

branchlines

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university of british columbia

dean's message



This issue of Branchlines differs from most of its predecessors in that it is, by chance, dominated by articles which could be broadly described as 'opinion pieces'. We strongly encourage all members of the university, whether they be students, faculty or staff, to develop critical thinking skills and a direct consequence of this is the development of opinions about particular issues. These opinions are hopefully well-developed and based on knowledge and understanding. However, the expression of such opinions should, in a university environment, stimulate debate and deeper understanding.

Again, more by chance than by planning, this issue of Branchlines contains a number of articles about some of the many different ways in which the Faculty is interacting with Aboriginal communities. It is by no means comprehensive, and there are many other ways in which interactions are occurring. For example, the newly established Aboriginal Natural Resources Centre, a joint venture of the Faculty of Forestry, the Faculty of Applied Sciences and the Sauder School of Business. This Centre is working with Aboriginal communities to assist them in making decisions about their natural resources.

Another area is our continued

involvement with the Haida Gwaii Higher Education Society (HGHEs). This is a long-standing project: students attending the semesters offered by the HGHEs receive credits from the Faculty of Forestry. The Faculty helped with the development of the first 2 semesters, and more recently was responsible for the development of a third semester dealing with the difficult topic of reconciliation. This unique program grew out of the report of the Truth and Reconciliation Commission of Canada, and is a suite of 5 courses intended to provide students with an in-depth understanding of what is meant by reconciliation and why it is so important in Canada. The semester will be offered for the first time in September 2017.

I have previously expressed my belief that over time, First Nations will have increasing control of the land base, particularly in British Columbia. However, before that happens, we will go through a period of uncertainty, especially over access to natural resources. It is everyone's best interests to ensure that this period of uncertainty is minimized, but there is every indication that the resolution of land claims will not only be a long and drawn-out affair, but that it will be hugely expensive. Upsetting the status quo, at great cost, is not a strategy likely to win votes for any government, and so progress is likely to be very slow.

This begs the question: if treaty settlement is going to be such a long-term process, can greater certainty over the land be achieved more

quickly, for example through a form of Interim Measures that resolves control of the land while leaving other issues for further negotiation. This might also require a hard look at existing forms of tenure: something that is inevitable, long overdue but another political 'hot potato'.

The Faculty of Forestry could play multiple roles in the resolution of some of these issues. A primary role will be in capacity building through the training of future Aboriginal land managers, something that I view as absolutely critical. Such training needs to combine Traditional Ecological Knowledge with western science so that the land can be managed in a way that meets the need for both harmony and prosperity. However, the Faculty could also play a bigger role in finding solutions to many of the issues that will arise as these changes occur. We need to answer questions such as how we can extract more economic value from the forest while maintaining all the other values that are expected.

The changes will occur. We should seize the opportunity to start addressing the issues now.

A handwritten signature in blue ink, which appears to read "John L. Innes".

John L Innes
Professor and Dean

forestrynews

Aboriginal high school students experience UBC Forestry



From left to right: Andrea Lyall, Sue Grayston, Lori Daniels and Julie Cool

The Verna J Kirkness Education Program was founded in 2009, and was designed to increase the number of Aboriginal students in science programs. This past spring saw the first year of this program at UBC, with 8 grade 11 students spending one week at the Faculty of Forestry working on science projects. Students were supported by professors, undergraduate and graduate students, and staff – with mentors outnumbering the students. The students and mentors got a hands on experience about the forest by visiting the Faculty of Forestry's Malcolm Knapp Research Forest in Maple Ridge.

Jayme from Grindrod and Mary from Skidegate worked with Lori

Daniels in her tree ring lab, researching the properties of western redcedar. The students analyzed a cross section of an old-growth cedar that was being carved into a canoe by the Musqueam Nation. Jayme and Mary found out that the tree was over 350 years old, originally from Vancouver Island, and cut in 2013. Professor Daniels' said "the week was very rewarding to me. We had the opportunity to meet the carvers and learn about the cultural significance of the Musqueam canoe. We spent a day doing ecological fieldwork and then worked in the lab analyzing tree rings. I was really impressed with how quickly Jayme and Mary learned – using power tools, running computer programs,

interpreting results and finding really cool outcomes".

Another group of students, Samantha, from Salmon Arm and Faith from Powell River worked in Sue Grayston's soils lab, researching the properties of different varieties of soil. The students collected soil samples to later analyze in the lab. While out in the field, they practiced soil texturing and vegetation analysis.

In Julie Cool's lab, Amun from Lake Country and Olivia from Quesnel worked in the Centre for Advanced Wood Processing making their own custom veneer projects. They learned how to sand, press, and finish wood products alongside technicians and also visited 2 local sawmills. During the week-long program the students lived on campus, studied along side other students, and received a feel for the university life. In some cases it helped students overcome doubts of leaving their hometowns to study in Vancouver. Faith shared, "it for sure makes me want to join the post-secondary club. Dorms weren't too scary".

The week ended with the students sharing the results of their science projects with all students and professors in the program. The professors also learned from the students; Sue Grayston shares, "whether or not the students carry on with forestry, the program helps the students think about other subjects that they can do and about the wider applicability of science subjects to study as well as the broad range of careers you can have as a result." The week was a great learning experience for students and faculty and we hope to see these students at UBC next year!

For further information contact Andrea Lyall, Aboriginal Initiatives Coordinator, at andrea.lyall@ubc.ca.

New appointments



Dr Cecil Konijnendijk has joined the Department of Forest Resources Management as a Professor in Urban Forestry. Cecil is a Dutch National who moved to Canada from Sweden, where he headed the landscape department at the Swedish University of Agricultural Sciences. He obtained his MSc in forestry from Wageningen University, Netherlands, and did his doctoral work at the University of Joensuu (now the University of Eastern Finland). Cecil has previously held professorships at the University of Copenhagen and the University of Hong Kong. His research and teaching focus on urban forestry, urban green space governance, cultural ecosystem services, and relations between people and nature in an urban context. Cecil will teach and provide strategic leadership in the new Bachelor of Urban Forestry (BUF) program and future new urban forestry programs. He also wants to help build up a strong urban forestry research environment at the Faculty. Cecil can be reached at cecil.konijnendijk@ubc.ca.



Dr Matilda van den Bosch has joined the Department of Forest and Conservation Sciences as an Assistant Professor and is jointly appointed to the School of Population and Public Health. This mirrors her research focus which bridges the disciplines of environmental and health sciences. Matilda earned a medical degree from the University of Uppsala, Sweden, and practiced as a general physician and later radiologist for several years. In 2011 she obtained a PhD in Landscape Planning and Public Health at the Swedish University of Agricultural Sciences. She is also affiliated with Lund University through an ongoing European project. Matilda explores relations between access to forests and other natural environments to various aspects of human health and wellbeing by epidemiological and experimental studies. She has a particular interest in “green” prevention of chronic disorders and climate change related morbidity and mortality. Matilda will teach in the Urban Forestry program and contribute to collaboration with health departments. She can be reached at matilda.vandenbosch@ubc.ca.



Dr Hisham Zerriffi has joined the Department of Forest Resources Management as an Associate Professor in Energy. Hisham was previously in the Liu Institute for Global Issues at UBC where he has been a faculty member since 2006. Hisham obtained his MSc and PhD in Engineering and Public Policy from Carnegie Mellon University and an MSc (Applied) from McGill University. His research has primarily been on various aspects of energy in developing countries including work on household decision-making, technology adoption, resources, policy and regulation related to cooking with biomass and electricity access. His research projects have included primary data collection in a number of countries (eg India, Cambodia, China, Kyrgyzstan). Hisham will be teaching courses in energy policy and bioenergy and will provide valuable expertise in international energy issues, energy data analysis and modelling, and energy policy and regulation. He can be reached at zerriffi@mail.ubc.ca.



Dr Patrick Culbert has been appointed as an Instructor in the Department of Forest and Conservation Sciences. Patrick earned his PhD from the University of Wisconsin-Madison and was most recently a teaching fellow at Middlebury College in Vermont. In addition to teaching a mix of second-year courses at UBC, he will regularly teach at partner universities in China. Patrick is a landscape ecologist whose research interests include spatial patterns of biodiversity and the effects of agricultural land use. He can be reached at patrick.culbert@ubc.ca.

Cool tools for a warming world:

Can augmented reality save our communities from climate change?



Last month Pokémon Go became the fastest selling app ever, bringing augmented reality into mainstream. What if the goal was to use this type of technology to teach kids something really important, such as what climate change means for their own communities and what they can do about it?

The Collaborative for Advanced Landscape Planning (CALP) at UBC's Faculty of Forestry is working on just that. The viral phenomenon of Pokémon demonstrates what recent research suggests for engaging youth: make it local, visual, interactive, social, and fun. These tenets have been built

into Future Delta 2.0, an educational climate change videogame prototype now available for download. Based on scientific data and projections for Delta BC and the greater Lower Mainland region, the game allows players to explore different scenarios for saving the community. It was developed over the past 4 years with an interdisciplinary team from UBC and UBCO, and co-designed with high school students, teachers and administrators. This game was then tested in Delta classrooms where research confirmed that the kids had fun while learning important climate change concepts.

The potential of such tools to mobilize the public on climate change was recently recognized by Prime Minister Trudeau in the Canadian Intergovernmental Vancouver Declaration, which states: "the public, including youth, will be engaged using online tools in particular to solicit input and to increase climate change awareness and literacy."

Now with seed funding from the Social Science and Humanities Research Council and UBC Vice President Research + International Office, CALP is expanding the team and goals. The Cool Tools for a Warming World Symposium and Workshop will be held October 13th and 14th 2016 at UBC's immersive state-of-the-art BC Hydro Theatre. Here we will demonstrate digital media prototypes, disseminate research outcomes, and brainstorm strategies for a new research cluster. The workshop will focus on a Teachers Guide to support educators, and new tools such as an augmented reality app.

For further information on these workshops and other events visit the website <http://futuredelta2.ca/events/> or contact Alicia LaValle (CALP Project Manager) at alicia.lavalle@ubc.ca.

Undergraduate enrolment reaches new heights

Undergraduate enrolment in the Faculty of Forestry continues to set new records. Once again, we have attained an all-time high with total enrolment (as of Sep 1, 2016) estimated at 1027 students. Our newest undergraduate degree, the Bachelor of Urban Forestry (BUF), which we began rolling out in September of last year, now has 96 students registered in the first 3 years of the 4-year program. Growth continues in all of our undergraduate offerings (Wood Products Processing, Forestry and Forest Sciences), but our most popular program continues to be the BSc degree in Natural Resources Conservation with 342 students spread over the 4 years. Although our overall

student count represents an increase of almost 10% over the past year, we are particularly happy to report that our international students now represent close to 35% of the undergraduate student body, an increase of 23% over last year.

Update

As of July 1, 2016, Dr Rob Kozak has taken on the role of Associate Dean Academic, replacing Dr Peter Marshall who has taken a well-earned administrative leave after serving in this capacity for the past 18 years. In this role, Rob is responsible for all aspects of undergraduate academic programs. He can be reached at rob.kozak@ubc.ca.



Confessions of a conservation co-op student: Working in a production world

By Emily Janzen

"As a Conservation student, why do you want to work for an oil company?" It is a condemning question, persistent in my life, and was the last question asked in my interview with one such company. This article is the long version to my short answer: "Because companies like these need people like me."

The BSc degree in Natural Resources Conservation (NRC) is something of an anomaly; a collision between a romantic interest in nature and scientific literacy. If you've spent any time in the Faculty of Forestry, you'll know that each student in this program is a perfect representation of this incongruity – level-headed and logical but with innate imagination and creativity. In our Faculty, it is understood that the natural world cannot be reduced solely to science, economics or facts, but requires appreciation of hidden unities and a wider, philosophical picture. The blend of mindsets is critical.

Part of that wider picture is accepting the world as an immeasurable continuous relationship instead of today's dominant paradigm of claiming things as individual objects with monetary value. Our program is built out of this clash between the natural and economic world. We are faced with an incredibly difficult, seemingly impossible question: how do we successfully manage both worlds and come to a sustainable agreement? An answer may not exist, but turning our backs on each other and cultivating a lack of understanding would leave the world at a disadvantage. Alternatively, as Douglas Adams said, we should "take the awe of understanding over the awe of ignorance any day".

Looking back at my "awe of understanding" track record - working for Syncrude Canada Ltd, Atomic Energy of Canada Ltd, and Suncor Energy Inc - I am arguably the least "conservative" NRC student that has ever walked

the halls of UBC Forestry. But consider that just as science cannot be reduced solely to facts, you do not need to hate the industrial world to care about the beauty of Earth. My degree program forced me to think critically, be hard on my beliefs, and identify my biases. I eventually came to terms with an unromantic reality: production always comes first in each industry and serves as a reflection of our consumption. This includes production of energy, food, medical isotopes, gasoline, jet fuels, or timber. The industries where production takes precedence over conservation is territory no NRC student wants to go (or will admit they do, anyways).

I found myself a referee between worldviews epitomized by picket-line hippies and suit-and-tie corporate folk. I felt I was betraying my studies and classmates. How could I justify working for an industrial company, their production sites regarded as sacrificial zones, their environmental degradation unleashing a Pandora's Box of moral issues? Unsurprisingly, these images proved to be at least half correct. The degraded areas embody Canada's suffering of a moral and technical dilemma and promote a short-sighted interest at the expense of natural resources. It's an extremely controversial, political place.

So, where is a conservation-aware viewpoint needed, if not here? I took the job at Suncor. Upon arrival, my new manager handed me a copy of Dr Seuss' *The Lorax*, a story riddling of the turmoil between the environmentalist movement and big businesses. To me, it represents an unspoken understanding that we are here to instill a mindset in those who need it the most, to drive change from the inside where it is hardest to ignore. This is not an easy place to be a conservationist but it's where it's needed. After all, as Dr Seuss said, "Unless someone like you cares a whole awful lot, nothing is going to get better. It's not."

Emily Janzen is a 4th year student in the Faculty of Forestry's Natural Resources Conservation program. She is currently on her 6th co-op work term. For further information about our co-op programs, please contact Tony Loring at tony.loring@ubc.ca.



Alice in Waldland: A forestry excursion in Germany



My name is Alice, so perhaps it is fitting that I am always in search of an adventure worthy of a Lewis Carroll story. My academic studies have already taken me a long way, from my native country of China to my new home in the Faculty of Forestry at UBC. Studying forestry here in Canada has been a great opportunity to embrace my sense of wanderlust in the forests of the Canadian wilderness, while also learning about forestry and ecology in other parts of the world through courses such as those offered here in international forestry. This summer I was very fortunate to receive an invitation to participate in the 2016 International

Work Camp Excursion Week in forestry organized by the Ministry of Forestry of Rhineland-Palatinate in Germany, in cooperation with Union of European Foresters and Protection Society for German Forests.

The event took place at beautiful Kastellaun Forest District in the western state of Rhineland-Palatinate. Joining me were 11 other students representing 8 nations in total: Belgium, Canada, Greece, Ireland, the Netherlands, Rwanda, South Africa, South Korea and Spain. During the week we enjoyed a variety of forestry-related activities each day. In addition to observing and learning about local forests and wildlife,

we also visited the Research Center for Climate Change and Forest Ecology, Hunsrück-Hochwald National Park, and also had a chance to enjoy the astonishing forest scenery during a tour of Germany's longest suspension bridge, Hängeseilbrücke Geierlay. While not sight-seeing, we learned about a state-of-the-art silviculture method known as *Qualifizieren-Dimensionieren*, which has been practiced in the region, as well as how forest operations are carried out locally. As the birthplace of the discipline of sustainable forest management, Germany has long been practicing sustainable and multipurpose forest management. Therefore, the local forest office is particularly focused on conducting good environmental education and public engagement.

As a student of forestry and a future warden of the forest, I have found it invaluable to get out of the classroom and into the woods. Although I spent a mere 10 days in the Rhenish woodlands, I was able to learn an immense amount about German forests and forest management during my excursion. The experience also drove home for me the importance of internationalism in our field. While methods and doctrines may differ between countries, foresters all over the world are confronting broadly similar issues in sustainable forest management. We can only benefit from having our assumptions challenged by different ways of approaching the same problems that we face here at home. And in a world faced with daunting global challenges, such as climate change, it has never been more vital to approach forestry from a broad international perspective.

Alice Miao is a 3rd year undergraduate student in Forest Resources Management. Her attendance at the work camp excursion week for International forestry students was supported in part by the Faculty of Forestry.



Unceded knowledge

By Dylan Thomas Mendenhall

There I was, wrestling my way through an ocean of salal, contemplating how to practice ecology in a way that is in balance with the land. More importantly, I wondered, how can non-indigenous researchers practice ecology in a way that is respectful of First Nations?

Science has long been complicit in the injustices of colonization, particularly through the exploitation of land and the oppression of Indigenous Peoples. How can non-indigenous researchers disavow such a legacy? When land is unceded, so too is the knowledge of its ecology.

Permission to come ashore

My master's thesis with Dr Sue Grayston (Department of Forest and Conservation Sciences) has brought me to Haida Gwaii where I am studying the cascading effects of deer on mycorrhizal fungi. The Sitka black-tailed deer were introduced to the archipelago over a hundred years ago. In the absence of predators, the deer have devastated the understory and profoundly altered forest succession, leaving behind a wake of deceptively beautiful moss.

My experience on Haida Gwaii has been unlike any other scientific project that I have worked on. For one thing, I had to ask for permission, not simply from the Canadian government, but from the people who have lived there since the very beginning.

The Haida Nation never ceded their land to the Crown. Our research sites in the Gwaii Haanas National Park Reserve and Haida Heritage Site are managed under their authority through a partnership with Parks Canada.

Our research site at Windy Bay, for example, is guarded by the Watchmen, a program initiated by the Haida in 1981 to protect historic village sites. Every morning we woke up at the floating cabins, ate breakfast, loaded our gear, then

zipped across the water in our boat. Just offshore of Windy Bay, we paused our engine and used our radio to contact the Watchmen, asking for permission to come ashore.

The process of applying for our research permit was another way of asking for permission, a requirement for all researchers doing work in Gwaii Haanas. What were the benefits of our fieldwork for the Haida community? What were the harmful effects of our research? These were just a few of the questions that forced me to reflect on my role as a non-indigenous researcher working on unceded territory.

Where ecologists fear to tread

In contrast to my research in the Faculty of Forestry, my experience studying ecology at the University of Washington provided an unfortunate example of how scientists unwittingly participate in the cultural erasure of Indigenous Peoples. In Seattle, this injustice started with a broken promise over 150 years ago.

Chief Seattle, for whom the city is named, was the leader of the Duwamish Tribe and the first signatory of the Treaty of Point Elliott in 1855. Ostensibly, this treaty ceded away Indigenous land in exchange for permanent reservations and continued access to resources such as timber and salmon.

However, as the City of Seattle thronged with more and more immigrants, the Duwamish people were forced from their homes through evictions, firebombing and violence. In 1865, the city passed an ordinance banning Indians from living in the city. It was a dangerous time to be Duwamish in Seattle.

As in Canada, Indigenous children were taken from their communities and forced to attend boarding schools where they were physically and emotionally abused. These systematic acts of violence disrupted the transmission of

knowledge from one generation to the next. Lushootseed, the language spoken by the Indigenous Peoples of Puget Sound, was driven to the brink of extinction.

To this very day, the Treaty of Point Elliott has not been honoured. Despite being promised a reservation of land and access to natural resources, the Duwamish Tribe continues their struggle for recognition by the United States government. Officially, the Duwamish Tribe does not exist.

Injustice has a way of trickling down. Because the United States does not recognize the Duwamish Tribe, neither does Washington State. Because Washington State does not recognize the Duwamish Tribe, neither does the City of Seattle, nor any other agency or institution, including the University of Washington where I studied forestry as an undergraduate.

As a student at the University of Washington, my research focused on how the diversity and structure of old growth forests were affected by Indigenous resource management, particularly through prescribed burning. Seattle offered the perfect outdoor laboratory, with remnant stands of old growth forest adjacent to the historical prairies and towns of the Duwamish Tribe. I wanted to validate the intrinsic role of the Duwamish in sustaining the diversity of these forest ecosystems. The only problem was that I didn't ask if that's what the Duwamish wanted.

When we ran transects through the remnant old growth forests of Seattle, we didn't ask for permission. When we took tree cores from ancient cedars, we didn't ask how our research would benefit the Duwamish Tribe. When we dug up soil samples from the hills and valleys of Seattle, we didn't check the maps of Lushootseed place-names to see if they were culturally significant sites. We never asked for consent for the knowledge that we sought. And it was wrong.

I did not receive the support that I needed to form a collaborative relationship with the Duwamish Tribe. It was only after graduating from the University of Washington that I finally reached out to the Duwamish as I should have in the first place. I studied Lushootseed and ethnobotany at the Duwamish Longhouse where I learned the fullness of their story and what it would take to become an ally.

Towards allyship in the academy

I wish I could write a blog titled 10 Easy Steps for Decolonizing the Ivory Tower, but the fact is that allying is a process that requires time and hard work. It took hundreds of years to forge an empire and it will take hundreds more to heal from it. Furthermore, I am still learning how to be an ally and I probably always will be. Nonetheless, the following are lessons I have learned from working and studying with Indigenous folks in the Salish Sea and Haida Gwaii – some basic guidelines for how non-Indigenous researchers can be better allies of First Nations.

Ask for consent. The process of seeking permission is a gateway to a greater conversation about the ideas and concerns of the Indigenous community. Many First Nations have research protocols that need to be followed.

Reflect on your identity. How does your privilege as a non-Indigenous person affect your research? How might you be biased in your research objectives? Who will benefit from the

knowledge that you seek to uncover? Who will be harmed?

Educate yourself. Everywhere we step has a language, a people and a story. Who are the people whose land you wish to study? What is their history and where are they today? It should not be the exclusive burden of First Nations to teach non-Indigenous people about alliances and oppression.

Respect Indigenous ways of knowing. The logical and empirical methods of science represent only a few of the many diverse ways we create and discover knowledge.

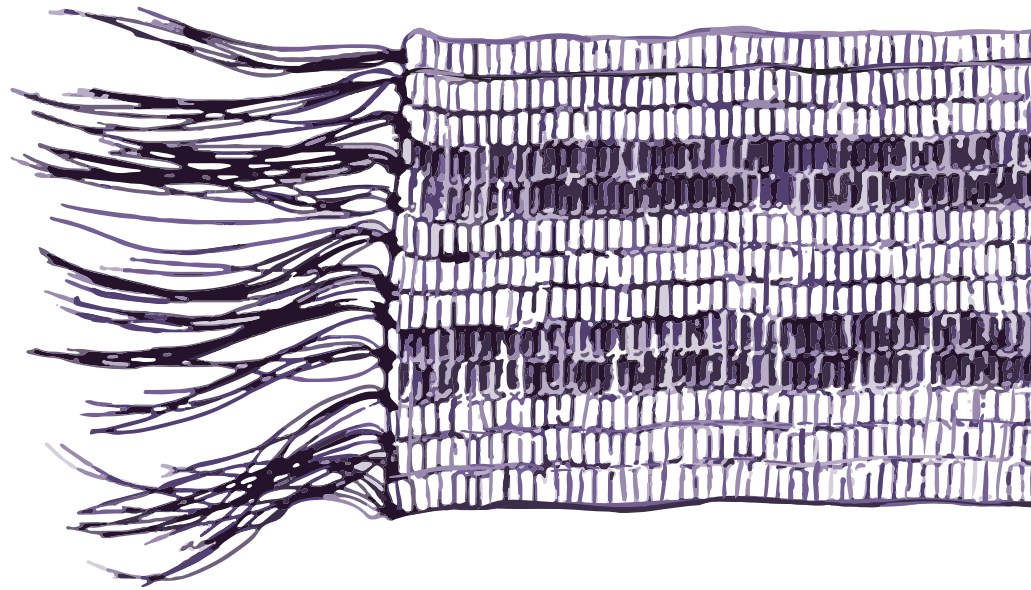
Foresters and ecologists have a special role to play in the healing of our community. Interdisciplinary by nature, we see the hidden connections between culture and ecology. It is at this confluence that we have the opportunity to be leaders in the sciences and allies of First Nations.

Dylan Thomas Mendenhall is an MSc student working under the supervision of Dr Sue Grayston. He can be reached at dylan.mendenhall@alumni.ubc.ca.



Engaging forestry in Indigenous law

By Natalie A Swift



“Indigenous law is the great project of Canada and it is the essential work of our time. It is not for the faint of heart. It is hard work. We need to create meaningful opportunities for Indigenous and non-Indigenous people to critically engage in this work because all our futures depend on it.”

Doug S White III (Kwulasultun) of the Snuneymuxw First Nation
(16 November 2012)

The reconciliation of Indigenous and non-Indigenous societies in Canada is, undoubtedly, the “essential work of our time” and it is being taken seriously by Canadian institutions. The courts are advancing it in their judgments, the federal government is pursuing it by exploring how to approach implementing the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), and even our cultural icons are declaring that something must be done. Part of this “great project of Canada” includes critically engaging with the laws of the respective societies that share the “lands, territories, and resources” of this country.

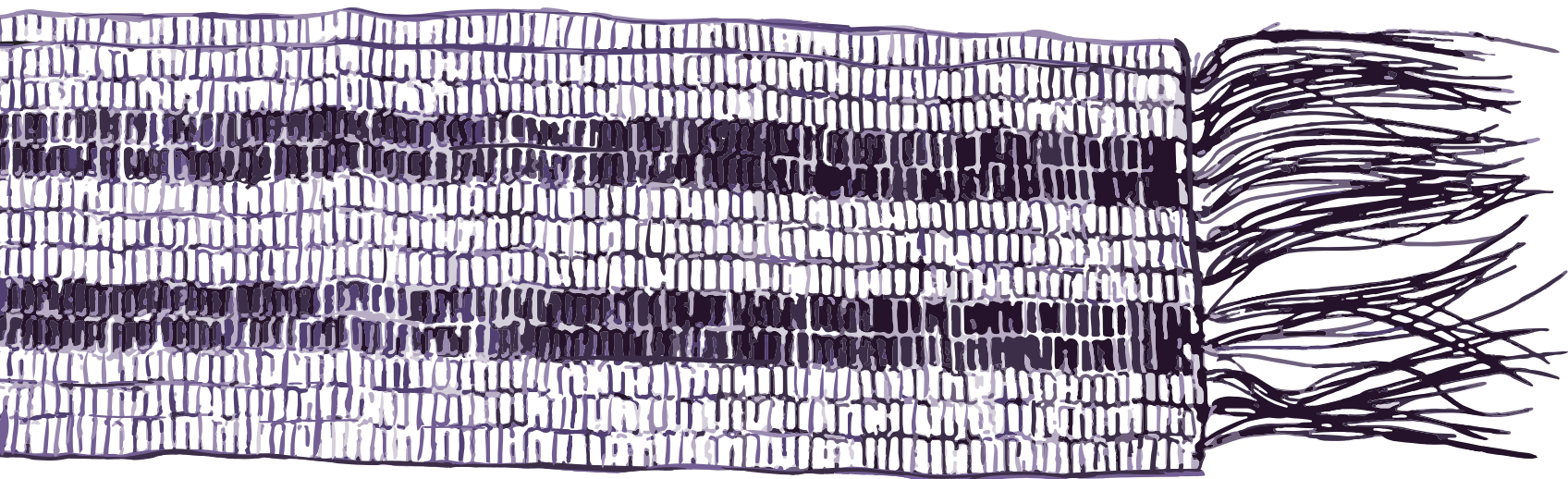
These laws are nested within diverse legal traditions: Indigenous, common, and civil. Although Canada was founded on the idea that European and Indigenous legal traditions would co-exist (as reflected in the wampum belts), settler-colonists came to delegitimize Indigenous traditions over time. Regardless, Indigenous societies have been – and continue to be – guided by distinct legal traditions that reflect their cosmology and worldview. There is no singular Indigenous legal

tradition that has arisen from a particular place, but a diversity of traditions that exist across this country, each with their own laws concerning the array of topics relevant to any society. Although many Indigenous nations are now recording their laws in text, there are still a myriad of Indigenous laws that continue to be transmitted via various other means, such as: stories, oral history, songs, art, dance, and landforms.

The common and civil law legal traditions, on the other hand, have been recorded in text for quite some time and find their respective origins in medieval England and continental Europe. The common law is not codified, is based on cases and precedent, and is used by all the provinces in Canada except Quebec, while the civil law legal tradition is codified, based on broad principles, and is used only in Quebec. It is within these traditions that we find the laws with which many Canadians are likely most familiar. As with Indigenous legal traditions, the common and civil law legal traditions also reflect a particular cosmology and worldview.

Regrettably, the delegitimization of Indigenous legal traditions by settler-colonists has had a devastating impact on Indigenous societies. Nevertheless, these societies have persevered and there are tremendous efforts underway to revitalize their laws.

In turn, there is a recognized need for individuals and groups across Canada to learn about Indigenous law and how to engage with it. This was well-articulated by the Truth and Reconciliation Commission of Canada (TRC) in their Calls to Action – an outcome of the TRC’s effort to redress the harms of residential schools and advance the reconciliation of Indigenous and non-Indigenous people in Canada. The 94 Calls to Action were made public when the TRC released its summary report in June 2015: *Honouring the Truth, Reconciling for the Future*. These Calls to Action are relevant to us all, including forestry students, academics, and practitioners. Of the Calls to Action that reference Indigenous law, there are at least three that should be of interest to those involved in forestry: Calls 45, 57, and 92



Within Call 45, the Government of Canada is called upon to “reaffirm the nation-to-nation relationship between Aboriginal peoples and the Crown” and to pursue four commitments in this area. One of these commitments involves reconciling “Aboriginal and Crown constitutional and legal orders to ensure that Aboriginal peoples are full partners in Confederation, including the recognition and integration of Indigenous laws and legal traditions in negotiation and implementation processes involving Treaties, land claims, and other constructive agreements”. This Call should be of interest to forestry students, academics, and practitioners in Canada as we engage in study and work on land subject to the aforementioned negotiation and implementation processes. We also often collaborate with Indigenous communities to deliver educational opportunities, conduct research, and develop plans relevant to treaties, land claims, and other agreements.

Calls 57 and 92 should also be of interest, as they are directed at 2 major employers of those who study and work in forestry: the government and corporate sectors. Both Calls share wording about how those employed in these sectors should be provided education concerning “the history of Aboriginal peoples, including the history and legacy of residential schools, the United Nations Declaration on the Rights of Indigenous Peoples, Treaties and Aboriginal rights, Indigenous law,

and Aboriginal–Crown relations”.

Many of the topics highlighted in Calls 57 and 92 are now taught in institutions that deliver forestry education. But are such institutions teaching Indigenous law to the depth necessary for forestry students, academics, and practitioners to critically engage with it in their study and work? As this is still a relatively nascent area of study for many of those involved in law, let alone forestry, it may be the case that the answer is “no”. If so, does this mean we should wait for legal scholars and lawyers to reach a certain point in their understanding before we consider how to engage with Indigenous law? Based on Doug White’s sentiment around the importance of Indigenous law in Canada, it would seem that waiting is not worthwhile and that we should pursue opportunities to engage critically with the topic alongside those that are working on this “great project of Canada”.

By pursuing opportunities to learn about and engage with Indigenous law, forestry students, academics, and practitioners will be better prepared to collaborate with Indigenous communities in their study and work. This includes opportunities to learn about Indigenous legal traditions and reflect on how we engage with them: how we have engaged with them in the past, how we engage with them now, and how that might change in the future. Or, we might also wish to consider how the perspectives of those with a

forestry education could be of value to the “hard work” of engaging with Indigenous law. By providing opportunities for forestry students, academics, and practitioners to learn about and engage with Indigenous law we can position ourselves to meaningfully contribute to the difficult, but crucial, work of reconciliation in Canada – “the essential work of our time”.

Natalie A Swift is an MSc student in the Department of Forest Resources Management interested in Canadian identity and forest governance, planning, and management. In May 2016, she participated in an intensive summer course in Indigenous law at the University of Victoria. The interactive seminar “Indigenous Laws: Questions and Methods for Engagement” provided students with the opportunity to explore theories concerning the nature and source of law, reflect on the challenges of recognizing and working with Indigenous law, and practice engaging with Indigenous legal traditions through the study of primarily Tsilhqot’in stories. Natalie is currently working under the supervision of Drs Shannon Hagerman and Janette Bulkan. She can be reached at natalie.swift@forestry.ubc.ca.

Stewardship contracting: A tool for revitalizing BC's dry forests

Since the early 2000s, the forests of North America have seen increasingly long, dry, and intense wildfire seasons. At the same time, pine forests from Mexico to British Columbia have been ravaged by mountain pine beetle. These and other threats to Canadian forests have left many in the timber industry in BC feeling uncertain about future timber supply in threatened forests. This is especially true in dry forests in the province, such as the interior Douglas-fir (IDF) stands in regions such as the Cariboo in central BC.

As licensees in the Cariboo transition out of pine-beetle salvage harvesting and into the IDF, a new set of challenges will need to be addressed. Many of these stands have been neglected for a long time. Because of this, and because of a century of fire suppression, IDF stands have stagnated. They have become so dense that there is a lack of quality timber to be harvested and no room for it to develop in the future.

Currently, there is little incentive for timber licensees to enter these stands for harvesting. A combination of factors, from economics, to policy, to the complexity of BC's tenure system leave little desire among timber companies to take financial or ecological responsibility in the IDF. New tools need to be developed and put into practice here in BC to address these issues.

During a preliminary study (funded by Mitacs) in the spring of 2016, graduate student Judah Melton interviewed forest professionals from industry, academia, provincial government, and First Nations to determine what they see as the greatest barriers to working in at-risk stands in the IDF. This study was the first part of Judah's research for his Master's degree, which will attempt to identify the challenges and benefits to a new policy approach aimed at

addressing wildfire risk and future merchantability of stands in the IDF.

While answers for this interview varied depending on the individual's organization and personal views and goals, a majority of respondents identified a few common barriers. These included the Government Action Regulation Order requiring harvesting activities to allow for the preservation of mule deer winter range, the specific economics related to the treatments, and the extensive use of volume-based tenure in the province.

In the early 2000s, after one of the most intense and severe fire seasons ever recorded at the time in the United States, the US Congress passed


a series of bills that aimed to provide an updated set of funding, legislation, and tools for addressing wildfire risk in the country.

One such tool, called 'stewardship end-results contracting,' or stewardship contracting for short, was an idea originally launched in 1998. This pilot program authorized the United States Forest Service (USFS) to enter into contracts with private companies or landowners to "perform services to achieve land management goals for the national forests that meet local and rural community needs."

Officially passed into law in 2003 and re-authorized in 2014 until 2023, stewardship contracting allows both the USFS and the Bureau of Land Management (under the US Department of Agriculture and the US Department of the Interior, respectively) to exchange goods for services with contractors. Though they are under separate departments in the US government, the USFS and the BLM have similar missions: "to sustain the health, diversity, and productivity" of forests and grasslands, or public lands, respectively. The objectives for work under these missions can vary, with projects ranging from thinning/fuels reduction, to watershed protection, prescribed burning, and even road maintenance.

Stewardship contracting allows the USFS or the BLM to "apply the value of the timber or other forest products from stewardship sales as an offset against the costs to accomplish land and resource management objectives."

There are 2 types of arrangements under this program: contracts and agreements. Both function in the same way, save for one exception: *contracts* are given when the value of the timber to be removed exceeds the cost of the



If these types of agreements could be adapted to BC's system, the province would have a powerful tool in the effort to revitalize stagnant stands in the interior. Not only would this decrease wildfire risk by reducing fuels, but it could also work to protect watersheds, improve wildlife habitat, and strengthen future yields in Douglas-fir and other dry forests in the province."



work or service being performed by the contractor, *agreements* are given when the value of the timber is less than the cost of the work or service.

Stewardship contracts are awarded on a “best-value” basis, as opposed to lowest-cost. This means that a potential contractor can be assessed on factors beyond cost, including previous performance with a stewardship contract. However, due to the scale of some of these projects, economics remains an important factor in awarding contracts.

The contracts trade goods for services, that is, they allow contractors to use removed timber or other forest products to offset the cost of the services provided in a contract. They can be up to 10 years in duration, and their dollar values vary widely across the country. These contracts are in place in every region of the US. Some notable examples of places where stewardship contracting is used include: Colorado, Wyoming, Montana, Kentucky, Tennessee, Michigan. Since the program began in 2003, the USFS has treated over 500,000 hectares,

awarded 1,793 contracts and agreements, and utilized over 28,000,000 cubic metres of wood using stewardship contacts or agreements.

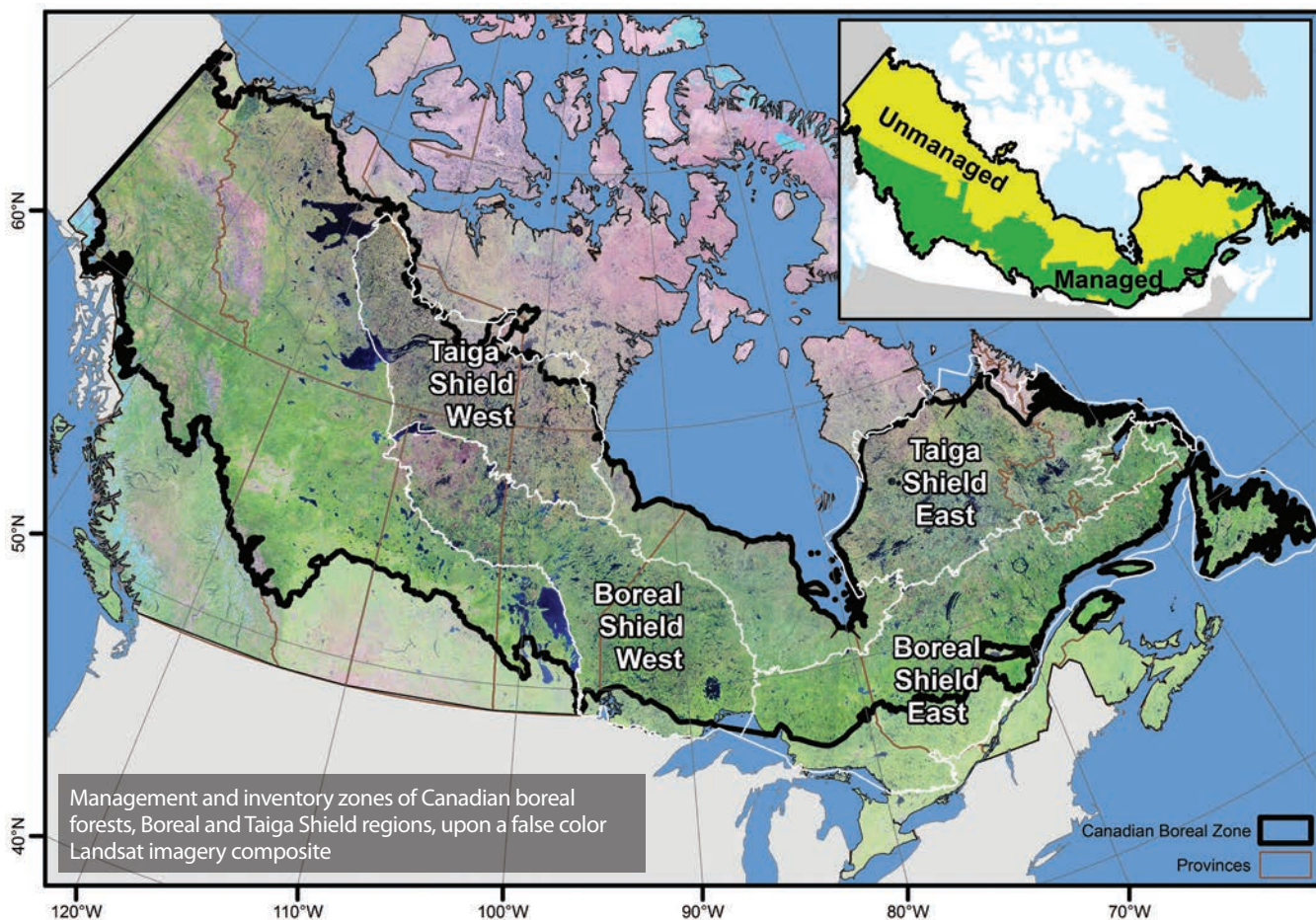
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Some further questions will need answering before this tool can be adapted: who will perform the work, the Ministry of Forests, Lands, and Natural Resource Operations; BC Wildfire Service; or private licensees? How can a balance between goods and services be achieved to make this type of work economically feasible? How can the industry best utilize materials removed in these treatments? Even with answers to these questions, more remain.

In December of 2015, the provincial government formed the Forest Enhancement Society of British Columbia (FESBC). Backed by \$85 million in funding, the province is making steps to address wildfire risk in the forests of BC. In time, this organization could be the one to set up and administer stewardship contracts in BC. Stewardship contracting will not be the only tool BC will need to combat issues in dry forests, but it can be the start of a larger effort to revitalize forests in the province, not only economically, but ecologically as well.

Judah Melton is an MSc candidate from the United States working under the supervision of Dr Harry Nelson in the Department of Forest Resources Management in the Faculty of Forestry at UBC. He can be reached at judahmelton@gmail.com.

Monitoring remote forests from space: The Landsat perspective



The Landsat series of satellites have been capturing snapshots of the Earth since 1972, with the imagery often playing a pioneering role in land characterization using remotely-sensed data. Landsat sensors collect data on reflected light in red, green, and blue light spectrums, but also in the critical near and shortwave infrared portions of the spectrum that help describe vegetation health and abundance. Two of the most crucial components of Landsat data are first the comparability of old and new images, and second the buildup of the imagery archive over the past 40 years. The open archive of imagery is available to all in an analysis-ready state, and researchers are practically able to travel back in time to understand past states of landscapes!

Ryan Frazier has recently completed his PhD within the Integrated Remote Sensing Studio (under the supervision of Dr Nicholas Coops) and utilised this extensive archive of Landsat imagery in collaboration with the Canadian Forest Service to better understand disturbances and recovery in Canadian boreal forests.

Forest mapping was an explicitly stated mission objective of the Landsat program, with many applications focused on

mapping deforestation. Initial widely publicized research using Landsat data focused on tropical deforestation, with images of bare ground surrounding a dense forest, often resembling a fishbone pattern. Recent developments have further enhanced the ability of researchers to analyze forested landscapes over time through the creation of several automated change detection algorithms. Using these algorithms, recent studies have used Landsat data to report on deforestation globally, which is relevant to international agencies, national decision making, regional management objectives, and local stakeholders. For example, the results of one global study have been used to report on deforestation within nations that lack the rigorous monitoring framework stipulated in some international agreements. A direct result of that same study has been the creation of an early detection system for illegal forest harvesting around the world that is able to report on very small and large events with ease. Thus, the open access Landsat imagery archive and automated change detection routines have facilitated researchers to examine large forested areas over time and then report useful information to decision makers and other researchers alike.

Now that access and preprocessing barriers have been

removed, Landsat data can be used to characterize forests over time. This is critical to nations that also lack access to remote forests where in situ measurement and monitoring is not feasible or cost prohibitive. The ability of Landsat data to be used to monitor forests is a boon to Canada, which contains about 30% of the world's boreal forests. Although Canadian boreal forests are extensive, only half has the detailed and repeated monitoring that is typical of sustainably managed forests. The other half of the Canadian boreal forest lacks the same descriptive data and comprehensive information. This disparity in forest data describing extent and condition across the Canadian boreal is brought into sharp focus when the effects of global climate change are assessed. It is critical to know the past and present states to determine how the boreal forest may be changing. The International Panel on Climate Change has indicated that higher latitudes, such as the Canadian boreal, will be affected by a changing climate sooner than lower latitudes and change in the Canadian boreal could result in global impacts

The dominant agent of change in Canadian boreal forests is fire – it is massively critical to maintaining the diversity of species, stand structures that define the boreal, and acts as an important agent renewal. In fact, tree species that largely dominate forest stands in the boreal, such as black and white spruce, are well adapted to fire and require its heat to initiate a new stand after disturbance. And it is those newly initiating stands that should be monitored in aggregate across large regions, as they can reveal very important information about how Canadian boreal forests are responding the broad environmental changes presented by a changing climate. For example, are fire characteristics (severity, extent, and frequency) altered by climate change further modifying how forests are recovering, or has the lengthened growing season that many boreal regions are experiencing lent itself to more rapid growth than in previous eras?

Landsat imagery time series are currently being used to understand the subsequent regrowth of vegetation

after a fire, especially in the Boreal and Taiga Shield regions. For example, an examination using Landsat time series data into the regrowth of disturbed forests revealed that the Boreal Shield East and West regions undergo differing post-disturbance recovery processes. Specifically, the western region has an initial resurgence of needle-leaf vegetation, while the eastern region typically has an initial recovery dominated by broadleaf species. Interestingly, this recovery difference reinforces previously known reasons that split a larger Boreal Shield region into East and West portions, which was based climate and disturbance characteristics.

Post-disturbance recovery has been further investigated in the Boreal and Taiga Shield regions using Landsat time series. Wall-to-wall mapping of post-disturbance recovery in those regions allows researchers to aggregate many scattered events into annual statistics. Between 1984 and 2007, recovery was tracked in five-year windows with results showing that the rate of spectral forest recovery did not remain fixed, and in fact was quite variable across the regions. Furthermore, the Taiga Shield East and West rates showed a consistent annual increase over time, showing that spectral forest recovery rates have accelerated and were larger in the present than in the past. This is an important result as it is suggestive that forests may recover more rapidly under a changing climate.

These results highlight the need to monitor Canadian boreal forests using remote sensing data. In particular, Landsat data and its long imagery archive offer researchers a chance to observe the past and present states of landscapes. The use of Landsat data allowed researchers to examine post-disturbance recovery in both inventoried and non-inventoried forests, with results revealing broad environmental change occurring over time.

For further information on this and other research in the Faculty of Forestry's Integrated Remote Sensing Studio, contact Dr Nicholas Coops at nicholas.coops@ubc.ca.



Typical Landsat time series showing forest harvest in Quebec, and then regeneration occurring over time



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Climbing in the Carmanah: Adventures in evolutionary biology

Trees in the Carmanah Valley of south-western Vancouver Island have the proportions of sewing needles, though they are many times larger. The Sitka spruce in particular are slender but incredibly tall – 80-metre towers that are just 2 metres in diameter at breast height. The valley is a lush old-growth forest descending on terraces to Carmanah Creek, with tall stands of spruce beside the creek and older mixed stands of western red-cedar, western hemlock, and amabilis fir higher up. Carmanah Walbran Provincial Park was formed in 1991 to protect this luxuriously forested valley, as well as adjacent watersheds.

The Sitka spruce in Carmanah are columnar, mossy for the first few metres and then covered with loose grey bark similar to fish scales. They are neither the oldest nor the widest trees in British Columbia, but they are the tallest – and the tallest tree in Canada, the Carmanah Giant, grows at the base of a cliff in the lower Carmanah Valley. Even in open stands, the tops of these spruce are out of sight, and estimating their heights from the forest floor is difficult. In July 2016, a team of researchers from UBC's Centre for Forest Conservation Genetics travelled to Carmanah to climb to the top of 10 or 20 of the tallest Sitka spruce they could find. They camped for a week in the forest there and collected samples for Vincent Hanlon's research on somatic mutations, part of his Master's project supervised by Dr Sally Aitken in the Department of Forest and Conservation Sciences.

Somatic mutations are changes to a cell's DNA sequence that happen in the body cells of a single tree, in needles, cambium, and new shoots rather than in reproductive cells like the precursors to pollen and ovules. They are the same sort of mutations that cause cancer in humans. Climbing a

tall tree allows researchers to obtain a sample from the top of the tree, extract DNA, and compare it with a sample from the bottom to find somatic mutations that occurred while the tree was growing.

Vincent's project is to find out how frequently these mutations occur and how important they are for genetic diversity. Because somatic mutations happen when cells divide, and because large trees are built from many, many cell divisions, there are likely very many somatic mutations in large trees. But although there are perhaps a few hundred or even many thousand mutations in every big old spruce, they are hidden among tens of billions of base pairs of non-mutant DNA. Researchers looking for somatic mutations must extract DNA from one part of the tree, sequence it, and compare it with DNA extracted from a distant part of the same tree, separated by as many cell divisions as possible. To maximize the chance of finding any mutations, the research team needed to climb the very tallest trees.

Although most somatic mutations are individually unimportant, together they may be a very important source of genetic diversity. Since the early 1980s researchers have speculated that heritable somatic mutations might boost the evolutionary speed of large tree species, helping them adapt more quickly to changing climates and evolve defenses against fast-evolving, short-lived insects. But it has only recently become possible, with the development of next-generation DNA sequencing technology, to assess the magnitude of these effects by estimating the frequency of somatic mutations. More than this, there are many hypotheses that depend on the somatic mutation rate in large trees. Ideas about evolution within individual trees – competition between genetically different branches, buds, or cell lineages – as well as theories of ageing and mating system, all depend on assumptions about the rate of somatic mutation.

The research required a small handful of young green needles and a few measurements from as high as possible in each tree, paired with 4 samples of the inner bark cut from the base of the tree using a leather punch. The climbers – Matthew Beatty, James Luce, and Ryan Murphy – are recreational as well as professional tree climbers, and they were very pleased to spend a week in such a spectacular canopy. The time, effort, skill, and experience required for a low-impact climb of an 80-metre tree are considerable, and the safety precautions are extensive – these spruce are as tall as the Walter Gage Towers stacked on top of the Forest Sciences Centre at UBC, as PhD student Jon Degner pointed out. Because the climb-

ers do not use spikes or other damaging hardware, the climb is an exciting and athletic 4-hour ordeal while they expertly manipulate ropes and anchors.

How do you climb an 80-metre tree?

Every climb begins with a line. Using a Big Shot, a large slingshot on a pole, the climbers shoot a small weight attached to a fishing line up into the canopy, aiming for high, healthy-looking branches. After retrieving the weighted end of the line from the tangle of understory vegetation and debris, they assess the stability of the branches that the line is draped over. Manoeuvring it to their satisfaction, they then pull progressively larger ropes up into the canopy, check again for hazards and load-test the rope.

The climbing gear sounds like something out of the wild-west. With a mechanical rope ascender attached to the inside of each heel, footsteps jingle as though the climbers are wearing spurs. They wear heavy harnesses, loaded with dozens of carabiners, lines, and more complex tools that clank and chime as they clip into the rope and walk up it into the canopy. Once the climbers reach the top of the rope, they use a lanyard to anchor themselves to the trunk or a sturdy branch and climb up the canopy like a ladder, attaching and reattaching themselves as they step onto higher and higher branches.

Because tall spruces often grow in pure stands, it is often faster to traverse between trees, 60 metres in the air, than to

descend and set new lines from the ground. From the top of a tall spruce the tallest trees are as obvious as a church steeple among ordinary rooftops. If climbers are in a tree with another tall tree nearby, they throw a weighted line over a branch, retrieve the end using a grapple, and haul across a climbing rope. Then, hanging from the horizontal rope by their harnesses, with their backs towards the ground far below, they pull themselves across to sample and measure the adjacent tree, return, and then rappel back to earth.

The week of camping and climbing in the Carmanah was both successful and fun. Unfailingly sunny weather, and exceptional dedication and skill on the part of the climbers, allowed the research team to sample 23 spruce averaging 76 metres tall by the end of the week, exceeding all expectations. In their spare time, members of the research team also found and measured the 2 tallest known amabilis firs in BC for the BC Big Tree Registry. And although Vincent and Jon spent most of the week on the ground communicating with the climbers by radio, measuring tree diameters, recording GPS coordinates, organizing and processing samples, and swatting mosquitoes, the climbers also took them up the largest tree climbed that week, an 84.4-metre giant in the Randy Stoltmann Commemorative Grove.

For further information contact Vincent Hanlon at vincent@alumni.ubc.ca or Dr Sally Aitken at sally.aitken@ubc.ca.



Respectful research with Indigenous communities: A non-Indigenous researcher's experience

By Ngaio Hotte



Indigenous communities are receiving a great deal of attention from researchers these days. At the same time that interest has grown in topics such as Indigenous governance, language, health, law and natural resource governance, so too has awareness of ethical issues associated with conducting this research. The Tri-Council Agencies have developed a policy for Research Involving the First Nations, Inuit and Métis Peoples of Canada; however, this policy is focused on addressing fundamental ethical issues associated with research from the perspective of a large, federal institution that supports projects in a broad range of fields. As such, these guidelines are necessary, but not sufficient, for conducting research in an ethical manner. Several books by authors such as Linda Tuhiwai Smith, Cora Weber-Pillwax and Bagele Chilisa offer helpful guidance to researchers about how to engage and work with Indigenous communities that provide an important, high-level overview of Indigenous researchers' perspectives on methods and practices supported by examples.

The combination of increased engagement with Indigenous communities and heightened awareness of the need for ethical research practices can create a daunting situation for inexperienced researchers and even experienced ones entering a new field. As a mid-career professional pursuing doctoral studies in the UBC Faculty of Forestry, I fall somewhere in the middle of the continuum of experience. While I have worked with First Nations in Alberta and British Columbia since the beginning of my career, I am rather embarrassed to admit that, for the most part, I did so with little to no training or awareness of Indigenous cultures or research methods. I began to learn how to conduct respectful research slowly, over time, mostly through trial and error. This stepwise approach to learning research skills can be not only awkward and uncomfortable for everyone involved, but may also impose a cost on Indigenous community members whose time is required to manage these types of interactions with many non-Indigenous researchers or other workers.

Now, in the first year of my doctoral studies in the Forests and Communities in Transition (FACT) lab, a research team led by Dr Rob Kozak, I have started to engage with the Council of the Haida Nation about my proposed research, which focuses on how trust is created between First Nations and federal or provincial governments that share decision-making authority regarding stewardship of natural resources. If granted permission, I will conduct case studies in forestry, fisheries and parks management on Haida Gwaii involving interviews with individuals from the 3 governments. The topic itself sets a high standard of conduct for respectful research: in order to study trust, you need to build it first. There is no trust without respect.

In preparation for my research I read numerous books and papers on Indigenous research methods, history, decolonization and nation-building, was involved in workshops on Indigenous governance as well as research ethics and spoke with Indigenous scholars and community members about research practices.

Undertaking training and sharing experiences can help to build a body of knowledge that elevates research practices across fields. I still have a lot to learn, but in the spirit of building this knowledge, I will share a few of the things I have learned thus far.

Start with the community. Believe it or not, many researchers establish their research project without even talking to the community: they develop a proposal, seek approval from their committee and/or funding agency and even obtain approval from the Office of Research Ethics before approaching the community about a partnership. This can create difficulties for both the community and the researcher if a partnership either does not develop or the scope and research questions need substantial revision. There is an art to investing the right amount of preparation in reviewing the literature and developing broad research questions, finding an appropriate community partner that is interested in those questions and then integrating input from community members. You will need to balance a good grasp of your research topic with a willingness to be flexible.

Talk to the right people. When you are starting your journey to explore the possibility of partnering with an Indigenous community on a research project, it may be appropriate to speak with many people to understand different perspectives on a topic and identify various ways in which the research can be conducted to be valuable to the community. In some Indigenous communities, permission may be required before even preliminary conversations take place. Once you have a sense of how your research interests can be integrated with those of the community, make sure that you request permission to conduct the research from those who have the authority to grant it.

“No” means no. When approaching a representative of an Indigenous community about a potential research partnership, it is important to be sensitive to and honour their wishes regarding participation. When someone clearly states that they do not wish to participate in research, it is important to respect

their position and avoid the temptation to convince them to change their mind. This may mean that you need to revise the approach to your research. A research supervisor, whether they are new to or experienced in research with Indigenous communities, should understand this possibility at the outset and be willing to accommodate these types of adjustments.



The combination of increased engagement with Indigenous communities and a heightened awareness of the need for ethical research practices can create a daunting situation for inexperienced researchers and even experienced ones entering a new field.”

Ethical research is respectful research. Nobody would disagree with the importance of treating others with respect, but what does that mean in the context of research? Respectful research means honouring participants’ time, knowledge, capacity and constraints. While your research is your number one priority, the people that you are approaching about your research have many other responsibilities and commitments. Some may be hereditary or elected officials who are involved in many important roles. Indigenous community representatives may also be responding to multiple inquiries from researchers on a range of topics that are only peripherally, if at all, relevant to their roles. For example, if you are setting up a meeting with a representative of an Indigenous com-

munity, ensure that you make every effort to minimize demands on their time and acknowledge the time that they have made to speak with you.

These reflections share a brief overview of considerations for engaging in research with Indigenous communities based on my experiences as a consultant and researcher. They are intended to touch on a few key issues and stimulate discussion about how to conduct respectful research with Indigenous communities. The UBC Centennial Emerging Workshop on Ethics and Pragmatism in Indigenous Research provided some insights into important considerations when conducting this type of research. This is a good start, but with the number of researchers interested in this type of research, UBC will need to develop and offer more curricula and training opportunities for both young and experienced researchers and systems of accountability for ensuring respectful research with Indigenous communities.

New and experienced researchers who are interested in building partnerships with Indigenous communities can find resources and training to help build their skills here at UBC. Developing the necessary awareness, understanding and skills to conduct respectful research with Indigenous communities is an essential component of the research that is often overlooked not just by students but also by their supervisors. The UBC First Nations and Indigenous Studies program and the Department of Educational Studies offer courses in Indigenous research methods and the School of Population and Public Health has started offering training for students working with Indigenous communities. Researchers within the Faculty of Forestry would benefit from similar training offered as a module or intensive workshop and taught by an experienced Indigenous researcher or community representative.

Ngaio Hotte (article author) can be reached at ngaio.hotte@alumni.ubc.ca. For enquiries about this and other research in the FACT lab, Dr Rob Kozak can be reached at rob.kozak@ubc.ca.

Cheaper home heating with waste timber from the Cheakamus Community Forest

Standing in a clearcut on the coast of British Columbia, things are not as 'clear' as one would imagine. Scattered around cut-over sites is the woody debris of logging branches, pieces of tree roots and trunks, collectively known as biomass residuals. The century-old BC coastal tradition of taking only the very finest old-growth timber leads to felling and wastage of what in other countries would be highly acceptable millable timber. In a world with increasing shortages of fine lumber, the felling and discard of good sawtimber from public forest assets would be a heavily penalised offence in most countries. But not yet in BC. Sometimes, depending on the location of the site, someone might come along and pick up some free scraps of wood. However, more often than not, this wood is not put to use and is burned at a cost to the forestry company, as a necessary precaution against future wildfire which would destroy natural regeneration and planted seedlings.

At the Cheakamus Community Forest (CCF), adjacent to Whistler, BC, forest managers requested a study of a different approach; to use the waste wood profitably for heat generation in nearby communities. The CCF agreed to participate in such a sustainability impact assessment, which was conducted by FP Innovations, Ecotrust Canada and UBC's Faculty of Forestry. Using a multi-criteria decision mak-

ing tool, the Tool for Sustainability Impact Assessment developed by the European Forest Institute, researchers Tonya Smith (Forestry PhD student under the supervision of Dr Janette Bulkan) and Marian Marinescu (FP Innovations) compared the economic, environmental and social aspects of 2 practices of waste wood management. The business-as-usual case, wherein foresters ignited burn piles in the cut-block, was compared to an alternate scenario in which the abandoned wood was retrieved at the roadside. This waste wood could be transported to a nearby facility to be processed, dried and sold to the community as firewood. Instead of community members heating their houses with natural gas, the firewood could provide a local source of heating fuels, which is the norm in parts of Europe and increasingly in Canada too.

For the 2 scenarios, the researchers analyzed different indicators of sustainable forest management, including: the economic costs and profits, local jobs and income generated by firewood collection and sale, and greenhouse gas emissions. The firewood project would involve some up-front capital costs, including the purchase of a mechanized firewood processor and a firewood seasoning shed, which would be amortized over a period of 15- and 25-years, respectively. Factoring in these costs, the firewood project could provide a lower-cost alternative to natural

gas heating for local communities over the total 25-year lifetime of the project. Additionally, due to the jobs created by firewood transportation, processing and drying, the firewood project would create additional local revenue and jobs for nearby communities, which include Lil'wat and Squamish First Nations on-reserve communities. The firewood project would also reduce the greenhouse gas emissions produced by the business-as-usual pile and burn in-forest by almost half.

The results of this study have been presented to the Board of Directors at the CCF. The outcomes from this research could work synergistically with other initiatives in neighbouring communities, including replacement of old fireplaces and wood burning stoves with more efficient models. Additionally, the study found that if other local forest licensees were to harvest biomass residuals for firewood, the project would benefit from economies of scale.

This study was part of FP Innovations Aboriginal Program, and was conducted in close consultation with Satnam Manhas of Ecotrust Canada, an independent consultant with sustainability initiatives at the CCF. The findings of this study support alternative pathways for First Nations seeking energy independence. For more information, please contact Tonya Smith at tonya.smith@ubc.ca or Marian Marinescu at marian.marinescu@fpinnovations.ca.

development & alumni news

Mark your calendars for the following Forestry alumni events



- UBC Forestry & Medicine Alumni Event in Prince George – Wednesday, October 12th, 2016
- Class of 1986 30th Reunion in Harrison Hot Springs, BC – October 14th - 16th, 2016
- Class of 1976 40th Reunion in Ladner, BC – October 14th – 15th, 2016
- Alumni and Friends Dinner at IUFRO Asia and Oceania Conference in Beijing, China – Tuesday, October 25th, 2016

For more information on these events visit – getinvolved.forestry.ubc.ca/alumni/events/ or contact Janna Kellett at janna.kellett@ubc.ca or 604.827.3082.

Forestry Class of 1971 45th Reunion



The Class of 1971 met from July 12th to 15th, 2016 in Sidney BC for our 9th reunion, celebrating 45 years of survival since graduation. Thirty-two classmates joined together with 23 spouses on the evening of the 14th for the reunion banquet. Joining us from Norway were classmates Truls & Brigitte Omtvedt and Cam & Bodil Day.

A quiet moment was observed and remembrances were shared for- 8 classmates who have passed on. The highlight of the evening was the 'Brownie Club' in true form, led by the Father Al Nikkel.

Planning for the 10th reunion began as the last item on the agenda for the evening. We will be celebrating our 50th anniversary in 2021, coinciding with the 100th anniversary of the Faculty of Forestry, and tentative plans are to meet in Vancouver at either UBC or the Malcolm Knapp Research Forest. Tony Sauder was elected as chair, ably assisted by Brian Bustard, Brian Nordman, Al Nikkel and Alan Fry.

Submitted by the Class of 1971

Urban forestry opens a new career for alumna



With a brand-new consulting business and a position managing a Model Forest, **Astrid Nielsen** (BSF 1995, RPF) is embracing the changing role of the Forester in urban settings. "I'm the General Manager of the Eastern Ontario Model Forest, and also the principal of Dendron Forestry Services, specializing in urban forestry consulting," she says. "This is a great way to bring my skills and experience together to tackle challenges in sustainable forest management."

The Eastern Ontario Model Forest is 1 of 8 such forests across the country and the only one in Ontario. Core activities include forest certification, landowner liaison, First Nations engagement, information-sharing for regional forest health issues, woodland restoration, and communications and outreach. "We do a lot of awareness and partnership building in eastern Ontario," Astrid says. "Much more of the land here is in private hands compared to out west, and we have many stakeholders."

Astrid launched Dendron Forestry Services to build on her urban forestry experience working for the City of Ottawa. "I am passionate about practicing responsible and sustainable forest management in an urban setting," she says. "I want to help my clients implement sound forestry practices and also communicate effectively with the public or other target audiences."

Astrid is a third-generation forester, with roots in Germany and Chile. "My grandfather was a forester in Germany, and he was offered a short-term teaching position at Austral University in Valdivia, Chile. My mother went to Chile with him, and there she met my father Udo Nielsen, who was studying at the same university. They went back to Germany together."

Udo continued his studies in Germany, where he received a PhD from the University of Freiburg. In 1968 he took a position with the Canadian government at the National Forestry Institute. Ten years later he and 2 colleagues established Dendron Resource Surveys and ran it successfully for 35 years.

Astrid came to UBC to study forestry in 1989. As part of her program she did a 1-year exchange at Laval University in

Quebec. While there, she became aware of the International Forestry Students Association (IFSA) and attended symposia in Finland and Switzerland.

She established an IFSA chapter at UBC on her return. In 2014 that chapter hosted over 130 forestry students from around the world at the International Forestry Student Symposium, a 2-week conference and study tour conceived and organized by students.

Astrid graduated in 1995 with a BSF focused on forest management and forest resources management. After 2 years working in forest engineering based out of Penticton, she returned to Ottawa to work with her father at Dendron Resource Surveys.

"I worked with my dad for 11 years, and I learned a lot," she says. "We worked mostly on forest inventory and remote sensing projects. There was a core group of about 10 staff, and up to 25 people total when we were busy. I learned that you have to diversify your talents and be flexible in order to sustain your business over the long term."

After earning a masters degree in Forest Conservation at the University of Toronto, Astrid sharpened her focus on urban forestry when she joined the City of Ottawa in 2009. She led a project to implement new infill guidelines for building permits and changes to the Distinctive Tree permitting process. She also developed and implemented forest management plans for woodlots experiencing significant decline due to the Emerald Ash Borer.

In addition to her 2 new career roles, Astrid is also the volunteer President of the Ontario Professional Foresters Association. "I started with the OPFA as a regional councilor in 2009, and have been committed to it ever since.

"The role of Forester has changed quite a bit, and there are fewer traditional roles. But urban forestry and environmental areas are growing, and there are new opportunities there. I'm passionate about forestry in Ontario, and I want to help it grow."

Engaging Aboriginal people in forestry management



As Dean of the Faculty of Forestry, Dr John Innes has dedicated his career to advancing sustainable forestry practices. As he begins his second term at the helm of the Faculty, Aboriginal engagement continues to be a strategic priority for him. In fact, Dr Innes and his wife Jill have just established a fund that will help make education more accessible for Aboriginal students.

“We anticipate that the control over significant amounts of land will be transferred to First Nations in the coming years,” says Dr Innes. “How long this will take, we don’t know. We’ve certainly seen the new federal government expressing a lot of interest in moving things forward but it may take some time for the words to become actions.”

As this happens, many big questions will emerge. The most important are what will happen to this land, and who is going to benefit? Without the application of both traditional and western expertise, there’s a risk that resources could be depleted very quickly, and that’s something the Faculty hopes to prevent.

“When an individual or group has a decision to make about the resources on the land, there are many factors to consider. For example, do you cut the timber and use the money to build much-needed housing or a school, or do you conserve the forest and go without? When groups are facing these decisions, we want to make sure there’s an optimal decision-making process—and that all options available are understood.”

“Returning the control of Crown land to indigenous peoples presents great opportunities to manage the land sustainably, creating local jobs and generating income that will benefit local communities,” says Dr Innes, adding that the Faculty is proud to be taking a leadership role and supporting those who want help with resource management and development. “Ideally, First Nations would do this internally, but right now there’s a lack of capacity and a huge demand for decision-making. We intend to help build that capacity, and accessible education is key.”

“We want to attract and educate those students who are interested in

conservation, forestry, forestry management, and wood products. We want to support students who are going to complete their training and help achieve what we want, which is to have sound land management throughout British Columbia, regardless of who has control of the land.”

“Aboriginal students are still under-represented at UBC. We want to make it as easy as possible for suitably qualified students to study in the Faculty,” says Dr Innes. “What Jill and I both realized was that First Nations students face many challenges when moving to a large university such as UBC. Many come from small, close-knit communities, and the city, processes, and structures can all seem quite intimidating. We wanted to do what we could to help those students succeed.”

Aboriginal engagement is not a new direction for the Faculty, which has been actively cultivating relationships with different groups throughout BC for over 20 years. What has changed are people’s perceptions about what constitutes fairness and justice in our society.

The Faculty has made significant strides towards increased Aboriginal engagement in recent years. Coursework now features a more diverse range of projects in collaboration with different communities. Additionally, the Faculty of Forestry is working hand-in-hand with the Faculty of Applied Science and the Sauder School of Business to establish a team of experts who will be available as a resource for First Nations groups.

Although it will take some time to increase student numbers, Dr and Mrs Innes hope that the **John and Jill Innes Aboriginal Award in Forestry** will not only be part of the solution, but also inspire others to do the same.

“I think there’s a way to do things better,” says Dr Innes. “And that’s what we’re working towards – a way to do things better.”

Log Stacker auction to support Forestry field camp students



Mr Charlie Andersen of **AnFor Holdings Ltd** is a strong proponent of hands-on practical field experiences for foresters-in-training. "Students who have experienced field school have a much richer sense of what it means to work in the profession, and a greater sense of connec-

tion with the forest," says Charlie.

With this in mind Charlie has donated a Raygo Wagner L90 Log Stacker formerly used by Northview Enterprises (one of the subsidiaries of AnFor Holdings Ltd). Charlie sees this as an opportunity to raise awareness of the importance of field school and

provide much needed support for this program.

Also keen to lend their support, **Ritchie Bros. Auctioneers** have offered to sell the log stacker at their Chilliwack auction taking place on October 12th.

All proceeds from the auction will go directly to support the Faculty of Forestry's field school and the students who attend. "Field school provides the opportunity for hands-on application and learning of the subject matter taught in the classes while building closer relationships and networking opportunities with peers. It's the most intensive learning experience I had as a student in UBC Forestry," says Stephanie, BSF 2007 alumna.

The Faculty invites all interested parties to attend Ritchie Bros' Chilliwack auction and put in their best offer – the log stacker will be sold via live unreserved auction, with no minimum bids or reserve prices.

The auction starts at 8:00am on Wednesday October 12th, for further details see rbaction.com/Chilliwack or call 604.823.2700.

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