AVALANCHE news

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inside

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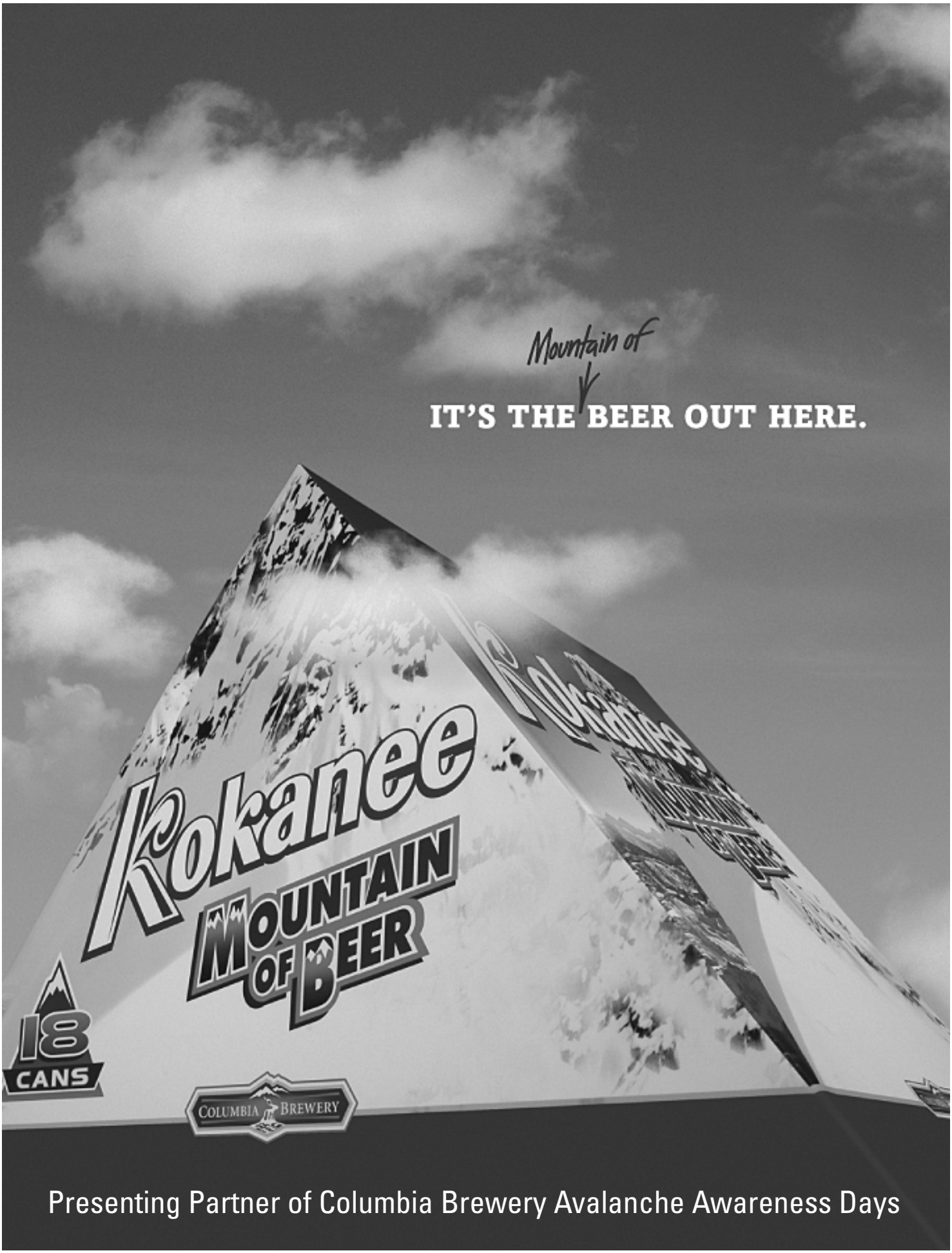

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Avalanche News Volume 69 ❄ Summer 2004

Avalanche News is the official publication of the Canadian Avalanche Association, a national non-profit society based in Revelstoke, BC. The goal of *Avalanche News* is to keep readers current on the issues and happenings affecting avalanche safety in Canada. It is published quarterly.

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

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Note: Digital contributions work best for us. For details, contact Brent Strand at publish@avalanche.ca.

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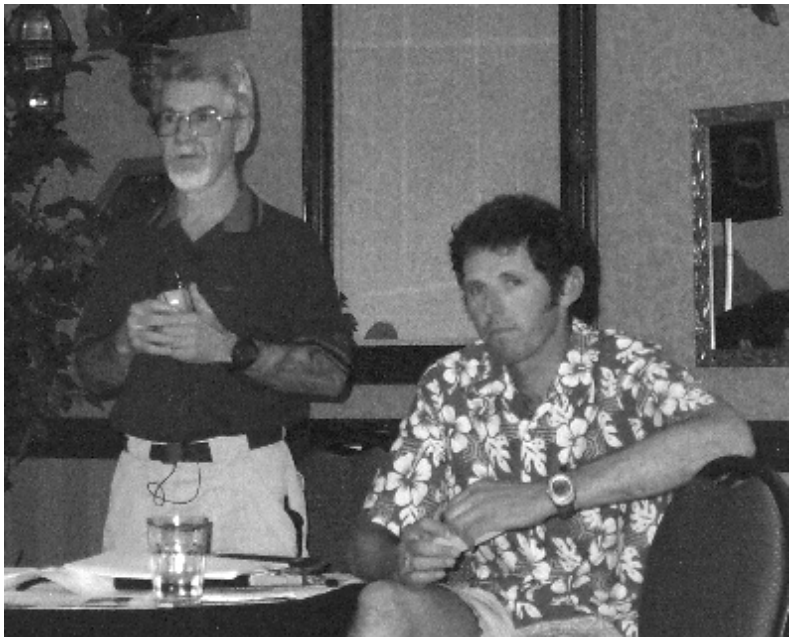

The new president of the CAA, John Hetherington, and outgoing president Bill Mark.

Editor's View

If anyone had told me what this part-time job was really going to entail, I'm not sure I would have believed them. It's been an incredibly busy spring and though summer may be the off-season for avalanche work, there's little sign of any slowdown at the CAA. There are a number of projects underway and it's almost business as usual, only warmer. OK, there's one little difference—there's a construction project underway in the front entrance. You can find out what that's all about on page 32.

Other construction plans include the new responsibilities of the Canadian Avalanche Centre. Some important details have been hammered out and you can read about them in the Executive Director's Report (page 6). The CAC is taking shape this summer as a number of projects within its mandate begin to gel. We'll have a lot more information for you on that front in our fall issue. For now you can read what the CAA sent to the media earlier this year (page 10) and see what our ED had to say in a recent public presentation about the project (page 11). Needless to say the CAC remains on top of the agenda and continues to generate loads of excitement as we explore its potential.

Back in May, the CAA's annual general meeting in Penticton generated its own excitement. We've got full coverage of that event for you in this issue. For those of you who couldn't attend, check out the list of donated goodies provided by our sponsors for the silent auction (page 15). There was close to $10,000 worth of fantastic products up for grabs. But you've got to play to win, as they say, and you no-shows missed out on some great deals. Of course, the auction wasn't the only reason to attend. There were some fascinating presentations, thought-provoking workshops and good discussion all around. For the official record, we've got minutes from day one of the public and technical meetings beginning on page 36, thanks to scribe extraordinaire Sue Hairsine. We'll have the remainder of the proceedings in our fall issue. Until then, page 44 has scenes from the AGM, and on page 34 you can see the winning images from the CAA's first annual photo contest.

Later on in May, I attended another conference in Penticton. This one was the annual gathering of BC Broadcasters. Representatives from almost every public radio and TV station in the province were there and I took the opportunity to introduce the CAA as a potential partner in the regular delivery of avalanche risk information. The mainstream media is a powerful tool and our association will be using it much more effectively in the future. My main focus at that conference was to present the idea of a daily, simplified avalanche risk assessment that would be made available to the media in the same way they access weather forecasts from Environment Canada. The enthusiasm for the concept was unanimous. Members of the CAA and Parks Canada will be working hard on this project this summer and we'll have more on its progress in the issues to come.

In this issue we're introducing a new section that will hopefully become a regular feature. *"Profile"* presents a feature interview with a CAA member. Our inaugural subject is Pascal Hägeli, project manager for the Avalanche Decision Framework project. Turn to page 31 to find our more about Pascal and why he's been chosen to lead this exciting venture. If you have an idea for someone you think should be better known in the avalanche community, feel free to drop me a line. My e-mail address is editor@avalanche.ca.

This year's CPD session at the AGM was another well-attended event with a lot of opportunity for learning. The theme was "Responding to a Rescue" and the list of speakers provided a full overview of the best practices in avalanche emergency response. It was an excellent group and personally, I was riveted. One of the things that jumped out at me was the similarity I found between two of the presenters. Chris Brown is a CBC reporter who spoke about the media's role in avalanche accidents. Bob Stair is one of the senior coroners for BC and his talk was on the coroner's investigative role. Both of these jobs are often seen as necessary evils. And each, perhaps not surprisingly, had similar insights into dealing with avalanche accidents.

Both Chris and Bob mentioned the challenges they and their colleagues face when reacting to avalanche accidents. Chris took a question from the floor asking if reporters EVER learned anything from these incidents, while Bob made joking reference to coroners "in their Gucci shoes" disembarking from helicopters onto remote avalanche sites. Each of them made the point that their jobs are unusual and demanding. For coroners, their next investigation could be a drug overdose, a murder or a drowning. For reporters, their next assignment could be mad cow disease, terrorism or a hurricane. In effect, they both have to know a little bit about an incredibly wide range of topics. Their jobs force them out of their element every day. Not everyone can meet that kind of challenge and it's important to realize the people who can, deserve some respect.

I know my own media background provides me with more than a little sympathy for my former colleagues. I had never thought of coroners in the same way but I see now the challenges they face are much the same. The message I heard is these people are professionals. Within that description there's a wide range of ability but rarely negligence or malice. They want to get it right. And if you can appreciate some of the challenges they're facing, and maybe take a moment to offer some education, perhaps next time you could be the one to help make sure they get the story straight.

Hope you enjoy our summer issue.

Mary Clayton
editor@avalanche.ca

Executive Director's Report

BY CLAIR ISRAELSON

Professionalism in the Canadian Avalanche Association

Earlier this spring the CAA retained Peter Zyla, an MBA program instructor at the University of Calgary, to help us prepare a strategic plan to focus and guide the CAA's operations for membership, schools, industry services and public avalanche safety programs. We worked through an analysis of strengths, weaknesses, opportunities and threats and identified the specific things the CAA would be doing in 2004-05. As we did this, Peter asked us "what one word captures everything the CAA is trying to do this year?" We were stumped. We'd never tried to capture everything we do in one word.

Peter's response was "**Professionalism.**" We looked at each other, smiled, and all nodded agreement. It makes sense. In 2003 the CAA membership revised our mission and vision statements. Professionalism is the CAA's first commitment.

Mission Statement:

"The CAA is dedicated to bringing the avalanche community together to develop knowledge and understanding of avalanches, facilitate communication, promote professionalism, and provide quality avalanche education."

Vision Statement:

The CAA is Canada's national organization promoting avalanche safety.

The CAA is a non-profit society that will:

- *Promote professionalism in Canadian avalanche safety programs*
- *Enhance and promote public avalanche safety programs through partnerships with the private and public sectors*
- *Facilitate information and technology transfer*
- *Develop, maintain and deliver avalanche education programs*
- *Promote avalanche research and development*
- *Ensure value of membership and encourage participation*

This year everything the CAA will do is tied to achieving our mission. Here are a few of the highlights of the CAA's commitment to **promote professionalism in Canadian avalanche safety programs.**

"promote professionalism in Canadian avalanche safety programs"

Our Board of Directors has just completed a two-day Board Development Workshop in Canmore, sponsored by Alberta Community Development, Grant MacEwan College and The Wild Rose Foundation. This workshop provided the board, committee chairs and CAA managers with a common understanding of best practices for non-profit governance, so that we all work together in a seamless and effective manner which demonstrates professionalism. At the end of the weekend all participants agreed this type of training should become an annual event. As well, as a measure of ensuring succession planning for CAA committee and board service, it was suggested up and coming committee members be invited to participate.

Over the coming months you will notice numerous changes resulting from this training. Immediate changes will be revisions to committee terms of reference, with clarified guidance regarding authorities and mechanisms for reporting. The board will be developing job descriptions for each of the board members. It will also be creating an improved process for ensuring the names of members who volunteer their services are compiled in one place, so that when an appropriate opportunity for volunteer service presents itself we know who to call first.

At the Canmore meeting the board also approved the CAA 2004-05 Strategic Plan, which sets specific goals for all of our activities and ensures everything we do directly supports the CAA's mission and vision. This is a major step forward and I am confident our entire organization will become stronger and healthier as a result of this clear and consistent direction. The CAA's Board of Directors is demonstrating their professionalism and leading by example.

On June 15th the National Search and Rescue Secretariat hosted a meeting in Ottawa of key stakeholders to finalize the governance structure for the National Avalanche Centre.

At that meeting we agreed that the name Canadian Avalanche Centre will be used to refer to all public avalanche safety programs and services. We'll also establish a western Canadian Avalanche Centre at the CAA's offices in Revelstoke and work towards establishment of an eastern Canadian Avalanche Centre at Ste. Anne Des Monts that will address the needs of Quebec, Newfoundland and Labrador, and the eastern Arctic.

Thanks to assistance from the National Search and Rescue Secretariat and Parks Canada, we were able to hire two highly regarded experts on governance to review the goals and needs of the CAA and stakeholders, and to make recommendations for CAC governance structure and reporting relationships with funding agencies. At the Ottawa meeting, Barbara Laskin of Institute Associates and Tim Plumptre, executive director of the Institute on Governance, delivered their report. They offered excellent advice and all stakeholders in attendance agreed their recommendations provided a sound and durable foundation for a partnership to deliver public avalanche safety programs in Canada. Their professionalism will help us deliver professionalism.

Earlier this spring Dan Markham, Director of Marketing Communications for Canadian Pacific Railway, graciously offered to assist the CAA by covering the expense of redesigning the CAA's website. The first thing he did was to commission Ipsos-Reid, one of Canada's most prestigious polling firms, to determine who our website visitors are, why they come to our website, and what they like and dislike about the site. Earlier this week I received the Ipsos-Reid report from Dan. It is a powerful document, containing information that will be used by Indigo Ice, the top-tier web design company Dan has retained to work with us to create the most powerful and professional website possible. The survey will also be invaluable to our public avalanche bulletin team to target our users with the information they want. One more example of professionals working with us to help the CAA be more professional. Thanks Dan!

"The survey will also be invaluable to our public avalanche bulletin team to target our users with the information they want."

In April, Parks Canada offered the services of their networks specialist Greg Thompson to assess the CAA's networking capacity and reliability. In May, Greg presented his report to the CAA board and managers. It contains sound technical analysis of our current capacity and offers recommendations for upgrading to ensure reliability. Finances permitting, we will be implementing all of Greg's recommendations this summer, before the September crush of activity hits.

There are so many good things going on that exemplify the CAA's commitment and progress toward professionalism: John Kelly and Dominic Boucher's work developing a situation analysis for a CAC office in Quebec; Roger Atkins and Pascal Hägeli's collaboration to build an internet browser-compatible InfoEx system that will provide western Canadian avalanche safety operations with the most powerful analysis tool ever; Mary Clayton's commitment to work for the CAA and lead development of a professional communications capacity; the newly formed Information Technologies committee chaired by Jeff Goodrich, developing Canadian standards for a markup language to facilitate technology transfer between Canadian avalanche operations; Alan Jones and Grant Statham building new systems for warning the public of avalanche risks. There are so many more…. and not enough space to list them all here. We have momentum.

Our goal this year is professionalism. The CAA's staff will be in our Revelstoke office through the summer, coordinating and assisting with these and many other initiatives. We're trying our best to deliver the professionalism expected from the CAA. I believe that every CAA member across Canada is doing their part, too. Over the summer drop us a note, and tell us what you're doing. It will be great copy for the fall edition of Avalanche News.

Have a great summer!

Clair Israelson
Executive Director

President's Report

BY JOHN HETHERINGTON

At some time around 1980 someone (perhaps Peter Schaerer?) had come up with the idea of an association of avalanche people in Canada. I was invited, along with about 20 other people, to a meeting at the Fairmont Hotel in Vancouver to discuss this concept. As a result of the meeting the Canadian Avalanche Association was developed. The purpose and goals of the new association were not extremely clear and there was suspicion from some employers that it might be some sort of ski patrol union. About a year later I attended what was probably the first AGM of the new CAA. Clair Israelson likes to tell a story about part of the proceedings. Precise memories of this event have faded somewhat, but what I remember was that Geoff Freer's verbal financial report announced that we had collected a certain amount of money, we had spent a certain amount of money, and that we had a certain amount of money left in the bank. Prompted by my economics background and experience as a municipal councilor, I suggested that perhaps a more formal printed set of financial statements would be in order for the next AGM. My suggestion was met with a certain amount of incredulity, but at the next year's meeting Geoff announced that a rather simple set of financial statements had been prepared, with one copy set aside for me.

"The financial health of our association is always a concern as it directly impacts all of the activities that the members, various governments, industry and the public now expect of the CAA."

Fast forward to 2004 and I am attempting to get up to speed as your new president. Immediately I am impressed by the complexity of the several pages of financial statements that are required to cover the many activities of the CAA. With revenue and expenses totalling more than a million dollars, the growth of the membership of the CAA and the extent of its responsibilities are evident. The financial health of our association is always a concern as it directly impacts all of the activities that the members, various governments, industry and the public now expect of the CAA. Revenue comes from a multiplicity of sources including government, corporate and private donations, none of which are ever as secure as one would like them to be. As the CAA prepares to become a national association, it is likely to become even more dependent on these types of funding.

There are several challenges facing the new Board of Directors. These include:

1. Getting up to speed with the governance of the CAA. To facilitate this the BOD and standing committee chairs met in Canmore June 18-20.
2. CAA Training Schools (CAATS). CAATS has long been at the heart of the CAA's activities but the declining enrollment in the Level 1 Ski Operations courses is a concern. The BOD and the Education Committee along with Ian Tomm are working to map out a viable future for CAATS as it moves in new directions and takes on new roles.
3. National Avalanche Centre. The move to become a truly national association has legal, organizational and financial implications, all of which must be well-considered in advance of changing the status of the CAA..
4. Responsibility to the members. As the CAA grows and becomes more complex and has more obligations to the world beyond the membership, it must continue to be responsive and responsible to the core of the CAA, which is the membership.

I expect that as your new president I will be busier than I would like. The CAA now wears the public face of the avalanche situation in Canada and as such, will likely experience increasing demands for information and accountability. The CAA can never rest on its laurels and past successes. It must be concerned with present challenges and must always look to the future.

John Hetherington
President
Canadian Avalanche Association

Photo: Canadian Pacific Railway Archives

Rebuilding important infrastructures since 1910

The CAA says "Thank You" to our friends and partners at Canadian Pacific Railway!

Our website, www.avalanche.ca, is being rebuilt and remodelled. The funds, creative talent and drive required to achieve our new look have all been made possible by Canadian Pacific Railway. To determine the direction of reconstruction, CPR commissioned the nationally-recognized polling firm Ipsos-Reid to survey our website users. That research has now been made available to the CAA and will be an invaluable resource in refining both our website and our services. We are honoured and privileged to be associated with Canadian Pacific Railway.

CPR and the CAA. Together, we're making the backcountry safer.

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NATIONAL AVALANCHE CENTRE RECEIVES FEDERAL SUPPORT

Release time 4:30 PST Thursday, February 19th

The Canadian Avalanche Association (CAA) welcomes an expansion of its public services role through the creation of a National Avalanche Centre. David Anderson, Minister of Environment, announced today new federal government funding for the next three years to support Centre operations. "The first recommendation of the BC Public Avalanche Safety Program Review is the formation of a National Avalanche Centre," says CAA President Bill Mark. "With this federal government support we will improve public avalanche safety in all areas of Canada, in both official languages. The CAA is delighted to be chosen as the organization Canadians trust to deliver these services through a National Avalanche Centre."

The BC review identified six objectives for a National Avalanche Centre:

- Coordinate public avalanche safety programs
- Provide a public avalanche warning system
- Deliver public avalanche awareness and education programs
- Provide avalanche-related training for amateur backcountry recreationists
- Be the point of contact for public, private and government avalanche information
- Encourage avalanche research

Currently the CAA provides avalanche information three days a week coveringa large part of BC's mountains. These reports are created after gathering daily snow and weather observations from a vast network of industry and government sources. "Today's announcement means Ottawa has now joined a partnership that's been growing for years," says CAA Executive Director Clair Israelson. "Our industry recognized long ago the need to provide avalanche safety information for the public. Now, with the federal government joining British Columbia in support of a National Avalanche Centre, we can start building avalanche safety programs that will save lives in all areas of Canada where avalanches threaten human activities. We are having very positive discussions with Quebec, and I truly hope the provincial government in Alberta recognizes its essential role in this initiative and commits to joining this national partnership."

The National Avalanche Centre will work closely with government departments, industry and outdoors clubs and groups. "Our approach has always been to get the best expertise possible to work with our stakeholders to develop world-class avalanche safety programs," says Israelson. "Now, with this federal support, we start work tomorrow to develop and deliver public avalanche safety programs that will be commensurate with Canada's mountains, snow and outdoor recreation opportunities. We need to look forward to the 2010 Winter Olympics and beyond, and build for the future. Public use of Canada's mountains is increasing and as a result, more people are exposed to avalanche risk. We can do better, and we will."

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February 19, 2004

Speaking Notes, Clair Israelson – Calgary press conference

Canadians and visitors from around the world are drawn to our mountains because mountains are the grand cathedrals of nature. Going into the mountains engages our bodies and our spirits. We're inspired by the grandeur of these wild places, and we come away from our mountain experiences with a renewed appreciation and respect for nature's power. To stand on top of a mountain on a blue-sky winter day, and to see untouched snow covered peaks stretching to the horizon in every direction is a Canadian experience that no one ever forgets. We return to our homes and our jobs with a renewed appreciation for Canada's natural heritage, and our need to learn to respect and live in harmony with nature.

From Newfoundland to Ellesmere Island to Vancouver Island, snow covers our mountains for more than half the year. Avalanches are part of the natural cycle of winter in Canada. The tragedies of last winter, especially the event involving the Calgary high school students, have strengthened our collective resolve to work harder to prevent avalanche accidents in winter recreation. Reviews conducted by the Parks Canada Agency, the Strathcona Tweedsmuir School, and the province of British Columbia set good, clear direction. In the past month, avalanche accidents in Eastern, Northern and Western Canada remind us that avalanche safety is a truly national issue.

Today's announcement by federal Environment Minister David Anderson assures a National Avalanche Centre that will work with federal and provincial government agencies, industry and key outdoors organizations across Canada to develop and deliver world class public avalanche safety programs in both official languages. The Canadian Avalanche Association is pleased to be the organization chosen to deliver National Avalanche Centre services.

Our mission will be to help Canadians, and our visitors, learn to understand and live in harmony with nature. As immediate first steps, we'll be increasing the frequency and geographical coverage of avalanche warnings for Western Canada. We will be engaging our colleagues in Quebec, and working toward establishment of a French language National Avalanche Centre office in Quebec that will mirror the work we do here in the west. We'll also be scanning the world for best practices developed by others, borrowing shamelessly, and adapting those best practices to prevent avalanche accidents and save lives in Canada.

Other work needs to be done as we build for the future. It may take two or three years before these efforts produce results, but the wait will be worth it.

We need to learn more about the interrelationships between mountains, snow and weather that create avalanche danger. To do this we will draw upon the expertise of avalanche researchers at universities in Quebec, Alberta and British Columbia, engage the weather expertise and research capacity of the Meteorological Service of Canada, and solicit the energy, experience and wisdom of Parks Canada and industry organizations.

We need to learn more about ourselves, about risk perception, human behavior, and all of the "human factors" that influence our decisions in the mountains. We will bring together avalanche specialists and experts in risk psychology and communications, and redesign our safety messaging so that avalanche risks are presented in ways that our target audiences truly understand.

Today, with this announcement by Environment Minister David Anderson we start by building capacity to better understand and interpret the music of the mountains. And, as we learn to dance in harmony with nature, and as we pass those skills along to our children, our time in the mountains, in nature's grand cathedrals, will be safer and more enjoyable for all Canadians, and for our visitors from around the world. We are determined to work together, and get it right.

My old friend and mentor, mountain guide Willy Pfisterer summed it up this way: "We need to learn to hear the music of the mountains, and dance to that music. If we don't get that dance right, mother nature can be cruel." We've learned from those lessons, and there have been too many tears. We must do better, and we will.

Canadian Meteorological and Oceanographic Society
Société canadienne de météorologie et d'océanographie

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For Immediate Release

Meteorological and Oceanographic Private Sector Directory

The meteorological and oceanographic private sector is expanding and diversifying. In an effort to assist consumers with the selection of suppliers, the Canadian Meteorological and Oceanographic Society (CMOS) has developed a directory of businesses and consultants that specialize in the provision of meteorological and oceanographic services in Canada.

The directory provides potential customers with background information about an extensive list of companies and consultants. They have expertise in a vast number of specialties and services in meteorology, hydrology, hydrometry, oceanography and limnology. Areas of specialization are listed on the directory web pages.

The directory is located at http://www.cmos.ca/Privatesector/indexe.html.

This searchable database is used as a referral list by Environment Canada's Meteorological Service of Canada and by Fisheries and Oceans Canada.

For further information please contact Susan Woodbury, Chair of the CMOS Private Sector Committee at psc@cmos.ca or (902) 468-3007 ext. 232.

March 2004

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Don't delay your dreams!
Send material to editor@avalanche.ca

National Search and Rescue Secretariat | Secrétariat national Recherche et sauvetage

NEWS RELEASE

MINISTER PRATT APPROVES NEW SEARCH AND RESCUE INITIATIVES

23 February 2004, Ottawa – The Honourable David Pratt, Minister of National Defence and Lead Minister for Search and Rescue, has approved 42 search and rescue projects for 2004-05. The projects will be funded from the New Search and Rescue Initiatives Fund, managed by the National Search and Rescue Secretariat.

"Canada continues to be a world leader in its exceptional search and rescue services. As such, many of this year's projects are innovative in terms of advancing Canada's search and rescue capability in alerting, searching and responding," said Minister Pratt. "Others focus more on the prevention side, helping to reduce the need for search and rescue."

The 2004-05 New Search and Rescue Initiatives Fund projects include the development of a multi-agency incident command structure for ground SAR, a new volunteer marine SAR training program using a marine simulator, a helicopter hover exit training and wilderness rescue exercise, and a public avalanche safety awareness project.

The projects were reviewed by the National Search and Rescue Secretariat and representatives from the six federal departments involved in search and rescue: Department of National Defence (Canadian Forces), Department of Fisheries and Oceans (Canadian Coast Guard), Environment Canada (Meteorological Service of Canada; Parks Canada), Public Safety and Emergency Preparedness (Royal Canadian Mounted Police) and Transport Canada, as well as provincial and territorial search and rescue authorities.

The Fund improves search and rescue efforts through state-of-the-art equipment, technology, research, prevention programs and training. With an annual budget of $8.1 million, the fund supports search and rescue projects that enhance air, marine and ground search and rescue activities in Canada. Since 1988, $130 million has been invested in over 700 projects.

Past projects have included: programs on the risks of outdoor recreation in secondary schools; expert training for police and volunteers to manage search incidents; and improvements to infrared technology to help locate people in conditions such as blinding snow storms and dense woods.

For a complete list of new projects, visit the Secretariat's website at *www.nss.gc.ca*/site/newSARInitiatives/MeritList0405_e.htm.

The National Search and Rescue Secretariat, created in 1986, is an independent agency of the federal government, which works with all levels of government, police and emergency services, and volunteers to coordinate search and rescue activities throughout Canada.

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Secretariat's Website: *www.nss.gc.ca*

Columbia Brewery Brings the Mountains to BC Bars

New, innovative draught pouring system shaped like a mountain is first of its kind in Canada

Creston, BC, March 24, 2004 — The Columbia Brewery, BC's mountain brewery, today announced it will provide BC beer drinkers with the perfect pour of award-winning Kokanee beer from its new, innovative Glacier Draught System.
As part of the launch, Kokanee Beer drinkers, participating bars and the Columbia Brewery's mountain partners will help raise awareness and funding for the Canadian Avalanche Association (CAA).

The Glacier Draught System is Canada's first draught tower in the shape of a mountain to reflect Kokanee's roots in the Kootenay mountains where every drop of Kokanee is brewed. The mountain-shaped tower is designed to form a layer of ice on its upper half or "peak", by actually condensing and freezing the vapour in the room, to ensure every glacier-fresh pint is served perfectly ice cold between 2-4 degrees Celsius. It will be available in more than 100 bars and restaurants in BC.

"The Glacier Draught System is innovative beer pouring technology for an innovative brand like Kokanee – and we are very pleased with the results, and we think BC beer drinkers will be too," said Dave McAnerney, Brewery Manager, Columbia Brewery.

He added: "Throughout its history, the Columbia Brewery has produced high quality beer using an all-natural brewing process and the finest ingredients available. Our new draught serving technology enhances the overall quality experience for Kokanee beer drinkers, strengthening the authenticity of the beer, while providing the same great tasting beer as before, pour after pour."

For every Kokanee ordered at Glacier Draught System launch bars in BC from March 26 through March 28, the Columbia Brewery will donate a percentage of proceeds to the CAA. The participating launch bars and the brewery's mountain partners will match the Columbia Brewery's donation dollar for dollar. The proceeds will support a variety of CAA initiatives, including the creation of a National Avalanche Centre in Revelstoke, BC. The Glacier Draught System program is also supported by point-of sale materials, featuring avalanche awareness information that will be displayed in participating bars throughout BC.

"We are committed to promoting avalanche awareness in BC mountain communities. By working closely with the Canadian Avalanche Association, our mountain partners and participating bar sponsors, we can reach beer drinkers and outdoor enthusiasts with the CAA's valuable messages," said McAnerney. "The Columbia Brewery has a tradition of supporting the BC mountain life-style and is a long time sponsor of the CAA. Thanks to the support of our key program partners and BC beer drinkers, we're proud to continue those efforts with this special program in 2004."

"With the increased popularity of backcountry skiing and riding, public awareness is a necessity. Through this successful partnership and program, the Columbia Brewery continues to exhibit leadership in corporate commitment to avalanche awareness in BC," said Clair Israelson, Executive Director, CAA.

The new draught pouring system is the latest in a series of packaging and brewing innovations the Columbia Brewery has recently made to provide Kokanee beer drinkers with the highest quality product. In January 2004, the Columbia Brewery introduced its Signature Mountain Series – 12 million specially labeled Kokanee bottles featuring one of seven BC ski mountains – and last year the brewery introduced the "Mountain of Beer," a mountain-shaped, specialty 18-pack case of Kokanee.

Built in 1959, the Columbia Brewery is located in picturesque Creston and is part of the rich brewing tradition of British Columbia. The brewery traces its heritage to the Fort Steele Brewery, established in 1898. The Columbia Brewery began brewing its award winning Kokanee lager in 1959 and was purchased by Labatt in 1974. Sourced exclusively from the Columbia Brewery in the heart of the Kootenay Mountains, Kokanee lager is an authentic domestic specialty beer and a true taste of British Columbia. In addition to Kokanee and Kokanee Light, the Columbia Brewery also produces Kokanee Gold, Kootenay True Ale, and Kootenay Mountain Ale.

For more information, contact:
Larina Dyck
Manager, Public Affairs
The Columbia Brewery
604.520.7269
larina.dyck@columbiabrewery.com

Andrea McDonald
Grace Communications
604.899.4009
andrea@gracepr.com

Canadian Avalanche Association Silent Auction

One of the most successful events at the AGM this year was the silent auction. There were generous donations from a wide variety of sponsors—almost $10,000 worth of goods and services up for grabs. This is a very impressive level of support and the CAA would like to extend a thank you to each and every donor.

The list of donors and their products is below. We've also included the winners. Total amount raised from the evening was $4765. Congratulations to everyone who participated and a big thank you to all!

Donated By	Item	Value	Bid	Bidder
Kelley's Sports International	Avalanche Handbook	$27.95	$20.00	Mark Klassen
Kelley's Sports International	Powder Guide book	$26.95	$21.00	Al Matheson
Swiss North Marketing	Snow-Pro Trekking Poles	$87.00	$53.00	AnneMarie Prudhome
Swiss North Marketing	Snow-Pro Snow and Ice Saw	$57.00	$27.00	John Kelly
Kelley's Sports International	Voile Shovel	$67.00	$37.00	Rick Schroeder
SEAR	Rescue Probe	$90.00	$45.00	Mark Vesely
SEAR	Rescue Probe	$90.00	$45.00	Kyle Hale
Arc'teryx	T-Shirt	$40.00	$28.00	D. Anderson
Swiss North Marketing	Recta DS50 Compass	$42.00	$35.00	Rupert Wedgwood
Mammut	Barryvox Transceiver	$395.00	$285.00	Simon Fowle
Castle Mountain Resort	Seasons Pass	$600.00	$80.00	Dan Markham
Golden Alpine Holidays	One Week Ski Touring Trip	$1,750.00	$1,000.00	Dan Markham
Alpine Club of Canada	Two nights accommodation for two at a hut	$100.00	$50.00	Ryan Gallagher
Kelley's Sports International	Bush Hat	$42.00	$36.00	Susan Hairsine
Swiss North Marketing	Recta DS50 Compass	$42.00	$31.00	Jeremy Cox
Kelley's Sports International	Powder Guide book	$26.95	$25.00	Jeremy Cox
CIL Orion	Signal Survival Kit	$120.00	$40.00	Robin Siggers
The North Face	Cat's Meow Sleeping Bag	$169.00	$110.00	Marc Deschenes
CMH	Volkl Explosive Skis	$900.00	$270.00	AnneMarie Prudhome
Kelley's Sports International	Avalanche Handbook	$27.95	$16.00	Ryan Johnstone
Island Lake Lodge	Two nights and meals at Cedar Lodge	$680.00	$271.00	Ryan Gallagher
Deuter	Ballcap	$20.00	$5.00	Ryan Gallagher
The North Face	Pivotal 60 Backpack	$329.00	$155.00	Kelly Z
Swiss North Marketing	Snow-Pro Snow and Ice Saw	$57.00	$33.00	Finbar O'Sullivan
Arc'teryx	Bora Backpack	$250.00	$125.00	Alison Dakin
CMH	Marmot Adamant Jacket	$400.00	$175.00	Andre Martin
Kicking Horse Mountain Resort	Second Skin Hydra Shield Jacket	$75.00	$55.00	Andre Martin
Kicking Horse Mountain Resort	Second Skin Hydra Shield Jacket	$75.00	$32.00	Phil Hein
Kicking Horse Mountain Resort	Ballcap	$20.00	$7.00	Phil Hein
Kicking Horse Mountain Resort	Ballcap	$20.00	$8.00	Phil Hein
Swiss North Marketing	DSP-Peips Transceiver	$629.00	$296.00	Cam Campbell
Kelley's Sports International	ALF Womens Sweater	$78.00	$45.00	Mikey olsthoorn
CIL Orion	Signal Survival Kit	$120.00	$35.00	Jeff Haack
CMH	Ski Bag	$95.00	$92.00	Gord Burns
CMH	Laptop Bag	$75.00	$56.00	Gord Burns
Kelley's Sports International	Voile Shovel	$67.00	$36.00	Alec van Herwijnen
Kelley's Sports International	ALF Mens Fleece	$85.00	$60.00	Jan Johnson
SEAR	Rescue Field book	$25.00	$12.00	Steve Parsons
SEAR	Crystal Screen and Clinometer	$17.00	$7.00	Bruce Jamieson
Kicking Horse Mountain Resort	Ballcap	$20.00	$9.00	Bruce Jamieson
Columbia Brewery	Hubcapz Hoodie	$50.00	$25.00	Othmar Kagi
Kelley's Sports International	Voile Shovel	$58.00	$41.00	Roger Atkins
SEAR	Crystal Screen and Clinometer	$17.00	$7.00	Jon Davis
Kelley's Sports International	Voile Shovel	$58.00	$40.00	Paul Vidalin
Kelley's Sports International	Bush Hat	$42.00	$25.00	Helene Steiner
Columbia Brewery	Kootenay Fleece Vest	$69.00	$40.00	Jan Johnson
CIL Orion	Denim Shirt	$60.00	$26.00	Doug Tuck
Deuter	Ballcap	$20.00	$3.00	Evan Manners
Columbia Brewery	Hubcapz Hoodie	$50.00	$13.00	Evan Manners
Alpine Club of Canada	Two nights accommodation for two at a hut	$100.00	$44.00	Evan Manners
MEC	JetRanger Daypack	$69.00	$45.00	Ryan Gill
Mammut	La Sportiva Mountain Boots	$600.00	$290.00	Rob Hemming
Recreation Outfitters Inc.	Diamir Freeride Bindings	$490.00	$305.00	Donna B

Meteorological Service of Canada Transition Update

Retrospective

Environment Canada's Meteorological Service of Canada (MSC) has been providing meteorological support to the CAA for more than 20 years. Throughout our partnership, there has always been a key individual or small group within a Weather Centre or Weather Office, working in close collaboration with a similar key individual or small group of snow avalanche professionals. What has evolved could be termed a Snow Avalanche 'Community of Practice': a group of individuals sharing common vision and purpose and working collectively towards a common goal of informing, educating and advising the general public on snow avalanche hazards and awareness. Since 1993, MSC's Mountain Weather Centre in Kelowna, BC has been the primary source of meteorological guidance to the CAA InfoEx and the Canadian Avalanche Centre. In recent years, MSC's forecast centre in Rimouski, Quebec has provided similar support to the Quebec Avalanche Centre in Gaspe.

Regional Storm Prediction Centres

MSC's 14 Regional Weather Centres have recently consolidated into five Regional Storm Prediction Centres (SPCs). This process, part of a comprehensive restructuring involving significant investments in automation, infrastructure replacement and organizational renewal, necessitates a new working relationship between MSC and the snow avalanche community. The Vancouver SPC is now responsible for all of BC and Yukon, while the Montreal SPC is responsible for all of Quebec and southeastern Nunavut. Similar levels of responsibility exist for Edmonton (Prairie and Northern Region); Toronto (Ontario Region) and Halifax (Atlantic Region). Service to Aviation clients has been centralized into two large centres in Edmonton and Montreal.

National Laboratories

Coinciding with the centralization of weather centres into SPCs, each of MSC's five Regions will also implement a National Lab tasked with applied research into high impact weather events, and transfer of related knowledge into the SPCs. The labs will operate in partnership with universities and other national laboratories. Of particular note to the CAA is the Vancouver lab's research focus on Coastal and Mountain Meteorology; with a potential link to snow avalanche R&D. The National labs will gradually come on board during spring 2005.

National Service Offices

In addition to SPCs and National Labs, a few of MSC's existing weather centres will be restructured into National Service Offices (NSOs). Each NSO will have as its primary focus the goal of improving (on a national basis) the utility of meteorological information and services to targeted economic sectors involved with weather sensitive activities. For example, the Kelowna NSO's assigned sectors will initially include national road weather information systems and forestry, eventually expanding to include road and rail transportation, tourism, forestry, energy, avalanche protection, municipalities, construction and manufacturing. Other NSOs will focus on agriculture (Regina), media (Rimouski) and marine (Gander). NSOs will be expected to provide their services in both official languages. The first NSOs (including Kelowna) will gradually come on line during winter 2004/05.

Investments in the future

Externally, but through a reallocation of existing funds, MSC has recently committed $225,000 over three years to support the development of a National Avalanche Centre. Internally, MSC has invested considerable capital in the renewal of observational networks and numerical weather prediction technology. Remote sensing technologies such as MSC's national Lightning Detection & Doppler Radar Networks currently enable forecasters to monitor atmospheric processes on scales of a few kilometres and a few minutes. It is the goal of the MSC's National Labs to improve forecasters' abilities to understand those complex processes which lead to high impact weather, of the Storm Prediction Centres to forecast such events, and of the National Service Offices to increase the usefulness of such forecasts to weather-sensitive clients such as the CAA.

Useful contact information:

MSC on the Web: www.weatheroffice.ec.gc.ca

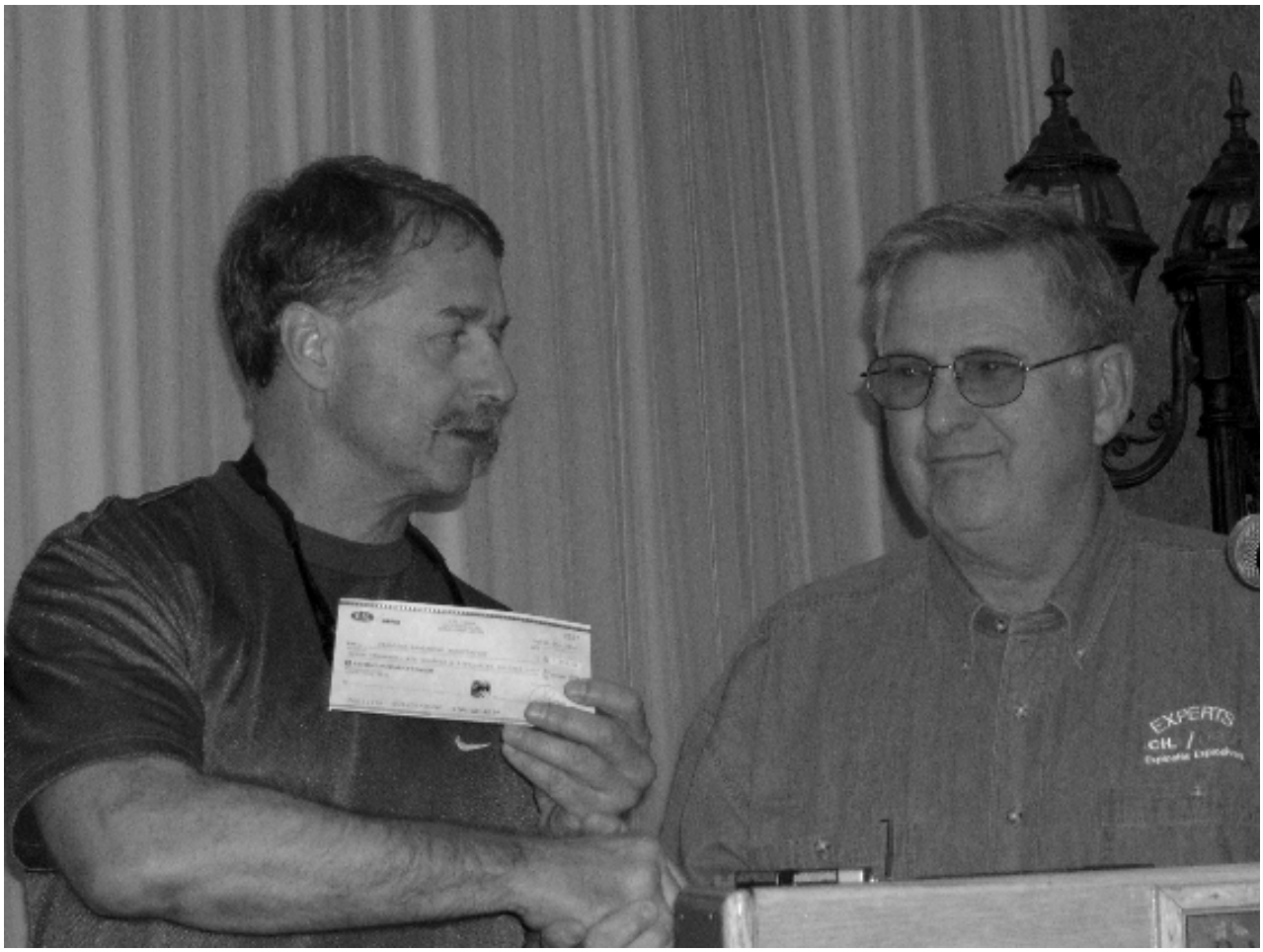
Client Services & Outreach Division, Pacific & Yukon
- BC South Coast & Lower Mainland: David.Jones@ec.gc.ca 604-664-9072
- BC Interior South: Jim.Steele@ec.gc.ca 250-376-4867
- Yukon & BC Interior North: William.Miller@ec.gc.ca 867-667-8459
- BC North Coast &Vancouver Island: Anne.McCarthy@ec.gc.ca 250-363-0410

LIVE CONSULTATION: Storm Prediction Centre (24/7):
1-900-565-5555 (English)
1-900-565-4455 (Francais)

NATIONAL SERVICE OFFICE (Kelowna)
Gabor.Fricska@ec.gc.ca 250-491-1510

CIL/Orion Donation

Once again, CIL/Orion has made a generous donation to the CAA Explosives Committee. For the past four years, the company has demonstrated a tremendous commitment to the CAA by sharing a portion of its profits from the sale of avalanche explosives. This year the cheque was close to $7300.00, the largest contribution yet. The money received from CIL/Orion is used to benefit CAA members in a variety of ways, including explosives training courses. The explosives committee, in conjunction with the Board of Directors and with input from Everett Clausen, will discuss the best possible use of this year's donation. The company has proven a valuable partner over the years, always providing prompt service and sound technical advice. The CAA is proud to be associated with the firm and offers a sincere "**thank you**" to CIL/Orion.



CIL/Orion President Everett Clausen presents a cheque to Explosives Committee chair Bernie Protsch at this year's AGM.

Avalanche Safety in the Public Domain

Reprinted from a document prepared by Walter Bruns, Professional Member of CAA, February 10, 2004

With respect to avalanche danger, people have been sorted into four groups: the totally unaware, the aware (but untrained) recreationists; the trained recreationists; and the professionals. [1] These folks can all end up in very similar environments, yet with a wide range of understanding of their actual circumstances.

An effective message aiming to enhance their safety must be tailored to the specific audience, and it ought to conform to the process sequence of analysis, decision and action:

danger (estimation) ⇨ *hazard (assessment)* ⇨ *risk (management)*

Understanding	danger estimation	hazard assessment	risk management
nescient	none	none	none
aware/unknowing	some	a little	none
cognizant	yes	evolving	emerging
knowledgeable	yes	yes	refining.

Table 1.

So,

message to provide	danger estimation	hazard assessment	risk management
the unaware with…	basic awareness	simple rules	specific advice
the untrained with…	interpreted data	standard rules	general advice
to the trained…	filtered data	advanced rules	guidance
among professionals...	all data	peer judgement	peer action.

Table 2.

Data is the raw material for danger estimation, rules provide a framework for hazard assessment, and advice applies to risk management. In each case, the more general must become more specific, and the complex needs to be simplified, so that effective messages can move up the ladder (with added value) to those with lesser understanding.

Table 2 presents a matrix for the 'scope' of the message. Each message must also reflect the 'scale' of the overall situation under consideration, and it must provide sufficient 'resolution' of its constituent elements over appropriate domains of space and time.

Finally, given the probabilistic nature of avalanche phenomena, and the inherent uncertainties embedded in every step towards fuller understanding, any meaningful message must be couched in the language of likelihoods.

Rather than mushing the message, public avalanche advisories require rigorous focus and clarity. This will stimulate interest, ensure their efficacy, and maintain credibility over time.

Responsibility

Government agencies have a social obligation to strive to enhance avalanche safety for the public. The failure of some governments to adequately support those institutions and associations that are already engaged in public avalanche safety initiatives is unconscionable.

Avalanche professionals have a moral obligation to send knowledge up the ladder, and to interact with one another ethically in the common effort towards greater understanding. Note that messages with respect to hazard between professionals are not rule based; they are an exchange of judgement among peers. Similarly, strategies and tactics for the management of risk are relayed by demonstrated action, rather than by the giving of advice.

Whoever crafts a message has responsibility for both its content and effectiveness. They also have some degree of responsibility for its possible ineffectiveness, as an unintended consequence of its misinterpretation. But this holds only insofar as the target audience is concerned. In addition to scope, scale and resolution, any message should therefore also clearly identify its target audience. Simply put, it must be presented in proper context.

The issuer's responsibility does not extend beyond the target audience, to others who are outside the scope of the message. Yet their message can generate unintended ramifications further afield. Tactics to alert all those at a lower common denominator of understanding can pose problems for those with a higher level of skill and knowledge.

This is very much the case for avalanche professionals working in the commercial sector. For example, warnings of grave avalanche

danger issued to the unaware or untrained public recreationist, accompanied by exhortations to stay at home, could give rise to serious repercussions for professional guides or commercial operators who do understand how to find safe terrain for their clients, and who do take them there under those very same circumstances. Furthermore, seeing these advisories, prospective clients may become apprehensive and lose their inclination to proceed, which can hurt the business.

Liability
Any serious loss experienced by those in the target audience, which arises out of their misinterpretation of a message, raises the spectre of liability exposure for the issuer of the message. The ramifications of public advisories being taken out of context, and held up against the actions of professionals (especially in the aftermath of a mishap), do the same.

Assessment of such potential risk, and procurement of liability cover to mitigate it, is the business of every entity engaged in issuing a message. Groups and individuals would be well served to assure their own coverage.

Codification
A proactive way to mitigate liability exposure is to codify the processes by which data is presented, rules are written, and advice is given. That is, develop a consistent "standard of care" for the providers (and content) of messages.

Werner Munter's "reduction method" falls into this category. It overlays a professionally-derived "bulletin" of current danger estimation on a statistical compilation of historical data from avalanche accidents, referenced to the danger estimation at the time, to generate rules and advice. It is prophetic, but in a self-fulfilling or tautological sense. It also mushes the scope, scale and resolution of the message by virtue of its statistical underpinnings.

Professionals
Avalanche professionals are inherently (and unsurprisingly) averse to codified decision processes when it comes to the governance of their own activities. This is what fuels the controversy over the reduction method and other such rules-based approaches.

Professionals are distinct from the broader audiences, however. They are the ones that have supplied and distilled all data to create the bulletin in the first place. They do have the highest level of knowledge generally attainable. To bring such a rule or advice back on itself, after having been simplified, and then to apply it to the professional's own conduct, is a circular exercise stripped of meaning.

Does that imply that avalanche professionals are above reproach? Not at all. Their standard of care is just one that they must set for themselves.

Summary
For public avalanche advisories:

- identify the target audience;
- tailor the message in terms of its scope, scale and resolution;
- set bounds for its interpretation and application, with reasonable disclaimers; and
- give due credit to all contributors.

The final conundrum, of course, is that everyone who ventures into avalanche terrain must impose a deterministic 'go/no-go' value on a multi-valued state. No message can solve the dichotomy. Ultimate safety remains unattainable – the ultimate irony of our quest.

[1] Steve Blake, "*Considering Considerable and Other Considerations,*" Avalanche News, Vol 65, Summer 2003

Parks Canada's Backcountry Avalanche Risk Review – Spring 2004 Update

Grant Statham, Parks Canada Agency, May 19, 2004

It's been nearly one year since the release of Parks Canada's Backcountry Avalanche Risk Review – a report from an independent panel that scrutinized public avalanche safety in the Mountain National Parks (Banff, Jasper, Kootenay, Yoho, Glacier, Mt. Revelstoke, Waterton Lakes). The past year has seen the report evolve into a full-scale project, as the Parks Canada Agency takes a close look at its systems for public avalanche risk management. The Risk Review project marks a starting point, where more formal recognition is given to the changed demographics of backcountry use.

The scope of Parks Canada's Risk Review project takes into account recommendations stemming from four external reviews completed in 2003, all looking at different aspects of public avalanche safety in Canada.

1. Parks Canada's Backcountry Risk Review
2. BC Solicitor General – Public Avalanche Safety Review
3. Strathcona-Tweedsmuir Outdoor Education Program Review
4. BC Coroners Service, Judgement of Inquiry – Connaught Creek Avalanche Accident

Parks Canada's overriding goal is to implement the 36 recommendations from its own report, taking into account the additional messages received from the other reports. Current initiatives under this project are as follows.

Emergency Contact Numbers

All of the Mountain National Parks reviewed their emergency callout systems to ensure phone numbers were broadcasted consistently throughout each park. Glacier Park has established a new backcountry emergency phone number, which links to the Jasper dispatch and insures 24/7 coverage. The new number is 1-877-852-3100.

Highway Signage

New signage has been installed at the entrance points of all the mountain parks with the message "You Are in Avalanche Country," and directions for more information. The intention of this sign is to alert anyone who travels in the national parks that backcountry avalanche hazards exist and more information is available.

Backcountry Use Survey

Glacier Park conducted a trailhead survey this past winter. Data was gathered in person at specific trailheads at Rogers Pass, as well as from survey boxes at designated locations. The objectives of this survey were to begin compiling data on where people are traveling; where they get their information; the training and experience of the group; and how these groups make decisions. This survey was a pilot, and the first of a series of backcountry use surveys to be conducted in the coming years through the CAA Decision Making Framework project.

Public Information Seminars

Parks continued its efforts to contribute to public education by offering seminars and workshops in all the communities surrounding the national parks. Often this was done in conjunction with the CAA's Avalanche Awareness Days. Jasper Park produced an excellent mobile display, which will accompany public awareness seminars in the future.

New Requirements for Custodial Groups

This complex topic is explored in detail in the spring 2004 issue of the ACMG News. Custodial groups are now required by law to employ the leadership of a certified mountain or ski guide. As well, a maximum group size of nine plus guides is now in effect during the avalanche season.

There are also certain locations within the national parks backcountry which are deemed inappropriate for custodial groups. At the moment those areas are defined as "serious, complicated avalanche terrain" which is obviously very grey. Parks is working on a classification system for recreational use of avalanche terrain which will better clarify appropriate locations for winter travel by custodial groups.

National Avalanche Centre

Parks Canada has stepped up its support of the CAA as the delivery agent of public avalanche warnings for national parks. One-stop shopping is in the best interest of the public. As a measure of this support, and to strengthen support for sustainable avalanche bulletins outside park boundaries, Parks Canada will commit $100,000 per year for the next three years towards establishment of a National Avalanche Centre.

The Meteorological Service of Canada will also commit $75,000 per year for the next three years, and the National Search and Rescue Secretariat is also on board with major in-kind and financial support for projects (including developing the structure of the NAC). The federal government's commitment to public avalanche safety is significant, with the three agencies mentioned contributing more than $3 million towards public avalanche safety in the next three years.

Terrain Information Project

The goal of this project is to offer the public better information on popular backcountry trips and the type of avalanche terrain that can be expected. Using a digital blend of GIS and airphoto technology, Parks is producing detailed visual terrain information which identifies major avalanche terrain in colour – similar to an avalanche atlas. These images will be accompanied by specific information on local terrain issues and will be tailored differently for each audience. Backcountry skiers, ice climbers and ski area boundary jumpers each have their own unique issues - hopefully all can be reflected in displays to be posted at trailheads, on-line and in visitor centres.

Media Portal – Simplified Public Avalanche Warnings

Parks is working closely with the CAA to develop strategies for communicating avalanche risk through the mass media. The key to this is developing simple communication tools and making them easily available in a media-friendly format. A media portal is a password-accessed site where the media can download information they need instantly, in formats similar to newspaper weather maps. Current tools used in the avalanche bulletins are too complex for mainstream distribution via the media, so the development of new communication tools is underway.

Parks Canada sees the management of a media portal as a core responsibility of a new National Avalanche Centre – consistent with the principles of one stop shopping. This new layer of avalanche information will be designed to penetrate mainstream society with the goal of raising cultural avalanche awareness in Canada. This is in no way intended to replace current technical avalanche bulletins. Rather, this added level of information will enhance the bulletins by offering an introductory level of information for less skilled readers. More readers = more awareness.

That is a brief overview of the major components of the Risk Review project. Many other initiatives were undertaken involving media outreach, avalanche bulletin translation projects, English writing workshops and prototype web developments. While strengthening old relationships and creating new ones, this project has primarily been a collaboration between public safety and communication specialists – a powerful blend which should ultimately result in a new standard for the production of public avalanche information.

Online Learning Project

Thanks to the generous support of the Search and Rescue Initiatives Fund, the CAA has recently launched a 1.5-year project focusing on on-site first response to avalanche accidents. This is an on-line learning project targeted to a variety of audiences with the intent of increasing awareness of avalanches and the need to ensure proper protocol during and after an avalanche occurs. The RCMP "E" Division in BC is the sponsor of this project and the CAA looks forward to establishing a solid relationship with this group.

The project began in April 2004 and is expected to be completed by December 2005. The CAA is working closely with the Justice Institute in BC for on-line content and design, given its extensive history in online emergency response learning. The CAA is also working closely with a number of critical stakeholders in the avalanche community to ensure the integrity and relevancy of the on-line content.

Parties interested in learning more are urged to contact Project Manager Peter Zyla at peter@zyla.ca or the CAA directly.

The Quebec Collaborative Avalanche Project Final Report 2004

By Marc Deschênes

The successful Quebec Collaborative Avalanche Project (QCAP) was recently completed after nearly four years in progress and I have to say that the project exceeded all expectations. This $455,000 project was financially supported by the National Search and Rescue Secretariat- New Initiatives Fund (NSS-NIF) and sponsored by Parks Canada. Plenty of hard work by many players went into achieving the project objectives and making QCAP a success. The purpose of QCAP was to plant the seed about avalanche awareness in Quebec. This not only created a relationship between the CAA and Quebec stakeholders, but it also broadened the CAA's presence in Eastern Canada. New developments with the proposed National Avalanche Center will hopefully strengthen this bond and help provide public avalanche safety programming, education and training to other regions of Eastern Canada.

I continued to meet people this past winter who were unaware that avalanches in Quebec are a reality. The province has a history of both recreational and residential avalanche accidents and fatalities . In the past three decades, their industry has seen a handful of small commercial mechanized ski operations (currently none exist) in the Chic-Chocs Mountains of Gaspesie and a few RAC providers. Highway 132 on the Gaspe Peninsula has had isolated avalanche issues since the road was built.

Gaspe area: part of the Chic-Chocs mountains.

Traditionally, most backcountry winter recreationists have wandered the valley bottoms and gently rolling hills of the Quebec landscape on snowshoes, X-country skis and snowmobiles. However the past 20 years has seen change and, like many other regions of Canada, adventure tourism and year-round backcountry recreation is growing rapidly. This has resulted in more winter recreationists (skiers, boarders and snowshoers) being lured into avalanche terrain, aided by improvements in equipment and skills, the search for untracked slopes and the steep and deep, etc. However, during our visits to Quebec in the winter, it became apparent that a lack of avalanche awareness and education prevailed among most recreationists, the public, government officials and the media. Only those few serious adventurers who have traveled the mountain ranges of Quebec (Chic-Chocs, Monts Groulx, Torngats) seemed to have a grasp on avalanche safety and seemed to have some form of avalanche safety training.

Stephane Gagnon demonstrating a profile to Inuit students

Here is a little history on the origins of QCAP. In 1999, the CAA was requested to assist in developing the forecasting skills for the staff of the Centre d'avalanche de la Haute Gaspesie (CAHG). Consequently, a Discovery Session took place in Quebec City in 2000 between CAA professional members and Quebec stakeholders to determine the desires and needs of Quebec and the appropriateness of the CAA collaboration to help develop improved avalanche safety capacities in Quebec. Based on strong support for a collaborative avalanche safety initiative in Quebec, the CAA successfully got approval for QCAP in April 2001 from the NSS – NIF with Parks Canada as the project sponsor. My involvement began shortly afterwards when the CAA asked if I would be interested in applying for the position of project coordinator since I was originally from la Belle Province and bilingual. I thought: Wow, what a cool opportunity and challenge! Besides, my first avalanche involvement was on a short, artificially-made slope in Montreal back in 1982, and all I knew of avalanches in Quebec was what I had read in *Avalanche Accidents in Canada*, Vol IV and other events broadcasted by the media. So I got the job and Susan Hairsine was hired as the project's administrative assistant.

The project kicked off with another meeting taking place in Quebec City, attended by 30 stakeholders, to introduce the project and set the stage for its implementation. We started by selecting a six-member facilitation team (FT) from Quebec to help coordinate the project and whose members would represent various backgrounds (CAHG, research, outdoor retail, provincial police, SAR manager, la Federation Quebecoise de la Montagne et de l'Escalade - FQME).

The first project objective was to develop and document all structures, information and processes necessary to deliver the QCAP. We began in October 2001. Susan and I had a meeting with the FT and a consultant in social marketing/behavioural science and communications in Quebec to conduct a detailed program design of the project. Here's what we came up with:

- Key hazard locations
- Target audience
- SAR agencies and groups
- Partners
- Communications plan
- Poster and pamphlet design and message distribution
- Bernard Hetu (researcher at the Universite du Quebec in Rimouski), and Alain Bergeron (Env. Canada) were selected to take on a project to research avalanche accidents in Quebec and analyze the weather data associated with these events.
- Storefront services for QCAP were undertaken by the FQME in Montreal in the first year, but due to re-structuring of the administration, these services were passed on to the CAHG for the remainder of the project.

We also spent time scoping and selecting potential sites in various regions of Quebec to deliver QCAP courses.

An important objective of QCAP was to assist in developing the CAHG and train their staff. The CAHG's main focus is to promote public avalanche safety programming and develop a Quebec-based expertise in the avalanche industry. Project activities completed were:

- Staff internship at various avalanche operations in Western Canada (01-03):
  CMH, Parks Canada, CAC, BC MoTH, Ski Whitewater, Whistler, Mike Wiegele
- Staff mentoring by CAA professionals and course instructors (02-04):
  Colani Bezzola, Clair Israelson, Bruce Jamieson, Marc Ledwidge, Marc Deschênes, Sylvain Hebert, Val Visotzky.
- CAATS Level 2 training at Blue River, Dec. 02 for 2 staff from CAHG:
  Dominic Boucher and Stephane Gagnon
- Participation CAA-AGM / CPD (01-04)
- Participation ISSW 2002
- Internship at New-Hampshire Avalanche Forecasting Center (2004)
- Avalanche course instructor training on QCAP courses

The CAHG staff were given advice, ongoing feedback and a written subjective performance evaluation. CAHG submitted written reports of lessons learned during internship in Western Canada. Mentorship by CAA professional members and course instructors in Quebec provided expert coaching, advice and guidance in regards to an avalanche safety operation and public avalanche forecasting. A series of successful presentations by the CAHG staff were delivered at the annual CAA meetings describing the genesis, activities and achievements of the CAHG.


Village of Kangiqsualujjuaq

Another of QCAP's main objectives was to increase the awareness, knowledge and skills of winter recreationists, improve their understanding of snow-avalanche bulletins and forecasts, modify their attitudes and behaviours in response to fluctuating conditions and to help develop Québec trainers to deliver RAC courses in Quebec. Courses and activities completed included:

- nine two-day IRAC (1 in English): 100 participants
- four four-day ARAC: 61 participants
- two seven-day CAATS Level 1: 23 graduates
- Avalanche awareness/SAR training sessions with the Inuit people in Kangiqsualujjuaq: 50 participants
- Translation of CAATS Level 1 manual and OGRS document
- five Quebec candidates successfully complete CAATS Level 1 in western Canada (01-03)
- Internship of Level 1 graduates as assistant instructors on QCAP courses (01-03)
- three-day skills training course for Quebec RAC Providers (04) with Sylvain Hebert

Course participants were mainly recreationists, outdoor leaders and educators, ski patrollers and park employees. Recreational course participants were given pre- and post-course written tests to measure changes in their knowledge, skills and risk perception. Assistant instructors received coaching, advice and guidance during course delivery.


Teaching a RAC in an Inuit school

QCAP also embarked on a public avalanche awareness campaign with the goal of increasing public awareness in Quebec and improve public education to identify locations of avalanche areas which threaten the public winter activities. The campaign's activities included:

- Purchase of French books and videos from the CAA and the ANENA in France
- Translation of CAA's "Beating the Odds"
- Develop, distribute posters & brochures
- Radio, TV and newspaper interviews
- Information booth at the Warren Miller Film Festival – Montréal
- Ski and ice climbing festivals
- Information booth and workshops at the MEC store in Montréal
- Newspaper and magazine articles
- More than 40 presentations to outdoor clubs, youth groups, schools and public ~1200 people
- Regional TV coverage of RAC/SAR courses in Gaspesie
- Press conference – Montréal (03)
- Avalanche Awareness Days:
  Mont Comis, Rimouski (02)
  Mt Ste-Anne, Québec (03)
  Mont-Tremblant, Montréal (04)
- Development of a promotion/educational video by Stephane Gagnon
- Establishment of lending library of resources for avalanche education in Québec at the CAHG

Another QCAP objective was to increase awareness, knowledge and skills of SAR professional - volunteer members through training courses and workshops, develop capacity to assess and manage residual avalanche risks, and respond effectively to avalanche accidents. Courses and activities completed included:

- three four-day SAR courses: 40 participants
- CPD for 2 Québec SAR managers by attending ISSW 2002
- QCAP presentation at SARScene 2003, Kingston, ON.

Course participants were mainly provincial police, SAR volunteers and professionals groups, park employees, ski-patrollers and recreationists. Participants were given pre- and post-course written tests to measure changes in their knowledge, skills and risk perception.

In terms of the impact and benefits of QCAP, I would say the project resulted in greatly contributing to the development of the CAHG and providing advanced training and mentorship to their staff. The CAHG has succeeded in providing public information and education and delivering training and public avalanche bulletins to winter recreationists and SAR members. The project also assisted in the development of strong avalanche awareness programming, education and training in Quebec resulting in the development of a core group of avalanche instructors to provide ongoing recreational avalanche safety courses, SAR courses and public avalanche awareness and safety presentations in Quebec. The following is a summary of the successes and challenges of the QCAP:

Successes:

- Assisted in the development and growth of the CAHG to achieve the promotion of public avalanche safety programming and develop a Quebec-based expertise in the avalanche industry. The CAHG recently received recognition and merit awards from the Quebec Ministry of Public Safety, the Association of Eco-tourism in Quebec and the Insurance Bureau of Canada.
- Increased avalanche awareness, knowledge and skills of Quebec winter recreationists (210) through the promotion and provision of avalanche training courses, including a one-week visit to Kangiqsualujjuaq in northern Quebec. Successful completion of CAATS Level 1 (5) and Level 2 (2) training courses in Western Canada by seven Quebec candidates. Successful completion of CAATS Level 1 training courses by 23 candidates in Quebec.
- Broad distribution of avalanche awareness and safety message throughout selected regions of Quebec by means of posters,

brochures, presentations, public workshops and production of a promotional and educational avalanche video in Quebec.
- Increased avalanche awareness, knowledge and skills of Quebec SAR volunteers and professional members (40) through the promotion and provision of avalanche SAR training response courses.
- Partnership between MEC – Montreal, the CAHG and the CAA-QCAP to help promote public avalanche awareness and safety in Quebec.

Challenges:

- Difficulty in connecting with the media and convincing them about the realities of avalanches in Quebec, and the need and importance for public avalanche awareness campaigning.
- Convincing government organizations about the need and importance of public avalanche awareness and safety programming and accident prevention measures in Quebec, and to become more involved.
- Attracting government officials, land managers and park officials to participate in avalanche SAR and/or recreational training courses.

With the completion of QCAP, the next steps will be:

- Inclusion of Quebec avalanche industry into the National Avalanche Centre initiative to continue providing avalanche safety programming, training and services to Eastern Canada
- Ongoing development of Quebec based expertise in the avalanche industry and self-sustaining avalanche safety capacity in Quebec.
- Enhanced promotion and delivery of public avalanche awareness and safety and events through television, radio and print media.
- Continued discussions with government organizations to promote the need and importance for broadened public awareness and safety programming in Quebec.
- Networking and contacts with avalanche organizations, avalanche researchers and practitioners from around the world to promote knowledge transfer and collaborative research.
- Translation of the CAHG web site and continued acquisition of French and English educational materials for the lending library.

The CAA and all of those people involved in QCAP would like to acknowledge and extend their thanks to the NSRS-NIF for their financial support and Parks Canada (Michel Villeneuve) for acting as the project sponsor. Without them this project would have not been possible. This also includes the following organizations and individuals.

Quebec's main QCAP partners:

- MRC de la Haute-Gaspésie
- CAHG
- Sureté du Quebec
- SÉPAQ - Parc national de la Gaspésie
- Environment Canada
- FQME
- Université du Quebec à Rimouski
- Mountain Equipment Coop – Montréal
- Alpine Club of Canada

As well as the support and efforts of :

- QCAP Facilitation Team
- CAC staff in Revelstoke
- CAA instructors : Sylvain Hebert, Marc Ledwidge, Val Visotsky
- CAA mentors : Colani Bezzola, Bruce Jamieson, Clair Israelson
- ANENA and Francois Sivardiere
- Fizz Imagination
- Parc National de la Gaspésie
- Destination Chic-Chocs
- Les Productions Vic Pelletier
- Steve Kroschel Productions
- Canadian Mountain Holidays
- Survival on Snow
- Stethem & Associates
- Translators: Marc Perron, Francoise Muhn

New Committee Emails

At the CAA Annual Spring Meetings, a great suggestion came from some members of the Technical Committee of the CAA. They recommended creating generic e-mails for each committee and some Board of Directors positions, so that as new faces moved into the positions, the members and our partners out there did not have to continuously update their contacts.

This has now been implemented and the CAA mail server forwards the e-mails sent to these generic committee e-mail addresses to the appropriate members. When new committee members are elected or appointed, the forwarding addresses will be changed to reach those new people. Throughout the process, the basic e-mail address will always remain the same.

Here's a list of the new e-mails:

President	president@avalanche.ca
Membership Committee	membcom@avlaanche.ca
Education Committee	educom@avalanche.ca
Technical Committee	techcom@avalanche.ca
Explosives Committee	explocom@avalanche.ca
Information Technology Committee	itcom@avalanche.ca
Professionalism/Ethics Committee	procom@avalanche.ca
Audit Committee	auditcom@avalanche.ca

CAA Training Schools 2004-05 New Courses!

Avalanche Control Blasting
CPD Field Courses for Members
Snowmobile Operations Level 1
Combined Operations Level 2 Module 1/2
Intro to Snow Avalanche Mapping
Snowmobile-specific Operations Module 2

Check out these and many more avalanche courses at www.avalanche.ca
Level 2 enrolment starts June 1, 2004.
Enrolment for all other courses starts September 1, 2004.
Register early to avoid disappointment.

ATTENTION INDUSTRY EMPLOYERS:
DO YOU SEND STUDENTS TO THE CAA TRI COURSE?
IF SO PLEASE READ ON.

The CAA wishes to modernize its TRI program to meet the changing needs of industrial avalanche safety training. If you employ and/or send people to the TRI course we want to hear from you. If you do not and currently wish the CAA had a course that meet your specific needs for avalanche training and certification, we also want to hear from you!

Please contact Ian Tomm, Schools Coordinator at ian@avalanche.ca or 403-862-0727 for more information.

Potential changes include:

- A shortened course for frontline workers not requiring the heavy theory as in past courses.
- A course specifically tailored to supervisors, managers and decision makers in industrial avalanche safety programs.
- New content developed to meet the needs of the forestry and mining sectors.

ATTENTION ALL MEMBERS!
CAA TRAINING SCHOOLS NEEDS YOUR IMAGES and VIDEO CLIPS.

The CAATS program is currently undergoing an enhancement of our a/v materials for all our programs and we need your help. Any images or video clips that contain the following would be greatly appreciated:

- Avalanches in motion
- Fracture propagation
- Ski/snowmobile/snowboard triggering
- Avalanche involvements – case histories
- Destruction/damage caused by avalanches – property or natural
- Explosives use in avalanche control
- Avalanche terrain – specifically good imagery of treeline and below treeline terrain
- Just plain old avalanches – anything and everything, as long as it's a good quality image/ video

Conditions of your donation to CAATS:

- CAATS will only use your image if we have a signed contribution agreement on file – a copy will be also be given to you.
- CAATS will only use your image on CAATS courses specifically unless we get your permission otherwise.
- All photographers will be credited on the image itself – we will ensure the proper recognition will always be given.
- Your image will go into the CAA Image Database and could potentially be used for additional projects (only with your permission).
- Original prints and/or slides will be scanned and immediately returned to you along with a CD of the scans and examples of how the image will appear in our CAATS Image Sets for your approval.
- Video Clips will be copied and converted to DVD – you will be sent your original and a copy of the DVD version.

FAME AND FORTUNE AWAIT YOU!
Please donate your images to the CAATS program today!

Please contact Ian Tomm, Schools Coordinator for more information at ian@avalanche.ca.
Images and/or Video can be sent directly to the CAC in Revelstoke c/o CAATS Program.

January 2004

Dear CAATS,

This card is to let you know how great the instructors were during my course Jan 4-10, 2004. Robin, Rocket & Bender "did" the course for me! Their professionalism, experience, sense of humour & love for the outdoors were transmitted to me throughout the week & enjoyed everything I learned! Thank you! Christine Fuse ☺

CAATS Historical Trends Analysis 1990-2004

By Ian Tomm, CAATS Coordinator

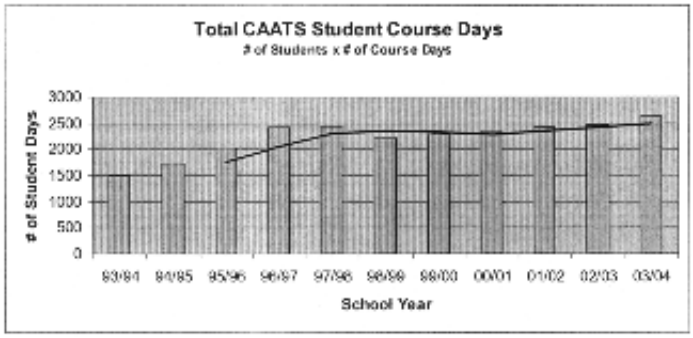
This is a summary of a presentation at the 2004 AGM.

Background

In 1989 the CAA took over from Selkirk College the administration and delivery of professional avalanche training in Canada. Since that time the Canadian Avalanche Association Technical Schools (CAATS) program has grown in step with the rest of the winter adventure tourism industry and has resulted in the development of the CAATS program as it is today. As with many aspects of the snow avalanche industry, the CAATS program is currently experiencing new changes and developments which require us to look at where we've come from in order to gain an appreciation and understanding of where we are going, as well as where we need to go.

While many members may read this article and think there is an increased focus on the business side of the CAATS program and less focus on the educational side, I have to assure everyone this is not the case. In order to maintain a viable, financially stable and sustainable post-secondary institution, which the CAATS program currently is, we need to improve our business and management processes so we can readily adapt to changing needs and requests from our community. Furthermore, a post-secondary institution like ours does not have access to public support for our programs and therefore rides a precarious line between financial stability and instability. Business foresight and sound financial management are key ingredients to ensuring low course tuitions, long-term sustainability and excellence in instruction on our courses.

General Program Trends

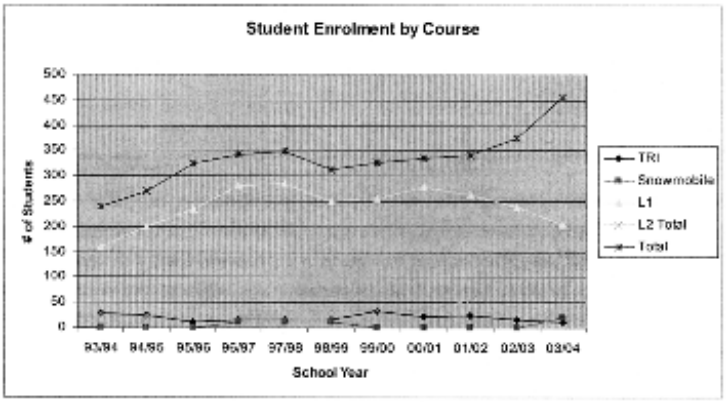


The past 10 years of course enrolment paints an intriguing picture when it comes to anticipating future changes in CAATS. Enrolment grew steadily in the mid to late 90s with the Level 1 program, and took a sharp hit in the 98/99 season when the RAC program was officially launched. With the growth of additional programming in CAATS, general student enrolment has increased slowly over the past six years.

2003/04 marked a significant milestone in CAATS history as we passed the 2500 student course day mark (# of students x # of course days). While we were close in 97/98 and in 02/03, last year saw additional diversification in CAATS programming and a subsequent increase in course demand and overall student enrolment.

When we look at student enrolment by specific course we see a very different picture. It is clear the newly revamped Level 2 program is becoming a core program of CAATS while the Level 1 program is seeing a steady decline in enrolment. These developments need careful consideration for future planning and budgeting.

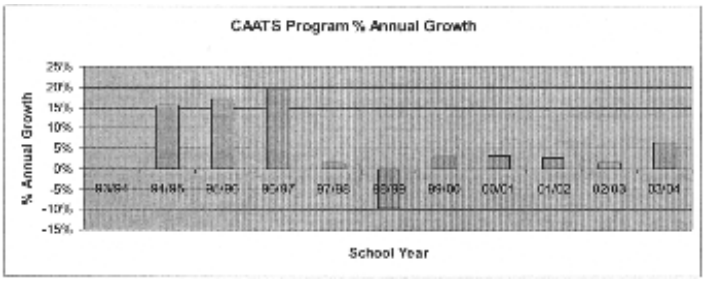
The 98/99 RAC hit to the Level 1 program is obvious in the graph above. The notable departure in overall school enrolment being closely linked to the Level 1 program was during the 2000/01 school season. Other significant benchmarks identified here are the 02/03 season where the Level 2 program saw the Module 1 integrated into the training stream and therefore increases in student numbers in that program. The 03/04 year saw the complete implementation of the three modules of the Level 2 program and a resulting ballooning of students through the Level 2 program and the spike in enrolment illustrated.



If we look at growth in a different way, as a percentage of growth compared to the previous school season, we identify significant differences in growth patterns in the past 10 years. It is clear the mid-nineties were a time of considerable growth in the CAATS program, specifically in the Level 1 program. While that was before my time, it no doubt placed significant pressures on the CAA and our ability to effectively administer a program that was growing so quickly. Level 1 enrolment has subsequently declined (refer to the Level 1 section) and has left the rest of the CAATS program in more manageable growth rates, although the sudden drop felt with the implementation of the RAC program in 98/99 no doubt caused some stress at that time.

An interesting view of the CAATS program is from the financial side of things, specifically using an Expense/Revenue graph. While the bars follow the same basic pattern as that of overall student enrolment (adjusted to the periodic increase in course fees due to inflation) the three-year running averages illustrate a maturation in financial policy handed down by the BOD. In the mid-nineties, when the CAC was a relatively young entity and learning how to manage itself, the annually averaged revenue and expense lines cross each other and show us an awkward operation with undoubtedly difficult management challenges as a result. Since the turn of the century these averages even out and become smoother and more predictable, which may be seen as an indication of two things: 1) maturation of financial policy and/

or 2) luck.

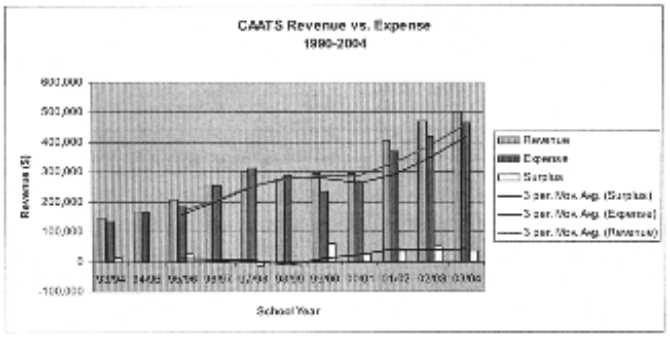


When trying to find meaning in all of this I am drawn to a few key observations about the history and current trends in the overall CAATS program:

- The CAATS program has become a stable financial entity with long-term viability as an independent post-secondary educational institution.
- CAATS has created the financial resources to be able to react to changing needs from the industry and/or demands placed upon it.
- Further diversification of programming is an essential part of maintaining financial viability and long-term sustainability.

CAATS Administrative Infrastructure

The past 10+ years of experience in running the CAATS program has enabled the development and refinement of a good administrative infrastructure in CAATS and subsequent supporting infrastructure at the CAC. This infrastructure is strong enough to meet the current demands placed on the program but will require expansion in order to incorporate much of the new directions that CAATS will undertake in the next few years.

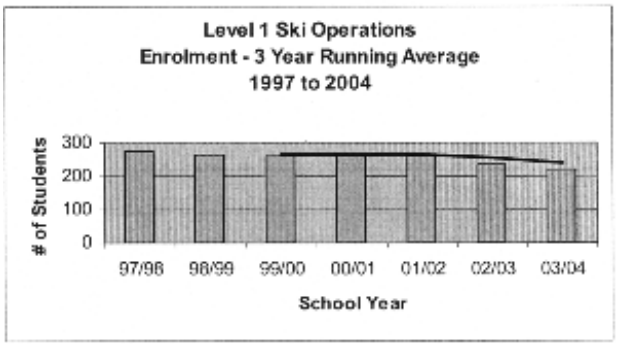


While the CAATS infrastructure is a true asset to the program, and the association in general, it is worth noting it requires a critical mass in order to maintain. The CAATS program needs a minimum amount of student traffic through its programs in order to maintain its infrastructure. The period of change the program seems to be in currently needs to be carefully considered in any future program additions and/or expansion, as the resulting effect on the infrastructure needs to be sustainable over the long term. These are considerations I take very seriously as does Clair and the BOD. No doubt this will prove to be a significant management challenge in the years to come.

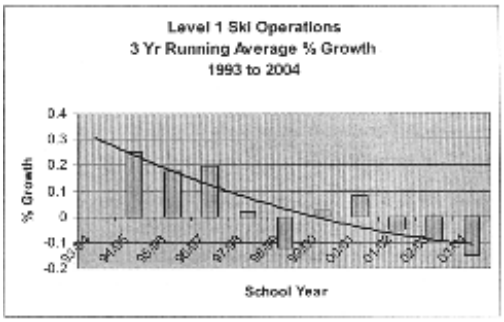
Ski Operations Level 1 Program

Enrolment in the Ski Operations Level 1 program (Level 1) in the past 10 years has changed significantly. This will be the single greatest challenge in CAATS management in the immediate future as currently it is the core program of CAATS and whenever core programs change, it places stress on the entire school. As with the historical analysis of the entire program, looking at the Level 1 Program in a little more depth brings out other observations. When we look at annual percentage growth we see a slightly different pattern emerge with the Level 1 program that is worth some attention.

We see the same growth patterns earlier identified in the 90s, but when we look at the program's growth, or rather lack of growth in the past three years, a different picture emerges. Now, as I am sure you've heard before, the Level 1 program has been prone to random fluctuations in enrolment in the past. So while this particular graph looks alarming it is not cause for concern. It wouldn't surprise me, or any CAATS instructor, if the Level 1 program saw significant growth next year that would throw the trends and averages of this program way off the current values. However, from a planning and management point of view these trends need to be carefully considered and evaluated to ensure overall program stability over time. Needless to say we are all eager to see what happens with Level 1 enrolment next year.



Looking at the graphs of the Level 1 program brings out a few key issues that seem to always come up when we talk about the Level 1 program and its future in the industry:



- **Job Market Motivation**: There is no question there are not as many entry level openings in our industry as a whole than there have been in the past. This may very well be one of the reasons enrolment is down. In addition to this, the minimum standards of employment for many operations are also changing as there are more and more Level 2 graduates in the market. It will be interesting to see what happens in the next few years as some of our valued members retire and/or move on and new openings make themselves available.

- **Perceived Value of Level 1**: Depending on who you talk to this might be a topic of conversation in reference to the Level 1 program. I have to reference the recent Educational Visioning Membership survey and course feedback received by Level 1 students. Both the survey and student feedback overwhelmingly identify the Level 1 program as a highly regarded course. While we need to ensure this program maintains its currency in our industry, I feel, through this feedback, that the value of this course is still, and will continue to be, very high.
- **Core CAATS Programs Changing**: There's no doubt the core programs of CAATS are changing and the decline in Level 1 enrolment needs to be offset by additional programs (which we have thankfully!). This is indeed a time of change in CAATS and will certainly result in a better technical school to serve the ever-changing needs of our industry.

What does this all mean?

It is one thing to look at these numbers and statistics and draw conclusions but it is another issue altogether to use these conclusions in the ongoing management of the CAATS program. All we know for certain is that change is happening and it's the establishment of good sound managerial policy that will see the CAATS program through these changes and emerge a stronger, more respected and more diverse technical school. To summarize:

- **Level 1 Program Enrolment**: It is declining and we have to plan accordingly. The real question is will it stabilize and, if so, at what numbers?
- **Level 2 Program**: After experiencing rapid growth in not only size and complexity but also in demand for the course, we have to plan for its popularity to stabilize, even decline a little, in the next few years. The real question is when it will stabilize.
- **Snowmobile Level 1 Program**: While not discussed in this article the newly revamped snowmobile program saw increased popularity last year and even a waiting list for the single course offered last year. More programs are in the works for the coming season in addition to a Module 2 for sledders and a combined Module 3 (hopefully). Both the BCSF and CAA hope these new initiatives will be embraced and adopted by the snowmobiling industry as necessary training. Dialogue is ongoing between the CAA and the snowmobiling community to ensure we develop tools and courses which truly meet the demands of this specialized industry.
- **Transportation and Resource Industry**: The TRI course needs some work to modernize and better tailor to the increased needs of the various industries that use this course. This could potentially include two courses in the TRI stream to meet both the needs of frontline workers as well as address the demands of supervisors and decision-makers in forestry, mining and other industrial applications.

Program diversification is necessary in the CAATS program. The reasons are plentiful but it essentially comes down to the changing demands placed on the program and the ever-changing needs of the avalanche industry as a whole. With this in mind it is important we ensure that we stick to our core competencies and continue to do what we are good at doing. Here are a few of the key initiatives currently underway to meet these demands:

- **Avalanche Control Blasting Course**: This recent addition came out of a collaborative project between the CAA and WCB and was a huge success last year. This will now become a regular course in CAATS with annual curriculum changes to meet the annual changes in the explosive industry in regulations and/or common practice.
- **QCAP**: With the completion of the QCAP project the CAATS program will now take over the administration of Ski Operations Level 1 courses in Quebec. An English course is tentatively scheduled for late March 2005 in the Chic Chocs.
- **Avalanche Mapping Courses**: After a brief period when these courses were not offered, the CAA has taken over the administration and running of these courses. Tentatively an Intro to Avalanche Mapping course is scheduled for May 2005 with the advanced course running May 2006. These will become a regular course in the CAATS program although interest will most likely dictate that they are offered every other year or so.
- **CPD Programming**: The BOD has given the Education Committee and the CAATS program the direction to start to offer CPD programming to members on an annual basis. While this will still include the annual CPD session at the AGM, other field-based CPD sessions are in the works for the winter. Tentative CPD sessions are planned for the Whistler and Golden areas in early winter, content still to be determined. If you have ideas please let us know!
- **International Aid Programs**: Increasingly the CAA is being approached by other avalanche programs internationally for help in the establishment or refinement of professional level avalanche training. While this is not a core focus of the CAATS program we have the resources and experience now to be able to offer this assistance if required. Our involvement in Japan over the last few years is a good model to use in future projects with other countries.
- **Industry Requests**: The CAATS program is primarily here to serve the Canadian avalanche industry and as such we will work our hardest to develop new programs upon request from industry. Currently conversations are taking place between several organizations to see if the development of targeted professional level avalanche training is possible. This will no doubt prove to be an important part of the CAATS program in the future.

Many challenges lie ahead in our future, both as an association and certainly for the CAATS program. It is my confident opinion that with the continuing support of our membership, strong direction from our Education Committee and BOD, along with the significant experience, enthusiasm and professionalism present in the CAATS instructor pool, we will meet these challenges head on and excel.

Profile: Pascal Hägeli

Making a difference in Canada's avalanche community is no small goal, but Pascal Hägeli seems very determined to reach it. Born in Basel, Switzerland, the 32-year-old is here in Canada completing his doctorate research under Dr. Dave McClung at the University of B.C. He chose Canada "almost by accident" when his studies in Europe required him to do an internship at a different university. He ended up at UBC for six months in 1996 and "fell in love with Vancouver." He moved there in 1998, changing his educational aims from atmospheric science to snow studies. "I realized I didn't want to launch weather balloons for the rest of my life," he says of the decision. "I've been a backcountry skier most of my life and this program seemed an ideal fit."

Pascal speaks highly of the applied nature of his studies at UBC and sees a lot of opportunity for practitioners to have an impact on the science of snow and avalanches. "I've had close contact with guides through my entire doctorate," he says. "My views on avalanche forecasting in general have changed dramatically from working with them." The guides Pascal works so closely with are employees of Canadian Mountain Holidays (CMH), a company that's also the industrial sponsor of the research chair in the avalanche and snow science department at UBC. "We try to do applied research for our partners," says Pascal. "CMH has a very extensive database and my goal is to create additional tools to help them make better use of the information collected."

Ski guiding in Canada's mountains is a demanding business and Pascal says he's excited about the possibilities of his science having a direct affect on the industry. "One of the challenges is to present the data most effectively," he says. "Together with CMH, I am working on improving information exchange among their operations." He's hoping that one of his data visualization products will someday be used at guides' meetings as a tool to aid in choosing the day's run list. "I think it's a crucial issue," he says, "and it could contribute to better decision making."

He first became connected with the CAA after taking a Level 1 course in Lake Louise in 2000. He became an affiliate member after that course and in August of 2003, began work in an advisory role for the association's data management project. Now, as of April 1 of this year, he's taken on yet another challenging position – project manager for the Avalanche Decision Framework for Amateur Winter Recreationists (ADF). The ADF project is an ambitious one for the CAA—redesigning, even revolutionizing, the decision-making process for winter backcountry users. It's been tackled before but Pascal wants to make sure Canada benefits from the errors made in his native Europe.

Primarily, that means cooperation from the entire avalanche community. In Europe, professional mountain guides felt left out of a highly-publicized decision-making scheme developed by prominent avalanche researcher Werner Munter. Munter's "rules-based" system has been both effective and popular with amateur recreationists. However, its introduction created a lot of controversy. "Even though it was not developed for them, the guiding world felt this simplified method was forced on them," Pascal explains. "I hope we can learn from these mistakes and make sure that doesn't happen here."

Pascal plans to take what he can from Munter's model and apply it to a "made in Canada" solution. He credits Munter for at least one important innovation—using avalanche accident statistics to try and discover which areas should be avoided and in what conditions. Such an approach potentially bridges some of the difficulties traditional snow science has with the probabilistic nature of avalanches. The first step of the ADF project, after a complete review of the European method, will be to compile and analyze Canadian avalanche accident data.

"I think (Munter's) approach has merit," he says, "but it's not the one-and-only tool. The key is to combine as many valid approaches as possible to come up with the most comprehensive evaluation we can." For Canada, that means factoring in the differences between the three main geoclimatic zones of the western part of the country. It also means gaining a better understanding of the people who will use the decision-making tool. This will entail a thorough demographic study of the target groups—backcountry skiers and boarders, out-of-bound skiers and boarders, and snowmobilers. Questions such as who they are, why they pursue their sport, what their propensity for risk is, will all need to be answered. "This project will be much wider-reaching than the European model," says Pascal. "I think we can come up with a really good tool for the recreationist that's supported by the whole community."

Ultimately, Pascal hopes to bring a unique perspective to this project, one that no other country has ever experienced. After he completes his doctorate in September of this year, he intends to work towards becoming a certified ski guide. "A scientific background allows only a certain amount of insight into avalanches," he says. "I think a combination of scientific and guiding experience together will be very valuable." The analytical powers of a scientist blended with the decision-making strengths of a guide will be a potent mix. Pascal knows he'll need all those attributes and more for this project; many eyes will be tracking its progress and expectations are high. The challenge to effect meaningful change has been clearly presented to both the avalanche and winter recreational industries. Using insight gained from his own scientific background and guiding experience, Pascal Hägeli is working hard to ensure the ADF project meets that challenge.

Under Construction

Members dropping by the CAA office this summer will find it a noisier place than usual. Construction workers began rebuilding the entrance way to our building on June 1. When we purchased the building, the porch was one of the only obvious drawbacks of the whole place. Visually, it was quite an eyesore and functionally, it served no useful purpose. On top of that, it was poorly constructed which has led to problems like cracks in the adjoining wall. Overall, its poor design made it more of a barrier instead of the welcoming entrance it should be.

Soon after we bought the building, members of the Revelstoke Chamber of Commerce approached us with a proposal. They offered to foot the bill for remodelling the front of our building in exchange for letting them use that area during the summer months for the next five years. The deal was struck and work on the design began.

As you can see in the architect's drawings, the plan is to remove the old porch entirely by taking out the wall between it and the existing reception area. This will not only make the front end much more inviting to the public, it will also add about 175 sq ft of usable space to the reception area. Overall, the project will significantly increase the value of the building, with no cash outlay by the CAA.

Construction will proceed in three phases. From June 1 - June 21, the old porch will be removed and new exterior walls will be built. Interior construction, wiring, flooring and painting is scheduled for June 22 – July 15 and we hope to see the finishing work completed in the two weeks following that. If all goes well, the new entrance will be open to the public by August 1.

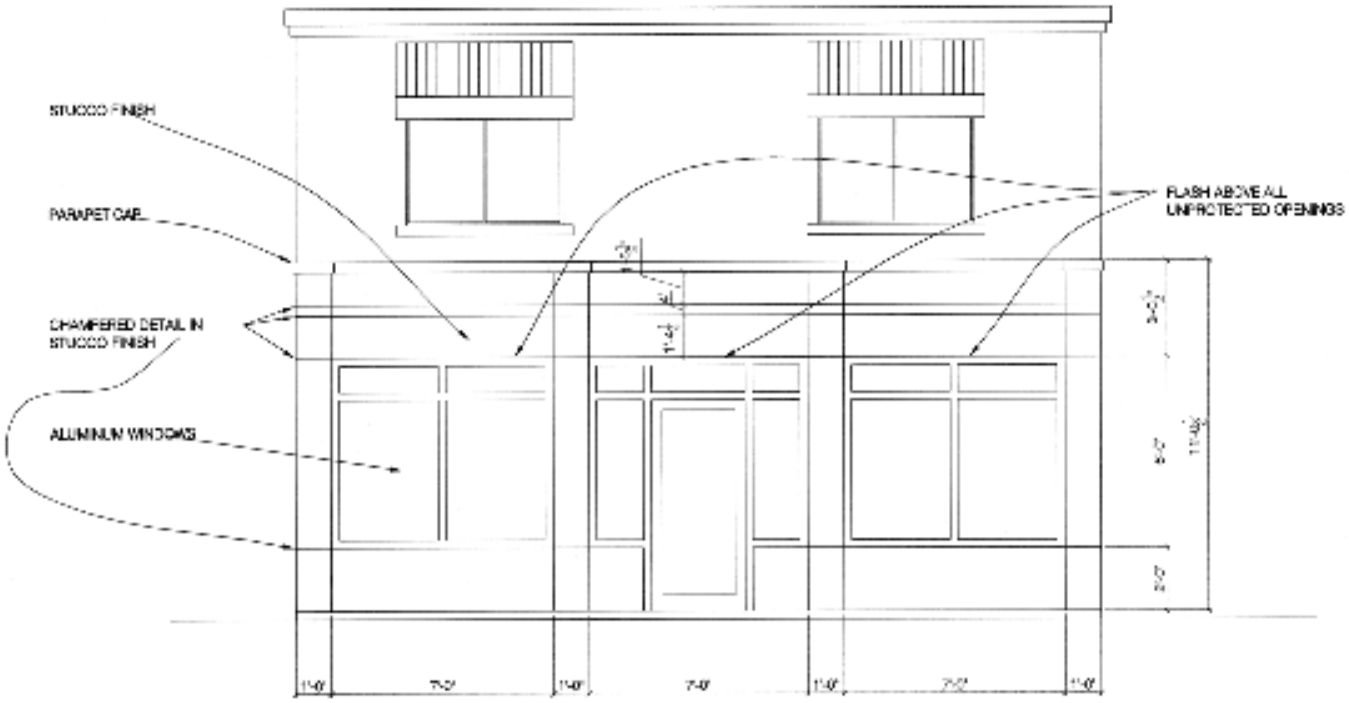
Of course, we'll still be operating throughout construction. To accommodate the changes, we've moved our entrance to the back of the building on the ground floor. This new entrance is across the parking lot from the Regent Hotel and signs will be installed to indicate where we are. Once the construction is completed, our reception area will move back to its original place.

But starting next summer, and every summer through to 2009, the front entrance of our building will become Revelstoke's Tourist Information Centre. During that time, the CAA's reception area will be via the back entry. The benefits we receive from this upgrade more than offsets the small inconvenience to the operation of our office during the summer months. We'll have photos of the finished project in the Fall issue of *Avalanche News* but if you can't wait until then, feel free to drop by and check out the progress.

Going, going, GONE! It took contractors less than 2 days to remove the front of our building.

Canadian Avalanche Centre Streetfront Redesign

ORIGINAL EXTERIOR



COMPLETED EXTERIOR

1st Annual CAA Photo Contest

BY BRENT STRAND

I'm happy to report that the CAA's first annual photo contest held on May 6th in Penticton during the Annual General Meetings – was a big success. Last winter, I wasn't so sure it was going to work. After two requests for photo submissions were published in the *Avalanche News* I had still only received one entry! As the next few months went by I confidently waited for more submissions to pour in but I was mistaken. Four weeks to the entry deadline and I only had three entries. Basically each one would have been guaranteed 1st place!

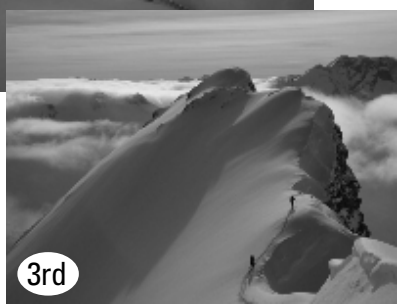
I knew I had take action so I sent out a bulk e-mail to rattle the cages of the members. It seems timing was key because in the next two weeks I received 27 entries for a total of 57 photos. After the weight of a pending flop was lifted we had to get down to some judging and pick some winners. Eight CAA staff members and local professional photographer Mike Pirnke sat down for about two hours viewing all the photos. It was not an easy job as there were many excellent images to look at. There were varying opinions but with the help of Mike we managed to come to some decisions.
The winners are as follows:

Events and Occasions:

1st	Monashee Powder Adventures	"Herb's New Look"	Marmot Quantum Jacket
2nd	Kyle Hale	"The Pimp Jeremy Cox"	Deuter Backpack
3rd	Jeremy Cox	"I Like Beer"	Draw Prize

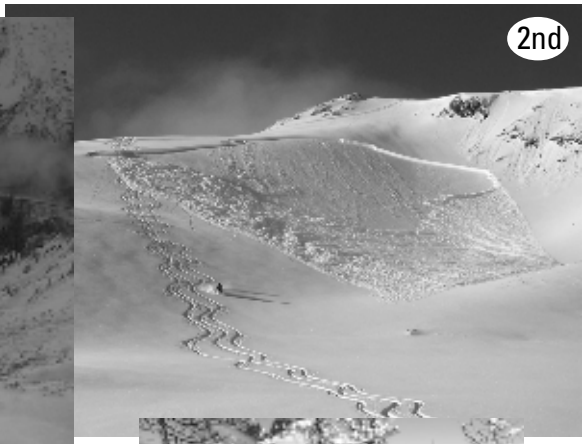
Members at Work:

1st	Hatha Callis	"Untitled"	Marmot Quantum Jacket
2nd	Cam Campbell	"Cam Full Depth"	Deuter Backpack
3rd	Jordy Shepherd	"Terminal Peak"	Draw Prize



Avalanches:

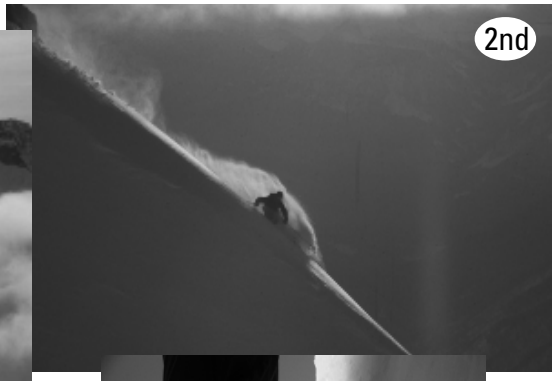
1st	Doug Wilson	"Entrance Slide"	Marmot Quantum Jacket
2nd	Jordy Shepherd	"Selkirk Mountains"	Deuter Backpack
3rd	Andrew Nelson	"Almost…"	Draw Prize



The winners of the People's Choice awards were decided at the AGM. All the photos were projected on to a large screen during the Trade Show and members were invited to view the images and cast a vote for their favourite. Here are the results of that contest:

People's Choice:

1st	Jordy Shepherd	"Terminal Peak"	Marmot Never Summer Sleeping Bag
2nd	Hatha Callis	"Untitled"	Deuter Backpack
3rd	Cam Campbell	"Cam full depth"	Draw Prize



All in all I would like to thank all the members who submitted photos and the CAA staff and Mike Pirnke for judging the entries. Start snapping those pictures now to get ready for next year's contest. It will be even bigger and better!

Canadian Avalanche Association
Annual General Meeting and Committee Reports
May 6, 2004 ~ Penticton, B.C.

Canadian Avalanche Association President Bill Mark called the annual general meeting to order at 1:23 PM and thanked the members for attending.

Financial Report ~ John Kelly:

John stated that he has had the pleasure of serving as secretary/treasurer for five years and this is his final meeting. Highlights of his term included:

- 1999 ~ Cash crunch ~ zero-based budgets were imposed with cuts across all areas to ensure we could keep the association running
- 2001 ~ planned financial activity ~ structures were implemented to allow us to better cope with cash flow and big projects, and allow the association to grow forward
- 2001/2002 ~ Intellectual Property Renewal Fund ~ a system was created to account for replacing intellectual properties and we ensured that all cost centre activities had to pay into this fund
- 2002/2003 ~ reduce dependence on management fees to subsidize our operations ~ we have been relatively successful in narrowing the gap
- 2003/2004 ~ multi-year commitments for public money have been made by government, financial planning exercise is underway for business planning, financial strategies document developed, and an increased growth in all cost centres, public funding, etc.

John reviewed the revenue and expense summary for all of the CAA's cost centres. The amount of business we do is steadily increasing. John showed a break down by cost centres of revenue and expenses.

He discussed a graph showing CAA Members' Equity. The building purchase was made with IPRF money but is being paid back at $900.00 per month over 25 years. Should the Association need more IPRF money, we will borrow it from the bank at prime minus 1% rather than have a mortgage on the building.

Bruce Allen made a motion to accept financial report. Bob Sayer seconded the motion. The motion was carried with all in favor.

At this time, only an interim budget for the first quarter has been drafted due to the unknown total financial commitment of governments. Approved capital expenditures include $30K for accounting software, $21K for CAA business planning in cooperation with NSS, and $15K building maintenance and upgrade. This first quarter budget was approved by the BOD, but will be re-approved by the new Board.

John closed by giving some project timelines including:

Business Planning Exercise - May 24
National Avalanche Centre governance – June 21
Detailed budget - July 1

Detailed financial statements are available upon request to the membership and were available at the meeting.

Technical Committee Report ~ Rob Whalen:

The Technical Committee is comprised of Rob Whalen (Chair), Bruce Jamieson, Dave McClung, Simon Walker, and Bob Sayer. Bruce stepped down as chair in the summer and the members applauded Bruce for his hard work over the years as Committee Chair. Alan Jones also attended meetings before his IT Committee involvement.

This year the Technical Committee was involved with:

- CAAML review for the IT committee
- Request for AAAP for US standards review. This is ongoing and Rob stated that the Technical Committee will respond to specific requests but not complete an overall review of their final document. Rob added that they are hopeful that the work done by the IT Committee and the U.S. counterparts to standardize electronic data transfer will help bring us closer together. They will continue to work with the U.S. as required.

Upcoming committee work includes:

- Review of the glossary for InfoEx and Public Avalanche Bulletin
- Work with the IT committee as required on CAAML data specifications

Dave McClung is also working on an ICSS committee regarding snow crystal classification scheme. This project has a one year time frame and an international committee with broad representation from the avalanche industry is reviewing this. Dave has additional information as well as his contact details in *Avalanche News*. Members are requested to contact Dave with any comments regarding any clarification, or changes they would like to see. (*Editor's note: See page 68 in this issue for more information*)

Rob stated that the Technical Committee will let the Fracture Character/ Shear Quality issues evolve, rather than imposing any standards in the immediate future.

The technical committee can be reached at: techcom@avalanche.ca

Membership Committee Report – Anton Horvath:

The Membership Committee is comprised of Johann Slam, Helene Steiner, Brad White and Anton Horvath as Chair.

There are 327 professional members (317 practicing and 10 non-practicing), 283 affiliate members, 100 associate members and five honorary members (included in the professional category). Total Canadian Avalanche Association membership is currently 710 people.

There were 24 new professional members this year with seven switching from affiliate to professional status. There were five resignations or defaulted memberships.

The affiliate category saw 75 new members with six resignations or defaulted memberships and the seven individuals above who become professional members.

There were 14 new associate members with three resignations or defaulted memberships.

Anton added that a total of 120 applications for membership were received and approved during the 2003/2004 season. The application process has been streamlined. Anton reviewed the membership statistics since 1988, and the affliliates are still the fastest growing segment of the Association.

Anton recommended that members update their personal contact information in the members' only section of the CAA website.

Anton added that ten professional members were audited this year. Six of the 10 have completed the audit and had satisfactory CPD records. The remaining four will be completed soon. Thirty professional members have been audited in the past three years.

Associate Members ~ John Birrell:

John has enjoyed his previous year as the Associate Members' Representative on the Board of Directors and looks forward to continuing in that role this year. He hopes to get to know more of the membership this year. John has tried to engage associate members to see if there are partnership options that can be pursued or other ways to strengthen their relationship. John added that he has received good ideas from the Associate Members and he encouraged members to contact him with ideas to forge stronger partnerships. John hopes to engage the retail market more and use them as a way to pass on bulletin information and to further educate recreationists.

Affiliate Members Report ~ Lori Zacurak:

Bill advised that Lori Zacaruk had work commitments that came up at the last moment and she regretted that she could not attend the AGM and report on behalf of the Affiliate Members.

Professionalism & Ethics Committee ~ John Hetherington:

Bill Mark had asked John to take on P&E Committee chair earlier this year. The BOD requested the committee help resolve a conflict of interest situation. The BOD then asked the committee to look at membership issues, and communication from P&E Committee to membership. John added that Alison has done a great deal of work on a framework for professionalism and ethics. There is also a policy for data sharing in the works. The P&E Committee are meeting today giving members a chance to meet face to face. Phil Hein is stepping down from the committee and they may be looking for additional members.

Education Committee Report – Helene Steiner:

The Education Committee is currently comprised of Dave Smith (Chair), Phil Hein, Marc Deschenes, and Helene Steiner. Helene thanked Laura Adams, Robin Siggers and Steve Blake for their involvement over the past few years. The Education Committee is concentrating on Education Planning initiatives, RAC, CAATS and Snowsmart.

Jan Johnson discussed Education Planning initiatives currently underway. These include:

- Developing a plan for building on and improving CAATS programs. This also includes exploration of developing career development guidelines in the industry (particularly the 100 days between the Level 1 and Level 2 programs) in conjunction with employers.
- Justice Institute relationship regarding on-line learning. The National Search and Rescue Secretariat funded New Initiatives Fund project was approved and the goal is to produce a self-paced interactive model for education on companion rescue in avalanches. This will be available on web sites of the various stakeholders. Curriculum development work is well underway and the beta version will be ready in November 2004.

Helene stated that a new RAC providers' advisory group had been formed and Al Matheson and Ryan Gallagher will be the co-chairs. The Education Committee representative will be Marc Deschenes. Work on a new risk management policy for ARAC is underway.

The Snowsmart program developed by the Smartrisk Foundation, has seen good success this year. Program partners are the Canadian Ski Patrol System (CSPS), Parks Canada, Smart Risk and the CAA. Peter Spear and CSPS have been extremely helpful in their promotion of the program and it was delivered in eighty classrooms in Calgary this winter. A CD Rom will be completed this summer. The program is offered to educate students about taking smart risks in all snow sports and is part of the Grade 7 and Grade 10 curriculum. There will be a June meeting to discuss streamlining the process. A peer-to-peer program was instituted in three schools as a pilot project and seven more will come on board this fall.

The focus for Education Committee this year will include the On Line Learning project, career development guidelines, improving the existing CAATS, RAC, youth education (Snowsmart) and other collaborative projects.

Explosives Committee Report – Bernie Protsch;

Bernie Protsch thanked Everett Clausen and CIL Orion for their generous donation again this year. The Explosives Committee is comprised of Bernie (chair) Scott Aiken, Colani Bezzola, Dave Iles and Brian Johnston. Bernie discussed the importance of including any explosive problems encountered onto InfoEx news to distribute the information promptly and professionally. The Explosives Committee could review these technical problems that occur each year. Bernie would also like to see an open forum at the AGM where users could gather with technical representatives that supply products and discussions on training and products, etc. could occur.

Bernie discussed due diligence regarding the explosives regulatory division. As of May 31, 2004, a number of things must be done with Type 4 and 6 caches to improve security measures. These include proper doors and locks, etc. as per the new industry regulations and we all need to move ahead with this. Bernie has a list of fabricators that can make these changes. He added that there will be spot inspections so members should ensure they are in compliance. There were three or four significant explosive thefts in the last year, and in one instance a theft was attempted for a second time. Bernie also recommended personal contact with Explosives regulatory personnel, due to the changing world and the important issues of explosives security.

There was excellent feedback on this year's Blasting Course from WCB and the 60 participants that attended the course.

Bernie thanked the other members of the Explosives Committee and added that anyone with questions could contact committee members.

Information Committee Report – Jeff Goodrich:

The IT committee is a new committee formed this year. Initially, the group was established as an ad hoc committee, and was to investigate a web based InfoEx using XML standards for data transmission. An XML working group was established including Jan Begstrom (CMH), Jeff Goodrich (Parks Canada), Pascal Häegeli, Evan Manners, Mark Myhre (CMH) and Simon Walker (BC MoTH).

CAAML was reviewed by the technical committee and an independent XML expert. This was then implemented by Pascal Haegeli and Roger Atkins for the CAA. Key points of CAAML are data-transfer protocols, the observation data complies with OGRS, and the OGRS portion is in use in InfoEx and at CMH. This product is in its initial testing stage. Jeff added that this adds ability to include other content (pictures, etc.) and offers huge possibilities in future.

Following this work an IT Committee was formed. Members include Jeff Goodrich (Chair), Jan Bergstrom, Donna Delparte and Simon Walker. The committee mandate is to advise and support the Board of Directors and Executive Director and to investigate and pursue technologies that will facilitate data management, ensure CAA is applying best practices, and is a resource for CAA members and their employers.

The Committee has currently been tasked to develop a data-sharing policy in conjunction with Professionalism and Ethics committee for BOD approval. They will also be involved with work on CAAML extensions including adding geographical specification, snowprofile specification, and complete the OGRS specification.

Contact information for the IT Committee is itcom@avlanche.ca

ISSW Canada 2008:

Nic Seaton stated that they are looking for an organization committee to get this event going. The event will likely be held in the Whistler area. Talk to Chris Stethem if you are interested in having your name put forward. This is a great opportunity to showcase what we do.

President's Report – Bill Mark:

This was Bill's final president's report and he stated it has been a real pleasure to work and be involved with the CAA and the variety of people he has met as President of the organization. He added that the make-up of the BOD reflects a good range of the snow and avalanche community. Bill thanked the CAA staff, and the other Board members who contribute a great deal of time and effort on behalf of the association. He acknowledged the work over the years of John Kelly, and Robin Siggers who are also stepping down from the Board at this meeting.

Bill discussed the advantages of having John Kelly and Alan Jones on staff at the Canadian Avalanche Centre this winter and added there was no conflict of interest with this.

Bill stated that the Committees also do a tremendous amount of work for the Association and the Education Committee got special recognition for the amount of work they have accomplished during Bill's term as president.

The main goal of the BOD is to look after the mission statement. Bill reviewed the CAA Mission and Vision statements and emphasized that it is a unique blend of all these things that makes us a strong organization.

Bill explained that the Board direction has been to use the mission and vision as our guide, keep our roots as professionals, explore opportunities to deliver public safety service, and continue to better support the membership with service. Bill added that an emphasis this year will be to promote professionalism within the association. He stated that members should give the Board feedback and tell them what you need from the organization.

Board of Director activities this year included:

- Develop systems for a sustainable CAA (governance, financial policies, BOD training and procedures)
- Review CAA programs (CAATS direction (ongoing), industry support, public information services

Bill added that the Board leads the CAA and the work is to provide the strategic direction.

Bill discussed the Constitutional Revision Process. He would like to see full membership participation and have a meeting at the ISSW to discuss the full review. Bill added that some of the proposed constitutional changes regarding the BOD were to ensure that professional members were in the majority and would continue to steer the organization, but well-qualified members within the association should also be given the opportunity to work for the BOD.

Bill chaired the voting on Specific Resolutions as previously sent to the membership:

Special Resolution #1 - Part 4 - Section 23 Paragraph (1)

The necessary quorum for a general meeting is twenty (20%) percent of the Professional Members, but not less than 40 Professional Members.

Shall now read:

The necessary quorum for a general meeting is ten (10%) percent of the Professional Members, but not less than 40 Professional Members.

Paragraph 28 Section 4:

(4) Voting shall be by show of hands, unless a secret ballot is required by twenty (20%) percent of the active Members present.

Shall now read:

(4) Voting shall be by show of hands, unless a secret ballot is required by twenty (20%) percent of the Professional Members present.

Paragraph 28 Section 6:

(6) At a special General meeting voting on a special resolution may be by a show of hands, secret ballot or mail in ballot.

These resolutions were all voted on together and all passed with no one opposed.

There was general discussion on Special Resolution #2 regarding the president being a professional member. There was also discussion of whether an Associate member is a representative or an organization, club, or business or an individual. Voting on Special Resolution 2 required a secret ballot and occurred later in the meeting.

Special Resolution 3, Part 5, Paragraph 30 Section 1 (b)

(b) A Professional Member elected as Vice-President of the Society;

Shall now read:

(b) A Member elected as Vice President of the Society

There were 61 votes in favour of the special resolution and 9 against. The special resolution was passed.

Special Resolution #4 - Part 5 – Paragraph 30 Section 1 (c)

(c) A Professional Member elected as Secretary-Treasurer of the Society;

Shall now read:

(c) A Member elected as Secretary-Treasurer of the Society;

This resolution was passed with all in favour.

Special Resolution #5 - Part 5 – Paragraph 30 Section 1 (i)

(i) A majority of the Board of Directors must be Professional members.

This resolution passed with all in favour.

Special Resolution #6 - Part 5 – Paragraph 30 Section 1 (j)

(j) The immediate Past president may continue as a non voting member of the Board for a period of one year after leaving the presidents position

There were 68 votes in favour of this resolution and 2 against. There was a question as to why the past president could not vote. The resolution was passed.

Special Resolution #7 - Part 5 – Paragraph 33

(33) The Members may, by special resolution, remove an officer or Director before the expiration of his term of office, and may elect a successor to complete the term of office

Shall now read:

(33) The Professional Members may, by special resolution, remove an officer or Director before the expiration of his term of office, and may elect a successor to complete the term of office

The membership discussed Special Resolution #7. If the resolution was passed and Affiliates or Associates wanted to remove their representative, it would have to be by special resolution of the professional members. The way the special resolution is worded is in direct conflict with the way the associate or affiliate is elected. Although Alison made a motion to withdraw the special resolution, it became apparent that this resolution required a vote since it had gone to the membership.

The resolution was defeated as all the members voted against it.

Special Resolution #8 – Part 5 – Paragraph 35

(35) No Director shall be remunerated for being or acting as a Director, but a Director shall be reimbursed for all expenses necessarily and reasonably incurred by him while engaged in the affairs of the Society.

Delete paragraph 35

Bill Mark gave the rationale behind deleting this resolution and proposed that we review the Society's Act and other similar organizations to determine a fair and reasonable fee structure. The membership agreed that the intent was good but controls are required and requested more parameters before it could be voted on.

Bill Mark made a motion to withdraw special resolution number 8. Robin seconded the motion. The motion was withdrawn.

Special resolution number 2 - Part 5 – Paragraph 30 Section 1 (a)

(a) A Professional Member elected as President of the Society;

Shall now read:

(a) A Member elected as President of the Society

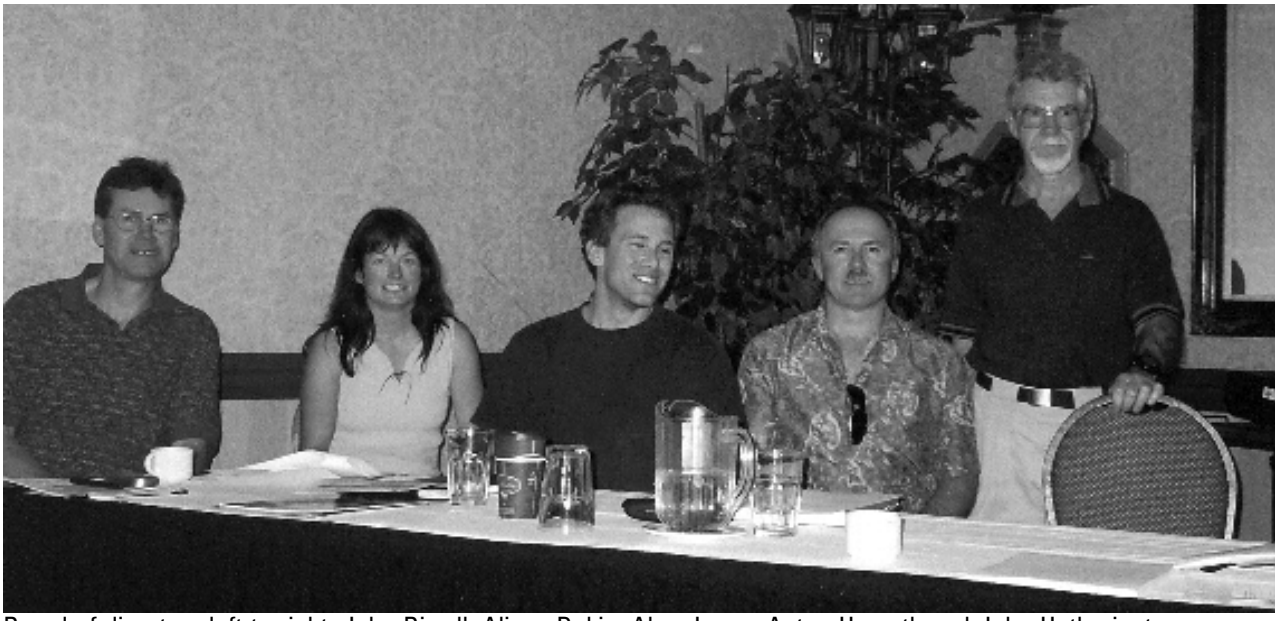
Bill Mark stated that the intent of the resolution was that some Affiliate and Associate members that would make excellent candidates for President and this would provide an opportunity for the professional members to vote for the most qualified person for the position. A secret ballot vote occurred and votes were collected and audited.

Special Resolution 2 was defeated with 29 votes for and 49 against.

It was recommended that more rigorous, expert examination occur in future before constitutional changes are brought forward. The ISSW could be an opportunity for a forum with discussion. A draft of proposed constitutional changes is currently available on the "members' only" website. These were drafted by an outside consultant.

Bruce Allan made a motion to review the constitution within the next year. John Hetherington seconded the motion. The motion carried with all in favor.

Bill Mark received a standing ovation for all his hard work on behalf of the Association.



Board of directors left to right: John Birrell, Alison Dakin, Alan Jones, Anton Horvath and John Hetherington

The elections for the 2004/05 Board of Directors were held and the following people were elected:

John Hetherington - President
Anton Horvath - Vice President
Steve Blake - Secretary/Treasurer
Alan Jones - Director at Large
Rob Rohn - Director at Large
Alison Dakin - Membership Committee Chair
John Birrell - Associate Representative
Lori Zacaruk - Affiliate Representative

Alberta auditors: Mark Klassen and Grant Statham

The Alberta Auditors for 2004/05 are Mark Klassen and Grant Statham.

Membership Committee representatives are Johann Slam, Helene Steiner and Brad White.

On behalf of the CAA, Bruce Allen thanked Bill Mark for his time and energy on the BOD as President and he was presented with a gift in appreciation. Bill presented Robin and John Kelly with a parting gift as well. Both Robin and JK said how much they enjoyed their time on the BOD and how proud they were to have had the opportunity to represent such a professional organization.

John Hetherington thanked the membership for his appointment as President. He asked for cooperation while he gets up to speed and looks forward to representing the CAA.

Scott Aitken made a motion to adjourn the meeting. Mike Boissenneault seconded the motion. The motion was carried with all in favor.

The meeting was adjourned at 4:22 PM.

End/sh

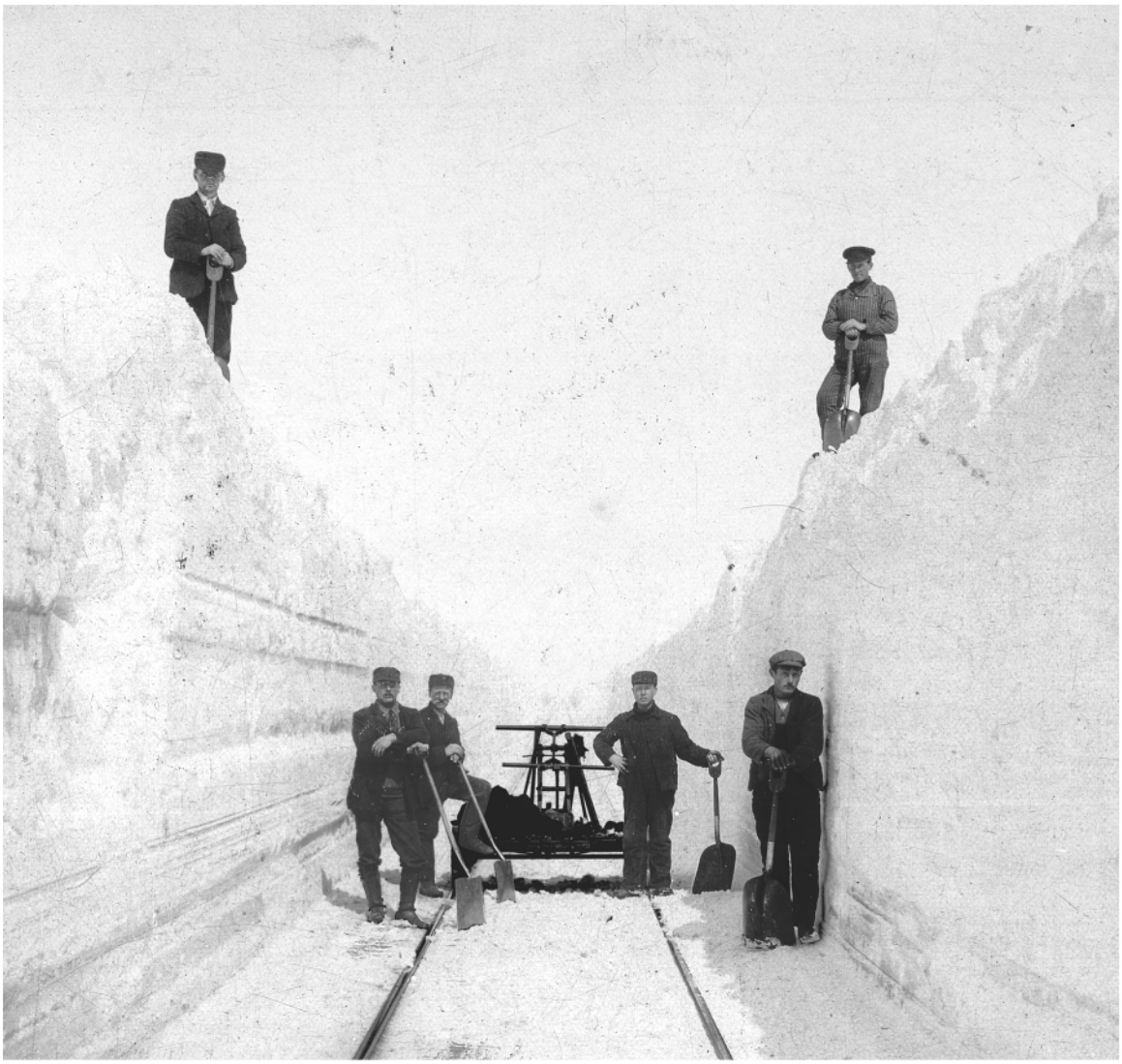


Photo: Canadian Pacific Railway Archives

Making tracks in the backcountry since 1884.

Since coming to Western Canada over 100 years ago, Canadian Pacific Railway has been a pioneer of backcountry exploration and safety. By finding the first route through Rogers Pass and opening the West. By building Mount Macdonald Tunnel, the longest railway tunnel in the western hemisphere, to avoid the avalanches and dangers of the Pass. By hiring Swiss guides to help ensure tourists stayed safe while mountaineering and exploring the backcountry. That tradition continues today through CPR's partnership with the Canadian Avalanche Association to make the backcountry a safer place for people to work and play.

To find out how you can support the Canadian Avalanche Association, please call 1-250-837-2435.

www.cpr.ca

CANADIAN PACIFIC RAILWAY
Ingenuity.

CAA's Annual General Meetings: People, smiles and more people.

CAA's Logo Policy

By Evan Manners

The policy guidelines for the use of the official CAA logo are the end result of several years of work. Back in the early 1990s, the policy for the use of the logo was fairly loose. That was before the widespread use of the internet so the logo was generally only used on business cards and the policy worked pretty well. But by the mid 90s, when people began making their own web pages and brochures for small businesses, staff at the CAA found the policy for logo use was becoming less helpful for members trying to incorporate the CAA logo into their own business and marketing products without creating confusion with the public.

In 2000, our new logo was launched and as members began to use it, it became obvious the onus was on the CAA to establish clearer guidelines for the future. We also saw members, working in good faith, altering the new logo in order to fit their own projects. After all our efforts at brand recognition for the new logo, these freelance designs were somewhat counter-productive. So the pace increased on providing the members with easy, clear policy guidelines for the proper use of the CAA logo. Things were proceeding well until we ran into the trademark issue. Establishing legal ownership of a logo takes a long, long time and policy work was put on the back-burner while that issue was dealt with. The CAA and CAF worked together, with Clair Israelson and Chris Stethem leading the charge, but it still took 18 months before trademarking the logo in Canada and internationally was complete.

Since then, work on developing a policy to guide the proper use of the logo has been finalized. With this new policy we hope to aid members in determining how and when to use the CAA logo. Brent Strand, Audrey Defant and Jane Mitchell have been the main participants in this process and they are pleased to present the final draft of the CAA's logo policy here.

the society logo

placement & size

If the logo is “floating”, an exclusion zone is required around the logo. A ratio of 1/6 the logo width. i.e.: 3” wide logo, 1/2” exclusion zone surrounds logo.

If the logo is to the edge of a publication, the logo is to be positioned no closer than 1/4” from the edge, regardless of the logo size.

The logo will be reproduced no smaller than 1” wide.

the society logo

colours

The society logo may be printed in the following colours only.

canadianavalancheassociation

Pantone spot colour

PMS 186 & Black

canadianavalancheassociation

Four-colour process

Use the following values for four-colour process print jobs.

C = 0 M = 91 Y = 76 K = 6

canadianavalancheassociation

Pantone process black

The logo will be reproduced with the word avalanche at a 40% value of black.

canadianavalancheassociation

Reverse

The logo may be reversed out of any colour, however, the base colour must be at least 30% darker than white. If the contrast is not at least 30% different, the black or colour logo must be used.

Photographs

The logo may be reversed out of or placed on top of photographs, however, the background must be a uniform colour, solid and non-textured (i.e. sky, snow). Rocky mountain peaks, forests or a powder cloud will interfere with the reading of the logo.

the society logo

who can use it

canadianavalancheassociation

The society logo and word-marks Canadian Avalanche Association and InfoEx are registered trade-marks of CAA. Non-members may not use or reproduce the CAA trade-marks for any purpose without written permission. All rights or licenses of any CAA trade-marks will be specified in a user agreement (i.e.: Membership, IRAC, ARAC, InfoEx or sponsorship agreements).

Member of canadianavalancheassociation

Membership use of the CAA logo and word-mark is only permitted by members in good standing in conjunction with the wording Member of.

InfoExpartner2003-04

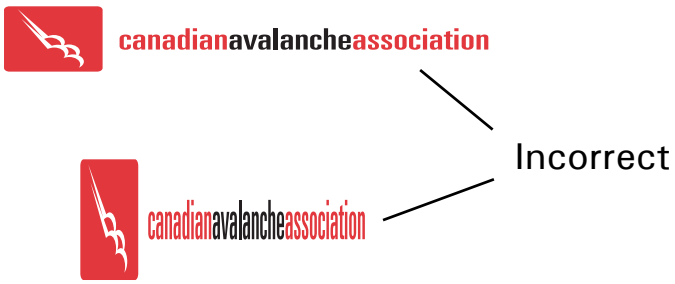
Use of the CAA InfoEx partner logo and word-mark is only permitted by subscriber companies as specified in the Industry Information Exchange Agreement. Please refer to previous pages for placement and colour specs.

Introductory Recreation Avalanche Course (IRAC) or Advanced Recreation Avalanche Course (ARAC) providers may use the CAA logo or word-mark on their advertising materials with the prior written permission of the RAC Programs Administrator. Use of the CAA logo and word-mark is only permitted as outlined in the RAC Instructor Agreement or in conjunction with the wording Member of with the exception of copyright materials supplied by the CAA.

Sponsors use of the CAA logo and word-mark are only permitted as outlined in the Sponsorship Agreement.

the society logo

incorrect use



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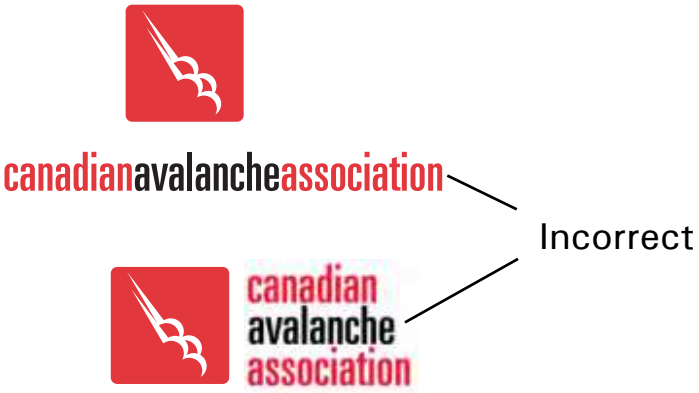


The logo may not be cut and or pieced together.

Any further questions or concerns contact:
Brent Strand
(250) 837-2435 or publish@avalanche.ca

Events Schedule

July 5-8, 2004

5th International Conference on Snow Engineering

The Snow Engineering Conference is an established forum for snow practitioners and researchers to present, discuss and exchange research results. Unlike other snow conferences, Snow Engineering is dedicated to the application of snow science to industrial and engineering applications. The sponsor of the conference is the Swiss Federal Institute for Snow and Avalanche Research SLF, Davos. For more information on the conference, visit www.snow2004.ch.

Where: Davos, Switzerland,
Contact: Snow Engineering Secretariat at E-mail: snow2004@slf.ch

September 19-24, 2004

International Snow Science Workshop (ISSW) 2004

Snow scientists and avalanche practitioners from many nations will meet in Jackson Hole, Wyoming to present papers and exchange information at the International Snow Science Workshop 2004. ISSW 2004 will continue the theme of past workshops "A Merging of Theory and Practice". The American Avalanche Institute, Jackson Hole Mountain Resort, and United States Forest Service will be hosting this event.

Where: Teton Village, Wyoming
More info: www.issworkshop.org
Contact: American Avalanche Institute, PO Box 308, Wilson, WY 83014; Tel: (307) 733-3315; E-mail: issw@aol.com

October 13-16, 2004

SAR*SCENE* 2004

Organized by the National Search and Rescue Secretariat and the Search and Rescue Association of Alberta. Don't miss the games, workshops, tradeshow and search and rescue demonstrations.

Where: Calgary, Alberta
More info: www.nss.gc.ca or call 1-800-727-9414
Contact: Registration - Lynn Tremblay (613) 996-4737; E-mail: ltremblay@nss.gc.ca
Inquiries - Tina Bouchard (613) 992-8215; E-mail: tbouchard@nss.gc.ca
Games - Carole Smith (613) 996-3727; E-mail: csmith@nss.gc.ca

3 Dimensional Flux Line Model

BY BRIAN MCKIRDY

I developed this 3D model in an effort to grasp some of the more advanced searching techniques such as pinpointing in a circle, searching in the vertical plane, finding the jump point, etc. I built upon the 2D flux graph developed by Backcountry Access. There are probably other models out there and some may well be more advanced than mine.

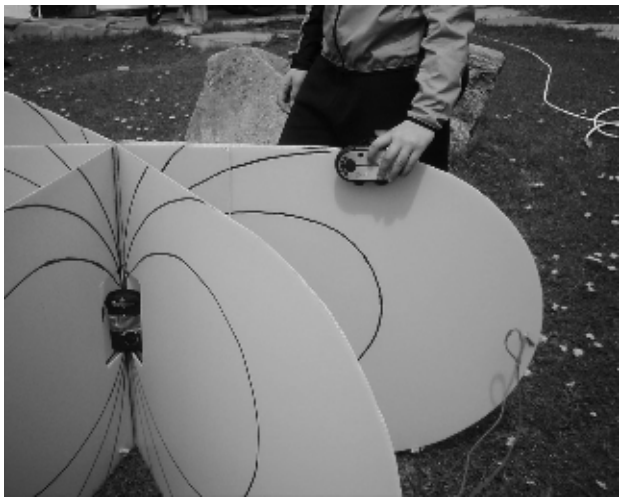
After fooling around with this model for a while I realized that not only could you explore advanced techniques with it, it was also very good for explaining basic search techniques and theory. You can simulate the different burial positions and their corresponding flux lines (rainbows and fountains).

This training tool is especially useful for demonstrating the sensitivity of 2 axis digital beacons such as the Tracker and the Barryvox. This is not an endorsement of 2 axes digital beacons. We simply need to recognize that they are popular and that different training styles are necessary.

With digital beacons users are finding spikes and nulls where they don't expect them. To explain what is happening one needs to delve further into theory then was previously necessary. Using the 3D model one can easily demonstrate where these occur.

The training aid is also useful with analog models. Besides teaching basic theory, it is handy for demonstrating the importance of maintaining beacon orientation. Advanced users of analog beacons will also find the explanation of spikes and nulls enlightening.

If I understand the literature correctly, beacons with three antennas should make knowledge of theory unnecessary for the average user. I can't wait!



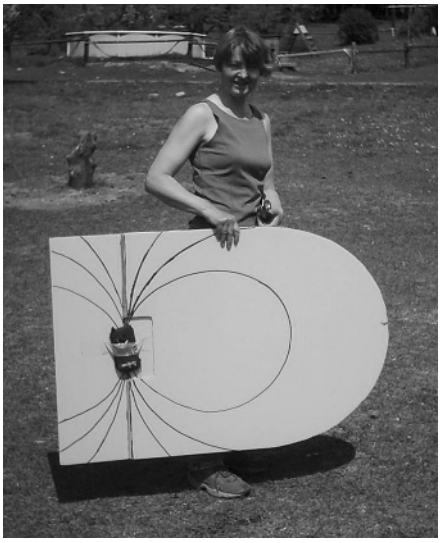
Building your own

Having looked at the pictures you may choose to design your own or change the scale. Following are the instructions for reproducing mine.

Tools and Materials

- Two 4x8 sheets of corrugated plastic
- Clear duct tape
- String
- Knife
- Straight edge
- Felt marker
- Two beacons, one of them should be digital
- Pencil

Take a look at the pictures before you start. Notice that one of the sheets is a little longer. This gives you a place to attach the beacon. Cut each 4x8 plastic sheet into three 32" x 48" sheets. You now have 6 sheets. Take one and measure 10 inches in from a factory edge. Draw a line parallel to the edge (it will be 32 in long). This will be your long sheet.



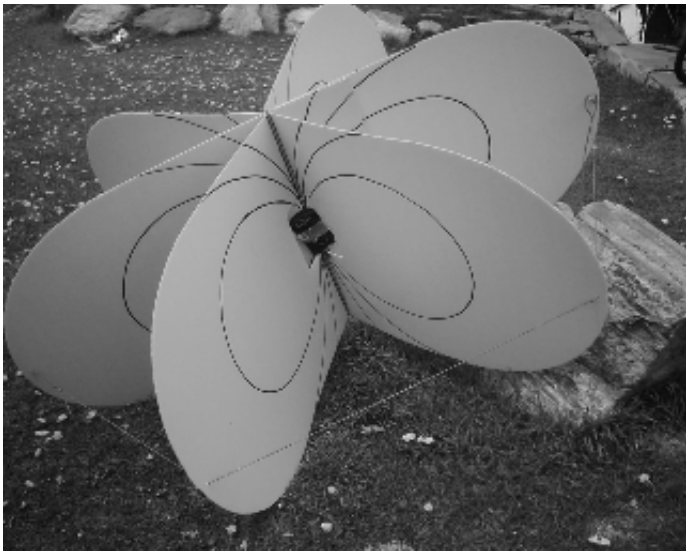
Turn on a beacon and place it in the centre of this line. Align the antenna with the line. Using your digital beacon to check the alignment. Tape the beacon down.

Now comes the fun part! Use your digital beacon and a pencil to trace out some flux lines. How many is up to you. I kept it minimal. Once you're happy with your pencil lines, colour them in with a felt marker. At this point I cut the outside curve in the shape of a flux line. You now have a template. By supporting your template over a lamp or taping it to a window you can trace lines on to the other five sheets. Remember, these sheets will all be 10 inches shorter than the template.

After these five sheets are cut and marked. Make a cut out in them for the beacon and tape them to the template—three on one side, two on the other. Stand it up and space out the sheets. You can poke holes in them with a nail to attach the string. I have a number of loops and knots in my string so that I can fold parts of the model as suits me.

Well that's it, y'er done, thanks for promoting safety, and you deserve a medal!

TEACHING TECHNIQUES



Visualizing
Hold up a mandarin orange, or a pumpkin or an onion (depending on how you're feeling). Imagine this orange had a transmitter in the centre and was about 80 metres across. You now have an image of the transmitting pattern of an avalanche beacon.

Tracing flux lines (best done on snow)
Place a transmitting beacon on top of the surface in an open area like a playground. Walk away from it in a straight line at 90 degrees to the antenna axis. Place students along the line every five metres or more. If you have more than six students put some on the other side of the beacon (extend the line). If your students are using digital beacons you can start them in pairs, standing back to back.

Ask your students to switch to receive, walk slowly, shuffle their feet and follow the strongest signal. When they arrive at the beacon they will have traced out a full-size two dimensional diagram of the flux pattern. With a little bit of group management you can all stand back and see the results in the snow. With no snow it is still a useful exercise but it is helpful to lay the beacon on a flux diagram or model at the beginning.

Tracing flux lines on flux diagram or 3D model can be done in the classroom and is useful for reinforcing the concept.

Spikes and nulls
The best way to demonstrate what is going on here is with a digital beacon and a 3D model. As you pass the receiving beacon over the transmitter, students can see when the beacon is parallel to a flux line and how that relates to signal strength.

Demonstrating the importance of beacon orientation
This is easily done on a flux diagram or better yet with a 3D model. Lacking these tools you can hold a receiving beacon at a given distance from a transmitting beacon and show how the signal strength changes with orientation. Remember, tilt the beacon up and down as well as side to side.

Searching
If possible choose a large open classroom like a gymnasium or community hall where you have access to the basement or lower floor. Prior to the training session place your activated beacons beneath the classroom. Unless you are training pros keep the transmitters well spaced and away from walls and corners. In a gymnasium you have easily room for three beacons. With three beacons I would put one flat, close to the floor. The second one I would also put flat and down a metre or so. The third one I would put down more than a metre and would orient the antenna vertically. (Remember, the antenna may sit diagonally in some beacons).

Before class starts go into the classroom and search for your "buried transceivers." We don't want any surprises. Pay particular attention to your vertical transmitter—there should be a poor signal right over top of it and strong readings in a circle around it. That is, of course, if you hold your searching beacon horizontally. If you hold it vertically the strongest signal will be directly over top of it.

When the students have finished the search exercise it is useful to place the 3D model in the locations where the beacons were found. Orient it to the hidden beacon. This helps students (and me) to visualize the flux lines and should clarify the entire exercise.

Retraining

In the course of doing practice beacon searches I find that a significant number of people are not functioning well. Some require a quiet environment to go through the basics one-on-one with an instructor. Take the rush out of it and focus on understanding the concepts. Remember the Midas Muffler ad? "First you get good, then you get fast."

Common search errors – digital (2 antenna)

- Not maintaining beacon orientation during fine search
- Following a flux line away from the buried transmitter after reaching a point very near it. Usually this is caused by following the arrows when within three metres of the "victim"
- Stopping at the first spike
- Unaware that the beacon performs differently with multiple burials and consequently being unable to perform in that situation
- Assuming that because they have bought the latest technological marvel, practice won't be necessary

Common search errors – analog

- Traveling too slow while using the tangent search method (i.e. trying to find the loudest point on a line by walking very slowly with ear held to receiver)
- Not maintaining beacon orientation
- Not making best use of volume control
- Not practicing multiple burials
- Assuming that because they have owned this beacon for a long time and are familiar with it, practice won't be necessary

I understand these errors well, I've made 'em all! And yes there are others. Volumes could be written. For me, for now, this is enough. Stay safe.

Brian McKirdy was raised in Valemount, BC, and has been travelling the surrounding mountains since he was old enough to crawl out the door. Brian and his wife Liz, along with their two teenage children, Karen and Ross, are the owners and operators of the Dave Henry Lodge. Most of the winter clientele are self-guided. In Brian's role as caretaker he encourages guests to practice beacon searches and avalanche scenarios. He often participates in these exercises and has come to appreciate the need for regular practice and upgrading of skills. Brian and Liz have also volunteered their time to teach avalanche awareness to local high school and college students.

Review of Glide Processes and Glide Avalanche Release

Alan Jones

Abstract

Glide, the process whereby a snowpack on a slope moves along the ground interface, is an important process that often leads to the formation and release of glide avalanches. Glide avalanches often mobilize large volumes of snow, and can have major destructive potential. A review of gliding concepts, glide mechanics, glide avalanche trigger mechanisms, factors affecting glide rates, methods for forecasting, and artificial release (control) of glide avalanches is presented.

The understanding of glide processes and glide avalanche formation and release has increased significantly in the last 40 years, with the development of numerous models based on constitutive equations and mechanics of materials. Research has shown that the amount of free water at the interface between the snowpack and the ground is likely the most important factor affecting glide rate and acceleration, which are in turn understood to be important indicators of natural glide avalanche release. The amount of free water at the snow/ground interface is controlled by precipitation from rain-on-snow events, melting due to solar radiation, and melting of the snowpack from higher air temperatures.

Progress has been made over the last 40 years to better forecast glide avalanche release, while methods for effectively releasing glide avalanches using artificial means are somewhat limited at present.

1. Introduction

In the classification of avalanches, distinctions are typically made between dry snow avalanches and wet snow avalanches. Avalanches consisting of dry snow are responsible for most of the damage and fatalities from avalanches (McClung and Schaerer, 1993). However, the destructive potential of wet snow avalanches has also been acknowledged as important, particularly in locations where human lives or structures are threatened (Wilson et al., 1996). A *glide avalanche* (Figure 1) is a unique type of avalanche, that may loosely be classified as a wet avalanche (e.g. McClung and Schaerer, 1993, p. 83), and is particularly dangerous due to the potentially large volume of snow involved and difficulty to forecast release. Snow glide is associated with glide avalanches, and therefore an understanding of glide processes is considered critical to understanding how glide avalanches develop and often lead to full-depth releases of the snowpack.

Figure 1. Slab avalanche released by gliding snow cover (Photo credit: R. Perla)

In this paper, the processes and mechanisms associated with glide avalanche formation and release are discussed. This is followed by a discussion of the difficulties involved with forecasting for glide avalanches, and some of the forecasting methods that are available to the avalanche forecaster.

2. Background

One of the earliest mentions of the glide process was by Seligman (1936), where he proposed the name "*snow rift*" to describe the development of a crack in a snow slope, now commonly known as a *glide crack*. The first period of extensive research of glide processes and glide avalanches was conducted in Switzerland in the late 1930's through the 1940's, predominantly by the Swiss researchers Haefeli, Bader and Bucher (Bader et al., 1939). Their work included laboratory tests to study glide velocity, and descriptions of the relationship of glide to interface temperature and snow viscosity, shear stress conditions and differences between wet and dry gliding. Important conclusions of research from this period include: (1) gliding velocity increases linearly with shear stress and reaches a constant value; (2) gliding velocity depends on the stress condition and the interface temperature; (3) the friction coefficient decreases from a high value for dry gliding to a low value for wet gliding; (4) when a critical gliding velocity is achieved, the process becomes dynamic and avalanche formation results; and (5) glide velocity, similar to creep velocity, is determined by shear stress and snow viscosity (Bader et al., 1939). They summarized the most important factors that have an effect on glide as: slope exposure; degree of surface roughness; temperature of the ground surface; and the thickness and properties of the snow cover. They proposed that the primary action of these factors is their effect on the frictional conditions of the slide surface.

Between the mid 1950's and late 1960's, In der Gand and Zupanièiè conducted research on glide avalanches for the Federal Institute for Snow and Avalanche Research in Davos, Switzerland. A summary of field investigations in the Swiss Alps was provided by In der Gand and Zupanièiè (1966), describing the influence of ground surface roughness, terrain shape and snow characteristics on glide avalanches. A method for measuring glide velocity was presented, including the introduction of the use of *glide shoes* to measure glide on avalanche slopes, and a glide velocity equation was developed from field measurements and glide theory.

During the 1970's and 1980's, much of the theoretical understanding of glide and glide avalanches was developed in Canada, Switzerland and Japan. McClung (1980; 1981; 1987a; and 1987b), developed various aspects of glide avalanche theory, including: constitutive equations that relate shear stress to glide velocity (McClung, 1980); constitutive equations relating tangential drag on the snowpack to slip velocity (McClung, 1981); a model for glide crack initiation (McClung 1987); and the effects of free water at the snow-earth interface on glide velocity (McClung and Clarke, 1987). Lackinger (1987) conducted field experiments in Switzerland on glide avalanches to develop a theory for glide crack formation and the mechanism of release for glide avalanches. Results were presented relating glide rates to the climate prior to full-depth avalanche release. Concurrent with research in Canada and Switzerland, Japanese researchers were conducting field and laboratory studies to describe glide mechanisms on slopes covered with bamboo bushes in Japan. Most notably, Endo and Akitaya (1978) and Endo (1983; 1985) described the anchoring effect of vegetation on a slope for full-depth avalanche release, and provided further insight into glide crack formation (Endo, 1983; Endo and Akitaya, 1978).

The most recent glide avalanche research reported in the literature is for field studies conducted on slopes adjacent to the Coquihalla Highway, in the Cascade Mountains of British Columbia. Results from these studies describe the temporal and spatial dependence of gliding (McClung et. al, 1994), and expand on current understanding of snow glide rates and their relationship to climatic conditions (Clarke and McClung, 1999).

3. Concepts of snow gliding

On a slope, snow is affected by three general deformation processes: *settlement* (perpendicular to snow surface); internal *shear deformation* (parallel to snow surface); and *glide* (Figure 2). The term creep is used to describe the resultant of settlement and internal shear deformation. The third component, snow glide, is the translational slip of the entire snowpack along an interface, typically either the ground surface or a thin water/ice layer (McClung and Schaerer, 1993). Glide occurs on both dry and wet snowpacks, but is typically negligible on dry snowpacks because dry snow has a high degree of friction along the ground interface (McClung and Schaerer, 1993). In wet snowpacks, snow gliding is a more important process that can result in full-depth avalanche release with large impact forces, as well as deformation of structures located along a slope where glide is occurring.

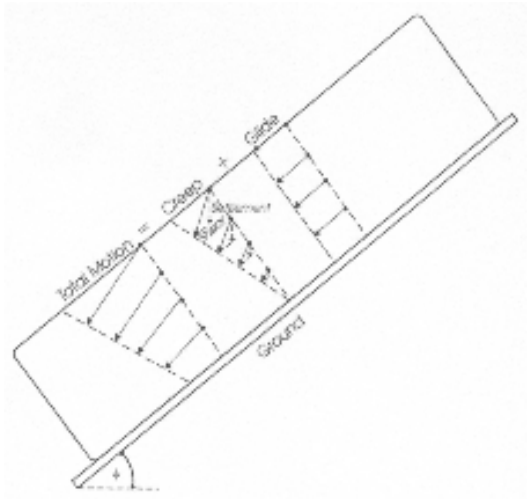


Figure 2. Components for snowpack deformation (after McClung and Schaerer, 1993)

Previous field studies have shown that there are three basic prerequisites that must be met before gliding can occur (Clarke and McClung, 1999):

(1) the interface must be smooth (e.g. bare rock or grassy vegetation);
(2) the temperature at the snow/ground interface must be at 0º Celsius, guaranteeing the presence of free water at the interface; and
(3) the slope angle must be at least 15º for roughness typical of alpine ground cover.

Surfaces that provide a smooth snow/ground interface, such as polished rock slabs or grassy slopes, are associated with the fastest glide rates. (McClung and Clarke, 1999). For glide to occur on rock, free water must reach the rock/snow interface. Glide on grass-covered slopes can occur without the presence of free water, but is greatly enhanced by the presence of free water (McClung and Clarke, 1999). For vegetative surfaces with high roughness (e.g. a harvested forest area, slide alder), glide is typically not observed.

Studies have shown that the rate of gliding is very sensitive to the amount of free water present at the snow/ground interface (e.g. Clarke and McClung, 1999; Lackinger, 1987). Sources of free water to the interface include: (1) rainfall; (2) melt at the interface resulting from stored summer heat; (3) snowpack melt by solar (short wave) radiation; and (4) melt from geothermal hot spots and groundwater outflows (McClung and Clarke, 1987). The first three sources are typically considered most important, while the effects of geothermal hot spots and groundwater outflows are seldom observed and are of limited interest.

Glide only occurs when the slope angle of the ground is at least 15º. Above this angle, the downslope portion of the gravitational force acting on the snowpack is larger than the combined frictional forces from the snow/ground interface and the internal frictional forces within the snowpack.

According to the model developed by McClung and Clarke (1987), free water at the interface has two principal effects on glide mechanics: it promotes separation of the snowpack from the ground at the interface; and it decreases the snow viscosity. By increasing the separation of the snowpack from the surface, irregularities on the ground surface tend to be 'drowned out', allowing the snow to move downslope unimpeded (McClung and Clarke, 1987). Free water available at the surface influences the stiffness of the snow slab because the slab viscosity decreases with increasing water content, making movement of the snowpack over ground roughness features easier (McClung and Clarke, 1987).

An increase in the snow/ground separation and a reduction in snow viscosity can sometimes combine to reduce the friction over a critical region of the base of the snowpack. The area of this region has been estimated to be 10 slab thicknesses long and wide (McClung and Shaerer, 1993), although there are no field studies to support this hypothesis. When friction is reduced in a downslope part of the slab, stress is transferred to the upslope portion of the slab, above the area of reduced friction. Tensile stress results in the upslope part of the slab, often resulting in formation of a tensile fracture, or glide crack (Figure 3). This crack initiates at the snow/ground interface and propagates upwards toward the snow surface, perpendicular to the interface (McClung, 1987).

Figure 3. Tensile crack formation in the snowpack (Photo credit: Bruce Jamieson)

Field observations show that glide crack formation is a prerequisite for full-depth glide avalanches, but that glide avalanche release does not always immediately follow glide crack formation (Clarke and McClung, 1999). The time between glide crack formation and glide avalanche release can typically range from a few hours up to several weeks (Lackinger, 1987), and occasionally up to months (McClung and Shaerer, 1993).

The locations where glide cracks tend to form are highly dependent on the ground topography (Lackinger, 1987). The most common locations for glide crack formation include convex rolls, where tensile stresses are concentrated; on slopes where the ground bed surface roughness changes (e.g. transition between rock slab and grassy slope); and below steps in rock (McClung and Schaerer, 1993). Glide crack formation is also dependent on ground roughness and slope angle (McClung, 1987). In der Gand and Zupanièiè (1966) suggest a slope angle of 30º as a lower limit for glide crack formation, applicable to grass covered slopes or rock slabs. Areas with higher surface roughness may require slope angles greater than 40º for glide crack formation (McClung, 1987).

4. Snow glide mechanics

Swiss, Canadian and Japanese researchers have developed several glide models. The most recent, and perhaps most comprehensive theory was developed by McClung and Clarke (1987). This theory expands on a previous theory developed by McClung in the early 1980's (McClung, 1980; McClung, 1981) and is discussed in the following section.

McClung and Clarke (1987) developed a model that assumes that the water within the snowpack and at the snow/ground interface is the critical parameter that determines glide velocity and glide avalanche release. Their model provides a constitutive equation that relates the local *basal stress*, *ô*, at the snow/ground interface to the *glide velocity*, U_0, as:

$$\tau = \frac{\mu U_0}{2(1-\nu)D^*},$$

where D^* is the *stagnation depth*, ì is the *shear viscosity* and õ is the *viscous Poisson Ratio* of the snow above the snow/ground interface. The parameter D* is a geometric construct that is a function of the snow/ground interface geometry and water distribution at the interface (Figure4) . If the glide velocity, U_0, is zero either due to high surface roughness or a sub-freezing interface temperature, the stagnation depth, D^* is also zero. The shear viscosity and viscous Poisson Ratio are functions of the changing density of the snowpack due to shear and compressive deformations, and the water content of the snowpack. Thus, if a significant amount of free water is present at the interface, the shear viscosity may be reduced, resulting in increasing glide rate.

McClung and Clarke (1987) emphasize the effect of water on the interface geometry, rather than the effects of varying shear viscosity and viscous Poisson Ratio with varying water content. Further studies by McClung et al. (1994) found that measurements of the characteristics of the snow at the interface with the ground showed only minor variation through the winter, while glide rates fluctuated substantially through the winter. Thus, they conclude that the effects of water on partial separation of the snowpack from the glide interface and in filling of irregularities in the ground has a greater affect on glide velocity than varying snow properties.

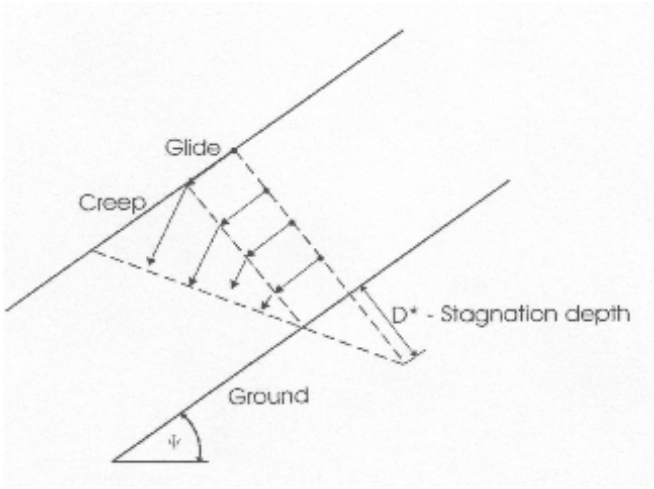


Figure 4. Schematic of creep and glide velocity components for the snowpack showing geometrical construction of D, the stagnation depth (from McClung and Clarke 1987, with modifications)*

5. Glide avalanche trigger mechanisms

Full-depth glide avalanche release is understood to be triggered by three general events: (1) loading by new snow; (2) rain-on-snow events; and (3) snowmelt. Snowmelt can either be from incoming solar (short wave) radiation, or by warming air temperatures that result in higher snowpack temperatures (Clarke and McClung, 1999). Lackinger (1987) found that glide avalanches were released more often after high air temperatures persisted for several days than after periods of rain. Release due to loading by fresh snow was only observed in one case during a period of record snowfall. Clarke and McClung (1999) found that most full-depth avalanches were triggered after the input of water from rain or snowmelt. The results of interpreted trigger mechanisms of 21 avalanches by Lackinger and 104 avalanches by Clarke and McClung are summarized in Figure 5. The difference between the number of rain-on-snow events between Lackinger and McClung and Clarke is likely because Lackinger observed rain-on–snow events concurrent with the associated melting, and interpreted the snowmelt as being the more critical trigger mechanism. There may also be significant climatic differences between the Swiss Alps and Canadian Cascade mountain ranges that could partially account for these differences.

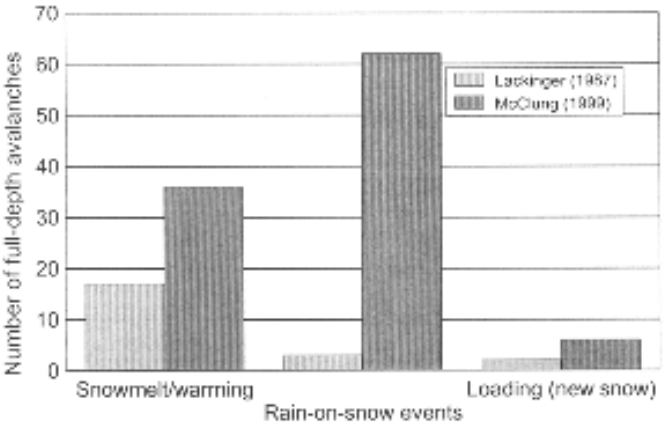


Figure 5. Full-depth glide avalanche trigger mechanisms (source data from Lackinger, 1987, and Clarke and McClung, 1999)

Release of glide avalanches on days with cold temperatures, although uncommon, was observed by both Lackinger and Clarke and McClung. The latter explain this phenomenon by the presence of melt-water at the snow/ground interface that is unaffected by low air temperatures due to snowpack acting as an insulator. Exposed rock surfaces near the upper part of the avalanche release zone may be warmed by solar radiation on cold days and cause additional snow melting, and this may be sufficient to trigger a glide avalanche. An alternate explanation was provided by McClung and Schaerer (1993), whereby diurnal changes in temperature cause the surface snow to contract as it freezes, due to the low water content (as would be expected near the surface). This may result in increased tensile stress in the crown area and fracture formation and lead to avalanche release. This may only apply to thin, wet slabs, making this an uncommon occurrence. Lackinger (1987) proposed that nighttime cooling makes the snow surface and flanks of the tension cracks freeze, changing the stress pattern within the snowpack. This may result in the damming up of meltwater at the snow/surface interface, and possibly lead to glide avalanche release. This same process may be responsible for avalanches triggered during cold periods.

6. Factors affecting glide rates

It is generally accepted that the supply of free water to the snow/ground interface is the principal mechanism controlling snow glide and glide avalanche release (Clarke and McClung, 1999). This supply of free water is critical in determining the glide rate. In der Gand and Zupanièiè (1966) surmised that there is a critical value of gliding velocity that can be used to forecast glide avalanche release. Much of the subsequent research has focused on investigating the relationship between rapid rates of glide, climatic conditions and the release of glide avalanches. Most researchers have been confounded by this relationship, due to the difficulty in obtaining accurate measurements of glide avalanches and time lags between climatic effects and avalanche release. Clarke and McClung (1999) found that there was no clear direct relationship

between glide rates and full-depth avalanche occurrence for their data. They proposed that full-depth glide avalanche releases may best correlate with periods of increased glide acceleration, rather than increased glide rates. This has yet to be investigated, and therefore, glide rate is still used as the most likely indicator of glide avalanche release. The following sections describe the relationship between glide rates and temporal, spatial and climatic variations.

6.1 Seasonal variation

Glide rates vary at any particular site throughout the winter season, and from year to year. Lackinger (1987) proposed that glide avalanches might be expected to occur in a season when gliding motion begins early in the season, particularly in seasons with early, heavy snowfall. McClung et al. (1994) noted higher glide rates and glide rate fluctuations in early season and attributed it to: (1) summer heat stored in the rock causing melting at the interface and (2) the early season snow is of low density, has a low shear viscosity and therefore deforms faster at the snow/rock interface. They also noted higher glide rates and fluctuations late in the season, corresponding to spring conditions. At this time of year, higher glide rates can be attributed to significant melting, warmer temperatures and higher likelihood of rain-on-snow events (Clarke and McClung, 1999). Figure 6 shows the mean monthly glide rate for 4 glide avalanche locations over a two-year period. Although there is significant variation, the general trend shows highest glide rates at the beginning of the season (i.e. November and December), lowest glide rates mid-winter (i.e. January to late February), and slightly increasing glide rates toward the end of the season (i.e. March to April). In der Gand and Zupanièiè (1966) noted a similar seasonal trend at a number of Swiss sites, with glide rates slowing down in the middle of January, and increasing in the middle of February, with increasing snowpack temperatures. Typical glide velocities are in the range of 1 to 100 mm/day (McClung and Schaerer, 1993), with mean monthly glide rates typically ranging between 5 and 20 mm/day (Figure 6).

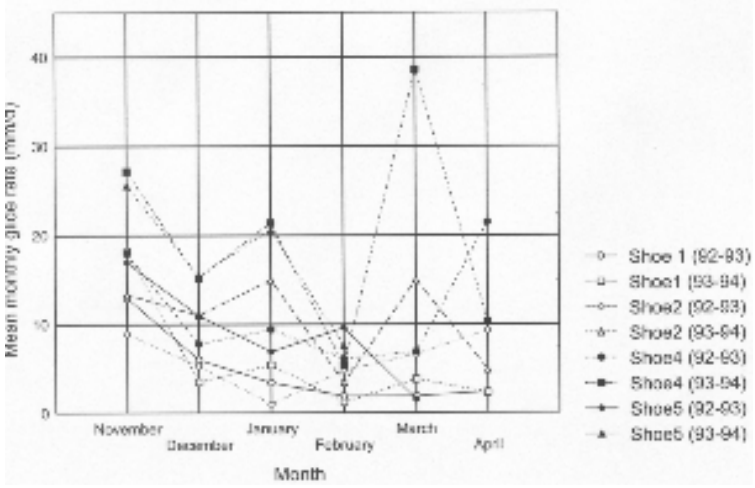


Figure 6. Mean monthly glide rates from Coquihalla Highway, Cascade Mountains, British Columbia (source data from Clarke and McClung, 1999)

Data from the Coquihalla Highway (McClung et. al, 1994) indicated a similar seasonal pattern of gliding rates on a year-to-year basis. This was attributed to the similar snowpack and weather patterns for the two seasons presented. It is likely that comparison of glide rates for a given site on a long term basis will show larger variations in glide rates, although there is no research to support this hypothesis. Figure 7 shows the mean seasonal (November through April) glide rates from 9 study sites on the Coquihalla Highway for the two-year period. The overall trend shows similar seasonal glide rates for each study site for the two-year period, with three sites (Shoe 4, Shoe 5 and Gauge 5) showing a large change between years.

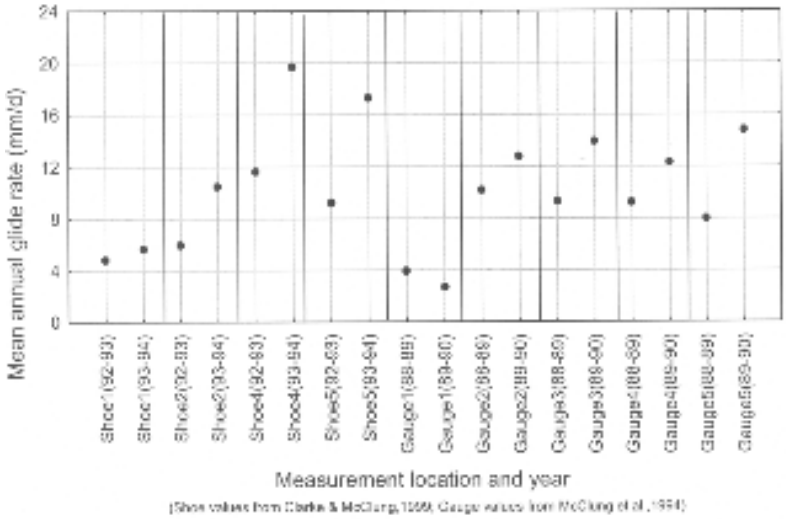


Figure 7. Mean seasonal (Nov.-Apr.) glide rates from Coquihalla Highway, Cascade Mountains, British Columbia (source data from Clarke and McClung, 1999 and McClung et. al., 1994)

6.2 Spatial variation

Glide rates on a slope are highly variable, both downslope and across the slope. McClung et al. (1994) note that glide rates increased in the downhill direction. Endo and Akitaya (1978) found that after a glide crack formed, the glide velocity decreases on the slope above the crack, but increases on the slope below the crack. Clarke and McClung (1999) found that glide rates vary across the slope of a glide avalanche, making it difficult to specify a threshold glide rate for avalanche release. Variations in glide rates are thought to arise from variable shear resistance at the snow/ground interface that result from natural features of the snowpack and topography (e.g. slope inclination, roughness, snow depth, viscosity) (Lackinger, 1987). With variable shear resistance across and up the slope, glide velocity gradients occur in the snowpack, which give rise to stress gradients. The snowpack deforms in response to these stress gradients, but when the tensile strength of the snowpack is exceeded, glide cracks form and subsequent glide avalanche release often occurs.

Due to the high spatial variation in glide rates between adjacent slopes, monitoring glide rates at sites away from avalanche initiation zones is of limited use for forecasting purposes (Clarke and McClung, 1999).

6.3 Diurnal variation

There is no conclusive evidence to relate glide avalanche release to diurnal variations. Lackinger (1987) found that avalanche release often occurred during the night. They surmise that nighttime cooling makes the snow surface and lateral edges of the glide cracks freeze, changing the stress distribution and causing free water to dam up along the ground/snow interface. In contrast to their findings, McClung et al. (1994) found that gliding was generally faster during the day for one year of data, and that there was no difference between nighttime and daytime glide rates for a second year of data. Further analysis (Clarke and McClung, 1999) for the same study site leads to the conclusion that there is no significant difference between nighttime and daytime glide rates.

6.4 Air temperature variation

Most studies of glide have confirmed that air temperature strongly influences glide rate (e.g. In der Gand and Zupanièiè, 1966; Akitaya and Endo, 1984; Lackinger, 1987; Clarke and McClung, 1999). However, this relationship is complex and multivariate in nature, making it difficult to use air temperature as a forecasting tool for glide avalanches. Other factors that complicate this relationship include loading by precipitation (snow and rain), snowmelt by solar radiation, direct water inputs to the interface from rainfall (McClung et al., 1994). Cross-correlation analyses between glide velocity and air temperature by Clarke and McClung (1999) showed that glide rate at their sites correlates positively with air temperature, with lag times of 12 to 24 hours. Their results also show that the correlation between glide velocity and air temperature is higher during snowmelt-triggered avalanches than during rain-on-snow events.

7. Forecasting glide avalanches

Numerous methods have been proposed over the years to try to forecast the release of glide avalanches, but the level of success has been limited. Consequently, forecasting glide avalanches remains a difficult process and relies heavily on the experience of the forecaster. Lackinger (1987) presented the results of a study where two measures were used to forecast: (1) measuring the glide velocity on the active glide avalanche; and (2) measuring the *micro seismic and acoustic emissions* (*MSE*) in the area of the glide avalanche. The concept behind measuring MSE is that during periods of increased glide velocities and acceleration, which are believed to precede full-depth avalanche release, increased amplitudes and frequencies of MSE can be measured, allowing for prediction of imminent avalanche release. Using MSE measurements, Lackinger (1987) was able to predict a small glide avalanche 3 hours before release due to an increase in the frequency and amplitude of MSE signals. However, these readings are complicated by the fact that signals originate both from the micro-fracturing of the snow, and an increase of gliding noise from the snowpack moving along the ground surface. French researchers also tried similar measurements (Lackinger, 1987), but found that they measured lots of extraneous signals from things such as helicopters and earthquakes. Distinguishing noise signals from the snowpack (e.g. due to creep) from noise signals from those generated at the snow/ground interface complicates signal differentiation.

A second method field tested by Rice et al. (1996) at the Alta ski area, Utah, involves the use of sensors that are designed to measure snow creep and glide in avalanche start zones. These sensors included an accelerometer and temperature sensor. One sensor was placed at the ground surface, while the other two were place one and two metres above the ground, respectively, allowing measurement of differential creep and glide movements. Using these instruments, there was some success in measuring the elastic response of the snowpack to nearby explosive use, and measurement of increasing creep rates prior to avalanching. These sensors seemed best suited for measuring creep, and their utility for measuring glide was limited, based on their results.

Wilson et al. (1996) tried similar field experiments near Revelstoke, British Columbia, using a sprung probe in the avalanche start zone that tilts as the snow moves downslope. The probe is pushed over by the snow until an avalanche occurs, at which point it returns to the upright position ready to monitor the next avalanche release. Again, the probe uses an accelerometer and temperature sensor for monitoring purposes. Snowpack movement was monitored by measuring the tilt of the probe, and transmitting signals via radio communication to a forecasting centre. Due to the large forces resulting from creep and glide, some of the probes were damaged during trials. Results from this study show that the probes can monitor snow movement prior to avalanche release with some reliability. Limitations include: that if there are no glide avalanche releases, the probes don't return to their upright position; this system doesn't differentiate between glide avalanches and normal slab avalanches; and this method does not differentiate between glide and creep.

All the three methods described above are limited by the fact that they have difficulty differentiating between glide and creep processes in the start zone. The one method developed to date that allows discrete measurement of glide rates is the use of glide shoes. Glide shoes were first developed by In der Gand and M. Zupanièiè (1966), and subsequent installations of glide shoes have been based primarily on this pioneering work. Glide shoes are flat-bottomed steel boxes with inner baffles that are placed on the glide surface before snowfall (Clarke and McClung, 1999). The glide shoes are open at the top so that snow can fall into them. The shoes are connected to a potentiometer with a cord, which measures displacement of the glide shoe. This information is typically recorded on a data logger and downloaded via a modem to a forecasting centre. Use of glide shoes allows the measurement of glide displacements, and the corresponding velocity and acceleration due to the movement of the snowpack over the interface.

Perhaps the most reliable method of forecasting glide avalanches uses a combination of one of the methods described above to measure glide rate and acceleration, combined with the monitoring of meteorological conditions. Meteorological conditions have proved to be critical in determining the release of full-depth glide avalanches (e.g. Clarke and McClung, 1999; Lackinger, 1987), particularly conditions that produce free water. Meteorological variables that are likely most important for forecasting glide avalanches include: precipitation (particularly rain from rain-on-snow events); air temperature (and the related snowpack temperature); and solar radiation.

8. Control of glide avalanches

Very little research has been conducted to date on the use of artificial control methods for glide avalanches. There is a lack of published articles in this field which is likely related to the limited success rate of control methods. Lackinger (1987) makes mention of the "Schmalzberg avalanche" that occurred in Switzerland in 1974, with a death toll of 12 people. Attempts were made to release the avalanche by using explosives along a glide crack, but were unsuccessful. An avalanche measuring 2 m thick by 100 m wide finally released due to melting water on the slope and recent snowfall, burying a ski tow and killing 12 people.

In contrast to dry slab avalanches, increasing the load on the snowpack on a glide avalanche does not generally trigger glide avalanches. This is partly due to the high frictional forces from the mass of the glide avalanche slab against the ground. More free water at this interface serves to reduce this friction, making avalanche release more likely. Because of this high friction and the large mass of snow, control of glide avalanches by explosives is generally unsuccessful. Perhaps a better method that has been proposed (B. Jamieson, personal communication) would be to introduce additional water into the avalanche start zone. This could entail introducing water into a glide crack from the air (e.g. helicopter water bombing), pumping water into the start zone, or using heat tape or other heat conductors at the snow/ground interface to generate additional free water at the interface. Such methods may have been tried, but little information on control methods exists in the literature.

9. Conclusions

Understanding of snow glide processes and glide avalanche formation has increased significantly in the last 40 years. Before the 1960's, glide processes and glide avalanches were a poorly understood phenomena that occasionally had significant consequences, resulting in impacts on human lives and structures. Development of an understanding of the mechanics associated with glide has provided researchers with some important tools for understanding how these avalanches form and when they may release. Important developments include the understanding that free water at the interface between the snow and the ground surface is likely the most important factor in the glide process. The amount of free water available is the principal factor that controls the glide rate and acceleration of the snowpack over the surface, which in turn affects when a glide avalanche will occur. Factors that contribute significantly to the amount of free water available at the snow/ground interface include rain-on-snow events, and melting due to solar radiation and warming from higher air and snowpack temperatures.

The knowledge of methods for forecasting and artificial release of glide avalanches is relatively limited when compared to methods available for dry slab avalanches. Some progress has been made in recent years for forecasting when glide avalanches will occur, but ways of controlling these avalanches are limited at present. Additional research and field studies could help forecasters further reduce the risk associated with glide avalanches by improving forecasting and control methods.

Acknowledgments

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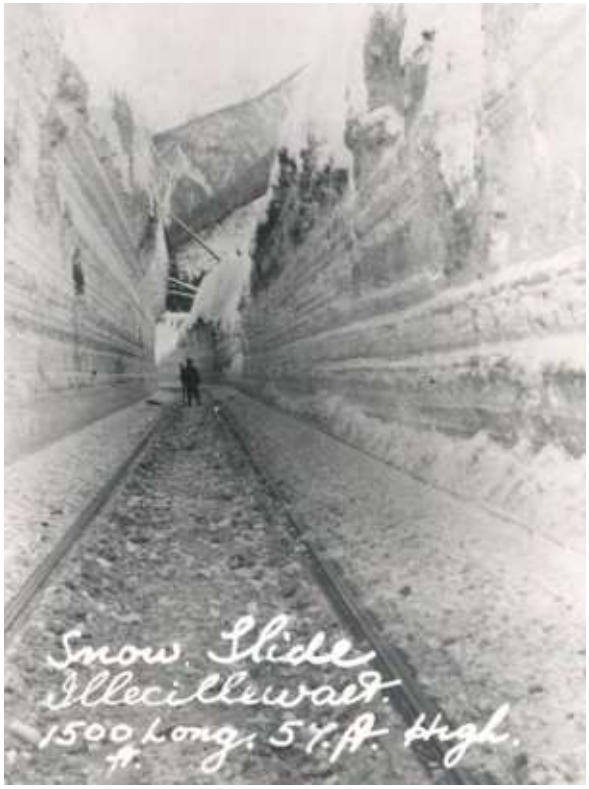
The CAA's Oral History Project

BY CHRISTINE EVERTS

Editor's Note: *In the spring of 2003, the CAA Board of Directors decided to use money from the Art Twomey Memorial Fund to finance the creation of an oral history of the CAA. Key avalanche pioneers were selected to share their memories and insights into the growth of the avalanche industry. A steering committee, comprised of Margie Jamieson, Simon Walker and Gord Burns, helped determine the terms of reference and the individuals to interview for the project. Christine Everts was contracted to conduct the interviews and write the history, while Susan Hairsine volunteered to provide overall project management, report collation and distribution.*

In the last issue of Avalanche News*, we published the chapter called "The Widespread Development of Recreational Pursuits." In this issue we'll take you to the early days of industrial avalanche accidents. As railways, highways, and the search for natural resources expanded in Canada's mountains, numerous avalanche fatalities spurred a growing awareness of winter's deadly potential. Read how these accidents, and the government reaction that followed, played a vital role in the development of the avalanche industry we know today.*

The Role of Industry-Related Avalanche Accidents



"We visited the owner of the mine in Vancouver and he said, 'No way, we've been mining there for 30 years and I've never seen an avalanche on that slope.' That was at the end of October. Between Christmas and New Year, an employee went to the site with a snow cat for an inspection. The snow cat started a big avalanche, which destroyed the temporary building, moved all the equipment and partially buried the machine. That was always quite satisfying to see that the predictions were correct!"[1]

For centuries, snow avalanches have affected recreation, transportation, resource industries and property in Canada.[2] With the onset of hard-rock mining in the province of B.C., developers began to recognize avalanches as a significant hazard.[3] However, the destruction and cost associated with avalanches were not widely publicized until the building of the Canadian Pacific Railway (CPR) through the mountains. In the search for a transcontinental railway route across the Selkirks, Rogers Pass was "discovered" in 1882. Three years later, in 1885 the track was laid.[4]

That same year Philo Ventas from Montreal published a booklet entitled *An Appeal to Public Opinion Against the Railway Being Carried Across the Selkirks – The Route Being Objectionable*. In it Ventas described avalanche paths where trees had been broken and crushed in all directions. He wrote, "I do not hesitate to say it will be a public scandal if the line be permitted to be taken in the threatened direction. There will be a perpetual risk of stoppage of traffic and at an immense cost the line will eventually be changed round the river Columbia."[5] While the controversial route was not changed, the regular occurrence of snow slides continued to cause a stir in political circles across the country.[6] In 1886, avalanches tore sections of the new track from the grade, and construction on 31 snow sheds began.[7]

At the turn of the century, William Vaux, a member of the famous Philadelphian family presented a paper to his local engineering club documenting the CPR route from Laggan, AB (now Lake Louise) to Revelstoke, B.C. In it, he commented that, "these snow avalanches are most dreaded by the railway company and it has been an endeavor to reduce their powers of destruction…costly structures in the form of snow sheds and bridges have been erected."[8] By 1904, 53 sheds with a combined length of 9.4 kilometres (km) were built.[9]

While the wooden sheds kept the railway line operational for most of the winter, their high maintenance cost reinforced Ventas' argument. By the turn of the century some of the original sheds were abandoned. Ironically, in 1910, near one of the abandoned sheds, 62 men died in a massive avalanche while clearing a slide that blocked the main line.[10] It was later referred to as the "Night of White Death."

Between 1885 and 1911, more than 200 people were killed in avalanches at Rogers Pass.[11] To reduce this number and find an alternative to the costly sheds, the eight-km long Connaught Tunnel was built. Its 1916 construction eliminated some of the most dangerous and avalanche prone railway track in the world.[12] With the completion of the tunnel and the closing of Glacier House in 1925, activity at Rogers Pass subsided until work on the Trans-Canada Highway began.

On December 10, 1949 the Trans-Canada Highway Act became law.[13] Construction standards for the nation's "main street" called for an all-weather, all-season transportation system. Due to the CPR's experience with avalanches and the political pressure to build a highway that would remain open year round, avalanche prevention and protection was taken into account from the beginning. In 1953, foreseeing the possibility that the highway might follow the short route through Rogers Pass, staff from the Department of Public Works (DPW) started gathering snow and avalanche data and a preliminary survey of avalanche sites began."[14]

Hans Gmoser, founder of the world's first and largest heli-skiing operation, CMH, remembers skiing into Rogers Pass in the early 1950s. On one of his trips, he was accompanied by Noel Gardner, the man credited with initiating avalanche science in Canada. "The time I really got to know him (Noel) well was in the spring of 1954 when he and his wife Gladys, and Jim Webb, who was with Public Works, went to Rogers Pass to photograph the avalanche paths across the proposed route of the Trans-Canada Highway. He invited me to come along with them… That was in early May 1954. We've been pretty good friends ever since. When he took the job at Roger Pass with the avalanche control, I saw a lot of him because I did a lot of ski touring up there."[15] According to Hans, "I learned quite a bit from him, particularly in terms of record keeping and trying to use past conditions and avalanche occurrences to predict what would happen in the future by keeping track of the snow pack."[16] Gardner's systematic observations and record keeping played an important role in the early development of the Trans-Canada Highway.

In 1956, the proposed route through Rogers Pass was accepted. Survey crews set to work and the search for snow researchers began. Lured by opportunity to develop the avalanche control at Rogers Pass, Swiss engineer, and Order of Canada recipient for his life-long contributions to avalanche safety, Peter Schaerer accepted a position with the National Reasearch Council (NRC). "They offered me several research projects. One was studying the properties of snow, another one studying the bearing capacity of ice on lakes, and one was to develop the avalanche control at Rogers Pass. That was the only one I was interested in…so I said, "Definitely I will come and work in Canada if I can get that project." The project was also related to highway engineering. In Switzerland I worked on highway engineering. This was a perfect combination, doing avalanche control for the highways. In fact still now I am most happy doing avalanche work for the highways."[17]

> *"This was a perfect combination, doing avalanche control for the highways. In fact still now I am most happy doing avalanche work for the highways." Peter Schaerer*

After finishing his service with the Swiss delegation of the Neutral Nations Supervisory Commission in Korea, Schaerer began his work with the NRC in the spring of 1957. "I was employed by the National Research Council and when the highway was built in 1957 to 1961, I was on loan to the Department of Public Works. As I said before, they needed an engineer to develop the avalanche control, but there was nobody available in Canada. The Department of Public Works being a federal department couldn't hire foreigners, but the National Research Council could, because they were a Crown corporation. So the National Research Council hired me and then loaned me to the Department of Public Works. So actually I worked for two bosses you see…"[18]

In 1962, the Trans-Canada Highway officially opened. As a means of promoting avalanche safety for highway travellers, the government published *A Winter Guide to the Rogers Pass Section of the Trans-Canada Highway.* In the guide, motorists were told "your realization of the dangers of avalanches, your appreciation of the magnitude of the engineering works and research that are contributing to public safety and above all your cooperation in following the instruction for traffic procedures will assure that your drive is both interesting and pleasant."[19] The engineering works and avalanche research undertaken in Rogers Pass can be credited with ensuring the safety of millions of travellers. During the first 20 years of highway operation, there were only two avalanche fatalities. The hazard had been significantly reduced, although not eliminated.[20]

While the avalanche hazard was controlled at Rogers Pass, other roads in the province of B.C. continued to be affected by their destructive forces. Avalanche fatalities along B.C. highways prompted the provincial government to form an Avalanche Task Force. The Task Force established an extensive highway avalanche safety and control program as the result of a 1974 avalanche near Terrace, B.C. that destroyed the North Route Café and killed seven people.[21]

> *"The avalanche came down and destroyed the café and to make a long story short, the Minister decided to form an Avalanche Task Force." Geoff Freer*

Geoff Freer, a member of the Task Force who spent two winters (1972/73) working as Schaerer's assistant in Rogers Pass recalled its formation. "[The accident] happened to be in the political riding of the Minister of Highways of the day. He all of a sudden became interested in snow avalanches because some people had been killed. These were actually people that were in a café having coffee because the road was closed. The avalanche came down and destroyed the café and to make a long story short, the Minister decided to form an Avalanche Task Force. Peter Schaerer was one of those people on the Task Force [and they] asked me if I would be on it too. So I left Rogers Pass at the end of the winter, May 1, 1974 and started working on the Avalanche Task Force in Victoria. Peter Schaerer, Roger Tremblay who was an avalanche consultant from Stewart, [B.C.], Dudley Godfrey who was a former Chief Engineer of the Ministry of Transportation, Steve Evans who was a Geo-Technical Engineer for the Ministry of Transportation and myself, [formed the Task Force]. We did a study for six months and delivered the report in the fall of 1974."

"The Ministry of Transportation asked me if I would stay on and implement the recommendations of that report. So I didn't go back to the National Research Council... The Ministry then formed a Snow and Avalanche Section. It started out as a very small group. We

basically just spent time defining the problem, creating snow avalanche atlases, identifying the primary areas of concern, focusing on those, hiring staff, getting equipment, training road crews, their foremen, the executive of the Ministry, and developing public information… That was full-time because in the summer you did a lot of the terrain work and fixed your weather equipment. Setting up weather stations actually was a big thing then..."[22] Today, B.C Highway's Snow Avalanche Program is the largest avalanche safety program in Canada.[23] Staff use the network of manual and automated weather stations established by the Ministry to ensure the safety of winter travellers on the 1,200 km of roads prone to avalanche hazards.[24]

Along with the province of B.C., Parks Canada established avalanche control programs on the roads in the four mountain parks. Toni Klettl, retired Jasper Park Warden, spoke of the early days of avalanche control along the Banff-Jasper Highway. "Actually it was quite interesting how we (Jasper National Park) got involved in doing avalanche control in Banff. We used to have the maintenance camp at Tangle Creek. One day the Tangle Creek crew refused to go to work because the Banff crew who were a little too far away, didn't put too much effort into their section (from Saskatchewan Crossing up to the Park boundary). Our crew had to clean the highway down to Saskatchewan Crossing. The crew decided they would go on sort of a semi strike unless it was looked after a little better. So we had a meeting at Saskatchewan Crossing with some of the fellows from Banff. The Assistant Superintendent Balding said, 'If you are not going to look after the goddamn thing then we will do it.' That's how we got stuck doing it until a number of years ago."[25]

Avalanches continue to be a significant issue in the transportation industry. Their direct cost is five million dollars annually due to traffic hazards and economic losses caused by delays.[26] Despite high economic costs, the numbers of avalanche fatalities on roads and highways have been considerably reduced. The success of avalanche control programs in Canada's transportation corridors is due to a three phased approach that includes: hazard mapping and location planning; defense structures (earthworks and snow sheds); and avalanche forecasting, detection systems, temporary closures and explosive avalanche control.[27]

Similar methods are used to reduce avalanche hazards in other industries such as mining. From 1870 to 1979, the mining industry officially recorded 114 avalanche fatalities. [28] Such fatalities played an important role in developing the industry's avalanche programs. The largest industry related avalanche accident since the Night of White Death in Rogers Pass occurred in 1965 at the Granduc Mine, 30 km northwest of Stewart. Twenty-six men were killed. [29] A number of participants in this project became involved in Granduc and shared their memories.

Norm Wilson, an American avalanche consultant, went up to Granduc following the disaster. "As it happened they knew of Monty Atwater who was living in Squaw Valley in 1965. He was still with the Forest Service at that time. He was known in the mining industry because he had pioneered avalanche control in Chile with other mining companies. So he was called upon to come and give advice. Part of his advice was to hire an avalanche control person to oversee avalanche problems that would be part of the picture on the road access to the mill site, to the mill site itself, and also to the mine site which is separate… Monty inquired as to whether or not I would be interested in doing the job there… At the time of the Granduc accident, I was a State of California Snow Ranger at Squaw Valley. I'd been doing that since the end of the 1960 (Olympic) games…at the end of that season…I moved from my home in Lake Tahoe to Stewart in June of 1965… I had guaranteed that I would stay for at least one season and I did."[30]

Herb Bleuer, founder of Whistler Heli-Skiing, came to Canada in the late 1960s when he was offered a job at Granduc, working on the avalanche control programs Wilson had established. "I was in New Zealand and I met a guy by the name of Murray Coates, who is a Canadian. He was on the ski patrol in Whistler and he was running the avalanche project for Granduc Mine up in Stewart. There were three of us, a New Zealander, a Tasmanian, and myself came up to Canada to work at Granduc..."[31]

Bleuer remembered Wilson. "He set it all up for Granduc, the 75-millimetre recoilless rifle…His recommendations were right on. They worked…He trained Murray Coates and Murray Coates took over… But you know it was a mine…mining is horrible…horrible work…horrible conditions… Nobody ever lasted very long with mining. I was probably the one that lasted there the longest. I was up there for five seasons, from 1970 to 1975/74." He went on to say, "There were two of them (mine sites) and the road. There must have been 15 miles of avalanche terrain along that road. That's how I got involved. In the few years that I was up there I ran the project…the avalanche control crew…"[32] In addition to his work at Granduc, Bleuer was involved in avalanche control in the logging industry.

Canadian consultant Schaerer was also involved in Granduc. "The avalanche accident happened in February 1965. In May, I got involved with the avalanche hazard at the access road…About three or four times, I went to the site to study alternatives for the access road to the mine."[33] Along with working on the access road, Schaerer examined the snow load on buildings at the mine. "The new Tide Camp at the Granduc Mine was in area where historically the deepest snow in the whole of Canada was observed. The engineers were concerned about the snow load on the roof of the big mill building. It was a huge building; I believe it was about 200 metres wide and 600 metres long with a sloping roof. I came to the conclusion that the roof load should be 280 pounds per square foot. We had long discussions here in Vancouver with the building design engineers and the company, and figured that it was an extremely high load. We concluded that the building would be heated during the winter. Therefore the snow would slide off and there would never be a maximum load of snow on the roof. I think they designed the roof for a load of 150 pounds per square foot. It was fine. The snow really slid off in spectacular roof avalanches! Then one winter the mine closed which happens often in mining when the metal prices are low. The snow did not slide because the building was not heated and part of the roof collapsed. They had quite a lot of damage to the equipment…"[34]

In addition to his work at Granduc, Schaerer later consulted for the Scotty Gold Mine. "The Scotty Gold Mine is on the road to the Granduc Mine. All that area is full of old mines. When the price of gold was high in the 1970s they began to redevelop them again…"[35] When the mine reopened, the mine inspector who had attended early avalanche courses, suspected there was an avalanche hazard above the mine. He sought an expert opinion, and Schaerer confirmed his suspicions. However, when they approached the owner of the mine, he dismissed their warnings. An avalanche later destroyed the buildings and equipment in the area – satisfyingly confirming their predictions![36]

To ensure the safe production of active mines following the Granduc Disaster, the Chief Inspector of Mines for B.C., Mr. J.W. Peck, asked Schaerer and Fred Schleiss to conduct an avalanche safety course for provincial mine inspectors and mine managers.[37] The two-day course which took place in Rogers Pass in 1969 marked the beginning of courses for industry professionals. Following this course, Schaerer and Schleiss, head of the Snow and Avalanche Warning Section in the Glacier National Park, received additional requests for avalanche safety courses. Due to such requests, they decided to formally establish a professional avalanche course.[38] A third instructor, Willi Pfisterer, an Alpine Specialist for National Parks, was hired to teach the search and rescue component. "With the training of the people, it was not Peter Schaerer's job. He made it his job. It was not my job, but I made it my job. Basically he took the snow and I took the rescue…"[39]

"With the training of the people, it was not Peter Schaerer's job. He made it his job" Willi Pfisterer

The first professional course took place in 1971 at Rogers Pass. Topics addressed included: properties of the snow pack; formation of avalanches; weather observations; snow profile observations; terrain; safety measures; and search and rescue. Of the original 15 participants, eight represented the transportation and resource industry, and seven represented ski operations, including Lloyd Gallagher a helicopter ski guide from CMH.[40\]

That same year, a number of Canadians representing various operations affected by avalanches attended the U.S. Forest Service's first National Avalanche School in Reno, Nevada.[41] At the school, Schaerer was a principal instructor on avalanche terrain and control. Gmoser remembered, "a number of us went down to Reno in 1970/71 when they had one of the early Snow Science Workshops. [We went] thinking that we would learn everything we needed to know, measure the temperature, look at the snow and then we would know whether we could ski or not." Realizing there was a lot more to learn, CMH "invited people like Ed LaChapelle and Peter Schaerer to come up…"[42]

Following the avalanche school in Reno, Canadian avalanche courses for professionals continued to develop. Pfisterer noted, "I think it was the second school we ran, it was at Whistler. We had 60 students between the two of us. By that time some of the guys crystallized already you know and they could be used as instructors. But anyway then we turned it over to BCIT (British Columbia Institute of Technology) to run the whole goddamn thing because it just got to be too much. The interest was so great and obviously the need was there..."[43]

In 1974, BCIT began to administer the courses through its Continuing Studies Department.[44] With the support of the National Research Council (responsible for the content of the courses) and the CAA, (responsible for standards and training objectives as of 1985), BCIT avalanche courses for professionals continued until 1988. In August of that year BCIT withdrew from administering the courses due to financial cutbacks and restructuring.[45] Selkirk College administered the courses the following year, after which time the CAA assumed responsibility. In addition to providing high quality avalanche education, the CAA brings together professional in the industry to further develop knowledge and understanding of avalanches, while also encouraging communication and promoting industry standards.[46]

Avalanche courses and the establishment of industry standards through the development of avalanche control programs can be credited with the significant reduction in the number of industry related avalanche fatalities. In the 15-year period, 1959-1974 there was 33 avalanche fatalities. In the subsequent 15 years, 1959-1974, the number was reduced to six.[47]

[1] Schaerer. June 17, 2003. 3.

[2] Stethem, Jamieson, Schaerer, Liverman, Germain and Walker. "Snow Avalanche Hazard in Canada – A Review." Natural Hazards 28: 487-515. (Netherlands: Kluwer Academic Publishers, 2003), 487.

[3] Schaerer. "Canadian Avalanche Association Training Schools – History" 2003, 1.

[4] Woods, John. Snow War. (Toronto: National and Provincial Parks Association of Canada, 1983), 9

[5] Ventas, Philo. "An Appeal to Public Opinion Against the Railway Being Carried Across the Selkirks - The Route Being Objectionable." 1885, 52.

[6] "Snow Slides in the Selkirks" Calgary Weekly Herald. February 19, 1885.

[7] Woods, John. Snow War. (Toronto: National and Provincial Parks Association of Canada, 1983), 7.

[8] Vaux, William. "The Canadian Pacific Railway from Laggan to Revelstoke, British Columbia." 1900.

[9] Woods, John. Snow War. (Toronto: National and Provincial Parks Association of Canada, 1983), 9.

[10] Ibid, 19.
[11] Ibid, 34.
[12] Ibid, 32.
[13] "Final Report Under the Trans Canada Highway Act, December 10, 1949 – May 31, 1971" (Department of Public Works. Ottawa, 1972), 9.
[14] Ibid, 12.
[15] Gmoser. July 7, 2003. 3.
[16] Gmoser. July 7, 2003. 1.
[17] Schaerer. June 17, 2003. 1.
[18] Schaerer. June 17, 2003. 4.
[19] "A Winter Guide to the Rogers Pass Section of the Trans Canada Highway." (Ottawa: National Parks Branch, , 1963), 7.
[20] Woods, John. Snow War. (Toronto: National and Provincial Parks Association of Canada, 1983), 49.
[21] Stethem C.J. and P.A. Schaerer. Avalanche Accidents in Canada I. A Selection of Case Histories of Accidents 1955 to 1976. (Ottawa: National Research Council of Canada - Division of Building Research, 1979) 92.
[22] Freer. June 18, 2003. 2.
[23] Schaerer, Peter. "Memoirs of Peter Schaerer" (Vancouver, 2003), 37.
[24] http://www.vancouverisland.com/Information/p18avalanches.html#top
[25] Klettl. June 12, 2003. 3.
[26] Stethem, Jamieson, Schaerer, Liverman, Germain and Walker. "Snow Avalanche Hazard in Canada – A Review." Natural Hazards 28: 487-515. (Netherlands: Kluwer Academic Publishers, 2003), 494.
[27] Ibid.
[28] Ibid, 498.
[29] Stethem C.J. and P.A. Schaerer. Avalanche Accidents in Canada I. A Selection of Case Histories of Accidents 1955 to 1976. (Ottawa: National Research Council of Canada - Division of Building Research, 1979) 24.
[30] Wilson. June 23, 2003. 3.
[31] Bleuer. July 9, 2003. 1.
[32] Bleuer. July 9, 2003. 2.
[33] Schaerer. June 17, 2003. 5.
[34] Schaerer. June 17, 2003. 5.
[35] Schaerer. June 17, 2003. 4.
[36] Schaerer, Peter. "Memoirs of Peter Schaerer" (Vancouver, 2003), 39.
[37] Schaerer, Peter. "Canadian Avalanche Association – Training Schools History" (Vancouver, 2003), 1.
[38] Schaerer, Peter. "Memoirs of Peter Schaerer"(Vancouver, 2003), 38.
[38] Schaerer, Peter. "Canadian Avalanche Association – Training Schools History" (Vancouver, 2003), 1.
[39] Pfisterer, June 12, 2003. 1.
[40] Schaerer, Peter. "Canadian Avalanche Association – Training Schools History" (Vancouver, 2003), 2.
[41] Schaerer, Peter. "Canadian Avalanche Association – Training Schools History" (Vancouver, 2003), 3.
[42] Gmoser. July 7, 2003. 5.
[43] Pfisterer, June 12, 2003. 1.
[44] Schaerer, Peter. "Canadian Avalanche Association – Training Schools History" (Vancouver, 2003), 4.
[45] Schaerer, Peter. "Canadian Avalanche Association – Training Schools History" (Vancouver, 2003), 8.
[46] http://www.avalanche.ca/
[47] Schaerer, Peter. "Canadian Avalanche Association – Training Schools History" (Vancouver, 2003), 14.

Christine Everts, author of the CAA's Oral History Project, was born in Banff and grew up in the mountains. She graduated from Simon Fraser University with a Bachelor of Arts in History and Anthropology and recently completed a Bachelor of Education at the University of Ottawa. Last fall she began teaching a Grade 2/3 class at the Chief Jacob Bearspaw Memorial School in Eden Valley, AB. She valued the opportunity to learn from friends, mentors and co-workers about an industry loved by her dad, Keith Everts (1942-1999), former National research Council of Canada employee and Banff Park warden.

Avalanche Pipe Demonstration

E-mail sent March 25, 2004

I am pleased to announce we have successfully fired two "live " rounds from our Avalanche Pipe at Kicking Horse Mountain Resort. We deployed the charges in an actual control area on the mountain named G7. Our good friends at Kicking Horse have been extremely helpful in adapting our system to meet Canadian requirements. I now have the loading and firing procedures completely nailed down. Videos will be available at the AGM in Penticton of the demos.

In order to address the WCB concerns, we were careful to stay well under the maximum propelling cup levels currently used in Europe for these demos until further testing is done on the new Austin composition B charge. As well, to insure flexibility and ease in maintaining stand off distances, a 500' firing line conveniently spooled on a detonating cord reel was used. We had the 150' minimum distance marked on the line. All personnel witnessing the demo were well back of the minimum distance and in fact were approximately 250' away and in the cover of a forested area.

A 40-gram launching cup filled with 1.1D black powder was used for both tests. The cup was primed with a North American made electric squib. The cups were assembled on a wood table well away from the public. The pipe was mounted on the front blade of a snowcat. The Pipe was sighted into the targets by eye. A North American electric blasting machine was used to initiate the squibs.

Both targets were hit in the bulls-eye. We were surprised and pleased at the distance and elevation the charges were propelled to. Both charges stuck into the snow even though they were on a very steep slope. Both charges fired at about 45 seconds after launching, which is bang on what a one foot fuse assembly should fire at, considering the altitude we were working at.

Over the next weeks before the CAA AGM we will be testing another pipe at Whistler/Blackcomb. I will keep you informed of the dates so those of you who want to witness the pipe in action can attend. As well we will be conducting more tests at our magazine site in Westlock, Alberta. This site is wide open prairie well away from any affect on the public. Here we can establish maximum propelling cup levels for our charge. We are also testing a new North American made shock tube squib, which fits nicely into the launching. This squib will hopefully eliminate the use of all electricity and associated issues when using the pipe. The remote system will still require electric squibs.

Very soon we should have a prototype launching cup, factory made at our plant in Tennessee with 1.4S Pyrodex black powder. This cup will round out the system nicely.

When you get a chance please give Steve Parsons, Jeremy Cox or Mike Rubenstein a call at Kicking Horse, for a first hand impression of the system. 1-250-439-5422.

Thanks and best regards,

David Sly
CIL/Orion Inc
Senior Technical Sales
Maple Leaf Powder Company
2025 Allenby Street
Victoria, BC, V8R 3B9
(250) 744-8765

The Avalanche Ball

By Manuela Eder, Export Manager of the Avalanche Ball

After having been buried under an avalanche in 1994, Herbert Fournier and his partner Daniela Venier began to view and evaluate avalanche research data. They collected numerous accident reports and statistics from all over Austria and Switzerland.

They found three significant and encouraging details:

- 63% of all completely buried people, found within 15 minutes, were located due to visible clues.
- 92%–or 9 out of 10 people–can survive if found and recovered within 15 minutes.
- Most avalanche victims are buried relatively close to the surface not deeper than 1.5m.

They concluded that because most people buried in an avalanche are actually close to the surface, they can be located and recovered within 15 minutes if there is a visible clue. So they began to develop a new system to locate avalanche victims, based on the above mentioned facts.

The next step was the development of a visible "clue" small enough to be carried along with regular safety and touring gear yet able to become—within fractions of a second—big enough to stay on top of an avalanche by buoyancy. After various experiments with foam materials, compressed air systems and gas cartridges, the first prototype of a "mechanical balloon"' was built.

The system uses spring activation to deploy a folded balloon with a rope connection to the body. When releasing the system, the balloon pops out of the system bag and remains floating on top of the avalanche.

This new technology did not only meet the first requirements identified by the inventors, but offered many other advantages which has made the Avalanche Ball such a successful invention.

The main advantages of the system are:

- Unlimited use.
- Maximum reliability - no batteries, no gas cartridges, no limitations of use even on tours of several days or abroad.
- No 'technical safety loopholes' such as insufficiently filled or empty batteries or cartridges, malfunction of batteries or cartridges, no "reload" problem in case of release for check or by error.
- The system can be test-released and function-checked any time without further cost.
- Users can easily activate the system and repack it without expert help.
- Users can be identified within seconds when buried under an avalanche. Searchers are oriented immediately and can proceed right to recovery.

For practically thinking professionals, the Avalanche Ball is a logical response to the facts. Up to now, the search for buried persons was far too complicated.

Das Skimagazin, extracts of an article appeared originally in German.

(...) the Avalanche Ball system is a step into the right direction towards more safety in snowsports (...) This new safety device is as brilliant as it is simple, an excellent example for the outflow of synergy between professional mountain rescuers and ingenious inventors.

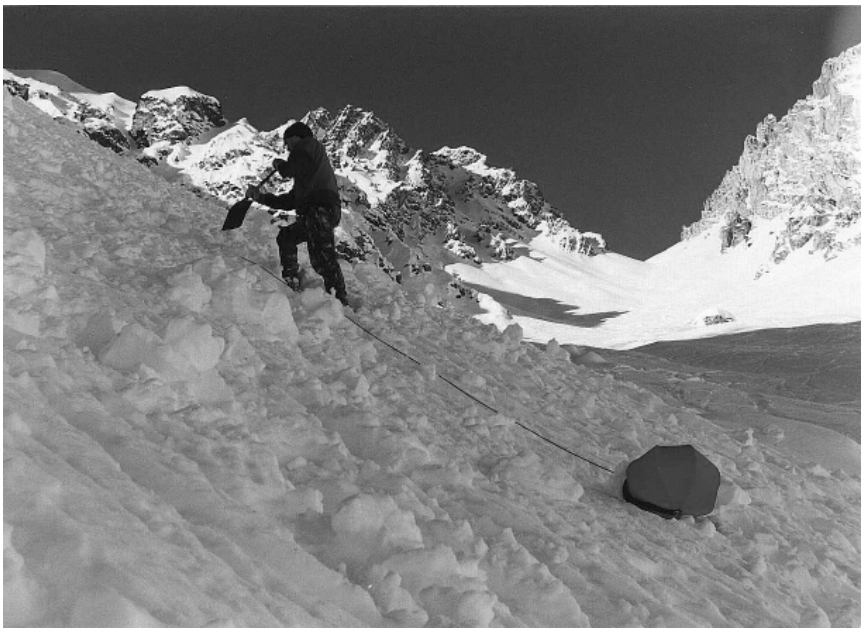
The SLF avalanche research institute of Weißfluhjoch/Davos (CH) states:

"Most entirely buried persons were found due to visible clues like body parts or objects, followed by persons found due to transceivers. While victims found due to 'visible clues' have relatively high chances of survival (85%), the survival rate of victims found due to transceivers seem deceivingly low (51%)." This circumstance has been stated before (Dr. Brugger, 1997). Survival chances of entirely buried avalanche victims depend primarily on burial time.

After their transceiver field test ("Piepstest") in 1998, the IKAR (International Commission for Alpine Rescue) stated:

"…It is necessary to develop devices, enabling average non-expert users in the future to search even under stress or shock on their own and successfully for avalanche victims."

A concept became a successful product after five years of intense research and development, the Avalanche Ball was presented to the public and awarded to numerous safety and innovation awards. Its low weight, simple use and reliable functioning made the Avalanche Ball a standard safety device for many backcountry professionals. Now, it is becoming more and more a regular safety tool for all powder hunters.



New product allows the recovery of avalanche victims immediately, without time-consuming search

Comments IKAR/ USA:

Colorado Avalanche Information Center

Dale Atkins: US representative to the Avalanche Commission for IKAR and also the committee chairman for the Search and Rescue Committee for the American Association of Avalanche Professionals.

"I have been following from afar the development of the avalanche ball for several seasons. I first heard of it at the IKAR meeting a couple of years ago. I must compliment you on such a novel, simple and affordable idea. Well done!"

Press:

Snow & Rock

"One of the fastest systems available to locate buried avalanche victims. The 'Ball' can be attached to any backpack, it's logical and simple to use. If you are hit by an avalanche, pull the ripcord, this launches the 'Ball' outwards and to the rear. The 'Ball' stays attached via a long rope fixed to large waist belt, even if the backpack is ripped of your back you will be still attached to the 'Ball'."

For more information on the Avalanche Ball e-mail avalancheball@aon.at or check their website at www.avalancheball.com. Currently there is no distributor in Canada but the Avalanche Ball can be purchased by mail order from the website.

Revision of International Snow Classification (1990)

The International Commission on Snow and Ice has requested that the International Classification for Snow on the Ground be updated and revised. An international committee has been formed for this purpose with Dr. David McClung at UBC being the Canadian representative. The focus of the update is to correct any errors, include any omissions and, most importantly, make the classification easier to use. Snow avalanche professionals make up the largest source of users by far and, therefore, most useful information will come from that group. Any suggestions can be sent to the committee chair: Dr. Charles Fierz at the Swiss Federal Institute for Snow and Avalanche Research, Flueelastrasse 11, Davos, CH-7260 Switzerland or fierz@slf.ch. Information can also be sent to Dr. McClung at: Dept. of Geography, UBC, 1984 West Mall, Vancouver, V6T 1Z2 or mcclung@geog.ubc.ca . The committee would be grateful for any suggestions you have. Target date for revisions is early 2005.

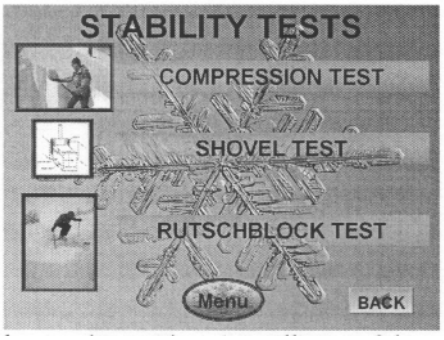
Looking Through The Loupe

A DVD Tool For Instructors & Students

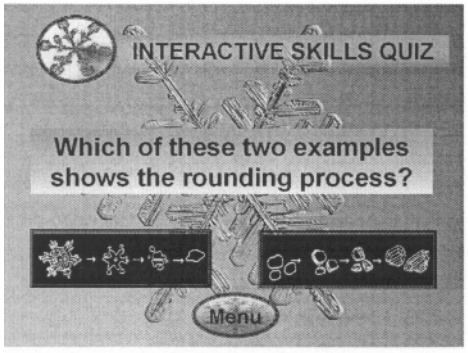
BY RYAN GALLAGHER

The vision for this project came from a compression test video done in the spring of 2001. That video demonstrated the proper techniques for performing that stability test. We all know how to do these tests but, in my experience, I find I need to refresh my skills every season. From this little epiphany I decided to try and put together a teaching/learning tool that could be used by a range of people— from RAC students and instructors up to Level 1 students, as well as any operation with new and returning staff.

The layout of the DVD is designed to be as easy to use as possible. It will have the option of audio and subtitles in French and English, with the future possibility of adding other languages.



In the main menu, there are all the standard field stability tests (CT, ST, RB) as well as test and full profiles. Information on fracture character from Dr. Bruce Jamieson and his students will likely be added. Currently I plan on making an interactive menu with quizzes and a web-based shopping area for potential sponsors. The interactive quiz is designed around the IRAC curriculum and will have interactive pictures for terrain and site selection as well as general information questions on snowpack, etc. The concept of a support tool for instructors and students is an old one but the use of technology such as the DVD is relatively new, and it brings an endless potential to make the lessons interactive. As well, one of the real highlights of DVD is portability. It can be used anywhere your laptop can go. With this ease of use, students can refresh skills and be more current when they attend further avalanche education courses.



Well, I guess the idea is here. Now, whether we make a working product is up to me and hopefully some generous supporters. The only drawback for this idea is, as usual, the cost. The average non-Hollywood movie is around $1000.00-$5000.00 per finished minute. Currently this project has already cost close to $20,000.00 with a lot more to come. I have approached Jeff Haack to aid in my attempt to go after a NIF grant but as we all know, there is no guarantee we will get those funds. So, we will be trying just about every operator—from our friends at Kokanee and Marmot to local supporters like the CAA. Our hope is that once we get the support from one operation, others will follow. Every penny adds up. I believe the DVD represents the future of teaching and learning for all of us.
It can save us time and space to get those classroom days done quickly and efficiently so we can go play in the snow sooner!!

I hope you all have a great off-season and we will likely see you again at the next AGM.

If anyone has any constructive ideas please contact me.

Cheers,
Ryan Gallagher

Ryan Gallagher was born in Banff. His father, Kiwi Gallagher, is a well-known and well-respected mountain guide who served as the Public Safety Coordinator in Kananaskis Country for 18 years. Naturally, Kiwi and his colleagues had a big impact on Ryan and he realized quite early that a lot of people can use all the help they can get while enjoying the mountains. Currently Ryan works as an avalanche research technician with Dr. Bruce Jamieson and the ASARC crew out of the University of Calgary. He's been with that team since 2000 and hopes to stay with the project as long as possible.

PIEPS-DSP

BY OTHMAR KAGI

The revolutionary PIEPS-DSP avalanche beacon is enhanced by the latest DSP (digital signal processing) technology and a triple antenna system. With the triple antenna system, the DSP can receive and measure all three dimensions of a burial while in search mode. The user does not have to change the position of the transceiver to achieve this as the signal processor does that work instead. As the results are displayed, the searcher is provided with the direction and distance to the closest burial.

Once a burial location is pinpointed, the reading then indicates the depth of the buried transceiver. This could allow a life-saving decision to be made. Provided with this information, searchers are able to distinguish between a 0.5 – and a 3-metre burial.

Another important innovation for the PIEPS-DSP is the highly useful SCAN feature. This gives rescuers an overview of all received signals within a range of approximately 60 m. When receiving multiple signals, the PIEPS-DSP can detect, locate and separate each signal. The signals are classified into three groups: 5 m, 20 m and 50 m. To activate this feature, the searcher presses the SCAN key while in SEARCH mode and – most importantly – avoids hasty movements.

It's critical that users fully realize the essential difference between analogue and advanced digital technology. With the newest technology, rapid or hasty movements MUST be avoided in order to allow the digital processor the time it needs to assess the information. This point is probably one of the most noticeable changes users must adapt to. People who are accustomed to using analogue transceivers must be aware of this in order to benefit from advanced digital technology.

The PIEPS-DSP has been tested and certified to all international norms. The unit was introduced successfully in the 2003-04 season and is distributed exclusively in Canada by Swiss North Marketing-

The user manual for the PIEPS DSP can be seen at: http://www.swissnorth.com/BDE_2003-10_englisch_pre.pdf

For more information please contact Othmar Kagi at www.swissnorth.com or info@swissnorth.com

InfoEx in the Field

BY DOUG BALESHTA

One of the challenges for a majority of operators and businesses generally is how to economically maximize their use of information, existing equipment and services. For example, North America is fortunate to have an extensive communications/information system including cell, satellite, phone, VHF and repeaters, internet and GPS. Is it possible to utilize any of these systems to provide a cost-effective method of communicating information or does each system provide a stand-alone solution? The purpose of this article is to illustrate how an existing system may provide a cost-effective solution for distributing information.

In 1978, a group of Canadian amateur radio enthusiasts in Montreal (including my uncle, Mr. Ted Baleshta) successfully demonstrated and are given credit for the first transmission of digital text and data using amateur radio (ham) frequencies. Their system (primitive by today's standards) consisted of connecting two remote teletype machines to short-wave radios and sending data/text. Today, similar systems are being used by amateur radio enthusiasts to transmit text, files and images over VHF and other frequencies.

I demonstrated this system at the CAA's Annual General Meeting in Penticton on May 5th, 2004. Using two hand-held VHF radios (5 watts), two laptops (P2 – 233MgHz and a P4 – 1.3 gHz), appropriate software and a terminal network controller (one for each radio), InfoEx was transmitted in real time between the two computers. The transmission speed of the information depends on the software being used and can vary from 50 words per minute to approximately 100 words per minute (faster than I can type!). The file can then be saved, printed or retransmitted.

JPEG digital pictures can also be transmitted with this system (i.e,, weather maps, satellite images, accident areas) but the transmission speed is slow and there is a restriction on the file size (using ham radio software). Although the transmission sounds can be heard on any radio, only those individuals with the appropriate software/hardware can interpret the information. One could also encrypt the data restricting the information to only those with appropriate de-encryption keys.

It is also possible to connect these systems to the internet and send your data to a network node which can then transmit the information through an existing radio system. For example, a central information gathering group can send information to a network node in Prince George through the internet, which then connects to its local radio repeater system and transmits the information to operators throughout the region. Appropriate transmission times could be setup when the radio system is idle (late evening, early morning) and the receiving group just leaves the system on and does not have to be present when data is being sent.

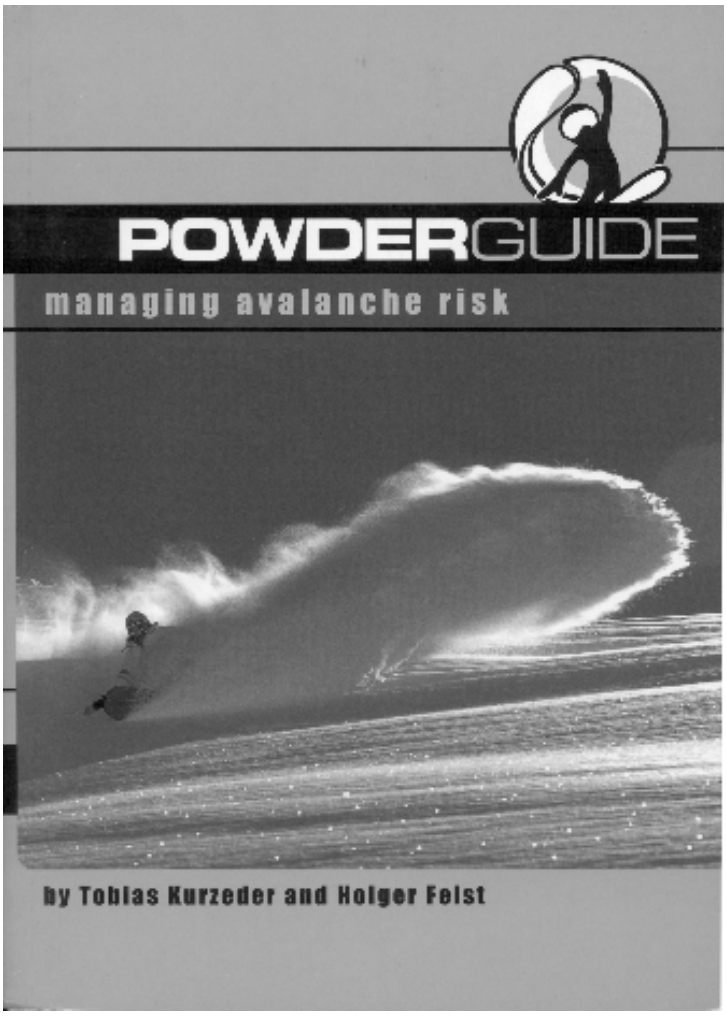
Satellite phones can also provide a similar service by using a data connector between the computer and the satellite phone. Sat phones are costly ($1000-$1500 range) and connect time can be pricey depending on your subscription service. Why not use an existing system such as VHF and save the sat phone costs?

Doug Baleshta is an Assistant Professor at the University College of the Cariboo in Kamloops, BC. He recently received his amateur (ham) radio license and has explored a variety of applications for this technology. He is an active pilot, trekker, skier and musician and takes on far too many hobbies than he should. He can be contacted at dbaleshta@cariboo.bc.ca or at 250-828-5446 for more information on this subject.

Book review: *PowderGuide: Managing Avalanche Risk*

Written by Tobias Kurzeder and Holger Feist, published by Mountain Sports Press

Reviewed by: Alan Jones



There was a bit of a buzz around town when this brightly coloured (orange) book arrived with a stunning photo of a snowboarder carving powder on the front cover. A quick gloss through the book revealed great photos, a catchy design and overall appealing presentation. I decided to take the book in for a week of skiing in the Kootenays based out of the new Kokanee Mansion, the perfect place to review an avalanche book.

The first couple of chapters of *PowderGuide* are devoted to mountain terrain, travel and the snow avalanche phenomenon. Chapter 3 presents danger evaluation, including a discussion of the Munter 3x3 Reduction Method, with examples applied to North America. Chapter 4 talks about different types of backcountry equipment, and Chapter 5 describes avalanche self-rescue, organized rescue and first aid. Chapter 6 is devoted to terrain evaluation and trip planning. Chapter 7 talks about some of the warm and fuzzy topics, including personal responsibility, group dynamics, risk perception, and even a section on risk reduction for snowmobilers. Chapters 8 and 9 close the book off with additional resources for avalanche courses and training, and lists of public avalanche bulletin resources for Europe, the United States and Canada. The epilogue is provided by none other than Werner Munter who leaves us with the classic lines "*…let's face it, the steeper the run, the better the fun is bullshit,*" and, "*It's better to be chicken and survive than to be a hero and die!*" The photographs and figures are definitely one of the books strengths, with numerous images to illustrate key images in the text.

Each day after returning from incredible powder skiing, I would read a section of the book. As I delved deeper, my disappointment grew with the technical errors, poorly presented concepts and the authors' lack of understanding of North American mountain culture and their target audience. This book may work for a European audience in its original language, but either something was lost in translation or the authors simply don't get it. Let me provide a few examples.

It's great to finally see a detailed presentation of the 3x3 Reduction Method in English. A small point, but this is not the latest version of the "Golden Rule." While providing some examples of the method applied to North America, the authors' extrapolation by latitude does not work because of differences in snow climate, vegetation and user groups, to name only three factors. Skiing or snowboarding in the trees is an important risk reduction factor that works in Canada and is not part of this Reduction Method. Using the method as presented likely "cries wolf" (over-estimates the risk) so often that it is unusable, or takes all the fun out of why we go there in the first place.

I won't go into detail on the technical errors, but one figure says friction "*holds individual snow layers together.*" No one can argue with crafting explanations that work for the target audience, but to confuse bonding (cohesion) with friction is wrong. One doesn't need a PhD in snowology to figure that one out. In another example, the authors state that "*whumpfing noises indicate a life-threatening situation and…the fracture propagates invisibly at the speed of sound within the snowpack, until it probably releases a large slab on a steep slope.*" Whumpfing sounds are a good indicator of instability, but aren't always "life-threatening," and modern avalanche research indicates that whumpfs don't travel at the speed of sound (340 m/s). Rather, based on recent research at the University of Calgary, it's more like 20 m/s.

This book obviously follows the lines of the Reduction Method, which emphasizes use of public avalanche bulletins and the formalized 3x3 Reduction Method designed for European recreationists to make backcountry decisions. This becomes clear in the complete absence of descriptions of how or where to dig a snowpit, or any of the tests that can be used by a recreationists to assess the snowpack. In the half-page devoted to snow profiles and shear tests (in a 192 page book), the authors state that "*proper interpretation of snow pits requires a lot of experience, which is why it makes sense only for experts to dig them.*" Following along this line is the authors' opinion that, other than finding a buried victim, "*an avalanche probe is also very useful for checking out the landing zone of cliff jumps for hidden rocks.*" I don't think that North American backcountry users are quite ready to leave behind snowpits and stability tests in favour of a formalized risk reduction method. Perhaps in the future, but for now digging in the snow is something we do.

Perhaps the biggest downfall of this book is the authors' lack of understanding of the North American audience. All sections in this book concerning snowmobiling will irritate rather than communicate with snowmobilers. Comments like, "*High-marking in national forests (and other mountain areas) shows the same degree of ignorance as throwing a stick of dynamite into a mountain stream,*" "*High-marking hillbilly racer on his testosterone sled triggering a slab avalanche,*" and "*…there are some possibilities for increasing the life span of testosterone sled riders,*" have no place in an educational avalanche book. If the authors don't like snowmobilers, then they should just not mention them in their book. Their statement that the Reduction Method does not work for snowmobilers likely has no scientific backing and more likely reflects the limited use of snowmobiles for recreation in Europe.

Rather than completely dismiss this book, there are some good concepts and excellent visuals that still may make it worth having on your bookshelf. If you have all the other recreational avalanche books on your shelf, and want to have a look at the 3x3 Reduction Method in English, I'd recommend adding this one to your collection. However, for the inexperienced user or first-time buyer, much better recreational avalanche books include the avalanche series by Bruce Jamieson, *Staying Alive in Avalanche Terrain* by Bruce Tremper, or *Snow Sense* by Jill Fredston and Doug Fesler. And if you're a snowmobiler, stay away from this book lest you be completely insulted.

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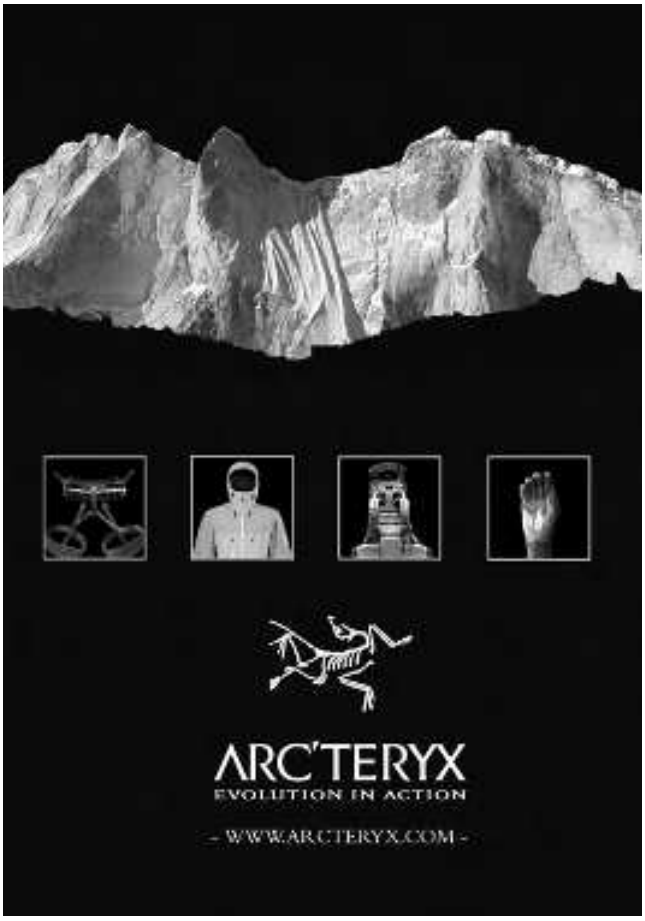

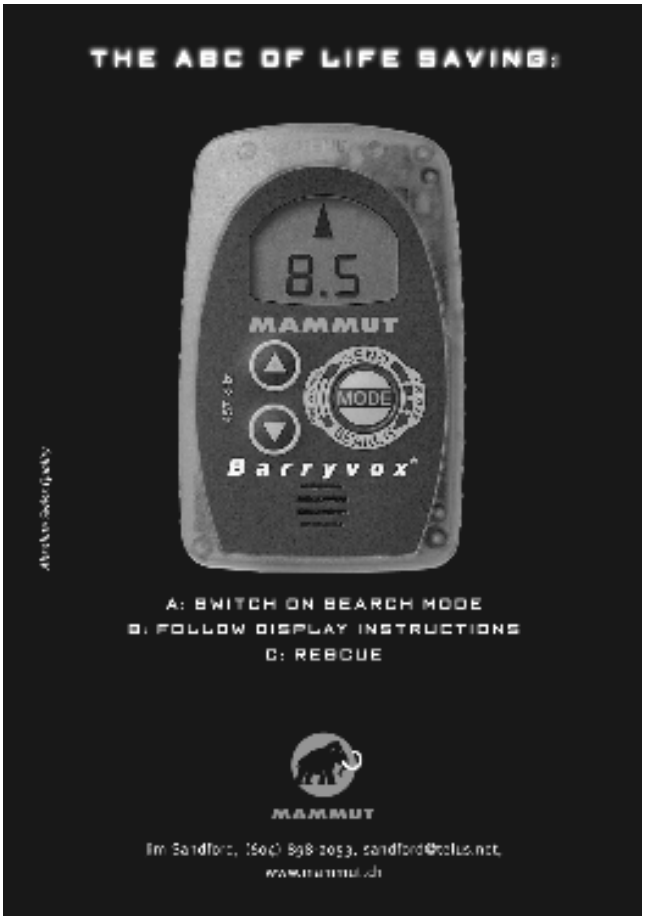

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Board Member Profile: Director at large

Name: Alan Jones
Age: 33
Lives in: Revelstoke
Employer: CAA Public avalanche forecaster in winter
Self-employed engineering consultant/climbing bum in the summer
Years as a member of CAA: 6
Years involved in avalanche safety: 6
Preferred method of snow travel: Ski, high-speed butt glissading
Number of days on snow per year: 50 +

What motivates you to serve as a director? A gang of Board of Directors at last years AGM saying "you want to be a Director, don't you?" Actually, the CAA is a great organization full of good people doing good work. My motivation comes from knowing that my work as a Director benefits both the membership as well as the general public through the CAA public bulletins and educational programs.

Biggest challenge facing avalanche professionals today: Defining what exactly the CAA does in relation to what we should be doing, and making sure we're representing the CAA membership first.

Biggest challenge facing backcountry users: Probably the same as always: Making the right decisions to be able to go home safely at the end of the day and maximize the "fun factor", which is why we're out there in the first place!

Biggest lesson I've learned about avalanches in the last year: The right decision can often be to turn around and come back for "the line" on another day...or another year. The line will be there much longer than we'll be around! I also like how Werner Munter puts it: "…lets face it, 'the steeper the run, the better the fun' is bullshit. I'll bet that you'll draw the most radical turns at around 35 degrees!" and "It's better to be chicken and survive than to be a hero and die!"

Bio: Alan Jones is the Coordinator of the Public Avalanche Warning System at the CAA in Revelstoke, BC. He works as an avalanche forecaster for mountain regions across the province, combining principles of snow science, meteorology as well as practical experience with avalanches. Prior to working with the CAA, Alan worked on an avalanche forecasting and control program in northern BC for the Ministry of Transportation, was an avalanche researcher at the University of Calgary, and worked as an engineering consultant investigating avalanches and landslides. Alan splits his time between avalanche forecasting with the CAA and being a geotechnical engineering and avalanche consultant on various projects in Western Canada, as well as in South America.

Things I like to do outside of work: Rock climbing and alpine mountaineering in the summer and backcountry skiing in the winter. I'm all about road trips too, often to cold and hostile mountain environments where I can sit in a tent and catch up on my reading and maybe occasionally getting out to climb something. I'm trying to learn to play the guitar right now, but I'm not very good!

Robin Siggers: Outgoing Vice-President

Age: 49
Lives in: Fernie, BC
Employer: Fernie Alpine Resort
CAA member since: 1986
Years involved in avalanche safety: 26
Preferred method of snow travel: skis
Number of days on snow per year: 100+

Short history of previous jobs: Ski Patroller, Avalanche Forecaster, Ski Patrol Director, currently Mountain Manager

Memories of being on the board of directors: The great atmosphere of teamwork. As well, the feelings of accomplishment and a wonderful opportunity for personal growth.

Biggest challenge facing the CAA: The biggest challenge to the CAA will be dealing with growth. We have always been very successful at handling our internal structure, programs, and business. We will now be faced with expectations and partnerships with external organizations. Our ability to deliver on these unknown expectations from our relatively small organization will be a huge challenge.

Reflections of the Past President: Bill Mark

I have been asked to provide a few memories from my seven years serving as a CAA board member and president. Rather than reminisce too much, I thought I would use some of my past experiences as a board member and president and relate them to my own personal view of what some the challenges will be for the CAA and its board in the future.

Before I start, I would like to thank everyone that I have had the opportunity to work with. I have encountered many different personal styles and ideas, and I have learned from all of them.

I don't have the space to thank everyone individually, but there are some I must mention. I would like to thank my employer of the past five years, Mike Wiegele Helicopter Skiing, who supported me and provided the flexibility to take time to work on CAA matters. The staff at the CAA are also a tremendous support. Clair Israelson is a huge asset to the organization, and it has been a privilege to work with him. Evan Manners has been a solid rock in the background always willing to provide a historic perspective. Thanks also to my fellow Board members and also to the staff at the CAC and the CAA committees, the behind the scene work horses.

When I was first elected to the CAA Board in 1997, tradition was that the new board would trek across the road to an often colourful "Dennys" meeting where the new board members got their first taste of the current issues. These issues were often operational in nature, which reflected where the CAA was at developmentally in 1997.

In 2000, a "CAA vision" was developed by the board and past presidents, based on the constitution. The membership's endorsement of this vision was a giant step toward ensuring a consistent CAA direction. The CAA boards have grown with the development of the organization and the current board now deals mostly with strategic direction and policy matters. I urge current and future boards to continue to stay focused at the policy level.

As the CAA continues to get busier the board must focus on the "big picture items" and give clear direction to the people doing the work, i.e. CAA committees, employees and contractors. I think one of the challenges in the past has been that when the board has asked employees or committees to do work, we sometimes gave poor direction and parameters for what we were expecting (i.e. scope of work). This has led to frustration by both committees and the board. The new board needs to do a better job of this and some training for the board and committee chairs early this summer should help with this.

The election onto the board and appointment of committee members has been an interesting process. I think we are missing a huge population of members who are willing to help out but don't know how to find their way into the "club" to participate. The CAA needs a better recruitment system where there is a recognized way for members to register their interest in committee and board participation. There also needs to be a succession plan for committees and the board.

Bruce Allen giving Bill a fond farewell.

As a community we need to continue to work as professionals and to further develop our levels of professionalism as avalanche specialists. In the past couple of years this has been off the radar, but I think it needs to be brought back into focus, along with a clear understanding of the scope of practice of what CAA trained avalanche specialists can and can't do. To go along with this, clear career path options could be better developed.

Balancing member service while providing expanded public avalanche service will continue to be a challenge. It is a tribute to the founders of the CAA in 1981 that they developed a balanced strategy from the start, as stated by the *purposes of the Society* on the first page of the constitution. This balanced approach has led to the success of the CAA.

As we embark into partnerships with federal and provincial governments, it will be a constant challenge to not be totally consumed by the government and public safety machine. A successful CAA will continue to have a balance of professionalism and member services as well as a strong public service section. The balance is the challenge!

From the early 1990s, industry, private sponsors and CAA members have provided ongoing sustainable support for the CAA's public avalanche programs. Occasional one-off government support, especially the National Search and Rescue Secretariat new initiative fund (NSS-NIF) has certainly helped. (Remember that NSS-NIF provided some of the initial funding for the opening of the Canadian Avalanche Centre in 1991). Last winter the BC Government, followed by the Federal Government, made three-year commitments to CAA public programs. This marked the first time any government has made any multi-year commitment. This is a huge step forward but let's not forget that industry, private sponsorship and the membership resources have sustained the CAA public safety programs for over a decade, and will keep supporting the public avalanche safety programs in the future no matter what government is in office!

CAA public services have historically provided excellent value for the dollars that have been raised and pledged. We need to continue to provide good value, and make sure we only promise what we know we have the resources to deliver. Public avalanche service delivery takes not only money but good products, trained and talented people and continued partnership and cooperation between other service providers, e.g. Parks Canada and the recreation industry. As these services expand, maintaining value will be an ongoing challenge.

The CAA needs to stay focused on providing the membership service while all this other "stuff" is going on. The upcoming web services are just the beginning. It is also up to the membership to provide feedback on how the board is doing, and what services you would like. Tell your board what you need as an avalanche professional.

The CAA constitution and bylaws need some serious revision. The bylaws are becoming contradictory and are, in some cases, out of date. It looks like a full revision of the bylaws is in order. The goal is not to change the intent of the bylaws but to try to simplify and make the document more user friendly. We will be continuing to work on this over the summer. We will keep you updated and give a progress report at the ISSW.

Thanks for reading the Past President's personal views! I wish the new board all the best for the future. It has been a privilege to work with such great people and for such a great organization.

John Hetherington, New President

Age: 61
Lives in: Whistler, BC (arrived in 1967)
Employer: Whistler Heli-Skiing Ltd
CAA member since: 1981
Years involved in Avalanche Safety: Most winters since 1967 - 35 years?
Preferred method of snow travel: Heli-skiing, of course
Number of days on snow per year: 75 approx.

Short history of previous jobs: Whistler Heli-Skiing 18yrs; SRAWS (Rogers Pass); Snow Safety Services Ltd. (Chris Stethem); Shell Canada Resources (private consulting); various ski patrols - Whistler, Panorama, Todd Mtn., Squaw Valley, St. Moritz. Kitchen cabinet business; river raft guide, carpenter etc.

Challenges facing the CAA: Becoming a national organization and all that that implies; finances; dealing with an array of governments and government agencies; future of CAATS

Expectations/plans/vision for the future: I expect to be helping guide the CAA into a somewhat changing role as it becomes a national operation while at the same time ensuring that the CAA remains responsive to its members. Finances are always a major consideration but I expect this area to become more complex as we deal with more responsibilities, more governments and their demands, and an increasing financial load on the CAA. CAATS has always been at the heart of the CAA and currently it faces significant challenges with declining enrolments in the Level 1 courses, requests from other countries for CAA educational products, and unanswered questions regarding CAATS' role in specialized and CPD courses and the relationship with Selkirk College. With several new members on the BOD (including your's truly), the Board will have to be quickly brought up to speed on past and present issues, on useful management and communication techniques, on the relationships with the various committees, and on finances. I expect to be busy.

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