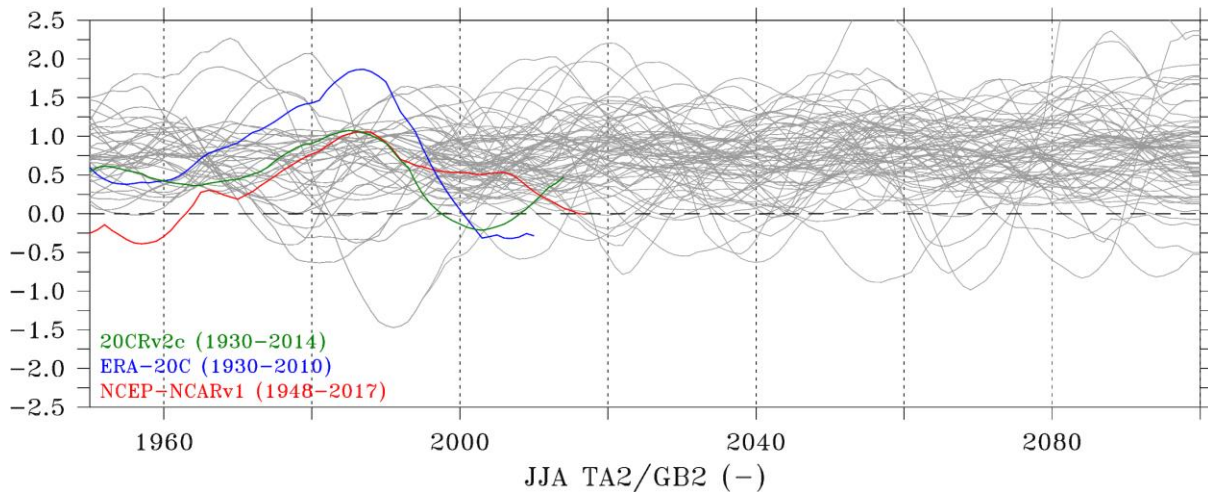


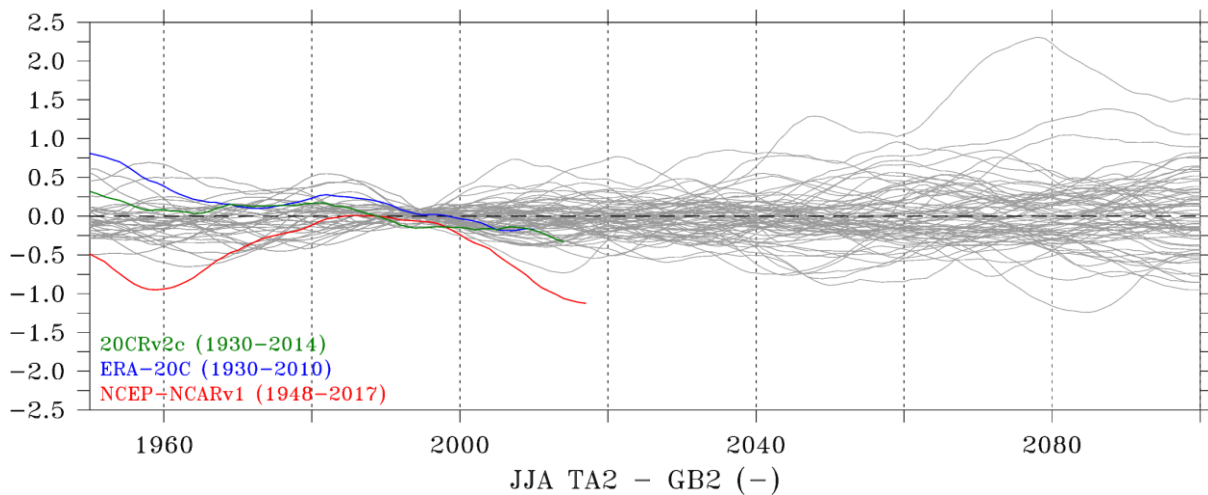
We thank Referee 2 for their helpful comments. Regarding the referee’s main concern, we can confirm that each one of the CMIP5-based Greenland Blocking (GB) time series is one realisation (run rlilpl) of each GCM from the CMIP5 database for which both RCP4.5 and RCP8.5 are available. Therefore it is fair to directly compare the variability of these series with that of the reanalysis GB series. In extra work we have now formally compared trends in the reanalysis and CMIP5-based GB series for several recent 20-year periods (1998-2017, 1997-2016, 1996-2015 and 1995-2014), which confirms that *all* of the CMIP5 GB trends are much smaller (about one order of magnitude less than) the reanalysis-based GB trends. Following our response to Referee 1, we will present a statistical analysis of these results, which will clearly demonstrate that the recently observed GB trend is well outside (larger) than any CMIP5 GB trend for the equivalent period. In the revised manuscript we will also address the specific comments (and make several technical corrections) raised by Referee 2.

Finally, this is a plot showing normalized TA2/GB2 as requested by Referee 2:



This indicates that since around the year 2000 TA2/GB2 is higher with NCEP1 than with other reanalyses where there is no assimilation in free atmosphere. But, as shown by Fettweis et al. (2017), there are biases in Z500 and T700 from 20CR and ERA-20C with respect to ERA-Interim and such biases explain the discrepancies between the reanalyses while NCEP1 and ERA-Interim agree well. Except for showing these discrepancies between reanalysis, we do not see the interest of such a plot.

A plot showing TA2 – GB2 is likely to be more useful:



This graph clearly confirms that the anomalies simulated by NCEP1 are out of range with respect to GCMs.