

branchlines

Volume 22#2 2011



Forestry
University of British Columbia

dean's message



Redefining forestry

In this issue of Branchlines, we continue to report on some of our activities while providing information about the diverse research being undertaken within the Faculty of Forestry. A persistent theme is the breadth of the discipline known simply as “forestry”. While some forests have been managed for thousands of years, forestry became a scientific discipline more recently. Forestry, in the narrowest sense of the discipline, emerged in the early 18th century. At that time, it was concerned with the sustainable yield of timber for mines and other strategic purposes.

While many people still associate forestry with the harvesting of timber, the discipline is now much broader, as is evident from the articles published in Branchlines. It encompasses all aspects of the ecology, stewardship and use of forests and forested ecosystems, and extends to the use of the products derived from forests and the links between forests and human livelihoods. However, it goes even further as the skills that people working in what we know as forestry have gained can be applied in many different situations, especially those related to environmental sustainability.

In this issue, we depart from previous practice by including an article by one of our Forestry Advisory Council members, David Gandossi. I asked David to contribute a piece because his company, Mercer International Inc, provides a great example of the sorts of

changes that many forestry companies will need to adopt if they are to compete successfully in the 21st century. Just as we are adapting to the changing research and education environment, so Mercer is adapting to the changing business environment. Their success during a difficult period for the sector as a whole provides an example of why the expansion of our interests to new areas is so important.

Two articles in this issue deal with projects being undertaken in Africa, more by coincidence than design. There is also an article examining climate change impacts in the high Arctic. These might at first sight seem surprising topics for the Faculty of Forestry at UBC. However, they reflect the broadening of our interests, and also the fact that our skills are in demand globally, and not just in places dominated by trees. This is a trend that I am keen to encourage, while not losing sight of the strong need to work also on issues of concern to British Columbians.

As another example of the breadth of what is covered within the Faculty, Scott Hinch has provided a description of the work that he and his group are doing with the sockeye salmon of the Fraser River. Some of this cutting edge research has been published in the prestigious journal *Science*, and will form an important part of the evidence being considered by the Cohen Inquiry into the decline of Fraser River sockeye.

A handwritten signature in blue ink, which appears to read "John L. Innes". The signature is stylized and cursive.

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

Conservation students compete for Project Borneo 3D



Olivia Sanchez from Mexico City and Kirsten Falkenburger from Ontario are two very passionate students in our Natural Resources Conservation program. They are

committed to making a difference through DeforestACTION, a global initiative that supports conservation through the engagement of youth in the decisions made

about forests. Olivia and Kirsten are currently participating in a competition to become 2 of the 10 selected project leaders that will be headed for the island of Borneo, Indonesia, for 100 days to film a 3D nature documentary about deforestation and orangutans, Project Borneo 3D: An Action Movie. Out of 231 entries from 26 countries, Olivia and Kirsten are in the top-50 finalists.

Project Borneo 3D was developed to help save endangered rainforest and orangutans, create awareness about the destruction caused by deforestation, restore a full forest ecosystem and provide a sustainable livelihood for the local communities. The project will also create the world's largest and most technology rich orangutan sanctuary on earth.

Olivia and Kirsten aim to raise as much awareness as possible around the issues involving deforestation in Indonesia and around the world, but most importantly to prompt us to take action and do something about these issues. Should they become a part of this incredible project they will be communicating with the rest of the world through videos, pictures and blogs how the work is progressing and how the problems that they encounter are resolved – a true action agent story!

For further information visit dfa.tigweb.org/hub/pinkink or dfa.tigweb.org/hub/kvfalks. We wish these two every success in the competition for selection as project leaders.

World Forestry Day

21st March 2011



Left to right: **Ashok Das**, Consul General of the Consulate of India in Vancouver, **Sarah Morgan-Silvester**, Chancellor of UBC, **Liang Shugen**, Consul General of the Consulate of the People's Republic of China in Vancouver, **Steve Thomson**, Minister of Forests, Lands and Natural Resource Operations for British Columbia, **John Innes**, Dean of the Faculty of Forestry, UBC

World Forestry Day has been celebrated annually around the globe for the past 40 years. Its purpose is to remind people of the importance of forests, and the tremendous benefits they provide.

This year (which is also the International Year of Forests) we celebrated with a tree planting event outside the Forest Sciences Centre on the UBC campus. The occasion at UBC also recognized the increasing international reach of both the UBC Faculty of Forestry and the province's forest industry. The special relationship

with Asia, in particular, was highlighted with the Consuls General of both China and India taking part in the ceremony. Steve Thomson, British Columbia's Minister of Forests, Lands and Natural Resource Operations, UBC chancellor Sarah Morgan-Silvester and Forestry dean John Innes were all part of the ceremony and reception that followed.

Thank you to McMillan LLP and alumnus Jeremy Shelford, BSF '02, for donating the *Davidia involucrata* for the planting ceremony.

Mid-career training India's Forest Service

We are continuing to provide top-level leaders of the Indian Forest Service with mid-career training through programs delivered jointly by the UBC Faculty of Forestry, BC Ministry of Forests, Lands and Natural Resource Operations, BC Ministry of Environment, and the Canadian Forest Service. So far, 3 groups of 30 participants per group have been introduced to the activities of the BC Forest Practices Board, Parks Canada, Ecotrust Canada, BC Community Forests Association, FORREX, Tsleil-Waututh Nation, Cowichan Tribes, District of North Cowichan, Municipality of Whistler, Vancouver Island University, Stanley Park Ecology Society, Cheakamus Community Forest, Squamish First Nation and many others. Two more groups of Indian Forest Service personnel will be visiting British Columbia and UBC Forestry this summer.

The purpose of these programs is to provide senior

Indian Forest Service officers with an increased knowledge of strategic planning, policy making and governance aspects of forest management. Each program starts in India with a one-week orientation involving 60 participants. Half of this group then travels to the US and the other half to British Columbia for an intensive two-week training program. The program concludes with a final week in India where participants share their experiences in both countries. The training programs are coordinated by a consortium consisting of the UBC Faculty of Forestry, the Maxwell School of Citizenship & Public Affairs at Syracuse University in New York, the Indian Institute of Management in Bangalore and the Indira Gandhi National Forest Academy in Dehradun.

For further information contact Jorma Neuvonen, director of special projects, at jorma.neuvonen@ubc.ca

Forestry Leaders Summit

Vancouver, Canada | April 2011

In celebration of the 2011 International Year of Forests, and in recognition of concerns about forestry education and research worldwide, senior representatives of education and research institutions, international organizations and students convened at the University of British Columbia for the Forestry Leaders Summit. The meeting focused on concerns about the need to improve the skill sets of forestry graduates in order for them to be able to effect forest policy decisions and the need for forestry research to be responsive to global forest policies. In particular, the meeting examined how better and more collaborative partnerships among education and dedicated research institutions could advance effective and more relevant forestry education and research for the benefit of society and attract even more students to international forestry.

Recommendations

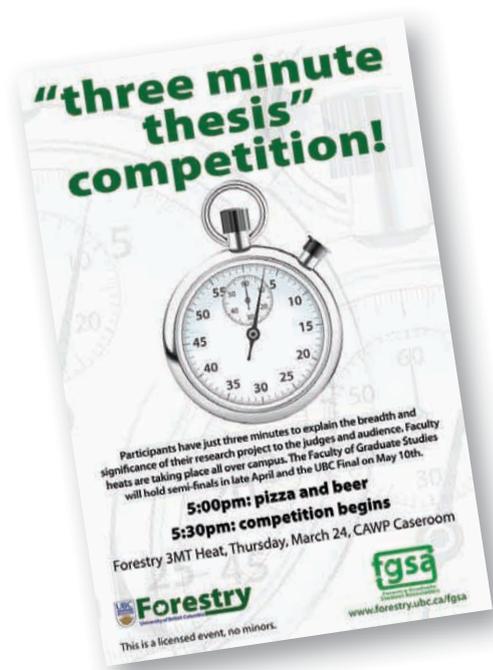
- 1 Engagement of forest researchers, educators and students is essential for improved forest policies, timely forestry research and relevant forestry education.
- 2 Scientists and policy makers should fully connect and collaborate in recognition of the different skill sets held by each group.
- 3 Forestry education and research needs to go beyond the 'forest sector' to include other disciplines and cover all related activities in the landscape. A solid component of forestry education should include the cultural and social aspects internationally.
- 4 Additional joint training and research partnerships are required between developing and developed countries. Existing and new partnerships should be encouraged in order to support greater interactions in this arena.

- 5 A 360° approach to sustainable forest management that emphasizes the power of cross-sectoral and cross-institutional perspectives should be emphasized.
- 6 There should be an expansion of the international "Community of Practice" of educators and practitioners who are using experiential approaches to connect the younger generation to agriculture, forests and nature.
- 7 There is a need to recognize, conceive and nurture new business models that will highlight the role of forests, forestry and forest products in sustainable development.
- 8 A global forum of forest deans and directors of forest research institutions should be created.
- 9 A special program for international forest internships (through for example, the UN system) should be developed.
- 10 In view of the shortage of skilled foresters worldwide, and the need to strengthen partnerships in forestry education and research, a strong statement of these concerns should be made at the Rio +20 Conference in 2012.
- 11 Forest education and research should be included in the forest finance discussions at the 2013 UNFF session. One percent of finances should be allocated to forestry education and research in order to help support global partnerships in forestry education and research. Furthermore, REDD + initiatives and programs should allocate 2 % to a capacity building fund dedicated to forestry education and research.

For further information contact Jorma Neuvonen, director of special projects, at jorma.neuvonen@ubc.ca



Three Minute Thesis competition



An 80,000 word thesis would take 9 hours to present. On March 24th, our graduate students were given just 3 minutes to explain the breadth and significance of their research to a “non-specialized” audience of their peers. The 3MT competition is an initiative of the University of Queensland that began in 2008. UBC is one of the first universities to host this competition in North America. We began with our own heat in March and then advanced our top three students to a campus wide semi-final in April. Fourteen of our students rose to the challenge and the calibre of presentation from each person was exceptional. Our finalists were: Carolina Chanis Morales talking about her research on straw as a potential biofuel; Chunling Liu talking about her research on photo-stabilization of wood and Colin Ferster who presented on his research involving mobile hand-held devices for remote sensing in forestry. Check the Faculty’s youtube link at <http://www.youtube.com/user/UBCForestry> for videos of our student presentations. The event was such a success that we will repeat it again next year with an open invitation for any of our readers to attend the evening presentations. Watch this newsletter or our website for an announcement next spring.

New appointments



On April 1st, 2011, **Dr Thomas Tannert** joined the Department of Wood Science (joint-appointed with the Department of Civil Engineering, Faculty of Applied Science) as a tenure-track Assistant Professor and Associate Chair in Wood Building Design and Construction. Thomas comes to us from the Bern University of Applied Sciences, Switzerland, where he was a Research Associate and Lecturer. His research and teaching interests revolve around the assessment and monitoring of wooden structures and the use of wood in building design. Thomas received his PhD from the University of British Columbia in Timber Engineering and his Masters in Wood Science and Technology from the University of Bio-Bio in Chile. He brings with him a wealth of expertise that is vital to our growing research activities in the areas of wood building design and construction. Thomas can be reached at thomas.tannert@ubc.ca



We are pleased to welcome **Emma Starritt** to the Faculty. Emma joins us as the new Director of Development, effective April 11th, 2011. Previously Emma was with the Faculty of Applied Science at UBC, Associate Director – Development, for seven years. Prior to that she was with the Vancouver Art Gallery, Corporate Development and Foundations Specialist. Emma joins us at an exciting time as we prepare to launch a fundraising and alumni engagement campaign that will strive to ensure the Faculty has the resources it needs to remain a world class forestry school well into the future. Emma looks forward to meeting the alumni, donors and friends of the Faculty. She can be reached at emma.starritt@ubc.ca or by phone at 604.822.8716.

Forestry Advisory Council

The Faculty's Forestry Advisory Council, first established in 1993, includes a membership of 28 senior representatives from industry, government, academia, environmental organizations, research groups, professional associations and First Nations. In this issue of Branchlines we are featuring profiles on 2 of our members and a member opinion piece (see page 8).

Profiles



Reid Carter is currently a Managing Partner with Brookfield Asset Management and President of Brookfield's Timberlands Investment Management Organization: Brookfield Timberlands Management GP Inc. In this role, Reid has led the acquisition of over 1 million hectares of private timberlands throughout North America and in Brazil and directs the teams responsible for all operational aspects of these businesses. Reid is also President and Chief Executive Officer of Acadian Timber Corp, a Canadian publicly traded company and the second largest publicly traded private timberlands in Canada. Reid is well known within the forest industry and investment community and has been a frequent guest speaker at major industry conferences. He has also served as Past Chair of the Forest Management Institute of British Columbia and Past-President of the Soil Science Society of British Columbia.

Reid graduated from UBC Forestry with a combined degree in biology and forestry. He also has a graduate degree in forest soils from UBC. He is a Registered Professional Forester in British Columbia and holds directorships with Selectseed Inc, Okanagan Specialty Fruits, Brookfield Infrastructure Investments Corporation, Island Timberlands GP Ltd and Acadian Timber Corp. Reid has served as a member of the Faculty of Forestry's Advisory Council since 2005. His many years of experience in the forest industry and investment community continue to be of great value as the Faculty seeks advice on aspects of education, research and funding.

Keith Atkinson is the CEO of the British Columbia First Nations Forestry Council (FNFC), a non-profit society working to support 203 First Nations communities in BC with their involvement in the forest sector. Over the past decade, First Nations involvement in forestry has grown to include over 12 million cubic meters of annual timber harvest rights. There have also been significant developments in partnerships with industry, capacity building in communities and policy changes including the development of a new form of forest tenure, the First Nations Woodlands License. The current focus of the FNFC is to support business development in forestry; provide a forest resource office to assist with community issues; and to advocate for continued policy changes that recognize and support First Nations values and principles.

Keith grew up in coastal communities of British Columbia and is a member of the Snuneymuxw First Nation. He graduated from the Faculty of Forestry at UBC in 1994 and developed his career as a Professional Forester through consulting forest management with an emphasis on First Nations participation in tenure opportunities. Since his graduation, Keith has maintained contact with the Faculty through his involvement with the Faculty's First Nations Council of Advisors. For the past three years Keith has also served as a member of the Faculty's Forestry Advisory Council. His commitment to First Nations community involvement in natural resources management and his ongoing dedication to forestry education make him a valuable member of the Faculty of Forestry's Advisory Council.

Our forest industry needs to change

by David Gandossi



Whether you believe it to be from climate change, technological advances, or improving global living standards, there is no denying it – the world is changing. If we want the Canadian forestry industry to benefit from this change, then so too must we change. We must look beyond our national and continental borders, and look around the world for new opportunities, technologies, and best practices. As an industry, we need to collaborate and forge new partnerships so we can continue to be innovative, develop new products and adopt new technologies that will reduce our environmental footprint and improve our productivity. This all must culminate in an increase in the value that we extract from our forests – not only by producing more lumber, pulp, or paper, but by optimizing the way we use these resources down to a molecular level and utilizing our natural resources in ways not yet envisioned. Those who are successful in transforming their operations to maximize the value they extract from our forests will reap the

lion's share of the benefits. Mercer International is a perfect example of a company that is leading the charge and adapting to these new global realities by striving to extract every bit of value from our forest resources.

Since 1999, Mercer has grown from a single pulp mill, producing 175,000 tonnes annually, to three world-class mills with annual capacity of about 1.5 million tonnes of high quality Northern Bleached Softwood Kraft (NBSK) pulp. We take the concept of utilizing all parts of a tree for their highest value end-use to a whole new level. Mercer focuses on taking northern softwood fibre that cannot be made into lumber and

“We need to do a better job of communicating the great career opportunities that exist in Forestry.”

fractionating it on a molecular level into bio-products including pulp, renewable bioenergy and biochemicals. All three of our mills are large net exporters of green electricity. That means that they all produce far more power than they consume during operations, and sell the excess to the local grids. In 2010 for example, Mercer's three mills co-generated over 1.4 million MWh of green electricity – enough to power nearly 130,000 average BC homes - and sold over 520,000 MWh to the local grids. Mercer aggressively employs cogenera-

tion, or combined heat and power (CHP), to provide thermal energy to our processes and to generate green electricity. This very efficient process drastically reduces the use of fossil fuels and the emission of GHGs, and extracts the maximum value from the forest resource. For perspective, if the pulp and paper industry in British Columbia produced only kraft pulp and generated power on a level equal to our Celgar mill, the BC Industry could produce 10 million MWh more electricity – enough to supply nearly 1 million BC homes – all without consuming any additional wood.

Another currently small, but developing part of our business involves the extraction and production of biochemicals. Wood has many components that can be synthesized into valuable chemicals and by-products. Mercer currently produces bio-turpentine, which among other things is used as a solvent and in the synthesis of organic compounds, and tall oil, which is used in products such as printing inks, paints, adhesives and bio fuels. We continuously participate in R&D initiatives with various partners to generate new ideas and evaluate emerging commercial opportunities. While bio-products represent the next stage of full forest utilization, a true industry transformation requires more than just forward thinking; it requires collaboration and cooperation between government, research and industry.

The Canadian government has made a concerted effort to promote innovation and improvement within the forest sector. Since 2009, the federal government has

implemented numerous programs worth over \$1.1 billion dollars in order to support the transformation of our industry so that we are better able to compete on the global stage. While these contributions are a great catalyst to set in motion the transformation of our industry, continued governmental support is necessary to continue this transformation, to foster production of new bio-products, and to create a solid foundation on which to build future economic success.

While we have some of the most talented industry personnel in the world, we are losing too many to retirement and other industries. We need to do a better job of communicating the great career opportunities that exist in forestry. There are many high paying jobs spanning many professions and skill sets with great careers for foresters, engineers, accountants, millwrights, electricians and other trades people. Beyond simply retaining our forestry talent, stronger connections between research and industry need to be forged, as the important research being

performed by universities and other organizations is often not fully utilized. If we are to achieve the transformative change that is

“ We need to attract the best and brightest minds through continued education, greater investments in research and development, and greater cooperation between industry and government.”

necessary to remain viable on the global stage, new partnerships that focus on new, viable technologies must be made. All stakeholders must engage with one another and work together in order to manage this change and effectively incorporate the new ideas and technologies into our processes. We need bright minds and fresh perspectives to continue to enter

the Canadian forestry industry to help drive this transformation and to leverage the natural resource strength of our great country for the betterment of everyone.

Forestry not only played a very important role in Canada's past, but has a very important economic and environmental role in Canada's future, one that is only starting to be defined and understood. We must keep our industry strong by staying actively engaged with government and other policymakers so that we have the support required to continue our transformation. We need to attract the best and brightest minds through continued education, greater investments in research and development, and greater cooperation between industry and government.

David Gandossi is Secretary, Executive Vice President and Chief Financial Officer of Mercer International Inc. He has been a member of the Forestry Advisory Council for the Faculty of Forestry at UBC for the past two years. David Gandossi can be reached at dgandossi@mercerint.com



Lumber production in an Interior mill

Exploring alternative production strategies for the coastal forest supply chain



A Chilean log yard

AS BRITISH COLUMBIA'S COASTAL forests change in structure from old growth to second growth stands, the composition of the harvest is also changing. Much of the second growth that is nearing maturity is relatively easy to access. These trees are more uniform, have fewer defects and are easier to process than old growth timber. Furthermore, harvesting second growth stands usually raises fewer environmental concerns than harvesting old growth. However, second growth wood lacks the unique high-quality properties of old growth and there are many competing suppliers of second growth timber in the marketplace.

In BC's forest-to-products supply chain, material flows are primarily focused on push marketing (production based on anticipated demand) of price-sensitive commodity prod-

ucts. However, long lead times make it difficult to control inventory levels throughout the supply chain. Other factors such as uncertain raw material supplies, variation in the quality of raw materials, remote locations, weather and complex land and water transportation systems also lead to inefficiencies in the supply chain.

That said, forest companies still have access to high quality timber and are producing appearance-grade products and specialty structural products for foreign markets. Typically, coastal mills have commanded premium prices by processing large high-grade logs while Interior mills have used smaller, lower quality logs to produce commodity construction grade products. However, softwood lumber disputes with the USA, changing harvest policies

and shifting market demands are causing an erosion of the coast's competitive position. Sawmilling costs are high on the coast where head rig mills are needed to process large logs. Market prices suggest reasonable revenues can be obtained with Douglas-fir and western red cedar, while western hemlock and balsam operations are unprofitable (according to the 2007 report "The status and potential of the coastal secondary wood products industry", produced by BC Wood). Recently, coastal mills have been operating at less than 80% of capacity (experts suggest an ideal rate is 92%). This unutilized milling capacity has created uncompetitive costs for the mills.

Expert suggestions for probable outcomes to the year 2020 range between an 'optimistic survival scenario', a 'decline scenario' and a 'renewed growth scenario' (2009 report "Opportunity BC 2020 BC's forest industry" prepared by Woodbridge Associates for the Business Council of BC). Basically, future economic scenarios will be determined by public policy, the ability to explore new markets and products, innovation in supply chain management and new capital being attracted to the industry.

Francisco Vergara is a doctoral student from Chile who is working with Dr Tom Maness from Oregon State University and Dr John Nelson in the Department of Forest Resources Management to help make the forest-to-product supply



Radiata pine in Chilean sawmill

chain (FPSC) more responsive and more efficient. Francisco is conducting an extensive literature review as well as a SWOT (strengths, weaknesses, opportunities, threats) analysis in order to craft a set of strategies that will explore how to make the FPSC more innovative.

Francisco plans to model and test alternative production strategies using an integrated decision support system. Specifically, he is exploring how supply chain drivers such as uncertainty in log grades, aggregate production planning strategies

and flexible lumber manufacturing facilities impact the uses of resources, output and flexibility of the FPSC. The formulation of the decision support system is based on mixed integer programming models and simulation, as well as appropriate scenarios and case studies. These models will provide Francisco with the opportunity to understand how these drivers impact FPSC outcomes.

Currently, Francisco is working with decision support system prototypes to analyze trade-offs in scenario and case study combina-

tions. He plans to run his integrated decision support system under scenario-case studies that will represent the reality of an integrated BC coast forest company. The redesign of the forest-to-product supply chain for BC's coastal forest industry is of major interest, not only to the industry, but also to local communities relying on the forest industry for employment and a tax base to support public services. Francisco also hopes that his work will provide a novel way to view and model supply chains in other environments.

The forest-to-product supply chain in Francisco's home country of Chile is mostly based on plantations of radiata pine, with the prime focus of profit maximization and less consideration to other factors. Francisco intends to return to his position as a researcher at Bio Bio University in Concepción, Chile with newly acquired experience and knowledge that will help him to better influence the management of Chile's forest resources.

For further information contact Francisco Vergara at pancho44@interchange.ubc.ca, Dr Tom Maness at thomas.maness@oregonstate.edu or Dr John Nelson at john.nelson@ubc.ca



Francisco Vergara at work on Vancouver Island

Microfinance for small-scale forest enterprises in The Gambia



Firewood

MICROFINANCE IS INCREASINGLY BEING USED AS an effective mechanism to reduce poverty, especially in developing economies. By providing credit to low-income people, as well as deposit accounts, insurance, money transfers, and other banking services, entrepreneurship and local enterprise development can be fostered and enabled. To date, microfinance programs have been successfully deployed in a number of sectors and have even been integrated into environmental and conservation efforts.

In the forest sector, microfinance has the potential to support the development of small and medium forest enterprises (SMFEs) – small-scale business operations (often community-owned) that are linked to forest-based activities. Like microfinance, SMFEs have been heralded as an important instrument of change in that they can provide a formal and sustainable means of generating wealth to the more than one billion people who rely on forests for their livelihoods, most of whom live in extreme poverty. However, for SMFEs to flourish, communities require financial services to develop, manage, and upgrade local forest enterprises. Unfortunately, insufficient access to finance is commonplace and is constantly cited as one of the major hindrances to the success of SMFEs.

The Gambia is a small nation in West Africa (its total area is equivalent to about one-third of Vancouver Island) where more than half of the population lives below the poverty line. Forests still cover 43% of the country, but less than 3% are considered to be closed woodlands. The Gambia has been recognized as a pioneer in Africa for its participatory approach towards forest management. During the past two decades, its Forestry Department has supported the development of SMFEs by granting local communities secure access to forest resources, and by providing local villagers with the necessary training for building capacity in forest and business management. While the development of these SMFEs has been well documented, very little is known about the sources of financial services available to these enterprises, and the possible financial struggles that they currently still face.

With funding provided by the Africa Forests Research Initiative on Conservation and Development (AFRICAD), a qualitative multiple case study was undertaken in the Western Region of The Gambia with the purposes of evaluating SMFEs' access to microfinance – primarily to savings accounts and credit – and identifying strategies for improving the delivery of these services. A total of 43 semi-structured interviews were carried out with vil-

lage leaders, enterprise members, entrepreneurs from 16 forest-based enterprises, and executives from 14 financial institutions (six commercial banks and eight microfinance institutions).

The SMFEs in this study did, in fact, have reasonable access to savings accounts. Community credit unions have been strategic in providing this service, especially in remote communities that do not have access to other financial institutions. This is valuable given that safe savings services can promote the accumulation of assets over time, while reducing the risk associated with storing money and providing a buffer to overcome hard times and economic shocks. As one enterprise member remarked: "Thanks...for the credit union. It is a logical coincidence: [first]...comes the forest with resources, and [then] comes the credit union to save our money."

The situation, however, is quite different with respect to SMFEs' access to credit. Even though some of the studied enterprises have been successful in acquiring financing from community credit unions and microfinance institutions, not one has obtained a bank loan. One reason for this is that microfinance institutions tend to be more flexible in their requests for guarantees than commercial banks, accepting small property and household items, for instance, or allowing individuals to secure one another within formal group mechanisms. One respondent disclosed that his institution occasionally provides microcredits without any guarantees, so long as the business proposition in question is solid and viable. Banks, on the other hand, are much more stringent in demanding collateral, and this is one criterion that many poor people cannot meet.

Interestingly, our data also show that while formal financial providers are not fully satisfying credit demand from SMFEs in The Gambia, other institutions, such as NGOs, producer's associations, and government projects, are filling this gap. It seems that these non-financial institutions are offering credit-only schemes that do not require savings as a condition for lending. The impact of these interventions is generally positive as they can help meet the rural demand for credit and contribute to the development of income-generating endeavours. However, they also tend to have a limited reach and offer only a narrow range of financial services. Additionally, they can distort the microfinance market and hinder the efforts of other non-subsidized approaches.

This study also highlighted several challenges that

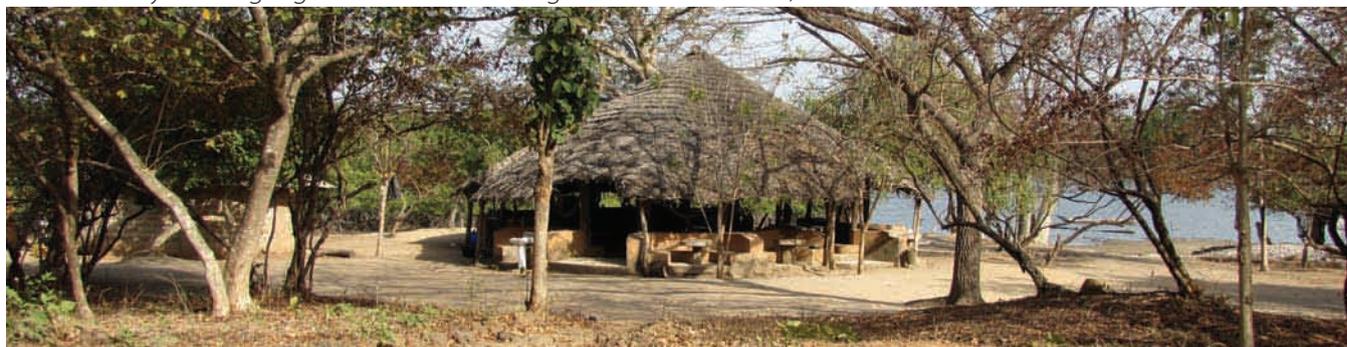
financial institutions face in delivering their services to small forest-based enterprises in rural communities. Sustainability is a critical issue, as the future availability of raw materials could be compromised if business activities are not carried out in a judicious manner. This concern was described by one microfinance executive: "...there is a real challenge in forestry in the rational use and sustainable use of resources." The formality of enterprises is another major issue; many forestry businesses in The Gambia are not officially registered and are therefore perceived as risky ventures due to the high probability of having their products seized. Finally, some of the respondents felt that an unstable forest policy environment and the ability of the government to suddenly develop restrictive regulations that could affect business operations and the ability to pay back loans are also fundamental barriers to delivering financial services in The Gambia.

Data from our study of SMFEs and financial institutions in The Gambia suggest a need for the implementation of several key strategies to improve the delivery of microfinance to forest-based enterprises, including:

- establishing group-based mechanisms to reduce the costs and risks of delivering microfinance to SMFEs;
- endorsing linkages and cooperation between financial institutions to increase the reach of financial services into rural communities;
- promoting formality within the forest sector;
- maintaining stable forest policies;
- granting communities clear access and ownership to forest resources; and
- offering SMFEs adequate business training.

This research represents a first pass at understanding forest-based enterprises' access to microfinance in The Gambia. Financial services are a crucial element in creating an enabling environment for SMFEs to thrive. It is essential to keep exploring new and innovative ways to improve the delivery of these types of services as a means of effectively reducing poverty in the forest-dependent communities of developing economies.

This research was made possible by the Africa Forests Research Initiative on Conservation and Development (AFRICAD) at the UBC Faculty of Forestry (www.africad.ubc.ca). For more information, please contact Maria Fernanda Tomaselli (fertomaselli@hotmail.com), Joleen Timko (joleen.timko@ubc.ca), or Robert Kozak (rob.kozak@ubc.ca).



An eco-tourism camp studied by SMFEs

Fraser River sockeye and migration mortality

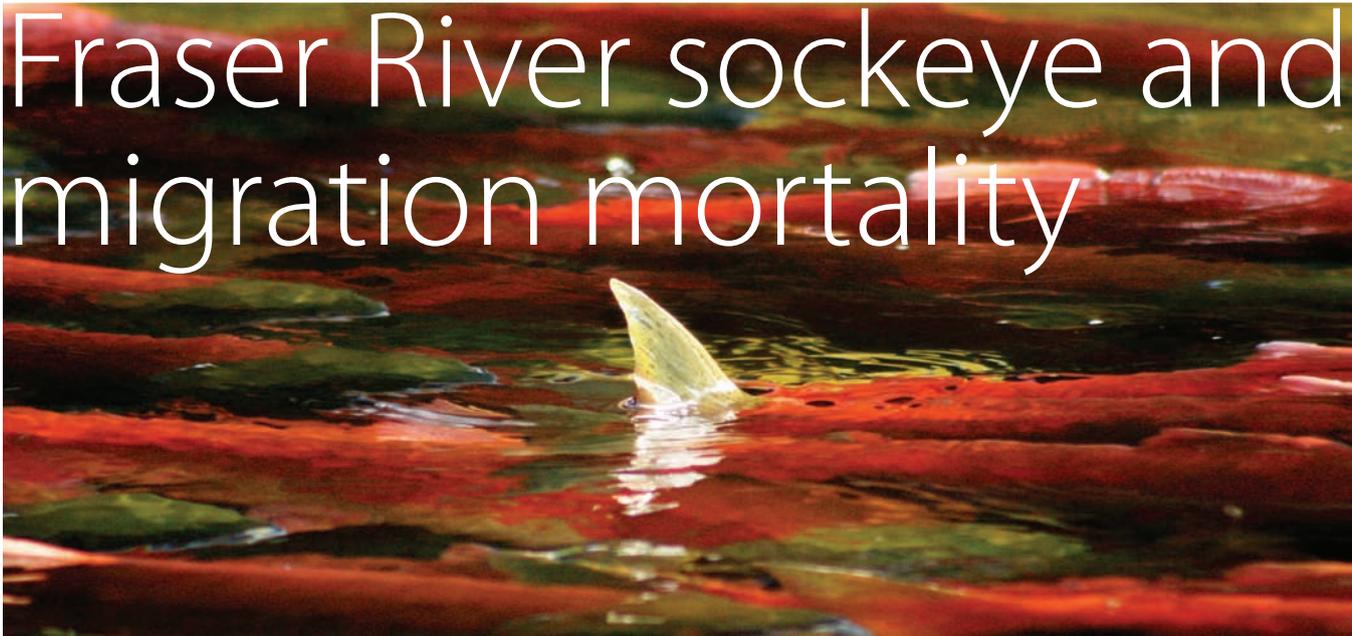


Photo: Jenn Burt

ABUNDANT AND SUSTAINABLE PACIFIC SALMON (*Oncorhynchus* spp) stocks are important economically, ecologically, and culturally to Canada. The five species of Pacific salmon represent some of Canada's last remaining large commercial fisheries on wild fish and recreational salmon fishing in British Columbia generates more than \$1 billion annually in expenditures, supporting more than 10,000 jobs in communities throughout the province. Salmon are important components of food and nutrient webs in both freshwater and marine environments and they are integral to the mythology, spiritual integrity, and livelihoods of Pacific First Nations. Indeed, Pacific salmon are icons with abundant salmon confirming a healthy and productive environment in British Columbia.

So it is troubling that one of the most important and abundant groups of these fish, the Fraser River sockeye (*O nerka*), has exhibited a steady decline in productivity since the mid-1990s with the total adult return in 2009 being the lowest in over 50 years. This prompted the creation of a federal judicial inquiry, the Cohen Commission, an on-going investigation into the potential causes of this situation. It will make recommendations for improving the sustainability of sockeye salmon and the fishery.

"What is going on? How could this happen? Are salmon to go the way of the cod? Who is at fault, or to blame? ... some have suggested the nation, and we, as individuals – are all to blame because this shows a failing to exercise wise stewardship over a precious resource." This statement, though potentially apropos to our current situation, was made in 1995 by the Honourable John Fraser in his final report to the federal Minister of Fisheries based on the '1994 missing salmon' inquiry that he led. Since 1992 there have been four federal inquiries or investigations into Fraser River sockeye declines and although they have differed in their mandates and specific goals, they reflect how much our society cares about salmon and how difficult it has been to manage and conserve

this resource. To further highlight the complexity of our salmon system, Fraser sockeye adult returns in 2010 were one of the highest in the historical record.

Dr Scott Hinch is Director of the Pacific Salmon Ecology and Conservation Laboratory and a member of the Department of Forest Sciences at UBC. In 1994, one of Scott's first years studying Fraser sockeye, researchers in his group used radio transmitters to track adults as they migrated through the Fraser River canyon in July. That month was one of the warmest on record for salmon migrations. Water temperatures warmed as the month progressed, reaching 20 °C, and they found that salmon started to migrate erratically and disappear as temperatures approached or exceeded 18 °C. These were some of the first direct field observations that linked high temperatures to salmon mortality during migrations, and along with other 'evidence' presented at the 1994 inquiry led to a recommendation that the Department of Fisheries and Oceans (DFO; the federal agency that manages salmon) should be using information on water temperatures to aid with "in-season risk-averse management". In other words, to ensure that adequate numbers of fish reach spawning grounds during periods of high river temperatures, DFO must reduce harvest rates to compensate for natural migration mortality.

Since the mid-1990s Hinch's group has embarked on a highly collaborative research program that has grown over the years involving colleagues from several UBC departments, universities, private companies and fisheries management agencies, to examine how high temperatures kill salmon, populations differ in thermal tolerance, the condition of salmon prior to entering the river affects thermal tolerance, and how other in-river stressors affect migration mortality. They have been addressing these by linking large-scale telemetry observations with physiological and genomic assays on thousands of migrants, and conducting lab swimming performance and thermal tolerance experiments. High temperatures are currently a significant issue for Fraser

sockeye because the river has experienced ~ 2.0 °C average summer warming compared to 60 years ago, with nearly half of that warming occurring since the early 1990s and water temperatures in 13 of the past 20 summers have been the warmest on record. In recent years migration mortality has ranged from 40–95% in many populations of Fraser sockeye.

There are more than 100 distinct populations of sockeye salmon in the Fraser River watershed and each must complete a unique migration route that varies in distance, elevation gain, river temperature and flow. In a recent study led by PhD student Erika Eliason and involving other students and colleagues from UBC Forestry and Zoology, published this year as a cover article in the journal *Science* (*Science* 332:109–112), researchers measured the swimming ability of adults from eight populations by monitoring metabolic and heart rates as they swam through a “fish treadmill” – a tunnel capable of producing varying water speeds and temperatures. The populations with the most difficult migrations were more athletic, displaying superior swimming ability and specialized heart adaptations. The optimal water temperature for a population, (the temperature at which the fish performed the best), matched the historical river temperatures encountered by each population on its migration routes, suggesting thermal adaptation. In water temperatures above their optimal, the salmon’s swimming ability declined. Some populations, like those that spawn at Chilko Lake, were very resilient to high temperatures whereas others were less able to cope. Currently, the Fraser River’s peak river tempera-



Photo and front cover: Matt Casselman

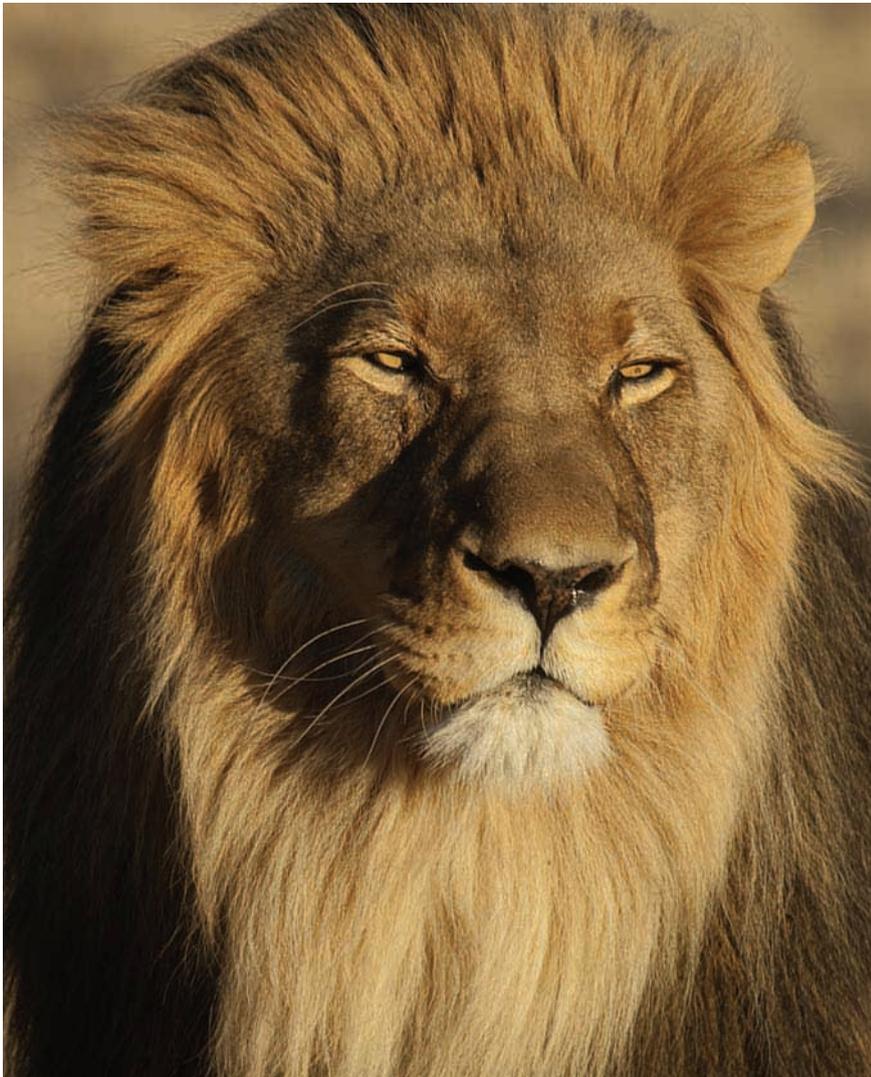


tures during the summer months exceeds the optimal temperatures for every population examined and cardiovascular collapse is clearly one explanation for the migration mortality now observed within some populations. In a recent field telemetry study led by postdoctoral fellow Eduardo Martins (*Global Change Biology* 17:99–114) researchers confirmed that river migrating adults perished at rates and temperatures that were population-specific, and also confirmed that Chilko Lake sockeye survival was the least affected by warm river temperatures. However, high river temperatures are but one of several factors contributing to migration mortality. In another recent study published earlier this year (*Science* 331:214–217), Hinch’s group demonstrated that salmon with a gene expression signature reflecting immune-suppression and disease, potentially caused by a virus, were much more likely to die during the migration.

The science of understanding and predicting adult salmon migration mortality has come a long way in 20 years, and though there is still much to learn, the real challenge ahead lies in how to manage and conserve salmon as the climate, and Fraser River, continues to warm.

For further information contact Scott Hinch, Director, Pacific Salmon Ecology and Conservation Laboratory, Department of Forest Sciences, at scott.hinch@ubc.ca or visit <http://faculty.forestry.ubc.ca/hinch/>. For additional reading, a recent article in the journal *Scientific American* provides a comprehensive summary of the work of Hinch’s group. This can be viewed at www.scientificamerican.com

Can Africa's Peace Parks bring hope for people and animals under threat?



THERE HAS NEVER BEEN A greater need to find a balance between the growth rate of human populations and the dwindling numbers of wild animals, and the continent struggling with this the most is undoubtedly Africa. The enormous pressure exerted by people on the ecosystems and resources of Africa has caused some regions to become depleted

of even the most inconspicuous bird species, not to mention large wildlife species. Desertification of massive areas in Africa has caused an even greater concentration of people in the most fertile regions of the continent. Our generation could be the last to witness any wild carnivores and herbivores roaming freely in their natural habitats unless the custodians of Africa's

natural resources can develop a solution to this conundrum.

Part of the problem lies in separating the disciplines of biology and anthropology, and discovering solutions to the problems in one discipline by ignoring the plight of the other: fortress conservation disregards the needs of local communities, and resource depletion presents a future without biodiversity. Community-based conservation, where local communities are empowered to manage their own resources, has been hailed by scholars and governments as the only sustainable option, but the past forty years have taught us that a great deal of research, understanding and financial input is required to understand precisely how local communities should manage the delicate ecosystems entrusted to them. Some lessons are generic, but others are very case-specific and are learned through trial and error. We urgently need to develop meaningful frameworks that would guide the policy makers of the continent towards sustainable community-managed ecosystems.

One option, developed in Africa in the nineties by political leader Nelson Mandela in collaboration with other political and business leaders from the southern half of the continent, is the establishment of "peace parks" or transboundary (transfrontier) areas. This conservation initiative proposed to use revenue created by ecotourism to enhance investment in remote, poor communities, while simulta-

neously stimulating peaceful relations between neighbouring countries and enlarging ecosystems that would better serve the protection of wildlife and unhindered migration of wildlife species.

Transfrontier conservation is no newcomer to the environmental stage. It has in fact been around for centuries, but very often these areas are never formally proclaimed as such, since the cooperation across borders and between neighbours is often loosely based on informal friendly relations. Although present in North America for 80 years, the concept is a rather new idea on the African continent. With all the complex conservation issues that the African nations have to contend with, the advent of transfrontier conservation areas has been hailed by many as the solution to Southern Africa's under-developed rural areas and conflict headaches.

While the study of governance issues involved in the transfrontier conservation areas of Southern Africa is interesting and as yet unexplored, there is also a danger of producing oversimplified frameworks in order to produce key indicators that could make or break the initiative. Suzi Malan (doctoral candidate in UBC's Faculty of Forestry) has undertaken a fascinating study in environmental governance across the disciplines of ecology, governance and socio-economic development. Suzi is examining the management of transfrontier conservation areas to help develop improved decision-making processes for the managers of the "peace parks". The overall objective of her research project is to provide a centralized response framework or decision support model that identifies adaptation strategies within the three dimensions of socio-economic systems, ecological management and governance. This decision-making tool should help prevent incremental problems that may occur following a reactive response aimed at cop-

ing with some of the issues. This will be achieved by working closely in consultation with all stakeholders and policy makers to:

- synthesize the current state of knowledge (including Indigenous Knowledge where available and accessible);
- define the range of potential land management options and adaptation actions that may be applied (eg different tourist activities, predator stocking rates, no response, etc) at various scales;
- define and quantify the range of potential effects of major disturbance types on natural and human systems;
- define and quantify the range of potential incremental effects of management responses on natural and human systems relative to those caused by natural disturbances;
- integrate the range of values that may be affected in order to assess whether the potential incremental effects of management responses support adaptation to natural disturbances or generate economic impacts;
- develop a decision support framework to help guide decision makers to ultimately reduce the shocks from unexpected disturbances and disasters such as an outbreak of disease or conflict on ecosystem services and human systems. The decision support framework will allow decision makers to address when, where, and what type of management interventions should be applied to support healthy ecosystems and communities.

Suzi Malan is currently in Southern Africa collecting data and working closely with her stakeholder and policy maker groups. She can be reached at suzimalan@gmail.com



Mapping endangered Garry oak ecosystems

GARRY OAK (*Quercus garryana*) habitats are among the most diverse yet simultaneously rare, at-risk and degraded terrestrial ecosystems in Canada. According to the Committee on the Status of Endangered Wildlife in Canada and specialists from the British Columbia Conservation Data Centre, over 100 floral and faunal species in these habitats are currently at-risk and several have been extirpated. Gulf Islands National Park Reserve and its surrounding lands in the Strait of Georgia are one of the few places where near-natural Garry oak habitats remain. Currently Garry oak distribution is identified by park managers through field visits or through terrestrial ecosystem mapping (TEM), which is based on interpretation of air photos at 1:10,000 or coarser scales. However, TEM often lacks the spatial detail and accuracy required to locate all

of these natural occurrences.

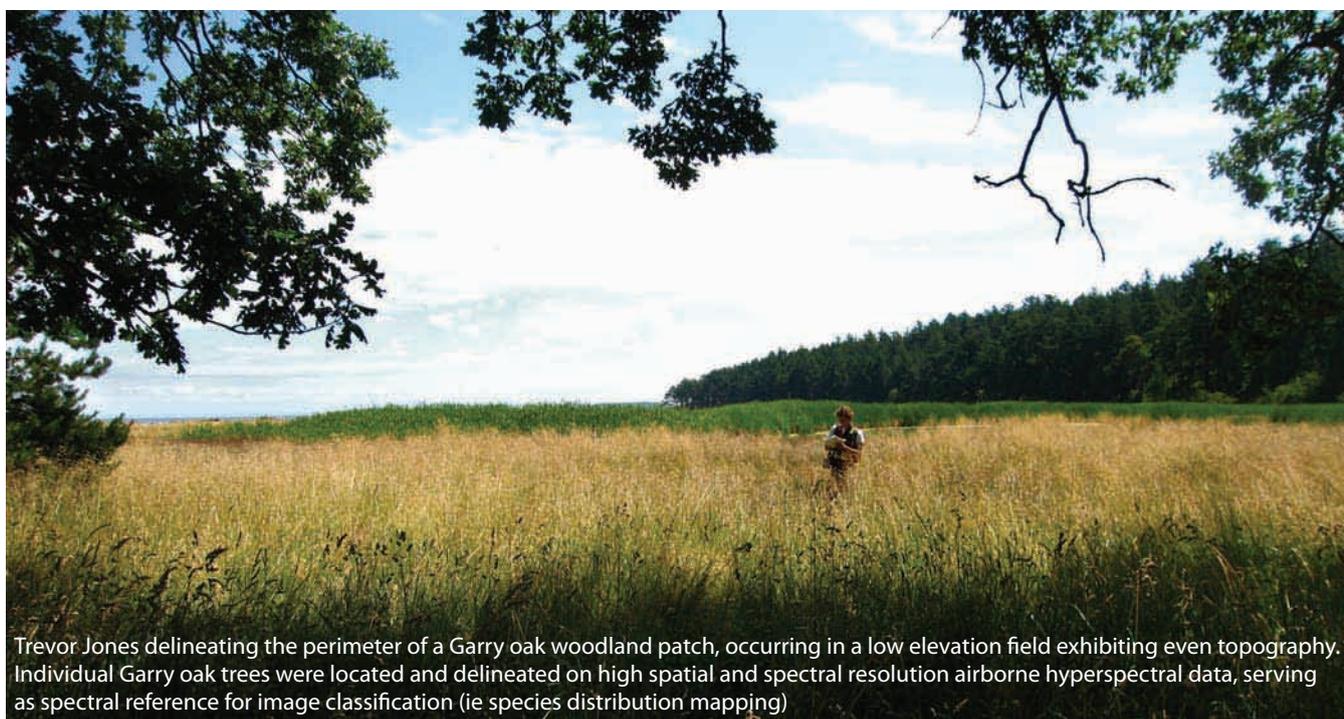
Faculty of Forestry recent PhD graduate Trevor Jones, faculty member Dr Nicholas Coops, and Dr Tara Sharma from Parks Canada are utilizing two new types of remote sensing technology, hyperspectral and light detection and ranging

“Trevor’s results indicate that the spectral signature of Garry oak vegetation is unique and very different from other broadleaf species...”

(LiDAR) data to map the species across the park. Hyperspectral remote sensors acquire image data simultaneously in upward of hundreds of narrow, adjacent spectral

channels with each pixel containing a complete reference spectrum. LiDAR technology generates active pulses of near infrared light that measure the vertical distribution of vegetation and can characterize vertical forest structure.

Trevor Jones and his team studied the distribution of Garry oak on two islands totaling approximately 600 ha for which hyperspectral and LiDAR data were collected in transects. On these islands, Garry oak are known to occur within three types of areas: rocky bluffs with woodland patches, fields with woodland patches, and steep slope woodlands. At a large number of plots, the locations of Garry oak trees were recorded using a global positioning system (GPS) and delineated on the airborne imagery. Airborne hyperspectral and LiDAR data were simultaneously collected in July 2006 with a spatial resolu-



Trevor Jones delineating the perimeter of a Garry oak woodland patch, occurring in a low elevation field exhibiting even topography. Individual Garry oak trees were located and delineated on high spatial and spectral resolution airborne hyperspectral data, serving as spectral reference for image classification (ie species distribution mapping)

tion of 2x2 m pixels.

The hyperspectral and LiDAR data were then classified to predict the location of the species. Trevor's results indicate that the spectral signature of Garry oak vegetation is unique and very different from other broadleaf species in the Park such as bigleaf maple and arbutus. The accuracy of the maps produced was independently assessed as being in excess of 87%, which is considered highly accurate for mapping purposes. In general, lodgepole pine and bigleaf maple were primarily responsible for commission error whereas Douglas-fir and arbutus were the main source for omission error. The study found that within the region, standard TEM mapping delineated 21 polygons containing approximately 2.9 ha of Garry oak. In contrast, Trevor's research identified 217 polygons containing 3.1 ha of Garry oak.

The fusion of hyperspectral imagery with LiDAR data increased the accuracy for many tree species located within the Park. The research concluded that

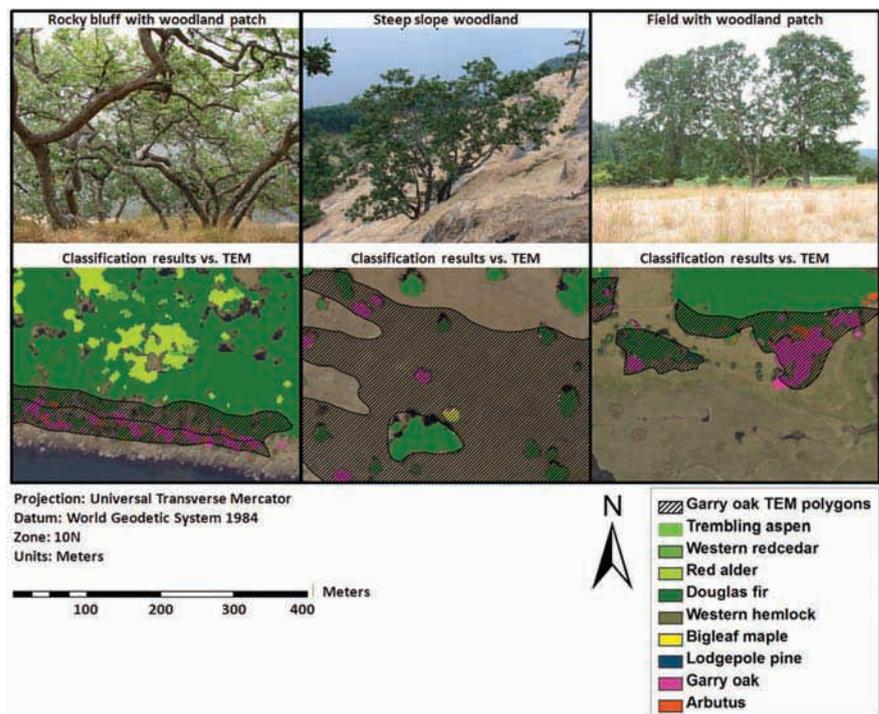
- The use of advanced geotechnologies results in detailed and accurate species distribution maps applicable to a wide variety of conservation and restoration oriented managerial goals.
- Species distribution maps serve as contemporary reference data, which help to establish baseline reference from which restoration activities can be themed and assessed.

The methodology outlined in this research is replicable for land managers tasked with restoring a wide variety of degraded ecosystems.

For further information contact Dr Nicholas Coops at nicholas.coops@ubc.ca. Building on his doctoral research, Trevor Jones has taken a job with Blue Ventures (a non-profit environmental organization) mapping the distribution of mangrove forests on the west coast of Madagascar. He can be reached at tjones1251@gmail.com



A Garry oak tree located in a low elevation field exhibiting even topography



Comparison of existing Garry oak locations based on aerial photograph derived Terrestrial Ecosystem Mapping (TEM) polygons versus hyperspectral image classification results for three distinct Garry oak habitat types (ie, rocky bluff with woodland patch, steep slope woodland, and field with woodland patch). Hyperspectral image classification results are detailed and accurate enough to determine the precise location and amount of Garry oak within each TEM polygon

Visualizing climate change in Canada's Arctic



RESEARCHERS AT UBC'S Collaborative for Advanced Landscape Planning (CALP) in the Faculty of Forestry are helping to plan for climate change through the use of science-based 3D visualization tools. There is an urgent need for governments at all levels to make decisions concerning climate change adaptation and planning strategies. Many public, non-governmental, and research organizations have emphasized the need for communities to adapt proactively to increasing risks. However, there are few planning processes in place that permit Canadian communities to translate global and national climate change imperatives into: a) tangible and local adaptation and mitigation strategies, and b) decision-making processes that foster the development and evaluation of specific adaptation or mitigation alternatives.

Funded by the Geomatics for Informed Decision-making (GEOIDE) Network of Centres of Excellence, a case study to develop and apply such a process is underway in Canada's arctic community of Clyde River, Nunavut, as well as a variety of other sites across Canada.

Clyde River is a community of approximately 820 people on Baffin Island's east coast in the territory of

Nunavut. Ninety-six percent of the community is Inuit, and approximately 50% of community members were under the age of 18 in 2006, indicating a very young and growing population. The community recently completed a climate change adaptation plan with the Canadian Institute of Planners, and is home to the Ittaq Heritage and Research Centre, a community-based organization supporting research activities.

CALP's project is a three-year study (2009–2012) to research the effectiveness of 4D visualization (3D visualization over time), and participatory processes in climate change decision-making across a range of Canadian communities. Building upon the directions and priorities identified in previous work in Clyde River (such as the Climate Change Adaptation Action Plan, the Community Economic Development Plan, and the existing zoning bylaw and subdivision plans), CALP hopes to produce useful mapping and visualization materials for decision-making, with the input of key user groups, local governments, and the community, in order to help develop a more resilient Clyde River.

In November 2009, CALP members traveled to Clyde River to introduce the project to community



Early Spring in Clyde River

groups, answer questions, and gather feedback about key issues that might be addressed in this project. The visit included face-to-face meetings with Hamlet staff, elders and other community members, a community open house, and participation in a radio call-in show. Housing and energy emerged as prominent issues during this visit.

CALP researchers made a return trip in March 2010 to conduct a community mapping workshop. In this workshop, community members, key stakeholder groups, and the research team discussed and mapped-out the key issues, as well as known existing landscape hazards that could be aggravated by climate change. This session coincided with the final report of four years of Natural Resources Canada studies on geophysical aspects of climate change adaptation, including landscape hazards (permafrost and drainage), coastal erosion and sea level rise, and future freshwater supply. The research team ran a second mapping exercise with these scientists to augment the community's map.

Out of these sessions, housing quality and quantity, landscape hazards, walkability (due to severe weather

and future development patterns), and energy issues emerged as priorities. From here, CALP researchers developed, modeled, and visualized four preliminary scenarios for future community growth. These ranged from the plans currently in place for future expansion, to scenarios that avoided hazard areas but still provided adequate housing, to plans that were more compact and walkable with new housing forms, and which moved towards independence from fossil-fuel energy through the use of more efficient buildings and a combination of alternative technologies.

CALP members returned to Clyde River in the fall of 2010 to gather feedback from the community, local and Territorial government representatives, and key stakeholders. Feedback was positive, with excellent suggestions for refinement and the use of these approaches for climate change planning in the north. At a climate change workshop in Iqaluit hosted by the Government of Nunavut, CALP researchers presented this work to Territorial government representatives. Further support and capacity building will be offered in the use of visioning tools in community planning, in the hopes that it might help inform climate change planning not just in Clyde River, but across Nunavut and Canada's Arctic.

CALP is an informal group of researchers based in the Department of Forest Resources Management at UBC. CALP researchers strive to bridge the gap between research and practice by bringing science, environmental design, and participatory processes to community and landscape planning. More recently, CALP's activities have focused on the use of visualizations in climate change planning processes, and recently released a guidance manual for local climate change visioning and landscape visualizations. For more information visit www.calp.forestry.ubc.ca or email David Flanders, Research Scientist, at david.flanders@ubc.ca



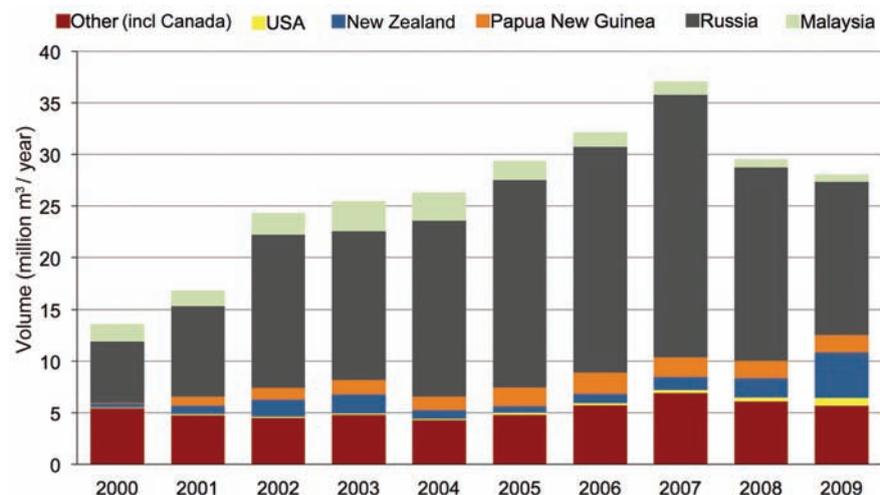
This scenario demonstrates the build-out of the current zoning bylaw and lots surveyed in the community (new homes top right)

Legality requirements and the Chinese wood products industry

CHINA HAS EMERGED AS A very important player in the global wood products trade. Currently, China is the largest importer of logs and lumber and the largest exporter of value-added wood products in the world. However, the industries' dominance could be curtailed by new 'legality' requirements from Europe and North America. In addition, there are antidumping complaints from the United States (US), Canada, and the European Union (EU) on furniture and plywood, there is price competition from Indonesia, Malaysia and Vietnam, and there is some harsh criticism of their industries' procurement of illegal logs and lumber.

China's wood products industry largely relies on sawlog and veneer log imports due to the constraints on economically available domestic log supply. In the past 10 years, China's timber harvest was around 52 million m³ per year. In order to meet the increasing domestic demand and production capacity for an export-oriented industry, sawlog and veneer log imports almost tripled in less than a decade, reaching a peak of 37.1 million m³ in 2007.

In recent times, China's main source of imported logs was Russia, accounting for up to 60% of import volume (graph above). Other important log suppliers included New Zealand, Papua New Guinea, USA, Malaysia, Gabon, Congo and Canada. Of these coun-



China's sawlog and veneer log imports (by region)
Data source: UN Comtrade

tries, Russia, Papua New Guinea, Gabon and Congo are perceived as countries where illegal logging happens frequently.

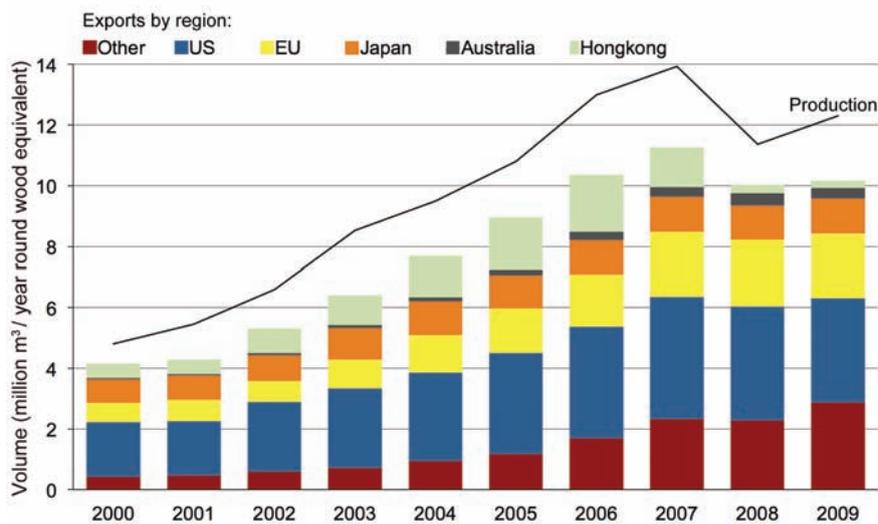
China's lumber imports have also exhibited strong growth, jumping from about 3.8 million m³ in 2000 to about 8.8 million m³ in 2009. In the near future, China is projected to become the world's largest lumber importer.

Utilizing some of this imported material, the Chinese value-added wood products industry has played a dominant role in the global wood products trade. Today, China exports most of its value-added wood products as wooden furniture, wood flooring and plywood. The wooden furniture industry is the largest subsector of China's wood products industry and has grown almost threefold between 2000 and 2009 (graph opposite). In 2009, China's wood furniture

production increased to 205 million pieces of which 169.5 million pieces were exported. Over 70% of this furniture is exported to environmentally sensitive markets in the US, EU, Japan and Australia. Since 2005, China has overtaken the traditional European manufacturers, Germany and Italy, as the leading wooden furniture exporter. Similar growth patterns are also found in the wood flooring and plywood industries. However, this growth is now being challenged by a new set of regulatory requirements.

In 2008, the US Lacey Act Amendment was passed and, in 2010, the EU Timber Regulations was passed. Both of the enactments require that purchasers of Chinese products can demonstrate that legal wood has been used in the manufacture of their products.

In order to address the legal verification challenge, China has



China's wooden furniture production and exports (by region)
 Data source: China National Furniture Association, UN Comtrade

to implement rigid wood procurement policies and after the legality issue is addressed will likely have to ensure the full implementation of its national forest certification system.

In an attempt to help address these challenges, Yu Huang (a doctoral candidate in UBC's Department of Forest Resources Management) is analyzing the impacts of global legality requirements on

the Chinese wooden furniture industry. Through a large scale furniture industry survey, she will assess firms' awareness of legality requirements and certification, how these firms will respond to the new market challenges and the rationale for their response. Working under the supervision of Dr Gary Bull (Department of Forest Resources Management, UBC) she will create scenarios for future

development options in the industry using the International Forest and Forest Products (IFFP) Model, developed at UBC by Drs Steven Northway and Gary Bull.

The research is important as it could provide useful information on private firm behaviour to stakeholders, including the domestic industry, other wood products industries, and representatives for certification programs, NGOs, government, and trade partners.

The work will build on the recently completed studies of UBC colleague Juan Chen. Juan examined the attitudes of Chinese wood products manufacturers to certification, finding that many were either unaware of it, or had doubts about its financial viability.

Legality requirements may be a more practical way of making sure than buyers from environmentally sensitive markets are receiving products made from legal wood.

For further information contact Yu Huang at huangyu0716@yahoo.com.cn or Dr Gary Bull at gary.bull@ubc.ca



Logs being exported from Vladivostok, Russia

The power of wind



IN METRO VANCOUVER A FEW times a decade, intense extratropical cyclones generate two-minute average winds in excess of 80 km/h, with gusts sometimes greater than 100 km/h. Such winds can cause widespread damage to trees and structures. The windstorms of history are in this category, such as the severe gale of 21 Oct 1934, the great Columbus Day Storm (AKA “Freda”) of 1962 and the more recent “Hanukkah Eve” storm of 14–15 Dec 2006. These three powerful events are known for causing significant loss of human life, forest damage in places such as Stanley Park and disruption of electrical services in the Lower Mainland.

Wind speeds, however, do not have to reach historical magnitudes to cause power interruption. And weather events with modest winds are far more frequent. A typical wet-season (October to April) brings

numerous storms with 40–59 km/h wind speeds to the Lower Mainland, and one to a few cyclones with winds above the high-wind threshold of approximately 60 km/h. These routine winter breezes and gales can break branches and topple scattered trees. Quite often, this debris ends up crashing through power lines.

The transmission grid is less vulnerable to tree-falls than the distribution grid, largely due to differences in infrastructure scale. About 80% of all tree outages on transmission lines are on 69 kV circuits with a further 18% on 138 kV circuits and 2% on 230 kV. Most of the higher voltage outages are on storm track vulnerable corridors and a handful of circuits at these higher voltages show chronic propensity of failure related to the entire asset class. The lower-voltage lines are often carried on wooden poles that are

shorter than the typical tree height in coastal southwest British Columbia. Transmission line rights-of-way are often cut through forests, and due to competing land-use interests, the corridors tend not to be wide enough to prevent toppled trees from striking the lines.

For a 50 km radius around the Vancouver International Airport (YVR), much of the transmission grid can be found within forested corridors. Routine hourly meteorological observations taken at the airport record the magnitude of the numerous weather systems that affect the region. Comparison of all discrete storms isolated from the record with tree-related outage data for 1990–2008 is providing insight into the transmission line response to wind-thrown trees.

For storms with lower wind speeds, the transmission grid is rarely impacted. Typically, just

10–20% of wind events ranging from 48 to 69 km/h (note that gusts are typically 1.3–1.5 times faster than the two-minute average wind) are associated with a tree-related outage. However, given the frequency of these events, transmission-line disruption related to wind-broken trees occurs nearly every year. For the stronger storms, those producing winds of 70 km/h or greater, the proportion where trees impact transmission lines climbs significantly. Approximately 75% of the events with speeds at historic-windstorm level (greater than 80 km/h) are associated with one or more transmission outages in the vicinity of Vancouver.

Distribution poles are generally at a smaller scale than the transmission grid, but are much more common. These are the lines that bring electricity through communities, down lanes and to homes and businesses. Due to their close proximity to forests, parks, golf courses and gardens, the power cables are often near trees. As a result, the distribution system is much more vulnerable to wind-thrown trees than the transmission grid.

For the distribution network within a 50 km radius of YVR, typical winter storms can have a significant impact. For the period October 2005 to August 2009, 70% of events with modest 40–49 km/h wind speeds were associated with tree- and branch-related outages



Disrupted distribution lines

on distribution lines. Storms with wind speeds above 60 km/h produce one or more outages nearly 100% of the time. This suggests that tree-related power disruptions can be expected to continue on a regular basis.

Given Vancouverites' love of trees, there is a necessary trade-off between security of electricity supply and maintenance of forest and tree cover. BC Hydro has an active program of pruning and hazard tree-management to reduce the frequency of outages. However, for circuits that pass through forests, stand-level management for windthrow may offer a means to mitigate the frequency of tree-

related disruptions along some of the more wind-prone corridors. Silvicultural procedures aimed at greater wind-firmness can be applied to stands within a tree-height or two of the power-line right-of-way. Efforts may include the preservation of tree species known to have better wind resistance and gradual thinning to improve tree vigour. Such strategies may effectively reduce the frequency of outages along wooded corridors.

Wolf Read is a doctoral student with Dr Steve Mitchell in the Department of Forest Sciences at UBC. The above description outlines a subset of his research focused on the climatology of windstorms in southwest British Columbia, and the impact of these storms on the transmission and distribution grids. Understanding the broad set of physical phenomena related to tree-failures, along with tools such as GIS, can help pinpoint locations along power-line rights-of-way where useful silvicultural strategies could be applied in an effort to reduce the frequency of outages from tree-falls. Both BC Hydro and BC Transmission Corporation (now part of BC Hydro) have provided funding for this project. For further information, contact Wolf Read at wolfread@interchange.ubc.ca



Snapped Douglas- fir

alumni news

Reunions and events

Please mark your calendars for the following UBC alumni events:

- June 11, 2011 – UBC Alumni and Friends: Munich. Interested in attending? Contact alumna Louise McLean, BA'91, MA'96, at klee.mclean@t-online.de
- June 21, 2011 – UBC Alumni and Friends: Montreal. Call 604.822.8643 for details or to register.
- June 22, 2011 – UBC Alumni and Friends: New York. Call 604.822.8643 for details or to register.
- August 9–11, 2011 – Class of 1971 40th Reunion at the Heartstone Lodge in Sun Peaks. Contact Jim Engleson at engleson@shaw.ca for more information.
More information on each of these events and all the services available to Forestry alumni can be found at www.forestry.ubc.ca/alum

Alumni in action

One of the common questions raised by our alumni is “What happened to my classmates after graduation?” Similarly, 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.



Jeremy Shelford BSF 2002

From which program did you graduate?

Forest Operations (including courses for registration as a PEng, Forest Engineering)

Where did you grow up?

Vancouver, BC

Why did you choose UBC Forestry?

My father was a professor in

Agriculture at UBC and my mother was a teacher so there was never really any doubt about pursuing a post-secondary education – the question was more in what area. Also, both my parents had rural up-bringsings and many of my early summers were spent working on a dairy farm in the Fraser Valley, exploring the family ranch on Francois Lake and hiking around Vancouver. Due to these sorts of activities I think I had a

natural draw to a profession that could get me working outside. Plus, my father's relatives up north and family friends were involved with forestry and at an early age pick-up trucks and caulk boots were familiar items for me and my brothers. I was strong in sciences in high-school and I already had a brother in engineering at UBC, so the Forest Operations program at UBC seemed a good fit.

What was your first job after graduation?

A friend of mine from UBC Forestry put me in touch with some people at Weyerhaeuser's Stillwater Division in Powell River. Right after graduation I got a GST number and some insurance in Vancouver, moved to Powell River and started working as a contracting forest engineer. I spent 9 months there before getting laid-off for the winter. Following the lay-off, I did what most recently-graduated and laid-off engineers do – skiing and a trip to a sunny destination prior to start-up of the next field season.

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

Currently I'm a Registered Professional Forester and lawyer with McMillan LLP in Vancouver (formerly Lang Michener LLP). I practice business and regulatory law for natural resource clients, with a focus on forestry, mining and carbon trading. I don't really have a "typical day in the office", as what I do changes daily based on the needs of our clients. Sometimes I'm helping with the sale of a forest tenure or preparing for an administrative hearing relating to forestry legislation infractions. At other times I'll be helping with the negotiation of supply contracts, dealing with First Nations consultation issues or reviewing policy relating to certification or carbon trading.

I became aware of a possible career in law after I attended my first ABCFP policy review seminar and began studying for the registration practices exam. The review seminar was probably my first conscious realization that our profession is ultimately governed by statute and if we didn't understand the statutes and how to work within them, we really couldn't do our jobs to the best of our ability. Also, I remember really enjoying the forest policy course in my last term at UBC and I think this course was the first spark for my interest in forest policy in general.

During my forest engineering days (post-graduation from UBC), I began thinking about heading back to school again. I remember considering everything from an MBA, to applying to NSERC for funding to do a PhD in forest hydrology, to applying for law school – but I was certain that I wanted to remain in the forest industry. Ultimately, I think enrolling in law school came about after

I realized the importance of having people who not only understand good forest stewardship principles and the nuts and bolts of how our industry works, but who also can apply this understanding in light of complicated legal considerations. I am now lucky enough to enjoy this challenge on a daily basis.

Do you have any fond memories of your time at UBC?

I wouldn't know where to begin on this question – I was there for seven years, what else can I say?! One of my highlights was Dr Worrall's Big Trees trip in first-year. I can remember sitting in his lab, feeling the anticipation of the draw for the final seats in the van for the trip (one of which I secured), plus it was a great getaway after a hectic first year of university to break away and see some amazing sites and make a few great friends. Also, I was fortunate to have the opportunity to travel to Sweden for an exchange in third-year. I enjoyed this so much that I took the opportunity to go on an exchange to Australia in law school as well.

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

Probably teaching or involvement somehow in education.

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

Taking the plunge to start essentially a new career by going to law school was probably the toughest decision I've made so far. At the time I knew I was giving-up a good career and there was the uncertainty surrounding finding a position I was interested in after graduation. Looking back, I don't think I really understood what a career in law would entail (or really had any idea of the hard work it would take to get me where I am

today). Also, it's obviously a challenge having to give advice to people on a daily basis, as often the issues are complex, the clients need my help for a reason and time is of the essence.

What do you aspire to 10 years from now?

Ten years ago I would have never guessed that I'd be working in an office tower in Vancouver as a lawyer. In another ten years I really don't know where I'll be, but I'm excited for the path that takes me there.

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

When I first started forestry at UBC I think most of my peer group believed that in four years we'd be graduated, working for a major forest licensee and hanging ribbons in the bush. The reality is that most of us took more than four years to get through our degrees and that in those years our ideas and understanding of "forestry" changed. Now I can only think of a handful of my classmates who still are working in what we would have called those traditional forestry jobs.

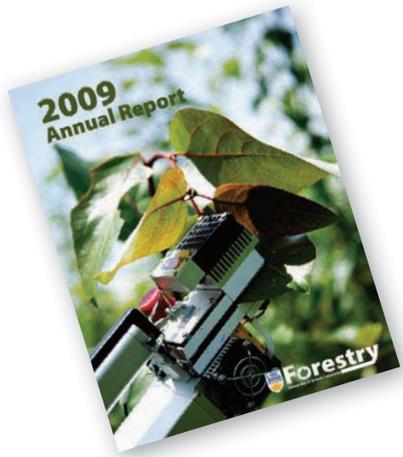
I think students have to think outside the box about what a degree in forestry can provide and be open to taking a chance on something new if an opportunity is presented that looks interesting. For example, I've found that combining my forestry degree with law has opened up new opportunities that my forestry or law degrees alone wouldn't necessarily afford. My familiarity with the forest industry has led me to working on deals originating not only in BC, but also in Ontario, Quebec and even China. And be patient... not everybody starts out in exactly their dream job!

Interested in sharing your story? Send submissions with a photo to Jenna McCann at jenna.mccann@ubc.ca



Healthy forests – healthy communities

As one of the partners in the Healthy Forests - Healthy Communities initiative, we (together with the Canadian Institute of Forestry) are hosting a Community Dialogue Session at the UBC Forest Sciences Centre on June 23, 2011 at 7pm. The Healthy Forests – Healthy Communities initiative is intended to capture the concerns and recommendations of experts and community members to enable informed decision making for forest lands management in British Columbia. Dialogue sessions are being held around the province with the purpose of capturing the public’s vision for a sustainable future. Further details can be found at www.bcforestconversation.com or from a link provided on the Faculty of Forestry website under News and Events.



Annual Report

Our 2010 Annual Report for the Faculty of Forestry will be available for viewing from our website (www.forestry.ubc.ca/Publications/AnnualReport.aspx) sometime in July, 2011. This report, now in its 20th year, provides annual information on students and teaching programs, faculty member research activities (including publications), development and alumni. If you would prefer to receive the annual report in hard-copy, please let us know before the end of June so that we can update our mailing lists accordingly. Alternatively, we can send you an email to let you know when the report is available on-line. Requests for mailing or email notification should be directed to Jamie at jamie.myers@ubc.ca

Electronic versus paper newsletter?

Branchlines is currently mailed to over 4,000 forestry alumni, interested groups and individuals. We also post an electronic version of each issue on our Faculty website (go to www.forestry.ubc.ca and click on “Publications”).

If you would prefer to stop receiving paper copies we can notify you by email when electronic versions are available online. To change your subscription from paper to electronic notification please send your request to Jamie at jamie.myers@ubc.ca



Branchlines now displays this QR (quick response) code which allows users to access current or back issues online by scanning the code via their cell phone (using a QR code reader application).

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