



UNIVERSITY OF
SASKATCHEWAN

School of Environment
and Sustainability

Annual Report 2011-2012

Cover photographs, clockwise from top left:

Dr. Julia Baird with her PhD supervisor, Dr. Ken Belcher. Julia successfully defended her PhD dissertation in 2012, and was the first SENS student to do so.

Students from SENS represent the U of S at the Invitational Drought Tournament, hosted by Agriculture and Agri-food Canada. The U of S team won the tournament.

Northern Elder-in-Residence Randall Tetlichy visited the School in autumn 2011.

MSEM student Branimir Gjetvaj discusses his poster at the annual ENVS 992 proposal symposium in March 2012.

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The School of Environment and Sustainability – Five Years On

On July 1, 2012, the School of Environment and Sustainability (SENS) at the University of Saskatchewan marked its fifth anniversary, and with it, ended another year of “firsts.” Experiential field components were added to two core courses. SENS’ first PhD candidate to defend her dissertation, Julia Baird, did so successfully. The School hosted its first “in residence” visit when Northern Elder-in-Residence Randall Tetlichy spent a few weeks sharing his knowledge and perspectives with SENS and the wider campus community.

The School continued to grow during 2011/12, with the addition of several new faculty affiliated with the Global Institute for Water Security: Assistant Professor Helen Baulch, and Associate Professors Karl-Erich Lindenschmidt and Naveed Khaliq. Assistant Professor Tim Jardine joined SENS with an affiliation with the Toxicology Centre. The School expanded its staff complement as well, with Charlotte Hampton taking a 0.5 FTE position as Financial and Administrative Assistant.

Working with Great Places, the City of Saskatoon, and the U of S Office of Sustainability, SENS hosted a visit from University of British Columbia’s John Robinson, Executive Director of the UBC Sustainability Initiative. Dr. Robinson gave a well-attended public lecture, and spoke to senior university and city officials, and to students.

After many successful research collaborations, SENS signed a Memorandum of Understanding with the Redberry Lake Biosphere Reserve. This partnership will allow SENS students and faculty to conduct research in the biosphere reserve, and gives the biosphere reserve’s personnel access to faculty and student expertise at SENS. This MOU will no doubt enhance the already strong partnership between SENS and the Redberry Lake Biosphere Reserve.

Vision

We will create and integrate multiple understandings of natural and human environments and be internationally known for innovative, provocative, and wide-ranging approaches to environmental sustainability.

Mission

We enable sustainable communities and environments through collaborative research and teaching, graduate student engagement, and community involvement. We broaden understanding and develop champions of environmental sustainability by creating, exchanging, and translating knowledge using diverse perspectives.

Core Values

As a School, we value:

- Scholarly dialogue and debate regarding environment and sustainability
- Interdisciplinary and transdisciplinary scholarship
- Innovation and academic excellence among students and faculty
- Student growth and success
- Systems and holistic approaches to environmental sustainability
- Working on a variety of spatial and temporal scales
- Collaboration in teaching, research, and engagement
- Consultative and cooperative decision-making
- Respectful and substantive engagement with wide communities
- Inclusion of different ways of knowing
- Supporting sustainable and healthy communities and environments
- Making a difference through public discourse, deliberative processes, and informed citizenship
- Leading by example through attention to our own environmental footprint

Programs Offered

The School of Environment and Sustainability offers three graduate programs:

- **Master of Sustainable Environmental Management (MSEM):** an interdisciplinary, course-based, professional-style program that can be completed in one year of full-time study. Students enrolled in this program are required to complete 24 credit units of course work and a 6 credit unit service learning project, and to participate in the Seminar in Environment and Sustainability. This program is intended to provide prospective or current environmental practitioners a post-graduate learning opportunity in sustainable environmental management.
- **Master of Environment and Sustainability (MES):** an interdisciplinary, thesis-based program that can be completed in two years of full-time study. Students enrolled in this program are required to complete 12 credit units of course work and a thesis based on original research, and to participate in the Seminar in Environment and Sustainability.
- **Doctor of Philosophy (PhD):** an interdisciplinary, research-based program that can be completed in three years of fulltime study. Students enrolled in this program are required to complete a qualifying examination, 6 credit units of course work, a

comprehensive examination, and a dissertation based on original research, and to participate in the Seminar in Environment and Sustainability.

Courses

The following courses were offered by the School of Environment and Sustainability during the 2011-2012 academic year.

Core Courses

ENVS 801.3 Ecosystem Science and Sustainability

Instructors: Vladimir Kricsfalusy and Christy Morrissey

An introduction to how principles and concepts of ecology and ecosystems science are applied to advance environmental sustainability. Students will gain a solid understanding of how natural systems function, and how scientists apply their understanding and uncertainties about ecosystems to address environmental management problems and to advance environmental sustainability.

ENVS 802.3 Human Dimensions of Environmental Change

Instructor: Doug Clark, Marcia McKenzie, Joe Schmutz and Marie-Ann Bowden

This course explores the past and present interactions between people and the natural world. It addresses ways that environment has molded human societies and ways that people have altered nature. Contemporary concerns for environmental sustainability are introduced by examining human entanglement with a range of natural and modified systems.

ENVS 803.3 Research in Environment and Sustainability

Instructors: Bram Noble and Cherie Westbrook, Department of Geography and Planning, College of Arts and Science

The purpose of this course is to introduce graduate students to conceptual, practical, and ethical issues in conducting interdisciplinary research about environment and sustainability. By the end of the course, students will have a research plan from which their proposal and research activities can be developed.

ENVS 804.3 Decision-Making for Environment and Sustainability

Instructors: Douglas Clark and MJ Barrett

Intended to enhance students' professional and scholarly effectiveness, this course introduces an interdisciplinary approach to environmental conservation problems (from the policy sciences) that enables them to critically appraise and constructively engage with environmental and sustainability policy processes, and develop functional understanding of conventional institutional approaches to environmental management and new emergent approaches.

ENVS 805.3 Environmental Data Analysis and Management

Instructors: Bing Si, Andrew Ireson, Bethany Haalboom and Merle Massie

Environmental data management is complex because of its volume, qualitative and quantitative forms, and temporal and spatial characteristics. This course introduces students to statistical, qualitative, and visual methods of problem solving and data reduction and representation, and describes methods for managing large and complex data sets.

ENVS 990 Seminar in Environment and Sustainability

Co-ordinator: Paul Jones

The ENVS 990 Seminar Series features topics relevant to environment and sustainability. In addition to speakers from a variety of academic and non-academic backgrounds, MES and PhD students are required to present their research in the seminar.

ENVS 992.6 Project in Environment and Sustainability

Required For MSEM Program

ENVS 994 Research in Environment and Sustainability (Thesis)

Required For MES Program

ENVS 996 Research in Environment and Sustainability (Dissertation)

Required for PhD Program

Restricted Electives

ENVS 811.3 Multiple Ways of Knowing in Environmental Decision-making

Instructor: MJ Barrett

This course examines multiple ways of knowing (epistemologies) used in environmental decision-making, including, but not limited to, Aboriginal knowledge systems. The course supports active engagement with epistemological difference, and asks students to examine their own decision-making beliefs and practices in the context of colonization. Applications to the legal "duty to consult" with Aboriginal peoples, in particular where they are affected by decisions made in relation to public lands, waters, and other resources will be addressed.

ENVS 831.3 Current Issues in Land Reclamation and Remediation

Instructor: Charles Maulé

Current issues in land reclamation and remediation are examined. The impact of human activity in a variety of environments is examined and strategies for reclamation and remediation are investigated. Biophysical factors are the emphasis of the course, however the context of social and economic issues are incorporated.

ENVS 898.3 Biodiversity Conservation and Sustainability

Instructor: Vladimir Kricsfalusy

This course is designed to introduce students, in an integrative manner, to the field of biodiversity conservation and various aspects of sustainable development. Understanding biodiversity and its management requires an interdisciplinary approach with particular reference to mechanisms of change and human impacts on the environment.

ENVS 898.3 Resource and Environmental Policy Analysis

Instructor: Ken Belcher

This course is cross-listed with the Department of Bioresource Policy, Business, and Economics.

This course focuses on developing a formal understanding of natural resource use and resource and environmental policy using economic models. The focus of the course will be on renewable resources with some consideration of the unique characteristics of non-renewable resources. The course will develop detailed analyses of existing and proposed natural resource and environmental policy using the economic framework to evaluate the structure, efficiency, effectiveness and flexibility of these policies.

ENVS 898.3 Legal Issues and the Environment

Instructor: Marie-Ann Bowden

Designed for graduate students, particularly in the areas of Engineering, Agriculture, Resources and Environmental Studies with no legal background. This course explores the legal aspects of environmental protection, environmental offences, constitutional law, environmental impact assessment, environmental audit and professional responsibility in relation to environmental advice and decision-making.

Other Electives

ENVS 898.3 Chemicals in the Environment

Instructor: Paul Jones

This course will supply the student with an understanding of the processes that control the movement of organic and inorganic contaminants in the environment. The structure and uses of monitoring programs to evaluate environmental contamination, and temporal and spatial trends in chemical contamination will be discussed. Local and global methods for chemical regulation and management will be addressed in the context of society and economics. Finally, the use of modeling methods to predict the environmental fate and effects of chemical contaminants will be presented.

ENVS 898.3 Introductory Numerical Modeling for Environmental Scientists

Instructor: Andrew Ireson

The purpose of this course is to provide graduate students with a set of modeling skills to allow them to develop their own numerical models to solve problems of coupled flow and transport in porous media. The course requires a basic understanding of groundwater flow and transport processes. A particular set of numerical methods for solving sets of partial differential equations are introduced to the student. Models are written in MATLAB using ODE solvers. Specific applications include models for water supplies in aquifers, contamination in aquifers, and water and energy balances in soils. This will also provide the student with an in-depth understanding of widely used commercial and non-commercial software such as USGS MODFLOW. The models help the student to think through the physical processes and interpret field data.

ENVS 898.3 Environmental Issues and Negotiations

Instructors: Paul Jones and Markus Hecker

This course aims to help students develop a comprehensive understanding of the interdisciplinary nature of environmental issues, and will teach them the roles that science and society have in the assessment and management of such issues. The class will elucidate the perspectives of the different stakeholders such as government, industry, scientists, lawyers, lobbyists, etc. that are typically involved in the assessment and management of environmental issues. It will be taught in an open format using classic (e.g. lectures by instructors and guest speakers) and interactive (group discussions/negotiations; student projects) elements.

ENVS 898.3 Sustainability Case Studies

Instructors: Joe Schmutz

The course goal is to use critically-constructive interdisciplinary analysis in a case-studies framework to allow students to recognize and “learning-from-the-past” to be able to influence future forces that may enhance or detract from achieving sus-

tainability. Studies can address products (DDT, wind turbines), management approaches (improving energy efficiency, forest-stewardship certification), or personal or community-wide initiatives (community-supported agriculture, doctors without borders).

ENVS 898.3 Multi-Level Environmental Governance

Instructors: Maureen Reed and Jeremy Rayner, Johnson-Shoyama Graduate School of Public Policy

This course examines theoretical and practical issues associated with defining, describing and evaluating environmental governance at multiple scales. We identify a range of environmental problems and consider various actors, institutional forms, and ideas about governance that shape environmental policies and practices, particularly in Western contexts.

ENVS 990: Seminar in Environment and Sustainability

- ❖ Social Entrepreneurship: Balancing Social and Profit Objectives. Lee Swanson and David Zhang, Department of Management and Marketing, Edwards School of Business, September 16, 2011.
- ❖ Indigenous Peoples and Protecting Land and Environment: Law as Burden or Benefit. Mary Eberts, College of Law, September 23, 2011.
- ❖ Northern Voices, Southern Choices: Water Policy Lessons for Saskatchewan from the Leading Edge of Canadian and World Examples. Bob Sandford, EPCOR Chair of the Canadian Partnership Institute Initiative in support of the United Nations “Water for Life” Decade, October 7, 2011.
- ❖ Traditional Knowledge and the Environment, Part I. Randall Tetlich, Northern Elder-in-Residence, October 28, 2011.
- ❖ Traditional Knowledge and the Environment, Part II. Randall Tetlich, Northern Elder-in-Residence, November 4, 2011.
- ❖ Is Sustainable Development an Oxymoron? Lynn Oliphant, Professor Emeritus in Veterinary Biomedical Sciences, November 18, 2011.
- ❖ Oil Sands Development: The Good, the Bad and the Ugly of the Science and Policy of a Natural Resource. John Giesy, Canada Research Chair in Environmental Toxicology, November 25, 2011.
- ❖ Is Livestock Production for the Birds: Linking Ranchers, Range Health and Grassland Songbird Abundance. Allison Henderson, PhD Candidate; Examining the Effects of a Participatory, Action-Based Environmental Education Program on Saskatoon Families. Shannon Dyck, MES Candidate; Simultaneous Denitrification and Desulfurization Using Elemental Sulfur and Hydrogen Sulfide. Yimin Sun, MES Candidate, December 2, 2011.
- ❖ Modelling as a Tool for Decision-Making for Sustainable Water Security. Andrew Ireson, January 6, 2012.
- ❖ Sustainability Leadership Skills: Addressing the Challenges at Our Post-Secondary Institutions. Geoff Scott, University of Western Sydney, January 13, 2012.
- ❖ Relearning Our Roots: Youth Participatory Research, Indigenous Knowledge, and Sustainability Through Agriculture. Jean Kayira, PhD Candidate; From Partnership to Action: Building Respectful Research Partnerships with First Nations Communities. Lalita Bharadwaj, School of Public Health, January 20, 2012.
- ❖ Mining MNEs, Communities of Place and the Informal Economy: Implications for Entrepreneurship and Poverty Alleviation in Developing Countries. Aloysius Newenham-Kahindi, Edwards School of Business, January 27, 2012.
- ❖ SENS Associate and Adjunct Panel: David Natcher, Angela Bedard-Haughn, Chelsea Willness, and John-Mark Davies. February 3, 2012.
- ❖ SENSSA Panel: Dara Hrytzak-Lieffers, Cameco; Sharla Guinan, PotashCorp; Debbie Nielsen, SaskPower; and, Geoff Waters, Go Green Fund, February 10, 2012.
- ❖ Toward a Sustainability Assessment Tool for Small Town Planning. Viktoriya Zamchevska, MES Candidate; Selecting Valued Ecosystem Components for Cumulative Effects in Road Construction Projects. Ayodele Olagunju, MES Candidate; Investigating the Impact of Tar Sand Excavation on Some Fish Species in the Athabasca and Slave Rivers. Ehimai Ohiozebau, PhD student, February 17, 2012.
- ❖ Environmental Career Panel: Karl-Erich Lindenschmidt; Peter Goode, Stantec; Allyson Brady, Saskatchewan Environmental Society, March 2, 2012.
- ❖ ENVS 992: Project in Environment and Sustainability Proposal Symposium, March 9, 2012.
- ❖ Layered vs. Non-Layered: Water Storage and Stability of Water Flow in Coarse-Textured Reclamation Covers. Yekaterina Dobrovolskaya, MES Candidate, March 16, 2012.
- ❖ Next Generation Sustainability at UBC. John Robinson, The University of British Columbia, March 23, 2012.
- ❖ Sustainable Energy Futures: Towards an Integrated Strategic Environmental Assessment Process for Energy Planning. Lisa White, PhD Candidate; Collaboration between Researchers and Biosphere Reserve Practitioners: A Case Study of the Redberry Lake Biosphere Reserve, Canada. Oksana Zbyranyk, MES Candidate; Fulfilling Sustainable Development Principles: Lessons Learned from O.U.R. Ecovillage. Iryna Zamchevska, MES Candidate, March 30, 2012.

People

Administration

- ❖ **Karsten Liber** (BSc, Guelph; PhD, Guelph), Executive Director (to December 31, 2011)
- ❖ **Maureen Reed** (BSc, Victoria; MA, Toronto; PhD, Waterloo), Assistant Director – Academic (to December 31, 2011); Acting Executive Director (January 1 – July 31, 2012)

Faculty

Standard Appointments

- ❖ **Helen Baulch**, Assistant Professor (BSc, Waterloo; MSc, Alberta; PhD, Trent) (started November 2011)
- ❖ **Douglas Clark**, Assistant Professor and Centennial Chair in Human Dimensions of Environment and Sustainability (BSc, Victoria; MSc, Alberta; PhD, Wilfrid Laurier)
- ❖ **Markus Hecker**, Associate Professor and Canada Research Chair in Predictive Aquatic Ecotoxicology (Diploma (MSc Equivalent), Hamburg; PhD, Hamburg)
- ❖ **Tim Jardine**, Assistant Professor (BSc, Dalhousie; MSc, New Brunswick; PhD, New Brunswick) (started January 2012)
- ❖ **Paul Jones**, Associate Professor (BSc, Otago; PhD, Otago)
- ❖ **Naveed Khaliq**, Associate Professor (BSc, University of Agriculture, Faisalabad; ME, Asian Institute of Technology; MSc, National University of Ireland; PhD, National University of Ireland) (started January 2012)
- ❖ **Vladimir Kricsfalusy**, Associate Professor (MSc, Uzhgorod; PhD, Uzhgorod and the Academy of Sciences of Ukraine)
- ❖ **Karsten Liber**, Professor (BSc, Guelph; PhD, Guelph)
- ❖ **Karl-Erich Lindenschmidt**, Associate Professor (BSc, Manitoba; MAsC, Toronto; PhD, Technical University of Berlin) (started February 2012)

Primary Joint Appointments

- ❖ **MJ Barrett**, Assistant Professor (BAS, Harvard; BEd, Queen's; MES, York; PhD, Regina) (51% SENS; 49% Department of Curriculum Studies, College of Education)
- ❖ **Andrew Ireson**, Assistant Professor (MEng, Bath; MSc, Imperial College London; PhD, Imperial College London) (70% SENS; 30% Department of Civil and Geological Engineering, College of Engineering)
- ❖ **Maureen Reed**, Professor (BSc, Victoria; MA, Toronto; PhD, Waterloo) (70% SENS; 30% Department of Geography and Planning, College of Arts and Science)
- ❖ **Howard Wheeler**, Professor and Canada Excellence Research Chair in Water Security (MA, Cambridge; PhD, Bristol) (70% SENS, 30% Department of Civil and Geological Engineering, College of Engineering)

Secondary Joint Appointments

- ❖ **Ken Belcher**, Associate Professor (BSA, Manitoba; MNRM, Manitoba; PhD, Saskatchewan) (30% SENS; 70% Department of Bio-resource Policy, Business, and Economics, College of Agriculture and Bioresources)
- ❖ **Marie-Ann Bowden**, Professor (BA, Mount Allison; LLB, Queen's; LLM, Osgoode Hall) (25% SENS, 75% College of Law)
- ❖ **Geoff Cunfer**, Associate Professor (BA, North Carolina; MA, Texas Tech; PhD, Texas) (25% SENS; 75% Department of History, College of Arts and Science)
- ❖ **Charles Maulé**, Professor (BSc, British Columbia, MSc, Alberta; PhD, Alberta) (33% SENS; 67% Department of Chemical and Biological Engineering, College of Engineering)
- ❖ **Marcia McKenzie**, Assistant Professor (BSc, British Columbia; MEd, Brock; PhD, Simon Fraser) (25% SENS; 75% Department of Educational Foundations, College of Education)
- ❖ **Christy Morrissey**, Assistant Professor (BSc, British Columbia; PhD, Simon Fraser) (30% SENS, 70% Department of Biology, College of Arts and Science)
- ❖ **Bram Noble**, Professor (BA, Memorial; MES, Wilfrid Laurier; PhD, Memorial) (30% SENS; 70% Department of Geography and Planning, College of Arts and Science)
- ❖ **Bing Si**, Professor (BSc, Hebei Agricultural; MSc, Hebei Agricultural; PhD, Guelph) (30% SENS; 70% Department of Soil Science, College of Agriculture and Bioresources)

Associate Faculty

- ❖ **Angela Bedard-Haughn**, Associate Professor (BSc, Saskatchewan; MSc, Saskatchewan; PhD, California-Davis), Department of Soil Science, College of Agriculture and Bioresources
- ❖ **Scott Bell**, Professor (BEd, British Columbia; MA, California-Santa Barbara; PhD, California-Santa Barbara), Department of Geography and Planning, College of Arts and Science

- ❖ **Lalita Bharadwaj**, Associate Professor (BSc, Saskatchewan; MSc, Saskatchewan; PhD, Saskatchewan), School of Public Health
- ❖ **Ryan Brook**, Assistant Professor (BSc, Manitoba; MNRM, Manitoba; PhD, Manitoba), Department of Animal and Poultry Science, College of Agriculture and Bioresources
- ❖ **Rachel Engler-Stringer**, Assistant Professor (BSc, Montreal; PhD, Saskatchewan), Department of Community Health and Epidemiology, College of Medicine
- ❖ **Jill Gunn**, Assistant Professor (BA, Saskatchewan; MSc, Northern British Columbia; PhD, Saskatchewan), Department of Geography and Planning, College of Arts and Science
- ❖ **Hayley Hesselin**, Associate Professor (BComm, Saskatchewan; PhD, Colorado), Department of Bioresource Policy, Business, and Economics, College of Agriculture and Bioresources
- ❖ **Suren Kulshreshtha**, Professor (BSc, Agra; MSc, Agra; PhD, Manitoba), Department of Bioresource Policy, Business, and Economics, College of Agriculture and Bioresources
- ❖ **Ted Leighton**, Professor (AB, Cornell; DVM, Saskatchewan; PhD, Cornell; DACVP), Department of Veterinary Pathology, Western College of Veterinary Medicine
- ❖ **Yen-Han Lin**, Professor (BSc, National Taiwan Institute of Technology; PhD, Rensselaer Polytechnic Institute), Department of Chemical Engineering, College of Engineering
- ❖ **David Natcher**, Associate Professor (BA, Alberta; MA, Alaska; PhD, Alberta), Department of Bioresource Policy, Business, and Economics, College of Agriculture and Bioresources
- ❖ **Mehdi Nemati**, Professor (BSc, Amirkabir; MSc, Amirkabir; PhD, Manchester), Department of Chemical Engineering, College of Engineering
- ❖ **Aloysius Newenham-Kahindi**, Associate Professor (BA, Pontifical Urbaniana University; MSc, University College Dublin; PhD, University College Dublin), Department of Human Resources and Organizational Behaviour, Edwards School of Business
- ❖ **Robert Patrick**, Assistant Professor (BA, British Columbia; BEd, Dalhousie; MA, Simon Fraser; PhD, Guelph), Department of Geography and Planning, College of Arts and Science
- ❖ **Greg Poelzer**, Associate Professor (BA, Alberta; MA, Carleton; PhD, Alberta), Department of Political Studies, College of Arts and Science
- ❖ **Elizabeth Robertson**, Assistant Professor (BSc, Alberta; MA, Queen's; PhD, Alberta), Department of Archaeology and Anthropology, College of Arts and Science
- ❖ **Vladimir Vujanovic**, Associate Professor (BSc, Zagreb; MSc, Belgrade; PhD, Belgrade), Department of Food and Bioproduct Sciences, College of Agriculture and Bioresources
- ❖ **Bill Waiser**, Professor (BA, Trent; MA, Saskatchewan; PhD, Saskatchewan), Department of History, College of Arts and Science
- ❖ **Ryan Walker**, Associate Professor (BA, Lethbridge; MA, Waterloo; PhD, Queen's; MCIP), Department of Geography and Planning, College of Arts and Science
- ❖ **Clinton Westman**, Assistant Professor (BA, Calgary; MES, York; PhD, Alberta), Department of Archaeology and Anthropology, College of Arts and Science
- ❖ **Chelsea Willness**, Assistant Professor (BA, Saskatchewan; MSc, Calgary; PhD, Calgary) Department of Human Resources and Organizational Behaviour, Edwards School of Business

Adjunct Faculty

- ❖ **Murray Bentham** (BSc, Saskatchewan; MSc, Saskatchewan; PhD, Saskatchewan), Agriculture and Agri-Food Canada
- ❖ **Biplob Das** (BSc, Chittagong; MSc, Chittagong; MSc, Alberta; PhD, Victoria), Saskatchewan Environment
- ❖ **John Mark Davies** (BSc, Saskatchewan; MSc, Manitoba; PhD, Victoria), Saskatchewan Watershed Authority
- ❖ **Annette Desmarais** (BA, Simon Fraser; MA, Sussex; PhD, Calgary), Department of Justice Studies, University of Regina
- ❖ **Steven Franklin** (BES, Waterloo; MA, Waterloo; PhD, Waterloo), Trent University
- ❖ **Monique Haakensen** (BSc, Saskatchewan; PhD, Saskatchewan), Contago Strategies
- ❖ **Andrew Harwood** (BSc, Edinburgh; PhD, Glasgow), Ecofish Research
- ❖ **Michael Hill** (BSc, North Carolina State; MSc, Eastern Kentucky; PhD, Western Ontario), Golder Associates
- ❖ **Mark Johnston** (BSc, Minnesota; MSc, Alberta; PhD, SUNY), Saskatchewan Research Council
- ❖ **Carrie Rickwood** (BSc, Essex; MRes, Plymouth; PhD, Saskatchewan), Natural Resources Canada
- ❖ **Richard Roberts** (BSc, Victoria; MSc, Waterloo; PhD, Rhodes), Environment Canada
- ❖ **Joe Schmutz** (BSc, Wisconsin; MSc, Alberta; PhD, Queen's; BEd, Saskatchewan), Prairie Ecodesign
- ❖ **Judit Smits** (BSc, Guelph; DVM, Ontario Veterinary College; MVetSc, Saskatchewan; PhD, Saskatchewan), University of Calgary

- ❖ **Garth van der Kamp** (BSc, British Columbia; MSc, British Columbia; PhD; Free University, The Netherlands), National Hydrology Research Institute, Environment Canada
- ❖ **Marley Waiser** (BSc, Trent; MSc, Saskatchewan; PhD, Napier)
- ❖ **Elaine Wheaton** (BSc, Saskatchewan; MSc, Saskatchewan; PhD, Saskatchewan)

Sessional Lecturers

- ❖ **Bethany Haalboom** (BA, McMaster; MA, McMaster; PhD, Duke)
- ❖ **Merle Massie** (BA, Saskatchewan; MA, Saskatchewan; PhD, Saskatchewan)
- ❖ **Joe Schmutz** (BSc, Wisconsin; MSc, Alberta; PhD, Queen's; BEd, Saskatchewan)

Staff

- ❖ **Sharla Daviduik** (BSc, Saskatchewan; MRM, Simon Fraser, EPT), Administrative Officer
- ❖ **Charlotte Hampton**, Financial and Administrative Assistant (*started March 2012*)
- ❖ **Meagan Hinthier** (BSc, McGill), Communications Specialist
- ❖ **Twyla Rudovica** (BComm, Saskatchewan; CMA), Financial Officer
- ❖ **Irene Schwalm** (BAC, Saskatchewan), Graduate Secretary

Students

An asterisk indicates that the student completed program requirements during the 2011-2012 year.

Master of Sustainable Environmental Management

- ❖ **Kingsley Ahey**, BSc, Kwame Nkrumah University of Science and Technology*
- ❖ **Cynthia Avila**, BSS, Ottawa*
- ❖ **Graham Barber**, BA, Calgary*
- ❖ **Kirk Bors**, BA, University of Saskatchewan
- ❖ **Daniel Brent**, BComm, Ryerson*
- ❖ **Liu Cao**, BEcon, Nanjing University of Aeronautics and Astronautics*
- ❖ **Evelyn Cerda Acosta**, BA, Sonora*
- ❖ **Branimir Gjetvaj**, MSc, Dalhousie; PhD, Queen's
- ❖ **Charu Gupta**, BSc, Delhi*
- ❖ **Vanessa Hickey**, BA, Saint Mary's University
- ❖ **Elisa Hseih**, BSc, British Columbia*
- ❖ **Willem Kruger**, BSc, Saskatchewan
- ❖ **Anna Larson**, BPAPM, Carleton; MPA, Regina
- ❖ **Jennifer Locke**, BSc, Western; MES, Western
- ❖ **Jonathan Matson**, BA, Guelph
- ❖ **Ana Isabel Melgarejo Mendoza**, BSc, Universidad Iberoamericana
- ❖ **Jostein Misfeldt**, BSc, Saskatchewan*
- ❖ **Brittany Morgan**, BA, Vancouver Island University*
- ❖ **Natalie Nikiforuk**, BSc, Lethbridge*
- ❖ **Emmanuel Obgeide**, BSc, Benin; MSc, Nottingham
- ❖ **Darcy Paslawski**, BSc, Saskatchewan*
- ❖ **Elizaveta Petelina**, BSc, Moscow
- ❖ **Joshua Salisbury**, BA, Wilfrid Laurier
- ❖ **Al Scholz**, BSc, Saskatchewan; BEd, Saskatchewan
- ❖ **Sarah Turkeli**, BA, St. Francis Xavier*
- ❖ **Matthew Wolsfeld**, BSc, Saskatchewan*
- ❖ **Stephanie Woods**, BSc, Western Ontario*
- ❖ **Jesse Woodward**, BFA, Emily Carr*
- ❖ **Firas Younes**, BSc, Damascus
- ❖ **Xi (Cecilia) Zhao**, BA, Henan University, China

Master of Environment and Sustainability

- ❖ **Saima Abbasi**, MSc, NWRP Agricultural University, Pakistan



- ❖ **Kari Amick**, BSc, Wheaton College
- ❖ **Maya Basdeo**, BES, Waterloo
- ❖ **Dylan Beach**, BSc, Denison
- ❖ **Amanda Burke**, BSc, Saskatchewan
- ❖ **Jania Chilima**, BSc, Trent*
- ❖ **Chelsea Dale**, BA, Malaspina*
- ❖ **Shannon Dyck**, BA, Saskatchewan
- ❖ **Yekaterina Dobrovolskaya**, BE, Kazakh-British Technical University
- ❖ **Tobi Jeans**, BA, Memorial
- ❖ **Vijayalakshmi Kalagnanam**, BEd, Saskatchewan
- ❖ **John Kearns**, BA, Carleton*
- ❖ **Skye Ketilson**, BSA, Saskatchewan*
- ❖ **Vernon Kiss**, BA, Saskatchewan; LLB, Saskatchewan
- ❖ **Ayodele Olagunju**, BSc, Abafemi Awolowo University
- ❖ **Nargiz Rahimova**, BA, Baku State; MA, Yokohama National
- ❖ **Yimin Sun**, BSc, East China Normal University; MSc, East China Normal University*
- ❖ **Iryna Zamchevska**, BSc, Girne American University
- ❖ **Viktoriya Zamchevska**, BArch, Girne American University
- ❖ **Oksana Zbyranyk**, BSc, Girne American University

Doctor of Philosophy in Environment and Sustainability

- ❖ **Julia Baird**, BSc, Alberta; MSc, Saskatchewan*
- ❖ **Jania Chilima**, BSc, Trent; MES, Saskatchewan
- ❖ **Ranjan Datta**, BSS, Shahjalal University of Science and Technology; MSS, Monmouth; MSS, Shahjalal University of Science and Technology
- ❖ **Dennis Duro**, BA, British Columbia; MGIS, Calgary*
- ❖ **Colleen George**, BA, McMaster; BSc, McMaster; MES, Lakehead
- ❖ **Joshua Gibb**, BSc, Leeds; MSc, Leeds
- ❖ **Allison Henderson**, BSc, Saskatchewan; MSc, Simon Fraser
- ❖ **Matthew Hiltz**, BSc, Saskatchewan; MSEM, Saskatchewan
- ❖ **Jean Kayira**, BEd, Malawi; MA, Clark
- ❖ **Anson Main**, BA, Alberta; MLA, Toronto
- ❖ **Ehimai Ohiozebau**, BSc, Benin; MSc, Robert Gordon
- ❖ **Mayanin Sosa**, BA, Merida; MSc, Merida
- ❖ **Lindsay Tallon**, BSA, Saskatchewan; MSc, Saskatchewan
- ❖ **Aniekan Udofia**, BSc, Calabar; MSc, Saskatchewan
- ❖ **Arcadio Viveros Guzman**, MSc, Colegio de Postgraduados; MEd, Saskatchewan
- ❖ **Lisa White**, BSc, Saskatchewan; MSc, Saskatchewan

Post-Doctoral Fellows

- ❖ **Ryan Bullock**
- ❖ **Kwok Chun**
- ❖ **M. Reza Ghanbarpour**
- ❖ **Muluneh Mekonnen**
- ❖ **Merle Massie**
- ❖ **Uri Nachson**
- ❖ **Armelle Paule**
- ❖ **Jeffrey Sereda**
- ❖ **Graham Strickert**

Student Demographics

Admissions

Admissions statistics for 2011-2012 are summarized in the table below. One hundred eighty-six applications were received for the School's three graduate programs, with forty-nine offers of admission made. Twenty-four students accepted and began their studies at SENS in 2011-2012.

Table 1 - Admissions 2011/12							
Program	Applications Received	Offers of Admission	Transfers from Other Units	Total Offers of Admission and Transfers	New Students	Continuing Students	Total Number of Students
MSEM	80	29	0	29	13	17	30
MES	64	10	0	10	4	16	20
PhD	42	10	0	10	7	9	16
Total	186	49	0	49	24	42	66

The admission grade point averages for new students registering in the three programs in 2011-2012 were:

- MSEM – 78.1%
- MES – 82.6%
- PhD – 87.2%

To date, the average completion times for students at SENS are:

- MSEM – 1.21 years
- MES – 2.33 years
- PhD – 4.67 years

Students registered at SENS in 2011-2012 came to the School from around the world:

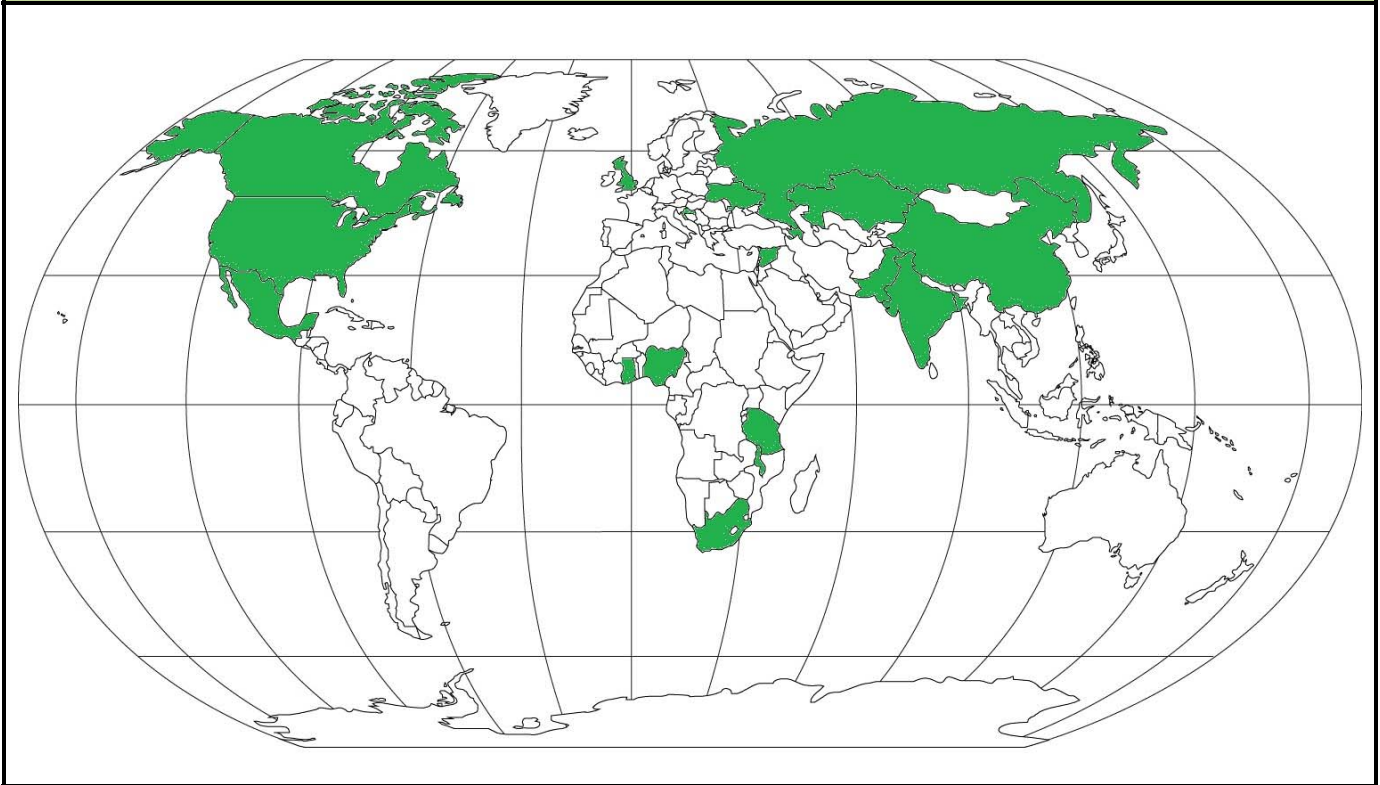
- 27.3% from Saskatchewan
- 27.3% from other provinces in Canada
- 45.5% from other countries

Nineteen countries were represented by SENS students during 2011/12:

- Azerbaijan
- Bangladesh
- Canada
- China
- Croatia
- Ghana
- India
- Kazakhstan
- Malawi
- Mexico
- Nigeria
- Pakistan
- Russia
- South Africa
- Syria
- Tanzania
- Ukraine
- United Kingdom
- United States of America



Figure 2 – Countries Represented by SENS Students, 2011-2012



Student Initiatives – SENSSA

SENSSA, the School of Environment and Sustainability Student Association, had another busy, productive year in 2011-2012, partnering on several events with SENS, with the University, and with the broader community. Within SENS, SENSSA organized a Christmas Party and developed the first official SENS clothing. SENSSA also organized an ENVS 990 seminar panel of representatives from government and major private corporations in Saskatchewan, including representatives from provincial government, SaskPower, PotashCorp, and Cameco. For World Water Day, SENSSA encouraged members of the SENS community to participate in the 25 L/day challenge. SENSSA was also pivotal in facilitating a student feedback session that was used for SENS' Curriculum Development Workshop in 2012. On campus, SENSSA helped to organize campus events for World Water Day and the Better than Bottled Group, comprised of SENS students, set up an information booth in the tunnel. SENSSA also partnered with the Office of Sustainability, SENS, the Environmental Studies' Students Association and other campus members to host a Carbonless Community Concert for Earth Hour that was open to the broader community.

SENSSA executive members for 2011-2012 were:

- President - Colleen George
- Vice-President - Vanessa Hickey
- Secretary - Willem Kruger
- Treasurer - Shannon Dyck
- Community Liaison - Emmanuel Ogbeide
- Campus Liaison - Ana Isabel Melgarejo
- Academic Liaison - Amanda Burke
- Webmaster - Kari Amick
- Social Coordinator - Jennifer Locke

Research and Scholarly Work

The following is a summary of the research and scholarly work of faculty holding standard, primary-joint, or secondary-joint appointments in the School of Environment and Sustainability during 2011-2012. While all research grants listed may not have been managed through the School, the research often involves SENS graduate students.

Name of researchers affiliated with SENS are bolded. These include core faculty, students, post-doctoral fellows, and staff.

Books, Chapters in Books, Expository and Review Articles

Butler, A.P., A.G. Hughes, C.R. Jackson, A.M. Ireland, S.J. Parker, **H.S. Wheeler**, and D.W. Peach. 2012. Advances in modelling groundwater behaviour in Chalk catchments. In: *Groundwater Resources Modelling: A Case Study from the UK*, Eds. M.G. Shepley, M.I. Whiteman, P.J. Hulme, and M.W. Grout, Geological Society, Special Publications, London, pp.113-127.

Elliott, J.E., C.A. Bishop, and **C.A. Morrissey**, Eds. 2011. *Wildlife Ecotoxicology: Forensic Approaches*. Springer.

Hu, W., A. Biswas, and **B.C. Si**. 2012. Scale-specific control of soil water storage using multivariate empirical mode decomposition. In: *Digital Soil Assessment and Beyond*, Eds. B. Minasny, B.P. Malone, and A.B. McBratney. CRC Press, London, pp. 139-144.

Morrissey, C.A. and J.E. Elliott. 2011. Toxic trees: arsenic pesticides, woodpeckers and the mountain pine beetle. In *Wildlife Ecotoxicology: Forensic Approaches*, Eds. J.E. Elliott, C.A. Bishop and C.A. Morrissey. Springer.

Noble, B.F. 2011. Environmental Impact Assessment. In: eLS 2011, John Wiley & Sons, Ltd: Chichester <http://www.els.net/> [DOI: 10.1002/9780470015902.a0003253.pub2]

Noble B.F. 2012. Cumulative environmental effects: thinking beyond the project in environmental assessment. Guest Statement. In *Environmental Change and Challenge: A Canadian Perspective*, 4th Edition, Eds. P. Dearden and B. Mitchell. Oxford University Press.

Wheater, H.S., C. Ballard, N. Bulygina, N. McIntyre and B.M. Jackson. 2012. Modelling Environmental Change: Quantification of Impacts of Land Use and Land Management Change on UK Flood Risk. In: *System Identification, Environmental Modelling, and Control System Design*, Eds. L. Wang, and H. Garnier, Springer-Verlag, London, pp.449-481.

Papers in Refereed Journals

Anderson, J.C., S.B. Wiseman, A. Moustafa, M. Gamal El-Din, **K. Liber** and J.P. Giesy. 2012. Effects of exposure to oil sands process-affected water from experimental reclamation ponds on *Chironomus dilutus*. *Water Research* 46:1662-1672.

Anderson, J.C., S.B. Wiseman, N. Wang, A. Moustafa, M. Gamal El-Din, L. Perez-Estrada, J. Martin, **K. Liber** and J.P. Giesy. 2012. Effectiveness of ozonation treatment in eliminating toxicity of oil sands process water to *Chironomus dilutus*. *Environmental Science and Technology* 46:486-493.

Ballard, C.D., N. McIntyre, and **H.S. Wheeler**. 2012. Effects of peatland drainage management on peak flows. *Hydrology and Earth System Sciences* 16:2299-2310, doi:10.5194/hess-16-2299-2012.

Banerjee, S., **B.C. Si**, and S. Siciliano. 2011. Evidence of high microbial abundance and spatial dependency in three Arctic soil ecosystems. *Soil Science Society America Journal* 75:2227-2232.

Barrett, M.J. 2011. Doing activist research in academia: a methodological framework. *Canadian Journal of Environmental Education* 16:123-141.

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Baulch, H.M., S.L. Schiff, R. Maranger, and P.J. Dillon. 2011. Nitrogen enrichment and the emissions of nitrous oxide from streams. *Global Biogeochemical Cycles* 25, GB4013. doi:10.1029/2011GB004047

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- Biswas, A., and **B.C. Si**. 2011. Scales and locations of time stability of soil water storage in a hummocky landscape. *Journal of Hydrology* 408(1-2):100-112.
- Biswas, A., T.B. Zeleke, and **B.C. Si**. 2012. Multifractal detrended fluctuation analysis in examining scaling properties of the spatial patterns of soil water storage. *Nonlinear Processes In Geophysics* 19:227-238.
- Bradley, P.W., Y. Wan, **P.D. Jones**, S. Wiseman, H. Chang, M.H. Lam, D.T. Long, and J.P. Giesy. 2011. PBDEs and methoxylated analogues in sediment cores from two Michigan, USA, inland lakes. *Environmental Toxicology and Chemistry* 30(6):1236-1242.
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- Chun, K.P.**, **H.S. Wheeler**, and C.J. Onof. 2012. Projecting and hindcasting potential evaporation for the UK between 1950 and 2099. *Climatic Change* 113(3):639-661.
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- Higley, E., S. Grund, **P.D. Jones**, T. Schulze, T.B. Seiler, U.L.V. Varel, W. Brack, J. Wälz, H. Zielke, J.P. Giesy, H. Hollert, and **M. Hecker**. 2012. Endocrine disrupting, mutagenic, and teratogenic effects of upper Danube River sediments using effect-directed analysis. *Environmental Toxicology and Chemistry* 31(5):1053-1062.
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- Lindenschmidt, K.-E.**, M. Sydor, and R. Carson. 2012. Modelling ice cover formation of a lake-river system with exceptionally high flows (Lake St. Martin and Dauphin River, Manitoba). *Cold Regions Science and Technology* 82:36-48.
- Lindenschmidt, K.-E.**, M. Sydor, R.W. Carson, and R. Harrison. 2012. Ice jam modelling of the Lower Red River. *Journal of Water Resource and Protection* 4:1-11.
- Liu, F., S. Wiseman, Y. Wan, J. Doering, **M. Hecker**, M.H.W. Lam, and J.P. Giesy. 2012. Multi-species comparison of the mechanism of biotransformation of MeO-BDEs to OH-BDEs in fish. *Aquatic Toxicology* 114-115:182-188.
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- Morrissey, C.A.**, I. Pollet, S.J. Ormerod, and J.E. Elliott. 2012. American dippers indicate contaminant biotransport by Pacific salmon. *Environmental Science and Technology* 46(2):1153-1162.
- Naile, J.E., J.S. Khim, T. Wang, Y. Wan, W. Luo, W. Hu, W. Jiao, J. Park, J. Ryu, S. Hong, **P.D. Jones**, Y. Lu, and J.P. Giesy. 2011. Sources and distribution of polychlorinated-dibenzo-p-dioxins and -dibenzofurans in soil and sediment from the Yellow Sea region of China and Korea. *Environmental Pollution* 159(4):907-917.
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- Noble, B.F.**, **P. Sheelanere**, and R. Patrick. 2011. Challenges and opportunities for watershed cumulative effects assessment and management: Lessons from the South Saskatchewan River watershed, Canada. *Journal of Environmental Assessment Poli-*

cy and Management 13(4):567-590.

Phibbs, J., E. Franz, D. Hauck, M. Gallego, J. Tse, I.J. Pickering, **K. Liber** and D.M. Janz. 2011. Evaluating the trophic transfer of selenium in aquatic ecosystems using caged fish, X-ray absorption spectroscopy and stable isotope analysis. *Ecotoxicology and Environmental Safety* 74:1855-1863.

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Pourrezaei, P., P. Drzewicz, Y. Wang, M. Gamal El-Din, L.A. Perez-Estrada, J.W. Martin, J. Anderson, S. Wiseman, **K. Liber** and J.P. Giesy. 2011. The impact of metallic coagulants on the removal of natural organic compounds from oil sands process-affected water. *Environmental Science and Technology* 45:8452-8459.

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Wiseman, S.B., Y. Wan, H. Chang, X.W. Zhang, **M. Hecker, P.D. Jones**, and J.P. Giesy. 2011. Polybrominated diphenyl ethers and their hydroxylated/methoxylated analogs: Environmental sources, metabolic relationships, and relative toxicities. *Marine Pollution Bulletin* 63:179-188.

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Papers in Non-Refereed Journals

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Biswas, A., H.P. Cresswell, and **B.C. Si**. 2011. Identifying the effects of local and nonlocal controls of soil water storage using cyclical correlation analysis. International annual meetings of the American Society of Agronomy (ASA), the Crop Science Society of America (CSSA), and the Soil Science Society of America (SSSA) in association with the Canadian Society of Soil Science (CSSS), San Antonio, TX, USA.


Biswas, A., **B.C. Si**, and H.P. Cresswell. 2011. Landscape characteristics of soil water spatial pattern: Similarity at depths and over times. International annual meetings of the American Society of Agronomy (ASA), the Crop Science Society of America (CSSA), and the Soil Science Society of America (SSSA) in association with the Canadian Society of Soil Science (CSSS), San Antonio, TX, USA.

Biswas, A., **B.C. Si**, H. Cresswell, and R. Viscarra Rossel. 2011. Scale-location characterization of nonlinear soil systems. International Conference of Pedometrics 2011: Innovations in Pedometrics, Prague, Czech Republic.

Biswas, A., **B.C. Si**, H. Cresswell, and R. Viscarra Rossel. 2011. Curvelet transform for soil spatial variation. International Conference of Pedometrics 2011: Innovations in Pedometrics, Prague, Czech Republic.

Chau, H.W., A. Biswas, V. Vujanovic, and **B.C. Si**. 2011. Determination of intrinsic conducting porosity from infiltration measurements on a water repellent sandy soil. International annual meetings of the American Society of Agronomy (ASA), the Crop Science Society of America (CSSA), and the Soil Science Society of America (SSSA) in association with the Canadian Society of Soil Science (CSSS), San Antonio, TX, USA.

Chau, H.W., T. Pernitsky, A. Biswas, and **B.C. Si**. 2011. Determination of water content and water repellency in soils from the Athabasca oil sands. International annual meetings of the American Society of Agronomy (ASA), the Crop Science Society of America



(CSSA), and the Soil Science Society of America (SSSA) in association with the Canadian Society of Soil Science (CSSS), San Antonio, TX, USA.

Dobrovolskaya, Y., and B.C. Si. 2011. Water storage and preferential flow in layered soil covers with abrupt and long interlayer transition zones. International annual meetings of the American Society of Agronomy (ASA), the Crop Science Society of America (CSSA), and the Soil Science Society of America (SSSA) in association with the Canadian Society of Soil Science (CSSS), San Antonio, TX, USA.

Kricsfalusy V. 2012. Native prairie restoration: a case study in the Redberry Lake Biosphere Reserve, Saskatchewan. Restoration 2012: Beyond Borders WABC-AFS & SER NW/BC Joint Annual Meeting. University of Victoria, Victoria, BC.

Tallon, L, B.C. Si, and S.L. Barbour. 2011. Spatial variability of energy in an unsaturated soil cover system. International annual meetings of the American Society of Agronomy (ASA), the Crop Science Society of America (CSSA), and the Soil Science Society of America (SSSA) in association with the Canadian Society of Soil Science (CSSS), San Antonio, TX, USA.

Tallon, L, B.C. Si, and S.L. Barbour. 2011. Spatial variability of hydraulic, physical, and thermal properties in unsaturated soil covers. International annual meetings of the American Society of Agronomy (ASA), the Crop Science Society of America (CSSA), and the Soil Science Society of America (SSSA) in association with the Canadian Society of Soil Science (CSSS), San Antonio, TX, USA.

Zbyranyk, O., M. Reed, and **V. Kricsfalusy.** 2012. Collaboration between researchers and biosphere reserve practitioners: A case study of Redberry Lake Biosphere Reserve, Canada. Linking the North and the South: Responding to Environmental Change. 18th International Symposium on Society and Resource Management. University of Alberta, Edmonton, AB.

Technical Reports Relevant to Academic Field

Abernethy, P., and **M.G. Reed.** 2012. Partnering & Networking in Canadian Model Forests. Prepared for the SSHRC Partnership. April 2012. 25 pp.

Abernethy, P., and **M.G. Reed.** 2012. Canadian Biosphere Reserve Partnership Development: Baseline Study. Prepared for the SSHRC Partnership. April 2012. 25 pp.

Belcher, K., J. Lokken and **M. Wolsfeld.** 2011. *Economic Impact of Drainage on Flooding.* Final Report submitted to Ducks Unlimited Canada in fulfillment of research contract. 25 pages.

Egunyu, F., and **M.G. Reed.** 2012. *Learning from the Periodic Reviews of Biosphere Reserves in Canada.* Report to Canada-MAB Committee. Canadian Commission for UNESCO. Main report 26 pp, Appendices 25 pp.

Jardine, T.D., D. Valdez, M. Kainz, R. Woods, D. Hooloway, and J. Fawcett. 2012. Food webs in waterholes of the Balonne and Weir Rivers assessed with stable isotopes of carbon and nitrogen. In: *Riverine and floodplain responses to flooding in the Lower Balonne and Border Rivers – Final Report*, Eds. R.J. Woods, J.S. Lobegeiger, J.H. Fawcett, and J.C. Marshall. Department of Environment and Resource Management, Queensland Government, pp. 94-111.

Kainz, M., Z. Changizi, S. Lugbauer, J. Marshall, J. Lobegeiger, **T. Jardine,** D. Valdez, R. Woods, and J. Fawcett. 2012. Food webs in waterholes of the Balonne and Weir Rivers assessed with total lipids and fatty acids – a trophic gradient from leaves to fishes. In: *Riverine and floodplain responses to flooding in the Lower Balonne and Border Rivers – Final Report*, Eds. R.J. Woods, J.S. Lobegeiger, J.H. Fawcett, and J.C. Marshall. Department of Environment and Resource Management, Queensland Government, pp. 112-131.


Kricsfalusy, V. 2011. Advancing biodiversity conservation and sustainable management in the Canadian prairies and Ukrainian steppes by enhancement of international research partnerships. Saskatoon: University of Saskatchewan. 17 pp.

Noble, B.F. 2011. Criteria for Ministerial decisions under section 12.5.7 of the Nunavut Land Claims Agreement. Report prepared for Aboriginal Affairs and Northern Development Canada. Her Majesty the Queen in Right of Canada: Hull, QC.

Reed, M.G. 2012. Gender Equality. In *Encyclopedia of Sustainability: Vol. 8. The Americas and Oceania: Assessing Sustainability*, Ed. R.A. Anderson. Great Barrington, MA: Berkshire Publishing.

Reynolds, B., M. Marshall, Z. Frogbrook, I. Solloway, N. McIntyre, and **H.S. Wheeler.** 2012. The Pontbren Hydrological Database. FRMRC Report, 11 pp. Available from www.floodrisk.org.uk

Rushton R., and **B.F. Noble.** 2012. Efficacy of SEA for sustainable forest management. In *Energy Future: The Role of Impact Assessment.* Proceedings of the International Association for Impact Assessment. Fargo, ND: IAIA.



Townsend, S., C. Humphrey, S. Choy, R. Dobbs, M. Burford, R. Hunt, **T. Jardine**, M. Kennard, J. Shellberg, and E. Woodward. 2012. Monitoring river health in the wet-dry tropics: strategic considerations, community participation, and indicators. Nathan, QLD: Griffith University. 44 pp.

White, L., and **B.F. Noble**. 2012. The contribution of SEA to energy sector planning. In *Energy Future: The Role of Impact Assessment*. Proceedings of the International Association for Impact Assessment. Fargo, ND: IAIA.

White, L., and **B.F. Noble**. 2012. Strategic environmental assessment of electricity futures. In *Energy Future: The Role of Impact Assessment*. Proceedings of the International Association for Impact Assessment. Fargo, ND: IAIA.

Invited Lectures (Outside the U of S) and Invited Conference Presentations

Barrett, M.J. and **D. Clark**. 2012. Understanding Aboriginal perspectives through critical examination of human-nature relations. 2nd Annual Scholarship of Teaching & Learning Symposium, University of Saskatchewan, Saskatoon, SK.

Clark, D. 2011. Foundations of natural resource policy and management, Guest lecture: F&ES826a, Yale School of Forestry & Environmental Studies, New Haven, CT.

Clark, D. 2011. Northern research in the 20-teens: evolving methods and enduring challenges. 1st annual University of Saskatchewan Northern Research Forum, Saskatoon, SK.

Clark, D., **F. Egunyuy**, A.L. Foote, and S.G. Clark. 2011. Polar bear social science: is anyone listening? Seventh International Congress for Arctic Social Sciences, Akureyri, Iceland.

Clark, D. 2012. Transformations in wildlife & subsistence systems in the southwest Yukon, Canada (case study presentation). Arctic Resilience Report meeting. Montreal, QC.

Clark, D. 2012. Advocacy, controversy, and professional insecurity: navigating public controversies in research. Wildlife Disease Society, University of Saskatchewan Student Chapter, Saskatoon, SK.

Clark, D. 2012. Working with a Yukon community to ameliorate wildlife-human conflicts. University of Tromso, Tromso, Norway.

Cunfer, G. 2011. Wind erosion and dust storms in the American Great Plains, 1830-1940: Reassessing the 1930s Dust Bowl. Presented to the Center for Environmental History Symposium, Institute of Social Ecology, Alpen Adria University, Vienna, Austria.

Cunfer, G. 2012. Farming the Good Earth: 150 Years of Great Plains history from the ground up. Presented to the Seminar on Socio-Ecological Transitions, Santiago de Compostela, Spain.

Cunfer, G. 2012. Farming the Good Earth: 150 Years of Great Plains History from the ground up. Presented to the Workshop on Social Metabolism of American Agricultural Systems, Laboratory of Historical Agroecosystems, Pablo de Olavide University, Seville, Spain.

Cunfer, G. 2012. Farming the Good Earth: 150 Years of Great Plains History from the Ground Up. Presented to the Economic History Seminar, University of Barcelona, Barcelona, Spain.

Cunfer, G. 2012. The Canadian SSHRC Sustainable Farm Systems Project: State of the Art and Future Perspectives. Presented to the Fourth Workshop on the Social Metabolism of Agricultural Systems, University of Barcelona, Barcelona, Spain.


Hecker, M. 2011. Metal exposure and recruitment failure of white sturgeon (*Acipenser transmontanus*) in the trans-boundary reach of the Columbia River between Canada and the US. Technical University Dresden, Dresden, Germany.

Hecker, M. 2011. 20 Years of Endocrine Disrupter Research-What's Next? King Saud University, Riyadh, Saudi Arabia.

Hecker, M. 2011. Introduction into environmental risk assessment: A case study on metal exposure and recruitment failure of white sturgeon (*Acipenser transmontanus*) on the upper Columbia River. King Saud University, Riyadh, Saudi Arabia.

Ireson, A.M. and A.P. Butler. 2012. A rigorous method for quantifying recharge using simple and complex models. Geophysical Research Abstracts, Vol. 14, EGU2012-6542, 2012 EGU General Assembly.

Khalik, M.N. 2012. Extreme precipitation and flood risk analysis using Regional Climate Model projections. Invited presentation at NATEG Days 2012, Monastir, Tunisia.



Khaliq, M.N. 2012. Extreme precipitation and flood risk analysis using dynamical downscaling and regional frequency analysis approach. Invited presentation at the Prairie Hydrology, Flood Modeling and GIS Workshop, Saskatoon, SK.

Khaliq, M.N. 2012. Projected changes to precipitation extremes over Canada. Invited seminar at the National Hydrology Research Centre, Saskatoon, SK.

Lindenschmidt, K.-E. 2012. Predicting and monitoring ice cover formation along the Lake St. Martin - Dauphin River System. Speaker Event - Emergency Measures for Lowering Water Levels on Lake Manitoba and Lake St. Martin, Canadian Water Resources Association. Winnipeg, MB.

Lindenschmidt, K.-E. 2012. Predicting and monitoring ice cover formation along extremely flooded and hydraulically altered lake-river systems. National Hydrology Research Centre seminar series, Saskatoon, SK.

McIntyre, N., C. Ballard, M. Bruen, N. Bulygina, W. Buytaert, I. Cluckie, S. Dunn, U. Ehret, J. Ewen, A. Gelfan, T. Hess, D. Hughes, B. Jackson, T. Kjeldsen, R. Merz, J.-S. Park, E. O'Connell, G. O'Donnell, L. Oudin, E. Todini, T. Wagener and **H. Wheeler**. 2012. Modelling the hydrological impacts of rural land use management: current state of the science and future challenges. Proceedings of the British Hydrological Society Symposium, Dundee, Scotland.

McIntyre, N., C. Ballard, N. Bulygina, Z. Frogbrook, I. Cluckie, S. Dangerfield, J. Ewen, J. Geris, A. Henshaw, B. Jackson, M. Marshall, T. Pagella, J.-S. Park, B. Reynolds, E. O'Connell, G. O'Donnell, F. Sinclair, I. Solloway, C. Thorne, and **H. Wheeler**. 2012. The potential for reducing flood risk through changes to rural land management: outcomes from the Flood Risk Management Research Consortium. Proceedings of the British Hydrological Society Symposium, Dundee, Scotland.

McKenzie, M. 2012. Environmental education: Where are we? Talkin' About Schools and Society Discussion Series, Regina, SK.

Morrissey, C.A. 2011. Department of Biology Seminar Series. University of Regina, Regina, SK.

Morrissey, C.A. and J.E. Elliott. 2011. Toxic trees: MSMA and the Mountain Pine Beetle. Special session on Wildlife Toxicology Forensic Approaches. Society of Environmental Toxicology and Chemistry, Boston, USA.

Reed, M.G. 2012. Gender and feminism in environmental and natural resources research. Invited Panelist, International Symposium for Society and Natural Resource Management. Edmonton, AB.

Reed, M.G. 2012. Seeing the trees within the forest: Social challenges of sustainable forest management. Gender and Natural Resource Management PhD Course, Department of Forest Resource Management, Swedish University of Agricultural Sciences, Umeå, Sweden.

Reed, M.G. 2012. Mind the gap: connecting scholarship on gender and sustainable forest management. Faculty of Forestry. The University of British Columbia, Vancouver, BC.

Si, B.C. 2011. Scaling of soil water in rolling landscapes. University of Northwest Agricultural and Forestry Sciences. Yangling, China.

Si, B.C. 2011. Soil water repellency in coarse-textured soils. University of Northwest Agricultural and Forestry Sciences. Yangling, China.

Si, B.C. 2011. Scale-specific control of soil water storage using multivariate empirical mode decomposition. Proceedings of Digital Soil Mapping, 2012.


Si, B.C. 2011. Understanding enhanced soil water storage in layered soils for the oilsand industries. Huazhong Agricultural University. Wuhan, China.

Wheater, H.S., A.R. Nazemi, and A. Elshorbagy. 2012. How the changes in flow regime can affect the security of water resources systems in southern Alberta. CWRA/CGU Annual Meeting. Banff, AB.

Contributed (Non-Invited) Papers/Abstracts at Conferences

Abernethy, P., and **M.G. Reed**. 2012. Social networking and learning in Canadian biosphere reserves. Environmental Studies Association of Canada and the Congress of the Social Sciences and Humanities, Waterloo, ON.

- Aitken A, **S. Ketilson**, **B.F. Noble**, G. Poelzer, and C. Fidler. 2012. Value-added of regional and strategic environmental assessment for offshore oil and gas planning and development in Canada's Arctic. International Polar Year, Montreal, QC.
- Anderson, J., S.B. Wiseman, N. Wang, A. Moustafa, L. Perez-Estrada, M. Gamal El-Din, J. Martin, **K. Liber** and J.P. Giesy. 2011. Comparison of ozonation and reclamation pond biodegradation as treatments to eliminate oil sands process-affected water toxicity in *Chironomus dilutus*. Society of Environmental Toxicology and Chemistry 32nd Annual Meeting, Boston, MA, USA.
- Barrett, M.J.** 2012. Engaging Indigenous knowledges: Naming the elephant. International Symposium for Society and Resource Management, Edmonton, AB.
- Barrett, M.J.** 2012. Decolonizing research: Using a dialogic method(ology) for a sustainable future. 8th International Congress of Qualitative Inquiry, Urbana-Champaign, IL.
- Barrett, M.J.**, S. Mills, **T. Ingram**, and J. Dietrich. 2012. The gradual reveal: Getting off your paradigm! Society for Teaching and Learning in Higher Education annual conference, Montreal, QC.
- Barrett, M.J.**, S. Mills, M. Patterson, M. Flowers, **K. Bors**, and J. Dietrich. 2012. Cracks in consent: Traditional ecological knowledge in natural resource management. International Symposium for Society and Resource Management, Edmonton, AB.
- Baulch, H.M.** 2012. Nitrogen enrichment of streams: The downstream consequences of food & fuel. National Hydrology Research Centre. Saskatoon, SK.
- Belcher, K.W.** 2011. The value of grasslands in maintaining biodiversity. Canadian Forage and Grassland Association Conference. Saskatoon, SK.
- Ciborowski, J., L. Foote, G. Dixon, **K. Liber** and J. Smits. 2012. CFRAW: Review, conclusions & recommendations of a 5 year collaborative study. Canadian Oil Sands Network for Research and Development (CONRAD), Environmental and Reclamation Research Group 2012 Symposium, Edmonton, AB.
- Clark, D.**, **S. Daviduik**, **C. Maulé**, and **M. Reed**. 2011. Integrating knowledge and action for a better world? The SENS case study. 2011 Policy Sciences Annual Institute, Yale Law School, New Haven, CT.
- Clark, D.A.**, R. Brook, A.L. Lynch, D.J. Mattson, C.L. Meek, and **R.J. Watters**. 2012. Policy challenges for conserving Arctic species-at-risk. IPY 2012 Conference.
- Crawford, S.E. and **K. Liber**. 2011. Bioavailability and toxicity of sediment-associated uranium to the freshwater midge *Chironomus dilutus*. Society of Environmental Toxicology and Chemistry 32nd Annual Meeting, Boston, MA, USA.
- Crawford S.E., L.E. Doig and **K. Liber**. 2011. Sediment-associated uranium bioavailability and toxicity to a model freshwater benthic organism, *Chironomus dilutus*. 38th Annual Aquatic Toxicity Workshop, Winnipeg, MB.
- Crawford, S.E., L.E. Doig, and **K. Liber**. 2012. Quantifying bioavailability and toxicity of sediment associated uranium to a model freshwater benthic organism, *Chironomus dilutus*. SETAC-Prairie Northern Chapter 3rd Annual Meeting, Saskatoon, SK.
- Crawford, S.E., L.E. Doig and **K. Liber**. 2012. Bioavailability and toxicity of sediment-associated uranium to the freshwater midge *Chironomus dilutus*. World Water Day Workshop: Water Issues at Home and Abroad, Saskatoon, SK.
- Egunyu, F.**, and **M.G. Reed**. 2012. The role of periodic reviews in biosphere reserves for improving the practice of protected area management. International Symposium for Society and Natural Resource Management, Edmonton, AB.
- Fidler, C., and **B.F. Noble**. 2012. Coordinating regional strategic impact assessment offshore initiatives in Canada's Beaufort Sea: a case study on the current state-of-practice. International Polar Year, Montreal, QC.
- Fidler, C., and **B.F. Noble**. 2012. Offshore SEA: lessons from Norway, Canada and the UK. International Association for Impact Assessment AGM, 'Energy Future', Porto, Portugal.
- Flahr, L., P. Jones, and **C.A. Morrissey**. 2012. Physiological and functional effects of Aroclor 1254 on avian cognition and migratory behaviour. Society for Environmental Toxicology and Chemistry. Prairie Northern Meeting. Saskatoon, SK.
- George, C.**, and **M.G. Reed**. 2012. Thinking outside the box: exploring issues of power and justice in environmental governance. International Symposium for Society and Natural Resource Management, Edmonton, AB.



Godmaire, H., G. Poirier-Ghys, M.A. Guertin, and **M. Reed**. 2012. Quarante ans de pratique: Les réserves de biosphère se révèlent. ERE, EDD (Education relative à l'environnement et au développement durable), ACFAS Colloque Savoirs (Association francophone pour le savoir), Laval University, Québec City, PQ.

Hanna, K., **B.F. Noble**, and P. Usher. The future of environmental assessment: panel discussion. Canadian Association of Geographers AGM, Waterloo, ON.

Hecker, M., S.E. Wiseman, J. Thomas, E. Higley, O. Hursky, M. Pietrock, J. Raine, J.P. Giesy, and D. Janz. 2011. Chronic exposure to dietary selenomethionine increases gonadal steroidogenesis in female rainbow trout. 38th Aquatic Toxicity Workshop, Winnipeg, Canada.

Hecker, M., J. Doering, S.E. Wiseman, S. Beitel, B. Tendler, and J.P. Giesy. 2011. Biochemical and molecular responses of white sturgeon (*Acipenser transmontanus*) to an aryl hydrocarbon receptor agonist. 38th Aquatic Toxicity Workshop, Winnipeg, MB.

Hecker, M., Y. He, S.B. Wiseman, **P. Jones**, A. Moustafa, N. Wang, L. Perez, M.G. Din, J.W. Martin, and J.P. Giesy. 2011. Toxicity of untreated and ozone-treated oil sands process-affected water (OSPW) to early life stages of the fathead minnow (*Pimephales promelas*). SETAC North America 32nd Annual Meeting, Boston, MA, USA.

Hecker, M., J. Doering, S. Beitel, B.J. Tendler, S.B. Wiseman, and J.P. Giesy. 2011. Biochemical and molecular responses of white sturgeon (*Acipenser transmontanus*) to an aryl hydrocarbon receptor agonist. SETAC North America 32nd Annual Meeting, Boston, MA, USA.

Hecker, M., D.W. Vardy, A. Doering, S.C. Beitel, B.J. Tendler, R. Santore, A.C. Ryan, and J.P. Giesy. 2011. Assessment of chronic toxicity of Upper Columbia River sediments to early life stage white sturgeon. SETAC North America 32nd Annual Meeting, Boston, MA, USA.

Hecker, M., S. Beitel, S. Wiseman, and J. Raine. 2011. Effects of 17 α -ethinylestradiol (EE₂) on northern pike (*Esox lucius*). SETAC North America 32nd Annual Meeting, Boston, MA, USA.

Hecker, M., A.R. Tompsett, S. Wiseman, E. Higley, S. Pryce, and J.P. Giesy. 2012. All mixed up: phenotypic plasticity in a genotypic world. SETAC Europe 22th Annual Meeting, Berlin, Germany.

Hecker, M., A. Wichmann, C. Schaefer, H. Hollert, R. Kriehuber, and M. Fenske. 2012. Refining the 48h-zebrafish embryo test—a mode of action dependent approach. SETAC Europe 22th Annual Meeting, Berlin, Germany.

Hecker, M., Y. Wan, X. Zhang, H. Chang, F. Liu, **P. Jones**, J. Giesy, and S. Wiseman. 2012. Dietary accumulation, maternal transfer and metabolic inter-conversion of methoxylated, hydroxylated and synthetic PBDEs. SETAC Europe 22th Annual Meeting, Berlin, Germany.

Hecker, M., M. Brinkmann, S. Hudjetz, S. Kuckelhorn, M.P. Hennig, C. Cofalla, S. Roger, U. Kammann, J.P. Giesy, H. Schüttrumpf, A. Schäffer, and H. Hollert. 2012. Can flood events affect rainbow trout? The biomarker-cascade after exposure to PAHs in sediment suspensions. SETAC Europe 22th Annual Meeting, Berlin, Germany.


Hecker, M., J. Giesy, S. Wiseman, Y. Wan, X. Zhang, H. Chang, F. Liu, D. Jones, J. Musaraat, and A. Al Kedhairi. 2012. Hydroxylated/methoxylated analogs of polybrominated diphenyl ethers: biotransformation products of PBDEs or natural products. SETAC Europe 22th Annual Meeting, Berlin, Germany.

Hecker, M., C. Schönlaue, E. Higley, T. Schulze, W. Brack, G. Streck, A. Hallare, and H. Hollert. 2012. Assessing the endocrine activity of sediment samples from Laguna Lake, Philippines, using the LYES and H295R assays. SETAC Europe 22th Annual Meeting, Berlin, Germany.

Hecker, M., M. Wollenweber, S. Maletz, E. Higley, H. Ma, and H. Hollert. 2012. Do *Bacillus thuringiensis israelensis* products affect the endocrine system? SETAC Europe 22th Annual Meeting, Berlin, Germany.

Hecker, M., V.S. Schiller, A.F.M. Wichmann, R. Kriehuber, and M. Fenske. 2012. Can fish embryos help predict endocrine disruption? An example with genistein. SETAC Europe 22th Annual Meeting, Berlin, Germany.

Hecker, M., Y. He, S.B. Wiseman, **P.D. Jones**, L.A. Perez, M.-G. El-Din, A. Moustafa, J.W. Martin, and J.P. Giesy. Endocrine disrupting effects of OSPW and ozonated OSPW on sex steroid synthesis and signalling in fathead minnows. SETAC Europe 22th Annual Meeting, Berlin, Germany.



Hecker, M., F.Y. Liu, S.B. Wiseman, Y. Wan, J.P. Doering, M.H.W. Lam, and J.P. Giesy. 2012. Multi-species comparison of the mechanism of biotransformation of MeO-BDEs to OH-BDEs in fish. SETAC Europe 22th Annual Meeting, May 20-24, 2012, Berlin, Germany.

Hecker, M., S.B. Wiseman, Y. He, J.P. Giesy, and **P.D. Jones.** 2012. Defining the transcriptome of the fathead minnow liver using high-throughput sequencing: effects of chemical and environmental stressors. SETAC Europe 22th Annual Meeting, Berlin, Germany.

Jardine, T.D., S.K. Hamilton, and S.E. Bunn. 2012. Food webs of the wet-dry tropics: multiple sources of primary production fuel animal biomass. 9th INTECOL International Wetlands Conference, Orlando, FL.

Jones, P.D., E.H. Ohiozebau, A.H. Hill, B.T. Tandler, J.G. Giesy, P.H. Hodson, E.K. Kelly, J.S. Short, and G.C. Codling. 2012. Health of and contaminants in fishes from the Slave/Athabasca River System, Canada, relative to oilsands extraction activities. 6th SETAC World Congress / SETAC Europe 22nd Annual Meeting, Berlin, Germany.

Kovach, M., **M.J. Barrett,** and C. Gillies. 2012. Insider, outsider, or both? Indigenous methodologies and diverse identity positionings. 8th International Congress of Qualitative Inquiry, Urbana-Champaign, IL.

Krausmann, F., and **G. Cunfer.** 2012. Adaptation on an agricultural frontier: The socio-ecological metabolism of Great Plains homesteading, 1870-1940. Bi-annual meeting of the Society for Latin American and Caribbean Environmental History (SOLCHA), Villa de Leyva, Colombia.

Labarerre, C.R., and **C.A. Morrissey.** 2012. Assessing the risk of petroleum contaminants in migratory shorebirds. Society for Environmental Toxicology and Chemistry. Prairie Northern Meeting. Saskatoon, SK.

Liber, K. 2012. Risks and reclamation-related research at the Canadian oil sands. Department of Environmental Science special seminar, Aarhus University, Roskilde, Denmark.

Liber, K. 2012. Toxicology and environment programs at the University of Saskatchewan, Canada. Special Seminar, Institute of Environmental Toxicology, Clemson University, Clemson, SC, USA.

Liber, K. 2012. The Canadian oil sands: Prosperity and pollution. Environmental Toxicology Seminar Series, Institute of Environmental Toxicology, Clemson University, Clemson, SC, USA.

Liber, K. and S. Crawford. 2012. Uranium bioavailability in freshwater sediment. Society Of Environmental Toxicology and Chemistry – Europe 22nd Annual Meeting, Berlin, Germany

Lindenschmidt, K.-E. 2012. Predicting and monitoring ice cover formation along river systems ... with an outlook for the South Saskatchewan River. Saskatchewan Watershed Authority, Moose Jaw, SK.

Lindenschmidt, K.-E. 2012. Predicting and monitoring ice cover formation along river systems ... with an outlook for Swift Current Creek and Moose Jaw River. Saskatchewan Watershed Authority, Moose Jaw, SK.

Lindenschmidt, K.-E., J. Long and D. Watkinson. 2012. A GIS approach to define the hydro-geomorphological regime for in-stream flow requirements using geomorphic response units (GRU). CWRA/CGU National Conference, Banff, AB.

Lindenschmidt, K.-E., M. Sydor and R. Carson. Monitoring and modelling ice formation on a flooded and hydraulically altered lake-river system (Lake St. Martin and Dauphin River, Manitoba). CWRA/CGU National Conference, Banff, AB.

Lucas B.T., **K. Liber, P.D. Jones,** J.P. Giesy, J. Sereda, L. Bharadwaj, J. Hudson, D.H. De Boer, **H.S. Wheeler,** and L.E. Doig. Reconstructing the past environmental conditions of Lake Diefenbaker. World Water Day Workshop: Water Issues at Home and Abroad, Saskatoon, SK.

Lucas B.T., **K. Liber, P.D. Jones,** J.P. Giesy, J. Sereda, L. Bharadwaj, J. Hudson, D. De Boer, **H. Wheeler** and L.E. Doig. 2011. Reconstructing the past environmental conditions of Lake Diefenbaker. 38th Annual Aquatic Toxicity Workshop, Winnipeg, MB.

Lucas, B.T., **K. Liber, P.D. Jones,** J.P. Giesy, **H.S. Wheeler,** and L.E. Doig. 2012. Reconstructing the past nutrient status of a Canadian Great Plains reservoir using depositional sediments and paleolimnological techniques. SETAC-Prairie Northern Chapter 3rd Annual Meeting, Saskatoon, SK.

- Main, A., and C.A. Morrissey.** 2012. Distribution and impact of neonicotinoid insecticides on agricultural wetlands of prairie Canada. Society for Environmental Toxicology and Chemistry. Prairie Northern Meeting. Saskatoon, SK.
- Massie, M., and M.G. Reed.** 2012. Flooding in the Saskatchewan River Delta: comparing 2011 flood responses of two boreal forest communities in western Canada. International Symposium for Society and Natural Resource Management, Edmonton, AB.
- McKenzie, M.** 2012. A politics of scale in research: the 'Youth Making Place' project and sustainability education policy. American Education Research Association Annual Meeting, Vancouver, BC.
- McKenzie, M.** 2012. Discussant for panel on Land curriculum: indigenous, postcolonial, and decolonizing perspectives on place, education, and educational research. American Education Research Association Annual Meeting, Vancouver, BC.
- McKenzie, M.** 2012. Walking as participatory method: 'ways of operating' in youth research on sustainability, in panel on "Critical place research: Theories and methods." American Association of Geographers Annual Meeting, New York.
- Morrissey, C.A.,** D. Stanton, C.R. Tyler, J. Newton, G. Pereira, and S.J. Ormerod. Tracing the exposure and effects of urban pollutants to an aquatic songbird in UK rivers. Society of Environmental Toxicology and Chemistry, Boston, USA.
- Naile, J.E., J. Khim, T. Wang, Y. Wan, S. Hong, **P. Jones**, Y. Lu, and J. Giesy. 2011. Sources and distribution of polychlorinated-dibenzo-p-dioxins and dibenzofurans in soil and sediment from the Yellow Sea region of China and Korea. SETAC North America, Boston, USA.
- Noble, B.F.** 2012. Strategic environmental assessment for Arctic energy resource planning and development: opportunities and constraints. Canadian Association of Geographers AGM, Waterloo, ON.
- Noble, B.F.,** and C. Fidler. 2012. Advancing strategic environmental assessment in Canada's Arctic offshore oil and gas sector: Lessons from Norway, Canada, and the United Kingdom. International Polar Year, Montreal, QC.
- Noble, B.F.,** and R. Patrick. 2012. Requisites and capacity for watershed cumulative effects assessment and management in Canada. International Symposium on Society and Resource Management, Edmonton, AB.
- Parastoo, P., L.A. Perez-Estrada, J. Anderson, S. Wiseman, **K. Liber**, J.P. Giesy, J.W. Martin and M. Gamal El-Din. 2012. Coagulation/flocculation/sedimentation treatment of oil sands process affected water. Canadian Oil Sands Network for Research and Development (CONRAD) 2012 Water Conference, Edmonton, AB.
- Patrick, R., **P. Sheelanere,** and **B.F. Noble.** 2011. Requisites for watershed-scale cumulative effects assessment and management. Presentation at the PCAG Annual Meeting. North Dakota.
- Patrick, R., and **B.F. Noble.** 2012. Watershed cumulative effects assessment and management in Canada: Institutional arrangements, capacity, and scale. Canadian Water Resources Association AGM, Banff, AB.
- Patterson, M., M. Flowers, **K. Bors,** and **M.J. Barrett.** 2012. Holistic knowing and natural resource management: preparing for the field. International Symposium for Society and Resource Management, Edmonton, AB.
- Poelzer, G., **B.F. Noble, S. Ketilson,** A. Aitken, and C. Fidler. 2012. Challenges to the efficacy of environmental assessment in Canada's Beaufort Sea. International Polar Year, Montreal, QC.
- Pourrezaei, P., J.P. Giesy, P. Drezewicz, Y. Wang, M.G. El-Din, L.A. Perez-Estrada, J.W. Martin and **K. Liber.** 2011. Dissolved organic compounds removal from oil sands process water by coagulation/flocculation. The 1st International Association of Science and Technology for Development International Conference on Unconventional Oils and the Environment, Calgary, AB.
- Reed, M.G.** 2012. Embracing ecological and social learning: Biosphere reserves as exemplars of changing conservation practices. Canadian Association of Geographers at the Congress of the Social Sciences and Humanities, Waterloo, ON.
- Rushton, R., and **B.F. Noble.** 2012. The efficacy of EA for sustainable forest management. International Association for Impact Assessment AGM, 'Energy Future', Porto, Portugal.
- Rushton, R., and **B.F. Noble.** 2012. The efficacy of environmental assessment in the forest resource sector: 20-year forest management planning in Saskatchewan, Canada. International Symposium on Society and Resource Management, Edmonton, AB.



Schiffer S.R., **K. Liber**, and L.E. Doig. 2011. The paleoecotoxicology of Ross Lake, MB: Reconstructing the impacts of 80 years of industrial and municipal activities. 38th Annual Aquatic Toxicity Workshop, Winnipeg, MB.

Sereda, J., **H. Wheeler**, J. Hudson, L. Doig, **K. Liber**, **P. Jones**, J. Giesy and L. Bharadwaj. 2011. Lake Diefenbaker: water quality assessment and modeling for management under environmental change. American Geophysical Union Annual Meeting, San Francisco, CA, USA.

Tello, E., **G. Cunfer**, and M. Gonzalez de Molina. 2011. The First Globalization and World War II: socio-ecological turning points in the end of traditional organic agrarian systems in Europe and North America. Bi-annual meeting of the European Society for Environmental History, Turku, Finland.

Tse, T.J., L.E. Doig, **K. Liber**, J.P. Giesy, J. Sereda, L.A. Bharadwaj, **H. Wheeler**, D. De Boer and **P.D. Jones**. 2011. Faecal sterol analysis of Ross Lake sediment cores. 38th Annual Aquatic Toxicity Workshop, Winnipeg, MB.

White, L., and **B.F. Noble**. 2012. The role and contribution of strategic environmental assessment in the energy sector: best practice process elements and outcomes of six international case studies. International Symposium on Society and Resource Management, Edmonton, AB.

White, L., and **B.F. Noble**. 2012. Saskatchewan's energy futures: development and application of a strategic environmental assessment process for electricity sector planning based on sustainability criteria. International Symposium on Society and Resource Management, Edmonton, AB.

White, L., and **B.F. Noble**. 2012. A SEA process incorporating sustainability criteria. International Association for Impact Assessment AGM, 'Energy Future', Porto, Portugal.

White, L., and **B.F. Noble**. 2012. The contribution of SEA to energy sector planning. International Association for Impact Assessment AGM, 'Energy Future', Porto, Portugal.

Whitfield, C.J., **H.M. Baulch**, and C.J. Westbrook. 2012. Beaver pond contribution to increased global atmospheric methane. Canadian Geophysical Union. Banff, AB.

Zbyranyk, O., **M.G. Reed**, and **V. Kricsfalusy**. 2012. Collaboration between researchers and biosphere reserve practitioners: A case study of Redberry Lake Biosphere Reserve, Canada. International Symposium for Society and Natural Resource Management, Edmonton, AB.

Research Grants and Contracts

Baulch, H. 2012-2016. Biogeochemistry of lakes in winter, and the implications of declining ice cover. Natural Sciences and Engineering Research Council, Discovery Grant.

Belcher, K.W. 2012. Economic impact of drainage on flooding in the Smith Creek Watershed. Ducks Unlimited Canada.

Clark, D. 2012. Developing non-invasive approaches for monitoring polar bear-human interactions. Parks Canada research support through the Churchill Northern Studies Centre.

Clark, D. and R. Brook. 2012. Human dimensions of polar bear-human conflicts: understanding, prevention, and mitigation. Social Sciences and Humanities Research Council of Canada, Insight Development Grant.

Clark, D., P. Gober, **H. Wheeler**, **M. Reed**, **B. Noble**, R. Patrick, and L. Bharadwaj. 2011. A collaborative approach to defining water security in the South Saskatchewan River Basin. Science in Society, University of Saskatchewan.


Cunfer, G., D. Soto Fernandez, E. Tello, F. Krausmann, G.I. Guzman Casado, M. Gonzalez De Molina, R. Funes, S. Gallini, E. Domene, F.R. Funes-Monzote, G. Jover, J. Marull, J. Ramon, J. Infante-Amate, K. Sylvester, M. Gutmann, R. Garrabou, R. Estrada, R. Soto, R. Garcia, S. Leonard, V. Winiwarter, and X. Cusso. 2012-2017. Sustainable farm systems: Long-term socio-ecological metabolism in western agriculture. Social Sciences and Humanities Research Council of Canada, Partnership Grant.

Hanna, K. and **B.F. Noble**. 2009-2012. Effectiveness and Canadian environmental impact assessment. Social Sciences and Humanities Research Council of Canada.

Hausner, V., E.-G. Broderstad, and **D. Clark**. 2011. Finnmark landscape in change. NORUT Research Institute, Alta, Norway.



- Hecker, M.** 2011-2012. Expansion and commercialization of *in vitro* screening assays for the detection and assessment of endocrine disrupting potentials of chemicals, waste- and drinking-water. Communities of Tomorrow.
- Hecker, M.** 2011-2012. Expansion and commercialization of *in vitro* screening assays for the detection and assessment of endocrine disrupting potentials of chemicals, waste- and drinking-water. MITACS, Accelerate Student Internship Program.
- Hecker, M.** 2011-2013. Endocrine disrupting chemicals: potential effects on female reproductive health in Saskatchewan. Royal University Hospital Foundation.
- Hecker, M.** 2012-2017. Functional transcriptomics of native Canadian fish species. Natural Sciences and Research Council of Canada, Discovery Grant.
- Ireson, A.** 2011. Understanding and modeling the hydrology of the southern boreal forest. Canadian Foundation for Climate and Atmospheric Sciences.
- Ireson, A.** 2012. Causes and health impacts of saline intrusion into drinking water ponds in Bangladesh. Leverhulme Trust.
- Ireson, A.** 2012-2017. Groundwater surface interactions on the prairies. Natural Sciences and Research Council of Canada, Discovery Grant.
- Keskitalo, C., M. Tennberg, and **M.G. Reed.** 2011-2013. Preparing for and responding to disturbance: Arctic lessons for Sweden. MISTRA, The Foundation for Strategic Environmental Research (Sweden).
- Jones, P.D.** 2011. Analysis of fish collected from the Slave River, NWT in fall and winter 2011. Department of Aboriginal Affairs and Northern Development Canada.
- Jones, P.D.** 2012. Investigation of fish health and environmental contaminants in fishes collected from the Peace and Slave Rivers. Government of the Northwest Territories.
- Liber, K.** (co-principal investigator). 2008-2011. Investigation of temporal and spatial distribution, fate and biological effects of selenium in a boreal aquatic ecosystem. Natural Sciences and Engineering Research Council, Collaborative Research and Development Grant.
- Liber, K.** (co-investigator). 2012-2014. Sino-Canadian cooperation on microbial and phytoremediation technologies for clean-up of PAH and heavy metal contaminated soils in Shanxi industrial regions. Shanxi Science and Technology Department, Taiyuan, Shanxi, P.R. China.
- Liber, K.** (co-investigator). 2012-2014. Network on environmental impact assessment of industry-contaminated areas in the Arctic. Nordic Council of Ministers' Arctic Co-operation Programme, Copenhagen, Denmark.
- Lindenschmidt, K.-E.** 2012-2014. Defining hydro-geomorphological regimes for instream flow requirements using geomorphic response units (GRU). Saskatchewan Watershed Authority.
- Lynch, A., **D. Clark,** and C. Meek. 2012. Understanding the policy challenges of climate change for conserving polar bears. U.S. National Science Foundation Grant.
- McKenzie, M.,** D. Greenwood, T. Wright, A. Wals, C. Russell, D. Diplo, G. Fallon, L.A. Sandberg, L. Fawcett, **M. Reed,** M. Peters, M. Beaulieu, M. Stroink, R. Haluza-Delay, R. Kahn, R. Stewart, R. Walter, S. Bell, and T. Leduc. 2012-2019. The sustainability and education policy network: leading through multi-sector learning. Social Sciences and Humanities Research Council, Partnership Grant.
- Morrissey, C.** 2010-2015. Effect of endocrine disrupting chemicals on avian life cycles. Natural Sciences and Engineering Research Council, Discovery Grant.
- Morrissey, C.** 2011-2012. Natural Sciences and Engineering Research Council Early Career Discovery supplement.
- Morrissey, C.** 2012. Environmental contaminants in Prairie wetlands. Environment Canada.
- Morrissey, C.** 2012. Identification of prairie watersheds at high risk from the use of neonicotinoid insecticides. Environment Canada.



Morrissey, C. 2012-2013. Neonicotinoid pesticides and effects on agricultural wetlands and wetland-associated birds of Prairie Canada. Ducks Unlimited.

Noble, B.F., A. Aitken, G. Poelzer, M. Peters, T. Smith, and E. Arkin. 2009-2012. Strategic environmental assessment roles and stakes in Arctic oil and gas development. Social Sciences and Humanities Research Council of Canada: Northern Communities Grants.

Noble, B.F., R. Patrick, M. Dubé, R. deLoe, and H. Schrier. 2009-2012. Institutional arrangements for watershed-based cumulative effects assessment. Social Sciences and Humanities Research Council of Canada, Canadian Environmental Issues Grants.

Noble, B.F., J. Jaeger, and J. Gunn. 2012-2016. Uncertainty analysis and communication in Canadian environmental impact assessment practice and decision making. Social Sciences and Humanities Research Council of Canada, Insight Grant.

Reed, M.G., and M.A. Guertin. 2011-2014. Creating networking and social learning strategies in Canadian biosphere reserves. Social Sciences and Humanities Research Council, Partnership Development Grant.

Reed, M.G., J. Sinclair, and J. Parkins. 2012-2016. The role of communities in collaborative forest governance in Canada: contributing to theory and practice through comparative study. Social Sciences and Humanities Research Council, Insight Grant.

Si, B.C. 2010-2014. Soil water redistribution and the fate and transport of chemicals in nonlevel landscapes. Natural Sciences and Engineering Research Council of Canada, Discovery Grant – Category 1.

Si, B.C. and S.L. Barbour. 2010-2012. A comparison of the water storage capacity of peat mineral mixes and LFH in reclamation covers for coarse textured soils. Syncrude.

Si, B.C. and S.L. Barbour. 2012-2016. Evaluation and modeling of soil water dynamics to determine land capability of coarse textured hydrocarbon affected reclamation Soils. Canadian Oilsand Research and Development Network (CONRAD).

Si, B.C. and J. Schoenau. 2010-2013. . Determining the representative sampling size for soil testing in direct seeding fields. Agriculture and Development Funds(ADF), Saskatchewan.

Si, B.C., J. Schoenau, and H. Cutforth. 2010-2013. An evaluation of soil water use efficiency for different seeding row spacings. Agriculture and Development Funds (ADF), Saskatchewan.

Southcott C., et al, including **B.F. Noble**. Resources and sustainable development in the Arctic. Social Sciences and Humanities Research Council of Canada, Major Collaborative Research Initiatives Program.

Wheater, H.S. 2010-2013. Knowledge and information community for climate change, European Institute of Technology.

Wheater, H.S. 2011-2014. Hydrological extremes and feedbacks in the changing water cycle, Changing Water Cycle, Natural Environment Research Council (UK).

Wheater, H.S., J. Pomeroy, and **H. Baulch.** 2012-2014. Monitoring and assessment of beneficial management practices: insights from the Tobacco Creek Watershed. Canadian Water Network Grant.

Public and Community Outreach

SENS held several outreach events in 2011-2012; these ranged from public lectures to a three-week long visit by Northern Elder-in-Residence Randall Tetlich. Major initiatives are summarized below:

- **SENS Connect**, October 14, 2012. This event was designed for students to network with representatives of the Saskatchewan environmental sector using a tradeshow format. Several MSEM projects resulted. Organizations which attended included:
 - City of Saskatoon Environmental Services
 - Federated Co-operative Ltd.
 - Office of Sustainability, Facilities Management Division, University of Saskatchewan
 - Redberry Lake Biosphere Reserve
 - Saskatchewan Environmental Industry and Managers' Association
 - Saskatchewan Environmental Society
 - Saskatchewan Waste Reduction Council

- Saskatoon Environmental Advisory Committee
- SOS Elms Coalition
- South Saskatchewan River Watershed Stewards
- **Northern Elder-in-Residence Visit**, October 21 to November 12, 2011. Randall Tetlich, a member of the Vuntut Gwitch'in First Nation in Yukon, spent three weeks at SENS. Mr. Tetlich gave seminars in several venues, including the Western College of Veterinary Medicine, the Lutheran Theological Seminary, and SENS. These lectures provided insights about human-animal relations from an Aboriginal perspective, Aboriginal spirituality, and traditional knowledge and the environment. He also visited many classes in SENS, the College of Education, and the International Centre for Northern Governance and Development.
- **Environmental Career Panel**, March 2, 2012. Intended to provide students with information about the current and future job market, as well as with tips about how to succeed in securing employment, the panel featured speakers from a variety of backgrounds. Allyson Brady, Executive Director of the Saskatchewan Environmental Society, represented the non-governmental sector, while Peter Goode, Principal and Senior Environmental Planner with Stantec, spoke about working in environmental consulting. Karl-Erich Lindenschmidt, Associate Professor with SENS and the Global Institute for Water Security, was present to speak about employment with government, given his experience working with the Government of Manitoba.
- **John Robinson Visit**, March 22 and 23, 2012. Dr. John Robinson, Executive Director of the University of British Columbia Sustainability Initiative, visited Saskatoon to give a public lecture entitled *Redefining Green: UBC's Centre for Interactive Research on Sustainability (CIRS)*. Co-sponsored by Great Places, SENS, the U of S Office of Sustainability, and the City of Saskatoon, the lecture was held at the Frances Morrison Library with 170 people in attendance. The lecture focused on the innovative CIRS building at UBC – this building is net positive in four environmental and three human aspects of sustainability, and is billed as the most sustainable building in North America. Dr. Robinson also addressed senior U of S and City of Saskatoon administrators at a workshop to discuss possibilities for collaboration regarding sustainability initiatives, and he gave the ENVIS 990 seminar during his visit.
- **Earth Day Lecture by Stephen Stec**, April 12, 2012. Dr. Stec, Senior Researcher, Center for Environment and Security, Central European University, visited the University of Saskatchewan in mid-April. During his time at the U of S, he gave the SENS Earth Day Lecture, which was co-sponsored by the Johnson-Shoyama Graduate School of Public Policy and the College of Law. Entitled *Rio + 20: Choosing the Future We Want*, the presentation outlined the complex process of policy development used at the United Nations Conference on Sustainable Development, which was held in Rio in June 2012.
- **Memorandum of Understanding with the Redberry Lake Biosphere Reserve**. SENS and the Redberry Lake Biosphere Reserve (RLBR) recently signed a Memorandum of Understanding to formalize the partnership between the two organizations. The partnership allows for the completion of mutual research projects, as well as the exchange and sharing of research results. The implementation of regular field trips for students to RLBR and access to RLBR resources (such as the Research and Education Research Centre at Redberry Lake) for students are also key features of the MOU. By working together in this way, SENS and RLBR will be able to expand the scope of research and education projects relating to the environment and sustainability sectors.
- **MESPOM (Master's in Environmental Sciences, Policy, and Management) Memorandum of Understanding**. The University of Saskatchewan joined the MESPOM consortium of universities in 2011/12. This prestigious Erasmus Mundus master's program is managed by four European and two North American universities, and is supported by the European Commission. The consortium universities are Lund University (Sweden), the University of Manchester (UK), Central European University (Hungary), the University of the Aegean (Greece), Middlebury College (USA), and the University of Saskatchewan (Canada).
- **Talking SENSE and the Alumni SENSor**: SENS continued to provide updates to its community members and the wider public through *Talking SENSE*, an electronic newsletter published three times a year. *The Alumni SENSor* is sent to SENS alumni exclusively.



Governance

The School of Environment and Sustainability follows a collegial model of decision-making, where committees are responsible for overseeing the development of policies and procedures. Final approval is sought from the SENS Faculty Council, which is comprised of all faculty holding standard, primary-joint, or secondary-joint appointments in the School. Membership of the School's committees for 2011-2012 was as follows:

Academic Programs

- Charles Maulé (chair, Term 1)
- Bram Noble (chair, Term 2)
- Helen Baulch
- Maureen Reed
- Bing Si
- Amanda Burke

Admissions and Awards

- Ken Belcher (chair)
- Marie-Ann Bowden
- Markus Hecker
- Vladimir Kricsfalusy

Interdisciplinary Research

- Maureen Reed (chair, Term 1)
- Doug Clark (chair, Term 2)
- MJ Barrett
- Markus Hecker
- Andrew Ireson
- Bram Noble
- Vanessa Hickey

Outreach and Engagement

- Marcia McKenzie (chair)
- Doug Clark
- Tim Jardine
- Jennifer Locke

Seminars and Special Lectures

- Paul Jones (chair)
- MJ Barrett
- Vanessa Hickey
- Ana Isabel Melgarejo

Teaching and Learning

- Maureen Reed (chair)
- Marie-Ann Bowden
- Paul Jones
- Vladimir Kricsfalusy
- Marcia McKenzie
- Christy Morrissey
- Amanda Burke
- Colleen George

Finances

For the Period Ended April 30, 2012

Fund balances, beginning of year	\$	412,695.55
Revenue (1)		
Student Fees		4,101.83
Operating Allocation		831,282.19
Internal Transfers		
Graduate Scholarship Allocation		0.00
Capital Equipment Allocation		8,000.00
Centennial Chair Allocation		122,249.92
Total Funds Available	\$	<u>1,378,329.49</u>
Expenses		
Salaries		740,452.78
Employee Benefits		76,171.49
Operational Supplies and Expenses		60,517.79
Travel		13,911.22
Maintenance, Rental and Renovations		277.50
Scholarships, Bursaries and Prizes		92,549.31
Capital Assets		6,359.21
Transfers to other funds (2)		57,920.79
Total Expenses	\$	<u>1,048,160.09</u>
Fund balances, end of year	\$	<u><u>330,169.40</u></u>

(1) Only core operating and scholarship funding is summarized; research, overhead and Federal Indirect Cost Program funding for the School of Environment and Sustainability is not included.

(2) Relates to Senior Administrators' Expenses (DSEA), New Faculty Capital Start-up match, sessional lecturer support transferred to Education and support for the Science in Society research project.