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Hydrology and Earth System Sciences Discussions

Interactive comment on "Uncertainty in climate change impacts on water resources in the Rio Grande Basin, Brazil" *by* M. T. Nóbrega et al.

Anonymous Referee #2

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This paper evaluates impacts of global climate changes on river discharges using a variety of general circulation model (GCM) runs in order to better quantify uncertainties in future projections of streamflow patterns. The proposed methodology is applied to the Rio Grande Basin located in southeastern Brazil. Overall, I think the authors present their ideas in a concise and well organized way, addressing an important topic in hydrology that should be of keen interest of the Hydrol. Earth Syst. Sci. Journal readers. However, there are some weaknesses in the present form of the manuscript that the authors should address in order to improve its quality and being recommended for publication. Please see my comments below.

Note: I made this review without reading the review posted by Referee #1. As expected,

there may be some overlapping comments in this review.

Major Comments

1) In line 16 of page 6104 the authors mention that the 1981-2001 period was used for model validation but the results shown in figure 2 along with the comments in lines 22-29 of page 6105 refer to the calibration period (1970-1980), which is well-known to produce good skills since the parameters are estimated using this data. I suggest the authors: a) Show some observed versus predicted values for the validation period (1981-2001). Maybe for at least one reservoir as they did for the Agua Vermelha reservoir; b) Show the skill metrics (volume bias, NS Nash-Sutcliffe coefficient and NSlog) for all reservoirs used for calibration and present them for both periods (calibration and validation) separately. If the number of reservoirs used is large, then maybe a boxplot would be good enough to show the average skill and the associated variability.

2) This paper requires a significant effort to be understood if you are not well familiar with specific climate changes concepts and definitions. Section 4 (climate projections) is explained in only one paragraph and some procedures/methods need clarification, for instance: a) Line 6, item (2); b) Lines 12-13: Baseline data. What is it and what is the purpose of it?; c) Lines 13-16: Why was the trend in the data removed? What variables were used? What method was used to remove the trend? Is there actually any trend in the data? If yes, does this trend relates to any possible trend in the streamflow data?

Minor Comments

1) Acronyms should be defined in the Abstract and along the text the first time they appear. For instance: SRES (Abstract, line 5), GCM (Abstract, line 7), GCMs (page 6101, line 10), TRMM (page 6104, line 1), etc.

2) I suggest the authors to switch the words when they state the river names (e.g. replace River Parana, River Paraguay, River Uruguay by Parana River, Paraguay River, Uruguay River and so on).

3) Lines 19-21, page 6101. The sentence is a bit confused and should be rewritten.

4) Lines 24-25, page 6102: I suggest to replace "River Paranaiba which marks the start of the River Paraná" by "Paranaiba River to become the Paraná River".

5) There are a few typos in the text that the authors should address. For instance: a) Abstract, line 2: replace "of the Rio" for "of Rio"; b) Line 17, page 6107: replace "all the durations" by "all durations".

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 6099, 2010.