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SEARCH PATTERN OF ANTARCTIC PETRELS AND THE SPATIAL DYNAMICS OF THE MARINE ENVIRONMENT

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Spatio-temporal dynamics and scale has been a central topic in marine ecology in recent years. In the Southern Ocean, a special attention has been directed towards the large variance in the abundance and distribution of the Antarctic krill, which has been monitored by acoustic surveys. However, such surveys have limited ability to cover large areas in short time. The idea behind the present study was to use the pathway of individual seabirds to investigate the spatial dynamics of their environment. To do this, we use a new methodology based on first-passage time that makes it possible to quantify the scale-dependent search effort of animals from their pathways observed through e.g. satellite telemetry. In the present study, this technique is applied on the foraging trips of Antarctic petrels which main diet is Antarctic krill. The Antarctic petrels used a nested search strategy to localize aggregations of their prey. By comparing the synoptic search pattern of several birds we were able to quantify the spatial and temporal scales of these foraging areas. Our results reveal a surprisingly complex and dynamic pattern where large-scale foraging areas with a size of several hundred kilometres change position during a period of three weeks.