

Table S1. Summary of soil and site characteristics.

Site	Distance to center (m)	Direction	Latitude	Elevation (m)	Mean annual temperature (°C)	Annual precipitation (mm ³)	Soil water content / moisture (%)	pH	Total Carbon (g/kg)	Total Nitrogen (g/kg)
NW T	0	Center	40.04	3186.00	2.50	798.74	7.79	5.15	3.93	0.15
	1	East	40.04	3186.00	2.50	798.74	10.07	5.03	5.66	0.22
	1	North	40.04	3186.00	2.50	798.74	8.07	5.27	2.36	0.11
	1	South	40.04	3186.00	2.50	798.74	13.18	4.76	9.95	0.35
	1	West	40.04	3186.00	2.50	798.74	10.29	5.03	3.70	0.16
	10	East	40.04	3186.00	2.50	798.74	12.55	4.59	12.78	0.33
	10	North	40.04	3186.00	2.50	798.74	8.77	4.82	16.95	0.48
	10	South	40.04	3186.00	2.50	798.74	35.01	5.33	16.47	0.42
	10	West	40.04	3186.00	2.50	798.74	16.90	4.25	13.91	0.32
	50	East	40.04	3186.00	2.50	798.74	14.25	4.30	24.83	0.68
	50	North	40.04	3186.00	2.50	798.74	10.73	4.45	26.36	0.81
	50	South	40.04	3186.00	2.50	798.74	25.42	5.22	4.05	0.16
	50	West	40.04	3186.00	2.50	798.74	18.97	5.01	6.91	0.21
	100	East	40.04	3186.00	2.50	798.74	34.91	4.58	9.84	0.26
	100	North	40.04	3186.00	2.50	798.74	21.48	4.29	17.15	0.41
	100	South	40.04	3186.00	2.50	798.74	19.30	5.07	14.82	0.41
	100	West	40.04	3186.00	2.50	798.74	9.72	4.66	11.37	0.32
	200	East	40.04	3186.00	2.50	798.74	5.82	4.92	8.84	0.28
	200	North	40.04	3186.00	2.50	798.74	22.75	4.52	20.39	0.57
	200	South	40.04	3186.00	2.50	798.74	5.60	4.74	4.20	0.15
200	West	40.04	3186.00	2.50	798.74	24.50	5.53	6.24	0.20	
HFR	0	Center	42.54	356.40	8.27	1099.73	33.93	4.00	11.99	0.42
	1	East	42.54	356.40	8.27	1099.73	30.00	4.17	16.59	0.49
	1	North	42.54	356.40	8.27	1099.73	33.14	3.74	16.80	0.55
	1	South	42.54	356.40	8.27	1099.73	35.87	3.70	8.65	0.31
	1	West	42.54	356.40	8.27	1099.73	29.87	3.78	16.28	0.47
	10	East	42.54	356.40	8.27	1099.73	36.55	3.41	15.14	0.46
	10	North	42.54	356.40	8.27	1099.73	50.95	3.95	22.03	0.68
	10	South	42.54	356.40	8.27	1099.73	29.47	3.69	25.17	0.76
	10	West	42.54	356.40	8.27	1099.73	44.80	3.69	22.15	0.72
	50	East	42.54	356.40	8.27	1099.73	55.15	4.70	35.21	1.38
	50	North	42.54	356.40	8.27	1099.73	24.39	3.61	28.95	0.92
	50	South	42.54	356.40	8.27	1099.73	31.18	3.72	17.46	0.60
	50	West	42.54	356.40	8.27	1099.73	24.35	4.04	8.93	0.30
	100	East	42.54	356.40	8.27	1099.73	34.27	3.68	14.13	0.49
	100	North	42.54	356.40	8.27	1099.73	18.20	3.94	10.92	0.40
	100	South	42.54	356.40	8.27	1099.73	18.93	4.07	11.61	0.43
	100	West	42.54	356.40	8.27	1099.73	45.73	3.62	39.22	1.27
	200	East	42.54	356.40	8.27	1099.73	18.25	4.19	8.90	0.32
	200	North	42.54	356.40	8.27	1099.73	41.54	3.77	28.08	0.68
	200	South	42.54	356.40	8.27	1099.73	39.48	3.78	20.90	0.71

	200	West	42.54	356.40	8.27	1099.73	45.26	3.44	24.32	0.58
AND	0	Center	44.23	860.00	8.94	2261.22	25.05	5.91	4.66	0.21
	1	East	44.23	860.00	8.94	2261.22	29.29	5.37	11.30	0.26
	1	North	44.23	860.00	8.94	2261.22	64.63	4.43	35.51	0.42
	1	South	44.23	860.00	8.94	2261.22	22.45	6.13	3.67	0.17
	1	West	44.23	860.00	8.94	2261.22	32.95	6.09	16.18	0.45
	10	East	44.23	860.00	8.94	2261.22	50.48	5.18	21.09	0.46
	10	North	44.23	860.00	8.94	2261.22	28.49	5.37	10.45	0.36
	10	South	44.23	860.00	8.94	2261.22	34.69	5.56	13.40	0.39
	10	West	44.23	860.00	8.94	2261.22	39.92	5.83	34.19	0.59
	50	East	44.23	860.00	8.94	2261.22	44.60	4.00	41.89	0.63
	50	North	44.23	860.00	8.94	2261.22	56.34	4.07	36.13	0.42
	50	South	44.23	860.00	8.94	2261.22	32.30	5.45	31.15	0.81
	50	West	44.23	860.00	8.94	2261.22	24.95	5.62	8.76	0.30
	100	East	44.23	860.00	8.94	2261.22	56.12	4.80	34.86	0.65
	100	North	44.23	860.00	8.94	2261.22	60.38	4.16	44.91	0.67
	100	South	44.23	860.00	8.94	2261.22	28.15	5.61	13.33	0.40
	100	West	44.23	860.00	8.94	2261.22	42.87	5.22	13.52	0.35
	200	East	44.23	860.00	8.94	2261.22	34.93	5.07	19.17	0.43
200	North	44.23	860.00	8.94	2261.22	19.70	5.46	2.59	0.12	
200	South	44.23	860.00	8.94	2261.22	19.35	5.77	3.19	0.16	
200	West	44.23	860.00	8.94	2261.22	26.85	5.78	6.54	0.25	
CWT	0	Center	35.05	864.00	12.62	1789.92	31.87	4.90	6.95	0.29
	1	East	35.05	864.00	12.62	1789.92	28.29	4.94	4.62	0.21
	1	North	35.05	864.00	12.62	1789.92	29.12	4.84	5.23	0.23
	1	South	35.05	864.00	12.62	1789.92	29.60	4.97	6.61	0.28
	1	West	35.05	864.00	12.62	1789.92	28.67	4.89	6.19	0.26
	10	East	35.05	864.00	12.62	1789.92	38.00	4.76	6.68	0.27
	10	North	35.05	864.00	12.62	1789.92	26.36	5.09	5.19	0.22
	10	South	35.05	864.00	12.62	1789.92	29.62	4.69	4.35	0.22
	10	West	35.05	864.00	12.62	1789.92	26.58	4.99	4.00	0.19
	50	East	35.05	864.00	12.62	1789.92	44.23	3.81	14.44	0.44
	50	North	35.05	864.00	12.62	1789.92	27.34	4.73	3.72	0.18
	50	South	35.05	864.00	12.62	1789.92	19.30	4.67	2.82	0.14
	50	West	35.05	864.00	12.62	1789.92	32.56	4.51	8.24	0.29
	100	East	35.05	864.00	12.62	1789.92	31.04	4.43	5.72	0.22
	100	North	35.05	864.00	12.62	1789.92	43.04	4.05	20.46	0.48
	100	South	35.05	864.00	12.62	1789.92	29.86	4.92	5.20	0.25
	100	West	35.05	864.00	12.62	1789.92	22.35	4.78	5.89	0.22
	200	East	35.05	864.00	12.62	1789.92	33.71	4.04	9.54	0.32
200	North	35.05	864.00	12.62	1789.92	23.88	5.20	3.24	0.15	
200	South	35.05	864.00	12.62	1789.92	26.82	4.62	3.65	0.18	
200	West	35.05	864.00	12.62	1789.92	33.60	5.22	7.55	0.28	
LUQ	0	Center	18.32	385.80	23.62	3687.38	37.18	5.39	3.35	0.24
	1	East	18.32	385.80	23.62	3687.38	37.64	5.43	3.22	0.24
	1	North	18.32	385.80	23.62	3687.38	37.75	5.19	5.89	0.38

	1	South	18.32	385.80	23.62	3687.38	43.85	5.57	4.82	0.26
	1	West	18.32	385.80	23.62	3687.38	35.07	5.38	4.48	0.30
	10	East	18.32	385.80	23.62	3687.38	41.17	5.45	8.41	0.47
	10	North	18.32	385.80	23.62	3687.38	39.20	5.39	12.27	0.73
	10	South	18.32	385.80	23.62	3687.38	51.41	5.53	4.45	0.31
	10	West	18.32	385.80	23.62	3687.38	37.22	4.83	8.67	0.56
	50	East	18.32	385.80	23.62	3687.38	38.15	4.99	10.63	0.71
	50	North	18.32	385.80	23.62	3687.38	41.33	4.81	5.71	0.43
	50	South	18.32	385.80	23.62	3687.38	44.31	4.88	11.08	0.54
	50	West	18.32	385.80	23.62	3687.38	38.88	4.81	8.19	0.51
	100	East	18.32	385.80	23.62	3687.38	36.98	4.86	4.27	0.37
	100	North	18.32	385.80	23.62	3687.38	38.99	4.40	11.55	0.69
	100	South	18.32	385.80	23.62	3687.38	38.86	5.51	5.45	0.31
	100	West	18.32	385.80	23.62	3687.38	52.18	4.32	10.59	0.70
	200	East	18.32	385.80	23.62	3687.38	42.92	4.55	12.90	0.73
	200	North	18.32	385.80	23.62	3687.38	40.02	4.67	8.44	0.60
	200	South	18.32	385.80	23.62	3687.38	37.58	4.91	7.16	0.43
	200	West	18.32	385.80	23.62	3687.38	40.48	5.38	6.81	0.41
BCI	0	Center	9.16	157.15	25.71	2657.94	23.25	5.68	1.63	0.15
	1	East	9.16	157.15	25.71	2657.94	26.25	5.74	1.98	0.19
	1	North	9.16	157.15	25.71	2657.94	25.12	6.05	2.07	0.18
	1	South	9.16	157.15	25.71	2657.94	27.03	6.27	2.57	0.21
	1	West	9.16	157.15	25.71	2657.94	26.33	6.57	2.55	0.22
	10	East	9.16	157.15	25.71	2657.94	27.62	5.26	3.13	0.26
	10	North	9.16	157.15	25.71	2657.94	29.00	5.69	2.03	0.20
	10	South	9.16	157.15	25.71	2657.94	35.14	6.11	8.23	0.47
	10	West	9.16	157.15	25.71	2657.94	35.67	6.63	6.35	0.46
	50	East	9.16	157.15	25.71	2657.94	38.49	5.84	6.15	0.44
	50	North	9.16	157.15	25.71	2657.94	20.67	5.67	1.65	0.16
	50	South	9.16	157.15	25.71	2657.94	31.56	5.91	2.66	0.26
	50	West	9.16	157.15	25.71	2657.94	41.48	5.43	4.30	0.39
	100	East	9.16	157.15	25.71	2657.94	28.08	5.76	4.20	0.32
	100	North	9.16	157.15	25.71	2657.94	38.65	5.92	6.49	0.39
	100	South	9.16	157.15	25.71	2657.94	37.26	6.34	4.03	0.35
	100	West	9.16	157.15	25.71	2657.94	47.09	5.29	7.07	0.54
	200	East	9.16	157.15	25.71	2657.94	24.95	6.44	3.56	0.30
	200	North	9.16	157.15	25.71	2657.94	28.55	5.77	3.01	0.27
	200	South	9.16	157.15	25.71	2657.94	31.30	5.75	2.81	0.26
200	West	9.16	157.15	25.71	2657.94	36.54	5.11	7.42	0.52	

Table S2. Sequence statistics (OTU generated under 97% similarity)

Samples	# of sequence reads	Effective # of reads	Chao 1 estimator (Theoretical estimation)	Total numbers of OTUs (Empirical estimation)	Total number of OTUs after resampling
NWT_C	58113	47663	20495.02	9789	6800.72±37.76
NWT_1E	59299	49356	20924.50	10257	7046.88±36.1
NWT_1N	50713	40432	20883.00	9445	7165.56±35.81
NWT_1S	46567	38403	18504.63	8615	6812.26±27.41
NWT_1W	42413	35222	18278.57	8495	7071.45±29.55
NWT_10E	45492	37793	17661.18	7975	6347.61±28.7
NWT_10N	50408	44404	12845.83	6726	5019.5±31.98
NWT_10S	39376	33336	16146.45	7614	6572.84±26.32
NWT_10W	46837	40519	14454.08	7245	5632.89±28.43
NWT_50E	32349	28752	9593.45	4962	4687.32±13.46
NWT_50N	48881	42219	14047.92	6733	5124.68±33.09
NWT_50S	54555	47430	17985.12	8776	6163.4±36.41
NWT_50W	61036	51122	19475.68	9354	6276.8±31.32
NWT_100E	63339	53012	18667.86	9393	6232.16±38.36
NWT_100N	39928	34442	13690.64	6407	5424.37±26.5
NWT_100S	45883	39459	13578.03	6926	5475.69±32.32
NWT_100W	39318	32941	15598.77	7392	6428.87±26.94
NWT_200E	37978	31370	18001.81	8067	7190.18±22.22
NWT_200N	47432	41328	14145.04	6737	5164.57±32.89
NWT_200S	47172	39337	17227.67	7899	6175.17±33.48
NWT_200W	39736	33913	16413.34	7970	6807.48±27.86
HFR_C	63480	51991	22732.68	10616	6999.29±44.93
HFR_1E	53968	43506	21195.30	9707	7053.66±37.34
HFR_1N	46892	38242	20199.37	8987	7088.14±31.02
HFR_1S	42772	33662	19494.26	8748	7435.09±27.04
HFR_1W	48491	41298	16808.39	7966	6030.05±29.78
HFR_10E	77623	62868	19997.35	10040	6012.1±37.84
HFR_10N	116566	103821	23026.42	12490	5920.9±41.71
HFR_10S	57423	43207	23772.06	10855	7879.17±39.42
HFR_10W	55264	48415	16267.57	8260	5830.43±31.16
HFR_50E	34854	25901	21370.66	8185	8185±0
HFR_50N	70561	56055	21979.47	10369	6520.97±40.01
HFR_50S	68678	59144	16712.65	8692	5495.59±38.67
HFR_50W	34512	28116	16060.39	7101	6753.9±14.16
HFR_100E	56425	49975	15122.43	8180	5707.18±31.8
HFR_100N	38248	33010	15428.31	6954	6021.39±22.91
HFR_100S	47051	39685	18486.53	8496	6559.85±33.2
HFR_100W	48691	39739	14600.89	7161	5581.65±32.69
HFR_200E	47773	38412	19122.76	8887	6985.44±34.95
HFR_200N	70142	59361	17529.24	8951	5587.41±36.97
HFR_200S	63669	51871	19916.99	9619	6379.76±39.39
HFR_200W	42358	37428	13413.46	6535	5292.24±32.25
AND_C	81547	61380	37635.53	15877	9096.16±48.64
AND_1E	98944	79847	29903.56	16926	9001.29±48.22
AND_1N	89431	72409	33293.69	16773	9107.93±55.62
AND_1S	83258	61206	35657.20	15475	8943.78±43.9
AND_1W	81120	60031	45701.74	18860	10735.89±54.45
AND_10E	60567	53485	19445.04	11108	7556.75±40.85
AND_10N	44176	36263	21085.51	9422	7639.38±34.23

AND_10S	84566	73619	21765.32	12162	6872.98±43.65
AND_10W	82216	66985	31026.08	16665	9704.75±53.08
AND_50E	57327	47925	23954.85	12199	8459.39±48.2
AND_50N	83784	71800	20927.50	10886	6188.58±38.46
AND_50S	88861	75843	25155.45	13186	7155.53±43.24
AND_50W	70891	54838	37225.45	15720	9579.35±51.6
AND_100E	88036	74361	27501.65	13937	7566.29±44.65
AND_100N	89414	70270	26363.17	12261	6727.93±39.6
AND_100S	58554	48509	24856.37	11398	7757.24±44.06
AND_100W	48112	40710	19872.84	9513	7272.18±34.96
AND_200E	70641	56076	31913.09	15007	9234.02±49.52
AND_200N	64954	48501	29018.71	12479	8316.8±46.4
AND_200S	76130	63592	22793.31	12108	7276.69±41.55
AND_200W	76796	57759	41354.28	16908	9906.49±47.03
CWT_C	35521	31313	17754.06	7984	7101.41±22.05
CWT_1E	35487	29455	20301.12	8125	7480.05±20.54
CWT_1N	61804	52434	27164.48	12569	8105.05±44.86
CWT_1S	61443	52868	21918.86	11127	7301.2±35.1
CWT_1W	45804	38931	21975.07	9665	7495.09±35.06
CWT_10E	36926	30901	22821.02	9516	8504.12±28.04
CWT_10N	39512	32154	23803.77	10016	8710.32±29.45
CWT_10S	38065	32008	19683.64	8385	7324.93±26
CWT_10W	48942	40911	24534.63	10595	7944.3±42.67
CWT_50E	41874	35000	18919.85	8264	6853.99±32.93
CWT_50N	59641	45167	30936.95	12578	8723.58±41.56
CWT_50S	46469	39046	20744.96	9060	7004.34±32.71
CWT_50W	49289	41858	19911.30	9193	6862.12±33.89
CWT_100E	50777	40538	21672.82	9237	6945.82±38.77
CWT_100N	52550	43406	19878.64	9232	6762.27±32.23
CWT_100S	62635	54072	22012.85	10391	6674.21±42.97
CWT_100W	58705	46357	27384.91	10926	7484.18±40.34
CWT_200E	50202	42624	17489.92	8954	6726.06±32.53
CWT_200N	37665	30419	24036.65	9679	8705.74±24.39
CWT_200S	38152	31869	20458.04	8582	7524.44±26.66
CWT_200W	44761	37983	21387.60	9425	7430.64±33.49
LUQ_C	52006	41894	33120.22	14309	10527.36±43.95
LUQ_1E	38629	30387	25178.46	10334	9328.4±25.23
LUQ_1N	48767	37935	32435.31	13349	10400.15±37.9
LUQ_1S	46798	36156	33727.78	13483	10832.2±34.65
LUQ_1W	51341	40040	32825.98	13003	9757.21±37.69
LUQ_10E	43524	32840	33549.07	12647	10773.22±32.7
LUQ_10N	56901	45523	31528.11	13411	9370.17±45.69
LUQ_10S	48280	37500	33855.55	13658	10698.64±38.82
LUQ_10W	69196	56242	23255.72	10567	6575.75±42.63
LUQ_50E	68587	52990	30411.22	12729	8040.09±36.74
LUQ_50N	61721	53911	22011.36	11705	7741.54±39.55
LUQ_50S	48862	41263	23210.39	10258	7720.6±36.03
LUQ_50W	75719	58628	32635.56	14932	8900.29±43.86
LUQ_100E	47564	38736	23165.73	9813	7631.61±35.6
LUQ_100N	71767	56490	28898.38	12659	7807.24±43.61
LUQ_100S	44262	33661	30044.16	11146	9334.99±37.36
LUQ_100W	59908	50528	22272.78	10754	7270.38±36
LUQ_200E	70105	54975	24808.02	11266	7052.96±41.49
LUQ_200N	74466	58362	23891.57	10960	6709.42±45.18

LUQ_200S	41731	38400	11170.51	6698	5572.86±24
LUQ_200W	47463	40038	24566.20	11033	8426.71±40.29
BCI_C	65161	48927	38091.70	14160	9195.96±42.07
BCI_1E	75449	56939	45624.72	17622	10293.43±47.71
BCI_1N	64682	49599	34203.01	13692	8886.11±42.68
BCI_1S	85352	65544	46319.00	18419	9819.34±55.14
BCI_1W	83925	66924	35019.23	15658	8531.85±45.13
BCI_10E	53215	41143	32025.55	12584	9226.67±36.59
BCI_10N	78267	60455	38258.20	17084	9820.19±52.88
BCI_10S	78498	59937	41106.60	18000	10369.07±50.83
BCI_10W	73968	57669	34925.40	14508	8549.35±44.73
BCI_50E	75582	61649	31799.60	14236	8257.24±46.67
BCI_50N	66651	50961	37594.76	14414	9053.26±47.12
BCI_50S	75015	56979	36928.03	14674	8697.52±40.09
BCI_50W	96699	75495	44518.58	19337	9594.31±52.09
BCI_100E	78114	70520	22039.99	12673	7457.25±43.53
BCI_100N	66118	49967	44183.20	16841	10696.67±46.13
BCI_100S	39796	32320	21359.63	8921	7747.66±31.22
BCI_100W	78154	60884	38167.29	16310	9299.57±49.05
BCI_200E	92153	70993	42849.02	19606	10276.98±39.59
BCI_200N	65528	48163	44129.07	16379	10640.85±51.81
BCI_200S	76852	59389	35774.72	15000	8694±54.33
BCI_200W	88221	72522	22532.78	13481	8096.09±42.89

Table S3. Model to fit the experimental data

Model name	Formula	BCI		LUQ		CWT		AND		HFR		NWT	
		AIC	R ²	AIC	R ²	AIC	R ²	AIC	R ²	AIC	R ²	AIC	R ²
Power	$S = cA^z$	74.91	1.00	75.68	0.99	68.67	1.00	76.94	0.99	59.81	1.00	71.15	0.99
Exponential	$S = c+z\log(A)$	83.51	0.98	79.35	0.99	79.63	0.98	83.60	0.96	75.29	0.99	76.58	0.97
Negative exponential	$S = c(1-\exp(-zA))$	97.24	0.61	96.01	0.66	94.02	0.61	95.34	0.55	91.45	0.62	89.91	0.62
Monod	$S = (cA)/(z+A)$	100.64	0.23	95.79	0.67	97.58	0.20	95.19	0.57	91.25	0.64	89.74	0.63
Logistic	$S = c/(1+\exp(-zA+f))$	93.34	0.88	92.74	0.88	89.60	0.89	89.63	0.90	86.93	0.90	86.23	0.88
Rational function	$S = (c+zA)/(1+fA)$	114.47	-7.16	114.75	-8.73	111.33	-7.35	113.35	-10.02	109.83	-9.00	91.78	0.63
Lomolino	$S = c/(1+z^{\log(f/A)})$	77.07	1.00	77.19	0.99	70.68	1.00	79.14	0.99	62.44	1.00	73.15	0.99
Cumulative Weibull	$S = c(1-\exp(-zA^f))$	76.91	1.00	77.21	0.99	70.67	1.00	78.94	0.99	61.81	1.00	73.15	0.99

Table S4. Slopes of taxa-area relationships for the whole microbial communities

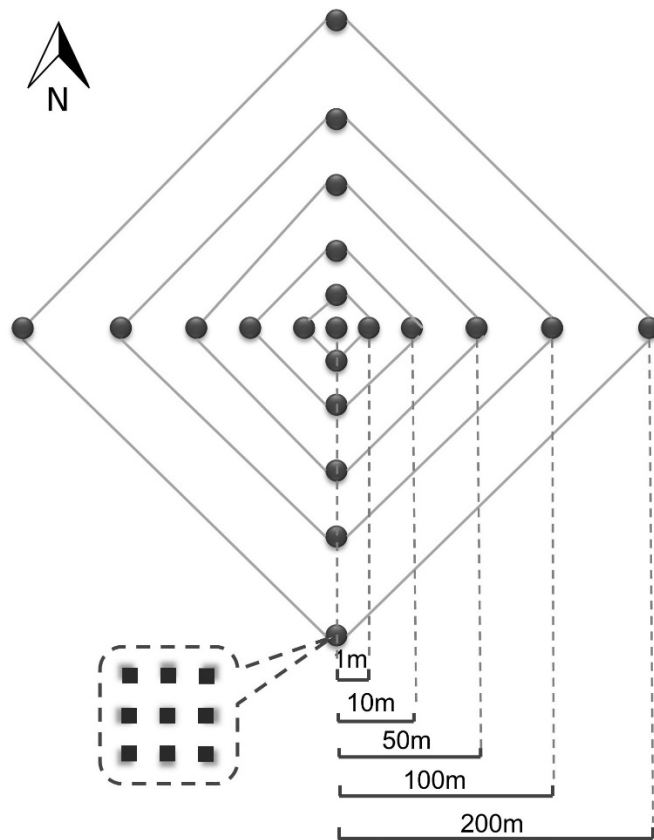
across different sites

Sites	resolution	Observed empirical OTUs				Chao 1-based theoretical OTU estimation			
		n [#]	c	z [*]	p ^{&}	n	c	z	P
BCI	99%	11641.6	43118.8	0.104	<0.001	78309.7	254160.8	0.091	<0.001
	98%	9354.8	30831.7	0.091	<0.001	45291.4	124686.8	0.081	<0.001
	97%	8290.7	26388.9	0.085	<0.001	36545.2	96137.2	0.072	<0.001
LUQ	99%	12783.9	46013.2	0.098	<0.001	56776.0	201046.6	0.096	<0.001
	98%	10281.3	33840.3	0.084	<0.001	33822.7	107974.0	0.081	<0.001
	97%	9201.3	29052.1	0.078	<0.001	27455.3	81344.0	0.075	<0.001
CWT	99%	10741.5	32424.0	0.106	<0.001	46837.9	121181.6	0.100	<0.001
	98%	8518.4	22902.0	0.091	<0.001	27180.8	63031.5	0.085	<0.001
	97%	7507.8	19572.2	0.084	<0.001	22132.9	49005.3	0.077	<0.001
AND	99%	9683.0	44508.4	0.090	<0.001	62287.5	236370.1	0.073	<0.001
	98%	7432.7	31606.6	0.075	<0.001	35724.7	115876.0	0.061	<0.001
	97%	6444.3	26826.7	0.070	<0.001	28878.6	87191.6	0.055	<0.001
HFR	99%	11800.7	32059.7	0.097	<0.001	42561.7	124218.3	0.090	<0.001
	98%	9599.2	21614.8	0.081	<0.001	23582.0	60301.2	0.075	<0.001
	97%	8593.5	17910.9	0.076	<0.001	18725.6	46081.8	0.068	<0.001
NWT	99%	9068.9	31414.0	0.087	<0.001	35028.2	118540.6	0.076	<0.001
	98%	6976.2	21345.3	0.072	<0.001	20141.6	58543.4	0.061	<0.001
	97%	6172.5	18068.6	0.068	<0.001	16600.9	44641.7	0.057	<0.001

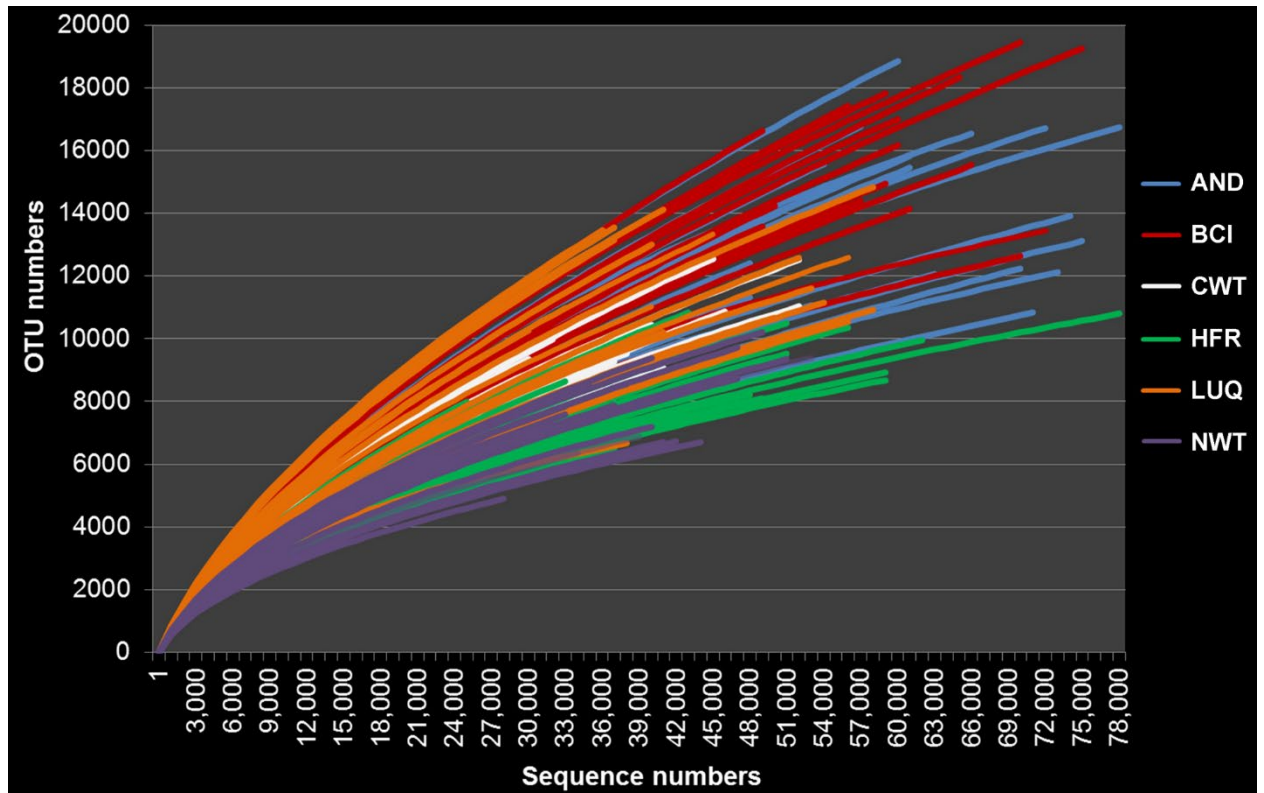
[#]n is the mean number of OTUs from 21 samples^{*}z value is estimated based on the mean OTUs over 100 resampling[&]P is the significance value to evaluate whether z is significantly different from 0 based on 10,000 bootstrapping permutations.

Table S5. The significances (*P* values) of Spearman correlation between *z* values of TARs from different phylogenetic groups and environmental variables

Taxa	Relative abundance (%)	<i>z</i> values correlate with							
		temperature	precipitation	moisture	pH	TC	TN	NH4.N	NO3.N
Bacteria	99.73	0.033*	0.103	0.919	0.658	0.058	0.419	0.497	0.356
Acidobacteria	22.07	0.242	0.175	1.000	0.714	0.103	0.497	0.919	0.564
Actinobacteria	8.54	0.297	0.242	1.000	0.564	0.136	0.803	0.419	0.242
Armatimonadetes	0.28	0.175	0.419	1.000	0.497	0.356	0.297	0.658	0.658
Bacteroidetes	2.70	0.913	0.827	0.742	0.618	0.658	0.742	0.288	0.913
Chlamydiae	0.16	0.242	0.175	0.103	0.175	0.919	0.919	0.242	0.103
Chloroflexi	0.81	0.242	0.356	0.356	0.564	0.658	0.564	0.103	0.564
Cyanobacteria	0.51	0.419	0.497	0.803	0.297	0.419	0.803	0.103	0.356
Firmicutes	0.99	0.175	0.297	0.564	0.803	0.356	0.803	0.242	0.658
Bacilli	0.27	0.356	0.419	1.000	0.497	0.175	1.000	0.242	0.419
Clostridia	0.31	0.257	0.321	0.389	0.321	0.538	0.499	0.015*	0.321
Gemmatimonadetes	0.47	0.297	0.356	0.803	0.658	0.242	0.803	0.175	0.497
OD1	0.02	0.714	0.419	0.919	1.000	0.658	0.658	0.714	0.356
Planctomycetes	7.61	0.103	0.242	0.658	0.136	0.497	0.419	0.297	0.242
Proteobacteria	36.47	0.419	0.658	0.419	0.497	0.297	0.017*	0.803	0.658
Alpha-	20.44	0.033*	0.017*	0.497	0.242	0.175	0.564	0.297	0.017*
Beta-	3.71	0.175	0.103	0.175	0.136	0.803	1.000	0.242	0.017*
Delta-	4.43	0.497	0.919	0.356	0.419	0.356	0.058	1.000	0.919
Gamma-	6.08	0.033*	0.103	1.000	0.242	0.058	0.136	0.497	0.136
Verrucomicrobia	12.07	0.658	0.497	0.356	0.356	0.919	0.356	0.919	1.000
WS3	0.14	0.499	0.321	0.257	0.125	0.913	0.827	0.257	0.050*
Archaea	0.26	0.714	0.497	0.017*	0.564	0.419	0.103	0.175	0.356

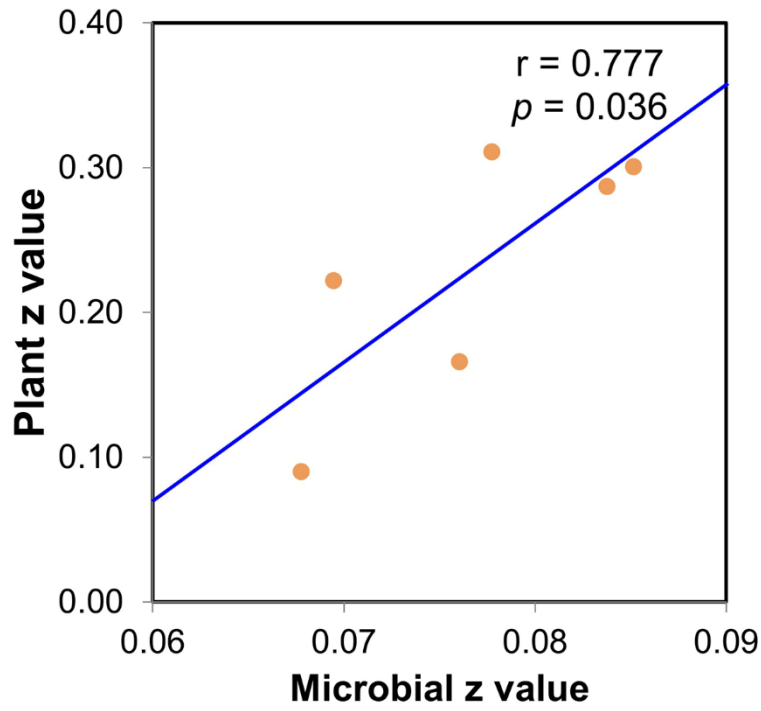


Supplementary Fig. 1. The strategy of soil sampling. At each site, 21 nested samples including center sample have been collected from the distance of 1, 10, 50, 100, and 250m to the center. At each sample point (1 x 1m), nine soil cores were composited for microbial and soil analysis.

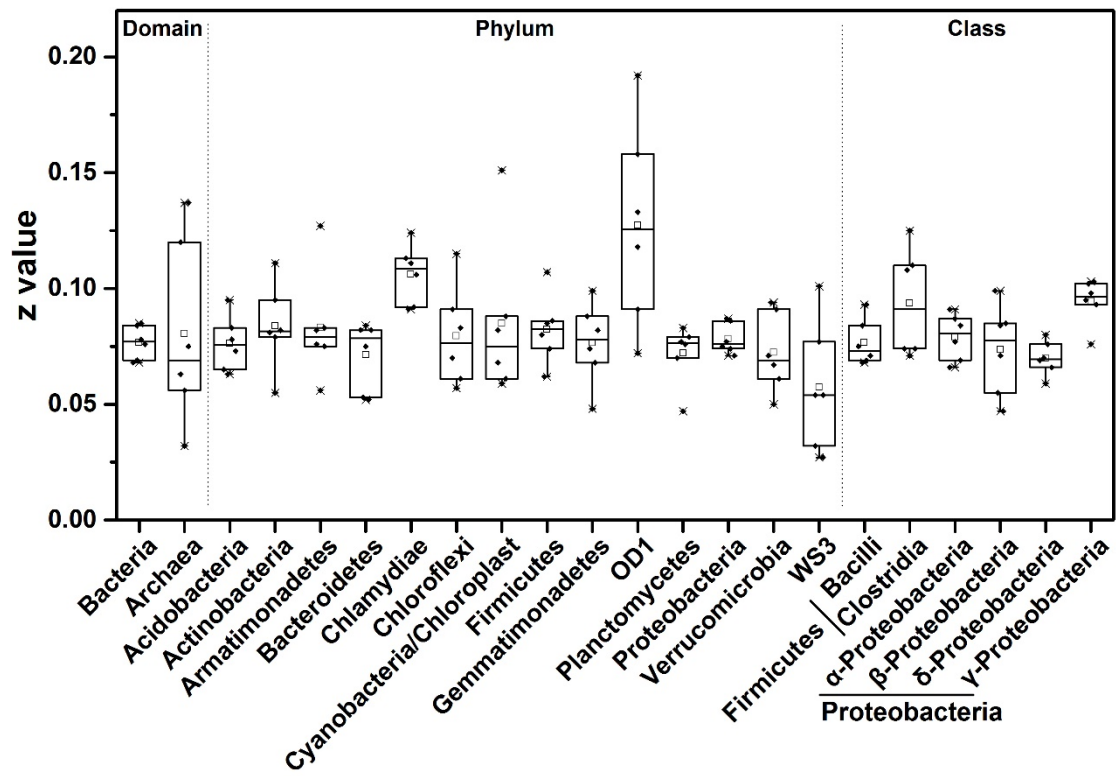


Supplementary Fig. 2. Rarefaction analysis on OTUs from different soil samples.

Each curve represented a single sample and the color indicated its sampling site.



Supplementary Fig. 3. The correlation on microbial z values and plant z values from 6 sampling sites. r is the Pearson correlation coefficient and P is its significant level.



Supplementary Fig. 4. The z values of TARs from different phylogenetic groups at domain, phylum and class level based on 97% similarity OTU table.