

# Supplementary Material

Table S1 The list of phytoplankton species in Dongting Lake (March 2017–December 2019)

	Phyla	Genera/Species		Phyla	Genera/Species
1	Cyanobacteria	<i>Oxynema acuminatum</i> (Gomont) Chatchawan, Komárek, Struneky, Smarda & Peerapornpisal	35	Bacillariophyta	<i>Actinastrum</i> sp.
2		<i>Raphidiopsis</i> sp.	36		<i>Crucigenia quadrata</i> Morren
3		<i>Dactylococcopsis raphidiooides</i> Hansgirg	37		<i>Chodatella</i> sp.
4		<i>Microcystis</i> sp.	38		<i>Fragilaria radians</i> (Kützing) D.M.Williams & Round
5		<i>Aphanizomenon</i> sp.	39		<i>Meridion</i> sp.
6		<i>Limnothrix</i> sp.	40		<i>Stephanodiscus</i> sp.
7		<i>Cuspidothrix</i> sp.	41		<i>Aulacoseira granulata</i> (Ehrenberg) Simonsen
8		<i>Cylindrospermopsis</i> sp.	42		<i>Nitzschia gracilis</i> Hantzsch
9		<i>Merismopedia</i> sp.	43		<i>Surirella</i> sp.
10		<i>Chroococcus</i> sp.	44		<i>Cyclotella meneghiniana</i> Kützing
11		<i>Lyngbya</i> sp.	45		<i>Navicula radios</i> Kützing
12		<i>Anabaena azotica</i> Ley	46		<i>Gyrosigma</i> sp.
13		<i>Pseudanabaena catenata</i> Lauterborn	47		<i>Gomphonema</i> sp.
14		<i>Spirulina</i> sp.	48		<i>Pinnularia gracillima</i> W.Gregory
15	Chlorophyta	<i>Scenedesmus naegelii</i> Brébisson	49		<i>Cymbella</i> sp.
16		<i>Volvox</i> sp.	50		<i>Stauroneis</i> sp.
17		<i>Schroederia</i> sp.	51		<i>Fragilaria</i> sp.
18		<i>Quadrigula chodatii</i> (Tanner-Fülleman) G.M.Smith	52		<i>Eunotia</i> sp.
19		<i>Ankistrodesmus</i> sp.	53		<i>Cymatopleura</i> sp.
20		<i>Planktosphaeria</i> sp.	54		<i>Amphora</i> sp.
21		<i>Coelastrum</i> sp.	55		<i>Diatoma</i> sp.

22	<i>Chlorella vulgaris</i> Beijerinck	56		<i>Asterionella</i> sp.
23	<i>Selenastrum</i> sp.	57		<i>Achnanthes</i> sp.
24	<i>Cosmarium</i> sp.	58		<i>Coccconeis</i> sp.
25	<i>Pediastrum</i> sp.	59	Cryptophyta	<i>Teleaulax acuta</i> (Butcher) D.R.A.Hill
26	<i>Oocystis</i> sp.	60		<i>Chroomonas</i> sp.
27	<i>Pandorina</i> sp.	61		<i>Strombomonas</i> sp.
28	<i>Eudorina</i> sp.	62	Euglenozoa	<i>Phacus</i> sp.
29	<i>Kirchneriella</i> sp.	63		<i>Trachelomonas</i> sp.
30	<i>Tetrastrum</i> sp.	64		<i>Euglena</i> sp.
31	<i>Tetraedron</i> sp.	65		<i>Gymnodinium</i> sp.
32	<i>Treubaria</i> sp.	66	Miozoa	<i>Ceratium</i> sp.
33	<i>Cosmarium abbreviatum</i> Raciborski	67		<i>Peridinium bipes</i> F.Stein
34	<i>Staurastrum</i> sp.			

Table S2 Correlation between water quality factors and phytoplankton community in different areas of Dongting Lake

		WT	pH	Cond	DO	COD <sub>Mn</sub>	BOD <sub>5</sub>	COD <sub>Cr</sub>	NH <sub>4</sub> -N	TN	TP
Phytoplankton Density	Dongting Lake	0.0309	0.0520	<b>0.4856*</b>	-0.1447	<b>0.8573**</b>	<b>0.5807*</b>	<b>0.8492**</b>	<b>0.2016*</b>	<b>-0.1682*</b>	<b>0.2702*</b>
	Western Dongting Lake	-0.0473	-0.1939	0.1432	-0.0806	0.1584	-0.2317	0.2055	0.0774	<b>0.2546*</b>	<b>0.2746*</b>
	Southern Dongting Lake	-0.0591	-0.1244	<b>0.5074*</b>	-0.0117	0.0999	0.0613	0.2081	0.0180	-0.0240	0.0852
	Eastern Dongting Lake	0.0649	0.1773	<b>0.6120*</b>	<b>-0.2667*</b>	<b>0.8887**</b>	<b>0.7108**</b>	<b>0.8814**</b>	<b>0.3147*</b>	<b>-0.4081*</b>	0.1563
Phytoplankton Species	Dongting Lake	0.0737	0.0400	<b>0.5210*</b>	-0.1469	<b>0.7186**</b>	<b>0.3780*</b>	<b>0.7107**</b>	0.1470	-0.1264	0.1458
	Western Dongting Lake	0.1830	-0.0355	0.0304	-0.2463	0.2434	<b>-0.3525*</b>	0.1685	0.0515	-0.1511	-0.0865
	Southern Dongting Lake	0.0709	-0.1590	<b>0.5006*</b>	-0.0981	-0.0435	-0.1557	0.1223	-0.0581	0.0109	-0.0762
	Eastern Dongting Lake	0.0569	0.2402	<b>0.7331**</b>	-0.2126	<b>0.7926**</b>	<b>0.6022*</b>	<b>0.7879**</b>	<b>0.2726*</b>	<b>-0.3394*</b>	0.0420
Shannon Wiener Index	Dongting Lake	<b>-0.1609*</b>	-0.0867	<b>-0.1806*</b>	<b>0.2377*</b>	<b>-0.2255*</b>	<b>-0.1593*</b>	<b>-0.2814*</b>	-0.0571	0.1319	-0.1432
	Western Dongting Lake	-0.1373	0.0824	0.0421	0.1719	0.0398	-0.0387	-0.1281	-0.2080	0.1057	-0.1142
	Southern Dongting Lake	-0.2022	0.0282	-0.0278	<b>0.2976*</b>	0.0021	-0.1257	-0.0779	0.1868	0.1042	0.0329
	Eastern Dongting Lake	-0.1498	<b>-0.3692*</b>	<b>-0.4276*</b>	<b>0.2565*</b>	<b>-0.3160*</b>	-0.1923	<b>-0.3734*</b>	-0.1927	0.2482	-0.0559
Margalef Index	Dongting Lake	0.0971	0.0409	<b>0.4774*</b>	-0.1469	<b>0.6224*</b>	<b>0.2844*</b>	<b>0.6150*</b>	0.1131	-0.1095	0.1169
	Western Dongting Lake	0.2054	0.0013	0.0108	-0.2498	0.2273	<b>-0.3410*</b>	0.1496	0.0345	-0.1878	-0.1301
	Southern Dongting Lake	0.0815	-0.1484	<b>0.4482*</b>	-0.1001	-0.0536	-0.1646	0.0960	-0.0634	0.0111	-0.0952
	Eastern Dongting Lake	0.0765	0.2479	<b>0.7095**</b>	-0.1967	<b>0.7100**</b>	<b>0.5147*</b>	<b>0.7067**</b>	0.2321	<b>-0.2908*</b>	0.0169
Pieloud Index	Dongting Lake	<b>-0.1674*</b>	-0.1062	<b>-0.2428*</b>	<b>0.2261*</b>	<b>-0.2906*</b>	-0.1262	<b>-0.3345*</b>	-0.0497	0.1087	<b>-0.1574*</b>
	Western Dongting Lake	-0.1677	0.0831	0.0260	0.1997	-0.0515	0.0776	-0.1445	-0.1794	0.1566	-0.0413
	Southern Dongting Lake	-0.1608	0.0183	-0.1359	0.2256	0.0213	-0.0049	-0.0746	0.1461	0.0499	0.0153
	Eastern Dongting Lake	-0.1899	<b>-0.4252*</b>	<b>-0.4763*</b>	<b>0.2828*</b>	<b>-0.3704*</b>	-0.2059	<b>-0.4242*</b>	-0.1438	0.2089	-0.0450

Note: Samples  $n_0$ (Dongting Lake)=178;  $n_1$  (Western Dongting Lake)=60;  $n_2$  (Southern Dongting Lake)=58;  $n_3$  (Eastern Dongting Lake)=60; \* indicates  $p<0.05$ , \*\* indicates  $p<0.01$ .

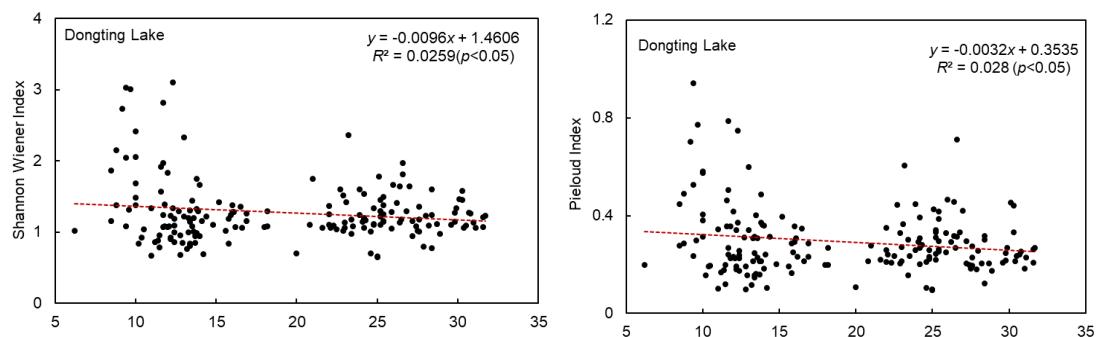


Figure S1 Linear relationship between water temperature and phytoplankton community

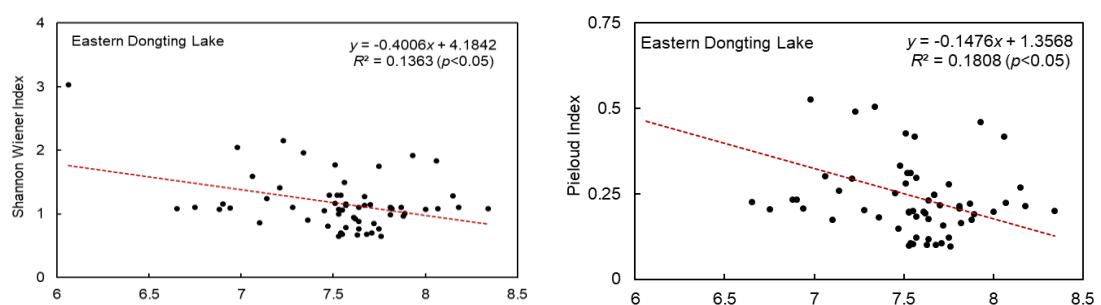
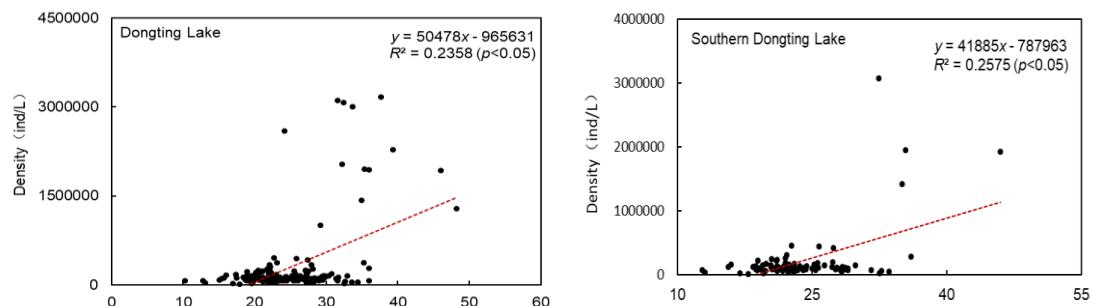
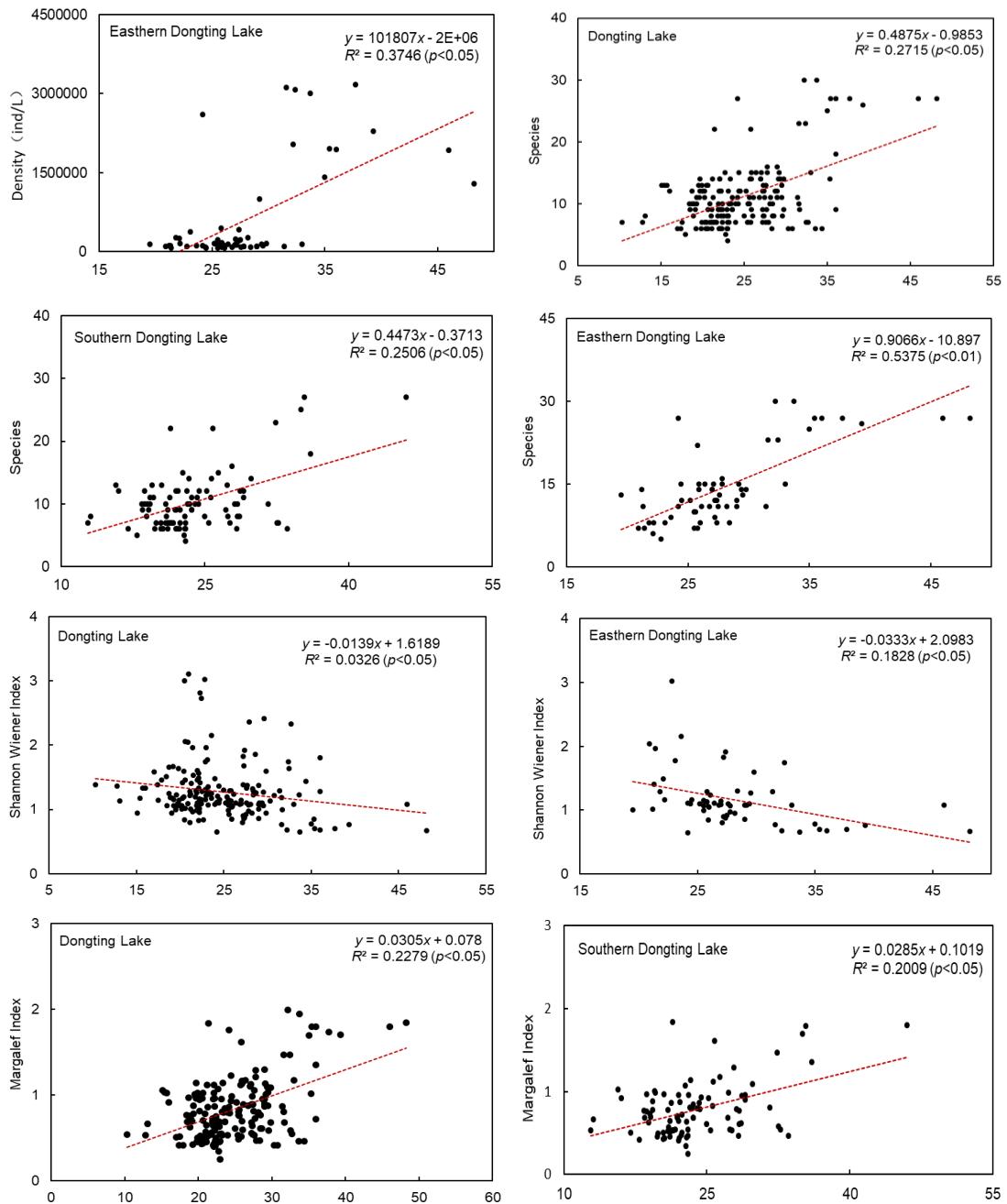


Figure S2 Linear relationship between pH and phytoplankton community





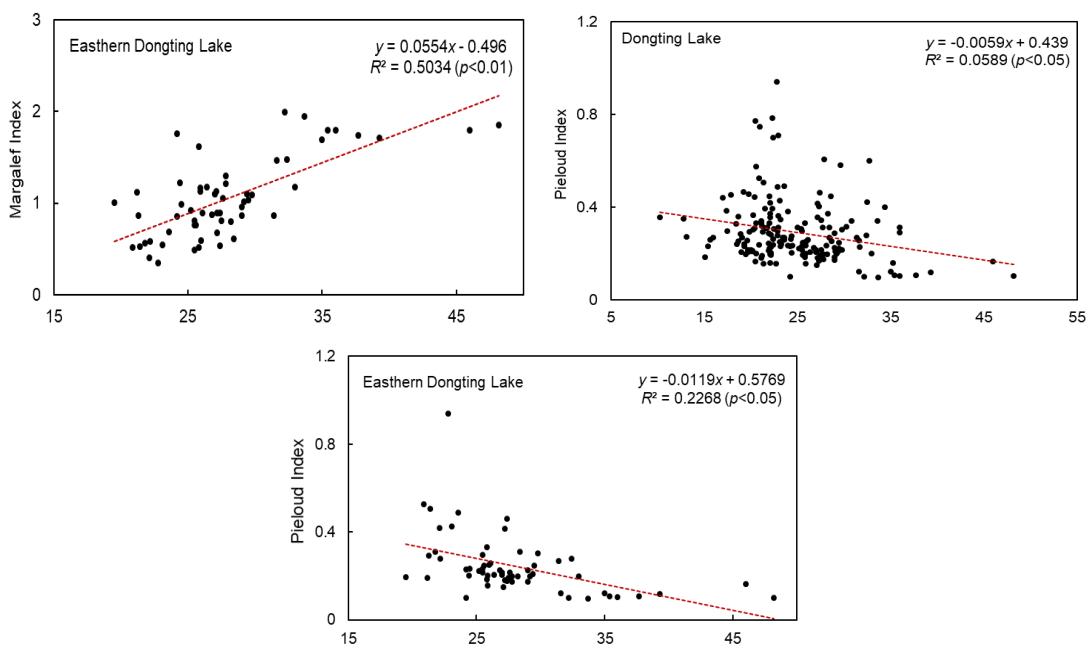


Figure S3 Linear relationship between electrical conductivity and phytoplankton community

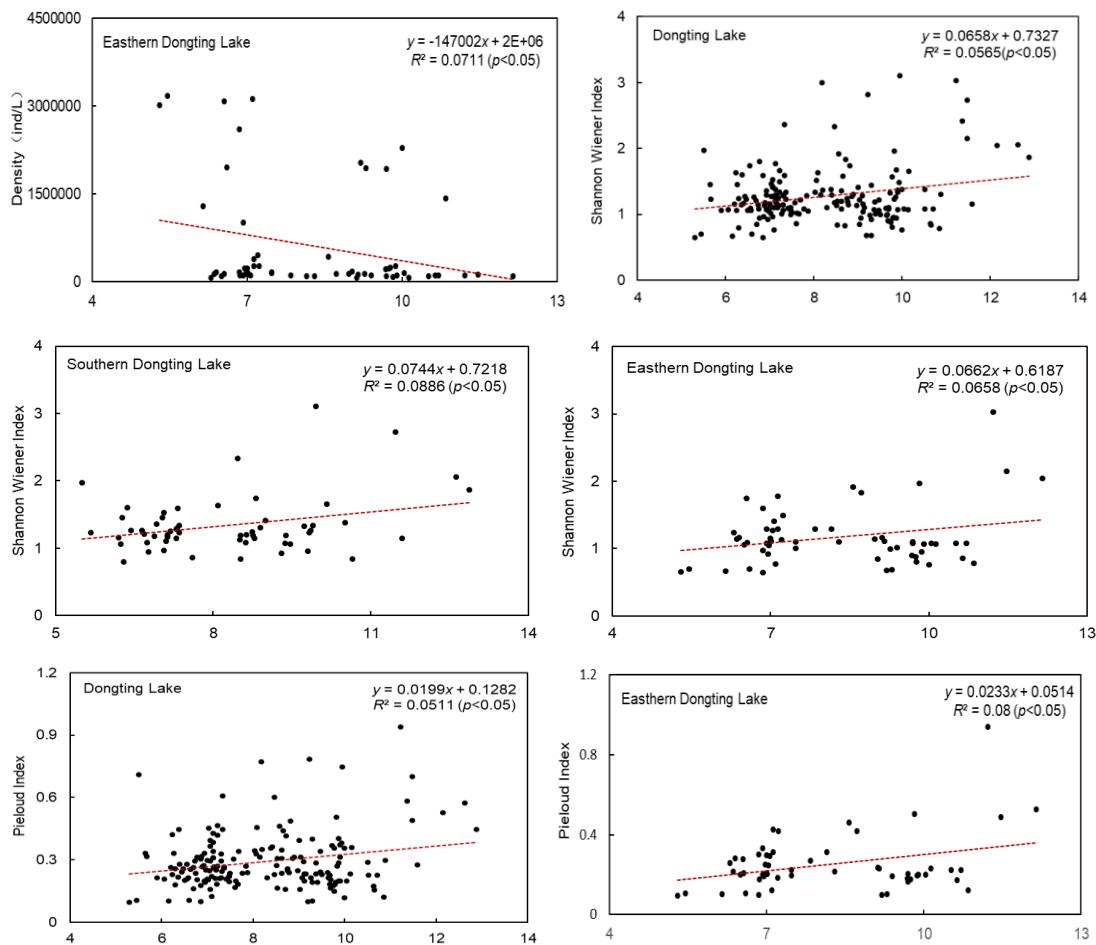
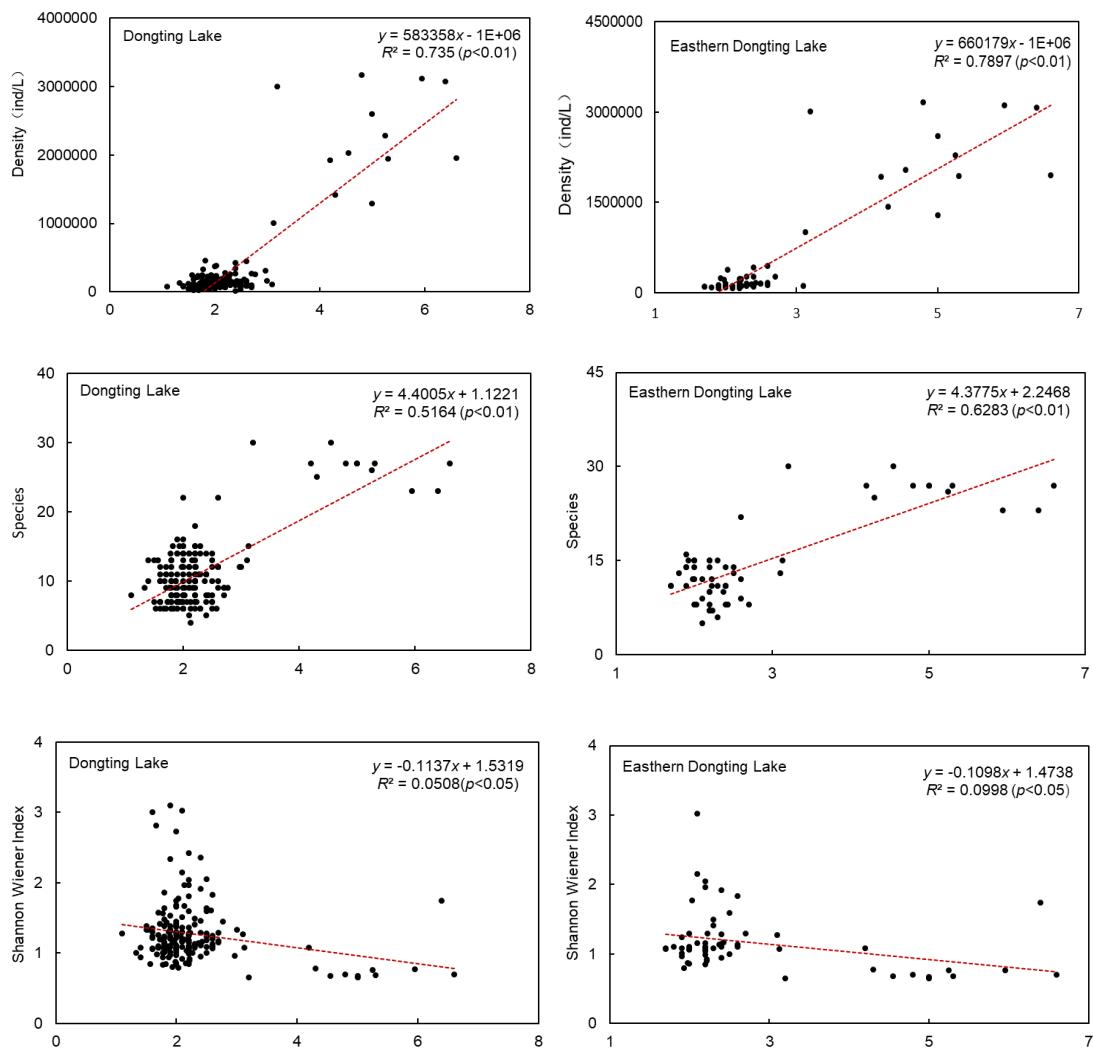


Figure S4 Linear relationship between DO and phytoplankton community



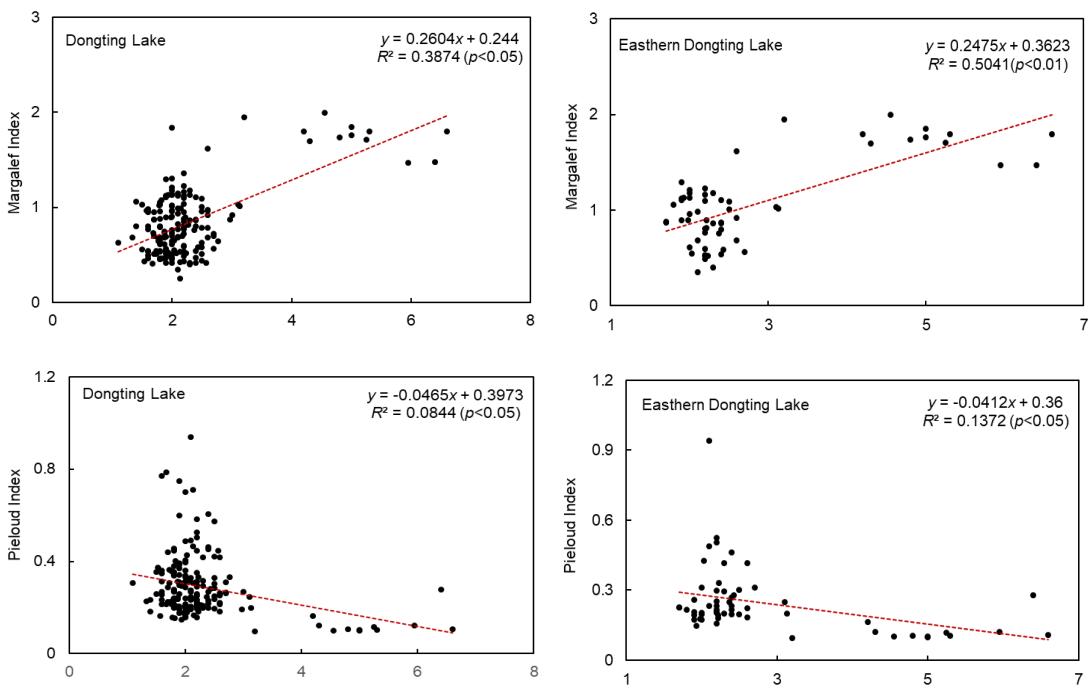
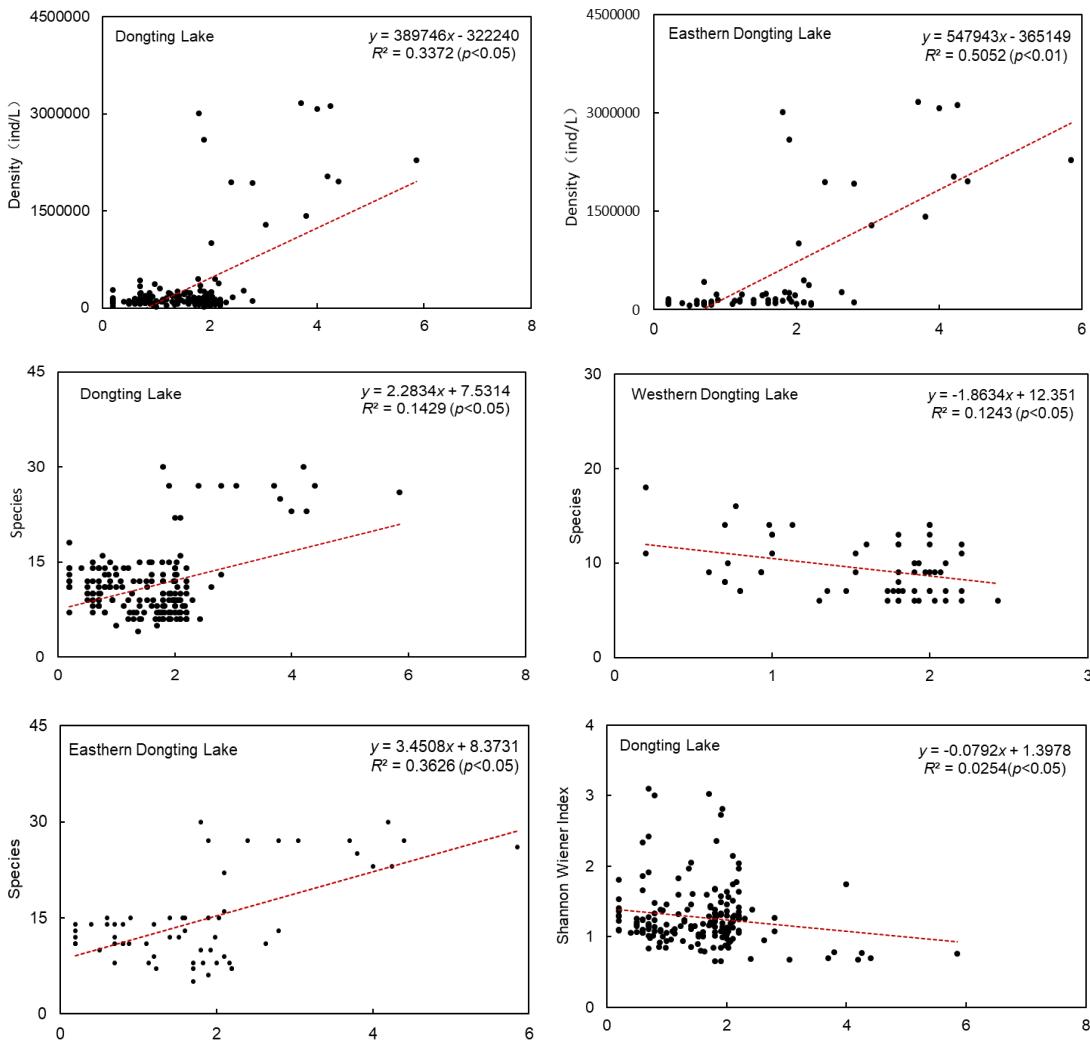


Figure S5 Linear relationship between  $\text{COD}_{\text{Mn}}$  and phytoplankton community



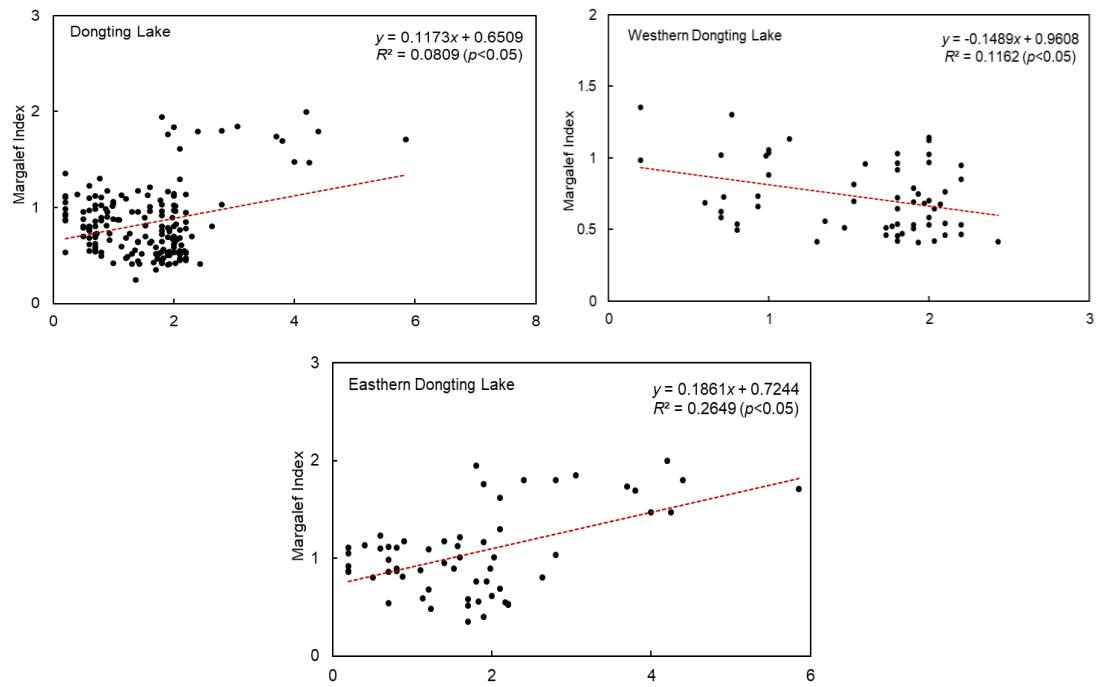


Figure S6 Linear relationship between BOD<sub>5</sub> and phytoplankton community

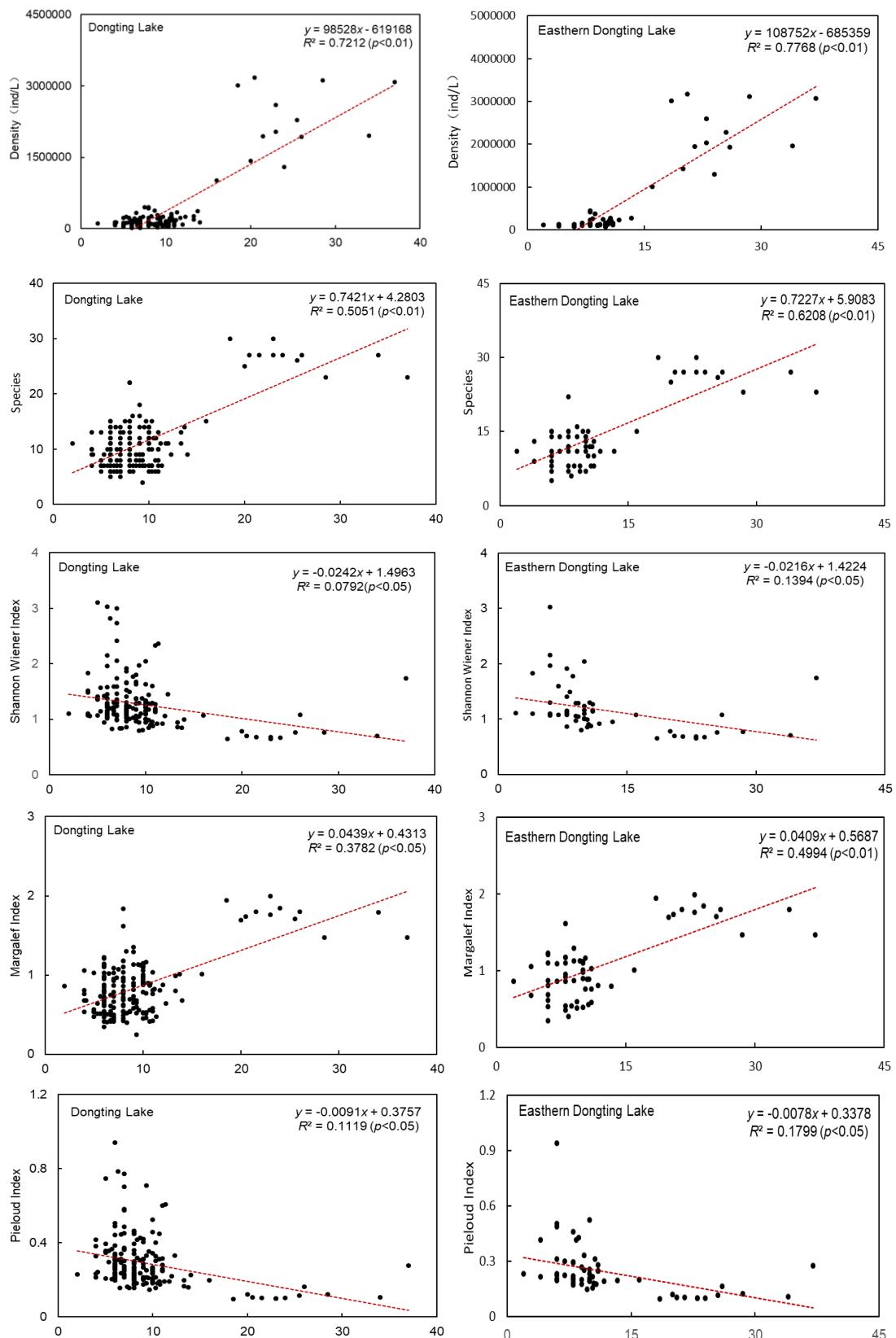


Figure S7 Linear relationship between  $\text{COD}_{\text{Cr}}$  and phytoplankton community

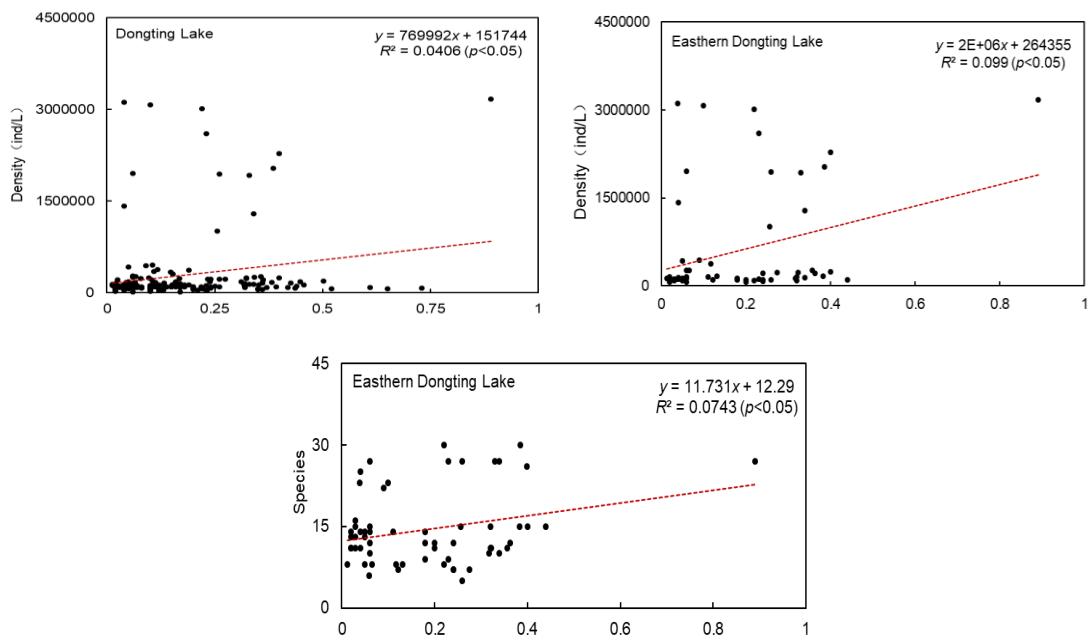


Figure S8 Linear relationship between NH<sub>4</sub>-N and phytoplankton community

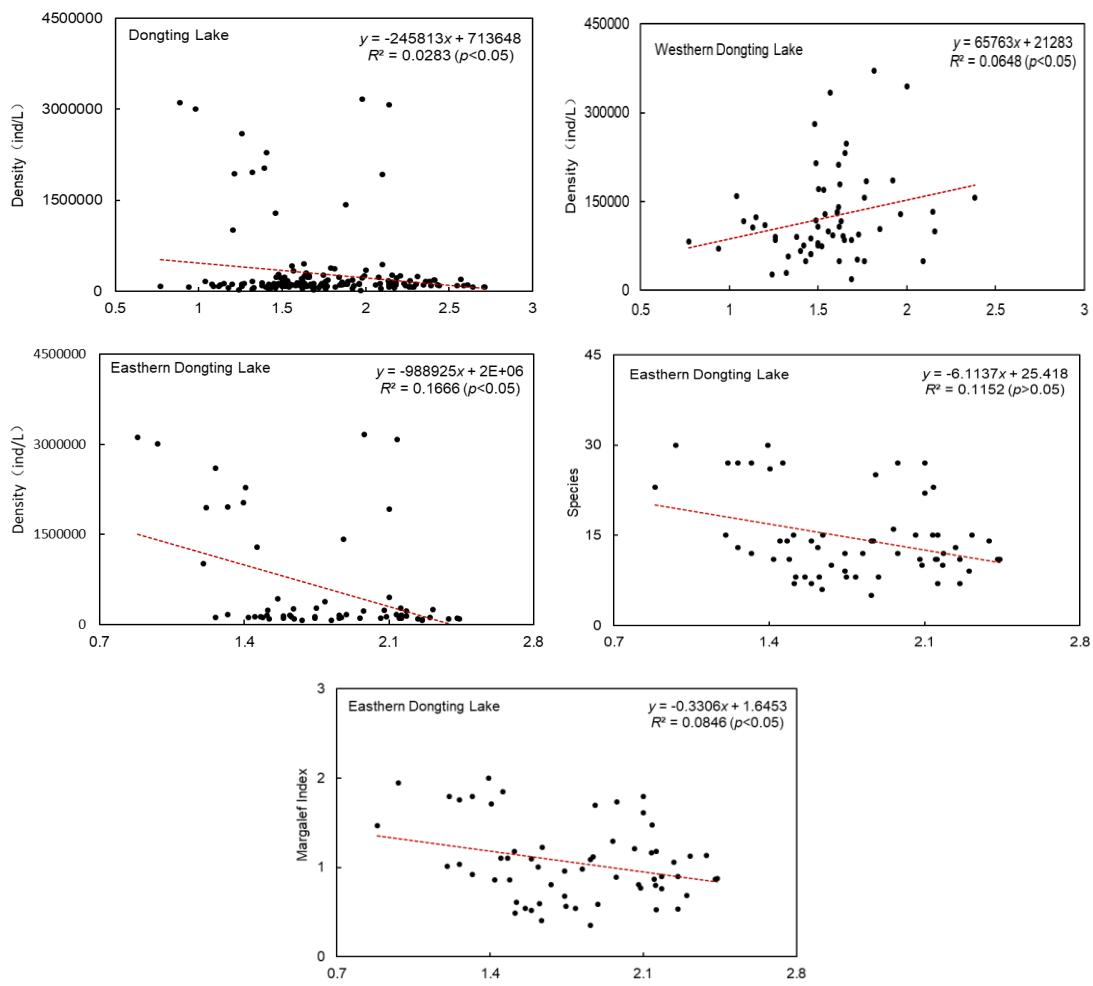


Figure S9 Linear relationship between TN and phytoplankton community

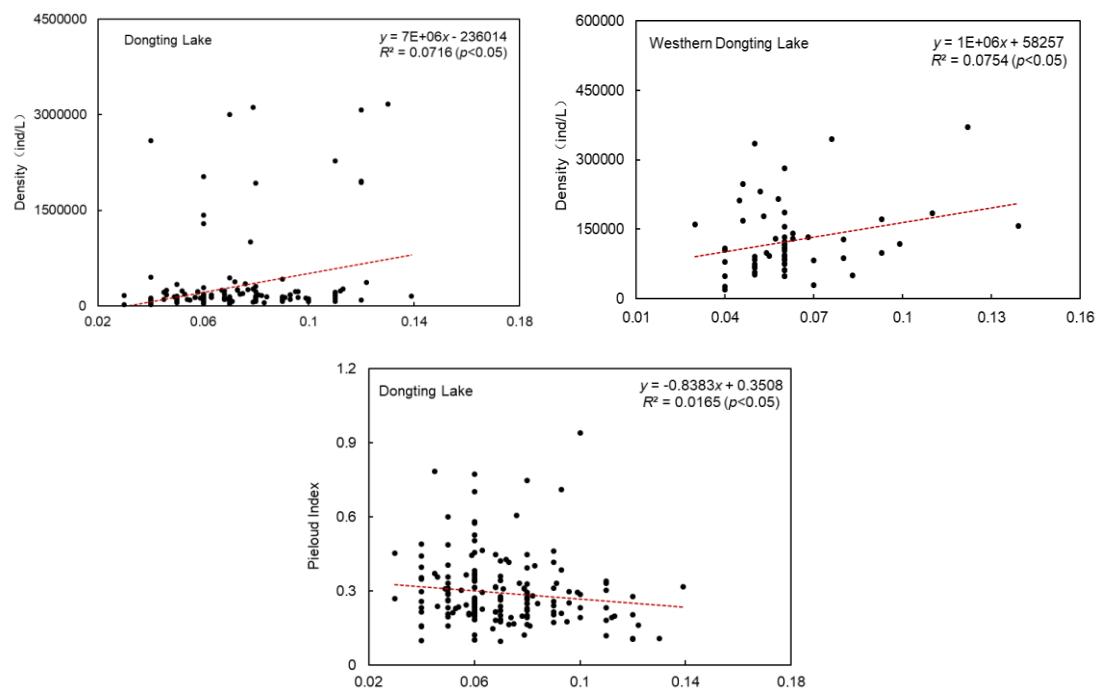


Figure S10 Linear relationship between TP and phytoplankton community