

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	9,813.8	3,789.1	311

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	2			High	21	26	Increase	28	38	Very Good	8	10
Hickory	5			Medium	28	52	No Change	13	7	Good	20	24
Maple	4	Abundant	5	Low	39	13	Decrease	21	17	Fair	12	12
Oak	11	Common	26	FIA	6		New	11	15	Poor	11	9
Pine	6	Rare	37				Unknown	21	17	Very Poor	10	7
Other	40	Absent	24							FIA Only	3	3
	68		92		94	91		94	94	Unknown	15	11
											79	76

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	54.8	56.7	58.9	59.1	
	CCSM85	54.8	57.1	59.6	62.6	
	GFDL45	54.8	57.6	60.3	61.2	
	GFDL85	54.8	58.0	61.4	65.3	
	HAD45	54.8	57.3	60.6	61.8	
HAD85	54.8	57.5	61.6	66.0		
Growing Season May—Sep	CCSM45	69.6	71.5	73.5	74.1	
	CCSM85	69.6	71.8	74.4	78.3	
	GFDL45	69.6	72.7	75.9	77.2	
	GFDL85	69.6	73.4	77.3	81.6	
	HAD45	69.6	72.5	75.7	77.2	
HAD85	69.6	72.6	77.8	82.6		
Coldest Month Average	CCSM45	32.9	34.9	36.0	36.4	
	CCSM85	32.9	35.3	36.5	37.6	
	GFDL45	32.9	36.3	36.7	37.4	
	GFDL85	32.9	35.3	36.2	37.4	
	HAD45	32.9	34.0	35.9	36.1	
HAD85	32.9	34.4	35.9	37.4		
Warmest Month Average	CCSM45	75.0	77.2	78.3	78.5	
	CCSM85	75.0	77.4	79.2	80.9	
	GFDL45	75.0	78.4	80.0	81.1	
	GFDL85	75.0	79.5	81.7	84.2	
	HAD45	75.0	78.4	80.5	81.5	
HAD85	75.0	79.2	82.5	85.6		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	43.8	47.9	49.8	50.0	
	CCSM85	43.8	49.1	50.3	55.8	
	GFDL45	43.8	48.8	51.2	53.1	
	GFDL85	43.8	46.1	51.5	52.8	
	HAD45	43.8	46.8	47.5	46.8	
HAD85	43.8	48.7	46.9	49.1		
Growing Season May—Sep	CCSM45	19.9	23.7	24.5	24.5	
	CCSM85	19.9	23.5	23.3	25.9	
	GFDL45	19.9	22.0	22.9	23.9	
	GFDL85	19.9	20.3	23.0	23.4	
	HAD45	19.9	22.5	21.2	20.7	
HAD85	19.9	22.8	21.6	22.2		

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
chestnut oak	Quercus prinus	NDH	High	72.3	1557.2	16.0	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
yellow-poplar	Liriodendron tulipifera	WDH	High	81.3	1249.8	13.1	Sm. dec.	Lg. dec.	High	Abundant	Good	Good			1	2
red maple	Acer rubrum	WDH	High	92.8	934.3	8.0	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
Virginia pine	Pinus virginiana	NDH	High	75.5	860.7	9.5	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	4
white oak	Quercus alba	WDH	Medium	84.5	674.2	6.1	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	5
loblolly pine	Pinus taeda	WDH	High	22.4	407.2	13.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	6
scarlet oak	Quercus coccinea	WDL	Medium	57.7	392.3	5.0	No change	Sm. dec.	Medium	Common	Fair	Poor			1	7
black locust	Robinia pseudoacacia	NDH	Low	63.5	375.3	4.6	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	8
northern red oak	Quercus rubra	WDH	Medium	66.3	365.3	4.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	9
eastern white pine	Pinus strobus	WDH	High	39.9	332.8	5.6	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	10
blackgum	Nyssa sylvatica	WDL	Medium	80.1	325.5	3.2	No change	Sm. inc.	High	Common	Good	Very Good			1	11
black oak	Quercus velutina	WDH	High	69.3	278.1	3.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	12
sourwood	Oxydendrum arboreum	NDL	High	54.6	256.4	4.3	No change	Sm. dec.	High	Common	Good	Fair			1	13
eastern redcedar	Juniperus virginiana	WDH	Medium	38.8	250.7	4.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	14
mockernut hickory	Carya alba	WDL	Medium	65.7	240.2	2.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	15
pignut hickory	Carya glabra	WDL	Medium	56.1	188.8	2.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	16
black cherry	Prunus serotina	WDL	Medium	49.4	183.5	3.1	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	17
pitch pine	Pinus rigida	NSH	High	30.3	168.3	3.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	18
green ash	Fraxinus pennsylvanica	WSH	Low	37.6	161.9	3.7	No change	Sm. inc.	Medium	Common	Fair	Good			1	19
white ash	Fraxinus americana	WDL	Medium	29.4	140.4	3.3	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	20
sweet birch	Betula lenta	NDH	High	23	118.9	4.4	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	21
black walnut	Juglans nigra	WDH	Low	26.3	114.7	3.7	No change	Sm. inc.	Medium	Common	Fair	Good			1	22
ailanthus	Ailanthus altissima	NSL	FIA	31.7	111.0	3.3	Unknown	Unknown	NA	Common	NNIS	NNIS			0	23
American beech	Fagus grandifolia	WDH	High	25	109.1	3.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	24
sugar maple	Acer saccharum	WDH	High	17.4	82.6	3.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	25
flowering dogwood	Cornus florida	WDL	Medium	44.9	79.4	1.4	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	26
southern red oak	Quercus falcata	WDL	Medium	26.9	76.2	2.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	27
sassafras	Sassafras albidum	WSL	Low	31.4	74.2	2.0	No change	No change	Medium	Common	Fair	Fair			1	28
sycamore	Platanus occidentalis	NSL	Low	16.6	68.8	2.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	29
eastern redbud	Cercis canadensis	NSL	Low	29.5	64.0	1.7	No change	Sm. inc.	Medium	Common	Fair	Good			1	30
Table Mountain pine	Pinus pungens	NSL	Low	16.4	56.0	3.5	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	31
eastern hemlock	Tsuga canadensis	NSH	High	17.2	49.2	2.6	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	1	32
American basswood	Tilia americana	WSL	Medium	15	47.5	2.5	No change	No change	Medium	Rare	Poor	Poor			1	33
shortleaf pine	Pinus echinata	WDH	High	14.8	47.0	3.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	34
American hornbeam; muscley	Carpinus caroliniana	WSL	Low	23.8	45.8	1.8	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	35
shagbark hickory	Carya ovata	WSL	Medium	13	43.8	1.5	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	36
common persimmon	Diospyros virginiana	NSL	Low	15.5	38.8	2.3	No change	Lg. inc.	High	Rare	Fair	Good			1	37
cucumbertree	Magnolia acuminata	NSL	Low	24.9	38.0	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	38
bitternut hickory	Carya cordiformis	WSL	Low	16.4	34.1	1.5	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	39
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	10.2	23.6	1.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	40
yellow birch	Betula alleghaniensis	NDL	High	4.5	22.0	3.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	41
striped maple	Acer pensylvanicum	NSL	Medium	12.5	21.7	1.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	42
paulownia	Paulownia tomentosa	NSL	FIA	4.9	18.1	3.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	43
American elm	Ulmus americana	WDH	Medium	15.5	17.6	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	44
slippery elm	Ulmus rubra	WSL	Low	12.9	16.7	0.8	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	45
serviceberry	Amelanchier spp.	NSL	Low	21.8	15.7	0.4	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	46
post oak	Quercus stellata	WDH	High	10.1	15.2	1.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	47



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sweetgum	Liquidambar styraciflua	WDH	High	4.7	14.1	2.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	48
pin cherry	Prunus pensylvanica	NSL	Low	4.1	13.5	3.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	49
boxelder	Acer negundo	WSH	Low	6.1	12.4	2.0	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	1	50
willow oak	Quercus phellos	NSL	Low	2.9	9.4	2.8	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	51
Siberian elm	Ulmus pumila	NDH	FIA	1	6.9	6.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	52
pawpaw	Asimina triloba	NSL	Low	5.2	6.0	0.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	53
river birch	Betula nigra	NSL	Low	1	4.9	4.8	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +	Infill ++	2	54
hackberry	Celtis occidentalis	WDH	Medium	6.1	4.9	0.8	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	55
blackjack oak	Quercus marilandica	NSL	Medium	3.3	4.5	0.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	56
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	2.3	4.4	1.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	57
winged elm	Ulmus alata	WDL	Medium	2	3.9	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	58
butternut	Juglans cinerea	NSLX	FIA	1	3.2	3.1	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	59
red mulberry	Morus rubra	NSL	Low	3.7	3.0	0.7	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	60
black willow	Salix nigra	NSH	Low	1	2.7	2.6	Lg. dec.	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	61
American chestnut	Castanea dentata	NSLX	FIA	5.2	2.3	0.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	62
chinkapin oak	Quercus muehlenbergii	NSL	Medium	2	2.0	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	63
Osage-orange	Maclura pomifera	NDH	Medium	0.8	1.2	0.9	Very Lg. dec.	No change	High	Rare	Lost	Fair		Infill +	2	64
shellbark hickory	Carya laciniosa	NSL	Low	1	1.1	1.1	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	65
honeylocust	Gleditsia triacanthos	NSH	Low	1	0.7	0.7	Lg. dec.	Lg. inc.	High	Rare	Poor	Good			2	66
yellow buckeye	Aesculus flava	NSL	Low	0.1	0.6	0.0	No change	No change	Low	Rare	Very Poor	Very Poor			2	67
American holly	Ilex opaca	NSL	Medium	0.9	0.5	0.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	68
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	69
northern white-cedar	Thuja occidentalis	WSH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	70
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	71
black maple	Acer nigrum	NSH	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	72
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	73
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	74
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	75
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	76
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat		Likely +	3	77
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	78
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat		Likely +	3	79
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	80
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	81
redbay	Persea borbonia	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	82
eastern cottonwood	Populus deltoides	NSH	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	83
bigtooth aspen	Populus grandidentata	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	84
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	85
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	86
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat		Migrate +	3	87
bur oak	Quercus macrocarpa	NDH	Medium	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	88
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	89
pin oak	Quercus palustris	NSH	Low	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	90
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat		Migrate +	3	91
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	92
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	93
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	94

