

branchlines

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Forestry

University of British Columbia

dean's message



Over the past year, I have received many positive comments about the diversity of research being undertaken in the Faculty of Forestry. Many readers of BranchLines were simply unaware of the range of the work being undertaken by our faculty members, and the research reported in this issue is no exception. The diverse research provides a great basis for the teaching programs being undertaken in the Faculty, at both the undergraduate and graduate levels. One of our goals is to provide links between our research and our teaching, and it is with great pleasure that we can announce several important initiatives, thanks to the funding provided by a private foundation.

Over the coming years, we will be offering internships for undergraduates and graduates in our research forests. These internships provide a wonderful opportunity for our students to interact not only with the research being undertaken in the forests but also with the more practical aspects of managing a working forest. We will also be enhancing the project work undertaken in the final term of our Forest Resources Management program, with funding being provided to students drawing up management plans for particular areas to enable them to interact with the communities in those areas. The most important development is the provision of a new fellowship, known as the Future Forests Fellowship, which will be awarded to an outstanding graduate student to conduct a PhD in one of the Faculty of Forestry's areas of expertise. The Fellowship is intended to be the most prestigious award that a graduate student can gain, and I am delighted that it is being located in the Faculty of Forestry.

The donations that have enabled these opportunities are a great start to the Faculty's campaign efforts. Over the next three years, we are seeking to enhance our teaching, research and service contributions significantly but, in the current economic climate, we will only be able to do this through the generosity of our supporters. The goods and services provided by forests represent a vital contribution to the well-being of humankind, yet we increasingly take forests for granted and ignore the significant deforestation and degradation that is occurring globally. Our Faculty could make important contributions in this area, but we need to develop more capacity if we are going to take up such opportunities. This will only be possible through the support of generous donors.

This fall has seen the highest numbers ever of undergraduates registered for the Faculty of Forestry's programs. The increase in numbers is distributed across all the programs offered by the Faculty, and appears to represent an increased interest in education programs associated with the natural environment. Changing attitudes towards the forest sector may also be playing a role: while the traditional forest sector continues to experience multiple challenges, there are notes of optimism amongst those involved in the transformation of the sector, well-described in a recent issue of this magazine. As the Faculty diversifies, so will the range of students it can draw on, and so will the opportunities that they can generate.

A handwritten signature in blue ink, which appears to read "John L. Innes". The signature is written in a cursive style.

John L Innes
Professor and Dean
Forest Renewal BC Chair, Forest Management

forestrynews

Learning by experience



Student with trap used for capturing fish prior to measuring and marking

Photo: Joanna Rickard

The Integrated Field School (CONS 451) is a unique capstone course in the Faculty of Forestry's Natural Resources Conservation program. Students majoring in Science and Management participate in week-long trips to the alpine, grasslands and aquatic environments. The students then analyze the results of these field studies and write up their findings as scientific papers. What sets this course apart from many others is the integrative approach to learning, bringing ecological theory and management practices together with technical and analytical skills.

Since 2005, Dr Suzie Lavallee (Department of Forest Sciences) has filled the multi-dimensional role of course coordinator for CONS 451 – managing everything from transportation logistics for field trips to the statistics labs conducted in the classroom, and developing close relationships with her students. This complex role includes her responsibility for maintaining

high academic standards for the students' written and oral projects, while developing new curriculum materials for statistics labs and field exercises with each year's activities. Over the course of the semester, Suzie gets to know her students very well, living with them in relative isolation for almost a month and providing them with mentorship, career counseling, and firm encouragement when necessary. Dr Scott Hinch, fellow instructor in CONS 451 and program director for the Natural Resources Conservation Program, has often described Suzie's work as "part traffic cop, part den mother, part scientist". It's this close relationship with her students that has led her to her current interest in research on teaching methods.

On a yearly basis, Suzie sees students undergo an incredible transformation, both academically and emotionally. These deeper connections with their studies are reflected in their exit surveys, which cite CONS 451 as "the most mean-

ingful experience in my undergrad" and "making what we learned in the classroom make sense". Emotional connections such as these are described in the pedagogical literature as "affective domain learning". Recent studies suggest that "affective domain learning" is a necessary component for deeper, lifelong learning and change. Experiential learning on field trips is thought to be one of the most effective forms of learning because it allows students to develop strong emotional ties with subject material, thus enhancing "affective domain learning". After many years of seeing students develop strong connections with their study subjects through experience, Suzie Lavallee felt that it would be valuable to capture some of that experience, to share with others.

Documentary filming of experiences in a field school was no small feat, but when Suzie first came up with the idea for this project, she knew exactly the person for the job. Jenn Burt, a Killam Award winning graduate teaching assistant who had recently completed her MSc with Dr Scott Hinch, had both the technical skills and the understanding of the field school to tackle the project. The end result, a 12 minute video highlighting the experiences of students on the Aquatic Module field trip to UBC's Malcolm Knapp Research Forest, is truly amazing. In the video, students explain their work at each of the six stations, and talk about their favourite parts of the week-long trip.

The video was aired at the UBC Forest Sciences Centre on Friday, November 4th, and plans are underway for a second viewing. All are welcome to attend. Contact Dr Suzie Lavallee at suzie.lavallee@ubc.ca for more details.

Forestry Co-op

Since 1996, Forestry Co-op has been providing employers with tomorrow's leaders in Conservation, Forestry and Wood Products Processing. Cooperative education ("co-op") is an educational model that allows students to integrate formally their classroom learning with relevant paid work experience. Forestry Co-op students work locally, nationally and throughout the world on their co-op work terms. Close to home, Forestry Co-op students are found throughout the Lower Mainland, elsewhere in British Columbia and across Canada. Supporting the UBC mandate to create globally engaged students, Forestry Co-op actively supports students looking to complete international co-op work terms. These provide students with the added value of gaining relevant and unique work experiences as well as being the first step in becoming engaged global citizens. Forestry Co-op students may be found working on forest harvesting projects in South Africa, researching tiger sharks in the Galapagos Islands, implementing on-the-ground conservation efforts in the United States or conducting wood adhesive research in Germany. About 20% of co-op

work terms have been based outside of Canada including placements in Australia, Chile, China, Ecuador, Germany, Mexico, New Zealand, South Africa, Uganda and the United States.

Khalil Walji, a Natural Resources Conservation Co-op student, worked in Uganda this past summer. His first co-op work experience was with TAG – The Africa Group. This NGO is working to bring awareness and solutions to endemic crises taking place in Africa, focusing on health, education, and the environment. TAG is a network of people, organizations, and the private sector that have come together to make things happen in Africa. Khalil was involved with two projects during his work term. The first was working with local landowners to assess timber inventory through the compilation of an inclusive report on DBH and crown compaction rates. The tree species included eucalyptus (*Eucalyptus grandis*) and Caribbean pine (*Pinus caribaea*). The report discussed issues such as stand health, illegal early harvesting by locals and ongoing corruption. Khalil's second

project centered on Sight for Life; a project to provide corrective eye surgeries to the local population. Khalil's employer partnered with a hospital in the Ugandan District of Tororo and an international relief team from California to provide sight-saving surgeries. Khalil had the opportunity to participate in the pre and post-surgery activities. The surgical team performed over 300 surgeries in seven days. All in all, a very enriching and rewarding first co-op work term for Khalil.

For further information contact Forestry's co-op coordinator Geoff Anderson at geoff.anderson@ubc.ca



Faculty member awards

Dr Yousry El-Kassaby (Acting Head, Department of Forest Resources Management) has been awarded a Professor Honoris Causa by the Czech University of Life Sciences at a ceremony in Prague in early October. Yousry has collaborated with several forest geneticists from the Czech University's Department of Dendrology and Forest Tree Breeding including supervising Ms Irena Fundova (MSc), Mr Tomas Funda

(PhD), Dr Jaroslav Klapste (PDF), and hosting Dr Milan Lstiburek (Associate Professor). Several research papers were published during this collaboration, including the revolutionary concept of "Breeding without Breeding" (coauthored with Dr Lstiburek) which is currently being applied in the Czech Republic and globally. See the article in this issue of BranchLines for further information on this research.



Faculty member awards (cont)

Dr Scott Hinch (Department of Forest Sciences) was named the 2011 recipient of the Excellence in Fisheries Education Award, presented to him at the annual meeting of the American Fisheries Society (AFS) in Seattle, WA. The award is given “in recognition of continuous dedication to the teaching profession and personal contributions to the education of fisheries professionals”. The Education Section of the AFS noted in their award announcement that Scott Hinch consistently ranked near the top among the 50-some professors in the Faculty of Forestry in the area of instruction. They reported that he became involved in undergraduate curriculum early in his academic career and has been credited in large part with shaping UBC’s highly successful Natural Resources Conservation



(NRC) program. Scott Hinch has advised over 1,000 undergraduate student careers since becoming program director of the NRC program in 1999 and has mentored and supervised 22 MSc and 8 PhD

students along with numerous post-doctoral fellows. Most are established as fisheries professionals and 4 are professors who still consider him a mentor shaping and improving their careers.

New dual forestry masters program

Over the next 3 years, 44 students (24 from Canadian and 20 from European universities) will be participating in the new TRANSFOR-M program. They will earn dual Canadian and European graduate degrees while studying modern sustainable forestry and environmental management approaches and gaining multicultural perspectives on environmental, economic, and social issues. The program is funded by the European Commission of the European Union and Human Resources and Skills Development Canada.

The TRANSFOR-M consortium includes:

- University of British Columbia
- University of New Brunswick
- University of Alberta
- Albert-Ludwigs-University, Freiburg, Germany
- Bangor University, Wales
- University of Eastern Finland, Finland
- Swedish University of Agricultural Sciences, Sweden

Students spend 1 year at their home institution and 1 year at a partner university abroad with all instruction in English. Canadian students are required to complete an intensive language course during their stay in Europe (in German, Swedish, or Finnish). The program also includes field courses providing students with a broad exposure to forest management approaches in different forest regions of Europe and Canada.



TRANSFOR-M
Transatlantic Forestry Master

The first intake of students to this program included 6 UBC Forestry graduates heading to Sweden, Finland and Germany.

For further information contact Jorma Neuvonen at jorma.neuvonen@ubc.ca

Promoting the importance of forests

An invitation to Dean Innes from the STS (Science and Technology in Society) Forum in Kyoto, Japan, provided an important opportunity to emphasize to a range of policy makers and influential thinkers the importance of forests to society. Reporting on the session 'Sustaining Forests' chaired by Dean Innes, University of Ottawa President and Vice-Chancellor Allan Rock stated how critical it is to maintain the world's forest

cover while at the same time utilizing the goods and services provided by forests. Forests are often omitted from such discussions, and the forum provided an important opportunity to emphasize their significance in a meeting otherwise dominated by concerns such as nuclear safety and global health issues. We need to keep emphasizing the importance of forests at every opportunity.

Record enrollment in the Faculty of Forestry

The start of the 2011-2012 academic year saw a marked rise in interest in the programs offered by the Faculty of Forestry, and applications were up by about 40%. This resulted in record enrollment numbers and the Faculty has 684 undergraduate students registered for the current academic year. As in recent years, the highest numbers are in our Natural Resources Conservation program (315 students, or 46% of the student body), but interest is also growing in all our other programs. The Faculty now has one of the most

diverse student bodies on campus, with 19% of our undergraduate students and 56% of our graduate students coming from outside Canada. Although many of our international students come from the USA and China, there is still considerable diversity: our undergraduates come from 21 countries and our graduates from 39 countries. The rise in numbers is enabling us to improve our services to students even further, and will lead to some exciting new developments – to be announced in future issues of BranchLines.

Major new forestry award

Canada has placed a great deal of emphasis on attracting the best students in the world to study in this country. Every year, about 130 Vanier and 15 Trudeau Fellowships are awarded throughout Canada, each with a value of approximately \$150,000 over three years. Competition for these fellowships is intense, as they are awarded to outstanding students in any discipline undertaking studies at any Canadian university. Since their inception in 2003, students at UBC have won 16 Trudeau scholarships, although none of these have come to students in the Faculty of Forestry. UBC has won 66 Vanier scholarships since they started in 2009, including one to Lee Kalcsits in the Department of Forest Sciences in 2010.

Now, thanks to the generosity of a private foundation, the Faculty of Forestry is able to offer what we believe is the most prestigious PhD fellowship available in Canada, and certainly the most significant fellowship available in forestry globally. To be known as the Future Forests Fellowship, the award will enable an outstanding graduate student to undertake a PhD in the Faculty of Forestry

at UBC. The Fellowship will pay \$60,000 per annum, which is intended to cover all expenses incurred in the preparation and conduct of the research project. The Fellowship will last for three years, subject to satisfactory progress, with a possibility of extension to a fourth year at the same rate. The Fellowship is intended to allow a student to devote her or his time purely to pursuing excellence in research and community outreach in the field of forestry.

The Fellowship will be awarded to a student who chooses to work in one of the following areas of excellence for the Faculty: forest products biotechnology/bioenergy, business operations and management, forest genetics/forest genomics, belowground ecology, river and landscape ecology, climate change and advanced landscape planning or forest management. The successful project will take place in British Columbia in one of these research areas.

Further details will be announced soon on the Faculty's website.

Networking amongst Forestry Deans

In November, the second meeting of the Asia Pacific Forestry College Deans was held. The meeting provided an opportunity for Forestry Deans from around the Pacific to network, compare notes and assess regional trends in forestry education. During the meeting, a formal mechanism for cooperation around the region was put in place, a steering committee was established and a chair

(Professor Luo Youqing, Vice President of Beijing Forestry University) and Co-Chair (Dean Innes) elected. In a first step, a SWOT (strengths, weaknesses, opportunities and threats) analysis of post-secondary forestry educational institutions in the region will be undertaken, with a questionnaire sent to forestry schools and networks of schools around the Pacific. This will then be used to identify edu-

cational needs and to build project teams to address these needs. Over the coming years, a number of projects will be undertaken to improve forestry education in the region, and exchange opportunities for students and faculty members will be developed. Funding will be provided by the Asia-Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet).

Links with India strengthened

In November, Dean Innes and Special Projects Director Jorma Neuvonen visited the Indian Ministry of Environment and Forests/ Indian Forest Service in Delhi and then the Indira Gandhi National Forest Academy, the Wildlife Institute of India and Forest Research Institute in Dehradun. Talks were held aiming to strengthen our links with these institutions, and research agreements are being developed. The Indian Forest Service is unique in that its primary focus is the conservation of India's native forests, and the Faculty of Forestry is proud to be involved in the provision of mid-career training for its senior officers. Our links with the wildlife and forest research institutes are intended to create research opportunities and to promote the exchange of faculty members between the institutions.



Can lodgepole pine provide its own nitrogen?



LODGEPOLE PINE IS a commercially important gymnosperm indigenous to western North America. It thrives in a wide range of soil moisture and topographical conditions and is notable among conifers for its ability to flourish on nutrient poor, often scorched, sites that are severely limited in nitrogen (N). As a result, N inputs to lodgepole pine forests are of great interest from both ecological and management perspectives. Mineralization of organic nitrogen by free-living soil microorganisms has traditionally been viewed as the primary process by which plant-usable nitrogen is released in soil, and as the step which limits nitrogen accretion in forest ecosystems. In addition, certain mycorrhizal fungi possess enzymes that allow direct access to nitrogen bound in forest floor organic matter, thereby “short-circuiting” the well-known nitrogen mineralization pathway. Such “short-circuiting” could be an

important route of nitrogen transfer in some forest ecosystems rich in organic matter. However, this theory is too restrictive to explain the nitrogen nutrition of lodgepole pine in view of its ability to grow on nutrient poor mineral soils with little or no accumulated organic nitrogen.

The atmosphere, which is composed of 78% biologically inert N_2 gas, is the obvious nitrogen pool for plants growing on N-poor substrates. Nitrogen fixation, the process by which inert atmospheric N_2 is converted to plant usable NH_3 , occurs biologically only through the activity of certain prokaryotic microorganisms (ie, Bacteria and Archaea). Free-living nitrogen-fixing bacteria are known to associate with, and fix N_2 near roots and mycorrhizae of many plant species including gymnosperms, but quantitative estimates suggest that root-associated fixation is not a principal nitrogen

source for most non-nodulating plants.

However, the rhizosphere, which is the zone of soil surrounding plant roots and influenced by their metabolism, is not the only microsite associated with plants that could be amenable for biological N_2 fixation. Bacteria that colonize the plant interior interact more closely with their plant hosts and experience less competition for carbon sources and a more protected environment than rhizosphere colonizers. In crop plants such as sugarcane, these bacteria have been shown to provide more than 50% of the plant's foliar N. Bearing in mind the ability of lodgepole pine to grow on N-poor sites, Dr Chris Chanway (Department of Forest Sciences and Faculty of Land and Food Systems) hypothesized that these bacteria could be present in forest tree species, particularly those growing at nutrient poor sites, and

that such microbes could provide a significant proportion of foliar N to their plant hosts.

To test this idea, Chris Chanway's research group looked for nitrogen fixing bacteria residing within naturally regenerating lodgepole pine seedlings and 40-year old trees at a stand growing on a nutrient poor site near Williams Lake, BC. They successfully isolated several bacteria from inside needle, stem and root tissues. They then inoculated pine seed with one of these bacterial strains, *Paenibacillus polymyxa* strain P2b-2R, and grew seedlings under nitrogen-limited conditions in a greenhouse. This bacterial strain was modified so that they could detect it under fluorescent light using a confocal laser scanning microscope (CLSM). This allowed them to determine the specific plant tissues, if any, it had colonized. Nearly one year later, they measured the biomass and foliar N content of seedlings and found that pine treated with strain P2b-2R had more than double the plant dry weight and 50% greater foliar N content compared to non-inoculated control seedlings (see graph below).

In addition, by studying the

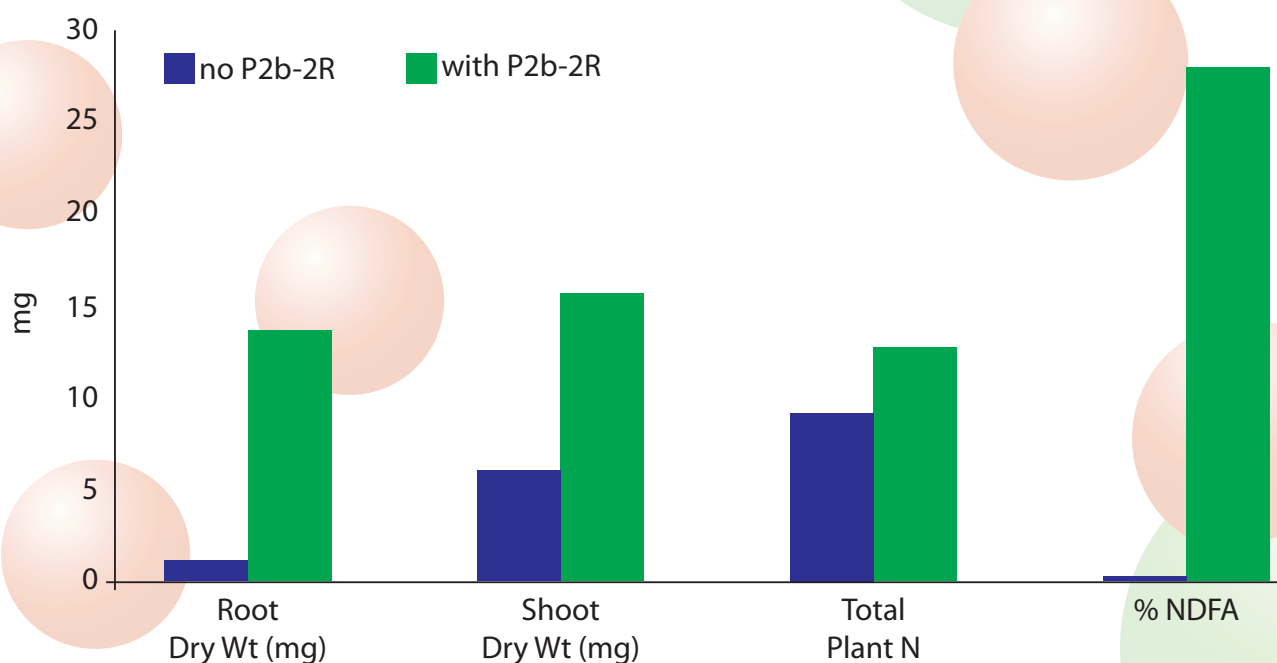
isotopic composition of the N in pine foliage, they were able to tell whether foliar N had originated from the soil or from the atmosphere. N originating from the atmosphere would be a strong indication of nitrogen fixation by strain P2b-2R. Isotopic analysis revealed that nearly 30% of the pine foliar N in inoculated seedlings originated from the atmosphere ie, was provided by the bacterium. Subsequent experiments by the group have confirmed statistically significant seedling biomass and foliar N increases in response to inoculations with the amount of foliar N derived from the atmosphere varying from 27% to 70%.

Chris Chanway's research group also found that strain P2b-2R colonized internal pine needles, stems and roots with population sizes of 1,000-50,000 bacterial cells per gram (fresh weight) of plant tissue. Bacterial cells could be visualized using CLSM, which led to a very interesting observation: bacteria appeared to preferentially colonize microsites near, on or possibly in chloroplasts within the plant cells. More research is required to confirm this observation, but it is tempting to speculate that

strain P2b-2R colonizes plant cells near ATP-generating chloroplasts because nitrogen fixation is a very energetically expensive process.

The pine growth results suggest that seedlings and trees growing at N-poor sites may rely on bacteria to supplement or, in some situations, provide the majority of their N requirements. If this is the case, it may be possible to manipulate bacterial populations to maximize N₂ fixation, thereby preparing tree seedlings to fertilize themselves after out-planting. Chris and his research group are currently evaluating this possibility as well as the mechanisms by which these microorganisms colonize internal tissues of seedlings and trees and influence their growth.

For further information contact DrChris Chanway at chris.chanway@ubc.ca



Growth of inoculated pine 45 weeks after seed treatment. %NDFA is the percentage of N derived from the atmosphere and indicates the amount of N fixed by strain P2b-2R

The changing face of preservative-treated wood

WOOD THAT IS in service will last longer if it is pre-treated with a preservative of some sort. Most of us are familiar with the old creosote-treated railway ties and marine pilings at our ferry terminals. You may have noticed the changes that have occurred in the preservation treatment used on power poles that, until recent times, were all treated with a dark oily preservative, but which now are "green". Over the past 30 years the biggest changes in wood treatments have occurred right under our feet with the use of pressure-treated wood for deck construction. The increasing demand for pressure-treated wood in residential construction has helped to support a major market for the wood-preserving industry. Initially the biocide of choice was chromate copper arsenate (CCA). However, the poor public perception of products containing arsenic led to the industry voluntarily withdrawing the use of CCA in protecting residential wood products. By the mid-1990s the industry had evolved a number of new copper-based biocides which could provide excellent performance – particularly for Canada's timber that apart from one or two exceptions is difficult to treat due to the high proportion of heartwood in the sawn wood.

For over 3 decades the wood-preserving industry had been striving to continue to improve its environmental stewardship. The industry now requires: products to be free of surface deposits; an emphasis on recycling of treated products at the end of their primary life; and fixation chemistry to be completed before products leave a pressure-treating facility. Research at UBC, FPInnovations and the University of Toronto has been critical in helping to support these industry goals and in sustaining continued innovation while advancing the knowledge of "how wood treatments work". In traditional treatments with copper-based preservatives, the copper compound (usually basic copper carbonate), together with an organic co-biocide, is dissolved in a solvent. The solvent first used was ammonium hydroxide. However, due to issues such as poor appearance, it was replaced by monoethanolamine, an organic solvent. The solution is forced into the wood under pressure. During fixation the wood (which is slightly acidic) neutralizes the amine leading to the copper becoming "fixed" or bound

to the wood chemical components. Research over the past three decades has focused on how to maximize this fixation chemistry.

More recently, a new approach to wood preservation has been developed in the USA. In this approach, the basic copper carbonate is first micronized into small particles and dispersed in water (with the same co-biocides as before). The insoluble copper carbonate penetrates with the water into the wood, where the acidity of the wood dissolves some of the particles. How much is dissolved and how fast was not fully understood and yet these answers are needed before the new preservative treatment can be used by the Canadian industry. In order to better understand the chemistry of this novel system, industry has sponsored research by UBC Wood Science Department's wood preservation group to study the chemistry of this new approach. This group, led by Dr

John Ruddick, has studied the chemistry of copper-based preservatives for more than 20 years. Recognizing the value of collaborative research, John invited Dr Pierre Kennepohl from UBC's Department of Chemistry to co-research this problem. Together with Wei Xue (a PhD student in Pierre Kennepohl's laboratory) they began the task of unravelling how the micronized copper-based biocide works. The key to their success was the use of electron paramagnetic resonance (EPR) spectroscopy. The basic physical concepts of EPR are analogous to those of nuclear magnetic resonance (NMR), but it is electron spins that are excited instead of spins of atomic nuclei. Using this technique they were able to identify the mobile copper as soon as it was released from the copper carbonate by

the acidic nature of the wood. While most copper chemicals are paramagnetic (a form of magnetism that occurs only in the presence of externally applied magnetic fields), copper carbonate is not paramagnetic but is anti-ferromagnetic and invisible to EPR. Following their initial success in demonstrating the rate of copper solubilization and complex formation within wood, the research team then developed new EPR approaches to quantify the copper chemicals being formed in wood. In May of this year, Wei Xue presented the results of this research at the Annual Meeting of the International Research Group in Wood Protection in New Zealand and was awarded

In May of this year, Wei Xue presented the results of this research at the Annual Meeting of the International Research Group in Wood Protection in New Zealand and was awarded the Gareth Williams Award for the best student presentation."

the Gareth Williams Award for the best student presentation. So we now know that the amount of the copper biocide that is dissolved is controlled by the wood, and every acidic site which causes the copper to dissolve also forms a potential

“... wood treated using this novel method needs to be available for the benefit of Canadians...”

fixation site. This new knowledge can help us to understand how these new preservative systems that have low amounts of mobile copper can be effective in protecting Canadian residential timber, while at the same time minimizing their environmental impact.

But for the story to have a happy ending, wood treated using this novel method needs to be available for the benefit of Canadians. As part of this effort, our research team has been expanded to include students from the Wood Science Co-op program. Two co-op students, Mike Kofoed and Shenghao Xie have been studying the corrosiveness of micronized copper-treated wood. They found it to be similar in corrosiveness to untreated western red cedar. In the summer of 2011 another co-op student, Ravi Parhar, studied the differences in the chemistry of the micronized copper system in earlywood and latewood of pine. Ravi and Wei are also completing a study of the chemistry of micronized copper treatment of eastern spruce, lodgepole pine, red pine, and hem-fir treated in Canada. We hope that in the near future, the Canadian public will have an expanded choice of residential treated wood products, designed to contribute to the sustainable use of our forest resources.

Dr John Ruddick can be reached at john.ruddick@ubc.ca



Typical presure-treated decking



Typical treated board (left) and new micronized copper treated board (right)

Understanding rock climbers' attitudes to the environment



OUTDOOR RECREATION participation is relatively ubiquitous among British Columbians. For many people, the pursuit of an outdoor recreation activity provides the impetus to interact with, and learn about, the natural environment. Outdoor recreation forms the basis for much of the general public's impressions of our natural areas. Perhaps geographer Hobson Bryan said it best when he characterized outdoor recreation activities as "windows to the environment". Understanding the way that people engage with the natural environment is important for addressing growing public concerns with, and expectations of, natural resource management. Dr Howie Harshaw (Department of Forest Resources Management) is leading a new SSHRC-funded research project to document the patterns of participation in rock climbing in Squamish, British Columbia. He will examine the roles of structural location (within the context of social networks) and identity (within the context of recreation specialization) in contributing to attitudes towards the environment and to attitudes about specific management actions that lessen the impacts of rock climbing on the environment.

Squamish is an internationally recognized destination for rock climbers, with opportunities for a variety of skill levels and climbing styles. The number of rock-climbing participants in this area has been increasing by 5%-7% annually and is projected to double, reaching more than 250,000 individuals, over

the next decade. The economic value of rock climbing in this area is estimated at \$25 million in direct impacts per year. However, this high level of rock-climbing activity in Squamish has the potential to cause ecological impacts on the local environment (eg wildlife interactions, vegetation destruction, soil erosion). Howie Harshaw's research project will help to improve our understanding of the motivations, management preferences, and characteristics of rock climbers in the area. A better understanding of these attitudes towards the environment and towards specific management actions that may constrain their activities will help in the development of management strategies that support the continuation of climbing activities in an ecologically sustainable manner.

This 2-year project will integrate 3 areas of theory: recreation specialization, social structure, and environmental sociology. Jason Byrd (MSc student) will lead the on-site data collection at climbing sites throughout the Squamish region, and will supervise an undergraduate research assistant. The research seeks to extend recreation specialization theory to social structure, and test theoretical assumptions that increasing degrees of specialization lead to increased degrees of biocentrism and recognition of the necessity of management actions that may constrain climbing activities. The results will provide baseline data for a future longitudinal study of rock climbers' progression through increasing degrees of recreation specialization, as well as

an examination of people's social networks and environmental values over time.

Recreationists, even those that pursue the same activity, are not homogeneous: recreationists differ in their values, the activities that they pursue, the settings that they prefer, the experiences they desire, and their motivations for participating. The recreation specialization framework can help to explain variations among preferences, attitudes, and behaviors. The framework examines a person's commitment to an outdoor recreation activity along a continuum from general interest/low involvement to specialized interest/high involvement. Recreation specialization theory assumes that as specialization increases, attitudes shift from consumption to preservation, and the setting in which the activity occurs becomes more important. Although there has been modest support for the proposition that recreation preferences are associated with environmental attitudes and activity choice, past research has focused on the influence of environmental attitudes on recreation behaviour and has been uni-dimensional in the treatment of recreation participation (ie, focusing on frequency of participation). Recreation specialists and recreation generalists do not usually share the same motives for participating in activities: specialists tend to focus on the quality of the recreation experience and place more importance on non-activity-specific elements such as the recreation setting. As specialization increases, commitment to the activity increases such that it becomes a person's life focus, and may become a central, dominant force that becomes a standard of reference. Additionally, as a person's degree of specialization increases, their identity and values become more focused and less diverse, and their recreation manage-

ment preferences may shift from resource consumption to resource preservation.

Outdoor recreation is a socially significant endeavour that is an intrinsic part of many aspects of our lives. We generally engage in outdoor recreation activities with others (eg, friends, family, clubs); this socialization function not only serves instrumental goals (such as safety), but also creates and maintains social relationships – an important element for sustainable communities. Leisure pursuits such as recreation are essential for the creation and fostering of social capital. Social capital provides the context for examining people's relationships with outdoor recreation through social networks. Social capital can be considered a social good (such as information, knowledge, or social influence) that is produced and dissipated through social relations. Knowing more about recreationists' attitudes, behaviours and characteristics can help us to understand the contributions of this socially significant pursuit in the creation and dissemination of social capital and help us to understand the role of social networks in influencing recreationists' attitudes towards the environment.

Outdoor recreation plays a critical role in fostering and maintaining people's relationships with one another, and with the natural environment. Through this research, an improved understanding of the relationships between participation in outdoor recreation, social structure, and environmental values can provide benefits to rural communities that face transitions from traditional resource-based economies to more diversified approaches to community sustainability.

For further information contact Dr Howie Harshaw at howard.harshaw@ubc.ca



Squamish, BC

Tree cavities – a vital wildlife habitat

OVER 1,000 BIRD species, and many mammals, amphibians and reptiles worldwide depend on using tree cavities for nesting and shelter. In interior British Columbia, about 25% of forest birds and mammals use tree cavities to conduct their critical life activities. Tree cavities can be formed by excavation or decay. Some cavity-dependent species are able to excavate their own holes in trees. In other situations the normal decay processes in senescing trees gradually form holes, some of which are suitable for nesting and roosting. Cavity-using species are classified into three guilds according to how they acquire cavities. Woodpeckers, nuthatches and some chickadees are primary excavators that create cavities in trees. Secondary cavity nesters include a variety of songbirds, ducks (yes, some ducks nest in tree holes!), birds of prey, and medium-sized mammals that use but cannot excavate cavities. Thus, they rely on cavities created by excavators or decay. A third guild, weak excavators, may excavate their own cavities in decayed trees or use existing decay-formed or excavated cavities. Dr Kathy Martin (Department of Forest Sciences) coined the term Nest Web to describe the inter-dependence among the three groups with respect to the creation and use of nesting and roosting tree cavities. Nest Web wildlife communities occur on all continents except the Antarctic where there are no trees.



Pileated woodpecker feeding chicks

Photo: Amanda Adams

Woodpeckers and Aspen

When Kathy Martin started her research on cavity-nesting vertebrates in interior British Columbia 17 years ago, it was immediately obvious to her that aspen, especially decayed trees, were a very important resource for cavity nesters. Although aspen comprised only 15% of the trees in her study sites, over 95% of the 4,850 nests of 32 species of cavity-using birds and mammals were found in aspen. In British Columbia, about 90% of secondary cavity nesters use excavated cavities, with the rest in decay-formed holes. The northern flicker is the most important of the 10 excavating species at Kathy's sites because it is abundant and produces many medium to large-sized cavities that can be used by species ranging from bluebirds and swallows to squirrels and ducks. The less abundant pileated woodpecker provides large long-lasting cavities for owls, kestrels, goldeneye, pine marten, and fisher. Woodpeckers prefer to excavate cavities in trees that are still alive but unhealthy with some internal decay or damage, but aspen that are recently dead and those with advanced decay are frequently used. To support cavity-dependent wildlife communities, it is important to keep aspen in a range of conditions, especially live unhealthy aspen (hard trees with soft spots of decay) and dead trees.

Woodpecker Legacies

Woodpeckers can produce several cavities annually but use each cavity only once for nesting. Since tree cavities can last for 10 to 15 years or longer, these cavities are available for over 30 other species to use. Kathy Martin's research group followed the lives of tree cavities and found that a cavity over its lifetime may be used by such different species as flickers, red squirrels, northern flying squirrels, saw-whet owls, kestrels, tree swallows, chickadees, and several duck species. One cavity was used 17 times in 13 years (cavi-



Male northern flicker

Photo: Jenny McDonnell

ties can be re-used sequentially in the same year). In North America, woodpeckers are often considered to be a keystone species or an ecosystem architect because they form high quality tree cavities that are suitable for use by many cavity-using vertebrates. Kathy's research group discovered that woodpeckers are excellent indicators of biodiversity as forest stands with many woodpeckers generally also have high avian biodiversity.

Decay Legacies

Kathy and her research group have also looked at the use of excavated and non-excavated cavities and at cavity persistence across continents. They found striking differences among regions. In North America, woodpeckers were responsible for a large proportion of functional cavities, and both excavated and decay-formed cavities had a similar lifespan. In South America, there are many cavity-using birds and mammals, including very colourful species such as toucans and parrots. In Argentina, about 80% of the non-excavating cavity users nested in decay-formed cavities, despite the presence of many woodpecker species. This extensive use of decay-formed cavities was found in South America, Europe, Asia, and Australia. In contrast to North America, decay-formed cavities elsewhere persisted much longer

than the woodpecker cavities. But decay is a very slow process. Trees can be 100 years old before decay processes are advanced enough to form cavities and are usually several centuries old before a number of suitable cavities are formed. Thus, wildlife species using decay-formed cavities are relying on large old living trees, but these valuable cavity trees are also targeted for harvest in South America and across much of the tropics. Kathy Martin's results suggest that excavating species may be able to ameliorate some impacts of tree harvest on cavity-using species in North America, but that this approach will not work so well in other regions.

High quality cavities are limiting in almost all ecosystems and this research supports the need to ensure an ongoing supply of tree cavities for cavity-using wildlife. In North America, management for woodpecker friendly forests is required, and this involves retaining as much aspen as possible in a range of live and dead, mid-aged and older trees. The majority of cavity-using species live in South America and other continents, and here large old trees, in which decay-created cavities are found, need to be retained to support these complex wildlife communities.

For further information contact Dr Kathy Martin at kathy.martin@ubc.ca or kathy.martin@ec.gc.ca

Breeding without breeding – the rest of the story



Totem Field research plot, UBC

TRADITIONAL BREEDING is tied to the generation of new genetic combinations following sexual reproduction and the selection of desirable individuals after their phenotypic evaluation. This process is the hallmark of most, if not all, domesticated plant and animal species breeding, delivering outstanding results that have kept pace with the increasing demands of population growth. Although this process appears to be the same for most species, aspects of biology and amenability to breeding differences have created a multitude of subtle modifications, only noticeable to

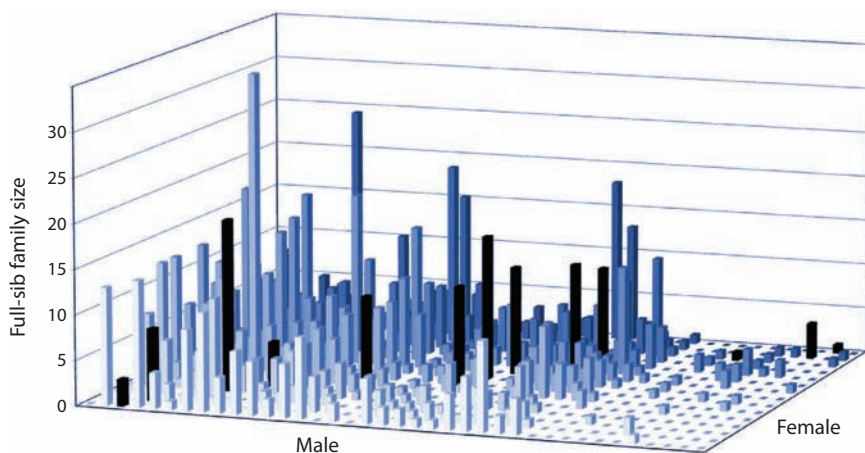
specialists. Trees, for example, have their own challenges related to their large size, long generation span and the vast areas needed for their evaluation and deployment. The “wild state” of trees has provided a treasure of variability that has not been matched by any other organisms.

Dr Yousry El-Kassaby (NSERC Senior Chair in Forest Genetics and Biotechnology, Department of Forest Sciences) introduced the concept of “breeding without breeding” in a BranchLines article 4 years ago (Vol 18#2, September 2007). In this article, Yousry made the claim that breeding without breeding

(BwB) will increase the efficiency of tree breeding and will represent a significant deviation from the long-term resource-demanding classical “breeding/testing/selection” cycle. Simply, BwB by-passes the breeding phase (no need to control matings or crosses) and utilizes DNA fingerprinting techniques and paternity assignment methods to reconstruct natural matings. These assembled individuals form a network of half- and full-sib families (see figure below left) permitting the use of advanced quantitative genetics analyses. Ultimately each individual’s and parent’s genetic worth is determined with a high degree of accuracy.

This concept was empirically tested and the results, surprisingly, exceeded initial expectations. The experiment was based on wind-pollinated seed collected from 15 seed-donors representing a small subset of a 41-parent western larch population. The seeds were used to produce seedlings for testing and were planted in UBC’s Totem Field research plot on the university campus.

The test was comprised of 6,000 individuals with known maternal parents. A subset of 1,500 individuals was fingerprinted using DNA genetic mark-



Pedigree reconstruction results showing the formation of full-sib families nested within the maternal and paternal half-sib families (from El-Kassaby et al 2011 PLoS ONE 6(10): e25737)

ers and their respective pollen-donors were determined. Yousry was surprised to note that the un-sampled parents (41-15 = 26 parents) were represented in the offspring after pedigree reconstruction (figure page 16). A novel quantitative genetics analysis was used to concurrently include the two pedigree groups (those with

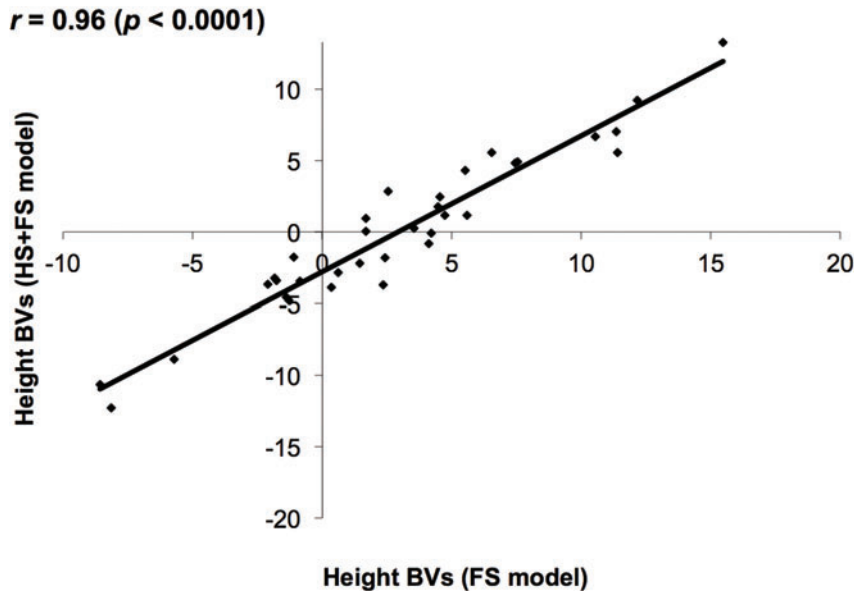
known maternal and paternal parents (full-sibs) and those with only known maternal parents (half-sibs)). When the genetic worth of the parents (first figure below) and offspring (second figure below) were compared to that from the “traditional” test (ie, full-sib), both analyses produced identical results. The proposed BwB

was superior for several reasons: 1) it is a crossing-free approach to breeding, 2) it is applicable to experimental and natural populations, 3) it required a simplistic field experimental design, 4) it is a method for a mating scheme assembly that only requires paternity assignment of offspring from a subset of female parents while the remaining parents are captured through their pollen contribution (ie, paternal half-sib families), 5) it represents a compendium of innovative quantitative genetics analyses that combine the use of offspring with complete and incomplete pedigrees, and 6) BwB is more informative than the “ideal” full-sib families (complete pedigree) for evaluating a larger sample size with improved accuracy and precision (1,500 vs 6,000 individuals).

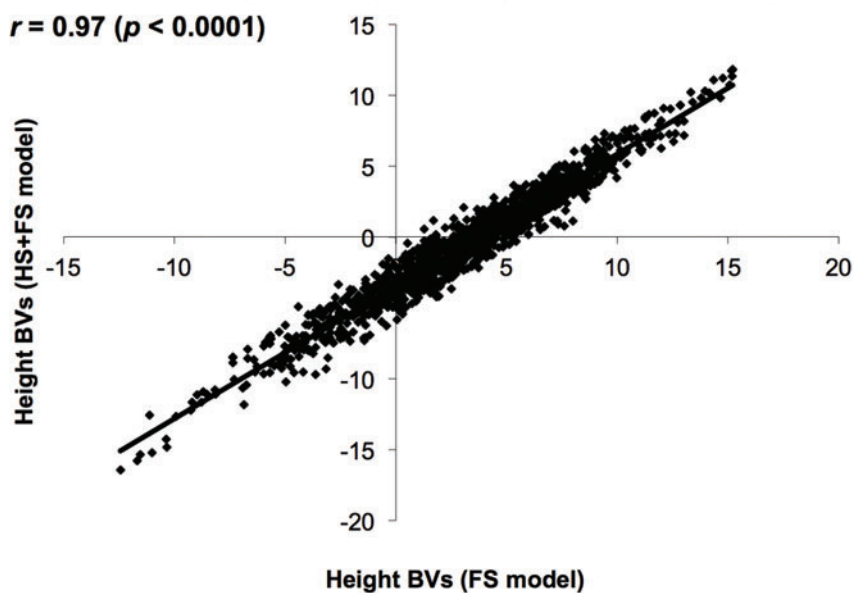
The simplicity and applicability of this method is evident from its successful implementation in the Czech Republic. The method is also under consideration by the Tree Improvement Branch of British Columbia’s Ministry of Forests, Lands and Natural Resource Operations as well as agencies in the USA, Thailand, Sweden, Norway, Denmark, France and Greece.

At present, two new BwB approaches are under development. One approach that incorporates genomics information was presented at the recent IUFRO conference on Restoring Forests: Advances in Techniques and Theory (held in Madrid, Spain). The second approach does not require pedigree reconstruction and is under development with colleagues from the Czech University of Life Sciences.

For further information contact Dr Yousry El-Kassaby at y.el-kassaby@ubc.ca. This work is supported by an NSERC Discovery Grant.



Correlation of parents’ predicted breeding values between the traditional complete full-sib (FS) and the proposed BwB combination of half- and full-sib (HS+FS) (note the different in precision represented by the degree of points dispersal between the two analyses) (from El-Kassaby et al, 2011 PLoS ONE 6(10): e25737)



Correlation of offspring’s predicted breeding values between the traditional complete full-sib (FS) and the proposed BwB combination of half- and full-sib (HS+FS) (note the different in precision represented by the degree of points dispersal between the two analyses) (from El-Kassaby et al, 2011 PLoS ONE 6(10): e25737)

Indigenous perspectives on climate change adaptation

THE PROFOUND interrelationships between people, places and livelihoods have integral cultural values for many indigenous people as they adapt and cope with changes in the climate and broader environment. Knowledge of the land, cultural practices/traditions and languages aid Aboriginal communities throughout British Columbia and across Canada to achieve resilience over time – having dynamic, responsive capacities for fostering healthy development, interaction and adaptation in the face of a challenge or crisis at the individual and group (or community) levels.

The South Selkirks Climate Change Study has been considering Aboriginal viewpoints about climate change to be as valuable, informative and relevant as existing western science approaches in understanding climate change adaptation in the region. Dr Natasha Caverley has reviewed existing literature and conducted in-depth semi-structured interviews with thirteen Aboriginal Knowledge Keepers about their perspectives of climate change. Her research framework centered on the research team's three Resiliency Dimensions – economic, ecological, and human; and on the role of positive psychology in identifying optimal characteristics for humans to thrive in sub-optimal conditions and maintain equilibrium despite economic, ecological and social disturbances. Positive psychology involves a shift away from what is wrong with people (eg, dysfunction, illness) to what is right with people (eg, strengths and

well-being) – focusing on optimal human behaviours and social functioning, often described by terms such as thriving, flourishing or resilience.

Natasha found that respondents are continually examining the pros and cons of climate change adapta-

nections to the land (including loss of traditional knowledge), survival methods, sustenance and biodiversity in the region that are integral to monitoring and adapting to changing climates.

Respondents felt that climate change is a natural process; however, human activity is accelerating the speed and intensity of the change. Major vulnerabilities included land development and overpopulation, logging, extreme weather events, water quality and wildlife changes. Respondents felt that the future of the Aboriginal peoples in the region lies in the wisdom of Elders and Knowledge Keepers, the revitalization and sharing of culture, traditional knowledge and language and youth engagement. In particular, adaptation strategies cannot simply move Aboriginal people away from their communities due to climate change-effects in the area, thereby distancing citizens from their ancestral linkages to the region. Instead, climate change initiatives must consider approaches that bring together social, cultural, economic and ecological interests in relation to climate change.

Aboriginal peoples in the region are adapting harvesting patterns and travel routes to mitigate the effects of the changing environment. They are adjusting their harvesting and hunting schedules and routes to maintain sustainable practices taught to them by Elders, Knowledge Keepers and legends (traditional historical stories about cultural values and beliefs). Weaving and integration of traditional knowledge with western



Respondents felt that

the future of the Aboriginal peoples in the region lies in the wisdom of Elders and Knowledge Keepers, the revitalization and sharing of culture, traditional knowledge and language and youth engagement.”

tion strategies in terms of trade-offs in advancing Aboriginal interests in the context of self-governed and self-sustaining communities, now and in the future. Five major themes emerged from the in-depth interviews.

Respondents expressed a dilemma that certain economic development initiatives that are threatening the regional environment also allow Aboriginal groups to generate revenue at the individual citizen level that will promote self-sufficiency. Due to the interrelationships between the people, the land and its natural resources, there is a risk of gradual loss of traditional languages, social and cultural con-



science are new coping strategies for Aboriginal people in the region – patiently and respectfully waiting for game to arrive, waiting for the weather to improve, and integrating indigenous and western sciences and technologies to more effectively adapt to changing climates. Respondents felt an overwhelming sense of connection and sense of place that influence their personal and cultural identity. Sense of place for respondents represented a deep connection to cultural and spiritual values that sustain them as individuals and as Peoples.

Key strategies centered on renewable energy (eg, solar and geothermal); awareness and education on climate change; enhancement of social networks and dialogue; full participation and engagement in climate change adaptation decision-making; recognition and integration of language, cultural and localized knowledge in climate change processes; utilization of community forests and conservation forestry practices; implementation of ecological restoration; growth or purchase of local foods, products and services; and continuation of ecological monitoring and climate change adaptation specific to the region.

At first glance, these themes may not seem to be directly related to climate change. However, climate change adaptation is a priority for Aboriginal peoples. As climate change research, debate and decision-making continue in BC and abroad, studies such as Natasha's analysis remind us of the continued importance to respect, recognize and hear from Aboriginal communities to gain innovative, indigenous and integrated approaches to understanding our climate, forests and broader ecosystems.

For more information about the South Selkirks Climate Change Research Study, please contact Dr John Innes at john.innes@ubc.ca or Dr Natasha Caverley at natasha@turtleislandconsulting.ca

Innovative communication of science for graduate students

Why isn't our research being considered? If you are an academic and feeling frustrated by political and public inaction over issues such as climate change, food security, forest degradation, loss of biodiversity, you are not alone! Our science clearly has not motivated positive social changes to influence the global environmental agenda. Why? Our communication methods are partly to blame – we have not embraced the communication revolution that has the

potential to alter global behaviour for the better. We do not need to look very far to see how effective we have been. Do we know what our colleagues or fellow students down the hall are working on? It is no wonder that our scientific discoveries about the living world are not communicated – not just among ourselves but to the non-scientific community. Does our scientific research reach the public, and thus inform them of our changing and evolving under-

standing of the values of nature? Does it provide strong incentives to better treat our world's ecosystems? And even more concerning is that scientific research does not often play a significant role in political decisions. These seemingly simple but important questions motivated Drs Julia Dordel, Maja Krzic, and Suzanne Simard to take action. Their infectious enthusiasm brought together a team of academics and non-academic collaborators and a successful proposal to the Canadian Natural Science and Engineering Research Council (NSERC), which led to the creation of TerreWEB, an innovative graduate training program.

To enhance graduate student training focused on global change and terrestrial ecosystems research, the group of UBC scientists led by Dr Suzanne Simard received a six-year NSERC CREATE grant to incorporate state-of-the-art communications and social science research in global change research. The goal of TerreWEB (Terrestrial Research on Ecosystems & Worldwide Education and Broadcast) program (www.terreweb.ubc.ca) is to establish an enriched, interdisciplinary and collaborative graduate training program focused on global change impacts on terrestrial ecosystems, mitigation and adaptation strategies, and the role of scientific communication to effect appropriate changes



Photo: Mike Mander



TerreWEB focuses on training students to become better communicators of their global change research, using multimedia. TerreWEB members, including the program PI Dr Suzanne Simard, are collaborating with multimedia experts from the UBC Centre for Teaching, Learning and Technology

Photo: Maja Krzic

in human behaviour for dealing with global change. The program will train masters and doctoral students from various backgrounds to become better communicators of their global change research using TV, film, internet, mobile applications and more, in order to benefit the general public and contribute to a “greener future”. This innovative program includes researchers from UBC’s Faculties of Land and Food Systems, Forestry, Arts, Science, and Education, as well as the Centre for Teaching, Learning and Technology. The principal co-applicants come from Forest Sciences, Botany, Geography, Soil and Biometeorology, Microbiology and Immunology, Theatre and Film, the Institute for Resources Environment and Sustainability, the School of Community and Regional Planning, and the School of Journalism.

Training of TerreWEB graduate students will proceed through research projects on global change and communication research

based on workshops, the development of new courses and laboratory and internships with collaborating institutions in Canada and abroad. The TerreWEB program will allow students to develop a broad network of contacts with industry, governmental- and non-governmental organizations, educational institutions, and academia worldwide. TerreWEB students will work closely with the non-academic and international academic sectors to embark on several mandatory exchanges and internships to allow them to explore possible career pathways as well as gain those crucial connections to increase their competitiveness for global change-related positions. In addition, TerreWEB will also initiate two new graduate courses that integrate ecosystems science with human behavioural and communication sciences, as well as professional workshops and a seminar series open to the entire UBC community. Since global change

is of interest to us all, TerreWEB is all-inclusive, thus graduate students and their supervisors with research focussing on terrestrial ecosystems and communication of their research findings are invited to become a part of TerreWEB.

TerreWEB also collaborates closely with two other NSERC CREATE programs at UBC, namely BRITE (Biodiversity Research: Integrative Training & Education) and WoW (Working on Walls – biosynthesis of plant cell walls and the practical implications of cell wall research). The three CREATE programs will be sponsoring collaborative workshops that focus on scientific filmmaking and media workshops for graduate students, including teaching and marketing strategies for global change science research.

For more information, please check out www.terreweb.ubc.ca or contact Dr Julia Dordel (TerreWEB Program Coordination and Liaison) at Terre.WEB@ubc.ca

development & alumni news

We are pleased to announce 3 new members of the Faculty's Development and Alumni team in this issue of BranchLines. We look forward to continuing to reach out to alumni, industry, members of the profession and friends of the Fac-

ulty with impactful opportunities to connect, engage and donate to the Faculty. In this section you will find stories that share how some of our alumni and friends of the Faculty are already making a difference by joining forces with UBC Forestry.

We welcome your feedback, ideas and queries, and encourage you to get in touch.

Emma Starritt

Director of Development
emma.starritt@ubc.ca

development news

New staff contacts



At the end of October, **Janna Kellett** joined the Faculty as our new Development Coordinator. Her past experience includes working in development and as a project manager for a local non-profit. Janna is very excited to join

Forestry at this momentous time as we launch our Start an Evolution campaign. Janna looks forward to meeting alumni, donors and friends of the Faculty. She can be reached at janna.kellett@ubc.ca or 604.827.3082.

In November, **Deepti Mathew Iype** joined the Faculty as our new Development Officer. Deepti has been working in the environment and climate-change education field focusing on raising awareness of environmental issues through educational and community outreach initiatives, most recently with the World Wildlife Fund in

India. While at WWF, she developed partnerships with key stakeholders, including government, schools, communities and donors. Deepti looks forward to helping the Faculty reach its goals and to meeting the alumni, donors and friends of the Faculty. She can be reached at deepti.mathewiype@ubc.ca or 604.822.0898.



Faculty of Forestry **starts an evolution**

ON SEPTEMBER 28th UBC launched the most ambitious fundraising and alumni engagement campaign in Canadian university history. Its twin goals are to raise \$1.5 billion in support of student learning, research and community engagement, and to double the number of alumni who are participating in the life of the University.

The campaign theme, start an evolution, captures the spirit of this extraordinary endeavour. UBC generates ideas that start evolutions. Ideas that change the way people think and the way the world works. We see this change as an evolution, one that improves upon what has come before and inspires the generations that follow.

In the Faculty of Forestry we are embracing the start an evolution campaign in a variety of ways, creating opportunities for you to combine your energy with ours to create lasting change. The Faculty is well-positioned to play a major leadership role globally, but to do this effectively we need to improve our programs and services.

start an evolution

As a truly interdisciplinary Faculty, we want to be the nexus for ideas about forests and their goods and services; a place where ideas are turned into actions that benefit forests, the people who depend on forests, and all of humanity. There are huge opportunities open to us. You can help start an evolution through

involvement and investment. This can be as simple as reconnecting with the Faculty or as generous as making a donation. If there is an idea that keeps you up at night, a passion that inspires you, or a problem that needs a comprehensive solution, you will find the resources at the Faculty of Forestry to address it. Consider

combining your energies with ours for meaningful change.

For more information, please contact Emma Starritt, Director of Development, at 604.822.8716 or emma.starritt@ubc.ca. Look for campaign updates in future issues of BranchLines and on the web at www.startanevolution.ca

Private foundation supports student work experiences

AN UNDERGRADUATE student gaining valuable GIS experience and a graduate student researching the forest/community interface are two of the Forestry students benefitting from private foundation support of co-op work terms and internships at UBC's Research Forests. This newly established private foundation gift has already supported work term and research opportunities for six undergraduate and three graduate students in our Malcolm Knapp, Alex Fraser and Aleza Lake research forests.

After **Jeremy Watkins** finished his third year in the Natural Resources Conservation (NRC) program in April 2011, he applied for a co-op work term at the Malcolm Knapp Research Forest. "The main reason I wanted this position was to learn more about GIS – Geographic Information Systems – so I could apply in the field what I had learned in the classroom," he says. "I also wanted the experience of working with a team of forestry professionals."

Jeremy so enjoyed his summer work experience that he decided to delay his return to UBC in the fall and continue working in the Research Forest instead. Working closely with Resident Forester Cheryl Power, he is doing silviculture surveys and prescriptions, as well as continuing and deepening his GIS experience. "GIS transfers very well to conservation and mod-

eling, so it will really help me in my NRC program," he says.

Teresa de la Fuente Diez completed her masters degree in Forests and Society in May 2011, then spent the summer researching the recreational use of the Malcolm Knapp Research Forest. "I developed and administered a questionnaire to community members to find out how they are using the forest now and what they would like to see in the future," she says. Originally from Spain, Teresa's love of nature and interest in the linkages between forest conservation and forest-dependent communities brought her to UBC. Once she completed her degree program, she started looking for practical experience. "This research opportunity was perfect for me," she says. "I got to do valuable work in a won-

derful place. I'm so grateful for the funding that made this possible."

Paul Lawson, Director of the UBC Research Forests, is also enthusiastic about the program and grateful for the financial support. "There are lots of job opportunities in industry, but they tend to be very focused and specific. These internships are ideal for students who want a broad range of work experience, and without the private foundation support we would not be able to offer them to our students," he says.

Thanks to the success of this program in 2011, the private foundation has renewed its commitment and will provide work and research opportunities for up to six undergraduate and three graduate students in 2012.



Student award captures alumnus' beliefs and hopes

LIKE MANY UBC Forestry alumni, Gary Kenwood firmly believes that "forests are everyone's heritage", and that young people are our future. Unlike many others, Gary and his wife Louise have acted on those beliefs with a gift to support undergraduate students.

Gary was raised in Maple Ridge BC, where he camped and hiked in Golden Ears Provincial Park throughout his youth. "I really loved the outdoors, so when it came time to go to university it felt natural to study forestry at UBC," he says. After graduating in 1961, Gary worked briefly for MacMillan Bloedel, then spent some time traveling in Europe. Upon returning to Vancouver he joined Reid, Collins and Associates, where he eventually became a partner. About the same time, he met Louise, then a nurse at Vancouver General Hospital, and they were married in 1968. (Gary is quick to note that they met through mutual friends, not in the ER.)

Now retired, Gary and Louise are doting grandparents, keen travellers and engaged volunteers. They have remained connected with UBC Forestry over the years, attending the Dean's annual alumni events and helping coordinate the 50th anniversary reunion of the Class of '61. "We've donated regularly to Forestry and other UBC Faculties," Gary says, "but we were looking to make a gift that would be more personal and meaningful to us." Louise adds, "We were both taught growing up that it's important to give back in support of your community. "Treaty negotiations and court rulings in BC suggest to us that Aboriginal people will and should be more directly involved in all aspects of resource use and management, and forests are an

important part of their heritage," Gary explains. Louise notes, "When the Faculty suggested there was a need for specific support of Aboriginal students studying forestry, we jumped on it."

The Gary and Louise Kenwood Forestry Award for undergraduate students will be given first and foremost to Aboriginal students, but if there are none eligible in a given year it will be awarded to students with a demonstrated interest in Aboriginal issues. The first award will be given in September 2012. "It's not a scholarship; it's an award for well-rounded students," Gary

stresses. "We want to support students who are doing well academically but who also are involved in all aspects of their community."

A recent visit to Haida Gwaii reinforced Gary and Louise's decision to establish the award. "Support needs to go to young people who we believe will impact the future of their forest resources," Gary says. Louise adds, "We were so impressed with the young Haida people and their understanding of the importance of retaining their cultural heritage that we knew our decision to support students in this area was the right one."



Gary and Louise Kenwood in SGang Gwaay, Haida Gwaii, summer 2011

alumni news

New staff contact



This past October, **Caely-Ann McNabb** joined the Faculty of Forestry Dean's Office as Alumni Relations Manager, a role which she'll fill for the next year while Jenna McCann is on maternity leave. Caely-Ann comes to the Faculty from the UBC Alumni Affairs Office where she focused on regional and

affinity alumni programs, events and volunteers. Caely-Ann looks forward to working exclusively with Forestry alumni and would love to hear from you about your alumni experiences or to share any ideas you may have. She can be reached at 604.822.8787 or caely-ann.mcnabb@ubc.ca.

Reunions and events

The Forestry Class of 1961 celebrated its 50th anniversary reunion this past September. Twenty-six alumni plus their guests came from all over BC and as far away as New York and Manitoba to reunite for two days of celebrations. The alumni were pleased to welcome their former Professor and Dean, Dr Bob Kennedy, and his wife and to read a letter of congratulations from the only other surviving professor from their time at UBC Forestry, Dr Jack Ker, who was unable to make the trip from his home in New Brunswick.

The reunion kicked off with a tour of the Malcolm Knapp Research Forest near Maple Ridge, BC. The day included lunch in the Koerner Centre with Cheryl Power, Resident Forester, and a tour of the other Loon Lake facilities, substantially changed since the Class of '61 Spring Camp!



The next day was a busy one with a visit to UBC's Point Grey Campus. The group enjoyed a tour of the Forest Sciences Centre, a walk across campus to Sage Bistro to join Dean John Innes for lunch, and concluded with a visit to the Museum of Anthropology. Seeing how much the campus has changed over the past 50 years, seeing students enjoying the day

between classes and walking by the old F&G building where most of the Forestry courses used to take place were all highlights.

It was a memorable two days for all attendees and a big thank you goes out to the Class of '61 Organizing Committee for all of their work in planning the reunion and making it enjoyable for their fellow alumni.

An organizing committee has volunteered to start planning the Class of 1962's 50th reunion in 2012. Keep an eye out for your invitation! Will your class be celebrating a milestone reunion in 2012? Contact Caely-Ann McNabb at 604.822.8787 for assistance with planning or to find out if a reunion organizer has already stepped forward for your year.

Mark your calendars for the following events:

- Jan 24, 2012 – UBC Dialogues: North Shore, Kay Meek Centre - Body image: Is fat all in our heads?
- Feb 7, 2012 – UBC Dialogues: Surrey, Surrey Arts Centre – Fountain of youth: How do we live longer, and better?
- Feb 24, 2012 – UBC Forestry Alumni Breakfast at the ABCFP Conference – Victoria, BC
- Mar 1, 2012 – UBC Dialogues: Coquitlam, Evergreen Cultural Centre - Sustainability: Are you seeing red in the push to "go green"?

More information on these events and others can be found at www.forestry.ubc.ca/alum

Alumni in action

One of the common questions raised by alumni is 'What happened to my classmates after graduation?' Our students wonder 'What can I do with my degree?' To answer both of these questions, this column features stories from our alumni, highlighting the various career paths our graduates have followed.



Natalie Swift, BSc'10

What year did you graduate and from which program?

I graduated in 2010 with a Bachelor of Science in Natural Resources Conservation and a Major in Global Perspectives.

Where did you grow up?

I was born in Bath, England but spent most of my childhood in Peterborough, Ontario.

Why did you choose UBC Forestry?

Well, it was a bit of an accident

really or maybe just good luck! As a college student in Ontario, I had to complete an assignment that required me to compare and evaluate the sustainability policies of various institutions. One of the institutions I chose to review was the University of British Columbia. Throughout the process, I stumbled upon a number of initiatives and courses related to sustainability; the UBC Farm, SEEDS, the Sustainability Office and the Natural Resources Conservation program (NRC) in the Faculty of Forestry.

At the time, I was thinking about pursuing further education in international sustainability policy and when I came across the conservation program at UBC, I knew it was the right program for me.

What was your first job after graduation (related or not to your degree)?

The summer before starting at UBC, I worked as a Forest Technician with a forestry consulting firm in North Vancouver. As a student, I worked for the firm each summer and continued working for it after graduation.

What are you doing now and how did you end up there?

I am currently working as a Forest Technician for a contractor in Quesnel, British Columbia. After working at the consulting firm post-graduation, I took a contract position as a pre-commercial thinning supervisor in New Brunswick to be closer to family. Upon completion of the contract and further work with the consulting firm, I travelled to the Ecuadorian Andes to work as a Forest Research and Communications Assistant for a conservation group that I was exposed to during the "international component" of my degree. While in Ecuador, I had the opportunity to attend a hydrology workshop hosted by local researchers, assist in hydrological field-data collection and to compile a hydrology database for the organization I was working for. Low and behold, I discovered I have a passion for high-elevation tropical forest hydrology! Now I'm hunkering down for the winter, working in a part of the province I absolutely adore (the Cariboo), reading about forest hydrology and applying to graduate school!

What is your fondest memory of your time at UBC?

Difficult question! My mind is immediately flooded with fond memories of various events hosted by the Forestry Undergraduate Society (FUS) and I would have a hard time picking any particular one to highlight. At the end of the day, I'd have to say it was the opportunity to be a part of such a tight-knit community of laid-back, like-minded, thoughtful, adventurous, slightly quirky but completely endearing "forestry folk".

If you weren't working where you are now what profession would you most like to try?

I've always wanted to make a living as an artist but feel that I would lose my creativity if it was my day-job. So now I work in the woods, where I am continuously inspired, and paint when I can.

What is the toughest business or professional decision you've had to make?

I don't think I can select any particular decision as being the "toughest" decision I've had to make. With that said, I do find it

consistently difficult whenever I reach a cross-road between pursuing my dreams and settling down to the status-quo. At times, the comfort and predictability of the status-quo is tempting, but I know I'll never be happy if I don't make a few sacrifices and pursue what I love. I'm happy to report that I do what I love.

What do you aspire to 10 years from now? (personally and/or professionally)

Ten years from now I aspire to be living my childhood dream and, luckily, with my current and continuing education and a little perseverance, I'm confident I will be. As a child, I adored the National Geographic and day-dreamed about what it would be like to have my research featured in the magazine. I even envisioned the photo that would one day appear: me, with my hair a little frazzled from a long day in the field, up late at night, sitting in a canvas tent in the jungle, crunching numbers from a day of data collecting with, of course, monkeys hanging around in the trees outside.

I no longer care about being in the National Geographic but my work in Canada, and especially Ecuador, makes me feel like I'm staying true to my childhood dream.

Do you have any advice for students considering enrolling in forestry?

First, throw out any pre-conceived notions of what you think "forestry" is. Prior to attending UBC, I would never, NEVER have thought I would find myself working in forestry. I thought forestry was only about logging and that foresters were the opposite of nature loving. Of course, my previously-held beliefs are far from true. The UBC Faculty of Forestry is full of excellent professors conducting research and teaching about topics such as: fungi, energy policy, wildlife, globalization and sustainability, genetics, hydrology, ecology, etc.

Second, if you're a tree-hugger like me, don't shy away from taking a forest operations course or working in the BC forest industry. The things you will learn will be invaluable.

Making a difference

Mitch Wilson, BSF'10

Forestry Alumnus Mitch Wilson has been hard at work since graduating from UBC. Using connections he made in Mahenge, Tanzania, while he was there as part of his Forestry degree, Mitch is now working with the local government and its forestry department to start a community tree nursery. The goal for the Ulanga District Tree Nursery is to supply 100,000 tree seedlings each year to the community for

planting in an area that has a high level of deforestation. The Ulanga District Tree Nursery is currently looking for volunteers to help promote the project. If you are interested in learning more about this opportunity, please email Mitch at mitch@udtn.org. More information on the Ulanga District Tree Nursery can be found online at www.udtn.org or on its Facebook page at www.facebook.com/UlangaTree

Do you have a story you'd like to share?

Do you know the whereabouts of any Lost in the Woods alumni? (list can be found at www.forestry.ubc.ca/alum)

Have you moved recently and/or would like to get the monthly Alumni e-newsletter?

Contact Caely-Ann McNabb at caely-ann.mcnabb@ubc.ca or 604.822.8787



New Master of Sustainable Forest Management degree

Traditionally, most professional foresters completed undergraduate degrees in forestry. With the broadening of undergraduate programs in environmental sciences, graduates with allied sciences degrees are finding employment in forest land management but without a solid foundation in the ecology, growth, conservation, economics and management of forested lands. Our new Master of Sustainable Forest Management degree is a one-year course-based program that provides students with opportunities for advanced scholarship and professional growth in natural resource management principles and practice. The program is designed for individuals with undergraduate degrees in forest sciences, conservation, ecology, physical geography, environmental sciences or other allied disciplines. It prepares students for careers as forestry professionals in temperate forests in North America and overseas, and sets the stage for life-long learning.

The major components of this program are:

- Tree and stand dynamics
- Forest to landscape: structure and function
- Forest management
- Economics and administration of forestry
- Leadership skills: communication and critical reasoning
- Information acquisition and analysis
- Professionalism and ethics.

For their integrative capstone project, students will work in teams to design site- and forest-level plans. This will involve working with clients to develop management plans for woodlots, community forests, and conservation areas. During the program students will visit the University Research Forests and rural communities, giving them an opportunity to learn about old-growth and managed forest ecology, indigenous rights, and life in resource-dependent communities.

Pre-applications to this new program must be made prior to February 20, 2012 for the August 2012 program start date. For more information please visit www.forestry.ubc.ca/grad or email mfm.program@ubc.ca

**University of British Columbia
Faculty of Forestry
Master of Sustainable Forest Management**



For more information:
www.forestry.ubc.ca/grad
mfm.program@ubc.ca



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