

An Antarctic krill (*Euphausia superba*) hotspot: population characteristics, abundance and vertical structure explored from a krill fishing vessel

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Abstract

Antarctic krill (*Euphausia superba*) aggregate in various ways depending on a range of biological and physical factors. In some areas, typically associated with bathymetric features such as shelf edges and canyons, they may aggregate densely to form hotspots. Despite the importance of such hotspots, their development over time in demographic composition and spatial distribution is not well understood. A fishing vessel during regular operation was used for collection of krill demographic and acoustic data on the shelf northwest of South Orkney Islands. Results show a decrease in the proportion of subadult males, partly reflected in an increase in mature adult males. Concurrently, there was a change in the proportion of males in the sampled population from 0.8 to 0.3, indicating immigration or emigration of krill through the hotspot. A clear trend was observed in the diurnal vertical distribution with deeper and more vertically compact swarms during the day. However, some days displayed very small differences between the day and night distribution and considerable variability in the daytime depth distribution. It was noted that although fishing was carried out during the entire period of the study, there was no obvious trend in the acoustic backscatter, suggesting that the overall krill density was not changing during this period. Using a fishing vessel as a research platform has advantages for understanding the dynamics of the fishery and in quantifying biological and physical processes during actual exploitation of these resources.

Keywords: South Orkney Islands, Southern Ocean, Zooplankton, Reproduction, Hydro acoustics, Diel vertical migration.

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