

Table S1. Values of r_{ij} and r_{ij}^2 of lakes (reservoir) in China

Parameter	chl- <i>a</i>	TP	TN	SD	COD _{Mn}
r_{ij}	1	0.84	0.82	-0.83	0.83
r_{ij}^2	1	0.7056	0.6724	0.6889	0.6889

Calculation formula for nutrient status index:

$$TLI(\text{chl-}a) = 10 \times (2.5 + 1.086 \ln \text{chl-}a) \quad (1)$$

$$TLI(\text{TP}) = 10 \times (9.436 + 1.624 \ln \text{TP}) \quad (2)$$

$$TLI(\text{TN}) = 10 \times (5.453 + 1.694 \ln \text{TN}) \quad (3)$$

$$TLI(\text{SD}) = 10 \times (5.118 - 1.94 \ln \text{SD}) \quad (4)$$

$$TLI(\text{COD}_{\text{Mn}}) = 10 \times (0.109 + 2.661 \ln \text{COD}_{\text{Mn}}) \quad (5)$$

In the Eq. (1) to Eq. (5), the unit of chl-*a* was $\text{mg} \cdot \text{m}^{-3}$, the unit of SD was m, the unit of TP, TN and COD_{Mn} were $\text{mg} \cdot \text{L}^{-1}$.

Table S2. Grading value for nutrient status

Value of TLI_{Σ}	Grading
$TLI_{\Sigma} < 30$	Oligotrophe
$30 \leq TLI_{\Sigma} \leq 50$	Mesotropher
$TLI_{\Sigma} > 50$	Eutropher
$50 < TLI_{\Sigma} \leq 60$	Light Eutropher
$60 < TLI_{\Sigma} \leq 70$	Middle Eutropher
$TLI_{\Sigma} > 70$	Hyper Eutropher

Table S3. Grades and ranges of E_r^i and $PERI$ (Hakanson, 1980)

E_r^i	Grades of E_r^i for metal <i>i</i>	$PERI$	Grades of $PERI$
$E_r^i < 40$	Low risk	$PERI < 150$	Low risk
$40 \leq E_r^i < 80$	Moderate risk	$150 \leq PERI < 300$	Moderate risk
$80 \leq E_r^i < 160$	High risk	$300 \leq PERI < 600$	High risk
$160 \leq E_r^i < 320$	Very high risk	$PERI \geq 600$	Very high risk
$E_r^i \geq 320$	Extremely high risk		

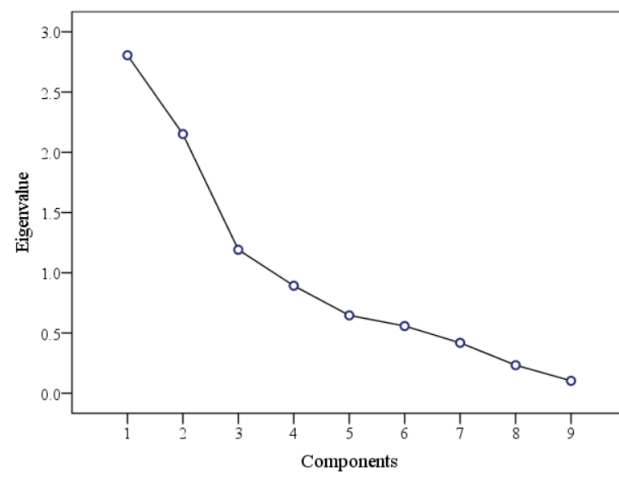


Figure S1. Eigenvalues for principal component analysis (PCA).