Author's response

We would like to thank the editor for her constructive comments and feedback on this manuscript. Here the comments in black colors with our replies in blue:

Most of the remaining concerns relate to the figures.

1. Figure 1: In the legend, the label "16 sub-basins" may be misleading, as the number itself does not convey meaningful information to the reader. I suggest replacing it with a more descriptive expression, such as "selected sub-basins" or "study sub-basins." In addition, the authors should carefully verify that all place names mentioned in the text are clearly identified in Figure 1 or in subsequent figures. Since the journal addresses an international audience, readers cannot be expected to be familiar with the local geography discussed in the manuscript.

→ Thank you, we modified the legend description into "Sub-basins for model validation" for clarity. Moreover, we removed the subbasins names mentioned in the text of section 3.2 to more clearly distinguish them from the valley names reported in figure 5. Nevertheless, subbasins IDs and related names are all reported in the supplementary material. Finally, we checked that all other names mentioned in figures are also mentioned in the manuscript text.

2. Figure 2: As sufficient space is available, the legend could be enlarged to improve readability. The equation also appears rather small and, for some reason, is displayed in a different color from the rest of the diagram. Furthermore, the authors should ensure that a single, consistent font is used throughout all diagrams and figures, avoiding the appearance of multiple font styles within the same graphic.

→ Thank you for the comment, we have enlarged the legend and the equation, changed color to the equation and used the same font in all figures. Also, we modified the figure caption to improve its clarity.

3. Figure 3: The figure remains somewhat difficult to interpret. At a minimum, the values reported in the legend should be properly aligned by category, as their current arrangement is neither aligned nor centered, reducing readability. Additionally, the title of the second y-axis is excessively long and should be reformatted or abbreviated, as it currently resembles a block of text rather than an axis label.

→ Thank you, we have modified the legend text moving it into 2 rows and shorten the right x-axis title.

4. Figure 4: The figure uses too many colors and appears visually overloaded. Alternating the year labels could improve readability and reduce clutter. Moreover, the color scheme adopted in panel B should be harmonized with the tones used in the other panels to provide a more coherent visual presentation.

→ Thank you for your feedback, we alternated the year label as requested. On using the same color tones for all panels, we used different tones for panel (b) to clearly distinguish the Mann-Kendall correlations (red-blue) to the z-scores (green-purple). Unless there are other major objections, we would prefer to stick to the two color-tones so to avoid confusion from the readers.

5. Figure 5: The authors should clarify whether the valley names shown in the figure are discussed in the manuscript and therefore necessary for interpretation. In addition, the meaning of the blue line appearing across the central part of the figure is unclear and should be explained. The y-axis labels in the diagrams should also be improved. While "Temp" may be relatively intuitive, abbreviations such as "Preci" are not self-explanatory. Either the labels should be written in full (using a smaller font size if necessary) or abbreviated consistently and explained in the legend. The current hybrid approach requires readers to infer the meaning, which is not appropriate. Finally, the authors should verify that all labels and graphical elements remain within the plotting area. For example, some labels appear to extend beyond the figure boundaries.
   These may seem like minor graphical issues, but they are important for ensuring the clarity, readability, and professional presentation expected in an international scientific journal.

→ Thank you for raising this point. On the blue line across the central part of the figure, there should not be any in the final version. The image with a blue line across the central part is only displayed in the removed image in the track change manuscript and it will not be displayed in the cleaned version of the manuscript.

On the y-axis labels, we see the point of making them consistent throughout all images. For this reason, we modified “Preci” into “Precipitation” and “Temp” into “Temperature” in all figures.

On the valley names, we introduced them in figure 5 and in the text describing the results to point to specific locations and their anomalies. At the beginning of section 3.3.2 we also added a sentence pointing to figure S1 and table S2 of the supplementary material for info on all subbasins locations and their names. We used valley names instead of id numbers to improve interpretability of the results and to facilitate the identification of specific locations by readers. We consider valley names to provide a more intuitive geographic reference than numerical identifiers supporting the characterization of spatial patterns discussed in the manuscript.

6. Finally, the reference list should be carefully checked, as it does not appear to fully comply with the journal's required formatting style.

→ we have modified the final list of references following the Copernicus formatting style.

In addition, we implemented typos and grammatical changes throughout the manuscript to improve its clarity. We pasted the supplementary material at the end of the track changes manuscript version to highlight in different color the implemented changes as suggested by the editorial support team.