Supplementary Information

Figure S.1: Graphs showing the relative percentage (% total calcareous) distributions of the abundant living benthic foraminifera.

Figure S.2: *Q*-mode hierarchical cluster analysis (UPGMA Bray-Curtis similarity index) applied on living taxa.

Figure S.3: Canonical Correspondence Analysis (CCA) results applied to living foraminifera census dataset. Blue dots indicate the species and crosses indicate the samples. Abundant species included in the quantification approach together with species mentioned in the text are shown in bold and with their names.

Table S.1: Results of bottom-water oxygenation estimations ($[O_2]_{BW}$) in 3 sediment cores with the core depth and calibrated age point information.

Figure S.1. Graph showing the relative percentage (% total calcareous) distributions of abundant living benthic foraminifera. X-axis indicates the stations (water depth(m)) which are grouped according to the prevailing bottom.-water-oxygen concentrations (black for microxic (<5 µmol/kg), orange for dysoxic (5-45 µmol/kg), green for oxic (>45 µmol/kg)).

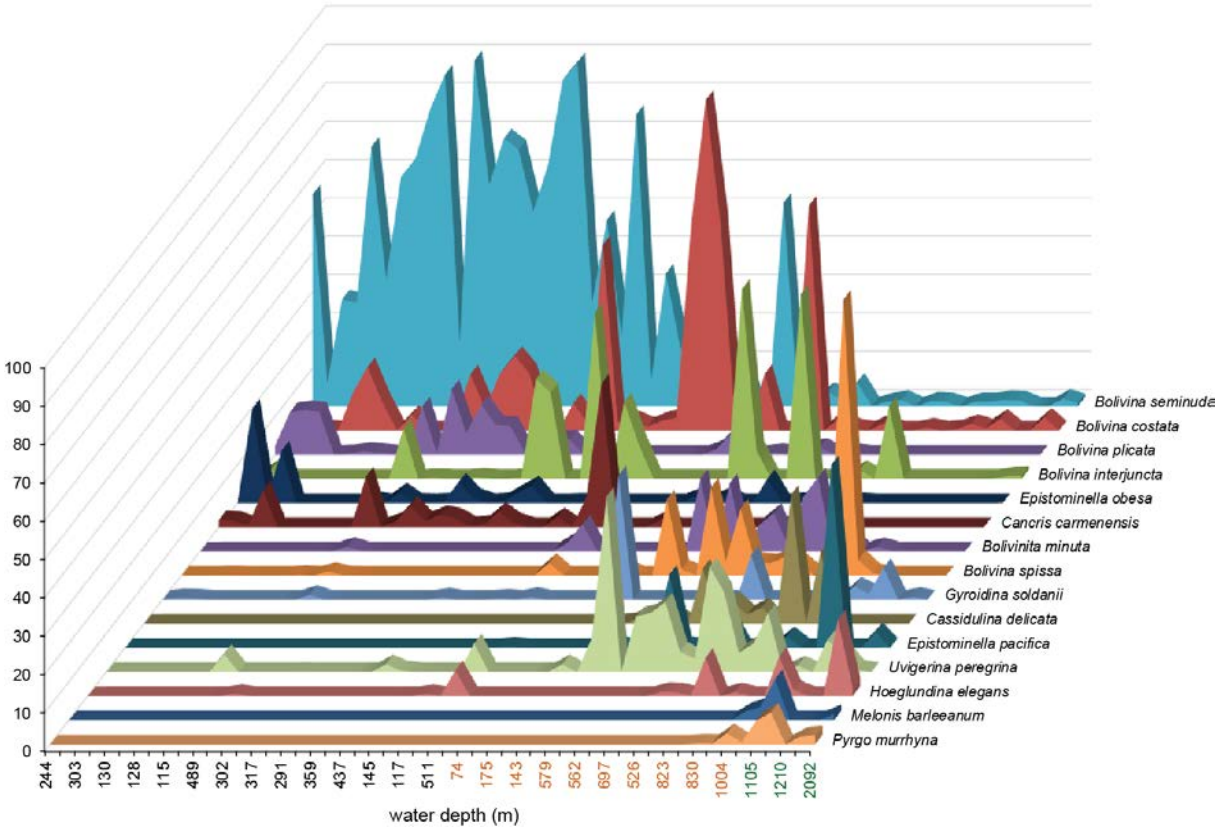


Figure S.2: *Q*-mode hierarchical cluster analysis (UPGMA Bray-Curtis similarity index) applied on living taxa.

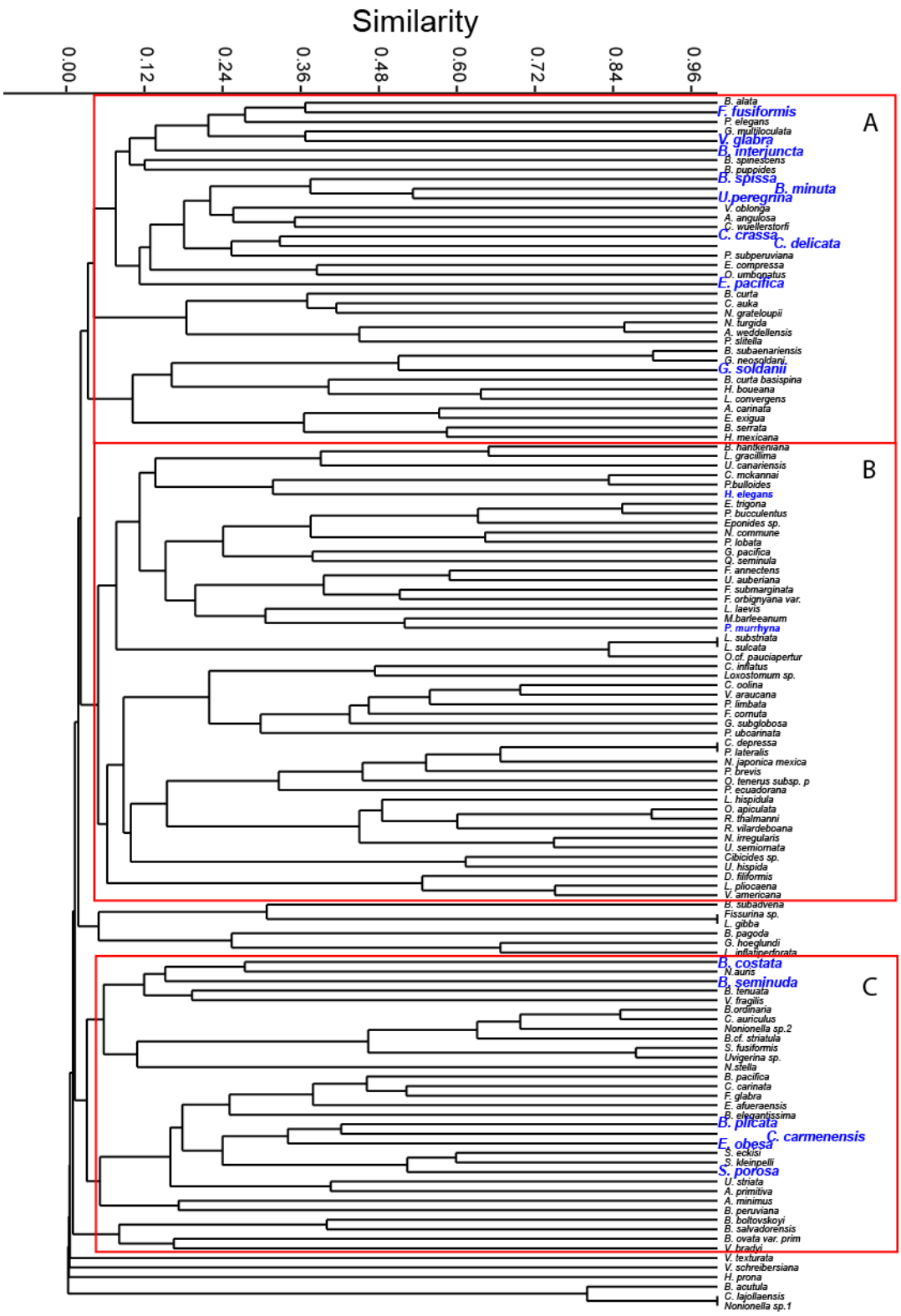
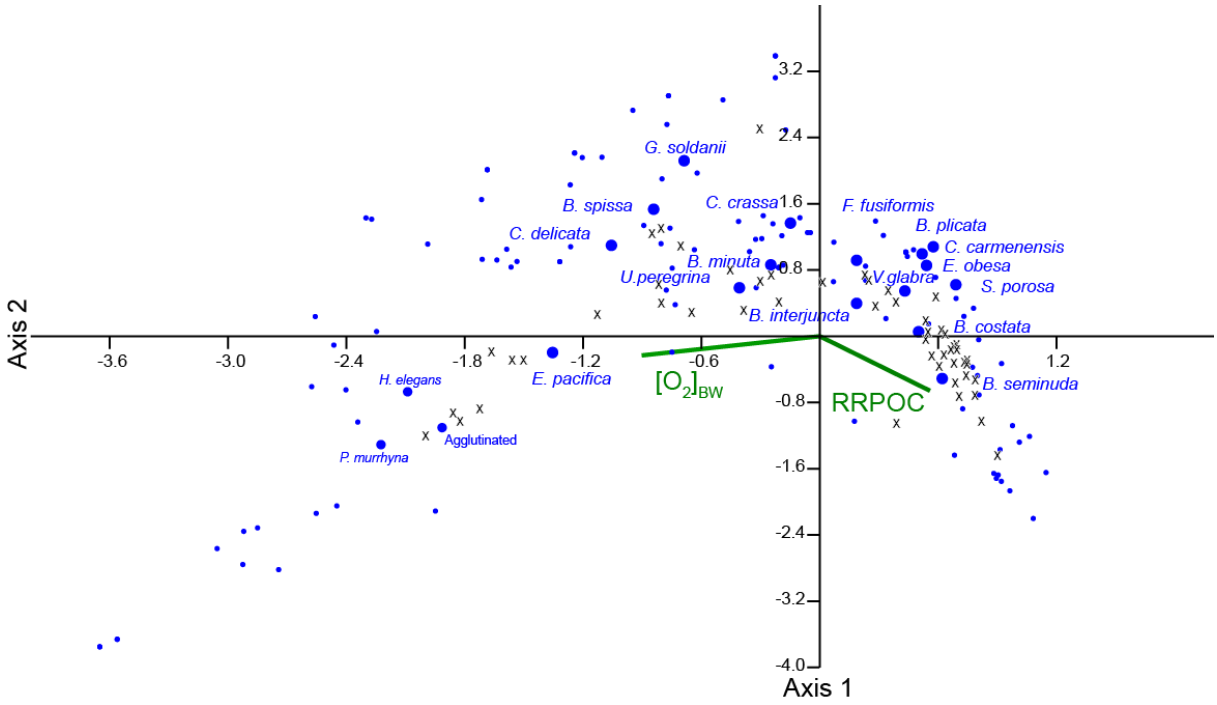


Figure S.3: Canonical Correspondence Analysis (CCA) results applied to living foraminifera census dataset. Blue dots indicate the species and crosses indicate the samples. Abundant species included in the quantification approach together with species mentioned in the text are shown in bold and with their names.



Supplementary information Table 1. Results of bottom-water oxygenation estimations ($[O_2]_{BW}$) in 3 sediment cores with the core depth and calibrated age point information.

	M77/2-50-4 8°S 1013 m				M77/2-52-2 5°S 1249 m				M77/2-59-1 3°57'S 997 m			
	Core depth (cm)	**Age (cal yrs BP)**	**$[O_2]_{BW}$ (µmol/kg)**	**error**	**Core depth (cm)**	**Age (cal yrs BP)**	**$[O_2]_{BW}$ (µmol/kg)**	**error**	**Core depth (cm)**	**Age (cal yrs BP)**	**$[O_2]_{BW}$ (µmol/kg)**	**error**
late Holocene	**HIATUS**				90	3130	32.40	12.42	143	3024	8.91	21.88
					110	3845	25.58	14.18	163	3413	6.79	22.14
					120	4202	31.01	12.11	183	3801	-9.91	28.54
					130	4559	23.29	14.41	203	4178	3.84	22.85
					140	4917	31.30	11.98	223	4531	11.36	20.88
									243	4877	25.37	15.68
early Holocene	**HIATUS**				230	8097	13.67	16.88	403	8098	30.76	14.64
					240	8486	18.43	14.22	443	8596	22.20	17.46
					250	8839	30.15	12.15	483	9095	19.84	17.82
					260	9192	25.81	12.75	523	9594	11.15	20.44
					270	9546	24.85	12.94	563	10093	13.25	20.38
					280	9899	19.74	14.66				
BA/ACR	70	13502	12.05	17.45	350	12714	25.47	14.58	803	13112	17.98	18.95
	80	14131	9.97	18.32	360	13177	9.90	20.27	843	13504	36.47	12.17
	90	14377	15.02	16.03	370	13641	43.91	11.39	883	13867	49.34	9.74
	100	14622	14.13	13.71	380	14143	35.62	12.04	923	14230	48.87	10.03
	110	14868	23.89	13.71	390	14465	53.07	10.10	963	14569	63.32	8.12
Heinrich Stadial 1	130	15359	21.54	15.48	400	15147	51.85	9.13	1043	15080	34.55	13.28
	150	15850	29.55	13.86	410	15469	56.22	8.74	1163	15643	43.56	11.53
	170	16341	26.16	20.62	420	16151	46.66	12.53	1243	16330	57.41	9.05
	190	16832	37.23	12.23	430	16653	52.94	11.59	1323	17065	59.96	9.09
	210	17215	30.68	17.35	440	17155	58.08	10.46				
	230	17598	40.20	13.79	450	17657	55.73	9.79				
Last Glacial Max	330	20095	39.40	15.56	500	20168	58.74	8.46	**NO RECORD**			
	340	20359	40.96	16.68	510	20670	60.88	8.21				
	350	20623	39.68	13.74	520	21172	55.1	9.36				
	370	20900	42.93	13.63	530	21674	58.49	10.06				
	390	21178	35.89	14.61	540	22176	52.2	10.72				
	410	21455	43.12	11.97								
	430	21733	40.05	9.70								
	450	22010	35.44	13.16								