

## Differences in plankton diversity between the East Antarctic and Ross Sea regions

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The SCAR Southern Ocean CPR Survey started in 1991 to map and monitor spatial patterns and temporal trends in zooplankton biodiversity. The highest concentration of sampling has been in the East Antarctic region, notably between 60 and 160°E (south and east of Australia) using vessels from Australia (*Aurora Australia*) and Japan (*Shirase* old and new, *Umitaka Maru*, *Kaiyo Maru*, *Hakuho Maru*, and the New Zealand vessel *Tangaroa*). New Zealand joined the Survey in 2006 conducting regular tows in the Ross Sea region (160°E to 150°W) using the *Tangaroa* and fishing vessel *San Aotea II*. Zooplankton abundances and community composition were compared between the Ross Sea and the East Antarctic regions, with the expectation that within the Antarctic Circumpolar Current, the Ross Sea region would show similar patterns to zooplankton upstream in the East Antarctic. There were statistically significant trends of increasing zooplankton abundance in all zones of the East Antarctic region since 1991, i.e. the Sub-Antarctic, Polar Frontal, Open Ocean, and Seasonal Ice Zones. There were also corresponding significant trends towards larger copepod species in all zones based on the Copepod Community Size index. However, the Ross Sea region proved to be quite different. There were no similar trends in either abundance or Copepod Community Size in the Ross Sea region. Latitudinal patterns in species composition were similar between the two regions and with previous publications, but the Ross Sea area had substantially higher abundances than in the East Antarctic region, and higher than predicted from models built from previously-collected CPR data. Chlorophyll-*a* concentrations were also higher in the Ross Sea region as shown in both CPR Phytoplankton Colour Index and ocean colour satellite data. There is also an indication that variability in zooplankton abundance in the Ross Sea region is higher than in the East Antarctic. For example, very high zooplankton abundances occurred in December 2009 as a result of a >10-fold increase of larvacean *Fritillaria* spp. numbers, which corresponded with unusually high chl-*a* throughout the Ross Sea. Despite being downstream in the ACC, the Ross Sea region appears to be substantially different ecologically.

### References

Robinson, K.V., Pinkerton, M.H., Hall, J.A., Hosie, G.W., (2014) Continuous Plankton Recorder Time Series. New Zealand Aquatic Environment and Biodiversity Report No. 128. Ministry for Primary Industries, Wellington. 74 pp. ISBN 978-0-478-43226-8