



# 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 :**

Sea ice concentration decline in a critical Adélie penguin molt area in the Ross Sea

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Unlike in many polar regions, the spatial extent and duration of the sea ice season have generally increased in the Ross Sea sector of the Southern Ocean since monitoring began in 1979. Simultaneously, populations of ice-obligate Adélie penguins (*Pygoscelis adeliae*) have been stable or increasing in the region. However, demonstrating links between Adélie penguin population growth and sea ice concentration has proved complex, with sea ice being implicated in different, sometimes contrasting, demographic patterns. Adélie penguins undergo a complete molt, replacing all their feathers shortly after the breeding season. Unlike most penguins, Adélies typically molt on sea ice, away from the breeding colonies, which makes this potentially vulnerable period particularly difficult to study. We tested the hypothesis that Adélie penguins require abundant sea ice for completing their molt. We analyzed data from 195 geolocating dive recorders deployed on adult penguins at two colonies (Cape Crozier and Cape Royds on Ross Island in the southern Ross Sea) from 2017 to 2019 and clearly identify the molting area and time period for these populations for the first time. Sea ice concentration during the molt period in the core molt area has been anomalously low in recent years, and annual return rates of penguins to breeding colonies were positively correlated with sea ice concentration in the molt area. Together these results suggest that sea ice conditions during Adélie penguin molt may represent a previously underappreciated annual bottleneck for adult survival, with important consequences for population dynamics.

