Reply to review by Ron Stouffer

- *In the Introduction, this paper needs to clearly state what is its focus and what is found in the other strongly related GMD CMIP6 papers. The split between the physical climate and the carbon MIPs needs to be made much clearer and early in the paper.*

  This comment is also made by Paul Dirmeyer and Gab Abramowitz. We've added a paragraph on the LS3MIP focus and links to LUMIP and C4MIP in particular (see comments above)

- *Page 11, Lines 389-402 – You may want to note here that these runs will be performed sometime in the future after the ESM data is available in the CMIP6 archive. This could be a year or 2 or more in the future.*

  Pointed out in a comment

- *Page 12, line 405 – Is there an interaction between LFMIP and FAFMIP? It seems there should be and it should be noted in this section.*

  We did make a reference to FAFMIP in this section, but plans for coordinated analyses have not yet been discussed with the FAFMIP panel: "This set-up is similar to the Flux Anomaly Forced MIP (FAFMIP, Gregory et al. 2016), where the role of ocean-atmosphere interaction at climate time scales is diagnosed by idealised surface perturbation experiments.". However, a stronger link with OMIP is included in the new version, to cross-reference offline generated freshwater fluxes: "Interactions with the Ocean MIP (OMIP; Griffies et al. 2016) are arranged by the use of terrestrial freshwater fluxes produced in the LMIP simulations as a boundary condition for the forced ocean-only simulations in OMIP, in addition to the forcing provided by (Dai and Trenberth 2002)."

- *Page 14, line 523 – "A perfect boundary condition" – several studies have shown that prescribed SSTs are less than perfect since it breaks the atmosphere-ocean coupling and feedbacks. This issue distorts the variability in models forced by SSTs relative predicted SSTs. I assume the land surface will have even larger issues since it has much smaller heat capacity. Reword.*

  Also Paul Dirmeyer made a comment on the notion that prescribed SSTs are not necessarily perfect. We've rephrased it as "pseudo-observed boundary condition" experiment.

- *In the table "direction" should be changed to "Positive direction". Just to be very clear.*

  See reply above