

BG-2018-360 decision

Dear Carolina Cisternas-Novoa,

First of all I would like to thank both reviewers again for their insightful reviews and you for your better organized comments. I think the manuscript has improved significantly, but do still have some smaller and perhaps bigger issues. I guess one of the more major comments has to do with your MnOx-like particles, they are MnOx-like up until page 31 and then they become MnOx? Looking at your M&M section, I am not entirely clear what they are. If the method you describe for measurement of these particles is known to target MnOx particles I would expect one or more references indicating this. If not, than how do you know what these particles are? If they do contain MnOx, please indicate how you know, is MnOx-like the best name for them? MnOx containing might be better?

What is CSP? I know what it stands for, but what is it? Proteins or particle containing relatively large amounts of proteins? Is CSP correlated to DI?

Minor comments:

Line 16: "Sinking particles are the main form in which photosynthetically fixed carbon is transported from the euphotic zone to the ocean interior, the so called biological pump (BCP)". And of course you can discuss the Baltic being an ocean.

Line 22: GB, but not

Line 25: oxygenated by the inflow of relatively saline waters from the North Sea?

Line 28: POC has not been defined. Abbreviations and acronyms are typically defined the first time you use them in the abstract and again in the main text. If you only use them once, just use the full name.

Line 48: We're in the main text now so define BCP again.

Line 49: POC is defined, great, do the same in the abstract.

Line 53-54: What do these authors mean with "higher refractory nature of sinking particles in the OMZ?

Line 58-60: Didn't you just give that information?

Line 70: Gotland Basin (GB)

Line 73: Define OM or even POM

Line 84: "... would be necessary the bottom water...."?

Line 85: Gotland Basin, used before in line 70, define GB in line 70.

Line 87: just Kattegat should do I think.

Line 98: GB, it has been defined now.

Line 105: "Water column stratification..."

Line 108: Does that redoxcline still exists during/after the MB?

Line 109: this pelagic redoxcline is the original or the second redoxcline from the previous sentence?

Line 114-115: "...under oxic conditions OR in the presence of nitrate they react with O<sub>2</sub> and ..." They will get oxidized, but in the latter case there is no O<sub>2</sub>?

Line 127: TEP is or TEP particles are

Line 133: by Stokes law...

Line 161: special variability?

Line 173: filled up to 10 L? How much water did you have to add to get to 10 L. And why would you dilute your samples?

Line 174: swimmers were removed with a 500 µm mesh screen?

Line 185: Aliquots from the 10 L? So not only trapped material, but diluted trapped material?

Line 192: Did you define POP?

Line 200-209: Am I correct in thinking that everything between 5 and 20 µm is both counted by flow cytometer and microscopy? I am assuming the flow cytometer is counting cells containing chlorophyll and/or phycoerythrin?

Line 214: Explain what coomassie normally stains. Later on explain why that might be interesting.

Line 231-236: If this is a known method to measure particles containing MnOx, refer to these papers or methods. MnOx-like particles could basically be anything. Line 243-244 "... Undergoes degradation..."

Line 272: The deepest point sampled in the LD (430 m)

Line 299: increased to 38.9

Line 301: the lowest concentration was not at 180 m?

Line 304: GB µg per liter, LD µg per liter and µM?

Line 304-312: There is overlap in your defined pico- and nanophytoplankton (< 20 µm) and large phytoplankton (> 5 µm)?

Line 314: Filament counts, so the actual biomass or even individual cell counts could be even way larger, right? This also means that the other spp are a percentage of the total **counts** or phytoplankton **counts**. Not of the total biomass or even cell counts. Completely dwarfed by the cyano's therefore, right?

Line 315: total counts, so you could wonder if they are indeed significant based on biomass or cell counts taking into account you counted filaments rather than cyano cells.

Line 317: total phytoplankton counts

Line 318: phytoplankton counts

Line 331: TEP particles were counted right? So shouldn't this be counts as well? Line 340: so here is a little indication of what CSP might be... gel like, the question what it is still remains.

Line 345: MnOx containing particles? But did you actually measure MnOx? Or just counted particles that looked and behave as MnOx?

Line 362-363: by 18%

Line 376: Fully oxygenated water depths

Line 384-387: IS the TAA related to CSP?

Line 398: SOM or DOM?

Line 406: indicate the Redfield ratio for Si.

Line 411: TCHO?

Line 427: biomass? Or counts?

Line 437: the overlap in size classes again?

Line 483: MnOx-like and in line 485 you are sure it is actually MnOx, what has changed?

Line 531-532: So in Glockzin et al they actually measure manganese?

Line 533: (H<sub>2</sub>S), pretty sure there is H<sub>2</sub>O.

Line 537-538: "... redox conditions favorable for the formation of MnOx resulting in the high MnOx flux measured ..."

Line 547: containing or should it be like?

Line 590: we consider

Line 592: mixed

Line 598: mixed

Line 606: than rather than that?

Line 615: "... how similar the biogeochemical conditions were ..."

Line 625: Hence the N<sub>2</sub> fixing cyano's?

Line 660: transporting solid material from the and ?

Line 662: for the comparison of POM