

Interactive comment on “Land-surface modelling in hydrological perspective” by J. Overgaard et al.

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Received and published: 3 February 2006

General Comments:

This paper is an interesting review of land surface water and energy balance models. I congratulate the authors in raising many important issues. In section 2 micrometeorological models representing soil and vegetation energy balance are presented. It is appropriate to discuss the validity of the use of diffusion theory in this context and the alternative Lagrangian methods. In Section 3 the use of remotely sensed data is discussed (further comments below) and Section 4 discusses coupling between atmospheric models and catchment hydrology models.

I recommend that the context of the review be explained more clearly in the introduction. It appears that the authors' perspective is one of modelling catchment hydrology using groundwater models or MIKE SHE (p. 1838). What are the 'rather conceptual evapotranspiration components' referred to on page 1818? These are the starting point

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from which the review looks at energy balance approaches. (This comment reiterates some comments submitted by Reviewer 4.)

There are about 100 references in this paper and I hesitate to recommend adding more, however I think the paper would be strengthened with reference to some more recent publications (publications after 2001). The remote sensing section takes the perspective of ‘evaluating’ models of land surface water balance. In my opinion, fluxes estimated using remotely sensed data should be evaluated as an important new input to models of catchment hydrology, possibly replacing the ‘conceptual evapotranspiration components’ that might otherwise be used. Examples of recent relevant papers found in a quick search are: McCabe et al., 2005 (HESS, 9:467-480); Min and Lin, 2006 (Remote Sensing of Environment, 100:379-387); French et al., 2005 (Remote Sensing of Environment. 99:55-65). These or other similar papers would add to the review.

Specific comments:

1) the paper may be better suited to publication in Hydrology and Earth Systems Science Discussions rather than Biogeosciences Discussions - although this is perhaps a matter for the Editor. 2) A more accurate description of the paper might be provided by the title ‘Review of land surface water and energy balance models’. 3) The structure of the paper could be improved, e.g. section headings could be added and used consistently. The initial part of Section 2 could be renamed ‘2.1 Evolution of land surface energy balance models’. Parts of the introduction and Section 4 could be combined in a discussion section toward the end of the paper. Also the Context of the Review could be a separate subsection in section 1. 4) In my opinion section 4 is a weaker part of the paper because there are many more references that could be discussed here. Perhaps it is slightly outside the context of the review?

Interactive comment on Biogeosciences Discussions, 2, 1815, 2005.

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