



## ***Interactive comment on “A new dataset for systematic assessments of climate change impacts as a function of global warming” by J. Heinke et al.***

### **Anonymous Referee #2**

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[Overall Evaluation]

This paper describes procedures which the authors adopted in order to develop a new dataset of climate change scenarios based on a widely-used existing methodology called “pattern scaling” (in Section 2) and discuss characteristics of the developed dataset (in Section 3).

In Section 1 (Introduction), background of the research and motivation of the authors are well explained and I fully agree to the authors’ views. Existing researches are also properly reviewed and mentioned.

In Section 2 (Methods), the methodology adopted to develop the dataset is explained

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in detail. Input data used in the methodology is also specified precisely. Thus, I think readers of the article can replicate the procedures of this research based on the description in this section if they want.

In Section 3 (Results and discussion), characteristics of the developed dataset are introduced based on simple analyses of them. Here, applicability of the methodology explained in Section 2 is also tested and discussed briefly.

Through the paper, text is carefully written and any serious flaws of logic are not found.

I am afraid that novelty of this study is limited when I consider the methodology adopted in this work (pattern scaling) has been applied in many existing climate change impact studies. However, I think usefulness of the paper outstrips the limited novelty. Though the pattern scaling method has been utilized in many climate impact studies, it is usual that detail of the application is not described precisely. The concrete procedures of pattern scaling application are described so carefully in this paper that we can expect this paper to enhance more appropriate application of the pattern scaling method in future climate change impact studies.

Based on the overall evaluations above, I recommend that this paper is published on the journal.

[Major specific comments]

(1) [P3543L26 – P3544L10] Definitions of “absolute change” and “relative change” are not clear here, although I could understand them after reading through 2.3.1 – 2.3.5. I think the terms should be explicitly defined here at the head of Section 2.3.

(2) In Equations (4)-(11), parameters of them ( $x$ ,  $y$ ,  $m$ , etc.) should not be omitted.

(3) [P3534L18] The authors tell that the developed dataset will be available online upon final publication of the paper. I strongly expect the authors to publicize not only the produced dataset but also the program source codes used for the data development. It will definitely complement the description of the adapted procedures in this paper.

(4) For Figures 3, 4, 5, and 6, I suggest the authors to write the equations used for the map development using the same variable names used in Equations (1)-(11) as a figure caption or in main text. Since the current titles of the figures are not easy to understand intuitively. I think it will help readers understand the meaning and intention of the figures correctly and efficiently.

[Technical corrections]

(1) Very minor point. Between Equations (1) and (2), the order of  $V^*(x,m)$  and  $dTglob(y)$  is different.

(2) [P3552L9] “cloudiness “ should be “precipitation”.

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Interactive comment on Geosci. Model Dev. Discuss., 5, 3533, 2012.

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