Dear Editor,

Thank you for your careful review. Below we reply to your final comments. In addition to these revisions, we fixed an error in the Abstract, where “2.1%” was not yet replaced by “1.5%” in the previous revision.

We hope the manuscript is now ready for publication and we look forward to your positive assessment.

On behalf of all authors,

Kind regards,

Arie Staal

* Line 227, " implying that long-term climate variability in NorESM2 does not affect our main outcomes." should probably be "implying that internal variability in NorESM2 does not affect our main outcomes at the global scale."

Thank you for spotting this, we adjusted as suggested.

* Thinking along these lines, Figure A7 is a good addition to check whether 10 year periods are sufficient to robustly sample forced climatic changes, rather than random changes due to internal variability. However, you performed this analysis at the global scale, where averaging has substantially improved signal-to-noise. Please assess if the grid point-based analyses and river basin-based analyses are equally robust, for all SSPs.

This is a good point, so we analyzed the terrestrial precipitation recycling ratios of the 26 major river basins in the same way as we did for the global land area. We find that the robust patterns between 10- and 30-year time slices that we found for the global land are also present in all of these river basins. Below, in Figures R1-R4, we paste a few examples of major river basins at different continents: the Amazon, Congo, Mississippi and Yangtze basins. We decided, however, not to include these additional figures in the supplement of the paper itself, to limit the figures to the most essential ones. Thank you in advance for your understanding.

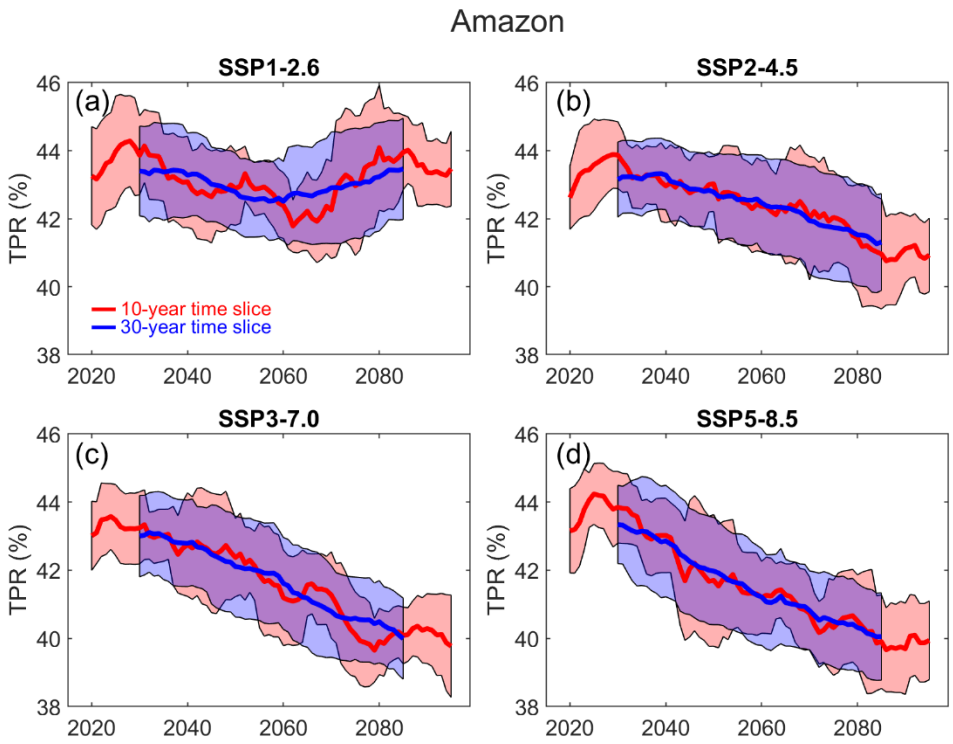

Figure R1: Moving averages of the global terrestrial precipitation recycling ratio (TPR, in %) ± one standard deviation for ten-year time slices (in red) and 30-year time slices (in blue) in the Amazon basin, for (a) SSP1-2.6, (b) SSP2-4.5, (c) SSP3-7.0, and (d) SSP5-8.5.

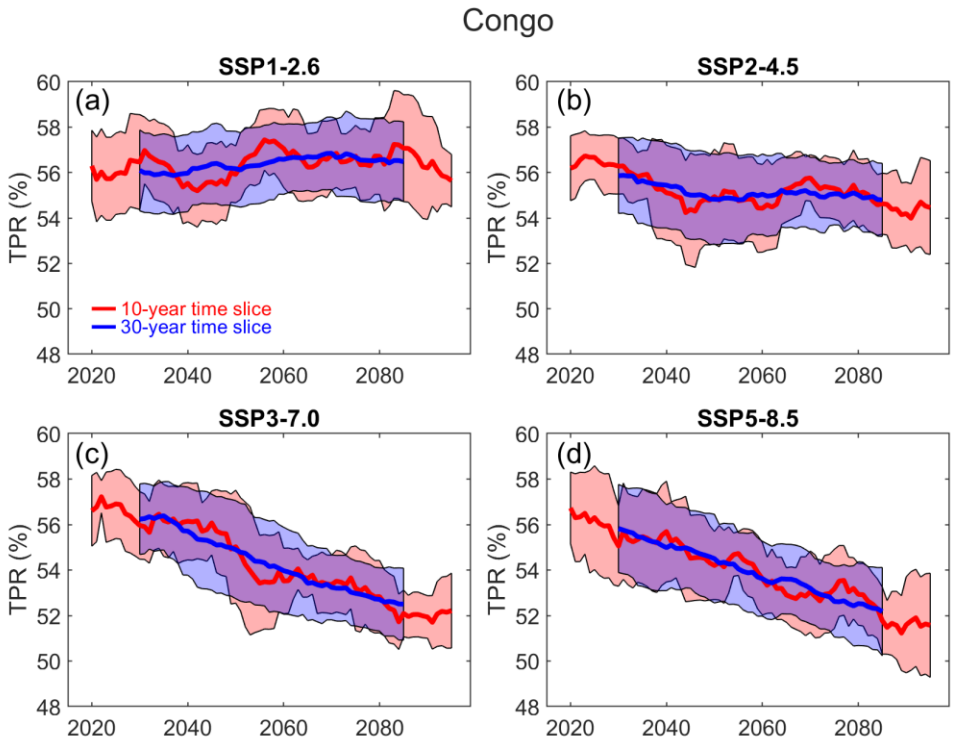

Figure R2: Moving averages of the global terrestrial precipitation recycling ratio (TPR, in %) ± one standard deviation for ten-year time slices (in red) and 30-year time slices (in blue) in the Congo basin, for (a) SSP1-2.6, (b) SSP2-4.5, (c) SSP3-7.0, and (d) SSP5-8.5.

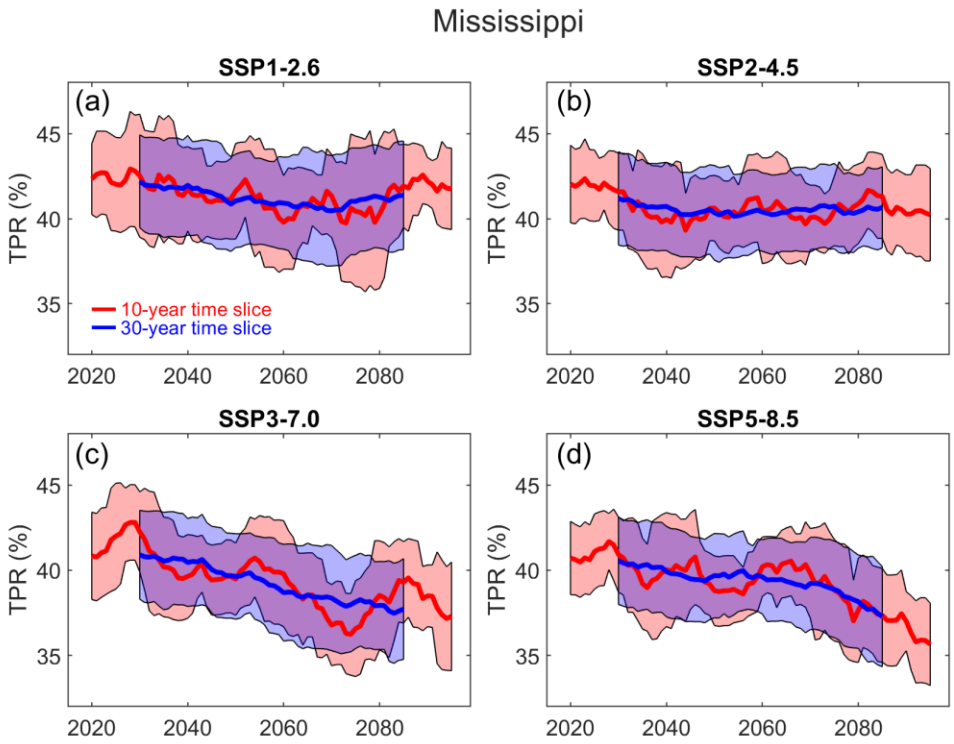

Figure R3: Moving averages of the global terrestrial precipitation recycling ratio (TPR, in %) ± one standard deviation for ten-year time slices (in red) and 30-year time slices (in blue) in the Mississippi basin, for (a) SSP1-2.6, (b) SSP2-4.5, (c) SSP3-7.0, and (d) SSP5-8.5.

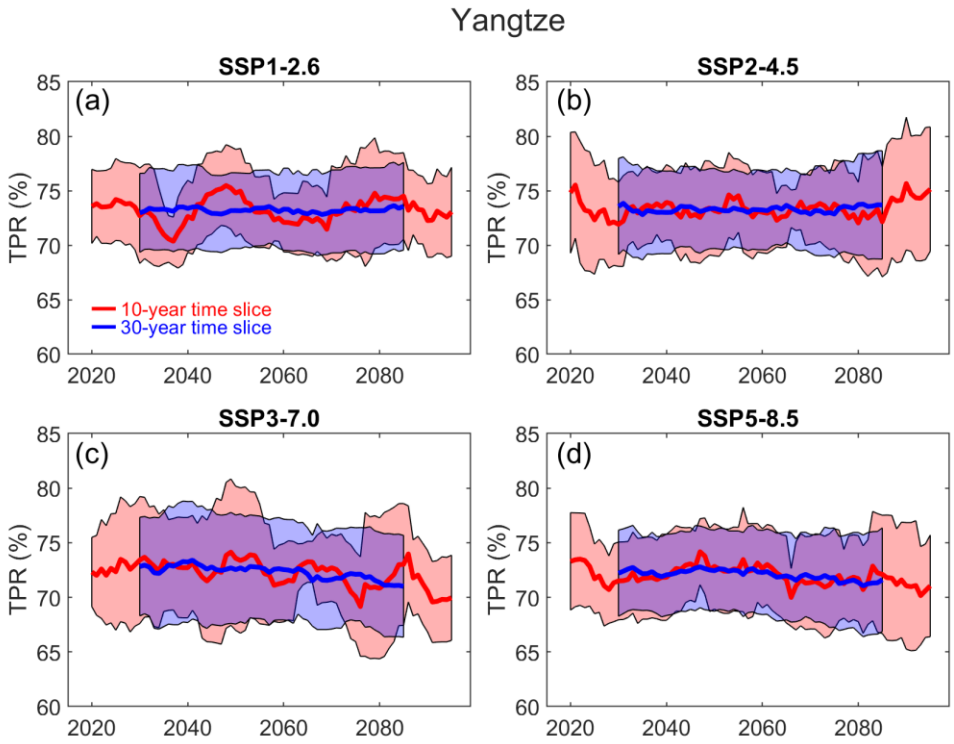

Figure R4: Moving averages of the global terrestrial precipitation recycling ratio (TPR, in %) ± one standard deviation for ten-year time slices (in red) and 30-year time slices (in blue) in the Yangtze basin, for (a) SSP1-2.6, (b) SSP2-4.5, (c) SSP3-7.0, and (d) SSP5-8.5.

* Figure 2- units along side the colour bar should be % or %-point I think.

Thank you for spotting this. We fixed this error (without applying tracked changes).

* In the discussion you state, line 631: "Three ensemble members of historical runs gave around 0.1 °C difference in global temperature on a yearly basis (Seland et al., 2020)." I don't believe this is true, ENSO variations in these runs should lead to much larger difference at yearly timescales.

We removed this sentence so the text that was added in the previous revision now reads: “Furthermore, the model generates internal climate variability. Ensemble runs allow for the separation of internal climate variability from the forced climatic signal. In the future, different ensemble members can be used to force UTrack, so the signal and noise in precipitation recycling can be separated, even though it is unlikely that the global trends and patterns would be affected by different ensemble members.”