

Replies to the editor' comments

Authors' replies are in BLUE color.

Editor Decision: Publish subject to minor revisions (Editor review) (28 Dec 2015) by Prof. Harrie-Jan Hendricks Franssen

Comments to the Author:

Dear Dr Ke,

Your manuscript "Variability in snow cover phenology of China from 1952 to 2010" was subjected again to review by one of the original reviewers. This reviewer recommended rejection of the manuscript.

Given the in general positive evaluation by two of the original reviewers and one unfavorable review, I went through the manuscript. As you handled in subsequent revisions a large part of earlier comments, I think that the paper can be accepted after additional revisions. However, I found that the text still needs to be improved and that there is still some doubt on part of the methodology you used. The paper needs therefore additional moderate revision.

Thank you very much for detailed comments.

Detailed comments:

L22: As you worked only with the 296 stations I think this text part can be condensed.

Replies: We deleted 3 sentences to condense this part.

L44-L45: I suggest to include China as keyword, replace "trend" with "temporal trend" and skip "spatiotemporal variation".

Replies: We changed the key words as suggested.

L94: skip "the" before Western Europe

Replies: We deleted it as suggested.

L115-L116: rephrase.

Replies: We rephrased the sentence.

L160: rephrase.

Replies: We rephrased it.

L205: skip "only". Before you also mentioned 95% but here only 90%. Please be consistent. I feel it would be more meaningful to document only trends with 95% significance.

Replies: We skipped it, and the sentence is changed as “and confidence levels of 90% and 95% are considered”. Yes, you are right, only trends with 95% significance are more meaningful, however, if we omitted trends with 90% significance, the number of stations will reduce, therefore, we considered trends with both 90% and 95% significance.

L210-L214: This explanation can be skipped as it is basic knowledge.

Replies: We skipped them as suggested.

L215: skip "only". Change to: "are considered significant (...)".

Replies: We changed them as suggested.

L217: It was not indicated that this is a cross-validation.

Replies: We add a new Table 1 (now moved to the result section according to your suggestion) to illustrate “how good the procedure works”, and also provide some description in the revised manuscript. We use prediction errors of cross-validation, including mean error, average standard error, root mean squared error, root mean squared standardized error, to validate the gridding procedure applied to SCD (per year), SCOD and SCED data. Table 1 indicated that prediction errors are unbiased and valid, except for slightly overestimated coefficients of variation (CV) and slightly underestimated SCD in 2002. Overall, the interpolation results have fewer errors and are acceptable.

We implemented the spatial interpolation with ArcGIS, and performed cross-validation to evaluate the interpolation results with its relevant module ‘Geostatistical Analyst--Evaluating interpolation results’. The details can be found at the website http://resources.arcgis.com/en/help/main/10.1/index.html#/Performing_cross_validation_and_validation/003100000059000000/

Table 1. Prediction errors of cross-validation for the spatial interpolation with the ordinary kriging method.

Item (Figures)	Mean error	Average standard error	Root mean squared error	Root mean squared standardized error
Mean SCD (Fig.3a)	-0.0230	11.0558	13.7311	1.1097
CV (Fig.3b)	0.0017	0.7364	0.5510	0.7579
SCD in 1957 (Fig.5a)	-0.0015	11.1561	13.4662	1.1898
SCD in 2002 (Fig.5b)	0.0306	6.6185	8.5887	1.2522
SCD in 2008 (Fig.5c)	0.0477	7.3167	8.1968	1.0969
SCED in 1957 (Fig.5d)	-0.0449	15.0528	18.9860	1.1921
SCED in 1997 (Fig.5e)	0.0696	15.5722	17.7793	1.1040
SCOD in 2006 (Fig.5f)	0.0482	15.4503	16.1757	1.0449
SCOD (Fig.8a)	0.0293	11.2458	13.9078	1.1712
SCED (Fig.8b)	-0.0222	15.2265	18.3095	1.1308

L220: What do you mean? Did you use universal cokriging? Was altitude included as a covariable for generating the map?

Replies: We checked the interpolation method and processing, and found that it is ordinary kriging, not universal cokriging (universal kriging in our original paper). Altitude was not included as a covariable for generating the map. Now we changed the interpolation method as ordinary kriging, and deleted sentence L220 and reference.

L221-L226: This is a result and does not belong in this section.

Replies: we moved them to result section.

L243: include everywhere in the paper the units for SCD (per year).

Replies: We changed most of them in the paper, except for ‘annual mean SCD’, ‘seasonal SCD’, SCD in an exact year, and its definition.

L243: Change to: "Areas with SCDs of 10-60 per year are called unstable (...)"

Replies: We changed the sentence as suggested.

L246: Change to: "(...) regions north of the (...)".

Replies: We changed the sentence as suggested.

L247: Change to: Areas with SCDs of 1-10 per year are called unstable snow regions (...)"

Replies: We changed the sentence as suggested.

L278: Change to: "(...) show large fluctuations (...)".

Replies: We changed the sentence as suggested.

L283: Change to: "(...) also have large SCD fluctuations (...)"

Replies: The middle and lower Yangtze River Plain is one plain, therefore, here 'has' is right.

L294: Change to -7.7 degrees Celsius and 7.9 mm.

Replies: We changed them as suggested, and also the following sentence.

L309-L313/314-L336-L340-L352-L359: not scientific language or imprecise statements, please modify.

Replies: We deleted the sentences L309-L321, and modified all other sentences.

L309-L321: Is this needed and relevant for the paper?

Replies: We deleted the sentences L309-L321 and the relevant references.

L344-L347: reformulate sentence.

Replies: We reformulated the sentences.

L349: skip "there".

Replies: We skipped it as suggested.

L457: As you worked only with the 296 stations I think this text part can be condensed.

Replies: We deleted some sentences in the second paragraph of the conclusion section to condense this part as suggested.

Caption Table 4: Rewrite, this is unclear. Do you mean significant trends and significant relations?

Replies: Yes, I mean significant trends and significant relations. We rewrote the caption.

caption Figure 6: Significance of trends according Mann-Kendall test of annual mean SCDs (...)

Replies: We changed the caption as suggested.

In your answer to the main points and detailed comments, please indicate how comments have been handled exactly, indicating also whether text has been deleted and what the position of newly included text blocks is. Please add a version of the paper which highlights all the changes made. I am looking forward to the new version of the paper.

Best regards,

Harrie-Jan Hendricks Franssen - editor -