

One x One Degree
Climate Change Atlas Tree Species
 Current and Potential Future Habitat, Capability, and Migration

sq. km sq. mi FIA Plots
 Area of Region 10,066 3,886.5 310

Species Information

The columns below provide brief summaries of the species associated with the region and described in the table on the next pages. Definitions are provided in the Excel file for this region.

Genus	Species	Abundance		Model		Potential Change in Habitat Suitability		Capability to Cope or Persist		Migration Potential					
				Reliability	Adaptability	Scenario RCP45	Scenario RCP85	Scenario RCP45	Scenario RCP85	SHIFT RCP45	SHIFT RCP85				
Ash	3			High	23	26	Increase	24	30	Very Good	11	15	Likely	1	1
Hickory	5			Medium	31	53	No Change	18	16	Good	13	14	Infill	13	19
Maple	7	Abundant	6	Low	37	16	Decrease	28	24	Fair	12	13	Migrate	4	12
Oak	12	Common	29	FIA	8		New	17	17	Poor	22	20		18	32
Pine	6	Rare	43				Unknown	12	12	Very Poor	10	7			
Other	45	Absent	18					99	99	FIA Only	5	5			
	78		96		99	95				Unknown	4	4			
											77	78			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	57.5	59.4	61.6	61.7	
Average	CCSM85	57.5	59.8	62.3	65.1	
	GFDL45	57.5	60.2	62.6	63.3	
	GFDL85	57.5	60.3	63.7	67.2	
	HAD45	57.5	59.8	62.8	64.1	
	HAD85	57.5	60.1	64.5	68.4	
Growing Season	CCSM45	71.9	73.7	75.7	76.2	
	CCSM85	71.9	73.9	76.6	80.3	
May—Sep	GFDL45	71.9	74.9	77.7	79.0	
	GFDL85	71.9	75.2	79.2	83.2	
	HAD45	71.9	75.0	77.8	79.3	
	HAD85	71.9	75.1	81.3	84.9	
Coldest Month	CCSM45	36.1	38.4	39.4	39.4	
	CCSM85	36.1	39.0	39.8	41.1	
Average	GFDL45	36.1	39.5	39.5	39.8	
	GFDL85	36.1	37.9	39.0	39.5	
	HAD45	36.1	35.8	37.9	38.2	
	HAD85	36.1	37.1	38.6	40.2	
Warmest Month	CCSM45	76.7	78.7	79.7	79.9	
	CCSM85	76.7	78.9	80.5	82.3	
Average	GFDL45	76.7	80.0	81.4	82.2	
	GFDL85	76.7	80.2	82.7	84.7	
	HAD45	76.7	80.8	82.9	83.6	
	HAD85	76.7	81.5	85.9	87.6	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	55.9	58.7	62.8	61.3	
Total	CCSM85	55.9	60.7	62.4	67.5	
	GFDL45	55.9	62.9	64.4	69.1	
	GFDL85	55.9	62.3	65.9	67.7	
	HAD45	55.9	54.5	59.2	60.4	
	HAD85	55.9	59.0	53.7	57.9	
Growing Season	CCSM45	22.9	23.8	25.2	25.0	
	CCSM85	22.9	24.3	23.5	25.9	
May—Sep	GFDL45	22.9	27.1	27.2	28.6	
	GFDL85	22.9	26.0	28.1	28.6	
	HAD45	22.9	22.4	22.5	22.9	
	HAD85	22.9	24.3	18.8	21.2	

NOTE: For the six climate variables, four 30-year periods are used to indicate six potential future trajectories. The period ending in 2009 is based on modeled observations from the PRISM Climate Group and the three future periods were obtained from the NASA NEX-DCP30 dataset. Future climate projections from three models under two emission scenarios show estimates of each climate variable within the region. The three models are CCSM4, GFDL CM3, and HadGEM2-ES and the emission scenarios are the 4.5 and 8.5 RCP. The average value for the region is reported, even though locations within the region may vary substantially based on latitude, elevation, land-use, or other factors.

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
Virginia pine	Pinus virginiana	NDH	High	75.7	1119.8	10.9	Sm. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	1
red maple	Acer rubrum	WDH	High	78.6	925.4	7.9	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
yellow-poplar	Liriodendron tulipifera	WDH	High	77.6	828.6	7.8	Sm. dec.	Lg. dec.	High	Abundant	Good	Good			1	3
chestnut oak	Quercus prinus	NDH	High	59	760.4	10.1	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	4
white oak	Quercus alba	WDH	Medium	71.6	690.6	6.4	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	5
loblolly pine	Pinus taeda	WDH	High	33.2	593.3	14.7	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	6
sourwood	Oxydendrum arboreum	NDL	High	71.6	404.5	3.6	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	7
eastern white pine	Pinus strobus	WDH	High	33.6	393.3	7.9	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	8
southern red oak	Quercus coccinea	WDL	Medium	45.8	364.8	5.5	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	9
scarlet oak	Quercus velutina	WDL	Medium	54.7	303.0	3.6	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	10
blackgum	Nyssa sylvatica	WDL	Medium	72.2	291.4	2.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	11
shortleaf pine	Pinus echinata	WDH	High	47	290.1	3.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	12
eastern redcedar	Juniperus virginiana	WDH	Medium	36.9	285.1	6.8	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	13
black cherry	Prunus serotina	WDL	Medium	57	282.0	4.0	No change	Sm. inc.	Low	Common	Poor	Fair			1	14
pignut hickory	Carya glabra	WDL	Medium	60.3	271.5	3.1	No change	Sm. dec.	Medium	Common	Fair	Poor			1	15
sweetgum	Liquidambar styraciflua	WDH	High	35.3	256.4	6.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
black oak	Quercus velutina	WDH	High	57	243.5	3.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	17
mockernut hickory	Carya alba	WDL	Medium	56.5	240.4	3.0	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	18
northern red oak	Quercus rubra	WDH	Medium	50.4	177.1	2.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	19
eastern hemlock	Tsuga canadensis	NSH	High	25	171.6	4.1	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	20
post oak	Quercus stellata	WDH	High	41	165.2	3.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	21
winged elm	Ulmus alata	WDL	Medium	23.3	162.8	5.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	22
flowering dogwood	Cornus florida	WDL	Medium	60.1	142.7	1.7	No change	No change	Medium	Common	Fair	Fair			1	23
shagbark hickory	Carya ovata	WSL	Medium	28.6	138.8	3.1	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	24
sugar maple	Acer saccharum	WDH	High	33.4	138.0	2.7	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	25
green ash	Fraxinus pennsylvanica	WSH	Low	18.9	100.5	4.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	26
hackberry	Celtis occidentalis	WDH	Medium	13.9	96.3	6.3	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	27
American elm	Ulmus americana	WDH	Medium	12	82.9	4.0	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	28
chinkapin oak	Quercus muehlenbergii	NSL	Medium	12.8	80.6	5.6	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	29
sweet birch	Betula lenta	NDH	High	17.3	74.5	2.5	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	0	30
American beech	Fagus grandifolia	WDH	High	19.8	72.1	1.9	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good	Infill ++	Infill ++	1	31
eastern redbud	Cercis canadensis	NSL	Low	20	66.0	2.2	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	32
black locust	Robinia pseudoacacia	NDH	Low	26.2	59.7	1.6	No change	Sm. inc.	Medium	Common	Fair	Good			1	33
white ash	Fraxinus americana	WDL	Medium	17.2	59.2	2.4	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	34
pitch pine	Pinus rigida	NSH	High	13.1	50.0	3.2	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	35
sassafras	Sassafras albidum	WSL	Low	33.1	47.0	1.0	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	36
common persimmon	Diospyros virginiana	NSL	Low	13	45.7	1.7	Sm. inc.	Sm. inc.	High	Rare	Good	Good			1	37
sycamore	Platanus occidentalis	NSL	Low	6.2	41.3	2.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	38
bitternut hickory	Carya cordiformis	WSL	Low	10.2	39.7	3.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	39
black walnut	Juglans nigra	WDH	Low	14.2	38.8	2.1	No change	No change	Medium	Rare	Poor	Poor			1	40
boxelder	Acer negundo	WSH	Low	7.4	37.4	3.1	No change	No change	High	Rare	Fair	Fair			1	41
yellow birch	Betula alleghaniensis	NDL	High	4.1	37.0	4.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	42
slippery elm	Ulmus rubra	WSL	Low	7.1	32.9	2.8	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	43
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	10.2	27.9	1.3	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	44
sugarberry	Celtis laevigata	NDH	Medium	1	25.3	25.5	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	45
yellow buckeye	Aesculus flava	NSL	Low	3.3	21.5	2.6	No change	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	46
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	13.1	19.2	1.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	47



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serviceberry	Amelanchier spp.	NSL	Low	16.3	13.3	0.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0	48
Table Mountain pine	Pinus pungens	NSL	Low	6	13.2	2.2	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +		2	49
American holly	Ilex opaca	NSL	Medium	12.2	13.0	0.6	Sm. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair		Infill +		1	50
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	7.2	11.8	1.2	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good				1	51
paulownia	Paulownia tomentosa	NSL	FIA	3.1	11.1	2.7	Unknown	Unknown	NA	Rare	NNIS	NNIS				0	52
American basswood	Tilia americana	WSL	Medium	4.2	10.4	0.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +		1	53
red mulberry	Morus rubra	NSL	Low	4.1	8.7	1.6	No change	No change	Medium	Rare	Poor	Poor		Infill +		1	54
silverbell	Halesia spp.	NSL	Low	1.1	6.9	0.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +		2	55
striped maple	Acer pensylvanicum	NSL	Medium	4.3	6.6	0.5	No change	No change	Medium	Rare	Poor	Poor		Infill +		1	56
sand hickory	Carya pallida	NSL	FIA	3.9	5.1	0.6	Unknown	Unknown	NA	Rare	FIA Only	FIA Only				0	57
cucumbertree	Magnolia acuminata	NSL	Low	3.8	4.8	0.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +		2	58
blackjack oak	Quercus marilandica	NSL	Medium	2.2	4.8	1.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++		2	59
silver maple	Acer saccharinum	NSH	Low	1.9	4.4	2.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor				0	60
Shumard oak	Quercus shumardii	NSL	Low	4	4.2	1.1	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +		2	61
ailanthus	Ailanthus altissima	NSL	FIA	3.7	3.8	0.9	Unknown	Unknown	NA	Rare	NNIS	NNIS				0	62
bigleaf magnolia	Magnolia macrophylla	NSL	Low	2.1	3.6	0.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0	63
willow oak	Quercus phellos	NSL	Low	3	2.6	0.9	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +		2	64
black willow	Salix nigra	NSH	Low	0.1	2.2	0.3	No change	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +		2	65
honeylocust	Gleditsia triacanthos	NSH	Low	1	1.8	1.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good				2	66
wild plum	Prunus americana	NSLX	FIA	1	1.5	1.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0	67
Osage-orange	Maclura pomifera	NDH	Medium	1	1.5	1.5	Very Lg. dec.	Sm. inc.	High	Rare	Lost	Good				2	68
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	1	1.4	1.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0	69
white mulberry	Morus alba	NSL	FIA	1	0.9	0.9	Unknown	Unknown	NA	Rare	NNIS	NNIS				0	70
American chestnut	Castanea dentata	NSLX	FIA	2	0.7	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0	71
pawpaw	Asimina triloba	NSL	Low	1	0.7	0.7	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0	72
butternut	Juglans cinerea	NSLX	FIA	1	0.5	0.5	Unknown	Unknown	Low	Rare	FIA Only	FIA Only				0	73
red spruce	Picea rubens	NDH	High	1	0.5	0.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				0	74
black maple	Acer nigrum	NSH	Low	0.1	0.4	0.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor				0	75
mountain maple	Acer spicatum	NSL	Low	1	0.4	0.4	No change	No change	High	Rare	Fair	Fair				0	76
blue ash	Fraxinus quadrangulata	NSL	Low	1	0.3	0.3	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor				0	77
overcup oak	Quercus lyrata	NSL	Medium	1	0.1	0.1	Lg. dec.	No change	Low	Rare	Very Poor	Very Poor				0	78
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0	79
slash pine	Pinus elliottii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3	80
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3	81
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +		3	82
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0	83
river birch	Betula nigra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3	84
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3	85
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +		3	86
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3	87
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3	88
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3	89
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3	90
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +		3	91
bigtooth aspen	Populus grandidentata	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0	92
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0	93
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3	94



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laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	95
swamp chestnut oak	Quercus michauxii	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 96
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	97
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	98
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	99