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Physical oceanography of the East Antarctic marine ecosystem

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In January-March 2006 a regional hydro-acoustic survey of the Antarctic margin around Enderby Land and the Amery Basin (30–80 E) set out to investigate the influence of the physical environment on the marine ecosystem . Six meridional transects were completed with extensive sampling of physical and biological parameters in the upper water column. We found that the large-scale wind-driven ocean circulation and sea-ice melt patterns controlled the variability in the seasonal summer mixed layer. On the upper continental slope we consistently observed a fast and narrow westward current associated with the Antarctic Slope Front. This physical process and its spatial variability influences the different levels of the ecosystem in a variety of ways that we explore in this paper. The importance of the physical environment to this marine ecosystem highlights the potential threat of amplified climate change in the polar regions. This study fills a gap in the biological oceanographic observations around Antarctica and will provide vital data for fisheries management, modelling studies and an invaluable base-line for future climate work.