

## Author's response

Comments by the editorial team	Author's response
<p>With the next file upload request, please number the tables and figures in your supplements per our guidelines and adjust the references in the main text accordingly:<a href="https://www.natural-hazards-and-earth-system-sciences.net/submission.html#assets">https://www.natural-hazards-and-earth-system-sciences.net/submission.html#assets</a> (section "Supplements").</p>	<p>In the Supplement file, all Supplement headings (A-D) have been deleted and tables and figures have been named according to the guidelines, Table S1, Figure S1, etc.</p> <p>In the text, references have been changed accordingly in all relevant places. There is now always a direct reference to the table (e.g., Table S1) or figure with the additional phrase “in the Supplement”.</p>
<p>The manuscript aligns well with the scope of this Special Issue. We recommend starting the review process once the authors adjust the citations in the text to be linked to the references section. This adjustment will enhance readability and facilitate the review process.</p>	<p>We agree with the suggestion for improvement. All quotations in the text are now visibly linked to the respective references in the reference list.</p> <p>In addition, indents have been added to the reference list to allow better identification of the individual references.</p>
Comments by Anonymous Referee #1	Author's response
<p>The boundaries shown in Fig. 1 imply that the German boundary to Poland and Czech Republic is a federal state boundary. In fact, these are national boundaries. You may add an additional class. In addition, the statement of map sources seems to be insufficient. This information should follow the utilisation permits of the data used - please prove.</p>	<p>The state boundaries of Poland and Czech Republic have been added to Figure 1. There is also now a smaller overview map showing the location of the Spree River basin in Germany.</p> <p>In addition, the map data sources are now specified for all figures in the manuscript and supplement.</p> <p>A detailed overview of the data used for the maps is now available in Table S19 in the Supplement.</p>
<p>A full stop is missing at the end of line 169</p>	<p>The point has been added to the manuscript.</p>
<p>In Fig. 2 the symbol for federal state boundaries is hardly visible. Maybe use a rectangle with a dark background and a line of the corresponding colour in the center.</p>	<p>The legend of Fig. 2 has been adjusted in order to make the federal state boundaries better visible.</p>
<p>Line 222: Please prove the sentence, there is either a word missing (“and”) or a part of the sentence is left from editing.</p>	<p>The sentence has been changed to make it easier to understand.</p>
<p>Line 273: Fig. S2 should be named as table</p>	<p>The incorrect designation “Fig.” has been changed to “Table” in the manuscript and supplement.</p>
<p>For the paragraph starting at line 274, but also in general: Maybe you could take use</p>	<p>The UBA report (Garack et al. 2022) is a great addition to our manuscript. We have included the</p>

---

of the following UBA report: Entwicklung der ökologischen Beschaffenheit von Oberflächengewässern im Klimawandel - Wirkungsmechanismen, Modellierungsansätze und Handlungsempfehlungen zur Umsetzung der EG-WRRL <https://www.umweltbundesamt.de/publikationen/entwicklung-der-oekologischen-beschaffenheit-von>

---

report in Sect. 5.5 Addressing climate change explicitly in the WFD and its planning instruments (former line 273 onwards) and also added the reference to the Introduction and Study scope section. The report is now listed in the references.

5

---

**Comments by Anonymous Referee #2**

“1. Strengthen Purpose and Scope of Paper in introduction: The contextualization of the study is nicely done in the introduction. The indication of the scope and paper as part of the final paragraph could benefit from further elaboration. Both, the question of research gap and how this study addresses this gap and what can be learned from it, as well as the actual work should be addressed. For the latter, the authors might want to reuse lines 86 to 96 which seem out of context in the section on the case study and should either be moved to the introduction or the method section anyways.”

“2. Detailed information on case study area differences: In the later analysis, it is mentioned that some plans don't capture specific fields of action and information is provided on a sub-basin level (compare Figure 2). It could be beneficial to provide more context for these specific sub-basin areas as part of the case study description. This could help contextualize whether it is an actual gap in all sub-basin areal plans if some of the fields of action are not considered. This study does not provide any context about the different requirements or settings of the sub-basin areas, which leaves the reader to estimate the 'goodness' of flood/drought planning at the sub-basin scale to the number of fields of action that are considered. I am aware that this might be out of the scope of this study, but mentioning/discussing it as part of the limitations would be valuable in that case. In any case, for readers not familiar with the German Spree river basin, it could be beneficial to adjust Figure 1 to show, which plans listed in Tab.2 capture which parts of the river basin area.”

---

**Author's response**

We have revised the last paragraph of the introduction to be more explicit about the scope and intent of the study.

The paragraph of the former lines 86 to 96 (in Sect. 2.2 Water-related planning) have been moved to Sect. 3 Methodology, where it is better suited.

It is true that we have not looked closely at how the sub-regions explicitly differ in their environmental conditions and what different climate adaptation needs can be derived from this. Therefore, in Sect. 6 Limitations we point out that a more detailed analysis of the sub-regions is needed in order to be able to draw concrete conclusions for the individual sub-regions. In particular, this requires a look at the regional planning and landscape plans at the local planning level. However, this would go beyond the scope of this study, as the aim of this study was to provide an initial overview of the current state of climate change adaptation in water-related and legally defined plans in the Spree River basin.

Despite the heterogeneity of the environmental conditions in the various sub-regions of the Spree River basin, the report “Klimawirkungs- und Risikoanalyse 2021 für Deutschland, Teilbericht 6: Integrierte Auswertung – Klimarisiken, Handlungserfordernisse und Forschungsbedarfe” by Kahlenborn et al. (2021), published by the German Environment Agency (UBA), shows that the Spree River basin is likely to be affected by climate change in

---

a similar way. On p. 90, Fig. 10 illustrates that according to their k-means cluster analysis of 14 climate indicators for the reference period (1971 to 2000), the Spree River basin is mainly located in the “Klimaraumtypen” (climate area types) “Wärmste Region” (warmest region) and “Trockenste Region” (driest region) and that the climate change impacts are expected to be very similar across the entire river basin. We have added these findings to the introduction of the study area in Sect. 2.1 and included the literature in the references.

We also included 4 new figures to the Supplement (Figure S1-S4) that show the spatial locations of the 28 plans analysed within the Spree River basin. Due to many overlapping planning areas and resulting complexity, it was impossible to include them in Fig. 1.

---

3. Methodology: The methodology is comprehensively explained. Two aspects might require additional attention: 1) The authors indicate in line 117 that some measures were excluded from the list without any elaboration on which measures and why. 2) Additional elaboration on the inclusion/exclusion criteria would be beneficial: a) it seems that here the authors should also mention that planning statements were also excluded when they did not (explicitly?) refer to the German Spree river basin. b) It is unclear how authors define whether a statement 'is described in the context of climate change adaptation or climate change and its (potential) impacts'. Is it when these terms are used, or referring to the consequence (e.g. shifts in flow regimes) or to future uncertainty or to something else?

In Sect. 3 Methodology, we now explain in more detail why some measures from the LAWA report were excluded from the analysis.

Furthermore, we describe in more detail what we mean by including statements in the analysis that are described in the context of climate change adaptation or climate change and its (potential) impacts.

Moreover, we added that statements had to refer explicitly to (parts of) the Spree River basin or to water management in the planning area in general in order to be included in the analysis. Here we also refer to the discussion in Sect. 6, as although we took care to only consider statements that refer to the Spree River basin, this could not always be fully ensured.

---

4. The results and discussion section are well written, and informative. Depending on any clarifications in the introduction section as suggested in my first comment, it would be beneficial to consider the structure in the discussion section. Additionally, one minor point of attention could be that currently the limitations of the study are presented as a subsection following this statement in the introductory paragraph of the discussion section: "Therefore, the subsequent sections elaborate on opportunities to improve the integration of climate change adaptation into planning instruments that treat water management issues".

---

We have decided to devote a separate section to the limitations of this study (now: “Sect. 6 Limitations”).