We thank the anonymous referee very much for the constructive comments and suggestions. We hope to have addressed all raised issues in our response and in the revised manuscript.

Ⅰ Anonymous Referee #1

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General comments:

This manuscript focused on the precipitation trends over a special region, the Southeast Tibetan Plateau during the past half century. It analyzed the trends in annual and different season's precipitation series from 14 meteorological stations, as well as the spatial variability of precipitation caused by the complex topography. There are a lot of publications on precipitation trends at regional or national scales. This manuscript is a piece of regional study on climate change. Some revisions and more explanations were required.

We do this study and write this manuscript according to the following reasons, which have introduced in present manuscript. (1) Information on the temporal and spatial distributions of precipitation is important for a variety of applications in hydrology and water resources management. Related to global warming, changing precipitation patterns and their effect on surface water resources are currently important climatic problems. Under the background of global warming, the globally averaged mean precipitation exhibits an increase with a strong spatial variation based on observations and model simulations. Previous studies have shown that the temporal and spatial distributions of precipitation changes were extremely uneven and variable between regions. So it is necessary to study the regional precipitation variations. (2) The Tibetan Plateau (TP) is appropriately known as "the roof of the world". The large area's abnormal thermodynamic and dynamic effects and other land-air physical processes obviously affect climate variations and disastrous weather in China, eastern Asia and the entire world. Significant research has been focused on the analysis of precipitation characteristics in the TP under global warming. Generally, most studies have determined the changes in precipitation in the TP as a whole, but there are obvious regional disparities in the precipitation distribution because of the special topography features in the TP. To date, no research on spatio-temporal variations in precipitation trends in the Southeast Tibetan Plateau (STP) have been conducted. So it is necessary to study the precipitation variations in the STP. (3) The STP, the southeastern edge of the TP, experiences the interaction between the south Asian climatic system and the TP. In addition, the STP is the primary area of water vapor transfer from the Bay of Bengal to China. Moist air masses from the Indian Ocean bring abundant precipitation to this region through the valleys of the Lancangjiang, Nujiang and Yarlung Zangbo Rivers. The STP is also the central rainfall area of the TP because of its special topography. The water vapor convergence in the STP and its surrounding areas indicate the occurrence of subsequent precipitation in the STP and in southern China, particularly in the Yangtze River Basin. Therefore, located in the key area of water-heat balance and water vapor transfer, the STP plays an important role in weather processes. Climate anomalies in the STP exert strong effects in that region, in the Yangtze River Basin, and even in southern China. Analyses of the climate variability in the STP, particularly of precipitation trends, are important. Specifically, the analysis of precipitation variability in the STP is critically important for managing water resources. (4) In this study, the temporal and

spatial variability in precipitation trends over the STP are researched for the first time using observational data from 1961 to 2012 on the seasonal and annual time scales. The results can enhance our understanding of the regional climate changes in the study area, particularly in the TP. The precipitation change analysis is beneficial for regional water resources management in the STP.

In addition, I am not sure whether it is suitable for Climate of the Past, since the scope of this journal is restricted as "CP covers all temporal scales of climate change and variability, from geological time through to multidecadal studies of the last century. Studies focusing mainly on present and future climate are not within scope".

This study focused on the precipitation trends analysis over the STP during the past half century, which does not involve analysis about present and future climate. It is within the scope of CP.

Special comments:

1. P.448, Line 10, "the extreme precipitation, including the maxima and minima…", I think that they are monthly precipitation. Clarify please!

For this sentence, the correct expression should be "the seasonal and annual extreme precipitation, including the maxima and minima…"

2. P.450, Line 17, the reference format "J. J. Xu et al." should be "Xu et al.", as well as P.455, Line 5 and P.462, Line 25.

A few citations are not suitable for the formatting citations of CP. (1) P.450, Line 17, "J. J. Xu et al., 2007" should be "Xu et al., 2007a". (2) P.455, Line 5, "Z. X. Xu et al., 2007" should be "Xu et al., 2007b". (3) P.462, Line 25, "D. Q. Zhang et al. (2004)" should be "Zhang et al. (2004a)".

3. Figure 2, the name of meteorological stations should be given in the figure, because the results and discussion were explained according to the station name.

The station ID is given in the present Figure 2. We also would give the name of meteorological stations in Figure 2 (which is attached below).

4. Figure 5, it is better to use the same legend for all the subfigures.

The revised Figure 5 used the same legend for all the subfigures (which is attached below).

5. The method for the interpolation of precipitation from gauges to areal value should be introduced.

The simple average method is used to calculate the regional mean seasonal and annual precipitation time series according to the precipitation records from individual stations (except for the Zuogong and Chayu stations).

6. This manuscript tried to reveal the effect of topographic map on precipitation, however no topography was shown. I suggest a topographic map in Figure 2.

The revised Figure 2 showed the topography (which is attached below).

7. In this manuscript, the extreme precipitation was defined as the maximum and minimum monthly precipitation, which is incorrect because the extreme value is usually defined for one rainfall event or daily average.

"the extreme precipitation" is a bit of a misnomer. In this manuscript, the extreme precipitation is the maximum and minimum precipitation on the seasonal and annual time scales.

8. In Data section, the precipitation data was collected at daily or monthly scales? Explain, please!

The precipitation data was collected at monthly scales in this manuscript.

Ⅱ Additional changes

1. P.448, Line 7, “pre year” should be “per year”.
2. P.450, Line 1-2, “D. Q. Zhang et al., 2004, Y. S. Zhang et al., 2004” should be “Zhang et al., 2004a, Zhang et al., 2004b”.
3. P.472, Line 6, “2007” should be “2007a”.
4. P.472, Line 11, “2007” should be “2007b”.
5. P.472, Line 24, “2004” should be “2004a”.
6. P.473, Line 3, “2004” should be “2004b”.
7. P.477, Table 4, “Positive and not significant trend” should be “Positive trend”. “Negative and not significant trend” should be “Negative trend” (the right one for Table 4 is attached below).
8. Figure 4 missed a legend for all the subfigures (the right one for Figure 4 is attached below).

Ⅲ Attachments (Figure and Table)

Table 4 Number of stations for MK trend tests of the mean precipitation from 1961 to 2012 in the STP.

Time	Positive trend		Positive significant trend (α=0.05)		Negative trend		Negative significant trend (α=0.05)	
	Number of stations	Percentage	Number of stations	Percentage	Number of stations	Percentage	Number of stations	Percentage
Spring	13	93	5	36	1	7	0	0
Summer	7	50	1	7	7	50	1	7
Autumn	11	79	3	21	3	21	0	0
Winter	8	57	2	14	6	43	0	0
Annual	11	79	2	14	3	21	0	0

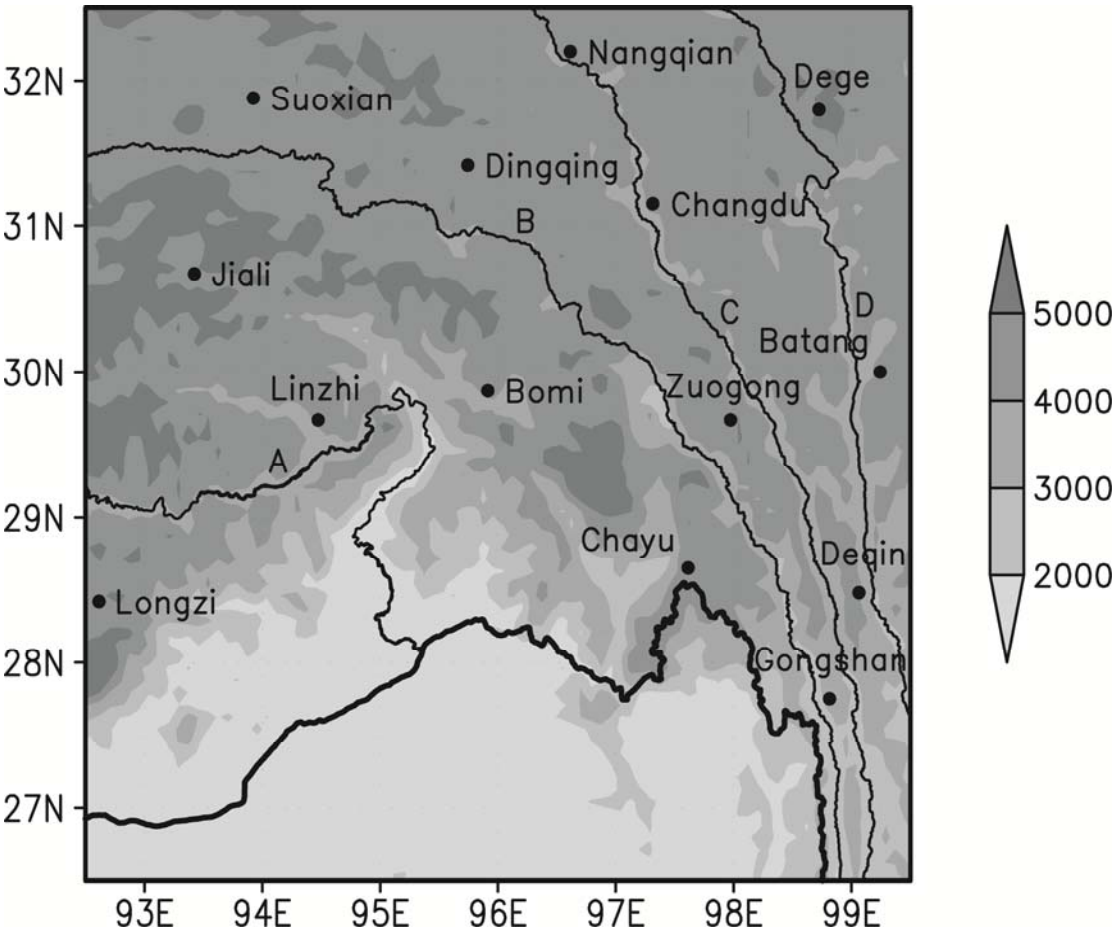

Figure 2. Sketch of the spatial distribution of the meteorological stations used in the STP. A: the Yarlung Zangbo River; B: the Nujiang River; C: the Lancangjiang River; and D: the Jinshajiang River. The heavy solid line represents the national boundaries of China. Shading is terrain height in meters.

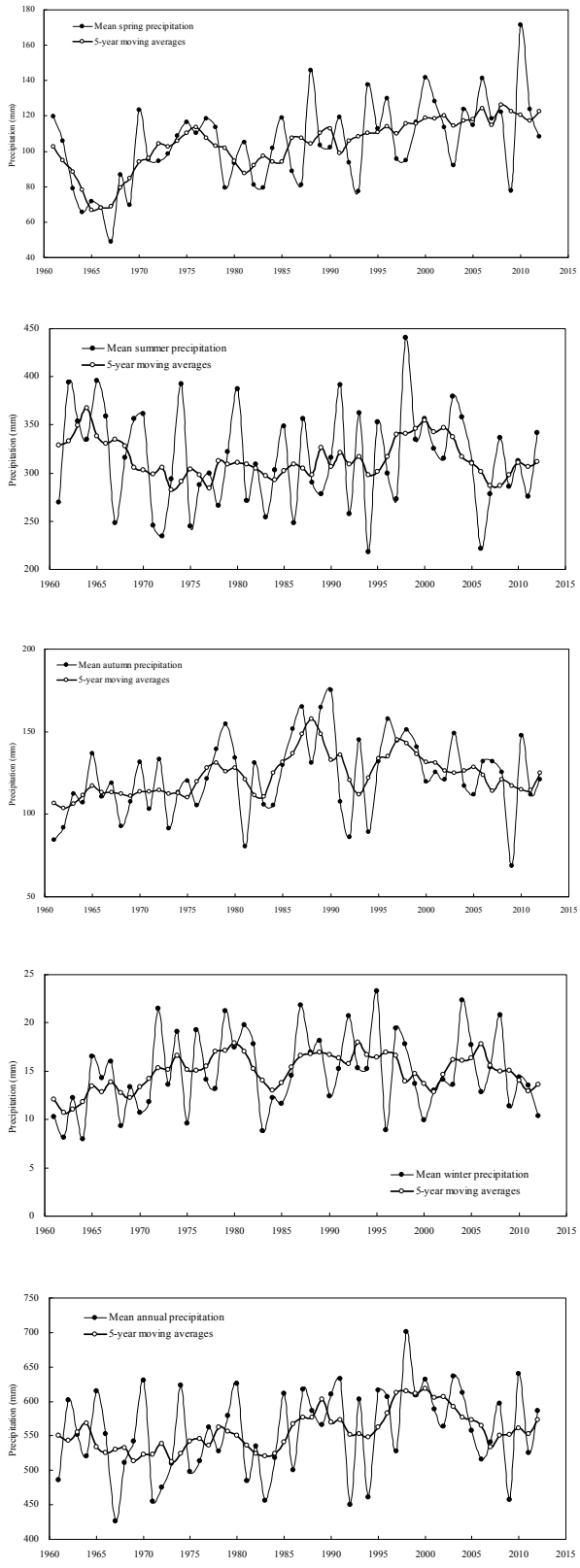

Figure 4. Time series of the mean precipitation from 1961 to 2012 in the STP.

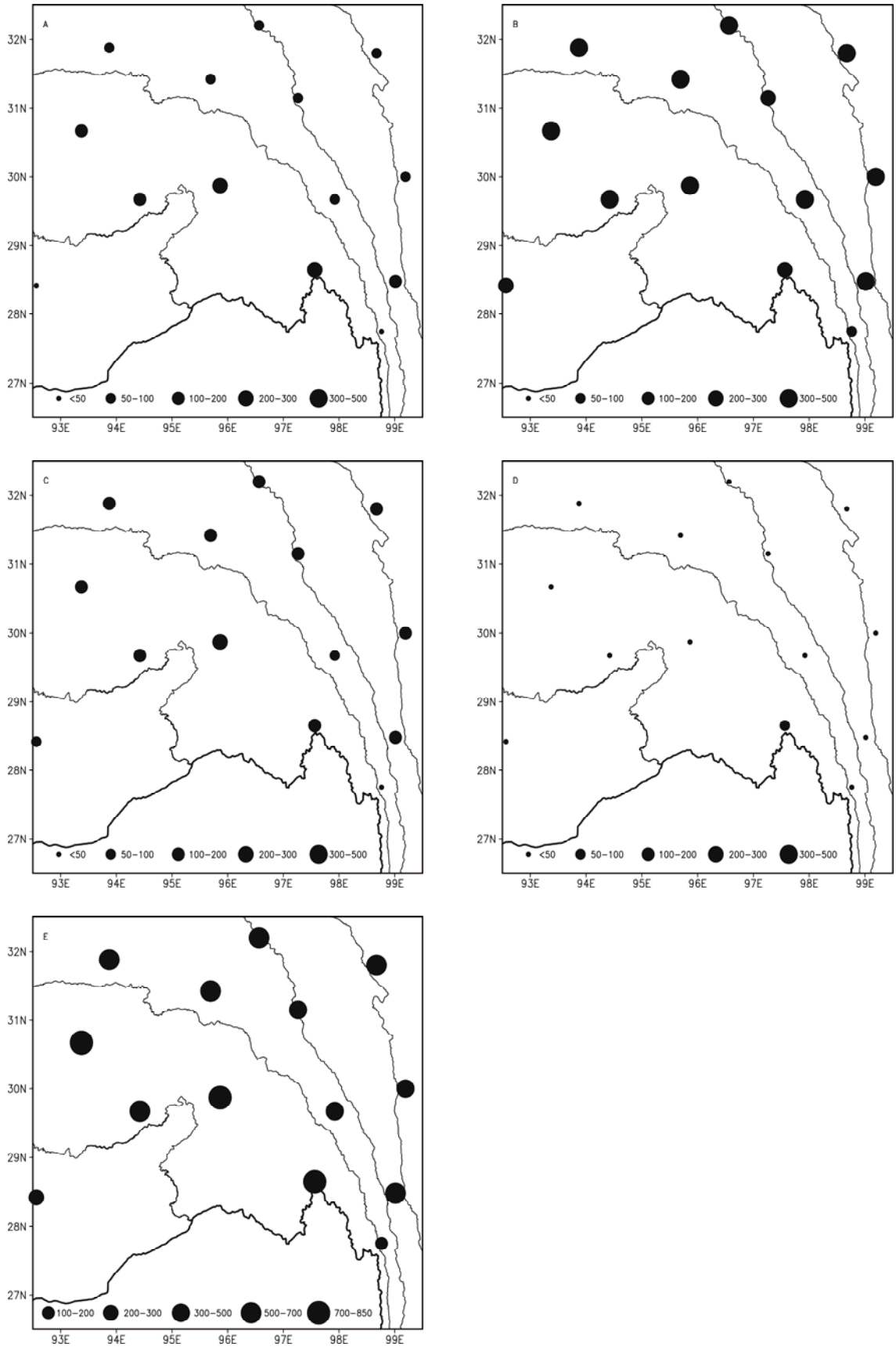

Figure 5 Spatial distribution of the mean seasonal and annual precipitation from 1961 to 2012 in the STP. A: Spring; B: Summer; C: Autumn; and D: Winter (units: mm).