

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

	sq. km	sq. mi	FIA Plots
Area of Region	79,945	30,867	2,501

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	4			High	23	28	Increase	31	36	Very Good	13	14	Likely	1	1
Hickory	8			Medium	38	59	No Change	35	33	Good	15	18	Infill	35	36
Maple	4	Abundant	4	Low	41	16	Decrease	24	21	Fair	17	18	Migrate	1	2
Oak	21	Common	26	FIA	10		New	7	9	Poor	22	19			
Pine	9	Rare	70				Unknown	15	13	Very Poor	21	19			
Other	54	Absent	12							FIA Only	7	7			
										Unknown	7	5			
	<b>100</b>		<b>112</b>		<b>112</b>	<b>103</b>		<b>112</b>	<b>112</b>		<b>102</b>	<b>100</b>		<b>37</b>	<b>39</b>

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	62.9	64.6	66.6	66.6	
	CCSM85	62.9	64.9	67.2	69.9	
	GFDL45	62.9	65.7	67.6	68.4	
	GFDL85	62.9	65.6	68.7	72.3	
	HAD45	62.9	65.0	67.7	69.1	
HAD85	62.9	65.3	68.9	72.8		
Growing Season (May—Sep)	CCSM45	76.2	77.8	79.4	79.9	
	CCSM85	76.2	77.9	80.4	83.7	
	GFDL45	76.2	79.2	81.1	82.4	
	GFDL85	76.2	79.2	82.5	86.6	
	HAD45	76.2	79.0	81.4	83.0	
HAD85	76.2	79.0	83.9	87.8		
Coldest Month (Average)	CCSM45	43.1	45.5	46.3	46.2	
	CCSM85	43.1	45.3	46.4	47.6	
	GFDL45	43.1	46.1	46.4	47.0	
	GFDL85	43.1	45.1	46.1	46.8	
	HAD45	43.1	43.4	45.0	45.5	
HAD85	43.1	44.2	45.2	46.8		
Warmest Month (Average)	CCSM45	80.9	82.6	83.6	83.6	
	CCSM85	80.9	82.9	84.3	86.0	
	GFDL45	80.9	83.3	84.2	85.1	
	GFDL85	80.9	83.7	85.4	87.6	
	HAD45	80.9	84.1	85.5	86.1	
HAD85	80.9	84.5	87.5	89.5		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	47.1	50.9	53.1	54.5	
	CCSM85	47.1	51.1	54.1	59.4	
	GFDL45	47.1	52.8	56.3	59.0	
	GFDL85	47.1	51.8	58.4	58.0	
	HAD45	47.1	47.5	49.7	50.4	
HAD85	47.1	51.1	46.9	48.2		
Growing Season (May—Sep)	CCSM45	22.1	25.6	27.0	27.5	
	CCSM85	22.1	24.4	26.4	28.7	
	GFDL45	22.1	27.0	29.4	30.2	
	GFDL85	22.1	25.9	31.2	31.3	
	HAD45	22.1	22.1	22.5	22.5	
HAD85	22.1	24.1	20.1	19.3		

**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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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	89.4	3733.8	40.0	No change	No change	Medium	Abundant	Good	Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	87	1038.8	11.3	No change	No change	Medium	Abundant	Good	Good			1	2
water oak	Quercus nigra	WDH	High	77.9	573.5	7.2	Sm. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	3
red maple	Acer rubrum	WDH	High	78.1	516.1	6.1	No change	No change	High	Abundant	Very Good	Very Good			1	4
longleaf pine	Pinus palustris	NSH	Medium	20.2	280.8	14.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	5
yellow-poplar	Liriodendron tulipifera	WDH	High	42.1	259.7	5.6	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	6
swamp tupelo	Nyssa biflora	NDH	Medium	34.6	225.4	6.2	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	7
white oak	Quercus alba	WDH	Medium	39.4	215.3	5.0	No change	No change	High	Common	Good	Good			1	8
shortleaf pine	Pinus echinata	WDH	High	27	170.8	5.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	9
laurel oak	Quercus laurifolia	NDH	Medium	34.3	163.2	4.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	10
black cherry	Prunus serotina	WDL	Medium	51	147.2	2.8	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	11
southern red oak	Quercus falcata	WDL	Medium	37.2	131.9	3.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	12
eastern redcedar	Juniperus virginiana	WDH	Medium	28.5	121.6	4.1	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	13
Virginia pine	Pinus virginiana	NDH	High	12.5	109.1	7.6	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	14
willow oak	Quercus phellos	NSL	Low	30.3	99.2	3.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	15
mockernut hickory	Carya alba	WDL	Medium	37.7	98.8	2.5	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	16
blackgum	Nyssa sylvatica	WDL	Medium	43.9	91.3	1.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	17
winged elm	Ulmus alata	WDL	Medium	27.9	90.4	3.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	18
green ash	Fraxinus pennsylvanica	WSH	Low	28.6	90.3	2.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	19
post oak	Quercus stellata	WDH	High	36	89.4	2.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	20
slash pine	Pinus elliotii	NDH	High	10.5	71.3	7.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	21
sourwood	Oxydendron arboreum	NDL	High	18.1	70.0	3.2	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	22
scarlet oak	Quercus coccinea	WDL	Medium	16.3	67.0	3.5	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	23
water tupelo	Nyssa aquatica	NSH	Medium	7.9	65.8	7.8	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	24
turkey oak	Quercus laevis	NSH	Medium	8.1	60.4	7.8	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	25
pond pine	Pinus serotina	NSH	Medium	8.4	58.7	6.8	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	26
bald cypress	Taxodium distichum	NSH	Medium	12	55.4	4.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	27
American holly	Ilex opaca	NSL	Medium	28.7	54.4	1.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	28
flowering dogwood	Cornus florida	WDL	Medium	33.1	52.7	1.5	No change	Sm. inc.	Medium	Common	Fair	Good			1	29
pignut hickory	Carya glabra	WDL	Medium	21.2	52.2	2.0	No change	No change	Medium	Common	Fair	Fair			1	30
American hornbeam; muscley	Carpinus caroliniana	WSL	Low	22	49.6	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	31
redbay	Persea borbonia	NSL	Low	22.2	46.6	2.1	No change	No change	High	Rare	Fair	Fair			1	32
black willow	Salix nigra	NSH	Low	10.3	44.3	4.4	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair			1	33
northern red oak	Quercus rubra	WDH	Medium	15.1	43.1	2.4	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	34
live oak	Quercus virginiana	NDH	High	9.3	41.8	5.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	35
chestnut oak	Quercus prinus	NDH	High	4.4	41.3	5.5	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	36
American elm	Ulmus americana	WDH	Medium	19.6	40.5	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	37
black oak	Quercus velutina	WDH	High	17.8	37.4	1.9	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	38
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	12.7	33.1	2.6	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	39
sugarberry	Celtis laevigata	NDH	Medium	10	32.9	3.2	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	40
common persimmon	Diospyros virginiana	NSL	Low	20.7	32.2	1.5	Lg. dec.	No change	High	Rare	Poor	Fair			1	41
river birch	Betula nigra	NSL	Low	7	32.0	4.4	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	42
sycamore	Platanus occidentalis	NSL	Low	7.2	28.5	3.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	43
swamp chestnut oak	Quercus michauxii	NSL	Low	10.1	25.0	2.6	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	44
sweetbay	Magnolia virginiana	NSL	Medium	13.5	24.5	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	45
pond cypress	Taxodium ascendens	NSH	Medium	4.9	24.3	4.8	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	46
blackjack oak	Quercus marilandica	NSL	Medium	8.6	22.8	2.5	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
eastern white pine	Pinus strobus	WDH	High	2.5	21.5	4.7	No change	No change	Low	Rare	Very Poor	Very Poor			2	48
American beech	Fagus grandifolia	WDH	High	11.4	20.4	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	49
slippery elm	Ulmus rubra	WSL	Low	11.8	18.7	1.6	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	50
sand hickory	Carya pallida	NSL	FIA	5.5	17.8	3.0	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	51
loblolly-bay	Gordonia lasianthus	NSH	Medium	2.8	16.5	5.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	52
white ash	Fraxinus americana	WDL	Medium	8.4	16.3	1.8	No change	No change	Low	Rare	Very Poor	Very Poor			0	53
shagbark hickory	Carya ovata	WSL	Medium	7.6	15.4	2.4	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	54
bluejack oak	Quercus incana	NSL	Low	3.3	12.3	3.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	55
boxelder	Acer negundo	WSH	Low	5.9	11.7	2.7	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	1	56
water hickory	Carya aquatica	NSL	Medium	4.5	10.5	2.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	57
overcup oak	Quercus lyrata	NSL	Medium	4	10.2	2.2	No change	No change	Low	Rare	Very Poor	Very Poor			2	58
red mulberry	Morus rubra	NSL	Low	6.6	9.0	1.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	59
sassafras	Sassafras albidum	WSL	Low	9.2	9.0	1.0	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	60
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	5.6	8.6	1.5	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	61
black locust	Robinia pseudoacacia	NDH	Low	2.3	8.0	2.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	62
bitternut hickory	Carya cordiformis	WSL	Low	3.9	8.0	2.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	63
florida maple	Acer barbatum	NSL	Low	5.5	7.9	1.3	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	64
eastern hemlock	Tsuga canadensis	NSH	High	1.3	7.9	2.9	No change	No change	Low	Rare	Very Poor	Very Poor			2	65
water elm	Planera aquatica	NSL	Low	2.3	6.5	2.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	66
ailanthus	Ailanthus altissima	NSL	FIA	1.4	6.4	4.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	67
eastern cottonwood	Populus deltoides	NSH	Low	2.4	6.2	2.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	68
black walnut	Juglans nigra	WDH	Low	4.3	5.6	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	69
pecan	Carya illinoensis	NSH	Low	2.6	5.0	2.3	No change	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	70
pitch pine	Pinus rigida	NSH	High	1.2	4.1	1.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	71
spruce pine	Pinus glabra	NSL	Low	1.9	4.1	2.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	72
hackberry	Celtis occidentalis	WDH	Medium	1.5	3.9	2.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	73
southern magnolia	Magnolia grandiflora	NSL	Low	2.2	3.7	2.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	74
eastern redbud	Cercis canadensis	NSL	Low	5.2	3.7	0.6	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			0	75
sweet birch	Betula lenta	NDH	High	0.7	3.4	2.1	No change	No change	Low	Rare	Very Poor	Very Poor			2	76
cabbage palmetto	Sabal palmetto	NDH	Medium	1.5	3.3	7.3	No change	Lg. inc.	NA	Rare	Unknown	Unknown			0	77
honeylocust	Gleditsia triacanthos	NSH	Low	1.3	2.2	1.6	No change	Sm. inc.	High	Rare	Fair	Good			2	78
pawpaw	Asimina triloba	NSL	Low	1.9	1.9	1.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	79
cucumbertree	Magnolia acuminata	NSL	Low	1	1.9	1.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	80
Carolina ash	Fraxinus caroliniana	NSL	FIA	0.5	1.8	3.7	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	81
silverbell	Halesia spp.	NSL	Low	0.9	1.2	0.9	No change	Sm. dec.	Medium	Rare	Poor	Very Poor	Infill +		2	82
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0.5	0.9	1.3	No change	No change	NA	Rare	Unknown	Unknown			0	83
wild plum	Prunus americana	NSLX	FIA	1.6	0.7	0.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	84
sugar maple	Acer saccharum	WDH	High	0.2	0.7	2.0	No change	Lg. dec.	High	Rare	Fair	Poor	Infill +		2	85
waterlocust	Gleditsia aquatica	NSLX	FIA	0.1	0.7	5.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	86
paulownia	Paulownia tomentosa	NSL	FIA	0.4	0.6	1.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	87
American basswood	Tilia americana	WSL	Medium	0.3	0.5	0.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	88
shellbark hickory	Carya laciniosa	NSL	Low	0.2	0.4	1.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	89
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0.2	0.4	1.2	No change	No change	Medium	Rare	Poor	Poor			0	90
Shumard oak	Quercus shumardii	NSL	Low	0.8	0.3	1.0	Sm. dec.	No change	High	Rare	Poor	Fair			0	91
yellow birch	Betula alleghaniensis	NDL	High	0.2	0.3	0.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	92
white mulberry	Morus alba	NSL	FIA	0.5	0.3	0.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	93
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0.1	0.2	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	94

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
serviceberry	Amelanchier spp.	NSL	Low	0.3	0.2	0.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	95
butternut	Juglans cinerea	NSLX	FIA	0.1	0.2	1.5	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	96
swamp white oak	Quercus bicolor	NSL	Low	0.2	0.2	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	97
pumpkin ash	Fraxinus profunda	NSH	FIA	0.1	0.1	1.1	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	98
yellow buckeye	Aesculus flava	NSL	Low	0.2	0.1	0.4	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	99
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	0.1	0.1	0.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	100
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	NA	Absent	New Habitat	New Habitat			0	101
sand pine	Pinus clausa	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate ++	Migrate +	3	102
black maple	Acer nigrum	NSH	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			0	103
silver maple	Acer saccharinum	NSH	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	104
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	105
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	106
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	107
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	108
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat		Migrate +	3	109
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	110
Nuttall oak	Quercus texana	NSH	Medium	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	111
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			2	112