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Hydrology and Earth System Sciences Discussions

Interactive comment on "Simulating stream flow over data sparse areas – an application of internet based data" *by* M. T. Vu et al.

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1. The error measure used in the paper (NSC and CC) seem not to be reliable for the conclusions given in this case. I believe there is an important problem related to the large amount of data used. Figure 3 in all the results shows that on a daily basis in all low and normal flows the error is more than 100% of the actual value (at each time step). This low and normal flow rates roughly represent around 50 to 70% if we look at the figure (dry or summer seasons). The high flows in almost all the graphs show to be not accurate and although it might follow overall shapes if we try to visualize a kind of moving average it is not possible to see the use of this daily values (for sure not in flood management). I mean there is no use on the time to the peak situations as

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Interactive Discussion

Discussion Paper

well as there is no use in the quantification of the peak value itself. This would imply very dangerous mistakes. I think may be the comments on promising can be clarified on how the authors see this information can be used (on daily scale). Also I think is important to assess the problem as a modular system looking first low flows and then high flows.

Authors' Response:

The error measures NSE (Nash Sutcliffe Efficiency) and CC (Correlation coefficient) are the most common statistical indices used for discharge comparison. Many applications can be found in the following SWAT link: http://swatmodel.tamu.edu/

The model uses auto-calibration PARASOL method which focuses on the highest NSE index. Hence the low flow, as you see in Figure 3, is underestimated. This problem can be solved by applying manual calibration for groundwater flow module inside the model. However, manual calibration is quite time consuming and the main purpose of this paper is to introduce the approach to data sparse area that yield reasonable results. Hence in this case, we do not focus much on the calibration part.

Besides, this is daily long term run for 5 years and we do not focus on flood management, instead on the long term water flow on the big catchment which can later be used for evaluating climate change impacts on long term flow for this region. Thus, daily peak to peak comparisons are ignored.

2. The paper does not sufficiently explain the methodology so it cannot serve as a reference. I believe it requires a couple of diagrams where the process done with each data set and its format was taken and transformed to be used. I mean, there is no information on the correction or adaptation to SWAT formatting (Time, scales, computational format, others). This might be very important since the idea of the title is to explain an application of internet based data. If this explicitly done by the SWAT model, then this is more a SWAT paper showing how to click on swat and obtain results. In fact a modeling tool particular feature and might not represents too much without

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SWAT (title of the paper doesn't fit since it is not as general as it says).

Authors' Response: Updated section 3.1 which exclusively explains the methodology in detail.

3. There are plenty of papers on the case of using missing data as a solution and combining them with places that do have. I didn't see reference of the possible alternative to the use of internet based. Also there are cases that used Internet based data showing good results and didn't use SWAT.

Authors' Response: We agree. Our contribution is just one of them and SWAT is just a widely used hydrology model. In this case, we focus in detail on the SWAT model to solve the trans-boundary problem only.

4. These are other minor comments on the different components of the paper

a. If we read the Introduction it appears that somehow we end up in a paper that is justified on the basis of the international conflicts or on data quality problems. It should narrow the solution from the alternative solutions. But in my opinion the introduction goes too much into a theoretical part and not to a technical (scientific) part that will be developed along the paper.

Authors' Response: Noted. Revised accordingly.

b. Line 20 on the page 11018 provides the idea that what is in this paper is already done, so no need for this paper. I think in the whole paragraph you mention at least one case that also contributes with spatial data at daily time scale using meteorological data from the internet. For sure there are plenty more of cases, so no innovation can be seen if this is true. May be as a case study but it requires more detailed observations and a stronger conclusion.

Authors' Response: Noted. Line 20 revised accordingly.

c. I think the methodology and results should go apart. Also the results need to be

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stronger and provide a match to what you can observe on the time series analysis and the idea of using daily data. If not, daily might not be the scale and also no reason to use spatial interpolation of precipitation when you use SWAT.

Authors' Response:

As described in question 1, NSE and CC are the most 2 common comparison indices used widely by the SWAT community. Besides, the reason for using daily data for this region is to prove that it is possible to apply the model to daily scale that can be used for any other purpose of water consumption in the region: like irrigation and water management.

Please find the revised manuscript in the supplement pdf file

Please also note the supplement to this comment:
http://www.hydrol-earth-syst-sci-discuss.net/8/C6439/2012/hessd-8-C6439-2012-supplement.pdf

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