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### **Modelling and mapping trophic overlap between seabirds and marine fisheries on a global scale**

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Coexistence of foraging seabirds and operating fisheries may result in interactions, such as competition for the same prey resources. We used GIS-based modelling at a scale of 30-min spatial cells to: (a) map the foraging distribution of seabirds; (b) predict their annual food consumption rates in a spatially-explicit manner; and (c) estimate a spatially-explicit seabird – fisheries overlap index. Information on population size, diet composition, and foraging attributes of 351 seabird species was compiled into a database. Global annual food consumption by enumerated seabirds was estimated to be 96.4 million tonnes (95% CI: 78.0 to 114.7 million tonnes), compared to a total catch of nearly 120 million tonnes by all fisheries. Krill and cephalopods comprised over 58% of the overall food consumed and fishes most of the remainder. The families *Procellariidae* (albatrosses, petrels, shearwaters, etc.) and *Spheniscidae* (penguins) were responsible for over 54% of the overall food consumption. Seabird foraging distribution maps revealed that areas around New Zealand, the eastern Australian coast, and the sub-Antarctic islands had high species richness. However, temperate and polar regions supported high seabird densities, and most food extracted by seabirds originated there. Furthermore, maps of food consumption rates revealed that most food consumed by seabirds was extracted from offshore rather than near shore waters, and from areas where seabird – fisheries overlap was low. The trophic overlap maps identified ‘hotspots’ of highest potential for conflict between fisheries and seabirds. Thus, this study may provide useful insight when developing management approaches for designing offshore marine conservation areas.

**Keywords:** seabird–fisheries interactions, trophic overlap, at-sea distribution, seabird food consumption.

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