

***Interactive comment on* “Collection of large benthic invertebrates in sediment traps in the Amundsen Sea, Antarctica” by Minkyoung Kim et al.**

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The manuscript by M. Kim describes a discovery of benthic invertebrates from the sediment traps deployed in Amundsen Sea, Antarctica. They discussed several possibilities and concluded that the dispersal by anchor ice seems to be a plausible reason for this discovery. The redistribution of geochemically important components like iron by sea ice has been proposed as an extra source of trace nutrients for those HNLC region of Southern Ocean. While this paper suggests another mechanism to redistribute benthic materials to the ocean surrounding Antarctica. This mechanism potentially is a more efficient way to influence the geochemical cycling in Antarctica region than sea ice, in

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which the nutrients mostly comes from atmospheric deposition. This paper is generally well organized and discussed in a clear logic. The topic fully meets the scopes of Biogeosciences. However, a revision of this manuscript is suggested with the following comments addressed before it can be published.

1) My major concern is the introduction part. Some detailed review should be provided on sea ice or anchor ice transport and their importance to Antarctica environments. The environmental setting of Amundsen sea should also be introduced with information like seasonal variations in nutrient supply, primary productivity, export productivity and so on. Benthic community structure in Antarctic coastal water should also be discussed if available, particularly those related to those invertebrates.

2) Another suggestion is a broader implication of benthic materials dispersal by anchor ice for Antarctic ecosystem. I noticed the author discussed the contribution of those benthic organisms vs POC flux from primary production. Then how about the cycling of other benthic components like nutrients, detrital materials and so on? Their geochemical importance under a changing climate might be as importance as the sea ice melting. I agree with the author that more future work should be addressed on how this new mechanism influences the Antarctic ecosystem, which of course could not be fully covered in this manuscript just considering the difficulty to work in Antarctica.

3) Page3, line18, genetic identification is very challenge even without formalin, since the organism has been frozen for a very long time before captured in trap. I suggest to identify those species with some traditional taxonomic approach.

4) Page3, line 29. The worms are sediment scavenger. They ingest the sediment as a whole, and their guts contain large abundance of digested sediment, which is reshaped both physically and chemically. Therefore, the worm not only contributes to the POC as biomass, but also the sediment materials. Anyway, my point here is the contribution of zooplankton and other higher level organisms has long been ignored in the evaluation of POC flux with current strategy of trap collection. If we count in all the materials in

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the cup, the contribution of worms might be not that astonishingly high.

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