

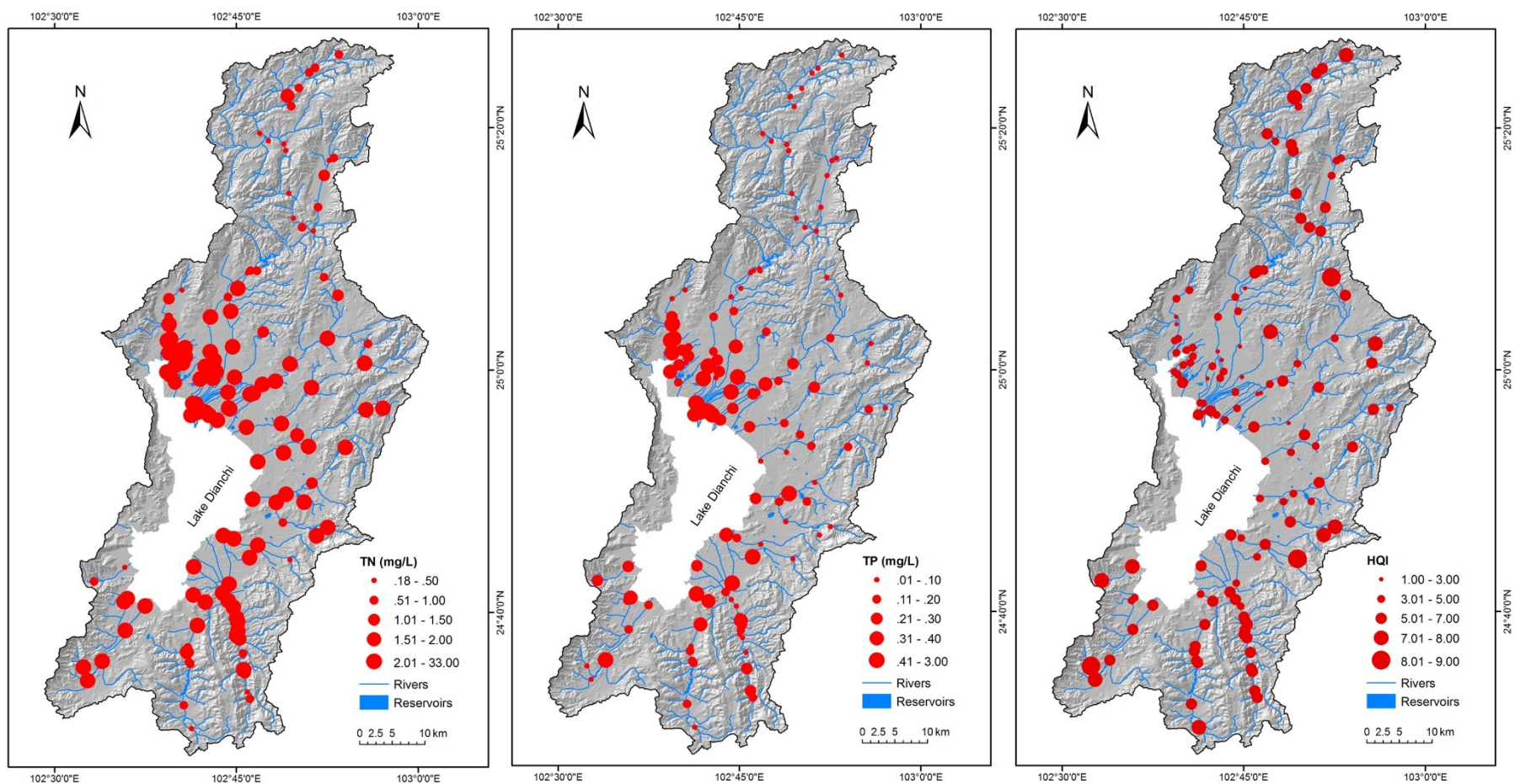


Fig. S1 Spatial pattern of TN, TP concentration and HQI

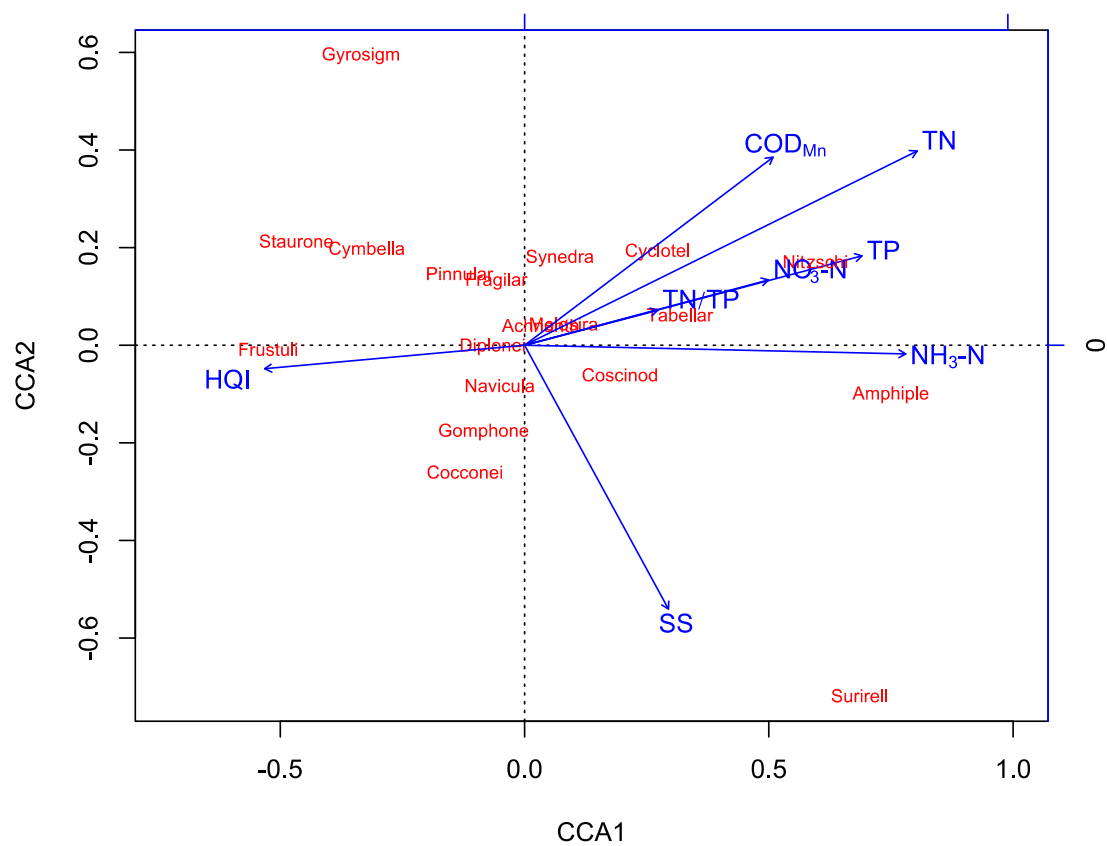
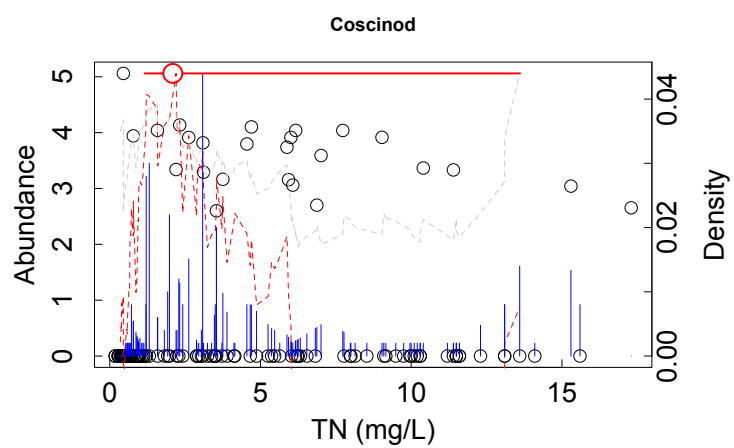


Fig. S2 CCA ordination diagram of environmental variables and diatom assemblage.



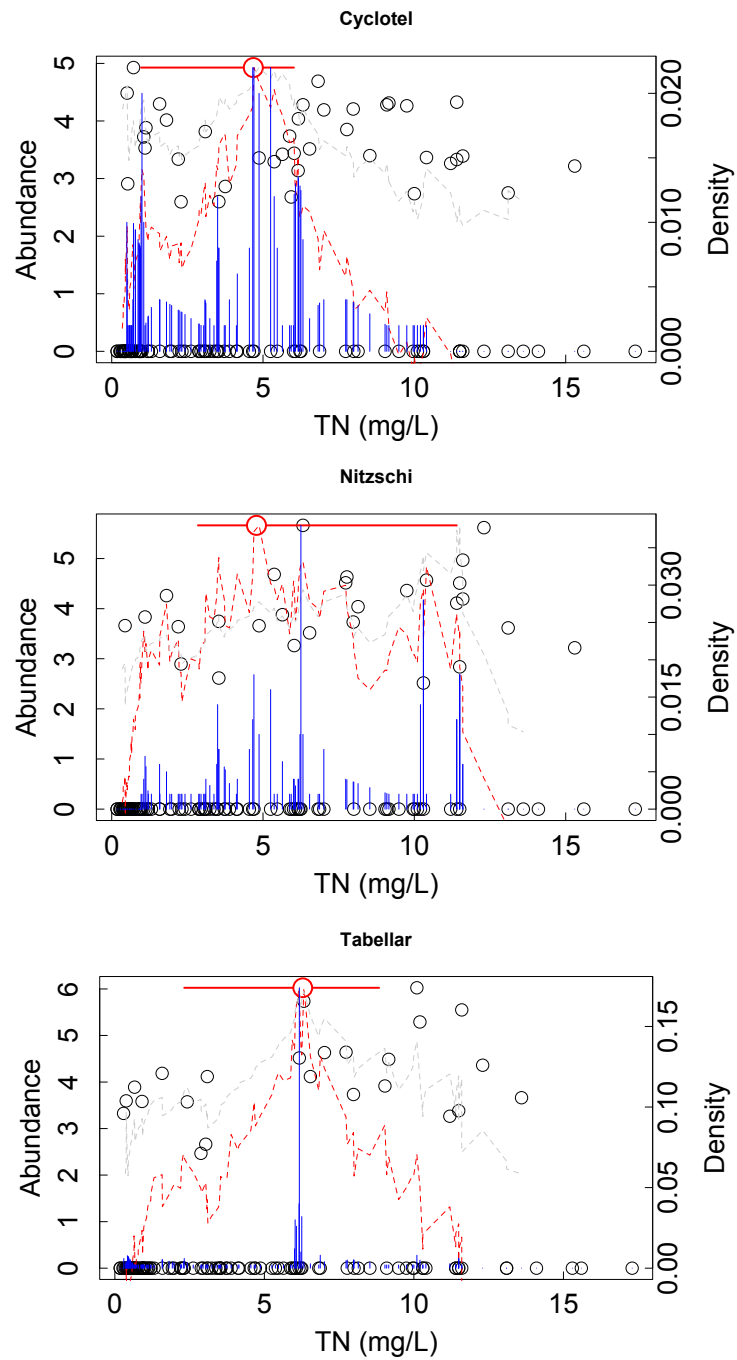


Fig. S3 Abundance distribution of significant indicator taxa along the TN gradient. The red circle near the top of the figure is the observed change point.

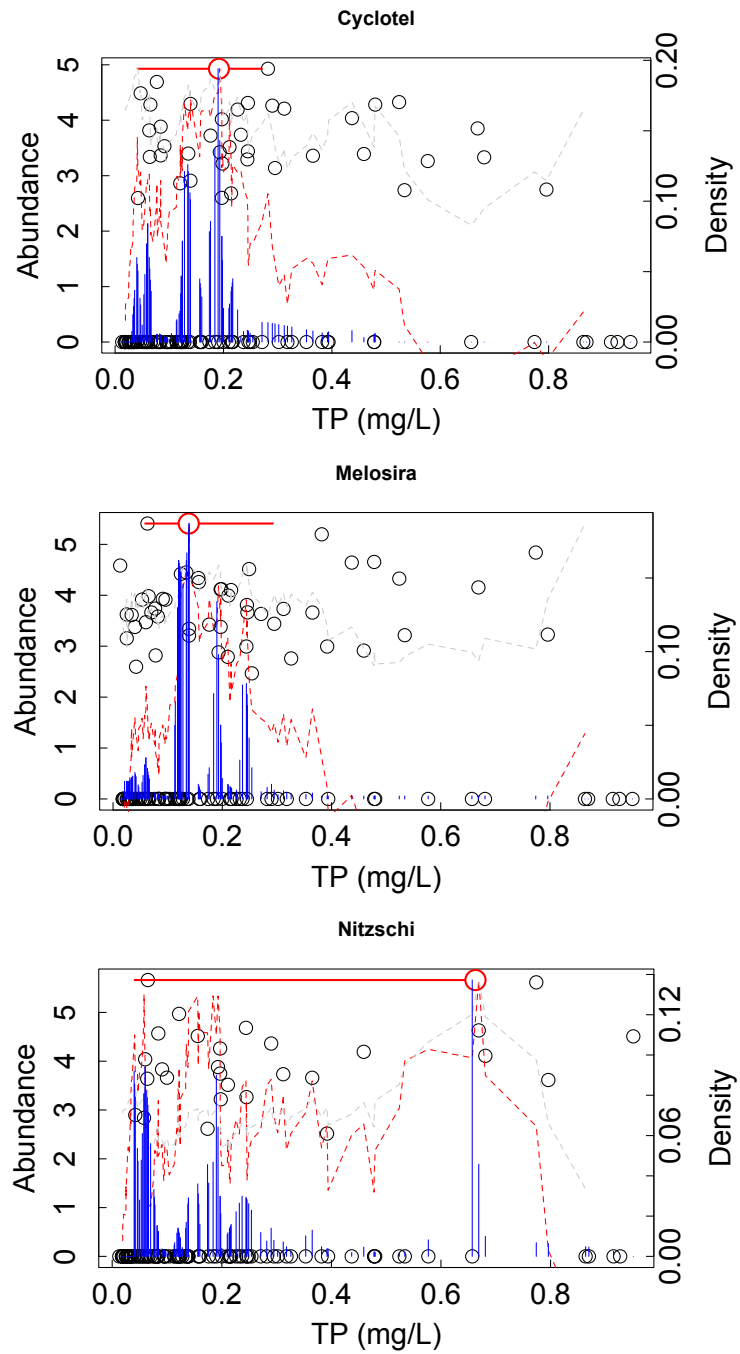
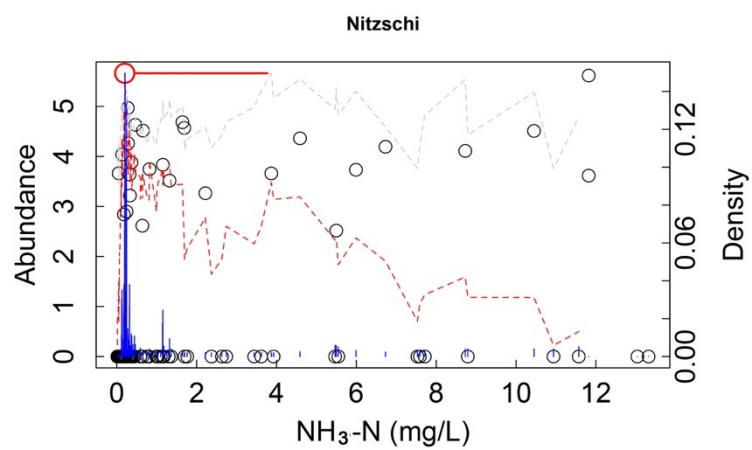
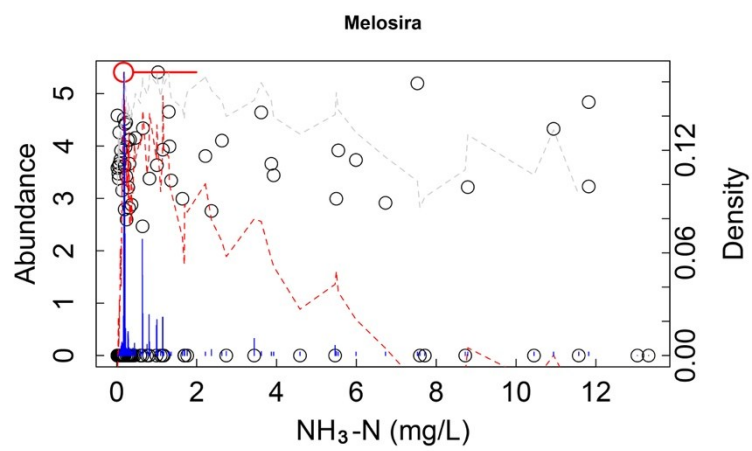
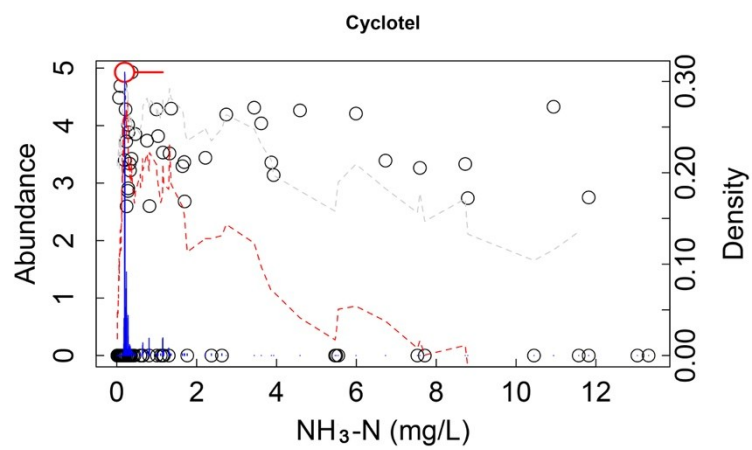
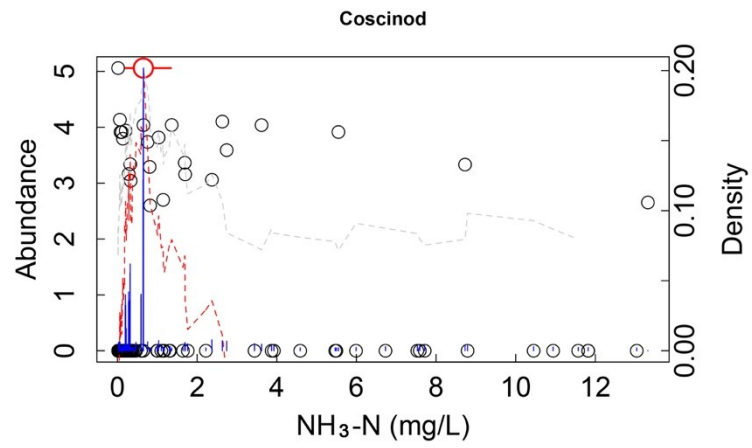


Fig. S4 Abundance distribution of significant indicator taxa along the TP gradient. The red circle near the top of the figure is the observed change point.



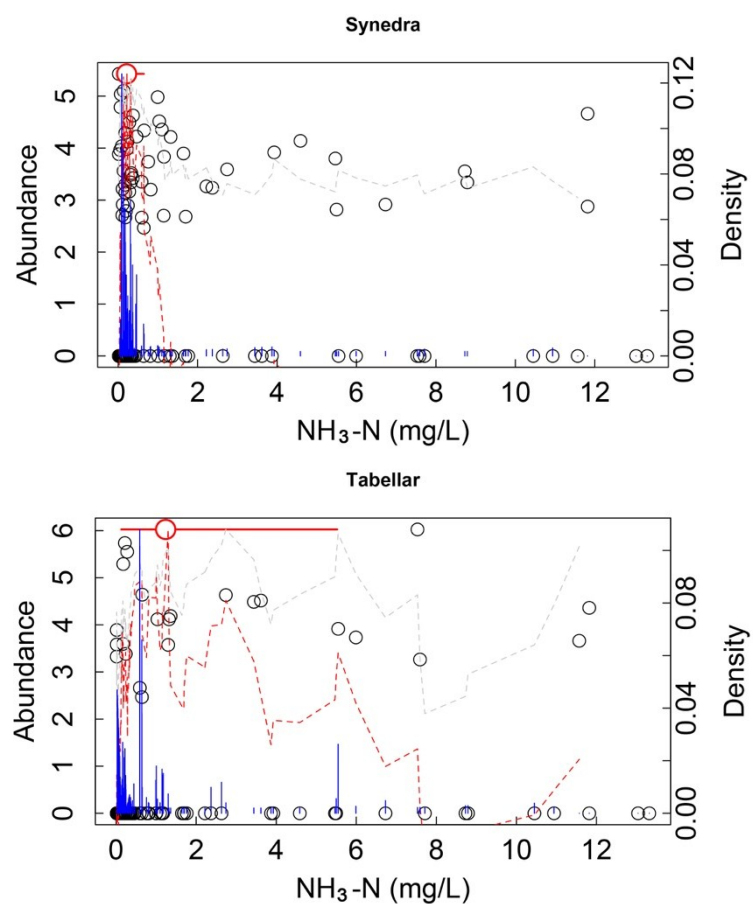


Fig. S5 Abundance distribution of significant indicator taxa along the NH₃-N gradient. The red circle near the top of the figure is the observed change point.

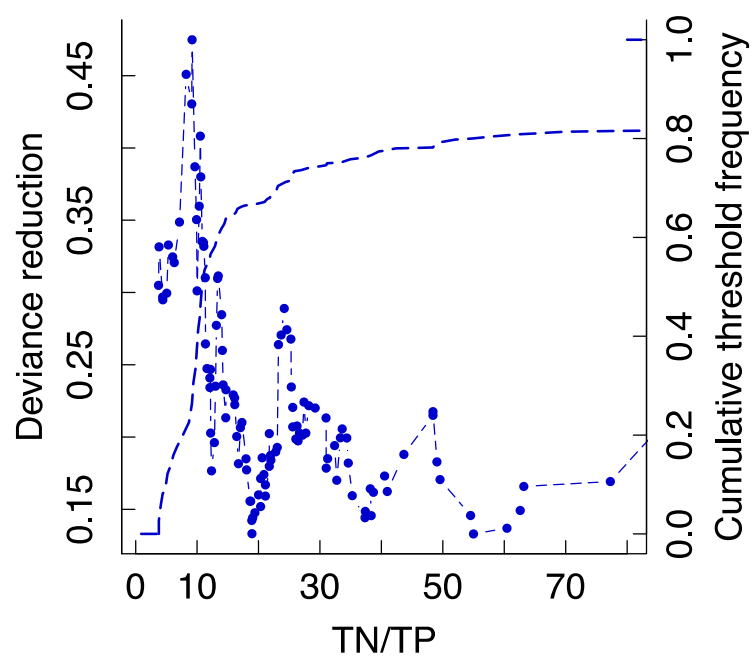


Fig. S6 Change point analysis (nCPA) of diatom taxa response to TN/TP gradient

Table S1. Stepwise linear regression of environmental variables and diatom assemblage

Function	R	<i>p</i> value
$Y_{\text{Shannon-Wiener}} = -0.253 * X_{\text{HQT}} + 0.009$	0.253	0.004
$Y_{\text{Shannon-Wiener}} = -0.234 * X_{\text{HQT}} + 0.197 X_{\text{NO}_3\text{-N}} + 0.013$	0.316	0.027
$Y_{\text{Pielou}} = 0.348 X_{\text{TN/TP}} + 0.036$	0.205	0.019

Table S2. Proposed nutrient criteria for TN and TP from the literatures.

TN (mg/L)	TP (mg/L)	NH ₃ -N (mg/L)	Location	Reference
2.40	0.20	-	Jiaxing urban river	Liang et al., 2014
1.70	0.055	-	Cao-E river	Chen & Lu, 2014
0.35	0.03	-	Clark Fork River	Dodds et al., 1997
0.54	0.033	-	Ecoregion VII	USEPA, 2000
0.70	0.03	-	USA	Smith et al., 2003
0.40-1.00	0.01-0.03	-	Kentucky and Michigan	Stevenson et al., 2006
-	0.065	-	New York State	Smith et al., 2007
0.70	0.03	-	New York State	Smith et al., 2010
2.00	0.07	-	Pennsylvania watershed	Sheeder & Evans, 2004
1.22-1.50	0.019-0.036	0.03-0.04	Tamsui River	Hsieh et al., 2016

Dodds, W.K., Smith, V.H., Zander, B., 1997. Developing nutrient targets to control benthic chlorophyll levels in streams: A case study of the Clark Fork River. *Water Research* 31, 1738-1750.

Hsieh, P. Y., Shiu, H. Y., & Chiueh, P. T. (2016). Reconstructing nutrient criteria for source water areas using reference conditions. *Sustainable Environment Research*, 26(5), 243-248.

Liang, X., Zhu, S., Ye, R., Guo, R., Zhu, C., Fu, C., ... & Chen, Y. (2014). Biological thresholds of nitrogen and phosphorus in a typical urban river system of the Yangtz delta, China. *Environmental Pollution*, 192, 251-258.

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Smith, A. J., & Tran, C. P. (2010). A weight-of-evidence approach to define nutrient criteria protective of aquatic life in large rivers. *Journal of the North American Benthological Society*, 29(3), 875-891.

Stevenson, R.J., Rier, S.T., Riseng, C.M., Schultz, R.E., Wiley, M.J., 2006. Comparing Effects of Nutrients on Algal Biomass in Streams in Two Regions with Different Disturbance Regimes and with Applications for Developing Nutrient Criteria. *Hydrobiologia* 561, 149-165.

USEPA, 2000. Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Nutrient Ecoregion VII. United States Environmental Protection Agency, Office of Science and Technology, Health and Ecological Criteria Division, Washington, D.C.. EPA 822-B-00- 018

Table S3. Full name of significant indicator taxa in Fig. 3.

Abbreviation	Taxa	Response to nutrients
<i>Tabellar</i>	<i>Tabellaria</i>	TN/NH ₃ -N
<i>Nitzschi</i>	<i>Nitzschia</i>	TN/TP/NH ₃ -N
<i>Cyclotel</i>	<i>Cyclotella</i>	TN/TP/NH ₃ -N
<i>Coscinod</i>	<i>Coscinodiscus</i>	TN/NH ₃ -N
<i>Melosira</i>	<i>Melosira</i>	TP/NH ₃ -N
<i>Synedra</i>	<i>Synedra</i>	NH ₃ -N