Supplement to: Sea Surface Temperature of the mid-Piacenzian Ocean: A Data-Model Comparison

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Table S1. Ninety-three localities discussed in text and used as points for comparison of PlioMIP Experiment 1 simulations.

Table S2. Faunal census from ODP Site 1208.

Supplementary Figure S1. Scatter plots showing distribution of individual model and PRISM data anomalies for each of the eight PlioMIP models.

Supplementary Figure S2. Distribution of proxy SST data based upon (a) quantitative analysis of planktonic foraminifera, (b) alkenones, (c) foraminiferal Mg/Ca and (d) other proxies including diatoms, radiolaria, ostracods and mollusks in the PRISM3 synthesis. Maps created in iMap v.3.5 using World Vector Shoreline (NOAA National Geophysical Data Center, Date Retrieved 4/17/2011, *http://www.ngdc.noaa.gov/mgg/shorelines/shorelines.html)*.

PRISM and PlioMIP data sets are available from

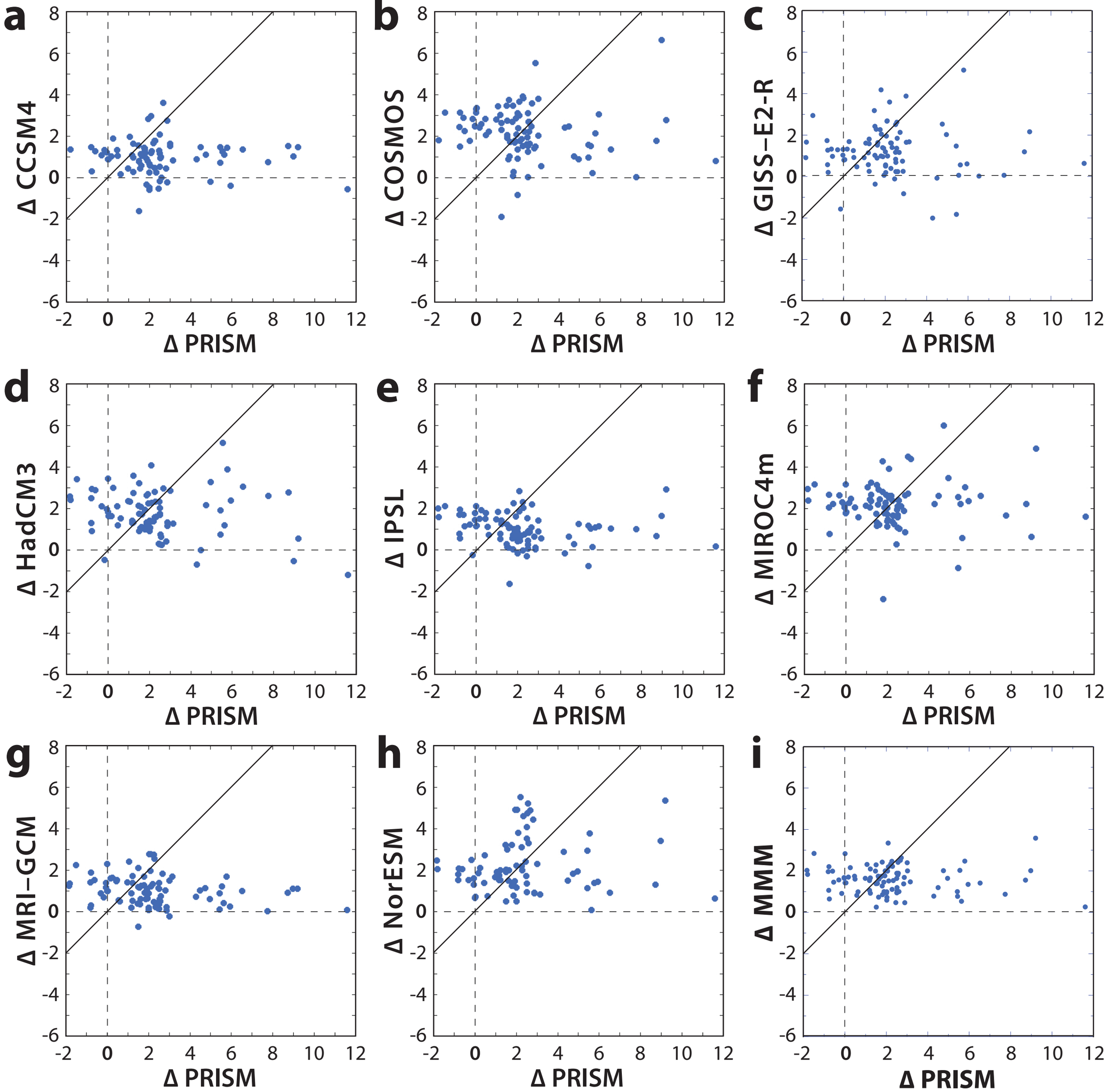
http://geology.er.usgs.gov/eespteam/prism/index.html

Table S1.

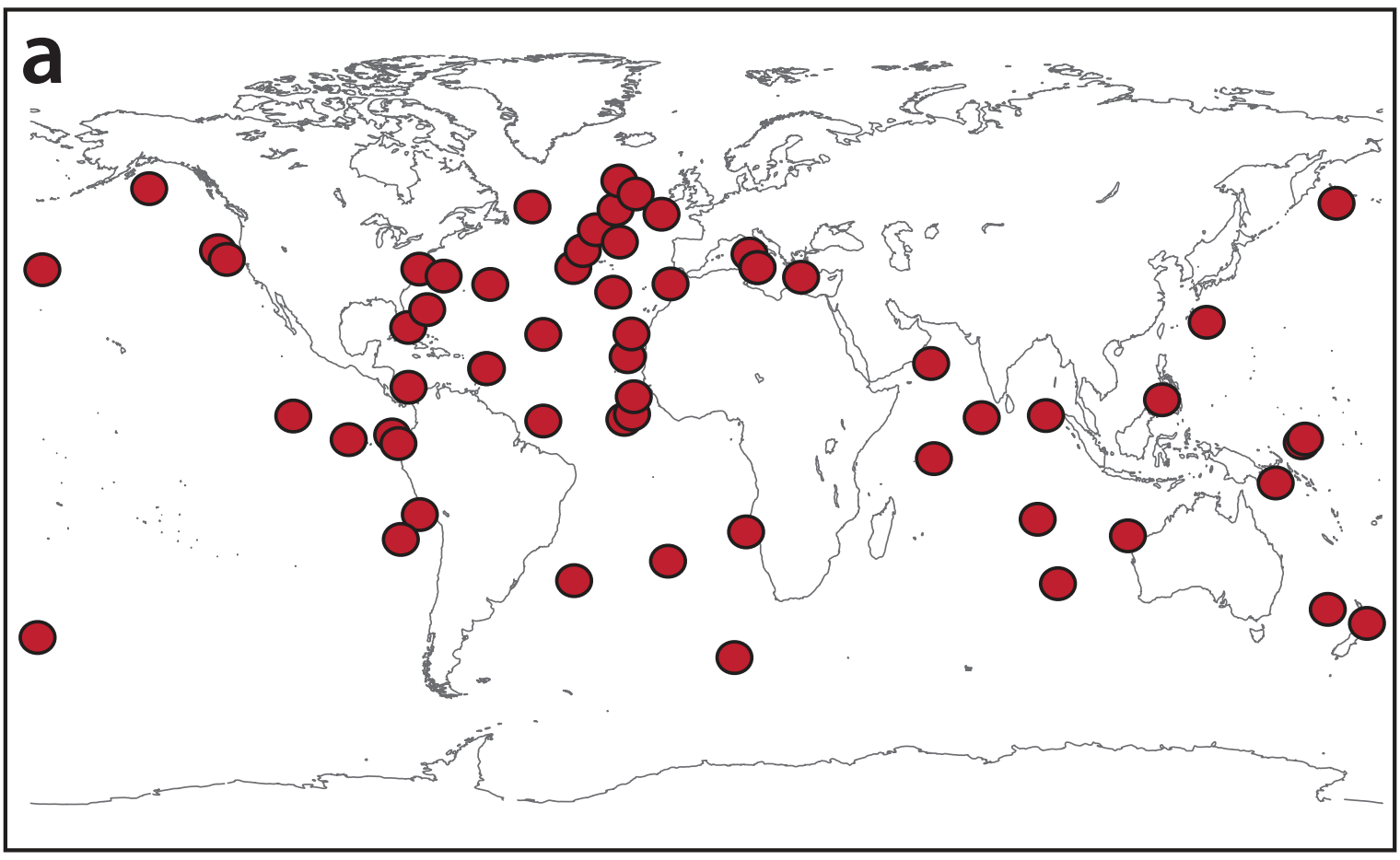
Locality	Lat °N	Lon °E	SST Anomaly (°C)										λ	Variab.
			CCSM4	COSMOS	GISS-E2-R	HadCM3	IPSL	MIROC4m	MRI	NorESM	MMM	PRISM3		
DSDP 310	36.87	-176.90	0.54	1.54	0.69	1.70	0.45	2.12	0.37	0.94	1.04	2.51	Medium	1.25
E14-8	-59.67	-160.29	0.59	1.02	1.52	1.11	-1.65	1.23	0.60	1.49	0.74	1.62	Medium	1.85
Colvillian	70.29	-150.42	---	---	---	---	---	---	---	---	---	3.01	High	2.00
ODP 887	54.37	-148.45	-1.61	2.06	-0.36	0.91	0.13	1.18	-0.71	0.51	0.26	1.51	High	1.43
DSDP 573	0.49	-133.30	1.29	2.89	1.33	2.89	1.69	2.22	1.53	2.07	1.99	-0.60	High	0.25
DSDP 36	40.98	-130.12	-0.47	3.10	0.51	1.38	0.85	2.02	0.08	0.49	1.00	2.01	Medium	1.25
ODP 1021	39.09	-127.78	-0.38	3.05	0.62	2.40	1.13	2.37	0.24	1.44	1.36	5.94	High	2.16
E13-17	-65.68	-124.11	0.83	0.55	1.68	1.28	0.55	4.39	1.70	0.83	1.48	3.15	Medium	1.85
ODP 1018	36.98	-123.28	0.29	-1.88	0.26	2.75	1.29	3.24	0.52	---	0.93	1.22	Very High	0.96
ODP 1014	32.83	-119.98	0.76	0.04	0.07	2.62	1.00	1.68	0.02	---	0.88	7.73	Very High	1.10
ODP 852	5.28	-110.07	1.30	1.95	1.18	2.33	1.54	1.94	1.14	1.72	1.64	2.49	Very High	0.28
Meighen Island	79.00	-99.00	---	---	---	---	---	---	---	---	---	3.50	Medium	1.50
DSDP 323	-63.68	-97.99	1.31	0.09	1.00	1.01	0.03	4.27	1.29	1.26	1.28	1.79	Medium	1.85
ODP 847	0.18	-95.32	1.63	2.04	1.66	2.85	1.42	2.72	1.50	2.31	2.01	3.01	Very High	1.03
ODP 625	28.83	-87.17	1.19	2.99	2.69	---	1.86	2.52	1.97	---	2.20	2.09	High	0.92
ODP 677	1.20	-83.74	0.92	1.70	1.40	2.63	1.00	1.78	0.93	1.29	1.46	1.87	High	0.21
Sarasota	27.25	-82.66	---	3.15	2.95	3.43	2.12	3.17	2.24	---	2.85	-1.50	High	1.00
Pinecrest Beds	27.35	-82.43	---	3.15	---	3.44	2.12	3.17	2.31	---	2.84	0.00	Medium	1.00
ODP 1239	-0.67	-82.08	1.64	2.30	1.81	3.59	1.43	2.66	1.38	1.99	2.10	1.22	High	0.35
Cayo Agua	9.15	-82.05	---	---	---	---	1.10	---	0.56	---	0.83	0.57	Medium	1.00
ODP 1236	-21.37	-81.43	1.11	0.21	0.57	1.19	0.15	0.59	0.41	0.09	0.54	5.62	High	0.10
SEFlor	25.78	-80.28	---	3.14	1.28	2.95	1.95	---	1.89	2.08	2.21	-0.78	Medium	1.00
ODP 1006	24.40	-79.46	0.45	2.81	0.92	2.35	1.46	2.13	1.43	1.68	1.65	0.98	High	0.18
DSDP 502	11.49	-79.38	1.06	2.05	0.93	1.19	1.77	---	1.54	2.73	1.61	0.48	Very High	0.60
Duplin	34.00	-79.00	---	2.25	0.98	---	1.15	---	---	---	1.46	-0.55	High	1.00
Lee Creek	35.38	-76.75	---	3.59	2.14	---	2.19	---	---	---	2.64	2.71	High	1.00
Yorktown	37.00	-76.50	---	---	---	---	---	---	---	---	---	3.50	High	1.00
ODP 1237	-16.00	-76.37	1.48	1.59	1.48	1.93	1.18	-0.86	0.12	1.13	1.01	5.42	Very High	0.85
ODP 1062	28.25	-74.41	0.80	2.86	1.37	2.69	1.61	2.27	1.10	1.46	1.77	1.92	Very High	0.07
DSDP 603	35.49	-70.03	-0.22	1.51	-0.82	1.17	0.10	0.87	0.23	0.93	0.47	2.88	High	0.94
DSDP 541	15.52	-58.72	1.04	2.41	1.33	1.64	1.51	2.28	1.61	1.85	1.71	0.16	High	0.37
ODP 672	15.50	-58.50	1.04	2.41	1.33	1.64	1.51	2.28	1.61	1.85	1.71	0.16	High	0.37
ODP 1063	33.69	-57.61	0.17	2.23	0.48	1.54	0.72	1.58	0.50	0.75	1.00	0.63	Very High	0.52
DSDP 111	50.43	-46.37	1.45	2.13	5.14	3.89	1.08	3.04	1.69	1.40	2.48	5.78	Very High	3.10
DSDP 396	22.90	-43.50	0.96	2.64	1.59	1.33	1.26	2.35	1.73	1.54	1.67	1.22	High	0.00
ODP 925	4.20	-43.49	1.21	2.51	1.04	1.97	1.77	2.16	1.17	1.61	1.68	-0.05	Very High	0.20
ODP 695	-62.39	-43.45	0.44	1.41	0.75	0.41	0.65	1.90	1.04	4.45	1.38	2.83	Medium	1.85
DSDP 606	37.34	-35.50	1.09	3.04	1.15	1.42	0.54	2.44	0.90	1.76	1.54	1.18	Very High	1.09
DSDP 516	-30.27	-35.28	-0.59	1.35	0.20	1.41	0.42	1.71	0.19	1.16	0.73	2.02	High	0.60
DSDP 607	41.00	-32.96	1.34	2.83	-1.56	-0.48	-0.24	2.30	0.69	2.50	0.92	-0.16	Very High	1.07
ODP 699	-51.54	-30.68	1.68	1.87	3.60	1.40	0.70	2.62	1.33	5.53	2.34	2.21	Medium	1.85
DSDP 410	45.51	-29.48	0.88	2.42	-2.00	-0.68	-0.16	2.22	0.73	2.90	0.79	4.28	High	0.05
ODP 951	32.03	-24.87	-0.34	1.78	0.97	1.33	0.94	2.05	0.60	0.78	1.01	1.88	Very High	0.42
DSDP 609	49.88	-24.24	0.72	0.96	-1.82	0.74	-0.77	2.56	0.88	2.95	0.78	5.43	Very High	0.65
DSDP 552	56.04	-23.23	1.25	1.53	0.07	5.17	1.02	2.22	1.21	3.78	2.03	5.54	Very High	0.91
DSDP 608	42.84	-23.09	1.47	2.46	-0.07	0.00	0.63	2.60	1.03	1.49	1.20	4.49	Very High	0.25
ODP 667	4.55	-21.90	1.21	2.47	1.32	1.97	1.45	2.05	1.39	1.32	1.65	-0.04	High	0.47
ODP 659	18.08	-21.03	1.77	3.93	1.63	2.81	2.30	2.40	2.76	2.19	2.47	2.26	Very High	0.53
ODP 958	23.00	-20.00	1.77	3.83	1.62	2.33	2.03	1.67	2.57	1.99	2.23	2.29	Very High	0.49
DSDP 366	5.68	-19.85	1.34	2.83	1.26	2.12	1.50	2.07	1.47	1.38	1.75	0.46	High	0.82
ODP 661	9.45	-19.39	1.96	3.45	1.62	2.34	1.83	3.02	2.43	1.91	2.32	1.06	Very High	0.26
DSDP 610	53.22	-18.89	1.35	1.35	0.03	3.05	1.02	2.60	1.01	0.93	1.42	6.52	Very High	0.59
ODP 693	-70.83	-14.57	0.01	1.63	0.24	0.24	0.86	1.04	0.75	3.30	1.01	2.60	Medium	1.85
ODP 907	69.25	-12.70	1.47	2.79	9.58	0.56	2.93	4.90	1.12	5.37	3.59	9.20	High	0.90
DSDP 548	48.85	-12.00	1.54	1.79	1.20	2.77	0.67	2.22	0.93	1.32	1.56	8.71	Very High	0.65
DSDP 521	-26.07	-10.27	0.68	0.93	0.57	0.93	-0.16	1.15	0.17	0.50	0.59	2.01	Medium	0.85
DSDP 546	33.80	-9.60	1.27	1.79	1.00	2.29	0.44	2.62	1.22	---	1.52	2.11	High	1.38
ODP 690	-65.16	1.21	-0.53	1.62	-0.11	0.30	-0.31	0.29	0.16	2.43	0.48	2.45	Medium	1.85
North Sea	52.50	1.50	---	2.21	2.63	---	---	---	---	---	2.42	2.56	Medium	1.50
ODP 909	78.58	3.07	1.04	6.64	2.17	-0.52	1.64	0.65	1.12	3.42	2.02	8.96	Medium	2.00
ODP 704	-46.88	7.42	2.09	1.25	2.52	2.04	0.88	1.70	1.10	3.52	1.89	2.50	Very High	1.21
PS1448	-58.64	7.92	0.46	1.54	0.40	1.59	-0.02	1.36	0.46	3.12	1.11	2.27	Medium	1.85
ODP 911	80.47	8.23	-0.55	0.81	0.64	-1.20	0.17	1.60	0.08	0.63	0.27	11.59	Medium	1.40
DSDP 532	-19.74	10.52	1.19	0.27	2.05	1.13	2.26	-2.36	0.92	1.40	0.86	1.81	Medium	0.85
DSDP 132	40.25	11.43	1.15	3.74	0.90	2.08	1.06	2.92	0.37	---	1.75	1.60	High	0.24
Punta di Maiata	37.33	13.50	---	---	0.58	1.32	0.77	2.05	0.19	1.52	1.07	-0.79	High	0.85
Punta Piccola	37.33	13.58	---	---	0.58	1.32	0.77	2.05	0.19	1.52	1.07	1.18	High	0.85
Finikia	35.25	25.17	---	---	0.92	2.58	2.00	2.94	1.26	2.46	2.03	-1.84	High	0.85
ODP 722	16.62	59.80	2.98	3.68	2.68	4.08	2.84	3.93	2.79	3.80	3.35	2.08	High	0.85
ODP 709	-3.92	60.55	1.09	1.79	1.30	2.10	1.21	2.65	0.89	1.54	1.57	-0.30	High	1.29
ODP 736	-49.40	71.66	3.62	2.48	1.17	2.97	1.08	2.10	1.84	4.89	2.52	2.67	Medium	1.85
ODP 716	4.93	73.28	1.46	2.45	1.74	2.51	1.69	2.66	1.42	1.81	1.97	-0.81	High	1.01
ODP 747	-54.81	76.79	2.84	2.08	0.07	2.24	0.64	2.68	0.64	4.91	2.01	1.94	Medium	1.85
ODP 748	-58.44	78.98	0.94	2.69	1.37	0.75	0.93	2.43	0.61	4.74	1.81	2.55	Medium	1.85
ODP 751	-57.73	79.81	0.99	2.70	1.85	0.63	0.83	2.38	0.50	5.23	1.89	2.57	Medium	1.85
ODP 745	-59.60	85.86	0.26	2.22	1.41	1.62	0.76	1.25	0.21	4.60	1.54	2.33	Medium	1.85
ODP 757	-17.02	88.18	1.05	1.72	1.64	1.72	1.08	2.45	1.24	2.01	1.61	1.64	High	0.75
ODP 758	5.38	90.37	1.36	1.80	1.67	2.43	1.59	2.40	1.37	2.06	1.84	-1.81	High	1.94
DSDP 266	-56.40	110.11	1.55	3.48	3.19	2.13	0.29	1.76	0.40	3.21	2.00	1.47	Medium	1.85
ODP 763	-20.59	112.21	0.77	1.91	1.03	1.75	1.22	1.33	1.20	1.91	1.39	1.50	Very High	1.64
ODP 769	8.78	121.29	1.89	2.59	1.69	3.00	1.91	2.48	1.63	2.11	2.16	0.25	Medium	0.30
DSDP 445	25.52	133.20	0.82	2.76	2.43	3.21	1.87	3.14	2.11	2.02	2.30	1.50	High	0.30
Yabuta	37.00	137.00	---	---	---	---	---	---	---	---	---	0.00	Medium	0.62
Sasaoka	39.50	140.50	---	---	---	---	---	---	---	---	---	1.76	Medium	1.00
E50-28	-62.90	150.68	0.59	2.39	1.96	1.08	0.78	1.48	2.78	4.92	2.00	2.05	Medium	1.85
E36-33	-57.75	150.88	1.42	3.48	4.19	1.94	0.73	2.80	1.69	3.23	2.43	1.79	Medium	1.85
ODP 1115	-9.18	151.57	0.30	1.49	0.21	0.93	0.56	0.78	0.31	---	0.65	-0.76	Very High	0.33
DSDP 579	38.63	153.84	-0.19	0.88	2.03	3.28	1.24	3.46	0.60	1.94	1.65	4.95	Very High	1.85
DSDP 580	41.63	153.98	1.12	1.04	2.54	2.18	0.28	6.01	1.13	1.84	2.02	4.75	Very High	1.85
DSDP 586	-0.50	158.50	0.89	3.32	0.80	1.84	1.15	1.78	1.01	0.66	1.43	0.00	Medium	0.30
ODP 806	0.31	159.36	0.90	3.35	0.82	1.64	1.17	1.83	1.01	0.72	1.43	0.04	Very High	0.30
ODP 881	47.10	161.49	2.76	5.52	0.26	1.33	0.04	2.65	0.07	0.89	1.69	2.86	Very High	1.00
E. Kamchatka	56.00	163.00	1.44	2.70	2.27	---	0.55	---	---	---	1.74	1.75	Medium	1.50
Karaginsky	58.85	164.04	1.53	3.82	3.89	---	0.89	4.50	-0.22	---	2.40	3.00	Medium	1.50
DSDP 592	-36.47	165.44	0.25	-0.84	1.20	1.33	1.07	1.39	0.89	2.22	0.94	2.00	Very High	1.64
AND-1B	-77.89	167.09	---	---	---	---	---	---	---	---	---	1.39	High	1.85
ODP 883	51.20	167.77	1.18	3.10	0.24	1.74	0.24	1.58	0.14	1.35	1.20	2.51	High	1.14
E50-33	-61.09	170.06	0.45	0.89	2.29	1.06	0.12	2.19	1.17	3.01	1.40	1.56	Medium	1.85
DSDP 274	-68.99	173.43	-0.17	0.03	0.84	0.28	0.05	1.08	1.39	4.09	0.95	2.50	Medium	1.85
Rangitikei R.	-39.50	175.87	---	---	---	---	---	---	---	---	---	2.00	Medium	0.85

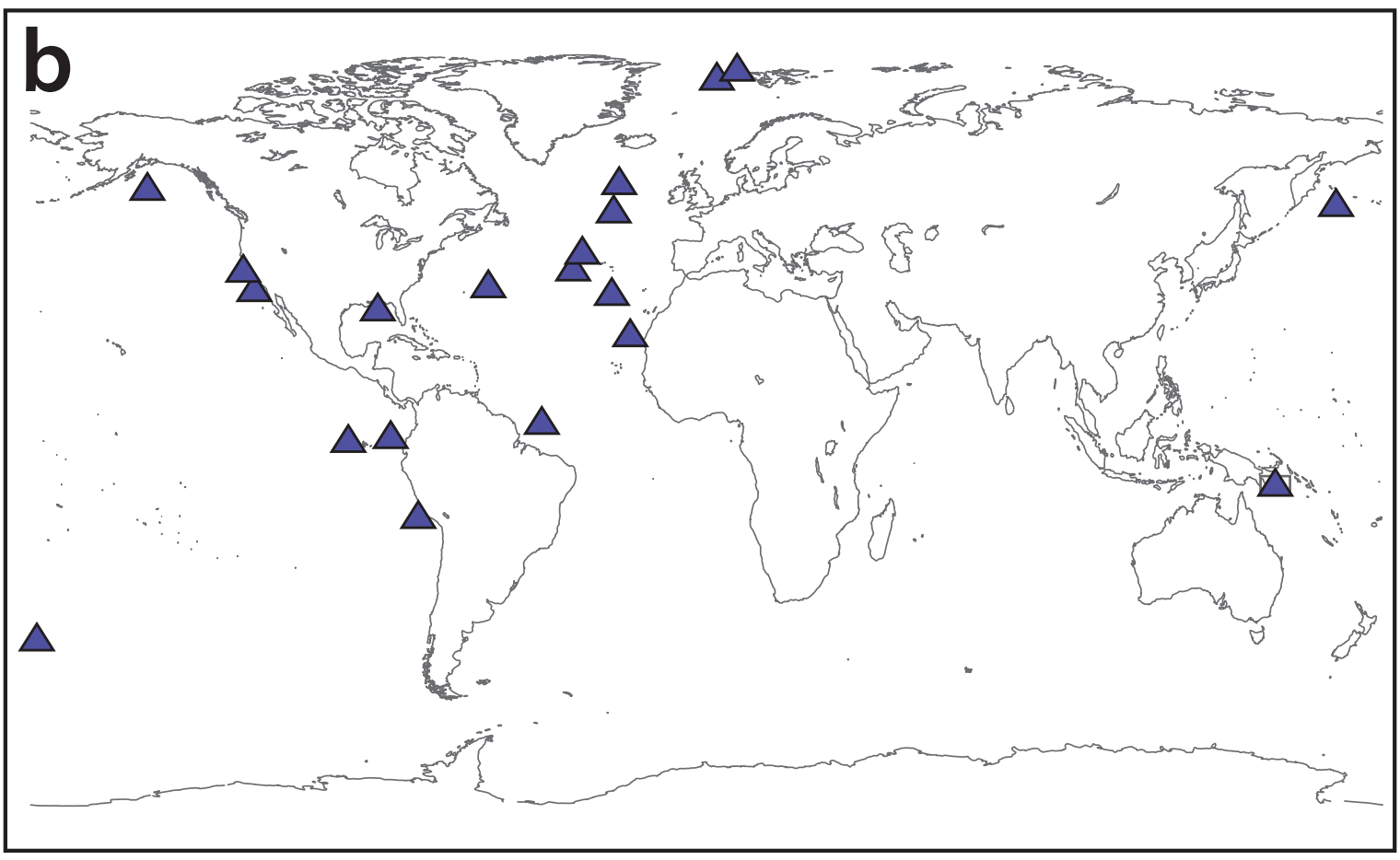
Site	Hole	Core - Section	Sample (cm)	*Dentoglobigerina altispira*	*Globigerina bulloides*	*Globigerina calida*	*Globigerina decoraperta*	*Globigerina falconensis*	*Globigerina praedigitata*	*Globigerina pseudobesa*	*Globigerina woodi*	*Globigerinella aequilateralis*	*Globigerinita glutinata*	*Globigerinoides obliquus*	*Globigerinoides ruber*	*Globigerinoides sacculifer*	*Globorotalia crassaformis*	*Globorotalia inflata/puncticulata*	*Globorotalia margaritae*	*Globorotalia menardii*	*Globorotalia scitula*	*Globorotalia tumida*	*Neogloboquadrina acostaensis*	*Neogloboquadrina dutertrei*	*Neogloboquadrina humerosa*	*Neogloboquadrina pachyderma (d)*	*Neogloboquadrina pachyderma (s)*	*Orbulina universa*	*Sphaeroidinellopsis spp.*	*Turborotalia quinqueloba*	**TOTAL PLANKTICS**	Benthics
1208	A	15H-6	70-72	0	6	1	1	3	6	0	0	0	28	3	5	1	24	215	0	0	4	0	0	29	0	48	0	3	0	0	377	42
1208	A	15H-6	80-82	0	3	0	1	0	0	0	2	0	1	0	5	0	11	161	0	0	0	0	0	16	0	52	1	5	0	0	258	32
1208	A	15H-6	90-92	0	6	2	0	1	1	0	1	0	7	0	3	0	5	172	0	1	0	0	0	21	0	61	1	2	0	0	284	44
1208	A	15H-6	100-102	0	5	0	0	0	3	0	1	0	9	0	3	0	5	147	1	0	0	0	0	15	0	47	0	0	0	1	237	62
1208	A	15H-6	110-112	0	1	0	0	1	1	0	1	0	1	0	0	0	2	162	0	0	0	0	0	11	0	18	1	0	0	0	199	
1208	A	15H-6	123-125	0	8	5	0	3	0	0	2	0	16	0	2	0	3	113	0	0	1	0	0	24	0	37	1	1	0	0	216	34
1208	A	15H-6	130-132	0	6	4	2	7	1	0	11	0	31	0	0	0	9	158	0	0	1	0	0	28	0	28	3	2	0	1	292	60
1208	A	16H-5	40-42	0	2	2	0	1	0	0	1	0	0	0	0	0	4	73	0	0	0	1	0	9	0	8	0	0	0	0	101	2
1208	A	16H-5	50-52	0	4	0	0	1	3	0	2	0	2	0	0	0	3	182	1	0	0	1	0	53	0	15	0	0	2	0	269	102
1208	A	16H-5	60-62	0	3	2	0	0	1	0	0	1	6	0	3	1	7	214	0	0	0	2	0	34	0	52	0	0	0	1	327	
1208	A	16H-5	70-72	0	1	0	0	0	1	0	0	0	2	0	2	0	0	200	0	0	0	1	0	25	0	62	0	5	1	0	300	16
1208	A	16H-5	80-82	0	1	0	0	0	0	0	0	0	0	0	0	0	1	26	0	0	0	0	0	0	0	0	0	0	0	0	28	37
1208	A	16H-5	90-92	0	1	0	0	1	0	0	0	0	0	0	0	0	2	43	0	0	0	1	0	0	0	4	0	1	0	0	53	
1208	A	16H-7	32-34	24	8	4	0	0	0	1	0	0	2	5	12	6	105	52	0	0	1	0	1	115	1	170	4	9	3	0	523	
1208	A	16H-7	40-42	18	14	1	0	0	1	0	0	0	1	8	3	5	54	77	0	0	1	0	4	110	0	134	5	8	0	0	444	89
1208	A	16H-7	50-52	12	6	0	2	1	0	0	0	0	2	0	5	2	46	126	0	4	1	1	0	97	0	109	0	21	1	0	436	
1208	A	16H-7	70-72	2	0	0	0	3	0	0	0	0	1	0	1	0	14	299	0	1	0	0	0	8	0	14	1	2	0	0	346	28
1208	A	16H-CC	0-2	4	3	1	0	11	0	0	2	0	3	1	0	1	10	223	0	0	1	0	0	55	0	39	0	7	0	0	361	27

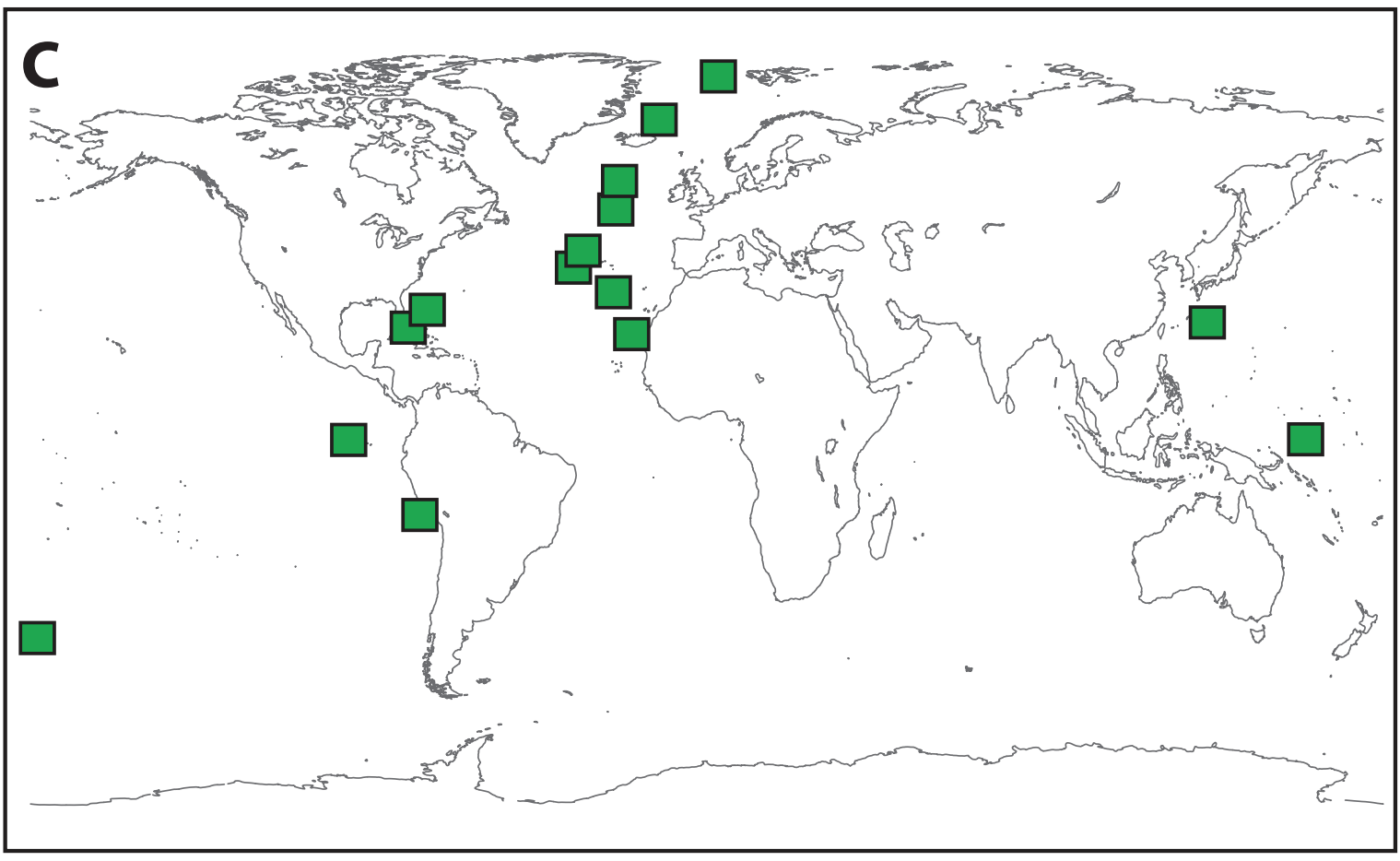
SUPPLEMENTARY FIGURE S1.

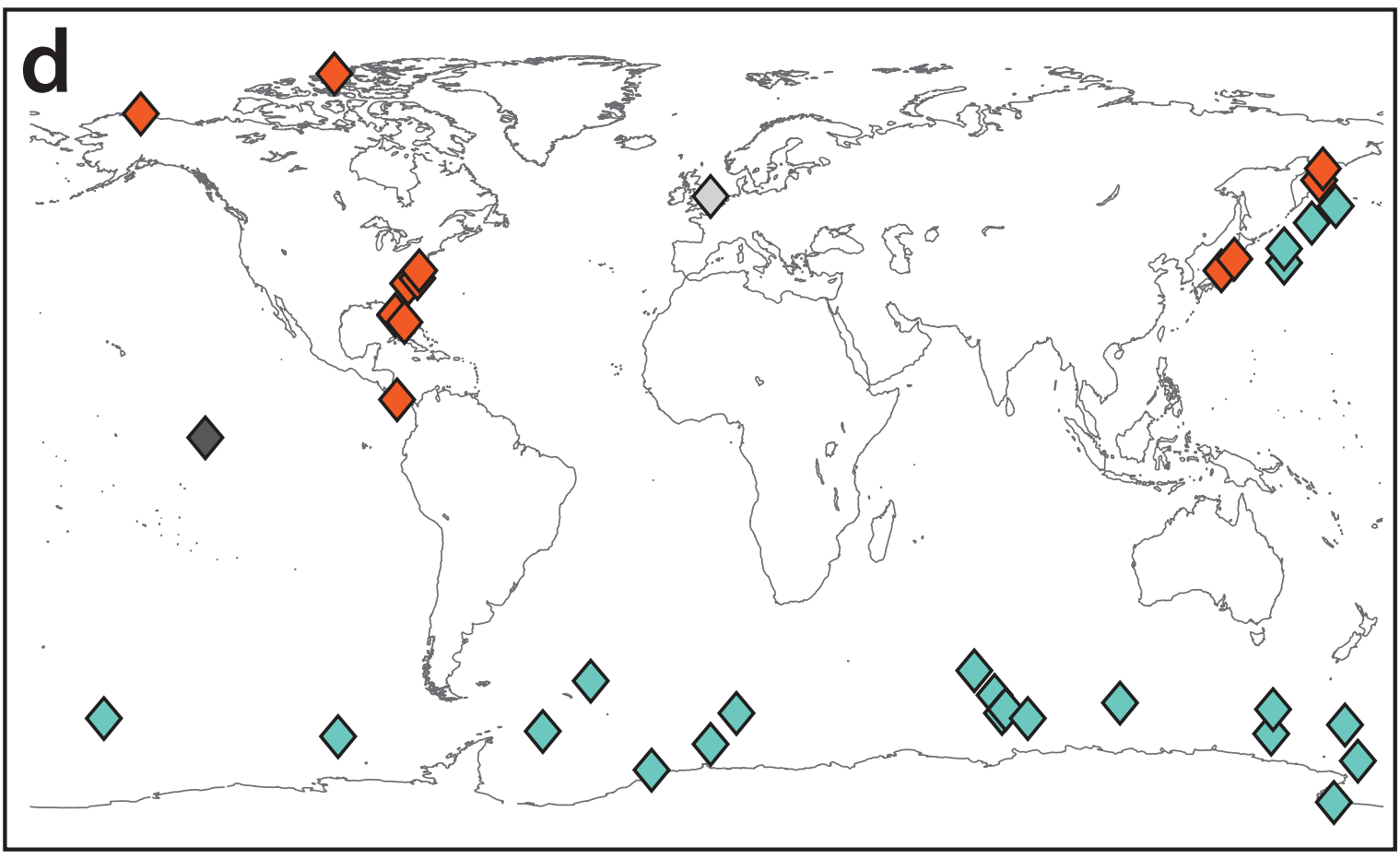


SUPPLEMENTARY FIGURE S2.









SST Proxy Method:

Foraminifera Alkenone ($U^{K'}_{37}$) Mg/Ca

Ostracod Diatom Mollusc Radiolarian