

Ecography

E7852

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Supplementary material

Appendix 1. List of sites that contributed to the generalized dissimilarity modeling analyses. The site handle, collection unit ID, and site name correspond to those given in the Neotoma database (www.neotomadb.org). Some sites have not yet been added to the database and thus do not have a collection unit ID, but the site handle is expected to remain the same. Latitude and Longitude are given in WGS84. 'Age Older' and 'Age Younger' indicate the temporal range of each site, in calibrated years before 1950.

Site Handle	Collection Unit ID	Site Name	Longitude	Latitude	Age Older	Age Younger
3PINES	7	Three Pines Bog	-80.116667	47	7169	-24
AINO	NA	Aino Pond	-71.9254	42.6805	1368	-36
ALEXISLK	25	Alexis Lake	-57.033333	52.516667	22834	34
ALEXLAKE	24	Alexander Lake	-60.583333	53.333333	6529	4562
ALIUK	27	Aliuk Pond	-57.366667	54.583333	7894	2363
ANDERSON	203	Anderson Pond	-85.5	36.033333	30881	-238
ANGE	208	Lac à l'Ange	-70.684722	47.481667	12359	0
ANNIE	NA	Lake Annie	-81.3471	27.2103	13521	221
APPLEMAN	NA	Appleman Lake	-85.2136	41.6237	14785	3423
ARRINGTO	213	Arrington Marsh	-95.526667	39.495	29272	19286
ARTHURB	NA	Lake Arthur	-92.6598	30.0772	6564	-7
ARTHURE	NA	Lake Arthur	-92.6598	30.0772	3370	-34
ATO	217	Lac des Atocas	-73.311111	45.543056	11977	0
AXELAKE	219	Axe Lake	-79.51	45.38	11159	-15
BALLSTON	NA	Ballston Lake	-73.8481	42.9566	12602	1728
BALSAM	NA	Balsam Lake	-74.601	42.03	15219	-28
BARCHAMP	229	Barchampe Lake	-83.253889	30.622222	8103	-32
BARRY	232	Barry Lake	-77.916667	44.3	10967	-16
BASEBALL	233	Baseball Bog	-79.78	47.23	11125	-21
BASINPND	234	Basin Pond	-70.05	44.47	1580	-10
BASSWOOD	2958	Basswood Road Lake/ Splan Pond	-67.330556	45.255556	14339	0
BASTIEN	235	Lac Bastien	-78.916667	46.4	10833	0

BATESON	NA	Bates Marsh	-81.844444	42.345556	4697	27
BEARBOG	242	Bear Bog	-80.16	47.18	11127	4076
BEAVERWI	NA	Beaver Lake	-88.1555	44.9205	5952	-35
BELMONT	249	Belmont Bog	-77.916667	42.25	14675	35
BER	252	Bereziuk	-76.120278	54.047222	7389	90
BERRYOND	254	Berry Pond	-73.316667	42.5	14433	40
BIGJOHN	266	Big John Pond	-94.966667	47.558333	3379	-30
BIGPOND	268	Big Pond	-78.55	39.766667	12885	0
BIGREED	NA	Big Reed Pond Hollow	-69.0675	46.353333	6120	96
BINNEWTR	NA	Binnewater Pond	-74.5467	41.4128	27225	-40
BISHOPSF	270	Bishops Falls	-55.505556	48.936111	7192	130
BLACKGUM	NA	Black Gum Swamp	-72.175	42.542	13112	-14
BLACKPOND	272	Black Pond	-84.186667	35.620833	2545	-23
BLACKWDS	NA	Blackwoods Hollow	-68.2204	44.3133	11445	215
BLBIGBEE	275	BL-Tombigbee	-88.474444	33.563333	10977	36
BLUMOUND	281	Blue Mounds Creek	-89.866667	43.083333	12104	0
BOGD	292	Bog D	-95.166667	47.183333	10888	-10
BONDI	294	Bondi Section	-82.6375	42.088056	16273	15798
BORDER	297	Border Beacon	-63.2	55.333333	7405	45
BORIACKB	298	Boriack Bog	-97.126111	30.36	18463	11
BOUC	300	Lac Boucané	-69.452778	47.457778	10206	498
BRADSHAW	NA	Bradshaw Lake peat section	-95.181389	57.767778	7187	-41
BRANDRET	303	Brandreth Bog	-74.683333	43.916667	12214	34
BRI2	304	Brisay 2	-70.357778	54.355833	6820	0
BRIERISL	NA	Brier Island Bog MS-85-22	-66.340833	44.286667	14335	11460
BROWNSPD	309	Browns Pond	-79.616389	38.154722	19996	1
BUCKLAKE	312	Buck Lake	-81.332222	27.234444	8958	0
BUCKLEY	NA	Buckley Pond Hollow	-69.04	46.331944	9780	175
BUCYRUS	314	Bucyrus Bog	-82.933333	40.797222	14978	11311

BURDEN	317	Burden Lake	-73.566667	42.604167	9736	1789
BUSQUE	319	Lac à la Busque	-70.595833	46.279167	10261	157
BYRONMRL	NA	Byron-Bergen Swamp (Site 2)	-78.005833	43.095833	12099	-13
BYRONSWP	NA	Byron-Bergen Swamp (Site 1)	-78.00582	43.09582	6137	119
CAHABA	321	Cahaba Pond	-86.533333	33.5	13776	560
CAL	322	Saint-Calixte	-73.868056	45.961111	11209	77
CAMEL	324	Camel Lake	-85.016667	30.266667	35981	22
CAMP11LK	325	Camp 11 Lake	-88.016667	46.666667	11232	105
CANYON	2955	Canyon Lake	-87.921389	46.833333	11033	113
CAPITOLA	NA	Capitola Lake	-89.5538	45.5202	7628	-5
CAR	330	Tourbière Caribou	-71.235833	47.639722	5559	2345
CARIB	332	Lac Caribou	-64.94	48.197778	11025	74
CARIBBOG	333	Caribou Bog	-68.766667	45.933333	10869	59
CARIBOU	334	Caribou Hill	-63.25	55.666667	6871	46
CARTER	337	Carter Site	-84.680556	40.216667	17938	13686
CAS	338	Lac Castor	-72.998611	46.613889	10900	136
CEDARBLK	344	Cedar Bog Lake	-93.197222	45.411111	10723	-10
CHANCEHA	NA	Chance Harbour Lake (MS-85-16)	-62.606944	45.672778	16330	-35
CHASE	353	Chase Pond	-60.675	45.651389	17092	10384
CHAT2003	NA	Chatsworth Bog	-88.323	40.676	17133	2566
CHES2207	NA	Chesapeake Bay, main branch (MD99-2207)	-76.214444	38.030278	9841	939
CHES2208	NA	Chesapeake Bay, main branch (MD99-2208)	-76.486389	38.537222	8544	-38
CHES2209	NA	Chesapeake Bay, main branch (MD99-2209)	-76.394444	38.886111	7895	619
CHESPTMC	NA	Chesapeake Bay, main branch (PTMC3-2)	-76.219722	38.026667	1425	-16
CHEYENNE	358	Cheyenne Bottoms	-98.666667	38.466667	34203	17
CHIPPEWA	360	Chippewa Bog	-83.241111	43.123889	11262	1188
CHISM1	361	Chism 1	-76.145556	54.799444	6150	-1
CHISM2	362	Chism 2	-76.339167	53.090833	7161	1
CLEARLIA	478	Clear Lake (US:Iowa)	-93.35	43.15	11922	-29

CLEARPND	480	Clear Pond (US:South Carolina)	-78.953611	33.798611	21010	101
CLEARWTR	481	Clearwater Lake	-107.933333	50.873611	7321	-3
COGHILL	484	Coghill Lake	-66.766667	53.9	6146	-31
COLOMSH	485	Colo Marsh	-93.27	42.02	13200	13
COMBLAKE	488	Comb Lake	-57.71	49.69	7980	63
COMPASS	489	Compass Pond	-56.196389	50.034167	11427	-11
CONROY	491	Conroy Lake	-67.883333	46.283333	1916	-17
CONROYME	NA	Conroy Lake	-67.8735	46.2912	12948	10267
COT	496	Lac Côté	-65.95	48.966944	11232	-1
COTJ	498	Tourbière de Lanoraie COTEAU JAUNE	-73.341944	45.960833	7289	1643
COTTONWD	500	Cottonwood Lake (US:South Dakota)	-99.906389	44.836111	13141	-155
COWLES	NA	Cowles Bog	-87.092	41.637	6614	84
CRANBER	503	Cranberry Lake	-78.1	44.1	13550	-26
CRANGLDS	505	Cranberry Glades	-80.283333	38.2	14185	57
CRATES	506	Crates Lake	-81.266667	49.183333	9771	16
CRAWFBOG	NA	Crawford Bog	-79.945278	43.471667	16553	-21
CRAWFDC	NA	Crawford Lake (CA:Ontario)	-79.947778	43.469444	11588	-44
CRIDERS	510	Crider's Pond	-77.55	39.966667	18341	10
CRISTAL	511	Cristal Lake	-90.083333	52.116667	7546	441
CROOKEDN	NA	Crooked Lake (Northwest Basin)	-89.2907	46.247	11762	-9
CROOKEDR	NA	Crooked Lake (Resort Basin)	-89.2681	46.2503	73	-40
CROOKEDU	NA	Crooked Lake(Undisturbed Basin)	-89.2681	46.2503	81	-40
CRYSTAL	NA	Crystal Lake	-88.3442	42.2306	16393	6557
CUB2	518	Cub Lake	-85.958333	44.7	8763	23
CUPOLA	525	Cupola Pond	-91.1	36.8	20379	-11
CYCLOID	527	Cycloid Lake	-105.266667	55.266667	9484	11
DANSVILL	NA	South Dansville buried peat	-77.6315	42.4984	18474	1010
DAU	533	Daumont	-69.4	54.883333	6065	598
DBATHTUB	NA	Devil's Bathtub	-77.573889	43.024444	13029	2103

DEADFROG	NA	Dead Frog Pond	-72.508611	42.574444	2194	-37
DECOY	656	Decoy Lake	-80.366667	43.233333	13569	42
DEEPLAKE	NA	Deep Lake	-95.401	47.684	7694	144
DEEPPOND	NA	Deep Pond	-69.9911	41.7395	2270	-49
DEER	657	Deer Lake Bog	-71.833333	44.033333	15286	0
DEL1	658	Delorme 1	-69.918889	54.418889	6017	372
DEL2	659	Delorme 2	-69.929722	54.423611	7100	423
DEMONT	NA	Demont Lake	-85.0532	43.5084	13282	13
DEVILSLK	665	Devils Lake (US:North Dakota)	-98.933333	48.083333	7005	78
DEVILSWI	666	Devils Lake (US:Wisconsin)	-89.7256	43.4273	14735	9566
DIA375	669	Diana 375	-69.958333	60.9875	7692	0
DIAB	671	Lac du Diable	-66.125	48.910833	12532	0
DISMAL	679	Dismal Swamp (91)	-76.45	36.583333	9882	41
DISTRHFT	2980	Disterhaft Farm Bog	-89.166944	43.916944	14252	6235
DIVERS	NA	Divers Lake	-78.3993	43.0411	13464	-55
DOSQUET	702	Dosquet	-71.5	46.45	9738	219
DUARTE	NA	Duarte Pond	-70.6137	41.4211	2590	-50
DUCKPOND	752	Duck Pond	-70.000556	41.932778	13541	11
DUFRESNE	753	Lac Dufresne	-70.35	45.85	12741	152
DUGASBAY	NA	Dugas Bay Bog	-79.365	46.320278	4681	-27
EAGLE	756	Eagle Lake Bog	-71.666667	44.166667	10347	0
EAGLELK	757	Eagle Lake	-58.55	53.233333	12300	26
EAGLEPND	NA	Eagle Pond	-70.1349	41.6992	3854	-49
EBALTIC	762	East Baltic Bog	-62.15	46.408333	9374	-20
ELAKE68	3024	E Lake	-99.658333	50.691389	12890	-18
ELYLAKE	774	Ely Lake	-75.833333	41.766667	2345	-15
EMRICK	NA	Emrick Lake	-89.594	43.8	13422	-55
ERIE	784	Lake Erie	-82.76	41.92	14427	-11
ESOLDIER	NA	East Soldier Lake	-84.858	46.347	9388	17

ESPOIR	788	Lac à la Fourche	-70.615833	47.609722	10768	-1
ETWINOH	790	East Twin Lake (US:Ohio)	-81.333333	41.198611	13062	41
FAKIII98	NA	Fakahatchee Strand Preserve State Park	-81.4417	25.9816	4873	-48
FAR	796	Lac Faribault	-71.716944	58.866944	4361	-1
FARN1	797	Tourbière de Farnham	-72.982778	45.282778	8966	1
FAWN	799	Fawn Lake (CA:Ontario)	-79.39	45.41	11160	-31
FIRST	806	First Pond	-75.026667	41.135278	144	-34
FLINFLON	809	Beaverhouse Lake	-101.681667	54.742222	8228	-25
FORGE	818	Forge Pond	-74.399167	40.855833	189	-25
FRAINSLK	820	Frains Lake	-83.63	42.33	14417	22
FRBLAKE	822	Hayes Lake	-93.75	49.583333	11125	104
FRENCHBY	824	Frenchmens Bay	-79.1	43.82	2731	-26
FRESH	NA	Fresh Pond (US:Massachusetts)	-70.5315	41.5958	2049	-44
FRESHPND	825	Fresh Pond	-71.575	41.158333	14024	-34
FUDGER	827	Fudger Lake	-83.533333	40.1	13538	-9
FURNIVAL	828	Furnival Lake	-84.93	48.21	8340	-28
GABRIEL	829	Saint-Gabriel	-73.475833	46.275833	10058	93
GASS	832	Gass Lake	-87.733333	44.05	13753	1
GDF141	NA	Little Salt Spring (GDF 141)	-82.233	27.0748	9422	21
GEAI	836	Lac Geai	-73.992778	45.995833	11619	0
GER	841	Lac à St-Germain	-74.370833	45.945833	12281	121
GILES	843	Giles Lake	-75.093333	41.376111	386	-34
GLENBORO	848	Glenboro Lake Site	-99.283333	49.433333	13819	12
GLIMMER	NA	Glimmerglass Lake	-89.3181	46.2177	10965	52
GOSHEN	939	Goshen Springs	-86.134167	31.721111	28124	1
GOULD	940	Gould Pond	-69.316667	44.983333	14478	-66
GRAHAM	942	Graham Lake	-77.35	45.183333	11611	1
GRANDRAP	943	Grand Rapids	-98.25	53	8055	360
GRAS	945	Lac Gras	-67.066667	52.25	7300	-30

GRAVEL	947	Gravel Ridge	-62.633333	55.033333	7279	47
GREENLK	951	Green Lake	-85.116667	44.883333	11306	219
GREENNJ	952	Green Pond (US:New Jersey)	-74.496389	41.004444	1159	-25
GREENPND	NA	Green Pond	-72.5089	42.5685	2464	-31
GRENADIE	955	Grenadier Pond	-79.47	43.64	4631	-27
GREYIS	956	Grey Islands	-55.516667	50.768889	11366	-37
GUARD	NA	Guard Lake	-84.779	46.127	2389	495
GUMLIMDH	960	Water Conservation Area 3B, Gumbo Limbo Dry Head	-80.505556	25.773889	1872	-37
GUMLIMFT	961	Water Conservation Area 3B, Gumbo Limbo Far Tail	-80.505556	25.774722	4653	-40
GUMLIMM	962	Water Conservation Area 3B, Gumbo Limbo Marsh	-80.511111	25.778889	4324	-34
GUMLIMNT	963	Water Conservation Area 3B, Gumbo Limbo Near Tail	-80.561389	25.886944	3737	131
GUMLIMWH	964	Water Conservation Area 3B, Gumbo Limbo Wet Head	-80.506389	25.773611	4201	-44
HACK	967	Hack Pond	-78.997222	37.984722	15120	12
HAFICHUK	968	Hafichuk Site	-105.883889	50.320556	13473	11998
HAMSLAKE	970	Hams Lake	-80.413333	43.236667	11945	-29
HANSON	972	Hanson Marsh	-89.675	43.433056	12527	-15
HARLOCK	NA	Harlock Pond	-70.71	41.4041	2286	-50
HARR	975	Lac Harriman	-65.838889	48.2375	14125	0
HARRIE	976	Harrie Lake	-66.95	52.933333	6805	-5
HAUTNOR	NA	Isle au Haut - North Hollow	-68.6238	44.0786	3747	247
HAUTSOU	NA	Isle au Haut - South Hollow	-68.6176	44.0403	5038	579
HAWKE	978	Hawke Hills Kettle	-53.133333	47.322222	8121	-27
HEBRON	995	Hebron Lake	-63.033333	58.2	9003	45
HELLSKIT	3030	Hell's Kitchen Lake	-89.7	46.183333	2018	-20
HELMETTA	997	Helmetta Bog	-74.433333	40.383333	11240	2
HEMLOCK	NA	Hemlock Lake	-91.1967	46.3081	6536	-34
HEN	999	Tourbière de Lanoraie HENRI	-73.3	45.988889	6620	265
HIGHLAKE	1071	High Lake	-76.6	44.516667	10566	0
HISCOCK	NA	Hiscock Site	-78.0681	43.0977	12756	200

HORSESHA	NA	Horseshoe Lake (US:Illinois)	-90.0663	38.7084	1702	271
HOSTAGE	1077	Hostage Lake	-94.133333	46.55	3624	-29
HOUGHTON	1079	Houghton Bog	-78.670278	42.541667	13567	-9
HOWES	1080	Howes Prairie Marsh	-87.072222	41.65	2252	5
HUMBER3	1101	Humber Pond 3	-79.48	43.64	4093	-29
HUMBER5	1102	Humber Pond 5	-79.49	43.64	4203	-25
HUMBER7	1103	Humber Pond 7	-79.5	43.65	3686	-22
ICEHSPA	NA	Icehouse Pond	-69.9597	41.7988	2076	-48
INDIAN	1112	Indian Lake	-90.45	50.916667	10290	5820
INGLESBY	1114	Inglesby Lake	-77.05	44.483333	10389	564
IRVIN	1118	Irvin Lake	-93.643611	47.135556	10771	-20
ITASCAMB	NA	Itasca Bison Kill Site	-95.2247	47.197	10425	9611
ITASCAMC	NA	Itasca Bison Kill Site	-95.2247	47.197	8642	7548
ITASCAMD	NA	Itasca Bison Kill Site	-95.2247	47.197	9930	4792
ITASCAT2	NA	Itasca Bison Kill Site	-95.2247	47.197	8179	6748
JACKLAKE	1122	Jack Lake	-81.766667	47.316667	10735	18
JACKSON	1124	Jackson Pond	-85.7238	37.4331	24321	-24
JACOBSN1	1127	Jacobson Lake	-92.716944	46.416944	12115	9199
JACOBSN2	3037	Jacobson Lake	-92.716944	46.416944	9989	18
JAYLAKE	NA	Jay Lake	-89.2804	46.2353	10296	28
JBL004	1135	James Bay	-80.2	50.22	2897	-14
JEAN	1218	Saint-Jean Ile d'Orléans	-70.932778	46.932778	6561	143
JEMIMA	NA	Jemima Pond	-69.9836	41.8301	1857	-49
JEWELL	1219	Jewell Site	-93.7	42.26	10819	1221
JOES3	1355	Joes Pond	-58.24	48.24	12761	-17
JON	1357	Tourbière du lac Joncas	-71.162778	47.257778	7967	119
JOS	1361	Tourbière de Lanoraie JOSEPH	-73.302778	45.991944	5526	0
KAN	1399	Kanaaupscow	-76.643889	54.027778	7236	0
KELLHOL1	1409	Kellys Hollow	-90.35	45.3	10656	-29

KELLHOL2	3351	Kellys Hollow	-90.35	45.3	10680	-29
KELLNERS	1410	Kellners Lake	-87.848056	44.238056	17078	-23
KENNYS	1412	Kennys Pond	-52.713889	47.590278	9558	-31
KENOGAMI	1413	Lac K�nogami	-71.566944	48.365833	8252	145
KENOSEE	1414	Kenosee Lake	-102.3	49.816667	5511	67
KERRMI	NA	Kerr Lake	-89.274	46.2443	8151	867
KESV	3353	Marais de Keswick	-79.512778	44.195833	4328	47
KETTLE	NA	Kettle Lake	-103.6241	48.607	12972	621
KILBRIDE	NA	Kilbride Swamp	-79.913056	43.466111	8349	-51
KIMBLE	NA	Kimble Pond	-93.8383	44.2201	11725	-48
KINSMAN	1480	Kinsman Pond	-71.733333	44.133333	9692	0
KIRCHNR1	1482	Kirchner Marsh	-93.1202	44.7724	13517	149
KOTIRANT	1509	Kotiranta Lake	-92.62	46.72	16287	150
KROENING	NA	Kroening Lake	-88.8689	44.8061	4322	-33
KYLENLK	1525	Kylen Lake	-91.8	47.35	18918	9424
LACAWAC	1529	Lake Lacawac	-75.292778	41.381944	722	-24
LACCOLIN	1530	Lac Colin	-70.3	46.716667	12976	56
LACLOUIS	1532	Lac Louis	-79.116667	47.2875	10161	54
LACMAGIE	1533	Lac � Magie	-66.079167	44.263889	14018	10465
LAKE16	1539	Lake Sixteen	-84.316667	45.6	12470	2335
LAKEA	1542	Lake A	-105.725	53.2375	13492	-1
LAKEANNF	3366	Lake Ann	-93.6875	45.425	10435	910
LAKEB	1545	Lake B	-106.079167	53.8	11981	-1
LAKEBI2	3368	Lake BI2	-76.378333	57.116667	7791	-42
LAKEBN7	1546	Lake BN7	-73.516667	55.009167	6737	-39
LAKECH2	1548	Lake CH2	-74.583333	49.683333	8332	1
LAKEEC1	1579	Lake EC1	-75.1	56.283333	6610	58
LAKEEC2	1550	Lake EC2	-74.945	56.023333	6359	59
LAKEGB1	1552	Lake GB1	-75.248889	55.110833	6390	0

LAKEGB2	1553	Lake GB2	-75.283333	56.1	7225	56
LAKELB1	1555	Lake LB1	-75.616667	57.916667	6931	7
LAKELR1	1556	Lake LR1	-75.25	58.583333	7570	88
LAKELR3	1557	Lake LR3	-75.245	58.578333	5796	74
LAKELT1	1558	Lake LT1	-75.15	58.141667	6536	-57
LAKEMARY	3370	Lake Mary	-89.9	46.25	10978	206
LAKEQC	1560	Lake QC	-80.698333	46.828333	10273	10
LAKESIX	1561	Lake Six	-81.316667	48.4	7694	25
LAN17	1565	L'Anse aux Meadows Site	-55.55	51.573333	2403	15
LANGDALE	1567	Langdale Pond	-83.195	30.641667	8483	2
LANSTJE	1568	Tourbière de Lanoraie STJEAN	-73.216944	46	5468	0
LEADINGT	1575	Leading Tickles	-55.473056	49.471389	15252	-30
LEO	1578	Lac à Léonard	-65.812778	49.207778	9791	523
LEVI	NA	Levi Pond	-72.228056	44.265278	3183	-45
LILYLAKE	1585	Lily Lake (US:Minnesota)	-92.825	45.05	12869	-5
LILYMI	NA	Lily Lake (US:Michigan)	-89.0881	47.9134	10679	998
LILYWAR	NA	Lily Warwick	-72.3371	42.6882	1235	-38
LIMABOG	NA	Lima Bog	-88.8285	42.8003	10988	-20
LINSLEY	NA	Linsley Pond	-72.7824	41.3192	778	-22
LITTBASS	1589	Little Bass Lake	-93.6	47.283333	12368	23
LITTLEBO	NA	Little Bolton	-71.585	42.4239	1175	-43
LITTLEM	NA	Little Mirror Lake	-71.6077	42.5253	899	-36
LKANNIE	1596	Lake Annie	-81.416667	27.2	47478	10
LKCLDSH	3379	Lake of the Clouds (US:Minnesota)	-91.116667	48	10391	1623
LKHOPE	1598	Lake Hope Simpson	-56.433333	52.45	12182	232
LLAKE	1599	Little Lake (CA:Nova Scotia)	-63.938889	44.668056	13322	12535
LOCKPORT	1603	Lockport Gulf Section	-78.716667	43.166667	12554	10475
LONESOME	1606	Lonesome Lake	-71.701111	44.14	12253	190
LONGSWMP	1609	Longswamp	-75.666667	40.483333	14474	-267

LORRAINE	NA	Lorraine Lake	-86.4811	46.1461	6395	-33
LOSTMOOS	NA	Lost Moose Core 128	-94.219167	57.588056	4819	-34
LOSTPOND	1614	Lost Pond	-71.251389	44.246944	15455	13
LOUISE-D	3381	Lake Louise	-83.258333	30.725	9308	10
LOUISEMB	NA	Lake Louise (CA:Manitoba)	-97.2275	49.041944	1459	-46
LOVESIC1	NA	Lovesick Lake (core 1)	-78.194167	44.566667	11031	-50
LOVESIC3	NA	Lovesick Lake (core 3)	-78.194167	44.566667	11031	-50
LOXAHAT1	1618	Loxahatchee National Wildlife Refuge Site 1 (EPA Site 7)	-80.415556	26.481111	1473	-39
LTDOLLAR	NA	Little Dollar Lake	-85.306	46.186	6617	19
LXSITE10	NA	Site 10	-71.654444	58.314444	1681	-45
LXSITE4	NA	Site 4	-75.284444	57.834722	3511	-45
LXSITE5	NA	Site 5	-75.284444	57.834722	4321	-45
LYNNLAKE	1628	Lynn Lake	-101.041944	56.841667	7428	1447
MAL	1635	Tourbière du lac Malbaie	-70.976389	47.597222	8143	305
MANSELL	1642	Mansell Pond	-68.733333	45.041667	9153	-20
MAPLHRST	1645	Maplehurst Lake	-80.659722	43.225	13556	47
MARC	1646	Lac Marcotte	-71.422778	47.077778	11075	96
MARKPOND	NA	Mark Pond	-89.613611	51.841111	7882	-27
MARTYNE	1652	Lac Martyne	-64.833333	56.783333	6798	46
MASHPAUG	1655	Mashapaug Pond	-71.433333	41.783333	4209	-17
MAU3	1658	Wapizagonke	-73.030556	46.726389	11086	881
MAU5	1659	Sud du Lac du Noyer	-72.837778	46.787778	10945	260
MAYFLOWR	1661	Mayflower Lake	-66.070833	45.302778	13815	12631
MAYFLWON	NA	Mayflower Lake	-79.213889	45.391389	6598	-23
MCCAR	1662	McCarston's Lake	-80.09	45.05	9614	-28
MCDONALD	NA	McDonald Lake	-86.8031	46.0442	6131	-33
MENDOTAC	1678	Lake Mendota	-89.416667	43.1	13260	72
MENDOTAD	3385	Lake Mendota	-89.416667	43.1	10511	77
MERMAID	1683	Mermaid Bog	-63.025	46.25	9602	-26

MILLER21	NA	Miller Woods Pond 21	-87.274	41.612	2079	2
MILLER32	NA	Miller Woods Pond 32	-87.284	41.607	1893	47
MILLER44	NA	Miller Woods Pond 44	-87.293	41.604	2374	538
MILLER51	NA	Miller Woods Pond 51	-87.288	41.602	3174	0
MIMI	1697	Lac Mimi	-70.375833	47.496944	12771	1064
MINNIEO	3389	Lake Minnie	-95.01	47.24	10887	1
MKPEACEA	NA	Makepeace Cedar Swamp	-70.7505	41.9482	13442	17
MKPEACEB	NA	Makepeace Cedar Swamp	-70.7505	41.9482	4315	-14
MKPEACED	NA	Makepeace Cedar Swamp	-70.7505	41.9482	11618	-2
MOHAWK	3390	Mohawk Pond	-73.283333	41.816667	16337	215
MONTAGNA	1708	Lac Montagnais	-71.175	47.907778	9515	229
MOONLAKE	1710	Moon Lake	-98.158333	46.8575	13650	-32
MORAIN	1711	Moraine Lake	-58.05	52.266667	10728	146
MORDSGER	1712	Mordsger Lake	-94.25	51.383333	10113	31
MORRISON	NA	Morrison Lake	-88.6222	46.1626	2899	-20
MS7812X	NA	MS7812X Island Lake	-66.178611	47.831389	11375	6
MS9011	NA	Pye Lake	-62.085556	44.978056	13548	-40
MUDCRK1	1717	Mud Creek Site 1	-80.604722	25.219722	1901	-42
MUDLAKE	1718	Mud Lake (US:Florida)	-81.866667	29.3	9015	0
MUDLKMI	NA	Mud Lake (US:Michigan)	-88.305556	47.134722	9770	-49
MUDLKMN2	1720	Mud Lake (US:Minnesota:Hubbard)	-94.75	46.866667	2870	-29
MUDPOND	NA	Mud Pond (USA:Maine)	-68.0871	44.6342	13489	11415
MUSCOTAA	1724	Muscotah Marsh	-95.513333	39.53	27726	58
MYRTLE	1728	Myrtle Lake	-93.383333	47.983333	12841	28
NED	1732	Nedlouc	-71.65	57.65	4154	81
NELSONMI	NA	Nelson Lake	-85.3764	46.2307	7526	-45
NELSONPD	1735	Nelson Pond	-92.683333	46.4	8030	6387
NICHOLS2	3394	Nichols Brook Site	-78.478889	42.544722	14414	10235
NINA	1748	Nina Lake	-81.5	46.6	11426	11

NOBOTTOM	1755	No Bottom Pond	-70.208333	41.283333	16548	-32
NORTHSPND	1758	North Pond	-73.05	42.65	13083	-105
NORTHRND	NA	North Round Pond	-72.4502	42.8492	1680	-43
NUTHSFT	1759	Water Conservation Area 3B, Nuthouse Far Tail	-80.556667	25.885556	3651	-17
NUTHSH	1760	Water Conservation Area 3B, Nuthouse Head	-80.5125	25.889167	2404	-39
NUTTLAKE	1761	Nutt Lake	-79.45	45.216667	11080	113
NWRIVER	1762	Northwest River Pond	-60.166667	53.516667	5473	42
OJIBWAY	NA	Lake Ojibway	-88.6024	48.1053	9824	562
OKOBOJI	1765	Lake West Okoboji	-95.2	43.333333	16851	5
OLDFIELD	1767	Old Field	-89.833333	37.116667	9818	5868
OLIVER	1769	Oliver Pond	-89.323889	48.422222	9476	-23
ONDRISPD	1771	Ondris Pond	-94.4	46.35	874	-15
OPINES	NA	Lake O' Pines	-89.2536	46.1415	12469	-39
OTISVILL	NA	Otisville	-74.5162	41.4749	17383	54
OTTER	NA	Otter Pond	-72.5318	42.655	832	-42
OUEL	1781	Lac Ouellet	-68.943889	47.532778	12371	118
PANTHER	1788	Panther Run Pond	-77.416667	40.8	13557	0
PARADISE	1789	Paradise Lake	-57.75	53.05	11243	11
PARROTT	1795	Parrott's Pond	-76.7	44.22	4528	-25
PASACACO	1796	Pasacaco Pond	-71.45	41.516667	1172	-17
PASSLAKE	1799	Pass Lake	-88.74	48.56	10325	2
PATRICIA	1801	Lac Patricia	-64.68	56.67	5581	-2
PATSCHKE	3397	Patschke Bog	-97.116667	30.366667	20593	183
PAW2	NA	Fort Bragg (core PAW2)	-79.09	35.174167	10169	-51
PAWELSKI	NA	Pawelski Farm	-74.4172	41.3458	15846	-45
PAYNTER	1805	Paynter Marsh	-78.34	44.1	9809	0
PECKER	NA	Pecker Pond	-71.9614	42.7168	1307	-38
PEGGY	1818	Peggy Lake	-92	49.48	7967	-14
PENEGOR	NA	Penegor Lake	-88.859	46.6164	9574	-35

PERCH	NA	Perch Lake	-77.370833	46.035833	11351	-10
PERCHDUC	1823	Perch Lake (CA:Manitoba)	-100.898889	51.651389	6058	-14
PETEL	1825	Lac Petel	-66.266667	50.55	8374	19
PETERSL	1826	Peterson Slough	-95.316667	46.966667	2799	-29
PICKEREL	3425	Pickerel Lake (US:South Dakota)	-97.33	45.5	11061	0
PIERMONT	NA	Piermont Marsh	-73.909	41.036	1337	-50
PILOTMND	1832	Pilot Mound Site	-93.9	42.16	10410	352
PINELAKE	NA	Pine Lake	-113.406667	52.114444	3799	-43
PINEWI	NA	Pine Lake	-88.5717	45.2635	12497	-27
PINHOOK	NA	Pinhook Bog	-86.849	41.616	13963	-13
PINKLAKE	1839	Pink Lake	-75.808333	45.469444	12359	-30
PITCHER	1840	Pitcher Bog	-79.98	44.82	3746	-28
PLEASANT	NA	Lake Pleasant	-72.5103	42.564	1165	-41
PLU	1892	Lac Pluvieux	-69.352778	47.843889	7331	63
POGONIA	3440	Pogonia Bog Pond	-93.633333	45.033333	11114	-24
POLAND	1895	Poland Spring Pond	-70.35	44.033333	14018	-38
PONDMILL	1897	Pond Mills Pond	-81.25	42.916667	7933	3
PORQUI2	1899	Porqui Pond	-79.78	44.93	11192	-9
PORTAGE	1900	Portage Lake	-94.113333	47.081389	10763	25
PORTAGE1	1901	Portage Marsh	-87.2225	41.576111	11332	3408
PORTAGE2	3441	Portage Marsh	-87.2225	41.576111	2829	1204
POTTSMTN	1906	Potts Mountain Pond	-80.133333	37.6	12808	77
PRESTON	NA	Preston Lake	-79.372778	43.988056	4098	-27
PRIEND	NA	Prien Lake	-93.2673	30.2043	5229	-40
PROTECTN	1913	Protection Bog	-78.466667	42.622222	11346	-14
PTESCUMI	1914	Point Escuminac	-64.8	47.075	12471	261
PWFTSWAL	1907	Powers Fort Swale	-90.583333	36.6	20679	-32
QUAG	NA	Quag Pond	-71.9565	42.5676	932	-45
QUALLY	NA	Qually Pond	-96.1998	47.6849	13485	1809

QUICKSND	1938	Quicksand Pond	-84.865278	34.326389	23594	16621
QUILLIN	1939	Quillin Site	-81.966667	41	15712	7680
RADTKE	1943	Radtke Lake	-88.1	43.4	13358	1
RAF1	1944	Rivière-aux-Feuilles 1	-72.066944	58.232778	6011	565
RAF2	1945	Rivière-aux-Feuilles 2	-71.95	58.216944	5615	493
RAFT	1946	Tourbière de la Rivière- aux-Feuilles	-72.066944	58.232778	5703	0
RAMSAYLK	1953	Ramsay Lake	-76.1	45.6	12724	-30
RATTLE	1956	Rattle Lake	-92.7	49.35	13057	5
RAY	3447	Saint-Raymond	-71.807778	46.891944	8846	139
REDRIVER	1974	Vallée de l'Albion	-71.325	45.670833	12809	162
REIDEL	1978	Reidel Lake	-95.284167	46.211944	13480	-31
RHULEFEN	1988	Rhule Fen	-85.741667	39.953611	11246	9935
RICELAKE	1989	Rice Lake (US:North Dakota)	-101.530278	48.008056	10610	1295
RICEMNB	3450	Rice Lake	-95.575	46.922222	9474	-15
RICEMSH2	NA	Rice Lake (marsh core 2) (CA:Ontario)	-78.178889	44.198056	4137	-27
RICEMSH3	NA	Rice Lake (marsh core 3)	-78.178889	44.198056	11704	2789
RICEON	NA	Rice Lake (CA:Ontario)	-78.044167	44.266111	11106	-24
RIFESWMP	NA	Rife Swamp	-79.983056	43.471389	10423	-50
RILEY	1992	R Lake	-84.558333	54.305556	7388	6
ROADCUT	2186	L'Anse aux Meadows Road Cut Bog	-55.53	51.6	7162	-2
ROBIN	2188	Lac à Robin	-65.266944	48.051944	10758	507
ROBPOND	2189	Robinson's Pond	-58.8	48.26	13179	-11
ROCHMOUT	2190	Lac des Roches Moutonnées	-64.816667	56.766667	5804	502
ROCKYHOC	3464	Rockyhock Bay	-76.683333	36.166667	32120	60
ROGERSLK	2193	Rogers Lake	-72.116667	41.366667	17938	27
ROM	2208	Lac Romer	-73.330833	45.963889	7440	0
ROQUEIS	NA	Roque Island Hollow	-67.518	44.5729	9498	89
ROSE1	2209	Rose Swamp	-79.44	44.18	11718	-28
ROSELK	2211	Rose Lake	-77.925	41.916667	17097	82

ROSSBURG	2212	Roszburg Bog	-93.6	46.583333	11429	1999
ROSSPOND	2213	Ross Pond	-69.410278	43.921389	13336	-23
ROSTOCK1	2214	Rostock Mammoth Site	-81	43.5	14607	12713
ROUND	NA	Round Pond	-70.0095	41.9718	3358	-27
ROUNDON	NA	Round Pond (CA:Ontario)	-91.368889	52.533333	8786	-27
RUBYLAKE	2230	Ruby Lake	-91.458333	45.283333	785	-15
RUTZLAKE	2234	Rutz Lake	-93.87	44.87	13667	99
RYERSE	2238	Ryerse Lake	-85.179167	46.131944	10106	885
SABLE	2239	Lac au Sable	-66.216667	51.4	7607	4418
SAM	2252	Lac à Sam	-72.978889	46.654167	10706	361
SANDY	NA	Sandy Hill Pond	-70.3621	41.6905	1919	-49
SANDYCOV	2256	Sandy Cove Pond	-57.716667	54.4	5305	11
SANDYRUN	NA	Sandy Run Creek	-83.052	32.589	30011	102
SAV1	2261	Lac Manitou	-74.466944	46.057778	11785	61
SAV2	2262	Lac aux Quenouilles	-74.395833	46.171944	12600	41
SBURIN	2266	Lake Site South Burin Peninsula	-55.6125	46.919444	15553	12832
SCHOODIC	NA	Schoodic Peninsula Hollow	-68.0741	44.395	7406	982
SCOTTLK	2268	Scott Lake	-81.95	27.966667	4879	-18
SEPTILES	2284	"LD" Lake	-67.131944	50.140278	7789	51
SFS	2290	Saint-Francois de Sales	-72.146944	48.293889	9967	132
SHADYVAL	2291	Shady Valley Bog	-81.933333	36.525	10823	1028
SHARKEY	NA	Sharkey Lake	-93.411	44.5938	10778	72
SHAWSBOG	2294	Shaws Bog	-64.183333	45.016667	10373	1
SHE	2295	Mont Shefford	-72.584722	45.358889	13653	63
SHOULD1	2299	Shouldice Lake	-81.416667	45.15	11071	6
SILCOX52	NA	Silcox Core 52	-94.171389	57.211389	3108	-35
SILVERNS	2301	Silver Lake (CA:Nova Scotia)	-63.642778	44.563333	10982	0
SILVERPA	2303	Silver Lake (US:Pennsylvania)	-74.986944	41.251389	800	-17
SINKHOLE	2307	Sinkhole Pond	-70.35	43.966667	4415	1061

SIOUX	2308	Sioux Pond	-91.566667	49.933333	11070	3575
SMOOTLK	2493	Smoot Lake Bog	-82.445833	40.205556	16760	11661
SNAKE	NA	Snake Pond	-72.0148	42.5566	2464	-38
SNOW	3653	Snow Lake	-63.883333	56.633333	5675	46
SOUTHBOG	NA	South Bog	-67.1882	44.7286	2986	-43
SPIRIT	2501	Spirit Lake (US:Michigan)	-86.958333	46.47	12775	-21
SPIRITWD	3655	Spiritwood Lake	-98.587222	47.073611	10099	-15
SPLANPD	3656	Basswood Road Lake/ Splan Pond	-67.330556	45.255556	13504	10800
SPRINGLK	2506	Spring Lake (US:Pennsylvania)	-76.35	41.673889	14405	4
SPRUCE	2507	Spruce Pond	-74.204167	41.239444	14510	119
STAGESPD	2511	Stage's Pond	-82.9375	39.668056	3676	64
STEELMN	NA	Steel Lake	-94.684	46.974	11419	-51
STJOHN	2515	Saint John Island Pond	-58.916667	53.95	6045	34
STOTZEL	2519	Stotzel-Leis Site	-84.689444	40.216667	17999	51
STWDARK2	3660	Stewart's Dark Lake	-91.45	45.3	12447	1923
SUGRLOAF	2520	Sugarloaf Pond	-52.666667	47.616667	7875	-27
SUTHRLND	2526	Sutherland Pond	-74.037778	41.391389	15012	45
SWANLAKE	2529	Swan Lake (US:Nebraska)	-102.508611	41.721389	9978	33
SZABOPND	2532	Szabo Pond	-74.483333	40.4	13327	-25
TAMARACK	2533	Tamarack Creek	-91.45	44.15	4917	11
TANNERSV	2535	Tannersville Bog	-75.266667	41.033333	15879	29
TAUPAW	2538	Taupawshas Bog	-70.058333	41.275	12739	-28
TAYCRK2A	2539	Taylor Creek Site 2	-80.643889	25.205556	528	-35
TAYCRK2B	3661	Taylor Creek Site 2	-80.643889	25.205556	1487	-26
TAYLSL15	2541	Taylor Slough Site 15	-80.687222	25.201944	567	-41
TAYLSL7	2542	Taylor Slough Site 7	-80.646389	25.287222	3848	-36
TERHELL	2547	Terhell Pond	-95.770556	47.187778	10843	-8
TERRIEN	2548	Petit Lac Terrien	-70.62	46.58	14620	0
THIB127B	NA	Thibaudeau CORE127B	-94.149722	57.099167	6926	-34

TITICUT1	2553	Titicut Swamp	-71.033333	41.95	11329	0
TOMSWAMP	3666	Tom Swamp	-72.2125	42.516667	14960	200
TONAWA	2559	Tonawa Lake	-77.175	44.85	11513	-29
TOR	2561	Lac à la Tortue	-73.316944	45.545833	10254	1
TROUTLBG	NA	Trout Lake Bog	-85.013	46.21	3599	-29
TULANEG	NA	Lake Tulane	-81.5008	27.5895	47983	987
TUR	2576	Lac Turcotte	-65.762778	49.157778	12138	665
TWISMARL	NA	Twiss Marl Pond	-79.9525	43.447778	12758	-45
UNKNOWN	2790	Unknown Pond	-70.633333	45.6	4534	50
UPMALLOW	2792	Upper Mallot Lake	-84.258333	47.308333	11294	-2
UPWALLFC	3706	Upper Wallface Pond	-74.054167	44.146389	13163	250
VALHALLA	2804	Valhalla Hollow	-74.370833	44.308611	1127	-44
VANNOSTR	2805	Van Nostrand Lake	-79.38	44	11745	-17
VHC1	2814	Baie du Diana	-69.832778	60.782778	7207	288
VOLOBOG	2821	Volo Bog	-88.184444	42.351111	12926	104
WCA2AF1	2845	Water Conservation Area 2A, Site 2 (Site F1)	-80.370556	26.359722	2238	-41
WCA2AU3	2846	Water Conservation Area 2A, Site 3 (Site U3)	-80.411389	26.2875	2045	-36
WCA3A15	2847	Water Conservation Area 3A, Site 4 (CA315 (AAS))	-80.668889	28.974167	2506	-38
WEBBS	NA	Webbs Lake	-78.100833	44.168056	8426	-30
WENTZEL	2850	Wentzel's Pond	-94.95	46.95	2425	-29
WESLEM1	2851	Weslemkoon Lake	-77.433333	45.033333	11369	7066
WESLEM2	3715	Weslemkoon Lake	-77.433333	45.033333	7526	59
WESTHAWK	NA	West Hawk Lake	-95.19	49.758	9460	64
WESTOLAF	NA	West Olaf Lake	-96.187	46.6	8945	26
WHITEPND	3716	White Pond	-80.775	34.166667	22579	5
WHITGLCH	2853	Whitney's Gulch	-57.3	51.516667	11110	-26
WICKETT	NA	Wickett Pond	-72.4281	42.555	2130	-35
WILWRDPD	2858	Willow River Pond	-92.783333	46.333333	8633	5910
WINNE	2861	Winneconnet Pond	-71.116667	41.966667	16204	51

WINTERGR	2863	Wintergreen Lake	-85.383333	42.4	15553	-24
WL02-1	NA	White Lake	-74.908	41.002	14251	8199
WNTRGULF	2862	Winter Gulf Site	-78.933889	42.561111	15220	14819
WOLFCRK	2931	Wolf Creek	-94.116667	46.116667	24521	10787
WOLSFELD	2932	Wolsfeld Lake	-93.566667	45	12774	-26
WOLVERIN	2933	Wolverine Lake	-85.661111	46.429167	11551	120
WOODLAKE	2936	Wood Lake	-90.083333	45.333333	15948	-85
WYLDEBOG	2942	Wylde Bog	-80.4	43.9	11532	53
WYLDELK	2943	Wylde Lake	-80.4	43.91	12723	-25
YELLE	2946	Lac Yelle	-79.637778	48.503889	9983	0
YELLOWDG	2947	Yellow Dog Pond	-87.95	46.75	10259	1
ZUEHL	2950	Zuehl Farm Site	-93.87	43.03	13854	1080

Appendix 2. List of pollen types used in the generalized dissimilarity modeling (GDM) analyses. The columns list the family-level classification ('Family'), original name of the pollen type in the Neotoma database ('Neotoma database taxonomy'), the name assigned to the higher-level group used for the GDM analyses ('GDM taxonomy'), a note about whether a particular group was used in the genus-level dataset described in the main paper ('Genus-level dataset'), the number of sites at which that taxon occurred ('Number of sites'), and comments about decisions ('Notes'). Pollen types excluded from all analyses and the reason for the exclusion are listed at the bottom of the table. Exclusion was usually because of rarity (e.g., taxon found at <5 sites) or taxonomic imprecision (e.g., taxon identified at the level of order or higher). Note that in the main paper, we used only genus-level taxa for GDM analyses (with a few exceptions such as *Ostrya/Carpinus*) but in Supplementary material Appendix 5 we conduct sensitivity analyses using the full set of taxa listed in the 'GDM taxonomy' column.

Family	Neotoma database	GDM taxonomy	Genus-level Number		Notes
	taxonomy		dataset	of sites	
Acanthaceae	Avicennia	Acanthaceae	No	4	All genera in this family lumped due to rarity
	cf..Acanthaceae	Acanthaceae		3	
	Justicia	Acanthaceae		5	
Adoxaceae	cf..Sambucus	Sambucus	Yes	1	
	Sambucus	Sambucus		107	
	Sambucus.racemosa	Sambucus		1	
	Sambucus.type	Sambucus		2	
	cf..Viburnum.lentago	Viburnum	Yes	1	
	Viburnum	Viburnum		107	
	Viburnum.acerifolium.type	Viburnum		1	
	Viburnum.alnifolium	Viburnum		9	
	Viburnum.edule	Viburnum		31	
	Viburnum.lentago	Viburnum		19	
	Viburnum.lentago.type	Viburnum		1	
	Viburnum.nudum	Viburnum		21	
	Viburnum.opulus	Viburnum		10	
	Viburnum.opulus.type	Viburnum		4	
	Viburnum.rafinosquianum.type	Viburnum		6	
	Viburnum.type	Viburnum		1	

	Viburnum.undiff.	Viburnum		18
Altingiaceae	Liquidambar	Liquidambar	Yes	170
	Liquidambar.styraciflua	Liquidambar		7
Amaranthaceae	Froelichia.type	Chenopodiaceae/ Amaranthaceae	No	1
	Gomphrena.type	Chenopodiaceae/ Amaranthaceae		3
	Tidestromia	Chenopodiaceae/ Amaranthaceae		4
	Tidestromia.type	Chenopodiaceae/ Amaranthaceae		4
	Alternanthera	Chenopodiaceae/ Amaranthaceae		4
	Chenopodiineae	Chenopodiaceae/ Amaranthaceae		18
	Chenopodiineae.undiff.	Chenopodiaceae/ Amaranthaceae		7
	Amaranthaceae	Chenopodiaceae/ Amaranthaceae		252
	Amaranthaceae.undiff.	Chenopodiaceae/ Amaranthaceae		121
	Chenopodiaceae.Amaranthaceae	Chenopodiaceae/ Amaranthaceae		27
	Chenopodiaceae.Amaranthaceae.undiff.	Chenopodiaceae/ Amaranthaceae		15
	Chenopodiaceae	Chenopodiaceae/ Amaranthaceae		54
	Chenopodium.type	Chenopodiaceae/ Amaranthaceae		17
	Chenopodiaceae.undiff.	Chenopodiaceae/ Amaranthaceae		11
	Beta.vulgaris.type	Chenopodiaceae/ Amaranthaceae		1
	Chenopodium	Chenopodiaceae/ Amaranthaceae		2
	Chenopodium.album.type	Chenopodiaceae/ Amaranthaceae		1
	Kochia.type	Chenopodiaceae/ Amaranthaceae		1

	Salicornia.type	Chenopodiaceae/ Amaranthaceae		1	
	Suaeda	Chenopodiaceae/ Amaranthaceae		1	
	Salsola	Salsola	Yes	17	
Amaryllidaceae	Allium.type	Allium	Yes	13	
	Allium	Allium		3	
Anacardiaceae	Anacardiaceae	Anacardiaceae	No	16	
	Anacardiaceae.undiff.	Anacardiaceae		3	
	Anacardiaceae.type.undiff.	Anacardiaceae		1	
	Rhus	Anacardiaceae		85	
	cf..Rhus	Anacardiaceae		2	
	Rhus.Toxicodendron	Anacardiaceae		1	
	Rhus.typhina	Anacardiaceae		3	
	Rhus.typhina.type	Anacardiaceae		1	
	Pistacia	Anacardiaceae		1	
	Schinus	Anacardiaceae		3	
	Toxicodendron	Anacardiaceae		2	
	Toxicodendron.radicans	Anacardiaceae		3	
	Toxicodendron.radicans.type	Anacardiaceae		1	
Annonaceae	Annona	Annonaceae	No	2	
	Annonaceae	Annonaceae		1	
Apiaceae	Apiaceae	Apiaceae	No	281	
	Apiaceae.undiff.	Apiaceae		8	
	Eryngium.type	Apiaceae		1	
	Heracleum.type	Apiaceae		1	
	Sium	Apiaceae		1	
Apocynaceae	Apocynaceae	Apocynaceae	No	1	
	Apocynum	Apocynaceae		2	
Aquifoliaceae	Aquifoliaceae	Aquifoliaceae undiff	No	27	Aquifoliaceae has two genera: Ilex and Nemopanthus. So any case where the analyst couldn't decide between the two, we called it Aquifoliaceae undiff.
	Aquifoliaceae.undiff.	Aquifoliaceae undiff		1	

	cf..Nemopanthus	Aquifoliaceae undiff		1	
	Ilex.Nemopanthus	Aquifoliaceae undiff		61	
	Ilex.Nemopanthus.undiff.	Aquifoliaceae undiff		5	
	Ilex.type	Aquifoliaceae undiff		3	
	Ilex	Ilex	Yes	152	
	Nemopanthus	Nemopanthus	Yes	9	Nemopanthus is now treated as Ilex, but it is(was) a monotypic genus so it should just refer to one species, N. mucronatus
	Nemopanthus.mucronatus	Nemopanthus		23	
Araceae	Araceae	Araceae	No	1	
	cf..Araceae	Araceae		1	
	cf..Arisaema	Araceae		1	
Araliaceae	Aralia	Araliaceae	No	1	
	Aralia.hispida	Araliaceae		2	
	Araliaceae	Araliaceae		5	
	cf..Araliaceae	Araliaceae		1	
Arecaceae	Arecaceae	Arecaceae	No	5	
	Arecaceae.undiff.	Arecaceae		3	
	Sabal	Arecaceae		4	
	Serenoa	Arecaceae		10	
Asteraceae	Ambrosia.lva	Ambrosia-type	Yes	5	We are probably lumping some lva grains in with Ambrosia
	Ambrosia.type	Ambrosia-type		244	
	Ambrosia	Ambrosia-type		272	
	Asteraceae.subtribe.Ambrosiinae	Ambrosia-type		1	
	Asteraceae..low.spine.	Ambrosia-type		4	
	Artemisia	Artemisia	Yes	507	
	Bidens.type	Bidens	Yes	1	
	Bidens	Bidens		15	
	Iva	Iva	Yes	37	
	Iva.annua	Iva		55	
	Iva.annua.type	Iva		92	
	Iva.frutescens	Iva		1	

	Iva.frutescens.type	Iva		4
	Iva.xanthifolia.type	Iva		58
	Iva.type	Iva		2
	Iva.undiff.	Iva		8
	Iva.xanthifolia	Iva		58
	Xanthium	Xanthium	Yes	93
	Xanthium.type	Xanthium		4
	Asteraceae.subf..Asteroideae.undiff.	Asteroideae undiff	No	437
	Aster	Asteroideae undiff		6
	Aster.type	Asteroideae undiff		1
	Anthemis.type	Asteroideae undiff		1
	Achillea.type	Asteroideae undiff		6
	Eupatorium	Asteroideae undiff		6
	Eupatorium.type	Asteroideae undiff		5
	Helianthus.type	Asteroideae undiff		1
	Senecio	Asteroideae undiff		1
	Solidago	Asteroideae undiff		3
	Asteraceae.subf..Cichorioideae	Cichorioideae	No	242
	Taraxacum.type	Cichorioideae		1
	Lactuca.type	Cichorioideae		1
	Asteraceae.cf..Cirsium	Carduoideae	No	1
	Cirsium	Carduoideae		1
	Cirsium.Carduus.type	Carduoideae		3
	Centaurea	Carduoideae		1
	Centaurea.type	Carduoideae		1
	Asteraceae.tribe.Cynareae	Carduoideae		3
	Asteraceae.undiff.	Asteraceae undiff	No	102
	Asteraceae	Asteraceae undiff		3
	Asteraceae..high.spine.	Asteraceae undiff		4
Balsaminaceae	Balsaminaceae	Balsaminaceae	No	1
	Impatiens	Balsaminaceae		64
	Impatiens.capensis	Balsaminaceae		1

Berberidaceae	Berberidaceae	Berberidaceae	No	2
	Caulophyllum.thalictroides	Berberidaceae		4
	cf..Podophyllum	Berberidaceae		1
	Podophyllum	Berberidaceae		1
Betulaceae	Alnus	Alnus	Yes	323
	Alnus..hexaporate.	Alnus		1
	Alnus..pentaporate.	Alnus		4
	Alnus..tetraporate.	Alnus		4
	Alnus..triporate.	Alnus		1
	Alnus.cf..A..incana	Alnus		5
	Alnus.cf..A..viridis	Alnus		5
	Alnus.incana	Alnus		69
	Alnus.incana.type	Alnus		120
	Alnus.undiff.	Alnus		40
	Alnus.viridis	Alnus		28
	Alnus.viridis.subsp..crispa	Alnus		33
	Alnus.viridis.subsp..crispa.type	Alnus		4
	Alnus.viridis.type	Alnus		114
	Corylus	Corylus	Yes	396
	Corylus.comuta	Corylus		61
	Corylus.type	Corylus		1
Ostrya	Ostrya/Carpinus	Yes	46	
Ostrya.Carpinus	Ostrya/Carpinus		417	
Ostrya_Carpinus	Ostrya/Carpinus		1	
Ostrya.type	Ostrya/Carpinus		15	
Carpinus	Ostrya/Carpinus		4	
Carpinus.type	Ostrya/Carpinus		1	
Betula	Betula	Yes	499	
Betula..corroded.	Betula		1	
Betula..shrub.	Betula		1	
Betula..small.	Betula		16	
Betula.20.25microm	Betula		1	

	Betula.greater.than.20.microm	Betula		3
	Betula.greater.than.20microm	Betula		1
	Betula.less.than.20.microm	Betula		3
	Betula.less.than.20microm	Betula		1
	Betula.undiff.	Betula		26
	cf..Betula	Betula		1
Boraginaceae	Boraginaceae	Boraginaceae	No	7
	Boraginaceae.undiff.	Boraginaceae		1
	Heliotropium	Boraginaceae		2
	Onosmodium	Boraginaceae		2
	Mertensia	Boraginaceae		1
	Myosotis.type	Boraginaceae		1
	Hydrophyllum	Boraginaceae		5
	Hydrophyllum.virginianum	Boraginaceae		1
	Phacelia	Boraginaceae		2
	Phacelia.hastata.type	Boraginaceae		1
Brassicaceae	Brassicaceae	Brassicaceae	No	192
	Brassicaceae.undiff.	Brassicaceae		6
	Brassicaceae.cf..Brassica	Brassicaceae		1
	Brassicaceae.type	Brassicaceae		6
	Brassica	Brassicaceae		6
Bromeliaceae	Bromeliaceae	Bromeliaceae	No	1
	Bromeliaceae.undiff.	Bromeliaceae		1
	Tillandsia	Bromeliaceae		3
Burseraceae	Bursera	Bursera	Yes	1
	Bursera.simaruba	Bursera		9
Cactaceae	cf..Opuntia	Opuntia	Yes	1
	Opuntia	Opuntia		4
Campanulaceae	Campanulaceae	Campanulaceae	No	27
	Campanula	Campanulaceae		13
	Campanula.type	Campanulaceae		11
	Campanula.rotundifolia.type	Campanulaceae		4

	Campanula.aparinoides.type	Campanulaceae		1
	Jasione	Campanulaceae		1
	Lobelia.type	Campanulaceae		1
Cannabaceae	Celtis	Celtis	Yes	213
	Celtis occidentalis	Celtis		9
	Trema	Trema	Yes	4
	Trema.micrantha	Trema		1
	Cannabaceae	Cannabaceae undiff	No	28
	Cannabaceae.undiff.	Cannabaceae undiff		1
	Cannabis.sativa	Cannabaceae undiff		2
	Cannabis.sativa.type	Cannabaceae undiff		2
	cf..Humulus	Cannabaceae undiff		2
	Humulus.Cannabis.sativa	Cannabaceae undiff		14
	Humulus	Cannabaceae undiff		66
	Humulus.type	Cannabaceae undiff		8
	Humulus.lupulus	Cannabaceae undiff		6
Caprifoliaceae	Diervilla	Diervilla	Yes	3
	Diervilla.lonicera	Diervilla		2
	Lonicera	Lonicera	Yes	13
	Lonicera.caerulea	Lonicera		1
	Lonicera.canadensis	Lonicera		1
	Lonicera.canadensis.type	Lonicera		1
	Lonicera.involucrata	Lonicera		3
	Lonicera.type	Lonicera		1
	Linnaea.borealis	Linnaea borealis	Yes	7
	Symphoricarpos	Symphoricarpos	Yes	3
	Symphoricarpos.albus	Symphoricarpos		6
	Symphoricarpos.occidentalis	Symphoricarpos		4
	Symphoricarpos.type	Symphoricarpos		3
	Caprifoliaceae	Caprifoliaceae undiff	No	20
	Caprifoliaceae.undiff.	Caprifoliaceae undiff		24
Caryophyllaceae	Caryophyllaceae	Caryophyllaceae undiff	No	281

	Caryophyllaceae.undiff.	Caryophyllaceae undiff		13	
	Arenaria	Caryophyllaceae undiff		1	
	Caryophyllaceae.cf..Dianthus	Caryophyllaceae undiff		1	
	Dianthus.type	Caryophyllaceae undiff		1	
	Paronychia.americana	Caryophyllaceae undiff		1	
	Paronychia.chartacea	Caryophyllaceae undiff		1	
	Scleranthus	Caryophyllaceae undiff		1	
	Spergula	Caryophyllaceae undiff		1	
	Spergula.type	Caryophyllaceae undiff		1	
	Stellaria	Stellaria	Yes	11	
	Stellaria.type	Stellaria		1	
Celastraceae	Parnassia	Celastraceae	No	8	All genera in this family lumped due to rarity
	cf..Parnassia	Celastraceae		1	
	Hippocratea	Celastraceae		4	
	Hippocratea.type	Celastraceae		1	
	Celastraceae	Celastraceae		1	
Cistaceae	Cistaceae	Cistaceae	No	5	
	cf..Cistaceae	Cistaceae		1	
	Helianthemum	Cistaceae		3	
	Helianthemum.type	Cistaceae		1	
	Lechea	Cistaceae		7	
	Hudsonia	Cistaceae		3	
Clethraceae	Clethra	Clethra	Yes	20	
	cf..Clethra	Clethra		1	
Combretaceae/ Melastomataceae	Combretaceae.Melastomataceae	Combretaceae/ Melastomataceae	No	3	
	Combretaceae.Melastomataceae.undiff.	Combretaceae/ Melastomataceae		1	
	Rhexia	Combretaceae/ Melastomataceae		2	
	Rhexia.type	Combretaceae/ Melastomataceae		1	
	Conocarpus	Combretaceae/ Melastomataceae		5	

	Melastomataceae	Combretaceae/ Melastomataceae		3
Convolvulaceae	Convolvulus,	Convolvulaceae	No	2
	Calystegia	Convolvulaceae		1
	Convolvulaceae	Convolvulaceae		1
	Cuscuta	Convolvulaceae		2
Cornaceae	Cornus	Cornus	Yes	159
	Cornus.alternifolia	Cornus		2
	Cornus.canadensis	Cornus		24
	Cornus.canadensis.type	Cornus		3
	Cornus.florida	Cornus		2
	Cornus.racemosa	Cornus		5
	Cornus.rugosa	Cornus		1
	Cornus.sericea	Cornus		18
	Cornus.sericea.type	Cornus		10
	Cornus.suecica	Cornus		2
	Cornus.cf..C..sericea	Cornus		1
	Cornus.undiff.	Cornus		15
	Nyssa	Nyssa	Yes	150
	Nyssa.sylvatica.type	Nyssa		1
Crassulaceae	Crassulaceae	Crassulaceae	No	2
	Crassulaceae.undiff.	Crassulaceae		1
	Sedum	Crassulaceae		5
Cupressaceae	cf..Cupressaceae	Cupressaceae/ Taxaceae undiff	No	1
	Cupressaceae	Cupressaceae/ Taxaceae undiff		293
	Cupressaceae.Taxaceae	Cupressaceae/ Taxaceae undiff		22
	Cupressaceae.Taxaceae.undiff	Cupressaceae/ Taxaceae undiff		1
	Cupressaceae.Taxaceae.undiff.	Cupressaceae/ Taxaceae undiff		1
	Cupressaceae.type	Cupressaceae/ Taxaceae undiff		1

	Cupressaceae.undiff.	Cupressaceae/ Taxaceae undiff		16	
	Cupressus	Cupressaceae/ Taxaceae undiff		1	
	Chamaecyparis	Cupressaceae/ Taxaceae undiff		1	Lumped with Cupressaceae/Taxaceae undiff due to rarity
	Chamaecyparis.thyoides	Cupressaceae/ Taxaceae undiff		1	Lumped with Cupressaceae/Taxaceae undiff due to rarity
	Chamaecyparis.type	Cupressaceae/ Taxaceae undiff		1	Lumped with Cupressaceae/Taxaceae undiff due to rarity
	Cupressaceae.cf..Thuja.occidentalis	Cupressaceae/ Taxaceae undiff		2	Lumped with Cupressaceae/Taxaceae undiff due to rarity
	Juniperus	Juniperus/Thuja	Yes	23	
	Juniperus.type	Juniperus/Thuja		68	
	Juniperus.Thuja	Juniperus/Thuja		52	
	Juniperus.communis.Thuja.occidentalis.type	Juniperus/Thuja		58	
	Thuja	Juniperus/Thuja		2	
	Thuja.plicata.type	Juniperus/Thuja		1	
	Thuja.type	Juniperus/Thuja		5	
	Taxodium	Taxodium	Yes	20	
	Taxodium.type	Taxodium		1	
Cyperaceae	Cyperaceae	Cyperaceae	No	500	
	Cyperaceae.undiff.	Cyperaceae		25	
	Carex	Cyperaceae		1	
Cyrillaceae	Cyrilla.racemiflora	Cyrilla racemiflora	Yes	10	
Diapensiaceae	Diapensia	Diapensia	Yes	1	
	cf..Diapensia.laponica	Diapensia		4	
Elaeagnaceae	Shepherdia	Shepherdia	Yes	45	
	Shepherdia.argentea	Shepherdia		41	
	Shepherdia.canadensis	Shepherdia		176	
	Elaeagnaceae	Elaeagnaceae undiff	No	2	
	Elaeagnaceae.undiff.	Elaeagnaceae undiff		1	
	Hippophae.rhamnoides	Elaeagnaceae undiff		1	
	Elaeagnus	Elaeagnaceae undiff		37	Folded genus into family
	Elaeagnus.commutata	Elaeagnaceae undiff		9	Folded genus into family

Ephedraceae	Ephedra	Ephedra	Yes	76	
	Ephedra.nevadensis.type	Ephedra		14	
	Ephedra.torreyana.type	Ephedra		16	
	Ephedra.trifurca.type	Ephedra		15	
	Ephedra.viridis.type	Ephedra		15	
	Ephedra.undiff.	Ephedra		1	
Ericaceae	Arctostaphylos	Arctostaphylos	Yes	7	
	Empetrum	Empetrum	Yes	6	
	Empetrum.type	Empetrum		1	
	Moneses.uniflora	Pyroleae	No	2	
	Pyrola	Pyroleae		3	
	Rhododendron	Rhododendron	Yes	3	
	Rhododendron.canadense	Rhododendron		3	
	Ledum	Rhododendron		2	Now treated as Rhododendron
	Ledum.type	Rhododendron		2	
	Ledum.Chamaedaphne.calyculata	Rhododendron		12	
	Chamaedaphne.calyculata	Chamaedaphne.calyculata	Yes	7	
	Vaccinium	Vaccinium	Yes	11	
	Vaccinium.angustifolium.type	Vaccinium		1	
	Vaccinium.macrocarpon.type	Vaccinium		2	
	Vaccinium.oxycoccus	Vaccinium		4	
	Vaccinium.type	Vaccinium		2	
	Vaccinium.uliginosum.type	Vaccinium		4	
	Vaccinium.undiff.	Vaccinium		2	
	Ericaceae	Ericaceae undiff	No	387	
	Ericaceae.type	Ericaceae undiff		2	
Ericaceae.undiff.	Ericaceae undiff		24		
Cassiope.type	Ericaceae undiff		3		
Gaultheria	Ericaceae undiff		2		
Gaultheria.procumbens	Ericaceae undiff		1		
Gaylussacia	Ericaceae undiff		1		
Kalmia	Ericaceae undiff		3		

	Lyonia	Ericaceae undiff		1	
	Monotropa	Ericaceae undiff		2	
	Ceratiola.ericoides.type	Ericaceae undiff		2	Lumped into Ericaceae undiff due to rarity
	Ceratiola.ericoides	Ericaceae undiff		1	Lumped into Ericaceae undiff due to rarity
	Andromeda	Ericaceae undiff		1	Lumped into Ericaceae undiff due to rarity
	Andromeda.glaucophylla	Ericaceae undiff		2	Lumped into Ericaceae undiff due to rarity
	Andromeda.polifolia	Ericaceae undiff		1	Lumped into Ericaceae undiff due to rarity
Euphorbiaceae	Acalypha	Euphorbiaceae	No	2	
	Acalypha.type	Euphorbiaceae		1	
	Euphorbia	Euphorbiaceae		23	
	Euphorbia.subg..Chamaesyce	Euphorbiaceae		3	
	Euphorbia.subg..Chamaesyce.type	Euphorbiaceae		2	
	Euphorbiaceae	Euphorbiaceae		20	
	Euphorbiaceae.undiff.	Euphorbiaceae		1	
Fabaceae	Amorpha	Amorpha	Yes	36	
	Amorpha.canescens	Amorpha		3	
	Amorpha.type	Amorpha		25	
	Dalea	Dalea	Yes	42	
	Dalea.candida	Dalea		10	
	Dalea.candida.type	Dalea		18	
	Dalea.feayi.type	Dalea		1	
	Dalea.purpurea	Dalea		23	
	Dalea.purpurea.type	Dalea		9	
	Dalea.undiff.	Dalea		6	
	Fabaceae.cf..Trifolium	Trifolium	Yes	1	
	Trifolium	Trifolium		4	
	Trifolium.pratense	Trifolium		1	
	Trifolium.repens	Trifolium		1	
	Trifolium.repens.type	Trifolium		6	
	Trifolium.type	Trifolium		3	
	Fabaceae.cf..Melilotus	Melilotus	Yes	1	
	Fabaceae.cf..Melilotus.officinalis	Melilotus		1	

	Melilotus.type	Melilotus		8	
	Astragalus	Astragalinae	No	2	
	Oxytropis	Astragalinae		1	
	Oxytropis.maydelliana.type	Astragalinae		15	
	Oxytropis.type	Astragalinae		1	
	Hedysarum	Faboideae undiff	No	2	
	Lotus	Faboideae undiff		2	
	Vicia.type	Faboideae undiff		2	
	Robinia	Faboideae undiff		2	
	Robinia.type	Faboideae undiff		1	
	Sophora	Faboideae undiff		4	
	Vigna	Faboideae undiff		4	
	Crotalaria.type	Faboideae undiff		1	
	Genista.type	Faboideae undiff		1	
	Lupinus.type	Faboideae undiff		1	
	Pediomelum.type,	Faboideae undiff		3	
	Chamaecrista	Caesalpinioideae	No	3	
	Chamaecrista.type	Caesalpinioideae		4	
	Chamaecrista.fasciculata.type	Caesalpinioideae		1	
	Cassia	Caesalpinioideae		1	
	Gleditsia	Caesalpinioideae		5	
	Acacia	Fabaceae undiff	No	1	Lumped into Fabaceae undiff due to rarity
	Fabaceae	Fabaceae undiff		137	
	Fabaceae.undiff.	Fabaceae undiff		69	
	cf..Fabaceae	Fabaceae undiff		1	
	Medicago	Fabaceae undiff		2	
	Medicago.sativa	Fabaceae undiff		1	
	Ononis.type	Fabaceae undiff		1	
Fagaceae	Castanea	Castanea	Yes	223	
	Castanea.dentata	Castanea		52	
	Fagus	Fagus	Yes	404	
	Fagus.grandifolia	Fagus		7	

	Fagus.Grandifolia	Fagus		2
	Fagus.undiff	Fagus		2
	Quercus	Quercus	Yes	531
Gentianaceae	cf..Gentiana	Gentianaceae	No	1
	Gentiana	Gentianaceae		4
	Gentiana.andrewsii.type	Gentianaceae		3
	Gentiana.puberulenta.type	Gentianaceae		1
	Gentiana.type	Gentianaceae		1
	Gentianaceae	Gentianaceae		11
	Gentianaceae.undiff.	Gentianaceae		2
	Gentianella	Gentianaceae		1
	Lomatogonium	Gentianaceae		1
	Sabatia.type	Gentianaceae		1
Geraniaceae	Geranium	Geranium	Yes	7
Grossulariaceae	Ribes	Ribes	Yes	19
	Ribes.undiff.	Ribes		1
	Ribes.aureum	Ribes		1
	cf..Ribes	Ribes		1
Hypericeae	Hypericum	Hypericum	Yes	24
	cf..Hypericum	Hypericum		7
	Hypericum.type	Hypericum		1
Iridaceae	Iris	Iris	Yes	4
	Sisyrinchium	Sisyrinchium	Yes	6
Iteaceae	Itea	Itea	Yes	8
Juglandaceae	Carya	Carya	Yes	414
	Carya.cordiformis	Carya		2
	Carya.ovata	Carya		58
	Engelhardtia	Engelhardtia	Yes	2
	Juglans	Juglans	Yes	142
	Juglans.cf..J..cinerea	Juglans		1
	Juglans.cf..J..nigra	Juglans		1
	Juglans.cinerea	Juglans		279

	Juglans.cinerea.type	Juglans		14
	Juglans.nigra	Juglans		210
	Juglans.nigra.type	Juglans		13
	Juglans.undiff.	Juglans		33
	Pterocarya	Pterocarya	Yes	3
Juncaceae	Juncaceae	Juncaceae	No	2
Lamiaceae	Stachys	Stachys	Yes	3
	Stachys.type	Stachys		12
	Lamiaceae.cf..Stachys	Stachys		1
	Lycopus	Lycopus	Yes	2
	Lycopus.type	Lycopus		15
	Mentha.type	Mentha	Yes	9
	Mentha	Mentha		1
	Mentha.arvensis	Mentha		1
	Lamiaceae	Lamiaceae undiff	No	121
	Lamiaceae.undiff.	Lamiaceae undiff		11
	Agastache.type	Lamiaceae undiff		2
	Dracocephalum.type	Lamiaceae undiff		1
	Prunella.type	Lamiaceae undiff		2
Liliaceae	Liliaceae	Liliaceae	No	69
	Liliaceae.undiff.	Liliaceae		3
	Lilium	Liliaceae		2
	Lilium.philadelphicum.type	Liliaceae		1
Lythraceae	Lythrum	Lythrum	Yes	4
	Lythrum.alatum	Lythrum		1
	Lythrum.salicaria	Lythrum		1
Magnoliaceae	Magnolia	Magnolia	Yes	23
	Magnolia.virginiana	Magnolia		1
	Magnolia.virginiana.type	Magnolia		1
	Liriodendron	Liriodendron	Yes	20
	Liriodendron.tulipifera	Liriodendron		3
Malvaceae	Tilia	Tilia	Yes	404

	Tilia.americana	Tilia		5	
	Waltheria	Waltheria	Yes	4	
	Waltheria.indica	Waltheria		1	
	Sphaeralcea	Sphaeralcea	Yes	5	
	Malvaceae	Malvaceae undiff	No	17	
Mimosaceae	Mimosaceae	Mimosaceae	No	3	
	Prosopis	Mimosaceae		2	
	Schrankia	Mimosaceae		1	
Moraceae	cf..Morus	Moraceae	No	1	
	Moraceae	Moraceae		14	
	Moraceae.undiff.	Moraceae		4	
	Morus	Moraceae		119	
	Morus.rubra	Moraceae		3	
	Morus.rubra.type	Moraceae		11	
	Morus.type	Moraceae		1	
	Ficus.aurea	Moraceae		1	
Myricaceae	Myricaceae	Myricaceae	No	14	
	Myrica	Myricaceae		275	
	cf..Myrica	Myricaceae		6	
	Comptonia.peregrina	Myricaceae		4	
	Myrica.cerifera	Myricaceae		1	
	Myrica.Comptonia.peregrina	Myricaceae		30	
	Myrica.gale	Myricaceae		67	
	Myrica.Gale	Myricaceae		1	
	Myrica.type	Myricaceae		6	
	Myrica.undiff.	Myricaceae		2	
Myrsinaceae	cf..Lysimachia	Myrsinaceae	No	1	All genera in this family lumped due to rarity
	cf..Lysimachia.thyrsiflora	Myrsinaceae		2	
	Lysimachia	Myrsinaceae		10	
	Lysimachia.quadriflora.type	Myrsinaceae		1	
	Lysimachia.thyrsiflora	Myrsinaceae		1	
	Trientalis	Myrsinaceae		2	

	Glaux.maritima	Myrsinaceae		1	
	Myrsine	Myrsinaceae		1	
	Myrsine.cubana	Myrsinaceae		1	
Myrtaceae	Myrtaceae.undiff.	Myrtaceae	No	2	
	Myrtaceae	Myrtaceae		1	
	Eugenia	Myrtaceae		1	
	Eucalyptus	Myrtaceae		4	
Oleaceae	Fraxinus	Fraxinus	Yes	180	
	Fraxinus..tetracolpate.	Fraxinus		29	
	Fraxinus..tricolpate.	Fraxinus		30	
	Fraxinus.americana	Fraxinus		60	
	Fraxinus.americana.type	Fraxinus		36	
	Fraxinus.caroliniana	Fraxinus		1	
	Fraxinus.cf..F..caroliniana	Fraxinus		1	
	Fraxinus.cf..F..nigra	Fraxinus		1	
	Fraxinus.nigra	Fraxinus		134	
	Fraxinus.nigra.type	Fraxinus		152	
	Fraxinus.pennsylvanica	Fraxinus		42	
	Fraxinus.pennsylvanica.F..americana.type	Fraxinus		15	
	Fraxinus.pennsylvanica.type	Fraxinus		136	
	Fraxinus.quadrangulata.F..nigra.type	Fraxinus		2	
	Fraxinus.undiff.	Fraxinus		98	
	Osmanthus	Osmanthus	Yes	3	
Onagraceae	Epilobium	Epilobium	Yes	89	
	Epilobium.latifolium	Epilobium		2	
	Epilobium.type	Epilobium		4	
	Onagraceae.undiff.	Onagraceae undiff	No	11	All genera in this family lumped due to rarity
	Onagraceae	Onagraceae undiff		95	
	Circaea	Onagraceae undiff		2	
	Gaura	Onagraceae undiff		7	
	Ludwigia.type	Onagraceae undiff		1	
	Oenothera	Onagraceae undiff		4	

	Calylophus	Onagraceae undiff		1	
Orobanchaceae	Agalinis.type	Orobanchaceae	No	1	All genera in this family lumped due to rarity
	Pedicularis	Orobanchaceae		9	
	Pedicularis.lanceolata	Orobanchaceae		2	
	Rhinanthus	Orobanchaceae		1	
	Melampyrum	Orobanchaceae		1	
	Melampyrum.type	Orobanchaceae		1	
Oxalidaceae	Oxalidaceae	Oxalidaceae	No	1	
	Oxalis	Oxalidaceae		3	
	cf..Oxalis	Oxalidaceae		2	
Pinaceae	Abies	Abies	Yes	397	
	Abies.undiff.	Abies		2	
	Abies.balsamea	Abies		67	
	Abies.Balsamea	Abies		1	
	Larix	Larix	Yes	414	
	Larix.laricina	Larix		11	
	Larix.Laricina	Larix		1	
	Larix.Pseudotsuga	Larix		2	
	Larix.undiff	Larix		1	
	Pseudotsuga	Larix		1	
	Picea	Picea	Yes	419	
	Picea.cf..P..glauca	Picea		3	
	Picea.glauca	Picea		19	
	Picea.glauca.type	Picea		48	
	Picea.mariana	Picea		20	
	Picea.mariana.type	Picea		68	
	Picea.indet.	Picea		1	
	Picea.rubens.type	Picea		3	
	Picea.undiff.	Picea		83	
	Pinus	Pinus undiff	Yes	189	
	Pinus..1.2.grains.	Pinus undiff		3	
	Pinus..whole.grains.	Pinus undiff		3	

	Pinus.undiff.	Pinus undiff		314
	Pinus.banksiana	Pinus.subg.Pinus	Yes, as Pinus undiff.	6
	Pinus.banksiana.P..divaricata	Pinus.subg.Pinus		1
	Pinus.banksiana.P..resinosa	Pinus.subg.Pinus		88
	Pinus.banksiana.Pinus.divaricata	Pinus.subg.Pinus		1
	Pinus.banksiana.type	Pinus.subg.Pinus		71
	Pinus.clausula.type	Pinus.subg.Pinus		1
	Pinus.det..P..banksiana.P..resinosa	Pinus.subg.Pinus		8
	Pinus.elliottii	Pinus.subg.Pinus		1
	Pinus.resinosa	Pinus.subg.Pinus		1
	Pinus.resinosa.type	Pinus.subg.Pinus		32
	Pinus.subg..Pinus	Pinus.subg.Pinus		153
	Pinus.subg..Pinus.undiff.	Pinus.subg.Pinus		7
	Pinus.det..P..strobis	Pinus.subg.Strobis	Yes, as Pinus undiff.	8
	Pinus.strobis	Pinus.subg.Strobis		165
	Pinus.Strobis	Pinus.subg.Strobis		4
	Pinus.strobis.type	Pinus.subg.Strobis		4
	Pinus.subg..Strobis	Pinus.subg.Strobis		158
	Pinus.subg..Strobis.undiff.	Pinus.subg.Strobis		6
	Tsuga	Tsuga	Yes	346
	Tsuga.canadensis	Tsuga		76
	Tsuga.canadensis.type	Tsuga		1
	Tsuga.undiff.	Tsuga		2
Plantaginaceae	Plantaginaceae	Plantaginaceae	No	4
	Plantaginaceae.undiff.	Plantaginaceae		5
	Plantago	Plantaginaceae		227
	Plantago.lanceolata	Plantaginaceae		22
	Plantago.lanceolata.type	Plantaginaceae		3
	Plantago.major	Plantaginaceae		28
	Plantago.major.P..media	Plantaginaceae		1

	Plantago.major.type	Plantaginaceae		3	
	Plantago.media	Plantaginaceae		1	
	Plantago.rigida.type	Plantaginaceae		3	
	Plantago.undiff.	Plantaginaceae		19	
	Veronica	Plantaginaceae		2	
Platanaceae	Platanus	Platanus	Yes	299	
	Platanus.occidentalis	Platanus		9	
Plumbaginaceae	Armeria	Plumbaginaceae	No	2	All genera in this family lumped due to rarity
	Armeria.maritima	Plumbaginaceae		5	
	Plumbaginaceae.cf..Armeria	Plumbaginaceae		1	
	Limonium	Plumbaginaceae		1	
	Limonium.cf..L..limbatum	Plumbaginaceae		1	
	Plumbaginaceae	Plumbaginaceae		1	
Poaceae	Elymus	Poaceae	No	4	
	Elymus.type	Poaceae		4	
	Avena.type	Poaceae		8	
	Avena.Triticum	Poaceae		4	
	Secale	Poaceae		7	
	Secale.type	Poaceae		8	
	Triticum	Poaceae		1	
	Triticum.type	Poaceae		5	
	Zea	Poaceae		28	
	Zea.mays	Poaceae		34	
	Poaceae	Poaceae		424	
	Poaceae.1	Poaceae		1	
	Poaceae.undiff.	Poaceae		108	
Polemoniaceae	Gilia	Polemoniaceae	No	1	
	Phlox	Polemoniaceae		14	
	Polemonium	Polemoniaceae		6	
	Polemoniaceae	Polemoniaceae		7	
Polygalaceae	Polygala	Polygalaceae	No	3	
	Polygalaceae	Polygalaceae		9	

Polygonaceae	Polygonaceae	Polygonaceae undiff	No	26
	Polygonaceae.undiff.	Polygonaceae undiff		68
	cf..Coccoloba	Polygonaceae undiff		1
	Polygonella	Polygonella	Yes	2
	Polygonella.ciliata.type	Polygonella		1
	Polygonella.fimbriata.P..myriophylla	Polygonella		1
	Polygonella.fimbriata.type	Polygonella		4
	Polygonella.polygama.type	Polygonella		5
	Polygonum	Polygonum	Yes	96
	Polygonum.amphibium	Polygonum		20
	Polygonum.amphibium.type	Polygonum		4
	Polygonum.arenastrum.type	Polygonum		1
	Polygonum.aviculare	Polygonum		6
	Polygonum.aviculare.type	Polygonum		9
	Polygonum.bistorta.type	Polygonum		2
	Polygonum.bistortoides	Polygonum		8
	Polygonum.bistortoides.type	Polygonum		2
	Polygonum.cf..P..hydropiperoides	Polygonum		1
	Polygonum.cf..P..lapathifolium	Polygonum		1
	Polygonum.cf..P..scandens	Polygonum		1
	Polygonum.convolvulus	Polygonum		1
	Polygonum.convolvulus.type	Polygonum		1
	Polygonum.hydropiper.type	Polygonum		4
	Polygonum.lapathifolium	Polygonum		12
	Polygonum.lapathifolium.type	Polygonum		32
	Polygonum.persicaria	Polygonum		9
	Polygonum.persicaria.type	Polygonum		5
	Polygonum.ramosissimum.type	Polygonum		2
	Polygonum.tenue.type	Polygonum		3
	Polygonum.type	Polygonum		1
	Polygonum.viviparum	Polygonum		26
	Polygonum.viviparum.type	Polygonum		3

	Polygonum.undiff.	Polygonum		10
	Eriogonum	Eriogonum	Yes	8
	Fagopyrum	Fagopyrum	Yes	5
	Koenigia.islandica	Koenigia	Yes	8
	Rumex	Rumex/Oxyria	Yes	306
	cf..Rumex	Rumex/Oxyria		1
	Rumex.type	Rumex/Oxyria		31
	Rumex.type.undiff.	Rumex/Oxyria		5
	Rumex.Oxyria.digyna	Rumex/Oxyria		7
	Rumex.Oxyria.digyna.undiff.	Rumex/Oxyria		3
	Rumex.acetosa	Rumex/Oxyria		1
	Rumex.acetosa.type	Rumex/Oxyria		4
	Rumex.acetosella	Rumex/Oxyria		1
	Rumex.mexicanus	Rumex/Oxyria		1
	Rumex.undiff.	Rumex/Oxyria		1
	cf..Oxyria.digyna	Rumex/Oxyria		33
	Oxyria.digyna	Rumex/Oxyria		19
	Oxyria.Digyna	Rumex/Oxyria		1
	Oxyria.digyna.type	Rumex/Oxyria		2
Portulacaceae	Portulaca	Portulacaceae	No	3
	Portulacaceae	Portulacaceae		5
Primulaceae	Androsace	Primulaceae	No	1
	cf..Primula	Primulaceae		2
	Primula	Primulaceae		6
	Primula.farinosa.type	Primulaceae		1
	Primula.type	Primulaceae		1
	Primulaceae	Primulaceae		13
	Dodecatheon	Primulaceae		1
	Dodecatheon.type	Primulaceae		1
Ranunculaceae	Anemone	Anemone	Yes	2
	Anemone.canadensis.type	Anemone		5
	Anemone.patens	Anemone		1

	Anemone.quinquefolia.type	Anemone		2	
	Anemone.type	Anemone		5	
	Hepatica	Anemone		1	Considered synonymous with Anemone.
	Ranunculus	Ranunculus	Yes	83	
	Ranunculus.acris.type	Ranunculus		1	
	Ranunculus.flabellaris	Ranunculus		1	
	Ranunculus.flabellaris.type	Ranunculus		2	
	Ranunculus.pensylvanicus.type	Ranunculus		3	
	Ranunculus.subg..Batrachium	Ranunculus		4	
	Ranunculus.type	Ranunculus		4	
	Ranunculus.type.undiff.	Ranunculus		1	
	Ranunculus.undiff.	Ranunculus		4	
	Thalictrum	Thalictrum	Yes	395	
	Ranunculaceae	Ranunculaceae undiff	No	24	
	Ranunculaceae..pericolpate.	Ranunculaceae undiff		1	
	Ranunculaceae..tricolpate.	Ranunculaceae undiff		1	
	Ranunculaceae..tricolpate..undiff.	Ranunculaceae undiff		2	
	Ranunculaceae.undiff.	Ranunculaceae undiff		147	
	Actaea.type	Ranunculaceae undiff		1	
	Caltha.type	Ranunculaceae undiff		9	
	Clematis.type	Ranunculaceae undiff		1	
	Coptis	Ranunculaceae undiff		1	
	Coptis.trifolia	Ranunculaceae undiff		1	
Rhamnaceae	Ceanothus	Rhamnaceae	No	15	
	cf..Ceanothus	Rhamnaceae		1	
	Berchemia.scandens	Rhamnaceae		1	
	Rhamnus	Rhamnaceae		45	
	Rhamnus.alnifolia	Rhamnaceae		2	
	Rhamnus.alnifolia.R..frangula	Rhamnaceae		19	
	Rhamnus.cathartica	Rhamnaceae		8	
	Rhamnus.frangula	Rhamnaceae		1	
	Rhamnaceae	Rhamnaceae		22	

	Rhamnaceae.undiff.	Rhamnaceae		5	
	cf..Rhamnus	Rhamnaceae		1	
	cf..Rhamnus.alnifolia	Rhamnaceae		1	
Rhizophoraceae	Rhizophora	Rhizophora	Yes	5	
	Rhizophora.mangle	Rhizophora		1	
Rosaceae	Amelanchier.type	Amelanchier	Yes	7	
	Dryas	Dryas	Yes	32	
	Dryas.type	Dryas		16	
	Geum	Geum	Yes	3	
	Geum.type	Geum		6	
	Potentilla	Potentilla	Yes	39	
	Potentilla.palustris	Potentilla		1	
	Potentilla.palustris.type	Potentilla		30	
	Potentilla.subg..Comarum.type	Potentilla		1	
	Potentilla.type	Potentilla		34	
	Potentilla.type.undiff.	Potentilla		1	
	Comarum.type	Potentilla		1	Lumped with Potentilla because Comarum was formerly included within Potentilla
	Sanguisorba	Sanguisorba	Yes	49	
	cf..Sanguisorba	Sanguisorba		1	
	Sanguisorba.canadensis	Sanguisorba		12	
	Spiraea	Spiraea	Yes	9	
	Spiraea.type	Spiraea		12	
	Prunus	Prunus	Yes	22	
	Prunus.americana.type	Prunus		2	
	Prunus.cf..P..serotina	Prunus		1	
	Prunus.pensylvanica	Prunus		16	
	Prunus.Pyrus	Prunus		1	
	Prunus.serotina	Prunus		1	
	Prunus.Sorbus	Prunus		14	
	Prunus.type	Prunus		9	
	Prunus.type.undiff.	Prunus		1	

	Prunus.undiff.	Prunus		8	
	Prunus.virginiana	Prunus		7	
	Prunus.virginiana.type	Prunus		1	
	Rosaceae.cf..Prunus.serotina	Prunus		4	
	Rosa	Rosaceae undiff	No	1	Lumped into Rosaceae undiff due to rarity
	Rosa.type	Rosaceae undiff		1	Lumped into Rosaceae undiff due to rarity
	Rosaceae.undiff.	Rosaceae undiff		181	
	Fragaria	Rosaceae undiff		1	Lumped into Rosaceae undiff due to rarity
	Rosaceae	Rosaceae undiff		216	
	Rosaceae.herbs.undiff	Rosaceae undiff		1	
	Rosaceae.trees	Rosaceae undiff		5	
	Sorbus	Rosaceae undiff		2	Lumped into Rosaceae undiff due to rarity
	Crataegus	Rosaceae undiff		1	Lumped into Rosaceae undiff due to rarity
	Crataegus.type	Rosaceae undiff		2	Lumped into Rosaceae undiff due to rarity
	Filipendula	Rosaceae undiff		3	Lumped into Rosaceae undiff due to rarity
	Filipendula.rubra	Rosaceae undiff		1	Lumped into Rosaceae undiff due to rarity
	Pyrus.type	Rosaceae undiff		4	Lumped into Rosaceae undiff due to rarity
Rubiaceae	cf..Cephalanthus	Cephalanthus	Yes	2	
	Cephalanthus	Cephalanthus		130	
	Cephalanthus.occidentalis	Cephalanthus		7	
	Galium	Galium	Yes	122	
	Galium.type	Galium		1	
	Rubiaceae	Rubiaceae undiff	No	38	
	Rubiaceae.undiff.	Rubiaceae undiff		15	
	Rubus	Rubiaceae undiff		37	
	Rubus.cf..R..chamaemorus	Rubiaceae undiff		1	
	Rubus.chamaemorus	Rubiaceae undiff		22	
	Rubus.type	Rubiaceae undiff		2	
	Hedyotis	Rubiaceae undiff		1	Lumped into Rubiaceae undiff due to rarity
	Psychotria	Rubiaceae undiff		1	Lumped into Rubiaceae undiff due to rarity
	Diodia	Rubiaceae undiff		1	Lumped into Rubiaceae undiff due to rarity
	Diodia.teres	Rubiaceae undiff		1	Lumped into Rubiaceae undiff due to rarity

Rutaceae	Rutaceae	Rutaceae	No	2
	Rutaceae.undiff.	Rutaceae		1
	Zanthoxylum	Rutaceae		6
	Zanthoxylum.americanum	Rutaceae		2
	Zanthoxylum.fagara	Rutaceae		1
	Zanthoxylum.type	Rutaceae		2
	Citrus	Rutaceae		2
Salicaceae	Populus	Populus	Yes	329
	Populus.balsamifera	Populus		22
	Populus.balsamifera.type	Populus		77
	Populus.deltoides.type	Populus		7
	Populus.grandidentata.type	Populus		3
	Populus.tremuloides	Populus		9
	Populus.tremuloides.type	Populus		90
	Populus.undiff.	Populus		17
	Salix	Salix	Yes	504
	Salix.caroliniana.type	Salix		1
	Salix.herbacea.type	Salix		22
	Salix.reticulata.type	Salix		2
	Salix.undiff.	Salix		23
	Salix.vestita.type	Salix		16
Santalaceae	Comandra	Comandra	Yes	5
Sapindaceae	Acer	Acer	Yes	123
	Acer.cf..A..pennsylvanicum	Acer		3
	Acer.glabrum.type	Acer		1
	Acer.negundo	Acer		115
	Acer.negundo.type	Acer		7
	Acer.nigrum	Acer		10
	Acer.pennsylvanicum	Acer		46
	Acer.rubrum	Acer		279
	Acer.rubrum.type	Acer		1
	Acer.saccharinum	Acer		68

	Acer.saccharinum.type	Acer		42
	Acer.saccharum	Acer		257
	Acer.Saccharum	Acer		1
	Acer.saccharum.type	Acer		81
	Acer.spicatum	Acer		91
	Acer.undiff.	Acer		103
	cf..Acer	Acer		1
	cf..Sapindaceae	Sapindaceae undiff	No	1
	Sapindaceae	Sapindaceae undiff		1
	Sapindus	Sapindaceae undiff		2
	Aesculus	Sapindaceae undiff		1
	Dodonaea	Sapindaceae undiff		2
Sapotaceae	Bumelia	Sapotaceae	No	9
	Sideroxylon	Sapotaceae		1
Sarcobataceae	Sarcobatus	Sarcobatus	Yes	1
	Sarcobatus.vermiculatus	Sarcobatus		158
	cf..Sarcobatus.vermiculatus	Sarcobatus		7
Saxifragaceae	cf..Saxifragaceae	Saxifragaceae	No	1
	Saxifraga	Saxifragaceae		15
	Saxifraga.cernua	Saxifragaceae		1
	Saxifraga.cernua.type	Saxifragaceae		17
	Saxifraga.cf..S..punctata	Saxifragaceae		1
	Saxifraga.cf..S..stellaris	Saxifragaceae		1
	Saxifraga.oppositifolia	Saxifragaceae		4
	Saxifraga.oppositifolia.type	Saxifragaceae		24
	Saxifraga.pensylvanica	Saxifragaceae		1
	Saxifraga.stellaris	Saxifragaceae		1
	Saxifraga.stellaris.type	Saxifragaceae		6
	Saxifraga.type	Saxifragaceae		9
	Saxifraga.undiff.	Saxifragaceae		3
	Saxifragaceae	Saxifragaceae		52
	Saxifragaceae.type	Saxifragaceae		1

	Saxifragaceae.undiff.	Saxifragaceae		15
	Mitella	Saxifragaceae		2
Scrophulariaceae	Scrophulariaceae	Scrophulariaceae	No	17
	Scrophulariaceae.type	Scrophulariaceae		1
	Scrophulariaceae.undiff.	Scrophulariaceae		1
	Scrophularia	Scrophulariaceae		5
	cf..Verbascum	Scrophulariaceae		1
Simaroubaceae	Ailanthus	Simaroubaceae	No	4
	Leitneria.floridana	Simaroubaceae		2
Solanaceae	Solanaceae	Solanaceae	No	17
	Solanaceae.type	Solanaceae		1
	Solanaceae.undiff.	Solanaceae		1
	cf..Physalis	Solanaceae		1
	Solanum	Solanaceae		4
	Solanum.rostratum	Solanaceae		3
Symplocaceae	Symplocos	Symplocos	Yes	5
Taxaceae	cf..Taxus	Taxus	Yes	4
	Taxus	Taxus		120
	Taxus.canadensis	Taxus		3
	Taxus.undiff.	Taxus		2
Theaceae	Gordonia	Gordonia	Yes	10
Ulmaceae	Ulmus	Ulmus	Yes	512
	Planera.aquatica	Planera.aquatica	Yes	9
Urticaceae	Laportea	Urticaceae	No	1
	Laportea.type	Urticaceae		9
	Parietaria	Urticaceae		2
	Parietaria.type	Urticaceae		1
	Pilea.type	Urticaceae		4
	Boehmeria	Urticaceae		1
	Boehmeria.type	Urticaceae		1
	Urticaceae	Urticaceae		41
	Urticaceae.undiff.	Urticaceae		1

	Urtica	Urticaceae		80	
	Urtica.type	Urticaceae		73	
Valerianaceae	Valeriana	Valerianaceae	No	4	
	Valeriana.type	Valerianaceae		1	
	cf..Valerianella	Valerianaceae		1	
Verbenaceae	Verbenaceae	Verbenaceae	No	1	
	cf..Verbenaceae	Verbenaceae		1	
	Verbena	Verbenaceae		7	
	cf..Verbena	Verbenaceae		1	
Violaceae	Viola	Violaceae	No	7	
	Violaceae	Violaceae		3	
Viscaceae/ Loranthaceae	Arceuthobium	Viscaceae/ Loranthaceae	No	31	
	Arceuthobium.Loranthaceae	Viscaceae/ Loranthaceae		1	
	Arceuthobium.pusillum	Viscaceae/ Loranthaceae		6	
	Phoradendron	Viscaceae/ Loranthaceae		3	
	Viscaceae	Viscaceae/ Loranthaceae		1	
	Viscaceae.undiff.	Viscaceae/ Loranthaceae		1	
Vitaceae	Parthenocissus	Parthenocissus	Yes	29	
	cf..Vitis	Vitis	Yes	2	
	Vitis	Vitis		158	
	Vitis.riparia	Vitis		2	
	Vitaceae	Vitaceae undiff	No	6	
Xyridaceae	Xyris	Xyris	Yes	5	
Other taxa	Betulaceae.Myricaceae.undiff.	Not assigned	No	1	Could belong to two separate families; Excluded from ALL analyses
	Betulaceae.undiff.	Not assigned	No	23	Not a meaningful group; Excluded from ALL analyses
	Celtis.Maclura	Not assigned	No	1	Could belong to two separate families; Excluded from ALL analyses

Celtis.Maclura.type	Not assigned	No	3	Could belong to two separate families; Excluded from ALL analyses
Coniferophyta.undiff.	Not assigned	No	6	Not a meaningful group; Excluded from ALL analyses
Corylus.Myrica	Not assigned	No	1	Could belong to two separate families; Excluded from ALL analyses
Ericales	Not assigned	No	15	Not a meaningful group; Excluded from ALL analyses
Ericales.undiff.	Not assigned	No	5	Not a meaningful group; Excluded from ALL analyses
Fagus.Nyssa	Not assigned	No	1	Could belong to two separate families; Excluded from ALL analyses
Ficus.Celtis	Not assigned	No	1	Could belong to two separate families; Excluded from ALL analyses
Herbs.undiff.	Not assigned	No	71	Not a meaningful group; Excluded from ALL analyses
Meliaceae.Sapotaceae	Not assigned	No	1	Could belong to two separate families; Excluded from ALL analyses
Other.herbs	Not assigned	No	23	Not a meaningful group; Excluded from ALL analyses
Other.shrubs	Not assigned	No	9	Not a meaningful group; Excluded from ALL analyses
Other.trees	Not assigned	No	8	Not a meaningful group; Excluded from ALL analyses
Other.trees.and.shrubs	Not assigned	No	7	Not a meaningful group; Excluded from ALL analyses
Other.upland.herbs	Not assigned	No	1	Not a meaningful group; Excluded from ALL analyses
Pinaceae	Not assigned	No	10	Not a meaningful group; Excluded from ALL analyses
Pinaceae..vesiculate..undiff.	Not assigned	No	4	Not a meaningful group; Excluded from ALL analyses
Pinaceae.undiff.	Not assigned	No	19	Not a meaningful group; Excluded from ALL analyses
Rhamnaceae.Vitaceae	Not assigned	No	21	Could belong to two separate families; Excluded from ALL analyses
Rhamnaceae.Vitaceae.undiff.	Not assigned	No	12	Could belong to two separate families; Excluded from ALL analyses
Rhamnus.Vitis	Not assigned	No	17	Could belong to two separate families; Excluded from ALL analyses

Rhamnus.Vitis.undiff	Not assigned	No	1	Could belong to two separate families; Excluded from ALL analyses
Shrubs.undiff.	Not assigned	No	13	Not a meaningful group; Excluded from ALL analyses
Trees.undiff.	Not assigned	No	37	Not a meaningful group; Excluded from ALL analyses
Urticales.undiff.	Not assigned	No	2	Not a meaningful group; Excluded from ALL analyses
Catalpa.speciosa	Not assigned	No	1	rare; Excluded from ALL analyses
Buxus	Not assigned	No	1	rare; Excluded from ALL analyses
Styloceras	Not assigned	No	1	rare; Excluded from ALL analyses
Calycanthus	Not assigned	No	1	rare; Excluded from ALL analyses
Casuarina	Not assigned	No	13	native to Australia; Excluded from ALL analyses
Hedyosmum	Not assigned	No	1	rare; Excluded from ALL analyses
Commelinaceae	Not assigned	No	1	rare; Excluded from ALL analyses
Tradescantia	Not assigned	No	2	rare; Excluded from ALL analyses
Echinocystis.lobata	Not assigned	No	1	rare; Excluded from ALL analyses
cf..Weinmannia	Not assigned	No	1	rare; Excluded from ALL analyses
Dipsacaceae	Not assigned	No	1	rare; Excluded from ALL analyses
Knautia	Not assigned	No	1	rare; Excluded from ALL analyses
Dipsacus	Not assigned	No	1	rare; Excluded from ALL analyses
Diospyros	Not assigned	No	2	rare; Excluded from ALL analyses
Diospyros.type	Not assigned	No	2	rare; Excluded from ALL analyses
Dicentra	Not assigned	No	2	rare; Excluded from ALL analyses
Hamamelidaceae	Not assigned	No	1	rare; Excluded from ALL analyses
Hypoxis	Not assigned	No	2	rare; Excluded from ALL analyses
Hypoxis.hirsuta	Not assigned	No	1	rare; Excluded from ALL analyses
Juglandaceae.undiff.	Not assigned	No	1	rare; Excluded from ALL analyses
Linaceae	Not assigned	No	1	rare; Excluded from ALL analyses
Linum	Not assigned	No	3	rare; Excluded from ALL analyses
Mentzelia	Not assigned	No	1	rare; Excluded from ALL analyses
Byrsonima	Not assigned	No	1	rare; Excluded from ALL analyses
Zigadenus	Not assigned	No	4	rare; Excluded from ALL analyses
Meliaceae	Not assigned	No	1	rare; Excluded from ALL analyses

Menispermaceae	Not assigned	No	1	rare; Excluded from ALL analyses
Menispermum	Not assigned	No	1	rare; Excluded from ALL analyses
cf..Menyanthes.trifoliata	Not assigned	No	1	rare; Excluded from ALL analyses
Maclura.pomifera.type	Not assigned	No	4	rare; Excluded from ALL analyses
Myricaria	Not assigned	No	1	misspelled?; Excluded from ALL analyses
Ximenia	Not assigned	No	1	rare; Excluded from ALL analyses
Orchidaceae	Not assigned	No	1	rare; Excluded from ALL analyses
Papaver.type	Not assigned	No	1	rare; Excluded from ALL analyses
Papaver.argemone	Not assigned	No	1	rare; Excluded from ALL analyses
Papaveraceae	Not assigned	No	1	rare; Excluded from ALL analyses
Sanguinaria.canadensis	Not assigned	No	1	rare; Excluded from ALL analyses
Mimulus	Not assigned	No	4	rare; Excluded from ALL analyses
Cedrus	Not assigned	No	1	rare; Excluded from ALL analyses
Pinus.edulis.type	Not assigned	No	2	a western pinyon pine which technically has its own subgenus: Pinus subg. Ducampopinus. Only at 2 sites in dataset; Excluded from ALL analyses
Piperaceae.type	Not assigned	No	1	rare; Excluded from ALL analyses
Cerealia	Not assigned	No	35	human cultivar indicator; Excluded from ALL analyses
Cerealia.type	Not assigned	No	1	human cultivar indicator; Excluded from ALL analyses
Cerealia.undiff.	Not assigned	No	7	human cultivar indicator; Excluded from ALL analyses
Podocarpus	Not assigned	No	1	rare; Excluded from ALL analyses
cf..Heteranthera	Not assigned	No	1	rare; Excluded from ALL analyses
Maianthemum	Not assigned	No	2	rare; Excluded from ALL analyses
Smilax	Not assigned	No	4	rare; Excluded from ALL analyses
Tofieldia	Not assigned	No	2	rare; Excluded from ALL analyses
Triantha.glutinosa	Not assigned	No	1	rare; Excluded from ALL analyses
Ulmaceae	Not assigned	No	1	rare, also a somewhat meaningless group; Excluded from ALL analyses
Iridaceae	Not assigned	No	1	rare, also a somewhat meaningless group; Excluded from ALL analyses
Pinguicula	Not assigned	No	1	rare; Excluded from ALL analyses

Appendix 3.

Site data-quality index

The density of pollen sampling and chronological sampling (e.g. radiocarbon dates and other independent age controls) are useful indices of 'site data-quality', i.e. whether a site provides a relatively certain estimate of pollen relative abundances for a particular 1 kyr period. For each site at a particular 1 kyr time period, site data-quality was calculated as the mean normalized distance of the nearest pollen sample and the nearest chronological control. We calculated the distance in years of the nearest pollen sample and the nearest chronological control to each 1 kyr time period. We eliminated sites where the nearest pollen sample was over 2000 years away or the nearest chronological control was over 5000 years away. For the remaining sites in each 1 kyr period, we created a summary measure of site data-quality by rescaling the two distances in years to a 0 - 1 scale and calculating the mean. For example, if the nearest sample to the 1 kyr BP time period at a given site was at 1.050 kyr BP and the nearest chronological control was at 1.100 kyr BP, the raw distances would be 50 years and 100 years, respectively. These equate to scaled values of 0.975 (i.e., $1 - 50/2000$) and 0.98 (i.e., $1 - 100/5000$) for sample and chronological quality, respectively, with a mean data-quality for this site at the 1 kyr BP time period of 0.9775.

To determine whether site data-quality changed through time and could have influenced GDM analyses (in particular, $GDM_{\text{single-wv}}$ and GDM_{single}), we calculated the mean (\pm standard error of the mean) site data-quality across all sites for each 1 kyr time period.

Mean site data-quality was particularly low during the glacial times (21 to 18 kyr BP), but was relatively high and stable for all time periods from 17 to 1 kyr BP before increasing substantially again at 0 kyr BP (Fig. A3), due to the greater number of relatively precise Pb-210 dates in the age models of the youngest sites.

We investigated whether there were systematic spatial biases in site data-quality by correlating site data-quality with latitude and longitude, using a Spearman rank correlation test. Some significant correlations were found, particularly between site data-quality and latitude during the Holocene (Table A3), but as site data-quality was generally much higher during the Holocene than in the Pleistocene, these correlations are unlikely to significantly affect the results. We did not calculate mean site data-quality for the pooled analyses (i.e., GDM_{forward} and GDM_{backward}).

Table A3. Correlation between mean site data-quality and either latitude or longitude for all sites from 21 to 0 kyr BP. Times with significant correlations are indicated in bold font. r_s = Spearman rank correlation coefficient.

Time (kyr BP)	Latitude		Longitude	
	r_s	P-value	r_s	P-value
0	-0.02	0.70	0.15	0.02
1	-0.20	0.00	-0.01	0.79
2	-0.04	0.39	-0.07	0.17
3	0.05	0.29	0.00	0.94
4	0.13	0.01	0.06	0.21
5	0.01	0.89	0.10	0.05
6	0.11	0.04	-0.01	0.92
7	0.20	0.00	-0.01	0.82
8	0.19	0.00	-0.03	0.66
9	0.09	0.13	-0.10	0.10
10	0.10	0.11	-0.03	0.64
11	-0.04	0.52	0.06	0.38
12	0.01	0.93	0.14	0.09
13	0.13	0.17	0.09	0.35
14	0.13	0.25	0.13	0.26
15	-0.10	0.49	-0.02	0.90
16	0.11	0.52	-0.09	0.58
17	0.06	0.77	-0.10	0.63
18	0.17	0.46	-0.13	0.58
19	0.09	0.75	-0.36	0.19
20	0.07	0.82	-0.23	0.44
21	0.28	0.43	0.09	0.81

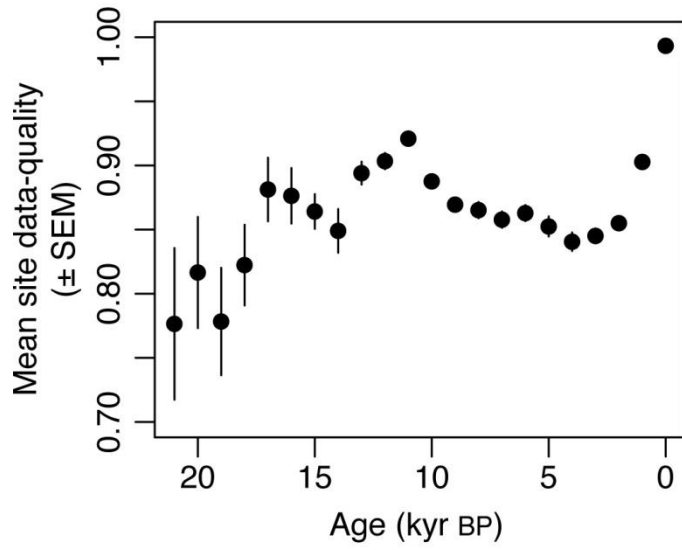


Figure A3. Mean (\pm standard error of the mean; SEM) site data-quality through time.

Appendix 4.

Collinearity in climate variables through time

In order to assess the amount of collinearity between different climate variables based on the National Center for Atmospheric Research Community Climate System Model version 3 (CCSM3) paleoclimate simulations, we calculated the Spearman rank correlation (r_s) for each pair of variables across all sites within a single time period, and repeated the analysis for all times from 21 to 0 kyr BP. Collinearity was generally <0.75 for all variable pairs at all times, except for between winter precipitation and precipitation seasonality in the late Pleistocene, winter temperature and temperature seasonality in the Holocene, and winter temperature and summer temperature for most times (Fig. A4).

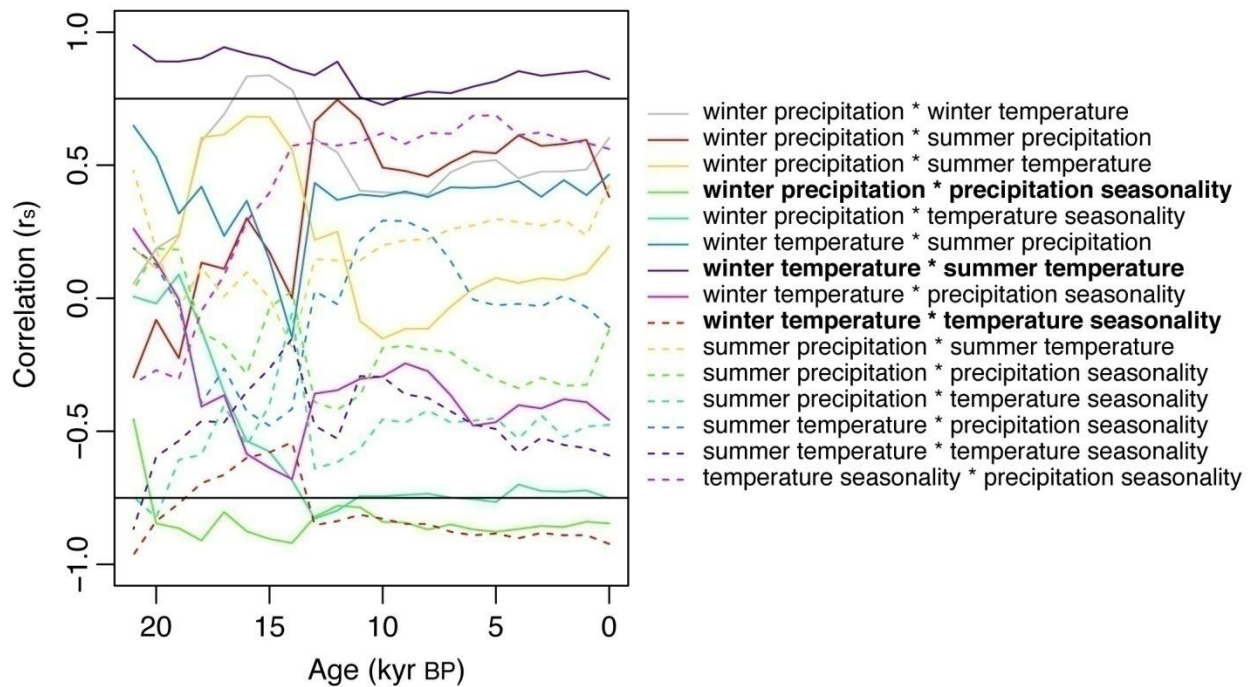


Figure A4. Temporal changes in collinearity between climate variables from 21 kyr BP to the present. We have plotted values as lines rather than points for clarity, since there are so many different pairs of variables on the same figure. The horizontal black lines indicate $r_s=0.75$. Variable pairs with correlations that are consistently greater than 0.75 are indicated in bold. Climate values are based on the National Center for Atmospheric Research Community Climate System Model version 3 (CCSM3) paleoclimate simulations.

Appendix 5.

Influence of taxonomic resolution

Taxonomic resolution of the community composition data may affect observed levels of compositional dissimilarity, because sites with taxa identified to genus should show greater compositional dissimilarity than sites with taxa identified to family. To determine the influence of taxonomic resolution, we used generalized dissimilarity modeling (GDM) to fit models for each time period using a fossil-pollen dataset that included all taxa regardless of taxonomic resolution (which mostly meant adding family-level pollen types such as Poaceae and Cyperaceae to the genus-level dataset used for the main analyses; Supplementary material Appendix 2). These models were fitted in the same way as $GDM_{\text{single-wv}}$ in the main text, but with the full taxonomic dataset rather than the genus-only dataset. We then examined the deviance explained and final variables for each model.

For most time periods from 16 kyr BP to the present, the variables remaining in the final models were the same or differed by one, and percentage of deviance explained was very similar (Table A5). Models from 21 to 17 kyr BP were more dissimilar, both in terms of the final variables chosen as well as deviance explained, but these time periods were ultimately disregarded due to the low number of sites in these analyses (Supplementary material Appendix 6). Thus, taxonomic resolution does not substantially influence the GDM analyses, but all analyses in the main paper were done on the genus-only dataset.

Table A5. Comparison of final models based on the genus-only dataset used for all main GDM analyses ('genus') and the full taxonomic dataset ('genus + family'). Shown are the percentage of deviance explained and the variables included in each final model. An 'x' indicates the variable was present in the final model.

Age (kyr BP)	<u>Deviance Explained</u>			<u>Variables</u>	
	genus	genus + family		genus	genus + family
0	48.07	49.21	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		
			Winter Precipitation		
			Temperature Seasonality		x
			Precipitation Seasonality	x	x
1	50.91	50.26	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality	x	x
2	49	49.58	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality	x	x
3	50.82	50.1	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality	x	x
4	49.96	49.99	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		x
			Winter Precipitation	x	x
			Temperature Seasonality		
			Precipitation Seasonality		
5	51.25	51.66	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		x

			Winter Precipitation		x
			Temperature Seasonality		
			Precipitation Seasonality	x	
6	47.68	47.27	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality	x	x
7	43.6	43.46	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature	x	x
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality	x	x
8	41.16	43.7	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation	x	x
			Winter Temperature	x	x
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality	x	x
9	41.61	41.17	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation	x	x
			Winter Temperature	x	x
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality	x	x
10	37.24	36.55	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		x
			Winter Temperature	x	x
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality	x	x
11	32.34	32.13	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		x
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality		
12	36.78	34.3	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		

			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality		
13	38.29	38.07	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality		
14	41.37	36.89	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality		
15	39.98	37.53	Geographic	x	x
			Summer Temperature		
			Summer Precipitation		
			Winter Temperature		
			Winter Precipitation	x	x
			Temperature Seasonality		x
			Precipitation Seasonality		
16	37.75	34.12	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation	x	
			Winter Temperature		
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality		
17	37.53	38.08	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		x
			Winter Precipitation		x
			Temperature Seasonality		x
			Precipitation Seasonality		
18	64.43	52.75	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation	x	x
			Winter Temperature	x	x
			Winter Precipitation	x	x
			Temperature Seasonality		
			Precipitation Seasonality		
19	68.23	43.96	Geographic		x
			Summer Temperature	x	x
			Summer Precipitation	x	
			Winter Temperature		

			Winter Precipitation		
			Temperature Seasonality	x	x
			Precipitation Seasonality	x	
20	68.02	49.58	Geographic	x	
			Summer Temperature		x
			Summer Precipitation	x	x
			Winter Temperature		x
			Winter Precipitation		
			Temperature Seasonality	x	x
			Precipitation Seasonality	x	x
21	83.8	NA	Geographic		
			Summer Temperature	x	
			Summer Precipitation	x	
			Winter Temperature		
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality	x	

Appendix 6

Influence of variation in the number of sites

The number of sites and hence occupied grid cells in a dataset varies through time (Table A6). We determined the minimum sample size (number of grid cells) at which we could confidently attribute model differences to ecological and environmental processes and not sampling effects. To do this, we sampled without replacement between 10 and 100 grid cells from the final data matrices in steps of 10 (e.g., we randomly chose 10 grid cells and retrieved the taxon and environmental data for those grid cells), fit a model using generalized dissimilarity modeling (GDM) without variable selection, and calculated the percent deviance explained by the model. We repeated this procedure 100 times for each sample size. For each sample size, we calculated the mean and 95% confidence interval of the distribution of percentages of deviance explained. If the percent deviance explained of the full dataset was within the confidence interval of the bootstrapped dataset, we were confident that the models were comparable across times despite different sample sizes. However, because the confidence intervals were very small due to the large number of bootstraps and no sample size met this test (see below), we also calculated the upper and lower limits of the 95% range of deviance explained, as well as the upper and lower limits of the 50% range.

We expected that sample size could influence the percentage of deviance explained. For example, if there are few sites in the dataset and those sites are distributed across a large region, the dataset only captures high compositional

dissimilarities between sites. Hence, the differences between climates at the sites explain compositional differences extremely well. We view these high fits as unrealistic, or “overfit”. As more sites are added to the dataset and fill in the spatial gaps between widely distributed sites, site pairs with small environmental and compositional dissimilarities are added to the dataset which reduces the overall deviance explained. At some point, the percentage of deviance explained should stabilize with respect to the influence of sample size and it is this sample size that we sought to identify.

We found that sample size varied substantially through time (Table A6) and significantly influenced the percentage of deviance explained for some of the GDM analyses (Fig. A6). As expected, percentage deviance explained was very high at very low sample sizes due to overfitting (Table A6, Fig. 2). However, percentage deviance explained was significantly positively correlated with sample size for times with >60 sites ($r_s = 0.8529$; $p < 0.01$) or >60 cells ($r_s = 0.8321$; $p < 0.01$).

Even when sampling 100 sites from the dataset, the observed percentage of deviance explained did not fall within the bootstrapped 95% confidence interval for some times (Fig. A6). However, the 95% range of the observed percentage of deviance explained was too permissive and did not adequately screen out time periods with overfitted models. Thus, we settled on the 50% range of the observed percentage of deviance explained as a way to minimize the influence of sample size on GDM results. The observed deviance explained fell within the 50% range of the subsampled deviance explained for all time periods when $n=60$ or greater (Fig. A6), indicating GDM results are

robust for times 14 kyr BP to the present. We therefore consider results from 21 to 15 kyr BP to be tentative.

Table A6. Sample sizes for each 1000-year time period. Number of sites: the total number of sites with fossil-pollen data. Number of cells: the number of climate grid cells that contain at least one fossil-pollen site for a time period.

Time (kyr BP)	Number of sites	Number of cells
0	252	161
1	445	294
2	438	297
3	410	291
4	397	288
5	372	278
6	354	269
7	334	249
8	300	223
9	280	210
10	251	188
11	205	160
12	155	128
13	117	100
14	75	65
15	49	44
16	37	35
17	28	26
18	20	19
19	15	15
20	14	14
21	10	10

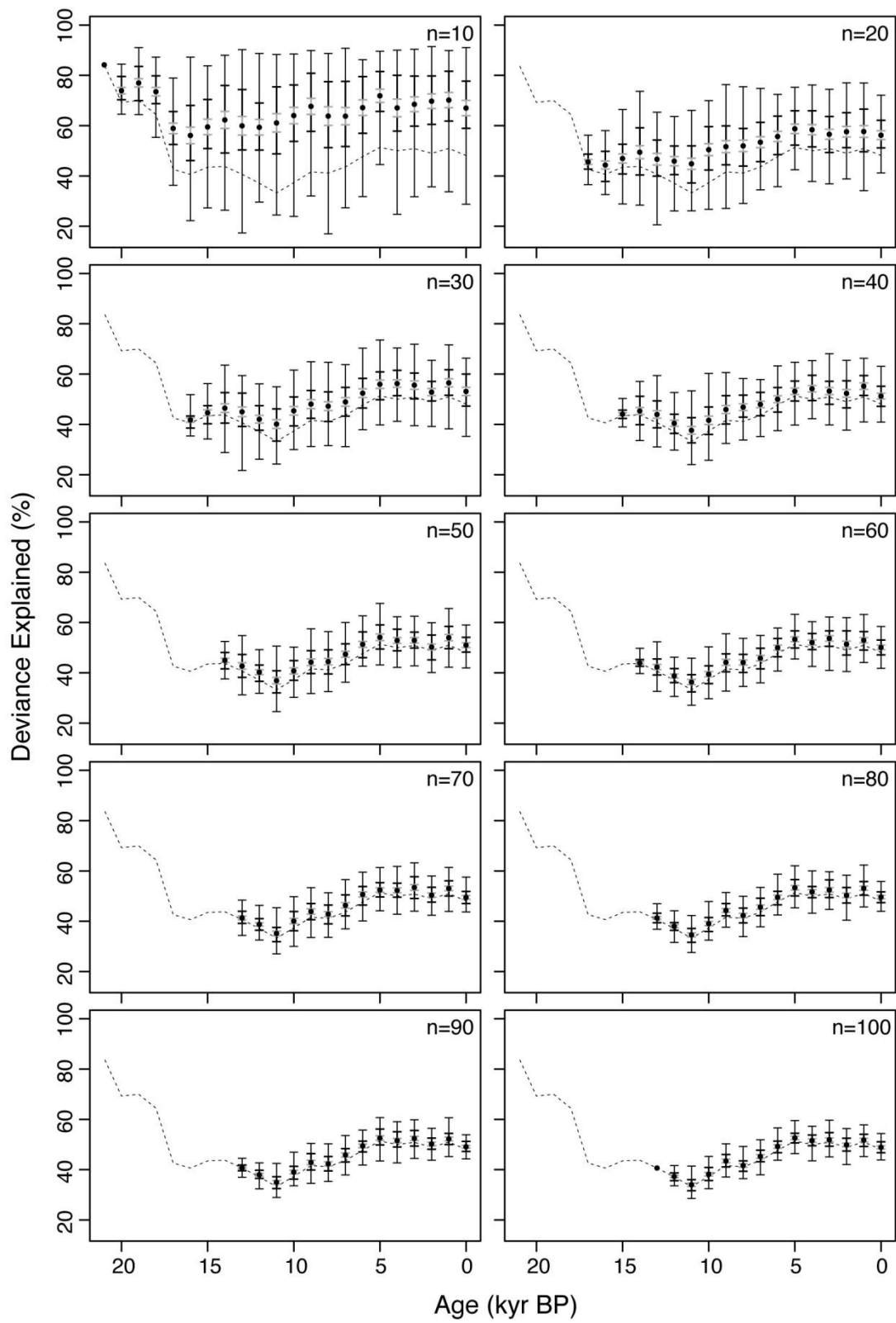


Figure A6. Dashed black line: observed percentage of deviance explained using all sites in the dataset for each time period, based on the genus-only dataset and CCSM3 simulations. Black dots: mean simulated percentage of deviance explained across 100 bootstraps, with the 95% confidence interval (gray line), the 50% range (thick solid black line) and the 95% range (thin solid black line). The sample size (n) is indicated on the top right of each plot.

Appendix 7.

HadCM3 global climate model

We tested the sensitivity of generalized dissimilarity modeling (GDM) to the choice of climate model by fitting models for each time period using the Hadley Centre general circulation model (HadCM3; Singarayer and Valdes 2010). HadCM3 contains coupled ocean, atmosphere, and sea ice modules, and in these simulations HadCM3 was run in a series of “snapshots” spaced 1 kyr apart, in which major boundary conditions (the Earth’s orbital configuration, atmospheric greenhouse gas concentrations, and ice-sheet height and extent) were prescribed and the model run to equilibrium. The resulting simulated climates were downscaled to a 0.5 x 0.5 degree grid (~50 x 50 km), using the same methods as for the National Center for Atmospheric Research Community Climate System Model version 3 (CCSM3) simulations described in the main text.

We fitted single-time models ($GDM_{\text{single-wv}}$) using HadCM3 climate simulations and the genus-level community composition dataset. We fitted an initial model based on the six-variable climate dataset plus geographic distance, then performed model selection to determine a final model, as described in the main text. Overall, climate based on the HadCM3 model explained a similar percentage of deviance in compositional dissimilarity from 15 to 0 kyr BP as the CCSM3 model (35 to 48%) though deviance explained did not differ as much between the latest Pleistocene and the Holocene time periods as in the CCSM3-based models (Table A7). The final predictor variables in HadCM3 models were similar to those in CCSM3-based models, but changes between models were more gradual in HadCM3 than CCSM3-based models (Fig. A7, Fig. 3). Similar to the CCSM3 model, the HadCM3 model indicated that

summer temperature and geography were the most influential predictor variables for most times over the past 15 kyr (Fig. A7), though the presence or absence of the minor predictors differed from CCSM3 at some times (Table A7). Given the overall similarity between the models and the lower fit of the HadCM3-based models relative to CCSM3-based models, throughout the main paper all results rely on models fitted using the CCSM3 climate simulations.

Literature Cited

Singarayer, J. S. and Valdes, P. J. 2010. High-latitude climate sensitivity to ice-sheet forcing over the last 120kyr. – *Quaternary Science Reviews* 29: 43-55.

Table A7. GDM_{single-wv} analyses for models relying on either the CCSM3 or HadCM3 climate simulations. Shown are the percentage of deviance explained and the variables included in each final model. An 'x' indicates the variable was present in the final model.

Age (kyr BP)	Deviance Explained			Variables	
	CCSM3	HadCM3		CCSM3	HadCM3
0	48.07	46.43	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality	x	x
			<hr/>		
1	50.91	42.46	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality	x	
			<hr/>		
2	49	42.68	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality	x	
			<hr/>		
3	50.82	43.25	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality	x	
			<hr/>		
4	49.96	45.25	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		
			Winter Precipitation	x	
			Temperature Seasonality		
			Precipitation Seasonality		x
			<hr/>		
5	51.25	45.95	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		
			Winter Precipitation		

			Temperature Seasonality		
			Precipitation Seasonality	x	x
6	47.68	41.57	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		x
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality	x	x
7	43.6	37.18	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature	x	x
			Winter Precipitation		x
			Temperature Seasonality		
			Precipitation Seasonality	x	
8	41.16	34.96	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation	x	x
			Winter Temperature	x	x
			Winter Precipitation		x
			Temperature Seasonality		
			Precipitation Seasonality	x	
9	41.61	40.91	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation	x	x
			Winter Temperature	x	x
			Winter Precipitation		x
			Temperature Seasonality		
			Precipitation Seasonality	x	
10	37.24	42.53	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		x
			Winter Temperature	x	x
			Winter Precipitation		x
			Temperature Seasonality		
			Precipitation Seasonality	x	
11	32.34	35.32	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		x
			Winter Temperature		x
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality		
12	36.78	41.19	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		x
			Winter Temperature		x
			Winter Precipitation		

			Temperature Seasonality		
			Precipitation Seasonality		
13	38.29	43.77	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality		
14	41.37	48.33	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality		
15	39.98	40.34	Geographic	x	x
			Summer Temperature		x
			Summer Precipitation		
			Winter Temperature		
			Winter Precipitation	x	
			Temperature Seasonality		
			Precipitation Seasonality		
16	37.75	38.93	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation	x	
			Winter Temperature		
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality		x
17	37.53	39.14	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation		
			Winter Temperature		
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality		
18	64.43	51.52	Geographic	x	x
			Summer Temperature	x	x
			Summer Precipitation	x	
			Winter Temperature	x	
			Winter Precipitation	x	
			Temperature Seasonality		
			Precipitation Seasonality		
19	68.23	57.6	Geographic		x
			Summer Temperature	x	x
			Summer Precipitation	x	
			Winter Temperature		
			Winter Precipitation		

			Temperature Seasonality	x	
			Precipitation Seasonality	x	
20	68.02	57.93	Geographic	x	x
			Summer Temperature		x
			Summer Precipitation	x	
			Winter Temperature		
			Winter Precipitation		
			Temperature Seasonality	x	x
			Precipitation Seasonality	x	
21	83.8	NA	Geographic		
			Summer Temperature	x	
			Summer Precipitation	x	
			Winter Temperature		
			Winter Precipitation		
			Temperature Seasonality		
			Precipitation Seasonality	x	

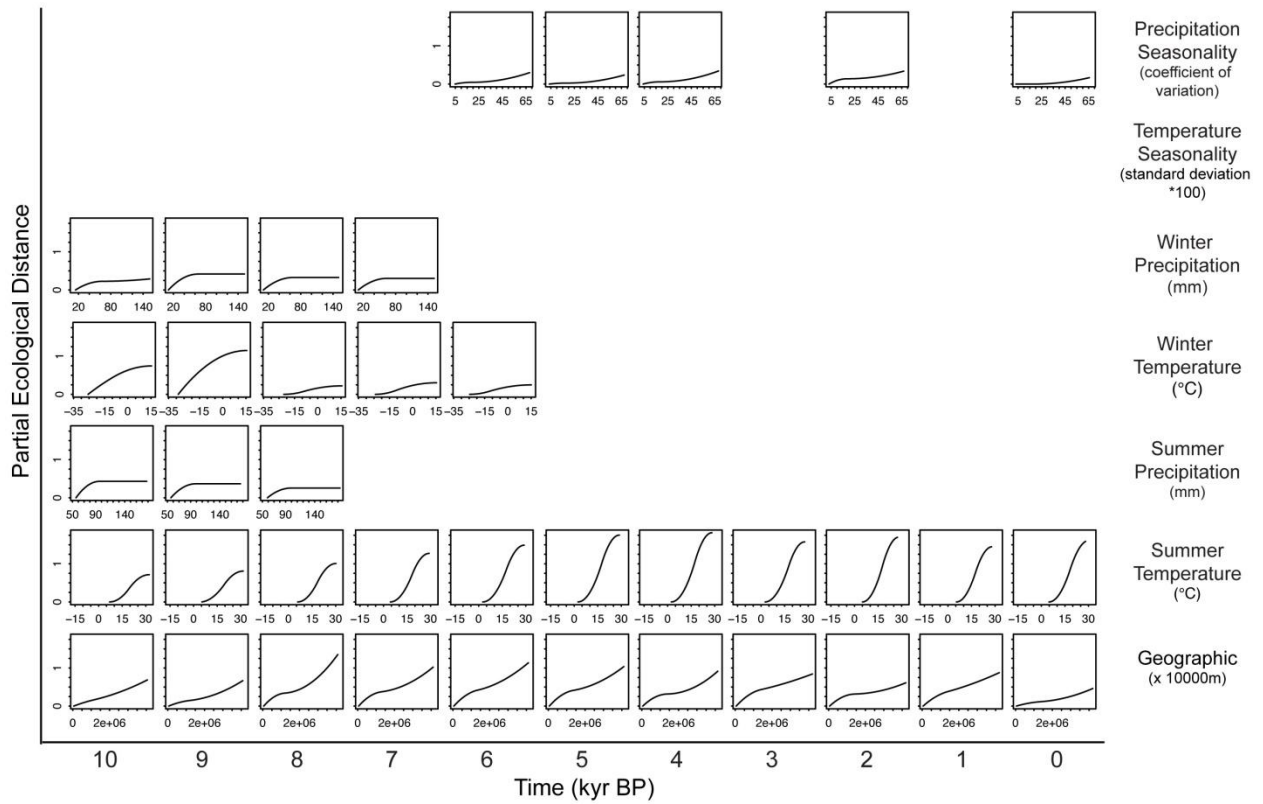
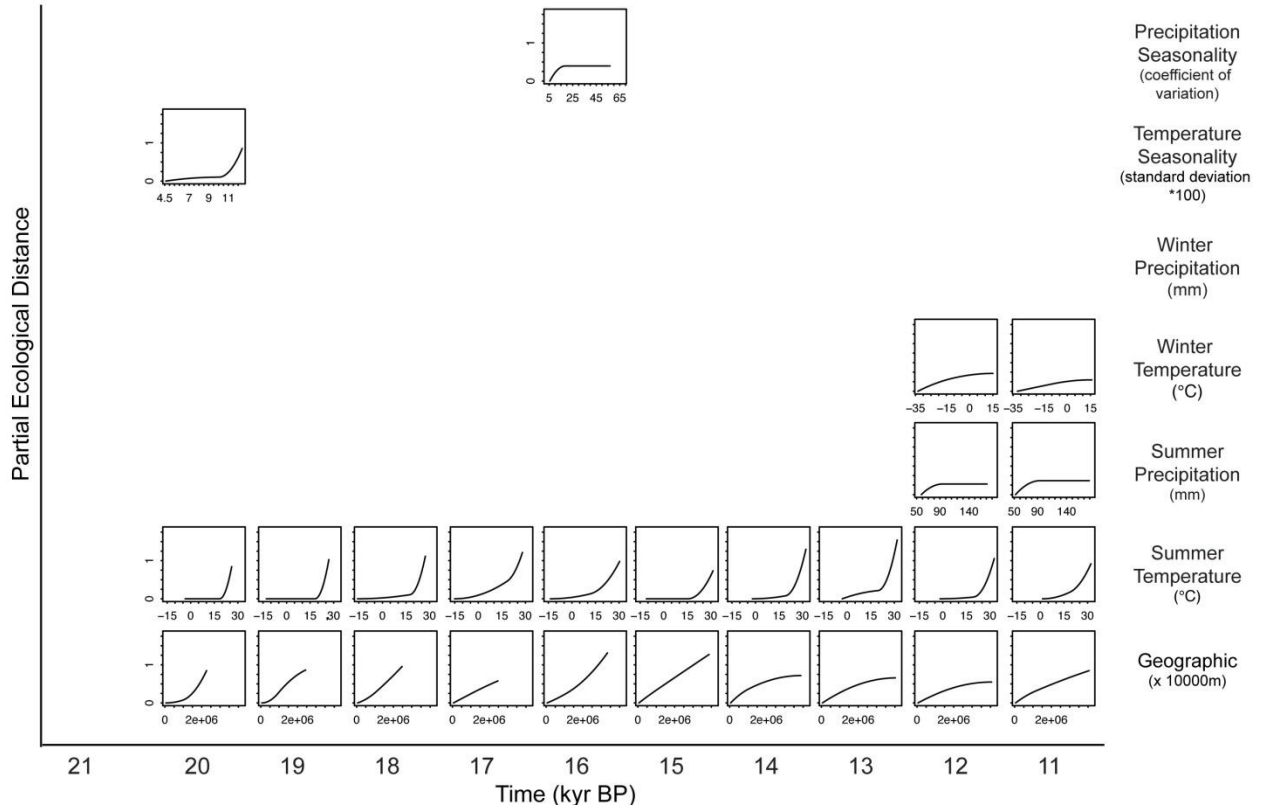


Figure A7. Significant predictors of compositional dissimilarity at each time period from 21 to 0 kyr BP, based on the HadCM3 climate simulations. Each plot shows the function fitted to a single variable within the overall model for each time period. The slope at any point on this function indicates the rate of community turnover at that position along the environmental gradient, while the total height reached by the function indicates the total amount of turnover along the entire gradient, holding all other variables constant (e.g., 'partial ecological distance'). Plots are shown only for significant predictors of compositional dissimilarity. Partial ecological distance is scaled the same for all plots, so variables with a larger modeled y-amplitude have a larger influence on community dissimilarity. Note how the shape and height of the modeled relationship varies within variables over time and among variables, indicating variation in the rate and magnitude of compositional change associated with that variable.

Appendix 8.

GDM weights

In the main paper, the primary method of incorporating site data-quality into GDM used the mean site data-quality across all sites within a grid cell as the custom weight in GDM (based on $GDM_{\text{single-wv}}$; Table A8, model e). We tested the sensitivity of generalized dissimilarity modeling (GDM) to four alternative methods of weighting sites. First, we ran preliminary GDM analyses using no weights (i.e. all grid cells were weighted equally) (Table A8, model a). Second, we used the ‘standard’ weights in GDM, where sites were weighted by the number of taxa present at those sites (Table A8, model c). In both of these analyses, if more than one site fell within a climate grid cell, the relative abundance of each taxon was simply averaged across all sites in the cell. As an alternative, we used the site data-quality as weights on the relative abundance data itself, by calculating the weighted relative abundance of taxa in each grid cell *before* running GDM analyses. We then performed GDM analyses with both equal (Table A8, model b) and standard (Table A8, model d) weights.

For most time periods from 21 kyr BP to the present, the variables remaining in the alternative models were the same, and percentage of deviance explained was very similar, to the main set of models (model e; Table A8). Thus, different methods of weighting sites do not substantially influence the GDM analyses.

Table A8. Comparison of final models based on weighting grid cells by the average site data-quality of all sites within that grid cell (model e: used in all main GDM analyses) and four alternative ways of weighting grid cells (models a-d, explained in Appendix 8 text). Shown are the deviance explained and the variables included in each final model. An 'x' indicates the variable was present in the final model.

Age (kyr BP)	Deviance Explained						Variables																																									
	a	b	c	d	e		a	b	c	d	e																																					
0	48.07	48.07	48.7	48.71	48.07	Geographic	x	x	x	x	x	Summer Temperature	x	x	x	x	x	Summer Precipitation						Winter Temperature						Winter Precipitation						Temperature Seasonality						Precipitation Seasonality	x	x				x
1	50.96	50.98	51.65	51.67	50.91	Geographic	x	x	x	x	x	Summer Temperature	x	x	x	x	x	Summer Precipitation						Winter Temperature						Winter Precipitation						Temperature Seasonality						Precipitation Seasonality	x	x	x	x	x	
2	48.99	49.06	49.66	49.74	49	Geographic	x	x	x	x	x	Summer Temperature	x	x	x	x	x	Summer Precipitation						Winter Temperature						Winter Precipitation						Temperature Seasonality						Precipitation Seasonality	x	x	x	x	x	
3	50.69	50.68	51.09	51.09	50.82	Geographic	x	x	x	x	x	Summer Temperature	x	x	x	x	x	Summer Precipitation						Winter Temperature						Winter Precipitation						Temperature Seasonality						Precipitation Seasonality	x	x	x	x	x	
4	49.48	49.47	49.77	49.76	49.96	Geographic	x	x	x	x	x	Summer Temperature	x	x	x	x	x	Summer Precipitation						Winter Temperature						Winter Precipitation	x	x	x	x	x	Temperature Seasonality						Precipitation Seasonality						
5	50.73	50.72	50.99	50.98	51.25	Geographic	x	x	x	x	x	Summer Temperature	x	x	x	x	x	Summer Precipitation						Winter Temperature						Winter Precipitation						Temperature Seasonality						Precipitation Seasonality						

						Winter Temperature					
						Winter Precipitation					
						Temperature Seasonality					
						Precipitation Seasonality	x	x	x	x	x
6	47.14	47.23	47.58	47.67	47.68	Geographic	x	x	x	x	x
						Summer Temperature	x	x	x	x	x
						Summer Precipitation					
						Winter Temperature					
						Winter Precipitation					
						Temperature Seasonality					
						Precipitation Seasonality	x	x	x	x	x
7	43.4	43.47	43.6	43.67	43.6	Geographic	x	x	x	x	x
						Summer Temperature	x	x	x	x	x
						Summer Precipitation					
						Winter Temperature	x	x	x	x	x
						Winter Precipitation					
						Temperature Seasonality					
						Precipitation Seasonality	x	x	x	x	x
8	40.86	40.99	41.17	41.31	41.16	Geographic	x	x	x	x	x
						Summer Temperature	x	x	x	x	x
						Summer Precipitation	x	x	x	x	x
						Winter Temperature	x	x	x	x	x
						Winter Precipitation					
						Temperature Seasonality					
						Precipitation Seasonality	x	x	x	x	x
9	41.5	41.55	40.95	41	41.61	Geographic	x	x	x	x	x
						Summer Temperature	x	x	x	x	x
						Summer Precipitation	x	x			x
						Winter Temperature	x	x	x	x	x
						Winter Precipitation					
						Temperature Seasonality					
						Precipitation Seasonality	x	x	x	x	x
10	36.33	37.25	36.76	36.82	37.24	Geographic	x	x	x	x	x
						Summer Temperature	x	x	x	x	x
						Summer Precipitation					
						Winter Temperature	x	x	x	x	x
						Winter Precipitation					
						Temperature Seasonality					
						Precipitation Seasonality		x			x
11	32.84	32.4	32.17	32.15	32.34	Geographic	x	x	x	x	x
						Summer Temperature	x	x	x	x	x
						Summer Precipitation					
						Winter Temperature	x				
						Winter Precipitation					
						Temperature Seasonality					
						Precipitation Seasonality					
12	36.65	36.6	36.53	36.48	36.78	Geographic	x	x	x	x	x
						Summer Temperature	x	x	x	x	x
						Summer Precipitation					

						Winter Temperature Winter Precipitation Temperature Seasonality Precipitation Seasonality					
13	38.77	38.77	38.37	38.38	38.29	Geographic Summer Temperature Summer Precipitation Winter Temperature Winter Precipitation Temperature Seasonality Precipitation Seasonality	x	x	x	x	x
14	41.54	41.55	41.27	41.29	41.37	Geographic Summer Temperature Summer Precipitation Winter Temperature Winter Precipitation Temperature Seasonality Precipitation Seasonality	x	x	x	x	x
15	39.72	39.74	40.34	40.36	39.98	Geographic Summer Temperature Summer Precipitation Winter Temperature Winter Precipitation Temperature Seasonality Precipitation Seasonality	x	x	x	x	x
16	38	38.01	40.57	38.46	37.75	Geographic Summer Temperature Summer Precipitation Winter Temperature Winter Precipitation Temperature Seasonality Precipitation Seasonality	x	x	x	x	x
17	36.85	36.83	35.98	35.97	37.53	Geographic Summer Temperature Summer Precipitation Winter Temperature Winter Precipitation Temperature Seasonality Precipitation Seasonality	x	x	x	x	x
18	65.11	58.8	56.87	63.57	64.43	Geographic Summer Temperature Summer Precipitation Winter Temperature Winter Precipitation Temperature Seasonality Precipitation Seasonality	x	x	x	x	x
19	69.22	69.22	69.92	69.92	68.23	Geographic Summer Temperature Summer Precipitation	x	x	x	x	x

						Winter Temperature Winter Precipitation Temperature Seasonality Precipitation Seasonality	 x x x x x x x x x x
20	67.97	36.89	67.94	67.94	68.02	Geographic Summer Temperature Summer Precipitation Winter Temperature Winter Precipitation Temperature Seasonality Precipitation Seasonality	 x x x x x x x x x x x x x x x x x x x x
21	83.03	83.03	82.51	82.51	83.8	Geographic Summer Temperature Summer Precipitation Winter Temperature Winter Precipitation Temperature Seasonality Precipitation Seasonality	 x x x x x x x x x x x x x x x

Appendix 9. Predicted community dissimilarity for four time periods (14, 11, 7, and 4 kyr BP), mapped as the mean dissimilarity between all sites within 250 km (top), 500 km (middle) or 1000 km (bottom) radius around each grid cell. The mapped radii are shown in the maps for 4 kyr BP.

