Hydrol. Earth Syst. Sci. Discuss., 5, S2359–S2361, 2009
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Hydrology and Earth System Sciences Discussions



# *Interactive comment on* "Analysing the temporal dynamics of model performance for hydrological models" *by* D. E. Reusser et al.

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Received and published: 13 January 2009

General comments

The analysis of the temporal dynamics of model error, in opposition to the general time-aggregated analysis, is definitely an issue of great interest for the hydrological community and it is a relevant scientific question within the scope of this journal. The removal of highly correlated measures from the performance sets, the use of SOM and cluster analysis are powerful method for data reduction. The synthetic peak errors analysis is a correct method to assess performance measure error response. I appreciate the use of a very wide number of error measures to check the whole range of model errors. It is true that very close error measures can see very different model er-



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Interactive Discussion

Discussion Paper

ror in a very different way and the more the error measures are, the best the global idea of the model performance is. Moreover, the paper is well structured and it contains two case study which are sufficient to support and to illustrate the employed methodology. The title and the abstract reflect the contents of the paper. Therefore, my opinion is very positive about the work done. It finally deserves to be published. However, two general comments can be done. First, I am sure that a little bit more can be said about the consequences of the applied methodology on the identification of model structural error, at least in the two case study. For example, how would you improve the model structure of the model used for our case study or what kind of suggestion can you give for the correct use of the two models. Second, the used methodology being complicated (due also to the wide number of error measure quoted above), some more care in the description of methods could be used. I try to explain these two points in the section of Specific Comments

Specific comments

1. I generally agree with the specific technical comment of the previous interactive discussion, so I try to list here only the original comments.

2. It seems to me that the section 5.1 contains a huge amount of information about the general behavior of error measures. Namely from line 8/3185 to the end of the section. This paragraph should be placed in the section ‘methods’ and not in the section ‘case study’. In particular, the information about the general behavior of error measures in section 5.1 could be given in table 3 ‘summary of performance measures’ instead of into the main text. That could simplify the lecture of table 3 and make the reading lighter.

3. The figure 4 is valid for the case study of Weisseritz and the WaSim-ETH model or for both? Make this point more clear.

4. The table 2, ‘Performances measure to remove based on high correlation for the Weisseritz case study’ is valid for the case study of Malalcahuello or



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not? The correlations between the performance measures depend on the case study, on the hydrological model or what? I think that this point could be made more clear.

5. I would also find the paper more readable if Figure 7 comes before Figure 8

6. The sensitivity of the method on the choice of the size of the window is evocated at line 12 page 3190 for the Weisseritz case study. For the Malalcaheullo case study a size of 5 days has been chosen following physical consideration, page 3190. Please make clear the suggested procedure for the choice of the size of the window as it is done in the section ‘methods’, page 3177; while you can give the actual chosen value for each case study in the section concerning each case study.

7. I do not agree with the sentence at page 3174 ‘these two case studies differ in catchments characteristics (size). We have indeed two small catchments $<$50km2.

8. What doest it means the sentence at page 3182 ‘the climate is moderate’ on Weisseritz catchments. Explain more.

9. Figure 5 could be spitted in at least three different figures.

10. I do not like (very personal opinion) the wide use of references to some results obtained by the authors but not shown on the paper, see page 3186, 3192, for instance. A reader should be able to appreciate the conclusion and the discussion contained into paper from results showed in tables and figure.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 5, 3169, 2008.