

What do Skiers and Snowboarders Consider Optimal Conditions for a Good Day on the Mountain?

Session #1 Poster 40



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Introduction and Rationale

- Skiing and snowboarding (hereinafter skiing; **Figure 1**) are important economically for many mountain regions worldwide (Scott et al., 2006; Müllner, 2013; Hull, 2025)
- Current climate trends are making the ski season is becoming less viable (Scott et al., 2006; Burakowski & Magnusson, 2012; Scott & Steiger, 2024)
- Warming trends are being observed in most areas with drying (less precipitation) trends in some areas (Lackner et al., 2021; Siirila Woodburn et al., 2021; Hammond et al., 2023)
- Most current investigations are limited focusing on
 - Acceptable temperatures (Steiger & Scott, 2025; Wei et al., 2025)
 - Change in start and length of snow season using a minimum depth or snow water equivalent (SWE) (e.g., Damm et al., 2017; Steiger & Scott, 2025)
 - Change in snowmaking opportunities considering temperature (sometimes wet-bulb temperature) (e.g., Caskey, 2011)
- Modeling future scenarios are often at coarse resolutions (Damm et al., 2017; Wei et al., 2025) that may not represent a ski slope, i.e., are larger than an entire ski resort



Figure 1. (left) Skiing in the backcountry and (right) snowboarding at a resort.

Research Question and Objectives

The main research question is to determine what makes a “good” ski day. This was done using interviews of skiers and snowboarders (CSU IRB protocol 6741) (see center column).

We want to establish metrics from the survey to assess the number of “good” days per year using daily meteorological data.

FIRST TIME SKIER

- Level 1: “I’ve never skied.”

GREEN ZONE SKIERS

- Level 2: “I can slide, slightly change direction, and come to a stop.” – **Easiest green terrain**
- Level 3: “I can link turns together and stop where I want to on the easiest green terrain. My turns are usually all the same size.” – **Green terrain**
- Level 4: “I am linking turns together smoothly on all green terrain. I can make narrow and wide turns” – **All green and easiest blue terrain**

BLUE ZONE SKIERS

- ■ Level 5: “I am skiing mostly parallel in a couple different turn sizes and shapes on most blue terrain. I am beginning to use my poles and can hockey stop in both directions.” – **All green terrain and most blue terrain**
- Level 6: “I am skiing parallel and confidently on all groomed blue terrain. I am exploring un-groomed trails and the easiest bumps. I usually make the same turn sizes and shapes on un-groomed trails.” – **All groomed blues, easy blue bumps, easy groomed blacks**
- ◆ Level 7: “I am able to smoothly link parallel turns together with a pole plant on all blue and black terrain. I am exploring un-groomed black terrain, including bumps. I can connect different turn sizes and shapes seamlessly for the different challenges.” – **All blue terrain and most black terrain**

BLACK/EXPERT ZONE SKIERS

- ◆ Level 8: “I am making different turns sizes and shapes, including rhythmic short turns and large carved turns, on all blue and black terrain (groomed or un-groomed). I feel comfortable exploring harder blacks and easier double black terrain.” – **All black and easy double black terrain**
- ◆◆ Level 9: “I can ski the entire mountain and am working on skiing faster, smoother, difficult lines, and learning different strategies in the hardest terrain and snow conditions.” – **Entire mountain, all conditions**

Figure 2. Self-identified nine-point ski skills. <https://teamavsc.org/Ability-Levels>

The Questionnaire

Core Questions

1. When did you begin skiing/snowboarding?
2. Where have you skied/snowboarded?
3. Describe a “good” ski day.
4. What makes up a "good" day on the snow for you?
 - If weather/company/conditions & snow/other (or miscellaneous response), tell me more:
5. When and where was your best ski day in recent years? Why?
6. When and where was your best ski day ever (if it wasn't in recent years)? Why?
7. Compared to when you began skiing, would you say the number of "good" ski days have increased or decreased?
 - If you think they've *decreased/increased* in frequency, approximately how many *fewer/more* good ski days would you say you have each year compared to when you started skiing?

Demographic Questions

1. Which "resort" sports do you participate in?
2. Do you participate in backcountry snow sports? If so which sport?
3. Could you estimate your skill out of 9 using the Aspen Valley Ski & Snowboard Club ratings (1 = novice, 9 = expert)? (**Figure 2**)
4. How frequently do you go skiing/snowboarding every year (approximately)?
5. Do you live in Colorado? If no, where do you live? If yes, how long have you lived in Colorado (and which city)?
6. How old are you?

Location, Time and Date of Interview



Figure 3. Snow sticking to a skin in the backcountry.

Results

We used both an online form and in-person interviews (**Figure 4**) to interview 27 people; most lived in Colorado. Participants had a range of self-reported skills (as per **Figure 2**) with some correlation between length of time skiing and skill level (**Figure 4**).

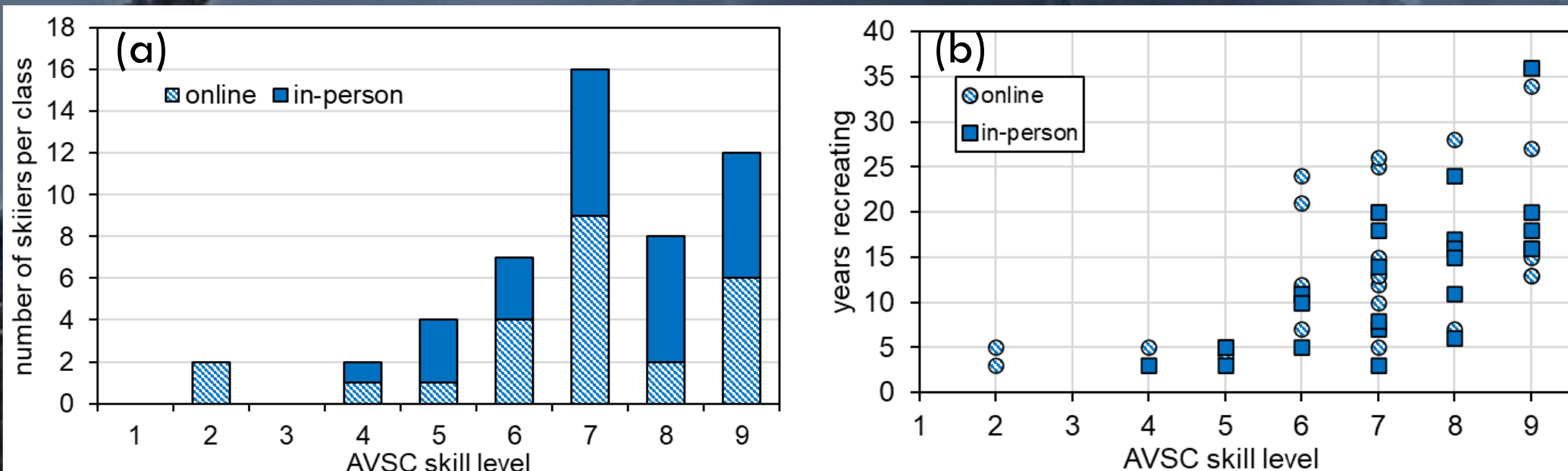


Figure 4. (a) Interview count per ski level and (b) years recreating versus skill level



Figure 5. Ski/snowboard piste (left) and chair lifts (right) as an integral part of a resort.

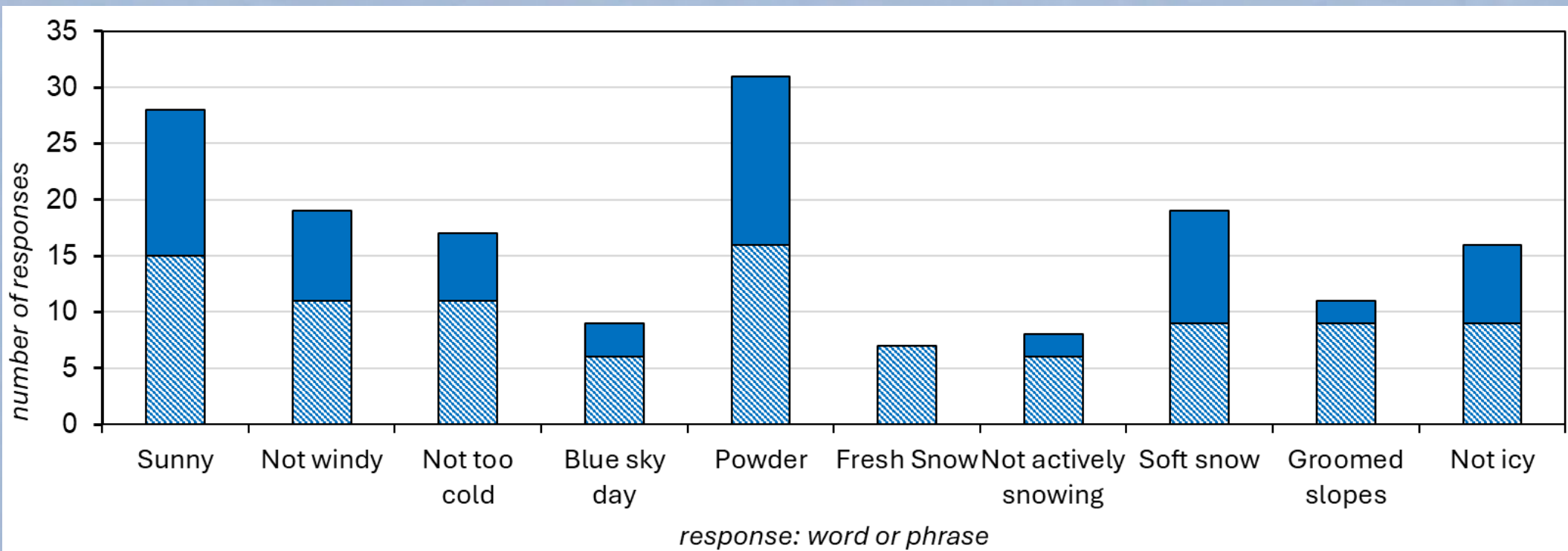


Figure 6. Main responses for what makes a “good” ski day.

Acknowledgments

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Results

There were a variety of reasons for a “good” day on the mountain. Many respondents emphasized the company that joined them (**Figure 5**). The weather, conditions and the snow were separated by some (more for the in-person interviews) and merged by others. Some responses were more specific (powder) and others more general (soft snow) (**Figure 6**).

There was some consensus in the overall comments (see below), and yet no full agreement. Many gave a range of suitable temperatures. Only the in-person interviewees (bottom of list) gave details about the ideal fresh snow density; those people were prompted about specific numbers as they presented knowledge about snow and snow conditions.

Ideal Conditions

The following are some specific interviewee comments:

- “maybe around **30 degrees...**”
- “...not windy or **sub 0**”
- “...ideally between **25-30 degrees**”
- “...at least **4 inches** of powder”
- “...so not above **30 degrees**”
- “...really anything not **below 0** degrees is good”
- “...**20-30 degrees**”
- “I do not care about what the weather is. Sunny, **-15 degrees** out...”
- “...at least **2 feet...**” (of fresh powder)
- “Powder, **4-6 inches**”
 - “...maybe **an inch or two** of powder...”
 - “...like six inches 12 inches 24 in like I think **anything from like four inches to a couple of feet...**”
 - “...at least I would say like **an inch to two inches...**”
 - “A foot deep. I would say a **density of 2%...**”
 - “**A foot of snow...**a five percent is a 20 to one ratio yeah sure 50 kilograms per cubic meter so **five percent...**”
 - “...somewhere between **20 and 32**”

Next Steps

We intend to use the range of responses to define “ideal” conditions. These will be applied to niveometeorological data to determine the number of “good” days per year. We will examine their occurrence in “snow drought” years, such as 2012 and 2026, as well as years that had more than average snow. We may refine the questionnaire for more specific answers.

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