2nd review for "Future changes in the mean and variability of extreme rainfall indices over the Guinea Coast and role of the Atlantic equatorial mode" by Worou et al.

Overview

I commend the authors on a vastly improved iteration of their manuscript. From my side, the authors have satisfactorily answered and addressed all my concerns, the paper is close to a publishable state in my view. There are only a few very minor points left.

General comments/questions

- Even though the paper focuses on extreme rainfall, I think the pronounced mismatch between models and observations in CWD and FRQW (Fig. 1 e+f) deserves a bit more discussion. Clearly, there is a bimodal imprint in the observational data from the Guinea Coast region, which the models are just unable to resolve for present day scenarios. And this may or may not be of relevance for the characteristics of future daily rainfall, perhaps rather more so for multi-day precipitation extremes.

  Figure R2.1 indicates that there are some models which present a bi-modal structure for the FRQW under present-day conditions (e.g. GFDL-ESM4, IPSL-CM6A-LR, MIROC6, NorESM2-LM and NorESM2-MM). These models keep the bimodality structure for the long-term future period. On the other hand, CanESM5 shows no bimodal structure in the FRQW under the present-day climate situation, while in the long-term future, the bimodality structure appears, due to a substantial decrease in the projected boreal summer FRQW values. The other GCMs conserve their annual cycle structures in both climates.

  Overall, there is no clear relation between the biases in the FRQW index and the projected long-term changes in FRQW (Fig. R2.2).

  The reviewer wonders if the biases in the FRQW could be relevant to the projected changes in the multi-day precipitation extremes. Considering the maximum rainfall over five consecutive days (Rx5day), we found no clear relationship between the biases in FRQW and the projected changes in Rx5day over Guinea Coast, during the boreal summer (Fig. R2.3).

  A similar result is obtained when we consider the link between the biases in the CWD index and the projected changes in the CWD and Rx5day indices (Fig. R2.4).

  We added the following sentence in the revised manuscript: "Noteworthy, we found no clear linkages between the JAS CWD and FRQW biases and the JAS long-term projected mean changes in the extreme rainfall indices (not shown)."
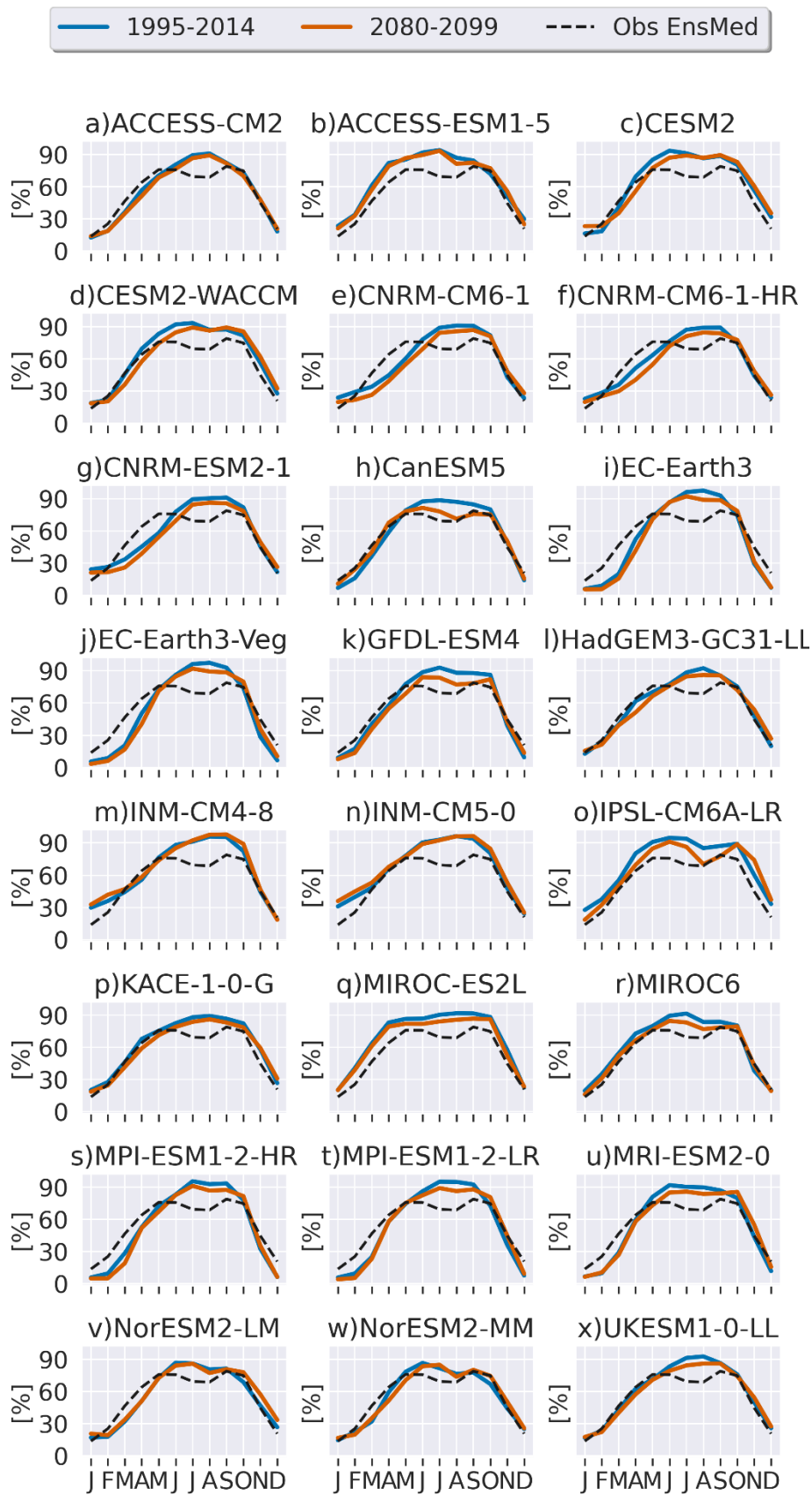
Figure R2. 1 Annual cycle of the FRQW index averaged over the Guinea Coast, for the 1995-2014 (blue curves) and 2080-2099 (orange curves) periods, and for the 24 GCMs. Observations ensemble median is also indicated in dashed lines for the 1995-2014 period.
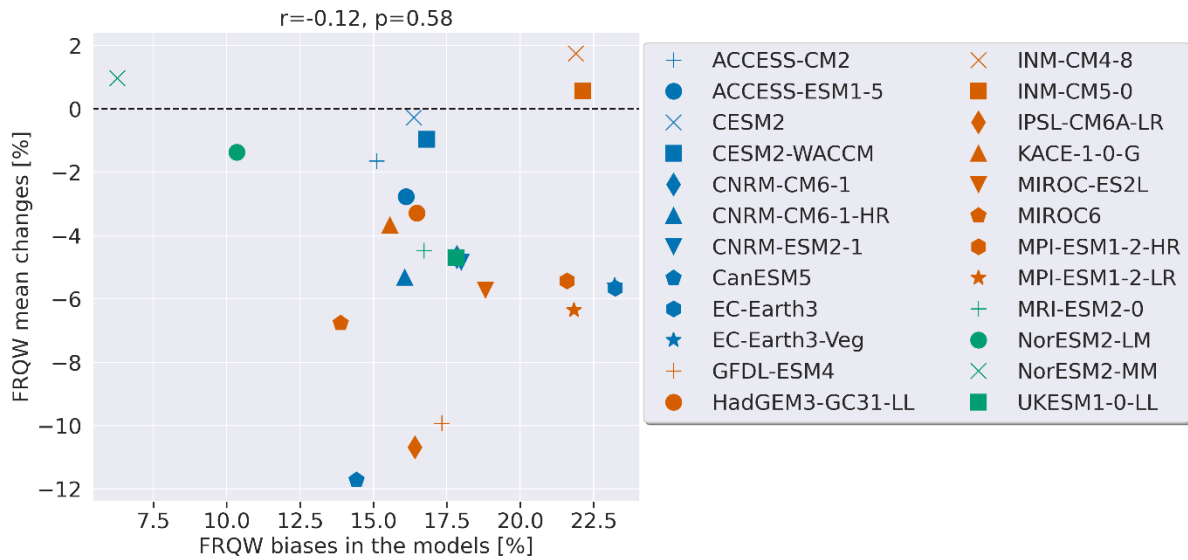
Figure R2. 2 Link between the FRQW biases (model minus the observations EnsMedian) and the FRQW long-term changes (2080-2099 minus 1995-2014) over Guinea Coast during July-September. Biases and changes are computed at a monthly level before being averaged over July-September.
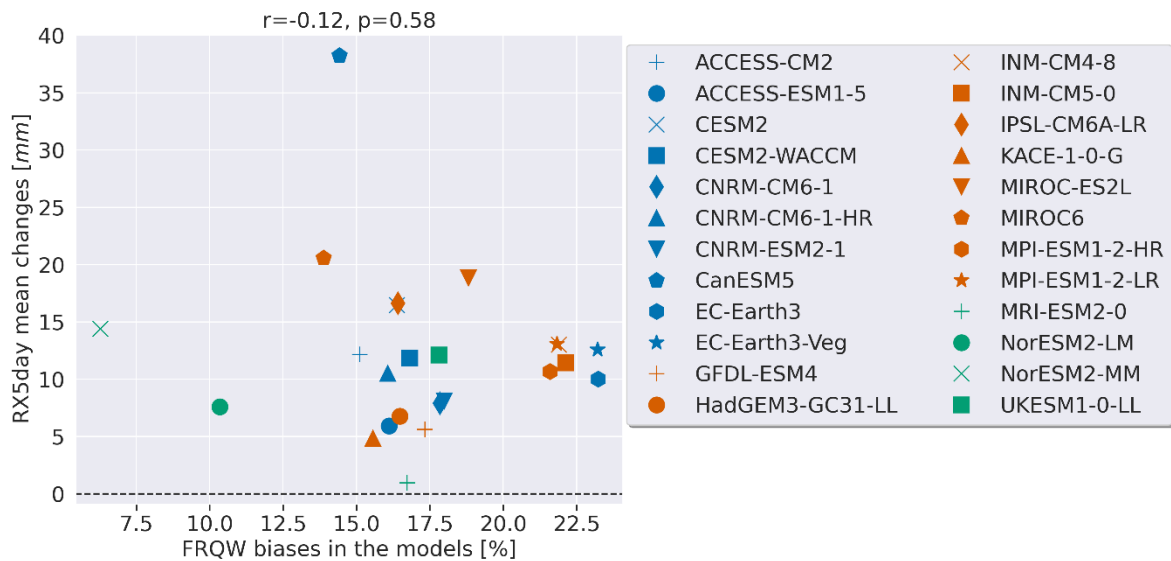

Figure R2. 3 Link between the FRQW biases (model minus the observations EnsMedian) and the long-term changes (2080-2099 minus 1995-2014) in the RX5day over the Guinea Coast. Biases and changes are computed at a monthly level and averaged over July-September.

Figure R2. 4 Link between the CWD biases (model minus the observations EnsMedian) and the long-term changes (2080-2099 minus 1995-2014) in the RX5day over the Guinea Coast. Biases and changes are computed at a monthly level and averaged over July-September.
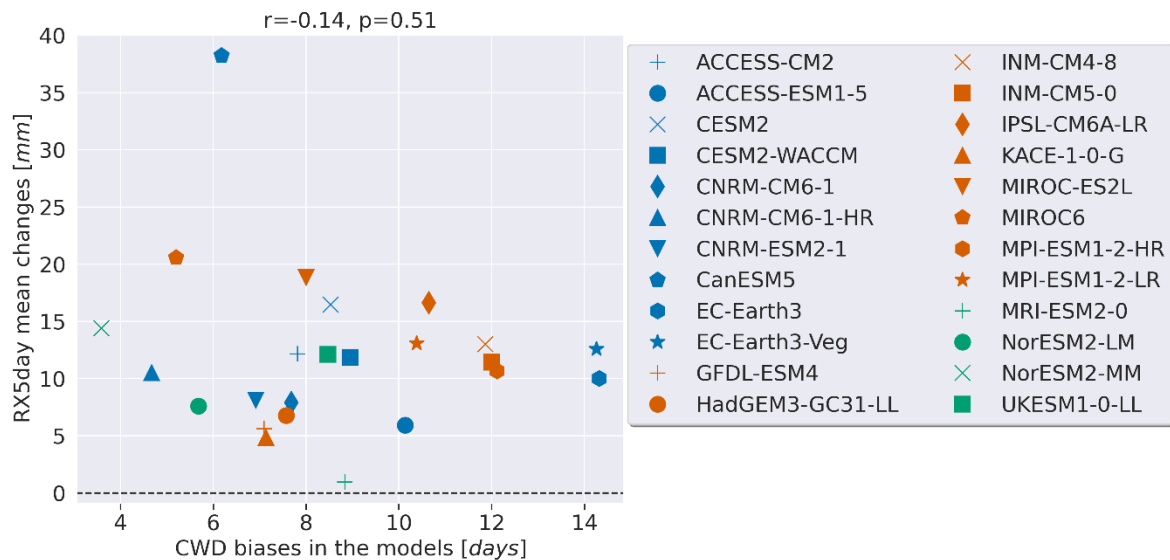
Specific comments/questions

- L278: "…are two orders of magnitude greater…". If this is related to 100%, then it is rather "…twice as high…".
  Thank you for your suggestion. We take it into account.
  "This means, in other words, that the CWD values in the GCMs are twice as high as in the observations."
- Figure 3: This is model minus observation, correct?
  Yes, it is. We add this information in the captions of Fig. 3 and Fig. 8 of the revised manuscript.
- Figure 5: This is long-term minus present day, correct? What do the blank areas without stippling/hatching/etc. indicate?
  Yes, it is correct. We specified at the end of the sentence the difference performed (2080-2099 minus 1995-2014).

  Blank areas without stippling/hatching/and crossed lines are due to a non-interpolation between the three robustness categories. Their visibility is strengthened by the coarse grid resolution (2.8°x2.8°). We add this sentence to the figure in the revised article:

  Figure R2.5 includes blue dots in all the grid points over West Africa. These blue dots can help to visualize the delimitation between each robustness category.
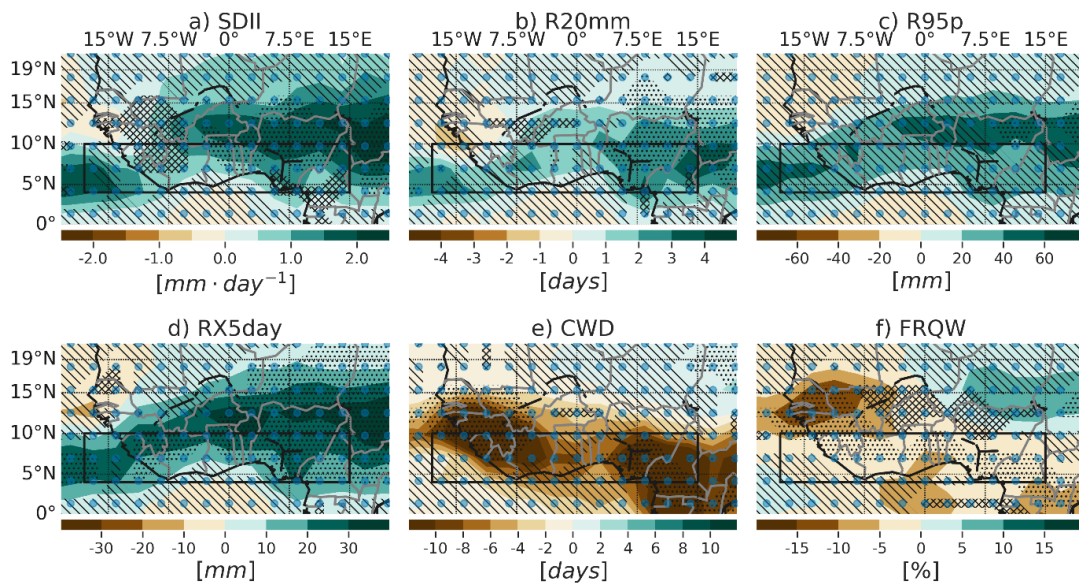
*Figure R2. 5 Projected multi-model ensemble long-term median change in the JAS rainfall extreme indices over West Africa, relative to the present-day period (2080-2099 minus 1995-2014). The stippling indicates regions where the change robustly emerges from internal variability (at least 66% of the models show a change greater than the IAV and at least 80% of the models agree on the sign of change); hatching (\\) indicates regions where the change is non-robust (fewer than 66% of the models show change greater than the IAV); crossed lines (X) indicate conflicting signals where at least 66% of the models show change greater than the IAV, with less than 80% agreement on the sign of the change. **Blue dots indicate grid points**.*

- L452: Typo for "averaged".
  Thank you for the correction, we take it into account.
- L475: Do the authors mean the "fraction of explained variance"?
  Yes, we replace the variance explained fraction (VEF) with the fraction of explained variance (FEV)