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Biogeosciences Discussions

Interactive comment on "Denitrification and inference of nitrogen sources in the karstic Floridan Aquifer" *by* J. B. Heffernan et al.

P. McMahon

pmcmahon@usgs.gov

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Sorry for not getting my review comments back to you sooner. I enjoyed reading this paper very much. It's one of the first attempts that I know of to estimate denitrification in aquifers at a regional scale. The approach for estimating recharge temperatures and excess air also were quite new. Very nice effort. Most of my comments are listed in the manuscript, but I'll mention here the three main concerns I had with the paper. The first concern I had was that not enough effort was given to addressing the likely effect of mixing on apparent denitrication rates, age, and isotope fractionation. You've already shown in your work on springs in Florida that they represent a mixture of ages, and Chris Green's 2010 WRR paper nicely shows the effects of mixing on some of these parameters, so it seems like those mixing effects need to be acknowledged it not

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quantified. The second concern had to do with age dating. "He dates" are mentioned on page 10263, but the reader doesn't really know anything about those data. Maybe more discussion of those data are warranted. The last concern had to do with back calculation of initial delta 15N values from fractionation factors. Maybe I missed them, but I didn't see where those fractionation factors where calculated and shown in the paper. Also, mixing almost certainly results in lower fractionation factors than actually exist so what does that mean for calculation of initial delta 15N values?

Thanks for the opportunity to review the paper.

Please also note the supplement to this comment:
http://www.biogeosciences-discuss.net/8/C5005/2012/bgd-8-C5005-2012-supplement.pdf

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Interactive comment on Biogeosciences Discuss., 8, 10247, 2011.