

HOW DO FULMARINE PETRELS MANAGE TO BREED DURING SHORT SUMMERS IN ANTARCTICA?

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The breeding biology of the closely related fulmarine petrels was studied during three austral summers on Ardery Island, Antarctica. Here, a short time window for reproduction exists, because sea-ice cover and snowfall limits the possibilities for successful breeding. The extent of sea-ice directly affects food availability for seabirds, whereas severe snow conditions, especially early and late in the season, cause many breeding failures.

The group of fulmarine petrels is highly successful in the Antarctic ecosystem. In this group of birds breeding events, such as egg-laying, hatching and fledging of the chicks, occur highly synchronised, but are differently timed in each species. We compared an early breeding species with a late-breeding species. Antarctic Petrels (*Thalassoica antarctica*) breed 2 to 2.5 weeks earlier than Southern Fulmars (*Fulmarus glacialisoides*). Snow conditions early in the season caused a high egg failure rate in Antarctic Petrels, and 30% of all nests had already failed before Southern Fulmars started to lay. Hatching success was similar between both species.

After hatching, petrel chicks are guarded by their parents to attain homeothermy and for protection against predators. At the end of the guarding period increased chick mortality was found in Antarctic Petrels, but not in Southern Fulmars. Antarctic Petrels have to leave their chicks unguarded 7 days earlier, due to a different foraging strategy. They have longer foraging trips (on average twice as long), despite a similar diet. Therefore an automatic weighing- and identification nest system was installed to find out whether chicks of both species grow equally fast, and receive similar amounts of food from their parents. Preliminary results did not show differences between the species, although Southern Fulmars chicks were fed more frequently due to the shorter foraging flights.

Late chick mortality was generally low in both species, except in one season, when a heavy snowfall occurred at a time when Antarctic Petrel chicks were fledging. In this season, however, extreme chick mortality in Southern Fulmars occurred and 45% of all their nests failed. Averaged over the three seasons, Antarctic Petrels and Southern Fulmars appeared to have a similar reproductive output (number of chicks fledged out of all eggs laid). The timing of breeding failures, however, is also important when comparing breeding strategies between species. If many breeding failures regularly occur late in the season, a late-breeding strategy would incur high energetic costs because of high parental investment in failed offspring. Antarctic Petrels are able to start breeding earlier because of their capacity to fly over large areas with sea ice. In contrast, Southern Fulmars adopted a more flexible breeding strategy with short flights, which might be necessary to counteract the chances of high costs of late breeding failures.