

Replies to RC1: Heye Bogena, 08 Apr 2026

The authors have addressed all of my previous comments thoroughly, and both the content and overall structure of the manuscript have been significantly improved. The paper is now clearer, easier to follow, and I enjoyed reading it.

I have only a few minor comments that, if addressed, could further enhance the clarity of the manuscript. Overall, I believe the manuscript is now close to being suitable for publication.

We would like to thank Heye Bogena for the positive feedback on our revised manuscript. Please find below our replies to the remaining minor comments in blue.

L11: You are mixing the terms “volumetric water content (VWC)” and ‘soil moisture’, which may be confusing. I recommend using either ‘soil moisture’ or ‘volumetric water content (VWC)’ consistently throughout the manuscript.

We use the general term “soil moisture” to refer to both the volumetric and the integrated soil water content. These latter technical terms are used when describing the provided data.

L19: ‘in situ’ should be written in italics, here and elsewhere.

According to the [journal guidelines](#), “Common Latin phrases are not italicized (for example, et al., cf., e.g., a priori, in situ, bremsstrahlung, and eigenvalue).”

L69: Change to ‘This data paper presents and documents the SwissSMEX long-term ...’

The sentence has been changed accordingly.

L75: Change to ‘Figure 1. Locations of the SwissSMEX stations on the Swiss Plateau, along with the nearest grid cells of ERA5-Land and C3S SM PASSIVE (see Sect. 2.2). Station abbreviations are provided in Table 1.’

The figure caption has been changed accordingly.

L102: Change to ‘had ceased to function since their installation between 2008 and 2010’

The sentence has been changed accordingly.

L331: Please use the present tense consistently, i.e. ‘present’ here.

We changed the tense in this section to present, in agreement with the rest of the manuscript.

L334: I suggest using the term ‘root-zone water availability’ throughout the manuscript.

In distinction to volumetric soil water content, we prefer to use the term integrated soil water content in this data paper.

Replies to RC2: Matthias Zink, 22 May 2026

With great interest I read through the revisions of the re-submitted manuscript of Hirschli et al. My major points of criticism were addressed satisfactory: The storyline of the manuscript has

been streamlined and shortened including refactoring of the results, discussion and summary & conclusions sections. Maths for the major calculations as well as software packages used have been added which helps reproducibility. An overview figure has been added and the figure captions have been streamlined with the text. The metadata have been made machine readable and a lookup table for the stations and their nomenclature was added.

After some minor rather technical corrections I recommend to publish the manuscript in Earth System Science Data.

We would like to thank Matthias Zink for the positive feedback on our revised manuscript. Please find below our replies to the remaining comments in blue.

Minor issues:

L37 & L40: Can you please add a reference for your statements?

These statements are based on S22, which is referenced already. We slightly rephrased this paragraph of the introduction and changed the tense to past to clearly indicate that this is based on S22.

L153: Is there a minimum number of observations for the overlap period. If this period is too short an e.g. in drought conditions your correction method may be biased.

The minimum overlap is 54 days at the station CHM (cf. Figure 4). And as mentioned, there is no overlap at BAS and WYN, where instead all time steps are used to calculate the scaling parameters.

L182 Table 1 -> Figure 1

Thanks for spotting. This has been changed accordingly.

L198 Table 1 -> Figure 1

Has been changed accordingly.

L219 I guess you mean 2010-2025 instead of 2010-2022

2010–2022 is correct, since this refers to the historical period before the addition and replacement of new TDR sensors. We added “historical” to make this clearer.

L210 & caption Fig 6: Why do you restrict the calculation of the mean for deriving the anomalies to 2010-2020. I strongly recommend to use the entire dataset length 2010-2025 for deriving the mean. I guess it won't make a huge difference to the analysis but using the whole observational period is mathematically correct for standardization/z-score/anomalies. It might make sense to define anomalies as some people understand anomalies as $x_anomaly = (x - \mu_x) / \sigma_x$ (μ being mean and σ being standard deviation).

We added the formulas for the calculation of the summer anomalies in Section 2.3.

To demonstrate the utility of the SwissSMEX data, it is applied to investigate the temporal evolution and drying trends in mean summer (June to August, JJA) and summer-half-year (April to September, AMJJAS) soil moisture anomalies. Calculated based on the daily IWC time series (i.e. the merged IWC_{orig} and $IWC_{TDReonly_corrected}$; see Sect. 2.1.2), the anomalies are expressed as absolute or percentage deviations from the corresponding summer (Eq. 6a,b) or summer-half-year mean for 2010–2025 (i.e. in mm or % relative to the 2010–2025 mean, respectively).

$$IWC_{mm_anomaly} \text{ (in mm)} = (IWC_{JJA} - \overline{IWC_{JJA}}) \quad (6a)$$

$$IWC_{\%_anomaly} \text{ (in \%)} = \frac{IWC_{JJA} - \overline{IWC_{JJA}}}{\overline{IWC_{JJA}}} * 100 \quad (6b)$$

IWC_{JJA} are the annual mean summer values calculated from the daily IWC time series, and the overbar denotes the temporal average over 2010–2025. The summer-half-year anomalies are calculated analogously. Note that the percentage anomalies

In addition, the reference period for the anomaly calculation has been changed from 2010–2020 to 2010–2025. This results in slight changes to the comparison statistics and trends because the associated shift in the anomaly time series differs among the stations that form the basis of the Swiss Plateau median time series. This applies to both the in situ data and the corresponding gridded products. Figures, tables and numbers in the text have been updated accordingly. Note that the previously significant summer drying trend in C3S SM PASSIVE is now also non-significant over the 2010–2025 period for the absolute anomalies, in line with the other products.

L258: Please replace “evident” with “noticeable” or “indisputable”. Evident has a too strong meaning given the trends are all not significant.

This has been changed to “noticeable”.

L349: A better formulation could be: The non-significant drying trend over the period 2010–2025,

This has been changed accordingly, also in the Abstract.