Byer, Beth Savan and Kundan Kumar. The following are excerpts of memorable speeches given at their farewell receptions.

## PHIL BYER

*Retired as Professor in December 2011 after 36 years at U of T (Civil Engineering and Inst. for Environmental Studies then Centre for Environment); now Professor Emeritus, Civil Engineering.*

*By Ingrid Leman Stefanovic, Professor, Dept. of Philosophy and former Director of the Centre for Environment.*

“The graduate Environmental Decision Making [ENV 1001] course that Phil and I co-presented for many years really brought out his extraordinary talents. First, he was a trained engineer who easily moved beyond his discipline to engage social, political, economic, and philosophical issues, always in a brilliant way. He was an engaging teacher, whom students loved and respected. Most importantly for me, he was my friend. We had so much fun co-teaching this course. You can imagine what it is like putting an engineer and a philosopher into the same room! It was definitely not a dull class! In fact, it was my favourite class by far and mostly that was because I always was learning from Phil, and together, we were building a truly innovative, interdisciplinary experience together with a fabulous group of graduate students every year...

Phil, I am happy to know that you will be happy in your new life. And I know that you will be. But selfishly, I will say that you will be missed by many of us. Your presence at Governing Council has meant that the University as a whole has benefited from your wisdom. Students have benefited from your wisdom. Colleagues have benefitted from your wisdom. And I have benefitted from your wisdom and especially, your friendship...”

## BETH SAVAN

*Retired as Senior Lecturer in June 2012 after 31 years at U of T (including seven at the Centre for Environment); now Senior Lecturer Emerita, School of the Environment.*

*By Ingrid Leman Stefanovic*

“...Beth’s career in environmental curriculum planning goes back a long time, and amazingly, her commitment and enthusiasm in advancing environmental awareness at U of T has never waned. In fact, I would say that this commitment has only increased over the years, culminating in her dedication to helping to build both the Centre for Environment, and especially the Sustainability Office, where she leaves an incredibly important impact upon U of T...

As I am sure that you all know, Beth’s career has been more than merely academic. She has accumulated more research grants than most of my colleagues... But her academic work has also always been complemented by her desire to see the impact of her research on the broader community. Through her courses and through her leadership at the Sustainability Office, Beth has showed students the importance of linking theory with praxis... Those of us who know that environmentalism demands actual lived changes in the way in which we run our institutions, governments, businesses and society in general – we know that her legacy is a vital one, that has helped to raise the profile of this university in uniquely important ways.



**TOP:** Phil Byer opens his retirement gifts at a special reception in December 2011 as his wife Sandy (centre) and Ingrid Leman Stefanovic, former Director of the Centre for Environment (right), look on.

**BOTTOM:** Beth Savan (left) and Kundan Kumar speak at a special reception held in June 2012 at which they were honoured.

## KUNDAN KUMAR

*Assistant Professor, Dept. of Geography and Centre for Environment, 2009-12. Now Assistant Professor, Faculty of Forestry, U of T.*

*By Don Jackson, Interim Director, School of the Environment*

“We were fortunate when Kundan joined the Department of Geography and Centre for Environment in 2009 as an Assistant Professor, after receiving his Ph.D. in Resource Development from Michigan State University. When joining U of T, he continued his important research in environmental governance, forest tenure and property rights in India. In Geography, he was an active and valuable departmental citizen, serving on many committees. In both Geography and at the Centre, he was a valuable instructor who taught courses on environmental justice at both the graduate and undergraduate levels. These courses filled important gaps in our curriculum and were much appreciated by our students. The following comment summarizes some of the high praise he received from students: “Awesome!! Amazing! He is outstanding ... passionate, inspiring teacher who knows his material.”

## PROFILES: FACULTY



### Christian Abizaid

Assistant Professor, Dept. of Geography and School of the Environment.

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Licenciatura (International Relations), Iberoamericana, Mexico; M.A. and Ph.D. (Geography), McGill.

2012-13 Instructor of JGE 321H

Multicultural Perspectives on Environmental

Management (joint course with Dept. of Geography).

**Research Interests:** Human-environment interactions, environmental conservation and development, cultural ecology, peasant livelihoods in tropical forests, environmental change, human responses to natural hazards and vulnerability, human-induced environmental change, land use and land cover change, Latin America, Amazon, Mexico.

#### Featured Research Projects:

*Floodplain Dynamics, Socioeconomic Change, and Traditional Livelihoods in the Upper Amazon.* This project examines the prospects for economic livelihood within the context of rapid environmental and socioeconomic change. As part of my dissertation, I studied the origins, and the (social and economic) consequences of a recent meander cutoff along the Ucayali River in Peru. Since then, South American governments announced important infrastructure projects in the Amazon, under IIRSA, which are likely to change the prospects for economic livelihood in my study area. Building on my earlier research in the region, I have a unique opportunity to document long-term livelihood responses to river channel dynamics in a socioeconomic context that is rapidly changing.

*Community Location, Geographical Poverty Traps, and Community-based Programs.*

This project is in collaboration with Yoshito Takasaki (University of Tsukuba), Oliver Coomes (McGill University) and Pablo Arroyo (McGill). It uses remote sensing imagery and community/household surveys to study the determinants and implications of geographical location of rural settlements in the Peruvian Amazon as a new approach that promises to improve our understanding of geographical poverty traps and community-based conservation and development.

#### Recent Publications:

Coomes, O., Y. Takasaki, C. Abizaid and B. Barham. 2010. Floodplain fisheries as natural insurance for the rural poor in tropical forest environments: evidence from Amazonia. *Fisheries Management & Ecology*. 17:513-521.

Coomes, O.T., C. Abizaid and M. Lapointe. 2009. Human modification of a large meandering Amazonian river: genesis, ecological and economic consequences of the Masisea cutoff on the central Ucayali, Peru. *Ambio* 38(3): 130-34.

Abizaid, C. 2005. An anthropogenic meander cutoff along the Ucayali River, Peruvian Amazon. *The Geographical Review* 95(1): 122-135.



### Karen Ing

Senior Lecturer and Undergraduate Coordinator, School of the Environment.

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M.Sc. (Zoology), Toronto.

2012-13 Instructor of SII 199H Debating and Understanding Current Environmental Issues, ENV 200H Assessing Global Change: Science and the Environment, ENV 221H Multidisciplinary Perspectives on Environment.

#### Research Interests:

Environmental education, interdisciplinary team teaching, valuing ecosystem services and well-being; incentive mechanisms for provisioning of ecosystem services.

#### Featured Research Projects:

*Incentive Mechanisms for the Provision of Ecosystem Services in Ontario.* The provision of ecosystem services poses challenges similar to as those associated with the provision of public goods. These challenges become more serious when the providers are private landowners. In partnership with conservation authorities in Southern Ontario, this project is being undertaken to enable community organizations to implement the most appropriate incentive mechanisms by enhancing their capacities, and to facilitate relevant policy changes related to the provision of ecosystem services, at the national, provincial, and municipal levels.

*Ecosystems and Human Well-Being* (UNEP).

In collaboration with **Professor Shashi Kant** (Faculty of Forestry, U of T), the goal of this project is to increase awareness and understanding of the links between ecosystem and human well-being, especially in developing countries. Workshops have been offered in China and Vietnam.

*Team Teaching: Does It Strengthen Or Undermine a Learning Community?* With a

cross-disciplinary group of U of T colleagues, this study explores the extent and variety of team teaching models at U of T. Over 64 team taught courses were surveyed in the Faculty of Arts & Science to assess the perceived advantages and disadvantages of team teaching both from the faculty and student perspective.

*Survey of Raccoon Movement in the Niagara Region from 1994 to 1997.* This project was a critical component in developing Ontario's strategies on management and potential disease spread of raccoon rabies into Southern Ontario. It analyzed data from the Trap-Vaccinate-Release program in the Niagara Region to study movement trends associated with variables such as sex, age, and seasons.

#### Recent Publications:

Rosatte, R., M. Ryckman, K. Ing, S. Proceviat, M. Allan, L. Bruce, D. Donovan, J.C. Davies. 2010. Density, movements, and survival of raccoons in Ontario, Canada: implications for disease spread and management. *Journal of Mammalogy* 91(1): 122-135.

Neumann, M, S. Browning, J. Clarke, J. Harlow, D. Harrison, K. Ing, L. Kushnir, C. Kutas, J. Pitre, R. Serbanescu, M. Wall, and R. Wilson. 2008. Serial team teaching and the evolving scholarship of learning: students' perspective. *Collected Essays on Teaching and Learning* 1: 28-34.

## Donald Jackson

Professor, Department of Ecology and Evolutionary Biology;

Interim Director, School of the Environment.

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B.Sc., M.Sc., Ph.D. (Zoology), Toronto.

**Research Interests:** The mechanisms by which environmental conditions determine the composition of ecological communities and species distribution; fish and aquatic invertebrate communities; statistical methodologies; environmental contaminants; ecological restoration/recovery.

### Featured Research Projects:

*Impact of Invasive Species on Biodiversity of Lakes.* Much of our research focuses on factors impacting the biodiversity of ecological systems. One research theme relates to the impact of invasive species on the biodiversity of lakes. We have ongoing projects examining the impact of invasive species of fish and invertebrates on our native species, determining the potential invisibility of Canadian lakes, and assessing how large-scale environmental alterations, such as climate change, further increase the vulnerability of our ecosystems to invasive

species. Often human actions contribute to the dispersal and impact of these species through largely unrecognized ways. Our work also aims to better educate the public about these unrecognized actions and consequences.

*Conservation Biology.* Freshwater ecosystems and their species have been identified as the most threatened ones in the world. Stressors such as climate change, habitat alterations/loss, and invasive species pose major threats to our species and ecosystems. We work on studying the stressors and their effects on species at risk, including whether we are correctly identifying the most vulnerable species in Canada. Our work includes field research studying individual populations through to identifying the critical landscape features necessary for the survival of species.

*Statistical Ecology.* Determining relationships between many species present in ecological communities and the many associated environmental conditions provides significant challenges. Our lab has a strong emphasis on the development and use of statistical methodologies, typically multivariate statistical methods, that can be used to determine these associations, test for relationships, and develop predictive tools for research and management.

### Recent Publications:

Poos, M., Lawrie, D., Tu, C., D.A. Jackson, and N.E. Mandrak. 2012. Estimating local and regional population sizes for



an endangered minnow, reddsides dace (*Clinostomus elongatus*), in Canada. *Aquatic Conservation: Marine and Freshwater Ecosystems* 22:47-57.

Walker, S.C. and D.A. Jackson. 2011. Random-effects ordination: describing and predicting multivariate correlations and co-occurrences. *Ecological Monographs* 81: 635-663.

Neff, M.R. and D.A. Jackson. 2011. Effects of broad-scale geological changes on patterns in macroinvertebrate assemblages. *Journal of the North American Benthological Society* 30: 459-473.

## Douglas Macdonald

Senior Lecturer, School of the Environment.

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Hon. B.A., M.A., Toronto; Ph.D. (Environmental Studies), York.

On sabbatical leave July 1/12 to June 30/13.

**Research Interests:** Politics of Canadian environmental policy making; waste and pollution policy; the business firm and trade association as environmental policy actors, Canadian national, federal-provincial climate-change policy; environmental legitimacy as a source of political power.

### Research Projects:

(See page 4 for more details.)

*Governance Innovation and the Transition to a Low Carbon Economy* (Carbon Management Canada, 2010-13; with James Meadowcroft and Glen Toner of Carleton University). This project is concerned with innovation in governance practices to address climate change and accelerate the transition towards a low carbon Canada. It addresses the particular issue of distributional conflicts, focussing on three dimensions of climate-related political conflict related in Canada: regional/inter-governmental, industrial, and social. The

project also examines innovative measures for such things as mobilizing capital for low-carbon investment being implemented in leading European jurisdictions.

*Allocating Canadian Greenhouse Emission Reductions Amongst Sources and Provinces: Learning from the EU and Germany* (SSHRC, 2009-12; with Jochen Monstadt, Technische Universität Darmstadt, Germany and Kristine Kern, Wageningen Universiteit, The Netherlands). This project studies the failure of the Canadian federal government and provinces to reach agreement on one effective, coherent national climate change policy which explicitly states what portion of the over-all cost of action will be borne by each province and studies lessons learned from two other federated systems – Germany and the EU. Draft recommendations for Canadian governments were discussed at three workshops in 2011. The final project report will be released in 2012.

*Carbon Province, Hydro Province: The Tragic Failure of Canadian National Climate Policy.* This is the working title of a book Dr. Macdonald plans to write during his sabbatical leave, examining the effort by Canadian federal and provincial governments to develop co-ordinated national climate-change policy during the period 1992 – 2002 and the subsequent unco-ordinated policy making by all fourteen Canadian governments.



### Recent Publications:

Macdonald, D. 2012. State interest as an explanatory factor in the failure of the soft-path energy vision. *Energy Policy* 43 (April 2012): 92-101.

Macdonald, D. 2012. Harper energy and climate policy: failing to address the key challenges. In G.B. Doern and C. Stoney (eds.) *How Ottawa Spends 2011-12*. McGill-Queen's University Press, Kingston-Montreal.

Macdonald, D. 2007. *Business and Environmental Politics in Canada*. Broadview Press, Peterborough, Ontario. 240 pages. (Winner of the Donald Smiley Prize.)



**W. Scott Prudham**

Professor, Department of Geography and School of the Environment.

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**Research Interests:** The commodification of nature; market-based mechanisms for dealing with environmental problems; political ecology, political economy and environmental change/politics in North America; industrial and alternative forestry in western North America; social regulation of commercial biotechnology in agriculture and forestry.

**Featured Research Project:**

*Double Movements: A Political Ecology of Land, Labour and Livelihoods in British Columbia* (SSHRC, 2008-12). This project examines the inter-connected political, ecological, economic and cultural aspects of commodification in British Columbia’s forest economy. The goals are to understand trajectories of commodification, specifically relating to forest based work and forest products production, but also to examine opportunities and constraints facing sustainable livelihoods based on forest appropriation. It proposes and addresses several interconnected questions: How do labour and land come to circulate as commodities? How does commodification rely on specific processes of political, cultural, and institutional objectification whereby the social allocation of labour and land seem to elude everyday influence? How are these processes evident in the historical and contemporary political ecology of BC’s globalist forest economy? What strategies are appropriate and available

through which sustainable livelihoods based on forest use in BC’s Cowichan Valley may be reclaimed, and what can be learned from these?

The research addresses these issues through a combination of historical and contemporary analysis, using secondary and primary sources of evidence, including active, and action oriented collaboration with NGOs and community forestry groups in the province.

**Recent Publications:**

Prudham, S. 2012. Pimping climate change: Richard Branson, global warming and the performance of green capitalism. In: S. Eldon et al (eds.) *Environment and Planning: Five Volume Set*. Volume 1: Cities and Regions.  
Prudham, WS. 2012. The political economy of a crisis. In: N. Castree and D. Gregory (eds). *Human Geography*. Volume 4. Sage Publications, Thousand Oaks, California.  
Prudham, S. and W. Coleman. 2011. Introduction: Property, autonomy, territory, and globalization. In: W. Coleman (ed.) *Property, Territory, Globalization: Struggles Over Autonomy*. University of British Columbia Press, Vancouver. Pages 1-28.  
Prudham, S. 2011. Making forests “normal”: Sustained yield, improvement, and the establishment of globalist forestry in British Columbia. In: W. Coleman (ed.) (See above.) Pages 80-100.



**Stephen B. Scharper**

Associate Professor, Department of Anthropology, U of T Mississauga and School of the Environment.

Offices: 1) School of the Environment, Room 2103, 33 Willcocks St., Toronto, ON, M5S 3E8; tel: 416-978-7433; fax: 416-978-3884; 2) Dept. of Anthropology, U of T Mississauga, Rm 118, 3359 Mississauga Rd. N., North Building, Mississauga, Ont. L5L 1C8; tel: 905-569-4912; fax: 905-828-3837; stephen.scharper@utoronto.ca; http://www.environment.utoronto.ca B.A. Hons., Toronto; M.A. (Theology), Toronto; Ph.D. (Religious Studies), McGill.

2012-13 Instructor of ENV 100H Introduction to Environment and ENV 1008H Worldviews and Ecology.

**Research Interests:**

Environmental ethics, environmental worldviews, liberation theology and ecology, religions and environmentalism.

**Featured Research Projects:**

*Cosmological Underpinnings of Urban Sustainability*. This research has explored some of the cosmological and spiritual presuppositions that lie behind the integration of urban ecological thought and planning, involving the work of wildlife biologist Aldo Leopold and cultural historian and Passionist priest Thomas Berry.

*Religion and Ecology: Exploring the Interconnection of Liberationist and Ecological Theologies* (recently completed SSHRC project). This research was on the integration of liberation theology and newer religious approaches to environmental questions, such as the new cosmology of Thomas Berry. While much of the religious conservation around ecology has entailed ontological, doctrinal, and cosmological or “worldview” questions, there have also been religious responses that take issues of class, race, gender, poverty, and justice seriously. Indeed, many tensions have surfaced and continue to exist between these two broadly

outlined ecological approaches. Thus, the question has emerged whether the ecological contributions of the world’s religions are chiefly in the realm of worldviews, doctrine, and cosmology, or in the realm of a political and economic critique.

This research probed this question by focusing on one of the most challenging religious developments of the past thirty years – that of the theology of liberation, a theology that takes poverty, and increasingly, ecological destruction, seriously. Early formulations of the theology of liberation, through its use of the social sciences and critique of structural economic and political systems such as developmentalism and modernization, yields an approach where questions of worldview and cosmology potentially unite with social, economic, and political critiques, leading to a possible integration of social, religious, and ecological concerns instructive for religious ecological engagement.

**Recent Publications:**

Scharper, S.B. 2011. The power and the glory: a spiritual connection with energy can save us in many ways. *Alternatives* 5: 10-13.  
Stefanovic, I.L. and S.B. Scharper (eds.) 2011. *The Natural City: Re-Envisioning the Built Environment*. University of Toronto Press. 356 pages.

## Willem Vanderburg

Professor, Dept. of Civil Engineering and School of the Environment; Director, Centre for Technology and Social Development.

Office: Centre for Technology and Social Development (Dept. of Civil Engineering), Rm. 319, 35 St. George St., Toronto, M5S 1A4; tel: 416-978-2924; fax: 416-978-6813; bill.vanderburg@utoronto.ca; http://www.civil.engineering.utoronto.ca; http://cts.utoronto.ca; http://www.environment.utoronto.ca  
B.A.Sc., M.A.Sc., Ph.D (Mech. Eng.), Waterloo.

On leave 2012-13; retired from July 1, 2013.

### Research Interests:

Ecology of technology (how technology fits into, depends on and interacts with human life, society and the biosphere); preventive engineering and management (adjusting theory and practice to help create cleaner and greener technologies); relationship between culture of society and “cultures” of science and technology, with emphasis on embedded values, beliefs and world-views.

### Featured Research Projects:

*Knowledge Infrastructure for Sustainable Cities.* The evolution of contemporary cities into sustainable cities will be affected by the decisions of countless specialists according

to an established intellectual and professional division of labour. They belong to groups responsible for advancing and applying a body of knowledge, making up a knowledge infrastructure. Some characteristics of these infrastructures are being studied insofar as they inhibit the evolution toward sustainable cities. The results will be used to unleash the potential of preventive approaches aimed at achieving the desired results while preventing or minimizing undesired consequences.

*Desymbolization.* For as long as humanity has been a symbolic species, cultures have been the bases for making sense of and living in the world. Contemporary ways of life have created a flood of desymbolizing experiences that are undermining our ability to relate highly specialized knowing and doing to a broader context, thus creating a great many “collisions” with human life, society and the biosphere. Desymbolization is now one of the primary threats to a livable and sustainable future. This diagnosis is the basis for a prescription to turn this situation around, beginning with the university and the professions.

### Recent Publications:

Vanderburg, W.H. 2012. *Our War on Ourselves.* Toronto: University of Toronto Press, Toronto. 400 pages.



Vanderburg, W.H. 2012. Placing the engineering profession under public oversight: a first step toward dealing with our economic, social and environmental crises. *Bulletin of Science, Technology and Society* 31(2): 161-170.

Vanderburg, W.H. 2012. Moving beyond technological determinism and autonomy to face our responsibilities. *Educational Technology* 52(1); 25-31.

Vanderburg, W.H. 2011. Assessing our ability to design and plan green energy technologies (Editorial) *Bulletin of Science, Technology and Society* 31(4): 251-255.

## Clare Wiseman

Assistant Professor and Coordinator, Environment and Health Collaborative Graduate Prog., School of the Environment.

Office: School of the Environment, Room 2097, 33 Willcocks St., Toronto, Ontario, M5S 3E8; tel: 416-978-2972; fax: 416-978-3884; clare.wiseman@utoronto.ca; http://www.environment.utoronto.ca

B.E.S. Hons. (Waterloo), M.Nat.Res.Mgmt. (Simon Fraser), Dr. phil.nat. (Frankfurt). 2012-13 Instructor of ENV 341H Environment and Human Health and ENV 4001H Graduate Seminars in Environment and Health.

**Research Interests:** Organomineral associations in soils, human health effects of contaminant exposures, environmental health of vulnerable populations, metal emissions and their potential impacts.

### Featured Research Projects:

*Urban Gardening & Airborne Particulate Matter: Exploring the Fate of Traffic-Related Emissions and the Effectiveness of Risk Reduction Measures.* This research examines the fate of traffic-related metal emissions in the urban environment, their uptake by commonly cultivated plants and the effectiveness of soil remediation measures. Different plant species are cultivated at several locations in Toronto, with variable traffic densities to assess the soil accumulation and fate of metal emissions over time, their

bioaccessibility and potential health risks of consumption. This research looks at the extent soil mineralogy influences the transport of trace metals from the solid to liquid phase where they become bioaccessible to plants and how soil ageing under field conditions influences the availability of trace metals for uptake by plants. (See page 2 for more info.)

*Platinum Group Element Emissions: Environmental Concentrations, Exposure Levels and Human Health Risks* (Ongoing collaboration with Fathi Zereini, University of Frankfurt). Investigates platinum group element (PGE) emissions from automobiles, equipped with catalytic converters, and how their concentrations have increased over time. Potential human exposures and health impacts are also assessed. Current research examines the bioaccessibility of PGE in the human lung in the presence of organic complexing agents, together with other trace elements, in airborne PM samples collected in Germany using physiologically-based extraction tests.

*Children and Contaminants in Public Settings: Assessing Dermal Exposure Levels and Risks.* Preliminary research is underway to assess the feasibility of dermal wipe techniques to determine contaminant exposures in children playing in public parks and playgrounds. Metal exposures from local emission sources and through contact with various construction materials in Toronto is the focus of this study initiated in August 2010.



### Recent Publications:

Zereini, F., C.L.S. Wiseman, W. Pittmann. In vitro investigations of platinum, palladium and rhodium mobility in urban airborne particulate matter (PM10, PM2.5 and PM1) using simulated lung fluids. *Environmental Science & Technology* 46(18): 10326-10333.

Zereini, F et al. 2012. Platinum group elements (Pt, Pd, Rh) in airborne particulate matter in rural vs. urban areas of Germany: concentrations and spatial patterns of distribution. *Sci of the Total Environ.* 416:261-268.

Zereini, F and C.L.S. Wiseman. (Editors.) *Urban Airborne Particulate Matter: Origins, Chemistry, Fate and Health Impacts.*

# PROFILES: OTHER INSTRUCTORS & SESSIONAL LECTURERS

## GRADUATE INSTRUCTORS/SESSIONALS



Mercer

### Jane Ambachtsheer

**Adjunct Professor and Sessional Lecturer**  
**ENV 1707H Environmental Finance and Sustainable Investing**  
 Ms. Ambachtsheer is a Partner of Mercer, based in Toronto. She leads Mercer's global responsible investment business, and consults to North American and international investors. She was a consultant to the United Nations and is a global advisor to the Carbon Disclosure Project. She is a member of the School of the Environment's Environmental Finance Advisory Committee (*see pages 19-20*).



P. Muldoon

### Paul Muldoon

**Adjunct Professor and Sessional Lecturer**  
**ENV 1701H Environmental Law**  
 Mr. Muldoon is Vice-Chair of the Environmental Review Tribunal, a body that adjudicates appeals, applications and referrals under 12 statutes. He is the former Executive Director of the Canadian Environmental Law Association. He has graduate degrees from McMaster University and McGill University and has written and co-written books and articles on Canadian environmental law and policy.



### Brad Bass

**Adjunct Professor; Sessional Lecturer (2011-12)**  
**ENV 1004H Urban Sustainability & Ecological Technology**  
 Dr. Bass is a Nutrient Initiative Program Officer in Environment Canada's Great Lakes Issues Management & Reporting Section. His research interests include best management practices for limiting nutrient loads into the Great Lakes, green infrastructure, ecological and socio-economic modelling with emergent computing and artificial intelligence and community energy systems planning.



C. Ollson

### Christopher Ollson

**Sessional Lecturer**  
**ENV 1704 Environmental Risk Analysis and Management**  
 Dr. Ollson is VP Strategic Development with Intrinsik Environmental Sciences, Mississauga. He has been practicing in the field of environmental risk and toxicology for 15 years and has an active research program in the oral bio-availability of contaminants and potential health effects associated with living in proximity to wind turbines. He is also Adjunct Assistant Professor, Royal Military College of Canada.



M. Diamond

### Miriam Diamond

**Professor, Dept. of Earth Sciences, U of T**  
**JGE 1212H Contaminants in the Environment**  
 Dr. Diamond is interested in chemical contaminants from source to health effects. Her research includes measuring and modelling sources, fate and exposure of the plasticizers phthalates indoors to advancing methods in Life Cycle Impact Assessment. Her projects are oriented towards informing policy and practice such as minimizing exposure to contaminants via our indoor and outdoor environments.



D. Pond

### David Pond

**Sessional Lecturer**  
**ENV 1001H Environmental Decision Making**  
 Dr. Pond teaches environmental politics, Canadian politics and public policy in the Department of Political Science at U of T, at both the Mississauga and St. George campuses. His most recent publication is a comparative study of the federal Commissioner of the Environment and Sustainable Development and the Environmental Commissioner of Ontario (Canadian Study of Parliament Group, 2010).



### A.P. Lino Grima

**Associate Professor (retired), Geography, U of T**  
**ENV 1703H Water Resource Management and Policy**  
 Dr. Grima has taught environmental/water resources management at the University of Toronto since 1972. His research and advocacy of Great Lakes water quantity and quality issues go back to the 1970s. He has published over 60 scientific papers and several books on natural resources and environmental management. He has also served as a consultant for public and private bodies.



I. Stefanovic

### Ingrid Leman Stefanovic

**Professor, Department of Philosophy, U of T**  
**JVP 2147 Environmental Philosophy, 2011-12**  
 Dr. Stefanovic was Director of the Centre for Environment, 2005-10. She serves as Senior Scholar, Center for Humans and Nature, and an Academic Fellow, Potomac Institute for Policy Studies, both in the US. She researches perceptions of space and how values and attitudes affect decision making. Her recent co-edited book is *The Natural City: Re-Envisioning the Built Environment* (U of T Press, 2012).



S. McGeachie

### Susan McGeachie

**Adjunct Professor and Sessional Lecturer**  
**ENV 1707H Environmental Finance and Sustainable Investing**  
 Ms. McGeachie leads Ernst & Young's Climate Change and Sustainability Services practice out of Toronto. She advises companies in a variety of sectors on managing risks associated with environmental, social and governance issues, as well as developing appropriate governance and management models. She is a member of the School of the Environment's Environmental Finance Advisory Committee (*see pages 19-20*).



S. Wakefield

### Sarah Wakefield

**Associate Professor, Department of Geography and Programme in Planning, U of T**  
**JGE 1413H Workshop in Environmental Assessment**  
 Dr. Wakefield's current research explores community and policy responses to food insecurity and food system sustainability concerns at a variety of scales, from the local to the global. She is interested in critical social theory and its application to food system and environmental health/justice issues.

## UNDERGRADUATE INSTRUCTORS/SESSIONALS



S. Appolloni

### Simon Appolloni

**Ph.D. candidate, Religion/Environment**  
**ENV 222H Interdisciplinary Environmental Studies**  
 Mr. Appolloni is a doctoral candidate in the Dept. for the Study of Religion and the School of the Environment. His doctoral dissertation investigates how Christian thinkers are engaging with “new science” in order to unite a liberationist agenda with an environmental ethic. He also teaches a course on religion, ethics and environment for his department, and has taught tourism ethics at Brock University.



www.es.utoronto.ca

### Michael Gorton

**Asst. Professor, Dept. of Earth Sciences, U of T**  
**ENV 315H Chemical Analysis of Environmental Samples**  
 Dr. Gorton is a geochemist who has specialized in the trace element geochemistry of rocks and especially, the rare earth elements. His research includes a wide range of practical applications on the origin of rocks and theoretical studies on the effects of intense alteration on the usefulness of trace element geochemistry in rocks. He also specializes in analytical methods and supervises a range of analytical instruments.



### Brad Bass

**Adjunct Professor; Sessional Lecturer (2011-12)**  
**ENV 431H Urban Sustainability & Ecological Technology**  
 Dr. Bass is a Nutrient Initiative Program Officer in Environment Canada’s Great Lakes Issues Management & Reporting Section. His research interests include best management practices for limiting nutrient loads into the Great Lakes, green infrastructure, ecological and socio-economic modelling with emergent computing and artificial intelligence and community energy systems planning.



M. Hathaway

### Mark Hathaway

**Ph.D. candidate, OISE UT/Environment**  
**ENV 333H Ecological Worldviews**  
 Mr. Hathaway is a Ph.D. candidate in Adult Education and Community Development (OISE/UT) and the School of the Environment. He researches the relationship between adult transformative learning, ecological worldviews, and engagement for sustainability. He co-wrote *The Tao of Liberation* (Orbis, 2009). He has extensive experience in social and ecological justice issues in Canada and Latin America.



R. Bray

### Riina Bray

**Sessional Lecturer (2011-12)**  
**ENV 341H Environment & Human Health**  
 Dr. Riina Bray is the Medical Director of the Environmental Health Clinic at Women’s College Hospital, Toronto. She has recently completed research on toxic metals in Canadians, a scoping review on health effects, physician and public health management strategies. She has been involved in the development of educational resources in children’s health and the environment.



S. Liu

### Monika Havelka

**Senior Lecturer, Environment Programs, University of Toronto Mississauga**  
**ENV 395Y Special Topics Field Course. Ecology and Conservation in the Andes, Western Amazonia & Galápagos**  
 Dr. Havelka received her Ph.D. in Zoology at the University of Western Ontario. She has taught a wide variety of courses in evolutionary biology, ecology and environmental science, and field courses in Ecuador, Ontario, and the Arctic. She was twice a semi-finalist and once a finalist in the TVO Best Lecturer Competition.



www.eeb.utoronto.ca

### Hélène Cyr

**Associate Professor, Dept. of Ecology and Evolutionary Biology, University of Toronto**  
**ENV 234H Environmental Biology**  
**ENV 334H Environmental Biology: Applied Ecology**  
 Dr. Cyr’s interests are in the ecology of littoral areas in lakes (spatial and temporal distribution of habitats and benthic communities), foodwebs (feeding interactions in planktonic and benthic communities, especially between invertebrates and algae), and macroecology (body size distribution, allometric relationships, scaling of environmental variability).



R. Houldin

### Russ Houldin

**Sessional Lecturer**  
**ENV 323H Ontario Environmental Policy**  
**ENV 347H Power of Economic Ideas**  
 Mr. Houldin has worked, mainly as a policy adviser, in the Ontario Public Service for over 30 years in a variety of Ministries. He is currently a senior adviser to the Ontario Energy Board. His interests include environmental and ecological economics, sustainable electricity systems, environmental and economic regulation, and Ontario environmental policy.



M. Diamond

### Miriam Diamond

**Professor, Dept. of Earth Sciences, U of T**  
**JGE 236H Human Interactions with the Environment**  
 Dr. Diamond is interested in chemical contaminants from source to health effects. Her research includes measuring and modelling sources, fate and exposure of the plasticizers phthalates indoors to advancing methods in Life Cycle Impact Assessment. Her projects are oriented towards informing policy and practice such as minimizing exposure to contaminants via our indoor and outdoor environments.



B. Karney

### Bryan W. Karney

**Professor, Dept. of Civil Engineering, U of T**  
**ENV 346H Terrestrial Energy Systems**  
 Dr. Karney is also Associate Dean, Cross-Disciplinary Programs in the Faculty of Applied Science and Engineering. His current research considers the design, analysis, operation and optimization of various water resource and energy systems, with emphasis on hydroelectric and pumped storage systems, pipe networks and water distribution systems. He is also interested in engineering education and ethics.



A. Martin

**Adam Martin**  
**Post-doctoral Fellow, Faculty of Forestry, U of T**  
 ENV 223H Fundamental Environmental Skills  
 Dr. Martin recently completed his Ph.D. in the Faculty of Forestry, U of T. His research focuses on forest ecology, with an emphasis on tropical forests and global change. His work is based in forests in Central America, South-east Asia, and the Caribbean, where he examines the role tropical forests play in the global carbon cycle. He also has interests in Canadian forest conservation and management.



D. Pond

**David Pond**  
**Sessional Lecturer**  
 ENV 320H National Environmental Policy  
 Dr. Pond teaches environmental politics, Canadian politics and public policy in the Department of Political Science at U of T, at both the Mississauga and St. George campuses. His most recent publication is a comparative study of the federal Commissioner of the Environment and Sustainable Development and the Environmental Commissioner of Ontario (Canadian Study of Parliament Group, 2010).



Physics, U of T

**Bernd Milkereit**  
**Professor, Department of Physics, U of T**  
 ENV 235H Physics & Chemistry of the Evolving Earth  
 Dr. Milkereit is a geophysicist with interests in seismic imaging, borehole geophysics, petrophysics and scientific drilling. He has over 35 years of international experience and joined Physics at U of T in 2001 as the first Teck Chair in Exploration Geophysics. His current research is on scale and frequency dependent geophysical responses for mineral, hydrocarbon and groundwater exploration and monitoring.



D. Sider

**David Sider**  
**Sessional Lecturer**  
 ENV 307 Urban Sustainability, ENV 421H Environmental Research, ENV 440H Professional Experience Course  
 Dr. Sider received his Ph.D. in Geography and Environmental Studies at U of T, for which he carried out his fieldwork in India, focusing on community-based approaches to water supply, sanitation, and solid waste management in low-income urban settlements. He has also worked with environmental organizations in Nicaragua, Malaysia, and Canada.



P. Muldoon

**Paul Muldoon**  
**Adjunct Professor and Sessional Lecturer**  
 ENV 422H Environmental Law  
 Mr. Muldoon is Vice-Chair of the Environmental Review Tribunal, a body that adjudicates appeals, applications and referrals under 12 statutes. He is the former Executive Director of the Canadian Environmental Law Association. He has graduate degrees from McMaster University and McGill University and has written and co-written books and articles on Canadian environmental law and policy.



K. Stewart

**Keith Stewart**  
**Sessional Lecturer**  
 ENV 350H Energy Policy and Environment  
 Mr. Stewart has worked as an energy policy analyst and advocate for various non-profit groups for over a decade and currently works for Greenpeace Canada where he promotes the efficient use of renewable energy. He is the co-author of the book *Hydro: The Decline and Fall of Ontario's Electric Empire* and author of numerous articles, reports and op eds on climate change policy and politics.



B. Murck

**Barbara Murck**  
**Senior Lecturer, Geography, U of T Mississauga**  
 ENV 395Y Special Topics Field Course. Ecology and Conservation in the Andes, Western Amazonia & Galápagos  
 Dr. Murck received her undergraduate degree from Princeton U. and her Ph.D. in Geology from U of T. She has focused on international development, through environmental management projects in Africa, China, and SE Asia. She is an award-winning lecturer (President's Teaching Award 2010) and has written many books in geology and environmental science.



E. Vogt

**Erich Vogt**  
**Sessional Lecturer**  
 ENV 322H International Environmental Policy  
 ENV 451H Current Environmental Debates  
 Dr. Vogt's interests address the policies and politics of climate change, contemporary international environmental issues and global governance innovations. He has taught at George Washington University and American University in Washington, D.C. and was IUCN's senior multilateral policy advisor and managing editor of World Bank-incubated Development Gateway.



J. Nugent

**James Nugent**  
**Ph.D. candidate, Dept. of Geography, U of T**  
 JGE 331H Resource & Environmental Theory (2011-12)  
 Mr. Nugent is a Ph.D. candidate in the Department of Geography at U of T. He examines the responses of trade unions to the current dual ecological and economic crisis viewed through climate change politics and the dawn of the "green economy". He is also interested in biological conservation through an environmental justice lens and in the (re) production of environmental ideologies.



S. Waite-Chuah

**Sheila Waite-Chuah**  
**Sessional Lecturer**  
 ENV 335H Environmental Design  
 Ms. Waite-Chuah has been teaching environmental/sustainable design for 15 years. Her interest in sustainable design is intimately linked with sustainable development, in both local and global contexts. She received a Masters in Environmental Studies from York University. She also teaches sustainable design at the Ontario College of Arts and Design University.

## DISTANCE EDUCATION INSTRUCTORS



B. Baser

### Bob Baser

#### Distance Education Instructor Renewable Energy Program

Mr. Baser is an independent consultant providing international business services in market assessment, strategic alliance creation and project management for companies setting up international joint ventures. Since 2003, he has specialized in international Environmental Impact Assessment services for companies in such countries as China, Poland, Nigeria, Serbia, and Trinidad and Tobago.



T. Johnson

### Tom Johnson

#### Distance Education Instructor Carbon Finance Program

Mr. Johnson has over 12 years of experience in the environmental and greenhouse gas sectors. He has held senior roles related to both GHG accounting and reporting and to carbon finance, and is currently helping the province of Ontario implement its Cap and Trade system. He holds a B.A. in Geography and Environment from McGill University, and is Qualified as an ISO 14964 GHG Auditor by Environment Canada.



O. Bussler

### Oliver Bussler

#### Distance Education Instructor Carbon Finance Certificate Program

Mr. Bussler is Director, Sustainable Development at TransAlta Corporation. He currently leads the group responsible for TransAlta's emissions reporting and compliance programs. He has spent the past decade involved with Canadian environmental policy and has developed a broad skill set in the world of environmental and carbon finance, project development and carbon offset acquisitions.



A. Moser

### Anne Moser

#### Distance Education Instructor Environmental Management & Renewable Energy Programs

Ms. Moser is an engineering analyst with a major consulting firm in Ontario, and is involved in developing large scale wind and solar energy projects. She is also completing doctoral research in wind turbine aerodynamics at U of T and has a Master of Applied Science in Chemical Engineering from the University of Erlange-Nuernberg, Germany. She has been teaching in the distance education program for four years.



G. Gienko

### Gennady Gienko

#### Distance Education Instructor GIS for Environmental Management Certificate Program

Dr. Gienko is an Associate Professor in the Dept. of Geomatics, School of Engineering at the University of Alaska Anchorage, where he develops and teaches undergraduate and graduate courses in geographic information systems, geospatial image analysis, remote sensing and photogrammetry. He has extensive international experience in geospatial science, geomatics and photogrammetry.



D. Sider

### David Sider

#### Distance Education Instructor Environmental Management Certificate Program

Dr. Sider received his Ph.D. in Geography and Environmental Studies at U of T, for which he carried out his fieldwork in India, focusing on community-based approaches to water supply, sanitation, and solid waste management in low-income urban settlements. He has also worked with environmental organizations in Nicaragua, Malaysia, and Canada.



M. Govorov

### Michael Govorov

#### Distance Education Instructor GIS for Environmental Management Certificate Program

Dr. Govorov has instructed in the School's GIS (geographic information systems) in Environment Management distance program since its advent and was instrumental in its initial development. He has been teaching GIS and remote sensing in the online environment for over eight years and currently teaches and prepares undergraduate and postgraduate courses at the Vancouver Island University.



K. Snarr

### Kimberley Snarr

#### Distance Education Instructor Environmental Management Certificate Program

Dr. Snarr is an environmental anthropologist with a specialist in primatology, and employs a biocultural approach to understanding conservation management of large mammal populations, in mainland China, the Caribbean, and Central America. She has been teaching in the online environment for over a decade and helped develop and teach courses in the School's distance program since its inception.



S. Greenberg

### Sharonna Greenberg

#### Distance Education Instructor Environmental Management Certificate Program

Dr. Greenberg is a chemist whose research involved designing new polymers and technologies. These technologies are used in manufacturing electronics, pharmaceuticals and pesticides, and they rely on more environmentally friendly chemical species, eliminating the need for toxic metals. She is currently teaching at the University of Toronto and Ryerson University.



L. Sportza

### Lucy Sportza

#### Distance Education Instructor Environmental Management & Renewable Energy Programs

Dr. Sportza has also been teaching in the online environment and undergraduate program at the University of Guelph for the last several years. She has a M.A. and Ph.D. in Planning from the University of Waterloo. Her doctoral research focused on planning for Toronto's urban parks and protected areas. Her current interests focus on the use of parks and other protected areas as part of overall urban sustainability.



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Cover photos, clockwise from top left:

1. Undergraduate students in the El Junco Highlands, San Cristóbal, Galápagos Islands during Summer 2012 field course ENV395Y (*credit: Lucy Cullun*);
2. Ph.D. candidate Zen Mariani (Physics/Environmental Studies program) on Ellesmere Island, Nunavut, studying remote sensing of the Arctic atmosphere (*credit: Zen Mariani, PEARL*);
3. Ph.D. candidate Amy Mui (Geography/Environmental Studies program) uses radio-telemetry to search for Blanding's turtles in rural wetlands in Brantford (*credit: Amy Mui, Brennan Caverhill*);
4. Ph.D. candidate Dan Weaver (Physics/Environmental Studies program) adjusting a sun tracker instrument on the roof of the Polar Environment Atmospheric Research Laboratory (PEARL) on Ellesmere Island, Nunavut (*credit: Dan Weaver, Volodya Savastiouk*);
5. Undergraduate student Emma Cancelliere in Uganda where she studied conservation and development for an independent research project and internship with the Jane Goodall Institute (*credit: Emma Cancelliere*).