

Interactive comment on “Future directions for hydrogeology: quantifying impacts of global change on land use” by M. J. Vepraskas et al.

J. Bouma (Referee)

johan.bouma@planet.nl

Received and published: 9 March 2009

The paper by Vepraskas et al on Future Directions for Hydrogeology: Quantifying Impacts of Global Change on Land Use is, in my opinion, a valuable addition to the soil science and hydrological literature. It also represents a true contribution to the Hydrogeology literature and this is important because many papers that are presented at Hydrogeology conferences and workshops are in fact rather traditional pedology or hydrology papers. Old wine in old bottles.

The authors raise an important and highly relevant issue: how to predict possible effects of climate change on soil functioning in relation to two important land-uses: septic tank disposal and wetlands. They quote older papers of their research group in which the chief author has successfully related measured and modelled water regimes to soil

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morphological features. They have proved that the DRAINMOD model is suitable for this particular type of application. They now investigate whether or not local modelling results can be extrapolated to other areas using county soil maps by relating water-table data to various mapping units. They work in the context of toposequences which is wise because such sequences are correlated nicely with drainage classes. They describe their procedures very well and concisely and their Figure 5 shows clearly the possibilities and potential of their approach. By showing where possible changes may occur, planners and county sanitarians are alerted ahead of time to possible problems and this represents a highly significant signal. The authors use available data and models in an innovative manner and this is highly significant as thus they can rapidly produce results, not needing years of additional study which is a rather usual reflex in scientific research. Of course, nobody can know what the future will bring so the authors would be well advised to stress the exploratory character of what they present. Still, this is significant work and an excellent illustration what the combination of pedological and hydrological expertise can achieve.

Just two detailed questions:

1. The authors are somewhat vague about alternative septic systems. In a previous life I worked on septic systems and we had success in Wisconsin in the 1970's with Mound systems of which many have been built. The negative effect of raised watertables can be overcome by raising the infiltration bed. Perhaps the authors should comment on this. Or is this what they mean by a "raised system"?
2. The minimum distance for effluent to percolate is set by them at 30 cm. Again, older work done in association with bacteriologists indicated 60 cm to be needed. But more important is the fact that travel time of water was the determining factor, rather than distance as such. And this can be governed by application rate and regime. The authors are aware of this?

Overall I consider this to be a very good paper. In fact, Dr.Vepraskas is the leading sci-

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entist in the field of hydrogeology in my view and this paper confirms this judgement.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 1737, 2009.

HESD

6, C32–C34, 2009

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