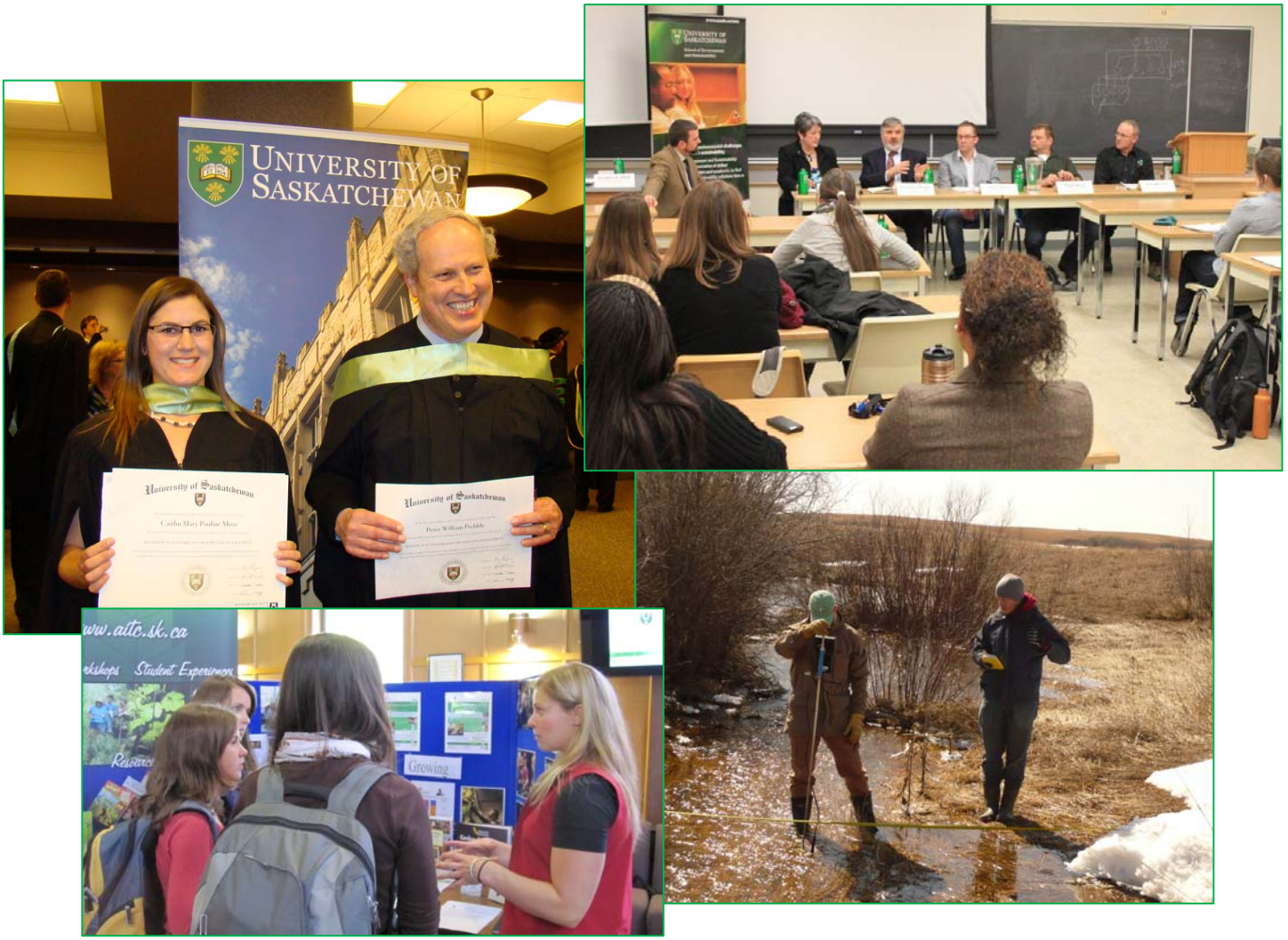


UNIVERSITY OF SASKATCHEWAN

School of Environment and Sustainability

Annual Report

2010 - 2011

On the cover:

Clockwise from upper left: Caitlin Mroz and Peter Prebble receive their Master of Sustainable Environmental Management degrees at Spring Convocation 2011; the SENS Environmental Career Panel, February 2011; Environment Canada Research Scientist Chris Spence (left) and SENS Assistant Professor Andrew Ireson (right) collect data during the spring melt near St. Denis; students meet with representatives from a variety of organizations working in the environmental sector during SENS Connect, September 2010.

School of Environment and Sustainability

Annual Report

2010 - 2011

School of Environment and Sustainability
University of Saskatchewan
Room 323, Kirk Hall
117 Science Place
Saskatoon, SK
Canada S7N 5C8

www.usask.ca/sens

Telephone: (306) 966-1985
Facsimile: (306) 966-2298
E-mail: sens.info@usask.ca

Table of Contents

Tables

Figures

SENS in 2010-11

From July 1, 2010 to June 30, 2011, the focus at the School of Environment and Sustainability (SENS) shifted slightly, moving from an emphasis on growth and internal development to include an increased level of engagement with the external community and a formalization of structures to advance, coordinate and integrate the School's teaching and learning initiatives. More than sixty graduate students were registered at SENS in 2010-2011, and the faculty grew in number with the addition of Dr. Howard Wheater, Canada Excellence Research Chair in Water Security, Associate Professor Dr. Markus Hecker, Assistant Professor Dr. Andrew Ireson, and Assistant Professor Dr. Christy Morrissey, who holds a secondary-joint appointment with the School.

Several student-focused events were held during the year; these included the SENS Connect networking event in September 2010, an environmental career panel in February 2011, and workshops focused on financial management and human resource management. The School continues to gather feedback from students at key points throughout their programs of study. This feedback, in part, assists in the continual refinement of the School's programs and curricula, as does the faculty's annual curriculum review workshop.

Collegial processes within the School received a considerable amount of attention during 2010-2011, with the development of the School's standards for promotion and tenure, along with documents addressing items such as salary review processes.

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 independent 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 within 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 within three years of full-time 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 2010-2011 academic year.

Core Courses

ENVS 801.3 Ecosystem Science and Sustainability
Instructors: Josef Schmutz and Vladimir Kricsfalusy
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: Geoff Cunfer, Marcia McKenzie, Douglas Clark, 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: Maureen Reed and Alec Aitken, 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
Instructor: Douglas Clark
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 and Monique Dubé
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 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 Environmental Economics and Policy Making
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.

GEOG 886.3 Advanced Environmental Impact Assessment
Instructor: Bram Noble
A project-based course focusing on emerging concepts and broader applications of environmental assessment principles and practices. Course topics vary from year to year following developments in the field, and may include such topics as cumulative effects assessment, strategic environmental assessment, project scoping, assessment methods and techniques, monitoring and follow-up.

Other Elective Courses

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 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 898.3 Experimental Design and Statistical Analysis for Environmental Sciences
Instructor: Monique Dubé
This course is designed for graduate students to improve their knowledge of experimental design and application in environmental research. Content will include a review of basic statistical concepts and techniques, presentation of different types of experimental designs, case studies, and a discussion of common problems and solutions for analyses when experiments do not go as planned. The primary objective is for students to understand that experimental design is a scientific process. As such, key fundamentals apply irrespective of a discipline or specific research program. The intention is for students to be able to understand the process and apply it to different disciplines as well as to their own research program.

ENVS 990: Seminar in Environment and Sustainability, 2010 - 2011

- Adaptive Governance for Fire Management Planning - A Case Study on Prince Albert National Park, Saskatchewan, Åsa Almstedt, MES Candidate, and Low Impact Development Strategies and Best Practices for Saskatoon, Colin Gibb, MSEM Candidate, September 17, 2010
- Climate Change, Prairie Agriculture and Prairie Economy: The New Normal, Suren Kulshreshtha, Department of Bioresource Policy, Business, and Economics, College of Agriculture and Bioresources, September 24, 2010
- Building Water Security through Source Water Protection: Lessons from the Okanagan Basin, British Columbia, Robert Patrick, Department of Geography and Planning, College of Arts and Science, October 8, 2010
- Making SENS at the University of Saskatchewan: Innovation and Transformation, Sharla Daviduik, October 15, 2010
- Clarifying Students' Goals and Expectations of Their Graduate Programs at SENS: An Un-seminar, moderated by Douglas Clark, October 22 and 29, 2010
- Groundwater – Easy To Forget ... Until Your Basement Floods Or The Creek Dries Up, Garth van der Kamp, Environment Canada, November 12, 2010
- A Performance-Based Approach to Agri-Environmental Policy: Development and Comparative Assessment, Julia Baird, PhD Candidate, November 19, 2010
- Putting the Ecology into Ecotoxicology: Using Avian Life Cycles to Aid Interpretation of Contaminant Exposure and Effects, Christy Morrissey, November 26, 2010
- Postcards From the Edge: Breaking the 'Prairie' Paradigm in Saskatchewan, Merle Massie, Department of History, College of Arts and Science, January 14, 2011

- Resiliency of Water Apportionment in Western Canada, John Pomeroy, January 21, 2011
- Deforestation – Its Impact on the Sahariya Tribe, Rajasthan, India, Viji Kalagnanam, MES Candidate, and Regional Strategic Environmental Assessment Roles and Stakes in Arctic Oil and Gas Development, Skye Ketilson, MES Candidate, January 28, 2011
- Water Management for a Changing Climate: Challenges and Opportunities, Howard Wheater, February 11, 2011
- Metal Exposure and Recruitment Failure of White Sturgeon (*Acipenser transmontanus*) in the Transboundary Reach of the Columbia River Between Canada and the US, Markus Hecker, February 18, 2011
- The Second Edition of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans, Diane Martz, Director, Ethics Office, March 11, 2011
- ENVS 992 Proposal Symposium, March 18, 2011
- Positive Entrepreneurial Roles in Providing Health Care, Rein Lepnurm, School of Public Health, March 25, 2011
- The Ninginganiq National Wildlife Area and the Proposed Igalirtuuq Marine Biosphere Reserve: An Exploration of Multilevel Environmental Governance in Nunavut, John Kearns, MES Candidate, and Investgating Cowichan River Collaborative Salmon Management Institutions: The Cowichan Harvest Roundtable and the Traditional Cowichan Fish Weir, Chelsea Dale, MES Candidate, April 1, 2011
- Paleolimnology: The Limnologist's Time Machine, Biplob Das, Saskatchewan Environment, April 8, 2011
- Evaluating Institutional Arrangements to Support Watershed-Scale Cumulative Effects Assessment in the Grand River Watershed, Canada, Jania Chilima, MES Candidate, and The Cross-Border Dimensions of Vuntut Gwitch'in Food Security, Tobi Jeans, MES Candidate, April 15, 2011

People

Administration

- Karsten Liber (BSc, Guelph; PhD, Guelph), Executive Director
- Maureen Reed (BSc, Victoria; MA, Toronto; PhD, Waterloo), Assistant Director - Academic

Faculty

Standard Appointments

- Douglas Clark, Assistant Professor and Centennial Chair in Human Dimensions of Environment and Sustainability (BSc, Victoria; MSc, Alberta; PhD, Wilfrid Laurier)
- Monique Dubé, Associate Professor and Canada Research Chair in Aquatic Ecosystem Health Diagnosis (BSc, British Columbia; MSc, Saskatchewan; PhD, New Brunswick)
- Markus Hecker, Associate Professor (Diploma (MSc Equivalent), Hamburg; PhD, Hamburg) (*started March 2011*)
- Andrew Ireson, Assistant Professor (MEng, Bath; MSc, Imperial College London; PhD, Imperial College London) (*started March 2011*)
- Vladimir Kricsfalusy, Associate Professor (MSc, Uzhgorod; PhD, Uzhgorod and the Academy of Sciences of Ukraine)
- Karsten Liber, Professor (BSc, Guelph; PhD, Guelph)
- Paul Jones, Associate Professor (BSc, Otago; PhD, Otago)

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) (*started January 2011*)
- Maureen Reed, Professor (BSc, Victoria; MA, Toronto; PhD, Waterloo) (70% SENS; 30% Department of Geography and Planning, College of Arts and Science)
- Howard Wheater, 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) (*started October 2010*)

Secondary Joint Appointments

- Ken Belcher, Associate Professor (BSA, Manitoba; MNRM, Manitoba; PhD, Saskatchewan) (30% SENS; 70% Department of Bioresource 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 Agricultural and Bioresource 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) (*started October 2010*)
- Bram Noble, Associate Professor (BA, Memorial; MES, Wilfrid Laurier; PhD, Memorial) (30% SENS; 70% Department of Geography and Planning, College of Arts and Science)
- John Pomeroy, Professor and Canada Research Chair in Water Resources and Climate Change (BSc, Saskatchewan; PhD, Saskatchewan) (10% SENS; 90% 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 Appointments

- Angela Bedard-Haughn, Assistant Professor (BSc, Saskatchewan; MSc, Saskatchewan; PhD, California – Davis), Department of Soil Science, College of Agriculture and Bioresources
- Scott Bell, Associate 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
- Michael Gertler, Associate Professor (BES, Waterloo; MSc, McGill; PhD, Cornell), Department of Sociology, College of Arts and Science
- Jill Gunn, Assistant Professor (BA, Saskatchewan; MSc, Northern British Columbia; PhD, Saskatchewan), Department of Geography and Planning, College of Arts and Science
- Xulin Guo, Associate Professor (BSc, Beijing; MSc, Beijing; PhD, Kansas), Department of Geography and Planning, College of Arts and Science

- Hayley Hesseln, Associate Professor (BComm, Saskatchewan; PhD, Colorado), Department of Bioresource Policy, Business, and Economics, College of Agriculture and Bioresources
- Jeff Hudson, Associate Professor (BSc, Trent; MSc, Guelph; PhD, Waterloo), Department of Biology, College of Arts and Science
- Susan Kaminskyj, Professor (BSc, Toronto; MSc, Toronto; PhD, York), Department of Biology, College of Arts and Science
- 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
- Janet McVittie, Assistant Professor (BSc, Saskatchewan; BEd, Saskatchewan; PhD, Saskatchewan), Department of Curriculum Studies, College of Education
- David Natcher, Associate Professor (BA, Alberta; MA, Alaska; PhD, Alberta), Department of Bioresource Policy, Business, and Economics, College of Agriculture and Bioresources
- Mehdi Nemati, Associate Professor (BSc, Amirkabir; MSc, Amirkabir; PhD, Manchester), Department of Chemical Engineering, College of Engineering
- Aloysius Newenham-Kahindi, Assistant Professor (BA, Pontifical Urbaniana Universitat; 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
- Ryan Walker, Associate Professor (BA, Lethbridge; MA, Waterloo; PhD, Queen's; MCIP), Department of Geography and Planning, College of Arts and Science
- Bill Waiser, Professor (BA, Trent; MA, Saskatchewan; PhD, Saskatchewan), Department of History, College of Arts and Science
- Yangdou Wei, Associate Professor (BSc, Huazhong; MSc, Huazhong; PhD, Copenhagen), Department of Biology, College of Arts and Science
- Clinton Westman, Assistant Professor (PhD, Alberta; MES, York; BA, Calgary), Department of Archaeology and Anthropology, College of Arts and Science
- Karen Wiebe, Professor (BSc, Simon Fraser; PhD, Saskatchewan), Department of Biology, 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 Appointments

- Murray Bentham (BSc, Saskatchewan; MSc, Saskatchewan; PhD, Saskatchewan), Specialist, Agri-Environmental Modelling, Agriculture and Agri-Food Canada

- Biplob Das (BSc, Chittagong; MSc, Chittagong; MSc, Alberta; PhD, Victoria), Senior Aquatic Scientist, Science Support Unit, Saskatchewan Environment
- John-Mark Davies (BSc, Saskatchewan; MSc, Manitoba; PhD, Victoria), Water Quality Scientist, Saskatchewan Watershed Authority
- Annette Desmarais (BA, Simon Fraser; MA, Sussex; PhD, Calgary), Associate Professor, International Studies Program, Faculty of Arts, University of Regina
- Steven E. Franklin (BES, Waterloo; MA, Waterloo; PhD, Waterloo), President and Vice-Chancellor, 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), Head of Wetland Restoration, Ducks Unlimited
- Mark Johnston (BSc, Minnesota; MSc, Alberta; PhD, SUNY), Saskatchewan Research Council
- Carrie Rickwood (BSc, Essex; MRes, Plymouth; PhD, Saskatchewan)
- Richard Robarts (BSc, Victoria; MSc, Waterloo; PhD, Rhodes), Director, UNEP/GEMS Water Programme, National Water Research Institute, Environment Canada
- Josef Schmutz (BSc, Wisconsin; MSc, Alberta; PhD, Queen's; BEd, Saskatchewan), Prairie Ecodesign
- Judit Smits (BSc, Guelph; DVM, Ontario Veterinary College; MVetSc, Saskatchewan; PhD, Saskatchewan), Faculty of Veterinary Medicine, University of Calgary
- Garth van der Kamp (BSc, British Columbia; MSc, British Columbia; PhD; Free University, The Netherlands), Research Scientist, National Hydrology Research Centre, Environment Canada
- Elaine Wheaton (BSc, Saskatchewan; MSc, Saskatchewan; PhD, Saskatchewan), Climatologist, Saskatchewan Research Council

Sessional Lecturers

- Josef Schmutz (BSc, Wisconsin; MSc, Alberta; PhD, Queen's; BEd, Saskatchewan)

Staff

- Sharla Daviduik, Administrative Officer (BSc, Saskatchewan; MRM, Simon Fraser; EPt)
- Irene Schwalm, Graduate Secretary (BAC, Saskatchewan)

Joint Positions shared with the Global Institute for Water Security:

- Twyla Rudovica, Financial Officer (BComm, Saskatchewan, CMA)
- Meagan Hinther, Communications Specialist (BSc, McGill) (*started March 2011*)

Joint Positions shared with the School of Public Health and the Johnson-Shoyama Graduate School of Public Policy:

- Erica Schindel, Communications and Marketing Specialist (BComm, Saskatchewan) (*to December 2010*)

Students

An asterisk indicates that the student completed program requirements during the 2010-2011 year.

Master of Sustainable Environmental Management Candidates

- Kingsley Ahey (BSc, Kwame Nkrumah University of Science and Technology)
- Cynthia Avila (BSS, Ottawa)

- Graham Barber (BA, Calgary)
- Daniel Brent (BComm, Ryerson)
- Andrew Cameron (BComm, Queen's) *
- Liu Cao (BEcon, Nanjing University of Aeronautics and Astronautics)
- Evelyn Cerda (BA, Sonora)
- Xing Chen (BE, Tianjin University of Technology) *
- Gurbinder Singh Dhaliwal (BSc, Punjab Agricultural University; MSc, Punjab Agricultural University)
- Colin Gibb (BSc, Saskatchewan) *
- Charu Gupta (BSc, Delhi)
- Elisa Hsieh (BSc, British Columbia)
- Chad Jackson (BComm, Saskatchewan; BSc, Saskatchewan)
- Jasper Johnson (BA, Bishop's) *
- Cara Klassen (BA, Saskatchewan) *
- Rita Marcinowski (BSc, Saskatchewan)
- Jostein Misfeldt (BSc, Saskatchewan)
- Brittany Morgan (BA, Vancouver Island University)
- Caitlin Mroz (BSc, McMaster) *
- Natalie Nikiforuk (BSc, Lethbridge)
- Darcy Paslawski (BSc, Saskatchewan)
- Peter Prebble (BBA, Prince Edward Island; MEd, Saskatchewan) *
- Al Scholz (BSA, Saskatchewan; BEd, Saskatchewan)
- Sarah Turkeli (BA, St. Francis Xavier)
- Matthew Wolsfeld (BSc, Saskatchewan)
- Stephanie Woods (BSc, Western Ontario)
- Jesse Woodward (BFA, Emily Carr)
- Victoria Worm (BSc, Western Washington)
- Brienne Young (BA, Saskatchewan) *

Master of Environment and Sustainability Candidates

- Åsa Almstedt (BA, Stockholm) *
- Amanda Burke (BSc, Saskatchewan)
- Jania Chilima (BSc, Trent)
- Chelsea Dale (BA, Malaspina)
- Shannon Dyck (BA, Saskatchewan)
- Yekaterina Dobrovolskaya (BE, Kazakh-British Technical University, Kazakhstan)
- 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)
- 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 Candidates

- Saima Abbasi (MSc, NWRP Agricultural University, Pakistan)
- Julia Baird (BSc, Alberta; MSc, Saskatchewan)
- Ranjan Datta (MSS, Monmouth; MSS, Shahjalal University of Science and Technology; BSS, 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)
- Ehimai Ohiozebau (BSc, Benin; MSc, Robert Gordon)
- Lindsay Tallon (BSA, Saskatchewan; MSc, Saskatchewan)
- Arcadio Viveros Guzman (MSc, Colegio de Postgraduados; MEd, Saskatchewan)
- Lisa White (BSc, Saskatchewan; MSc, Saskatchewan)
- Rebecca Zagozewski (BA, Saskatchewan; MA, Saskatchewan)

Student Demographics

Admissions

Admissions statistics for 2010-2011 are summarized in Table 1. One hundred twenty-two applications were received for the School's three graduate programs, with thirty-nine offers of admission made. Twenty-seven students accepted and began their graduate programs at SENS in 2010-2011.

Table 1 – Admissions 2010 - 2011

Program	Applications Received	Offers of Admission	Transfers from Other Units	Total Offers of Admission and Transfers	New Students Registering	Continuing Students	Total Number of Students
MSEM	56	24	0	24	17	12	29
MES	41	7	0	7	5	11	16
PhD	25	8	0	8	5	9	14
Total	122	39	0	39	27	32	59

The admission grade point averages for new students registering in the three programs in 2010 - 2011 were:

- MSEM – 77.1%
- MES – 82.3%
- PhD – 80.6%

The first SENS students to complete their programs graduated in 2010-2011, with fifteen MSEM students and three MES students being awarded their degrees. Nine of these students graduated at the May 2011 Convocation Ceremony, which means that SENS had a total of fifty-nine graduate students during the 2010-2011 academic year.

The average completion times for students which have graduated from the MES and MSEM programs to date are:

- MSEM – 1.37 years
- MES – 2.11 years

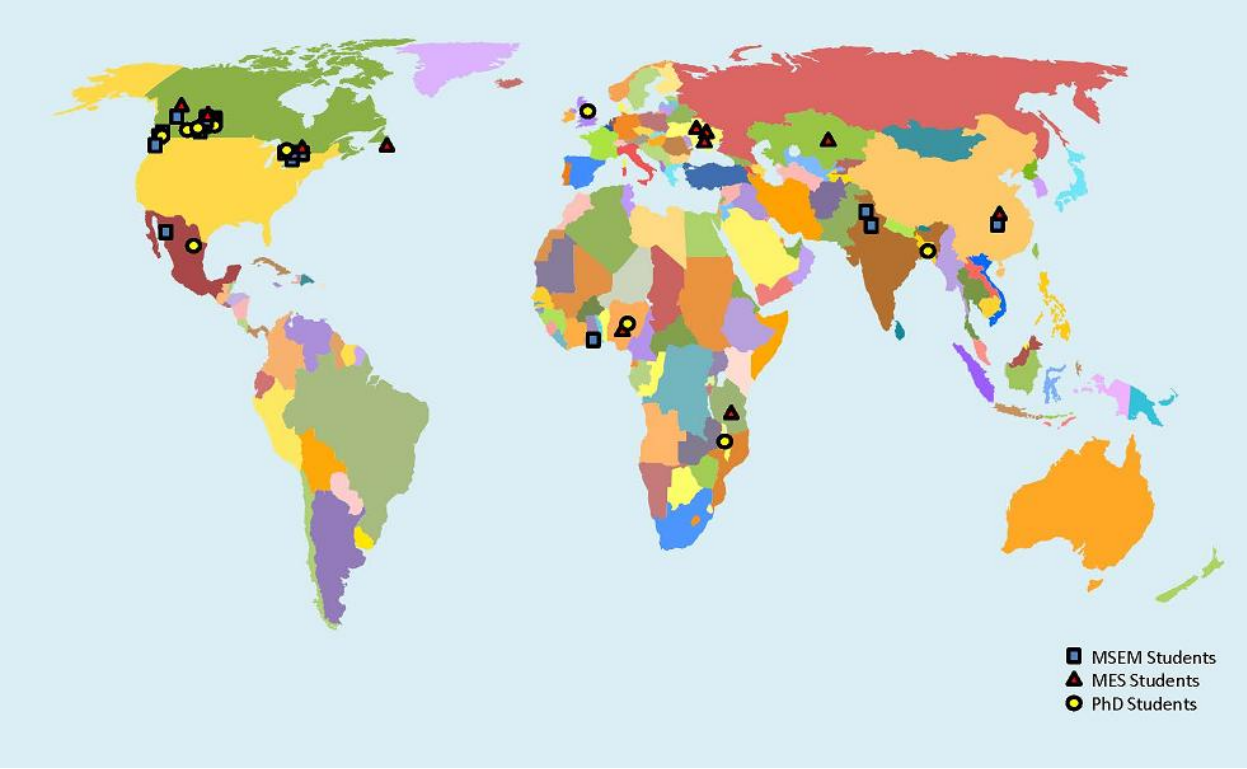
The School's first PhD graduates are anticipated in 2011-2012. The development of an alumni engagement strategy is a major initiative for SENS in 2011-2012.

The students attending SENS in 2010-2011 came to the School from around the world:

- Saskatchewan – 23 students (37.7%)
- Other Canadian Provinces/Territories – 17 students (27.9%)
- International – 21 students (34.4%)

This distribution is shown in Figure 1. These students represented fourteen countries: Bangladesh, Canada, China, Ghana, India, Kazakhstan, Malawi, Mexico, Nigeria, Pakistan, Tanzania, Ukraine, the United Kingdom, and the United States.

Figure 1 – SENS Student Geographic Origins, 2010 - 2011



Scholarships, Awards and Student Funding

Depending on their program, SENS students are eligible to receive funding from a variety of sources:

- SENS Scholarship Funding – this funding is provided to the School by the College of Graduate Studies and Research, specifically to support SENS graduate students.
- Other University of Saskatchewan Funding – this includes funding provided to students from other academic units, and includes campus-wide awards administered by the College of Graduate Studies and Research, such as Dean's Scholarships and the Robson Bursary.
- Tri-Council Funding – students in thesis programs are eligible to apply for SSHRC or NSERC scholarships, depending on the focus of their research. Students may also be supported by Tri-Council funds received by their supervisor.
- Other External Funding – this includes funding from provincial government sources, non-Tri-Council federal government funding, awards administered by agencies external to the University of Saskatchewan, industry funding, and funding from other faculty research grants.

Several SENS students received major Tri-Council scholarships for the 2010 -2011 academic year:

- Lindsay Tallon, PhD student, received a NSERC Industrial Postgraduate Scholarship.
- Jania Chilima, an MES student, received a SSHRC Canada Graduate Scholarship.
- Shannon Dyck, also in the MES program, received a SSHRC Canada Graduate Scholarship.

Other major scholarships received by SENS students during 2010-2011 include:

- Arcadio Viveros Guzman, in the PhD program, received a Public Health and the Agricultural Rural Ecosystem (PHARE) scholarship.
- Ayodele Olagunju, an MES student, received a University of Saskatchewan Dean's Scholarship.

SENS was fortunate to receive scholarship funding from Nexen, Inc. in 2010. The first Nexen Scholarships were awarded to PhD candidate Colleen George and MES student Viktoriya Zamchevska.

Student Initiatives

In 2010-2011, the School of Environment and Sustainability Students' Association (SENSSA) executive members were:

- Shannon Dyck – President
- Ranjan Datta – Vice-President
- Skye Ketilson – Secretary
- Charu Gupta – Treasurer
- Graham Barber – Social Coordinator
- Rezaur Rahman – Social Coordinator
- Sarah Turkeli – Campus Liaison
- Jesse Woodward – Community Liaison
- Amanda Burke – Community Liaison
- Colleen George – Academic Affairs
- John Kearns – Webmaster

A number of events were hosted by SENSSA during the year. The first, in partnership with SENS, was SENS Connect. This event allowed students to network with environmental organizations, with the potential to identify research projects, and to meet possible future employers. SENSSA also set up a booth during Green Yourself Week to promote the School. In December, some SENSSA students participated in Aden Bowman's Sustainability Youth Conference. Three students

presented (two on water and one on energy), while another five helped with registration and facilitation. Soon after that, SENSSA held a Christmas Party, entitled "Nog Fest," at St. Andrew's College. Much fun was had by all!

In early 2011, SENSSA wrote a letter in support of more Aboriginal engagement in SENS. Some students collaborated with the Aden Bowman Earthkeepers (Grade 10 students enrolled in a special environment-focused curriculum) on their green building design and landfill publications. Near the end of the year, the SENSSA students passed the SENSSA Constitution, and gave feedback on their experiences as SENS students. Last, SENSSA held a year-end wind-up at Fuddruckers and Eastview Bowl.

SENSSA continued with its Better than Bottled campaign to promote the implementation of sustainable water practices at the University of Saskatchewan (betterthanbottled.jimdo.com). Its goals were to improve access to clean, safe, public drinking water to members of the University of Saskatchewan community, and to compile information regarding the environmental and social impacts of bottled water. Members of the campaign began to map the water fountains on campus, published two articles in the campus newspaper, *The Sheaf* (one on water research and one on bottled water), presented at two conferences, and were interviewed on community radio (CFCR).

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 2010-2011. While all research grants listed may not have been managed through the School, the research often involves SENS graduate students.

Books, Chapters in Books, Expository and Review Articles

Bowden, M.A. and M.Phillipson, eds. 2010. Third JELP Environmental Law Conference: The Demise of Environmental Assessment in Canada? *Canadian Journal of Environmental Law and Practice*: 21.

Bowden, M.A., and L. Duncan. 2010. A Legal Guide to Aboriginal Drinking Water: A Prairie Provinces Perspective. Alberta: Tomorrow Foundation, Alberta Law Foundation, Walter and Duncan Gordon Foundation.

Hecker M. and J.P. Giesy. 2011. Effect-directed analysis of Ah-receptor mediated toxicants, mutagens and endocrine disruptors in sediments and biota. In: *Handbook of Environmental Chemistry*, Vol. 15: Effect Directed Analysis of Complex Environmental Contamination. Brack W., ed. Springer, Heidelberg, Germany. p 285-313.

Hecker, M. and H. Hollert. 2011. Endocrine Disruptor Screening: Regulatory Perspectives and Needs. *Environmental Sciences Europe* 23:15.

Wheater, H.S., S. Mathias, and X. Li. (eds). 2010. *Groundwater modelling in arid and semi-arid areas.* Cambridge: Cambridge University Press.

Wheater, H.S. 2011. Flood hazard, floodplain policy and flood management. In: *Water Resources Planning and Management*, Grafton, R.Q. and K. Hussey, eds. Cambridge: Cambridge University Press.

Wheater, H.S., N. McIntyre, B.M. Jackson, M.R. Marshall, C. Ballard, N.S. Bulygina, B. Reynolds, and Z. Frogbrook. 2010. Multiscale impacts of land management on flooding. In: *Flood Risk Science and Management*, Pender, G., and H. Faulkner, eds. Oxford, UK: Wiley-Blackwell. p 39-59.

Wheater, H.S., N.J.D. Graham, M. Popcock, and B. Holden. 2011. Water supply systems. In: *Water Distribution Systems*. Savic, D.A., and J.K. Banyard, eds. London: ICE Publishing.

Papers in Refereed Journals

Ballard, C.E., N. McIntyre, and **H.S. Wheater**. 2011. Effects of peatland drainage management on peak flows. *Hydrology and Earth System Sciences Discussions* 8:1-31.

Banerjee S., A. Bedard-Haughn, **B.C. Si**, and S.D. Siciliano. 2011. Soil spatial dependence in three arctic ecosystems. *Soil Science Society of America Journal* 75:591-594.

Banerjee S., Y.H. He, X. Guo, and **B.C. Si.** 2011. Spatial relationships between leaf area index and topographic factors in a semiarid grassland: joint multifractal analysis. *Australian Journal of Crop Science* 5(6):756-763.

Biswas A. and **B.C. Si**. 2011. Depth persistence of the spatial pattern of soil water storage in a hummocky landscape. *Soil Science Society of America Journal* 75:1099-1109.

Biswas A. and **B.C. Si**. 2011. Revealing the controls of soil water storage at different scales in a hummocky landscape. *Soil Science Society of America Journal* 75:1295-1306.

Biswas A. and **B.C. Si**. 2011. Identifying scale specific controls of soil water storage in a hummocky landscape using wavelet coherency. *Geoderma* 165:50–59.

Bowden, M.A. 2010. Taking care of business: environmental assessment reform in Saskatchewan. *Journal of Environmental Law and Practice*: 21.

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.

Chang, H., Y. Wan, J. Naile, X. Zhang, S. Wiseman, M. Hecker, M.H.W. Lam, J.P. Giesy, and **P.D. Jones**. 2010. Simultaneous quantification of multiple classes of phenolic compounds in blood plasma by liquid chromatography-electrospray tandem mass spectrometry. *Journal of Chromatography* 1217(4):506-513.

Clark, D. and D.S. Slocombe. 2011. Grizzly bear conservation in the Foothills Model Forest: appraisal of a collaborative ecosystem management effort. *Policy Sciences* 44(1):1-12.

Clark, S., M. Rutherford, M. Auer, D. Cherney, R. Wallace, D. Mattson, **D. Clark,** L. Foote, N. Krogman, P. Wilshusen, and T. Steelman. 2011. College and university environmental programs as a policy problem (part 1): integrating knowledge, education, and action for a better world? *Environmental Management* 47(5):701-715.

Clark, S., M. Rutherford, M. Auer, D. Cherney, R. Wallace, D. Mattson, **D. Clark**, L. Foote, N. Krogman, P. Wilshusen, and T. Steelman. 2011. College and university environmental programs as a policy problem (part 2): strategies for improvement. *Environmental Management* 47(5):716-726.

Cohen-Barnhouse, A.M., M.J. Zwiernik, J.E. Link, S.D. Fitzgerald, S.W. Kennedy, J. C. Hervé, **P.D. Jones**, J.P. Giesy, et al. 2011. Sensitivity of Japanese quail (*Coturnix japonica*), common pheasant (*Phasianus colchicus*) and white leghorn chicken (*Gallus gallus domesticus*) embryos to *in ovo* exposure to TCDD, PeCDF, and TCDF. *Toxicological Sciences* 119(1):93-103.

Cohen-Barnhouse, A.M., M.J. Zwiernik, J.E. Link, S.D. Fitzgerald, S.W. Kennedy, J.P. Giesy, S. Wiseman, **P.D. Jones**, J.L. Newsted, D. Kay, and S.J. Bursian. 2011. Developmental and posthatch effects of *in ovo* exposure to 2,3,7,8-TCDD, 2,3,4,7,8-PECDF, and 2,3,7,8-TCDF in Japanese quail (*Coturnix japonica*), common pheasant (*Phasianus*

colchicus), and white leghorn chicken (*Gallus gallus domesticus*) embryos. *Environmental Toxicology and Chemistry* 30(7):1659-1668.

Doig, L. and **K. Liber**. 2010. An assessment of *Hyalella azteca* burrowing activity under laboratory sediment toxicity testing conditions. *Chemosphere* 81:261-265.

Driessnack, M.K., **M.G. Dubé**, L.D. Rozon-Ramilo, **P.D. Jones**, C.I.E. Wiramanaden, and I.J. Pickering. 2011. The use of field-based mesocosm systems to assess the effects of uranium milling effluent on fathead minnow (*Pimephales promelas*) reproduction. *Ecotoxicology* 20(6):1209-1224.

Franz, E.D., C.I.E. Wiramanaden, D.M. Janz, I.J. Pickering and **K. Liber**. 2011. Selenium bioaccumulation and speciation in *Chironomus dilutus* exposed to water-borne selenate, selenite, or seleno-DL-methionine. *Environmental Toxicology and Chemistry* 30:2292-2299.

Giesy, J.P., J.E. Naile, J.S. Khim, **P.D. Jones**, and J.L. Newsted. 2010. Aquatic toxicology of perfluorinated chemicals. *Reviews of Environmental Contamination and Toxicology* 202:1-52.

Grund S., E. Higley, R. Schönenberger, M. Suter, J.P. Giesy, T. Braunbeck, **M. Hecker**, and H. Hollert. 2010. Effect directed analysis of the endocrine disrupting potential of sediments from the Upper Danube River (Germany) using *in vitro* bioassays and chemical analysis. *Environmental Science and Pollution Research* 18:446-460.

Guérin J., L.-E Parent, and **B.C. Si**. 2011. Spatial and seasonal variability of phosphorus risk indexes in cultivated organic soils. *Canadian Journal of Soil Science* 91:291-302.

He, Y., S.B. Wiseman, X. Zhang, **M. Hecker, P.D. Jones**, M.G. El-Din, J.W. Martin, and J.P. Giesy. 2010. Ozonation attenutates the steroidogenic disruptive effects of sediment free oil sands process water in the H295R cell line. *Chemosphere* 80(5):578-584.

He, Y., S.B. Wiseman, **M. Hecker**, X. Zhang, N. Wand, L.A. Perez, **P.D. Jones**, M.G. El-Din, J.W. Martin, and J.P. Giesy. 2011. Effect of ozonation on the estrogenicity and androgenicity of oil sands process-affected water. *Environmental Science and Technology* 45(15):6268-6274.

Hecker, M., H. Hollert, R. Cooper, A.-M. Vinggaard, Y. Akahori, M. Murphy, C. Nellemann, E. Higley, J. Newsted, J. Laskey, A. Buckalew, S. Grund, J. Giesy, and G. Timm. 2011. The OECD Validation Program of the H295R Steroidogenesis Assay. Phase 3: Final Inter-Laboratory Validation Study. *Environmental Science and Pollution Research* 13:503-515.

Huang M. S.L. Barbour, A. Elshorbagy, J.D. Zettl and **B.C. Si**. 2011. Water availability and forest growth in coarse-textured soils. *Canadian Journal of Soil Science* 91:199-210.

Huang M. S.L. Barbour, A. Elshorbagy, J.D. Zettl and **B.C. Si**. 2011. System dynamics modeling of infiltration in drainage in layered coarse soil. *Canadian Journal of Soil Science* 91:185-197.

Huang M. S.L. Barbour, A. Elshorbagy, J.D. Zettl and **B.C. Si**. 2011. Infiltration and drainage processes in multi-layered coarse soils. *Canadian Journal of Soil Science* 91:169-183.

Hunter A., H. W. Chau, and **B.C. Si.** 2011. Impact of tension infiltrometer disc size on measured soil water repellency index. *Canadian Journal of Soil Science* 91:77-81.

Kramer V.J., M.A. Etterson, **M. Hecker**, C.A. Murphy, G. Roesijadi, D.J. Spade, J.A. Spromberg, M. Wang, and G.T. Ankley. 2011. Adverse outcome pathways and ecological risk assessment: bridging to population level effects. *Environmental Toxicology and Chemistry* 30:64-76.

Kricsfalusy V., G. Budnikov, and I. Lesio. 2010. Rare and protected plant species of the Uzhansky National Nature Park (Transcarpathia, Ukraine). *Thaiszia – Journal Of Botany* 20(2):115-125.

Liber, K., L.E. Doig and S.L. White-Sobey. 2011. Toxicity of uranium, molybdenum, nickel, and arsenic to *Hyalella azteca* and *Chironomus dilutus* in water-only and spiked-sediment toxicity tests. *Ecotoxicology and Environmental Safety* 74:1171-1179.

Liu C., X. Zhang, J. Deng, **M. Hecker**, J. Giesy, A. Al-Khedhairy, and B. Zhou. 2011. Effects of prochloraz or propylthiouracil on the cross-talk between the HPG, HPA and HPT axes in Zebrafish. *Environmental Science and Technology* 45:769-775.

Liu, C., X. Zhang, H. Change, **P.D. Jones**, S. Wiseman, J. Naile, **M. Hecker**, J.P. Giesy, and B. Zhou. 2010. Effects of fluorotelomer alcohol 8.2 FTOH on steroidogenesis in H29R cells: targeting the cAMP signaling cascade. *Toxicology and Applied Pharmacology* 247(3):222-228.

Liu G. and **B.C. Si**. 2011. Single- and dual-probe heat pulse probe for determining thermal properties of dry soils. *Soil Science Society of America Journal* 75:787-794.

Liu G. and **B.C. Si**. 2011. Soil ice content measurement using a heat pulse probe method. *Canadian Journal of Soil Science* 91:235-246.

Naile, J.E., J.S. Khim, J.N. House, **P.D. Jones**, and J.P. Giesy. 2010. Standard purity and response factors for perfluorinated compounds. *Toxicological and Environmental Chemistry* 92(7):1219-1232.

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.

Naile, J.E., J.S. Khim, T. Wang, C. Chen, W. Luo, B. Kwon, J. Park, C, Koh, **P.D. Jones**, Y. Lu, and J.P. Giesy. 2010. Perfluorinated compounds in water, sediment, soil and biota from estuarine and coastal areas of Korea. *Environmental Pollution* 158(5):1237-1244.

Noble, B.F., M. Hill and J. Neilsen. 2011. Environmental assessment framework for identifying and mitigating the effects of linear development to wetlands. *Landscape and Urban Planning* 99:133-140.

Noble, B.F., and C. Fidler. 2011. Advancing indigenous community – corporate agreements: lessons from practice in the Canadian mining sector. *Oil, Gas and Energy Law Intelligence* 9(4):1-30.

Neuman, A.D. and **K.W. Belcher**. 2011. The contribution of carbon-based payments to wetland conservation compensation on agricultural landscapes. *Agricultural Systems* 104(1):75-81.

Phibbs, J., C.I.E. Wiramanaden, D. Hauck, I.J. Pickering, **K. Liber** and D.M. Janz. 2011. Selenium uptake and speciation in wild and caged fish downstream of a metal mining and milling discharge. *Ecotoxicology and Environmental Safety* 74:1139-1150.

Puttaswamy, N. and **K. Liber**. 2010. Variation in toxicity response of *Ceriodaphnia dubia* to Athabasca oil sands coke leachates. *Chemosphere* 80:489-497.

Puttaswamy, N. and **K. Liber**. 2011. Identifying the causes of oil sands coke leachate toxicity to aquatic invertebrates. *Environmental Toxicology and Chemistry* 30:2576-2585.

Reed, M.G. and C. George. 2011. Where in the world is environmental justice? *Progress in Human Geography*. DOI: 10.1177/0309132510388384. Published online February 2011.

Richardson, K., J. Sinclair, **M.G. Reed**, and J. Parkins. 2011. Constraints to participation in Canadian forestry advisory committees: a gendered perspective. *Canadian Journal of Forest Research* 41:524-532.

Seitz, N.E.., C.J. Westbrook, and **B.F. Noble**. 2011. Bringing science into river systems cumulative effects assessment practice. *Environmental Impact Assessment Review* 31:180-186.

Si B.C., G.W. Parkin, and M. Dyck. 2011. Flow and transport in layered soils. Preface. *Canadian Journal of Soil Science* 91:127-132.

Smyth, S.J., M. Gusta, **K. Belcher**, P.W.B. Phillips and D. Castle. 2011. Environmental impacts from herbicide tolerant canola production in western Canada. *Agricultural Systems* 104:403-410.

Smyth, S.J., M. Gusta, D. Castle, P.W.B. Phillips, and **K. Belcher**. 2011. Economic benefits of genetically modified herbicide tolerant canola for producers. *AgBioForum* 14(1):1-13.

Wan Y., F. Liu, S. Wiseman, X. Zhang, H. Chang, **M. Hecker**, **P.D. Jones**, M.H.W. Lam, and J.P. Giesy. 2011. Interconversion of hydroxylated and methoxylated polybrominated diphenyl ethers in Japanese medaka. *Environmental Science and Technology* 44:8729-8735.

Wan, Y., K. Choi, S. Kim, K. Ji, H. Chang, S. Wiseman, **P.D. Jones** et al. 2010. Hydroxylated polybrominated diphenyl ethers and bisphenol A in pregnant woman and their matching fetuses: placental transfer and potential risks. *Environmental Science and Technology* 44(13):5233-5239.

Wan, Y., **P.D. Jones**, S. Wiseman, H. Cha, D. Chorney, K. Kannan, K. Zhang, et al. 2010. Contribution to synthetic and naturally occurring organobromine compounds to bromine mass in marine organisms. *Environmental Science and Technology* 44(16):6068-6073.

Wang Z.Y., Q.S. Shu, L.Y. Xie, Z.X. Liu, and **B.C. Si**. 2011. Joint multifractal analysis of scaling relationships between soil water retention parameters and soil texture. *Pedosphere* 21:373-379.

Wiramanaden, C.I.E., **K. Liber** and I.J. Pickering. 2010. Selenium speciation in whole-sediment using X-ray absorption spectroscopy and micro X-ray fluorescence imaging. *Environmental Science and Technology* 44:5389-5394.

Wiseman S., J.K. Thomas, E. Higley, O. Hursky, M. Pietrock, J.C. Raine, J.P. Giesy, D.M. Janz, and **M. Hecker**. 2011. Chronic exposure to dietary selenomethionine increases gonadal steroidogenesis in female rainbow trout. *Aquatic Toxicology* 105:218-226.

Wiseman, S.B., Y. Wan, H. Chang, X. 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* doi:10.1016/j.marpolbul.2011.02.008

Yang, Y., S. Wiseman, A.M. Cohen-Barnhouse, Y. Wan, **P.D. Jones**, J.L. Newsted, D.P. Kay, et al. 2010. Effects of *in ovo* exposure of white leghorn chicken, common pheasant, and Japanese quail to 2,3,7,8-tetrachlorodibenzo-p-dioxin and two chlorinated dibenzofurans on cyp1a induction. *Environmental Toxicology and Chemistry* 29(7):1490-1502.

Yu, J. and **K. Belcher**. 2011. An economic analysis of landowners' willingness to adopt wetland and riparian conservation management. *Canadian Journal of Agricultural Economics* 59:207-222.

Zettl J.D., S.L. Barbour, Huang M, **B.C. Si**, and L.A. Leskiw. 2011. Influence of textural layering on field capacity of coarse soils. *Canadian Journal of Soil Science* 91:133-147.

Zhang, K., Y. Wan, J.P. Giesy, M.H.W. Lam, S. Wiseman, **P.D. Jones**, and J. Hu. 2010. Tissue concentrations of polybrominated compounds in Chinese sturgeon (*Acipenser sinensis*): origin, hepatic sequestration, and maternal transfer. *Environmental Science and Technology* 44(15):5781-5786.

Zhang, X., H. Chang, S. Wiseman, Y. He, E. Higley, **P. Jones**, C.K. Wong, A. Al-Khedhairy, J.P. Giesy, and **M. Hecker**. 2011. Bisphenol A disrupts steroidogenesis in human H295R cells. *Toxicological Sciences* 121(2):320-327.

Zhang X., S. Wiseman, H. Yu, H. Liu, J. Giesy, and **M. Hecker**. 2011. Assessing the toxicity of naphthenic acids using a microbial genome wide live cell reporter array system. *Environmental Science and Technology*. Published online (dx.doi.org/10.1021/es1032579).

Papers in Non-Refereed Journals

Biswas A. and **B.C. Si**. 2011. Depth persistent control of soil water storage in a hummocky landscape. *Elements* 29(2):19-23.

Contributed (Non-Invited) Papers/Abstracts in Published Conference Proceedings

Biswas, A. and **B.C. Si**. 2010. Revealing controls of soil water in the landscape. Soil Science Society of America Conference. Long Beach, CA.

Biswas, A. and **B.C. Si**. 2010. Direct and indirect control of soil water in a hummocky landscape. Soil Science Society of America Conference. Long Beach, CA.

Biswas A. and **B.C. Si**. 2011. Depth persistent control of soil water storage in a hummocky landscape. Canadian Geophysics Union. Banff, Alberta.

Kricsfalusy V. 2010. Conservation assessment of remnant fescue grasslands in Saskatchewan, Canada. 24th International Congress for Conservation Biology – Conservation for a Changing Planet. Edmonton, Canada.

Kricsfalusy V. 2010. Invasion success of *Cynanchum rossicum* (Kleopow) Borhidi: do habitat affinities and species traits matter? Anthropization and environment of rural settlements. Flora and vegetation: IX Intern. Conf. M.G. Kholodny Institute of Botany NAS of Ukraine, Kyiv.

Si, B.C. and G. Liu. 2010. Single heat pulse probe for measurement of soil thermal properties in dry soils. Soil Science Society of America Conference. Long Beach, CA.

Tallon, L. and **B.C. Si**. 2010. Soil water in two reclaimed landscapes. Soil Science Society of America Conference. Long Beach, CA.

Technical Reports Relevant to Academic Field

Barrett, M.J. 2011. Inclusion of Indigenous/Traditional Ecological Knowledge in Resource Management and Research Processes. Literature review. For Environment Canada.

Clark, D. 2010. Socio-Economic Impact Assessment of the Aishihik Wood Bison Transplant. Report under contract #K2F50-09-4987 to Environment Canada. 63p.

Francis, G., S. Mendis-Millard, and **M.G. Reed.** 2010. Clayoquot Sound Biosphere Reserve Periodic Review Report 2010. Prepared on behalf of the Canadian Biosphere Reserves Association for submission to the Canadian Commission for UNESCO. Ottawa, Ontario. 139 p.

Noble, B.F. 2011. Criteria for Ministerial Decisions under Sections 12.4.7 and 12.4.9 of the Nunavut Land Claims Agreement. Her Majesty the Queen in Right of Canada. Ottawa, ON.

Pankhurst H., K. Ursic, and **V. Kricsfalusy** . 2010. Eastern Prickly Pear Cactus (*Opuntia humifusa*): COSEWIC Status Report. Committee on the Status of Endangered Wildlife in Canada, Environment Canada, Ottawa, 38 p.

Reed, M.G., S. Mendis-Millard, and G. Francis. 2010. Mount Arrowsmith Biosphere Reserve Periodic Review Report 2010. Prepared on behalf of the Canadian Biosphere Reserves Association for submission to the Canadian Commission for UNESCO. Ottawa, Ontario. 55 p.

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

Baird, J., **K.W. Belcher** and M. Quinn. 2011. Performance-based policy instruments to manage agricultural water quality. Linking Environment and Agriculture Research Network (LEARN) and International Water Resource Economics Consortium (IWREC) Workshop, Banff, Alberta.

Baird, J.M., **K.W. Belcher**, and M. Quinn. 2011. Social norms and values in agricultural water quality management. The Future of Farms and Food in Canada Conference. Ottawa, ON.

Belcher, K.W. 2010. Policy challenges and ecosystem goods and services. Saskatchewan chapter of the Canadian Association for Business Economics Annual Workshop – OSkAER. Saskatoon.

Bowden, M.A. 2010. Environmental regulation: is it being improved or "messed up:" a participatory discussion on changes going on in environmental legislation and regulation in Saskatchewan and Canada. The federal perspective. Saskatchewan Environmental Society. Saskatoon.

Bowden, M.A. 2010. Saskatoon's recycling initiative. Presentation to City of Saskatoon Administration and Finance Committee on behalf of the Saskatoon Environmental Advisory Committee. Saskatoon.

Bowden, M.A. 2011. Indigenous Land Management Institute Lecture Series, University of Saskatchewan. Land management workshop – First Nations jurisdiction of lands and resources, various regimes on reserve land. English River First Nation, SK.

Bowden, M.A. 2011. Senate Standing Committee on Aboriginal Peoples. Proceedings, presentation, and submission. Bill S-1: Safe Drinking Water for First Nations Act. Ottawa.

Bowden, M.A. 2011. One step back: two steps forward. Renewing Environmental Law: A Conference for Public Interest Environmental Law Practitioners. Ecojustice, Environmental Law Centre, University of Victoria. Vancouver, BC.

Clark, D. 2010. Scientific management and its discontents. in Conservation in a rapidly changing world: revitalizing paradigms and practice. 24th International Congress for Conservation Biology, Edmonton, AB.

Cunfer, G. 2010. Invited commentator on keynote address by Dr. Marina-Fischer-Kowalski, Ester Boserup's contribution to understanding long-term socio-ecological change. Ester Boserup Centennial Conference, Vienna, Austria.

Hecker, M. 2011. 20 years of endocrine sisruptor research – what's next? 17th Annual German-American Kavli Frontiers of Science Symposium, National Academy of Science of the USA, Irvine, CA, USA.

Hecker, M. 2011. Aquatic ecotoxicology in times of climate change: a Canadian prairies perspective. 2nd Annual Meeting of the Prairie Northern Chapter of SETAC: Pole to pothole: Ecotoxicology in a changing climate. Winnipeg, MB.

Hickman, K. and **K.W. Belcher**. 2011. To graze or not to graze: managing for plant diversity? Society of Range Management Annual Meeting, Billings, Montana.

Ireson, A.M. 2011. Groundwater flooding in the UK: when groundwater becomes surface water. Environment Canada Seminar, National Hydrology Research Centre. Saskatoon, SK.

Ireson, A.M. and **Wheater, H.S**. 2011. Groundwater flooding in the UK. Canadian Geophysical Union Joint Meeting with Canadian Society of Agricultural and Forest Meteorology, Banff, AB.

Ireson, A.M. and **Wheater, H.S.** 2011. The role of the unsaturated zone in the English Chalk. Canadian Geophysical Union Joint Meeting with Canadian Society of Agricultural and Forest Meteorology. Banff, AB.

McKenzie, M. 2011. What we can do with culture: socio-ecological experience towards cultural change. Canadian Network for Environmental Education and Communication Conference, Regina, Saskatchewan.

McKenzie, M. 2011. Research symposium. Canadian Network for Environmental Education and Communication Conference, Regina, Saskatchewan.

McKenzie, M. 2011. Critical ethnography field trip. Canadian Network for Environmental Education and Communication Conference, Regina, Saskatchewan.

McKenzie, M. 2011. Politics, policy, and practices of ESD. Graduate Program in Education for Sustainable Development Conference. Uppsala, Sweden.

McKenzie, M. 2011. Social and spatial theory and educational research. Graduate Program in Education for Sustainable Development, Uppsala, Sweden.

McKenzie, M. 2011. Narration, place, and the social: practices of socio-ecological education. Graduate Program in Education for Sustainable Development, Uppsala, Sweden.

McKenzie, M. 2011. Capacity building in ESD at the University of Saskatchewan. Sustainability and Education Training Academy, Saskatchewan Ministry of Education, Waskesiu, Saskatchewan.

McKenzie, M. 2011. When oil meets water: anticipating our environmental future through time and space. American Education Research Association Invited Plenary Panel, New Orleans, LA.

McKenzie, M. 2011. Perspectives on curriculum studies. American Education Research Association Invited Plenary Panel, New Orleans, LA.

Noble, B.F. 2011. Environmental assessment: state of the art. Invited Workshop Address. Concordia University EA Graduate Program 10th year anniversary, Concordia University, Montreal, QC.

Noble, B.F. 2011. Environmental assessment: where to go from here? Invited Keynote Address. Concordia University EA Graduate Program 10th year anniversary, Concordia University, Montreal, QC.

Noble, B.F. 2011. Cumulative effects assessment for integrated land use planning: principles, practices, and lessons learnt. Invited presentation. Ontario Ministry of Natural Resources workshop on cumulative effects assessment, Toronto, ON.

Noble, B.F. 2010. Watershed cumulative effects assessment. Integrated Water Resources Management in Indigenous Communities Research Forum, Saskatoon, SK.

Reed, M.G., 2011. Social-ecological inventories: building resilience to environmental change within Biosphere Reserves. Brock Environmental Sustainability Research Unit, Brock University, St. Catherine's, ON.

Reed, M.G., L. Swystun, and J. Kindrachuk. 2010. Building a Biosphere Reserve: The role of the Redberry Lake Biosphere Reserve in promoting rural sustainability planning and reflection. Taking the Next Steps: Sustainability Planning, Policy and Participation for Rural Canadian Communities, Alberta Centre for Sustainable Rural Communities (ACSRC), Camrose, AB.

Reed, M.G., S. Mendis-Millard, and A. Henderson. 2010. Assessing the needs of collaborative conservation: A framework for consideration. Symposium Developing Adaptability: The Promise and Pitfalls of Collaborative Conservation, Society for Conservation Biology, Edmonton, AB.

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

Si, B.C. 2011. Multi-scale control of soil water in two landscapes in Canada. College of Hydraulic Engineering. University of Northwest Agricultural and Forestry Sciences, Yangling, China.

Si, B.C. 2011. Toward understanding soil water storage in two ecosystems in Canada. Institute of Soil and Water Conservation, Chinese Academy of Science.

Si, B.C. 2010. Benchmarking of soil water in rolling landscape. Workshop On World Mollisol, Harbin, China.

Contributed (Non-Invited) Papers/Abstracts at Conferences

Baird, J., **K.W. Belcher**, and M. Quinn. 2011. Social norms and values in agricultural water quality management. International Association for Society and Natural Resources (IASNR) Annual Meeting, Madison, WI.

Ball, M., **B.F. Noble**, and **M. Dubé**. 2011. Scaling-up valued ecosystem components for watershed cumulative effects assessment. Special session 'Watershed Science and Management.' Annual General Meeting of the Canadian Association of Geographers, Calgary, AB.

Ball, M., **B.F. Noble**, and **M. Dubé**. 2011. Scaling-up valued ecosystem components for watershed cumulative effects assessment. Poster presentation at "Connecting Water Resources 2011: Responding to the Opportunities." Annual General Meeting of the Canada Water Network, Ottawa, ON.

Barrett, M.J. 2011. Researching through an animist epistemology: barriers to environmental education research 'in connection' with Animate Earth. American Educational Research Association Annual Meeting, New Orleans, LA.

Barrett, M.J. 2011. An arts-based approach to an old epistemology: Researching with Animate Earth. American Educational Research Association Annual Meeting. New Orleans, Louisiana.

Barrett, M.J, and B. Wotherspoon. 2011. Who is in our community? Including the more-than-human in social studies class. Awâsis Aboriginal Education Conference, Saskatoon, SK.

Barrett, M.J. 2011. Redefining community as all our relations: A path to a decolonizing teaching practice. Society for Teaching and Learning in Higher Education Annual Conference, Saskatoon, SK.

Barrett, M.J. 2011. Intuition, creativity, and discourse: Addressing cultural differences in knowing in higher education. Society for Teaching and Learning in Higher Education Annual Conference, Saskatoon, SK.

Barrett, M.J. 2011. Multiple knowledge systems and environmental decision-making: making a difference in graduate teaching. Environmental Education and Communication Annual Meeting, Regina, SK.

Barrett, M.J. 2011. Redefining community as all our relations. Environmental Education and Communication Annual Meeting, Regina, SK.

Bullock, R. and **M.G. Reed.** 2011. Remodelling Canada's model forests: implications for multi-level governance. Resilience, Innovation, and Sustainability: Navigating the Complexities of Global Change, Arizona State University, Tempe, AZ.

Chilima, J., J. Gunn, **B.F. Noble**, and R. Patrick. 2011. Evaluating institutional arrangements to support watershed-scale cumulative effects assessment in the Grand River Watershed, Ontario, Canada. Annual General Meeting of the International Association for Impact Assessment, 'Impact Assessment and Responsible Development for Infrastructure, Business, and Industry,' Puebla, Mexico.

Chilima, J., J. Gunn, **B.F. Noble**, and R. Patrick. 2011. Evaluating institutional "degree of readiness" to support watershed-scale cumulative effects assessment: the case of the Grand River Watershed, Ontario, Canada. Canada Water Resources Association Annual General Meeting, 'Our Water – Our Life – The Most Valuable Resource,' St. John's, NL.

Clark, D. 2010. Creating a respectful arena: socio-economic impact assessment of the Aishihik wood bison transplant. Policy Sciences Annual Institute, New Haven, CT.

Clark, D. 2010. Resilience thinking and the policy sciences. Policy Sciences Annual Institute, New Haven, CT.

Clark, D. 2010. Integrating environmental conservation and human dignity: a research agenda. Northern Rockies Conservation Co-operative Research Symposium, Moose, WY.

Clark, D., J. Gailus, and M. Gibeau. 2010. Grizzly bear conservation in Alberta: an explanatory hypothesis for a wicked problem. 24th International Congress for Conservation Biology, Edmonton, AB.

Clark, D. 2011. Polar bear-human interactions: state of knowledge and research opportunities. Parks Canada/ Churchill Northern Studies Centre Research Symposium, Winnipeg, MB.

Cunfer, G. 2010. Crop yields and soil chemistry in Great Plains agriculture, 1870-1940. Ester Boserup Centennial Conference, Vienna, Austria.

Cunfer, G., E. Merchant, W. Parton, and M. Gutmann. 2010. Crop yields and soil chemistry in U.S. Great Plains agriculture. Annual Meeting of the Social Science History Association, Chicago, IL.

Davis, E. and **M.G. Reed.** 2011. Changes in forest communities: multi-level governance and resilience in British Columbia, Canada. Resilience, Innovation, and Sustainability: Navigating the Complexities of Global Change, Arizona State University, Tempe, AZ.

Hanna, K. and **B. Noble**. 2011. Effective environmental assessment. Clean energy superpower and environmental assessment: Canada's ambitions and choices. Queen's University, Kingston, ON.

Hecker, M., A. Tompsett, S. Wiseman, E. Higley, and J.P. Giesy. 2011. All mixed up: phenotypic plasticity in a genotypic world. SETAC Prairie Northern Chapter Annual Meeting, June 24, 2011, Winnipeg. MB.

Hecker, M., J. Doering, S. Beitel, B. Tendler, S. Wiseman, and J.P. Giesy. 2011. Biochemical and molecular responses of white sturgeon (*Acipenser transmontanus*) to an aryl hydrocarbon agonist. SETAC Prairie Northern Chapter Annual Meeting, June 24, 2011, Winnipeg. MB.

Hecker, M., A.E. Higley, S. Tompsett, S. Wiseman, and J.P. Giesy. Effects of triphenyltin exposure during the larval period in wood frogs (*Rana sylvaica*). SETAC Prairie Northern Chapter Annual Meeting, June 24, 2011, Winnipeg. MB.

Hecker, M., F. Liu, S. Wiseman, Y. Wan, X. Zhang, H. Chang, P.D. Jones, and J.P. Giesy. 2011. The mechanism of biotransformation of 6-MeO-BDE-47 to 6-OH-BDE-47. SETAC Prairie Northern Chapter Annual Meeting, June 24, 2011, Winnipeg. MB.

Kearns, J. and **M.G. Reed.** 2011. The evolution of principles and guidelines for northern research. ICASS VII - 7th International Congress of Arctic Social Sciences, Akureyri, Iceland.

Klenk, N., **M.G. Reed**, D. Hemingway, and C. McLennan. 2010. Gender and adaptive capacity in Canadian model forest regions. Healthy forests, healthy people – gender perspectives on climate change. Session organized for the 23rd IUFRO World Congress. Seoul, Republic of Korea.

Meek, C. and **Clark, D.** 2011. Resilience thinking and the policy sciences: thoughts towards productive engagement. Second International Science and Policy Conference, Tempe, AZ.

Noble, B.F., S. Ketilson, and A. Aitken. 2011. Advancing regional, strategic environmental assessment for offshore energy development in Canada's Beaufort Sea. Special session 'Technologies of Oil.' Annual General Meeting of the American Association of Geographers, Seattle, WA.

Noble, B.F., and A. Aitken. 2011. Advancing environmental assessment in Canada's Arctic energy environment: opportunities, challenges, research directions. Special session 'Arctic Energy Development: Impacts, Management, and Perspectives.' Annual General Meeting of the Canadian Association of Geographers, Calgary, AB.

Noble, B.F. 2011. Environmental assessment retrospect and prospect. Special session 'Arctic Energy Development: Impacts, Management, and Perspectives.' Annual General Meeting of the Canadian Association of Geographers, Calgary, AB.

Noble, B.F., N. Seitz, C.J. Westbrook, and R. Patrick. 2011. Cumulative effects assessment for river systems: bringing science into practice. Special session 'Watershed Science and Manaegment.' Annual General Meeting of the Canadian Association of Geographers, Calgary, AB.

Noble, B.F., and R. Patrick. 2010. Watershed cumulative effects assessment. Annual Meeting of the Prairie Division of the Canadian Association of Geographers, North Battleford, SK.

Patrick, R., P. Sheelanere, and **B.F. Noble**. Institutional requirements to support watershed cumulative effects assessment and monitoring in Canada. Cumulative effects assessment for river systems: bringing science into practice. Special session 'Watershed Science and Manaegment.' Annual General Meeting of the Canadian Association of Geographers, Calgary, AB.

Reed, M.G. 2011. Biosphere reserves as learning sites for sustainability: the debate about representativeness in the Canadian network. Annual General Meeting, Canadian Association of Geographers, Edmonton, AB.

Research Grants and Contracts

Barrett, M.J. (principal investigator). 2010-2011. Design and facilitate two professional development workshops for Branch staff. Project Grant. Saskatchewan Ministry of Education, First Nations, Métis, and Community Education Branch.

Barrett, M.J. (principal investigator), **D. Clark**, **M Dubé**, B. Maracle, and D. Musqua. 2011. Encounters with the living world: indigenous knowledges and natural resource management. Social Sciences and Humanities Research Council of Canada Insight Development Grant.

Barrett, M.J. (co-principal investigator) and **M. Dubé**. 2011. Rivers without borders (educational project development aspect). Environment Canada.

Belcher, K.W. 2010-2012. Targeting ecosystem goods and services: directing agri-environmental policy innovation. Food and Bioproducts Innovations Scholars Program.

Belcher, K.W. 2011. Economic impact of drainage on flooding. Ducks Unlimited Canada.

Belcher, K.W., J.Baird and M. Quinn. 2011. A performance-based approach to agri-environmental policy for water quality in Canada. University of Ottawa/Social Sciences and Humanities Research Council of Canada.

Bharadwaj, L, et al, including **B.F. Noble** (co-investigator). 2009-2011. Safe water for health research network. Saskatchewan Health Research Foundation.

Clark, D. 2011. Traditional and local knowledge of wildlife in changing environments: enhancing research methods and improving uptake in decision-making. Social Sciences and Humanities Research Council of Canada Standard Research Grant, New Scholar Award.

Clark, D. 2011. Polar bear-human interactions in Wapusk National Park. Parks Canada Project Support.

Clark, D. (principal investigator), and **M.J. Barrett** (collaborator). 2010. Indigenous and local knowledge of wildlife in changing environments: enhancing research methods and improving uptake in decision-making. Social Sciences and Humanities Research Council of Canada Standard Research Grant.

Clark, D., L. Bharadwaj, P. Gober, **M. McKenzie**, **B.F. Noble**, R. Patrick, J. Pomeroy, **M. Reed**, and **H. Wheater**. 2011. A collaborative approach to defining water security in the South Saskatchewan River basin. Science in Society Grant, Office of the Vice-President Research, University of Saskatchewan.

Cunfer, G. (principal investigator). 2011-2012. Sustainable farm systems: long-term socio-ecological metabolism in western agriculture. Social Sciences and Humanities Research Council of Canada Partnership Grant Letter of Intent.

Cunfer, G. and B. Waiser. 2010-2011. History of bison decline in the grassland symposium. Network in Canadian History and Environment.

Doig, L., **K. Liber**, **P.D. Jones** and J.P. Giesy. 2011-2014. Paleolimnological studies of Lake Diefenbaker. Canada Excellence Research Chair Program, funding held by **H.S. Wheater**.

Dubé, M. (principal investigator), with K. Munkittrick, L. Jackson, **B. Noble**, P. Duinker, C. Westbrook, and M. McMaster (co-investigators). Development of the healthy river ecosystem assessment systems (THREATS) for assessing and adaptively managing the cumulative effects of man-made developments on Canadian freshwaters. Canada Water Network.

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

Hecker, M. (principal investigator). 2010. Assessment of sediment toxicity to white sturgeon (*Acipenser transmontanus*) in the Upper Columbia River. Teck America Inc.

Hecker, M. (principal investigator). 2011. 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. (co-principal investigator). 2011. Endocrine disrupting chemicals: potential effects on female reproductive health in Saskatchewan. Royal University Hospital Foundation.

Jones, P.D. (principal investigator). 2010. Contamination of country foods by emissions from Alberta tar sands industry. Pew Charitable Trusts/Oak Foundation/Boreal Songbirds Initiative.

Jones, P.D. (co-principal investigator). 2010. In land and life: cadmium and health implications for indigenous communities in central Alberta. Health Canada, National First Nations Environmental Contaminants Programme.

Jones, P., A. Cessna, M. Waiser, J. Giesy, **M. Hecker**, G. Putz, J. Kells, D. Janz and S. Siciliano (co-principal investigator). 2011-2014. 'Exotic' chemical contaminants in the South Saskatchewan River Basin. Canada Excellence Research Chair Program, funding held by **H.S. Wheater**.

Keskitalo, C. (principal investigator), M. Tennberg (co-investigator), and **M.G. Reed** (co-investigator). 2011-2013. Preparing for and responding to disturbance: Arctic lessons for Sweden. MISTRA, The Foundation for Strategic Environmental Research (Sweden).

Kricsfalusy, V. (principal investigator). 2010-2012. Threat syndromes, biodiversity patterns and conservation of indigenous temperate grasslands. President's Natural Sciences and Engineering Research Council Fund, University of Saskatchewan.

Kricsfalusy, V. (principal investigator). 2010 – 2011. Advancing biodiversity conservation and sustainable management in the Canadian prairies and Ukrainian steppes by enhancement of international research partnerships. International Development Research Centre.

McKenzie, M. 2010. What we call home: transcultural youth orientations to place and sustainability. University of Saskatchewan Tri-Council Bridge Funding.

McKenzie, M. (principal investigator). 2011. The sustainability and education policy network: leading through multi-sector learning. Social Sciences and Humanities Research Council of Canada Partnership Grant Letter of Intent.

McKenzie, M. (principal investigator). 2011-2014. Youth identifications with place and sustainability: implications for environment-related education. Social Sciences and Humanities Research Council of Canada Standard Grant.

Morrissey, C. 2011-2016. Effect of endocrine disrupting chemicals on avian life cycles. Natural Sciences and Engineering Research Council of Canada Discovery Grant.

Noble, B.F. (principal investigator) and R. Patrick. 2009-2012. Institutional arrangements for watershed-based cumulative effects assessment. Social Sciences and Humanities Research Council of Canada Canadian Environmental Issues Grant.

Noble, B.F. 2009-2012. Strategic environmental assessment roles and stakes in Arctic oil and gas development. Social Sciences and Humanities Research Council of Canada Northern Communities Grant.

Reed, M.G. (principal investigator) with the Prince Albert Model Forest and R. Brook, S. Carr, N. Carriere, **D. Clark**, H. Hesseln, M. Johnston, L. Jougda, C. Keskitalo, **V. Kricsfalusy**, A. Löf, M. Manseau, D. Natcher, C. Sandström, P. Sandström, the University of the Arctic, Vilhelmina Model Forest. 2010-2012. Learning from our elders: Aboriginal perspectives on climate change and caribou/reindeer habitat in the circumboreal forest. Natural Resources Canada.

Reed, M.G. (principal investigator), M.A. Guertin (co-investigator), with 6 collaborators and 17 partners and contributors. 2011-2014. Creating Networking and Social Learning Strategies in Canadian Biosphere Reserves. Social Sciences and Humanities Research Council of Canada Partnership Development Grant.

Reed, M.G. (principal investigator) and R. Gibson. 2009 – 2012. Environmental Governance for Sustainability and Resilience: Innovations in Canadian Biosphere Reserves and Model Forests. Social Sciences and Humanities Research Council of Canada Canadian Environmental Issues Grant.

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, Saskatchewan.

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

Si, B.C., and 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. 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.

Southcott, C. (principal investigator), et al, including **B.F. Noble** (co-investigator). 2011. Resources and sustainable development in the Arctic. Social Sciences and Humanities Research Council of Canada Major Collaborative Research Initiatives Program.

Public and Community Outreach

Outreach is a key component of the activities of the School of Environment and Sustainability. The School's efforts in this area are now expanding, with the establishment of the Outreach and Engagement Committee in 2010 and an increase in the amount of Communications support dedicated to the School in 2011.

The following is a summary of the School's outreach activities in 2010-2011.

- **SENS Connect**, September 16, 2010. This event was designed for SENS students to network with representatives of the Saskatchewan environmental sector using a trade show format. Several MSEM projects resulted from conversations which began at SENS Connect.
- **Memorandum of Understanding with Saskatoon Public School Division #13**, signed October 13, 2010, in effect for one year. This memorandum between SENS and the Saskatoon Public School Division describes opportunities for interdisciplinary engagement and learning related to environment and sustainability with the Earthkeepers Program at Aden Bowman Collegiate. SENS and Earthkeepers students have participated in several events, including a Sustainability Conference, a visit to the Eco-Centre in Craik, and in green design projects in Saskatoon.
- **SENS Environmental Career Panel**, February 4, 2011. This event included panelists representing the government, industry, non-governmental organizations, and private consulting areas of Saskatchewan's environmental sector, as well as the Saskatchewan Environmental Industry and Managers' Association. The panelists provided students with advice regarding career paths in the environmental sector, largely focusing on skills such as writing, listening, attention to detail, and empathy – the less tangible talents that students can develop through graduate research.
- **"The New Normal" – SENS Earth Day Lecture featuring David Sauchyn**, April 19, 2011. Dr. Sauchyn, a professor at the University of Regina and senior research scientist at the Prairie Adaptation Research Collaborative, presented climate change research collected from a diverse range of scholars, and discussed how we can take advantage of new opportunities provided by a warmer climate. Dr. Suren Kulshreshtha, SENS associate faculty, joined the question and answer session following Dr. Sauchyn's presentation. The book *The New Normal: The Canadian Prairies in a Changing Climate* was edited by David Sauchyn, Harry Diaz, and Suren Kulshreshtha. The event was covered by the local CTV evening news and by CBC radio.
- **Talking SENSe.** "Talking SENSe," the SENS newsletter, is published three times a year, and features news about recent SENS events and activities, as well as profiles of SENS faculty, students, and alumni. The newsletter is distributed electronically more than 250 people, and is also available on the SENS website.
- **Task Force on City-University Sustainability Initiatives**. The School's Executive Director is a member of this Task Force, which also includes representatives from the University of Saskatchewan Facilities Management Division and the Office of Sustainability. Membership from the City of Saskatoon includes representatives from Infrastructure Services, Utility Services, and Environmental Services. Administrative support is provided by the School. The Task Force's mandate is to provide advice and input to the City of Saskatoon and the University of Saskatchewan on the potential for and strategies associated with joint sustainability initiatives that can improve the quality of the local environment and contribute to innovation in a manner that is socially acceptable, environmentally sound, and economically feasible. Examples of past initiatives include the implementation of "green" purchasing policies and testing recycled materials for use in road paving.

Governance

Committees

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 faculty as a whole. Membership of the School's committees for 2010-2011 was as follows:

Admissions and Awards Committee

- Ken Belcher, Associate Professor, Graduate Chair
- Marie-Ann Bowden, Professor
- Vladimir Kricsfalusy, Associate Professor
- Paul Jones, Associate Professor

Academic Programs Committee

- Charles Maulé, Professor, Chair
- Bram Noble, Associate Professor
- Maureen Reed, Professor
- Amanda Burke, MES Student

Interdisciplinary Research Committee

- Maureen Reed, Professor, Chair
- Monique Dubé, Associate Professor
- Doug Clark, Assistant Professor
- Bram Noble, Associate Professor
- MJ Barrett, Assistant Professor
- Colleen George, PhD Candidate

Seminar and Special Lectures Committee

- Paul Jones, Associate Professor, Chair
- Vladimir Kricsfalusy, Associate Professor
- Allison Henderson, PhD Candidate

Outreach and Engagement Committee

- Marcia McKenzie, Assistant Professor, Chair
- Doug Clark, Assistant Professor
- John Pomeroy, Professor

The School struck a Teaching and Learning Committee late in the year; this committee is responsible for overseeing the design and implementation of innovative practices within courses and the three SENS graduate programs. This committee was chaired by Maureen Reed, Professor, and included Marie-Ann Bowden, Professor; Paul Jones, Associate Professor; Vladimir Kricsfalusy, Associate Professor; Marcia McKenzie, Assistant Professor; and, Christy Morrissey, Assistant Professor.
Also during the 2010-2011 year, the School struck an *ad hoc* committee to draft the SENS Standards for Promotion and Tenure. This committee was chaired by Marie-Ann Bowden and included Charles Maulé, Doug Clark, and MJ Barrett.

Finances

School of Environment & Sustainability
Consolidated Statement of Operations
For the Period From May 1, 2010 to April 30, 2011

Fund balances, beginning of year	**$**	**395,888.71**
Revenue [1]		
Student Fees		$3,835.36
Operating Allocation		793,106.98
Internal Transfers		
Graduate Scholarship Allocation		70,000.00
Capital Equipment Allocation		8,000.00
Centennial Chair Allocation		138,448.09
Total Funds Available	**$**	**1,409,279.14**
Expenses		
Salaries		662,793.79
Employee Benefits		69,155.18
Operational Supplies and Expenses		37,043.09
Travel		6,558.27
Maintenance, Rental and Renovations		266.53
Scholarships, Bursaries and Prizes		110,503.92
Capital Assets		18,749.13
Transfers to Other Funds [2]		91,513.68
Total Expenses	**$**	**996,583.59**
Fund balances, end of year	**$**	**412,965.55**

(1) Only operating funding is summarized; research funding for the School of Environment and Sustainability is not included.
(2) Related to funding provided by the School of Environment and Sustainability for Kirk Hall renovations, New Faculty Equipment, Deans' and Senior Administrators' Expenses (DSAE) and the Social Science Research Lab.