SUPPORTING INFORMATION

Inversion of Water Quality Parameters from UAV Hyperspectral Data Based on Intelligent Algorithm Optimized Backpropagation Neural Networks of a Small Rural River

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Figure legend

Figure S1. Distribution of water quality categories for the 47 samples.

Table contents

Table S1. The detailed UAV flight parameters.

Table S2. Standard limits for basic items of environmental quality standards for surface water (mg/L).

Table S3. Population information questionnaire.

Table S4. Aquaculture information questionnaire.

Table S5. Plantation information questionnaire.

Table S6. Livestock and poultry breeding information questionnaire.

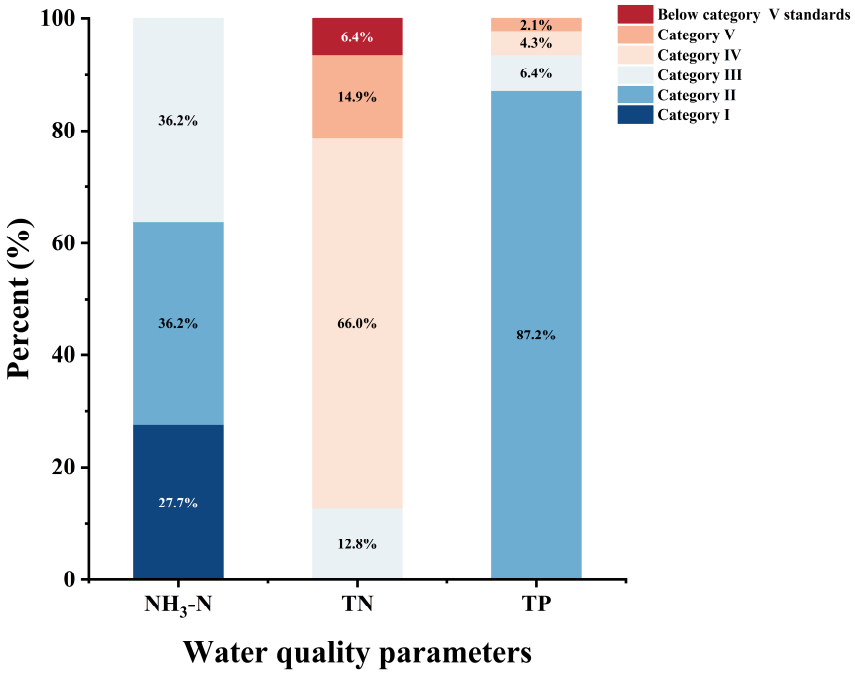


Figure S1. Distribution of water quality categories for the 47 samples.

Table S1. The detailed UAV flight parameters.

Class	Parameter	Class	Parameter
Wavelength range	400–1000 nm	spectral resolution	5.5 nm
Number of spectral	224	Spectral sampling rate	2.7 nm
Flight height	350 m	Spectral resolution	0.3 m
Study area A covers pixels	135000	Study area B covers pixels	204083

Table S2. Standard limits for basic items of environmental quality standards for surface water (mg/L).

water quality parameters	I	II	III	IV	V
NH_3-N≤	0.15	0.5	1.0	1.5	2.0
TN≤	0.2	0.5	1.0	1.5	2.0
TP≤	0.02	0.1	0.2	0.3	0.4

Notes: Category I: It applies to source water and national nature reserves; Category II: It applies to the primary protection zone of centralised domestic drinking water surface water sources, rare aquatic organisms' habitats, etc; Category III: It applies to the secondary protection zone of centralised drinking water surface water sources, fishery waters such as fish and shrimp wintering grounds and swimming areas; Category IV: It applies to general industrial water areas and human non-direct contact recreational water areas; and Category V: It applies to agricultural water use areas and general landscape requirements of the waters.

Study Area A belongs to the Liujiafan community and Study Area B belongs to the Hongguang community, the detailed survey data are as follows：

Table S3. Population information questionnaire.

	household number	**Resident population**
Liujiafan Community	1867	3271
Hongguang Community	1059	1000

Table S4. Aquaculture information questionnaire.

	Aquaculture area（ha）	**Yield（kg）**
Liujiafan Community	10.81	5.00×10^5
Hongguang Community	5.37	2.41×10^4

Table S5. Plantation information questionnaire.

	Crop sown area (ha)					**Garden**
	Rice	**Wheat**	**Corn**	**vegetable**	**Other**	**area (ha)**
Liujiafan Community	4.20	0.33	4.94	11.87	1.87	0.00
Hongguang Community	7.24	10.25	6.67	6.67	2.33	26.68

Table S6. Livestock and poultry breeding information questionnaire.

	Number of livestock and poultry		
	Laying hen	**Broiler**	**Duck**
Liujiafan Community	6300	5800	0
Hongguang Community	400	1000	1200