



Knowledge that Inspires

RESEARCH & GRADUATE STUDIES |
ANNUAL REPORT 2015-16



THOMPSON RIVERS
UNIVERSITY



- 3 **Message from Dr. Will Garrett-Petts, Associate Vice-President, Research & Graduate Studies**
- 4 **From strategic planning to strategic impact** — Implementing the five-year research plan
- 5 **World-class grasslands research** — Dr. Lauchlan Fraser
- 6 **Breathing life into an ancient language** — Drs. Patrick Walton, Gloria Ramirez & Haytham El Miligi
- 8 **TRU Graduate Studies** — Sharing research & celebrating success
- 11 **How high can they reach?** — Undergraduate researchers
- 12 **Global storytelling** — Mobilizing knowledge
- 14 **Research as a service to others** — Dr. Airini
- 18 **All My Relations Centre** — Dr. Rod McCormick
- 20 **Discrete mathematics** — Dr. Sean McGuinness
- 22 **Eye in the sky over B.C. ranchlands** — Dr. John Church
- 24 **Finding Place** — Dr. Lyn Baldwin



Visual Arts faculty member Donald Lawrence was in Dawson City, YT, leading a team of international artists and researchers for the Midnight Sun Camera Obscura Festival. The research group, which included four TRU student research assistants, worked with the Klondike Institute of Art and Culture to develop a range of camerae obscurae within Dawson. Read more on Page 21.



Dr. Will Garrett-Petts predicts that in the next five years, TRU will see a significant increase in critical and creative inquiry at Thompson Rivers University.

Driven to inform and engage the community

Thompson Rivers University's new five-year Strategic Research Plan (SRP), the result of extensive community dialogue, is our blueprint for both expanding the university's existing research capacity and mobilizing the new knowledge created. The SRP is a shared articulation of our strategic vision for integrating research and creative inquiry into all areas of the university. The next five years at TRU will be focused on capacity development, knowledge mobilization and the implementation of this vision. Our university boasts a remarkably comprehensive set of assets, including academic programming; graduate studies; trades and vocational training; Open Learning; TRU World; unique academic, career and vocational laddering opportunities; and outstanding faculty and staff in all these areas. The possibilities afforded by these assets inform our research and no doubt will shape future directions for our work.

In addition, the interdisciplinary opportunities fostered by the relative absence of academic silos at TRU is nothing short of inspiring. Our place in the community is equally remarkable: the people of the Interior of British Columbia see TRU as their university; and as one of the

many bridges between the community and the university, the Office of Research and Graduate Studies remains acutely aware of how valuable our collective research capacity has become to our region's community groups and organizations, non-profits, Aboriginal communities, cultural groups, businesses and industries. It seems clear to me that TRU's increasing research profile not only reflects, but enables and drives our collective sense of the role research can play in engaging and enriching the communities we serve.

We will always be a university that puts its students and commitment to teaching excellence first, but we have demonstrated that provision of research support and the celebration of research engagement is in no way antithetical to those principles. Indeed, in a small university like TRU, support for faculty research—including undergraduate and graduate student research—is seen as a necessary extension of good teaching practice.

Looking forward, and supporting all five research themes of the SRP, I anticipate increased participation in critical and creative inquiry; an increased share of external funding; enhanced supports for student research training; significant investment in internally and externally funded research chairs; a renewed commitment to innovation, technology transfer, and knowledge translation; an increased complement of dedicated research space; and the strategic development of new research centres and groups. I anticipate an even more robust slate of graduate programming, along with the development of doctoral student supervision and training opportunities on campus. We know that individual success breeds collective success, and with that in mind, I am delighted to share with you this annual report, which is a reflection of some of these individual and collective successes, and provides a venue to showcase the world-class research that is being conducted right here, in our small but vibrant community-engaged university.

**Dr. Will Garrett-Petts, Associate Vice-President
Research & Graduate Studies**

“The interdisciplinary opportunities fostered by the relative absence of academic silos at TRU is nothing short of inspiring.”



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From strategic planning to strategic IMPACT

Thompson Rivers University has a new, Strategic Research Plan (SRP) — a blueprint for research for the next five years.

The SRP, which received approval from the TRU Board of Governors on Feb. 13, 2015, is the result of a two-year consultation process spearheaded by Dr. Will Garrett-Petts, AVP Research and Graduate Studies and the University's Senate Research Committee. The SRP was informed by faculty and student surveys, a community advisory group, a focus group, departmental consultations, and three town hall meetings.

"The Strategic Research Plan is an authentic reflection of the trajectory of the university," said Dr. Alan Shaver, President and Vice-Chancellor, adding that its implementation is auspicious, coming during TRU's 10th anniversary as a full-service university.

While TRU encourages research in all disciplines, the plan identifies five key areas of collaborative excellence, all of which reflect the university's overall research strengths.

"TRU is developing national and international leadership in many of our areas of emerging research strength, and our researchers have the capacity to make a real difference in their fields," said Garrett-Petts. "Our researchers are providing excellent opportunities for their students, and in doing so, are successfully drawing some of the brightest minds to this campus."

The research plan includes specific objectives, such as the development of a research culture on campus, achieved by celebrating the success of faculty and student research, as well as by increasing the number of research chairs and support for research conferences, workshops and outreach. The plan emphasizes, in particular, the importance of strong partnerships, with researchers working together with cultural groups, industries, community agencies, businesses, institutions and government agencies to create innovative solutions to everyday challenges.

"We are community-based problem solvers with a tradition of knowledge creation that goes back for more than half of our history. The Strategic Research Plan keeps us focused on this upward trajectory, and fosters the growth of our research and entrepreneurial capacity," said Shaver.

The 5 research themes



COMMUNITY & CULTURAL ENGAGEMENT



TECHNOLOGY & OPTIMIZATION



SUSTAINABILITY, ENVIRONMENT & THE PHYSICAL WORLD



ABORIGINAL UNDERSTANDING



EDUCATION, HEALTH & DIVERSITY



World-class grasslands research provides new insight into biodiversity

In a recently published paper in *Science*, the world's leading journal for scientific news, commentary and cutting-edge research, Dr. Lauchlan Fraser and his co-authors show a link between plant biomass and species richness in grassland ecosystems – the highest diversity is found at intermediate levels of plant biomass. The results of these findings have global ramifications for the management and conservation of biodiversity.

In their paper, "Worldwide Evidence of a Unimodal Relationship Between Productivity and Plant Species Richness," Fraser designed the experiment and coordinated the efforts of 62 scientists from 19 countries and six continents. He describes the effort of collecting and analyzing the data as "Herculean." This project is part of "HerbDivNet," a network of scientists

studying the relationships between plant biomass production and species diversity.

"The project is exciting because it is such a broad international collaboration. We all went into this project on trust, on an idea, said Fraser."

Ecosystem productivity, one factor considered responsible for regulating diversity, has long been a subject of debate. This new research is groundbreaking in that it reaffirms a previously held theory of biodiversity, and challenges a four-year-old article in *Science* that effectively disproved it.

"The danger in the earlier paper was that it said there was no pattern. That could have thrown us off and we could have gone down rabbit holes looking for patterns. We wouldn't have come any closer to understanding biodiversity." With such a tremendous data set to work from, Fraser is confident there are many more discoveries to make.



Results from a research project led by TRU's Dr. Lauchlan Fraser, published in the journal *Science*, shows a link between plant biomass and species richness in grassland ecosystems.

Breaking ground on Genomic research

A new TRU-led research project, funded by Genome British Columbia and



Genome Canada, aims to improve strategies for monitoring the impact of the Mount Polley Mine tailings breach on the ecosystem and to provide recommendations for environmental remediation. Led by Dr. Fraser, the main goals of the project are to:

- ▶ Determine the likelihood of long-term metal leaching into the watershed
- ▶ Improve tools for monitoring passive bioremediation in soil and water
- ▶ Develop molecular markers of metals removal and soil rehabilitation
- ▶ Conduct controlled bioaugmentation/biostimulation trials



Technology breathes new life into an ancient, endangered language

Is it possible to use modern technology to teach children an ancient and endangered language?

A trio of TRU researchers asked that question one year ago, and today they're convinced that the answer is yes.

Doctors Gloria Ramirez, Patrick Walton and Haytham El Miligi are working together to preserve and digitize the Secwepemctsin language. Applications developed by Dr. El Miligi's computer science research assistants are already in use at the Tk'emlups te Secwepemc Indian Band's Sk'elep School of Excellence, and are showing promising early results.

Supported by a Social Sciences and Humanities Research Council (SSHRC) Aid to Small Universities Grant, the team has developed the apps for use on tablets, and are currently testing and modifying them based on feedback from Sk'elep teachers and students.

Walton says the project has been "transformational" for language instruction in the school, and has added another dimension to traditional methods of teaching.

One of the school's goals is to achieve full Secwepemctsin-immersion, but to reach this goal the children need to hear the language spoken as much as possible.

"Some of the elders were reluctant until they saw the response from the children," said Walton. "These apps are interactive and students are engaged. If they hear more of the language it's another piece added to the puzzle, which will hopefully add up to a full immersion school." The teachers and elders have been vital in the development of this language tool, as they are the holders of the knowledge, and they have been instrumental in helping the two research assistants populate the apps with words, sounds and images.

The whole experience has been positive, said Walton, who explained that Sk'elep administration approached TRU researchers with this language challenge, and researchers were able to help. When the apps are complete, the school will own the content, though the technology has been designed to facilitate the development of other apps in other Aboriginal languages.

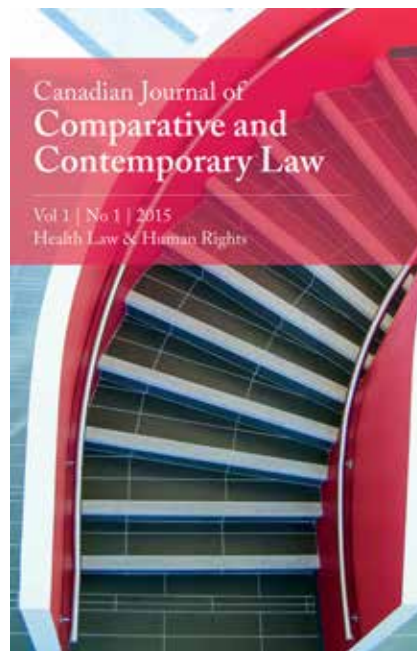


Dr. Patrick Walton is part of a team of interdisciplinary researchers working with the Sk'elep School of Excellence to help revitalize the Secwepemctsin language.

TRU Law School launches new journal

In January, the TRU Faculty of Law published a new journal, which has already been cited and is drawing praise.

The inaugural issue of the *Canadian Journal of Comparative and Contemporary Law* (CJCLL), an open access journal, was edited by law faculty Robert Diab, Chris Hunt and Lorne Neudorf. The journal is mandated to publish innovative and rigorous scholarship that makes a significant contribution to legal study. The inaugural issue examines the intersection between health law and human rights, and features contributions from some of the leading scholars in the field. An article from the inaugural issue, "Informal Care and Private Law: Governance or Failure Thereof?," written by Dr. Brian Sloan of the Faculty of Law, University of Cambridge, was cited in the new book, *Modern Studies in Property Law Vol. 8*. The second issue, to be published in January 2016, will investigate the theme: "Equity in the 21st Century: Problems and Perspectives."



Indigenous control over biodiversity

Another project supported by the 2014 SSHRC Aid to Small Universities Grant explores Indigenous control over access to biodiversity and traditional knowledge in their territories in the BC Interior. The territories of Indigenous people are home to the highest concentration of biodiversity world-wide, and traditional knowledge and practices have been found to enhance biodiversity and ensure environmentally, socially, culturally and economically sustainable development. Led by law faculty members Dr. Tesh Dagne and Nicole Schabus, this project brings academics together with Secwepemc leaders, elders and land users to further research and develop the concept of the territorial authority.

Speaking their truth

Home/Less/Mess was a collective creation theatre project that ran over four nights in summer 2014, but the impacts of the play continue to be felt. Funded in part by a SSHRC Aid to Small Universities Grant, the play was directed by Robin Nichol and Heidi Verwey of the Department of Visual and Performing Arts, and involved six actors, all of whom had first-hand knowledge of homelessness. The play sold out its four-night run.

"It was so important for those actors to tell their stories and speak their truth for a group of people who paid for the privilege of hearing it," said Nichol. The play empowered the actors to speak — elevated them to the level of experts trying to solve some of the problems that create homelessness. Sociologist Dr. Dawn Farough has presented findings from audience surveys taken during the play's run to both national and international audiences, while Ginny Ratsoy in the department of English and Modern Language will examine the script in the context of Canadian collective creation.



Dr. Ehsan Latif, economics, says early results indicate rent banks are an effective way to prevent homelessness.

Research shows Rent Banks work

According to results from the first year of a three-year research study into the effectiveness of rent banks, it is clear that they work.

While the data pool is still small, Dr. Ehsan Latif, an economist and the project's principal investigator, confirmed that all clients issued loans in the Kamloops Rent Bank's first year of operations were still housed one year later.

Rent banks provide small loans at low interest rates in an effort to prevent evictions or help pay utility bills. To qualify for a loan, clients must prove that they are capable of paying it back, and they must attend financial literacy counselling.

In the first year of the study, Latif, who is funded by a SSHRC Aid to Small Universities Grant, conducted a series of structured interviews involving clients, landlords and staff of the Kamloops Rent Bank.

The study found high client satisfaction; it also found high loan repayment. In fact, the

loan repayment rate from the Kamloops Rent Bank was higher than other rent banks that exist in the province.

"When we had that report and went to City Council to ask for support they know that we're being rigorous and that we're achieving our goals," said Tangie Genshorek, Coordinator of the Kamloops Homelessness Action Plan (HAP).

The City has now committed to providing the Kamloops Rent Bank with \$15,000 annually for the next five years.

Latif hopes that his research — which is now entering Year 2 — will eventually result in provincewide rent banks. "To do that, we need to convince the government that it is actually helping to prevent homelessness."

The next stage of the research looks at other communities to determine the rates of homelessness and eviction in those cities, the percentage of income people pay for housing, as well as any current homelessness prevention policies.

Mitigating Wildfire Damage

Colin Swan was on the ground during the catastrophic 2003 BC wildfire season, and the response to the wildfires left him with many unanswered questions — most important being how to prevent this from happening again. The Master of Science in Environmental Science student knows that the key to mitigating wildfires is removal of fuel, and this was done extensively on Crown lands following the 2003 season.

According to Swan: “A lot of research supports that it is really irrelevant what we do on public lands if nothing is done on private land.” His research now centres around whether or not the fuel removal on Crown land had an impact, and if there is a more sustainable method of forest fire prevention.

“We are spending a lot of taxpayer dollars. Are we getting value?”



Understanding the international student experience

Three years into her Master of Education Misty Sheldon is nearly done, and she is confident that the path she has taken has made her a better teacher.

In her professional life, Sheldon is a primary itinerant counsellor for the Nicola-Similkameen School District, meaning she spends her time going from school to school assessing and assisting children in kindergarten through Grade 3.

She opted to go back to school and earn her masters for the same reason as so many others in her field — a burning passion for continued learning.

“It sounds a little cliché, but I’ve always considered myself a life-long learner. I love to learn, and people interest me.”

Through the course of her program, Sheldon became a research assistant working with Drs. Carol Rees and Toupey Luft on the research project, “Self Reflection and Mentoring for International Graduate

Students Developing a Professional Identity in Canada.”

The project, which is supported by an Internal Research Fund Grant, saw Sheldon co-facilitate a roundtable discussion during March’s Intercultural Intersections conference (**See Page 16**). Sheldon joined Dr. Luft in presenting the research at the National Conference of the Canadian Counselling and Psychotherapy Association in Niagara Falls, ON.

Sheldon immersed herself into the project, and was captivated by it. While the subject matter was a departure for her, she found many ways the results can inform her work, even at the primary level. The results indicate that to better serve international graduate students, more effort needs to be placed on creating on-campus supports and career counselling. “When we get these students here we need to keep them happy, healthy and mentally well. How can we support that best?”



Misty Sheldon, a Master of Education student, participated as a research assistant alongside Drs. Carol Rees and Toupey Luft on the research project, “Self Reflection and Mentoring for International Graduate Students Developing a Professional Identity in Canada.”

Stemflow research leads to TRU's first Governor General's Gold Medal

It is the highest achievement awarded to Canadian graduate students, and when it was awarded to Julie Schooling at this spring's graduation, she humbly offered credit to those who helped guide her through her academic journey.

Schooling's thesis, "The Influence of Tree Traits and Storm Event Characteristics on Stemflow Production from Isolated Deciduous Trees in an Urban Park," was the product of a two-year partnership between TRU and the City of Kamloops. Schooling investigated 40 deciduous trees of 22 different species in McArthur Island Park to gain a better understanding of how stemflow and canopy interception work together in Kamloops' climate, and whether runoff can be reduced by planting certain types of trees.

While studying, she received an Industrial Postgraduate Scholarship from the

Natural Sciences and Engineering Research Council (NSERC). The scholarship, sponsored by Golder Associates, allowed her to concentrate on her research and coursework.

Schooling's work was visible — her research involved wrapping stemflow collars around the trunks of trees in McArthur Island Park — and was featured by a variety of local media outlets. The results of her research can be found on the City of Kamloops website, and she has co-authored several journal articles with her supervisor Dr. Darryl Carlyle-Moses.

Schooling now works as a landscape architect, where her expertise in urban forestry has proven valuable.

"When you think about it, it's impossible to do any landscaping without addressing water. You need to know where your water is coming from, and where it will go."



Julie Schooling, MSc. in Environmental Science, was awarded the Governor General's Gold Medal in June. This medal is the highest achievement offered to Canadian graduate students, and this marks the first time it was awarded at TRU.



Graduate Research

Sustainability in BC's Ranching Community

Having completed an undergraduate degree in Environmental Chemistry with a minor in Environmental Economics and Sustainable Development, it is no wonder Sarah Whitehouse opted for her current research focus when she enrolled in TRU's Master of Science in Environmental Science program. Her graduate work is two-fold — while she will spend time in the TRU Research Greenhouse investigating carbon sequestration in grasslands and how it can be positively influenced by grazing, she intends to put the bulk of her time into developing an effective incentive strategy to promote better land management.

"The goal would be to establish a framework for policy makers to work with that will set ranchers up to receive carbon credits."





Photo by Dave Eagles, Kamloops This Week

TRU's top finalist

Kristen Marini, a Master of Science in Environmental Science student, advanced from the TRU 3MT finals to the Western Canadian Regional competition for her presentation, "Living in the Ghetto: Effects of city life on chickadees."

Three Minute Thesis takes over TRU

On March 27, the five finalists in TRU's Three Minute Thesis (3MT) competition arrived early to Old Main's Black Box Theatre to present their research to a panel of non-expert judges. The graduate students were allotted three minutes and a single static slide.

Master of Business Administration student Lesia Romaniuk was up first, followed by Master of Science in Environmental Science student Kristen Marini, Tallon Milne, MSc., Master of Education student Hasan Kettaneh, and Amna Farooq, MSc.

Judges for the TRU final included Kamloops-North Thompson MLA and Minister of Health Dr. Terry Lake, Western Canada Theatre General Manager Lori Marchand and Interior Health Communications Officer Susan Duncan. The judges agreed that it was a tough competition, but with her use of humour coupled with her confidence and effective slide, Marini was the winner.

Marini then joined 13 other graduate students vying for top spot in the Western Canadian 3MT finals, hosted by TRU on April 30.

"The 3MT was a great chance to do something outside my normal comfort zone and practice talking about my research to a large audience," she said.

More than 100 people attended the regionals, and the event was live-streamed, with more than 3,000 people casting votes for People's Choice. Judging that event were Kamloops lawyer and motivational speaker Lesra Martin, TRU Chancellor Wally Oppal, and CFJC-TV media personality Susan Edgell. Elizabeth Watt of the University of Calgary took first place, with Erika Bachmann of the University of Saskatchewan coming in second and Rebecca Dielschneider of the University of Manitoba being selected People's Choice winner. Watt advanced to Canada's 3MT, hosted virtually by the Canadian Association of Graduate Studies (CAGS) in May, and in June was chosen first of the 11 finalists.

This was the second-year TRU has participated in the competition, originally developed in 2008 by the University of Queensland.



National 3MT winner

Elizabeth Watt from the University of Calgary took first place at the Western Canadian Regional 3MT competition hosted by TRU in April, and advanced to the National 3MT competition, where she also took top spot for her presentation, "Permanent Breast Seed Implant: Improving Patient Experience in Early-Stage Breast Cancer."



Why do students volunteer?

Felicia Girouard turned a class assignment into a successful Undergraduate Research Experience Award Program study. Majoring in international business with a minor in economics, Girouard completed her project, "TRU Student Motivations to Volunteer," under the guidance of economist Dr. Ehsan Latif. Her research question was prompted by her own curiosity. "I do a lot of volunteering, and when I volunteer I noticed some people will stay for 10 hours, and some for much less. I wondered why people do it, and how they manage it."

The intent was to explore volunteer motivations in various contexts. A student's residential status (domestic or international), year of study, religion, academic program and gender were all important variables.

The UREAP experience was overwhelmingly positive, said Girouard.

"It was great preparation for my honours thesis and for work experience."



Research leads to graduate school success


Supervised by Dr. Meredith Burles (Sociology), Ashley Berard's UREAP project, "With the Dragon Wrapped Around Us: Examining the Creation of Online Discourse while Negotiating Fibromyalgia," gave her the research tools she needed to succeed in her first year of graduate studies. She is currently entering her second year of the Master of Sociology program at the University of Victoria. She presented her research with Dr. Burles at the Qualitative Health Research Conference in Victoria.



How to retain staff at a ski resort

Employee retention is a phrase often heard within the tourism industry, and a concern Bachelor of Tourism Management student Sarbjit Gill decided to investigate through his UREAP project, "Understanding Employees' Sense of Place at a Snow Sport Resort and its Role in Serving a Competitive Advantage for Retention of the Staff: The Case of Sun Peaks Resort." Gill, who was supervised by Dr. John Hull, found employees need to establish deeper relationships with the place to remain longer.





John Hull and Anne Terwiel led workshops in promoting service excellence at ski resorts at Buskerud and Vestfold University College, Drammen, Norway

Charles Anaere presented *Effectiveness of Bank Capitalization in Sub Saharan Africa: Evidence from Nigeria*, at the Africa-Berlin International Conference in Berlin, Germany.

Kellee Caton spoke at the Tourism Postdisciplinary Conference on *Freedom. Art. Power.* in Copenhagen, Denmark

Kim Calder Stegemann delivered the keynote address, "Don't throw the baby out with the bathwater: A reasoned approach to inclusive education," at the International Conference on Inclusive Education in Wuppertal, Germany

Meridith Burles presented *Mixed Messages: A Discursive Analysis of Ovarian Cancer in Popular Print Media* at the Institute for Education and Research Conference, Athens, Greece

Alex Ng presented *Owner Theory of the Firm, Corporate Malfeasance and Economic Predation: Principal and Agent Behaviour, Costs and Governance* at the International Corporate Governance Symposium, Pattaya, Thailand

Belayet Hossain and Ahmed Hoque presented *Women Empowerment and Antenatal Care Utilization in Bangladesh* at the AABSS conference, Kuala Lumpur, Malaysia

Grant Larson presented *BC Wildfires — Recovery/Renewal Ten Years Post-Disaster* at the International Academy of Law and Mental Health Congress, Vienna, Austria

Julie Drolet (Adjunct) presented *Rebuilding Lives Post Disaster: An International Research Partnership* at the Joint World Conference on Social Work, Education and Social Development in Melbourne, Australia

World-class research at work

One of the main objectives of TRU's new Strategic Research Plan is to support and build upon existing and emerging research strengths in order to develop national and international leadership in those areas, with the goal of making a real difference to the world, both in terms of providing excellent opportunities for attracting and training the best students, and through the application of research in ways that improve the quality of life for all.

Another overarching goal of the SRP is to facilitate the development of partnerships with communities, scholars, cultural organizations, industries and institutions, and to do this on a global scale. This map highlights just a few of the many ways TRU scholars are actively mobilizing their knowledge nationally and internationally, and in the process, developing partnerships and connecting with colleagues and students around the world.



WWI Book & Screenplay

Dr. George M. Johnson (English) authored Mourning and Mysticism in First World War Literature and Beyond: Grappling with Ghosts, which was published this spring. He was also named as a finalist in Euroscript, a major UK-based screenwriting competition, for Peace Pledge.



Attention on plastics

Chemistry lecturer Dr. Dipesh Prema was listed as the third inventor on a US patent. In March, his paper, "Decarbonization of an imino-N-heterocyclic carbene ligand via triple benzyl migration from hafnium" was published in Chemical Communications, and was also featured in an April edition of Chemical and Engineering News.



Dementia and the Law

Margaret Hall (Law) published a chapter in The Law and Ethics of Dementia. In "Dementia, Autonomy and Guardianship for the Old," she argues that current guardianship law — as it applies to persons with dementia — is unhelpful, and that we need to reconsider how the law can respond effectively to the needs of people living with dementia.



New Dean considers research as a form of service to others

Dr. Airini, an accomplished scholar and university administrator, joined the TRU community in November 2014 as the new Dean of the Faculty of Human, Social and Educational Development (FoHSED). Prior to her arrival, Airini was on a Fulbright Senior Fellowship researching how universities and higher education policy can accelerate success of Indigenous and under-served students.

"FoHSED provides real strength to TRU's mandate to serve the educational and training needs in the region through our research, teaching and service," said Airini. "Our focus is on research that realizes potential — both in the benefits from the research findings, and in developing excellent researchers. I'm thrilled to be part of this research community where research is inspired and inspiring."

Since her arrival, Airini has been impressed by FoHSED's commitment to research as a form of service to others. "Our research mission

is knowledge creation to move debates and actions forward in ways that improve student success, enhance social and human opportunity, enable equity, advance reconciliation, and support wellbeing."

Dr. Airini's credentials include a PhD in curriculum and instruction from the University of British Columbia, and master's degrees in Business Administration and in Education. She is also an Adjunct Professor at Victoria University in Melbourne, Australia, and at Auckland University of Technology. These are honorary appointments for distinction in the advancement of research in education, diversity and lifelong learning.

Dr. Airini was the founding leader for the School of Critical Studies in Education at New Zealand's highest ranked research university, The University of Auckland, and within its Faculty of Education and Social Work, which ranks the highest in New Zealand and in the Top 3 per cent of over 800 universities world-wide.

Dr. Airini began her five-year term as Dean of the Faculty of Human, Social and Educational Development in November.





On the Tenure Track

Dr. Victoria Handford (Education) is the co-editor of the forthcoming book, The Academic Gateway: Understanding the Journey to Tenure, to be published by the University of Ottawa Press. The 16-chapter book was developed with the participation of 30 tenure-track assistant professors across Canada.



Perceptions of crime

Supported by the Internal Research Fund, Sociologist Dr. Camilla Sears examines the role of digital media and how it shapes the public perception of crime and crime causation. Sears led a Restorative Justice Symposium, attended by RCMP, stakeholders from the Ministry of Children and Family, and interested community members.



Legal Status of Animals

TRU Law Faculty member Katie Sykes co-edited Canadian Perspectives on Animals and the Law. The book features 12 essays by leading academics and practicing lawyers, and provides an important new contribution to the debate on the legal status and treatment of animals in Canada.

Russian history: If these walls could speak

On the surface, the building at 44 Lenin Avenue is a nondescript, four-storey structure in the heart of Tomsk, Siberia. But for Russian historian Dr. Wilson Bell, this address will be a portal — a gateway into Siberia's tumultuous 20th-century history — that remains little explored or understood.

Awarded a 2015 SSHRC Insight Development Grant for his project "44 Lenin Avenue: Siberia's 20th Century History as Told through its Most Remarkable Building," Bell will travel to 44 Lenin Avenue next summer where he will expand his research into this remarkable address, focusing on two events that took place there: The murder of an Orthodox Priest in the basement of the building in 1917, and the opening of a museum dedicated to memorializing Stalinist repression in 1992.

Bell will also research two other stories related to the building: one on the building's Stalinist history as a remand prison for the NKVD (security police), and one on the building's post-Stalinist history as a club space for Soviet youth. Bell, accompanied by a research assistant, will spend eight weeks completing archival research in Tomsk, supplemented by interviews with current and former residents of the building. He intends to complete his work with a book-length manuscript on 44 Lenin Avenue. It is important that he complete this research soon, as the prison museum is under threat. Central Russian



authorities have begun to intimidate non-governmental organizations, including Memorial and the Sakharov Centre, that focus on human rights and past injustices.

Prior to embarking on this project, Bell devoted his academic career to one particular horror story in Russian history — the Gulag. He is in the process of publishing a book on the Gulag in Western Siberia during the Second World War.



National security law

Dr. Robert Diab (Law), wrote The Harbinger Theory: How the Post-9/11 Emergency Became Permanent and the Case for Reform, which explores the evolution of criminal law and national security. Dr. Diab was interviewed about the controversial new Anti-Terrorism 2015 Act, Bill C-51 by CBC Television.



Advancing chemistry

Computational physical and organic chemist Dr. Nelaine Mora-Díez is helping researchers at the University of Guelph to advance understanding of isotope effects on the thermodynamics of chemical systems, of significance to the Canadian Nuclear Agency. Mora-Díez is supported by an NSERC Discovery Grant.



Pointed evidence

Archaeologist Dr. Karl Hutchings examined micro fractures on obsidian spear tips found in East Africa and discovered they were made from throwing, rather than thrusting, giving evidence to show humans used spear throwers as early as 279,000 years ago. He discussed his findings on CBC's Quirks & Quarks.



Dr. Kyra Garson

Intercultural Intersections

“All of our students are going to be graduating into increasingly multicultural societies and globalized realities. So how do we provide them with opportunities to develop the knowledge, skills and attitudes to be engaged and informed citizens and professionals?” asked Dr. Kyra Garson.

In March, TRU hosted Intercultural Intersections: International Research Conference, as a way of answering this question. Organized by Dr. Garson of the Centre for Student Engagement and Learning Innovation, along with Drs. Carol Rees and Gloria Ramirez from the Faculty of Human, Social and Educational Development, the conference was supported by a \$25,000 grant from the TRU International Conference Research Fund. The conference brought together scholars in the field of intercultural learning from as far away as South Africa, Brazil and the Netherlands.



Big data predictions

In his NSERC Discovery Grant-funded study: "Leveraging Ubiquity: A Big Data Approach to Environmental Observation," Dr. David Hill intends to find ways to use data that are already being collected to better understand how urban systems react and behave during extreme weather events.



Charitable giving

Doctors Laura Lamb and Belayet Hossain were awarded an Internal Research Grant to study whether tax incentives inspire charitable donations, and if so, how effective they are. The pair found there are many other factors that motivate giving more than tax incentives, including education levels and household income.



Virtual environments

Computer scientist Dr. Andrew Park has developed a modeling and simulation system able to predict how crowds behave during terrorist attacks, and where to best place first responders. Park received support from the Canadian Network for Research on Terrorism, Security and Society.



Kukpi7 Wayne Christian, Secwepemc Health Caucus Chair

Interior Nation Research Forum

With a Strategic Research Plan that prioritizes Aboriginal Understanding and Community and Cultural Engagement, Thompson Rivers University was pleased to host the first ever Interior Nation Research Forum in partnership with the Secwepemc Health Caucus and the First Nations Health Authority in September 2014.

Chiefs from 54 First Nations communities in the Interior were invited to the forum, and were joined there by scholars, elders and health representatives from the region's seven Indigenous Nations, in what marked the first of an annual gathering.

The objectives of the forum were to strengthen relationships between the Interior Nations and universities in relation to Indigenous research, as well as to begin shaping the Interior Nation's Research Agenda. Participants began the establishment of common ethical ground upon which to build respectful and mutually beneficial relationships that advance both individual and collective research agendas. It also provided an opportunity for nations in the Interior to lead the discussion and begin defining what meaningful research means looks like, and how partners can work best with their communities to serve and involve them in effective and innovative ways.

Royal Society Inductee

Dr. Cynthia Ross Friedman became TRU's first faculty member inducted to the newly formed College of New Scholars, Artists and Scientists by the prestigious Royal Society of Canada, joining an elite collection of 91 of the country's most notable academics. The inaugural members represent the emerging generation of scholarly, scientific and artistic leadership in Canada.

A professor in the Department of Biological Sciences, Ross Friedman investigates the reproductive capacity of dwarf mistletoes, parasitic flowering plants found in Canadian forests. She draws upon her expertise in the fields of forest and urban ecology, microscopy, mathematical biology and physics to conduct pioneering work that explores the mechanism of explosive seed discharge in these parasites. Her research has contributed greatly to the understanding of plant development as well as forest ecology and conservation. In February, results from a study led by Ross Friedman were published in *Nature Communications*, one of the highest-ranked multidisciplinary journals in the world. The paper, "Thermogenesis-triggered seed dispersal in dwarf mistletoe" confirmed the team's finding that the plant produces its own heat, and that heat provides the trigger for seed dispersal.

'All My Relations' a grass-roots solution

One year from now Dr. Rod McCormick (Mohawk Nation) expects to officially welcome visitors into the All My Relations Centre: a research and training centre focused on developing grass roots solutions to address the mental health concerns of Indigenous families, communities and nations in culturally relevant ways.

"The centre will operate under the premise that healing resources exist within communities and within nations, and in some ways we have forgotten what they are. The basis of the whole initiative is to identify and reclaim some of those healing resources," explained the BC Innovation Chair in Aboriginal Health.

McCormick, who holds a PhD in Counseling Psychology and is recognized as a national expert in First Nations' mental health, joined TRU in 2013.

The establishment of this centre is in line with TRU's five strategic priorities, as well as its Strategic Research Plan.

When he is working with Aboriginal communities

dealing with a mental health crisis, one of the first questions McCormick asks is: "When was your community the healthiest?"

It is through answering that question, he said, that community members recognize the tools and resources that already exist that could be leveraged to better effect.

"Some of the best examples of healing occur when the community comes together on a voluntary basis," he said.

The first task of the All My Relations Centre is to create inventories of healing resources for each community, and the second is to train up to 250 community mental health workers to mobilize these healing resources.

With funding for traditional mental health resources in jeopardy, and with the publication of the final report of the Truth and Reconciliation Commission of Canada, there has never been a better time to embark on such an ambitious project, said McCormick.



Dr. Rod McCormick, BC Innovation Chair in Aboriginal Health, expects to open the All My Relations research and training centre within the next year.

Waging war against the invasive European Fire Ant

In the seemingly impossible battle to control the spread of the European Fire Ant, Thompson Rivers University entomologist Dr. Robert Higgins says he and his team have finally found some success.

Over the past year Higgins and his team have been frustrated at nearly every turn. Even with pesticides, fire ants are difficult to control or eradicate, as their nests are hard to find. Once the nests are found, just putting a shovel into the ground allows the queens to migrate to escape tubes. If boiling water is poured into the colony the queens emerge unscathed, and the colony can recover.

The insects are wreaking havoc at botanical gardens, equestrian centres, along rail lines, at the Port of Metro Vancouver and in numerous backyards. Last year, VanDusen Botanical Gardens in Vancouver was forced to close two areas to the public as a result of the fire ant. Following significant efforts to remove the pest, however, one previously closed area at VanDusen opened up this summer.

"We tried out a lot of different control methods there, and we did find one that worked," said Higgins.

The first step was to find the nests — a challenge because there is no anthill or any external disturbance. Nests were found by laying out apple slices in grids to attract the ants. The European Fire Ant will only travel a couple of metres for food, so the more ants on the apple slices, the nearer they are to the nests.

Once the general area was pinpointed, researchers dug up the soil, treated it with a low concentration of the insecticide Permethrin, and put the treated soil back. The treated soil directly kills the ants in the soil and traps escaped queens, giving them nowhere to go but back into treated soil.



Dr. Robert Higgins



The method isn't simple, and it isn't easy, but it has been the most effective treatment to date.

Another option for homeowners, albeit a costly one, is to redo your landscaping. "If we xeriscape — remove vegetation and put in gravel — the ant doesn't have a food source," he said.

While his team continues to develop control methods with support from the BC Inter-Ministry Invasive Species Working Group, Higgins says the fire ant appears to be here for the long term.

"There's no question they've got the upper hand. It's as if everything we do in an urban environment is good for them."

This summer's hot, dry weather only helps the ants mature faster. The mild winter meant the aphid populations are also healthy. Ants, being thermophilic, thrive in high temperatures, so global warming is good news for them.



Dr. Wendy Gardner

The impact of biosolids on mine tailings

Are biosolids a viable long-term solution for soil development on mine tailings? Dr. Wendy Gardner (Natural Resource Science) and a team of TRU faculty and graduate student researchers will spend the next two years answering that question. Supported by Metro Vancouver, the researchers will study two tailing sites at Highland Valley Copper that were amended using Metro-Vancouver biosolids in 1998. It is hoped that the long-term data set will determine how biosolid treatments impact the chemical and physical properties of the soil, specifically in terms of plant available nutrients and metals, carbon sequestration, soil texture and water holding capacity. The study also aims to discover how biosolid treatments impact the development of soil microbial communities, and how these communities impact soil development and plant growth.



High tech bird watching

Ornithologist Dr. Matthew Reudink is collaborating with Swedish researchers to use radio frequency identification technology to track the movement of small birds across two university campuses. This will allow near real-time web-based visualization of bird movements, and allow researchers to answer questions in conservation biology.



Tourism and gender

A cultural studies scholar working in the area of tourism and leisure, Dr. Kellee Caton collaborated with a team of 12 tourism scholars in six countries on a large-scale gender equity project, which mapped over 9,000 leadership positions in the tourism academy to reveal a severe under representation of women in key power roles.



Snow sport resorts

Dr. John Hull (Tourism) is collaborating with Norwegian researchers and Tourism Sun Peaks on a project that aims to enhance long-term sustainability of mountain resort communities. It is hoped the study will be of significant value to these communities, which are major contributors to regional economies.



Discrete mathematics — where small discoveries can have a big impact

In a field that seems beyond the grasp of so many, Dr. Sean McGuinness compares his work in discrete mathematics to a tree with deep roots.

“At the root you have all these small problems. There’s a hierarchy here. To get to the bigger problems you have to solve some of the smaller ones. Solving a small conjecture is still a victory for me.”

McGuinness will be able to devote much more of his time to solving the small problems — and perhaps some of the larger ones — thanks to support from an NSERC Discovery Grant. His project, “*Base Exchange and Extremal Properties of Matroids*,” has two main functions: first, he will look at specific problems dealing with so-called growth-rates of matroid classes, and second, to shed light on the so-called base-exchange properties of matroids.

Some of the problems he tackles have been around for decades. Some will never be

solved, but the excitement is in the discovery, he said.

The federal funding allows McGuinness to hire students to support his research, and it allows him the time and space to consider the larger questions, and the ability to travel, learn and share his insights with others.

“I don’t need to buy a lot of equipment, but this does buy me time; and collaborations are important as is the ability to travel and meet with other like-minded scholars at conferences. Mathematicians can be very solitary creatures otherwise.”

McGuinness’ research journey was not always clear, and he encourages his students to explore outside the field as well. At first, he set his sights on becoming a physicist, and then discovered theoretical physics.

“Then I discovered this field and it became more interesting, more elegant. I’ve been very fortunate. I like pure math.”



Mathematician Dr. Sean McGuinness was awarded a 2015 NSERC Discovery Grant for his project, “*Base Exchange and Extremal Properties of Matroids*.”

Global optimization: Solving some of industry's most difficult problems

Global optimization is the process of finding the absolutely best set of parameters to optimize an objective function. Supported by an NSERC Discovery Grant for his project, "Metaheuristics and Heuristics for Global Optimization Problems," Dr. Mohamed Tawhid works to solve some of the most difficult, real-life problems.

Global optimization has innumerable applications, not only in engineering, but also in applied sciences and economics.

Dr. Tawhid's current research is in the areas of metaheuristic algorithms in global optimization arising from nonlinear optimization, output feedback, wireless sensor networks and mechanical engineering. He is also actively working with industry through several NSERC Engage Grants. One of his projects involved supporting a company's nearly complete research

and development initiative of enhanced analytics through the use of targeted statistical models. These models provide a foundation for more intelligent analytics that tie together the data collected by the company to create a more detailed picture of social network activities.

In the second project, he developed static single period and dynamic multi-period portfolio selection models, testing and implementing them with both simulated and live investment data; he included postdoctoral fellows and undergraduate research assistants in his work whenever possible.

Tawhid is now preparing to begin another NSERC supported project, working with an engineering company to develop the optimal cost design of water pump switching for water distribution networks.



Dr. Mohamed Tawhid is a mathematician specializing in computational optimization. He is supported in his work by an NSERC Discovery Grant, and several NSERC Engage Grants.



The Dream Machine developed by Kevin Schmidt and Holly Ward

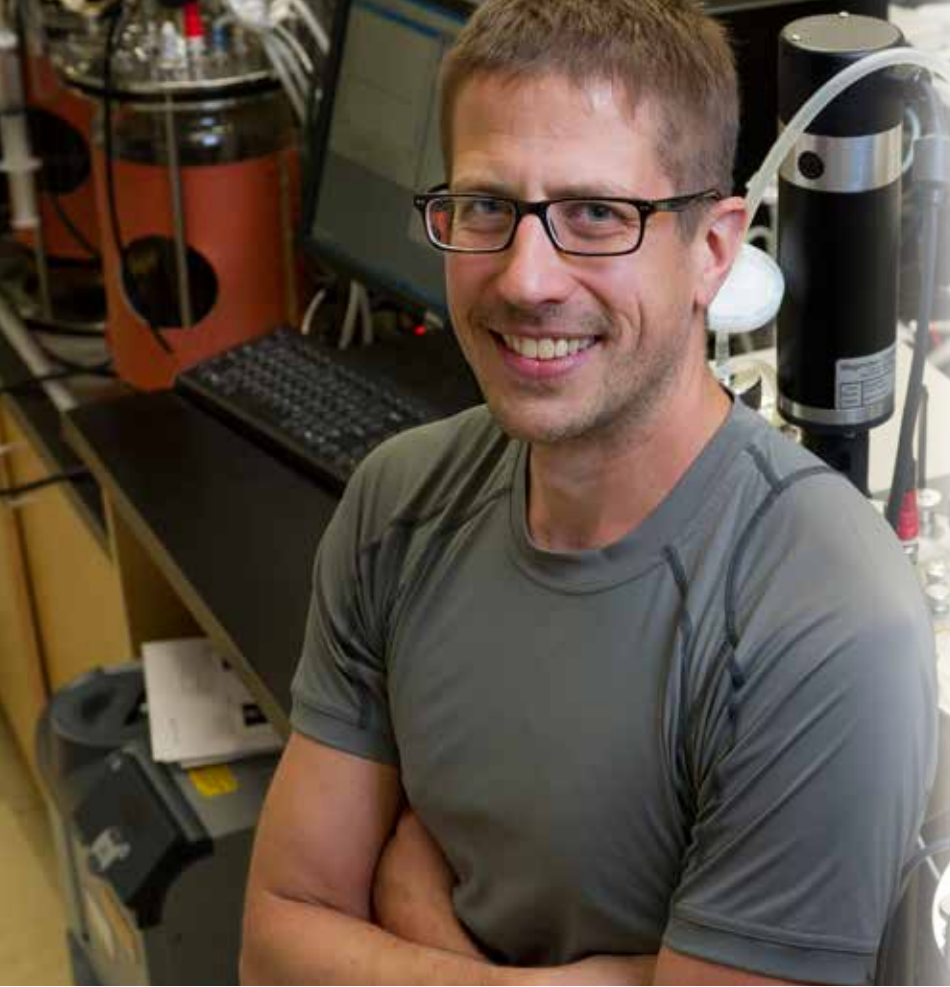
Camera Obscura festival

When Donald Lawrence and his team arrived in Dawson City, Yukon in June, the goal was to carry out the Midnight Sun Camera Obscura Festival that was more than a decade in the making. The international research group, which included four TRU student research assistants, worked with the Klondike Institute of Art and Culture to realize a wide range of artworks around interests in the camera obscura. Latin for "dark room," a camera obscura sees an image cast inside a darkened structure — of whatever is outside — by way of a simple lens or open aperture.

According to Lawrence, who is funded by a five-year SSHRC Insight Grant, the event accomplished even more than he had hoped, and far from winding down, he is preparing to expand on the project.

Now, along with producing a book-length publication about the research group's activities, the team looks forward to the development of further exhibitions as well as a potential national touring exhibition, thanks to a collaboration with the University of Lethbridge Art Gallery Curator Josephine Mills.

"This is like a gift that has just been dropped into my lap," said Lawrence.



Microbiology is good for business

Helping a local u-brew operation save money by reducing the cost of brewing supplies, and working with a local microbrewery to sequence the genomes of unique yeast strains are just two ways Dr. Jonathan Van Hamme is using his microbiology research lab to create solutions for the challenges faced by local business owners.

This spring, Van Hamme was awarded two NSERC Engage Grants allowing him to spend six months focused on finding solutions for two local businesses. The bulk of the funding goes to hiring two research assistants who spent their summer and fall working in Van Hamme's lab. Both students were also awarded NSERC Undergraduate Student Research Assistantships (USRA). A third student was awarded an NSERC Industrial USRA, and will contribute to the research while working on site at the u-brew operation.

Van Hamme, who holds an NSERC Discovery Grant for his research into converting toxic flourinated compounds into non-toxic products, has long been interested in brewing microbiology. With a background in applied research and development, he was intrigued by the challenges faced by the businesses, and was excited to use his experience in genomics to develop solutions. "It's important to be flexible and to develop skills that are of value to the community."



Eyes in the skies over BC ranch lands

The practical purposes of Unmanned Aerial Devices (UAVs) on cattle ranches are, if you ask Dr. John Church, almost endless.

Church, the BC Innovation Chair in Cattle Industry Sustainability, has spent the past year investigating the use of UAVs, or drones, by ranchers, and this summer he completed field-testing at four separate ranches.

Church is now responding to feedback, including the need for increased flight time and the ability for the UAVs to fly in inclement weather.

"The type of drone being tested is reliable and affordable for most ranching families," he said.

Church began his research into the use of UAVs with the goal of helping ranchers manage and track their livestock, thereby saving them valuable time and money.

"Ninety per-cent of the ranching industry uses Crown range. When winter arrives, about 85 per cent of the cattle return, but the rancher

must track down the remainder, which can be a time consuming and challenging task."

Equipping the drones with infrared cameras was also introduced as a method to detect sick or diseased animals in feedlot settings. The value of the UAVs has now been expanded to include range management, mapping, weed control and forestry.

"There is no doubt in my mind that UAVs are the future of agriculture and will quickly be adopted into existing operations," said Phil Braig, assistant manager of the Douglas Lake Cattle Co.

Church expects to field-test the drones on one additional ranch in the B.C. Interior, and will host a workshop on the use of UAVs in conjunction with the B.C. Cattlemen's AGM in summer 2016.

This research is supported by a \$112,000 grant from the Canada-BC Agri-Innovation Program under Growing Forward 2, a federal-provincial-territorial initiative.



Dr. John Church's project, "Demonstration of aerial infrared thermography for improved cattle management," is supported by the BC Investment Agriculture Foundation's Agri-Innovation Program.

Can fast-growing hybrid poplar address demand for increased timber supply?



Hydrologist Dr. Thomas Pypker (Natural Resource Science) is working with Sk7ain Ventures to determine whether the Southern Interior is hospitable to hybrid poplar plantations.

When faced with the possibility of shutting down mills due to lack of lumber supply, two local groups have come together to look for a solution, and they've enlisted the help of TRU hydrologist Dr. Tom Pypker.

The Skeetchestn Indian Band and Norbord Inc. work together through Sk7ain Ventures, and have asked Dr. Pypker's research team to determine whether fast-growing hybrid poplar is a viable crop for their land — a 100-hectare plot located along the Deadman River. Initial research from nearby locations suggests that with well-planned intensive management, high-yields may be achieved on these semi-arid lands.

"The hybrid poplar is a very fast growing species with a very short rotation. We can harvest every 10 to 30 years as opposed to our typical 50 to 90 years," Pypker said, but the challenge will be soil fertility, cold hardiness and the poplar's high water needs.

Supported by an NSERC Engage Grant, Pypker and his research team will determine the feasibility of planting the hybrid poplar, and match the best clones to the soil and climate of the region. In the summer of 2016, the team will assess the success of the different clones and test different mulches for prevention of water loss and weed issues.

"If we can demonstrate success in this particular region, then this technique could be transferred to other semi arid regions to generate increased wood supply," he said.

"We really want to find something we can invest in, and it would be very difficult for us to move forward with this without the science and the research that TRU brings," said Don Ignace, President of Sk7ain Ventures.



Commercializing innovation: The case of Hummingbird Drones

Hummingbird Drones, founded by TRU alumni Richard Sullivan and Robert Atwood, is a great example of the technology transfer opportunities available through the TRU Generator. Atwood and Sullivan were encouraged by faculty to explore the programs offered to students with start-up ideas. The resources provided by the Generator helped them formalize their ideas and launch their new venture.

"Six months after starting work with the Generator we hired three more TRU graduates and were fulfilling contracts with the Province of BC," said Atwood.

Entrepreneurial capacity is a strategic priority of TRU, and is a core component of many research endeavours. The Generator provides the space to facilitate innovation transfer off campus into our community and into the world.

The Generator supports students and faculty to commercialize products or services that are developed on campus, with programs designed to help individuals access funding, acquire mentors, and better evaluate the commercial potential of their ideas.

Science and art meet in celebration of the natural history found in BC's Southern Interior in, *Finding Place: Exploring Home through Field Journal Art*, Dr. Lyn Baldwin's exhibit of field journal art. In recognition of the story-telling power of richly illustrated narratives, Baldwin's field journal art uses both written text and images to help guide us through the stories of the ecosystems we call home. In 2014-2015, this work has been on display at the Kamloops Art Council, Old Courthouse Cultural Centre in Kamloops, BC, the Royal Alberta Museum in Edmonton, AB, and the Art Gallery of Golden, in Golden, BC. Baldwin, a plant ecologist, has also used her field journal art as a launch point for longer essays published in journals including *Terrain.org*, *Cirque* and the *Journal of Natural History Education and Experience*.



On the back



Trophy Meadow Transit
 The mountain shoulders up, exposing backbone, revealing heart. Here, where earth bones touch sky, a gradient of winter's persistence is patterned in the land. Soil forms slowly, if at all, and rarely rests from the freeze-thaw cycle that shatters mountain rock inside out.



For One Day, my body converses with topography and I walk change upward. Heart thuds as I climb the slopes where the endurance of trees is tested and then surpassed. Pulse beats when I clamber from the exuberance of flower meadows into the exaltation of tundra. From molecules to ecosystems, I think, change is the way of the world.



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