

Interactive comment on “Building hazard maps of extreme daily rainy events from PDF ensemble, via REA method, on Senegal River Basin” by J. D. Giraldo and S. G. García Galiano

Anonymous Referee #1

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This study examines possible changes in extreme rainfall for the Senegal River Basin. I think this is an interesting topic and the manuscript is generally well-written. I have different major and minor comments that should be addressed before considering the manuscript for publication.

- Which scenario was considered?
- Pg. 3823, lines 19-20: the sentence “The first of them consists in a model performance criterion (RB), considering the present-day climate” seems incomplete.
- Pg. 3823, lines 20-21: the “convergence” to what?

- Pg. 3823, equation 1: why were m and n set equal to 1? How sensitive are the results to different values of m and n ?
- Section 3.2: the authors use non-stationary statistical model to describe AMDR time series. However, have they first checked that there is statistical evidence against the use of a stationary model?
- Is it really meaningful to model a 20-year record of annual maxima with a non-stationary model which uses a large number of degrees of freedom for the fit? I personally think that 20 years are not enough.
- A much more extensive discussion of the statistical modeling should be provided. After reading the manuscript, I still have several questions: 1) how did the authors select their final distribution? 2) What distribution was generally chosen? 3) Can this be generalized?
- Figure 3: based on this figure, I find it a bit hard to believe that the statistical models are really able to describe the data. I would be interested in seeing the corresponding residual plots used to assess the goodness of fit. I am not sure that the statement on pg. 3828, line 6 (“the good fit of the GAMLSS statistical model to simulated AMDR time”) is really supported by the results presented.
- Figure 3: please add the corresponding time series from the data. It would be interesting to see whether the models can actually reproduce the patterns in the data.
- Pg. 3825, lines 20-24: the authors mention how they checked the goodness of the fit but don't state whether the residuals supported their choice of models.
- Pg. 3827, last paragraph: why are the results in Garcia and Giraldo (2011) “numerically quite different”? Please explain.
- Figure 5 and others: the authors should mention more clearly in the text that the results in the south-west part of the domain are based only on interpolation, since no data are available.

- Pg. 3821, line 11: “Smirnov-Kolmogorov”

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