

Samplename	Location	Coordinates	Waterdepth [m]	Temperature [°C]	Salinity [PSU]	pH	Reference
A1 - A4	Traenadjupet, Norwegian Sea	66°58.40' 0'N 11°06.52' 9'E	300	7.2	35.2	8.02	Dullo et al. (2008), Rüggeberg et al. (2011)
B1 - B2	Whittard Canyon, Celtic Sea	48°46.79' N 10°34.20' W	835	9.79	35.5	7.99	Raddatz et al. (2013)
C1 - C2	Stjernesund Fjord, Norwegian Sea	70°16.04' N 22°27.37' E	295	5.9	35	8.20	Rüggeberg et al. (2011)
D1 - D4	Little Galway Mound, Belgica Mound Province	51°26.51' N 11°45.43' W	881	8.96	35.53	7.99	Dullo et al. (2008), Rüggeberg et al. (2011)
E1 - E3	Santa Maria di Leuca, Ionic Sea	39°125.0' 0'N 18°127.0' 0'E	560-750	13.66	38.66	8.08	Flögel et al. (2014)
F1 - F4	Guilvinec Canyon, Bay of Biscay	46°56.20' N 5°21.60' W	800	10.29	35.6	8.08	Raddatz et al. (2013)
G1 - G4	Sotbakken, Norwegian Sea	70°45.35' N 18°40.04' E	265	6.6	35.2	8.06	Raddatz et al. (2013)
H1 - H3	Galway Mound, Belgica Mound Province	51°26.94' N 11°45.16' E	837	9.54	35.53	7.99	Dullo et al. (2008), Rüggeberg et al. (2011)
I1 - I3	Urania Bank, Strait of Sicily	36°50.32' N 13°09.35' E	559	13.5	38.8	8.11	Raddatz et al. (2013), López Correa et al. (2010)
J1 - J2	Meknes Carbonate Mound Province, Gulf of Cadiz	34.59.98' N 7°04.51' W	738	10.28	35.7	7.76	Raddatz et al. (2013)
K1 - K5	Trondheimfjord, Norwegian Sea	63°28.61' N 9°59.72' E	240	8.1	31.2	8.03	Dullo et al. (2008), Rüggeberg et al. (2011)
LO1	Bari Canyon, Adriatic Sea	41°18.00' N 17°12.00' E	315-650	13.49	38.62	8.08	Flögel et al. (2014)
MSS1	Santa Maria di Leuca, Ionic Sea	39°25.00' N 18°27.00' E	560-750	13.66	38.66	8.08	Flögel et al. (2014)
MA1	Bari Canyon, Adriatic Sea	41°18.00' N 17°12.00' E	315-650	13.49	38.62	8.08	Flögel et al. (2014)

MSM1	Campeche Bank, Gulf of Mexico	23°50.12 1'N 87°10.48 4'W	565	10.59	35.24	7.94	WOA 2013 (Locarnini et al., 2013; Zweng et al., 2013)
MSM2	Great Bahama Bank Mound E, Northwest Atlantic	24°35.62 3'N 79°16.80 8'W	579	9.24	35.084	7.94	WOA 2013 (Locarnini et al., 2013; Zweng et al., 2013)
MSM3	Great Bahama Bank Mound B, Northwest Atlantic	24°33.84 8'N 79°19.81 1'W	616	9.27	35.1	7.94	WOA 2013 (Locarnini et al., 2013; Zweng et al., 2013)
MSM4	Southwest Florida, Gulf of Mexico	24°58.16 4'N 84°17.97 3'W	483	8.29	35.17	7.85	WOA 2013 (Locarnini et al., 2013; Zweng et al., 2013)
ALB1	El Idrissi Bank, Alboran Sea	36°06.31' N 3°29.33' W	647	12.98	38.464	8.06	WOA 2013 (Locarnini et al., 2013; Zweng et al., 2013)
KRS1	Northeastern Red Sea	27°42.30 6'N 35°09.04 6'E	954	21.66	40.55	7.94	WOA 2013 (Locarnini et al., 2013; Zweng et al., 2013)
KRS2	Northeastern Red Sea	22°17.85 7'N 38°53.64 8'E	580	21.66	40.55	7.94	WOA 2013 (Locarnini et al., 2013; Zweng et al., 2013)
KRS3	Northeastern Red Sea	27°42.30 6'N 35°09.04 6'E	954	21.66	40.55	7.94	WOA 2013 (Locarnini et al., 2013; Zweng et al., 2013)
KRS4	Northeastern Red Sea	27°42.30 6'N 35°09.04 6'E	954	21.66	40.55	7.94	WOA 2013 (Locarnini et al., 2013; Zweng et al., 2013)
KRS5	Northeastern Red Sea	22°46.14 9'N 38°02.94 4'E	625	21.66	40.55	7.94	WOA 2013 (Locarnini et al., 2013; Zweng et al., 2013)
L10-1	Tautra Reef, Norwegian Sea	63°35.36' N 10°31.23' E	39	6	30.1	7.99	Neulinger (2008)
L2-1 – L2-2	Lopphavet, Norwegian Sea	70°26.80' N 21°10.38' E	230	6.5	35.1	8.06	Raddatz et al. (2013)

L3-1 – L3-2	Lopphavet, Norwegian Sea	70°26.80' N 21°10.38' E	230	6.5	35.1	8.06	Raddatz et al. (2013)
L5-1 – L5-2	Stjernesund Fjord, Norwegian Sea	70°16.04' N 22°27.37' E	295	5.9	35	8.20	Rüggeberg et al. (2011)
L6-1 – L6-2	Sula Reef, Norwegian Sea	64°05.93' N 8°05.47'E	286	7.6	35.3	8.08	Raddatz et al. (2013)
L7-1 – L7-2	Sula Reef, Norwegian Sea	64°05.93' N 8°05.47'E	286	7.6	35.3	8.08	Raddatz et al. (2013)
L8-1 – L8-2	Nordleksa, Norwegian Sea	63°36.43' N 9°22.66'E	155	7.8	35	8.03	Dr. S. Flögel
LR1 – LR6	Lopphavet, Norwegian Sea	70°26.59' N 21°10.00' E	230	6.5	35.1	8.05	Raddatz et al. (2013)
LW1 – LW5	Lopphavet, Norwegian Sea	70°26.59' N 21°10.00' E	230	6.5	35.1	8.05	Raddatz et al. (2013)
NL-1 – NL6	Nordleksa, Norwegian Sea	63°36.43' N 9°22.66'E	155	7.8	35	8.03	Dr. S. Flögel
OS1 – OS6	Oslo Fjord, North Sea	59°04.01' N 10°44.31' E	115	8.2	35.2	7.98	Raddatz et al. (2013)
P391-1 – P391-3	Lopphavet, Norwegian Sea	70°26.59' N 21°10.00' E	230	6.5	35.1	8.05	Raddatz et al. (2013)
RL1-1 – RL1-4	Trondheimfjord, Norwegian Sea	63°28.61' N 9°59.72'E	240	8.1	31.2	8.03	Dullo et al. (2008), Rüggeberg et al. (2011)
RL4-1 – RL4-4	Trondheimfjord, Norwegian Sea	63°28.61' N 9°59.72'E	240	8.1	31.2	8.03	Dullo et al. (2008), Rüggeberg et al. (2011)
RL9-1 – RL9-5	Trondheimfjord, Norwegian Sea	63°28.61' N 9°59.72'E	240	8.1	31.2	8.03	Dullo et al. (2008), Rüggeberg et al. (2011)
SJ1 – SJ6	Stjernesund Fjord, Norwegian Sea	70°16.04' N 22°27.37' E	295	5.9	35	8.20	Rüggeberg et al. (2011)
SJ2-1 – SJ2-4	Stjernesund Fjord, Norwegian Sea	70°16.04' N 22°27.37' E	295	5.9	35	8.20	Rüggeberg et al. (2011)

TF1 – TF2	Tautra Reef, Norwegian Sea	63°35.36' N 10°31.23' E	39	6	30.1	7.99	Neulinger (2008)
TF2-1 – TF2-6	Trondheimfjord, Norwegian Sea	63°28.61' N 9°59.72'E	240	8.1	31.2	7.99	Dullo et al. (2008), Rüggeberg et al. (2011)
EFC1 – EFC6	Sula Reef, Norwegian Sea	64°05.93' N 8°05.47'E	286	7.6	35.3	8.03	Raddatz et al. (2013)
EFE1 – EFE4	Sula Reef, Norwegian Sea	64°05.93' N 8°05.47'E	286	7.6	35.3	8.08	Raddatz et al. (2013)

Table S1 Sample ident and location Metadata. Sample names such as A1-A4 relate to multiple samples that derive from the same coral specimen/calice.

Samplename	Species	Na/Ca [mmol/mol]	Mg/Ca [mmol/mol]	Sr/Ca [mmol/mol]
A1 - A4	D	29.02	3.83	10.23
B1 - B2	D	24.87	3.17	9.91
C1 - C2	D	29.25	3.97	9.95
D1 - D4	D	27.57	3.94	10.01
E1 - E3	D	24.14	4.03	9.84
F1 - F4	D	24.61	3.56	10.05
G1 - G4	D	31.04	4.25	10.18
H1 - H3	D	23.93	3.62	10.21
I1 - I3	D	23.75	3.99	9.65
J1 - J2	D	21.2	2.45	10.35
K1 - K5	D	28.72	7.84	9.6
LO1	D	26.74	3.94	10
MSS1	D	26.85	5.41	10.03
MA1	M	25.18	3.73	10.47

MSM1	D	66.24	7.71	10.31
MSM2	D	30.17	6.38	10.42
MSM3	M	56.92	9.98	10.62
MSM4	D	25.43	3.04	10.22
ALB1	D	49.9	3.82	10.08
KRS1	C	45.84	4.37	9.94
KRS2	C	22.33	4.47	10.15
KRS3	C	20.91	4.73	9.46
KRS4	C	20.49	2.81	9.78
KRS5	C	20.78	3.49	10.36
L10-1	D	21.12	2.2	10
L2-1 – L2-2	D	24.61	3.04	10.11

L3-1 – L3-2	D	24.58	3.19	10.36
L5-1 – L5-2	D	23.43	3.1	10.39
L6-1 – L6-2	D	23.79	3.68	10.26
L7-1 – L7-2	D	25.45	3.49	10.41
L8-1 – L8-2	D	23.67	3.23	10.21
LR1 – LR6	D	27.18	3.34	10.31
LW1 – LW5	D	26.23	3.79	9.63
NL-1 – NL6	D	28.14	4.67	9.9
OS1 – OS6	D	24.81	5.73	9.7
P391-1 – P391-3	D	24.45	6.26	10.38
RL1-1 – RL1-4	D	21.32	3.03	10.27
RL4-1 – RL4-4	D	24.36	4.72	10.38
RL9-1 – RL9-5	D	22.68	3.41	10.26
SJ1 – SJ6	D	28.64	4.51	10.07
SJ2-1 – SJ2-4	D	29.38	5.37	10.42

TF1 – TF2	D	25.72	6.1	10.13
TF2-1 – TF2-6	D	21.42	3.78	10.2
EFC1 – EFC6	D	26.01	4.31	9.94
EFE1 – EFE4	D	27.1	3.8	10.31

Table S2 Results of the ICP-OES measurements. Red values are identified as outliers and not considered for further calculations.

Species abbreviations stand for D=*Desmophyllum pertusum* , M=*Madrepora oculata* and C=*Caryophylliidae*. Sample names such as A1-A4 relate to multiple samples that derive from the same coral specimen/calice.