

Micronekton Community Structure

on the Southern Kerguelen Axis

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1 Introduction

The fish and macrozooplankton that inhabit the Mesopelagic as a black hole in understanding of ocean systems Particularly true in the southern ocean K-axis as a region of particular interest to Australia This study: an overview of mesopelagic community structure Micronekton communities are generally highly diverse, consisting of small but mobile crustaceans, cephalopods, fishes, and gelatinous animals 2 to 20 cm in size (Seki Polovina 2001, Brodeur Yama- mura 2005). Many micronekton animals are primary prey of marine mammals, seabirds, and commer- cially important tunas and billfishes (e.g. Harrison Seki 1987, Pauly et al. 1998, Watanabe et al. 2009). Previous studies have focused on distributions and associations of individual taxa and/or functional groups. While of great value for ... biogeography... Here we aim to provide a summary in a form that can directly inform ecosystem modelling Robust model representations will be important for guiding the future fisheries and conservation management in this area, and the strong biophysical gradients in the region make it an ideal testbed for model development The aim of this study was to describe the summer composition and vertical distribution of the mesopelagic micronekton community and explore associations with biophysical... We developed hypotheses that could explain the relationship between...

2 Methods

The mesopelagic community was sampled at 36 stations along the voyage track, from the surface to 1000 m, using an International Young Gadoid Pelagic Trawl net (IYGPT, with an opening of 188 m²) equipped with a multiple opening and closing cod-end device (MIDOC). The MIDOC comprises 6 separate cod-ends (with a mesh size of 20 mm,

terminating in a removable "soft" codend bag made of 0.5 mm mesh). The MIDOC allows cod-ends to be opened sequentially at pre-programmed intervals, such that each cod-end samples a different depth stratum. The first cod end was open as the net descended from the surface to a maximum depth of 1000 m, then the remaining 5 cod-ends each sampled a 200 m depth band as the net returned to the surface (1000–800 m, 800–600 m, 600–400 m, 400–200 m, and 200 m–surface). Nets were towed for 30 min at an average speed of 2.7 knots for each 200 m depth band (covering a mean distance of 1.35 nautical miles, and sweeping a mean volume of 450,800 m³), and at 3.9 knots for 60 to 90 minutes for the first descending cod-end (covering a mean distance of 5.95 nautical miles and sweeping a mean volume of 1.98×10^6 m³).

Catch was converted to densities by dividing numbers and weights by the volume swept for each cod end. Acoustic backscatter in the water column was characterised during tows using an Simrad EK60 echosounder operated at 38 kHz. Acoustic data were filtered and quality controlled prior to the derivation of the total Nautical Area Scattering Coefficient (NASC) for the time period and depth range corresponding to each depth stratum. NASC is an acoustic density measure, corresponding to the acoustic energy per unit distance, which can be translated into biologically more meaningful biomass or abundance estimates, if the species composition and the sound scattering of an individual of the given species group is known. TODO: say something more here

3 Results

4 Discussion

Previous work on biomass/abundance:

BROKE W: only 332 fish and larvae and 58 squid collected from 125 target and routine RMTs at 60 stations (Van de Putte *et al.*, 2010)

Hydrographic conditions and food availability have been identified as the major driving forces for *E. antarctica* to form concentrations (Loots et al 2007; Flores et al 2008). Biomass density from night RMT8 and RMT25 hauls was 3.04g/1000m³ (Collins et al 2008). The main biomass of myctos and bathylagids was between 400 and 1000 m during the day and 0 - 400 m at night. From RMT25 catches, density per m² in stratum of 0-1000m has ranged from 1.6 to 15 gm.m⁻² (Collins et al 2008, Chindova 1987, Filin et al. 1990, Kozlov et al 1990)

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6 References

Van de Putte, A.P., Jackson, G.D., Pakhomov, E., Flores, H. & Volckaert, F.A.M. (2010) Distribution of squid and fish in the pelagic zone of the Cosmonaut Sea and Prydz Bay region during the BROKE-West campaign . *Deep-Sea Research Part II*, **57**, 956–967.