Supplementary Material

1 SUPPLEMENTARY INFORMATION

1.1 Conversion factors used to unify the Φ, chl-*a* and Φ/chl-*a* units.

- When Φ/chl-*a* is reported in μg O_2 h^{-1} (μg chl-*a*)$^{-1}$ (Martinez et al., 1990), we divided Φ/chl-*a* by the O_2 molecular weight (32 μg μmol^{-1}) and then multiplied by the volume occupied by one μmol of gas (22.4 μL μmol^{-1}).
- When Φ is reported in μg O_2 d^{-1} L^{-1} (Packard and Williams, 1981; Arístegui and Montero, 1995), we divided it by the O_2 molecular weight (32 μg μmol^{-1}) and by the number of hours in a day (24h d^{-1}). Then, we multiplied it by the volume occupied by one μmol of gas (22.4 μL μmol^{-1}). This Φ, now in μL O_2 h^{-1} L^{-1} units, was then divided by the respective values of chl-*a*, in μg chl-*a* L^{-1} to develop the Φ/chl-*a* ratio.
- When Φ is reported in nMO_2 h^{-1} (Packard et al., 2000), it is the same as if it was reported in nmolO_2 L^{-1} h^{-1}. Thus we divided it by the number of nmol that are in a μmol (1000 nmol μmol^{-1}), and then we multiplied it by the volume occupied by one μmol of gas (22.4 μL O_2 μmol $O_2{}^{-1}$).
- When Φ is reported in mL O_2 h^{-1} m^{-2} and chl-*a* in mg chl-*a* m^{-2} (Packard, 1979): the Φ/chl-*a* ratio results in mLO_2 h^{-1} (mg chl-*a*)$^{-1}$ units, which is the same value as when reported in μL O_2 h^{-1} (μg chl-*a*)$^{-1}$.

In addition, note that some of the Φ in Table 1, although they were originally measured by different versions of the ETS method, are now comparable after using the conversion factors in Christensen and Packard (1979). The ETS method has been improved since it was developed in the 70's. During the first decade, improvements in the sensitivity of the assay facilitated detection of up to three times previous ETS activity measurements. Christensen and Packard (1979) compared the different versions of the method to the most advanced ETS assays at that time. They calculated conversion factors between all the assays to allow comparison. In Table 1 we used ETS and chl-*a* data from both old and new papers, before and after the development of the kinetic ETS assay of Packard and Christensen (2004). Without this understanding and exercise one cannot compare ETS data from this millennia with ETS data from the previous millennia.

2 SUPPLEMENTARY DATA

Table S1. Potential respiration per Chlorophyll *a* ratio (Φ/Chl_*a*) during the Oligotrophic phase (Phase I) in the KOSMOS GC 2014 experiment. Mesocosms have been classified as Low, Intermediate or High depending on the pCO_2 levels of the treatment. Note that Φ/Chl_*a* is expressed in $\mu LO_2 h^{-1} \mu g$ Chl_a^{-1} units.

Φ/Chl_*a*		I: Oligotrophic phase							
Treatment	**Mesocosm**	**-1**	**3**	**7**	**11**	**15**	**19**	**23**	
Low	**M1**	8.432	9.048	9.303	6.231	6.355	5.080	4.708	3.822
High	**M2**	5.717	8.071	9.527	3.731	2.910	5.173	4.895	3.162
Intermediate	**M3**	5.078	11.759	6.471	7.826	5.597	4.530	5.037	3.708
Intermediate	**M4**	5.643	8.164	5.377	6.712	4.291	5.490	4.846	5.401
Low	**M5**	5.111	7.385	7.822	5.147	6.441	2.586	6.373	4.128
Intermediate	**M7**	3.795	6.194	7.312	6.367	4.912	3.273	4.333	4.418
High	**M8**	5.299	9.147	5.419	7.611	5.535	2.289	5.742	6.711
Low	**M9**	4.205	9.040	6.809	1.563	3.762	2.385	4.432	3.241
Atlantic	**Atlantic**	4.367	5.907	2.000	3.630	4.001	3.174	1.971	4.679

Table S2. Potential respiration per Chlorophyll *a* ratio (Φ/Chl_*a*) during the Bloom phase (Phase II) in the KOSMOS GC 2014 experiment. Mesocosms have been classified as Low, Intermediate or High depending on the pCO_2 levels of the treatment. Note that Φ/Chl_*a* is expressed in $\mu LO_2 h^{-1} \mu g\ Chl\_a^{-1}$ units.

Φ/Chl_*a*		II: Bloom Phase				
		26	**28**	**30**	**32**	**35**
Low	**M1**	6.468	1.851	1.182	2.282	6.180
High	**M2**	1.646	0.260	0.906	1.689	5.908
Intermediate	**M3**	3.867	0.602	1.277	5.824	7.923
Intermediate	**M4**	3.899	1.529	1.310	7.616	10.201
Low	**M5**	5.397	1.241	0.550	0.945	3.891
Intermediate	**M7**	5.300	1.991	0.925	1.909	6.805
High	**M8**	4.899	1.962	0.625	3.963	6.800
Low	**M9**	3.983	0.827	0.059	0.194	4.018
Atlantic	**Atlantic**	4.317	4.584	2.621	4.368	5.291

Table S3. Potential respiration per Chlorophyll *a* ratio (Φ/Chl_*a*) during the Post-bloom phase (Phase III) in the KOSMOS GC 2014 experiment. Mesocosms have been classified as Low, Intermediate or High depending on the pCO_2 levels of the treatment. Note that Φ/Chl_*a* is expressed in $\mu LO_2 h^{-1} \mu g\ Chl\_a^{-1}$ units.

Φ/Chl_*a*		III: Post-bloom Phase				
		39	**43**	**47**	**51**	**55**
Low	**M1**	2.316	7.936	10.147	3.583	6.915
High	**M2**	3.689	3.414	2.868	2.047	8.623
Intermediate	**M3**	2.288	3.828	3.482	6.336	7.296
Intermediate	**M4**	6.682	4.044	4.500	3.317	2.723
Low	**M5**	4.304	5.701	7.604	4.912	0.751
Intermediate	**M7**	7.051	3.817	9.852	4.885	1.973
High	**M8**	3.271	2.828	4.009	2.711	2.876
Low	**M9**	5.633	5.848	7.711	5.104	6.518
Atlantic	**Atlantic**	3.766	4.701	4.462	4.061	9.926

Table S4. Potential respiration (Φ) during the Oligotrophic phase (Phase I) in the KOSMOS GC 2014 experiment. Mesocosms have been classified as Low, Intermediate or High depending on the pCO_2 levels of the treatment. Note that Φ is expressed in $\mu LO_2 h^{-1} L^{-1}$ units. To convert to "per protein" units, use the data on table S10.

Φ		I: Oligotrophic phase (day)							
Treatment	**Mesocosm**	**-3**	**-1**	**3**	**7**	**11**	**15**	**19**	**23**
Low	**M1**	0.595	0.477	0.641	0.644	1.023	0.543	0.660	0.496
High	**M2**	0.460	0.369	0.852	0.339	0.362	0.656	0.780	0.675
Intermediate	**M3**	0.347	0.513	0.467	0.678	0.680	0.599	0.774	0.711
Intermediate	**M4**	0.438	0.470	0.452	0.589	0.509	0.526	0.720	0.674
Low	**M5**	0.381	0.440	0.716	0.640	0.706	0.328	0.780	0.697
Intermediate	**M7**	0.318	0.302	0.486	0.598	0.486	0.328	0.674	0.713
High	**M8**	0.427	0.486	0.396	0.736	0.650	0.273	0.734	0.756
Low	**M9**	0.440	0.601	0.418	0.186	0.497	0.340	0.768	0.601
Atlantic	**Atlantic**	0.350	0.302	0.440	0.272	0.273	0.215	0.267	0.314

Table S5. Potential respiration (Φ) during the Bloom phase (Phase II) in the KOSMOS GC 2014 experiment. Mesocosms have been classified as Low, Intermediate or High depending on the pCO_2 levels of the treatment. Note that Φ is expressed in $\mu LO_2 h^{-1} L^{-1}$ units. To convert to "per protein" units, use the data on table S11.

Φ		II: Bloom Phase (day)				
Treatment	**Mesocosm**	**26**	**28**	**30**	**32**	**35**
Low	**M1**	2.483	3.529	1.285	1.496	2.167
High	**M2**	2.392	1.043	1.490	2.254	5.174
Intermediate	**M3**	2.766	2.107	1.622	4.708	3.515
Intermediate	**M4**	2.190	5.044	2.398	6.194	5.845
Low	**M5**	2.724	4.254	0.855	1.229	2.683
Intermediate	**M7**	2.373	4.652	2.197	2.779	4.220
High	**M8**	2.631	4.494	1.257	5.136	6.321
Low	**M9**	2.477	3.733	0.152	0.441	3.277
Atlantic	**Atlantic**	0.467	0.388	0.234	0.465	0.565

Table S6. Potential respiration (Φ) during the Post-bloom phase (Phase III) in the KOSMOS GC 2014 experiment. Mesocosms have been classified as Low, Intermediate or High depending on the pCO_2 levels of the treatment. Note that Φ is expressed in $\mu LO_2 h^{-1} L^{-1}$ units. To convert to "per protein" units, use the data on table S12.

Φ		III: Post-bloom Phase (day)				
Treatment	**Mesocosm**	**39**	**43**	**47**	**51**	**55**
Low	**M1**	1.691	1.995	2.214	1.659	2.419
High	**M2**	4.573	3.371	2.032	1.524	3.837
Intermediate	**M3**	1.692	1.647	1.409	2.658	3.071
Intermediate	**M4**	4.189	1.657	1.811	2.048	1.443
Low	**M5**	2.548	2.146	2.339	3.146	0.408
Intermediate	**M7**	4.080	1.952	2.793	3.100	1.736
High	**M8**	4.672	3.331	2.309	1.926	2.377
Low	**M9**	4.001	2.548	2.606	2.257	3.506
Atlantic	**Atlantic**	0.328	0.459	0.711	0.631	1.978

Table S7. Chlorophyll *a* (Chl_*a*) during the Oligotrophic phase (Phase I) in the KOSMOS GC 2014 experiment. Mesocosms have been classified as Low, Intermediate or High depending on the pCO_2 levels of the treatment. Note that Chl_*a* is expressed in $\mu g\ L^{-1}$ units. To convert to "per protein" units, use the data on table S10.

Total Chl_*a*		**I: Oligotrophic phase (day)**							
Treatment	**Mesocosm**	**-3**	**-1**	**3**	**7**	**11**	**15**	**19**	**23**
Low	**M1**	0.071	0.053	0.069	0.103	0.161	0.107	0.140	0.130
High	**M2**	0.081	0.046	0.089	0.091	0.124	0.127	0.159	0.213
Intermediate	**M3**	0.068	0.044	0.072	0.087	0.122	0.132	0.154	0.192
Intermediate	**M4**	0.078	0.058	0.084	0.088	0.119	0.096	0.149	0.125
Low	**M5**	0.075	0.060	0.091	0.124	0.110	0.127	0.122	0.169
Intermediate	**M7**	0.084	0.049	0.066	0.094	0.099	0.100	0.156	0.161
High	**M8**	0.081	0.053	0.073	0.097	0.117	0.119	0.128	0.113
Low	**M9**	0.105	0.067	0.061	0.119	0.132	0.143	0.173	0.185
Atlantic	**Atlantic**	0.080	0.051	0.220	0.075	0.068	0.068	0.136	0.067

Table S8. Chlorophyll *a* (Chl_*a*) during the Bloom phase (Phase II) in the KOSMOS GC 2014 experiment. Mesocosms have been classified as Low, Intermediate or High depending on the pCO_2 levels of the treatment. Note that Chl_*a* is expressed in $\mu g\ L^{-1}$ units. To convert to "per protein" units, use the data on table S11.

Total Chl_*a*		**II: Bloom phase (day)**				
Treatment	**Mesocosm**	**26**	**28**	**30**	**32**	**35**
Low	**M1**	0.3838	1.9067	1.0872	0.6553	0.3506
High	**M2**	1.4529	4.0160	1.6453	1.3349	0.8758
Intermediate	**M3**	0.7153	3.5005	1.2707	0.8083	0.4436
Intermediate	**M4**	0.5618	3.2992	1.8301	0.8133	0.5730
Low	**M5**	0.5048	3.4288	1.5563	1.3006	0.6894
Intermediate	**M7**	0.4477	2.3366	2.3752	1.4558	0.6201
High	**M8**	0.5371	2.2904	2.0110	1.2962	0.9296
Low	**M9**	0.6218	4.5137	2.5883	2.2726	0.8154
Atlantic	**Atlantic**	0.1081	0.0847	0.0892	0.1065	0.1067

Table S9. Chlorophyll *a* (Chl_*a*) during the Post-Bloom phase (Phase III) in the KOSMOS GC 2014 experiment. Mesocosms have been classified as Low, Intermediate or High depending on the pCO_2 levels of the treatment. Note that Chl_*a* is expressed in $\mu g\ L^{-1}$ units. To convert to "per protein" units, use the data on table S12.

Total Chl_*a*		**III:Postbloom Phase (day)**				
Treatment	**Mesocosm**	**39**	**43**	**47**	**51**	**55**
Low	**M1**	0.7304	0.2513	0.2182	0.4631	0.3497
High	**M2**	1.2395	0.9873	0.7085	0.7447	0.4449
Intermediate	**M3**	0.7393	0.4303	0.4046	0.4195	0.4210
Intermediate	**M4**	0.6270	0.4098	0.4024	0.6174	0.5299
Low	**M5**	0.5920	0.3764	0.3075	0.6406	0.5428
Intermediate	**M7**	0.5786	0.5112	0.2835	0.6345	0.8797
High	**M8**	1.4283	1.1776	0.5760	0.7102	0.8263
Low	**M9**	0.7103	0.4357	0.3379	0.4422	0.5378
Atlantic	**Atlantic**	0.0871	0.0977	0.1593	0.1553	0.1992

Table S10. Biomass (B) during the Oligotrophic phase (Phase I) in the KOSMOS GC 2014 experiment. Mesocosms have been classified as Low, Intermediate or High depending on the pCO_2 levels of the treatment. Note that B is expressed in mg protein L^{-1} units.

B		I: Oligotrophic phase (day)							
Treatment	**Mesocosm**	**-3**	**-1**	**3**	**7**	**11**	**15**	**19**	**23**
Low	**M1**	0.027	0.012	0.018	0.006	0.005	0.007	0.021	0.031
High	**M2**	0.022	0.009	0.011	0.008	0.010	0.013	0.017	0.023
Intermediate	**M3**	0.025			0.008	0.009	0.015	0.013	0.018
Intermediate	**M4**	0.021	0.013		0.009	0.014	0.010	0.005	0.019
Low	**M5**	0.026	0.005	0.012	0.005		0.006	0.013	0.024
Intermediate	**M7**	0.014	0.004	0.002	0.009		0.006	0.008	0.023
High	**M8**	0.022		0.009	0.018	0.014		0.013	0.017
Low	**M9**	0.019	0.006	0.003		0.006	0.003	0.012	0.016
Atlantic	**Atlantic**	0.018	0.007	0.022	0.005	0.006	0.005	0.009	0.023

Table S11. Biomass (B) during the Bloom phase (Phase II) in the KOSMOS GC 2014 experiment. Mesocosms have been classified as Low, Intermediate or High depending on the pCO_2 levels of the treatment. Note that B is expressed in mg protein L^{-1} units.

B		II: Bloom Phase (day)				
Treatment	**Mesocosm**	**26**	**28**	**30**	**32**	**35**
Low	**M1**	0.029	0.079	0.079	0.047	0.050
High	**M2**	0.079	0.163	0.158	0.146	0.067
Intermediate	**M3**	0.054	0.096	0.134	0.103	0.091
Intermediate	**M4**	0.040	0.101	0.170	0.161	0.078
Low	**M5**	0.024	0.140	0.162	0.141	0.089
Intermediate	**M7**	0.042	0.082	0.159	0.096	0.111
High	**M8**	0.040	0.116	0.201	0.195	0.154
Low	**M9**	0.054	0.165	0.192	0.124	0.099
Atlantic	**Atlantic**	0.016	0.032	0.030	0.009	0.010

Table S12. Biomass (B) during the Post-bloom phase (Phase III) in the KOSMOS GC 2014 experiment. Mesocosms have been classified as Low, Intermediate or High depending on the pCO_2 levels of the treatment. Note that B is expressed in mg protein L^{-1} units.

B		III: Post-bloom Phase (day)				
Treatment	**Mesocosm**	**39**	**43**	**47**	**51**	**55**
Low	**M1**	0.038	0.063	0.034	0.030	0.049
High	**M2**	0.071	0.094	0.044	0.066	0.095
Intermediate	**M3**	0.042	0.035	0.041	0.026	0.043
Intermediate	**M4**	0.107	0.041	0.023	0.072	0.045
Low	**M5**	0.087	0.026	0.067	0.095	0.055
Intermediate	**M7**	0.085	0.064	0.066	0.119	0.039
High	**M8**	0.144	0.137	0.095	0.089	0.081
Low	**M9**	0.110	0.089	0.065	0.053	0.080
Atlantic	**Atlantic**	0.005	0.015	0.017	0.020	0.047

Table S13. Integral analysis of potential respiration (Φ) per phase and mesocosm in the KOSMOS GC 2014 experiment, normalized per number of days in each phase. The slopes (α) and R^2 values represent the correlation between Φ and the pCO_2 levels, after extracting M9 values. Note that * represent the correlation between Φ and pCO_2 after extracting, in addition to the M9 values, the values from the mesocosms M2 and M8, where the community was disrupted by the presence of *Vicicitus globosus*.

Phase	MK	pCO_2	Φ	α	R^2	α*	R^2*
	M9	**406**	0.38				
	M1	**401**	0.57				
	M5	**502**	0.53				
	M3	**636**	0.55				
I	**M7**	**746**	0.45	-0.00010	0.38870	-0.00020	0.65400
	M4	**800**	0.48				
	M2	**1050**	0.48				
	M8	**1195**	0.49				
	M9	**343**	1.48				
	M1	**374**	1.74				
	M5	**404**	1.82				
	M3	**493**	2.48				
II	**M7**	**571**	2.67	0.00230	0.30090	0.00730	0.89360
	M4	**620**	3.76				
	M2	**748**	1.90				
	M8	**902**	3.31				
	M9	**297**	2.23				
	M1	**326**	1.58				
	M5	**427**	1.82				
	M3	**546**	1.62				
III	**M7**	**672**	2.15	0.00100	0.58450	0.00060	0.19000
	M4	**710**	1.67				
	M2	**830**	2.23				
	M8	**944**	2.22				

Table S14. Integral analysis of Chlorophyll *a* (Chl_*a*) per phase and mesocosm in the KOSMOS GC 2014 experiment, normalized per number of days in each phase. The slopes (α) and R^2 values represent the correlation between Chl_*a* and the pCO_2 levels after extracting M9 values. Note that * represent the correlation between Chl_*a* and pCO_2 after extracting, in addition to the M9 values, the values from mesocosms M2 and M8, where the community was disrupted by the presence of *Vicicitus globosus*.

Phase	MK	pCO_2	Chl_*a*	α	R^2	α*	R^2*
	M9	**406**	0.23				
	M1	**401**	0.16				
	M5	**502**	0.22				
	M3	**636**	0.23				
I	**M7**	**746**	0.19	-0.00003	0.08630	-0.00003	0.02350
	M4	**800**	0.15				
	M2	**1050**	0.19				
	M8	**1195**	0.17				
	M9	**343**	2.83				
	M1	**374**	1.35				
	M5	**404**	2.15				
	M3	**493**	1.68				
II	**M7**	**571**	2.14	0.00090	0.22510	0.00140	0.19580
	M4	**620**	1.91				
	M2	**748**	2.47				
	M8	**902**	1.94				
	M9	**297**	0.52				
	M1	**326**	0.39				
	M5	**427**	0.52				
	M3	**546**	0.52				
III	**M7**	**672**	0.59	0.00100	0.84440	0.00050	0.86360
	M4	**710**	0.59				
	M2	**830**	0.94				
	M8	**944**	1.04				

Table S15. Integral analysis of Biomass (B) per phase and mesocosm in the KOSMOS GC 2014 experiment, normalized per number of days of each phase. The slopes (α) and R^2 values represent the correlation between B and the pCO_2 levels, after extracting M9 values. Note that * represent the correlation between B and pCO_2 after extracting, in addition to the M9 values, the values from mesocosms M2 and M8, where the community was disrupted by the presence of *Vicicitus globosus*.

Phase	MK	pCO_2	B	α	R^2	α*	R^2*
I	**M9**	**406**	0.01	0.00003	0.22210	-0.00001	0.24400
	M1	**401**	0.01				
	M5	**502**	0.01				
	M3	**636**	0.01				
	M7	**746**	0.01				
	M4	**800**	0.01				
	M2	**1050**	0.01				
	M8	**1195**	0.01				
II	**M9**	**343**	0.11	0.00010	0.64280	0.00010	0.28410
	M1	**374**	0.05				
	M5	**404**	0.10				
	M3	**493**	0.08				
	M7	**571**	0.08				
	M4	**620**	0.10				
	M2	**748**	0.11				
	M8	**902**	0.13				
III	**M9**	**297**	0.06	0.00005	0.67420	0.00004	0.37400
	M1	**326**	0.03				
	M5	**427**	0.05				
	M3	**546**	0.03				
	M7	**672**	0.06				
	M4	**710**	0.04				
	M2	**830**	0.06				
	M8	**944**	0.09				

Table S16. Mann-Whitney test on Φ to analyse the effects of acidification on the mesocosm communities. Note that mesocosms shaded in blue are those under low-pCO_2 levels, intermediate-pCO_2 levels are shaded in grey and shaded in red are those under high-pCO_2 levels. Significant differences (p<0.05) are not clearly related to the increasing pCO_2 levels.

Φ	MK1	MK2	MK3	MK4	MK5	MK7	MK8	MK9	Atlantic
MK1	1	0.436	0.481	0.28	0.579	**0.036**	0.052	0.123	<**0.001**
MK2	0.436	1	0.912	0.589	0.589	0.589	0.393	0.971	<**0.001**
MK3	0.481	0.912	1	0.436	0.684	0.218	0.278	0.796	<**0.001**
MK4	0.28	0.589	0.436	1	0.481	0.853	0.631	0.853	<**0.001**
MK5	0.579	0.589	0.684	0.481	1	0.218	0.143	0.631	**0.001**
MK7	**0.036**	0.589	0.218	0.853	0.218	1	0.587	0.631	<**0.001**
MK8	0.052	0.393	0.278	0.631	0.143	0.587	1	0.353	<**0.001**
MK9	0.123	0.971	0.796	0.853	0.631	0.631	0.353	1	**0.012**
Atlantic	<**0.001**	<**0.001**	<**0.001**	<**0.001**	**0.001**	<**0.001**	<**0.001**	**0.012**	1

Table S17. Mann-Whitney test on chl-*a* to analyse the effects of acidification on the mesocosm communities. Note that mesocosms shaded in blue are those under low-pCO_2 levels, intermediate-pCO_2 levels are shaded in grey and shaded in red are those under high-pCO_2 levels. Significant differences ($p<0.05$) are not clearly related to the increasing pCO_2 levels.

Chl-*a*	MK1	MK2	MK3	MK4	MK5	MK7	MK8	MK9	Atlantic
MK1	1	**0.006**	0.311	0.103	0.123	0.062	**0.002**	0.085	**<0.001**
MK2	**0.006**	1	**0.021**	**0.047**	0.115	0.184	0.953	0.365	**<0.001**
MK3	0.311	**0.021**	1	0.525	0.563	0.321	**0.017**	0.521	**<0.001**
MK4	0.103	**0.047**	0.525	1	1	0.726	**0.041**	0.815	**<0.001**
MK5	0.123	0.115	0.563	1	1	0.77	0.122	0.682	**<0.001**
MK7	0.062	0.184	0.321	0.726	0.77	1	0.184	0.953	**<0.001**
MK8	**0.002**	0.953	**0.017**	**0.041**	0.122	0.184	1	0.4136	**<0.001**
MK9	0.085	0.365	0.521	0.815	0.682	0.953	0.4136	1	**<0.001**
Atlantic	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**0.001**	**<0.001**	**<0.001**	**<0.001**	1

Table S18. Mann-Whitney test on B to analyse the effects of acidification on the mesocosm communities. Note that mesocosms shaded in blue are those under low-pCO_2 levels, intermediate-pCO_2 levels are shaded in grey and shaded in red are those under high-pCO_2 levels. Significant differences ($p<0.05$) are not clearly related to the increasing pCO_2 levels.

B	MK1	MK2	MK3	MK4	MK5	MK7	MK8	MK9	Atlantic
MK1	1	**0.004**	0.393	0.19	0.063	**0.009**	**<0.001**	**<0.001**	**<0.001**
MK2	**0.004**	1	0.089	0.579	0.579	0.631	0.279	0.796	**<0.001**
MK3	0.393	0.089	1	0.578	0.436	0.248	**0.023**	0.063	**<0.001**
MK4	0.19	0.579	0.578	1	0.853	0.796	0.123	0.278	**<0.001**
MK5	0.063	0.579	0.436	0.853	1	0.912	0.123	0.579	**<0.001**
MK7	**0.009**	0.631	0.248	0.796	0.912	1	0.105	0.481	**<0.001**
MK8	**<0.001**	0.279	**0.023**	0.123	0.123	0.105	1	0.315	**<0.001**
MK9	**<0.001**	0.796	0.063	0.278	0.579	0.481	0.315	1	**<0.001**
Atlantic	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	1

Table S19. pCO_2 levels in the surrounding Atlantic waters during the whole experiment. Note that the Standard deviation (SD) is Not Available (NA) because there was one Atlantic sample every sampling day. pCO_2 is reported in μatm units.

Treatment	Time	Phase	pCO_2	SD
Atlantic	-3	I	383.8	NA
Atlantic	-2	I	359.4	NA
Atlantic	-1	I	385.4	NA
Atlantic	1	I	415.0	NA
Atlantic	3	I	464.6	NA
Atlantic	5	I	416.2	NA
Atlantic	7	I	404.9	NA
Atlantic	9	I	404.7	NA
Atlantic	11	I	407.8	NA
Atlantic	13	I	410.1	NA
Atlantic	15	I	395.2	NA
Atlantic	17	I	406.7	NA
Atlantic	19	I	402.0	NA
Atlantic	21	I	388.0	NA
Atlantic	23	I	396.6	NA
Atlantic	25	II	389.5	NA
Atlantic	26	II	398.5	NA
Atlantic	27	II	398.0	NA
Atlantic	28	II	396.4	NA
Atlantic	29	II	406.4	NA
Atlantic	30	II	388.6	NA
Atlantic	31	II	391.8	NA
Atlantic	32	II	387.2	NA
Atlantic	33	II	382.3	NA
Atlantic	35	II	395.6	NA
Atlantic	37	III	400.5	NA
Atlantic	39	III	397.6	NA
Atlantic	41	III	401.9	NA
Atlantic	43	III	384.1	NA
Atlantic	45	III	387.5	NA
Atlantic	47	III	383.5	NA
Atlantic	50	III	397.2	NA
Atlantic	51	III	392.5	NA
Atlantic	53	III	384.6	NA
Atlantic	55	III	388.0	NA

Table S20. pCO_2 levels in the low-pCO_2 mesocosms (M1, M5 and M9) during the whole experiment. pCO_2 is reported in μatm units.

Treatment	Time	Phase	pCO_2	SD
Low	-3	I	367.7	8.8
Low	-2	I	368.9	11.2
Low	-1	I	402.5	18.1
Low	1	I	423.9	38.3
Low	3	I	444.6	59.9
Low	5	I	440.6	46.6
Low	7	I	449.8	69.5
Low	9	I	439.4	67.6
Low	11	I	442.3	62.1
Low	13	I	434.4	60.4
Low	15	I	439.8	66.6
Low	17	I	440.2	57.8
Low	19	I	432.3	53.9
Low	21	I	425.9	58.7
Low	23	I	423.1	47.4
Low	25	II	466.5	46.1
Low	26	II	461.8	41.5
Low	27	II	451.4	39.0
Low	28	II	418.0	39.4
Low	29	II	374.7	21.8
Low	30	II	329.1	34.5
Low	31	II	314.5	28.7
Low	32	II	308.0	30.2
Low	33	II	302.0	29.5
Low	35	II	308.1	24.6
Low	37	III	319.6	25.0
Low	39	III	361.5	79.4
Low	41	III	368.2	81.6
Low	43	III	355.7	79.4
Low	45	III	349.6	77.1
Low	47	III	348.7	78.6
Low	50	III	352.8	70.3
Low	51	III	356.4	71.8
Low	53	III	346.0	67.3
Low	55	III	343.6	67.4

Table S21. pCO_2 levels in the intermediate-pCO_2 mesocosms (M3, M4 and M7) during the whole experiment. pCO_2 is reported in μatm units.

Treatment	Time	Phase	pCO_2	SD
Intermediate	-3	I	376.7	0.5
Intermediate	-2	I	366.8	5.2
Intermediate	-1	I	423.6	25.7
Intermediate	1	I	583.4	47.1
Intermediate	3	I	679.7	94.4
Intermediate	5	I	816.4	141.2
Intermediate	7	I	840.3	132.3
Intermediate	9	I	801.2	108.5
Intermediate	11	I	777.8	88.7
Intermediate	13	I	714.3	60.4
Intermediate	15	I	719.7	61.8
Intermediate	17	I	722.9	70.4
Intermediate	19	I	686.5	66.8
Intermediate	21	I	654.1	43.0
Intermediate	23	I	733.7	139.2
Intermediate	25	II	723.6	105.6
Intermediate	26	II	710.5	105.1
Intermediate	27	II	687.9	89.5
Intermediate	28	II	649.5	88.0
Intermediate	29	II	544.0	62.1
Intermediate	30	II	494.3	53.4
Intermediate	31	II	465.2	44.1
Intermediate	32	II	449.6	34.4
Intermediate	33	II	443.1	37.8
Intermediate	35	II	447.8	38.7
Intermediate	37	III	461.7	40.0
Intermediate	39	III	740.2	123.0
Intermediate	41	III	724.2	100.8
Intermediate	43	III	687.7	101.2
Intermediate	45	III	669.6	98.1
Intermediate	47	III	655.6	95.6
Intermediate	50	III	640.1	97.1
Intermediate	51	III	640.6	82.8
Intermediate	53	III	615.7	75.6
Intermediate	55	III	590.5	68.8

Table S22. pCO_2 levels in the high-pCO_2 mesocosms (M2 and M8) during the whole experiment. pCO_2 is reported in μatm units.

Treatment	Time	Phase	pCO_2	SD
High	-3	I	369.4	4.1
High	-2	I	375.3	7.7
High	-1	I	449.6	63.9
High	1	I	679.8	1.1
High	3	I	1106.1	45.0
High	5	I	1321.6	95.8
High	7	I	1374.6	150.7
High	9	I	1301.7	159.2
High	11	I	1223.1	120.0
High	13	I	1129.5	107.7
High	15	I	1101.3	130.4
High	17	I	1075.4	114.4
High	19	I	979.3	103.4
High	21	I	929.7	49.3
High	23	I	1246.1	152.5
High	25	II	1108.8	108.2
High	26	II	1086.8	121.2
High	27	II	1023.8	104.3
High	28	II	917.2	108.5
High	29	II	787.3	107.1
High	30	II	735.1	121.3
High	31	II	692.9	125.6
High	32	II	654.0	101.0
High	33	II	625.8	101.2
High	35	II	621.2	89.1
High	37	III	622.0	70.9
High	39	III	1106.8	120.2
High	41	III	1024.6	102.2
High	43	III	952.7	86.9
High	45	III	914.2	93.9
High	47	III	891.7	90.1
High	50	III	873.0	107.7
High	51	III	869.2	66.1
High	53	III	821.8	49.5
High	55	III	792.6	23.3

Table S23. Φ/chl-*a* ratio in the surrounding Atlantic waters during the whole experiment. Note that the Standard deviation (SD) is Not Available (NA) because there was one Atlantic sample every sampling day. Φ/chl-*a* is reported in μL O_2 h^{-1} (μg chl-*a*)$^{-1}$ units.

Treatment	Time	Phase	Φ/chl-*a*	SD
Atlantic	-3	I	4.37	NA
Atlantic	-1	I	5.91	NA
Atlantic	3	I	2.00	NA
Atlantic	7	I	3.63	NA
Atlantic	11	I	4.00	NA
Atlantic	15	I	3.17	NA
Atlantic	19	I	1.97	NA
Atlantic	23	I	4.68	NA
Atlantic	26	II	4.32	NA
Atlantic	28	II	4.58	NA
Atlantic	30	II	2.62	NA
Atlantic	32	II	4.37	NA
Atlantic	35	II	5.29	NA
Atlantic	39	III	3.77	NA
Atlantic	43	III	4.70	NA
Atlantic	47	III	4.46	NA
Atlantic	51	III	4.06	NA
Atlantic	55	III	9.93	NA

Table S24. Φ/chl-*a* ratio in the low-pCO_2 mesocosms (M1, M5 and M9) during the whole experiment. Φ/chl-*a* is reported in μL O_2 h^{-1} (μg chl-*a*)$^{-1}$ units.

Treatment	Time	Phase	Φ/chl-*a*	SD
Low	-3	I	5.92	2.23
Low	-1	I	8.49	0.96
Low	1	I	8.23	0.83
Low	3	I	7.98	1.25
Low	7	I	4.31	2.44
Low	9	I	4.92	1.97
Low	11	I	5.52	1.52
Low	15	I	3.35	1.50
Low	17	I	4.26	0.77
Low	19	I	5.17	1.05
Low	23	I	3.73	0.45
Low	25	II	4.51	0.80
Low	26	II	5.28	1.25
Low	28	II	1.31	0.51
Low	30	II	0.60	0.56
Low	32	II	1.14	1.06
Low	33	II	2.92	1.15
Low	35	II	4.70	1.29
Low	39	III	4.08	1.67
Low	41	III	5.29	0.40
Low	43	III	6.49	1.25
Low	47	III	8.49	1.44
Low	50	III	6.51	0.32
Low	51	III	4.53	0.83
Low	55	III	3.63	4.08

Table S25. Φ/chl-*a* ratio in the intermediate-pCO_2 mesocosms (M3, M4 and M7) during the whole experiment. Φ/chl-*a* is reported in μL O_2 h^{-1} (μg chl-*a*)$^{-1}$ units.

Treatment	Time	Phase	Φ/chl-*a*	SD
Intermediate	-3	I	4.84	0.95
Intermediate	-1	I	6.71	1.28
Intermediate	1	I	6.55	0.37
Intermediate	3	I	6.39	0.97
Intermediate	7	I	6.97	0.76
Intermediate	9	I	5.95	0.66
Intermediate	11	I	4.93	0.65
Intermediate	15	I	4.43	1.11
Intermediate	17	I	4.58	0.70
Intermediate	19	I	4.74	0.36
Intermediate	23	I	4.51	0.85
Intermediate	25	II	4.43	0.57
Intermediate	26	II	4.36	0.82
Intermediate	28	II	1.37	0.71
Intermediate	30	II	1.17	0.21
Intermediate	32	II	5.12	2.92
Intermediate	33	II	6.71	2.28
Intermediate	35	II	8.31	1.73
Intermediate	39	III	5.34	2.65
Intermediate	41	III	4.62	1.35
Intermediate	43	III	3.90	0.13
Intermediate	47	III	5.94	3.42
Intermediate	50	III	5.40	1.78
Intermediate	51	III	4.85	1.51
Intermediate	55	III	4.00	2.88

Table S26. Φ/chl-*a* ratio in the high-pCO_2 mesocosms (M2 and M8) during the whole experiment. Φ/chl-*a* is reported in μL O_2 h^{-1} (μg chl-*a*)$^{-1}$ units.

Treatment	Time	Phase	Φ/chl-*a*	SD
High	-3	I	5.51	0.30
High	-1	I	8.61	0.76
High	1	I	8.04	1.07
High	3	I	7.47	2.91
High	7	I	5.67	2.74
High	9	I	4.95	2.30
High	11	I	4.22	1.86
High	15	I	3.73	2.04
High	17	I	4.52	0.72
High	19	I	5.32	0.60
High	23	I	4.94	2.51
High	25	II	4.10	2.40
High	26	II	3.27	2.30
High	28	II	1.11	1.20
High	30	II	0.77	0.20
High	32	II	2.83	1.61
High	33	II	4.59	1.12
High	35	II	6.35	0.63
High	39	III	3.48	0.30
High	41	III	3.30	0.36
High	43	III	3.12	0.41
High	47	III	3.44	0.81
High	50	III	2.91	0.64
High	51	III	2.38	0.47
High	55	III	5.75	4.06

Table S27. P_N in the surrounding Atlantic waters during the whole experiment. Note that the Standard deviation (SD) is Not Available (NA) because there was one Atlantic sample every sampling day. P_N is reported in mg protein d^{-1}.

Treatment	Time	Phase	P_N	SD
Atlantic	-2	I	-0.0052	NA
Atlantic	1	I	0.0035	NA
Atlantic	5	I	-0.0042	NA
Atlantic	9	I	0.0003	NA
Atlantic	13	I	-0.0004	NA
Atlantic	17	I	0.0010	NA
Atlantic	21	I	0.0036	NA
Atlantic	26	II	-0.0024	NA
Atlantic	27	II	0.0084	NA
Atlantic	29	II	-0.0011	NA
Atlantic	31	II	-0.0107	NA
Atlantic	33.5	II	0.0005	NA
Atlantic	37	III	-0.0013	NA
Atlantic	41	III	0.0026	NA
Atlantic	45	III	0.0005	NA
Atlantic	49	III	0.0006	NA
Atlantic	53	III	0.0068	NA

Table S28. P_N in the low-pCO_2 mesocosms (M1, M5 and M9) during the whole experiment. P_N is reported in mg protein d^{-1}.

Treatment	Time	Phase	P_N	SD
Low	-2	I	-0.0080	0.0021
Low	0	I	0.0009	0.0014
Low	2	I	0.0009	0.0014
Low	5	I	-0.0016	0.0015
Low	8	I	0.0002	0.0005
Low	10	I	0.0002	0.0005
Low	13	I	0.0000	0.0006
Low	16	I	0.0024	0.0010
Low	18	I	0.0024	0.0010
Low	21	I	0.0022	0.0010
Low	24	I	0.0029	0.0057
Low	25.5	II	0.0059	0.0114
Low	27	II	0.0462	0.0184
Low	29	II	0.0084	0.0070
Low	31	II	-0.0203	0.0123
Low	32.5	II	-0.0123	0.0139
Low	34	II	-0.0062	0.0069
Low	37	II	-0.0018	0.0019
Low	40	III	-0.0047	0.0108
Low	42	III	-0.0047	0.0108
Low	45	III	-0.0011	0.0099
Low	48.5	III	0.0007	0.0034
Low	50.5	III	0.0021	0.0102
Low	53	III	0.0005	0.0091

Table S29. P_N in the intermediate-pCO_2 mesocosms (M3, M4 and M7) during the whole experiment. P_N is reported in mg protein d^{-1}.

Treatment	Time	Phase	P_N	SD
Intermediate	-2	I	-0.0030	0.0027
Intermediate	0	I	-0.0002	0.0003
Intermediate	2	I	-0.0002	0.0003
Intermediate	5	I	-0.0012	0.0030
Intermediate	8	I	0.0004	0.0005
Intermediate	10	I	0.0004	0.0005
Intermediate	13	I	-0.0001	0.0014
Intermediate	16	I	-0.0004	0.0009
Intermediate	18	I	-0.0004	0.0009
Intermediate	21	I	0.0028	0.0012
Intermediate	24	I	0.0064	0.0022
Intermediate	25.5	II	0.0127	0.0045
Intermediate	27	II	0.0239	0.0058
Intermediate	29	II	0.0306	0.0100
Intermediate	31	II	-0.0171	0.0136
Intermediate	32.5	II	-0.0135	0.0253
Intermediate	34	II	-0.0068	0.0127
Intermediate	37	III	-0.0038	0.0101
Intermediate	40	III	-0.0079	0.0078
Intermediate	42	III	-0.0079	0.0078
Intermediate	45	III	-0.0008	0.0031
Intermediate	48.5	III	0.0048	0.0063
Intermediate	50.5	III	0.0145	0.0188
Intermediate	53	III	-0.0075	0.0122

Table S30. P_N in the high-pCO_2 mesocosms (M2 and M8) during the whole experiment. P_N is reported in mg protein d^{-1}.

Treatment	Time	Phase	P_N	SD
High	-2	I	-0.0049	0.0021
High	0	I	-0.0015	0.0027
High	2	I	0.0002	0.0003
High	5	I	0.0007	0.0022
High	8	I	-0.0001	0.0011
High	10	I	-0.0001	0.0011
High	13	I	0.0003	0.0006
High	16	I	0.0003	0.0008
High	18	I	0.0005	0.0007
High	21	I	0.0013	0.0004
High	24	I	0.0098	0.0059
High	25.5	II	0.0196	0.0119
High	27	II	0.0400	0.0028
High	29	II	0.0200	0.0322
High	31	II	-0.0046	0.0021
High	32.5	II	-0.0299	0.0130
High	34	II	-0.0150	0.0065
High	37	III	-0.0008	0.0022
High	40	III	0.0020	0.0054
High	42	III	0.0020	0.0054
High	45	III	-0.0115	0.0013
High	48.5	III	0.0013	0.0033
High	50.5	III	0.0040	0.0098
High	53	III	0.0026	0.0066

Table S31. Microzooplankton abundance in low-pCO_2 mesocosms. Note that the abundance is expressed in individuals L^{-1}.

Day	MK	Ciliates	Dinoflagellates	Total microzooplankton
-3	1	200	880	1080
1	1	1080	900	1980
9	1	1780	1280	3060
17	1	1940	1640	3580
25	1	1840	4080	5920
33	1	1380	6460	7840
41	1	2640	3440	6080
50	1	5280	2460	7740
-3	5	940	1540	2480
1	5	1500	1480	2980
9	5	3160	1640	4800
17	5	2700	1980	4680
25	5	1560	2820	4380
33	5	1080	9840	10920
41	5	2800	8660	11460
50	5	2920	18040	20960
-3	9	660	840	1500
1	9	1860	6680	8540
9	9	1400	1120	2520
17	9	2560	3640	6200
25	9	1820	1620	3440
33	9	4080	27640	31720
41	9	9080	34440	43520
50	9	19720	13480	33200

Table S32. Microzooplankton abundance in intermediate-pCO_2 mesocosms. Note that the abundance is expressed in individuals L^{-1}.

Day	MK	Ciliates	Dinoflagellates	Total microzooplankton
-3	3	480	780	1260
1	3	820	2120	2940
9	3	2060	1060	3120
17	3	1720	1640	3360
25	3	1600	1020	2620
33	3	700	9940	10640
41	3	5940	8440	14380
50	3	2420	3100	5520
-3	4	660	4060	4720
1	4	1560	1260	2820
9	4	2000	2060	4060
17	4	720	820	1540
25	4	864	2400	3264
33	4	2160	21840	24000
41	4	2260	12240	14500
50	4	3820	5960	9780
-3	7	620	1200	1820
1	7	2100	2480	4580
9	7	4240	1860	6100
17	7	560	720	1280
25	7	2720	1320	4040
33	7	2880	32560	35440
41	7	2120	27480	29600
50	7	3540	8020	11560

Table S33. Microzooplankton abundance in high-pCO_2 mesocosms. Note that the abundance is expressed in individuals L^{-1}.

Day	MK	Ciliates	Dinoflagellates	Total microzooplankton
-3	2	420	1240	1660
1	2	1340	1900	3240
9	2	3080	1500	4580
17	2	1740	2880	4620
25	2	620	1160	1780
33	2	580	160	740
41	2	4580	1060	5640
50	2	14500	4980	19480
-3	8	1040	1940	2980
1	8	2660	2720	5380
9	8	3920	1200	5120
17	8	1900	600	2500
25	8	540	1480	2020
33	8	160	460	620
41	8	620	900	1520
50	8	27280	3060	30340

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