



Interactive comment on “The Norwegian Earth System Model, NorESM1-M – Part 2: Climate response and scenario projections” by T. Iversen et al.

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We are grateful for this constructive review and have addressed all the minor issues, as detailed below.

1) Page 2951, line 26: I had a hard time trying to understand how increased precipitation over land and an increased flux of moisture from the oceans to the land supports the statement that “the space-time fraction of dry spells over land must increase and thus also the average intensity of precipitation”. The trick is trying to explain how it is possible to get increased precipitation over land without getting increased evaporation from an apparently more waterlogged land surface. The answer is more extreme

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events with longer droughts between them. To try and describe this theory more clearly I have made an attempt to rewrite the start of your paragraph but feel free to edit it as you see fit as you insert it in the text.

“Evaporation from the land surface is heavily influenced by water availability in the soil and would normally be expected to increase with increased precipitation. However, here we are seeing that this is not happening and land evaporation is not changing. This means that the soil is being allowed to dry out more by either having longer dry spells between precipitation events or by increasing the spatial scale of dry regions. Thus we can hypothesise that in NorESM1-M future climate change scenarios there is an increase in both the precipitation intensity and space-time fraction of dry spells. Such effects were deduced for a warmer climate by . . .” (rest of paragraph can remain unchanged)

Many thanks for this constructive proposal which we have taken the liberty to use with a few adaptations.

*** Technical corrections ***

2) Page 2935, line 21: Delete “for inclusion in the fifth Assessment” as this has already been suggested earlier on in the same sentence and is not needed. DONE

3) Page 2936, line 15: The start of this sentence is hard to read. I suggest changing it to “Over the last 15 years, research and modelling groups at the University of Oslo and the Norwegian Meteorological Institute (also in Oslo) have used NCAR models to develop representations of aerosols and . . .” (the rest of the sentence can stay the same). DONE (with correction of the misspellings)

4) Page 2936, line 28: Change “times” to “by”. DONE

5) Page 2937, line 4: Do not capitalise “Convective Momentum Transport”. DONE

6) Page 2939, line 12: Change “influence” to “influences”. DONE

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7) Page 2940, line 3: Change “increase” to “increases”. DONE

8) Page 2944, line 14: Change “Table 2” to “Table 3”. DONE

9) Page 2946, line 3: This sentence is hard to read and hard to determine what time periods the trends are calculated from. I suggest changing it to “While a negative trend is simulated for both the long-wave and short-wave from 1850 to 1970, the net radiative flux has a trend close to zero.” DONE

10) Page 2961, line 26: The El Nino Southern Oscillation is not a “weather pattern” but a combination of oceanic (El Nino) and atmospheric (Southern Oscillation) components (the word “weather” suggests it is atmospheric only). Thus remove “weather pattern” from the text. Perhaps reword it as “The El Nino Southern Oscillation phenomenon is a dominant mode of interannual climate variability based in the tropical Pacific but with far reaching atmospheric teleconnections (Trenberth, 1997).”.

Thank you for this suggestion. We have decided to write:

The “El Niño Southern Oscillation” phenomenon is a dominant mode of interannual climate variability based in the tropical Pacific which is associated with far reaching atmospheric teleconnections (Trenberth, 1997).

11) Page 2962, line 1: Change “weather pattern” to “climate pattern”.

Here we have chosen to write:

Nevertheless, it is a well recognized pattern of variability with large impacts on the weather over. . . .

12) Page 2962, line 16: This sentence is hard to read. I suggest changing it to “It is possible to identify a more frequent occurrence of ENSO events in the piControl and Historic1 simulations compared to HadISST.”. DONE

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