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Biogeosciences Discussions

Interactive comment on "Coccolithophore populations and their contribution to carbonate export during an annual cycle in the Australian sector of the Antarctic Zone" *by* Andrés S. Rigual Hernández et al.

Anonymous Referee #1

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The manuscript documents an annual record of coccolithophore production and coccolith weights/lengths at a Southern Ocean site. The topic is worthy of publication in biogeosciences, and the results will be of potential interest to the wider scientific community. In general, the manuscript is well written and illustrated, and does not contain any major flaws. However, see below for minor points.

Scientific points Line 38: " . . . coccolith assemblages experienced weight and length reduction .." !? It is not the assemblages that have reduced weight and length, it is the coccoliths.

Line 89: the Southern Ocean is a small area ? – 25% of the global area looks quite significant to me

Line 148: why is this section in the methods ? move regional setting and oceanography to the introduction

Line 235: why unfiltered ? I am not a specialist on sediment traps but it seems odd to use unfiltered seawater. Is there not a risk of contamination ?

Lines 357 and 345: "coccolith particle bloom" – since coccoliths are inanimate (just pieces of calcium carbonate) I think the word 'bloom' is inappropriate here – use 'The summer coccolith flux exhibited . . .'

Line 548: you mention two factors that possibly explain the changes in calcification. Calcification (i.e. overgrowth) tends to increase with depth in the photic zone, at least in some areas of the world. So in winter it may be that the coccolithophores are sitting deeper and therefore have more calcified coccoliths than in the summer when they are closer to the surface and therefore with lightly calcified coccoliths. Of course this difference in surface vs deeper photic could be related to various parameters (light, nutrients, temperature). Do you have data/images of coccoliths from different photic depths ? In Plate 1 you show lightly and heavily calcified coccoliths from the traps - but how do they relate to the surface oceans ?

Minor points for correction/consideration Title and elsewhere: Just a query. Is the use of Australian Sector OK ? Naming the sectors after the oceans, like the Atlantic Sector, Pacific Sector and Indian Ocean Sector is fine, but I wonder whether using country names (for sectors and territories) is considered to be geopolitical.

Line 30: Don't mix z and s verbs. For example, here you use 'characterized' and on line 151 'summarized', but on line 35 you use 'analysed' and on line 135 'fertilisation'. Furthermore, on line 236 you use 'programmed' and on line 349 'grey'. You need to be consistent, and choose between British English and US English. It looks like you are

favouring the former.

Line 45: coccolithophorid vs coccolithophore. Be consistent, and choose one.

Line 62: " ..some species (but not all) of coccolithophore .." – please change to 'some species of (but not all) coccolithophores ..'

Lines 71-75: needs to be rewritten, as it doesn't make sense

Line 79: one bracket is missing

Line 102: dominantly present -> dominate

Line 115: spares -> sparse

Line 149: ".at the north . . . at the south .." -> ' ..in the north . . . in the south ..'

Line 203: CO2 rich -> CO2-rich

Line 253: "After settling 12 hours .." -> 'After settling for 12 hours ..' Line 271: by using -> using

Line 273: " ..to the winter .." -> ' ..to winter ..'

Line 285: Scanning Electron Microscopy -> scanning electron microscope (SEM)

Line 298: "..using a with a Nikon .." -> ' . . .using a Nikon ..'

Line 346: " ..should be looked with caution .." -> 'should be viewed with caution'

Line 358 (and elsewhere) : you need to insert x (times) between the number and the power. For example, 2.2 10 -> 2.2. x 10

Line 365: Biogenic -> biogenic

Line 370: of the species Calcidiscus -> of Calcidiscus

Figure 5 (and elsewhere): I realise that 'liths' is in common use in presentations, but it is not an official term. Better to use coccoliths.

Line 382: tiles? I think you mean 'elements'

Line 384: "Distal shield measures ranged between 2 and 4,35 .." -> 'Distal shield ranges from 2.0-4.35 ..' [use decimal point not comma]

Line 424: here you use station 62 S, and before 62 S site – perhaps be consistent in usage

Line 463: genetical -> genetic

Line 550: degrees of calcification -> degree of calcification

Line 555: B/C south 50°S -> B/C south of 50°S

Line 576: light-dependant -> light-dependent

Line 617: absence accompanying in situ -> absence of in situ

Line 643: That supported -> That is supported

Lines 741-759: delete, as the same as later references

Lines 773 and 816 (and elsewhere): Deep Sea -> Deep-Sea Line 860: emiliania huxleyi (haptophyta) Âź, Journal of phycology, -> Emiliania huxleyi 860 (haptophyta) Âź, Journal of Phycology, [why is there a superscript 1 at the end of the title ?

Lines 864, 867 and 884 (and elsewhere): italicize the species name

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