

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC4
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Comment on nhess-2021-298

Anonymous Referee #4

Referee comment on "Hotspots for warm and dry summers in Romania" by Viorica Nagavciuc et al., Nat. Hazards Earth Syst. Sci. Discuss.,
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General comment

The authors present a comprehensive analysis regarding the spatial-temporal variability of hot and dry summer in Romania, as well as their combined effect (compound events) that can be considered a novelty for this region. Various characteristics of the heat waves (duration, spatial extent and frequency) and drought index (represented by the standardized precipitation index) have been analysed in terms of their long term trends, decadal variability and driving factor triggering their occurrence. The title "*Hotspots for warm and dry summers in eastern Europe, with a focus on Romania*" is not fit very well with the analysis carried out in this article that is done only for Romania and can not be extended over the entire eastern Europe. Therefore, the title could be changed. Same comment for the title of the sections (3.1, 3.2,...).

The manuscript represent a substantial contribution to the understanding of large-scale mechanisms controlling the variability of extreme climate events (heatwaves and droughts) in a region with complex topographic features such as Romania. The scientific approaches and the applied methods are valid at international standards. The results are discussed in an appropriate and balanced way, including appropriate references. The tables and figures are appropriate to present the results. The conclusions are clear presented and supported by the obtained results.

Considering all these aspects, the manuscript can be published with some minor corrections presented in my specific comments and technical corrections.

Specific comments

1) Pag 13, L429, "in the eastern part of Europe" should be completed with "focusing on Romania" since the heatwaves have been analysed only over Romania.

2) Pag 13, L431-432: The conclusion "i) the length, spatial extent and frequency of HWs in Romania has increased significantly over the last 70 years, for all summer month" is not entirely true; there is a strong decadal variability with a slight decreasing before '70 years (a correct change point could be find by using the Pettit test) and a real (accelerated) increase after 1990. I) and ii) could be combined. This is also in agreement with the author's comments presented in sections 3.1.

3) Pag 13, L438-439, "A significant increase in the frequency of hot extremes has been found at country level, with the most affected regions being in the north-western part and the Dobrogea region (Figure 4)". As I see in Fig. 4, this conclusion is true only on seasonal scale (JJA) and the most affected regions are more extended than those mentioned by the authors. There are differences between the individual months: for example, in July, only a small part (eastern regions and some very small south-western areas) exhibit significant trends. In Table S1 is not clear if the trend is computed for the time series of spatial average over the country. This should be clear mentioned.

4) Pag 13, L459, "The occurrence of HWs in the eastern part of Europe", " the eastern part of Europe" should be replaced by "Romania", see also my previous comments

Technical corrections

- Pag3, L86 "to determined" change in "to determine"

- Pag4, L111-112 "values < 1", insert "SPI1 after "1-month"

- Pag 5, L158, change "two centuries" with "two decades".

- Pag 7, L233, replace "Europe" with "Romania".

- Pag 12, L414: "August 2015 is also the month with the longest July heatwave (Figure 2c)" something is not correct here: ."July heatwave (Figure 2c)" should be replaced by "August heatwave (Fig. 2e)"

- Pag 12, L417, "periods (i.e. 1950 – 200": 1950 – 200 should be replaced by 1950-2020.

- Pag 12, L427: I think that "To extended the overview also" should be replaced by "To extend...."

- Pag 13, L429, "in the eastern part of Europe" should be completed with "focusing on Romania" since the heatwaves have been analysed only over Romania.

- Pag 14, L475, "IPP report (IPCC, 2021)", IPP should be replaced by IPCC.

- References: please check all references, there are some duplications in the authors' list: example, Bădăluț, C.-A., Perșoiu, A., Ionita, M., Nagavciuc, V., Bistricean, P.-I. P.-I., Persoiu, A., Ionita, M., Nagavciuc, V. and Bistricean, P.-I. P.-I.: Stable H and O isotope-based investigation of moisture sources and their role in river and groundwater recharge in the NE Carpathian Mountains, East-Central Europe, *Isot. Environ. Heal. Stud.*, 55(2), 1–18,.....