

SOUTHERN OCEAN FOOD WEBS: DEVELOPING NEW PERSPECTIVES

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There is increasing recognition of the need to understand the complexity of Southern Ocean ecosystems, especially in the current context of global climate change and sustainable resource management. In particular, we need a better understanding of food web connections involving groups other than Antarctic krill, which have been the main focus of food web analyses in the region to date. To address this, we are integrating present knowledge on the trophic ecology, biology and physiology of key species in the South Georgia region of the Scotia Sea to develop large-scale conceptual and quantitative models of the major energy flows. Here we explore the importance of different factors that may influence the magnitude and direction of energy flows including: a) pathways involved in transferring energy to higher trophic levels which have been previously ignored or unknown (e.g. salps, hyperiid amphipods, and myctophid fish), b) competitive effects (e.g. how predators respond in years of low Antarctic krill abundance/availability or favoured resource supply), c) top-down versus bottom-up controls (i.e. interactions between trophic levels), d) coupling between benthic and pelagic communities and e) human impacts (e.g. commercial fishing and climate change). We also examine the problem of specifying suitable spatio-temporal scales, and how these may be taken into consideration when constructing appropriate food web models for the Scotia Sea. Development of these issues and their incorporation into food web models will help elucidate the dynamic nature of this ecosystem and its links to the wider circumpolar ocean. This information may then be used in a predictive capacity and for sustainable resource management strategies within the region.