

Report #1

Submitted on 25 Mar 2022

**Anonymous referee #3**

This study focuses on assessing the Daily Severity Rating (DSR), an additional component of the Canadian Fire Weather Index (FWI), to provide insight into its suitability for summer large fires in Portugal and the role of vegetation. The manuscript states that filling this knowledge gap can support the study region's fire prevention and suppression planning. Overall, the paper was informative. However, there were several issues with clarity, conciseness and structure, which makes it hard to evaluate the validity of the methods, results and the overall study.

**Answer:** We want to start by thanking the reviewer for the work and time spent on reviewing. The reviewer's constructive comments and suggestions were very helpful in clarifying and strengthening the manuscript, that we believe is now improved the quality and, therefore, the suitability for publication.

**Anonymous referee #3:** Some major general points:

1. The title would spark more interest keeping it shorter and removing redundancy. The authors should consider editing the title to be concise and relevant.

**Answer:** We edited the title, making it more concise as the reviewer suggested.

2. The abstract explained the aims and tasks of the research and the main findings. However, authors should improve the context and state the research's need and conclusion to make it easy to understand to less specialised audiences.

**Answer:** The abstract was changed, in particular the conclusion and introduction, taking into account the limit of word's number.

3. The introduction provided enough background and a clear knowledge gap that the study aims to address. However, to improve the understanding, the authors should reorganise the background topics into a logical, simple, and clear structure, avoiding talking about the same point multiple times throughout the introduction. For example, the authors could move from the Mediterranean context to Portugal, join fire weather and indices background, and combine vegetation with land uses changes, referring briefly to the urban-rural interface as this driver is not the focus of the study. The last paragraph of the introduction could mention the study of Calheiros et al. (2020), indicate the knowledge gap, what the authors did to fill the gap, and finally, an overview of the paper's contributions.

**Answer:** We agree with the reviewer that the Introduction was not well structured, so we change it accordingly. We highlight that, in the track change file, it shows that most of introduction is new. However, that is not true. We generally reorganized the Introduction, now in lines 14-94.

4. The authors could complete the study area description providing information about the vegetation across Portugal. Additionally, as the map of figure 1 shows pyroregions, the authors should refer to them in the text or remove them. Finally, the last sentence, lines 108-110, should be moved to the introduction (e.g., before mentioning the findings from Calheiros et al. (2020) in the introduction) or discussion.

**Answer:** Two phrases regarding the vegetation in Portugal were added, in lines 103-106. Additionally, we added a brief description of the pyro-region, in lines 107-109. We agree with the reviewer that the last sentence should be moved. However, we changed the sentence to better include in the new Introduction's structure. This subject is now better explained in lines 95-103.

5. The methods section should be reorganise to present the data and the approaches in a clear structure. For example, the author could use tables to list the data sources and the burned areas metrics. Furthermore, split the information into focused and clear subsections. A similar structure should be followed when reporting the results. The discussion should focus on the main findings.

**Answer:** We consider that this reviewer's commentaries were very constructive and useful for this manuscript's improvement.

Firstly, we created two tables to list data sources and to clarify burned areas metrics. In particular, Table 1 describes the data sources, types, variables and methodology where it is used. Table 2 describes the burnt area metrics used, including acronym, definition and spatial scale of application or use. Both tables were included in pdf file format (in page 33 and 34).

Secondly, we slip the information into more focused and clear subsections. In particular, we created new Data and Methodology subchapters, and the Results are also shown in the same subsections. The Data and Methodology chapter is now between lines 95 and 219. The Results chapter is now in lines 220-345.

Thirdly, we changed the Discussion as the reviewer suggested. We believe that the Discussion in now more focused on the main findings. The Discussion is now in lines 346-417.

6. The conclusion should be more general and concise. The authors should avoid repeating the results and focus on the meaning of the results and perhaps implications and perspectives. As a first step, they could focus only on the last paragraph and remove the earlier information.

**Answer:** We changed the conclusion as the reviewer suggested. The conclusion is now more general and concise, in lines 419-430.

7. To improve the quality of the figures, the authors should be consistent using the same map layout, the terms (e.g.,  $r_2$  vs  $R_2$ ) and plot frames. Furthermore, they could make all the plots bigger, remove titles on the top of the plots and ensure the caption descriptions.

**Answer:** We changed the figures as the reviewer's suggested. In particular, we changed the Figure 2, because we believe that the new format can explain our work in a much better way than the previous one. We increased the file original size and resolution in all Figures. However, we want to highlight that the Figures in pdf are all sized by the LaTeX template to create the pdf.

8. The references are relevant, and appropriate key studies are included. However, authors should review and correct the list. For example, on page 18, line 569:679, remove the link.

**Answer:** We corrected the references, taking into account the reviewer's suggestion.

9. The English language is simple. However, some odd constructs that, if rephrased, would improve the quality and flow of the manuscript's text and make it easy to read. The manuscript should get proofread in English.

**Answer:** We carefully reviewed the manuscript and corrected several phrases.

**Anonymous referee #3:** Some minor points:

1. On page 2, line 37, to remove statistical concept.

**Answer:** The phrase was corrected and also moved to the beginning of Introduction, now in line 15.

2. On page 2, line 23, to add, e.g., in the references.

**Answer:** As previously, the phrase was corrected and moved, now in line 37.

3. On page 3, line 57:59, to provide references.

**Answer:** We modified the sentence to clarify that the references were provided before. The sentence is now in lines 60-61.

4. On page 3, line 88, to edit, for Portugal. Entire and Continental Portugal are redundant.

**Answer:** We agree with the reviewer that say in the same phrase "Entire" and "Continental" is redundant. However, we deleted part of the sentence and merged it with other. The new phrase regarding this subject is now in lines 82-84.

5. On page 3, line 89, change reveal to revealed.

**Answer:** As previously, we merged the two sentences and deleted some parts, including the word “revealed”. The new phrase is currently in lines 82-84.

6. On page 4, line 112:114, to re-edit.

**Answer:** We agree that this sentence was not clear and re-edited. The new phrase is in lines 111-112.

7. Define the first time using acronyms in the text and all the figure captions. For example, on page 4, line 117, to define ECMWF.

**Answer:** We regret that lack of attention of us. The ECMFW acronym is now defined in lines 115-116. Additionally, we reviewed all the acronyms in text and figure captions.

8. On page 5, line 122:123, remove the last sentence.

**Answer:** The phrase was removed as the reviewer suggested. Now this paragraph ends in line 121.

9. On page 6, line 167:176, to move to the discussion.

**Answer:** We agree with the reviewer that this paragraph should move to the discussion, now in lines 392-401.

10. On page 7, line 205, remove because the software was mentioned before.

**Answer:** The phrase was removed. The last paragraph ends in line 194.

11. On page 14, line 430:436, to re-edit, remove or move to the introduction, where the authors should be sure the study goal is clear.

**Answer:** We accepted the reviewer’s suggestion and removed the paragraph.