Ecography

ECOG-00299
Cumming, S. G., D. Stralberg, K. Lefevre, E. Bayne, S. Fang, T. Fontaine, D. Mazerolle, F. K. A. Schmiegelow, P. Sólymos, and S. Song. Climate and vegetation hierarchically structure patterns of songbird distribution in the Canadian boreal region. – Ecography 36:000-000.

Supplementary Material

Appendix 1. Landcover class codes

Appendix 2. Spatial weights and exposure calculations

Appendix 3. Model results

Appendix 1. Landcover class codes

Table A1. The habitat classification used by the Boreal Avian Modelling Project (BAM), based on a reclassification of the Land Cover Map of Canada 2005 (Latifovic et al. 2008). The published legend contained 39 labels (LCC05). These were reclassified to 17 classes (BAM Class Name and Code) based on representation within the BAM sample, geographic distribution, similarity within the hierarchical legend, and estimated mean abundances of three widely distributed bird species. F = forest types, NF = non-forest types. Type photographs for the raw LCC05 classes, as published by the Canadian Centre for Remote Sensing, are viewable on-line at http://www.borealbirds.ca/files/LC_2005_Legend_39Classes_1.pdf.

BAM Class Name	BAM Code	LCC05	Type
Closed Coniferous	A	1	F
Closed Deciduous	B	2	F
Closed Mature Mixed	C	3	F
Closed Young Mixed	D	4	F
Closed Deciduous Mixed	E	5	F
Open Coniferous	F	6,7	F
Sparse Coniferous	H	8,13,20	F
Sparse Coniferous Shield	I	9	F
Poorly Drained	J	10,19	F
Open Mature Deciduous	K	11	F
Open Young Deciduous	L	12,16	F
Open Mixed	N	14	F
Open Young Mixed	O	15	F
Open Herb/Grass	Q	17,18	NF
Open Northern	R	21,22,23,24,25,30,31,32	NF
Mixed Forest/Crop	S	26,27,28,29	NF
Burns	T	33,34,35	F
Not used		36,37,38,39	

Literature Cited

Latifovic, R. et al. 2008. Land cover map of Canada 2005 at 250m spatial resolution. Natural Resources Canada/ESS/Canada Centre for Remote Sensing. ftp://ftp.ccrs.nrcan.gc.ca/ad/NLCCLandCover/LandcoverCanada2005_250m/.

Appendix 2. Spatial weights and exposure calculations

Spatial weights

The spatial distribution of sampling locations was neither random nor uniform (Fig. 1). To adjust for this clustered spatial distribution, we used an inverse geographic weighting scheme (Isaaks and Srivastava 1989, Bel et al. 2005). We overlaid a regular grid of 100 km^2 hexagons over the study region and counted the number of point-count stations in each hexagon. For each cell, the inverse of the count was assigned as the spatial weight for all stations within that cell. This is consistent with our decision to treat observations at a single station in multiple years as independent.

Exposure

The response variables are counts of individual species observed at a point-count survey conducted at a point-count station. We will use here the terms "visit" and "location", respectively. Visits are characterised by the date and time of survey and the survey protocol. Locations are characterised by geographic coordinates. The data are affected not only by the ecological factors under investigation, but by the details of the survey protocol. The duration and radius of survey varied among data sources (Table A1). The time of day and date of year also varied among visits. Each of these four factors is known to affect observed counts (Alldredge et al. 2007). In the context of the regression tree analysis presented here, it was not possible to estimate the effects of these nuisance factors and of the ecological factors simultaneously. Our approach was to treat nuisance factors as having a constant multiplicative effect on the Poisson mean rate over all stations. Thus, nuisance factors were treated as exposure in Poisson generalized linear models (GLMs) with log-link, which have a multiplicative effect on the mean on the response scale. The log of exposure is often used as an offset term with known effect size 1 on the scale of the linear predictors in GLMs. Note that these offsets do not "adjust" the observational data in GLMs; rather, they adjust the deviance associated with the observation given the estimated mean for that location by standardising the mean for exposure or effort. Because regression trees are fit using an iterative non-parametric method, offsets can be specified as exposure. Exposure values were estimated independently for different levels of sampling protocol factors and for sampling data and time. Exposure values were standardised to the interval (0,1]. The product of the nuisance-factor exposures is a single visit-level offset. The group means are interpreted as the expected count that would be detected by a standardised 10 minute, unlimited distance point-count survey conducted at the locally optimal time and date, when singing rates are highest. Here, we explain how these nuisance-factor exposure values were estimated.

Effects of survey duration and radius

Point-count surveys had durations of 3, 5 or 10min. There were also three sample distance classes: 50ms, 100m or unlimited distance. To estimate the effects of variation in these survey characteristics on the estimated mean count, we took advantage of a large group of 10 min, unlimited distance point-count surveys in which individual observations had been assigned to time and distance bands. With these data, it was possible to calculate, for each visit, the "reduced count" that would have been observed under of the other six combinations of duration and distance classes. The estimated exposure values in this case were calculated simply by dividing the sum over all visits of the reduced counts by the sum of the observed counts. This is equivalent to conditioning on total sum, which is common practice in wildlife related statistical inference (e.g. Buckland et al. 1993). These ratios take values between 0 and 1, and are exactly the ratios between two expected mean counts. They are interpreted as the proportional change in mean count due to protocol effects relative to the reference level of 10 minutes duration and unlimited distance.

Effects of survey time and date

The singing behaviour of birds is influenced by many environmental factors but particularly time since local sunrise and the time-of-year. Most passerines show a strong tendency to sing early in the morning and decrease their singing frequency as the day progresses. Similarly, male birds sing most aggressively when they are establishing a territory and trying to attract a mate, which in migratory species occurs shortly after returning from spring migration. Singing rate generally declines as the breeding season progresses. The end result of these behaviours is that the number of individuals likely to be detected by point-count survey varies diurnally and seasonally due to differential detectability rather than to changes in abundance.

The local time and date of sampling are known for each visit. However, the effects of sampling time and date are not absolute, but are relative to sunrise and the start of the breeding season. We calculated the time of local civil sunrise for each visit, as a function of the date of survey and the latitude and longitude of the location, using the 'sunriset' functions of the R (R Core Development Team 2011) package 'maptools' (Levin-Koh and Bivand 2011) that is based on algorithms provided by National Oceanic & Atmospheric Administration (NOAA; http://www.srrb.noaa.gov/highlights/sunrise/sunrise.html). Relative sampling times were expressed as the difference in minutes between the times of sampling and local civil sunrise. For each location, we adopted the interpolated bioclimatic variable JDAYST (Julian date of start of growing season; McKenney et al. 2006) as the first day of local spring. Relative sampling dates were defined by subtracting JDAYST from the Julian date of the visit.

Preliminary analysis showed that relative times and dates were uncorrelated. Each was also independent of habitat class, spatial location and survey protocol. It was therefore possible to estimate their effects on the per-station expected Poisson mean rate by univariate analysis. In each case, the unexplained variance resulting from these other factors unaccounted-for would decrease the precision of the parameter estimates, but would not introduce bias, which was our main concern. We considered that, given the large sample sizes available to this analysis, the effects of such imprecision on our conclusions was likely to be negligible.

We subsampled species counts from all stations that had at least two visits. Relative times were binned by half-hour interval since sunrise. Relative dates were binned into calendar weeks. We binned data were modelled using a Poisson GLMM with log-link and a random effect for location. The variables were modelled as fractional polynomials. The shape and location of the estimated response curves were confirmed visually by fitting Generalised Additive Models to the same data. The estimated responses to relative date and time were each scaled to the interval (0,1], with 1 corresponding to the maximum value of the fractional polynomial over the range of the dates and times. An example for Ovenbird (*Seiurus aurocapilla*) is shown in Fig.A1. These scaled functions can be used to calculate multiplicative exposures for any given relative time and date.

Effects of repeated visits within and between years

Repeated visits to the same location within years are clearly not independent samples (Table A2). The number of birds actually present that year is, by our hypothesis, a Poisson random variable. The observed counts are repeated samples where the individuals actually present are detected with some probability, which may varies with protocol, time of day, and date. It was not possible to include the effects of detection error specifically in this study, as the appropriate model (repeated samples from a binomial-Poisson mixture) could not be accommodated within the tree fitting code. However we did not wish to inflate the degrees of freedom by taking each visit as an independent observation. Our compromise was to aggregate repeated visits within years into a single observation. In such cases, the annualised response variable was the sum of the per-visit counts divided by the per-visit exposure values. Repeated visits to the same location among years were considered to be independent (Table A3).

Literature Cited

Alldredge, M.W et al. 2007. Factors affecting aural detections of songbirds. — Ecol. Appl. 17: 948-955.

Bel, L. et al. 2005. A spatial extension of CART: application to classification of ecological data. — In: Renard, P. et al. (eds), Geostatistics for Environmental Applications. Springer, pp. 99-109.

Buckland, S. T. et al. 1993. Distance Sampling: Estimating Abundance of Biological Populations. — Chapman and Hall.

Isaaks, E.H. and Srivastava, R.M. 1989. Applied Geostatistics - Oxford University Press, Oxford, UK.

Lewin-Koh, N.J. and Bivand, R. 2011. maptools: Tools for reading and handling spatial objects. R package version 0.8-10. http://CRAN.R-project.org/package=maptools

McKenney, D. W. et al. 2006. The development of 1901-2000 historical monthly climate models for Canada and the United States. — Agric. For. Meteorol. 138: 69-81.

R Development Core Team 2011. R: A language and environment for statistical computing. R Foundation for Statistical Computing.

Table A1. Cross tabulation of sampling duration and radius for point-count survey locations used in regression tree models.

		Sampling Radius			
		50 m	100 m	Unlimited	Subtotal
Sampling Duration	3 minutes	0	0	3,430	3,430
	5 Minutes	769	15,328	4,449	20,546
	10 Minutes	73	955	10,841	11,869
	Subtotal	842	16,283	18,720	35,845

Table A2. Tabulation of number of annual visits for point-count survey locations used in regression tree models.

Max visits/year	1	2	3	4	5	6	8
# Stations	28,231	1,528	4,222	1,020	668	88	88

Table A3. Tabulation of maximum number of years visited for distinct point-count survey locations used in regression tree models.

Max years visited	1	2	3	4	5	6	7	8	9	10	11	12
# Stations	29,467	3,844	1,303	600	68	112	160	0	0	48	58	185

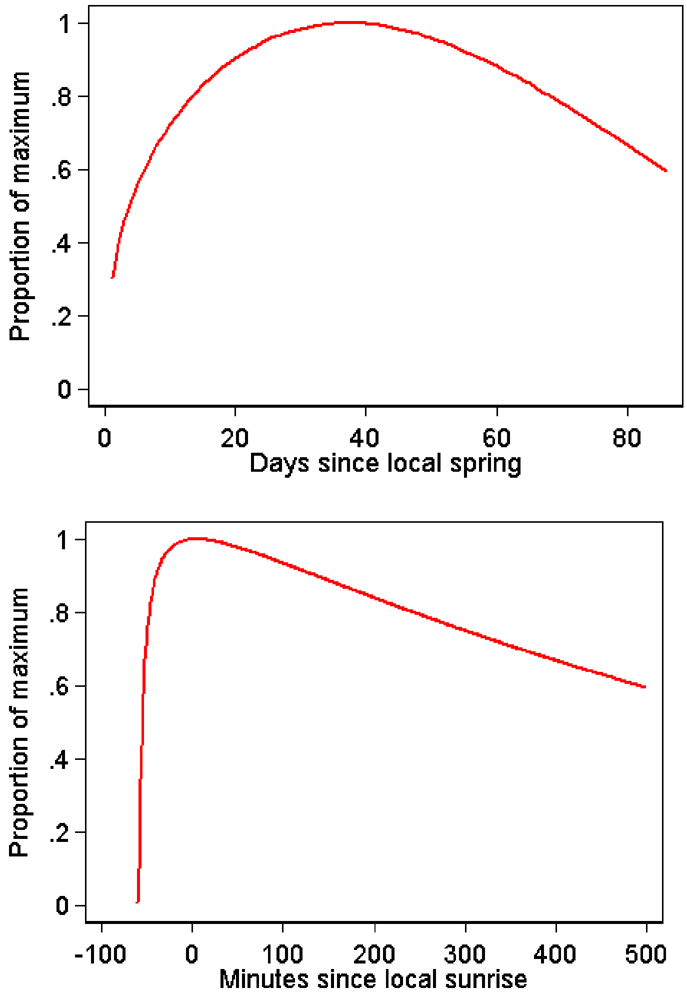

Figure A1. Relationship between Ovenbird (*Seiurus aurocapilla*) counts as a function of days since local spring (top) and of minutes since local sunrise (bottom), as fit by fractional polynomials. The *y*-axis is scaled to the maximum predicted mean count under the given model.

Appendix 3. Model results

Table A1. Summary of species models analysed, in decreasing order of the proportion deviance explained by the pruned regression tree model.

Species Code	English Name	Scientific Name	Mig, Group[1]	Forest Associated (Y/N)[2]	Prop. Range in Boreal[3]	Prop. Deviance Explained	Root Variable
TOWA	Townsend's Warbler	*Setophaga townsendi*	LD	1	0.26	0.80	TMAXSDApr
GCTH	Gray-cheeked Thrush	*Catharus minimus*	LD	1	0.76	0.77	TMIN
VESP	Vesper Sparrow	*Pooecetes gramineus*	SD	0	0.24	0.77	LANDCOV
WCSP	White-crowned Sparrow	*Zonotrichia leucophrys*	SD	0	0.55	0.77	TAVGApr
ATSP	American Tree Sparrow	*Spizella arborea*	SD	0	0.77	0.73	TMINMar
TOSO	Townsend's Solitaire	*Myadestes townsendi*	SD	0	0.26	0.69	TAVGAug
BTBW	Black-throated Blue Warbler	*Setophaga caerulescens*	LD	1	0.69	0.68	PCPApr
WETA	Western Tanager	*Piranga ludoviciana*	LD	1	0.27	0.68	PCPSep
CCSP	Clay-colored Sparrow	*Spizella pallida*	LD	0	0.51	0.67	LANDCOV
MGWA	MacGillivray's Warbler	*Geothlypis tolmiei*	SD	1	0.08	0.67	TMINMar
CONW	Connecticut Warbler	*Oporornis agilis*	LD	1	0.87	0.66	PCPSDJun
VATH	Varied Thrush	*Ixoreus naevius*	SD	1	0.55	0.65	TMINJul
BOBO	Bobolink	*Dolichonyx oryzivorus*	LD	0	0.27	0.65	TMINMay
AMRE	American Redstart	*Setophaga ruticilla*	LD	1	0.44	0.63	PCPSDJun
NAWA	Nashville Warbler	*Oreothlypis ruficapilla*	LD	1	0.68	0.63	PCPMay
HOWR	House Wren	*Troglodytes aedon*	LD	0	0.01	0.62	LAIApr
BBMA	Black-billed Magpie	*Pica hudsonia*	RES	0	0.25	0.62	LAIApr
BRBL	Brewer's Blackbird	*Euphagus cyanocephalus*	SD	0	0.18	0.62	LAIApr
MAWR	Marsh Wren	*Cistothorus palustris*	SD	0	0.14	0.61	LANDCOV
BHVI	Blue-headed Vireo	*Vireo solitaries*	SD	1	0.84	0.60	TMINSDOct
CORE	Common Redpoll	*Acanthis flammea*	RES	1	0.17	0.59	TMINFeb
BLPW	Blackpoll Warbler	*Setophaga striata*	LD	1	0.86	0.59	TMAXAug
SAVS	Savannah Sparrow	*Passerculus sandwichensis*	SD	0	0.47	0.59	LANDCOV
NOWA	Northern Waterthrush	*Parkesia noveboracensis*	LD	1	0.79	0.57	TMINMay

Species Code	English Name	Scientific Name	Mig, Group[1]	Forest Associated (Y/N)[2]	Prop. Range in Boreal[3]	Prop. Deviance Explained	Root Variable
VEER	Veery	*Catharus fuscescens*	LD	1	0.38	0.56	TAVGSep
RCKI	Ruby-crowned Kinglet	*Regulus calendula*	SD	1	0.68	0.56	TAVGApr
SOSP	Song Sparrow	*Melospiza melodia*	SD	0	0.36	0.55	TAVGAug
HOSP	House Sparrow	*Passer domesticus*	RES	0	0.01	0.55	LANDCOV
TEWA	Tennessee Warbler	*Oreothlypis peregrina*	LD	1	0.86	0.55	TAVGApr
HAFL	Hammond's Flycatcher	*Empidonax hammondii*	LD	1	0.22	0.55	TMINSDAug
BTNW	Black-throated Green Warbler	*Setophaga virens*	LD	1	0.80	0.54	NDVISep
SWSP	Swamp Sparrow	*Melospiza georgiana*	SD	0	0.69	0.54	TAVGSDMay
AMGO	American Goldfinch	*Spinus tristis*	SD	0	0.23	0.54	PET
FOSP	Fox Sparrow	*Passerella iliaca*	SD	1	0.62	0.53	TMAXApr
WAVI	Warbling Vireo	*Vireo gilvus*	LD	0	0.18	0.53	PCPAug
CSWA	Chestnut-sided Warbler	*Setophaga pensylvanica*	LD	0	0.71	0.52	TAVGSep
NSTS	Nelson's Sparrow	*Ammodramus nelsoni*	SD	0	0.63	0.52	TAVGSDJun
SEWR	Sedge Wren	*Cistothorus platensis*	LD	0	0.08	0.52	LAIApr
RUBL	Rusty Blackbird	*Euphagus carolinus*	SD	1	0.85	0.52	TAVGApr
AMCR	American Crow	*Corvus brachyrhynchos*	SD	0	0.33	0.51	TMINSDJun
PISI	Pine Siskin	*Spinus pinus*	SD	1	0.51	0.50	LAIMar
RBNU	Red-breasted Nuthatch	*Sitta canadensis*	RES	1	0.47	0.50	TMINSDJan
BLJA	Blue Jay	*Cyanocitta cristata*	RES	1	0.25	0.50	TAVGSep
EAKI	Eastern Kingbird	*Tyrannus tyrannus*	LD	0	0.28	0.49	LANDCOV
LEFL	Least Flycatcher	*Empidonax minimus*	LD	1	0.52	0.49	TAVGApr
RBGR	Rose-breasted Grosbeak	*Pheucticus ludovicianus*	LD	1	0.35	0.48	TMINMay
MOBL	Mountain Bluebird	*Sialia currucoides*	SD	0	0.28	0.48	TMAXSDAug
WIWR	Winter Wren	*Troglodytes hiemalis*	SD	1	0.46	0.48	PCPSep
HOLA	Horned Lark	*Eremophila alpestris*	SD	0	0.18	0.47	JDAYST
EUST	European Starling	*Sturnus vulgaris*	SD	0	0.12	0.47	TMAXAug
DEJU	Dark-eyed Junco	*Junco hyemalis*	SD	1	0.64	0.46	LAIApr
PAWA	Palm Warbler	*Setophaga palmarum*	LD	1	0.98	0.46	NDVIJun

Species Code	English Name	Scientific Name	Mig, Group[1]	Forest Associated (Y/N)[2]	Prop. Range in Boreal[3]	Prop. Deviance Explained	Root Variable
WEME	Western Meadowlark	*Sturnella neglecta*	SD	0	0.09	0.46	LAIApr
WIWA	Wilson's Warbler	*Cardellina pusilla*	LD	1	0.75	0.45	LAIApr
MAWA	Magnolia Warbler	*Setophaga magnolia*	LD	1	0.88	0.45	TMINJul
BLBW	Blackburnian Warbler	*Setophaga fusca*	LD	1	0.75	0.45	TAVGAug
EAWP	Eastern Wood-Pewee	*Contopus virens*	SD	1	0.14	0.45	TAVGSep
EVGR	Evening Grosbeak	*Coccothraustes vespertinus*	RES	1	0.43	0.44	TMAXAug
SCTA	Scarlet Tanager	*Piranga olivacea*	LD	1	0.20	0.44	TAVGSep
GRCA	Gray Catbird	*Dumetella carolinensis*	SD	0	0.12	0.44	LAIApr
YBFL	Yellow-bellied Flycatcher	*Empidonax flaviventris*	LD	1	0.84	0.43	PCPSep
RWBL	Red-winged Blackbird	*Agelaius phoeniceus*	SD	0	0.26	0.43	LANDCOV
EAPH	Eastern Phoebe	*Sayornis phoebe*	SD	0	0.41	0.43	PET
AMRO	American Robin	*Turdus migratorius*	SD	0	0.41	0.42	TMAXSDSep
OCWA	Orange-crowned Warbler	*Oreothlypis celata*	SD	1	0.60	0.42	MOctPCP
HETH	Hermit Thrush	*Catharus guttatus*	SD	1	0.57	0.42	NDVIJun
CAWA	Canada Warbler	*Cardellina canadensis*	LD	1	0.86	0.42	GDD>5
ALFL	Alder Flycatcher	*Empidonax alnorum*	LD	0	0.77	0.42	TMINAug
PHVI	Philadelphia Vireo	*Vireo philadelphicus*	LD	1	0.72	0.41	TMINAug
GCKI	Golden-crowned Kinglet	*Regulus satrapa*	SD	1	0.52	0.41	TMAXSDMar
COYE	Common Yellowthroat	*Geothlypis trichas*	SD	0	0.36	0.40	TAVGAug
WEWP	Western Wood-Pewee	*Contopus sordidulus*	SD	1	0.19	0.40	MOctPCP
CMWA	Cape May Warbler	*Setophaga tigrina*	LD	1	0.93	0.40	PET
BAOR	Baltimore Oriole	*Icterus galbula*	LD	0	0.21	0.40	TMIN
CORA	Common Raven	*Corvus corax*	RES	1	0.09	0.39	TAVGSDNov
SWTH	Swainson's Thrush	*Catharus ustulatus*	LD	1	0.74	0.39	PCPSDAug
PIWA	Pine Warbler	*Setophaga pinus*	LD	1	0.25	0.38	TAVGSep
RECR	Red Crossbill	*Loxia curvirostra*	RES	1	0.15	0.37	PCPSDDec
BCCH	Black-capped Chickadee	*Poecile atricapillus*	RES	1	0.43	0.37	TAVGSep
OVEN	Ovenbird	*Seiurus aurocapilla*	LD	1	0.49	0.36	TAVGMay

Species Code	English Name	Scientific Name	Mig, Group[1]	Forest Associated (Y/N)[2]	Prop. Range in Boreal[3]	Prop. Deviance Explained	Root Variable
LISP	Lincoln's Sparrow	*Melospiza lincolnii*	SD	0	0.75	0.35	TAVGSDOct
YWAR	Yellow Warbler	*Setophaga petechia*	LD	0	0.41	0.35	TAVGJun
BBWA	Bay-breasted Warbler	*Setophaga castanea*	LD	1	0.97	0.34	TMINJul
BOCH	Boreal Chickadee	*Poecile hudsonicus*	RES	1	0.90	0.34	LAIJan
REVI	Red-eyed Vireo	*Vireo olivaceus*	LD	1	0.24	0.34	TAVGSep
GCFL	Great Crested Flycatcher	*Myiarchus crinitus*	LD	0	0.21	0.34	TAVGAug
MOWA	Mourning Warbler	*Geothlypis philadelphia*	LD	1	0.81	0.34	GDD>5
COGR	Common Grackle	*Quiscalus quiscula*	SD	0	0.31	0.32	PCPSDApr
BRCR	Brown Creeper	*Certhia americana*	RES	1	0.39	0.30	TMINAug
CEDW	Cedar Waxwing	*Bombycilla cedrorum*	SD	1	0.38	0.30	PCPSDApr
PUFI	Purple Finch	*Carpodacus purpureus*	SD	1	0.61	0.29	TMAXSDMar
WWCR	White-winged Crossbill	*Loxia leucoptera*	RES	1	0.37	0.28	TMAXSDFeb
GRAJ	Gray Jay	*Perisoreus canadensis*	RES	1	0.80	0.28	TMAXSDFeb
WBNU	White-breasted Nuthatch	*Sitta carolinensis*	RES	1	0.09	0.27	GSDAYS
PIGR	Pine Grosbeak	*Pinicola enucleator*	RES	1	0.36	0.26	TMINMay
WTSP	White-throated Sparrow	*Zonotrichia albicollis*	SD	1	0.87	0.24	TMINApr
OSFL	Olive-sided Flycatcher	*Contopus cooperi*	LD	1	0.53	0.23	TMAXSDSep
CHSP	Chipping Sparrow	*Spizella passerina*	SD	0	0.33	0.15	TAVGSDMar

[1] LD = long-distance migrant; SD = short-distance migrant; RES = year-round resident. Supporting material on class assignments are given in species accounts and references to primary literature on the Boreal Avian Modelling project website (http://www.borealbirds.ca/).
[2] Forest associations based on the Cornell Lab of Ornithology "All About Birds" website (http://www.allaboutbirds.org/guide/search).
[3] Boreal range proportion based on the intersection of NatureServe range maps (http://www.natureserve.org/getData/birdMaps.jsp) with boreal bird conservation regions (http://www.bsc-eoc.org/international/bcrmain.html). Spatial analysis performed by Peter Blancher, Environment Canada in Spring 2011.

Figure A1. Graphical representation of the relative importance and proportion of positive effects for variable classes by season + annual ("ann") metrics (Table 1) over models of (A) all species, (B) long-distance migrants, (C) short-distance migrants, and (D) year-round residents. Variable importance is a measure of the relative contribution of a variable or group of variables to the total deviance explained by a group of models. Variable group names refer to pre-defined variable subsets ("veg" = vegetation; "landcov" = landcover; "product" = productivity; "clim" = climate; "temp" = temperature; "precip" = precipitation; "sd" = variability) (see Table 1). Spring ("spr") = April, May; Summer ("sum") = June, July, Aug; Autumn ("fall") = Sept, Oct; Winter ("wint") = Nov, Dec, Jan, Feb, Mar.

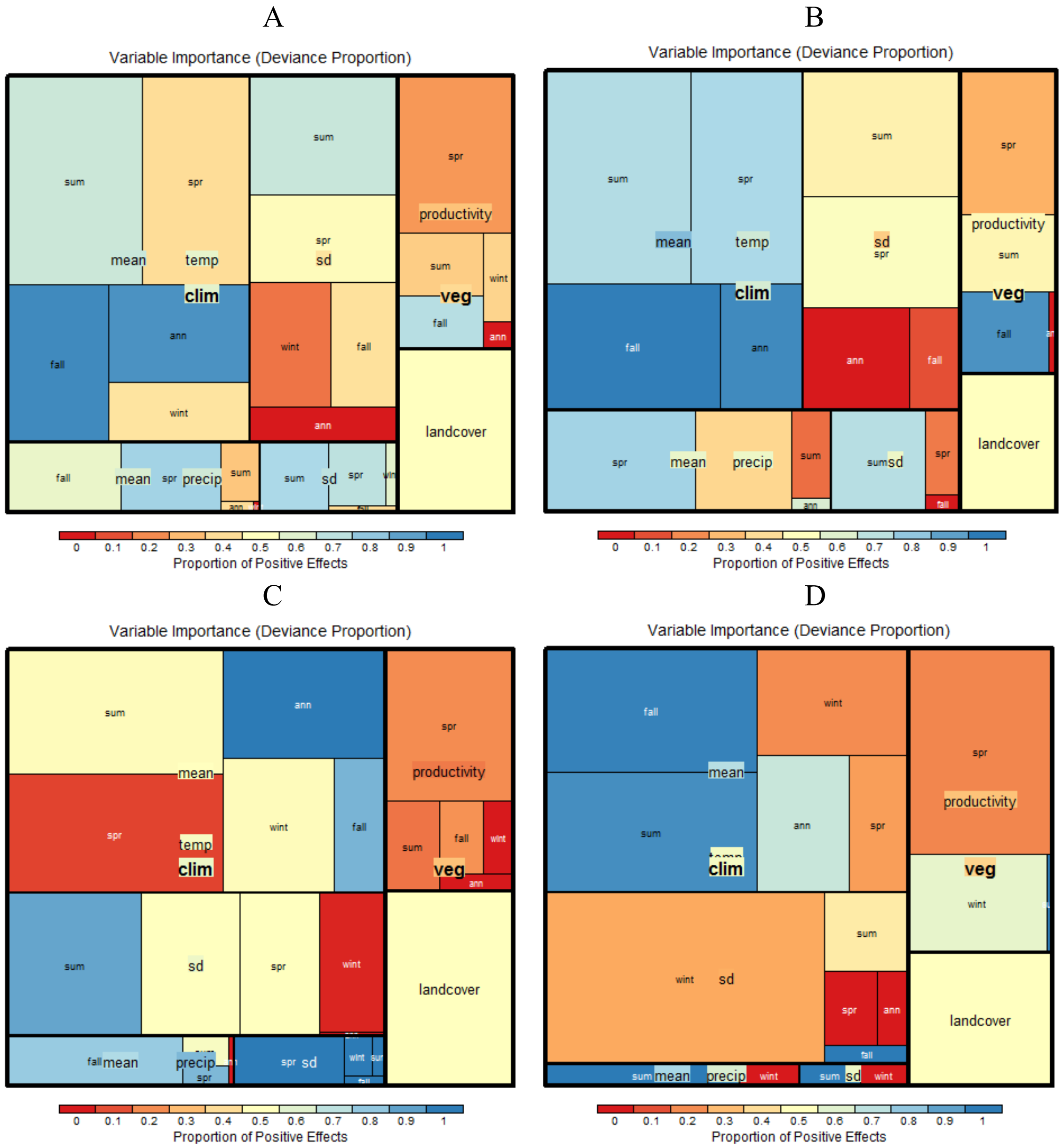

Table A2. Each record represents an individual split for a given regression tree, indicated with an identifying number ("Node"), variable name ("Variable"), and tree section ("Side"). Numbers of nodes immediately above ("Parent") and below ("Left" and "Right") are also indicated (see Figs. 4 and 5 for examples of tree node numbering convention). Directions of relationships between species abundance and variables are indicated for continuous variables ("Dir"). Landcover values associated with higher abundance values are listed along with split values for continuous variables ("Cutoff"). Node-level explained deviance proportions are also listed ("Deviance"). Terminal node predicted values and sample sizes are presented in Table A3. See Table A1 for species code definitions, Table 1 for variable definitions and Supplememtary Material Appendix 1 Table A1 for LANDCOV classes.

Species	Side	Node	Parent	Left	Right	Dir	Variable	Cutoff	Deviance
ALFL	Root	1	0	2	3	+	TMINAug	6.595	0.290
ALFL	Left	2	1	4	5	-	TMAXAug	19.641	0.034
ALFL	Right	3	1	6	7	+	PCPSep	76.415	0.027
ALFL	Right	7	3	8	9	-	LAIJun	41.308	0.040
ALFL	Right	9	7	10	11	-	PCPSDAug	25.279	0.024
AMCR	Root	1	0	2	3	+	TMINSDJun	1.152	0.331
AMCR	Right	10	7	14	15	+	TAVGMay	7.695	0.009
AMCR	Right	3	1	4	5	+	GSDAYS	166.5	0.086
AMCR	Right	4	3	6	7	+	PCPSDOct	19.51	0.023
AMCR	Right	5	3	8	9	+	TMAXSep	17.814	0.032
AMCR	Right	7	4	10	11	-	NDVIMay	0.395	0.006
AMCR	Right	8	5	12	13	=	LANDCOV	AHJLQST	0.026
AMGO	Root	1	0	2	3	+	PET	443.263	0.329
AMGO	Left	2	1	4	5	+	PCPSDMar	19.521	0.078
AMGO	Right	3	1	6	7	-	NDVIApr	0.364	0.100
AMGO	Right	6	3	8	9	+	TAVGYR	4.174	0.028
AMRE	Root	1	0	2	3	+	PCPSDJun	40.334	0.254
AMRE	Left	2	1	4	5	+	NDVISep	0.67	0.081
AMRE	Right	3	1	6	7	+	TMINSDJun	0.996	0.053
AMRE	Left	4	2	8	9	+	TMINJul	7.703	0.022
AMRE	Left	5	2	10	11	-	PCPSDJun	26.256	0.022
AMRE	Right	6	3	12	13	-	PCPSDSep	28.87	0.055

Species	Side	Node	Parent	Left	Right	Dir	Variable	Cutoff	Deviance
AMRE	Right	7	3	14	15	=	LANDCOV	EKNOQ	0.146
AMRO	Root	1	0	2	3	-	TMAXSDSep	2.69	0.270
AMRO	Right	10	7	12	13	-	TMAXSDAug	2.026	0.012
AMRO	Right	11	7	14	15	-	TAVGSDAug	1.565	0.005
AMRO	Left	2	1	4	5	-	TAVGSDMar	3.566	0.065
AMRO	Right	3	1	6	7	-	TAVGSDSep	1.827	0.023
AMRO	Right	6	3	8	9	-	TMAXSDAug	2.112	0.006
AMRO	Right	7	3	10	11	=	LANDCOV	IJKLST	0.037
ATSP	Root	1	0	2	3	-	TMINMar	-22.6	0.645
ATSP	Left	2	1	4	5	-	NDVIJun	0.463	0.011
ATSP	Right	3	1	6	7	+	TMINJul	9.708	0.073
BAOR	Root	1	0	2	3	+	PET	440.293	0.297
BAOR	Right	3	1	4	5	-	PCPSep	39.433	0.084
BAOR	Right	4	3	6	7	+	PCPSDAug	42.605	0.017
BBMA	Root	1	0	2	3	-	LAIApr	52.06	0.511
BBMA	Left	2	1	4	5	=	LANDCOV	LS	0
BBMA	Right	3	1	6	7	-	NDVIApr	0.385	0.087
BBMA	Left	5	2	8	9	+	TAVGSDAug	1.689	0.005
BBMA	Right	7	3	10	11	+	TMAXMay	17.845	0.018
BBWA	Root	1	0	2	3	+	TMINJul	9.695	0.274
BBWA	Right	10	9	12	13	+	TMINSDApr	2.047	0.016
BBWA	Right	3	1	4	5	=	LANDCOV	ACDFIR	0
BBWA	Right	4	3	6	7	-	TMAXApr	8.696	0.006
BBWA	Right	5	3	8	9	+	TAVGApr	-1.605	0.027
BBWA	Right	9	5	10	11	+	LAIApr	215.389	0.020
BCCH	Root	1	0	2	3	+	TAVGSep	8.563	0.258
BCCH	Left	2	1	4	5	-	TAVGSDDec	5.131	0.054
BCCH	Right	3	1	6	7	+	TAVGOct	3.537	0.030
BCCH	Left	5	2	8	9	+	TAVGApr	-0.814	0.019
BCCH	Right	6	3	10	11	=	LANDCOV	CDEKLNQS	0.008

Species	Side	Node	Parent	Left	Right	Dir	Variable	Cutoff	Deviance
BHVI	Root	1	0	2	3	+	TMINSDOct	1.282	0.179
BHVI	Right	3	1	4	5	-	TAVGSDMay	1.556	0.176
BHVI	Right	5	3	6	7	-	TMINSDApr	1.657	0.184
BHVI	Right	7	5	8	9	+	LANDCOV	EKRT	0.061
BLBW	Root	1	0	2	3	+	TAVGAug	14.145	0.363
BLBW	Left	2	1	4	5	+	NDVISep	0.672	0.037
BLBW	Right	3	1	6	7	+	NDVIJul	0.733	0.026
BLBW	Right	6	3	8	9	+	TAVGJul	16.976	0.007
BLBW	Right	7	3	10	11	-	LAISep	11.773	0.013
BLJA	Root	1	0	2	3	+	TAVGSep	9.012	0.419
BLJA	Left	2	1	4	5	+	TMAXAug	21.228	0.027
BLJA	Right	3	1	6	7	+	GDD>5	1429.358	0.038
BLJA	Right	6	3	8	9	+	TAVGJan	-20.015	0.007
BLJA	Right	7	3	10	11	+	GSDAYS	185.013	0.005
BLPW	Root	1	0	2	3	-	TMAXAug	19.742	0.432
BLPW	Left	2	1	4	5	-	PET	398.153	0.016
BLPW	Right	3	1	6	7	-	TAVGMay	3.82	0.088
BLPW	Right	6	3	8	9	+	TMAXSDMay	2.246	0.026
BLPW	Right	7	3	10	11	=	LANDCOV	BCEHKLNOQS	0.024
BOBO	Root	1	0	2	3	+	TMINMay	5.072	0.609
BOBO	Left	2	1	4	5	+	TMAXSep	17.834	0.042
BOCH	Root	1	0	2	3	+	LAIJan	191.442	0.214
BOCH	Right	3	1	4	5	+	PCPJul	106.251	0.051
BOCH	Right	4	3	6	7	-	TAVGSDJul	0.887	0.039
BOCH	Right	5	3	8	9	-	TAVGMar	-10.193	0.020
BOCH	Right	6	4	10	11	=	LANDCOV	ACDFILOQRT	0.018
BRBL	Root	1	0	2	3	-	LAIApr	50.429	0.41
BRBL	Left	2	1	4	5	=	LANDCOV	LS	0.037
BRBL	Right	3	1	6	7	-	LAIOct	19.214	0.128
BRBL	Right	6	3	8	9	=	LANDCOV	HS	0.041

Species	Side	Node	Parent	Left	Right	Dir	Variable	Cutoff	Deviance
BRCR	Root	1	0	2	3	+	TMINAug	7.316	0.250
BRCR	Right	3	1	4	5	+	NDVIJun	0.576	0.016
BRCR	Right	5	3	6	7	=	LANDCOV	ACDFHIOR	0
BRCR	Right	7	5	8	9	+	TMAXSDJun	1.623	0.012
BRCR	Right	8	7	10	11	+	TAVGSDAug	1.653	0.022
BTBW	Root	1	0	2	3	+	PCPApr	44.843	0.480
BTBW	Left	2	1	4	5	+	PCPMay	57.862	0.016
BTBW	Right	3	1	6	7	+	NDVIJun	0.768	0.136
BTBW	Right	6	3	8	9	+	TMINMay	1.974	0.026
BTBW	Right	7	3	10	11	=	LANDCOV	BDFHIKLNOQRST	0.025
BTNW	Root	1	0	2	3	+	NDVISep	0.68	0.374
BTNW	Left	2	1	4	5	+	TMINSep	2.676	0.072
BTNW	Right	3	1	6	7	-	TSEASON	4.855	0.026
BTNW	Left	5	2	8	9	-	TSEASON	4.284	0.044
BTNW	Right	6	3	10	11	+	NDVIJul	0.827	0.014
BTNW	Right	7	3	12	13	-	PCPSDJul	39.423	0.007
CAWA	Root	1	0	2	3	+	GDD>5	1047.937	0.257
CAWA	Right	12	7	14	15	+	TAVGSDMay	1.466	0.012
CAWA	Left	2	1	4	5	+	NDVIJun	0.759	0.041
CAWA	Right	3	1	6	7	+	NDVIJul	0.759	0.051
CAWA	Left	4	2	8	9	+	LAISep	47.41	0.014
CAWA	Right	6	3	10	11	+	TMAXSep	14.722	0.006
CAWA	Right	7	3	12	13	+	TAVGSDApr	2.38	0.034
CCSP	Root	1	0	2	3	=	LANDCOV	LS	0.466
CCSP	Left	11	5	14	15	-	PCPAug	57.346	0.013
CCSP	Left	2	1	4	5	-	LAIApr	72.486	0.098
CCSP	Right	3	1	6	7	+	TMAXSDApr	2.989	0.039
CCSP	Left	4	2	8	9	-	PCPAug	65.601	0.029
CCSP	Left	5	2	10	11	-	LAISep	33.035	0.024
CEDW	Root	1	0	2	3	+	PCPSDApr	11.876	0.195

Species	Side	Node	Parent	Left	Right	Dir	Variable	Cutoff	Deviance
CEDW	Right	3	1	4	5	+	TAVGSep	8.718	0.064
CEDW	Right	4	3	6	7	+	PET	437.096	0.015
CEDW	Right	5	3	8	9	-	LAIMay	30.216	0.022
CHSP	Root	1	0	2	3	-	TAVGSDMar	3.38	0.028
CHSP	Left	2	1	4	5	-	TMINJul	7.879	0.027
CHSP	Right	3	1	6	7	+	TAVGSDApr	2.068	0.026
CHSP	Right	6	3	8	9	-	TMINSDMar	3.531	0.034
CHSP	Right	7	3	10	11	+	TMINSDAug	1.315	0.008
CHSP	Right	9	6	12	13	-	PCPYR	987.154	0.027
CMWA	Root	1	0	2	3	-	TMIN	-19.766	0.228
CMWA	Right	13	9	16	17	+	TMAXJun	20.219	0.014
CMWA	Right	3	1	4	5	+	TMINJun	6.834	0.059
CMWA	Right	4	3	6	7	-	TMINSDJun	1.335	0.006
CMWA	Right	5	3	8	9	=	LANDCOV	AFILOR	0.058
CMWA	Right	7	4	10	11	+	PCPSDJun	18.426	0.007
CMWA	Right	9	5	12	13	-	TAVGSDMay	1.789	0.026
COGR	Root	1	0	2	3	+	PCPSDApr	17.207	0.230
COGR	Left	2	1	4	5	+	TMINAug	8.043	0.019
COGR	Right	3	1	6	7	+	TMAXMay	14.697	0.057
COGR	Right	7	3	8	9	-	TMINSDJul	1.1	0.017
CONW	Root	1	0	2	3	+	PCPSDJun	40.478	0.314
CONW	Left	2	1	4	5	+	TMINJun	6.347	0.106
CONW	Right	3	1	6	7	-	PCPSDMay	27.375	0.170
CONW	Left	5	2	8	9	+	TAVGSDAug	1.563	0.053
CONW	Left	9	5	10	11	-	TAVGSDApr	2.401	0.019
CORA	Root	1	0	2	3	-	TAVGSDNov	3.895	0.264
CORA	Left	2	1	4	5	-	TMAXSDFeb	5.345	0.051
CORA	Right	3	1	6	7	+	TMINSDOct	1.539	0.041
CORA	Right	7	3	8	9	-	PCPMar	19.904	0.016
CORA	Right	8	7	10	11	+	TAVGAug	14.114	0.019

Species	Side	Node	Parent	Left	Right	Dir	Variable	Cutoff	Deviance
CORE	Root	1	0	2	3	-	TMINFeb	-28.653	0.332
CORE	Left	2	1	4	5	+	LAIApr	218.515	0.156
CORE	Right	3	1	6	7	-	TMAXSDMay	1.97	0.062
CORE	Left	5	2	8	9	-	TMAXSDMay	2.627	0.044
COYE	Root	1	0	2	3	+	TAVGAug	13.173	0.262
COYE	Right	11	7	12	13	+	PCPSep	91.747	0.020
COYE	Left	2	1	4	5	+	LAIApr	91.322	0.020
COYE	Right	3	1	6	7	-	TAVGSDSep	1.566	0.054
COYE	Right	6	3	8	9	-	LAIMay	23.925	0.019
COYE	Right	7	3	10	11	-	LAIAug	59.735	0.029
CSWA	Root	1	0	2	3	+	TAVGSep	8.723	0.387
CSWA	Right	11	6	12	13	+	TMINSDJun	1.132	0.024
CSWA	Left	2	1	4	5	+	PCPSDApr	12.405	0.034
CSWA	Right	3	1	6	7	+	TMAXJul	23.837	0.049
CSWA	Left	5	2	8	9	+	TMAXSDApr	3.269	0.025
CSWA	Right	6	3	10	11	=	LANDCOV	BEHKLNT	0.001
DEJU	Root	1	0	2	3	+	LAIApr	78.36	0.329
DEJU	Left	2	1	4	5	-	TMAXSDOct	2.229	0.044
DEJU	Right	3	1	6	7	-	TMAXJun	19.616	0.072
DEJU	Right	6	3	8	9	=	LANDCOV	AFHIJLOQR	0
DEJU	Right	7	3	10	11	+	PCPSDApr	12.886	0.014
EAKI	Root	1	0	2	3	=	LANDCOV	T	0.389
EAKI	Left	2	1	4	5	+	TMAXAug	21.26	0.071
EAKI	Right	3	1	6	7	+	TMINSDJul	1.114	0.034
EAPH	Root	1	0	2	3	+	PET	440.48	0.302
EAPH	Left	2	1	4	5	+	TMINJul	9.401	0.040
EAPH	Right	3	1	6	7	=	LANDCOV	LOQRST	0.073
EAPH	Left	5	2	8	9	-	NDVIApr	0.396	0.008
EAPH	Left	8	5	10	11	-	LAIMay	23.574	0.006
EAWP	Root	1	0	2	3	+	TAVGSep	9.334	0.34

Species	Side	Node	Parent	Left	Right	Dir	Variable	Cutoff	Deviance
EAWP	Left	2	1	4	5	+	PCPSDMar	15.864	0.023
EAWP	Right	3	1	6	7	-	TMAXSDOct	1.744	0.053
EAWP	Right	6	3	8	9	+	AugNDVI	0.832	0.030
EUST	Root	1	0	2	3	+	TMAXAug	22.131	0.262
EUST	Left	2	1	4	5	+	TMAXSDJun	1.815	0.017
EUST	Right	3	1	6	7	=	LANDCOV	HLQRS	0.100
EUST	Left	5	2	8	9	-	LAIOct	44.975	0.009
EUST	Right	6	3	10	11	+	PCPSDSep	41.09	0.014
EUST	Right	7	3	12	13	+	NDVISep	0.68	0.063
EVGR	Root	1	0	2	3	+	TMAXAug	21.31	0.337
EVGR	Left	2	1	4	5	-	TMAXSDMar	3.292	0.027
EVGR	Right	3	1	6	7	-	LAIFeb	207.822	0.045
EVGR	Right	6	3	8	9	+	TMAXApr	7.178	0.014
EVGR	Right	9	6	10	11	-	TMINSDJun	1.281	0.021
FOSP	Root	1	0	2	3	-	TMAXApr	2.878	0.398
FOSP	Left	2	1	4	5	-	TMAXOct	7.789	0.095
FOSP	Right	3	1	6	7	-	TAVGMay	3.902	0.022
FOSP	Left	5	2	8	9	-	TMAXAug	20.963	0.017
GCFL	Root	1	0	2	3	+	TAVGSep	9.127	0.264
GCFL	Left	2	1	4	5	+	PET	442.798	0.045
GCFL	Right	3	1	6	7	-	PCPSDApr	24.008	0.03
GCKI	Root	1	0	2	3	-	TMAXSDMar	2.876	0.329
GCKI	Left	2	1	4	5	+	TMINSDOct	1.289	0.058
GCKI	Right	3	1	6	7	=	LANDCOV	ACD	0
GCKI	Left	5	2	8	9	+	TAVGYR	-0.77	0.021
GCKI	Right	7	3	10	11	+	PCPSDMay	19.952	0.005
GCTH	Root	1	0	2	3	-	TMINCOLD	-31.669	0.667
GCTH	Left	2	1	4	5	-	TAVGSDAug	0.981	0.096
GCTH	Left	4	2	6	7	+	TMAXSDJun	2.208	0.008
GRAJ	Root	1	0	2	3	-	TMAXSDFeb	5.415	0.267

Species	Side	Node	Parent	Left	Right	Dir	Variable	Cutoff	Deviance
GRAJ	Right	3	1	4	5	=	LANDCOV	AFHIJOQRT	0
GRAJ	Right	5	3	6	7	-	NDVIApr	0.305	0.011
GRCA	Root	1	0	2	3	-	LAIApr	43.546	0.290
GRCA	Left	2	1	4	5	-	TMAXSDOct	1.864	0.059
GRCA	Right	3	1	6	7	+	TAVGMay	9.8	0.078
GRCA	Left	5	2	8	9	+	TMAXSep	15.283	0.014
HAFL	Root	1	0	2	3	-	TMINSDAug	1.198	0.333
HAFL	Left	2	1	4	5	+	TMINSDSep	1.633	0.014
HAFL	Right	3	1	6	7	+	TMAXSDAug	1.929	0.172
HAFL	Left	5	2	8	9	-	TMINSDAug	1.446	0.004
HAFL	Right	6	3	10	11	+	TMAXSDSep	2.396	0.022
HETH	Root	1	0	2	3	+	MOctPCP	30.126	0.212
HETH	Left	10	5	12	13	+	TMAXJul	21.444	0.022
HETH	Left	2	1	4	5	+	TMAXSDMay	2.163	0.079
HETH	Left	4	2	8	9	-	TMAXSDMay	2.155	0.036
HETH	Left	5	2	10	11	+	TMINMar	-10.574	0.067
HOLA	Root	1	0	2	3	+	JDAYST	154.5	0.467
HOLA	Left	2	1	4	5	=	LANDCOV	RS	0
HOSP	Root	1	0	2	3	=	LANDCOV	S	0.503
HOSP	Left	2	1	4	5	-	LAIApr	46.178	0.048
HOWR	Root	1	0	2	3	-	LAIApr	46.804	0.465
HOWR	Left	2	1	4	5	+	TMAXMay	16.023	0.070
HOWR	Right	3	1	6	7	-	NPP	0.322	0.062
HOWR	Left	5	2	8	9	-	NDVIMay	0.516	0.027
LEFL	Root	1	0	2	3	+	TAVGApr	2.306	0.294
LEFL	Left	2	1	4	5	+	GDD>5	941.524	0.016
LEFL	Right	3	1	6	7	=	LANDCOV	E	0.002
LEFL	Right	6	3	8	9	+	TMINSDJun	0.975	0.143
LEFL	Right	8	6	10	11	+	TMINSDAug	1.216	0.013
LEFL	Right	9	6	12	13	-	TMINSDMay	1.167	0.022

Species	Side	Node	Parent	Left	Right	Dir	Variable	Cutoff	Deviance
LISP	Root	1	0	2	3	+	TAVGSDOct	1.659	0.192
LISP	Left	2	1	4	5	+	TMINAug	6.729	0.043
LISP	Right	3	1	6	7	-	TMINSDApr	1.675	0.096
LISP	Right	7	3	10	11	=	LANDCOV	BCDJKNST	0.021
MAWA	Root	1	0	2	3	+	TMINJul	7.775	0.395
MAWA	Left	2	1	4	5	+	PCPYR	584.91	0.015
MAWA	Right	3	1	6	7	-	TAVGSDSep	1.88	0.035
MAWA	Right	6	3	8	9	+	TAVGJul	16.197	0.004
MAWR	Root	1	0	2	3	=	LANDCOV	LS	0.390
MAWR	Left	2	1	4	5	-	LAIOct	29.382	0.040
MAWR	Right	3	1	6	7	+	TMAXSDApr	3.368	0.130
MAWR	Left	5	2	8	9	+	TMINSDOct	1.668	0.020
MAWR	Right	6	3	10	11	-	LAIMay	6.858	0.030
MGWA	Root	1	0	2	3	+	TMINMar	-9.489	0.487
MGWA	Left	2	1	4	5	-	TMAXJun	12.776	0.06
MGWA	Right	3	1	6	7	+	TMAXSDJul	1.593	0.122
MOBL	Root	1	0	2	3	+	TMAXSDAug	2.302	0.360
MOBL	Left	2	1	4	5	-	TSEASON	3.214	0.021
MOBL	Right	3	1	6	7	-	NDVIJun	0.637	0.096
MOWA	Root	1	0	2	3	+	GDD>5	972.866	0.284
MOWA	Left	2	1	4	5	+	NDVISep	0.672	0.019
MOWA	Right	3	1	6	7	=	LANDCOV	BCDEKLNT	0
MOWA	Right	6	3	8	9	+	TAVGSep	9.003	0.016
MOWA	Right	7	3	10	11	+	TMAXSDJun	1.888	0.018
NAWA	Root	1	0	2	3	+	PCPMay	48.462	0.486
NAWA	Right	11	7	12	13	=	LANDCOV	ACDFHIJKOQT	0.001
NAWA	Left	2	1	4	5	+	PCPApr	23.92	0.042
NAWA	Right	3	1	6	7	+	TMINSDMay	1.567	0.069
NAWA	Right	6	3	8	9	-	TAVGSDSep	1.711	0.021
NAWA	Right	7	3	10	11	+	TMAXSep	14.416	0.009

Species	Side	Node	Parent	Left	Right	Dir	Variable	Cutoff	Deviance
NOWA	Root	1	0	2	3	-	TMINMay	2.065	0.266
NOWA	Right	15	7	16	17	-	PCPMay	54.705	0.050
NOWA	Left	2	1	4	5	-	TAVGSDJul	1.092	0.032
NOWA	Right	3	1	6	7	+	TMAXSDMay	2.159	0.111
NOWA	Left	4	2	8	9	+	TMINSDMay	1.424	0.013
NOWA	Left	5	2	10	11	+	TMAXSDJul	1.446	0.009
NOWA	Right	6	3	12	13	-	TMAXMay	9.693	0.026
NOWA	Right	7	3	14	15	+	TMINSDApr	1.642	0.058
NSTS	Root	1	0	2	3	+	TAVGSDJun	1.951	0.351
NSTS	Left	2	1	4	5	-	NPP	0.319	0.101
NSTS	Left	4	2	6	7	+	TMINSDMar	4.068	0.018
NSTS	Left	5	2	8	9	+	PCPSDApr	12.369	0.050
OCWA	Root	1	0	2	3	-	NDVIJun	0.715	0.181
OCWA	Right	10	6	14	15	-	PCPApr	41.785	0.013
OCWA	Right	13	7	16	17	-	PCPJun	31.872	0.016
OCWA	Left	2	1	4	5	-	TMAXSDOct	2.312	0.037
OCWA	Right	3	1	6	7	-	TMINApr	-9.157	0.063
OCWA	Left	5	2	8	9	-	TMINJul	8.702	0.024
OCWA	Right	6	3	10	11	+	TAVGMar	-5.476	0.057
OCWA	Right	7	3	12	13	-	TAVGSDAug	1.62	0.025
OSFL	Root	1	0	2	3	-	TMAXSDSep	2.465	0.148
OSFL	Left	2	1	4	5	+	PCPJul	86.771	0.048
OSFL	Right	3	1	6	7	+	PCPYR	487.141	0.016
OSFL	Right	7	3	10	11	-	LAIJun	41.429	0.018
OVEN	Root	1	0	2	3	+	TAVGMay	8.202	0.166
OVEN	Right	10	7	12	13	+	NDVIJun	0.682	0.014
OVEN	Left	2	1	4	5	+	TREE	77.321	0.085
OVEN	Right	3	1	6	7	+	TMINSDMay	1.182	0.027
OVEN	Left	4	2	8	9	+	TAVGSDMay	1.566	0.050
OVEN	Right	7	3	10	11	-	TMINSDApr	1.856	0.020

Species	Side	Node	Parent	Left	Right	Dir	Variable	Cutoff	Deviance
PAWA	Root	1	0	2	3	-	NDVIJun	0.714	0.287
PAWA	Right	10	7	12	13	-	TMAXSDMay	2.523	0.009
PAWA	Right	11	7	14	15	-	TAVGSDAug	1.631	0.017
PAWA	Left	2	1	4	5	+	TMINSDApr	1.695	0.023
PAWA	Right	3	1	6	7	+	TAVGSDMay	1.685	0.07
PAWA	Right	6	3	8	9	-	TAVGSDJun	1.033	0.016
PAWA	Right	7	3	10	11	=	LANDCOV	HIJO	0.034
PHVI	Root	1	0	2	3	+	TMINAug	7.141	0.205
PHVI	Right	3	1	4	5	+	TAVGSDJun	1.828	0.159
PHVI	Right	4	3	6	7	+	TAVGYR	-1.078	0.034
PHVI	Right	7	4	8	9	-	TMAXSDJul	1.253	0.016
PIGR	Root	1	0	2	3	-	TMINMay	1.987	0.173
PIGR	Left	2	1	4	5	-	TMINSDMar	3.676	0.028
PIGR	Right	3	1	6	7	+	TMAXNov	-1.509	0.029
PIGR	Right	6	3	8	9	-	TAVGJun	10.46	0.033
PISI	Root	1	0	2	3	-	LAIMar	178.236	0.201
PISI	Left	10	5	12	13	+	TMINMar	-17.646	0.034
PISI	Left	13	10	14	15	+	TMAXSDSep	2.221	0.035
PISI	Left	2	1	4	5	-	TMAXSDMar	3.367	0.113
PISI	Right	3	1	6	7	+	TMINSDJun	0.995	0.052
PISI	Left	4	2	8	9	-	TMINSDJun	0.957	0.017
PISI	Left	5	2	10	11	+	PCPSDJul	48.41	0.048
PIWA	Root	1	0	2	3	+	TAVGSep	9.168	0.307
PIWA	Right	3	1	4	5	+	TAVGSep	11.126	0.026
PIWA	Right	4	3	6	7	+	TMINSDMay	1.655	0.042
PUFI	Root	1	0	2	3	-	TMAXSDMar	3.156	0.165
PUFI	Right	13	9	14	15	-	TAVGJul	15.698	0.011
PUFI	Left	2	1	4	5	+	GDD>5	1005.14	0.032
PUFI	Right	3	1	6	7	-	TAVGSDSep	1.499	0.036
PUFI	Right	7	3	8	9	=	LANDCOV	CDEKNORS	0.019

Species	Side	Node	Parent	Left	Right	Dir	Variable	Cutoff	Deviance
PUFI	Right	8	7	10	11	+	TMAXMar	-3.367	0.023
PUFI	Right	9	7	12	13	+	TAVGSDJun	1.656	0.008
RBGR	Root	1	0	2	3	+	TMINMay	2.158	0.364
RBGR	Right	10	7	12	13	-	PCPYR	614.445	0.019
RBGR	Right	11	7	14	15	-	LAIApr	53.466	0.005
RBGR	Left	2	1	4	5	-	TMAXSDSep	2.663	0.054
RBGR	Right	3	1	6	7	=	LANDCOV	BCDEJKLNOT	0
RBGR	Left	5	2	8	9	+	TAVGMay	7.273	0.027
RBGR	Right	7	3	10	11	+	TMINMay	4.441	0.011
RBNU	Root	1	0	2	3	+	TMINSDJan	5.738	0.287
RBNU	Left	2	1	4	5	-	TMAXSDNov	4.28	0.065
RBNU	Right	3	1	6	7	-	LAIJan	202.196	0.111
RBNU	Left	5	2	8	9	+	TMINFeb	-24.862	0.035
RCKI	Root	1	0	2	3	-	TAVGApr	2.246	0.402
RCKI	Left	2	1	4	5	-	TMAXSDOct	2.239	0.051
RCKI	Right	3	1	6	7	+	PCPAug	80.166	0.066
RCKI	Right	6	3	8	9	=	LANDCOV	ACDFHIJOQT	0
RCKI	Right	7	3	10	11	-	TMAXMar	-1.163	0.040
RECR	Root	1	0	2	3	-	PCPSDDec	20.278	0.070
RECR	Right	10	8	12	13	-	TMINOct	-2.532	0.009
RECR	Right	11	8	14	15	+	TAVGSDDec	4.091	0.026
RECR	Right	13	10	16	17	+	TMINSDMar	3.726	0.015
RECR	Left	2	1	4	5	-	TSEASON	3.333	0.018
RECR	Right	3	1	6	7	+	PCPSDJul	49	0.087
RECR	Right	6	3	8	9	-	GDD>5	483.405	0.115
RECR	Right	8	6	10	11	+	TMINJul	11.435	0.032
REVI	Root	1	0	2	3	+	TAVGAug	13.266	0.238
REVI	Left	2	1	4	5	+	NDVIMay	0.536	0.093
REVI	Left	4	2	8	9	+	TMINJul	7.922	0.008
RUBL	Root	1	0	2	3	-	TAVGApr	-3.367	0.396

Species	Side	Node	Parent	Left	Right	Dir	Variable	Cutoff	Deviance
RUBL	Left	2	1	4	5	-	LAIJun	47.711	0.017
RUBL	Right	3	1	6	7	-	TAVGJun	11.708	0.059
RUBL	Right	7	3	8	9	=	LANDCOV	ACEHINOS	0.045
RWBL	Root	1	0	2	3	=	LANDCOV	ELST	0.365
RWBL	Left	2	1	4	5	+	TAVGJul	14.127	0.049
RWBL	Left	5	2	8	9	-	NDVIApr	0.394	0.020
SAVS	Root	1	0	2	3	=	LANDCOV	IJLRS	0.368
SAVS	Right	12	6	14	15	-	TAVGSDJul	1.278	0.012
SAVS	Right	15	12	16	17	-	NDVIOct	0.501	0.010
SAVS	Left	2	1	4	5	-	TMINApr	-8.477	0.114
SAVS	Right	3	1	6	7	-	TMINJun	3.586	0.030
SAVS	Left	4	2	8	9	-	LAIOct	24.242	0.013
SAVS	Left	5	2	10	11	-	TMAXMay	9.093	0.006
SAVS	Right	6	3	12	13	-	LAIOct	33.869	0.032
SCTA	Root	1	0	2	3	+	TAVGSep	9.696	0.384
SCTA	Left	2	1	4	5	+	PCPMay	51.718	0.020
SCTA	Right	3	1	6	7	+	NDVIJul	0.85	0.040
SEWR	Root	1	0	2	3	-	LAIApr	62.397	0.330
SEWR	Right	10	7	12	13	-	AugNDVI	0.734	0.017
SEWR	Left	2	1	4	5	+	TMAXSDJul	1.68	0.033
SEWR	Right	3	1	6	7	+	TMAXSDMay	2.469	0.089
SEWR	Left	5	2	8	9	+	PCPSDAug	33.601	0.014
SEWR	Right	7	3	10	11	+	TMINApr	-2.923	0.036
SOSP	Root	1	0	2	3	+	TAVGAug	14.072	0.325
SOSP	Right	11	6	14	15	-	NDVIMay	0.459	0.017
SOSP	Left	2	1	4	5	+	TMINSDAug	1.398	0.030
SOSP	Right	3	1	6	7	+	PET	451.995	0.095
SOSP	Left	5	2	8	9	-	TAVGSDAug	1.517	0.010
SOSP	Right	6	3	10	11	=	LANDCOV	ALST	0.032
SOSP	Right	7	3	12	13	=	LANDCOV	AHILRST	0.042

Species	Side	Node	Parent	Left	Right	Dir	Variable	Cutoff	Deviance
SWSP	Root	1	0	2	3	+	TAVGSDMay	1.701	0.285
SWSP	Right	10	7	14	15	-	TMAXSDApr	2.406	0.013
SWSP	Left	2	1	4	5	+	TMINJul	7.948	0.025
SWSP	Right	3	1	6	7	+	TMINSDJun	1.69	0.105
SWSP	Right	6	3	8	9	-	NDVIApr	0.264	0.022
SWSP	Right	7	3	10	11	-	TAVGSDJul	1.117	0.073
SWSP	Right	8	6	12	13	+	PET	496.178	0.013
SWTH	Root	1	0	2	3	-	PCPSDAug	36.008	0.198
SWTH	Left	2	1	4	5	+	TMINSDApr	1.64	0.065
SWTH	Right	3	1	6	7	-	TAVGSDJul	0.948	0.047
SWTH	Left	4	2	8	9	-	TMINSDAug	1.198	0.079
TEWA	Root	1	0	2	3	-	TAVGApr	2.296	0.164
TEWA	Right	13	7	16	17	-	PET	439.422	0.018
TEWA	Left	2	1	4	5	-	TMAXSDSep	2.691	0.176
TEWA	Right	3	1	6	7	-	PCPAug	72.976	0.077
TEWA	Left	5	2	8	9	+	TAVGSDSep	1.759	0.013
TEWA	Right	6	3	10	11	-	TAVGSDApr	1.517	0.028
TEWA	Right	7	3	12	13	+	NDVISep	0.527	0.070
TOSO	Root	1	0	2	3	-	TAVGAug	12.157	0.431
TOSO	Right	3	1	4	5	+	PET	381.718	0.216
TOSO	Right	4	3	6	7	+	LAIJun	58.689	0.039
TOWA	Root	1	0	2	3	-	TMAXSDApr	2.088	0.521
TOWA	Right	3	1	4	5	-	PCPMay	50.5	0.274
VATH	Root	1	0	2	3	-	TMINJul	7.455	0.531
VATH	Left	2	1	4	5	-	TMINSDMar	3.642	0.034
VATH	Right	3	1	6	7	+	TMINApr	-8.921	0.040
VATH	Left	5	2	8	9	+	TMAXSDSep	2.248	0.037
VATH	Right	9	5	10	11	-	TAVGSDApr	1.963	0.011
VEER	Root	1	0	2	3	+	TAVGSep	8.965	0.450
VEER	Right	3	1	4	5	+	TMINMay	4.013	0.040

Species	Side	Node	Parent	Left	Right	Dir	Variable	Cutoff	Deviance
VEER	Right	4	3	6	7	+	NDVISep	0.676	0.036
VEER	Right	7	4	8	9	-	PCPSDMay	27.393	0.027
VEER	Right	8	7	10	11	+	TAVGSDMay	1.607	0.004
VEER	Right	9	7	12	13	-	TMAXSDMay	2.314	0.006
VESP	Root	1	0	2	3	=	LANDCOV	S	0.630
VESP	Left	2	1	4	5	-	LAIMay	13.484	0.060
VESP	Right	3	1	6	7	+	TMAXSDAug	2.376	0.040
VESP	Left	4	2	8	9	-	LAIApr	48.305	0.030
VESP	Left	5	2	10	11	-	NPP	0.366	0.010
WAVI	Root	1	0	2	3	-	PCPAug	68.458	0.159
WAVI	Left	11	5	18	19	-	TMINSDAug	1.357	0.017
WAVI	Right	12	6	20	21	=	LANDCOV	KLOQ	0
WAVI	Right	13	6	22	23	-	PCPSep	40.227	0.017
WAVI	Left	2	1	4	5	-	TMINSDJun	0.97	0.124
WAVI	Right	3	1	6	7	-	TAVGSDApr	2.147	0.083
WAVI	Left	4	2	8	9	-	TSEASON	3.554	0.044
WAVI	Left	5	2	10	11	+	TAVGSDJul	0.982	0.024
WAVI	Right	6	3	12	13	+	PCPSDJul	30.956	0.031
WAVI	Right	7	3	14	15	+	TAVGSDJul	0.969	0.023
WAVI	Left	8	4	16	17	+	TMINSep	5.468	0.004
WBNU	Root	1	0	2	3	+	GSDAYS	177.372	0.120
WBNU	Left	2	1	4	5	+	GDD>5	1010.379	0.065
WBNU	Right	3	1	6	7	-	TAVGSDJul	0.976	0.04
WBNU	Left	5	2	8	9	-	TSEASON	4.835	0.046
WCSP	Root	1	0	2	3	-	TAVGApr	-3.74	0.623
WCSP	Left	2	1	4	5	-	TMAXMay	13.232	0.021
WCSP	Right	3	1	6	7	+	TMAXSDOct	2.503	0.073
WCSP	Right	6	3	8	9	-	LAIJun	32.174	0.040
WCSP	Right	9	6	10	11	-	TAVGMay	3.554	0.008
WEME	Root	1	0	2	3	-	LAIApr	37.622	0.388

Species	Side	Node	Parent	Left	Right	Dir	Variable	Cutoff	Deviance
WEME	Left	2	1	4	5	+	TMAXSDAug	2.383	0.058
WEME	Left	4	2	6	7	+	TMAXJul	23.694	0.009
WETA	Root	1	0	2	3	-	PCPSep	49.859	0.463
WETA	Left	2	1	4	5	-	TMINSDMay	1.124	0.023
WETA	Right	3	1	6	7	-	TMINSDAug	1.281	0.121
WETA	Right	6	3	8	9	-	TMAXSDJun	1.344	0.018
WETA	Right	7	3	10	11	+	TMAXSep	14.692	0.05
WEWP	Root	1	0	2	3	-	MOctPCP	28.229	0.169
WEWP	Left	2	1	4	5	-	PCPAug	64.83	0.044
WEWP	Right	3	1	6	7	+	TMAXAug	20.339	0.048
WEWP	Left	4	2	8	9	+	TMAXSDAug	2.196	0.079
WEWP	Left	5	2	10	11	-	TMINSDAug	1.519	0.008
WEWP	Right	7	3	12	13	+	TMAXSDSep	2.662	0.053
WIWA	Root	1	0	2	3	+	LAIApr	111.109	0.237
WIWA	Right	13	9	14	15	-	PCPSDMay	20.237	0.011
WIWA	Left	2	1	4	5	+	TMINSep	2.859	0.017
WIWA	Right	3	1	6	7	-	TMINJul	8.363	0.086
WIWA	Right	6	3	8	9	+	TMINSDJun	1.599	0.036
WIWA	Right	7	3	10	11	+	PCPApr	26.557	0.051
WIWA	Right	9	6	12	13	-	TMINSDJul	1.172	0.015
WIWR	Root	1	0	2	3	+	PCPSep	66.253	0.373
WIWR	Left	2	1	4	5	+	TMINSep	2.654	0.088
WIWR	Right	3	1	6	7	+	PCPSep	84.857	0.015
WTSP	Root	1	0	2	3	-	TMINApr	-2.552	0.109
WTSP	Left	2	1	4	5	-	TMAXSDMar	3.413	0.048
WTSP	Right	3	1	6	7	+	PCPMay	43.524	0.069
WTSP	Left	5	2	8	9	+	TMINJul	8.762	0.016
WWCR	Root	1	0	2	3	-	TMAXSDFeb	5.395	0.210
WWCR	Right	3	1	4	5	+	TAVGSDJun	1.677	0.021
WWCR	Right	4	3	6	7	+	TMAXFeb	-1.490	0.019

Species	Side	Node	Parent	Left	Right	Dir	Variable	Cutoff	Deviance
WWCR	Right	5	3	8	9	-	TMINSDJun	1.736	0.021
WWCR	Right	9	5	10	11	-	TAVGSDJan	3.378	0.012
YBFL	Root	1	0	2	3	+	PCPSep	67.801	0.318
YBFL	Left	2	1	4	5	+	TAVGSDJul	1.109	0.068
YBFL	Right	3	1	6	7	-	TMAXSDMay	1.779	0.027
YBFL	Left	6	2	8	9	+	PCPSDMay	18.276	0.015
YBFL	Left	9	6	10	11	-	TMINApr	-3.670	0.006
YWAR	Root	1	0	2	3	-	TAVGJun	11.965	0.220
YWAR	Left	2	1	4	5	-	NDVIApr	0.393	0.015
YWAR	Right	3	1	6	7	+	TMAXSDMay	2.161	0.064
YWAR	Right	6	3	8	9	+	TMINSDMay	1.273	0.005
YWAR	Right	7	3	10	11	-	TMAXSDAug	2.062	0.044

Table A3. Mean predicted values and sample sizes for regression tree model terminal nodes. Each record represents a terminal node for a given species model tree, indicated with an identifying number ("Node"). Terminal nodes are related to variable splits presented in Table A2 by the "Parent" and "Parent Variable" fields (see Figs. 4 and 5 for examples of tree node numbering convention). The complete structure of the trees can be recovered by joining Tables A2 and A3.

Species	Node	Mean Pred	Sample Size	Parent	Parent Variable
ALFL	4	0.000	202	2	TMAXAug
ALFL	5	0.152	1308	2	TMAXAug
ALFL	6	0.236	15047	3	PCPSep
ALFL	8	0.350	9488	7	LAIJun
ALFL	10	0.910	2511	9	PCPSDAug
ALFL	11	2.420	202	9	PCPSDAug
AMCR	2	0.002	10623	1	TMINSDJun
AMCR	6	0.034	3977	4	PCPSDOct
AMCR	14	0.142	2670	10	TAVGMay
AMCR	15	0.633	2506	10	TAVGMay
AMCR	11	1.050	236	7	NDVIMay
AMCR	12	0.678	5571	8	LANDCOV
AMCR	13	1.544	2785	8	LANDCOV
AMCR	9	4.857	390	5	TMAXSep
AMGO	4	0.002	16389	2	PCPSDMar
AMGO	5	0.160	4363	2	PCPSDMar
AMGO	8	0.247	5819	6	TAVGYR
AMGO	9	2.791	206	6	TAVGYR
AMGO	7	2.971	1990	3	NDVIApr
AMRE	8	0.002	979	4	TMINJul
AMRE	9	0.094	13818	4	TMINJul
AMRE	10	0.445	10380	5	PCPSDJun
AMRE	11	3.490	264	5	PCPSDJun
AMRE	12	0.061	1252	6	PCPSDSep
AMRE	13	1.362	441	6	PCPSDSep
AMRE	14	0.033	886	7	LANDCOV
AMRE	15	2.063	637	7	LANDCOV
AMRO	4	0.001	781	2	TAVGSDMar
AMRO	5	0.578	1246	2	TAVGSDMar
AMRO	8	0.122	4196	6	TMAXSDAug
AMRO	9	0.706	1410	6	TMAXSDAug
AMRO	12	0.310	4548	10	TMAXSDAug
AMRO	13	0.916	9654	10	TMAXSDAug
AMRO	14	1.206	3472	11	TAVGSDAug
AMRO	15	2.138	3392	11	TAVGSDAug

Species	Node	Mean Pred	Sample Size	Parent	Parent Variable
ATSP	4	0.000	27623	2	NDVIJun
ATSP	5	0.054	200	2	NDVIJun
ATSP	6	0.044	259	3	TMINJul
ATSP	7	0.591	588	3	TMINJul
BAOR	2	0.000	20138	1	PET
BAOR	6	0.005	6183	4	PCPSDAug
BAOR	7	0.089	304	4	PCPSDAug
BAOR	8	0.126	2142	5	PCPSep
BBMA	4	0.000	23593	2	LANDCOV
BBMA	8	0.000	568	5	TAVGSDAug
BBMA	9	0.156	203	5	TAVGSDAug
BBMA	6	0.026	2449	3	NDVIApr
BBMA	10	0.639	1686	7	TMAXMay
BBMA	11	2.084	234	7	TMAXMay
BBWA	2	0.009	8444	1	TMINJul
BBWA	6	0.039	7457	4	TMAXApr
BBWA	7	0.126	3738	4	TMAXApr
BBWA	8	0.066	506	5	TAVGApr
BBWA	12	0.156	3329	10	TMINSDApr
BBWA	13	0.619	5023	10	TMINSDApr
BBWA	11	1.641	261	9	LAIApr
BCCH	4	0.000	504	2	TAVGSDDec
BCCH	8	0.011	5073	5	TAVGApr
BCCH	9	0.126	3234	5	TAVGApr
BCCH	10	0.130	4001	6	LANDCOV
BCCH	11	0.371	8663	6	LANDCOV
BCCH	7	0.707	7294	3	TAVGOct
BHVI	2	0.003	1158	1	TMINSDOct
BHVI	4	0.091	23631	3	TAVGSDMay
BHVI	6	0.067	2762	5	TMINSDApr
BHVI	8	0.065	882	7	LANDCOV
BHVI	9	1.856	325	7	LANDCOV
BLBW	4	0.000	6438	2	NDVISep
BLBW	5	0.035	2862	2	NDVISep
BLBW	8	0.039	3992	6	TAVGJul
BLBW	9	0.328	857	6	TAVGJul
BLBW	10	0.331	14280	7	LAISep
BLBW	11	1.366	252	7	LAISep
BLJA	4	0.000	10915	2	TMAXAug
BLJA	5	0.050	5010	2	TMAXAug
BLJA	8	0.067	4792	6	TAVGJan
BLJA	9	0.400	5783	6	TAVGJan

Species	Node	Mean Pred	Sample Size	Parent	Parent Variable
BLJA	10	1.346	1996	7	GSDAYS
BLJA	11	2.362	269	7	GSDAYS
BLPW	4	0.000	17020	2	PET
BLPW	5	0.016	7077	2	PET
BLPW	8	0.037	2587	6	TMAXSDMay
BLPW	9	0.189	848	6	TMAXSDMay
BLPW	10	0.267	450	7	LANDCOV
BLPW	11	0.953	699	7	LANDCOV
BOBO	4	0.000	28212	2	TMAXSep
BOBO	5	0.089	302	2	TMAXSep
BOBO	3	2.226	247	1	TMINMay
BOCH	2	0.001	1815	1	LAIJan
BOCH	10	0.019	8971	6	LANDCOV
BOCH	11	0.061	16179	6	LANDCOV
BOCH	7	0.299	231	4	TAVGSDJul
BOCH	8	0.105	1192	5	TAVGMar
BOCH	9	0.527	345	5	TAVGMar
BRBL	4	0.000	20709	2	LANDCOV
BRBL	5	0.137	2663	2	LANDCOV
BRBL	8	0.019	3723	6	LANDCOV
BRBL	9	0.911	1216	6	LANDCOV
BRBL	7	4.275	460	3	LAIOct
BRCR	2	0.000	3058	1	TMINAug
BRCR	4	0.012	2611	3	NDVIJun
BRCR	6	0.057	11283	5	LANDCOV
BRCR	10	0.022	1126	8	TAVGSDAug
BRCR	11	0.115	3726	8	TAVGSDAug
BRCR	9	0.173	6958	7	TMAXSDJun
BTBW	4	0.000	17626	2	PCPMay
BTBW	5	0.009	4912	2	PCPMay
BTBW	8	0.006	1693	6	TMINMay
BTBW	9	0.128	1544	6	TMINMay
BTBW	10	0.288	2716	7	LANDCOV
BTBW	11	0.679	267	7	LANDCOV
BTNW	4	0.000	2806	2	TMINSep
BTNW	8	0.006	5366	5	TSEASON
BTNW	9	0.093	8943	5	TSEASON
BTNW	10	0.121	3185	6	NDVIJul
BTNW	11	0.413	4099	6	NDVIJul
BTNW	12	0.372	1244	7	PCPSDJul
BTNW	13	0.938	3129	7	PCPSDJul
CAWA	8	0.000	3205	4	LAISep

Species	Node	Mean Pred	Sample Size	Parent	Parent Variable
CAWA	9	0.014	3297	4	LAISep
CAWA	5	0.124	533	2	NDVIJun
CAWA	10	0.002	1341	6	TMAXSep
CAWA	11	0.041	10631	6	TMAXSep
CAWA	14	0.012	1178	12	TAVGSDMay
CAWA	15	0.117	6178	12	TAVGSDMay
CAWA	13	0.232	2448	7	TAVGSDApr
CCSP	8	0.001	15190	4	PCPAug
CCSP	9	0.020	4538	4	PCPAug
CCSP	10	0.033	5430	5	LAISep
CCSP	12	0.218	916	11	PCPAug
CCSP	13	1.239	247	11	PCPAug
CCSP	6	0.519	723	3	TMAXSDApr
CCSP	7	2.530	1714	3	TMAXSDApr
CEDW	2	0.000	4847	1	PCPSDApr
CEDW	6	0.039	7528	4	PET
CEDW	7	0.332	750	4	PET
CEDW	8	0.141	4957	5	LAIMay
CEDW	9	0.357	10676	5	LAIMay
CHSP	4	0.711	420	2	TMINJul
CHSP	5	1.074	24159	2	TMINJul
CHSP	8	0.046	235	6	TMINSDMar
CHSP	12	0.058	471	9	PCPYR
CHSP	13	0.581	200	9	PCPYR
CHSP	10	0.344	669	7	TMINSDAug
CHSP	11	0.676	2490	7	TMINSDAug
CMWA	2	0.000	3592	1	TMIN
CMWA	6	0.005	4381	4	TMINSDJun
CMWA	10	0.001	255	7	PCPSDJun
CMWA	11	0.054	819	7	PCPSDJun
CMWA	8	0.043	14123	5	LANDCOV
CMWA	12	0.107	4196	9	TAVGSDMay
CMWA	14	0.193	1143	13	TMAXJun
CMWA	15	0.393	263	13	TMAXJun
COGR	4	0.000	4398	2	TMINAug
COGR	5	0.005	10493	2	TMINAug
COGR	6	0.009	1838	3	TMAXMay
COGR	8	0.075	7756	7	TMINSDJul
COGR	9	0.210	4263	7	TMINSDJul
CONW	4	0.001	4566	2	TMINJun
CONW	8	0.031	7457	5	TAVGSDAug
CONW	10	0.111	7714	9	TAVGSDApr

Species	Node	Mean Pred	Sample Size	Parent	Parent Variable
CONW	11	0.284	5938	9	TAVGSDApr
CONW	6	0.056	2668	3	PCPSDMay
CONW	7	1.876	337	3	PCPSDMay
CORA	4	0.000	437	2	TMAXSDFeb
CORA	5	0.050	8482	2	TMAXSDFeb
CORA	6	0.195	7053	3	TMINSDOct
CORA	10	0.167	1165	8	TAVGAug
CORA	11	0.818	11152	8	TAVGAug
CORA	9	2.242	405	7	PCPMar
CORE	4	0.000	26741	2	LAIApr
CORE	8	0.029	895	5	TMAXSDMay
CORE	9	0.336	320	5	TMAXSDMay
CORE	6	0.324	262	3	TMAXSDMay
CORE	7	1.686	480	3	TMAXSDMay
COYE	4	0.000	213	2	LAIApr
COYE	5	0.034	3974	2	LAIApr
COYE	8	0.061	5780	6	LAIMay
COYE	9	0.293	5643	6	LAIMay
COYE	10	0.269	8014	7	LAIAug
COYE	12	0.458	3889	11	PCPSep
COYE	13	1.662	1106	11	PCPSep
CSWA	4	0.000	3748	2	PCPSDApr
CSWA	8	0.127	7314	5	TMAXSDApr
CSWA	9	4.744	506	5	TMAXSDApr
CSWA	10	0.500	6794	6	LANDCOV
CSWA	12	0.127	1136	11	TMINSDJun
CSWA	13	3.144	3153	11	TMINSDJun
CSWA	7	4.300	6136	3	TMAXJul
DEJU	4	0.000	223	2	TMAXSDOct
DEJU	5	0.258	9117	2	TMAXSDOct
DEJU	8	0.289	6750	6	LANDCOV
DEJU	9	0.728	4979	6	LANDCOV
DEJU	10	0.745	2800	7	PCPSDApr
DEJU	11	1.829	4898	7	PCPSDApr
EAKI	4	0.000	14945	2	TMAXAug
EAKI	5	0.034	13343	2	TMAXAug
EAKI	6	0.016	323	3	TMINSDJul
EAKI	7	0.664	201	3	TMINSDJul
EAPH	4	0.000	10357	2	TMINJul
EAPH	10	0.000	7135	8	LAIMay
EAPH	11	0.008	1570	8	LAIMay
EAPH	9	0.009	1071	5	NDVIApr

Species	Node	Mean Pred	Sample Size	Parent	Parent Variable
EAPH	6	0.016	6028	3	LANDCOV
EAPH	7	0.131	2533	3	LANDCOV
EAWP	4	0.000	13528	2	PCPSDMar
EAWP	5	0.002	4007	2	PCPSDMar
EAWP	8	0.007	8954	6	AugNDVI
EAWP	9	0.065	982	6	AugNDVI
EAWP	7	0.079	1197	3	TMAXSDOct
EUST	4	0.000	13939	2	TMAXSDJun
EUST	8	0.003	3458	5	LAIOct
EUST	9	0.074	2089	5	LAIOct
EUST	10	0.019	6405	6	PCPSDSep
EUST	11	0.403	484	6	PCPSDSep
EUST	12	0.258	1887	7	NDVISep
EUST	13	4.360	291	7	NDVISep
EVGR	4	0.000	3685	2	TMAXSDMar
EVGR	5	0.018	9307	2	TMAXSDMar
EVGR	8	0.043	3554	6	TMAXApr
EVGR	10	0.154	1707	9	TMINSDJun
EVGR	11	0.215	9673	9	TMINSDJun
EVGR	7	0.802	843	3	LAIFeb
FOSP	4	0.001	19755	2	TMAXOct
FOSP	8	0.024	4102	5	TMAXAug
FOSP	9	0.137	3219	5	TMAXAug
FOSP	6	0.409	613	3	TAVGMay
FOSP	7	1.140	1069	3	TAVGMay
GCFL	4	0.000	13832	2	PET
GCFL	5	0.027	2389	2	PET
GCFL	6	0.008	2639	3	PCPSDApr
GCFL	7	0.088	9797	3	PCPSDApr
GCKI	4	0.000	1084	2	TMINSDOct
GCKI	8	0.011	2535	5	TAVGYR
GCKI	9	0.131	10783	5	TAVGYR
GCKI	6	0.367	9551	3	LANDCOV
GCKI	10	0.330	210	7	PCPSDMay
GCKI	11	0.824	4654	7	PCPSDMay
GCTH	6	0.000	27111	4	TMAXSDJun
GCTH	7	0.016	638	4	TMAXSDJun
GCTH	5	0.129	613	2	TAVGSDAug
GCTH	3	1.020	298	1	TMINCOLD
GRAJ	2	0.002	229	1	TMAXSDFeb
GRAJ	4	0.118	11321	3	LANDCOV
GRAJ	6	0.280	16641	5	NDVIApr

Species	Node	Mean Pred	Sample Size	Parent	Parent Variable
GRAJ	7	0.792	397	5	NDVIApr
GRCA	4	0.000	20248	2	TMAXSDOct
GRCA	8	0.023	200	5	TMAXSep
GRCA	9	0.109	5560	5	TMAXSep
GRCA	6	0.046	2130	3	TAVGMay
GRCA	7	0.396	566	3	TAVGMay
HAFL	4	0.000	21614	2	TMINSDSep
HAFL	8	0.005	2155	5	TMINSDAug
HAFL	9	0.092	1337	5	TMINSDAug
HAFL	10	0.000	2065	6	TMAXSDSep
HAFL	11	0.205	355	6	TMAXSDSep
HAFL	7	1.908	1207	3	TMAXSDAug
HETH	6	0.001	261	4	TMAXSDMay2
HETH	7	0.387	3487	4	TMAXSDMay2
HETH	10	0.014	738	8	TMAXJul
HETH	11	0.539	4691	8	TMAXJul
HETH	9	1.393	255	5	TMINMar
HETH	3	1.284	19333	1	PCPOct
HOLA	4	0.000	26557	2	LANDCOV
HOLA	5	0.110	1677	2	LANDCOV
HOLA	3	1.427	450	1	JDAYST
HOSP	4	0.000	25307	2	LAIApr
HOSP	5	0.022	1976	2	LAIApr
HOSP	3	0.186	1450	1	LANDCOV
HOWR	4	0.000	12806	2	TMAXMay
HOWR	8	0.003	10586	5	NDVIMay
HOWR	9	0.061	2776	5	NDVIMay
HOWR	6	0.091	1256	3	NPP
HOWR	7	0.607	1357	3	NPP
LEFL	4	0.053	4088	2	GDD>5
LEFL	5	0.260	19261	2	GDD>5
LEFL	7	0.018	279	3	LANDCOV
LEFL	10	0.364	2355	8	TMINSDAug
LEFL	11	1.027	1787	8	TMINSDAug
LEFL	12	2.262	272	9	TMINSDMay
LEFL	13	4.561	564	9	TMINSDMay
LISP	4	0.001	204	2	TMINAug
LISP	5	0.122	13050	2	TMINAug
LISP	6	0.332	14883	3	TMINSDApr
LISP	8	0.185	406	7	LANDCOV
LISP	9	1.361	215	7	LANDCOV
MAWA	4	0.000	834	2	PCPYR

Species	Node	Mean Pred	Sample Size	Parent	Parent Variable
MAWA	5	0.223	1051	2	PCPYR
MAWA	8	0.124	5282	6	TAVGJul
MAWA	9	0.462	245	6	TAVGJul
MAWA	7	0.538	21346	3	TAVGSDSep
MAWR	4	0.000	23895	2	LAIOct
MAWR	8	0.005	1976	5	TMINSDOct
MAWR	9	0.171	381	5	TMINSDOct
MAWR	10	0.016	1722	6	LAIMay
MAWR	11	0.244	491	6	LAIMay
MAWR	7	0.986	215	3	TMAXSDApr
MGWA	4	0.000	27124	2	TMAXJun
MGWA	5	0.025	213	2	TMAXJun
MGWA	6	0.013	866	3	TMAXSDJul
MGWA	7	0.818	584	3	TMAXSDJul
MOBL	4	0.000	21562	2	TSEASON
MOBL	5	0.008	215	2	TSEASON
MOBL	6	0.000	3940	3	NDVIJun
MOBL	7	0.008	2959	3	NDVIJun
MOWA	4	0.001	4068	2	NDVISep
MOWA	5	0.206	718	2	NDVISep
MOWA	8	0.069	1751	6	TAVGSep
MOWA	9	0.389	14071	6	TAVGSep
MOWA	10	0.506	5991	7	TMAXSDJun
MOWA	11	1.355	2075	7	TMAXSDJun
NAWA	4	0.002	7427	2	PCPApr
NAWA	5	0.336	5868	2	PCPApr
NAWA	8	0.008	1756	6	TAVGSDSep
NAWA	9	1.659	2424	6	TAVGSDSep
NAWA	10	1.046	253	7	TMAXSep
NAWA	12	3.512	3126	11	LANDCOV
NAWA	13	6.712	7904	11	LANDCOV
NOWA	8	0.053	2985	4	TMINSDMay
NOWA	9	0.286	4950	4	TMINSDMay
NOWA	10	0.186	10360	5	TMAXSDJul
NOWA	11	0.413	792	5	TMAXSDJul
NOWA	12	0.053	1401	6	TMAXMay
NOWA	13	1.955	648	6	TMAXMay
NOWA	14	0.570	597	7	TMINSDApr
NOWA	16	0.308	4074	15	PCPMay
NOWA	17	2.795	2964	15	PCPMay
NSTS	6	0.000	24283	4	TMINSDMar
NSTS	7	0.008	1871	4	TMINSDMar

Species	Node	Mean Pred	Sample Size	Parent	Parent Variable
NSTS	8	0.000	595	5	PCPSDApr
NSTS	9	0.086	1627	5	PCPSDApr
NSTS	3	0.694	405	1	TAVGSDJun
OCWA	4	0.000	797	2	TMAXSDOct1
OCWA	8	0.013	11395	5	TMINJul
OCWA	9	0.291	730	5	TMINJul
OCWA	14	0.004	3387	10	PCPApr
OCWA	15	0.062	9660	10	PCPApr
OCWA	11	0.299	1012	6	TAVGMar
OCWA	12	0.055	719	7	TAVGSDAug
OCWA	16	0.317	885	13	PCPJun
OCWA	17	0.920	226	13	PCPJun
OSFL	4	0.002	6165	2	PCPJul
OSFL	5	0.038	5795	2	PCPJul
OSFL	6	0.095	200	3	PCPYR
OSFL	8	0.059	11226	7	LAIJun
OSFL	9	0.181	5367	7	LAIJun
OVEN	8	0.028	1839	4	TAVGSDMay
OVEN	9	0.304	7423	4	TAVGSDMay
OVEN	5	1.352	258	2	PREC_TREE
OVEN	6	0.540	1575	3	TMINSDMay
OVEN	12	0.490	1167	10	NDVIJun
OVEN	13	1.437	298	10	NDVIJun
OVEN	11	2.262	16198	7	TMINSDApr
PAWA	4	0.000	1553	2	TMINSDApr
PAWA	5	0.041	11364	2	TMINSDApr
PAWA	8	0.013	2497	6	TAVGSDJun
PAWA	9	0.246	2408	6	TAVGSDJun
PAWA	12	0.163	2201	10	TMAXSDMay
PAWA	13	0.473	5590	10	TMAXSDMay
PAWA	14	0.363	1556	11	TAVGSDAug
PAWA	15	1.389	1470	11	TAVGSDAug
PHVI	2	0.000	2596	1	TMINAug
PHVI	6	0.019	1963	4	TAVGYR
PHVI	8	0.083	21580	7	TMAXSDJul
PHVI	9	0.228	2377	7	TMAXSDJul
PHVI	5	2.143	233	3	TAVGSDJun
PIGR	4	0.000	9763	2	TMINSDMar
PIGR	5	0.003	9468	2	TMINSDMar
PIGR	8	0.005	4061	6	TAVGJun
PIGR	9	0.042	1182	6	TAVGJun
PIGR	7	0.106	4259	3	TMAXNov

Species	Node	Mean Pred	Sample Size	Parent	Parent Variable
PISI	8	0.004	694	4	TMINSDJun
PISI	9	0.219	1856	4	TMINSDJun
PISI	12	0.027	3576	10	TMINMar
PISI	14	0.346	11903	13	TMAXSDSep
PISI	15	1.007	6127	13	TMAXSDSep
PISI	11	4.963	485	5	PCPSDJul
PISI	6	0.639	2458	3	TMINSDJun
PISI	7	4.983	1582	3	TMINSDJun
PIWA	2	0.000	16948	1	TAVGSep
PIWA	6	0.001	3794	4	TMINSDMay
PIWA	7	0.008	6010	4	TMINSDMay
PIWA	5	0.040	2001	3	TAVGSep
PUFI	4	0.000	2046	2	GDD>5
PUFI	5	0.013	6815	2	GDD>5
PUFI	6	0.018	8448	3	TAVGSDSep
PUFI	10	0.002	425	8	TMAXMar
PUFI	11	0.076	4771	8	TMAXMar
PUFI	12	0.095	4052	9	TAVGSDJun
PUFI	14	0.158	1825	13	TAVGJul
PUFI	15	0.739	275	13	TAVGJul
RBGR	4	0.000	614	2	TMAXSDSep
RBGR	8	0.008	4672	5	TAVGMay
RBGR	9	0.068	4833	5	TAVGMay
RBGR	6	0.071	5922	3	LANDCOV
RBGR	12	0.129	4097	10	PCPYR
RBGR	13	0.432	7567	10	PCPYR
RBGR	14	0.595	412	11	LAIApr
RBGR	15	2.398	574	11	LAIApr
RBNU	4	0.017	1164	2	TMAXSDNov
RBNU	8	0.020	2211	3	LAIJan
RBNU	9	0.329	24161	3	LAIJan
RBNU	6	0.104	883	5	TMINFeb
RBNU	7	3.017	203	5	TMINFeb
RCKI	4	0.000	309	2	TMAXSDOct
RCKI	5	0.250	5812	2	TMAXSDOct
RCKI	8	0.226	4141	6	LANDCOV
RCKI	9	0.757	8619	6	LANDCOV
RCKI	10	0.425	6292	7	TMAXMar
RCKI	11	2.129	3585	7	TMAXMar
RECR	4	0.000	3785	2	TSEASON
RECR	5	0.067	994	2	TSEASON
RECR	12	0.009	15312	10	TMINOct

Species	Node	Mean Pred	Sample Size	Parent	Parent Variable
RECR	16	0.015	2487	13	TMINSDMar
RECR	17	0.257	1022	13	TMINSDMar
RECR	14	0.072	4063	11	TAVGSDDec
RECR	15	0.778	411	11	TAVGSDDec
RECR	9	0.648	200	6	GDD>5
RECR	7	1.088	339	3	PCPSDJul
RUBL	4	0.000	14106	2	LAIJun
RUBL	5	0.023	12910	2	LAIJun
RUBL	6	0.002	366	3	TAVGJun
RUBL	8	0.247	913	7	LANDCOV
RUBL	9	0.935	492	7	LANDCOV
RWBL	4	0.000	3714	2	TAVGJul
RWBL	6	0.032	19619	5	NDVIApr
RWBL	7	0.229	3458	5	NDVIApr
RWBL	3	1.137	1972	1	LANDCOV
SAVS	8	0.005	22287	4	LAIOct
SAVS	9	0.561	1213	4	LAIOct
SAVS	10	0.425	762	5	TMAXMay
SAVS	11	2.270	200	5	TMAXMay
SAVS	14	0.120	670	12	TAVGSDJul
SAVS	16	0.332	790	15	NDVIOct
SAVS	17	1.808	1256	15	NDVIOct
SAVS	13	3.852	1102	6	LAIOct
SAVS	7	8.070	397	3	TMINJun
SCTA	4	0.000	16422	2	PCPMay
SCTA	5	0.002	4620	2	PCPMay
SCTA	6	0.028	6729	3	NDVIJul
SCTA	7	0.221	996	3	NDVIJul
SEWR	4	0.000	22886	2	TMAXSDJul
SEWR	8	0.000	877	5	PCPSDAug
SEWR	9	0.137	875	5	PCPSDAug
SEWR	12	0.005	1805	10	NDVIAug
SEWR	13	0.034	474	10	NDVIAug
SEWR	11	0.305	1517	7	TMINApr
SEWR	6	1.083	226	3	TMAXSDMay
SOSP	4	0.000	3830	2	TMINSDAug
SOSP	8	0.062	4786	5	TAVGSDAug
SOSP	9	0.934	211	5	TAVGSDAug
SOSP	10	0.263	12374	6	LANDCOV
SOSP	14	0.778	1639	11	NDVIMay
SOSP	15	5.098	514	11	NDVIMay
SOSP	12	1.521	3444	7	LANDCOV

Species	Node	Mean Pred	Sample Size	Parent	Parent Variable
SOSP	13	6.038	2013	7	LANDCOV
SWSP	4	0.000	1635	2	TMINJul
SWSP	5	0.033	8267	2	TMINJul
SWSP	12	0.126	14943	8	PET
SWSP	13	0.949	225	8	PET
SWSP	9	0.954	269	6	NDVIApr
SWSP	14	0.302	2948	10	TMAXSDApr
SWSP	15	0.992	200	10	TMAXSDApr
SWSP	11	2.971	210	7	TAVGSDJul
SWTH	8	0.199	263	4	TMINSDAug
SWTH	9	1.354	656	4	TMINSDAug
SWTH	5	0.723	8045	2	TMINSDApr
SWTH	6	1.081	19433	3	TAVGSDJul
SWTH	7	4.133	285	3	TAVGSDJul
TEWA	4	0.010	320	2	TMAXSDSep
TEWA	8	0.454	2581	5	TAVGSDSep
TEWA	9	2.858	2339	5	TAVGSDSep
TEWA	10	0.648	11406	6	TAVGSDApr
TEWA	11	5.587	498	6	TAVGSDApr
TEWA	12	0.716	2065	7	NDVISep
TEWA	14	1.299	2548	13	PET
TEWA	15	4.526	6921	13	PET
TOSO	2	0.000	27101	1	TAVGAug
TOSO	6	0.017	1198	4	LAIJun
TOSO	7	0.125	201	4	LAIJun
TOSO	5	1.017	264	3	PET
TOWA	2	0.000	26311	1	TMAXSDApr
TOWA	4	0.000	1897	3	PCPMay
TOWA	5	0.461	454	3	PCPMay
VATH	4	0.000	15247	2	TMINSDMar
VATH	8	0.001	10677	5	TMAXSDSep
VATH	10	0.029	820	9	TAVGSDApr
VATH	11	0.271	475	9	TAVGSDApr
VATH	6	0.003	442	3	TMINApr
VATH	7	0.502	1020	3	TMINApr
VEER	2	0.001	14792	1	TAVGSep
VEER	6	0.068	4933	4	NDVISep
VEER	10	0.008	558	8	TAVGSDMay
VEER	11	0.187	1289	8	TAVGSDMay
VEER	12	0.478	3565	9	TMAXSDMay
VEER	13	0.810	960	9	TMAXSDMay
VEER	5	0.992	2661	3	TMINMay

Species	Node	Mean Pred	Sample Size	Parent	Parent Variable
VESP	8	0.000	23884	4	LAIApr
VESP	9	0.076	2020	4	LAIApr
VESP	10	0.068	1239	5	NPP
VESP	11	0.563	215	5	NPP
VESP	6	0.257	204	3	TMAXSDAug
VESP	7	1.508	1249	3	TMAXSDAug
WAVI	16	0.000	8396	8	TMINSep
WAVI	17	0.012	6335	8	TMINSep
WAVI	9	0.123	857	4	TSEASON
WAVI	10	0.002	784	5	TAVGSDJul
WAVI	18	0.056	1197	11	TMINSDAug
WAVI	19	0.369	523	11	TMINSDAug
WAVI	20	0.006	4072	12	LANDCOV
WAVI	21	0.063	1491	12	LANDCOV
WAVI	22	0.027	2427	13	PCPSep
WAVI	23	0.225	1210	13	PCPSep
WAVI	14	0.095	291	7	TAVGSDJul
WAVI	15	0.547	1139	7	TAVGSDJul
WBNU	4	0.000	5081	2	GDD>5
WBNU	8	0.000	4179	5	TSEASON
WBNU	9	0.004	10475	5	TSEASON
WBNU	6	0.015	8567	3	TAVGSDJul
WBNU	7	0.330	411	3	TAVGSDJul
WCSP	4	0.000	25310	2	TMAXMay
WCSP	5	0.027	1772	2	TMAXMay
WCSP	8	0.085	604	6	LAIJun
WCSP	10	0.441	353	9	TAVGMay
WCSP	11	1.195	457	9	TAVGMay
WCSP	7	2.355	203	3	TMAXSDOct
WEME	6	0.000	15866	4	TMAXJul
WEME	7	0.000	7569	4	TMAXJul
WEME	5	0.008	3626	2	TMAXSDAug
WEME	3	0.051	1620	1	LAIApr
WETA	4	0.000	17130	2	TMINSDMay
WETA	5	0.130	842	2	TMINSDMay
WETA	8	0.004	2902	6	TMAXSDJun
WETA	9	0.125	6674	6	TMAXSDJun
WETA	10	0.250	225	7	TMAXSep
WETA	11	0.763	1052	7	TMAXSep
WEWP	8	0.000	15617	4	TMAXSDAug
WEWP	9	0.010	2179	4	TMAXSDAug
WEWP	10	0.000	815	5	TMINSDAug

Species	Node	Mean Pred	Sample Size	Parent	Parent Variable
WEWP	11	0.010	1665	5	TMINSDAug
WEWP	6	0.002	1642	3	TMAXAug
WEWP	12	0.019	5601	7	TMAXSDSep
WEWP	13	0.094	1250	7	TMAXSDSep
WIWA	4	0.000	288	2	TMINSep
WIWA	5	0.011	15162	2	TMINSep
WIWA	8	0.029	6939	6	TMINSDJun
WIWA	12	0.051	2346	9	TMINSDJul
WIWA	14	0.101	1212	13	PCPSDMay
WIWA	15	0.406	407	13	PCPSDMay
WIWA	10	0.131	1398	7	PCPApr
WIWA	11	0.879	848	7	PCPApr
WTSP	4	0.108	1264	2	TMAXSDMar
WTSP	8	1.396	5479	5	TMINJul
WTSP	9	3.138	1028	5	TMINJul
WTSP	6	3.492	5466	3	PCPMay
WTSP	7	8.925	15521	3	PCPMay
WWCR	2	0.000	317	1	TMAXSDFeb
WWCR	6	0.127	22732	4	TMAXFeb
WWCR	7	1.184	225	4	TMAXFeb
WWCR	8	0.128	1933	5	TMINSDJun
WWCR	10	0.156	1837	9	TAVGSDJan
WWCR	11	0.872	1769	9	TAVGSDJan
YBFL	4	0.001	5967	2	TAVGSDJul
YBFL	5	0.029	8930	2	TAVGSDJul
YBFL	8	0.053	861	6	PCPSDMay
YBFL	10	0.108	3358	9	TMINApr
YBFL	11	0.269	9316	9	TMINApr
YBFL	7	1.145	255	3	TMAXSDMay
YWAR	4	0.084	20843	2	NDVIApr
YWAR	5	0.576	2811	2	NDVIApr
YWAR	8	0.066	571	6	TMINSDMay
YWAR	9	0.411	1374	6	TMINSDMay
YWAR	10	0.351	388	7	TMAXSDAug