

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC2
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Comment on nhess-2021-242

Anonymous Referee #2

Referee comment on "Characteristics of Heatwaves in Africa: Morocco 2000 and South Africa 2015/16" by Chloe Brimicombe et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-242-RC2>, 2021

General Comments

This paper discusses heat waves in Africa, and provides a list of African heat wave events compiled from peer reviewed literature, as well as grey literature and media reports. Case studies of two heatwaves is provided, with discussion of air temperature, UTCI, and pressure systems.

This paper is important because the impacts of heatwaves in sub-Saharan Africa are possibly under-reported.

Before publication, the method of the literature search needs to be more thoroughly described.

There are a few sentences that are confusing. The text is well organized and about the right length. It refers to appropriate related literature.

Specific Comments

It is not explained how the 21 academic papers and grey literature were arrived at. Typically, if a paper relies on a systematic search of the literature, then the search engine and search terms used should be given. The reader is not able to judge whether the search was systematic or totally ad-hoc, and therefore whether or not the search is exhaustive.

The only rows in the table that have human impacts have a reference to CRED. Are all of the human impacts from CRED? Do none of the reports from other sources mention human impacts? If so, this should be highlighted.

Page 14 line 236. "This is the first time heatwaves from two different African regions have been presented and compared using both their physical characteristics and reported impacts" The impacts are barely discussed in this paper. They are stated in the table, but the information comes directly from EM-DAT and no further information is added. No comparison is made between the impacts of the heatwaves.

Page 11, figure 1. During the heatwave, it does not appear that temperatures are really higher than usual in South Africa, whereas there is a high temperature anomaly over Namibia. Perhaps this is something to do with the resolution of the image, or the choice of color scale. Actual values for the temperature anomaly during the heatwave are not given in the text, and the reader is left wondering if temperatures were actually anomalously high during this period according to the reanalysis.

Is there any reporting for this time period in Namibia? It might be good to point out the discrepancy in reporting.

The figures are quite hard to view in the format given. It is difficult to compare different time steps in the same variable as they are not adjacent. The maps are tiny, so appear low resolution in the PDF version.

Technical Comments

The word "mandate" is used a few times to mean a motivation for further study - I am not sure this is a correct use of the word.

On page 3, line 66 the phrase "between 1980 and 2020 to date" is confusing. Does the author mean 2020 up to the date at which they are writing? They should instead say when that date was specifically.

EM-DAT is first mentioned in section 2.1, but is not defined or referenced.

On page 4, line 90. "It [UTCI] has further been shown to be able to forecast heatwaves internationally (Pappenberger et al 2015)". The phrasing suggests that UTCI in isolation is able to create international forecasts. The referenced paper retrospectively shows that a NWP forecast of UTCI could have been used to forecast the 2010 Russia heatwave. The point is that UTCI forecasts can be used, not that UTCI produces forecasts.

Page 5, line 118. Hard to read sentence. "Academic Literature and reports for Africa show that 39 heatwaves are reported for somewhere in Africa almost every year since 1980." This reads as if each year 39 heatwaves are reported somewhere.

Page 8, in the table. "Was the warmest April to date at the time in the Sahel" is in the "Heatwave Impacts" column, it should be in the "Heatwave Characteristics" column.

Page 12, line 205. The phrase "heat stress" is used instead of "UTCI" making it unclear what is being measured.

Page 14 line 222, "suggesting that international databases such as EM-DAT (CRED 2020) are not accurately recording heatwaves for Africa". These other studies are not suggesting that EM-DAT is not accurate, rather that it is not complete. Harrington & Otto make no mention of accuracy.

Page 14 line 222. "our study supports others (i.e. Harrington and Otto, 2020; van der Walt and Fitchett , 2021) suggesting that international databases such as EM-DAT (CRED 2020) are not accurately recording heatwaves for Africa including sub-Saharan Africa only including 7 out of our 39 listed heatwaves in their records, which is less than 20%." This sentence is hard to read. Break it into two sentences.

Page 14, line 229. "However, there are some heatwave warning systems (Hafez and Almazroui 2016, Boubaker

230 2010)" Are these systems another potential source for identifying heatwaves? Were the heatwaves in your study identified by these systems?

Page 14, line 225 to 228 repeats points already made in lines 221-224.

Page 14, line 231. "and there is some reporting in place for African Nations that is not always captured at an international scale" what is meant here by the "international scale"? Does it mean the international databases referenced above?

Page 15, line 250 - 253. The evidence provided on lines 250-252 does not directly support the hypothesis on line 253. Comparing an air temperature mortality effect with a UTCI anomaly in this way is misleading. We can see from figure 1 that the UTCI anomaly was large during the South Africa heatwave, but we cannot see that the air temperature anomaly is large. You should state what the air temperature anomaly was. This probably still leads to more deaths than the 11 reported.