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Andrea is an oceanographer interested in understanding, describing and modeling physical and biological interactions in high latitude marine ecosystems. She is been studying the role of ocean dynamics in the transport, pathways, and connectivity of marine organisms at different spatial and temporal scales, using numerical modeling as a tool to evaluate the performance of different base models and their coupling with ocean circulation models. She is a research assistant professor in the Department of Oceanography and Limnological Sciences at Universidad Austral of Chile and a research fellow at the Center for Global Change Science. A recently funded project focuses in understanding the role of Circumpolar Deep Water intrusions into small embayments and the innershelf of the South Shetland and Doumer Islands, in particular, determine the influence of intrusions in transporting heat and nutrients into two highly productive embayments. Other projects she has lead focused in understanding the effect of climate-induced changes in the environmental conditions of the Southern Ocean and determining the effect of these changes on the habitat of Antarctic krill (*Euphausia superba*). Krill is a key species in the southern ocean food web, understanding the effects of global warming in their early development is crucial to understand the fate of their dependent predators. To accomplish this goal she implemented a circumpolar one-dimensional temperature-dependent growth model for the embryos and early larval stages of Antarctic krill. Projections for the end of the 21st century for the habitat of Antarctic krill and projected environmental conditions have been used to force the krill model. Analysis of sea ice extension and duration of season complemented the simulations for krill early development. The study found a high likelihood of krill population decline by the end of this century with large implications for the productivity of the marine food webs of the Ross Sea and the western Weddell Sea.

Think small!!! Processes taking place at organism, short-time and small spatial scales: a missing gap or negligible effects under global forcing?

Andrea Piñones, Juan Höfer, Humberto González

Comprehensive, multidisciplinary studies around the Southern Ocean during the past four decades have provided insights to understand the structure, functioning and resilience of a krill-based ecosystem, however, the role of individual species in the processes influencing these linkages are still poorly understood. Recent studies have highlighted the importance of understanding how food-web structure varies across the Southern Ocean and the need for developing a consistent conceptual framework for understanding the interactions that structure ecosystem's functioning. Ongoing changes in environmental conditions may shape new SO ecosystems. Shift in habitat boundaries may change energy pathways altering regional food webs. It is paramount to understand the roles of individual species and small scale processes in energy fluxes. Also determining how global change will affect organism's interactions is needed for future polar research all of which has been identified as one of the major goals for Chilean researchers of the IDEAL Center (Research Center Dynamics of High Latitude Marine Ecosystems). The western Antarctic Peninsula (wAP) supports and contributes to the largest population of Antarctic krill and to this day is one of the regions suffering

greater climate change impacts. For example, during the last two summers the wAP presented the lowest sea ice extent recorded over the last four decades with near-shore ecosystems experiencing sea surface temperatures close to 2100 projections. Insights from two contrasting coastal locations along wAP, Maxwell Bay in King George Island and South Bay in Doumer Island, have shown the importance of understanding local small-scale processes to disentangle ecosystem functioning. Along with that, studying how organism's interactions are going to change under global change scenarios are the next challenges that researchers have to tackle in an Antarctica in the brink of major changes.



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