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Climate of the Past Discussions
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Interactive comment on "A comparison of model simulations of Asian mega-droughts during the past millennium with proxy reconstructions" *by* B. Fallah and U. Cubasch

Anonymous Referee #1

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General remarks: ==========

This is a nice and detailed study about the occurrence and reasons of droughts in central and southern Asia over the 1300-1860 period. The comparison of different model ensembles with available proxy data sets is quite insightful and highlights the usefulness of paleo-climatological modeling. The physical explanation of drought conditions is also helpful and reasonable. Therefore, I basically recommend publication of this manuscript in Climate of the Past after minor revisions according to the following aspects:

The bad point about this manuscript is that there are many inaccuracies in terms of the

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use of english, typos and inconsistencies with the reference list. I have made a large number of specific (mostly technical) remarks which should addressed thoroughly. In addition, please check the entire document with respect to typos.

There are 15 figures assigned to 9 pages of text which is bit 'over-illustrated'. Maybe the authors can at least recombine the panels from Figs. 3-7 to one common figure. One may also think of putting 11+14 and 12+15 together.

The remarkable differences between both model ensembles as seen in Figs. 10-15 is neither mentioned in subsection 4.2.2 nor discussed in section 4. In general, model uncertainty is barely addressed in the text. Some discussion is needed about how model uncertainty relates to uncertainty from proxies.

Specific remarks: ==========

Page 1, line 25: Insert: ... that 'are' lasting ...

Page 14, line 12: Shift Wang and Morrill 2010 to the right place in the reference list.

Page 2, line 18: Maybe to or into Asia instead of in Asia?

Page 3, first sentence: A verb is missing. Same for the next sentence in section 2.

Page 3, line 21: Schmidt et al. 2011 is missing in the reference list.

Page 3, last sentence: Is each model ensemble averaged to a model-specific ensemble mean, or is everything averaged to a multi-model ensemble mean?

Page 4, line 4: Monsoon or monsoons in Asia?

Page 4, line 12: What is a coupled EOF analysis? Do you mean SVD? Has SVD been used or entirely replaced by MCA? Please clarify.

Page 4, line 16: The 1300-1860 period does not represent the past millennium, as promised in the title. Why is the anthropogenic component out of interest and why isn't the analysis starting before 1300?

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Fig. 2: The different scales of y-axes are misleading and, in my opinion, not necessary.

Page 5, line 8: Remove 'dipole' once.

Page 5, lines 10+13: It must be mid-14th century.

Figs. 3-7: Dots indicate that models and proxies agree by sign?

Page 5, line 15: Refer to Fig. 4.

Page 5, line 25: What means the 'broad drought patterns of the linear trends between reconstructions and simulations ...'? Please clarify.

Page 5, line 29: Is Kazakhstan already Siberian Plains?

Page 5, bottom: If the dryness is not related to the monsoon because the latter is hardly (= almost not) weakened, what has been the cause for the drought in India?

Page 6, line 7: Really the observed ocean influence - over the period 1300-1860?

Page 6, line 12: El Nino-like instead of ENSO-like.

Page 6, line 13: Krishna Kumar et al. 2006 is missing in the reference list.

Table 1: A measure of statistical significance should be indicated for the correlation coefficients.

Page 6, last line: Grove 2007 is missing in the reference list.

Page 8, line 9: Define LIA - Little Ice Age - when first used.

Page 8, line 31: Given the results in Fig. 2, I suggest to use a more constraining statement like, e.g., ... mostly agree ...

Page 9, line 7: Mann et al. 2005 is missing in the reference list.

Reference list: Some of the references have not been cited in the text. Please check D'Arrigo 2006, Raftery et al. 2005, Taylor et al. 2012.

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Interactive comment on Clim. Past Discuss., 10, 2685, 2014.