Ecography

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Appendix 1a. Trip duration and number of individuals consumed according to water mass for each wandering albatross (May–July 1999).

Bird number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Sex	M	M	M	M	M	F	F	F	M	M	M	M	F	F	F	F	F	F
Time spent (d) in Antarctic (AZ) waters	2.1	3.0	6.2	2.1	1.7	3.4	1.3	2.7	2.1	4.3	1.6	1.7	1.8	3.0	0.2	1.9	2.1	4.4
Time spent (d) in sub-Antarctic (SAZ) waters	0.0	0.0	4.1	3.9	7.9	25.7	6.7	8.3	3.1	11.7	5.9	4.3	3.7	3.4	36.3	2.1	7.0	15.0
Time spent (d) in subtropical (STZ) waters	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	5.9	0.4	9.3	1.4	4.6	0.4	7.4	3.4	17.1
Total trip duration (days)	2.1	3.0	10.3	6.0	9.6	29.1	8.0	11.0	7.9	21.9	7.8	15.3	7.0	11.1	36.9	11.5	12.4	36.5
Cephalopods																		
Alluroteuthis antarcticus										1					3		2	1
Chiroteuthis sp.																	1	
Galiteuthis glacialis					1						1	1	1	1	2		1	1
Gonatus antarcticus			1							1							1	2
Histioteuthis atlantica											1				1			6
Histioteuthis eltaninae								1			1	3			9			2
Histioteuthis miranda																	1	
Illex argentinus						12												
Kondakovia longimana											1			1	1			
Moroteuthis knipovitchi												1			3		1	2
Taonius sp.																		2
Todarodes sp.																		1
Fish (targeted/by-catch by fishery)																		
Dissostichus eleginoides		2							1									
Champsocephalus gunnari												1						
Macrourus holotrachys					1													
Fish (caught naturally)																		
Bathylagus sp.																	1	
Chaenocephalus aceratus													1					
Gobionotothen gibberifrons	1																	
Muraenolepsis microps							1											
Others																	2	
Pasiphaea scotiae											1							
Carrion (whale, seal)												2						
Total number of individuals/items	1	2	1	0	2	12	1	1	1	2	5	8	2	2	19	1	10	17

Appendix 1b. Trip duration and number of individuals consumed according to water mass for each wandering albatross (May–July 2000).

Bird number	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
Sex	M	M	M	M	M	M	M	F	F	F	F	M	F	F	F	M	M	F	F	F
Time spent (d) in Antarctic (AZ) waters	1.8	3.2	1.9	1.0	3.8	0.9	4.3	1.2	2.0	5.0	1.1	2.9	1.9	3.6	1.4	1.1	5.2	1.9	4.4	5.2
Time spent (d) in sub-Antarctic (SAZ) waters	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.1	4.2	9.2	7.9	6.3	1.9	3.7	5.2	8.5
Time spent (d) in subtropical (STZ) waters	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	6.4	3.3	4.4	3.9
Total trip duration (days)	1.8	3.2	1.9	1.0	3.8	0.9	4.3	1.2	2.0	5.0	1.1	15.0	6.0	12.8	9.3	8.8	13.4	8.9	14	18
Cephalopods																				
Alluroteuthis antarcticus											4									
Chiroteuthis sp.																			2	
Galiteuthis glacialis																		1		1
Gonatus antarcticus					1															
Histioteuthis eltaninae											1									
Histioteuthis macrohista																				1
Illex argentinus					1			6			2									
Kondakovia longimana							1													1
Moroteuthis knipovitchi																	1			
Taonius sp.														1						
Fish (targeted/by-catch by fishery)																				
Antimora rostrata					1												1			
Dissostichus eleginoides	1	1	1						3								1		1	
Macrourus holotrachys														1				1	1	
Sardinops sagax																		7		
Fish (caught naturally)																				
Anopterus pharao													1							
Chaenocephalus aceratus				1																
Diaphus sp.														1						
Gobionotothen gibberifrons											1									
Lionurius filicauda												1		1	1					
Pseudochaenichthys georgianus				1																
Ventrifossa nasuta								1												
Others																				
Themisto gaudichaudii										1										
Scyphozoa (jellyfish)																		1		
Carrion					1															1
Nematodes				2				2												
Total number of individuals/items	1	1	1	4	4	0	1	9	3	1	8	1	1	4	1	0	3	10	4	4

Appendix 2. List of parameters used to model prey distribution of wandering albatross satellite tracking and diet data.

Symbol	Definition	Unit
C	average catch rate in a particular water mass	individuals per unit time
CA	average catch rate in the Antarctic Zone (AZ)	individuals d^{-1}
CSA	average catch rate in the sub-Antarctic Zone (SAZ)	individuals d^{-1}
CSA, upper	upper catch rate in the sub-Antarctic Zone (STZ)	individuals d^{-1}
CST	average catch rate in the sub-Tropical Zone (STZ)	individuals d^{-1}
CST, upper	upper catch rate in the sub-Tropical Zone (STZ)	individuals d^{-1}
K	number of prey items in stomach	number of individuals
t	time spent foraging in a given water mass	d
tant	time spent foraging in AZ	d
tsa	time spent foraging in SAZ	d
tst	time spent foraging in STZ	d
i	bird that only foraged in AZ	–
j	bird that foraged in AZ and SAZ	–
l	bird that foraged in AZ, SAZ and STZ	–
o	bird of unspecified foraging route	–
x	unspecified water mass	–
E	absolute number of items caught by a bird while within a water mass	number of individuals
s	prey species	–
N	number of individuals	number of individuals
P	the probable number of individuals of a prey species caught within a particular water mass by a bird	number of individuals
T	total amount of time spent by all birds within a particular water mass	d
wt	amount of time spent in contact with salt-water in a particular water mass	d
R	average relative catch reward rate by a bird in a particular water mass	–

Appendix 3. The estimated effort (1/ ψ; lower and high estimates, or >) using trip duration data that an albatross has to spend in a given water mass to encounter a certain prey species (the values are given in days). (AZ – Antarctic waters; SAZ – Sub-Antarctic waters; STZ – Subtropical waters.)

	Water zones		
	AZ	SAZ	STZ
Cephalopods			
Alluroteuthis antarcticus	0.4–0.5	>1.5	0.5–1.0
Chiroteuthis sp.	1.5–2.2	>12.2	1.4–1.5
Galiteuthis glacialis	0.4–0.8	>1.4	0.4–0.5
Gonatus antarcticus	0.7–0.9	>6.7	>0.8
Histioteuthis atlantica	0.8–1.7	>2.6	>0.4
Histioteuthis eltaninae	0.3–0.9	>0.6	0.2–0.4
Histioteuthis macrohista	3.8–5.6	>31.9	5.2–6.2
Histioteuthis miranda	5.1–8.9	>24.9	>3.9
Illex argentinus	0.1–0.2	>0.7	
Kondakovia longimana	0.7–1.1	>3.4	1.3–1.8
Moroteuthis knipovitchi	0.8–2.1	>1.6	0.4–0.6
Taonius sp.	1.6–2.7	>8.7	>1.4
Fish			
Anopterus pharao	2.6–3.9	>16.6	
Antimora rostrata	1.7–1.8	>158.7	3.5–4.5
Chaenocephalus aceratus	1.5–1.8	>27.2	5.3–6.0
Champsocephalus gunnari	11.3–19.3	>69.4	2.4–2.5
Dissostichus eleginoides	>0.3	>19.9	1.3–1.5
Gobionotothen gibberifrons	>1.3		
Lionurius filicauda	0.9–1.6	>3.9	
Macrourus holotrachys	0.8–1.4	>4.9	1.9–2.2
Muraenolepsis microps	2.6–5.7	>10.2	
Pseudochaenichthys georgianus	2.6–5.7		
Sardinops sagax	0.8–1.2	>5.9	>0.5
Ventrifossa nasuta	>2.6		
Others			
Pasiphaea scotiae	2.9–5.4	>13.5	6.4–17.1
Themisto gaudichaudii	>2.6		

Appendix 4. Estimated probabilities (%) of albatross prey species being distributed in Antarctic (AZ), sub-Antarctic (SAZ) and subtropical (STZ) waters using trip duration.

	Water zones (% in range)		
	AZ	SAZ	STZ
Cephalopods			
Alluroteuthis antarcticus	52–59	0–17	31–41
Chiroteuthis sp.	35–51	0–7	49–58
Galiteuthis glacialis	30–49	0–17	51–52
Gonatus antarcticus	44–53	0–6	47–50
Histioteuthis atlantica	18–32	0–12	68–70
Histioteuthis eltaninae	22–42	0–34	43–58
Histioteuthis macrohista	45–62	0–8	38–48
Histioteuthis miranda	28–43	0–10	57–63
Illex argentinus	79–100	0–21	0
Kondakovia longimana	51–64	0–17	32–36
Moroteuthis knipovitchi	17–34	0–22	61–66
Taonius sp.	31–46	0–9	54–60
Fish			
Pseudochaenichthys georgianus	100	0	0
Ventrifossa nasuta	100	0	0
Anopterus pharao	81–100	0–19	0
Antimora rostrata	65–73	0–1	27–34
Chaenocephalus aceratus	71–79	0–5	21–24
Dissostichus eleginoides	81–85	0–1	15–18
Gobionotothen gibberifrons	100	0	0
Lionurius filicauda	70–100	0–30	0
Macrourus holotrachys	49–72	0–14	28–37
Muraenolepsis microps	64–100	0–36	0
Champsocephalus gunnari	11–18	0–34	82–86
Sardinops sagax	27–41	0–6	59–67
Others			
Pasiphaea scotiae	58–85	0–23	15–18
Themisto gaudichaudii	100	0	0