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Hydrology and Earth System Sciences Discussions

Interactive comment on "HESS Opinions "Crash tests for a standardized evaluation of hydrological models"" *by* V. Andréassian et al.

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Dear colleagues,

Thank you for the talent with which you answered to our "car crash test" metaphor with a "car industry induction-deduction cycle" metaphor! Thank you also for your extremely valuable comments. We do agree with many of them, and disagree with some of them. Here, we would like to bring the following complementary explanations, in order to bring some light on the points where we think that our opinions diverge:

. first of all, we believe that we were not clear enough to state that we did not consider the hydrological "crash testing" as a SUFFICIENT step towards model improvement.

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You are perfectly right in stating that it is not. Thus, we need to make clear that we only consider it to be a NECESSARY step, just like a car crash test can only help identify a safe car from an unsafe one (a scientific test should not be overinterpreted).

. second, we believe that where our opinions really diverge, is that we do not agree with your 'induction-deduction' cycle. Of course, we agree that it corresponds to the common practice in hydrological modeling. But our point of view is that ideally, the deductive part of it should be have been preceded by a long inductive part : the local adaptation should be preceded by the search for generically valid model components. We have in fact no objection with models 'customization' (i.e. with making generic model elements catchment specific), as long as the elementary building blocks of these models are "safe" and "robust" elements, i.e. as long as they have been widely tested.

. last, we would like to dwell on a point where we seem to have a diverging opinion, but where we believe in fact that this could well just be a misunderstanding : we agree with the distinction you make between engineers (who support management decisions) and scientists (who are interested in developing theories and models of the most general applicability). Of course, the engineer is perfectly right and respectable in seeking for the "locally-best" model. He is asked to find a local solution, and not a global one. But the question we would like to raise here is the following: how can the engineer be sure that he has identified the "locally-best" model? Remember that an important aspect of his work is that he has to provide an answer with the data at hands (he can certainly not answer: keep recording the data, I will answer in ten years). Thus, the only way for him to ensure the robustness of the solution he will submit to his customers is – in our opinion – to use well-tested ("crash tested") elements: they are the only guarantee that can be offered to him for extrapolating the observed behaviour of his catchment towards the future. Our opinion is that to answer locally, the engineer has to think globally; and this is all the more true in a context of great climatic uncertainty.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 3669, 2009.