

***Interactive comment on “Assessment of
alternative land management practices using
hydrological simulation and a decision support
tool: Arborea agricultural region, Sardinia” by
P. Cau and C. Paniconi***

Anonymous Referee #1

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GENERAL COMMENTS

The discussion paper is of moderate quality and addressing a topical hydrological problem about effects of land use changes on quantity and quality of river flows.

There is no clear distinction between the presentation of the Methodology, Results, and a Discussion of these results. The results of analysis done are not explicitly presented.

In Section 2 “Description of the hydrological model and the decisions support system”, the authors are describing the model used which is part of Methodology.

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In Section 3 “Model Setup and Simulation”, the authors are describing how they setup the model on their study area. This section also covers how data was obtained for Soil and Land Cover, derivation of daily rainfall from monthly data, how model calibration was done, and finally how they did simulate streamflows, nitrogen and phosphorous. Thus this section is mainly part of Methodology as it covers HOW the study was undertaken. The results of model calibration are mentioned just in passing.

Section 4 “DSS Application”, this mainly presents HOW the decision support system part of the modeling was used. Three out of four paragraphs are addressing HOW the decision support system was used in the study. The last or fourth paragraph presents the results of the use of this model.

Section 5 “Conclusion”, this presents the conclusions of the study.

There is no clear distinction between a description of the methods, results, and discussions. Results tend to be presented to illustrate how a particular method was used.

SPECIFIC COMMENTS

The authors have not addressed how the use of data available at different spatial and temporal scales affected the accuracy of their streamflow simulation. For example, soil properties were derived from a 1:250 000 soil map while land cover was obtained from a 1:100 000 map, how did they deal with this problem of using data obtained at different spatial scales?

The authors state that they had problems in obtaining daily precipitation data, and generated synthetic precipitation daily time series. How did the generated daily time series compare with the measured precipitation at perhaps a few stations with daily data? How well did the synthetic daily time series preserve properties such as duration of dry and wet spells, daily rainfall amount. Precipitation is the major driver for hydrological processes and outputs of SWAT greatly depend on how accurate the precipitation data is. The authors do not however inform the readers whether synthetic daily time series

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used represented accurately conditions within the selected basins.

The authors do not again demonstrate whether the streamflows were modeled accurately. All they have done is to state that they obtained a Nash-Sutcliffe value of 0.77. It is known that a high Nash-Sutcliffe index can be obtained when dry season flows are sometimes not correctly simulated. Did the calibrated model parameters enable accurate simulation of both high and low flows? Since synthetic daily precipitation time series were used, how accurately were the daily streamflow characteristics preserved? The paper has been presented in such a way that readers have to assume that all the modeling was done very well, which may not be the case.

The authors again present the results of modelling nutrient and pesticide concentrations, without any comparison with measured or observed concentrations. They do not present evidence to convince the readers that simulation of nutrients and pesticides was done accurately.

TYPOGRAPHICAL ISSUES

It is suggested that letters representing variables, coefficients and constants used in equations be written in italics in the main text to avoid confusion with the ordinary use of these letters.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 4, 747, 2007.

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