

# Long Solo Migrations Across the Southern Ocean by Juvenile Wandering Albatrosses

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Albatrosses are seabirds with a natural history shaped by an extreme oceanic lifestyle. They are known for their impressive navigational abilities, enabling them to successfully locate isolated breeding islands and to cover thousands of kilometres during migrations across open seas, but very little is known about their migratory movements. They were the first birds to be studied by the Argos system since 1989 and now the foraging behaviour of breeding birds is very well known. However what juvenile and immature birds do when at sea remained a mystery. From the time young albatrosses leave the colony on their first flight until they first breed, they spend 6 to 10 years at sea. In 2001, Susanne Åkesson at Lund University and Henri Weimerskirch, CNRS, Chizé started a collaboration to study by satellite telemetry, the first time migration by young wandering albatrosses born at the French Sub-Antarctic Crozet and Kergulen Islands, south-western Indian Ocean. To start with we used six solar panel powered 35–50g satellite transmitters (Microwave PTT 100) with a duty cycle of 10 hours on and 24 hours off, and seven 35-45g battery powered satellite transmitters with a duty cycle of 10-18 h on and 54 h off fitted with adhesive tape on the back feathers to fully feathered juvenile wandering albatrosses in 2001 and 2002.

On 23 November 2002 a young female wandering albatross, called “Boule de Plume”, was fitted with a 35g solar PTT at Crozet Island, 46.357 latitude S and 51.716 longitude E. At capture she weighed 12.6 kg and when she left the nest and the Island 8 days later she had reduced her weight to 11.6 kg. She remained in the area of the Island for 9 more days and then started her migration journey to the northeast until she crossed the subtropical convergence 600 km to the north of the Crozet Islands. The flight north happened when southerly winds were blowing in the region of Crozet Islands, and thus, she could get some tailwind assistance during this rapid flight north. We received 792 positions from 23 November 2002 to 23 June 2003 from the female wandering albatross and she had by then covered a distance of 52,346 km with her last location at 166.925 longitude East. During this time she covered an average distance of 610 km/day.

The pattern of migration for this individual female wandering albatross was very similar to what we observed for other young albatrosses from Crozet Island. At first she departed offshore from the island, probably sitting on the water drifting with ocean currents and practicing flying, and then when suitable southerly winds appeared she departed north with some wind assistance. These flights often lasted until the albatross had reached the area of the subtropical convergence zone and suitable foraging waters with somewhat lower wind speeds. The migration routes taken by individual young wandering albatrosses contained similar features, like sections of straight flights and then return movements and circuitous flights influenced strongly by the winds, during which the albatross often returned to an ocean area previously visited. Based on the 13 satellite trackings, the juvenile Crozet Island wandering albatrosses on average fly distances corresponding to 4.6 times around the Earth during the first year of life! This is an amazing achievement for a bird which is making this journey alone without assistance from its parents, and

A young female fitted with a GPS PTT displaying with a young male at the Crozet Islands. These birds have been tracked for the last 2 months and have now left the Crozet sector to forage in the Tasman Sea.

for the first time in their life. We found that the migration distance covered per day increased during the tracking period, while the individual birds improved their skills to manage their peculiar and energy-minimizing flying technique (dynamic soaring).

Our results will be important for conservation issues, as we have found that the juvenile wandering albatrosses from Crozet Island fly to ocean regions to the north of those used by adult wandering albatrosses, and thus frequent areas which are intensely used for long-line fishing. In this region these inexperienced young albatrosses face the risk of being captured on the long-lines while being attracted by the easy-captured prey items exposed during fishing. Our satellite tracking data will also be extremely important for us to understand how a young oceanic avian migrant navigates during its first migration, and how this navigation system is shaped by experience into the one used by adult birds.

We are currently using GPS PTTs to study the phase of the life cycle of albatrosses that is still unknown, the period of immaturity. Indeed after their first years at sea, young birds start to visit briefly their birth colonies from the age of 4-5 years. During the past two years we have been tracking these young birds to understand how the behaviour of these birds evolves from a purely oceanic life during their first year of life and to the first breeding. This period of learning is probably very important since albatrosses appear to start breeding only when they have acquired foraging skills similar to those of adult birds.



Helène Maheo, field worker at the Crozet Islands for the program on the ecology of seabirds holding the young male before its release.

Satellite tracking of the first migration of a young female wandering albatross born at the Crozet Islands. The PTT was deployed on 23 November 2002.

