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Biogeosciences Discussions

Interactive comment on "Short term changes in zooplankton community during the summer-autumn transition in the open NW Mediterranean Sea: species composition, abundance and diversity" *by* V. Raybaud et al.

Anonymous Referee #3

Received and published: 28 August 2008

General comments:

The manuscript describes the composition of zooplankton on a high taxonomical resolution in the Ligurian Sea. Sixteen stations were sampled using two different mesh sizes in autumn 2004. During the period of sampling, the sampling area was influenced by the intrusion of low salinity water, which changed the composition of the zooplankton community in the area. Although the manuscript contains valuable data about the zooplankton composition, I have some doubts that the current version fits in the scope of "Biogeochemistry". The authors stated in the introduction that the "structural and

functional diversity of zooplankton is a keystone in carbon transport to deep layers", however, this issue is not further addressed in the paper. Right now, the main message of the paper is that zooplankton is transported by currents, which is not surprising since this is the nature of plankton, and that these transports also occur in the Ligurian Sea. Nevertheless, the data are valuable and I will recommend the publication of the paper if the following comments are regarded in a modified version of the manuscript.

Specific comments:

Page 2240, "Study area": What are the water depths in the area of sampling?

Page 2240, "Study area": It is stated that the position of the time series station was decided on the basis of a transect from the coast to offshore waters. How was this decided? I cannot find the data from the transect in the manuscript.

Page 2241, "Zooplankton sampling": Add a table with haul data. Add numbers to the grid stations and then give details about the dates and times of sampling at each grid station. Also add information about how the data was further treated (Was the data pooled? Were the whole samples counted or were some samples split?).

Page 2242, lines 18ff, "In WP2 samples": Why was it not possible to determine the individuals at species level? Were mainly juveniles caught with the smaller net? If yes, what was the ratio adult to juveniles?

Page 2246, "Total zooplankton biomass": How was the biomass determined? Is it wet weight or dry weight?

Page 2247, first two sentences: Delete these sentences. They are not necessary.

Pages 2247 and 2248: Do not jump between the nets. Rearrange this paragraph! First describe the results obtained by the WP2 net and then the BIONESS results or vice versa.

Page 2249, lines 17-25: This sentence leads to the impression that copepods actively

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favor different salinities. Make clear that salinity is used as an indicator of different water masses and that the distribution of zooplankton taxa is related to the water masses.

Page 2251, last paragraph of results: Sixteen stations were sampled three times during the cruise, but the sampling period is divided into four time intervals. Why are the differences time-related? Also spatial differences within the sampling grid are possible. Please clarify!

Page 2252, lines 6-9: The taxa listed here are very common in the zooplankton. It is not very surprising that the periods share a great number of taxa. It would be better to present numbers of these taxa for Dynaproc 1 and 2 in a Table. Then these abundances could be compared with other regions in the Med and elsewhere.

Page 2252, lines 11-14: It would be interesting to see the relative abundance of these taxa during Dynaproc 1.

Page 2252, line 17: Information about the biology of Mesocalanus would be useful. Is this species an indicator of low salinity waters? What was the abundance of this species in coastal areas? Was it also found on the transect from the coast into the Dynaproc area?

Page 2253, lines 19ff: Does a transport of coastal species into open waters also occur in other regions? I would like to see a discussion on this topic! For example, the transport of Calanoides carinatus from coastal upwelling regions into the open ocean in the Atlantic and the Arabian Sea.

Page 2254, lines 22-23: How is the flux of matter affected by the offshore transport of zooplankton? Give more details! How much material is transported? How big is the increase in organic matter flux? Enhance the discussion on this topic. Also use other literature sources for comparison. This is a critical point in the manuscript and a sophisticated discussion on this topic is necessary to accept the manuscript for publication.

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Table 1: Add the number of day and night samples.

Appendix: These tables are useless without a temporal resolution because the paper deals with temporal changes. Modify the tables accordingly.

Technical comments and suggestions for rewording:

Page 2238, lines 8-9, "most important": maybe "most intense" is a better word.

Page 2239, line 11: "at short time scales"

Page 2240, first paragraph: Add the water depths.

Page 2242, line 25: "allow to reveal whether or not diversity"

Page 2243, line 18: "to determine relationships between"

Page 2244, line 16: "to determine relationships between"

Page 2245, line 5: Add the year after "September"

Page 2254, line 5: "gusts"

Page 2245, line 7: " distribution of water temperature (Fig. 2b) shows a highly"

Page 2245, line 11 "at the end of the cruise (11-16 October 2004), when it"

Page 2245, line 12: "wind events. The deepening of the thermocline was"

Page 2245, line 13 "mixed layer and suggests the beginning of an autumnal"

Page 2246, line 2-3: "a vertical bimodal distribution during the beginning"

Page 2246, lines 14-15: "day data, except for one datum (night between 18 and 19 September). This general pattern was caused by migratory"

Page 2247, line 8: "which represent more"

Page 2250, line 2: "Diversity of large copepods"

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Page 2250, line 12: "during the time of sampling between"

Page 2250, line 18: "N. gracilis and N. minor"

Page 2251, line 6: "four sequences"

Page 2252, line 5: Do you mean "is very similar"?

Page 2252, line 19. "the low salinity"

Page 2253, lines 11-12: "increased in abundance at the beginning of LSW-1 but their abundance decreased quickly after the event"

Page 2254, line 15: "was recorded"

Page 2254, line 21: "frequent than previously thought". Add a citation!

Appendix A: In my opinion it is better to present numbers than categories.

Interactive comment on Biogeosciences Discuss., 5, 2237, 2008.