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Biogeosciences Discussions

Interactive comment on "Deep, diverse and definitely different: unique attributes of the world's largest ecosystem" *by* E. Ramirez-Llodra et al.

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This is a valuable and timely compilation on deep-sea biology bringing together an impressive number of important researchers in the field from both Europe and North America. It is a welcome update of recent advances since Gage and Tyler's 1991 book including an extensive literature list of 32 pages. It certainly merits to be published with minor revisions.

Not being a native English speaker I have refrained from attempting to correct phrasing, spelling or grammar except where I think it could lead to misunderstandings.

General comments

Like so many multi-author papers it contains a number of repetitions, which may be ok

from a didactic viewpoint, but should be carefully crosschecked to avoid contradictions. For example, the depth to which photosynthetically active light penetrates is given on pages 2378 and 2379 with 200 m, on pages 2371, 2380 and 2435 with 250 m. The parabolic or unimodal pattern in species diversity with depth is mentioned on p 2404, 2414 and 2417. Repeatedly used terms, which have an accepted abbreviation, should be listed with the full name and the abbreviation in brackets. From then on the abbreviation suffices. For example the "oxygen minimum zones" are first introduced on p 2370 as abbreviation (OMZ) only, also in the following pages 2371 and 2378 they appear only as abbreviation. The first explanation is given on p 2386 and then repeated on p 2420 and 2470. On p 2381 only the written out term instead of the abbreviation is used.

Throughout the text species and genus names are written in italics (as it is usual in practically all scientific journals), in several cases, however, also Latin Greek higher taxonomic categories (families, classes, orders, phyla) have been italicised. I sympathise with this practice, but when adopted it should be used with consequence. For example on p 2398 (lines 24 and 27) Foraminifera and on p 2410 (lines 13, 14, 18) several nematode families are not written in italics. This should be checked in the whole manuscript.

Specific comments

p 2369 line 9 and p 2370 line 4 (plus Table 2) – I think this should read "continental slope" in all cases

p 2371 line 22: "seasonal" should be changed to "predictable" or "regular" (since tidal currents are not "seasonal")

pp 2372 to 2374: In this chapter headed "Diversity. . . .on continental margins" there is a mix of information on "active continental margins" and "convergent plate margins" (line 19 and following lines on p 2374). When "ocean crust is subducted beneath more ocean crust" this does not happen at a "continental margin"

p 2377 lines 9 and 27: the name “Hellenic trench” should be used already in line 9

p 2381 line 25: manganese is also a metal

p 2383 line 12: I think it should read: ”photoautotrophy” instead of “heterotrophy” there

line 25: Hessler

p 2384 line 16: “transformation of organic matter by high temperatures” is also of “biological origin”

p 2386, line 1: “reducing communities”? Are communities reducing or are “environments” reducing?

lines19ff: should better read: “Studies initiated. . . . . ..autotrophic bacterial mats despite intense oxygen depletion” (the “studies” were not influenced by “oxygen depletion”)

p 2388 lines 20-21: “macrophytes” are also “organic carbon”

p 2390 line 7: should the book: Cold-Water Corals: The Biology and Geology of Deep-Sea Coral Habitats

J. Murray Roberts, Andrew J Wheeler, André Freiwald, Stephen D. Cairns

Cambridge University Press, Cambridge UK

2009

be cited here?

P 2391 lines 27-29: is “refractory material” transferred to higher levels by “bacterial mineralization”? Mineralization should produce CO2, water and inorganic nutrients?

P 2393 line 10: Why are the Pycnogonida specifically labelled as “Arthropoda”? Also the isopods treated in the preceding lines belong to this phylum.

Line 24 and 28: “phyla” and “phytodetritus” not italics

Line 26: would “species” be more appropriate than “individuals”?

Pp 2393 and 2394 last and first line respectively: Sipunculids live in “tubes, skeletons and tests of other organisms” also in shallow water – this is no special adaptation to living in the deep sea

P 2399 lines 26-29: the point is that cold seep tubeworms are extremely long-lived, whereas hot vent worms are short-lived despite their larger size.

P 2400 lines 8-9: Why should “specimens of smaller size” be “able to better tolerate . . . high pressures”? Give a citation!

P 2401 lines 28-29: Commensal relationships between polychaetes and bivalves are also found in shallow water and are no special adaptation to life in the deep sea

P 2402 lines 10-11: “Reduction of tissue density . . . .” Is common also in shallow water pelagic animals! If this is more common in the deep sea, please give figures.

P 2406 lines 25-26: Whereas the statement that “Acantholaimus, Thalassomonhystera . . . . Are rarely recorded in shallow water” is correct, this is not true for the genus Halalaimus, which is common in shallow waters

P 2410 line 24: Would not “cold water coral reefs” be more general than “Lophelia reefs”?

P 2417: The last paragraph is very rambling and nor easy to understand.

P 2421 lines 8-9: 75 532 is 0.4% of 19.4 million, not 0.0004%!

P 2428 lines 13-17: A few examples would be very helpful

P 2430: I think lines 16-19 should be rewritten in view of the recent Gulf of Mexico oil spill and the role oil companies played in this matter!

P 2431 line 5: “EEZ” should be explained; since this is the first time this term has been mentioned

P 2434 line 4: Examples of “some predictions” would be helpful

P 2432 line 18 it says “about 5% of surface production reaching the deep-sea bed” whereas on p 2380 line 22 is stated “only 0.5 to 2% of the net primary production in the euphotic zone reaches the deep-sea floor”

Table 1: line 7 from below “hypersaline” instead of “hipersaline”

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