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Hydrology and Earth System Sciences
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Discussions

Interactive comment on "Applying SWAT to predict orthophosphate loads and trophic status in four reservoirs in the upper Olifants catchment, South Africa" *by* J. M. Dabrowski

Anonymous Referee #2

Received and published: 26 March 2014

General remarks:

This paper presents a SWAT application to a watershed in South Africa. The model is used to simulate orthophosphate loads to assess the trophic state of four reservoirs. In my opinion, this is a very good paper. It states a clear objective, which was defined based on one of the most pressing water quality issues in the country that has wide-spread impacts on aquatic ecology. The results of the study provide scientific evidence that South Africa should make an effort to better comply with their water quality standards. Therefore, this study is highly relevant as a basis for future policy decisions in South Africa. At the same time, this study is one of only a few studies that have

used SWAT explicitly for simulating reservoirs, which makes it very interesting to the SWAT community. The paper is clearly and concisely written and results are analyzed and generally discussed thoroughly. I would suggest discussing the role of phosphorus processes within the reservoirs (interactions between water column and sediment) and the performance of SWAT in simulating those processes in a little more detail.

Specific comments:

P13638, L23: I recommend referring to Arnold et al. 1998 here, since this is the first time you mention SWAT.

P13638, L26: You could consider citing the Gassman et al. 2007 paper here in addition to Arnold & Fohrer 2005, since that paper actually gives a much more complete overview of SWAT studies all over the world.

P13641, L2-3: Is this realistic? Do you have any data or references suggesting that local farmers comply with FAO recommendations? Or do you lack that sort of information, so you were forced to assume these fertilizer amounts to be realistic for your study area?

P13641, L23-25: How did you quantify this?

P13646, L24-28: In my opinion, using cumulative loads is not suitable for identifying subbasins responsible for high annual OP loads. In this map, subbasins can have high average annual loads even though they do not contribute large amounts of OP. I think, a map showing the average annual input of OP from the land area and the point sources per subbasin would make more sense here.

P13647, L25: Where did the measured values for OP concentrations in the reservoirs come from? You do not mention this in Chapter 2.2 and in Figure 1 I cannot see any monitoring stations located within the reservoirs.

P13649, L3-4: Here it is a little confusing whether you refer to the Middelburg reservoir or the Bronkhorstspruit reservoir. Based on the data you presented I was able to

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figure it out, but the wording in this sentence and the one before made me assume the opposite at first.

P13649, L6-21: These results are illustrated in Figure 7, so you should refer to the figure in this paragraph.

Table 2: What does the asterisk behind SOL_AWC indicate?

Technical corrections:

P13636, L9: Nash-Sutcliffe

P13637, L8: it is well known

P13637, L27: located at the bottom of

P13643, L3: Do you mean NS instead of R2 here?

P13644, L2: Remove the semicolon after “was used to”

P13647, L10: replace “were” with “was”

P13647, L16: Lake Erie (just one e)

P13647, L17: to be the first

P13648, L28: Middelburg reservoir

P13649, L27: remove “the”

P13651, L15: replace “above” with “within”

Figures: The font in some of the excel graphs is very small

Figure 2: validation (typo in the figure caption)

Figure 3: I recommend formatting the legend in this figure like the ones in Figures 6 and 7.

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Figure 4: The header of the legend overlaps the map. Also, I believe the caption is not right here. This seems to be the caption for Figure 7.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 13635, 2013.