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www.hydrol-earth-syst-sci-discuss.net/4/S549/2007/

Hydrology and Earth System Sciences Discussions

Interactive comment on "Parameter extrapolation to ungauged basins with a hydrological distributed model in a regional framework" *by* J. J. Vélez et al.

Anonymous Referee #1

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The paper is a good paper which is worthwhile publishing.

Nonetheless there are two points that have to be further clarified and discussed.

The first point (a minor one) relates to Section 4.3 and Figure 7 (http://www.hydrol-earth-syst-sci-discuss.net/4/909/2007/hessd-4-909-2007.pdf).

It is well known that precipitation trends are not linear. They may appear linear up to a certain elevation, but there is an elevation, which varies with the local conditions, at which this growth disappears.

The authors should discuss this aspect since they might generate higher rainfall (or snow) rates.

The second point is more important. It relates to the statement at the end of section 4.4:

"This calibration results can be considered as excellent" The problem here relates to the fact that the authors are aware of the uncertainty introduced by the parameter estimation:

"The challenge is to estimate the best parameters set of distributed conceptual models. Due to the inability to accurately measure distributed physical properties of environmental systems, calibration against observed data is typically performed, which is most often achieved with limited rainfall-runoff data. The equifinality noted by Beven (1989) indicates that given the complexity of such models, many different combinations of parameter values may simulate the discharge equally well. These parameter sets may be located throughout many areas of the parameter space (Duan et al., 1992; Beven, 1989). This uncertainty of the appropriate parameter values yields predictive uncertainty as has been demonstrated through applications of the Generalized Likelihood Uncertainty Estimation methodology (Beven and Binley, 1992; Freer et al., 1996; Beven, 2000)".

But they do not discuss this problem in their paper in relation to their results.

In particular, more than the uncertainty induced in the sections used for calibration they should investigate and discuss the uncertainty induced in the other sections (they say that they must provide information in 567 sections most of which ungauged, which is the reason for using a distributed modelling approach) by the model parameters and their uncertainty. Failing to do this, the paper would appear to be a good complex hydrological application to a catchment, but still an application that could be performed by many of hydrological consulting companies instead of a qualified research institute.

In other words they should provide an assessment of the level of reliability of their work, which cannot be limited to the assessment of the calibration qualities at the gauged sites using the classical indicators, but should encapsulate a measure of uncertainty to

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be used by the end users, who, according to the authors will use the system for water resources planning and management.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 4, 909, 2007.