SEABIRD OBSERVATIONS IN THE SOUTHERN OCEAN SOUTH OF AFRICA, SUMMER 1975/1976

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ABSTRACT

Daily bird observations were made between Cape Town, South Africa, and 65 30S, 30 00E during Cruise 93 aboard the R.V. *Atlantis II* in the summer of 1975-1976. Twenty-one different species of seabirds were identified and found to be distributed in distinct zones related to physical factors including sea surface temperature and proximity to land.

INTRODUCTION

During the austral summer of 1975-1976 the Woods Hole Oceanographic Institution's Research Vessel *Atlantis II* conducted a sedimentary marine chemistry study south of the Republic of South Africa (Cruise 93). In addition to the primary study, underway geophysical, physical and biological properties were measured. This paper is a summary of the seabird observations made throughout the cruise.

A plot of the ship's track, observation locations and sea surface temperature are shown in Fig. 1. Fifteen to thirty minute observations were made from both the bridge and fantail between one and two hours after sunrise. Unless positive identification could be made, only birds coming within a one nautical mile radius of the ship were counted. Afternoon observations were made when weather would not allow morning counts, or when a significant change in sea surface temperature was noted. In all, 21 different species of seabirds were identified (Table 1).

RESULTS AND DISCUSSION

Three distinct zones of seabird distribution are apparent in the oceanic regions between Cape Town and the Antarctic continent. The temperate zone, extending from Cape Town to the Subtropical Convergence, was the least densely populated. Large numbers of gulls Laridae, cormorants Phalacrocoracidae and other continental shorebirds were seen in Table Bay harbour, Cape Town, but were absent as we proceeded south from the productive coastal upwelling area into the warmer waters of the Agulhas Current approximately 30 nautical miles (nm) south of Cape Town. The few oceanic birds seen in the temperate zone included the Wandering Albatross *Diomedea exulans*, the Blackbrowed Albatross *D. melanophris*, Schlegel's Petrel *Pterodroma incerta*, and the Whitebellied Stormpetrel *Fregetta grallaria*. Conspicuous by its absence was the Yellownosed Albatross *D. chlororhynchos*, seen in large numbers in the coastal waters north of Cape Town.

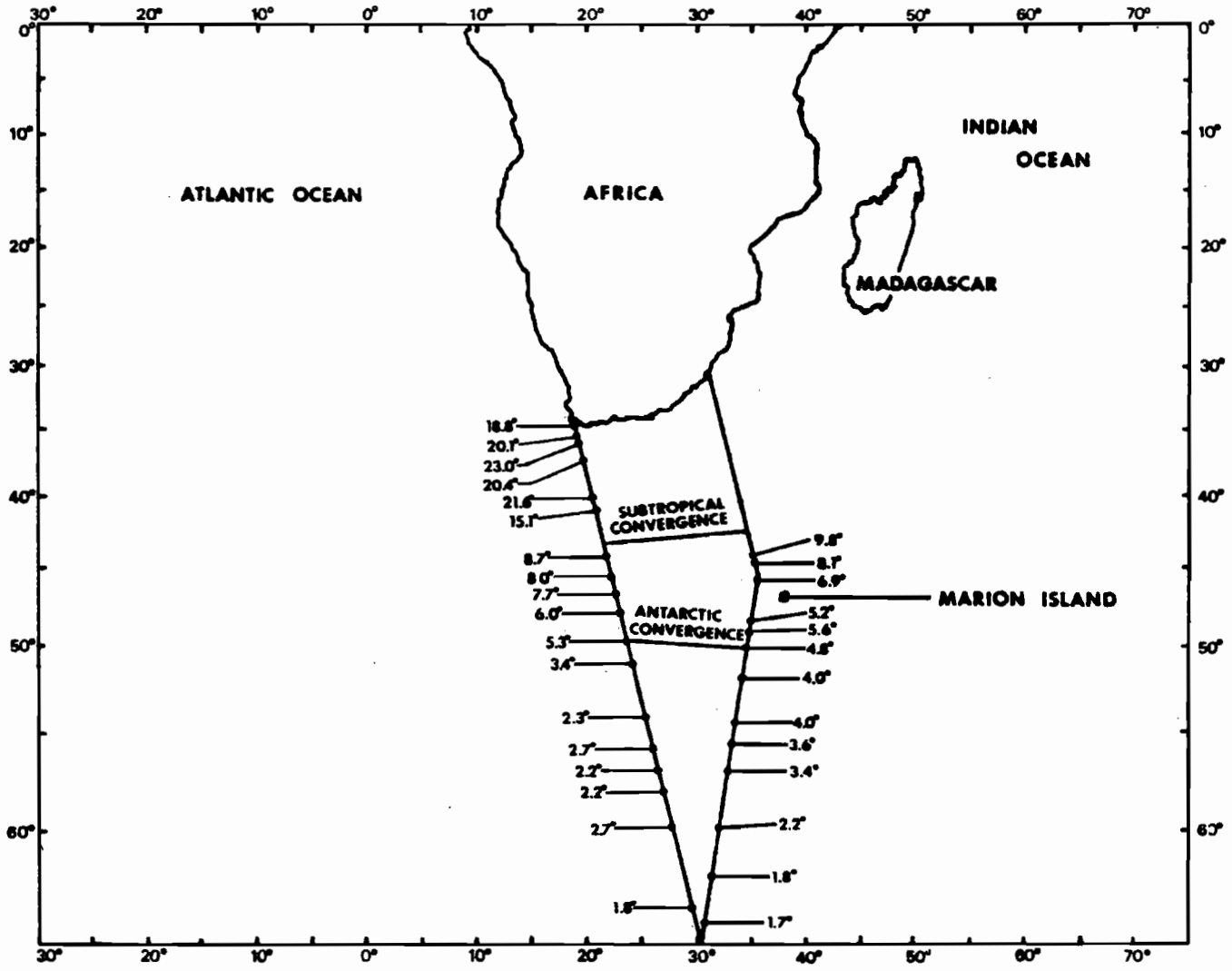

Figure 1

Ship's track, observation locations and sea surface temperature, R.V. *Atlantis II* Cruise 93, January - February 1976

TABLE 1

SEABIRDS OBSERVED ON CRUISE 93 OF THE R.V. *ATLANTIS II*, JANUARY-FEBRUARY 1976

Date	Position	Water temperature °C	Air temperature °F	SPHENISCIDAE	*King Penguin Aptenodytes patagonicus*	DIOMEDEIDAE	*Wandering Albatross Diomedea exulans*	*Blackbrowed Albatross D. melanophris*	*Greyheaded Albatross D. chrysostoma*	*Sooty Albatross Phoebetria fusca*	*Lightmantled Sooty Albatross P. palpebrata*	PROCELLARIIDAE	*Southern Giant Petrel Macronectes giganteus*	*Southern Fulmar Fulmarus glacialoides*	*Antarctic Petrel Thalassoica antarctica*	*Cape Pigeon Daption capense*	*Snow Petrel Pagodroma nivea*	*Prions Pachyptila* spp.	*Greatwinged Petrel Pterodroma macroptera*	*Schlegel's Petrel P. inexpta*	*Whitechinned Petrel Procellaria aequinoctialis*	*Sooty Shearwater Puffinus griseus*	OCEANITIDAE	*Wilson's Stormpetrel Oceanites oceanicus*	*Blackbellied Stormpetrel Fregetta tropica*	*Whitebellied Stormpetrel F. grallaria*	STERCORARIIDAE	*Subantarctic Skua Catharacta antarctica*	*Pomarine Skua Stercorarius pomarinus*	UNIDENTIFIED
Temperate Subzone (North of the Subtropical Convergence)																														
14 Jan 76 (am)	35 04S, 18 21E	20,6	70																	1	1									2
15 Jan 76 (am)	38 58S, 19 10E	21,4	70				3	5											3	10						2				5
16 Jan 76 (am)	40 38S, 19 34E	21,6	70				2													8						2				5
05 Feb 76 (am)	39 50S, 34 02E	18,5	68				3														1	1				1				
06 Feb 76 (am)	36 25S, 33 06E	24,0	72					1													3									
Subantarctic Zone (between Subtropical and Antarctic Convergences)																														
16 Jan 76 (pm)	41 33S, 20 15E	15,0					6	3												8						2				
17 Jan 76 (am)	43 52S, 20 55E	15,2	54				3	3																						
17 Jan 76 (pm)	44 57S, 21 12E	8,6	58				2											6	5	4									1	
18 Jan 76 (pm)	48 10S, 22 26E	8,0	48				4											5		10										
19 Jan 76 (am)	48 43S, 22 40E	5,4	45				6											30		10	6					1				3
02 Feb 76 (am)	49 11S, 36 39E	5,0	47		5		7											10		1						5				
03 Feb 76 (am)	47 22S, 36 31E	6,0	48				40	1		1			2					12		1	15				2	4		2		
04 Feb 76 (am)	43 10S, 22 40E	9,8	52				5	1												1	9									
Antarctic Zone : Maritime Subzone																														
20 Jan 76 (am)	51 55S, 24 13E	3,2					6											10								20				
21 Jan 76 (am)	52 05S, 24 25E	2,4					4											20								4				
22 Jan 76 (am)	55 10S, 24 54E	2,6					6											100+			1					11				4
23 Jan 76 (am)	56 07S, 25 25E	2,7					1											30												
24 Jan 76 (am)	58 38S, 26 14E	2,2					6							1				600+			3									
25 Jan 76 (am)	61 22S, 27 56E	1,3					3			1								200+												
29 Jan 76 (am)	59 47S, 33 19E	2,2																100+			5									
30 Jan 76 (am)	58 56S, 33 29E	2,9					5		2									100+			15				1					
31 Jan 76 (am)	53 35S, 34 47E	3,4					5											20												
01 Feb 76 (am)	52 49S, 35 43E	4,0					3						1					8						1						
Antarctic Zone : Continental Subzone																														
25 Jan 76 (pm)	63 23S, 29 08E	2,0					5				13				20	2		50						3						
26 Jan 76 (am)	64 54S, 29 59E	0,9									8				50		2	60						4						1
26 Jan 76 (pm)	66 44S, 30 00E	-0,03									8				20		20	10												
27 Jan 76 (am)	66 31S, 30 22E	1,8									1				10		10							8						
28 Jan 76 (am)	63 55S, 31 26E	2,0									1				13			50												

Numbers and diversity did not increase greatly until we crossed the Subtropical Convergence at approximately 41°S. South of this point the Subantarctic zone is characterized by surface water temperatures ranging from 5°C to 15°C, and by increased biological productivity (Ryther 1963). Increases in numbers of previously recorded species were noted as well as sightings of additional species including the Whitechinned Petrel *Procellaria aequinoctialis*, prions *Pachyptila* spp., and the Greatwinged Petrel *Pterodroma macroptera*. While most of this zone is classified as maritime, changes in the avifauna were observed near Marion Island (46 54S, 37 45E). This well studied island is the summer breeding ground for many Subantarctic species (van Zinderen Bakker 1971). Passing within 30 nm, we observed actively feeding King Penguins *Aptenodytes patagonica*, the Subantarctic Skua *Catharacta antarctica*, giant petrels *Macronectes* spp. and greatly increased numbers of other oceanic species.

The third zone, the Antarctic zone, can be divided into two subzones, the maritime subzone and the continental subzone (Watson 1971). The maritime subzone extended south from the Antarctic Convergence (approximately 51°S) to the vicinity of 65°S. This highly productive region is the result of cold, northward flowing, Antarctic surface water. These waters are richer than the Subantarctic waters with a major component of the near surface zooplankton being composed of euphasid crustaceans (krill), the primary food source of many of the smaller seabirds, fish and squid (Watson 1971). In this zone it was common to see large flocks of prions and stormpetrels Oceanitidae feeding on krill thrown up by the ship's wake.

On both 24 January 1976 and 25 January 1976 the bridge reported seeing several large flocks of prions each consisting of several hundred individuals flying in a westerly direction. Also numerous in the Antarctic zone were Wandering Albatrosses and Whitechinned Petrels. Schlegel's Petrel, numerous in the Subantarctic zone, was absent in the Antarctic zone, while the Whitebellied Stormpetrel was found only in the northern regions of the Antarctic zone.

The continental subzone of the Antarctic zone extended approximately from 65°S to the Antarctic continent. While we traversed only the northern edge of this zone, significant changes in the species present were noted. The Wandering Albatross was absent and appeared to be replaced by the smaller Lightmantled Sooty Albatross *Phoebetria palpebrata*. The numbers of prions decreased and the Whitebellied Stormpetrel was not noted. In their place were great numbers of Antarctic Petrels *Thalassoica antarctica* and Snow Petrels *Pagodroma nivea*. Wilson's Stormpetrel *Oceanites oceanicus*, recorded in only one more northerly observation, were frequently observed in the continental waters of the Antarctic zone.

The observations made during Cruise 93 of the R.V. *Atlantis II* tend to agree with observations of Subantarctic and Antarctic avian zonation reported by Watson (1975). Additionally, these observations extend southward similar observations reported by Summerhayes (1975) for the Cape Basin area along the west coast of Africa. In both these studies, important factors influencing

avian communities appeared to be biological productivity of the area waters and the proximity to land masses.

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REFERENCES

RYTHER, J. 1963. Geographic variation in productivity. In: HILL, M.N. (Ed.) The Sea: Ideas and Observations in the Study of the Seas. New York: Wiley. pp.347-381.

SUMMERHAYES, C.P. 1976. Seabird observations between Dakar and Cape Town, December 1973 - January 1974. *Ostrich* 47: 55-58.

VAN ZINDEREN BAKKER JR, E.M. 1971. Birds observed at sea from Prince Edward Island to Cape Town. In: VAN ZINDEREN BAKKER SR, E.M., WINTERBOTTOM, J.M. & DYER, R.A. (Eds.) Marion and Prince Edward Islands. Cape Town: Balkema. pp.249-250.

WATSON, G.E. *et al.* 1971. Birds of the Antarctic and Sub-antarctic. *Antarctic Map Folio Ser.* 14: 1-18.

WATSON, G.E. 1975. Birds of the Antarctic and Subantarctic. Washington: American Geophysical Union.

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