# Coupling between Hydrodynamics and Chlorophyll $a$ and Bacteria in a Temperate Estuary: A Box Model Approach 

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Additional Water Column Characterization
Additional physical-chemical analyses were performed for the water samples collected in the Lima estuary. For the determination of total suspended solids (TSS), the water samples were filtered through pre-combusted glass fiber filters (GF/F Whatman), and dried at $105{ }^{\circ} \mathrm{C}$ [1]. The dissolved orthophosphate, nitrite, ammonium and silicate determinations were performed according the methods described by Koroleff [2]. Orthophosphate ions react with an acid solution containing molybdate and antimony ions to form a phosphomolybdate antimony complex, followed by reduction of the latter with ascorbic acid to form a blue molybdenum complex. For dissolved silica quantification, an acidic solution of ammonium molybdate was added to the sample to produce silicomolybdic acid which is then reduced to silicomolybdous acid (a blue compound) using ascorbic acid. Ammonia, in moderately alkaline solutions, reacts with the hypochlorite to form monochloramine, which in the presence of a catalyst (nitroprusside), phenol, and excess hypochlorite gives rise to an intense blue complex (indophenol blue). The nitrite was determined by diazotizing nitrite with sulfanilamide and coupling it with N -(1-napthyl)-ethylenediamine hydrochloride to form a highly coloured azo dye. The concentration of nitrate was obtained by the method described by Jones [3], and adapted by Joye and Chambers [4], which consists of the nitrite determination procedure, after the reduction of nitrate to nitrite using spongy cadmium (total concentration of $\mathrm{NO}_{x}$ ). The nitrate concentration was obtained subtracting the nitrite from the total concentration of $\mathrm{NO}_{x}$ obtained. After color development, all nutrients were determined by molecular absorption spectrophotometry. Determination of total dissolved carbon (TDC), dissolved organic carbon (DOC), and total dissolved nitrogen (TDN) was performed by high-temperature catalytic oxidation with a TOC-VCSN analyzer (Shimadzu Instruments), according to Magalhães et al. [5]. Briefly, TDC was measured by high temperature catalytic oxidation followed by nondispersive infrared detection of $\mathrm{CO}_{2}$. For DIC determination, samples were automatically acidified ( $1.5 \% \mathrm{HCl} 2 \mathrm{M}$ ), and sparged with carrier gas (purified air) to convert only the inorganic carbon to $\mathrm{CO}_{2}$. DOC was determined by the difference between TDC and DIC. TDN was thermally decomposed in a combustion tube and the resulting nitric oxide detected by chemiluminescence. All analyzes were performed in triplicate.

Table S1. Mean concentrations $\pm$ SE for key environmental parameters measured at the surface of the sampling sites: Secchi disc (SD) - m (in bold-bottom depth); temperature $-{ }^{\circ} \mathrm{C}$; salinity; dissolved oxygen ( DO ) $-\mathrm{mg} \mathrm{O}_{2} \mathrm{~L}^{-1} ; \mathrm{pH} ; \mathrm{NO}_{3}{ }^{-}, \mathrm{NO}_{2}{ }^{-}, \mathrm{NH}_{4}{ }^{+}, \mathrm{PO}_{4}{ }^{3-}, \mathrm{N}: \mathrm{P}$, and $\mathrm{Si}-\mu \mathrm{M}$; chlorophyll $a$ (CHL $a$ ) $-\mathrm{mg} \mathrm{m}^{-3}$; total cell counts (TCC) $-\log _{10}$ cells $\mathrm{mL}^{-1}$. In brackets - minimum and maximum values.

| Site | SD | T | Salinity | DO | pH | $\mathrm{NO}_{3}$ | $\mathrm{NO}_{2}{ }^{-}$ | $\mathrm{NH}_{4}{ }^{+}$ | $\mathrm{PO}_{4}{ }^{3}$ | N:P | Si | CHL $a$ | TCC |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | $\begin{aligned} & \hline 2.48 \pm 0.33 \\ & (1.30-3.30) \end{aligned}$ | $\begin{gathered} 15.47 \pm 1.58 \\ (11.06-20.56) \end{gathered}$ | $\begin{aligned} & 18.29 \pm 5.89 \\ & (1.99-30.30) \end{aligned}$ | $\begin{gathered} \hline 8.80 \pm 0.60 \\ (7.69-10.89) \end{gathered}$ | $\begin{aligned} & 7.75 \pm 0.09 \\ & (7.51-7.96) \end{aligned}$ | $\begin{aligned} & 19.97 \pm 7.09 \\ & (9.12-46.75) \end{aligned}$ | $0.189 \pm 0.043$ | $\begin{aligned} & \hline 1.517 \pm 0.355 \\ & (0.818-2.800) \end{aligned}$ | $\begin{aligned} & 0.384 \pm 0.065 \\ & (0.211-0.562) \end{aligned}$ | $\begin{gathered} 60 \pm 17 \\ (25-107) \end{gathered}$ | $\begin{aligned} & 47.01 \pm 16.59 \\ & (15.29-95.67) \end{aligned}$ | $\begin{aligned} & 1.04 \pm 0.16 \\ & (0.57-1.50) \end{aligned}$ | $\begin{aligned} & 5.72 \pm 0.12 \\ & (5.38-6.08) \end{aligned}$ |
| 2 | $\begin{gathered} 2.46 \pm 0.39 \\ (1.3-3.30) \end{gathered}$ | $\begin{gathered} 15.65 \pm 1.57 \\ (11.06-20.64) \end{gathered}$ | $\begin{aligned} & 17.32 \pm 5.53 \\ & (1.99-29.70) \end{aligned}$ | $\begin{gathered} 8.87 \pm 0.58 \\ (7.61-10.89) \end{gathered}$ | $\begin{aligned} & 7.81 \pm 0.07 \\ & (7.57-7.96) \end{aligned}$ | $\begin{gathered} 22.42 \pm 6.31 \\ (13.00-46.75) \end{gathered}$ | $\begin{aligned} & 0.202 \pm 0.046 \\ & (0.110-0.319) \end{aligned}$ | $\begin{aligned} & 2.000 \pm 0.557 \\ & (0.850-3.877) \end{aligned}$ | $\begin{aligned} & 0.409 \pm 0.076 \\ & (0.226-0.639) \end{aligned}$ | $\begin{gathered} 66 \pm 15 \\ (27-107) \end{gathered}$ | $\begin{aligned} & 50.49 \pm 15.19 \\ & (20.41-95.67) \end{aligned}$ | $\begin{aligned} & 1.08 \pm 0.18 \\ & (0.57-1.69) \end{aligned}$ | $\begin{aligned} & 5.71 \pm 0.15 \\ & (5.38-6.17) \end{aligned}$ |
| 3 |  |  | $\begin{aligned} & 12.49 \pm 4.44 \\ & (1.59-23.30) \end{aligned}$ | $\begin{gathered} 9.14 \pm 0.63 \\ (8.14-11.26) \end{gathered}$ | $\begin{aligned} & 7.84 \pm 0.11 \\ & (7.44-8.12) \end{aligned}$ | $\begin{gathered} 25.91 \pm 5.15 \\ (16.75-45.71) \end{gathered}$ | $\begin{aligned} & 0.162 \pm 0.036 \\ & (0.062-0.245) \end{aligned}$ | $\begin{aligned} & 1.576 \pm 0.335 \\ & (0.839-2.554) \end{aligned}$ | $\begin{aligned} & 0.355 \pm 0.049 \\ & (0.243-0.477) \end{aligned}$ | $\begin{gathered} 81 \pm 13 \\ (48-103) \end{gathered}$ | $\begin{aligned} & 64.19 \pm 11.75 \\ & (35.71-97.58) \end{aligned}$ | $\begin{aligned} & 1.29 \pm 0.17 \\ & (0.81-1.86) \end{aligned}$ | $\begin{aligned} & 5.80 \pm 0.14 \\ & (5.56-6.23) \end{aligned}$ |
| 4 |  |  |  | $\begin{gathered} 9.37 \pm 0.57 \\ (8.25-11.18) \end{gathered}$ | $\begin{aligned} & 7.85 \pm 0.12 \\ & (7.45-8.21) \end{aligned}$ | $\begin{aligned} & 26.56 \pm 5.82 \\ & (9.46-45.78) \end{aligned}$ | $\begin{aligned} & 0.146 \pm 0.032 \\ & (0.038-0.222) \end{aligned}$ | $\begin{aligned} & 1.746 \pm 0.854 \\ & (0.472-5.115) \end{aligned}$ | $\begin{aligned} & 0.320 \pm 0.049 \\ & (0.205-0.455) \end{aligned}$ | $\begin{gathered} 96 \pm 17 \\ (32-128) \end{gathered}$ | $\begin{gathered} 69.79 \pm 10.52 \\ (41.35-100.22) \end{gathered}$ | $\begin{aligned} & 1.63 \pm 0.23 \\ & (0.92-2.38) \end{aligned}$ | $\begin{aligned} & 5.82 \pm 0.15 \\ & (5.53-6.27) \end{aligned}$ |
| 5 |  |  |  | $\begin{gathered} 9.38 \pm 0.60 \\ (8.15-11.31) \end{gathered}$ | $\begin{aligned} & 7.79 \pm 0.12 \\ & (7.46-8.12) \end{aligned}$ | $\begin{gathered} 25.81 \pm 3.56 \\ (15.71-35.61) \end{gathered}$ | $\begin{aligned} & 0.118 \pm 0.024 \\ & (0.046-0.182) \end{aligned}$ | $\begin{aligned} & 1.176 \pm 0.614 \\ & (0.248-3.563) \end{aligned}$ | $\begin{aligned} & 0.287 \pm 0.048 \\ & (0.138-0.425) \end{aligned}$ | $\begin{aligned} & 117 \pm 38 \\ & (60-262) \end{aligned}$ | $\begin{gathered} 78.01 \pm 7.84 \\ (53.31-100.59) \end{gathered}$ | $\begin{aligned} & 2.52 \pm 0.52 \\ & (0.66-3.54) \end{aligned}$ | $\begin{aligned} & 5.96 \pm 0.14 \\ & (5.63-6.33) \end{aligned}$ |
| 6 |  |  | $\begin{gathered} 5.60 \pm 2.53 \\ (0.03-13.40) \end{gathered}$ | $\begin{gathered} 9.39 \pm 0.58 \\ (8.23-11.23) \end{gathered}$ | $\begin{aligned} & 7.52 \pm 0.14 \\ & (7.09-7.90) \end{aligned}$ | $\begin{gathered} 35.72 \pm 4.16 \\ (27.63-51.37) \end{gathered}$ | $\begin{aligned} & 0.139 \pm 0.024 \\ & (0.046-0.174) \end{aligned}$ | $\begin{aligned} & 0.565 \pm 0.167 \\ & (0.141-0.968) \end{aligned}$ | $\begin{aligned} & 0.238 \pm 0.062 \\ & (0.074-0.439) \end{aligned}$ | $\begin{gathered} 208 \pm 70 \\ (102-483) \end{gathered}$ | $\begin{gathered} 82.90 \pm 6.91 \\ (59.60-101.79) \end{gathered}$ | $\begin{aligned} & 3.39 \pm 0.77 \\ & (0.75-5.06) \end{aligned}$ | $\begin{aligned} & 6.06 \pm 0.12 \\ & (5.61-6.26) \end{aligned}$ |
| 7 | $\begin{aligned} & 1.30 \pm 0.08 \\ & (\mathbf{1 . 1 0 - 1 . 5 0}) \end{aligned}$ | $\begin{gathered} 16.99 \pm 2.11 \\ (10.54-21.41) \end{gathered}$ | $\begin{gathered} 4.56 \pm 2.01 \\ (0.02-10.30) \end{gathered}$ | $\begin{gathered} 9.58 \pm 0.57 \\ (8.19-11.34) \end{gathered}$ | $\begin{aligned} & 7.30 \pm 0.14 \\ & (6.97-7.67) \end{aligned}$ | $\begin{gathered} 30.98 \pm 4.55 \\ (19.93-47.56) \end{gathered}$ | $\begin{aligned} & 0.108 \pm 0.021 \\ & (0.038-0.158) \end{aligned}$ | $\begin{aligned} & 0.536 \pm 0.206 \\ & (0.018-1.243) \end{aligned}$ | $\begin{aligned} & 0.249 \pm 0.060 \\ & (0.106-0.462) \end{aligned}$ | $\begin{aligned} & 152 \pm 36 \\ & (71-283) \end{aligned}$ | $\begin{gathered} 83.76 \pm 5.23 \\ (66.80-99.55) \end{gathered}$ | $\begin{aligned} & 3.79 \pm 1.19 \\ & (0.74-6.67) \end{aligned}$ | $\begin{aligned} & 6.04 \pm 0.14 \\ & (5.50-6.26) \end{aligned}$ |
| 8 | $\begin{aligned} & 1.18 \pm 0.17 \\ & (\mathbf{0 . 6 0}-\mathbf{1 . 6 0}) \end{aligned}$ | $\begin{gathered} 17.08 \pm 2.15 \\ (10.50-21.10) \end{gathered}$ | $\begin{aligned} & 2.50 \pm 1.10 \\ & (0.00-5.60) \end{aligned}$ | $\begin{gathered} 9.76 \pm 0.59 \\ (8.35-11.63) \end{gathered}$ | $\begin{aligned} & 7.39 \pm 0.15 \\ & (6.90-7.71) \end{aligned}$ | $\begin{gathered} 33.98 \pm 4.64 \\ (24.87-49.91) \end{gathered}$ | $\begin{gathered} 0.126 \pm 0.012 \\ (0.094-0.157) \end{gathered}$ | $\begin{aligned} & 0.916 \pm 0.355 \\ & (0.077-2.047) \end{aligned}$ | $\begin{aligned} & 0.253 \pm 0.058 \\ & (0.150-0.477) \end{aligned}$ | $\begin{gathered} 154 \pm 29 \\ (108-265) \end{gathered}$ | $\begin{gathered} 91.67 \pm 4.48 \\ (80.57-105.41) \end{gathered}$ | $\begin{gathered} 5.13 \pm 2.63 \\ (0.59-15.24) \end{gathered}$ | $\begin{aligned} & 5.97 \pm 0.10 \\ & (5.59-6.14) \end{aligned}$ |
| 9 | $\begin{aligned} & 2.02 \pm 0.25 \\ & (\mathbf{1 . 3 0}-2.70) \end{aligned}$ | $\begin{gathered} 17.13 \pm 2.19 \\ (10.58-22.20) \end{gathered}$ | $\begin{aligned} & 0.30 \pm 0.16 \\ & (0.00-0.70) \end{aligned}$ | $\begin{gathered} 9.72 \pm 0.52 \\ (8.65-11.63) \end{gathered}$ | $\begin{aligned} & 7.29 \pm 0.2 \\ & (6.68-8.05 \end{aligned}$ | $\begin{gathered} 41.05 \pm 4.11 \\ (26.51-50.60) \end{gathered}$ | $\begin{aligned} & 0.116 \pm 0.020 \\ & (0.038-0.149) \end{aligned}$ | $\begin{aligned} & 0.867 \pm 0.343 \\ & (0.306-2.068) \end{aligned}$ | $\begin{aligned} & 0.234 \pm 0.055 \\ & (0.106-0.431) \end{aligned}$ | $\begin{gathered} 227 \pm 70 \\ (105-499) \end{gathered}$ | $\begin{gathered} 97.89 \pm 5.73 \\ (79.68- \\ 115.55) \end{gathered}$ | $\begin{gathered} 8.53 \pm 3.25 \\ (0.66-16.50 \end{gathered}$ | $\begin{aligned} & 5.93 \pm 0.08 \\ & (5.63-6.12) \end{aligned}$ |
| 10 | $\begin{gathered} 1.11 \pm 0.348 \\ (0.35-2.50) \end{gathered}$ | $\begin{gathered} 19.60 \pm 2.11 \\ (13.74-23.30) \end{gathered}$ | $\begin{aligned} & 0.46 \pm 0.38 \\ & (0.00-1.60) \end{aligned}$ | $\begin{gathered} 9.27 \pm 0.43 \\ (8.21-10.07) \end{gathered}$ | $\begin{aligned} & 7.17 \pm 0.21 \\ & (6.66-7.51) \end{aligned}$ | $\begin{gathered} 41.61 \pm 6.01 \\ (24.35-51.83) \end{gathered}$ | $\begin{aligned} & 0.122 \pm 0.031 \\ & (0.046-0.189) \end{aligned}$ | $\begin{aligned} & 1.912 \pm 0.462 \\ & (0.940-3.164) \end{aligned}$ | $\begin{aligned} & 0.212 \pm 0.031 \\ & (0.138-0.286) \end{aligned}$ | $\begin{gathered} 227 \pm 59 \\ (114-391) \end{gathered}$ | $\begin{gathered} 99.36 \pm 6.63 \\ (87.64-118.35) \end{gathered}$ | $\begin{gathered} 7.11 \pm 3.43 \\ (1.22-17.04) \end{gathered}$ | $\begin{aligned} & 5.99 \pm 0.04 \\ & (5.90-6.09) \end{aligned}$ |
| 11 | $\begin{aligned} & 0.38 \pm 0.02 \\ & (0.35-\mathbf{0 . 4 0}) \end{aligned}$ | $\begin{gathered} 21.44 \pm 0.89 \\ (20.02-23.08) \\ \hline \end{gathered}$ | $\begin{array}{r} 0.04 \pm 0.03 \\ (0.00-0.10) \\ \hline \end{array}$ | $\begin{gathered} 9.32 \pm 0.53 \\ (8.72-10.38) \\ \hline \end{gathered}$ | $\begin{aligned} & 7.24 \pm 0.14 \\ & (6.98-7.45) \\ & \hline \end{aligned}$ | $\begin{gathered} 46.44 \pm 2.97 \\ (41.54-51.81) \\ \hline \end{gathered}$ | $\begin{aligned} & 0.139 \pm 0.030 \\ & (0.108-0.198) \\ & \hline \end{aligned}$ | $\begin{aligned} & 2.225 \pm 0.786 \\ & (1.160-3.758) \\ & \hline \end{aligned}$ | $\begin{aligned} & 0.160 \pm 0.035 \\ & (0.106-0.224) \\ & \hline \end{aligned}$ | $\begin{gathered} 339 \pm 87 \\ (222-508) \\ \hline \end{gathered}$ | $\begin{gathered} 105.35 \pm 8.23 \\ (95.45 \mathrm{v} 121.69) \\ \hline \end{gathered}$ | $\begin{aligned} & 6.80 \pm 1.70 \\ & (3.88-9.78) \\ & \hline \end{aligned}$ | $\begin{aligned} & 6.07 \pm 0.01 \\ & (6.06-6.08) \\ & \hline \end{aligned}$ |

Table S2. Mean concentrations $\pm$ SE for key environmental parameters measured at middle depth of the sampling sites: temperature $-{ }^{\circ} \mathrm{C}$; salinity; dissolved oxygen (DO) $-\mathrm{mg} \mathrm{O} \mathrm{O}_{2} \mathrm{~L}^{-1} ; \mathrm{pH} ; \mathrm{NO}_{3}{ }^{-}, \mathrm{NO}_{2}{ }^{-}, \mathrm{NH}_{4}{ }^{+}, \mathrm{PO}_{4}{ }^{3-}, \mathrm{N}: \mathrm{P}$, and $\mathrm{Si}-\mu \mathrm{M}$; chlorophyll $a(\mathrm{CHL} a)-\mathrm{mg} \mathrm{m} \mathrm{m}^{-3}$; total cell counts (TCC) -log ${ }_{10}$ cells mL ${ }^{-1}$. In brackets - minimum and maximum values.

| Site | T | Salinity | DO | pH | $\mathrm{NO}_{3}{ }^{-}$ | $\mathrm{NO}_{2}{ }^{-}$ | $\mathrm{NH}_{4}{ }^{+}$ | $\mathrm{PO}_{4}{ }^{3-}$ | N:P | Si | CHL $a$ | TCC |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | $\begin{gathered} \hline 15.48 \pm 1.47 \\ (11.24- \\ 20.32) \end{gathered}$ | $\begin{aligned} & 23.43 \pm 4.36 \\ & (8.99-33.20) \end{aligned}$ | $\begin{gathered} 8.44 \pm 0.52 \\ (7.65-10.51) \end{gathered}$ | $\begin{aligned} & 7.59 \pm 0.22 \\ & (6.73-7.90) \end{aligned}$ | $\begin{aligned} & 17.62 \pm 7.54 \\ & (6.32-47.02) \end{aligned}$ | $\begin{gathered} \hline 0.224 \pm 0.047 \\ (0.084- \\ 0.333) \end{gathered}$ | $\begin{aligned} & 1.768 \pm 0.587 \\ & (0.425-3.639) \end{aligned}$ | $\begin{aligned} & 0.438 \pm 0.079 \\ & (0.180-0.593) \end{aligned}$ | $\begin{aligned} & 47 \pm 15 \\ & (18-98) \end{aligned}$ | $\begin{gathered} 38.21-16.74 \\ (10.35-97.65) \end{gathered}$ | $\begin{aligned} & 1.56 \pm 0.35 \\ & (0.66-2.75) \end{aligned}$ | $\begin{aligned} & 5.72 \pm 0.12 \\ & (5.40-6.12) \end{aligned}$ |
| 2 | $\begin{gathered} 15.45-1.49 \\ (11.24- \\ 20.28) \end{gathered}$ | $\begin{aligned} & 23.29 \pm 4.34 \\ & (8.99-32.60) \end{aligned}$ | $\begin{gathered} 8.35 \pm 0.55 \\ (7.52-10.51) \end{gathered}$ | $\begin{aligned} & 7.59 \pm 0.22 \\ & (6.73-7.89) \end{aligned}$ | $\begin{aligned} & 18.84 \pm 7.16 \\ & (9.44-47.02) \end{aligned}$ | $\begin{gathered} 0.234 \pm 0.043 \\ (0.124- \\ 0.340) \end{gathered}$ | $\begin{aligned} & 1.842 \pm 0.369 \\ & (0.979-2.758) \end{aligned}$ | $\begin{aligned} & 0.452 \pm 0.052 \\ & (0.336-0.624) \end{aligned}$ | $\begin{aligned} & 47 \pm 14 \\ & (20-98) \end{aligned}$ | $\begin{aligned} & 39.99 \pm 16.14 \\ & (12.69-97.65) \end{aligned}$ | $\begin{aligned} & 1.75 \pm 0.49 \\ & (0.66-3.54) \end{aligned}$ | $\begin{aligned} & 5.74 \pm 0.14 \\ & (5.40-6.14) \end{aligned}$ |
| 3 | $\begin{gathered} 15.30 \pm 1.53 \\ (11.00- \\ 20.35) \end{gathered}$ | $\begin{aligned} & 16.37 \pm 5.66 \\ & (1.91-28.40) \end{aligned}$ | $\begin{gathered} 8.80 \pm 0.71 \\ (7.31-11.11) \end{gathered}$ | $\begin{aligned} & 7.68 \pm 0.12 \\ & (7.21-7.89) \end{aligned}$ | $\begin{gathered} 22.37 \pm 5.87 \\ (11.75-43.98) \end{gathered}$ | $\begin{gathered} 0.192 \pm 0.047 \\ (0.086- \\ 0.319) \end{gathered}$ | $\begin{aligned} & 1.609 \pm 0.357 \\ & (0.944-2.975) \end{aligned}$ | $\begin{aligned} & 0.410 \pm 0.073 \\ & (0.228-0.587) \end{aligned}$ | $\begin{gathered} 70 \pm 20 \\ (23-116) \end{gathered}$ | $\begin{aligned} & 52.54 \pm 15.62 \\ & (15.97-96.75) \end{aligned}$ | $\begin{aligned} & 1.97 \pm 0.38 \\ & (0.83-3.09) \end{aligned}$ | $\begin{aligned} & 5.86 \pm 0.14 \\ & (5.56-6.26) \end{aligned}$ |
| 4 | $\begin{gathered} 15.62 \pm 1.67 \\ (10.83- \\ 20.70) \end{gathered}$ | $\begin{aligned} & 13.65 \pm 5.55 \\ & (0.90-26.20) \end{aligned}$ | $\begin{gathered} 9.00 \pm 0.68 \\ (7.66-11.13) \end{gathered}$ | $\begin{aligned} & 7.65 \pm 0.10 \\ & (7.26-7.87) \end{aligned}$ | $\begin{aligned} & 24.63 \pm 5.71 \\ & (7.57-43.32) \end{aligned}$ | $\begin{gathered} 0.167 \pm 0.037 \\ (0.054- \\ 0.269) \end{gathered}$ | $\begin{aligned} & 2.024 \pm 1.139 \\ & (0.551-6.533) \end{aligned}$ | $\begin{aligned} & 0.338 \pm 0.073 \\ & (0.202-0.593) \end{aligned}$ | $\begin{gathered} 94 \pm 19 \\ (24-132) \end{gathered}$ | $\begin{gathered} 65.37 \pm 13.10 \\ (28.21-100.15) \end{gathered}$ | $\begin{aligned} & 2.64 \pm 0.52 \\ & (0.91-3.95) \end{aligned}$ | $\begin{aligned} & 5.87 \pm 0.16 \\ & (5.56-6.29) \end{aligned}$ |
| 5 | $\begin{gathered} 16.57 \pm 1.97 \\ (10.54- \\ 21.33) \end{gathered}$ | $\begin{gathered} 7.22 \pm 3.16 \\ (0.05-16.40) \end{gathered}$ | $\begin{gathered} 9.32 \pm 0.60 \\ (8.02-11.22) \end{gathered}$ | $\begin{aligned} & 7.61 \pm 0.14 \\ & (7.18-7.87) \end{aligned}$ | $\begin{gathered} 34.09 \pm 4.23 \\ (23.11-49.13) \end{gathered}$ | $\begin{gathered} 0.146 \pm 0.029 \\ (0.038- \\ 0.206) \end{gathered}$ | $\begin{aligned} & 1.220 \pm 0.560 \\ & (0.321-3.390) \end{aligned}$ | $\begin{aligned} & 0.293 \pm 0.055 \\ & (0.154-0.477) \end{aligned}$ | $\begin{aligned} & 136 \pm 26 \\ & (77-230) \end{aligned}$ | $\begin{gathered} 76.98 \pm 7.93 \\ (52.27-100.25) \end{gathered}$ | $\begin{aligned} & 2.73 \pm 0.59 \\ & (0.74-3.90) \end{aligned}$ | $\begin{aligned} & 6.02 \pm 0.15 \\ & (5.66-6.35) \end{aligned}$ |
| 6 | $\begin{gathered} 16.81 \pm 2.05 \\ (10.50- \\ 21.41) \end{gathered}$ | $\begin{gathered} 5.89 \pm 2.63 \\ (0.04-13.85) \end{gathered}$ | $\begin{gathered} 9.44 \pm 0.57 \\ (8.19-11.23) \end{gathered}$ | $\begin{aligned} & 7.43 \pm 0.12 \\ & (7.06-7.73) \end{aligned}$ | $\begin{gathered} 34.71 \pm 4.19 \\ (28.71-51.24) \end{gathered}$ | $\begin{gathered} 0.134 \pm 0.022 \\ (0.054- \\ 0.182) \end{gathered}$ | $\begin{aligned} & 0.639 \pm 0.168 \\ & (0.139-1.198) \end{aligned}$ | $\begin{aligned} & 0.253 \pm 0.064 \\ & (0.106-0.473) \end{aligned}$ | $\begin{aligned} & 171 \pm 38 \\ & (98-314) \end{aligned}$ | $\begin{gathered} 83.02 \pm 7.40 \\ (58.04-103.23) \end{gathered}$ | $\begin{aligned} & 3.55 \pm 0.81 \\ & (0.75-4.79) \end{aligned}$ | $\begin{aligned} & 6.05 \pm 0.12 \\ & (5.61-6.27) \end{aligned}$ |
| 7 | $\begin{gathered} 16.98 \pm 2.11 \\ (10.54- \\ 21.41) \end{gathered}$ | $\begin{gathered} 4.59 \pm 2.02 \\ (0.02-10.40) \end{gathered}$ | $\begin{gathered} 9.56 \pm 0.58 \\ (8.18-11.33) \end{gathered}$ | $\begin{aligned} & 7.27 \pm 0.15 \\ & (6.91-7.64) \end{aligned}$ | $\begin{gathered} 32.64 \pm 3.96 \\ (26.05-47.92) \end{gathered}$ | $\begin{gathered} 0.116 \pm 0.020 \\ (0.038- \\ 0.149) \end{gathered}$ | $\begin{aligned} & 0.535 \pm 0.182 \\ & (0.156-1.161) \end{aligned}$ | $\begin{aligned} & 0.244 \pm 0.064 \\ & (0.106-0.477) \end{aligned}$ | $\begin{aligned} & 166 \pm 38 \\ & (99-306) \end{aligned}$ | $\begin{gathered} 83.61 \pm 5.36 \\ (66.18-99.87) \end{gathered}$ | $\begin{aligned} & 3.93 \pm 1.15 \\ & (0.70-6.85) \end{aligned}$ | $\begin{aligned} & 6.05 \pm 0.12 \\ & (5.56-6.26) \end{aligned}$ |
| 8 | $\begin{gathered} 17.00 \pm 2.12 \\ (10.50- \\ 21.11) \end{gathered}$ | $\begin{aligned} & 2.88 \pm 1.39 \\ & (0.00-7.45) \end{aligned}$ | $\begin{gathered} 9.75 \pm 0.60 \\ (8.30-11.58) \end{gathered}$ | $\begin{aligned} & 7.30 \pm 0.15 \\ & (6.84-7.64) \end{aligned}$ | $\begin{gathered} 34.89 \pm 4.22 \\ (26.67-49.85) \end{gathered}$ | $\begin{gathered} 0.130 \pm 0.018 \\ (0.066- \\ 0.162) \end{gathered}$ | $\begin{aligned} & 0.915 \pm 0.350 \\ & (0.048-2.137) \end{aligned}$ | $\begin{aligned} & 0.245 \pm 0.067 \\ & (0.142-0.507) \end{aligned}$ | $\begin{gathered} 187 \pm 43 \\ (101- \\ 311) \end{gathered}$ | $\begin{gathered} 91.36 \pm 5.54 \\ (75.67-108.11) \end{gathered}$ | $\begin{gathered} 5.76 \pm 2.64 \\ (0.62- \\ 15.47) \end{gathered}$ | $\begin{aligned} & 5.99 \pm 0.10 \\ & (5.62-6.15) \end{aligned}$ |
| 9 | $\begin{gathered} 16.98 \pm 2.11 \\ (13.74- \\ 23.30) \end{gathered}$ | $\begin{aligned} & 0.70 \pm 0.41 \\ & (0.00-2.20) \end{aligned}$ | $\begin{gathered} 9.58 \pm 0.58 \\ (8.10-11.41) \end{gathered}$ | $\begin{aligned} & 7.07 \pm 0.16 \\ & (6.58-7.52) \end{aligned}$ | $\begin{gathered} 36.39 \pm 4.63 \\ (25.25-50.16) \end{gathered}$ | $\begin{gathered} 0.092 \pm 0.016 \\ (0.054- \\ 0.133) \end{gathered}$ | $\begin{aligned} & 1.066 \pm 0.358 \\ & (0.105-1.937) \end{aligned}$ | $\begin{aligned} & 0.186 \pm 0.021 \\ & (0.135-0.235) \end{aligned}$ | $\begin{gathered} 207 \pm 23 \\ (146- \\ 289) \end{gathered}$ | $\begin{gathered} 97.51 \pm 5.23 \\ (80.80-113.07) \end{gathered}$ | $\begin{gathered} 8.57 \pm 3.23 \\ (0.57- \\ 15.07) \end{gathered}$ | $\begin{aligned} & 5.91 \pm 0.09 \\ & (5.65-6.13) \end{aligned}$ |
| 10 | $\begin{gathered} 19.60 \pm 2.11 \\ (13.74- \\ 23.30) \end{gathered}$ | $\begin{gathered} 0.436 \pm 0.39 \\ (0.00-1.60) \end{gathered}$ | $\begin{gathered} 9.22 \pm 0.44 \\ (8.21-10.07) \end{gathered}$ | $\begin{aligned} & 7.15 \pm 0.20 \\ & (6.66-7.51) \end{aligned}$ | $\begin{gathered} 36.60 \pm 6.62 \\ (24.35-51.83) \end{gathered}$ | $\begin{gathered} 0.112 \pm 0.034 \\ (0.046- \\ 0.189) \end{gathered}$ | $\begin{aligned} & 1.933 \pm 0.482 \\ & (0.940-3.249) \end{aligned}$ | $\begin{aligned} & 0.223 \pm 0.041 \\ & (0.138-0.332) \end{aligned}$ | $\begin{aligned} & 206 \pm 68 \\ & (91-391) \end{aligned}$ | $\begin{gathered} 99.54 \pm 6.61 \\ (87.64-118.35) \end{gathered}$ | $\begin{gathered} 7.11 \pm 3.43 \\ (1.22- \\ 17.04) \end{gathered}$ | $\begin{aligned} & 6.01 \pm 0.04 \\ & (5.90-6.09) \end{aligned}$ |
| 11 | $\begin{gathered} 21.44 \pm 0.89 \\ (20.02- \\ 23.08) \\ \hline \end{gathered}$ | $\begin{aligned} & 0.04 \pm 0.03 \\ & (0.00-0.10) \end{aligned}$ | $\begin{gathered} 9.32 \pm 0.53 \\ (8.72-10.38) \end{gathered}$ | $\begin{aligned} & 7.24 \pm 0.14 \\ & (6.98-7.45) \end{aligned}$ | $\begin{gathered} 46.44 \pm 2.97 \\ (41.54-51.81) \end{gathered}$ | $\begin{gathered} 0.139 \pm 0.030 \\ (0.108- \\ 0.198) \\ \hline \end{gathered}$ | $\begin{aligned} & 2.225 \pm 0.786 \\ & (1.160-3.758) \end{aligned}$ | $\begin{aligned} & 0.160 \pm 0.035 \\ & (0.106-0.224) \end{aligned}$ | $\begin{gathered} 339 \pm 87 \\ (222- \\ 508) \\ \hline \end{gathered}$ | $\begin{gathered} 105.35 \pm 8.23 \\ (95.45-121.69) \end{gathered}$ | $\begin{aligned} & 6.80 \pm 1.70 \\ & (3.88-9.78) \end{aligned}$ | $\begin{gathered} 6.07 \pm 0.01 \\ (6.06 .08) \end{gathered}$ |

Table S3. Mean concentrations $\pm$ SE for key environmental parameters measured near bottom of the sampling sites: temperature $-{ }^{\circ} \mathrm{C}$; salinity; dissolved oxygen (DO) $-\mathrm{mg} \mathrm{O} \mathrm{O}_{2} \mathrm{~L}^{-1} ; \mathrm{pH} ; \mathrm{NO}_{3}{ }^{-}, \mathrm{NO}_{2}^{-}, \mathrm{NH}_{4}{ }^{+}, \mathrm{PO}_{4}{ }^{3-}, \mathrm{N}: \mathrm{P}$, and $\mathrm{Si}-\mu \mathrm{M}$; chlorophyll $a(\mathrm{CHL} a)-\mathrm{mg} \mathrm{m} \mathrm{m}^{-3}$; total cell counts (TCC) -log 10 cells mL ${ }^{-1}$. In brackets - minimum and maximum values.

| Site | T | Salinity | DO | pH | $\mathrm{NO}_{3}{ }^{-}$ | $\mathrm{NO}_{2}{ }^{-}$ | $\mathrm{NH}_{4}{ }^{+}$ | $\mathrm{PO}_{4}{ }^{3-}$ | N:P | Si | CHL $a$ | TCC |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | $\begin{gathered} \hline 15.48 \pm 1.19 \\ (12.56- \\ 19.13) \end{gathered}$ | $\begin{gathered} 30.32 \pm 1.69 \\ (26.00- \\ 30.90) \end{gathered}$ | $\begin{aligned} & 8.02 \pm 0.37 \\ & (7.28-9.24) \end{aligned}$ | $\begin{aligned} & 7.76 \pm 0.16 \\ & (7.20-8.14) \end{aligned}$ | $\begin{gathered} 9.37 \pm 3.27 \\ (1.10-21.07) \end{gathered}$ | $\begin{gathered} \hline 0.233-0.045 \\ (0.060- \\ 0.317) \end{gathered}$ | $\begin{aligned} & 1.613 \pm 0.629 \\ & (0.000-3.428) \end{aligned}$ | $\begin{aligned} & 0.394 \pm 0.073 \\ & (0.165-0.593) \end{aligned}$ | $\begin{aligned} & 28 \pm 9 \\ & (7-55) \end{aligned}$ | $\begin{aligned} & 17.57 \pm 7.38 \\ & (2.25-41.33) \end{aligned}$ | $\begin{aligned} & 2.33 \pm 0.66 \\ & (1.14-4.87) \end{aligned}$ | $\begin{aligned} & 5.79 \pm 0.10 \\ & (5.55-6.13) \end{aligned}$ |
| 2 | $\begin{gathered} 15.61 \pm 1.33 \\ (12.56- \\ 19.87) \end{gathered}$ | $\begin{gathered} 30.06 \pm 1.56 \\ (26.00- \\ 33.70) \end{gathered}$ | $\begin{aligned} & 7.95 \pm 0.35 \\ & (7.25-9.24) \end{aligned}$ | $\begin{aligned} & 7.76 \pm 0.16 \\ & (7.20-8.14) \end{aligned}$ | $\begin{gathered} 9.86 \pm 3.09 \\ (2.23-21.07) \end{gathered}$ | $\begin{gathered} 0.240 \pm 0.048 \\ (0.060- \\ 0.343) \end{gathered}$ | $\begin{aligned} & 1.881 \pm 0.528 \\ & (0.830-3.536) \end{aligned}$ | $\begin{aligned} & 0.466 \pm 0.087 \\ & (0.272-0.731) \end{aligned}$ | $\begin{gathered} 28 \pm 8 \\ (12-55) \end{gathered}$ | $\begin{aligned} & 18.18 \pm 7.12 \\ & (4.82-41.33) \end{aligned}$ | $\begin{aligned} & 2.05 \pm 0.34 \\ & (1.47-3.37) \end{aligned}$ | $\begin{aligned} & 5.79 \pm 0.11 \\ & (5.55-6.07) \end{aligned}$ |
| 3 | $\begin{gathered} 14.89 \pm 1.49 \\ (11.20- \\ 20.06) \end{gathered}$ | $\begin{gathered} 23.83 \pm 4.21 \\ (11.66- \\ 32.20) \end{gathered}$ | $\begin{gathered} 8.49 \pm 0.61 \\ (7.18-10.36) \end{gathered}$ | $\begin{aligned} & 7.61 \pm 0.20 \\ & (6.88-7.93) \end{aligned}$ | $\begin{aligned} & 16.14 \pm 5.38 \\ & (5.96-36.39) \end{aligned}$ | $\begin{gathered} 0.226 \pm 0.050 \\ (0.076- \\ 0.340) \end{gathered}$ | $\begin{aligned} & 2.005 \pm 0.446 \\ & (1.124-3.652) \end{aligned}$ | $\begin{aligned} & 0.457 \pm 0.064 \\ & (0.257-0.639) \end{aligned}$ | $\begin{aligned} & 40 \pm 10 \\ & (22-75) \end{aligned}$ | $\begin{aligned} & 37.91 \pm 14.90 \\ & (12.61-89.83) \end{aligned}$ | $\begin{aligned} & 2.22 \pm 0.54 \\ & (0.91-4.16) \end{aligned}$ | $\begin{aligned} & 5.84 \pm 0.14 \\ & (5.52-6.21) \end{aligned}$ |
| 4 | $\begin{gathered} 15.02 \pm 1.58 \\ (10.89- \\ 20.48) \end{gathered}$ | $\begin{aligned} & 19.61 \pm 5.39 \\ & (1.45-31.10) \end{aligned}$ | $\begin{gathered} 8.69 \pm 0.74 \\ (7.32-11.08) \end{gathered}$ | $\begin{aligned} & 7.57 \pm 0.15 \\ & (7.17-7.88) \end{aligned}$ | $\begin{aligned} & 19.81 \pm 7.94 \\ & (4.70-50.22) \end{aligned}$ | $\begin{gathered} 0.205 \pm 0.035 \\ (0.132- \\ 0.287) \end{gathered}$ | $\begin{aligned} & 2.592 \pm 0.834 \\ & (1.368-5.895) \end{aligned}$ | $\begin{aligned} & 0.426 \pm 0.068 \\ & (0.272-0.654) \end{aligned}$ | $\begin{gathered} 58 \pm 18 \\ (17-116) \end{gathered}$ | $\begin{aligned} & 46.35 \pm 15.02 \\ & (16.63-99.82) \end{aligned}$ | $\begin{aligned} & 3.04 \pm 0.53 \\ & (1.00-3.83) \end{aligned}$ | $\begin{aligned} & 5.91 \pm 0.14 \\ & (5.63-6.30) \end{aligned}$ |
| 5 | $\begin{gathered} 16.44 \pm 1.93 \\ (10.54- \\ 21.33) \end{gathered}$ | $\begin{gathered} 7.33 \pm 3.20 \\ (0.056- \\ 16.70) \end{gathered}$ | $\begin{gathered} 9.35 \pm 0.59 \\ (8.154- \\ 11.19) \end{gathered}$ | $\begin{aligned} & 7.55 \pm 0.14 \\ & (7.10-7.81) \end{aligned}$ | $\begin{gathered} 31.12 \pm 4.16 \\ (21.86-45.60) \end{gathered}$ | $\begin{gathered} 0.133 \pm 0.023 \\ (0.046- \\ 0.174) \end{gathered}$ | $\begin{aligned} & 0.655 \pm 0.122 \\ & (0.321-1.042) \end{aligned}$ | $\begin{aligned} & 0.298 \pm 0.073 \\ & (0.122-0.552) \end{aligned}$ | $\begin{aligned} & 126 \pm 24 \\ & (65-203) \end{aligned}$ | $\begin{gathered} 76.32 \pm 7.75 \\ (52.31-97.73) \end{gathered}$ | $\begin{aligned} & 3.14 \pm 0.79 \\ & (0.75-4.86) \end{aligned}$ | $\begin{aligned} & 6.01 \pm 0.15 \\ & (5.63-6.35) \end{aligned}$ |
| 6 | $\begin{gathered} 16.77 \pm 2.04 \\ (10.50- \\ 21.40) \end{gathered}$ | $\begin{gathered} 6.11 \pm 2.73 \\ (0.04-14.30) \end{gathered}$ | $\begin{gathered} 9.43 \pm 0.58 \\ (8.15-11.22) \end{gathered}$ | $\begin{aligned} & 7.37 \pm 0.13 \\ & (7.03-7.72) \end{aligned}$ | $\begin{gathered} 34.77 \pm 4.24 \\ (28.74-51.11) \end{gathered}$ | $\begin{gathered} 0.145 \pm 0.022 \\ (0.062- \\ 0.190) \end{gathered}$ | $\begin{aligned} & 0.558 \pm 0.236 \\ & (0.080-1.427) \end{aligned}$ | $\begin{aligned} & 0.258 \pm 0.073 \\ & (0.090-0.507) \end{aligned}$ | $\begin{aligned} & 185 \pm 56 \\ & (93-394) \end{aligned}$ | $\begin{gathered} 82.64 \pm 7.91 \\ (56.49-104.67) \end{gathered}$ | $\begin{aligned} & 3.92 \pm 0.95 \\ & (0.74-5.57) \end{aligned}$ | $\begin{aligned} & 6.04 \pm 0.12 \\ & (5.62-6.28) \end{aligned}$ |
| 7 | $\begin{gathered} 16.97 \pm 2.11 \\ (10.54- \\ 21.40) \end{gathered}$ | $\begin{gathered} 4.62 \pm 2.04 \\ (0.02-10.50) \end{gathered}$ | $\begin{gathered} 9.54 \pm 0.58 \\ (8.16-11.31) \end{gathered}$ | $\begin{aligned} & 7.23 \pm 0.15 \\ & (6.85-7.61) \end{aligned}$ | $\begin{gathered} 34.30 \pm 3.69 \\ (27.60-48.27) \end{gathered}$ | $\begin{gathered} 0.124 \pm 0.022 \\ (0.038- \\ 0.158) \end{gathered}$ | $\begin{aligned} & 0.534 \pm 0.163 \\ & (0.139-1.078) \end{aligned}$ | $\begin{aligned} & 0.240 \pm 0.068 \\ & (0.106-0.492) \end{aligned}$ | $\begin{gathered} 180 \pm 41 \\ (101- \\ 330) \end{gathered}$ | $\begin{gathered} 83.46 \pm 5.50 \\ (65.57-100.19) \end{gathered}$ | $\begin{aligned} & 4.08 \pm 1.15 \\ & (0.66-7.02) \end{aligned}$ | $\begin{aligned} & 6.05 \pm 0.12 \\ & (5.62-6.28) \end{aligned}$ |
| 8 | $\begin{gathered} 16.93 \pm 2.09 \\ (10.50- \\ 21.12) \end{gathered}$ | $\begin{aligned} & 3.25 \pm 1.70 \\ & (0.00-9.30) \end{aligned}$ | $\begin{gathered} 9.74 \pm 0.61 \\ (8.24-11.52) \end{gathered}$ | $\begin{aligned} & 7.21 \pm 0.15 \\ & (6.77-7.56) \end{aligned}$ | $\begin{gathered} 35.80 \pm 4.18 \\ (26.71-49.79) \end{gathered}$ | $\begin{gathered} 0.134 \pm 0.026 \\ (0.038- \\ 0.198) \end{gathered}$ | $\begin{aligned} & 0.915 \pm 0.407 \\ & (0.018-2.227) \end{aligned}$ | $\begin{aligned} & 0.236 \pm 0.079 \\ & (0.090-0.537) \end{aligned}$ | $\begin{aligned} & 219 \pm 69 \\ & (94-469) \end{aligned}$ | $\begin{gathered} 91.04 \pm 6.66 \\ (70.77-110.81) \end{gathered}$ | $\begin{gathered} 6.40 \pm 2.68 \\ (0.66- \\ 15.69) \end{gathered}$ | $\begin{aligned} & 6.00 \pm 0.09 \\ & (5.65-6.16) \end{aligned}$ |
| 9 | $\begin{gathered} 16.09 \pm 1.80 \\ (10.54- \\ 20.68) \end{gathered}$ | $\begin{gathered} 6.79 \pm 3.90 \\ (0.00-16.70) \end{gathered}$ | $\begin{gathered} 9.13 \pm 0.72 \\ (7.33-11.40) \end{gathered}$ | $\begin{aligned} & 7.07 \pm 0.21 \\ & (6.50-7.65) \end{aligned}$ | $\begin{gathered} 33.28 \pm 5.12 \\ (22.53-48.03) \end{gathered}$ | $\begin{gathered} 0.138 \pm 0.026 \\ (0.038- \\ 0.174) \end{gathered}$ | $\begin{aligned} & 1.065 \pm 0.375 \\ & (0.141-2.161) \end{aligned}$ | $\begin{aligned} & 0.223 \pm 0.051 \\ & (0.090-0.348) \end{aligned}$ | $\begin{aligned} & 192 \pm 47 \\ & (70-312) \end{aligned}$ | $\begin{gathered} 80.00 \pm 9.07 \\ (53.43-102.31) \end{gathered}$ | $\begin{gathered} 8.28 \pm 3.54 \\ (0.74- \\ 17.24) \end{gathered}$ | $\begin{gathered} 5.98 \pm 0.09 \\ (5.63- \\ 6.14) \end{gathered}$ |
| 10 | $\begin{gathered} 19.62 \pm 2.11 \\ (13.74- \\ 23.30) \end{gathered}$ | $\begin{aligned} & 0.43 \pm 0.39 \\ & (0.00-1.60) \end{aligned}$ | $\begin{aligned} & 9.20 \pm 0.435 \\ & (8.21-10.07) \end{aligned}$ | $\begin{aligned} & 7.12 \pm 0.19 \\ & (6.66-7.51) \end{aligned}$ | $\begin{gathered} 40.99 \pm 5.86 \\ (24.35-51.83) \end{gathered}$ | $\begin{gathered} 0.126 \pm 0.030 \\ (0.046- \\ 0.189) \end{gathered}$ | $\begin{aligned} & 1.895 \pm 0.448 \\ & (0.940-3.098) \end{aligned}$ | $\begin{aligned} & 0.196 \pm 0.021 \\ & (0.138-0.228) \end{aligned}$ | $\begin{gathered} 236 \pm 57 \\ (114- \\ 391) \end{gathered}$ | $\begin{gathered} 99.31 \pm 6.63 \\ (87.64-118.35) \end{gathered}$ | $\begin{gathered} 6.81 \pm 3.50 \\ (1.22- \\ 17.04) \end{gathered}$ | $\begin{aligned} & 6.01 \pm 0.04 \\ & (5.90-6.09) \end{aligned}$ |
| 11 | $\begin{gathered} 21.44 \pm 0.89 \\ (20.02- \\ 23.08) \\ \hline \end{gathered}$ | $\begin{gathered} 0.04 \pm 0.03 \\ (0.00-0.10) \end{gathered}$ | $\begin{gathered} 9.32 \pm 0.53 \\ (8.72-10.38) \end{gathered}$ | $\begin{aligned} & 7.24 \pm 0.14 \\ & (6.98-7.45) \end{aligned}$ | $\begin{gathered} 46.44 \pm 2.97 \\ (41.54-51.81) \end{gathered}$ | $\begin{gathered} 0.139 \pm 0.030 \\ (0.108- \\ 0.198) \\ \hline \end{gathered}$ | $\begin{aligned} & 2.225 \pm 0.786 \\ & (1.160-3.758) \end{aligned}$ | $\begin{aligned} & 0.160 \pm 0.035 \\ & (0.106-0.224) \end{aligned}$ | $\begin{gathered} 339 \pm 87 \\ (222- \\ 508) \\ \hline \end{gathered}$ | $\begin{gathered} 105.35 \pm 8.23 \\ (95.45-121.69) \end{gathered}$ | $\begin{aligned} & 6.80 \pm 1.70 \\ & (3.88-9.78) \end{aligned}$ | $\begin{aligned} & 6.07 \pm 0.01 \\ & (6.06-6.08) \end{aligned}$ |



Figure S1. Longitudinal profiles of temperature and total suspended solids in the temperate Lima estuary.

## References

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