Dear reviewer,

thank you for your comments and suggestions, which were very useful and helped us to draft a clearer, more scientifically sound and better graphically structured manuscript. We will do our best to implement all the proposed recommendations.

Line 14: "thermal values" – why not "temperatures"? ("thermal values" are used to quantify insulating properties)

We agree with your suggestion. We will modify it accordingly.

Line 47: "individualized" is generally understood as a synonym for "personalized" – that's not what you wanted to say about the MM.

We agree with your suggestion. We will modify it accordingly.

Line 91: What are "centralised studies"?

We want to refer to the fact that existing studies do not consider the use of multidimensional data (e.g. temperature, precipitation, risk phenomena, etc.) over a whole century or over several centuries. There are a few studies that analyze at a local level or over a limited period of years, a certain climatic element. But the term can be replaced by simply "studies".

Line 94: "when meteorological observations were not available" I would suggest to use "measurements" instead of "observations" – since observations (described in historical archives) are in fact the basis of your analysis.

Implemented!

Line 97: "experiential dimension of climate". I would understand "experiential" as "based on experience", like in "experiential learning".

We agree with your suggestion. We will modify it accordingly.

Figure 1, caption: "territorial expansion". "Expansion" means an increase in size – that's not what you want to say.

We agree with your suggestion. We will modify it accordingly.

Figure 1: "Altimetry" is the science of the science of measuring altitudes/elevations …I would suggest to use "elevation" instead.

We agree with your suggestion. We will modify it accordingly.

Line 131: I am aware that "Pontic" refers to the "Black Sea", however, I have never seen "Pontic air mass" mentioned in scientific literature.

We agree that the term "Pontic air mass" is not standard in scientific literature. We will revise the text to use a more appropriate and widely recognized formulation, such as "Black Sea influence" or "air masses influenced by the Black Sea region", to avoid confusion.

Line 136: "fohn movements" I guess that you mean the "Föhn effect"

Yes. We will correct to be as direct as possible in expression.

Line 257: "glacier in the Scarisoara cave". The ice in this cave is certainly not a glacier. Glaciers are formed by compression of snow – and they move (by definition).

This is widely recognized in the specialized literature as the "glacier from the Scarisoara cave", although it is not a glacier in the classical geomorphological sense of the word (i.e. a moving mass of ice, flowing under its own weight, as in the case of glaciers in the Alps or Himalayas). Although it is a deprecated term, it is in fact a stationary accumulation of permanent underground ice, located in a cave; therefore, a block of perennial ice formed by the refreezing of water from infiltrations and snow, under favourable microclimate conditions. In the manuscript, we will refer to it as "perennial ice block" or "cave ice block", for better understanding.

Figure 10: "solar points" should be "sunspots" (and not "sun spots").

Of course. We will modify it accordingly.

(2) The presentation of the results needs to be improved. Several examples are included in the (again non exhaustive) list of specific comments below. I understand that acronyms are necessary, but the inconsistent use (see specific comments) makes it particularly hard to follow the argumentation. Another example: In Fig. 4 "violet" means "cold" and yellow"means "warm" (which is fine). However, in Fig. 3 immediately above "yellow" means "cold" and "warm". Similar in Fig. 5: Please use different colors for cold, warm, dry and excess (precipitation). In Fig. 6 "no data" s represented by "green" in (b) and by "yellow" in (a) – please avoid! Figure 7 is particularly hard to read.

We will revise the figures to present the available data in a more centralized and accessible manner, improving clarity and visual coherence. Regarding the use of acronyms, we have decided to remove them entirely from the main text. They will be retained only within the figures, where necessary for space constraints, and each acronym will be clearly explained in the respective figure legend.

While we acknowledge that Figure 7 may appear somewhat dense at first glance, we consider it to be highly illustrative and essential to the paper. It presents nearly 400 historical records, including 116 events related to cold and heat waves, 170 events associated with precipitation excess or deficit, and 102 climate-related risk phenomena. Despite its complexity, the figure provides a necessary overview of the temporal distribution and nature of extreme climatic events, which could not be effectively conveyed through text alone. We believe it is a key component in understanding the dataset and its implications.

(3) The attribution of the climate variations to solar forcing is too exaggerated (e.g., "The most plausible explanation for the high frequency of very low temperatures during the 17th century is low solar activity.", line 594) and not backed by the results shown. This attribution is also not really supported by the cited references. E.g., Stangl and Foelsche (2022) conclude: "This comparison suggests a certain solar influence but the agreement is not very pronounced." And they found "an unusually small number of severe winters during the last decades of the MM" (for the same study area) – which does not speak for a strong solar influence.

Regarding the reference to Stangl and Foelsche (2022), we note that their conclusion is based on a much more limited dataset compared to the one presented in our study. Our documentary database not only includes the sources they used, but also many additional and previously unutilized records, which allows for a broader and more detailed perspective. This expanded dataset likely explains the discrepancy in the reported frequency of severe winters.

That said, we maintain that the pronounced cooling observed during the Maunder Minimum is unlikely to be coincidental, especially given the consistency of the signal across multiple figures and datasets presented in our study. As emphasized in the text, the clustering of cold winters, increased reports of cold waves, and climate-related societal impacts during this period all support the idea of an underlying external forcing mechanism. While we recognize that other drivers (e.g., volcanic activity, ocean-atmosphere dynamics etc) may also have contributed, we consider that low solar activity remains a plausible and important contributing factor, particularly when viewed in the broader paleoclimatic context.

(4) Please provide references for all the software packages used.

We will do so.

(5) References: Please provide DOIs for all the references.

We will do so.

Specific comments:

Line 20: "of which 36 occurred during the Maunder Minimum (1645-1715)." Do you actually mean in the period 1645-1715, or in the period 1645-1700 (which would be the end of your study period)?

We mean between 1645 and 1700, which falls within our study period. We will point this out better in the text.

Line 23: "from the natural archive" --> "from natural archives" (there is not just one).

We agree with your suggestion. We will modify it accordingly.

Line 40: "In this regard, Perşoiu et al. (2017) mention that in the first part of the Holocene …" Is the first part of the Holocene really relevant for your study period?

We agree that the first part of the Holocene is not directly related to our study period. However, we included the reference to Perşoiu et al. (2017) to provide brief paleoclimatic context in the introduction. This helps situate the climatic dynamics of the 17th century within a broader temporal framework.

Line 48: "2°C" --> "2 °C" – you should always use space between number and unit.

We agree. We will modify it accordingly.

Line 60: "cores" – do you mean "ice cores"?

Yes. We will modify it accordingly.

Line 83: "The hypothesis from which it was started is that, in agreement with western and central Europe, the territory of Transylvania must have been characterized by a similar climate …" Is this really true? It is contradicted by the statements in the following lines. And isn't one of the values of your study, that you can characterize differences to the climate in Western and Central Europe?

You are correct in noting that the statement regarding similarity with Western and Central Europe may appear inconsistent with later discussions in the manuscript. In fact, as shown in our previous study (Gaceu et al., 2025), there is evidence that Transylvania exhibited a somewhat different climatic pattern during the 16th century, with numerous reports of warm weather even during periods when the Little Ice Age was strongly expressed in Western Europe. In the current study, we aimed to further explore whether this divergence persisted in the 17th century (probably we will do it in another article, considering that such an analysis would be very extensive and inappropriate to be introduced in the present manuscript, which is already quite long). However, since we do not perform a direct comparative analysis in this paper, we recognize that the initial phrasing may be misleading. We will revise the introductory statement to better reflect the actual scope and goals of the study.

Figure 1: The color bar for the elevation ("altimetry") is a bit misleading, sin the colos don't match those of the map. Furthermore, it starts with "-20 m". I am aware that parts of the Danube Delta are below seal level – but the map doesn't show this part of modern Romania.

The regions of Wallachia and Moldavia were intentionally masked with a neutral color to visually emphasize that, although historically part of the Romanian principalities, they are not included in the scope of this study. This is why the color bar and elevation scale may appear misleading. We will revise Figure 1 to more accurately reflect the geographical realities of the study area, adjusting both the color scale and the visual representation where necessary.
Also, it seems that the value of -20 m was an error generated by the use of the DEM, and this has been corrected.

Figure 1: "Localities referred to in the" There is something missing.

Yes, we will correct the sentence.

Methods: Apparently, the method applied is (understandably) very similar to the one used by the same authors (Gaceu et al, 2025) for the 16th century. I wonder why this is not mentioned in the text.

The methodology is similar. We will introduce the citation in the text explicitly, so as not to cause confusion.

Line 177: "literate people, with writing concerns." I would understand "Writing concerns" as "Writing difficulties". I don't think that you wanted to say this.

Yes. We will modify it accordingly.

Figure 2: "Climat" --> "Climate"; "regim" --> "regime"

We will modify it accordingly.

Line 215: "cold (CY) and warm (HY) years". According to Fig. 2, HY should stand for "hot" year (not "warm").

It was a typo. We will modify it accordingly.

Line 215: "cold (HW) … winters". According to Fig. 2 "H" stands for "harsh" – and this not a very good choice, since "H" can also mean "hot" sea above.

We agree with your suggestion. We will modify it accordingly.

Line 220: "heavy precipitation (AP)". According to Fig. 2 this would by "abundant" precipitation. If it should stand for extreme precipitation than I would suggest to use " heavy precipitation" with the acronym "AP".

We agree with your suggestion. We will modify it accordingly.

Line 225: "high prices and famine (IH)". According to Fig. 2 "IH" stands for "inflation and hunger"

We will modify it accordingly.

Line 257: $\delta^{18}O$ have been used – as a proxy for what?

For winter temperatures. We will explain this fact better in the main text.

Line 276: $\delta^{13}C$ have been used – as a proxy for what?

For precipitation. We will explain this fact better in the main text.

Figure 4: "no data". This is a bit misleading. As you described before (and after), this can also mean that nothing was mentioned, because the weather was "normal". If there should be real data gaps, I would suggest to mark them in a different color.

"No data" may include multiple possible situations. However, we cannot confidently distinguish between years with truly normal weather (and therefore no mention), and those where data is missing due to other factors, such as lost manuscripts, lack of interest in recording the weather, or unrelated historical disruptions. Because of this uncertainty, we chose to use a single "no data" category. That said, we will clarify this limitation better in the main text to avoid any potential misunderstanding.

Figure 4: How is, e.g., the "Winter 1601" to be understood. Is this the winter 1600/1601 or the winter 1601/1602?

Winter 1601 refers to the winter between 1601 and 1602. We will clarify it.

Line 321: In the second half of the century, when the cooling was more pronounced, winters were reported as being extremely cold, 36 out of the 55 winters ..". This is a bit misleading- The second **half** of the century should not include more than 50 winters, right?

You are correct, the second half of the 17th century formally includes only 50 winters. Our reference was based on the Maunder Minimum period, which is commonly considered to have started around 1645. Therefore, the 55 winters mentioned refer to the interval 1645–1700, which slightly exceeds the calendar definition of "second half of the century." We will clarify this distinction in the revised manuscript to avoid any confusion.

Line 326: "the winter of 1645". Is this 1645/46?

Yes, it is 1645/1646.

Line 359: "In this century, 64 years, testimonies of these types of climatic phenomena were recorded." What does this mean?

We wanted to say that, in this century (17th), a total of 64 years were identified as being marked by the occurrence of cold or heat wave events.

Line 366: ".. anticyclones, most often united in winter," What does "United" mean in this context? Do you mean that different anticyclones merged?

Yes. We will explain this fact better in the main text.

Figure 9, caption: "b – famine and famine" ?

It supposed to be inflation and hunger. We will correct.

Figure 10: I cannot distinguish the colors for "warm spring" and "warm summer". The figure shows more a "comparison" than a "correlation". If you would indeed compute a correlation, it

would likely be small (e.g. 3 cold winters in the decade with lowest solar activity, but 4 in the decade with highest solar activity ?).

We will adjust the colour to be easier to distinguish. Regarding the correlation, we highlight not only the clear increase in the frequency of cold winters, for instance, between 1655 and 1665, all ten winters were reported as particularly cold, but also the rising number of accounts describing cold waves and exceptionally cold conditions during other seasons, especially during the transitional periods (spring and autumn).

Figure 11: The description of the comparison with proxy data is not very clear. If I understand it correctly, low δ^{18}O from Scărișoara Cave shall reflect cold winters (line 621: " a sharp decrease in winter temperature starting ~800 years ago, with a minimum during the MM and LIA, when δ^{18}O values reached their lowest levels"). However, according to Fig. 11 the lowest δ^{18}O values within the 17th century occurred **after** the MM – when the winters where **not** particularly cold. The absolute minimum occurs in 1619 – together with a warm winter.

As we also noted in the manuscript, the correlation between documentary evidence and the δ^{18}O proxy record from Scărișoara Cave is partial but not complete. This lack of full alignment may be explained by several factors. First, the ice from Scărișoara represents a mountain cave environment, which may not always reflect the same thermal signals captured in historical accounts originating from lowland or plains regions, often several hundred km away.

Second, local microclimatic conditions or regional topographic influences may result in discrepancies between the isotopic signal and broader-scale weather reports. Furthermore, some studies suggest that cave ice (and not only) can exhibit a delayed isotopic response to external climate forcing, which might help explain cases such as the low δ^{18}O value in 1619 coinciding with a reported warm winter.

Despite these limitations, the Scărișoara record remains the only available continuous winter temperature proxy for Transylvania, and while it may not perfectly match all historical testimonies, it still provides valuable large-scale climatic insight for the region. We will clarify these aspects further in the revised text.

Figure 12: Als the discussion related to this Fig. is not clear enough. First you report on δ^{18}O values from stalagmites – but you don't show the data.

The δ^{18}O values referenced in the text are derived from ice deposits in Scărișoara Cave, not from stalagmites. We did not include these values in the figure because they are already published and thoroughly discussed in the study by Perșoiu et al. (2017), which we cited in the manuscript. The complete dataset is publicly available in that publication and its associated supplementary materials.

Nevertheless, you find that "The data from these natural reconstructions fit perfectly with the data obtained in this study from historical documents", line 661). Then you jump to δ^{13}C data – without

explaining what they are supposed to tell us – which are actually shown in Fig. 12. If the "perfect fit" refers to this Fig. – I cannot see it. And how could there be a perfect fit, when the $\delta^{13}C$ data change only gradually, while the historic data show much higher variability.

To clarify, Figure 12 presents data from the OWDA (Old World Drought Atlas), which are tree-ring based reconstructions of precipitation variability. The figure shows the maximum, mean, and minimum values of reconstructed precipitation for the Transylvanian region, as extracted from the OWDA dataset. We will also add to the supplement the raw data used.

The reference to $\delta^{13}C$ was not intended to suggest a perfect year-to-year match with historical data. Rather, we aimed to highlight a general trend, particularly the increase in precipitation excess during the Maunder Minimum, especially in its later phase, a pattern that is supported both by the OWDA data and by the historical records.

We agree that $\delta^{13}C$ values generally change more gradually due to the nature of the proxy and the calibration method used. In contrast, the OWDA precipitation data have annual resolution, which naturally results in more pronounced interannual variability.

To avoid further confusion, we will revise the discussion in the manuscript to better distinguish between the different datasets used and the nature of the correlations being presented.

Line 734: I wonder if this "data availability statement" will be satisfactory for *Climate of the Past*.

The statement is wrong, considering that we included all the data we used in the supplement, the database is open access, and we are open to making it public. We will change the statement in the revised version of the manuscript.

Thank you very much once again, and we are looking forward to your answer!

All the best!