

## ***Interactive comment on “A regional atmosphere-ocean climate system model (CCLMv5.0clm7-NEMOv3.3-NEMOv3.6) over Europe including three marginal seas: on its stability and performance” by Cristina Primo et al.***

**Alistair Sellar (Referee)**

alistair.sellar@metoffice.gov.uk

Received and published: 25 July 2019

This new model is a useful contribution to the field of regional climate modelling. I congratulate the authors on its completion, as it must surely have been a difficult task. This manuscript does a good job of assessing the robustness of the coupled system and summarising its performance in key output variables.

For me, however, there is a gap in the interpretation of the precipitation results. Significant effort has been put into the calculation of indices which describe various aspects of

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precipitation variability, but the text contains very few conclusions which can be drawn from these indices beyond a description of the main state bias.

I would like to see some brief discussion of the likely causes of differences between the coupled and uncoupled systems. For example, why does the coupled system have a larger seasonal temperature range in the Med, and why is the coupled system colder in the North and Baltic Seas?

There should ideally be some description of the steps taken to tune the coupled model. Were some model parameters adjusted to achieve acceptable performance, or were the component models simply coupled together and required no further tuning (i.e. all parameters are the same as for the un-coupled equivalents)? Even if no coupled model tuning were required, it would be useful to state this. In global climate model development, there is a growing consensus that it is important (and helpful to other modellers) to document such tuning. See e.g. Hourdin et al (2017, doi:10.1175/BAMS-D-15-00135.1), Schmidt et al (2017, doi:10.5194/gmd-10-3207-2017), Golaz et al (2019, doi:10.1029/2018MS001603). Such information would be equally useful for a regional modelling paper.

Please see the supplement PDF for a list of minor corrections and suggestions.

Please also note the supplement to this comment:

<https://www.geosci-model-dev-discuss.net/gmd-2019-73/gmd-2019-73-RC1-supplement.pdf>

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Interactive comment on Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2019-73>, 2019.

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