



Global Biogeochemical cycles

Supporting Information for

Surface distribution of dissolved trace metals in the oligotrophic ocean and their influence on phytoplankton biomass and productivity

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Introduction

The data in the supporting information correspond to Figures 1 (Table S1), and 2 – 7 (Table S2). Data presented in table S2 was used to build the multivariable linear regression model presented in Figure 10.

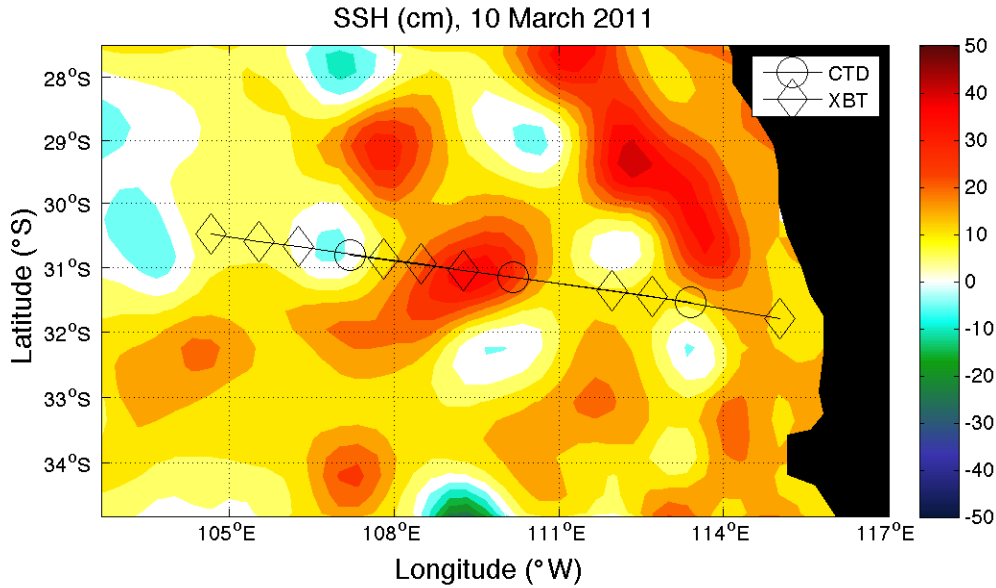


Figure S1. Vertical temperature field contour from the combined CTD and XBT data showing changes in the isotherms/isopycnals due to cyclonic and anticyclonic eddies developed from the Leeuwin current.

| | | |
|--|---|---|
| 1. Alaska Downwelling Coastal Province | 19. Red Sea, Persian Gulf Province | 37. Pacific Equatorial Divergence Province |
| 2. Australia-Indonesia Coastal Province | 20. Sunda-Arafura Shelves Province | 38. S. Atlantic Gyral Province |
| 3. Benguela Current Coastal Province | 21. SW Atlantic Shelves Province | 39. W. Pacific Warm Pool Province |
| 4. Brazil Current Coastal Province | 22. W. India Coastal Province | 40. Western Tropical Atlantic Province |
| 5. California Upwelling Coastal Province | 23. Antarctic Province | 41. Gulf Stream Province |
| 6. Canary Coastal Province | 24. Atlantic Arctic Province | 42. Kuroshio Current Province |
| 7. Central America Coastal Province | 25. Atlantic Subarctic Province | 43. Mediterranean Sea, Black Sea Province |
| 8. Chile-Peru Current Coastal Province | 26. Austral Polar Province | 44. N. Atlantic Drift Province |
| 9. China Sea Coastal Province | 27. Boreal Polar Province | 45. N. Atlantic Subtropical Gyral Province (east) |
| 10. E. Africa Coastal Province | 28. N. Pacific Epicontinental Province | 46. N. Atlantic Subtropical Gyral Province (west) |
| 11. E. India Coastal Province | 29. Archipelagic Deep Basin Province | 47. N. Pacific Polar Front Province |
| 12. E. Australia Coastal Province | 30. Caribbean Province | 48. N. Pacific Subtropical Gyre Province (west) |
| 13. Guianas Coastal Province | 31. Eastern Tropical Atlantic Province | 49. Pacific Subarctic Gyres Province (east) |
| 14. Guinea Current Coastal Province | 32. Indian Monsoon Gyres Province | 50. Pacific Subarctic Gyres Province (west) |
| 15. NE Atlantic Shelves Province | 33. Indian S. Subtropical Gyre Province | 51. S. Pacific Subtropical Gyre Province |
| 16. New Zealand Coastal Province | 34. N. Atlantic Tropical Gyral Province | 52. S. Subtropical Convergence Province |
| 17. NW Arabian Upwelling Province | 35. N. Pacific Equatorial Countercurrent Province | 53. Subantarctic Province |
| 18. NW Atlantic Shelves Province | 36. N. Pacific Tropical Gyre Province | 54. Tasman Sea Province |

Table S1. Complete list of Longhurst biogeographical provinces shown in Figure 1

| Transect | Station number | Longitude | Latitude | Mo (nM) | Cd (pM) | V (nM) | Fe (nM) | Co (pM) | Ni (nM) | Cu (nM) | Salinity (psu) | Temperature (°C) | PO4 (µM) | NO3 (µM) | SiO4 (µM) | Chla (µg/L) | PPi (mgC/m ² h) |
|------------------------|----------------|-----------|----------|---------|---------|--------|---------|---------|---------|---------|----------------|------------------|----------|----------|-----------|-------------|----------------------------|
| S. Africa to Australia | 1 | 27.5 | -34.8 | 26.33 | 107.19 | 26.50 | 1.81 | 32.25 | 2.66 | 1.05 | 35.29 | 26.39 | 0.070 | 0.400 | 1.740 | 0.170 | 49.08 |
| S. Africa to Australia | 2 | 31.1 | -34.4 | 95.31 | 24.81 | 20.81 | 1.53 | 30.09 | 2.06 | 0.76 | 35.52 | 23.70 | 0.010 | 0.310 | 0.940 | 0.090 | 3.94 |
| S. Africa to Australia | 3 | 33.7 | -34.2 | 94.19 | 12.37 | 22.80 | 0.57 | 19.53 | 1.27 | 0.88 | 35.60 | 23.93 | 0.027 | 0.331 | 1.448 | 0.090 | 19.78 |
| S. Africa to Australia | 4 | 37.1 | -33.9 | 83.83 | 20.94 | 25.37 | 0.38 | 26.90 | 2.19 | 0.84 | 35.63 | 23.86 | 0.080 | 0.310 | 1.470 | 0.110 | 10.16 |
| S. Africa to Australia | 5 | 39.9 | -33.5 | 86.14 | 21.30 | 26.73 | 0.47 | 24.58 | 2.06 | 0.82 | 35.55 | 24.46 | 0.071 | 0.281 | 1.198 | 0.110 | 18.73 |
| S. Africa to Australia | 6 | 43.3 | -33.2 | 113.18 | 16.34 | 28.93 | 0.62 | 24.76 | 1.81 | 1.17 | 35.51 | 23.71 | 0.260 | 0.370 | 1.380 | 0.080 | 15.55 |
| S. Africa to Australia | 7 | 63.6 | -27.9 | 86.90 | 23.28 | 23.39 | 0.53 | 30.84 | 2.04 | 0.79 | 35.32 | 26.32 | 0.030 | 0.510 | 0.620 | 0.080 | 20.37 |
| S. Africa to Australia | 8 | 66.5 | -28.2 | 83.13 | 21.33 | 25.09 | 0.52 | 28.54 | 2.05 | 0.79 | 35.40 | 25.78 | 0.030 | 0.410 | 1.133 | 0.070 | 14.65 |
| S. Africa to Australia | 9 | 69.9 | -29.3 | 73.20 | 20.63 | 28.68 | 0.51 | 27.26 | 1.89 | 0.58 | 35.54 | 25.70 | 0.020 | 0.370 | 1.030 | 0.050 | 8.11 |
| S. Africa to Australia | 10 | 73.1 | -29.6 | 78.59 | 20.94 | 20.31 | 0.50 | 25.97 | 1.74 | 0.95 | 35.77 | 24.92 | 0.010 | 0.390 | 2.380 | 0.040 | 7.30 |
| S. Africa to Australia | 11 | 76.2 | -29.9 | 79.77 | 19.29 | 24.55 | 0.53 | 24.68 | 1.83 | 1.61 | 35.98 | 22.90 | 0.060 | 0.566 | 1.570 | 0.030 | 9.34 |
| S. Africa to Australia | 12 | 79.6 | -29.8 | 83.75 | 16.30 | 18.32 | 0.70 | 19.24 | 1.66 | 0.68 | 36.01 | 23.55 | 0.070 | 0.410 | 1.700 | 0.060 | 8.95 |
| S. Africa to Australia | 13 | 97.2 | -29.6 | 96.90 | 27.24 | 27.63 | 0.19 | 3.56 | 2.42 | 1.06 | 35.76 | 22.20 | 0.020 | 0.040 | 0.690 | 0.130 | 6.85 |
| S. Africa to Australia | 14 | 100.0 | -29.9 | 104.59 | 22.70 | 29.18 | 0.30 | 22.40 | 1.84 | 0.89 | 35.55 | 22.12 | 0.020 | 0.090 | 1.550 | 0.070 | 3.90 |
| S. Africa to Australia | 15 | 103.9 | -30.4 | 74.16 | 17.57 | 20.67 | 0.31 | 25.74 | 1.65 | 1.13 | 35.73 | 22.11 | 0.030 | 0.100 | 1.850 | 0.060 | 12.80 |
| S. Africa to Australia | 16 | 107.3 | -30.8 | 80.08 | 23.21 | 21.68 | 0.52 | 21.52 | 2.46 | 0.98 | 35.52 | 23.43 | 0.050 | 0.120 | 1.340 | 0.100 | 13.53 |
| S. Africa to Australia | 17 | 110.9 | -31.2 | 94.62 | 22.02 | 24.82 | 0.65 | 15.58 | 2.17 | 0.93 | 35.47 | 23.41 | 0.040 | 0.240 | 1.030 | 0.160 | 21.67 |
| S. Africa to Australia | 18 | 114.2 | -31.6 | 105.09 | 24.04 | 31.75 | 0.81 | 27.95 | 2.09 | 1.14 | 35.32 | 25.20 | 0.030 | 0.840 | 2.050 | 0.100 | 10.31 |
| Colombia to Spain | 19 | -74.7 | 11.9 | 79.73 | 25.79 | 17.87 | 1.19 | 54.03 | 1.99 | 1.38 | 35.70 | 28.90 | 0.061 | 0.506 | 2.443 | 0.130 | 18.97 |
| Colombia to Spain | 20 | -72.3 | 13.7 | 76.03 | 25.39 | 15.36 | 1.02 | 26.57 | 1.19 | 1.64 | 35.56 | 29.21 | 0.071 | 0.569 | 1.258 | 0.145 | 26.72 |
| Colombia to Spain | 21 | -69.9 | 14.8 | 92.51 | 17.94 | 19.62 | 0.67 | 23.54 | 1.68 | 0.94 | 35.45 | 29.31 | 0.068 | 0.340 | 1.513 | 0.091 | 13.05 |
| Colombia to Spain | 22 | -67.8 | 15.4 | 90.79 | 23.93 | 23.91 | 0.49 | 23.84 | 1.74 | 1.23 | 35.53 | 29.64 | 0.038 | 0.569 | 1.451 | 0.193 | 38.50 |
| Colombia to Spain | 23 | -59.8 | 17.4 | 115.40 | 23.69 | 25.99 | 0.93 | 25.54 | 2.05 | 1.25 | 35.52 | 29.43 | 0.025 | 0.342 | 1.160 | 0.267 | 34.36 |
| Colombia to Spain | 24 | -58.6 | 17.8 | 104.78 | 20.21 | 11.85 | 0.70 | 28.63 | 1.92 | 1.30 | 35.65 | 29.03 | 0.006 | 0.379 | 1.247 | 0.307 | 19.96 |
| Colombia to Spain | 25 | -55.9 | 18.7 | 86.53 | 17.65 | 15.07 | 0.55 | 23.75 | 1.26 | 1.27 | 36.66 | 28.52 | 0.088 | 0.446 | 1.086 | 0.054 | 18.35 |
| Colombia to Spain | 26 | -53.2 | 19.9 | 79.38 | 20.52 | 22.44 | 0.55 | 30.45 | 1.98 | 1.19 | 36.83 | 28.08 | 0.054 | 0.506 | 1.368 | 0.073 | 20.41 |
| Colombia to Spain | 27 | -50.3 | 20.7 | 93.46 | 26.51 | 19.76 | 0.82 | 29.83 | 1.96 | 1.05 | 37.07 | 27.63 | 0.049 | 0.598 | 0.840 | 0.056 | 19.34 |
| Colombia to Spain | 28 | -48.5 | 21.4 | 107.30 | 29.20 | 23.32 | 0.73 | 29.39 | 2.42 | 1.36 | 37.07 | 27.49 | 0.053 | 0.402 | 0.832 | 0.058 | 21.50 |
| Colombia to Spain | 29 | -38.7 | 24.9 | 83.24 | 14.14 | 28.94 | 0.61 | 35.28 | 1.90 | 1.12 | 37.56 | 25.67 | 0.085 | 0.288 | 0.819 | 0.077 | 19.66 |
| Colombia to Spain | 30 | -35.3 | 26.1 | 76.70 | 18.30 | 25.93 | 0.45 | 45.23 | 1.14 | 0.76 | 37.63 | 24.88 | 0.069 | 0.442 | 0.987 | 0.049 | 15.99 |
| Colombia to Spain | 31 | -32.9 | 26.9 | 79.54 | 19.43 | 26.73 | 0.54 | 43.47 | 1.12 | 0.45 | 37.47 | 24.39 | 0.088 | 0.342 | 0.567 | 0.045 | 13.00 |
| Colombia to Spain | 32 | -30.0 | 27.8 | 81.64 | 17.47 | 26.49 | 0.62 | 47.14 | 1.69 | 0.67 | 37.33 | 23.31 | 0.062 | 0.412 | 0.554 | 0.044 | 9.45 |
| Colombia to Spain | 33 | -27.0 | 28.9 | 75.74 | 15.52 | 19.00 | 0.41 | 41.92 | 1.67 | 0.61 | 37.37 | 23.00 | 0.057 | 0.472 | 1.099 | 0.099 | 17.11 |
| Colombia to Spain | 34 | -24.1 | 29.8 | 110.11 | 10.30 | 28.53 | 0.56 | 44.52 | 1.55 | 0.60 | 36.95 | 21.62 | 0.131 | 0.564 | 0.586 | 0.065 | 27.61 |
| Colombia to Spain | 35 | -20.6 | 31.0 | 80.18 | 8.34 | 20.65 | 0.90 | 38.75 | 1.12 | 0.74 | 36.88 | 21.52 | 0.100 | 0.453 | 0.583 | 0.075 | 29.33 |
| Colombia to Spain | 36 | -17.3 | 32.1 | 100.41 | 6.35 | 20.15 | 1.12 | 36.97 | 1.35 | 1.38 | 36.86 | 21.88 | 0.093 | 0.437 | 1.507 | 0.066 | 27.81 |
| Spain to Brazil | 37 | -9.2 | 35.3 | 115.67 | 27.63 | 26.12 | 1.59 | 59.97 | 1.85 | 2.17 | 36.52 | 18.95 | 0.074 | 0.646 | 0.874 | 0.145 | 6.98 |
| Spain to Brazil | 38 | -17.2 | 29.8 | 92.39 | 21.37 | 23.04 | 1.00 | 24.26 | 1.58 | 0.77 | 36.93 | 21.19 | 0.084 | 0.646 | 0.874 | 0.114 | 8.01 |
| Spain to Brazil | 39 | -18.8 | 28.7 | 79.87 | 26.12 | 21.75 | 1.49 | 40.29 | 2.08 | 1.04 | 37.08 | 22.19 | 0.022 | 0.259 | 0.890 | 0.094 | 9.99 |
| Spain to Brazil | 40 | -20.8 | 25.4 | 72.07 | 18.87 | 25.38 | 1.46 | 34.03 | 2.60 | 1.04 | 36.95 | 23.20 | 0.009 | 0.731 | 0.626 | 0.151 | 9.50 |
| Spain to Brazil | 41 | -22.1 | 23.5 | 76.91 | 24.92 | 26.36 | 1.63 | 33.23 | 2.13 | 1.12 | 37.06 | 23.81 | 0.022 | 0.623 | 0.874 | 0.222 | 9.74 |
| Spain to Brazil | 42 | -23.4 | 21.5 | 88.30 | 22.60 | 24.01 | 1.54 | 18.00 | 1.51 | 0.97 | 36.69 | 26.88 | 0.078 | 0.263 | 1.001 | 0.179 | 20.58 |
| Spain to Brazil | 43 | -24.3 | 20.3 | 110.51 | 27.76 | 25.47 | 1.89 | 22.39 | 1.74 | 1.12 | 36.61 | 25.57 | 0.084 | 0.646 | 0.874 | 0.140 | 18.26 |
| Spain to Brazil | 44 | -26.0 | 16.6 | 95.78 | 22.78 | 26.12 | 1.75 | 10.00 | 1.72 | 1.12 | 36.40 | 27.00 | 0.084 | 0.208 | 0.849 | 0.201 | 38.26 |
| Spain to Brazil | 45 | -26.0 | 7.3 | 81.15 | 19.58 | 20.09 | 0.55 | 9.71 | 1.75 | 0.90 | 35.40 | 28.27 | 0.017 | 0.344 | 1.549 | 0.245 | 31.19 |
| Spain to Brazil | 46 | -27.3 | -3.0 | 85.67 | 24.75 | 24.66 | 0.81 | 28.24 | 1.49 | 0.96 | 36.15 | 28.00 | 0.112 | 0.102 | 0.956 | 0.146 | 21.48 |
| Spain to Brazil | 47 | -27.8 | -4.1 | 87.57 | 15.73 | 24.58 | 0.91 | 27.25 | 1.00 | 0.94 | 36.35 | 27.75 | 0.148 | 0.232 | 0.966 | 0.109 | 15.08 |
| Spain to Brazil | 48 | -29.3 | -7.2 | 87.25 | 16.68 | 26.25 | 0.66 | 25.67 | 1.10 | 0.73 | 35.81 | 30.90 | 0.135 | 0.082 | 1.148 | 0.099 | 19.68 |
| Spain to Brazil | 49 | -30.0 | -8.7 | 85.18 | 13.54 | 19.78 | 0.72 | 28.95 | 0.98 | 0.83 | 36.65 | 27.65 | 0.215 | 0.083 | 0.400 | 0.058 | 20.91 |
| Spain to Brazil | 50 | -31.0 | -10.9 | 93.28 | 25.94 | 20.15 | 0.66 | 20.08 | 1.74 | 0.95 | 36.87 | 27.67 | 0.138 | 0.102 | 1.456 | 0.040 | 21.01 |
| Spain to Brazil | 51 | -32.4 | -13.7 | 81.10 | 22.70 | 23.74 | 0.67 | 29.61 | 0.93 | 1.05 | 37.13 | 27.43 | 0.130 | 0.102 | 0.956 | 0.047 | 13.47 |
| Spain to Brazil | 52 | -33.1 | -15.2 | 95.64 | 27.82 | 27.37 | 0.76 | 20.77 | 1.88 | 1.15 | 37.24 | 27.84 | 0.112 | 0.102 | 0.956 | 0.090 | 27.92 |
| Spain to Brazil | 53 | -35.7 | -20.6 | 133.96 | 27.31 | 33.23 | 0.64 | 27.13 | 1.97 | 1.19 | 36.99 | 27.40 | 0.110 | 1.588 | 0.804 | 0.125 | 15.64 |
| Spain to Brazil | 54 | -36.7 | -24.2 | 89.86 | 21.39 | 24.23 | 0.71 | 22.86 | 1.49 | 1.47 | 36.57 | 26.95 | 0.090 | 0.140 | 0.820 | 0.077 | 16.00 |
| Brazil to S. Africa | 55 | -36.7 | -24.2 | 89.86 | 21.39 | 24.23 | 0.71 | 22.86 | 1.49 | 1.47 | 36.57 | 26.95 | 0.090 | 0.140 | 0.820 | 0.077 | 16.00 |
| Brazil to S. Africa | 56 | -33.5 | -14.8 | 84.45 | 12.07 | 19.84 | 0.90 | 20.55 | 0.92 | 1.05 | 36.65 | 27.12 | 0.010 | 0.520 | 1.060 | 0.064 | 37.06 |
| Brazil to S. Africa | 57 | -30.2 | -25.4 | 80.24 | 23.31 | 18.40 | 0.82 | 23.60 | 1.57 | 1.31 | 36.58 | 26.04 | 0.000 | 0.350 | 0.930 | 0.097 | 27.02 |
| Brazil to S. Africa | 58 | -28.4 | -25.7 | 84.93 | 15.02 | 21.17 | 0.77 | 21.53 | 1.09 | 1.18 | 36.49 | 25.68 | 0.096 | 0.243 | 1.041 | 0.078 | 22.48 |
| Brazil to S. Africa | 59 | -24.5 | -26.4 | 71.11 | 17.31 | 22.17 | 0.72 | 27.30 | 1.96 | 1.45 | 36.41 | 24.62 | 0.060 | 0.340 | 1.330 | 0.047 | 17.81 |
| Brazil to S. Africa | 60 | -22.2 | -26.8 | 80.73 | 12.61 | 19.28 | 0.63 | 21.54 | 1.12 | 1.14 | 36.21 | 23.94 | 0.100 | 0.200 | 1.490 | 0.094 | 19.39 |
| Brazil to S. Africa | 61 | -18.5 | -27.5 | 81.19 | 26.11 | 19.04 | 0.53 | 26.50 | 1.94 | 1.45 | 36.21 | 23.82 | 0.100 | 0.100 | 1.390 | 0.036 | 11.45 |
| Brazil to S. Africa | 62 | -15.6 | -28.0 | 86.67 | 22.37 | 24.96 | 0.53 | 23.99 | 1.77 | 1.42 | 36.51 | 23.80 | 0.096 | 0.243 | 1.041 | 0.035 | 14.70 |
| Brazil to S. Africa | 63 | -9.9 | -29.0 | 66.99 | 14.43 | 24.89 | 0.65 | 29.61 | 1.80 | 1.29 | 36.04 | 23.32 | 0.093 | 0.274 | 1.075 | 0.063 | 23.09 |
| Brazil to S. Africa | 64 | -5.6 | -29.7 | 75.92 | 17.95 | 19.20 | 0.59 | 35.94 | 1.81 | 1.92 | 36.10 | 22.74 | 0.150 | 0.300 | 0.770 | 0.040 | 12.40 |
| Brazil to S. Africa | 65 | -3.1 | -30.1 | 79.77 | 19.29 | 24.55 | 0.63 | 26.68 | 1.83 | 1.61 | 35.98 | 22.90 | 0.170 | 0.243 | 1.041 | 0.034 | 25.18 |
| Brazil to S. Africa | 66 | 0.8 | -30.8 | 80.44 | 15.81 | 20.19 | 0.54 | 29.98 | 2.03 | 1.63 | 36.10 | 22.80 | 0.180 | 0.360 | 0.670 | 0.060 | 22.01 |
| Brazil to S. Africa | 67 | 3.7 | -31.3 | 84.79 | 16.33 | 17.97 | 0.60 | 37.35 | 2.05 | 1.73 | 35.79 | 21.67 | 0.110 | 0.340 | 1.310 | 0.041 | 12.65 |
| Brazil to S. Africa | 68 | 6.8 | -31.8 | 76.80 | 13.36 | 22.04 | 0.65 | 38.39 | 2.15 | 1.80 | 35.77 | 21.37 | 0.130 | 0.435 | 1.040 | 0.058 | 14.09 |
| Brazil to S. Africa | 69 | 12.7 | -32.8 | 82.51 | 18.13 | 21.37 | 0.77 | 39.93 | 2.19 | 1.84 | 35.47 | 20.91 | 0.140 | 0.520 | 0.960 | 0.064 | 37.06 |
| NZ to | | | | | | | | | | | | | | | | | |

| Element | Certified value | Measurement result |
|---------|-----------------|--------------------|
| Mo | 9.59 ± 0.70 | 10.0 ± 0.06 |
| Cd | 0.0210 ± 0.0017 | 0.022 ± 0.0002 |
| Pb | 0.011 ± 0.002 | 0.0097 ± 0.0004 |
| V | 1.28 ± 0.14 | 1.30 ± 0.007 |
| Fe | 1.40 ± 0.11 | 1.47 ± 0.004 |
| Co | 0.093 | 0.10 ± 0.0002 |
| Ni | 0.322 ± 0.022 | 0.31 ± 0.003 |
| Cu | 0.371 ± 0.028 | 0.36 ± 0.001 |

Table S3. Analytical results of the analysis of nearshore seawater reference material for trace metals CASS-5.

| Ratio | Dissolved Colombia to Spain | | Dissolved Spain to Brazil | | Dissolved Brazil to S. Africa | | Dissolved South Africa to Australia | | | Dissolved NZ to Hawaii | | Dissolved Hawaii to Panama | | Laboratory culture |
|--------|--------------------------------|-----------------------|------------------------------|----------------------|----------------------------------|-----------------------|--|----------------------|-----------------------|---------------------------|----------------------|-------------------------------|----------------------|-------------------------|
| | Section 1 | Section 2 | Section 1 | Section 2 | Section 1 | Section 2 | Section 1 | Section 2 | Section 3 | Section 1 | Section 2 | Section 1 | Section 2 | |
| N:P | 5.0 - 63 (10.9) | 3.8 - 12.2 (6.6) | 0.9 - 80 (7.7) | 0.3 - 14 (0.7) | 1.0 - 35.0 (2.7) | 1.4 - 3.7 (3.1) | 1.4 - 31 (5.1) | 5.8 - 39 (15) | 2.0 - 28 (3.9) | 0.3 - 7.2 (1.4) | 2.0 - 12 (7.2) | 0.1 - 8.3 (0.7) | 0.7 - 17 (2.1) | 5.4 - 38 (16) |
| SiO4:P | 17 - 207 (39.1) | 4.4 - 25.3 (14.3) | 6.4 - 69 (11.7) | 1.8 - 27 (8.5) | 5.1 - 106 (14.4) | 3.7 - 11.9 (6.6) | 5.3 - 94 (21) | 20.6 - 238 (31) | 25 - 77 (48) | 1.8 - 95 (4.7) | 4.3 - 345 (16) | 2.0 - 32 (5.7) | 2.7 - 15 (7.7) | 4.9 - 52.0 (15) |
| Fe:P | 9.7 - 117 (16.9) | 4.2 - 16.7 (7.1) | 6.1 - 161 (21) | 3.3 - 23 (5.1) | 3.9 - 90.1 (7.5) | 3.0 - 5.4 (4.9) | 2.4 - 152 (14) | 8.9 - 49 (17) | 9.4 - 27 (12) | 2.0 - 23 (4.1) | 1.1 - 55 (4.3) | 1.0 - 62 (2.2) | 0.6 - 10 (2.5) | 0.3 - 15.4 (7.5) |
| Cu:P | 13.7 - 216 (27.7) | 4.5 - 25.6 (13.2) | 6.3 - 115 (13) | 3.8 - 48 (8.1) | 11.3 - 130 (14.6) | 9.0 - 15.7 (13.1) | 4.4 - 32 (13) | 9.6 - 95 (26) | 19 - 53 (37) | 3.7 - 20 (7.8) | 1.2 - 32 (4.7) | 1.7 - 32 (3.2) | 1.8 - 4.9 (2.5) | 0.06 - 1.36 (0.38) |
| Co:P | 0.35 - 4.77 (0.75) | 0.27 - 0.76 (0.56) | 0.12 - 1.8 (0.2) | 0.13 - 0.7 (0.19) | 0.22 - 2.3 (0.29) | 0.16 - 0.3 (0.28) | 0.09 - 3.0 (0.4) | 0.2 - 2.5 (0.9) | 0.17 - 1.1 (0.6) | 0.06 - 0.36 (0.11) | 0.04 - 0.9 (0.11) | 0.007 - 1.2 (0.03) | 0.03 - 0.1 (0.05) | 0.01 - 0.46 (0.19) |
| Cd:P | 0.26 - 3.4 (0.52) | 0.06 - 0.55 (0.27) | 0.1 - 2.0 (0.3) | 0.06 - 0.7 (0.18) | 0.11 - 2.3 (0.24) | 0.08 - 0.14 (0.11) | 0.06 - 2.4 (0.3) | 0.2 - 1.0 (0.7) | 0.4 - 1.3 (0.6) | 0.1 - 0.6 (0.23) | 0.05 - 1.2 (0.14) | 0.04 - 1.2 (0.1) | 0.04 - 0.1 (0.08) | 0.068 - 0.73 (0.21) |
| Mo:P | 1070 - 17463 (1874) | 801 - 2024 (1316) | 590 - 7960 (1320) | 397 - 2995 (674) | 506 - 8445 (897) | 446 - 770 (589) | 435 - 3527 (1368) | 261 - 1434 (2833) | 1601 - 5229 (2987) | 750 - 2745 (1140) | 237 - 4070 (784) | 458 - 4070 (703) | 400 - 841 (472) | 0.009 - 0.11 (0.033) |
| V:P | 216 - 1975 (461.1) | 171 - 440 (378) | 165 - 2803 (312) | 92 - 807 (194) | 128 - 1983 (265) | 112 - 169 (152) | 111 - 2080 (376) | 23 - 173 (807) | 433 - 1459 (873) | 200 - 743 (330) | 92 - 1010 (239) | 96 - 1010 (220) | 68 - 187 (114) | |
| Ni:P | 16.7 - 319 (39.2) | 11.2 - 45.7 (27.2) | 6.7 - 287 (20.8) | 4.5 - 49 (12) | 11.2 - 156 (19.4) | 10.7 - 18.6 (15.6) | 6.9 - 205 (33) | 20 - 238 (68) | 49 - 120 (62) | 11.0 - 42 (20) | 7.8 - 104 (16) | 6.6 - 104 (10) | 4.5 - 12 (6.9) | |

Table S4 – Comparison of the range and median values (in parentheses) of dissolved nutrients with literature values from laboratory culture experiments, standardized to P.