

Interactive comment on “Assessing the biodegradability of terrestrially-derived organicmatter in Scottish sea loch sediments” by P. S. Loh et al.

P. S. Loh et al.

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Responses to General Comments:

The results published currently in the ECSS were used to explain the fate of the organic matter (OM), especially terrestrial OM, in the water column, surface and subsurface sediments in the lochs. The results from these parameters: lignin, OM, OC and the oxygen uptake rates, are used to prove the usefulness of the oxygen uptake rate, Rp value (the ratio of the refractory to total OM) and OC/N ratio to serve as proxies to indicate sediment biodegradability. In order to prevent more confusion between the two papers, all mention of the fate of terrestrial OM and the contribution of terrestrial OM to

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the cycling of carbon in the lochs are deleted from this paper. This paper now concentrates on the use of these proxies to determine the biodegradability of the sedimentary OM.

Objectives: hypothesis included at the beginning of the last paragraph of the Introduction: The hypothesis is not included. But it is now stated clearly that the objective of this study was to determine the use of these proxies to determine the biodegradability of the sedimentary OM.

Statistical test: now outlined in a new Section 2.3.5 Statistical analyses. All statistical results are included in the results section.

Refer to the corresponding method and results sections when discussing correlations in the discussion. The situation in the discussion section is that this does not need to be specifically referred to the method and result sections.

Specific comments:

Outline in your text where your sample sites are in relation to the sills in Loch Creran: In Section 2.1.1, this is explained: LC0 and LC1 are situated in the upper basin of the loch, after the sill at Creagan Bridge; LC2, LC3 and LC5 are situated in the second basin, between the sill at Creagan Bridge and the sill separating the entrance of the loch from the Firth of Lorne. Similarly, the locations in Loch Etive are also explained relative to the sill at Bonawe: Sample sites RE2 and RE5 are located in the upper loch above the sill at Bonawe, RE6 in the lower loch below the sill at Bonawe.

Is there a reference you can cite for the residence times of the waters in Loch Etive? It is Edwards and Trusdale (1997).

How exactly were the samples fixed? Every 10 ml of water sample was fixed with 0.1 ml alkaline iodide and 0.1 ml of MnSO₄.

Can you cite Loh et al. (2002) in the methods section? Done; the CuO oxidation method used in this study has been described by Loh et al. (2002).

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It would be beneficiary if you included a paragraph in a section at the end of the methods, i.e. as section 2.3.5 Statistical analyses. Done; 2.3.5 Statistical analyses: Single factor ANOVA was used to determine whether there is significant difference between two results. Correlation and regression analyses were used to determine whether there are significant relationships between these parameters: lignin, oxygen uptake rates, labile, refractory and total OM, OC, Rp values and OC/N ratios.

Results. Try to keep results section tight. The lines mentioned by the referee are now deleted.

P value or the statistical test used: The statistical test used and also the results in p are now given for the lines mentioned, except for the following: Page 4015 line 6, as the -13.5‰ consists of just one and not triplicate result (hence the word significant is deleted).

In Section 3.2.1 state the changed in oxygen uptake rates along the loch and refer to Figure 2 (Done).

Technical corrections: All corrected to Loch Creran and Loch Etive. All others corrected.

Others: Line 6: refer to correlation or section where correlation results are found. Done.

Can you correlate OC and oxygen uptake rate to support this? There are no correlations between oxygen uptake rates with OC, lignin and OM. This is because the oxygen uptake rate was slightly lower at LC2 compared to LC5 and LC6. However, the oxygen uptake rates decreased from the head to mouth of the lochs indicate that the rates were affected most greatly due to the contribution of OM from the rivers.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 4, 4005, 2007.

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