Supplementary Data

Early Aboriginal pottery production and offshore island occupation on Jiigurru (Lizard Island Group), Great Barrier Reef, Australia

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Supplementary Table S1. Summary excavation data, South Island Headland Midden, Square A.

XU	Depth Below Surface (mm)	Mean Thickness (mm)	Weight (kg)	Munsell Soil Color®	Colour	pH
0	0.0	0.0	0.0	NA	NA	NA
1	11.5	11.5	11.9	7.5YR 2.5/1	Black	9
2	24.8	13.2	14.2	7.5YR 3/1	Very dark gray	8.5
3	44.2	19.4	14.7	7.5YR 3/1	Very dark gray	9
4	60.7	16.4	15.4	7.5YR 3/1	Very dark gray	9
5	79.4	18.8	18.0	7.5YR 3/1	Very dark gray	8.5
6	96.7	17.2	27.8	7.5YR 2.5/1	Black	9
7	121.0	24.3	23.5	7.5YR 3/1	Very dark gray	8.5
8	139.3	18.3	27.5	7.5YR 3/1	Very dark gray	10
9	147.3	8.0	19.2	7.5YR 2.5/1	Black	8.5
10	180.3	33.0	28.1	7.5YR 3/1	Very dark gray	9
11	195.5	15.2	23.0	7.5YR 3/1	Very dark gray	8.5
12	216.4	20.9	24.7	7.5YR 3/1	Very dark gray	8.5
13	235.5	19.1	21.8	7.5YR 3/1	Very dark gray	8.5
14	255.2	19.7	24.6	7.5YR 3/1	Very dark gray	8.5
15	272.8	17.6	25.4	7.5YR 3/1	Very dark gray	8.5
16	293.7	20.9	28.9	7.5YR 3/1	Very dark gray	8.5
17	317.5	23.9	30.3	7.5YR 3/1	Very dark gray	9
18	335.6	18.0	23.9	7.5YR 3/1	Very dark gray	8.5
19	358.7	23.1	22.0	7.5YR 3/1	Very dark gray	9
20	372.5	13.9	25.0	7.5YR 2.5/1	Black	8.5
21	395.0	22.4	30.2	7.5YR 3/1	Very dark gray	9
22	416.8	21.8	35.3	7.5YR 3/1	Very dark gray	8.5
23	434.7	17.9	20.2	7.5YR 3/1	Very dark gray	9
24	455.7	21.0	27.5	7.5YR 2.5/1	Black	8.5
25	474.5	18.9	27.2	7.5YR 3/1	Very dark gray	9
26	494.4	19.9	24.6	7.5YR 3/1	Very dark gray	8.5
27	517.7	23.2	25.0	7.5YR 3/1	Very dark gray	9
28	539.1	21.4	32.0	7.5YR 3/1	Very dark gray	9
29	557.4	18.3	17.2	7.5YR 3/1	Very dark gray	9
30	576.9	19.4	23.1	7.5YR 3/1	Very dark gray	9
31	598.0	21.1	28.9	7.5YR 3/1	Very dark gray	9
32	618.5	20.6	23.1	7.5YR 3/1	Very dark gray	8.5
33	636.1	17.6	24.8	7.5YR 3/1	Very dark gray	8.5
34	660.3	24.2	28.2	7.5YR 3/1	Very dark gray	8.5
35	680.5	20.2	18.1	7.5YR 3/1	Very dark gray	8.5
36	701.2	20.7	23.4	7.5YR 3/1	Very dark gray	9
37	723.9	22.7	27.3	7.5YR 3/2	Dark brown	9
38	741.7	17.8	18.7	7.5YR 3/2	Dark brown	9
39	763.7	22.0	26.6	7.5YR 3/1	Very dark gray	8.5
40	780.4	16.8	24.8	7.5YR 4/1	Dark gray	9
41	802.0	21.6	26.2	7.5YR 3/1	Very dark gray	9
42	820.3	18.3	19.6	7.5YR 3/1	Very dark gray	8.5
43	840.8	20.4	26.4	7.5YR 3/1	Very dark gray	8.5
44	857.7	16.9	25.6	7.5YR 3/1	Very dark gray	8.5
45	877.3	19.7	28.7	7.5YR 3/1	Very dark gray	9
46	895.9	18.6	14.5	7.5YR 3/1	Very dark gray	9
47	917.0	21.1	24.6	7.5YR 3/1	Very dark gray	9

48	938.4	21.4	26.5	7.5YR 3/1	Very dark gray	9
49A	960.3	21.9	21.3	7.5YR 3/1	Very dark gray	9
49B	957.8	19.4	4.1	7.5YR 4/1	Dark gray	8.5
50	979.2	18.9	14.1	7.5YR 4/1	Dark gray	9
51	997.7	18.4	19.1	7.5YR 4/1	Dark gray	9
52	1019.5	21.9	22.8	7.5YR 4/1	Dark gray	8.5
53	1043.3	23.8	15.7	7.5YR 4/1	Dark gray	8.5
54	1067.0	23.7	27.2	7.5YR 4/1	Dark gray	8.5
55A	1087.2	20.2	11.3	7.5YR 4/1	Dark gray	9
55B	1088.8	21.8	4.2	7.5YR 4/1	Dark gray	8.5
56A	1111.7	24.5	15.0	7.5YR 4/1	Dark gray	8.5
56B	1120.6	31.8	5.8	7.5YR 4/1	Dark gray	9
57A	1141.8	30.2	15.7	7.5YR 4/1	Dark gray	8.5
57B	1140.3	19.8	3.8	7.5YR 4/1	Dark gray	8.5
58A	1160.3	18.5	10.4	7.5YR 4/1	Dark gray	8.5
58B	1162.3	22.0	4.8	7.5YR 4/1	Dark gray	8.5
59A	1179.2	18.8	13.4	7.5YR 4/1	Dark gray	8.5
59B	1181.7	19.3	3.8	7.5YR 4/1	Dark gray	8.5
60A	1197.5	18.3	7.5	7.5YR 4/1	Dark gray	8.5
60B	1200.3	18.7	2.8	7.5YR 5/1	Gray	8.5
61A	1219.2	21.7	10.8	7.5YR 4/1	Dark gray	8.5
61B	1218.3	18.0	4.1	7.5YR 5/1	Gray	8.5
62A	1248.7	29.5	8.8	7.5YR 4/2	Brown	9
62B	1246.8	28.5	3.0	7.5YR 5/2	Brown	9
63A	1270.2	21.5	12.6	7.5YR 5/2	Brown	9
63B	1273.1	26.3	3.4	7.5YR 4/2	Brown	9
64A	1299.3	29.2	7.5	7.5YR 4/2	Brown	9.5
64B	1297.8	24.8	2.9	7.5YR 5/2	Brown	9.5
64C	1298.7	28.5	6.6	7.5YR 4/1	Dark gray	9
64D	1298.7	28.5	30.2	7.5YR 5/2	Brown	9
64E	1293.5	23.3	44.6	7.5YR 6/2	Pinkish gray	9
65A	1323.7	25.1	22.1	7.5YR 5/2	Brown	9.5
65B	1322.4	23.8	8.4	7.5YR 6/2	Pinkish gray	9.5
66A	1345.2	21.4	17.1	7.5YR 5/2	Brown	9
66B	1340.6	18.2	3.6	7.5YR 6/2	Pinkish gray	9.5
67A	1355.5	10.3	7.1	7.5YR 6/1	Gray	9
67B	1360.9	20.3	6.4	7.5YR 6/2	Pinkish gray	9
68A	1377.4	22.0	14.7	7.5YR 5/2	Brown	9
68B	1380.5	19.6	5.7	7.5YR 7/2	Pinkish gray	9
69A	1401.3	23.9	14.4	7.5YR 6/2	Pinkish gray	9
69B	1398.3	17.8	4.5	7.5YR 6/2	Pinkish gray	9
70A	1418.1	16.8	6.6	7.5YR 5/2	Brown	9
70B	1417.6	19.3	6.8	7.5YR 6/2	Pinkish gray	9.5
71A	1439.1	21.0	9.4	7.5YR 5/2	Brown	9
71B	1440.3	22.7	9.0	7.5YR 6/2	Pinkish gray	9.5
72A	1461.6	22.5	8.5	7.5YR 5/2	Brown	9
72B	1459.8	19.5	9.7	7.5YR 6/2	Pinkish gray	9
73A	1482.2	20.6	13.0	7.5YR 6/2	Pinkish gray	9
73B	1479.9	20.1	6.7	7.5YR 7/2	Pinkish gray	9
74A	1501.2	19.0	7.1	7.5YR 5/2	Brown	9.5
74B	1499.4	19.6	7.1	7.5YR 6/3	Light brown	9
75A	1524.7	23.5	7.3	7.5YR 5/2	Brown	9

75B	1519.2	19.8	7.5	7.5YR 7/2	Pinkish gray	9
76A	1542.3	17.6	6.0	7.5YR 5/2	Brown	9
76B	1540.6	21.4	7.0	7.5YR 7/2	Pinkish gray	9
77A	1561.1	18.8	8.0	7.5YR 6/2	Pinkish gray	9
77B	1562.3	21.8	8.8	7.5YR 7/2	Pinkish gray	9
78A	1581.2	20.1	7.0	7.5YR 5/2	Brown	9
78B	1583.7	21.4	7.6	7.5YR 6/2	Pinkish gray	9
79A	1603.2	22.0	6.0	7.5YR 6/2	Pinkish gray	9
79B	1601.6	17.9	7.5	7.5YR 7/2	Pinkish gray	9
80A	1620.2	17.0	8.0	7.5YR 6/2	Pinkish gray	9
80B	1622.3	20.8	7.0	7.5YR 7/2	Pinkish gray	9
81A	1640.7	20.6	7.2	7.5YR 6/2	Pinkish gray	9
81B	1640.7	18.4	5.9	7.5YR 7/2	Pinkish gray	9
82A	1662.8	22.1	5.8	7.5YR 7/2	Pinkish gray	9
82B	1660.6	19.9	8.2	7.5YR 7/2	Pinkish gray	9
83A	1679.6	16.8	5.5	7.5YR 5/2	Brown	9.5
83B	1680.3	19.8	8.2	7.5YR 7/2	Pinkish gray	9.5
84A	1699.7	20.1	6.3	7.5YR 6/2	Pinkish gray	9
84B	1699.9	19.6	7.7	7.5YR 7/2	Pinkish gray	9
85A	1723.3	23.6	2.9	7.5YR 6/2	Pinkish gray	9
85B	1719.7	19.8	7.9	7.5YR 7/2	Pinkish gray	9
86A	1743.6	20.3	5.8	7.5YR 5/2	Brown	9
86B	1739.9	20.3	10.0	7.5YR 7/2	Pinkish gray	9
87A	1771.0	27.4	6.1	7.5YR 5/2	Brown	9
87B	1758.9	18.9	9.2	7.5YR 7/2	Pinkish gray	9
88A	1778.9	7.8	3.8	7.5YR 6/2	Pinkish gray	9
88B	1779.7	20.8	7.9	7.5YR 7/2	Pinkish gray	9
89A	1801.2	22.3	5.2	7.5YR 6/2	Pinkish gray	9.5
89B	1799.1	19.4	8.5	7.5YR 7/2	Pinkish gray	9
90A	1823.7	22.5	4.7	7.5YR 6/2	Pinkish gray	9
90B	1822.3	23.3	8.5	7.5YR 6/2	Pinkish gray	9
91A	1841.8	18.2	4.2	7.5YR 6/2	Pinkish gray	9
91B	1844.2	21.9	9.8	7.5YR 7/2	Pinkish gray	9
92A	1862.5	20.7	5.0	7.5YR 6/2	Pinkish gray	9
92B	1862.4	18.3	8.7	7.5YR 6/3	Light brown	9
93A	1882.3	19.8	6.5	7.5YR 6/2	Pinkish gray	9
93B	1883.7	21.3	8.4	7.5YR 7/3	Pink	9
94A	1903.6	21.3	5.0	7.5YR 6/2	Pinkish gray	9
94B	1901.1	17.4	7.0	7.5YR 7/2	Pinkish gray	9
95A	1923.2	19.5	3.8	7.5YR 6/2	Pinkish gray	9
95B	1918.2	17.1	9.5	7.5YR 7/3	Pink	9
96A	1940.1	16.9	4.3	7.5YR 6/2	Pinkish gray	9
96B	1939.4	21.3	8.7	7.5YR 7/3	Pink	9
97A	1962.0	21.9	3.0	7.5YR 6/2	Pinkish gray	9
97B	1960.3	20.9	8.4	7.5YR 7/3	Pink	9
98A	1981.8	19.8	5.2	7.5YR 7/2	Pinkish gray	9
98B	1980.1	19.8	8.5	7.5YR 8/2	Pinkish white	9
99A	2000.6	18.8	3.3	7.5YR 6/2	Pinkish gray	9
99B	2001.1	21.0	9.0	7.5YR 8/2	Pinkish white	9
100A	2023.3	22.8	5.0	7.5YR 7/3	Pink	9
100B	2020.6	19.5	7.7	7.5YR 7/3	Pink	9
101	2042.2	18.9	12.3	7.5YR 7/3	Pink	8.5

102	2074.7	32.6	20.7	7.5YR 8/3	Pink	8.5
103	2091.6	16.9	8.7	7.5YR 8/3	Pink	9
104	2112.7	21.1	9.1	10YR 8/3	Very pale brown	9
105	2130.8	18.1	10.7	10YR 8/3	Very pale brown	9
106	2150.9	20.1	13.8	10YR 8/3	Very pale brown	9
107	2170.5	19.6	10.7	10YR 8/3	Very pale brown	9
108	2190.7	20.3	10.2	10YR 8/3	Very pale brown	9
109	2211.7	20.9	10.5	10YR 8/3	Very pale brown	9
110	2231.5	19.8	12.7	10YR 8/3	Very pale brown	9
111	2253.7	22.3	13.7	10YR 8/3	Very pale brown	9
112	2271.2	17.4	10.0	10YR 8/3	Very pale brown	9
113	2290.8	19.6	10.2	10YR 8/3	Very pale brown	9
114	2311.3	20.5	11.6	10YR 8/3	Very pale brown	9
115	2330.5	19.1	10.2	10YR 8/3	Very pale brown	8.5
116	2352.0	21.6	13.6	10YR 8/3	Very pale brown	8.5
117	2370.6	18.5	10.2	10YR 8/3	Very pale brown	8.5
118	2392.0	21.5	11.7	10YR 8/3	Very pale brown	8.5
119	2410.6	18.6	9.3	10YR 8/3	Very pale brown	8.5
120	2430.7	20.1	12.4	10YR 8/3	Very pale brown	8.5

Supplementary Table S2. Accelerator Mass Spectrometry ^{14}C ages obtained from the South Island Headland Midden, Square A. Radiocarbon ages were calibrated using OxCal (v.4.4) (Bronk Ramsey, 2009a) and the IntCal20 (Reimer et al., 2020) and Marine20 calibration datasets (Heaton et al., 2020). Marine radiocarbon ages were calibrated using a ΔR of -197±56 years for 5500-0 cal BP (5099-0 BP) and-38±158 years for 7000-5500 cal BP (6740-5099 BP) (see Methods). # = Objects were individually plotted in situ during excavation. CRA = Conventional radiocarbon age. $\delta^{13}C$ and $\delta^{18}O$ values were measured on solid sample (shell) or CO_2 gas prepared on AMS vacuum lines using a cavity ring-down CO_2 isotope analyser (CRDS) (Los Gatos Research model CCIA-46). Phosphoric acid (102%) was added to each ground shell sample (0.42-0.5 mg) to evolve CO_2. Samples were heated (72°C, ≥1 hr) to promote hydrolysis before analysis of the $\delta^{18}O$ and $\delta^{13}C$ values. IAEA International Atomic Energy Agency standards NBS-18 (calcite) and NBS-19 (limestone) were used to construct a two-point isotope calibration curve ($\delta^{13}C$=-5.014‰, $\delta^{18}O$=-23.2‰ and $\delta^{13}C$=1.95‰, $\delta^{18}O$=-2.20‰ respectively) and further evaluated using BDH ($\delta^{13}C$=-24.95‰, $\delta^{18}O$=-13.99‰) and Sigma ($\delta^{13}C$=-14.18‰, $\delta^{18}O$=-20.07‰) synthetic $CaCO_3$ standards (Beinlich et al., 2017). A drift correction is made after every two samples using 1500ppm CO_2 reference gas. $\delta^{13}C$ and $\delta^{18}O$ values are reported as ‰ V-PDB. Routine precision of 0.3‰ or better is typical as determined using sample reproducibility of duplicate measurements. $\delta^{13}C$ of four charcoal samples (Wk-46094, Wk-46095, Wk-46097, Wk-46098) was measured by Continuous-Flow Isotope Ratio Mass Spectrometry (CF-IRMS). 3 mg of dried and ground sample pressed into a sphere and loaded into an autosampler attached to a Europa Scientific ANCA-SL elemental analyser. Samples were introduced into a combustion reactor at ~1020°C and combusted in a temporarily enriched atmosphere of oxygen to convert the solid sample to CO_2. The resulting gases were swept through a reduction reactor, a water filter and onto a gas chromatograph column by the carrier gas Helium to separate the CO_2. A subsample of CO_2 was transferred into a Europa Scientific 20-20 Stable Isotope Analyser for the measurement of ^{13}C abundance. The CO_2 gas was ionised by the mass spectrometer and the area under the curves produced by the ion beams measured for ^{13}C abundance. Samples were analysed against a laboratory sucrose standard with delta value of -10.80, standardized against a certified CSIRO standard (calibrated relative to PDB). Instrument error is ~±0.3‰.

Lab. Code	Depth (cm)	XU	Field Specimen/ Object#	Sample	Species	$\delta^{13}C$ (‰)	$\delta^{18}O$ (‰)	Fraction Modern Carbon ($F^{14}C$)	CRA (years BP)	Unmodelled Calibrated Age (95.4%) (cal BP)	Median Calibrated Age (cal BP)
Wk-46094	4.4	3	7/1	charcoal	Unidentified	-24.96±0.3	na	97.1±0.2	235±16	152-308	289
Wk-46095	6.1	4	10/1	charcoal	Unidentified	-25.25±0.3	na	97.2±0.2	225±15	151-305	274
Wk-48792	6.1-7.9	5	12	marine shell	*Rochia nilotica*	2.82±0.25	-2.66±0.45	91.1±0.2	746±18	240-541	394
Wk-48793	11.4	7	412/1	marine shell	*Rochia nilotica*	3.18±0.25	-1.18±0.45	91.1±0.2	749±18	243-542	396
Wk-48794	30	16	43/1	marine shell	*Rochia nilotica*	2.35±0.25	-0.34±0.45	78.6±0.2	1936±19	1351-1721	1541
Wk-48795	35.9-37.3	20	52	marine shell	*Rochia nilotica*	2.84±0.25	-1.28±0.45	76.4±0.1	2158±13	1603-1995	1803
Wk-48796	45.6-47.5	25	63	marine shell	*Rochia nilotica*	3.24±0.25	-0.23±0.45	75.5±0.2	2260±19	1724-2126	1928
Wk-46096	49.3	26	67/1	marine shell	*Anadara antiquata*	1.23±0.20	-0.45±0.35	76±0.2	2206±16	1673-2074	1861
Wk-48797	55.7-57.7	30	76	marine shell	*Rochia nilotica*	1.72±0.25	-1.25±0.45	75.2±0.1	2286±13	1746-2156	1960
Wk-47850	57.7-59.8	31	79	charcoal	Polydrupe *Pandanus* endocarp	-25.10±0.30	Na	77±0.2	2099±17	2000-2116	2058

Wk-50059	57.7-59.8	31	79	marine shell	*Rochia nilotica*	2.67±0.30	-0.72±0.50	74.8±0.2	2334±25	1817-2260	2022
Wk-47851	59.8-61.9	32	83	charcoal	Polydrupe *Pandanus* endocarp	-25.40±0.30	Na	78.3±0.2	1969±16	1832-1979	1899
Wk-50060	59.8-61.9	32	83	marine shell	*Rochia nilotica*	2.38±0.30	-2.16±0.50	75±0.2	2307±24	1766-2206	1987
Wk-47852	61.9-63.6	33	85	charcoal	Polydrupe *Pandanus* endocarp	-25.00±0.30	Na	77.9±0.2	2002±16	1888-1993	1943
Wk-50061	61.9-63.6	33	85	marine shell	*Rochia nilotica*	2.34±0.30	-1.04±0.50	65.5±0.2	3393±24	3111-3516	3320
Wk-47853	63.6-66	34	87	charcoal	Polydrupe *Pandanus* endocarp	-24.40±0.30	Na	76.6±0.2	2142±16	2009-2294	2122
Wk-50062	63.6-66	34	87	marine shell	*Rochia nilotica*	3.02±0.30	-0.11±0.50	65.8±0.2	3366±24	3074-3474	3287
Wk-47854	66-68.1	35	89	charcoal	Polydrupe *Pandanus* endocarp	-25.20±0.30	Na	72.9±0.1	2540±16	2518-2740	2707
Wk-46097	66-68.1	35	89	charcoal	Unidentified	-25.45±0.30	Na	72.9±0.2	2535±17	2516-2739	2627
Wk-48798	66-68.1	35	89	marine shell	*Rochia nilotica*	3.16±0.25	-1.3±0.45	74.3±0.1	2382±14	1889-2295	2083
Wk-47855	68.1-70.1	36	93	charcoal	Polydrupe *Pandanus* endocarp	-24.3±0.30	Na	73±0.2	2524±17	2500-2729	2614
Wk-46098	68.1-70.1	36	93	charcoal	Unidentified	-25.26±0.30	Na	73.5±0.1	2473±15	2466-2707	2597
Wk-48799	68.1-70.1	36	93	marine shell	*Rochia nilotica*	3.21±0.25	-0.45±0.45	64.3±0.1	3543±13	3315-3702	3499
Wk-47856	70.1-72.4	37	100	charcoal	*Pandanus* indet endocarp	-26.00±0.30	Na	73.2±0.1	2508±16	2497-2723	2579
Wk-48800	70.1-72.4	37	100	marine shell	*Rochia nilotica*	3.29±0.25	-1.07±0.45	56.3±0.1	4613±14	4655-5125	4887
Wk-47857	72.4-74.2	38	106	charcoal	*Pandanus* indet endocarp	-24.2±0.30	Na	58.3±0.1	4332±17	4847-4960	4871
Wk-48801	72.4-74.2	38	106	marine shell	*Rochia nilotica*	2.99±0.25	-1.17±0.45	56.4±0.1	4598±16	4631-5101	4868
Wk-47858	74.2-76.4	39	110	charcoal	Polydrupe *Pandanus* endocarp	-25.6±0.30	NA	72.9±0.1	2535±16	2516-2739	2628
Wk-48802	74.2-76.4	39	110	marine shell	*Rochia nilotica*	2.59±0.25	-2.5±0.45	56.7±0.1	4564±15	4592-5037	4821
Wk-47859	76.4-78	40	116	charcoal	Polydrupe *Pandanus* endocarp	-26.3±0.30	Na	59.2±0.1	4209±19	4650-4842	4742
Wk-46554	76.4-78	40	116	marine shell	*Periglypta puerpera*	3.61±0.20	-0.10±0.35	48.5±0.1	5813±20	5674-6417	6063
Wk-48803	76.4-78	40	116	marine shell	*Rochia nilotica*	4.09±0.25	-0.65±0.45	50.9±0.1	5429±13	5274-6021	5654
Wk-48804	78-80.2	41	122	marine shell	*Rochia nilotica*	3.56±0.25	-0.32±0.45	49.5±0.1	5648±13	5537-6263	5887
Wk-48805	80.2-82	42	124	marine shell	*Rochia nilotica*	4.91±0.25	-0.74±0.45	51.5±0.1	5331±13	5141-5918	5544
Wk-49180	82-84.1	43	126	marine shell	*Rochia nilotica*	3.73±0.30	-0.18±0.55	56.9±0.1	4536±15	4555-4996	4782
Wk-48807	84.1-85.8	44	129	marine shell	*Rochia nilotica*	4.34±0.25	-0.55±0.45	47.7±0.1	5944±14	5837-6591	6202
Wk-48808	85.8-87.7	45	131	marine shell	*Rochia nilotica*	2.53±0.25	-1.46±0.45	47.8±0.1	5921±14	5796-6551	6177
Wk-46101	91.8	48	140/1	marine shell	*Anadara antiquata*	2.22±0.20	0.16±0.35	47.9±0.1	5920±16	5793-6550	6176
Wk-48809	97	50	241/1	marine shell	*Rochia nilotica*	2.82±0.25	-2.02±0.45	47.5±0.1	5979±14	5878-6624	6241
Wk-48810	106.7-108.7	55A	155	marine shell	*Rochia nilotica*	2.99±0.25	-1.07±0.45	48±0.1	5899±14	5763-6518	6153
Wk-48811	119.3	60A	408/1	marine shell	*Rochia nilotica*	3.03±0.25	-0.09±0.45	47.9±0.1	5916±17	5786-6545	6172

Wk-46102	119.7-121.9	61A	195/1	marine shell	*Asaphis violascens*	3.62±0.20	-0.35±0.35	47.3±0.1	6019±17	5908-6653	6286
Wk-48812	131.3	65A	230/1	marine shell	*Rochia nilotica*	3.11±0.25	-0.23±0.45	48.2±0.1	5856±16	5725-6470	6108
Wk-46555	137.9	69A	237/1	marine shell	*Barbatia foliata*	2.49±0.20	-0.17±0.35	47.9±0.1	5921±19	5793-6552	6177
Wk-48813	140.1-141.8	70A	242	marine shell	*Rochia nilotica*	2.01±0.25	-0.38±0.45	47.4±0.1	5996±13	5892-6635	6260
Wk-46556	153.7	76A	275/3	marine shell	*Saccostrea scyphophilla*	2.05±0.20	-0.53±0.35	47.2±0.1	6035±19	5919-6667	6304
Wk-48814	153.6	76A	277/5	marine shell	*Rochia nilotica*	3.40±0.25	-0.36±0.45	48.4±0.1	5828±15	5695-6438	6079
Wk-48815	161.7	80A	298/1	marine shell	*Rochia nilotica*	2.90±0.25	-1.08±0.45	47.5±0.1	5981±14	5880-6625	6243
Wk-48816	171.5	85A	336/4	marine shell	*Rochia nilotica*	3.62±0.25	0.83±0.45	47.3±0.1	6013±13	5905-6647	6280
Wk-48817	182.3	90A	357/1	marine shell	*Rochia nilotica*	4.27±0.25	0.43±0.45	47.3±0.1	6010±14	5902-6646	6276
Wk-46557	192.6	95A	383/1	marine shell	*Rochia nilotica*	4.08±0.20	0.88±0.35	47.2±0.1	6030±22	5914-6664	6299

Supplementary Table S3. U-Th ages obtained on corals from the South Island Headland Midden, Square A. WZ2010-45 and WZ2010-47 are *Acropora* sp. and WZ2010-44 is *Pocillopora* sp.

Lab. Code	XU	U (ppm)		^{232}Th (ppb)		(^{230}Th/^{232}Th)		(^{230}Th/^{238}U)		(^{234}U/^{238}U)		uncorr. ^{230}Th Age (ka)		corr. ^{230}Th Age (ka)		corr. ^{230}Th Age (cal BP)		corr. Initial (^{234}U/ ^{238}U)		δ^{234}U (T)	
		mean	2σ	mean	2σ	mean	2σ	mean	2σ	mean	2σ	mean	2σ	mean	2σ	mean	2σ	mean	2σ	mean	2σ
WZ2010-44	24	2.6763	0.0025	1.1139	0.0030	149.22	0.71	0.020470	0.000083	1.1434	0.0011	1.969	0.008	1.956	0.009	1886	9	1.1442	0.0011	144.2	1.1
WZ2010-45	32	3.4638	0.0025	2.4447	0.0045	91.83	0.36	0.021360	0.000076	1.1424	0.0010	2.057	0.008	2.040	0.008	1970	8	1.1432	0.0010	143.2	1.0
WZ2010-47	38	2.8057	0.0013	0.4012	0.0008	1075.63	3.69	0.050694	0.000145	1.1420	0.0015	4.947	0.016	4.939	0.016	4869	16	1.1440	0.0016	144.0	1.6

Supplementary Table S4. ΔR values calculated on paired U-Th/^{14}C dated corals from the South Island Headland Midden, Square A.

XU	U-Th Lab. Code	U-Th Age (cal BP)		^{14}C Lab. Code	δ^{13}C (‰)	^{14}C Age (BP)		ΔR (^{14}C yr)	
		mean	2σ			mean	1σ	mean	1σ
24	WZ2010-44	1886	9	OZZ664	-0.1	2176	21	-249	23
32	WZ2010-45	1970	8	OZZ662	-1.3	2270	20	-222	22
38	WZ2010-47	4869	16	OZZ665	-0.8	4507	24		
				OZZ665 rep	-1.0	4579	24		
				OZZ665 mean		4543	36	-275	41

Supplementary Table S5. ΔR values for the northern Great Barrier Reef. ΔR and associated uncertainty calculated using the online *deltar* software (Reimer and Reimer, 2017) and Marine20 data (Heaton et al., 2020).

	Lab ID	Sample ID	Sample Type	Sample Location	Collection Year (CE)	U-Th Age (cal BP)		^{14}C Age (BP)		ΔR (^{14}C year)		Reference
						mean	2σ	mean	1σ	mean	1σ	
Period 0-5.5 ka												
1	OZJ245	C.29757/1	shell	Murray Is. (9°55'S, 144°03'E)	1907			445	45			Hua et al. 2020
	OZJ247	C.29840/1	shell	Murray Is. (9°55'S, 144°03'E)	1907			480	30			Hua et al. 2020
	OZL273	C.29840/1	shell	Murray Is. (9°55'S, 144°03'E)	1907			380	30			Hua et al. 2020
		mean						*433*	*56*	*-176*	*57*	
2	OZU731	CLE S1C2	coral	Clerke Is. (11°58'S, 143°17'E)		187	5	552	19	-173	20	Hua et al. 2020
3	OZU737	GOR S3C2	coral	Gore Is. (11°59'S, 143°14'E)		237	21	544	23	-218	33	Hua et al. 2020
4	OZV813	GOR S1C4	coral	Gore Is. (11°59'S, 143°14'E)		1428	6	1808	18	-237	19	Hua et al. 2020
5	OZV810	GOR N002	coral	Gore Is. (11°59'S, 143°14'E)		2815	33	3030	26	-163	41	Hua et al. 2020
6	OZV811	GOR N004	coral	Gore Is. (11°59'S, 143°14'E)		3510	37	3540	22	-218	39	Hua et al. 2020
7	OZV812	GOR N006	coral	Gore Is. (11°59'S, 143°14'E)		4065	42	3938	22	-244	38	Hua et al. 2020
8	OZV809	GOR 005	coral	Gore Is. (11°59'S, 143°14'E)		4284	47	4083	29	-254	45	Hua et al. 2020
9	OZU741	HAG S3C2	coral	Haggerstone Is. (12°02'S, 143°17'E)		643	7	1121	24	-120	27	Hua et al. 2020
10	OZU740	HAG S2RFC1	coral	Haggerstone Is. (12°02'S, 143°17'E)		934	8	1467	24	-87	26	Hua et al. 2020
11	OZV816	HAG 006	coral	Haggerstone Is. (12°02'S, 143°17'E)		3874	38	3847	21	-189	39	Hua et al. 2020
12	OZV815	HAG 003	coral	Haggerstone Is. (12°02'S, 143°17'E)		3999	28	3878	23	-251	31	Hua et al. 2020
13	OZU738	HAG 002	coral	Haggerstone Is. (12°02'S, 143°17'E)		4592	33	4503	28	-80	37	Hua et al. 2020
14	OZU739	HAG 016	coral	Haggerstone Is. (12°02'S, 143°17'E)		5096	36	4778	29	-200	37	Hua et al. 2020
15	OZZ664	SQ.A - XU24 FS#61	coral	Lizard Is. (14°42'S, 145°25'E)		1886	9	2176	21	-249	23	This study
16	OZZ662	SQ.A - XU32 FS#83	coral	Lizard Is. (14°42'S, 145°25'E)		1970	8	2270	20	-222	22	This study
17	OZZ665	SQ.A - XU38 FS#106	coral	Lizard Is. (14°42'S, 145°25'E)		4869	16	4543	36	-275	41	This study
18	OZV804	ALR 043	coral	Alexandra Reef (16°31'S, 145°28'E)		4473	48	4319	28	-172	51	Hua et al. 2020
							weighted mean (n = 18)			***-197***	***56***	

Period 5.5-7.0 ka												
1	OZU732	CLE S2RFC1	coral	Clerke Is. (11°58'S, 143°17'E)		6273	35	6284	19	237	44	Hua et al. 2020
2	OZU733	GOR N010	coral	Gore Is. (11°59'S, 143°14'E)		5580	44	5162	27	-243	54	Hua et al. 2020
3	OZU734	GOR N019	coral	Gore Is. (11°59'S, 143°14'E)		5694	65	5718	23	197	63	Hua et al. 2020
4	OZU736	GOR S2RFC4	coral	Gore Is. (11°59'S, 143°14'E)		7009	52	6759	24	54	49	Hua et al. 2020
5	OZU735	GOR N021	coral	Gore Is. (11°59'S, 143°14'E)		7038	48	6611	27	-118	48	Hua et al. 2020
6	OZU745	HIG MA015E2	coral	High Is. (17°09'S, 146°00'E)		6611	18	6263	20	-93	26	Hua et al. 2020
7	OZU742	HIG 005C	coral	High Is. (17°09'S, 146°00'E)		6761	62	6237	33	-258	64	Hua et al. 2020
8	OZH575	Basal layer NEL03	coral	Magnetic Is. (19°10'S, 146°51'E)		6127	40	5870	50	-51	103	Lewis et al. 2012
9	OZH574	Outer layer NEL03	coral	Magnetic Is. (19°10'S, 146°51'E)		6007	90	5740	60	-28	62	Lewis et al. 2012
							weighted mean (n = 9)			***-38***	***158***	

Supplementary Table S6. OxCal code - “Charcoal Plus” Outlier model with IntCal20, South Island Headland Midden, Square A.

```
Plot()
 {
  Outlier_Model("General",T(5),U(0,4),"t");
  Outlier_Model("Charcoal_Plus",Prior("Charcoal_Plus"),U(0,3),"t");
  Sequence("")
  {
   Boundary("Start Headland Midden");
   Phase("")
   {
    Curve("Marine20","Marine20.14c");
    Delta_R("Higher MRE", -38, 158);
    R_Date("Wk-46557", 6030, 22)
    {
     Outlier("General",0.05);
     color="blue";
    };
    R_Date("Wk-48817", 6010, 14)
    {
     Outlier("General",0.05);
     color="blue";
    };
    R_Date("Wk-48816", 6013, 13)
    {
     Outlier("General",0.05);
     color="blue";
    };
    R_Date("Wk-48815", 5981, 14)
    {
```

```
 Outlier("General",0.05);
 color="blue";
};
R_Date("Wk-46556", 6035, 19)
{
 Outlier("General",0.05);
 color="blue";
};
R_Date("Wk-48814", 5828, 15)
{
 Outlier("General",0.05);
 color="blue";
};
R_Date("Wk-48813", 5996, 13)
{
 Outlier("General",0.05);
 color="blue";
};
R_Date("Wk-46555", 5921, 19)
{
 Outlier("General",0.05);
 color="blue";
};
R_Date("Wk-48812", 5856, 16)
{
 Outlier("General",0.05);
 color="blue";
};
R_Date("Wk-46102", 6019, 17)
{
 Outlier("General",0.05);
```

```
 color="blue";
};
R_Date("Wk-48811", 5916, 17)
{
 Outlier("General",0.05);
 color="blue";
};
R_Date("Wk-48810", 5899, 14)
{
 Outlier("General",0.05);
 color="blue";
};
R_Date("Wk-48809", 5979, 14)
{
 Outlier("General",0.05);
 color="blue";
};
R_Date("Wk-46101", 5920, 16)
{
 Outlier("General",0.05);
 color="blue";
};
R_Date("Wk-48808", 5921, 14)
{
 Outlier("General",0.05);
 color="blue";
};
R_Date("Wk-48807", 5944, 14)
{
 Outlier("General",0.05);
 color="blue";
```

```
 };
};
Boundary("End early occupation 1");
Boundary("Start early occupation 2");
Phase("")
{
 Curve("=Marine20");
 Delta_R("=Higher MRE");
 R_Date("Wk-48805", 5331, 13)
 {
  Outlier("General",0.05);
  color="blue";
 };
 R_Date("Wk-48804", 5648, 13)
 {
  Outlier("General",0.05);
  color="blue";
 };
 R_Date("Wk-48803", 5429, 13)
 {
  Outlier("General",0.05);
  color="blue";
 };
 R_Date("Wk-46554", 5813, 20)
 {
  Outlier("General",0.05);
  color="blue";
 };
};
Boundary("End early occupation 2");
Boundary("Start early charcoal horizon");
```

```
Phase("")
{
 Curve("=Marine20");
 Delta_R("Lower MRE", -197, 56);
 R_Date("Wk-48802", 4564, 15)
 {
  Outlier("General",0.05);
  color="green";
 };
 Curve("IntCal20","IntCal20.14c");
 R_Date("Wk-47857", 4332, 17)
 {
  Outlier("General",0.05);
  color="brown";
 };
 Curve("=Marine20");
 Delta_R("=Lower MRE");
 R_Date("Wk-48801", 4598, 16)
 {
  Outlier("General",0.05);
  color="green";
 };
 R_Date("Wk-48800", 4613, 14)
 {
  Outlier("General",0.05);
  color="green";
 };
};
Boundary("End early charcoal horizon");
Interval("Duration early charcoal horizon - intensive ceramic horizon");
Boundary("Start intensive ceramic horizon");
```

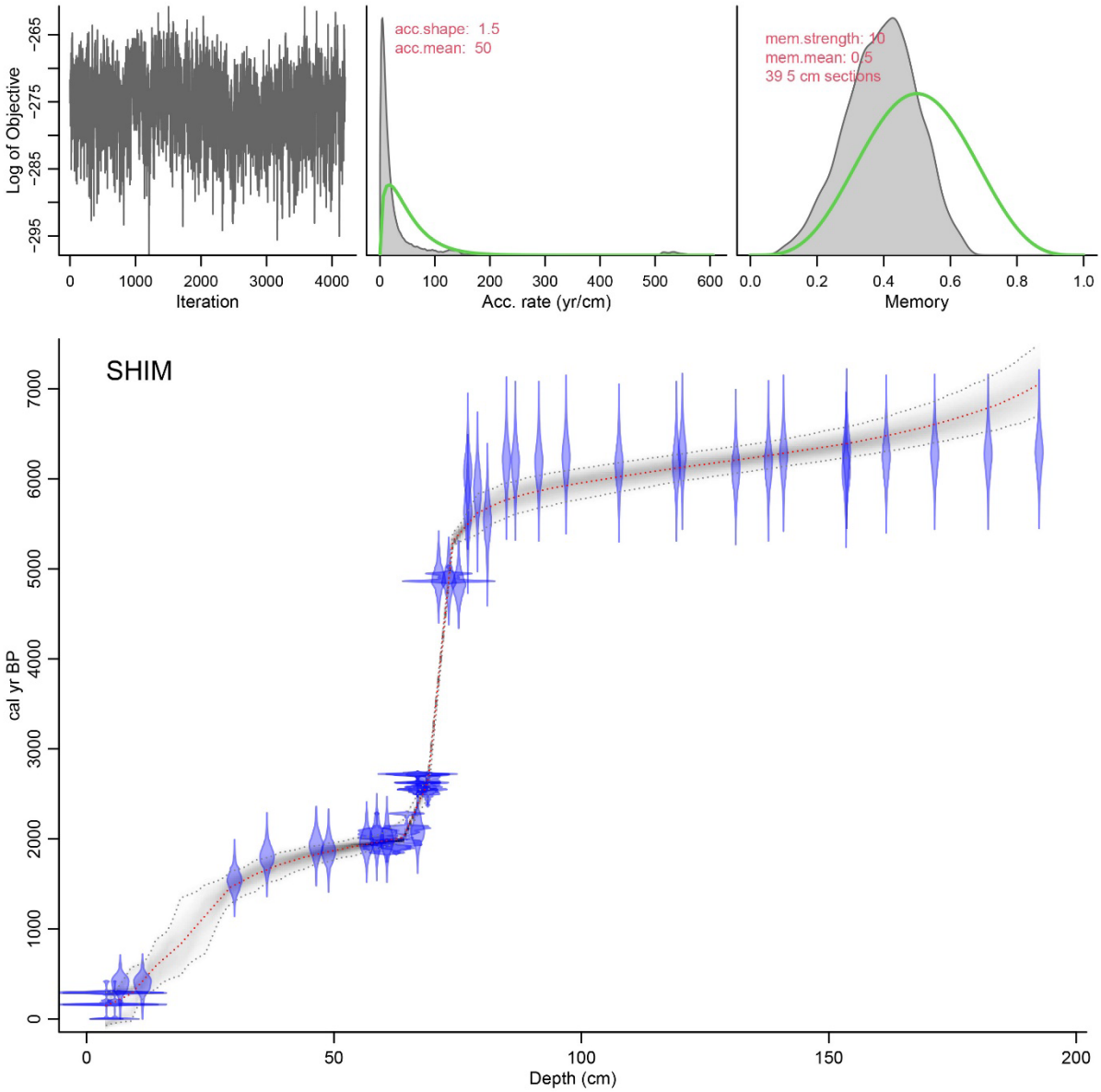
```
Phase("")
{
 Curve("=IntCal20");
 R_Date("Wk-47855", 2524, 17)
 {
  Outlier("General",0.05);
  color="brown";
 };
 R_Date("Wk-46098", 2473, 15)
 {
  Outlier("Charcoal_Plus",1);
  color="orange";
 };
 R_Date("Wk-47854", 2540, 16)
 {
  Outlier("General",0.05);
  color="brown";
 };
 R_Date("Wk-46097", 2535, 17)
 {
  Outlier("Charcoal_Plus",1);
  color="orange";
 };
 Curve("=Marine20");
 Delta_R("=Lower MRE");
 R_Date("Wk-48798", 2382, 14)
 {
  Outlier("General",0.05);
  color="green";
 };
 Curve("=IntCal20");
```

```
R_Date("Wk-47853", 2142, 16)
{
 Outlier("General",0.05);
 color="brown";
};
R_Date("Wk-47852", 2002, 16)
{
 Outlier("General",0.05);
 color="brown";
};
R_Date("Wk-47851", 1969, 16)
{
 Outlier("General",0.05);
 color="brown";
};
Curve("=Marine20");
Delta_R("=Lower MRE");
R_Date("Wk-50060", 2307, 24)
{
 Outlier("General",0.05);
 color="green";
};
Curve("=IntCal20");
R_Date("Wk-47850", 2099, 17)
{
 Outlier("General",0.05);
 color="brown";
};
Curve("=Marine20");
Delta_R("=Lower MRE");
R_Date("Wk-50059", 2334, 25)
```

```
 {
  Outlier("General",0.05);
  color="green";
 };
 R_Date("Wk-48797", 2286, 13)
 {
  Outlier("General",0.05);
  color="green";
 };
 Interval("Duration intensive ceramic horizon");
};
Boundary("End intensive ceramic horizon");
Boundary("Start late occupation 1");
Phase("")
{
 Curve("=Marine20");
 Delta_R("=Lower MRE");
 R_Date("Wk-46096", 2206, 16)
 {
  Outlier("General",0.05);
  color="green";
 };
 R_Date("Wk-48796", 2260, 19)
 {
  Outlier("General",0.05);
  color="green";
 };
 Interval("Duration late occupation 1");
};
Boundary("End late occupation 1");
Boundary("Start late occupation 2");
```

```
Phase("")
{
 Curve("=Marine20");
 Delta_R("=Lower MRE");
 R_Date("Wk-48795", 2158, 13)
 {
  Outlier("General",0.05);
  color="green";
 };
 R_Date("Wk-48794", 1936, 19)
 {
  Outlier("General",0.05);
  color="green";
 };
};
Boundary("End late occupation 2");
Interval("Duration late occupation 2 - late occupation 3");
Boundary("Start late occupation 3");
Phase("")
{
 Curve("=Marine20");
 Delta_R("=Lower MRE");
 R_Date("Wk-48793", 749, 18)
 {
  Outlier("General",0.05);
  color="green";
 };
 R_Date("Wk-48792", 746, 18)
 {
  Outlier("General",0.05);
  color="green";
```

```
  };
 };
 Boundary("End late occupation 3");
 Boundary("Start late occupation 4");
 Phase("")
 {
  Curve("=IntCal20");
  R_Date("Wk-46095", 225, 15)
  {
   Outlier("Charcoal_Plus",1);
   color="orange";
  };
  R_Date("Wk-46094", 235, 16)
  {
   Outlier("Charcoal_Plus",1);
   color="orange";
  };
 };
 Boundary("End Headland midden occupation");
};
};
```



Supplementary Figure S1. Age-depth model for South Island Headland Midden, Square A, constructed using *rbacon* (Blaauw and Christen 2011) at the 95% confidence interval. Top panel: left diagram depicts Markov Chain Monte Carlo (MCMC) iterations, and middle and right diagrams show model priors (green curves) and posteriors (shaded curves) for accumulation rate and memory effect, respectively. Bottom panel: unmodelled calendar age distributions are shown in blue, and the shaded grey curve represents uncertainty range (95% CI) of the age-depth model with red curve indicating 'the best' modelled ages based on the mean calendar age for each depth.

Supplementary Table S7. Age-depth *rbacon* (Blaauw and Christen, 2011) model for South Island Headland Midden, Square A. Constructed using at the 95% confidence interval.

Depth (cm)	Modelled cal Age (cal BP)			
	95% CI - Age Range		Median	Mean
4	297	-71	164	146
5	302	-55	234	172
6	324	-45	288	199
7	400	-37	296	225
8	482	-30	300	252
9	573	-24	306	278
10	589	108	348	340
11	614	204	388	402
12	661	269	465	464
13	750	310	533	526
14	882	325	591	588
15	917	387	634	637
16	956	424	688	685
17	1046	448	729	734
18	1188	466	774	782
19	1344	482	817	831
20	1365	566	879	894
21	1386	627	945	958
22	1407	661	1013	1021
23	1450	697	1092	1084
24	1494	728	1166	1148
25	1506	862	1220	1210
26	1526	995	1276	1273
27	1547	1114	1336	1335
28	1578	1212	1399	1398
29	1637	1273	1463	1460
30	1650	1312	1493	1489
31	1666	1348	1522	1518
32	1688	1377	1551	1546
33	1721	1395	1582	1575
34	1764	1410	1610	1604
35	1773	1459	1631	1626
36	1785	1494	1652	1648
37	1799	1519	1674	1670
38	1821	1535	1698	1693
39	1848	1545	1720	1715
40	1857	1580	1735	1731
41	1868	1610	1753	1747
42	1877	1631	1770	1764
43	1891	1651	1786	1780
44	1909	1664	1802	1796
45	1915	1691	1813	1809

46	1921	1712	1825	1821
47	1927	1728	1837	1834
48	1937	1739	1850	1846
49	1953	1750	1862	1859
50	1959	1767	1872	1870
51	1968	1786	1883	1881
52	1977	1797	1895	1892
53	1991	1803	1907	1903
54	2007	1809	1920	1914
55	2012	1831	1928	1925
56	2018	1849	1936	1935
57	2024	1865	1943	1945
58	2030	1879	1950	1956
59	2042	1886	1960	1966
60	2070	1909	1966	1976
61	2103	1925	1973	1986
62	2139	1938	1980	1996
63	2175	1946	1988	2006
64	2212	1955	1995	2016
65	2307	2073	2127	2140
66	2405	2177	2259	2264
67	2504	2273	2389	2388
68	2602	2365	2518	2513
69	2719	2453	2649	2637
70	3241	3021	3180	3171
71	3773	3593	3713	3705
72	4309	4154	4240	4240
73	4849	4707	4763	4774
74	5400	5246	5293	5308
75	5462	5292	5367	5371
76	5537	5315	5437	5434
77	5628	5339	5499	5497
78	5729	5360	5560	5559
79	5836	5381	5622	5622
80	5848	5428	5648	5648
81	5866	5469	5674	5674
82	5888	5499	5700	5700
83	5912	5526	5727	5726
84	5946	5546	5754	5752
85	5954	5571	5769	5769
86	5964	5595	5785	5786
87	5977	5614	5802	5802
88	5994	5626	5820	5819
89	6015	5639	5838	5835
90	6023	5657	5851	5847
91	6030	5671	5864	5860

92	6042	5684	5877	5872
93	6056	5694	5890	5884
94	6069	5701	5903	5896
95	6075	5721	5913	5906
96	6083	5733	5923	5916
97	6089	5745	5934	5926
98	6099	5755	5943	5936
99	6110	5763	5952	5946
100	6116	5776	5961	5955
101	6124	5785	5970	5964
102	6132	5797	5978	5973
103	6140	5807	5986	5982
104	6151	5814	5994	5990
105	6158	5829	6002	5999
106	6166	5839	6012	6008
107	6174	5850	6020	6017
108	6183	5860	6029	6026
109	6194	5869	6037	6035
110	6200	5877	6046	6043
111	6206	5887	6054	6052
112	6214	5897	6062	6060
113	6223	5905	6071	6068
114	6232	5913	6079	6077
115	6237	5926	6088	6085
116	6244	5938	6096	6093
117	6250	5946	6104	6101
118	6260	5956	6112	6110
119	6268	5963	6120	6118
120	6274	5973	6127	6125
121	6283	5983	6134	6133
122	6292	5991	6141	6140
123	6301	5997	6148	6148
124	6310	6003	6155	6155
125	6316	6014	6163	6162
126	6322	6022	6169	6170
127	6329	6030	6177	6177
128	6338	6037	6185	6184
129	6346	6043	6191	6191
130	6352	6052	6199	6199
131	6358	6061	6206	6207
132	6366	6069	6214	6214
133	6375	6075	6222	6222
134	6382	6080	6229	6229
135	6389	6089	6237	6237
136	6395	6100	6245	6245
137	6403	6107	6253	6253

138	6413	6113	6260	6261
139	6424	6119	6267	6269
140	6432	6130	6274	6277
141	6440	6140	6284	6285
142	6451	6147	6292	6294
143	6463	6155	6299	6302
144	6476	6160	6307	6311
145	6482	6168	6316	6319
146	6491	6176	6324	6328
147	6504	6183	6332	6336
148	6517	6191	6340	6344
149	6534	6199	6348	6353
150	6542	6208	6356	6361
151	6551	6217	6365	6370
152	6561	6224	6373	6378
153	6570	6231	6381	6387
154	6581	6236	6390	6395
155	6593	6247	6400	6406
156	6606	6257	6410	6416
157	6619	6266	6419	6427
158	6637	6272	6430	6437
159	6652	6278	6441	6448
160	6664	6290	6452	6460
161	6678	6302	6465	6471
162	6692	6311	6476	6483
163	6714	6317	6488	6495
164	6736	6322	6500	6506
165	6749	6336	6512	6519
166	6764	6346	6524	6532
167	6782	6356	6537	6544
168	6799	6365	6550	6557
169	6822	6372	6562	6570
170	6835	6387	6576	6585
171	6852	6398	6591	6600
172	6875	6407	6606	6614
173	6897	6417	6621	6629
174	6929	6425	6636	6644
175	6945	6441	6654	6661
176	6965	6452	6670	6678
177	6987	6463	6686	6695
178	7015	6474	6701	6711
179	7052	6481	6715	6728
180	7067	6499	6736	6747
181	7084	6513	6753	6765
182	7114	6525	6773	6784
183	7144	6533	6790	6803

184	7179	6542	6809	6821
185	7203	6563	6834	6846
186	7232	6583	6862	6872
187	7268	6598	6887	6897
188	7305	6608	6911	6922
189	7354	6619	6935	6947
190	7393	6650	6966	6977
191	7432	6673	6996	7007
192	7477	6690	7028	7037

Supplementary Table S8. Key deposit characteristics, South Island Headland Midden, Square A.

Series	XU	Depth (mm)	Munsell Soil Color®	Colour	pH	Ceramic (n)	Ceramic (g)	Charcoal (125µm)	Charcoal (250µm)	Mass Susceptibility (m^3/kg)
A	1	11.5	7.5YR 2.5/1	Black	9.0			0	0	2.37737E-07
A	2	24.8	7.5YR 3/1	Very dark gray	8.5			5	0	3.65866E-07
A	3	44.2	7.5YR 3/1	Very dark gray	9.0			2	0	3.46957E-07
A	4	60.7	7.5YR 3/1	Very dark gray	9.0			3	2	3.39441E-07
A	5	79.4	7.5YR 3/1	Very dark gray	8.5			8	1	3.8751E-07
A	6	96.7	7.5YR 2.5/1	Black	9.0			0	0	3.29291E-07
A	7	121.0	7.5YR 3/1	Very dark gray	8.5			0	1	3.03251E-07
A	8	139.3	7.5YR 3/1	Very dark gray	10.0			1	0	3.09302E-07
A	9	147.3	7.5YR 2.5/1	Black	8.5			2	0	2.82203E-07
A	10	180.3	7.5YR 3/1	Very dark gray	9.0			1	1	2.53183E-07
A	11	195.5	7.5YR 3/1	Very dark gray	8.5			0	0	2.92852E-07
A	12	216.4	7.5YR 3/1	Very dark gray	8.5			1	0	2.70235E-07
A	13	235.5	7.5YR 3/1	Very dark gray	8.5			0	0	2.96962E-07
A	14	255.2	7.5YR 3/1	Very dark gray	8.5			0	0	2.71988E-07
A	15	272.8	7.5YR 3/1	Very dark gray	8.5			0	0	2.80626E-07
A	16	293.7	7.5YR 3/1	Very dark gray	8.5			0	0	2.76486E-07
A	17	317.5	7.5YR 3/1	Very dark gray	9.0			0	0	2.66126E-07
A	18	335.6	7.5YR 3/1	Very dark gray	8.5			1	0	3.25521E-07
A	19	358.7	7.5YR 3/1	Very dark gray	9.0			0	0	2.7651E-07
A	20	372.5	7.5YR 2.5/1	Black	8.5			0	0	3.23919E-07
A	21	395.0	7.5YR 3/1	Very dark gray	9.0			0	0	2.18247E-07
A	22	416.8	7.5YR 3/1	Very dark gray	8.5			0	0	2.32523E-07
A	23	434.7	7.5YR 3/1	Very dark gray	9.0	1	0.4423	0	0	1.90602E-07
A	24	455.7	7.5YR 2.5/1	Black	8.5			1	0	2.31916E-07
A	25	474.5	7.5YR 3/1	Very dark gray	9.0	1	0.6430	1	0	2.11665E-07
A	26	494.4	7.5YR 3/1	Very dark gray	8.5			0	0	2.32368E-07
A	27	517.7	7.5YR 3/1	Very dark gray	9.0			0	2	2.11541E-07

A	28	539.1	7.5YR 3/1	Very dark gray	9.0			0	0	2.16555E-07
A	29	557.4	7.5YR 3/1	Very dark gray	9.0	1	3.8800	0	0	2.5892E-07
A	30	576.9	7.5YR 3/1	Very dark gray	9.0			0	0	2.69649E-07
A	31	598.0	7.5YR 3/1	Very dark gray	9.0			0	0	2.89706E-07
A	32	618.5	7.5YR 3/1	Very dark gray	8.5	7	8.6514	0	0	2.47547E-07
A	33	636.1	7.5YR 3/1	Very dark gray	8.5	4	10.8799	2	5	2.5021E-07
A	34	660.3	7.5YR 3/1	Very dark gray	8.5	8	2.4292	0	0	2.95309E-07
A	35	680.5	7.5YR 3/1	Very dark gray	8.5	10	27.2082	1	0	2.98631E-07
A	36	701.2	7.5YR 3/1	Very dark gray	9.0	20	42.8747	0	0	3.07571E-07
A	37	723.9	7.5YR 3/2	Dark brown	9.0	10	14.5864	0	0	2.67745E-07
A	38	741.7	7.5YR 3/2	Dark brown	9.0	6	15.9108	1	0	2.79817E-07
A	39	763.7	7.5YR 3/1	Very dark gray	8.5	9	66.1427	1	0	2.31704E-07
A	40	780.4	7.5YR 4/1	Dark gray	9.0	2	6.5150	1	0	2.71754E-07
A	41	802.0	7.5YR 3/1	Very dark gray	9.0	2	0.1768	0	0	3.79788E-07
A	42	820.3	7.5YR 3/1	Very dark gray	8.5	1	0.1647	0	0	3.41212E-07
A	43	840.8	7.5YR 3/1	Very dark gray	8.5			0	1	3.89704E-07
A	44	857.7	7.5YR 3/1	Very dark gray	8.5			0	0	3.37346E-07
A	45	877.3	7.5YR 3/1	Very dark gray	9.0			0	0	2.51987E-07
A	46	895.9	7.5YR 3/1	Very dark gray	9.0			0	0	2.93696E-07
A	47	917.0	7.5YR 3/1	Very dark gray	9.0			0	0	2.50736E-07
A	48	938.4	7.5YR 3/1	Very dark gray	9.0			0	0	2.46334E-07
A	49A	960.3	7.5YR 3/1	Very dark gray	9.0			0	0	2.16342E-07
B	49B	957.8	7.5YR 4/1	Dark gray	8.5			1	0	1.50079E-07
A	50	979.2	7.5YR 4/1	Dark gray	9.0			1	0	2.19174E-07
A	51	997.7	7.5YR 4/1	Dark gray	9.0			1	0	2.06615E-07
A	52	1019.5	7.5YR 4/1	Dark gray	8.5			0	0	2.16597E-07
A	53	1043.3	7.5YR 4/1	Dark gray	8.5			0	0	2.012E-07
A	54	1067.0	7.5YR 4/1	Dark gray	8.5			2	3	2.8521E-07
A	55A	1087.2	7.5YR 4/1	Dark gray	9.0			0	0	2.03902E-07
B	55B	1088.8	7.5YR 4/1	Dark gray	8.5			0	0	1.0949E-07

A	56A	1111.7	7.5YR 4/1	Dark gray	8.5			0	0	1.85273E-07
B	56B	1120.6	7.5YR 4/1	Dark gray	9.0			0	0	1.15986E-07
A	57A	1141.8	7.5YR 4/1	Dark gray	8.5			1	0	2.53824E-07
B	57B	1140.3	7.5YR 4/1	Dark gray	8.5			0	0	1.07046E-07
A	58A	1160.3	7.5YR 4/1	Dark gray	8.5			0	0	1.72076E-07
B	58B	1162.3	7.5YR 4/1	Dark gray	8.5			0	0	1.10268E-07
A	59A	1179.2	7.5YR 4/1	Dark gray	8.5			2	0	1.9781E-07
B	59B	1181.7	7.5YR 4/1	Dark gray	8.5			0	0	9.99389E-08
A	60A	1197.5	7.5YR 4/1	Dark gray	8.5			0	0	1.8379E-07
B	60B	1200.3	7.5YR 5/1	Gray	8.5			0	0	9.86565E-08
A	61A	1219.2	7.5YR 4/1	Dark gray	8.5			0	0	1.43825E-07
B	61B	1218.3	7.5YR 5/1	Gray	8.5			0	0	1.15174E-07
A	62A	1248.7	7.5YR 4/2	Brown	9.0			0	0	1.26134E-07
B	62B	1246.8	7.5YR 5/2	Brown	9.0			0	0	1.03189E-07
A	63A	1270.2	7.5YR 5/2	Brown	9.0			0	0	1.26096E-07
B	63B	1273.1	7.5YR 4/2	Brown	9.0			0	0	1.00856E-07
A	64A	1299.3	7.5YR 4/2	Brown	9.5			0	0	1.15625E-07
B	64B	1297.8	7.5YR 5/2	Brown	9.5			0	0	1.0506E-07
A	65A	1323.7	7.5YR 5/2	Brown	9.5			0	0	1.08429E-07
B	65B	1322.4	7.5YR 6/2	Pinkish gray	9.5			0	0	1.04355E-07
A	66A	1345.2	7.5YR 5/2	Brown	9.0			0	0	1.2231E-07
B	66B	1340.6	7.5YR 6/2	Pinkish gray	9.5			1	0	8.15543E-08
A	67A	1355.5	7.5YR 6/1	Gray	9.0			0	0	9.42691E-08
B	67B	1360.9	7.5YR 6/2	Pinkish gray	9.0			0	0	7.98012E-08
A	68A	1377.4	7.5YR 5/2	Brown	9.0			0	0	1.30114E-07
B	68B	1380.5	7.5YR 7/2	Pinkish gray	9.0			0	0	7.22391E-08
A	69A	1401.3	7.5YR 6/2	Pinkish gray	9.0			0	0	1.18407E-07
B	69B	1398.3	7.5YR 6/2	Pinkish gray	9.0			0	0	6.68625E-08
A	70A	1418.1	7.5YR 5/2	Brown	9.0			0	0	1.68629E-07
B	70B	1417.6	7.5YR 6/2	Pinkish gray	9.5			0	0	9.25381E-08

A	71A	1439.1	7.5YR 5/2	Brown	9.0			1	0	1.48381E-07
B	71B	1440.3	7.5YR 6/2	Pinkish gray	9.5			0	0	1.07308E-07
A	72A	1461.6	7.5YR 5/2	Brown	9.0			0	0	1.699E-07
B	72B	1459.8	7.5YR 6/2	Pinkish gray	9.0			0	0	8.12584E-08
A	73A	1482.2	7.5YR 6/2	Pinkish gray	9.0			0	0	1.20101E-07
B	73B	1479.9	7.5YR 7/2	Pinkish gray	9.0			1	0	8.45317E-08
A	74A	1501.2	7.5YR 5/2	Brown	9.5			0	0	1.46699E-07
B	74B	1499.4	7.5YR 6/3	Light brown	9.0			0	0	8.02906E-08
A	75A	1524.7	7.5YR 5/2	Brown	9.0			1	0	1.58197E-07
B	75B	1519.2	7.5YR 7/2	Pinkish gray	9.0			0	0	7.39111E-08
A	76A	1542.3	7.5YR 5/2	Brown	9.0			0	0	1.53524E-07
B	76B	1540.6	7.5YR 7/2	Pinkish gray	9.0			0	0	7.44378E-08
A	77A	1561.1	7.5YR 6/2	Pinkish gray	9.0			0	0	1.37129E-07
B	77B	1562.3	7.5YR 7/2	Pinkish gray	9.0			0	0	7.42023E-08
A	78A	1581.2	7.5YR 5/2	Brown	9.0			0	0	1.48947E-07
B	78B	1583.7	7.5YR 6/2	Pinkish gray	9.0			0	0	1.03821E-07
A	79A	1603.2	7.5YR 6/2	Pinkish gray	9.0			0	0	1.48271E-07
B	79B	1601.6	7.5YR 7/2	Pinkish gray	9.0			0	0	7.33205E-08
A	80A	1620.2	7.5YR 6/2	Pinkish gray	9.0			0	0	1.4317E-07
B	80B	1622.3	7.5YR 7/2	Pinkish gray	9.0			0	0	6.82171E-08
A	81A	1640.7	7.5YR 6/2	Pinkish gray	9.0			0	0	1.46224E-07
B	81B	1640.7	7.5YR 7/2	Pinkish gray	9.0			0	0	7.17359E-08
A	82A	1662.8	7.5YR 7/2	Pinkish gray	9.0			0	0	1.38346E-07
B	82B	1660.6	7.5YR 7/2	Pinkish gray	9.0			0	0	6.50695E-08
A	83A	1679.6	7.5YR 5/2	Brown	9.5			0	0	1.32045E-07
B	83B	1680.3	7.5YR 7/2	Pinkish gray	9.5			0	0	5.61804E-08
A	84A	1699.7	7.5YR 6/2	Pinkish gray	9.0			0	0	1.49363E-07
B	84B	1699.9	7.5YR 7/2	Pinkish gray	9.0			0	0	6.27613E-08
A	85A	1723.3	7.5YR 6/2	Pinkish gray	9.0			0	0	1.47217E-07
B	85B	1719.7	7.5YR 7/2	Pinkish gray	9.0			0	0	5.87172E-08

A	86A	1743.6	7.5YR 5/2	Brown	9.0			0	0	1.49985E-07
B	86B	1739.9	7.5YR 7/2	Pinkish gray	9.0			0	0	5.87892E-08
A	87A	1771.0	7.5YR 5/2	Brown	9.0			0	0	1.3033E-07
B	87B	1758.9	7.5YR 7/2	Pinkish gray	9.0			0	0	5.86762E-08
A	88A	1778.9	7.5YR 6/2	Pinkish gray	9.0			0	0	1.16624E-07
B	88B	1779.7	7.5YR 7/2	Pinkish gray	9.0			0	0	5.17318E-08
A	89A	1801.2	7.5YR 6/2	Pinkish gray	9.5			0	0	1.18201E-07
B	89B	1799.1	7.5YR 7/2	Pinkish gray	9.0			0	0	5.71737E-08
A	90A	1823.7	7.5YR 6/2	Pinkish gray	9.0			0	0	1.22199E-07
B	90B	1822.3	7.5YR 6/2	Pinkish gray	9.0			0	0	4.94101E-08
A	91A	1841.8	7.5YR 6/2	Pinkish gray	9.0			0	0	1.32257E-07
B	91B	1844.2	7.5YR 7/2	Pinkish gray	9.0			0	0	4.83876E-08
A	92A	1862.5	7.5YR 6/2	Pinkish gray	9.0			0	0	1.18156E-07
B	92B	1862.4	7.5YR 6/3	Light brown	9.0			0	0	4.88907E-08
A	93A	1882.3	7.5YR 6/2	Pinkish gray	9.0			0	0	1.30448E-07
B	93B	1883.7	7.5YR 7/3	Pink	9.0			0	0	3.99861E-08
A	94A	1903.6	7.5YR 6/2	Pinkish gray	9.0			0	0	1.41304E-07
B	94B	1901.1	7.5YR 7/2	Pinkish gray	9.0			0	0	4.22887E-08
A	95A	1923.2	7.5YR 6/2	Pinkish gray	9.0			0	0	1.20679E-07
B	95B	1918.2	7.5YR 7/3	Pink	9.0			0	0	3.72517E-08
A	96A	1940.1	7.5YR 6/2	Pinkish gray	9.0			0	0	1.13265E-07
B	96B	1939.4	7.5YR 7/3	Pink	9.0			0	0	3.45722E-08
A	97A	1962.0	7.5YR 6/2	Pinkish gray	9.0			0	0	1.21638E-07
B	97B	1960.3	7.5YR 7/3	Pink	9.0			0	0	3.35664E-08
A	98A	1981.8	7.5YR 7/2	Pinkish gray	9.0			0	0	9.68715E-08
B	98B	1980.1	7.5YR 8/2	Pinkish white	9.0			0	0	3.76357E-08
A	99A	2000.6	7.5YR 6/2	Pinkish gray	9.0			0	0	8.70261E-08
B	99B	2001.1	7.5YR 8/2	Pinkish white	9.0			0	0	3.82965E-08
A	100A	2023.3	7.5YR 7/3	Pink	9.0			0	0	8.57561E-08
B	100B	2020.6	7.5YR 7/3	Pink	9.0			0	0	4.27757E-08

A	101	2042.2	7.5YR 7/3	Pink	8.5			0	0	4.78154E-08
A	102	2074.7	7.5YR 8/3	Pink	8.5			0	0	2.13457E-08
A	103	2091.6	7.5YR 8/3	Pink	9.0			0	0	2.70508E-08
A	104	2112.7	10YR 8/3	Very pale brown	9.0			0	0	2.35997E-08
A	105	2130.8	10YR 8/3	Very pale brown	9.0			0	0	2.49312E-08
A	106	2150.9	10YR 8/3	Very pale brown	9.0			1	0	2.1609E-08
A	107	2170.5	10YR 8/3	Very pale brown	9.0			0	0	2.33011E-08
A	108	2190.7	10YR 8/3	Very pale brown	9.0			0	0	2.36953E-08
A	109	2211.7	10YR 8/3	Very pale brown	9.0			0	0	1.93182E-08
A	110	2231.5	10YR 8/3	Very pale brown	9.0			0	0	2.01901E-08
A	111	2253.7	10YR 8/3	Very pale brown	9.0			0	0	1.88672E-08
A	112	2271.2	10YR 8/3	Very pale brown	9.0			0	0	2.03165E-08
A	113	2290.8	10YR 8/3	Very pale brown	9.0			0	0	1.76288E-08
A	114	2311.3	10YR 8/3	Very pale brown	9.0			0	0	1.61602E-08
A	115	2330.5	10YR 8/3	Very pale brown	8.5			0	0	1.78728E-08
A	116	2352.0	10YR 8/3	Very pale brown	8.5			0	0	1.55816E-08
A	117	2370.6	10YR 8/3	Very pale brown	8.5			0	0	1.70443E-08
A	118	2392.0	10YR 8/3	Very pale brown	8.5			0	0	1.53607E-08
A	119	2410.6	10YR 8/3	Very pale brown	8.5			0	0	1.70738E-08
A	120	2430.7	10YR 8/3	Very pale brown	8.5			0	0	1.68981E-08

Supplementary Table S8. Key deposit characteristics, South Island Headland Midden, Square A (cont.).

Series	XU	% Water Content	% Organic Content	% Carbonate Content	Mean Particle Size	Total Clay	Total Silt	Total Sand	Very Fine Sand	Fine Sand	Medium Sand	Coarse Sand	Very Coarse Sand
A	1	4.17	16.17	12.57	22.70	3.87	71.89	24.24	48.32	18.95	20.21	12.52	0
A	2	4.06	10.95	15.36	22.17	3.79	72.38	23.84	60.45	29.26	9.38	0.91	0
A	3	3.53	10.18	15.55	61.77	2.67	47.07	50.26	26.66	29.14	35.23	8.98	0
A	4	2.59	9.52	15.41	191.01	1.14	19.18	79.69	9.77	26.72	39.04	21.62	2.85
A	5	3.39	8.94	16.38	226.64	0.69	14.42	84.89	10.46	33.40	42.23	13.90	0.01
A	6	3.61	8.37	17.70	104.00	1.68	31.69	66.63	19.67	30.12	33.33	16.66	0.21
A	7	3.11	7.11	19.10	230.71	0.73	14.98	84.30	10.07	31.57	39.31	15.85	3.20
A	8	3.16	7.09	18.91	93.62	1.80	33.94	64.26	20.60	32.58	37.83	8.99	0
A	9	3.41	7.39	19.41	27.18	4.20	70.04	25.77	38.41	27.51	25.56	4.75	3.77
A	10	3.62	7.10	20.76	245.69	1.06	15.89	83.04	8.60	22.36	40.34	26.49	2.20
A	11	4.36	7.45	21.32	223.61	0.68	16.91	82.41	9.03	26.21	41.64	22.14	0.99
A	12	4.14	7.09	22.00	83.03	0.00	44.19	55.81	11.23	36.03	42.45	10.25	0.03
A	13	4.51	7.67	22.00	125.97	0.00	29.64	70.36	7.41	27.82	43.88	20.11	0.78
A	14	3.93	7.45	21.81	121.23	1.72	27.98	70.30	16.77	30.23	33.85	16.70	2.44
A	15	4.29	7.11	21.80	170.98	1.01	19.74	79.26	12.66	32.94	40.38	14.03	0
A	16	3.84	6.67	21.27	73.13	2.32	41.18	56.50	26.22	30.81	30.46	12.51	0
A	17	4.17	6.21	21.97	213.20	0.93	18.95	80.13	11.09	23.85	36.61	23.50	4.95
A	18	4.07	6.69	21.13	172.51	0.98	21.55	77.48	14.45	28.73	38.24	18.42	0.16
A	19	3.70	5.71	21.29	280.21	0.60	13.21	86.19	7.40	24.86	42.33	23.95	1.46
A	20	5.03	6.74	20.68	232.05	0.51	14.84	84.65	11.48	30.50	39.43	18.32	0.26
A	21	6.42	8.12	12.07	193.54	0.83	17.19	81.99	12.12	33.60	41.49	12.80	0.00
A	22	5.05	6.48	12.15	221.97	0.98	19.73	79.29	10.45	21.37	32.28	26.25	9.66
A	23	5.45	6.67	14.58	209.83	0.88	18.06	81.06	12.15	27.75	35.51	20.03	4.56
A	24	5.76	7.21	12.27	94.38	1.47	30.42	68.10	26.73	41.42	28.15	3.70	0
A	25	4.88	7.12	14.22	174.76	0.97	21.18	77.86	14.33	29.34	36.23	18.44	1.65
A	26	5.66	7.40	12.34	167.79	1.26	21.62	77.12	11.39	27.56	42.24	18.79	0.02
A	27	5.22	6.90	13.36	120.46	1.36	27.73	70.91	21.95	33.82	28.19	14.00	2.05

A	28	5.77	6.92	15.77	167.10	1.13	21.63	77.24	15.72	30.25	36.49	16.82	0.72
A	29	6.44	7.49	12.63	167.99	1.48	28.89	69.63	16.49	22.59	20.19	18.60	22.13
A	30	5.79	6.91	12.29	162.85	0.99	19.68	79.33	17.05	36.26	32.79	11.87	2.02
A	31	6.35	7.36	10.41	295.47	0.76	15.95	83.29	10.45	17.60	19.96	25.34	26.65
A	32	6.43	7.36	10.41	508.60	0.38	9.33	90.30	8.76	21.52	13.22	19.28	37.21
A	33	6.90	7.22	12.57	44.98	2.66	52.11	45.23	51.65	33.72	5.83	3.36	5.44
A	34	7.31	7.44	12.20	251.47	0.97	17.66	81.38	10.71	25.61	26.48	19.18	18.02
A	35	7.47	7.47	11.25	197.10	1.18	20.53	78.29	14.52	32.35	25.51	11.36	16.25
A	36	7.53	7.70	8.89	298.10	0.84	16.83	82.33	10.01	22.79	20.57	19.62	27.01
A	37	6.90	7.43	9.86	100.54	2.23	30.59	67.18	12.46	32.64	42.01	12.89	0
A	38	6.76	7.06	10.12	20.49	3.86	75.36	20.78	68.81	30.08	1.11	0.00	0
A	39	4.28	6.03	12.73	24.96	3.26	70.77	25.97	68.28	30.52	1.20	0.00	0
A	40	6.58	7.66	8.44	25.45	3.86	66.87	29.27	65.51	32.54	1.95	0.00	0
A	41	6.09	6.54	10.36	125.05	1.47	25.93	72.60	15.54	31.78	36.30	15.56	0.81
A	42	5.44	6.88	14.85	24.83	3.97	71.40	24.63	71.69	27.76	0.56	0.00	0.00
A	43	5.65	6.85	14.04	28.54	3.84	65.89	30.28	57.40	29.41	11.41	1.78	0.00
A	44	4.53	5.69	12.30	92.85	2.01	36.54	61.46	20.09	27.88	34.90	17.03	0.09
A	45	4.80	5.47	14.08	29.76	3.06	63.67	33.27	54.46	31.68	12.92	0.94	0
A	46	5.34	6.07	12.01	44.30	3.25	53.19	43.56	31.22	31.63	28.75	8.40	0
A	47	3.11	5.86	16.20	91.36	2.04	33.96	64.00	21.14	31.17	30.72	15.58	1.39
A	48	4.89	5.98	11.69	25.14	4.10	69.86	26.04	66.80	27.29	5.30	0.61	0
A	49A	4.63	5.96	17.41	32.44	3.48	63.37	33.15	47.89	27.93	16.84	7.34	0
B	49B	4.90	5.59	15.03	34.80	3.10	60.40	36.51	53.39	38.22	8.39	0.00	0
A	50	5.44	5.57	12.76	88.19	1.81	34.75	63.45	25.27	35.94	30.45	8.33	0
A	51	3.87	4.93	13.63	117.46	1.71	27.64	70.65	15.78	31.96	39.88	12.39	0
A	52	4.62	5.61	14.91	192.79	1.05	20.83	78.13	11.53	24.26	36.13	23.63	4.45
A	53	3.44	5.16	12.37	37.10	3.12	58.81	38.08	47.78	31.39	13.17	5.90	1.76
A	54	4.45	5.78	14.22	81.97	2.75	40.42	56.83	15.01	21.68	33.11	24.96	5.24
A	55A	5.64	6.02	12.42	25.79	4.03	66.45	29.52	60.51	30.68	6.23	2.58	0
B	55B	2.36	3.78	5.62	90.86	1.95	40.11	57.93	22.48	22.65	26.17	21.65	7.06

A	56A	4.37	5.98	13.74	54.35	2.90	50.77	46.33	33.22	25.84	29.92	11.01	0
B	56B	3.26	3.63	5.79	22.66	3.74	75.73	20.53	74.15	19.66	2.69	3.51	0
A	57A	4.07	4.67	13.97	58.05	2.83	47.94	49.24	29.73	26.07	29.37	14.78	0.05
B	57B	2.64	3.38	5.41	139.33	1.35	27.82	70.83	19.62	26.87	26.36	19.57	7.58
A	58A	3.81	4.88	12.76	188.45	0.92	20.17	78.91	15.26	27.81	33.21	20.25	3.46
B	58B	2.97	4.03	4.99	34.69	3.18	61.23	35.59	50.64	28.16	13.63	7.35	0.22
A	59A	3.99	4.92	16.61	160.91	1.29	24.80	73.90	17.48	25.06	27.93	22.41	7.13
B	59B	2.70	3.10	5.18	23.92	3.65	73.58	22.77	70.81	23.70	4.95	0.54	0
A	60A	3.86	3.74	11.79	151.50	1.16	26.69	72.15	15.93	26.32	32.59	20.88	4.27
B	60B	2.60	3.47	3.63	27.88	3.53	67.33	29.15	61.24	29.04	7.50	2.21	0
A	61A	4.02	4.76	14.78	305.29	1.29	26.25	72.46	17.86	28.72	32.26	18.69	2.48
B	61B	2.66	4.30	4.28	35.58	2.96	59.88	37.16	56.39	35.33	7.95	0.32	0
A	62A	4.41	4.65	15.39	27.77	3.61	67.59	28.80	67.45	31.46	1.08	0.00	0
B	62B	2.86	3.75	4.33	57.91	2.23	46.76	51.01	37.03	36.97	22.47	3.53	0
A	63A	2.83	4.27	14.60	91.45	1.96	39.29	58.74	26.94	22.76	21.01	23.34	5.95
B	63B	2.71	3.32	6.11	26.06	3.88	69.81	26.31	42.95	23.16	19.02	13.81	1.06
A	64A	3.54	4.49	16.62	27.77	4.01	63.94	32.05	56.28	30.75	8.82	4.14	0
B	64B	2.65	4.19	5.74	26.42	3.42	70.63	25.96	65.49	30.09	3.87	0.55	0
A	65A	2.95	3.88	12.05	30.28	3.50	65.02	31.47	59.00	26.50	8.21	6.29	0
B	65B	2.21	3.96	5.25	29.73	3.14	68.33	28.53	62.11	29.51	6.66	1.72	0
A	66A	3.48	3.64	16.59	33.94	3.54	60.26	36.20	45.69	28.84	14.94	10.26	0.27
B	66B	2.40	4.13	6.75	30.13	3.09	67.93	28.98	61.30	29.41	8.57	0.72	0
A	67A	2.26	2.71	10.49	24.41	3.60	71.64	24.76	68.02	25.40	5.26	1.32	0
B	67B	3.02	3.61	7.28	31.15	2.88	66.84	30.29	58.85	30.79	9.62	0.74	0
A	68A	2.24	3.51	12.85	179.13	1.06	22.44	76.50	14.05	25.02	33.92	23.03	3.98
B	68B	2.53	4.06	7.69	42.06	2.47	59.30	38.24	43.22	26.40	21.28	9.10	0
A	69A	2.85	3.22	11.23	48.58	2.70	50.92	46.39	38.31	33.69	23.28	4.71	0
B	69B	2.73	3.16	8.32	29.40	2.86	69.66	27.49	63.94	28.41	7.34	0.31	0
A	70A	2.32	3.26	8.62	31.28	3.16	64.92	31.92	60.79	30.64	8.13	0.44	0
B	70B	2.58	3.17	7.43	57.62	2.25	53.83	43.92	35.98	22.11	13.50	17.34	11.08

A	71A	1.49	2.63	5.31	171.90	2.66	49.64	47.71	27.94	29.66	28.41	13.64	0.35
B	71B	2.74	3.39	7.15	28.46	2.83	70.40	26.77	64.06	28.10	7.25	0.59	0
A	72A	2.55	2.97	5.75	26.81	3.23	68.40	28.37	64.48	29.00	5.75	0.77	0
B	72B	3.06	4.31	1.55	48.41	2.36	54.17	43.48	41.05	29.94	19.34	9.26	0.41
A	73A	2.50	2.54	7.86	21.54	3.29	77.90	18.81	72.67	23.03	4.26	0.05	0
B	73B	3.26	4.01	6.18	29.39	2.96	68.81	28.23	60.14	32.91	5.88	0.72	0.36
A	74A	2.84	3.03	6.64	80.65	2.16	43.01	54.83	29.93	22.49	18.37	22.31	6.91
B	74B	3.36	3.81	7.39	35.83	2.73	63.74	33.54	45.44	25.54	15.96	11.23	1.83
A	75A	3.03	3.53	8.51	23.21	3.70	73.49	22.81	70.37	29.11	0.52	0.00	0
B	75B	3.37	3.76	6.60	29.64	2.90	68.87	28.23	62.15	28.82	8.03	1.00	0
A	76A	2.64	3.23	7.62	26.07	3.54	73.07	23.39	76.32	22.18	1.01	0.49	0
B	76B	3.86	4.44	6.18	28.24	3.07	70.18	26.75	65.25	28.26	5.94	0.55	0
A	77A	3.11	2.97	9.05	25.64	3.33	71.34	25.33	68.07	27.79	4.12	0.02	0
B	77B	4.15	4.62	6.08	83.34	1.95	41.50	56.55	25.52	26.04	26.60	18.54	3.31
A	78A	3.03	2.85	7.17	27.09	3.51	67.52	28.97	62.06	33.82	4.12	0.00	0
B	78B	3.92	4.30	5.64	66.22	2.07	47.46	50.47	31.57	27.21	23.49	15.86	1.87
A	79A	3.56	3.01	7.23	21.96	3.94	76.36	19.70	74.22	23.66	1.49	0.63	0
B	79B	4.45	4.78	5.27	30.50	2.72	67.74	29.55	59.41	30.51	9.02	1.06	0
A	80A	3.17	3.38	6.78	27.26	3.33	69.58	27.09	65.65	27.92	6.01	0.43	0
B	80B	4.47	4.41	5.89	31.11	2.97	66.12	30.91	59.53	31.49	7.78	1.20	0
A	81A	3.72	3.23	6.41	163.59	3.30	74.39	22.32	70.04	24.46	5.37	0.13	0
B	81B	4.02	4.34	5.62	55.88	2.38	50.42	47.20	33.96	29.66	24.36	11.83	0.19
A	82A	3.22	3.35	6.60	30.32	3.48	65.63	30.89	57.78	28.49	11.22	2.50	0
B	82B	3.86	4.57	5.48	50.31	2.28	53.55	44.17	38.60	29.37	18.09	9.26	4.68
A	83A	2.84	3.65	7.26	62.70	2.27	48.73	49.01	34.71	26.67	22.00	13.31	3.31
B	83B	3.61	4.81	4.73	108.58	1.57	35.32	63.11	20.69	23.60	30.50	22.77	2.45
A	84A	3.04	3.38	7.53	92.26	1.89	38.03	60.08	23.85	26.42	27.14	18.85	3.73
B	84B	3.56	4.44	4.66	108.34	1.60	36.78	61.62	21.59	21.46	24.93	24.31	7.71
A	85A	2.85	2.94	9.42	61.74	2.20	45.11	52.69	37.30	32.61	21.03	8.89	0.16
B	85B	3.55	3.94	4.76	57.15	1.98	48.13	49.90	41.30	35.14	18.99	4.57	0

A	86A	2.89	3.80	8.59	38.89	2.85	57.37	39.78	49.33	32.27	14.11	4.29	0
B	86B	3.69	4.24	4.53	125.85	1.36	31.68	66.97	19.29	24.14	30.79	22.60	3.18
A	87A	3.32	3.66	6.77	206.23	1.15	24.43	74.42	16.26	23.23	17.95	18.92	23.63
B	87B	4.37	3.73	4.81	128.83	1.39	31.99	66.62	20.22	22.98	26.36	23.15	7.29
A	88A	3.85	4.36	5.42	217.98	1.09	25.87	73.04	15.43	17.39	12.49	23.39	31.30
B	88B	3.48	4.09	3.92	199.01	1.00	23.22	75.78	13.13	18.96	31.40	29.17	7.35
A	89A	3.63	3.76	6.23	107.69	1.89	40.62	57.49	29.02	27.11	9.77	10.62	23.48
B	89B	4.52	3.68	4.90	74.45	1.84	44.87	53.29	31.68	26.29	21.08	17.27	3.68
A	90A	3.19	3.60	6.14	56.80	2.10	47.21	50.70	41.90	38.70	17.33	2.07	0
B	90B	4.86	4.27	4.11	129.02	1.37	30.30	68.33	19.79	25.91	29.98	20.99	3.33
A	91A	3.87	4.05	5.56	145.19	1.96	42.80	55.24	37.31	35.64	22.63	4.42	0
B	91B	4.90	4.67	3.82	34.68	2.72	63.16	34.12	57.57	32.11	8.96	1.37	0
A	92A	2.92	3.33	5.97	57.87	2.14	47.90	49.96	40.53	33.05	19.15	7.22	0.05
B	92B	4.77	3.74	4.83	126.18	1.32	30.04	68.64	21.25	27.64	30.32	18.68	2.11
A	93A	3.27	3.80	6.01	161.48	1.13	25.48	73.39	17.08	24.91	31.43	22.59	3.99
B	93B	4.93	3.71	4.26	114.80	1.84	33.25	64.91	17.89	23.29	29.95	24.15	4.73
A	94A	4.21	3.96	5.78	107.59	1.40	32.23	66.37	24.66	31.83	28.85	13.60	1.07
B	94B	5.20	4.35	3.67	42.96	2.48	56.44	41.09	48.21	33.33	14.46	3.99	0
A	95A	4.18	3.02	6.19	125.75	1.12	28.51	70.37	21.50	31.83	30.17	14.28	2.22
B	95B	3.60	4.03	3.45	91.59	1.72	38.35	59.93	27.56	27.02	25.73	17.16	2.53
A	96A	4.05	3.05	5.92	63.34	2.81	67.32	29.88	64.71	29.37	5.66	0.25	0
B	96B	5.17	3.34	4.32	34.64	2.99	62.96	34.05	57.15	30.35	10.17	2.33	0
A	97A	4.00	4.16	4.19	26.71	2.42	72.10	25.48	70.27	25.36	4.04	0.33	0
B	97B	4.47	3.96	3.11	171.39	1.21	26.38	72.41	17.46	19.89	28.25	26.98	7.41
A	98A	3.81	3.19	4.79	106.52	1.26	31.84	66.91	26.75	33.71	27.65	11.51	0.38
B	98B	4.18	3.94	3.23	168.38	1.25	25.50	73.25	17.78	22.15	29.23	25.04	5.80
A	99A	3.93	3.54	3.97	37.44	2.34	61.60	36.06	60.43	33.39	6.14	0.03	0
B	99B	5.35	3.71	3.35	28.88	3.66	68.02	28.33	66.34	28.24	5.25	0.17	0
A	100A	4.06	3.38	3.57	60.85	1.90	48.24	49.86	37.77	31.43	19.72	9.62	1.46
B	100B	5.28	3.12	3.69	125.91	1.55	31.50	66.95	22.15	24.00	27.61	22.02	4.21

A	101	4.23	1.42	1.05	50.38	3.17	51.51	45.32	37.53	29.59	19.49	11.21	2.18
A	102	5.72	1.51	1.44	130.33	2.26	32.56	65.18	15.72	18.34	24.73	28.45	12.76
A	103	6.08	1.36	1.13	67.54	2.52	44.07	53.41	35.31	30.34	21.56	11.08	1.72
A	104	5.92	1.03	1.18	40.65	3.11	57.61	39.28	47.63	30.80	16.39	5.18	0
A	105	5.36	1.76	1.80	101.10	1.60	32.17	66.24	28.82	35.58	25.85	8.85	0.90
A	106	5.24	1.45	1.45	120.09	1.62	31.01	67.37	23.40	28.92	28.45	16.15	3.07
A	107	5.49	0.99	0.91	60.52	2.50	47.24	50.26	39.07	32.03	20.15	8.36	0.38
A	108	5.23	0.90	1.44	93.13	1.86	36.81	61.33	28.00	30.53	25.87	13.29	2.31
A	109	4.92	1.13	1.74	100.85	1.68	34.23	64.08	28.40	31.47	27.46	11.97	0.70
A	110	4.56	1.14	1.62	105.05	1.82	33.47	64.71	27.83	30.53	23.37	14.06	4.21
A	111	5.33	1.18	1.32	137.14	1.86	29.76	68.38	15.63	21.46	31.93	24.95	6.03
A	112	4.79	1.20	0.87	39.11	2.78	60.77	36.44	55.90	29.10	10.26	4.35	0.39
A	113	4.89	0.98	0.70	108.81	1.85	34.52	63.63	23.69	25.35	28.16	19.81	3.00
A	114	4.60	1.39	0.98	111.82	1.48	33.75	64.77	26.92	28.31	25.32	15.85	3.60
A	115	4.27	1.32	1.42	44.20	2.58	56.82	40.60	54.03	32.18	12.77	1.02	0
A	116	5.04	1.01	0.71	172.36	1.50	23.55	74.96	13.26	22.80	36.17	24.52	3.24
A	117	4.67	1.52	1.39	104.37	1.79	35.09	63.12	27.51	27.83	23.86	15.69	5.11
A	118	4.37	1.42	0.95	95.73	1.64	34.83	63.54	31.60	33.52	22.30	10.34	2.24
A	119	3.96	1.47	1.28	95.48	1.57	35.02	63.42	33.26	33.24	21.12	10.41	1.97
A	120	5.05	1.60	1.66	83.29	1.97	40.29	57.75	31.89	30.26	22.77	12.59	2.48

Supplementary Table S9. Magnetic susceptibility data, South Island Headland Midden, Square A.

Series	XU	Depth (mm)	Mass Susceptibility (m^3/kg)	Volume Susceptibility (SI)	Frequency Dependence (%)	Xlf-Xhf (X 10-7 m3/kg)
A	1	11.5	2.37737E-07	2.16124E-05	9.348709708	0.00000989
A	2	24.8	3.65866E-07	3.46464E-05	10.34442803	0.000017855
A	3	44.2	3.46957E-07	3.54843E-05	8.586772188	0.00001519
A	4	60.7	3.39441E-07	3.53585E-05	8.056509035	0.0000142
A	5	79.4	3.8751E-07	4.10995E-05	6.427303887	0.00001322
A	6	96.7	3.29291E-07	3.74194E-05	7.442993256	0.000013905
A	7	121.0	3.03251E-07	3.50346E-05	8.702998368	0.000015195
A	8	139.3	3.09302E-07	3.69054E-05	6.830089312	0.00001258
A	9	147.3	2.82203E-07	3.20685E-05	8.328627894	0.000013275
A	10	180.3	2.53183E-07	2.87707E-05	7.414815595	0.000010565
A	11	195.5	2.92852E-07	3.4388E-05	5.981433909	0.000010245
A	12	216.4	2.70235E-07	3.01968E-05	5.751193298	8.615E-06
A	13	235.5	2.96962E-07	3.59954E-05	5.876782531	0.00001055
A	14	255.2	2.71988E-07	3.14228E-05	8.463608406	0.00001321
A	15	272.8	2.80626E-07	3.34838E-05	6.927900627	0.000011545
A	16	293.7	2.76486E-07	3.14189E-05	5.940023068	0.00000927
A	17	317.5	2.66126E-07	3.22577E-05	7.021701172	0.00001126
A	18	335.6	3.25521E-07	3.88406E-05	8.175987223	0.00001587
A	19	358.7	2.7651E-07	3.56111E-05	7.07969586	0.00001257
A	20	372.5	3.23919E-07	3.86494E-05	8.220064725	0.000015875
A	21	395.0	2.18247E-07	3.76145E-05	6.695240124	0.000012575
A	22	416.8	2.32523E-07	4.31576E-05	7.336925105	0.000015865
A	23	434.7	1.90602E-07	3.57379E-05	5.931537598	0.00001057
A	24	455.7	2.31916E-07	4.34843E-05	6.365013079	0.00001387
A	25	474.5	2.11665E-07	3.76828E-05	5.835149067	0.00001098
A	26	494.4	2.32368E-07	4.18086E-05	7.588859163	0.000015885
A	27	517.7	2.11541E-07	4.00647E-05	8.254316798	0.00001654

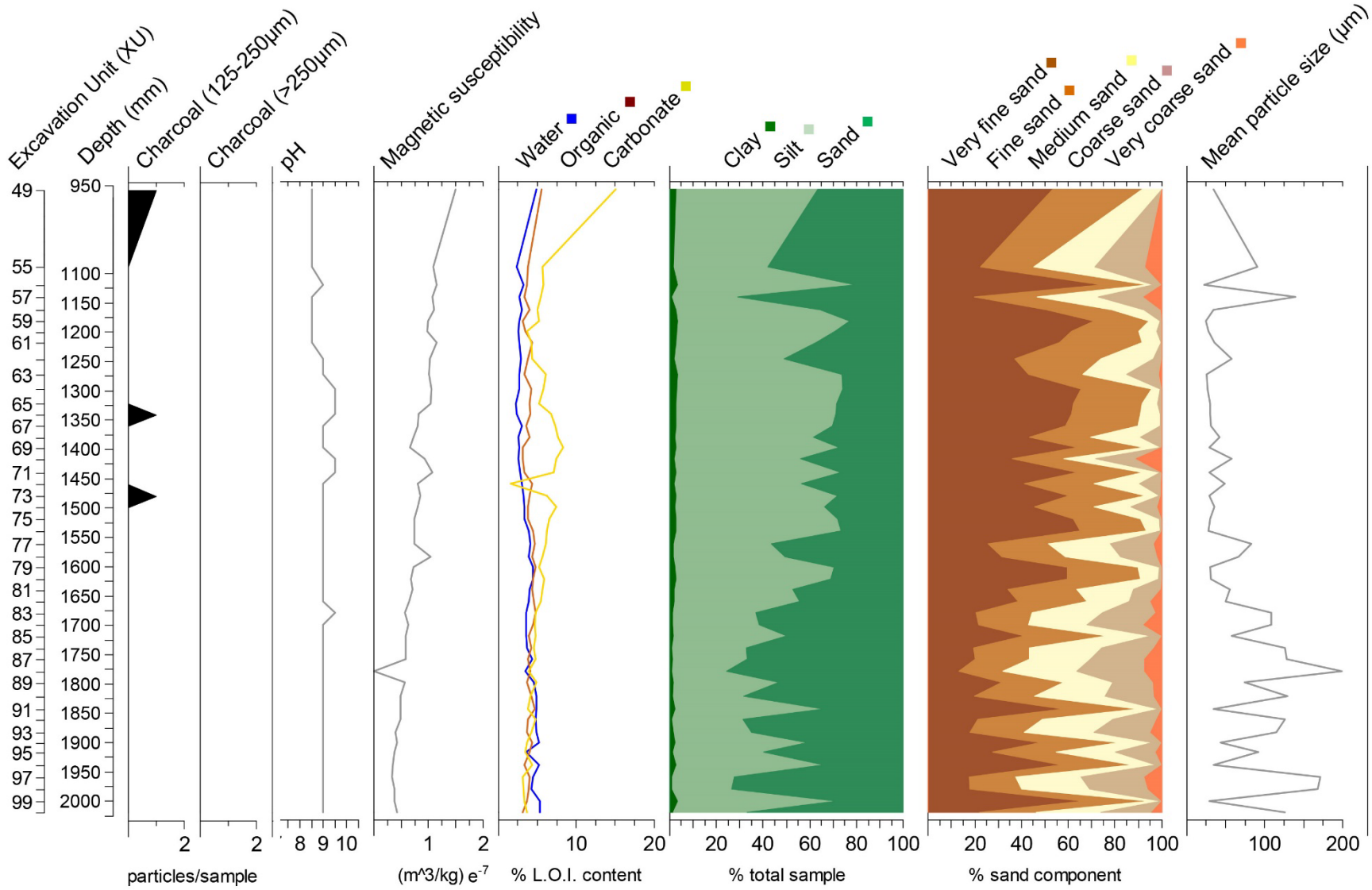
A	28	539.1	2.16555E-07	4.14243E-05	7.333011816	0.000015205
A	29	557.4	2.5892E-07	5.0509E-05	8.717312539	0.000022135
A	30	576.9	2.69649E-07	4.85163E-05	8.424119325	0.00002053
A	31	598.0	2.89706E-07	5.43198E-05	8.694300708	0.000023775
A	32	618.5	2.47547E-07	4.03202E-05	7.209083247	0.00001454
A	33	636.1	2.5021E-07	3.98062E-05	9.630504132	0.00001917
A	34	660.3	2.95309E-07	5.25739E-05	9.007391165	0.000023825
A	35	680.5	2.98631E-07	5.09031E-05	8.011643354	0.000020505
A	36	701.2	3.07571E-07	5.94171E-05	8.393277367	0.000025145
A	37	723.9	2.67745E-07	4.71596E-05	8.105596621	0.00001919
A	38	741.7	2.79817E-07	5.40555E-05	10.32341051	0.00002809
A	39	763.7	2.31704E-07	4.43222E-05	8.800432033	0.000019555
A	40	780.4	2.71754E-07	4.63217E-05	10.39340948	0.00002416
A	41	802.0	3.79788E-07	5.25085E-05	8.125449521	0.000021465
A	42	820.3	3.41212E-07	4.1359E-05	10.23838852	0.000021195
A	43	840.8	3.89704E-07	5.01891E-05	7.345013477	0.00001853
A	44	857.7	3.37346E-07	4.60018E-05	8.032406906	0.00001854
A	45	877.3	2.51987E-07	3.72253E-05	9.07843401	0.00001687
A	46	895.9	2.93696E-07	4.1162E-05	9.625979952	0.00001983
A	47	917.0	2.50736E-07	3.5616E-05	9.874700831	0.000017535
A	48	938.4	2.46334E-07	3.21914E-05	10.52993376	0.00001685
A	49A	960.3	2.16342E-07	3.03206E-05	8.356046001	0.00001257
B	49B	957.8	1.50079E-07	2.87083E-05	10.7023529	0.000015215
A	50	979.2	2.19174E-07	2.8642E-05	9.095716552	0.0000129
A	51	997.7	2.06615E-07	3.01314E-05	9.072661582	0.00001356
A	52	1019.5	2.16597E-07	3.19973E-05	9.118063198	0.0000145
A	53	1043.3	2.012E-07	2.85796E-05	9.808840677	0.00001388
A	54	1067.0	2.8521E-07	3.61914E-05	8.05428611	0.00001454
A	55A	1087.2	2.03902E-07	2.58739E-05	8.532142437	0.00001089
B	55B	1088.8	1.0949E-07	2.23957E-05	7.850280042	0.00000862

A	56A	1111.7	1.85273E-07	2.56154E-05	9.971498694	0.000012595
B	56B	1120.6	1.15986E-07	2.43835E-05	12.62552606	0.00001515
A	57A	1141.8	2.53824E-07	3.50932E-05	6.981331656	0.00001221
B	57B	1140.3	1.07046E-07	2.27068E-05	10.96050269	0.00001221
A	58A	1160.3	1.72076E-07	2.54203E-05	8.175724204	0.000010245
B	58B	1162.3	1.10268E-07	2.21372E-05	10.3890118	0.00001127
A	59A	1179.2	1.9781E-07	2.69741E-05	11.91521291	0.00001588
B	59B	1181.7	9.99389E-08	2.02528E-05	10.3116778	0.00001019
A	60A	1197.5	1.8379E-07	2.47141E-05	10.35006985	0.000012595
B	60B	1200.3	9.86565E-08	1.9806E-05	8.909147415	8.6E-06
A	61A	1219.2	1.43825E-07	2.80568E-05	9.720871601	0.000013495
B	61B	1218.3	1.15174E-07	2.29038E-05	11.16003914	0.000012545
A	62A	1248.7	1.26134E-07	2.41279E-05	8.06757383	9.575E-06
B	62B	1246.8	1.03189E-07	2.07161E-05	12.12016404	0.000012265
A	63A	1270.2	1.26096E-07	2.4837E-05	8.608567691	0.00001053
B	63B	1273.1	1.00856E-07	1.87195E-05	9.883465259	8.99E-06
A	64A	1299.3	1.15625E-07	2.38695E-05	10.70637355	0.000012565
B	64B	1297.8	1.0506E-07	2.12906E-05	12.96331861	0.0000135
A	65A	1323.7	1.08429E-07	2.0125E-05	10.4161361	0.000010225
B	65B	1322.4	1.04355E-07	2.19382E-05	10.78075563	0.000011585
A	66A	1345.2	1.2231E-07	2.4323E-05	8.823160797	0.00001056
B	66B	1340.6	8.15543E-08	1.6836E-05	8.861693623	0.000007205
A	67A	1355.5	9.42691E-08	1.91038E-05	8.188959432	7.61E-06
B	67B	1360.9	7.98012E-08	1.6323E-05	8.395297108	0.000006605
A	68A	1377.4	1.30114E-07	2.73535E-05	3.645910368	0.00000493
B	68B	1380.5	7.22391E-08	1.36816E-05	10.61641207	6.915E-06
A	69A	1401.3	1.18407E-07	2.39953E-05	9.770772425	0.00001153
B	69B	1398.3	6.68625E-08	1.34232E-05	9.841717599	0.00000628
A	70A	1418.1	1.68629E-07	2.49112E-05	9.429502852	0.00001157
B	70B	1417.6	9.25381E-08	1.22683E-05	10.91725687	0.00000632

A	71A	1439.1	1.48381E-07	2.13579E-05	9.197492463	0.00000961
B	71B	1440.3	1.07308E-07	1.50394E-05	10.1393994	7.31E-06
A	72A	1461.6	1.699E-07	2.31682E-05	12.53461082	0.00001426
B	72B	1459.8	8.12584E-08	9.23391E-06	3.106176922	0.000001315
A	73A	1482.2	1.20101E-07	1.77421E-05	9.610238511	8.26E-06
B	73B	1479.9	8.45317E-08	1.26477E-05	4.428845993	0.00000265
A	74A	1501.2	1.46699E-07	2.0838E-05	11.69220192	0.000011905
B	74B	1499.4	8.02906E-08	1.11008E-05	3.891725267	0.00000202
A	75A	1524.7	1.58197E-07	2.18719E-05	8.009708738	0.00000858
B	75B	1519.2	7.39111E-08	8.39899E-06	9.643936408	0.00000367
A	76A	1542.3	1.53524E-07	1.94812E-05	9.740157065	9.24E-06
B	76B	1540.6	7.44378E-08	1.07145E-05	3.294942414	0.000001645
A	77A	1561.1	1.37129E-07	2.02576E-05	9.01917143	8.915E-06
B	77B	1562.3	7.42023E-08	1.0259E-05	8.268543812	0.000003935
A	78A	1581.2	1.48947E-07	2.20036E-05	11.65174637	0.00001256
B	78B	1583.7	1.03821E-07	1.25843E-05	9.43538901	0.000005615
A	79A	1603.2	1.48271E-07	2.07804E-05	11.72125092	0.0000119
B	79B	1601.6	7.33205E-08	1.01371E-05	9.145108059	4.295E-06
A	80A	1620.2	1.4317E-07	2.14213E-05	11.03902299	0.00001157
B	80B	1622.3	6.82171E-08	8.13954E-06	12.67528931	0.000004655
A	81A	1640.7	1.46224E-07	1.99397E-05	12.58550635	0.000012235
B	81B	1640.7	7.17359E-08	7.88009E-06	16.51363187	0.000005845
A	82A	1662.8	1.38346E-07	1.78172E-05	9.237273412	7.975E-06
B	82B	1660.6	6.50695E-08	8.13368E-06	15.86047145	0.00000582
A	83A	1679.6	1.32045E-07	1.82562E-05	15.64034543	0.000013855
B	83B	1680.3	5.61804E-08	7.23536E-06	2.181364911	7E-07
A	84A	1699.7	1.49363E-07	2.2065E-05	11.62704653	0.00001257
B	84B	1699.9	6.27613E-08	8.91496E-06	13.12039312	0.00000534
A	85A	1723.3	1.47217E-07	2.1748E-05	11.809175	0.000012575
B	85B	1719.7	5.87172E-08	8.00688E-06	9.182965737	3.31E-06

A	86A	1743.6	1.49985E-07	2.18729E-05	8.625437573	0.00000924
B	86B	1739.9	5.87892E-08	7.23731E-06	13.34890966	0.000004285
A	87A	1771.0	5.86762E-08	6.77888E-06	13.37815126	0.00000398
B	87B	1758.9	1.3033E-07	1.82659E-05	10.12015569	8.97E-06
A	88A	1778.9	1.16624E-07	1.4578E-05	8.038147139	0.000005605
B	88B	1779.7	5.17318E-08	5.87861E-06	15.81460115	0.000003975
A	89A	1801.2	1.18201E-07	1.43273E-05	9.628168603	0.00000659
B	89B	1799.1	5.71737E-08	6.38873E-06	21.53153153	0.000005975
A	90A	1823.7	1.22199E-07	1.73578E-05	10.63943796	8.935E-06
B	90B	1822.3	4.94101E-08	6.45701E-06	11.72597865	0.000003295
A	91A	1841.8	1.32257E-07	1.7033E-05	12.44609123	0.000010245
B	91B	1844.2	4.83876E-08	6.32338E-06	12.01896772	0.000003295
A	92A	1862.5	1.18156E-07	1.7231E-05	13.8725549	0.00001156
B	92B	1862.4	4.88907E-08	5.55576E-06	22.65758092	0.00000532
A	93A	1882.3	1.30448E-07	1.58119E-05	8.283479061	0.0000063
B	93B	1883.7	3.99861E-08	5.30118E-06	7.621195039	0.00000169
A	94A	1903.6	1.41304E-07	1.63249E-05	10.48484463	0.00000825
B	94B	1901.1	4.22887E-08	6.32728E-06	9.65919446	0.00000265
A	95A	1923.2	1.20679E-07	1.39421E-05	13.92357454	9.255E-06
B	95B	1918.2	3.72517E-08	4.65646E-06	7.180710122	0.000001355
A	96A	1940.1	1.13265E-07	1.26565E-05	14.92150969	0.000008935
B	96B	1939.4	3.45722E-08	4.51795E-06	30.72687225	0.00000558
A	97A	1962.0	1.21638E-07	1.33617E-05	11.51271754	0.00000731
B	97B	1960.3	3.35664E-08	3.94151E-06	4.242025649	6.45E-07
A	98A	1981.8	9.68715E-08	1.28428E-05	8.161420235	0.000004965
B	98B	1980.1	3.76357E-08	5.41725E-06	15.87615283	0.000003615
A	99A	2000.6	8.70261E-08	9.55969E-06	12.06681059	0.00000531
B	99B	2001.1	3.82965E-08	4.20681E-06	20.22336251	0.00000335
A	100A	2023.3	8.57561E-08	9.74501E-06	23.59025692	0.000010605
B	100B	2020.6	4.27757E-08	5.42798E-06	20.21905805	0.000004615

A	101	2042.2	4.78154E-08	8.78426E-06	6.744941294	0.0000027
A	102	2074.7	2.13457E-08	3.88103E-06	6.982208795	0.00000104
A	103	2091.6	2.70508E-08	4.96955E-06	15.97069597	0.00000327
A	104	2112.7	2.35997E-08	4.33556E-06	17.47460087	0.00000301
A	105	2130.8	2.49312E-08	4.72181E-06	1.978651393	0.00000038
A	106	2150.9	2.1609E-08	4.01076E-06	12.98200514	0.00000202
A	107	2170.5	2.33011E-08	4.32483E-06	3.756552126	6.45E-07
A	108	2190.7	2.36953E-08	4.39798E-06	11.45625534	0.00000201
A	109	2211.7	1.93182E-08	3.29288E-06	5.387205387	6.4E-07
A	110	2231.5	2.01901E-08	3.74741E-06	11.61154117	0.00000165
A	111	2253.7	1.88672E-08	3.43041E-06	5.323798172	6.7E-07
A	112	2271.2	2.03165E-08	3.42455E-06	15.9299084	0.000002
A	113	2290.8	1.76288E-08	3.0383E-06	3.026004728	0.00000032
A	114	2311.3	1.61602E-08	2.9076E-06	3.129732458	0.00000031
A	115	2330.5	1.78728E-08	2.97881E-06	25.80331061	0.00000265
A	116	2352.0	1.55816E-08	2.65596E-06	4.294834591	3.7E-07
A	117	2370.6	1.70443E-08	3.0344E-06	21.79062056	0.0000023
A	118	2392.0	1.53607E-08	2.85103E-06	10.55642226	0.000001015
A	119	2410.6	1.70738E-08	3.16901E-06	23.74388617	0.00000267
A	120	2430.7	1.68981E-08	3.23241E-06	5.66119274	0.000000655



Supplementary Figure S2. Deposit characteristics, Series B. See Supplementary Table S8 for raw data.

Supplementary Table S10. Ceramic sherd descriptions, South Island Headland Midden, Square A. Objects were individually plotted in situ during excavation.

FS#	XU	Object #	Conjoins	Weight (g)	Thickness (mm)	Maximum Length (mm)	Vessel Part	Decoration	Surface Modification Manufacturing Marks	Rim Description	Colour (interior)	Colour (exterior)
59/1	23	-		0.44	3.42	12.96	body				7.5YR 5/6	10YR 6/6
63/1	25	-		0.64	4.73	13.20	body				5YR 4/6	7.5 YR 5/4
73/1	29	-		7.05	3.88	44.02	body		dimple impressions		10YR 6/4	N2.5
83/1	32	-		0.32	4.92	9.61	body				5YR 6/4	weathered
83/2	32	-		0.70	3.96	15.98	body				10YR 6/6	weathered
83/3	32	-		5.94	8.29	29.79	neck				7.5YR 7/3	7.5YR 7/3
83/4	32	-		0.77	5.43	14.13	body				10YR 6/6	weathered
83/5	32	-		0.51	4.44	14.86	body				10YR 6/6	weathered
83/6	32	-		0.18	3.15	10.24	body				10YR 7/6	10YR 7/2
83/7	32	-		0.23	3.86	8.66	body				10YR 5/3	10YR 5/2
85/1	33	-		7.35	8.55	29.02	body				2.5Y 8/3	2.5Y 2.5/1
85/2	33	-		1.85	5.35	21.09	body				2.5Y 7/4	5YR 6/6
85/3	33	-		1.59	6.73	17.59	body				10YR 7/3	weathered
85/4	33	-		0.09	4.89	14.37	body		fingernail or paddle impression?		10YR 6/4	10YR 6/4
87/1	34	-		0.22	3.59	11.29	indeterminate				weathered	weathered
87/2	34	-		0.13	3.93	7.36	body	red-slip			5YR 6/4	weathered
87/3	34	-		0.61	4.36	15.18	body				10YR 6/6	10YR 2/1
87/4	34	-		0.07	2.69	5.67	body				10YR 7/2	10YR 7/2
87/5	34	-		0.18	3.75	8.14	body				10YR 6/6	10YR 2/1
87/6	34	-		0.60	4.58	12.14	body				10YR 6/4	10YR 6/4
87/7	34	-		0.14	4.25	6.82	body				10YR 6/4	10YR 6/4

87/8	34	-		0.48	3.69	12.88	body				2.5Y 6/1	2.5Y 6/1
91	35	1		8.43	8.08	34.71	body				7.5YR 1/2.5	10YR 5/6
92	35	2		8.45	10.49	31.86	body				7.5YR 6/6 and 10YR 7/6	2.5Y 7/4
89/1	35	-		0.40	4.51	9.97	body				2.5Y 6/3	weathered
89/2	35	-		1.76	4.85	19.95	neck				2.5Y 6/3	2.5Y 6/3
89/3	35	-		0.56	5.28	10.47	body				2.5Y 7/2	2.5Y 5/1
89/4	35	-		0.73	4.27	14.46	body				2.5Y 6/2	2.5Y 6/2
89/5	35	-		1.69	6.39	21.05	body				2.5Y 6/1	weathered
89/6	35	-		0.43	4.22	13.99	body				2.5Y 8/1	weathered
89/8	35	-		0.94	7.98	17.85	body				2.5Y 8/1	weathered
95	36	1	FS196, 197, 198, 199	1.45	5.00	17.11	body				10YR 6/6	10YR 4/6
196	36	6	FS95, 197, 198, 199	1.53	5.47	16.37	body				10YR 6/6	2.5Y 3/1
197	36	7	FS95, 196, 198, 199	0.70	4.77	13.50	body				10YR 6/6	weathered
198	36	8	FS95, 196, 197, 199	2.68	4.58	22.91	body				10YR 6/6	2.5Y 3/1
199	36	9	FS95, 196, 197, 198	1.24	4.75	17.71	body				10YR 6/6	weathered
97	36	3		24.78	10.69	45.29	body				7.5YR 6/6 and 10YR 7/6	2.5Y 7/4
93/1	36	-		0.96	5.12		body	red-slip			2.5Y 7/4	weathered
93/2	36	-		0.64	5.43	13.30	body				2.5Y 7/4	2.5Y 2.5/1
93/3	36	-		0.37	3.24	11.54	body				2.5Y 6/2	2.5Y 6/1
93/4	36	-		0.40	3.92	12.76	body				2.5Y 6/2	2.5Y 6/1
93/5	36	-		2.19	9.93	21.28	body				7.5YR 7/4	7.5YR 7/4
93/6	36	-		0.20	3.22	11.34	body				2.5Y 7/2	weathered
93/7	36	-		1.60	4.17	20.93	body				10YR 5/4	10YR 3/1
93/8	36	-		0.38	4.35	12.72	body				10YR 5/4	10YR 3/1
93/9	36	-		1.18	5.38	15.49	body				10YR 6/6	10YR 6/6
93/10	36	-		0.33	3.36	10.22	Body	indeterminate red pigmentation on exterior surface			10YR 6/4	10YR 6/4

93/11	36	-		0.68	3.84	15.61	body				10YR 6/6	weathered
93/12	36	-		0.70	6.11	12.66	body				2.5Y 7/4	2.5Y 7/4
93/13	36	-		0.67	3.98	5.94	body				10YR 7/4	10YR 7/4
457	36	-		2.1945	5.99	21.85	body				5YR 4/1	indeterminate
103	37	2	FS104	1.69	4.48	22.78	body				10YR 6/6	10YR 7/1
104	37	3	FS103	3.68	4.91	23.98	body				10YR 7/1	10YR 7/1
105	37	4		1.94	4.47	21.21	body				10YR 7/1	7.5YR 5/4
100/1	37	-		0.45	4.18	12.53	body				2.5Y 6/2	2.5Y 4/1
100/2	37	-		1.23	4.72	18.45	body				2.5Y 7/6	2.5Y 7/2
100/3	37	-		0.35	4.39	11.40	body				2.5Y 3/1	2.5Y 3/1
100/4	37	-		0.55	4.98	12.25	body				2.5Y 7/2	2.5Y 3/1
100/5	37	-		0.89	3.87	18.94	body				2.5Y 7/2	2.5Y 3/1
100/6	37	-		2.40	6.85	24.46	Body		paddle impression?		2.5Y 8/3	10YR 5/3
100/7	37	-		1.38	4.37	25.40	body				10YR 6/4	10YR 6/1
108	38	1	FS109	8.02	6.69	35.14	body				10YR 5/4	10YR 6/6
109	38	2	FS108	4.25	7.59	30.72	body				10YR 5/4	10YR 6/6
106/1	38	-		0.72	3.80	14.58	rim	parallel diagonal lines incised on lip-top		Flat lipped, incurving rim, interior and exterior concave at neck	2.5Y 7/3	2.5Y 4/1
106/2	38	-		1.00	3.66	18.76	neck				10YR 7/4	2.5Y 7/3
106/3	38	-		1.57	5.52	20.05	body				2.5Y 7/3	2.5Y 7/3
106/4	38	-		0.35	7.02	12.36	indeterminate				weathered	weathered

112	39	1		2.23	5.00	22.99	rim and neck	fingernail impression on lip-top (zigzag)		Flat lipped, incurving rim, interior and exterior concave at neck; orifice diameter >20 cm	10YR 6/6	10YR 6/6
113	39	2		47.36	15.14	57.26	body		dimple impressions		5YR 4/6	10YR 6/6
114	39	3		3.61	6.22	22.85	neck				10YR 2/1	5Y 2/1.5
115	39	4		9.91	6.52	35.70	body				7.5YR 5/4	10YR 6/6
110/1	39	-		0.80	3.68	15.00	body				2.5Y 6/3	2.5Y 4/1
110/2	39	-		0.31	3.15	9.96	body				2.5Y 6/3	2.5Y 6/3
110/3	39	-		0.43	3.84	12.41	body				2.5Y 6/3	2.5Y 6/3
110/4	39	-		0.92	3.92	17.00	body				2.5Y 5/2	2.5Y 5/2
110/5	39	-		0.56	3.52	15.73	body				indeterminate	indeterminate
118	40	1		5.75	9.32	29.24	body				10YR 6/6	2.5YR 4/8
119	40	2		0.77	3.91	13.56	body				10YR 6/6	10YR 6/6
122/1	41	-		0.04	3.27	8.03	body				10YR 7/4	10YR 7/4
122/2	41	-		0.14	2.93	5.29	body				10YR 7/1	indeterminate
124/1	42	-		0.16	4.20	7.57	body				10YR 7/4	10YR 7/4
200	-	-		0.49	3.88	12.58	body				2.5Y 7/4	2.5Y 7/4

Supplementary Table S10. Ceramic sherd descriptions, South Island Headland Midden, Square A. Objects were individually plotted in situ during excavation (cont.).

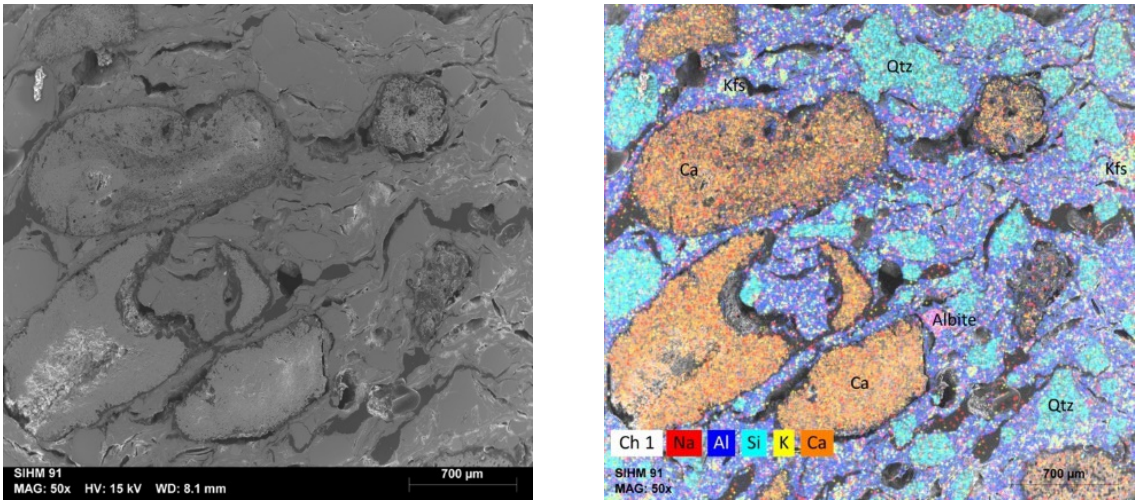
FS#	XU	Object #	Aplastic 1	Aplastic 2	Aplastic 3	Aplastic 4	Aplastic Grain Size	Aplastic Roundness	Aplastic Sphericity	Aplastic Abundance	Aplastic Sorting	Oxidation/ Reduction Pattern
59/1	23	-	voids	quartz	feldspar		fine-coarse	0.3	0.7	20%	poorly sorted	no cross-section visible; surfaces oxidized
63/1	25	-	voids	quartz	feldspar		fine-medium	0.3	0.7	20%	moderately sorted	no cross-section visible; surfaces oxidized
73/1	29	-	quartz	feldspar	voids	hematite	fine-medium	0.3	0.7	20%	moderately sorted	interior oxidised, exterior reduced
83/1	32	-	mica	quartz	voids		fine-coarse	0.3	0.7	20%	poorly sorted	no cross-section visible; surfaces oxidized
83/2	32	-	mica	quartz	voids		fine-coarse	0.3	0.7	20%	poorly sorted	no cross-section visible; surfaces oxidized
83/3	32	-	quartz	mica	voids		fine-coarse	0.3	0.7	20%	poorly sorted	no cross-section visible; surfaces oxidized
83/4	32	-	mica	quartz	voids		fine-coarse	0.3	0.7	20%	poorly sorted	no cross-section visible; surfaces oxidized
83/5	32	-	mica	quartz	voids		fine-coarse	0.3	0.7	20%	poorly sorted	no cross-section visible; surfaces oxidized
83/6	32	-	feldspar	mica	quartz		fine-medium	0.3	0.7	20%	well sorted	no cross-section visible; surfaces oxidized
83/7	32	-	quartz	voids			fine			<20%	well sorted	no cross-section visible; surfaces oxidized
85/1	33	-	quartz	mica	ferro-magnesian	voids	fine-coarse	0.3	0.7	20%	poorly sorted	no cross-section visible; surfaces oxidized
85/2	33	-	quartz	voids	calcareous		fine-medium	0.3	0.7	<20%	moderately sorted	no cross-section visible; surfaces oxidized
85/3	33	-	quartz	mica	voids		fine-coarse	0.3	0.7	20%	poorly sorted	no cross-section visible; surfaces oxidized
85/4	33	-	quartz	feldspar	voids	calcareous	fine-medium	0.3	0.7	20%	moderately sorted	no cross-section visible; surfaces oxidized
87/1	34	-	quartz	calcareous			medium	0.3	0.7	20%	moderately sorted	no cross-section visible
87/2	34	-	quartz	voids			medium	0.5	0.7	<20%	moderately sorted	no cross-section visible.
87/3	34	-	quartz	feldspar	voids	ferro-magnesian	fine-medium	0.3	0.7	20%	moderately sorted	oxidised exterior to reduced core

87/4	34	-	quartz	mica			medium	0.5	0.5	<20%	moderately sorted	no cross-section visible; surfaces oxidized
87/5	34	-	quartz	feldspar	voids	ferro-magnesian	fine-medium	0.3	0.7	20%	moderately sorted	oxidised exterior; reduced core
87/6	34	-	quartz	feldspar	voids		fine-medium	0.3	0.7	40%	poorly sorted	weathered
87/7	34	-	quartz	feldspar	voids		fine-medium	0.3	0.7	40%	poorly sorted	weathered
87/8	34	-	quartz	hematite	feldspar	voids	fine-medium	0.3	0.7	20%	moderately sorted	no cross-section visible; surfaces oxidized
91	35	1	calcareous	quartz	feldspar	mica	medium-coarse	0.5	0.7	20%	poorly sorted	no cross-section visible; exterior surface oxidized; substantial organic voids
92	35	2	quartz	mica	voids		fine-very coarse	0.3	0.7	20%	poorly sorted	no cross-section visible; surfaces oxidized
89/1	35	-	quartz	feldspar	ferro-magnesian		fine-medium	0.3	0.7	<20%	moderately sorted	no cross-section visible; surfaces oxidized
89/2	35	-	quartz	feldspar	ferro-magnesian		fine-medium	0.3	0.7	<20%	moderately sorted	no cross-section visible; surfaces oxidized
89/3	35	-	quartz	voids	mica		fine-medium	0.3	0.7	<20%	moderately sorted	exterior oxidised interior thin reduced
89/4	35	-	quartz	feldspar	ferro-magnesian	calcareous	fine-medium	0.3	0.7	<20%	moderately sorted	no cross-section visible; surfaces oxidized
89/5	35	-	quartz	calcareous	ferro-magnesian		medium	0.3	0.7	20%	moderately sorted	no cross-section visible; surfaces oxidized
89/6	35	-	quartz	mica			medium	0.3	0.7	20%	moderately sorted	no cross-section visible; surfaces oxidized
89/8	35	-	quartz	mica			fine-coarse	0.3	0.7	20%	poorly sorted	no cross-section visible; surfaces oxidized
95	36	1	ferro-magnesian	feldspar	quartz	voids	fine-medium	0.3	0.7	20%	moderately sorted	no cross-section visible; surfaces oxidized
196	36	6	feldspar	quartz	ferro-magnesian	voids	fine-medium	0.3	0.7	20%	moderately sorted	no cross-section visible; surfaces oxidized
197	36	7	feldspar	quartz	ferro-magnesian	voids	fine-medium	0.3	0.7	20%	moderately sorted	no cross-section visible; surfaces oxidized
198	36	8	feldspar	quartz	ferro-magnesian	voids	fine-medium	0.3	0.7	20%	moderately sorted	no cross-section visible; surfaces oxidized

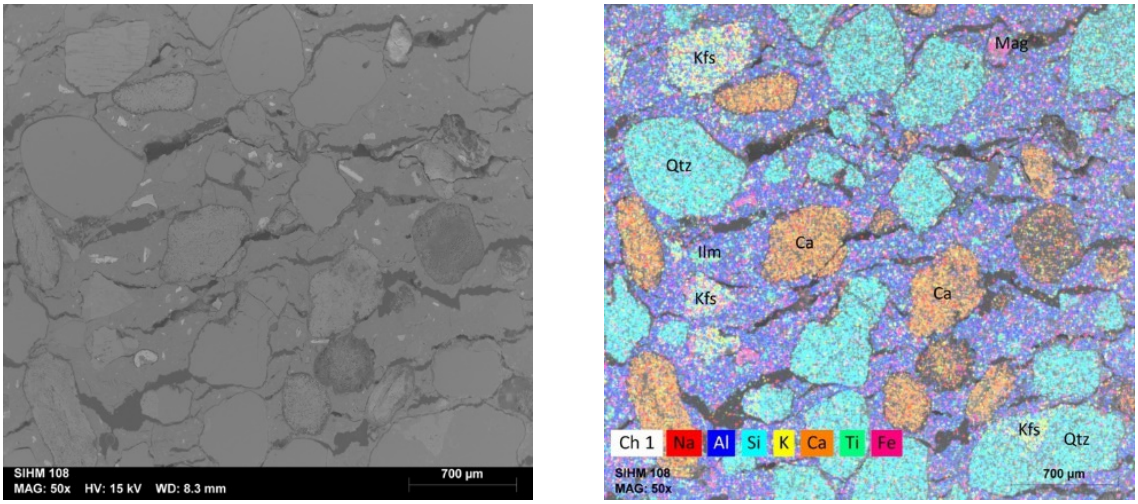
199	36	9	quartz	feldspar	ferro-magnesian	voids	fine-medium	0.3	0.7	20%	moderately sorted	no cross-section visible; surfaces oxidized
97	36	3	quartz	mica	voids		fine-very coarse	0.3	0.7	20%	poorly sorted	no cross-section visible; surfaces oxidized
93/1	36	-	quartz	mica			medium	0.3	0.7	<20%	moderately sorted	no cross-section visible; surfaces oxidized
93/2	36	-	quartz	voids			fine-medium	0.3	0.7	<20%	moderately sorted	no cross-section visible; surfaces oxidized
93/3	36	-	quartz	ferro-magnesian	calcareous	voids	fine	0.3	0.7	<20%	moderately sorted	oxidised interior
93/4	36	-	quartz	ferro-magnesian	calcareous	voids	fine	0.3	0.7	<20%	moderately sorted	oxidised interior
93/5	36	-	quartz	mica	voids		fine-coarse	0.3	0.7	20%	poorly sorted	no cross-section visible; surfaces oxidized
93/6	36	-	mica				fine	0.5	0.5	<20%	well sorted	weathered
93/7	36	-	quartz	voids			fine-medium	0.3	0.7	<20%	moderately sorted	oxidised interior to reduced exterior
93/8	36	-	quartz	feldspar	ferro-magnesian	voids	fine-medium	0.3	0.7	20%	moderately sorted	oxidised interior to reduced exterior
93/9	36	-	quartz	voids	calcareous		fine-medium	0.3	0.7	20%	moderately sorted	no cross-section visible; surfaces oxidized
93/10	36	-	quartz	voids			medium	0.3	0.7	20%	moderately sorted	no cross-section visible; surfaces oxidized
93/11	36	-	quartz	calcareous	voids		medium	0.3	0.7	20%	moderately sorted	no cross-section visible; surfaces oxidized
93/12	36	-	quartz	mica	feldspar		fine-medium	0.3	0.7	40%	poorly sorted	weathered
93/13	36	-	indeterminate					0.3	0.7	<20%	moderately sorted	weathered
457	36	-	quartz	calcerous	voids		medium-coarse	0.3	0.7	30-40%	poorly sorted	weathered
103	37	2	quartz	feldspar	ferro-magnesian	voids	fine-medium	0.3	0.7	20%	moderately sorted	no cross-section visible; surfaces oxidized
104	37	3	quartz	feldspar	ferro-magnesian	voids	fine-medium	0.3	0.7	20%	moderately sorted	no cross-section visible; surfaces oxidized
105	37	4	quartz	feldspar	mica		fine-medium	0.3	0.7	<20%	moderately sorted	no cross-section visible; surfaces oxidized
100/1	37	-	quartz	feldspar			fine	0.3	0.7	<20%	moderately sorted	thin reduced surface on interior all other sides oxidised

100/2	37	-	quartz	feldspar	ferro-magnesian		fine-medium	0.3	0.7	20%	moderately sorted	no cross-section visible; surfaces oxidized
100/3	37	-	calcareous	quartz	voids		fine	0.3	0.7	20%	moderately sorted	no cross-section visible; exterior surface oxidized; substantial organic voids
100/4	37	-	quartz	feldspar	ferro-magnesian		fine-medium	0.3	0.7	20%	moderately sorted	interior oxidised, exterior reduced
100/5	37	-	quartz	feldspar	ferro-magnesian		fine-medium	0.3	0.7	20%	moderately sorted	interior oxidised, exterior reduced
100/6	37	-	calcareous	quartz	voids		fine-medium	0.3	0.7	<20%	moderately sorted	no cross-section visible; surfaces oxidized
100/7	37	-	quartz	voids	feldspar	calcareous	fine-medium	0.3	0.7	<20%	moderately sorted	no cross-section visible; surfaces oxidized, very thin exterior surface gray overlay
108	38	1	calcareous	quartz			fine-coarse	0.3	0.7	20%	poorly sorted	no cross-section visible; surfaces oxidized
109	38	2	calcareous	quartz			fine-medium	0.3	0.7	20%	well sorted	no cross-section visible; surfaces oxidized
106/1	38	-	quartz	feldspar	voids		fine-medium	0.3	0.7	<20%	moderately sorted	no cross-section visible; surfaces oxidized, very thin interior surface reduced
106/2	38	-	quartz	ferro-magnesian			fine-medium	0.3	0.7	<20%	moderately sorted	no cross-section visible; surfaces oxidized
106/3	38	-	voids	calcareous	quartz		fine-medium	0.3	0.7	<20%	moderately sorted	no cross-section visible; surfaces oxidized
106/4	38	-	mica	voids			fine	0.5	0.5	<20%	well sorted	eroded
112	39	1	ferro-magnesian	quartz			fine	0.3	0.7	<20%	well sorted	no cross-section visible; surfaces oxidized
113	39	2	calcareous	quartz	voids		medium	0.3	0.7	<20%	moderately sorted	no cross-section visible; surfaces oxidized
114	39	3	calcareous	quartz	ferro-magnesian	voids	fine	0.3	0.7	<20%	well sorted	no cross-section visible; surface reduced
115	39	4	calcareous	mica			fine-medium	0.3	0.7	20%	moderately sorted	no cross-section visible; surfaces oxidized
110/1	39	-	feldspar	quartz	voids		fine-medium	0.3	0.7	<20%	moderately sorted	interior oxidised, exterior reduced
110/2	39	-	quartz	voids	feldspar		fine-medium	0.3	0.7	<20%	moderately sorted	no cross-section visible; surfaces oxidized

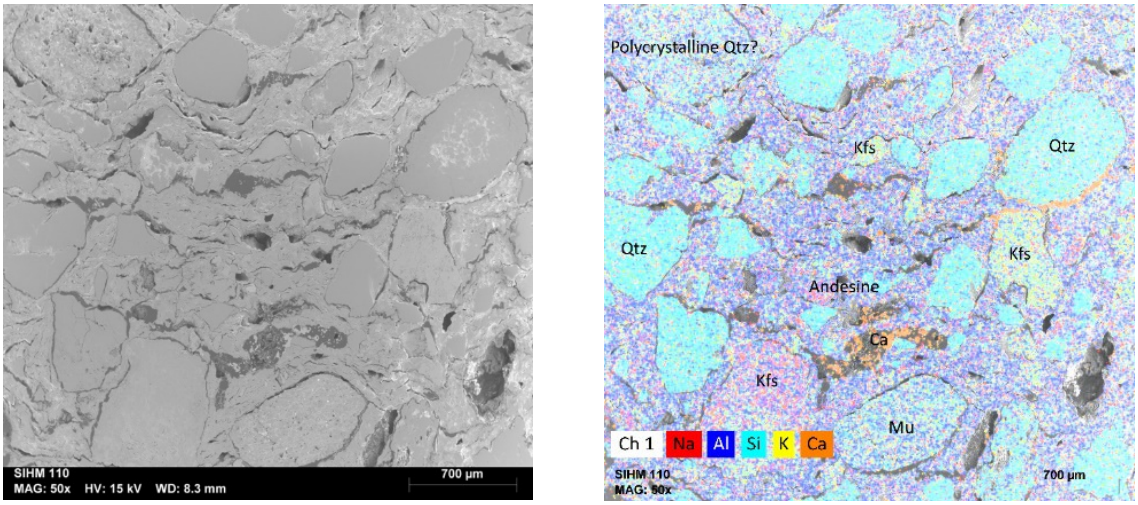
110/3	39	-	quartz	voids	feldspar		fine-medium	0.3	0.7	<20%	moderately sorted	no cross-section visible; surfaces oxidized
110/4	39	-	feldspar	ferro-magnesian	quartz	calcareous	fine-medium	0.3	0.7	<20%	moderately sorted	no cross-section visible; surfaces oxidized
110/5	39	-	calcareous	quartz	feldspar	voids	medium	0.3	0.7	20%	moderately sorted	no cross-section visible; surfaces oxidized
118	40	1	calcareous	quartz			fine-medium	0.3	0.7	<20%	moderately sorted	no cross-section visible; surfaces oxidized
119	40	2	quartz	calcareous	feldspar		fine-medium	0.3	0.7	40%	moderately sorted	no cross-section visible; surfaces oxidized
122/1	41	-	quartz	feldspar	voids		fine	0.5	0.6	20-40%	moderately sorted	weathered
122/2	41	-	feldspar				fine	0.5	0.6	20-40%	moderately sorted	weathered
124/1	42	-	feldspar	quartz	voids		fine	0.3	0.7	20-40%	moderately sorted	no cross-section visible; surfaces oxidized
200	-	-	voids	quartz	calcareous		fine-medium	0.3	0.7	20%	moderately sorted	no cross-section visible; surfaces oxidized



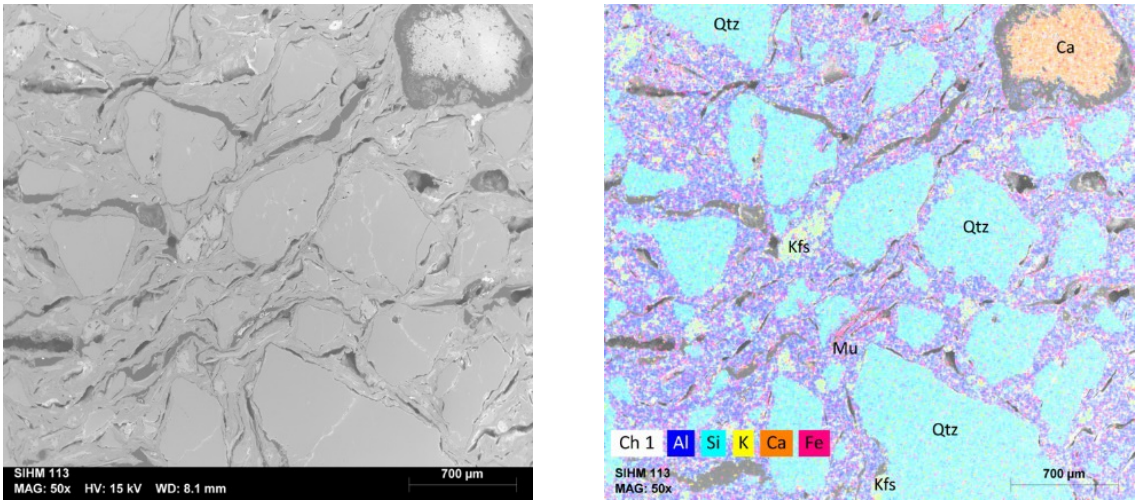
Supplementary Figure S3A. Sherd FS91 with electron backscattered images showing the nature of inclusions (left) and elemental map with minerals identified (right).



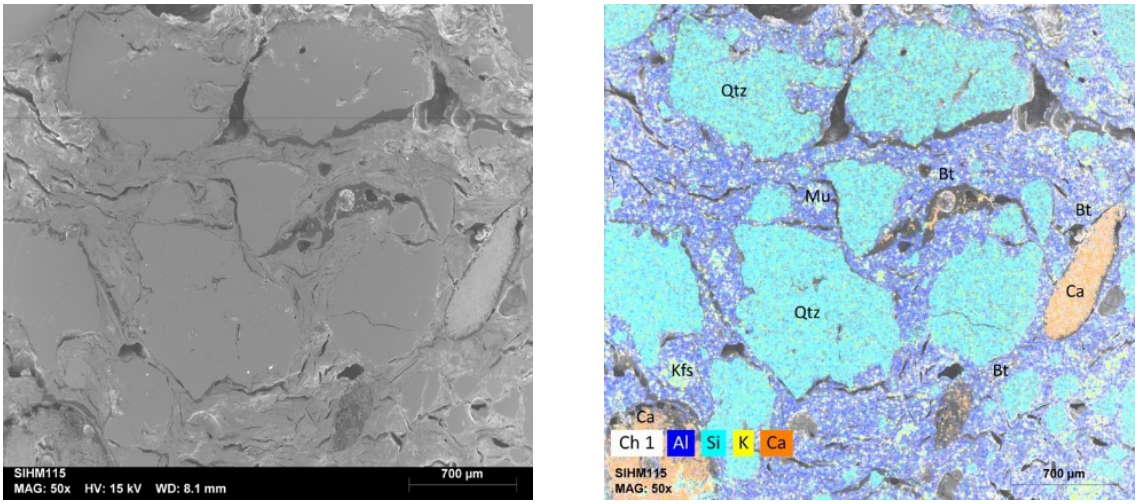
Supplementary Figure S3B. Sherd FS108 with electron backscattered images showing the nature of inclusions (left) and elemental map with minerals identified (right).



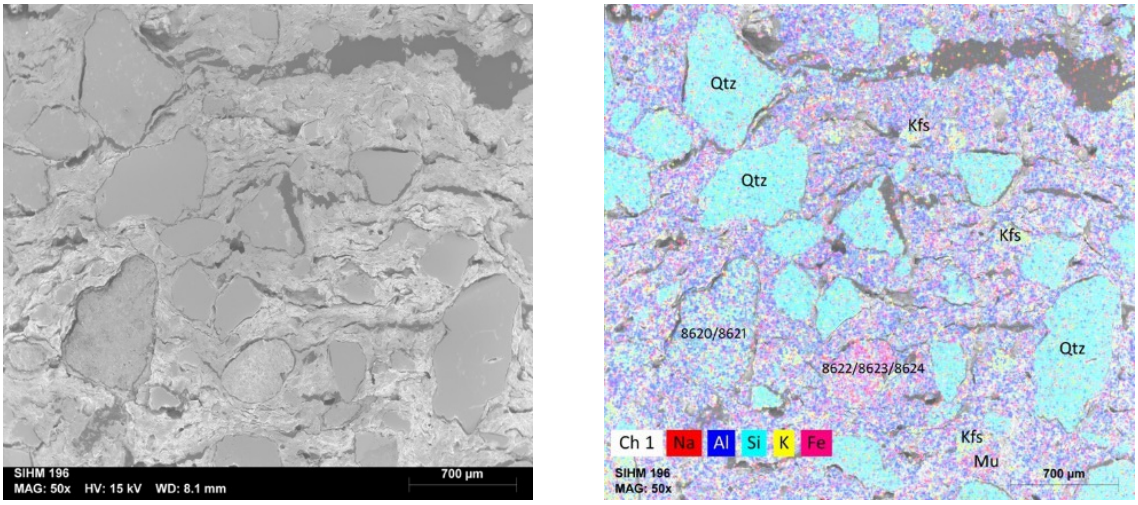
Supplementary Figure S3C. Sherd FS110/1 with electron backscattered images showing the nature of inclusions (left) and elemental map with minerals identified (right).



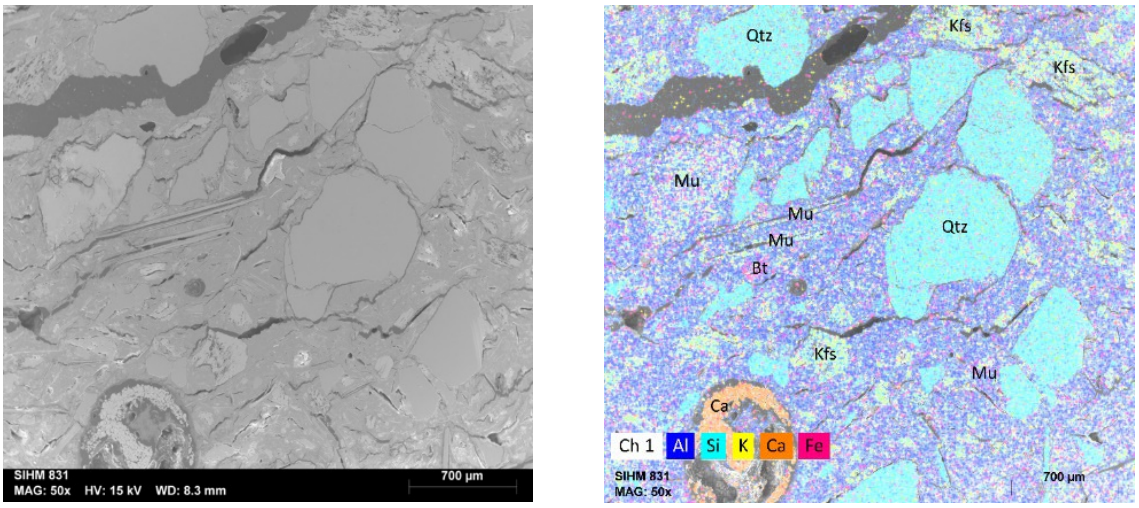
Supplementary Figure S3D. Sherd FS113 with electron backscattered images showing the nature of inclusions (left) and elemental map with minerals identified (right).



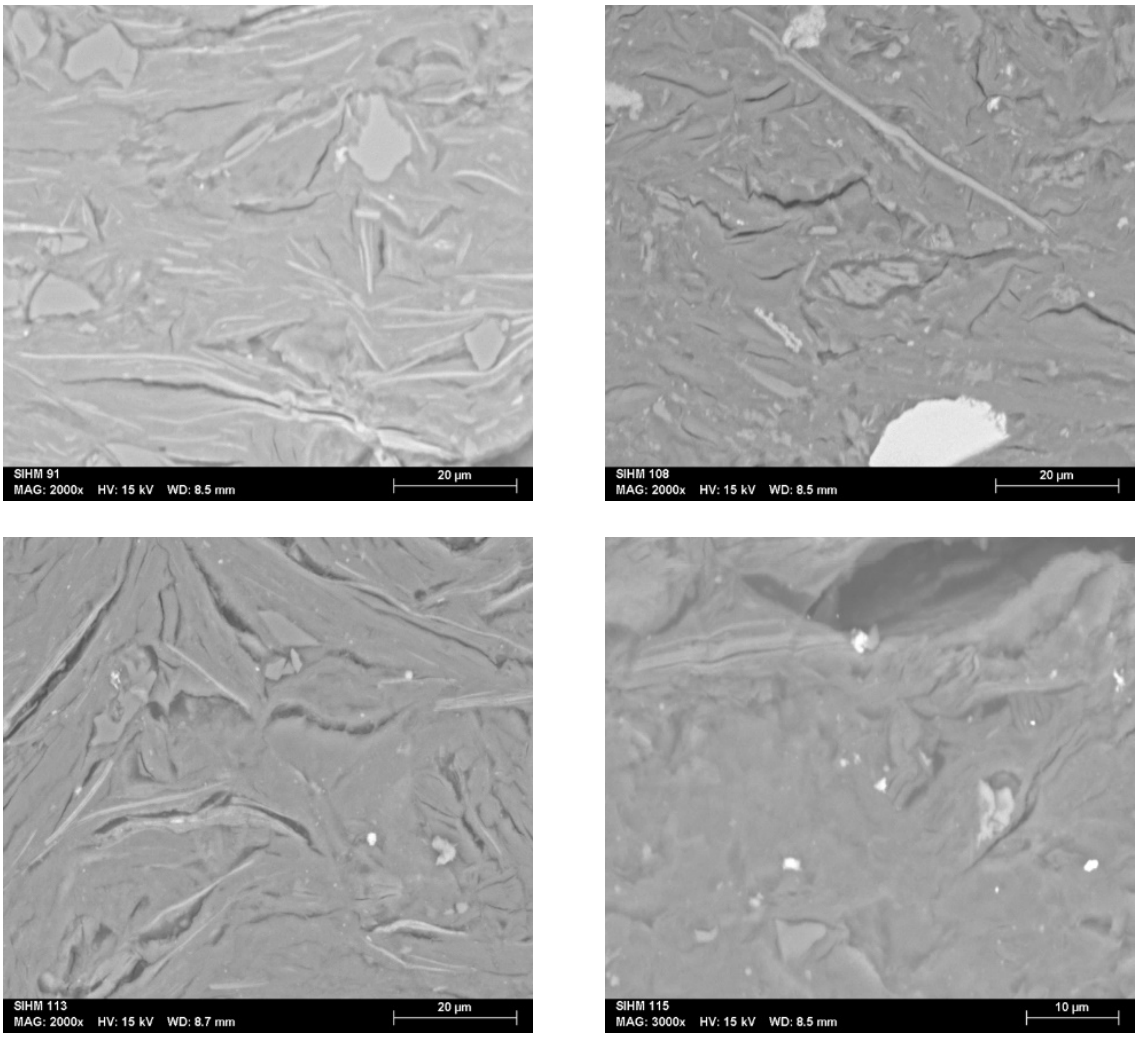
Supplementary Figure S3E. Sherd FS115 with electron backscattered images showing the nature of inclusions (left) and elemental map with minerals identified (right).



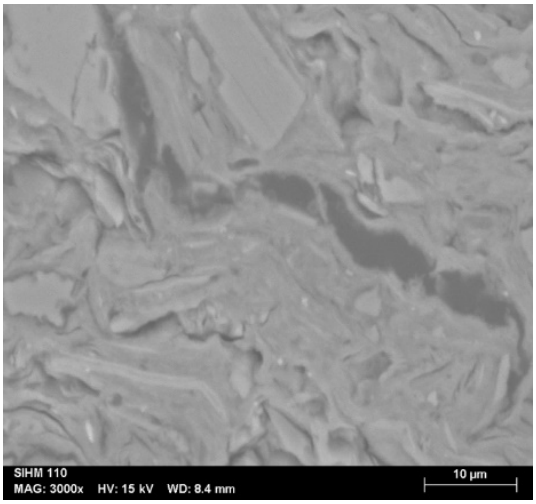
Supplementary Figure S3F. Sherd FS196 with electron backscattered images showing the nature of inclusions (left) and elemental map with minerals identified (right).

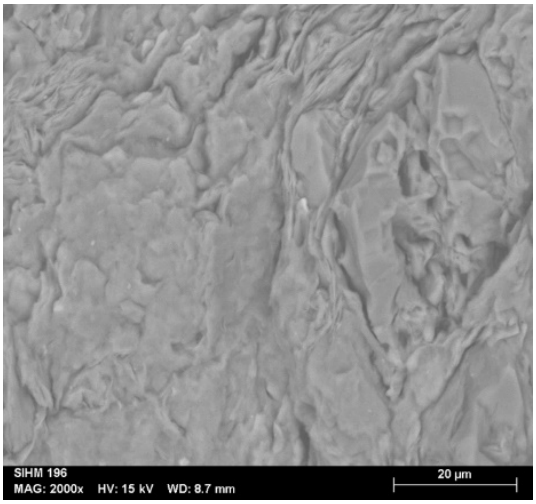


Supplementary Figure S3G. Sherd FS83/3 with electron backscattered images showing the nature of inclusions (left) and elemental map with minerals identified (right).



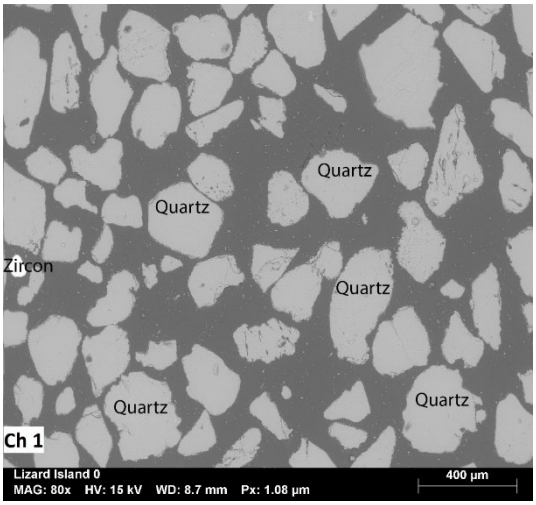
Supplementary Figure S3H. Micrographs showing texture of sherds under x2000 magnification in Clay Source 1 showing microscopic fibrous mica. Clockwise from top left: FS91, FS108, FS115, FS113).



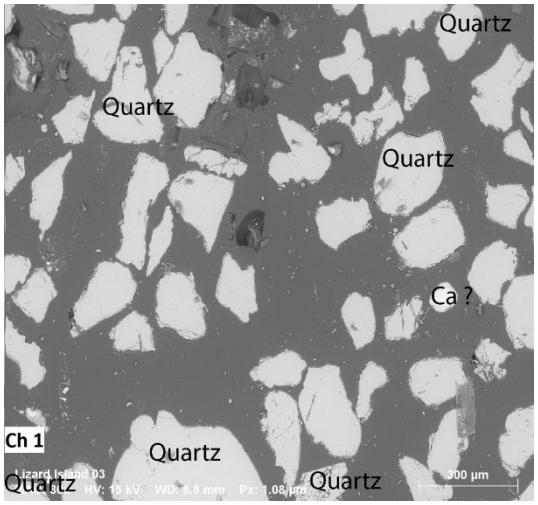


Supplementary Figure S3I. Micrographs showing texture of sherds under x2000 magnification in Clay Source 2 showing microscopic fibrous mica. Left: FS110/1. Right: FS196.

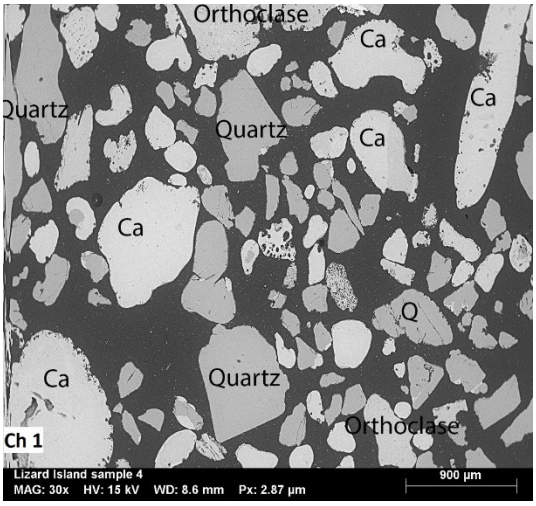
Supplementary Figure S3J. Micrographs showing texture of sherds under x2000 magnification in Clay Source 3 showing microscopic fibrous mica (FS83/3).



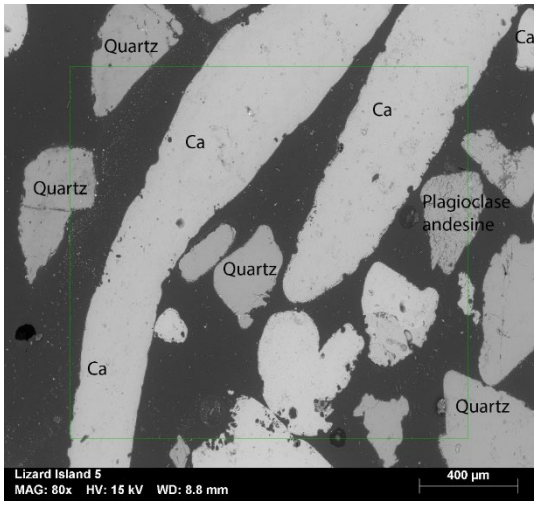
Supplementary Figure S3K. Micrograph of Sand Sample 0 with mineral sands identified.



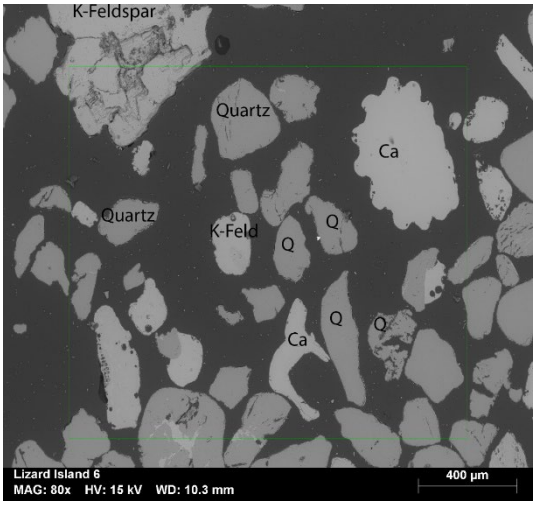
Supplementary Figure S3L. Micrograph of Sand Sample 3 with mineral sands identified.



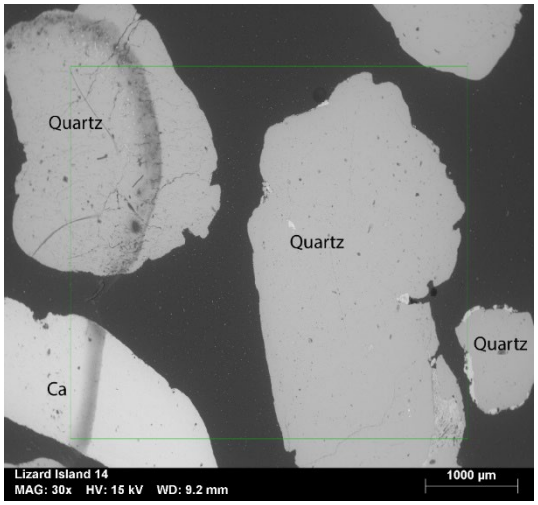
Supplementary Figure S3M. Micrograph of Sand Sample 4 with mineral sands identified.



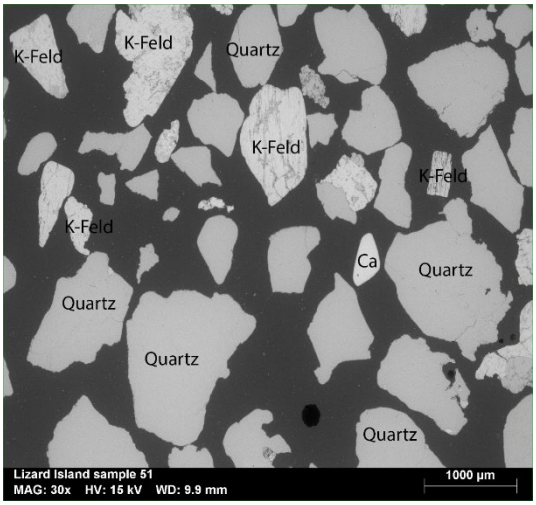
Supplementary Figure S3N. Micrograph of Sand Sample 5 with mineral sands identified.



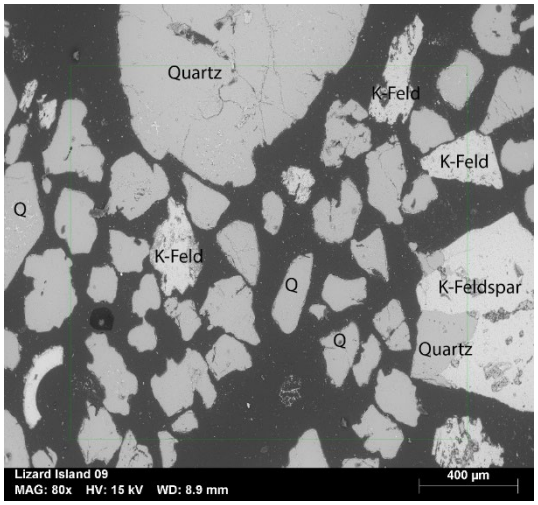
Supplementary Figure S3O. Micrograph of Sand Sample 6 with mineral sands identified.



Supplementary Figure S3P. Micrograph of Sand Sample 14 with mineral sands identified.

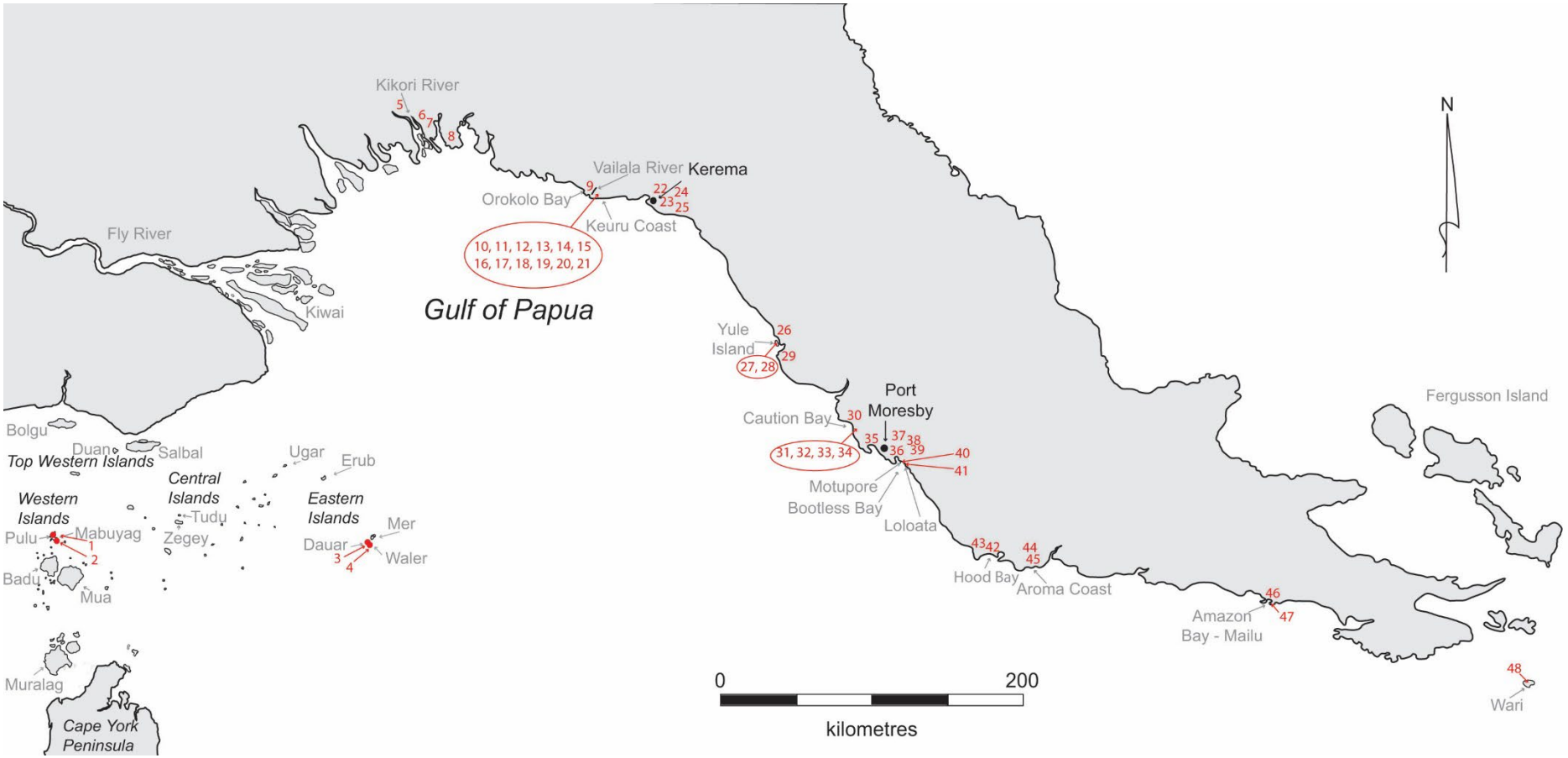


Supplementary Figure S3Q. Micrograph of Sand Sample 51 with mineral sands identified.



Supplementary Figure S3R. Micrograph of Sand Sample 60 with mineral sands identified.

Supplementary Figure S4. Map of sediment sample locations at Jiigurru (Lizard Island Group). Location of sediment samples used to compare with ceramic temper. Beach sands from locations 0, 3, 4, 5, 6, 14, 51 and 60 were analysed in this study using the scanning electron microscope (see main text).



Supplementary Figure S5. Location of sites with ceramics sequences in the western Coral Sea region. Only sites with published radiocarbon chronologies are included. Numbers refer to full dating details in Supplementary Table S11.

Supplementary Table S11. Commencement and termination ages for ceramics in sequences in the western Coral Sea region. Radiocarbon ages were calibrated using OxCal (v.4.4) (Bronk Ramsey, 2009a) and the IntCal20 (Reimer et al., 2020) and Marine20 calibration datasets (Heaton et al., 2020). Marine radiocarbon ages were calibrated using ΔR values from Ulm et al. (in press) for Torres Strait, Petchey et al. (2012, 2013:Table 2) for Caution Bay (updated to Marine20 using Reimer and Reimer's (2017) online *deltar* program), and from Petchey et al. (2013:Table 1) for the remaining southern Papua New Guinea sites (updated to Marine20 using Reimer and Reimer's 2017 online *deltar* program and then pooled). Ages reported as pMC were converted to $F^{14}C$ and calibrated using the SH Zone 3 calibration dataset (Hua et al. 2022). Only sites with available radiocarbon chronologies are included. Relative dates based on the inter-site comparison of ceramic attributes such as vessel form and/or decoration are not included. * = Age may extend out of range for calibration curve (i.e. modern). # = Estimated. See Supplementary Figure S5 for site locations. NMAG site codes have been provided by the PNG National Museum and Art Gallery, Port Moresby.

Map Ref.	Site Name	NMAG Site Code	Dated Material (ΔR)	cal BP (95.4% probability)	cal BP (median)	References	^{14}C Age (years BP) (Lab. No.)
				Line one = ceramic onset Line two = ceramic termination			
Torres Strait							
1	Mask Cave	na	Charcoal	2740-2430 1692-1401	2586 1515	McNiven et al. 2006	2507±42 (Wk-11904) 1640±50 (OZH-277)
2	Mui	na	Charcoal	1422-1701 1517-1351	1578 1407	Wright & Dickinson 2009	1686±37 (Wk-20913) 1538±30 (Wk-20914)
3	Sokoli	na	*Strombus luhuanus* ΔR=-178±25	911-612	747	Carter 2001	1180±45 (Wk-7444)
4	Ormi	na	*Lambis lambis* ΔR=-178±25	2316-1937 1960-1578	2128 1769	Carter 2002	2435±48 (Wk-10163) 2148±48 (Wk-10162)
Kikori River and Delta Region (Gulf Province)							
5	Kikiniu (Kulupari)	ODI	Charcoal	1537-1275 1513-1007	1375 1264	Rhoads 1980	1480±80 (ANU-1963) 1360±100 (ANU-1962)
6	Samoa	OAC	Charcoal	1990-1542 672-557	1763 624	Rhoads 1983 David et al. 2010	1850±95 (I-6153) 662±30 (Wk-23049)
7	Kumukumu 1	OAI	Charcoal	659-553 549-499	599 523	David et al. 2015	632±30 (Wk-25296) 495±30 (Wk-25293)

8	Kinomere	OAP	Charcoal	554-295	442	Frankel et al. 1994	410±80 (SUA-1879)
Orokolo Bay (Gulf Province)							
9	Popo	OAK	Charcoal	554-295 270-10*	442 107	Rhoads 1994 Urwin et al. 2018	410±80 (ANU-2181) 131±20 (Wk-41608)
Kouri Lowlands (Gulf Province)							
10	Old Helau 1	OJY	Charcoal	284-0* 268-0*	152 109	Skelly 2014	155±25 (Wk-32240) 117±25 (Wk-33955)
11	Old Helau 2	OJQ	Charcoal	280-6* 279-6*	127 124	Skelly 2014	142±25 (Wk-33957) 141±25 (Wk-33956)
12	Keveoki 1	OKE	Charcoal	647-530 503-317	601 438	David et al. 2009	581±33 (Wk-22743) 376±32 (Wk-22741)
13	Keveoki 2	OKG	Charcoal	493-315 462-297	397 387	Skelly & David 2017	355±33 (Wk-22745) 306±33 (Wk-22744)
14	Meiharo	OKF	Charcoal	644-526 504-319	598 447	Skelly et al. 2010	569±30 (Wk-22746) 381±30 (WK-22750)
15	Lui Ova	OJX	Charcoal	675-562 645-537	652 603	Skelly 2014	683±25 (Wk-29546) 583±25 (Wk-31826)
16	Oheo Yopo	OJU	Charcoal	1530-1407 1346-1282	1468 1301	Skelly 2014	1592±25 (Wk-32243) 1388±25 (Wk-29545)
17	Iri Kahu	OKA	Charcoal	1700-1540 670-560	1605 629	Skelly 2014	1720±26 (Wk-34212) 664±25 (Wk-29547)
18	Kaveharo	OJV	Charcoal	2710-2367 275-8*	2566 113	Skelly 2014	2465±32 (Wk-33961) 133±25 (Wk-29543)
19	Hopo	OJS	Charcoal	2749-2516 305-0*	2712 186	Skelly 2014	2552±25 (Wk-31232) 212±25 (Wk-31221)
20	Hohelavi	OJT	Charcoal	2700-2362 291-0*	2510 183	Skelly 2014	2449±25 (Wk-31829) 177±25 (Wk-29536)
21	Hivo	OKB	Charcoal	293-0* 284-0*	183 149	Skelly 2014	180±25 (Wk-33263) 153±25 (Wk-33265)
Kerema Coast (Gulf Province)							
22	Lou'upuru	OFA	Charcoal	Modern	Modern	Frankel et al. 1994	1.023±0.03 (SUA-1797)
23	Maero	OFC	Charcoal	527-0*	358	Frankel et al. 1994	310±100 (SUA-1798)

24	Quarry Site	OEA	Charcoal	469-0*	198	Frankel et al. 1994	0.989±0.023 (SUA-1725)
25	Eleven Km Site	OEB	Charcoal	474-0*	200	Frankel et al. 1994	0.99±0.024 (SUA-1796)
Yule Island-Hall Sound							
26	Abe	AEX	Charcoal	1688-1301	1450	Vanderwal 1973	1560±85 (ANU-731)
27	Oposisi[1]	ADI	Charcoal	2100-1890 1509-689	1982 1092	Allen et al. 2011 Vanderwal 1973	2041±30 (Wk-21615) 1180±200 (ANU-725)
28	Urourina	ADG	Charcoal	904-525	669	Vanderwal 1973	720±105 (ANU-730)
29	Kukubu Cave	ADL	Charcoal	1302-973	1165	Vanderwal 1973	1250±85 (ANU-732)
Caution Bay (Central Province)							
30	Papa Salt Pan	AWL	Charcoal	1530-801	1181	Swadling & Kaiku 1980	1280±170 (SUA-1524)
31	Bogi 1	ABEN	Charcoal	2958-2784 1535-1406	2880 1471	McNiven et al. 2011	2783±30 (Wk-27707) 1603±30 (Wk-28266)
32	Edubu 1	ABAO	Charcoal	2748-2498 2465-2312	2629 2350	McNiven et al. 2012	2546±30 (Wk-27516) 2339±30 (Wk-27302)
33	Ruisasi 1	ABKO	Charcoal *Gafrarium tumidum* ΔR=-59±15	2115-1942 1391-1116	2028 1260	David et al. 2016	2068±27 (Wk-27839) 1807±33 (Wk-29344)
34	Moiapu 3	AAZD	*Anadara antiquata* ΔR=-127±15	2700-2370	2545	David et al. 2019	2814±25 (Wk-36369)
35	Ava Garau	AMH	Charcoal	1300-956	1136	Swadling 1977	1220±95 (SUA-515)
Port Moresby Region (Central Province)							
36	Taurama	AJA & AGN	Charcoal	1062-555 678-460	800 578	Bulmer 1978	865±140 (I-6863) 560±85 (I-6862)
37	Nebira 2[2]	ACJ	Charcoal	785-545 503-0*	665 335	Bulmer 1978	720±80 (GaK-2346) 280±80 (GaK-2672)
38	Nebira 4[2,3]	ACL	Charcoal	1872-1414 1340-341	1653 842	Allen 1972	1760±90 (I-5796) 880±250 (GaK-2667)
39	Eriama 1[2]	ACV	Charcoal	2426-1349 434-0*	1883 197	Bulmer 1978	1930±230 (GaK-2670) 210±70 (GaK-2671)

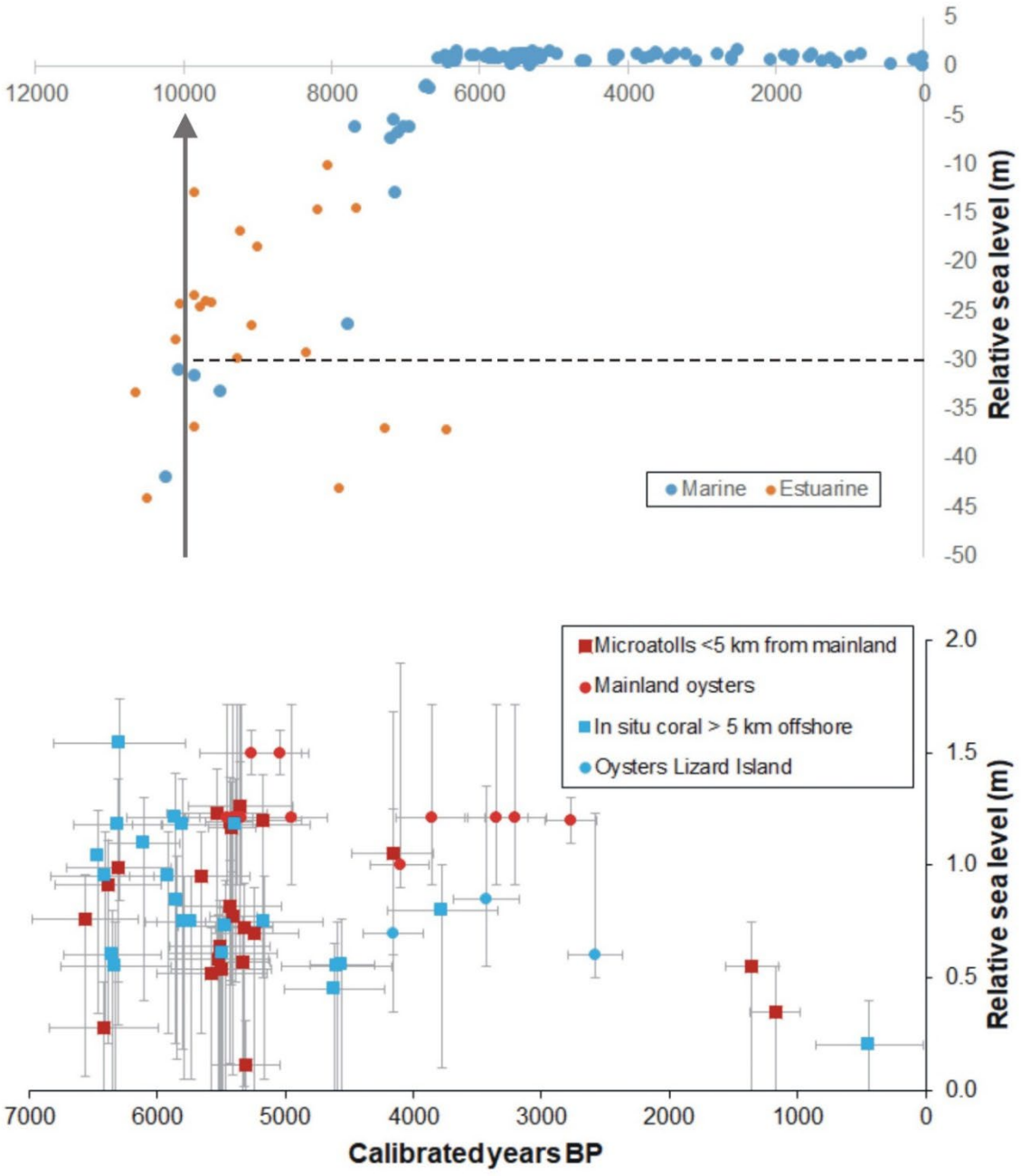
40	Motupore[4]	AAK	Charcoal	1173-731 503-152	910 382	Allen 2017	1010±80 (ANU-1219) 310±60 (ANU-1218)
41	Loloata Island	ABYL	Marine shell ∆R=-150±21	2232-1635	1923	Sullivan & Sassoon 1987	2300±100 (ANU-4808)
Hood Bay (Central Province)							
42	Agila	ABQL	Charcoal *Anadara antiquata* ∆R=-150±21	649-552 38-0*	602 0*	Skelly et al. 2018, 2023	617±17 (Wk-54913) 386±23 (Wk-42520)
43	Veirarupu	AHA	Charcoal	495-326 476-317	450 381	Skelly at al. (in press)	372±17 (Wk-54916) 349±17 (Wk-54915)
Aroma Coast (Central Province)							
44	Vavine Eouale	ABYQ	*Tegillarca granosa* ∆R=-150±21	1952-1649 1740-1449	1801 1601	Skelly (pers. comm., 2023)	2204±13 (Wk-56261) 2035±13 (Wk-56259)
45	Giligilina	ABYP	Charcoal	1526-1411 493-321	1468 436	Skelly (pers. comm., 2023)	1593±18 (Wk-56258) 364±17 (Wk-56256)
Amazon Bay-Mailu (Central Province)							
46	Oriado	ABYM	Charcoal	1992-1629	1815	Irwin 1985	1900±70 (ANU-1316)
47	Selai	AUE	Charcoal	1866-1535 1831-1526	1679 1658	Irwin 1985	1790±70 (ANU-1316) 1770±70 (ANU-1317)
Wari Island (Milne Bay Province)							
48	Kasasinabwana Shell Midden	BALU	*Tridacna* sp. ∆R=-150±21	2851-2506 2305-1955	2699 2128	Negishi & Ono 2009	2921±36 (Wk-25604) 2463±38 (Wk-25603)

1 Vanderwal (1973:49) interpreted ANU-726 (940±180 BP) as potentially contaminated and the determination is not included here.

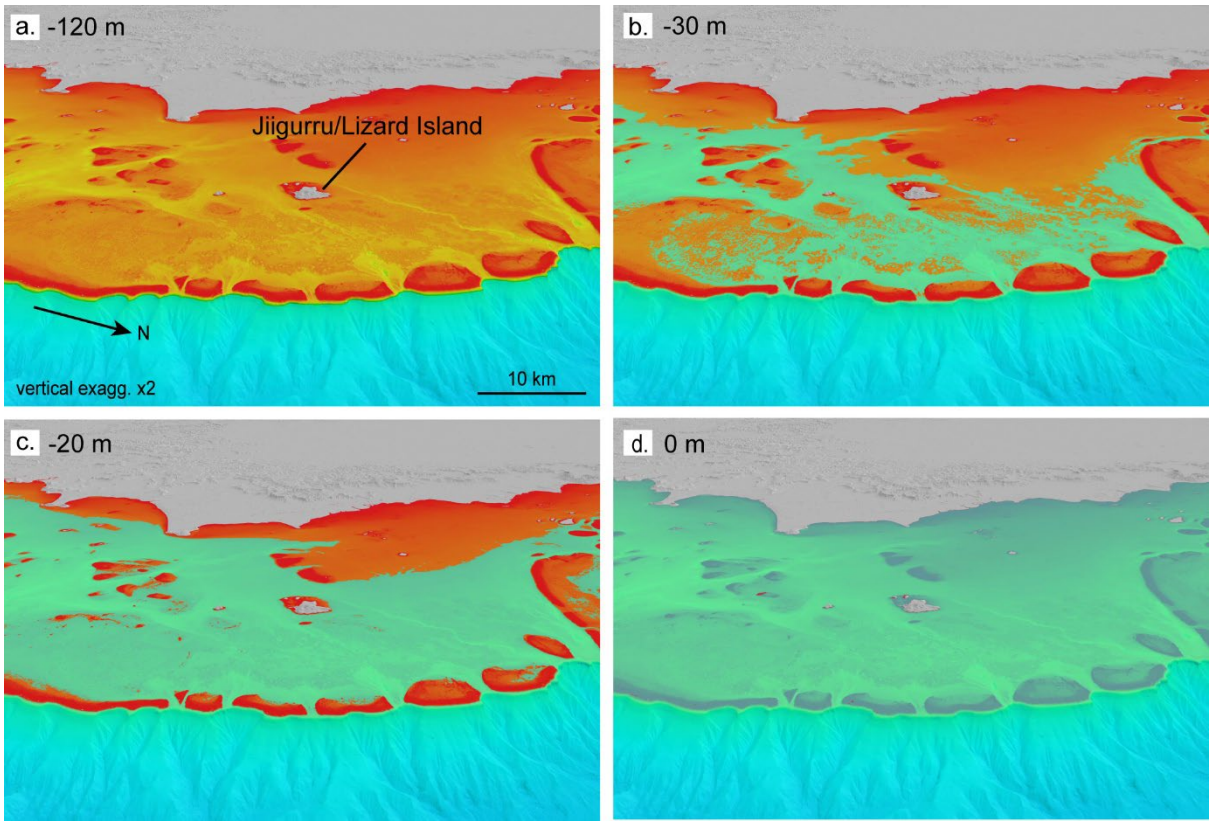
2 Some Gakushuin Laboratory (Gak-) dates are demonstrably anomalous. Spriggs and Anderson (1993) note that: 'Many Gakushuin dates for Pacific and Asian samples are anomalous in comparison with results from other laboratories (see Kirch, 1975:49-51, 1984:73; Spriggs, 1989:604; Anderson, 1991:768). Later-run Gakushuin dates, Gak-4500 and later, do not appear to suffer from these problems.'

3 Based on ceramic analyses, Allen (1972:120) rejected Gak-2990 (3340±160 BP) in favour of I-5796 (1760±90 BP) which was obtained from the same piece of charcoal. The older unreliable Gak-2990 (3340±160 BP) is not included here.

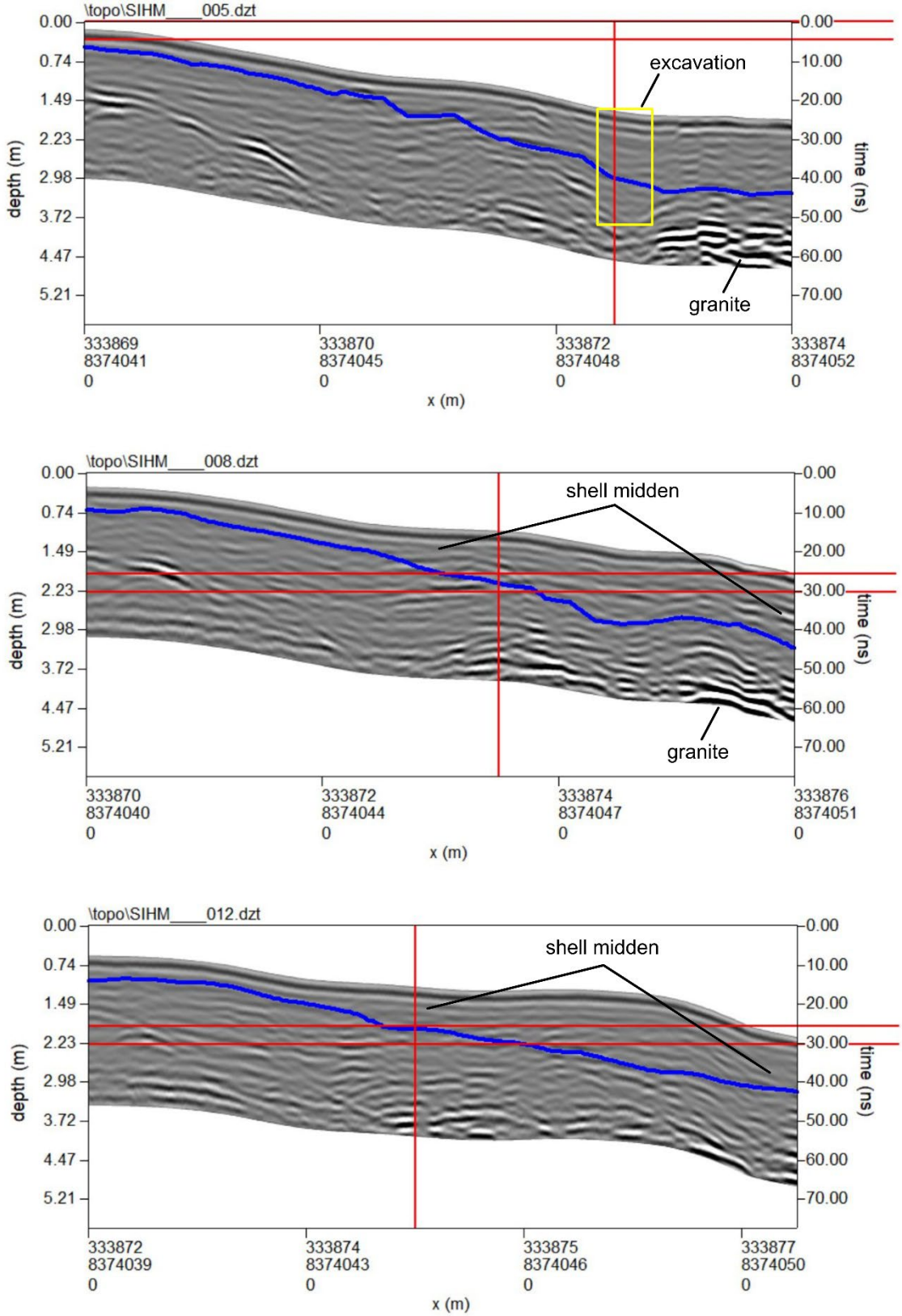
4 ANU-1219 (1010±80 BP) is interpreted as 'the earliest date for human presence' on Motupore Island. ANU-1218 (310±60 BP) is the most recent determination associated with site abandonment (Allen, 2017:118).



Supplementary Figure S6. Holocene sea-level change in the Jiigurru (Lizard Island Group) region. (Top) Marine (coral microatoll, oysters) and estuarine (mangrove mud/peat) sea-level indicator data for the northern Great Barrier Reef (north of Cairns) for the last 10,500 years. Dashed line at -30 m and vertical arrow at c.10,000 cal BP indicate when Jiigurru become an island with rising sea-levels. (Bottom) All reliable sea-level indicators for the last 7,000 years (fossil coral microatolls considered to have moated have been removed). Sea-level indicator data (coral microatolls, oysters) from the Jiigurru region show a +0.5 to +0.8 m highstand persisted between at least 6500 and 2300 cal BP. It appears the highstand may have been approximately 0.5 m lower than that recorded from sites on the mainland possibly due to the variable influence of hydro-isostatic loading (Lambeck and Nadaka 1990). Data were originally compiled from Lewis et al. (2013) with additional datapoints from Kench et al. (2012) and Perry et al. (2017). All ages have been recalibrated using IntCal20 for terrestrial (mangrove) samples and Marine20 for marine samples, using a ΔR of -197±56 for 0-5500 cal BP (0-5099 BP) and -38±158 for 5500-7000 cal BP (5099-6740 BP) (see Methods).



Supplementary Figure S7. Impact of sea-level rise on Jiigurru (Lizard Island Group). Red indicates the extent of terrestrial landscapes. Clockwise from top left: (a) -120 m, c.21,000 years ago, (b) -30 m, c.10,000 years ago, (c) -20 m, c.9,500 years ago, (d) 0 m, c.500 years ago. By at least -30 m (10,000 years ago), Jiigurru would have been surrounded by water. Islandisation may have occurred slightly earlier, allowing for several metres of post-glacial marine transgression sediments, reflected in this modern surface. Note that islands identified in (b) and (c) include topographic features from Holocene reef-growth. However, the general pattern reflects landforms created during the last interglacial period. Bathymetric data from Beaman (2017).



Supplementary Figure S8. Example GPR reflection profiles showing horizon 2 (blue line) – the detected base of the shell deposit, the Square A excavation (yellow square) and granite bedrock. Note red lines are used to mark anomalies of interest which are the locations and extent of the shell deposit and the excavation unit.

Supplementary Figure S9. Walk-through of South Island Headland Midden, Square A, site context. Maptek's I-Site 5016 long range, time of flight 3D scanner was used with a reverse tripod to capture a high-resolution three-dimensional model of the excavation and surrounding area. An Artec Eva structured light 3D scanner attached to a painter's pole was used to capture fine detail of the sections of the excavation. Post-processing of raw 3D scans was done using Maptek I-Site Studio (I-Site 5016) and Artec Studio (Eva). These 3D point clouds were then imported and combined in GeoMagic Wrap to produce a triangulated mesh for export as *.STL and *.OBJ. A separate photogrammetry model was generated using a pool of DSLR imagery and software Reality Capture. These two 3D models were composed and merged together in Unreal Engine to provide a representation of the midden site in situ alongside a Digital Elevation Model and 3D artist interpretation of the South Island Headland Midden and its surrounds..

Additional References Not Cited in the Main Text

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