

Interactive comment on “Detecting impacts of extreme events with ecological in-situ monitoring networks” by Miguel D. Mahecha et al.

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Received and published: 2 May 2017

The manuscript describes a very well conducted study of the potential to detect extreme events by in situ observation networks. I agree with the analytical approach and the analysis results.

There are however many language and style errors and the manuscript requires a serious editing effort. I provide meticulous editing comments below. These refer to the text until about page 13. There are problems past it, I just didn't have more time.

Minor comments: P3L31 All MODIS datasets have a code (typically starting with three letters, often MOD or MYD with lots of numbers that encapsulate the product type, resolution, return period. . .Pinty references MCD43B3.005, but I think that is what he used to make the next level product). Please list the code of the exact dataset you

C1

used. If it is not from one of the MODIS DAACs and doesn't have a MODIS code, please provide the reference to where you downloaded the data from.

Eq. 1 is trivial and can be removed. The explanation of space-time voxel you provide in P4L3-4 is enough (and can easily be revised so that it doesn't need the equation).

Section 2.2 – please emphasize that you only used the location of each existing flux tower and did not use any of the data collected by the tower. Explaining what types of fluxes and other measurements are done at each site (P4L11-14) is rather confusing and to some degree, misleading

P4L17 Please add the link to Ameriflux, (<https://ameriflux.lbl.gov/>) and ICOS (<https://www.icos-cp.eu/>) in the same way you added the links to all other networks you used (fluxnet, euroflux, neon. . .)

P4L24 Are you sure that the NEON sites “that can be moved for dedicated studies” include EC towers? Did you use any? I think not (for either questions), and if I am correct, you should remove their mention from here as these were not used and create a false impression that they were.

P6L7 Appendix A (or any other appendix) does not include any details of the event detection method. It only contains supplementary figures. Please provide the detailed method description, as it is potentially some of the most exciting and applicable parts of this manuscript.

P10L1 “shown before for the US in Fig. 8.” ??? Fig. 8 did not appear yet and nothing was shown for the US

Section 4.1 – please make a conclusive statement (I ended the section confused and wondering)— after all the tests you conducted and results you show in appendix A, is the discrepancy presented in figure 6 explained by the spatial/temporal autocorrelation of the extreme event or the discrepancy must have another explanation. Does it indicate a weakness of random in-situ networks?

C2

Table 1 – lines are strangely discontinuous. Fix it to look like a proper table. In any case, I am not sure that I truly understand the details of what you are trying to convey with this table. Can there be a better way to explain it? Is it necessary and are you using all the categories listed in the table?

P12L3 what is beta? Is it coming from some equation that you did not provide?

Editing comments: P2L27 Today,

P2L29 depths

P2L29 remove “for instance” (already said in L28). Also – collected by (not collected in)

P2L33 And in fact,

P2L34 But it is also shown (cant switch tense in the middle of a sentence)

P3L4 remove repeated “detect”

P3L6 may be of relevant

P3L7 theoretical probabilistic approaches allow us to explain

P3L8 Third, we analyze the detection probabilities. . .

P3L10 I suggest revising to: improved network that could detect and quantify the distribution and effects of extreme events

P3L20 I think you are overdoing it with “plethora” (dictionary meaning - a large or excessive amount of something). I do not think FAPAR supports an excessive amount of studies. Can you simply say “large number of “, or “a large variety of “

P3L28 “but likewise encodes e.g. fire events amongst other extreme reduction of. . .” this sentence is very badly phrased. I was trying to suggest some replacement, but realized that I am not even sure about what you are trying to say here.

C3

P4L6 replace “Firstly” and “Secondly” by “First” and “Then”

P4L9 As an example

P6L8 datasets (one word)

P6L9 i.e. reduce the temporal dimensionality P6L23 replace “firstly” and “Secondly” by “primarily” and “Additionally” . Also – no comma before “that”

P6L31 “the spatial or temporal voxel neighbors” , or “spatially or temporally neighboring voxels”

P8L7 replace “at the center” by “centered on a locally detected extreme event”

P9L15 allows us to answer

P9L15 the hypothetical question whether a certain

P9L17 investigate whether random (similarly, replace "if" by "whether" for indirect questions in many places in the manuscript)

P9L18 remove “amongst other questions” (or rephrase the sentence as an example for other questions that could be studied)

P9L29 across network sizes

P10L3 as black lines

P11L12 within the inline equation, put the n on the left side of the ln to match the format of eq. 4

P11L24 events, which

P13L12,14 replace” firstly” and “secondly” with “(1)” and “(2)”

P14L1 both can be obtained

P14L11 expected detection rates for various

C4

