Hydrology and Earth System Sciences Discussions

Interactive comment on "Transport at basin scales: 2. Applications" *by* A. Rinaldo et al.

A. Rinaldo et al.

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Reply to Referee #2

All authors feel they have to thank this reviewer for his thorough review work and the interest in the paper.

A detailed answer to the specific comment by Referee #2 is reported below. Italics refer to the reviewer's comment, our rebuttal right below.

Apparently, during the calibration period of the transport model (from 20 October to 12 November 1993) the water discharge was not recorded. This fact may be a source of uncertainty for the transport model which computes the mass flux rather then the flux concentration at the control section. If would be nice if the authors comment on the possible implications of calibrating the transport model on periods where the discharge is not available.

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Flow measurements were indeed available during the calibration period, but they are not reported for brevity - the reliability of the flow model is clearly shown already in Figures 8 and 10. Because the hydrologic parameters are not event-based empirical parameters, but rather physical parameters, upon any suitable calibration procedure the flow model can be applied in a "blind" way without major errors in the estimate of the ensuing runoff. Our result indeed seem to confirm the reliability of the procedure.

As per mass fluxes, moreover, the model computes mass discharges rather than flux concentrations and thus computes simultaneously both mass discharges and flux concentrations on the basis of the resident concentration of the water particles within the control volume. Both of them depend on the rainfall volumes and patterns and on the travel time distributions within hillslopes and channels e.g. via non-linear relationships. Water discharges (and their timing) are thus crucial for computing mass fluxes, concentrations etc. Whether you rely on data or on sound models is a matter of methodology. We have added a short sentence to the caption of Figure 10 to clarify this point.

Interactive comment on Hydrology and Earth System Sciences Discussions, 2, 1641, 2005.

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