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Hydrology and Earth System Sciences Discussions

Interactive comment on "Daily reservoir inflow forecasting combining QPF into ANNs model" *by* Jun Zhang et al.

Jun Zhang et al.

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4. Some specific comments:

Comment:

i) The acronyms, i.e. QPF, NWP, MLP-ANNs and ARIMA, may be avoided in the Abstract. Rather, acronyms are to be provided in the main body of the paper with their first appearance provided alongside the respective expanded form.

Response:

Relevant acronyms will be corrected in revised version.

Comment:

ii) In the 'Introduction' section, the authors have stated that '...the black-box models...

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are widely applied to forecast the streamflow because of their requirement of little data...' (12-15/123). This is not quite right. Whereas the physically distributed and some conceptual models of the mechanistic category of hydrological models require large data of different types, all hydrological models, irrespective of these being mechanistic or black-box, require sufficient data of relevant hydrological variables for effective calibration and for being reliable in forecasting applications. ANNs which are non-linear black-box models also require adequate (and not 'limited') data for being trained.

Response:

Relevant inappropriate description will be corrected, in revised version, to emphasize large data of different types as referee #1 pointed out.

Comment:

iii) The references in 19-26/123 and elsewhere may be provided in chronological, rather than in alphabetical, order.

Response:

The references order will be corrected in revised version.

Comment:

iv) The caption of section 2 may be changed to 'Study area and data characteristics'. The study area in section 2 describes the Fujian province in great details and includes reference to all eight 'hydrographic basins'. Some of these details, which are not relevant to the study, may be dropped. Instead, as indicated in Sl. No. (i) under 2: Shortcomings, more details specific to the Minijiang River and the reservoirs and hydropower plants upstream of the Shuikou reservoir should be provided. No information is available either about the rainfall stations in the study area or about the rainfall data used in the study. These details are required. Some statistics of the series of observed rainfall and discharge data and a plot of the seasonality of these variables, as indicated in Sl. No. (iii) under 2: Shortcomings, may be included for facilitating

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a better understanding of the data characteristics. Information about the data for the period 1990-2000 (11-14/126), which have not been used in the study, is superfluous and may be dropped.

Response:

The caption of section 2 will be changed to 'Study area and data characteristics'. More data and statistics about Minjiang River, rainfall and other relevant aspects will be provided, while some descriptions which are not relevant to the study will be dropped in revised version.

Comment:

v) Figures 1 to 5 require improvements. In addition to the comments in Sl. No. (ix) under 2: Shortcomings for the plots in Figs. 3 and 4, the texts in Fig. 1 and Figs. 3-5 are too small to be intelligible. Authors must take care to see that the texts in these plots are made sufficiently large to be readable in the journal format. In Fig. 1, the names of the country and the province in the respective map and an index to indicate the rivers and reservoirs, together with their captions, will be required.

Response:

Figures 1 to 5 will be redrawn to make them more intelligible. The names of the country and the province in the respective map and an index to indicate the rivers and reservoirs, together with their captions, will be added in revised version.

Comment:

vi) 'Hydropower power' (20/124)? Not sure about the inclusion of 'ecological destruction' in 22/124 as one of the justifiable motivations for laying more emphasis on hydropower generation in comparison with other conventional forms of nergy production!

Response:

'Hydropower power' will be replaced by 'Hydropower'. The 'ecological destruction'

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mainly means environmental pollution caused by thermal power which occupies the dominant position in China now. The 'ecological destruction' will replaced by a more appropriate word or phrase.

Comment:

vii) All symbols in page 129 are to be defined. For example, 'Delta'E(k), E(k), 'Delta'wji(k+1), 'Delta'qji(k+1), dpj etc. have not been defined.

Response:

These symbols will be described in detail about their definitions and express.

Comment:

viii) Which two 'existed' systems in 15/134?

Response:

We suppose that the term 'two existed system' questioned by Referee #1 appears in 15/133. Two existed system refer to the Chinese national flood control system for reservoirs (Cheng and Chau, 2004) and the Web-based flood forecasting system (Cheng et al., 2004), respectively. This term will be replaced by 'two existing systems'.

Comment:

ix) What is 'approbatory simulation' in 29/134?

Response:

For every day, two sets of forecasting plan for next several days can be saved to database, one set is auto forecasting plan (16/134) and the other is manual plan (1/135). The former uses QPFs released by authoritative department while the latter uses modificative or simulated QPFs. In addition, the former is accomplished automatically and results can not changed, while the latter can recalculated many times based on different QPFs assumptions and one of them with which the forecasting operators

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are satisfied will be saved to database as the manual plan of that day.

Comment:

x) As stated in the last sentence of 1: General Comments, the language needs improvement. Some examples are as follows. The use of the term 'severed' in 16/122 or in 17/135 is not appropriate. Replace 'relationship' in 18/130 and 1/131 by 'degree of fit', 'dynamic, uncertain, and nonlinear' in 23/122 by 'dynamism, uncertainty and non-linearity' and '...hydropower is strongly advocated by the...' in 22-23/124 by '...the development of hydropower is strongly advocated in the...'. Drop 'So' in 1/126. Replace 'statistic' in 6/125 by 'statistical, 'approximate' in 22/125 by 'approximately', 'downriver' in 11/126 by 'downstream', 'generational' in 17/126 by 'generation', 'revealing' in 23/128 by 'establishing', 'obviously' in 11/132 by 'obvious', 'affection' in 28/132 by 'effect', 'two existed system' in 15/133 by 'two existing systems', 'By the aid' in 20/133 by 'With the aid', 'accomplished' in 21/133 by 'obtained', 'popularly' in 11/134 by 'popular', 'input' in 27/134 by 'inputting' and so on.... Replace lines 20-21/126 by 'The application of the models, developed in the study, will be illustrated by considering the Shuikou reservoir which is the most important reservoir in the Fujian province'. The term 'general quantitative scope' in 3/132 is inappropriate.

Response:

In revised version, the language will be improved, all incorrect usages and inappropriate expresses, some of which were pointed out by Referee #1, will be corrected. The word 'severed' in 16/122 and in 17/135 will be replaced by 'served', 'relationship' in 18/130 and 1/131 will be replaced by 'degree of fit', 'dynamic, uncertain, and nonlinear' in 23/122 will be replaced by 'dynamism, uncertainty and non-linearity', '...hydropower is strongly advocated by the...' in 22-23/124 will be replaced by '...the development of hydropower is strongly advocated in the...'. 'So' in 1/125 will be dropped. 'statistic' in 6/125 will be replaced by 'statistical, 'approximate' in 22/125 will be replaced by 'approximately', 'downriver' in 11/125 will be replaced by 'downstream', 'generational' in

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17/126 will be replaced by 'generation', 'revealing' in 23/128 will be replaced by 'establishing', 'obviously' in 11/132 will be replaced by 'obvious', 'affection' in 28/132 will be replaced by 'effect', 'two existed system' in 15/133 will be replaced by 'two existing systems', 'By the aid' in 20/133 will be replaced by 'With the aid', 'accomplished' in 21/133 will be replaced by 'obtained', 'popularly' in 11/134 will be replaced by 'popular', 'input' in 27/134 will be replaced by 'inputting'. Lines 20-21/126 will be replaced by 'The application of the models, developed in the study, will be illustrated by considering the Shuikou reservoir which is the most important reservoir in the Fujian province'. The term 'general quantitative scope' in 3/132 will be replaced by a more appropriate term.

5. References:

Comment:

i) Goswami, M., O'Connor, K.M, Bhattarai, K.P., Shamseldin, A.Y., 2005. Assessing the performance of eight real-time updating models and procedures for the Brosna River. Hydrology of Earth System Sciences, 9(4), 394-411.

ii) Toth, E, Brath, A., Montanari, A., 2000. Comparison of short-term rainfall prediction models for real-time flood forecasting. J. Hydrology, 239, 132-147.

Response:

The references mentioned by Referee #1 will be added in revised version.

Once again, we would like to Referee #1 for the valuable review.

References used in this response:

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