Understanding the role of environmental conditions on the performance of Laternula elliptica (King & Broderip) in King George Island.

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Ecosystems from the Western Antarctic peninsula (WAP) are thought to be particularly vulnerable to global change, as this region is currently challenged by rapid rates of temperature rise. Global change has a cascading effect that is causing a variety of changes in marine ecosystems, influencing both their physical and biotic components. In that manner, global change is impacting the distribution and population dynamics of Antarctic marine organisms.

Life history, distribution and abundance of species are depending on the functioning of metabolic processes. Knowledge of these processes is essential to understand a species population dynamics, performance, and functional role within a given ecosystem. Dynamic Energy Budget (DEB) theory provides a framework to describe the process of energy uptake and allocation during the whole life cycle of an organism as a function of temperature and food availability, allowing the integration of a species' physiology with its physical environment.

The bivalve Laternula elliptica (King & Broderip) is a filter feeder with an important role in the bentho-pelagic coupling function in Western Antarctic Peninsula shallow ecosystems. To assess how global change affects this key species, we propose to study the mechanisms underlying its responses to changes in its environment. In this study, we have assessed the DEB parameters for this species, as inferred from field and experimental data. These parameters were used in conjunction with times series of biological traits obtained for King George Island (South Shetlands) populations, to reconstruct the feeding history of these species over two consecutive years. Feeding history was afterwards related to indicators of resource availability: chlorophyll levels, particulate organic matter, sediment load, duration of ice cover to assess the role of these variables in the observed patterns through a mechanistic link.