Referee #2

Dear Reviewer,

Thank you for your careful review of our manuscript. Your comments are greatly appreciated and we think this new version of the manuscript responds to your concerns and provides an interesting contribution to the study of forecast extreme September-to-November rainfall events. Below, each comment was addressed separately in a concise manner, with the Referee's comment in *italic*, and Authors comment in **bold**. Proposed changes and additions are highlighted in **red** in the updated manuscript and <u>underlined</u> here.

Specific comments

4. Please check units in Fig. 4. If this is a regression map, the time-series index used (DMI in this case) is standardised and therefore has no units. The resulting regression units are mm/day. Otherwise, if the index is not standardised, the map shown is a covariance map, not a regression map. If that is the case, the units are indeed mm/day/^{o}C but the figure caption needs to be changed.

<u>Authors:</u> **We thank the reviewer for drawing our attention to this point. Since the expected analysis is based on regression, we normalized the DMI by its variance. The changes specifically associated with this analysis have been incorporated into the revised manuscript. We note that there were no changes in the overall pattern of the results.**

12. Line 203: "From November 2022 onwards, the updated version SEAS5.1 is used". This statement might be misleading because the reader may understand that the data from 1981-2021 is from SEAS5 and from 2022 is from SEAS5.1. I recommend rewriting it so that it is clear that all the data used in the study is from SEAS5.1.

<u>Authors:</u> **We thank the reviewer for drawing our attention to this point. The changes have been incorporated in the revised manuscript. Please see the Section 2.1.**

13. In the Methods subsection, the authors indicate that the horizontal resolution from SEAS5.1 data is 1o. Please indicate that this is the resolution available from the Copernicus CDS, because the model's native grid for the atmospheric component of SEAS5 has a spectral resolution of TCo319 (which is of about 36 km). The model analysis is an important part of this study, so it would be worth devoting just a few lines in the Data subsection to introducing the SEAS5 model: the different model components (atmosphere, ocean and land surface) and where do the initial conditions come from.

Authors: We thank the reviewer for drawing our attention to this point. We added that this is a resolution specific to the Copernicus Climate Data Store library. We agree with the reviewer regarding the presentation of the model. However, we indicated above (in section 2.1) that information concerning the ECMWF's fifth generation seasonal forecast system can be found in Johnson et al. (2019).

All the seasonal forecast data used in this study are from SEAS5.1. Although SEAS5.1 replaced SEAS5 operationally in November 2022, the full dataset analyzed here (including the 1981–2021 period) corresponds to the reprocessed SEAS5.1 version. SEAS5.1 differs from the original SEAS5 mainly through the adoption of a new interpolation tool and a revised 1° grid (in the Copernicus Climate Data Store portal) with half-degree–centred latitude/longitude points, ensuring consistency with other Copernicus Climate Change Service seasonal forecast systems.

14. *The discussion of Fig. 12 is very descriptive and, in my opinion, lacks a bit of discussion. I think it is worth discussing what these differences could signify in terms of forecast skill. In particular: could the differences in the westward/eastward extension of the zonal moisture flux and wind anomalies explain why SEAS5 lacks skill in particular regions? This would also further improve the comprehensiveness of the manuscript, as it links the analysis of mechanisms with the preceding analysis of forecast skill.*

Authors: We thank the reviewer for drawing our attention to this point. The changes have been incorporated in the revised manuscript. Please see the comments of Figure 12.

In particular, the differences in the westward/eastward structure of the zonal moisture flux and associated wind anomalies appear to be dynamically consistent with the spatial distribution of forecast skill discussed in the previous section. At L1 (Fig. 12g–i), the southward displacement of the AEJ-N core (around 5°N instead of 10°N as in observations and L0) is associated with enhanced mid-tropospheric divergence and a reduction of the observed moisture convergence over western EA. In addition, the absence of the AEJ-S in both the climatology and composites suggests that the model fails to properly represent the meridional coupling between the two AEJ branches that modulates moisture convergence during SY and WY events. These circulation biases likely affect the zonal moisture transport between 10°E and 30°E, altering the westward/eastward extension of moisture flux anomalies. As a consequence, the model may misplace or weaken the mid-

tropospheric convergence zone that is dynamically linked to wet conditions over western EA. This displacement and structural bias provide a plausible dynamical explanation for the reduced forecast skill identified in specific regions, particularly where the model underestimates moisture convergence anomalies.