Figure 8 caption. Please, explain it better, what is delta_m?

Why is the irrigation applied during the day hours? I thought irrigation is politically regulated with a rotational supply in predetermined areas equipped for irrigation that is not completely irrigated in reality. Second, in our experiments, we keep the irrigation effects. And therefore, it might overestimate irrigation effects. First, our irrigated fraction is based on the names of the analysis regions in capital letters, since these are rather names than abbreviations and are defined in Figs. 3.

To be able to make the feedback a longer experiment and convection-permitting resolution are needed. Convective precipitation genesis depends on multiple, interconnected factors such as atmospheric stability, moisture content, temperature profiles, and wind patterns. The climatology and surrounding meteorological conditions are further influencing factors, which drive the development of irrigation effects. Our region is characterized by a Mediterranean climate as well as showing influences from the Alps, whereas Nebraska shows a continental climate. These regional differences are also shown eg. in Thierry et al. 2017, Llobet et al. 2009.

During the initialization, there is no irrigation carried out. The irrigation is only applied after the hydrological processes of the soil from the previous time step (t-1). In this way, the irrigation processes are propagated from step to step, which are strongly influenced by the soil moisture content in the soil and in the atmosphere of the same time step (t). In whole text, eg., line 179: threshold (irrh), line 128: maximum water-holding capacity (wsmx), line 119: land surface parameters (LSP).

The initialization of the model is explained in section 4.1 Experiment setup and in 5 Discussion. We improved our text and pointed out the advantages.

The "adaptive irrigation" is also based on a prescribed soil moisture target and a prescribed, limited irrigation time. Again, for each grid cell, the water amount is calculated that is necessary to reach the soil moisture target. The water amount added every time step follows a relaxation approach (Eq. 1), which simulates the increase of soil moisture during the time steps of irrigation and simultaneously, considers the changes of soil moisture not related to irrigation. Further, our relaxation approach takes into account the number of irrigation time steps remaining. Using this approach the soil moisture increases until the irrigation target is exactly reached during the prescribed irrigation time.

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Despite the request by the handling topical editor regarding this issue, we do not accept this. You must publish the code of the new developments to the atmosphere through land-atmosphere interactions, in particular through fluxes.

Referring to Fig. 16c, we show only specific dates of the simulations. For the 05/08 precipitation increase through irrigation, for the 05/08 decrease and for the 07/08 showing no effect for our analysis region IT during the heat wave. As showing also in Fig. 12, the effects of irrigation on precipitation are not clear in our simulations. For the 06/08 we can only give a hypothesis. Irrigation does not only increase the moisture in the soil and atmosphere, through changes in the temperature it has the potential also to affect the wind conditions. Analysing limiting areas gives the option, that the increased humidity from the evapotranspiration in the irrigated simulation could have been advected to adjacent regions causing a decrease of precipitation. Another explanation could be that the cooler surface temperature through irrigation lead to less convective processes above the irrigated areas. In the end, precipitation-irrigation effects are more complex than eg. irrigation-temperature effect and require a different experiment setting as we pointed out also to the comment of Jozsef Szilagyi.

We added these hypotheses in our text.

Thank you for pointing out the uncertainty. We improved the captions for all figures showing irrigation effects.

Thank you for your suggestion. Less thick was not possible, but we selected another marker and changed the color and transparency for the outliers. In addition we increased the line width of the box and whiskers to make clear what is important. We believe, these changes improved the readability of the diagram.

New Fig. 11b and e)

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New Fig. 11b and e)
<table>
<thead>
<tr>
<th>line</th>
<th>Authors</th>
<th>comment from</th>
<th>author's response</th>
<th>author's changes in manuscript (in bold) with line number in revised version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1 caption</td>
<td>Authors</td>
<td>Caption of Fig. 1 is not clear enough.</td>
<td>We improved the caption of Fig. 1 and made clear that the two bars show one example grid cell without the irrigation parameterization and one with the irrigation parameterization.</td>
<td></td>
</tr>
<tr>
<td>309</td>
<td>Authors</td>
<td>In Bjorneberg, we found the number of irrigation hours specifically for channel irrigation with 12-24 h, and not as we stated 6-12 h.</td>
<td>We corrected this mistake and verified the numbers with another source.</td>
<td>line 231: Following Bjorneberg (2013) and Zucaro (2014) channel irrigation is performed for up to 24 hours depending on the channel width and length, we chose 10 h irrigation time for our experiment.</td>
</tr>
<tr>
<td>122</td>
<td>Authors</td>
<td>We found a mistake in the definition of fast drainage in REMO2020-iMOVE. Fast drainage occurs from 90 %.</td>
<td>We corrected it in the text.</td>
<td>line 122: Drainage occurs for soil moisture larger than 5 % of wsm. Between 5 % and 90 % of wsm, drainage is slow. If the soil moisture is larger than 90 % of wsm, the drainage is fast (Kotlarski, 2007).</td>
</tr>
<tr>
<td>511</td>
<td>Authors</td>
<td>The dissertation on a 5-layer scheme for REMO was recently published.</td>
<td>Therefore, we adjusted the information about it in the text and used it as reference.</td>
<td>line 528: For the future, for irrigation studies, we recommend the representation of the soil hydrology with a multiple layer scheme as for WRF (Valmassoi et al., 2019) or CLM (Lawrence et al., 2019; Ozdogan et al., 2010) if already exists, and which was currently developed for REMO2015 (Abel, 2023).</td>
</tr>
<tr>
<td>512</td>
<td>Authors</td>
<td>Rai et al. did not use the 5-layer scheme, they used REMO2015-iMOVE.</td>
<td>We added Rai et al. 2022 to a better fitting place.</td>
<td></td>
</tr>
<tr>
<td>106, 617</td>
<td>Authors</td>
<td>Hoffmann et al. was published recently published.</td>
<td>We added the correct reference of the published paper version (before it was referred to the preprint).</td>
<td>line 106: For this experiment, the definition and distribution of PFTs are based on the land cover maps of the European Space Agency Climate Change Initiative (ESA-CCI) (Reinhart et al., 2022; Hoffmann et al., 2023). line 654: Hoffmann, P., Reinhart, V., Rechid, D., de Noblet-Ducoudré, N., Davit, E. L., Asmus, C., Bechtel, B., Bühner, J., Katragkou, E., and Luyssaert, S.: High-resolution land use and land cover dataset for regional climate modeling: historical and future changes in Europe, Earth System Science Data, 15, 3819–3852, 2023.</td>
</tr>
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</table>