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Interactive comment on "The Met Office Unified Model Global Atmosphere 6.0/6.1 and JULES Global Land 6.0/6.1 configurations" *by* David Walters et al.

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This comment is submitted as an author's response to both referees and the additional comment in the discussion.

1 Comments from referees

Both referees have made positive comments about the discussions paper and have not suggested or requested any changes to this ahead of publication.

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Discussion paper

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2 Author's response

We thank both referees for their reviews and for their support for the publication of this paper. Given how widely the Global Atmosphere/Land configurations are used, we believe it to be an important part of our development/implementation process to produce a peer-reviewed paper documenting the configuration as a whole, as well as highlighting the changes made since the previous configuration and the impacts these have on model performance.

3 Comments from other contributors to the discussion

In addition to the reviews, there were some specific questions from Imtiaz Dharssi at the Bureau of Meteorology in Australia about our description of some of the land surface ancillary data. Imtiaz was involved in the development and implementation of these ancillaries during his previous employment at the Met Office and is therefore particularly well placed to comment on the details of their description.

His specific comments were:

1. Are the GA6 soil properties only using HWSD or are other datasets also used? For the United States region, is the State Soil Geographic Database (Miller and White,1998) used? Are point observations of soil sand, silt and clay fractions (Batjes, 2009) used?

2. Is canopy height based on MODIS data as suggested in Table 1 or is it based on IGBP landcover?

3. For the "Urban Canopy" perhaps it would be worth also referencing Best et al (2006) which shows some limitations with the simple scheme. As well as men-

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tioning the MORUSES scheme which is used in the convective scale versions of the Unified Model (Porson et al, 2010).

Imtiaz's full comments are available in discussion comment **SC1**

4 Author's response

Imtiaz's comments were most welcome and again highlight the benefit of an open discussion on these papers. They have allowed us to improve the accuracy of our documentation, which is of benefit to us as well as to the users of our configurations.

A full reply to Imtiaz's comments area available in discussion comment **AC1**, but we include the main reply below for completeness:

1. *Soil properties*: Yes, you are correct that these are really a blend of HWSD and the other datasets you have referenced. The details of this blending is not published, but we have updated table 1 to reflect the source data used.

2. *Canopy height*: Yes, again, you are correct. The canopy height is currently held in the same file as the leaf area index, which was calculated from MODIS data, but it is actually calculated from IGBP data. Again, we have clarified this in an updated version of table 1.

3. *Urban scheme*: The aim of this paper is not to document the available options within the UM or JULES, but to specifically describe how these are used in our Global Atmosphere and Global Land configurations. To date, the improvement of the urban scheme has focussed on non-GA/GL convection permitting configurations of UM/JULES, so we believe that it will be best to leave the discussion of this issue to the upcoming documentation of those configurations.

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5 Author's changes to manuscript

Following Imtiaz's suggestions in discussion comment **SC1**, we have updated table 1 as discussed above to more accurately cite the source data used for certain land surface ancillaries.

In addition to this, we have also made the following changes as highlighted in the latexdiff created pdf linked to below:

1. In Sect. 2.11, we have corrected an error in the description of the "inland water canopy". Whilst some configurations of JULES assign the lake canopy with a heat capacity of $4.18 \times 10^6\,\mathrm{J\,K^{-1}\,m^{-2}}$ (which is the equivalent of $\approx 1\mathrm{m}$ depth of water), the GL configuration uses $2.11 \times 10^7\,\mathrm{J\,K^{-1}\,m^{-2}}$ (i.e. $\approx 5\mathrm{m}$ depth), which is believed to be more representative of lakes globally.
2. We have improved the consistency of the labelling in sub-sub-sections of Sect. 3.
3. We have updated a URL cited in the "Code availability" section.

Please also note the supplement to this comment:
http://www.geosci-model-dev-discuss.net/gmd-2016-194/gmd-2016-194-AC2-supplement.pdf

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