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Hydrology and Earth System Sciences Discussions

Interactive comment on "Impact of long-term drainage on summer groundwater flow patterns in the Mer Bleue peatland, Ontario, Canada" *by* B. J. Kopp et al.

Anonymous Referee #3

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My review will be short, since my comments are in good agreement with the other reviewers. The objectives are clear and the hypothesis pertinent, but I believe that using so little real data (only three sampling dates of water heads, one transect only, simple bulk density and somehow imprecise in situ saturated hydraulic conductivities) to make a very precise simulation is not the most appropriate approach to demonstrate, with great confidence, the validity of the hypothesis. Bulk density and porosity taken in the field were possibly the most relevant information concerning the physical change of the peatland following drainage, but the real data is only very shortly described in the text. The in situ hydraulic conductivities were not determined using the most appropriate methodology, thus leaving some reasonable doubts about the validity of the data in the

mind of attentive readers. Water heads were also measured with a strange protocol since piezometers were emptied a day before sampling. This procedure was appropriate for water sampling protocols, but inappropriate for water head measurement in very low K soils. It is very probable that some piezometers would have equilibrated within 24 hours while some others might not. Differences in heads for two piezometers could therefore be due to protocol artifacts. More links should be made between the occupancy of the neighboring of piezometer nests by vegetation. A simple Google Earth visit of the site, guided by the Fig.1 map, shows that it is not so evident to see a drastic change in vegetation between the bog and the forest and that the vegetation in the forest can be very variable spatially. The authors should try to reformulate the objectives and hypothesis to aim the flow simulation part, since the information gathered in the field is good enough to enable a pertinent simulation, if the uncertainties of values are fully documented and considered.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 33, 2013.