RESPONSE TO REVIEWER RC2

Anonymous Referee #2
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Dear Referee #2

Thank you for taking the time to read through our manuscript and provide comments and suggestions . Below we highlight our responses.

Obs4MIPs is a quite important tool for the climate modeling community to use to evaluate model output. It is really useful to pre-filter the vast amount of observational data to identify the subset directly comparable with fields output by models. This paper provides a straightforward update of the Obs4MIPs project to support CMIP6, and should be largely publishable in its current form with a few minor tweaks.

Minor Issues
The draft is currently a bit unclear as how to to effectively track which observational data is used for model parameterization and how to avoid (when appropriate) using it for model evaluation. This could be clarified.

Obs4MIPs data is principally used for model evaluation, not for developing/testing a model parameterization. Most datasets included as part of obs4MIPs are large to global scale monthly mean gridded products. These data are useful for evaluating climate models holistically, and some cases where higher frequency dataset are available (e.g., TRMM precipitation), some process-oriented analysis is possible.

A number of important observational datasets use fields that are not directly included in model outputs but can be created by combining different output fields. Examples include in-situ global surface temperature products –which blend land SAT and ocean SSTs with specific behavior over regions with changing sea ice cover, and MSU/AMSU measurements which cover a wide range of pressure levels. The paper could more clearly discuss how such observational datasets can be used in the context of Obs4MIPs, and how the required combination of fields (e.g. pressure level weightings for MSU/AMSU) can be communicated to modelers as part of the dataset indicators or supplementary materials.

This is a very good question / observation. Within the initial tenets and framework of obs4MIPs, this consideration was to be addressed through the The “technical notes” associated with the datasets; specifically there is a section that asks for the dataset provider to address the methodologies and nuances associated with applying observations to model evaluation. The text has been updated to address this.

Suggestions/Corrections to the text:

Page 4 Lines 9-15: Might also be worth mentioning (here or later) the important systematic biases present in some observational datasets as well. There is an unfortunate tendency for some modelers to assume observations are necessarily unbiased and not

account for structural uncertainties that is worth pushing back against.
AGREED, already noted in the text but added again here.

Page 6 Line 4: I assume "(cite the COSP)" is included in error.
FIXED

Page 8 Line 25: Can go ahead and define the CCI acronym here rather than on Page 9 Line 19.
FIXED

Page 14 Line 1: Should that be "Data Specifications"?
FIXED