

About the return period of a catastrophe

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Submitted to Natural Hazards and Earth System Sciences
MS-NR: nhess-2021-86_R2

REFeree REPORT

I confirm what I stated in my first report: the technical content is worth publication, while presentation remains the weak aspect of this paper.

Nevertheless, I recognize that the Author made a big effort to rearrange the text, make corrections, and pay a proof reading service to double check the language.

At this stage, asking for further changes makes little sense; so, I suggest acceptance.

Below, I report a residual comment, which I already raised but was not addressed, and some typos I spotted here and there. In principle, I would suggest a double check for typos, but it is clear that the Author already did his best with a foreign language.

I do not know if Copernicus/NHESS can provide some quick proof-reading for free, just to double check typos... Anyway, that's it.

L26: "... the extension... depend on" -> "... the extension... depends on"

L54-60: I already mentioned that Author's interpretation is incorrect: the random field models proposed by Youngman and Stephenson (2016) perform simulation of whole season scenarios accounting for spatio-temporal correlation, then 3-day events are selected, and only some of them are critical. The latter, which are those of interest, are not annual occurrences! There can be years where the simulated events are not critical in terms of losses: the occurrence of critical events of interest is not one per year, as the Author incorrectly thinks.

The same holds for Papalexiou et al. (2021)'s models; they are devised to perform continuous simulation of the whole year of rainfall process, for instance, at a given time scale (e.g. daily), including wet and dry periods, seasonal fluctuations, etc. Storms, as intended by the Author, can be extracted by thresholding such continuous simulations, and the occurrence of such over-threshold events can be approximately Poissonian for high threshold. Again, in this framework there is no a "draw of the annual random variable", whatever it means.

The Author should realize that the world is not limited to Extreme Value Theory and Poissonian point processes. Problems can be approached by starting from the generating (underlying) processes.

If the rationale of those approaches are not clear, I invite the Author (once again) to avoid unsupported criticisms. As mentioned in my previous report, criticisms are welcome and necessary,

but cannot be raised and justified by misunderstanding of the criticized works, and superficial statements.

L90: "The more recent approaches area functions..." -> "The more recent results concerning the theory of area functions..."

L96(and rest of the text): "Supplementary and Supplementary data" -> "Supplementary material and data" when referring to both, or "Supplementary material" and "Supplementary data" when referring to one of them. Please fix the name of the "supplementary" file: "Supplementory.docx" -> "Supplementary material.docx"

"3 The combined return period (CRP)" -> "3 Combined return period (CRP)"

"3.1 The stochastic derivation" -> "3.1 Stochastic derivation of CRP"

L266: "of locale event intensity" -> "of local event intensity"

L296: "*n* measuring station" -> "*n* measuring stations"

L589: "Effron" -> "Efron"

L677: "They have not depicted ... and does not provide" -> "They have not depicted ... and do not provide"

Sincerely,

Francesco Serinaldi