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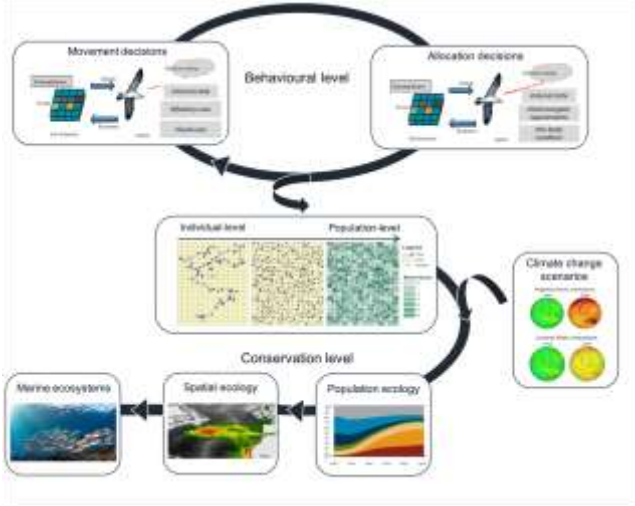
Orientation: Ocean Observation and Global Change
Specialization Area: Ocean Observation
Research Area: 1.4 Biological Oceanography



PhD project: **Foraging ecology of breeding shearwaters in the north Atlantic: A multi-level modelling approach to support upcoming decision-making for the conservation of marine ecosystems**

Supervisors: Dr. João Alexandre Cabral (University de Trás-os-Montes e Alto Douro)
Dr. Ines Alvarez (University de Vigo)
Dr. Jaime Ramos (University of Coimbra)

Summary: Marine top predators, such as seabirds, are largely regulated by food web dynamics, offering unique insights into marine ecosystem status and change. In this thesis, Rita used GPS tracking datasets of Cory's and Cape Verde shearwaters (*Calonectris borealis* and *Calonectris edwardsii*, respectively) and mechanistic modelling approaches (i.e. system dynamics and individual-based models) to explore hypothesis related to the foraging ecology of shearwaters breeding in the North Atlantic Ocean (Berlengas, Azores, Madeira and Cape Verde archipelagos). In particular, she investigated individual-level mechanisms underlying shearwaters foraging behaviour during chick rearing, and evaluated behavioural strategies that enable individuals to maximize their fitness under contrasting foraging conditions. A special emphasis was given to processes related with their sensorial and cognitive capacities to locate prey at sea, and the need to balance the demands of self-feeding and chick provisioning within the constraints imposed by central place foraging. This study revealed: 1) a potential link between shearwaters foraging behaviour and the decision processes associated with timing of nest arrival; 2) a synergistic effect between olfactory foraging and local enhancement for the optimal foraging behaviour of pelagic seabirds; 3) flexible strategies of parental behaviour and cooperation for chick provisioning and foraging decisions; and 4) guidelines for site-specific management programmes with implications for the conservation of shearwaters. Overall, this thesis advanced understanding about the behavioural flexibility of shearwaters to variations in foraging conditions during the breeding season, and demonstrates the role of model-based research in linking foraging behaviour with reproductive success to anticipate seabirds' demographic and spatial responses to climate-mediated environmental and trophic changes in the North Atlantic Ocean.