

Ecography

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Supplementary material

Appendix 1

List of the 598 species and their characteristics.

Range Area are in $\times 1000 \text{ km}^2$.

Genus	Species	Family	Range Area
abies	amabilis	pinaceae	189.408
abies	balsamea	pinaceae	3328.126
abies	bracteata	pinaceae	0.206
abies	concolor	pinaceae	180.677
abies	fraserii	pinaceae	4.156
abies	grandis	pinaceae	241.549
abies	lasiocarpa	pinaceae	1359.768
abies	magnifica	pinaceae	31.679
abies	procera	pinaceae	34.052
acacia	berlandieri	fabaceae	395.687
acacia	farnesiana	fabaceae	577.899
acacia	rigidula	fabaceae	223.795
acacia	roemeriana	fabaceae	207.910
acacia	tortuosa	fabaceae	551.622
acacia	wrightii	fabaceae	211.208
acer	barbatum	sapindaceae	426.849
acer	circinatum	sapindaceae	233.429
acer	glabrum	sapindaceae	1206.162
acer	grandidentatum	sapindaceae	77.793
acer	leucoderme	sapindaceae	128.037
acer	macrophyllum	sapindaceae	302.628
acer	negundo	sapindaceae	4324.487
acer	nigrum	sapindaceae	985.611
acer	pensylvanicum	sapindaceae	756.642
acer	rubrum	sapindaceae	3245.055
acer	saccharinum	sapindaceae	2526.282
acer	saccharum	sapindaceae	2284.554
acer	spicatum	sapindaceae	2100.981
aesculus	californica	sapindaceae	66.218
aesculus	glabra	sapindaceae	933.066
aesculus	octandra	sapindaceae	253.707
aesculus	parviflora	sapindaceae	64.800
aesculus	pavia	sapindaceae	731.759
aesculus	sylvatica	sapindaceae	115.251
alnus	maritima	betulaceae	3.756
alnus	oblongifolia	betulaceae	30.742
alnus	rhombifolia	betulaceae	139.424
alnus	rubra	betulaceae	357.871
alnus	rugosa	betulaceae	5727.118
alnus	serrulata	betulaceae	1424.317

alnus	sinuata	betulaceae	1202.079
alnus	tenuifolia	betulaceae	2749.494
amelanchier	alnifolia	rosaceae	3963.375
amelanchier	arborea	rosaceae	2797.204
amelanchier	interior	rosaceae	51.190
amelanchier	sanguinea	rosaceae	366.386
amelanchier	utahensis	rosaceae	240.004
annona	glabra	annonaceae	37.383
aralia	spinosa	araliaceae	1238.398
arbustus	arizonica	ericaceae	116.373
arbustus	menziesii	ericaceae	148.970
arbustus	texana	ericaceae	13.355
asimina	parviflora	annonaceae	142.078
asimina	triloba	annonaceae	1582.098
avicennia	germinans	acanthaceae	313.816
betula	alleghaniensis	betulaceae	1519.416
betula	lenta	betulaceae	506.026
betula	nigra	betulaceae	1484.457
betula	occidentalis	betulaceae	740.264
betula	papyrifera	betulaceae	7182.119
betula	populifolia	betulaceae	419.622
betula	uber	betulaceae	0.203
bumelia	celastrina	sapotaceae	204.145
bumelia	lanuginosa	sapotaceae	1201.039
bumelia	lycioides	sapotaceae	345.243
bumelia	tenax	sapotaceae	36.463
bursera	fagaroides	burseraceae	519.994
bursera	microphylla	burseraceae	148.286
bursera	simaruba	burseraceae	16.921
caesalpinia	mexicana	fabaceae	160.323
calyptanthus	pallens	myrtaceae	0.907
calyptanthus	zuzygium	myrtaceae	0.219
canella	winterana	canellaceae	0.435
canotia	holacantha	celastraceae	42.222
carpinus	caroliniana	betulaceae	2765.650
carya	aquatica	juglandaceae	660.014
carya	cordiformis	juglandaceae	2538.472
carya	floridana	juglandaceae	29.961
carya	glabra	juglandaceae	1937.982
carya	illinoensis	juglandaceae	794.911
carya	laciniosa	juglandaceae	589.467
carya	myristicaeformis	juglandaceae	30.422
carya	ovata	juglandaceae	2060.410
carya	pallida	juglandaceae	435.293
carya	texana	juglandaceae	434.572
carya	tomentosa	juglandaceae	1895.984

castanea	alnifolia	fagaceae	45.437
castanea	dentata	fagaceae	765.225
castanea	ozarkensis	fagaceae	55.905
castanea	pumila	fagaceae	890.312
castanopsis	chrysophylla	fagaceae	82.382
catalpa	bignonioides	bignoniaceae	137.301
catalpa	speciosa	bignoniaceae	43.738
ceanothus	arboreus	rhamnaceae	0.680
ceanothus	spinosus	rhamnaceae	4.764
ceanothus	thyrsiflorus	rhamnaceae	30.023
celtis	laevigata	ulmaceae	1623.777
celtis	lindheimeri	ulmaceae	1.242
celtis	occidentalis	ulmaceae	2084.994
celtis	reticulata	ulmaceae	689.026
celtis	tenuifolia	ulmaceae	434.206
cephalanthus	occidentalis	rubiaceae	3970.029
cercidium	floridum	fabaceae	259.592
cercidium	macrum	fabaceae	109.752
cercidium	microphyllum	fabaceae	233.782
cercis	canadensis	fabaceae	2243.549
cercis	occidentalis	fabaceae	53.773
cercocarpus	betuloides	rosaceae	81.369
cercocarpus	breviflorus	rosaceae	50.565
cercocarpus	ledifolius	rosaceae	209.924
cercocarpus	traskiae	rosaceae	0.195
cereus	giganteus	cactaceae	175.619
chamaecyparis	lawsoniana	cupressaceae	14.274
chamaecyparis	nootkatensis	cupressaceae	257.324
chamaecyparis	thyoides	cupressaceae	140.474
chilopsis	linearis	bignoniaceae	787.961
chionanthus	virginicus	oleaceae	910.712
chrysobalanus	icaco	chrysobalanaceae	27.363
citharexylum	berlandieri	verbenaceae	72.551
cladrastis	kentukea	fabaceae	52.289
clethra	acuminata	clethraceae	48.202
cliftonia	monophylla	cyrillaceae	101.199
coccoloba	diversifolia	polygonaceae	6.667
condalia	globosa	rhamnaceae	126.430
condalia	hookeri	rhamnaceae	243.764
cordia	boissieri	boraginaceae	189.050
cornus	alternifolia	cornaceae	1922.824
cornus	drummondii	cornaceae	1108.537
cornus	florida	cornaceae	1984.878
cornus	glabrata	cornaceae	39.465
cornus	nuttallii	cornaceae	255.421
cornus	sessilis	cornaceae	24.113

cornus	stolonifera	cornaceae	7205.797
cornus	stricta	cornaceae	695.490
corylus	cornuta	betulaceae	2523.005
cotinus	obovatus	anacardiaceae	29.405
cowania	mexicana	rosaceae	431.937
crataegus	chrysocarpa	rosaceae	603.182
crataegus	columbiana	rosaceae	44.495
crataegus	douglasii	rosaceae	956.677
crataegus	erythropoda	rosaceae	17.883
crataegus	succulenta	rosaceae	606.489
crataegus	tracyi	rosaceae	8.679
Cupania	glabra	sapindaceae	0.037
cupressus	arizonica	cupressaceae	71.413
cupressus	bakeri	cupressaceae	1.017
cupressus	goveniana	cupressaceae	0.664
cupressus	guadalupensis	cupressaceae	1.112
cupressus	macnabiana	cupressaceae	2.038
cupressus	macrocarpa	cupressaceae	0.250
cupressus	sargentii	cupressaceae	3.294
cyrilla	racemiflora	cyrillaceae	369.959
dalea	spinosa	fabaceae	107.885
diospyros	texana	ebenaceae	367.707
diospyros	virginiana	ericaceae	1921.965
dodonaea	viscosa	sapindaceae	808.807
Dryopteris	laterifolia	rhamnaceae	0.662
ehretia	anacua	boraginaceae	188.216
elliottia	racemosa	ericaceae	1.892
erythrina	flabelliformis	fabaceae	200.487
erythrina	herbacea	fabaceae	394.498
eugenia	axillaris	myrtaceae	28.608
eugenia	foetida	myrtaceae	17.140
Eugenia	confusa	myrtaceae	0.193
Eugenia	rhombea	myrtaceae	0.060
euonymus	atropurpureus	celastraceae	1079.304
euonymus	occidentalis	celastraceae	59.239
Exothea	paniculata	sapindaceae	1.920
eysenhardtia	polystachya	fabaceae	671.038
fagus	grandifolia	fagaceae	2292.492
figus	aurea	moraceae	43.966
figus	citrifolia	moraceae	0.950
forestiera	acuminata	oleaceae	382.080
forestiera	angustifolia	oleaceae	554.991
forestiera	phillyreoides	oleaceae	15.256
forestiera	segregata	oleaceae	37.513
franklinia	alata	theaceae	0.071
fraxinus	americana	oleaceae	2882.324

fraxinus	anomala	oleaceae	89.567
fraxinus	berlandieriana	oleaceae	207.651
fraxinus	caroliniana	oleaceae	439.862
fraxinus	cuspidata	oleaceae	12.063
fraxinus	dipetala	oleaceae	60.799
fraxinus	gooddingii	oleaceae	2.418
fraxinus	greggii	oleaceae	179.972
fraxinus	latifolia	oleaceae	155.794
fraxinus	nigra	oleaceae	2202.618
fraxinus	papillosa	oleaceae	2.137
fraxinus	pennsylvanica	oleaceae	5211.268
fraxinus	profunda	oleaceae	163.455
fraxinus	quadrangulata	oleaceae	344.590
fraxinus	texensis	oleaceae	26.018
fraxinus	velutina	oleaceae	93.678
fremontodendron	californicum	malvaceae	35.005
fremontodendron	mexicanum	malvaceae	1.042
garrya	elliptica	garryaceae	34.375
genipa	clusiifolia	rubiaceae	0.798
gleditsia	aquatica	fabaceae	284.306
gleditsia	triacanthos	fabaceae	1735.515
gordonia	lasianthus	theaceae	226.974
guaiacum	angustifolium	zygophyllaceae	329.764
guaiacum	sanctum	zygophyllaceae	0.072
gymnanthes	lucida	euphorbiaceae	0.368
gymnocladus	dioicus	fabaceae	718.976
halesia	carolina	styraceae	207.064
halesia	diptera	styraceae	217.730
halesia	parviflora	styraceae	21.599
hamamelis	virginiana	hamamelidaceae	1941.296
helietta	parvifolia	rutaceae	181.923
holacantha	emoryi	simaroubaceae	87.981
hypelate	trifolia	sapindaceae	0.129
ilex	ambigua	aquifoliaceae	447.249
ilex	amelanchier	aquifoliaceae	15.641
ilex	cassine	aquifoliaceae	171.352
ilex	coriacea	aquifoliaceae	292.626
ilex	decidua	aquifoliaceae	1232.122
ilex	krugiana	aquifoliaceae	0.240
ilex	laevigata	aquifoliaceae	109.046
ilex	longipes	aquifoliaceae	6.411
ilex	montana	aquifoliaceae	258.741
ilex	myrtifolia	aquifoliaceae	189.601
ilex	opaca	aquifoliaceae	1228.655
ilex	verticillata	aquifoliaceae	1924.977
ilex	vomitaria	aquifoliaceae	423.896

illicium	floridanum	austrobaileyaceae	106.951
illicium	parviflorum	austrobaileyaceae	1.604
juglans	californica	juglandaceae	5.449
juglans	cinerea	juglandaceae	1504.127
juglans	hindsii	juglandaceae	1.531
juglans	major	juglandaceae	300.876
juglans	microcarpa	juglandaceae	34.074
juglans	nigra	juglandaceae	2305.521
juniperus	ashei	cupressaceae	45.230
juniperus	californica	cupressaceae	31.519
juniperus	communis	cupressaceae	8276.413
juniperus	depeana	cupressaceae	133.250
juniperus	flaccida	cupressaceae	115.776
juniperus	monosperma	cupressaceae	166.455
juniperus	occidentalis	cupressaceae	107.558
juniperus	osteosperma	cupressaceae	278.653
juniperus	pinchotii	cupressaceae	92.518
juniperus	scopulorum	cupressaceae	571.605
juniperus	silicicola	cupressaceae	134.961
juniperus	virginiana	cupressaceae	2805.420
kalmia	latifolia	ericaceae	912.035
koeberlinia	spinosa	koeberliniaceae	609.583
larix	laricina	pinaceae	5960.031
larix	lyallii	pinaceae	37.996
larix	occidentalis	pinaceae	172.719
leitneria	floridana	simaroubaceae	18.062
leucaena	pulverulenta	fabaceae	200.567
leucaena	retusa	fabaceae	72.925
libocedrus	decurrens	cupressaceae	110.974
licaria	triandra	lauraceae	0.064
liquidambar	styraciflua	hamamelidaceae	1474.456
liriodendron	tulipifera	magnoliaceae	1598.501
lithocarpus	densiflorus	fagaceae	29.259
lyonia	ferruginea	ericaceae	145.177
lyonothamnus	floribundus	rosaceae	0.876
lysiloma	latisiliquum	fabaceae	2.748
lysiloma	microphylla	fabaceae	218.549
maclura	pomifera	moraceae	116.478
magnolia	acuminata	magnoliaceae	499.419
magnolia	ashei	magnoliaceae	5.286
magnolia	fraseri	magnoliaceae	79.527
magnolia	grandiflora	magnoliaceae	389.794
magnolia	macrophylla	magnoliaceae	154.727
magnolia	pyramidata	magnoliaceae	39.255
magnolia	tripetala	magnoliaceae	183.572
magnolia	virginiana	magnoliaceae	698.923

malus	angustifolia	rosaceae	421.572
malus	coronaria	rosaceae	433.617
malus	diversifolia	rosaceae	311.823
malus	ioensis	rosaceae	382.428
metopium	toxiferum	anacardiaceae	2.618
morus	microphylla	moraceae	79.921
morus	rubra	moraceae	2787.304
Myrcianthes	fragrans	myrtaceae	5.530
myrica	californica	myricaceae	46.086
myrica	cerifera	myricaceae	702.792
myrica	heterophylla	myricaceae	311.636
myrica	inodora	myricaceae	45.700
myrica	pensylvanica	myricaceae	138.738
Nectandra	coriacea	lauraceae	1.825
nolina	bigelovii	ruscaceae	26.832
nyssa	aquatica	nyssaceae	462.966
nyssa	ogeche	nyssaceae	80.265
nyssa	sylvatica	nyssaceae	1976.014
olneya	tesota	fabaceae	281.746
opuntia	fulgida	cactaceae	147.864
osmanthus	americanus	oleaceae	288.823
ostrya	knowltonii	betulaceae	4.681
ostrya	virginiana	betulaceae	3204.123
oxydendron	arboreum	ericaceae	722.794
parkisonia	aculeata	fabaceae	692.357
persea	borbonia	lauraceae	484.473
photinia	arbutifolia	rosaceae	94.408
picea	breweriana	pinaceae	1.645
picea	chihuahuana	pinaceae	7.451
picea	engelmannii	pinaceae	725.938
picea	glauca	pinaceae	7062.227
picea	mariana	pinaceae	7170.232
picea	pungens	pinaceae	80.869
picea	rubens	pinaceae	401.946
picea	sitchensis	pinaceae	317.756
pinckneya	pubens	rubiaceae	67.107
pinus	albicaulis	pinaceae	397.204
pinus	aristata	pinaceae	20.004
pinus	attenuata	pinaceae	16.976
pinus	ayacahuite	pinaceae	58.838
pinus	balfouriana	pinaceae	2.588
pinus	banksiana	pinaceae	3212.642
pinus	caribaea	pinaceae	71.665
pinus	cembroides	pinaceae	227.821
pinus	clausa	pinaceae	57.938
pinus	contorta	pinaceae	1730.737

pinus	cooperi	pinaceae	59.495
pinus	coulteri	pinaceae	6.710
pinus	cubensis	pinaceae	3.643
pinus	culminicola	pinaceae	0.058
pinus	douglasiana	pinaceae	25.543
pinus	durangensis	pinaceae	92.128
pinus	echinata	pinaceae	1106.727
pinus	edulis	pinaceae	275.696
pinus	elliottii	pinaceae	257.880
pinus	engelmannii	pinaceae	144.920
pinus	flexilis	pinaceae	236.414
pinus	glabra	pinaceae	228.772
pinus	greggii	pinaceae	15.757
pinus	hartwegii	pinaceae	20.546
pinus	jeffreyi	pinaceae	85.098
pinus	lambertiana	pinaceae	109.462
pinus	lawsonii	pinaceae	27.509
pinus	leiophylla	pinaceae	182.233
pinus	longaeva	pinaceae	8.567
pinus	lumholtzii	pinaceae	88.171
pinus	maximartinezii	pinaceae	0.066
pinus	michoacana	pinaceae	62.821
pinus	monophylla	pinaceae	75.932
pinus	montezumae	pinaceae	56.519
pinus	monticola	pinaceae	326.566
pinus	muricata	pinaceae	2.358
pinus	nelsonii	pinaceae	7.287
pinus	occidentalis	pinaceae	9.509
pinus	oocarpa	pinaceae	252.705
pinus	palustris	pinaceae	516.462
pinus	patula	pinaceae	9.094
pinus	pinceana	pinaceae	19.890
pinus	ponderosa	pinaceae	742.013
pinus	pringlei	pinaceae	36.073
pinus	pseudostrobus	pinaceae	140.297
pinus	pungens	pinaceae	89.882
pinus	quadrifolia	pinaceae	5.212
pinus	radiata	pinaceae	0.670
pinus	resinosa	pinaceae	1184.746
pinus	rigida	pinaceae	475.554
pinus	sabiniana	pinaceae	39.221
pinus	serotina	pinaceae	311.712
pinus	strobiformis	pinaceae	182.327
pinus	strobus	pinaceae	1858.906
pinus	taeda	pinaceae	864.211
pinus	teocote	pinaceae	118.611

pinus	torreyana	pinaceae	0.241
pinus	tropicalis	pinaceae	7.164
pinus	virginiana	pinaceae	528.536
pinus	washoensis	pinaceae	0.438
Pisonia	rotundata	nyctaginaceae	0.080
pistacia	texana	anacardiaceae	3.455
pithecellobium	flexicaule	fabaceae	163.275
pithecellobium	guadelupense	fabaceae	1.597
pithecellobium	pallens	fabaceae	179.248
pithecellobium	unguis-cati	fabaceae	0.858
planera	aquatica	ulmaceae	419.903
platanus	occidentalis	proteaceae	2554.163
platanus	racemosa	proteaceae	67.306
platanus	wrightii	proteaceae	104.870
populus	angustifolia	salicaceae	326.795
populus	arizonica	salicaceae	48.126
populus	balsamifera	salicaceae	5907.322
populus	deltoides	salicaceae	3891.577
populus	fremontii	salicaceae	229.419
populus	grandidentata	salicaceae	2270.768
populus	heterophylla	salicaceae	213.487
populus	hinckleyana	salicaceae	0.243
populus	tremuloides	salicaceae	7906.853
populus	trichocarpa	salicaceae	1365.895
prosopis	pubescens	fabaceae	150.014
prunus	alleghaniensis	rosaceae	13.382
prunus	americana	rosaceae	2451.690
prunus	angustifolia	rosaceae	1233.023
prunus	caroliniana	rosaceae	403.712
prunus	emarginata	rosaceae	505.720
prunus	fremontii	rosaceae	25.682
prunus	hortulana	rosaceae	173.322
prunus	ilicifolia	rosaceae	58.740
prunus	lyonii	rosaceae	1.022
prunus	mexicana	rosaceae	718.025
prunus	munsoniana	rosaceae	169.205
prunus	myrtifolia	rosaceae	0.740
prunus	nigra	rosaceae	494.259
prunus	pensylvanica	rosaceae	4777.342
prunus	serotina	rosaceae	3637.354
prunus	subcordata	rosaceae	102.208
prunus	umbellata	rosaceae	474.917
prunus	virginiana	rosaceae	6246.044
pseudotsuga	macrocarpa	pinaceae	6.723
pseudotsuga	menziesii	pinaceae	1122.115
Psidium	longipes	myrtaceae	0.257

ptelea	crenulata	rutaceae	23.774
ptelea	trifoliata	rutaceae	1923.664
quercus	agrifolia	fagaceae	58.503
quercus	ajoensis	fagaceae	2.043
quercus	alba	fagaceae	2571.213
quercus	arizonica	fagaceae	59.126
quercus	arkansana	fagaceae	12.355
quercus	bicolor	fagaceae	869.804
quercus	chapmanii	fagaceae	84.508
quercus	chrysolepis	fagaceae	120.452
quercus	coccinea	fagaceae	934.420
quercus	douglasii	fagaceae	57.659
quercus	dunnii	fagaceae	22.199
quercus	durandii	fagaceae	180.117
quercus	ellipsoidalis	fagaceae	285.278
quercus	emoryi	fagaceae	38.351
quercus	engelmannii	fagaceae	5.784
quercus	falcata	fagaceae	1339.920
quercus	gambelii	fagaceae	320.785
quercus	garryana	fagaceae	128.299
quercus	georgiana	fagaceae	2.940
quercus	glaucoides	fagaceae	21.081
quercus	graciliformis	fagaceae	0.449
quercus	gravesii	fagaceae	5.785
quercus	grisea	fagaceae	28.309
quercus	hypoleucoides	fagaceae	31.862
quercus	ilicifolia	fagaceae	207.350
quercus	imbricaria	fagaceae	659.030
quercus	incana	fagaceae	394.979
quercus	kelloggii	fagaceae	83.342
quercus	laevis	fagaceae	374.473
quercus	laurifolia	fagaceae	516.294
quercus	lobata	fagaceae	96.074
quercus	lyrata	fagaceae	913.561
quercus	macdonaldii	fagaceae	0.680
quercus	macrocarpa	fagaceae	2470.176
quercus	marilandica	fagaceae	1841.590
quercus	michauxii	fagaceae	957.219
quercus	mohriana	fagaceae	75.239
quercus	muehlenbergii	fagaceae	1741.622
quercus	myrtifolia	fagaceae	98.320
quercus	nigra	fagaceae	1050.727
quercus	nuttallii	fagaceae	270.769
quercus	oblongifolia	fagaceae	21.825
quercus	oglethorpensis	fagaceae	5.030
quercus	palustris	fagaceae	987.007

quercus	phellos	fagaceae	1000.085
quercus	prinus	fagaceae	797.099
quercus	pungens	fagaceae	28.405
quercus	rubra	fagaceae	2929.026
quercus	rugosa	fagaceae	455.622
quercus	shumardii	fagaceae	1481.199
quercus	stellata	fagaceae	2133.515
quercus	tomentella	fagaceae	1.124
quercus	toumeyii	fagaceae	5.429
quercus	turbinella	fagaceae	79.070
quercus	velutina	fagaceae	2297.828
quercus	virginiana	fagaceae	518.460
quercus	wislizeni	fagaceae	78.660
rapanea	punctata	myrsinaceae	40.248
reynosia	septentrionalis	rhamnaceae	0.376
rhamnus	betulaefolia	rhamnaceae	179.736
rhamnus	californica	rhamnaceae	196.442
rhamnus	caroliniana	rhamnaceae	791.698
rhamnus	crocea	rhamnaceae	126.162
rhamnus	purshiana	rhamnaceae	339.797
rhizophora	mangle	rhizophoraceae	607.257
rhododendron	catawbiense	ericaceae	71.487
rhododendron	macrophyllum	ericaceae	68.497
rhododendron	maximum	ericaceae	332.399
rhus	choriophylla	anacardiaceae	13.685
rhus	copallina	anacardiaceae	2038.005
rhus	glabra	anacardiaceae	2901.259
rhus	integrifolia	anacardiaceae	16.904
rhus	kearneyi	anacardiaceae	4.388
rhus	lanceolata	anacardiaceae	168.353
rhus	laurina	anacardiaceae	28.517
rhus	ovata	anacardiaceae	46.236
rhus	typhina	anacardiaceae	1312.231
robinia	kelseyi	fabaceae	3.788
robinia	neomexicana	fabaceae	48.752
robinia	pseudoacacia	fabaceae	439.868
robinia	viscosa	fabaceae	11.949
roystonea	elata	arecaceae	0.226
sabal	mexicana	arecaceae	66.540
sabal	minor	arecaceae	609.290
sabal	palmetto	arecaceae	119.347
salix	alaxensis	salicaceae	2566.473
salix	amygdaloides	salicaceae	3386.342
salix	arbusculoides	salicaceae	3244.328
salix	bebbiana	salicaceae	6744.248
salix	bonplandiana	salicaceae	563.414

salix	caroliniana	salicaceae	596.415
salix	discolor	salicaceae	3949.854
salix	exigua	salicaceae	6827.740
salix	floridana	salicaceae	3.279
salix	fluviatilis	salicaceae	6.905
salix	geyeriana	salicaceae	309.360
salix	hookeriana	salicaceae	38.039
salix	laevigata	salicaceae	124.240
salix	lasiandra	salicaceae	2492.397
salix	lasiolepis	salicaceae	249.348
salix	lucida	salicaceae	3538.247
salix	nigra	salicaceae	3400.208
salix	pellita	salicaceae	1630.146
salix	petiolaris	salicaceae	2169.524
salix	pyrifolia	salicaceae	3064.834
salix	scouleriana	salicaceae	3175.141
salix	sericea	salicaceae	1003.044
salix	sessilifolia	salicaceae	18.110
salix	sitchensis	salicaceae	536.427
salix	taxifolia	salicaceae	466.519
salix	tracyi	salicaceae	10.301
sambucus	callicarpa	caprifoliaceae	428.892
sambucus	canadensis	caprifoliaceae	3536.838
sambucus	glauca	caprifoliaceae	493.440
sambucus	mexicana	caprifoliaceae	189.150
sambucus	velutina	caprifoliaceae	12.216
sapindus	drummondii	sapindaceae	785.461
sapium	biloculare	euphorbiaceae	118.161
sassafras	albidum	lauraceae	2184.763
sequoia	sempervirens	cupressaceae	11.818
sequoiadendron	giganteum	cupressaceae	0.143
serenoa	repens	arecaceae	197.551
sheperdia	argentea	rhamnaceae	982.254
solanum	erianthum	solanaceae	948.993
sophora	affinis	fabaceae	78.533
sophora	secundiflora	fabaceae	488.850
sorbus	americana	rosaceae	1888.813
sorbus	decora	rosaceae	2357.750
sorbus	scopulina	rosaceae	1213.659
sorbus	sitchensis	rosaceae	730.375
staphylea	bolanderi	staphyleaceae	10.361
staphylea	trifolia	staphyleaceae	1273.151
stewartia	malacodendron	theaceae	97.134
stewartia	ovata	theaceae	52.965
styrax	grandifolia	styraceae	511.862
styrax	platanifolia	styraceae	19.956

swietenia	mahagoni	meliaceae	11.519
symplocos	tinctoria	symplocaceae	618.707
taxodium	distichum	cupressaceae	889.092
taxodium	mucronatum	cupressaceae	131.824
taxus	brevifolia	taxaceae	388.269
taxus	floridana	taxaceae	0.566
Tetrazygia	bicolor	melastomataceae	0.459
thuja	occidentalis	cupressaceae	1635.711
thuja	plicata	cupressaceae	434.950
tilia	americana	malvaceae	2245.861
tilia	caroliniana	malvaceae	667.935
tilia	heterophylla	malvaceae	553.494
torreya	californica	taxaceae	3.124
torreya	taxifolia	taxaceae	0.810
toxicodendron	vernix	anacardiaceae	577.463
trema	micrantha	ulmaceae	12.238
tsuga	canadensis	pinaceae	1212.771
tsuga	caroliniana	pinaceae	20.317
tsuga	heterophylla	pinaceae	483.512
tsuga	mertensiana	pinaceae	287.358
ulmus	alata	ulmaceae	1213.303
ulmus	americana	ulmaceae	5457.227
ulmus	crassifolia	ulmaceae	450.876
ulmus	rubra	ulmaceae	2894.135
ulmus	serotina	ulmaceae	39.254
ulmus	thomasi	ulmaceae	800.871
umbellularia	californica	lauraceae	82.192
ungnadia	speciosa	sapindaceae	30.954
vaccinium	arboreum	ericaceae	1089.193
vauquelinia	californica	rosaceae	10.112
viburnum	lentago	adoxaceae	1228.276
viburnum	nudum	adoxaceae	585.851
viburnum	obovatum	adoxaceae	166.528
viburnum	prunifolium	adoxaceae	908.769
viburnum	rufidulum	adoxaceae	1226.113
washingtonia	filifera	arecaceae	1.244
yucca	aloifolia	agavaceae	32.158
yucca	brevifolia	agavaceae	60.662
yucca	carnerosana	agavaceae	6.303
yucca	elata	agavaceae	254.983
yucca	faxoniana	agavaceae	6.135
yucca	gloriosa	agavaceae	6.437
yucca	mohavensis	agavaceae	68.093
yucca	rostrata	agavaceae	4.923
yucca	schottii	agavaceae	10.216
yucca	torreyi	agavaceae	204.072

yucca	treculeana	agavaceae	231.094
zanthoxylum	americanum	rutaceae	985.574
zanthoxylum	clava-herculis	rutaceae	364.735
zanthoxylum	coriaceum	rutaceae	0.133
zanthoxylum	fagara	rutaceae	574.417
zanthoxylum	hirsutum	rutaceae	129.154

Appendix 2

Pearson correlations among range area and the niche characteristics, calculated on the 549 species. Significant correlations ($p < 0.05$) are highlighted in bold.

	RA	MinAET	MaxT _{RANGE}	MaxT _{ISO}	MaxP _{CV}	MinT _{MIN}	MinP _{MIN}	MaxS _{PH}	MinS _{WC}
RA									
MinAET	-0.59								
MaxT _{RANGE}	0.74	-0.47							
MaxT _{ISO}	-0.05	-0.14	-0.30						
MaxP _{CV}	0.03	-0.28	0.03	0.77					
MinT _{MIN}	-0.70	0.43	-0.94	0.32	0.01				
MinP _{MIN}	-0.15	0.39	-0.30	-0.51	-0.83	-0.42			
MaxS _{PH}	0.53	-0.35	0.54	0.02	0.20	-0.19	0.34		
MinS _{WC}	-0.52	0.26	-0.20	0.01	0.03	-0.15	-0.37	-0.24	
MinS _D	-0.64	0.50	-0.29	-0.13	-0.12	-0.17	-0.40	-0.33	0.44

Appendix 3

GLM and GEE - corrected for phylogenetic relationships, for further details see Paradis & Claude (2002) - models of species range area against MaxT_{RANGE}, MinS_{WC}, MinS_D, MinP_{MIN}, MaxS_{PH}, MaxT_{ISO} and MinAET for the four quartiles of the 549 species ranked according to their range area. For both kinds of models, tests were made with type-II errors meaning that every variable present in the model significantly explains a portion of the total variance in range size independently from all others (Sokal & Rohlf, 1995).

S.E.: standard error; *t*: t value; *df*: degrees of freedom; *Cum. r²*: cumulative r²; *Pdf*:

Phylogenetic degrees of freedom - see Paradis & Claude (2002).

1st quartile

	Estimate	S.E.	t	Df	P-value	Cum. r ²
MaxT _{RANGE}	0.064	0.006	10.06	1	***	0.233
MinS _D	-0.015	0.003	-5.94	1	***	0.480
MinS _{WC}	-0.009	0.002	-5.57	1	***	0.553
MaxT _{ISO}	0.025	0.005	4.60	1	***	0.575
MinP _{MIN}	0.003	0.001	4.07	1	***	0.611
MinAET	-0.0002	0.0001	-1.85	1	0.066	0.618
Residual df = 131						

2nd quartile

	Estimate	S.E.	t	Df	P-value	Cum. r ²
MaxT _{RANGE}	0.015	0.004	3.41	1	***	0.012
MinP _{MIN}	0.001	0.000	2.81	1	0.006	0.012
MaxT _{ISO}	0.006	0.002	2.57	1	0.011	0.046
MinAET	-0.0001	0.000	-2.17	1	0.032	0.095
MinS _{WC}	-0.003	0.002	-1.81	1	0.072	0.115
MinS _D	-0.001	0.003	-0.37	1	0.710	0.115
Residual df = 130						

3rd quartile

	Estimate	S.E.	t	Df	P-value	Cum. r ²
MaxT _{RANGE}	0.017	0.004	4.63	1	***	0.028
MinP _{MIN}	0.001	0.000	3.34	1	0.001	0.030
MaxT _{ISO}	0.006	0.002	3.31	1	0.001	0.112
MinS _D	-0.006	0.003		1	0.083	0.139
MinAET	-0.0001	0.0001	-0.68	1	0.496	0.139
MinS _{WC}	-	-	-	-	-	-

Residual df = 131

4th quartile

	Estimate	S.E.	t	Df	P-value	Cum. r ²
MaxT _{RANGE}	0.037	0.005	7.52	1	****	0.460
MaxT _{ISO}	0.006	0.002	3.09	1	0.002	0.513
MinS _D	-0.013	0.007	-1.84	1	0.068	0.535
MinAET	-0.001	0.0009	-1.56	1	0.121	0.541
MinP _{MIN}	0.0004	0.001	0.56	1	0.573	0.541
MinS _{WC}	-	-	-	-	-	-

Residual df = 131

Paradis, E. & Claude, J. (2002) Analysis of comparative data using generalized estimating equations. *Journal of Theoretical Biology*, **218**, 175-185.

Sokal, R.R. & Rohlf, F.J. (1995). *Biometry: the principles and practice of statistics in biological research*, New York, W. H. Freeman and Co.

Appendix 4

Clades (orders, families and genera) that show the strongest and weakest conservatism for range area and $\text{MaxT}_{\text{RANGE}}$, among clades that have more than 10 species for orders and families, and more than 5 species for genera. Note that in the total data set (598 species), there are 12 orders and 16 families with more than 10 species and 24 genera with more than 5 species.

	Conservatism in Range Area		Conservatism in $\text{MaxT}_{\text{RANGE}}$	
	Strong	Weak	Strong	Weak
Orders	<i>Malphigiales</i>	<i>Lamiales</i>	<i>Asparagales</i>	<i>Pinales</i>
	<i>Aquifoliales</i>	<i>Pinales</i>	<i>Ericales</i>	<i>Rosales</i>
	<i>Asparagales</i>	<i>Rosales</i>	<i>Lamiales</i>	<i>Sapindales</i>
Families	<i>Betulaceae</i>	<i>Cupressaceae</i>	<i>Agavaceae</i>	<i>Pinaceae</i>
	<i>Juglandaceae</i>	<i>Oleaceae</i>	<i>Ericaceae</i>	<i>Rhamnaceae</i>
	<i>Salicaceae</i>	<i>Pinaceae</i>	<i>Oleaceae</i>	<i>Sapindaceae</i>
Genera	<i>Acacia</i>	<i>Cupressus</i>	<i>Acacia</i>	<i>Abies</i>
	<i>Acer</i>	<i>Fraxinus</i>	<i>Aesculus</i>	<i>Pinus</i>
	<i>Carya</i>	<i>Juniperus</i>	<i>Cupressus</i>	<i>Prunus</i>
	<i>Magnolia</i>	<i>Pinus</i>	<i>Magnolia</i>	<i>Yucca</i>

Appendix 5

Methodological issues and limits

In this study, we derive environmental correlates from the observed ranges, which may limit extrapolation of our results to other biomes. All the derived niche-characteristics, however, have been calculated independently of the size of the range and using only values at the cell level. Thus no environmental correlate was obtained from comparison of cells within a range. For example, we did not calculate the annual temperature range tolerated by a species as the difference between the temperatures of the warmest and coldest cells included in the range, which would have introduced a major flaw in the analysis, as the annual temperature range calculated in such a way does not reflect the actual tolerance of the same population. We also used null models to explore whether a signal was detectable beyond the correlations. Although some of the simulations from null models returned non-negligible levels of explained variance, these null models were all much less accurate than the corresponding GLM made with real data (see Results section in the manuscript).

The methodology we used assumes that species can be treated as "averages" and that there is minimal genetic variation across their ranges - range size is therefore solely a reflection of the variance of the species' plasticity/tolerance. This assumption is not defensible, as studies have shown considerable provenance variation across the ranges of widely-distributed tree species e.g. Roberds et al. 1990 *Silvae Genetica*, Li et al. 1993 *Silvae Genetica*, Ying 1991 *Silvae Genetica*. Furthermore, range sizes of plants are known to be positively correlated with genetic variation – see Hamrick, J. L. and M. J. Godt. 1989. *Allozyme diversity in plant species*. pp 43-63 In Brown, A. H. D., M. T. Clegg, A. L. Kahler and B. S. Weir (eds), *Plant Population Genetics, Breeding and Germplasm Resources*. Sinauer, Sunderland, Mass.

Regarding data quality, although the available digital representations of ranges for North American trees were mapped at various levels of precision, their average accuracy is high enough to allow meaningful comparisons with georeferenced environmental variables. Likewise, the quality and precision of the climate surfaces is influenced by the density of weather stations. However this problem seems minor in our case as this density is particularly high in North America (Hijmans *et al.*, 2005).

Hijmans, R.J. et al. 2005. Very high resolution interpolated climate surfaces for global land areas. – *International Journal of Climatology* 25: 1965-1978.