

Interactive comment on “Constraining the temperature history of the past millennium using early instrumental observations” by P. Brohan et al.

P. Brohan et al.

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Thanks for this comment. We are fully persuaded of the value and importance of CMIP5 model simulations and realise that any analysis of the simulations must take care to represent the capabilities of the models accurately. In response to the specific points:

1) Climate model drift: In principle we agree that model drifts should be removed before analysing or plotting simulations; but there is no universally agreed method for identifying such drifts, all methods contaminate the residual to some extent, and many climate analyses (including one IPCC chapter) explicitly decide not to remove them.

(The method used in the comment removes long-term drifts at the cost of inflating 30-year mean variability - as the amount of multi-decadal variability is a major uncertainty in the reconstructions, this is not ideal). As our main comparison in fig. 9 is not much influenced by any drifts we propose to continue to make this comparison using uncorrected data; but we accept that figure 1 is influenced by drift to an unacceptable extent and we will adjust the simulations in a revised version of the paper - we plan to use the method described in Tett et al. 2007 (DOI 10.1007/s00382-006-0165-1) to do this.

2) Volcanic forcing uncertainty: We agree entirely that forcing uncertainty is a major component in the simulated response to volcanoes, and that in the early nineteenth century that uncertainty is sufficiently large that simple comparisons between simulated and observed temperature change can't be used to judge the skill of GCMs - any such skill assessment should take other information into account as well. For this reason the paper says nothing at all about the skill of any GCM - we wrote the conclusions with care to avoid any such assertion. All it says is that some simulations are unlikely to be accurate - our interest is in the accuracy of the available simulations as a representation of reality, not in the underlying GCMs. It's clear from the reviews though, that this section is easy to misinterpret, and we will make this distinction explicit in a revised version.

3) Citation of the simulations used: We agree that citing the simulations used is very desirable, and we would have liked to add references to dataset DOIs to table 1 (as recommended by the CMIP website). We tried, but failed, to find such DOIs for the simulations used. We found <http://cera-www.dkrz.de/WDCC/CMIP5/Compact.jsp?acronym=NCCNMpc>, but it's not for a simulation we used. We will try again, for a revised version, but it is possible that the necessary DOIs do not yet exist.

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