

Centre for Environment
UNIVERSITY OF TORONTO

2008 Annual Report



Centre for Environment
UNIVERSITY OF TORONTO

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2008 Annual Report

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Message from the Director

BY INGRID LEMAN STEFANOVIC,
Director, Centre for Environment, 2005-2010.

The environment, I am told, is an increasingly hot topic these days – no pun on global warming intended!

A recent set of articles in *The New York Times* reports that universities are racing to be the “greenest of them all.” And students are paying attention. According to a Princeton Review survey of over 10,000 applicants to U.S. colleges, 63% state that how a college commits to environment may influence their choice of where to study.

The University of Toronto itself is making great progress in this area. Our own Sustainability Office continues to involve students in greening the campus, often with course credit through the Centre for Environment (see page 12). The Centre itself is offering new courses and programs in energy, ecosystem health, and environmental policy.

Significantly, the Provost’s own Round Table on the Environment – representing multiple faculties and all three campuses – completed its work last spring after one and a half years of reflection and discussion, with concrete suggestions for new strategies to encourage interdisciplinary research and university-wide institutional changes, all to contribute to a stronger set of environmental program offerings. A Provostial Task Force is continuing these discussions to suggest specific institutional improvements, despite the fact that **Vice-President and Provost Vivel Goel** – a staunch supporter of environmental initiatives at U of T – has moved on to serve as Founding President and CEO of Ontario’s Agency for Health Promotion and Protection. We will miss him, while we continue to take his environmental legacy at U of T forward!

It is certainly an exciting time to be involved in these issues. “Environment” is no longer a topic of interest for a specialized audience but it touches everyone on a daily basis. As smog days make air pollution visually evident, as asthma attacks increase, as energy prices rise, as weather disruptions raise concern and awareness about longer term climate change – environmental issues are no longer perceived as abstract concepts but touch each of us on a daily basis.

There is talk these days about how blue and white collar workers are both feeling the impact of the economic downturn, but that increasingly, new opportunities are emerging for the recently-emerging “green collar workers”! The economic and investment possibilities of longer term environmental improvements are being recognized within all sectors of society.

Certainly, the City of Toronto itself is viewed as a financial centre for Canada. For this reason, the Centre for Environment has been offering multiple workshops and certificates in the areas of Environmental Finance and Carbon Finance (see pages 2-3). The success of these initiatives is ensured, through the collaboration of our partners from the corporate community who serve on our Environmental Finance Advisory Committee and through the hard work of **Donna Workman**, our Manager of Program Development and External Relations and her assistant, **Emma Thacker**. I thank them all for the enormous success of these initiatives.

Our Distance Education programs have grown exponentially as well, under the coordination of Donna Workman. New certificate programs in Renewable Energy and in Environmental Health are fast attracting student interest, while the traditional programs in Environmental Management and GIS continue to flourish (see page 26).

Our Graduate programs have undergone a thorough review, under the expert guidance of **Professor Hilary Cunningham**, our Graduate Coordinator. The process of consultation with departments around the launch of a stand-alone Masters in Environment has begun, and we hope to see OCGS approval by next year (see page 20).

Our Undergraduate Coordinator, **Karen Ing**, has done a more-than-heroic job over the last few years, in streamlining curriculum, launching new courses and programs, hiring multiple sessional instructors and coordinating teaching assistant appointments. We congratulate her on her tireless oversight of our large slate of undergraduate offerings.



Geoff George

While I took a partial sabbatical last fall, **Professor Philip Byer** of the Department of Civil Engineering was kind enough to step into my place. We are all grateful to him for his energy and devotion to promoting the ideals of the Centre for Environment.

I am also particularly grateful to **Professor Pekka Sinervo**, who served as Dean of the Faculty of Arts and Science since the Centre’s inception, and who retired from his post this spring. He supported us without hesitation over the years and he will be sorely missed. We do hope that he will continue to remain in touch as a long-standing friend of the Centre.

The year has also solidified many of our partnerships, including the Jane Goodall Institute, the Adaptation and Impacts Research Division of Environment Canada, and the multiple partners of the United Nations University Regional Centre of Expertise for Education for Sustainable Development, which we currently co-chair (see pages 6, 11, 13).

Overall, the accomplishments of our faculty, staff and students in raising the profile of environment at U of T cannot be over-estimated. I thank them all for their commitment and energy towards building the Centre and ensuring that the university can be proud of these accomplishments.

The eminent thinker and futurist Marshall McLuhan once wrote that “there are no passengers on Spaceship Earth. We are all crew.” For all who have contributed towards the success of the Centre for Environment and ultimately, to building a more sustainable “spaceship earth”, I extend my thanks – and I look forward to continuing to develop these and other initiatives in the coming academic year!

Carbon Finance Series

2008 series offered at two different times with option of Certificate

BY IBTISSAM MUSTAQ

Carbon Finance Workshop Series, Spring and Fall, 2008.

With the growing importance of carbon specific issues within the realm of environmental finance, businesses and investors need to learn and apply new financial market instruments and practices of the management of these specific issues. Since 2004-05, the Centre for Environment has offered an annual series of workshops on Environmental Finance to promote dialogue among academics, businesses, government and the investment community. In 2008, the spring series focused on Carbon Finance and were offered in collaboration with **Bill Tharp**, CEO of Climate Change Infrastructure Corporation, **Stefan Reichenbach**, Global Head of Environmental Markets at Thomson Reuters and **Errick (Skip) Willis**, President and CEO of Carbon Capital Management.

A series of four workshops was held in the spring and will be repeated in the fall, to be offered in two full-day sessions. Participants who attend the four workshops in the series and successfully write a final exam may receive a Certificate in Carbon Finance from the Centre for Environment.

1. Introduction to Carbon Markets:

February 22, 2008; repeats November 13, 2008

The first workshop in the series opened with an introduction by Skip Willis on the basic principles of carbon markets and discussion of those already implemented and functioning today. **Susan McLean**, then Senior Manager of Business Development at the Toronto Stock Exchange Group and now at Carbon Capital Management, presented the roles of exchanges in emissions markets and stressed the importance of creating a price signal in order to facilitate the transition from voluntary to regulatory markets in Canada and globally. The workshop closed with a presentation by

Stefan Reichenbach on the fundamentals of carbon market structure.

2. Carbon Risks Broken Down:

February 29, 2008; repeats November 13, 2008

The second workshop began with a lecture by **Rodney White**, Professor of Geography at U of T, on the risks of climate change.

Barbara Hendrickson, partner at McMillian Binch Mendelsohn LLP, followed with a discussion on the Carbon Disclosure Project (www.cdproject.net) and the obligations of public companies to disclose their carbon emissions to their shareholders and potential investors. The workshop ended with a discussion from Davis LLP Associate Counsel **Douglas Tingey** on managing carbon risk and the role of insurance.

3. Project Finance, Investment Opportunities:

March 7, 2008; repeats November 14, 2008

Bill Tharp commenced the third workshop with an overview of capital markets. He discussed venture capital to project finance, the option of government involvement, and he encouraged companies to initiate action by describing first mover advantages and disadvantages. The workshop closed with **Svetlana Morozova**, who provided an overview of traditional project finance methods and carbon project finance.

4. Market Outlook:

March 28, 2008; repeats November 14, 2008

The final workshop started with **Matthew Kiernan**, Founder of Innovest Strategic Value Advisors, looking at how climate is driving global industrial restructuring across multiple sectors. He also discussed the myths and facts about climate and investment returns. Skip Willis closed the series by predicting that the carbon market will be driven by regulation in the short-term.

Advisory Committee

The Centre for Environment (CFE) is pleased to have an Environmental Finance Advisory Committee for this series that includes members of the business and U of T communities: **Jane Ambachtsheer**, Principal, Mercer Investment Consulting; **Chris Carradine**, Chief Operating Officer, Jantzi Research; **Alex Chamberlain**,



Barbara Hendrickson, partner at McMillian Binch Mendelsohn LLP, made a presentation on the Carbon Disclosure Project in the second workshop in the 2008 Carbon Finance Workshop series.

Managing Partner, Investeco Capital; **Valerie Chort**, Partner and National Leader, EHS and Sustainability Services, Deloitte Enterprise Risk; **Don Cormack**, Chair, Department of Physical and Environmental Sciences, U of T Scarborough; **Ron Dembo**, Founder & CEO, Zerofootprint; **Julie Desjardins**, Advisor, Canadian Institute of Chartered Accountants; **Michael Jantzi**, President, Jantzi Research Inc.; **Deborah Kaplan**, Executive Director, Zerofootprint; **Sonia Labatt**, Associate Member of CFE graduate faculty; **Todd Latham**, President, WE Communications; **Sue McGeachie**, Sustainable Business Solutions, PricewaterhouseCoopers; **Svetlana Morozova**, former Technology Officer, CO₂e - North America; **Alan Polak**, Principal, Investment Banking, Genuity Capital Markets; **Stefan Reichenbach**; **Bill Tharp**; **Errick (Skip) Willis**, and **Rodney White**.

Please note that Fall 2008 speakers, topics and/or schedule are subject to change.

Ibtissam Mustaq is a former work/study student at the Centre for Environment, in her fourth year, International Development Program at U of T Scarborough.

FOR MORE INFORMATION

on Environmental Finance Workshops:

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The Value of Water Workshop

In collaboration with Canadian Water Treatment

BY JOHN NICHOLSON

“The Value of Water” Workshop, May 29, 2008

As part of its Environmental Finance series, the Centre for Environment hosted a half day *Value of Water* Workshop on May 29, 2008 in collaboration with *Canadian Water Treatment* magazine. Published six times a year, *Canadian Water Treatment* is Canada’s only magazine dedicated to the water quality and water treatment industries.

The morning workshop had experts address financial, legal, and political issues associated with water and was well attended with approximately 80 attendees. Those in attendance included investment bankers, mutual fund managers, academics, industry representatives, government bureaucrats, consultants and environmental activists.

Alex Chamberlain, the Managing Partner at Investeco Capital, served as the moderator for the workshop. He began the session by framing the importance of water to humans and the challenges facing all nations in ensuring accessing to drinking water.

Maude Barlow, National Chairperson of the Council of Canadians: *None Without Water: The Fight for the Right to Water*

Providing an environmental activist’s viewpoint, Ms. Barlow highlighted the abuses of water she has witnessed while advocating for various environmental organizations. She was concerned with the private sector’s involvement in addressing the world’s water infrastructure crisis and a growing global water cartel focused on owning and/or controlling the world’s water resources. She also believes that there is too much emphasis placed on the treatment of water and not enough on source protection and conservation, and does support desalination or recycling wastewater into drinking water. She called for government ownership of water and pricing for the provision of water services, not the commodity itself.

John Nicholson, Editor, *Canadian Water Treatment* magazine: *The Value of Water: The Incalculable Commodity*

The author of this article refuted some the allegations made by Ms. Barlow about private sector involvement in water. In his 20 years in the profession, Mr. Nicholson found that the vast majority of professionals in the industry viewed their work as helpful to the environment and to communities. He called for a science-based approach for managing and protecting water resources and applauded the recent work of Ontario Environment Minister **John Gerretsen** and the scientific approach being used to protect Lake Simcoe. With respect to business opportunities, Mr. Nicholson predicted continued growth in all sectors of the water industry. He especially saw potential for growth in companies that specialize in water re-use, water recycling and water conservation technologies.

Dr. Blair Feltmate, Director of Sustainable Development, Ontario Power Generation: *Corporate Sustainable Development, With a Focus on Water*

In his presentation, Dr. Feltmate provided background information on corporate sustainable development trying to balance business, environmental, and societal needs. He emphasized that the driver for companies to pursue sustainable development is shareholder value. In order for a company to commit to sustainable development, there needs to be a direct bottom line impact. He called for a “Water” Disclosure Project requiring the world’s largest companies to



John Nicholson, Editor of *Canadian Water Treatment* magazine (left) and Dr. Blair Feltmate, Director of Sustainable Development at Ontario Power Generation and were two of the engaging expert speakers at the Value of Water workshop.

disclose the impact of their operation on the water cycle which would be accessible to investors and shareholders.

Marc Levinson, Industrial Economist, JP Morgan Chase:

Watching Water: A Guide to Evaluating Corporate Risks in a Thirsty World

Mr. Levinson outlined three main risks facing companies with respect to water. The first is the physical risk associated with water scarcity: like people, companies need water to function. The second is government regulation, citing an example in the U.S. where drought conditions resulted in the government mandating higher prices to industry to offset increased hydro-electric costs to residential consumers. The third is reputation: if a company has a reputation of being a water hog, it can hurt business. A lesser known risk facing large companies is an indirect one from a supplier or sub-contractor that is directly impacted.

Pricing water will promote its conservation. In the U.S., the biggest driver for water conservation is anti-pollution laws. The cost of treating wastewater to meet regulatory discharge limits causes companies to conservewater use.

David Henderson, Managing Director, XPV Capital: *Water: Time to Invest?*

Mr. Henderson expressed his faith in the utilization of technology to solve the world’s water crisis and presented five trends that will create investment opportunities: 1) supply and demand imbalances; 2) more stringent regulations; 3) higher input costs; 4) market structural shifts; and 5) the increasing value of water.

In the last four years, there have been approximately 400 mergers and acquisitions in the water sector. As a result, there are a few large companies, many small to medium and very few mid-sized companies. He believes that there is opportunity to invest in the smaller water companies or those offering new technologies for water conservation.

John Nicholson is Editor of Canadian Water Treatment magazine (<http://watertreatment.ca>). This is an edited version of an article appearing in the July/August 2008 issue of the magazine.

Art and Ecology Symposium

In collaboration with No.9: Contemporary Art & the Environment

BY CATHERINE DEAN



No.9's inaugural installation by visual artist collective BGL on the turgid waters of Toronto's Lower Don River was the starting point for the Art & Ecology Symposium. The disproportioned giant life buoy and shrunken blackened cruise ship are emblems of luxury, idleness and materialism, representing a leisure activity gone wrong. RIGHT: Doctoral candidate Jennifer Bonnell makes a presentation of the progression of the Don River from a wild, natural area to its current polluted and industrialised state, as BGL artist Nicolas Laverdière and moderator Jane Farrow look on.

"Art & Ecology Symposium - Water: From Local to Global", June 26, 2008

No.9: Contemporary Art & the Environment was pleased to collaborate with the Centre for Environment in the presentation of the symposium *Art & Ecology – Water: From Local to Global* on June 26, 2008.

Toronto-based No.9 is committed to the belief that contemporary art can stimulate positive social and environmental change. As a curatorial agency, it provides artists who share this conviction with the opportunity to make ambitious work in the public realm. It brings the power of art to bear on some of the most pressing issues of our time, using urban public space as a forum for creativity and vital discussion.

No.9's inaugural installation, Project for the Don River by Québec City-based visual artist collective BGL (**Jasmin Bilodeau, Sebastien Giguère, Nicolas Laverdière**) opened on Earth Day, April 22, 2008 and ran until June 29. It consisted of a shrunken cruise ship – christened the *Nowhere II* – 30 feet long, completely blackened and anchored on the turgid waters of Toronto's Lower Don River. Installed just upriver on the old Eastern Avenue bridge was a giant life buoy, totally out of proportion to the ship. With these absurd shifts in scale, the function of the objects are brought into question. In case of emergency, is the buoy intended to save the entire ship, or is it meant for the river itself? If the ship is seen as full size, then what monstrous waterway

is the Don? The *Nowhere II* and its life buoy are emblems of luxury, idleness and materialism, representing a leisure activity gone slightly wrong. They point to the possibility of being in a place without really seeing it. With their belief in the capacity of art to elucidate the consciousness of an era, BGL are reflecting back to us the conditions of our time, while bringing attention to the ecological issues of the site.

BGL's phantom cruise ship makes the connection between water, waste and luxury, and the fact that water is never just a local issue. If a luxury can be defined as something of value that is available only to a few then water is the ultimate luxury, while at the same time being the ultimate necessity. The Don is our local water challenge, but also a symbol of water in a larger sense.

The Art & Ecology symposium took BGL's installation as its starting point in order to make the connection between contemporary art and environmental awareness. BGL's Nicolas Laverdière started things off with a discussion of their work, much of it made in the public realm and relating to natural systems and ecologies. Often using found materials and repurposed objects, they are known for making work which responds directly to a specific site. The ecological ideas implicit in their work often stem from a subtle anti-materialism and anti-commercialism.

Jennifer Bonnell, a doctoral candidate in OISE/UT's Department of Theory and

Policy Studies in Education, followed with an illustrated talk on the ecological and social history of the Don River, the focus of her thesis work. By showing the progression of the Don from a wild, natural area to its polluted and industrialised current state, her talk was enlightening as well as sobering. After decades of treating the river as a dumping ground, it is only in the fairly recent past that we have begun to see the Don as a valuable asset which should be restored to its natural condition.

The evening was moderated by renowned broadcaster and writer **Jane Farrow**. After the first two speakers, she led a discussion with Bring Back the Don's **John Wilson**, who spoke briefly about the current health of the river, which has improved since the years when heavy industry lined the banks of the Don but is now compromised by runoff from the city and an aged sewer system.

The evening was completed by a special screening of Irena Salinas' acclaimed documentary film *FLOW: For Love of Water*. The film, which concentrates on water privatisation and governance worldwide, provided a global view of water and demonstrated just how crucial it is that this precious resource not be taken for granted.

Catherine Dean is Director of Programming at No.9: Contemporary Art & the Environment. For more information, please visit www.no9.ca or contact Ms. Dean at cdean@no9.ca or 416-347-1691.

Seminar on Pumped up Prices

In collaboration with the Society of Environmental Journalists

BY PETER FAIRLEY

“Pumped Up Prices: Can We Combat Climate Change by Raising the Cost of Energy?”, June 20, 2008

Can increasing the cost of energy solve climate change and, if so, will carbon taxes or cap-and-trade programs deliver the needed emissions reductions with the least economic disruption? A panel of journalists and carbon finance experts met on June 20, 2008 to sort through these issues during “Pumped Up Prices”, an open seminar presented by the Centre for Environment and the Society of Environmental Journalists (SEJ). The event was held the same week that **Stephane Dion** put carbon taxes on the Liberal party’s election platform.

Stefan Reichenbach, Global Head of Environmental Markets for Thomson Reuters, contrasted market-based policies from legal mandates such as banning incandescent bulbs. He then contrasted carbon taxes from carbon trading: governments set prices on carbon emissions

through carbon taxes but with carbon trading, governments set the quantity of emissions allowed and let markets sort out the price. Mr. Reichenbach’s preference? Trading, because taxation’s ultimate impact on emissions is hard to predict.

Fellow panelists **Jim Lebens**, Producer with CBC Radio’s Quirks & Quarks and **Sue McGeachie**, of Sustainable Business Solutions, PricewaterhouseCoopers, noted that the Canadian people and business community were less interested in the environmental bottom line than in how much it will cost them. Mr. Lebens suggested the more certain cost of a tax may be why Dion chose it over cap-and-trade as the latter is more difficult for people to understand.

Alternatives Journal editor **Nicola Ross**, the evening’s moderator, asked panelist **Peter Gorrie**, to weigh carbon finance policies against the recent demand-driven energy price increases which have already spurred greater investment in energy efficiency and renewable energy. Mr. Gorrie,

a *Toronto Star* environment reporter and now freelance journalist, noted that pricey natural gas was actually spurring companies and countries to switch to coal – the worst in terms of greenhouse gas.

Canadian media got relatively high marks from panelists for constructively reporting on the policy choices at hand. **Mark Lutes**, Climate Change and Energy Policy Analyst for the David Suzuki Foundation, said journalists seemed mindful of the risk of converting readers’ lack of awareness directly into despair and that they are reporting on the opportunities offered by new technologies.

The Society of Environmental Journalists Board of Directors were also in Toronto for a board meeting hosted by the Centre. Both organizations look forward to cooperation on further seminars to raise the profile of environmental policy discussions and equip journalists to bring them to the public.

SEJ Board Member Peter Fairley is a freelance journalist based in Victoria, BC.

Solar Thermal Water Heating Training

In collaboration with the Assoc. of Energy Engineers South Ontario Chapter

BY MOHAMMAD WATHAIFI

Solar Thermal Water Heating Training Workshop, July 10, 2008

The South Ontario Chapter of the Association of Energy Engineers (AEE) organized a full day workshop on Solar Thermal Water Heating on July 10, 2008, in collaboration with the Centre for Environment. The workshop, part of a series organized by the Chapter on renewable energy, was held at the U of T campus to provide students hands-on technical training on renewable energy, and an opportunity to network with industry professionals. The event was sponsored by Viessmann Manufacturing Co., one of the world’s leading manufacturers of heating and renewable energy systems.

Robert Waters, Manager of the Solar Products Division at Viessmann and Manager of Viessmann Academy, led the workshop which started with a presentation of solar energy fundamentals followed by a discussion of the different applications for solar thermal water heating. System design and layout and the considerations for site selection and collector mounting were also covered. Participants were given an insight into global markets, the accelerating trends in adopting new solar heating technologies, solar system performance simulation software, and an update on the latest governmental incentive programs.

The AEE, consisting of 67 international chapters, is an international non-profit organization dedicated to furthering education in energy and management and fostering action for



Robert Waters of Viessman Manufacturing Company leads participants in a technical training workshop on solar thermal energy.

sustainable development. It offers a full array of outreach programs and materials, and certification programs offered through the Canadian Institute for Energy Training.

AEE Southern Ontario Chapter Board Member Mohammad Wathaifi is an Energy Engineer at Siemens Building Technologies. Email: mohamad.alwathaifi@siemens.com; tel: 416-548-4112.

Jane Goodall Institute

Fall 2007 lectures and panel session part of ongoing collaboration

BY EMMA THACKER AND INGRID LEMAN STEFANOVIC

In January 2007, the Centre for Environment formalized a partnership with the Jane Goodall Institute of Canada (JGI), when the Institute was relocated to the University of Toronto. JGI is a major, international non-profit organization dedicated to wildlife research, environmental education and the conservation and welfare of all species while encouraging social change within the developing world. The partnership hopes to encourage collaborative teaching and research, as well as enable guest speakers to address issues of conservation programs in Africa. In addition, opportunities will be identified for U of T students to participate in JGI programs at the University and abroad through the establishment of a new undergraduate scholarship fund.

As part of this new partnership, the Centre was pleased to co-host, with the JGI, three special events during the fall of 2007. The first event consisted of a special lecture presentation on September 15, 2007, when **Dr. Jane Goodall**, JGI founder and United Nations Messenger of Peace, spoke to a sold-out audience in Convocation Hall, on the theme of *Gombe and Beyond*, marking JGI's 30th Anniversary. Crediting her mother's support, Dr. Goodall described her childhood fascination with all animals and how this led to her to make a journey to Africa as a young woman, launching her lifelong commitment to environmental protection. She discussed some of the latest research being undertaken at Gombe Stream National Park in Tanzania, where she continues her 47-year-long chimpanzee research programme. She reflected on the critical need to protect Africa's Great Apes, the conservation of the leafy corridors through which the primates live and reproduce, and the mounting pressure placed on the programme due to loss of habitat and the commercial bush-meat trade. Dr. Goodall discussed some of the innovative community centred programmes to save habitat, preserve biodiversity and empower and improve lives in local African communities. Guests attending the packed lecture also enjoyed the lively question and answer period, followed by a book signing.

The second event occurred on September 17, 2007, when the University of Toronto Schools (UTS), the Centre for Environment, and JGI hosted a special session with Dr. Goodall and a panel of experts for high school and university students titled *Community Centred Conservation: Finding Ways to Meet the Needs of People, Wildlife and Habitat*. Students' questions were directed to Dr. Goodall and the panel, consisting of **Dr. Kerry Bowman**, Assistant Professor at U of T's Joint Centre for Bioethics, President and founder of the Canadian Ape Alliance, and JGI board member; **Barbara Cartwright**, conservationist and President of JGI; and **Professor Ingrid Stefanovic**, Director of the Centre for Environment.

The innovative and rare discussion format inspired a number of excellent questions from the students involved. They were curious



Victor Young

Dr. Jane Goodall (far right), founder of the Jane Goodall Institute (JGI) and U.N. Messenger of Peace, joins panellists at a special event for high school and university students on community centred conservation. Panellists from left are Ingrid Stefanovic, Director, Centre for Environment; Barbara Cartwright, conservationist and President of JGI; and Kerry Bowman, Assistant Professor, Joint Centre for Bioethics, U of T and President and founder of Canadian Ape Alliance.

about the ways in which Canadians could learn from JGI's community-centred conservation approach to solve their own conservation challenges. They explored other topics such as excessive consumption and how our daily choices as citizens can contribute to global conservation. Dr. Goodall works with youth, particularly through JGI's Roots and Shoots program, a global network of youth, inspired to make positive change within their own communities.

Throughout her lecture and panel discussion, Dr. Goodall addressed the need to protect all of Africa's animals and their natural habitat. As always in Dr. Goodall's speeches, she found a way to balance the harsh realities in Africa with success stories to inspire and provide hope. Keeping to her signature and welcomed entrance, Dr. Goodall amazed the students with a light-hearted lesson in chimpanzee calling.

Finally, in October, 2007, **Debbie Cox**, Executive Director of JGI of Uganda visited U of T to present a lecture on the complex factors that threaten the survival of wild chimpanzees and JGI's innovative community-centred conservation approach that involves working with African communities to improve their lives and protect key areas of habitat at the same time.

We welcomed the participation of Debbie Cox in our fall JGI series of events, and we now look forward to Dr. Goodall's return to the University of Toronto campus in November, 2008, when she will receive an Honorary Doctorate from the University of Toronto. A ceremony will be held at that time to honour Dr. Goodall's achievements.

Emma Thacker is Program Development and External Relations Assistant at the Centre for Environment. Ingrid Leman Stefanovic is Director of the Centre for Environment.

FOR MORE INFORMATION:

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Centre for Environment:
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Research Day

Annual event showcases research of the Centre's faculty and students

The following research presentations were made on April 29, 2008 as part of the Centre for Environment's (CFE) Research Day. The annual event showcases research done by some of the Centre's faculty and students. Condensed abstracts are included below.

MIRIAM DIAMOND, Professor, Department of Geography; Research Director, CFE; *Canadian Geographic's* 2007 Canadian Environmental Scientist of the Year. **How did that chemical inside my computer get inside me?** Although synthetic chemicals have improved our lives through technology, some chemicals can inadvertently escape into the environment and enter us. Problems arise when they have the potential to act as toxins and are persistent. This presentation examined polybrominated diphenyl ethers, used as flame retardants in electronic equipment and furnishings, and traced the origin of these chemicals in various products and how they enter us via the indoor environment and food.

NILIMA GANDHI, Ph.D. candidate, Department of Chemical Engineering and CFE Environmental Studies Program. **A new method for assessing metal hazards in freshwater ecosystems: evaluating influences of environmental chemistry on metal's fate and ecotoxicity issues.** Hazard for compounds, including organic chemicals and metals, is currently ranked by numerically ordering characterisation factors (CFs). The current method of estimating metal hazards based on persistence, bioaccumulation and toxicity as applied to organic chemicals, is inappropriate mostly because metal speciation is used as a function of changing ambient water chemistry. This presentation discussed a new modelling approach designed to develop and evaluate improved CFs for metals and its application to several Sudbury lakes to compare estimated metal ecotoxicities and assess the influence of environmental variability on the fate and effect calculations.

STEPHEN SCHARPER, Associate Professor, Department of Anthropology, U. of Toronto Mississauga, and CFE. **Hope in a time of climate change: perspectives from religion and the environment.** This presentation focussed on the intersection of liberation theology and other religious environmental paradigms, such as "new cosmology". Over the past few decades, within religious circles in general and Christian circles in particular, tension has surfaced between those focusing on social and economic concerns and those dealing primarily with environmental issues. Reporting on preliminary findings from a 3 year SSHRC-

funded project, Dr. Scharper discussed some of the underlying interconnections between Christian social justice perspectives and those focused more directly on environmental issues.

KATE PARIZEAU, Ph.D. candidate, Department of Geography and CFE Environment and Health Program. **An investigation of informal recyclers' health status in Buenos Aires, Argentina.** This presentation highlighted Ms. Parizeau's doctoral research for which she received the prestigious Trudeau Scholarship. She is examining how political and economic changes have affected the lives and work of *cartoneros*, informal recyclers in Buenos Aires and the ways they cope with the dangers and difficulties that accompany poverty. **Please see page 22 for an article on this research.**

TERRIS LUTTER, M.A. alumna (Nov, 2007), Department of Geography and CFE Environmental Studies Program. **Biofuels and food security in Barbados.** In recent years there has been much debate in the media about the potential impact of increased biofuel production on food security. This presentation considers this debate in the context of the development of a biofuel industry in Barbados. Issues such as local food production, tourism, and environment were discussed. It concluded that energy security is currently discursively more important than food security in Barbados. This may result in serious long-term consequences for the island, a situation that may also be paralleled in other biofuel-producing countries.

DOUG MACDONALD, Senior Lecturer, Centre for Environment. **Business and environmental politics in Canada.** This presentation examined the ways in which large firms at the centre of major pollution issues, such as the smelting industry and acid rain and the oil gas industry and climate change, have worked to influence Canadian environmental policy from the 1960s to the present. Dr. Macdonald won the Canadian Political Science Association's Donald Smiley Prize for the best book published in English or French in 2007 on government and politics in Canada. **Please see page 30 for more information on this book and prize.**

ANA TINTA, B.Sc. (Hons) student, CFE Environment and Health Specialist Program. **Greening the University of Toronto.** This past year, senior undergraduate students in the Centre's course ENV421H *Environmental Research* undertook projects which provided viable recommendations for further action to green the University of Toronto. This talk featured a summary of the four projects



Professor Miriam Diamond, named Canadian Geographic's 2007 Canadian Environmental Scientist of the Year, spoke about some of her research on toxins in electronic equipment and furnishings can enter our bodies.

FOR MORE INFORMATION:

www.environment.utoronto.ca
or contact Mona El-Haddad,
416-978-6526; m.elhaddad@utoronto.ca

investating water practices at Sidney Smith Hall, the installation of green roofs, environmental literacy, and sustainable paper procurement. **Please see page 15 for an article on these projects.**

JASON ASLANIDIS, B.A. (Hons) student, CFE Environmental Policy and Practice Specialist, International Relations major; and **SUGANYA BALACHANDRAN**, B.Sc. (Hons) student, majors in Environment and Society and Psychology. **Greening waste management at St. Michael's Hospital, Toronto.** As part of a larger greening initiative, St. Michael's Hospital asked senior undergraduate students of this past year's Centre's course ENV 420Y *Environmental Research* to do research and develop recommendations to improve management of solid, biomedical and hazardous wastes generated by the hospital. The students conducted a world-wide scan of best practices for hospital waste management; and a waste management "pilot project" on selected areas of the hospital. **Please see page 15 for an article on these projects.**

Special Lectures presented in 2007-08

PIMLOTT MEMORIAL LECTURE

GUILLERMO PENALOSA

Exec. Director, Walk & Bike for Life.

***Walking and bicycling:
creating great healthy cities.***

(presented with Innis College, U of T.)

On the evening of March 26, 2008, the Centre for Environment was pleased to have **Gil (Guillermo) Penalosa**, Executive Director of Walk & Bike for Life, present the Douglas Pimlott Memorial Lecture. In this lecture, Mr. Penalosa expressed his passion for improving the quality of life by promoting walking and bicycling through Walk & Bike for Life (www.walkandbikeforlife.org). One of the main objectives of this Canadian non-profit organization is to foster healthier and happier communities by converting public spaces into places for recreational use. He stressed the importance of facilitating and encouraging bicycling through the development and maintenance of safe, bicycle-designated routes that interconnect throughout the city. He was former Commissioner of Parks, Sport and Recreation in Bogotá, Colombia where he led his team to design and build over 200 parks and open 91 km of car-free city roads on Sundays.

(Abstract by **IBTISSAM MUSTAQ**, *Work Study student, Centre for Environment.*)

BOB MUGERAUER

Professor, Department of Urban Design and Planning, University of Washington.

***The place of the environment:
City of Man or City of God?***

(presented with Centre for the Study of Religion; Religion in the Public Sphere; Cities Centre; Faculty of Architecture, Landscape, and Design, U of T.)

What is the significance of “universal” human rights for environmental devastation at a time when “foundationalist” and “universalist” approaches have been rejected by post-enlightenment thought (rejecting God and other authorities), post-structuralisms (radically asserting differences and condemning idea of objective truth), and neo-liberal globalism (advocating the “free market” exploitation of resources)? In this lecture, Dr. Mugerauer presented material from environmental anthropology and ideas relating to a contemporary basis for human rights, by drawing on “new universalism”. Addressing the relation of environment and religion, he discussed St. Augustine’s “City of God, City of Man”, using examples of decision making that invoke Islam and Christianity. The feasibility of seeking solutions to environmental and social justice problems with and without formalized religion was discussed, referencing critical theory, phenomenology and Buddhism.

SARAH MCFARLAND TAYLOR

Associate Professor of Religion, Northwestern University

***Missionaries to the planet:
Green Sisters, Catholic environmentalism,
and the renewal of religious life.***

(presented with Centre for the Study of Religion and Elliott Allen Inst. for Theology and Ecology, U of T.)

Green sisters are ascribing new meanings to their vows of poverty, chastity and obedience through the practice of non-materialist poverty that uses few of the Earth’s resources, and remains chaste from consumerist desires. Dr. Taylor is the author of *Green Sisters: A Spiritual Ecology*, which explores the work of Catholic sisters who have made the caring for the Earth their primary ministry. She argues that as they find their way back to the roots of religious life through environmentalism, they are also revitalizing their communities. She was privy to a world of athletic, jean-clad suntanned nuns digging vegetable beds, building eco-villages, and launching clean water campaigns. Novices are being attracted to religious communities which previously seemed to be heading for extinction. The moving ahead with this mission of Earth healing is about a kind of reinvention that generates interest in younger generations.

(Abstract by **STEPHEN SCHARPER**, *Associate Professor, Anthropology UTM, & CFE.*)

EcoEco Student Seminar Series with Hart House

The Centre for Environment was pleased to co-present a special student seminar series in 2007-08 with U of T’s Hart House. Condensed abstracts are below. Exploring Ecology and Economy and the challenges of sustainability, “EcoEco” was last year’s focus of Hart House’s themed programming. For more info, please visit www.harthouse.utoronto.ca, call 416-978-2452 or email jenifer.newcombe@utoronto.ca.

SAMINA ESSAJEE, M.A. candidate, School of Public and International Affairs, University of Ottawa. ***The role of the World Trade Organization in environmental dispute resolution.*** The tenuous link between WTO’s involvement and success at environmental dispute resolutions has been arbitrary. In a handful of cases, WTO has made laudable progress and has incorporated recommendations made by Daniel Esty in his landmark book, *Greening the GATT*. However, Esty considers WTO dispute resolution a second-best solution, arguing instead for a new international organization, which would more effectively handle environmental dispute resolution. Other theorists believe that the WTO provides a mechanism for enforcement. Further progress may be unlikely given the present discourse of absolute WTO success, which is based on a lack of real evidence and does not consider possible risks.

MARTIN HIJAZI, Ph.D. alumnus (Nov, 2007), Faculty of Forestry and Centre for Environment (see page 21). ***Environmental and economic entitlements in moderating human and environmental well-being in Mount Kilimanjaro, Tanzania.*** Environmental entitlements are a function of resource abundance and acquisition, while economic entitlements are a function of relative command over land, labor and technology. This seminar featured a study in Mount Kilimanjaro which found that consumption of resources and welfare sensitivity are largely explained by a household’s environmental entitlements, rather than economic entitlements. In order to ensure rural environmental resource security and sustainability, rural development programs must incorporate environmental sustainability, and optimal institutional rules governing environmental entitlements.

CATHERINE TSATOUHAS, Faculty of Law, Civil Law, University of Ottawa. ***European regulatory context for release of genetically-modified organisms (GMOs) into biodiversity.*** This presentation highlighted the implementation of controls for GMOs in the European Union (EU) context with respect to identifying important lessons that can be adopted by Canada. A brief survey of International and EU environmental laws on biodiversity and biotechnology, and the marketing of GMOs, particularly food produced from GMOs was provided. The key issues associated with GMO legislation were analysed: the Convention on Biological Diversity, the Cartagena Protocol on Biosafety as regulation of the contained use of GMOs, and the deliberate release of GMOs into the environment. Lastly, lessons from the European Regulatory experience were drawn for applicability in the Canadian context.

Environment Seminar Series

The following seminars were presented in this series in 2007-08. Condensed abstracts are included below.

MAUREEN CARTER-WHITNEY, Research Director, Canadian Institute for Environmental Law and Policy, Toronto. *Incineration: the burning debate and need for a comprehensive waste management policy in Ontario.* The exploration of Ontario municipalities on the use of incineration as a waste management option has led to a polarized debate regarding its safety and appropriateness. Although proponents have argued that new technologies are cleaner and safer, environmental and health concerns remain. It should not be considered without a provincial policy in place.

ALANA BOLAND, Assistant Professor, Department of Geography, University of Toronto. *Eco-cities, green communities and environmental governance in China.* There has been a recent increasing emphasis on sustainability as a key component of urban development strategies in Chinese cities, e.g. new programs for “eco-cities” and “green communities” which valorize the environment as both a material and symbolic form of investment. This seminar highlighted the broader economic and political imperatives driving these programs and the forms of state regulation guiding them.

BRIAN BRANFIREUN, Associate Professor, Dept. of Geography, and Director, Environment Programs, University of Toronto Mississauga. *Watershed management and mercury cycling in freshwaters of western Mexico.* Lake Zapotlán in Mexico has been recognized as a globally important wetland but there has been a marked degradation of its ecosystem health due largely to municipal sewage discharge, and nutrient loading from agricultural activities. This and its location near an active volcano have led to concern about potential exposure to methylmercury. This seminar featured preliminary findings of a current study.

QUENTIN CHIOTTI, Climate Change Programme Director and Senior Scientist, Pollution Probe. *Climate change impacts in Ontario: translating the national assessment from science into policy.* This presentation reported on the Natural Resources Canada’s report *From Impacts to Adaptation: Canada in a Changing Climate, 2007* which provide evidence that Canada’s climate is changing; that impacts are evident and will exacerbate many climate risks; and that the capacity to adapt is unevenly distributed. This provides a solid foundation for development and implementation of effective adaptation measures.

TED FLEMING, Project Developer, Airtricity Canada Ltd., Toronto. *Opportunities and challenges for wind power development in Ontario.* After 15 years of under investment, a comprehensive power system plan called the Integrated Power System Plan is being prepared by the Ontario Power Authority to tackle a looming supply-demand imbalance. In this seminar, the current state of the electricity market, the changes proposed over the next 20 years, and the place of wind power within the mix were discussed.

ANDREW GREEN, Assistant Professor, Faculty of Law and School of Public Policy and Governance, U. of Toronto. *Insulating climate policy: the role of the public in climate policy decisions.* Although climate policy is technical and requires expertise, it also involves value choices and trade-offs. The issue of value choices speaks to the need to involve the public, but complexity of the issues produces limitations on the usefulness of such involvement. This talk discussed the arguments in favour of increased public participation and the need to tailor it in the context of climate change.

SHUBRA GURURANI, Associate Professor, Department of Anthropology, York University. *Cultural politics of race, gender, and place in nature-making in India.* The analyses of gender in environment are typically marked by a utilitarian and mechanistic approach. This seminar argued for a culturally and geographically embedded understanding of the nature-society relationship. Places of nature are not just biophysical entities but are constituted by local politics of place, history, and ecology and by social relations.

NASRAT HIJAZI, Professor, Department of Physical & Environmental Sciences, U. of Toronto Scarborough. *The new approach to environmental regulation across Canada.* Canadian environmental policy and standards are undergoing a fundamental transition to a risk based system, consisting of a triad of risk assessment, risk management, and risk communication. This lecture focussed on the scientific methodology underlying the first component, the administrative non-scientific assumptions, and the conflicting philosophical underpinnings of environmental policy.

STEVEN W. PECK, Founder and President, Green Roofs for Healthy Cities – North America Inc. *Developing a new industry: the rise of green*

Held Wednesdays, 4:00 p.m.

FOR MORE INFORMATION

on past and upcoming seminars:

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roofing in North America. The formation and growth of the non-profit Green Roofs for Healthy Cities were discussed, highlighting the steps taken to become a full fledged industry association. Also addressed were the future of green roofs and the role of standard setting bodies, policy makers, the design community, media, research community and private sector.

CASSANDRA POLYZOU, Toxic Nation Coordinator, Environmental Defence. *“Toxic Nation”: the toxic pollution of our bodies and how Canada needs to take action.* Through its *Toxic Nation* campaign, Environmental Defence informs Canadians on how to protect themselves from exposure to toxins and works with governments to strengthen standards. This seminar featured bisphenol A as an example of a toxin long suspected of having adverse health effects and used in products, but only now considered for regulation.

DAVID ZINGG, Professor and Director, U. of Toronto Institute for Aerospace Studies. *Toward greener aircraft: mitigating the effect of aviation on climate change.* This presentation addressed how substantial the impact of aviation is on climate change and projections for the future. Means of reducing the impact were discussed, including operational improvements, novel aircraft designs, and alternative fuels. With aggressive action, the net effect per passenger-kilometer may be reduced by a factor of four to eight by 2050.

Eric Krause Memorial Lecture

CHRIS KENNEDY, Associate Professor, Dept. of Civil Engineering, University of Toronto. *Restructuring Toronto’s carbon metabolism.* The annual Eric Krause Memorial Lecture is presented jointly with the City of Toronto and held in memory of Eric Krause, a 1997 M.A. graduate of Geography and the former Institute for Environmental Studies (now Centre for Environment) and a City of Toronto environmental planner.

In this year’s lecture, held in March 2008 as part of the Environment Seminar Series, **Dr. Chris Kennedy** reviewed the current understanding of greenhouse gas emissions from the Greater Toronto Area (GTA) and discussed strategies to achieve reductions in the regions’ emissions. An inventory of emissions was presented, compared with other urban regions. Discussions of strategies for emission reductions were based on global studies, and ideas generated by students in sustainable urban design classes in the Dept. of Civil Engineering, U of T. Following the lecture, there was a presentation of the Eric Krause Graduate Fellowship to **Laina Smith**, an M.A. student in the Geography and Centre for Environment’s Environmental Studies Collaborative Program who is researching the composting behaviours of residents living in multi-unit dwellings.



Speaker Chris Kennedy (left) joins Eric’s parents Wendy and Arnold Krause, sister Katy Krause, and graduate fellowship recipient Laina Smith at the Eric Krause Memorial Lecture.

Jackie Vanterpool

Environment & Health Seminar Series

The following seminars were presented in this series in 2007-08. Condensed abstracts are included below.

Held Thursdays, 4:00 p.m.

FOR MORE INFORMATION

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CHARLES-ANTOINE ROUYER, Freelance journalist; Course Director, Glendon College, York University. **Communications, health and environment: media literacy and the news media contribution (or not) to healthy public policy.** Do news media provide a public arena whereby citizens can be informed or have they simply become another channel to sell advertising? This seminar addressed how the interaction of communication, health and environment can or cannot influence public policy and the avenues to better engage news media coverage of health and environment issues.

NEIL ARYA, Family Physician; Adjunct, Family Medicine, U. of Western Ontario; Environment and Resource Studies, Health Studies and Gerontology, U. of Waterloo. **Towards a rational basis of environmental health regulation: pesticides as a case study.** This seminar explored the basis behind environmental health decision-making, using the example of pesticide regulation. The scientific basis behind regulation and the limitations of these approaches were examined, as well as post-market surveillance; concepts of risk, precaution and weight of evidence, and the role of the corporate sector in generating evidence.

DIEGO BASSANI, Epidemiologist, Centre for Global Health Research, St. Michael's Hospital, University of Toronto. **Indoor air pollution and child mortality in India.** Half of the world's population uses solid fuels such as coal, dung, crop residues and wood for cooking and heating, usually in inefficient devices. The sub-products from burning these materials are the major sources of indoor air pollution causing ill health among children. A study on the association between early life exposure to indoor air pollution and child mortality in India was discussed.

KERRY BOWMAN, Bioethicist, Mount Sinai Hospital and Joint Centre for Bioethics, Univeof Toronto. **Environmental degradation and emerging diseases: the case of HIV, SARS and Ebola.** This seminar reviewed the history of zoonotic diseases and possible causes of outbreaks. Deforestation, commodification and trade in wild animals, and ecosystem changes have serious implications for the distribution of micro-organisms and health of humans and animals. The effects of rapid global travel and climate change and the roles of ethics and global health initiatives were also discussed.

JIM BROPHY, Executive Director, Occupational Health Clinics for Ontario Workers, Sarnia. **Asbestos Disease in Sarnia, Ontario: a case study into a**

Canadian blue-collar community living a preventable cancer tragedy. Sarnia-Lambton, the centre of Canada's petrochemical industry, has made extensive use of asbestos, leading to a wide range of asbestos-related diseases among its industrial workers. This seminar discussed studies revealing the area has the highest rates of pleural mesothelioma in Ontario and elevated rates of asbestos-related respiratory diseases and cancers.

JOHN EYLES, University Professor, School of Geography and Earth Sciences, McMaster University. **At the margins: will environmental health ever get its place in the sun?** Environmental health seems such a vital part of public health, but this seminar argued that its centrality has tended to be episodic. Discussed were a review of its history, which is seen as closely related to the environmental movement as concerns about environmental racism and justice. A prognosis was also discussed, highlighting both the facilitators of and challenges for the future.

MURRAY FINKELSTEIN, Associate Professor, Occupational and Environmental Health, McMaster University; Assistant Professor, Family and Community Medicine, U. of Toronto. **Air pollution and Parkinson's Disease in Southern Ontario cities. (Co-hosted by the Centre for Urban Health Initiatives, U of T.)** There is concern that industrial emissions of manganese (Mn) and the use of Mn-containing compounds might increase the risk of Parkinson's Disease (PD)-like disorders. A study of the associations between the diagnosis and treatment of PD and markers of exposure to vehicle exhaust and Mn industrial emissions in Hamilton and Toronto was reviewed.

JOHN FRANK, Scientific Director, Canadian Institutes of Health Research (CIHR) Inst. of Population and Public Health; Professor, Public Health Sciences, U. of Toronto. **Studying gene-environment interactions with large cohort studies: a tale of (more than?) two Canadian cohorts.** This seminar featured a study of the joint influence of genetic and environmental factors on traits underlying conditions of childhood and biomarkers that presage problems in later life. The approach of investigating causal pathways to traits indicating abnormal human development and function, rather than specific diseases was discussed.

RICK GLAZIER, Senior Scientist, Institute for Clinical Evaluative Sciences; Scientist, Centre for Research on Inner City Health, St. Michael's Hospital. **The neglect of place as a determinant of health: why urban neighbourhoods matter. (Co-hosted by the Centre for Urban Health Initiatives.)** This seminar reviewed a study of 140 Toronto neighbourhoods which found poverty and immigration to be key factors leading to high rates of diabetes in many parts of the city and that the environment in which people live can greatly influence daily activity and access to resources for health.

JEFF MUSADA, Postdoctoral Fellow, Inst. of Health Promotion Research, University of British Columbia. **Building capacity for environmental inequity research in Canada.** The uneven distribution of environmental hazards across space and populations reflect underlying societal inequities.

This presentation discussed the state of research in Canada which lacks scrutiny of the societal causes of inequities. A brief overview was done of the new grassroots Canadian Network on Environment, Health, and Social Equity, launched in 2007.

BRUCE NEWBOLD, Professor, School of Geography & Earth Sciences, Institute of Environment and Health, McMaster University. **The healthy immigrant? Myth and reality.** Immigration has recently once again become a prominent national policy issue in Canada. Literature has established that the health and health-seeking behaviour of Canada's immigrants diverges within the first few years of residency from that of the native-born population. The extent of the decline in health status, and the need for health care within this potentially vulnerable population were discussed.

SUSAN PHILLIPS, Professor, Family Medicine, Community Health and Epidemiology, Queen's University. **Measuring phthalates in breast milk: how to become a pariah in medicine.** The findings of the first study of phthalates (plasticizers in the environment which act as endocrine disruptors) found in human milk were discussed. The policy maker's dilemma of assuming safety until harm is proven, or limiting exposure to a chemical with potential risk was debated. Human milk as a possible source of phthalates and the transmission from mother to infant were discussed.

STEPHEN B. SCHARPER, Associate Professor, Centre for Environment, and Dept. of Anthropology, U. of Toronto Mississauga. **The notion of hope in an environmental age.** The study of the environment has come to replace economics as "the gloomy science" with near-apocalyptic implications of climate change, species extinction, and pollution. How does one thus talk of hope in an age of environmental destruction? This was explored, with reference to our time as a "diagnostic moment" rather than a "tipping point".

JAMES SCOTT, Assistant Professor, Dept. of Public Health Sciences, University of Toronto. **Unbidden houseguests: A discussion of moulds, buildings and health.** Despite studies worldwide, the environmental risk factors of asthma and allergic disease remain poorly understood. The ecology of the indoor environment is complex and conditions do not occur in isolation. This seminar described these complexities, housing characteristics, exposure surrogates useful for indoor studies and the new Canadian Healthy Infant Longitudinal Development (CHILD) study.

PETER G. WELLS, Professor, Faculty of Pharmacy, and Dept. of Pharmacology and Toxicology, U. of Toronto. **The fetus in utero: reactive oxygen species, oxidative DNA damage and repair in teratogenesis.** In the developing embryo and fetus, endogenous or xenobiotic-enhanced formation of reactive oxygen species (ROS) may cause structural and/or functional birth defects, known as teratogenesis, by oxidatively damaging cellular macromolecules and/or by altering signal transduction. The teratogenicity of agents like benzo[a]pyrene can be modulated by altering pathways that control embryonic ROS balance.

Adaptation & Impacts Research Division

Collaboration with Environment Canada researchers at the University of Toronto

Part of the Science and Technology Branch of Environment Canada, the Adaptation and Impacts Research Division's (AIRD) research efforts are directed towards understanding the impacts of weather, climate, air quality and related environmental impacts on human health and safety, economic prosperity and environmental quality and adaptation. A key element of the research agenda is carried out through partnerships and collaborations, such as the formal arrangements with specific universities: British Columbia, Waterloo, New Brunswick and Toronto, where the group has a co-operative research relationship with the Centre for Environment and the Department of Physical and Environmental Sciences at University of Toronto Scarborough. AIRD's collaborative research at the Centre focusses on impacts and adaptations in the context of hazardous and anomalous weather in urban environments: defining hazardous and anomalous weather and climate, identifying the value of weather information, identifying vulnerabilities and changing vulnerabilities under climate change, assessing the impacts of hazardous and anomalous weather and climate in urban areas, and assessing adaptive strategies. **For more information on AIRD at Environment Canada, please contact Indra Fung Fook, Administrative Officer, 416-739-4436, indra.fungfook@ec.gc.ca.**



Xiao Li

The breathing wall in the i2c lab of the Department of Civil Engineering, Galbraith Building at U of T, is one of several used in a collaborative research project between Brad Bass of AIRD, Tamer el-Diraby of Civil Engineering and Genetron Systems Inc, to assess the impact of this technology on indoor air quality and energy consumption.

AIRD Researchers and Projects at U of T

BRAD BASS

Office: Centre for Environment, Room 3039, 33 Willcocks St., U of T; tel: 416-978-6285; fax: 416-978-3884; brad.bass@ec.gc.ca.

Research Interests: Simulating adaptation with anticipatory/emergent computing; ecological engineering adaptations to atmospheric change (green walls, green roofs, living machines); energy sector adaptations to climate, policy & technological change; climate change scenarios.

Current and Recent Projects:

Simulating Adaptation with Anticipatory/Emergent Computing. This research uses agent-based simulation in the COBWEB (Complexity and Organized Behaviour Within Environmental Bounds) platform to explore the behaviour of complex systems in changing environments.

Ecological Engineering Adaptations to Atmospheric Change. The Environmental Services Performance research model is used to simulate the effectiveness of green roofs and walls in reducing energy consumption. Breathing walls are used to assess the impact of different green roof plants on air and water quality.

Energy Sector Adaptations to Climate, Policy and Technological Change. Energy sector adaptations to climate and policy changes have been explored for Ontario and different regions using the Regional Energy and Analysis Model (REAM), developed at U of T. *Climate Change Scenarios.* The main node of the Canadian Climate Change Scenarios Network (CCCSN) is located within the Centre and is used to disseminate global climate model output, analytical tools and technical advice for climate impact assessment.

GRACE KOSHIDA

Office: Centre for Environment, Room 3046, 33 Willcocks St., U of T; 416-978-0309; fax: 416-978-3884; grace.koshida@ec.gc.ca.

Research Interests: Agricultural and urban drought impacts; high-impact weather events; disaster mitigation; climate change impacts on Canadian water resources.

Recent Projects:

Canadian Agricultural Adaptations to 21st Century Droughts: Preparing for Climate Change? This project assessed the

effectiveness of adaptation options in reducing the vulnerability of agriculture to drought through regional stakeholder consultations and case studies in S. Ontario, Nova Scotia and Prince Edward Island. *The Tap Runs Dry: Lessons Learned and Forgotten by Southern Ontario Communities During Past Severe Droughts and Implications for Climate Change.* This completed project focussed on documenting past drought impacts and responses in Southern Ontario communities. Drought contingency plans in cities have primarily focused on temporary reactive management of water shortages rather than on water supply protection plans. One of the key outputs from the project was a vulnerability index and web-based mapping tools to quantify and visualize drought vulnerability.

MONIRUL MIRZA

Office: Dept. of Physical and Environmental Sciences, Room S-653, U of T at Scarborough, 1265 Military Trail, Toronto, M1C 1A4; tel: 416-208-4874; fax: 416-287-7279; monirul.mirza@utoronto.ca.

Research Interests: Hydro-meteorological analyses, extremes and natural hazards, climate change and sea-level rise vulnerability, impacts and adaptation for water and energy sectors, climate change scenarios, environmental security and sustainable development, hydro-politics and transboundary water resources management, water resources modelling and assessment, application tools and GIS.

Current and Recent Projects:

Climate Change in the Greater Toronto Area (GTA). Examines climate change and variability in the GTA, human interferences and activities, urban heat island effect, climate change scenarios and implications for water, energy, infrastructure and health. *Synthesis of the 2007 Fourth Assessment Report (AR4) Intergovernmental Panel on Climate Change.* A report on evidence of climate warming based on increases in average air and ocean temperatures, melting of snow and ice and rising global average sea level. *International Assessment of Agricultural Science and Technology for Development (IAASTD).* Coordinating lead author of "Scenarios" chapter of the East, South Asia and Pacific Regional Assessment and lead author of Global Scenarios chapter in 2008 Report.

U of T Sustainability Office

Bridging research and practises to create a more sustainable campus

BY LEAH SUMNAUTH MCINTOSH AND BETH SAVAN

The Sustainability Office enjoys a warm collaborative relationship with the Centre for Environment. The Office was established in 2004 with wide support from across the University of Toronto, meeting a need for a central body that would address sustainability on campus, and undertake multi-faceted conservation initiatives. Through the Office, the university community is engaged in contributing to a healthier campus by bridging the gap between sustainability research, teaching and institutional practice.

The past year has been an exciting one. Under the guidance of Director **Dr. Beth Savan** (also Senior Lecturer at the Centre for Environment) and Acting Director **Professor Sarah Wakefield** (during Beth's sabbatical in the first half of 2008), the Office has continued to tackle complex and ever-changing environmental issues on campus. Two coordinators, **Stuart Chan** and **Ashley Taylor**, and a number of full-time specialists are directly involved with the Office's projects. Additionally, each year approximately 40 work-study and part-time students are employed, and another 40 or so students, mostly enrolled at the Centre, are engaged through course work, independent study courses, and placements.

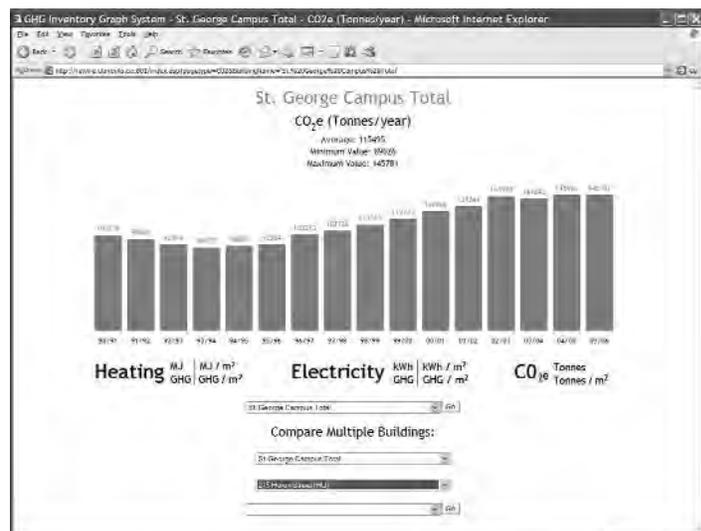
This past year, the Office's programs continued to develop and grow. The **Rewire** project, both student-initiated and student-driven, has entered its fourth year. Starting as a pilot project at one residence, it now includes twelve residences participating across the St. George campus. It is a unique, community-based energy conservation program, which empowers students and staff to reduce their energy usage through simple changes in lifestyle. In 2007, the Office was fortunate to receive a three year grant from the Ontario Centres of Excellence, via the Centre for Environment, to further develop the program and to transfer it to off-campus institutions.

As part of the **ReSource** project, a rigorous investigation of paper use on campus was completed and modules were developed to be incorporated into the **Rewire** project. **Resource** aims to radically reduce the massive amount of paper consumed by the university, currently estimated at over a billion sheets of paper every year.

The **Transportation Demand Management** project was also developed in 2008. Its focus has entailed analysis of GPS to gauge the use patterns of U of T's fleet of vehicles and to analyze whether vehicle type and vehicle use are properly matched.

Lastly, the **GHG (Greenhouse Gas) Inventory** is a fundamental tool that quantifies all resource consumption of the University, in terms of GHG emissions. It is currently being updated to include another year of data. The results for each building on the St. George campus are available online and is being expanded to include waste and transportation data, the latter of which has been found to contribute 18,000 tonnes of eCO to U of T's annual emissions.

Several new programs which address major sustainability issues on campus have also taken root in the past year. **Green IT** (Information Technology) is a new program with the goal of reducing IT equipment electricity consumption. Workshops will allow IT staff to exchange knowledge and develop new solutions collaboratively.



Yearly resource consumption, in terms of greenhouse gas (GHG) emissions, for the St. George campus and each of its buildings, are available on the Sustainability Office's website as part of the Office's ongoing and expanding GHG Inventory.

The Office is also pioneering a new **Departmental Engagement** project which seeks to engage and empower faculty and staff to shape their unit's sustainable future through a 'living' Environmental Plan detailing conservation measures they plan to undertake.

The **Fume Hoods Initiative** is also a new addition. A fume hood is a workstation, typically in labs, that protects users from hazardous fumes by drawing air away at a rapid rate. The average fume hood uses 3.5 times the energy of the average North American home. With over 1100 fume hoods at U of T, the goal of this initiative is to reduce energy consumption. Currently, it aims to run a pilot project in the Lash Miller Building (home to about one third of U of T fume hoods), to upgrade existing and remove unused fume hoods.

The Sustainability Office continues to work closely with U of T's Facilities and Services Department on major sustainability initiatives, such as **building retrofits**, the **Revolving Fund**, and the **Energy and Resource Plan**. Currently, a 20 million dollar retrofit program is underway, which replaces lighting systems and "chillers" (central cooling systems) on campus. The Revolving Fund will soon be established for energy efficiency projects and will include a payback to be re-invested. Lastly, the Energy and Resource Plan will lay out options for achieving greater efficiency and conservation.

The collaborative relationship between the Sustainability Office and the Centre for Environment has contributed to the success of the Office, and has brought tangible benefits to both units in the form of increased student engagement and new research opportunities. The Office is grateful to the Centre for providing it with space in the Earth Sciences building. Although the Office will soon be moving to the South Borden Building, we look forward to continued collaboration with the students, faculty and staff of the Centre.

Leah Sumnauth McIntosh is a Rewire Project Specialist, U of T Sustainability Office and Beth Savan is Senior Lecturer at the Centre for Environment and U of T Sustainability Director.

FOR MORE INFORMATION:

www.sustainability.utoronto.ca

tel: 416-978-6792; email: sustainability@utoronto.ca

Education Alliance for a Sustainable Toronto

Part of the United Nations University's network of Regional Centres of Expertise

BY INGRID LEMAN STEFANOVIC

In 2006, the Centre for Environment joined the City of Toronto and other local organizations to participate in the development of a new coalition, to advance the aims of the United Nations Decade for Education for Sustainable Development.

The Education Alliance for a Sustainable Toronto (EAST) has become the official name for the Toronto Regional Centre of Expertise (RCE) that, in the words of the Memorandum of Understanding signed by the partners, consists of a "coalition of formal, informal, and non-formal educators collaborating to promote the objectives of the United Nations Decade for Education for Sustainable Development in the Toronto region, and in doing so, empower students, the general public, and professionals to transform the Toronto region to a sustainability-oriented society." In addition to the Centre for Environment at U of T, membership includes the City of Toronto, as well as York University, the Toronto District School Board, the Toronto Zoo, Citizens' Environment Watch, the Toronto and Region Conservation Authority, Seneca College, and the Education Alliance for a Sustainable Ontario.

In 2007, **Professor Ingrid Stefanovic**, Director of the Centre for Environment, was elected as inaugural Chair of "EAST" for a period of one year. In order to actively encourage a broader level of engagement by other members, a new structure of Co-Chairs was established in 2008. **Professor Roy Paluoja**, Acting Chair of the Centre for the Built Environment at Seneca College has agreed to serve in this position of Co-Chair from 2008 to 2010, along with Professor Stefanovic.

A number of collaborative activities have been undertaken since the RCE/EAST was created. These include a **survey of Education for Sustainable Development (ESD) programs in the Toronto region**. The objective was to determine the degree to which ESD programs in Toronto reflect the United Nations' themes for the International Decade for Education for Sustainable Development (2005-2014). Over 400 organizations were invited to complete the survey, with over 87% respondents coming from the informal education sector. Several key findings emerged. First, there seemed to be a lack of awareness of the links between ESD and issues of environmental justice and poverty alleviation. Second, there seemed to be a clear gap in terms of available training programs specifically aimed at the social service sectors. Third, very few training opportunities appear to be available on-line, with over 80% of education occurring face-to-face.

As a result of the survey, several project proposals are being developed. These include:

- A **"train-the-trainer" program** for the social service sector, in conjunction with the City of Toronto's Climate Change plan. Recognizing the central role of social service providers in working with multiple groups within Toronto, this project aims to design a two-day "train the trainer" workshop for these providers and for community-based organizations, about climate change education. The workshop would initially run three times over the course of six months, followed by possible additional events.
- **Free, public distance education modules**, targeted at advancing understanding of Toronto Climate Change issues. Building on the Centre for Environment's existing Distance Education certificate programs (see page 26), the aim is to design an on-line course/primer about ESD and Climate Change initiatives in

Toronto, aimed at an audience with little previous environmental knowledge (accessible to new Canadians and some of the special needs populations). Linking issues of poverty alleviation and climate change action, the primer would offer practical suggestions for lifestyle changes and would provide links to existing programs around the Greater Toronto Area.

In addition, the following other projects are in development:

- **A case study at the neighbourhood scale**, building on the success of the University of Toronto Sustainability Office's success in developing the "ReWire" project, aimed at changing behaviour to encourage energy conservation. (See page 12.)
- Designing an **internet-based "Sustainability Map"** to assist the public in identifying projects and local initiatives that successfully advance sustainability in the Toronto region, such as field trip opportunities and curriculum resources, and, at the same time, to inspire new initiatives.
- **Best Practices Case Studies**. As part of a fourth year independent research course, a Centre for Environment student worked together with City of Toronto staff to identify 10 to 12 case studies that would serve as significant examples of ESD within the Toronto area.
- The development of a **new Centre for Sustainable Life and Learning at the Toronto Zoo**, providing a home for the Zoo's various educational outreach programs.

Other proposals, such as designing a video-based presentation about climate change and sustainability challenges for Toronto, are also under discussion.

The RCE initiative has its challenges. Our collective Memorandum of Understanding extends to the summer of 2009, at which time future directions will become more evident. What is certainly clear is that members of the group have a strong sense of commitment to the goals of educating students and the public about issues relating to sustainable development. In fact, each member organization of the steering committee is already undertaking important activities to advance these goals. The challenge will be to see what kinds of collaborations develop that will add value to the important initiatives that each group is pursuing on its own.

A website, detailing the activities of the RCE and providing a forum for dialogue, is currently in development and should be available by the fall of 2008. It is our hope that it will provide an additional venue for sharing of information, collaboration and joint commitment to advancing in a concrete way, the goals of the United Nations Decade for Education for Sustainable Development.

*Ingrid Stefanovic is Director of the Centre for Environment and Co-Chair of the Education Alliance for a Sustainable Toronto.
Email: ingrid.stefanovic@utoronto.ca.*

FOR MORE INFORMATION:

Education Alliance for a Sustainable Toronto:
www.unurce-toronto.org (available Fall, 2008)

United Nations University world-wide RCE network:
www.ias.unu.edu
(click Research then Education for Sustainable Development)

Message from the Undergraduate Coordinator

BY KAREN ING

The past year has been productive for the Centre for Environment (CFE) undergraduate office with several new programs and courses put forth and approved for the 2008-09 academic year. Many of these are the culmination of strategic planning of expansion into areas of growing societal environmental interest and concern.

One area of growing interest is around energy use and supply, recognized as being fundamental to many of our future environmental challenges and solutions. To better prepare our students to meet this challenge, we have introduced a **new Environment and Energy Science Minor** spearheaded by **Professor Phil Byer** of Civil Engineering and CFE and designed to promote understanding of the intersection of concepts such as sustainable development, and the technical, scientific, environmental, economic and political factors related to energy use and supply.

In addition to an existing third year energy themed course ENV350H Energy Policy and Environment, three new courses have been developed for this minor. In collaboration with **Professor Danny Harvey** of the Department of Geography, two new joint courses, **JGE347H Efficient Use of Energy** and **JGE348H Carbon Free Energy**, will be offered in 2008-09. A third course, **ENV346H Terrestrial Energy Systems**, is being developed by **Professor Bryan Karney**, Director of the Division of Environmental Engineering and Energy Systems.

This past year also saw the Centre collaborating with colleagues from the Department of Psychology to mount a **new minor in Environment and Behaviour**, stemming from the recognition that sustained positive environmental change cannot occur in the absence of broad-based behaviour changes. This minor will focus on the issues of psychological motivation and attitudes that underlie environmental decision making.

Building on the increasing interest in environment and human health, the Centre collaborated with the Human Biology program at New College to offer a new fourth year course, **JEH455H Current Issues in Environment & Health**. **Professor Valerie Watt**, Director of the Human Biology Program, is designing the course to explore the interface between environment and health from scientific, medical, political and policy perspectives.

The Centre continues to foster opportunities to provide our students with more international exposure and experiences. The collaboration with the Summer Abroad program at Woodsworth College is in its third successful year with students having the opportunity to take ENV395Y Ecology and Conservation in the Amazon, Galápagos, and Andes. This year the course was led by **Professors Spencer Barrett** and **Chris Darling**, of the Department of Ecology and Evolutionary Biology (EEB).

For the second year, the Centre obtained funding from the Faculty of Arts and Science (FAS) to send students to serve a portion of their professional work placement in Costa Rica in July, 2008 for

ENV440Y Professional Experience Course.

The past year also saw the creation of two **new joint minors, Environmental Biology and**

Nanoscience, with the National University of Singapore (NUS), an initiative sponsored by FAS and spearheaded through U of T's International Student Exchange Office. In these programs, students take courses at both U of T and NUS. As part of this initiative, the Centre mounted a new field course, **ENV336H Ecology in Human Dominated Environments**, at the Koffler Scientific Reserve at Jokers Hill in August, 2008, led by **Dr. Ivana Stehlik** of EEB.

Looking ahead to the upcoming year, I anticipate a year of reflection and lively discussions around our curriculum and core areas of strength. This will be spurred on both by the FAS Curriculum Review and Renewal Project and from the Centre's own review process of how to best deliver a strong and relevant curriculum in light of ever evolving and emerging environmental challenges. New initiatives that are in the early planning stages include expanding the Environment and Energy Minor to the B.A. program, developing an introductory energy science course for non-science students, introducing a fourth-year project course in energy, and pursuing a joint minor in environmental studies with NUS.

In closing, I would like to acknowledge and thank the many collaborative partners and colleagues who have worked with us over the past year to bring many of these developments to fruition. Without their continued support and contributions, we would not be able to sustain and develop the interdisciplinary curriculum that is integral to studies of the environment.

Karen Ing is Senior Lecturer and Undergraduate Coordinator at the Centre for Environment.

Centre for Environment students shelling cacao beans at an organic sustainable farm in Costa Rica. Roasting, shelling and grinding the cacao beans into cacao powder are some of the activities of their work placement in the ENV 440Y Professional Experience course. From left: Sarah Lenarcic, April Colosimo, Alix Aylen, Angela Garvey, Lena Phillips and Kate Raycraft.



FOR MORE INFORMATION

on undergraduate programs and courses:

www.environment.utoronto.ca

or David Powell, Undergraduate Student Advisor,
416-946-8100, david.powell@utoronto.ca

Undergraduate Research Courses

In 2007-08, senior undergraduates in the Centre's Environmental Research courses investigated the waste management system of Toronto's St. Michael's Hospital and the sustainability of U of T.

Greening St. Michael's Hospital Waste Management System

ENV420Y Environmental Research

Instructors: Karen Ing, Doug Macdonald, Centre for Environment

BY DOUG MACDONALD

In 2007-08, ENV420Y students carried out two co-ordinated research projects intended to contribute to the *St. Michael's Hospital Greening Initiative*: 1) a world-wide project to identify and study leading health-care facility waste management practices; and 2) a pilot project done on two floors of the St. Michael's Health Centre in Toronto, to test staff education and physical modifications as a means of increasing solid waste diversion.

The first project examined solid, hazardous and biomedical waste streams, and policies for hospital purchasing and staff education. Thirty-seven hospitals in North America and Europe were reviewed based on website documents. Detailed information was obtained from 11 hospitals through surveys and semi-structured interviews. It was found that the essential first step for St. Michael's is to give priority to environmental protection amongst its strategic objectives. Secondly, staff commitment and involvement, at all levels, is essential. Other recommendations include waste management practices to reduce and recycle solid waste and improve segregation of biomedical wastes.

Staff involvement and training were also central elements in the second research effort. A base-line audit was done of solid waste generated on two floors of the Health Centre. Staff were invited to a waste reduction training seminar and changes were made to signage and placement of recycling bins. A second audit found a decline in the average waste generated per person over a three-day period. Other data on reduction of recyclable material in disposal waste also indicated the efficacy of education and physical methods tested.

Findings and analyses were presented to St. Michael's officials in a verbal presentation and written report. Students participating in the research were: **Abdifatah Abdi, Jason Aslandis, Suganya Balachandran, Amina Lang-Bismillah, Earlyn Etienne, Lawrie Gluck, Marcie Lariviere and Alexandra Palazzolo.**

Doug Macdonald is a Senior Lecturer at the Centre for Environment and Co-Instructor of ENV 420Y and ENV 421H.

Greening the University of Toronto

ENV421H Environmental Research

Instructors: Karen Ing, Doug Macdonald, Centre for Environment

BY ANA TINTA

In their book *Planet U: Sustaining the World, Reinventing the University* (2006, New Society Publishers), Michael M'Gonigle and Justine Starke advocate the reinvention of the university as a sustainability leader while challenging its members to take action, not only in their own energy use and waste management, but in their teaching, research, land development and community relations. Using this as inspiration in the ENV 421H course in 2007-08, students undertook four specific projects themed around "Greening the University of Toronto": 1) improving water practices at Sidney Smith Hall, 2) installation of green roofs, 3) sustainable paper procurement, and 4) encouraging environmental literacy.

A variety of methodologies were used by the students to acquire data, namely observations of bathroom usage, interviews with key personnel, reviews of primary documents, in person questionnaires, case study analyses, an online survey and focus group sessions.

It was found that although U of T has started to move toward the "Planet U" vision, it still lags behind the leading North American universities. Further, students identified that the university is currently facing two main barriers: the need to spend money on sustainability initiatives during a time of fiscal restraint and the need to codify the vision in policy and organization. Selected recommendations for U of T include: 1) in Sidney Smith Hall, non-porous asphalt should be replaced with permeable material and the replacement of high maintenance water fixtures should be prioritised; 2) a green roof should be installed on the Athletic Centre; 3) sustainability should be formally adopted as a university objective and be put into the purchasing policy; the 1994 Environmental Policy should also be updated to incorporate sustainability; 4) environmental issues should be integrated into the arts and science curriculum; 5) the university should accept that it may cost more to be sustainable; and 6) the challenge of its decentralized structure should be addressed.

Ana Tinta is a recent Honours B.Sc. graduate in the Centre for Environment's Environment and Health specialist program, with minors in Geography and Environmental Policy and Practice.

ENV 421H students present their group research projects at a public poster session. LEFT: Environmental Literacy Group members Ana Tinta, Leya Barry-Zachary, Addie North, Alan Cooper (not shown: Emma Saltmarche). MIDDLE: Green Roof Group members Gustavo Oliveira, Raluca Hlevca, Ann Marie Jesupillai, Zhanna Marushchak. RIGHT: Paper Procurement Group members Emmanuel Mabe, Nora Saks, Youri Lee, Allison Chiu.



Emma Thacker

Programs

For more information, please visit www.environment.utoronto.ca

Core Programs:

The Centre for Environment offers three core interdisciplinary undergraduate programs in minor, major or specialist streams:

1. Environment and Science (B.Sc.)
2. Environment and Society (B.A.)
3. Environmental Policy and Practice (B.A.)

Collaborative Programs:

These programs combine the Centre's interdisciplinary core with a set of discipline-specific courses:

Specialist Programs:

1. Earth Systems: Physics and the Environment (B.Sc.): with Department of Physics
2. Environment and Health (B.Sc.): with Human Biology Program, New College
3. Environmental Chemistry (B.Sc.) with Department of Chemistry
4. Environmental Geosciences (B.Sc.): with Department of Geology
5. Past Environments (B.Sc.): with Archeology Program, Anthropology
6. Environment and Toxicology (B.Sc.): with Department of Pharmacology

Collaborative Programs cont'd:

Major Program:

1. Environmental Ethics (B.A.): with Department of Philosophy

Minor Programs (NEW):

1. Environment and Behaviour (B.Sc.): with Department of Psychology
2. Environment and Energy (B.Sc.): with Department of Geography

Directed Minors:

These programs are for students interested in acquiring a limited body of knowledge in one discipline.

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

Courses

2008-09 undergraduate offerings and instructors are subject to change. (*Not offered in 2008-09.)

ENV199Y Debating and Understanding Current Environmental Issues (<i>K.Ing, D.Macdonald, CFE</i>)	ENV350H Energy and Environmental Policy and Politics (<i>R.Houldin, Sessional</i>)
ENV200Y Assessing Global Change: Science & the Environment (<i>A.Zimmerman, Ecology & Evol. Bio, EEB; K.Ing</i>)	ENV395Y Special Topics Field Course (<i>S. Barrett, C.Darling, EEB</i>)
ENV223H Fundamental Environmental Skills (<i>D. Sider, Sessional</i>)	ENV410H Environmental Research Skills (<i>U.Acharya, Sessional</i>)
ENV234Y Environmental Biology (<i>I. Stehlik, et al., EEB</i>)	ENV420Y Environmental Research (<i>D.Macdonald</i>)
ENV235Y Physics and Chemistry of Planet Earth (<i>J.Abbatt; Chemistry; J.Mitrovica, Physics</i>)	ENV421H Environmental Research (<i>K.Ing, D.Macdonald</i>)
ENV236Y Human Interactions with the Environment*	ENV422H Environmental Law (<i>P.Muldoon, Sess.</i>)
ENV299Y Research Opportunity Program (<i>B.Bass, Env.Can.; B.Savan, CFE</i>)	ENV423H Public Policy and Environment (<i>R.Houldin</i>)
ENV315H Chemical Analysis of Environmental Samples (<i>M.Gorton, Geol.</i>)	ENV424H Environment and Community Engagement*
ENV320Y National & International Environmental Policy Making (<i>D.Macdonald</i>)	ENV440Y Professional Experience Course (<i>S.King, Sessional</i>)
ENV321Y Approaches to Environmental Issues (<i>D.Sider, U.Acharya, S.Cohen, Sess.</i>)	ENV441H Politics of the Environment*
ENV332H Culture and Nature*	ENV442H Corporate Perspectives on Environment*
ENV333H Ecological Worldviews (<i>T.Leduc, Sess.</i>)	ENV443H Applied Environmental Research* (also ENV444H*)
ENV335H Environmental Design*	ENV445H U.S. Environmental Politics*
ENV336H Ecology in Human Dominated Landscapes (<i>new in Summer 2008; I. Stehlik</i>)	ENV446H Cities & Urban Environmentalism in a Global Context (<i>TBA</i>)
ENV346H Terrestrial Energy Systems (<i>new in 2008-09; B. Karney, Civ.Eng.</i>)	ENV447H The Power of Economic Ideas*
JGE347H Efficient Use of Energy (<i>new in 2008-09; D. Harvey, Geog.</i>)	JEH 455H Current Issues in Environment and Health (<i>new in 2008-09; R. Wilson, et al., Human Biology</i>)
JGE348H Carbon-Free Energy (<i>new in 2008-09; D. Harvey</i>)	ENV481H Special Topics in the Environment I
ENV340H Informed Environmental Practice (<i>C. Young, Sessional</i>)	ENV482H Special Topics in the Environment II
ENV341H Environment and Human Health (<i>A.Abelsohn, Sessional</i>)	ENV483Y Special Topics in the Environment III
	ENV490Y Senior Essay
	ENV491Y Independent Studies Project (also 492H/493H)
	JGE221Y Environment & Sustainable Development (<i>K.Ing, S.King, D.Macdonald</i>)
	JIE307Y Urban Sustainability (<i>E.Opoku-Boateng, Sessional</i>)



David Powell

Career Day

This successful annual event, held in the spring, has been a collaborative effort by the Centre for Environment, Graduate Environmental Students Association (GESA), Toronto Undergraduate Geography Society (TUGS), and the Environmental Students' Union (ENSU). The day-long event, open to all registered university and community college students, includes a career expo with approximately 30 exhibitors from government, consulting and non-governmental organizations, providing students with advice and many potential career, job and volunteer opportunities. In addition to the career expo, the event includes presentations by speakers from various sectors.

For more information, please contact David Powell, 416-946-8100, david.powell@utoronto.ca or visit www.environment.utoronto.ca/careerday

ENSU: Environmental Students' Union

The Environmental Students' Union (ENSU) is a student organization that aims to create and support initiatives to increase environmental awareness and sustainability both on and off the U of T campus. Membership is open to students at the university regardless of area of study or degree. The executive, however, is comprised of elected undergraduate representatives, and positions of academic concern are reserved for students in environmental programs affiliated with the Centre for Environment.

ENSU has recently worked on environmental projects on campus such as the installation of a solar panel array on Sidney Smith Hall and a project aimed at improving the composting collections. It has also organized socials and environmentally themed film nights, a winter retreat to Hart House Farm, and a graduate studies information session, and has continued to play a role in the annual Career Day (see above). These activities will be continued in 2008-09, and ENSU looks forward to working in closer conjunction with other environmental groups on campus in the upcoming year.

For more information, please visit <http://ensu.sa.utoronto.ca> or email studentaffairs.ensu@utoronto.ca.

Undergraduate Students' Awards

Congratulations to the latest recipients of the following undergraduate awards.

Frances L. Allen Scholarship: This award is for an outstanding second or third-year student in a Specialist or double Major program in environmental studies at the Centre for Environment. The 2007-08 recipient was **David Berliner**, third-year B.Sc. student in the Environment and Health Specialist Program, major in Human Biology.

Chachra Family Scholarship in Environment and Science: This is awarded to a student enrolled in a B.Sc. specialist or major program, offered by the Centre for Environment, on the basis of financial need. Academic merit is also considered. The 2007-08 recipients were **Adrienne DeBond**, fourth-year Hons. B.Sc. student, Environmental Geosciences Specialist Program; and **Felix Gunawan**, Hons. B.Sc. alumus, major in Human Biology, Environment and Health Specialist Program.

Dr. Stanley Allan Cord Scholarship in Environmental Studies: This scholarship is awarded to students in the third or fourth year at the Centre for Environment who have achieved academic excellence. All other things being equal, preference is afforded to Innis College students, extending the tradition of the former Innis College Environmental Studies Program. The 2007-08 recipient was **Jennifer Loo**, Hons B.Sc. alumna, Environment and Health Specialist Program.

Peter John Hare Memorial Scholarship in Environment (new in 2007-08): This is awarded to a specialist or major in environmental studies on the basis of academic merit and financial need. Preference is given to students taking courses in Environment and Science. Demonstrated commitment to social involvement in environmental issues is also considered. The 2007-08 recipient was **Cindy Chao**, third-year B.Sc. student, Environment and Health Specialist Program.

Kathryn S. Rolph Scholarship: This is awarded to an outstanding student in a Centre program who has achieved a high mark in a course on environmental issues (currently JGE221Y or ENV321Y). The 2007-08 recipients were: 1) for JGE 221Y: **Isabelle Eckler**, B.A. student, majors in Environment and Society, and English; 2) for ENV 321Y: **Angela Garvey**, B.A. student, majors in Environment and Society, and Urban Studies.

Sidney and Lucille Silver Scholarship: This is awarded to an outstanding third-year student in a Specialist or double Major program in environmental studies at the Centre for Environment or the Department of



Ibtissam Mustaq

Undergraduate students and alumni presented with Pimlott and/or Hunter awards at the Douglas Pimlott Lecture in March, 2008. BACK ROW, from left to right: Abdifatah Abdi (Pimlott), Emily van Halem (Hunter), Dawn Strifler (Hunter), Elena Jusenlijska (Pimlott), Linda Varekamp (Pimlott), Samantha Azzarello (Pimlott), Ian Aley (Hunter and Pimlott). FRONT row, from left to right: Erin Hamayda (Pimlott), May Jeong (Pimlott), Cindy Chao (Pimlott), and Joanna Vince (Pimlott). Alex Doukas and Monika Kastelic were not in attendance.

Geography. The 2007-08 recipient was **David Photiadis**, third-year B.A. student, majors in Environment and Society, and Environment and Resource Management.

Robert Hunter Scholarship: This new scholarship was created, with financial assistance from CHUM Ltd., in memory of Bob Hunter, Ecology Specialist Reporter at CITY TV in Toronto and co-founder of Greenpeace. It is awarded to outstanding undergraduate students enrolled in the Centre for Environment's environmental programs. Preference is given to students focusing their studies on climate. All other things being equal, preference is afforded to Innis College students, extending the tradition of the former Innis College Environmental Studies Program. The 2006-07 recipients of the inaugural scholarship, awarded at the Douglas Pimlott Lecture on March 26, 2008 (see page 8) were: **Ian Aley**, Hons. B.A. alumnus, majors in Environmental Policy and Practice, and Urban Studies; **Alex Doukas**, Hons. B.A. alumnus, majors in Environmental Policy and Practice, and English; **Dawn Strifler**, Hons. B.A. alumna, majors in Environmental Policy and Practice, and Anthropology; and **Emily Van Halem**, Hons. B.A. alumna, majors in Environmental Policy and Practice, and International Development Studies.

Douglas Pimlott Award and Scholarships: These are awarded to Centre for Environment students with excellent levels of academic achievement combined with a demonstrated commitment to social involvement in environmental issues. All other things being

equal, preference is afforded to Innis College students, extending the tradition of the former Innis College Environmental Studies Program. The 2006-07 recipients, presented at the 2008 Douglas Pimlott lecture, were:

Pimlott Award:

Abdi Abdifatah, 3rd year, Environmental Policy and Practice specialist program; **Samantha Azzarello**, 2nd year, majors in Environment and Science, and Economics; **Cindy Chao** (see Hare scholarship above); **Erin Hamayda**, 3rd year, major in Environment and Society; **(May) Sori Jeong**, 4th year, majors in Environmental & Society, Political Sci.; and **Elena Jusenlijska**, Hons. B.A. alumna, majors in Environmental Policy and Practice, and Political Science.

Pimlott Entrance Scholarship:

Cindy Chao (see above).

Pimlott Graduating Scholarship:

Ian Aley (see Hunter scholarship above); **Alex Doukas** (see Hunter scholarship above); **Linda Varekamp**, Hons. B.A. alumna, majors in Environmental Studies and English; and **Joanna Vince**, Hons. B.Sc. alumna, majors in Biology, and Environment and Science. Also awarded at the 2008 Pimlott Graduating Scholarship to **Monika Kastelic**, Hons. B.A. alumna, majors in Environmental Studies, and Environment and Resource Management.

FOR MORE INFORMATION:

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

Message from the M.Env.Sc. Program Director

BY DONALD CORMACK

The Centre for Environment's Master of Environmental Science professional program, located at University of Toronto Scarborough, is a unique interdisciplinary program in the field of biophysical interactions in terrestrial and aquatic systems, focusing on the transport and fate of contaminants in natural and degraded environments. The objective is to enable students to become skilled practitioners of environmental science, well-trained in field and laboratory techniques, with opportunities to develop skills in site assessment, project management and environmental law. This 12-month program, includes coursework and an internship or a research paper, and can be completed full-time or part-time.

FOR MORE INFORMATION:

www.utsc.utoronto.ca/envsci/menvsci/
or Julie Quenneville, Program Assistant,
416-287-7357, menvsc@utsc.utoronto.ca

In the latest academic year, we mounted five new courses: ENV1121 Modeling the Fate of Organic Chemicals in the Environment, ENV1122 Global Environmental Security and Sustainability, ENV1123 Environmental Regulations, ENV1124 Environmental Project Management, and ENV1125 Contaminated Site Remediation.

Although the primary objective is to meet the needs of private industry, government agencies and non-government organizations, some graduates of the program have gone on to Ph.D. programs. The first class of students was admitted in January 2006, and there have been 32 graduates to date. This summer, 29 students were placed in internships and four students pursued the research paper program option (see page 19). Most of these students are expected to graduate this November. At the time of writing of this article, 50 students were expected to start in September, 2008.

Two new faculty members have been added to the program in the past year. **Professor Nasrat Hijazi** (Ph.D., Chemistry,



Ken Jones

1973) has worked in the environment industry for the past 30 years and brings to the program many years of experience that includes among other things, site remediation, risk assessment and project management. Joining us this summer is **Professor Carl Mitchell** (Ph.D. Physical Geography, 2007) who has just completed a postdoctoral fellowship at the Smithsonian Institute in Washington D.C. and has expertise in transport and fate of mercury in the environment.

Donald Cormack is Director of the M.Env.Sc. Program and Chair of the Dept. of Physical and Environmental Sciences, University of Toronto Scarborough.

M.Env.Sc. Faculty

The following faculty members at the Department of Physical and Environmental Sciences, U of T Scarborough, hold graduate appointments at the Centre for Environment.

Full Members:

George Arhonditsis, Assistant Professor
Donald Cormack, Professor
(Chair; Director, MEnv.Sc. program)
Nick Eyles, Professor
Roberta Fulthorpe, Associate Professor
William Gough, Associate Professor
(Associate Chair)
Nasrat Hijazi, Professor
Ken Howard, Professor
Carl Mitchell, Assistant Professor
Anthony Price, Associate Professor
Andre Simpson, Assistant Professor
Myrna Simpson, Associate Professor
Frank Wania, Associate Professor
Mathew Wells, Assistant Professor
Dudley Williams, Professor

Associate Members:

Monirul Mirza, Researcher, Environment Canada

Members Emeriti:

Rorke Bryan, Professor Emeritus
Brian Greenwood, Professor Emeritus

M.Env.Sc. Courses

The following graduate courses are offered by the Department of Physical and Environmental Studies, U of T Scarborough as part of the M.Env.Sc. program. 2008-09 course offerings and instructors indicated are subject to change.

ENV 1100H	Advanced Seminar in Environmental Science (D. Cormack)
ENV 1101Y	Research Paper in Environmental Science (Faculty)
ENV 1102H	Analytical Chemistry for Geoscientists (Not offered)
ENV 1103H	Air and Water Quality Sampling and Monitoring (A. Price)
ENV 1104H	Methods for the Detection of Pathogens (R. Fulthorpe)
ENV 1105H	Soil Contamination Chemistry (M. Simpson)
ENV 1106H	Geology and Geophysics of the Shallow Subsurface (N. Eyles)
ENV 1107H	Remediation Methods (N. Hijazi)
ENV 1108H	Environmental Science Field Camp (K. Howard)
ENV 1109H	Advanced Techniques in Geographic Information Systems
ENV 1110H	Sediment and Contaminant Transport in Aquatic Systems (Not offered)
ENV 1111H	Freshwater Ecology and Biomonitoring (Faculty)
ENV 1112H	Boundary Layer Climates and Contaminant Fate (W. Gough)
ENV 1113H	Groundwater Hydrochemistry and Contaminant Transport (K. Howard)
ENV 1114H	Directed Readings in Environmental Science I (Faculty)
ENV 1115H	Directed Readings in Environmental Science II (Faculty)
ENV 1116H	Internship Placement (D. Cormack)
ENV 1117H	Climate Change Impact Assessment (Not offered)
ENV 1118H	Fundamentals of Ecological Modelling (G. Arhonditsis)
ENV 1119H	Quantitative Environmental Analysis (G. Arhonditsis)
ENV 1120H	The Dynamics of Contaminant Dispersal in Fluids (M. Wells)
ENV 1121H	Modeling the Fate of Organic Chemicals in the Environment (Faculty)
ENV 1122H	Global Environmental Security and Sustainable Development (M. Mirza)
ENV 1123H	Environmental Regulations (N. Hijazi)
ENV 1124H	Environmental Project Management (N. Hijazi)
ENV 1125H	Contaminated Site Remediation (N. Hijazi)
ENV 1701H	Environmental Law (Faculty)
ENV 1704H	Environmental Risk Assessment (N. Hijazi)

M.Env.Sc. Students' Research & Internships

2007-08 Alumni

The following alumni convocated in 2007-08 from the M.Env.Sc. Professional Program (Research or Internship Options). Condensed abstracts of theses are included for alumni of the Research Option.

Research Option:

MADIHA SAEED, M.Env.Sc. November 2007; supervisor: Frank Wania, Physical and Environmental Sciences, UTSC. *Determination of the global distribution of polyaromatic hydrocarbons (PAHs) using passive air samplers and the relationship between population density and PAH concentration.* The global atmospheric behaviour of polycyclic aromatic hydrocarbons (PAHs) was investigated empirically and theoretically by conducting sampling and modeling studies, respectively. Four gas-phase PAHs (fluoranthene, pyrene, benzo(a)anthracene and chrysene) were measured in the global atmospheric passive air sampling (GAPS) study. In addition, five-particle bound PAHs were included in the modeling study using TaPL3 software. The objectives of the GAPS study were to determine the relationship of atmospheric PAH levels to local human population density and the overall global trends of atmospheric PAHs, using 2005 samples. The highest total mean concentrations of 4-ring PAHs were found in Asia, followed by North America. Pyrene was the most abundant 4-ring PAH detected with agricultural sites having the highest concentrations. Except for background and agricultural sites, the atmospheric concentration of PAHs scaled well with local human population density. In the modeling study, a sensitivity analysis was conducted, and the CTD of PAHs in three different environments (polar, temperate and tropical) was calculated. It was found that gas-phase PAHs are more sensitive to photochemical oxidation, whereas the particle bound PAHs were most sensitive to the concentration of aerosols. Gas-phase PAHs had the highest CTD in the polar environment whereas particle-bound PAHs had the highest CTD in the temperate environment.

LISA SEALOCK, M.Env.Sc. June 2008; supervisor: Mathew Wells. *Residence timescales and the underlying hydrodynamic processes in Frenchman's Bay, a Lake Ontario coastal embayment.* Frenchman's Bay is permanently connected to Lake Ontario through a narrow and shallow channel. Exchange between the bay and the lake is the result of thermal variations, oscillations in water level and wind. This study uses water level time series, and water physico-chemical data to characterize the residence time for the bay. One-half the daily sum of water level increments is directly interpretable as the depth of water column affected by all seiche and tide oscillation modes combined. This is used to estimate the seiche-induced exchange flow rate. Inviscid exchange flow rate is calculated to estimate a residence time based on temperature-induced flow. Taking into consideration the effects of both temperature and seiche-induced exchange flow, a total residence time within Frenchman's Bay was calculated. Assuming a steady state in the salinity of the bay, a second residence time based on salinity differences between the bay and Lake Ontario was calculated. The average length of time water remains within the boundaries of an aquatic system is a key parameter controlling the biogeochemical behaviour of Frenchman's Bay. Data provided supports future efforts to understand seiche and water temperature influences on Great Lakes embayments.

JINGYANG ZHAO, M.Env.Sc. November 2007; supervisor: George Arhonditsis, Physical and Environmental Sciences, UTSC. *Competition patterns among phytoplankton functional groups: how useful are the complex mathematical models?* Although simple models have significant contributions to the development of ecological theory, they usually focus on a small subset of the causes of a phenomenon and neglect important aspects of system dynamics. In this study, a complex

aquatic biogeochemical model was used to examine competition patterns and structural shifts in the phytoplankton community under nutrient enrichment conditions. The model simulated multiple elemental cycles (org. C, N, P, Si, O), multiple functional phytoplankton (diatoms, green algae and cyanobacteria) and zooplankton (copepods and cladocerans) groups. It provided a realistic platform to examine the functional properties and the abiotic conditions under which the different phytoplankton groups can dominate or can be competitively excluded in oligo-, meso- and eutrophic environments. Based on the results, the intergroup variability in the minimum cell quota and maximum transport rate at the cell surface for phosphorus along with the group-specific metabolic losses can shape the structure of plankton communities. A classification tree analysis was also used to elucidate aspects of the complex interplay among physical, chemical and biological factors. The study highlights the importance of improving the mathematical representation of phytoplankton adaptive strategies for resources procurement to effectively link variability at the organismal level with ecosystem-scale patterns.

Internship Option: The following alumni completed internships at Conestoga-Rovers & Associates Ltd.; Custom Data Imaging Corporation; Curd Inco Ltd.; Engineering & Public Works, Richmond Hill; Environment Canada; Innovest Strategic Value Advisors; International Development Research Centre; Ontario Ministry of the Environment; City of Toronto; Novopharm, Office of Interprofessional Education, U of T Health Network; Soil Engineers Ltd.; Sustainability Office, U of T Scarborough; Toronto and Region Conservation Authority, or York-Durham Regional Environmental Laboratory. **Andrea Accardo** (convocated June 2008); **Aamna Arora** (Nov 2007); **Kristy Chow** (Nov 2007); **Shaun DeSouza** (Nov 2007); **Lisa Dumond** (Nov 2007); **Jamila Elmir** (Nov 2007); **Sherif Kinawy** (Nov 2007); **Leanne Kresky** (Nov 2007); **Yee Ki Esther Lee** (June 2008); **Sanja Lukic** (June 2008); **Gladys Mok** (Nov 2007); **May Quach** (Nov 2007); **Robert Salemi** (June 2008); **Dhinesh Sivananthan** (June 2008); **Nathalie Tauvette** (Nov 2007); **Allan Truong** (Nov 2007); **Hiu Ching Elizabeth Tsui** (Nov 2007); **Sheng Yang** (Nov 2007); **Xiaohua Yang** (Nov 2007).

New & Continuing

The following students were enrolled in the M.Env.Sc. program in 2007-08 and may continue or convocate in 2008-09.

Research Option:

Vincent Cheng: *A Bayesian revisit of the lake phosphorus retention and nutrient loading concept in limnology.* (Supervisor: George Arhonditsis.)

Anne Griffith: *Hydrogeological modelling for sustainable management practices in the Absheron Peninsula, Azerbaijan* (Supervisor: Ken Howard.)

Tony Law: *Structural changes in lake functioning induced from climate variability.* (Supervisor: George Arhonditsis.)

Nicole Ricker: *The role of recombination in the evolution of chlorobenzoate degradation genes.* (Supervisor: Roberta Fulthorpe.)

Internship Option: The following students are proposed to complete internships in 2008: **Sara Adamkowski**, **Shabnam Bagher**, **Amanda Baltimore**, **Steven Beecraft**, **Jennifer Bennett**, **Erin Caplan**, **Giselle Davidian**, **Heena Dhawan**, **Eric El Masri**, **Daniel Gibson**, **Adam Griffiths**, **Kristina Hausmanis**, **Yvonne Henry**, **Lilian Hoang**, **Chi-Wai Andy Lai**, **Melanie Langille**, **Iir Liko**, **Mathieu Morin**, **Na Qu**, **Jessica Rando**, **Shaun Sharma**, **Serguei Stremilov**, **Eugent Toni**, **Pearl Vas**, **Michael Wallace**, **Xiaohui Wang**, **Kirk Wong**, **Wing-Shun Wu**, **Xing Wu**.

Message from the Graduate Coordinator

BY HILARY CUNNINGHAM

The Centre for Environment offers two major collaborative programs of study at the Masters and Doctoral level: 1) Environmental Studies, and 2) Environment and Health. Students admitted to a “home” department 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. By utilizing the university’s extensive resources, the Centre offers one of North America’s most engaging and inter-disciplinary programs in the environment.

Stand-alone Masters in Environment

In 2007-08 the Centre began to explore the possibility of a stand-alone Masters in Environment, which would allow the Centre to admit graduate students directly into its

FOR MORE INFORMATION

on collaborative graduate programs:

www.environment.utoronto.ca
or Pavel Pripa, Graduate Student Advisor
416-978-3475, pavel.pripa@utoronto.ca

programs. Preparation of the proposal for an M.Env. will continue in 2008-09.

Environmental Studies Collaborative Program

The Centre’s Environmental Studies Collaborative Program (ES) currently has graduate students from across the disciplinary spectrum. Collaborating units are: Adult Education, Community Development and Counselling Psychology (OISE/UT); Anthropology; Chemical Engineering and Applied Chemistry; Chemistry; Ecology and Evolutionary Biology; Economics; Forestry; Geography and Planning; Geology; Information Studies; Management; Philosophy; Physics; Political Science; Religion; Sociology; Sociology and Equity Studies in Education (OISE/UT); and Women and Gender Studies. Students may also be admitted from other graduate units on an individual basis.

In 2007-08, the Centre welcomed six Ph.D. and 21 Master’s students in the ES program. The majority of the new students are enrolled in Geography; others are in Adult Education, Community Development and Counselling Psychology (OISE/UT); Chemistry; Economics; Information Studies; Physics; Political Science; and Religion.



Continuing students include several from other units such as Chemical Engineering, Ecology and Evolutionary Biology, Forestry, Philosophy, and Social Work.

In 2008-09, the Centre introduced two new graduate course offerings in this program: 1) **ENV 1005H Business and Environmental Politics** explored the role played by business in the development and implementation of environmental policy at international and domestic levels. Although other countries were examined, the primary subject was the business role within Canada. 2) **ENV 1008H Worldviews and Ecology** pursued a historical and interdisciplinary examination of diverse ecological worldviews as a means for analyzing both the current environmental situation and various religious/spiritual responses to it.

Hilary Cunningham is Associate Professor of Anthropology and Graduate Coordinator at the Centre for Environment.

Environment and Health Collaborative Program

BY CLARE WISEMAN

The collaborative graduate program in Environment and Health is offered by the Centre for Environment, in conjunction with the graduate units of Geography and Planning, Medical Science, Public Health Sciences, and Women and Gender Studies. It 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.

The public **Environment and Health Seminar Series** and core course in the program (ENV 4001H) 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. (See **page 10 for this year’s past seminars.**) In addition to this course, students can choose an elective from a diverse range of environment and health-related disciplines, to design a program of study which specifically suits their academic interests and needs. In this respect, the program is intended for students who are interested in the linkages between environmental factors and health as they relate to

the etiology and pathophysiology of human disease and pathways of contaminants in the environment, as well as the sociological, policy and ethical dimensions of environment and health issues.

Current and past students of the program have contributed greatly to the field of environment and health, researching a broad range of highly pertinent, interesting topics, such as Ph.D. candidate **Kate Parizeau** (Geography) who recently received a Trudeau Foundation Scholarship for her work on the environment and health risks posed to informal waste collectors in Buenos Aires. (See **page 22.**)

I am pleased to be teaching a new graduate seminar, **ENV 4002H The Environment and Health of Vulnerable Populations** in the Fall 2008 term. This course explores how and why certain populations may be especially vulnerable to environmental hazards and will address not only the role of various biological, neurodevelopmental and physiological factors in determining vulnerability but also related sociocultural, equity and justice issues.

Dr. Clare Wiseman is Assistant Professor and Coordinator of the Environment and Health Program, Centre for Environment.

Collaborative Students' Research

Environmental Studies Collaborative Program 2007-08 Alumni

The following alumni convoked in 2007-08 from the Centre for Environment's (CFE) graduate Environmental Studies (ES) Collaborative Program. Condensed abstracts of research papers or theses are included.

GABRIEL EIDELMAN, M.A., November, 2007; Political Science/CFE ES. Coursework only program.

JUDITH EIGENBROD, M.Sc., November, 2007; Ecology and Evolutionary Biology/CFE ES; supervisor: Dudley Williams, Physical and Environmental Sciences, U of T Scarborough. *Effects of Anthropogenically Induced Groundwater Discharge on Benthic Macroinvertebrate (BMI) Communities in Urban Streams*. Three urban streams in south-central Ontario were monitored at four month intervals over one year, upstream and downstream of anthropogenically induced groundwater discharge. The influence of the discharge was greatest in one stream and the effect on the BMI was found to exceed the influence of natural seasonal variability. Changes in temperature also corresponded to reductions in disturbance-sensitive taxa and species diversity. This study highlights the importance of mitigating temperature differences and maintaining diel temperature variability for BMI communities and stream health.

CHRIS GORE, Ph.D., March 2008, Political Science/CFE ES; supervisor: Richard Stren, Political Science. *Power and Process: The Politics of Electricity Sector Reform in Uganda*. In 2007, Uganda had one of the world's lowest levels of access to electricity. This thesis examined the multilevel politics of Uganda's electricity sector reform process and contends that explanations for its reform problems must move beyond technical and financial factors. Problems have also been the result of a model of reform (promoted by the World Bank) that was antagonistic to domestic and international civil society organizations and was presented as a technical, apolitical exercise. Policymaking and reform must be understood as political processes, which not only define access to services, but also participation in, and exclusion from, national debates.

MARTIN KIJAZI, Ph.D., November, 2007; Forestry/CFE ES; supervisor: Shashi Kant, Forestry. *Stakeholder-Centered Evaluations of Needs, Priorities and Well-Being of Forest Beneficiaries, Kilimanjaro, Tanzania*. A non-market technique was used to evaluate welfare functions of wood fuels and a social choice approach was used to investigate forest values that enhance human and environmental well-being. It was found that people's amenity aspirations shifted with the amenity level attained, per capita fuel consumption decreased with household size, "environmental entitlements" were critical in regulating resource consumptions, individual and social conscience were found in stakeholder evaluations of forest values, forest stakeholders had a strong desire to be engaged in decision making, and educational and occupational institutions were critical in modulating forest stakeholders' behaviors.

SARAH KING, Ph.D., June 2008, Religion/CFE ES; supervisor: Ingrid Stefanovic, Philosophy/CFE. *Contested Place: Religion and Values in the Dispute, Burnt Church/Esgenoôpetitj, New Brunswick*. This dissertation investigates how implicit values, concerns and beliefs shaped the prolonged and violent environmental conflict in Burnt Church/Esgenoôpetitj, New Brunswick from 1999 to 2002. The dispute was sparked by a decision by the Supreme Court of Canada, which recognized the treaty rights of Mi'kmaq people to fish, and prompted their entry into the lobster fishery outside of the regulated season. This study demonstrates that the dispute was not simply a conflict over access to the lobster fishery, but a result of the deeply contested nature

of this place and is an example of the larger dilemma of place-based conflicts between indigenous and settler communities across Canada.

KARA LEFEVRE, Ph.D., June 2008, Ecology and Evolutionary Biology/CFE ES; supervisor: Helen Rodd, Ecology and Evolutionary Biology. *The Influence of Human Disturbance on Avian Frugivory and Seed Dispersal in a Neotropical Rainforest*. Patterns of frugivory in three adjacent rainforest habitats in Tobago, West Indies were compared along a gradient of increasing disturbance. The unprotected portion of the rainforest was found to have a markedly different plant and bird community than the primary forest in a reserve, and avian frugivory and seed dispersal were found to be influenced by moderate human activity. The disturbed forest had different species assemblages than the primary forest, more birds, and a shift in the relative abundance of avian feeding guilds. Fruit composition of avian diets also varied with disturbance. Plants in the intermediate forest outside of the reserve were more similar to the disturbed than the primary forest, suggesting that habitat adjacent to areas of human activity can also be susceptible.

TERRIS LUTTER, M.A., November, 2007; Geography/CFE-ES; supervisor: Michael Bunce, Geography, U of T Scarborough. *Food Security and the "Biofuel Panacea": A Case Study of the Barbados "Fuel Cane" Project*. Much of the recent renewed interest in biofuels is due to their potential to increase energy supply, improve rural livelihoods and mitigate climate change. This study examined whether biofuels can achieve all of these goals, and whether there may be unintended consequences on other types of agriculture, particularly food production. It is revealed through a case study approach that in Barbados there are numerous limitations of the "fuel cane" project, which is currently being implemented. In particular, biofuels may have long-term consequences for food security on the island.

COREY MACIVER, M.A., November, 2007; Political Science/CFE ES. Coursework only program.

LISA MELYMUK, M.Sc., November, 2007; Geography/CFE-ES; supervisor: Miriam Diamond, Geography. *Are PCBs Really Legacy POPs (Persistent Organic Pollutants)? A Spatial Evaluation of PCBs in Toronto, Canada*. This study assessed the use in, and release from urban infrastructure of PCBs. An assessment of PCB stocks in Toronto shows that most PCBs are contained in building sealants. Lesser stocks are contained within in-use transformers, the largest cluster of which is in large, electricity-intensive office towers. Concentrations of PCBs in soil and sediment samples collected from ten riverside sites in the Greater Toronto Area show 10-fold and 30-fold urban-rural gradients, respectively. The gradient of increasing concentrations from rural to urban areas peaks in downtown Toronto, and mimics the pattern of the stock of PCBs in building sealants and electrical equipment.

DAVID SIDER, Ph.D., June 2008, Geography/CFE ES; supervisor: Virginia Maclaren, Geography. *Community-Based Urban Environmental Management: A Case Study of Low-Income Settlements in Delhi, India*. Focussing on several neighbourhoods in the Sultanpuri Resettlement Colony, this study examined collective action under the PLUS Project, a recent community-NGO-government collaboration to improve water supply, sanitation, solid waste management, and local municipal parks. Social capital and collective action theories were utilized to characterize the prevailing social dynamics and to assess the potential for collective action. A low level of social capital was found, as evidenced by patterns of informal social interaction, associational life, and generalized trust. The outcomes of various collective activities, moreover, were found to be partial. The research highlights a number of shortcomings to the explanatory power of the social capital paradigm.

Continued on page 22 ...

Environmental Studies Collaborative Program

New & Continuing

The following graduate students were enrolled in the Centre's (CFE) Environmental Studies (ES) Collaborative Program in 2007-08 and may continue or convocate in 2008-09. Research topics are included.

- Rachel Alexander**, M.Ed., OISE/UT (Adult Education, Community Development & Counselling Psych.)/CFE ES; supervisor: Roxana Ng, AECDPC. *Consumption and production in the garment industry.*
- Jacqueline Barber**, M.A., Religion/CFE ES; supervisor: Ajay Rao, Historical Studies, UTM. *Hinduism and the environment.*
- Julia Barnes**, Ph.D., Geography/CFE ES; supervisor: Ken MacDonald, Social Sciences, UTSC. *Social justice issues that arise from conservation in developing areas: the possibility of institutional change.*
- Rachel Bryant**, Ph.D. Philosophy/CFE ES; supervisors: Wayne Sumner & Denis Walsh, Philosophy. *Normative foundations and ethical implications of conservation biology.*
- Craig Butt**, Ph.D., Chemistry/CFE ES; supervisors: Scott Mabury & Derek Muir, Chem. *Fate of neutral fluorinated surfactants in biological systems.*
- Anna Chase**, Ph.D., OISE/UT (Curriculum, Teaching & Learning)/CFE ES; supervisor: Linda Cameron, CTL. *Ocean immersion: An exploration of human relations with the aquatic realm.*
- Aurel Cristian Ches**, Ph.D., Geography UTSC/CFE ES; supervisor: Brian Greenwood, Physical and Environmental Sciences, UTSC. *Climate change and environmental policies.*
- Joshua Cornfield**, M.A., Political Science/CFE ES; supervisor: David Pond, Political Science UTM. *Land-use planning.*
- Sarah Da Silva**, M.A., Geography/CFE ES; supervisor: Danny Harvey, Geography. *Perceptions, trends and impacts of environmental indicators and reporting in the Great Lakes Basin.*

- Jessica D'eon**, Ph.D., Chemistry/CFE ES; supervisor: Scott Mabury, Chemistry. *Investigating the prevalence and transformation of fluorinated industrial materials to explain observed environmental contamination.*
- Amy Didrikson**, M.A., Geography/CFE ES; supervisor: Alana Boland, Geography. *Ecological modernization through the evolving policy regime of conservation authorities in the Greater Toronto Area.*
- Catherine Febria**, Ph.D., Ecology & Evol. Biology/CFE ESP; sup: Dudley Williams, Phys. & Env. Sci., UTSC. *Characterization of dissolved organic carbon & microbial communities in hyporheic zone of stream ecosystems.*
- Nilima Gandhi**, Ph.D., Chemical Eng./CFE ES; supervisor: Miriam Diamond, Geography. *Method development for hazard analysis of chemicals: addressing metal fate, exposure and toxicity issues.*
- Tracie Greenberg**, M.Sc., Geography UTM/CFE ES; supervisor: Harvey Shear, Geog. UTM. *Water pollution in Lake Zapotlan, Mexico.*
- Emma Hemmingsen**, M.A., Geography/CFE ES; supervisor: Scott Prudham, Geography. *The impact of a 'peak' in the rate of global oil production on exploration and production in the Athabasca Oil Sands.*
- Elise Ho**, Ph.D., Geography, UTSC/CFE ES; supervisor: William Gough, Physical & Environmental Sciences, UTSC. *Children's ideas about climate change: a rural, suburban, and urban comparison.*
- David Houle**, Ph.D., Political Science/CFE ES; supervisors: Grace Skogstad, Political Science; Doug Macdonald, CFE. *Climate change policy of the Canadian federal and provincial governments.*
- Munya Kabba**, Ph.D., OISE/UT (Sociology and Equity Studies in Education)/CFE ES; supervisor: George Dei, SESE. *Critical investigation of civilian conflict.*
- Soojong Kim**, M.A., Economics/CFE ES. *Course work program.*
- Anthony Kimaro**, Ph.D., Forestry/CFE ES; supervisor: Vic Timmer, Forestry. *Improving soil fertility, wood & maize yields in semi-arid areas of Tanzania by sequential agroforestry systems.*
- Smita Kothari**, Ph.D., Religion/CFE ES; supervisor: Arti Dhand, Religion. *Green yoga and Jain Yoga; contemp. yoga in North America.*
- Angela Loder**, Ph.D., Geography/CFE ES; supervisors: Ted Relph, Social Sci., UTSC; Sarah Wakefield, Geography. *Greening the city: exploring health and well-being, and green roofs in the workplace.*

Ph.D. student Kate Parizeau receives prestigious Trudeau Scholarship for her research

We are pleased to announce that Kate Parizeau, Ph.D. student in Geography and the Centre's Environment and Health Collaborative Program, was awarded a \$150,000 Trudeau Scholarship in 2007 for her research on the environmental health risks to informal waste collection workers in Buenos Aires, Argentina. The following is an article by Kate on her research.

BY KATE PARIZEAU

When we think of recycling, we imagine our blue boxes lining the curbs, waiting for uniformed municipal workers to empty them into their trucks. We think of environmentalism, civic responsibility and of reducing the burden on distant Michigan landfills. This vision, however, is distinctly Torontonion. Recycling is place-specific in terms of its practice and its social context.

My Ph.D. research investigates environmental health risks and diverse coping mechanisms in the informal recycling industry in Buenos Aires, Argentina. The people who sort through curbside trash on a daily basis are called "cartoneros," named for the cardboard so many of them collect. Most live in the provinces surrounding the city limits, and

travel into Buenos Aires in the evenings via trucks or specialized trains. *Cartoneros* usually collect cardboard, newspapers, white paper, plastic, glass, metals, household items and clothing discarded from residences and businesses. These materials are either re-sold or re-used. *Cartoneros* are often stigmatized and marginalized because their work is informal, low-income, and perceived as dirty.

I spent nine months in Buenos Aires in 2006-07, where my research assistants and I conducted a survey of 400 *cartoneros* and 30 follow-up interviews. We collected information on the ways that *cartoneros* live, work, and deal with adversity.

In addition to examining how political and economic changes have affected the lives and work of *cartoneros*, I am also investigating the ways they cope with the dangers and difficulties that accompany poverty. For example, income insecurity is high in informal work. When talking about their health, people referred to both the risks associated with this work (exposure to pathogens, cuts and punctures, strain from heavy lifting) as well as the potential health benefits (leaving the house, working, walking, earning an income). These complicated negotiations of poverty and inequality are a



Kate Parizeau

major focus in my research. I also focus on the themes of environmental health, rights to the city, social difference, and labour.

Apart from learning about the lives of these recyclers, I hope to contribute to local policy discussions about the role of these workers in Argentine society and economy. The practice of recycling can reveal much about a community's dynamics and its values.

For more information, please email Kate at kate.parizeau@utoronto.ca.

Andrew McKinley, M.A., Geography UTM/CFE ES; supervisor: Pierre Desrochers, Geography UTM. *The drivers and performance of corporate social responsibility in the Canadian mining industry.*

Brenda Medjuck, M.A., Religion/CFE ES; supervisor: Stephen Scharper, Anthropology UTM/CFE. *Natural capitalism.*

Kate Moss, Ph.D., OISE/UT (Curriculum, Teaching & Learning)/CFE ESP; supervisor: Dennis Thiessen, CTL. *Comparative international education for sustainability: Canada, Lithuania and Sweden.*

Bridgette Murphy, M.S.W., Social Work/CFE ES; supervisor: Cheryl Mitri, Social Work. *Coursework only program.*

Katharine Myrans, M.A., Geography/CFE ES; supervisor: Danny Harvey, Geography. *Perceptions, trends and impacts of environmental indicators and reporting in the Great Lakes Basin.*

Beverly Neapetung, M.A., OISE/UT (Adult Education, Community Development & Counselling Psychology)/CFE ES.

Mark Poos, Ph.D., Ecology & Evol. Biology/CFE ES; supervisor: Donald Jackson, EEB. *The importance of species interactions in quantitative conservation ecology: improving statistical models with biological data.*

Raluca Popescu, Ph.D., Chemistry/CFE ES; supervisor: Jennifer Murphy, Chemistry. *Measurements of ammonia concentrations and fluxes in urban and rural settings.*

Renata Ramasra, M.A., Geography/CFE ES; supervisor: André Sorensen, Social Sciences, UTSC. *Assigning "value": challenging the tensions between "green" capitalism and traditional environmentalism.*

Catherine Robin, Ph.D., Physics/CFE ES; supervisor: Robert Bailey, Physics. *Vertical tectonics on Venus and the early earth.*

Kathleen Romatowski, M.A., Geography/CFE ES; supervisor: Scott Prudham, Geography/CFE. *Small scale farming and globalization/urbanization.*

Maxime Roy, M.A., Economics/CFE ES; supervisor: Diego Restuccia, Economics. *Economics of ultimate change.*

Laina Smith, M.A., Geography/CFE ES; supervisor: Virginia Maclaren, Geography. *Composting behaviours of residents living in multi-unit dwellings.*

Rachel Stack, M.A., Political Science/CFE ES; supervisor: David Pond, Political Science, UTM. *The relationship between political and partisan interests & environmental issue consideration in public policy.*

Liviu Timotin, M.Sc.Pl., Geography/CFE ES. *Sustainable neighborhoods/green buildings.*

Daniel Vandervoort, M.A., OISE/UT (Adult Education, Community Development & Counselling Psych.)/CFE ES; supervisor: Roxanna Ng, AECDPC. *Informal education about environmental information.*

Jennifer Weaver, Ph.D., Geography UTM/CFE ES; supervisor: Tenley Conway, Geography UTM. *Interests in urban forestry, urban ecology.*

Xianming Zhang, M.Sc., Geography/CFE ES; supervisor: Miriam Diamond, Geography. *Polybrominated biphenyl ethers (PBDEs) in the indoor environment: levels, sources and fates.*

Katrine Mazer, M.Sc.Pl., Geography/CFE ES; supervisor: Virginia Maclaren, Geography. *Planning plus community scale effects of climate change.*

Ranieri, Joanna, M.A., Geography/CFE ES; supervisor: Virginia Maclaren, Geography. *Waste and value: bottle scavenging and the informal waste sector in Toronto, Canada.*

GESA Student Group

The Graduate Environmental Students' Association (GESA) organizes initiatives and events designed to bring together graduate students from environmental disciplines across campus. All Centre for Environment graduate students are automatically members of GESA, along with its elected executive committee.

Some past GESA's activities have included assisting in organizing the annual Environmental Career Day (see page 16) and the Centre for Environment's graduate orientation session, as well as organizing environment-related film screenings, library research orientations, New Year's pub nights, weekend retreats at U of T's Hart House Farm and various other events.

In addition, GESA collaborates with other environmental campus organizations including the University of Toronto Environmental Resource Network (UTERN) in order to participate in larger environmental projects and decisions affecting the university.

For more information, please email gesa@utoronto.ca.

Environment and Health Collaborative Program 2007-08 Alumni

The following alumni convoked in 2007-08 from the Centre's (CFE) graduate Environment and Health (EH) Collaborative Program. Condensed abstracts of research papers or theses are included.

ROBIN KORTRIGHT, M.A. November, 2007; Geography/CFE EH; supervisor: Sarah Wakefield, Geography. *Edible Backyards: Residential Land Use for Food Production in Toronto.* By providing convenient access to diverse varieties of affordable and nutritious produce, informal house-lot food growing can provide an important support for community food security. In-depth interviews were conducted with gardeners in two contrasting neighbourhoods in Toronto. It was found that growing food contributes to food security at all income levels by encouraging and enabling a more nutritious diet. The sustainability of household food sourcing and gardeners' overall health and well-being also increased with food production. Access to suitable land and gardening skills were the most significant barriers.

LIANA DEL GOBBO, M.Sc., November, 2007; Geography/CFE EH; supervisor: Miriam Diamond, Geography. *Consumer and Environmental Factors Influencing Benefits and Risks of Fish Consumption.* This thesis examined the role of consumer practices on affecting concentrations of perfluorinated compounds and lipids in the muscle tissues of 25 commercial fish and seafood species. It was found that baking fish for 15 minutes at 325°F resulted in complete removal of perfluorinated compound residues in fish muscle tissue. Eighty to ninety-five percent declines in total lipid concentrations occurred in five of eight fish species after one week of frozen storage at -20°C. Changes in lipid class proportions were observed during freezing. Fish should be consumed fresh for maximal retention of beneficial lipids.

STEPHANIE SUSKI, M.H.Sc., Public Health Sciences/CFE EH; supervisor: Ann Fox, Nutritional Sci. Course work program in Community Nutrition.

New & Continuing

The following graduate students were enrolled in the Centre's (CFE) Environment and Health (EH) Collaborative Program in 2007-08 and may continue or convocate in 2008-09. Research topics are included.

Ilan Alleson, Ph.D., Public Health Sciences/CFE ESP; supervisor: Anne-Emanuelle Birn, Public Health Sciences. *NGOs, organizational collaboration and social enterprise.*

Ian Arnold, M.H.Sc., Public Health Sciences/CFE ESP; supervisor: Frances Silverman, Medicine. *Occupational and environmental health: effects of ambient particulate matter exposure in outdoor occupations.*

Suzannah Bennett, M.H.Sc., Public Health Sciences/CFE ESP. *Course work program in Health Promotion.*

Catherine Maule, Ph.D., Public Health Sciences/CFE ESP; supervisor: Blake Poland, Public Health Sciences. *Social construction of "natural" places and their role in the protection of health.*

Sonia Narula, M.H.Sc., Public Health Sciences/CFE ESP. *Course work program in Occupational and Environmental Health.*

Michelle North, Ph.D., Medical Science/CFE ESP; supervisors: James Scott & Frances Silverman, PHS. *Airway responsiveness in murine asthma model I linked to L-arginine metabolism and exacerbated by air pollution.*

Balwinder Pandher, M.H.Sc., Public Health Sciences/CFE ESP. *Course work program in Occupational and Environmental Health.*

Kate Parizeau, Ph.D., Geography/CFE ESP; supervisors: Virginia Maclaren & Amrita Daniere, Geography. *Vulnerability and coping in the informal recycling industry in Buenos Aires, Argentina. (See page 22.)*

Iffath Syed, M.H.Sc., Public Health Sciences/CFE ESP. *Course work program in Occupational and Environmental Health.*

Benita Tam, M.Sc., Geography/CFE ESP; supervisor: William Gough, Geography, UT Scarborough. *Assessing the impacts of climate change to the spread of furunculosis found in fish species of Ouje-Bougoumou.*

Bruce Urch, Ph.D., Medical Science/CFE ESP; supervisor: Paul Corey, Public Health Sciences. *Controlled human exposures: cardiorespiratory responses to ozone and fine particles.*

Grad Courses

The following Centre for Environment graduate courses and joint courses are offered as part of the Collaborative Programs in Environmental Studies and Environment & Health. 2008-09 offerings and instructors indicated are subject to change.

For more information, please contact Pavel Pripa, Graduate Student Advisor, 416-978-3475, pavel.pripa@utoronto.ca.

Core Courses

- ENV 1001H Environmental Decision Making (*P. Byer, Civil Eng/CFE; K. Maly, Sessional*)
 ENV 4001H Seminars in Environment and Health (*C. Wiseman, CFE*)

Other Courses

- ENV 1002H Environmental Policy (*D. Macdonald, CFE*)
 ENV 1004H Urban Sustainability*
 ENV 1005H Business and Environmental Politics*
 ENV 1008H Worldviews and Ecology (*new in 2008-09; K. Maly*)
 ENV 1410H Analytical Environmental Chemistry*
 ENV 1444H Capitalist Nature (*W.S. Prudham, Geography/CFE*)
 ENV 1701H Environmental Law (*P. Muldoon, Sessional*)
 ENV 1703H Water Resources Management*
 ENV 1704H Environmental Risk Analysis and Management*
 ENV 1707H Environmental Finance: Risk Management and Business Opportunities (*J. Ambachtsheer, S. McGeachie, Sessionals*)
 JEI 1901H Technology, Society & Environment (*W. Vanderburg, Civil Eng/CFE*)
 JEI 1902H Technology, Society & Environment II (*W. Vanderburg*)
 JGE 1212H Fate of Contaminants in the Environment*
 JPV 1201H Politics, Bureaucracy and the Environment*
 JGE 1413H Environmental Assessment*
 JGE 1420H Urban Waste Management: An International Perspective*
 JGE 1609H Cities, Industry and the Environment (*P. Desrochers, Geography*)
 ENV 2000H Independent Study
 ENV 2001H Special Topics in Environment and Health
 ENV 2002H Special Topics: Environmental Governance
 JVP 2147H Environmental Philosophy*
 JNC 2503H Environmental Pathways (*TBA*)
 ENV 3000H Special Topics: Environment and Health
 ENV 4002H The Environment and Health of Vulnerable Populations (*new in 2008-09; C. Wiseman*)

* Not offered in 2008-09.

Graduate Faculty

The following individuals currently have graduate faculty appointments at the Centre for Environment. Membership is subject to change. For info on graduate appointments and student supervision, please contact Pavel Pripa, 416-978-3475, pavel.pripa@utoronto.ca.

Full Members

- Jonathan Abbatt, *Chemistry*
 Barry Adams, *Civil Engineering*
 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*
 Brian Branfireun, *Geography, UT Mississauga*
 Michael Bunce, *Social Sciences, UT Scarborough*
 Philip Byer, *Civil Engineering/CFE*
 Catherine Chalin, *Public Health Sciences*
 Jing Chen, *Geography*
 Donald Cole, *Public Health Sciences*
 Tenley Conway, *Geography, UT Mississauga*
 Paul Cooper, *Forestry*
 Paul Corey, *Public Health Sciences*
 Donald Cormack, *Physical & Environ. Sci., UTSC*
 Sharon Cowlng, *Geography*
 Frank Cunningham, *Philosophy*
 Hilary Cunningham, *Anthropology*
 Amrita Daniere, *Geography*
 Anthony Davis, *Geography*
 George Dei, *OISE/UT Sociology & Equity Studies*
 Donald Dewees, *Economics*
 Miriam Diamond, *Geography*
 James Eckenwalder, *Ecology & Evol. Biology*
 Elizabeth Edwards, *Chemical Eng. & Applied Chem.*
 Margrit Eichler, *OISE/UT SESE*
 Mark Engstom, *Ecology & Evol. Biology/ROM*
 Greg Evans, *Chemical Eng. & Applied Chemistry*
 Nick Eyles, *Physical & Environmental Sci., UTSC*
 Roberta Fulthorpe, *Physical & Environ. Sci., UTSC*
 William Gough, *Physical & Environ. Sci., UTSC*
 L. Danny Harvey, *Geography*
 Nasrat Hijazi, *Physical & Environ. Sciences, UTSC*
 D. Linn Holness, *Public Health Sciences*
 Tad Homer-Dixon, *Political Science*
 Ken Howard, *Physical & Environmental Sci., UTSC*
 Charles Jia, *Chemical Eng. & Applied Chemistry*
 Shashi Kant, *Forestry*
 Bryan Karney, *Civil Engineering*
 Chris Kennedy, *Civil Engineering*
 J. Gary Knowles, *OISE/UT Adult Education, Community Development & Counselling Psych.*
 Scott Mabury, *Chemistry*
 Laurel MacDowell, *History, UT Mississauga*
 Virginia Maclaren, *Geography*
 Heather MacLean, *Civil Engineering*
 Jay Malcolm, *Forestry*
 David Martell, *Forestry*
 Patricia McCahey, *Political Science*
 Andrew Miall, *Geology*
 Eric Miller, *Civil Engineering*
 Carl Mitchell, *Physical & Environ. 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 Sciences*
 Anthony Price, *Physical & Environ. Sci., UTSC*
 W. Scott Prudham, *Geography/CFE*
 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 Sciences*
 Lawrence Sawchuk, *Social Sciences, UTSC*
 Stephen Scharper, *Anthropology, UT Mississ./CFE*
 Barbara Sherwood Lollar, *Geology*
 Krystyna Sieciechowicz, *Anthropology*
 Frances Silverman, *Medicine*
 Andre Simpson, *Physical & Environ. Sci., UTSC*
 Myrna Simpson, *Physical & Environ. Sci., UTSC*
 Grace Skogstad, *Social Sciences, UT Scarborough*
 C. Tattersall Smith, *Forestry*
 Sandy Smith, *Forestry*
 Mark Stabile, *Management; Public Policy & Gov.*
 Ingrid Stefanovic, *CFE/Philosophy*
 Kimberly Strong, *Physics*
 Susan Tarlo, *Public Health Sciences*
 Ross Upshur, *Family & Comm. Med.; Public Health*
 Willem Vanderburg, *Civil Engineering/CFE*
 Sarah Wakefield, *Geography*
 Denis Walsh, *Philosophy*
 Frank Wania, *Physical & Environmental Sci., UTSC*
 Mathew Wells, *Physical & Environ. Sci., UTSC*
 Peter Wells, *Pharmacy*
 Dudley Williams, *Physical & Environ. Sci., UTSC*
 Kathi Wilson, *Geography, UT Mississauga*

Associate Members

- Jane Ambachtsheer*, *Mercer Investment Consulting*
 Nathan Basiliko, *Geography, UT Mississauga*
 Brad Bass, *Environment Canada*
 Kerry Bowman, *Joint Centre for Bioethics*
 Quentin Chiotti, *Pollution Probe*
 James Dooley
 Andrew Green, *Law*
 A.P. (Lino) Grima
 H. Roland Hosein, *GE Canada Inc.*
 Andy Kenney, *Forestry*
 Sonia Labatt
 Douglas Macdonald, *Centre for Environment*
 Sue McGeachie*, *PriceWaterhouse Coopers*
 Monirul Mirza, *Environment Canada*
 Paul Muldoon, *Environmental Review Tribunal*
 Barbara Murck, *Geography, UT Mississauga*
 Dennis O'Hara, *St. Michael's College*
 Stefan Salbach
 Beth Savan, *Centre for Environment*
 Lesbia Smith, *Public Health Sciences*
 Peter Telford
 Mark Winfield, *York University*
 Clare Wiseman, *Centre for Environment*
 Cindy Woodland, *Pharmacology*

*Adjunct Professor, Centre for Environment

Members Emeriti

- Paul Aird, *Forestry*
 Terry Blake, *Forestry*
 Rorke Bryan, *Forestry*
 Frances Burton, *Social Sciences, UT Scarborough*
 Ian Burton, *Environment Canada*
 Brian Greenwood, *Physical & Environ. Sci., UTSC*
 William Michelson, *Sociology*
 R.E. (Ted) Munn
 Edmund O'Sullivan, *OISE/UT Adult Education*
 Henry Regier
 D.N. Roy, *Forestry*
 Richard Stren, *Political Science*
 Wayne Sumner, *Philosophy*
 Vic Timmer, *Forestry*
 Rodney R. White, *Geography*
 Joseph Whitney, *Geography*
 G. Ronald Williams

Graduate Students' Awards

The Centre for Environment wishes to congratulate the recipients of the following graduate awards, most of which were presented at Research Day on April 29, 2008 (see page 4).

Arthur and Sonia Labatt Graduate Fellowships

These fellowships are awarded on an annual basis to support students enrolled in a Centre for Environment graduate program or the Juris Doctor Certificate in Environmental Studies (Faculty of Law and CFE). Students were asked to submit a paper on practical solutions to environmental issues and/or marketplace for solutions to environmental issues. This year, six recipients were awarded \$5000 each:

1. **Joshua Cornfield**, M.A. student, Political Science/CFE Environmental Studies;
2. **Kristen Courtney**, J.D. student, Law/CFE;
3. **Sarah DaSilva**, M.A. student, Geography/CFE Environmental Studies (ESP);
4. **Gabrielle Eidelman**, Ph.D. student, Political Science/CFE ESP;
5. **Andrew McKinley**, M.A. student, Geography UTM/CFE ESP; and
6. **Shaun Sharma**, M.Env.Sc. student, CFE program at Physical and Environmental Sciences, U of T Scarborough.

John Brown Prize

This prize is awarded for the best applied research project dedicated to the analysis and improvement of occupational or environmental health by a full-time graduate student in the Gage Occupational and Environmental Health Unit, the Dept. of Chemical Engineering and Applied Chemistry, the Dept. of Public Health Sciences, and/or the Centre for Environment. This year, the award went to **Lisa Melymuk**, M.Sc. alumna (Nov, 2007) of Geography and CFE's Environmental Studies and current Ph.D. student in the Dept. of Chemical Eng. and Environmental Engineering collaborative program. She is researching the sources and fates of organic pollutants.

Sperrin Chant Masonic Award in Toxicology

This award is given to students completing research in toxicology who demonstrate academic excellence and strength of character. This year, a first prize was awarded to **Jessica D'eon**, Ph.D. candidate in Chemistry and CFE's Environmental Studies Program, who is researching the sources of perfluorinated contamination in humans and the environment. A second prize was awarded to **Nilima Gandhi**, Ph.D. candidate in Chemical Eng. and CFE's Environmental Studies Program. She is studying method development for hazard analysis of chemicals: metal fate, exposure and toxicity issues.



Arthur and Sonia Labatt (centre) join recipients of their Graduate Fellowships from left Joshua Cornfield, Kristen Courtney, Sarah DaSilva and on far right, Shaun Sharma and Gabrielle Eidelman.

Tony Ferguson Book Prize

This new annual book prize is awarded to an outstanding graduate student registered in a Centre for Environment graduate program. Preference is given to a student whose area of study encompasses environmental health, ecological zoology or psychology. In its inaugural year, the \$500 book prize was awarded to **Laina Smith**, M.A. student in Dept of Geography and CFE's Environmental Studies Program. She is researching the composting behaviours of residents living in multi-unit dwellings.

Eric David Baker Krause Graduate Fellowship

This scholarship was established by the City of Toronto and U of T in memory of the late Eric Krause, M.A. alumnus in Geography and the former Institute for Environmental Studies (now Centre for Environment) who studied ecological footprints and then became an environmental planner with the City of Toronto. This year, the award went to **Laina**

Smith (see above), in a presentation at the Krause Memorial Lecture, held in March, 2008 (see page 9).

George Burwash Langford Prize

This prize provides support and encouragement for student service and research at the Centre for Environment. It is awarded to a CFE graduate student who best combines excellence in research and contribution to the work of the Centre. This year, the prize was awarded to **Nicole Ricker**, M.Env.Sc. student, CFE program at the Dept. of Physical and Environmental Sciences, UTSC. She is investigating phenotypic instability in chlorobenzoate degrading bacteria.

FOR MORE INFORMATION:

www.environment.utoronto.ca
Pavel Pripa, Graduate Student Advisor,
 416-978-3475, pavel.pripa@utoronto.ca

LEFT: Nicole Ricker, recipient of the Langford Prize and presenter Ingrid Stefanovic, CFE Director. RIGHT: Brown recipient Lisa Melymuk (left) and Chant recipients Jessica D'eon & Nilima Gandhi, join presenter Clare Wiseman, Coordinator of CFE's Environment & Health Program (far right).



Web-based Distance Ed Programs

The Centre for Environment has had great success with its distance certificate programs and courses with increasing enrollment each year. Since its first offerings in 2003-04, enrollments in the courses have increased more than three-fold. Through its internet-based courses, the programs have accommodated environmental practitioners and professionals, as well as individuals new to the field of environment who wish to pursue professional and educational development while continuing their careers. With the use of discussion forums, conferencing, and live chats, students from all over the world are able to interact with each other, the instructors and guest experts. Students have participated from countries as far away as South Africa and the United Arab Emirates.

In addition to offering Certificates in Environmental Management and GIS for Environmental Management, the Centre is pleased to have recently introduced certificates in **Renewable Energy**, in 2007-08, and **Environmental Health**, which will start in the Fall of 2008.

Graduates may be eligible for the Canadian Certified Environmental Practitioner designation under the Canadian Environmental Certification Approvals Board's national certification program. The Centre also has a partnership with the Canadian Centre for Environmental Education (CCEE; <http://www.ccee.ca>) at Royal Roads University, Victoria, B.C., to deliver on-line distance education courses which may be used as elective courses towards CCEE's newly created Certificate in Environmental Practice.

Certificate in Environmental Management

Instructors: Kymberley Snarr, Ph.D.; Sarah King, Ph.D.

The objectives of this program are to develop an understanding of the basic premises, theories and practices associated with environmental management and to provide an insight into the systems approach used to mitigate a wide range of environmental problems. The certificate is designed to bridge the gap between theoretical knowledge and methodologies of environmental management with a detailed deconstruction of Canadian issues. Grounded in an holistic approach, the program aims to develop strategic, consensual, and inclusive solutions to resource and environmental management case studies.

FOR MORE INFORMATION:

<http://distanceed.environment.utoronto.ca>
or **Donna Workman, Manager of Program Development and External Relations,**
416-978-7077; d.workman@utoronto.ca

Certificate in Renewable Energy

Instructors: Kymberley Snarr, Ph.D.; Sarah King, Ph.D.

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 an unprecedented global rate of development. With this program, students will explore historical and current perspectives on forms of renewable energy, their current usage in developed and developing nations, and how they drive markets and political will. The interdisciplinary approach used challenges students with a holistic view of the impact of renewable energy on the global energy picture. The incorporation of renewable energy into the foundation of the above Environmental Management program provides students with strategies and premises to place the various forms of renewable energy into the systems approach of environmental management.

In 2007-08, **two new courses** were introduced as part of this new program: CRE 400 Principles in Renewable Energies and CRE 401 Case Studies in Renewable Energies.

Certificate in GIS for Environmental Management

Instructors: Michael Govorov, Ph.D.; Gennady Gienko, Ph.D.

Environmental GIS (Geographic Information Systems) describes the use of geo-spatial management methodology and tools in order to assist in developing an environmental management strategy. GIS has become a primary means of communicating spatial information in a multitude of settings in environmental applications. The objectives of this certificate program are to build a foundation for understanding GIS and Remote Sensing theory and techniques, and develop GIS software skills to solve practical tasks related to environmental management.

In 2008-09, **three new courses** will be offered as part of this program: GEM 402 Geospatial Technologies for Environmental Mapping with GIS, GEM 403 Environmental Remote Sensing, and GEM 404 GIS Modeling for Environmental Applications.

Certificate in Environmental Health (new in 2008-09)

Instructors: Larry Frisch, M.D.; Lenore Newman, Ph.D.

Environmental Health is defined by the World Health Organization as "those aspects of human health and disease, including quality of life, that are determined by physical, chemical, biological, social, and psychosocial factors in

J.D. Certificate in Environmental Studies

This certificate program is offered by the Faculty of Law and the Centre for Environment and is designed for Juris Doctor (J.D.) students interested in environmental law and policy. In addition to receiving the J.D. degree, students in the program will receive a certificate issued by the Faculty of Law stating that they have successfully completed the program requirements.

In their second and third years, students will complete a minimum of 48 law school credits, including *Environmental Law*. They will also take ENV 1001F Environmental Decision Making, plus one half-course elective offered by the Centre for Environment, write a research paper (ENV 5555Y) and complete an internship (ENV 4444Y).

The following students were enrolled in 2007-08 and may continue or convocate in 2008-09. Research topics are indicated.

Kristen Courtney. *The environmental impacts of the Alberta oil sands industry.* (Supervisor: Andrew Green, Law.)

Kate Skipton: *Environmental regulations in Canada.* (Supervisor: Andrew Green.)

Jane Stewart: *International law and food security.* (Supervisors: Jutta Brunnée, Andrew Green, Law.)

FOR MORE INFORMATION:

Faculty of Law:

www.law.utoronto.ca; 416-978-3716
law.admissions@utoronto.ca

Centre for Environment:

www.environment.utoronto.ca
416-978-3475; pavel.pripa@utoronto.ca

the environment". It is increasingly becoming a critical branch in contemporary medical science due to anthropogenic and natural environmental changes. In this new certificate program proposed to start in the Fall of 2008, a holistic approach is taken. Flowing from the new foundations course (ENH 400 Environment and Human Health) which covers the key elements, students will then examine these key elements in more specialized courses. The scope of courses includes risk assessment, the impact of health policy, vulnerable populations, global environmental change, and climate change impacts on human health. The courses will cover both the natural and built environment, and involve occupational or personal environments, and will engage local, national, and global environments. Upon completion, students will have a strong ability to critically evaluate, and draw upon research to be utilized in decision-making processes, policy development, and the multiple arenas of Environmental Health.

Rodney White retires

Dinner celebrates former IES Director & Centre for Environment co-founder

BY INGRID LEMAN STEFANOVIC



Jennifer Owen

At a celebratory dinner, Professor Rodney White (centre) is presented with a gift by Professor Virginia Maclaren, Chair of Geography (left) and Professor Ingrid Stefanovic, Director of the Centre for Environment.

Kin Hubbard, a nineteenth century American humorist once wrote: “When some fellers decide to retire, nobody knows the difference.” When **Professor Rodney White** chose to retire, there was a seismic upheaval in the environmental world at the University of Toronto!

Having led the former Institute for Environmental Studies (IES) Director for more than ten years until 2005, Rodney worked with me and **Dr. Doug Macdonald** as one of the three founders of the Centre for Environment. We all know him as a leader with a heart: always clear-headed, focused, attentive, brilliant and caring. To so many of us, he has been and continues to be a friend, one whom we hold in the highest regard both for his administrative accomplishments at the university but also for his academic wisdom, his teaching acumen and his collegial spirit.

Rodney studied geography at Oxford University receiving his B.A. in 1965. A Fulbright Travel Scholarship brought him to Penn State, where he completed his M.Sc. in 1967 and in 1971, he received his Ph.D. from Bristol University. His teaching career has taken him to Northwestern University, the University of Ibadan, to McMaster University and finally, since 1974, the Department of Geography and former IES at the University of Toronto.

He has undertaken numerous international research assignments, from Senegal to Nigeria to Ghana, and to China. Most of his career has been spent in infrastructure planning, both in rural as well as more recently, in urban areas. Some of his most important publications include his book, entitled *Building the Ecological City* and more recently, his wonderful books written in collaboration with **Dr. Sonia Labatt**: *Environmental Finance: A Guide to Environmental Risk Assessment and Financial Products* and *Carbon Finance: The Financial Implications of Climate Change*.

Rodney has forged new areas of research, both in terms of the urban/environment interface but also in terms of defining and refining a field of study that brings together issues of investment finance and sustainability. And he has done so all during the period of time when he also held an administrative post of Director of IES. In this respect again, those of us who know the challenges of balancing these multiple responsibilities can only be in awe of Rodney’s accomplishments.

At a dinner on May 8, 2008 at the U of T Faculty Club, Rodney’s accomplishments were celebrated by **Professor Virginia Maclaren**, Chair of the Department of Geography, as well as Dr. Sonia Labatt, Rodney’s co-author and colleague. As Director of the Centre, I was also pleased to have the opportunity of lauding Rodney’s achievements. We chose to honour Rodney with a historical map of Toronto, and an album in which friends and colleagues each took the time to insert comments and words of respect and gratitude.

Someone once pointed out the irony of the typical presentation of a watch as a retirement gift at a point in life when schedules and time are no longer such a matter of urgency! Avoiding the watch, we chose instead to honour Rodney with a historical map of Toronto and an album where friends and colleagues each took the time to insert comments and words of respect and gratitude.

As Rodney formally leaves the university, we know that he has retired from teaching but we also know that he will continue to be a strong force in the intellectual world of environment, urban sustainability and financial research and thinking. Author Hartman Jule has said that “retirement has been a discovery of beauty for me. I never had the time before to notice the beauty of my grandkids, my wife, the tree outside my very own front door. And the beauty of time itself.” May Rodney now enjoy these moments – but may he also continue to keep in touch with us here at the University of Toronto, where he will continue to be held in highest possible regard.

Ingrid Stefanovic is Director of the Centre for Environment.

Appointed and/or Administrative Faculty

The following faculty members have budgetary cross-appointments and/or administrative appointments at the Centre for Environment (CFE). Please see pages 28-33 of this Annual Report for their research profiles.

PHILIP BYER, Professor, Civil Engineering/Centre for Environment

HILARY CUNNINGHAM, Professor, Anthropology;

Graduate Coordinator, Centre for Environment;

MIRIAM DIAMOND*, Professor, Geography; *Research Director, CFE*

KAREN ING, Senior Lecturer, *Undergraduate Coordinator, CFE*

DOUGLAS MACDONALD, Senior Lecturer, Centre for Environment

W. SCOTT PRUDHAM, Associate Professor, Geography/CFE

BETH SAVAN**, Senior Lecturer, Centre for Environment;

Acting Research Director, CFE, July-Dec, 2008

STEPHEN SCHARPER*, Associate Professor, Anthropology UTM/CFE

INGRID LEMAN STEFANOVIC, Professor, Philosophy/CFE;

Director, Centre for Environment

WILLEM VANDERBURG, Professor, Civil Engineering/CFE

CLARE WISEMAN, Assistant Professor, Centre for Environment;

Coordinator of Environment and Health Program, CFE

* On sabbatical leave July 1, 2008 to June 30, 2009.

** On sabbatical leave January 1 to June 30, 2009.



Philip Byer

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<http://www.civil.engineering.utoronto.ca/>;
<http://www.environment.utoronto.ca>
 S.M. (Civil Eng.), S.B. (Electrical Eng.), Ph.D. (Civil Eng.), Mass. Inst. Technology
 Professor, Department of Civil Engineering and Centre for Environment.
 2008-09 Co-Instructor of ENV1001H
 Environmental Decision-Making.

Research Interests:

Environmental planning and decision making; multiobjective project evaluation; environmental assessment; risk management; brownfields redevelopment; solid waste management; climate change.

Featured Research Project:

Classification System for Assessing and Promoting Development of Brownfield Sites. Contract from Earth and Environmental Technologies, Ontario Centre of Excellence (with E. Tam, University of Windsor), to 2008. Significant economic, legal and environmental concerns present obstacles to the redevelopment of thousands of brownfields in Canada, which have the potential to stimulate economic growth, community revitalization, and urban renewal. In this joint project, we are developing a methodology for classifying brownfields on the basis of a broad set of factors including site characteristics, alternative remedial actions, existing and proposed site uses, potential liability, and community settings, in order to prioritize sites for redevelopment, identify obstacles to their redevelopment and serve as a communications tool among stakeholders.

Recent Publications:

Byer, P.H., C.P. Hoang, T.T.T. Nguyen, S. Chopra, V. Maclaren and M. Haight. 2006. Household, hotel and market waste audits for

composting in Vietnam and Laos, *Waste Management and Research* 24 (5): 465-472.
 Cuddihy, J., C. Kennedy and P. Byer. 2005. Energy use in Canada: environmental impacts and opportunities in relationship to infrastructure systems. *Canadian Journal Of Civil Engineering* 32 (1): 1-15.
 Tam, E.K.L. and P.H. Byer. 2004. Estimating the liability of redeveloped contaminated lands. *Journal of Urban Planning and Development (ASCE)* 130 (4): 184-194.

Featured Recent Publication:

Byer, P. and J.S. Yeomans. 2007. Methods for addressing climate change uncertainties in project environmental impact assessments, *Impact Assessment and Project Appraisal* 25(2): 85-99. (Awarded prize by International Association for Impact Assessment for best paper published in 2007 in *Impact Assessment and Project Appraisal*.)
 Three basic analytical approaches to uncertainty analysis – scenario analysis, sensitivity analysis, and probabilistic analysis – are presented that proponents could use for integrating climate change-induced impacts and their uncertainties into their environmental assessments. Their use is illustrated on the environmental impacts of a run-of-the-river hydroelectric project.



Hilary Cunningham

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 2) Centre for Environment, Room 1016V, 33 Willcocks St., Toronto, Ontario, M5S 3E8; tel: 416-978-6409; fax: 416-978-3884; hilary.cunningham@utoronto.ca;
<http://www.chass.utoronto.ca/anthropology/>;
<http://www.environment.utoronto.ca>
 M.A. (Anthropology), Toronto; Ph.D. (Anthropology), Yale University.
 Associate Professor, Department of Anthropology. Graduate Coordinator, Centre for Environment.

Research Interests:

International borders, environmental politics at borders, social stratification and human mobility, biotechnology and intellectual property regimes.

Featured Research Project:

Securing the "Homeland": Local Communities in the Context of New Security Practices at the U.S.-Canada Border. SSHRC, 2005-2008. The implementation of new security measures at the U.S.-Canada border has raised discussion about how they will affect the lives of citizens and non-citizens. What is not clear is the "social distribution" of the new measures, that is, a sense of how the lives of specific groups of people will be changed. This research examines how communities living within and across the border are experiencing the emergence of "Homeland Security" as a political and ideological project aimed at reorganizing U.S. sovereign power. It also looks at how "nature" and "security" are intersecting in communities where "emergency preparedness" now includes not only responses to natural disasters but also terrorist threats.

Forthcoming and Recent Publications:

Cunningham, H. (with J. Maskovsky). The state of sovereignty: national security in a neoliberal age. In I. Susser and J. Maskovsky (eds.), *State of Fear*. SUNY Press, Albany, New York. (Forthcoming.) This chapter explores the ways in which new security

cultures in the U.S. establish spatial and ideological connections between international borders in "frontiers" with the urban spaces of the "interior" resulting in new "calibrated political geographies."

Cunningham, H. Ecology, poverty and possible urban worlds. In I. Stefanovic and S. Scharper (eds.), *The Natural City: Re-envisioning the Built Environment*. University of Toronto Press. (Forthcoming.) This chapter explores the nexus between poverty alleviation and environmental sustainability in cities and critically examines the potential of the "global" city to address both.
 Cunningham, H. Of genes and genealogies: contesting ancestry and its applications in Iceland. In S. Bamford and J. Leach (eds.), *Genealogy Beyond Kinship: Sequence, Transmission, and Essence in Ethnography and Social Theory*. Berghahn, Oxford, New York. (Forthcoming.) This chapter focuses on how cultural understandings of genes and genealogical inheritance are changing as a result of new biotechnologies. It explores claims about how genetic information can be moved around, positioned and deployed, and how these possible "genetic mobilities" interface with capital markets, human disease and the pharmaceutical industry.
 Cunningham, H. 2008. Religious movements, in P. Clarke and P. Beyer (eds.), *The World's Religions: Continuities and Transformations*. Routledge. Pages 581-594.

Miriam Diamond

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B.Sc. Hons (Toronto), M.Sc. (Alberta), M.Sc.Eng. (Queen's), Ph.D. (Toronto)
Professor, Department of Geography; cross appointed to Department of Chemical Engineering and Applied Chemistry.
Research Director, Centre for Environment.
(On sabbatical leave July 1, 2008 to June 30, 2009.)

Research Interests:

Environmental chemistry; sources, fate, exposure and potential health effects of chemical contaminants; environmental modelling; water pollution; air pollution; chemical dynamics in cities.
Awarded *Canadian Geographic's* Canadian Environmental Scientist of the Year, 2007.
Co-Chair of Ontario Ministry of the Environment Toxics Reduction Scientific Expert Panel.

Featured Research Projects:

Where are contaminants coming from and going to in Toronto? (OMOE, TRCA, Great Lakes Comm., Environment Canada, NSERC) Measure and modelling of

contaminant loadings to Lake Ontario via urban rivers, deposited from the atmosphere and from sewage treatment plant discharges.

The effect of metals discharged into the environment. (Int. Council of Mining and Metals, NSERC, Xstrata, Iron Ore Co. of Canada) Investigates chemistries of metals and the receiving environment to derive a general method of estimating potential ecotoxicity of metals entering the environment. Included is an assessment for Canada and for generic "global" conditions. *Contaminants indoors* (NSERC).

Measurement and modelling of selected trace organic contaminants in indoor environment and estimates of our exposure to the contaminants.

Contaminants in aquatic food webs (NSERC).

Modelling the transfer of contaminants and nutrients (omega-3 fatty acids) in lake foodwebs.

Recent Publications:

Bhavsar, S.P., N. Gandhi, M.L. Diamond, A.S. Lock, G. Spiers, and M.C. Alfaro De La Torre. 2008. Effects of estimates from different geochemical models on metal fate predicted by coupled speciation-fate models. *Environmental Toxicology and Chemistry* 27(5): 1020-1030.
Gandhi, N., S. Bhavsar, M.L. Diamond, J.S. Kuwabara, M. Marvin-Dipasquale. 2008. Development of mercury speciation, fate and



bioaccumulation (BIOTRANSPEC) model: application to the Lahontan Reservoir. *Environmental Toxicology and Chemistry*. (In press.)

Harrad, S., C. Ibarra, M. Diamond, L. Melymuk, M. Robson, J. Douwes, L. Roosens, A. Constantin Dirtu And A. Covaci. 2008. Polybrominated diphenyl ethers in domestic indoor dust from Canada, New Zealand, United Kingdom and United States. *Environment International* 34: 232-238.
Diamond, M.L. and E.M. Hodge. 2007. From source to effect: urban contaminant dynamics. *Environmental Science & Technology* 41(11): 3796-3805.

Karen Ing

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M.Sc. (Zoology), Toronto.
Senior Lecturer, Centre for Environment.
Undergraduate Coordinator, Centre for Environment.

2008-09 Co-Instructor of ENV/SSC199Y Debating and Understanding Current Environmental Issues, ENV 200Y Assessing Global Change: Science and the Environment, ENV 421H Environmental Research, and JGE 221Y Environment and Sustainable Development (joint Geography and Environment).

Research Interests:

Climate change impacts on fish populations and habitat space; science literacy in environment decision making; interdisciplinary team teaching.

Featured Research Projects:

Impacts of Climate Change on Ice Formation in Canadian Lakes. This study is in collaboration with scientists from Ontario Ministry of Natural Resources, Environment Canada and Canadian Centre for Remote Sensing. Models based on historical records of lake ice formation and climate are being generated and compared with more current

remote sensing observations to better delineate present and future thermal seasons in lakes so as to explore potential climate impacts on aquatic communities.

Ecosystems and Human Well-Being. This study is in collaboration with Shashi Kant of the Faculty of Forestry, and funded by the United Nations Environment Program (UNEP) awarded for "Developing a Comprehensive Understanding of Environment and Development". A project goal is to increase awareness and understanding of the links between ecosystem and human well-being, especially in developing countries. Recent project efforts include delivery of a course to faculty and students in Zhejiang Forestry University in China and Vietnam National Forestry University in Hanoi. The course titled "Ecosystems and Human Well Being" was based on the Assessment Framework published in 2003 by the UNEP-sponsored Millennium Ecosystem Assessment Project and linked the condition of ecosystems and ecosystem services to human well being thus encouraging a more holistic and interdisciplinary approach to the environment.

Forthcoming Publication:

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 (FLC). 2008. Serial team teaching and the evolving scholarship of learning: students' perspective. *CELT- Collected Essays*



on Teaching and Learning. (In press.)
The Faculty Learning Community at the University of Toronto, comprised of faculty who meet on a monthly basis to discuss and share teaching interests, conducted a faculty and student survey to investigate approaches and attitudes to team teaching within the Faculty of Arts and Science at the St. George Campus of U of T. Results from the faculty survey revealed a wealth of knowledge and experience of various models presently used at U of T. Student opinions on team teaching varied significantly, but in general it was found that students in upper years were less supportive of team teaching than students in their first and second years.



Douglas Macdonald

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 Hon. B.A., M.A., Toronto; Ph.D. (Environmental Studies), York.
 Senior Lecturer and Associate Member of graduate faculty, Centre for Environment.
 2008-09 Instructor of ENV320Y National and International Environmental Policy Making, and ENV1002H Environmental Policy.

Co-Instructor of ENV/SSC199Y Debating and Understanding Current Environmental Issues, ENV420Y/421H Environmental Research, and JGE221Y Environment and Sustainable Development (joint Geography/Environment).

Research Interests:

Politics of Canadian environmental policy making; waste and pollution policy; the business firm and trade association as environmental policy actors, Canadian and international climate change policy.

Research Projects:

Study of Voluntarism as a Policy Instrument for Climate Change. SSHRC grant; with Jean Mercier, Université Laval (Principal Investigator) and other Laval faculty. This project studies voluntarism as an environmental policy instrument used by the Québec and Canadian governments to date and the potential for future use of voluntary programs in Canadian climate policy. In 2007, worked with Centre for Environment undergraduate student Caitlin Patterson and Political Science doctoral student David Houle to research and write the article titled “L’utilisation du volontarisme afin de contrôler les émissions de gaz à effet de serre du secteur industriel” which will be published in an edited volume generated by this project.

Study of New England Governors and Atlantic Premiers Climate Change Action Plan.

SSHRC grant; with Jean Mercier, Université Laval (Principal Investigator), and Ph.D. candidates in Political Science, U of T. The purpose of the project is to study factors influencing instrument choice selection to date, particularly asymmetries of legitimacy and information between environmental regulators and firms in Quebec, New Brunswick, Massachusetts and Vermont.

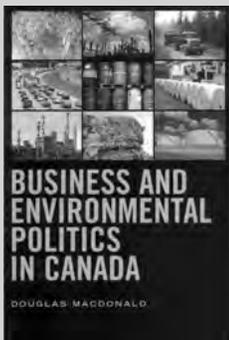
Forthcoming and Recent Publications:

Macdonald, D. Explaining the failure of Canadian climate change policy, in H. Compston and I. Bailey (eds.), *Turning Down the Heat: The Politics of Climate Policy in Affluent Countries.* Palgrave (Forthcoming.)
 Macdonald, D. Climate change, in D.L. VanNijnatten and R. Boardman (eds.), *Canadian Environmental Policy*, third edition, (Forthcoming in 2009.)
 Macdonald, D. 2007. *Business and Environmental Politics in Canada.* Broadview Press, Peterborough, Ontario. 240 pages. (**Winner of the Donald Smiley Prize; see article below.**)
 Winfield, M. and D. Macdonald. 2007. The Harmonization Accord and climate change policy: two case studies in federal-provincial environmental policy. In H. Bakvis and G. Skogstad (eds.), *Canadian Federalism: Performance, Effectiveness, and Legitimacy*, second edition, Oxford University Press. Pages 266-288.

Doug Macdonald wins Smiley prize

The Centre for Environment is pleased to announce that **Doug Macdonald**, Senior Lecturer at the Centre, has won the Canadian Political Science Association’s (CPSA) Donald Smiley Prize for the best book published in English or French in 2007 on government and politics in Canada: *Business and Environmental Politics in Canada* (Broadview Press, Peterborough, Ontario. 240 pages). He was awarded with a special plaque at the CPSA annual dinner held in Vancouver, on June 5, 2008.

Hailed by the CPSA as “well-written, accessible, concise, and one of the most outstanding studies of public policy in Canada to appear in recent years”, *Business and Environmental Politics in Canada* examines the ways in which large firms at the centre of major pollution issues have worked to influence environmental policy from the 1960s to the present. Although action is primarily intended to contribute to profitability, firm participation is influenced also by its need for legitimacy by complying with environmental regulation and corporate-image advertising and by actively promoting environmental norms, such as sustainable development. Firms always rely upon the strategy of privileged access to environmental decision-makers and only supplement closed-door negotiation with public campaigns for support when the former process is not yielding desired results. Despite exerting considerable influence upon policy, regulation has forced firms to make significant improvements to



their environmental performance. The concluding message is that the firm is not a pathological monster, untouched by societal norms. It is adaptive and legitimacy-seeking and will respond, given sufficient external pressure.

The Donald Smiley prize was established to honour the life and work of Donald V. Smiley (1921-1990) and to encourage the ideals of scholarship represented by this Canadian political scientist. An internationally renowned professor of Canadian government and politics and later Professor Emeritus at York University, he served as President of the CPSA. **For more information, please visit www.cpsa-acsp.ca.**

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B.A. & Sc., McMaster; M.A. (Geography),
Victoria; Ph.D. (Energy and Resources),
California, Berkeley.

Associate Professor, Department of

Geography and Centre for Environment.

Instructor of ENV1444H Capitalist Nature.

Research Interests: Political, ecological, and cultural implications of producing and circulating non-human biophysical nature in the commodity-form (commodification of nature); environmental change and politics in capitalist political economies; political economy and environmental change/politics in the North America; political ecology of industrial forestry in western North America; political economy of biotechnology.

Featured Research Project:

Double movements: a political ecology of land, labour and livelihoods in British Columbia, SSHRC, 2008-2012. Through historical and contemporary analyses and based on an ongoing collaboration with a local NGO in the Lake Cowichan area of Vancouver Island, B.C., this project examines how labour and land

come to circulate as commodities, how commodification relies on specific processes of political, cultural, and institutional objectification, how these processes are evident in the historical and contemporary political ecology of B.C.'s forest economy, how livelihood strategies are pursued, and how the research process can advance processes of subjectification with respect to forest-based livelihoods.

Recent Publications:

Prudham, W.S. 2008. Tall among the trees:

Organizing against globalist forestry in rural British Columbia. *Journal of Rural Studies* 24(2): 182-196.

Prudham, S. 2007. The fictions of autonomous invention: accumulation by dispossession, commodification, and life patents in Canada. *Antipode* 39(3): 406-429.

Prudham, S. 2007. Sustaining sustained yield: class, politics and post-war forest regulation in British Columbia. *Environment and Planning D: Society and Space*. 25: 258-283.

Prudham, W.S. 2005. *Knock on Wood: Nature as Commodity in Douglas-Fir Country*. Routledge Press, NY. 272 pages.

Featured Recent Publication:

Heynen, N., J. McCarthy, S. Prudham, and P. Robbins (eds.) 2007. *Neoliberal Environments: False Promises and Unnatural Consequences*. Routledge Press, UK. 320 pages. Over the past few decades, the



governance of nature has taken its most radical turn, propelled by a dramatic reprise of liberal faith in less regulated markets and minimalist states, and underpinned by advocacy for extending exclusive property rights to nearly everything imaginable. This complex turn is captured by the contentious concept of neoliberalism, which provides the context and direction for how humans affect and interact with the non-human world and with one another. This volume consists of case studies that link neoliberalism with concrete environmental changes, politics, and outcomes in international contexts. It evaluates political ecologies and dynamics, and implications of particular neoliberal reforms and enforcements.

Beth Savan

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B.Sc. Hons., Toronto; Ph.D., London, U.K.

Senior Lecturer, Centre for Environment;

Director, U of T Sustainability Office.

Supervisor, ENV299Y Research Opportunity

Acting Research Director, Centre for

Environment, July to Dec, 2008.

(On sabbatical leave Jan 1 to June 30, 2009.)

Research Interests:

Sustainability planning, energy conservation, community based research, environmental education and community based social marketing; environmental assessment.

Featured Research Project:

Managing energy-related behaviours: using a social marketing approach to promote energy efficiency and energy technologies, Ontario Centres of Excellence, 2007 to 2010. As part of the *Rewire* project of U of T's Sustainability Office (see page 12), this research will generate best-practice 'toolkits', allowing private and public partners to easily integrate energy efficient technology upgrades with an understanding of building user behaviour into their marketing and operations. They will gain

the ability to predict the financial savings and energy reductions associated with particular efficiency improvements and social marketing approaches to changing energy-related behaviour. A typical 'toolkit' will include a step-by-step implementation strategy, a discussion of barriers to behavioural change, and 'action tools' which outline the steps needed to motivate a specific behaviour outcome and the resources needed to implement these steps.

Forthcoming and Recent Publications:

Chan, S, S. Wakefield, B. Savan. Project Rewire: practicing sustainability in an institutional setting. IRNOSD Congress, Lyon, France, June 2008. (Forthcoming.)

Taylor, A., B. Savan, and J. Fiddler.

Overcoming barriers to sustainability and implementing institutional reform: a case study of the University of Toronto, Canada. IRNOSD Congress (See above; forthcoming.)

Flicker, S, B.I. Savan, M. McGrath, B. Kolenda and M. Mildemberger. 2008. If you could change one thing; what community-based researchers wish they could have done differently. *Community Development Journal* 43(2): 239-253.

Purcell, B., C. Caners and B. Savan. 2007.

The University of Greentopia: great minds for a green future, in J. Dovercourt, C. Palassio, A. Wilcox (eds.) *GreenTopia: Towards a Sustainable Toronto*, Coach House Books, Toronto. Pages 182-189.



Featured Recent Publication:

Flicker, S, B.I. Savan, B. Kolenda and M. Mildemberger. 2008. A snapshot of Community-Based Research in Canada: Who? What? Why? How? *Health Education Research* 23(1):106-114.

Community-Based Research (CBR) is rapidly gaining recognition as an important tool in addressing complex environmental, health and social problems. However, little is known about the Canadian CBR context. This paper discusses the results of a web-based survey which was circulated to a cross-section of the CBR community including service providers, community members and academic partners to investigate the status of CBR in Canada.



Stephen Scharper

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

Featured Research Project and Activities:

Religion and Ecology: Exploring the Interconnection of Liberationist and Ecological Theologies. SSHRC, 2006-2009. This research is on the integration of liberation theology and newer religious approaches to environmental questions, such as the new cosmology of Thomas Berry. This research attempts to probe differences and confluences between social justice approaches and more spiritual, worldview based environmental approaches. Since October 2006, has served as a bi-monthly *Faith and Ethics* columnist for the Saturday *Toronto Star*, covering topics such as climate change, environmental racism and religious environmental activism. He also serves as a regular panelist on CBC Radio's *Sounds Like Canada* spirituality panel.

Forthcoming and Recent Publications:

Scharper, S. B. and A. Weigert. Environmental ethics and Catholic social teaching: an assessment. In P. Sullins and A. Blasi (eds.) *Commentaries on the Compendium of the Social Doctrine of the Church*. Oxford University Press. (Forthcoming.) Scharper, S.B. Option for the poor and option for the earth: toward a sustainable solidarity. In G. Gutiérrez and D. Groody (eds.) *Option*

for the Poor: An Interdisciplinary Perspective. Univ. of Notre Dame Press. (Forthcoming.) Stefanovic, I.L. and S.B. Scharper (eds.) *The Natural City: Re-Envisioning the Built Environment*. University of Toronto Press. (Forthcoming.) Scharper, S.B. From metropolis to cosmopolis: placing the natural city in cosmological perspective. *The Natural City: Re-envisioning the Built Environment*. (See above.) Scharper, S.B. 2006. Finding our place: the ecological challenge to being human. In A. Luengo (ed.), *Eco Nightmare: Culpability, Responsibility and the Environmental Crisis*. Walter Gordon Massey Symposium Papers. Massey College, U. of Toronto. Pages 35-43.

Featured Recent Publication:

Scharper, S.B. 2007. From anthropocentrism to anthropoharmonism: connections with animals. In M. Bekoff (ed.) *Encyclopedia of Human Animal Relationships*, volume 2 (4 volumes). Greenwood Press. This article delineates the novel notion of "anthropoharmonism" as opposed to "anthropocentrism" as a more viable environmental posture for the contemporary role of the human. Noting both human contingency and mutuality in regard to the rest of nature, this idea suggests that humanity is in a dialectical relationship with all of creation, one rooted ultimately in community.



T. Stefanovic

Ingrid Lemán Stefanovic

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Research Interests:

Environmental philosophy, environmental and architectural phenomenology, philosophical

foundations of sustainable development policies; values and assumptions affecting environmental decision making and risk assessment.

Featured Research Projects:

Humanities Policy: The Case of Water. There is growing recognition of the important relation between scientific research and the development of public policy. Less attention is placed on the impact of the social sciences and, particularly, the humanities and how they might best impact upon sound environmental policy development. This project focuses on the issue of water policy, recognizing that water is the "new oil." The aim is to investigate instances whereby the arts and humanities have focused on issues of water and impacted upon public policy. Guidelines for improved communication and collaboration between the humanities and public policy makers will be developed.

Evaluative Images of the Lake Ontario Waterfront Trail (SSHRC). A research project investigating perceptions and values of the 700+ km long Lake Ontario Waterfront Trail, that provides the opportunity to hike or bike by or through 31 cities, towns and villages; 182 parks and natural areas; and countless historic areas, galleries and museums. The research is concluding with investigating children's perceptions of "nature in the city."

Forthcoming and Recent Publications:

Stefanovic, I.L. Holistic paradigms of health and place: how beneficial are they to environmental policy and practice? In J. Eyles and A. Williams (eds.) volume in *Geographies of Health* series, Ashgate Publishing. (Forthcoming.) Stefanovic, I.L. 2006. (ed.) Triple issue of *Ekistics*. Articles from 2004 & 2006 *Natural City* conferences Vol. 71 (424, 425, 426) Stefanovic, I.L. 2004. Children and the ethics of place. In Frodeman, R. and Foltz, B. (eds.), *Rethinking Nature: Essays in Environmental Philosophy*. Indiana University Press, Bloomington, Indiana. Pages 55-76. Stefanovic, I.L. 2000. *Safeguarding Our Common Future: Rethinking Sustainable Development*. State University of New York Press, New York. 272 pages.

Featured Forthcoming Publication:

Stefanovic, I. L. and S. Scharper (eds.) *The Natural City: Re-Envisioning the Built Environment*. University of Toronto Press. (Forthcoming.) This edited volume explores the philosophical and spiritual issues that are necessary conditions of building sustainable human settlements. While some people may perceive nature and cities to be separate entities, this book argues that cities and the provision of shelter are natural moments in the development of society and that urban and natural environments must be balanced for sustainable, healthy settlements to occur.

Willem Vanderburg

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B.A.Sc., M.A.Sc., Ph.D (Mech.Eng.), Waterloo. Professor, Department of Civil Engineering and Centre for Environment; Director, Centre for Technology and Social Development. 2008-09 Instructor of JEI 1901H Technology, Society and the Environment I and JEI 1902H Technology, Society and the Environment II (joint Civil Engineering and Environment).

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 Project:

Knowledge Infrastructure for Sustainable Cities. Ongoing. 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.

Recent Publications:

Vanderburg, W.H. 2008. The most economic, socially viable, and environmentally sustainable alternative energy. *Bulletin of Science, Technology & Society*, 28(2): 98-140.
Vanderburg, W.H. 2007. Evolving cities into a sustaining and sustainable habitat. *Ekistics*, Vol.71 no.424/425/426: 20-25.
Vanderburg, W.H. June 2006. Can the University escape from the labyrinth of technology? *Bulletin of Science, Technology and Society* 26(3): 4 parts, pages 176-221.
Vanderburg, W.H. 2005. *Living in the Labyrinth of Technology.* University of Toronto Press. 550 pages.

Featured Forthcoming Publication:

Vanderburg, W.H. The anti-money and anti-economy hypothesis: from wealth production to wealth extraction (Part 1). *Bulletin of Science, Technology and Society.* (In press.)



This paper attempts to make some sense of what is happening to the role of money and the economy in our lives and in our communities. Corporations and national economies have become wealth extractors as opposed to wealth creators. Only about 3% of daily financial flows around the globe have any meaningful connection to the production and distribution of goods and services or to direct productive investments. Free trade is restricted to the flows of goods and services, but it is forced trade to people and communities. These developments have transformed the role of money and economy into wealth extraction or anti-money and anti-economy.

Clare Wiseman

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B.E.S. Hons. (Waterloo), M. Nat. Res. Mgmt. (Simon Fraser), Dr. phil.nat. (Frankfurt). Assistant Professor, Centre for Environment. **Coordinator of the Environment and Health Collaborative Program, Centre for Environment.** 2008-09 Instructor of ENV4001H Graduate Seminars in Environment and Health and ENV4002H Environment and Health of Vulnerable Populations.

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:

Platinum Group Element Emissions: Environmental Concentrations, Exposure Levels and Human Health Risks. (Ongoing collaboration with Fathi Zereini, University of Frankfurt). Investigates platinum group element emissions from automobiles, equipped with catalytic converters, and how their concentrations have steadily increased over time. Potential human exposures and health impacts are also assessed. Currently

working with Environment Canada, Ontario Ministry of the Environment and U. of Frankfurt to collect and analyse airborne particulate matter samples along major roadways in the Greater Toronto Area. *Soils and their Carbon Sequestration Capacity: Does Mineralogy Matter?* This research investigates the sorptive dynamics of soil clay minerals or phases with organic compounds. The goal is to help clarify the mechanisms of carbon stabilization in soils and their use as a potential sink in strategies to mitigate climate change.

Environment and Health of Vulnerable Populations. This research investigates how certain populations may be differentially impacted by environmental hazards and the factors that contribute to vulnerability. Planned research will focus on the extent to which pollutant exposure levels in urban areas are a function of place of residence and socioeconomic status.

Forthcoming and Recent Publications:

Zereini, F and C. Wiseman. Platinum group elements in soil. In P. Hooda (ed), *Trace Metals in Soils*, Blackwell Publishing, Oxford. (Forthcoming.)
Zereini, F., C. Wiseman, and W. Püttmann, 2007. Changes in palladium, platinum and rhodium concentrations and their spatial distribution in soils along a major Autobahn in Germany from 1994 to 2004. *Environmental Science & Tech.* 41: 451-456.



Wiseman, C.L.S. 2006. Palladium from catalytic converters: exposure levels and human risk. In F. Zereini and F. Alt (eds.), *Palladium Emissions in the Environment: Analytical Methods, Environmental Assessment and Health Effects*, Springer-Verlag, Berlin, pages 565-574.
Wiseman, C.L.S. and W. Püttmann, W. 2006. Interactions between mineral phases in the preservation of soil organic matter. *Geoderma* 134: 109-118.
Wiseman, C.L.S. and Püttmann, W. 2005. Soil organic carbon and its sorptive preservation in central Germany. *European Journal of Soil Science* 56: 65-76.



PEase Media

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