

# Supplementary Material

Article

## Fish Biomonitoring and Ecological Assessment in the Dianchi Lake Basin Based on Environmental DNA

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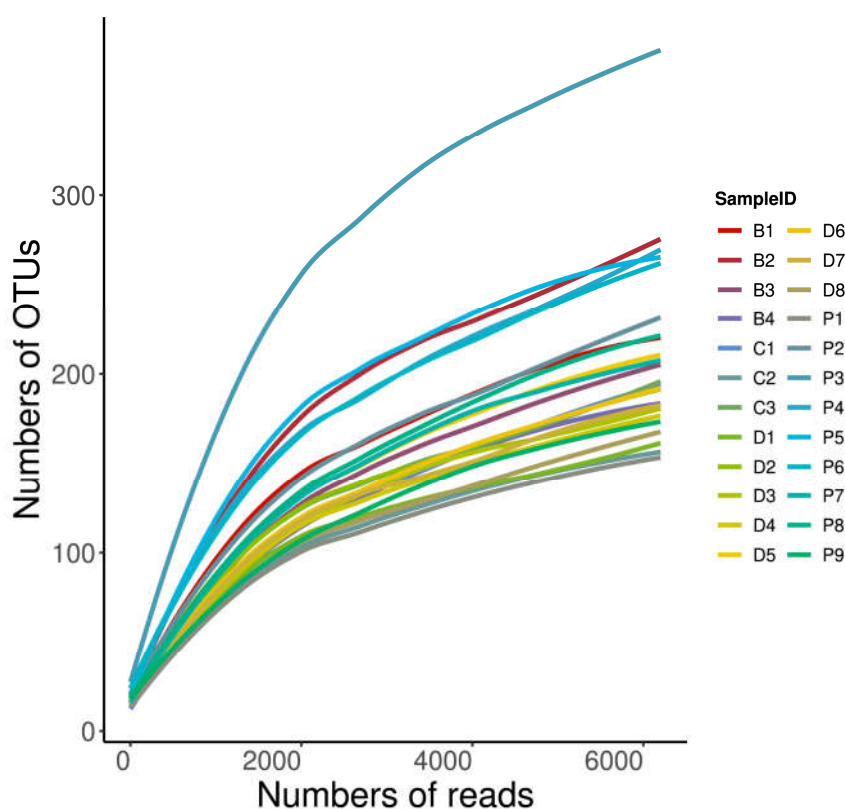
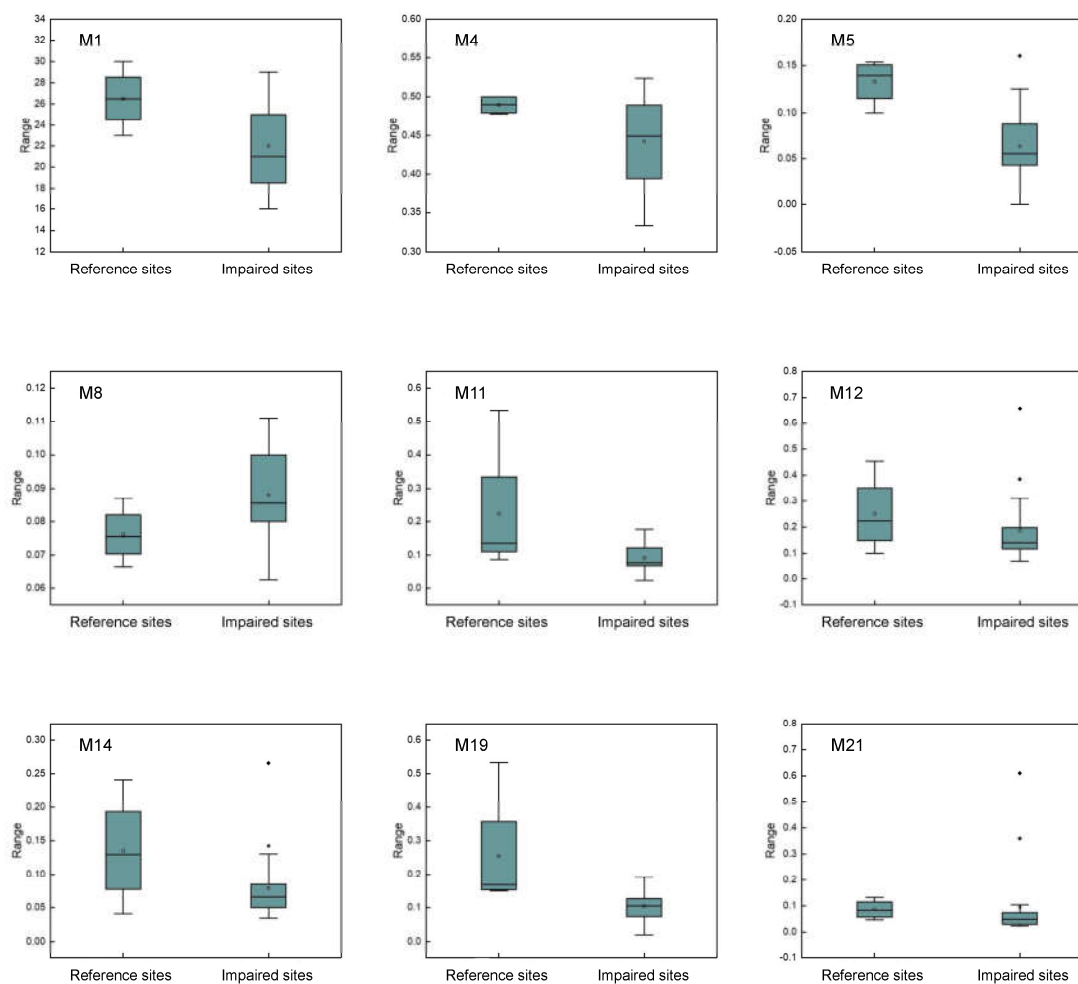


Figure S1. Rarefaction curves of fish species at sampling sites. (each line represents a sampling site).



**Figure S2.** Box-plots of nine accepted candidate metrics between reference and impacted sites.

**Table S1.** Detection methods and instruments used for physicochemical indices analyses.

physicochemical indices	International standard method	Detection limit	Detection instrument
WT	Water temperature gauge method	/	Mercury thermometer
pH	Portable pH meter method	/	pH meter (PHBJ-260, Leici, China)
DO	Portable dissolved oxygen meter method	0.2 mg/L	dissolved oxygen meter (JPBJ-609L, Leici, China)
TN	Alkaline potassium persulfate digestion-ultraviolet spectrophotometry	0.05 mg/L	UV-Vis spectrophotometer (752N, LICHEN, China)
TP	Ammonium molybdate spectrophotometry	0.01 mg/L	Visible spectrophotometer (722S, Lengguang, China)
NH <sub>3</sub> -N	Knott's spectrophotometry	0.025 mg/L	Visible spectrophotometer (722S, Lengguang, China)
COD	Potassium dichromate method	4 mg/L	Standard COD digester (HCA-101, YETO, China)
Cond	Conductivity meter method	/	Conductivity meter (DDS-11A, Leici, China)

**Table S2.** List of fish species in Dianchi Lake and the three inflowing rivers.

Order	Family	Genus	Species	Baoxiang River	Chai River	Dianchi Lake	Panlong River
Cypriniformes	Cyprinidae	<i>Pseudorasbora</i>	<i>Pseudorasbora parva</i>	✓	✓	✓	✓
		<i>Hemibarbus</i>	<i>Hemibarbus medius</i>	✓		✓	✓
		<i>Hemibarbus</i>	<i>Hemibarbus sp.</i>	✓	✓	✓	✓
		<i>Toxabramis</i>	<i>Toxabramis swinhonis</i>	✓	✓	✓	✓
		<i>Megalobrama</i>	<i>Megalobrama amblycephala</i>	✓	✓	✓	✓
		<i>Culter</i>	<i>Culter alburnus</i>	✓	✓	✓	✓
		<i>Culter</i>	<i>Culter oxycephaloides</i>				✓
		<i>Schizopygopsis</i>	<i>Schizopygopsis malacanthus</i>	✓	✓	✓	✓
		<i>Bangana</i>	<i>Bangana sp.</i>				✓
		<i>Carassius</i>	<i>Carassius auratus</i>	✓	✓	✓	✓
		<i>Cyprinus</i>	<i>Cyprinus carpio</i>	✓	✓	✓	✓
		<i>Abbottina</i>	<i>Abbottina rivularis</i>	✓	✓	✓	✓
		<i>Mylopharyngodon</i>	<i>Mylopharyngodon piceus</i>	✓	✓		✓
		<i>Hemiculter</i>	<i>Hemiculter leucisculus</i>	✓	✓	✓	✓
		<i>Rhodeus</i>	<i>Rhodeus sinensis</i>	✓	✓	✓	✓
		<i>Acheilognathus</i>	<i>Acheilognathus macropterus</i>				✓
		<i>Ctenopharyngodon</i>	<i>Ctenopharyngodon idella</i>	✓	✓	✓	✓
		<i>Hypophthalmichthys</i>	<i>Hypophthalmichthys nobilis</i>	✓	✓	✓	✓
		<i>Xenocypris</i>	<i>Xenocypris sp.</i>			✓	
		<i>Sarcocheilichthys</i>	<i>Sarcocheilichthys nigripinnis</i>			✓	
		<i>Acanthorhodeus</i>	<i>Acanthorhodeus chankaensis</i>	✓	✓	✓	✓
	Cobitidae	<i>Misgurnus</i>	<i>Misgurnus anguillicaudatus</i>	✓	✓	✓	✓
		<i>Paramisgurnus</i>	<i>Paramisgurnus dabryanus</i>	✓	✓	✓	✓
Perciformes	Gobiidae	<i>Rhinogobius</i>	<i>Rhinogobius sp.</i>	✓	✓		✓
		<i>Rhinogobius</i>	<i>Rhinogobius giurinus</i>	✓	✓		✓
		<i>Mugilogobius</i>	<i>Mugilogobius myxodermus</i>		✓		✓
	Odontobutidae	<i>Micropercops</i>	<i>Micropercops swinhonis</i>	✓	✓	✓	✓
	Cichlidae	<i>Oreochromis</i>	<i>Oreochromis aureus</i>	✓		✓	✓
		<i>Oreochromis</i>	<i>Oreochromis niloticus</i>	✓			✓
Siluriformes	Siluridae	<i>Silurus</i>	<i>Silurus asotus</i>	✓	✓	✓	✓





			<i>Silurus soldatovi</i>	✓	✓	✓	✓
	Ictaluridae	<i>Ictalurus</i>	<i>Ictalurus punctatus</i>				✓
	Bagridae	<i>Tachysurus</i>	<i>Tachysurus fulvidraco</i>				✓
			<i>Tachysurus nitidus</i>	✓	✓	✓	✓
Osmeriformes	Salangidae	<i>Neosalanx</i>	<i>Neosalanx taihuensis</i>	✓	✓	✓	✓
	Osmeridae	<i>Hypomesus</i>	<i>Hypomesus olidus</i>			✓	✓
Acipenseriformes	Acipenseridae	<i>Acipenser</i>	<i>Acipenser baerii</i>	✓	✓	✓	✓
Beloniformes	Hemiramphidae	<i>Hyporhamphus</i>	<i>Hyporhamphus intermedius</i>	✓	✓	✓	✓
Clupeiformes	Engraulidae	<i>Coilia</i>	<i>Coilia brachygnathus</i>	✓	✓	✓	✓
Cyprinodontiformes	Poeciliidae	<i>Gambusia</i>	<i>Gambusia affinis</i>	✓	✓	✓	✓
Synbranchiformes	Synbranchidae	<i>Monopterus</i>	<i>Monopterus albus</i>		✓	✓	✓

**Table S3.** Correlation coefficients of Pearson tests between nine candidate metrics.

	M1	M4	M5	M8	M11	M12	M14	M19	M21
M1	1								
M4	0.601**	1							
M5	0.458*	0.065	1						
M8	−0.529**	−0.221	−0.601**	1					
M11	0.238	0.018	0.19	−0.276	1				
M12	0.017	0.175	0.3	−0.174	−0.128	1			
M14	−0.015	−0.221	0.528**	−0.324	0.149	0.499*	1		
M19	0.477*	0.088	0.426	−0.493*	0.902*	−0.007	0.327	1	
M21	0.1	0.223	0.182	−0.021	−0.177	0.818**	0.067	−0.12	1

\* means significant correlation at 0.05 level, \*\* means significant correlation at 0.01 level.

**Table S4.** Classification of F-IBI in Dianchi lake and the three inflowing rivers.

Class	Classification standard	Color	Sample
Healthy	F-IBI $\geq$ 6.0374	Blue	
Fine	6.0374 > F-IBI $\geq$ 4.9931	Green	
Marginally Impaired	4.9931 > F-IBI $\geq$ 3.9439	Yellow	
Moderately Impaired	3.9439 > F-IBI $\geq$ 3.2568	Orange	
Seriously Impaired	F-IBI < 3.2568	Red	