Natural Hazards
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Sciences

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Discussions

Interactive comment on "Seasonal predictability of the 2010 Russian heat wave" *by* P. Katsafados et al.

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Received and published: 17 March 2014

This article, which investigates the impact and sensitivity of lead-time to seasonal forecasting, is of great interest and adds important results and knowledge to the research community. The study is relevant to be published in NHESS journal and I recommend that the article is accepted after minor corrections.

Reply: We would like to thank the reviewer for the useful and constructive comments. The revised manuscript includes reviewer's entire recommendations and corrections. Our reply to the reviewer's comments follows:

SpeciïňĄc comments (suggestions): I suggest to clarify that the seasonal forecast ensembles are built up by using different lead-time initializations. Page 5058, lines 8-9

and page 5060, lines 10-13: It should be more clearly explained that the study investigate the predictability due to lead-time, as the initial condition.

Reply: The suggested clarification has been added in the abstract and the introduction of the revised manuscript.

Have there been other studies/articles on the same subject as in this article? If so, there could be a discussion and comparison of the results (perhaps in chapter Introduction or Conclusions).

Reply: The principal aim of this study is to examine the predictability of the Russian heat wave on a seasonal time scale. In this context, there isn't any paper dealing with this particular event in a seasonal time scale. Only a few papers studied this event in a medium-range and not in seasonal time scale and they all agreed that the predictability has been lost after a few weeks of simulation. Following the reviewer's recommendation, the paragraph of discussion has been extended in the revised manuscript including the evidences provided by Dole et al. and Ghelli et al. manuscripts.

Page 5058, line 23 - page 5059, line 2: Are those statements related to reference: Barriopedro et al., 2011? If so, then move reference to end of paragraph. If not, add reference for those statements.

Reply: Corrected.

Page 5059, lines 12-16: Is the analysis made by authors or can there be an reference to the statements?

Reply: This discussion is based on the work of Dole et al. and is referred at the end of the relevant content.

Page 5062, lines 1-2: The Pakistan ïňĆooding event is not much investigated in this article and should not be mentioned as one of the main subjects.

Reply: Corrected.

Page 5064, chapter 4.1: Members 0422 and 0425 are pointed out in the context. How do those members relate to the other members? Do they show similarities to the other members or are they predicting the event better and are therefore chosen? This could be mentioned in this chapter.

Reply: These members showed exceptionally forecasting skill of the event comparing against the rest members. They referenced in the context of pointing out the predictability existence even 3 months in advance. This is mentioned in page 5064, lines 7-9 "Some members indicate an early warning of the event and reveal the large scale spatiotemporal characteristics of the blocking system prevailed over Russia even 3 months in advance". However an additional mention has been also inserted in this chapter.

Page 5065, line 14: Figure 12 is referred to before ïňĄgure 11 (page 5066, line 4). Should change ïňĄgure references and ïňĄgure numbers to come in correct chronological order.

Reply: Corrected.

Page 5065. lines 16-18: The statement of divergence is related to Fig. 10b but according to me it is also true for Fig. 10a. The divergence looks very much alike in both Fig.10a, b and should maybe be pointed out.

Reply: Corrected.

Page 5065, lines 20-22: The wording of "...stronger persistence..." is maybe not justiïňĄed (see above comment) and it is also not consistent with the conclusion at page 5065, lines 25-28.

Reply: The stronger persistence is mainly attributed to the limited spread of members focused over Eastern Europe for the August (Fig.10d) and how they are compared to the relevant members initiated on January (Fig.10b). Following reviewer's suggestion, this phrase has been removed in the revised paper and we remained focused at the

C2850

important outcomes of the plots and their consistency.

Page 5067, lines 6-8: Suggestion to include that this result is an outcome from a "medium range ensemble forecast model system", which is a different model than what is used in this article.

Reply: Corrected.

Page 5079 – 5086: Figures 1-3, 5, 7-10 and 13-14 should have same coordinates (latitude/longitude at axises) and same projection. This would make it easier to compare and read the ïňĄgures. Also, include in ïňĄgure texts what parameters are plotted with shadings and contours.

Reply: Corrected.

Page 5082, Fig. 10: Perhaps ïňĄgure b should be situated on the right hand of ïňĄgure a and ïňĄgure c should be situated below ïňĄgure a.

Reply: The figures are placed in column order in the original submitted document (in docx format). We assume that the convert procedure to pdf shrank the figures and changed the order. We will pay attention to be fixed in the final version of the manuscript.

Technical corrections (suggestions): Page 5059, line 24: Change "affected" to "affecting".

Reply: Corrected. Thanks.

Page 5059, lines 26-28: Suggestion to change sentence; "For such intrinsically low-probability with long return period events the questions of whether the event could be predictable and over what lead time are of highly importance" to; "For such intrinsically low-probability events, with long return period, the questions of whether the events are predictable and over what lead time are of high importance".

Reply: Corrected.

C2851

Page 5060, lines 6-8: Suggestion to change; "So, it is of great interest AGCMs to be able to resolve the main atmospheric mechanisms that trigger potential intense phenomena on various spatiotemporal scales and ïňĄnally to produce credible forecasts." to; "So, it is of great interest to understand if AGCMs are able to resolve the main atmospheric mechanisms that trigger potential intense phenomena on various spatiotemporal scales, and ïňĄnally, to produce credible forecasts.".

Reply: Corrected.

Page 5060, lines 8-10: Should there be an reference here, to the models used? Maybe same as used at page 5062, line 7.

Reply: Corrected.

Page 5060, lines 13-14: Should there be a reference for the statement "...limit of few weeks to the predictability....." ? Similar to the reference at page 5067, line 7.

Reply: Corrected.

Page 5061, line 26: Suggestion to move reference (Fig. 5) to previous sentence.

Reply: Corrected.

Page 5063, lines 27: Add 'were' in sentence ".... model outputs were compared against....".

Reply: Corrected.

Page 5064, line 12: Change "comparing against" to "compared to" in sentence "....more intense system comparing against...".

Reply: Corrected.

Page 5064, line 13: It should be reference to (Fig. 7b) and not (Fig. 7a) in this sentence.

Reply: Corrected.

C2852

Page 5064, line 22: Suggestion to change to this "....blocking pattern which lasted only 5-6 days".

Reply: Corrected.

Page 5066, lines 6-7: Change to "...predictability compared to the....".

Reply: Corrected.

Page 5067, line 3: Put a space in "The above mentioned....".

Reply: Corrected.

Page 5067, line 6: Take away 'is' and change to "This fact is also in agreement...".

Reply: Corrected. This paragraph has been totally revised based on the above mentioned reviewer's comments.