

Responses to Reviewer 1 (EGUSPHERE-2025-475):

RC1	
1.01	<p>Reviewer comment</p> <p>The paper is well written and focused. The results should be further developed and discussed on the basis of other socio-hydrological studies (on collective memory, decline of civilizations, governance and conflict over water use). Studies on water-scarce regions can help in the perspective of changing human desires. In particular, I would welcome more descriptive papers, but I must say that the results of this study are of local importance (the editor should take this into account).</p> <p>Author response</p> <p>Thank you for this valuable comment. We want to highlight here that all line numbers mentioned in our comments refer to the preprint version of our paper, and proposed changes to the manuscript are written in red font.</p> <p>In this paper, we have focused on a local example that highlights the combined challenge of political complexity and specific natural conditions. For these reasons, we have refrained from comparing other regions, also to allow more space for bringing together our studies. We also welcome further papers on this topic, but this paper is in dialogue with other contributions to the special issue and contributes to a more nuanced understanding of the term “hazard” for the region Berlin-Brandenburg. To make this more explicit we will add this to our introduction.</p>
1.02	<p>Reviewer comment</p> <p>How was the subjectivity of the researchers managed during the qualitative analysis? (add in the text).</p> <p>Author response</p> <p>Thank you for this question. Although not explicitly stated in the submitted manuscript, we did in fact address subjectivity through the use of different research methods. As highlighted below in our other responses, triangulation was not the primary goal of the study, but our approach does resemble triangulation in some steps of the research and also allows us to limit the degree of influence of subjectivity on the results. Therefore, we will incorporate an updated description in the 2.2 Mixed-methods approach section under line 180 as follows: “To fully exploit the potential of a mixed-methods approach, we considered the empirical data from all three studies and combined their findings to gain a deeper understanding of the mechanisms behind different local perceptions. Through this combination, we managed the potential influence of subjectivity on the results as the researchers maintained transparency, participated to different degrees in each of the different methodological approaches and actively and iteratively communicated and collaborated on the elicitation of findings across the research methods. Based on the empirical findings, we generated overarching themes, which we formulated as questions in order to relate results from individual empirical approaches to each other and to the overarching discussions in the joint research project.”</p>

1.03	Reviewer comment
	Line 29 - check the concepts of hard-path to soft-path solutions (I think it would be interesting to add it to the work or quote it)
	Author response
	<p>Thank you for this suggestion. We agree that the hard-path vs. soft-path distinction in water management is a valuable conceptual lens that aligns well with our findings. We will add this and make a brief reference to this framework towards the end of the relevant section of the manuscript (the paragraph starting in line 76) to better situate our analysis within existing debates on technical versus integrated approaches to water-related challenges.</p> <p>Reference to be added:</p> <p>Gleick, P. H. (2003). Global freshwater resources: soft-path solutions for the 21st century. <i>Science</i>, 302(5650), 1524–1528. https://doi.org/10.1126/science.1089967</p>

1.04	Reviewer comment
	Add legend to Figure 1.
	Author response
	Thanks for this suggestion. We will add a legend to figure 1 during the revision.

1.05	Reviewer comment
	Line 107 - I missed historical information and quotes about the lakes (add);
	Author response
	<p>Although we appreciate this comment, we fail to see how further historical information and quotes about the lake could provide pivotal beneficial information beyond the current descriptions in the manuscript. We have already devoted a significant amount of space in lines 108-129 to describe the study area, including a description of the historical division of the study area between East and West Germany. Moreover, subsections 3.2.2, 3.2.3 and 3.2.4 (starting at line 309) describes the political history of the area. Lastly, the whole manuscript is devoted to better understanding the connections between the people and the lakes. We would propose to move some parts from sections 3.2.2, 3.2.3 and 3.2.4 to the 2.1 case study description and additionally to indicate that further information on the social structure, political history and administrative fragmentation of the lakes/of the area can be found in the corresponding sections (also see response to comment 2.07).</p>

1.06	Reviewer comment
	Line 170 - is it possible to show this socio-hydrological system in a figure/loop/map?
	Author response
	We certainly agree that visualizations can be beneficial for understanding the system as a whole, but we do not see a possibility to represent the entire socio-hydrological system in

	one figure. Some visualizations were used during the stakeholder workshops, but these did not represent the system as a whole and would then make the understanding for the manuscript difficult. Therefore, we have to refrain from visualizing the socio-hydrological system, unfortunately.
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1.07	Reviewer comment
	Line 171 - what are the eight functions?
	Author response

The eight functions are based on the common ecosystem services that have been customized for the case study together with workshop participants. This has been presented in Figure 6.: create an attractive and healthy living space and enable social participation, protect biodiversity and climate, conserve natural resources, regulate the water balance, preserve the historical-cultural identity of the region, ensure water-sensitive urban design, secure economic livelihoods, provide provisioning services. We will clarify this at the end of the sentence in line 172 with a reference to subsection 3.2.1 as follows:

“The first step in this process was to define the study area as such a social-hydrological system based on its main physical and social characteristics, the core and contextual actors that shape it, and the essential functions it is supposed to fulfill ([see figure 6 in section 3.2.1](#)).”

1.08	Reviewer comment
	Methodology - perhaps it would be interesting to show the paths through a flowchart;
	Author response

Thank you for this suggestion, and we agree with the idea to include a visual depiction of the work in the manuscript and how we arrived at the overarching themes and questions. We would propose the following visualization to be included at the end of section 2.2 Mixed-methods approach:

The diagram illustrates the Mixed-methods approach and Overarching themes for the Socionatural hazard of lake level loss. It features a central grey pyramid labeled 'Socionatural hazard of lake level loss' with a grey arrow pointing towards it. To the left, a yellow box labeled 'Mixed-methods approach' contains a 'Joint exploration phase' section with three methods: Ethnographic research (Qualitative interviews, Informal discussions, Participant observations), Household survey (Quantitative data collection, Choice experiment), and Stakeholder workshops (Focus groups, Resilience assessment framework). A vertical blue bar labeled 'Collaboration and analysis' is positioned between the methods and the pyramid. To the right, a white box labeled 'Overarching themes' contains four numbered items: (1) Perceptions of social-ecological changes, (2) Social structures underlining and interacting with perceptions, (3) Willingness to act and perception of responsibilities, and (4) Local practices for dealing with challenges.

1.09	<p>Reviewer comment</p> <p>Line 199 - it's worth noting that more than 40% answered that the quality of the water remained the same or they didn't identify anything, a percentage greater than the sum of a little and a lot;</p> <p>Author response</p> <p>Thank you for noticing this. We will adjust the description to better reflect the higher percentage of respondents noticing no change in the quality of the water. At line 199, the sentence will read: “Although 35 % of respondents felt that water quality 200 had declined slightly or greatly, and similar responses were received for bird, insect, and plant diversity, approximately half of the respondents either did not notice a change, or indicated that it had stayed the same.”</p>
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1.10	<p>Reviewer comment</p> <p>Line 203 - why have visitors increased?</p> <p>Author response</p> <p>The causes of the increase in visitors was not investigated in the course of the study, but perceptions in the interviews and the survey indicated that residents believe that the lockdowns during the coronavirus pandemic were associated with the increase. We highlighted this in line 335. Nonetheless, we will mention this already in line 203 in the revision as follows:</p> <p>“Strong majorities perceived that the number of visitors (> 80 %), vehicles (> 80 %), and litter (65 %) had increased slightly or greatly. Indeed, many open-ended responses highlighted the issues of littering, visitor pressure resulting from lockdown measures during the corona pandemic and also leading to trampling of shoreline vegetation, unsanitary infrastructure and wild bathing.”</p>
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1.11	<p>Reviewer comment</p> <p>Were there differences in perception between different groups of interviewees, such as old residents versus new residents or people with different levels of education?</p> <p>Author response</p> <p>This region is very dynamic, mainly due to demographic change since 1990 and further densification due to increasing pressure in the city of Berlin. Statements concerning the lakes cannot be separated according to age or educational aspects. However, there are varying degrees of concern depending on how close the actual place of residence is to the lakes. We have illustrated this using the results of the survey throughout section 3.</p>
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1.12	<p>Reviewer comment</p> <p>Line 210 - characterize hydrology with historical data for the region (precipitation, evaporation, etc.) This could be added to the “study area” item;</p> <p>Author response</p> <p>We cannot to delve deeply into this, because we do not want to juxtapose the citizens' perceptions with “the truth”, but we will add the following sentence on this in the case study area section (line 109): “Both lakes are exclusively fed by groundwater, i.e. they have no surface inflow and thus ultimately depend on the rainfall and the evapotranspiration in the case study area. As in the entire Berlin-Brandenburg region, the hydrology of the case study area is fundamentally characterised by dryness. While the annual precipitation remained more or less constant in recent decades, however, the spatio-temporal variability of precipitation patterns and in particular the changes in the frequency and intensity of precipitation extremes have increased significantly in the context of climate change, as historical data show (Bart et al., 2025)”</p> <p>Reference to be added:</p> <p>Bart, F., Schmidt, B., Wang, X., Holtmann, A., Meier, F., Otto, M., and Scherer, D.: The Central Europe Refined analysis version 2 (CER v2): evaluating three decades of high-resolution precipitation data for the Berlin-Brandenburg metropolitan region, metz, 33, 339–363, https://doi.org/10.1127/metz/2024/1233, 2025.</p>
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1.13	<p>Reviewer comment</p> <p>Line 256/257 - are there any federal/state/municipal public policies on land use and occupation or master plans?</p> <p>Author response</p> <p>There are a plethora of federal/state/municipal public policies and strategies/master plans that affect land use and occupation in the region. On the one hand, though, it is impossible to represent them in their entirety. On the other hand, it is not possible to pick one or a few representative ones. On a more abstract level, Dombrowsky et al. (2022) address the aforementioned governance-related issues, albeit not entirely, and the solution remains somewhat beside the point. As a result, we cannot satisfy this request, because doing so would be disproportionate in the context of this paper, both in terms of the effort needed and the space it would take up in the paper.</p> <p>Dombrowsky, I., Lenschow, A., Meergans, F., Schütze, N., Lukat, E., Stein, U., & Yousefi, A. (2022). Effects of policy and functional (in) coherence on coordination—A comparative analysis of cross-sectoral water management problems. <i>Environmental Science & Policy</i>, 131, 118-127.</p>
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1.14	<p>Reviewer comment</p> <p>Line 297 - it would be interesting to present the number of cafés, restaurants and parking spaces in the area. The density of these services can influence the social perspective;</p>
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	<p>Author response</p> <p>Thank you, this is a valid point. We will add a short description following line 280 as follows:</p> <p>“When stakeholders were asked about the essential functions of the lake as a social-hydrological system during the workshops 280 (see section 2.2), an attractive and healthy living space offered by the lakes and the social participation they enable were rated highest (see Fig. 6).2 The residential area of Sacrow, Groß Glienike and Kladow is currently characterised by its proximity to the city, but its distance from the urban centre gives it a village feel. The necessary shopping facilities are complemented by a few cafés and a handful of restaurants. A restaurant on the northern shore of Lake Sacrow has been converted into a temporary event venue, and the café on Lake Groß Glienike is usually open on weekends during the summer months. Both residents and visitors emphasise the tranquillity of the area and the natural surroundings by the water. The preference to keep this healthy environment intact is thus related to the rising number of people and visitors and their (allegedly) harmful behavior, which is perceived as a challenge or threat (see previous section). Closely related to the attractiveness of living space and social participation is the environmental health of the system, represented by the functions of biodiversity and climate protection as well as the conservation of natural resources, which are perceived as being challenged indirectly by the increasing 285 number of users and their harmful behavior, but also - more importantly - directly by the decline in lake water levels and quality. Lastly, the meaning of the lakes with regard to the preservation of the historical and cultural identity of the region plays a meaningful role in the participants' evaluation of the essential functions of the social-hydrological system.”</p>
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1.15	<p>Reviewer comment</p> <p>Line 409 - I believe there may be a relationship with collective memory here. Please, if possible, link to this theme;</p> <p>Author response</p> <p>This is a valid point, and thank you for pointing this out. This is certainly very important when it comes to seeing the lake as a memorial of German history. However, since this area is highly dynamic and changed considerably since 1990 to apply collective memory here would need further work with the material. We will pick this up in future contributions. At this point it would take the paper into a different direction.</p>
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1.16	<p>Reviewer comment</p> <p>Line 427 - Is it possible to make a loop figure with these identified interactions?</p> <p>Author response</p> <p>The results discussed in line 427 refer to the analysis of the choice modeling. This modeling associated choices made in the discrete choice experiment with the respondents' answers to the climate change skepsis questions. Therefore, eliciting these one-way interactions in a loop figure would not be appropriate or elicit any further understanding of the interactions.</p>
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1.17	Reviewer comment
	Line 501 - I think the political bias could be explored further. How can the political spectrum influence the conservation policies of these lakes and the environment (for example, the city being run by a left-wing or right-wing politician)?
1.18	Author response
	<p>It is a little unclear to us what is meant by “political bias” here. The political nature of the actions of citizens with regard to the lakes that is mentioned here is to be understood as political in a very basic sense, i.e. relating to the public affairs of a community and challenging the respective (non-)decisions and (non-)actions of the involved governments/administrations. Party politics, in fact, play a very subordinate role in this respect, i.e. with regard to such a very specific local issue like the one at hand here, as one interview specifically said.</p>

1.18	Reviewer comment
	Line 625 - Is it possible to add a paragraph of recommendations for the population, public administration or other researchers?
1.18	Author response
	<p>Thank you for the suggestion to include recommendations. Our study was focused on understanding the hazards and perceptions around the two lakes rather than directly looking for solutions to address the hazards. Therefore, we cannot jump to recommendations for the population, public administration or other researchers in taking care of the hazard. Nonetheless the conclusion starting at line 625 does shed light on how understanding the diverse social challenges and functions are important and pursuing approaches to elicit these allows for a broader understanding of the socionatural nature of hazard beyond the declining lake levels as a natural hazard. Given these conclusions in light of our research questions, we refrain from providing recommendations beyond methodological approaches for understanding hazards.</p>