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Discussions

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Interactive comment on "Upscaling of regional models into basin-wide models" *by* Luc Vandenbulcke and Alexander Barth

Anonymous Referee #2

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The paper presents the upscaling technique applied to a realistic nested model configuration in the Mediterranean Sea domain. A NW-Med model is nested into a Mediterranean model (MED) with a downscaling factor of 5 and the aim is to prove that the upscaling technique is driving the parent model (MED) solution towards the child model one (NW-Med). The upscaling consists in assimilating the 3D temperature and salinity child model fields as pseudo-obs in the parent model. The upscaled model solution is thus closer to the child model when compared to the parent model using 5 different metrics.

General Comment

The paper presents the upscaling technique as a relevant scientific question in the operational model community, however it needs a lot of revisions to make it more a

scientific paper than a technical report. The English could be improved and detailed suggestions have been given but the reviewer is not mother tongue, thus take them carefully. The description of the methodology, results and conclusions appears sometime superficial and needs to be improved to be more complete and precise to allow their reproduction by fellow scientists. The figures must show always the same models (NW-Med, MED and upscaled). Labels, legends must be enlarged and captions improved. The RMSD could always be provided (MED-NW-Med and Upscaled-NWMed), and eventually be summarized in a table for the 5 metrics. The models' nomenclature should be consistent throughout the manuscript. Some references are missing. The underlying assumption that the child model has a better performance is only stated in the conclusions, while is should be clearly stated in the abstract or at least in the introduction, since this is not always true due to possible phase errors (in space and time) in the higher resolution models. Moreover the upscaling technique to be more powerful could weight pseudo-obs according to their misfit with real observations assuring that the upscaling is stronger when and where the child model is closer to reality.

Please also note the supplement to this comment:
https://www.ocean-sci-discuss.net/os-2018-79/os-2018-79-RC3-supplement.pdf