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Glacier or Not? The Importance of Nuance in Definitions of Vanishing Glaciers

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Glacier or Not? The Importance of Nuance in Definitions of Vanishing Glaciers

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ABSTRACT. Glaciers provide critical ecosystem services, including water resources, biodiversity, cultural value, and climate signals. But what makes a glacier a glacier? Different definitions of what characterizes a glacier can conflict with each other. While a common definition emphasizes "past or present flow," practical applications involve various criteria like currently observable ice flow, crevassing, minimum thickness, minimum area, surficial features related to hydrology and/or debris cover, or relative size. Increasingly, glacier inventories are applying multiple criteria, acknowledging the nuanced, continuous nature of glacier retreat rather than a binary status. In the context of increasingly melting, shrinking, and vanishing glaciers, it is important to explore glacier definitions and their application. Ultimately, the glacier definition applied depends on the specific context, purpose, and audience. This also highlights the need for careful language choice, clear communication, and localized expertise in considering glacier loss.

INTRODUCTION

Glaciers are integral to many high latitude and high altitude environments. As we move towards a world with less ice, in addition to vanishing charismatic symbols of climate change, we also lose glaciers' important ecosystem services (Huss and others, 2017). Despite glaciers' multifaceted societal contributions, there is a clear consensus that the world will lose much of its ice, and that the extent of this loss is dependent on the emissions and warming pathways that society chooses in the future (e.g., Rounce and others, 2023; Zekollari and others, 2025).

Global glacier volume change estimates (Zemp and others, 2025) are dominated by changes to larger glaciers, but accelerating reductions in global glacier ice volume will also necessarily mean both the increase in numbers of small glaciers and the disappearance of many currently existing small glaciers. When does that transition from glacier to not-a-glacier happen? How do we consider or talk about this transition? Is this simply a theoretical question or does it have real-world impacts? In the context of the United Nations declaring 2025 as the International Year of Glaciers' Preservation (UN General Assembly, 2022), this paper will explore these questions.

IMPORTANCE OF VANISHING GLACIERS

Significant portions of the world have deglaciated since the last glacial maximum. No matter what a glacier's retreat looks like, deglaciation has enormous impacts. Small glaciers, while diminutive, are critical components of the cryosphere. As glaciers recede and vanish, impacts will be felt differently nearest to their (former) locations versus downstream, and some impacts will be gradual while others are step changes. Shrinking and vanishing glaciers, in particular, are important to consider for their highly varied roles, including:

Water Resources: Glaciers, including small glaciers, serve an important role in buffering and smoothing variability in interseasonal and interannual water resources (e.g., Schuster and others, 2025; Ultee and others, 2022) whether for agricultural, hydropower, or other uses. At different stages of glacial retreat, glacier recession and disappearance can either increase or decrease available water resources, as well as change sediment and nutrient loading and water quality of meltwater and runoff. The framing of glaciers as water resources itself is nuanced and requires translation of knowledge into effective policy (Fox and others, 2024).

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Climate Proxies: Retreating glaciers can be good climate indicators, especially as small glaciers can respond quickly to climate changes (e.g., Hinzmann and others, 2024). In addition, as glaciers melt more and lose their accumulation areas, we lose the unique climate records that they store (e.g., Kehrwald and others, 2008; Moser and others, 2024). However, as glaciers retreat, they can also expose unique climate proxies in the form of tree stumps, other plant materials, soils, and more (e.g., Menounos and others, 2008).

Biodiversity: Glaciers are unique ecological niches themselves, and they also contribute to cooler air and water temperatures and unique nutrient conditions downstream; changing the glacierized proportion of catchments therefore also changes downstream ecosystems in glacial streams (e.g., Sudlow and others, 2023; Tsuji and others, 2022). In addition, as glaciers vanish, some existing ecotones may expand and new ecosystems emerge (Bosson and others, 2023).

Archaeology: As glaciers shrink and vanish, they can uncover unique records of the human history. From people like Austria's 5,300-year-old Ötzi and other ancient mountaineers in the Alps, Himalayas, and Andes to arrows, spears, and other tools in Norway, Alaska, and Peru, vanishing ice can expose treasures, with glaciers' status leading archaeologists to search in particular areas (e.g., Baril, 2024; Caspari and others, 2023).

Cultural Value: The disappearance of glaciers leaves voids in culture and heritage, including recreation, tourism (both through last-chance tourism and loss or change of tourist attraction), landscape, identity, religion, and more (e.g., Altemus Cullen and others, 2025; Cruikshank, 2007; Huss and others, 2017; Jackson, 2015b; López-Moreno and others, 2025).

Communication and Advocacy: Glacier recession and disappearance can be an important tool in climate change communication and environmental advocacy. In public communication, glaciers are a highly visible and emotive demonstrations of climate change (NSIDC, 2002). In addition, the retreat and projected disappearance of glaciers (e.g., López-Moreno and others, 2025; UNESCO, 1970) can also be used as a call to collaborative climate action with regards to difference emissions scenarios (Howe and Boyer, 2025).

Hazards: As glaciers recede and vanish, they leave unstable terrain in their wake, increasing the potential for a variety of geohazards like landslides, floods, and detachments (e.g., Ding and others, 2021; Svennevig and others, 2024; Walden and others, 2025). Ironically, there are potential conflicts between glacier protection legislation and managing glacial hazards related to glacier retreat and disappearance (Anacona and others, 2018).

Legal Protections: Some glaciers are specially protected natural resources, and so the specifics of glacier definitions in the law can have great significance (Fernández and others, 2021). As of publication, Tajikistan (Republic of Tajikistan, 2024) and Argentina (Wetherbee, 2025) still retain the world's only glacier protection laws, which define monitoring requirements and limit industrial activity on or near glaciers; however, a respected Argentine glaciologist was indicted related to creation of the mandated national industry despite it being in compliance with international norms and standards (Fraser, 2017; Tollefson and Rodríguez Mega, 2017). Although glacier protection legislation was drafted and eventually rejected in Kyrgyzstan and many times in Chile (Anacona and others, 2018), Chilean glaciers are protected through broader environmental impact assessment processes (Rivera, 2022), and Swiss and Russian civil codes include their own forms of glacier protection via other environmental protections (Cox, 2016).

Clearly, there are many reasons to focus attention on vanishing glaciers, encouraging glaciologists and policymakers to characterize and identify that process and/or point of transition.

GLACIER DEFINITIONS

As befits fundamental questions in understanding landscapes and environmental processes, it is important to be clear about what constitutes a glacier. However, while defining a glacier might seem straightforward, there is a surprising amount of ambiguity. Cogley and others (2011) document a community-consensus definition of "a perennial mass of ice, and possibly firn and snow, originating on the land surface by the recrystallization of snow or other forms of solid precipitation and showing evidence of past or present flow." Flow, as defined by Cogley and others (2011), includes both internal deformation and basal sliding.

Clarke (1987) agrees with many glaciologists in stating that, "The most interesting property of glaciers is that they flow." However, the inclusion of past flow in Cogley and others' definition means that some features may retain their status as "glacier" even if they might not have it applied anew. Put another way, according to the Cogley and others (2011) definition, ice must start flowing to become a glacier, but it doesn't have to keep flowing to stay a glacier. Post and LaChapelle (1971) also pose the question in two directions: "When does a snowfield reach a sufficient size to become a glacier? Or, conversely, when does a retreating glacier cease to be one?" As glaciologists, they discuss both physical ice properties and evidence of current flow, while acknowledging that geomorphologists might point to evidence like moraines or glacial scratches/gouges in bedrock. This opens the door to evidence of past flow and ultimately contradictory definitions of a glacier. Practically, the definitions which include past flow can both allow glaciers to not lose their status as quickly and also potentially allow for a glacier to re-grow without needing to change its status, at the expense of not requiring what some glaciologists consider to be a fundamental characteristic.

Glacier Definitions in Practice

As in many cases, context matters in defining a glacier. Where theory meets the real world, practical, pragmatic, operational definitions of glaciers are required. In this section, I attempt to provide examples of widely applied methods of glacier definitions by glaciologists. Some of these criteria are objective, others are more subjective, and the application of applying particular criteria can be a nuanced decision. There is, however, a consistent thread of recognizing the importance of local knowledge and context and deferring to local glaciologists in determining what criteria to apply when identifying glaciers and/or declaring them vanished (e.g., Boyer and Howe, 2024; GLIMS Consortium, 2005).

Area

Many glacier inventories adopt an area-based threshold for glacier identification, as well as declaring glaciers as no-longer-glaciers. In addition to a minimum glacier area, size thresholds have been used to categorize glaciers: glacierets are smaller glaciers, typically defined as under 0.25 km^2 (Cogley and others, 2011; Ugalde and others, 2025), and "very small glaciers" are under 0.5 km^2 (Huss and Fischer, 2016), although this threshold is somewhat arbitrary and varies in usage (Fisher, 2018). While earlier glacier inventories used topographic maps and photography (UNESCO, 1970), modern minimum-area based glacier definitions are often a solution to operational issues raised by using digital satellite imagery in glacier inventories. The selection of a glacier area threshold balances both glaciological factors and technological limitations.

These minimum glacier areas range widely, from 0.1 km^2 (USGS, 2025) and 0.09 km^2 (Selkowitz and Forster, 2015) down to 0.005 km^2 (Huss and Fischer, 2016) and, in one instance, 0.001-0.1 km^2 (Ugalde and others, 2025), the lower thresholds sometimes applying additional criteria. By far, the most common area threshold for glacier identification is 0.01 km^2 (e.g., Barcaza and others, 2017; Baumann and others, 2021; He and Zhou, 2022; Linsbauer and others, 2021; Paul and others, 2023; Pelto, 2008; Pfeffer and others, 2014; Tielidze and others, 2022; Way and others, 2014), with many surveys referencing a set of community recommendations (Paul and others, 2009). Some surveys choose to use higher thresholds like 0.05 km^2 (Bevington and Menounos, 2022; Bolch and others, 2010) and 0.09 km^2 (Selkowitz and Forster, 2015) in order to reduce the inclusion of non-glaciers at the expense of excluding very small glaciers; the latter also included a requirement that the area of snow or ice be detected in over 80% of available imagery.

While present-day glacier area is usually determined using satellite imagery, in situ GPS measurements of glacier boundaries have also been used frequently in the past to track glacier change and recession. For example, Braun and Bezada (2013), building on a rich history of glacial fieldwork in Venezuela, used GPS to measure the Humboldt Glacier in 2009 and 2011, then Venezuela's last remaining glacier, before its demise was declared in 2024 (Howe and Boyer, 2025). In addition, some studies which aim to project glacier disappearance extrapolate to zero surface area (e.g., Hinzmann and others, 2024) and thus also zero thickness (e.g., Monty and others, In Review).

Relative Size. In addition to absolute area, some approaches use relative size to determine glacier disappearance. For example, Huss and Fischer (2016) "define the disappearance date of very small glaciers as the year in which their area is either <3% of their extent in 2010, or <0.005 km^2." Similarly, the Goodbye Glaciers Goodbye Glaciers Project (2025) provides outreach materials and defines glaciers as "mostly gone ... when either less than 10% of the glacier's 2020 volume or less than 0.01 km^3 is expected to remain - whichever threshold is crossed first."

Ice Flow and Thickness

Some definitions of glaciers require current movement to qualify as a glacier. A requirement of current ice flow would imply a glacier definition based upon measurable movement and/or some theoretical combination of minimum glacier thickness (e.g., 30 m for pure ice; Cuffey and Paterson, 2010) and surface slope. This also implies that the setting of an ice mass could determine whether it becomes and/or remains a glacier.

Using a theoretical basis, Fountain and others (2017) distinguished glaciers and perennial snowfields from each other by estimating the basal shear stress from topographic data. Using high-resolution satellite imagery, Zalazar and others (2020) distinguished glaciers from snowfields by identifying indicators of past or present flow. Arie and others (2025) used in situ observations of thickness and flow to determine that two previously identified perennial snow patches are actually glaciers in the Japanese Alps. In Iceland, Hannesdóttir and others (2020) used DEMs to identify flowing versus non-flowing ice, and in Chile remote sensing methods were also used to identify glaciers and rock glaciers as flowing (Falaschi and others, 2025), also implementing a minimum glacier area of 0.01 km^2. Hartz and Carlson (2020) also regressed thickness and glacier area to identify their higher minimum surface area threshold of 0.1 km^2. It is not uncommon to combine thickness and flow with area, with the USGS (2025) discussing surface area as a proxy for thickness and therefore flow. In Indonesia, the remaining ice on Puncak Jaya has been tracked both for thickness (Permana and others, 2019) as well as area (Ibel and others, 2025) to project its utility as a climate record, as well as its expected complete disappearance.

Conversely, depth and lack of ice flow were used to determine that Uganda's Mount Speke no longer hosts a glacier (Dieckman, 2025), and lack of flow was used to declare Germany's Southern Schneeferner as no longer a glacier (Bayerische Akademie der Wissenschaften, 2022). Direct observations of stagnation caused Yosemite National Park's Lyell Glacier to be downgraded in 2013, with its neighbor the Maclure Glacier still demonstrating movement by sliding but not deformation (Miller, 2013; National Park Service, 2013; Stock and Anderson, 2012).

Multiple Factors, Checklists, and Scorecards

While Pelto and Pelto (2025) summarized the demise of the Iceworm Glacier as insufficient to generate movement, multiple factors were identified as contributors, including thinning but also including crevasses and other melt features extending through to the glacier bed and an ice cave traversing the full length of the glacier. Increasingly, glaciologists are pointing to a convergence of direct observations and proxies to identify vanishing glaciers in a range of complex cryospheric environments.

The first of these was Leigh and others (2019), also partially applied by others (e.g., Andreassen and others, 2022), who used satellite imagery and sub-meter aerial orthoimagery to classify "certain," "probable," or "possible" glaciers using weighted criteria, including identifying crevasses, flow features/deformed stratification, multiple debris bands in ice, visible ice, a bergschrund, moraine, and/or unbroken snow accumulation with a possibly convex surface. Carlson and others (In Review) apply criteria from Leigh and others (2019) and terminology from the Global Glacier Casualty List ("disappeared," "almost disappeared," and "critically endangered"; Boyer and Howe, 2024) to update the status of some glaciers in Oregon, USA with a combination of fieldwork and satellite imagery. They emphasize presence and status of crevasses, ice fragmentation, the curve of the terminus (i.e., convex indicating flow and concave indicating wasting), significantly reduced area, the presence/lack of an accumulation area, and the glacier's accumulation area ratio (Carlson and others, In Review).

Similarly, Izagirre and others (2024) require a minimum number of 2 to 3 features demonstrating the demise of a glacier, including an absence of crevasses, melting processes leading to collapse, water incisions in the ice, disconnection of the accumulation area, no upper crevasses or separation from the headwall, debris cover, and fragmentation in relict ice bodies. (Note that glacier disconnection or segmentation does not necessitate glacier disappearance, as glaciers may also 'regenerate' from falling ice (e.g., Engen and others, 2024).) In applying these criteria, Izagirre and others (2024) identified eight ice masses in the Pyrenees as no longer classified as glaciers, and one more nearby glacier has also since been added to that list (Revuelto and others, 2025). Recently, Ugalde and others (2025) developed a schema to classify possible glacierets in Chile between 0.01 km^2 and 0.001 km^2 by using a decision tree based upon surface conditions and morphological context; glaciers were categorized as either extant, "presumably vanished," or "entirely vanished."

This transition from a glacier to a not-a-glacier can be messy. Thanks to varying topography, precipitation, melt, and other local characteristics, a glacier's vanishing looks different in each case. The approaches using multiple criteria (e.g., Izagirre and others, 2024; Leigh and others, 2019; Ugalde and others, 2025) are perhaps more accurate than others as they consider individual glaciers and reflect their varying local conditions. However, these multi-criteria approaches are also more time consuming and depend on data availability, which can limit their usage. In addition, while these schemas follow a consistent structure, they provide guidelines moreso than strict definitions and therefore still leave open some uncertainty. The application of particular criteria can also conform with different definitions of glaciers which require evidence of past and/or present flow. Interestingly, based upon the needs of different use cases, they take two opposite approaches of either accumulating evidence to identify a glacier as existing (Andreassen and others, 2022; Leigh and others, 2019) or identify a glacier as vanished (Izagirre and others, 2024; Ugalde and others, 2025).

IF NOT A GLACIER, THEN WHAT?

The identification of glaciers implies the existence of non-glaciers, and so it begs the question of what a glacier may be called once it is no longer a glacier but before its ice completely vanishes. So, if it is not a glacier, these are a few terms that might apply (acknowledging this is in an English language context and some terms may or may not align with and/or translate well to other language contexts):

Terms Including "Ice": Serrano and others (2011) discuss a glacier in Spain transitioning into an "ice patch" (of glacial origin) as it no longer flows under its own weight, as do Securo and others (2025) in the Dolomites; in theory, ice patches can become glaciers again under the right conditions. Note that the term "ice patch" has also been used in non-glacial contexts (e.g., Davesne and others, 2023). Similarly, Cogley and others (2011) allow for the use of the terms "ice body" or "ice mass," which are inclusive of both glacial (e.g., Way and others, 2014) and non-glacial ice (e.g., López-Moreno and others, 2025). In addition, ice aprons are, "very small ice bodies covering steep rock slopes" (Ravanel and others, 2023).

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Remnant: The terms "remnant," "glacier remnant," and "remnant glacier" have been used (e.g., Field, 1947; Rippin and others, 2020; UNESCO, 1970; Whalley, 2021) and continue to be used colloquially in cases of significant deglaciation. These terms explicitly address the glacial source of ice bodies; "glacier remnant" implies that the ice mass is no longer a glacier while "remnant glacier" implies that it still qualifies as a glacier.

Glacieret: While Cogley and others (2011) adopt an area-based definition of glacieret of a glacier typically under 0.25 km^2 with no marked flow pattern on the surface, the term has also been used to describe any small ice, or possibly snow, mass of indefinite shape (UNESCO, 1970). Both definitions require persistence for at least two consecutive years.

Terms Including "Snow": In the context of possibly not ever having been considered a glacier, various terms including "snow" are applied when asking if something is a glacier or not. Leigh and others (2019) apply the terms "snow" or "perennial snow" to those features not meeting sufficient glacial criteria. Similarly, Fountain and others (2017) and Zalazar and others (2020) apply the term "perennial snowfields," while Selkowitz and Forster (2015) prefer the adjective "persistent," and Securo and others (2025) prefer the term "snow patch." Conversely, Post and LaChapelle (1971) apply the term "marginal glacier" in cases where there is uncertainty about a glacier's status. Interestingly, the Cogley and others (2011) glossary includes the terms "snowfield" and "snowpatch" but does not include "ice patch"; this is consistent with a glacier definition that includes evidence of past flow rather than requiring current flow .

Dead / Stagnant Ice: These terms refer to "any part of a glacier that does not flow at a detectable rate," including ice-cored moraines (Cogley and others, 2011). "Dead" and "stagnant" are frequently also used to refer to former glaciers rather than glacier components. Indeed, the term "dead" calls to mind the funerals and memorials held to recognize glacier disappearance, as well as implicitly recognizing ecological grief (see next section).

Debris-Related Terms: Anderson and others (2018) identify a continuum in which climate warming can cause debris-covered glaciers to transform into (much shorter) rock glaciers. As with non-rock glaciers, Cogley and others (2011) define rock glaciers as demonstrating evidence of past or present flow and could therefore face questions like those asked in this paper about non-rock glaciers. However, under future conditions, for example only about 3% of glacierized areas (namely cold, high elevation, moderate precipitation zones) in the contiguous western United States will have potential for glacier to rock glacier transformation (Lute and others, 2024). The above-mentioned terms "ice mass" and "ice body" may also apply to ice-cored moraines. These peri- and post-glacial features, and identifying the extent of ice still present under debris, are important for understanding the post-glacial hazards, like landslides, that they may pose (Bernard and others, 2024).

RECOGNIZING VANISHING GLACIERS

There are a range of ways that both scientists and society more broadly are acknowledging vanishing glaciers. At the international level, glacier databases are now including former glaciers in their datasets (GLIMS Consortium, 2005), maps are literally having to be redrawn in response to glacier disappearance (e.g., Poll and Buricelli, 2022; Sigurðsson and others, 2017), and the Global Glacier Casualty List was started in 2024 to share stories of vanished glaciers in a dynamic, web-based format (Boyer and Howe, 2024). To communicate the threat to glaciers and their expected fates, Glacier Loss Day can be observed (for consistently well-observed glaciers) when glaciers transition to a net negative mass balance (Voordendag and others, 2023).

Increasingly, the emotional component of glacier loss, and climate change more broadly, is also being recognized. Albrecht and others (2007) articulate the concept of solastalgia as "the distress that is produced by environmental change impacting on people while they are directly connected to their home environment," in opposition to nostalgia, which is "melancholia or homesickness experienced by individuals when separated from a loved home." Relatedly, Cunsolo and Ellis (2018) define ecological grief as "emotional responses to climate change and the impacts of climate change," which may be in response to either current loss or anticipated future losses. When we mourn the death of glaciers, though, we aren't just thinking about water and nutrients; glaciers are also cherished parts of the environment and representative sentinels of anthropogenic climate change. In alignment with the desire to mourn glacier loss, people around the world have held glacier funerals and memorials in Iceland (2019), Switzerland (2019), Mexico (2019), the United

States (2020), Austria (2023), France (2023), and Nepal (2025) to mark and solemnize the disappearance of glaciers (BBC, 2019; Holson, 2019; Howe and Boyer, 2025; Milman, 2021; Mountain Wilderness, 2025; ORF, 2023).

DISCUSSION AND CONCLUSION

Small and vanishing glaciers provide interseasonal water storage which in turn reduces drought resilience, changes sediment and nutrient fluxes, can reduce water quality, opens new habitats while removing existing ecological niches, impacts recreational opportunities, threatens cultural connections to the cryosphere, and more. As communities are holding glacier funerals to mourn vanishing glaciers, glacier loss is inspiring the glaciology community to rethink its approach to glacier inventories. Paradoxically, due to glacier fragmentation, the number of very small glaciers is increasing as glaciers recede. Thus, conversations about the definition of a glacier and when it vanishes are more important than ever and are moving from the theoretical to the real.

There are a range of definitions of a glacier, considering various aspects of past and/or present flow, thickness, area, relative size, and more. These different definitions, and their application, embody an inherent tension and subjectivity in classifying glaciers which glaciologists have struggled with for many decades. Some glaciological terms may even have conflicting popular usage and also be terms of art (e.g., ice cap). Other terms, like ice patch or glacier remnant, may be more appropriate terms for former glaciers. In a very literal sense, a glacier vanishes only when all of its ice is gone, which would be a logical interpretation and application. Indeed, many studies projecting ice loss adopt this approach of total disappearance. However, that has not been the implementation of what observationally constitutes a vanished glacier. Similarly, in the sea-ice literature, an "ice-free Arctic" includes some remnants of summer sea ice (i.e., <1 million km^2; Jahn and others, 2024). Understanding that the glaciology community uses a variety of terms and methods to describe what happens as a glacier nears its demise, it is critical that we are careful and clear in the determination of glacier disappearance and how it is described.

In many academic disciplines which involve classification, there is a tension between lumpers and splitters; the former opting for merging into broader, inclusive categories and the latter advocating for recognition of specific, smaller categories. Glaciology is no different. Hooke (2019) articulates, however, that while glaciologists may attempt categorization, "the natural world persistently upsets these schemes by presenting us with particular items that fit neither in one such pigeonhole nor the next, but rather have characteristics of both, for continua are the rule rather than the exception. This is as true of glaciers as it is of other natural systems."

There are some areas where glaciers need to be considered in a glacier versus non-glacier binary, for example in some legal contexts. In addition, there are certain ecosystem services that glaciers provide that non-glaciers do not (e.g., erosion contributing to downstream nutrient fluxes). However, much as how glaciers typically earn their title after existing as snow and stationary ice before flowing, there are many other ways in which glaciers progressively disappear following a continuum of behavior, for example protected by climatic and/or topographic factors (Fisher, 2018); there may even be snow and ice there while no longer a glacier. The observation of glacier loss depends on the technology we use (e.g., Bernard and others, 2024). For example, as sensors like satellites and GNSS receivers have improved, so has our ability to observe glaciers in higher temporal and spatial resolution; with higher resolution comes a reduction in the minimum glacier size or flow speed that we can detect and therefore use before potentially determining a glacier's demise.

Different lenses also provide different outcomes. Indeed, Meier and Post (1995) write that, "A strict definition of 'glacier' is virtually impossible. ... Few scientists would call ... tiny ice patches 'glaciers,' yet they are hydrologically indistinguishable from glaciers in all characteristics but size and rate of flow." As a perfect illustration, Paul and others (2023) choose to include smaller ice patches in their inventory "as they can still be considered as a water resource." A similar decision might be equally valid for, for example, ecologists or archaeologists studying these cryospheric features. Zooming out, considering catchment-scale or regional averages may be more useful in some contexts than attempts at the individual glacier level.

While this paper is framed around defining vanishing glaciers, there is a problem with focusing only on the vanishing rather than the survival of glaciers. As Jackson (2015a) identifies, "a glacier-ruins narrative is understood as a narrative about glaciers that tends to overlook the existing state of a glacier and/or glacier systems and speaks instead to imagined states of loss." This, in turn, can possibly lead to increased solastalgia (Albrecht and others, 2007) and ecological grief (Cunsolo and Ellis, 2018). Projections of glacier ice loss (e.g., Rounce and others, 2023; Zekollari and others, 2025) walk an important line by acknowledging widespread glacier disappearance while crucially also identifying the importance of human agency in determining the extent of glacier loss and deglaciation.

Headlines of vanishing glaciers grab attention, but they can hide the important nuance behind how that determination has been made. Classification can be a useful tool, but at times it can also be somewhat subjective or arbitrary. Understanding the implications of defining a glacier in a particular way is critical before selecting how the decision is made. Some applications might even call for novel criteria because of a unique context (e.g., water resource evaluation and management in the Southern Andes; Schaffer and MacDonell, 2022). As discussed above, the global glaciology community tends to defer to the determinations of specific experts, especially local glaciologists.

As the UN Year of Glaciers' Preservation transitions to the UN Decade of Action for Cryospheric Sciences (UN General Assembly, 2024), it is important to recognize that society has some control over how many more glaciers vanish. In considering and discussing vanishing glaciers, it is important to understand the nuance in the creation and use of definitions of glaciers. We, as a glacier-interested community, must continue to reflect on how best language can communicate the research we aim to share, keeping in mind audiences which range from other glaciologists to politicians, resource managers, decision-makers, interested public, the media, and more. Ultimately, the reason that we ask whether something is a glacier should determine which definitions, methods, and terminology are applied, because while glaciers are receding, the consequences of their loss will be felt around the globe.

So, when is a glacier no longer a glacier? Ultimately, the answer to that question depends on who is asking and why.

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Note: See question to Editor about formatting in IGS style.

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