Clim. Past Discuss., 10, C2183–C2185, 2015
www.clim-past-discuss.net/10/C2183/2015/


Climate of the Past Discussions



# *Interactive comment on* "Technical Note: Are large error bars desirable? A note on quantitative model-proxy comparison" *by* J. Liakka et al.

**Anonymous Referee #1**

Received and published: 12 January 2015

I certainly appreciate work in this area, as model-data comparison is a vital component of model validation and use. I am therefore disappointed that this manuscript does not appear to make a more helpful contribution to this topic.

The claim that OVL is an appropriate or useful metric is simply not supported. What is the basis for the underlying assumption that we should wish for the two distributions in the comparison to be the same, or even similar? The authors state "one must ensure that fm and fp are probability distributions of a variable, which is represented at the same point in time and space". However, as constructed in the paper, the two distributions do not represent the same thing at all. In particular, I see no reason to expect any relationship between the interannual variability of the model and the uncertainty of any proxy-based estimate of climate state. These are fundamentally unrelated quantities.



Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

Furthermore, I don't see why model interannual variability is something one should wish to take account of in model-data comparisons of this nature, and the authors do not justify or explain this. The interannual variability is not generally relevant even in principle to model-data mismatch, as paleoclimate proxy data is frequently considered (including in many of the examples cited) to represent climatological average conditions over some substantial period of time, and model data should be processed accordingly. For example, 30 year averages of model output are commonly used, with even this being something of a computationally-constrained compromise. If the intention of the authors is to allow for uncertainty in the model calculation arising from internal variability, then it should more properly be the variability of 30y averages (or whatever the appropriate value is) that is used. This will of course be a much smaller value than the interannual variability, and so would substantially change their results. When the relevant model internal variability is very small relative to observational uncertainty (which I think is normally the case) then OVL, while small in all cases, will be similar to the standard approach.

In contrast, the widespread RMS-based approach that the authors disparage is a simple form of log-likelihood and such has a well understood basis and interpretation which extends beyond paleoclimate applications. That is, it is proportional to the logarithm of the simple likelihood function arising from the assumption of Gaussian errors on the observations, and so has the potential to be interpreted as a weight or probability (though this is of course dependent on the validity of the assumptions). The fact that highly uncertain observations do not discriminate strongly between better and worse models is simply an inevitable and appropriate consequence of the limited value of such observations. The authors assert that this is undesirable, but I don't see anywhere where they explain what their actual objection to it is. They have simply set an entirely arbitrary threshold of 50% for the OVL calculation, and assert that results below this value are not useful, without further explanation.

In summary, I don't think that the metric presented here is useful or appropriate. I



CPD
10, C2183–C2185, 2015





don't think it provides a useful summary of model-data mismatch, and I don't think the authors have adequately justified themselves. Their recommendation to exclude data with uncertainties three times larger than model interannual variability seems arbitrary and unsupported, and appears to be nothing more than an artefact of the particular method they present for model-data comparison.

---

Interactive comment on Clim. Past Discuss., 10, 4535, 2014.