

Interactive comment on “Sediment release of dissolved organic matter to the oxygen minimum zone off Peru” by Alexandra N. Loginova et al.

Piotr Kowalczyk (Referee)

piotr@iopan.gda.pl

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General opinion

Authors have presented a study on quantification of dissolved organic matter return flux and diffusion coefficient from bottom sediments to overlying waters in the tropical eastern South Pacific in the Peru upwelling zone. The Peru upwelling is one of five oceanic upwelling systems and is regarded one the most productive oceanic region globally. The primary production is sustained by the constant supply of inorganic nutrients to the euphotic zone, that simulate high growth rate of the autotrophic protists, that are base of the food web. The inorganic nutrients are product of the aerobic microbial processes leading to remineralization sinking particulate organic matter produced by

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autotrophic protists in the euphotic zone. Aerobic microbial remineralization causes and decline of oxygen concentration in mesopelagic zone and below. Already published results of experiments and field studies in fjords and Baltic Sea coastal waters have provided evidence of the release of DOM from sediments to overlying water in anoxic conditions. Author have conducted their studies in the Peruvian upwelling system observing the differences in DOC, DON and CDOM and FDOM properties in the anoxic sediments in the continental shelf slope off Peru. They have quantified diffusion driven flux of DOC, CDOM and FDOM from sediments to near bottom waters. The overall DOC, and CDOM, DOM flux was low, and spatially variable. Using a chamber experiments Authors have found an accumulation of humic-like FDOM components in near bottom waters over time, that indicated active microbial reprocessing of FDOM released from sediments. The modification of DOM composition by microbial activity could be supported by high nitrate and nitrite concentration, and may lead to denitrification and loss of bio-available nitrogen in the near bottom waters.

The manuscript is very well written, and well edited serving as very important source if information on poorly described and quantified part of the DOM cycle. I found it very interesting and providing new and very relevant information. In my opinion this study deserved prompt publication in the current form.

Detailed remarks

Except of few typos error, that could be fixed during final edits I did not find any weak point in this presentation.

Piotr Kowalczyk

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