ICES/PICES 6ZPS 2016/S7

The graveyard diary - changes in the population structure and seasonal dynamics of Arctic zooplankton from a 10+ year time series of sediment traps

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Current evidence for global climate change indicates that Arctic regions will experience the greatest changes. Zooplankton are generally considered good indicators for ocean climate variability, but seasonal data from the Arctic are still comparatively scarce and long-term data rare due to challenges associated with sampling around the year. Here, we show that data on zooplankton swimmers collected by sediment traps deployed on oceanic moorings provide insights into annual and interannual variability in the zooplankton community structure. We analyzed zooplankton swimmers collected by sediment traps deployed in two high Arctic fjord systems, the sea-ice dominated Rijpfjorden and the Atlantic Water influenced Kongsfjorden. This valuable dataset, reaching from 2002 to 2015, provides a unique opportunity to identify trends and range shifts in the zooplankton community structure and relating these to hydrographical changes. Our preliminary results clearly highlight the close association between the zooplankton community and hydrographic changes in both fjords, e.g. warm years with high inflow of Atlantic water lead to an influx of Atlantic water associated species. Anticipated changes in oceanic fluxes will produce an adjustment of the hydrographic balance in Arctic shelf regions, with changes in the associated species, and ensuing effects on ecosystem functioning.

Keywords: Arctic, Zooplankton, Community composition, Sediment traps, Hydrography

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