The preprint of the dataset paper primarily presents monthly $\delta^{18}O/\delta^{2}H$ / measurements from 22 precipitation stations and 19 rivers across Romania and Moldova from the period 2015–2017, while sharing temperature/precipitation/discharge data and local meteoric water lines. The main findings of the paper are that precipitation isotopes signal is split into three regions shaped by the Carpathians blocking moisture from different sources (Atlantic, Mediterranean, Siberian High- driven continental air).
The paper fits nicely into the scope of ESSD. However, before publication, the following issues have to addressed.
Thank you for the supportive assessment of our ms and the comments contributing that helped better convey our message. We have addressed these, see a point-by-point reply below.

**Major comments**
Title — Spatial and temporal variability of δ18O and δ2H in rivers and precipitation in Eastern Europe suggests the database covers E EU, while it is restricted to data from Moldova and Romania. Therefore I would suggest either of the two versions below:

- Spatial and temporal variability of δ18O and δ2H in rivers and precipitation from Eastern Europe
- Spatial and temporal variability of δ18O and δ2H in rivers and precipitation in an Eastern European subregion

Thank you for the comment, we have settled for the first suggestion.

**Conclusions** — The three-region spatial framework (west/south/east of the Carpathians) is presented as a conclusion but is never formally derived, mapped, or statistically supported in the Results. This would be a genuine contribution if substantiated — add a map and basic statistical support (even preliminary), or soften the framing.
**Discussion/Conclusions general** — The dataset is only 3 years / 36 monthly points per station. This is adequate for a first regional dataset but should be stated explicitly as a limitation on climatological interpretation, rather than left implicit.
It was not our intention (as this is a data-reporting paper) to go into detailed investigations of the links between $\delta^{18}O$ and $\delta^{2}H$ in precipitation and regional climate. The data and preliminary analysis points into the directions we are suggesting (and these are indeed currently investigated). We have changed the text accordingly:
"*The precipitation data show clear spatial trends, which we suggest are determined by the presence of the Carpathian Mountains acting as an orographic barrier. We identified three separate regions, with different characteristics of $\delta^{18}O$ and $\delta^{2}H$ in precipitation, likely linked to regional climatic influences [...] However, these observations are based on 3-years worth of data and subsequent studies should consider expanding both the temporal and spatial coverage.*"

**Line specific comments**
1. **L105–106, Table 2 ("Average discharge")** — Clarify whether the reported values are mean or maximum discharge, specify the reference period, and cite the data source.
We added the following information: "[…] *we also considered rivers with markedly different average discharges (Badea, 1983)* […]". Table 2 states that the discharge values are averages, and we added Badea (1983) as source. The same source does not state the reference period, though.

2. **Section 3.3 (L176–191)** — Well-documented QC, but spatial-consistency checking across neighboring stations (useful for catching database errors or validating extreme values) is missing. Suggest the IsoQC web tool (https://sapps.geochem.hu/isoqc/) as a possible addition.
Thank your for the comment. Our group is collaborating with the developers of the IsoQC tool on analyzing the spatial coherence of this (and other) data set for a different study. Some of the results could have been affected by post-depositional processes and we have made this clear in the text ("*Nevertheless, all data is reported in this paper but readers are asked to exercise caution when using such data.*").

3. **L182 vs. L186** — Internal inconsistency: L182 states d-excess was calculated "For precipitation samples," but L186 ("Measurement of river samples did not yield negative d- excess values") and Fig. 3b (river d-excess boxplots) confirm it was also computed for rivers. Revise the methods text.

Thank you for the observation. We modified the text to read "*For all precipitation and river samples, we calculated the deuterium-excess*"

4. **L195–196** — I do not recommend using GNIP meteorological data; also, the source of the Moldovan discharge data is not stated anywhere.
The meteorological data for the stations in Moldova were provided to GNIP by the Moldavian Authority for Meteorology and Environmental Monitoring; these are the "official" meteorological data and we used them as such.

5. **L206–207 vs. Section 5 (L317–319)** — Data availability is stated twice (in-text and in the dedicated section). Consolidate; per ESSD convention this belongs only in the Data availability section.
Done. The text in lines 206-207 has been modified to read: "*The main characteristics of the $\delta^{18}O$ and $\delta^{2}H$ in precipitation and rivers from this study are presented in Figs. 2 and 3 and further discussed below.*" Data availability is now only presented in the dedicated section.

6. **L241** — "Marginally lower" is vague. Quantify, and state whether the 5 stations where PWLSR slope < OLSR slope show any spatial pattern.
We rephrased the text to read: "*The Local Meteoric Water Lines (LMWL, Table 3) reflect both the seasonal and regional distribution of $\delta^{18}O$ and $\delta^{2}H$. In general, the slopes of the LMWL determined with the PWLSR method are higher (13 out of 19) than those determined with the OLSR method (with a few (5 out of 19) being lower), whereas the intercepts are slightly more variable, with 8 out of 19 being lower in the case of PWLSR method. However, the differences are not spatially consistent. Potentially, the differences indicate the role of sub-cloud evaporation of raindrops through the dry atmosphere in summer, as well as the depletion of precipitation in the heavy $^{18}O$ and $^{2}H$ isotopes during prolonged or intense rain events (mainly in summer).*"

7. **L247–249** — If LMWL slopes are genuinely lower in eastern/southern Romania and Moldova, discuss this against the pattern identified from GNIP stations across the temperate and boreal regions of Europe (Lécuyer et al., 2020, https://doi.org/10.1144/SP507-2020-6 ) or the pattern identified recently in modern precipitation across the Mediterranean Basin (Hatvani et al., 2023 10.1016/j.jhydrol.2022.128925).
Thank you for the suggestions, added.

8. **L251–253** — Could you present the altitude gradient for d2H as well? Isotopic altitude gradient is often calculated using only d18O, on the grounds that d18O and d2H are closely correlated; however, in many isotope hydrology calculations, it is useful to include d2H data in the calculation, and the empirical gradient value determined for this parameter is useful for that purpose. For further regional comparisons, see Kern et al., 2020. https://doi.org/10.3390/w12061797
Thank you for the suggestion, we have included the isotopic lapse rate for $\delta^{2}H$, as well.

9. **L276, Fig. 3b dashed lines** — The "lower by ~1‰" claim needs an explicit reference point (vs. precipitation mean?).
We have removed this line altogether, as we did not find it to be really useful (mixing all rivers in one "pool" is not as meaningful as we originally thought).

10. **L304–316** — The snow-decline/heatwave narrative draws entirely on external trend studies (Birsan, Amihăesei, Micu), not on trends demonstrated within this 3-year dataset. Flag explicitly as literature-based inference, not a finding of this study.
Correctly put. We have modified the text by removing links between climate change and the stable isotopic composition of rivers and added a line calling for longer monitoring periods. The text now reads:
*"The study area is experiencing rising air temperatures (Birsan et al., 2019, 2025), increases in frequency of convective precipitation (Manea et al., 2016) and a marked decline in snow cover duration and persistence, particularly below 1,000-1,500 m asl (Micu et al., 2021; Birsan et al., 2024) and these together could lead to a potential reduction of buffering role of seasonal snowmelt on river discharge. As shown by Amihăesei et al. (2024), the shortening and upward shift of the snow season enhances the relative contribution of rainfall and*

*recycled moisture over snowmelt in lowland rivers. In addition, Mediterranean cyclones, historically responsible for up to ~50% of cold-season snowfall over Romania, show a declining contribution to snowfall in recent decades, particularly in late winter and spring, reinforcing reduced snow storage and a shift toward rainfall-dominated runoff (Amihaesei et al., 2026). However, long-term monitoring data is required to observe this recorded by the stable isotopic composition of river waters"*

**Tables and Figures Table 1 / L113** — Mark which precipitation stations belong to the GNIP network (5 Moldovan stations use GNIP data; unclear if any Romanian stations overlap).
Done.

**Table 2** — Mark whether any river stations are part of the GNIR network (Halder et al., 2015, already cited in the Introduction).
The stations are not yet officially part of GNIR (we will submit data after publication).

**Table 3,**
**L199–200,**— LMWLs use 2012–2017 data; confirm whether all stations meet the 48-month minimum-record criterion recommended by Putnam et al. (2019) for reliable LMWL fitting, and add a column with *n* (data pairs) per station in Table 3, flagging any that fall short.
We have added a new column with the number of data points used for the calculations of the LMWL characteristics and modified the caption accordingly. However, we do not wish to reinforce the recommendations of Putnam et al. (2019) for a minimum threshold for the number of months used for determining LMWLs, as we consider that the number of years is more important than that of months (for example, at stations where no monthly precipitation is recorded during dry seasons). Other groups recommend a minimum of 3 years, others 5 years and so on.

**L240–249** — The OLSR vs. PWLSR slope/intercept comparison ("higher in 13/19 stations") has no accompanying significance or uncertainty assessment; check whether differences fall within the reported ± errors before framing them as a real effect.
No, indeed. We did not attempt to make a complete assessment, we just pointed out these small differences, for the potential usage of other groups testing in detail the benefits of using either one or the other of the two methods. In general, PWLSR is better in regions with intensive evaporative conditions, but in more humid regions, the differences are small enough so that either of the two could be used (especially when precipitation amount is not always available)

**Fig. 1 caption** — "dark green" is imprecise; the catchments are simply left unshaded/undimmed against the background.
Corrected. Also the figure was redrawn for better visualization (see below).

**L85 / Fig. 1** — Indicate the extent of the Carpathian range directly on the map.
Done.

**Fig. 2 caption** — Additional description needed what do the dots, the horizontal lines represent, what does the box show... etc. E.g. "Two upright lines represent the data within the 1.5 IQR. The data between 1.5 times the IQR are indicated with an asterisk (outliers) (Kovács et al., 2012). Kovács, J., Tanos, P., Korponai, J., Kovácsné Székely, I., Gondár, K., Gondár-Sőregi, K., Hatvani, I.G., 2012. Analysis of water quality data for scientists. In: Voudouris, Kostas, Voutsa, D. (Eds.), Water Quality Monitoring and Assessment. InTech, pp. 65–94. https://doi.org/10.5772/32173.
We added explanations for the box-plot figures (we did not do it initially, as these are quite well-known, no need to explain them). The caption now reads:
*Figure 2. Boxplots of δ18O in precipitation (a) and rivers (b) in Romania and the Republic of Moldova. The boxes encompass the 1st (25th percentile) and 3rd (75 percentile) quartiles, the middle line indicates the median values, the vertical bars above and below the boxes show the 1.5 interquartile range and the asterisks indicate*

*outliers.*

**L208–209 vs. Fig. 2a** — Text states Tg. Secuiesc and Rarău have the lowest δ18O minima, but the boxplot appears to show the lowest value under Leaova. Verify against the underlying data.
Nicely spotted, thank you! In January 2017, a severe cold spell affected the eastern half of Europe and several stations recorded very (record) low δ values. We have added a brief text (see below) on this to the main text.
*"An outlying value of -22.1 ‰ for $\delta^{18}O$ was registered in January 2017 at Bravicea (Moldova), linked to a severe outbreak of northeasterly cold winds that affected Eastern Europe. The cold wave also affected other stations in our stud area, which registered record low $\delta^{18}O$ and $\delta^{2}H$ values (e.g., Bălți, Cahul, Chișinpu, Leaova, DTS, Tg Secuiesc, Doicești). All these low values occurred out stations located east and south of the Carpathian Mts., indicating a potentially blocking role of these mountains against northeasterly outbreaks of cold air."*

**L227, Fig. 3/Fig. 4** — The claim that autumnal d-excess maxima are higher in SW Romania is hard to verify from the current heatmap (Fig. 4). Add a map panel or plot the autumnal d-excess spatially.
Thank you for the suggestion. We tried with maps, using different interpolation methods, but due to the uneven distribution of stations (especially vertically) the results are very confusing, to the point of total irrelevance. We color codded (in red) stations in SW Romania and explained this in the caption, which now reads:
*"Figure 4. D-excess in precipitation at stations in Romania and Republic of Moldova. Stations in SW Romania (CV, DTS and TM) are shown in red and the autumn months are highlighted in black boxes. The bottom bar shows the range of d-excess values, between 0.32 and 21.7 ‰."*

**Fig. 4** — Needs a color scale/legend; station codes (BM, BN, BZ...) are undefined — cross- reference them in Table 1.
Done, see above.

**Fig. 6 caption, L300–302** — Increase axis-title/label font size; use a uniform y-axis scale across panels a–c for cross-panel comparability.
We modified the figure. However, we kept the bottom three panels (j-l) on a different δ2H scale because the minimum values are lower for these three stations. Putting similarly low scales on the top nine panels would have resulted in awkwardly skewed figures. We made clear in the caption the different scale for the lower 3 panels, by adding this line: *"The vertical axes in panels j, k and l are longer (between 0 and -200 ‰, compared to 0-160 for the upper nine panels)."*

**References**
**L55–56** — Holko et al. (2012) covers Central Europe and Vystavna et al. (2018) Eastern Europe, not SE Europe specifically. Replace with region-appropriate citations: Fórizs et al. (2025, *Central European Geology* 68(1), doi:10.1556/24.2025.00146 — Hungary) and Gjeshovska et al. (2026, doi:10.3390/w18151861 – Macedonia)
Thank you, we have added the suggested references.

**L129–131** — Add a reference supporting the claim that algal film alters 18O/16O and 2H/1H ratios.
These are our preliminary experimental observations. We do not have the final results published, yet, so we have removed the text.

**References, ~L478–479** — Rozanski et al. (1992) is listed as *J. Geophys. Res.* 78, 1–36, but the DOI (10.1029/gm078p0001) belongs to the AGU Geophysical Monograph Series vol. 78, not JGR. Correct the journal/series name.
Corrected.

Forray et al. (2024) DOI is broken: "https://soi.org/..." should read "https://doi.org/...".
Corrected.

**Minor comments**
- **L27, L341** — "asses" → "assess" (occurs twice: abstract and conclusions).

- **L29** — "long times series" → "long time-series." or “long-term data”
- **L176** — "was" → "were" ("data... were analyzed").
- **L220** — Insert "values": "...δ18O and δ2H values are much lower..."
- **L273–275** — A supporting reference for the evaporative-enrichment interpretation would strengthen this sentence.
- **L327** — Insert "signature": "...hence the δ18O and δ2H signature of precipitation."
- **L48** — Inconsistent punctuation: "Masse-Dufresne et al.; 2021, Vystavna et al., 2021" — normalize citation formatting.

Thank you, we have addressed all these (and other typos) comments.