

We thank all of the reviewers and editor for carefully reading our manuscript and taking time to make some useful comments to help improve our work. We believe that we have addressed all of the comments to the best of our ability and we hope that you all, and the audience of Geoscience Communication will find this research useful and a good contribution to the subject of the science-policy interface. With these updates we have made changes to the presentation and description of our main findings and recommendations to make it easier for the reader to get the main summaries, and we have clarified in more detail the methodology. We hope that you enjoy reading the new version of this manuscript.

Reviewer 1

Expanding the use of scientific knowledge in decision making processes is critical, especially in the case of policy initiatives and legislation. The integration of paleoclimate research into these processes is a key knowledge asset especially for crafting policies and initiatives for climate mitigation and adaptation strategies. This manuscript is a valuable addition to science-policy communication literature in its perspective on the integration of paleoclimate research and data into policy decision making, and the exploration of the existing barriers and opportunities for this integration.

We thank the reviewer for taking the time to read our manuscript, and for the positive and constructive comments made to help us improve our study.

In sections 3 and 4, the authors mention how decision makers use grey literature from governmental and non-governmental organizations to inform their decision making. Other literature has discussed this trend in the use of non-peer reviewed scholarly publications by policymakers. The authors might consider adding some background information to the manuscript to show that these trends from their survey results align with prior research. Here are some references that may provide some insight for this discussion:

Lawrence, A., Houghton, J., Thomas, J., and Weldon, P., 2014, Where is the evidence: realising the value of grey literature for public policy and practice, Swinburne Institute for Social Research, Melbourne, Australia. Retrieved from <http://apo.org.au/research/where-evidence-realising-value-grey-literature-public-policy-and-practice>

MacDonald, B. H., Ross, J. D., Soomai, S. S., and Wells, P. G., 2015, How information in grey literature informs policy and decision-making: A perspective on the need to understand the processes. *The Grey Journal*, 11:1, 7-16.

We agree with the reviewer that adding in more context into the discussion would be a useful addition to this manuscript. We also thank the reviewers for providing us with these references and we have added these in.

In Section 2 (Methods), the authors mention that the requirements for decision makers were that they “worked on some aspect of climate within their team”. Did the decision makers specify which aspects of climate they worked on? If so, it might be useful for the non-climate scientist audience to understand the breadth of climate-related expertise of the decision makers. Same goes for the paleoclimate researchers (“they have research expertise on some aspect of palaeoclimate”).

We thank the reviewer for this comment, and we think this would make a nice addition. Whilst neither group of participants were asked about their specific areas of work, a

few participants mentioned their background, and therefore we have added these examples.

The authors discuss policy training as a potential opportunity for academics. In the UK, do academic fellowships in policy making governmental agencies exist? If these opportunities do exist in the UK, it may be good to include this information as part of Section 4.3.3.

We agree with the reviewer that this is a good idea, and we have added a link to the discussion where both academics and decision makers can find opportunities for secondments and exchange partnerships in the UK. (line 489)

The authors acknowledge potential bias from their positionality when doing the qualitative coding. Given the advancements in technology, especially with respect to artificial intelligence, it may be useful to consider comparing the results from qualitative coding of the transcripts from a large language model to that of the authors to see if there are significant differences in the coding results. This may be outside the scope of this manuscript; however, it could be mentioned as a way to help identify and potentially minimize positionality bias in the interpretation and analysis of the data.

We thank the reviewer for this suggestion. This was discussed as an option for this study. However, once we had reviewed the transcripts it was clear that there was some personal details and information about specific projects that could have been related back to the interviewees. Therefore, we decided to do this ourselves manually to ensure that there was no breach in data confidentiality. However, we will note this for future work.

L46: When palaeoclimate evidence is not considered, our understanding of climate variability is constrained to only the last ~150 years, a period that captures neither the full range of natural variability nor the frequency of rare but high impact climate events which may lead to.

Thank you for noticing this – we have updated the sentence.

L134: Building on the broader literature on science-policy barriers and facilitators outlined above, recent investigations into the barriers and facilitators of palaeo science in general (Allen et al., 2025), and palaeoecology specifically (Siggery et al., 2023)

We thank the reviewer for noticing our mistake and we have finished the sentence.

Reviewer 2 Comments:

The aim of the paper is to examine why palaeoclimate data is underutilised by UK decision makers. The authors interviewed policymakers and advisors to identify potential barriers to the uptake of this information. They acknowledge that they faced challenges in carrying out their interviews due to somewhat low response rates to their emails, possibly due to the interviewees perceptions that they could not contribute knowledge. The paper is well organised and is overall a valuable contribution to this field of study.

We thank the reviewer for these positive comments, and we are pleased that they think this manuscript is a valuable contribution to the field.

Abstract: Lines 13-14 – I don't think net zero policies are a good example of how humans are framing adaptation strategies. Net zero more often is part of the discussion around mitigation rather than adaptation.

We agree with the reviewer that the example used may not have been appropriate and will have revised the abstract to remove the reference to Net Zero policies and will replace it with a more appropriate focus on adaptation, resilience, and risk management policies. (line 12)

Introduction: I agree with community comment CC1 that the introduction could benefit from shortening or at least breaking up into sections.

Thanks, we have removed the suggested sections reported by CC1.

Findings: Whilst the authors discuss how response rates were low; I couldn't see in the methods or the findings exactly how many people responded to their interview requests. Perhaps I missed something obvious, but it would be nice to see it mentioned in the outset of the findings.

We thank the reviewer for bringing this to our attention that it is not clear on how many people responded to our interview requests. We have added an additional sentence towards the end of the methods to mention that all the email responses led to an interview taking place. We have also added a reminder of the number of interviews in the opening of the findings. (Lines 163 and 201)

Discussions: Figure 2 is an incredibly useful figure. I was somewhat surprised that scientific journal articles ranked lower than government websites. I wonder if the arrows could be reduced to just one that says "Relevance and Reliability" given that they are both pointing in the same direction.

We agree with the reviewer that our results were surprising as coming from an academic background we had assumed that journal articles would have been much

higher. We thank the reviewer for the suggestion about having only one arrow – we think this makes a lot of sense and have made the suggested change.

Line 441 – the authors refer to there being “several barriers that limit the effective transfer of knowledge...” It would be nice if they could summarise them or give examples of the kind of barriers that exist.

We have added to that sentence to provide an example and reiterate that we are talking about the barriers already identified during the discussion in the article.

Conclusions: Under study reflections the authors discuss potential further work. I would add to this that it would be interesting to hear from decision makers in other countries. I'd be especially keen to see if these views are held by European decision makers given that UK decision makers often obtain their funding from European sources.

We think this is an excellent idea and have add this into the conclusion. (line 547)

Page 6, line 140: delete “this” from “To our knowledge this there...”

Done.

Reviewer 3 / Community Reviewer

This paper is a wonderful piece of work that helps to understand a context-specific science-policy gap. It is extremely valuable to have research like this supplying actionable recommendations that actors within these science-policy forums can implement. While this manuscript has a palaeoclimate focus, its findings are also relevant to non-palaeo science that is also utilised in decision-making processes. The manuscript is about barriers and facilitators, however, there are actionable recommendations as well, which I believe address a knowledge gap in the academic science-policy space. It would be great to see these brought to the forefront of the manuscript so they are more accessible to readers and interested parties in this space. I have made some suggestions for the sections below in the hope that they are of use to the authors. I congratulate the work they have undertaken, and the time to analyse transcripts. Well done, and I look forward to seeing this manuscript in its final form.

We thank the reviewer for taking the time to read our manuscript and providing positive and constructive comments to help us improve it.

1. Introduction - Is very long and could be shortened considerably (consider removing paragraphs from sections ~100-130). This would help the key aims of the manuscript come through. A lot of the introduction could be moved to the discussion, and while Figure 1 was great, I think it would be more interesting if it were the barriers and facilitators identified by the semi-structured interviews in this manuscript.

We agree with the reviewer that the introduction is very long and thank them for the suggestion of where to remove some text. We have followed their suggestion. Whilst we think it would have been a great idea to remove Figure 1 and create a figure similar in the discussion based on our results, we believe that this would create too much repetition to what has already been discussed. Therefore, we have removed Figure 1 from the manuscript.

2. Methods - Consider having definitions for the main themes (Evidence, Context, Temporal Resolution). This would be super helpful to have upfront in the methods to refer back to when reading the Findings.

We thank the reviewer for this suggestion. We have added our definitions for these three themes in the methods. (Lines 186)

3. Findings - Consider having a graph of some of the Findings. I totally understand that the small sample size means that it isn't as easy to translate it into a bar graph with the frequency of times forums were mentioned (e.g. IPCC, WMO), but maybe a table that has all the documents that are utilised by DPs could be helpful to visually see what DPs are interested in, rather than having to read into the Findings to get those answers.

We thank the reviewer for this suggestion. We think this is a good idea and have add in a figure into the findings on the main sources of evidence used (updated Figure 1). However, based on the transcripts we had decided it is best to categorise into groups rather than absolute counts of single organisations as single organisations may only be mentioned once amongst the decision makers. Nevertheless, we have produces a summary figure to help highlight the evidence sources in response to this comment (Figure 1)

It would also be useful to know how many PS were of similar or different palaeo themes (e.g. tree rings, corals, sediments, etc) or were they all the same? Again, understand that this may not be possible if it breaks ethics by potentially making participants identifiable. But if all PS were speaking in respect to 1 or 2 specific palaeo sources, then it could be worth noting in the bias section of the Methods. Similarly, putting your Figure 1 from the introduction, but making it from your results and putting it in the Findings would be super helpful and interesting too be able to see it all in one place. My last suggestion would be to have a table summary of your recommendations in this section - again to make the results easy to find.

In response to this comment and the comment of Reviewer 1, we have added in the areas of palaeoclimate that the scientists worked in. However, this was not a direct question in the interviews, but there were a few from both interview groups that mentioned what their areas of work.

4. Discussion - Para 335 "...Public funding can also be seen as a safeguard against perceived biases in evidence produced or commissioned by organisations with explicit advocacy roles or particular policy agendas..." This sentence either needs a Reference or to be rephrased to say that it's a perspective coming from the DM.

We thank the reviewer for bringing this to our attention, we have rephrase this sentence.

-Para 370 "...In addition, as touched upon above, the source of much of this..." Get rid of "In addition" OR "as touched upon above" it doesn't need both.

Done.

It would be great to have a table or figure with the actionable recommendations clearly accessible. Further down, it is discussed that the recommendations are for the PS. Maybe I missed it, but there doesn't appear to be any mention as to why the recommendations are only for PS, and whether they are for PS individuals or for the institutions that they're working for? It is fantastic that this manuscript discusses both barriers and recommendations, but it needs to be clear that the barriers are from PS and DM perspectives, but the recommendations are only for PS.

We thank the reviewer for this constructive suggestion. We agree that presenting the actionable recommendations in a dedicated table will improve their accessibility and clarity, and we have added Table 1 into the manuscript.

Regarding the scope of the recommendations, we acknowledge that this was not made sufficiently explicit in the original version. Although barriers were identified from both palaeoclimate scientist and decision maker perspectives, the interview data yielded concrete, evidence-based recommendations primarily directed towards palaeoclimate scientists. While recommendations for decision makers would be valuable, developing these would go beyond what can be robustly supported by the data collected in this study. We have clarified this in the revised manuscript that the

recommendations are intended for palaeoclimate scientists and that the absence of parallel recommendations for decision makers reflects the evidential scope of the interviews rather than their lack of importance.

5. Conclusion - Para 545 "... the use of palaeoclimate in the IPCC was considered an facilitator..." Do you mean a facilitator not an?

Done.

Para 550 - "...actionable recommendations..." Make sure that it is clear for whom the recommendations for. Bring that to the forefront and maybe foreshadow even in the introduction that you're talking about PS here, rather than recommendations for DMs. We agree with the reviewer that this should have been made clearer throughout the manuscript that these are recommendations for palaeoclimate scientists rather than decision makers. We have now emphasised this throughout added some more detail in the abstract and introduction.