Point-to-point replies to the review report

We would like to thank the editorial support team and the referees for the attention given to our manuscript and for providing a thoughtfully evaluation of our work. Our responses to their comments are provided below and we made the changes accordingly to improve the paper.

For clarity, Referee's comments are shown in bold font and the authors' replies in *italic*.

Referee's comments: *Our reply*

Referee #1 :

This paper reports on a synthesis analysis of EO altimetry data, surface water extent and in situ gauge data for the Congo Basin. It includes a large number of virtual stations derived from multiple missions (and adjusted to the same datum) and covers the whole basin spatially. The findings cover the surface water dynamics of the CRB in detail, including variations in WSE amplitudes and SWE extent, their seasonality and lag when compared to the gauged outlet of the basin.

This is an important paper in a relatively poorly studied basin. It is impressive in its scope and thorough in its analysis. It is well written and illustrated carefully. It has a detailed and considerate literature context covering previous work. While some results importantly confirm previous studies, this paper also uncovers new findings and detail that will be incredibly valuable to the science community that study the basin.

A few suggested minor changes are listed below, but other than these small typos there is a lot to recommend publishing this paper and no doubt it will become an important reference point for future work.

Our Reply: We appreciate your positive feedback on our work. We are glad that you have highlighted the fact that our findings will be a benchmark in the science community working on the CRB and therefore recommended it for publication. We took into consideration your suggestions and made changes accordingly to improve the paper.

1. Line 39: something is missing in this sentence "ranging from 0-1 month in its vicinity downstream the basin up to 3 months in remote areas and small tributaries." – maybe it should be "ranging from 0-1 month in its vicinity in downstream parts of the basin and up to 3 months in remote areas and small tributaries.

Our Reply: Yes, the reviewer is right and some words were missing. The sentence is now as you suggested: "ranging from 0-1 month in its vicinity in downstream parts of the basin and up to 3 months in remote areas and small tributaries".

2. Line 49, "40.500" should be "40,500"

Our Reply: The change has been made and the number is now correctly written: "40,500"

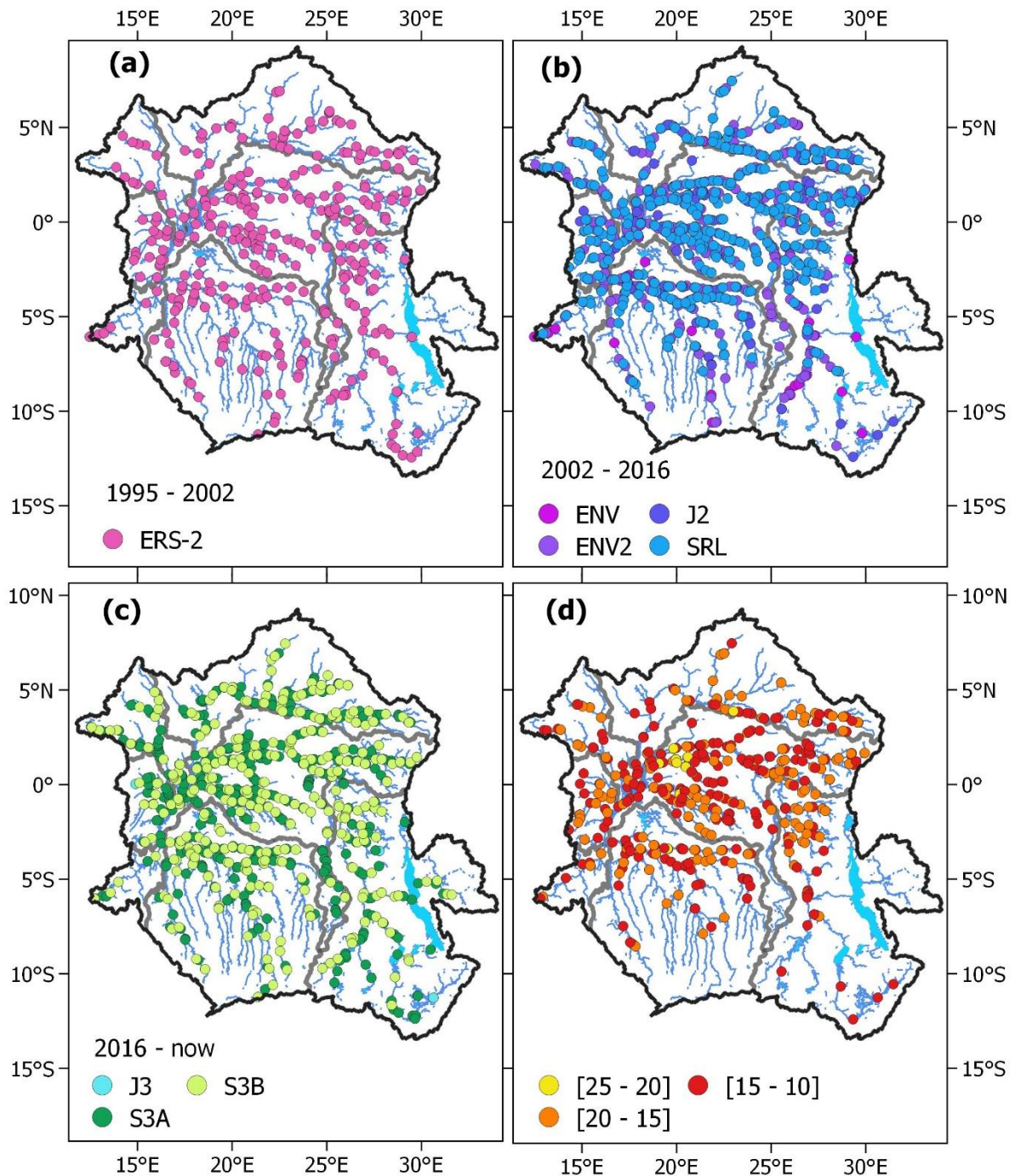
3. Where "CRB" is used at the start of a sentence, it would be better to say "The CRB"

Our Reply: Thank you for pointing this out. Following your suggestion, we have made the changes and we now use "The CRB" at the start of a sentence.

4. Line 208: "uncertainties ranging between few centimeters" should be "uncertainties ranging between a few centimetres" (note spelling of units)

Our Reply: We have inserted the article 'a'. We now also use "centimetres" rather than "centimeters" through the text.

5. Figure 2(d): end bracket on the key seem to be the wrong way around. Should be [xx-yy] instead of [xx-yy[.

Our Reply: Following your suggestion, we have modified Figure 2(d) by changing the bracket. Figure 2(d) is now as follow:

6.   Line 243: this sentence seems like it is missing something "surveyed by a ten of static and cinematic GNSS campaigns" Where there 10 campaigns? If so remove "a" and "of".

Our Reply: Yes, we want to say that data from many field campaigns were used. To be more accurate, we modified the sentence as follow: "The gauge has been surveyed during many static and cinematic GNSS campaigns, giving the ellipsoidal height of the gauge zero and the slope of the water surface."

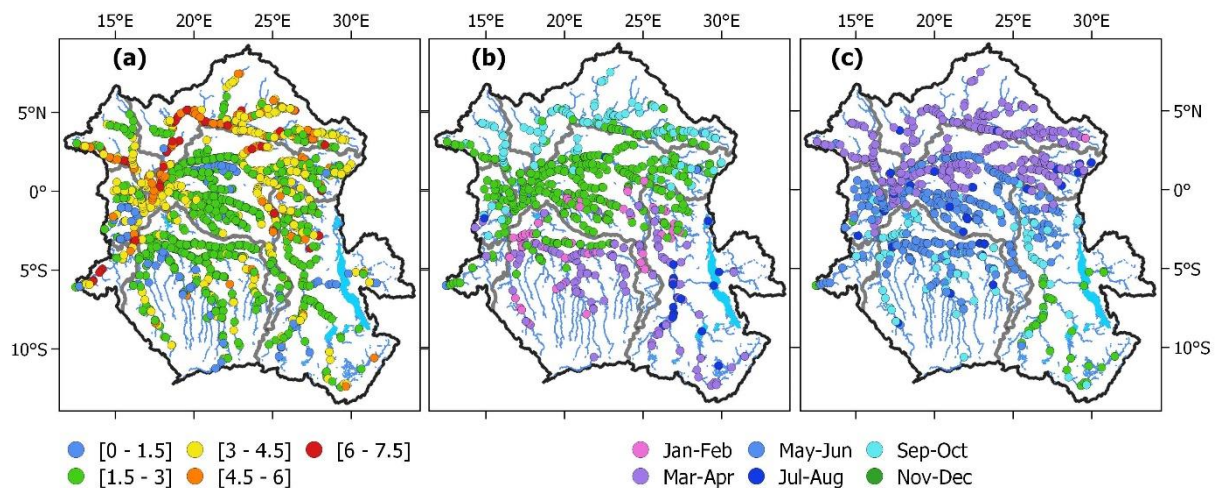
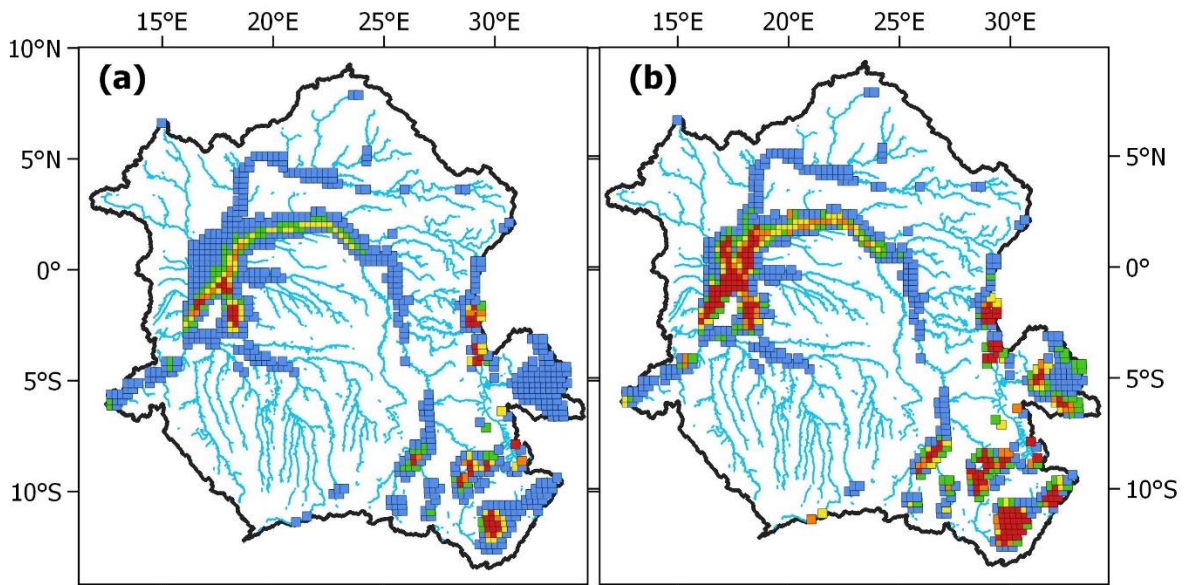
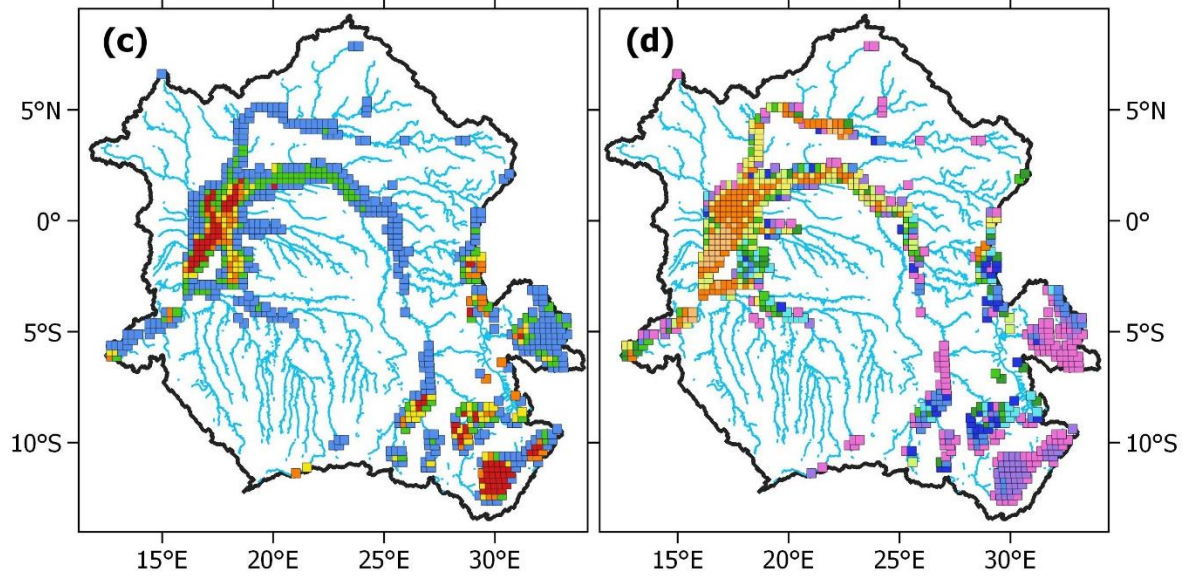
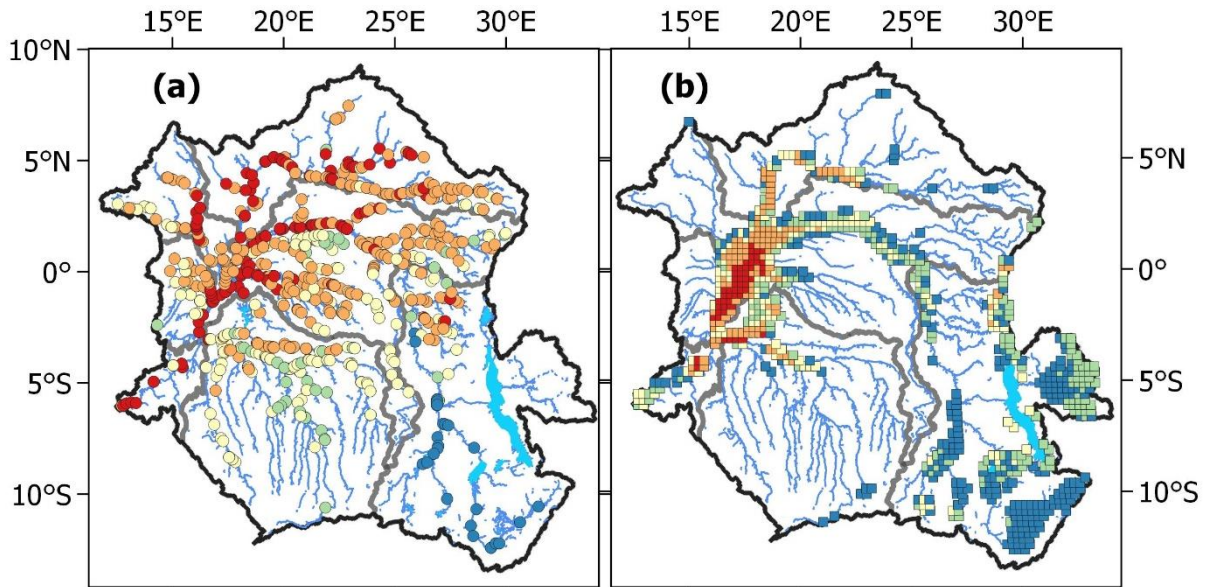
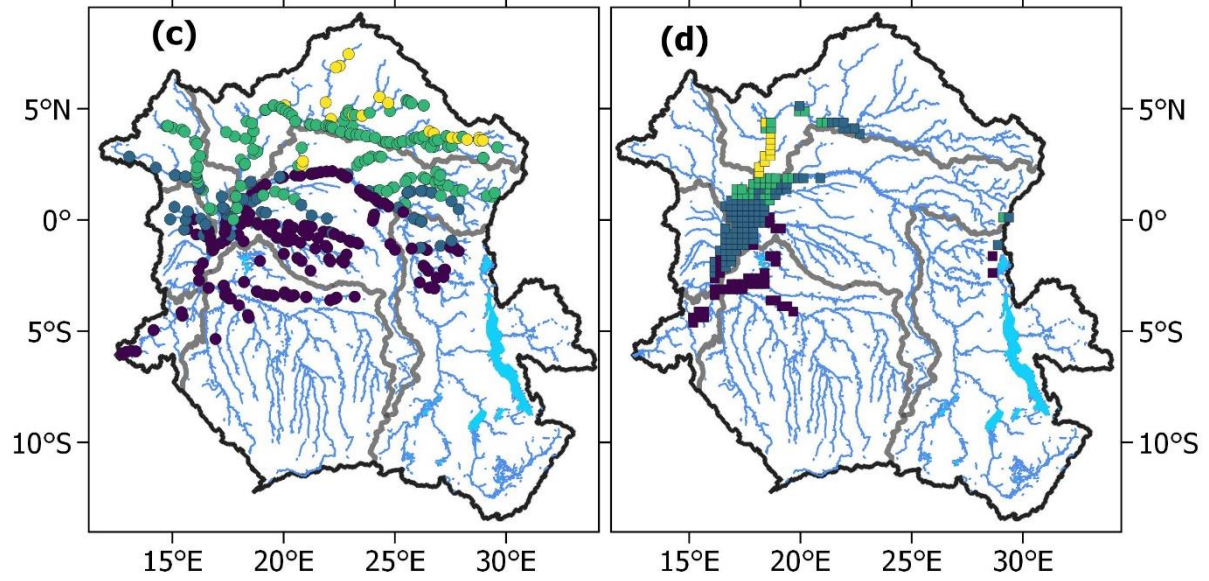
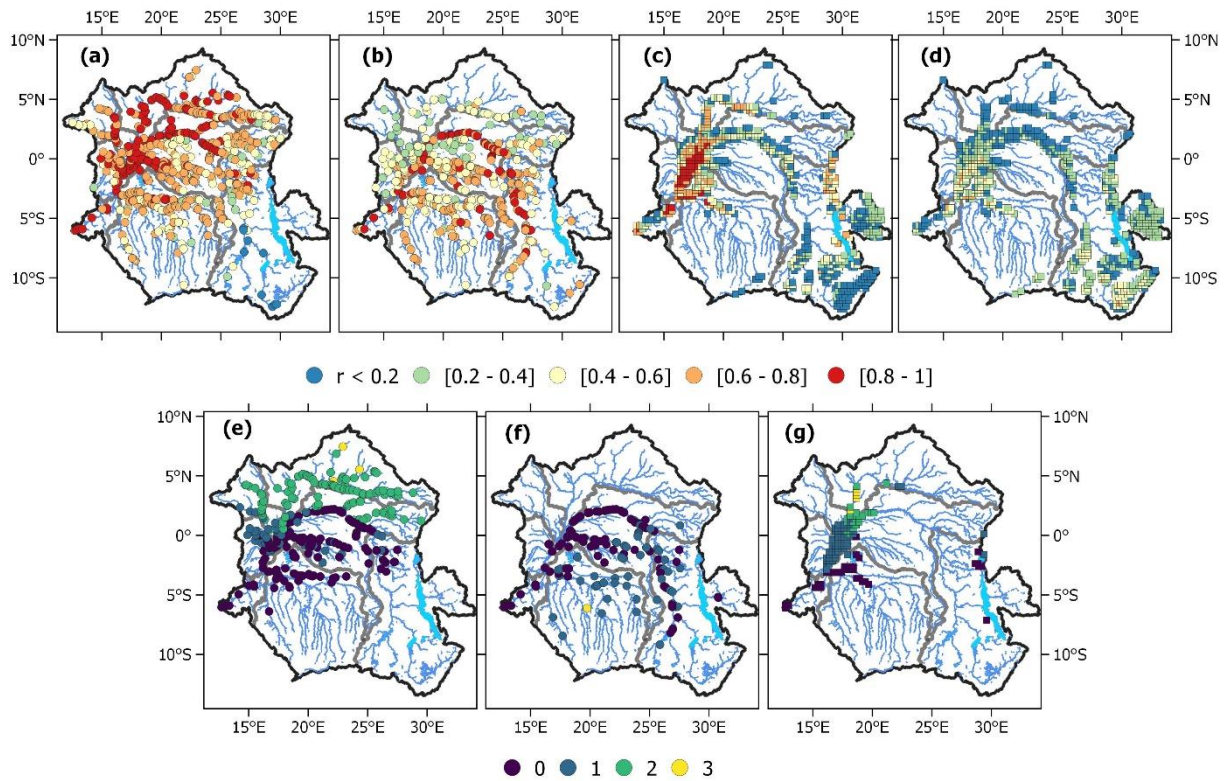
7.   Line 252: "we merged them in a same reference" would be better as "we merged them to the same reference"

Our Reply: Agreed. The sentence is now as follow: "we merged them to the same reference".

8.   Line 335: "The variation of amplitude in the southern is similar" - should this say southern part?

Our Reply: Modified. The sentence is now:" The variation of amplitude in the southern part is similar"

9.   Figure 4(a) and Figure 5: end bracket on the key seem to be the wrong way around. Should be [xx-yy] instead of [xx-yy[. Please also check all other figures.

Our Reply: Following your comment, we have changed the bracket in all figures. Figure 4(a), figure 5(a,b,c), figure 9(a,b), and figure 10(a,b,c,d) are now as follow:

10. **Line 426: "sub-basin which hydrology might" should be "sub-basin where the hydrology might"**

Our Reply: Corrected. The sentence is now as you suggested: "sub-basin where the hydrology might".

11. **Line 464: "complement each other individual result" should be "complement each other's individual result"**

Our Reply: Corrected. The sentence is now as follow: "complement each other's individual result".

12. **Line 520: "all over the various tributaries" should be "over all the various tributaries"**

Our Reply: Done, we have permuted the word "over". The sentence is now as follow: "over all the various tributaries".