Hydrol. Earth Syst. Sci. Discuss., 6, C2289–C2290, 2009
www.hydrol-earth-syst-sci-discuss.net/6/C2289/2009/

Hydrology and Earth System Sciences Discussions

Interactive comment on "The contribution of groundwater discharge to the overall water budget of Boreal lakes in Alberta/Canada estimated from a radon mass balance" *by* A. Schmidt et al.

Anonymous Referee #2

Received and published: 6 October 2009

Schmidt et al. utilize a radon mass balance method to estimate the role of groundwater recharge to the water balance of two lakes in northeastern Alberta, Canada. This is a well-written paper that clearly sets out the objectives of the study and then proceeds to relay interesting findings. While the title would suggest that this is a regional survey, it is instead an exploratory investigation on two lakes located in contrasting hydrological settings. I am not familiar with the technique, thus my ability to assess assumptions inherent in the method is limited, nonetheless I find it intriguing. The findings are interesting: groundwater recharge to Lake A water balance is negligible, while groundwater recharge to Lake B is substantial but highly variable on an annual basis. The authors

contend that differences in sediment type, hydraulic gradient and catchment area are likely to account for the different groundwater recharge results between the two basins.

While this certainly appears to be promising results, the implications of the study are largely left unexplored. For instance, 1) what are the management implications with respect to the fact that very different results were obtained on the two different lakes? 2) How will mining activities affect groundwater - surface water interactions? Given the results, is it not prudent for the authors to recommend a broader survey of lakes in the Fort McMurray area to test their hypotheses (i.e., sediment type, hydraulic gradient and catchment area detemine the role of groundwater recharge to lake water balances).

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 4989, 2009.