

Interactive comment on “Extreme wet seasons – their definition and relationship with synoptic scale weather systems” by Emmanouil Flaounas et al.

Anonymous Referee #1

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This thorough paper introduces a novel method to investigate seasonal precipitation extremes and the large-scale and synoptic conditions that give rise to these. This is an important study as such seasonal extremes can be responsible for a number of socioeconomic impacts.

The paper is mostly clear and well-written, with a few places that could use some clarification.

I give specific comments below.

1. Most of the English usage is British English, but there are some examples of “characterize”. Please ensure consistency, as per the WCD instructions.

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2. Line 68: “signalizes” -> “signals”.
3. Line 87: The use of the word “provoke” is a little strange – perhaps use “give rise to” or “produce”.
4. Line 174: I’m not sure what is meant by the “half of the month”. This is not referred to elsewhere – is this a mistake?
5. Line 187 and throughout: please use capitals for Northern Hemisphere and Southern Hemisphere. 6. Throughout: The use of the word “amount” for precipitation, might be better as “volume”.
7. Line 219: The language here is a bit unclear – “contrasting precipitation amount ratios”. I’m not sure what this means.
8. Line 220: But it seems that in parts of the ITCZ, there are high ratios of both the extremes and the wet days. One thing that might be useful in this figure (Figure 4) could be to show the climatological precipitation in fine contours (or just a couple of contours), so that the reader doesn’t have to check back to the climatology to see how well things match up.
9. Line 232: It is stated here that most of the ratios exceed 1, but the figures do not show values below 1. If there are values below 1, the contour intervals on the figure should reflect that and allow the reader to see where this occurs.
10. Figure 5: I really like this way of characterising the extreme seasons. However, it is very difficult to tell the difference between the green/cyan colours. As such some of the writing around this figure is difficult to understand.
 - a. E.g. line 243: The cyan colour referred to over equatorial Africa to me looks like the light blue from the bottom right bin. So it would appear to have a high ratio of daily extremes and low ratio of wet days. Especially as “cyan” is referred to again to describe this same colour on line 253.

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- b. It is mentioned in multiple places about the wet day ratio less than 1.2, but the 9-panel bins show “<2”.
 - c. Line 259: “20 to 60% more wet days”. This is confusing as everywhere else the ratios are referred to – please change this to be similar to previous.
 - d. In this figure it may be useful to also have the climatological precipitation contours.
 - e. In panel (a) there is typo in “precipitation”.
11. Line 276: El Nino and La Nina -> El Niño and La Niña.
12. Section 4.2: I would be interested to know the sensitivity of the results to defining these core periods. The core periods end up being typically longer than the initially 90 days anyway, so what is the impact of not worrying about it? I suppose the main difference will be when looking at the overlap of the patches with the synoptic systems. It does seem that the method ends up becoming rather complex, so it would be good to know if this extra complexity is necessary.
13. In figure 7, because there are fewer grid points contributing, the total precipitation is less, but some of those points may be experiencing their largest precipitation at that time. How is this taken into account?
14. Line 249: Why has this particular case been chosen?
15. Line 387: Please consider rewording this to make it clear it is a ratio.
16. Case studies: It is a bit confusing that the different cases show different things – it is hard to compare. Why is the Arctic case (Fig. 10) shown as a precipitation anomaly ratio rather than the total precipitation as in the other cases?
17. Line 409: “same dates” and grid points.
18. Lines 430-432 (first sentence): This information would be better in the introduction or methods.

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19. Line 440: Remove “relatively”. There are relatively many WCBs even though there are few in absolute terms.

20. Line 443-444: Again, this information could be relocated.

21. Line 449: “less” -> “fewer”.

22. Figure 12: There are places where the ratio is less than 1 (especially for the RWB), but this is not mentioned. Why might you expect fewer than normal of these systems? Could this vary depending on the time of year?

23. Figure 12 again: Since you have a large number of patches, with central months at different times of the year, I wonder what the figure would look like if this was taken into account? So for the NH midlatitudes, you could make two figures – one for extreme patches with central month in winter, and one for summer. This would surely help to answer the question of whether seasonal extremes are caused by the same mechanisms in different times of the year in the same location. Saying this I realise that I am suggesting making things even more complex despite previously suggested less complexity. However, I think this would be a very interesting addition.

24. References: There are quite a few errors in the references, where the “running title” is given as well as the proper title: e.g. Catto et al, Feng et al, Leung et al, as well as other typos.

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