

Interactive comment on “Uncertainty in water resources availability in the Okavango River Basin as a result of climate change” by D. A. Hughes et al.

D. A. Hughes et al.

d.hughes@ru.ac.za

Received and published: 22 September 2010

Thanks for pointing out the existence of larger RAMSAR sites, this error will be attended to.

With regard to the uncertainty bounds: The comment has focused on the model parameter uncertainty which was quantified during the initial calibration process using the limited local rainfall data that was available for the short period (1961 to 1972) and involved the parameters for all of the upstream gauged sub-catchments that dominate the runoff response. These results are not reported in the paper in detail as they are

C2417

very similar to the results obtained by Hughes et al. (2006) and there was not space to repeat these results. For this period and using these rainfall data, the simulated flow ensembles generally bracket the observed flows. The result given in Figure 7 is based on the same parameter set but using a longer rainfall data series (the UDEL data) that was compatible with the climate change data generated by the down-scaling process. Thus, the lack of fit between the observed and simulated ensembles is entirely associated with the use of the UDEL rainfall data (local data are not available for the extended time period) and has nothing to do with parameter uncertainty. As pointed out earlier in the paper (refer to Figures 5 and 6 and accompanying text), no amount of parameter re-calibration would have improved the fit of the seasonal distribution. It should also be pointed out that the poor reproduction of the seasonal distribution is mostly associated with the apparently inadequate representation of the rainfall inputs during the mid 1970s to 1908s period (see Figure 6). Thus the uncertainty represented by Figure 7 is in the rainfall inputs and not the parameters and there are no data available to quantify this component of the uncertainty. This is an unfortunate, but unavoidable (in the Okavango situation) consequence of ensuring that the baseline simulations are compatible with the climate change scenario simulations. It is therefore concluded that the model is conceptually OK (based on the earlier calibration results - Hughes et al., 2006), but that the rainfall inputs are not entirely representative. The critical point is that the rainfall inputs for the baseline and climate scenarios are compatible and therefore the simulated flows for the different climate models can be compared. I hope this explains the situation.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 5737, 2010.

C2418