

Interactive comment on “Climate records in ancient Chinese diaries and their application in historical climate reconstruction – A case study of Yunshan Diary” by Siying Chen et al.

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Dear Editors and Referees,

Thank you very much for taking your time to review this manuscript. We really appreciate all your comments and suggestions. They have enabled us to improve our work. According to the comments, we did some modifications. Please find our itemized responses below.

Thanks again!

Comment 1: L63, more descriptions on Guo Bi are necessary to added in this part,

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for example, his official position, life track etc, which will convince the readers in the reconstructions and records.

Response 1: According to the comment, a brief introduction to Guo's official position and life track was added: "Guo was born in present-day Zhenjiang in Jiangsu Province. He used to be a lecturer at local academies in Jiangsu and Jiangxi, and a county official in Zhejiang. During the period recorded in Yunshan Diary, Guo resided in Zhenjiang, but he travelled multiple times on official business or to visit friends."

Comment 2: L93 Four types of related information "weather records, meteorological disaster records, phenological records, and records relating to the characteristics of regional climate", please provide some example to tell readers what they were. And your full extraction method (including recognizing the missing or wrong records) needs to be given.

Response 2: Thank you for the comment. The explanations and examples of the four categories were added. The revised sentence is as follows: "On the whole, climate records in historical documents can be classified into four categories based on the content, (1) weather records, including qualitative descriptions (such as sunny, cloudy, rainy) and quantitative observation (such as the infiltration depth of each precipitation event in Yu Xue Fen Cun); (2) meteorological disaster records, such as floods, droughts and their impacts on agriculture and society; (3) phenological records, such as the flowering date of plants, the migration date of birds; (4) records relating to the characteristics of regional climate, such as cropping system, distribution range of specific crops and fruits, the southern boundary of snowfall and the southern boundary of river freezing." The extraction methods of various types of records were described in section 3.1.1, 3.2.1, 3.3.1 and 3.3.2 separately. The method for recognizing missing records was added in section 3.3.1.

Comment 3: L230-L235: Figure2 about precipitation and total number of rain days, in order to understanding the characteristics of precipitation in modern period, I would

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suggest to plot February, July and December information, and combine upper and bottom figure together, which is helpful to see the relationship between rain days and precipitation clearly. And how about other years, is there any month with plenty of rain from 1290 to 1320? Could you provide a case?

Response 3: According to the suggestion, modern precipitation information for February, July and December was added in Figure 2. And the upper and bottom figure was combined together. The modified figure is shown below as Fig.1. However, due to the lack of proxy data, there is no available case study of precipitation reconstruction in 1290 to 1320.

Comment 4: L363, "1308 and 1309 may have been years that marked climate change". This infer is arbitrary decision, it needs more evidences to support.

Response 4: Thank you for pointing out this deficiency. The inference is indeed too absolute and lacks sufficient evidence to support it. So the sentence was deleted.

Comment 5: L73, The annual average precipitation here is 1,000–1,400 mm, the annual average temperature is 15–16°C, and the average temperature in January 1.5–4°C. Please add the reference period, it is important to judge the cold/warm or dry/wet condition comparing a certain period.

Response 5: Thank you for the comment. The reference period is 1951-1980, and we added it in the manuscript.

Comment 6: L75 All the dates in this article are Gregorian dates. Here please show an example to readers how the date was converted.

Response 6: According to the suggestion, an example of date conversion was added: "For example, a record reads 'It is sunny on the second day of the ninth lunar month of the first year of Zhida', and the date can be converted to 16 September 1308."

Comment 7: In Section 4.1.1, the authors mentioned "the modern average" precipitation for several times. To be specific, which time period does it refer to?

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Response 7: Thanks for the comment. The reference period is 1981-2010 and we added it in the manuscript.

Comment 8: In Table 2, there is a column named "Other". What is the meaning? Does it represent some specific types of weather?

Response 8: Thanks for the comment. "Other" means weather records except for sunny, cloudy and precipitation, such as windy, frost, fog and so on. The explanation was added in the manuscript.

Comment 9: Table 3, the number of sample size and stated period are need to be provided.

Response 9: We are grateful for the comment. The data source, sample size and stated period of table 3 were all stated in the main text (Lines 236-239). So we didn't state it again in the footnote of table 3.

Interactive comment on Clim. Past Discuss., <https://doi.org/10.5194/cp-2020-72>, 2020.

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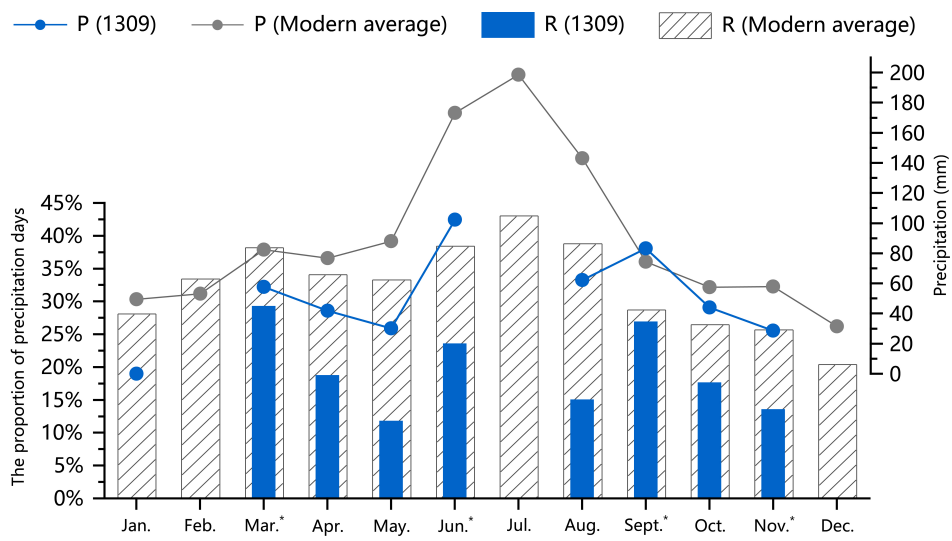


Fig. 1. Precipitation and the proportion of precipitation days in Zhenjiang for each month of 1309 and their comparison with the modern averages