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The journal of Canada's avalanche community

Avaluator 2, CAA Member Services, AvSAR Response and more!

Volume 34 Fall 2010
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REMEMBERING WILLI

AN ICON PASSES: MEMORIES OF WILLI PFISTERER

RECIPE FOR DISASTER

NEW RESEARCH LOOKS AT THE INGREDIENTS FOR PERSISTENT DEEP-SLAB INSTABILITIES

KEY MESSAGES

THE CAC'S COMMUNICATION STRATEGY FOR SNOWMOBILE SAFETY

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"Un Pas En Avant"
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Cover shot: This hummer was triggered by explosives in Bear Pass on January 25, 2007, the biggest winter in that region since 1972. "It was a pretty exciting avalanche to watch, the biggest I have ever seen," reports photographer Mark Austin. "Just after the picture was taken, the slide initiated seracs from the glacier increasing the size substantially." Recorded as a size 4 (though some thought it was 4.5) it buried the highway under 15 – 20 m of snow debris and glacier ice. The crown averaged 4 – 4.5 m, and the avalanche ran a distance of 3.5 km, 1800 m vertical.

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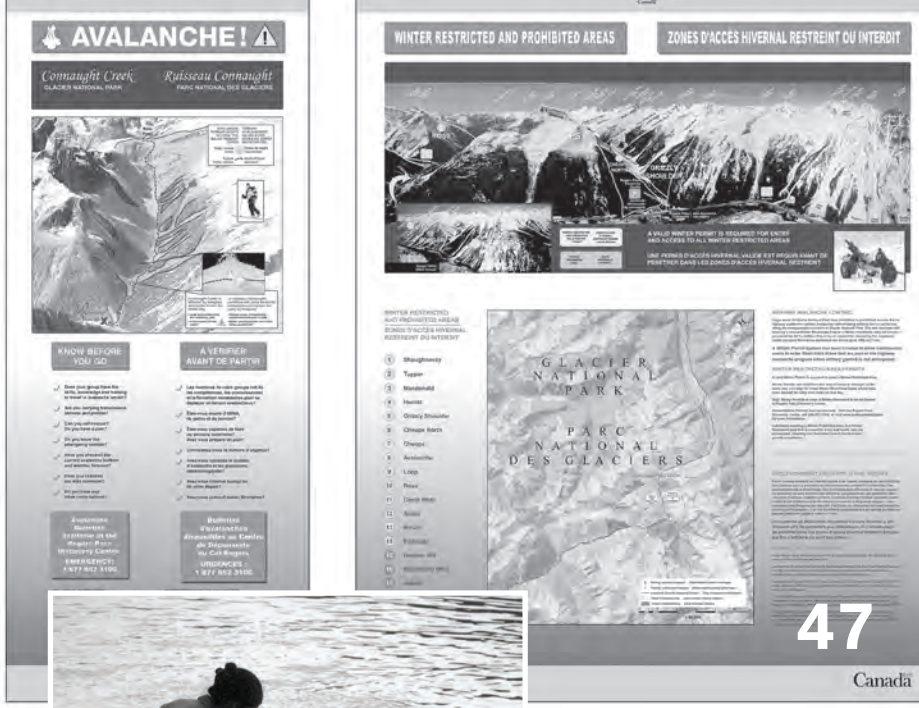

failure plane

In the summer issue of this journal (Vol 93) we had a report on the events surrounding the 1910 Centennial Ceremony, marking the 100th anniversary of Canada's worst avalanche accident. In that report we neglected to include the fact that the Yamagi family of Japan donated $1000 to the CAC during that ceremony. We deeply regret the omission. The CAC is very grateful to the Yamagi family for their generous donation.

This journal is the official publication of the Canadian Avalanche Association (CAA), the Canadian Avalanche Centre (CAC) and the Canadian Avalanche Foundation (CAF). The CAA and CAC are non-profit societies based in Revelstoke, BC, serving as Canada's national organizations promoting avalanche safety. The CAF is a registered charity formed to provide a tax-deductible fundraising mechanism for the support of public avalanche safety initiatives. The CAF is based in Canmore, AB.

The goal of *avalanche.ca* is to keep readers current on avalanche-related events and issues in Canada. We foster knowledge transfer and informed debate by publishing submissions from our readers. Responsibility for content in articles submitted by our readers lies with the individual or organization producing that material. Submitted articles do not necessarily reflect the views or policies of the CAA, CAC or CAF.

We always welcomes your opinions, teaching tips, photos, research papers, survival stories, new product announcements, product reviews, book reviews, historical tales, event listings, job openings, humourous anecdotes and, really, anything interesting about avalanches or those people involved with them. Help us share what you have. Please send submissions to:

Editor, *avalanche.ca*
Canadian Avalanche Association
PO Box 2759, Revelstoke, BC V0E 2S0
Tel: (250) 837-2435 Fax: (250) 837-4624
E-mail: editor@avalanche.ca

Editor	Mary Clayton
Layout & Design	Brent Strand

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Are we there yet?

As the CAC heads into its sixth winter of operations, it's with more than a little trepidation. While we are rightfully proud of the good work that's been accomplished since incorporation in 2004, we find ourselves on a bit of a collision course as we enter this coming season. The writing has been on the wall for a few years now. Snowmobiling avalanche fatalities are on the rise and what are we doing about it?

Readers of this journal know the issues well. A largely unaware and untrained user group has easy access to complex avalanche terrain. Their numbers are substantial, and growing. While inroads are being made in terms of awareness, riders with avalanche education remain the minority. Many of the accidents show a poor understanding of avalanche terrain, little or no knowledge of current avalanche conditions, and a tragic lack of awareness of the risks being taken.

In January of this year, we received a report from the BC Coroners Death Review Panel examining the snowmobile avalanche fatalities of 2008-09. We called that report our "road map" for moving ahead on dealing with this issue. Its 15 recommendations spoke to the heart of the matter, identifying the areas where change is needed and outlining the steps that need to be taken.

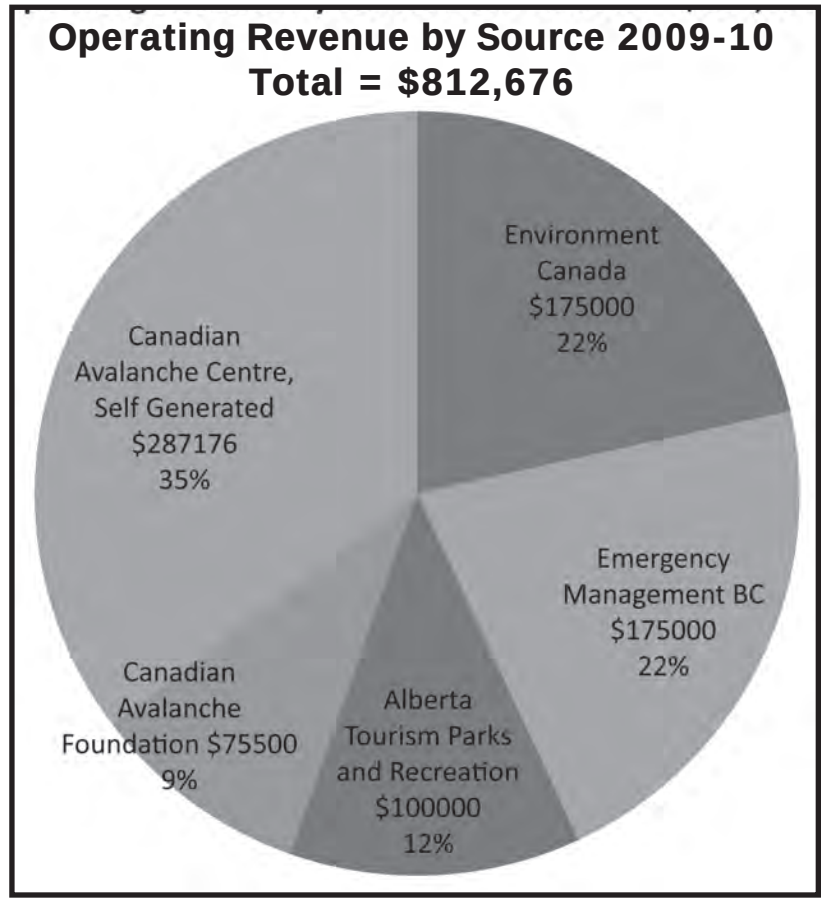
Where are we on that road map? Not very far. If you were travelling from, say, Vancouver to Calgary, we're at about Chilliwack. A long way to go yet, with several major mountain ranges still to cross.

So what's the hold up? It's not a navigation problem—we know where we want to go. It's not what we're driving. The CAC is no Ferrari, but it's been built to handle the road ahead. Our trouble is fuel. You've heard it before and I'm afraid you're going to hear it again—the CAC still needs substantial, sustainable funding before any real progress can be made in reversing the trend of snowmobiling fatalities.

Some progress has been made. We've been working closely with a number of stakeholders in the snowmobiling sector and have made some important connections. As you've read in this journal before, some great work has come from the "grassroots" of the sledding community. Over the summer we worked hard to engage more meaningfully with manufacturers and snowmobiling associations and, while we can't exactly report overwhelming success, there has been movement on a number of fronts.

The situation with government funding is similar. We've made some important connections and we're working more closely with the various ministries that have an interest in avalanche safety. The Solicitor General and Ministry of Public Safety is not the only door we've been knocking on. We work with the Ministry of Tourism, Culture and the Arts, the Ministry of Forestry and the Ministry of Transportation and Infrastructure. It's apparent that every one of these ministries sees the importance of avalanche safety, but making lasting decisions about taxpayers' money is (as it should be) a process that requires time and thought.

While the many discussions and meetings held over the summer show promise, the truth is we're not where we hoped to be. Many good ideas and projects are on hold because we don't have the resources to do anything more than focus on our core services. On the up side, we've made a lot of good friends over the summer, and a lot more people in power know how the CAC works. We hope these connections will get us the fuel we need soon because there's a long road ahead and right now, we're running on fumes.



Looking Ahead

What does the next 30 years hold for professional avalanche risk management in Canada?

The leaves are turning, it's cold and raining buckets—winter is coming. Staff is back at work, courses have already started and registrations continue to come in for the new Qualified Avalanche Planner class of membership as voted in this spring. There is a constant stream of phone calls into the CAA regarding worker safety, worker training, avalanche safety plans, land managers guides and the eagerly anticipated *Avalanche Accidents in Canada Volume 5* due out later this fall.

There is excitement and anticipation in the air both in our offices and in the community of Revelstoke. It's not long before the white stuff returns and we're out digging baseline profiles, testing and calibrating our explosives targets, reviewing emergency procedures and our avalanche safety plans, and getting ready for season startup. The extensive and diverse community of professional avalanche risk management programs in Canada is out of summer hibernation and getting ready for what mother nature will throw our way once again. Sounds like La Niña is knocking at our doorstep.

2011 will be a landmark year for the CAA and, as with any landmark year, we need to celebrate it as a community. The special events will start in March with the first-ever North American meeting of the International Commission of Alpine Rescues Avalanche Committee. This will take place in Revelstoke and will culminate in an educational symposium on the 40th anniversary of the first professional level avalanche training in Canada in December. I've received numerous messages from members who want to be involved. Here is the line up so far:

March 22 –24, 2011

International Commission of Alpine Rescue – Avalanche Commission meetings in Revelstoke, BC hosted by the CAA

Central themes will be showcasing the programs and services offered by the CAA and the network of avalanche risk management programs in place in western Canada. This field-based conference will include three full field days with evening seminars. Topics include best practices in avalanche education, avalanche search and rescue in large regions and avalanche safety and prevention issues of tomorrow.

This event will mark the official start of the 30 year anniversary celebrations for the CAA. If you are interested in volunteering during the event, please contact me directly.

May 2–6, 2011

CAA Annual General Meeting and Spring Conference, Penticton BC

The annual AGM for the CAA will take on a slightly different theme in recognition of our anniversary. A key focus will be on education and professionalism. There will be a special event planned for the afternoon and evening of Wednesday, May 4 at the Penticton Convention Centre that will include banquet dinner and speakers. Focus will be to highlight InfoEx, the CAA and Professional Training separately during this event. We're soliciting ideas on what this session could contain.

A great idea that surfaced recently is to do a historical visioning session with all those in attendance to map out the history of the CAA including key events, landmark accidents and various other drivers of change and success with an eye on developing a poster and/or a living historical timeline on the CAA's website. I'd like to hear your thoughts on what we can do and what you'd like to see on this 30 year event.

December 2–4, 2011
Avalanche Education Symposium, Rogers Pass, BC

A three-day avalanche education symposium hosted at the same venue where the very first professional-level avalanche course was run in 1971. This will be a mix of lectures and, conditions permitting, field sessions to discuss current and emerging topics of interest to both professional and recreational avalanche education.

Our hopes are that the outcomes of this symposium can be used as a guidance document for the CAA and other educational programs with respect to helping guide the next 40 years of avalanche education in Canada. It's a tough time of year but we're hoping to attract key representatives from employers and the community for this once-in-a-lifetime event.

It's going to be a good winter and an even better year with the 2011 anniversary celebrations planned. It's time to shift our focus now from the past to the future. Realizing that it's been a long and winding road for the CAA since 1981, what have we learned about professional avalanche work in this time that can help us in the next 30 years?

We live in an increasingly technological world, yet avalanche prediction and forecasting remains as much an art as it is a science. The wise old words of Peter Schaerer still ring true: "To do well in this industry you need one foot squarely planted in theory, the other in practice." As our role changes from that of fraternal organization to that of a professional organization, what does our past tell us about our future? Time will tell.

As you prepare for the winter ahead, think about your association, where it has come and where it needs to go. 2011 will mark another milestone in our organization's history and set the stage for what's to come. Your participation in the events, the Annual General Meeting this spring and on the committees and boards that help shape and steer the activities of the CAA is vital—as vital as the services that you provide to keep people and property safe from avalanches in Canada and set the standards that those around the world look upon as best in class.

Have a safe and productive winter everyone. Let's see what La Niña brings us this year!

Ian

Phil Heil collection

Strategic Plans

Fall weather arrived in late August and there is snow on the high peaks once again—the snow season cycle begins anew. Each year brings forth an uncertain pattern for the winter weather ahead and the snowpack conditions that result. If you subscribe to any of the long-range forecasts put out by various entities, many are pointing at the end of last year's El Niño pattern, and some variation of an ENSO (neutral) or La Niña pattern to take over this season. Longer-range predictions are anticipating increased precipitation and cooler temperatures from those of last season. We shall monitor and see.

The CAC and CAA offices have taken a well-needed break for part of this summer, closing for most of July and reducing staffing levels from June to September. Both operations rely heavily on annual budget planning, with revenues that have become more static over the past few years, especially in regards to CAC funding levels for public programs. Many of the regular staff for both organizations logged long days and weeks during the busy periods last winter, which turned out to be a large part of the time. Managing the fixed operational budgets means that staff who have worked overtime during the busy winter period, must take time off in the summer period to balance the books. This arrangement is similar to many of our government colleagues in the avalanche sector who work under these types of employment policies and conditions, as well as some of the larger established companies who use similar systems to retain long-term staff.

Meanwhile, the work-load and interests that surround both CAC and CAA organizational and operational activities rarely subsides from year-to-year. In fact, the demands have steadily grown over the years. Keeping up with the increasing number of user interests and new initiatives can be a constant case of prioritization, often with a number of items dropping down the list until time allows.

Both organizations face growing public, member and societal expectations at this time. With that increased scrutiny comes some tough questions: Is there a need to separate and better focus representation of CAC and CAA mandates? Do the two organizations need independent governance and management structures?

In regards to the public avalanche safety programs and services of the CAC, we are finding that government funding is closely evaluated and perhaps constrained at times, because of the close ties observed between the organizational structures of the CAC and CAA. The two organizations share five of eight positions on their respective boards of directors (President, Vice-President, Secretary-Treasurer, Membership Director, and the Director representing Professional members) as well as an Executive Director who divides his time 50/50 between both.

This structure was not created thoughtlessly. In 2004, the CAC was independently registered as a separate society from the CAA, and launched as a national focal point for public avalanche safety representation across Canada. The shared board was originally envisioned to help maintain the advantages and links between all parties involved in avalanche safety, as well as to save the costs of maintaining two separate organizations and physical offices for each.

While it made fiscal and operational sense at the time, it now appears further separation is required, which would benefit both organizations in terms of more clearly defined roles between board governance and key management staffing. This in turn would likely provide better support all the way down the line in both operational focus and managing staffing levels and support for each organization.

The two boards met for a weekend meeting in mid-September of this year, with the purpose of examining this issue. Our discussions resulted in several key structural organizational scenarios being analyzed and assessed, by considering the range of requirements identified. The review process is still in the early development stages at the board level, and we plan to gather governance and legal council input this fall and early winter. The three-year Strategic Plans for both the CAA and CAC (2010-2013) that began in June are moving closer to being finalized this fall. This will assist us in managing the more detailed organizational governance and structural review process ahead.

Meanwhile, the work of managing both organizations and their associated activities for the winter ahead continues. The demand for CAA avalanche training programs continues to be reasonably strong as workers upgrade skills for industry

employment and increased attention by safety regulators in work places. The CAC meanwhile is focusing efforts for maintaining core Public Avalanche Warning Services (PAWS), specifically the bulletin/advisory system.

Improving the effectiveness of the forecasting regions through reducing the large size of the forecast areas has not yet been supported by increased funding support from stakeholders. While some glimmers of additional support via new funding have recently appeared, it is only enough to allow the CAC to maintain the status quo. Improving the program, as has been identified for many years as a need especially for the snowmobile community, has seen very limited support over the past several years.

"Having engaged members sharing their experience and expertise has been a leading source of improvements in all that we have accomplished over the many years."

Changing gears in how the CAC and CAC are structured now appears to be the next required phase and evolution. We are planning an open discussion and exchange with CAA and CAC members attending the International Snow Science Workshop (ISSW) hosted this year at Squaw Valley, California. We welcome input from members of both organizations. What do you feel are the most important issues to address in the months and years ahead? How do you see the potential of re-structuring the governance and framework for our two organizations? If you're at the ISSW, please be sure to attend this meeting and voice your opinion on our next steps.

One other key message that I'd like to convey to members at this time is the need to renew and re-engage committee work for both the CAA and CAC. The strong roots of the CAA, going back 30 years now, is largely due to the backbone work performed by committees. These volunteer organizations were a key benefit to building our community's strength, and needs to be developed further within the CAC as well. We hope that recognition of this important value can be re-emphasized in the months and year ahead, as we embark on a new phase of organizational developments for the CAA and CAC. Having engaged members sharing their experience and expertise in different committees has often been a leading source of improvements in all that we have accomplished over the many years.

I look forward to seeing those of you who can make ISSW 2010 for the conference and exchange of ideas on avalanche safety and snow science later in this October, and others out in the hills this winter where our paths may cross. I also look forward to hearing that more people are able to contribute and assist the CAC with finding solutions to some of the funding challenges that continue to hold back the beneficial work and safety programs that the organization can provide on a greater scale.

All the best to everyone in their fall preparations for the winter ahead. You can contact me by email at president@avalanche.ca if you have any comments regarding either the CAC or CAA. In the spring issue of the journal, we unfortunately printed the wrong address (pres@avalanche) which would have resulted in bounced emails. Sorry if that happened to you—we'll try to get it right this time around. You know, it's often the new guy.

Best Regards, Phil Hein

Student Services, Member Services

Two familiar faces in new roles at the CAA


Audrey Defant collection


Siobhan Quinn collection

For many years, Audrey Defant has taken care of both member and Industry Training Program student services at the CAA. She's done a great job and, for many members and students, Audrey is the voice of the organization, the person they communicate with the most.

However, the time is past where one person can effectively handle both positions. Not only has our professional training program seen significant growth, the membership of the CAA has grown as well. Recognizing the reality of the work load, CAA Operations Manager Kristin Anthony-Malone split Audrey's responsibilities, effectively creating a new position.

Starting this fall, Audrey will now concentrate solely on Student Services, helping close to 750 people register for courses each year and juggling the demands of a very busy training school throughout the winter. It's not for the faint of heart, and we feel very fortunate that Audrey is here to guide student services as the CAA moves into its 40th year of providing professional avalanche training.

The CAA now has a dedicated Members Service position and our former receptionist Siobhan Quinn has accepted the challenge of this new role. Siobhan is looking forward to getting to know our members better, maintaining the excellent service Audrey has always provided, and forging new ground as the CAA continues to grow.

AvSAR Response

New CAA Seminar available this fall

After more than a year of curriculum development, the CAA is pleased offer a new professional avalanche seminar. Avalanche Search and Rescue Response (AvSAR) is a three-day course designed for any avalanche professional who would like to extend their knowledge of emergency medical care for avalanche victims and best practices for organized avalanche search and rescue in Canada. Taught by emergency physicians and avalanche search and rescue specialists, students will learn how to:

- Initiate an AvSAR response
- Manage resources
- Manage safety
- Apply appropriate AvSAR techniques
- Identify medical and evacuation priorities

Seminar participants must have a CAA Avalanche Operations Level 1 and/or be currently working in a professional or volunteer capacity for an agency or organization with an organized AvSAR response capacity. An 80-hour advanced first aid course is also required (e.g. OFA, WFR, WEC, OEC). A recommended course for preparation is the Introductory Level Incident Command System course.

The course will run November 19 – 21, 2010 in Revelstoke, BC. For more course details, tuition and registration go to www.avalanche.ca/caa/training/avalanche-search-and-rescue.

Alice Weber

CAA Industry Training Program

Training for avalanche workers in Canada.

Schedule for winter 2010-2011

Operations Level 1

Monashee Powder Snowcats	November 29 - December 6, 2010
Kokanee Glacier Cabin	December 4 - 11, 2010
Kokanee Glacier Cabin	December 11 - 18, 2010
Kootenay Pass Hut	December 12 - 18, 2010
Fernie	January 2 - 8, 2011
Burnie Glacier Chalet	January 7 - 14, 2011
Fernie	January 9 - 15, 2011
Boulder Hut (Ptarmigan Tours)	January 16 - 23, 2011
Valkyr Lodge	January 17 - 24, 2011
Hakuba, Japan	January 23 - 30, 2011
Kootenay Pass Hut	January 30 - February 5, 2011
Chic Choc	February 6 - 12, 2011
Kootenay Pass Hut	February 6 - 12, 2011
Revelstoke	February 20 - 26, 2011
Lake Louise	March 6 - 12, 2011
Lake Louise	March 13 - 19, 2011

Operations Level 1 – Educators

Lake Louise	March 20 - 26, 2011

Operations Level 1 – Snowmobile

Revelstoke	January 2 - 8, 2011

Operations Level 2 – Module 1

Revelstoke	October 26 - 29, 2010
Canmore	November 6 - 9, 2010

Operations Level 2 – Module 2

Whistler	December 2 - 5, 2010
Lake Louise	February 12 - 15, 2011
Lake Louise	February 16 - 19, 2011

Operations Level 2 – Module 3

Whistler	December 6 - 12, 2010
Hakuba/Myoko, Japan	February 15 - 21, 2011
Golden	February 20 - 26, 2011
Golden	February 27 - March 5, 2011

Operations Level 2 – Mod 1 + 2 combination

Hokkaido, Japan	February 26 - March 5, 2011

Operations Level 3

Canmore	October 4 - 8, 2010
Canmore	November 1 - 5, 2010

Introduction to Snow Avalanche Mapping

Golden	September 19 - 24, 2010
Nelson	September 27 - October 2, 2010

Avalanche Search and Rescue Response

Revelstoke	November 19 - 21, 2010

Resource and Transportation Avalanche Management

Nelson	December 6 -10, 2010

Introduction to Weather Skills for Avalanche Workers

Revelstoke	September 25 - 26, 2010
Canmore	November 6 - 7, 2010
Chic Choc	November 6 - 7, 2010
Montreal	November 13 - 14, 2010

Advanced Weather Skills for Avalanche Workers

Revelstoke	September 27 - 29, 2010
Canmore	November 8 - 10, 2010
Chic Choc, QC	November 8 - 10, 2010

Avalanche Control Blasting

Revelstoke	November 13 - 14, 2010

Wren McElroy

To the Rescue!

The CAA's eTraining project yields recommended best practices for avalanche search and rescue crews across the country

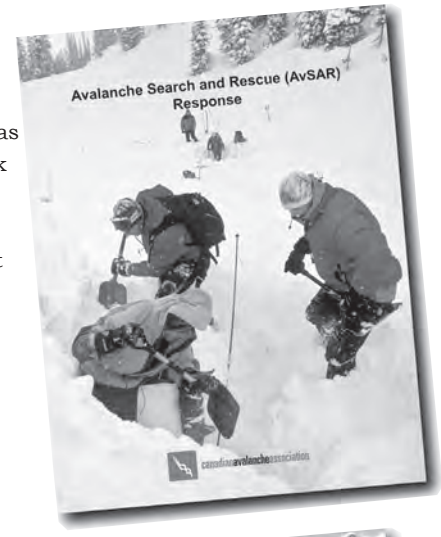
The CAA's eTraining project has ended but the results of all that great work and collaboration with so many talented individuals has yielded a terrific product—three technical manuals that together outline Canadian "best practices" for search and rescue in avalanche terrain.

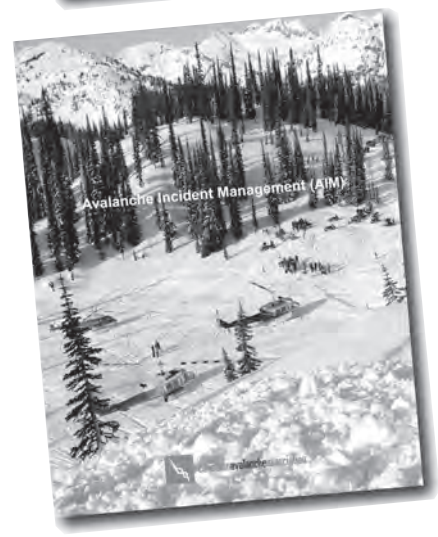
The project began back in April of 2007, and was funded through the National Search and Rescue Secretariat's (NSS) New Initiatives Fund. This fund has been the backbone of many CAA and CAC projects over the years. We admire the vision of the NSS as they continue to support new ideas and approaches, and are grateful to their commitment to furthering avalanche knowledge. Many thanks also go to the RCMP which acted as our sponsor for this project.

Ken Wylie was initially hired as the Lead Curriculum Developer for the project, and he made a great start on the first two volumes of our series—WinterSafe and AvSAR Response. Unfortunately Ken left the CAA in early 2008, but good work had begun on the project and we were able to fill his shoes with Mark Bender. Mark came on board that summer and has seen the project through to its official completion on March 3, 2010—great work Mark!

These new manuals are the result of an extensive and exemplary collaborative process. Determining best practices for avalanche safety and avalanche search and rescue required input from a wide variety of stakeholders, over a wide variety of issues. There were many individuals whose depth of knowledge and experience in avalanche search and rescue techniques was invaluable to the project. Mark tied all that information together and led the way to establishing standardized response protocols and field procedures.

A big thank you is also due to Jordy Shepherd, who was involved from the beginning as Subject Matter Expert. Over the last few months of the project, Jordy came in to help Mark writing and fine-tuning the manuals. He also helped create the AvSAR Response Seminar that will be running for the first time later this fall. Another vital individual has been Technical Editor Helen Rolfe. Helen played a huge role in taking the reams of material that had been produced, and assembling it into the finished, polished product we are proud to offer today.





The manuals are for sale on our website, and a package price for the three of them together is available.

- *WinterSafe* is a resource for any employer sending workers without professional avalanche training into the mountains: $10
- *Avalanche Search and Rescue Response* is a manual for trained and equipped organizations and provides peer-reviewed industry research and the best practices of national and international rescue teams: $14
- *Avalanche Incident Management* is for managers of teams that may respond to avalanche incidents. The purpose of this manual is to develop commonly accepted and applicable national standards based on best practices: $12

The Canadian Avalanche Archives

Bringing you the contents of the Art Twomey Library, and more

By Nancy Geismar

Anyone familiar with the CAA/CAC office in downtown Revelstoke may be surprised to learn that we have a library in the basement. Dedicated to Art Twomey, this tiny space (2.2 m by 3.2 m) houses an inordinate amount of archival avalanche-related materials, including historical journals, educational materials, avalanche publications, and training material that spans decades. We have avalanche research dating back to 1909.

While we have long recognized the "diamond in the rough" lurking downstairs, we have never had the resources or expertise available to properly handle it. Momentum for the Canadian Avalanche Archives project began building a couple of years ago, when local historian Dr. John Woods received a "box of gold"—memorabilia from long-time avalanche researcher and engineer, Peter Schaerer.

The material from Peter focused on Rogers Pass during the building of the Trans-Canada highway, engineering avalanche diversion tactics, weather and snow observations, and a multitude of published articles that Peter had written over the years. The box also contained descriptive photo albums and slides (including some of Bruno Engler's) documenting this period in chronological order, with precise captions written in German in Peter's fine penmanship. In short, this was a treasure trove.

In a meeting with the CAA, CAC and Revelstoke Museum and Archives, Dr. Woods proposed the establishment of the Canadian Avalanche Archives. A grant application was written to the Columbia Basin Trust, a fund established by BC Hydro for people living in the Columbia Basin. We received word in early 2010 that our grant was accepted, and work began this past summer when we hired archivist Catherine Tracy for this project.

Catherine brought previous experience in archival work to this position, so she was able to work independently with very little supervision through the summer. We started out with the Peter Schaerer collection, of which the physical archives will reside in the Revelstoke Museum and Archives. Then, Catherine tackled the crazy collection in our own library.

Our ultimate goal is to have the avalanche archive digitized and accessible online. To this end, we are using Greenstone Library, a digital library where our collection will be housed. There will be various "collections" from the archives on Greenstone, and the number of collections will increase as we continue to add to it. At this point, the digitizing of our collection in the Art Twomey library could be likened to a drop in the bucket. But the project will continue over the years and ultimately, all the relevant archival material in the library will be digitized and accessible to anyone.

The avalanche industry as we know it has spanned a couple of generations. Many people who were pioneers of avalanche research and avalanche education are still alive today. But how do we keep this historical perspective alive as time passes? The avalanche archives will preserve decades of research and scientific knowledge. The archive will ensure that the work from the early pioneers is not lost as the industry grows and changes

Though not accessible yet, the Greenstone Library collection is close to becoming live online. When it does, you will find collections on Peter Schaerer and Rogers Pass, the Granduc Mine, avalanche journals from Canada, the US and New Zealand, the Canadian Avalanche Association Training Schools, Snow Avalanche Atlases from the Ministry of Transportation, a variety of papers and publications generated through the CAA and the CAC, and National Research Council publications pertinent to avalanche research and science.

From my perspective, heading down to the cool basement on a 38°C day in the summer and finding some obscure article on skiing and avalanches written in 1929 is an escape to another era, traveling in time. There are many treasures in our library and our goal is to share them with all of you. Stay tuned for the launching of the Canadian Avalanche Archives live. We'll let you know.

>>Nancy Geismar takes care of Program Services for the CAC

Archivist Catherine Tracy was hard at work all summer sorting, scanning and digitizing reams of material from the Peter Schaerer collection and the Art Twomey Library. CAC Archive

The Man Behind the Art Twomey Memorial Library

Art Twomey was killed in a helicopter crash with four others on January 11, 1997. Art was leading a CAA Level 1 and flying into Ptarmigan Hut, the backcountry lodge he owned and ran with his partner Margie Jamieson. Art had been teaching courses for the CAA for nearly 20 years and was described by the Executive Director at the time, Alan Dennis, as a "gifted teacher, story teller, scientist, trapper—a true renaissance man."

Art Twomey collection

out-of-bounds

A new booklet takes aim at a high-risk crowd

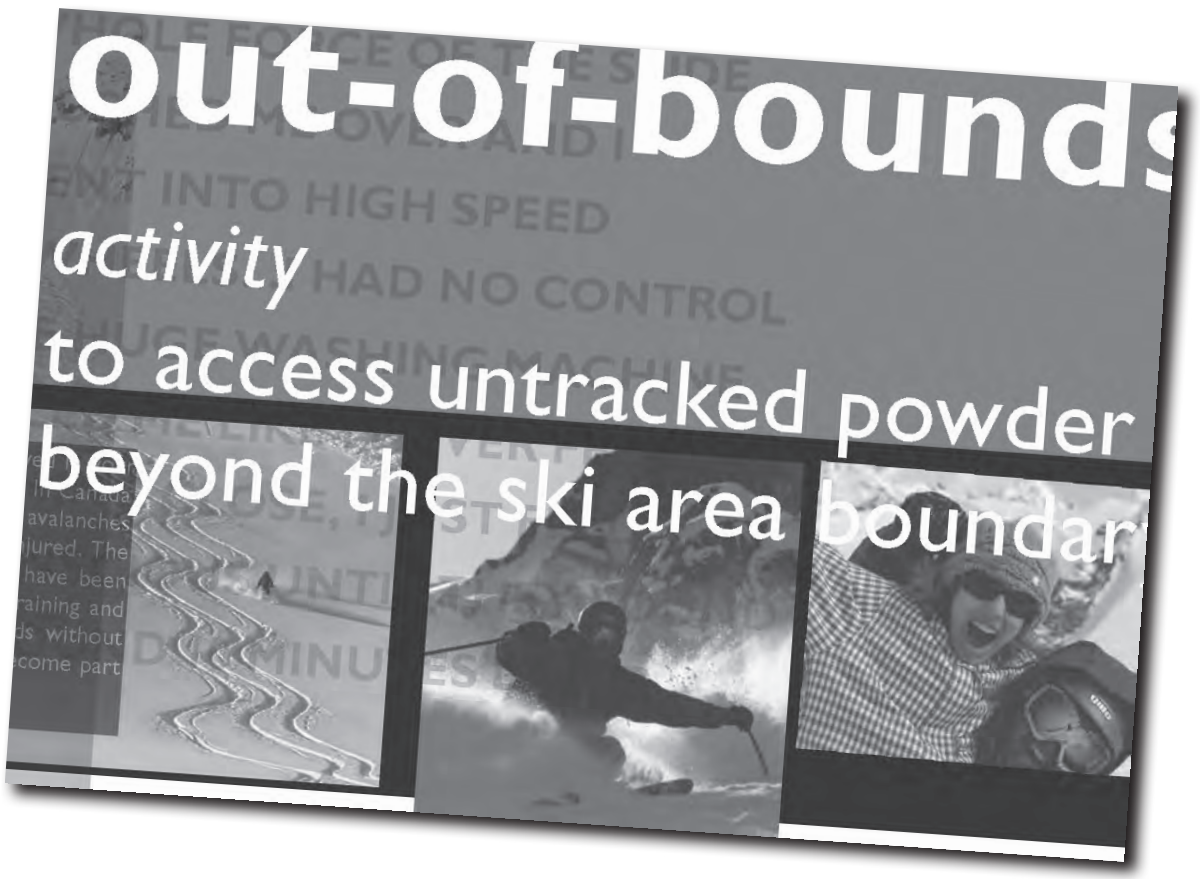
As most, if not all of us, know from experience, out-of-bounds (OB) skiing can offer some of the most memorable days at a ski area. However, if you can look back at your OB experiences, that means you survived them. Not everyone does.

In Canada, 19 people were killed while skiing OB or in closed resort terrain over the past 15 years. OB skiers are viewed as one of the most quickly growing user groups of avalanche terrain. Since it only takes ducking a rope or gliding through a gate to go from the controlled environment of a ski resort into serious avalanche terrain, communicating avalanche hazard to this group is a priority. But reaching this generally young and largely unaware crowd is a challenge. Furthering our understanding of this group was therefore one of the stated goals of the ADFAR 2 project. Over the past two winters, a team of researchers and avalanche educators conducted research into OB skiers and boarders in order to more effectively communicate avalanche awareness and safety messaging.

One of the off-shoots of that research yielded "out-of-bounds," a colourful and compelling booklet written by Ashley Turk. A student at the Emily Carr School of Design in Vancouver, Ashley`s original concept for the booklet came from a school assignment. An avid OB snowboarder, Ashley took the opportunity to combine her love of the mountains with her school work. She approached the CAC with her project and, after many months of back-and-forth, the booklet was finalized in time for the coming winter season.

Based on existing research on risk communication, and our improved understanding of the OB skiers most at risk, the booklet was purposefully designed to not look like an awareness brochure. Instead, it is modeled more on a catalogue or magazine. Its colourful design relies heavily on beautiful images of riding and fun in the snow. The content is punctuated with shots of avalanches and quotes from pro riders talking about their experiences in avalanches. Basic awareness information is also included—the meaning of different boundary signs, danger ratings, safety gear—along with instruction about where to go for more information.

However, the primary goal of "out-of-bounds" is to get the attention of riders who may not be aware of avalanches and may never pick up an awareness brochure. By simply sharing our love for the sport and planting a subtle seed, we are hopeful this approach will help some at-risk riders realize that avalanches matter when skiing out of bounds. Once this introduction to avalanche awareness is made, a world of education possibilities awaits.



The Avaluator V2.0

The next generation of the CAC's innovative approach to avalanche safety

The ADFAR 2 (Avalanche Decision Framework for Amateur Recreationists) project has concluded and, just in time for the winter of 2010-11, the CAC is introducing some new products created for backcountry users. First, let's look at the Avaluator V2.0. This second generation of our very popular Avaluator has maintained its most effective features, while integrating much of the feedback received in the original version.

As shown in Figure 1, the front of the card now consists of a Slope Evaluation matrix, which works in a similar fashion as the Trip Planner from the original Avaluator. Checklists are on side two of the card (Figure 2) and guides the user through separate assessments of the avalanche conditions and the terrain. The user then takes the scores from the two checklists and applies them to the Slope Evaluation matrix, which results in the decision guidance.

The warning signs and terrain characteristics included in the Avaluator`s Slope Evaluation tool are based on an extensive survey of Canadian avalanche professionals conducted by ADFAR 2's project manager, Dr Pascal Haegeli. The goal of the survey was to extract as much as possible from the assessment expertise of the professional community. The analysis of the survey was carried out over the past winter, and the results played a vital role in the redevelopment of the Avaluator.

The Trip Planner, which has remained unchanged, has been moved from the card to the accompanying booklet. It is now printed on the cover flap, which allows users to cut it off and have it wherever they plan trips. It was recognized that the Trip Planner was not something the user needed in the field and removing it from the card has allowed for a more detailed slope evaluation process.

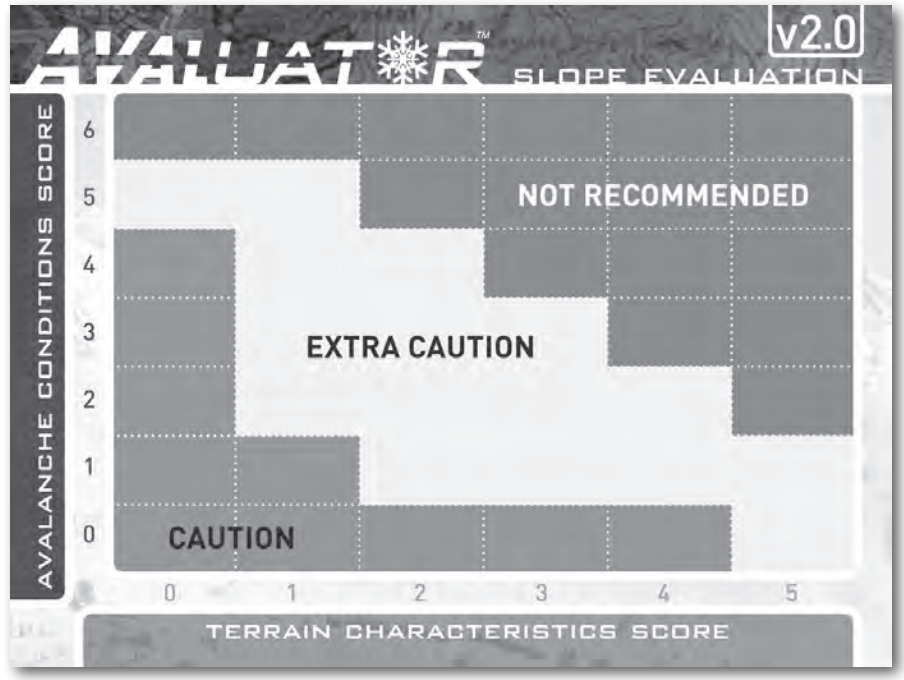


Figure 1

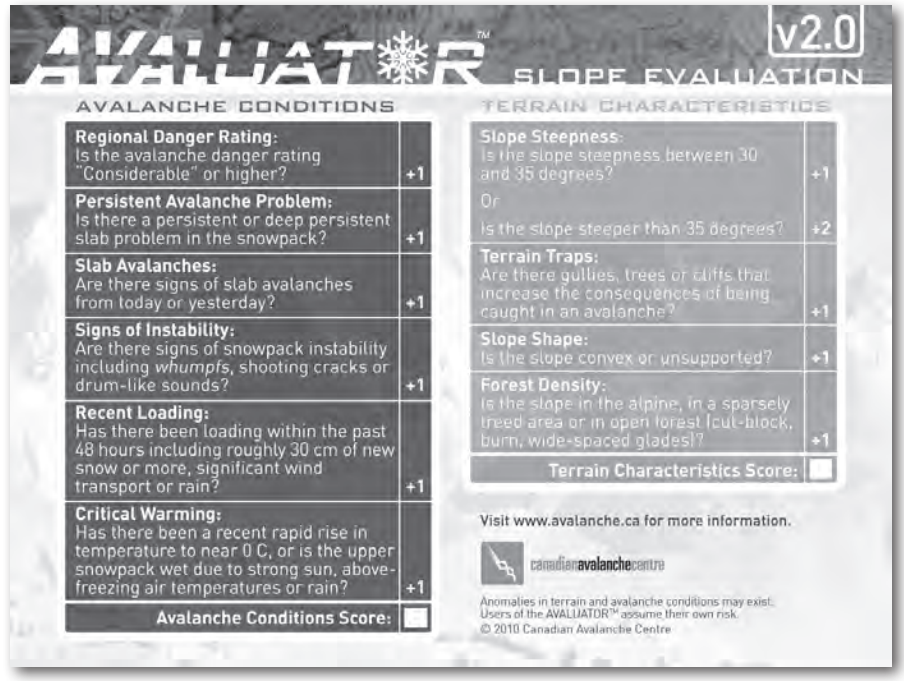


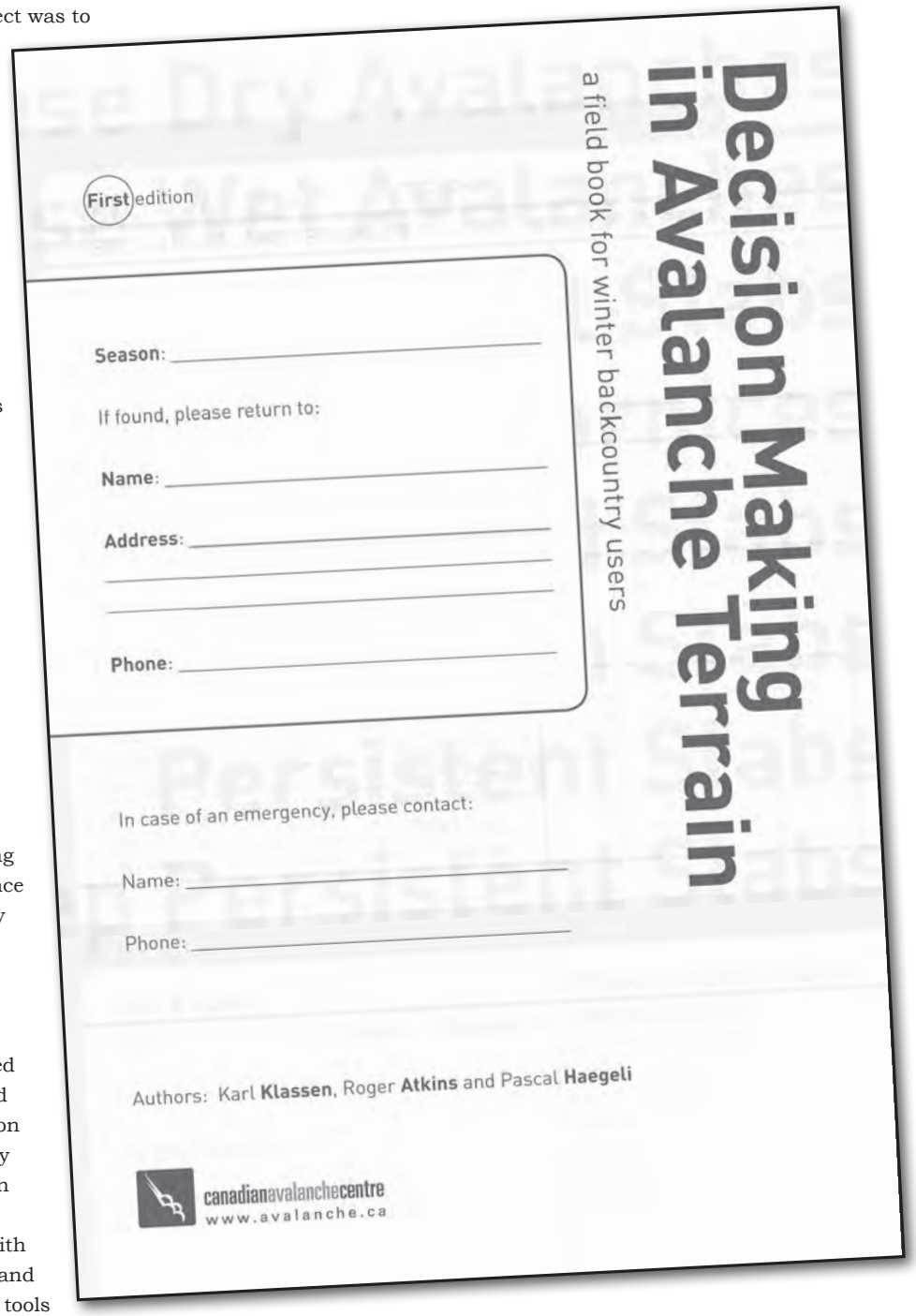
Figure 2

The next exciting addition to our suite of decision guidance tools is a new field book for more advanced backcountry users. One of the goals of the ADFAR 2 project was to "bridge the gap" in terms of decision support tools. The Avaluator fulfills the need of entry-level backcountry users but there is little out there for experienced amateurs. Our new field book is designed for that audience.

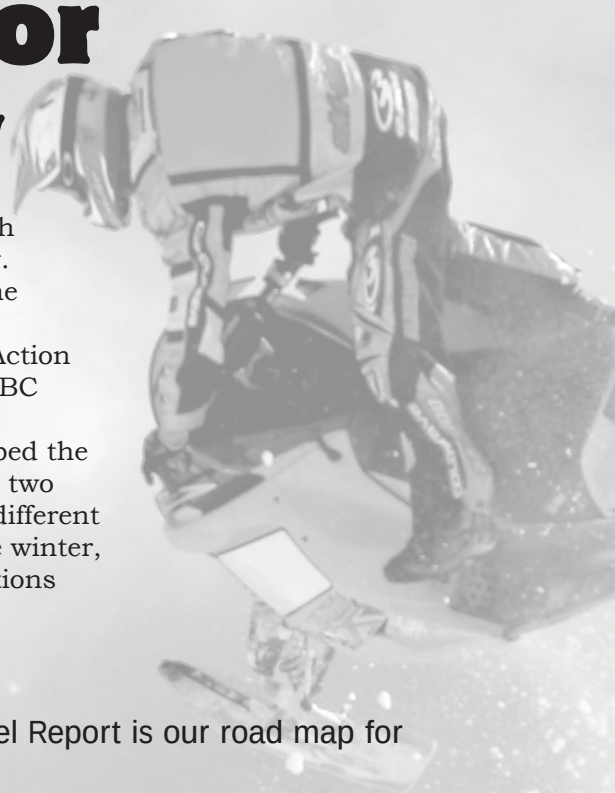
The field book provides more advanced users with a framework for decision-making when planning for and travelling in avalanche terrain. Modeled after the methods used by avalanche professionals, it introduces the user to the primary components of comprehensive avalanche risk management—helping users track conditions throughout the season, plan individual trips, record their observations, support their decision making in the field and acting as an aid to post-trip reflection. Focusing on the specific characteristics of different avalanche problems, the field book can help users to zero in on the most relevant observation and risk management strategies for the conditions at hand.

This field book is for those looking to build their knowledge and experience in a structured manner—backcountry users who are ready to take the next steps necessary to advanced decision making. It's not a simple approach because avalanche risk management is not a simple problem. It's structured with an emphasis on building detailed expectations of the conditions based on pre-trip planning, and then constantly assessing those expectations based on observations in the field.

Once again, we're very pleased with the outcome of the ADFAR 2 project, and we're looking forward to getting these tools into the hands of users for the coming winter.



Key Messages for Sledding Safety



Over the past couple of years, we have been meeting with numerous groups concerned with snowmobiling safety. Beginning with snowmobile stakeholder meetings at the Edmonton Snowmobile Show in November 2008, this collaboration includes our Snowmobiling White Paper, the CAC Action Plan and feedback sessions at the two AGMs and, of course, the BC Coroners Death Review Panel report.

As we prepare for the winter of 2010-11, the CAC has developed the following key messages, which have been synthesized from those two years of meetings and consultations. You will see that there are different messages aimed at different groups. As we move forward into the winter, these messages will form the backbone of the CAC's communications regarding this issue.

Universal messages:

- The British Columbia Coroners Service Death Review Panel Report is our road map for change.
- Snowmobile avalanche safety is at a critical spot in history with a dramatic increase in the proportion of snowmobile avalanche fatalities compared to all other groups. These accidents are not flukes of nature and we can prevent many of them.
- The Canadian Avalanche Centre needs the financial help and commitment of the snowmobile community to develop targeted programs that can affect avalanche safety for snowmobilers. The need for services is growing faster than our resources can sustain.

Are you a member of the snowmobiling public?

- Don't group up in terrain that is threatened from above; allow yourself a wide margin of safety.
- Speak up when you see others grouping together in avalanche threatened areas.
- Match terrain selection to what the avalanche danger will allow. Read the bulletin and plan your day to avoid the avalanche problems that are highlighted.
- Don't tolerate fellow riders not being prepared with rescue gear and practice with your own rescue gear at least once a month.
- An airbag is not the magic answer, but it is good technology when used properly. Learn how to use it and practice with it while riding at least twice a season.

Are you a policy maker?

- Avalanche prevention works. It costs less to prevent accidents than to clean up after them.

Graham Helfrick

- Organized search and rescue saves lives.
- Support core avalanche safety products and services. Avalanche forecasts, education and outreach activities save lives and are cost effective.
- The avalanche warning service is half built. Help us expand and improve the areas serviced and increase bulletin frequency.

Are you a land manager or are you inviting snowmobilers to recreate in your mountains?

- Inform users of the avalanche risks inherent in your terrain.
- Modern snowmobiles and groomed trails propel novice users to the heart of avalanche terrain often in times of heightened avalanche danger. There is a responsibility to help mitigate some of the problems that this creates.
- Get your users to read the avalanche bulletin—post it, promote it, praise it.
- Public avalanche safety in Canada is a public-private partnership. Support the Canadian Avalanche Centre and the vital public safety services it provides.
- Help spread priority messages to the snowmobiling public (see public messages above). Be an ambassador for the Canadian Avalanche Centre

Are you encouraging snowmobilers to recreate in avalanche terrain?

- Avalanche safety messages should be part of your marketing, especially if you use the allure of the backcountry to sell your product.
- Modern snowmobiles and groomed trails propel novice users to the heart of avalanche terrain often in times of heightened avalanche danger. There is a responsibility to help mitigate some of the problems that this creates.
- Get your users to read the avalanche bulletin—post it, promote it, praise it
- Public avalanche safety in Canada is a public-private partnership. Support the Canadian Avalanche Centre and the vital public safety services it provides.
- Help spread priority messages to the snowmobiling public (see public messages above). Be an ambassador for the Canadian Avalanche Centre

Are you a snowmobile avalanche educator?

- Focus on informing your students about their current levels of knowledge and competence and how to advance to the next stage.
- Good search and rescue techniques saves lives. Focus on a quick beacon search, effective probing and efficient shovelling.
- Teach students to match their terrain selection to what the conditions can permit. High-marking and hill climbing are high-end activities that require high-end snow stability assessment skills.

Mapping for Sledders

Graham Helfrick

A new project brings ATES ratings to snowmobiling areas

By Cam Campbell

Trailhead signs that include a terrain map or photo with areas shaded according to the Avalanche Terrain Exposure Scale (ATES) (Statham et al., 2006) are popping up all over the place. However, using ATES to rate entire areas is a departure from its intended use as a descriptor of the overall seriousness of a particular route, or line. The ATES technical model wasn't created to rate an area, it was created to rate a specific route, and there are some issues when trying to apply it in a deterministic way to a wider region. Furthermore, it is very scale dependant in that the classification of a particular area depends largely on the size of the area.

So, a judgement-based approach to assessing and rating the terrain needed to be applied. In many cases, a combination of the ATES technical model and public communication model, as well as the Avaluator's (Haegeli and McCammon, 2006) Trip Planner worked well to subjectively classify slope- to mountain-scale areas, as long as low precision and large scale maps ensured adequate accuracy.

In January of 2010 when the BC Coroners Service issued its Death Review Panel Report investigating the snowmobiling avalanche fatalities of 2008-09, it triggered an interest in a much more comprehensive approach to providing this information. BC's Ministry of Tourism, Culture and Arts (MoTCA) has always been very progressive in terms of avalanche awareness messaging for the backcountry areas they manage. In June of this year, a MoTCA-funded pilot project began to put tools in place for assessors of terrain across the province to efficiently rate terrain in their area.

This project has four goals. The first is to standardize how and what data will be captured, displayed, stored and made available to the public. The objective is to work with Recreation Sites and Trails BC and Geo BC to come up with standards and methodologies that can be passed on to qualified classifiers to ensure consistency.

The second goal is to peer-review 11 avalanche terrain assessments and Google Earth maps created for MoTCA in 2009/10. This will require developing an assessment rubric based on compliance with ATES parameters and quality control (i.e. drawn according to mapping standards determined in the first goal).

The third goal is to conduct an overview assessment of 41 or so MoTCA-managed snowmobile areas to determine priority for avalanche terrain assessment. This will be based on usage, fatalities, complexity of assessment, club support, etc.

The final goal is to complete terrain assessments and Google Earth maps for areas determined to be high priority. All of this will be in consultation with the appropriate agreement holders, clubs, commercial operators, District Recreation Officers, etc.

The quality and accuracy of these maps are primarily dependent on the scale of the map being produced, and the size of the area being mapped. A challenge with Google Earth representation is limitless and uncontrollable scale, which necessitates high precision. Therefore, a more deterministic method of assessing terrain is required.

With the recent advances in Geographic Information Systems (GIS) and terrain data, a reasonable approach to create such maps is with the help of digital elevation models and orthophotos. GIS visualization algorithms can be created for the more definitive and objective ATES parameters. For instance; surface area gives a good representation of convolution or slope shape, and upslope cumulative slope angle is a proxy for density of depression-type terrain traps (Richardson, M., 2010, pers. comm).

Delparte (2008) developed GIS algorithms to categorize forest density, slope angle, slope shape, and interaction with avalanche paths. Each attribute category is assigned a score that when totalled determined the ATES classification. These alone can produce a fairly accurate ATES maps as most of the other ATES parameters are a function of these variables. But, of course, on-the-ground expert judgement is trump (Vick, 2002).

Delparte, D. 2008. Avalanche Terrain Modeling in Glacier National Park, Canada. Ph. D. Thesis, University of Calgary, Calgary, AB, Canada. 195 pp.

Haegeli, P. and McCammon, I., 2006. Avaluator Avalanche Accident Prevention Card, Canadian Avalanche Association (CAA), Revelstoke, BC, Canada.

Statham, G., McMahon, B. and Tomm, I. 2006. The Avalanche Terrain Exposure Scale, International Snow Science Workshop (ISSW). Omnipress, Telluride, CO, p. 491-497.

Vick, S. 2002. Degrees of Belief: Subjective Probability and Engineering Judgment. American Society of Civil Engineers, Reston, VA, 472 pp.

HLH Memorial

Sixth annual golf tournament continues its successful streak for fundraising

By Morgan Hincks

Gord Ritchie

(l – r) Daniel Hincks, Todd Gardiner, Morgan Hincks and Teddy Hincks.

The 6th Annual HLH Memorial Golf day was held on September 10, 2010 at Greywolf Golf Course in Panorama Mountain Village. The event continues to offer an opportunity to gather and celebrate the lives of Hugh and Helen Hincks and Linda Putnam who perished in an avalanche in St. Anton, Austria in January of 2005.

The dinner reception was well attended and included an always-successful live and silent auction. The event raised over $15,000, part of which will be donated to the Canadian Avalanche Foundation.

From 2005-2010, the generous donations from HLH participants have created a lasting legacy. In addition to the over $150,000 raised for charity, in 2006, two memorial benches were erected at Panorama. The most recent legacy of the HLH event was the official opening of the HLH ski run on January 1, 2010.

>>Morgan Hincks is the daughter of Hugh and Helen Hincks and the organizer of the HLH Memorial.

Gord Ritchie

The dining room at the Greywolf Golf Course was packed for the event, which raised over $15,000.

New CAF Administrator

Goodbye MJ, hello Pattie

After 10 years on the front line of the Canadian Avalanche Foundation, Mary Jane Pedersen is moving on. MJ started her CAF career in a big way, by representing the Foundation on a Bryan Adams' concert tour in 2000. She staffed an information booth, sold CAF t-shirts and received donations, a gig that culminated with Bryan presenting the CAF with a $50,000 cheque during the concert in Cranbrook.

"The Bryan Adams concert tour was definitely one of the highlights of my years with the Foundation," she says. "It was quite an experience and a unique launch to the CAF's initial fundraising goals." Other highlights include the CAF fundraiser in 2004 at the Calgary Zoo's Safari Lodge. "It was our inaugural Calgary event and so well received."

But the most lasting memories are those made while assisting family and friends of avalanche victims establish memorial donations in their lost loved-one's name. "Our program offers a means for something constructive and tangible during a very difficult time," she explains. "That's always been a very rewarding part of the job."

Along with her position as CAF Administrator, MJ has always been the Office Manager at Chris Stethem & Associates - Snow Safety Services, and these duties will continue. "We are quite busy most of the year with the exception being the summer months," she says. "But I do hope to have a bit more time away from my desk and computer, and more time for the bikes, the skis and the horses."

Replacing MJ as CAF Administrator is Patricia (Pattie) Roozendaal. Pattie has been living in the Canmore/Banff area for most of the past 25 years. She is very active in the outdoors and lists hiking, backpacking, mountaineering and mountain biking as her interests, with a special focus on backcountry ski touring.

Pattie worked at CMH both as an accounts payable clerk in Banff and as a massage therapist in different lodges for some 15 years. She brings a good knowledge of bookkeeping to the role, as well as an appreciation of avalanche safety. "She has an enthusiastic and self-motivated attitude regarding her new role," says CAF President Gord Ritchie. "I'm very happy that she has agreed to join us and we're all looking forward to working with her."

For the past 17 years, Pattie has run her own business, Amica Massage Therapy, from her home. "When I heard about this opportunity at the Foundation, I thought it would be interesting work," she explains. "Fundraising is somewhat new to me, so it is exciting. And although I love my career in massage therapy, my first passion is ski touring so I'm happy to be involved with an organization that supports winter safety in the mountains."

Our best wishes to MJ, and a warm welcome to Pattie!

Grant Bowden

MJ in Maui.

: Julie Timmins

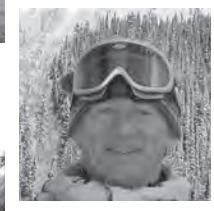
Pattie on the Wapta Icefields.

New CAF Board of Directors

President, Gordon Ritchie
Gordon is the National Avalanche Advisor for the Canadian Ski Patrol System (CSPS), a national volunteer organization providing rescue services at ski areas across Canada. Gordon has worked in the petroleum and natural gas industry for 30 years. He holds a B.Sc in Engineering and a M.Sc. in Economics.

Vice President Jack Bennetto
Jack has been involved in the delivery of avalanche safety programs on a full-time basis for more than 25 years, including helicopter ski operations and managing the program for the BC provincial highway network. Jack is a Past President of the Canadian Avalanche Association.

Secretary/Treasurer Ken Little
Ken comes to the CAF following retirement from the Meteorological Service of Canada. His association with the snow avalanche community dates back to the 1980s, when his duties included mountain weather forecasting for Parks Canada. Prior to his retirement from MSC's Mountain Weather Centre, Ken led the federal government's operational meteorological support program for the Canadian Avalanche Centre.



Past President Chris Stethem
Chris is President of Chris Stethem & Associates Ltd., Snow Safety Services, a consulting company specializing in avalanche protection and snow management. Chris is also a Past President of the Canadian Avalanche Association.

Director Colin Johnston
Colin is Professor Emeritus of Civil Engineering at the University of Calgary and an Affiliate Member of the Canadian Avalanche Association. He directed the ongoing avalanche research program at the University of Calgary from its inception in 1986 until he retired in 1998.

Director David G. Thompson
David has a B.Comm. (1979) and LLB (1983) from the University of British Columbia, and he is a governor of the Canadian Tax Foundation. David is also a member of the Planned Giving Committee of the BC Children's Hospital Foundation and the Vice President of the Deep Cove Action Committee.

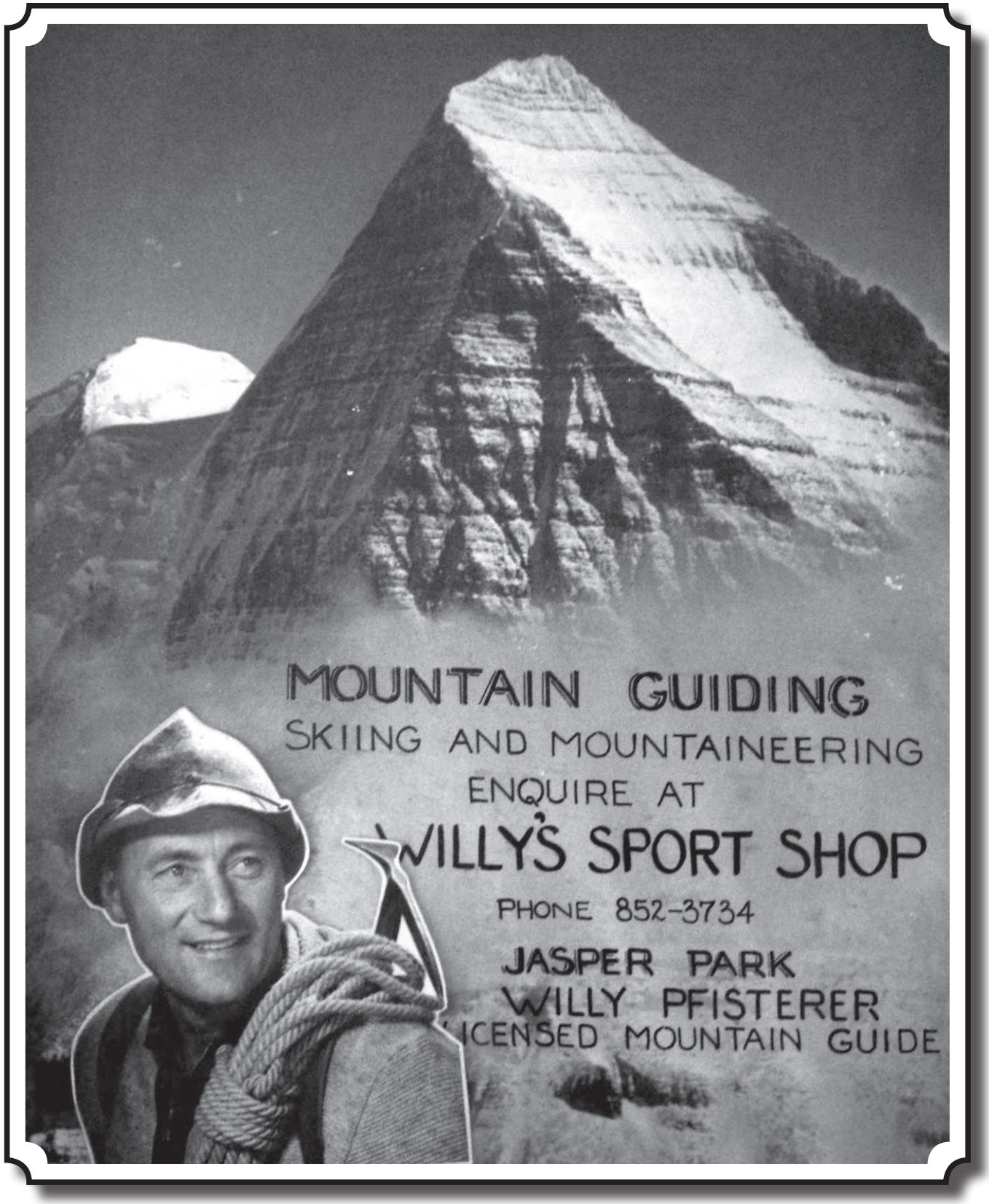
Director Morgan Hincks
Morgan became involved with the CAF as a result of a tragic avalanche accident that killed her parents in Austria on January 22, 2005. She, along with her brothers Teddy and Daniel Hincks, established the Hugh & Helen Hincks Memorial Fund in their parents' honour to further public avalanche safety initiatives, research and education. Morgan is the President of Morgan Lee Events, a Calgary-based event planning company and she holds a B.A. in Economics from the University of Victoria.

Director John Tweedy
John Tweedy has been involved in the avalanche industry for 35 years as a working forecaster in the transportation and ski resort sectors of the industry, as well being an avalanche safety educator. He is a charter member of the Canadian Avalanche Association (CAA) and has served as secretary-treasurer, chair of the explosives committee chair and a member of the technical committee. He looks forward in his pending retirement to assisting the CAF in their mandate.

Director John Hetherington
John is a long-time resident of Whistler, BC. He has been a Whistler Mountain ski patroller, a member of Whistler's first town council, a former part owner of Whistler Heli-Skiing, a heli-ski guide for 23 years, and has just finished a six-year term as secretary-treasurer for the Canadian Avalanche Association and Canadian Avalanche Centre.

Director Kevin Williams
Kevin is a passionate backcountry skier and ski mountaineer and has been involved in avalanche science, rescue, and education since the early 1980s. As a member of the Canadian Ski Patrol System, he patrolled and was involved in avalanche work at Lake Louise, Fernie and Whistler. He was instrumental in the early development of the Avalanche Skills Training (AST) education program. Kevin holds a B.Eng and M.Sc (Geophysics) from McGill University and was a PhD candidate in avalanche research at UBC. He works in oil and gas exploration and is based in Calgary.

Director Keenan Cannady
The newest member of the CAF board, Keenan is a keen skier, a devoted cyclist and enjoys climbing in the mountains. He is the Vice President-Land at Wrangler West Energy Corporation in Calgary. In addition to work, he has devoted much of his personal time to non-profit, charitable organizations.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Parks Rescue Pioneer and Legend Dies

By Lynn Martel

Willi Pfisterer was born in Austria in 1926 to a family of climbers and mountain guides, Pfisterer had earned his assistant mountain guide's license and was ranked fourth in Nordic combined (cross-country and ski jumping) when he took a job as a ski instructor in Quebec's Laurentian mountains. Moving west soon afterward, Pfisterer worked in a garage and as a ski instructor. While guiding on a two-week horse trip with legendary Columbia Valley outfitter Bill Harrison in 1955, Pfisterer climbed his first Canadian peak—the landmark northeast ridge of Sir Donald, solo without a rope.

By the time of his death on July 21, 2010 at 84, Pfisterer, who made his first 11,000-foot (3353-metre) ascent when he was 11, had climbed some 1600 peaks, including seven ascents of the Canadian Rockies' highest, Mount Robson, and as a member of Hans Gmoser's team that made the first Canadian ascent of the east ridge of Canada's highest, 5959-metre Mount Logan, in 1959.

After opening up Jasper's first ski shop in the late 1950s and coaching several young local skiers to become Canadian champions, Pfisterer moved briefly to Kelowna where he helped establish a ski school at Big White. He operated a trucking business in Penticton for a year until 1961, when he moved his family to Revelstoke to work in Glacier National Park with North America's biggest avalanche control program, protecting traffic through Rogers Pass on the new Trans-Canada Highway.

When Walter Perren, Parks' first alpine specialist, died of leukemia, Pfisterer was hired as alpine specialist responsible for Jasper, Waterton, Revelstoke/Glacier and Kluane parks in 1968, at the same time Peter Fuhrman assumed the same position in Banff, Kootenay, Yoho and Pacific Rim.

Throughout his career as a mountain rescue skills pioneer, Pfisterer exhibited an unfailing recognition of mountain sense in keen, young members—and yet to be members—of the warden service. "Willi had a very good eye for sizing up people, especially with younger people," said retired Banff park rescue specialist Gord Irwin. "He saw something in me when I was still working as a park naturalist, something that I didn't even see at the time."

Known and loved by many for his patented, sometimes gruff sense of humour, Pfisterer will be forever remembered for his original sayings and natural story-telling talents.

"He wasn't ever disingenuous at all," Irwin said. "What you saw was what you got. If you were willing to put in the time and energy and showed you had some skill, he'd put in the effort to teach you."

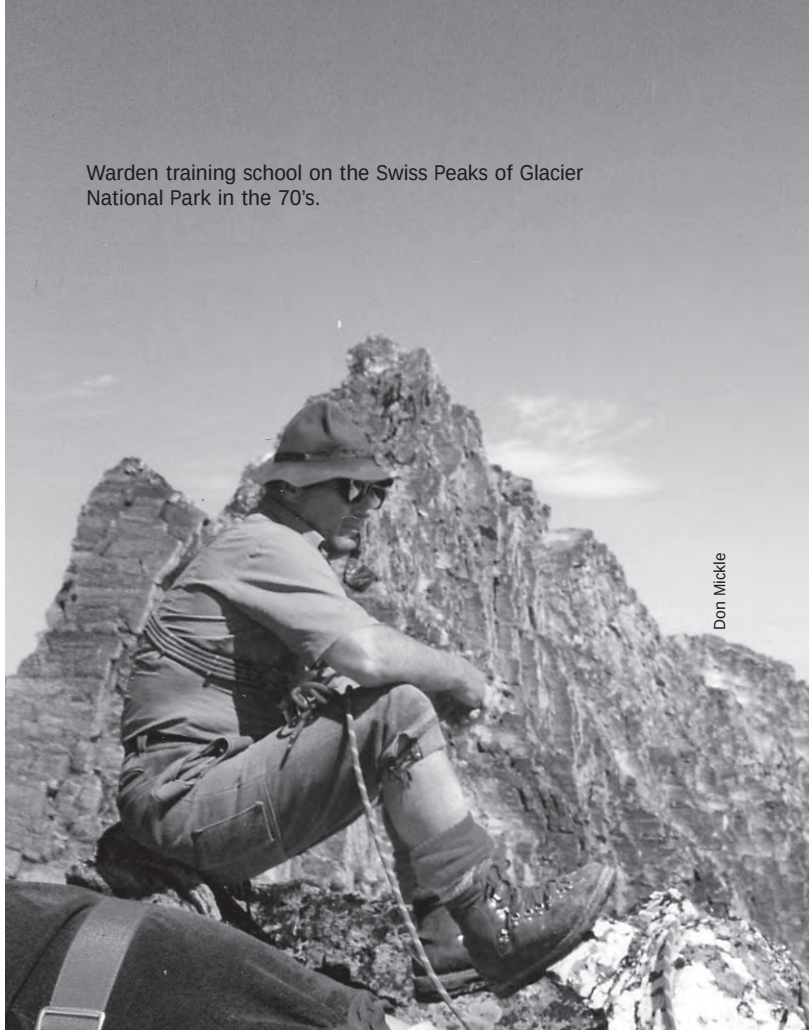
Once during a Nordic skiing clinic, Irwin, 25 years Pfisterer's junior, struggled to keep up. "I thought I was in pretty good shape, but I could not keep up with him," Irwin recalled. "Finally, with my tongue hanging out, I managed to keep up stride for stride. Then Willi turned and started talking. 'I finally tired you out enough to use technique to keep up.' That cadgey old mountain fox taught me another right there; technique is more important than strength."

Living by the example that a mountain rescue team must nurture its members to function at its best, Pfisterer was always thinking ahead. When the very first helicopter rescue systems were being developed, Pfisterer established the training program for the pilots who would be flying wardens to steep mountainsides on rescue missions. He established numerous skills exams for aspiring public safety wardens, even climbing Mount Robson with his warden charges. Pfisterer was also instrumental in setting up regular snow study plots in Banff and Jasper, implementing avalauncher control techniques for the Icefields Parkway, establishing high altitude rescue protocols in Kluane, leading skills courses in the Columbia Icefield area, in creating North America's first professional dog handling position and establishing Canada's involvement in the international rescue commission.

Later in life, Pfisterer embraced long wilderness canoe trips, panned for gold in Canada's far north, and encouraged young rock climbers to develop the sport in Thailand.

"He had an incredible sense of humour, he was always telling jokes and could always see the humour in anything," said Brad White, Banff National Park mountain safety program specialist who trained under Pfisterer. "He was a real mentor to me. He wasn't afraid to let me make mistakes but he was there in the background supporting my development through my guide's courses. There's a whole generation of wardens who trained with Willi; that is part of a legacy that has gone. We're definitely going to miss the old guy."

Brad White



Warden training school on the Swiss Peaks of Glacier National Park in the 70's.

Don Mickle

I first met Willi Pfisterer in Waterton in 1982. I was a fresh, green warden with dreams of someday making a career in Public Safety and Willi was down to teach the annual spring mountain rescue and climbing school as part of his role as Alpine Specialist, with responsibility for training in Waterton National Park.

The stories of Willi were already legend in the Warden Service, and his actual appearance lived up to the reputation: he was barrel-chested and walked with a rolling mountain guides gait; he smoked an ever-present hooked Peterson pipe and wore a Tyrolean felt hat and, yes, he had red knicker socks specially knitted with extra rows of wool to cover his jumbo calves. (We had heard of those socks, and knew only the Alpine Specialist dare wear red knicker socks to a school). He had an infectious grin and a twinkle in his eye as he introduced himself and asked in a rough Austrian accent if we were ready to "quit sucking coffee and spend a little time on the side hill?"

That was the first of several training schools and climbs I was fortunate enough to attend with Willi and he became a mentor that I only really appreciated in later years. Willi had a way of recognizing and fostering talent and was more than willing to allow others to learn to lead under his tutelage. As he put it: "Rescue work is all about the team. My job is to develop wardens with local knowledge and skills so the warden team can successfully complete any rescue."

His personality and direction and ambitious objectives set the perfect environment for learning. For example, when keeners were rushing early in the morning while he set off at a measured guide's pace, his comment of: "You rush on ahead; I'll wait for you on the top" was just enough to make them slow down.

On a climb of Mt. Crandell on that first school I also witnessed the uncompromising side of Willi. A new warden who had misrepresented his skills and ability had been hired on. When the exposure on the ridge became overwhelming, this individual began to crawl, even though the ridge was still about a metre wide. Willi took a spare piece of rope and tied the person between two trees with strict instructions not to touch anything. After summiting, we untied the hapless new warden on the way back to the office, and Willi suggested that perhaps it might be a good thing to "learn to walk if you want to be in the Warden Service."

Willi was hired as an Alpine Specialist with Parks Canada at the same time as Peter Fuhrman, to replace Walter Perren, whose pioneering Alpine Specialist role with Parks had been cut short due to leukemia. Willi's responsibilities included training for Jasper, Waterton, Revelstoke/Glacier and eventually Kluane, while Peter looked after Banff, Kootenay and Yoho and Pacific Rim.

While Peter was more suited to the political limelight of Banff and used his political skills to foster the Public Safety program with management, Willi was in essence a field man whose schools often took wardens to new and challenging locations. Willi led schools to all of the icefields in the Rockies and after several tries, he eventually got a group of wardens to the summit of Mt Robson, a mountain he had climbed seven times.

Willi's incredible familiarity with Robson and his sense of humour were evident several years later when a rescue team of younger public safety specialists he had tutored were attempting to reach some stranded climbers on the north face. Clair Israelson recalls climbing up in a storm from the Schwarz Ledges and being directed literally step-by-step by Willi, who was at the base with a radio. Eventually Clair called down and said to Willi that he was unsure of where to go as he was on a flat area of snow and that in every direction he went it dropped down. After a short pause Willi replied: "Yes, well, you screwed up. You're on the top."

When Prime Minister Pierre Trudeau was looking for a guide to climb some mountains in the national parks, it was natural that Willi should be the one to lead him. Willi was very proud of the ascents he did with Pierre including the east ridge of Edith Cavell, but only used his understated wit when describing them. He recounted that Pierre had said to him: "I trust you Willi, but what about the rope?" to which Willi replied: "Don't worry, if it breaks, I got a better one at home."

Prior to his posting as an Alpine Specialist, Willi had worked in Rogers Pass with the new avalanche research and control program created when the Trans-Canada Highway was completed in 1961. Willi brought his experience in snowcraft from there to

the mountain parks, where he was instrumental in setting up regular study plot observation sites in Banff and Jasper for avalanche forecasting, and he implemented both 105mm recoilless rifle and Avalauncher control techniques for the Banff-Jasper Highway.

He was also key in spearheading the rescue dog program in Parks Canada. He garnered support for creating the first professional avalanche dog handler position in North America when he had Alfie Bustrom and his dog Ginger posted to Jasper in 1969. Willi was also a founding member of both the Canadian Avalanche Association and the Association of Canadian Mountain Guides.

In the early 1970s when Peter Furhman brought the idea of helicopter sling rescue to the National Parks, it was Willi who created the pilot test still in use today to ensure rescuers are not put at risk with inexperienced or low-hour rescue pilots. He was also key in developing high-altitude rescue capability when Kluane Park was created. As part of the development of high-altitude response in the north, he organized warden training schools to numerous peaks in the park, including the east ridge of Mt. Logan, a climb he had completed on the first Canadian ascent in 1959 with Hans Gmoser.

It was on the descent of this climb in 1980 when near tragedy struck. Tim Auger and Peter Perren slipped and fell off the ridge and were avalanched over 600 metres to the glacier below. Incredibly, both survived the fall and even though Peter's knee was shattered, he was not buried. He managed to dig out Tim who was blue and not breathing but recovered quickly once his head was exposed. Willi and others made their way to the base and were amazed to find both climbers alive after falling such a distance.

When the helicopter arrived at base camp and could not get to the victims due to cloud, it was Willi's persuasion that convinced the pilot that it was clear above and he could fly up through the cloud to where they were and evacuate them. The weather socked in immediately afterwards, and it was unflyable for three weeks.

When Willi retired from Parks Canada in 1987, he estimated that he had climbed over 1600 mountains and been involved in some 700 rescues. Sadly, one of the last jobs he did as a rescue specialist was something no father should ever be asked to do. His son Fred had been working as a heli-ski guide in Blue River when he and his group were involved in a large avalanche. Willi was called in as part of the nearby rescue resources, and it was not until he got to Blue River that he found out his son was one of the seven fatalities. Willi had to take Fred's body back to Jasper for burial.

Willi retired to Tete Jaune, and when there was smoke coming from the chimney, I always made a point to stop for a cup of coffee and listen to some tales of rock climbing in Thailand or take a look at some of the gold mined from his claim in the Yukon. He was a great man and had a great influence on the Public Safety program as we know it today. He'll be missed.

Willi flanked by his daughters Eva and Susi Pfisterer at the CAA's 25th Anniversary AGM in 2007, where Willi was honoured with an Outstanding Achievement Award.

Brad White

Peter Amann

I just wanted to pass on a few notes on Willi Pfisterer from somebody who was not a warden or with Parks. I first knew of Willi in the late 1970s when I went to see him at the old Warden's station to ask about climbs and stuff like that. I remember his old "Guide" poster was always up in his window.

He knew me and my buddies, and referred to us as the Smitty's mountaineers, because that's where we used to hang out. I took my first Parks Canada Ski guide course with Willi in 1980, up into the Wabasso Creek drainage. I always remembered that on almost every switch back our eyes met…I could tell he was watching me. When asked to do a snow profile he quickly figured out I knew nothing other than how to dig a hole!

I did my CAA level 1 in 1982 at Marmot Basin with Willi, and did a few ski tours off the backside of the ski area. He was a big strong solid skier. Our class was right there when a snow cat got buried up in the Knob area.

This past winter in February I was working on a project on the history of avalanche control at Marmot Basin. I had the opportunity to talk to Willi again, video him and ask a bunch of questions. It has been almost since the mid 80s that I talked to him so this was a chance to catch up and actually get to know him a bit better.

He spent his last few winters right across the street from me in the senior's complex. I was very intimidated to go and see him but was so glad I did. The best part of my presentation is that Willi Pfisterer, Hans Schwarz and Toni Klettl were all in the room that night!

Willi had shingles for a long time and I could see he was in a lot of pain. However when we sat down and talked I could see a sparkle in his eye and see just how excited he was to talk about the old days and avalanche control, climbing, skiing and everything in between.

Though I didn't know Willi well, I held him at the top of my list of those I held in high esteem. He was "The Man" and he lived right here in Jasper! Maybe the younger generation didn't know him but we all knew who he was and had an immense amount of respect for him.

It is guys like Willi who have brought all of us guides to where we are today. He was an important icon in our association, a true mountain man and someone we should always remember.

Googs Koebel

Peter Schaerer

With Willi Pfisterer we have lost a pioneer of professional avalanche work in Canada, a founding director of the Canadian Avalanche Association and a great colleague and friend.

After joining the National Parks as an Alpine Specialist in Jasper in 1968, Willi introduced standard snow observations, identified avalanche paths, carried out avalanche control at highways and ski areas in the parks and trained park wardens in avalanche safety measures and search and rescue.

Willi became one of the four members of the Avalanche Committee, which was a forerunner of the CAA. The objective of the Committee was to promote avalanche safety in Canada by organizing workshops and publishing Avalanche News (now avalanche.ca). When the Avalanche Committee evolved into the CAA in 1981, Willi was part of the working group that defined the objectives and wrote the by-laws of the association. He was elected as the first vice-president of the CAA.

Other significant and impressive contributions by Willi were to the Industry Training Programs. He was an instructor in the first-ever industry course in December 1971 and in later Level 1 and Level 2 courses, where he excelled in teaching safety measures and recue and as a leader of field work. His practical knowledge, humour and clear presentation style earned him much appreciation and applause from the students, to the envy of the other instructors. After lessons and courses, the students' talk often centred on Willi's words of wisdom. Willi contributed with his experience also in meetings when the training objectives of the courses were developed. We missed him after he discontinued his involvement with avalanche courses in 1986.

Willi Pfisterer was a strong believer in standards and reliable work. Often he made critical comments when technicians made shortcuts and neglected good practice, for example with snow observations, safety measures and avalanche control. In later years, when I paddled kayaks with Willi, I noticed that he applied the same reliable caution and safe approach on the water as he did on snow. After his retirement from avalanche work, Willi's influence on the industry was still felt. He has contributed to the high standard of the CAA Industry Training Program and ethics of the Association.

Clair Israelson

Search!

Part 7: Training the Older Avalanche Dog

By Jay Pugh

This article is dedicated to Attila, Warden Service Search and Rescue Dog for Banff National Park 2001 – 2006 who passed away this August at the age of 14. Along with her partner Mike Henderson, Attila responded to over 400 calls including 72 avalanches. Mike, all of us in CARDA send our most sincere condolences and gratitude for allowing us to learn from your experiences with that amazing dog.

In the past installments of this series, all the aspects in the training of an avalanche dog team have been examined—from the selection process to the advanced courses. Every step is critical to the development of an efficient and timely resource for the rescue of avalanche victims. First time CARDA handlers mature greatly through this time, although not as fast as their partner. All too soon the handler must adjust to the fact that their dog has become older and is starting to come to the end of their working life.

The working life of a dog is the time from certification through to retirement. This is dependent on many factors such as the breed, injuries, and life changes for the handler. The larger dogs, such as the German Shepherd and the Labrador generally have a working life of 8 – 10 years, while the medium-sized breeds like the Border Collie may be able to last one or two seasons longer. Regardless of the breed, all handlers have to be aware of their dog's physical condition and recognize the signs of advancing age. This is not as easy as it sounds, given that dogs, like all animals, do not want to appear weak as that is a distinction of prey. Instinctively, to protect their safety and their social status, dogs will hide weakness for as long as they can.

Working dogs, like athletes, peak at the mid-point of their career when experience and physical capability combine to create an intelligent, fast and effective animal that responds to the handler's directions but still has the self-confidence to be independent. The peak can last for some time with good training but the handler will start to notice changes as time goes on. The major responsibility of the handler at this point is to identify the limitations of the dog by performance in training, not on a mission.

One of the first signs of aging is the dog being obviously stiff and sore after hard physical exertion. Later on, the dog will start to pick and choose a route through avalanche debris where it once barreled across at top speed. At this point the handler has to learn to play to the strengths of experience more and accept limitations. As an example, in a multi-dog search the handler should advise the Team Leader (Incident Site Commander) to put a younger, faster dog in the areas of high probability and use the older dog to cover the less likely areas. An older dog can be used to confirm the areas where younger dogs displayed weaker interest. This is valuable in difficult conditions such as heavily contaminated sites with little information on potential victim location, and is standard procedure for Disaster Search Dogs.

A dog's working life can be extended through changes in diet and, in the case of joint problems, with the help of medications. However, the time will come when the handler has to admit that the active career of their dog is coming to an end. This can be a difficult period with hard decisions.

The first is whether or not the individual wants to continue being a dog handler. Sometimes this is an easy decision, as the person may want to move into a life that does not involve the mountains. It may be to support a family, to meet personal goals, or simply because there wasn't enough real work for the team. Whatever the factors, there is always the fact that a new dog means another 10-year commitment. Those who continue on have generally found careers in the avalanche or mountain industry.

The next decision is when to start the new dog. There are two directions that can be taken. One is to start while the older dog is still working; the other is to wait for the retirement of the first dog. In the former case, the main advantage is that if all goes well, the new dog is certified by the time the previous one retires and there is no loss in hander's active status. The difficulty lies in the two years it takes to bring the new pup to active status, when the handler has to divide their time between the two animals.

The handler has to bond with the puppy, imprint the search drive, instill obedience and acclimatize the puppy to its work environment. At the same time the older dog's training has to be maintained, as well as its health and fitness. There can be some advantages, such as the older dog showing the puppy the pack hierarchy (obey the alpha!) but it can be emotionally tough as the older dog, who once received the handler's full attention, now gets considerably less. Also some handlers are in families where there are also dogs that are pets, so the overall number of animals to take care of is a factor.

In contrast, some handlers not only wait for the first dog to retire but for that point where it's a one-dog family again, with only a single animal to completely focus attention on. If this is the decision, the handler must accept that it might be some time before the retired dog passes on. Professional handlers like the RCMP have their older dogs adopted into other homes but this is rarely an option for CARDA personnel. As an example, a Border Collie, who may be retired at around ten years of age, has a life expectancy of up to fifteen. Potentially there is a five-year gap where the handler is inactive.

The final decision is what breed of dog to get. While some go with the same breed others opt for an entirely new type. Some get a breed with a reputation for high performance and others take advantage of access to RCMP dogs that have been going through their process for a year before being deemed unsuitable for police work. Whatever the decision, there is a common pitfall that catches a lot of experienced handlers.

Second-dog handler syndrome is characterized by the handler expecting the new dog to behave and act exactly like the last one did. "Experienced Handler" is a relative term if a person has only their previous dog to base their training on. It is all too easy to forget what it was like to have a puppy, given that there can easily be as long as a decade or more since the handler had to train a puppy.

Expectations can be too high and progress, or lack thereof, gets measured in unrealistic terms. One of the most delicate tasks instructors have is to tactfully find a way to get the handler to realize that they are starting over, and that they have to take baby steps. Often an experienced handler will want to move quickly to the intermediate stage where they are searching for articles. A strong handler will not deprive their dog of the power of live finds, where the rewards are the greatest and the positive association of searching for a human imprints that devoted search drive needed.

Regardless of the path chosen, the final stage of a CARDA team's life is the late retired life. There often is a noticeable relaxation of discipline. It's allowable in that the older dog does not have the energy of a younger dog and spends a great deal of time napping and taking it easy. Hopefully the dog will have a long and happy retirement despite the physical toll taken on them by the job. But sadly there will come a day when the handler will face the fact that the bond will be broken by factors beyond their control and the dog will pass on. A partnership which has taught the human so much about themselves, often in ways not foreseen, will end and the pain will be deeply felt. It is a testament to the rewards of being a dog handler that so many CARDA members have put themselves through this difficult period several times.

Ian Cruickshank

Terms used by CARDA

Senior Avalanche Rescue dog Team • This status is earned after the successful completion of an advanced course. It designates the handler as capable of co-coordinating several dog search teams at once.

Working Life • The time between certification and retirement. Generally dogs begin their working life at around one-and-a-half to two years old and retire around ten.

Peak • Where the dog team combines experience and high physical energy and performs at the highest level of the career.

Active Status • The team is a certified and on the call-out lists to responding agencies

Work Environment • The conditions the dog will undergo while in its daily workplace. Includes living area, contact with public and transportation (e.g. helicopters).

Second-Dog Handler Syndrome • Expecting the second dog to be like the last.

Retirement • taking the dog off active status for good.

Realization • what the author with the ten-year-old Border Collie is struggling with.

Bond • The trust and respect between the dog and the human that creates all the highs during the working life and the deep hurt at the end.

RCMP "Rejects" • a misnomer in that these are high-quality dogs with drive from the RCMP kennels but rejected as unsuitable for police work usually due to a lack of aggression, which is bad for police work but very desirable for search work.

In Memoriam: Attila

By Brad White

Brad White

Parks Canada Warden Service Search and Rescue dog, Attila, passed away in mid-August at the age of 14. Attila had a busy and varied career with her handler Warden Mike Henderson. She was active operationally from 2001-2006 before retiring. Based out of Banff National Park, Mike and Attila responded to over 400 calls during this period.

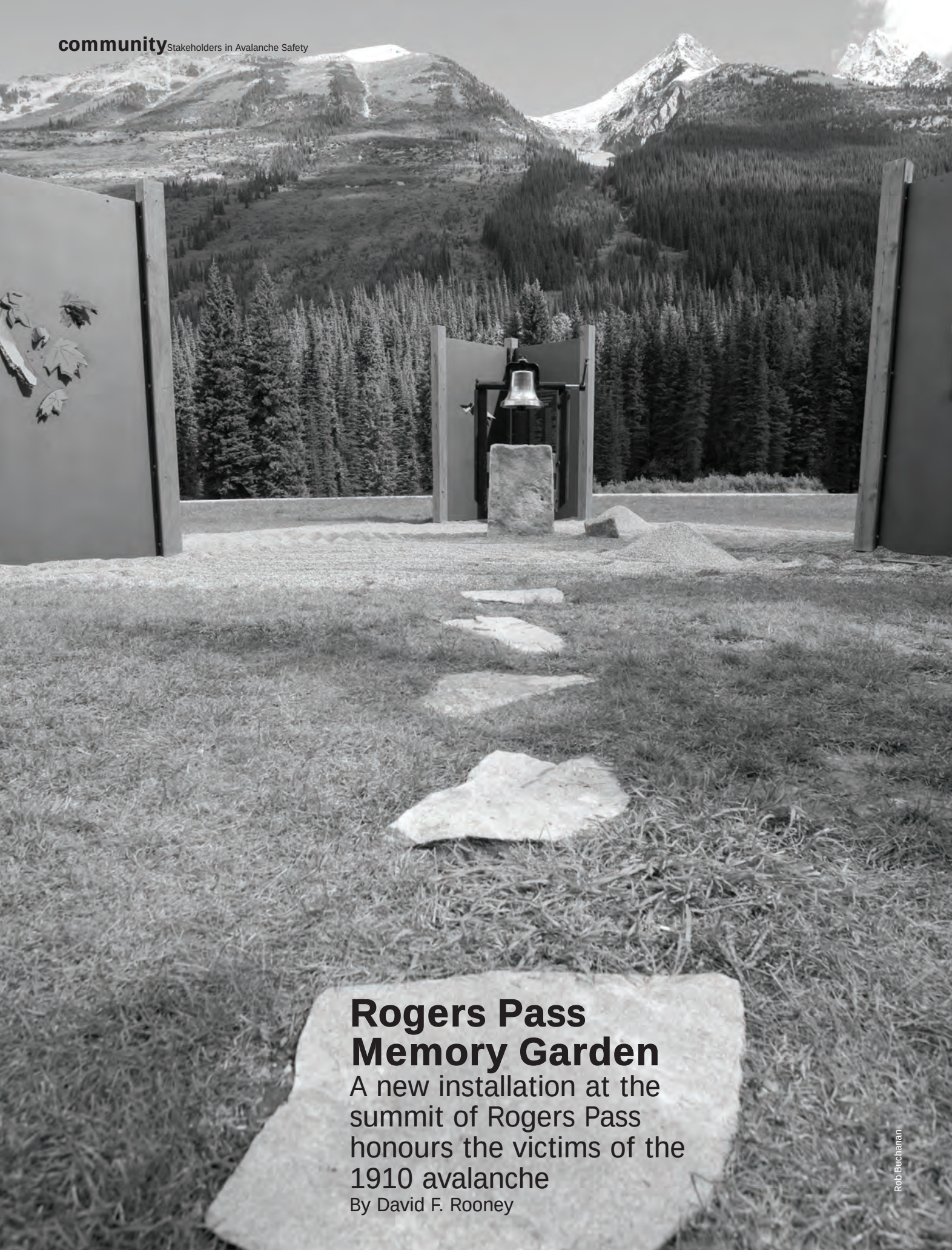
Attila was likely the busiest avalanche dog in Canadian history. During her career she responded to 72 avalanche calls in total. Of these responses, she was the key resource for indicating and pinpointing four immediate victim recoveries, and she gave indications in two other avalanche searches where the victims were later recovered due to other circumstances. Unfortunately none of these victims were recovered alive.

A trained avalanche dog and handler is a key resource in organized avalanche response. Where there is uncertainty about possible burials, or where there are certain victims buried without beacons, the dog is the tool of choice. Attila saved countless searcher hours and risk exposure by eliminating the likelihood of burial in many avalanches and by quick detection of victims where there were burials.

Attila spent the last years of her life on a ranch owned by a retired RCMP officer near Brooks, Alberta. She became a great ranch dog but with her RCMP training, she never did become friendly with pheasant hunters carrying shotguns.

She deserves credit for her dedicated service to Parks Canada and the greater search and rescue community.

>>Brad White is a Mountain Safety Programs Specialist for Parks Canada



Rogers Pass Memory Garden

A new installation at the summit of Rogers Pass honours the victims of the 1910 avalanche

By David F. Rooney

Rob Buchanan

Bill Fisher, Parks Canada's Director General for Western and Northern Canada, opens the Memory Garden with Tomo and Yuko Fujimura. Tomo, a CAA Professional Member, and his wife Yuko live in Revelstoke and worked tirelessly to research the 1910 disaster, contacting many Japanese families connected to the accident. It was Yuko's inspiration to start the highly successful origami crane project.

Rob Buchanan

This article is reprinted courtesy of the Revelstoke Current

The bonds between two cultures were strengthened on August 15 of this year, as Japanese and Canadians gathered together in two poignant and moving ceremonies to commemorate the 58 workers who died in the 1910 Rogers Pass avalanche. The main ceremony, which was sponsored b y Parks Canada at the Rogers Pass National Historic Site and included the public inauguration of Rob Buchanan's remarkable Memory Garden, mirrored the March 15 ceremony in many ways.

The workers of both Japanese and European ancestry were honoured and prayers were said in both the Buddhist and Christian traditions for the repose of their souls. Some of the Japanese visitors were so touched by the ceremony and the effort to honour the members of their families who vanished from history one cold March night that they wept openly.

This event was not just a commemoration. It was also an affirmation. Lessons were learned 100 years ago. The 1910 snow slide was one of several that were spawned by a vast snow storm. Little was known about avalanches at the time and the death toll was so shocking that scientists, industry and business began to finance research into their causes. The end result here is the existence of the Canadian Avalanche Association and its Centre here in Revelstoke. Their work doesn't mean avalanches won't continue to happen. And it won't stop people from ignoring the warning signs and, as a result, dying under the snow. But it does mean that we can do work towards better control programs and lower death tolls.

The most important affirmation was a simple human one as people from different cultures reached out to each other seeking the comfort and the bond that comes from shared pain and sorrow. This was most evident during the post-commemorative launching of 58 floating lanterns. The Japanese families who hosted this touching event invited local residents to write the names of departed loved ones on the lanterns. At the edge of the Columbia River the lanterns were floated out onto the current as dusk fell. A Japanese tradition, its spiritual solace was shared by everyone present.

It was sad, therefore, that the major media of this province chose to ignore this event, especially when you consider how quick they are to rush to Revelstoke whenever people die on our mountain slopes.

In the evening following the Memory Garden ceremony, participants gathered on the banks of the Columbia River to take part in a poignant and moving ceremony to remember the dead. Paper lanterns on wooden bases were set afloat, their warm candlelight casting a beautiful glow on the surface of the water. Each lantern was labelled with the name of a victim of the 1910 avalanche, as well as others who have passed on.

Rob Buchanan

Go On

A tribute to the survivors and the families of the victims of the 1910 avalanche in Rogers Pass

Time stopped for you
That day in March
But for us time marches on

My son, my brother, my husband, my love
Gone

A single, smothering instant
Gone

Days and weeks clearing debris to find you
Gone

Remember catching snowflakes on your tongue?
How light
Ephemeral
Innocent
That snow

They dug you out
Without a mark
Without a scratch
As natural as in life, they said

Found men standing as if in conversation
Frozen with one last joke on their lips

What remains

Your bible
Personal effects
Last paycheque

Sent to the new bride, just three months married
Sent to the aging mother without a pension
Sent to the family overseas
Who would never see your grave
Simply grieve
And go on

What, then, of the men who survived?
Witness to that terrible night
Helpless against a mountain's blind destruction
Of fifty-eight lives

We go on

Move tracks, build tunnels
Learn to read the mountains
Study slope, aspect, snowfall
Blast Howitzer rounds to shake slides down
On our terms

We go on

Send spirits home in paper cranes

Remember

Remember

Go on

This poem is by Laurie Schwartz, who is a member of Parks Canada's award-winning theatre company Mountain WIT

Created by Parks Canada Designer Rob Buchanan, the Memory Garden incorporates elements from a Japanese dry garden and interpretive public art to create a sense of space, place and time. Central to the installation is the Memory Bell, a heritage brass bell from a 1907 steam engine, held in place by two vertical rails with the date 1885 stamped into the steel. The yoke for the bell was fabricated from recycled parts of service trucks and snowplows that maintain the highway. The bell is designed to be rung and every time it is, it will make a sound that has not been heard for over 90 years.

The names of the victims of the 1910 avalanche disaster are etched on stone. The clang of the bell, the sounds of the highway and the quiet interludes between all combine to establish the mood of the garden—one of reflection and respect. A ceremonial rake will be left at the site with an inscription: "Please Rake the Memory Garden." The changing patterns visitors rake into the garden's gravel is symbolic of the changing moods of the area's snowpack.


RIGHT NOW THE VIEW IS SPECTACULAR.
Kokanee
GLACIER FRESH BEER
*TM/MC Columbia Brewery
IT'S ALL ABOUT NOW.

Rogers Pass Rules

Important changes to the Winter Permit System in Glacier National Park for 2010/11 winter season

By Alice Weber

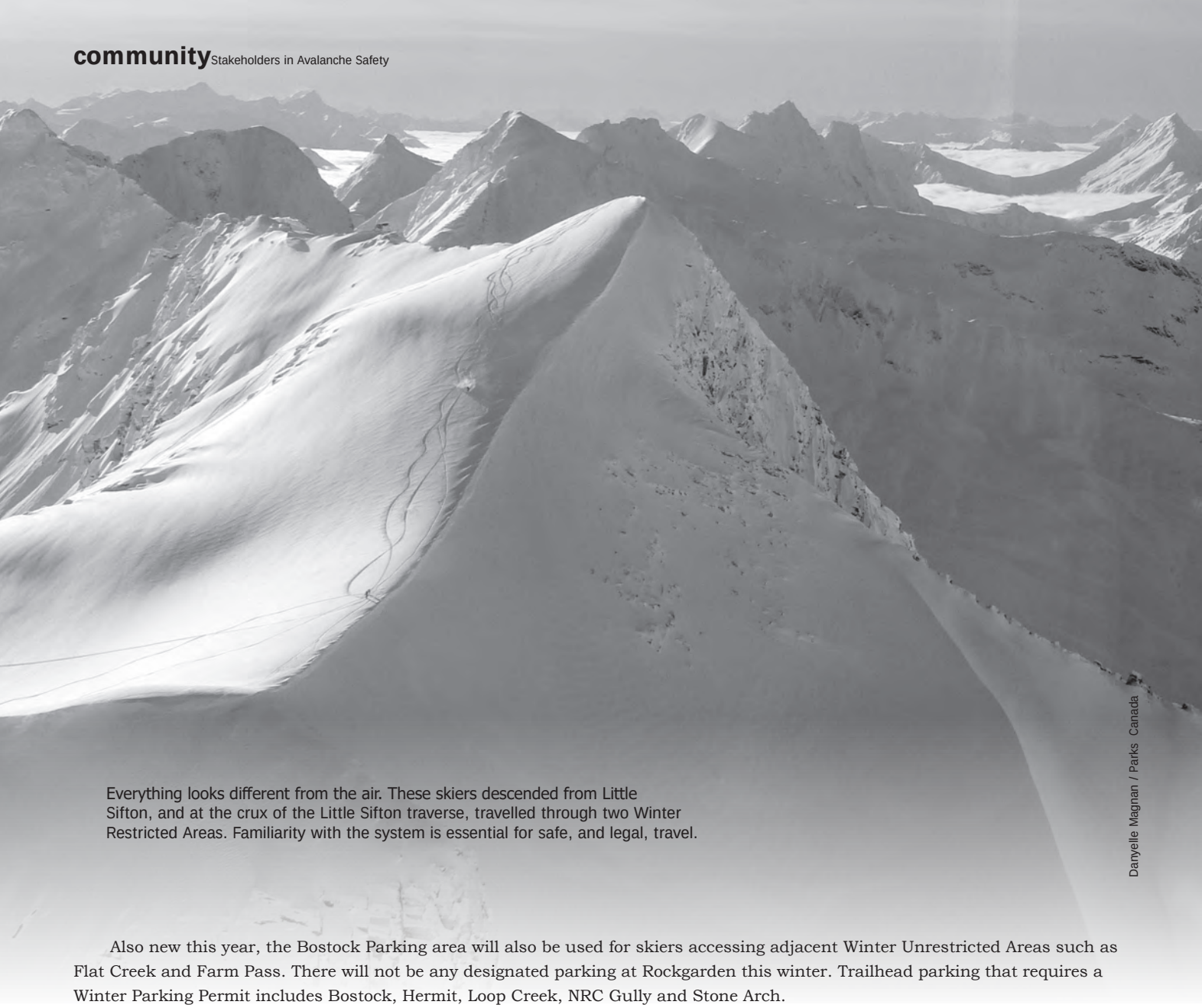
The 2010/11 Winter Permit System will take effect in Glacier National Park towards the end of November. Last year, there were extensive changes to the system—including changes to Winter Restricted and Prohibited Area boundaries, parking, and permit registration. Parks Canada continues to improve the system, and there are several additional changes this year.

Changes to the Winter Permit System are based on concern for public safety, due to expanding terrain use by backcountry recreationists and the operational need to separate recreation activities from avalanche control actions. Boundaries to Winter Restricted and Prohibited Areas have been adjusted in order to firmly apply accepted standards of 1000 metre standoff from artillery targets. The changes also incorporate safe public parking areas. Some changes have increased terrain accessible to skiers, while still preserving snow study areas for the avalanche control program.

New this year, Smart and Fortitude Winter Restricted Areas have been made accessible through the creation of a designated access route in cooperation with Canadian Pacific (CP). Parking for these areas is available for annual and daily winter permit holders only in the Bostock Parking Winter Restricted Area when it is posted as Open.

Hospital Bowl in Connaught Creek is one of many beautiful lines in Rogers Pass.

Danyelle Magnan / Parks Canada



Everything looks different from the air. These skiers descended from Little Sifton, and at the crux of the Little Sifton traverse, travelled through two Winter Restricted Areas. Familiarity with the system is essential for safe, and legal, travel.

Danyelle Magnan / Parks Canada

Also new this year, the Bostock Parking area will also be used for skiers accessing adjacent Winter Unrestricted Areas such as Flat Creek and Farm Pass. There will not be any designated parking at Rockgarden this winter. Trailhead parking that requires a Winter Parking Permit includes Bostock, Hermit, Loop Creek, NRC Gully and Stone Arch.

As of last winter season, Most Winter Restricted Area boundaries were expanded, and three new areas were created. Access to the Tupper Restricted Area and the Ross Peak Restricted Area was re-established via routes that avoid crossing CP property. Other changes included a decrease in the size of four Winter Prohibited Areas, and the addition of the one Winter Prohibited Area. A Winter Prohibited Area is an area to which access for winter recreationists is prohibited.

Parks Canada's primary concern is for public safety. Winter Permits will not be issued to Winter Restricted Areas where access depends on trespass of CP property. Access to four Winter Restricted Areas (Tupper, Ross, Fortitude and Smart) has been re-established via routes that avoid crossing CP property. CP Police patrol these sites and may tow and impound vehicles illegally parked on CP property.

The Trans-Canada Highway itself is not part of the restricted or prohibited areas, but highway ploughing and avalanche control activities place restrictions in some areas. This includes no stopping inside signed avalanche areas along the highway, and the requirement of a Winter Parking Permit when parking at designated parking areas. Visitors are asked to obey all signs along the highway. Skiers travelling alongside the highway are asked to travel on the other side of the snowbank rather than on the highway shoulder, for safety reasons.

For more information on the Winter Permit System and Orientation Sessions, please call 250-837-7500, or visit www.parkscanada.gc.ca/glacier. The most current conditions and daily avalanche bulletins are also available on Glacier National Park's website link above. Please note that the Rogers Pass Discovery Centre is closed for renovations and Parks Canada operations have been re-located to Glacier Park Lodge next door until further notice.

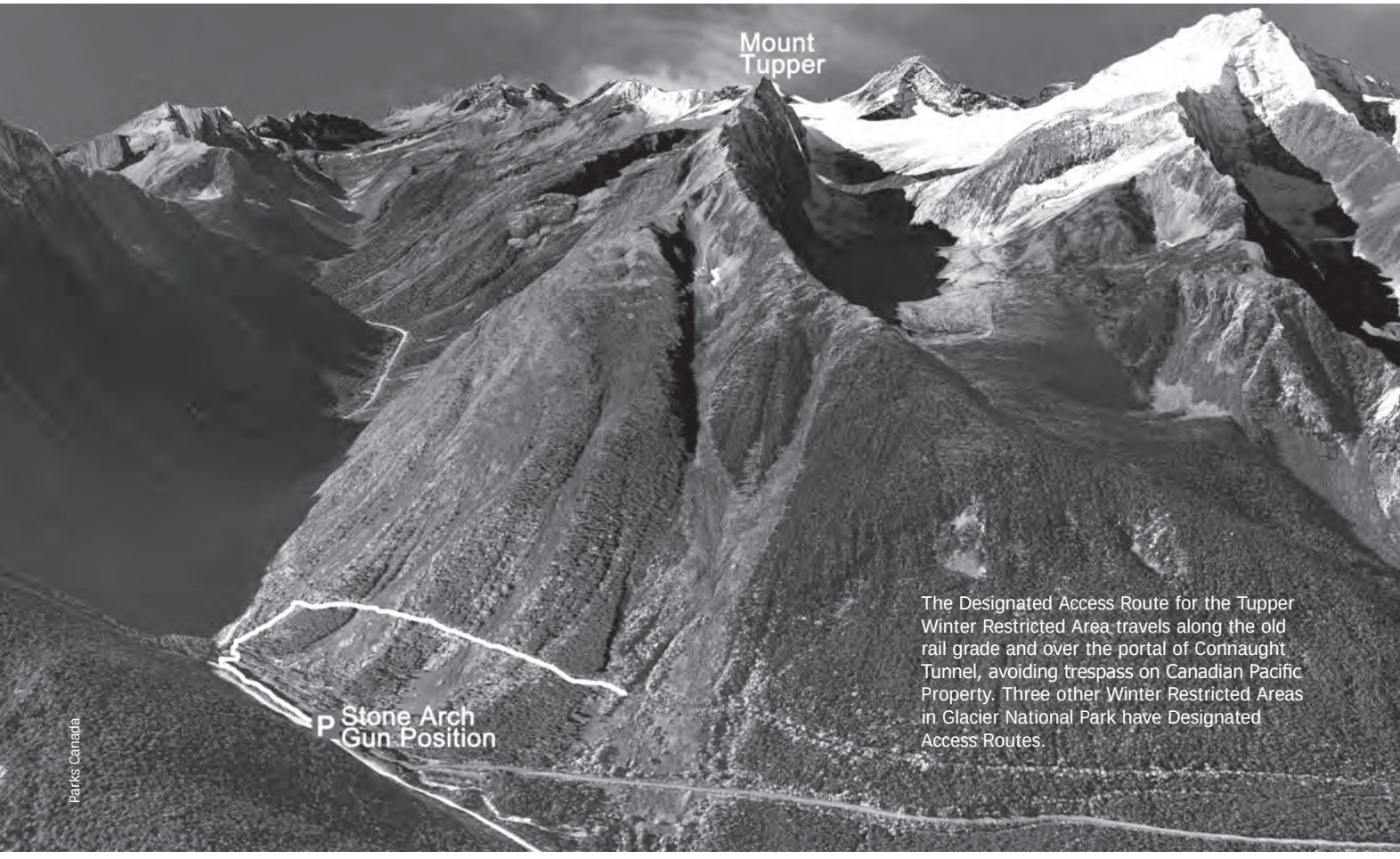
>>Alice Weber is the Outreach Education Officer for Mount Revelstoke and Glacier National Park

What is the Winter Permit System?

A Winter Permit is required to enter Winter Restricted Areas affected by the highway avalanche control program when artillery gunfire is not anticipated. This system protects the public from danger resulting from direct artillery fire, including shrapnel that can travel up to 1000 metres, and the potential for sympathetic avalanche releases.

To acquire an Annual Winter Permit, you must attend a Winter Permit Orientation Session, agree to a Waiver of Liability and Indemnity Agreement and accept specific terms and conditions. Please note that Daily Winter Permits are available to individuals who anticipate few ski days in Rogers Pass this winter; daily permits are not available for groups. Professional guides can pick up packages of Daily Winter Permits and Waivers in advance for their clients to fill out each morning.

Winter Permits are valid from the date and time of issue to midnight of the same day and are valid only for those Winter Restricted Areas which have been posted as open for entry and travel on that day. Overnight use or camping is not permitted in any Winter Restricted Area. Individuals entering a Winter Prohibited Area or a Winter Restricted Area that is closed to entry, or not complying with permit conditions or parking restrictions, may be prosecuted, resulting in a maximum fine of $2000 and/or permit cancellation. Vehicles parked illegally may be towed at the owner's expense.



Parks Canada

The Designated Access Route for the Tupper Winter Restricted Area travels along the old rail grade and over the portal of Connaught Tunnel, avoiding trespass on Canadian Pacific Property. Three other Winter Restricted Areas in Glacier National Park have Designated Access Routes.

Orientation Sessions for 2010-11 Winter Season

Orientation sessions will be available in the following locations/dates:

- *Revelstoke*—United Church, November 17, 18, & December 8, at 7pm.
- *Golden*—Seniors Centre, November 15 & December 15 at 7pm
- *Calgary*—Cardel Theater, 180 Quarry Park Blvd. SE, November 2 at 7pm & 8:30pm.
- *Banff*—Kinnear Centre, Room 305, November 3, 5pm & 6:30pm

Schedule of Coming Events

Oct 3 – 4, 2010

HeliCat Canada Fall Association General Meeting

Where: The Hillcrest Hotel, Revelstoke, BC
Info: Call (250) 542-9021 or e-mail info@helicatcanada.com

Oct 4 – 6, Oct 13 – 15, 2010

Canada West Ski Areas Association Zone Meetings and Safety & Risk Management Seminars

AB, SK & MB Zone, Oct 4 – 6
Where: Canyon Ski Area, Red Deer AB
BC & YT Zone, Oct 13 – 15
Where: Silver Star Club Resort, Silver Star Mountain, BC
Info: Call (250) 542-9020 or e-mail office@cwsaa.org

October 5 – 10, 2010

ICAR 2010

The International Commission of Alpine Rescue is once again hosting an open forum to discuss ideas and share information on mountain rescue. ICAR represents 30 mountain-rescue organizations from Europe and North America.
Where: Vysoké Tatry, Slovakia
Info: www.ikar-cisa2010.org

October 14 – 16, 2010

Wilderness Risk Manager's Conference

This annual conference focuses on risk management and practical skills for the wilderness adventure and education industry
Where: Colorado Springs, Colorado
Info: www.nols.edu/srmc

October 17 – 22, 2010

International Snow Science Workshop 2010

Join a wide range of snow scientists and avalanche practitioners at this biennial international conference celebrating "A Merger of Theory and Practice."
Where: Squaw Valley, California
Info: www.issw2010.com

October 30 – Nov 7, 2010

Banff Mountain Festival

The Banff Mountain Festival brings you the world's best mountain films, books and speakers.
Where: Banff Centre, Banff
Info: www.banffcentre.ca/mountainculture/

November 13 – 27, 2010

Backcountry Avalanche Workshop Series

Presented by Columbia Brewery, this year's BAW series will feature presentations from the CAC forecaster team, the University of Calgary's ASARC team, and local professionals with beta on local routes. Volunteers are always welcome.
Where: November 13 – Whitehorse
November 20 – Prince George, Terrace
November 27 – Fernie
Info: Call Nancy Geismar at (250) 837-2141 (233)

November 14 – Dec 1, 2010

AST Instructor Training

Where: November 14 – Whitehorse
November 24 – Squamish
November 28 – Golden
December 1 – Nelson
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Jeff Scott

January 14 - 16, 2011

Avalanche Awareness Days

The CAC's annual event continues the tradition! This year, our national media event will be held on Jan 14 in Vancouver's North Shore Mountains. Over the weekend of Jan 15 – 16, some 30 communities throughout Canada will host Avalanche Awareness Days. Check our website in early December for a complete schedule of events.
Info: www.avalanche.ca

The Temperature Profile Probe Revisited

By Craig Hollinger

Back in 2008, I introduced a temperature profile probe I was developing (*avalanche.ca* Volume 85, Summer 2008). Field tests I performed before the article was written showed the probe could provide useful temperature profile data, but further testing later in the spring showed up some of the probe's weaknesses. This is the beauty of the development process; you never get it quite right the first time!

One of the problems I mentioned in the article was the length of time the sensors in the probe took to reach equilibrium (for the readings to become constant with time). I call this the "settling time." In the usual West Kootenay mid-winter snowpack, where the snow temperature was around -8 °C, the probe settling time was over 15 minutes (see Figure 1). I felt, as did others I talked to, this was too long. In a warmer spring snowpack, the settling time was about three minutes, a more acceptable time (see Figure 2).

Another problem showed up when profiling a spring snowpack, especially on sunny days when the air temperature was well above freezing. The upper two or three sensors displayed considerable error. The surface, 10 cm and sometimes the 20 cm sensors often read well above freezing (see Figure 2). Not likely of course, even in a warm spring snowpack! The error was not due to the sensors themselves, as they are guaranteed to be accurate to +/- 0.5 °C.

So, what was causing the long settling time and the upper sensor errors? I believe these problems were caused by the way the probe was constructed. Due to a busy guiding schedule during the 2008/9 season, I had little time to address these issues. However I did spend a lot of time thinking about what was causing the issues. This is what I came up with.

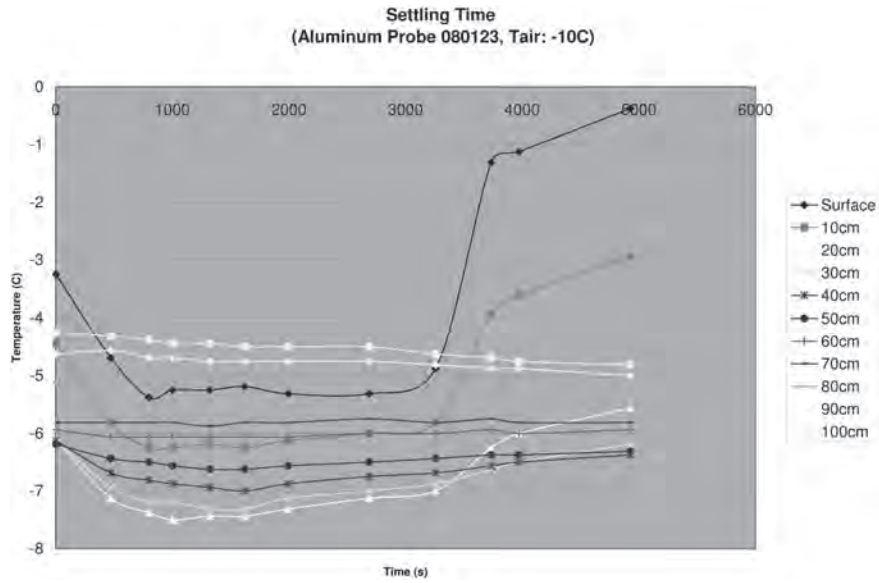


Figure 1: A plot of all temperature sensors Vs time from the aluminum probe. This test was taken in January 2008 in a typical snowpack for that time of year. The plot shows the settling time to be about 900 seconds (15 minutes). Note also how the surface and 10cm sensors suddenly warm up around the 3200 second mark. This is when the sun came out and warmed the surrounding air.

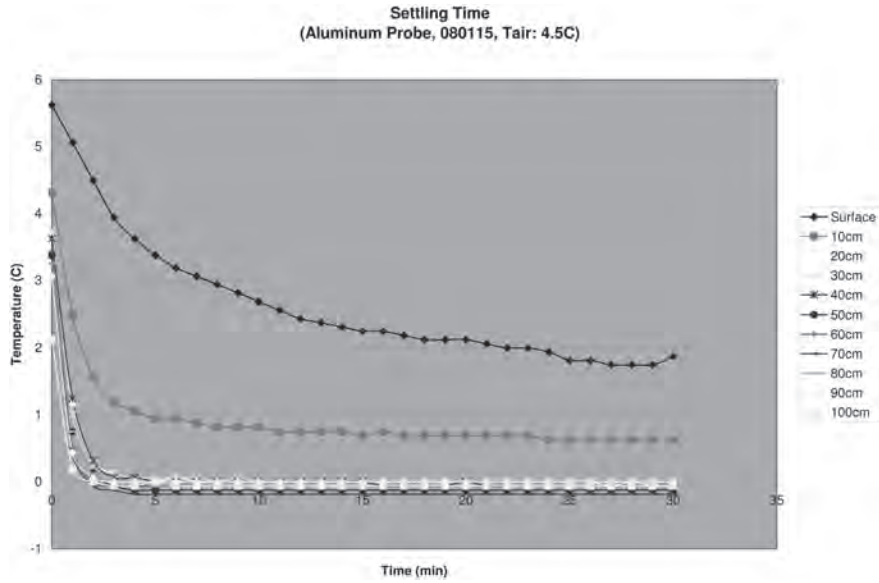


Figure 2: A plot of all temperature sensors vs time from the aluminum probe taken in January 2008. Although this was mid-winter, the snowpack was very warm, as was the air—almost spring-like. The settling time was about three minutes. Note the surface and 10cm sensors are reading well above zero.

The temperature sensors were installed inside an aluminum ski pole, mounted on small pieces of circuit board held in place with screws (see Photo 1). A hole was drilled at each sensor to expose it to the snow. Epoxy glue was injected around the sensor to fill in the gap and seal the sensor. This arrangement placed the sensor flush with the surface of the probe and reduced contact with the snow. The big blob of epoxy glue around the sensor also increased the thermal mass. I feltvthese two factors together increased the time for the sensor to reach the temperature of the snow.

No matter how carefully I inserted the probe into the snow, I could not hold it steady enough to prevent enlarging the space around the probe shaft near the snow surface. I believed this space allowed warm spring air to flow in around the probe

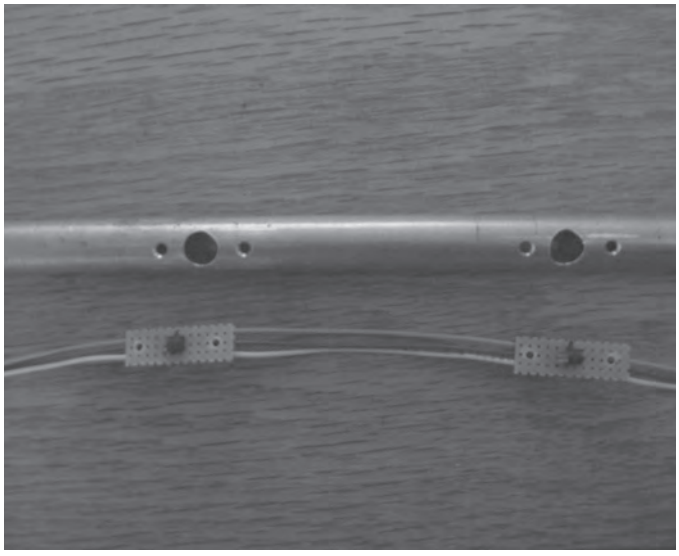


Photo 1: The aluminum probe under construction. Little pieces of perforated board held the sensors, while three wires daisy-chained the sensors together. The string of sensors was threaded into the probe and the boards aligned with the holes. Screws went through the smaller holes to hold the boards in place. The holes were then sealed with epoxy glue.

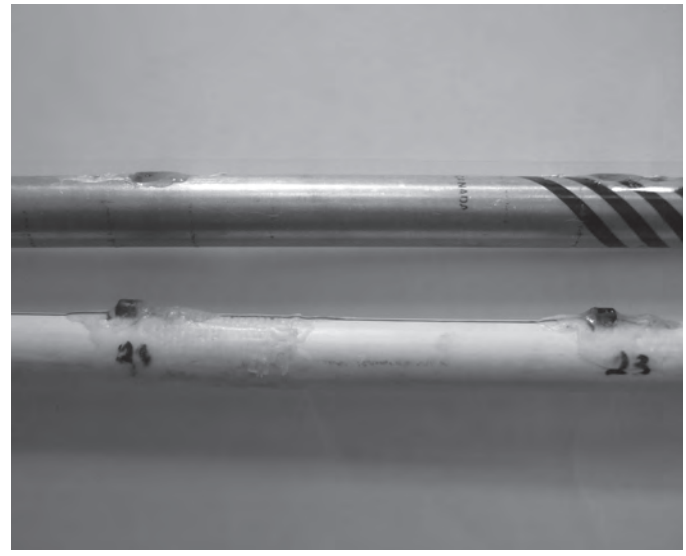


Photo 2: The original aluminum probe (top) shown next to the newly constructed fibreglass probe. The sensors are mounted on the outside of the fibreglass ski pole. Holes drilled near each sensor allowed the interconnecting wires to come up and connect to the sensor leads. The sensors are held in place and the holes sealed with fibreglass cloth and epoxy glue.

and warm up the upper sensors. Another contributing factor to the upper sensor heating could have been the high thermal conductivity of the aluminum probe shaft. The probe handle left in the air above the snow surface could have been conducting heat from the warm air and heat radiating from nearby snow banks and trees down to the upper sensors.

Now, how to address these problems? I needed a way to mount the sensors so the contact with the snow was improved and the thermal mass was reduced. I also needed to reduce the thermal conductivity of the probe shaft. I thought using a fibreglass ski pole (I had lots of them in my closet!) with low thermal conductivity and mounting the sensors outside on the surface of the shaft would help

This past winter, I spent some time testing this idea, gluing sensors onto pieces of fibreglass ski pole. I was concerned that the sensors would be vulnerable to damage while pushing the probe through icy layers in the snow. In one test I was able to knock a sensor off the probe. Wiring the sensors proved to be a challenge as well, as I wanted the cable to run up the centre of the probe. Eventually I worked out the challenges and built a new probe. The sensors are glued to the surface of the probe and the interconnecting wires are brought up through holes drilled near each sensor (see Photo 2).

In the spring and early summer this year I performed more field tests with the fibreglass probe. I was mainly interested in seeing if the new probe design would speed up the settling time and reduce the warming effect of the upper sensors.

A warm, sunny day was chosen for the tests. I let the probe stand upright in the air for several minutes to warm up to the air temperature. Two readings were taken, and then the probe was inserted into the snow. As the probe was inserted into the snow, I noticed the sensors carved a groove down the side of the hole. This groove, I felt, would not let the sensors make good contact with the snow. So after insertion, I gave the probe a twist to rotate the sensors into the snow. Also, I pushed some snow around the probe shaft to seal the top of the space around the shaft. A plot of the results is shown in Figure 3.

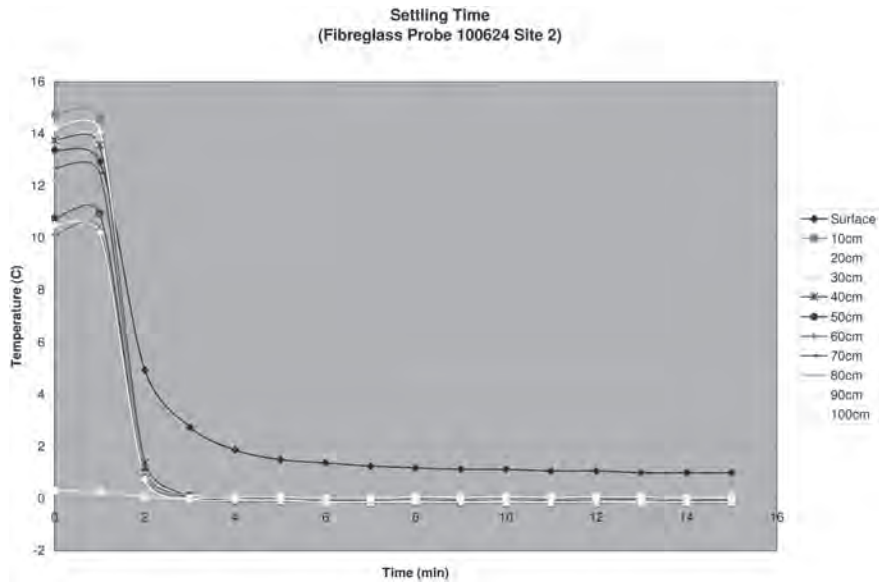


Figure 3: A plot of all temperature sensors Vs time from the fibreglass probe taken in June 2010. The probe was stood up in the air to warm it up before being inserted into the snow. Note that one of the sensors was reading the snow temperature before insertion. This was the bottom sensor that was stuck in the snow while the probe was warming up. The settling time was a quick two minutes.

The settling time was a little faster than that of the aluminum probe. The big thing to note here though is that only the surface sensor is reading incorrectly. The 10 and 20 cm sensor were not showing any error as they were with the aluminum probe. I tried another test without pushing snow up around the top of the shaft, but that made little difference in the results.

Conclusions from the Tests

Both the aluminum probe and the fibreglass probe seemed to take about the same time to reach equilibrium. Settling times were around two to three minutes in spring snow and over 10 minutes in colder winter snow (for the aluminum probe). I have not yet tested the fibreglass probe in winter snow, but I'd expect its response would be similar to that of the aluminum probe.

Settling times seem to depend on the snow type and temperature and not on the probe shaft material. I observed longer settling times in colder snow and that makes sense. Cold winter snow is less dense than warm spring snow, thus having a lower thermal mass to conduct heat away from (or into) the probe. I'd expect that free-water content would have an effect as well. With more free-water in the snow the better the thermal contact with the probe and the faster the settling time. Errors in the upper sensor readings seemed to be due to the probe shaft material. I think this may have to do with the higher thermal conductivity of the aluminum shaft, thus producing a greater error.

Temperature Profiles

Here are some examples of profiles to show what this probe was designed to do.

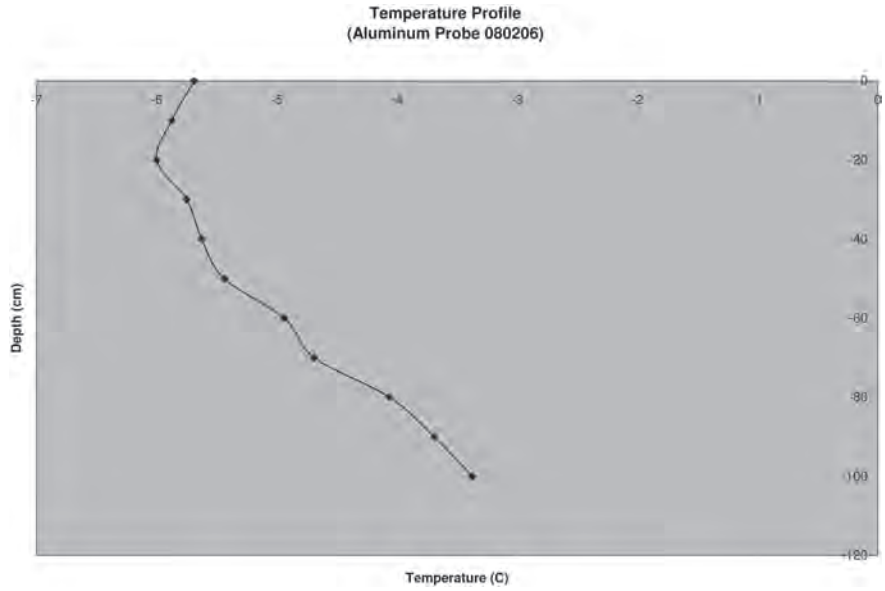


Figure 4: A temperature profile taken in February 2008 with the aluminum probe.

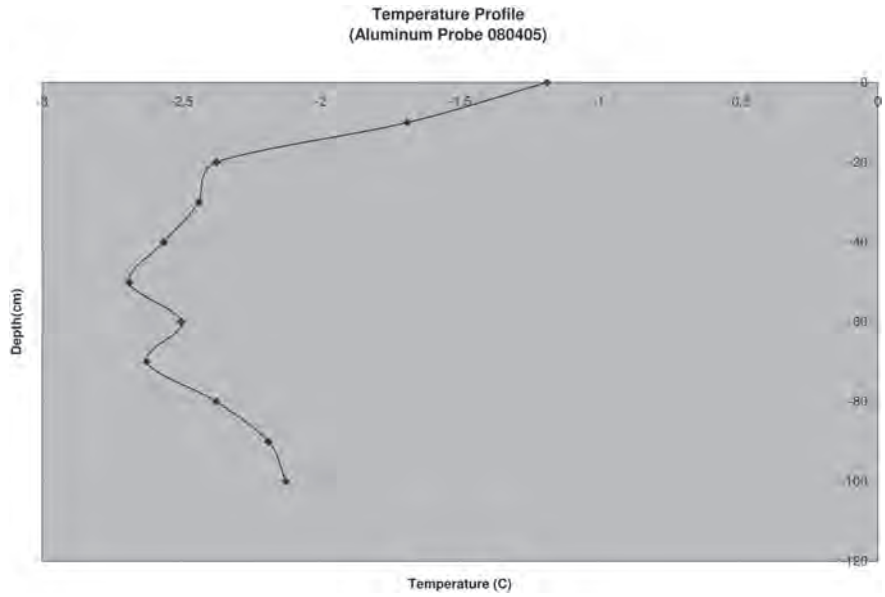


Figure 5: A temperature profile taken in April 2008 with the aluminum probe.

Figure 4 is a typical mid-winter temperature profile. Notice the normal temperature gradient below 2 cm and the slight reverse gradient above. The profile in Figure 5 was taken in April 2008 in an early-spring snowpack. As in Figure 4 above, there is a reverse temperature gradient in the upper 20 cm. I'm not sure if this is due to the previously discussed upper sensor errors. The air temperature in Figure 4 was -7 °C and -3 °C in Figure 5. For both tests, the sky was overcast so the snow surface might have been picking up some heat re-radiated from the clouds.

The ripple in the profile between 20 and 40 cm is due to the small error in each sensor's reading. I don't think the snowpack temperature was varying like this in reality (although it may have; something to investigate in the future?). The horizontal scale of this graph is only 3 °C, so the ripple becomes exaggerated.

Figure 6 shows a profile taken with the fibreglass probe in an early summer snowpack. At this time of the year, I'd expect the snow to be at 0 °C top to bottom, but we can see some ripple in the profile below 30 cm. Again, the expanded scale of this plot exaggerates the ripple. There is a mild temperature gradient in the upper 30 cm, probably due to the cool nights occurring at this time of the year. As discussed before, the surface sensor is reading well above zero.

Some Final Thoughts

The newly designed fibreglass probe seems to have addressed the problems seen with the aluminum probe. It

has a slightly faster settling time in a spring snowpack, but further field testing will be required to determine if this improvement carries over to a winter snowpack. The upper sensor error was significantly improved by the design of the new probe.

With the refinements of the new fibreglass temperature profile probe, I believe it is a useful instrument. Temperature profiles of the top metre of the snowpack can be taken in just a few minutes. Numerous profiles over a wide area can be taken in a short time without the need to excavate a pit each time. The probe and data logger are available for anyone to try out. If interested, please contact me by e-mail at craigh@netidea.com.

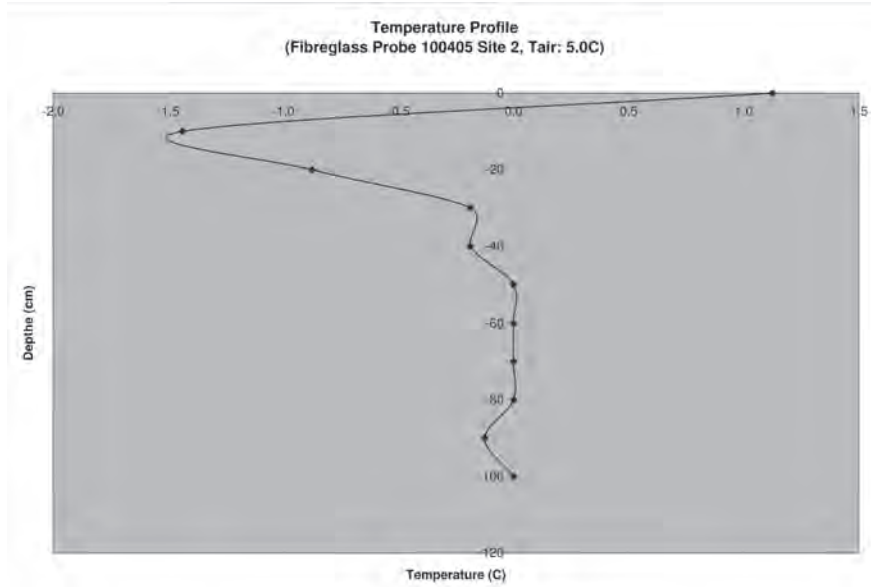


Figure 6: A temperature profile taken in June 2010 with the fibreglass probe.

Craig Hollinger has been ski-mountaineering for more than 20 years. He is an Assistant Ski Guide and a former electronics engineer who now resides in Nelson, BC.

A RECIPE FOR WIDESPREAD PERSISTENT DEEP SLAB AVALANCHE CHARACTERISTICS IN WESTERN CANADA

Cam Campbell[1]* and Matt MacDonald[2]
[1] Canadian Avalanche Centre, Revelstoke, British Columbia
[2] Pacific Storm Prediction Centre, Environment Canada, Vancouver, British Columbia

ABSTRACT: Of the 29 avalanche fatalities during the avalanche season of 2002-03 in western Canada, at least 14 were attributed to persistent deep slab avalanches, including one seven-fatality incident. The next highest number of avalanche fatalities this decade in western Canada was during the avalanche season of 2008-09 with at least 17 of the 25 fatalities attributed to persistent deep slab avalanches. Analysis of the commonalities between these two avalanche seasons showed that rain on a shallow early season snowpack, followed by a long period of clear and cold weather, set the stage for a deep slab avalanche problem. Similar early season weather occurred during the avalanche seasons of 2001-02 and 2009-10, yet a widespread persistent weak layer did not develop.

This paper presents a retrospective of the past ten avalanche seasons in western Canada. Weather, snowpack, and avalanche occurrence data are used to test the hypothesis that given weather conditions favourable for early season hard crusts with associated facets, persistent deep slab avalanche characteristics depend strongly on early season snowpack depths. It was found that below average early season snowpack depths is one of the major factors contributing to widespread persistent deep slab avalanche characteristics. Furthermore, below average and variable seasonal snowpack depths, weak, re-loaded bed surfaces, and favourable snowpack stratification for step-down fractures seemed to contribute to the persistence. By identifying early season patterns leading to the development of widespread persistent deep slab avalanche characteristics, this paper will aid in forecasting such avalanche seasons by providing a recipe using early season ingredients.

1. WESTERN CANADA AVALANCHE WINTER REGIMES

According to Haegeli (2004), the maritime avalanche winter regime in the South Coast Mtns (Figure 1) is characterized by a low number of persistent weak layers. Basal facet layers are not uncommon in the interior ranges of the South Coast Mtns, especially in shallow windswept areas. Although, relatively warm temperatures associated with mild air from the Pacific Ocean tends to prevent them from persisting.

The transitional Columbia Mtn (Figure 1) regime typically involves one or two facet-crust combination weaknesses, generally near the base of the snowpack, and several surface hoar layers every season.

In the continental Rocky Mtns (Figure 1) basal weak layers and deep slab avalanche characteristics are common. Therefore, this study considers persistent deep slab avalanche characteristics to be widespread throughout western Canada if a basal weak layer remains active throughout the avalanche season in the South Coast Mtns.

* *Corresponding author address:* Cam Campbell, Canadian Avalanche Centre, Box 2759, Revelstoke, BC, Canada, V0E 2S0.
p: 1-250-837-2141 ext: 230, f: 1-250-837-4624, ccampbell@avalanche.ca www.avalanche.ca

2. AVERAGE EARLY SEASON SNOWPACK DEPTHS

The average early season snowpack depths were compiled using a selection of tree-line and alpine weather stations in the Coast and Columbia Mtns. Data from the closest date between November 30th & December 3rd were used as an approximate of early season snowpack depth. The available values were taken from the 12 am observation on the day with the most data for each year. For the South Coast Mtns, the average snowpack depths were obtained using the British Columbia Ministry of Transportation and Infrastructure's (MoTI) Blowdown Mid (Figure 1) and Little Bear automatic weather stations (RWIS), Whistler Mountain's Pig Alley weather plot, and the Solar, Catskinner, and Horstman Hut automatic weather stations on Blackcomb Mountain. For the Columbia Mtns, Parks Canada's Roger's Pass and Mt Fidelity (Figure 1) weather plots, the MoTI Kootenay Pass RWIS, and Mike Wiegele Helicopter Skiing's Mt. St. Anne weather plot were used.

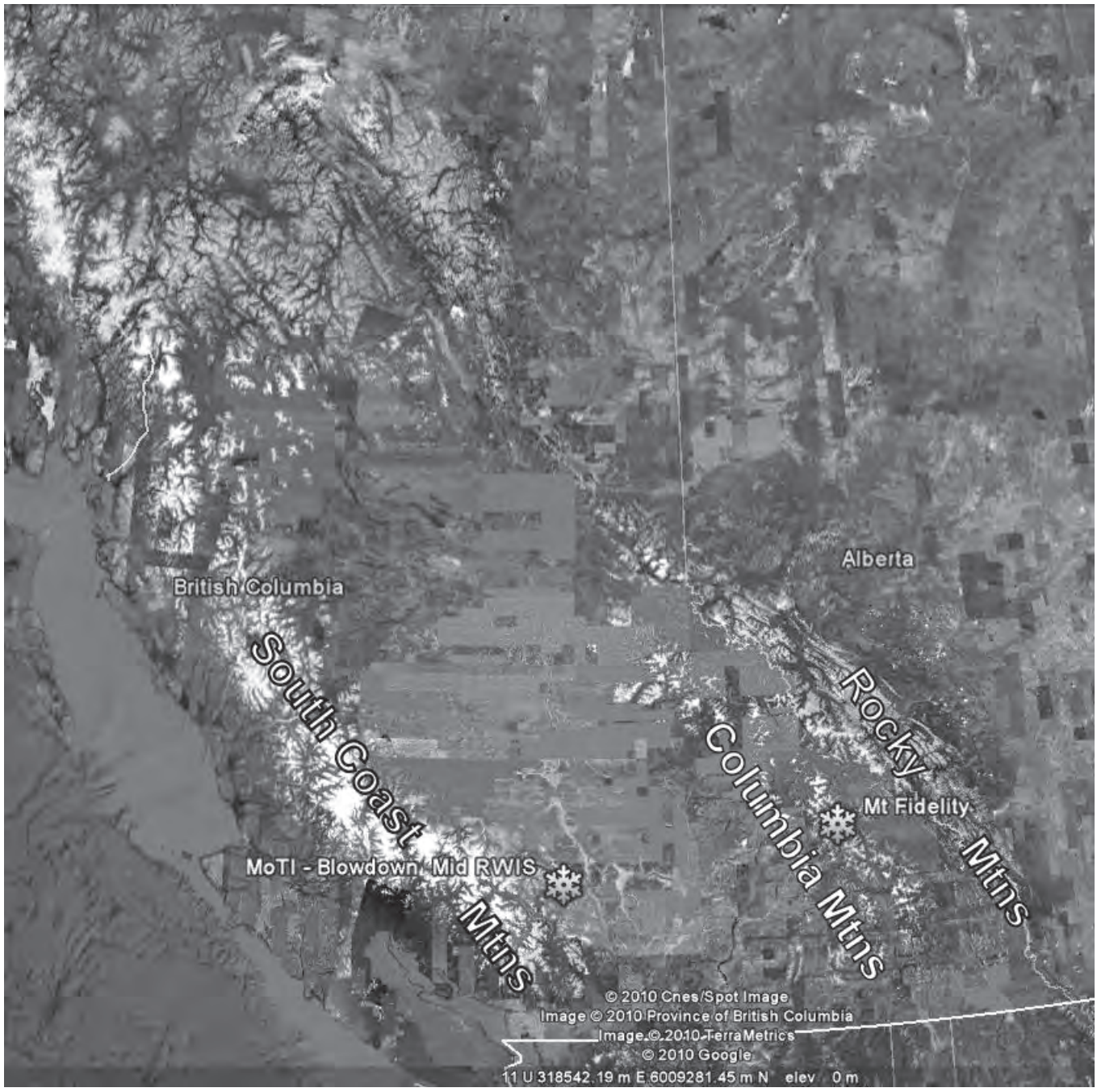


Figure 1: Image of western Canada showing the South Coast, Columbia, and Rocky Mtns. Blowdown Mid and Mt Fidelity weather stations are also shown

3. EARLY SEASON ARCTIC OUTBREAKS

Arctic outbreaks occur when dry frigid air that has been deepening north of the Arctic Circle spills south into lower latitudes. The blast of cold air causes temperatures to plummet and the lack of humidity creates clear skies. In western Canada, these cold clear conditions are brought on by ridges of high pressure over the Yukon or northern BC. Arctic outbreaks typically last multiple days and some can persist up to several weeks.

To identify past early season arctic outbreaks, daily minimum and maximum air temperatures as well as snowpack depths were plotted from November 1 to December 31 for each of the past ten years. Blowdown Mid, a treeline automated weather station from the MoTI RWIS network located at 1890 m near Pemberton, British Columbia (Figure 1), was deemed an ideal location representative of both the maritime and transitional avalanche winter regimes. Arctic outbreaks were identified by prolonged periods of well below normal temperatures with little to no precipitation. Corresponding surface analyses from the Pacific Storm Prediction Center were verified to confirm the presence of an arctic ridge of high pressure.

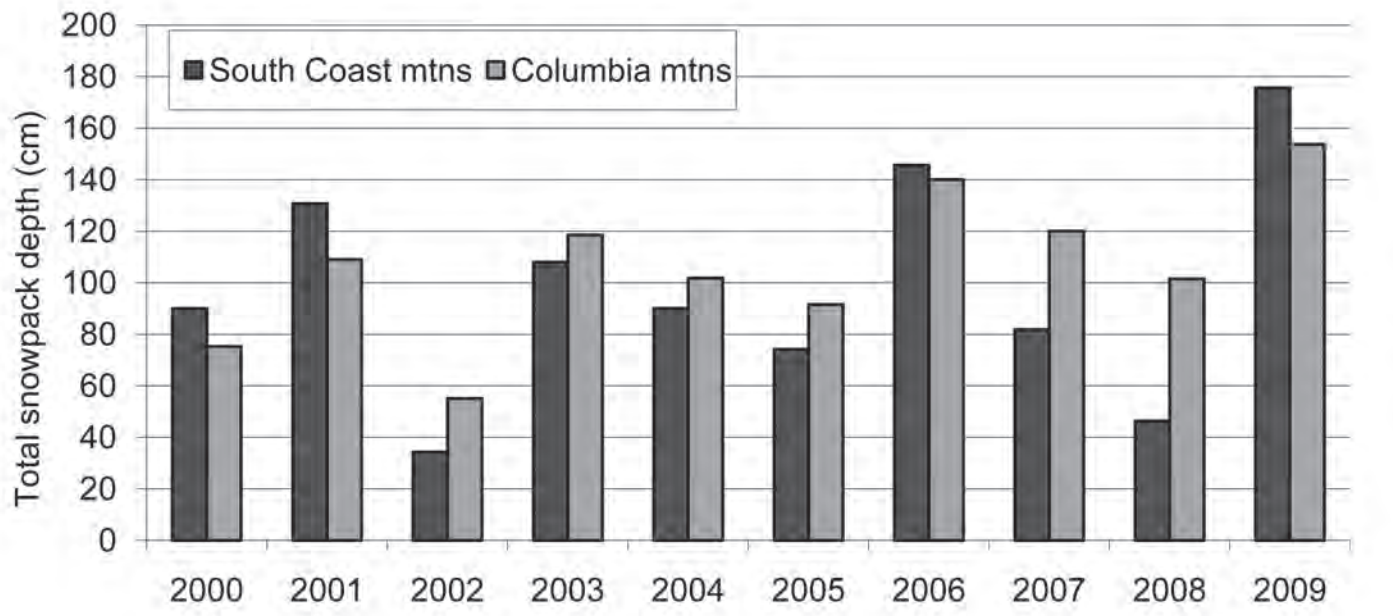


Figure 2: Average early season snowpack depths in the South Coast and Columbia Mtns for the past ten years. The ten-year average for the South Coast Mtns is 98 cm, and 107 cm for the Columbia Mtns.

Table 1: Early season arctic outbreaks (AO) in western Canada.

Year	Date	Comments
2000	Dec 10-15	Classic AO with light precip during last days.
2001	Dec 20-27	Relatively weak AO although very dry.
2002	Nov 24-30	Not extremely cold but dry throughout.
2003	Nov 20-23	Relatively short AO
2004	Nov 27- Dec 1	Not a true AO, more of a weak cold ridge with small precip amounts
2005	Nov 26- Dec 3	Strong outbreak with short interruption on 29th
2006	Nov 26-Dec 3	Deep AO with very cold temps.
2007	Nov 20-25	Not a true AO, more a cold ridge
2008	Dec 13-21	Perfect example of classic AO
2009	Dec 3-14	Long AO

4. WEATHER, SNOWPACK AND AVALANCHE RETROSPECTIVES

4.1 2000-01

The South Coast Mtns (90 cm) had a slightly below average early season snowpack depth, while the Columbia Mtns (75 cm) were well below average (Figure 1). A six-day arctic outbreak occurred mid-December (Table 1).

Data from the Canadian Avalanche Association's (CAA) daily avalanche industry information exchange (InfoEx) suggest that a basal facet and depth hoar weak layer formed in the South Coast Mtns. Associated avalanche activity persisted until mid-to-late January, when warm temperatures, rain, and weak temperature gradients resulted in bridging, rounding, and sintering of the basal snowpack.

4.2 2001-02

The South Coast Mtns (131 cm) had a well above average early season snowpack depth, while the Columbia Mtns (109 cm) were about average (Figure 1). An eight-day arctic outbreak occurred late-December (Table 1).

According to the CAA InfoEx, a significant mid-November rain event followed by a period of below average air temperatures resulted in a facet-crust weak layer that persisted throughout the season across much of western Canada. The pattern of the avalanche activity shows the weak layer to be most persistent in the Rocky Mtns, and limited to the central ranges of the Columbia Mtns. Related avalanche activity was largely absent in the South Coast Mtns (Haegeli, 2004).

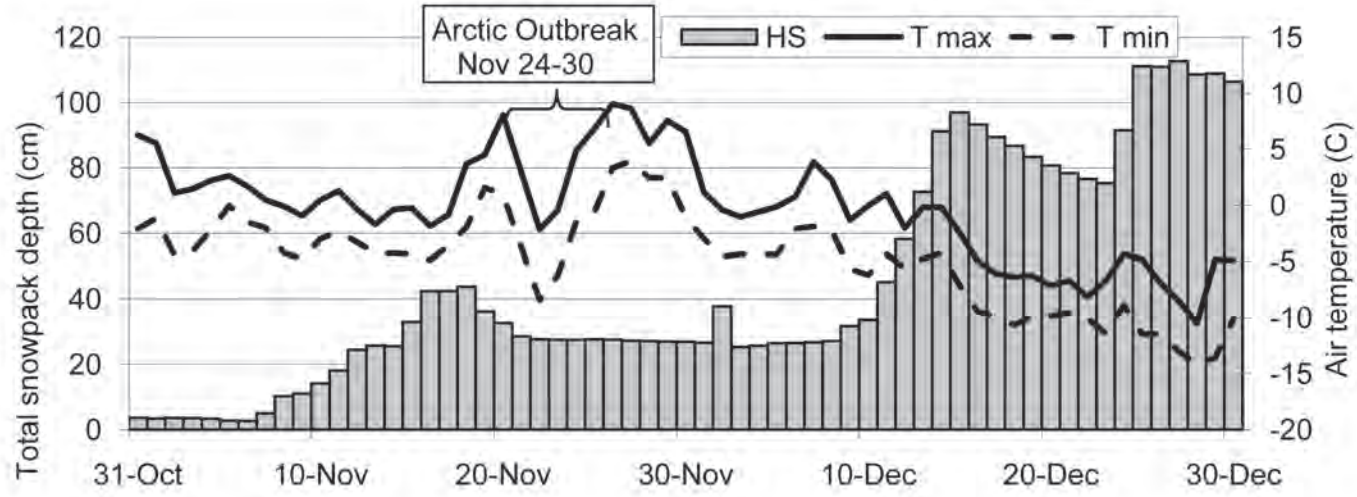


Figure 3: Daily time series of early season 2002-03 total snowpack depth (HS), and minimum (T min) and maximum (T max) air temperature for Blowdown Mid automatic weather station located at 1890 m in the South Coast Mtns near Pemberton.

4.3 *2002-03*

Both the South Coast (34 cm) and Columbia Mtns (55 cm) had a well below average early season snowpack depth (Figure 1). Multiple rain on snow events occurred before a late-November seven-day arctic outbreak (Table 1), which was followed by continued clear, dry, and calm weather in early-December (Figure 3).

Data from the CAA InfoEx suggest that the early season rain events followed by clear and cold weather resulted in a combination of several persistent weak layers at the base of the snowpack that was widespread across western Canada. Associated avalanches remained active throughout the avalanche season. Additional persistent weak layers distributed throughout the snowpack created a stratigraphy prone to step-down avalanches (Figure 4). Weak reloaded bed surfaces, as well as below average seasonal snowpack depths, also contributed to the persistence. The propensity for remotely triggered avalanches made this deep instability especially dangerous.

4.4 *2003-04*

Both the South Coast (108 cm) and Columbia Mtns (119 cm) had slightly above average early season snowpack depths (Figure 1). A relatively short arctic outbreak occurred near the end of November (Table 1).

According to the CAA InfoEx, no basal facets formed in the South Coast Mtns. Some areas in the Columbia Mtns reported basal facets at higher elevations, but associated avalanche activity was sporadic throughout the season.

4.5 *2004-05*

Both the South Coast (90 cm) and Columbia Mtns (102 cm) had near average early season snowpack depths (Figure 1). A short cold period occurred at the end of November (Table 1).

Data from the CAA InfoEx suggest no basal facets formed in the South Coast Mtns. Some areas in the Columbia Mtns reported basal crusts with associated facets and mixed forms at higher elevations, but associated avalanche activity was limited to early season direct action events.

4.6 *2005-06*

Both the South Coast (74 cm) and Columbia Mtns (92 cm) had below average early season snowpack depths (Figure 1). An eight-day arctic outbreak occurred during the end of November and into beginning of December (Table 1).

According to the CAA InfoEx, no basal facets formed in the South Coast. Basal crusts with associated facets were observed in the Columbia Mtns, but quickly gained strength.

4.7 *2006-07*

Both the South Coast (146 cm) and Columbia Mtns (140 cm) had well above average early season snowpack depths (Figure 1). A deep eight-day arctic outbreak occurred at the end of November (Table 1).

Data from the CAA InfoEx suggest, both the South Coast and Columbia Mtns had a well-settled and strong early season snowpack with various thick crusts that formed in October and November.

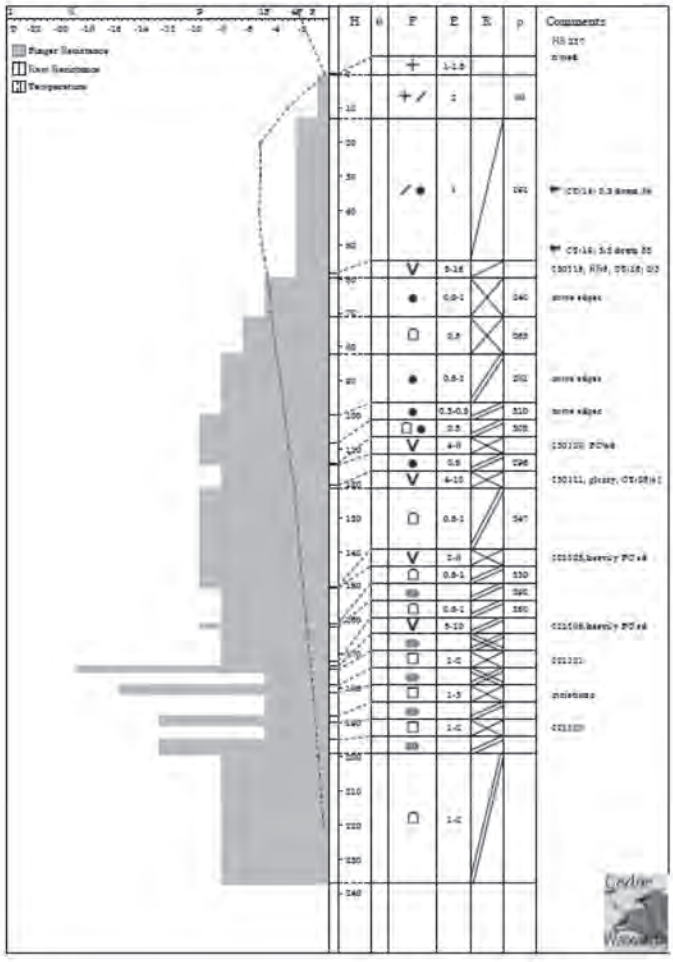


Figure 4: Snow profile from a treeline study plot on Mt Fidelity in the Columbia Mtns observed on 02 March 2003. (Profile: University of Calgary - Applied Snow and Avalanche Research).

4.8 2007-08

The South Coast Mtns (82 cm) had a below average early season snowpack depth, while the Columbia Mtns (120 cm) were above average (Figure 1). A short cold period occurred near the end of November (Table 1).

According to the CAA InfoEx, basal crusts and mixed forms produced early season avalanches in the South Coast Mtns, but quickly strengthened. However, associated surface hoar at lower elevations in the Columbia Mtns contributed to increased avalanche activity, and stronger temperature gradients allowed associated avalanche activity to persist until late-December.

4.9 2008-09

The South Coast Mtns (46 cm) had a well below average early season snowpack depth, while the Columbia Mtns (102 cm) were about average (Figure 1). A mid-December eight-day cold and dry period (Figure 5) was the best example of a true arctic outbreak in the past ten years (Table 1).

Data from the CAA InfoEx suggest that the snowpack was fundamentally structurally weak throughout western Canada. This was primarily due to a widespread basal facet-crust weak layer with weak reloaded bed-surfaces contributing to the persistence. The characteristics of the associated persistent deep slab avalanche activity were most atypical for the South Coast Mtns, and more typical of a continental avalanche winter regime.

After investigating two separate avalanche fatalities on consecutive days near Whistler, Avalanche Consultant, Chris Stethem concluded that “We are dealing with a continental snowpack more common in the Rockies. This deep seated instability hasn’t been seen to this degree in the South Coast region since the late 70s” (Whistler-Blackcomb press release, 2009). Mountain conditions reports (MCR) from experienced South Coast ski guides included statements such as: “Extremely unusual conditions….. Our guiding team has not seen such dangerous conditions in this area before….” (David Lussier, Association of Canadian Mountain Guides MCR, 31 Dec 2008).

4.10 2009-10

Early season snowpack depths in both the South Coast (176 cm) and Columbia Mtns (154 cm) were well above average. A late-November rain-on-snow event was followed by a long twelve-day arctic outbreak in early December (Table 1).

According to the CAA InfoEx, the both South Coast and the Columbia Mtns had an early season facet-crust weak layer that resulted in a large mid-December avalanche cycle, but associated avalanche activity didn’t persist.

5. DISCUSSION AND CONCLUSIONS

Based on the results presented in this paper, a reasonable recipe for widespread persistent deep slab avalanche characteristics in western Canada starts with below average early season snowpack depths. It is hypothesized that a sufficiently shallow early season snowpack is required to maintain a temperature gradient favouring faceting. However, the early season snowpack must also be sufficiently deep to overcome ground cover and create a uniform bed surface.

Patterns associated with widespread persistent deep slab avalanche characteristics include hard crusts on or near the snow surface, before a prolonged period of clear and cold weather. The duration and magnitude of this weather pattern must be sufficient for advanced faceting,

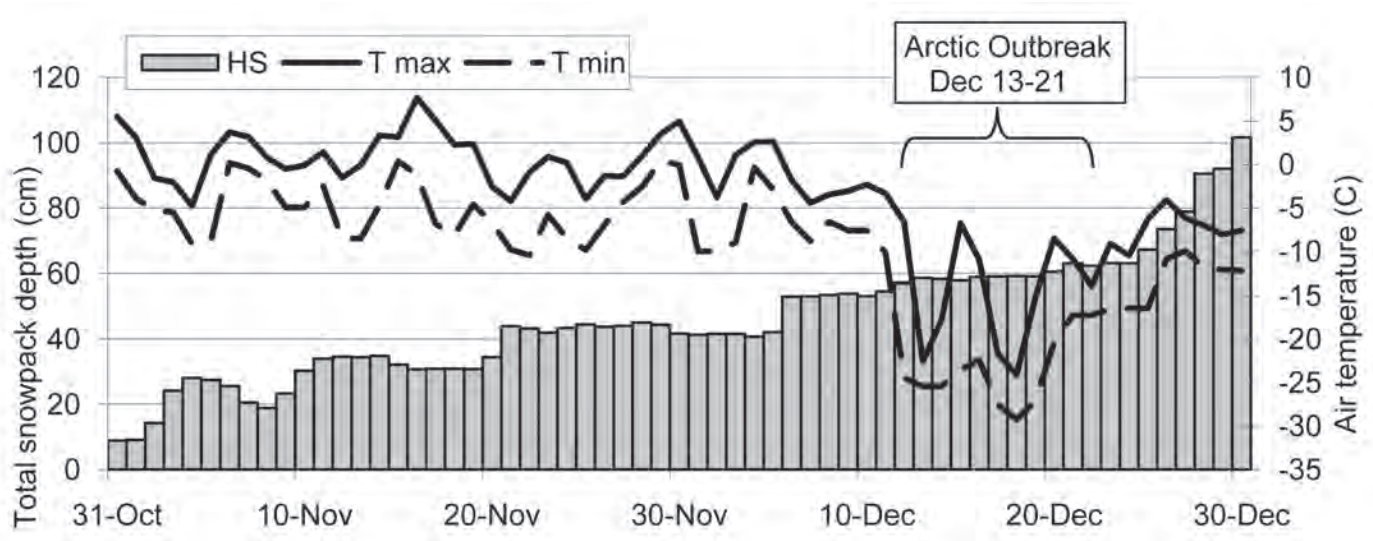


Figure 5 – Daily time series of early season 2008-09 total snowpack depth (HS), and minimum (T min) and maximum (T max) air temperature for Blowdown Mid automatic weather station located at 1890 m in the South Coast Mtns near Pemberton.

given the snowpack depth. Surface hoar formation during this period can increase the sensitivity to triggers and persistence of the subsequent basal weakness.

Below average and variable seasonal snowpack depths, weak re-loaded bed surfaces, and favourable mid- and upper-snowpack stratification for step-down fractures can contribute to the persistence of deep slab avalanche characteristics.

Further studies could analyze more data using statistical methods to determine significance of the contributing factors identified in this paper.

6. REFERENCES

Haegeli, P. (2004). Scale analysis of avalanche activity on persistent snowpack weaknesses with respect to large-scale backcountry avalanche forecasting. PhD Thesis, University of British Columbia. 254pp.

7. ACKNOWLEDGEMENTS

For use of their data, the authors would like to thank CAA InfoEx subscribers, Parks Canada, the University of Calgary Applied Snow and Avalanche Research (ASARC), and the BC Ministry of Transportation and Infrastructure.

Advanced Education for Snowmobilers in Alaska

Sean Wisner, Mike Buck, and Sarah Carter
Alaska Avalanche Information Center

In February of this year, the Alaska Avalanche Information Center (AAIC) hosted and instructed Alaska's first nationally recognized American Institute for Avalanche Research and Education (AIARE) Level I avalanche course specifically designed for backcountry snowmobilers. The course was held in Valdez, Alaska, with the field components taught in the spectacular setting of Thompson Pass and the Tsaina Glacier Valley.

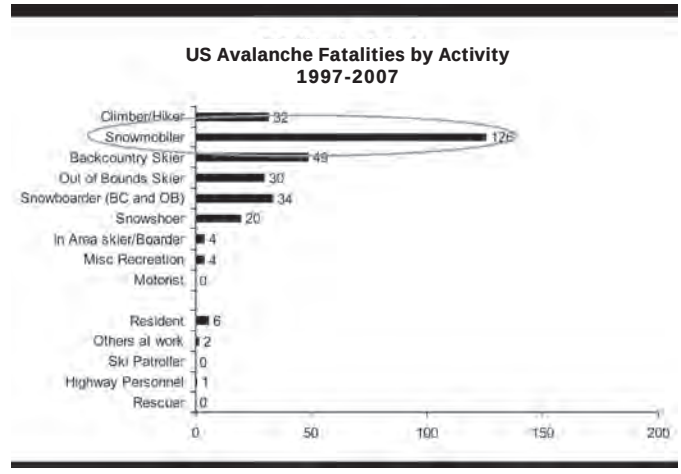
Snowmobilers in Alaska continually lead the statistics for avalanche fatalities in the United States. As this disturbing trend only gets worse, the need for snowmobile-specific courses taught by snowmobilers increases.

In the past, snowmobilers who took the initiative to enroll in an avalanche class higher than the awareness level stuck out like a sore thumb. They often became a logistical conundrum in the field and were sometimes alienated by the skier-oriented snow, terrain, and travel assessment/technique. They were asked to strap on a pair of skis or snowshoes (obviously not their first choice of travel tools), then required to chase the class around the hills, making timing and delivery of instruction often challenging for instructor and student alike.

Instructors on skis approach the terrain quietly, slowly, and cover a limited amount of ground each day. This is maybe the first and last time that the student will don a pair of snowshoes/skis in their life, or hear subtle changes in snow conditions while walking quietly through the mountains. The statistical trends in the United States have shown us quite clearly that this approach has not been effective. An educational paradigm shift was clearly needed.

The AIARE Level I curriculum currently taught is great for skiers, snowboarders, cross country skiers and snowshoers. It is the foundation of their avalanche education and has become the standard for recreational backcountry skiers for at least the past 15 years. After receiving criticism from snowmobilers yearning for higher education The Alaska Avalanche Information Center developed a curriculum to address the issues of terrain selection, travel techniques, slope stability testing, group dynamics and observational guidelines which are specific to backcountry users traveling on snowmobiles.

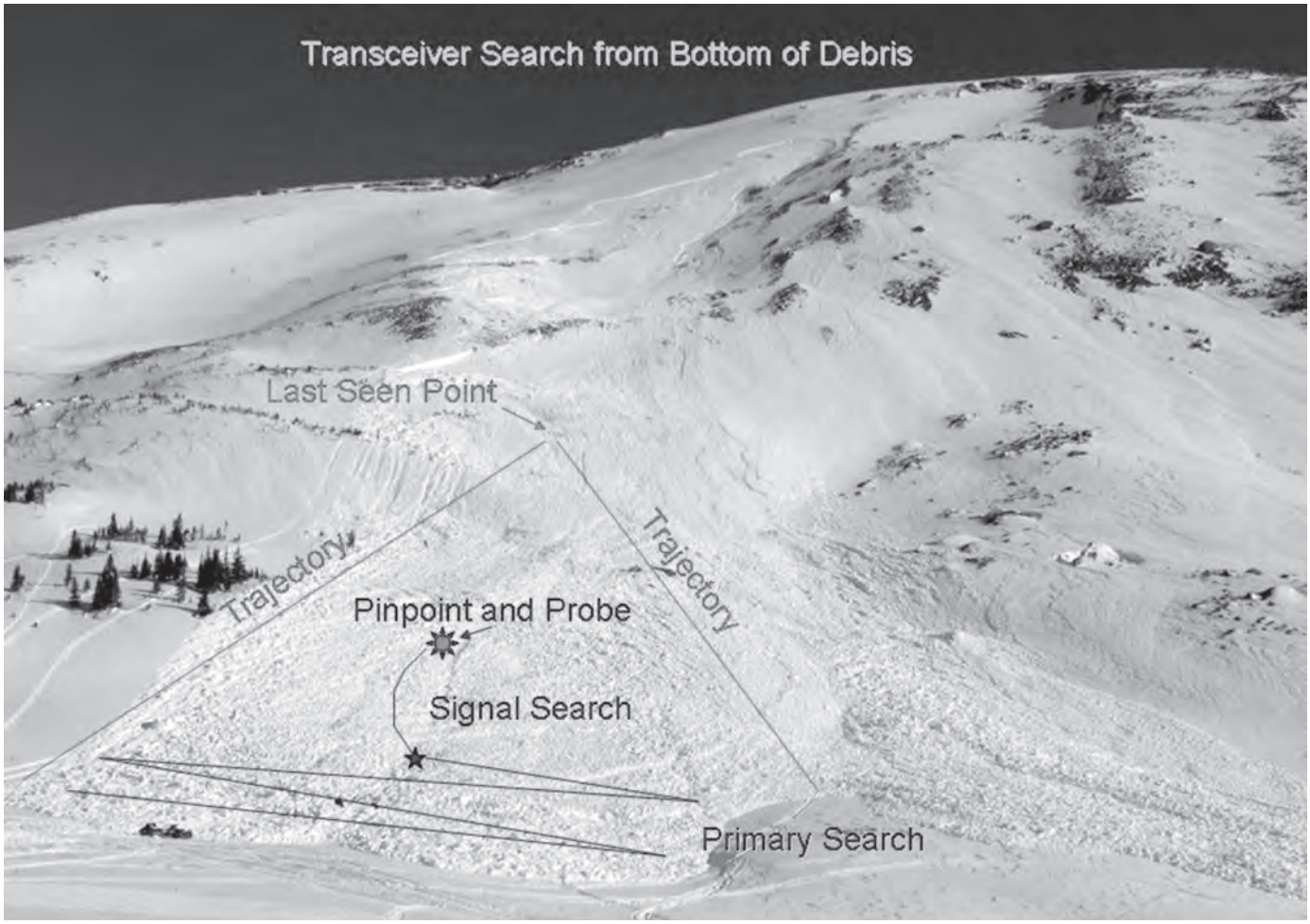
This 30-hour course was taught on snowmobiles by active snowmobilers who could speak the language of the user group. This course was very well received by participants. In addition to the AIARE Level One guidelines, material and techniques specific to backcountry snowmobile travel were added to the core curriculum. The classroom components consisted of:



Graph provided by AIARE

- An Introduction to AIARE and the Alaska Avalanche Information Center's mission
- The goals and objectives of Level One avalanche education
- The "anatomy of a decision" and the AIARE decision-making framework
- A detailed analysis of case studies pertaining to snowmobile triggered avalanche fatalities in Alaska and the United States, with specific emphasis on a human- triggered avalanche fatality in April of 2009 in Thompson Pass near Valdez
- The basics of avalanche types and characteristics
- Avalanche terrain recognition
- The formation of layers in the mountain snowpack and snow crystal metamorphism
- A review of the North American Danger Scale and how it relates to avalanche bulletins and forecasts
- Observing obvious clues and specific observational techniques that can be used while riding a snowmobile
- Tabletop exercises using the AIARE observation checklist
- Snowmobile trip planning and preparation
- A thorough review of human factors and heuristic traps
- Terrain selection and travel techniques specific to snowmobiling
- Snowpack stability tests both in the pit and on the go
- Snowmobiler companion rescue techniques

The main focus of the course was terrain selection appropriate for conditions. The participants conducted several table-top route finding scenarios and trip planning exercises before heading out to the field. Considerable time was spent reviewing the avalanche size table, reporting guidelines, and the language used by avalanche professionals. Because snowmobilers have the capability to cover tremendous amounts of terrain in a single outing, they have become one of our greatest assets in developing public avalanche bulletins.



All backcountry travellers should be able to effect a rescue from either the top or the bottom of the path. In this diagram, sledders imagine the trajectory of the sled in the debris.

We all gain when snowmobilers make and communicate quality observations.

The course field sessions focused on decision-making in avalanche terrain: communication techniques while on a snowmobile, several route finding exercises involving simple and challenging avalanche terrain features, weather observations, recent avalanche observations, snow stability tests both on and off the machine, and several complex companion rescue exercises.

The main difference between a skier-specific Level I program and the snowmobile-specific curriculum is the amount of terrain that can be covered in a single outing. Thirty-minute route finding exercises took place on slopes that could be the entire venue for a ski course day. The all-day field component on the third day of the course consisted of a snowmobile ride that covered the three distinct snow climate zones. In a single day, participants observed the maritime snowpack, traversed the inter-mountain region, and finished in a continental snowpack. This is typical of an outing for snowmobilers who often cover well over a hundred miles per day in this region of Alaska.

Another significant difference in the curriculum are the companion rescue techniques. Instead of starting from the last seen point and traveling downhill, most snowmobilers will be approaching the debris from the bottom to perform an initial search. The majority of snowmobile-related avalanche accidents involve a person climbing a hill and triggering a slide while their companions wait at the bottom. This is significantly different from the current search techniques developed by skiers involving only top-down search pattern. Skiers should learn these techniques as well, as anyone skiing a slope one at a time should be prepared for those at the bottom to effect a rescue.

Since there are currently no graphics available to visually demonstrate this technique, we were forced to create our own. We recommend: groups avoid congregating in runout zones, have their machines positioned for hasty retreat and not assist those stuck in avalanche start zones. The victim's companions are taught to spot the last seen point of the caught rider, calculate the downward trajectory and begin their primary search pattern from the toe of the debris directly below the last seen point.


Michel Freiderich

In Alaska, crevasse-rescue equipment is worn by all avalanche-course participants traveling across glaciers on snowmobiles. Participants are taught traditional snowpack stability tests in addition to snowmobile-specific tests.

Participants were also taught subtle differences with regard to companion rescue and "what to do if you are caught in an avalanche." For example, more often than not the snowmobiler will be traveling uphill when the avalanche occurs. If the rider is carrying some speed in an uphill trajectory when the slab fails, they should make every attempt to ride off of the top of the moving slab.

If, however, they have already made the turn, and are traveling back down the slope when the slab fails, they should proceed similarly to a skier and attempt to ride off of the slab at a 45-degree angle to the side. If they are at the bottom of the slope when the slide occurs, and have their machine pointed in the correct direction, attempts may be made to outrun the avalanche. Instructors need to remember that their students will be working with motorized equipment, and the additional 150 horsepower can sometimes be helpful when an avalanche occurs. Snowmobiling is both an uphill and a downhill activity.


Michel Freiderich

Strategic shoveling is the same for all disciplines: leave the probe in place and plan to make a hole whose diameter is determined by the burial depth. Many riders are found within two metres of their sleds.

Snowmobile slope stability testing differs greatly from techniques used by skiers or snowboarders. Although compression tests, hand shears, and extended column tests were demonstrated to the students in the pit, our main focus was on the representative slope stability testing that can be done while riding a snowmobile. These tests need to be demonstrated to the group on small, lower consequence slopes, and must be performed by competent snowmobile riders to be effective. Although these tests are not yet quantifiable, they are extremely effective at finding and identifying weak layers within the snowpack.

The following seven slope stability tests for snowmobilers are skills should only be demonstrated on small, low-consequence slopes (in the 30- to 40-degree range) and must be performed by competent snowmobile riders in order to be effective.

The "rip saw" technique is used for several tests. It is the process of leaning the snowmobile into the slope and counter-steering with the downhill ski in the air causing the track to cut deep into the slope. Riders should have this skill mastered to obtain quality results.

- Looping Slope Test
- Downhill Traverse Test
- Rollover Ride-Out Test
- Rip Saw Cut Test
- Parallel Rip Saw Cut Test
- Impact Test
- Rollover Rip Saw Cut Test

The most basic is the **Looping Slope**, performed by looping up, across, and down a slope in a half moon crescent to attempt to trigger a slope release. This basic test, when successful in triggering a release, indicates significant snowpack instability.

The **Downhill Traverse** Test starts from the top of the slope riding at a 30- to 45-degree angle across the face of the slope with some speed. The rider must not carve into the surface when performing this test. Slab release while performing this test will identify weak layers, sensitivity, and slab property.

The **Rollover Ride-Out** Test starts from the top of the slope riding straight down at a slow speed intermittently braking during the decent. This test is performed when stability is suspected to be poor to fair. Horizontal slab propagation from the machine indicates both weak layer and slab properties. Pushing powder snow in front of the machine means little; this is not an indicator of instability.


Michel Freiderich

Instructor Mike Buck demonstrates snowmobile slope-stability testing, including the rip saw technique (above). It is easier to teach a good rider to be an avalanche instructor than to teach an avalanche instructor to ride a snowmobile.

The **Rip Saw Cut** Test traverses the uphill track starting from the bottom and angles across the slope at a 30- to 45-degree angle. It is imperative to maintain track speed and counter-steering during this test, leaving a trench across the slope face. This test will provide data on deeper instabilities and weak layers in the snow pack by putting significantly more stress on the slope.

The **Parallel Rip Saw Cut** Test is performed from the bottom. The tester rides up the slope, then turns 90-degrees and rides across the slope parallel to the bottom. Multiple cuts are made parallel to one other, four to ten feet apart starting low, with each subsequent cut made above the previous. Data is obtained from cutting above unsupported snow. If poor stability is suspected the test should be reversed, cutting the slope from top to bottom. Both methods should be performed if any result is observed. Inspection of the results is required to assess the stability of the snowpack.

The **Impact** Test is performed from the top down. The tester should carry enough speed to make a small jump from the top of the hill onto the slope below. This test is best performed on a slope with a flat top and a convex rollover. A small cornice will often assist the tester. It is important to learn this technique from an experienced rider due to the potential of a back injury if not performed correctly.

The **Rollover Rip Saw** Test is performed from the top of the slope. A convex rollover is the best type of slope for this test. The tester begins the approach parallel to the horizontal convexity, drops just over the edge with a ripsaw cut along the apex of the rollover, and completes the test back on top of the test slope. This is an effective test to determine the stress in the snow pack at potential trigger points, similar to ski cutting convex rolls.

Participants were taught to examine the properties of any released slabs. The fracture, the slab, the weak layer, and the bed surface are the clues the riders use to make subsequent decisions on terrain and route selection for the day.

The keys to the success of the AIARE Snowmobile Specific Level I are the instructors and the terrain selected for the field components. It is easier to teach snowmobile riders to be avalanche instructors than it is to teach avalanche instructors to be good snowmobile riders.

Snowmobile riders need to be cultivated early and provided with the tools and education to be avalanche instructors. Teaching an avalanche class to a snowmobiler traveling on snowshoes is just as ineffective as an instructor who cannot ride the snowmobile proficiently and demonstrate slope stability testing techniques or terrain selection options well. To maintain our credibility with this user group, instructors for these courses must have extensive riding abilities and experience. We believe that minimum experience standards will need to be created for snowmobile instructors, similar to the standards that have been set for skier specific courses presently being taught.

At the Alaska Avalanche Information Center, we are focusing our efforts on snowmobile safety in an attempt to break the disturbing trend of snowmobile-related avalanche fatalities. To counter the argument that snowmobile riders are “not ready” for Level I avalanche education in favor of “advanced awareness” level courses, we submit that the industry as a whole should strive to educate all outdoor enthusiasts, and to provide quality education especially to those in the highest fatality category.

Contact the Alaska Avalanche Information Center at alaskasnow.org@gmail.com or www.alaskasnow.org for more for more information.

Sean D. Wisner is a professional member of the American Avalanche Association and the Executive Director of the Alaska Avalanche Information Center.

Mike Buck has been snowmobiling in the Valdez area for over 30 years, and is an assistant AIARE instructor. Mike holds a masters degree in education, and was instrumental in developing the snowmobile-specific curriculum for this course.

Sarah Carter is a professional member of both the American Avalanche Association and the Canadian Avalanche Association. She is an AIARE instructor and course leader, and the Education Director for the Alaska Avalanche Information Center.

Product Test

Brooks-Range Snow Profile Tools

By Greg Paltinger

In March of 2010, I was approached by the editor to test some new products from Brooks-Range Mountaineering Equipment Co. Though my seasonal work with Ministry of Transportation was soon to be finished for the season, there was still good opportunity to test these products with plenty of spring ski touring ahead. With a well-settled snowpack in the Columbia Mountains and the winter storm cycles behind us, testing snow stability products would prove to be challenging yet ideal, given the late season conditions.

Scientist 35 Snow Saw

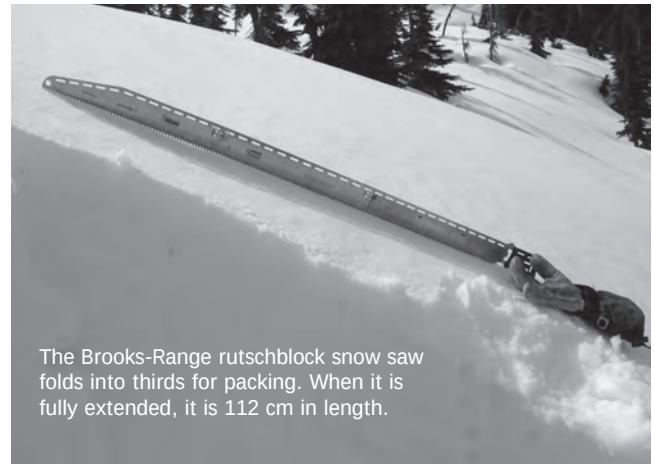
This snow saw proved to be very sturdy for a folding blade with lightweight steel construction. I found the saw to make precise, easy cuts while isolating columns. The sharp, offset teeth cut easily through crusts, dense snow and also easily cut through wood if needed to.

My only concerns with this saw would be when opening and closing the blade. The sharp teeth may damage gloves and the clasp that locks and unlocks the folding blade may not always keep the blade securely locked. I found the locking mechanism difficult to manipulate with ski gloves on.

I also did not see the need for attaching this saw to a ski pole to extend its reach, as thus would not provide the precision needed while isolating a column. All in all, a great saw and a good addition to any snow study kit or backcountry pack.

Rutschblock Folding Snow Saw

Now in my opinion, I never saw (excuse the pun!) the need or use for a rutschblock saw for isolating the large block of s now required for this stability test. In my experience, a knotted cord had always sufficed. Besides, who wants to carry such an awkward tool and add almost a pound to your pack? Despite my concerns and having never used one before, I ventured out with interest and optimism.



The Brooks-Range rutschblock snow saw folds into thirds for packing. When it is fully extended, it is 112 cm in length.

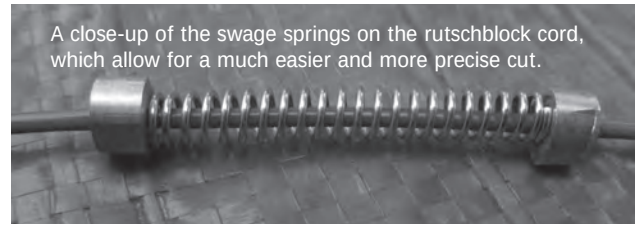
This saw was light weight despite its length and because it folds into thirds (45 cm), it was quite compact. It is ideal for a researcher to pack away, although the fully extended blade (112 cm) comes up short in order to make the 150 cm side wall cuts. The only other technique I experimented with was to walk or skin around the block and make the cuts straight down, but this would only allow the user to reach a maximum depth of 112 cm.

My other concern was with the overall length (more so with attached extension), which meant the saw would tend to wander and not make a straight, precise cut. Perhaps with some further testing and experimentation, this saw may prove to be quite useful for snow researchers. However, I believe that for this particular stability test, a rutschblock cord is the ideal tool for the backcountry user or ski guide.

Rutschblock Cord

I was intrigued and optomistic once again to use a new piece of equipment of which I thought might be over-engineered from its most simplistic genesis—the trusty knotted cord. The Brooks-Range rutschblock cord proved to be very effective, cutting easily through a well-settled snow pack. The coated cable and swage springs provided easy glide with precise cutting. Connecting the two ends simpified the task of guiding a cord around the avalanche probes. Each separate cord is laid down along either sidewall, around the probes and connected in the middle along the upper wall with a swivel hook.

My only concern with this product would be the damaging effect the swage springs will have over time, raking accross the avalanche probes during the cutting motion. I would suggest removing one or two of the swage springs on each section of cable between 160 – 200cm. This would allow for a smooth glide of only coated cable touching your probes. This is a fantastic tool for this stability test and a welcome addition to your snow study kit if you find yourself performing rutschblocks on a regular basis.



A close-up of the swage springs on the rutschblock cord, which allow for a much easier and more precise cut.

Scientist 35 Snow Saw

Size Blade Length: 35 cm (13.8”)
Total Length: 44.8 cm (17.6”)
Folded: 25 cm (9.75”)
Weight: 218 g (7.7oz)
Cost: $59.75

- Rubber coated handle for insulation, available for right or left handed
- Easily extended by attaching to ski pole, shovel shaft or ice axe
- Offset teeth cut wood, snow and ice
- Light weight, low profile and compact
- Dual scales— metric & imperial

Rutschblock Folding Snow Saw

Size Blade Length: 100 cm (39.4”)
Total Length: 112 cm (44”)
Folded: 45 cm (18”)
Weight: 586 g (20.7 oz)
Cost: $158.55

- Rubber coated handle for insulation, available for right or left handed
- Easily extended by attaching to ski pole, shovel shaft or ice axe
- Light weight, low profile and compact (folds into thirds)
- Dual scales—metric and imperial

Rutschblock Cord

Size Length: 580 cm (19 ft)
Weight: 73.7 g (2.6 oz)
Cost: $24.95

- Large loop handles for easy grasp with gloves
- “Safety Orange” coated industrial rated steel cable
- The cord is in two separate pieces and connects with large swivel hook
- Swage springs spaced every 20 cm for cutting

Greg Platinger collection

Greg Paltinger has been a CAA Professional Member since 2000 and working in the industry for the past 24 years. He currently works with the Ministry of Transportation as an Avalanche Assistant and lives with his family in Revelstoke.

Transitions

Alex Baechler

Michelle Polack
Reception and Sales

There's a new smiling face at the door of our Revelstoke office. After a brief competition with an astounding number of highly trained applicants, Michelle Polack won the position of Reception and Sales for the CAA and CAC. Michelle has lived in Revelstoke for two years and brings energy, enthusiasm and a strong outdoor background to the job.

Michelle was born in Sudbury, Ontario ("yes, the astronaut's moon-training capital," she admits) and graduated in 2000 from Thunder Bay's Lakehead University with an Honours in Outdoor Recreation Parks and Tourism and a BA in History. After school was finished, she packed her bags and headed west, eventually settling in the Comox Valley on Vancouver Island, where she lived for eight years.

Since becoming a BC resident, Michelle has completed her CAA Level 2 and other ski industry courses. She spent four winters working at Monashee Powder Snowcats as a tailguide, and the summer months working for the Ministry of Forest's rappel crews, "until I took on the job title as MOM."

Michelle enjoys skiing of all forms, Pilates, and towing daughter Autumn around in the trusty Chariot wherever possible, followed closely by her dog Laochi. "I am very excited to be working for the CAA and CAC," she says. "I'm looking forward to being a behind-the-scenes team member of an organization setting such high standards for safe winter practices in all aspects of the avalanche patch."

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