Biogeosciences Discuss., 7, C4574–C4575, 2011
www.biogeosciences-discuss.net/7/C4574/2011/


Biogeosciences Discussions



# *Interactive comment on* "Influence of bioturbation on the biogeochemistry of the sediment in the littoral zone of an acidic mine pit lake" *by* S. Lagauzère et al.

**Anonymous Referee #2**

Received and published: 4 January 2011

This paper presents the first geochemical data on the effect of bioturbation on the biogeochemical processes taking place in sediments of acidic mine pit lakes and thus should be highlighted. The biogeochemical functioning of these lakes, particularly processes taking place at the sediment-water interface, represents an important ecological problem. Despite some previous studies reporting the presence of living organisms in such ecosystems, the influence of these species on the sediment biogeochemical processes have not been investigates yet. Therefore this paper fits in the scope of Biogeosciences Discussions. This paper is very interesting as it presents the first geochemical and microbial data on the effect of bioturbation on the cycling of iron at the sediment-water interface of acidic mine pit lakes. In fact these effects have not been reported

before. The paper demonstrates the feasibility of the high resolution measurement of the iron and oxygen dissolved profiles at the sediment water interface together with the counting of the iron bacteria in controlled mescosms. Chironom-induced changes in the oxygen consumption, organic matter mineralisation and cycling of iron (oxidation and reduction of iron, abundance of iron-oxidising bacteria) could therefore be monitored. Though the iron cycle was impacted by the bioturbation activity, there was no significant effect on the iron flux at the sediment water interface and thus on the overlying water acidity budget.

The paper should be published providing minor revision. Comments: Material and methods 2.1 Sediment and organism sampling The authors should give more details about the sediment sampling procedure (corer etc.)

2.2 Micrososm set-up A period of 16 days of incubation was chosen. The authors should explain why the time duration was so short. The authors also did not mention whether the DET probes were deoxygenated before insertion in the sediment cores. The authors should also explain why distilled water instead of lake water was added to the cores to compensate for evaporation.

2.7 Analysis of the sediment Authors should provide more information about the MPN method and also say how C, N, S were determined in the solid sediment samples.

---

Interactive comment on Biogeosciences Discuss., 7, 7359, 2010.