

Do Antarctic fish like it hot?

What energy allocation can tell us about distribution shifts

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Despite evidence for distribution shifts of single species and ecosystem changes as a reaction to global warming, little is known about the underlying processes. As a consequence of warming waters in the Southern Ocean, shifts in species distribution are expected with sub-Antarctic species migrating southward to high-Antarctic waters, while species from temperate regions might intrude sub-Antarctic areas. Species distribution and abundance are driven by reproduction and somatic growth, which in turn, depend upon surplus energy being available after baseline costs of maintenance have been met. However, the effects of environmental warming and energy budgets of single species have rarely been investigated.

This study assesses the impact of temperature on energy budgets of Antarctic fish from different thermal habitats. Results show that increasing temperatures can enhance feeding efficiency and somatic growth. However, temperatures exceeding a species-specific threshold have detrimental effects on energy utilization and are likely to affect distribution patterns. In conclusion, energy budget studies are a crucial tool for understand species distribution limits and adaptations in response to a changing environment.