Estimation of Non-Optically Active Water Quality Parameters in Zhejiang Province Based on Machine Learning

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Figure captions

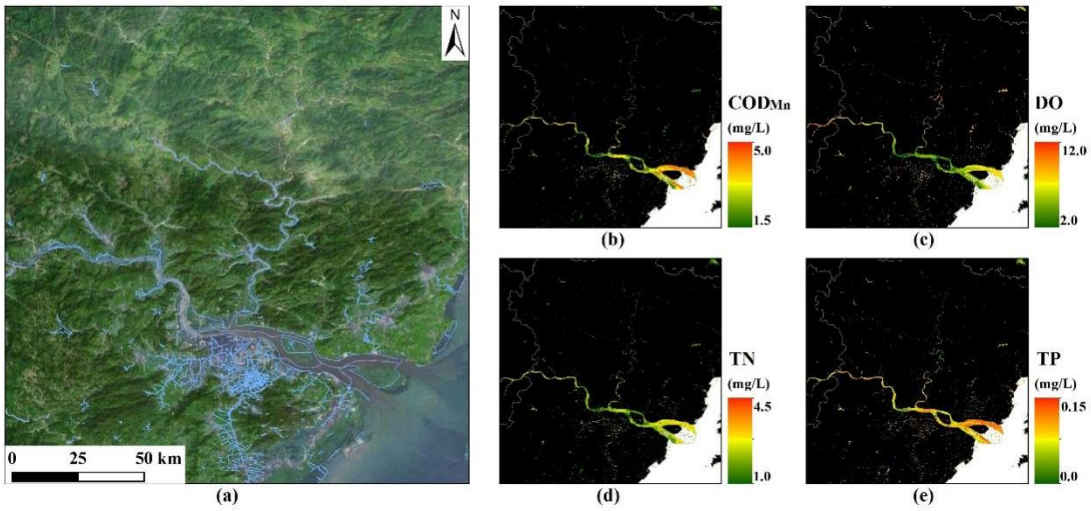
Figure S1: Oujiang River and the water quality in this river (annual mean in 2022). (**a**) the remote sensing image; (**b**) the distributions of COD_{Mn}; (**c**) the distribution of DO; (**d**) the distribution of TN and (**e**) the distribution of TP.

Figure S2: Seasonal variation of COD_{Mn} (**a**), DO (**b**), TN (**c**), and TP (**d**) concentrations in the Changtan Reservoir during 2022.

Figure S3: Seasonal variation of COD_{Mn} (**a**), DO (**b**), TN (**c**), and TP (**d**) concentrations at river confluence during 2022.

Table captions

Table S1: The daily averages of water quality parameters from 50 water quality monitoring stations (part of all stations) on January 3, 2022. T is the water temperature. DO is the dissolved oxygen. COD_{Mn} is the permanganate index. NH_3N is the ammonia nitrogen. TP is the total phosphorus. TN is the total nitrogen.



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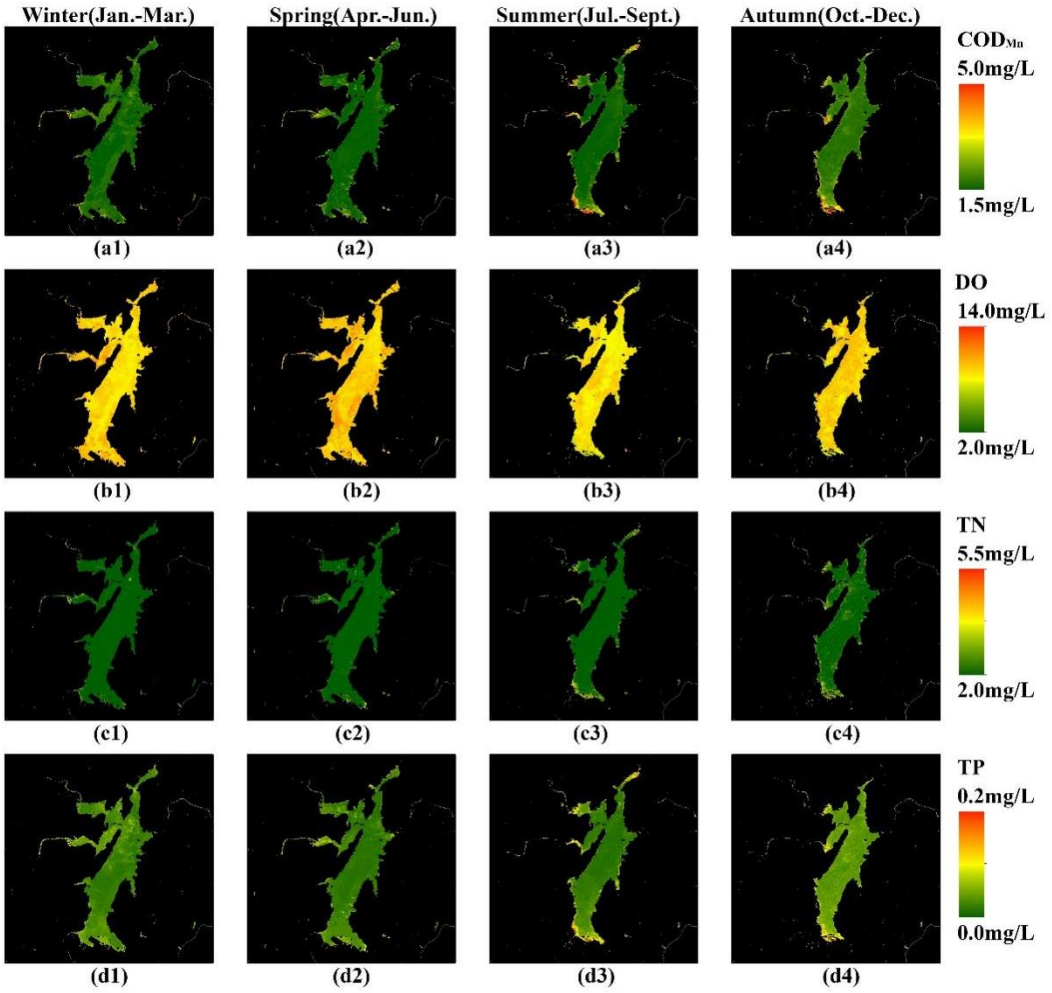

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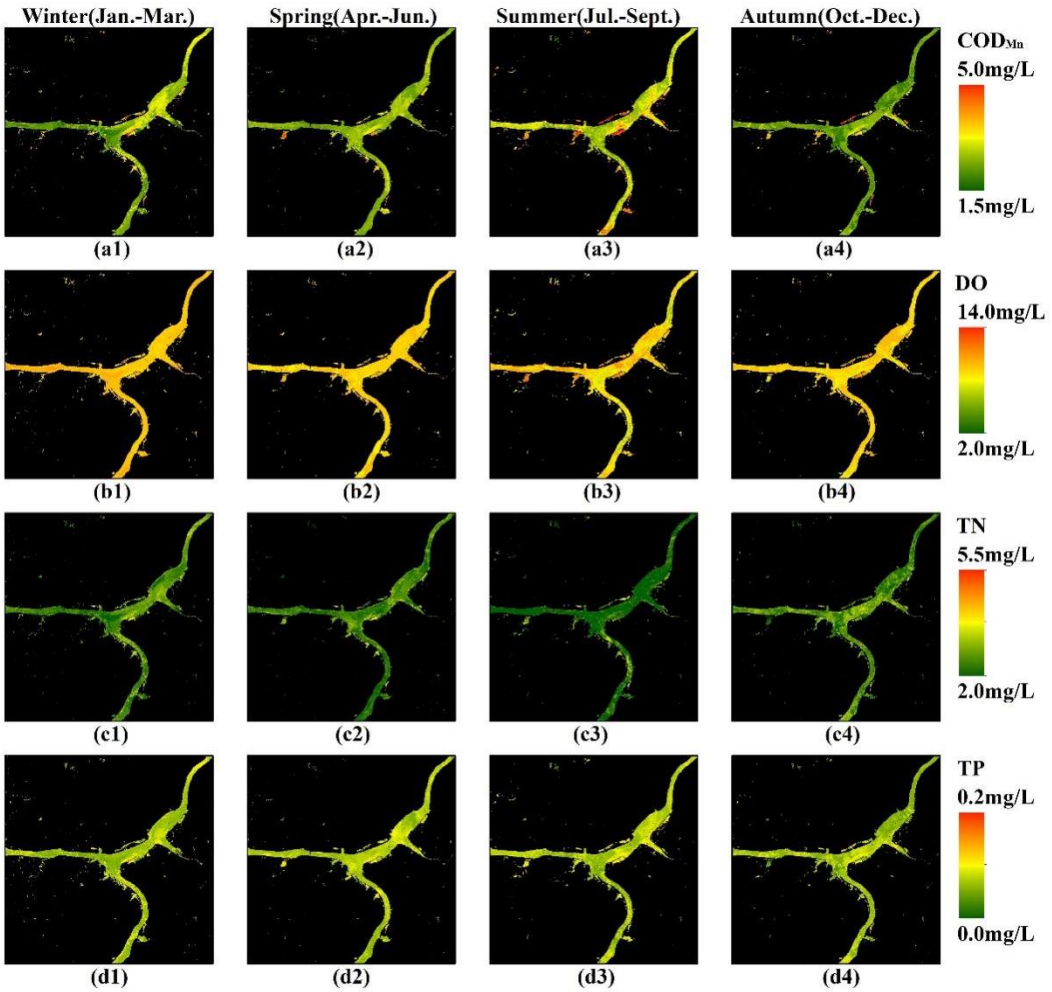

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Station	Latitude	Longitude	Time	T (℃)	pH	DO (mg/L)	Turbidy (NTU)	Conductivity (uS/cm)	COD_{Mn} (mg/L)	NH_3N (mg/L)	TP (mg/L)	TN (mg/L)
1	28.0013092	119.9419897	2022-01-03	14.6	7	8.3	3.7	38.9	1.2	0.05	0.01	0.26
2	28.577774	119.3393875	2022-01-03	17.7	7	8.9	2.2	392.2	1.7	0.66	0.051	4.37
3	28.51283273	120.0148743	2022-01-03	13.5	7	11.6	2.9	201.4	1.7	0.08	0.079	2.78
4	28.54077843	119.6521678	2022-01-03	9.2	7	10.1	4.7	66	1.4	0.03	0.019	1.49
5	28.66335855	119.8131129	2022-01-03	16.8	7	8.7	0.7	73.5	1.4	0.06	0.045	1.88
6	28.50676264	120.1276243	2022-01-03	8	8	10.8	1.1	66.2	1.3	0.02	0.005	0.77
7	28.54106823	120.107259	2022-01-03	9	7	11.9	2.8	73.5	0.9	0.02	0.005	0.47
8	28.89131557	120.3040241	2022-01-03	9.4	7	11.4	1.7	215.8	2.9	0.12	0.084	2.71
9	28.2019129	119.5075292	2022-01-03	14.8	7	10.4	2	66.7	1.4	0.1	0.02	0.9
10	27.49068488	119.3395806	2022-01-03	9.9	7	10.1	6.7	28	1	0.06	0.005	0.29
11	27.44050567	119.265648	2022-01-03	12.3	8	11.1	3.2	32	0.5	0.02	0.008	0.31
12	28.90176965	120.6198376	2022-01-03	9.4	7	11.8	5.4	86	0.2	0.07	0.005	1.42
13	29.05392611	120.753248	2022-01-03	8.5	8	11.2	4.4	137.3	0.9	0.12	0.025	1.62
14	29.04317944	121.0595143	2022-01-03	12.1	7	11.2	6.7	273	1.7	0.12	0.02	3.44
15	28.49235461	121.5559827	2022-01-03	10.4	8	10.8	11.6	687.4	6.1	1.1	0.154	7.01
16	28.72034296	121.3541107	2022-01-03	10.4	9	13.4	18	948.5	6	0.26	0.133	3.4
17	28.51915477	121.3629055	2022-01-03	9.6	8	11.1	4.9	480.4	4.5	0.56	0.123	4.51
18	28.2713	121.1973	2022-01-03	13.7	8	11.6	43.7	3133.8	6.6	0.02	0.08	1.31
19	28.1236235	121.258653	2022-01-03	11.8	8	9.2	25	856	5.8	0.32	0.12	5.66
20	29.11421904	121.5446516	2022-01-03	7.9	8	11.5	77.1	38075.2	5.6	0.21	0.067	1.78
21	29.04150355	121.6088376	2022-01-03	9.2	8	10.1	24.5	44665.6	4.4	0.07	0.028	0.79
22	30.70954253	120.6110946	2022-01-03	7.4	8	9.4	211	600.8	4.8	0.45	0.164	2.87
23	30.50492237	120.3243605	2022-01-03	9	7	9	79.2	628.5	3.7	0.35	0.126	4.29
24	30.59288654	120.3073996	2022-01-03	8.7	8	9.4	338.3	630.2	5.1	0.52	0.177	4.6
25	30.58692986	120.7059161	2022-01-03	8.8	8	10.8	162.9	668.9	5.2	0.48	0.138	3.79
26	30.56328227	120.6629895	2022-01-03	7.2	8	8	174.8	669.7	4	0.69	0.12	4.63
27	30.75724575	120.9199434	2022-01-03	7.6	8	9.1	58.1	713.5	3.4	0.43	0.094	4.43
28	30.82472782	120.8677844	2022-01-03	8	8	10.3	121	638.9	4.4	0.49	0.111	4.36

29	30.82933741	120.8203339	2022-01-03	11.7	8	10.8	368	610	7.7	0.69	0.271	4.26
30	30.43292189	120.3326386	2022-01-03	7.9	8	7.4	23.2	741.5	4.2	1.46	0.196	4.84
31	31.00472132	120.8251525	2022-01-03	7.2	8	10.2	78.6	573.7	4.5	0.31	0.078	1.82
32	30.75456862	120.4698009	2022-01-03	6.9	8	10.4	107.1	521.8	4.3	0.35	0.097	3.06
33	30.59308068	120.7422568	2022-01-03	8.7	8	8.2	130.8	706.9	3.8	0.4	0.13	4.2
34	30.47089515	120.795615	2022-01-03	8	8	6.5	62.7	658.1	3.4	0.53	0.105	4.32
35	30.92259023	120.7121996	2022-01-03	8	8	8	133.7	592.1	4.7	0.32	0.086	1.6
36	30.56916919	120.7031279	2022-01-03	8.7	8	8.4	76.1	778.5	3.5	0.52	0.101	4.44
37	30.8391855	120.5881182	2022-01-03	7.8	8	11.1	47.2	571.3	3.8	0.27	0.089	2.13
38	30.62409067	121.0066808	2022-01-03	7.2	8	9.6	110.8	880.3	3.5	0.57	0.13	4.19
39	30.49217349	120.3956992	2022-01-03	9.6	7	8.5	109.5	748.2	4.9	0.63	0.172	3.61
40	30.48135773	120.346492	2022-01-03	9	7	8.7	59.5	594.7	3.4	0.34	0.108	4.27
41	29.72371506	121.3789	2022-01-03	8	7	11.3	20.6	244.9	1.7	0.3	0.1	3.71
42	30.32755962	119.8148596	2022-01-03	16.2	8	10.5	21	347	2.9	0.32	0.04	3.77
43	29.99882774	119.4034707	2022-01-03	13.4	8	8.5	13	277	1.7	0.04	0.03	2.03
44	29.89559355	119.8217179	2022-01-03	15.9	8	10.2	11	359	2.1	0.11	0.05	2.18
45	30.07206179	120.0858776	2022-01-03	15.8	8	10.4	6.8	398	2.4	0.12	0.05	2.45
46	29.68627696	119.6472256	2022-01-03	13.4	8	8.4	24	312	2	0.34	0.06	2.35
47	29.94080236	120.2887389	2022-01-03	13.2	8	9	3.7	216	2.8	0.9	0.18	3.3
48	30.084065	119.7411219	2022-01-03	16	7	10.5	20	321	2.1	0.21	0.07	2.12
49	29.76603972	119.9580573	2022-01-03	15.8	7	10.7	12	198	1.8	0.08	0.05	1.87
50	29.67104793	119.9209176	2022-01-03	13.4	8	11.3	24	141	2.4	0.12	0.06	2.26