

**U.S. Census Bureau Urban Areas**  
**Climate Change Atlas Tree Species**  
 Current and Potential Future Habitat, Capability, and Migration

Area of Region    sq. km    sq. mi    FIA Plots  
 8,300.0    3,204.6    260

**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	24	26	Increase	27	32	Very Good	9	9	Likely	1	2
Hickory	5			Medium	32	54	No Change	16	20	Good	18	21	Infill	9	16
Maple	7	Abundant	5	Low	38	15	Decrease	23	14	Fair	8	13	Migrate	1	11
Oak	9	Common	23	FIA	4		New	20	22	Poor	17	14		<b>11</b>	<b>29</b>
Pine	6	Rare	42				Unknown	12	10	Very Poor	13	8			
Other	41	Absent	27					<b>98</b>	<b>98</b>	FIA Only	2	2			
	<b>70</b>		<b>97</b>		<b>98</b>	<b>95</b>				Unknown	8	6			
											<b>75</b>	<b>73</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

Scenario	2009	2039	2069	2099		
Annual	CCSM45	54.0	55.9	58.0	58.1	
Average	CCSM85	54.0	56.3	58.7	61.5	
	GFDL45	54.0	56.7	59.1	59.9	
	GFDL85	54.0	57.0	60.3	64.0	
	HAD45	54.0	56.3	59.3	60.5	
	HAD85	54.0	56.6	60.7	64.7	
Growing Season	CCSM45	67.1	69.0	70.9	71.4	
	CCSM85	67.1	69.2	71.8	75.5	
May—Sep	GFDL45	67.1	70.3	73.0	74.3	
	GFDL85	67.1	70.7	74.5	78.7	
	HAD45	67.1	70.3	73.0	74.5	
	HAD85	67.1	70.2	75.9	79.9	
Coldest Month	CCSM45	34.4	36.7	37.6	37.6	
	CCSM85	34.4	37.0	38.0	39.1	
Average	GFDL45	34.4	37.6	37.8	38.4	
	GFDL85	34.4	36.3	37.4	38.1	
	HAD45	34.4	34.5	36.3	36.7	
	HAD85	34.4	35.4	36.7	38.3	
Warmest Month	CCSM45	71.6	73.8	74.8	74.8	
	CCSM85	71.6	73.9	75.5	77.3	
Average	GFDL45	71.6	74.9	76.2	77.1	
	GFDL85	71.6	75.6	77.7	80.0	
	HAD45	71.6	75.3	77.3	78.0	
	HAD85	71.6	76.1	79.8	81.9	

**Precipitation (in)**

Scenario	2009	2039	2069	2099		
Annual	CCSM45	53.5	57.1	60.7	61.0	
Total	CCSM85	53.5	58.2	60.7	66.4	
	GFDL45	53.5	59.6	62.2	65.8	
	GFDL85	53.5	58.0	63.9	64.3	
	HAD45	53.5	53.2	56.9	58.2	
	HAD85	53.5	58.7	54.0	56.7	
Growing Season	CCSM45	23.1	25.9	27.8	28.4	
	CCSM85	23.1	25.8	26.3	29.1	
May—Sep	GFDL45	23.1	27.2	28.8	29.9	
	GFDL85	23.1	25.7	29.8	30.1	
	HAD45	23.1	23.1	23.5	24.5	
	HAD85	23.1	26.4	22.1	23.0	

**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
yellow-poplar	Liriodendron tulipifera	WDH	High	90.4	1388.1	14.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
chestnut oak	Quercus prinus	NDH	High	79.5	1112.8	13.3	No change	No change	High	Abundant	Very Good	Very Good			1	2
red maple	Acer rubrum	WDH	High	92.8	1032.4	10.6	No change	No change	High	Abundant	Very Good	Very Good			1	3
sourwood	Oxydendrum arboreum	NDL	High	88	545.0	5.9	No change	No change	High	Abundant	Very Good	Very Good			1	4
northern red oak	Quercus rubra	WDH	Medium	75.9	537.6	6.7	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	5
black locust	Robinia pseudoacacia	NDH	Low	83.1	471.1	5.4	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	6
white oak	Quercus alba	WDH	Medium	67.5	440.7	6.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	7
eastern white pine	Pinus strobus	WDH	High	49.4	426.0	8.2	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	8
Virginia pine	Pinus virginiana	NDH	High	42.2	420.2	9.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	9
sweet birch	Betula lenta	NDH	High	67.5	393.1	5.6	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	10
scarlet oak	Quercus coccinea	WDL	Medium	61.4	374.5	5.8	Sm. inc.	No change	Medium	Common	Good	Fair			1	11
eastern hemlock	Tsuga canadensis	NSH	High	60.2	270.5	4.3	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	12
pignut hickory	Carya glabra	WDL	Medium	60.2	248.7	3.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	13
black oak	Quercus velutina	WDH	High	57.8	246.2	4.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	14
white ash	Fraxinus americana	WDL	Medium	36.1	172.9	4.6	Sm. dec.	No change	Low	Common	Poor	Poor			0	15
blackgum	Nyssa sylvatica	WDL	Medium	66.3	168.9	2.4	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	16
pitch pine	Pinus rigida	NSH	High	30.1	148.5	4.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	17
mockernut hickory	Carya alba	WDL	Medium	42.2	134.7	3.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	18
sugar maple	Acer saccharum	WDH	High	25.3	108.4	4.1	No change	Sm. dec.	High	Common	Good	Fair	Infill ++	Infill +	1	19
American beech	Fagus grandifolia	WDH	High	42.2	106.1	2.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	20
black cherry	Prunus serotina	WDL	Medium	41	100.3	2.3	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	21
flowering dogwood	Cornus florida	WDL	Medium	54.2	92.6	1.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	22
black walnut	Juglans nigra	WDH	Low	22.9	90.9	3.8	Sm. dec.	Sm. inc.	Medium	Common	Poor	Good			1	23
yellow birch	Betula alleghaniensis	NDL	High	15.7	86.1	5.2	No change	No change	Medium	Common	Fair	Fair			1	24
shortleaf pine	Pinus echinata	WDH	High	25.3	73.0	2.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	25
silverbell	Halesia spp.	NSL	Low	22.9	71.5	3.0	No change	No change	Medium	Common	Fair	Fair			1	26
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	27.7	56.8	2.0	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			0	27
southern red oak	Quercus falcata	WDL	Medium	13.3	54.6	3.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	28
American holly	Ilex opaca	NSL	Medium	9.6	48.9	4.8	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	29
yellow buckeye	Aesculus flava	NSL	Low	19.3	48.0	2.4	No change	No change	Low	Rare	Very Poor	Very Poor			0	30
serviceberry	Amelanchier spp.	NSL	Low	38.6	47.1	1.2	No change	No change	Medium	Rare	Poor	Poor			1	31
red spruce	Picea rubens	NDH	High	7.2	46.3	6.1	No change	No change	Low	Rare	Very Poor	Very Poor			0	32
cucumbertree	Magnolia acuminata	NSL	Low	16.9	44.7	2.5	No change	No change	Medium	Rare	Poor	Poor			1	33
pin cherry	Prunus pensylvanica	NSL	Low	7.2	38.9	5.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	34
sassafras	Sassafras albidum	WSL	Low	28.9	38.2	1.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	35
striped maple	Acer pensylvanicum	NSL	Medium	20.5	37.5	1.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	36
American basswood	Tilia americana	WSL	Medium	12	31.8	2.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	37
bitternut hickory	Carya cordiformis	WSL	Low	16.9	29.9	1.7	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	1	38
sweetgum	Liquidambar styraciflua	WDH	High	7.2	25.9	3.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	39
eastern redcedar	Juniperus virginiana	WDH	Medium	3.6	20.7	5.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	40
green ash	Fraxinus pennsylvanica	WSH	Low	12	20.5	1.6	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	41
American chestnut	Castanea dentata	NSLX	FIA	16.9	17.8	1.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	42
ailanthus	Ailanthus altissima	NSL	FIA	3.6	16.3	4.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	43
sycamore	Platanus occidentalis	NSL	Low	2.4	16.2	6.4	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	44
American hornbeam; muscley	Carpinus caroliniana	WSL	Low	12	15.8	1.3	No change	Lg. inc.	Medium	Rare	Poor	Good			1	45
shagbark hickory	Carya ovata	WSL	Medium	9.6	15.8	1.6	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	46
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	10.8	15.5	1.4	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	47

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paulownia	Paulownia tomentosa	NSL	FIA	2.4	10.9	4.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	48
Table Mountain pine	Pinus pungens	NSL	Low	4.8	9.4	1.9	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	1	49
American elm	Ulmus americana	WDH	Medium	6	8.3	1.3	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	50
boxelder	Acer negundo	WSH	Low	2.4	8.2	3.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	51
post oak	Quercus stellata	WDH	High	6	8.0	1.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	52
red mulberry	Morus rubra	NSL	Low	7.2	6.7	0.9	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	53
eastern redbud	Cercis canadensis	NSL	Low	4.8	6.5	1.3	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	54
river birch	Betula nigra	NSL	Low	2.4	6.4	2.5	No change	No change	Medium	Rare	Poor	Poor		Infill +	2	55
common persimmon	Diospyros virginiana	NSL	Low	2.4	5.8	2.3	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1	56
honeylocust	Gleditsia triacanthos	NSH	Low	2.4	5.2	2.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	57
sand hickory	Carya pallida	NSL	FIA	1.2	5.0	4.0	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	58
loblolly pine	Pinus taeda	WDH	High	2.4	4.6	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	59
shingle oak	Quercus imbricaria	NDH	Medium	1.2	3.8	3.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	60
chinkapin oak	Quercus muehlenbergii	NSL	Medium	1.2	3.6	2.8	No change	No change	Medium	Rare	Poor	Poor			2	61
bigtooth aspen	Populus grandidentata	NSL	Medium	1.2	2.4	1.9	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	62
black willow	Salix nigra	NSH	Low	1.2	1.7	1.3	Very Lg. dec.	Lg. inc.	Low	Rare	Lost	Fair		Infill +	2	63
slippery elm	Ulmus rubra	WSL	Low	1.2	1.6	1.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	64
winged elm	Ulmus alata	WDL	Medium	1.2	1.4	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	65
silver maple	Acer saccharinum	NSH	Low	1.2	1.1	0.9	Sm. dec.	Lg. dec.	High	Rare	Poor	Poor			0	66
florida maple	Acer barbatum	NSL	Low	1.2	1.1	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	67
mountain maple	Acer spicatum	NSL	Low	1.2	0.9	0.7	Sm. dec.	No change	High	Rare	Poor	Fair			0	68
American mountain-ash	Sorbus americana	NSL	Low	2.4	0.6	0.2	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	69
pawpaw	Asimina triloba	NSL	Low	1.2	0.4	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	70
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	71
slash pine	Pinus elliottii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	72
spruce pine	Pinus glabra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	73
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	74
pond cypress	Taxodium ascendens	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	75
northern white-cedar	Thuja occidentalis	WSH	High	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	76
black maple	Acer nigrum	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	77
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	78
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	79
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	80
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	81
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	82
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat		Likely +	3	83
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	84
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	85
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	86
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	87
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	88
redbay	Persea borbonia	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	89
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	90
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	91
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	92
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	93
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	94



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willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	95
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown				0 96
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	97
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				0 98