

Interactive comment on “Statistical downscaling of climate data to estimate streamflow in a semi-arid catchment” by S. Samadi et al.

Anonymous Referee #1

Received and published: 30 April 2012

The authors have tried to downscale a HADCM3 scenario for a station in the Karkheh catchment in North-West Iran, and from that obtain streamflow projections using a hydrologic model. They use and compare two downscaling tools, whose projections both show a moderate warming of about 0.5C, and a similarly moderate decrease in precipitation (-0.1 to -0.4 mm/d). These averages come from strongly varying signals between seasons, with even a cooling reported for the summer season by both the downscaling and the GCM. The results are used to drive a hydrologic model, projecting an overall decrease in annual flow for the catchment.

Given the cooling temperature projections, something is obviously fundamentally wrong here. The attached Fig. 1 from the IPCC demonstrates that, instead, HADCM3

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projects a warming of about 4-5C for the entire area and not a cooling.

Because of these fundamental flaws I am bound to reject the paper for publication. The authors may consider to fix the corresponding simulations and resubmit the results. However, I strongly urge them to have a native English speaker read it first, as the present version of the paper makes it very difficult to understand. It is generally unfortunate when research papers cannot be published due to poor language. But the present manuscript, even without the above mentioned errors, would have to be re-written thoroughly in order to facilitate a better judgement of what has been done.

The author's other paper 'Methodology for selecting the best predictor for climate change impact assessment in Karkheh basin, Iran' may have been helpful but was inaccessible for the reviewer.

My reading log (stops at 4885):

Abstract: Too much detail. Do not use high precision numbers (e.g. -2.82%) in a climate change context.

4871, 24: The use of 'SDSM' as a general term is incorrect.

4872, 27: "voluminous" with 5 references and "few studies" with 8 references.

4874, 11: How exactly does Samadi et al., 2010 relate to this study?

4875, 4: "few studies" is not true.

4876, 23: The model description (this entire chapter) is incomprehensible for outsiders.

4878, 7: What is 'lhacres _v'?

4879, 8: That statement is so general that it requires a reference.

4879, 14: What are the 'calibration parameter thresholds'?

4880, 2: 'independent and dependent data' is a somewhat awkward characterization.

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4881, 6: the part 'varying from ... in this month' does not make sense to me.

4881, 16: How can one simulate streamflow of a 5793 m² nival catchment with a single meteorological station?

4882, 5ff: This should be moved to section 2.

4882, 21ff: This statement is there twice.

4883, 12ff: This also needs to go to section 2.

4883, 17: This paragraph should either be removed or, if not redundant, moved to section 2.

4883, 26: if no transformation is applied to temperature, is there one applied to precipitation, and if so, which?

4884, 5: How does one 'downscale equivalent regional predictor variables'?

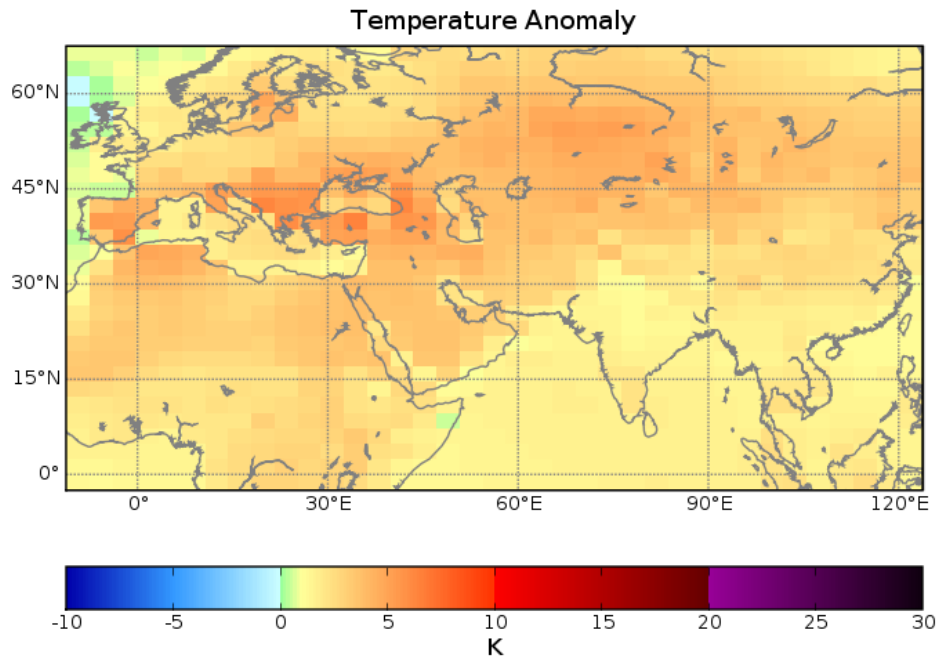
4884, 15ff: From Fig. 5 I conclude that the downscaling performance is quite bad. There seems to be hardly any skill left other than reproducing seasonality. Apparently the GCM was applied without any bias correction.

4884, 20ff: This is a good example of the rather awkward flow of argument: 'The model shows increasing precipitation...' starts with describing the climate change signal, but then continues with 'HadCM3 model under the SDSM projections...', so that the reader is left to wonder what he has just read. Unfortunately, these kind of stumbling blocks are found across all paragraphs, which makes the paper really hard to review.

4885, 2: What is an annual increase for autumn and winter? - Here the results are interpreted GCM(future) vs. OBS, neglecting the (absolutely crucial) information from GCM(present). But even when including GCM(present), temperature is decreasing. This doesn't make sense.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 4869, 2012.

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Surface Air Temperature Anomaly, July 2040-2069 mean.
 Projected by the UK Met Office;
 Scenario: A2 (SRES 2000); Model UKMO-HadCM3 (IPCC 2007).
 Figure obtained from www.ipcc-data.org. 30 April, 2012.

Fig. 1. warming projection from HadCM3

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