Interactive comment on "Decomposing uncertainties in the future terrestrial carbon budget associated with emission scenario, climate projection, and ecosystem simulation using the ISI-MIP result" *by* K. Nishina et al.

A. Hewitt

alan.j.hewitt@metoffice.gov.uk

Received and published: 10 November 2014

Dear Kazuya Nishina,

I have some concerns about the ANOVA methodology applied in the paper.

1) The description of the ANOVA methodology within the paper is brief and it would not be possible for your method to be reproduced with only the information contained in the paper.

2) The methodology developed in Yip et al 2011 is only suitable for a balanced ANOVA.

Assuming one run for each GCM*GVM*RCP combination this would require 120 simulations whereas 70 are used in this paper.

3) Internal variance is a non-negligible term and needs to be included in your ANOVA analysis. In order to quantify this, you will need to include multiple runs of at least some of your GCM*GVM*RCP combinations. Internal variance has been long observed, even in a stationary climate (see Madden 1976; Karoly and Wu 2005).

A recent publication (Hingray and Said 2014) contains an ANOVA approach for unbalanced data, which would appear to be suitable for your data. You may wish to develop an alternative ANOVA method for unbalanced data, in which case the onus would be upon you to prove it is a robust method.

Kind regards,

Alan Hewitt

Met Office

References:

Madden, R. A., 1976: Estimates of the natural variability of time-averaged sea-level pressure. Monthly Weather Review, 104, 942–952.

Karoly, D. J. and Q. Wu, 2005: Detection of regional surface temperature trends. Journal of Climate, 18, 4337–4343.

Hingray, B. and M. Said, 2014: Partitioning internal variability and model uncertainty components in a multimember multimodel ensemble of climate projections. Journal of Climate, 27, 6779–6798.

Interactive comment on Earth Syst. Dynam. Discuss., 5, 1197, 2014.