

Nicole Hellessey

Institute for Marine and Antarctic Studies, Australia

Relating Antarctic Krill Lipids and Fatty Acids to Environmental Parameters

Hellessey N.; Ericson, J.; Nichols, P.D.; Johnson, R.; Kawaguchi, S.; Nicol, S.; Hoem, N. and Virtue P.

Institute of Marine and Antarctic Studies, Hobart, Australia; Commonwealth Science and Industry Research Organisation (CSIRO), Hobart, Australia; Antarctic Climate and Ecosystems Co-operative Research Centre, Hobart, Australia; Australian Bureau of Meteorology, Melbourne, Australia; Australian Antarctic Division, Kingston, Australia; Aker BioMarine, Oslo, Norway

Antarctic krill are at the centre of the Antarctic ecosystem, linking phytoplankton and higher organisms. Knowledge of their lipid (oil) biochemistry can assist in understanding and predicting potential ecological changes and can also inform the fishery on sustainable practices, optimizing krill harvest. Knowing how krill will respond to environmental changes is difficult to predict or explore at large scales through typical experimentation. The use of satellite imagery can help look at krill production by using their lipids and fatty acids as a proxy for their health and ability to reproduce.

This study examined how the lipid and fatty acid content and composition of Antarctic krill was linked to large scale environmental parameters determined through satellite imagery. Lipids were analysed from krill collected by a commercial krill fishery over a 3 year time period, allowing for long-term environmental and seasonal shifts to be seen, as well as from the K-Axis and ACE voyages, allowing for regional differences to be seen.

The fluorescence levels, chlorophyll a, irradiance, sea surface height and temperature from the same collection dates and locations was used to compare krill lipids and fatty acids to their environment. Whilst this link has been studied on small scales and with few samples, this study describes differences seen temporally (over 3 years in the Scotia Sea) and spatially (in 3 ocean basins) in krill lipids with their relationship to environmental conditions.