

Clim. Past Discuss., referee comment RC3
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Comment on cp-2021-139

Anonymous Referee #2

Referee comment on "Reassessing long-standing meteorological records: an example using the national hottest day in Ireland" by Katherine Dooley et al., Clim. Past Discuss., <https://doi.org/10.5194/cp-2021-139-RC3>, 2021

This analysis reassess the 1887 high temperature record of Kilkenny, Ireland, using different datasets including the early-year records, current observations and reanalysis product, and concludes that this record and other early observations of extreme high temperature are not sufficiently reliable. The authors instead suggest the 1976 heat record at Boora as the highest national temperature measurement. The analysis is interesting, and the conclusion is also more or less convincing. This is not an easy work anyway. One of my concerns is the locality of the study, and thereby the narrowness nature of its significance if it is published in the CP. In addition, I find a few of other issues which demand further clarification.

- The Kilkenny observational site is located in the centre of Kilkenny Town. Was it also located in the town centre in 1887? What was the extent and population of the town in the early time? If the town has not changed much in urban area and population, would the central location of the observation in 1887 be more productive to the higher temperature records compared to other observational stations in the nearby cities and towns of similar size?
- The application of 20CR to show the synoptic situation seems not so persuasive, I feel. It indicates a favorable weather condition for the extreme hot and dry event, but when the authors said that the condition is not uncommon in the summer season over Ireland, they did not exhibit an example of the synoptic situation at present. Is there any similar or even more extreme high pressure system over the study region during the same length of periods in modern time?
- The exercise to compare the JJA season differences of maximum temperature between Kilkenny Greenshill and the four stations is convincing procedure. However, the representativeness/proximity of Kilkenny Greenshill to Kilkenny Castle would be important. The authors did not well document this. It would be good to at least give a large-scale map showing the specific locations of the two sites. Besides, all the data used should be evaluated for their quality and homogeneousness.
- Given Kilkenny Greenshill could well represent Kilkenny Castle, there are other issues that should be clarified. 1) Birr seems mostly close to Kilkenny Greenshill, with both being inland stations, but its modern data was not shown, why? 2) For the two sites (Roches Point and Armagh) which is located inland or more closely to Kilkenny, the

differences of Tmax between 1887 Kilkenny Castle record and those of the two stations are within 99% of the modern data, which means that the differences are not impossible. If the reference sites are closer to Kilkenny, would the possibility for the 1887 Tmax differences to occur be higher?

- Finally, I would suggest that all the figures be improved for their quality and clarity.