Glacial meltwater influences on plankton community structure and the importance of top-down control (of primary production) in a NE Greenland fjord

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Freshwater runoff from the Greenland Ice Sheet (GIS) can be an important driver influencing plankton community structure in Greenland fjords. In the present study, we describe physical, taxonomic and functional differences in the plankton community in Young Sound, a NE Greenland fjord, from the inner fjord close to the GIS towards the coastal region in late summer. The fjord is influenced by runoff from land-terminating glaciers that separated the surface layer from cold underlying waters. The highest chlorophyll a concentration (74.9% of the total copepod biomass at all stations, and their grazing impact was the highest among the copepod groups. Copepod grazing impact on the phytoplankton standing stock, however, was exceeded by microzooplankton grazing, investigated by dilution experiments, with the highest grazing impact on the phytoplankton standing stock of 63% d−1 in the inner part of the fjord. In spite of high phytoplankton instantaneous growth rates at the innermost fjord station, proto-zooplankton was capable of controlling the phytoplankton production. The study showed functional differences within the system and provides indications of how dynamic the coastal ecosystem of Greenland can be.

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