

Interactive comment on “Brief communication: CMIP6 does not suggest any circulation change over Greenland in summer by 2100” by Alison Delhasse et al.

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Dear authors,

Two referee reports are now available, and I would like to thank the two colleagues for their time and comments.

In my access review I noted some potential issues, which I would like to express in this discussion as well since they align with referee comments. In particular, there are two things that were unclear to me.

a) My main concern is that the GB2/TA2 indices are based on the entire NH condi-

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tions - why is that? I think it is hard to understand for the reader why such a large spatial reference is ingested into these indices, and how processes elsewhere (i.e. not near Greenland) could contribute to producing the difference between reanalysis and GCMs. I regard this as a potential weakness for the conclusions. - - Referee #2 made comments in a similar direction.

b) Why is only the oldest generation of reanalysis (NCEP/NCAR) used in the study? I appreciate that it provides the longest record, but you also refer to the reference period 1986-2005 or 2000-2019 in the paper, which are both covered by the latest generation of reanalysis (Merra-2, ERA5). You must include further analysis to demonstrate that your "observations" are robust across available products. - - Again, Referee #2 argued similarly.

Moreover, I agree with Referee #1 that using a GCM ensemble is problematic for concluding on processes. It is well known that GCMs have very different skills for different regions, and in a process-oriented study those GCMs with low skill for a certain region should not be allowed to participate. I also agree with Referee #2 that simplicity is a good approach sometimes, but here the analyses are overly simplistic, especially in face of the (very!) strong conclusion expressed in the title of the paper.

In summary, both referees and myself have major concerns that the conclusions drawn in the manuscript are supported by the presented material. My decision, therefore, is to not consider this manuscript for publication in TC further.

I would like to say again that the topic is very interesting and that I hope the authors will be able to follow this in future studies, in particular by adding process-based analyses of blocking over Greenland to the "index approach".

Interactive comment on The Cryosphere Discuss., https://doi.org/10.5194/tc-2019-332, 2020.

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