

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

Area of Region    sq. km    sq. mi    FIA Plots  
137,739    53,181    3,483

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	Scenario	Scenario	Scenario	SHIFT	SHIFT				
				High	20	28	Increase	39	44	Very Good	16	17	Likely	1	1
Ash	4			Medium	37	59	No Change	24	20	Good	13	18	Infill	27	27
Hickory	8			Low	43	16	Decrease	18	17	Fair	21	15	Migrate	6	6
Maple	5	Abundant	5	FIA	9		New	11	11	Poor	15	17			
Oak	20	Common	24				Unknown	17	17	Very Poor	15	13			
Pine	2	Rare	61							FIA Only	6	6			
Other	51	Absent	19							Unknown	9	9			
	<b>90</b>		<b>109</b>		<b>109</b>	<b>103</b>		<b>109</b>	<b>109</b>		<b>95</b>	<b>95</b>		<b>34</b>	<b>34</b>

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099	
Annual	60.8	62.6	64.5	64.8	
Average	60.8	62.9	65.4	68.2	
GFDL45	60.8	64.3	65.5	66.6	
GFDL85	60.8	63.7	66.6	70.2	
HAD45	60.8	63.3	66.2	67.5	
HAD85	60.8	63.6	68.1	71.8	
Growing Season	75.8	77.5	79.1	79.7	
May—Sep	75.8	80.0	81.3	83.2	
GFDL45	75.8	79.5	82.7	87.3	
GFDL85	75.8	78.9	81.7	82.9	
HAD45	75.8	79.2	85.3	88.6	
HAD85	75.8	79.2	85.3	88.6	
Coldest Month	38.1	40.4	41.5	41.7	
Average	38.1	40.7	41.8	43.3	
GFDL45	38.1	42.0	42.2	42.3	
GFDL85	38.1	39.4	40.8	41.4	
HAD45	38.1	39.1	41.1	41.4	
HAD85	38.1	40.3	42.1	43.9	
Warmest Month	81.4	83.0	83.9	84.1	
Average	81.4	83.7	84.6	86.4	
GFDL45	81.4	86.0	86.7	88.0	
GFDL85	81.4	85.7	87.2	90.4	
HAD45	81.4	85.2	87.0	87.3	
HAD85	81.4	86.2	89.8	90.9	

Precipitation (in)

Scenario	2009	2039	2069	2099	
Annual	50.7	50.5	54.8	53.2	
Total	50.7	52.2	54.9	56.0	
GFDL45	50.7	54.9	60.0	56.8	
GFDL85	50.7	55.0	59.9	60.6	
HAD45	50.7	49.6	53.6	55.6	
HAD85	50.7	54.4	47.7	52.0	
Growing Season	19.3	18.6	18.9	18.8	
May—Sep	19.3	20.9	22.3	21.7	
GFDL45	19.3	21.6	23.3	22.9	
GFDL85	19.3	18.0	18.4	17.9	
HAD45	19.3	19.3	14.4	14.7	
HAD85	19.3	19.3	14.4	14.7	

**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-DPC30 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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Current and Potential Future Habitat, Capability, and Migration

Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
loblolly pine	Pinus taeda	WDH	High	39	1497.2	38.4	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	1
shortleaf pine	Pinus echinata	WDH	High	38.7	638.3	16.3	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	2
white oak	Quercus alba	WDH	Medium	61.3	587.8	9.8	No change	No change	High	Abundant	Very Good	Very Good			1	3
post oak	Quercus stellata	WDH	High	56.5	561.4	9.9	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	4
sweetgum	Liquidambar styraciflua	WDH	High	55.8	540.0	10.1	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	5
eastern redcedar	Juniperus virginiana	WDH	Medium	37	352.0	9.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
black hickory	Carya texana	NDL	High	50.2	308.2	6.2	No change	No change	Medium	Common	Fair	Fair			1	7
black oak	Quercus velutina	WDH	High	37.4	271.0	6.9	No change	Sm. dec.	Medium	Common	Fair	Poor			1	8
winged elm	Ulmus alata	WDH	Medium	64.9	232.7	3.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	9
southern red oak	Quercus falcata	WDL	Medium	45	221.7	5.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	10
northern red oak	Quercus rubra	WDH	Medium	32.8	221.2	6.7	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	11
mockernut hickory	Carya alba	WDL	Medium	51.3	195.6	4.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	12
blackgum	Nyssa sylvatica	WDL	Medium	51.2	165.9	3.3	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	13
water oak	Quercus nigra	WDH	High	32.6	159.6	5.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	14
red maple	Acer rubrum	WDH	High	49.5	159.0	3.5	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	15
sugarberry	Celtis laevigata	NDH	Medium	22.2	142.0	8.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
green ash	Fraxinus pennsylvanica	WSH	Low	41	136.0	4.4	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	17
willow oak	Quercus phellos	NSL	Low	26.2	135.7	6.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	18
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	25.3	92.8	4.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	19
blackjack oak	Quercus marilandica	NSL	Medium	18.6	81.4	4.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	20
American elm	Ulmus americana	WDH	Medium	27.3	78.9	3.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	21
overcup oak	Quercus lyrata	NSL	Medium	14.5	76.9	8.5	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair	Infill +	Infill +	1	22
black cherry	Prunus serotina	WDL	Medium	37.2	74.7	2.3	Sm. inc.	Lg. inc.	Low	Common	Fair	Good			1	23
boxelder	Acer negundo	WSH	Low	10.5	65.6	7.3	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	24
black willow	Salix nigra	NSH	Low	9.5	65.0	11.4	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	25
common persimmon	Diospyros virginiana	NSL	Low	27.6	61.5	2.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	26
slippery elm	Ulmus rubra	WSL	Low	24.9	59.5	3.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	27
flowering dogwood	Cornus florida	WDL	Medium	36.5	56.6	1.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	28
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	20.2	53.5	2.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	29
sycamore	Platanus occidentalis	NSL	Low	13.1	49.2	4.4	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	30
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	24.8	47.9	1.9	Sm. inc.	Sm. inc.	High	Rare	Good	Good			1	31
white ash	Fraxinus americana	WDL	Medium	20.4	47.5	2.4	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor			1	32
bald cypress	Taxodium distichum	NSH	Medium	7	44.5	9.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	33
sassafras	Sassafras albidum	WSL	Low	19.3	40.7	2.2	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	34
shagbark hickory	Carya ovata	WSL	Medium	13.5	36.7	3.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	35
Nuttall oak	Quercus texana	NSH	Medium	10.1	36.7	7.8	No change	No change	High	Rare	Fair	Fair			0	36
water hickory	Carya aquatica	NSL	Medium	10.4	35.1	6.6	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	37
honeylocust	Gleditsia triacanthos	NSH	Low	11.1	34.9	3.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	38
pecan	Carya illinoensis	NSH	Low	7.5	33.7	6.6	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	39
water tupelo	Nyssa aquatica	NSH	Medium	4.3	33.5	16.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	40
florida maple	Acer barbatum	NSL	Low	9.7	32.7	4.1	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	41
bitternut hickory	Carya cordiformis	WSL	Low	12	32.6	2.9	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	42
chinkapin oak	Quercus muehlenbergii	NSL	Medium	10.2	29.2	2.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	43
hackberry	Celtis occidentalis	WDH	Medium	9.3	28.7	3.2	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	44
black walnut	Juglans nigra	WDH	Low	8.9	28.6	3.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	45
American holly	Ilex opaca	NSL	Medium	13	28.3	2.1	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	46
eastern cottonwood	Populus deltoides	NSH	Low	3.6	22.8	9.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
black locust	Robinia pseudoacacia	NDH	Low	6.4	22.1	3.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	48
water elm	Planera aquatica	NSL	Low	5.9	19.4	6.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	49
American beech	Fagus grandifolia	WDH	High	5.1	18.3	3.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	50
silver maple	Acer saccharinum	NSH	Low	3.6	18.2	5.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	51
pignut hickory	Carya glabra	WDL	Medium	8	17.9	2.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	52
eastern redbud	Cercis canadensis	NSL	Low	11.6	16.6	1.5	No change	Sm. inc.	Medium	Rare	Poor	Fair			0	53
swamp chestnut oak	Quercus michauxii	NSL	Low	7.8	14.4	2.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	54
Shumard oak	Quercus shumardii	NSL	Low	5.5	13.7	3.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	55
Osage-orange	Maclura pomifera	NDH	Medium	1.8	11.8	5.9	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	56
red mulberry	Morus rubra	NSL	Low	9.2	11.3	1.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	57
river birch	Betula nigra	NSL	Low	3.3	10.2	4.3	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	58
ashe juniper	Juniperus ashei	NDH	High	0.7	8.5	13.0	Lg. inc.	Lg. inc.	NA	Rare	Unknown	Unknown			0	59
cedar elm	Ulmus crassifolia	NDH	Medium	3.2	8.3	5.3	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	60
serviceberry	Amelanchier spp.	NSL	Low	7.5	7.6	1.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	61
sugar maple	Acer saccharum	WDH	High	1.5	7.5	2.5	Lg. dec.	Sm. dec.	High	Rare	Poor	Poor			0	62
waterlocust	Gleditsia aquatica	NSLX	FIA	4	5.9	3.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	63
pawpaw	Asimina triloba	NSL	Low	2.5	5.1	2.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	64
American basswood	Tilia americana	WSL	Medium	3.9	4.9	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	65
sweetbay	Magnolia virginiana	NSL	Medium	2.1	4.5	2.1	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	66
yellow-poplar	Liriodendron tulipifera	WDH	High	0.9	3.7	4.3	No change	Sm. inc.	High	Rare	Fair	Good	Infill +		2	67
laurel oak	Quercus laurifolia	NDH	Medium	0.9	3.1	3.0	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	68
blue ash	Fraxinus quadrangulata	NSL	Low	0.4	2.5	6.7	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	69
swamp tupelo	Nyssa biflora	NDH	Medium	0.3	1.7	5.5	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			2	70
wild plum	Prunus americana	NSLX	FIA	1.7	1.6	1.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	71
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	1.6	1.1	0.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	72
paulownia	Paulownia tomentosa	NSL	FIA	0.4	1.0	2.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	73
northern catalpa	Catalpa speciosa	NSHX	FIA	0.5	0.9	3.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	74
shellbark hickory	Carya laciniosa	NSL	Low	0.8	0.9	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	75
butternut	Juglans cinerea	NSLX	FIA	0.3	0.7	1.8	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	76
bur oak	Quercus macrocarpa	NDH	Medium	0.1	0.6	4.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	77
cucumbertree	Magnolia acuminata	NSL	Low	0.3	0.6	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	78
ailanthus	Ailanthus altissima	NSL	FIA	0.9	0.6	1.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	79
shingle oak	Quercus imbricaria	NDH	Medium	0.1	0.5	6.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	80
scarlet oak	Quercus coccinea	WDL	Medium	0.1	0.3	0.3	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	81
white mulberry	Morus alba	NSL	FIA	0.1	0.2	2.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	82
sourwood	Oxydendrum arboreum	NDL	High	0	0.2	0.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	83
Ohio buckeye	Aesculus glabra	NSL	Low	0.1	0.1	0.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	84
pin oak	Quercus palustris	NSH	Low	0.1	0.1	1.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	85
bluejack oak	Quercus incana	NSL	Low	0.1	0.1	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	86
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	0.1	0.1	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	87
redbay	Persea borbonia	NSL	Low	0.1	0.1	0.7	No change	Sm. inc.	High	Rare	Fair	Good			0	88
Carolina ash	Fraxinus caroliniana	NSL	FIA	0.3	0.0	2.1	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	89
southern magnolia	Magnolia grandiflora	NSL	Low	0.1	0.0	0.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	90
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	91
slash pine	Pinus elliottii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	92
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	93
eastern white pine	Pinus strobus	WDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	94

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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	<i>Pinus virginiana</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	95
striped maple	<i>Acer pensylvanicum</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	96
mountain maple	<i>Acer spicatum</i>	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	97
yellow buckeye	<i>Aesculus flava</i>	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	98
yellow birch	<i>Betula alleghaniensis</i>	NDL	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	99
sweet birch	<i>Betula lenta</i>	NDH	High	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	100
black ash	<i>Fraxinus nigra</i>	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	101
silverbell	<i>Halesia spp.</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	102
bigleaf magnolia	<i>Magnolia macrophylla</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	103
mountain or Fraser magnolia	<i>Magnolia fraseri</i>	NSL	Low	0	0	0	Unknown	Unknown	NA	Absent	Unknown	Unknown			0	104
pin cherry	<i>Prunus pensylvanica</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	105
swamp white oak	<i>Quercus bicolor</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	106
northern pin oak	<i>Quercus ellipsoidalis</i>	NSH	Medium	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	107
chestnut oak	<i>Quercus prinus</i>	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	108
live oak	<i>Quercus virginiana</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	109