

Interactive comment on “Representation of climate extreme indices in the coupled atmosphere-land surface model ACCESS1.3b” by R. Lorenz et al.

V. Brovkin (Referee)

victor.brovkin@zmaw.de

Received and published: 27 January 2014

The manuscript by Lorenz et al. is a well-written paper focused on evaluation of climate extreme indices simulated by the ACCESS1.3b model. The main results are that regional patterns and trends of extreme indices are captured well by the model, but the diurnal temperature range is strongly underestimated and the consecutive wet days are badly overestimated. The authors tried to explain temperature biases based on radiation fluxes, and suggested that precipitation biases are related to the “drizzle” problem. The manuscript is well structured and a use of figures is appropriate. I recommend accepting the manuscript after minor revision assuming that the following comments

C2440

are taken into account.

1. Several plots (e.g., 1c, 2c, 3c, 4e,f) show a difference between model results and observations. While it is clear that severe biases are significant, some areas have rather small biases. Are these small biases statistically significant? Also, are the data and models always compared on the same spatial resolution?
2. Figs. 9 and 10: How are the bins constructed? Are these both spatial and temporal bins? Are they based e.g. on $T_{\text{MIN}}(t,x,y)$, $T_{\text{MIN}}(x,y)$, or $T_{\text{MIN}}(t)$? Please explain this in more details in the text.
3. The text has many abbreviations. They could stay for a model, a dataset, a variable, a region, a season, or a software dataset. This extensive usage of abbreviations makes the text more compact, but also difficult to read, especially sections 3.3 and 4. To keep the text more easily readable, I suggest using the following notation rules to keep the meaning of abbreviation more clear: a) variables: indicate them by italic font or sub-indexes; b) names of subregions: either write them fully (e.g. North America, as written in many parts of the text anyway) or abbreviate them with four letters (NOAM) to avoid confusion with seasons abbreviated by 3 letters (eg NAM vs MAM); c) datasets: provide a list of datasets used in the paper in a separate table.
4. Usage of term $T_{\text{MIN}}/T_{\text{MAX}}$ (e.g. p. 6360, l. 26; Figs. 9, 10) is confusing. What is meant here is either variable T_{MIN} or variable T_{MAX} , but not their ratio. Please use T_{MIN} , T_{MAX} .
5. p. 6360, l. 27: Not everyone knows what NCL stays for.
6. p. 6364, l.7: definition of Rx5day is missing.
7. p.6365, l.1: “all regions bar North America” – a typo?
8. Figs. 4,5,6,7,8: optimize the usage of plot area as done in Figs. 1 to 3. For example, remove the subtitle ANN 1951-2010 and remove latitudinal labels for the upper two plots.

C2441

9. Figs. 9,10: remove T_MIN/T_MAX from the x-axis labels.

Interactive comment on Geosci. Model Dev. Discuss., 6, 6343, 2013.

C2442