

Review of Stephan et al. An Alpine Drought Impact Inventory to explore past droughts in a mountain region

By Anne Van Loon

This is a very interesting paper, presenting a drought impact database for the Alpine region and comparing the reported impacts with a similar European drought impact database. The authors also show interesting patterns of drought impacts in space and time. I really like the figures, they condense a lot of information in a few very clear maps and graphs. I have a few minor suggestions for improvement of the paper. I summarise these first and then share my more detailed comments below.

One comment is on the region you are looking at. You need to be clear from the start about the area you are studying. Now you mention 'Alpine Space', European Alpine region, mountain-foreland region, mountain-to-foothill transitions, etc. 'Alpine Space' is now defined in the Methods section, but it should be explained earlier in the Introduction.

My second point is on the compilation of the database. You need to explain more on how the information from the different sources were collected. Have all these data sources been compiled before and are they publicly available? Or have you collected, translated and mined text-based reports yourself?

Thirdly, please explain how you have dealt with overlap between EDIIeu and EDIIalps. Did you include EDIIeu impact reports for your region into EDIIalps? Or did you include your EDIIalps in the EDII database? It would be very interesting to compare your EDIIalps with the original EDII entries for your Alpine region to see the effect of differences in data collection.

Finally, I found it surprising that there is not many impacts reported in the Energy category. Please expand the discussion on this. Also in the Discussion, I expected you to say more about how perceptions of drought might have influenced the results, for example for the Energy category and for the impacts in the southern part of the Alpine region.

Specific comments:

Abstract:

- What is 'Alpine Space'?
- "The amount of more than 3200 compiled reports on negative drought impacts demonstrates the need to move from emergency actions to better preparedness" > not sure if the amount of impact reports demonstrates this need, maybe rephrase?

Introduction:

- Socio-economic drought: It is a bit confusing how this is different from the impacts that you are investigating. For example the sentence: "These indirect impacts are the least tangible and often related to DSE." (And in the Methods: "DSE is challenging to relate to specific impacts") Please remove DSE as a drought type to avoid confusion between hazard and impacts?
- P.3 l.58: maybe also mention DH impacts on hydropower production. A quite important sector in the Alpine region I thought. But from your results I see that the Energy and industry category is not often reported. Do you know why? Is it not an issue or does this just not end up in the newspapers?

Methods:

- Fig. 1: can you indicate the countries and their borders in the map? This is important as later in Fig. 2 & 3 you report impacts by country.
- Grouped into four domains: Northern, Southern, high-altitude and pre-Alpine. Please make it clear in the text that these are two different subdivisions. So you actually grouped two times into two domains. This comes back in the Results section (see below).
- P.4 l. 98: explain how you defined Europe as comparison for the Alpine Space analysis.
- P. 5 l.106-110: Are all the sources listed publically available? Or did you also compile some of these yourself, for example the Italian and German text-based reports? What is the origin of these text-reports?
- How did you check for overlap with the existing EDII? Did you include your EDIIalps in the EDII database, or the other way around did you include original EDII entries in your EDIIalps database? Did you compare your EDIIalps with the EDII entries for your Alpine region to see the effect of differences in data collection?

Results:

- Fig. 2: I would suggest to add the distribution of reported impacts in the Alpine Space but based on the EDIIeu, so that you can compare with those in your EDIIalps. Also, maybe refer to the figure a bit more in the text to help the reader.
- P. 7 l. 185-186: here you need to be careful with the regions again. You can only compare between the regions within a subdivision, so Northern with Southern and pre-Alpine with high-altitude, so rephrase to "... more reports located in the Northern than in the Southern region and more in the pre-Alpine than in the high-altitude region".
- Table 1: Add in the caption that this is a subset / selection of tested combinations. Now this is a bit hidden in the table footnote. In general extend the caption so that it is clear which results are presented in the table.
- P.7 l. 191-193: Is there a mistake in the numbers or am I failing to understand the difference between the numbers? For EDIIeu the numbers of the two categories add up to 56%, but for EDIIalps $48 + 21 = 69\%$ and not 61%.
- P.10 l.38-39: "the extreme relative dominance of the category Agriculture and livestock farming in 1976 (82 %) decreased substantially in the years 2003, ..." rephrase to something like "the category Agriculture and livestock farming was extremely dominant in 1976 (82 %) and much less apparent in the years 2003, ...", because there is not necessarily a change over time.
- P.11 l.256: Alpine Space
- Table 2: Like in Table 1, extend the caption so that it is clear which results are presented in the table.
- Figure 5: In the figure, Dsm and Dh are represented as SMD and HD. Please change for consistency and clarity.

Discussion:

- P.15 l.346: "30 % of all impact data across Europe is located in our study region" > Do you mean that within EDIIeu 30% of the impact report is located in your Alpine Space? Or that your EDIIalps has 30% of the impact reports of EDIIeu? The latter is not a conclusion you can draw because of the differences in data collection.
- P.16 l.378: "ressort"? Do you mean report?
- Please discuss the relatively low amount of impacts in the category Energy (and Tourism).

- P.17 l.413-414: Or maybe because dryness is more normalised in a Mediterranean climate and water shortages are not always reported as drought impacts?
- P.19 l.453-455: Or water shortages because of a delayed or lower snow melt might not be reported as drought impacts?

Conclusions:

- The first paragraph (l.475-487) fits better in the Discussion section than in the Conclusions.