

Branch LINES

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From the Dean's Desk



As you may well be aware, 2001 marks the 50th anniversary of Forestry as a Faculty at UBC. Although, compared to many scholarly institutions from around the world

with lineages going back for several centuries, we may appear to be mere “babes in the woods”, the rate of change is such that fifty years of heritage is certainly enough to be proud of. Many groups, individuals and events have contributed to what, in 2001, constitutes the Faculty of Forestry. For example our Sopron Alumni, who have contributed significantly to both B.C.’s and the Faculty’s past, would not have enriched our history if not for the Soviet invasion of Hungary in 1956. In terms of the next 50 years, some influences can be more easily predicted. First Nations involvement, from recruitment of students and acquisition of First Nations experience to the development of research into forest issues that will impact on the land claims and tenure decisions, will clearly influence teaching and research carried out in the Faculty over the coming years.

The structure of today’s forestry curriculum that incorporates disciplines such as sociology reflects the continuing evolution of what we at UBC believe encompasses “forestry”. One of the strengths of the Faculty is in our breadth and depth of disciplines ranging from policy and silviculture to engineering and molecular biology. This diversity and excellence of forestry research and teaching interests also provides a focus for many of our UBC colleagues based in other faculties, as well as the opportunity for beneficial synergistic interactions. However, as evidenced by the many organisations and

institutions that are involved in forestry-related education and research around the world, there are various ways of structuring the delivery of forest programs. Over the next 50 years we hope to play a major role in influencing forestry education.

As part of our 50th anniversary celebrations, we are working with the Food and Agriculture Organisation (FAO) to invite leaders of many of the world’s forestry and forest products educational institutions to visit our new Forest Sciences Centre. This international forestry educators meeting will coincide with our major anniversary event on Monday, December 3rd. The educators’ meeting will focus on common areas of concern such as recruiting the “brightest and best” students and the continuing evolution of “what constitutes a degree in forestry”.

The discussions of these international forestry educators will very likely mirror the current debate underway in B.C. as our new provincial government decides how best to structure the various ministries, their staff and programs, to better serve the people of British Columbia. Much of the wealth generated by B.C.’s forests is used to supplement provincial programs in health and education, with only a relatively small portion reinvested in forest-related programs. At a time of anticipated drop in forest-related revenues, it will be important to decide how best to invest these diminished funds.

In this time of global issues it is useful to look at the strategies adapted by other countries. For example, a recent (August 2001) issue of “Focus” from the New Zealand Forest Industries Council describes their goal of creating a \$20 billion forest industry by 2025, directly employing 60,000 people and contributing at least 14 per cent to New Zealand’s GDP. At the same time, in my submission to the “fix or scrap” review of

Forest Renewal BC, I quoted the 3.1 per cent of GDP invested in research, science and technology that has resulted in Finland receiving the number one ranking as the world’s most competitive economy (in the latest review of global competitiveness produced by the World Economic Forum). Much of this success can be traced back to reinvestment of forest generated funds into other sectors or within strategic areas of the forest sector itself.

Thus, as we at the UBC Faculty of Forestry celebrate our successes over the past 50 years, we will be looking to the future to determine what role we will play in ensuring that B.C.’s and Canada’s forests remain not only a source of revenue and jobs, but also a source of pride and a basis for education and research into current and future facets of forestry.

You can reach me in person, by letter, fax 604-822-8645, phone 604-822-2467, or e-mail saddler@interchg.ubc.ca.

Jack Saddler

RESEARCH HIGHLIGHT

Spacing effects on wood quality

As the forest industry becomes increasingly dependent on second-growth timber, the question of wood quality becomes more relevant. Accelerated growth, coupled with an earlier harvest, will lead to changes in the properties of the timber harvested. If target stand structures and crop objectives are to be met by forest managers, it is essential that a better understanding of the effects of tree development on wood quality be gained. To this end, the influence of cambial ageing, initial spacing, stem taper and growth rate was non-destructively evaluated on a range of wood quality characteristics of Douglas-fir, western hemlock and western redcedar.

A highly significant cambial age effect was noted for practically each wood property considered. An identical pattern of development, regardless of spacing or taper class, was identified for Douglas-fir via latewood proportion and whole-ring relative density, and for western hemlock via latewood width, earlywood relative density, late-wood relative density, whole-ring tracheid length and microfibril angle. No identical results were identified for western redcedar. An increasingly non-significant relationship evolved over time between growth rate and whole-ring relative density for Douglas-fir. A slight, but increasingly negative relationship unfolded for western hemlock. An

increasingly stronger negative relationship developed for western redcedar.

A gradual decrease in juvenile wood ring count was commonly identified with increasing height. When profiled by radial distance from pith, the juvenile cores ranged in shape from highly tapering to

more-or-less cylindrical. Generally speaking, the larger the volume of crown foliage relative to length of branch-free stem, the lower the passage from juvenile wood to mature wood below the base of the live crown.

In terms of the potential for modification of wood properties via stand density management, western hemlock was the most robust (fewer effects of spacing on the development of wood properties) followed by Douglas-fir. Relatively wide initial spacings could hypothetically be used to produce large diameter logs over a shortened rotation without having an adverse effect on the wood properties identified above. For western redcedar, no identical profiles of development were identified for any of the wood properties considered, suggesting greater sensitivity in terms of the relationship between available growing space and wood formation. This finding suggests that overall, western redcedar presented the greatest potential for modifying wood quality via stand density management.

This study was conducted in large part by Dr. Stéphanne Fabris for his Ph.D. thesis under supervision of Dr. Simon Ellis.

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Non-destructive core sampling.

DEPARTMENT NEWS

In September two new faculty members joined the department. See page 5 for details on the appointments of Mr. Robert Fürst and Dr. Taraneh Sowlati.

Dr. Rob Kozak received the Faculty of Forestry Killam Teaching Award at the May congregation ceremonies. Also in May, Rob gave a presentation on "Future Trends in Wood Products Research" to the Danish Centre for Forest, Landscape and Planning. In June, Rob co-chaired a conference on "Design for Secondary Wood Products" organized by the Centre for Advanced Wood Processing, Forintek Canada Corp. and

Université Laval. In July, Rob was invited, along with Dr. Chris Gaston of Forintek Canada Corp., to the United Nations in Geneva to work on their Forest Products Annual Market Review.

In June, Dr. Shawn Mansfield gave a presentation on the "Effect of Recombinant *Cellulomonas fimi* β -1,4-glycanases on Softwood Kraft Pulp Fibre and Paper Properties" at the 8th International Conference on Biotechnology in the Pulp and Paper Industry held in Helsinki, Finland. Dr. Jack Saddler gave a presentation on "Cellulases: Agents for Fibre Modification or Bioconversion?" at this same conference.

Dr. John Ruddick represented Canada at the ISO TC165 Subcommittee on Wood Durability, which drafted "An International Framework for Classifying Wood Products Durability Based on Use Classes".

Ms. Sungmee Choi (graduate student of John Ruddick) presented two papers on "Mechanisms of Fungal Colonization in Treated Decking" at the International Research Group on Wood Preservation in Japan. Sungmee is a recipient of the Ron Cockcroft Award provided by the International Research Group for outstanding young scientists. □

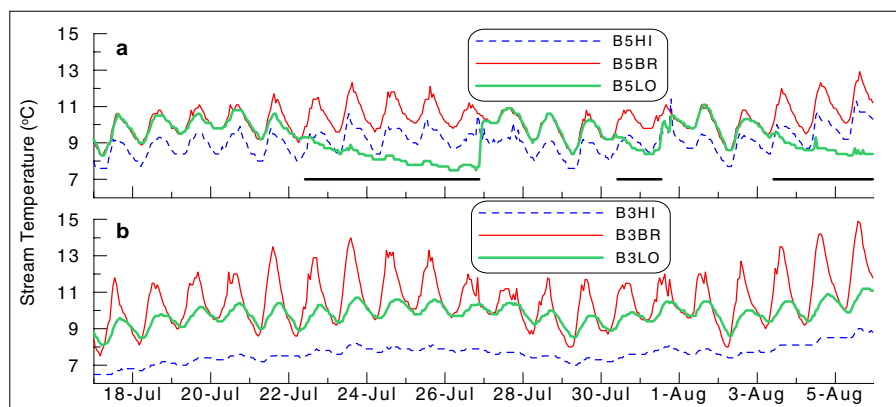
Do clearcut-heated streams cool when they flow back into the forest?

REMOVAL of riparian vegetation during forest harvesting generally increases day-time stream temperatures during summer, due to the increased energy input by solar radiation. These temperature increases are of concern in relation to species such as salmonids. For example, the Nicola River has been designated a “temperature sensitive stream,” and a contentious issue is whether harvesting around headwater streams at higher elevations can influence temperatures in lower-elevation, fish-bearing streams.

Few studies have examined what happens to stream temperatures downstream of forestry activity. Fisheries and Oceans Canada (DFO) have monitored stream temperatures since 1997 in three small streams in the Stuart-Takla Fish-Forestry Interaction Project in the central interior of B.C. The catchment of one stream, B4, was not logged, while the catchments of the other two streams, B3 and B5, were partially clearcut. Both B3 and B5 warmed through the cut blocks, but cooled markedly in less than 200 m after flowing back into undisturbed forest. The maximum daily temperature sometimes decreased by 4–5°C, occasionally exceeding the amount of warming through the clearcuts.

During 1999 and 2000, we conducted field campaigns to identify the causes of the observed stream cooling. Our key findings follow:

- The streams gained energy from the atmosphere/vegetation canopy through the “cooling reaches” during afternoons



Stream temperatures during part of summer 2000. The HI, LO and BR sites are located above the cut block, where the stream flows back into undisturbed forest, and approximately 170 to 200 m into the forest, respectively. The horizontal lines in (a) indicate when stream B5 was discontinuous.

and most evenings, even under complete forest cover.

- Where groundwater is in contact with the channel, inflow of cool groundwater, bed heat conduction and hyporheic exchange (two-way interaction between stream-water and riparian groundwater) may cause cooling.
- B5 lost warm water by bed infiltration in the upper part of the “cooling reach,” then gained cold groundwater just upstream of the lower temperature logger.
- The greatest “cooling” at B5 occurred during dry spells, when the stream became discontinuous between the two lower temperature loggers: warm water from the clearcut did not reach the lowest temperature logger in the forest.

Taken at face value, the observed cooling downstream of forestry activity suggests that harvesting in headwater streams may have little effect on temperatures in downstream reaches. However, the processes controlling the cooling in these streams may be site specific. Replication of the study in other geographic contexts would be required before any generalizations could be safely drawn about the distances required for downstream cooling of clearcut-heated streams.

This study was conducted in large part by Anthony Story for his M.Sc. thesis in Geography, under supervision of Dr. Dan Moore, Forest Renewal BC Chair of Forest Hydrology. Cooperation of DFO is gratefully acknowledged.

For additional information, please contact Dan Moore at 604-822-3538 or e-mail rdmoore@geog.ubc.ca.

DEPARTMENT NEWS

Effective July 1, Kevin Lyons has joined the department as an assistant professor in forest operations (see page 5). Dr. John Innes has been appointed as co-director of the Centre for Applied Conservation Research (see page 5) and as Chair of the Board of Directors of the Southern Interior Forest Extension and Research Planning Partnership.

In June, Dr. Dan Moore gave an invited presentation on stream temperature research to the Nicola Temperature Sensitive Stream

Committee. Earlier in the month, he participated in a meeting of the Arrow IFPA to develop criteria and indicators for sustainable forest management in relation to water quantity and quality.

In April, Dr. David Haley presented a paper on community forestry in B.C. at the 16th Commonwealth Forestry Conference in Perth, Australia.

Drs. Valerie LeMay and Temesgen Hailemariam presented papers at the Western Mensurationists meeting in Kalispell and

the IUFRO meeting in Greenwich, UK at the end of June.

Dr. Paul Wood (conservation policy) has returned to the department following a two-year leave of absence. His book, “Biodiversity and Democracy: Rethinking Society and Nature”, published by UBC Press, is now out in paperback. Paul has been awarded the K.D. Srivastava Prize for Scholarly Publications.

Dr. Casey van Kooten has resigned from the department, effective September 2001.

RESEARCH HIGHLIGHT

Kermode bear genes revealed

THE Kermode bear is the white-coated black bear that inhabits the rainforests on our north coast (see photo). It has a place in First Nations legends, and has been protected from sport-hunting since 1925. To aid in the management of these bear populations, and to provide perspectives about the uniqueness of the Kermode bear, we recently completed two genetic studies at UBC. These studies provide the first scientific basis for the management and appreciation of this bear.

Over three years, we obtained DNA samples from a total of 220 different bears across the region where white bears occur, starting with field-samples of bear hair collected from baited traps. We then surveyed levels of genetic variability at several locations in the genome (using microsatellite DNA markers), and found slightly (4%) less variation in Kermode-containing populations, and moderate levels of genetic differentiation (10%) among populations in this region, consistent with ca. 1-2 immigrants per generation into each island population.

We then found the gene responsible for this coat colour difference: a single nucleotide replacement in the melanocortin-1 (*Mclr*) receptor gene, which causes a change from adenine (A) to guanine (G) in the protein

product. A site near the end of this gene displayed an A to G change, which completely correlated with the change of coat colours: the 220 bear genotypes were GG in all 22 white bears, GA in 34 black bears, and AA in the remaining 164 black bears. This confirms a genetic control and recessive inheritance of the white coat.



*A white and a black bear, perhaps siblings, next to each other.
(Photo courtesy of Charlie Russell)*

Is the white bear significant? One can argue both ways. Yes – The single-nucleotide polymorphism has not been reported in any other study of *Mclr* variation, and is also the first documented white *Mclr* variant. And, evolution may have taken tens of thousands of years to find and establish

such a variant, which may have adaptive significance. No – There are billions of other nucleotide molecules that make up the bear genome, and genome-wide genetic differentiation of Kermode-containing populations are at levels expected for island populations of other species. Also, other traits unrelated to coat colour may underlie the subspecies (including both white and black bears) adaptation to the natural environment.

Two applications of our discovery are that (1) detection of heterozygotes (black bears possessing a Kermode allele) allows a more accurate prediction of the actual numbers of Kermode bears, and hence monitoring of their numbers under various forest practices, and (2) our proof of recessive inheritance of Kermodism indicates that management practices should aim to minimize cross-water gene flow into island populations containing white bears at high frequency.

This study was carried with the support of Western Forest Products and NSERC. Craig Newton and Dawn Marshall conducted the

molecular work, and John Barker and Tony Hamilton (MoE) provided much of the advice and guidance.

For further information, please contact Kermit Ritland at 604-822-8101, fax 604-822-9102 or e-mail ritland@interchg.ubc.ca. □

DEPARTMENT NEWS

Dr. Cindy Prescott gave a keynote address on “Canopy Complexity and Nutrient Cycling” at the IUFRO Canopy Processes conference in Oregon in July 2001.

Dr. Hamish Kimmins gave invited lectures at the University of Genoa, University of Florence and University of Viterbo, Italy in June. In May, he submitted a report to the Ministry of Forests on boreal mixedwood management issues in the Fort St. John and Dawson Creek Forest Districts. In April and

May, he participated in field trips to the mid-coast and the boreal northeast of the province. He is developing projects with Interfor on a decision support tool (Local Landscape Ecosystem Management Simulator – LLEMS) for the design and assessment of complex cutblocks, and with Western Forest Products for the assessment of carbon budgets in northern Vancouver Island and mid-coast forests.

In June, Dr. Yousry El-Kassaby attended the 21st Southern Forest Tree Improvement Conference in Athens, Georgia, where he

presented two papers. Yousry has also been appointed to the Editorial Board of “Forest Genetics”.

Dr. Jörg Bohlmann (with Steve Seybold of the University of Minnesota) has been awarded the Young Investigators Award of the Human Frontier Science Program Organization for “Comparative biochemical and molecular studies of isoprenoid biosynthesis in pines and pine bark beetles”. Jörg has also been appointed as a Peter Wall Early Career Scholar for 2001-2002. □

Faculty News



Dr. George Hoberg has been appointed head of the department of Forest Resources Management effective July 1. A political scientist by training, he received his B.S. from Berkeley and his Ph.D. from MIT, and has taught at UBC since 1987. His background is in public policy studies, focusing on forest and environmental policy. His work has focused on comparative public policy (especially Canada-US), the role of knowledge in the policy process, and international constraints on domestic policy autonomy. His most recent book (co-authored with four others) is *In Search of Sustainability: Forest Policy in British Columbia in the 1990s*. He is beginning a SSHRC-funded research project called *Shifting Boundaries in Forest Policy: Canada and the Emerging International Forest Regime*, which focuses on the privatization of forest policy involved in the certification movement. George Hoberg is also the director of *policy.ca*, a non-partisan resource for public analysis of Canadian policy issues.

As department head, George's priorities are strengthening the department's research capacities in three core areas: First Nations, certification, and intensive zoning. Rejuvenating the department's research and teaching capacity in resource economics is critical to all of these areas. In undergraduate teaching, the emphasis will be on implementing the new B.S.F. program, providing better integration between the forest management and conservation programs, expanding recruitment, and producing outstanding, thoughtful, professional graduates. In graduate studies, the department plans on developing more focused programs, including one on Forests and Society.

George also hopes the department will play a more public role in forestry debates – not by advocating particular positions on values, but by clarifying the boundaries between facts and values, and thereby informing public dialogue.

George can be reached at 604-822-3728, fax 604-822-9106 or e-mail hoberg@interchg.ubc.ca.



Dr. Taraneh Sowlati has joined the Wood Science department as an assistant professor. Taraneh received her B.Sc. and M.A.Sc. (Hons.) in industrial engineering from Sharif University of Technology and her Ph.D. in industrial engineering/IT from the University of Toronto. She has worked as a designer and software developer at the System Design and Development Co. where she developed software packages for Mehrabad International Airport. Her teaching responsibilities will include courses in industrial engineering and job costing and economics. Her current research interests are in the areas of efficiency and productivity measurement and improvement, optimization, operations research and information technology. One of the goals for her future research is to determine and improve the efficiency of labour and capital utilization in the wood industry in Canada.

Taraneh can be reached at 604-822-6109 or e-mail taraneh@interchg.ubc.ca.



Mr. Robert Fürst has joined the Wood Science department as an instructor in wood products processing. Robert received his Masters degree in wood processing from the Chamber of "Secondary Wood Processing" in Augsburg, Germany, and has worked for more than ten years in the secondary industry as a project and plant manager. For the past four years, Robert has taught courses for the Centre for Advanced Wood Processing, BC Wood, Forest Renewal BC and the secondary wood processing industry. He has also worked as a consultant and advisor in the areas of improved production flow, product quality, equipment performance, plant layout and plant safety. Robert's teaching responsibilities will include courses in wood products manufacturing, furniture construction and hands-on courses using wood processing machinery.

Robert can be reached at 604-822-0034 or e-mail furst@interchg.ubc.ca.



Dr. C. Kevin Lyons has joined the Forest Resources Management department as an assistant professor. Kevin graduated from the forest technology program at Malaspina College and then worked in the forest industry holding positions of cruising supervisor, logging engineer, roads foreman and woods foreman. In 1997, he completed a B.S.F. in forest operations followed by an M.F. from UBC in 1998. In September of 2001, he completed a Ph.D. in forest engineering at Oregon State University. Kevin will be teaching courses in forest transportation systems and cable mechanics. One of the goals for his future research is to increase understanding of the mechanics of the natural materials used in forest engineering. He also believes we need to find a balance between optimum solutions in forest operations research and ones that are robust and maintain future options.

Kevin can be reached at 604-822-3559 or e-mail kevlyons@interchg.ubc.ca.



During the summer, the Centre for Applied Conservation Biology underwent several changes. These reflect a widespread desire to see the Centre dealing with issues from multiple scientific viewpoints. To meet this challenge, **Dr. John Innes** has joined Dr. Fred Bunnell as a co-Director of the Centre, and the name of the Centre has been adjusted to reflect a broader range of research interests. The Centre is now extending its mandate to include social sciences, particularly economics, in the solution of conservation biology, land use and planning questions. The Centre will also be seeking to expand its interaction and involvement with First Nations over land management issues. Finally, a greater role will be given to extension and outreach, partly in collaboration with the Southern Interior Forest Extension and Research Partnership.

John can be reached at 604-822-6761 or e-mail innes@interchg.ubc.ca.

50th Anniversary of the Faculty of Forestry

Some history ...

The year 2001/2002 marks the 50th year for the Faculty of Forestry at UBC. However, some clarification may be needed on this date! Forestry courses at UBC were first taught through a department of Forestry housed in the Faculty of Applied Science. The first department head (H.R. Christie) was appointed in 1919. The first forestry undergraduate degrees (forest engineering) were awarded in 1923, and the first masters degrees (M.A.Sc. in forest engineering) were granted in 1933. The Bachelor of Science degree in Forestry was introduced as a double degree in 1939, to be replaced in 1947 by a four-year degree (following first year university matriculation).

The Masters of Forestry and Ph.D. degrees in forestry were authorized in 1949, but the Faculty of Forestry was not authorized as a Faculty at UBC until 1950. Following this formal "authorization", the Faculty of Forestry was officially formed in 1951. Hence our 50th Anniversary now!

Since the beginning of the Faculty we have had seven deans and three acting deans. The first dean was Lowell Besley, followed by George Allen, Robert Wellwood (acting), Thomas Wright, Joseph Gardner, Robert Kennedy, Tony Kozak (acting), Clark Binkley, Tony Kozak (acting), John McLean (acting) and today's dean, Jack Saddler.

In total since 1921, we have graduated 3,477 students from our undergraduate programs, 598 students from our masters programs and 275 students from our doctoral programs.

In celebration of our 50th Anniversary, we have several special events planned throughout the year. On Thursday, September 20th we began our Jubilee Lecture Series with a free public talk by Hamish Kimmins. Hamish holds the Canada Research Chair in Forest Ecosystem Modelling and is professor of forest ecology at UBC. Over 275 people attended the highly successful event held in the Forest Sciences Centre. Copies of Hamish's talk "**Future Shock in Forestry: Where have we come from and where are we going?**" are available from our web site at www.forestry.ubc.ca.

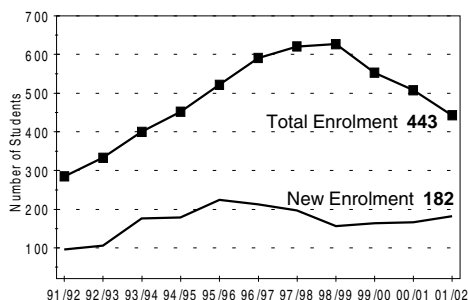
*Everyone is invited to our one-day Jubilee Anniversary celebration on December 3rd. See the flyer enclosed with this issue of **Branch Lines**, or call our 50th Anniversary Coordinator at 604-822-8787, e-mail 50anniv@interchg.ubc.ca for more information.*

Our next Jubilee Lectures will be by **Wade Davis** on Monday, October 22nd and **Stephen Sheppard** on Monday, November 19th. Watch our web site for further details on these events.

Undergraduate enrolment

These enrolment statistics are preliminary and will be finalized in mid-October.

We have 182 new undergraduate students enrolled for the 2001/02 academic session. This is up 11% from last year. While some of these new students are entering directly into second or third year, 84% are enrolled in first year. Although our total number of new students exceeded our initial target of 160, we have not attracted as many students as we had hoped to higher years of our programs. Our total undergraduate enrolment is now 443 students – a drop of 12% from last year and down for the third year in a row. Part of this decrease is caused by the large classes of the late 1990's moving through the system; however, a large portion is due to low retention levels from our first year classes. An increasing number of our new students come to us directly from high



school and do not meet our academic standards after their first year in a university setting. Others decide not to stay with our program or are asked by us to withdraw. We are presently engaged in several initiatives to increase the success rate of our new students.

Celebrating 10 years of success

Seminars in Biological Conservation

The **Seminars in Biological Conservation** lecture series is the Faculty of Forestry's most successful lecture series and the most well attended series of conservation lectures on campus. Since 1991, we have sponsored 101 lectures from 11 countries and 46 universities through this series. Our speakers are high profile scientists from major conservation and ecology research institutions, as well as from national and international conservation agencies. The lecture topics span the full range of conservation interests in the Faculty. For our graduate students, the lectures have provided high quality training and invaluable contact with internationally known academics. Finally, the **Seminars in Biological Conservation** have provided the Faculty with highly positive publicity as our invited speakers consistently praise our programs. The H.R. MacMillan Family Fund has provided the majority of financial support for these lectures and we thank them for a decade of support.

For further information, contact Dr. Kathy Martin at 604-822-9695 (e-mail kmartin@interchg.ubc.ca) or Dr. John Richardson at 604-822-6586 (e-mail jrichard@interchg.ubc.ca).

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