Geoscientific
Model Development
Discussions

Interactive comment on "The first Met Office Unified Model/JULES Regional Atmosphere and Land configuration, RAL1" *by* Mike Bush et al.

Anonymous Referee #2

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This is a nice overview of the current configuration of the UK Met Office Unified Model. I would recommend publication subject to the general and specific comments below: 1. Need to indicate that this is the UK Met Office in the title. 2. It would be nice to have a list of acronyms in an appendix. There are a lot of them! 3. Define UM and JULES at the first use (in the abstract as far as I can tell.). 4. Is there an internal report that this paper could reference? 5. While Kendon et al. 2017 is a good reference for km scale modeling, there are a lot more that could be given. General comment: There are a lot of UK Met Office references in the paper. It would make the paper more relevant if more of the communities efforts in these same areas are also referenced. Otherwise this reads as a UK Met Office report. 6. Page 3, line22. Suggest that say the "ENDGame" is the dynamical core used in the RAL1. 7. Page 3, line 14. A reference to

the hybrid height coordinate used would be appropriate here. 8. Page 6, line 12. Why has a scaling of 0.333 been applied to the Cusack et al. (1998) climatology? 9. Page 6, line 25. How is the surface albedo set? 10. Page 7, lines 14 – 23. Why isn't the CASIM microphysical parameterization developed by the Met Office not used instead of the Ballard scheme? 11. Page 8, line 7. Can you give the RH function for cloud fraction?

General Comment: I would suggest a table giving the changes from RAL0 to RAL1.

12. Page 16. I can't find Table 1 in my version of the paper. 13. Page 17. Is the size of the "triangles" in the "scorecard" proportional to a relative or absolute improvement/degradation of the model? 14. Page 18. How were the 100 cases used to verify the model chosen? 15. Page 18. What do you mean by "mixture of 00Z and 12Z runs of the Met Office global model? 16. Page 18, line 10. Suggest "By far the" instead of "One of the". 17. Page 18. Paragraph breaks are not consistent with the flow of the paper. 18. Page 18. It is interesting that the major improvement is the land surface. I wonder how dependent this is on the choice of the dates chosen to analyze? I assume there was a reason for choosing the specific 100 cases. I am wondering if this isn't biasing the results somehow. 19. Page 19. Lines 10-15. You can show anything with one case study. How robust is this result? I would suggest deleting this section. 20. Page 19. The fog "taper" is an interesting result I would like to learn more about. Why does the model produce too much fog near the surface, is dew deposition not considered? 21. Page 20, lines 13 – 16. The result described in this section needs to be expanded and explained better. 22. Page 21. Line 16. How does the storm initiation time and strength compare to observations?

General comments on figures: 1. The figures need more explanatory labels. 2. What is the verification data use for figures 4, 5,14,?