2009-10 Winter in Review

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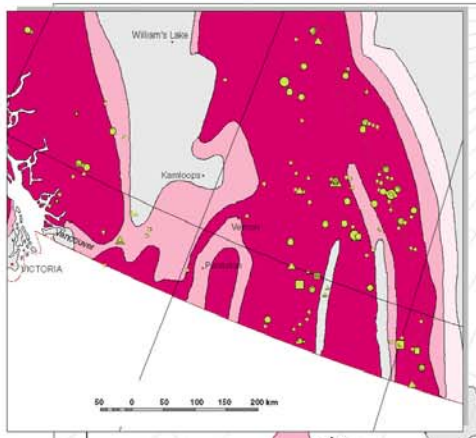
Natural Resources Canada | Ressources naturelles Canada



Regional snow avalanche activity and known fatal avalanche accidents for Canada (1863 to June 1997)

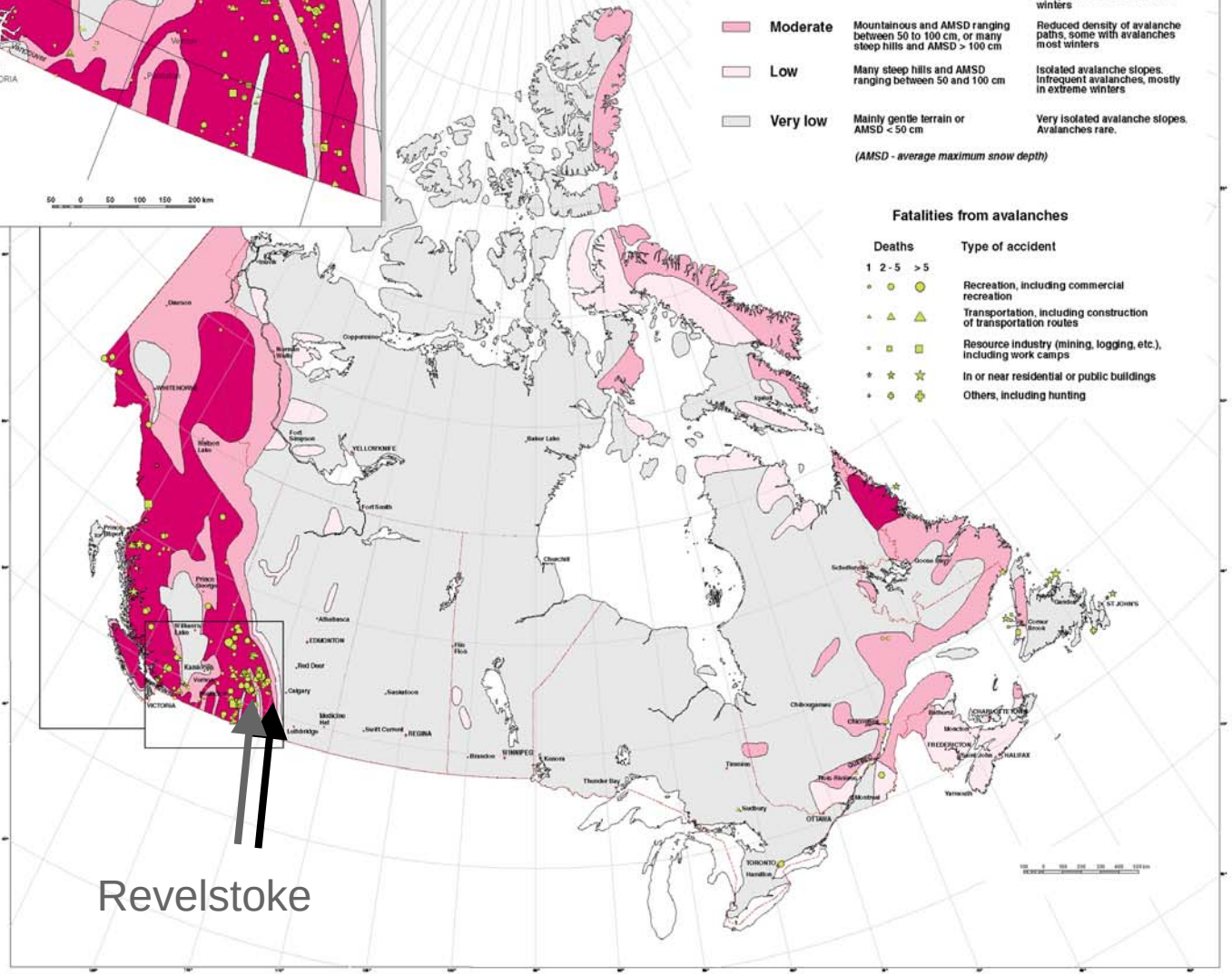
Avalanche activity zones

High	Mountainous and AMSD > 100 cm	Numerous avalanche paths, many with avalanches most winters
Moderate	Mountainous and AMSD ranging between 50 to 100 cm, or many steep hills and AMSD > 100 cm	Reduced density of avalanche paths, some with avalanches most winters
Low	Many steep hills and AMSD ranging between 50 and 100 cm	Isolated avalanche slopes. Infrequent avalanches, mostly in extreme winters
Very low	Mainly gentle terrain or AMSD < 50 cm	Very isolated avalanche slopes. Avalanches rare.

(AMSD - average maximum snow depth)

Fatalities from avalanches

Deaths 1	2 - 5	> 5	Type of accident
●	○	◯	Recreation, including commercial recreation
▲	△	▲	Transportation, including construction of transportation routes
■	□	■	Resource industry (mining, logging, etc.), including work camps
★	☆	★	In or near residential or public buildings
✚	✪	✚	Others, including hunting



Revelstoke

Canada

(Parks Canada photograph 615-288-O-064 taken by R. Greyell; reproduced with permission)

The four levels of avalanche activity shown on this map are based on terrain steepness from a shaded relief map and regional values of average maximum snow depth. As a consequence of the map scale and the qualitative method used to delineate the avalanche activity areas, this map is not suitable for site-specific assessments of snow avalanche activity or hazard since it does not take into account isolated steep areas, isolated areas of heavy snowfall or strong winds, extreme winters, unusual storms, or slush flows on less steep terrain. For example, the method used to delineate the regional snow avalanche activity underestimates the activity on areas of the Newfoundland coast where wind-blown snow creates local avalanche activity. Nevertheless, 92% of the reported snow avalanche accidents in Canada fall within the areas of high or moderate avalanche activity.

Note: some of the 216 accident locations depicted on the map are obscured by overlapping closely-spaced symbols.

Sources

Topographic information:

Canada. Energy, Mines and Resources
1983: Canada; Geological Surveys Directorate, Surveys and Mapping Branch, Energy, Mines and Resources Canada, Map MCR 125, 1: 5 000 000 scale.

Average maximum snow depth:

Canada. Fisheries and Environment
1978: Mean maximum depth of snow and times of occurrence, Map 11; Hydrological Atlas of Canada, Fisheries and Environment Canada, Ottawa.

Avalanche fatalities:

Batterson, M., Liverman, D. and Taylor, D.
1995: The assessment of geological hazards and disasters in Newfoundland; Newfoundland Department of Natural Resources, Geological Survey, Report 95-1, p. 55-75.

Jamieson, J.B and Geldsetzer, T.
1996: Avalanche Accidents in Canada. Vol. 4: 1984-1996; Canadian Avalanche Association, Revelstoke, BC, Canada, 202 p.

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McFarlane, R.C.
1985: Snow Avalanche Impacts and Management in Canada; Ph.D. Thesis, University of Waterloo, Waterloo, Ontario, Canada, 272 p.

Schaerer, P.A.
1987: Avalanche Accidents in Canada III, A Selection of Case Histories, 1978-1984; National Research Council of Canada, Institute for Research in Construction, Publication 27950, 138 p.

Stethem, C.J. and Schaerer, P.A.
1979: Avalanche Accidents in Canada I, A Selection of Case Histories of Accidents, 1955 to 1976; National Research Council of Canada Publication 17292, 114 p.

Stethem, C.J. and Schaerer, P.A.
1980: Avalanche Accidents in Canada II, A Selection of Case Histories of Accidents, 1943 to 1978; National Research Council of Canada Publication 18525, 75 p.

Recommended Citation:

Jamieson, B. and Brooks, G.R.
1998: Regional snow avalanche activity and known fatal avalanche accidents for Canada (1863 to June 1997); Geological Survey of Canada, Open File 3592.

Copies of this Open File may be obtained from:

Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario K1A 0E8

or

Geological Survey of Canada (Calgary), 3303-33rd Street N.W., Calgary, Alberta T2L 2A7

OPEN FILE
DOSSIER PUBLIC
3592
GEOLOGICAL SURVEY OF CANADA
COMMISSION GÉOLOGIQUE DU CANADA
OTTAWA
1998

Winter Weather & Snowpack

- Average winter snowpack to January 2010
- 30 year storm event January 6 – some areas >1.5m in 18 hr period
- Late Jan/early Feb - Multiple clear/cold periods followed by small storms
- Multiple surface hoar layers formed in snowpack, becoming reactive around February 14 to human triggering
- Extended period of elevated danger
- 4 ‘special public avalanche warnings’ issued 4 weekends in a row, unprecedented
- Size 2-3 avalanches starting on 20-25 degree terrain, reports to as low angled as 17 degrees.
- *‘I’ve never seen this in 35 years of guiding’*

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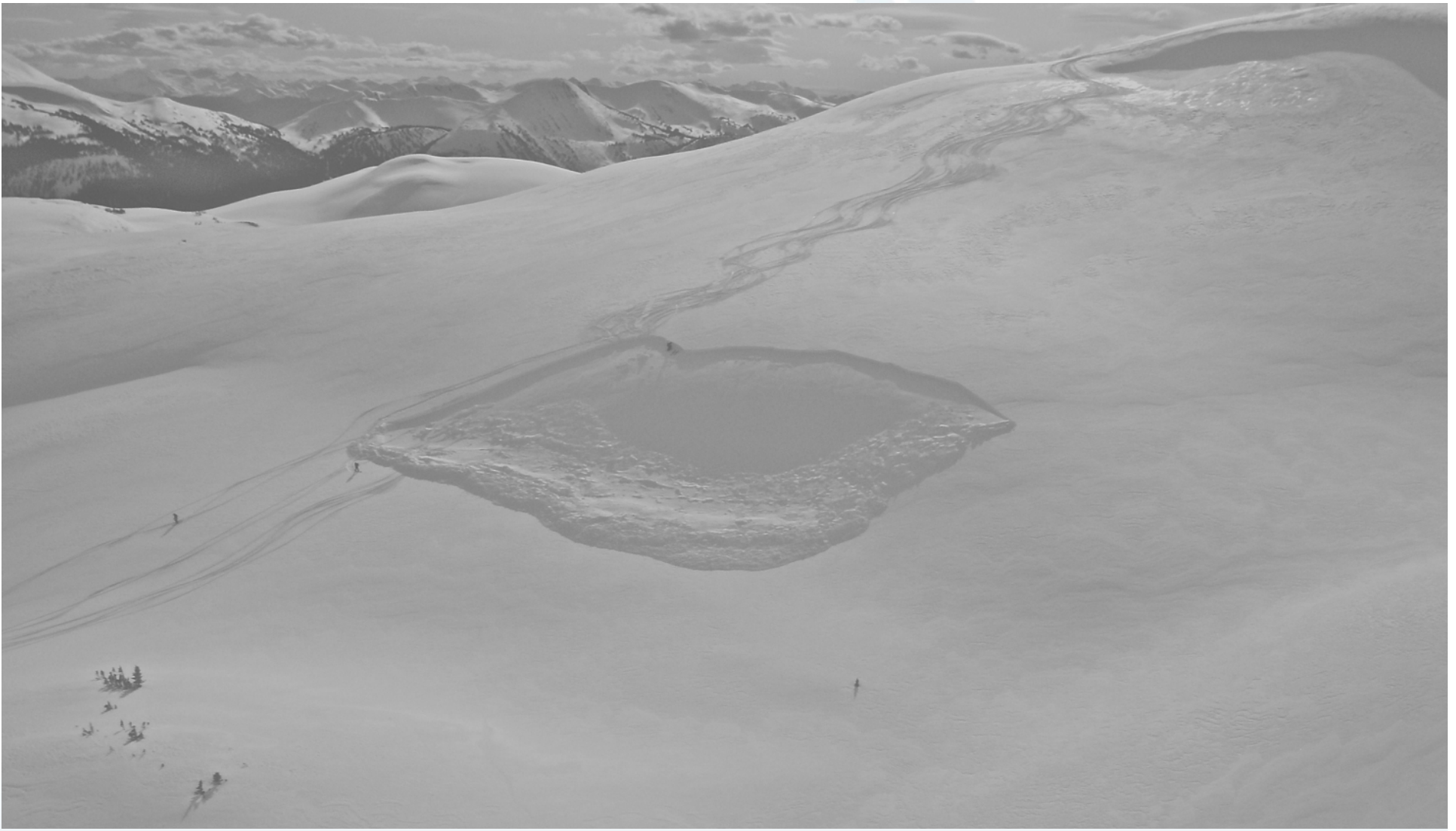

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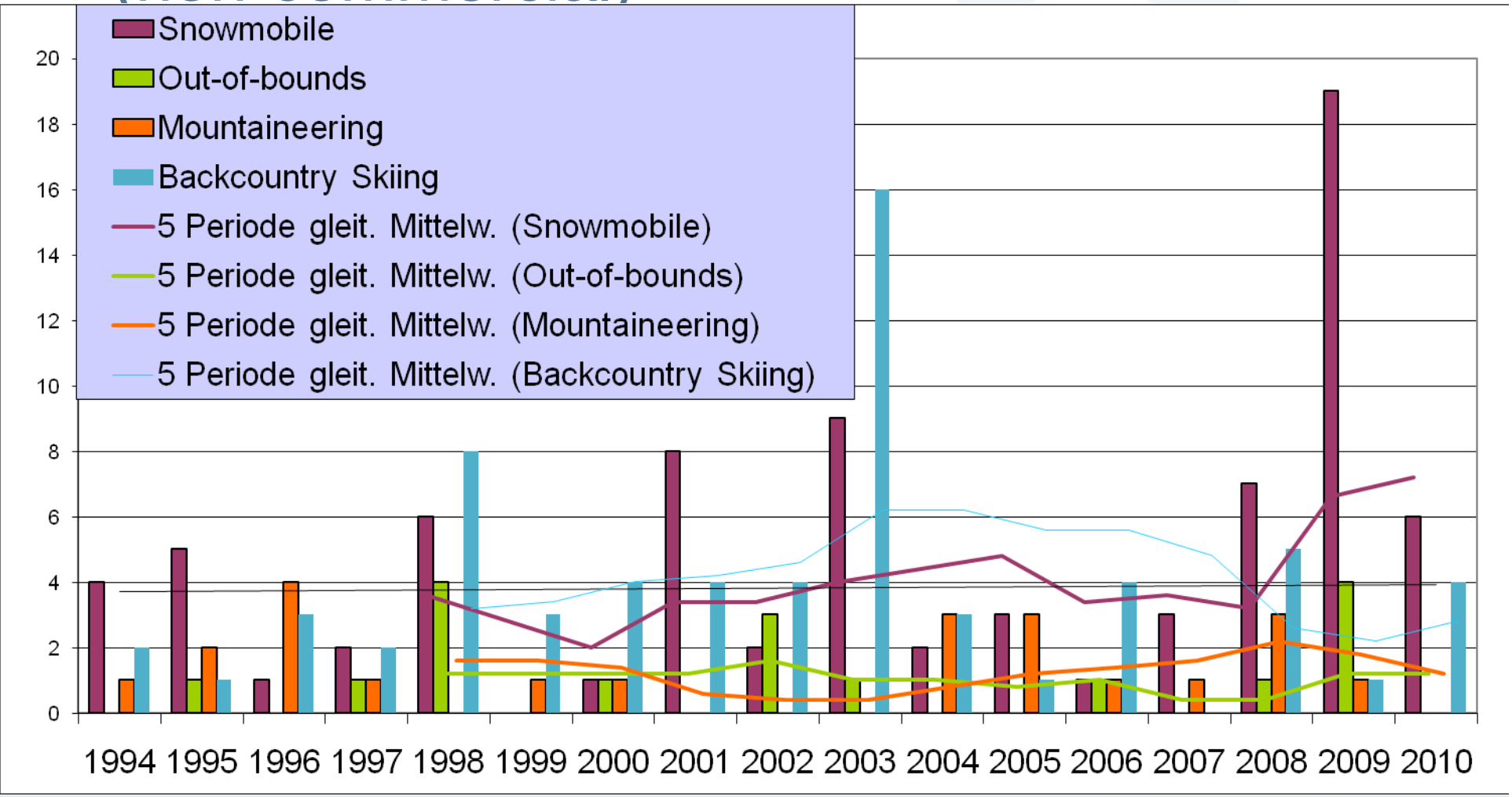
Avalanche Fatality Trends (non-commercial)



Fatality Summary 2009-10

Skiers (fatalities)

- 6 in total (4 rec, 2 guided)
- Jan 4 (1): Sled assisted skier (AFD)
- Feb 17 (1): ski tour (doctor, died in hospital)
- March 20 (2): heliskiing (AFD)
- March 31 (1): ski tour
- April 11 (1): ski tour

Snowmobilers (fatalities)

- 6 in total
- Jan 18 (1 - AFD), Feb 14 (1 – AFD)
- March 13 ‘Boulder Mountain’ (2)
- March 19 ‘Eagle Pass’ (1)
- April 5 (1)

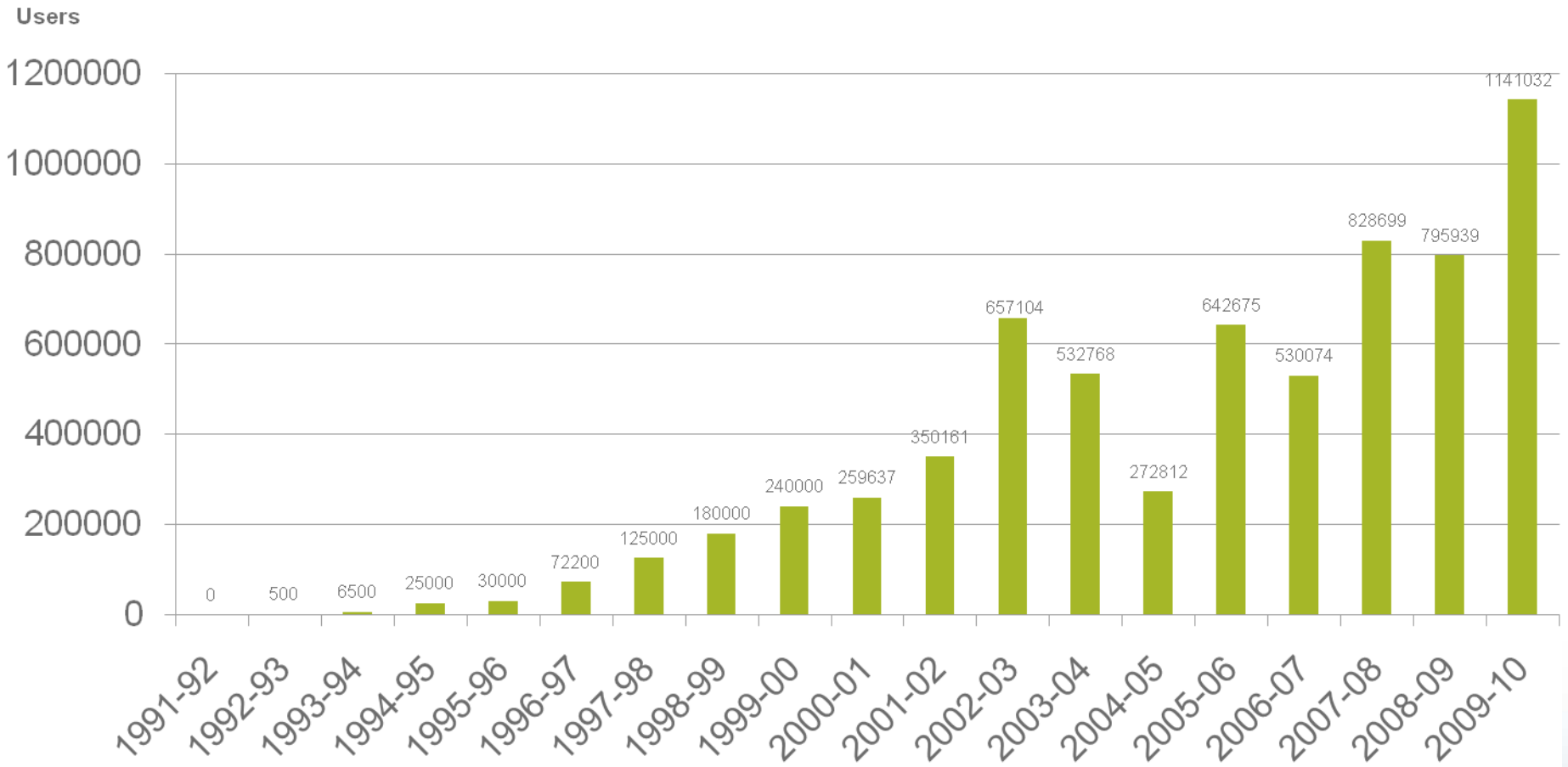
Snowmobiling…again.

- 2008-09 – 19 fatalities involving snowmobiling, >2x worst year on record for this user group
- Triggered the coroner to convene a special ‘Death Review Panel’
  - Report issued in January 2010 with 15 recommendations to reduce snowmobiling related avalanche fatalities
- 2009-10 – only 6 fatalities but the accidents were unprecedented
  - Saturday morning ‘Boulder Mountain Avalanche’ presentation, 2 fatalities, unknown number hit by avalanche 100? 200 watching?
  - Eagle Pass – 19 snowmobilers hit only 6 days later

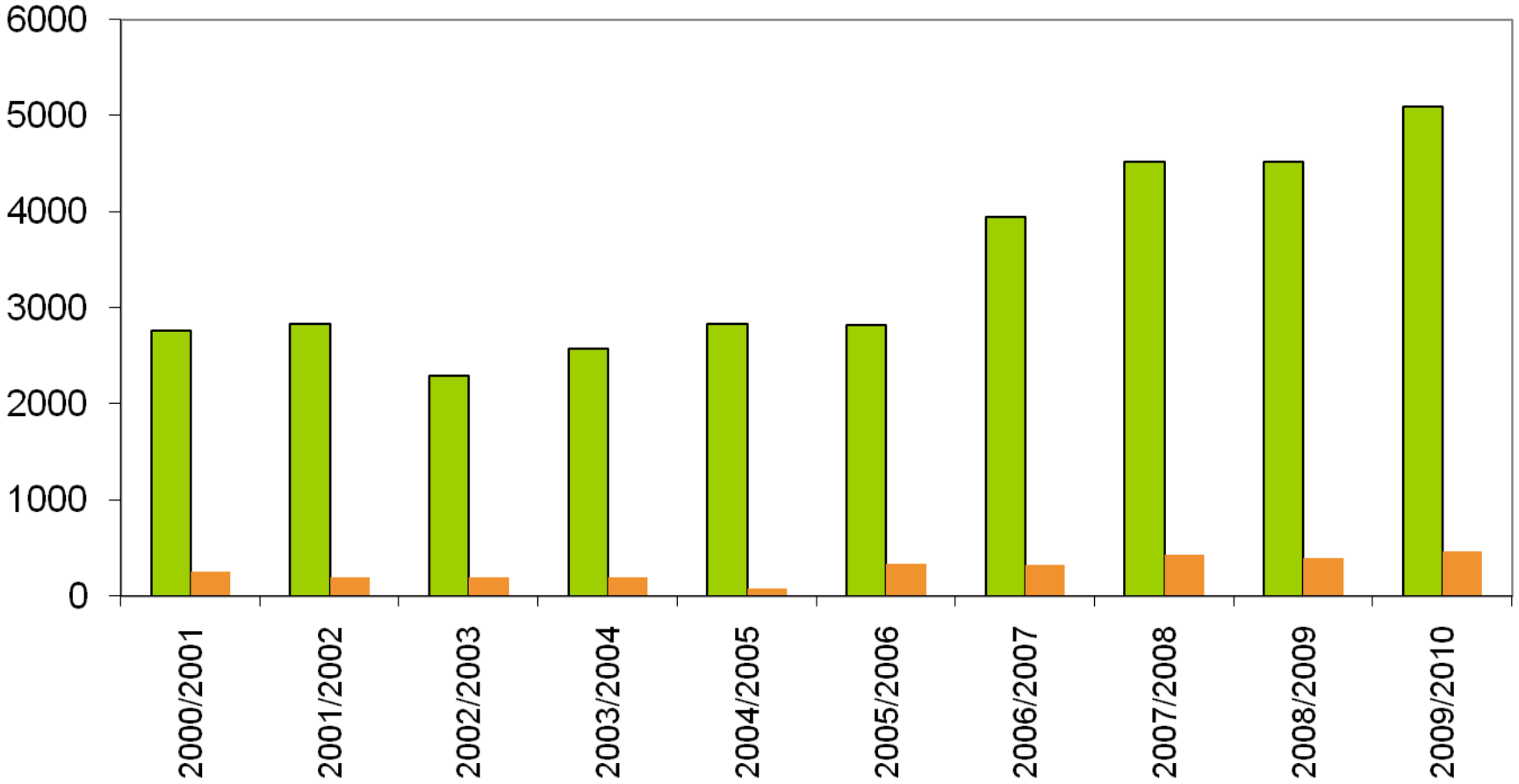
Prevention Initiatives

CAC Public Avalanche Bulletin Requests

(website, data feeds, email, fax, telephone)



AST Student Totals



Avalanche Incident Reporting

150 reports submitted

> 150,000 views by public

Forecaster

Joined on 01-17-2005
Posts 443

Avalanche Incident Report: 12/8/2007 : NE of Tent Ridge-Kananaskis Country-2 Fatalities

Avalanche Involvement Report

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This report was submitted by a third party individual.
It is transmitted "as is" in the interest of public safety.
The CAC makes no claim as to its authenticity or accuracy. Use and interpret at your own risk.

DATE, TIME AND LOCATION

Date/Time: 2007-12-08 13:30
Description: NE of Tent Ridge-Kananaskis Country-2 Fatalities
Coordinates: ()
Mtn Range: Rocky Mountains **Province:** AB

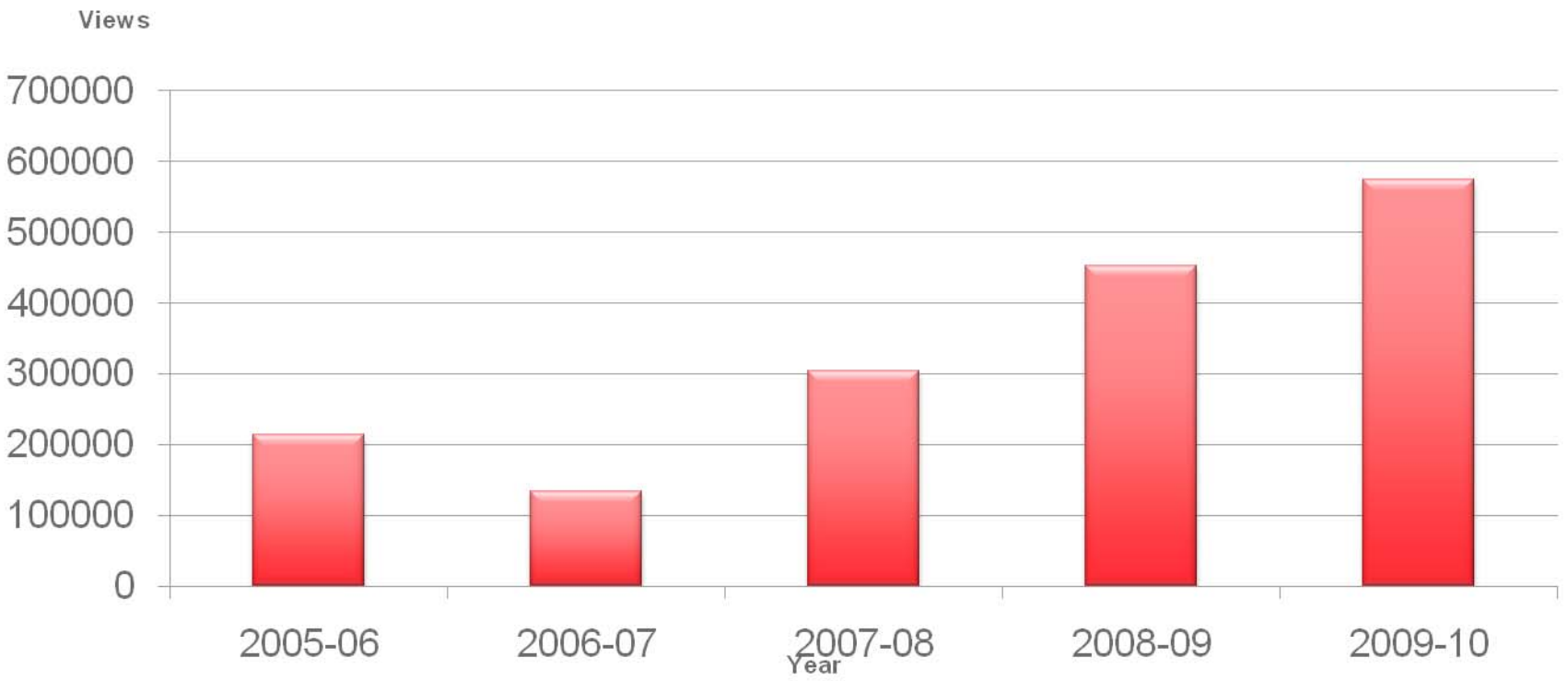
GROUP INFORMATION

Type: **Activity:** Backcountry Skiing
Size: 2

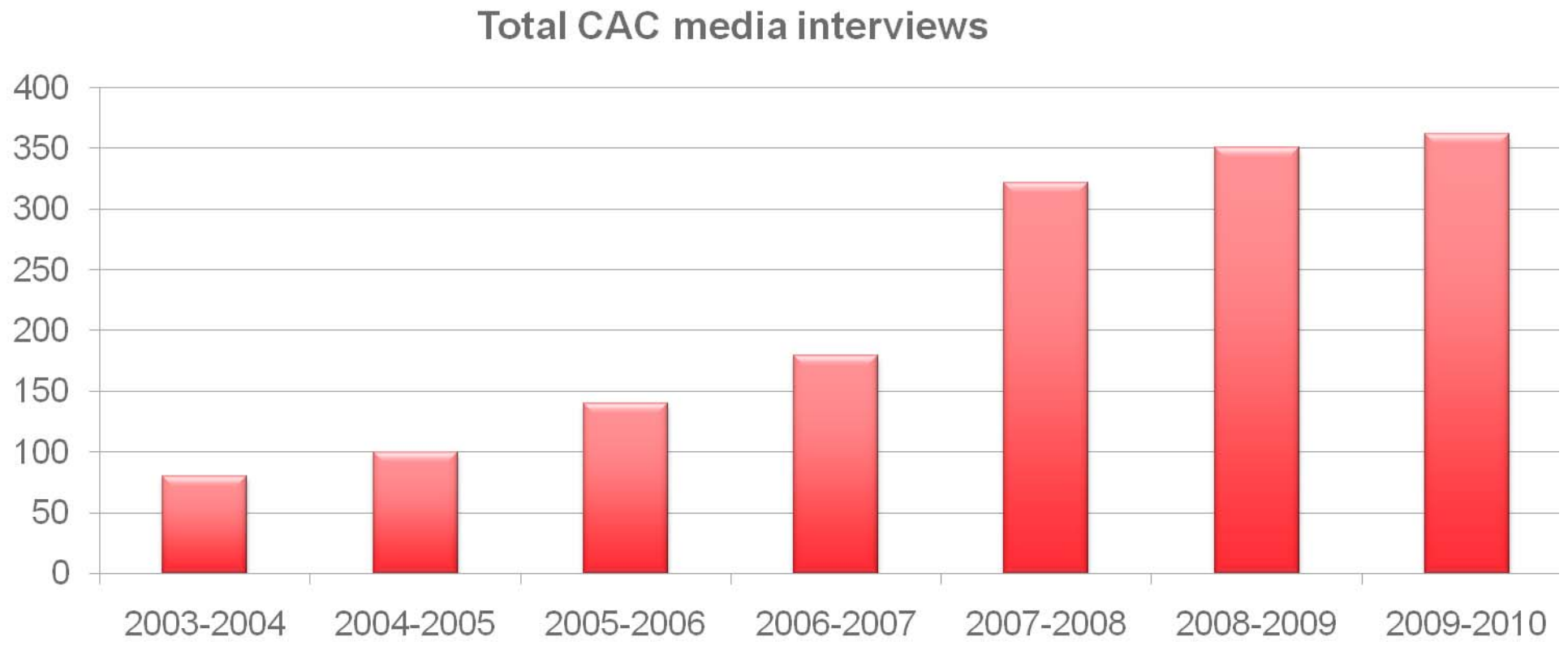
AVALANCHE INFORMATION

Number: 1 **Size:** Size class 3 **Type:** Slab avalanche
Trigger: Sa (While digging profile)
Dimension: 250m wide; ran for 750m; average slab depth of 100cm

Yearly Discussion Forum Use



Media Presence



Other initiatives

- New Avaluator
  - Untrained/slightly trained, aware
- New Field Book
  - Trained, aware, experienced
  - Helps structure decision making
  - Based on expert decision methods, Recognition Primed Decision Making, Avalanche Character
- Avalanche Accidents in Canada Volume 5
  - Case studies of every fatal accident 1996-2007
  - >400 pages
  - Due out in November 2010

AVALUATOR v2.0

SLOPE EVALUATION

AVALANCHE CONDITIONS

Regional Danger Rating: Is the avalanche danger rating "Considerable" or higher?	+1
Persistent Avalanche Problem: Is there a persistent or deep persistent slab problem in the snowpack?	+1
Slab Avalanches: Are there signs of slab avalanches from today or yesterday?	+1
Signs of Instability: Are there signs of snowpack instability including whumpfs, shooting cracks or drum-like sounds?	+1
Recent Loading: Has there been loading within the past 48 hours including roughly 30 cm of new snow or more, significant wind transport or rain?	+1
Critical Warming: Has there been a recent rapid rise in temperature to near 0 C, or is the upper snowpack wet due to strong sun, above-freezing air temperatures or rain?	+1
Avalanche Conditions Score:	

TERRAIN CHARACTERISTICS

Slope Steepness: Is the slope steepness between 30 and 35 degrees?	+1
Or	
Is the slope steeper than 35 degrees?	+2
Terrain Traps: Are there gullies, trees or cliffs that increase the consequences of being caught in an avalanche?	+1
Slope Shape: Is the slope convex or unsupported?	+1
Forest Density: Is the slope in the alpine, in a sparsely treed area or in open forest (cut-block, burn, wide-spaced glades)?	+1
Terrain Characteristics Score:	

Visit www.avalanche.ca for more information.

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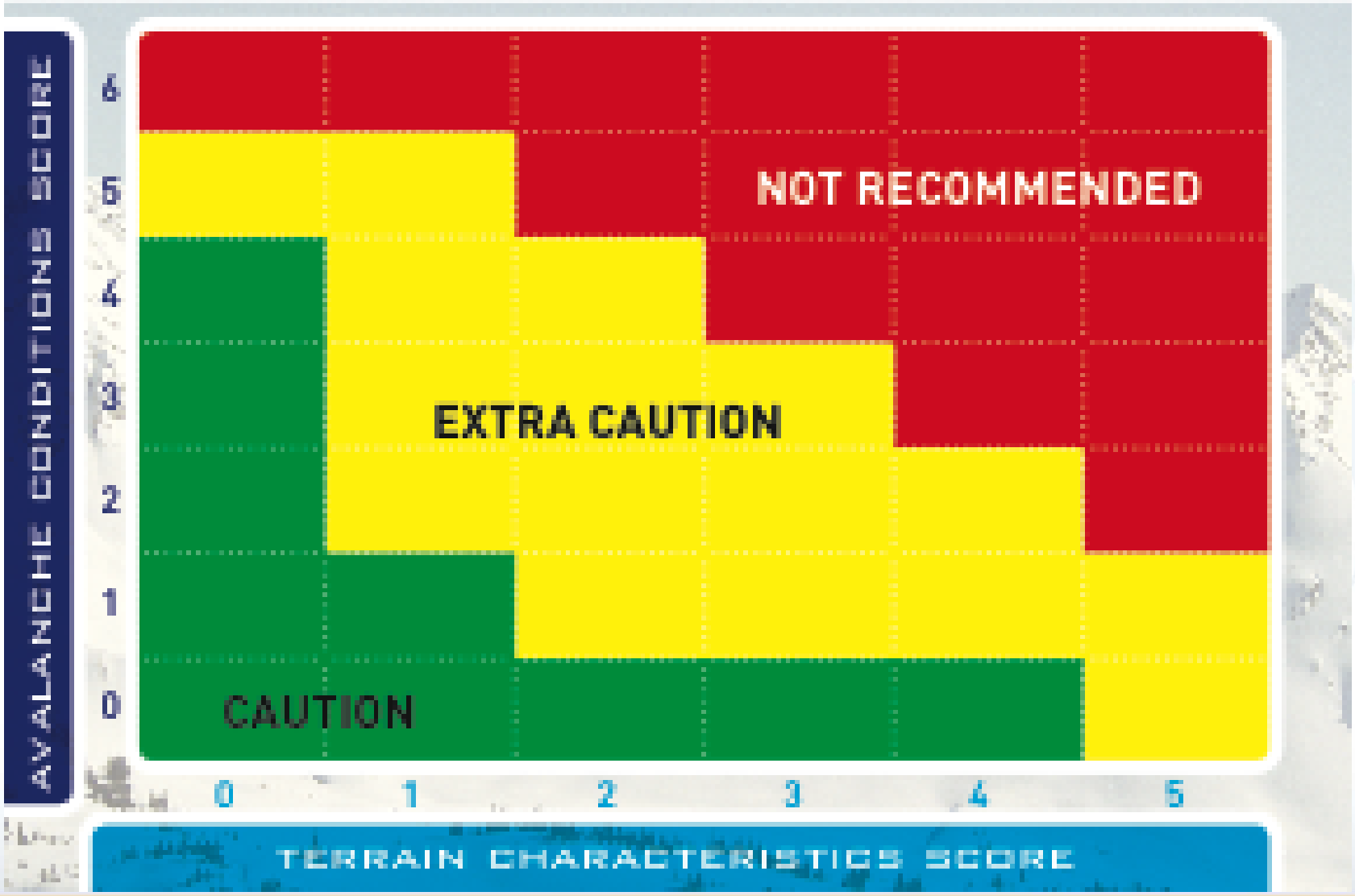
AVALANCHE EVALUATOR v2.0

SLOPE EVALUATION



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Avalanche Accidents in Canada

Vol. 5

Jamieson | Haegeli | Gauthier

97-07

Bruce Jamieson, Pascal Haegeli and Dave Gauthier
Foreward by Justin Trudeau

Avalanche
Accidents in Canada

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1997-2007 Volume 5

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