

MESSAGING FOR MOUNTAINEERS: NEW ZEALAND'S APPROACH TO REDUCING CLIMBER AVALANCHE ACCIDENTS IN SPRING AND SUMMER

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ABSTRACT: Over the last 27 years, 70% of New Zealand's fatal avalanche accidents involved mountaineers, and 76% of them occurred during spring and summer—an uncommon pattern internationally. These statistics have prompted industry-wide innovation to address this concerning trend. We conducted a series of interviews with representatives of the New Zealand avalanche, guiding/instructing and mountaineering community to determine strategies used to reduce risk to alpine climbers. These include communicating avalanche hazards using specific language and imagery, engaging with the mountaineering community to encourage information sharing, adapting alpine guiding techniques and fostering avalanche training amongst non-skiing alpine instructors. We also discuss developments in alpine climber-focused avalanche safety training and education, differentiated from traditional winter-based and skier-centric training.

KEYWORDS: Mountaineering, alpine climbing, summer, spring, avalanche, education.

1. INTRODUCTION

Avalanche accidents involving alpine climbers/mountaineers remain a persistent challenge in alpine environments worldwide. While many avalanche safety programmes, forecasting products, and education initiatives have traditionally focused on winter users such as skiers and snowboarders, mountaineers often interact with avalanche hazards differently. Their objectives, terrain choices, seasonal timing, weather windows/opportunities and decision-making contexts can differ substantially from other backcountry user groups. Engaging mountaineers requires communication and education strategies that are tailored to their needs.

New Zealand presents a particularly unusual case. Most fatal avalanche accidents involve mountaineers during the spring and summer mountaineering season (October–January). This seasonal and user-group distribution has challenged conventional approaches to avalanche forecasting, risk management, public safety messaging and education, that have historically been centred on winter snow sports.

Recognising this unique situation and risk profile, New Zealand's avalanche, guiding, and mountaineering communities have increasingly shifted their focus, requiring greater collaboration and innovation to better understand alpine climber behaviour and adapt avalanche education, communication and risk management accordingly.

This paper presents a simple comparison of the available avalanche fatality data involving mountaineers from a selection of countries or regions and a series of case studies describing the initiatives and collaborative approach taken across New Zealand's alpine sector. We examine how avalanche messaging has evolved to engage the mountaineering community and discuss developments in alpine climber-specific avalanche education, professional training and mentorship, and guiding strategies. We highlight adaptations that may be relevant to other regions where traditional winter avalanche communication does not adequately address the needs of alpine climbers.

2. BACKGROUND

Over the last 27 years, between 1999 and 2025, New Zealand recorded 30 total avalanche fatalities, including recreational and commercial users. Mountaineering accounted for 21 of the fatalities (70%), highlighting alpine climbers as the dominant at-risk user group, rather than winter backcountry skiers or snowboarders. Unlike some other parts of the world, snowmobiling is uncommon in New Zealand and generally not permitted on public conservation land.

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Recreational mountaineers were killed in 17 of the 21 fatalities (81%), while four fatalities (19%) occurred during commercially guided mountaineering activities (New Zealand Mountain Safety Council, 2026).

The seasonal distribution of fatalities is similarly distinctive. Sixteen (76%) of the mountaineering avalanche fatalities occurred during spring and summer, coinciding with New Zealand's primary alpine climbing season. December alone accounts for nine fatalities (43% of mountaineering avalanche fatalities), reflecting the concentration of climbing activity during the austral summer. In contrast, relatively few mountaineering avalanche fatalities occur during the winter months, when avalanche forecasting, public safety messaging, and education have traditionally been focused.

3. INTERNATIONAL COMPARISONS

Data comparisons between countries are challenging for several reasons. A primary challenge is the varying categorisation of activities and the subtleties of different foot-based travel modes, such as hiking vs mountaineering, which can often be season, conditions or location specific. Furthermore, we found that countries' records were kept for varying timescales, and in some cases multiple activities were combined into one activity category. Despite these challenges we have provided some simple comparisons to illustrate the unique situation found in New Zealand.

Overall, outside New Zealand, mountaineering avalanche fatalities are far less common when compared with other activities such as backcountry skiing, snowboarding or snowmobiling (Figure 1). New Zealand's seasonal distribution of fatalities is also unusual compared with other countries.

In Colorado State, between 2015-16 and 2024-25, climbers accounted for 5.2%, or three of the 58 fatalities. Two of the fatalities occurred in January (winter) and one in May (spring). Across the wider USA, climbers represent 5.5% (or 13 of 237) of all avalanche fatalities for the same period (Colorado Avalanche Information Center, 2024). Utah has not recorded any mountaineering avalanche fatalities in the 30 years to 2025 (D. Hardesty, personal communication, 31 July, 2026).

In Canada, over the past 27 seasons (from 1998-99 to 2024-25) mountaineering accounted for 14 of the 330 total fatalities, or 4.2%. Nine of the 14 fatalities occurred in April and May (spring), one in January (winter) and four in July and August (summer). If we look at the popular climbing areas of Banff, Yoho and Kootenay National Parks in the Canadian Rockies, mountaineers (including ice climbers) account for around 33% of fatalities in the 25 years up until 2023 (Statham and Hueniken, 2023). Canada's ice climbing fatalities mostly occurred during the fall and winter months of November to February, except for an accident on an alpine ice route which killed three climbers during April (Avalanche Canada, 2026).

In Austria, between 2006 and 2025 there were 24 avalanche fatalities involving mountaineers, representing 6% of all avalanche fatalities. However, this includes hiking, which was not possible to separate in the dataset. Seasonally, only 20% of these mountaineering (and hiking) avalanche fatalities occurred during the northern hemisphere spring and summer months (S. Mitterer, personal communication, 11 August, 2026).

In France, between 1999 and 2024 there were 106 avalanche fatalities involving mountaineers, representing 15% of all avalanche fatalities. Of the mountaineering fatalities, 36 (34%) occurred during spring (March-May) and 35 (33%) during summer (June-August) (F. Jarry, personal communication, 28 August, 2026). The seasonal distribution of avalanche fatalities in France is the only international comparison available that shares similarities to New Zealand.

In Italy, between 1985 and 2026 there were 133 avalanche fatalities involving mountaineers, representing 16.4% of all avalanche fatalities (I. Chiambretti, personal communication, 10 August, 2026).

In Switzerland, over the past 27 seasons (from 1998-99 to 2024-25) mountaineering accounted for 78 of 603 total avalanche fatalities, or 12.9 % (B. Zweifel, personal communication, 27 August, 2026).

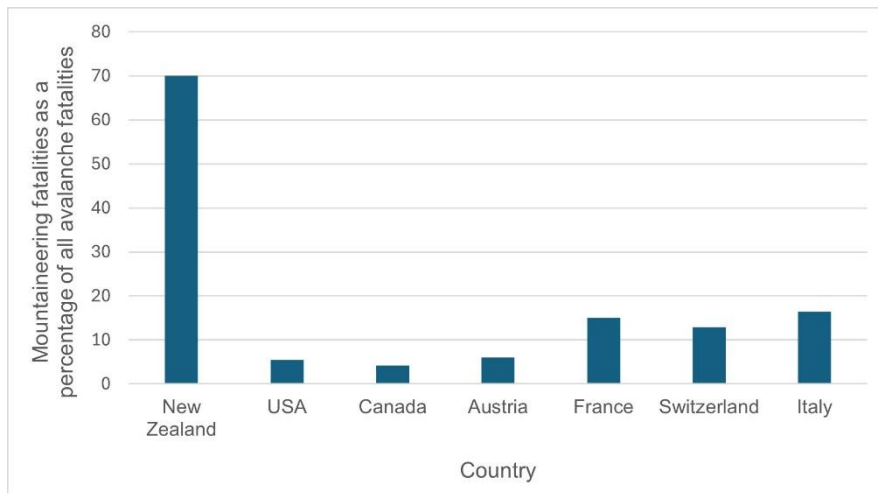


Figure 1. Mountaineering avalanche fatalities as a percentage of all avalanche fatalities, by country. Note; the data displayed per country has some variations in timescale and should be viewed as a simple representation only.

4. PREVIOUS MOUNTAIN SAFETY COUNCIL RESEARCH

New Zealand Mountain Safety Council (MSC)'s previous research (Watson et al., 2023), surveyed 691 recreational mountaineers in relation to avalanche safety. The findings identified several factors relevant to avalanche incident prevention. These are summarised as follows:

- **Avalanche knowledge:** Although 75% of respondents had completed formal avalanche training, only 20% considered their knowledge comprehensive. Key gaps included recognising unstable snowpack conditions (54%) and understanding weather-related instability (45%).
- **Rescue equipment:** A significant proportion did not consistently carry avalanche rescue equipment. Among those with formal training, 94–97% reported carrying equipment always or sometimes, highlighting a strong link between training and preparedness.
- **Community and belonging:** Perceptions of the mountaineering community were largely neutral, with some participants feeling less connected to the wider community. This suggests an opportunity to strengthen belonging and connection.
- **Incident reporting and learning:** Non-fatal avalanche incidents appear to be historically underreported. Limited sharing of near-misses and lessons learned may reduce opportunities for collective learning and improved practice.

These knowledge and behavioural differences appear to intersect with broader cultural factors, particularly community belonging, communication, and information sharing. These findings highlighted opportunities to strengthen mountaineering avalanche safety through more inclusive communication, knowledge sharing, and engagement with avalanche education and safer practices. They have informed new MSC initiatives and broader industry action.

5. NEW ZEALAND'S AVALANCHE TRAINING FRAMEWORK

New Zealand's recreational avalanche education is provided through MSC's Avalanche Skills Courses (ASC) levels 1 and 2, which are delivered by MSC-endorsed external providers. The courses establish nationally consistent standards for content, course duration, instructor qualifications and participant-to-instructor ratios. This framework provides a consistent national basis for recreational avalanche education while allowing delivery through independent providers.

Professional-level avalanche education is delivered at two levels: New Zealand Certificate in Avalanche Risk Management Level 5 and Level 6 (ARM5 and ARM6), both part of the New Zealand qualifications framework and formally recognised qualifications. These are modelled on the Canadian Avalanche Association's Avalanche Operations Level 1 and 2 courses. ARM5 is the standard prerequisite for entry into professional ski patrol employment, avalanche safety management operations, and guide and instructor training programmes.

6. CASE STUDIES

6.1 *Avalanche Course Providers*

To teach recreational alpine climbers about avalanche safety, alpine guides and instructors reported adapting MSC's ASC course content to more effectively cater to travel on foot (e.g. mountaineering and hiking); and to spring and summer conditions. Although there is no universal training course content for alpine climbers, several techniques and themes are commonly taught. The first is an avalanche hazard avoidance mindset, coupled with a focus on choosing appropriate timing for alpine objectives. Raising the awareness of avalanche risk to recreational mountaineers is an important component of this education. Despite the high proportion of avalanche fatalities attributed to alpine climbers, many instructors reported that students still tend to associate avalanche risk with winter activities such as skiing and snowboarding.

The high consequences of even a small avalanche in much of New Zealand's alpine climbing terrain, which is exposed to severe terrain traps, is emphasised to students. Analysing snowpack structure is often simplified when compared to winter courses. Instead, it is common to focus on the influence of warming temperatures and timing travel accordingly, as well as recognising the development of storm slabs and wind slabs, especially within 24 hours of a storm. Digging snow profiles and conducting snowpack tests are considered a lower priority, on the basis that most of the key decisions regarding climbing objectives and conditions should be made during pre-trip planning, before entering avalanche terrain; and that persistent weak layers are relatively rare during spring and summer.

There are limited options to avoid exposure to avalanche hazards once committed to many popular alpine climbing routes, therefore, the focus is strongly on timing ascents according to expected conditions using general rules of thumb, e.g. starting more than 24 hours after a storm, when rapid warming is not expected, and avoiding or reducing exposure to solar aspects during warm times of day.

Some guides and instructors teach recreationalists how to use a rope as a protection measure against avalanches; however, this was often referred to as an advanced skill, due to the complexity of assessing potential forces on snow or rock anchor systems.

6.2 *New Zealand Mountain Safety Council*

MSC has made numerous adjustments to the New Zealand Avalanche Advisory (NZAA) in response to the findings by Watson et al. (2023). These include:

- Forecast regions: a dedicated Aspiring forecast region was introduced to better represent its distinct terrain and snowpack, and to better cater to the alpine climbing user group.
- Forecast season duration: these have been extended in popular alpine climbing regions, including year-round forecasting for Aoraki/ Mount Cook, forecasting through to the end of December (mid-summer) for Aspiring, and through November (the end of spring) for Tongariro.

Alongside these changes, forecast messaging has evolved to better reflect how the predominant user group changes throughout the forecasting season. Investment has been made in professional writing workshops and courses to assist in upskilling written communication tone and consistency. Forecasters increasingly tailor messages to mountaineers during spring and summer, emphasising hazards relevant to mountaineering objectives, and where possible seek data to support accurate forecasting for popular alpine access routes and objectives. As an example, the inclusion of a daily sliding danger to communicate the risk of uncontrolled slides/falls on ice enhances communication to this group and encourages engagement in the full suite of forecast information.

Beyond the Avalanche Advisory, MSC has broadened its communication strategy to more effectively engage the alpine climbing community. Seasonal awareness campaigns now incorporate alpine climber-centric imagery, and partnerships with the New Zealand Alpine Club and other relevant organisations have enabled avalanche messaging to be shared through established community channels. Seasonal calls to action also shift from winter recreation to mountaineering from October onwards, while incentive campaigns encourage mountaineers to submit public avalanche observations.

In 2025, MSC launched a 25-part avalanche video series called *Avalanche Tips and Terms: From the Forecast to the Field*. This series was the first of its kind, using New Zealand-only video content and was produced with a distinct focus on alpine climbing; the series has amassed over 2.7 million views on YouTube (MSC, 2025).

MSC is recognised as a trusted technical advisor for New Zealand's Coronial process, informing recommendations to mountaineers and sector organisations following fatal avalanche accidents. This provides insight and ensures learnings include technical expertise; therefore the resulting messaging and narrative are relevant to and received by the alpine climbing audience.

In the future, a working group will be formed to update the New Zealand ASC curriculum to create a national standard for mountaineering-specific recreational avalanche education.

6.3 New Zealand Mountain Guides Association

The New Zealand Mountain Guides Association (NZMGA) has addressed the predominance of alpine climbers in avalanche fatality statistics through several initiatives. NZMGA makes professional-level avalanche certification a prerequisite for entry into alpine trekking and climbing guide training programmes, as well as for ski guide training. During NZMGA training and assessment courses, avalanche risk management is included in daily hazard assessment processes, year-round.

Advanced techniques for avalanche risk mitigation may be included during alpine guides' training when appropriate. Examples include the use of ropes along with snow or rock anchors for protection against avalanche risk; and determining the greater hazard between falling, crevasse fall and avalanche before choosing and applying appropriate mitigation measures.

The *New Zealand Mountain Guide Manual* (NZMGA, 2011) includes the chapter "Spring and Summer Avalanches and the Climbing Season". Considerations for guiding alpine climbing in avalanche terrain are outlined, including awareness of the consequences of small avalanches in combination with prevalent terrain traps such as cliffs, steep alpine faces and crevasses. NZMGA advises that spring and summer avalanche danger for alpine climbers comes mainly from dry slabs sitting on hard old snow or ice, and from rapid warming creating wet avalanches.

The manual points out that alpine climbers often travel roped together, move slowly, and operate in complex terrain. Exposure to wind-loaded or solar aspects, reduced mobility, limited snowpack information, and time pressure related to volatile weather all increase avalanche risk. Safe travel depends on early starts, patience after storms, and strict avoidance when obvious warning signs appear. A very conservative approach is recommended, especially when dealing with limited snowpack information.

6.4 New Zealand Outdoor Instructors Association

The New Zealand Outdoor Instructors Association (NZOIA) has addressed avalanche risk management for alpine climbers through an instructors' scope of practice, a syllabus for alpine climbing instructor training and assessment programmes, and ongoing training.

NZOIA issues two levels of alpine instructor certification. At Level 1, instructors avoid traveling in avalanche terrain. Professional-level avalanche certification is a prerequisite for Level 2 assessment courses. To address gaps in the professional-level certification, which is primarily designed for avalanche technicians working in an organised operational programme, as opposed to moving clients through terrain, an additional avalanche terrain assessment created by NZOIA is included in the Level 2 alpine instructor examination.

Continuing professional development, including ongoing avalanche safety training, is a requirement for NZOIA instructors. NZOIA holds refresher training workshops and a yearly instructor symposium to cater to this requirement.

Individual NZOIA-certified outdoor instructors and operations deliver alpine and avalanche training courses on foot. To achieve this, they have adapted MSC's ASC curriculum to suit the mode of travel. One operator is trialling a mentorship programme aimed at trainee alpine instructors to help improve avalanche risk management skills in this sector and assist trainees in achieving professional-level avalanche certifications.

6.5 New Zealand Alpine Club and Canterbury Mountaineering Club

The New Zealand Alpine Club (NZAC) and Canterbury Mountaineering Club (CMC) are well-established alpine climbing clubs which employ certified NZMGA or NZOIA guides/instructors to run instruction courses for their members. This ensures professional avalanche certifications are held and that instructors and guides operate within a professional scope of practice. Instructors are required to complete an avalanche hazard evaluation form before each day of teaching, at all times of year.

NZAC has also developed a “Snowcraft and Mountaineering Pathway” flowchart (Figure 2) which guides its members through a progression of training courses as they become a competent mountaineer. Avalanche education is included at every level of mountaineering competency.

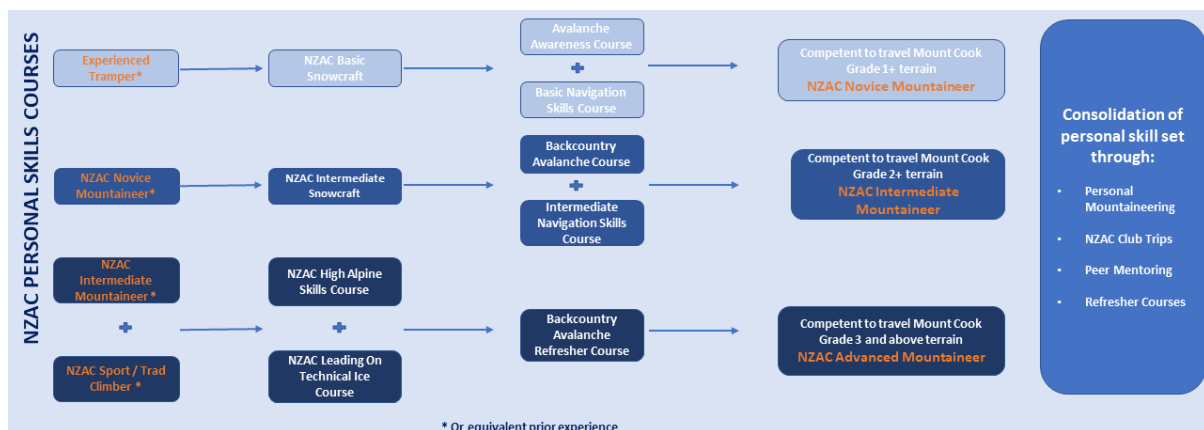


Figure 2: Snowcraft and Mountaineering Pathway, New Zealand Alpine Club

NZAC publishes the book *Avalanche Awareness in Aotearoa New Zealand* (Goddard, 2023) which serves as a reference text for recreational avalanche courses. In collaboration with MSC, two chapters are dedicated to practical advice for mountaineers in avalanche terrain and the results of MSC’s mountaineering research (Watson et al., 2023). Another NZAC publication, *The High Pathways—A Guide to Te Waipounamu’s Mountains* (Hersey, 2025), includes information about avalanche risk and encourages information sharing in a format specific to hikers and mountaineers.

6.6 Mountain Guiding Operators

Alpine climbing in avalanche terrain was described as a high-risk activity in New Zealand during interviews with guiding operators. Consequently, a very conservative decision-making process is used by many. This marks a shift away from guides making group management decisions once on a particular slope and towards go/no-go decisions much earlier in the planning process, using a hazard avoidance mindset. Such decisions are based on a conservative assessment of the likely conditions and the chance of even a small avalanche occurring in hazardous terrain with exposure to serious terrain traps. If a clear weather window is expected to last only 24 hours or so, snow climbing objectives are likely to be cancelled as the snowpack may remain unstable and the margin for error is very low due to terrain seriousness. Managing client expectations around summiting peaks, given time constraints and the need for stable snowpack conditions, is described as an ongoing challenge.

Guiding operators require guides to complete an avalanche risk assessment process for every trip, no matter the activity or season, whenever there is adequate snow cover for avalanches. In some cases, the trip plan and hazard assessment are reviewed by an external technical advisor before the trip starts.

Guiding companies also deliver training courses to mountaineers and reported including avalanche safety training within these courses, even during summer. The exact syllabus and the extent of the avalanche content vary from one guide to the next.

7. CHALLENGES

During interviews, several recurring themes arose. In New Zealand it has historically been challenging for non-skiing alpine climbers to achieve professional-level avalanche certification due to a lack of mentorship and workplace opportunities. Subsequently, structured and formalised avalanche hazard assessment processes are often missing from alpine climbing instructor workflows.

Lack of seasonal snow cover, combined with glacial recession and increased rockfall, is making access to New Zealand’s high alpine snow routes untenable during summer. This has led to a shift in the high alpine climbing/guiding season from summer into the spring months of October-November, when the weather is typically unstable and weather windows are short. This creates significant time pressure when trying to complete ascents. Furthermore, the snowpack is in a transitional phase between winter and summer states, making avalanche forecasting more complex than during the late summer season.

There is often overlap of ski mountaineering and alpine climbing activities during the spring season. Anecdotally, skiers tend to be equipped with transceivers, shovels and probes, while alpine climbers are

less likely to use this equipment, despite the two user groups co-inhabiting the same terrain at the same time. This may signal a cultural disparity in the assessment and management of avalanche risk.

With the absence of a standardised national avalanche training curriculum for mountaineers, individual guides and instructors have developed their own systems for training alpine climbers and managing their guests' exposure to avalanche risk. The lack of a unified approach makes it especially challenging for early career professionals to know how to manage this problem.

Lastly, while New Zealand currently lacks robust participation data regarding mountaineers, anecdotal evidence suggests that many mountaineers have not completed any formal training courses, instead learning skills through self-taught experiences, often with friends, or through informal arrangements. For many, this is a natural progression from tramping (hiking). A significant and ongoing challenge is connecting with and educating these recreational, aspiring mountaineers.

8. FUTURE WORK

The development of an official nationwide recreational avalanche course curriculum for alpine climbers is planned by MSC. An ideal addition would be for professional-level avalanche training curricula to also be designed for those managing others on foot in avalanche terrain year-round.

A pilot mentorship programme for alpine instructors, currently underway to address training gaps, could be expanded if successful.

9. CONCLUSION

New Zealand has an unusual problem, in that the large majority of its avalanche fatalities involve mountaineers during spring and summer months. The alpine community has responded with a variety of initiatives, including expanded avalanche forecasting seasons and regions, targeted safety messaging to alpine climbers, adapting avalanche skills training for this user group and adapting alpine guide and instructor training.

Ultimately, reducing avalanche fatalities among New Zealand mountaineers will require sustained, industry-wide collaboration and continued adaptation. Further research and time are required to evaluate the effectiveness and longer-term impact of these initiatives.

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