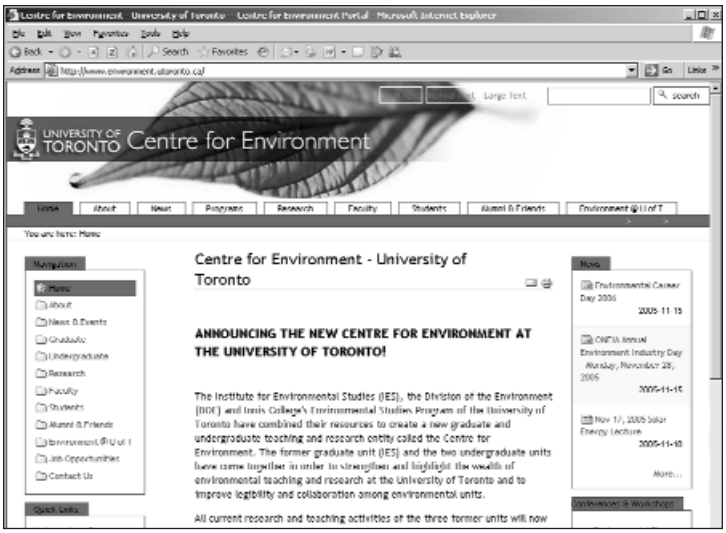
UNIVERSITY OF TORONTO

Centre for Environment

A new Centre combining the former Institute for Environmental Studies, Division of the Environment, and Innis College Environmental Studies Program.

2005 INAUGURAL REPORT



www.environment.utoronto.ca

Visit the new Centre for Environment website or read *Environews* for more information of the Centre and the University of Toronto environmental community. For improved accessibility, the Centre has introduced a new website that meets the guidelines of the World Wide Web Consortium's regulations for accessibility to people with disabilities.

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Welcome to the Centre for Environment

By Ingrid Leman Stefanovic, Inaugural Director.

Welcome to the interdisciplinary Centre for Environment -- a new undergraduate and graduate teaching and research unit, launched July 1st, 2005, through the Faculty of Arts and Science and the School of Graduate Studies at the University of Toronto.

The Centre brings together three former entities: the **Institute for Environmental Studies**, the **Division of the Environment** and the **Innis College Environmental Studies Program**. Building on the interdisciplinary strengths of these units, we hope that the Centre as a whole will consist of even more than the sum of its parts. A major academic goal will be to serve as a doorway to environmental research and teaching across the disciplines. While offering its own programs, the Centre will also serve a consultative function, directing students, where appropriate, to other counselors in units offering related environmental courses and programs across the university.

The foundation of the Centre is clearly built upon the successes of the three core units from which it was formed. Each brings unique strengths to the Centre. Since 1971, the Institute for Environmental Studies has developed impressive graduate collaborative programs between Geography, Chemistry, the Ontario Institute for Studies in Education, Economics, Philosophy, Religion, Medicine and a host of other Departments and Faculties. As of January 2006, a new Master of Environmental Science program is to be offered through the Centre and the University of Toronto Scarborough, thanks to initiatives undertaken by the former Institute for Environmental Studies.

Similar accomplishments define the work of the former undergraduate units. The Innis College Environmental Studies Program has built a reputation since 1978 as an interdisciplinary, self-standing environmental program with a focus on environmental policy and community engagement. From its inception in 1992, the Division of the Environment has developed strong teaching programs together with the Departments of Geography, Zoology, Botany, Geology, Anthropology, Chemistry, Forestry, Pharmacology and Toxicology, Philosophy, Economics, the Human Biology program, Environmental Geosciences, Physics and others.

The future holds great promise for the Centre for Environment. We will continue to forge new partnerships with other departments, faculties and campuses. New research programs will be built and partnerships with the community will be encouraged. We expect to move within the next short while into new physical space, to help to ensure that students are able to more easily identify with the single unit.

The interdisciplinary study of the environment has come to be recognized as central to task of building a sustainable world. In many ways, it will be the complex inter-linkages amongst social, cultural, economic, technological, regulatory and ecological initiatives that will be the key to improving human and environmental health. Research and teaching programs in the Centre will explore trans-disciplinary issues, such as climate change and sustainable energy - while at the same time recognizing that no one unit can possibly accomplish the task of addressing the complexities associated with challenges of sustainable development. We rely, therefore, upon the collaboration of the individual departments as well, to ensure that in-depth, interdisciplinary scholarship is built upon disciplinary strengths.

On a personal note, let me say that I feel deeply privileged to have worked for the last two years with Professor **Rodney White**, former Director of the Institute for Environmental Studies and Professor **Doug Macdonald**, former Director of the Innis College Environmental Studies Program, to jointly plan and create the new Centre for Environment. I thank members of the Ad Hoc Planning Committee -- representing a number of different departments and the Faculty of Applied Sciences and Engineering -- for their work in preparing the final planning document that helped to define the structure of the new unit. Finally, we are grateful for the continuing support of Professor **Pekka Sinervo**, Dean of the Faculty of Arts and Science, and Professor **Susan Pfeiffer**, Dean of the School of Graduate Studies, without whose help the Centre could not have been launched.

We invite interested units across the university to join us to continue to strengthen collaborations and to help to increase awareness of important environmental issues that are affecting the state of our planet. We encourage students to explore our programs and to join us in interdisciplinary research. We have much to accomplish collectively and the members of the Centre for Environment enthusiastically welcome the participation in this new unit of all who are concerned about the future health of our world.

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A Turning Point

By Rodney White,
Former Director, Institute for Environmental Studies,
July 1, 1994 to June 30, 2005.

It took five years to go from the 1992 Earth Summit at Rio de Janeiro to an agreement on the Kyoto Protocol in 1997 and more than six more years before the Protocol was ratified. It is true that other major developments were taking place during this long wait. The European Union was committed to a greenhouse gas Emissions Trading Scheme (EU ETS) whether Kyoto was ratified or not. Many other initiatives have been undertaken on a voluntary basis by companies, cities, sub-national bodies including many American states, and institutions like the World Bank.

However, until Kyoto was ratified all this activity took place under a great deal of uncertainty. The uncertainty would persist as long as the USA remained outside Kyoto and Russia did not sign. However, once Russia signed, in November 2004, momentum was resumed. As this coincided with the opening of the EU ETS, in January 2005, it now seems that a turning point has been reached.

Much uncertainty remains and many important elements for the successful implementation of Kyoto are missing - including data, technology, institutions and goodwill. Of these missing elements goodwill is likely to prove the most elusive due to the historical and geographical complexity of the climate change issue. Greenhouse gases are an unwanted by-product of the wealth of industrial society and hence - up until now - most of the emissions can be attributed to wealthy nations. Furthermore those countries and people that emit the most will not be the ones to suffer the worst of the consequences.

If the 15 years since the Earth Summit are a guide then the necessary institutional changes will come slowly. The United States and other countries without Kyoto targets must be brought into the agreement if a reduction strategy is to have any chance of being effective. Even at the level of a single institution we have seen that change comes more slowly than one might expect. At the University of Toronto we have recently formed a new **Centre for Environment** through the merger of the Institute for Environmental Studies, the Division of the Environment, and the Innis College Environmental Studies Program. The new Centre combines a graduate program and two undergraduate programs. We hope that this new unit will better serve its students, make more rational use of scarce resources, and enhance the visibility of environmental research and teaching both internally and externally.

The new centre is a symbol of the university's renewed commitment to interdisciplinary research and teaching. Here we have to recognise a paradox. Modern universities are structured around disciplines that -- for the most part -- emerged in the nineteenth century. This discipline-based model has undoubtedly been extremely successful. In the nineteenth century a university education was available to only a tiny minority in the wealthiest countries. Investment (public and private) has paid very handsome returns and we now speak of a "knowledge-based economy" as if that had been the goal all along. Access to university for all who may be qualified to benefit from it is now a widely declared societal objective. Yet the knowledge we need now is not the sole domain of the founding disciplines. We need to encourage students for whom phrases like "the greenhouse effect" and "environmental justice" both have meaning. Without students who are broadly educated it will take even longer to develop the institutions and create the goodwill to confront climate change and other complex environmental issues.

Undergraduate Programs

The Centre offers a variety of core and specialist environmental programs, as well as directed minor programs.

Core Programs

Three core programs provide a choice of interdisciplinary B.A. or B.Sc. minor, major or specialist streams:

1. Environment and Science (B.Sc.) is a core multidisciplinary program with a strong science focus which students are expected to combine with another science program. The combination of the Centre's advanced-level integrated science courses and the addition of another science program provides the scientific basis for an understanding of the physical, chemical and biological behaviour of planet Earth and gives the student an introduction to the economic, political and cultural influences that govern the choices we make about the environment.

2. Environment and Society (B.A.) is a core offering which students are expected to combine with another discipline in the social sciences, sciences or humanities. This combination allows students to develop expertise in a specific area or discipline, to see the contribution their chosen discipline makes to the protection and enhancement of the environment while developing an awareness of the socio-economic, political, technological and cultural influences that govern the choices we make.

3. Environmental Policy and Pactice (B.A.) focuses on environmental policy and governance. It relies upon an applied interdisciplinary approach, providing exposure to the people and organizations active in environmental work in Canada, and focusing on skills development and understanding. Courses offer rigorous academic study of the economic, social and political forces driving today's issues, such as globalization, species loss, biodiversity, climate change, the fight for sustainable cities, toxic pollution and human health.

Joint Specialist Programs

Six programs combine an interdisciplinary core with a specific discipline:

1. Earth Systems (B.Sc. with the Department of Physics) brings the basic science orientation of Environment and Science together with an understanding of the solid earth, oceans, and atmosphere on a planetary scale emphasizing the Earth as a unified, dynamic system.

2. Environment and Health (B.Sc. with New College) integrates life and health sciences components with an environment and science program, providing the scientific basis for understanding the physical, chemical and biological behaviour of planet earth and the relationships between our environment and aspects of human health. The program also introduces students to the economic, political and cultural influences that govern the choices we make about the environment and their implications for human health.

3. Environmental Chemistry (B.Sc. with the Department of Chemistry) focuses on analytical theory, instrumental and methodological aspects of trace concentrations of pollutants in soil, water, air and biological tissues. This provides students with skills in analytical and environmental chemistry combined with a broad introduction to other aspects of environmental issues.

4. Environmental Geosciences (B.Sc. with the Department of Geology) focuses on physical, chemical and biological events that have occurred over the past 4.5 billion years including the present influences of humans as agents of geologic change.

5. Past Environments (B.Sc. with the Archeology Program of the Department of Anthropology) looks at human interactions with the environment in both the past and the present.

6. Environment and Toxicology (B.Sc. with the Department of Pharmacology) combines the science orientation of Environment and Science with an emphasis on understanding the effects of contaminants in the environment and the implications of contamination for ecosystem health and rehabilitation.

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

Directed Minors

Nine minors are offered, intended for students interested in acquiring a limited body of environmental 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

The following course offerings of the Centre are an amalgamation of courses formerly offered by the Division of the Environment and the Innis College Environmental Studies Program, with 2005-06 instructors listed. Included are new course offerings for 2006-07.

* not offered in 2005-06
** new offering in 2006-07

ENV 199Y Environmental Justice*
ENV 200Y Assessing Global Change: Science and the Environment *(A. Zimmerman)*
ENV 222Y The Study of Environment *(C. Tam)*
ENV 223H Fundamental Environmental Skills *(C. Gore)*
ENV 234Y Environmental Biology *(J. Eckenwalder)*
ENV 235Y Physics and Chemistry of Planet Earth *(J. Abbatt, J. Mitrovica)*
ENV 236Y Human Interactions with the Environment*
ENV 299Y Research Opportunity Program *(B. Bass)*
ENV 315H Chemical Analysis of Environmental Samples *(M. Gorton)*
ENV 320Y National and International Environmental Policy Making *(J. Etcheverry)*
ENV 321Y Approaches to Environmental Issues *(S. King)*
ENV 332H Culture and Nature *(J. Cypher)*
ENV 333H Ecological Worldviews *(S. Scharper)*
ENV 335H Environmental Design *(S. Waite-Chuah)*
ENV 395Y Special Topics Field Course **
ENV 340H Informed Environmental Practice *(P. Ferguson)*
ENV 341H Environment and Human Health *(A. Abelsohn)*
ENV 350H Energy and Climate Change Policy and Politics**
ENV 410H Environmental Research Skills *(R. Rice)*
ENV 420Y Environmental Research Seminar *(J. Beyers, E. Halpenny)*
ENV 421H Environmental Research *(J. Beyers, E. Halpenny)*
ENV 422H Environmental Law *(P. Muldoon)*
ENV 423H Inside the World of Ontario Environmental Policy *(R. Houldin)*
ENV 424H Environment and Community Engagement**
ENV 440Y Professional Experience Course *(C. Gore)*
ENV 441H Politics of the Environment*
ENV 442H Corporate Perspectives on Environment*
ENV 443H Applied Environmental Research Course (also 444H) *(J. Beyers, E. Halpenny)*
ENV 445H U.S. Environmental Politics*
ENV 446H Cities and Urban Environmentalism in a Global Context *(C. Gore)*
ENV 447H The Power of Economic Ideas *(R. Houldin)*
ENV 481H Special Topics in the Environment I
ENV 482H Special Topics in the Environment II
ENV 483Y Special Topics in the Environment III
ENV 490Y Senior Essay
ENV 491Y Independent Studies Project (also 492H/493H)
JEG 221Y Environment and Sustainable Development**
JIE 307Y Urban Sustainability *(E. Opoku-Boateng)*

Graduate Programs

In addition to offering two interdisciplinary collaborative graduate programs, the Centre will also offer a new one-year stand-alone Master's Professional Program in Environmental Science starting January 2006, to be located at U of T Scarborough.

Master of Environmental Science Professional Program

The Centre for Environment at U of T is pleased to announce a new, one-year professional degree program: the Master of Environmental Science (M.Env.Sc.) to commence in January 2006. The program will be physically located and administered in the Department of Physical and Environmental Sciences at U of T Scarborough (UTSC). This stand-alone Master's program focuses on the transport and fate of contaminants in natural and degraded environments. It includes new graduate courses and has the objective of producing skilled practitioners of environmental science, well trained in field and laboratory techniques, primarily to meet the needs of industry and government. It will consist of two options (an all-course option and an intern option), both of which require the completion of five full course equivalents.

Courses (M.Env.Sc. at UTSC)

The following courses may be offered as part of the program.

ENV 1000H Advanced Seminar in Environmental Science
ENV 1001Y Research Paper in Environmental Science
ENV 1002H Analytical Chemistry for Geoscientists
ENV 1003H Air and Water Quality Sampling and Monitoring
ENV 1004H Methods for the Detection of Pathogens
ENV 1005H Soil Contamination Chemistry
ENV 1006H Geology and Geophysics of the Shallow Subsurface
ENV 1007H Remediation Methods
ENV 1008H Environmental Science Field Camp
ENV 1009H Advanced Techniques in Geographic Information Systems
ENV 1010H Sediment and Contaminant Transport in Aquatic Systems
ENV 1011H Freshwater Ecology and Biomonitoring
ENV 1012H Boundary Layer Climates and Contaminant Fate
ENV 1013H Groundwater Hydrochemistry and Contaminant Transport
ENV 1014H Directed Readings in Environmental Science I
ENV 1015H Directed Readings in Environmental Science II
ENV 1016H Intern Placement
ENV 1017H Climate Change Impact Assessment
ENV 1018H Contaminant Fate in Terrestrial Environments

Collaborative Graduate Programs

The Centre offers two graduate programs, offered at both the Master's and Ph.D. levels, which require students to enroll in a collaborating department. By special arrangement, students may be admitted from other departments than those listed below. Students are required to take "core" courses to facilitate interdisciplinary learning.

1. Environmental Studies

The collaborative program in Environmental Studies provides students with an opportunity to pursue interdisciplinary, graduate education, in conjunction with disciplinary grounding in departments and faculties such as Anthropology, Botany, Chemistry, Economics, Forestry, Geography, Geology, Information Studies, Management, OISE/UT (Adult Education, Community Development and Counselling Psychology; and Sociology and Equity Studies in Education), Philosophy, Political Science, Sociology and Zoology. Students from other departments may also obtain special permission to enrol in this program.

2. Environment and Health

The graduate units of Geography, Medical Science, and Public Health Sciences, in conjunction with the Centre for Environment, also offer a collaborative program in Environment and Health. The program has the aim of providing students in the health sciences with a broad environmental perspective while exposing environmental students to the health implications of environmental quality. In this respect, the program is designed to meet the needs of students who are concerned with sociological and policy approaches, as well as those working on the pathophysiology of human disease and those who are focussing on the pathways of contaminants in the environment.

FOR MORE INFORMATION:
M.Env.Sci. at U of T Scarborough:
http://www.utsc.utoronto.ca/~envsci/menvsci/ or contact Julie Quenneville, 416-287-7357, menvsc@utsc.utoronto.ca.
Collaborative Graduate Programs:
www.environment.utoronto.ca or contact Magdalene Garda, 416-978-3475, magdalene.garda@utoronto.ca.

Courses (Collaborative Programs)

The following courses are offered as part of the two collaborative programs. 2005-06 instructors are indicate; see p. 11 for affiliations.

Core Courses

ENV 1001H Environmental Decision Making *(P. Byer, I. Stefanovic)*
ENV 1002H Environmental Management Case Studies *(M. Winfield)*
MSC 4000H Seminars in Environment and Health (ENV 4001H: Ph.D.) *(L. Smith, F. Silverman, D. O'Hara.)*

Other Courses

ENV 1410H Analytical Environmental Chemistry *(S. Mabury)*
ENV 1433H Regional Resource Ecology: Evaluation of Natural Capital *(Not offered in 2005-06.)*
ENV 1701H Environmental Law (*P. Muldoon)*
ENV 1703H Water Resources Management (*A.P. Grima)*
ENV 1704H Environmental Risk Analysis and Management (*A.P. Grima)*
ENV 1705H Corporate Perspectives on the Environment *(Not offered in 2005-06.)*
ENV 1706H Natural Hazards and Natural Disasters *(M. Mirza)*
ENV 1707H Environmental Finance: Risk Management and Business Opportunities *(J. Ambachtsheer, S. McGeachie)*
ENV 2000H Independent Study
ENV 2000Y Independent Study
ENV 2000H Capitalist Nature *(S. Prudham; new course offering in Spring 2006.)*
ENV 2002H Environmental Governance *(J. Beyers, E. Halpenny)*
ENV 2501H Pollution Prevention and Control *(Not offered in 2005/06.)*
JGE 1212H Contaminants in the Environment (*M. Diamond)*
JGE 1420H Urban Waste Management: An International Perspective *(Not offered in 2005-06.)*
JNC 2503H Environmental Pathways *(C. Jia)*
JPV 1201H Politics, Bureaucracy and the Environment (*R. Stren)*
JEI 1901H Technology, Society & Environment (*W. Vanderburg)*

Certificate and diploma programs

Three internet-based distance certificate and diploma programs are offered, including the new certificate in GIS for Environmental Management, launched last year. Also newly offered is a Juris Doctor certificate in Environmental Studies with the Faculty of Law.

Distance Education

The Distance Education Programs are offered in an online, e-classroom environment and were originally launched to accommodate the busy lifestyle of professionals who wished to pursue environmental education while continuing with their careers. Upon completion of the certificate and diploma programs, students are eligible to apply for the Canadian Certified Environmental Practitioner designation under the Canadian Environmental Certification Approvals Board's national certification program for Canadian Environmental Practitioners.

1. Certificate in Environmental Management

2005-06 Instructor: Kymberley Snarr, kym.snarr@utoronto.ca.
Environmental management includes impact assessment, but also involves other strategies and tools, such as adaptive management, risk assessment, environmental site audits, assessments and remediation and conflict resolution. The objectives of Certificate in Environmental Management program are to develop an understanding of the basic premises, theories and practices associated with environmental management and provide an insight into the systems approach by which management can be employed to mitigate a wide range of environmental problems.

The two courses required for the certificate, **CEM 400 Fundamentals in Environmental Management** and **CEM 401 Environmental Case Management**, use the courseware WebCT, available through the University of Toronto. Each course takes ten weeks to complete. With the use of asynchronous discussion forums and synchronous live chats, the students are very much part of a dynamic and active classroom. Synchronous guest chats are employed to allow students to access to experts in specific areas of study. For example, CEM 401 has offered a group assignment in which the students were asked to evaluate the Kyoto Protocol as an environmental management plan in the face of the environmental challenge of global climate change.

2. Certificate in GIS for Environmental Management

2005-06: Instructor: Michael Govorov, mgovorov@uoguelph.ca.
The GIS (Geographical Information Systems) for Environmental Management Certificate Program is comprised of the two individual online GIS courses: **GEM 400 Introduction to GIS for Environmental Management** and **GEM 401 Advanced GIS for Environmental Management**.

GEM 400 provides an introduction to digital mapping and spatial analysis using GIS. Some topics include: scale and map projections, how to create maps, input data, and how to use GIS software to analyze geographic problems and learn techniques that can be applied to environmental management, and other subject areas. Students use leading-edge industry data and a case study, provided by EcoLog ERIS, of the former Stelco brownfield site in Toronto, which has recently been rehabilitated and where new condominiums are currently under construction.

GEM 401 builds on GEM400 and covers advanced topics in spatial analysis and data modeling using GIS for environmental management. Students learn how to interpret remotely sensed data, including multispectral satellite imagery and high resolution aerial photography, to map and analyze land cover patterns, and how to create and analyze three-dimensional surfaces, visualize geospatial data, and understand point patterns and spatial autocorrelation. The course material focuses on a case study of the Koffler Scientific Reserve at Joker's Hill, a field research reserve owned by the University of Toronto.

3. Diploma in Environmental Management

2005-06 Instructors: Kymberley Snarr, kym.snarr@utoronto.ca and Hannah Dvorak-Carbone, hdvorak@yahoo.com.
The diploma builds on the objectives of the above Certificate in Environmental Management program and 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 to sustainable development, the diploma program aims to develop strategic, consensual, and inclusive solutions to the resource and environmental management case studies which include: Globalization, climate change, water security, fisheries, agriculture, forestry, wildlife, parks, minerals, and waste management. The program also raises awareness of the complexity of risk management in addressing health, economics and environmental conservation.

The Diploma Program is comprised of the four online courses, CEM 400 and 401 of the Certificate in Environmental Management above and **CEM 402 Strategies in Environmental Management** and **CEM 403 Environmental Risk Assessment**.

FOR MORE INFORMATION:
Distance Education:
www.environment.utoronto.ca
or contact Donna Workman:
416-978-7077
d.workman@utoronto.ca

Juris Doctor Certificate:
www.law.utoronto.ca
416-978-3716
law.admissions@utoronto.ca

Juris Doctor 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. The program enables these students to specialize in their area of interest and obtain a form of accreditation for doing so. In addition to 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 the first year, students will complete all first year courses in the Faculty of Law. In the second and third years, students will complete a minimum of 48 law school credits, including Environmental Law. Students will also take two core courses, write a research paper, and complete an internship.

5-year waste management program in Vietnam, Cambodia and Laos wraps up

By Sharon Brown, Project Manager.

The CIDA-funded Waste-Econ Program (*Making Waste Work for the Economy in Vietnam, Cambodia and Laos*) has completed its fifth year and will wind-down its project activities in the fall of 2005. This Centre for Environment (CFE) project, joint with the Department of Geography, is led by **Virginia Maclaren** of the Department of Geography, with the purpose of building human and institutional capacity for implementing integrated waste management in Vietnam, Cambodia and Laos.

In one of the pilot project areas, residents of homes backing onto the Siem Reap River frequently throw their waste into the river because there is no collection service. (Photo: Kate Parizeau.)

Supporting University Training

A key activity in the past year has been the development of a textbook and supporting curriculum materials following the approval in March 2004 of the new *Waste Economy* curriculum by the Ministry of Education and Training in Vietnam. The six-credit curriculum will be available to undergraduate students at any university that chooses to implement the program (twelve have indicated an interest so far).

The text book developed to support the curriculum, *Integrated Waste Management in Cambodia, Laos and Vietnam: Theory and Practice*, includes contributions from our partners in Vietnam, Laos and Cambodia as well as Canadian team members **Virginia Maclaren**, **Philip Byer** (Civil Engineering/CFE), **Murray Haight** (University of Waterloo), and former U of T students **Carrie Mitchell** and **Esther Rootham**, **Curtis Puncher**, **Kate Parizeau** and **Tamar Heisler**.

In Cambodia, a 4th-year full course on *Waste Economy* was added to the Environmental Science curriculum at the Royal University of Phnom Penh. In Laos, we have been able to benefit from having Philip Byer present in Vientiane during the development of a curriculum for the National University of Laos' new Centre for Environment and Development.

Pilot Project Activities

Most of the pilot project studies in Vietnam have finished their activities. The projects in Ho Chi Minh City (*Cleaner production in industry*) and Nam Son (*Reduction in child waste pickers*) focused solely on dissemination of project results last year while the teams in Ha Long and Da Nang initiated a second phase of activities on composting of hotel organic wastes and household waste separation, respectively, to further emphasize other aspects of integrated waste management in the local areas. In Ha Long and Da Nang, a number of recommendations for policy changes from the first phase of activities have been put forward to their local governments.

A set of mini-pilot one-year projects in Vietnam were also completed and looked at methods to encourage private sector involvement in waste collection and ways to develop better understanding of the working conditions of waste workers.

In Cambodia, the pilot project to establish a community-based waste management program has made significant progress. Pending financial support, results from surveys and information sessions in the area indicate that there is support for waste collection from the majority of local residents and local authorities and a good understanding of the need for better waste management in the community. Students **Kate Parizeau** (Masters in Planning) and **Heather Marshall**, an undergraduate intern in the International Development Studies (IDS) program worked on this project.

In Laos, the pilot project is focusing on the development of a permanent large-scale compost facility. While the implementation of a large-scale facility was beyond the scope of a pilot project, there were other ways to help such as with siting and financial feasibility studies that assisted with funding applications for the permanent facility, which is now in fact being funded through the Canada Fund. Students **Kyoungsoo Kwon** (M.Eng. program) and **Anna McDonald** (Engineering undergraduate) and **Karline McCawley** (IDS intern), worked on this project.

Vietnam Solid Waste Monitor

We were asked by the World Bank Vietnam office to participate in the development of the ***Vietnam Environment Monitor 2004 on Solid Waste***, focusing on solid waste management. The document, a joint effort of the Waste-Econ Program, Vietnam's Ministry of Natural Resources and Environment and the World Bank, was very well received and provides a summary of waste information in Vietnam. A copy is available on the Waste-Econ website below.

Vietnamese Students at U of T

The following Vietnamese students have been sponsored by the Waste-Econ Program to do graduate work at U of T.

Nguyen Van Ha (Ph.D. Forestry): *Social capital in the paper recycling village of Duong O in northern Vietnam.*

Hoang Phuong Chi (M.Eng. Environmental Engineering): *Audit of hotel wastes collected as part of the composting demonstration for the Ha Long Bay pilot project.*

Nguyen Thi Thuc Thuy (M.Eng., Env. Eng.): *Waste composition and source separation opportunities in Da Nang.*

Nguyen Quang Tuan (Ph.D. continuing, Geography): *Landfills and community-driven regulation in Vietnam.*

For more information, please visit www.utoronto.ca/waste-econ or contact Virginia Maclaren, maclaren@geog.utoronto.ca.

Enhancing China's capacity for carbon sequestration: year three update

By Julia Pan, Project Manager

The CIDA-funded project ***Confronting Global Warming: Enhancing China's Capacity for Carbon Sequestration***, led by **Jing Chen** of the Department of Geography, has recently completed its third year. A project in partnership with the Centre for Environment, the Department of Geography and the Faculty of Forestry, it applies Canadian modelling and remote sensing technology to understanding the role of land-use change in China's carbon cycle. The goal of the project is to contribute to the global effort of reducing net greenhouse gas emissions by enhancing China's capacity to sequester carbon in natural sinks, thereby supporting environmentally sustainable development in China. U of T project team members also include **Rorke Bryan**, **John Caspersen**, and **Sean Thomas** of Forestry; and **Mingzhen Chen**, **Danny Harvey, Virginia Maclaren**, and **Rodney White** of Geography.

2004-05 Update of the Project's Components

The four project components include: 1. Remote Sensing and GIS/Carbon Cycle Modelling, 2. Forest Assessment and Ground-Truthing, 3. Integrated Assessment, and 4. Land Use Policy and Planning. These components were reviewed at the project symposium, *Enhancing China's Capacity for Carbon Sequestration: Progress and Prospects,* held in June, 2004 in Changbaishan.

During 2004, work at all of the component levels progressed satisfactorily. The Remote Sensing and GIS/Carbon Cycle Modelling component was able to complete most of its outstanding work including remote sensing image processing for most of the field sites and all GIS datasets, Leaf Area Index (LAI) mapping for the whole of China; high resolution Net Primary Productivity (NPP) maps for the three core sites, and preparation of all datasets needed for national scale Net Biome Productivity (NBP) modelling.

Forest Assessment and Ground Truthing field studies for LAI and NPP at Liping and Dunhua were completed during the year as were the forest resource use patterns and the tree species growing naturally. Data for the evaluation of potential forest practices for carbon sequestration maximization were collected in NE China for alternative tree species and will be analyzed during 2005.

The Integrated Assessment component has also progressed steadily. Household surveys were conducted of various stakeholders, including women and minority groups to determine peoples' sensitivity to potential tree species and forest practices that might be adopted for carbon sequestration maximization. Meetings were then held to design carbon sequestration strategies and plans. The initial framework for a sustainability system has been finalized.

Following the Changbaishan symposium, an important joint project steering committee was held in Beijing for the fourth component, Land Use Policy and Planning. It was suggested that relevant Chinese governmental agencies become better acquainted with the project's work and actively involved in promulgating its models and findings throughout China to ensure a greater measure of sustainability. In November, 2004 the China State Forestry Administration agreed to be the project's institutional home.

2005 Toronto Carbon Policy Forum

A project milestone, the *Toronto Carbon Policy Forum,* was held at U of T in May, 2005. This event provided a forum for 45 leading Chinese and Canadian experts and policy makers to discuss carbon sequestration methods and their implications for policies related to the Kyoto Protocol. The forum reviewed the project's carbon sequestration models and findings to date and their relevance to Chinese and Canadian governments' policies. A preliminary outline of the project's decision support tools to propagate the project's methods and models throughout China was presented and approved. The next important stage is to involve senior government officials in China in order to maximize the potential for actual incorporation of the project's results into public policy making.

Spring 2006 Journal Publication

A significant contribution to the carbon sequestration literature will be made in Spring 2006 when a special issue of the *Journal of Environmental Management* will be devoted to research results produced by the project. Please visit the website below for details.

For more information, please visit the project's website: www.utoronto.ca/cccs2002/ or contact Julia Pan, jpan@oise.utoronto.ca.

Project activities in Liping in southwestern China have included field studies in a forty-year old Chinese fir forest (left) and household surveys. Household surveys were done to determine peoples' sensitivity to potential tree species and forest practices that might be adopted for carbon sequestration maximization. (Photos: Sean Thomas and Yongyuan Yin.)

Adaptation & Impacts Research Group

By Brad Bass, David Etkin, Grace Koshida, Monirul Mirza, and Indra Fung-Fook.

Part of the Science and Technology Branch of Environment Canada, the Adaptation and Impacts Research Group's (AIRG) 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 thereto. A key element of the research agenda is carried out through partnerships and collaborations, such as the formal arrangements with specific universities: University of British Columbia, University of Waterloo, York University and the University of Toronto, where the group has a co-operative research relationship with the Centre for Environment. AIRG'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. The Director is **Don MacIver**.

For more information, please visit www.msc-smc.ec.gc.ca/airg or contact Indra Fung Fook, Administrative Officer, indra.fungfook@ec.gc.ca, 416-739-4436.

AIRG Research Projects at the Centre for Environment

For more information, please contact the researcher indicated (please see page 9 for profiles and contact information.)

1. **Complexity and Nonlinearities *(Brad Bass)*:** This research program uses the simulation platform, COBWEB (Complexity and Organized Behaviour Within Environmental Bounds) to explore the adaptation in complex systems and the emergence of nonlinearities during adaptation. The software utilizes genetic algorithms in a Java platform to simulate how a group of agents, with different strategies, cope with environmental variability and change. This year, Version 3 of the software will be launched, allowing users to test different kinds of agents within different environmental conditions during the same simulation run and evaluate the fitness of different strategies for adapting to change.
2. **The Impact of Climate Change on Regional Energy Systems *(Brad Bass)*:** The impact of climate change on regional energy systems in Saskatchewan and the Toronto-Niagara Region has been evaluated with the Canadian Regional Energy Model, developed in conjunction with **Dr. Guohe Huang** and students in Environmental Engineering at the University of Regina. The next phase of this work will extend the model to the Province of Ontario and the Region of Waterloo.
3. **Adapting Urban Environments to Atmospheric Change *(Brad Bass)*:** This study looks at the role of green walls and roofs in mitigating the urban heat island effect, improving air quality, reducing energy consumption and increasing storm water retention. One component uses the UFORE urban forest model to assess how these technologies can best be used to reduce energy consumption and improve air quality on a community scale. A second component simulates a building's energy consumption with and without a green roof. A third component assesses the impact of green walls on mental well being.
4. **Canadian Climate Scenarios Network, CCSN *(Brad Bass)*:** This year, AIRG launched the CCSN, with a node at the University of Toronto. It provides climate change scenario information for Canada from all global climate models, links to downscaling tools and bioclimate profiles, a biological reinterpretation of the scenarios for agricultural and forestry applications. Future plans include the provision of regional climate scenarios and other analytical tools.
5. **Canadian Agricultural Adaptations to 21st Century Droughts: Preparing for Climate Change? *(Grace Koshida)*:** Funded by the Climate Change Impacts and Adaptation Programme, the objective of this 2-year project is to determine the effectiveness of current adaptation options in reducing the vulnerability of agriculture to drought. Regional stakeholder consultations and case studies in Southern Ontario, Nova Scotia and Prince Edward Island will be conducted in order to enhance our understanding of the vulnerability of agriculture producers to the record-setting 2001 and 2002 droughts.
6. **Assessment of Prediction Tools and Atmospheric-Hydrological Hazards Information for Water Conservation Standards *(Grace Koshida)*:** This Agriculture and Agri-Food Canada-funded study will scope the potential for atmospheric-hydrological information and prediction tools to support enhanced agricultural decision-making. These decision-support systems can help to reduce future agricultural contaminations, improve adaptations to extreme weather and variable climate conditions, and make more effective use of water during developing drought conditions.
7. **Historical and Future Climates for the Assessment of Energy Sector Impacts in Canada *(Monirul Mirza)*:** Funded by the Program on Energy Research and Development, the major objectives of this project are to develop a nationally consistent set of energy sector scenarios of historical and future climate. A report titled *Climate Change and the Canadian Energy Sector: Report on Vulnerability, Impact and Adaptation* was published (AIRG, Meteorological Service of Canada, Environment Canada, 2004, 52 pages). In addition to this report, historical and downscaled future climate scenarios have been constructed.
8. **Climate Change and Water Resources in South Asia *(Monirul Mirza)*:** South Asia is a water scarce region especially in the dry season. In the future, increased water supply will be needed for agriculture, industry, rural and urban sectors mainly driven by increases in population and economic growth. Climate change and water resources problems are being addressed in this edited book project, *Climate Change and Water Resources in South Asia*, to be published by Taylor and Francis (United Kingdom) in 2005.
9. **Millennium Ecosystem Assessment Project *(Monirul Mirza)*:** This is the most extensive study of the linkages between the world's ecosystems and human well-being. Launched by UN Secretary General Kofi Annan in 2001, this study is comprised of three working groups: 1. Scenarios, 2. Conditions and Trends, and 3. Responses. A book will be published by Island Press, U.S.A. in 2005. Monirul Mirza is the coordinating lead author of a chapter, *Flood and Storm Control*, of the third working group on responses. (See page 9 for full citation.)
10. **Fourth Assessment Report of the Intergovernmental Panel on Climate Change *(Monirul Mirza)*:** The Intergovernmental Panel on Climate Change (IPCC) of the United Nations launched its Fourth Assessment Report (AR4) in September 2004; it is expected to be completed and published in 2007. Monirul Mirza has been contributing to the IPCC's AR4 as a Coordinating Lead Author for the Chapter 17: Assessment of Adaptation Practices, Options, Constraints and Capacity.

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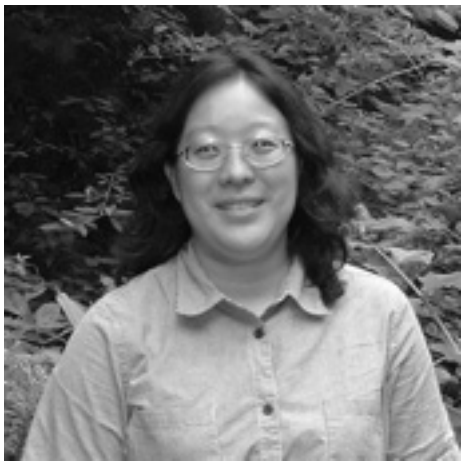
B.A. (Geography), Toronto; M.Sc. and Ph.D. (Geography), Penn State.
Manager, Climate Change Scenarios Network, Adaptation and Impacts Research Group, Science and Technology Branch, Environment Canada.
Associate Member, Graduate Faculty, Centre for Environment.

Research Interests:
The role of complexity and non-linear processes in adaptation; simulating adaptation with anticipatory computing; ecological engineering adaptations to atmospheric change including vertical gardens (green walls), green roofs and living machines; energy supply scenarios under climate and policy changes. ***(Also see page 8.)***

Recent Publications:
Lin, Q.C., G.H. Huang and B. Bass. 2005. An energy systems modelling approach for the panning of power generation: a North American case study. *International Journal of Computer Applications in Technology.* (In press.)

Bass, B. 2004. Characterizing adaptable systems: moving from simulation models to adaptation policy. In Fenech, A., D. MacIver, H. Auld, R. Bing Rong, and Y. Yin. *Climate Change: Building the Adaptive Capacity*, Meteorological Service of Canada, Environment Canada. Pages 136-152.

Bass, B. 2004. Is Smart Growth a Smart Adaptation Strategy: Examining Ontario's Proposed Growth Management Strategy Under Climate Change. In Fenech et al. (see above). Pages 289-304.



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B.E.S. (Geography), Waterloo;
Researcher, Adaptation and Impacts Research Group, Science and Technology Branch, Environment Canada.

Research Interests:
Drought/heat wave hazards in Canada; high-impact weather events; climate change impact indicators; disaster mitigation; climate change impacts on Canadian water resources. ***(Also see page 8.)***

Recent Publications:
Koshida, G., M. Alden, S. Cohen, R. Halliday, L. Mortsch,V. Wittrock and A. Maarouf. 2005. Drought risk management in Canada-U.S. transboundary watersheds: now and in the future. In D. Wilhite (ed.) *Drought and Water Crises: Science, Technology and Management Issues.* CRC Press, Boca Raton, Florida. Pages 287-317.

Bonsal, B., G. Koshida, E.G. O'Brien and E. Wheaton. 2004. Droughts. In *Threats to Water Availability in Canada*. National Water Research Institute, Burlington, Ontario. NWRI Scientific Assessment Report Series No. 3 and ACSD Science Assessment Series No. 1. Pages 19-26.

Koshida, G. 2003. *Climate, Nature, People: Indicators of Canada's Changing Climate.* Canadian Council of Ministers of the Environment (CCME), Winnipeg, Manitoba. 45 pages.

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Researcher, Adaptation and Impacts Research Group, Science and Technology Branch, Environment Canada.
Associate Member, Graduate Faculty, Centre for Environment.
Instructor of ENV 1706H *Natural Hazards and Natural Disasters*.

Research Interests:
Water resources modelling and assessment, hydro-meteorological analyses, analyses of extremes and natural hazards, river engineering and sediment transport, environmental management, environmental impacts assessment, climate change scenario construction, climate change and sea-level rise impacts and adaptation, greenhouse gas emissions assessment, development of statistical and management application tools and application of GIS. ***(Also see page 8.)***

Recent Publications:
Mirza, M.M.Q. (ed.) 2004. *The Ganges water diversion: environmental effects and implications.* Kluwer Academic Publishers, Dordrecht, the Netherlands. 367 pages.

Mirza, M.M.Q.(ed.), 2005. *Climate Change and Water Resources in South Asia.* Taylor & Francis, U.K. (In press.)

Mirza, M.M.Q and A. Patwardhan. 2005. Flood and storm control. In: *Ecosystem and Human-Wellbeing: Policy Responses* Island Press, USA. (In press.)

The value of water: a global perspective

By Lino Grima, Associate Member, Centre for Environment Graduate Faculty.

The conventional perception is that Canada has an abundance of water. This overly optimistic perception needs to be re-evaluated in the context of emerging threats to water availability. Canada possesses 7% of the earth's land surface and just about 7% of the world's renewable freshwater (*Threats to Freshwater Availability in Canada*, Environment Canada, 2004). Even if this relatively plentiful water were available for potential users, it would still place a major responsibility on the Canadian public.

Several federal departments plan to develop appropriate standards for agricultural water quality and quantity management. This is part of a larger program that aims to ensure that Canada becomes "a leader in producing food in an environmentally sustainable manner".

The Adaptation and Impacts Research Group (AIRG) of the Science and Technology Branch of Environment Canada, supported a research project on "water valuation" last year at the Institute for Environmental Studies (now the Centre for Environment, CFE) as part of a larger program involving several federal departments. The project team included **Lino Grima** and **Rodney White** of Geography and CFE and **Don MacIver**, **Heather Auld** and **Grace Koshida** of AIRG. An extensive literature review was also conducted by **Olivia Wong**, a U of T Scarborough undergraduate student working on a work study placement.

A draft report on this project, written by Lino Grima and Olivia Wong, is currently under review. It consists of six chapters, including an Introduction. Chapters 2-5 of the report examine emerging innovative institutions for expressing water value in Australia, California, the UK and Israel, with a view to learning which institutional mechanisms offer the most promise for Canada. The concluding chapter includes 30 recommendations, including suggestions for follow-up research and activities.

Expressing "water value" is problematic. It is relatively easy to estimate the capital, operational and maintenance cost of making water of a certain quality available for consumer demand. However, capturing the opportunity cost of water as part of its "value" is more complicated and valuing water for its ecosystem function, or for future generations, is an even more complex issue. The most obvious lesson for Canada is that innovative water resource institutions that reflect economic scarcity -- as opposed to physical scarcity -- are evolving in the countries that were reviewed. Very simply, scarcity in the economic sense is the recognition that in order to obtain access or use more water, users have to give up something else of value. Under conditions of economic scarcity, policy makers and legislators have to decide who will have the right to access a water resource and under what constraints.

The experience in other countries (and indeed in Canada) confirms that it is possible to develop and apply policies that allow water users to willingly change their water use patterns either by giving up some water against compensation (e.g. in a water market) or by using water more efficiently, thus becoming more productive producers.

Another very important lesson from the literature review is that it is never too early to start the dialogue, identify technical opportunities and fund the research and the public consultation. Reflecting on the slow and sometimes rocky progress in other countries, a win-win approach is recommended: if water scarcity does not materialize in the short run, reducing "wasteful" water uses would still be a step in the right direction.

For more information, please contact Lino Grima at lino.grima@utoronto.ca.

Project to study best practices in community-based research in Canada

By Beth Savan, Senior Lecturer, Centre for Environment

A new project funded by SSHRC Community-University Research Alliance (CURA) and administered at the Centre for Environment, ***Facilitating Best Practices in Community-Based Research in Canada*** started in 2005. It is a partnership between **Beth Savan** of the Centre for Environment and **Robb Travers**, Director of Research at Wellesley Central Health Corporation (WCHC).

Also in partnership with **Sarah Flicker**, Director of Research at WCHC, and ably supported by research assistants **Mary McGrath**, **Brian Kolenda** and **Matto Mildenburger**, Beth Savan is analyzing and interpreting a major survey of community-based research (CBR) in Canada. Community based research is research carried out by, for or with community members, which aims not only to increase understanding, but also to advance concrete and constructive change (Loka, 2002). The project is overseen by an Advisory Committee of senior people experienced in CBR and related policy and funding issues.

Preliminary results from the over three hundred respondents are intriguing, and support strong policy recommendations. The respondents represent a wide range of researchers across the country, who participate in a variety of research roles in large and small CBR projects. Overwhelmingly, they reported that community based research is an effective research process, with a high level of productivity in terms of publications, policy documents and recommendations and presentations. In addition, CBR fosters societal outcomes that are not generally achieved with traditional research methods. In particular, increased community capacity, plans for future projects, cordial working relationships, new coalitions and changes in agency programming and policy frequently resulted from the projects undertaken by the respondents.

A variety of factors both facilitate and frustrate success in CBR. While the lack of funding is universally identified as an important barrier, more important, for academics, is the lack of institutional support for CBR, most notably through the reward structure of hiring and promotion. The results will be presented in a variety of fora in the fall of 2005 and prepared for publication in 2006.

Reference cited: Loka Institute (2002) *About the CRN: What is Community Based Research?* (Visit www.loka.org/crn/ for more information and a copy of the publication.)

For more information, please contact Beth Savan at b.savan@utoronto.ca.

Appointed and/or Administrative Faculty:

Research profiles of administrative and appointed faculty are featured on pages 12-14. The Centre for Environment is noted below as CFE.

Phil Byer, *Professor, Civil Engineering/CFE*
Karen Ing, *Senior Lecturer, CFE**
Douglas Macdonald, *Senior Lecturer, CFE**
Virginia Maclaren, *Associate Professor, Geography;*
Graduate Coordinator, CFE, 2005-06
Scott Prudham, *Associate Professor, Geography/CFE;*
Research Director, CFE, 2005-06
Beth Savan, *Senior Lecturer, CFE*
Undergraduate Coordinator, CFE, 2005-06
Stephen Scharper, *Assistant Professor, Anthropology, UT Mississauga/CFE*
Ingrid Stefanovic, *Professor, Philosophy/CFE*
Director, CFE, 2005-2010
Willem Vanderburg, *Associate Professor, Civil Engineering/CFE*
*** on leave 2005-06**

Undergraduate Instructors:

(Please see page 3 for 2005-06 courses.)

Jonathan Abbatt, *Chemistry*
Alan Abelsohn, *Family & Community Medicine*
Joanna Beyers
Brad Bass, *Environment Canada*
Jennifer Cypher
James Eckenwalder, *Botany*
José Etcheverry, *David Suzuki Foundation*
Phil Ferguson
Chris Gore
Mike Gorton, *Geology*
Elizabeth Halpenny
Russ Houldin, *Ontario Energy Board*
Sarah King
Jerry Mitrovica, *Physics*
Paul Muldoon, *Can. Environmental Law Assoc.*
Ernest Opoku-Boateng
Gord Perks, *Toronto Environmental Alliance*
Roberta Lynne Rice
Keith Stewart, *Toronto Environmental Alliance*
Chui-Ling Tam
Sheila Waite-Chuah, *Ont. Coll. of Art & Design*
Ann Zimmerman, *Zoology*

Distance Education Instructors:

(Please see page 5 for 2005-06 courses.)

Hannah Dvorak-Carbone, *Trust Unlimited*
Michael Govorov, *Malaspina University-College*
Kimberley Snarr

Graduate Faculty

(Please see page 4 for 2005-06 graduate course instructors.)

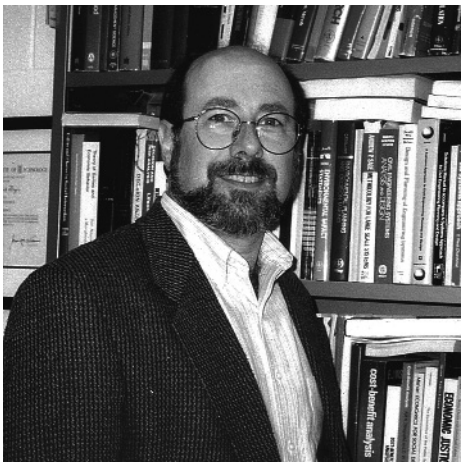
Full Members:

Jonathan Abbatt, *Chemistry*
Barry Adams, *Civil Engineering*
Grant Allen, *Chemical Engineering*
Robert Andrews, *Civil Engineering*
David Bagley, *Civil Engineering*
Spencer Barrett, *Botany*
Terry Blake, *Forestry*
Michael Bunce, *Social Sciences, UT Scarborough*
Frances Burton, *Social Sciences, UT Scarborough*
Phil Byer, *Civil Engineering/CFE*
Terry Carleton, *Forestry/Botany*
Catherine Chalin Clark, *Public Health Sciences*
Jing Chen, *Geography*
Donald Cole, *Public Health Sciences*
Paul Cooper, *Forestry*
Paul Corey, *Public Health Sciences*
Donald Cormack, *Physical & Environmental Sciences, UT Scarborough*
Frank Cunningham, *Philosophy*
Helene Cyr, *Zoology*
Amrita Daniere, *Geography*
Anthony Davis, *Geography*
George Dei, *Sociology & Equity Studies in Education (OISE/UT)*
Donald Dewees, *Economics*
Miriam Diamond, *Geography*
James Eckenwalder, *Botany*
Margrit Eichler, *Sociology & Equity Studies in Education (OISE/UT)*
Mark Engstrom, *Zoology/ROM*
Greg Evans, *Chemical Engineering & Applied Chemistry*
Nick Eyles, *Physical & Environmental Sciences, UT Scarborough*
Roberta Fulthorpe, *Physical & Environmental Sciences, UT Scarborough*
William Gough, *Physical & Environmental Sciences, UT Scarborough*
Brian Greenwood, *Physical & Environmental Science, UT Scarborough*
L. Danny Harvey, *Geography*
D. Linn Holness, *Public Health Sciences*
Tad Homer-Dixon, *Political Science*
Ken Howard, *Physical & Environmental Sciences, UT Scarborough*
Charles Jia, *Chemical Engineering & Applied Chemistry*
Shashi Kant, *Forestry*
Bryan Karney, *Civil Engineering*
Chris Kennedy, *Civil Engineering*
J. Gary Knowles, *Adult Education, Community Development & Counselling Psychology (OISE/UT)*
Hy van Luong, *Anthropology*
Scott Mabury, *Chemistry*
Laurel MacDowell, *History, UT Mississauga*
Virginia Maclaren, *Geography*
Heather MacLean, *Civil Engineering*
Jay Malcolm, *Forestry*
David Martell, *Forestry*
Patricia McCarney, *Political Science*
Andrew Miall, *Geology*
William Michelson, *Sociology*
G.W. Kent Moore, *Physics, UT Mississauga*
D. Scott Munro, *Geography, UT Mississauga*
Edmund O'Sullivan, *Adult Education, Community Development & Counselling Psychology (OISE/UT)*
Anthony Price, *Physical & Environmental Sciences, UT Scarborough*
Scott Prudham, *Geography/CFE*
James Purdham, *Public Health Sciences*
Douglas Reeve, *Chemical Engineering*
Helen Rodd, *Zoology*
Rowan Sage, *Botany*
Mohini Sain, *Forestry*
K. Richard Sandbrook, *Political Science*
Andrea Sass-Kortsak, *Public Health Sciences*
Lawrence Sawchuk, *Anthropology, UT Scarborough*
Barbara Sherwood Lollar, *Geology*
Krystyna Sieciechowicz, *Anthropology*
Frances Silverman, *Medicine*
Myrna Simpson, *Physical & Environmental Sciences, UT Scarborough*
Grace Skogstad, *Social Science, UT Scarborough*
Sandy Smith, *Forestry*
W. Gary Sprules, *Zoology, UT Mississauga*
Ingrid Stefanovic, *Philosophy/CFE*
Richard Stren, *Political Science*
Susan Tarlo, *Public Health Sciences*
Vic Timmer, *Forestry*
Willem Vanderburg, *Civil Engineering/CFE*
Frank Wania, *Physical Sciences & Environmental Sciences, UT Scarborough*
Rodney R. White, *Geography*
Dudley Williams, *Physical & Environmental Sciences, UT Scarborough*
Ann Zimmerman, *Zoology*

Associate Members:

Jane Ambachtsheer, *Mercer Management Consulting*
Brad Bass, *Environment Canada*
Alana Boland, *Geography*
Quentin Chiotti, *Pollution Probe*
James Dooley
A.P. (Lino) Grima
H. Roland Hosein, *GE Canada Inc.*
Andy Kenney, *Forestry*
Sonia Labatt
Douglas Macdonald, *Centre for Environment*
Sue McGeachie, *Innovest Strategic Value Advisors*
Monirul Mirza, *Environment Canada*
Paul Muldoon, *Canadian Environmental Law Association*
Barbara Murck, *Environmental Sciences, UT Mississauga*
Dennis O'Hara, *St. Michael's College*
David Powell
Pamela Robinson, *Ryerson University*
Stefan Salbach
Beth Savan, *Centre for Environment*
Stephen Scharper, *UT Mississauga/CFE*
M. Ronald Shimizu
Lesbia Smith, *Public Health Sciences*
Peter Telford
Peter Timmerman, *York University*
Sarah Wakefield, *Geography*
Douglas Whelpdale, *Environment Canada*
Kathi Wilson, *Geography, Mississauga*
Mark Winfield, *Pembina Institute*
Cindy Woodland, *Pharmacology*

Profiled on pages 12-14 are faculty members who hold administrative positions and/or budgetary appointments at the Centre for Environment.



Philip Byer

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S.M. (Civil Eng.), S.B. (Electrical Eng.), Ph.D. (Civil Eng.), Mass. Inst. of Technology
Professor, Dept. of Civil Engineering and Centre for Environment; Chair, Division of Environmental Engineering.
Co-Instructor of ENV 1001H *Environmental Decision-Making.*

Research Interests:
Environmental planning and decision making; multiobjective project evaluation; environmental assessment; risk management; solid waste management; climate change.

Recent Publications:

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.

Byer, P., J.S. Yeomans and M. Lalani. 2004. *Addressing Climate Change Uncertainties in Project Environmental Assessments*. Research report to the Canadian Environmental Assessment Agency. 108 pages.

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.

Tam, E.K.L. and P.H. Byer. 2002. Remediation of contaminated lands: a decision methodology for site owners. *Journal of Environmental Management* 64(4): 387-400.

Karen Ing

Office: Centre for Environment, Room 2098, 33 Willcocks St., tel: 416-978-4863, karen.ing@utoronto.ca; mailing address on inside cover.
B.Sc. and M.Sc. (Zoology), Toronto.
Senior Lecturer, Centre for Environment.
2004-05 courses: Coordinator of ENV 200Y *Assessing Global Change: Science and the Environment*, Co-Instructor of JIE 222Y *Study of Environment*, Instructor of ENV 321Y *Approaches to the Environment.*
On leave 2005-06.

Research Interests:
Climate change impacts on fish populations and habitat space; invasive species; fate of contaminants in the ecosystem; intersection of public policy and environmental science literacy; agent based modeling; interdisciplinary environment teaching; team-teaching; engagement and participatory problem solving in environmental education.

Recent projects include using a one-dimensional hydrodynamics model for predicting the vertical thermal characteristics in lakes. Such modeling allows for predictions of seasonal and inter-annual variability in lakes as well as sensitivity testing to long-term changes in environmental factors and watershed properties. Concurrently lake ice event modeling is being undertaken to investigate ice in/ice out dates and maximum ice thickness as potential impacts on availability and timing of fish habitat.

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.
2004-05 courses: Co-Instructor of JIE 222Y *Introduction to Environment*; Instructor of JIE 410Y *Environmental Research Skills* and INI/ENV 320Y *National and International Environmental Policy Making*.
On leave 2005-06.

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.

Recent Publications:

Macdonald, D (with A. Bjorn and D.L. VanNijnatten). 2004. Implementing Kyoto: when spending is not enough. In G. Bruce Doern (ed.), *How Ottawa Spends: 2004-05*. Montreal and Kingston: McGill-Queen's University Press.

Macdonald, D. (with D.L. VanNijnatten). 2003. Reconciling energy and climate change policies: how Ottawa blends. In G. Bruce Doern (ed.), *How Ottawa Spends: 2003-04*, Oxford University Press, Toronto.

Macdonald, D. 2002. The business response to environmentalism. In Debora VanNijnatten and Robert Boardman (eds.), *Canadian Environmental Policy: Context and Cases.* Oxford University Press, Toronto.

Macdonald, D. (with T. Brieger and T. Fleck). 2001. Political action by the Canadian insurance industry on climate change. *Environmental Politics* 10(3): 111-126.

Virginia Maclaren

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B.A. (Geography), Bishop's;
M.Pl. (Regional Planning), Ottawa;
M.S., Ph.D. (Regional Science), Cornell.
Associate Professor, Department of Geography.
Graduate Coordinator, Centre for Environment.
Instructor of joint Geography/Centre for Environment course JGE 1420H *Urban Waste Managment: An International Perspective*.

Research Interests:
Urban waste management; environmental reporting and indicators; environmental impact assessment; environmental management in developing countries (Southeast Asia). Principal Investigator of *Waste-Econ in Vietnam, Laos and Cambodia* project and research team member of *China's capacity for carbon sequestration* project ***(see pages 6-7)***.

Recent Publications:
Maclaren, V.W. 2004. Waste management: integrated approaches. In Bruce Mitchell (ed.), *Resource Management and Development in Canada,* 3rd ed. Oxford University Press. Pages 371-397.

Maclaren, V.W. 2004. Urban sustainability reporting. In S.M.Wheeler and T. Beatley (eds.) *The Sustainable Urban Development Reader.* Routledge, New York. Pages 203-210.

Nguyen Van Ha, S. Kant, and V.W. Maclaren. 2004. The contribution of social capital to household welfare in a Vietnamese paper recycling craft village. *Journal of Environment and Development* 13(3): 1-29.

W. Scott Prudham

Office: Department of Geography, Room 5028, 100 St. George St., U of T, M5S 3G3; tel: 416-978-4975; fax: 416-946-3886; scott.prudham@utoronto.ca; www.geog.utoronto.ca.
B.A.&Sc., McMaster; M.A. (Geography), Victoria; Ph.D. (Energy and Resources), California, Berkeley.
Associate Professor, Department of Geography and Centre for Environment.
Research Director, Centre for Environment.
Co-Instructor of ENV 1002H *Environmental Decision-Making*, 2004-05; and Instructor of new course ENV 2000H *Capitalist Nature*, 2005-06.

Research Interests:
Political economy; social theory and the environment; human aspects of environmental change; environmental justice; environmental policy and regulation; biotechnology politics and regulation; globalisation and environment; politics of natural resource use and management.

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

Prudham, W.S. 2004. Poisoning the well: neo-liberalism and the contamination of municipal water in Walkerton, Ontario. *Geoforum* 35(3): 343-359.

Prudham, W.S. 2003. Taming trees: capital, science, and nature in Pacific Slope tree improvement. *Annals of the Association of American Geographers.* 93(3): 636-656.

Prudham, W.S. 2002. Regional science, political economy, and the environment. *Canadian Journal of Regional Science* 25(2): 171-206.

Beth Savan

Office: Centre for Environment, Room 1048B, 5 Bancroft Avenue entrance. mailing address on inner cover. tel: 416-978-8202; fax: 416-978-3884; b.savan@utoronto.ca; http://www.sustainability.utoronto.ca/
B.Sc. Hons., Toronto; Ph.D., London,U.K.
Senior Lecturer, Centre for Environment;
Undergraduate Coordinator, Centre for Environment.
Director, University of Toronto Sustainability Office.

Research Interests:
Sustainability planning, climate change, environmental education; member of the Board of Directors of the Toronto Atmospheric Fund of the City of Toronto and of Citizens' Environment Watch, a student and citizen-run environmental monitoring project. Principal investigator of Centre for Environment project *Facilitating Best Practices in Community Based Research in Canada.* ***(see page 10)***.

Recent Publications:
Savan, B.I. 2005. Campus and community. In G. Jones, P. McCarney, M.L. Skolnik (eds.), *Creating Knowledge, Strengthening Nations.* University of Toronto Press. Page 195-204.

Savan, B. 2004. Community university partnerships: linking research and action for sustainable community development. *Community Development Journal* 39(4): 372-384.

Savan, B.I., C. Gore, A. Morgan. 2004. Shifts in environmental governance in Canada. *Environment and Planning C* 22: 605-619.

Savan, B.I. and D. Sider. 2003. Contrasting approaches to community based research and a case study of community sustainability in Toronto, Canada. *Local Environment* 8(3): 303-316.

Stephen Scharper

Office: 1) Innis College, Room 306, 2 Sussex Ave., U of T, M5S 1J5; tel: 416-978-7433; fax: 416-971-2078; OR 2) Department of Anthropology, U of T Mississauga, 3359 Mississauga Rd. N., North Building, Room 118, Mississauga, L5L 1C8; tel: 905-569-4912; fax: 905-828-3837; stephen.scharper@utoronto.ca.

B.A. Hons., Toronto; M.A. (Theology), Toronto; Ph.D. (Religious Studies), McGill.
Assistant Professor, Department of Anthropology and the Study of Religion, U of T Mississauga, and Centre for Environment.
Instructor of ENV 333H *Ecological Worldviews.*

Research Interests:
The connection between religious ethics and environmental ethics and how religions are engaging ecological concerns. A particular interest is the intersection of liberation theology, sustainability and development.

Recent Publications:

Scharper, S.B. 2006. Option for the poor and option for the earth: toward a sustainable solidarity. In Gustavo Gutiérrez and Daniel Groody (eds.), *Option for the Poor: An Interdisciplinary Perspective* (working title). University of Notre Dame Press, 2006. (Forthcoming.)

Scharper, S.B. 2005. Finding our place: the ecological challenge to being human. In *Walter Gordon Massey Symposium Volume.* Massey College, University of Toronto. (In press.)

Scharper, S.B. 2002. Green dreams: religious cosmologies and environmental commitments, *Bulletin of Science, Technology, and Society*, 22(1): 42-45.

Scharper, S.B. 1997. *Redeeming the Time: A Political Theology of the Environment.* Continuum Publishing Company, New York.

Ingrid Leman Stefanovic

Office: Centre for Environment, Room 1020, 33 Willcocks St., U of T, tel: 416-978-6526; fax: 416-978-3884; ingrid.stefanovic@utoronto.ca; mailing address on inside cover.

B.A., M.A. and Ph.D (Philosophy), Toronto.
Associate Professor, Department of Philosophy and Centre for Environment.
Director, Centre for Environment.
Co-Instructor of ENV 1001H *Environmental Decision-Making*.

Research Interests:
Environmental philosophy, environmental and architectural phenomenology, philosophical foundations of sustainable development policies.

Recent Publications:

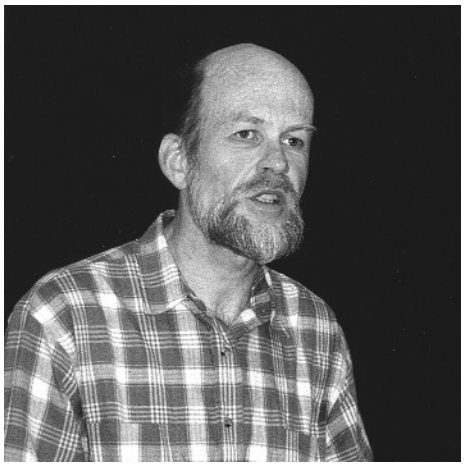
Stefanovic, I. and S. Scharper. 2006. *Natural City: Re-Envisioning the Built Environment.* University of Toronto Press. (Forthcoming.)

Stefanovic, I. 2005. Challenging traditional academic borders through interdisciplinarity: the case of environmental philosophy. In J. Goering, F. Guardiani and G. Silano (eds.), *Limina: Thresholds and Borders*. Legas Press, Ottawa.

Stefanovic, I. 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.

Etkin, D. and I. Stefanovic. 2005. Mitigating natural disasters: the role of eco-ethics. *Mitigation and Adaptation Strategies for Global Change*. 10(3): 467-490.

Stefanovic, I. 2000. *Safeguarding Our Common Future: Rethinking Sustainable Development*, State University of New York Press, New York. 272 pages.



Willem Vanderburg

Office: Centre for Technology and Social Development, Room 319, 35 St. George St., U of T, M5S 1A4; tel: 416-978-2924; fax: 416-978-6813; bill.vanderburg@utoronto.ca.

B.A.Sc., M.A.Sc., Ph.D (Mechanical Eng.), Waterloo.
Associate Professor, Department of Civil Engineering and Centre for Environment.
Director, Centre for Technology and Social Development. Instructor of joint Civil Engineering and Centre for Environment course JEI 1901H *Technology, Society and the Environment I.*

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; areas of application (life cycle design of materials, processes and products, preventive energy end-use strategies, healthy workplaces and cities); relationship between culture of society and "cultures" of science and technology, with emphasis on embedded values, beliefs and world-views.

Recent Publications:

Vanderburg, W.H. 2005. *Living in the Labyrinth of Technology.* University of Toronto Press. 550 pages.

Vanderburg, W.H. 2000. (2002, second printing). *The Labyrinth of Technology.* University of Toronto Press. 368 pages.

Vanderburg, W.H. 2002. Preventive approaches for the engineering and management of technology: bridging the gap between intellectual cultures. In Jim Downey and Lois Claxton (eds.), *What We Need to Know: Essays by Leading Canadian Researchers.* Canadian Foundation for Innovation/Key Porter Books, Toronto. Pages 194-201.

Student environmental groups try to make a difference at U of T

GESA: Graduate Environmental Students' Association

By Shelby Yamamoto and Julie Sommerfreund, 2004-05 President and Vice-President, GESA.

Having just completed its fourth year in 2004-05, the Graduate Environmental Students' Association (GESA) is still going strong. Last year, its members enjoyed another successful year of activities and events organized to bring together students, faculty and staff from environmental disciplines across campus.

Fall Orientation Sessions and Elections

For several years GESA has helped kick-start the academic year by helping to organize the annual September graduate orientation session of the Institute for Environmental Studies (IES), and now the Centre for Environment, CFE. This event is designed to welcome new and returning graduate students, and to acquaint them with the courses, programs, and other activities.

Shortly after the orientation session, GESA usually holds fall elections for its executive. The 2004-05 executive were:

- *President and Career Day Head:* **Shelby Yamamoto** (M.Sc. Public Health Sciences/CFE Environment and Health);
- *Vice-President, Environmental Engineering and Career Day Head:* **Julie Sommerfreund** (M.A.Sc., Chemical Eng./Environmental Eng.);
- *Communications Director and UTERN Rep:* **Anthony Liu** (Ph.D., Physics/CFE Environmental Studies);
- *Treasurer:* **Nadia Hernandez Martinez** (M.A.Sc., Chemical Engineering/ Environmental Engineering);
- *Social Director:* **Tarek Ayash** (Ph.D., Chemical Eng./Environmental Engineering);
- *Secretary and Environmental Studies Rep:* **Erica Pinto** (M.Sc.F, Forestry/CFE Environmental Studies);
- *Environment and Health Rep:* **Beth Noble** (M.A. Geography UT at Mississauga/CFE Environment and Health);
- *Environmental Protection Advisory Committee Rep:* **Sandy Kiang** (M.A., Geography/CFE Environmental Studies);
- *OISE Rep:* **Carolyn Webb** (M.Ed., Adult Education (OISE)/CFE Environmental Studies).

Craig Butt and Carolyn Webb (Chemistry/CFE Ph.D. and OISE/CFE M.Ed. students respectively) grilling up BBQ treats on a sunny September day at the graduate orientation session.

Also in the fall, GESA has organized library research orientation sessions aimed at providing students with information needed to maximize their use of library resources.

Last winter began with the annual **Hart House Farm Winter Retreat** which brought fourteen IES and Environmental Engineering students out for a weekend of hiking, snowshoeing and many other winter activities.

The mid-semester blues were interrupted by a well-attended movie screening of the environmental film, *Being Caribou* (National Film Board of Canada). The screening was free and donations were collected for the World Wildlife Fund.

March, 2005 was highlighted by the fourth **Annual Environmental Career Day**, an event co-hosted by multiple environmental organizations and student groups across campus. Open to students across southern Ontario, students were able to exchange career experience with leaders in the field and participate in a job fair. ***(See article on page 16.)***

In addition to these activities, GESA also collaborates with other environmental campus organizations including the Environmental Protection Advisory Committee (EPAC) and the U of T Environmental Resource Network (UTERN). Through these collaborations, GESA is able to participate in larger environmental projects on campus as well as play a part in the environmental decisions affecting the university. GESA also holds regular monthly meetings that all are welcome to attend.

Thanks to everyone who has participated in or organized these events! GESA is looking forward to continuing in this tradition and welcomes new people with fresh ideas and enthusiasm for the upcoming year.

For further information, visit www.utoronto.ca/env/ies/gesa or email gesa.ies@utoronto.ca.

ENSU: Environmental Students' Union

The Environmental Students' Union is an association for U of T students in environmental programs. It consists of elected student representatives and volunteers who dedicate their time and efforts to protect the environment on and off campus.

ENSU works with other student associations on a University-wide effort to help make its campus more sustainable. It aims to promote environmental awareness in

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the student community by organizing social events and offering information on undergraduate and graduate level environmental programs, a variety of environmental career paths available to students, and general information on sustaining individual lifestyles, campuses and the planet.

ENSU has been successful in launching the environmental magazine *Green Perspective*, which provides a medium whereby U of T students, staff, and faculty and members of the community can express their perspective on environmental issues. It has also helped with the creation of the University of Toronto Environmental Resource Network (UTERN) and coordinates joint activities with UTERN.

The creation of the Centre for Environment and the U of T Sustainability Office has given ENSU a better network within which to grow and exercise their mandate. ENSU will be able to form stronger partnerships throughout the university and subsequently throughout the City of Toronto, thereby demonstrating its dedication to the environment and its ability to bring relevant issues into public awareness. Although ENSU was created as a means through which environment students at Innis College could get in touch with their faculty, it has grown to encompass issues relevant to the entire university. However, it still remains a tight group in one of the most intimate colleges on campus.

One of the first actitivies planned so far in 2005-06 was an Environmental Social in the early fall at which students had an opportunity to learn more about ENSU, its executive positions, environmental courses and programs offered on campus, and upcoming events.

For more information, please visit www.utoronto.ca/envstudy/ensu or contact ENSU at utorensu@yahoo.ca or 416-978-1786. For more information on the *Green Perspective* magazine, please email greenperspective@gmail.com.

Environmental Career Day another successful group effort

By Shelby Yamamoto, 2004-05 President, GESA.

Once again, many University of Toronto units and student groups worked together to hold the fourth annual Environmental Career Day, held this year on March 16th, 2005. The success of the event can be attributed to the efforts of this year's dedicated steering committee which included representatives from the Graduate Environmental Students Association, the Environmental Students' Union, the three former units of the Centre of Environment (Institute for Environmental Studies (IES), Division of the Environment and Innis College Environmental Studies Program), as well as the Toronto Undergraduate Geography Society (TUGS), University of Toronto Scarborough Campus, Faculty of Law, and Division of Environmental Engineering.

All registered university and community college students from southern Ontario with valid student ID were invited to attend the day's career expo, speaker series and reception. A career expo with twenty-five exhibitors from government, consulting and environmental non-governmental organizations, held in two gymnasiums at the University of Toronto Schools, was attended by 270 people. The expo provided students with many potential career and summer job opportunities, volunteer experience and important career advice. Both students and exhibitors expressed their satisfaction with the session, remarking that it provided the chance to learn of job and career opportunities in the environmental field as well as network with others in attendance.

In addition to a career expo, various speakers gave presentations throughout the day. Opening remarks were given by **Rodney White** (then Director of IES), followed by seven diverse, inspirational and informative talks by **Ray Clement** (Ministry of the Environment), **John Ferguson** (Environmental Commissioner's Office of Ontario), **Michelle McCulloch** (Innovest Strategic Advisors), **Joy Williams** (ICF Consulting), **Joel Pagnucco** (CCHREI), **Carole Burnham** (Independent Consultant) and **Rosalind Cooper** (Fasken Martineau Law). Speakers detailed their background and the paths that led them to their current career and encouraged students to explore all of their interests.

The day ended with an evening reception catered by the Afghani Women's Group and with remarks given by **Susan Pfeiffer**, Dean of the School of Graduate Studies.

The successful career expo of this year's Environmental Career Day, featured many exhibitors from government, consulting and environmental NGOs. (Photo: Nadia Hernandez Martinez.)

This year, Environmental Career Day could not have been possible without the dedication of the organizing committee and volunteers, as well as funding generously provided by the Division of the Environment, Division of Environmental Engineering, Faculty of Arts and Science, Institute for Environmental Studies, Department of Geography, University of Toronto at Scarborough, Environmental Students' Union, Faculty of Law, Faculty of Forestry, Office of the Vice-President and Provost, School of Graduate Studies, Innis College's Environmental Studies Program and University of Toronto Environmental Resource Network.

For information on Career Day 2006, please visit www.environment.utoronto.ca or contact Magdalene Garda, 416-978-3475, magdalene.garda@utoronto.ca

Graduate Students' Research

Environmental Studies Program

The following students were registered in the collaborative graduate Environmental Studies Program in 2004-05, noted below as ESP. Please see box below for 2004-05 alumni.

Paul Adjei, M.A., OISE/UT (Sociology & Equity Studies in Education)/ESP.
Robert Barwell, M.Ed., OISE/UT (Adult Education, Community Development and Counselling Psychology)/ESP. Course work only program.
Rachel Bryant, Ph.D., Philosophy/ESP.
Craig Butt, Ph.D., Chemistry/ESP; supervisors: Scott Mabury, Chemistry; Derek Muir, National Water Research Institute. *Neutral polyfluorinated organic compounds in biota*. ***(Recipient of Arthur and Sonia Labatt Fellowship, 2004-05; see page 19.)***
Anna Chase, Ph.D., OISE/UT (Curriculum, Teaching & Learning)/ESP; supervisor: Linda Cameron, OISE/UT. *Ocean immersion: an exploration of human relations with the aquatic world.*
Arden Court, M.Ed., OISE/UT (Curriculum, Teaching & Learning)/ESP; supervisor: Jack Miller, OISE/UT. *A vision of a school with an earth education focus.*
Jessica Currie, Ph.D., Chemistry/ESP; supervisor: Scott Mabury, Chemistry.
José Etcheverry, Ph.D., Geography/ESP; supervisor: Danny Harvey, Geography. *Renewable energy for productive uses: strategies to enhance environmental protection and the quality of rural life.*
Chris Gore, Ph.D., Political Science/ESP; supervisor: Richard Stren, Political Science. *Electricity, infrastructure and development in Uganda: The multilevel politics of process and provision.*
Isabelle Faucher, M.A., Geography/ESP; supervisor: Virginia Maclaren, Geography. *Mitigating industrial pollution in Vietnam: examining the impact of societal pressures.* ***(Recipient of Arthur and Sonia Labatt Fellowship, 2004-05; see page 19.)***

FOR MORE INFORMATION:
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or contact Magdalene Garda:
416-978-3475
magdalene.garda@utoronto.ca

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2004-05 Graduate Alumni

Congratulations to the following students who graduated from one of the two collaborative graduate programs offered at the Institute for Environmental Studies (now Centre for Environment, noted below as CFE).

Environmental Studies Program

(noted below as ESP)

Sugako Amasaki, M.I.St. June 2005, Information Studies/ESP. *Course work only program.*
Martha Barriga, M.A. November 2004, OISE/UT (Adult Education, Community Development and Counselling Psychology)/ESP; supervisor: Daniel Schugurensky, OISE/UT. *Transformative learning and informal environmental education: the case of community gardens.*
Xiaojuan (Yvonne) Feng, M.Sc. June 2005, Geography, Scarborough/ESP; supervisor: Myrna Simpson, Physical and Environmental Sciences, UT Scarborough. *Humic acid conformation on clay surfaces and its influence on phenanthrene sorption*.
Christopher Filler, M.Ed. November 2004, OISE/UT (Adult Education, Community Development and Counselling Psychology)/ESP; supervisor: Daniel Schugurensky, OISE/UT. *Course work only program.*
Tamar Heisler, M.A. November 2004, Political Science/ESP; supervisor: Richard Stren, Political Science. *Course work only program.*
Mary Kearny, M.Sc. November 2004, Geology/ESP. *Course work only program.*
Fareeha Khalid, M.I.St. November 2004, Information Studies/ESP. Course work program; research paper: *Toronto's waste management and decision making: a case study.*
Tanya Labencki, M.Sc. November 2004, Geography/ESP; supervisor: Miriam Diamond, Geography. *Characterization of washoff from urban impervious surfaces.*
Brian Milani, Ph.D. June 2005, OISE/UT (Adult Education, Community Development and Counselling Psychology)/ESP; supervisor: Ed O'Sullivan, OISE/UT. *Building materials in a green economy: community-based strategies for dematerialization.*
Theresa Pazionis, M.A. June 2005, Economics/ESP. Course work only program.
Nicki Simms, M.A. November 2004, Geography/ESP; supervisor: W. Scott Prudham, Geography/CFE. *Women's indigenous knowledge and community forest management in British Columbia: a case study with the Huu-ay-aht First Nation.*
Amar Wahab, Ph.D. November 2004, OISE (Sociology & Equity Studies in Education)/ESP; supervisor: Alissa Trotz, OISE/UT. *Inventing "Trinidad": Colonial Representations in the Nineteenth Century.*
Levi Waldron, Ph.D. June 2005, Forestry/ESP; supervisor: Paul Cooper, Forestry. *Diffusion modeling of the leaching of inorganic wood preservatives from pressure-treated wood.*
Bob Willard, Ph.D., OISE/UT June 2005, OISE/UT (Adult Education, OISE/UT)/ESP; supervisor: J. Gary Knowles, OISE/UT. *Drivers of corporate commitment to sustainability and inhibiters to overcome: the importance of a compelling business case.*

Environment & Health Program

(noted below as EHP)

Ahmed Al-Yami, M.H.Sc. June 2005, Community Health (Public Health Sciences)/EHP. *Course work only program in Occupational and Environmental Health.*

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James Gray-Donald, Ph.D., OISE/UT (Adult Education, Community Development and Counselling Psychology)/ESP; supervisor: Edmund O'Sullivan, OISE/UT. *The environmental missionary: a narrative of humility (experiences of facilitation and change within a novel environmental education program in El Agustino, Lima, Peru).* ***(Recipient of Arthur and Sonia Labatt Fellowship, 2004-05; see page 19.)***

Sarah Hartley, Ph.D., Political Science/ESP; supervisor Grace Skogstad, Political Science. *A comparison of policy responses to environmental risk: the case of agricultural biotechnology in Canada and the UK.*

Taina Kanerva, M.A., OISE/UT (Curriculum, Teaching & Learning)/ESP; supervisor: Erminia Pedretti, OISE/UT. *Developing eco-consciousness: a critical exploration of the Ontario Grade 12 Environment and Resource Management course.*

Sandy Kiang, M.A., Geography/ESP; supervisor: Danny Harvey, Geography. *Investigating the energy efficiency of buildings at the University of Toronto.* ***(Recipient of Arthur and Sonia Labatt Fellowship, 2004-05; see page 19.)***

Martin Kijazi, Ph.D., Forestry/ESP; supervisor: Shashi Kant, Forestry. *Evaluation of stakeholder's preferences and welfare positions in a multi-objective forest regime: a case of Mount Kilimanjaro.*

Sarah King, Ph.D., Religion/ESP; supervisor: Ingrid Stefanovic, Philosophy/CFE. *The religious dimensions of Canadian Environmental Conflict: the case of Burnt Church, New Brunswick.* ***(Recipient of Arthur and Sonia Labatt Fellowship, 2004-05; see page 19.)***

Kara Lefevre, Ph.D., Zoology/ESP; supervisor: Helen Rodd, Zoology. *Frugivory and disturbance: implications for tropical rainforest ecology.*

Anthony Liu, Ph.D., Physics/ESP; supervisor: Kent Moore, Physics. *Severe lake-effect snowstorm over the Great Lakes.*

Angela Loder, Ph.D., Geography/ESP; supervisor: Ted Relph, Geography, Scarborough. *The effect of integrating greenery into/around buildings on worker health, well-being, and productivity in the context of the ecological city.*

Silvia Mancini, Ph.D., Geology/ESP; supervisor: Barbara Sherwood Lollar, Geology. *Monitoring biodegradation of benzene in groundwater systems using carbon and hydrogen compound specific isotope analysis.*

Jennifer McKelvie, Ph.D., Geology/ESP; supervisor: Barbara Sherwood Lollar, Geology. *Elucidating methyl-tert butyl ether biodegradation pathways using compound specific isotope analysis.*

James McKenzie, Ph.D., OISE/UT (Adult Education, Community Development and Counselling Psychology/ESP; supervisor: Roxana Ng, OISE/UT.

Kate Moss, Ph.D., OISE/UT (Curriculum, Teaching & Learning)/ESP; supervisor: Dennis Thiessen (Acting), OISE/UT. *The role of education in ecological economics.*

Ernest Opoku-Boateng, Ph.D., Geography/ESP; supervisor: Rodney White, Geography. *Urban environmental finance in Canada: an analysis of opportunities and barriers to action.*

Erica Pinto, M.Sc.F., Forestry/ESP; supervisor: Sharon Cowling, Geography. *How important is water recycling in Amazonian lowland forests to Andean cloud forests?*

Preeti Ramprasad, Ph.D., Forestry/ESP; supervisors: D.N. Roy, Forestry/Rodney White, Geography. *Exploring the impacts of transportation infrastructure development on local forest ecosystems in the Niagara Escarpment, Ontario.*

Andrea Reid, M.Ed., OISE/UT (Adult Education, Community Development and Counselling Psychology)/ESP; supervisor: Roxana Ng, OISE/UT.
Course work only program.

Carolyn Richardson, Ph.D., Philosophy/ESP; supervisor: Ingrid Stefanovic, Philosophy. *Philosophy and language, including environmental philosophy.*

David Sider, Ph.D., Geography/ESP; supervisor: Virginia Maclaren, Geography. *Community based environmental management in India.*

Carolyn Webb, M.Ed., OISE/UT (Adult Education, Community Development and Counselling Psychology)/ESP. Coursework only program.

Environment and Health Program

The following students were registered in the collaborative graduate Environment and Health Program in 2004-05, noted below as EHP. Please see page17 for 2004-05 alumni.

Kate Bassil, Ph.D., Community Health (Public Health Sciences)/EHP; supervisor: Donald Cole, Public Health Sciences. *Syndromic surveillance for emerging infectious disease in urban settings.*

Melanie Grunier, M.H.Sc., Community Health (Public Health Sciences)/EHP; supervisor: Karin Domnick, Public Health Sciences. Course work only program in Occupational and Environmental Health.

Eva Musso, M.A., Geography/EHP; supervisor: Sarah Wakefield, Geography.
A media analysis of the portrayal of cancer prevention in the mainstream, Canadian daily print media.
(Recipient of Sperrin Chant prize in Toxicology, 2004-05; see page 19.)

Elizabeth Noble, M.A., Geography (UT Mississauga)/EHP; supervisor: Kathi Wilson, Geography, UT Mississauga. *Examining residents' perceptions of their environment and health in Malton neighbourhoods.*

Rachel Saldanha, M.H.Sc., Community Health/EHP; supervisor: James Scott, Public Health Sciences. *Bioaerosol sampling.*

Shehrina Tabassum, M.Sc., Medical Science/EHP; supervisor: Frances Silverman, Medicine. *Symptomatic responses in studies of controlled human exposures to concentrated ambient fine particles (CAP) and/or ozone (O3).* ***(Recipient of Arthur and Sonia Labatt Fellowship, 2004-05; see page 19.)***

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

Stephanie Wolfe, M.H.Sc., Community Health (Public Health Sciences)/EHP; supervisor: Donald Cole, Public Health Sciences. Course work only program in Community Health and Epidemiology.

Shelby Yamamoto, M.Sc., Community Health (Public Health Sciences)/EHP; supervisor: Donald Cole, Public Health Sciences. *A screening-level risk assessment of children exposed to chemical contaminants in Kampala, Uganda.* ***(Recipient of Krause, Langford and Brown prizes, 2004-05; see page 19.)***

Graduate environmental awards

Congratulations to the recipients of the following graduate environmental awards presented at Research Day on May 5, 2005. For informatoin on graduate awards, please contact Magdalene Garda, magdalene.garda@utoronto.ca, 416-978-3475. For information on undergraduate awards, please contact David Powell, david.powell@utoronto.ca, 416-946-8100.

George Burwash Langford Prize: This prize provides support and encouragement for student service and research at the Centre for Environment. This year, $350 was awarded to **Shelby Yamamoto**, a M.Sc. candidate in Public Health Sciences and the Centre for Environment's Environment and Health Program. Shelby was the President of the Graduate Environmental Students' Association in 2004-05 and is researching a screening-level risk assessment of children exposed to chemical contaminants in Kampala, Uganda.

John Brown Prize: This prize is awarded for the best applied research project dedicated to the analysis and improvement of occupational or environmental health to 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, $1000 was awarded to **Shelby Yamamoto** (see above).

Rodney White, former Director of IES, joins the latest recipients of the Arthur and Sonia Labatt Graduate Fellowships. From left: Shehrina Tabassum, Rodney White, Craig Butt, James Gray-Donald and Isabelle Faucher. (Absent: Sandy Kiang and Sarah King.)

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, $1500 was awarded to **Eva Musso**, a M.A. candidate in Geography and the Centre for Environment's Environment and Health Program. Her research paper is an analysis of the portrayal of cancer prevention in the mainstream, Canadian daily print media.

AIRG Graduate Research Paper Award: The Adaptation and Impacts Research Group (AIRG) of the Meteorological Service of Canada awards an annual prize of $500 for the best graduate student research paper addressing one or more of its research interests (please visit www.msc-smc.ec.gc.ca/airg). This year's recipient was **Elise Ho**, a Ph.D. candidate in the Department of Geography. Her paper was titled *Climate Change, Uncertainty, and Human Health in Urban Environments: Research and Approaches***.**

Arthur and Sonia Labatt Graduate Fellowships: These fellowships are awarded annually to graduate students at the Centre for Environment. Students were asked to submit a paper which explores practical based solutions to environmental issues and/or examines the marketplace for solutions to environmental issues. This year, six recipients were awarded $4000 each:
1. **Craig Butt**, Ph.D. candidate, Chemistry and Centre for Environment's Environmental Studies Program (CFE-ESP);
2. **Isabelle Faucher**, M.A. candidate, Geography and (CFE-ESP);
3. **James Gray-Donald**, Ph.D. candidate, OISE (Adult Ed) and (CFE-ESP); 4. **Sandy Kiang**, M.A. candidate, Geography and ESP;
5. **Sarah King**, Ph.D. candidate, Religion and ESP; and
6. **Shehrina Tabassum**, M.Sc. candidate, Medical Science and Centre for Environment's Environment and Health Program.

Inaugural graduate fellowship in Eric Krause's honour

The inaugural presentation of a graduate fellowship in honour of the late Eric Krause was held in March 2005. At a special reception, the fellowship was awarded to **Shelby Yamamoto**, a M.Sc. candidate in the Department of Public Health Sciences and the Centre for Environment's Environment and Health Program.

Eric Krause passed away in May, 2002 after a courageous battle with cancer. In 2003, Eric's former colleagues at the City of Toronto and the University of Toronto came together to establish a scholarship in his memory. While at U of T, Eric earned both a B.A. and a B.Sc., then completed a M.A. in 1997 in the Department of Geography and the Institute for Environmental Studies (now Centre for Environment). His M.A. research on *Ecological Footprints, Climate Change and Sustainable Development in the Greater Toronto Area* led to a job at the City of Toronto where he became an environmental planner, playing an important role in developing the City's environmental plan.

The inaugural recipient, **Shelby Yamamoto** is a former President of the Graduate Environmental Students' Association and is researching a screening-level risk assessment of children exposed to chemical contaminants in Kampala, Uganda.

At a special reception in March, 2005, Rodney White, former Director of the Institute for Environmental Studies presents M.Sc. candidate Shelby Yamamoto with the inaugural graduate fellowship in honour of the late Eric Krause.

FOR MORE INFORMATION
on these events and 2005-06 Seminars Series and Research Day, visit www.environment.utoronto.ca or contact Mona El-Haddad, 416-978-6526, m.elhaddad@utoronto.ca.

Environment Seminar Series

(Wednesdays, 4:00 p.m.)

The following seminars were presented in this series in 2004-05.

Charles Caccia, Former M.P. for Davenport and Minister of the Environment: *Politics and the elusive goal of sustainable development.*

Murray Charlton, Research Scientist, National Water Research Institute, Environment Canada: *From dead zones to alien invaders, what's happening in the Great Lakes?*

Tanuja Kulkarni, Landscape Hazards Sector Coordinator, Cdn Climate Impacts & Adaptation Research Network: *Impacts and adaptation to climate change: floods, drought, permafrost, landslides.*

Eric Miller, Professor, Department of Civil Engineering; University of Toronto: *(Un)Sustainable transportation in the Greater Toronto Area.* (Co-hosted by the Centre for Urban and Community Studies.)

Tom Muir, Former Senior Environmental Economist, Environment Canada: *The future of our water: essential to life and security, or emerging crisis?*

Linda Mortsch, Senior Impacts and Adaptation Researcher, Adaptation and Impacts Research Group, Meteorological Service of Canada: *Climate, nature, people: indicators of Canada's changing climate.*

Paul Muldoon, Executive Director, Canadian Environmental Law Association: *Addressing toxic substances: approaches and trends in Canadian law and policy.*

Graham Rempe, Senior Solicitor, City of Toronto Legal Services: *How green is my city? The role of municipal government in regulating the environment.*

Beth Savan, Director, University of Toronto Sustainability Office: *Students driving sustainability: energy conservation and the Kyoto Protocol come to U of T.* (Co-hosted by the new U of T Sustainability Office.)

André Sorensen, Assistant Professor, Dept. of Social Sciences, U of T at Scarborough: *Community-based neighbourhood improvement and development of civil society in Japan.* (Co-hosted by the Centre for Urban and Community Studies.)

Mark Winfield, Program Director, Pembina Institute: *Power for the future: energy efficiency and renewable energy in Ontario.*

Frank Wania, Assistant Professor, Dept. of Physical and Environmental Sci, U of T Scarborough: *Pollutants without borders: global organic contaminant transport*.

Environment and Health Seminar Series (Thursdays, 4:00 p.m.)

Offered jointly with the Gage Occupational and Environmental Health Unit.

The following seminars were presented in this series in 2004-05.

Ron Brecher, Principal, GlobalTox Toxicology Focused Solutions: *Hormesis: When a little means a lot.*

Jeffrey Brook, Senior Research Scientist, Meteorological Service of Canada: *Urban air pollution exposure and impacts: today and "The Day After Tomorrow".*

Miriam Diamond, Professor, Department of Geography, University of Toronto: *Tracing contaminant sources and potential health effects: the Toronto experience.*

Jay Keystone, Senior Staff Physician, Centre for Travel and Tropical Medicine, Toronto General Hospital: *It's the singer not the song...how to give an effective presentation*.

Irena Kudla, Clinical Occupational Hygienist, Dept. of Occupational & Environmental Health, St. Michael's Hospital: *Protecting hospital employees ("first-receivers") during mass casualty incidents.*

Bob Kusiak, Biostatistician, Professional and Specialized Services, Occupational Health and Safety Branch, Ontario Ministry of Labour: *Cardiovascular disease and dust exposure: what can be learned from hospital discharge records.*

Todd Latham, General Manager, EcoLog Information Resources Group, Toronto: *Brownfield redevelopment in Canada: urban healthcare.*

Robert Paehlke, Professor Environmental and Resource Studies Program, Trent University: *Environmentalism, sustainability and public health.*

Ron Stager, Environmental statistician and engineer, Environmental statistician and engineer, SENES Consultants, Richmond Hill, Ontario: *Emissions, dispersion and deposition modelng in environmental applications.*

Sarah Wakefield, Assistant Professor, Department of Geography, University of Toronto: *Researching urban health in Canada: problems and prospects.*

Mark Winfield of the Pembina Institute presents a seminar on the energy efficiency and renewable energy in Ontario as part of the Environment Seminar Series.

Research Day

Held annually in the spring, Research Day features research presentations by faculty and students of the Centre for Environment, as well as a presentation of graduate student awards. On May 5, 2005, the following research presentations were made. For a listing of graduate awards presented, please see page 19.

Virginia Maclaren, Assoc. Professor, Department of Geography *Willingness to pay for waste collection: a case study in Siem Reap, Cambodia*

Jennifer McKelvie, Ph.D. Candidate, Dept. of Geology/CFE Environmental Studies: *The impact of adding ethanol to gasoline on groundwater quality.*

Lino Grima, Assoc. faculty member, Dept.of Geography and CFE: *A global perspective on water valuation*

Kara Lefevre, Ph.D. Candidate, Zoology/CFE Environmental Studies: *How habitat disturbance affects ecosystem function: bird-fruit interactions in a Neotropical rainforest.*

Shelby Yamamoto, M.Sc. Candidate, Public Health Sciences/CFE Environment & Health: *A screening-level risk assessment of children exposed to chemical contaminants in Kampala, Uganda.*

James Gray-Donald, Ph.D. Candidate, Adult Education, Community Development and Counselling Psychology (OISE/UT)/CFE Environmental Studies: *The environmental missionary: andragogy, accompaniment and apologies of a northern researcher in the inner city of Lima, Peru.*

Environmental Finance Workshop Series

By Rodney White, former Director, Institute for Environmental Studies

Oct. 29, 2004 to March 31, 2005
University of Toronto

The last ten years have witnessed the emergence of a new environmental management strategy known as environmental finance, which can be defined as "a set of market-based instruments designed to deliver environmental quality and to transfer environmental risk". It includes the refinement of existing insurance products, the trading of emission reduction credits, the trading of renewable energy credits, and the development of new financial products -- such as weather derivatives and catastrophe bonds. The first successful market to prove the worth of this approach was the trading of SO_2 and NO_x emission reduction credits under the U.S. Clean Air Act, beginning in 1995. In January, 2005 the European Union began trading credits for greenhouse gas emission reductions. Markets for weather derivatives and catastrophe bonds have been growing slowly since their inception in the mid 1990s.

These innovations, however, are not widely understood outside the community that actually works with them. The former Institute for Environmental Studies (in partnership with U of T's Risk Management Institute) launched a series of half-day workshops in 2004-05 to encourage a wider appreciation of the applicability of this approach and to develop partnerships between the university and the business community.

1. October 29, 2004: *The Investor's Perspective on Environmental Finance*.
2. December 9, 2004: *Renewable and Clean Energy: Opportunities for Investors.*
3. January 20, 2005: *Disclosure of Material Environmental Exposures: What Should Investors Expect?*
4. March 31, 2005: *Emerging Risk Management Strategies and Solutions.*

2005-06 Workshops

Oct. 12, 2005 to May 4, 2006
University of Toronto

Following the success of the inaugural series in 2004-05, a new series of half-day workshops have been scheduled in 2005-06:

1. October 12, 2005: *Wind Power as investment: tomorrow's oil?*
2. January 19, 2006: *Sustainable Investing - will we reach a tipping point?*
3. April 20, 2006: *Beyond the Public Markets: Alternative Investments in the Environmental Economy*
4. May 4, 2006: *High Risk Sectors: Managing Emissions for Success*

For more information, please visit www.environmental-finance.utoronto.ca or contact Donna Workman, 416-978-7077, d.workman@utoronto.ca.

The Health, Social, and Economic Impacts of Climate Change

Nov. 30 to Dec. 1, 2004, Ottawa

By Douglas MacDonald, Senior Lecturer, Centre for Environment

Understanding the Nexus of Health, Social and Economic Impacts of Climate Change on Canadians was organized by Health Canada (Climate Change and Health Office), Canadian Climate Impacts and Adaptation Research Network -- Health Sector, and the three former units of the new Centre for Environment at the University of Toronto (Division of Environment, Institute for Environmental Studies and Innis College Environmental Studies Program).

Approximately 75 academics and government officials attended this two-day session on the current state of research on adaptation to climate change impacts in Canada. Fourteen papers were presented, addressing such topics as adaptation in northern, coastal and rural communities; the current state of northern aboriginal research; research on water-infrastructure and heat-wave preparedness in cities; archival newspaper clippings as a research method; and the impact of prenatal stress associated with the Quebec ice storm.

The workshop concluded with three over-view presentations, based on discussion over the two days and on interdisciplinary research.

A number of the papers will likely appear in an edited volume, to be published by the University of Toronto Press.

For more information, copies of papers and PowerPoint presentations, please visit www.utoronto.ca/envstudy/socioeconomic or contact Douglas MacDonald at douglas.macdonald@utoronto.ca.

The Natural City: Success Stories

Keynote speaker: Stephen Lewis
May 31 to June 2, 2006
University of Toronto

By Ingrid Leman Stefanovic, Director, Centre for Environment

The Centre for Environment will be hosting the second Natural City conference at the University of Toronto. Just as the first Natural City conference, held in 2004, this conference aims to rethink how urban and natural environments must be integrated to promote sustainability. However, the more targeted theme this time will be *Success Stories*. Too often, society has come to focus upon environmental failures but this international conference aims to promote awareness of sustainable solutions that have proven track records and that can serve as models for future progress.

The conference will support two days of invited speakers and panelists, including a Keynote Address by Stephen Lewis on the evening of May 31, 2006. In 2001, Mr. Lewis was appointed UN Secretary-General Kofi Annan's Special Envoy for HIV/AIDS in Africa. He is the Director of the Stephen Lewis Foundation, which is dedicated to easing the pain of HIV/AIDS in Africa. Mr. Lewis is also the Commissioner for the World Health Organization's Commission on the Social Determinants of Health. In 2003 Macleans chose Mr. Lewis as their inaugural Canadian of the Year and in 2005 he was named one of the 100 Most Influential People In The World by TIME.

The third day will offer five, full-day workshops, led by expert instructors on themes ranging from green buildings to principles of environmental education.

For more details, please visit: www.environment.utoronto.ca/NaturalCity or email natural.city@utoronto.ca.

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Upcoming Events

Please visit www.environment.utoronto.ca for information on these and other events.

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Environment and Health Seminar Series

Thursdays, 4:00 p.m.

Environmental Finance Workshop Series

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January 19, 2006	*Sustainable Investing: Will We Reach a Tipping Point?*
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