

Review of “How well can we quantify when 1.5° of global warming has been exceeded”.

Thorne et al

This is an interesting paper which contains a lot of science. Broadly it aims to determine when 1.5C of warming has been exceeded framing the question as probabilistic and using calibrated uncertainty language. My main problem with the paper is the excessive length which precludes a detailed review.

Broadly the paper is a combination of a long literature review, an approach to determine how much temperatures have warmed since pre-industrial and if we have exceeded 1.5C warming (or other limits). The problem with the later is it requires some estimate of what the next 10 years of global temperature might be. As the limits are defined through 20-year centred averages.

My recommendation is to reject the paper as it is. 100+ pages is excessive. I think the paper should be split into three:

- 1) A literature review – though I recommend the authors be more critical than is normally the case.
- 2) A paper focused on how much warming since pre-industrial there has been to date.
- 3) A paper focused on exceedance of a limit defined through a long term average requiring future projections.

In doing this I recommend the author team are more focused. The goal should not be 3 40 page papers but 3 20 page papers. For example, resist the calls for community action within the body of the paper. If those are needed, they should go in the conclusions.

Other thoughts

- 1) I thought the debate about pre-industrial being 1850-1899 had been settled in the last IPCC report.
- 2) Given this the paper(s) should focus on changes relative to this period. No need to include other baselines.
- 3) I think the current presentation of the third part is quite weak with it being, I think, hidden in section 5.
- 4) How sensitive are results to changes in definition of family tree?

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