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Biogeosciences Discussions

Interactive comment on "Changes in mobility and solubility of the redox sensitive metals Fe, Mn and Co at the seawater-sediment interface following CO_2 seepage" *by* M. V. Ardelan and E. Steinnes

Anonymous Referee #1

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Changes in mobility and solubility of the redox sensitive metals Fe, Mn and Co in seawater - sediment interface following CO2 seepage M. V. Ardelan and E. Steinnes

General Comments Very pleased to see this work submitted to Biogeosciences as the paper presents some excellent data that is very relevant with regards the potential storage of CO2 in marine sediments. This manuscript has undergone some extensive re-working since I saw it in a different version some months ago. The authors have worked hard at putting together what is now an excellent paper.

Specific Comments How do you completely de-couple the seepage signal from that induced by the resuspension? How long after the resuspension event did you take

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your sample? From the figures it is not clear when this resuspension took place. How much material was resuspended?

How fast were the DGT units moving? They will be affected by limited flow and have an increased diffusive boundary layer, thus affecting the calculations. How did the authors overcome this and did they measure/estimate the DBL and is 12cms-1 fast enough?

What are the biological implications of the change in metal concentrations due to the CO2 seepage? The last paragraph of the conclusions could be very informative. Are the concentrations seen after CO2 seepage above OSPAR designated concentrations, would these conditions have a detrimental effect to the benthic community? What about speciation – you have used DGT probes which give an indication of speciation compared to total values from the sea water.

Technical Corrections The figures are still too small to see – I have printed out the PDF and can't read them. I have had to look at them on-line and expand them to see what the scales on the graphs are. Far too much going on in each diagram – Fig 3, 4 and 5, make the scales bigger (text) or produce more figures so they can be easily viewed. Not sure if colour is a good idea either – when printed out in black and white it is difficult to make out the lines and symbols.

The legend for Figure 3, 4 and 5: "Flux of FeDGT fromthe sediment and pore water into DGT units in different sections of the sediment during the first (g) and second (h) phases of the experiment are shown as full triangles and open circles for CO2 seepage control chamber, respectively. The total average flux of FeDGT into hole DGT unit in the sediment for CO2 and control chambers is indicated by a broken line and dotted line, respectively".

I think hole should be whole – but then that still doesn't make sense. Are you trying to say the averaged DGT flux over 150 mm in the sediment is indicated by the lines? Need to re-write this sentence.

BGD

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Interactive comment on Biogeosciences Discuss., 6, 5623, 2009.