

## **P04 The life history of the wandering albatross: how does the marine environment influence the demography of seabirds?**

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Compared with other birds, seabirds have a lower fecundity, breed at older age and have higher adult survival. The reasons for such characteristics are usually looked for in the marine habitat itself. The low fecundity of seabirds is often attributed to the poor, patchy and unpredictable environment on which they rely. The distances between breeding colony and food resources also places constraints on the amount of energy seabirds are able to invest in reproduction. The development of life history theory, and especially of the concept of reproductive cost and residual reproductive value, bring an additional dimension to these correlates.

To examine the different hypotheses, I use the single best-known life history of perhaps any seabird, instead of comparing species, families or orders of seabirds for which information on life history is always limited and often too general. The life history concerned is that of the wandering albatross, based on a study carried out in the Crozet Islands, Indian Ocean, over the past 40 years. The wandering albatross is one of the largest flying seabirds, with a wing span of more than 3 meters. It is sexually dimorphic, males being 20% larger than females. My main objective will be to relate the foraging constraints imposed by the marine environment to the processes of resource allocation and their consequence for the demography of the species. The foraging ecology of juveniles, immatures and adults, both during breeding and sabbatical years, is reviewed, based on information from various telemetry systems (GPS, Argos

transmitters, geo-location systems) for locating birds and on activity recorders, stomach temperature sensors and heart rate recorders, *inter alia*, for recording behavioral and physiological parameters.

These studies have allowed us to understand how the albatrosses forage in relation to environmental conditions and to the distribution of resources, and how they acquire energy for breeding in relation to the energetic costs of foraging over very long distances. Combined with foraging studies, land-based studies have been carried out as well to relate foraging and allocation processes through the study of mass regulation during incubation and offspring provisioning strategies, and to understand how birds deal with the constraint of distant foraging. The consequences of allocation processes for the demography of the species are reviewed, paying particular attention to the influence of parental provisioning on the survival and future reproduction of offspring, to the acquisition of sexual maturity, and to biased sex ratios and senescence. The influence of environmental variability and density dependence on demographic parameters such as survival, breeding success and dispersal will also be reviewed.

Like many species of Procellariiformes, albatrosses are declining in most regions today, not only because of fisheries, but also due to disease and possibly global changes in their environment. I will examine how these long-lived seabirds can survive in a changing and variable world.