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Hydrology and Earth System Sciences Discussions

Interactive comment on "Temperatures and precipitation totals over the Russian Far East and Eastern Siberia: long-term variability and its links to teleconnection indices" *by* V. V. Krokhin and W. M. J. Luxemburg

Anonymous Referee #3

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General comments

This paper addresses the question of periodic variability in Siberian air temperature and precipiation and links with atmospheric circulation. This is an interesting scientific question which deserves some attention. However, I can recommend publication of the paper after major modifications only, as explained below.

The general methodology is not described in sufficient detail and with sufficient clarity.As far as I have understood, a two-step approach is used. First, CPCA is used

on the temperature and precipitation fields separately. Secondly ('cross-spectral' = coherency) between dominant CPCA modes and circulation teleconnection indices is examined. This must be explained more clearly in the 'methods' section.

Specific comments

1916/19-1917/2: You state that linear methods can not be used, but the method you subsequently use (PCA and coherency) are as well as methods used by others are all linear.

1917/3-6: Is that the methodology you use? Then, shouldn't 'spectral analysis' and principal component analysis' be swapped? Also explain in detail why this is superior to other methods.

1917/17-22: A more extensive description of the data is needed, e.g.: missing data and homogeneity.

1917/23-1918/12: For readers (like myself) not familiar with the geographical region under investigation, you must justify, e.g. by referring to other autors' work, that the two circulation indices chosen are the relevant ones.

1918/5: It is usually termed the Pacific Decadal Oscillation (PDO). Since this is defined in terms of the SST field, it is strictly spoken not a 'circulation index'.

1920/18-20: Please elaborate on this sentence, which I don't understand.

1921/15: What does 'low pass' mean here

1921/14-:Selection of significant CPCA modes must be done objectively, e.g. by Preisendorfers rule-N.

1922/12: What is the 'Arctic Circumpolar Wave' and how is its conection with precipitation anomalies?

1922/17: Some sort of significance test of these values must be performed.

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1922/22-1923/1: I don't understand this bit, please elaborate.

1923/13-15. In section 4 you identified a period of 2-3 years in the leading mode of temperature and precipitation. Is it from these leading modes you calculate the power spectrum shown in fig 5a and 6a? Then, why is the 2-3 year peak not more distinct and why was the 6-8 year period not identified n the previous analysis? Please explain this controversy.

1924/4: The 'Quasi biennial oscillation' (QBO) is a stratospheric phenomenon. You have found a 2-3 year variability. Whether this is related to the QBO or no is a different question, which you have not answered.

1925/14-19: Explain, why you bring in the concept of 'long time memory'.

Figures 5a, 6a, 7a: Can you explain how the significance levels are calculated? Is the null-hypothesis a white noise process? And why is the 95% significance level almost always below the calculated spectrum

Technical corrections

- none

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 3, 1915, 2006.