

Dear Editor,

We thank you for your suggestions and comments. We have implemented all of them in the revised manuscript and listed them in Table 1. We also made some minor changes and additions to the manuscript, which are listed in Table 2.

Finally, authors sincerely thank you for your suggestions and comments throughout the review process. We also thank the reviewers, Dr Uwe Ehret and Dr Lu Li for their constructive comments, which helped improve the manuscript.

**Table 1: Response to Editor**

1.	<p>Grammar and Punctuation (Comma Splices) Throughout the manuscript, there are several instances of "comma splices", where two independent clauses are improperly joined by a comma instead of a period, semicolon, or conjunction. Please carefully read the entire manuscript to correct these. Some specific examples include:</p> <p>Lines 149–150 in the track changed version (also for the following line numbers): The sentence discussing "establishing causality..." appears to improperly join two separate thoughts. Please split this into two distinct sentences.</p>	<p>Revised as suggested.</p> <p>Original text: Even when such difficulties are absent, establishing causality for well-understood processes remains a non-trivial task (Delforge et al., 2022; Ombadi et al., 2020)</p> <p>Revised text, Line 147: <i>"These factors make the task of finding causal relations from real-world observational data difficult. Even in systems, where such difficulties are reduced, establishing causality for well-understood processes remains a non-trivial task (Delforge et al., 2022; Ombadi et al., 2020)."</i></p>
2.	<p>Line 165: "We also compare our results with a non-causal method, we conducted the analysis..." Please separate these into two sentences or use a semicolon.</p>	<p>Agreed. Revised as suggested.</p> <p>Original text: We also compare our results with a non-causal method, we conducted the analysis using the Pearson's Correlation Coefficient (PCC) method as well.</p> <p>Revised text, Line 165: <i>"We also compare our results with a non-causal method. For this, we selected Pearson's Correlation Coefficient (PCC)."</i></p>
3.	<p>Lines 272, and 275: Similar comma splice issues occur here (e.g., "TCDF can be divided into two broad steps, the first step involves identifying the potential causes of each variable by training deep neural networks.", "The first step forms the major analysis of TCDF, it can be broadly divided...").</p>	<p>Revised as suggested.</p> <p>Original text: TCDF can be divided into two broad steps, the first step involves identifying the potential causes of each variable by training deep neural networks.</p> <p>Revised text, Line 267: <i>"TCDF can be divided into two broad steps. The, the</i></p>

		<p><i>first step involves identifying the potential causes of each variable by training deep neural networks."</i></p> <p>Original text:</p> <p>The first step forms the major analysis of TCDF, it can be broadly divided into three parts, where...</p> <p>Revise text, Line 270:  <i>"The first step forms the major analysis of TCDF which can be broadly divided into three parts, where..."</i></p>
4.	<p>Figure 2 Caption: "We extracted data from locations... , these locations are spread across 5 river major river basins." This should be broken into two sentences. In addition, the "river" after 5 should be removed.</p>	<p>Revised as suggested.</p> <p>Original text:  We extracted data from locations in nine Köppen-Geiger Climate Classes (eight unique classes), these locations are spread across 5 river major river basins.</p> <p>Revised text, Figure 2 Caption:  <i>"We extracted data from locations in nine Köppen-Geiger Climate Classes (eight unique classes). These locations are spread across 5 major river basins."</i></p>
5.	<p>Scientific Clarification (Line 243) Regarding the sentence: "The vertical distribution of soil profile is derived from relations explained in Clapp and Hornberger (1978)." Please revise this for scientific precision. The Clapp and Hornberger (1978) model primarily provides soil hydraulic parameters, which typically need to be incorporated into a framework (such as the Richards equation) to calculate the actual soil moisture distribution. The current phrasing ambiguously implies that the 1978 model provides the soil moisture directly. Please clarify this wording to avoid confusing the readers.</p>	<p>Revised as suggested.</p> <p>Original text:  The vertical distribution of soil moisture profile is derived from relations explained in Clapp and Hornberger (1978).</p> <p>Revised text, Line 240:  <i>"The vertical distribution of soil moisture profile is derived within the model framework using the soil hydraulic parameters from the Clapp and Hornberger (1978) model."</i></p>
6.	<p>Formatting of Section Headings (3.4.1 to 3.4.4) Please remove the parenthetical figure references from your subheadings. For example, headings like "3.4.1 PCC (Fig 5a)" and "3.4.2 TCDF (Fig 5b)" are not standard for academic journals. Change these to simply "3.4.1 PCC", "3.4.2 TCDF", or use a descriptive phrase. You can refer to the figures within the main text of those sections instead.</p>	<p>Corrected as suggested.</p> <p>Headings now read as "3.4.1 PCC" and so on.</p> <p>Also, all figures are now referred in the main text. For example, Line 601:  <i>"Among the water budget related causal drivers, PCC identifies almost all the causal drivers correctly (Fig 5a), while missing plant canopy surface water in Temperate and Cold regions."</i></p>

7.	Underlined Sub-headings (Sections 3.4.1 to 3.4.4) You have used underlined text to act as inline sub-headers (e.g., Causal drivers and Non-causal drivers). This formatting is not standard for final publication. Please remove the underlines and either format them as standard sub-subheadings or integrate them into the paragraphs as complete, coherent introductory sentences.	We have removed the underlines and formatted them as standard sub-headings.  For e.g. Line 600, " <b>3.4.1.1 Causal drivers</b> ", and so on for the others.
8.	Table Caption Placement Currently, the caption for Table 1 (and potentially others such as Table 2) is placed at the bottom of the table. Standard journal formatting requires all table captions to be placed above the table. Please check and adjust all tables in the manuscript accordingly.	All table captions now appear above the table. Tables 1, 2, A1, A2, A3, A4 and A5 corrected.
9.	Minor Typographical Errors  Line 48: Please delete the unnecessary comma in "Second, is..." so it correctly reads "Second is the old problem of...".	Corrected as suggested
10.	Line 73: Please add the word "for" after "account" so it reads "do not account for auto-correlation".	Corrected as suggested
11.	Line 176: There is an unnecessary comma immediately preceding "Fig. R1" (or the figure reference in this section). Please remove it.	It is an artefact of Latex, will be removed in the accepted changes version.
12.	Line 236: The abbreviation "etc," should be corrected to "etc.,".	Corrected as suggested
13.	Line 903 (Section 5.3): The phrase "in different time period's" contains an errant apostrophe. Please correct this to "in different time periods".	Corrected as suggested

Some other changes in the manuscript from the authors in the table below.

**Table 2: Minor changes and additions**

14.		Some corrections of comma splice we found in the text.  Original text: To represent a causal relation with a graph, it
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		<p>requires two necessary conditions, directed edges and acyclicity.</p> <p>Revised text, Line 177:  <i>“To represent a causal relation with a graph two necessary conditions are required: directed edges and acyclicity.”</i></p>
15.		<p>We have added acknowledgement of the Editors and reviewer’s suggestions and comments, Line 1101.</p> <p><i>“We thank the Editor, Dr Yonggen Zhang for their valuable comments, which helped improve the discussion our results. Further, authors gratefully acknowledge the reviewers Dr Uwe Ehret and Dr Lu Li for their valuable comments, which improved the manuscript structure, strengthened the interpretation of the results and improved the analysis of causality-based time-series prediction models.”</i></p>
16.		<p>Removed grey shading from Table 2 as asked by the Editorial system in an earlier email.</p>