Environmental filtering and habitat (mis)matching of riverine invertebrate communities

NRSA DisEQ-BRT Supplemental Tables

DisEQ-by-Traits

Supplementary tables for the DisEQ-by-traits boosted regression trees. Complete tables of the relative influence for each trait predictor are provided (Tables 1-2), along with tables presenting the summed relative influence for all predictor variables within the respective category with a relative influence >5.00 (Tables 3-4).

Table 1: Table of relative influence values for trait predictors in the filtering-by-traits boosted regression trees, with relative influence values provided for each ecoregion.

	Low Dispersal	High Dispersal	Nonflyer	Weak Flyer	Strong Flyer	Small Size	Medium Size	Large Size	Depositional	Depositional-Erosional	Erosional	Cold Water	Cool-Warm Water	Warm Water	Sensitive Tolerance	Intermediate Tolerance	Tolerant	CG	CF	HB	PR
CPL	5.46	4.64	4.60	5.00	3.25	5.46	7.80	3.31	2.10	4.73	1.74	5.15	4.62	1.18	8.30	7.47	3.56	3.14	2.81	5.10	10.57
NAP	3.28	4.53	4.66	2.76	3.88	4.04	2.68	5.94	4.01	3.42	6.15	7.04	4.82	6.28	10.06	7.40	5.97	1.72	4.72	2.54	4.11
NPL	3.13	10.01	2.82	4.60	2.81	3.40	4.60	0.34	6.75	6.43	1.68	2.70	4.86	7.09	9.09	5.57	4.93	4.17	3.07	8.08	3.90
SAP	7.38	2.86	8.86	2.23	3.50	4.54	5.73	2.52	2.42	3.65	2.27	4.98	4.38	6.77	7.51	4.54	7.28	6.61	2.57	3.15	6.25
SPL	8.25	4.94	3.77	3.82	3.05	2.18	5.34	4.36	8.66	3.15	5.04	3.92	4.69	2.47	6.35	4.91	7.21	4.43	2.83	3.93	6.67
TPL	4.92	5.03	5.41	4.41	2.29	2.11	2.89	1.41	4.05	4.80	3.95	6.07	6.97	8.19	8.76	4.48	3.55	4.48	4.51	5.38	6.31
UMW	3.79	8.06	2.03	2.16	3.41	4.00	3.52	2.56	3.53	2.46	3.22	9.93	5.45	10.80	6.68	6.56	3.09	5.84	2.43	6.37	4.12
WMT	10.95	4.60	3.31	3.80	3.18	4.64	4.24	4.60	3.00	4.74	6.31	4.04	5.29	0.00	9.54	4.03	3.53	2.73	6.90	7.04	3.53
XER	4.80	6.49	4.24	5.75	5.30	2.20	6.68	4.54	7.92	6.21	3.55	6.28	4.93	0.00	5.51	4.76	6.02	2.53	3.55	4.17	4.56

Table 2: Table of relative influence values for trait predictors in the mismatch-by-traits boosted regression trees, with relative influence values provided for each ecoregion.

	Low Dispersal	High Dispersal	Nonflyer	Weak Flyer	Strong Flyer	Small Size	Medium Size	Large Size	Depositional	Depositional-Erosional	Erosional	Cold Water	Cool-Warm Water	Warm Water	Sensitive Tolerance	Intermediate Tolerance	Tolerant	CG	CF	HB	PR
CPL	9.44	5.54	4.02	3.90	1.26	3.51	4.02	1.15	2.30	4.62	2.73	5.12	6.77	0.89	2.59	3.98	17.74	1.92	5.42	5.72	7.37
NAP	4.11	2.45	7.01	3.34	1.85	1.34	2.69	4.46	4.06	2.42	1.05	3.09	3.96	9.88	31.96	3.81	2.03	2.53	2.29	1.51	4.14
NPL	3.48	2.36	3.53	5.01	2.21	2.19	3.89	0.22	4.19	5.00	0.65	5.49	8.94	11.47	3.45	3.28	3.06	4.11	2.64	11.78	13.04
SAP	4.02	5.06	3.24	2.17	3.49	6.63	7.05	13.91	3.52	2.98	3.51	6.20	3.65	3.74	4.08	8.06	5.44	3.34	2.28	1.77	5.85
SPL	10.75	8.30	7.69	5.07	1.65	1.68	3.47	4.81	4.25	6.55	2.19	3.02	2.11	5.43	2.98	10.63	6.11	0.99	2.95	4.31	5.05
TPL	4.18	8.98	7.07	3.43	2.04	2.84	7.54	6.46	4.51	5.20	2.05	4.24	2.74	2.85	4.63	9.81	3.73	2.66	3.48	7.32	4.24
UMW	4.77	2.30	5.19	4.28	5.97	7.12	4.25	2.55	2.08	3.49	3.20	3.75	5.95	10.14	5.08	4.56	3.02	5.15	6.39	3.83	6.95
WMT	4.35	4.19	5.94	2.04	18.10	4.96	2.53	0.79	4.40	12.09	3.00	2.20	8.94	0.00	2.29	4.65	4.49	6.41	3.10	3.04	2.47
XER	5.00	2.76	5.60	11.72	3.07	3.08	4.64	0.66	6.01	4.18	2.85	4.35	8.14	0.44	6.74	2.54	3.77	1.56	5.48	5.50	11.94

Table 3: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the filtering-by-traits boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Dispersal	23.72
CPL	Ecology	15.67
CPL	Habitat	20.92
NAP	Dispersal	5.94
NAP	Habitat	42.90
NPL	Dispersal	10.01
NPL	Ecology	8.08
NPL	Habitat	34.91
SAP	Dispersal	21.97
SAP	Ecology	12.86
SAP	Habitat	21.56
SPL	Dispersal	13.60
SPL	Ecology	6.67
SPL	Habitat	27.26
TPL	Dispersal	10.45
TPL	Ecology	11.69
TPL	Habitat	29.99
UMW	Dispersal	8.06
UMW	Ecology	12.21
UMW	Habitat	39.41
WMT	Dispersal	10.95
WMT	Ecology	13.94
WMT	Habitat	21.14
XER	Dispersal	24.22
XER	Habitat	31.95

Table 4: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the mismatch-by-traits boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Dispersal	14.97
CPL	Ecology	18.50
CPL	Habitat	29.63
NAP	Dispersal	7.01
NAP	Habitat	41.84
NPL	Dispersal	5.01
NPL	Ecology	24.82
NPL	Habitat	30.90
SAP	Dispersal	32.65
SAP	Ecology	5.85
SAP	Habitat	19.71
SPL	Dispersal	31.81
SPL	Ecology	5.05
SPL	Habitat	28.72
TPL	Dispersal	30.05
TPL	Ecology	7.32
TPL	Habitat	15.01
UMW	Dispersal	18.27
UMW	Ecology	18.49
UMW	Habitat	21.16
WMT	Dispersal	24.04
WMT	Ecology	6.41
WMT	Habitat	21.04
XER	Dispersal	17.33
XER	Ecology	22.91
XER	Habitat	20.88

Trait-by-Environment

Supplementary tables for the trait-by-environment boosted regression trees. Complete tables of the relative influence for each trait predictor are provided (Tables 5-25), along with tables presenting the summed relative influence for all predictor variables within the respective category with a relative influence >5.00 (Tables 26-46).

Table 5: Table of relative influence values for predictors in the low dispersal-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	10.21	7.20	3.98	6.64	4.40	0.73	3.52	9.66	5.37	2.78	2.80	2.64	15.46	6.22	5.28	4.67	4.32	4.13
NAP	3.88	8.96	5.40	5.82	3.04	1.94	7.41	21.40	11.48	1.75	3.40	5.99	4.64	2.04	2.57	2.99	3.69	3.62
NPL	3.05	12.29	4.23	2.10	2.80	7.43	4.43	2.71	3.40	3.32	6.28	6.13	5.23	6.53	14.16	5.09	5.26	5.55
SAP	3.57	6.63	4.65	8.68	8.16	2.50	7.20	4.15	3.72	2.97	2.64	4.58	6.80	11.03	4.13	4.03	7.94	6.63
SPL	6.78	10.36	5.58	2.86	7.43	6.90	9.69	4.08	3.68	2.37	3.54	9.40	3.13	4.22	11.32	2.44	1.33	4.88
TPL	6.61	4.07	4.31	5.33	8.07	0.39	4.33	1.93	7.28	2.52	4.20	3.43	7.69	13.71	5.51	7.52	10.02	3.09
UMW	4.30	15.87	11.10	3.39	8.37	3.87	4.01	5.57	3.95	2.51	11.54	2.54	3.45	5.65	2.91	4.58	3.09	3.28
WMT	4.90	3.56	6.73	5.24	7.42	2.35	7.29	2.40	14.54	6.69	2.74	3.63	5.94	4.36	12.56	4.06	3.28	2.30
XER	10.15	7.85	3.40	3.94	4.63	4.44	7.68	4.21	3.15	1.85	7.35	4.86	12.84	5.40	6.44	4.62	3.18	4.02

Table 6: Table of relative influence values for predictors in the high dispersal-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	4.96	3.68	3.43	4.70	3.96	1.18	4.34	6.54	4.24	9.25	5.31	4.42	12.65	17.32	3.90	3.58	3.76	2.76
NAP	4.78	4.48	3.75	7.21	8.82	6.77	3.49	2.26	4.74	2.69	2.32	3.60	10.79	5.33	3.48	11.50	6.95	7.02
NPL	4.28	9.81	2.71	3.09	4.10	1.77	3.76	5.86	10.59	11.28	7.60	1.94	6.45	9.43	3.10	2.63	3.54	8.08
SAP	4.90	7.97	4.79	6.26	6.96	2.15	0.85	9.31	3.22	7.85	8.22	3.14	5.97	6.80	3.60	3.92	6.01	8.08
SPL	3.87	6.71	7.68	3.81	5.57	2.64	4.65	4.35	3.52	3.28	2.98	6.19	10.44	16.00	4.82	3.35	5.95	4.20
TPL	7.09	14.33	7.22	4.44	3.94	1.75	1.59	3.77	10.29	4.05	2.29	3.20	4.29	4.28	6.04	7.51	3.57	10.34
UMW	5.91	8.14	3.88	2.70	9.49	8.80	4.99	4.64	7.40	2.59	12.49	4.16	4.46	5.42	1.93	6.08	2.76	4.15
WMT	4.23	3.35	2.64	2.87	20.41	9.79	3.89	7.86	1.19	4.87	2.86	3.21	5.11	4.91	5.59	7.46	4.73	5.01
XER	6.84	5.30	4.23	1.98	4.23	4.74	3.21	7.20	3.87	3.41	4.89	6.20	10.99	7.54	6.60	6.49	2.34	9.95

Table 7: Table of relative influence values for predictors in the nonflyer-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	10.93	9.89	3.29	1.94	3.34	0.55	4.31	3.53	10.48	1.87	2.01	6.22	7.14	7.69	7.43	6.01	5.57	7.80
NAP	1.08	4.97	3.57	1.84	0.70	0.54	9.02	51.95	12.30	1.99	0.55	0.62	0.74	0.74	0.70	2.32	5.60	0.77
NPL	2.18	2.99	5.67	0.95	3.44	10.94	20.85	2.51	2.84	8.62	9.71	6.19	1.39	2.24	1.46	9.17	2.35	6.50
SAP	1.66	8.59	5.70	5.74	4.50	1.67	6.93	3.04	2.41	3.67	1.49	3.11	12.20	9.88	13.04	10.79	2.26	3.31
SPL	1.84	2.04	9.27	2.78	4.83	6.75	10.34	6.18	2.66	2.56	8.65	15.35	2.58	2.87	13.12	1.31	2.57	4.29
TPL	3.08	5.61	5.53	2.40	5.41	0.64	3.57	3.61	4.58	3.81	6.16	2.92	10.32	5.14	19.81	7.24	7.36	2.82
UMW	4.77	16.88	4.84	3.77	10.78	2.62	2.90	5.88	6.80	2.53	5.78	4.32	3.42	8.74	4.06	4.69	3.79	3.43
WMT	1.65	2.62	7.32	2.56	2.46	0.62	31.17	4.20	13.79	2.25	2.66	6.84	2.72	1.85	9.75	1.42	3.01	3.12
XER	22.50	6.17	5.11	1.05	3.37	2.91	11.50	3.78	6.66	3.82	6.64	5.89	3.09	6.12	2.15	3.54	3.23	2.46

Table 8: Table of relative influence values for predictors in the weak flyer-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	11.24	3.76	9.80	8.93	7.20	0.77	4.55	7.34	2.55	3.79	3.56	5.23	7.29	8.25	3.42	3.27	4.35	4.72
NAP	6.15	2.36	3.86	5.74	5.53	5.77	2.76	4.02	4.51	3.65	1.92	10.13	7.17	6.30	3.70	11.80	9.64	4.98
NPL	2.93	18.54	2.68	3.77	2.45	4.17	7.17	2.67	7.76	4.49	5.38	2.57	7.96	6.94	12.60	1.56	2.62	3.73
SAP	3.70	5.65	4.08	5.95	11.41	2.07	1.14	8.84	6.25	7.15	5.60	2.30	5.14	10.72	4.45	5.80	5.20	4.54
SPL	4.79	15.53	4.43	3.54	6.28	2.39	2.79	8.70	5.17	3.26	3.91	5.89	9.29	6.70	5.72	4.27	4.17	3.17
TPL	10.54	16.51	5.02	2.25	4.16	1.07	1.02	3.55	6.98	5.52	2.64	3.48	2.80	5.86	6.80	7.78	4.36	9.67
UMW	5.46	5.48	3.39	4.31	8.70	6.91	5.25	7.51	6.88	2.69	4.99	7.35	3.64	6.61	3.18	8.36	3.68	5.62
WMT	6.49	6.70	2.95	3.31	9.43	7.78	4.83	5.04	1.43	2.52	3.80	6.68	4.96	8.77	6.74	6.08	2.97	9.52
XER	7.44	10.60	7.83	1.28	5.26	6.71	5.82	6.95	4.76	1.68	2.53	4.99	9.05	3.05	8.27	4.39	3.73	5.69

Table 9: Table of relative influence values for predictors in the strong flyer-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	8.04	3.97	10.76	1.94	3.04	0.32	0.89	15.73	3.80	1.96	2.02	3.74	3.44	18.78	1.18	14.45	2.13	3.81
NAP	4.96	3.67	5.40	6.93	5.49	4.55	2.81	6.56	3.86	6.10	4.45	7.61	6.90	5.58	8.34	8.01	5.42	3.37
NPL	5.57	4.64	2.14	4.79	7.07	3.67	2.05	3.53	2.01	7.12	2.90	15.64	4.10	1.96	20.69	3.06	2.81	6.25
SAP	3.60	6.76	6.27	12.53	3.73	0.42	0.80	5.10	6.35	8.32	6.65	4.05	3.73	9.85	4.29	6.77	5.87	4.92
SPL	2.48	2.34	4.54	1.97	9.53	1.01	0.87	2.36	4.14	2.53	3.16	14.13	21.24	5.11	7.40	8.53	3.04	5.62
TPL	18.36	1.52	3.50	4.48	6.47	0.50	10.88	1.25	1.88	10.05	12.70	2.62	4.60	1.81	1.46	13.21	2.70	2.04
UMW	7.25	12.28	7.57	9.84	4.87	1.23	2.09	2.39	6.24	1.95	2.54	8.49	5.49	9.59	2.38	7.80	4.23	3.78
WMT	5.01	2.43	4.42	4.92	5.50	2.47	8.66	5.69	3.46	3.47	4.66	5.20	7.61	13.63	12.46	3.25	2.44	4.71
XER	5.97	6.57	1.71	4.30	5.42	5.05	2.95	8.37	3.53	1.48	3.93	3.64	13.21	6.75	3.76	5.74	4.20	13.44

Table 10: Table of relative influence values for predictors in the small size-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	7.87	4.95	5.82	6.09	6.36	0.52	3.51	6.20	3.69	3.41	4.57	4.47	8.22	13.09	7.02	5.28	5.05	3.88
NAP	7.50	2.85	3.32	6.75	6.41	4.33	3.03	5.84	5.56	3.07	3.02	5.41	12.14	5.78	1.68	11.72	3.14	8.45
NPL	2.15	11.95	2.57	2.04	2.10	3.04	5.54	2.62	4.11	7.75	8.99	5.82	7.31	11.34	14.43	3.28	1.38	3.58
SAP	5.23	3.51	4.18	7.23	11.32	1.67	1.32	8.71	4.66	8.79	6.12	2.74	5.37	12.40	2.48	3.80	4.99	5.48
SPL	5.01	14.66	4.52	4.40	6.26	2.23	1.93	8.13	4.71	4.31	3.95	5.67	5.67	8.54	6.06	4.57	5.22	4.18
TPL	14.50	12.63	6.51	2.09	4.41	0.77	0.48	4.89	5.52	3.86	2.93	5.21	3.24	7.83	7.78	6.72	4.43	6.21
UMW	4.25	4.02	5.19	2.37	3.36	9.07	2.72	7.01	3.24	2.96	3.62	13.04	5.32	11.51	6.92	5.95	2.76	6.70
WMT	9.08	5.13	3.10	4.06	9.34	5.75	4.90	5.62	0.68	1.59	1.90	4.61	8.51	15.58	4.79	7.79	3.38	4.19
XER	7.10	6.52	4.36	2.07	4.63	8.45	5.34	7.28	3.13	2.36	5.07	9.11	7.47	4.85	11.66	3.44	3.63	3.53

Table 11: Table of relative influence values for predictors in the medium size-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	9.77	3.14	3.81	4.43	8.35	0.77	2.31	13.15	17.31	4.81	4.72	2.13	2.73	6.17	1.77	9.40	2.11	3.10
NAP	3.94	5.37	6.89	4.02	5.92	1.83	14.18	12.10	5.55	5.68	3.30	2.44	4.82	2.75	2.10	10.06	4.29	4.75
NPL	9.80	5.75	6.62	1.15	3.30	2.00	7.88	3.79	6.66	6.55	5.56	5.47	2.22	6.67	6.44	8.70	5.47	5.97
SAP	4.91	9.32	4.69	7.03	7.05	0.61	1.41	4.54	3.41	4.97	4.21	6.69	5.70	10.45	6.09	7.66	7.25	4.02
SPL	3.96	4.33	7.88	3.13	7.74	3.48	29.48	4.53	8.97	2.65	4.75	2.66	2.53	2.06	6.64	1.55	1.20	2.43
TPL	4.74	3.87	3.60	4.42	2.81	1.74	3.44	5.30	18.55	6.60	4.84	4.29	8.69	3.90	6.39	7.00	6.39	3.44
UMW	2.96	15.54	3.61	5.44	4.11	1.35	3.05	5.32	6.51	2.80	3.85	5.86	5.00	6.34	6.16	2.74	14.31	5.07
WMT	5.83	1.95	6.59	4.12	8.43	1.08	6.91	4.08	21.74	3.86	2.42	7.90	2.33	2.24	3.83	7.32	4.59	4.80
XER	17.03	4.48	2.88	1.97	4.63	1.35	3.49	5.98	2.02	4.84	2.36	15.73	2.56	9.44	2.34	8.92	6.28	3.71

Table 12: Table of relative influence values for predictors in the large size-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	3.89	14.03	2.91	2.96	1.40	0.53	0.49	2.93	6.35	8.80	22.66	4.21	6.00	6.22	4.07	1.66	6.25	4.63
NAP	1.80	6.70	0.69	2.94	2.45	0.27	3.12	15.30	4.50	13.24	16.03	0.63	2.39	20.24	1.39	6.33	0.66	1.30
NPL	0.99	2.03	30.56	0.81	3.90	1.03	20.99	0.81	2.29	6.86	0.36	2.29	1.30	12.64	5.94	2.66	4.10	0.44
SAP	8.45	4.70	4.01	3.14	4.47	0.84	4.15	4.11	3.57	2.92	2.36	3.17	23.17	8.21	2.75	10.03	4.14	5.84
SPL	0.54	0.39	0.99	1.69	0.43	0.18	0.93	2.16	0.40	0.87	5.45	0.64	15.15	0.35	2.02	15.49	1.36	50.99
TPL	7.20	3.00	10.58	0.98	3.34	0.77	0.40	2.27	0.68	2.14	3.00	5.02	8.80	1.64	35.62	6.56	5.43	2.57
UMW	9.99	12.42	30.28	1.55	1.70	2.19	2.19	5.88	1.09	2.70	3.51	2.33	7.14	7.97	1.77	1.54	2.81	2.95
WMT	1.91	2.47	26.22	1.81	0.27	0.07	15.16	34.99	7.38	0.48	0.71	0.55	0.17	0.39	1.89	0.11	1.20	4.21
XER	2.32	2.65	1.12	0.30	8.86	0.51	2.73	2.21	0.71	0.41	0.35	4.27	0.80	0.37	9.75	0.51	60.51	1.63

Table 13: Table of relative influence values for predictors in the depositional-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	7.23	3.78	9.04	9.41	7.79	0.63	6.31	8.81	3.16	4.31	4.00	4.76	6.12	8.38	2.65	3.98	3.93	5.71
NAP	4.19	3.02	3.20	9.89	14.17	3.73	3.86	2.63	3.79	3.00	1.94	3.65	14.77	4.13	3.97	10.99	3.34	5.73
NPL	3.17	16.13	2.89	5.53	2.94	2.31	5.72	3.40	4.75	6.47	9.06	4.25	5.04	5.88	8.36	3.70	3.96	6.46
SAP	3.59	4.58	7.39	9.63	7.23	2.13	1.03	7.59	5.20	4.57	6.41	2.35	5.85	8.64	3.92	7.19	4.51	8.18
SPL	3.86	11.63	5.13	2.68	7.49	2.79	3.06	5.44	3.36	2.58	4.03	5.74	9.13	8.30	8.38	3.87	8.99	3.54
TPL	7.41	23.35	4.26	2.63	3.90	3.03	0.68	3.77	7.21	3.55	3.32	2.27	4.85	4.63	3.26	8.59	3.12	10.15
UMW	4.84	9.12	5.43	4.52	6.30	9.08	4.48	5.43	5.98	3.47	7.62	6.60	5.24	6.66	2.64	3.56	3.98	5.06
WMT	4.50	3.09	3.72	2.07	23.54	7.81	3.37	10.19	1.32	3.38	2.25	2.59	3.42	7.86	3.72	6.03	4.16	6.98
XER	6.45	4.78	4.51	1.95	4.00	10.70	4.66	5.27	3.49	2.96	4.57	10.12	11.27	5.24	3.61	6.10	2.43	7.90

Table 14: Table of relative influence values for predictors in the depositional-erosional-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	9.49	8.49	3.74	2.42	5.77	0.54	2.57	3.92	10.23	2.36	2.19	4.36	8.20	10.80	8.37	4.86	3.90	7.79
NAP	4.83	9.73	7.50	6.48	5.19	2.08	7.49	19.57	5.85	1.61	1.24	4.49	4.40	2.22	1.72	4.31	4.08	7.22
NPL	3.72	5.28	6.16	2.00	2.86	17.37	11.28	2.96	4.06	8.04	5.83	4.86	3.30	3.98	3.56	8.71	2.15	3.88
SAP	5.32	6.88	4.05	5.53	7.48	2.87	7.55	3.13	2.82	4.68	3.68	3.66	7.42	10.47	4.88	3.63	6.72	9.24
SPL	4.72	4.68	6.97	5.48	7.67	3.89	13.18	4.30	4.55	2.96	6.55	10.69	3.16	3.83	9.62	1.54	2.12	4.08
TPL	7.64	8.43	4.90	3.18	5.92	0.58	1.52	1.88	3.96	2.48	4.43	3.30	17.76	8.53	8.32	5.92	7.09	4.15
UMW	3.33	21.33	7.35	2.98	9.05	2.76	2.33	7.24	3.09	1.98	7.68	3.62	3.74	7.29	4.56	6.84	1.90	2.93
WMT	4.10	9.13	12.15	5.57	4.45	1.90	6.95	2.51	13.48	6.40	2.84	5.92	4.74	1.81	5.26	5.20	4.16	3.43
XER	17.08	7.39	2.20	2.69	4.51	3.24	8.94	4.01	2.31	2.32	6.25	10.82	8.68	4.12	6.61	2.46	3.09	3.29

Table 15: Table of relative influence values for predictors in the erosional-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	3.79	26.96	2.60	3.56	4.41	0.33	4.55	5.48	12.31	4.33	6.77	2.08	2.95	4.69	3.20	1.71	8.31	1.95
NAP	7.59	2.35	2.76	12.25	5.47	1.47	1.90	3.23	4.19	7.34	7.41	6.46	4.18	3.17	6.68	4.90	14.95	3.69
NPL	8.29	4.93	2.78	4.11	7.17	2.82	2.90	3.70	3.65	6.31	4.13	13.76	3.24	2.65	15.83	3.25	3.54	6.93
SAP	4.05	8.82	4.90	9.50	4.56	0.57	1.07	4.40	5.54	8.10	5.82	4.54	2.66	13.06	8.53	5.03	3.80	5.06
SPL	2.25	2.05	2.92	4.37	8.56	1.50	1.54	3.52	2.66	1.44	11.94	2.05	20.50	1.58	4.92	2.99	0.87	24.34
TPL	9.74	1.92	3.28	3.46	7.57	0.50	7.63	1.41	2.74	6.45	11.95	9.48	10.64	3.86	4.79	9.60	2.50	2.49
UMW	7.41	5.65	11.84	7.83	4.84	0.86	2.38	3.37	4.32	2.88	3.69	6.55	4.63	10.48	2.36	8.32	7.67	4.91
WMT	4.65	5.15	4.56	3.39	9.42	3.41	7.41	4.84	11.06	2.74	5.79	3.32	5.79	8.98	7.35	4.66	4.19	3.28
XER	7.17	3.77	3.89	4.73	7.75	4.67	4.84	9.20	1.90	2.36	4.27	4.42	6.50	4.32	3.96	10.45	5.59	10.21

Table 16: Table of relative influence values for predictors in the cold water-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	8.47	17.98	3.12	2.89	4.17	0.64	1.89	6.30	12.15	3.30	4.40	3.52	6.64	7.03	3.80	2.53	7.17	4.01
NAP	3.92	2.95	3.58	12.05	8.52	2.03	1.35	5.45	1.74	4.41	7.50	2.57	3.01	6.58	3.37	3.76	7.54	19.67
NPL	2.70	10.98	28.13	1.15	2.10	6.97	11.26	3.55	2.07	4.36	1.68	5.64	1.36	1.85	2.05	2.17	1.97	10.00
SAP	4.78	5.62	2.58	7.27	5.26	1.33	5.68	7.11	3.29	2.72	2.58	8.48	2.96	16.08	12.12	3.91	2.31	5.91
SPL	1.35	4.59	1.14	2.41	2.84	1.28	1.99	4.45	5.89	1.50	4.98	22.04	8.76	2.31	6.64	5.76	3.37	18.71
TPL	5.29	1.53	5.80	1.89	3.53	2.33	4.55	2.23	1.61	11.80	10.83	4.77	6.21	28.68	1.33	2.80	2.19	2.62
UMW	2.52	6.87	10.64	5.94	6.62	7.93	3.73	3.15	10.28	0.74	1.60	2.00	4.71	2.88	1.64	12.86	8.13	7.75
WMT	8.12	2.73	3.30	3.01	3.14	1.24	6.50	10.08	13.52	3.50	2.29	6.02	5.95	2.66	1.71	3.68	3.21	19.33
XER	9.06	2.37	29.63	0.35	5.41	1.01	2.66	4.51	6.35	2.99	1.23	5.70	3.47	4.36	1.39	7.60	8.95	2.95

Table 17: Table of relative influence values for predictors in the cool-warm water-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	7.42	5.49	4.93	1.85	3.61	1.42	2.05	2.43	4.31	1.60	3.00	4.90	6.68	28.75	8.56	7.04	2.92	3.04
NAP	2.70	7.01	2.02	4.93	3.90	4.13	10.27	12.73	3.17	3.60	4.85	6.48	5.94	4.83	3.94	8.58	3.36	7.56
NPL	3.23	7.32	2.01	2.85	4.53	3.23	5.63	3.90	6.71	6.06	11.44	3.14	6.69	10.21	3.70	9.15	2.50	7.70
SAP	5.09	5.90	3.38	4.24	11.04	1.81	1.67	5.04	2.45	9.91	10.44	3.10	6.26	8.60	2.83	5.04	5.09	8.11
SPL	6.69	10.51	3.89	2.88	7.04	3.48	2.78	3.95	4.97	6.84	4.94	4.07	6.97	9.53	5.06	5.84	3.87	6.70
TPL	15.63	7.32	5.50	5.41	8.34	0.59	0.94	3.65	4.33	2.60	5.28	4.15	4.97	4.23	8.11	4.26	8.55	6.14
UMW	7.14	5.12	16.98	4.87	2.64	3.36	2.63	4.75	16.45	3.86	5.10	3.75	3.07	4.74	2.71	4.95	2.98	4.90
WMT	7.74	4.70	7.34	5.64	5.55	3.95	7.68	8.16	1.03	1.99	2.03	5.52	11.51	7.73	8.43	5.87	1.79	3.34
XER	8.20	5.71	7.95	2.70	4.75	8.45	4.61	6.12	3.38	1.84	4.76	4.35	8.61	2.83	13.29	2.97	4.52	4.99

Table 18: Table of relative influence values for predictors in the warm water-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	19.89	1.40	2.50	2.67	1.42	5.36	0.21	32.06	2.43	1.25	0.79	2.93	21.94	1.35	0.46	0.89	1.64	0.80
NAP	4.52	2.20	1.90	2.13	6.31	0.21	0.06	1.07	12.44	0.16	0.44	2.18	22.66	0.32	0.47	0.12	42.22	0.60
NPL	7.66	11.70	3.68	4.53	2.10	1.82	7.86	5.23	2.47	2.13	4.68	15.88	5.69	6.24	2.91	3.60	3.30	8.53
SAP	2.35	2.37	9.24	1.70	2.79	0.28	1.46	1.99	17.00	2.36	1.33	4.50	13.25	24.75	5.42	3.09	3.25	2.87
SPL	2.26	4.56	0.87	0.57	1.61	2.52	0.76	1.92	1.37	7.03	4.31	1.69	7.01	12.20	4.24	12.87	3.66	30.55
TPL	8.44	5.08	3.32	4.82	2.08	1.86	1.53	3.31	8.24	2.76	9.11	2.86	3.88	13.68	3.08	2.51	3.02	20.43
UMW	2.81	14.39	25.37	1.63	0.54	9.40	3.23	4.10	1.79	2.75	1.23	11.87	4.37	4.85	4.44	4.09	1.65	1.49
WMT	0.83	12.09	2.64	4.15	2.40	0.28	1.77	1.61	35.38	5.87	0.98	6.51	14.39	2.74	2.61	1.59	3.27	0.88
XER	0.30	0.21	14.79	0.00	0.24	10.61	0.95	9.13	1.61	4.84	0.26	1.58	27.55	20.64	0.10	0.98	1.14	5.07

Table 19: Table of relative influence values for predictors in the sensitive tolerance-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	13.23	6.76	25.39	8.46	5.45	2.53	2.12	3.30	2.39	2.29	1.60	5.58	3.75	2.67	2.60	4.20	3.70	3.97
NAP	16.70	3.51	4.48	19.09	3.75	1.00	7.59	2.32	3.23	1.75	4.02	3.14	3.77	2.45	0.79	5.34	14.55	2.52
NPL	1.92	3.70	2.05	5.37	1.92	1.08	0.69	3.97	2.18	1.78	0.79	0.90	20.35	1.90	0.82	26.07	9.06	15.45
SAP	7.89	6.41	7.90	4.29	4.62	0.28	2.88	7.72	2.10	5.40	2.91	3.57	14.99	6.41	2.94	3.54	7.25	8.89
SPL	4.72	12.18	5.21	1.54	22.12	2.09	0.39	1.32	1.97	0.41	2.37	8.31	14.93	1.47	9.62	2.91	7.60	0.84
TPL	3.07	2.83	9.73	3.64	8.08	0.72	0.85	27.76	7.51	3.00	2.89	2.83	5.74	3.45	1.59	5.86	1.34	9.12
UMW	3.74	5.98	3.89	2.24	5.09	2.06	5.48	7.73	8.42	3.56	3.73	2.24	10.69	12.99	7.07	2.09	6.05	6.96
WMT	11.67	3.86	7.18	2.78	5.91	1.65	5.82	5.21	6.70	2.52	1.97	14.30	8.99	1.88	4.75	4.04	7.85	2.93
XER	5.89	4.68	5.32	5.49	6.88	2.13	4.19	3.58	4.12	1.96	9.60	3.35	7.23	8.52	2.80	2.88	9.64	11.72

Table 20: Table of relative influence values for predictors in the intermediate tolerance-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	13.23	6.76	25.39	8.46	5.45	2.53	2.12	3.30	2.39	2.29	1.60	5.58	3.75	2.67	2.60	4.20	3.70	3.97
NAP	16.70	3.51	4.48	19.09	3.75	1.00	7.59	2.32	3.23	1.75	4.02	3.14	3.77	2.45	0.79	5.34	14.55	2.52
NPL	1.92	3.70	2.05	5.37	1.92	1.08	0.69	3.97	2.18	1.78	0.79	0.90	20.35	1.90	0.82	26.07	9.06	15.45
SAP	7.89	6.41	7.90	4.29	4.62	0.28	2.88	7.72	2.10	5.40	2.91	3.57	14.99	6.41	2.94	3.54	7.25	8.89
SPL	4.72	12.18	5.21	1.54	22.12	2.09	0.39	1.32	1.97	0.41	2.37	8.31	14.93	1.47	9.62	2.91	7.60	0.84
TPL	3.07	2.83	9.73	3.64	8.08	0.72	0.85	27.76	7.51	3.00	2.89	2.83	5.74	3.45	1.59	5.86	1.34	9.12
UMW	3.74	5.98	3.89	2.24	5.09	2.06	5.48	7.73	8.42	3.56	3.73	2.24	10.69	12.99	7.07	2.09	6.05	6.96
WMT	11.67	3.86	7.18	2.78	5.91	1.65	5.82	5.21	6.70	2.52	1.97	14.30	8.99	1.88	4.75	4.04	7.85	2.93
XER	5.89	4.68	5.32	5.49	6.88	2.13	4.19	3.58	4.12	1.96	9.60	3.35	7.23	8.52	2.80	2.88	9.64	11.72

Table 21: Table of relative influence values for predictors in the tolerant-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	5.59	6.51	5.27	6.20	3.39	0.86	2.50	6.29	11.52	2.60	3.17	1.80	15.01	7.47	4.37	6.87	6.02	4.56
NAP	1.55	4.52	10.04	2.48	2.66	1.65	10.54	34.34	8.19	1.40	0.64	2.31	5.50	2.97	1.97	1.57	5.22	2.47
NPL	2.38	8.76	5.96	1.51	2.06	7.71	6.93	6.93	2.98	7.43	9.49	8.89	3.36	2.59	5.43	6.84	6.04	4.72
SAP	3.04	5.02	6.34	8.88	8.36	0.88	4.66	6.01	8.85	2.67	3.67	2.49	3.21	10.09	2.68	12.65	5.49	4.99
SPL	3.77	5.46	5.67	1.75	2.61	6.06	11.01	3.13	3.09	1.92	3.96	5.54	2.62	5.88	24.42	2.11	4.06	6.94
TPL	7.30	2.63	5.40	4.05	5.55	2.20	12.65	3.49	4.26	3.32	4.44	2.68	6.04	7.31	8.94	4.32	8.62	6.80
UMW	4.17	13.15	9.32	10.11	5.87	4.21	2.84	6.82	4.09	3.52	4.24	2.47	4.93	5.33	2.10	2.01	11.19	3.61
WMT	6.79	7.79	9.09	3.55	5.47	1.31	7.56	17.73	1.64	6.05	3.08	3.00	2.79	5.92	2.72	3.98	6.99	4.55
XER	13.05	5.28	5.53	2.30	3.22	2.97	10.87	4.43	2.56	4.85	6.77	4.21	3.55	6.71	2.69	11.54	4.15	5.31

Table 22: Table of relative influence values for predictors in the collector-gatherer-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	8.19	3.94	6.12	6.89	7.87	0.71	4.38	10.36	3.76	3.55	3.64	4.61	6.24	11.31	5.14	3.84	5.71	3.74
NAP	8.55	2.30	2.38	5.19	7.02	2.45	2.23	4.63	9.54	2.84	2.61	7.04	11.56	5.76	3.07	12.50	5.69	4.62
NPL	2.02	13.28	1.79	2.36	1.64	5.63	4.21	2.49	3.28	9.55	10.30	3.91	7.68	9.35	13.93	3.10	1.34	4.13
SAP	3.58	4.53	2.96	8.84	10.66	1.61	1.95	7.24	3.66	6.17	7.57	1.71	5.10	13.51	1.72	6.31	5.37	7.51
SPL	4.55	13.04	4.01	3.80	5.58	1.90	2.71	6.14	4.24	4.23	4.46	6.41	6.59	9.97	6.58	5.40	6.56	3.82
TPL	9.09	17.58	7.77	2.09	7.05	1.05	0.76	3.46	7.52	4.47	2.45	5.16	3.18	6.52	5.79	5.13	4.60	6.35
UMW	3.22	3.52	5.17	3.04	4.48	10.05	5.17	6.11	4.02	2.35	4.94	10.88	5.24	9.48	5.88	7.13	2.41	6.91
WMT	8.35	5.60	2.42	2.76	16.92	7.68	1.91	7.50	1.08	1.20	1.97	3.87	5.94	10.09	6.79	7.84	2.68	5.40
XER	8.97	8.64	3.80	1.12	5.62	8.46	6.19	7.21	3.75	4.11	3.63	8.38	6.58	5.06	8.99	2.84	3.37	3.28

Table 23: Table of relative influence values for predictors in the collector-filterer-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	3.03	5.73	1.85	3.58	3.37	1.65	2.13	3.77	12.70	7.89	6.37	6.85	4.51	16.02	8.99	4.28	4.24	3.05
NAP	4.01	3.05	1.84	6.38	8.51	1.45	8.48	14.86	3.66	9.12	5.19	2.62	2.73	3.66	2.57	13.00	4.01	4.85
NPL	7.29	4.80	2.79	4.15	7.19	2.95	2.85	4.32	3.85	6.60	4.59	12.40	3.35	3.02	15.56	3.62	3.82	6.85
SAP	2.78	6.69	4.62	9.07	3.58	1.41	1.67	7.47	3.68	8.13	9.38	4.04	7.68	9.82	4.02	8.34	4.81	2.81
SPL	1.77	6.73	3.25	4.74	10.17	1.89	1.11	1.72	2.41	1.86	5.15	3.27	12.49	2.58	23.70	2.59	1.08	13.48
TPL	7.99	2.26	11.78	6.26	14.52	0.39	1.79	1.35	2.49	4.73	7.32	6.81	6.91	2.12	9.43	8.02	2.35	3.48
UMW	7.86	7.92	22.81	2.60	3.72	4.03	3.53	5.91	3.99	2.01	3.63	3.01	3.91	6.92	4.38	4.08	3.97	5.71
WMT	3.11	2.15	16.61	3.75	5.80	2.06	10.68	3.37	14.50	4.80	2.53	6.06	3.90	5.54	6.81	3.24	2.28	2.82
XER	4.16	3.61	3.41	4.97	5.64	5.82	4.81	8.04	3.33	2.54	3.61	5.08	11.65	6.43	5.00	8.01	7.03	6.85

Table 24: Table of relative influence values for predictors in the herbivore-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	17.12	2.91	0.41	0.53	1.77	2.67	0.46	3.48	14.58	7.08	2.10	4.79	13.23	1.02	9.01	3.95	3.51	11.36
NAP	2.59	4.79	8.07	12.71	6.38	9.19	14.62	2.09	2.50	1.80	1.17	6.37	6.34	2.93	1.19	7.53	2.64	7.09
NPL	2.40	8.01	3.06	0.89	1.91	25.40	7.22	2.00	12.22	1.46	11.62	3.02	2.06	3.50	2.52	4.39	3.29	5.02
SAP	6.95	3.96	3.25	10.63	5.41	0.35	1.27	7.71	2.38	10.45	2.82	8.30	9.02	6.97	9.86	2.75	4.44	3.50
SPL	4.85	3.86	17.06	3.73	4.98	7.41	26.32	3.19	4.48	5.24	4.76	1.97	2.03	1.72	2.37	2.10	1.04	2.91
TPL	4.64	3.84	9.09	3.78	4.80	2.63	4.47	2.65	5.27	4.08	9.85	4.75	2.38	3.71	6.96	4.07	18.85	4.18
UMW	25.73	2.78	1.60	5.43	7.99	0.57	10.03	3.08	7.24	1.35	2.98	11.46	6.12	3.54	4.19	2.17	2.50	1.26
WMT	6.89	5.68	3.74	14.75	10.48	2.29	8.79	4.29	1.71	0.95	3.22	2.40	2.02	8.41	3.91	2.30	3.40	14.77
XER	21.47	1.93	1.80	1.78	0.84	5.99	1.20	8.07	0.47	15.97	5.35	11.92	2.05	3.53	1.59	10.46	3.08	2.50

Table 25: Table of relative influence values for predictors in the predator-by-environment boosted regression trees, with relative influence values provided for each ecoregion.

	Total N	Total P	DOC	LWD Reach	NAT Cover	ALG Cover	AQM Cover	% Forested	% Ag	% Urban	% ISC	Mean Annual Flow	Longitude	Latitude	Basin Area	Mean Basin Elevation	Range Basin Elevation	Site Centrality
CPL	6.01	2.97	3.87	9.54	4.81	0.94	6.25	8.27	6.11	4.77	9.32	8.06	6.12	5.18	3.10	4.50	2.76	7.43
NAP	0.49	0.28	1.66	1.89	0.33	0.74	19.82	3.75	2.90	6.90	0.30	5.12	1.28	0.93	22.63	0.45	26.86	3.68
NPL	3.61	4.20	10.97	1.80	3.20	7.47	7.34	4.38	15.92	2.90	1.88	3.36	7.15	4.61	2.89	2.24	4.23	11.85
SAP	3.04	4.03	7.93	2.11	28.45	0.35	2.05	4.85	4.07	3.86	5.34	4.78	4.99	3.44	5.57	5.13	6.21	3.80
SPL	1.66	2.57	1.33	12.14	2.74	4.06	14.18	6.53	1.51	6.38	16.68	2.09	5.18	7.15	6.86	1.49	2.63	4.84
TPL	5.97	5.89	4.86	2.20	8.40	1.13	0.91	7.45	21.05	6.16	3.23	4.69	3.69	7.71	2.87	9.19	1.23	3.37
UMW	4.38	15.89	2.98	4.73	7.26	3.47	3.12	4.98	2.41	2.67	12.75	5.54	3.27	4.92	4.58	1.72	9.28	6.03
WMT	2.24	15.04	11.79	4.37	1.74	0.75	10.78	8.83	0.57	4.80	4.98	7.27	1.49	4.51	5.88	1.79	2.64	10.53
XER	1.74	3.55	7.47	10.65	9.08	5.03	4.52	3.69	14.99	4.38	2.81	8.82	2.77	4.82	4.03	5.39	3.25	3.01

Table 26: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the low dispersal-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Environmental	24.05
CPL	Landscape	15.02
CPL	Network	26.96
NAP	Environmental	27.58
NAP	Landscape	32.88
NAP	Network	5.99
NPL	Environmental	19.72
NPL	Landscape	6.28
NPL	Network	47.95
SAP	Environmental	30.66
SAP	Network	32.40
SPL	Environmental	46.74
SPL	Network	20.73
TPL	Environmental	20.00
TPL	Landscape	7.28
TPL	Network	44.46
UMW	Environmental	35.35
UMW	Landscape	17.11
UMW	Network	5.65
WMT	Environmental	26.67
WMT	Landscape	21.22
WMT	Network	18.50
XER	Environmental	25.69
XER	Landscape	7.35
XER	Network	24.67

Table 27: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the high dispersal-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Landscape	21.10
CPL	Network	29.98
NAP	Environmental	22.80
NAP	Network	41.60
NPL	Environmental	9.81
NPL	Landscape	35.33
NPL	Network	23.96
SAP	Environmental	21.19
SAP	Landscape	25.37
SAP	Network	26.87
SPL	Environmental	19.96
SPL	Network	38.58
TPL	Environmental	28.63
TPL	Landscape	10.29
TPL	Network	23.89
UMW	Environmental	32.35
UMW	Landscape	19.89
UMW	Network	11.50
WMT	Environmental	30.20
WMT	Landscape	7.86
WMT	Network	23.18
XER	Environmental	12.14
XER	Landscape	7.20
XER	Network	47.77

Table 28: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the nonflyer-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Environmental	20.82
CPL	Landscape	10.48
CPL	Network	47.86
NAP	Environmental	9.02
NAP	Landscape	64.25
NAP	Network	5.60
NPL	Environmental	37.46
NPL	Landscape	18.33
NPL	Network	21.86
SAP	Environmental	26.96
SAP	Network	45.92
SPL	Environmental	26.36
SPL	Landscape	14.83
SPL	Network	28.48
TPL	Environmental	16.55
TPL	Landscape	6.16
TPL	Network	49.86
UMW	Environmental	27.66
UMW	Landscape	18.46
UMW	Network	8.74
WMT	Environmental	38.48
WMT	Landscape	13.79
WMT	Network	16.59
XER	Environmental	45.29
XER	Landscape	13.31
XER	Network	12.01

Table 29: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the weak flyer-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Environmental	37.17
CPL	Landscape	7.34
CPL	Network	20.76
NAP	Environmental	23.19
NAP	Network	45.04
NPL	Environmental	25.71
NPL	Landscape	13.14
NPL	Network	27.50
SAP	Environmental	23.02
SAP	Landscape	27.84
SAP	Network	26.86
SPL	Environmental	21.81
SPL	Landscape	13.87
SPL	Network	27.60
TPL	Environmental	32.07
TPL	Landscape	12.49
TPL	Network	30.11
UMW	Environmental	31.79
UMW	Landscape	14.39
UMW	Network	27.94
WMT	Environmental	30.39
WMT	Landscape	5.04
WMT	Network	37.79
XER	Environmental	43.65
XER	Landscape	6.95
XER	Network	23.00

Table 30: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the strong flyer-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Environmental	18.80
CPL	Landscape	15.73
CPL	Network	33.23
NAP	Environmental	17.82
NAP	Landscape	12.66
NAP	Network	41.86
NPL	Environmental	12.63
NPL	Landscape	7.12
NPL	Network	42.59
SAP	Environmental	25.56
SAP	Landscape	26.41
SAP	Network	22.49
SPL	Environmental	9.53
SPL	Network	62.03
TPL	Environmental	35.70
TPL	Landscape	22.75
TPL	Network	13.21
UMW	Environmental	36.94
UMW	Landscape	6.24
UMW	Network	31.36
WMT	Environmental	19.17
WMT	Landscape	5.69
WMT	Network	38.90
XER	Environmental	23.00
XER	Landscape	8.37
XER	Network	39.15

Table 31: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the small size-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Environmental	26.14
CPL	Landscape	6.20
CPL	Network	38.67
NAP	Environmental	20.65
NAP	Landscape	11.40
NAP	Network	43.50
NPL	Environmental	17.49
NPL	Landscape	16.74
NPL	Network	38.90
SAP	Environmental	23.78
SAP	Landscape	23.62
SAP	Network	23.25
SPL	Environmental	25.93
SPL	Landscape	8.13
SPL	Network	31.16
TPL	Environmental	33.64
TPL	Landscape	5.52
TPL	Network	33.75
UMW	Environmental	14.26
UMW	Landscape	7.01
UMW	Network	49.44
WMT	Environmental	29.30
WMT	Landscape	5.62
WMT	Network	31.88
XER	Environmental	27.42
XER	Landscape	12.34
XER	Network	28.24

Table 32: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the medium size-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Environmental	18.12
CPL	Landscape	30.46
CPL	Network	15.57
NAP	Environmental	32.36
NAP	Landscape	23.33
NAP	Network	10.06
NPL	Environmental	30.04
NPL	Landscape	18.77
NPL	Network	38.73
SAP	Environmental	23.39
SAP	Network	43.84
SPL	Environmental	45.10
SPL	Landscape	8.97
SPL	Network	6.64
TPL	Landscape	30.45
TPL	Network	28.47
UMW	Environmental	20.98
UMW	Landscape	11.83
UMW	Network	37.73
WMT	Environmental	27.75
WMT	Landscape	21.74
WMT	Network	15.22
XER	Environmental	17.03
XER	Landscape	5.98
XER	Network	40.37

Table 33: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the large size-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Environmental	14.03
CPL	Landscape	37.81
CPL	Network	18.48
NAP	Environmental	6.70
NAP	Landscape	44.58
NAP	Network	26.58
NPL	Environmental	51.55
NPL	Landscape	6.86
NPL	Network	18.58
SAP	Environmental	8.45
SAP	Network	47.24
SPL	Landscape	5.45
SPL	Network	81.63
TPL	Environmental	17.78
TPL	Network	61.43
UMW	Environmental	52.69
UMW	Landscape	5.88
UMW	Network	15.11
WMT	Environmental	41.38
WMT	Landscape	42.36
XER	Environmental	8.86
XER	Network	70.26

Table 34: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the depositional-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Environmental	39.78
CPL	Landscape	8.81
CPL	Network	20.21
NAP	Environmental	24.06
NAP	Network	31.49
NPL	Environmental	27.38
NPL	Landscape	15.53
NPL	Network	25.74
SAP	Environmental	24.26
SAP	Landscape	19.20
SAP	Network	29.87
SPL	Environmental	24.25
SPL	Landscape	5.44
SPL	Network	40.54
TPL	Environmental	30.76
TPL	Landscape	7.21
TPL	Network	18.74
UMW	Environmental	29.93
UMW	Landscape	19.03
UMW	Network	23.56
WMT	Environmental	31.34
WMT	Landscape	10.19
WMT	Network	20.87
XER	Environmental	17.15
XER	Landscape	5.27
XER	Network	40.63

Table 35: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the depositional-erosional-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Environmental	23.75
CPL	Landscape	10.23
CPL	Network	35.16
NAP	Environmental	36.40
NAP	Landscape	25.42
NAP	Network	7.22
NPL	Environmental	40.09
NPL	Landscape	13.87
NPL	Network	8.71
SAP	Environmental	32.75
SAP	Network	33.85
SPL	Environmental	33.30
SPL	Landscape	6.55
SPL	Network	20.31
TPL	Environmental	21.99
TPL	Network	47.62
UMW	Environmental	37.73
UMW	Landscape	14.92
UMW	Network	14.13
WMT	Environmental	33.80
WMT	Landscape	19.88
WMT	Network	16.37
XER	Environmental	33.40
XER	Landscape	6.25
XER	Network	26.10

Table 36: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the erosional-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Environmental	26.96
CPL	Landscape	24.56
CPL	Network	8.31
NAP	Environmental	25.31
NAP	Landscape	14.75
NAP	Network	28.08
NPL	Environmental	15.46
NPL	Landscape	6.31
NPL	Network	36.51
SAP	Environmental	18.32
SAP	Landscape	19.46
SAP	Network	31.68
SPL	Environmental	8.56
SPL	Landscape	11.94
SPL	Network	44.84
TPL	Environmental	24.94
TPL	Landscape	18.39
TPL	Network	29.72
UMW	Environmental	32.73
UMW	Network	33.02
WMT	Environmental	21.98
WMT	Landscape	16.85
WMT	Network	22.11
XER	Environmental	14.92
XER	Landscape	9.20
XER	Network	32.76

Table 37: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the cold water-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Environmental	26.45
CPL	Landscape	18.45
CPL	Network	20.84
NAP	Environmental	20.57
NAP	Landscape	12.94
NAP	Network	33.78
NPL	Environmental	57.34
NPL	Network	15.64
SAP	Environmental	23.83
SAP	Landscape	7.11
SAP	Network	42.60
SPL	Landscape	5.89
SPL	Network	61.91
TPL	Environmental	11.10
TPL	Landscape	22.63
TPL	Network	34.89
UMW	Environmental	37.99
UMW	Landscape	10.28
UMW	Network	28.75
WMT	Environmental	14.62
WMT	Landscape	23.60
WMT	Network	31.29
XER	Environmental	44.10
XER	Landscape	6.35
XER	Network	22.25

Table 38: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the cool-warm water-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Environmental	12.91
CPL	Network	51.03
NAP	Environmental	17.28
NAP	Landscape	12.73
NAP	Network	28.56
NPL	Environmental	12.95
NPL	Landscape	24.21
NPL	Network	33.74
SAP	Environmental	22.04
SAP	Landscape	25.39
SAP	Network	33.09
SPL	Environmental	24.24
SPL	Landscape	6.84
SPL	Network	34.09
TPL	Environmental	42.19
TPL	Landscape	5.28
TPL	Network	22.80
UMW	Environmental	29.24
UMW	Landscape	21.54
WMT	Environmental	33.96
WMT	Landscape	8.16
WMT	Network	39.05
XER	Environmental	30.30
XER	Landscape	6.12
XER	Network	21.89

Table 39: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the warm water-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Environmental	25.25
CPL	Landscape	32.06
CPL	Network	21.94
NAP	Environmental	6.31
NAP	Landscape	12.44
NAP	Network	64.88
NPL	Environmental	27.22
NPL	Landscape	5.23
NPL	Network	36.33
SAP	Environmental	9.24
SAP	Landscape	17.00
SAP	Network	43.42
SPL	Landscape	7.03
SPL	Network	62.63
TPL	Environmental	13.52
TPL	Landscape	17.35
TPL	Network	34.11
UMW	Environmental	49.16
UMW	Network	11.87
WMT	Environmental	12.09
WMT	Landscape	41.24
WMT	Network	20.90
XER	Environmental	25.40
XER	Landscape	9.13
XER	Network	53.27

Table 40: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the sensitive tolerance-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Environmental	59.29
CPL	Network	5.58
NAP	Environmental	43.39
NAP	Network	19.89
NPL	Environmental	5.37
NPL	Network	70.94
SAP	Environmental	22.21
SAP	Landscape	13.12
SAP	Network	37.53
SPL	Environmental	39.50
SPL	Network	40.46
TPL	Environmental	17.81
TPL	Landscape	35.27
TPL	Network	20.72
UMW	Environmental	16.55
UMW	Landscape	16.14
UMW	Network	43.75
WMT	Environmental	30.58
WMT	Landscape	11.91
WMT	Network	31.13
XER	Environmental	23.58
XER	Landscape	9.60
XER	Network	37.11

Table 41: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the intermediate tolerance-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Environmental	12.84
CPL	Landscape	13.99
CPL	Network	44.66
NAP	Environmental	27.61
NAP	Network	28.59
NPL	Environmental	22.84
NPL	Landscape	19.17
NPL	Network	31.21
SAP	Environmental	14.69
SAP	Landscape	27.53
SAP	Network	36.46
SPL	Environmental	23.94
SPL	Network	38.40
TPL	Environmental	37.85
TPL	Network	21.94
UMW	Environmental	33.22
UMW	Landscape	5.33
UMW	Network	24.68
WMT	Environmental	35.31
WMT	Network	43.13
XER	Environmental	20.63
XER	Landscape	7.77
XER	Network	39.30

Table 42: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the tolerant-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Environmental	23.58
CPL	Landscape	17.81
CPL	Network	35.37
NAP	Environmental	20.57
NAP	Landscape	42.54
NAP	Network	10.72
NPL	Environmental	29.36
NPL	Landscape	23.84
NPL	Network	27.20
SAP	Environmental	28.60
SAP	Landscape	14.86
SAP	Network	28.24
SPL	Environmental	28.20
SPL	Network	42.78
TPL	Environmental	30.91
TPL	Network	37.71
UMW	Environmental	38.44
UMW	Landscape	6.82
UMW	Network	16.53
WMT	Environmental	36.70
WMT	Landscape	23.77
WMT	Network	12.91
XER	Environmental	34.73
XER	Landscape	6.77
XER	Network	23.55

Table 43: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the collector-gatherer-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Environmental	29.07
CPL	Landscape	10.36
CPL	Network	28.40
NAP	Environmental	20.76
NAP	Landscape	9.54
NAP	Network	42.55
NPL	Environmental	18.92
NPL	Landscape	19.85
NPL	Network	30.96
SAP	Environmental	19.50
SAP	Landscape	20.98
SAP	Network	37.79
SPL	Environmental	18.63
SPL	Landscape	6.14
SPL	Network	41.52
TPL	Environmental	41.48
TPL	Landscape	7.52
TPL	Network	28.95
UMW	Environmental	20.39
UMW	Landscape	6.11
UMW	Network	45.52
WMT	Environmental	38.56
WMT	Landscape	7.50
WMT	Network	36.05
XER	Environmental	37.88
XER	Landscape	7.21
XER	Network	29.01

Table 44: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the collector-filterer-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Environmental	5.73
CPL	Landscape	26.97
CPL	Network	31.85
NAP	Environmental	23.38
NAP	Landscape	29.17
NAP	Network	13.00
NPL	Environmental	14.48
NPL	Landscape	6.60
NPL	Network	34.82
SAP	Environmental	15.77
SAP	Landscape	24.97
SAP	Network	25.84
SPL	Environmental	16.91
SPL	Landscape	5.15
SPL	Network	49.67
TPL	Environmental	40.56
TPL	Landscape	7.32
TPL	Network	31.17
UMW	Environmental	38.59
UMW	Landscape	5.91
UMW	Network	12.63
WMT	Environmental	33.08
WMT	Landscape	14.50
WMT	Network	18.40
XER	Environmental	11.46
XER	Landscape	8.04
XER	Network	50.06

Table 45: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the herbivore-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Environmental	17.12
CPL	Landscape	21.67
CPL	Network	33.61
NAP	Environmental	50.97
NAP	Network	27.33
NPL	Environmental	40.63
NPL	Landscape	23.84
NPL	Network	5.02
SAP	Environmental	22.99
SAP	Landscape	18.16
SAP	Network	34.14
SPL	Environmental	50.78
SPL	Landscape	5.24
TPL	Environmental	9.09
TPL	Landscape	15.11
TPL	Network	25.82
UMW	Environmental	49.18
UMW	Landscape	7.24
UMW	Network	17.58
WMT	Environmental	46.58
WMT	Network	23.18
XER	Environmental	27.46
XER	Landscape	29.38
XER	Network	22.38

Table 46: Summed relative influence for all predictor variables within the respective category with a relative influence >5.00 for the predator-by-environment boosted regression trees. Summed relative influence was calculated for each of the ecoregions.

Ecoregion	Predictor Category	Relative Influence
CPL	Environmental	21.80
CPL	Landscape	23.70
CPL	Network	26.79
NAP	Environmental	19.82
NAP	Landscape	6.90
NAP	Network	54.61
NPL	Environmental	25.78
NPL	Landscape	15.92
NPL	Network	19.00
SAP	Environmental	36.38
SAP	Landscape	5.34
SAP	Network	16.90
SPL	Environmental	26.32
SPL	Landscape	29.58
SPL	Network	19.18
TPL	Environmental	20.25
TPL	Landscape	34.66
TPL	Network	16.90
UMW	Environmental	23.16
UMW	Landscape	12.75
UMW	Network	20.86
WMT	Environmental	37.61
WMT	Landscape	8.83
WMT	Network	23.68
XER	Environmental	32.23
XER	Landscape	14.99
XER	Network	14.21

R Session Information

Table 47: Packages required for data management and summaries.

Package	Loaded Version	Date
dplyr	1.0.8	2022-02-08
forcats	0.5.1	2021-01-27
ggplot2	3.3.5	2021-06-25
kableExtra	1.3.4	2021-02-20
knitr	1.38	2022-03-25
purrr	0.3.4	2020-04-17
readr	2.1.2	2022-01-30
reshape2	1.4.4	2020-04-09
stringr	1.4.0	2019-02-10
tibble	3.1.6	2021-11-07
tidyr	1.2.0	2022-02-01
tidyverse	1.3.1	2021-04-15