

Calcification and distribution of extant coccolithophores across the Drake Passage during late austral summer 2016

5 SUPPLEMENTARY MATERIAL:



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Fig. S1. Image of the CaCO₃ spine used for the calibration of the gray level using the software C-Calcita. Sample PS97/033-1 at 20 m water depth.

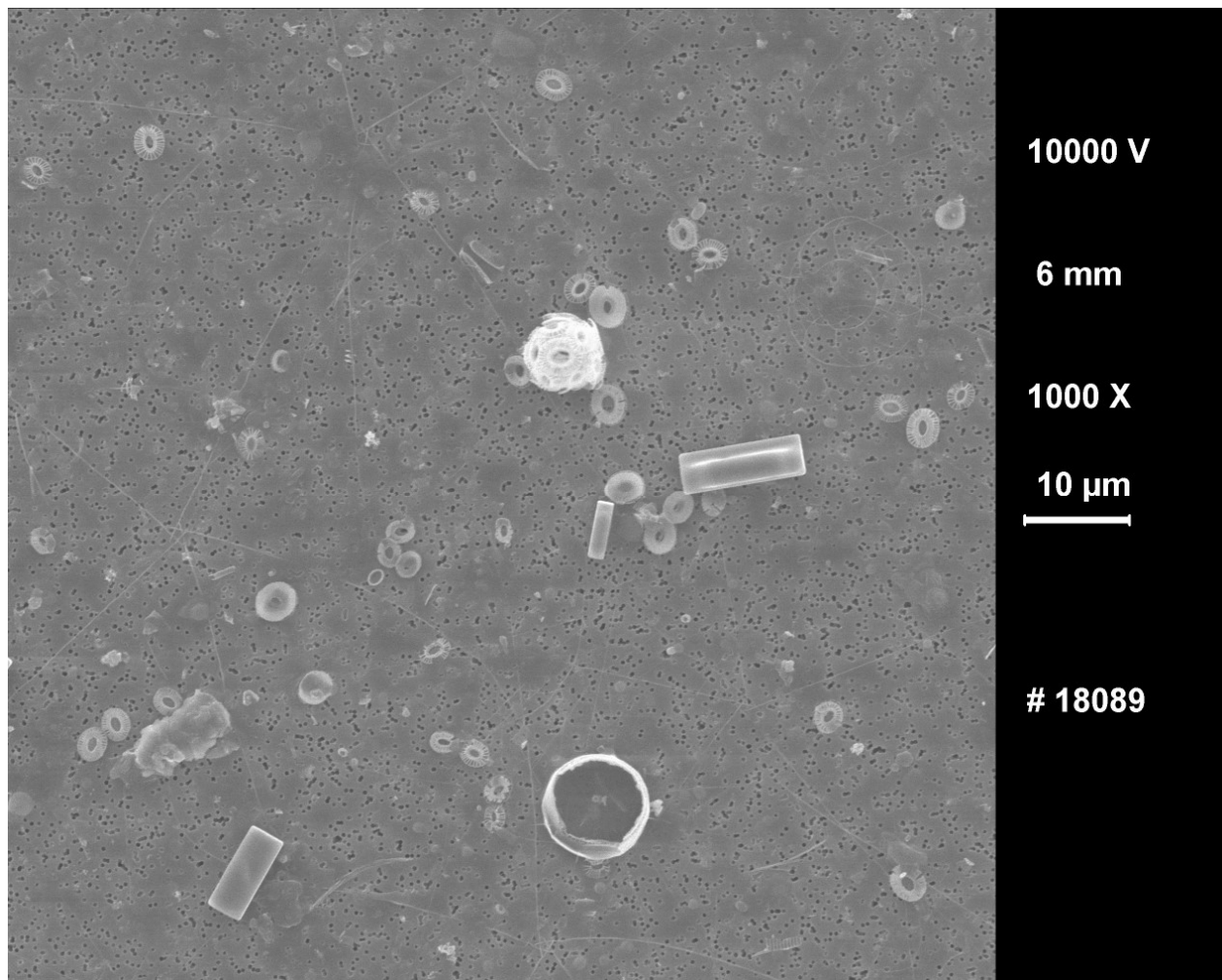


Fig. S3. Random field of view in scanning electron microscope of the sample PS97/018-1 at 10 m water depth.

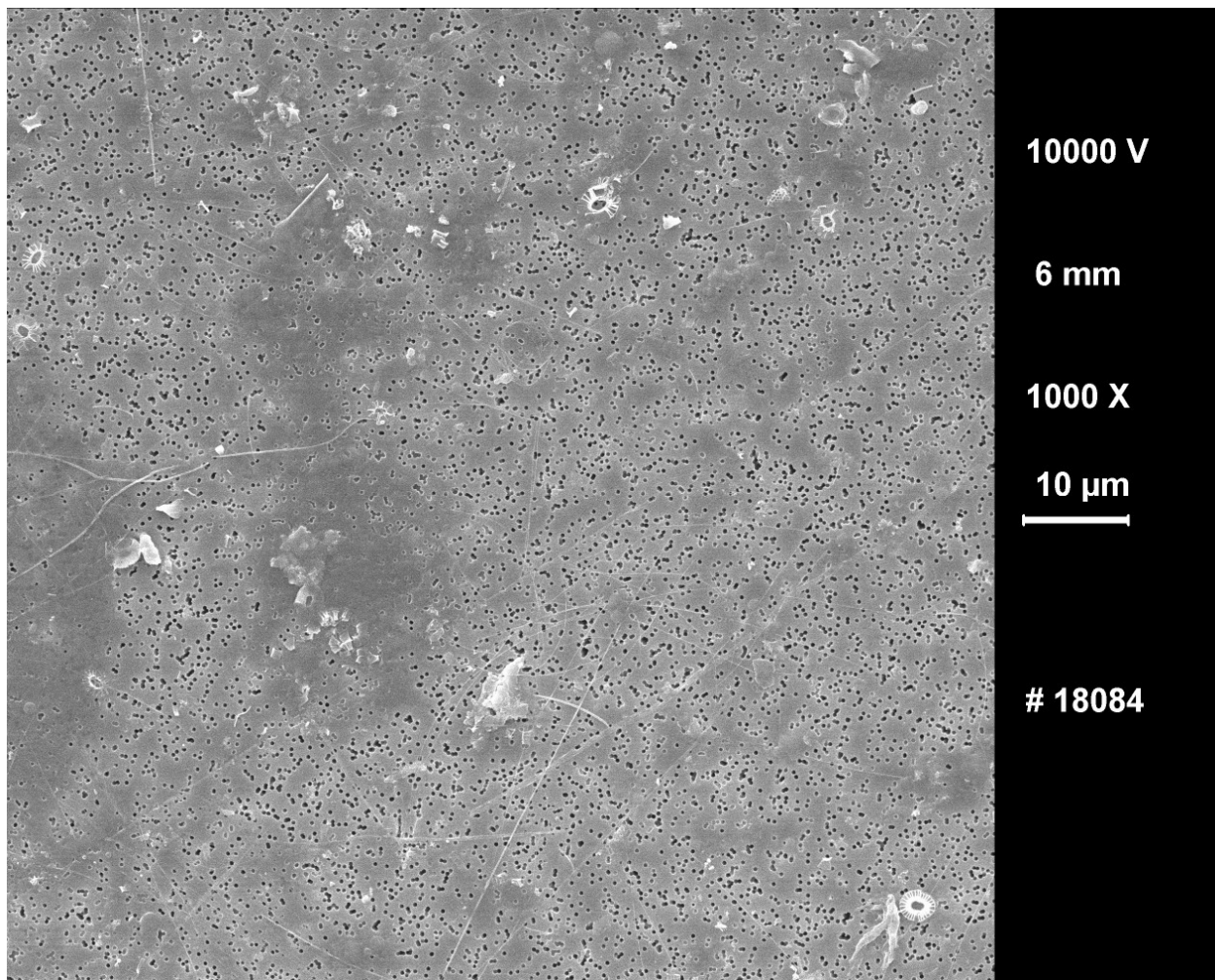


Fig. S4. Random field of view in scanning electron microscope of the sample PS97/018-1 at 10 m water depth after preparation for coccolith calcite estimates in light microscope. The polycarbonate filter appeared devoid of coccolith and only occasional detached coccoliths were observed.

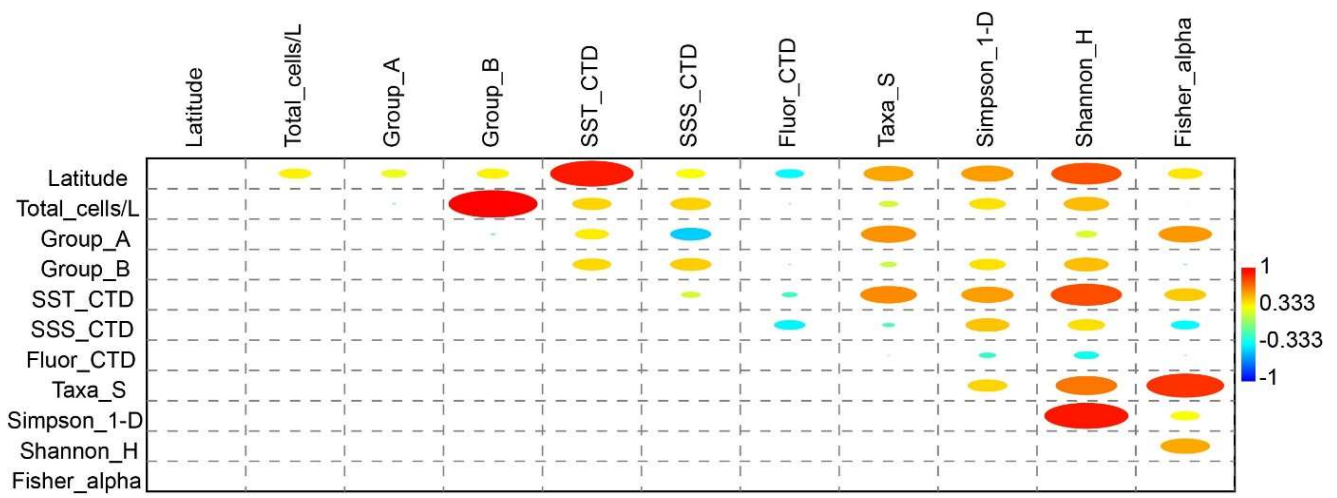


Fig. S5. Correlogram showing the most linearly related variables, which include latitude, number of cells/L (total concentration, *E. huxleyi* group A and group B), CTD in situ measurements (temperature, salinity and fluorescence), number of taxa and diversity indices (Shannon index H, Simpson index 1-D and Fisher's alpha). The correlations not significant have not been indicated.

Table S1. Main principal components (PC), eigenvalues and variance explained

| PC | Eigenvalue | % Variance |
|-----------|-------------------|-------------------|
| 1 | 0.28 | 45.25 |
| 2 | 0.11 | 17.28 |
| 3 | 0.09 | 14.90 |
| 4 | 0.03 | 5.29 |
| 5 | 0.03 | 4.38 |
| 6 | 0.02 | 3.08 |
| 7 | 0.02 | 2.51 |
| 8 | 0.01 | 2.18 |
| 9 | 0.01 | 1.72 |
| 10 | 0.01 | 1.02 |
| 11 | 0.01 | 0.83 |
| 12 | 0.00 | 0.58 |
| 13 | 0.00 | 0.37 |
| 14 | 0.00 | 0.29 |
| 15 | 0.00 | 0.17 |
| 16 | 0.00 | 0.13 |
| 17 | 0.00 | 0.01 |

Table S2. Main four principal components (PC) loadings.

| Taxa | PC 1 | PC 2 | PC 3 | PC 4 |
|-------------|-------------|-------------|-------------|-------------|
| E.hux_tR | 0.14 | -0.29 | 0.03 | 0.01 |
| E.hux_tA | 0.25 | -0.45 | 0.17 | -0.02 |
| E.hux_tB | 0.27 | 0.38 | 0.56 | -0.40 |
| E.hux_tBC | 0.04 | 0.65 | 0.08 | 0.26 |
| E.hux_tC | -0.62 | 0.05 | -0.29 | -0.02 |
| E.hux_tO | 0.64 | 0.19 | -0.66 | -0.03 |
| G.muell | 0.04 | -0.10 | 0.02 | -0.01 |
| Calcid | 0.15 | -0.29 | 0.13 | 0.07 |
| Calciopap | 0.02 | 0.06 | 0.11 | 0.56 |
| Syracosph | 0.07 | -0.05 | -0.13 | 0.33 |
| Wigwamm | -0.02 | 0.02 | -0.01 | 0.00 |
| Acanth | 0.02 | 0.00 | 0.03 | 0.09 |
| Holococco | 0.01 | -0.02 | -0.03 | -0.01 |
| Calciosol | 0.00 | 0.00 | 0.02 | 0.04 |
| Papposph | -0.02 | 0.07 | 0.05 | 0.30 |
| Pleuro | -0.01 | 0.00 | 0.00 | 0.00 |
| Ophias | 0.13 | -0.08 | 0.27 | 0.49 |

Table S3. Main four principal components (PC) scores

| Expedition | station | Latitude | Longitude | Depth | PC 1 | PC 2 | PC 3 | PC 4 |
|------------|---------|----------|-----------|-------|-------|-------|-------|-------|
| PS97 | 16-1 | -55.63 | -71.12 | 10 | 0.31 | 0.69 | 2.69 | -0.87 |
| PS97 | 16-1 | -55.63 | -71.12 | 20 | -0.39 | 0.68 | 0.20 | -0.43 |
| PS97 | 16-1 | -55.63 | -71.12 | 40 | 0.22 | 0.59 | -0.63 | 0.67 |
| PS97 | 16-1 | -55.63 | -71.12 | 60 | -0.16 | 0.43 | -0.65 | 0.27 |
| PS97 | 16-1 | -55.63 | -71.12 | 150 | -0.24 | 0.47 | -0.50 | 0.20 |
| PS97 | 17-1 | -55.53 | -71.01 | 10 | 1.31 | -1.40 | 0.23 | -1.57 |
| PS97 | 17-1 | -55.53 | -71.01 | 20 | 0.61 | 0.03 | -0.96 | -0.32 |
| PS97 | 17-1 | -55.53 | -71.01 | 40 | 0.55 | 0.04 | -0.57 | 0.38 |
| PS97 | 17-1 | -55.53 | -71.01 | 60 | 0.71 | -0.22 | 0.14 | 1.98 |
| PS97 | 17-1 | -55.53 | -71.01 | 150 | -2.28 | -2.21 | 2.09 | -0.92 |
| PS97 | 18-1 | -55.44 | -70.89 | 10 | 1.47 | -2.23 | 0.40 | -0.26 |
| PS97 | 18-1 | -55.44 | -70.89 | 20 | 2.21 | -2.78 | -0.16 | -0.39 |
| PS97 | 18-1 | -55.44 | -70.89 | 60 | 2.74 | -3.91 | 0.29 | 0.05 |
| PS97 | 18-1 | -55.44 | -70.89 | 100 | 2.45 | -3.07 | 0.40 | 0.73 |
| PS97 | 29-1 | -55.74 | -71.22 | 10 | 1.39 | 1.41 | 1.22 | -1.65 |
| PS97 | 29-1 | -55.74 | -71.22 | 20 | 1.82 | 0.86 | 0.81 | -1.65 |
| PS97 | 29-1 | -55.74 | -71.22 | 40 | 1.27 | 1.07 | 0.99 | -1.13 |
| PS97 | 29-1 | -55.74 | -71.22 | 60 | 0.96 | 1.04 | 0.07 | -1.26 |
| PS97 | 29-1 | -55.74 | -71.22 | 150 | 0.27 | 0.76 | -0.29 | -0.18 |
| PS97 | 30-1 | -55.84 | -71.32 | 10 | 0.93 | 1.13 | 1.45 | -1.38 |
| PS97 | 30-1 | -55.84 | -71.32 | 20 | 1.36 | 1.25 | 1.48 | 0.00 |
| PS97 | 30-1 | -55.84 | -71.32 | 40 | -0.10 | 0.68 | -0.24 | 0.07 |
| PS97 | 30-1 | -55.84 | -71.32 | 60 | 0.37 | 0.97 | 0.38 | -0.52 |
| PS97 | 30-1 | -55.84 | -71.32 | 100 | -0.02 | 0.85 | 0.17 | -0.95 |
| PS97 | 30-1 | -55.84 | -71.32 | 150 | 0.95 | 1.42 | 1.06 | -0.94 |

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|------|------|--------|--------|-----|-------|-------|-------|-------|
| PS97 | 31-1 | -55.94 | -71.42 | 10 | 0.42 | 0.99 | -0.01 | -1.02 |
| PS97 | 31-1 | -55.94 | -71.42 | 20 | 0.33 | 0.87 | -0.10 | -1.32 |
| PS97 | 31-1 | -55.94 | -71.42 | 40 | 0.72 | 1.24 | 0.41 | -0.90 |
| PS97 | 31-1 | -55.94 | -71.42 | 60 | 0.59 | 1.23 | 0.87 | -0.36 |
| PS97 | 31-1 | -55.94 | -71.42 | 150 | 0.38 | 0.54 | -0.73 | -0.08 |
| PS97 | 32-1 | -56.04 | -71.53 | 10 | 0.76 | 0.38 | -0.53 | 0.89 |
| PS97 | 32-1 | -56.04 | -71.53 | 20 | -0.24 | -0.12 | -1.13 | 0.08 |
| PS97 | 32-1 | -56.04 | -71.53 | 40 | 0.05 | 0.11 | -0.79 | 0.24 |
| PS97 | 32-1 | -56.04 | -71.53 | 60 | 0.39 | 0.34 | -0.68 | 0.72 |
| PS97 | 32-1 | -56.04 | -71.53 | 150 | 0.59 | -0.43 | -1.06 | 0.93 |
| PS97 | 33-1 | -56.41 | -71.76 | 10 | 0.29 | 0.43 | -0.69 | 1.10 |
| PS97 | 33-1 | -56.41 | -71.76 | 20 | 0.02 | 0.36 | -0.92 | 0.26 |
| PS97 | 33-1 | -56.41 | -71.76 | 60 | 0.18 | 0.42 | -0.89 | 0.86 |
| PS97 | 33-1 | -56.41 | -71.76 | 100 | -0.05 | 0.47 | -0.55 | 0.05 |
| PS97 | 33-1 | -56.41 | -71.76 | 150 | 0.37 | -0.17 | -0.60 | 0.36 |
| PS97 | 34-2 | -56.85 | -71.18 | 10 | -0.26 | 0.28 | -0.71 | 1.05 |
| PS97 | 34-2 | -56.85 | -71.18 | 20 | -0.29 | -0.20 | -1.12 | -0.14 |
| PS97 | 34-2 | -56.85 | -71.18 | 40 | -0.37 | -0.05 | -0.90 | 0.25 |
| PS97 | 34-2 | -56.85 | -71.18 | 60 | -0.37 | 0.14 | -0.77 | 0.15 |
| PS97 | 34-2 | -56.85 | -71.18 | 100 | -0.89 | -0.10 | -0.19 | -0.47 |
| PS97 | 34-2 | -56.85 | -71.18 | 150 | -0.68 | -0.01 | -0.46 | 0.25 |
| PS97 | 35-1 | -57.27 | -70.60 | 10 | -0.30 | 0.11 | -0.88 | 0.73 |
| PS97 | 35-1 | -57.27 | -70.60 | 20 | -0.39 | -0.26 | -0.44 | 0.05 |
| PS97 | 35-1 | -57.27 | -70.60 | 60 | -0.53 | -0.29 | -0.62 | 1.11 |
| PS97 | 35-1 | -57.27 | -70.60 | 100 | -0.91 | -0.08 | -0.12 | 0.09 |
| PS97 | 36-1 | -57.69 | -69.98 | 10 | 0.07 | 0.49 | -0.79 | 0.40 |
| PS97 | 36-1 | -57.69 | -69.98 | 20 | -0.16 | -0.18 | -1.13 | 0.63 |
| PS97 | 36-1 | -57.69 | -69.98 | 40 | -0.37 | -0.13 | -0.50 | 0.34 |
| PS97 | 36-1 | -57.69 | -69.98 | 60 | -0.10 | -0.03 | -1.14 | -0.66 |
| PS97 | 36-1 | -57.69 | -69.98 | 100 | -1.08 | -0.55 | -0.17 | 0.04 |

| | | | | | | | | |
|------|------|--------|--------|-----|-------|-------|-------|-------|
| PS97 | 36-1 | -57.69 | -69.98 | 150 | -0.49 | -0.05 | -0.78 | 0.03 |
| PS97 | 37-1 | -58.17 | -69.26 | 10 | -0.47 | 0.01 | -0.75 | -0.55 |
| PS97 | 37-1 | -58.17 | -69.26 | 20 | -0.50 | -0.28 | -0.82 | -0.27 |
| PS97 | 37-1 | -58.17 | -69.26 | 40 | -0.44 | 0.00 | -0.81 | 0.05 |
| PS97 | 37-1 | -58.17 | -69.26 | 60 | -0.55 | -0.02 | -0.68 | -0.19 |
| PS97 | 38-1 | -58.79 | -68.42 | 10 | 0.59 | 0.60 | 4.41 | 4.58 |
| PS97 | 38-1 | -58.79 | -68.42 | 20 | 0.23 | 0.32 | 0.26 | 2.25 |
| PS97 | 38-1 | -58.79 | -68.42 | 40 | -0.47 | 0.61 | 0.15 | 2.48 |
| PS97 | 38-1 | -58.79 | -68.42 | 60 | -0.50 | 0.11 | -0.63 | -0.44 |
| PS97 | 39-1 | -59.35 | -67.22 | 10 | -0.72 | 0.63 | 0.64 | 1.24 |
| PS97 | 39-1 | -59.35 | -67.22 | 20 | -1.19 | -1.02 | 0.41 | -0.76 |
| PS97 | 39-1 | -59.35 | -67.22 | 40 | -0.99 | -0.42 | -0.23 | -0.70 |
| PS97 | 39-1 | -59.35 | -67.22 | 150 | -1.44 | 0.04 | 1.04 | 0.38 |
| PS97 | 40-1 | -59.69 | -66.45 | 10 | -1.06 | -0.46 | -0.16 | -0.72 |
| PS97 | 40-1 | -59.69 | -66.45 | 20 | -1.69 | -1.09 | 0.71 | -0.92 |
| PS97 | 40-1 | -59.69 | -66.45 | 40 | -1.38 | -0.84 | 0.24 | -0.87 |
| PS97 | 40-1 | -59.69 | -66.45 | 60 | -1.17 | -0.31 | 0.21 | -0.01 |
| PS97 | 40-1 | -59.69 | -66.45 | 100 | -2.29 | -0.72 | 2.11 | -0.30 |
| PS97 | 47-1 | -61.45 | -64.87 | 80 | -2.40 | -1.43 | 1.94 | -0.85 |