<Supplementary Materials>

**Application of satellite remote sensing in monitoring dissolved oxygen variabilities: A case study for mid-western coastal waters of Korea**

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**Fig. S1.** Scatter plot of satellite Chl-a (averaged monthly) and *in situ* Chl-a averaged in region A, B and C.



**Fig. S2.** Time-series of in situ and estimated DO in surface waters of the study area.

|  |  |  |
| --- | --- | --- |
| Parameters | Before and after dike construction | Among regions |
| Temperature | n.s. | n.s. |
| Salinity | n.s. | A<B\*\*\*c, A<C\*\*\*c |
| Suspended sediment | Be>Af\*\*\*a | n.s. |
| Chl-a | n.s. | n.s. |
| pH | n.s. | n.s. |
| Dissolved oxygen | n.s. | n.s. |
| Chemical oxygen demand | Be<Af\* | n.s. |
| Ammonia | Be>Af\*a | A>B\*b, A>C\*b |
| Nitrite | n.s. | A>C\*\*b |
| Nitrate | Be>Af\*\*\* | A>B\*\*c, A>C\*\*\*c |
| Dissolved inorganic nitrogen | Be>Af\*\*\*a | A>B\*\*c, A>C\*\*\*c |
| Total nitrogen | Be>Af\*\*\* | A>B\*\*c, A>C\*\*\*c |
| Dissolved inorganic phosphorus | Be>Af\*\*\* | n.s. |
| Total phosphrus | Be>Af\*\*\*a | n.s. |
| Silicate | n.s. | A>C\*c |
| Secchi depth | n.s. | n.s. |

**Table S1**. Results of one-way ANOVA and post-hoc test to compare *in situ* water quality parameters in surface before (Be) and after (Af) the year of 2006 (dike construction), and among three regions (A, B, C) in the study area

aWelch's t-test (unequal variances)

bleast significant difference (LSD) test

cGames-Howell nonparametric test (unequal variances)

**Table S2**. Results of stepwise multiple regression analysis

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Model | Coefficient | Constant | R2\*\* | *p* |
| SST*m-1*\* | SST  | Chl-a*m-1*\* |
| 1 | -0.232 | - | - | 12.359 | 0.705 | <0.001 |
| 2 | -0.133 | -0.122 | - | 12.607 | 0.798 | <0.001 |
| 3 | -0.132 | -0.131 | 0.066 | 12.342 | 0.801 | <0.001 |

\*satellite data of one month prior to *in situ* measuring

\*\*modified coefficient of determination considering the degree of freedom

**Table S3**. Residual statistics from multiple regression analysis of this study

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Mean | Standard deviation | Minimum | Maximum |
| Predicted value | 8.70 | 1.605 | 6.05 | 11.90 |
| Standard error of predicted values | 0.17 | 0.044 | 0.101 | 0.35 |
| Residual | 0 | 0.781 | -1.87 | -2.58 |
| Standardized residual | 0 | 0.982 | -2.36 | 3.25 |
| Cook's distance | 0.15 | 0.29 | 0 | 0.19 |
| Durbin-Watson (d) | 1.811 |