

## ***Interactive comment on “Variations of future precipitations in Poyang Lake Watershed under the global warming using a spatiotemporally distributed downscaling model” by Ling Zhang et al.***

### **Anonymous Referee #2**

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Quantifying the spatio-temporal heterogeneities in the downscaling process is of great importance for future projections of climate change, especially for regional water resources adaptive management. The spatiotemporally distributed downscaling model (STDDM) proposed in this manuscript is of certain significance for statistical downscaling methodology, which could improve the simulation effects of climate variables at different spatial and temporal scales. However, the results, conclusions and discussion presented in current manuscript is not clear, concise, and well structured. The manuscript in current form needs a major revision before acceptance. Specific com-

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ments are as follows:

1. Assemble projection based on multi-GCMs has been widely used for regional future climate change scenarios, which is referred as the mainstream and popular method in the downscaling technique. However, only one GCM MRI-CGCM3 was selected in this study, based on the conclusions from Yuan et al. (2013) indicating a better performance in simulating diurnal rainfall over subtropical China, which is not enough for performance evaluation of multi-GCMs from CMIP5 in the specific Poyang Lake basin.

2. In order to detect sensitivity of precipitation change under global climate warming, different RCP scenarios should be selected to do comparative analysis. However, only RCP 8.5 was selected to generate future climate change scenarios in current manuscript, which is insufficient to obtain a scientific and convinced projection for the study area.

3. Too many time periods are defined in the manuscript corresponding to different years, such as baseline and future periods, historical, historical extent and future, etc., which would make readers confused and difficult to understand.

4. It will be better to add an evaluation section for the gridded meteorological data by using gauging stations observation.

5. English writing is poor in current manuscript, which needs to be polished by a native English-speaking editor. Examples of grammar errors are as follows:

Line 27: threatening to → threatening

Line 37: constructed → constructs

Line 43: in the station scale → at the station scale, many similar errors in other paragraphs.

Line 45: as underlays of local region is complex → as underlays of local region are

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complex

Line 57: project → projects

Line 69: Precipitation redistributions under global warming has → Precipitation redistributions under global warming have

Line 77: includes → include

Line 84: metrological → meteorological, many similar errors in other sentences.

Figure 2, 1(a): observitions → observations

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