

Figure 2. Bathymetry, krill density, and bird abundance on a typical transect to the south of the islands (sector D). ("m" denotes "meter." "#/m³" denotes "number per cubic meter." "#/nm" denotes "number per nautical mile." "nm" denotes "nautical mile.")

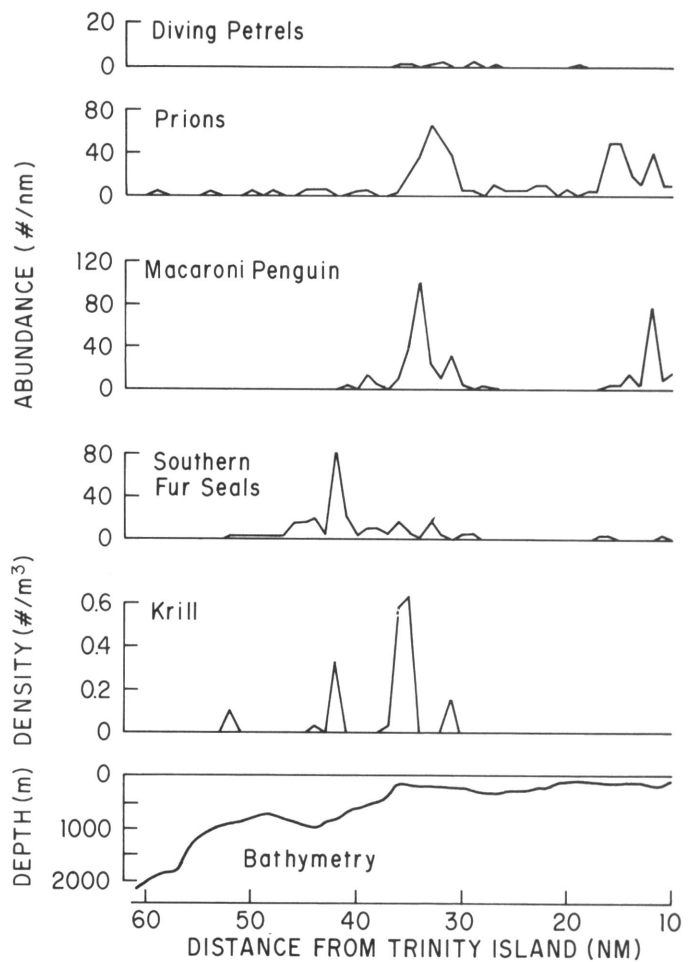


Figure 3. Bathymetry, krill density, and bird abundance on a typical transect to the north of the islands (sector A). ("m" denotes "meter." "#/m³" denotes "number per cubic meter." "#/nm" denotes "number per nautical mile." "NM" denotes "nautical mile.")

Ornithological observations west of the Antarctic Peninsula, August-September 1985

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Most research on the distributions and diets of antarctic birds has been restricted to the austral summer when ship travel is

least impeded by ice. During *Polar Duke* cruise 85-5 (WinCruise I), we had an opportunity to make observations along the Antarctic Peninsula during late winter. Our primary objectives were

- to document the distribution of birds at sea in relation to numerous parameters (e.g., ocean temperature, sea-ice cover, proximity to land) and
- to collect specimens of several species to examine their diet in different ice habitats and to examine their fat content and plumage condition.

Between 22 August and 22 September, we conducted 96 30-minute strip censuses using methods described by Ainley, O'Connor, and Boekelheide (1984). Census transects covered areas from the northern Drake Passage (56°30'S) to the north edge of Marguerite Bay (67°30'S). Twenty species of birds were recorded between these latitudes (table 1). Transect data will be analyzed by computer and compared with similar data sets collected in austral summer by D. Ainley and W. Fraser of Point Reyes Bird Observatory. Preliminary analyses suggest that snow petrels (*Pagodroma nivea*) and Adélie penguins (*Pygoscelis adeliae*) were the species most strongly associated with sea ice.

Table 1. Bird species observed in transects and their approximate latitudinal distributions

Species	Latitudinal distribution ^a (to the nearest 30'S)
Adélie penguin (<i>Pygoscelis adeliae</i>)	64°30'–67°30'
Chinstrap penguin (<i>P. antarctica</i>)	64° ^b
Gentoo penguin (<i>P. papua</i>)	62° –65° ^b
Wandering albatross (<i>Diomedea exulans</i>)	56°30'–58°30'
Black-browed albatross (<i>D. melanophris</i>)	56°30'–61°
Gray-headed albatross (<i>D. chrystoma</i>)	56°30'–57°30'
Southern giant fulmar (<i>Macronectes giganteus</i>)	56°30'–66°30'
Southern fulmar (<i>Fulmarus glacialis</i>)	56°30'–65°30'
Cape petrel (<i>Daption capense</i>)	56°30'–66°
Antarctic petrel (<i>Thalassoica antarctica</i>)	57°30'–67°30'
Snow petrel (<i>Pagodroma nivea</i>)	62° –67°30'
Antarctic prion (<i>Pachyptila desolata</i>)	56°30'–60°30'
Blue petrel (<i>Halobaena caerulea</i>)	56°30'–63°30'
Kerguelen petrel (<i>Pterodroma brevirostris</i>)	56°30'–61°
Diving petrels (<i>Pelecanoides</i>)	56°30'–58°30'
Blue-eyed shag (<i>Phalacrocorax atriceps</i>)	63°30'–65°30'
American sheathbill (<i>Chionis alba</i>)	61°30'–65°30'
Stercorariidae (unidentified)	60°30'
Southern black-backed gull (<i>Larus dominicanus</i>)	61° –67°30'
Antarctic tern (<i>Sterna vittata</i>)	62°30'–65°

^a Observations were precluded by darkness in the range of 58°30'–61°S on the southward crossing of the Drake Passage and 57°–60°S on the northward crossing.

^b Observations outside of transects were used in assessing distribution.

Antarctic avifauna present in austral summers but missing from our transects included brown and south polar skuas (*Catharacta lonnbergi*, *C. maccormicki*), Wilson's storm petrels (*Oceanites oceanicus*), and arctic terns (*Sterna paradisaea*).

Between Fournier Bay (64°32'S 63°07'W) and Lavoisier Island (66°11'S 67°46'W), we collected 78 birds of eight species (table 2). Specimens were weighed and examined for reproductive state,

fat content, and molt. Skins were frozen and later shipped to the Bell Museum of Natural History, Minneapolis, Minnesota.

Stomach contents of bird specimens were catalogued (table 2), weighed, and preserved within a few hours of collection using methods described by Ainley et al. (1984). These materials will be identified and measured at Point Reyes Bird Observatory. A small reference collection of otoliths was made to aid in identifying heavily digested fish. To help estimate the original size of heavily digested krill, we measured fresh krill (*Euphausia superba*) and determined correlations between eye diameter, body length, and body weight.

About 46 percent of the birds collected had no food items in the esophagus or proventriculus, and 9 percent had no trace of food even in the gizzard. Nevertheless, more than 61 percent had medium or heavy fat layers (fat classes of 2 or 3 on a scale of 0 to 4). About 32 percent had light fat (class 1), 6 percent had trace fat, and 1 bird had none.

On 30 August, during a visit to Palmer Station (64°46'S 64°03'W), station personnel helped us survey the area for breeding birds. We observed several things:

- (1) southern giant fulmars (*Macronectes giganteus*) on Humble Island had occupied most of the previous year's nest sites;
- (2) blue-eyed shags (*Phalacrocorax atriceps*) at Cormorant Island were paired and on breeding sites; and
- (3) Adélie penguins (*Pygoscelis adeliae*) at Torgersen and Cormorant Islands were gathering at the island edges but were not yet occupying traditional colony sites.

We wish to thank Bruce Carter and the captain and crew of the *Polar Duke* for excellent logistic support. We also thank Jeff Ash, Herb Butt, Skip Owen, and Mike Parfit for assisting with data collection. This research was supported by National Science Foundation grant DPP 82-13688 to David Parmelee.

Reference

- Ainley, D.G., E.F. O'Connor, and R.J. Boekelheide. 1984. *The marine ecology of birds in the Ross Sea, Antarctica*. (Ornithological Monographs No. 32.) Washington, D.C.: American Ornithologists' Union.

Table 2. Stomach contents and fat condition of birds collected

Species	Number collected	Average fat class (0-4)	Number with empty esophagus/proventriculus	Number of alimentary tracks containing:						
				Fish	Krill	Unidentified crustacean	Squid	Bird	Pebble	Miscellaneous
Southern giant fulmar	4	1.1	1	0	0	0	3	4	1	2 ^a
Cape petrel	4	1.8	0	1	3	0	3	0	1	0
Antarctic petrel	14	1.2	7	5	6	3	9	1	0	2 ^b
Snow petrel	32	1.8	15	19	18	2	1	0	1	1 ^a
Blue-eyed shag	2	1.0	0	2	0	0	0	0	0	0
American sheathbill	1	2.0	1	0	0	1	0	0	1	0
Southern black-backed gull	13	1.9	11	4	1	4	3	4	2	4 ^{a,c}
Antarctic tern	8	2.0	1	2	8	2	0	0	0	0

^a Seal (believed to be scavenged from remains of collected seal).

^b Amphipod (1), pteropod (1).

^c Shell fragments (3).