

Mapping marine debris encountered by albatrosses tracked across oceanic waters

Bungo Nishizawa¹, Jean-Baptiste Thiebot¹, Fumio Sato², Naoki Tomita², Ken Yoda³,
Rei Yamashita⁴, Hideshige Takada⁴, Yutaka Watanuki⁵

¹*National Institute of Polar Research, Tokyo, Japan*

²*Yamashina Institute for Ornithology, Chiba, Japan*

³*Graduate School of Environmental Studies, Nagoya University, Nagoya, Japan*

⁴*Laboratory of Organic Geochemistry, Tokyo University of Agriculture and Technology, Tokyo, Japan*

⁵*Graduate School of Fisheries Sciences, Hokkaido University, Hokkaido, Japan*

Anthropogenic marine debris are a threat to marine organisms and are found globally in increasing abundances. However, the spatial distribution patterns of debris at sea and their association with wildlife remain poorly understood. Using bird-borne GPS- and camera-loggers data from Black-footed albatrosses *Phoebastria nigripes* breeding on Torishima, Japan, we examined the distribution of large floating debris in the Kuroshio Current area, western North Pacific, and their spatial overlap with the foraging areas of the albatrosses. Floating debris photographed by albatrosses included Styrofoam, plastic pieces, plastic sheet, fishery-related items (rope or netting), seaweed, and unknown debris. The debris were concentrated in areas where surface current was weak, south of the Kuroshio Current. Further, the debris' distribution overlapped with the albatrosses' foraging areas. The albatrosses displayed changes in flight direction towards the debris, at mean distances of ~7 km, and one bird was observed pecking at a plastic sheet. These results suggest that the albatrosses actively interact with the debris. Our approach using wide-ranging marine predators as debris samplers through GPS- and camera-loggers is adequate to monitor the debris' distribution at the ocean surface and to highlight areas with increased risk of ingestion and entanglement for marine wildlife.