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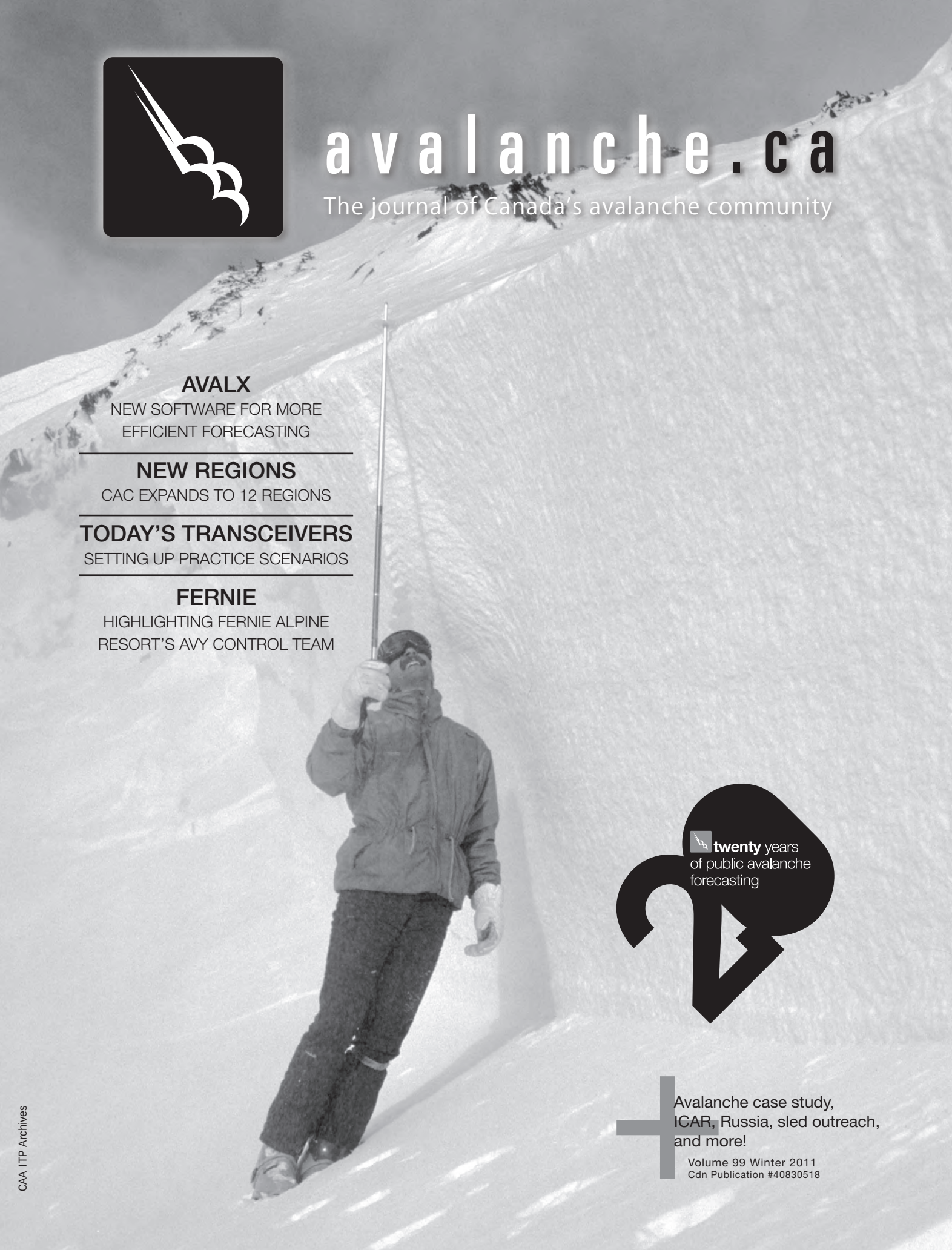

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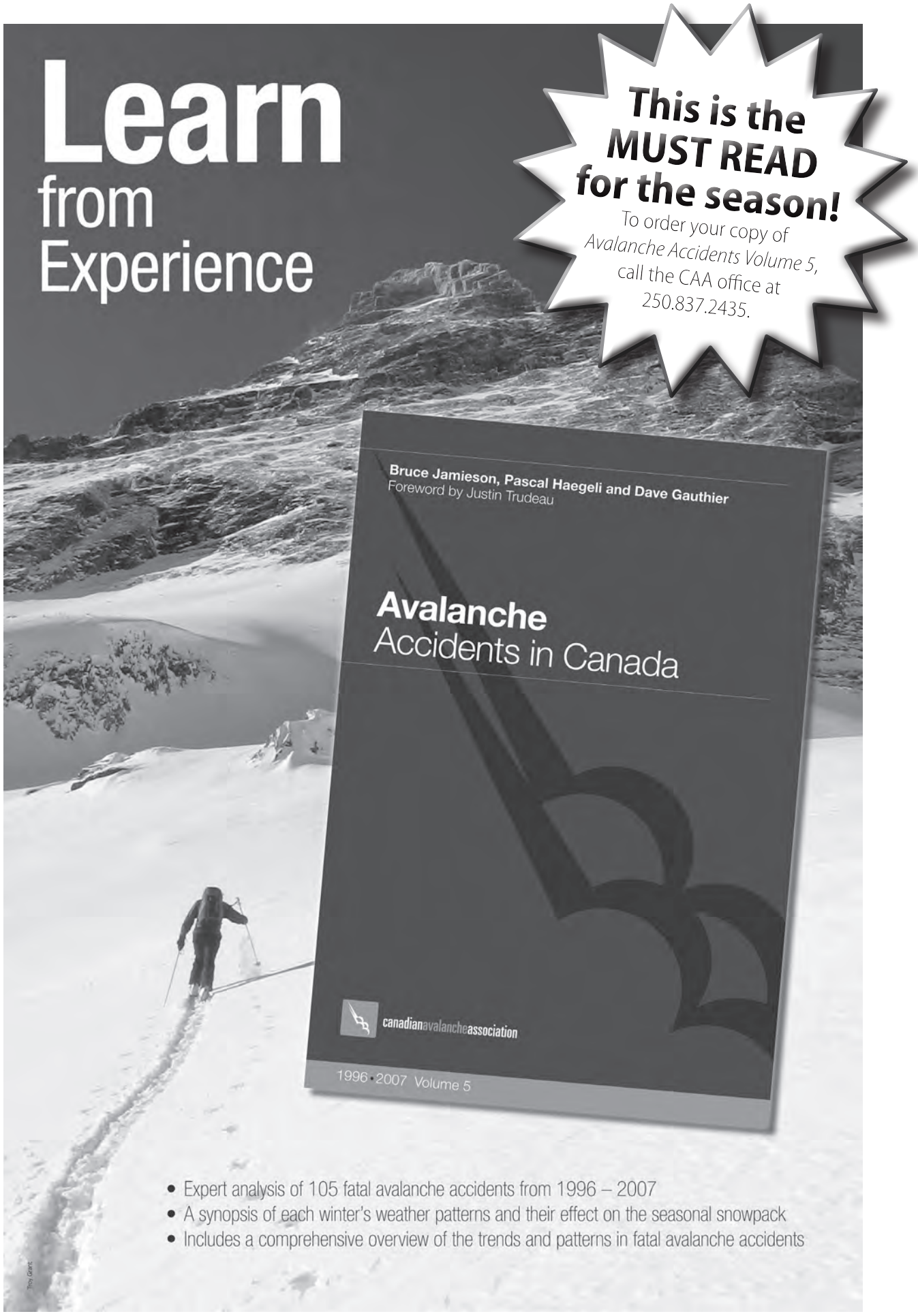
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The journal of Canada's avalanche community
Volume 99 Winter 2011

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 welcome 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:

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Our vision:
To be a world leader in avalanche awareness, education and safety services.

Will Gadd's response to concern about broken shower facilities at Kootenay Pass for the CAA Avalanche Operations Level 1 course in February

I could care less about showers. I signed up for this CAA Avalanche Operations Level 1 course prepared to sleep in some stinky-ass backcountry hut, so this still seems sort of plush to me—our own individual rooms, somebody else cooking, sleep, snow education, heaven! I'd stay in a snow cave just to get some sleep (I've got a seven month old baby that isn't sleeping) and learn about snow. This is solvable, and I don't think it's going to in any way change what we learn about snow during the week . . . I didn't even know there were showers when I signed up; most huts I stay at don't have showers, and I've never seen one on a ski tour.

Please let's not mess with the location or dates; if lack of showers is a deal breaker for some people then I respect that, but these dates are all I have this winter, and the location is cool—I really don't want to drive back and forth from some lame hotel in Creston just so I can get a shower, and most of all it seems cool to stay up there on the pass in that old highway building and learn about the white stuff. Yes, showers would be nicer, but the location is rad. Game ON!

Looking forward to getting out with all of you, stinky or not.

Best,

Will Gadd

P.S. Last word: "Babywipes."

Will Gadd collection

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Countdown to 100


John Brodie

Talk about milestones—in the past year we have seen 50 years of public avalanche control, 40 years of avalanche education, 30 years of the CAA and InfoEx, 20 years of public avalanche bulletins, and in April 2012 we will publish the 100th issue of the CAA journal. The 100th issue of the journal is a big one in my eyes. It started out in humble newsletter format, and as it matures, it has developed into a professional publication that will keep getting better. We have some big plans for it.

We have gotten approval from both the CAA and CAC boards to make some major changes for the 100th issue. Beginning in the spring, the journal will be published three times per year rather than four; issues will hit mailboxes in mid-April, mid-September and mid-December. This timing should make better sense—we'll have a season wrap-up in the spring, a pre-season issue in the fall, and the winter edition will be in hands and on shelves before Christmas. It will also give the production team the time we need to develop even better content for you.

We're changing the way the journal is bound so that we can introduce more colour into the magazine. Last issue's colour insert was so much fun that we can't wait to do it again. I am happy to say that we'll now be able to have a colour cover every time.

Speaking of the cover, you're going to love the new one. We have enlisted the help of an excellent graphic designer to really make the design sing (inside and out). Do you have any amazing photos that would make a great cover shot? We'd love to see your shots on the cover of the journal. You'll also notice that we're changing the name. It was named *avalanche.ca* to coincide with the launch of our website, but it's time to change to something that more accurately reflects the kind of professional industry publication it is.

I hope you enjoy the new columns and features. Some have been done in the past, and some are all new. History Lesson provides a summary of an avalanche incident from volumes of Avalanche Accidents in Canada. We hope you find the case studies a valuable refresher, and I encourage anyone who hasn't done so to read the books. Hot Routes is an opportunity for a CAA member to share an adventure—we'll highlight the good, the bad and the ugly--with details not found in the guidebooks.

In the Gear Guide section, CAA members will review products from one of our sponsors. Control Group will feature an avalanche control team in Canada, with a photo spread and a by-the-numbers report of what they're doing.

Slope Test is where we'll have opinion articles from CAA members on a variety of topics. This issue it's about whether AST instructors should wear airbags while teaching.

I hope you enjoy issue 99 of *avalanche.ca*. As always, I welcome articles, opinions, tips, letters, photos, research, stories, announcements, reviews and anything involving avalanches or those working in the profession. Send submissions, questions or comments to kkempton@avalanche.ca.

ICAR 2011 Report – Åre, Sweden October 18-23, 2011


Ian Tomm collection

The annual pilgrimage made by mountain rescue and safety agencies around the world to the annual conference of the International Commission on Alpine Rescue is an impressive one. This year we all convened in Åre, Sweden – a small mountain town in the foothills of the Swedish Alps home to one of the largest ski areas in Sweden.

ICAR is an eclectic mix of mountain rescue agencies, mountain emergency medicine physicians and accident prevention organizations from many different countries. The interactions between the various approaches to mountain rescue and prevention is the reason that all are involved. Sharing case studies of rescue missions along with accident patterns and analysis, each country learns about the challenges and successes of the other. In many ways Canada has a lot to learn from the European nations who have very mature and extensive mountain rescue programs. In other ways Canada has a lot to offer, particularly when it comes to prevention.

My involvement in ICAR is on the Avalanche Commission, appointed by Parks Canada to present the views of the Canadian avalanche community in this forum. This year was particularly busy as I was asked to give several presentations on all things avalanche in Canada. I arrived a day early and had the opportunity to address members of the Swedish Mountain Safety Council. Comprised of numerous government departments, policy and private sector agencies, this group's history is very similar to the CAA and CAC, in that a strong association of like-minded agencies got together after a series of high-profile accidents to work more proactively on accident prevention. My presentation to this group focused on public avalanche safety in Canada and our approach to target audience segmentation.

The conference began with a day of workshops, one of which was entirely focused on avalanche accident prevention. Hearing the various avalanche accident prevention challenges of each country and how they are addressed was very thought-provoking. Canada has learned a lot over the years from countries such as France and Switzerland. Now we are in a unique position to provide insight and expertise back to this group on our various approaches. From our social media strategy to our use of special warnings, many were interested in the Canadian approach to accident prevention.

The big question of the day was how to sensitize user groups to the risks associated with their activities without undermining the activity itself. Prevention initiatives should promote the activity yet all too often are seen as limiters. The ultimate prevention measure is to cease the activity but that's not the point. Something is lost if that is the take home message.

A working document came out of this workshop that, at time of printing this article, is still being refined but is aimed at establishing "best practices" in prevention. A matrix outlining the target audiences—snowshoers, snowmobilers, ice climbers, off-piste skiers and backcountry skiers—will list strategies and tactics to reach each user group. When this working document receives a little more refinement I'll be sure to post on the website for feedback.

A few other highlights from the week:

Social media: Many organizations are talking about the value of social media strategies, particularly to prevention work. Canada is viewed as a leader in this area although some countries are hesitant to engage in social media due to the lack of tangible evidence of benefit to prevention goals. It was clear that the CAC's success, particularly with Facebook, is being looked at as a potential model. There may come a time in the near future where avalanche agencies combine their various efforts to help each other optimize their various social media efforts.

Mobile applications: Switzerland is currently a leader in the design and deployment of mobile applications for avalanche safety. They have a variety of initiatives from the well-known White Risk training DVD for iPhone (currently

> "How do we sensitize user groups to their risks without undermining the activity itself?"

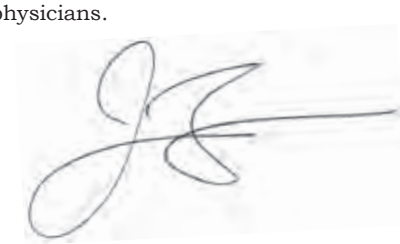
only in German or French) and observer applications where volunteers can submit data to the SLF's forecasting programs. The CAA and CAC are both considering various mobile strategies in the near and medium future, and we will continue to monitor the Swiss approach.

The ethics of avalanche balloon packs: Albert Lund from Norway brought up an interesting discussion on the ethics of these packs. His context was both personal and professional. He asked, what does it mean if a group of ski touring friends all have airbags except one? Should the group allow that person to come? If it was a transceiver, the answer would be no. Yet when it comes to a balloon pack the answer is yes, even though statistics indicate balloon packs are more effective than transceivers in saving lives. Similarly in a professional context—what does it say when a guide wears a balloon pack but doesn't require his guests to wear one? Again, if we were talking about transceivers then it would be an easy answer, yet with balloon packs things change. It was a very interesting and insightful discussion from Norway that will no doubt continue for years to come.

The use of transceivers in the US: Dale Atkins from the US provided an interesting tidbit in his summary of avalanche accidents in the past year. Only 11 of the 26 people killed last year in the US in avalanches were wearing transceivers. This is a remarkable change in US statistics and Dale is wondering if this was an anomaly or a sign of what's to come.

Avalanche glossary: Manuel Genswein along with Dale Atkins and others from the avalanche commission have put together a comprehensive seven-language avalanche glossary. This is the most comprehensive multi-language glossary of avalanche related terms ever undertaken and will no doubt prove to be a valuable resources in years to come when working translation projects around the world.

Medical treatment: ICAR's Medical Commission's widely publicized algorithm for the treatment of avalanche victims has generated a lot of discussion in this country on its use and applicability to the Canadian context. Despite the issues, it's clear that a better understanding of how and why avalanche victims perish can aid rescuer efforts. The commission undertook a project last year to look into the use of the algorithm in Europe. Dr. Hermann Brugger presented the surprising results that it had been used for only 4% of victims over the past few years. Clearly, more work needs to be done to communicate and educate both SAR personnel and emergency medicine physicians on the value and utility of this process. Currently, the MedCom has a big project to establish basic guidelines around first aid kits for guides, general alpinists and mountain emergency physicians.



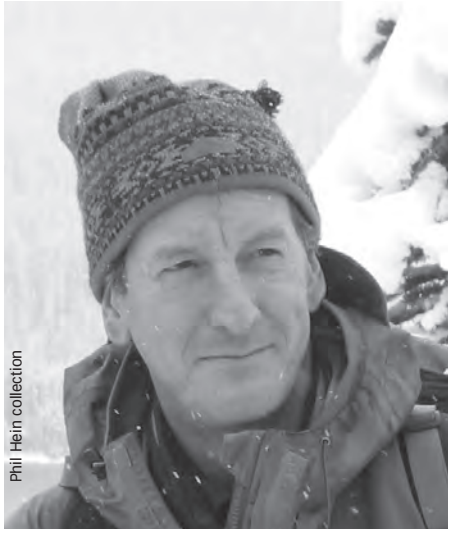
Ian Tomm

ICAR

For a video of the 2011 ICAR conference: vimeo.com/324157875

ICAR Avalanche Glossary

For a link to a new glossary of avalanche terminology in 7 languages: Ikar-cisa.org and click on "Glossary" in the left pane.w


Phil Hein collection

Managing Growth and Risk

Over the past few months, your association has seen some significant changes. With the splitting of the new CAC board, the members of the CAA board are now wholly focused on the business of your association. And as I write this, we are in the process of hiring a new CAA Executive Director who will also be dedicated solely to the work of serving and supporting professional avalanche workers in Canada. These are exciting times to be involved!

Let's backtrack a bit to explain how we got here and why this is such an important juncture in our history. As you know, since the incorporation of the CAC, whoever was elected to the president's position of the CAA was also automatically the president of the CAC. The same applied to four other members of the CAA board, including the vice-president and secretary-treasurer. On top of that, both organizations shared the same executive director.

Back in 2004 when the CAC was incorporated, this structure made sense. The overlap between the boards served to ensure the best practices of our association would be effectively translated to the new work of Canada's national public avalanche safety organization. The common executive director gave a public confirmation that the CAC was backed up by the expertise and professionalism of the CAA.

Now let's fast-forward to fall of 2011, when the CAC rewrote their bylaws to allow a board structure separate from the CAA. As a public safety organization, they faced a growing expectation that their governance cannot be dominated by industry. Similarly, the shared executive director position has encountered conflicting pressures. As government funding for public avalanche safety increases, so does the need for clarity in the separate roles of the CAA and CAC.

The CAC board is now comprised of people from outside our line of work but still part of our world, bringing to the table a wide range of skills and a deep dedication to public avalanche safety. Our former shared executive director Ian Tomm has taken on the role of CAC Executive Director and by the time you read this, our new CAA Executive Director will be at work.

Despite these many acts of separation, the bonds between our two organizations remain strong. We continue to work together under the same roof in Revelstoke, sharing staff and resources. The CAA's InfoEx system provides the data stream for most of the CAC's public forecasts. CAA members are the instructors teaching the CAC's Avalanche Skills Training courses. Many students taking those courses will end up in the CAA's Industry Training Program. And both sides of the house work closely with researchers, finding new solutions and inspiring new ideas. Together we have created an international reputation for excellence.

On this particular topic, one thing I would like to leave you with is this: Is it time for the CAA to rethink its board structure? We have seen other organizations close to us, such as the ACMG and the CAC, rewrite their bylaws to encourage others from outside the industry to sit on their boards. It brings in new skill-sets and new ideas, but does it dilute our purpose? What do you think? Send me your thoughts at president@avalanche.ca.

Managing Risk

Some people believe that risk management is primarily about managing financial and insurance risk. Those disciplines have indeed dominated the term's usage for many years, to the point that many people believe risk management is a complex endeavour best left to CEOs, CFOs, and legal experts in large corporations and agencies. Nothing could be further from the truth!

Managing risk is a core skill in most human endeavours, so tightly woven into our psyche that much of the time we are unaware we are constantly undertaking the practice. However, there is a higher order and framework involving formalized risk management. How many of us working in the avalanche sector are using the formalized practices of risk management principles and processes as outlined in national and international guides?

Canada was an early leader internationally in the modern era of developing a more comprehensive approach to risk management standardization, first publishing a guidance document in 1997. This national standard has supported numerous professions and professionals involved in managing risk to the public and workers for more than ten years. In the early 2000s, the CAA consulted these guidelines in the development of two important publications: the Land Managers Guide to Snow Avalanche Hazards and the Guidelines for Snow Avalanche Risk Determination and Mapping in Canada. These first-generation CAA documents are widely used within and outside our community, for avalanche planning guidance and reference to general practices in Canada.

In 2009, the International Standards Association (ISO), based in Switzerland, published a new risk management standard titled ISO 31000:

Risk Management—Principles and Guidelines. The ISO brings together international standards development from all corners of the world. From 2005 to 2009, 29 countries participated in the development of ISO 31000. In 2010, Canada fully adopted this standard without modification. In March of 2011, the Canadian Standards Association (CSA) published CSA-Q31001-11, an implementation guide and currently the most comprehensive reference to utilizing the new ISO 31000 risk management standard in Canada.

There are some fundamental changes in the new risk management standard that everyone should become familiar with. You will have to purchase your own copy, as copyright law prohibits the CAA from posting it for members' use. You can find it easily on the CSA's website at csa.ca; just enter Q31001-11 in the search function. I highly encourage you and your organization to read this document and consider how these new standards apply to our profession. Do the definitions fit? Do the principles fit? Do the standards fit?

The CAA Level 3 program incorporated a number of the new ISO 31000 definitions into the courses in the fall of 2011, such as the definition for risk and associated terminology. Change and improvement in methods and practices is ever constant, and it is incumbent on all of us, as professionals, to keep up with developments in our field. Please write and let me know your thoughts on any of this. We have many important issues to discuss at next May's annual meetings, and we always want to hear what you think our priorities should be.

Safe sliding, and all the best for the winter ahead.

Steve Kroschel

1 February 2004, Backcountry Skiing
Cayoosh Mountain, South Coast Mountains

Deaths	Avalanche Problem	Terrain
1	Storm/Wind Slab	Complex

- **Second day after a week of continuous significant snowfall**
- **High consequence route on unsupported slope**

The first few weeks of January 2004 were dry in the Duffey Lake area, but between January 24-30, 110cm of storm snow was deposited in four distinct storms. The final storm deposited 59cm of new snow at the Duffey Lake Road BC Ministry of Transportation weather plot between January 29 and 30.

Moderate to strong southwesterly storm winds led to wind slabs at higher elevations. A significant widespread cycle of storm snow avalanches took place on January 29 and 30 in particular, and the BC Highways avalanche control program for the Duffey Lake Road reported numerous small slabs from cutbanks affecting the closed highway, and an isolated large slab avalanche.

The snowpack slowly gained some strength on January 31 when snowfall stopped and the skies started to clear, but commercial backcountry operations in the area reported extensive storm snow avalanche activity on wind-loaded northerly to easterly aspects. In a January 31 bulletin, the Canadian Avalanche Centre downgraded the avalanche danger for the South Coast from High to Considerable in the alpine and at treeline, and from Considerate to Moderate below treeline, but advised conservative terrain choices because of considerable variability.

February 1 started out clear and cold. Three accomplished backcountry skiers left the Cayoosh Cabin at 9:00 to ascend Cayoosh Mountain via Armchair Glacier to a gap leading to a glaciated bench immediately east of the summit. The group dug test profiles and hand pits every 300 vertical metres, which showed good bonding between recent storm layers. Once the group reached the glaciated bench at 2400m at 12:30, they stopped for a break.

The group decided to ski Million Dollar Couloir on the northern side of the northeast ridge, reached by travelling across the flat section of the northeast glacier before gaining the northeast ridge. The route continues across the exposed ridgeline for approximately 500m before widening again near the couloir entrance; to skier's left is a large cornice, and to the right is an increasingly steep slope which rolls into a cliff band below. A large rock in the middle of the slope creates two route options for the traverse. The group reached the narrow ridgeline at 13:30 and chose to traverse below the large rock. While this is more exposed to cliffs below, it allowed them to avoid the cornice on the west side of the ridge.

With only minimal side-stepping needed, the group did not use climbing skins and left approximately 5 to 7m between each skier. The first skier passed the rock and angled the track back up toward the ridgeline. The second skier stopped at the rock to wait for a photo from skier three. Skier three stopped at the rock and angled his tracks just below skier two, facing uphill. As he took his pack off to put a camera back in, the slope fractured between them.

The first two skiers were above the fracture line, but skier three was on the slab with his skis across the fall line. He attempted to break the slab and regain a hold on the bed surface, but was hit by a chuck of snow from above that pushed him into the main slab's movement. The avalanche was approximately 40m wide and ran for 15 to 20m and over the edge of the cliff band to the east. The victim fell for about 125m through the cliffs and onto the slope below, where he was buried by avalanche debris. Falling debris triggered a second avalanche immediately below where he landed.

The survivors were unable to see where the victim went because the slope was convex. One survivor sidestepped down the bed surface precariously close to the out-of-sight cliff band and the other ascended with climbing skins to a higher vantage point. She warned the other skier to carefully climb back up to the ridgeline, and then immediately continued to drop into the hanging valley to follow the base of the cliff to the avalanche deposit. She reached the area where the victim was buried between 15 and 20 minutes after the avalanche. She switched her transceiver to receive and picked up a signal immediately, which grew stronger as she approached a glove sticking out of the ground. She began to dig right away and uncovered the victim.

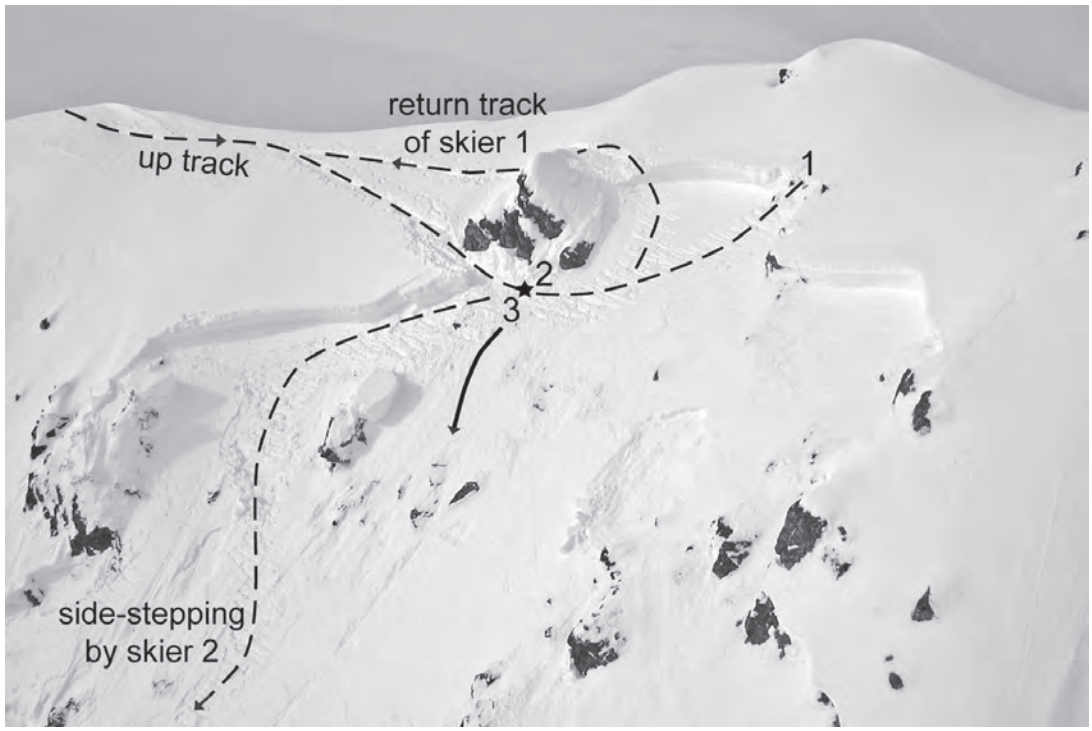
The victim was buried in a folded position with legs flat under 1m of firm avalanche debris. The survivor uncovered the victim enough to unfold his body and take a pulse. The victim was bluish and had no pulse, so she began CPR about 30 minutes after the avalanche. CPR continued for approximately 10 to 15 minutes until the second survivor arrived. They continued with resuscitation efforts for 45 minutes, until they

Weather observation at Cayoosh Summit Elevation 1350 m					
Date	Max. Temp. (°C)	Temp. Pres. (°C)	Min. Temp. (°C)	Snowfall (cm)	Snowpack (cm)
23 Jan	2.2	-0.5	-0.7	9	95
24 Jan	2.0	-2.5	-2.7	2	95
25 Jan	-0.6	-14.4	-14.4	22	110
26 Jan	-4.8	-6.9	-16.5	3	109
27 Jan	-3.4	-19.6	-19.7	14	116
28 Jan	-5.2	-5.2	-19.9	11	123
29 Jan	-0.6	-1.6	-2.8	0	118
30 Jan	2.0	-2.2	-2.4	40	152
31 Jan	-1.0	-5.5	-5.8	19	158
1 Feb	-1.6	-19.6	-19.6	0	149
2 Feb	-7.3	-15.7	-20.4	1	143

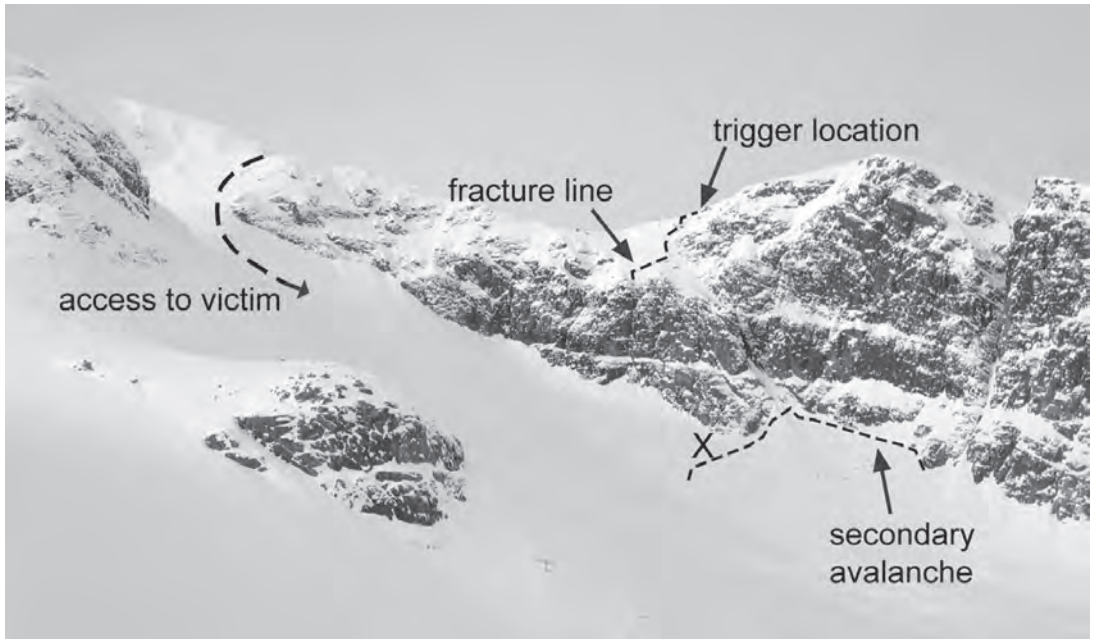
decided at approximately 15:30 that exhaustion was becoming a considerable risk factor since they had significant terrain to pass before making it back to the highway.

They placed a tarp over the victim and planted a ski in the ground as a reference point. After skiing down the logging road to Duffey Lake Road, they flagged down a passing motorist, as their keys were with the victim. The avalanche incident was reported to Pemberton RCMP at approximately 19:00.

The next day, a recovery team made up of one survivor, local SAR members, the RCMP and Blackcomb Ski Patrol avalanche technicians flew to the accident site to retrieve the victim and conduct an accident investigation. The initial avalanche was a size 1.5—a 60cm thick slab slid on a crust, possibly from a January 15 rain event or the January 24 melt-freeze crust that formed during a short period of warm, clear weather prior to the significant storm snow. Because the avalanche was on an exposed ridgeline, moderate to strong southwesterly winds during the storm event may have scoured the slope, leading to a shallower and more easily-triggered burial of the crust.



Cayoosh Mountain, 1 February 2004. Overview of start zone. 1, 2, 3 - location of skiers when avalanche was triggered. Photo: Wayne Flan.



Cayoosh Mountain, 1 February 2004. Overview of entire accident site with fracture lines of both avalanches and access route to victim. X - deceased.

Avaluator Warning Signs

Avalanche Conditions					
Regional Danger Rating	Persistent Avalanche Problem	Recent Slab Avalanches	Signs of Instability	Recent Loading	Critical Warming
Considerable	No	Yes	No	Yes	No

Terrain Characteristics			
Incline	Terrain Trap	Slope Shape	Forest Density
40°	Cliffs	Convex, unsupported	Open alpine slope

Source

- Personal exchange with accident party
- BC Coroners Service
- British Columbia Ministry of Transportation Weather data for Cayoosh Summit
- CAA avalanche bulletins for South Coast
- InfoEx

Comment

While the accident party was cognizant of the challenging avalanche conditions and examined the snowpack during their ascent in the morning, they did not take into account that the terrain characteristics at the accident location were different from the test sites. The easterly aspect of the slope immediately below the ridgeline and its exposure to recent wind transport resulted in a locally much more unstable snowpack. While snow profiles can help to develop a better understanding of the snowpack—particularly the development of persistent instabilities—using this information to assess snow stability is a complex subject. It is recommended to always combine the information from a snow profile with all other available information and be aware of the limitations of snow profiles. Snow profile test results should not be used to justify more aggressive terrain choices.

The location of this accident was a steep and unsupported piece of terrain with the potential for high consequences if something goes wrong. Travelling in this type of terrain is unforgiving and does not allow for any assessment errors. It is best to approach terrain of this severity only after extended periods of low avalanche hazard.

While the subsequent medical examination of the victim revealed the primary cause of death was asphyxia, the victim sustained major trauma from his fall through the cliff band. This likely compromised his capability to struggle out of the avalanche and significantly reduced his ability to survive the burial. In Canada, approximately one quarter of all avalanche fatalities die directly from trauma. In an additional 10% of the fatalities, trauma was a major contributor even though the victims eventually succumbed to asphyxia (Boyd et al. 2009).

History Lesson is a new column that will feature a case study from volumes of Avalanche Accidents in Canada.

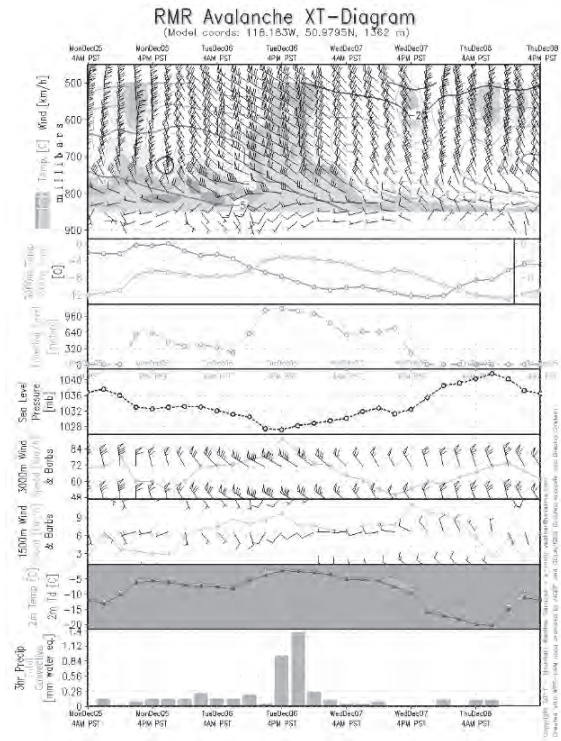
Weathering the Storm

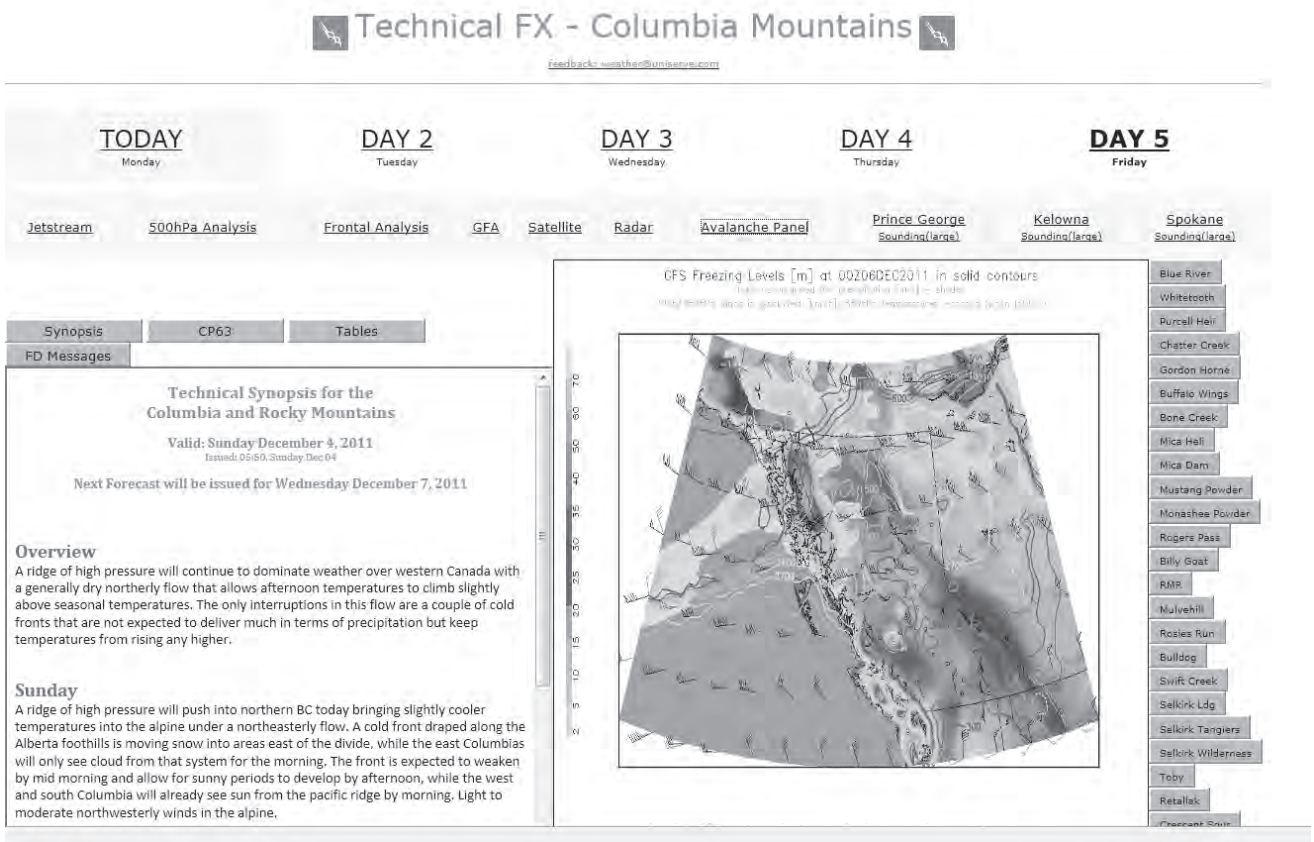
CAA offers improved weather product for the 2011-12 season

By Kristin Anthony-Malone

The CAA is excited to present our new weather service available to subscribers this season. The weather product is a web-based, self-briefing tool containing daily weather-related information available to InfoEx subscribers, and it is updated multiple times per day. It is a compilation of Environment Canada's CPN63 along with value-added input and additions from certified meteorologist Uwe Gramann of Mountain Weather Services, the creator of the TechFx and XT diagrams.

Uwe's weather products have revolutionized the way avalanche operators look at weather for their daily operations. His products have proven themselves over and over again as the go-to product for any operation affected by winter mountain weather. Subscription to the CAA weather service includes a five-day technical synopsis, a frontal analysis of significant weather features, an avalanche panel containing precipitation amounts, freezing levels, 1500 metre temperatures, and 3000/1500 meter winds, and an XT diagram of a specific location for each operation. Many InfoEx subscribers took advantage of a two-week free trial period of the new product at the start of the winter season and feedback was positive. For more information, please contact info@avalanche.ca.





ITP IN RUSSIA

Russia holds first CAA Avalanche Operations Level 1

As backcountry recreation continually gains popularity in Russia, the need for professional-level avalanche training and guide training is apparent.

In January 2012, students in the Russian Mountain Guides Association's guide training program will take a CAA Avalanche Operations Level 1 course. CAA Avalanche Operations Level 1 manuals have been translated into Russian, and the course will be taught in English with a Russian translator. The course will be combined with ACMG Assistant Ski Guide touring training as part of the RMGA program.

Fedor Farberov is the Technical Director Russian Mountain Guides Association and Chair of the RMGA Mountain Guides Training Program. Farberov has been a mountaineering instructor and mountain guide in Russia since the mid-1980s. He took the Adventure Guide Program at Thompson Rivers University in Kamloops in from 2001-2002 and took his Avalanche Operations Level 1 while in Canada. Farberov helped found the Russian Mountain Guides Association in 2009 with support from the Russian Mountaineering Federation, and the RMGA looked to the ACMG as the model system for training and certification. "Professional mountain guides training programs didn't exist in Russia before," says Farberov, "and our goal was to develop a training program based on internationally recognized professional standards of the IFMGA."

The RMGA chose to emulate the CAA's professional avalanche training programs because of some obvious geographical similarities: "We also have huge territories with wild mountains," grins Farberov. Professional avalanche training programs in Europe rely heavily on easily accessible professional avalanche forecasts, but Russian guides often work in very remote areas without forecasts, weather stations or peers. The RMGA hopes to continue working with the CAA to "develop a more broad system of avalanche education in Russia in the future," he says.

Backcountry freeriding with lift, snowmobile or heli access is Russia's most popular winter sport, and extended backcountry ski traverses through remote areas using simple cable bindings are also popular. Ski touring on alpine touring gear has been steadily gaining fans for nearly a decade and is catching up in popularity. However, public avalanche forecasts exist in only a few developed mountain regions in Russia, and are primitive in form compared to Canadian and European standards, says Farberov. With no governing body keeping detailed statistics on avalanche incidents in Russia, Farberov estimates that there are between 15-25 avalanche deaths per year.

Both the RMGA and the Russian Mountaineering Federation (RMF) are interested in developing recreational avalanche safety training programs for the general public, and professional programs for guides and mountaineering instructors. The RMF has already begun work on developing a recreational avalanche safety education program for the general public. While Russians have been studying snow science since the 1930s, research and study has taken place almost exclusively in universities and focused on industry protection or academic research by a small group of specialists. Farberov believes there are less than ten individuals lecturing on avalanche safety to recreationists across Russia. All are guides, and while three have university-level avalanche education, the others are self-taught avalanche safety enthusiasts. There are no standardized written materials for courses.

CAA professional training takes place around the world: Japan holds CAA Avalanche Operations Level 1 and Level 2 courses, and New Zealand is running their own Level 2 course using CAA material. Add this to the fact that "we've got students from all over the world coming to take our courses here," says Bridget Daughney, Interim Industry Training Program Manager, and the CAA continues to cement its role as a worldwide model for professional avalanche training.

Fedor Farberov

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- Source: SnoWest Volume 38, No. 3

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AvSAR Update

By Jordy Shepherd

Jordy Shepherd

On November 24, while prepping for the CAA AvSAR Response Seminar (Avalanche Search and Rescue), instructor Kyle Hale received a phone call that emphasized the need for and value of AvSAR training. A Golden CARDA dog handler, Golden and District SAR member, and Mountain Safety Supervisor at Kicking Horse Mountain Resort, Kyle received a request for response to an avalanche incident. Kyle was asked if he and his dog Wiser were available to come clear a site to check whether anyone was missing in the debris. By that point near the end of November, the season was already well underway and teams across North America and around the northern hemisphere were preparing for a long winter of training for, and responding to, avalanche accidents.

On November 24 – 27, the CAA ran its second ever AvSAR Response Seminar in Golden, BC. Twenty-two candidates attended three days of lectures, discussion and field practice, with close to 300 years of collective AvSAR experience. The candidates represented an excellent cross-section of the industry: highways operations, ski resorts, ski guiding (mechanized and touring), Parks, backcountry lodges, volunteer SAR, and the Canadian Avalanche Rescue Dog Association (CARDA). Jordy Shepherd, Kyle Hale, Garth Lemke and Renata Lewis facilitated, though with that much experience in the room, it was more like attending an AvSAR operational team meeting than delivering standard course curriculum. Candidates travelled from as far away as Colorado to share ideas and glean the experience of the many subject matter experts who developed the AvSAR Response curriculum, as well as offer up their own AvSAR experiences. A second AvSAR Response Course ran from December 9-11, 2011 in Whistler, British Columbia with twenty attendees.

Many thanks go to Kyle Hale and Kicking Horse Mountain Resort for providing the equipment, logistics and staff to make the field day on the mountain happen. Also thanks to Jasper National Park for loaning rescue and medical equipment to practice with. Dr. Renata Lewis, who started the Medical Aspects of Avalanche Rescue Seminar in 2008, delivered the medical portion of the seminar, offering her invaluable experience as an emergency physician and mountain rescue professional. Bridget Daughney, Kathy Bellis, Julie Matteau, Heather Abbott and the rest of the CAA team amazed us with their logistical prowess and enthusiastic problem solving (we created the problems, and they solved the problems).

Transport Canada Transports Canada

ATTENTION: Avalanche blasting may require a Transport Canada-approved Emergency Response Assistance Plan (ERAP)

If you are avalanche blasting, you may be required to have a Transport Canada-approved Emergency Response Assistance Plan (ERAP) to transport explosives, even if off-road, by snowmobile, snowcat or any other powered vehicle.

An ERAP requires:

- emergency response advice first by telephone, then by an expert visiting on site;
- specialized equipment; and/or
- a response team to reduce the effect of the dangerous goods at the accident site.

When you transport or import dangerous goods, it is your responsibility to find out if an ERAP is required. To learn which explosives and quantities require an ERAP, please contact Transport Canada's Transportation of Dangerous Goods Directorate by:

- telephone: 604-666-2955; or
- email: pacific-pacifique@tc.gc.ca.

AVERTISSEMENT : Le déclenchement préventif d'avalanches peut nécessiter un plan d'intervention d'urgence (PIU) approuvé par Transports Canada

Si vous effectuez le déclenchement préventif d'avalanches, vous pouvez être tenu d'avoir un plan d'intervention d'urgence (PIU) approuvé par Transports Canada pour transporter des explosifs, même hors route, au moyen d'une motoneige, d'une dameuse à neige ou de tout autre véhicule motorisé.

Un PIU comprend :

- des conseils sur l'intervention d'urgence donnés tout d'abord par téléphone, puis par une personne experte présente sur les lieux;
- le matériel spécialisé;
- une équipe d'intervention capable d'atténuer sur place les effets des marchandises dangereuses.

Lorsque vous transportez ou importez des marchandises dangereuses, il vous incombe de vérifier si un PIU est requis. Afin de savoir quels types et quelles quantités d'explosifs nécessitent un PIU, veuillez communiquer avec la Direction générale du transport des marchandises dangereuses de Transports Canada :

- par téléphone : 604-666-2955;
- par courriel : pacific-pacifique@tc.gc.ca.

To learn more or to view sample ERAPs, visit our website at: **www.tc.gc.ca/tdg** and click on Emergency Response Assistance Plans.

Pour en savoir plus au sujet des PIU ou pour en voir des exemples, visitez notre site Web au **www.tc.gc.ca/tmd** et cliquez sur plans d'intervention d'urgence.

Canada


Ross Cloutier collection

The CAC and its future

These are interesting times at the CAC! As you have likely heard, the CAA/CAC Board of Directors decided to separate into two entities. The separation happened in September 2011, and there are now two functioning boards. You can find the list of CAC board members in the front pages of this journal.

Given the large volume of work the "new" CAC board has inherited over the past three months, it must have taken a yeoman's effort for the previous board to manage both organizations simultaneously. They did a wonderful job, and many thanks should be given to past board members for shepherding the CAC from its creation in 2004 to the present.

The logical question is what now for the CAC? The CAC is a well-managed and well-staffed organization. The commitment and expertise of existing staff in delivering public avalanche safety is world class, and that fact is being recognized more and more around the globe. The future opportunities for the CAC are exciting, varied, and many.

The CAC board's efforts are multi-dimensional, but could be articulated as follows:

1. To organize the CAC so that it is poised to respond to the increasing opportunities that will be presented to it on the Canadian and world stage.
2. To professionalize the fiscal and administrative processes of the CAC in order to meet the increasingly stringent public scrutiny of being a prominent, national, not-for-profit organization.
3. To diversify and stabilize the funding of the CAC in order to create a sustainable and healthy organization.
4. To further develop identifiable public avalanche safety career paths and to be a desirable and sought-after employer.
5. To "nationalize" the CAC's public avalanche safety mandate and to play an increasingly involved role in all avalanche terrain where Canadians recreate—right across Canada.
6. To find ways for the CAC to serve its ever-expanding and diversified membership.

Since September, the CAC board has been working primarily on organizational things. We have struck board-level Governance, Finance & Audit, Business Development & Marketing, Membership, and Program committees, and we have developed terms of reference and work plans for each. We also have three working committees: Youth, Training and SLEDCOM (the Youth and Training committees are currently soliciting participants from CAC members. If you are interested in helping the development of the CAC by sitting on one of these committees, please let us know; you can phone or email me anytime about this). We have updated the CAC Board Code of Ethics & Conflict of Interest Policy. We have updated the CAC Intellectual Property & Licensing Policy. We have hired Ian Tomm as the full-time CAC Executive Director. And we have talked a lot about the future of the CAC—how big? How far? How fast? These are all good questions.

One fundamental question is what the long-term relationships between the CAA, CAF, and the CAC will look like as these three organizations progress into their bright and very optimistic futures. It is the CAC board's opinion that the relationship between these three groups is absolutely crucial. We need to find ways to maintain a strong and symbiotic connection with the CAA and CAF, while looking after the specific interests of the CAC and public avalanche safety overall. Through the eight years of the CAC's existence, the CAC has been managed primarily by CAA professionals. CAA members—professionals working in avalanche terrain—continue to play a vital role by providing a reliable stream of high-quality data to our forecasters at the CAC. This partnership, where private industry supports public avalanche safety, is essential to the CAC. It is unique to Canada and is the envy of our colleagues around the world. Going forward, the CAC Board will be comprised of many non-professional members who bring a broad, public and non-industry focus. To this end, we have on the CAC board two CAA representatives, Mike Boissonneault and Scott Hicks, and one CAF member, John Hetherington. We will be looking to them to help us address this very important question about a firm and effective relationship.

Another question is the CAC's relationships with key funders. To date, the CAC has been funded primarily through a mix of annual grants, multi-year contribution agreements, donations and special projects. From a management perspective, this has been a very volatile and irregular funding format, and it is nearly impossible to run a predictable, stable, and sustainable organization from this. While the short-term looks very good, the CAC board owes it to CAC employees, CAC members, and the public at large to find long-term, predictable, and sustainable funding models. We will need the participation of many of our partner agencies in this high priority issue.

This winter marks twenty years since the first public avalanche bulletin was issued in Canada. Over the past twenty years, many advances have been made in Canada that are admired and emulated by alpine nations around the globe. Together with Parks Canada; the provinces of British Columbia, Alberta and Quebec; the National Search and Rescue Secretariat; Canadian Pacific; and many other partners, we have made Canada a world leader in public avalanche education and accident prevention.

This piece was written on Remembrance Day. I am pretty certain that this winter we will not have incidents anywhere similar to those which occurred near Italy's Mount Marmolada during the winter of 1916-17. Avalanches in the Alps killed an estimated 10,000 Austrian and Italian troops during the month of December 1916 alone. The conditions in the mountains were worse than in actual fighting, and entire regiments were lost in moments. It is estimated that 50,000 to 60,000 troops were killed by avalanches on the Italian front from 1915-1918. Sixty thousand people froze to death in the Dolomites during this period. I trust we have learned much about avalanches and humanity since 1916. We are able to live in a recreation-oriented society today and engage in what sometimes can seem as a superficial search for meaning because of the price an earlier generation of risk-takers paid on our behalf. Canada lost 67,000 of its best and brightest young men in WWI and another 45,000 in WWII. I can only imagine where we'd be as a society today with them.

Have a safe and enjoyable winter.

Ross Cloutier
CAC Executive Director

Ross Cloutier is an Associate Professor and the founder of the Adventure Studies Department at Thompson Rivers University (TRU) in Kamloops, BC. He specializes in providing outdoor-related risk management services to schools, businesses, governments and law firms. Prior to joining TRU in 1992, Ross was employed by the Justice Institute of BC as the Provincial Search and Rescue Training Coordinator. He has guided journeys to 35 countries, including leading an Everest expedition in 1991. Since then, his expeditions primarily revolve around sailing on his Tartan 41, Carronade.

Big thanks to Yamaha and BRP

New sleds to help give the South Rockies field program traction.

Mary Clayton

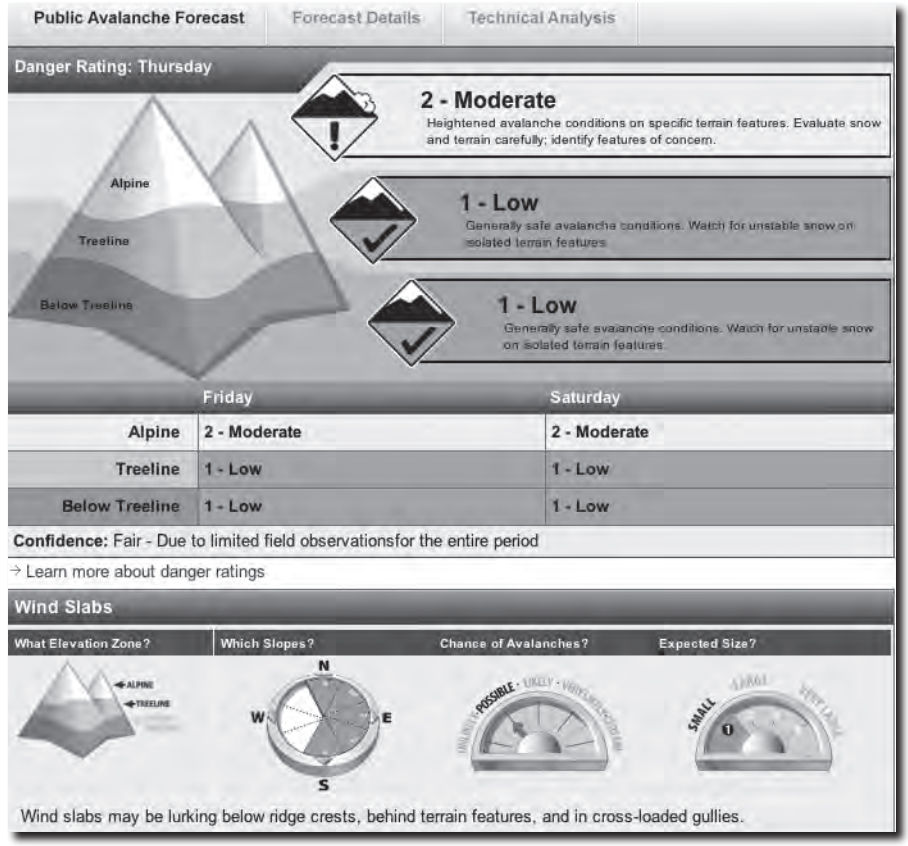
Randy Swenson, Regional Manager for Yamaha-Motor Canada Ltd, hands over the keys for a 2012 Yamaha Nytro MTX to Ian Tomm, Executive Director of the Canadian Avalanche Centre.

Mary Clayton

Gerry Dusessoy, BRP's District Sales Manager for BC and the Yukon, Executive Director Ian Tomm, and Craig Fortune, owner of RTR Performance in Kamloops.

Is A Picture Worth 1000 Words?

The CAC unveils new bulletins and forecasting software



A joint effort between Parks Canada and the Canadian Avalanche Centre led to a redesigned public avalanche bulletin system this winter season, meant to make the forecasts more user friendly. Behind the scenes is a brand new software system called AvalX, created by Parks and designed in part by CAC Public Avalanche Warning Service Manager Karl Klassen and Mike Koppang of Kananaskis Country. Klassen calls AvalX slick and easy: "AvalX offers a huge amount of flexibility for our forecasters," Klassen says, combined with a notable increase in efficiency.

The new image-heavy public avalanche bulletins were officially launched by Parks Canada on November 9, and the CAC followed suit days later. Improvements are meant to standardize the public avalanche warning system and make information easier to read.

The front page of each bulletin features simple, colour-coded danger ratings for each elevation, important problems to watch out for, the chance and expected size of possible avalanches, and which slopes they may be most likely to occur on.

The CAC takes a layered approach with the new bulletins, allowing website visitors to dig deeper into forecast details, technical analysis, a weekly analysis and a regularly updated Forecaster's Blog. "Feedback has been pretty uniformly positive," says Klassen, though he notes that users are going through a learning curve as well. Any issues that have arisen have quickly been worked on, including optimizing the bulletins for mobile devices and splitting the archives up into the new regions.

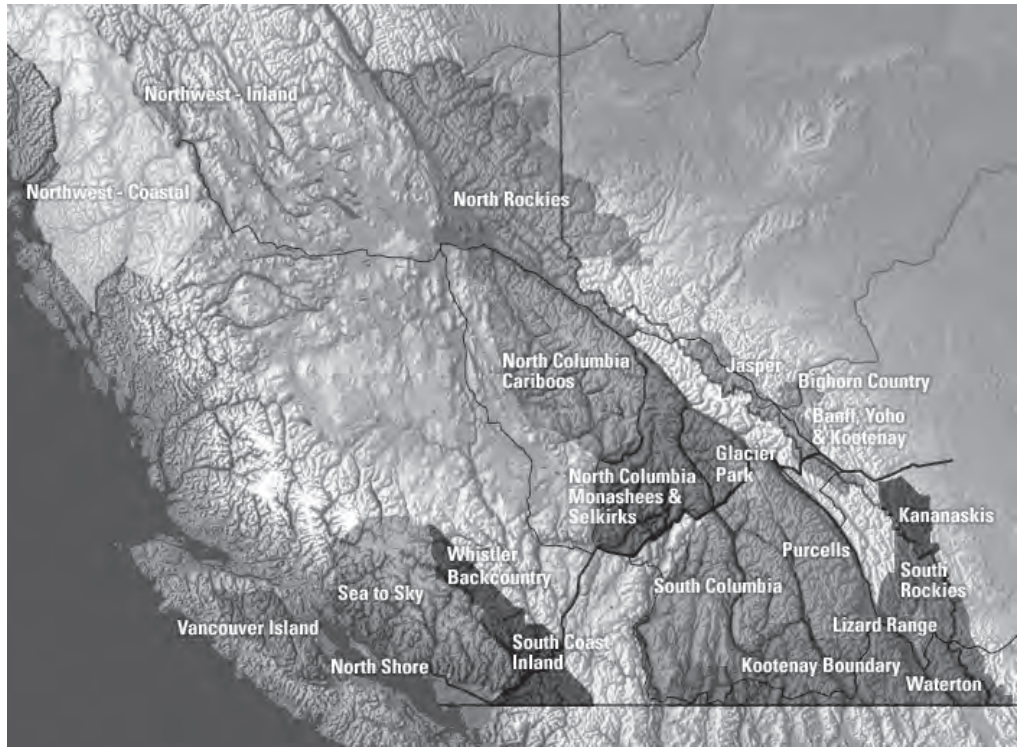
Klassen raves about how AvalX has streamlined the forecasting process: "We used to do different tasks in different pieces of software and various web applications. Now we have one piece of software where we do essentially everything." Because all forecast information is stored in a database, Klassen thinks processes will continue to be improved as designers can use that information to "study how forecasters think."

Three layers of information across twelve regions means many possible permutations, and this season forecasters are able to easily customize and fine-tune their output and analysis. "It's so much simpler to cut and paste and decide how and where to use information," Klassen says, and the software allows for interchangeability between forecasts and forecasters—important when producing a dozen forecasts out of one office.

He expects AvalX to become a public forecasting standard within the next few seasons, predicting that every partner agency doing avalanche forecasting will eventually transition to this system. "Parks has pushed Canada's public avalanche forecasting industry to be a world leader in terms of technology, due diligence and production processes, and efficiency," declares Klassen.

Smaller regions, better forecasts

CAC increases number of forecast regions from seven to twelve



The CAC marked the start of a new season of avalanche forecasts with a significant increase in the number of bulletin regions. CAC forecasters now provide daily avalanche information for 12 regions, up from seven last winter. Dividing some of the larger regions into smaller segments has been a long-held goal of the CAC. It is no surprise to anyone that "we deal with an unprecedented magnitude of scale in Canada," says Tomm.

The new forecasting software provided the push the CAC needed. "With the help from efficiencies of our new AvalX software, we were able to split some of our larger regions into smaller ones," says CAC Executive Director Ian Tomm. Public Avalanche Warning Service Manager Karl Klassen echoes the sentiment: "Because the work is done more efficiently, we can do more of it." Where last winter forecasters averaged three forecasts in a day, Klassen says they are now able to write four or more.

CAC forecasters have been issuing two sets of danger ratings for big regions like the North and South Columbias, Northwest, South Rockies and South Coast for several years, says Klassen, because "everyone knew from the beginning the regions were bigger than we'd like." He calls the new smaller regions the next step in an evolution that began a few years ago. Klassen admits he had some pre-season jitters about taking the fairly major step of almost doubling the forecasters' output while only increasing his forecasting team by one-third, but "it's very clear to me now that it was the right decision and we were ready."

Most of the new forecast regions have been created within the established boundaries of existing regions, but there are plans to add new territory as well. The Yukon Avalanche Association initiated a pilot project to produce a bulletin in the White Pass and Wheaton Valley, an area straddling the BC-Yukon border and a popular destination for backcountry skiers and snowmobilers in Whitehorse. The YAA has contracted the CAC to provide expertise and guidance in setting up this new region. The CAC will manage the field team in the region and produce the forecasts when an adequate data flow has been established. Similarly, in the South Rockies, Teck Coal has partnered with the CAC to provide the funding needed to run a field observation program in sections of this region where data is sparse.

Klassen hopes the CAC will find other partners to help enrich new data sparse areas in the coming years. "Adding more forecast regions is a two-pronged approach," he notes. Professional level data is the key component: "Hiring a forecaster and producing a forecast is relatively straightforward," says Klassen, but "the hardest and most expensive part is finding the information needed to produce those forecasts." While veins of data follow highway and rail lines, he points out "what we need are boots on the ground in data sparse areas." What Klassen would like to see is a phased approach to the issue: send experienced forecasters into the field to study what needs to be done in specific areas, and then put the pieces together in a plan for implementation. What it always comes down to is data, because "without professional-level data throughout an entire region, it's impossible to produce a credible forecast," says Klassen.

The New CAC Board – The First 75 Days

By Kevin Seel

As a rookie board member, I was not exactly sure what I was signing up for when I volunteered to let my name stand as Secretary Treasurer at the Special General Meeting in Revelstoke, BC on September 16. What I was certain about was that I wanted to be part of this organization, and that I was committed to finding a meaningful way to contribute to its success. The past two and a half months have gone by in a whirlwind of activity and surprising new challenges. Over that time I have had a unique opportunity to delve into the inner workings of a very complex and sophisticated business, and through that gain a huge amount of respect and appreciation for the efforts of staff, directors, members and stakeholders—both past and present. There are many accomplishments to be proud of, and there is much work yet to do.

So what has the newly fledged CAC Board accomplished since that warm and sunny afternoon in Revy? As Ross mentioned in his earlier editorial article, we have been focused primarily on organizational and administrative tasks—i.e. the proverbial "getting our ducks in a row."

One of our first priorities was to hire Ian Tomm as the full-time Executive Director of the CAC. Prior to this, Ian split his time and focus 50/50 between the CAA and the CAC. In the current plan, Ian will begin to transition out of the CAA as a new CAA Executive Director is hired and comes on board, hopefully early in the new year. In the spirit of cooperation, the CAC Board has agreed to support the CAA during this period to ensure the process goes smoothly and with the fewest negative impacts to both organizations.

Our second priority was to establish a new board level committee structure, Terms of Reference (TOR) and 2011-2012 work plans. As many of you know, committee level is really where much of the "heavy lifting" work of the board is actually accomplished. Towards that end, the following committee structure has been defined:

The Governance Committee is in charge of board governance policy development, recruitment strategies, training programs, monitoring of Board activities, and evaluation of the CAC Executive Director and Board member performance. One of the first tasks of the Governance Committee was to propose and implement a comprehensive Code of Conduct for all board and committee members. The code clearly stipulates the accountability for ethical behavior by all Directors, and removes any ambiguity regarding potential conflicts of interest and other non-ethical conduct.

The Finance and Audit Committee is a completely new entity. As the name suggests, this committee ensures proper financial oversight, risk management, reporting and compliance. Additionally, this committee will oversee the preparation of annual budgets, and ensure that an external audit is completed at year-end. The requirement for a full external audit comes about largely as a result of the CAC's successful growth, and consequently, the higher degree of financial scrutiny and accountability demanded of a large and high-profile not-for-profit organization. Unfortunately, the amount of time and effort required to perform a full external audit of this scope means that the final audited year-end financials will not be ready by the May 2012 AGM. We will have to come up with a plan to address this issue fairly early in 2012.

Another completely new committee struck by the CAC board is the Marketing and Business Development Committee (MBDC). The formation of this committee demonstrates one of the board's key priorities: to grow and strengthen the profile of the CAC, and expand and diversify its funding base, both domestically and internationally. Consequently, the MBDC will oversee all aspects of marketing policy and marketing strategy development, including the management of the CAC brand, overall business development and growth of sponsorship.

Related to this, the board has started to tackle the issue of how to address the ownership and potential licensing of the intellectual property and other assets owned by the CAC to third parties. In the short term, the board has agreed upon a set of guidelines and principals to serve as a framework for discussions between the CAC and others. Meanwhile, we are actively working towards developing a more comprehensive

strategy and policy to govern this critical aspect of the business.

The mandate of the Membership Committee is to ensure that the CAC retains and grows its membership, and that members are able to contribute and see value for belonging to the organization. This involves the development of recruitment and retention strategies, defining what it means to be a member of the CAC, and providing a framework whereby membership can thrive and diversify to accommodate a wider public base.

Lastly, the Programs Committee provides oversight and direction for all CAC program activities related to snowmobile outreach, youth outreach and ongoing public training program development. Each of these working sub-committees has the mandate to foster training and educational initiatives to meet the needs of their respective target audience and the public at large.

With the framework and TORs defined, our recent activity has shifted towards the recruitment and onboarding of external members to serve on committees. As you can appreciate, finding qualified volunteers with the appropriate level of skill and experience is a significant undertaking in itself. However, based on a few informal discussions with the other Board members, I would suggest we have met about three quarters of our external recruitment needs, and we are on track to complete recruitment before the end of the year.

Hopefully this brief overview has given you at least some sense of the level of activity and focus that the new board has brought forward on behalf of the CAC. Even during my short tenure, it is obvious how much of an advantage it is to concentrate on the specific needs of one particular organization, rather than dividing the board's attention between two. I can only imagine the level of effort and commitment it must have taken past CAA/CAC Boards to deal with this inherent challenge. The separation of boards has not only increased the speed and efficiency we can now get things done, but also the potential effectiveness of the outcomes. That said, it is clear to everyone that there is much to be gained by continuing to cooperate, share ideas and combine our mutual strengths between the two organizations when and where appropriate.

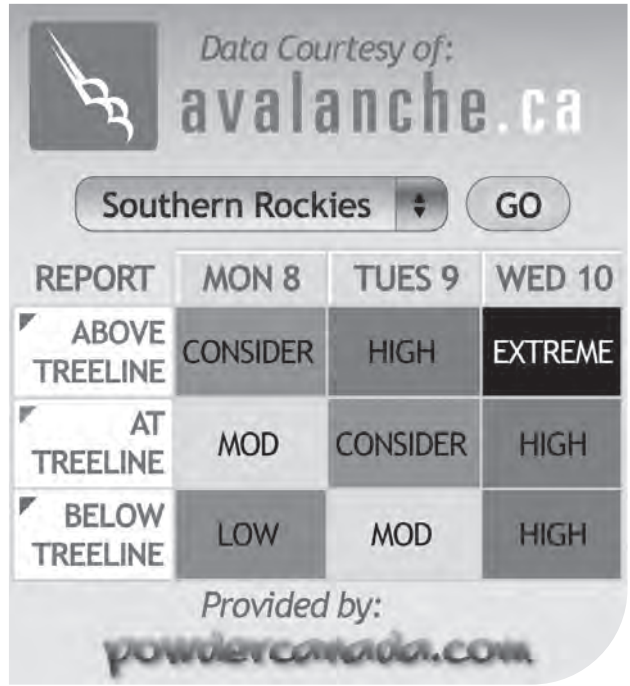
Originally from Waterton National Park, Kevin Seel currently lives in Calgary with his wife, Amanda. Both are avid recreational backcountry skiers by winter and road-tripping sea kaykers by summer. Kevin Seel and his wife Amanda live in Calgary and are avid backcountry skiers. With degrees in earth sciences and a doctorate in systems dynamics modeling from the University of Calgary, Kevin has worked across Canada and the US on environmental impact studies, strategic and financial risk modelling, and most recently as the co-founder of a start-up product development company.

Avalanche Danger Rating Widget

Dan Savage of Savage Marketing in Fernie, BC has released an updated avalanche danger rating widget to reflect this winter's change in regions. A widget is a compact application designed to display information on a website or web-based media device.

The widget was designed last year and helps communicate avalanche conditions by presenting danger ratings in an easy-to-recognize format. Presenting danger ratings in high traffic locations reaches people who may not make the effort to click through and read a bulletin. "In the big picture, hopefully more backcountry users will travel safely with knowledge of the present avalanche danger as a result of seeing this widget," says Savage.

To generate the HTML code for your website, click to http://powdercanada.com/avalanche-powder-info/caa/ and select your location as the default view. Copy the code and embed it in your website code. For more information email dan@fernie.com.



Sowing Seeds of Avalanche Awareness

By Nancy Geismar

Just as a proficient gardener wants to sow seeds in fertile soil, the Canadian Avalanche Centre wants to sow the seeds of avalanche awareness. The CAC Backcountry Avalanche Workshops in November and December had a new vision this year: to visit many smaller communities and include both a skiing and sledding component to reach into areas that we sometimes have not visited.

To continue with the gardening analogy, the seeds we sow are the presentations created by our Senior Public Avalanche Forecaster Ilya Storm: "Avalanche Characteristics," "Triggering Avalanches," "Not All Avalanches are Created Equal," "The Ten Commandments of Travel Techniques," and "Rescue Works." These presentations were mixed and matched, depending upon the audience, to best suit the needs of the community.

A gardener needs fertile soil for seeds to grow. What creates this? A group of backcountry recreationists—skiers, snowboarders, sledders or snowshoers—wanting to learn more about avalanche awareness is key. Another important aspect is finding one or two committed organizers or a group within the community to "fertilize" the idea. These key organizers have booked venues, helped spread the word via posters (created and distributed by the CAC), radio announcements, newspaper articles and interviews. With the help of social media, advertising has spread via Facebook, Twitter and organizational email blasts to membership. Word of mouth is another effective tool for the fertilization of these avalanche awareness workshops.

The CAC has been impressed with the level of commitment and willingness to help host events shown by the communities. Smithers, BC held two Backcountry Avalanche Workshops, one focused on skiers and the other on sledders. There was an impressive turn out with 100 skiers and 62 sledders—this is exceptional attendance for a small town. Kudos go to Ben Heemskerk of Recreation Sites and Trails BC, a dedicated group from the Bulkley Backcountry Ski Society (BBSS) and the Smithers Snowmobile Association for their concerted efforts in organizing and advertising the event. As Ben said, "it was fantastic to see such a great turnout . . . four or five years ago a friend of mine called me and said they were organizing an Avalanche Awareness Event in Prince George. He told me it was a good thing and suggested that we do the same in Smithers. That year we organized a skills day and 12 people showed up . . . half of the people were helping organize the event. Skip ahead a few years and it is very rewarding for everyone involved to see the attendance increase to over 160 people in two nights."

Synergy is one component of success. When we combine forces, (good soil, sunlight, water, weeding, tending), we will get a healthy plant. By combining the synergistic forces of both the skiing and sledding communities, we can reach far more people with our seeds of avalanche awareness. This was evident in Rossland, where Keith Robine, a ski guide and AST instructor, teamed up with Lori Woodhouse of the West Kootenay SnoGoers (snowmobile) Association to host the Rossland BAW. Keith and Lori worked together to gather skiers and sledders to the workshop. As well, they solicited food donations to benefit the Rossland Fire Fighters' Hamper Fund. The Rossland BAW brought in 275 participants, more than any other BAW in our history. Other venues are also using BAWs to create unique community opportunities: Nelson hosted a silent auction to raise funds to benefit the youth avalanche education program at LV Rogers Secondary School. All in all roughly 1250 people attended BAWs in 2011

Will the seeds grow into healthy plants? Time will tell. The CAC continues to nurture avalanche awareness through our daily public avalanche bulletins, Avalanche Awareness Days (January 21-22, 2012), training opportunities (via AST courses) and numerous features on the CAC's website (www.avalanche.ca) including training, pre-trip planning, equipment, decision making and much more.

The CAC is deeply grateful to all the communities who participated in the Backcountry Avalanche Workshop series this fall. Special thanks to: Damian Pighin and Frank Spears of Prince George; Ben Heemskerk and the BBSS of Smithers; Mark Pride of Mackenzie; Fred VanHeddegan and Tyria Plamondon of Chetwynd; Rene Remillard in Grande Prairie; Darlene Skehill and Garth Lemke in Jasper; Iain Stewart-Patterson in Kamloops; Matt Atton and Dale at Union Cycle in Kelowna; Keith Robine and Lori Woodhouse in Rossland; Martin Keyserlingk and Graeme Marshall in Nelson; Jeni Sugiyama in Fernie; Joel Wasnidge in Calgary; and Miles Tindal in Canmore.

Ben Heemskerk

Revving up the South Rockies

South Rockies Field Program gets a boost from two new sleds

The South Rockies Field Program has two brand-new snowmobiles to use for the 2011-12 winter season. In November, Bombardier Recreational Products (BRP) loaned the Canadian Avalanche Centre a 2012 Summit X mountain sled for the winter, just in time to head out into the field.

Days later, the CAC purchased a brand new 2010 Yamaha Nytro MTX from Kelowna Yamaha—they have been a solid supporter of the CAC for several years, raising thousands of dollars for CAC snowmobile programs through events.

The South Rockies Field Program is now into its fourth year, with long-time Fernie resident Gord Ohm manning the helm for his second year. Assistant Avalanche Field Technician Dave Tracz recently joined the team for the 2011-12 season. Technicians will be in the field four days per week, and the new sleds give the team a better range so that they can go further into the backcountry to access popular sledding areas. "I am looking forward to expanding our outreach within the sledding community," says Ohm, and these new snowmobiles provide a great start to the season.

The main goal of the South Rockies Field Program is to supplement weather, snowpack and avalanche data collection in areas with little reliable snowpack and weather information. These include the Crowsnest Pass, Elk Valley, the Flathead area. "Our observations of the snowpack, avalanche activity and high use areas will be detailed to the CAC forecast office in Revelstoke," says Gord Ohm, and "this data will be utilized to provide a more detailed and relevant public bulletin for the South Rockies region."

Both BRP and Yamaha have shown a dedication to avalanche awareness in Canada, each running a series of avalanche awareness seminars throughout British Columbia and Alberta. Gerry Dusessoy, BRP's District Sales Manager for BC and the Yukon, said helping out the CAC with its work is essential. "We at BRP have been very proud to help deliver the message through our many BRP dealerships over the past two seasons," said Dusessoy. "We very much thank the CAC for being a great partner as we deliver the message to as many users as we can."

Randy Swenson, Regional Manager for Yamaha-Motor Canada Ltd. arranged substantial support for the CAC to purchase this new snowmobile, which was bought through Kelowna Yamaha. "We are proud of our close alignment with the CAC," said Swenson; "Yamaha was the first snowmobile manufacturer to sponsor the work of the CAC, and we continue to raise money for their snowmobile programs."

Teck Resources Limited also stepped up to co-sponsor the South Rockies Field Program this season, along with the brand-new Companion Rescue Skills Course. "Teck is proud to continue our support of the CAC in their public safety initiatives," said Nic Milligan, Manager of Community and Aboriginal Affairs for Teck Coal. "The South Rockies Field Program and Companion Rescue Skills course will directly support the safety of backcountry users in our communities. Supporting the CAC in these endeavours is a natural expression of Teck's core value of safety—and of our desire to foster safety in our communities."

Gord Ohm and Dave tracz with their new sleds.

Penny Goddard

Showcasing the CAC around the world

Public Avalanche Warning Service Manager Karl Klassen recently attended the European Avalanche Warning Services (EAWS) conference in Grenoble, France in September 2011 and the Northwest Snow and Avalanche Summit (NSAS) in Seattle, WA in November 2011. At both events, Canada was once again looked at as a leader in public avalanche safety

The biennial EAWS conference focused heavily on Europe and was very operationally oriented, with little representation from outside that continent. Klassen presented the CAC's Online Trip Planner, which combines danger ratings, trip information and Avalanche Terrain Exposure Scale (ATES) ratings into a planning tool that backcountry recreationists can use to visualize terrain and get an idea of what risk level they may be facing.

"The Trip Planner helps you pick terrain to suit the danger rating," says Klassen. Though it is still in its infancy, Klassen is excited that "we are able to help people visualize how terrain and avalanche hazard affect risk, and then users can decide if they want to expose themselves to that risk." Response to the Trip Planner was positive and Klassen saw interest from countries like Sweden, Norway, New Zealand, and Scotland.

Grant Statham of Parks Canada spoke about AvalX, the new forecasting software and bulletin format developed by Parks and used by the Canadian Avalanche Centre's Public Avalanche Warning Service this year (see page 24). "AvalX raised a lot of eyebrows," said Klassen, nothing, "lots of people want to get their hands on it." Representatives from Scotland and Norway are visiting the CAC office this winter to learn more about AvalX.

At the Northwest Snow and Avalanche Summit, Klassen gave presentations on the Trip Planner as well as on AvalX. The NSAS audience was a mixed crowd of professional avalanche forecasters and recreationists. Response to the session was favourable and sparked an extended discussion from both the recreationists interested in the new bulletin format and the Trip Planner, and the professionals in the crowd who were drawn to AvalX and had questions about how to apply ATES ratings to public information products.

The Canadians at the EAWS conference in Grenoble. From back: Grant Stathan, Dominic Boucher, Karl and Aleks Klassen, Mary Clayton and Pascal Haegeli.

Mary Clayton collection

Go Farther, Experience More, Be Safe, Become Avalanche Trained

A new snowmobile outreach campaign with Service Alberta

By Carole Savage

This fall, the CAC revamped its "The Thrill is Gone" snowmobile avalanche awareness brochure and the new incarnation will make its way into tens of thousands of snowmobilers' hands this winter. Many of you may have seen "The Thrill is Gone," and it really is going, going, gone soon. The remaining copies will be distributed, but we are very excited about its major makeover. The new tagline is "Go Farther, Experience More, Be Safe, Become Avalanche Trained," and that will echo across the new mountain snowmobiler marketing campaign.

As part of the Mountain Snowmobile Education Project, funded by the National Search and Rescue Secretariat New Initiatives Funding program, we have been working with media firm Clearmotive Marketing on a marketing campaign targeted at the mountain snowmobiler audience. Instead of printing more old brochures, Clearmotive updated and redesigned the sled-specific brochure and it is now more closely aligned with the mountain snowmobiler marketing campaign.

Thirty thousand copies of the brochure were sent to Service Alberta for distribution on snowmobile registration renewal. This initiative gets fresh new content out to a substantial portion of our target audience. ICBC has also expressed interest in distributing copies of the brochure to snowmobilers registering their sleds, though registration is not mandatory in British Columbia. We have also had the brochure translated into French for our friends in Quebec, as there is a burgeoning mountain snowmobile population in that province.

CAC Publications and Properties Manager Brent Strand has been busy working with various snowmobile clubs around BC to place the Go Farther brochure on the back of new trail maps with Avalanche Terrain Exposure Scale (ATES) ratings. Snowmobile clubs in Smithers and Golden clubs have each printed 5000 copies of ATES-rated trail maps incorporating the Go Farther brochure, and snowmobile clubs in Mcbride and Smithers are interested and have been working closely with Brent on this initiative.

This is another great example of collaborative efforts and capitalizing on synergies within the CAC and our stakeholder groups.

Empowering Youth

An update on youth avalanche safety programming

By Bridget Daughney

Every year exciting things happen with youth avalanche education. We are happy to announce several new initiatives this school year. In the fall of 2011, Parks Canada extended their Avi-Smart program to take over the Golden area, bringing school-based snow and safety projects to the community and letting the CAC move outreach west into Salmon Arm and Sicamous.

The CAC continues to make strides with its Tool Box program. The Tool Box contains transceivers, proves, shovels and resource materials for educational practice, helping students familiarize themselves with basic backcountry safety equipment and learn basic avalanche awareness. A generous donation of avalanche safety gear from Backcountry Access helped us fill another Tool Box this winter. For the second year running, Kristie Simpson of the Yukon Avalanche Association is coordinating the Tool Box program. Kristie is also organizing educational seminars and courses throughout the northern communities. Keith Nicol in Newfoundland will be adding the use of the Tool Box to his school outreach programs.

Calgary continues to show a lot of support for avalanche education initiatives. The Calgary school area has been actively involved with the Tool Box program for the past two years. The CAC Youth Coordinator will present at the Calgary City Teachers' Convention in February, and the CAC and Yamnuska are pairing together to run some educational programs in the city.

For the first time, le Centre d'avalanche de la Haute-Gaspésie is doing avalanche awareness outreach in Quebec schools. Many new communities, including Smithers, Grand Prairie and Calgary, have individuals and educators taking on new youth educational initiatives. The Fernie team has added onto last year's success by expanding their school catchment this year.

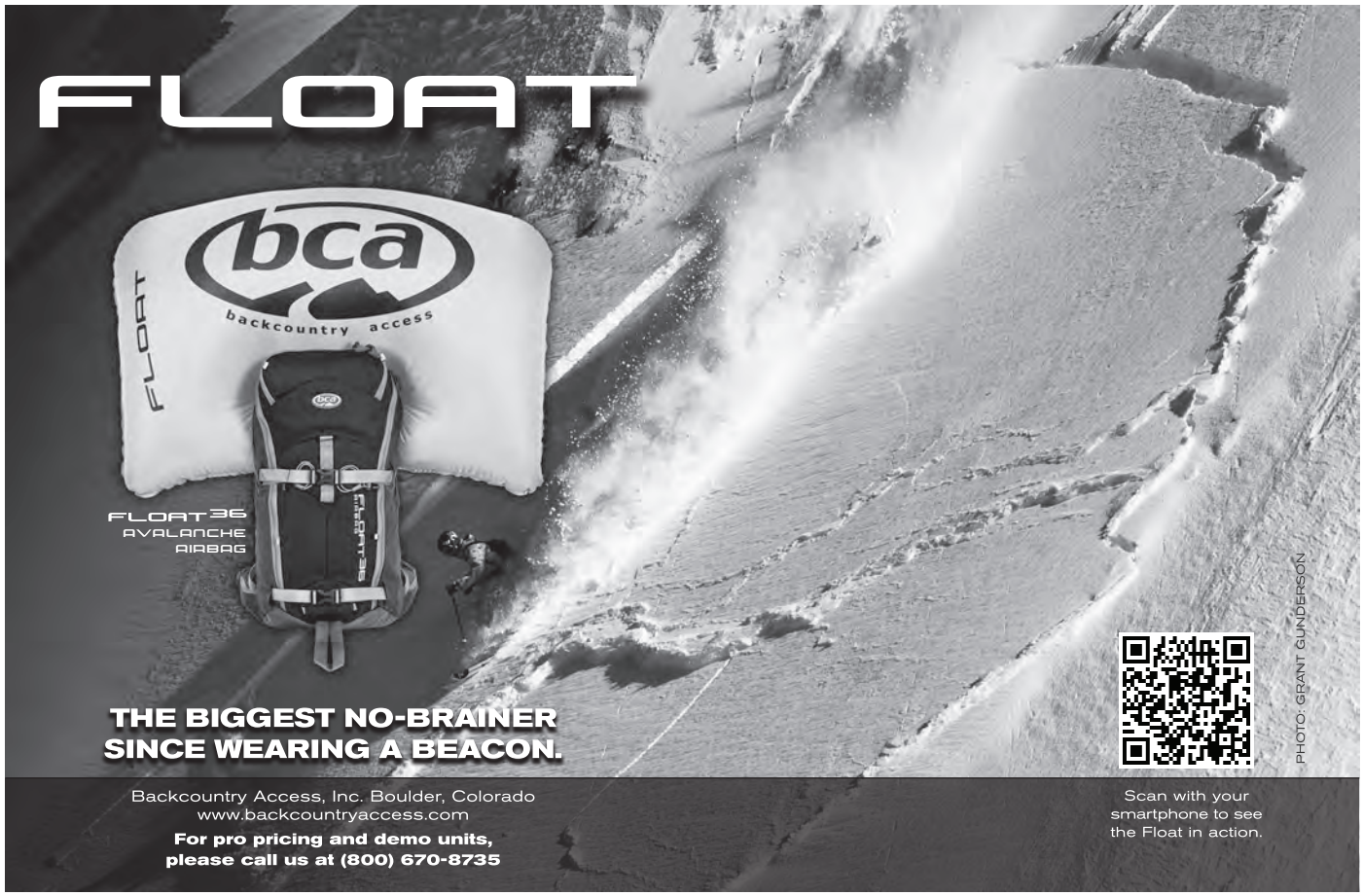
We are also pleased to report that many snowmobile clubs are jumping on board with youth education, realizing that their youth are riding in avalanche terrain and need to know about what they are getting into. Club members are starting or continuing awareness programs, and momentum is building within the snowmobile community.

More and more outdoor education programs are also adding an avalanche component to their curriculum. Educators are facilitating this as they become more educated and then pass this knowledge onto students through AST courses and more.

The list of youth education initiatives could go on and on, which is fantastic. It denotes a shift in the avalanche community into empowering youth to become aware of their actions and giving them tools to educate themselves and be safe. This spring will see the formation of a CAC Youth Committee to look into youth specific avalanche issues to find solutions and possibilities. The CAC is proud to be a part of this growing community.

Bridget Daughney is the CAC's Youth Education Coordinator.

Danyelle Magnan



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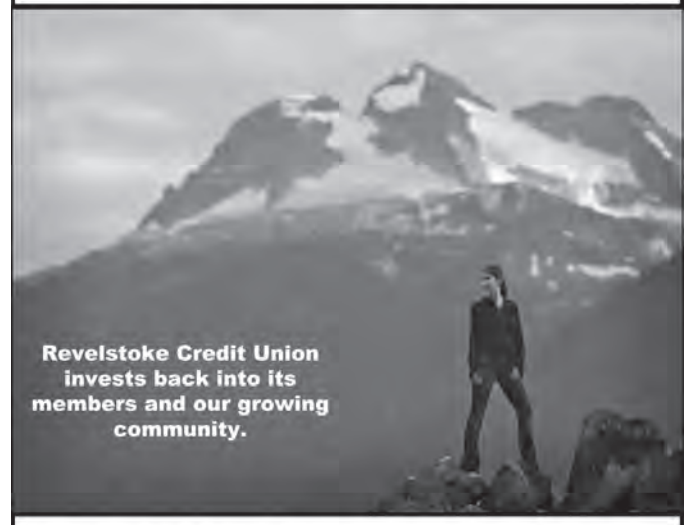

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CAF Supports Participants at ISSW 2012 & 2014

The Canadian Avalanche Foundation's ISSW Fund supports the preparation and presentation of applied avalanche research and innovative fieldwork at the International Snow Science Workshops held every two years in Canada or the United States. The ISSW Fund is intended to assist aspiring participants, particularly practitioners and others with limited financial resources, with part of their expenses, such as those associated with paper/poster preparation, travel and accommodation.

ISSW 2012 will be held in Anchorage, Alaska in September 2012. ISSW 2014 is planned for Banff, Alberta in the fall of 2014. The CAF encourages members of the Canadian avalanche community to think about making an ISSW presentation. You have time now to develop ideas and gather and analyze data for presentation.

For more information or to submit your grant application, visit http://www.avalanche.ca/caf/programs/ or contact the Canadian Avalanche Foundation office at info@avalanchefoundation.ca or 403-678-1235.

YOU ARE INVITED

CAF CALGARY GALA FUNDRAISER

The annual Canadian Avalanche Foundation Calgary Fundraiser will take place on March 1, 2012. Canadian Pacific will host the gala at the CP Rail Pavilion. Tickets are $75. Visit http://www.avalanche.ca/caf/ for event details.

CAF 2011-12 Grant Recipients

The Board of Directors of the Canadian Avalanche Foundation is pleased to announce its decision to approve funding of more than $135,000 in support of public avalanche safety initiatives in fiscal year 2011-12. In keeping with the Foundation's mission, funding will be directed towards operational programs, research, and public outreach activities.

This year's granting decisions include:

- $68,000 to the Canadian Avalanche Centre for ongoing operational support of Public Avalanche Safety Bulletins and Special Public Avalanche Warnings.
- $20,000 to the Applied Snow & Avalanche Research Chair at the University of Calgary.
- $10,000 to the Centre d'avalanche de La Haute-Gaspésie for ongoing operational support.
- $20,000 to the Canadian Avalanche Centre for start-up funding of a stand-alone Public Avalanche Bulletin for the Purcell Mountains.
- $11,450 to Dr. Pascal Haegeli for statistical analysis of avalanche hazard assessment expertise at the Canadian Avalanche Centre.
- $6,300 to Dr. Keith Nicol for ongoing support to avalanche awareness outreach in Newfoundland.

Since its inception in 1999, the Canadian Avalanche Foundation has distributed grants totalling more than 1.2 million dollars. This remarkable achievement is due solely to the generous support of the Foundation's many donors, volunteers & patrons. Thank you, everyone.

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CSGA Joining HeliCat Canada

Recent decision prompted by "a need for unification in the industry"

In October 2011, members of HeliCat Canada voted unanimously to accept the Canadian Ski Guide Association (CSGA) as fulfilling requirements of HeliCat Canada Operations Guidelines. HeliCat Canada is the standards body for helicopter and snowcat skiing operators in Canada, and its members may now accept ski guides meeting the requirements and standards set by either the Association of Canadian mountain Guides (ACMG) or the CSGA.

CSGA Level 3 Certification now meets ACMG Guide requirements, and CSGA Level 3 graduates may become Lead Guides if they meet the additional HeliCat Canada Operations Guidelines requirements. CSGA Level 2 certification meets the requirements of an Assistant Guide, and CSGA Level 1 graduates can fill other non-guiding support rules if they meet requirements outlined in the HeliCat Canada Operations Guidelines.

HeliCat Canada's Standards Committee made the decision after an extensive review of the CSGA training and certification program. "What prompted this is a need for unification in the industry," says Rod Gibbons, Chair of the HeliCat Canada Standards Committee; "It was overdue time to bring the two organizations together and recognize what the CSGA is doing in their training program."

HeliCat Canada's Standards Committee plans to work collaboratively with the CSGA and ACMG to keep improving their programs to meet the needs of the ski sector.

"Going forward, the exciting part is that the door is now open for us to have input on what goes on," says Gibbons. HeliCat Canada President Rob Rohn echoes the sentiment: "The strength of this partnership and the expertise that each party brings to the table will ensure that we continue to offer the safest, most rewarding experience for our guests," Rohn says.

Understandably, the CSGA is happy that their guides can now work industry-wide. "It's a good move that's been a long time in coming," says CSGA President Bob Sayer. "Now we can move ahead as one big industry instead of small divisions. Everybody wants good guides. The CSGA has been producing good guides, the ACMG has been producing good guides, and it's time to get things moving ahead."

There has been a false impression that this has been an ACMG vs CSGA dispute, says Sayer, which is simply not the case. "Everybody understands that guides need to work together," he says, "and the cycle of competition back and forth has continually kept both organizations improving their standards."

All see positive changes to come: "I am excited by the prospect of focusing our collective energies to making the best winter recreation experience available on the planet even better," says Rohn, and Sayer notes that "it allows us to focus on things that actually need our attention—like increasing standards, fighting red tape, land tenure issues, and safety issues."

CSGA is now equivalent to ACMG
CSGA level 3 = full ski guide
CSGA level 2 = ACMG assistant ski guide

Wren McElroy

A rare collective staff photo of the Fernie Pro Patrol enjoying a spring wrap up.
Team members: Back Row L to R: Fraser Miller, Ryan Merrill, Sheridan Morris, Dave Wall, Paul Wright, Tyler Steen, Steve Ruskay, Mark Smith, Shane Oneil, Brian Johnston, Stu Robins, Dave Aikens, Forest Latimer, Romi Binder, Matt Ouelette, Mike Tonge, Kevin Giffin
Front Row L to R: Mark Vesely, Bill Shumka, Jen Coulter and Farley, Mike Schoof, Jay Jones, Marc Ledoux, Kirk Gutzman and Lily, Tyler Carson, Steve Morrison and Mojo.

FAR Patrol

Fernie Alpine Resort Ski Patrol

Forecaster Morgan Funston inspects the crown from an explosives-controlled deep slab avalanche in the Shakey's Acres avalanche path.

Forest Latimer

Gunners Steve Morrison and Mike Tonge load the Timber Gun, targeted on the Currie headwall.

Steve Ruskay

Route Leader Steve Ruskay enjoying the fruits of the control team's labours.

Robin Siggers

By the Numbers -- Fernie Alpine Resort Ski Patrol

Number of people on the avalanche control team: **44. Our ski patrol department is our avalanche control team: two department managers, five avalanche forecasters, 16 route leaders, 14 assistants, two dispatchers, two snowmobile operators, three avalanche rescue dogs and a handful of on-call powder slaves.**

Number of CAA professional members: **12**

Number of CARDA dog teams in service: **4**

Number of avalanche paths affecting the ski area boundary: **64**

Current operational boundary: **2500 acres**

Number of avalauncher guns: **4**

Number of avalanche control sequences: **16**

Average number of charges deployed per season: **Appropriate to the conditions of the season.**

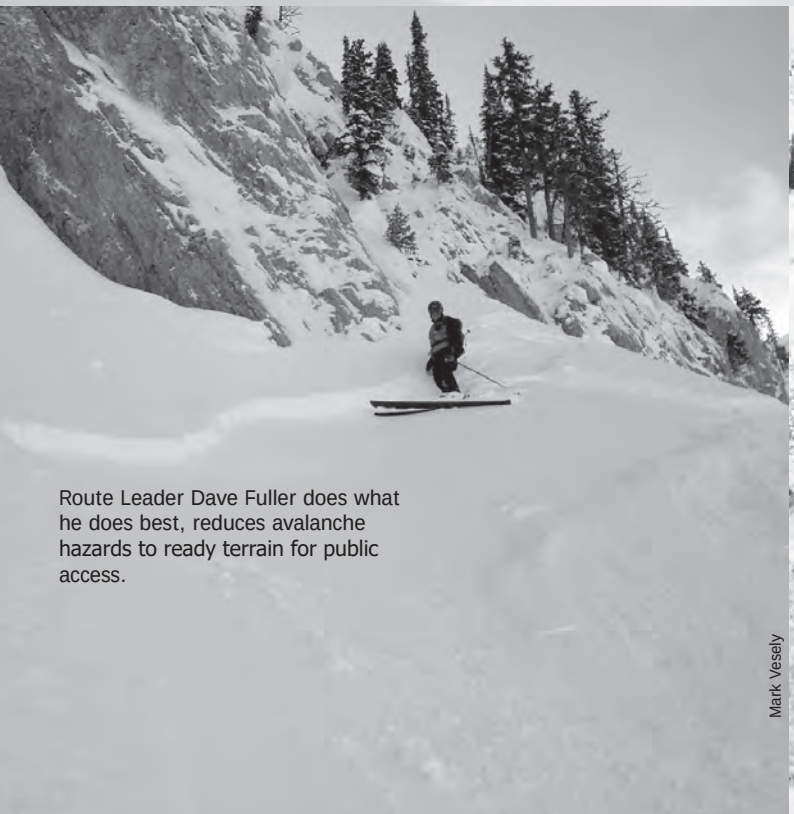
Average number of days on skis for control team: **90+**

Average snowfall: **8.75m / 29ft**

Mountain stats: **1082m vertical / 5 Bowls /142 named runs / 30% Novice - 40% Intermediate - 30% Advanced**

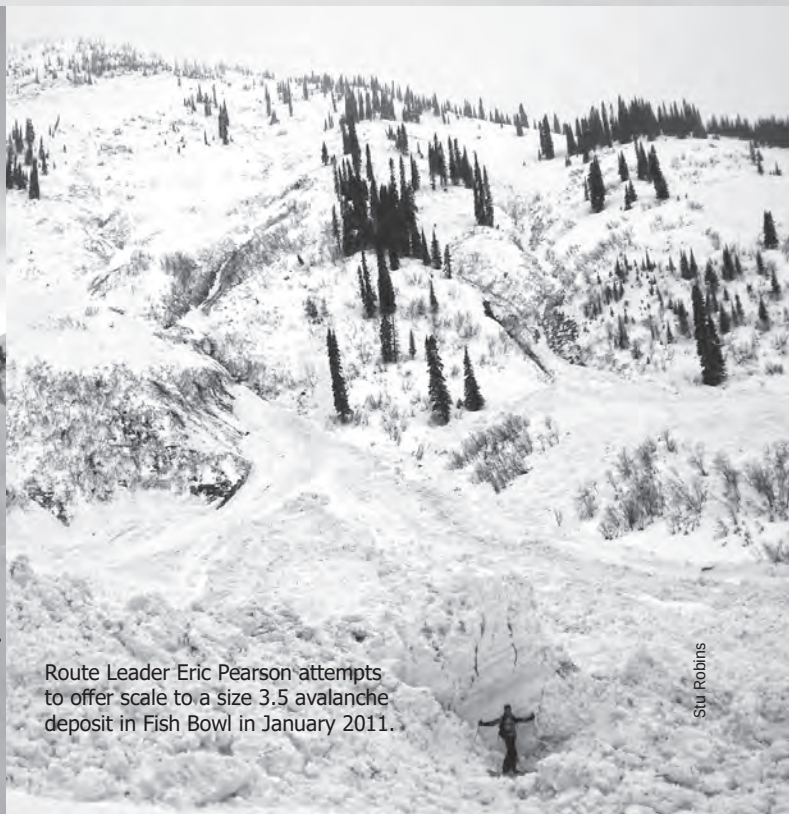
Terrain expansion: **Gradual growth into the Lizard and Cedar Bowls from 1962 to 1998. Three bowls added in 1998. New Polar Peak lift added in 2011.**

What Else?: **Fernie is celebrating 50 years as a resort. A lot of powder itch has been cured in five decades.**



Route Leader Dave Fuller does what he does best, reduces avalanche hazards to ready terrain for public access.

Mark Vesely



Route Leader Eric Pearson attempts to offer scale to a size 3.5 avalanche deposit in Fish Bowl in January 2011.

Stu Robins

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Schedule of Coming Events

April 22 – 27, 2012

European Geosciences Union, General Assembly

Where: Vienna, Austria
Info: http://meetings.copernicus.org/egu2012/

April 30 – May 4, 2012

CAA & CAC Spring Conference and Annual General Meetings

Mark your calendar: You won't want to miss any of the presentations, meetings or discussions at this year's AGM.

April 30 – May 4, 2012

Canada West Ski Areas Association 44th Spring Conference and Trade Show

Where: The Delta Grand Okanagan Hotel, Kelowna, BC
Info: http://www.cwsaa.org/index.html or e-mail office@cwsaa.org

May 4, 2012

HeliCat Canada Annual General Meeting

Where: The Ramada Inn, Pentiction, BC
Info: info@helicatcanada.com

May 21 – 24, 2012

Western Snow Conference

The theme for the 80th annual conference is: "Bright lights and winter nights—working with extremes."
Where: Anchorage, Alaska
Info: www.westernsnowconference.org

Deanna Anderson

For over 125 years, Canadian Pacific has been a pioneer of backcountry exploration, operations and safety in Western Canada. Building the railway opened up the west and helped form a nation. It also taught some difficult lessons about avalanches, and how to manage the risk in mountainous areas. CP and the Canadian Avalanche Centre are proud to continue this legacy, working together to raise avalanche awareness and making the backcountry a safer place for people to work and play.
To support the Canadian Avalanche Centre, visit www.avalanche.ca

www.cpr.ca

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CONNECTING WITH SNOWMOBILERS

Avalanche Awareness Workshops by BRP and Yamaha seed the need for avalanche education

Both Bombardier Recreational Products (BRP) and Yamaha Motor Canada held a series of avalanche awareness workshops for snowmobilers throughout the fall of 2011, and while the presentations reached new crowds, the question of how to get more riders into AST 1 and 2 courses remains.

The CAC's Snowmobile Program Coordinator Carole Savage presented the BRP Avalanche Awareness Seminar Series. Last year's BRP tour was very successful, says Savage, so BRP increased the number of Canadian venues for 2011 and expanded the program into the United States. Amber Wood of Trigger Point Snow Services presented Yamaha's Avalanche Awareness Seminars, which grew out of avalanche awareness open houses presented at Yamaha dealerships over the last several years.

Amber Wood giving presentation to sledders in Kelowna.

Terry Poirier

BRP's Avalanche Awareness Seminars throughout western Canada reached a total of 969 people at 22 venues in Alberta and British Columbia. Nine of the venues were for 2011, and Savage says feedback was excellent. Yamaha held six workshops around British Columbia with an average of thirty people at each venue, though only one person came to the Kamloops workshop.

What Savage and Wood both found was that while their audience consisted almost entirely of mountain snowmobilers, less than ten per cent of all attendees—at both BRP and Yamaha presentations—had taken an AST course. Wood notes that it is hard to convert Avalanche Awareness Seminar attendees into AST students. "I'm seeing lots of positive response but no follow through," she says. "If we see more hits on the bulletin it's better than nothing," says Wood, "but as far as taking the next step we don't see BC mountain sledders doing it yet."

Wood has been teaching AST courses for eight years, and calls this her slowest winter yet for AST sled course registration. Last year, a handful of her AST students came from BRP workshops and four or five came from her Yamaha dealer outreach talks last year, so she notes she may see some conversion next winter. Wood feels like BC sledders are several years behind Alberta in terms of making a commitment to avalanche education, and she calls Saskatchewan sledders "the hot ones right now" when it comes to taking avalanche skills training courses. Both BRP and Yamaha Avalanche Awareness Seminars focused on basic avalanche safety messaging to increase avalanche awareness, promoted checking the bulletins and pushed avalanche education. "I can see that while we have come far with avalanche awareness in the mountain snowmobile community, we still have a ways to go," Savage says. In her BRP seminars, Savage seeded the need for getting more training; she encouraged audience members to continue their quest for knowledge, and encouraged those entering bigger terrain to take an AST 2 course. Her goal was to provide the audience with some very basic avalanche safety knowledge, encourage them to read the CAC avalanche bulletin before heading out into avalanche terrain, carry the proper equipment, and take more avalanche training.

Savage took an informal poll at each workshop and found that only about five per cent of the audience had seen the 2010 presentation. These numbers are encouraging because the talks

reached a new group of people. In some BRP venues, up to 80% of audience members had been or knew someone who had been in an avalanche, while at other venues only one or two riders raised hands. Approximately 97% of audience member ride in the mountains at some point.

Amber Wood's Yamaha workshops followed a similar trajectory, dealing with avalanche trends and statistics; avalanche danger ratings; CAC information and resources; avalanche bulletins and special warnings; online resources like the Trip Planner and Avaluator; avalanche risk factors; tips for group safety; rescue basics; and the next steps in avalanche education.

Both found that a majority of riders carry the proper avalanche safety equipment, including a transceiver, shovel and probe, but some carry their equipment on their sleds rather than in their pack and some still venture out without any equipment at all.

Peer pressure is a crucial motivating factor; friends and families motivate their riding companions or family members to take avalanche skills training courses. The more sledders that take courses, the more other riders will be encouraged to further their avalanche education. These presentations are an important step in reaching the mountain snowmobiling community, but it is clear there is still much left to do to convince seminar attendees to take AST 1 or AST 2 courses.

Chelsea Willo

Packed house in Red Deer for the BRP Avalanche Awareness Workshop.

Raven Eye Photography

Sledhead Think Tank

Teck Coal also has workshops going again this winter in the crowsnest pass area with CAC Avalanche Forecasters giving talks on avalanche awareness.

Today's Transceivers

Part 3: Setting up a transceiver practice scenario

By Rob Whelan

Brent Strand

It might seem simple enough to set up a good scenario to practice avalanche companion rescue with your friends, clients or co-workers, but a few considerations will make the practice an even more valuable, positive learning experience.

The People

Avalanche rescue practice comes with a lot of emotional baggage. People fear that their lack of knowledge could be a life or death issue. Nowhere is this more apparent than in the use of the avalanche transceiver. People are emotionally attached to their transceiver; it is heresy to suggest that you do not use or know how to use one. Diffuse tension by reminding everyone that it is only practice, and they are looking for pieces of plastic rather than people. Encourage everyone to experiment and make mistakes—that is where the best learning happens. Establish a group norm that allows anyone to correct a mistake as soon as it is noticed during the practice. Ignoring mistakes as they happen or waiting to debrief after practice does not help to improve skills. Plan to practice for one hour at the most. Finish off with a simple scenario so that everyone is confident with the fundamental skill of finding a single burial.

Is your group all the same ability? Many may lack the confidence to say they are good at using a transceiver, but there is a big difference between someone who has never practiced and someone with years of experience who is just rusty. For those who grew up in the 'Analog Era' of analog beep sounds, the new digital beep sounds can be disconcerting. Reinforce that these digital sounds are simply a prompt to keep searching. It is even more challenging for someone who has only used digital technology to learn how to interpret analog beep sounds for the first time.

The Site

Make sure the site is safe from avalanches. Avalanche debris makes a great practice location, but remember that you will be there for an extended period. If a second avalanche happens, you will not be well protected and your practice targets may be found before you are. Choose a site away from known electrical interference; power lines and ski lifts are obvious, but also consider underground cables such as sprinkler systems that may cause interference. Sometimes you have the luxury of deep snow to hide the targets, but often the snow is shallow or even non-existent. Occasionally practice with the targets visible on the surface; this may help people relate the information from the transceiver to the reality they see on the ground in front of them. When it is time to hide the targets, use ten to twenty cheap plastic plant pots as decoys and hide transmitting targets under only two or three of them. Be sure to protect the buried transmitters from mechanical damage from boots and probes using a piece of wood or strong carpet over top.

The Transmitters.

Make sure the transmitters have fresh batteries in them, and (of course) that they are set to send before burial. When choosing which transmitters to hide, try to avoid using older analog transmitters (Ortovox F1, F1 Focus, F2, SOS) in multiple burial scenarios. These older transmitters still produce a strong signal, but are prone to prolonged periods of signal overlap when used together. For the same reason, also avoid using multiple older Tracker DTS devices if you are practicing multiple burials using marking functions (for more information on marking functions, see *avalanche.ca*, vol 97, summer 2011, pg 60-62). If you organize many practices as part of a rescue team, or you teach AST or Companion Rescue programs, you might consider getting a few Picos[1]. These are 457 kHz transmitters only, and can be set to emulate a wide range of modern transmitters. They are protected by a tough outer case and are a third of the cost of a regular transceiver—better than probing and stomping all over your new $500 transceiver.

The Scenario

Start the practice with a single burial. Repeat this scenario several times, concentrating on the balance of speed and precision. The airport approach[2] method is a great analogy, and when properly applied it greatly reduces the time spent on the fine search phase. Practice the airport approach until you are confident to indicate a probe location without bracketing. Work in pairs, one searching and one coaching, to help each other interpret and follow the distance and direction indicator. Keep your feet moving at all times, and avoid the temptation to drop to one knee; if you are that close, it is probably time to start probing. Finish each search with some disciplined spiral probing, even if you don't have probe targets. I often see professionals who are great at the transceiver search, but who have obviously not practiced probing enough. Probe gently using two hands, probe perpendicular to the snow surface, and be sure to step into the middle of the spiral after one revolution. Get your partner to check that the probe holes are about 25cm apart. If your transceiver has a marking function, remember that each search ends with marking the burial after probing.

When you are comfortable with the airport approach and have success on the fine search, it is time to add some complexity. Depending on the group, add another one or two transmitters, buried about 8m apart. Now that you are good at all the search phases, the emphasis should be on building a mental map of the situation as you search. Again, work in pairs—one searcher and one coach. Toward the end of the coarse search phase (before a 10m distance indication), the coach should stop the searcher and ask, "What is the scenario? Could it be only one signal?[3]" Depending on the type of transceiver being used, the searcher may have a multiple burial indication (a light or screen icon), or have alternating

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[1] *Picos are available by contacting Manuel Genswein at manuel@genswein.com .*

[2] *http://www.avalanche.ca/cac/training/online-course/rescue/transceiver-search/airport-approach.*

[3] *Avoid asking "How many signals are there?" It is easy to tell the difference between only one signal and only two signals. More than this is difficult to define with hearing or by interpreting digital distance indication.*

distance and direction indication. If the searcher has analog beep sounds available, and there are multiple burials nearby, he should be able to distinguish between only one signal and multiple analog beep sounds. Recognizing a multiple burial situation is the key to success. Once a multiple burial situation is recognized, it is time to apply a search strategy. For transceivers with a marking function, this is as simple as continuing with a good airport approach and probing, and anticipating that there will be a new search target show up on the screen as soon as the first burial has been marked. For transceivers without a marking function, it is time to practice a strategic multiple burial search method. The most reliable method is to use micro search strips.[4] The micro search strip technique is easy in theory, but in the real world it challenging to be disciplined in your application of the technique. Again, work in pairs, one searching and the other giving feedback on keeping the search strips parallel, and on when to start the fine search phase of the micro search strip (below 5m distance indication).

The wrap-up

Here are two possible exercises to wrap up the transceiver practice:

1. If you have enough snow, practice a full rotation of V-shaped conveyor shovelling,[5] concentrating on getting the spacing between shovellers correct—each shoveller should be responsible for keeping the snow moving back in an 80cm sector of the V. Keep this spacing even after several rotations.
2. Practice signal search while searchers are on skis or snowboards. Find a safe slope in the trees, hide a couple of transmitters, and call the searcher(s) down to search. This is a great lesson in balancing speed and precision. It is easy to get too low if searchers are not concentrating.

The best practice sessions are the ones where you correct the most mistakes in your technique. Do your partners a favour and be generous with your advice and corrections of their mistakes. And, of course, keep practicing.

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[4] *http://www.genswein.ch/downloads/microsearchstrips.pdf.*

[5] *http://www.avalanche.ca/adx/aspx/adxGetMedia.aspx?DocID=5c956bbb-c147-4aed-a002-6b5c1fb66a0e&MediaID=798da303-43a5-4844-870b-564d467dfa7b&Filename=Avalanche.ca+Vol84+Conveyor.pdf.*

Wren McElroy


At Teck, safety is a core value.
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What if You Know What's Next?

ASARC working on snow cover simulation in data sparse areas

By Sascha Bellaire

Canada's vast size poses some challenges when assessing snow cover stability. Assessing snow cover stability is mainly based on snow cover information and recent avalanche activity. Combining the nowcast with the weather forecast for the next few days allows one to estimate changes in the snow cover stability, and to forecast the avalanche danger. This concept may sound straightforward, but it relies heavily on two things. First, you need the information on snow cover stability for different regions, aspects and elevation bands, and secondly, you have to rely on the weather forecast.

This is where the challenge begins. The twenty Canadian avalanche forecasting regions range from 200 km^2 to over 50,000 km^2 covering a total area of 345,000 km^2. Some of these regions are data rich, meaning information is available on a regular basis and is provided by experienced persons and automatic weather stations. However, in some of the forecasting regions, like the North Rockies for example, almost no information on weather and snow cover conditions is available on a regular basis, making the nowcast and forecast impossible. Nevertheless, winter backcountry recreationists frequent avalanche terrain in these data-sparse areas, exposing themselves to a potential avalanche hazard.

I started this project in summer of 2010 and I had to answer one simple question. How do we get more snow cover information in data sparse areas? Lucky for me, Bruce Jamieson had considered the basic idea during the renewal of his NSERC Research Chair in Snow and Avalanche Risk Control and came up with a project called "Coupled meteorological and stochastic snowpack models for avalanche forecasting in data sparse areas." The following will explain the idea and first results of this project.

The basic processes of the formation and evolution of the snow cover are fairly well understood. During and after a storm, the atmospheric conditions in combination with the terrain determine the formation and evolution of the snow cover, i.e. snow metamorphism and weak layer formation. Because we understand the fundamental processes acting within and above a seasonal snow cover, researchers have developed physically-based snow cover models in order to simulate the snow cover using meteorological parameters as input data. The Swiss snow cover model SNOWPACK is one of the most advanced; this model was developed about ten years ago to simulate the snow cover at the location of automatic weather stations.

It would be great if we could send experienced people out to bring back information about the snow cover. However, this is time consuming, costs a lot of money and is often not possible due to weather conditions and local avalanche danger. In other words, when it is really interesting out there it is also often very dangerous.

Snow cover models are used to provide additional snow cover information, and this is how SNOWPACK is used in Switzerland. However, running SNOWPACK requires a weather station measuring radiation, air temperature, relative humidity, wind speed and wind direction, as well as a snow height measurement or precipitation amounts. This is where we run into a problem. Canada lacks a network of these full weather stations. In most cases the radiation measurements are missing. More importantly, weather stations are not available in data sparse areas—otherwise it would not be a data sparse area.

The solution to this problem lies in numerical weather prediction models. These models—nothing more than the weather forecast—run a couple of times daily providing all required information to force the snow cover model SNOWPACK. The Canadian regional weather prediction model is called GEM (Global Environmental Multiscale) and it provides meteorological parameters on a

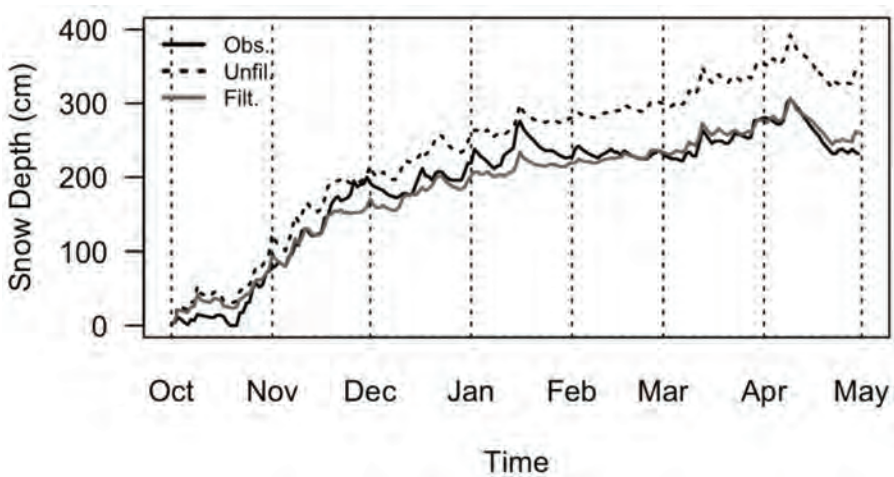


Figure 1: Comparison of observed and simulated snow depth at Mt. Fidelity Study plot. Solid black line shows the measured snow depth (Obs.) and the dashed line shows a simulation with SNOWPACK-GEM using the unfiltered precipitation forecast as input data (Unfil.). The solid grey line shows the result of a simulation after applying a constant factor to each forecasted precipitation amount (Filt.).

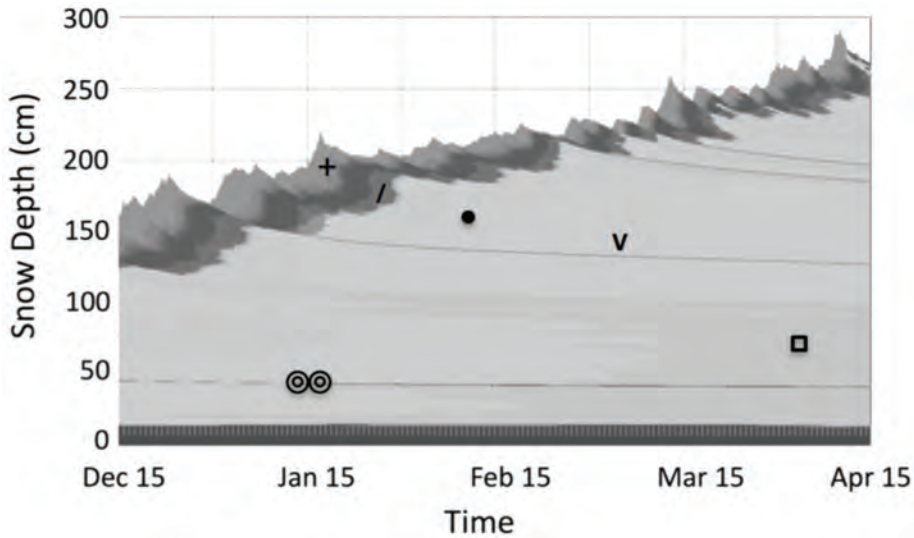


Figure 2: Snow cover simulation with the snow cover model SNOWPACK using forecasted GEM data as input. Shown is a simulation for the winter 2009-2010 for Mt. Fidelity Study Plot. Different grey scales indicate different grain types starting with precipitation particles over decomposed fragmented particles to small rounds and facets. The three grey lines above 100cm indicate surface hoar layers and the thin line around 50cm corresponds to a melt-freeze crust.

15km grid, i.e. weather data is available over North America every 15km in each direction. That means if we couple the snow cover model SNOWPACK with the numerical weather prediction model GEM, we would be able to not only simulate the snow cover and get a full depth profile every 15km, we would also be able to predict the evolution of the snow cover using the weather forecast.

Simply speaking, that is what I have done. I used the forecasted meteorological data from GEM to run SNOWPACK. Because this had never been done before, nobody knew if it would work. In addition, we all know how good the weather forecast is for the mountains. That means verification of such a model chain in a non data-sparse area with weather and snow cover information was necessary. Therefore, I analyzed weather and snow cover data from the winter 2009-2010 for a GEM grid point close to Mt. Fidelity Study plot at Rogers Pass, BC. It turned out that most meteorological parameters were reasonably forecasted by GEM, except for the precipitation amounts, which the model tends to over-estimate, i.e. GEM forecasted too much precipitation. However, this can be filtered and the simulated snow depth showed a fair agreement, considering the source of the input data (the weather forecast) compared to the measured snow depth at Mt. Fidelity study plot (Figure 1). The snow depth is of secondary interest for an avalanche forecaster. However, the new snow amounts and consequently the snow depth must be modeled with some confidence since it is relevant for the snow cover stability, i.e. how much snow is above a weak layer.

We all probably remember the winter of 2009-2010 as a very touchy winter with many surface hoar layers within the first meter of the snow cover. So what if you would have known in advance that these layers are out there? The model chain SNOWPACK-GEM allows us to know in advance what might be out there. As shown in Figure 2, most of the surface hoar layers were modeled and a comparison with a manual observed profile from Mt. Fidelity Study Plot showed a reasonable agreement of the general snow cover structure, including potential weak layers.

So what's next? It seems to work. Does this mean no more digging? Unfortunately, it is not that easy. The model chain seems to do a reasonable job for one point in the Columbia Mountains. However, Canada is huge and therefore has many different snow climates from wet to dry, sheltered to wind hammered. Furthermore, the showed simulation is only for a level site, which is useful, but we do not usually ski or sled on level sites. Therefore, simulations on different aspects and elevation bands in different snow climates are required to assess the difference, such as north versus south-facing slopes, for example. A lot of work remains.

Nevertheless, I will keep working on this together with the CAC forecasters this winter. The model chain will run on selected locations from the Yukon, over the Columbias to the South Rockies, and along the west coast over the North Rockies to the Haute Gaspésie. This setup will cover most snow climates and areas of interest. CAC field crews in the Yukon and South Rockies will provide snow cover information, and ASARC will be out there as well to gather data for detailed verification. This effort will hopefully result in a forecasting tool for data sparse areas.

Sascha Bellaire studied meteorology at the University of Hamburg, Germany. He worked on the stability formulation implemented into the current version of the snow cover model SNOWPACK for his M.Sc. thesis at the WSL Institute for Snow and Avalanche Research SLF in Davos, Switzerland. Sascha continued working at the SLF in Davos for his Ph.D. thesis for which he studied the effect of spatial variability on avalanche formation on the slope scale. He is a certified mountain instructor. He has worked as a post-doctoral fellow with ASARC at the University of Calgary since January 2010. If you have any questions, please email sascha.bellaire@ucalgary.ca.

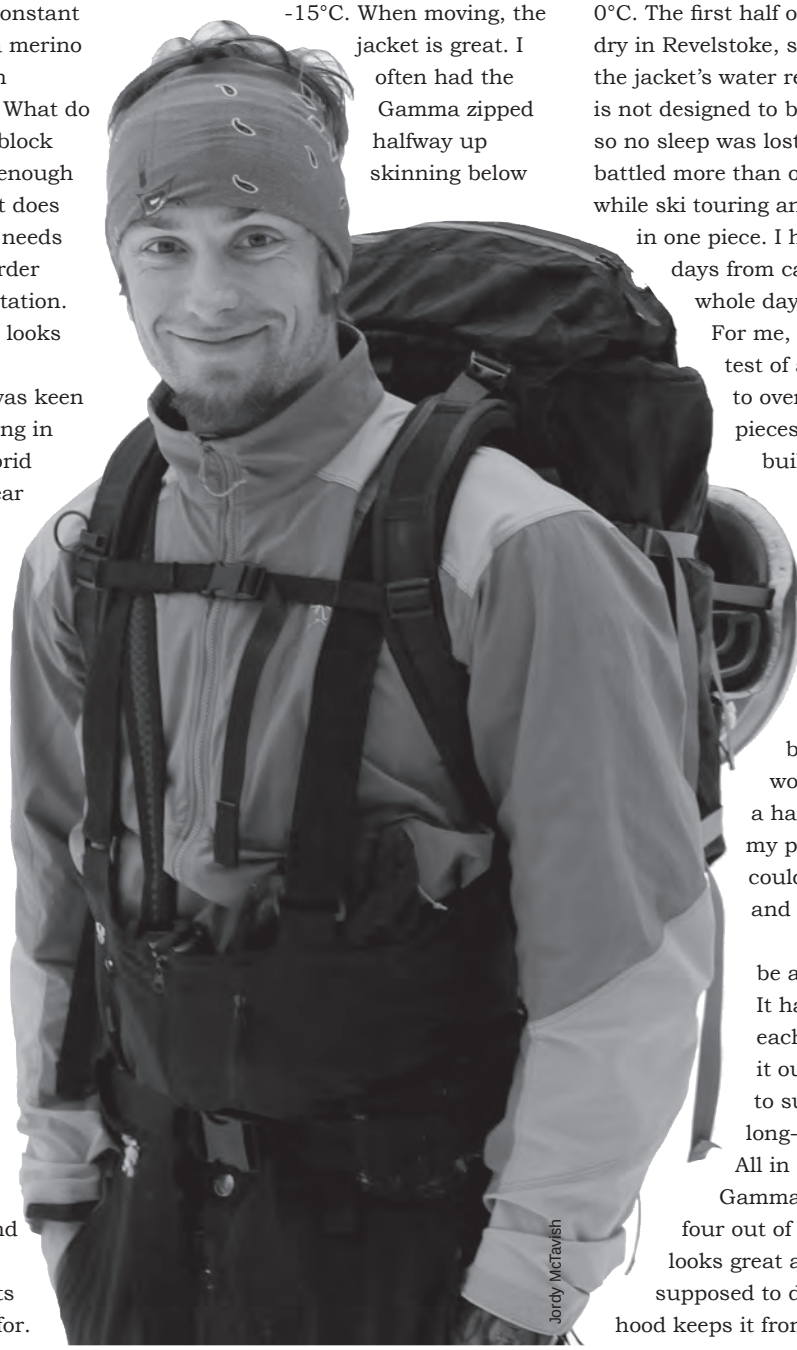
Review: Arc'teryx Gamma SL Hybrid Jacket

By Grant Helgeson

Like many of you, I have spent years in the mountains working and playing. I often change my kit based on the current conditions. Is it a hardshell or softshell day? Synthetic or down insulation? Light gloves or expedition mitts? A year-round constant for me is a windshirt worn over a merino wool t-shirt. I spend more time in windshirts than any other piece. What do I like in a windshirt? It needs to block the wind but remain breathable enough to wear during athletic activity. It does not need to be waterproof, but it needs to have a good DWR coating in order to shed small amounts of precipitation. It has to be comfortable, and if it looks good, that is an added bonus.

As windshirt power user, I was keen to test the newest Arc'teryx offering in the category: the Gamma SL Hybrid Jacket. At 5'10" and 145lbs, I wear a medium in almost everything. The Gamma is no exception. It offers an athletic fit, but has enough room that no one mistakes me for a rando racer. It is composed of two different materials: light, stretch woven fabric is used on the back, shoulders and biceps while a more durable nylon blend is used on the chest and forearms. Limestone climbing has been the demise of some of my favorite lightweight pieces, but the Gamma feels like it will be able to defend itself against the occasional sharp rock or tree branch. Both fabrics have a nice feel to them and the jacket is quite comfortable against the skin. The Gamma has a Napoleon pocket, great for holding things like Shot Bloks and keeping camera batteries warm. It also has two large hand pockets that I could not find a great use for. I tried keeping a field book in one, but I found that the breathability was inhibited and I did not like the feel of it so close to my body.

I had a chance to get out for a few early season ski tours in the jacket this fall in temps ranging from about 0°C to -15°C. When moving, the jacket is great. I often had the Gamma zipped halfway up skinning below treeline. Once I was up in the wind I would bring the zipper fully up, and the temperature regulation was perfect for me. My body is of the two stoke variety; I produce a lot of heat when I work hard. Despite this, I never overheated in the Gamma, even when trail breaking near 0°C. The first half of December was quite dry in Revelstoke, so I was not able to test the jacket's water resistance. However, it is not designed to be a waterproof piece, so no sleep was lost over the matter. I battled more than one patch of alder while ski touring and the Gamma is still in one piece. I have worn it a few days from car to car, going the whole day without taking it off. For me, that is the ultimate test of a windshirt. It is easy to overbuild one of these pieces, but Arc'teryx has built a product that is just right for aerobic, cold weather pursuits.



Jordy McTavish

The only major downfall of the Gamma is that lacks a hood. It layers better without a hood, but if it had one, I would rarely need to dig a hardshell jacket out of my pack. A hooded Gamma could be *the* jacket for light and fast missions.

I found the Gamma to be a very versatile piece. It has performed well each day that I have had it out and I look forward to subjecting it to a more long-term test this winter. All in all, I rate the Arc'teryx Gamma SL Hybrid Jacket four out of five. It is comfortable, looks great and does what it is supposed to do—only the lack of a hood keeps it from being a full five.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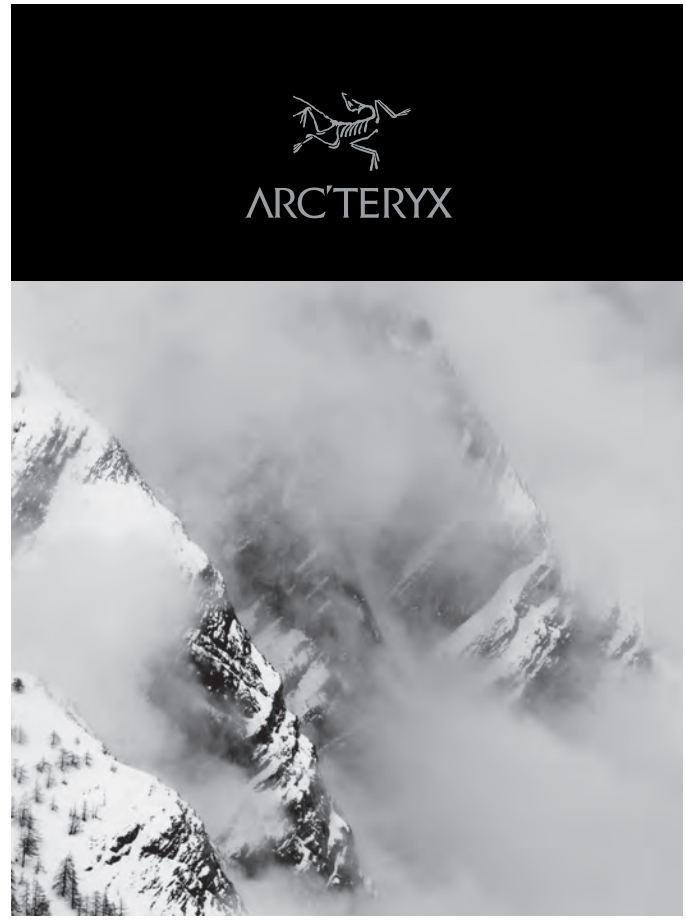
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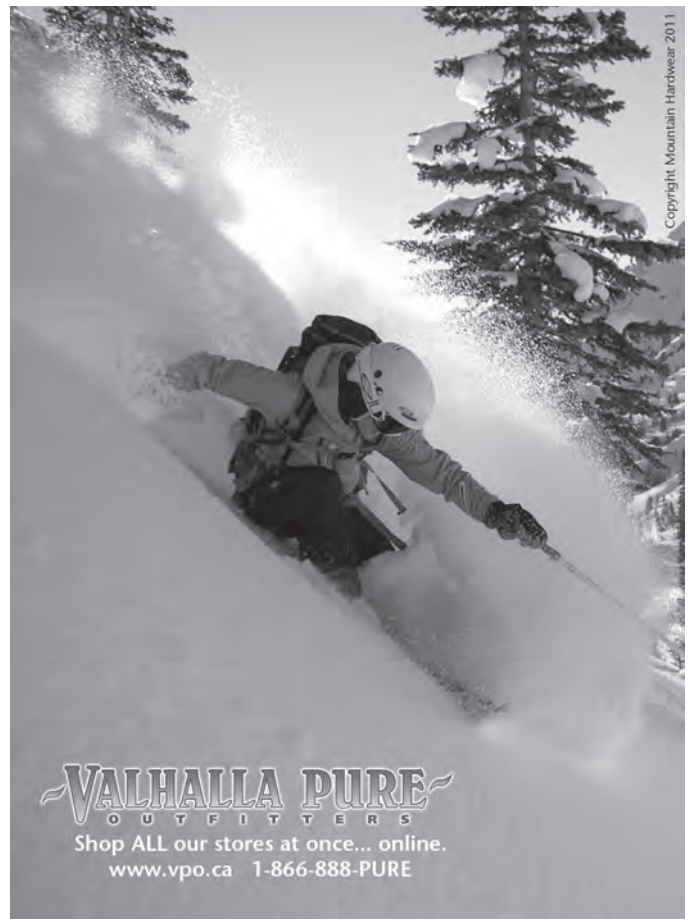
Marmot FOR LIFE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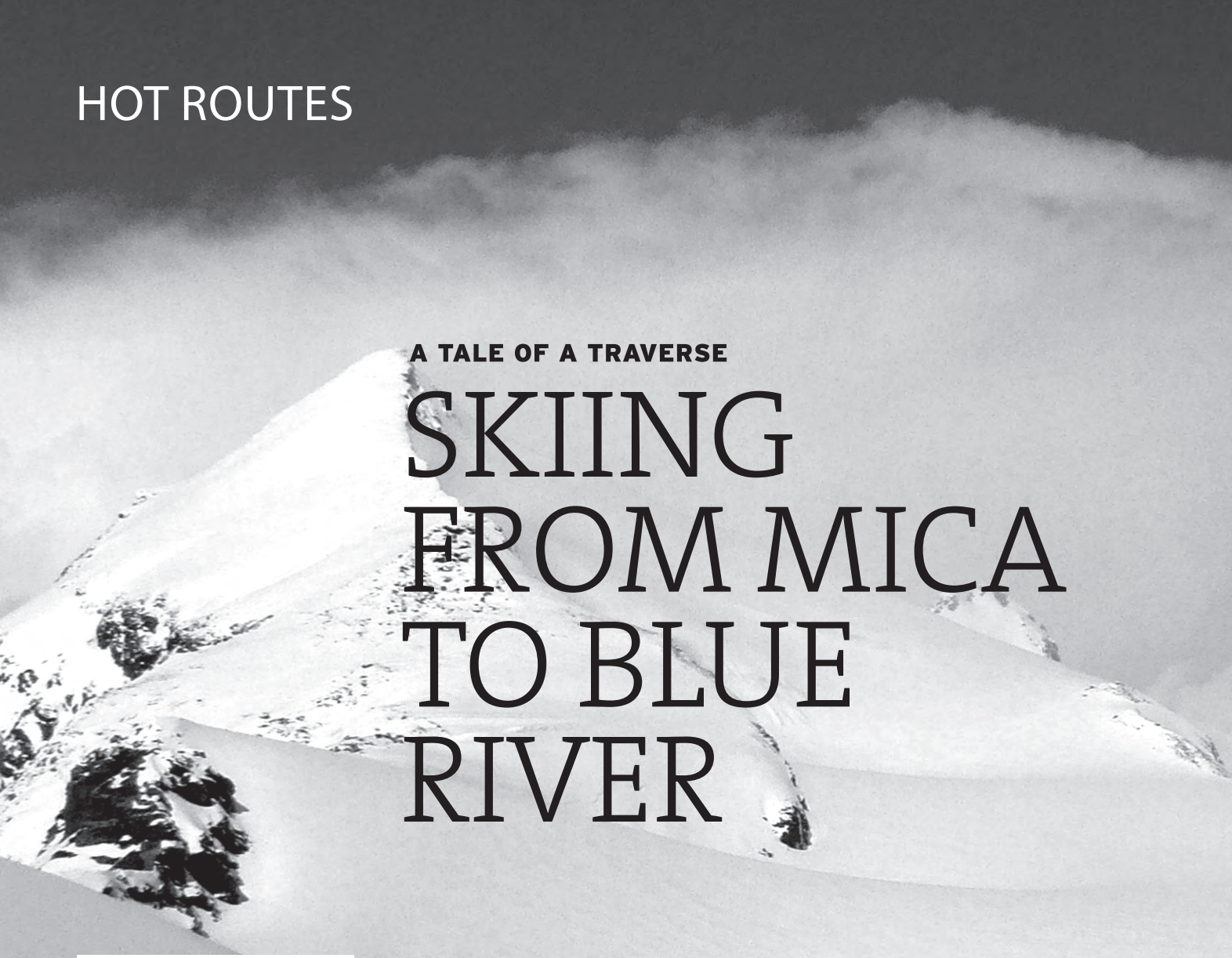


A TALE OF A TRAVERSE

SKIING FROM MICA TO BLUE RIVER

STATS	
SKIERS Larry Kelly, Bryan Thomas, Audray Ayotte, Gurpreet Chandna	
DISTANCE	81km
ELEVATION GAIN	4,700m
DAYS	7
STARTING POINT	Mica
FINISHING POINT	Blue River

DAY 1

WE SKI INTO CAMP and I do nothing to help set up. Bryan Thomas sees me hunched over and knows; I am dehydrated, pale and now dry heaving. I thought I was ready but I'm not. Downhill skiing, even in Revelstoke, and a few weekend tours are not enough. Bryan shoves my bowl of dinner at me and says, "Here, eat this. All of it." I imagine his dinner dates start much the same way. I start to feel better and drift off to sleep. I am too tired to worry about what lies ahead, or what my partners think.

I wake up feeling better. The first day of any big trip is always hard, and this is certainly my most ambitious. Our remarkably well-conceived route is Bryan's brainchild and has not been attempted. The ultimate goal is to cross from Mica Dam to Blue River, via the Hallam Glacier and Icefield, and exit at or around Blue River to the west. Style is important too; we want to stay mainly in the alpine negotiating the chain through high cols. We have all of our gear, food and fuel on our backs. Due to logistics and finances, there will be no supply caches. We've given ourselves seven to ten days for the entire mission. Joining us are fellow ski patroller and BC Ambulance friend Audray Ayotte and volunteer patroller Gurpreet "Gurpy" Chandna. Another team with a separate tent and stove is what we wanted, along with two more fools who consider this to be an enjoyable vacation.

The original plan had us exiting via the French peaks onto Blue River. Only once were we planning to drop below treeline, mid-traverse. Lacking a guidebook, the best beta we had was from Google Earth and my old friend Rooster at CMH Monashees, whose first words were, "I don't think you can do it." Undeterred, when we met with Rooster again to pore over maps, he grudgingly admitted, "You might be able to do it."

DAY 2

OFF TO A SLOW START and talking of just skiing lines above camp. Even Audray, the fittest of the bunch, had a rough night with a punctured Thermarest. We lend her packs and padding the rest of the trip. Audray and Gurpy convince us it is too early in the trip to spend a day in one spot. We move with the weather windows, stopping below a small col, our first crux. There is a surface instability, and I lead up.

I am slow but willing to go first. I am the literal greybeard of this group. It seems like yesterday I was the neophyte on a different traverse, but that is years ago. I know I will be called upon at the cruxes, but also know that there is deep experience along with me. Bryan may have a sled, but has walked many a mile in his native BC and the Yukon. Audray, the feisty Frenchie, completed an equally audacious traverse just last year. And Gurpy is just awesome, outwardly always at ease. He is the young buck and learned to ski at a young age in the Rockies and BC. He is a walking smile and gummy candy dispenser: "They're instant energy, dude."

I lead up, and cut out a small, fast-running 15cm wet slide. No panic; we are spaced out and aware. We gain the col and suddenly have visibility. We ski some debris and then some fine powder to Camp 2, struggling to make it look good with 60-pound packs. Things are looking up, but we have travelled only a few kilometres. Blue River still seems a long way from here.

DAY 3

WE ARE FINDING OUR RHYTHM. We tour past some heli stakes, and ski down a beautiful powder lap. Ever the individualist, Bryan takes a different line and mocks ours. Gurpy eats it and finds he was skiing with one boot in walk-mode, clearly a result of his overly baggy and torn pants. No matter, the powder turns have us all smiling. We are moving well now and the Hallam is getting closer. We graze the treeline, hopscotching from one side of the chain to the other to link alpine cols. Audray charges, as usual. Bryan keeps up, and Gurpy is not far behind. I ponder from the back. The hazard is low, with only surface instabilities; it is a perfect spring for ski-touring after an epic winter.

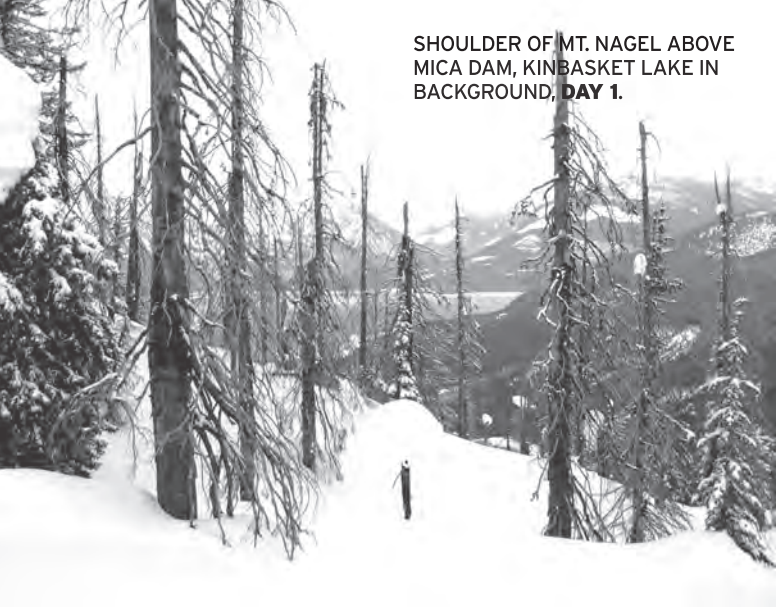
Our camp is well in the alpine. The view and terrain are equally stunning and we feel on top of the world. It is April 17, but at this elevation it feels very much like winter at -14C. Evening socializing is relegated to the tent, until our stove stops working. It is old, but Bryan assures me always trusty. It is too late to try to repair it, so Gurpy lends us his. We know we will all count on each other at some point.

DAY 4

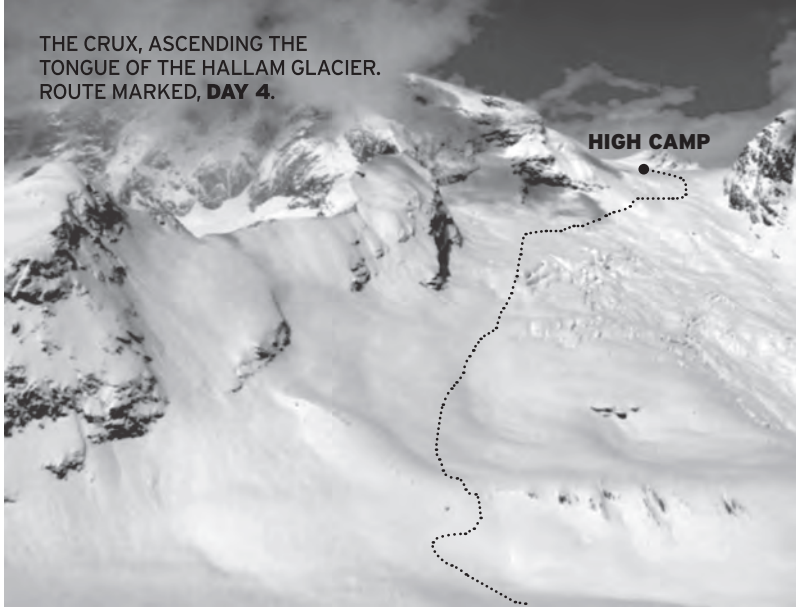
IT IS AN AMAZING DAWN, and after sharing the stove we set off to a col just above camp. The sky is radiant blue, and with the crux literally around the corner, the weather could not be better. Gurpy leads the col; it is small but steep, with variable re-freeze, and he advises ski crampons. We join him on top of the rolling ridge for our first glimpse of the Hallam.

It is big, and complex. We take photos, discuss, and encourage. It looks really broken up the guts. Right is too far, and would take us under some big slopes in the sun. Left is the straightforward line on the ice, but under some huge cliffs with hanging glaciers. There is no flat ground.

Our descent is disjointed and after a few kick



SHOULDER OF MT. NAGEL ABOVE MICA DAM, KINBASKET LAKE IN BACKGROUND, **DAY 1.**



THE CRUX, ASCENDING THE TONGUE OF THE HALLAM GLACIER. ROUTE MARKED, **DAY 4.**

turns we traverse into a small path with some old debris at the bottom. By the time we find any line, the heat of the day is upon us. It has truly turned to spring, and after three days of squalls and cold, we stop and enjoy our afternoon. There is no natural avalanche activity, but we wait for the cool afternoon of a long spring day. Bryan takes apart the stove and fixes it. We dry everything, nap in our improvised shade, and admire the tracks of a wolverine that directly crested the col behind us. We can only dream of travelling so unencumbered.

At 3 pm, it cools and we go. Audray and Bryan swap leads, and mid-glacier it is my turn. I am tired, but the progress is steady. We are moving well enough, visibility is perfect and there is at least a 5m snowpack. I cannot probe ice. I stay away from the biggest holes but feel good. In some ways my whole mountain apprenticeship has come to this. We reach our high camp on the icefield at 2460m; we have an hour of light to build camp and the temperature drops fast. We dig and set up, but my slow pace means we are all cold. Audray asks for help with her zipper after digging out a platform because she can't feel her fingers. Finally, dinnertime! Gurpy's stove won't light. Suddenly the time Bryan spent fixing ours seems even better spent.

DAY 5

IT IS A LATE START AFTER A BIG DAY, and getting out in the cold is always hard. We lounge in camp. Gurpy's Clif Bars and leftover Backpacker's Pantry look terrible for breakfast as Bryan and I sip coffee and mull whether to add cranberries or red currents to our oatmeal. No wonder Audray is on her own food program. Gurpy is probably the first Indo-Canadian to set foot here, but surprisingly there is no media.

We tour across the icefield. If there is anything as amazing as this I don't know it. It is quiet, sunny and majestic. Hallam, Milton, Deception and Foster: all the surrounding peaks astound. The high camp is behind us, the weather is good and the terrain flat. We consider staying another night to summit a peak, but we press on or risk possibly being pinned down by bad weather.

On the web it looked like the edge of the icefield had a rounded shoulder, but those were summer images from a satellite. Up close things are different. We peer down, the weather worsening. Audray looks for a way to down climb or ski but we see a gaping crevasse beyond the cliff below us. Talk turns to lowering packs with a rope, and we know we must look for another way. We skittle along the edge of the bowl and slither off the icefield slightly farther north. What should be an easy descent is a series of bewildering whiteouts permeated by brief windows, and lunch tucked under a big cliff. We are drawn too far left but eventually find a small gully feature to bypass the cliff band near the valley bottom. The gully is later nicknamed the "Keebler Scootch," named for my elfin ability to descend with no grace or technique.

It is snowing hard as we get into camp. We nailed the crux and are only 30km as the crow flies from the highway. But we are wet, and the French peaks range looks daunting. It is decision time.

Mud River is an option, but means close to 40km of river bottom, direct to Blue River. The French range would be another major glacial crux. Thoughts of sandals, summer jobs and climbing make a quicker exit sound good. So we opt for door number three, the Bone Creek drainage. Taking us farther north, the photos of Google Earth showed cut blocks, so there must be a road.

DAY 6

WE SHOULD GET OUT, or at least to the logging road. We cross the col below the French range, and look for a way to drop in to Bone Creek. We hear a helicopter; we're in Mike Wiegele's terrain. A group skiing the range across from us is having a very different day in the mountains.

We drop below the col and the first few hundred metres are fine skiing, but suddenly the creek bed becomes a waterfall. The map appeared to show benches to the right.

JUST BEFORE THE WEATHER WORSENED, PREPARING TO EXIT THE HALLAM ICEFIELD, **DAY 5.**

THE LAST OBSTACLE, THE DESCENT IN TO BONE CREEK, **DAY 7.**

We traverse and traverse, continually gaining elevation. Cliffs, big ones, confront us. Audray, with limitless energy, leads through the forest. Bryan and I are losing faith in the route, but Audray is far ahead. Bryan and I complain that we should have backtracked, but we follow her tracks with an occasional glimpse of Gurpy. Neither of us feels like breaking trail.

We find them in a sunny clearing setting up camp. We are all tired, and Bryan and I are grumpy. Today is my girlfriend's birthday, a milestone at that. Audray settles us down and helps us accept a good decision to stop. Gurpy, unruffled, shows he is wise beyond his years. We soon turn to the game we have brought. It is rolling pigs, a dice-like game where two pigs are rolled and fall into various positions for different scores. We smile again, and after some "snouters", "double razorbacks" and "leaning jowlers" Bryan is crowned Bone Creek Pig Champion. Once again, there is no media.

> Lacking a guidebook, the best beta we had was from Google Earth and my old friend Rooster at CMH Monashees, whose first words were, "I don't think you can do it."

DAY 7

BLUEBIRD. We tour a little higher to the ramp to get a gorgeous look around us. They tell me I have just missed a mountain goat, a good omen in my book. He leads the way, his tracks headed down the ramp. We finish the trip with a fantastic descent; a nice shaded tree run with fine powder turns leads us to the logging road before noon. It is only stamina now required to finish.

A curious mix of relief and melancholy washes over me. The adventure is coming to a close, but it is like somebody turned off an intensity switch. I begin to think of the "real" world as I put one foot in front of the other. Audray and Bryan are charging like horses for the barn. Gurpy is now at the back with me, and we share the last of my bread, salami and cheese. Gummies aren't always enough.

We round a bend and the road is plowed. There is a small hydro dam, but nobody in sight. Gurpy and I put our skis on our packs and begin to walk. My feet hurt now. Suddenly a truck appears, and the driver offers us a ride. We hesitate, but he tells us Audray and Bryan have already accepted so we can say yes without getting mocked. Once inside he shakes his head and asks, "Mica to Blue River? Are you nuts?!" We strike up a conversation, and find Audray and Bryan with our driver's colleague several kilometres down the road. John offers to drive us all to Blue River to call our ride. Once in town, John's wife of 49 years insists we come in to use the phone, so long as we pose for a photo. Although we can barely contain our enthusiasm for cookies and juice, we kindly do not take off our boots.

Our ride is unavailable, a contingency we had not planned for. We have a car in Kamloops and John and his wife offer to drive us there. I don't think a stranger has ever done anything so kind for me in all my life. We cram into John's big truck, and head to Kamloops. With full bellies and a full gas tank as our thanks, we bid farewell to our new friends from Blue River. Exhausted, we head to Revelstoke and arrive after midnight. Happy to be home, I sleep a long dreamless sleep.

Larry Kelly is a professional member of the CAA, and has pursued his passion for skiing, snow and mountain safety on three continents. He lives in Revelstoke, BC with his most patient partner, Christine. He enjoys long walks.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Do you think that Canadian law should require skiers and snowboarders heading out of bounds to carry avalanche safety equipment?

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Deadlines for submission:
February 1 (spring issue)
July 1 (fall issue)
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Should Avalanche Airbags Be Considered Best Practice For AST Instructors?

By Chuck Gorton

In the interest of full disclosure, my company distributes the Snowpulse avalanche airbag system in North America. I am also a professional member of the CAA and have been an AST instructor for approximately ten years, instructing both skiers and snowmobilers. I have also heard more comments—both negative and positive—about airbags than almost anyone else on the continent.

This fall, as part of the CAC's new Companion Rescue Skills instructor training program, I was asked to talk about products that we represent and distribute: Mammut avalanche transceivers and Snowpulse avalanche airbags. Perhaps not surprisingly, the beacon expertise was relatively high. Most students had used a Barryvox Pulse before and had a solid understanding of how it worked, though I was able to teach a few things. What I found surprising was that most course participants knew very little about airbags and had never used one, particularly those teaching skiers.

It is my job to know this stuff, but it is also the job of avalanche instructors to keep up to date on new technologies in our field. Educators and professionals have an impact on the habits and attitudes of their students, including what they use for safety gear. In my professional opinion, I believe that every AST instructor should use an avalanche airbag when teaching a course, and that not wearing one while teaching is unprofessional and perhaps even irresponsible.

Here is the reasoning that leads me to conclude that AST instructors should wear airbags while teaching:

1. Avalanche airbags are an extremely important safety tool for novice recreational backcountry users, such as those taking AST courses.
2. Recreational backcountry users are much more likely to use an airbag if their instructor is wearing one.

Let us explore point one. Airbags are an important tool for recreational backcountry users, including snowmobilers, off-piste skiers and ski tourers. Airbags significantly reduce mortality, and there are no significant logistical reasons why they should not be used.

Pascal Haegeli is currently undertaking a study on airbag experiences in Canada that will be released close to the publication of this journal. Most airbag studies are European, where there is a lower rate of avalanche fatalities due to trauma because there is considerably less tree skiing. Jeff Boyd found in his 2009 study "Patterns of Avalanche Fatalities" that 24% of avalanche fatalities in Canada were due to trauma, compared to roughly 5% in Europe. I think it is reasonable to assume that for the other 76% of avalanche fatalities in Canada due to asphyxiation, airbags will work similarly to how they do in Europe. I expect that Haegeli's study will show a positive Canadian airbag experience.

European studies show that avalanche airbags are highly effective. In a 2007 study "The Impact of Avalanche Rescue Devices on Survival," it was found that mortality rates were significantly lower in those equipped with an avalanche airbag compared to those without, "corresponding to a relative reduction in mortality of 91%."[1]

The 2002 study Analysis of Avalanche Safety Equipment for Backcountry Skier had similar results; it noted that the ABS avalanche balloon system significantly decreases mortality, and encouraged its use as "the safety equipment of choice."[2]

There is more circumstantial evidence. The International Commission of Alpine Rescue (ICAR) has recommended airbags as the safety device of choice. It is important to note that when ICAR calls the airbag the safety device of choice they are recommending it over any other avalanche safety equipment, including the transceiver, probe, and shovel which we promote as essential backcountry safety equipment.

The British Columbia Coroners Service made recommendations to WCB and to the CAC to evaluate the efficacy of airbags, based on an incident where the coroner believes an airbag had a major impact on saving several lives. Airbags are widely used by many professional operations in BC. In addition, the CAA has purchased airbags for ITP instructors to use if they wish to do so. Finally, there are several first hand incidents in Canada where individuals caught in avalanches believe that an airbag had a major influence on saving their life. So yes, airbags work. Particularly appealing to novices, avalanche airbags are the only piece of safety equipment that are designed to save the user regardless of the skill, knowledge, or fitness of companions, and airbags are very simple to use.

Now, are there any significant logistical reasons why airbags are not being widely used and promoted by AST instructors? I asked many AST instructors why they do not use an airbag and the primary answers were weight and cost. To me, those are not significant reasons to not use an

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[1] *Brugger H, Etter HJ, Zweifel B, Mair P, Hohlrieder M, Ellerton J, Elsensohn F, Boyd J, Sumann G, Falk M., The Impact of Avalanche Rescue Devices on Survival. Resuscitation. 2007 Dec; 75(3): 476-83. Epub 2007 Aug 6.*

[2] *Brugger, H., and Falk, M. Anaylisis of Avalanche Safety Equipment for Backcountry Skiers. Austrian Association for Alpine and High Altitude Medicine. 2002.*

avalanche airbag while instructing an avalanche course. The additional weight of an airbag and the cost is not so inhibiting that most avalanche course instructors cannot use one. Tens of thousands of people use them every winter, including many professionals in Canada. The additional two to four pounds of weight on an AST field day are not a big deal. The cost, while expensive, is close to what one pays for a pair of skis and will last just as long. If you are teaching AST courses they should be treated as part of your professional equipment.

The major argument I receive is one of risk compensation theory: it essentially asks whether it is worth promoting airbags when their users may take more risks. It is true that some percentage of the population will certainly take more risks because they are wearing an airbag. People routinely take more risk because they wear a helmet, wear a transceiver, or have a bunch of professionals close by to rescue them. However, those measures generally increase overall safety. The majority of my AST students take risks already: they are off-piste skiers skiing steep slopes out of bounds of Kicking Horse, and snowmobilers who have spent a few years charging all over at 50mph.

In my experience, most AST students have some backcountry experience, and are not planning to stick to solely simple terrain in the near future. Fat skis, ski movies, and 800cc engines are changing the game. As AST instructors, we need to recognize this change and realize that a lot of students are learning in a very different way than we did five, ten or twenty years ago. Even if a person does everything right, avalanche risk is not always completely mitigated; professional avalanche incidents occur regularly. Avalanche science is not exact, bulletins are not always correct, and unknowns can lead novice decision makers into avalanche incidents. And we have not even touched on the human factors involved.

Please recognize that I am not advocating that all professionals use an airbag when they are not teaching. Risk and decision making when you are not instructing is a personal choice. I have backcountry skied many times without an airbag, and occasionally without a transceiver, probe, shovel or friends. But when I am instructing AST courses, I always wear an airbag, always have a beacon, always do a beacon check, always cross slopes one at a time, am always ultra conservative, and always do a lot of things that I may not always do on my own time. Why? It is because I want to promote best practices and give my students the best set of tools possible for their level of decision making.

I believe that when their AST instructor does not wear an airbag, it signifies to students that it is not really necessary to wear one. We have seen that airbags work. For snowmobilers, off-piste skiers, and backcountry skiers that can afford it, it is potentially a life saving device. Avalanche instructors should be promoting their use and wearing one is the best way to do that.

Let me conclude with a scenario: after teaching a two-day AST course to an average student, you must follow him and his friends on their backcountry adventures for the next week with your mouth taped shut. You cannot give any input into the group's decision making. You follow them up and you are the guinea pig on the way down. Do you want an airbag now? I do. Personally, I have little confidence in the abilities of my students after a two-day course. It is not because I am a bad teacher, it is because students cannot learn as much as I know in a weekend, and I know that I don't know everything. I believe that AST courses and instructors should heavily promote airbag use to novice recreationalists because many of those novices do not prepare ahead of time and do not have effective decision making skills in the field. Avalanche airbags are pieces of safety equipment that do not rely on others, and have been proven to be highly effective in certain situations. We teach courses for the students, not for ourselves: professional AST instructors should demonstrate best practice for novice recreationalists, which should include wearing an airbag.

Chuck Gorton collection

Transitions


Jeff Colvin


Joe Lammers collection


Grant Helgeson collection

Julie Matteau
Interim Client Services - CAA

Julie Matteau recently joined the CAA in the role of Interim Client Services. Hailing from Grand-Mère, Québec, Julie relocated to Revelstoke, BC three years ago. Julie is interested in "mostly everything that ends with 'ing'"—skiing, climbing, mountain biking and anything that lets her be in the mountains, so Revelstoke was a natural choice.

Julie's degree in Business Commerce from the Université du Québec à Trois-Rivières has lent itself to a varied career in retail, payroll, human resources, and some trail building and construction, and then to the CAA.

Julie has always respected and valued the CAA and she already loves working for the organization: "I work with great people in a great work environment," she says.

Joe Lammers
Public Avalanche Forecaster - CAC

Joe Lammers came to Revelstoke, BC from Whistler, BC, and he jokes that he holds a M.G.A.S. (Master's of Gravity Assisted Sports) from the University of Whistler.

He did avalanche control for twenty years at ski resorts in Whistler, Chile, Argentina and New Zealand before moving to Revelstoke to run the ski patrol at Revelstoke Mountain Resort. He has a varied risk management background in the outside world. Joe's passions include skiing and ski mountaineering, whitewater sports, travel, music and building his home in Revelstoke.

Joe loves his role as Public Avalanche Forecaster for the CAC because of the people: "There's always a good energy in the office and the experience base of my coworkers is deep and varied," Joe says, and he notes that "the end result is an environment where I'm inspired to be the best I can be."

Grant Helgeson
Public Avalanche Forecaster - CAC

Grant grew up in Missoula, MT and has spent his last four years splitting time between Salt Lake City, UT and Hinton, AB. He went to Business School at the University of Montana, and shortly after graduation moved to Alberta where he took his Avalanche Operations Level 1. He completed his Level 2 last season and has spent four years as a senior forecaster at the Utah Avalanche Center. He also investigated avalanche accidents and fatalities, trained county SAR teams, spoke to school groups and working on the business side of the UAC as well.

Avalanche forecasting is Grant's "absolute passion," and he loves having "a career where I can be both investigative and social." He looks forward to new challenges: "I could be forecasting for any number of the 12 forecasting regions on a daily basis," he says, and is happy to "learn from all the experienced forecasters and avalanche pros in the great white north." Grant loves ski touring and sledding, and in the dry season he fights wildfires, climbs, bikes and hunts.


Anne Cayer-Huard

Eirik Sharp
Avalanche Field Technician - Yukon

Eirik Sharp came to Canada twelve years ago, and was excited to make the move to Whitehorse to join the YAA team. Originally from Norway, Eirik lived all over the world in his youth and spent the last six years in Golden, BC. He has a B.Sc in Mathematics from the University of British Columbia

Eirik started his career in the avalanche industry as a ski patroller and avalanche technician at Kicking Horse Mountain Resort, and has worked as a field research assistant for the UBC Avalanche Research Group in Rogers Pass. In the summers, he works as a mountain safety specialist and rescue technician for Global Mountain Solutions, and loves playing in the mountains. He's a skier, kayaker, fisherman and photographer.

Eirik looks forward to developing the new forecasting region in the Yukon: "The YAA have done a tremendous job of raising the funds and setting up the logistics for this project, and so far we have received warm welcomes from the Yukon's backcountry skiing and snowmobile community."


Justin Abbiss collection

Justin Abbiss
Assistant Avalanche Field Technician - Yukon

His new position with the YAA/CAC "culminates a love I have for travelling in the mountains," says Yukon Avalanche Field Technician Justin Abbiss, "while also making use of all the avalanche training I have gained in the past six years. " Justin was born and raised in Caledonia, Ontario, and now splits his time between Salmon Arm, BC in summers and Whitehorse, Yukon in the winter.

Justin has a background in Environmental Science and Outdoor Education and has worked as a ski patroller, a tail guide and a snow safety officer. During the summers, he is a forest fire fighting rappel crew leader. He volunteered time in 2011 to train ski patrollers in Kashmir, India in snow safety, avalanche control and first aid.

Justin looks forward to working for a relatively new organization: "I am really excited to be on the ground level of the new Yukon Avalanche Association and be an integral part of its growth and success over the next few years," he says. "All the people involved are extremely motivated and excited about the program. I feel fortunate to be a part of that."

Justin loves adventure, travelling, new cultures, exploring new mountain ranges, rock climbing, mountain biking, skiing, "and the odd game of pond hockey."


Colin Smith

Dave Tracz
Assistant Avalanche Field Technician – South Rockies

Dave Tracz hails from Burlington, Ontario and is calling Fernie home for the 2011-12 winter season, though he jokes that he'll live anywhere he "can make money skiing." Dave joined the CAC this season as an Assistant Avalanche Field Technician in the South Rockies region, and looks forward to working and learning with a "knowledgeable group of professionals." He relishes the winter ahead of him: "I'm excited to be given keys to a sled and told to go skiing. I can't think of a job that I would prefer to have."

Dave is completing a M.Sc. from the University of Calgary's Applied Snow and Avalanche Research Centre. Prior to joining the CAC, he worked as a municipal engineer. He loves skiing and snowboarding, climbing, and spending quality time with his friends and family.

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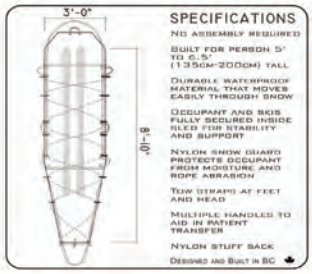

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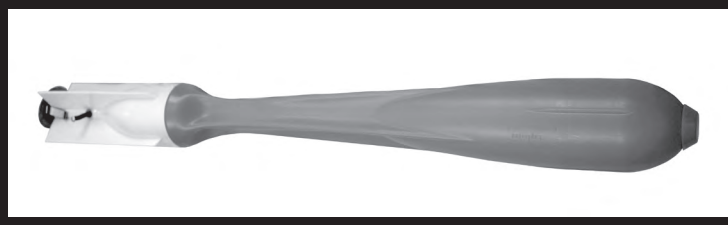

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