

We thank the reviewers for their detailed, thoughtful and constructive comments. Their feedback led to substantial revisions that have significantly strengthened the manuscript. Beyond addressing individual comments, we used the reviews as an opportunity to reconsider the overall framing, scope, and contribution of the paper. As a result, the revised manuscript is more clearly positioned as a scoping review and is grounded more firmly in the broader science communication, risk communication, and disaster risk reduction literature. The manuscript now also more clearly articulates its original contribution: examining how established communication principles are reflected in the quiescence-focused volcanic literature while identifying the volcano-specific communication challenges and research needs associated with volcanic quiescence. The revised manuscript highlights the limited empirical evaluation of many quiescent-volcano communication approaches. The revised manuscript also more clearly explains why communication during volcanic quiescence represents a distinct preparedness challenge rather than simply a quieter phase of crisis communication.

We also substantially expanded and reorganized the discussion throughout the manuscript to implement this revised framing. The reviewed studies are now synthesized and interpreted within the broader literature on science communication, risk communication, and disaster risk reduction, clarifying both where communication during volcanic quiescence reflects established communication principles and where volcanic systems present distinctive communication challenges that require additional volcano-specific research and evaluation. We strengthened the methodological framing by more clearly defining the review as a scoping review, introducing overarching research aims, and expanding the discussion of the review's limitations so that the scope and boundaries of the reviewed literature are more clearly stated. Throughout the manuscript, we also revised the language to distinguish carefully between findings supported by the studies captured in this review and conclusions drawn from the broader hazard communication literature. The discussion is now reorganized around audience-specific communication needs and pays greater attention to geographic, cultural, and governance context. We also improved the organization and readability of the manuscript by adding summary tables to the main text and strengthening the practical implications presented in the Conclusions.

Below, we respond to each reviewer comment individually.

Response to Reviewer 1

1. The abstract is clear, although it could be improved by stating the number of studies reviewed.
 - 1.1. Thank you for this suggestion. We revised the Abstract to state that the review identified 76 articles, which were grouped into three categories: formal educational materials, informal education approaches, and communication tools (Line 10).
2. Figures 1 and 2 should be enlarged, and a larger font size should be used for all text in order to improve readability.
 - 2.1. We revised Figures 1 and 2 to improve readability by increasing their size and enlarging the figure text where possible.
3. I strongly suggest adding summary reference tables to the main text for all three results subsections — **Formal Education, Approaches, and Tools**. These tables should include the studies cited by number in the text, together with their corresponding references. At present, the reader must repeatedly consult the supplementary Excel file to identify the papers behind the numbered citations, which reduces readability and traceability. Including these tables in the manuscript would greatly improve clarity and make the synthesis more accessible.
 - 3.1. We agree that summary tables in the main text improve readability and traceability. We added three summary tables for the Formal Education, Approaches, and Tools sections (Tables 1-3). Each table lists the citation, study area, communication approach or tool, whether the study included evaluation, and the principal recommendation or implication.
4. The Conclusions could be strengthened by providing a clearer original contribution from the authors. In particular, the manuscript would benefit from indicating which of the strategies identified in the scoping review may be most effective for communication efforts directed or undertaken by different stakeholder groups, including scientists, educators, communicators, and decision-makers. The paper would also benefit from clarifying how these stakeholders may themselves function as key actors within the various communication approaches discussed. This would enhance both the interpretative depth and the practical relevance of the study.
 - 4.1. We substantially revised the Conclusion to better articulate the original contribution and practical implications of the review. We added new text describing how educators, scientists, observatories, emergency managers, and decision-makers can support communication during volcanic quiescence. We also strengthened the overall conclusions by identifying common themes across the reviewed studies, relating these to broader science communication, risk communication, and disaster risk reduction literature, and highlighting the distinct communication challenges during volcanic quiescence. These revisions clarify both the review's original contribution and its practical relevance while remaining consistent with the scope of the available evidence.

Response to Reviewer 2

Choice and design of literature review

These comments all concern the framing and scope of the review. We addressed them through a comprehensive revision of the Methods and corresponding revisions throughout the manuscript.

1. While the authors state this is a scoping review, they present the results as if they represent a systematic review and are a complete picture of the literature. This is misleading, as the breadth of the search terms used means critical research and research studies is being missed within each of the topics. A scoping review is acceptable, but the authors must be more transparent about the limitations of such a review and that the literature they summarise may thus have overlooked critical studies.
 - 1.1. We revised the manuscript to consistently frame the study as a scoping review rather than a systematic or exhaustive synthesis. The Methods now define the scoping review approach, explain why it is appropriate for this topic, and clarify the limitations of the search strategy and resulting literature. Throughout the manuscript, we also revised the language to distinguish findings from the reviewed studies from conclusions drawn from the broader literature.
2. I would thus recommend the authors consult a paper such as Grant et al (2009) 'A typology of reviews' *Health Information and Libraries Journal*, 26, pp.91–108, and become more familiar with the different review types. Be transparent that as this is a scoping review it is a 'preliminary assessment of the literature', but is not a synthesis of research evidence (systematic review), nor does it critically evaluate its quality (critical review), etc.
 - 2.1. We incorporated Grant and Booth (2009) into the Methods to clarify the characteristics of a scoping review and distinguish it from other review types.
3. The authors then, like any research method chosen, need to a) justify why they have chosen a scoping review over other methodologies, and b) what specific research questions they seek to answer with that review. Currently there are some overall broad reasons provided for the search, but no clearly articulated research questions. These are critical to ensure a well-designed set of search terms.
 - 3.1. We revised the Methods to justify the use of a scoping review and to introduce the research questions that guided the review. These questions define the scope of the review and informed the development of the search strategy.
4. The authors must ensure that the article does not state 'synthesise' or 'systematic' when this is a scoping assessment. To do otherwise is misleading.
 - 4.1. We revised the manuscript throughout to avoid describing the review as systematic or exhaustive. The only remaining use of the word "systematic" refer to the name of Covidence systematic review software. We hope this clarifies any confusion about our original use of the word systematic, as Grant and Booth (2009) note that scoping reviews "share several characteristics of the systematic review in attempting to be systematic, transparent and replicable" (p. 101). We reduced the use of the word "synthensize" but respectfully disagree that this word is misleading. As Grant and Booth (2009) note, synthesis does happen in scoping reviews, just often in a tabular form and with narrative commentary (p. 95, Table 1).

5. If the authors feel that this is truly a systematic review, then I fear it has been poorly conducted, as the breadth of findings and the lack of depth within these topics (i.e., the missing of critical literature), suggests the search terms used were too broad and/or the exclusion criteria too strict to be a truly systematic review.

5.1. We agree and have consistently reframed the manuscript as a scoping review. The revised Methods explicitly distinguish this review from a systematic review and clarify that its purpose is to map the quiescence-focused literature captured by our search strategy, rather than provide an exhaustive synthesis of volcanic hazard communication research.

Analysis and interpretation of review findings

These comments concern the interpretation of the reviewed literature and its relationship to the broader science communication, risk communication, and disaster risk reduction literature. We addressed them by substantially expanding the discussion throughout the manuscript and clarifying the review's original contribution.

1. Unfortunately, the authors skim over the many important topics, but report their findings from these topics as exhaustive and fully inclusive. These findings must be rewritten to be much more transparent and clearer that they represent the **articles found in your preliminary scoping review** and do not represent a full assessment of literature on these sub-topics.
 - 1.1. We revised the Results and Discussion to make clear that the findings represent the studies captured by this scoping review rather than an exhaustive assessment of each topic. We strengthened the discussion of the review's limitations, consistently distinguished findings from the reviewed studies from findings in the broader literature, and added additional context where the reviewed studies captured only a small part of a much larger body of research, such as uncertainty communication.
2. To strengthen the review, I would recommend the authors include a discussion section where they critically review the findings for each of the three topics (formal education, approaches, tools), by conducting secondary mini reviews on those specific topics (and themes within) to ensure they are capturing the leading research in this space.
 - 2.1. We did not conduct separate secondary reviews because this would extend beyond the scope of the present scoping review. Instead, we substantially expanded the discussion throughout the Results by interpreting the reviewed studies within the broader science communication, risk communication, disaster risk reduction literature. This approach strengthens the interpretation while maintaining the scope of the review.
3. Currently, the article adds no new findings or novel insights and is rather a descriptive review. The findings about accessible language, participatory strategies, and trust through two-way communication, are not novel. At best the authors have identified their priority within a quiescent period, however this is well known from other communication best practice literature. A preliminary search on risk or science communication of natural hazards more broadly would have found numerous seminal articles in the DRR community not included in this review.

- 3.1. We agree that these communication principles are well established and revised the manuscript to make this explicit. The Introduction now situates the review within the broader science communication, risk communication, and disaster risk reduction literature. We also clarified that the manuscript's original contribution is not identifying new communication principles but examining how established principles are reflected in the quiescence-focused volcanic literature and identifying where volcano-specific evidence remains limited.
4. This latter point arises because while it's logical to refine the first search to volcanology, it's vital to then analyse your findings from the scoping review within the broader risk and science communication literature, and across the natural hazards sphere. This will then enable the authors to extract specific new findings and conclusions that are novel for volcanology. Currently, the authors overlook such important topics as citizen science, the science-to-society movement, the problematic knowledge deficit approaches critiqued in risk communication, etc.
 - 4.1. We agree and expanded the manuscript to include broader discussion of topics highlighted by the reviewer, including participatory communication, the deficit model, citizen science, trust, uncertainty communication, and science-to-society approaches where relevant. These additions strengthen the broader communication context and help distinguish established communication principles from the volcano-specific findings of the review.
5. To summarise, this paper would be greatly improved if this discussion section placed the volcanological approaches within the broader evolution of science and risk communication, from an older focus on dissemination to a more modern focus on participatory approaches, and included a more nuance discussion of how volcanology compares to the known best practice in this field – see the literature cited below for more. This would help support the authors to identify novel insights.
 - 5.1. We appreciate the reviewer's suggested literature and incorporated it throughout the revised manuscript. These additions strengthen how volcanic hazard communication during quiescence aligns with, and differs from, the broader evolution of science and risk communication best practices.

Presentation of found literature

1. Currently this is buried in a supplementary table, with numbered # references in the text that reference the table. This is not appropriate, and each paper needs to be cited in the paper itself and appear in the bibliography/reference list.
 - 1.1. We moved the reviewed-study information from the supplementary spreadsheet into the main text by adding summary tables for the Formal Education, Approaches, and Tools categories (Tables 1-3). We also added the reviewed papers to the manuscript reference list.
2. I would recommend the use of more tables within, including: a summary table of which papers sit within each theme, countries of origin of lead author, countries of case study areas (as appropriate) etc. Reviewing past literature reviews will help the authors identify suitable tables. The authors have much of this information in their supplementary excel file, but need to summarise some of this within the paper itself.
 - 2.1. The new summary tables provide key information from the supplementary spreadsheet, including citation, study area or case-study location, communication

or education tool/approach, evaluation status, and principal recommendations. These additions improve readability and allow readers to compare the reviewed studies without relying on the supplementary file.

Clarity around audience

1. It is currently very unclear which audience the authors are considering when they discuss communication and education. Best practice communication and education approaches vary considerably between audiences: from school children, to the public, to stakeholders and decision-makers, to communities as a whole. Yet at times the authors seem to flit between these, or lump them together. I would recommend clarifying clearly which audience, and then being very clear in your findings which audience you are considering. This could be supported by a summary table from the papers' metadata that matches the tool / approach to the audience.
 1. We revised the manuscript to distinguish more clearly between audiences and to specify when findings apply to particular groups rather than to communication more generally. The Methods now identifies audiences as an explicit focus of the review. The Results are organized to distinguish audience-specific findings (e.g., formal education settings, tourists, Indigenous communities, and community networks) from communication tools that may be adapted for multiple audiences. Throughout the manuscript, we also emphasize that communication strategies should be adapted to audience needs, accessibility, trust, decision context, and cultural and geographic setting.

More recognition of the nuance of space and place

1. The influence of cultural and geographic, as well as historic, contexts is very lightly reviewed in this paper. However, an article that considers public education in the pacific islands cannot be compared directly to that developed for communities within the USA at Mt Rainier, or Italy, or Nevado del Ruiz. People's connection to the land, their experience of government, their experience of past volcanic activity, their culture, etc., all impact the design of the education and communication programs within those papers. Hence, they cannot be reviewed collectively unless these factors are acknowledged more clearly and transparently.
 - 1.1. We revised the manuscript to more clearly acknowledge that volcanic hazard communication is shaped by cultural, geographic, historical, and governance contexts and that communication strategies should not be transferred across settings without adaptation. Throughout the revised Results, we now distinguish more carefully between communication approaches developed for a specific setting and broader communication principles. We also strengthened the discussion of place-based education, Indigenous communities, and geographic variability. We emphasize in the Conclusion that communication strategies must be adapted to audience, place, trust relationships, and decision context.
2. This also highlights the importance of including a summary table that maps communication approach to study / cultural context, so we can get a sense of the actual coverage of this review. Then when referencing a cluster of papers within the discussion of a topic, be clearer which geographic context those papers come from.

- 2.1. We added summary tables to the main text that identify the study area or case-study location for each reviewed paper, making the geographic coverage of the review more transparent. We also revised the Results to more consistently identify the geographic and cultural context of the reviewed studies being discussed and to highlight the uneven geographic coverage of the literature captured by this review.

Misrepresenting the extent of literature on key topics

These comments all concern ensuring that the manuscript accurately represents the scope of the reviewed literature and distinguishes it from the broader communication literature. We addressed them through revisions throughout the manuscript.

1. This is the most concerning flaw in this review. The authors have alighted on certain topics, covered them narrowly via the papers that exist in their review collection, and then made claims that that is the extent of the literature on that topic. This misrepresents literature and is poor review technique.
 - 1.1. We revised the manuscript to make clear that the findings represent the studies captured by this scoping review rather than the full extent of literature on each topic. We strengthened the discussion of the review's limitations consistently distinguishing findings from the reviewed studies from the broader literature, and expanded discussion where the reviewed studies captured only a small part of the much larger body of research, such as uncertainty communication.
2. Examples include their discussion on uncertainty (line 220) and probabilistic language, and "little work addresses this specific to volcanic contexts". This is misleading, as many authors have explored this topic within volcanology and across natural hazards, which can easily be found by scopus or google scholar. Authors should refrain from such sweeping statements if they have not conducted a secondary search to check. Its absence from your review articles, does not mean it doesn't exist. A secondary search should include a review of literature that cites your key review articles, and the articles they themselves cite.
 - 2.1. We agree and revised the manuscript to avoid implying that topics not well represented in the reviewed studies are absent from volcanology or the broader natural hazards literature. The discussion now explicitly distinguishes gaps within the reviewed studies from gaps in the broader literature, and places topics such as uncertainty communication within their wider research context.
3. Similarly, I would recommend the authors remove the paragraph on communicating uncertainty if they will not cover this topic more thoroughly. They have included unsupported statements about how people think over time (and misrepresent the complexity of this issue, including issues such as time discounting), and have several broad unsupported throw away statements that a further literature search would have found to be unsubstantiated.
 - 3.1. Rather than removing the section, we substantially revised it to avoid unsupported or overly broad statements. The revised discussion now places the reviewed studies within the broader literature on uncertainty communication, while making clear that the limited representation of this topic reflects the scope

of the reviewed studies, rather than the broader volcanology literature. We would be happy to make additional edits if the reviewer still feels that this section is underdeveloped.

4. The authors should also check the broader leading literature on topics such as trust and co-development, across natural hazards, to contextualise their discussions of this topic.
 - 4.1. We expanded the manuscript to better contextualize trust, participation, and co-development within broader science communication, risk communication, natural hazards, and disaster risk reduction literature. These additions strengthen the interpretation of the reviewed studies and distinguish broader communication principles from volcano-specific findings.
5. The authors should carefully reframe sentences throughout to be clear the lessons are relative to the studies they reviewed, not the literature/discipline as a whole. E.g., line 177: “For indigenous populations, studies focus” should be reframed as “our reviewed studies focus...”, etc.
 - 5.1. We revised the language throughout the manuscript to conclusions are explicitly attributed to the studies captured by this scoping review, rather than the literature or discipline as a whole.