Responses to Reviewer 3 (EGUSPHERE-2025-475):

RC1	
3.01	**Reviewer comment**
	The paper addresses relevant scientific questions within the scope of NHESS, contributing to the understanding of natural hazards and their societal impacts. It presents new data and novel insights, with methodologies that align with international standards. The methods and assumptions are valid, but the description should be improved to ensure greater transparency in the research process. The results are sufficient to support the research questions, and significant insights are drawn from the analysis. While the study provides an explanation of the data, methods, and results, the clarity could be improved to enhance the reproducibility of the research for fellow scientists.
	Author response
	Thank you for this valuable comment. We want to highlight here that all our comments refer to the preprint version of our paper. All changes are added to this document. We will address these points in the context of more specific comments regarding these issues (made above, by the other two reviewers, and below, by this reviewer).

3.02	**Reviewer comment**
	The title and abstract are well-aligned with the content of the paper, providing concise and accessible summaries of the research. The paper is well-structured, with quality figures. Overall, the presentation is clear, the technical language is precise, and the English is fluent and easy to understand for a diverse audience.
	Author response
	We appreciate the overall positive reception of our manuscript.

3.03	**Reviewer comment**
	The author's contributions are clearly outlined, however, the credit to prior work is insufficient. While the references are appropriate and accessible, greater acknowledgment of related research would strengthen the scientific merit of the paper. There are several claims regarding the past, current, and future status of the study area that are not supported by references. It is recommended to either provide appropriate sources for these claims (e.g., scientific literature, policy documents, local reports) or clearly describe in the Methods section how this information was obtained.
	Author response
	Thank you for bringing this to our attention. We will add some more literature on critical water management (Hüesker, Moss, Naumann 2012), multilevel water governance (Moss and Newig 2010), and contested areas of water use in the region (Thierauf et al 2024) in line 54 as part of the introduction. We will include a reference to the website of the citizen initiative for the paragraph starting line 43.

3.04	**Reviewer comment**
	The study results do not clearly distinguish between findings based on perceptions of current conditions and those concerning future expectations. It is recommended to clarify this distinction to improve the readability and interpretation of the results.
	Author response
	Thank you for this comment. We will address this issue in the further specific comments as in comments 3.14, 3.17, 3.18 and 3.19.

3.05	**Reviewer comment**
	The title refers to 'socionatural hazards,' whereas the term 'social-ecological hazards' is used in the Abstract section. To improve clarity and coherence, it would be helpful to clarify whether these terms are intended to be synonymous and ensure consistent use of terminology throughout the text.
	Author response
	Thank you for noticing the use of the two different terms. We will improve the clarity and coherence by opting to change the abstract to more clearly define the focus on socionatural hazards. We will update the abstract in the way foreseen in comment 3.07.

3.06	**Reviewer comment**
	In the Abstract section the sentences: “The interaction of social-ecological structures with these perceptions was analyzed, as well as the willingness to act, both individually and collectively, to address the challenges.” and “This understanding is based on perceptions of social-ecological hazards and the complexity of perceived responsibilities and willingness to contribute to managing risks.” provide overlapping information. I recommend to streamline or combine these sentences to avoid redundancy and improve clarity.
	Author response
	Good point. We agree and will leave the first sentence as is and delete the second one. The sentence after the deleted one (line 27/28) will then start with “This expanded understanding of lake level loss as a socionatural hazard therefore allows our analysis to shed more light on its practical implications…”.

3.07	**Reviewer comment**
	The Abstract should mention all four research questions: (1) perceptions of social-ecological change, (2) the social structures that interact with these perceptions, (3) willingness to act and perceptions of responsibility, and (4) local practices for dealing with the challenges. However, only the first three appear to be addressed in the Abstract. It is recommended to

	include the fourth research question to ensure completeness and alignment with the study's stated aims.
	Author response
	Thank you for this suggestion. We will update the abstract to include the four research questions as follows, also considering the other reviewer comments: "Groß Glienicker Lake and Sacrower Lake are two lakes in the Berlin-Brandenburg region that are facing significant challenges due to declining water levels associated with climate change. A mixed-method approach was employed, incorporating ethnographic research methods, a household survey and stakeholder workshops, in order to elicit perceptions on socionatural changes and challenges and address research questions pertaining to (1) perceptions of socionatural change, (2) social structures that interact with these perceptions, (3) willingness to act and perceptions of responsibility, and (4) local practices for dealing with the challenges. The analysis reveals that the hazard of lake level loss offers a prism through which diffracted socionatural challenges become visible, thus facilitating an understanding of social processes that shape the definition of the hazard beyond ecological aspects and the path forward in governing risks adaptively. This expanded understanding of lake level loss as a socionatural hazard therefore allows our analysis to shed more light on its practical implications in that focusing on purely technical solutions to maintaining or raising the water levels fails to orchestrate solutions to the social-ecological hazards."

3.08	**Reviewer comment**
	Page 2, lines 43 and 49: I recommended to provide references to support these claims, such as newspapers articles, or press releases, or other relevant sources.
	Author response
	Thanks for the comment. There are different ways of describing ethnographically, since you interact with people on a daily basis, you refer to their actions and descriptions of past events. We included a reference to the website of the citizen initiative for the paragraph starting line 43. We will also include references to newspaper articles where possible.

3.09	**Reviewer comment**
	Page 4, line 102: I recommended to replace 'shared' with 'public,' 'collective,' or 'communal' to enhance clarity and better reflect the social dimensions of the lake space.
	Author response
	This will be replaced matching the new structure of this paragraph.

3.10	**Reviewer comment**
	Page 4, line 103: I recommended to specify what the self-efficacy refers to in this context to provide a clearer understanding of what individuals are expected to develop self-efficacy in.

	Author response
	It is very good that this has been brought to our attention. This sentence is indeed misleading. Due to local initiative, which is met with uncertainty about one's own influence on other people, self-efficacy must indeed be taken into account in governance structures. We will change it as follows: Line 103: "Our analysis reveals a dynamic and changing approach to the lake as a shared and private space, the need for a governance that supports and enables residents' self-efficacy, and the problems of adopting one-size-fits-all strategies of action and communication."

3.11	**Reviewer comment**
	I recommended to use different font styles or formatting in Figure 1 to clearly differentiate between the federal state, district, and city names, in order to improve the readability of the figure.
	Author response
	Thanks for this suggestion. We will change figure 1 accordingly during the revision.

3.12	**Reviewer comment**
	In 2.2.1 Ethnographic methods section, I recommended to specify the number of interviews conducted for each category (neighbourhood representatives, household, and informal interviews) to provide a clearer breakdown of the data collection process.
	Author response
	Thank you for this comment. Informal interviews and neighbourhood representatives fall into the same category. We neither want to label conversations along certain types of categories nor show who represents what. Our aim is to give a general view on the discourse happening at the moment. Anonymity of research partners is a priority.

3.13	**Reviewer comment**
	For 2.2.3 Stakeholder workshops section, I recommended to specify whether the 8 to 10 representatives from the citizens' initiatives and public authorities participated in the four stakeholder workshops repeatedly or only once. Additionally, I recommend to identify the specific public authority institutions involved and clarify their roles in water management. This will provide a clearer understanding of the stakeholders' engagement and their respective contributions.
	Author response
	We agree and will specify in the text that representatives from the citizens' initiatives and public authorities participated in the four stakeholder workshops repeatedly and not only once. These were not necessarily the same persons at all four times. We will therefore add a table with the list of 11 organizations present throughout the workshop series and the

sectors they represent (some individuals represented more than one organisation, which is why there are more organizations listed than individuals present at each workshop). Since only two of the 11 organizations were public authorities, however, we refrain from additionally specifying their specific roles in water management. This is what the table will look like (to be added after line 179):

Table 1. Organisations represented throughout the workshop series

No.	Organisation	Sector
1.	City Administration of Potsdam (Urban Development, Construction, Economy and Environment Division)	Public administration
2.	Groß Glienicker Forum	Local political party
3.	Local Advisory Council Groß Glienicke	Municipal council
4.	Pro-Groß-Glienicker-See citizens' initiative	Civil society
5	Potsdam Institute of Inland Fisheries	Science
6.	Sustainability Platform Brandenburg	Public sustainability network
7.	Citizens' Advisory Council Sacrow	Civil society
8.	Freies Ufer	Civil society
9.	Potsdam Institute for Climate Impact Research	Science
10.	Kladower Forum	Civil society
11.	State Forest Enterprise Brandenburg (Forest enterprise Finkenkrug, Forest district Krampnitz)	Public administration

3.14	**Reviewer comment**
	I recommended to add the word 'future' in the title of Figure 3 for clarity, to indicate that the perceived challenges or dangers refer to future risks or concerns.
	Author response
	Thank you for the suggestion on precision. We will update the text in line 209 as follows: "This general awareness of current changes actually translates into concerns about the future for the Groß Glienicker lake, in which almost 90 % of the survey respondents reported the water level to be a large or very large future challenge for the lake (Fig. 3)" In addition, we will update the figure caption for Figure 3 to read (line 220): "Figure 3. Perceived future challenges or dangers for Groß Glienicker Lake (N = 644)."

3.15	**Reviewer comment**
	Page 9, line 230: Please expand on the claim that the resident's scientific community is divided on climate change. Specifically, clarify what this division refers to.

	Author response
	In this section, we provide the results of the survey concerning the respondents' perceptions on climate change skepsis. One item pertains to whether or not respondents believe that the scientific community is divided on climate change and not that the resident's scientific community is actually divided on climate change. Line 230 states this with "Moreover, one-third or less believe that the media exaggerate the effects of climate change and that the scientific community is divided on climate change." Therefore, we do propose any changes to the text beyond referring to the figure as in the following: "Moreover, as can be seen in Fig. 4, one-third or less believe that the media exaggerate the effects of climate change and that the 230 scientific community is divided on climate change."

3.16	**Reviewer comment**
	Regarding the question in Figure 4, the phrasing 'There are many different scientific opinions on climate change' is not accurate. The diversity of opinions is not relevant, as the discussion should focus on the scientific findings related to climate change, which are grounded in evidence-based analysis rather than opinions.
	Author response
	The questions in Figure 4 represent the three-question construct to elicit climate change skepticism among the respondents. Therefore, we are eliciting the perceptions of respondents in terms of to what degree they may be skeptical of climate change. We do not propose that there should or should not be a diversity of opinions on climate, and we do not discredit scientific findings related to climate change. For further clarification, if a respondent were not to be skeptical of climate change, they would respond with the answer "Very inaccurate". However, as can be seen in Figure 4, many respondents, despite evidence-based analysis, believe that there are different scientific opinions on climate change (i.e. approximately one-third answered slightly accurate, accurate or very accurate).

3.17	**Reviewer comment**
	I recommended to revise the title of Figure 5 to include the word 'future' for consistency and clarity.
	Author response
	Thank you for this suggestion. We will update the figure caption of Figure 5 to read (line 250): "Figure 5. Average stakeholder perception of future challenges becoming smaller (-2), staying the same (0) or becoming larger (2) (N = 8)."

3.18	**Reviewer comment**
	Page 12, lines 291-298: Why are the findings on improved water quality not mentioned as part of the preferences for future changes?

	Author response
	Thank you for this question. We will add a sentence at line 293 to mention these results and update the sentences starting at line 292 as follows: “Nearly 100 % of respondents indicated the importance of water level stabilization as important or very important, and almost 80% of respondents perceived future improvements in water quality to be important or very important. Improved waste disposal was similarly ranked by over 90 % of respondents.”

3.19	**Reviewer comment**
	Page 12, lines 279 to 287: the terms 'preference for future changes' and 'essential functions' appear to be used interchangeably. However, these concepts differ both conceptually and temporally—'preference for future changes' refers to desired or anticipated conditions, while 'essential functions' relate to current attributes or roles of the lake. It is recommended to clarify the distinction between these terms and ensure consistent usage throughout the text to avoid confusion.
	Author response
	Thank you for this comment. This has already been clarified in footnote number 2 of the original manuscript.

3.20	**Reviewer comment**
	The sections 3.2.2, 3.2.3, and 3.2.4 provide relevant information on the study site. However, the sources of this information are often not provided. I recommended to include appropriate references or clarify whether this information was obtained through primary data collection or secondary sources. This would strengthen the credibility and transparency of the study.
	Author response
	Thank you for this comment. We will add references where appropriate to clarify which information was obtained through primary data collection or secondary sources.

3.21	**Reviewer comment**
	Page 13, lines 310 to 319: include data on the average population age, income, and household size for both Berlin and Potsdam, along with appropriate references to support the claims that the studied population sample is older, wealthier, and has a larger household size. The demographic information will strengthen the validity of these comparisons.
	Author response
	Thank you for the suggestion to add further demographic information. We will update the text starting at line 311 as follows: “With regard to the quantitative survey, the sample from the study area was older (55 years on average) than the average population age of Berlin

	(42.8 years; Amt für Statistik Berlin-Brandenburg, 2024a) and Potsdam (43.2 years; Amt für Statistik Berlin-Brandenburg, 2024b). Overall, 66 % of the sample had at least a first degree and the average net income per month was over € 5,000, although the average monthly gross incomes of fully unemployed residents are approximately € 4,500 for Berlin and € 3,600 for Brandenburg (Amt für Statistik Berlin-Brandenburg, 2024c). Almost 60 % of the sample were employed at least part-time during the survey. The average household size was about 2.7 persons, higher than in Berlin (1.87 persons) and Potsdam (2,00 persons) (Statistisches Bundesamt, 2024). ”

3.22	**Reviewer comment**
	Table 1 does not provide a clear or understandable description in the first column. I recommend improving the table description to enhance clarity. Additionally, the meanings of AIC and BIC should be clarified, and the symbols *, **, and *** need to be explained.
	Author response
	We appreciate the suggestion to improve the table description. We will add the definitions below the table as caption for further information as follows: “Significance levels: ***p < 0.01, **p < 0.05, *p < 0.1 AIC: Akaike information criterion BIC: Bayesian information criterion” For improved clarity of the first column, we will add a column header with “(Interaction) variables of the model”. Before the row starting with “Log likelihood”, we will add a new header labeled “Model characteristics”.

3.23	**Reviewer comment**
	Page 21, line 522: what does CI stands for?
	Author response
	It stands for “citizen’s initiative”. However, we will remove this abbreviation and write out “citizen initiatives” throughout the manuscript.

3.24	**Reviewer comment**
	In the Discussion section, I recommend to provide information on the uncertainty and limitations of the collected data. This could include potential sources of bias, sampling limitations, and any factors that may affect the reliability or generalizability of the results.
	Author response
	We appreciate the suggestion to describe the limitations. We will add a final paragraph to the discussion section starting at line 625 to briefly highlight the limitations as follows:

	"Our mixed-methods approach provided a nuanced understanding through different perspectives, but a few limitations do need to be mentioned. Despite the three different research approaches, it is possible that we were not able to garner all perceptions. The survey administration did not follow a systematic and random sampling approach, making the extrapolation of sample results to the population level difficult. In addition, online surveys inherently embed a potential sampling bias, although the results of survey were evaluated in collaboration with insights from the ethnographic work. Furthermore, although the stakeholder workshops included many representatives, it is possible that only interested parties participated in the workshop. Regarding both the ethnographic research and the stakeholder workshops, the interviewer bias could have led to potential issues; however, we managed this through joint interviews in initial stages of the research. Also, the potential influence of subjectivity on the results was further managed through transparency, mutual participation to different degrees by the researchers in the different approaches and active and iterative communication and collaboration in the elicitation of findings."

3.25	**Reviewer comment**
	In the Conclusion section, I recommend to highlight the most important insights that directly address the four research questions. This will provide a clear and concise summary of the study's findings, ensuring that the key takeaways are easily accessible to readers.
	Author response
	Thank you for this valuable comment. We will make appropriate adjustments to the conclusion to ensure that the main insights in addressing the four research questions are highlighted.

3.26	**Reviewer comment**
	I recommend to add a description of the survey questions and the questions asked during the workshops to the Supplementary materials. This will allow readers to understand the data collection methods and the specific topics addressed in the study.
	Author response
	Given that the survey and the stakeholder workshops were carried out in German, we will add a footnote in the text at line 156 for the survey and line 170 for the stakeholder workshops with the following texts, respectively: "The survey can be made available upon request", "The structure and the guiding questions of the stakeholder workshop series can be made available upon request" (it is not possible to disclose all the questions asked during the workshops).

3.27	**Reviewer comment**
	Page 6, line 149: "...codes were grouped into thematic fields..." to "with codes grouped into thematic fields"

	Author response
	Thank you. We will change this in line 149.

3.28	**Reviewer comment**
	Page 20, line 480: "...they wanted to create awareness that you can't just go straight to the lake' (stakeholder representative)." to "..."you can't just go straight to the lake." (stakeholder representative)".
	Author response
	Thank you for indicating this error. We will make the correction as follows (line 480): "Rather they wanted to create awareness that "you can't just go straight to the lake" (stakeholder representative).

3.29	**Reviewer comment**
	Page 20, line 482: "...the aum is not to prohibit..." What is aum?
	Author response
	Thank you for indicating this error. This will be corrected as follows (line 479):"He explained that the aim is not to prohibit potential swimmers from coming to the lake, and hence they leave gaps between wooden fences."

3.30	**Reviewer comment**
	Page 23, line 566: "...responsibilities should be more clearly distributed between citizens, administration and politics." To "...between citizens, administrative bodies, and political decision-makers."
	Author response
	Thank you for indicating this error. This will be corrected as follows (line 565): "These local practices of concerned citizens on the ground indicate that concerted efforts on the part of the residents are appreciated, but also that responsibilities should be more clearly distributed between citizens, administrative bodies, and political decision-makers."