

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

G. Blöschl (Referee)

bloeschl@hydro.tuwien.ac.at

Received and published: 11 January 2006

Main comments:

This is an excellent review paper which I thoroughly enjoyed reading. My main comments on the paper all relate to time scale.

p. 1817: One of the main reasons for the use of the potential evaporation approach in hydrology has been the interest in seasonal or monthly model time scales. If one is interested in model time scales of an hour or less, the energy balance approach is an obvious choice.

Section 3 on remote sensing is very good but perhaps a little too optimistic. What is tested in the analyses of remote sensing data is a snapshot in time. The time constants of surface temperature are usually very short, on the order of an hour or less, so thermal remote sensing data can be expected to be representative over these very short time scales. In contrast, what hydrologists are most interested in is evaporation

Full Screen / Esc

Print Version

Interactive Discussion

Discussion Paper

that matters for runoff and recharge which is evaporation aggregated over a week or more. This disparity of time scales makes remote sensing data - for many situations - perhaps less efficient for testing hydrological models than what one would surmise from reading the manuscript.

The same issue applies to p. 1837 bottom. A more sophisticated evaporation model may represent the diurnal fluctuations of evaporation in a vastly more realistic way than conceptual models; however very small biases at the hourly time scale may translate into large biases at the weekly time scale. Conceptual evaporation models are usually calibrated to minimise biases at the weekly or monthly scales. I'm not saying that conceptual evaporation models are the future - we definitely need to go for more physical realism - but I'm saying that physical realism at one time scale may actually translate into poor performance at another time scale. These scale disparities may ultimately limit the usefulness of coupled models.

Additional comments:

p. 1826 line 2: Non-uniqueness in (distributed hydrological) ground water models has been addressed from the sixties of the past century.

p. 1827: It may be worthwhile to add a little more substance to section 2.2 along the lines of Lhomme et al. (1999) and similar research. When do approximate effective parameters exist and how are they related to the underlying patterns?

p. 1830 line 6: remove "close"

Typos and proposed changes to the wording:

Perhaps the title should be changed to "Land-surface modelling in hydrological perspective - a review"

p. 1816 line 25: energy balance equation at the land

p. 1820 line 22-23: Remove the sentence as it is redundant.

[Full Screen / Esc](#)[Print Version](#)[Interactive Discussion](#)[Discussion Paper](#)

- p. 1821 line 4: depends
- p. 1821 line 12: Schädlich
- p. 1821 line 16: This problem initiated
- p. 1821 line 18: applied separately to each
- p. 1822 line 14: of this type involve three
- p. 1825 line 27: requires
- p. 1826 line 4: address the question of how
- p. 1826 line 4: model can be
- p. 1826 line 6: appear
- p. 1830 line 20: evaluate the semi-distributed
- p. 1835 line 11: scales
- p. 1835 line 14: change

Recommendation:

This is an excellent paper. I recommend publication subject to the minor changes detailed above.

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

Full Screen / Esc

Print Version

Interactive Discussion

Discussion Paper