

## **The Canadian Avalanche Association Information System Project**

By Roger Atkins and Pascal Haegeli

The Canadian Avalanche Association (CAA) is in the process of developing a comprehensive system for the exchange and storage of snow avalanche related information. This process was begun in the spring of 2003 with the formation of an ad-hoc Information Technology (IT) committee whose initial mandate was to define standards for electronic exchange of avalanche related information. This initial committee was composed of representatives from different segments of the industry, including Jeff Goodrich (committee chair, Parks Canada), Jan Bergstrom and Mark Myhre (Canadian Mountain Holidays), Pascal Haegeli (University of British Columbia), Evan Manners (Canadian Avalanche Center), and Simon Walker (BC Ministry of Transport). Thanks to the initiative and efforts of this initial IT committee, the foundation has been laid for a cooperative system using new technologies to share information within the avalanche community and with the public.

The IT committee has since been made into a standing committee (with some change of membership but currently still chaired by Jeff Goodrich), which continues to represent the information requirements of different segments of the industry. The CAA has also contracted Roger Atkins and Pascal Haegeli to coordinate the development of an integrated information system for all avalanche related information, and several sub-contractors have been engaged to implement the system.

The successful history of the industry information exchange in Canada (InfoEx) has proven the benefits of information sharing. The new system will enhance the InfoEx and extend the benefits of information sharing beyond the confines of the confidential industry information exchange.

The main features of the system include:

- A Canadian standard for structured electronic exchange of avalanche related information. This standard is defined in a universal computer language named XML (eXtended Markup Language). We call this standard the CAAML, and it is at the heart of the information system as it allows different computer systems to communicate with each other.
- A set of databases maintained by the Canadian Avalanche Association, containing all avalanche related information that reaches the CAA. The sources of this information will include both professional observers on the InfoEx and a public observer network. These databases will ultimately include public avalanche bulletins, standard observations and subjective comments from professionals, observations from a public observer network, a library of photographic images of

terrain and avalanches, avalanche incident and accident data, and a Geographic Information System (GIS) based catalog of terrain information.

- A web server for InfoEx with interface tools for InfoEx subscribers. These interface tools are computer programs that allow InfoEx subscribers to input their observations and to download and view the InfoEx. These programs will also allow InfoEx technicians and avalanche forecasters at the CAC to access the InfoEx data. Operations with existing information systems, such as CMH and BC MoT, will be able to directly interface with the web server.
- Web access for public bulletins, including access to underlying information that is not proprietary and the ability for the public to submit their own observations. This also includes secure access for public forecasters to post bulletins.

Everyone will have access to the information system on the web, but much of the information is still confidential and will only be available to those with the right to access it. The public bulletins will continue to interpret the confidential information and make summaries publicly available that do not include confidential details.

When the information system is in place, the doors will be open to provide a surprising array of options for viewing the information. Tables of numbers will be replaced with visual displays in the form of graphs and maps that show the big picture at a glance. These visual displays will be interactive, and a few mouse clicks will focus down on underlying details of interest without getting bogged down in mountains of unrelated information.

The databases at the CAC will be a boon to researchers, and both public and industry will benefit from research based on the information contained there.

We expect that it will take about five years before all of the elements of the information system are complete and functioning smoothly. Our initial focus has been on the background work required by the system. We have released an initial version of the information exchange specification (CAAML) and are continuing to refine and extend it, a data model for the databases has been specified and we are starting to bring historic information into these databases, a web server and interface tools have been prototyped for the InfoEx and will be used this season, and the CAA web site is being rebuilt with plans to mesh with the information system in the near future.

So far, this project has experienced an incredible amount of cooperation and support from the entire avalanche community. We anticipate that this spirit will continue to grow and that the resulting information system will benefit all who choose to travel in the mountains.