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Hydrology and Earth System Sciences Discussions

Interactive comment on "On selection of the optimal data time interval for real-time hydrological forecasting" *by* J. Liu and D. Han

Anonymous Referee #1

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On selection of the optimal data time interval for real-time hydrological forecasting

Liu and Han

The paper describes an analysis to identify the optimal time interval of the input data for rainfall-runoff modeling/forecasting. The paper is interesting, well written but the question remains if the author really solved a burning issue.

I think amongst hydrologist it is basic knowledge that the temporal resolution of the input data and model should be several times smaller than the characteristic response time of the catchment (in other words the reaction time determines the maximal time interval). I would like to see an analysis of the rainfall-runoff models and their time

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interval + concentration time used by EA in England and Wales to see if this is really an issue in operational flood forecasting (I have my doubts this is the case for England and Wales). The EA in England and Wales used different models with different time intervals for different areas (depending on the concentration/reaction time).

(See for instance some publications on forecasting/modelling in England and Wales

The PDM rainfall-runoff model, R. J. Moore Hydrol. Earth Syst. Sci., 11, 483-499, 2007.

Risk-based Probabilistic Fluvial Flood Forecasting for Integrated Catchment Models. Phase 2 Report. Science Report – SR SC080030, Environment Agency, 2010. K. Sene, A.H. Weerts, K. Beven, R.J. Moore, C. Whitlow, J. Beckers, A. Minett, H.C. Winsemius, J. Verkade, P. Young, D. Leedall, P. Smith, S. Cole, A. Robson, P. Howard, M. Huband, N. Breton, 2010

The use of MOGREPS ensemble rainfall forecasts in operational flood forecasting systems across England and Wales, J. Schellekens, A.H. Weerts, R.J. Moore, C. E. Pierce and S. Hildon, Advances in Geoscience, special issue, vol. 29, 77-84, doi:10.5194/adgeo-29-77-2011, 2011

Estimation of predictive hydrological uncertainty using quantile regression: Examples from the National Flood Forecasting System (England and Wales), A.H. Weerts, H.C. Winsemius, J.S. Verkade, Hydrol. Earth Syst. Sci., 15, 255–265, doi:10.5194/hess-15-255-2011, 2011.)

One other burning issue is probably the estimation of the areal precipitation, which is not treated or hardly mentioned at all. I think this issue is more difficult and a bigger problem than the time interval of the input data (and which is probably well taken care of in England and Wales).

Please adopt the general guidelines for a publication completely separating material and methods (including the experimental design) from the results and discussion

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9, C5308–C5310, 2012

it is now completely mixed and makes the manuscript difficult to follow. Also use introduction-material&methods-results&discussion-conclusions instead of report style headings.

How much do the results depend on the use of the ARMA model? In otherwords, can you split the results or redo the experiment with only the PDM model? It might be that the results are completely due to the use of the ARMA model, as the behavior might be very different for different time intervals. This is mentioned as a problem/issue (section4) but not followed up. Please answer this important question because your conclusions (1-4) may depend on this.

Conclusions are very weak. I get the feeling nothing has been solved or clarified. Maybe because the hypothesis is not well posed (purpose is to explore the general impact of the data time interval on hydrological forecasting)

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 10829, 2012.