

The Fall: insights into biogenic matter fluxes in an Antarctic coastal setting beyond the summer.

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Mass and energy (e.g., organic carbon) fluxes in the marine water column are important to refine estimations on biogeochemical cycle dynamics (e.g., C and Si) and atmospheric carbon sinks into the ocean. In Antarctic offshore areas, >95% of these annual fluxes develop during the spring and summer; however, these information is scarce for the coastal environment. This province exports organic matter to the adjacent offshore areas becoming an important energy reservoir for life in the oceanic vicinity. In the present study, we set a sediment trap to assess near shore particle fluxes in Doumer Island's South Bay (Gerlache Strait), off the Chilean Antarctic Research Station "Yelcho". Particle fluxes collected at 190 m water depth on a site at 240 m water depth showed that organic carbon (OC), biogenic silica (bSi) and faecal pellet fluxes in the autumn were similar to those observed during the late summer. Microplankton (e.g. diatom, flagellates, tintinnids) fluxes were clearly dominated by diatoms along the study. In contrast, flagellates were more seasonal. Autumn OC and bSi fluxes were higher than those collected elsewhere in the oceanic Antarctic and for OC, comparable to the results of the only study developed at the coastal Antarctic, at Deception Island in the Bransfield Strait. Our results demonstrate the importance of the autumn biogenic matter fluxes in the annual context, remark the importance of coastal zone biogenic matter exports for the oceanic province and raise the question on whether this is a consequence of climate change in the Antarctic.

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