DATA REPOSITORY ITEM FOR: *A 45000-year record of Adélie Penguins and climate change in the Ross Sea, Antarctica*

TABLE DR1. SITES EXCAVATED IN THE ROSS SEA REGION, ANTARCTICA, IN 2004-2005.

Site	Location	Elevation (m)*	No. Levels†
Campo Icarus Site 2	74º 42' 45.2" S; 164º 06' 53.6" E	34	9
Campo Icarus Site 3	74º 42' 44.6" S; 164º 06' 43.4" E	41	6
North Adelie Cove Site 1	74º 44' 04.9" S; 164º 06' 37.0" E	54	7
North Adelie Cove Site 3	74º 43' 58.4" S; 164º 06' 21.7" E	105	3
Adelie Cove Site 3	74º 46' 05.8" S; 164º 00' 35.8" E	19	4
Inexpressible Island Site 3	74º 54' 18.0" S; 163º 43' 22.5" E	50	7
Inexpressible Island Site 4	74º 54' 17.2" S; 163º 43' 17.1 E	47	6
Edmonson Point Site 2	74º 19' 40.3" S; 165º 08' 07.8" E	32	3
Cape Hallett Beach Sample 2§	72º 19' 04.6" S; 170º 13' 24.9" E	1	-
Prior Island Site 1	75º 41' 26.5" S; 162º 52' 14.3" E	151	3
Prior Island Site 2	75º 41' 23.3" S; 162º 53' 17.4" E	100	5
Cape Hickey West Site 1	76º 05' 20.5" S; 162º 38' 20.9" E	46	2
Cape Hickey West Site 2	6º 05' 12.8" S; 162º 38' 15.0" E	49	4
Cape Hickey West Site 3	76º 05' 12.8" S; 162º 38' 16.1" E	52	3
Beaufort Island Site 1	76º 55' 47.5" S; 166º 53' 31.7 E	10	5
Beaufort Island Site 2	76º 55' 52.5" S; 166º 54' 15.1 E	22	7
Beaufort Island Molt Site§	76º 55' 51.5" S; 166º 54' 37.0 E	4	1

TABLE DR1 (CONTINUED).

Site	Location	Elevation (m)	No. Levels
Clear Lake Site 1	77º 32’ 22.9” S; 166º 09’ 12.1 E	13	3
Cape Adare Mound 3[§]	71º 18’ 15.5” S; 170º 12’ 14.7” E	3	1
Cape Adare Mound 4[§]	71º 18’ 19.6” S; 170º 12’ 39.3” E	24	2
Cape Adare Site 1[§]	71º 18’ 05.5” S; 170º 13’ 36.3” E	293	1
Cape Adare Site 2[§]	71º 18’ 05.5” S; 170º 13’ 33.3” E	285	1
Cape Adare Site 3[§]	71º 18’ 04.2” S; 170º 13’ 33.0” E	319	1

* All elevations are from GPS measurements re-calibrated daily with modern sea level.

[†]Most sites were sampled by excavating a 1x1 m pit in 5-cm levels.

[§]Indicates those sites that were sampled from exposures or test probes without excavation.

TABLE DR2. RADIOCARBON DATES FROM ADÉLIE PENGUIN EGGSHELL, BONE, AND FEATHER FROM THE ROSS SEA REGION, ANTARCTICA.

Lab No.	Site	Material	Uncorrected Age	2-σ Range (cal yr BP)*
NZA 20784	Cape Hickey Site 1 Level 2	eggshell	4226 ± 35	3470 – 3210
NZA 20785	Cape Hickey Site 1 Level 2	eggshell	4279 ± 45	3565 – 3260
NZA 20786	Cape Hickey Site 2 Level 2	eggshell	38230 ± 810	-
BETA 204544	Cape Hickey Site 2 Level 2	eggshell	41870 ± 1300	-
NZA 20904	Cape Hickey Site 2 Level 3	eggshell	34220 ± 500	-
NZA 20905	Cape Hickey Site 2 Level 4	eggshell	27170 ± 250	-
NZA 21056	Cape Hickey Site 2 Level 4	eggshell	35250 ± 620	-
BETA 204545	Cape Hickey Site 2 Level 4	eggshell	43010 ± 1400	-
BETA 202975	Cape Hickey Site 3 Level 1	eggshell	4650 ± 40	4050 – 3700
BETA 204546	Cape Hickey Site 3 Level 2	eggshell	37240 ± 700	-
NZA 20743	Campo Icarus Site 2 Level 3	bone	4053 ± 30	3315 – 2960
NZA 21106	Campo Icarus Site 2 Level 4	eggshell	3647 ± 35	2770 – 2480
NZA 20726	Campo Icarus Site 2 Level 5	bone	4504 ± 30	3830 – 3540
NZA 21057	Campo Icarus Site 2 Level 6	eggshell	4268 ± 50	3565 – 3240
NZA 20725	Campo Icarus Site 2 Level 7	bone	4507 ± 30	3830 – 3540
NZA 20787	Campo Icarus Site 2 Level 8	eggshell	6080 ± 45	5865 – 5570
NZA 21105	Campo Icarus Site 2 Level 9	eggshell	6144 ± 85	5950 – 5570
NZA 20727	Campo Icarus Site 3 Level 4	bone	4236 ± 35	3480 – 3225
NZA 21107	North Adélie Cove Site 1 Level 2	eggshell	5973 ± 50	5720 – 5445
NZA 21108	North Adélie Cove Site 1 Level 3	eggshell	5740 ± 55	5515 – 5130

TABLE DR2 (CONTINUED).

Lab No.	Site	Material	Uncorrected Age	2-σ Range (cal yr BP)
NZA 20729	North Adélie Cove Site 1 Level 4	bone	7162 ± 35	7020 – 6725
NZA 20744	North Adélie Cove Site 1 Level 5	bone	6993 ± 30	6800 – 6545
NZA 20745	North Adélie Cove Site 1 Level 6	bone	7088 ± 30	6935 – 6655
NZA 20746	North Adélie Cove Site 1 Level 7	bone	7177 ± 35	7060 – 6740
NZA 20728	North Adélie Cove Site 3 Level 2	bone	6297 ± 35	6090 – 5775
NZA 20747	Adelie Cove Site 3 Level 2	bone	1668 ± 30	620 – 450
NZA 20748	Adelie Cove Site 3 Level 4	bone	1809 ± 30	710 – 530
NZA 21134	Prior Island Site 1 Level 2	eggshell	4060 ± 30	3320 – 2970
NZA 20958	Prior Island Site 1 Level 3	feather	4317 ± 30	3590 – 3330
BETA 202949	Prior Island Site 2 Level 4	eggshell	4530 ± 50	3890 – 3540
BETA 202950	Prior Island Site 2 Level 5	eggshell	4450 ± 50	3810 – 3440
NZA 21135	Cape Hallett Beach Sample 2	eggshell	1985 ± 30	910 – 660
NZA 21155	Inexpressible Island Site 3 Level 3	eggshell	3127 ± 30	2140 – 1865
NZA 20749	Inexpressible Island Site 3 Level 4	bone	4166 ± 30	3405 – 3145
NZA 20750	Inexpressible Island Site 3 Level 6	bone	4208 ± 30	3455 – 3200
NZA 21156	Inexpressible Island Site 3 Level 7	eggshell	3831 ± 40	3000 – 2730
BETA 202951	Inexpressible Island Site 4 Level 5	eggshell	3500 ± 50	2700 – 2300
BETA 202952	Inexpressible Island Site 4 Level 6	eggshell	2210 ± 50	1160 – 890
NZA 21177	Edmonson Point Site 2 Level 2	eggshell	2542 ± 50	1495 – 1220
NZA 21136	Edmonson Point Site 2 Level 3	eggshell	2703 ± 30	1630 – 1365
NZA 20959	Edmonson Point Site 2 Level 3	feather	2605 ± 35	1525 – 1280

TABLE DR2 (CONTINUED).

Lab No.	Site	Material	Uncorrected Age	2-σ Range (cal yr BP)
BETA 202965	Cape Adare Mound 3 lower	eggshell	3090 ± 40	2110 – 1820
BETA 202966	Cape Adare Mound 3 lower	eggshell	3000 ± 40	1990 – 1700
BETA 202967	Cape Adare Mound 4 middle	bone	1980 ± 60	930 – 640
BETA 202968	Cape Adare Mound 4 lower	bone	2470 ± 40	1370 – 1160
BETA 202969	Cape Adare Mound 4 lower	eggshell	2430 ± 50	1350 – 1080
BETA 202972	Cape Adare Site 1 lower	eggshell	2140 ± 40	1050 – 790
BETA 202971	Cape Adare Site 2 lower	bone	2890 ± 50	1880 – 1550
BETA 202970	Cape Adare Site 3 lower	bone	2840 ± 60	1860 – 1490
BETA 202953	Clear Lake Site 1 Level 3	eggshell	1860 ± 50	780 – 540
BETA 202954	Clear Lake Site 1 Level 3	bone	1900 ± 60	880 – 560
BETA 202955	Beaufort Island Site 1 Level 3	eggshell	2220 ± 40	1160 – 910
BETA 202956	Beaufort Island Site 1 Level 4	eggshell	2210 ± 40	1140 – 900
BETA 202957	Beaufort Island Site 1 Level 5	eggshell	2240 ± 40	1170 – 920
BETA 202958	Beaufort Island Site 1 Level 5	bone	2390 ± 40	1290 – 1060
BETA 202961	Beaufort Island Site 2 Level 1	eggshell	1710 ± 40	640 – 480
BETA 202962	Beaufort Island Site 2 Level 3	eggshell	1880 ± 40	780 – 610
BETA 202963	Beaufort Island Site 2 Level 6	eggshell	2210 ± 40	1140 – 900
BETA 202964	Beaufort Island Site 2 Level 7	eggshell	2200 ± 40	1130 – 900
BETA 202960	Beaufort Island Molt Site, top	feather	>44000	
BETA 202959	Beaufort Island Molt Site, base	feather	>44000	
BETA 204543	Beaufort Island Molt Site, base	bone	>47600	

* Samples > 26000 ^{14}C yr BP cannot be calibrated.