

Comment on cp-2021-127

Linden Ashcroft (Referee)

Referee comment on "Insights from 20 years of temperature parallel measurements in Mauritius around the turn of the 20th century" by Samuel O. Awe et al., Clim. Past Discuss., <https://doi.org/10.5194/cp-2021-127-RC2>, 2021

This paper describes and explores an incredible parallel dataset for the Indian Ocean nation of Mauritius. The dataset presented in this paper is rare in its age and location, and the authors have done a service to the community by bringing it to light. While the analysis of the data is simple, it provides a useful new study of parallel observations in a region severely lacking in any historical weather data, let alone multiple simultaneous records.

The paper would be appropriate in a data journal such as Earth System Science Data or Geoscience Data Journal, but I believe the paper is suitable for Climate of the Past given the rarity of the record. I therefore recommend it be published once the authors have considered the suggestions below. Most of my suggestions are about improving the readability of the article so as many people can learn about this dataset as possible.

- My main comment on this manuscript is that it is very long. The sections on the key personnel of the RAO (in section 2.1) and the detailed metadata from the 1899 blue book (in section 2.2) could be placed in a supplementary section, with a one paragraph summary given in the main text instead. This would allow readers to focus on the key findings of the data analysis and explore the history of various elements if they are really interested.
- Similarly, the introduction could be tightened to tell the story of these valuable observations more directly. The current narrative of Paris agreement > early instrumental biases > homogenisation techniques > tropical data scarcity > necessity of parallel observations could be shortened to 'we need more data > the best kind of data are data we can trust > parallel obs allow us to have more confidence in early data but they are rare > we found some!' These ingredients are in the paper now (mainly section 1 and 3), but they could be rearranged.
- Finally, I don't mean to be that person who mentions their own work in a review, but given the Southern Hemisphere location, work we've done in Australia looking at simultaneous changes in observation practises might be relevant (Ashcroft *et al.*, 2012) if you want to keep some of that discussion in your introduction. Our recent publication

on the parallel observations in Adelaide will also be useful (Ashcroft *et al.*, 2021). In particular, the references to Blair Trewin personal comms could be replaced with this latter citation, as that paper contains all the details. It's encouraging your analysis in the tropics is similar to our assessment of the mid-latitude Adelaide dataset, particularly in terms of greater seasonality in the Tx differences compared to Tn.

Minor/typographical

Throughout: Extra commas throughout the manuscript would improve the readability of this paper, as I found I tripped up on the start of many sentence. E.g. Page 3, line 16 "when such biases change, they...", page 3, line 19 "prior to use in climate applications, these records...", page 13, line 17 "As the work progressed, the...", page 18, line 15 "As such, the substantive..."

Throughout: 'data' and 'metadata' are plural

Throughout: austral is lower case

Abstract line 12: within roughly 80 metre radius of each other?

Page 3, line 26. The new sentence on this line could be the start of a new paragraph

Page 4 line 28: Shamefully, I've never heard the Stevenson Screen being called a Cotton Region Shelter before! Is that a US name? A reference would be good here.

Page 4, line 35–38: this long sentence could be broken into two.

Page 6, line 9–11: you could remove this sentence as its message is clear from the previous one.

Page 6, line 18: you mention Mr Cere's many vocations, but then call him a scientist for the first time when he began publishing. That confused me a bit – did he train as a scientist and then start publishing, or call himself a scientist in his publications?

Page 11, first paragraph: Figure 10 should be mentioned here, as this timeline is hard to follow just by reading it.

Page 13, final sentence: I think you could make more of the fact that the data are available. It feels buried in this section and would be better in the conclusions. In revising the introduction you might find that Section 3 is not needed.

Page 14, line 4: Is there any reason why you have used 'were' instead of 'if' at the start of this sentence? Using 'were' makes that sentence harder to follow in my opinion.

Page 14, line 16: what do you mean by change in seasonality? An extra bit of info here saying that the differences are reduced during the cool part of the year compared to later observations would be helpful.

Page 14, line 19–20: I found this sentence hard to follow. "For the shift around 1892, there is for most of 1891 and thereafter also the Thermograph available permitting a 3-way comparison." Can you rephrase it?

Page 14, line 23: you talk about a major cyclone in April 1892 like we know all about it, but I didn't see earlier reference to it in the article. Perhaps you could say 'a major cyclone in April 1892' and/or provide a reference?

Page 15, line 18: Can you provide a reference for the statement about mean temperatures? There is probably guidance around this in (World Meteorological Organization, 2011)

Page 16, line 33: do you know why the reporting changed in those final three years?

Page 19, line 3: you don't need to say 'as follows'

Page 19, line 36–40: this sentence would be more powerful broken into two.

Page 20, lines 4–5: wouldn't there be more written about the RAO if it was a shining scientific beacon of its time? A reference to Mahony 2018 here might remind the readers that there are more explorations of the output from this remarkable observatory.

Page 20, final sentence: I'm a bit surprised by this statement, given that the Stevenson Screen is the world standard for exposure and has been for a long time. It's not perfect, but it's generally considered the best we can do. It would be worth clarifying which temperatures you think the room and Thermograph observations are more accurate for. In the next sentence you state that these observations sacrifice accuracy of daily and seasonal cycles, so are you saying they are most accurate for annual observations, rather than daily or monthly extremes?

Page 21, line 24: I'd remove the word very here, the sentence says the same thing without it.

Table 1: Can you list the years that are not present in each holding in this table? That will make it more useful to future researchers exploring these data

Table 2: Thick lines between each variable (Tx, Tn etc) would improve the readability of this table. I'm also not sure you need so many significant figures in your t-test results.

Table 3: Similarly, thick vertical lined between each comparison would help this table

Figure 2: The Adelaide observatory image comes from the Royal Society of New South Wales.

Figure 4: A comma needs to replace the full stop before 'Although'

Figure 6: How hard would it be to change the coloured dots to each have a different shape, for colourblind readers (or those who printed the paper out in black and white)?

Figure 7: I'm not sure you need this figure – it could go as an appendix

Figure 8: Again, not sure this figure is needed, particularly as it is low resolution

Figure 11, 13, 15: Ventilated is spelt incorrectly in the legend. It would also be better to

use 'differences' rather than 'offsets' in the caption, to be consistent with the axis label. Finally, is there a way you could differentiate the lines on the chart for colourblind readers? Different thicknesses or line types perhaps?

Figure 12, 14 and 16: This is monthly distribution rather than seasonal

Figure 15: There looks to be an outlier in the Hygrometer data in 1894 - can you comment on this?