

Author Response to Referee 2

Dear Referee 2,

Thank you very much for taking the time to review this manuscript and for your efforts to further improve it. Please find below a point-by-point response to your valuable comments.

Your comment: *The paper "A circulation-based atlas of the CMIP5 and 6 models for regional climate studies in the northern hemisphere" by Swen Brands analysis regional atmospheric circulation patterns based on Lamb (1972) for a set of CMIP5 and CMIP6 models. In general, the paper is a rich information source and an important contribution to the climate science community. In my view there are only some minor points that could be addressed differently or better.*

Response: Many thanks for taking the time to review this study and for your positive feedback. Please find below a point-to-point list of responses to your valuable comments.

Your comment: *In section 6 it might be worth mentioning that this study can serve as a basis for studies on future changes in LWT. It could be interesting to investigate, e.g. if certain LWT changes can be traced back to model families or model configurations (AOGCMs vs. ESMs).*

Response: You are right, this interesting idea is mentioned in more general terms in lines 743-745 of the revised manuscript.

Your comment: *Lines 575-594: The explanation of Table 2 and the metric behind is a bit too brief in my view. It seems an interesting analysis, but I cannot fully follow the different steps resulting in the numbers of Table 2. A bit more detailed explanation here, would be good.*

Response: Thanks for your valuable comment. In the revised manuscript, the procedure used to obtain the different mesh sizes is now explained with more detail (see lines 643-653) and an additional boxplot is introduced to visualize the relationship between the horizontal mesh size of the atmospheric model components and the coupled models' performance (see Figure 13, panel a).

Your comment: *Lines 621-622: I would just drop the name Commonwealth models here. It is used only once thereafter in the following sentence and does not improve the text (it might even confuse more than it helps).*

Response: The "Commonwealth" term has been completely removed from the revised manuscript.