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comment

Interactive comment on "The Making of the New European Wind Atlas – Part 2: Production and Evaluation" *by* Martin Dörenkämper et al.

Anonymous Referee #1

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This manuscript presents the results of a major multi-institutional technical landmark project to develop a new European wind energy atlas. The work is of the highest caliber, and for the most part is completely and carefully described. The evaluation of the wind atlas results demonstrates that the atlas provides usefully accurate estimates of the annual wind energy resource in both areas of flat and complex terrain. Notably the manuscript highlights the assumptions, simplifications, and limitations that were necessary to construct the atlas. The paper, when published, will be extremely useful to all who make use of the new atlas.

Specific comments:

P8. 8, Line 26: "The effective horizontal resolution of the mesoscale atlas is several kilometers ..." Is this referring to the effective resolution of the 3 km WRF runs, or of

the final atlas after downscaling? If it is of the 3 km WRF simulations, then I would say "resolution of the finest grid WRF simulations is". Also the effective resolution according to Skamarock (2004) will be approximately 7Δx, or $\sim$20 km, which is more than "several km".

Pg. 9, Lines 4-12. The procedure used here seems to be that WRF is run to simulate flow over topography, the effects of the topography then are removed using a complex procedure including the use of a simplified linear model, and then the effects of the topography are added back in using another linear model. The authors should motivate and describe in general terms why such a convoluted process is necessary.

Also the link to the reference by Hahmann et al., 2014 that describes this methodology already gives "page not found".

Pg. 10. Do the surface roughness lengths vary depending on season? Won't the roughness lengths for cropland and deciduous forests be much different from summer to winter? If they are not seasonally varying, are they more representative of summer or winter?

Pg. 13, line 32. How were the data on opposing booms used to reduce flow distortion effects? Presumably some sort of criteria were used to select one boom over the other. What were these criteria? Were the criteria dependent on wind direction, or only on speed differences? Was the selection based on hourly data, 1-min data, etc?

Pg. 15, lines 4-14. "For evaluation of the downscaled wind climate at each mast site, some modifications to the WRF-WAsP methodology were made" and following sentences. If I read this correctly, a separate and different set of downscaling procedures has been applied only to those locations where the atlas is compared to the observations. Why do something different at the evaluation sites? Won't this be comparing winds that are different from the rest of the atlas? If there are advantages to this new methodology, why not apply it everywhere?

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Technical corrections:

Pg. 2, Line 9: "It documents the meteorological basis for large parts of Europe". The meteorological basis of what? Of the atlas?

Pg.3, lines 2-8. If I interpret this correctly, the NEWA actually consists of two separate wind atlases. One is a mesoscale atlas based on WRF, while the second is a down-scaled WRF-WaSP product. It this interpretation is correct, I suggest that the text be modified to clearly state this.

Pg. 4, Line 9: "while the nudging" should be "while nudging"

Pg. 18, line 7. Does "mean wind speed" refer to the annual mean?

Interactive comment on Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2020-23, 2020.