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Interactive Comment

Interactive comment on "ESMValTool (v1.0) – a community diagnostic and performance metrics tool for routine evaluation of Earth System Models in CMIP" *by* V. Eyring et al.

V. Eyring et al.

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Reply to Anonymous Referee #2

We thank the reviewer for the helpful comments. We have now revised our manuscript in light of these and the other review comments we have received. A pointwise reply is given below.

[0] Ditto what the first reviewer wrote.

[1] I like that the tool is focused and modularized on 'specific scientific themes'. Unfortunately for me, the subsequent descriptions are a bit tedious to read because each theme section seems to follow a pattern. That said: the paper does what it has to do! I have no substantive suggestions that would improve the pace of the presentation.

Thanks very much for supporting the modularized structure around specific scientific themes!

[2] Regridding is mentioned several times in the text and I assume that each module has used the appropriate interpolation method. For example (p7553), "Model output is linearly regridded". I assume this means bilinear interpolation. Most commonly, this method is used because it is fast and simple. However, being 'fast and simple' does not mean it is the most appropriate. In practice, if the variable being interpolated is smoothly varying, just about any interpolation method will produce reasonable results. However, bilinear interpolation may not be appropriate for variables that are fractal in space such 3-hrly and daily precipitation. I suggest that in each place where regridding is mentioned it should mention the type of interpolation used. This could simply be an adjective: (p7562) "After regridding all .." use "After bilinearly regridding all ..".

Agreed. We have revised the text making sure that the adopted regridding method is mentioned in each section (where appropriate).

[3] The text (p7589) states "One current limitation is the lack of parallelization." The most recent version of the NCAR CVDP (v4.0.0) has a Python driver that uses simple task parallelism to substantially reduce wall clock times. The driver uses standard Python functions (no custom functions). This approach

GMDD
8, C4356–C4360, 2016

should be investigated for future use by the ESMValTool developers.

Thanks for this suggestion! We are currently planning to revise the parts of the code dealing with data preprocessing, which are the most time consuming operations in v1.0. The preprocessing includes common operation such as data reformatting and regridding. The goal is to move these operations to a higher level in the code structure, so that they can be performed in advance and in a parallel framework. This will be probably written in Python and the package you are suggesting could be useful.

[4] I note that there is wiki page (p7590) for developers and contributors. Like model development, developing data processing functionality is 'kinda' fun!!! The authors mention (p7548) a testing framework and code documentation. No details are mentioned. Sometimes developing good test codes can take more time than developing the processing function(s) they are testing. With regard to documentation, cryptic descriptions are better than nothing but *not* much better. I suggest encouraging (?requiring?), simple usage examples.

We aim at having a standardized code documentation based on Sphinx: the framework is already part of v1.0, but it has not been completely applied to existing code yet. Concerning automated testing, the developers are currently required to provide a test namelist together with their codes. The goal of such test namelists is to provide quick but yet comprehensive test cases and to serve as usage examples. Following the suggestion of the reviewer, we added more details on automated testing and on code documentation using Sphinx as well as a reference to the "ESMValTool User's Guide" (i.e., the supplementary information) to section 2 of the revised manuscript.

What is not mentioned at all? Ummm, let me think! Ah yes, now I remember:

GMDD

8, C4356–C4360, 2016

USER SUPPORT. I am sure: (a) the tool's implementation and the components are perfect; (b) all users will carefully read the documentation; (c) all users will write clean, unambiguous structured code; and (d) all users will spend time trying to debug their codes. However, in the highly unlikely event that my assertions are not correct, how do users get support? To whom or what should questions be addressed? Should questions be sent to some central location? Will someone monitor the support location? Ultimately, who is responsible for user support?
Based upon experience, user support can be time consuming, tedious and frustrating. On the other hand, it can be rewarding. It can expose developers to different ways of thinking. It can offer insight into new development paths.

Following your suggestion we are setting up a user mailing list, where users can submit questions and ask for support. Once fully operational, the link to the mailing-list will be made available on the ESMValTool webpage at www.esmvaltool.org.

[5] Some journals have suggested that software tools should be referenced via a DOI or a link. Python, NCL and R are mentioned but there are no references to these tools.

- **The original R reference is the following. Ihaka and Gentleman are the original R developers. It is 20 years old but I could not find any better reference. Also, I could not find a specific R language DOI.**
  R: A Language for Data Analysis and Graphics Ross Ihaka and Robert Gentleman Journal of Computational and Graphical Statistics Vol. 5, No. 3 (Sep., 1996), pp. 299- 314 DOI: 10.2307/1390807.
- **Python: https://www.python.org/ I could not find a specific DOI. Perhaps this link is the best.**

GMDD
8, C4356–C4360, 2016

- **Should NCL be spelled out in addition to the commonly used acronymn (NCL)? NCL (NCAR Command Language) NCL has a DOI. The NCL web page suggests the following citation:**
  The NCAR Command Language (Version 6.3.0) [Software]. (2016). Boulder, Colorado: UCAR/NCAR/CISL/TDD.
  http://dx.doi.org/10.5065/D6WD3XH5

We apologies for this omissions and agree these references should be added. Thanks for pointing us to the proper citations, which have been inserted in the manuscript. NCL has been spelled out as suggested.

I am happy to see that the ESMValTool will have a DOI!

We have assigned a DOI which is now given in the Code Availability Section.

Interactive comment on Geosci. Model Dev. Discuss., 8, 7541, 2015.