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Hydrology and Earth System Sciences Discussions

Interactive comment on "Assessment of climate change impact on hydrological extremes in two source regions of the Nile River Basin" *by* M. T. Taye et al.

Anonymous Referee #1

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The paper describes an impact study on extreme hydrological variables in the Nile basin by a modeling study of 2 different sub-catchments in different climatic regions. I see interesting elements by comparing 2 different regions and by focusing on the extremes (whereas most studies look at the global water balance). But there are several issues that require major revisions. The current paper is far from acceptance, mainly because it is written very poorly (conclusions are bullets, just copied from MSc thesis?), lack of decent literature review. Please account for the following remarks: (1) The paper needs editing for the English language (2) A better literature study would identify existing studies that have been looking at extremes. Many papers are miss-

ing. There also many studies done that used multiple GCM models on the Nile that were not mentioned (looking at the entire Nile). Also studies on extremes with several GCM's (Githui). Elshamy, M. E., Wheater, H. S. Performance assessment of a GCM land surface scheme using a fine-scale calibrated hydrological model: an evaluation of MOSES for the Nile Basin, Hydrological Processes, Online publication, 2009, DOI: 10.1002/hyp.7298 Elshamy, M.E., Sayed, M.A.-A., and Badawy, B., 2009b, Impacts of climate change on Nile flows at Dongola using statistically downscaled GCM scenarios, Nile Water Science & Engineering Magazine 2, Special issue on Water & Climate, p1-14. Soliman, E.S.A., Sayed, M.A.-A., Nour El-Din, M. and Samy, G., 2008. Integration of NFS with Regional Climate Model to Simulate the Nile Basin Hydro-climatology. Nile Basin Water Engineering Scientific Magazine, 1: 75-85.

(3) 2 different models are proposed in the study, which could be interesting, but a lumped versus spatially distributed would have been much more interested. Also, the difference of the model is just reported, but is not further integrated with the other climate results. (4) How could ET values been computed by point measurements? Next sentence states they are computed using temperature values.... Please clarify. (5) A very ad-hoc procedure is used for the climate change downscaling. On what basis, wet and dry days have been added? Why randomly? Does that respect the wet-after-day and wet=after-wet statistics? Why not using the many reported techniques that have been described in literature (e.g. statistical downscaling, regional climate models)? (6) P6 line 30: please describe the method is stead of referring to the paper. It can not be expected from the reader that s/he looks it up in order to understand the method. (7) 1/Q transformations could be dangerous for the very low flows that go close to 0. 50% decrease on nearly nothing is nearly nothing. (8) The conclusion section looks like it has been copied directly from a thesis and are not all supported by the text and figures.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 5441, 2010.