

## ***Interactive comment on* “Technical Note: Uncovering the influence of methodological variations on the extractability of iron bound organic carbon” by Ben J. Fisher et al.**

**Ben J. Fisher et al.**

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We received helpful comments via personal communication from Monique Patzner and colleagues, whose pre-print we cite in this manuscript (Patzner et al., 2020). We are grateful to this team for their discussion of our work and have corrected two sections in our manuscript where we cite their recent study.

1) On line 86-88 We correct an error in the original manuscript which suggested the extraction performed by Patzner et al., was 6 hours as oppose to 16, this now reads:

"Patzner et al. (2020) performed the CBD extraction of Lalonde et al., (2012), adjusted

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to room temperature, over 16 hours and Wagai and Mayer (2007) performed a 16 hour inorganic extraction”

2) On line 388-390, we suggested that SEM and nanoSIMS analysis was conducted on the CBD extracts when in fact this analysis was conducted on a fine soil fraction separated by a different method. This section has been restructured to remove this previous statement and the final two paragraphs of section 4.3 have been joined, now reading as follows:

"While under the Lalonde et al., (2012) protocol increasing extraction time had no benefit for extracting Fe with the purpose of determining the OC-FeR pool, Patzner et al. (2020) performed an adaptation of the CBD method where time was extended to compensate for a reduction in the temperature of the reaction. A low temperature approach was not tested in our study as we focused on increasing the efficiency, and therefore energy, of the reaction, this adaptation may prove useful should non-destructive analysis be required. For example, subsequent analysis of biomarkers in the extracted organics, something currently not possible due to temperature induced transformation and degradation of OC when heated to 80 °C. This raises an interesting question as to whether temperature and length of the extraction can compensate for each other to achieve the overall same %Fe extraction. While this seems unlikely due to the rapid decrease in the reducing power of dithionite when in solution, the potential merits of this system mean it is worthy of further study. Additionally, it is possible that the decomposition process may occur much slower at room temperature due to the decreased reaction energy. These type of additional analyses may allow us to better understand the origins and molecular composition of OM involved in mineral based preservation processes and offers promising scope for future experimentation with the CBD method."

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