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Interactive Comment

Interactive comment on "A regional climate modelling projection ensemble experiment – NARCliM" *by* J. P. Evans et al.

J. P. Evans et al.

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Our reply to the specific comments of reviewer 2 (R. Arritt) is given below.

1. The Abstract should be completely rewritten as it does not adequately describe the paper. It outlines the general problem but gives very little information on the methodology or findings.

The abstract has not been completely rewritten as introducing the general problem and highlighting the stakeholder engagement are considered to be important parts of the project and paper. The end of the abstract has been rewritten and expanded, it now states "The RCM selection process uses performance evaluation metrics to eliminate poor performing models from consideration, followed by explicit consideration of model

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independence in order to retain as much information as possible in a small model subset. In addition to these two steps the GCM selection process also considers the future change in temperature and precipitation projected by each GCM. The final GCM selection is based on a subjective consideration of the GCM independence and future change The created ensemble provides a more robust view of future regional climate changes. Future research is required to determine objective criteria that could replace the subjective aspects of the selection process."

2. The authors need to discuss the limitations of the approach used to filter the RCM configurations. Focusing on only a few storms will not necessarily give general results with regard to credibility of the models. Furthermore, running only short segments will remove any long-term memory from the system, e.g. the influence of soil moisture. The latter is especially important as some RCMs have shown a pathology in which they spuriously lock-in to a dry regime: low soil moisture causes low precipitation, which in turn causes low soil moisture. I am not asking that the authors redo the evaluation with long-term runs, only that they acknowledge these potential problems.

This text has been added to P5125 L23 "It should be noted that such an event based evaluation has a number of limitations. During long climate simulations weather periods will arise that were not present in any of the sample events and hence the model performance is untested during these periods, reducing the credibility of the models. Also, by testing a number of relatively short simulations no long-term memory of the system is considered. This may be important if, For example, a model has a strong soil moisture feedback that tends to produce persistence dry states. Ideally, this evaluation would be performed over multiple annual cycles to alleviate these issues, however practical considerations meant that this was not possible."

3. Can you give a table that summarizes the RCM configurations numbered in Figure 2? This information may be useful to others, who could cite it in their own work. This could help us build a base of experience on whether certain WRF configurations perform well or poorly across a range of applications.

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"(see Tables 1 2 of Evans et al., 2012)" was added to P5126 L4*This information is provided in tables in Evans, J., Ekström, M. and Ji, F.: Evaluating the performance of a WRF physics ensemble over South-East Australia, Clim. Dyn., 39(6), 1241–1258, doi:10.1007/s00382-011-1244-5, 2012.*

"(see Tables 1 2 of Evans et al., 2012)" was added to P5126 L4

Interactive comment on Geosci. Model Dev. Discuss., 6, 5117, 2013.