A PROCESS FOR MAKING EVIDENCE-BASED UPDATES TO RECREATIONAL AVALANCHE CURRICULUM TOOLS

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ABSTRACT: The AIARE fieldbook is the primary tool instructors use to deliver AIARE recreational avalanche courses, as well as a post-course planning and reference tool for backcountry travelers.

Although the fieldbook has been a cornerstone of AIARE's curriculum for nearly two decades, it has not undergone a significant update since the 2017–18 season. The empirical foundation for the revision discussed in this paper comes from two previous studies: a three-year investigation of how AIARE 1 courses influence backcountry behaviors and a survey-based examination of fieldbook value, use patterns, and barriers.

Using information from these studies to guide them, AIARE's team of curriculum specialists developed and filtered updates through multiple stakeholder groups at each step. Stakeholders included the researchers behind both studies, AIARE's Technical Committee, and a working group of approximately 70 instructors and course providers. This paper presents the fieldbook's updated learning outcomes, the techniques used to achieve them, and the start-to-finish process for making evidence-based curriculum updates that will improve the effectiveness of AIARE's recreational avalanche courses.

KEYWORDS: Avalanche education; Program evaluation; Action-oriented learning outcomes; Educational best practices; Pedagogy.

1. INTRODUCTION

The AIARE fieldbook, also sometimes called the AIARE “blue book,” is an integral part of AIARE’s recreational avalanche education courses. A physical copy of the book is distributed to every student who takes an AIARE 1 or AIARE 2 course. This tool is the foundation on which the rest of the curriculum (including student manuals, instructor lesson plans, and course agendas, as well as supplementary materials such as the interactive online learning modules) rests. It was originally intended to guide the planning process on the course itself and subsequently act as a resource so that students could continue to apply the repeatable decision-making framework they learned on their AIARE courses.

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The fieldbook has existed in a number of iterations since AIARE’s inception in 1998. Its last significant update was around the time of the professional/recreational split in U.S. avalanche education in the 2017–18 season.

1.1 Program audit and evaluation

In an effort to maintain high-quality, culturally relevant programming, AIARE embarked on a three-year program evaluation of its two most popular recreational courses, the AIARE 1 and the AIARE Avalanche Rescue course, in the 2021–22 season. The methods and results of that program evaluation are detailed by McNeil, Morgan, Riggs Meder, & Walker (2023).

1.2 Problem statement

Recent studies have shown that some parts of AIARE’s recreational programs were more effective than others; we sought to improve the fieldbook to address the shortcomings identified in our program evaluation, the specific feedback we had received on the fieldbook tool itself, and recently identified accident trends.

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McNeil's program evaluation study (2023), combined with the results of Frazer & Ball's study on the fieldbook (2023), gave us insight into both the positive impacts of the course and specifically the fieldbook tool, as well as its flaws. Some specific relevant takeaways from these studies include:

- 20–30% of respondents never practiced rescue after their courses; the majority have only ever practiced 1–2 times after their course.
- Most respondents check the Danger Rating, Bottom Line, and Avalanche Problem.
- Very few read the whole thing, look at social media posts by forecasters, or look at public observations.
- By and large, respondents were very confident in their group communication skills.

These gaps in safe backcountry behaviors are highlighted by McCammon & McNeil's (2024) risk trend research:

- Respondents said they understand the forecast and use it to make plans and pick terrain, but risk management trends show a gap here: 90% of accidents are on the slope identified in the local forecast as the problem slope for that day.
- Respondents say they can recognize signs of unstable conditions, but sometimes don't have adequate feedback; risk management trends show that many of those involved in avalanche incidents "did not see any signs of unstable conditions."

The sum of these trends shows a need for greater emphasis in educational programs on this section of the forecast. Their research also found that while 80% of respondents own transceivers, common errors still exist: forgetting to turn them on, leaving them in a backpack or at home altogether; travel techniques, too, showed a disconnect between perceived communication quality and competence—not traveling one at a time across or under avalanche terrain or effectively communicating about safe spots to regroup, for example.

There was considerable overlap between the lack of safe backcountry behaviors and the features users in Frazer & Ball's study wanted to see, such as pre-printed templates for common observations and decision-making processes, more examples and guidelines for filling in trip planning and observation pages, and a better way to keep forecast and observation information handy for reference in the field in a way that felt accessible and applicable to relatively inexperienced field users (such as a compass and aspect roses, improved pit profile pages, and more writing space).

Using demographic data from both studies, we developed a primary user persona to direct the fieldbook updates. The typical end user for the fieldbook, following an AIARE 1 course, aligns with a Type B or C in St Clair's Avalanche Bulletin User Typology (2021). We then referenced the AIARE 1 course learning outcomes as a benchmark and developed six action-oriented learning outcomes for the fieldbook to address the knowledge and behavior gaps identified in these studies.

1.3 Project aims

With the results of those studies in mind, AIARE staff began outlining changes to the fieldbook. In keeping with AIARE's student-centered, action-oriented educational philosophy, outlined in greater detail in Riggs Meder & Walker's "From knowledge conveyance to behavior change: An avalanche education theory of practice" (2023), we started by looking closely at the learning outcomes for the courses on which the fieldbook is used and developed a set of action-oriented learning outcomes based on those. We determined that the updated fieldbook should enable users to:

- Effectively plan a trip appropriate for the day's conditions using the AIARE framework and the current local avalanche forecast,
- Use the resources in the references section at the appropriate stage(s) of trip planning and execution,
- Record observations pertinent to the day's travel conditions and use them to adjust the day's plan accordingly,
- Debrief the day's outing and apply relevant takeaways to the next trip,

- Submit a useful, relevant public observation to the local avalanche center, and
- Practice safe backcountry habits, both daily and seasonally, including trip planning and companion rescue practice.

2. METHODS

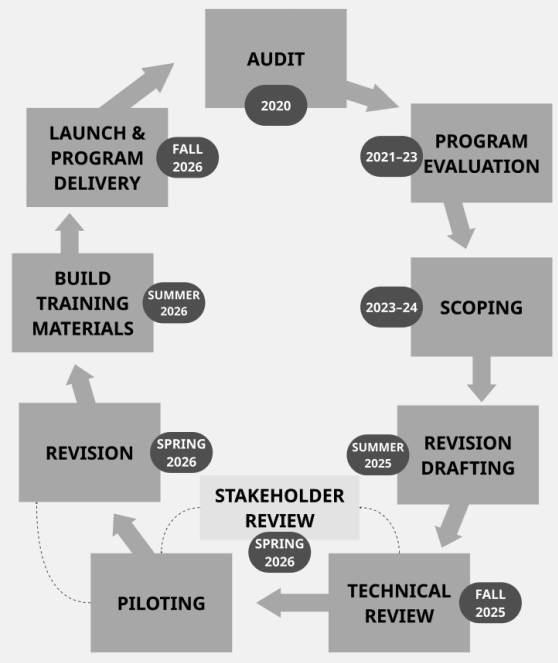
We developed a robust curriculum revision process used for each of the curricula we manage. Working with advisory and focus groups, as well as AIARE's Technical Committee of practitioners from various sectors of the industry, is a key step in this process.

2.1 Curriculum revision cycle

AIARE's curriculum revision cycle is a multi-step process that culminates in launch and program delivery, followed every few years by an audit, so that all curricular products are always at some point in the cycle. AIARE defines a "curricular product" as the complete set of materials necessary to deliver a course, including instructor- (lesson plans, curriculum guides and agendas, teaching tools, venue considerations) and student-facing (manuals, online learning modules, study guides) materials. The steps of the cycle are briefly described here; they are illustrated in Figure 1 with the timeline indicated next to each step for this specific project.

The first phase, the (1) audit, is conducted by an AIARE programs staff member and is a review of all the materials associated with a curriculum product. In this phase, we flag any missing or incomplete materials and begin sketching out the goals of the second step, (2) program evaluation. This second phase is typically conducted by a third party and may involve reviewing data on past student performance, surveying students and instructors, and/or auditing courses. It is followed by (3) scoping, in which the conductor of the program evaluation extends recommendations for updates to be made to the program.
During the (4) revision drafting, the work of envisioning an updated program begins. AIARE staff revisit course learning outcomes and determine the best ways to meet them, culminating in (5) review by the six-member AIARE Technical Committee. When possible, (5.5) stakeholder review makes for a more complete picture of the update's potential efficacy and creates buy-in among those who will be delivering the material. Once those phases are complete, it is time to (6) pilot a program.

Figure 1: AIARE Curriculum Revision Cycle components.



After a season of piloting, we typically undertake at least one (7) revision, sometimes reverting to the technical or stakeholder review stages. Once the materials themselves are finalized, AIARE staff must (8) build training materials for whoever will be delivering the course, whether recreational instructors or AIARE field staff. Finally, we work with our marketing and communications team to (9) launch and begin delivering programs.

For the AIARE fieldbook, this process began in 2021 and concluded in 2026, thanks to the need to deeply understand the changing recreational audience via a three-year evaluation before making changes to the tool. We did not pilot the changes on a smaller scale, as we often do with curriculum revisions, believing that the unusually deep-diving program evaluation and subsequent stakeholder participation in the revision process would yield results sufficient to test the updated tool with our entire network of providers and their recreational students.

2.2 Stakeholder involvement

To update the AIARE fieldbook, we chose to engage instructors, course leaders, and providers in a fieldbook working group. We reached out to these groups in summer 2025 to gauge interest and collect initial suggestions; around 70 people (many of whom hold multiple overlapping roles among the three groups) responded with interest.

We distributed a summary of the studies 'findings and an overview of our proposed changes, asking respondents to read them before reviewing an updated draft of the fieldbook, then drafted a layout and convened a meeting to collect feedback in March 2026. About 30 people attended this first meeting in person, and another 23 submitted feedback via Google form. We drafted another layout based on feedback from the working group and technical committee, overseen by study authors Ball & McNeil, and distributed it to the working group in April.

This second working group meeting drew around 30 attendees again, and an additional 15 contributed to a second Google form requesting final feedback on the layout and design of the book. The design was finalized in early May and shipped to a printer who will manufacture the books on water-resistant paper; AIARE providers will be able to purchase copies beginning in October to distribute to their students beginning in the 2026–27 winter.

3. OUTCOMES

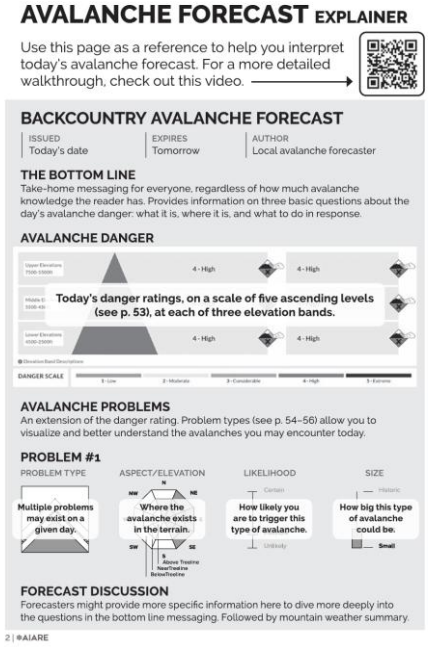
The collaborative process yielded some exciting updates to the fieldbook tool. Members of the fieldbook working group rose to the challenges posed by our proposed learning outcomes with creative ideas borne of many dozens of collective winters in the field with students. Some of the most significant updates undertaken include:

- Trip planning page adjusted to reflect the standard National Avalanche Center forecast format.
- Added NAC format overview reference page.
- Each trip now has 4 dedicated pages instead of 2.
- Pre-trip walkthrough updated to include step-by-step departure check.
- Trip page format updated with more room for structured observation & notetaking.
- Simplified prompts for monitoring conditions and debrief questions.
- Rescue practice resources created: rescue practice setup instructions, suggested rescue practice scenarios, rescue practice journal.
- Rescue card updated with simpler prompts and spiral technique illustration.

Several of the updated pages included QR codes linking to resources students can use to refresh their memories after they have completed the AIARE course on which they were first introduced to the fieldbook. The idea here was to make the tool more useful not only as a learning aid during the educational experience, but also to enhance its usefulness to students after the fact, encouraging them to bring it along as a reference on their own tours.

Figures 2–6 illustrate some of the updates made to the fieldbook; each corresponds to the research described in the Problem Statement section, the goals defined in the Project Aims section, or both.

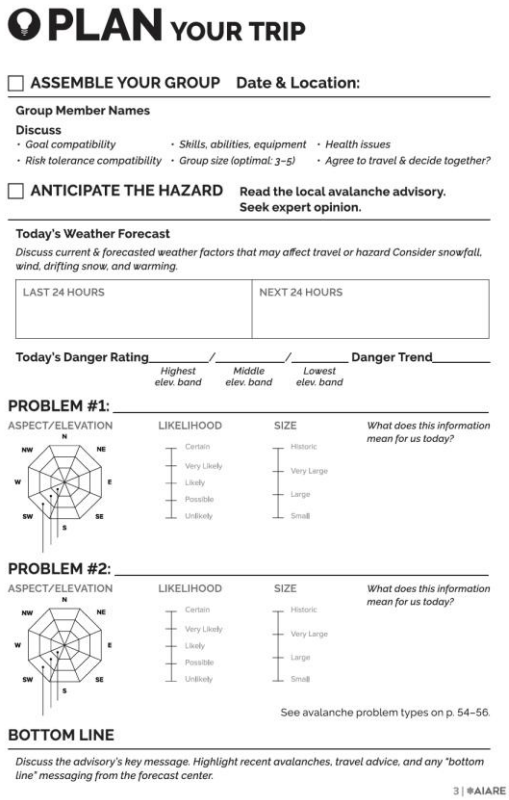
Figure 2: Avalanche forecast explainer to assist students in interpreting information in a National Avalanche Center-formatted bulletin after their course.



The avalanche forecast explainer page mimics the format of a National Avalanche Center (NAC)-standard forecast. While not all avalanche centers in the U.S. follow this format, enough do that the majority of students using the fieldbook will find familiar information here; instructors who teach in zones not served by a NAC forecast will have a bit of extra work to do in translating for their students.

The updated trip planning pages include explained pages with sample information and significantly more room to write. The aspect/elevation rose exists for students to illustrate where they expect to find a given problem (space for two in each set of trip planning pages), along with spaces for likelihood, size, and how the information will impact the day's trip plan.

Figure 3: Updated sample trip planning page with sample information and reference page numbers.



PLAN YOUR TRIP

☐ ASSEMBLE YOUR GROUP Date & Location:

Group Member Names

Discuss

- Goal compatibility
- Risk tolerance compatibility
- Skills, abilities, equipment
- Group size (optimal: 3–5)
- Health issues
- Agree to travel & decide together?

☐ ANTICIPATE THE HAZARD Read the local avalanche advisory. Seek expert opinion.

Today's Weather Forecast

Discuss current & forecasted weather factors that may affect travel or hazard Consider snowfall, wind, drifting snow, and warming.

LAST 24 HOURS	NEXT 24 HOURS

Today's Danger Rating ____/____/____ Danger Trend____

Highest elev. band *Middle elev. band* *Lowest elev. band*

PROBLEM #1: _____

ASPECT/ELEVATION LIKELIHOOD SIZE *What does this information mean for us today?*

PROBLEM #2: _____

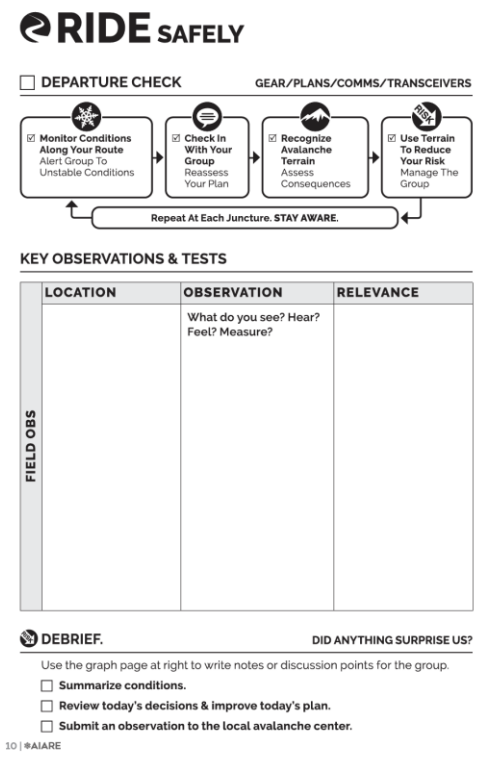
ASPECT/ELEVATION LIKELIHOOD SIZE *What does this information mean for us today?*

See avalanche problem types on p. 54–56.

BOTTOM LINE

Discuss the advisory's key message. Highlight recent avalanches, travel advice, and any "bottom line" messaging from the forecast center.

Figure 4: Tour page with departure check and structured observation table.



RIDE SAFELY

☐ DEPARTURE CHECK GEAR/PLANS/COMMS/TRANSCEIVERS

☑ Monitor Conditions Along Your Route — Alert Group To Unstable Conditions
→ ☑ Check In With Your Group — Reassess Your Plan
→ ☑ Recognize Avalanche Terrain — Assess Consequences
→ ☑ Use Terrain To Reduce Your Risk — Manage The Group

Repeat At Each Juncture. STAY AWARE.

KEY OBSERVATIONS & TESTS

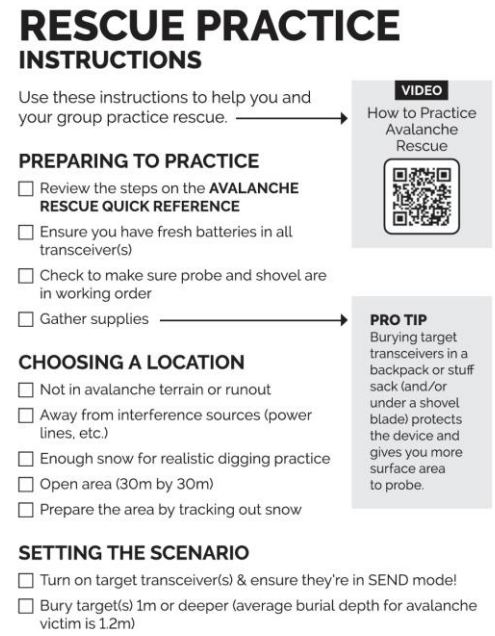
FIELD OBS	LOCATION	OBSERVATION	RELEVANCE
		What do you see? Hear? Feel? Measure?	

DEBRIEF. DID ANYTHING SURPRISE US?

Use the graph page at right to write notes or discussion points for the group.

☐ Summarize conditions.
☐ Review today's decisions & improve today's plan.
☐ Submit an observation to the local avalanche center.

Figure 5: Rescue practice instructions for reference after the course. The following page contains sample scenario setups.



RESCUE PRACTICE INSTRUCTIONS

Use these instructions to help you and your group practice rescue. →

VIDEO
How to Practice Avalanche Rescue

PREPARING TO PRACTICE

☐ Review the steps on the **AVALANCHE RESCUE QUICK REFERENCE**
☐ Ensure you have fresh batteries in all transceiver(s)
☐ Check to make sure probe and shovel are in working order
☐ Gather supplies →

PRO TIP
Burying target transceivers in a backpack or stuff sack (and/or under a shovel blade) protects the device and gives you more surface area to probe.

CHOOSING A LOCATION

☐ Not in avalanche terrain or runout
☐ Away from interference sources (power lines, etc.)
☐ Enough snow for realistic digging practice
☐ Open area (30m by 30m)
☐ Prepare the area by tracking out snow

SETTING THE SCENARIO

☐ Turn on target transceiver(s) & ensure they're in SEND mode!
☐ Bury target(s) 1m or deeper (average burial depth for avalanche victim is 1.2m)

We surmised that students did not practice rescue after their courses at least in part because they did not know how to properly set up a practice rescue scenario, something their instructors would have done for them on their courses. With this in mind, assembled some basic instructions on how to practice, beginning with basic information (remembering to turn on the buried transceivers) and building up to tips to make practice more realistic (stuffing a backpack for a bigger, softer target than a plywood strike board—and is also a more realistic simulation). This page also contains a QR code for a step-by-step video for practicing rescue.

The adjacent page contains a series of “recipes” for straightforward and more involved burial situations to take the guesswork out of setup for students. With a discrete set of boxes to check and the journal page for added accountability, our hope was that students would have the tools they needed to practice their rescue skills between courses.

Figure 6: Rescue practice journal for additional accountability in post-course rescue practice.

RESCUE PRACTICE
JOURNAL

Use this page to record your rescue practice sessions.

Date	Setting or Scenario	#transceivers	Time(s)
20261227	Pleasant Meadows - 30 by 30 m	2	8:09

When you've reached the end of this table, consider that it's probably time to take another one-day rescue course to learn updated best practices and reinforce good habits.

NOTES

4. FUTURE WORK

AIARE providers will begin distributing this fieldbook to their students in the 2026–27 season. AIARE will begin the monitoring phase, including the ways instructors customize and individualize the tool, whether the revisions we made impact the shortcomings mentioned in this paper, and the overall impacts on curriculum efficacy, at that time. We will monitor both in terms of fieldbook contents and delivery format, including the possibility of a digital product. By 2030, we will initiate another audit and program evaluation of the materials associated with the AIARE 1 course, and the cycle will begin again.

ACKNOWLEDGEMENTS

AIARE would like to thank the 70 dedicated instructors and providers who participated in its Fieldbook Working Group, as well as its Technical Committee, to collaborate on these updates. AIARE is a nonprofit organization whose mission is “saving lives through avalanche education,” and that is committed to continually evaluating the quality of its curricula and programming and collaborating with other avalanche professionals from across the industry as well as those in other disciplines.

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