

Table S1. The PERMANOVA result of the overall difference at all river system grouping levels.

	Df	Sums of squares	R <sup>2</sup>	F. Model	Pr (>F)
Site	11	6.539674557	0.610547581	5.130679948	0.001
Residuals	36	4.171488281	0.389452419		
Total	47	10.71116284	1		

Table S2. The PERMANOVA result of the pairs of river systems.

Pairs	Df	Sums of squares	F. Model	R <sup>2</sup>	Pr (>F)
HJ vs HSH	1	0.395737019	2.567379229	0.299669147	0.041
HJ vs GJ	1	0.174481133	1.457821555	0.195475521	0.186
HJ vs LJ	1	0.204948246	1.286252941	0.17653147	0.354
HJ vs NLJ	1	0.326621031	1.998252482	0.249836134	0.162
HJ vs NPJ	1	0.330430666	2.210427462	0.269221971	0.08
HJ vs OR	1	0.25652241	1.893173056	0.23984943	0.094
HJ vs QJ	1	1.068188089	6.357821772	0.514477542	0.02
HJ vs XJ	1	0.691870171	3.962651321	0.397750678	0.034
HJ vs YJ	1	0.435564166	3.465536026	0.366121477	0.025
HJ vs YYJ	1	0.365352004	2.337080611	0.280323619	0.062
HJ vs ZJ	1	0.153360067	1.348865336	0.183547429	0.253
HSH vs GJ	1	0.625401792	7.03552154	0.539719222	0.035
HSH vs LJ	1	0.334255198	2.60033238	0.302352545	0.08
HSH vs NLJ	1	0.241889537	1.823391179	0.233069156	0.133
HSH vs NPJ	1	0.873137602	7.3562658	0.550772642	0.024
HSH vs OR	1	0.802844402	7.667717685	0.56100937	0.024
HSH vs QJ	1	1.309452072	9.542896416	0.613971564	0.037
HSH vs XJ	1	1.031516129	7.17308902	0.544525966	0.025
HSH vs YJ	1	0.702332972	7.401523632	0.552289712	0.03
HSH vs YYJ	1	0.590036757	4.700207497	0.43926321	0.022
HSH vs ZJ	1	0.518694175	6.256757681	0.510474127	0.024
GJ vs LJ	1	0.139575399	1.483440063	0.198229698	0.28
GJ vs NLJ	1	0.569401768	5.798099185	0.491443502	0.028
GJ vs NPJ	1	0.605595665	7.189035388	0.545076662	0.028
GJ vs OR	1	0.627054466	8.926013331	0.598017242	0.036
GJ vs QJ	1	1.318557501	12.83102644	0.681376901	0.027
GJ vs XJ	1	1.049089093	9.593920678	0.615234672	0.031
GJ vs YJ	1	0.887114388	14.67855857	0.709844379	0.034
GJ vs YYJ	1	0.701571555	7.70281094	0.562133636	0.029
GJ vs ZJ	1	0.245879742	5.075212805	0.458249687	0.029
LJ vs NLJ	1	0.42088246	3.05305578	0.337240359	0.091
LJ vs NPJ	1	0.681985549	5.504765747	0.478476995	0.063
LJ vs OR	1	0.709508633	6.455861984	0.518299094	0.021
LJ vs QJ	1	1.291681358	9.069876217	0.601854726	0.024
LJ vs XJ	1	1.000584314	6.715304395	0.528127694	0.038

Pairs	Df	Sums of squares	F. Model	R <sup>2</sup>	Pr (>F)
LJ vs YJ	1	0.874444602	8.736818905	0.592856502	0.037
LJ vs YYJ	1	0.736122146	5.63080828	0.484128716	0.035
LJ vs ZJ	1	0.369941752	4.199187726	0.411717858	0.038
NLJ vs NPJ	1	0.53945411	4.214290319	0.412587677	0.054
NLJ vs OR	1	0.483282184	4.238672151	0.41398651	0.016
NLJ vs QJ	1	1.215218173	8.29328707	0.580222522	0.036
NLJ vs XJ	1	0.924418671	6.03735551	0.501551649	0.038
NLJ vs YJ	1	0.372332237	3.573136423	0.373246161	0.035
NLJ vs YYJ	1	0.224914639	1.667923852	0.217519616	0.17
NLJ vs ZJ	1	0.224005536	2.42918422	0.288187345	0.136
NPJ vs OR	1	0.100375596	1.003241851	0.143253921	0.449
NPJ vs QJ	1	0.793275628	5.984085066	0.499335997	0.032
NPJ vs XJ	1	0.570931308	4.102980653	0.406115858	0.019
NPJ vs YJ	1	0.39021086	4.324284776	0.418845941	0.029
NPJ vs YYJ	1	0.194681995	1.610526588	0.211618286	0.129
NPJ vs ZJ	1	0.268440453	3.430628018	0.363775139	0.078
OR vs QJ	1	1.076796183	9.081089199	0.602150752	0.033
OR vs XJ	1	0.797171707	6.369128845	0.514921376	0.031
OR vs YJ	1	0.241427629	3.166325411	0.345430177	0.033
OR vs YYJ	1	0.195553846	1.829445903	0.233662245	0.237
OR vs ZJ	1	0.202149692	3.145827205	0.343963114	0.082
QJ vs XJ	1	0.300388509	1.905114285	0.24099769	0.13
QJ vs YJ	1	1.260419756	11.58884055	0.658874615	0.031
QJ vs YYJ	1	1.036142712	7.432587886	0.553325089	0.033
QJ vs ZJ	1	1.15998293	11.98668574	0.666419924	0.028
XJ vs YJ	1	0.922569219	7.998161949	0.571372297	0.032
XJ vs YYJ	1	0.674908857	4.622931778	0.435184173	0.03
XJ vs ZJ	1	0.78473497	7.592340935	0.558574934	0.035
YJ vs YYJ	1	0.233640318	2.406721988	0.286285426	0.07
YJ vs ZJ	1	0.288152323	5.292493781	0.468673606	0.029
YYJ vs ZJ	1	0.100841271	1.185122231	0.164941137	0.394