Hydrol. Earth Syst. Sci. Discuss., 8, C3540–C3543, 2011
www.hydrol-earth-syst-sci-discuss.net/8/C3540/2011/

Hydrology and Earth System Sciences Discussions

Interactive comment on "Applicability of ensemble pattern scaling method on precipitation intensity indices at regional scale" *by* Y. Li and W. Ye

Y. Li and W. Ye

yinpengli@climsystems.com

Received and published: 18 August 2011

Comment: The paper presents an application of the pattern scaling method to evaluate changes in extreme precipitation indices from global mean temperature change of different GCMs projections over Australia. The variability of changes is evaluated within each GCM and considering all GCMs as an ensemble. Different levels of spatial scale are considered: grid cell level, regional scale (5 administrative units in Australia) and the whole Australia. The authors concluded that results show stronger evidence for changes when spatial scales are increase. It is not clear however if this is an expectable effect of averaging.

Response: It is en expectable result that results show stronger evidence for changes

when spatial scale are increase. However, the purpose of this study is on a method which could make the best use of the available GCM daily data for climate change impact on precipitation intensity assessment while more accurate and high resolution data are still pending. Given that the change pattern data can be processed beforehand, hence the proposed method does not require massive supporting database, and also does not require huge computational demand. It is then provide a great potential for implementing such a method practically in a software system to support urgent assessment need of climate change impact on extreme precipitation, which is in high demand for climate change impact planning.

This research proposed a method which could make the best use of the available GCM daily data for climate change impact on precipitation intensity assessment while more accurate and high resolution data are still pending. This research attempts to highlight and examine the fundamental assumptions of the pattern scaling technique, as well as uncertainty, and contributes to the practical application of GCM-derived climate projections. This study is not aiming to evaluation the performance of GCM in precipitation simulation.

Comment: The introduction presents relatively well the approaches in the literature, although it is not clear why "skill based weighted ensemble methods" are not appropriate to their case-study. The investigation of such approaches for the combination of projections would bring additional value to the results of the paper.

Response: Agreed and rephrased the sentence. As we intend to obtain the complete range of uncertainties that were represented by the GCM runs without any subjectivity, so no weighting scheme was adopted in this research, which is important for impact assessment. Though it has been found that some GCMs performed better than others for Australia region, but a complete evaluation study of GCM performance for the 3 indices would be both time and data demanding, and is beyond the scope and objective of this study.

Comment: The methodology section is confusing and the results are, at the end, a lot of numbers and percentages, presented in a repetitive way that makes the reading of the paper very boring. The discussion section basically focuses on the fact that a small sample of GCMs projections is insufficient for robust conclusions, which raises some doubts about the validity of paper's results themselves. It also lacks a comparison of the authors' achievements with other studies in the literature: do they converge/diverge, point out to the same limitations, etc.?

Response: We made major revision based on all reviewers' comments. The current MS focused on presenting results at national level and was shortened substantially. We compared our result with CSIRO and with global research. The results are in accordance with previous findings for Australia, which shows a 0 to 6% increase of P99 across Australia (added to MS), also with good agreement in spatial distribution (CSIRO figure not show in MS, but can be found: http://climatechangeinaustralia.com.au/documents/resources/TR_Web_Ch5i.pdf, p74) The median value of ΔRPD' is in an excellent agreement with the global average of 2.4 %K-1 projected by Sun et al. (2007).

Comment: In my opinion, this paper is not suitable for publication in HESS. Furthermore, I agree with all the comments of the other two reviewers of this paper to encourage the authors to revise it and, eventually, submit it again. Additionally, I also think that the study needs more investigation to make the results innovative and interesting to the hydrologic community.

Response: Referred to the reply above. To our knowledge, there have been few studies on the practical application of using daily GCM data for climate change impact on extreme precipitation. Exploring a practical method for the assessment of potential extreme precipitation changes in the future is very important for hydrological engineering, such as, one of the bridge design standard relies on the understanding of extreme precipitation intensity and frequency of historical period and potential changes caused by climate change which is the main interest of this paper. And this method has been

adopted by engineering firms for their impact assessment while the data from more complicated approaches are still pending.

Comment: Finally, I must say that I was surprised by the fact that the same paper was already submitted to another journal in 2009 (as indicated by Reviewer 1) and that the authors have ignored the reviews provided at that time (they probably received more than one review), even for simple language mistakes. It definitely does not encourage reviewers to do a hard work in their reviews to help the authors to improve their manuscript.

Response: We could not get any response from the Int. J. Climatology after we submitted to the journal two years ago. We made numeric request to the journal for the feedbacks but heard nothing back, hence we did not have chance to see the comments. We finally made decision to withdraw the MS from the journal and submitted to HESSD.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 5227, 2011.