**Hydrology and
Earth System
Sciences
Discussions**

Interactive
Comment

Interactive comment on "Expected changes in future temperature extremes and their elevation dependency over the Yellow River source region" *by* Y. Hu et al.

Anonymous Referee #1

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The Yellow River source region is one of the most sensitive areas to climate change. This study analyzes the changes of extreme temperature-based indices by using the SDSM tool. Meanwhile, the change dependency with altitude and the interannual variability are also investigated. It's an interesting topic for readerships if HESS. The paper may be considered for possible publication with revision. The manuscript remains some problems, which are needed to be improved. Details are listed as follows:

1) In the section of "study area", more references should be cited;

2) For the data set, the period of observed station data, re-analysis data, and GCMs

have been extended to 2000, why authors just used data for the period of 1961-1990. Longer data series should be added in order to improve the simulation. For the future period, people concerns more about the climate change before the mid-21st century in comparison of the end of 21st century. Authors should add more analyses on the period of 2046-2065;

3) Many studies have showed that ERA-40 has a better performance than NCEP/NCAR in the Tibetan Plateau, why authors didn't use this kind of data?

4) GCMs have different regional adaptability. Authors should explain how they choose those two GCMs;

5) It plays a central role to select the suitable predictors in the process of downscaling. Authors should present more details on the procedure of selecting the predictors. Many studies have showed that geopotential height is a key factor in downscaling the climatic elements, nevertheless, authors don't use this variable, which could affect the simulation. Authors should make a further explanation;

6) The elevation of the study area is higher than 700 hpa. In the manuscript, authors select the climate variables of 700, 850 and 1 000 hpa. Such kind of factors has meaning in the Yellow River source region?

7) In the section of 4.1, authors calculate the indices by averaging 100 simulation samples. However, the main purpose of 100 realization set in SDSM is to maintain the stabilization of simulation series. Therefore, the averaging method seems not suitable;

8) Authors should prove the ability of the SDSM in the study area by comparing the simulated and observed series in terms of explanation variance and bias at the daily scale or monthly scale, as it may average the bias just comparing the difference among the indices calculated at the seasonal scale;

9) In Fig. 2 and Fig. 3, it says that there are 14 stations in the titles of the figures, but there are only 13 stations in the text, authors should confirm this.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 13609, 2012.

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