

Interactive comment on “How to predict hydrological effects of local land use change: how the vegetation parameterisation for short rotation coppices influences model results” by F. Richter et al.

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General thanks:

We very much appreciate the general attention given to our manuscript and the constructive remarks of all reviewers and try to answer them here.

Reply to Anonymous Referee #2

1. R#2: “General Comments: The paper titled “How to predict hydrological effects of

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local land use change: how the vegetation parameterisation for short rotation coppices influences model results” by F. Richter et al. deals with the influences of three different parameters on the results of hydrological models. Specifically authors implemented WaSim hydrological model for their simulations. The paper does not have problems in the structure and English is good. Nevertheless some improvements are needed in the title and in the statement of the aim. The authors refer to Land Use Change with the intention of underlying the importance of their results, but there is not an evaluation of the change, quantifying it for example. But this is not a criticism of the paper itself but it is just a suggestion to help readers in the comprehension of the aim and consequently of the results.”

A: Thank you very much for a good comment. We have to state as much in the manuscript and suggest the following addition to introduction: The overarching aim of our research was the evaluation of land use change (LUC) affects. However, this study does not focus on LUC effects in any way but rather on the evaluation of a suitable tool.

2. R#2: “A general improvement has to be given to materials section, improving the description of which data authors have used for their study (the use of data from another sites or species). Authors will find more explanations in the following specific comments. Specific Comments Abstract: I suggest a general revision of the text, the aim has to be clearly stated. Authors declare that they want to test which parameter plays a major role in the general assessment of what? Line 6-10: I suggest a change in this sentence, authors did not apply a hydrological model to assess land use change, as a matter of fact there is no comparison with other crop.”

A: We agree about the land use change. We will insert the sentence stating the main aim of the study: “The aim of present study is to assess the effect of parameterization uncertainties of the land use type poplar SRC on modelling results“. We would retain the sentence in lines 6-9 as it shows the motivation of the present study.

3. R#2: “Introduction Page 407 Line3 and 5: Please add some references for this

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statement

A: We will add: DJOMO, S. N., KASMIQUI, O. E. and CEULEMANS, R. (2011), Energy and greenhouse gas balance of bioenergy production from poplar and willow: a review. GCB Bioenergy, 3: 181–197.

4. R#2: “Line 18: Please state clearly the assessment of what?”

A: This clearly refers to previous sentence, i.e. the negative effects on ground water recharge. The repetition is unnecessary in our opinion.

5. R#2: “Page 408 Line 1 to 28: please be more concise, try to focus more on your research aim this part.”

A: We added the formulation of research objectives – see answer to Referee#1 - Comments.

6. R#2: “Materials and methods Pag. 410 line 9 Please can you give more explanations about why you can consider these data in your research, I’ve seen that a better explanations is given in the Discussion section but I think has to be anticipated here.”

A: We agree. We will include the following sentences: Because the estimation of leaf unfolding (LU), as used in this study is based on meteorological measures, the parameterisation should hold true for the same poplar clone in the same age, if other environmental factors are of minor importance. The results will confirm this. Just for your information: The site Großfahner was also part of the BEST-research project. It was established with the same clone in the same year. This site was investigated by a project partner providing the data for the date of leaf unfolding. This project partner focuses explicitly on the vegetation length and the biomass, but did not investigate stomatal resistances and soil water quantities in the same extent like in Reiffenhausen.

7. R#2: “line 9: Please give some references about BEST research project and give an explanation about why you are using data from another site”

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12, C920–C924, 2015

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A: we will include the following sentences about BEST-Project at the beginning of the Materials and methods section, to clearly state which data are out of BEST: “Interdisciplinary investigations of SRC were facilitated by the joint integrated project BEST (“Bioenergie-Regionen stärken” - Boosting Bioenergy Regions), which ran from 2010 until 2014 and was funded by the German Ministry of Education and Research (BMBF). The aim of BEST was to develop regionally appropriate concepts and innovative solutions for the production of biomass, with focus on SRC, and to evaluate ecological and economic impacts.” If you refer to the site Großfahner, please see the explanation above. In case you refer to the observations of the phenological garden Tharandt, the reason is the long term investigation period of LU, which was not available on the research plots of the BEST project.

8. R#2: “Pag. 415: Line 11: Maybe it is better “according to (2), (3), (4) and (5)”.

A: Accepted, we will change the text accordingly.

9. R#2: “Pag. 416 Line 3 Please introduce the IPG235 (pag 427 line 23)

A: We agree. We will include following explanation: “IPG235” is the acronym of the parameterisation for *Populus tremula* used by Menzel (1997). We decided to retain this acronym to make it comparable to published results, and also because it is an acronym used in the data provided by the phenological garden network.”

10. R#2: “Results Pag 421 Line 7: please revise “2012 –1014”

A: You are right, thanks for the correction!

11. R#2: “Pag 422: Line 1-5: this seems more a motivation of your work- Maybe it is has to be moved in the Introduction

A: Thank you – we will implement the suggestion.

12. R#2: “Pag 425 Line 1-7: please give a better explanation of what you have done. Have you used or not data on so long period?

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A: To make it more clearly we will add following explanation in text, after the sentence in Page 425 line 12: ...the Max1 and IPG235 parameter set, respectively. "Results in Fig. 7 show the last to years from the long term simulations 1969-2013, mean values for ETR and GWR for the whole period 1969-2013 are presented in Tab. 5." For your information: Of course, we applied WaSim with the presented parameter sets and with the long term climate from the DWD for the period 1969-2013. Values for ETR and GWR for this period are presented in Table 5. Figure 7 also shows results from these simulations, but focuses on the last two years (2012-2013) to visualise differences.

13. R#2: "Pag 427 Line 23: This sentence maybe has to be replaced where you mention for the first time IPG235

A: Yes, this sentence is also an explanation for the goals and objectives of this paper.

14. R#2: "Figure 1, 2, 4, 5 and 6 can you use a better format for x-axis? You can use Jan- Feb ecc. or remove the full stop at the end of the data."

A: Good question, actually all figures are produced with the same software and the same printing routine, so I don't know where differences to fig. 3 are coming from! We will try to correct the figures.

15. R#2: "Technical corrections No technical corrections are needed

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