**Table S6. Results from PCA on physicochemical parameters.**

**pca\_Chem\_St.csv**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| KMO |  |  |  |  |  |  |  |  | Total |
|  |  |  |  |  |  |  |  |  |  |
|  | T | pH | DO | CD | NH3 | NO3 | NO2 | PO4 |  |
|  | 0.696 | 0.657 | 0.372 | 0.767 | 0.719 | 0.493 | 0.861 | 0.677 | 0.679 |

eig

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|   | eigenvalue | percentage of variance | cumulative percentage of variance |  |
| comp 1 | 3.7012 | 46.265 | 46.265 |  |
| comp 2 | 2.0892 | 26.1152 | 72.3802 |  |
| comp 3 | 1.0061 | 12.5757 | 84.9559 |  |
| comp 4 | 0.5138 | 6.422 | 91.3779 |  |
| comp 5 | 0.4036 | 5.0449 | 96.4228 |  |
| comp 6 | 0.1365 | 1.7057 | 98.1284 |  |
| comp 7 | 0.0888 | 1.1101 | 99.2386 |  |
| comp 8 | 0.0609 | 0.7614 | 100 |  |

var

coord

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|   | Dim.1 | Dim.2 | Dim.3 | Dim.4 | Dim.5 |  |
| T | 0.8807 | 0.4142 | -0.0525 | 0.017 | 0.0277 |  |
| pH | -0.8307 | 0.2465 | 0.3934 | 0.1065 | -0.1791 |  |
| DO | 0.1727 | -0.5897 | 0.695 | 0.3173 | 0.1729 |  |
| CD | 0.926 | -0.0884 | -0.0482 | 0.0237 | 0.2826 |  |
| NH3 | -0.7014 | 0.1949 | -0.4316 | 0.4101 | 0.3284 |  |
| NO3 | -0.0054 | 0.9306 | 0.1208 | 0.2462 | -0.0804 |  |
| NO2 | 0.6661 | -0.3933 | -0.2831 | 0.4146 | -0.3818 |  |
| PO4 | -0.6424 | -0.6653 | -0.2866 | -0.0149 | -0.0305 |  |

cor

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|   | Dim.1 | Dim.2 | Dim.3 | Dim.4 | Dim.5 |  |
| T | 0.8807 | 0.4142 | -0.0525 | 0.017 | 0.0277 |  |
| pH | -0.8307 | 0.2465 | 0.3934 | 0.1065 | -0.1791 |  |
| DO | 0.1727 | -0.5897 | 0.695 | 0.3173 | 0.1729 |  |
| CD | 0.926 | -0.0884 | -0.0482 | 0.0237 | 0.2826 |  |
| NH3 | -0.7014 | 0.1949 | -0.4316 | 0.4101 | 0.3284 |  |
| NO3 | -0.0054 | 0.9306 | 0.1208 | 0.2462 | -0.0804 |  |
| NO2 | 0.6661 | -0.3933 | -0.2831 | 0.4146 | -0.3818 |  |
| PO4 | -0.6424 | -0.6653 | -0.2866 | -0.0149 | -0.0305 |  |

cos2

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|   | Dim.1 | Dim.2 | Dim.3 | Dim.4 | Dim.5 |  |
| T | 0.7756 | 0.1716 | 0.0028 | 3e-04 | 8e-04 |  |
| pH | 0.69 | 0.0608 | 0.1548 | 0.0113 | 0.0321 |  |
| DO | 0.0298 | 0.3477 | 0.483 | 0.1007 | 0.0299 |  |
| CD | 0.8574 | 0.0078 | 0.0023 | 6e-04 | 0.0799 |  |
| NH3 | 0.4919 | 0.038 | 0.1863 | 0.1682 | 0.1078 |  |
| NO3 | 0 | 0.866 | 0.0146 | 0.0606 | 0.0065 |  |
| NO2 | 0.4437 | 0.1547 | 0.0802 | 0.1719 | 0.1458 |  |
| PO4 | 0.4127 | 0.4426 | 0.0821 | 2e-04 | 9e-04 |  |

Contrib(%)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|   | Dim.1 | Dim.2 | Dim.3 | Dim.4 | Dim.5 |  |
| T | 20.9541 | 8.2137 | 0.2741 | 0.0561 | 0.1894 |  |
| pH | 18.6429 | 2.9089 | 15.386 | 2.2091 | 7.9464 |  |
| DO | 0.806 | 16.6435 | 48.0081 | 19.5934 | 7.4063 |  |
| CD | 23.1651 | 0.3743 | 0.2306 | 0.1095 | 19.7869 |  |
| NH3 | 13.2914 | 1.8188 | 18.5181 | 32.7364 | 26.7222 |  |
| NO3 | 8e-04 | 41.4508 | 1.4505 | 11.7947 | 1.6016 |  |
| NO2 | 11.9887 | 7.4033 | 7.9671 | 33.4575 | 36.1168 |  |
| PO4 | 11.1511 | 21.1868 | 8.1654 | 0.0433 | 0.2303 |  |

ind

coord

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|   | Dim.1 | Dim.2 | Dim.3 | Dim.4 | Dim.5 |  |
| GK1\_17 | -2.8916 | -0.0538 | 0.7 | 1.4073 | 0.6905 |  |
| GK1\_18 | -0.2868 | -3.5447 | -0.549 | 0.7035 | -0.5581 |  |
| GK1\_19\_6 | 0.4793 | 1.8514 | 0.9485 | 0.766 | -0.4787 |  |
| GK1\_19\_10 | 0.7837 | 1.1837 | 0.3004 | -0.0269 | -1.5384 |  |
| GK1\_20 | 2.2169 | -0.2518 | 0.7777 | 1.1788 | 0.8621 |  |
| GK1\_21 | 0 | 0 | 0 | 0 | 0 |  |
| GK2\_17 | -4.2878 | 0.7661 | -1.3472 | 0.1744 | 0.1492 |  |
| GK2\_18 | -0.0895 | -2.3571 | 0.8224 | -0.6623 | 0.0465 |  |
| GK2\_19\_6 | 0.0738 | 1.0343 | 1.4369 | -0.7197 | 0.5259 |  |
| GK2\_19\_10 | 0.618 | 1.5557 | 0.4132 | -0.3475 | -0.641 |  |
| GK2\_20 | 2.7946 | -0.0523 | -0.9171 | 0.9671 | 0.011 |  |
| GK2\_21 | 0 | 0 | 0 | 0 | 0 |  |
| GK3\_17 | -3.5408 | 1.2488 | -1.3226 | -0.4814 | 0.1007 |  |
| GK3\_18 | -0.5326 | -2.5534 | 0.5212 | -1.1325 | 0.3388 |  |
| GK3\_19\_6 | 0.4694 | 1.1171 | 1.2996 | -0.8665 | 0.5872 |  |
| GK3\_19\_10 | 0.6831 | -0.7406 | -0.6225 | -0.3663 | -1.0355 |  |
| GK3\_20 | 3.5103 | 0.7967 | -2.4612 | -0.594 | 0.9399 |  |
| GK3\_21 | 0 | 0 | 0 | 0 | 0 |  |

cos2

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|   | Dim.1 | Dim.2 | Dim.3 | Dim.4 | Dim.5 |  |
| GK1\_17 | 0.7015 | 2e-04 | 0.0411 | 0.1662 | 0.04 |  |
| GK1\_18 | 0.0059 | 0.9036 | 0.0217 | 0.0356 | 0.0224 |  |
| GK1\_19\_6 | 0.0369 | 0.5501 | 0.1444 | 0.0942 | 0.0368 |  |
| GK1\_19\_10 | 0.1239 | 0.2826 | 0.0182 | 1e-04 | 0.4774 |  |
| GK1\_20 | 0.6124 | 0.0079 | 0.0754 | 0.1731 | 0.0926 |  |
| GK1\_21 | 0.0999 | 0.2272 | 1e-04 | 0.034 | 0.0131 |  |
| GK2\_17 | 0.8638 | 0.0276 | 0.0853 | 0.0014 | 0.001 |  |
| GK2\_18 | 0.0012 | 0.7984 | 0.0972 | 0.063 | 3e-04 |  |
| GK2\_19\_6 | 0.0014 | 0.2663 | 0.5141 | 0.129 | 0.0689 |  |
| GK2\_19\_10 | 0.097 | 0.6149 | 0.0434 | 0.0307 | 0.1044 |  |
| GK2\_20 | 0.8025 | 3e-04 | 0.0864 | 0.0961 | 0 |  |
| GK2\_21 | 0.0999 | 0.2272 | 1e-04 | 0.034 | 0.0131 |  |
| GK3\_17 | 0.7454 | 0.0927 | 0.104 | 0.0138 | 6e-04 |  |
| GK3\_18 | 0.0333 | 0.7651 | 0.0319 | 0.1505 | 0.0135 |  |
| GK3\_19\_6 | 0.0514 | 0.291 | 0.3938 | 0.1751 | 0.0804 |  |
| GK3\_19\_10 | 0.155 | 0.1822 | 0.1287 | 0.0446 | 0.3562 |  |
| GK3\_20 | 0.6042 | 0.0311 | 0.297 | 0.0173 | 0.0433 |  |
| GK3\_21 | 0.0999 | 0.2272 | 1e-04 | 0.034 | 0.0131 |  |

contrib

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|   | Dim.1 | Dim.2 | Dim.3 | Dim.4 | Dim.5 |  |
| GK1\_17 | 12.5501 | 0.0077 | 2.7057 | 21.4174 | 6.5624 |  |
| GK1\_18 | 0.1235 | 33.4124 | 1.6646 | 5.3513 | 4.288 |  |
| GK1\_19\_6 | 0.3448 | 9.1144 | 4.9682 | 6.3451 | 3.1542 |  |
| GK1\_19\_10 | 0.9218 | 3.7256 | 0.4984 | 0.0078 | 32.58 |  |
| GK1\_20 | 7.3771 | 0.1686 | 3.3396 | 15.0249 | 10.2296 |  |
| GK1\_21 | 0 | 0 | 0 | 0 | 0 |  |
| GK2\_17 | 27.5961 | 1.5607 | 10.023 | 0.3289 | 0.3063 |  |
| GK2\_18 | 0.012 | 14.7741 | 3.7345 | 4.7436 | 0.0298 |  |
| GK2\_19\_6 | 0.0082 | 2.8444 | 11.4013 | 5.6012 | 3.8077 |  |
| GK2\_19\_10 | 0.5732 | 6.4357 | 0.9428 | 1.3057 | 5.6552 |  |
| GK2\_20 | 11.7224 | 0.0073 | 4.6447 | 10.1136 | 0.0017 |  |
| GK2\_21 | 0 | 0 | 0 | 0 | 0 |  |
| GK3\_17 | 18.8185 | 4.1469 | 9.6604 | 2.5057 | 0.1395 |  |
| GK3\_18 | 0.4257 | 17.3371 | 1.5001 | 13.8691 | 1.5802 |  |
| GK3\_19\_6 | 0.3307 | 3.3185 | 9.326 | 8.1198 | 4.7465 |  |
| GK3\_19\_10 | 0.7003 | 1.4584 | 2.1401 | 1.4509 | 14.7597 |  |
| GK3\_20 | 18.4954 | 1.688 | 33.4505 | 3.815 | 12.1592 |  |
| GK3\_21 | 0 | 0 | 0 | 0 | 0 |  |

Dist

|  |
| --- |
| 3.452462 |
| 3.72902 |
| 2.496063 |
| 2.226518 |
| 2.832971 |
| 2.33E-09 |
| 4.613574 |
| 2.638045 |
| 2.004074 |
| 1.983972 |
| 3.119618 |
| 2.33E-09 |
| 4.101017 |
| 2.919097 |
| 2.070845 |
| 1.735041 |
| 4.516018 |
| 2.33E-09 |

svd

vs

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1.92385 | 1.445412 | 1.003023 | 0.7167705 | 0.6352885 | 0.3693953 | 0.2980109 | 0.2468073 |  |

U

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | -1.503 | -0.0372 | 0.6979 | 1.9634 | 1.0868 |  |
|  | -0.1491 | -2.4524 | -0.5474 | 0.9814 | -0.8785 |  |
|  | 0.2491 | 1.2809 | 0.9457 | 1.0687 | -0.7535 |  |
|  | 0.4073 | 0.8189 | 0.2995 | -0.0375 | -2.4217 |  |
|  | 1.1523 | -0.1742 | 0.7753 | 1.6445 | 1.357 |  |
|  | 0 | 0 | 0 | 0 | 0 |  |
|  | -2.2287 | 0.53 | -1.3432 | 0.2433 | 0.2348 |  |
|  | -0.0465 | -1.6308 | 0.8199 | -0.924 | 0.0732 |  |
|  | 0.0384 | 0.7155 | 1.4326 | -1.0041 | 0.8279 |  |
|  | 0.3212 | 1.0763 | 0.412 | -0.4848 | -1.0089 |  |
|  | 1.4526 | -0.0362 | -0.9144 | 1.3492 | 0.0174 |  |
|  | 0 | 0 | 0 | 0 | 0 |  |
|  | -1.8405 | 0.864 | -1.3187 | -0.6716 | 0.1584 |  |
|  | -0.2768 | -1.7665 | 0.5196 | -1.58 | 0.5333 |  |
|  | 0.244 | 0.7729 | 1.2956 | -1.209 | 0.9243 |  |
|  | 0.3551 | -0.5124 | -0.6207 | -0.511 | -1.63 |  |
|  | 1.8246 | 0.5512 | -2.4538 | -0.8287 | 1.4794 |  |
|  | 0 | 0 | 0 | 0 | 0 |  |

V

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|   |  |  |  |  |  |  |
|  | 0.4578 | 0.2866 | -0.0524 | 0.0237 | 0.0435 |  |
|  | -0.4318 | 0.1706 | 0.3923 | 0.1486 | -0.2819 |  |
|  | 0.0898 | -0.408 | 0.6929 | 0.4426 | 0.2721 |  |
|  | 0.4813 | -0.0612 | -0.048 | 0.0331 | 0.4448 |  |
|  | -0.3646 | 0.1349 | -0.4303 | 0.5722 | 0.5169 |  |
|  | -0.0028 | 0.6438 | 0.1204 | 0.3434 | -0.1266 |  |
|  | 0.3462 | -0.2721 | -0.2823 | 0.5784 | -0.601 |  |
|  | -0.3339 | -0.4603 | -0.2858 | -0.0208 | -0.048 |  |

> res.desc\_Ch\_St\_F

Link between the variable and the continuous variables (R-square)

============================================================================

|  |  |
| --- | --- |
| $Dim.1 | $Dim.2 |
|   | correlation | p.value |   | correlation | p.value |
| CD | 0.925950864 | 3.596646e-08 | NO3 | 0.93058898 | 2.175812e-08 |
| T | 0.880654851 | 1.414014e-06 | T | 0.41424901 | 8.743117e-02 |
| NO2 | 0.666126624 | 2.542745e-03 | pH | 0.24652364 | 3.240567e-01 |
| DO | 0.172719435 | 4.931182e-01 | NH3 | 0.19493020 | 4.382649e-01 |
| NO3 | -0.005404353 | 9.830202e-01 | CD | -0.08842462 | 7.271601e-01 |
| PO4 | -0.642437653 | 4.039202e-03 | NO2 | -0.39328212 | 1.063944e-01 |
| NH3 | -0.701384349 | 1.180694e-03 | DO | -0.58967612 | 1.000605e-02 |
| pH | -0.830668849 | 1.968556e-05 | PO4 | -0.66531033 | 2.585311e-03 |

> Cam4ia\_Chem\_St\_Fill

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|   | T | pH | DO | CD | NH3 | NO3  | NO2  | PO4 |
| GK1\_17 | 0.01538462 | 0.8958333 | 0.9183673 | 0.06220096 | 0.89285714 | 0.6011905 | 0.1818182 | 0.53703704 |
| GK1\_18 | 0.01538462 | 0.5729167 | 0.8954082 | 0.49760766 | 0.25000000 | 0.0000000 | 1.0000000 | 1.00000000 |
| GK1\_19\_6 | 0.47692308 | 0.8229167 | 0.5918367 | 0.56459330 | 0.17857143 | 1.0000000 | 0.4909091 | 0.01851852 |
| GK1\_19\_10 | 0.67692308 | 0.8125000 | 0.3826531 | 0.35406699 | 0.00000000 | 0.6190476 | 0.7090909 | 0.00000000 |
| GK1\_20 | 0.84615385 | 0.5729167 | 1.0000000 | 0.87559809 | 0.27976190 | 0.4840278 | 0.6909091 | 0.11111111 |
| GK1\_21 | 0.44923077 | 0.6590278 | 0.5821429 | 0.46411483 | 0.27976190 | 0.4840278 | 0.4387879 | 0.38148148 |
| GK2\_17 | 0.00000000 | 1.0000000 | 0.1785714 | 0.00000000 | 1.00000000 | 0.6488095 | 0.0000000 | 1.00000000 |
| GK2\_18 | 0.13846154 | 0.6354167 | 0.9056122 | 0.47368421 | 0.00000000 | 0.0000000 | 0.4545455 | 0.53703704 |
| GK2\_19\_6 | 0.55384615 | 0.8020833 | 0.6811224 | 0.53588517 | 0.07142857 | 0.6190476 | 0.0000000 | 0.12962963 |
| GK2\_19\_10 | 0.70769231 | 0.6354167 | 0.4591837 | 0.34928230 | 0.03571429 | 0.8035714 | 0.3636364 | 0.12962963 |
| GK2\_20 | 0.96923077 | 0.3541667 | 0.6071429 | 0.78947368 | 0.27976190 | 0.4840278 | 1.0000000 | 0.16666667 |
| GK2\_21 | 0.44923077 | 0.6590278 | 0.5821429 | 0.46411483 | 0.27976190 | 0.4840278 | 0.4387879 | 0.38148148 |
| GK3\_17 | 0.01538462 | 1.0000000 | 0.0000000 | 0.08612440 | 0.89285714 | 0.4880952 | 0.0000000 | 0.53703704 |
| GK3\_18 | 0.13846154 | 0.5937500 | 0.8494898 | 0.46889952 | 0.00000000 | 0.0000000 | 0.2727273 | 0.81481481 |
| GK3\_19\_6 | 0.63076923 | 0.6875000 | 0.6683673 | 0.52153110 | 0.03571429 | 0.6238095 | 0.0000000 | 0.07407407 |
| GK3\_19\_10 | 0.55384615 | 0.5000000 | 0.4846939 | 0.38277512 | 0.00000000 | 0.4047619 | 0.7272727 | 0.59259259 |
| GK3\_20 | 1.00000000 | 0.0000000 | 0.1096939 | 1.00000000 | 0.27976190 | 0.4840278 | 0.6909091 | 0.07407407 |
| GK3\_21 | 0.44923077 | 0.6590278 | 0.5821429 | 0.46411483 | 0.27976190 | 0.4840278 | 0.4387879 | 0.38148148 |