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Hydrology and Earth System Sciences Discussions

Interactive comment on "Using the MESH modelling system for hydrological ensemble forecasting of the Laurentian Great Lakes at the regional scale" *by* A. Pietroniro et al.

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The present paper describes a very interesting environmental modelling system that allows to couple different models with the ultimate objective to produce operational forecasts. Of particular interest, is also the fact that this product will be available on the web as an open source system. The study was conducted on the Laurentian Great Lakes basin testing the ability of the system to predict streamflow and snow water equivalent over this area.

The paper is clearly written and deserve to be published on this journal. Personally, I would prefer if the paper is shortened considering that there are many parts where

the reader is distracted from the content of the paper. In particular, the authors spend so much time describing in extreme details all the data input requirements of the modelling system and in comparison the modelling results loose its central role. Also, several paragraphs are useless for the scope of this paper. For instance, the paragraph describing CaPA product can be delated since this data was not used in this paper (see page 2485 from line14 to 22).

I have a number of minor comments that, hopefully, may assist in enhancing the readability of the paper.

A general remark, figures probably requires a little work of editing. For instance, the inset of figure 2 is confusing as it is, titles in figure 9 do not have the same sizes (compare "Lake Ontario" with "Lake Erie"), figure 6 should be bigger since it is very difficult to distinguish the flow directions and finally none of the labels of figures 16 can be read.

1. Figure 10 seems somewhat incomplete. I suggest to include a legend describing the meaning of each line and also change the colour for the predictions.
2. Figure 15 and 17, specify the units used for the map on the palette as in figure 16.
3. Simulations of WATFLOOD show that the model tends to slightly overestimate the streamflow. If this is true, why do we observe an underestimation of the lake's water level (see figure 9)?
4. The citations in the text should be formatted according HESS requirements. The correct citation style is: (Helliwell, 1965; Fejer et al., 1981).

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5. There is any reference for the parametrization used for the vegetation characteristics such as the leaf area index, vegetation fraction and root depth? It is not clear what really means that those parameters change according to a pre-established table (Page 2487 - line 22).

6. Honestly, I think that is obvious that GRUs with the exactly the same characteristics (vegetation, initial soil moisture, etc.) and under the same atmospheric forcing have the same runoff response (see page 2489 - 14:17). Is there something I'm missing or this sentence is useless?

7. Is it necessary to provide all the details about the model WATFLOOD? It wouldn't be better just to refer to the previous work of Kouwen et al. (1993). Also, there is a repetition in the text regarding the WATFLOOD routing model requirements at page 2488 - lines 17:18 and page 2490 - lines 23-24

8. It seems too vague the say ". . .requiring minimal changes to the model parameters..." (page 2491-line 8:9). Can you be more specific?

9. Please refrase the paragraph at page 2493 - lines 11:16 and go to the point.

10. It seems to me that the dashed lines (indicating the starting date of the forecast) of the two graphs at the bottom of Figure 10 are not in the right place. Probably, it is just a formatting problem.

11. I didn't find any comment regarding figure 13a and b in the text.

typing errors

1. Page 2489 - line 10: change in "A more suitable approach. . .".

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2. Page 2495 - line 4: leave some space after the comma ". . ./snowdepth), it is the region. . .".

3. Page 2495 - line 12: change to ". . .one observation is taken every. . .".

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 3, 2473, 2006.