

Ecography

E7132

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**Supplementary material**

# Appendix 1

**Table A1.** Simple OLS regressions for observed, rarefied, estimated (Chao2 and Jackknife2) and interpolated species richness against four selected factors. *Geo. Cons.* is geometric constraints.  $P_{adj}$  (in italics) is the adjusted P-value for  $R^2$  in simple OLS regression, based on degrees of freedom adjusted to account for spatial autocorrelation using Dutilleul's (1993) method. Bold numbers indicate significant  $R^2$  ( $P < 0.05$ ,  $P_{adj} < 0.05$ ) for simple OLS regression tests. Negative relationships are indicated by (-).

Regression	Species richness				
	Observed	Rarefied	Chao2	Jackknife2	Interpolated
Simple OLS					
Temperature( $R^2$ )	0.076	0.227	0.075	0.104	0.081
P	0.509	0.233	0.512	0.436	0.462
$P_{adj}$	<i>0.596</i>	<i>0.362</i>	<i>0.545</i>	<i>0.489</i>	<i>0.595</i>
Precipitation( $R^2$ )	(-)0.001	(-)0.07	(-)0.001	(-)0.01	(-)0.002
p	0.943	0.528	0.942	0.817	0.916
$P_{adj}$	<i>0.954</i>	<i>0.637</i>	<i>0.945</i>	<i>0.825</i>	<i>0.938</i>
Plant species( $R^2$ )	0.094	0.148	0.068	0.045	0.156
p	0.46	0.346	0.436	0.614	0.298
$P_{adj}$	<i>0.502</i>	<i>0.411</i>	<i>0.603</i>	<i>0.665</i>	<i>0.389</i>
Geo. cons.( $R^2$ )	<b>0.838</b>	<b>0.707</b>	<b>0.75</b>	<b>0.631</b>	<b>0.875</b>
p	<b>&lt;0.001</b>	<b>0.009</b>	<b>0.005</b>	<b>0.019</b>	<b>0.001</b>
$P_{adj}$	<b><i>0.012</i></b>	<b><i>0.04</i></b>	<b><i>0.043</i></b>	<b><i>0.077</i></b>	<b><i>0.009</i></b>

**Table A2.** Multiple regressions for observed, rarefied, estimated (Chao2 and Jackknife2) and interpolated species richness against four selected factors. Model selection (best model) and model averaging (which do not account for spatial autocorrelation) were based on minimizing AICc values and AICc weights among all 15 possible models. *Geo. Cons.* is geometric constraints. Negative relationships are indicated by (-).  $R^2_{adj}$  is the adjusted  $R^2$  value for multiple regressions. *Beta* (in brackets) is the standardized regression slope for each factor in the models, which indicates the relative importance of the factors.

Multiple regressions	Species richness				
	Observed	Rarefied	Chao2	Jackknife2	Interpolated
Best model					
$R^2_{adj}$	0.838	0.948	0.75	0.631	0.875
AIC	42.778	32.208	49.657	56.086	42.68
Temperature(beta)					
Precipitation(beta)		(-)0.508			
Plant species(beta)					
Geo. Cons.(beta)	0.915	0.969	0.866	0.794	0.935
Model averaging					
$R^2_{adj}$	0.757	0.355	0.686	0.488	0.758
AIC	127.314	124.378	132.789	140.011	129.235
Temperature(beta)	0.235	0.441	0.746	0.718	0.288
Precipitation(beta)	(-)0.002	(-)0.505	0.409	0.319	(-)0.293
Plant species(beta)	0.001	0.202	0.077	0.132	0.111
Geo. Cons.(beta)	0.752	0.926	0.868	0.797	0.956

## Appendix 2

**Table A3.** All of 15 regression models for interpolated overall species richness. Explanatory variables are: temperature (variable 1), precipitation (variable 2), plant species richness (variable 3) and geometric constraints (variable 4). Regression results are sorted by Akaike Information Criterion (AICc). *Num. Para.* is the number of parameters in each model, *Cond. Num.* is the condition number in each model, a measure of multicollinearity (lower value means less multicollinearity),  $L(gi|x)$  is the model likelihood and the *AICc wi.* is the AIC weightings. *I/Imax* is ratio of Moran's *I* to maximum Moran's *I*.

Model	Variables	Num. Para.	$R^2_{adj}$	Cond. Num.	AICc	Delta AICc	$L(gi x)$	AICc wi.	Moran's <i>I</i>	<i>I/Imax</i>
15	4	4	0.875	1	42.68	0	1	0.434	0.205	0.185
12	2, 4	5	0.957	1.294	43.511	0.831	0.66	0.286	-0.735	-0.56
8	1, 4	5	0.956	1.001	43.601	0.92	0.631	0.274	-0.578	-0.444
14	3, 4	5	0.884	1.402	51.396	8.716	0.013	0.006	0.039	0.036
2	1, 2	5	0.741	6.883	57.828	15.148	<.001	<.001	0.445	0.338
13	3	4	0.156	1	57.927	15.247	<.001	<.001	0.43	0.353
1	1	4	0.081	1	58.613	15.932	<.001	<.001	0.484	0.42
9	2	4	0.002	1	59.274	16.594	<.001	<.001	0.572	0.457
7	1, 3, 4	6	0.959	1.936	61.68	19	<.001	<.001	-0.619	-0.465
11	2, 3, 4	6	0.958	1.871	61.887	19.207	<.001	<.001	-0.733	-0.55
5	1, 2, 4	6	0.957	14.804	62.142	19.462	<.001	<.001	-0.69	-0.527
6	1, 3	5	0.168	1.683	67.147	24.467	<.001	<.001	0.425	0.361
10	2, 3	5	0.166	1.421	67.169	24.489	<.001	<.001	0.435	0.35
3	1, 2, 3	6	0.753	8.765	76.117	33.437	<.001	<.001	0.332	0.249
4	1, 2, 3, 4	7	0.959	16.952	117.671	74.991	<.001	<.001	-0.643	-0.483

**Table A4.** All of 15 regression models for interpolated insectivore species richness. Explanatory variables are: temperature (variable 1), precipitation (variable 2), plant species richness (variable 3) and geometric constraints (variable 4). Regression results are sorted by Akaike Information Criterion (AICc). *Num. Para.* is the number of parameters in each model, *Cond. Num.* is the condition number in each model, a measure of multicollinearity (lower value means less multicollinearity),  $L(gi|x)$  is the model likelihood and the *AICc wi.* is the AIC weightings. *I/Imax* is ratio of Moran's *I* to maximum Moran's *I*.

Model	Variables	Num. Para.	$R^2_{adj}$	Cond. Num.	AICc	Delta AICc	$L(gi x)$	AICc wi.	Moran's I	I/Imax
14	3, 4	5	0.982	1.328	29.54	0	1	0.933	-0.597	-0.45
15	4	4	0.886	1	34.924	5.383	0.068	0.063	0.443	0.558
8	1, 4	5	0.915	1.003	41.869	12.329	0.002	0.002	0.165	0.256
12	2, 4	5	0.906	1.292	42.668	13.127	0.001	0.001	0.25	0.36
7	1, 3, 4	5	0.982	1.864	48.031	18.491	<.001	<.001	-0.603	-0.458
11	2, 3, 4	6	0.982	1.783	48.174	18.633	<.001	<.001	-0.601	-0.454
9	2	4	0.141	1	51.054	21.514	<.001	<.001	0.541	0.427
1	1	4	0.031	1	52.018	22.478	<.001	<.001	0.503	0.424
13	3	4	0.001	1	52.255	22.715	<.001	<.001	0.471	0.424
2	1, 2	5	0.562	6.883	55.002	25.461	<.001	<.001	0.453	0.392
5	1, 2, 4	6	0.948	14.21	56.539	26.999	<.001	<.001	-0.377	-0.536
10	2, 3	5	0.149	1.421	60.305	30.765	<.001	<.001	0.514	0.413
6	1, 3	5	0.033	1.683	61.33	31.789	<.001	<.001	0.494	0.418
3	1, 2, 3	6	0.679	8.765	71.188	41.648	<.001	<.001	0.135	0.101
4	1, 2, 3, 4	7	0.988	17.05	100.898	71.357	<.001	<.001	-0.698	-0.526

**Table A5.** All of 15 regression models for interpolated rodent species richness. Explanatory variables are: temperature (variable 1), precipitation (variable 2), plant species richness (variable 3) and geometric constraints (variable 4). Regression results are sorted by Akaike Information Criterion (AICc). *Num. Para.* is the number of parameters in each model, *Cond. Num.* is the condition number in each model, a measure of multicollinearity (lower value means less multicollinearity),  $L(g_i|x)$  is the model likelihood and the *AICc wi.* is the AIC weightings. *I/Imax* is ratio of Moran's *I* to maximum Moran's *I*.

Model	Variables	Num. Para.	$R^2_{adj}$	Cond. Num.	AICc	Delta AICc	$L(g_i x)$	AICc wi.	Moran's I	I/Imax
13	3	4	0.496	1	45.534	0	1	0.313	0.019	0.015
1	1	4	0.444	1	46.329	0.795	0.672	0.21	0.201	0.199
8	1, 4	5	0.803	1.001	47.377	1.843	0.398	0.125	-0.354	-0.312
15	4	4	0.36	1	47.454	1.92	0.383	0.12	0.403	0.39
12	2, 4	5	0.778	1.293	48.316	2.782	0.249	0.078	-0.31	-0.273
2	1, 2	5	0.773	6.883	48.496	2.962	0.227	0.071	-0.143	-0.12
9	2	4	0.226	1	48.972	3.438	0.179	0.056	0.383	0.345
14	3, 4	5	0.637	1.446	52.244	6.71	0.035	0.011	-0.129	-0.113
6	1, 3	5	0.637	1.683	52.25	6.716	0.035	0.011	-0.069	-0.055
10	2, 3	5	0.56	1.421	53.789	8.255	0.016	0.005	-0.034	-0.027
7	1, 3, 4	6	0.85	1.981	63.854	18.32	<.001	<.001	-0.654	-0.492
11	2, 3, 4	6	0.841	1.931	64.293	18.759	<.001	<.001	-0.744	-0.559
5	1, 2, 4	6	0.811	15.124	65.691	20.157	<.001	<.001	-0.33	-0.286
3	1, 2, 3	6	0.807	8.765	65.84	20.306	<.001	<.001	-0.154	-0.116
4	1, 2, 3, 4	7	0.851	16.94	119.81	74.276	<.001	<.001	-0.601	-0.452

**Table A6.** All of 15 regression models for interpolated endemic species richness. Explanatory variables are: temperature (variable 1), precipitation (variable 2), plant species richness (variable 3) and geometric constraints (variable 4). Regression results are sorted by Akaike Information Criterion (AICc). *Num. Para.* is the number of parameters in each model, *Cond. Num.* is the condition number in each model, a measure of multicollinearity (lower value means less multicollinearity),  $L(gi|x)$  is the model likelihood and the *AICc wi.* is the AIC weightings. *I/Imax* is ratio of Moran's *I* to maximum Moran's *I*.

Model	Variables	Num. Para.	$R^2_{adj}$	Cond. Num.	AICc	Delta AICc	$L(gi x)$	AICc wi.	Moran's <i>I</i>	<i>I/Imax</i>
15	4	4	0.915	1	36.074	0	1	0.911	<.001	<.001
14	3, 4	5	0.949	1.382	41.31	5.236	0.073	0.066	-0.428	-0.324
8	1, 4	5	0.922	1.002	44.763	8.688	0.013	0.012	-0.098	-0.089
12	2, 4	5	0.919	1.293	45.039	8.964	0.011	0.01	-0.051	-0.046
9	2	4	0.09	1	55.051	18.976	<.001	<.001	0.572	0.446
13	3	4	0.015	1	55.682	19.608	<.001	<.001	0.472	0.418
1	1	4	0.007	1	55.752	19.677	<.001	<.001	0.516	0.433
2	1, 2	5	0.61	6.883	57.613	21.539	<.001	<.001	0.469	0.371
11	2, 3, 4	6	0.95	1.846	59.883	23.809	<.001	<.001	-0.461	-0.347
7	1, 3, 4	6	0.949	1.916	59.947	23.873	<.001	<.001	-0.443	-0.334
5	1, 2, 4	6	0.939	14.575	61.464	25.39	<.001	<.001	-0.6	-0.519
10	2, 3	5	0.148	1.421	63.862	27.787	<.001	<.001	0.512	0.409
6	1, 3	5	0.042	1.683	64.8	28.725	<.001	<.001	0.49	0.412
3	1, 2, 3	6	0.656	8.765	75.28	39.205	<.001	<.001	0.272	0.204
4	1, 2, 3, 4	7	0.955	16.871	115.045	78.971	<.001	<.001	-0.638	-0.479

**Table A7.** All of 15 regression models for interpolated non-endemic species richness. Explanatory variables are: temperature (variable 1), precipitation (variable 2), plant species richness (variable 3) and geometric constraints (variable 4). Regression results are sorted by Akaike Information Criterion (AICc). *Num. Para.* is the number of parameters in each model, *Cond. Num.* is the condition number in each model, a measure of multicollinearity (lower value means less multicollinearity),  $L(g_i|x)$  is the model likelihood and the *AICc wi.* is the AIC weightings. *I/Imax* is ratio of Moran's *I* to maximum Moran's *I*.

Model	Variables	Num. Para.	$R^2_{adj}$	Cond. Num.	AICc	Delta AICc	$L(g_i x)$	AICc wi.	Moran's I	I/Imax
1	1	4	0.666	1	37.022	0	1	0.514	0.077	0.077
2	1, 2	5	0.856	6.883	39.626	2.604	0.272	0.14	-0.278	-0.235
8	1, 4	5	0.851	1.302	39.913	2.891	0.236	0.121	-0.197	-0.177
13	3	4	0.472	1	40.682	3.66	0.16	0.082	-0.01	-0.008
9	2	4	0.433	1	41.25	4.228	0.121	0.062	0.338	0.304
12	2, 4	5	0.803	1.715	42.116	5.094	0.078	0.04	-0.023	-0.021
6	1, 3	5	0.78	1.683	43.004	5.981	0.05	0.026	-0.338	-0.272
15	4	4	0.042	1	45.45	8.427	0.015	0.008	0.589	0.526
10	2, 3	5	0.677	1.421	46.083	9.061	0.011	0.006	-0.226	-0.179
14	3, 4	5	0.478	1.206	49.92	12.898	0.002	<.001	-0.002	-0.002
7	1, 3, 4	6	0.889	2.013	56.22	19.198	<.001	<.001	-0.601	-0.452
3	1, 2, 3	6	0.877	8.765	57.008	19.986	<.001	<.001	-0.421	-0.317
11	2, 3, 4	6	0.87	2.227	57.492	20.47	<.001	<.001	-0.625	-0.47
5	1, 2, 4	6	0.864	15.858	57.831	20.809	<.001	<.001	-0.273	-0.237
4	1, 2, 3, 4	7	0.891	17.989	112.07	75.048	<.001	<.001	-0.557	-0.42



**Table A8.** All of 15 regression models for larger-ranged species richness. Explanatory variables are: temperature (variable 1), precipitation (variable 2), plant species richness (variable 3) and geometric constraints (variable 4). Regression results are sorted by Akaike Information Criterion (AICc). *Num. Para.* is the number of parameters in each model, *Cond. Num.* is the condition number in each model, a measure of multicollinearity (lower value means less multicollinearity),  $L(gi|x)$  is the model likelihood and the *AICc wi.* is the AIC weightings. *I/Imax* is ratio of Moran's *I* to maximum Moran's *I*.

Model	Variables	Num. Para.	$R^2_{adj}$	Cond. Num.	AICc	Delta AICc	$L(gi x)$	AICc wi.	Moran's I	I/Imax
15	4	4	0.875	1	38.438	0	1	0.968	-0.198	-0.155
12	2, 4	5	0.88	1.3	47.41	8.972	0.011	0.011	-0.202	-0.155
14	3, 4	5	0.879	1.403	47.476	9.038	0.011	0.011	-0.268	-0.21
8	1, 4	5	0.877	1.006	47.618	9.18	0.01	0.01	-0.188	-0.146
13	3	4	0.058	1	54.586	16.148	<.001	<.001	0.492	0.412
9	2	4	0.028	1	54.838	16.4	<.001	<.001	0.56	0.438
1	1	4	0.002	1	55.052	16.614	<.001	<.001	0.512	0.426
2	1, 2	5	0.543	6.883	58.131	19.693	<.001	<.001	0.38	0.287
10	2, 3	5	0.129	1.421	63.298	24.86	<.001	<.001	0.507	0.398
5	1, 2, 4	6	0.912	14.781	63.613	25.175	<.001	<.001	-0.729	-0.55
6	1, 3	5	0.065	1.683	63.862	25.424	<.001	<.001	0.498	0.408
11	2, 3, 4	6	0.894	1.879	65.148	26.71	<.001	<.001	-0.411	-0.312
7	1, 3, 4	6	0.889	1.941	65.503	27.065	<.001	<.001	-0.364	-0.277
3	1, 2, 3	6	0.557	8.765	76.551	38.113	<.001	<.001	0.274	0.205
4	1, 2, 3, 4	7	0.914	16.867	119.425	80.987	<.001	<.001	-0.719	-0.54

**Table A9.** All of 15 regression models for smaller-ranged species richness. Explanatory variables are: temperature (variable 1), precipitation (variable 2), plant species richness (variable 3) and geometric constraints (variable 4). Regression results are sorted by Akaike Information Criterion (AICc). *Num. Para.* is the number of parameters in each model, *Cond. Num.* is the condition number in each model, a measure of multicollinearity (lower value means less multicollinearity),  $L(gi|x)$  is the model likelihood and the *AICc wi.* is the AIC weightings. *I/Imax* is ratio of Moran's *I* to maximum Moran's *I*.

Model	Variables	Num. Para.	$R^2_{adj}$	Cond. Num.	AICc	Delta AICc	$L(gi x)$	AICc wi.	Moran's I	I/Imax
2	1, 2	5	0.938	6.883	30.147	0	1	0.94	-1.117	-0.856
1	1	4	0.478	1	37.914	7.767	0.021	0.019	0.06	0.054
8	1, 4	5	0.832	1.012	38.173	8.026	0.018	0.017	-0.434	-0.334
15	4	4	0.345	1	39.723	9.576	0.008	0.008	0.495	0.419
13	3	4	0.333	1	39.865	9.718	0.008	0.007	-0.048	-0.039
12	2, 4	5	0.762	1.307	40.964	10.818	0.004	0.004	-0.198	-0.151
9	2	4	0.22	1	41.117	10.971	0.004	0.004	0.309	0.253
6	1, 3	5	0.557	1.683	45.935	15.788	<.001	<.001	-0.228	-0.202
14	3, 4	5	0.518	1.379	46.611	16.464	<.001	<.001	-0.063	-0.056
10	2, 3	5	0.418	1.421	48.108	17.962	<.001	<.001	-0.143	-0.119
3	1, 2, 3	6	0.941	8.765	48.447	18.301	<.001	<.001	-1.074	-0.806
5	1, 2, 4	6	0.938	14.816	48.808	18.661	<.001	<.001	-1.113	-0.853
7	1, 3, 4	6	0.837	1.92	56.591	26.444	<.001	<.001	-0.601	-0.464
11	2, 3, 4	6	0.78	1.855	58.991	28.844	<.001	<.001	-0.49	-0.377
4	1, 2, 3, 4	7	0.941	17.11	104.417	74.27	<.001	<.001	-1.071	-0.803