

Interactive comment on “Selective preservation of organic matter in marine environments – processes and impact on the fossil record” by K. A. F. Zonneveld et al.

Anonymous Referee #1

Received and published: 22 September 2009

General comments: This manuscript provides a useful and somewhat overdue review of the factors affecting organic matter (OM) diagenesis and the possible effects OM diagenesis can have on currently used paleoproxies. It should be of interest to those just starting organic geochemical or paleo- careers (I plan to use it as a teaching tool) as well as experienced practitioners, who will find it a useful reference as they work to develop appropriate “deformation functions” for paleoproxies.

Specific comments: While I find the manuscript to be well-organized and well-written in general, there are a few areas of concern that the authors may wish to address. For example, section 2.2, which deals with FT-ICR-MS, is not well integrated into the

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remainder of the manuscript, which primarily focuses on particulate and sedimentary organic matter. I think that the FT-ICR-MS section is interesting in view of the role the technique can play in resolving complex mixtures, but especially in the context of the rest of the paper, insufficient emphasis is placed upon the fact that FT-ICR-MS requires samples dissolved in a suitable solvent, and that, therefore much of the particulate and sedimentary OM pools is uncharacterizable using this approach. Within section 2.5 (Physical factors...) reference to more recent work from the Keil lab (in addition to the Hedges and Keil, 1995 paper) would strengthen the discussion. In Section 3.3., something is incorrect in terms of the n-alcohol to n-alkane discussion. If the alcohol is more sensitive to aerobic degradation, the ratio of alcohol to alkane should decrease with increasingly aerobic conditions. Is the ratio really alcohol over summed alcohol plus alkane?

Technical corrections: There are a few grammatical issues. One that occurs in several places is the use of “particular” when “particulate” is meant (e.g., p. 6387, line 16, p. 6405, lines 10 & 16). Other grammar issues are listed below: 1. p. 6378, line 1. Remove “well” before “recognizable” 2. p. 6383, lines 23 & 24. The last sentence in the paragraph seems redundant. 3. p.6385, line 5. Replace “they” with “it” 4. p. 6386, line 27. I think “burial” is supposed to go before “efficiency.” 5. p. 6388, line 1 should read “. . .produced in the sedimentary biosphere and resulting. . .” 6. p. 6388, line 17. Replace “becomes increasingly less”, perhaps with “decreases”? 7. p. 6389, line 7. As defined previously, the ROM, ABROM, and RDOM pools overlap. Please clarify. 8. p. 6389, line 17. Please state which figure. 9. p. 6391, line 19. Replace “Taken” with “Taking” 10., p. 6395, line 10. “relative” should be “relatively” 11. p. 6402, line 7. “partly” should be “partial” 12. p. 6402, line 8. “trubiditic” should be “turbidite” 13. p. 6408, line 5. remove doubling of “quantitative” in this sentence 14. p. 6408, line 8, should be “another”

Interactive comment on Biogeosciences Discuss., 6, 6371, 2009.

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