Referee #2 responses:

Overall comment:

Reviewer General Comment:
The paper "SMC-Floods database: A high resolution press database on floods for the Spanish Mediterranean Coast (1960-2015)" provides a preliminary description and analysis of flood data collected from press news. It is not a novel initiative at European or Spanish level, but it comprises a large extension of a flood damage prone region. I admit that such effort merits publication somewhere, but not in the present format, which requires a major review before it can be published.

Authors Response:
Thank you for your suggestions, we have included all of them in the new manuscript version. According to your comments, different European research groups are faced with the effort to collect and organize large databases for extreme hydrometeorological events on a historical scale. In Spain, there are at least two working groups that collect events and cases of flood from historical periods until nowadays and try to cover the entire Spanish territory through different methodologies. The focus of our work is to cover two main needs:
1. Analyze the trends of flood cases and events in the Spanish Mediterranean coast. This is an area that has increased the number of floods and, according to the IPCC (2012), there are great uncertainties about the importance of the physical factor and the human factor in the balance of economic losses caused by floods.
2. The final goal of this study is focused on knowing to what extent the variability of floods is caused by changes in the social systems. In this regard, we consider that other floods databases show a lack of data of floods in small towns (Paprotny et al., 2018) and we show that the lack of information has a substantial impact on observed trends.

Reviewer General Comment:
In scientific outcomes are highly bias by the journalist judgment of the flood damages and newspaper coverage and audience. Therefore, caution should be placed on the interpretation of the data.

Authors Response:
We share your view of this point, for this reason the manuscript included a paragraph of assumption of limitations that takes into account the possible bias indicated by the reviewer: "*However, there are other factors that should not be overlooked or dismissed. According to Llasat et al., 2009, it is important to consider that trends may be biased by various reasons: i) a greater sensitivity or perception towards natural risks from the public opinion could increase news about floods in newspapers; ii) a greater spatial coverage of the news thanks to the improvement of communications. The complexity of the factors (social, cultural, environmental and perceptual) involved in flood processes make us think about the influence of the mentioned items in the observed trends. Therefore, a deeper knowledge on climatic, geographic and socioeconomic variables involved is necessary".*

To the above explanation we have added another possible biased commentary. Eisensee and Strömberg (2007) argue that the coverage of natural disasters in the press depends on the availability of other newsworthy material at the time of the disaster. Additionally, and as you point out, there may be some spatial bias in the news based on the newspaper's spatial coverage (Walmsley, 1980). In this regard, and as explained in section 3 (Methodology and sources), the newspapers used are regional newspapers, which specifically cover the information of each of the Autonomous Communities studied throughout the study period.

On the other hand, the experience of other related works (Llasat et al., 2009) and the way of gathering information, show that the subjectivity of the journalist or the newspaper can bias the level of intensity, but not the type of damage. In this regard, the type of damage may be under-documented, but it can rarely be over-documented. However, it is true that the increase of population has been able to influence the increase of news in small populations. This is precisely one of the facts that we highlight in this work, since a large part of the detected trends are influenced by the population increase. This fact can be observed when we analyze the trends in floods according to population growth. In making this analysis, we observed that the greater the population increase of the municipalities between 1960 and 2011 was (the two extreme census moments during the study period), the greater significance and intensity the trend detected has. In the following table (Table 1) it can be observed that in the set of municipalities where population have grown less than 50% between 1960 and 2011, the floods have no significant trend. However, floods have a statistically significant trend in municipalities that have grown more than 50%. The interesting thing is that the rate of increase in floods is greater as the population growth is greater. This shows that the detected trends are largely influenced by the increase in exposure.

Table 1: Floods trends in Spanish Mediterranean Coastal Municipalities related to ranges of population increase between 1960 and 2011.

Population increase range in %	Kendall's tau	P-value	Sen´s Slope
Less than 0%	-0.048	0.733	0
Between 0 and 50%	-0.060	0.550	0
More than 50 and less than 100%	0.280	0.005	0.127
More than 100 and less than 200%	0.340	0.000	0.286
More than 200 %	0.380	< 0,0001	0.471

**To calculate trends, we have used Hirsch and Slack's nonparametric test (1984), which is based on Mann-Kendall range. The trial version of XLSTAT software (Addinsoft, 2018) was used to calculate it. The Mann-Kendall test provides a level of statistical significance (p-value). The threshold of significance chosen was 95%, which indicates that p-values above 0.05 should lead to rejecting the hypothesis of a trend in the series. When the p-value is less than 0.05, the trend can be positive or negative. Sen´s Slope shows the annual change rate in floods. That is, the value informs about the annual increase or decrease of the floods.*

To clarify this point, we have added the previous table and part of the previous comments to section 4.5. of the manuscript. However, it is true that there are still many uncertainties regarding the possible information bias. For this reason, in the conclusions section we have qualified that, although the results are robust when relating population increase and increase in floods, the tendencies detected may be biased by journalistic issues.

Reviewer General Comment:

There is not a critical analysis of the results in relation to other more robust database, for instance the analysis from the National Insurance Consortium. As this database reflects risks (mostly exposure and vulnerability), most of the hydroclimatologic trends and changes on hydroclimatic conditions may not be valid.

Authors Response:

We agree with the reviewer. In the new version of the work, a critical analysis will be included in relation to the National Insurance Consortium database in order to show the possible similarities and differences with our database. However, it should be noted that the Spanish insurance contract law does not require the insurance of the home. Therefore, this database could be even more biased than ours depending on the degree of insurance coverage in the municipalities of the study area (Clavero, 2016). On the other hand, the fact

that the National Insurance Consortium database is based on private insured assets limits information on the impact of floods on public goods such as roads. In this regard, and taking into account the great weight that road damages have on our database, it is not surprising that the SMC-Floods database considers a number of cases far superior to the National Insurance Consortium database.

Reviewer Specific Comment:
1.- The manuscript requires a detail English correction on the style. It looks a direct translation from a Spanish text, I would say that the authors used google translator, otherwise, I cannot explain the use of some very incorrect terms. Among the most critical one are "Cold Drop" cited in the paper, and probably authors refer to "cold pool" or "mean mobile" (cited in figure 7) instead of "moving average". These are only few examples, but the text is full of informal terms or sentences that do not make any sense in English.

Authors Response:
A native English speaker will be responsible for reviewing the text of the new version before being sent.

Reviewer Specific Comment:
2.- The manuscript is very long and this makes difficult to read. The authors should analyze in each sentence and use proper language addressing the point in a direct way.

Authors Response:
The deep revision of the language of the manuscript by a native English speaker, has been an important summary and synthesis of the manuscript. In this way, we consider that the ideas are now expressed more clearly.

Reviewer Specific Comment:
3.- Several sections can be shortened, including the introduction and conclusions.

Authors Response:
The same than the last point.

Reviewer Specific Comment:
4.- Abstract: The abstract should be completely re-written. The way it is written looks and introduction rather than a summary. Sentences such as "Floods are the natural disaster that affects the greatest number of people and causes the highest economic losses in the world" are fine for the introduction, but not for the abstract. Please, start the abstract by telling the reader at once what the paper is: new data, a review of progress, a new technique, a synthesis, or whatever describes the nature of the paper. Unnecessary descriptive phrases and qualifiers should be left out of the abstract. Write the abstract as styled summary of its essential information; and include as much specific information as possible on the results.

Authors Response:
We appreciate the comment of the reviewer and we have rewritten completely the abstract following his suggestions.

Reviewer Specific Comment:
5.- Introduction: There is a long description of flood databases from press news in Europe and the world, and they do not provide any key information to objective or analysis to be addressed by the MSC database. I would suggest leaving only the most relevant databases, and includes the rest on a table indicating the country, region, time period covered, data source, type of data included, authors.

Authors Response:
We appreciate your comment. We have included a Table with the information that you suggest.

Reviewer Specific Comment:

6.- Page 4. Introduction Lines 24 to 30 I suggest to move to methodology section

Authors Response:

We appreciate your comment. We agree with what was suggested and we have relocated the paragraph that talks about the limitations and the bias derived from the application of the method in the methodology section.

Reviewer specific Comment:

7.- Page 4 introduction. Lines 31 to end of section, I suggest to delete this paragraph. Instead you should describe the specific objectives of this study.

Authors Response:

We agree with the suggestion and we have included a paragraph with the main objective and the sub-objectives of the work.

Reviewer specific Comment:

8.- Page 6, lines 13 to 15 probably not needed, delete.

Authors Response:

We have deleted this lines.

Reviewer specific Comment:

9.- Page 8. Indicate the list of damage types in a single line.

Authors Response:

We have indicated the list of damage types in a single line.

Reviewer specific Comment:

10.- Type of damages. Here roads and housing are the most common ones. I wonder if the news are bias to these two types because of most easy ones to be reported right after the event.

Authors Response:

The most frequent impacts caused by floods are usually road cuts. Riverbeds of the study area are of ephemeral functioning, therefore, a great part of them are crossed by the roads without bridges or, even, used as communication routes between the headwater and mouth areas. Therefore, it is logical that most of the damages are those of the roads. On the other hand, if we consider that floods are a natural risk, its measurement is based on the affection to human societies (Bates and Peacock, 1987, Tapsell, et al., 2002), therefore, it is not rare that another important part of the damages reports is housing. So, if we consider that the fact that road and housing damages are the most numerous, it does not imply a bias, but rather an evidence of the geographical and social reality of the floods in the study area. For clarity, we have added part of these arguments in section 4.4 (Flood damage variability) of the new version of the manuscript.

Reviewer specific Comment:

11.- page 10 line 25. How the quantity of damage was calculated?. In the case of housing, are you reporting the number of affected houses, or on roads, the number of cut roads...?

Authors Response:

The number of houses, the number of affected roads, and the number of other types of damage are not reported. For example, for each newspaper news about floods we assign, a value of 0 is assigned if there is no damage in a specific damage variable. Thus, this information only informs of absence or presence of damage, and not of the amount of each type of damage.

In this respect, and as we pointed out in section 3 of the manuscript, damages are constructed as dichotomic variables to point to the presence (1) or absence (0) of any of the studied damages by flood in each municipality. Thus, information regarding the type of

damage suffered in each municipality was categorized in a simple way, it is, being aware of the difficulty involved in objectivizing quantitative information, consistently in time and space (Gil-Guirado et al., 2016).

Reviewer specific Comment:
12 Page 15. “cold drops” is a direct translation of the Spanish informal term. Please, use “cold pool” or mesoscale convective systems.

Authors Response:
Thanks for detecting the mistake. We have corrected this word.

Reviewer specific Comment:
13.- Page 15. From line 20 to 28, it is poorly written and they need major changes.

Authors Response:
We appreciate your comment. We agree with the suggestion and we will make major changes to correct that lines.

Reviewer specific Comment:
14. Page 17. Line 6. I don’t understand “the latitudinal gradient referred to above continues to be reflected.

Authors Response:
We are sorry about the lack of clarity in this sentence. What we were trying to say is that the same latitudinal gradient is detected in that section (4.4 Flood damage variability) as the one mentioned in 4.2 Spatial Variability of floods.
This latitudinal gradient is characterized by more severe, intensive, extensive and damaging floods as we move from north to south of the study area and it is mainly due to greater deficiencies in the spatial planning of the provinces in the south, although the climatic and orographic factors cannot be ruled out.
In the new version of the manuscript, we have clarified line 6 on page 17, so that it is clear that we mean latitudinal gradient at this point.

Reviewer specific Comment:
15. Page 18. Line 25-27. This is not surprising due to the press nature of the database. As more small villages are cited on the newspaper, the flood extend on the database increases.

Authors Response:
As shown in panel b and c of figure 7, variability of annual cases of flooding and the annual area affected by floods seem very colinear. However, this should not necessarily be true, as there could be an increase in cases of flooding in municipalities with small size, while larger municipalities have a negative trend. In this way, panels b and c of figure 7 serve to confirm that there is no differential a flood trend in municipalities that has something to do with the surface of the municipalities. It is important to mention that, as indicated in section 4.2. of the manuscript, there is a great variability in the surface of the different municipalities studied.

Reviewer specific Comment:
16 Page 19. Lines 10-11. The sentence “The fact that the floods of L1 consider not only river floods (also consider flash floods and in situ floods), can magnify the importance of the increase in exposure, as to the growth of the exposed surface in flood zones.” I wonder if the main problem is the nature of the database, because social perception of risk increase with time, since any single damage is reported on the local news.

Authors Response:
Again, as we pointed out in the response to your second general comment, in the text of the manuscript we mention the possible biases that risk perception can introduce (Llasat et al.,

2009) in the trends obtained. However, as we showed in that same response to your general comment, trends are mainly influenced by population growth and therefore, are influenced by the increased exposure to flood danger.
In any case, in the new version of the manuscript we have explained better the main idea in that paragraph.

Reviewer specific Comment:
17.-Conclusions should go to the point of the main results. In the present format, there are too long, and they should be shortened.

Authors Response:
Again, taking advantage of the deep revision of the language, we have proceeded to rewrite the conclusions so that they are more concise and focused on the results of the work. Thank you very much for your important contribution.

Reviewer Other minor changes:
Other minor changes are suggested on the pdf document: https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2019-10/nhess-2019-10-RC2-supplement.pdf

Authors Response:
We appreciate all your important suggestions. All minor changes has been taken into account in the new version of the document.

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