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Geoscientific Model Development Discussions

Interactive comment on "JULES-GL7: The Global Land Configuration of the Joint UK Land Environment Simulation version 7.0" *by* Andrew J. Wiltshire e al.

Anonymous Referee #1

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The authors describe JULES-GL7, the latest land configuration for the JULES model. In particular JULES-GL7.0 and JULES-GL7.2 are the latest configurations for standalone JULES (without an atmospheric model). The background to various configurations used by the UK Met Office is described, before the main part of the manuscript goes through each of the main areas of the model in turn, describing the approaches used. Later sections cover how to run the model and evaluation.

In general I think this is an important manuscript as it describes a key part of the modelling system, namely the configuration. The provision and description of configurations is an essential underpinning activity, on which an entire community of modellers

can base their activities. Therefore I welcome this manuscript, although I have a few suggestions for relatively minor changes to the presentation. In particular I think that the main concepts of what a configuration is (and what it isn't) should be made clearer, and at any early point in the manuscript.

(Note that a large section of the manuscript is given over to describing how to run the model using standard suites on particular computers. I have not worked through the steps described and therefore cannot confirm their validity.)

Main comments

I would like to see a clearer explanation of exactly what defines a configuration, meaning what it covers and what it doesn't, how it differs from an "experimental setup" and the likes. There's a bit of this on P9 bottom paragraph, and possibly elsewhere, but it left me wanting to know more. Given that the paper is all about describing a configuration, it would be better to clarify the definition well before P9. Maybe at the start of section 2, when JULES configurations are first mentioned?

From what I understand, meteorological data are not part of the configuration, but I am less clear about some of the other inputs, e.g. soil and vegetation data. P7 L28 suggests some soil "parameter values...are described in...", and topographic index data are included; earlier we read about LAI derived from MODIS. Which of these are part of the configuration? Table 3 looks like the required inputs, but does not specify named files or sources for the information (e.g. MODIS processed according to a given recipe). It's all a bit confusing. If the datasets (or rather, input files derived from other datasets) are part of the configuration then (a) this should be clear, and (b) ideally we need to know more about the derivation of the files (thought that might be impractical to include). A diagram might be helpful here, to show what's in a configuration, and how it relates to other components of the system, e.g. the experimental setup, model suites, etc.. This might also be where the ideas of having standard model suites could also be explained.

P2 L17 and elsewhere: we are told that the paper covers GL7.0 and 7.2. In time we discover that these differ in terms of their treatment of radiation. It would be useful if the paper highlighted these differences more. For example, near P2 L17 briefly say that they differ slightly. And/or have a separate sub-section later that is just about GL7.2, so that the reader can easily navigate to find the answer as to how these configurations differ. And/or briefly note the differences at the top of Section 2. Also in abstract.

P2 L29 and elsewhere. I think the convention in use is that GL7 denotes a family of configurations, including GL7.0 and GL7.2. It would be good to have this clarified fromt he start, and to have the convention applied consistently - a.g. P3 L8 should be GL7.0? At present it is a bit confusing.

P3 L26: Here and elsewhere there are some terms that are probably more or less specific to JULES, e.g. ancillaries, rose suites, and that at any rate deserve more explanation for the broader readership. This is a wider point than just here - e.g. other comments about need to clarify what a "configuration" is. The ideas of suites etc. need to be properly introduced and woven into the manuscript at an appropriate place, and not assume too much background knowledge.

Section 4: There is a small amount of material related to evaluation of the configuration. The extent to which one paper can describe configurations and their evaluation is a tricky one, and it is important that the description of a configuration is not delayed substantially by the need to carry out a comprehensive evaluation. However I would suggest that any future updates on the JULES GL series should include a bit more on the evaluation, and/or signpost another set of papers that provides more in-depth evaluation.

Section 5: Most of this is very detailed and arguably is not required as part of the main manuscript (and for some people it will never be required). I suggest moving all or most of it to an Appendix. Only Sec5.4 "Inter-version compatibility" seems important enough for the main text, and I suggest that this should come much earlier as part of

the process of clarifying the terms and approaches used (the idea that the configuration is largely independent from the code version seems important to me, but at present the early discussion is possibly limited to a brief mention at P2 L36).

More minor comments and suggestions

Abstract: I would prefer to read more about the details of the GL7 configuration - at present the second half of the abstract is a rather rambling set of thoughts about the ideas behind the need for configurations, and similar. e.g. briefly note that GL7.0 and 7.2 are covered and how they differ?

Capitalise "coupled model intercomparison project"

Change "cluster accessible to all with links to JULES" to "cluster, accessible to all JULES users".

P2 L13: New paragraph at "JULES is the land component".

P2 L32 and nearby: Here I would just say that platforms and other tools are available, and give details later. Saying "Rose and Cylc" here doesn't add anything.

P2 L37 and others: Recommendations to use latest code version, temporary switches etc. - move these to later in the document. This level of detail is not useful this early, before we know much about the configurations themselves.

P2 L42 and others: There are many links that cannot be accessed without a valid login account. This should be indicated, e.g. with "login required". I suspect there might be a journal policy or guidance for this.

P4 L7: "Table B1" - inconsistent numbering. L12: add "Sections" before numbers.

P8 L13: "in the original version" - meaning what? An earlier configuration? An earlier iteration? I'm not sure we need to know this, and it shoudl certainly be made clearer.

Appendix A: JASMIN. This is very detailed information, and I worry that it might be the

kind of detail that tends to change relatively quickly as HPC platforms evolve. Could this detail be replaced by a reference to an online resource that is more likely to be kept up to date?

Appendix B: I'm pretty sure this is referenced before Appendix A - so change the order (B to become A).

Figures: In general I do not like colour schemes that use only 1 or 2 colours. They might look good but they tend to obscure information! e.g. Fig.2, Fig.5 (in particular!). However I realise these are very popular, so I will just note that they have major limitations!

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