

## Distribution and Abundance of Krill in the South Orkney Islands

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**Abstract** Net tows were completed during Leg II of the 2008/09 AMLR Survey in the South Shetland Islands to complement data collected the previous year, as well as finfish data collected during the same cruise. During this survey:

- Nineteen tows were completed at randomly selected stations throughout the South Orkney Islands;
- A total of 5,204 krill were caught, the majority of which were found to the northwest of Coronation Island; and
- Krill caught exhibited a unimodal length-frequency distribution around 44-48 mm.

### Introduction

During Leg II of the 2008/09 AMLR Survey, net-tow samples were taken in the South Orkney Islands to aid in measuring the meso-scale distribution of Antarctic krill (*Euphausia superba*) and support acoustic biomass estimates of krill. This is the second survey conducted in the South Orkney Islands during the International Polar Year. The data collected during this year's survey will complement last year's data to map zooplankton distribution, abundance and demography in the South Orkney Islands.

### Methods

Net tows were completed using a 1.8 m Isaacs-Kidd Midwater Trawl (IKMT) fitted with a 505  $\mu\text{m}$  mesh plankton net. All tows were fished to 170 m, or to within 10 m of the bottom where shallower. Real-time tow depths were measured using a depth recorder mounted on the trawl bridle. Flow volumes were measured using a calibrated General Oceanics flow meter mounted on

the frame in front of the net. Tow speeds were maintained at two knots.

Postlarval krill were removed from the sample counted, measured, and sexed. If the krill catch was greater than 100, a subset of 100 individuals were randomly selected and measured. Measurements were made of total length (mm) from the rostrum to the tip of the telson. After the krill were measured, they were returned to the remaining sample, which was preserved in formalin and stored at the Southwest Fisheries Science Center.

### Results

A total of 19 IKMT tows were completed at stations associated with the stratified random trawl survey stations (Chapter 9). Krill were found in 10 of the 19 tows, yielding a total of 5,204 krill. The largest catch of krill was northwest of Coronation Island, where 4,912 krill were caught in a single tow (Figure 12.1). Several smaller catches were encountered to the southeast of the South Orkney Islands shelf, near the 250 m isobath.

Of the total krill catch, 865 krill were measured and sexed. The length-frequency distribution of krill in the

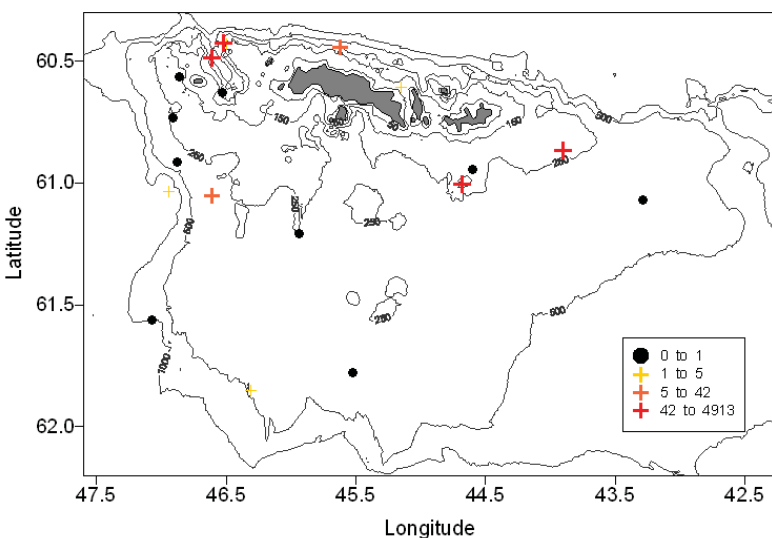


Figure 12.1. Geographic distribution and abundance of krill caught during Leg II of the 2008/09 AMLR Survey.

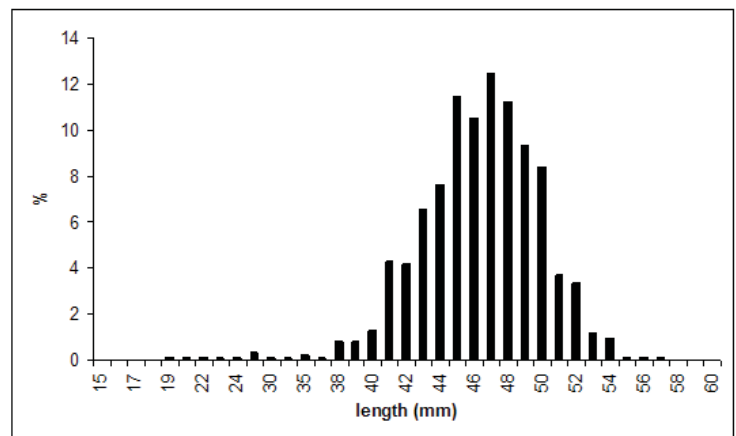


Figure 12.2. Length-frequency distribution of krill caught during Leg II of the 2008/09 AMLR Survey.

South Orkney Islands was unimodal and centered between 44-48 mm (Figure 12.2).

### Discussion

The length-frequency distribution of krill in the South Orkney Islands (Figure 12.2) was similar to that in the West Area of the South Shetland Islands during Leg I of the 2008/09 AMLR Survey (Figure 4.3). The majority of the krill measured were larger than 45 mm (> 3 yrs old), indicating a lack of recruitment of krill to the South Orkney Islands for at least three years. The results from the 2007/08 survey of the South Orkney Islands indicated a bimodal length-frequency distribution with modes at 29 mm (one-year-old krill) and 42-47 mm (two-year-old and older krill). Comparing the results from the two years, it seems likely that while last year's krill continued to grow, there was very little recruitment to the krill population from last year's breeding season.

The geographic distribution of krill around the South Orkney Islands shifted from last year, when the overall abundance of krill was greater to the south of the South Orkney Islands. This year very few krill were found on the southern shelf of the South Orkney Islands, and most of those were located near the 250 m isobath. However, last year's results were similar to this year's in that the greatest concentration of krill was found over the 1,000 m isobath to the northwest of Coronation Island; historically this area is the site of an active krill fishery (Jones and Ramm, 2004). The presence of commercial krill trawlers in this region was also noted during Leg II. Interestingly, the highest density of demersal finfish was also located to the northwest of the South Orkney Islands during Leg II of the 2008/09 AMLR Survey (Chapter 9, Fig 9.2a). The association of these ecosystem components and potential effects of the commercial krill fishery on the dynamics of finfish populations in this region are topics of further research.

### Protocol Deviations

There were no major deviations from the standard net-tow sampling protocol.

### Disposition of Data

Data and samples are available from Christian Reiss, NOAA Fisheries, Antarctic Ecosystem Research Division, 3333 Torrey Pines Court, Room 412, La Jolla, CA 92037. Ph: 858-546-7127, Fax: 858-546-5608

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### References

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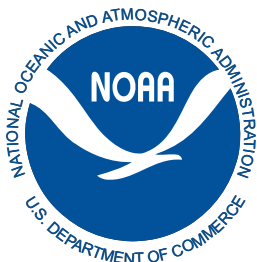
## AMLR 2008/2009 FIELD SEASON REPORT

### Objectives, Accomplishments and Tentative Conclusions

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