



# IV ROSS SEA CONFERENCE 2023

*Università degli Studi di Napoli "Parthenope"*

*Via Amm. F. Acton, 38 - 80133 Napoli, ITALY*

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**Topic:** Marine biology and ecology

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**ABSTRACT Subject :**

The impact of simulated diel vertical migration and sea ice drift on the connectivity of krill in the Ross Sea

**Abstract** 14/02/2023 21:30:07

The Ross Sea region contains one of the healthiest marine ecosystems on the planet. In 2016, the Commission on the Conservation of Antarctic Marine Living Resources created one of the largest Marine Protected Areas (MPA) in order to protect "the structure and function" of this ecosystem. As part of a study to examine the movement of one particular species, Antarctic krill (*Euphausia superba*), between and within key regions of the Southern Ocean including the Ross Sea MPA, we are modeling Lagrangian drifters to simulate pathways during early life stages. The simulated drifters are embedded within a 5-km horizontal resolution ocean/sea ice/ice shelf Regional Ocean Modeling System circulation model of the Southern Ocean. The drifters include simplistic behavior of the early life stages of krill including the initial descent/ascent cycle, diel vertical migration (DVM), and advection with simulated sea ice velocity (instead of ocean velocity) under certain conditions. It has been previously shown (e.g. Behrens et al., JGR, 2021; Hudson et al., JGR, 2022) that advective pathways of simulated drifters can change significantly when sea ice advection or DVM is added. Here, we explore changes in the pathways in the Ross Sea when changes are made to when sea ice advection occurs, when and to what depth DVM occurs, and the vertical rates in the initial descent/ascent cycle based on krill physiology. For example, when sea ice advection is added to the krill behavior, drifter pathways are less constrained to stay along the continental slope in areas where sea ice is advected off the continental shelf, and this changes the number of drifters that transit through specific parts of the Ross Sea MPA.

