FACULTY of ENVIRONMENT

ANNUAL REPORT

2015 - 2016

engaging a sustainable world

SFU

Contents

* This is an interactive document with embedded hyperlinks to departments, projects and news headlines to help you get to know our faculty.

Message From The Dean

Ingrid Leman Stefanovic
Professor and Dean

Welcome to the second Annual Report of the Faculty of Environment.

It has been a year of success and growth for the newest Faculty at SFU, home to departments and programs of the highest academic integrity and reputation.

According to the newly released 2016 QS World University Rankings, two of our departments—archaeology and geography—are now ranked in the top 10 among universities in Canada and among the top 25% of departments in their subject areas worldwide. The Department of Archaeology ranks fourth in Canada – and arguably sits among the top 15 departments for archaeological research on a global scale. The Department of Geography ranks sixth overall in Canada and 2nd amongst all Canadian comprehensive universities.

The Faculty's internationally-renowned School of Resource and Environmental Management (REM) is enlarging its long-standing reputation of excellence by hosting a REM Major in our new Bachelor of Environment degree. Our Environmental Science program boasts almost 300 program majors and is exploring ways in which to work more closely with faculty and students from our Professional Masters in Ecological Restoration, offered now as a joint degree with BCIT. We are also pleased to announce that Senate has recently approved a renamed Centre for Sustainable Development – part of a process to integrate established programs in sustainability.

Many more initiatives are described in this report. For instance, we now offer more non-credit professional programs coordinated by Dr. Joanna Ashworth, Director, Professional Programs and Partnerships. More information is available at: www.sfu.ca/fenv/professional-programs.html.

On the research front, we are pleased to welcome Dr. Zafar Adeel as Executive Director of the Pacific Water Research Centre. Following a successful career at the United Nations University, he is taking our Faculty of Environment mission internationally in this ever-important dimension of water research.

Increasingly, new faculty members, students, donors, and community members are joining us to strengthen the teaching, learning, research and community engagement of our unique, interdisciplinary Faculty.

We invite you to join us if you are not already engaged in advancing the most important educational mission today – one dedicated to finding solutions to problems of climate change and environmental well-being locally, regionally, nationally and on a global scale.

Ingrid

Faculty of Environment
Building a Just and Sustainable World

Our Vision

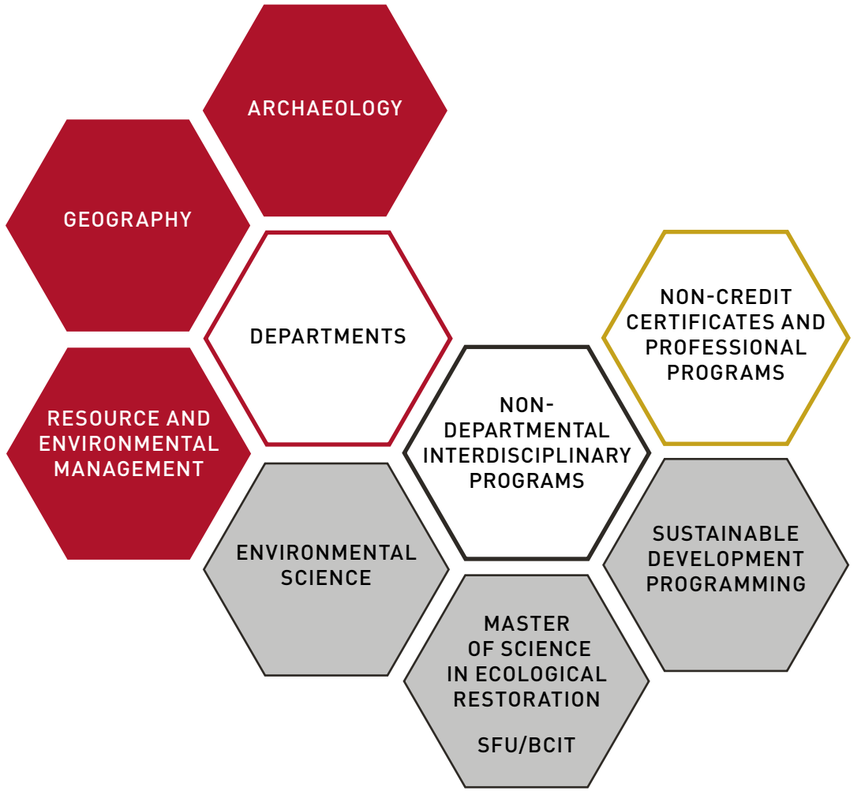
To be the leading Faculty of Environment, defined by its preeminent, community-engaged educational and research contributions to shaping a just and sustainable world.

Our Guiding Values

The Faculty of Environment's core values support:

- A realistic but positive, hopeful vision of a just and sustainable world;
- An understanding of "environment" that includes diverse processes across both natural landscapes and sustainable human settlements;
- Teaching, learning and research that are innovative, impactful, academically rigorous, collaborative, discipline-based as well as interdisciplinary;
- Indigenization and community engagement as integral, rather than supplementary to teaching, learning and environmental research;
- An experience that is rewarding and inspiring to students, staff, faculty, alumni, sponsors and community members;
- The promotion of social and environmental justice, equity and well-being at all levels, from hiring practices to research engagement.

Overview Of Academic Programs



The Faculty of Environment is a hybrid Faculty housing three academic departments (shown in red) and several academic and non-credit programs. Our newest academic additions include two degrees: the Bachelor of Environment and the Master of Science in Ecological Restoration.

Department of Archaeology

Founded in 1971, the Department of Archaeology has concentrated expertise in three areas:

- Archaeological and Environmental Science,
- First Nations Heritage and Resource Management, and
- Biological Anthropology, including Forensic Sciences.

It offers undergraduate BA honours, major, minor and joint major programs, an undergraduate Certificate in Cultural Resource Management, MA and PhD degrees, as well as a Professional MA in Heritage Resource Management. Housed within the Department are the SFU Museum of Archaeology and Ethnology, SFU Archaeology Press, the Human Evolutionary Studies Program, the Centre for Forensic Research (with Criminology), the joint SFU/Jilin University Centre for Bioarchaeology, and the SSHRC Major Collaborative Research Initiative on Intellectual Property Issues in Cultural Heritage (IPinCH).

The Department also has specialized laboratories dedicated to zooarchaeology, paleobotany, stable isotopes, geoarchaeology, geochemistry, human osteology and ancient and forensic DNA.

New Technology Reveals Ancient Ruins

David Burley's research sheds light on the Polynesian Kingdom of Tonga ruins by using new technology: light detection, and digital ranging. Burley and his team's study uncovered burial mounds, and showed that the ancient Tongans used simple and primitive tools. With the access to these technological resources, Burley's research can help preserve these ancient sites.

The 2016 McLean's National University rankings identified the Department as one of SFU's "Standout Programs" and as "one of North America's leading Archaeology programs". This recognition is supported in the 2016 QS International Rankings for Archaeology where, in the category of citations per paper, SFU Archaeology faculty members gained a cumulative score of 94. This is 9th highest among the top 100 archaeology units across the globe.

ARCHAEOLOGY BY THE NUMBERS

Undergraduate students: 206
Graduate students: 44
Full time equivalent faculty: 13

Recent research funding: $732,000

The Department welcomed two new faculty appointments:

1. Professor Michael Richards (FRSC, FSA), a SFU nominee for a Tier 1 Canada Research Chair in Archaeological Science, and
2. Dr. Denis Sandgathe, a Lecturer with expertise in Paleoanthropology.

Department faculty also had substantial success in research grants this year, with all four 2016 submissions to SSHRC and NSERC being funded.

Professional Masters in Heritage Resource Management (HRM)

Under the direction of Professor John Welch, Archaeology launched its inaugural cohort of students in the Professional Masters in Heritage Resource Management in September. Combining on-line course work with the requirement of a written and publicly defended thesis, this degree targets students who already are engaged in the business of HRM and who seek to continue their employment while satisfying degree requirements. Four courses are required including "Global Heritage Policy and Law", "Business Management for Heritage Professionals", "Professional Practice and Ethics in HRM" and "Archaeological Practice and Research Design in HRM". The thesis requirement is in recognition of educational qualifications established by the Register of Professional Archaeologists in the United States and by a number of provincial government heritage policies for archaeological permit holders. A Professional Graduate Certificate in Heritage Resource Management complements this degree for students who wish to take the coursework but not thesis.

Rising Star

SFU alumna Dr. Marina Elliot, along with a team led by Lee Berger, squeezed through an 18-cm-wide cave opening at the Rising Star cave in South Africa. The fossils they discovered in the deepest chamber of the cave belong to what is believed to be a new species of human called Homo naledi. Because of this expedition, Elliot was named one of the 2016 Emerging Explorers, as she continues to uncover our past at the Rising Star.

Highlights of Cool Stuff We Do

Thesis Inspires Value Added Research in Ethiopia
Professor Catherine D'Andrea has unearthed more than 70,000 artifacts from a dig site in Ethiopia where she has been conducting an archaeology program for over 10 years. The site provides annual income to locals who are subsistence farmers, income that provides a safety net for the community. Inspired by REM student Stephanie Jones' thesis that identified economic develop opportunities, D'Andrea has established a museum in Adigrat to preserve the artifacts. Working with SFU Archaeology Museum Director Dr. Barbara Winter and Laboratory Manager Shannon Wood, D'Andrea developed an exhibit showcasing the artifacts. D'Andrea anticipates that museum admission revenues will contribute to the impoverished area's economy.

Helping Students Achieve
Merril Farmer, the Chair's Secretary and Graduate Program Assistant received the SFU 2016 Staff Achievement Award for her contributions to student services.

Including Traditional Perceptions of Climate Change
Postdoctoral Fellow Valentino Savo with Professor Dana Lepofsky and others released a paper, "Observations of climate change among subsistence-oriented communities around the world", in *Nature Climate*. The inclusion of traditional observations in the understanding of how climate has changed augments the standard study of climate change, which typically includes data collected from scientific instruments.

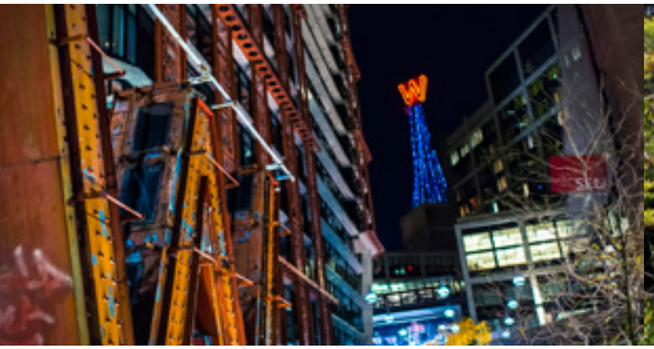
Failed Fashion for Neanderthals
Professors Mark Collard and Dennis Sandgathe with graduate students Lia Tarle and Alexander Allan received international coverage including postings on the CBC Technology and Science page and New Scientist for their work suggesting that if Neanderthals had worn fur parkas rather than capes, their extinction may have been prevented.

Understanding the Evolution of Bad Backs
Postdoctoral Researcher Kimberly Plomp is interested in how evolutionary adaptations have influenced health and disease in modern humans. Her recent paper on the evolution of bad backs was named among the 10 most popular articles of 2015 in BMC Evolutionary Biology.

Experiential Learning in the Museum of Archaeology
The museum supported five internships, showed a series of new student-developed displays and hosted a major exhibit on the Wayang shadow puppets which was attended by the Indonesian Consul General and delegates.

Learning from the Past

Dana Lepofsky and her team's research shows First Nation's way of life is sustainable. Human impact on the environment is often presented negatively, but in the central coast of B.C., the health of the soil, and trees are incredible. First Nations people inhabited this area for decades, and their methods, including using shells for better rain drainage, enriched the land.



Department of Geography

The Department of Geography celebrated its 50th anniversary this year. It has amongst its research and teaching faculty Canada Research Chairs, Michael Smith Scholars, Fellows of the Canadian Geographical Society, SFU excellence in teaching awardees, and other award holders.

Geography's enduring strength relates to its nature as an interdisciplinary discipline. Geography may be defined as how place and space shapes physical and social processes, and their interactions, as they work themselves out in differentiating and integrating the earth's surface. Geography as a discipline has no monopoly on this perspective but concerns for how and why places around the globe are different and how and why places are integrated (across space) are at the heart of modern geographical thinking.

Research Strengths

The Department's faculty have research strengths in geographical political economies, global environmental change, water sciences, the city, spatial health and spatial information theory.

Faculty explore topics as disparate as, sustainable economic development, climate change, tourism, augmented reality, cultural theory, health services, informatics and medical tourism, the politics of property, urban planning and policy, limnology, landscape ecology, soil-plant relationships, fluvial geomorphology, ecological modelling, paleoglaciology and more.

New tri-council grants to faculty this year include: a four-year Insight Grant from the Social Sciences and Humanities Research Council of Canada to Paul Kingsbury, entitled "Situating the Growth of Paranormal Investigation Cultures: A Critical Study of the Lived Spaces of Organizations and Conferences"; and five-year Discovery Grant from the Natural Science and Engineering Research Council to Tracy Brennand, entitled "Meltwater systems of past ice sheets: implications for ice sheet dynamics, meltwater routing and landscape change.

Geography ranks an impressive sixth of all Geography Departments in Canada, second amongst Canadian comprehensive universities in the 2016 QS University Rankings.

GEOGRAPHY BY THE NUMBERS

Undergraduate students: 417
Graduate students: 54
Research and Teaching Faculty 22

Recent research funding: $674,000

Highlights of Cool Stuff We Do

Senior Scholar of Distinction
Eugene McCann was appointed University Professor in Geography for a five-year term in recognition of his stellar scholarly contributions.

It's an Urban Future Out There, Metro Vancouver
Associate Professor Meg Holden ponders the challenges we face with future population growth in a Vancouver Sun edititoral. Are we dependant upon development or do developers need us, our infrastructure, governance, and our region? It is time to look more deeply at the regional nature of our Lower Mainland and craft a better urban future.

Medical Tourism

Valorie Crooks shares her research on the pros and cons of the growing industry, medical tourism. With each year, more Canadians are travelling to seek medical care, such as joint replacement surgery, cosmetic surgery, or experimental treatment. Crooks suggest that because the industry is relatively new, there are still many practices that can lead to negative consequences. Crooks hopes that her research will be able to engage the public in finding more ethical, and safer practices.

Understanding South African Cities After Apartheid
Alumnus and Professor Alan Mabin from the University of Prestoria and renowned urban geographer shared his research on capital cities as part of the global suburbanisms international project during a seminar last fall.

Can Canada Meet Its Paris Climate Targets?
Associate Professor Kirsten Zickfeld examines that question in a report she co-authored with UBC Geographer, Simon Donner. The Report evaluates future CO_2 emissions trajectories for Canada. The only thing that is clear from the analysis is that there is no easy solution for Canada.

Constitutional Challenge on Homeless Encampments
Professor Nick Blomley provided expert witness testimony to a BC Supreme Court concerning a constitutional challenge to the City of Abbotsford's policies and practices on homeless encampments. The judge sided with the homeless ruling that they are allowed to erect temporary shelters in parkland because of lack of accessible shelter space in the city.

PhD Geography Graduand Recognized
Andrew Perkins received the Dean of Graduate Studies Convocation Medal and the Canadian Association of Geography's 2016 Starkey-Robinson award in recognition of high quality graduate research that furthers understanding of the geography of Canada.

Student Project with Real World Impact
Alumna Terri Evans was one of four SFU students who founded the Coquitlam Farmers Market 20 years ago. It is one of the longest running farmers markets in the lower mainland and Terri remains involved as a board member. In addition to being an alumna, Terri is also a long time Geography Sessional Instructor involved in urban studies.

Excellence in Graduate Student Supervision
Professor Suzana Dragicevic received the 2016 Dean of Graduate Studies Award for Excellence in Supervision.

Canada-US Softwood Lumber Dispute
Professor Roger Hayter observed that the Canada-US softwood lumber dispute has been "long and acrimonious" tracing the origins of the dispute to a recession in the 1980s that launched the claims of unfair Canadian subsidies in an article featured in Canadian Sailings, a trade and transportation magazine.

Research in Bolivia Trains Thousands
Alumna Gretchen Ferguson (PhD 2016) helped train 4,000 municipal officials, NGOs, development professionals and indigenous leaders in community economic development during doctoral research in Bolivia.

Student Wins Award for Analysis of Job Creation Plan
Gabriel Boothroyd-Roberts (BA Hons June 2016) received the Canadian Association of Geographers Award for work on the impact of the BC provincial government's "Blueprint for Jobs." The analysis also won the 2016 Student Essay Award from the Progressive Economics Forum.

Comings and Goings
Associate Professor Janet Sturgeon retired this year and the department welcomes the arrival of Andrew Perkins, a Physical Geography Lecturer.

Alumni Working Abroad Engaging the World

- Alumnus Dr. Mark Kear, who in July 2015 defended his PhD dissertation "Governing Homo Subprimicus: The financial regulation of poverty after the subprime crisis", accepted a tenure-track position in the University of Arizona's School of Geography.
- Alumna Cristina Temenos (PhD 2014) received a three-year post-doctoral fellowship from the Urban Studies Foundation at the University of Manchester where she is exploring urban mobility policies dealing with subjects such as drug policy, transatlantic travels of tax increment financing and more.
- Alumnus Sai Lat (January 2016) is Research Director at the Pyidaungsu Institute for Peace and Dialogue, an NGO supporting ceasefire agreements between ethnic armies in Burma and the Burmese government. The efforts of Dr. Latt and colleagues contributed to the historic agreement of October 2015, where all parties consented to a ceasefire and the commencement of negotiations to end several decades of civil war.

School of Resource and Environmental Management

The School of Resource and Environmental Management was founded in 1979 with a mandate for interdisciplinary and applied graduate education and research to address natural resource and environmental issues of local, national, and international consequence. REM provides graduate training in applied resource and environmental management and unique undergraduate courses that complement other undergraduate degrees at SFU.

Graduate Program

The curricula of both the Master of Resource Management (MRM) and the PhD expose students to knowledge-based scientific integration among the core disciplines of resource and environmental management (i.e. ecology, other natural sciences, economics, policy and planning). The graduate students in the planning stream complete a MRM (Planning) degree that is certified by the Planning Institute of British Columbia. Masters students also have the opportunity to participate in Co-op to gain valuable work experience during their degree program.

Understanding Avalanches

Pascal Haegeli is the research chair in avalanche risk management. He and his team have been awarded $1.02 million dollars to conduct a five-year research project to better understand the patterns of an avalanche. Haegeli hopes that by the end of the project, he and his team will be able to educate adventurers to make better, and safer decisions.

REM has a strong international reputation as a top Canadian graduate program in resource and environmental management.

REM BY THE NUMBERS

Undergraduates: 130
Graduate students: 108
Postdoctoral fellows: 6
Faculty Members: 18
Adjunct Professors: 47

Recent research funding: $1,517,000

Undergraduate Program

Beginning Fall 2016, REM offers a new Major in Resource and Environmental Management (REM) at the undergraduate level. This major takes full advantage of the expertise existing across the faculty units, characteristic of BEnv majors. It will prepare students to enter positions or continue in graduate studies in the broadly defined area of resource and environmental management. REM program requirements provide students with a solid understanding of the interplay of historical, biophysical and socio-cultural factors, Indigenous/First Nations perspectives, resource use and sustainability, geospatial, statistical and modeling methodologies, decision making, economics, communication, conflict resolution, and legislative/regulatory frameworks as they related to resource management.

This major follows upon REM's development in 2015 of a Minor in Resource and Environmental Management. This minor is open to all SFU students as it will complement a diverse array of major degrees, especially since addressing environmental problems requires an academic background that integrates both natural and social sciences.

Highlights of Cool Stuff We Do

Graduate Student Informing International Governments
Masters Student Aimee McGowan recently presented her research on the ability of BC coastal ecosystems to capture and store carbon to the Ministers of Environment Canada, USA and Mexico as part of the Regular Session of the international Commission for Environmental Cooperation. Her goal is to inform policy makers about the value of these environments to the earth system.

Lifetime Achievement in Tourism Research
Professor Alison Gill received the 2016 John Rooney Award for outstanding contributions to the field and discipline of applied recreation, tourism and sport geography.

Resource And Environmental Planning Program

The Resource and Environmental Planning Program is a professional certified planning program accredited by the Planning Standards Board for the Planning Profession of Canada and the Planning Institute of B.C. (PIBC).

Students graduating from the Resource and Environmental Planning Program receive the degree of Master of Resource Management (Planning). They are eligible for membership in the Canadian Institute of Planners and the Planning Institute of B.C. and can receive professional designation as a Registered Professional Planner (RPP) upon completing the certification requirements set by the Planning Standards Board. Graduates who attain the RPP designation are also eligible for certification as professional planners in the U.S., Great Britain, and Australia through reciprocal agreements between Canada and these other countries.

Advantages of enrolling in the Resource and Environmental Planning Program and obtaining professional planning certification include: eligibility for special planning scholarships, improved employment opportunities, access to professional development programs, conferences and journal publications, and participation in a large network of practicing professional planners.

The Resource and Environmental Planning Program (REPP) is a separate academic program housed within the School of Resource and Environmental Management. REPP is one of three certified planning programs in BC and 18 certified programs in Canada. REPP is the only planning program in Canada that specializes in interdisciplinary training in policy, natural science and social science applied to natural resource and environmental planning. REPP has an average of about 60 masters students and its graduates work in many professional planning areas including urban sustainability planning, First Nations planning, and environmental and natural resource planning. REPP graduates are employed by all levels of government, planning agencies, First Nations, NGOs, and the private sector in Canada and abroad.

Grand Central Station for Salmon
Liber Ero Chair in Coastal Science and Management Jonathan Moore, in collaboration with First Nations scientists, published a letter in *Science* about the importance of aligning spatial scales of environmental assessment with scales of risks to environment and people in regards to the proposed LNG terminal in Flora Banks, an area that is a Grand Central Station for migrating salmon.

Storks in Spain
Professor Duncan Knowler conducted an innovative study of migratory white storks that divide their time between West Africa and Southern Spain. He identified incentives for landowners in Spain to conserve stork habitat and modelled the economic benefits of sustaining the stork population.

Placement of Wind Farms Is Crucial
Placing wind farms in the right location could have long-term benefits for BC's power supply. That is what graduate students Ben Cross and Joe Bailey's study found. Wind farms located where wind blows at more useful times allow storage of surplus water in hydroelectric facilities for future energy use. The research was published in PLOS ONE and featured in the Vancouver Sun.

Do Resource Royalties Help Rural Communities?
This is the question Professor Sean Markey is exploring as part of a four-year SSHRC Insight Grant just awarded.

Excellence in Graduate Student Supervision
Associate Professor Anne Salmon received the 2016 Dean of Graduate Studies Award for Excellence in Supervision.

Engaging Conservation Scientist Leaders
Assistant Professor Jonathan Moore received a Wilburforce Fellowship, a program that builds a community of conservation science leaders who excel in using science to help achieve durable conservation solutions in western North America.

Innovations Sustaining Rural Canadian Communities
Professor Sean Markey was the lead editor on a State of Rural Canada volume that has been downloaded over 12,000 times and has inspired numerous news stories and rural policy sessions at both provincial and federal levels across Canada.

Making Salmon Farming in BC More Sustainable
Professor Duncan Knowler co-authored a paper in the Canadian Journal of Agricultural Economics discussing the value of competing technologies to improve the environmental performance of salmon farming in BC.

Advising Vancouver City on Green Planning
Professor Mark Jaccard was named to the Mayor of Vancouver's advisory group as the city pursues its 100% nonrenewable target.

Ocean Acidification – Why Should We Care?
Ocean acidification threatens commercial finfish and shellfish fisheries and sea stars. Associate Professor Karen Kohfeld is leading a five-year, $775,000 research project comprised of a 13-member team representing eight universities, Fisheries and Oceans Canada and, industry. The team will study the impact of coastal ocean acidification on Canadian communities.

Ecological Restoration

Many ecosystem services and natural habitats have been severely impacted due to the cumulative impacts of previous and ongoing anthropogenic influences, for example: urban sprawl, industrial expansion, invasive species, and contamination of soils and water resources. These factors, and the need to improve habitat for threatened and endangered species, have led to the requirement for ecosystem restoration work across the province, Canada, and internationally.

The MSc in Ecological Restoration combines the applied technical (experiential) knowledge at the British Columbia Institute of Technology (BCIT) with the fundamental (contextual) basic science and community engagement expertise at SFU to provide a unique joint-degree program that fundamentally advances both the practice and science of ecological restoration.

This combination of skills is applied to the identification of factors responsible for degraded ecosystems and to the restoration of ecosystems functions, while advancing the scientific knowledge of this rapidly emerging discipline.

In The Field

The first cohort of Ecological Restoration students initiated their capstone projects, all aimed at ever increasing our knowledge base on how to successfully restore our damaged ecosystems.

Projects are diverse covering a wide range of ecosystems and include assessing the use of goats to control invasive species such as knot weed and ivy, to the restoration of Katzie Slough such that it can once again support a thriving salmonid population.

The four-term program produces graduates who will be capable of using critical thinking, adaptive management, and research within an applied problem-solving framework. Graduates will have the critical and theoretical skills needed to set priorities, develop a structured approach to restoring degraded ecosystems, and critically assess their success in highly complex and unpredictable environments with significant uncertainties.

Inherent in the program are the development of essential skills for program management, communication, and respectful community consultation. The program will leverage expertise at both institutions, and the setting of the region, to understand how to approach ecological restoration in diverse sociocultural and biophysical settings.

As part of the requirements to graduate, students complete an Applied Research Project in year two of the program. This provides students an opportunity to both specialize in a specific field of restoration and to link with industry, government, and NGOs interested in restoring degraded habitats within their area of operation.

Our first cohort of students are currently working with the following Project Partners to design a detailed restoration plan for a specific area of concern:

- Squamish Watershed Society,
- Nikomekl Enhancement Society,
- Friends of Semiahmoo Bay,
- B.C. Conservation Foundation,
- Campbell River Salmon Society,
- Fisheries and Oceans Canada,
- Parks Canada,
- Environment Canada,
- BC Ministry of Forests Lands & Natural Resources Ops,
- UBC - Malcolm Knapp Research Forest,
- Jericho Stewardship Group,
- Metro Vancouver (Parks),

and a few smaller organization, in North America, Central America, and South America.

Students will be presenting the highlights of their restoration plans in mid-April 2017.

There are two $10,000 scholarships from the Rudy North Foundation specific to graduate students in this program. Award of the scholarship is based upon financial need and is offered early in year two of the program.

Environmental Science

The Environmental Science Program (EVSC) provides a broad multidisciplinary undergraduate education with a solid background in the natural and mathematical sciences. Its goal is to train the next generation of scientists to deal with the environmental problems that we face today and new problems as they emerge. Students take a common first year of courses in environmental science, geography, earth science, biology, mathematics and statistics, chemistry and physics. Then they specialize in one of four concentrations:

- Applied Biology,
- Environmental Earth Systems,
- Water Science or
- Environmetrics (statistics applied to environmental problems).

EVSC graduates work in environmental consulting, industry, government and a wide variety of non-governmental organizations, applying what they learned at SFU to real-world environmental problem solving.

The program has grown rapidly to become the second largest program in the Faculty of Environment with over 280 majors and honours students.

Introduction to Environmental Science, a first-year course, is now being taught seven times per year at each of SFU's three campuses, exposing hundreds of undergraduate students to the science underlying environmental problems.

Expansion of our Environmental Science course offerings is possible because of our new Environmental Science Lecturer Marnie Branfireun, who joins us from the University of Western Ontario. Marnie literally wrote the book on Environmental Science, having authored the widely-used textbook 'Environmental Science for a Changing World'.

The program continues to attract some of the top undergraduate students in the province who consistently win the top entrance scholarships at SFU for their study of Environmental Sciences.

The large network of environmental scientists at SFU provides research experiences for our undergraduates in their labs and in the field. Experiential learning opportunities are a core component of many of our courses via field trips, field work and hands-on demonstrations. Our co-operative education program offers further opportunities to work for a wide range of environmental consultancies, NGOs, industry as well as municipal, federal and provincial governments.

Our graduates are active in the community and are passionate scientists. Tesicca Truong, a third-year Environmental Science student, was named on Starfish's Canada's Top-25 Environmentalists Under 25 in both 2012 and 2013, was nominated for the Greenest City Leadership award in 2015, and is involved in a wide range of other environmental leadership activities.

Tessa Ramburn: BSc, Environmental Science

Tessa's Co-op placement took her to Delémont, Switzerland at the Centre for Agricultural Bioscience International (CAB for six months. She observed the Spotted Wing Drosophilia or more commonly known as a vinegar fly, an invasive pest found in North America and Europe that damages fruit crops. Tessa's experiences at SFU helped her succeed. From working in quarantine, to learning a new language, Tessa has learned that taking up challenges can lead to fulfilling and rewarding outcomes.

Bachelor of Environment

SFU's newest degree, the Bachelor of Environment (BEnv) is founded on a broad vision of the environment, including the biophysical, social and built environments and its majors build toward a balanced understanding of human-nature relationships, sustainability, and decision-making.

BEnv majors emphasize the complexity and integration of environmental systems. The program culminates in a capstone course that uses all those skills in collaborative team projects in Global Environmental Systems, Resource and Environmental Management or Sustainable Business (a joint major with the Beedie School of Business).

The First-Ever BEnv Student Graduates

Charly Caproff, the first-ever Bachelor of Environment student and first-ever Environmental Resource Management graduate, addressed convocation in October. Charly co-founded the BEnv student union, acted as a Frosh coordinator and EnvironMentor, based her capstone project on her passion for karst ecosystems and the Walbran Valley, all the while blogging for Sierra Club BC.

Congratulations Charly!

Sustainable Development

The faculty has two academic areas that focus on sustainable development: one with an international focus— the Development and Sustainability Program, the other with a focus on regional economic development—Sustainable Community Development. Included below are descriptions of the two units as they are currently offered.

The **Development and Sustainability Program (DEVS)** is tasked with confronting what are arguably some of the most important global and local issues of our time – increasing inequality and the sustainability of our environment and our communities. They offer a graduate certificate and an undergraduate minor.

The design of the academic programs reflects our vision that there is no single disciplinary answer to sustainability and development. Our society needs solutions that span the sciences, the humanities, social sciences, business and the arts.

One of the highlights from this year is Director June Francis along with co-lead Kristina Henriksson receiving a $1.3 million grant from the Canadian International Resources and Development Institute for an interdisciplinary project aimed at supporting inclusive markets and sustainability from natural resources in Peru. Involving faculty from Beedie School of Business and the Faculty of Environment, the project fosters collaborative research, learning and dialogue with Peruvian colleagues in academia, government, civil society and communities.

Sustainable Community Development (SCD) aims to integrate economic, social and environmental objectives in community development. SCD is based on a consideration of the relationship between economic factors and other community elements such as housing, education, the natural environment, health, accessibility and the arts.

The certificate offers recognition to those who seek accreditation in community-based social and economic development with a practical credential; it's available within an undergraduate degree or as a stand-alone credential.

The post-baccalaureate diploma is designed for those who already have undergraduate degrees and is an excellent fit for those who are making a change of field, or who have previously obtained a Bachelor's degree in a different discipline.

Co-operative Education

Environment Co-operative Education (Co-op) provides students with a unique opportunity to apply their classroom learning to jobs in a wide variety of sectors across Canada and around the globe including, but not limited to, planning, waste management, environmental consulting, sustainability, research, facilities management, mining, tourism, and GIS.

Co-op is available to every undergraduate student majoring in the Faculty and to the REM graduate students.

Hiring a Co-op student is an investment in their future. However, employers also benefit by accessing a highly-skilled and motivated group of new employees who are eager to learn and contribute to their new organization. Here is what one employer shared about their experience with the program:

> "The BC Ministry of Agriculture has had the privilege to work with SFU Co-ops for over the past decade. We are able to get the most from our Co-ops and learn from them as well because SFU well prepares them so they can transition their academic skills into real work applications. One of the greatest benefits from hiring co-ops is that it's a good opportunity to see how schools and students are evolving and integrating with technology. Every Co-op experience provides us with different successes and beneficial challenges. Today, the majority of our co-ops that have graduated have continued on in the career of GIS and have taken their careers even further."

Sam Lee, BC Ministry of Agriculture

Community Economic Development

The Community Economic Development (CED) Program supports communities to find local solutions, acknowledging that the economy, the environment and people are interconnected.

It offers a certificate program, which is part-time over eight months, with two one-week, in-person residencies, and the rest delivered online. Two cohorts were offered this past year.

It also offers the Local Entrepreneurship Accelerator Program (LEAP!), which is an eight-week program for brand new start-up social entrepreneurs in rural B.C. using a lean start-up model. It prepares small groups of entrepreneurs to launch new local businesses in their communities. LEAP! was offered in two communities this year.

Additionally, CED hosted a number of public events and workshops around B.C. including a discussion exploring the question: "What if economic development were an act of reconciliation?" CED also visited five Northern B.C. communities with CED instructor Michael Shuman, giving workshops on strengthening local economies.

Alumna Mara St. Onge, inspired by what she learned in the program, launched a successful social enterprise and award-winning YMCA program called Friends, Fitness and Fun. The program offers practical tools for mindfulness and social and emotional learning and therapeutic items, all created by people with developmental disabilities and brain injuries.

Kelsey-Rae Russell: BA, Geography

After listening to her fellow students recommend co-op as a way to explore future career opportunities and apply what they were learning to real life situations, Kelsey joined up and kept at it for more than the required four terms.

"Now when I select courses, I am careful to choose ones that will allow me to explore interests that I have discovered through my co-ops. These are things I know will translate to marketable knowledge and skills after graduation."

Professional Programs

The vision of Professional Programs and Partnerships is to bring evidence-based, engaged learning experiences to professionals and aspiring professionals. Learning from the experience and expertise of the instructors and fellow students alike, these collaborative learning opportunities proved popular and necessary for today's workplace.

On offer this year were workshops, webinars, policy roundtables and public events for anyone wishing to upgrade their skills and knowledge in response to evolving research, marketplace and industry needs; professionals in management and leadership roles interested in gaining advanced skills through innovative and evidence-based learning experiences; public policy makers and others interested in current environmentally sustainability challenges and solutions.

Participants represented a wide spectrum of industries, governments, non-profits and NGOs from across British Columbia and, online, from all across North America.

Workshops

Procurement Through a Sustainability Lens with Tim Reeve shared best practices of incorporating sustainability into everyday and once in a lifetime purchases in an organization.

Using the Open Standards for Collaborative Resource Management with Abby Hook introduced concepts for collaborative multi-benefit strategic planning using the five-step adaptive management framework referred to as Open Standards.

Vancouver's Target of 100% Renewable Energy with Mark Jaccard invited discussion from a full house interested in discussing the path to success in this program.

The Circular Economy: A Pathway to a Sustainable Organization with Coro Strandberg offered insight into understanding how your organization can integrate circular economy practices such as product-as-a-service, sharing platforms, circular supplies, resource recovery and product life extension as well as other "green business" solutions. This was a practical, hands-on session and introduced participants to actionable ideas that can be pursued immediately. Participants also learned strategies to create a vision for and pathway to a more circular organization – preventing waste while reducing inefficiencies.

Webinars: Civic Participation and Sustainability

Engaging Citizens in Bike Lane Proposals: A Toronto Experience with Jason Diceman allowed viewers from around the globe a chance to learn how this major city is successfully integrating bike lanes into its busy streets.

Engaging the University Community in Realizing Sustainability: A Transformational Approach with Candace LeRoy of SFU's Sustainability Office shared SFU's successes.

Engaging the community to build flood resilience: 12,000 Rain Gardens for the Puget Sound with Aaron Clark looked at the plans to filter a majority of rain water in beautiful, functional gardens.

Public Programs

Opening our doors to the general public for free and low-cost events to deliver engaging, meaningful talks to encourage discussion and dissemination.

At the Nexus of Climate Change and Sustainable Development: Bringing the Global Agenda Home

Greening Your Organization: A Business Networking and Learning Event with Wes Regan

We recognize that a sustainable world requires knowledge mobilization and spaces for learning beyond university graduation to further develop the capacity for sustainability leadership – in organizations, communities and governments.

Donor Recognition

We would like to take this opportunity to thank the many alumni, faculty, staff, individuals and organizations that have made gifts to the Faculty of Environment over the past year. Your contributions are providing much needed support for research, students and community engagement activities. A special thanks to the following donors:

Advancing Maritime Archaeology

Dr. Robyn Woodward for establishing the Robyn P. Woodward Postdoctoral Fellowship in Maritime Archaeology. The fellowship is intended to recognize and reward an outstanding post-doctoral fellow who has a research and/or teaching focus on maritime archaeology, a discipline that studies human interaction with the sea, lakes and rivers through the study of associated physical remains, be they vessels, shore-side facilities, port-related structures, cargoes, human remains or submerged landscapes.

Avalanche Risk Management

Canadian Pacific, HeliCat Canada, Avalanche Canada Foundation, Canadian Avalanche Association, and Avalanche Canada for their continued support of Dr. Pascal Haegeli, Research Chair in Avalanche Risk Management. This research chair is combining the traditional, physically oriented studies with human-dimensions research on risk perception, decision-making, risk communication and health behavior. This innovative research perspective is creating the interdisciplinary foundation necessary for the development of more effective accident prevention initiatives.

Conservation Science & Environmental Stewardship

Tony Allard for his continued support for two important initiatives. The first one is salmon research in Rivers Inlet which is helping address some of the pressing questions regarding the decline of the Central Coast sockeye salmon populations, including the potential role of aquaculture-related pathogens. The second one is "Take A Stand: Youth for Conservation" which brought filmmakers, SFU scientists, high school educators and graduate students together to help educate BC youth on protecting our magnificent coastline and environment.

Engaging First Nations & Wild Salmon Conservation

Tides Canada Foundation for their support of a strategic dialogue that brought together First Nations of British Columbia and others to establish a common voice for the protection and conservation of wild salmon.

Implementing the BC Water Sustainability Act

BC Ministry of Environment, Water Protection & Sustainability Branch for their support to our Pacific Water Research Centre. This funding supports a project to inform decision making related to the BC Water Sustainability Act.

Advancing Sustainable Transportation

The Metcalf Foundation for their support to the "Driving Sustainable Shifts in Transportation" project. This important project is allowing our Sustainable Transportation Action Research Team (START) to conduct a scan of electric vehicle-related policies in Canadian provinces and cities, and assess their impact on electric vehicle adoption.

Advancing Water Science and Sustainable Business

The Blue Planet Links Foundation for establishing the Blue Planet Links Foundation Bursary. This bursary provides support for students in financial need who are enrolled in Environmental Science with a declared concentration in water science or a declared sustainable joint business major.

Enhancing Coastal Science and Management

Val and Dick Bradshaw, Rudy North, the Willow Grove Foundation and other individual donors for helping to establish the Patricia Gallaugher Award in Coastal Science and Management. This award, established in honor or Dr. Gallaugher's extensive, highly-respected contributions to coastal and marine conservation science and management, will provide much needed funding to graduate students conducting community-engaged research that informs policy and influences marine or coastal conservation.

Archaeology Student Research in Distant Places

Bob Kiaii and Mercedeh Kiaii for their ongoing support of the Alexia Sepideh Kiaii Memorial Endowment, established in memory of their sister, who was passionate about archaeology. This award provides support for graduate students in the Department of Archaeology who must travel to conduct research necessary for the completion of their dissertation or thesis.

Preserving Artifacts and Building Awareness

Dr. Ray Carlson, Dr. Louise Jilek-Aall, Dr. Wolfgang Jilek, Dr. George F. MacDonald, Joanne MacDonald, Dr. Rudolf Reimer, Dr. Arnoud Stryd and Dr. Barbara Winter for their gifts-in-kind to the Museum of Archaeology and Ethnology which collects, researches and exhibits artifacts from around the world with a focus on British Columbia.

Community Engagement

Sometimes we start the conversation...

The Faculty of Environment contributes to SFU's vision of engaging students, engaging research and engaging communities in a number of ways some of which have been featured in "highlights of cool stuff we do". Included here are a few highlights of additional ways the Faculty provides learning opportunities to diverse communities, provides community service and engagement, promotes research and teaching and promotes environment and sustainability.

Public Talks and Discussions

One of the ways the faculty starts the conversations on topical issues is to host public talks and discussions. This year the faculty explored sustainabile fashion and climate change over six talks that were attended by over 1,000 people. They included:

April 21, 2016
Why Sustainable Fashion? The 180 Style Challenge
Presented by Ingrid Urhrich, Instructor, Fashion Design and Merchandising, Centre for Arts and Technology, Kelowna. This discussion took a look at many unsustainable aspects of the fashion industry and identified solutions at the personal level.

SOLUTIONS AND YOU
Combating Climate Change Series

March 31, 2016
Climate Change and YOU: Making 1.5 a Reality
Presented by Mark Jaccard (REM) and Kirsten Zickfeld (Geography), SFU; and Simon Donner (Geography), UBC. These Vancouver-based world experts delved into implications for Canada and its support of the Paris climate change agreement to put a 1.5 degree ceiling on climate warming. They looked at how governments got to this number, what it means for both the Canadian and Global carbon budget and how we could actually achieve it.

October 29, 2015
A World of Climate Extremes
Presented by: Jana Sillmann, Center for International Climate and Environmental Research – Oslo (CICERO), Norway. If greenhouse gas emissions continue to rise unmitigated, future climate change will inevitably challenge our ability to manage the risks from changing patterns of extreme weather events.

October 15, 2015
The Optimistic Environmentalist: Planning for a 100% Renewable Future
Presented by David R. Boyd, Adjunct Professor, REM, SFU; Environmental Lawyer and Author. Boyd states:

> "I want to be crystal clear: our society faces serious environmental challenges, including climate change, toxic pollution, and the declining diversity and abundance of plant and wildlife species. The scientific evidence is irrefutable. But, based on humanity's track record over the past 50 years, the ready availability of effective solutions, and the potential of future innovations, I also believe that today's environmental challenges can be overcome."

September 24, 2015
How Large Is the Bill for Global Climate Change?
Presented by Chris Hope, Reader in Policy Modelling, Judge Business School, University of Cambridge, UK. This talk focused on the climate change policies in developed and developing countries with an emphasis on the economic and social costs of carbon.

September 17, 2015
The Hockey Stick and the Climate Wars: The Battle Continues
Presented by: Dr. Michael Mann, Distinguished Professor of Meteorology and Director, Earth System Science Center, Pennsylvania State University, USA. Mann discussed the basics of climate science and revealed the tactics which opponents of climate change use to distort the science and attack the reputation of scientists.

Engaging the Media

SFU in the News provides weekly snapshots of media coverage and based on these collections, the research and/or expert commentary of the Faculty's students and faculty members were featured in over 258 news stories this year on a myriad of issues ranging from the scientific underpinning of policy, environmental assessment, Queer history and activism, Mamoths on Haida Gwaii and more.

Sometimes we move the conversation forward...

One of the ways the Faculty of Environment helps to move conversations forward is through opinion editorials.

Environmental Risk Assessment
The Dean, Ingrid Leman Stefanovic, weighed in on the Kinder Morgan Pipeline discussion in an editorial featured in *The Georgia Straight* where she observes:

> "The recent dispute between the mayors of Vancouver and Calgary around the $6.8-billion Kinder Morgan pipeline expansion is a perfect example of why environmental risk assessment is never a simple matter.
>
> It is also an indication of why policy makers should be working more closely with universities on issues of such complexity."

After analyzing the mayoral points of view, Dean Stefanovic observes,

> "that the decision around the expansion of any pipelines today is very much a discussion of ethics. ... No longer ivory towers, universities provide venues for genuine dialogue and critical thinking around exactly these kinds of complex issues."

Experiential Learning
Director of Professional Programs, Joanna Ashworth was featured in *University Affairs* where she calls for the end of "single use, throw-away assignments" in an effort to improve student learning. Ashworth posits:

> "The gold standard for assignments would engage the student in learning activities that develop their capacity for research, analysis and writing while also contributing to the social good – perhaps beyond the walls of the academy, but definitely beyond the walls of the classroom – or at the very least, intervene in a meaningful and useful way into 'real world' practices, wherever we might find them."

She provides a compelling argument with examples of the faculty following this practice:

> "A colleague ... gives students an assignment that has them assist a local municipal government by researching a sustainability planning issue. The assignment involves the professor setting up agreements with various sustainability planners in local municipal governments in advance to ensure the scope and framing of the project is doable within the timeframe of a semester."

The Professor observes that,

> "the students enjoy 'wrestling with the complexity and uncertainty of real world issues.' They also experience the satisfaction of producing a piece of work that serves the city in a practical way. As one student remarked, 'the assignment ... made the course more meaningful because the City could use our work."

Engaging Indigenous and Western Views

The faculty may move the conversation forward though a TEDx talk.

Archaeology professor, George Nicholas gave a TEDx talk that builds understanding about the differences between western and indigenous ways of knowing. The talk demonstrated how traditional ecological knowledge is intellectual property and explored ways for equitable exchanges of knowledge.

Engaging Students: Grades 1-12

We provided non-credit, sustainability learning opportunities to students in grades 1-12 by building relationships with the schools, students and community groups. This process empowered students to participate in community service and engagement activities. Examples include:

Take A Stand: Youth for Conservation
This program is aimed at students in grades 1-12 to foster a connection between youth and nature and build awareness of BC's unique coastal wilderness home to rich First Nations cultures, diverse and productive oceans, and an expansive intact temperate rainforest. The program aims to inspire, motivate and empower youth to protect and conserve the environment through art, film and youth-driven actions. The program offers various components that meet the Province's environmentally oriented prescribed learning objectives in sciences, social studies and fine arts and includes:

• a screening of the award-winning Take a Stand documentary and discussion with filmmakers and outdoor enthusiasts,

• an interactive, environmental science activity led by graduate students,

• discussions with community organizations such as Pacific Wild and the Environmental Youth Alliance,

• a video contest and conservation activities.

The program connects youth and schools with SFU graduate students and faculty, conservation groups such as Environmental Youth Alliance and artists such as Take a Stand filmmakers Nicolas Teichrob, Anthony Bonello and Norm Hann. The Stand program has visited 60 schools, connected with 5,800 students in 18 communities since its inception in January 2015.

Here is what one teacher from David Thompson Secondary School shared about the program:

> "The presentation was a wonderful way to empower and connect students with the art form they love to watch, to an art form that can change the world and within their grasp to create themselves."

And a teacher from General Currie Elementary School shared:

> "This program gave my students a renewed interest in the world they live in and deeper passion to protect what they love. … I found the experience fit perfectly with how we as teachers are asking our students to think critically and take a more holistic view of education."

Sustainability Peer Mentor Program
This program empowers leaders in secondary school environment clubs through mentorship by senior Faculty of Environment students who provide specialized knowledge and resources to aid these students in developing and executing their sustainability goals. Through interactive workshops, our secondary school student partners develop the skills desired to increase the sustainability of their school and surrounding community.

Sustainability peer leader certificates were awarded to secondary school students after completion of ten hours of skill building workshops tailored to the needs of the individual.

Sustainable community engagement certificates were awarded to secondary school students who demonstrated an interest in, and a passion for, environmental stewardship by assisting in planning and facilitating club campaigns for a total of ten hours.

Engaging Students: Service Opportunities

EnviroFrosh
The second annual EnviroFrosh was organized and run entirely by students this year. They offered a series of events to new students to welcome them to the Faculty of Environment and give them a chance to forge friendships, explore career options and to learn about the many club and volunteer opportunities.

EnvironMentors
EnviroMentors are drawn from the faculty's senior undergraduates and trained to mentor first-year students from the time of their admission to the end of their first term with the goal of making the transition from secondary school to university a fun and exciting time. The EnvironMentors share their own experiences, expertise and SFU secrets to make new students feel connected and welcome right from the start. Often these relationships last well past the first term.

Sustainability Peer Mentorship

Secondary school environmental club leaders from the first-ever Sustainability Peer Mentorship program earned their peer leader certificates.

Pacific Water Research Centre

The Pacific Water Research Centre (PWRC) addresses complex water issues through cross-disciplinary, community-engaged, and policy-relevant research to support resilient water systems. It fosters community partnerships that build a common understanding of water values as they inform water resource management and security, while also providing a foundation to develop innovative water solutions.

In its nascent year, the Centre focused on building partnerships with organizations and engaging the public on a variety of topics developing a broader understanding of issues such as water security, marine biodiversity and healthy oceans through four public lectures and an invitational strategic dialogue. Approximately 750 people attended these events representing local and regional governments, First Nations, NGOs, industry, academia, and the public. To further expand access, the events also received radio and print coverage and podcasts, reports and abstracts are available on the PWRC website. A summary of these gatherings follows.

The PWRC launched the Water Solutions public lecture series, which examines challenges to water demand, availability and quality through a variety of lenses to identify solutions for water conservation and management. Dr. Zafar Adeel, who at the time was the director of the Institute of Water, Environment and Health, with the United Nations University, presented the first talk, *The Human Face of Water Security: A focus on vulnerable individuals and communities.* Adopting a policy lens, Dr. Adeel discussed how access to clean water is one of the most fundamental human needs affecting the sustainability of livelihoods, human wellbeing and health, environmental security, and resilience against hazards and extreme climate events. PhD student Steve Conrad offered a compelling response by linking Dr. Adeel's comments to regional concerns.

Stephen Scharper, (School of Environment, University of Toronto) presented the second talk, Water and the Sacred: The Flow from Commodity to Gift. He demonstrated how religion often creates a strong environmental ethos and this ethos could help us address the water crisis.

Picking up on the personal connection to water that Scharper raised, the PWRC celebrated World Waters Day on March 22 in collaboration with the Ruby Lake Lagoon Society and the Vancouver Aquarium, with a public talk by Wallace J. Nichols, author of the New York Times best seller, Blue Mind. Nichols illustrated the importance of our connection to water and the benefits of being on, under, in or near water.

Switching to a scientific lens, the Centre also hosted the 7th Canada Oceans Lecture on marine biodiversity and the health of Canada's oceans, a satellite event to GLOBE 2016. Dr. Paul Snelgrove, research professor in Oceans Sciences and Biology at Memorial University addressed a full house describing the new tools and approaches that have revolutionized ocean sciences in the last decade.

The Centre, through its Speaking for the Salmon Program, collaborated with the BC First Nations Wild Salmon Alliance to host a two-day dialogue that brought together First Nations leaders, administrators, fisheries technicians, aboriginal rights lawyers, biologists, ecologists, wild salmon conservation advocates and policy analysts to build awareness in the First Nations communities about the threats and challenges to wild salmon and to chart a course of action for management that will ensure the future of wild salmon along the coast of British Columbia.

Shifting the focus from public engagement to community engaged research, the PWRC was pleased to welcome internationally-respected water luminary Dr. Zafar Adeel as executive director of the PWRC and professor of professional practice in the School of Resource and Environmental Management in July. Dr. Adeel will work with PWRC members in the coming months to develop a strategic plan and prioritize the research themes of the Centre.

Zafar Adeel, Executive Director

Adeel chaired UN-Water from 2010–2012, coordinating water-related work in 30 United Nations organizations. He has also led an international task force on water security at the request of the UN, which has explored water challenges and solutions across the world.

Prior to his role at SFU, Adeel served ten years as the director of the Hamilton, Ontario-based United Nations University Institute for Water, Environment and Health. In this capacity, he mobilized over $25 million in resources for the institute.

Centre for Sustainable Community Development (CSCD)

The Centre aims to integrate economic, social and environmental objectives in community development.

It has partnered with the Hub for Social and Solidarity Economy in Athens, Greece to pilot a program to develop leadership for sustainable local economies and social ventures.

Its Sustainable Cities International Internship Program has 40 young Canadians working with the CSCD's partners in South Africa, Mexico, Tanzania, Bolivia and Mexico to support sustainable local economic development; improved waste management; urban densification; increased food security; and engaged communities.

Centre for Tourism, Policy and Research

The Centre engages with public and private sector tourism organizations to undertake research and professional development activities that address critical issues related to the use and management of natural and/or cultural resources for tourism and recreation purposes. Reflecting the evolving interests and needs of both the tourism sector and the Centre's members, recent core strategic areas of investigation have been sustainability management, growth management, as well as human dimensions and risk management research. Members of the Centre are drawn from across the Faculty and the two faculty leads are Alison Gill and Pascal Haegeli who are complemented by 10 graduate students. Currently, efforts are underway to establish an external Advisory Board drawn from industry members both in BC and internationally. As one of the few research Centres globally that addresses the interface of tourism and environmental management, developing a network of experts helps attract international attention from researchers and potential students.

Cooperative Resource Management Institute

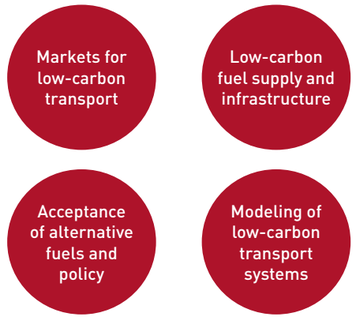
This institute houses personnel from governmental and non-governmental natural resource management and extension agencies.

It addresses challenging multidisciplinary issues in resource management by providing an environment where agency personnel who deal with forestry, fisheries, and wildlife can work on a daily basis with SFU faculty, graduate students, post-doctoral fellows, and research associates.

Sustainable Transportation Action Research Team

Currently, transportation is not sustainable and it accounts for roughly one quarter of global greenhouse gas emissions. The Sustainable Transportation Action Research Team (START) is a research collaborative led by Dr. Jonn Axsen that focuses on the transition to lower impact transportation systems. It takes a unique interdisciplinary approach to its research, combining elements of economics, engineering, marketing, policy and psychology into the analysis of sustainable transportation solutions.

Complementing the interdisciplinary approach, START integrates relevant insights from quantitative and qualitative research methods such as statistical analyses, energy-economy modeling, consumer and citizen surveys, stakeholder interviews, media analysis and policy analysis. The research focuses around four themes:



START conducts research and engages governments, industry and communities to actively transition the transportation sector towards a sustainable system that effectively:

1. limits emissions and waste to be within the planet's ability to absorb them (e.g. deep cuts to greenhouse gas emissions);
2. uses renewable resources efficiently (e.g. wind, solar, biofuels) while minimizing consumption of non-renewable resources (e.g. fossil fuels);
3. is economically efficient in transition and in operation, affordable to individuals and communities and supportive of a vibrant economy; and
4. allows the basic access needs of individuals and societies to be met safely and in a manner consistent with human and ecosystem health.

Over the last year, START has published several pieces of research related to alternative fuel vehicle technology including:

- a study of the past 30 years of hype and failure around alternative fuels for transportation (published in *Nature Energy*);
- a study highlighting the key distinctions between today's electric vehicle buyers and the electric vehicle buyers of tomorrow (published in Transportation Research Part D);
- Canada's first electric vehicle policy report card, which assesses how well Canadian provinces are doing at getting electric vehicles on the road;
- a study examining the impacts of electric vehicle use on the grid and opportunities for managing the grid with "smarter" vehicle charging technologies; and
- a study looking at the new vehicle buyers' confusion about electric vehicles and charging.

WE INVITE YOU...

...to partner with the Sustainable Transportation Action Research Team and help us:

- become leaders in sustainable transportation systems, producing innovative and integrated research;
- provide evidence-based policy advice and business strategy;
- bring together stakeholders in the transportation sector and build networks of strategic partnerships;
- disseminate research, education and training to stakeholders and the public;
- provide a foundation for faculty, graduate and undergraduate students to work together to develop innovative transportation solutions;
- support the piloting and demonstration of innovative systems and technologies, and;
- shape Canada's transportation future.

David Mark, PhD, Geography '77

David is an internationally-respected geographic information and cognitive scientist and Distinguished Professor of Geography at the University of Buffalo; this year, he received an Outstanding Alumni award from SFU.

David was one of the pioneering academics that helped develop Geographic Information Science (GIS), a field that combined cutting edge mapping software with traditionally spatially oriented fields such as geography and cartography to create new ways of seeing and understanding the world.

Erin Roberts: MSc Candidate, Ecological Restoration

Water has always been significant for Erin. She managed a student-organized, eco-friendly coffee shop, worked in water stricken communities in Eastern Africa, and provided water wetland assessments in Calgary. She is now working in the Squamish estuary for her capstone project.

Erin is passionate about restoration ecology as it provides a hands-on approach to nature conservation and preservation, and is critical in ensuring a healthy human-to-nature relationship.

Tessa Fryer: BA, Archaeology

Tessa received the 2016 Dean's Undergraduate Convocation Medal in June. Tessa completed a joint major in Archaeology and First Nations Studies as well as a certificate in Cultural Resource Management.

Tessa participated in the 2014 South Pacific field school in Fiji and Tonga and also spent one term as an exchange student at Monash University in Melbourne. Tessa's future plans are for a career in the field of Indigenous Heritage Management .

Archaeology

FRANCESCO BERNA
Assistant Professor

Origin of modern behaviour, archaeology of fire, ancient pyrotechnologies, use of space, site formation processes

DAVID BURLEY
Professor and Department Chair

South Pacific, Northwest North America, historical archaeology, archaeological theory, South Pacific prehistory, ceramics, maritime adaptations, ethnohistory

HUGO CARDOSO
Assistant Professor
Co-director, Centre for Forensic Research

Human juvenile osteology, dental and skeletal age estimation, child health in archaeological populations, trauma and taphonomy of immature bone

MARK COLLARD
Professor

Human evolution, primate evolution, evolutionary archaeology, phylogenetics, hominin and non-human primate fossil record, body size estimation, material culture studies

CATHERINE D'ANDREA
Professor

Palaeoethnobotany, cereal domestication, traditional agricultural knowledge, ethnoarchaeology, early agriculture, early complex societies, African archaeology

JONATHAN DRIVER
Professor

Zooarchaeology, cultural ecology, PaleoIndian adaptations, southwestern United States, and northeast British Columbia

BIRUTÉ M. F. GALDIKAS
Professor

Primate ecology, orangutan conservation

ROSS JAMIESON
Associate Professor

Andean South America, colonialism, historical archaeology, archaeological theory, South Pacific prehistory, ceramics, maritime adaptations, ethnohistory

DANA LEPOFSKY
Professor

Palaeoethnobotany, human ecology, prehistoric and traditional resource management, Northwest Pacific, Oceania, complex hunter-gatherers, public outreach

ROBERT MUIR
Senior Lecturer

Zooarchaeology, quantitative methods, cultural resource management, field methods, British Columbia, American Southwest

Archaeology

GEORGE NICHOLAS
Professor

Indigenous peoples and archaeology, intellectual property issues in cultural heritage, archaeological theory, wetland archaeology and human ecology

RUDY REIMER
Assistant Professor

Indigenous archaeology, BC archaeology, cultural resource management, lithic technology, materials science, geochemistry

MICHAEL RICHARDS
Professor

Evolution of human diets over time, especially the diets of Neanderthals and early modern humans, and the spread and adoption of agriculture in Eurasia

DENNIS SANDGATHE
Lecturer

Stone tool technology, Palaeolithic Eurasia, nature of Middle Palaeolithic adaptations, role that fire played in Neandertal adaptations

JOHN R. WELCH
Professor, Archaeology and Resource and Environmental Management
Director, Graduate Program in Heritage Resource Management

Sovereignty-driven research and Indigenous community collaborations in heritage stewardship and applied archaeology

DONGYA YANG
Associate Dean, Graduate and Research, Professor

Human osteology, molecular archaeology, animal and plant ancient DNA, forensic anthropology

Geography

SHIV BALRAM
Senior Lecturer

Collaborative GIS, environmental decision making

NICK BLOMLEY
Professor

Land, property and the geography of rights, legal geography, urban

Geography

TRACY A. BRENNAND
Professor and Department Chair

Glacial geomorphology, glacial sedimentology, paleoglaciology, paleohydrology, environmental and climate change, planetary geomorphology

ALEX CLAPP
Associate Dean, Undergraduate
Professor

Environmental and economic geography, resource conservation, forest management; environmental politics in the temperate rainforests

VALORIE CROOKS
Professor

Health, primary health care, palliative care services and family medicine, informal family care giving, health-related social programs, socio-spatial negotiations of chronic illness

SUZANA DRAGICEVIC
Professor

Modeling of complex spatial environmental systems; modeling land use, land cover and urban growth; modeling dynamic spatial phenomena in forestry and landscape ecology

ALISON GILL
Professor, Geography and Resource and Environmental Management

Centre for Tourism Policy and Research; tourism and environmental planning processes, community-based planning

ROGER HAYTER
Professor

Industrial restructuring, BC's forest industry, the location dynamics of business firms, regional development, environmental economic geography

NICK HEDLEY
Associate Professor

Visualization, 2D geovisualization, 3D visualization, geospatial interface research, natural hazards, ocean science, spatial cognition

MEG HOLDEN
Associate Professor

Urban, sustainable development and policy, sustainable assessment and evaluation, social learning in cities

PETER KELLER
VP, Academic and Provost
Professor

Resource management, mineral exploration and marine navigation support to preservation of Indigenous knowledge, environmental and human wellness and health, community mapping and tourism planning

PAUL KINGSBURY
Associate Professor

Cultural geography, consumption, social theory, psychoanalysis, aesthetics, and paranormal cultures

Geography

LANCE LESACK
Professor, Geography

Limnology, ecosystem science of large rivers, carbon and nutrient cycling in lakes, hydrology of lakes and river floodplains, biogeochemical mass fluxes to the ocean from small catchments through large rivers

GEOFF MANN
Professor

Centre for Global Political Economy; Resources, natural resource labour and labour markets, comparative natural resource policy, macroeconomic policy and commodity production, race and gender

EUGENE MCCANN
Professor

Urban, drug policy in relation to urban and regional built environments, urban public space and governance, urban and regional livability, quality of life and creativity

ANDREW PERKINS
Lecturer

Physical geography; geography of natural hazards; earth systems

JOHN PIERCE
Professor

Food systems, food security and sustainability of food systems

MARGARET SCHMIDT
Associate Professor

Soil science, digital soil mapping, predictive soil mapping and modelling, impact of forest management practices on soil properties and nutrient cycling, soil rehabilitation

NADINE SCHUURMAN
Professor

Health and environment, location of health services, population health, critical GIScience

IVOR WINTON
Senior Lecturer

Population geography; geographical thought in the western tradition

JEREMY VENDITTI
Professor
Director, Environmental Science Program

Fluvial Geomorphology and Sedimentology, River Dynamics, Physics of Sediment Transport

KIRSTEN ZICKFELD
Associate Professor

Climate science, climate modelling, climate carbon-cycle interactions, carbon budgets compatible with climate targets, climate tipping point

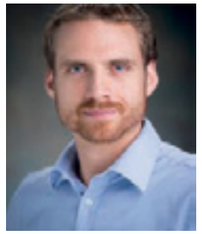
Resource and Environmental Management

ZAFAR ADEEL
Professor of Professional Practice
Executive Director, Pacific Water Research Centre

Water security and its links to the 2030 Agenda for Sustainable Development, including SDGs. Water policy and management in water-scarce environments. Threats to mangrove ecosystems.

CLIFFORD ATLEO (KAM'AYAAM/ CHACHIM'MULTHNII)
Instructor

Indigenous governance, community development and political economy



JONN AXSEN
Associate Professor

Adoption of pro-environmental technology; electric and alternative fuel vehicles; consumer attitudes, lifestyle, and social influence; citizen acceptance of energy and policy; energy system simulation modelling; climate policy design and impacts

SEAN COX
Associate Professor and Director

Application of mathematical, statistical, and technology solutions to fisheries stock assessment and management challenges

FRANK GOBAS
Professor

Environmental chemistry and toxiology; environmental behaviour and effects of pollutants; chemical engineering and biology

TOM GUNTON
Professor
Director, Resource and Environmental Planning Program

Forestry, land use, energy, mining and fisheries

PASCAL HAEGELI
Assistant Professor

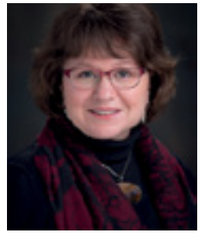
Interdisciplinary research in avalanche risk management for the development of practical tools that assist backcountry recreationists and avalanche professionals to make better informed decisions

MARK JACCARD
Professor

Sustainable energy and public policy; environmental economics; energy and materials

DUNCAN KNOWLER
Associate Professor

Env. influences in bioeconomic modeling of natural populations; economics of natural res. mgmt., economic incentives for biodiversity conservation, invasive species economics, and the economics of sustainable aquaculture/agriculture



KAREN E. KOHFELD
Associate Professor & Canada Research Chair (II) in Climate, Resource, and Global Change

Climate change and its regional impacts, earth system science, carbon cycling, paleoceanography, paleoclimatology, paleoecology, ocean acidification

Resource and Environmental Management

KEN LERTZMAN
Professor

Forest ecology, ecosystem dynamics, conservation and management; the dynamics of temperate rainforests; sustainability and Indigenous traditions

SEAN MARKEY
Associate Professor

Local and regional economic development; community sustainability; rural development and sustainable infrastructure

JONATHAN MOORE
Associate Professor

Aquatic ecology, fisheries, environmental decision-making, watershed science

EVELYN PINKERTON
Professor

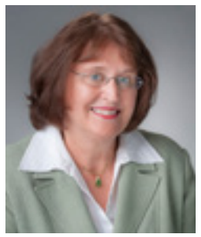
Co-Management of natural resources, political ecology and neoliberalism; local communities and fisheries management

MURRAY RUTHERFORD
Associate Professor

Environment and development; human dimensions of environmental policy and planning; conservation challenges and public policy

ANNE K. SALOMON
Associate Professor

Coastal marine ecology and conservation, resilience of social-ecological systems, marine policy



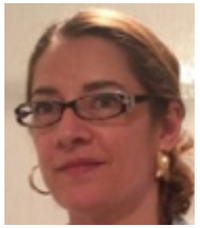
INGRID LEMAN STEFANOVIC
Dean, Faculty of Environment
Professor

Environmental ethics; how values drive environmental decision making, including water policy

MARK ROSELAND
Professor & Director, Centre for Sustainable Community Development

Sustainable planning & development theory and practice. Founding director of Pando | Sustainable Communities, an international network for sustainable communities researchers and practitioners

Environmental Science



MARNIE BRANFIREUN
Lecturer, Environmental Science and Ecological Restoration

Peatland ecology, stream ecosystem monitoring, marine food chain dynamics, contaminant biogeochemistry, field methods, environmental science teaching methodology.

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Dongya Yang, Associate Dean, Graduate

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June Francis, Director

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