I would like to thank the authors for considering the comments from me and the other reviewers. The inclusion of an description of the HAPPI protocol explains a lot and will avoid future misunderstandings. Unfortunately, the new text introduces some new unclear points that have to be resolved; and the paper doesn't make the impression of being carefully read through.
Mainly, there are two unresolved things: the shift in distribution of ATG28 and the frequency of dry periods. I, and other reviewers, commented on this in the last review, but I don't think the authors could motivate well enough in their response why they didn't agree with our comments. If the authors don't want to change the text they should be able to motivate why, and explain how the analysis supports their conclusions.
I don't want to come across a unnecessary disagreeable, but as a reviewer I am, in a way, responsible for this paper and that it is of good quality when its published. Comments follow below:

L81-82: "a weighted sum of RCP2.6 and RCP4.5 is calculated with a global mean temperature response of 2.05°C"
I don't understand this. What is weighted? Two time slices of RCP2.6 and RCP4.5? but RCP2.6 never reaches 2.05. Is it the sum of RCP2.6 and RCP4.5 at the end of the century? What is the level of warming in RCP4.5 at the end of the century? How is the sum weighted?

L83: "sea ice extend" → "sea ice extent"

L127-128: "All four climate indices are calculated from the daily mean precipitation, temperature, and/or dew-point temperature output of the model; for each year and ensemble member"
All four indices are **not** calculated from the daily mean precipitation, temperature, and/or dew-point temperature. I would suggest changing to: "All four climate indices are calculated for each year and ensemble member"

L164: "For each of the climate indices /.../ computed as follows". Since the change of the indices are calculated in different ways, I don't think this is the best way to start this section. I would go for something like: "The future change of the climate indices are computed as follows:"

L165-166: This seems to be a very complicated way to explain what you are doing. Why not just? "For ATG28 we calculate the differences of the 5^{th}, 50^{th} and 95^{th} percentiles between the current period and the projected periods".

L166-167: "20 exceedances" Per month, year, or in the whole 10 years?

L172: RX5day also show relative change (Fig. 4), it is not computed as a simple subtraction, and not similar to ATG28. Don't use "similar to ATG28" it is only confusing.

L177-178: Mann-Whitney is not mentioned in the description of ATG28, but it is in RX5day. Either mention Mann-Whitney in the description of ATG28, if you use it, or change to RX5day. Don't use "similar to ATG28" it is only confusing.

L184: Also add an explanation of grey boxes over ocean.

L189: "no shift in the distribution". Maybe I just don't understand what you mean, but I still don't see this. When I look at figs 2 d-f and 3 d-f I see that in some areas the 95^{th} percentile increases more than the 50^{th} and 5^{th} percentiles. To me this means, not only a shift in the distribution, but also a change in the shape of the distribution. I made a comment about this in my previous review. That you "have little reason to think that the shape of the distribution is changing" is not a satisfactory reply to that. I see a reason that the shape is changing: for temperature extremes warming is not linear and it is known that different parts of the distribution changes in different ways. A recent

example of this, using HAPPI data, is Lewis et al. (2019) (https://www.sciencedirect.com/science/article/pii/S2212094719300556). They identify temperature hotspots where the tail of the temperature distribution increases with mean land surface warming at a faster rate than the rest of the temperature distribution. Two of these hotspots are central Europe and the Mediteranean.
It would be easy for you to calculate the distance between the 5^{th} and 95^{th} percentiles for the current, 1.5 and 2 simulations respectively. That would give you some indication.

Fig 2 Explain grey areas over land. Change to a figure of higher resolution in the next version.

Fig 3: See comments on Fig 2.

Fig 4: Change to a figure of higher resolution in the next version.

L225: What do mean by “To account for”?

L238: “statically” → “statistically”

L239-240: This is a highly confusing sentence. It seems like you are comparing your p-value to 0.05 or a number smaller than that (alpha), and if the p-value is greater than that the difference is significant. However, if alpha is much smaller than 0.05, for example 0, all p-values will be greater. Also, you should have a fixed alpha, either its equal to 0.05 or something else. Furthermore, shouldn’t your p-value be **smaller** than 0.05 to be significant? Consider rewriting to something like: “When the resulting p-values of the test are smaller than or equal to a significance level of 0.05, the null hypothesis is rejected indicating that the distributions differ.”

L242-243: This is repeating what is written above, remove.

L250: “1.5°C vs. 2.0°C” Do you mean “1.5°C and 2.0°C”?

L252-254: I still don’t agree that you can conclude that the dry periods will occur more often, but after going through the reviewers comments and the responses again I start to see where the misunderstanding comes from. Remember that you only have the longest dry period for each grid point, you don’t know how many dry periods you have. Therefore you can’t say anything about the frequency of the dry periods. It could be that a prolongation of the longest dry period means that all dry periods will be longer (same or increased frequency). It could also be that several short dry period are replace by one long (decreased frequency). We don’t know that. You could, however, argue that within a region longer dry periods will be more probable. I suspect this is what you mean, correct me if I’m wrong.
Let’s take the example of the Iberian Peninsula in ECHAM. It’s clear that there is a shift in the distribution between “hist” and “2.0”. The longest dry period will be longer, and the chance that a gridpoint will experience a dry period of, let’s say, 10 weeks is much bigger in “2.0” than in “hist”. Does this mean that longer dry periods will occur more often (more frequent)? Not necessarily. You could say that its more likely in the future that the longest dry period somewhere on the Iberian Peninsula will be longer than 10 weeks, than today. The common definition of frequency is how often something happens in time, not in space. Remember also that the different gridpoints are not independent. It’s likely that several of the longest dry periods in different gridpoints occur at the same time. It could be that **all** of the longest dry periods occur at the same time.

L253: I think correct English is “indistinguishable from” not “indistinguishable compared to”

L253-254: This is a ambiguous sentence. It’s true that you can deduce that region 2, will suffer from more frequent and longer drought periods than experienced before. But compared to regions 6 and 8? Even if the increase in 2 is larger than in 6 and 8, the dry periods in 6 and 8 could still be longer than in 2 (I know it isn’t, but still). I guess what you’re after is that the longest dry period changes more in some regions (e.g region 2) and less in others (e.g. regions 6 and 8).

L256-258: With the same kind of argument you could say that the British Isles would benefit from an temperature increase of 2 instead of 1.5. From Fig 6 its obvious that several regions would benefit from a lower temperature increase. Wouldn’t you agree that the Iberian Peninsula would benefit more than the Mediterranean from a reduce warming? Although the change at 1.5 is already significant.

L287: Please insert “RI50” somewhere here.