

Interactive comment on “Model dependence in multi-model climate ensembles: weighting, sub-selection and out-of-sample testing” by Gab Abramowitz et al.

Anonymous Referee #1

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Review Comments: The authors present a review of a wide array of studies that address model dependence in multi-model climate ensembles. They also provide valuable guidance on how users can test the efficacy of approaches that account for dependence. This is a very timely contribution coming as it does in the months leading up to CMIP6 –easily the largest climate modeling exercise ever carried out. This manuscript will set the stage for how model simulations are treated – and hopefully move beyond equally weighted simulations.

My main comment is that the manuscript needs to be better organized. It currently has 11 sections and no roadmap up front on what these sections contain. Surely, there is a

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way to consolidate some of these into subsections and have fewer main sections. Most of the comments below are also related to readability.

Detailed comments: 1. Page 2, Line 8: The six sources of uncertainty are in the first paragraph.

2. Page 2, Line 25: The word “calibrated” may be replaced with “constructed” or “designed”.

3. Page 2, Line 36: Again the word calibrated is used in a different sense than is standard.

4. Page 4, Line 6 and Line 29: The analogies from evolutionary classifications may not help the typical reader or even make a connection. I suspect many, like this reviewer will have to look it up.

5. Page 4, Line 20: The use of “first version number” and “second version number” are actually better understood as MajorRevisionNumber and MinorRevisionNumber. Boé (2018) provides a version number example that avoids the confusion in this manuscript. Perhaps move the CLM4/CLM4.5 example up to avoid this confusion?

6. Page 4, Line 24-26: “A reminder . . .” is a complicated sentence. Perhaps rewrite in simpler language.

7. Page 5, Line 32: In the sentence “. . .these approaches could in principle address many of the shortcomings of approaches such as those above. . . ” I believe the latter “approaches” refers to the 3 discussed in the preceding paragraphs. This sentence should be reworded to make it clear.

8. Page 6, Lines 1-7: Is there an implicit assumption (in figure 1) that observational estimates are close together? In the regional context, it is quite common for multiple observational estimates to be further apart than inter-model distances.

9. Page 8, Line 28: The word “calibration” appears for the first time in the section

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heading. Some prior context is important.

10. Page 8, Line 30: "... how might proposals to account for independence interpreted?" is missing a "be".

11. Page 9, Line 6: "data" here refers to "observed data" right? This needs to be clarified.

12. Page 10, Lines 40-41: The sentence "Dependence is not a property of a model simulation per se, rather a property of a specific quantity in a particular simulation with respect to the rest of an ensemble" is a variant of the immediately preceding sentence.

Interactive comment on Earth Syst. Dynam. Discuss., <https://doi.org/10.5194/esd-2018-51>, 2018.

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