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Supplementary Material (SM)

Application of GIS and Multi-Criteria Statistical Techniques in Assessing Water Quality in the Coastal Province of Vietnamese Mekong Delta

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SM 1 Characteristics of the sampling locations

No.	Sign	X	Y	Description of sampling locations
1	M1	9°36'51.29"N	105°57'51.67"E	The area is near Kenh Xang bridge. The location was mainly affected by urban areas
2	M2	9°36'21.90"N	105°58'36.63"E	Belonging to the Maspero River (bridge area 30/4), this location was influenced by mainly residential and urban areas.
3	M3	9°36'31.05"N	105°59'37.78"E	Belongs to the Maspero River and is influenced by urban development and cultural activities of the Province
4	M4	9°46'43.87"N	106°02'20.91"E	The area is contiguous to the Hau River (Rach Mop bridge), which was mostly affected by perennial tree planting, rural population and religious institutions.
5	M5	9°33'20.29"N	105°59'57.78"E	In the area of Thanh Loi Bridge (Thanh Lo Canal), land use was predominantly for urban land
6	M6	9°25'37.56"N	105°56'25.15"E	Co Co market canal, this area has activities of riverside residents and aquaculture.
7	M7	9°19'35.11"N	105°58'49.05"E	Vinh Chau town canal, an area affected by seawater, arable farming, aquaculture, markets and residential areas.
8	M8	9°37'25.72"N	106°02'13.52"E	The Saintard River (Saintard Bridge area), uses land predominantly for rural land, markets, and educational institutions.
9	M9	9°46'08.93"N	105°59'10.60"E	Ke Sach market area (Channel 1) and urban residential land
10	M10	9°40'15.70"N	106°09'27.30"E	In the Ben Ba market area (Ben Ba River), there was other activities such as rice cultivation.
11	M11	9°30'09.25"N	105°51'10.52"E	Areas of Nhu Gia (Song Nhu Gia), this location was affected by riverine residents and aquaculture.
12	M12	9°25'43.60"N	105°44'44.56"E	Phu Loc market area, Phu Loc town Canal; water quality was affected by markets, residential areas, agricultural cultivation and partly aquaculture.

SM 1 Characteristics of the sampling locations (*continued*)

No.	Sign	X	Y	Description of sampling locations
13	M13	9°33'54.19"N	105°35'53.05"E	Market area of Nga Nam town and Nga Nam town canal
14	M14	9°55'48.00"N	105°53'27.75"E	This was located adjacent to Hau Giang at Cai Con Bridge (Xang Cai Con canal). This monitoring location is affected by the waste sources of two provinces, including the Cai Con urban residential area.
15	M15	9°38'10.13"N	105°48'39.19"E	Located in the branch of the Nhu Gia river, there were major activities such as urban development, perennial tree planting and religious facilities.
16	M16	9°28'38.64"N	106°08'48.47"E	The location is adjacent to the market, and the land is mainly used for rural housing, agricultural cultivation (rice cultivation).
17	M17	9°37'59.23"N	105°37'21.35"E	The location is on the Maspero River (area of Thuan Hoa Bridge) with main activities such as farming, rice farming and rural activities.
18	M18	9°37'16.26"N	106°07'12.04"E	In the area of Khoan Tan Bridge (Long Phu Canal), the activities that may affect water quality such as riverside residential activities and urban development.
19	M19	9°36'13.28"N	106°01'21.47"E	The location is near the wharf of Dinh river (Song Dinh) with the activities of urban residents, rice farming

SM 2 Classification of water quality using WQI_{VN}

Values	Water quality	Purposes of using water
91 – 100	Excellent	Domestic water supply
76 – 90	Good	Use for domestic water supply purposes but need appropriate treatment measures
51 – 75	Medium	Used for irrigation and other similar purposes
26 – 50	Fair	Used for navigation and other similar purposes
10 – 25	Poor	Heavy pollution, needing solutions in the future
<10	Very poor	Water was poisoned and needs remedy and treatment measures

SM 3 Prediction of the sources and parameters that cause water quality fluctuations

Variable	**PC1**	**PC2**	**PC3**	**PC4**
Temperature	-0.23	-0.07	-0.36	-0.13
pH	-0.11	-0.21	0.44	-0.29
DO	-0.30	0.03	0.34	0.10
EC	-0.02	-0.39	-0.01	-0.17
Turbidity	-0.06	-0.35	0.04	0.37
BOD	0.34	0.04	-0.07	0.07
COD	0.22	-0.30	-0.11	-0.09
TOC	0.31	-0.12	-0.29	-0.11
TSS	-0.07	-0.37	0.09	0.25
NH_4^+-N	0.34	0.02	0.18	0.07
NO_2^--N	0.27	-0.05	-0.05	-0.16
NO_3^--N	-0.26	-0.07	0.37	0.02
TN	0.34	-0.07	0.12	0.00
PO_4^{3-}-P	0.29	0.06	0.30	0.24
TP	0.31	-0.01	0.30	0.23
Cl^-	-0.02	-0.39	0.00	-0.16
SO_4^{2-}	-0.02	-0.39	-0.03	-0.16
Fe	0.04	-0.33	-0.11	0.34
Coliforms	0.17	-0.01	0.28	-0.57
Eigenvalues	7.61	6.08	1.63	1.27
%Variation	40.0	32.0	8.6	6.7
Cum.%Variation	40.0	72.0	80.6	87.3

Remark: The value of the observed parameters at the PCs is weight factor (loading).