

***Interactive comment on “GIBSI: an integrated  
modelling system for watershed management –  
sample applications and current developments”  
by R. Quilbé and A. N. Rousseau***

**Anonymous Referee #2**

Received and published: 26 June 2007

The authors describe briefly the structure and the simulation modules used in GIBSI. Readers can refer to previous papers to get details of the modules. After this short description, seven applications are presented. Each application is presented according to the same structure: i) context, objectives and general approach, ii) scenarios and simulation and iii) results. For each application only a brief presentation is given about points i) and ii), and the main results are given in point iii). All applications are briefly presented. Each application illustrates how GIBSI can quantify the influence of human activities or land-use modification on the flow regime of water quality. A short discussion focuses on future developments.

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The paper is clear, well written and well structured.

However, the paper presents dully applications and results. The applications are good illustrations of how GIBSI can be used to assess the a priori effect of management scenarios. But all applications except one have been already reported in previous papers, and the current paper lacks analysis of the experience that authors have gained through the various applications. This lack appears to be an obvious weakness of the paper and makes the novelty of the results very limited. All applications have been made with the same tool, GIBSI, but conclusions drawn from these applications that could be valid for most of DSS should be outlined and would interest readers. What are the main difficulties in applying DSS? What are the main limitations of current DSS? Such issues should be addressed in the discussion. Other issues such as uncertainty of simulations, or scenario building methods (see specific comment #1) deserve also to be developed in the discussion.

The uncertainty issue in DSS application is raised clearly in reading the paper. In section 3.1 it is mentioned that simulation results were less satisfactory for BOD5. But the authors state in the MCWP application that “we can conclude from this study that MCWP has a drastic effect on BOD5”. How can a drastic effect be predicted with uncertain simulations?

Furthermore the objective of the DSS is to support the implementation of integrated water management. But the authors do not evoke whether and how GIBSI's results have been used to guide water-resource management. What is the feedback from stakeholders?

The paper needs major revisions. The manuscript should be better balanced with fewer applications but a longer and deeper discussion that should outline and develop some of the major issues in DSS applications illustrated by GIBSI's applications.

Specific comments

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#1: p1308, line 4: how the bare soil frequency, i.e. 72%, in the DS scenario is chosen? Is there any justification for this frequency?

#2: p1308: the spatial distribution of deforestation should have an effect on watershed hydrology. How are distributed bare lands in the catchment?

#3: p1310 line 24: must be 7.5 1011 instead of 7.5 1011.

#4: p1314 lines 15-18: "This can be explained by the fact that the increase in thus more available water for overall runoff". Is this a simulation result? or is this a general assertion about the effect of agriculture on river flow? The same question can be asked about the sentence "Moreover, soil surface is more likely to produce faster runoff". Does this assertion come from an analysis of simulation results?

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 4, 1301, 2007.

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