

**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  
 8,200.0    3,166.0    235

**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	14	23	Increase	38	42	Very Good	12	17	Likely	5	5
Hickory	7		Medium	35	55	No Change	21	17	Good	20	18	Infill	15	18
Maple	3	Abundant	Low	36	9	Decrease	11	11	Fair	17	16	Migrate	0	1
Oak	18	Common	FIA	2		New	10	9	Poor	15	13		20	24
Pine	5	Rare				Unknown	7	8	Very Poor	6	6			
Other	37	Absent							FIA Only	2	2			
	<b>72</b>	<b>83</b>		<b>87</b>	<b>87</b>		<b>87</b>	<b>87</b>	Unknown	5	6			
										<b>77</b>	<b>78</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

Scenario	2009	2039	2069	2099
Annual	64.5	66.2	68.0	68.2
Average	64.5	66.5	69.0	71.4
GFDL45	64.5	67.4	68.9	69.8
GFDL85	64.5	67.1	70.1	73.5
HAD45	64.5	66.9	69.8	71.0
HAD85	64.5	67.2	71.3	75.1
Growing Season	77.7	79.2	80.7	81.1
May—Sep	77.7	81.0	83.7	84.6
Coldest Month	44.6	46.9	47.8	47.9
Average	44.6	48.3	48.3	48.4
GFDL45	44.6	46.1	47.2	47.6
GFDL85	44.6	45.0	46.8	47.6
HAD45	44.6	46.3	47.7	49.4
HAD85	44.6	46.3	47.7	49.4
Warmest Month	81.6	83.0	83.5	83.7
Average	81.6	83.1	84.2	85.8
GFDL45	81.6	85.5	85.5	86.8
GFDL85	81.6	84.8	86.3	88.7
HAD45	81.6	85.9	87.8	87.9
HAD85	81.6	86.5	90.0	91.1

**Precipitation (in)**

Scenario	2009	2039	2069	2099
Annual	55.1	58.5	63.6	60.6
Total	55.1	58.9	59.2	64.1
GFDL45	55.1	60.9	67.0	65.4
GFDL85	55.1	60.4	62.7	64.7
HAD45	55.1	54.0	57.6	60.3
HAD85	55.1	57.2	51.3	55.6
Growing Season	20.2	20.5	21.6	20.7
May—Sep	20.2	23.1	26.7	24.7
GFDL45	20.2	24.2	25.8	26.9
GFDL85	20.2	18.7	20.5	19.5
HAD45	20.2	20.1	16.2	16.4
HAD85	20.2	20.1	16.2	16.4

**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	86.6	2997.6	36.7	No change	No change	Medium	Abundant	Good	Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	89	1218.1	14.1	No change	No change	Medium	Abundant	Good	Good			1	2
water oak	Quercus nigra	WDH	High	90.2	952.9	10.9	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	3
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	53.7	375.2	7.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	4
winged elm	Ulmus alata	WDL	Medium	70.7	292.7	4.1	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	5
boxelder	Acer negundo	WSH	Low	18.3	282.9	15.3	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	6
white oak	Quercus alba	WDH	Medium	53.7	248.2	4.6	No change	Sm. inc.	High	Common	Good	Very Good			1	7
southern red oak	Quercus falcata	WDL	Medium	57.3	211.3	3.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	8
eastern redcedar	Juniperus virginiana	WDH	Medium	40.2	178.8	4.8	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	9
willow oak	Quercus phellos	NSL	Low	24.4	176.6	7.2	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	10
green ash	Fraxinus pennsylvanica	WSH	Low	42.7	170.4	4.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	11
American elm	Ulmus americana	WDH	Medium	57.3	157.2	2.9	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	12
yellow-poplar	Liriodendron tulipifera	WDH	High	28	154.4	5.4	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	13
red maple	Acer rubrum	WDH	High	48.8	135.5	2.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	14
black cherry	Prunus serotina	WDL	Medium	57.3	126.8	2.3	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	15
sugarberry	Celtis laevigata	NDH	Medium	29.3	123.7	4.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
blackgum	Nyssa sylvatica	WDL	Medium	54.9	113.8	2.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	17
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	40.2	107.7	2.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	18
mockernut hickory	Carya alba	WDL	Medium	53.7	107.2	2.1	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	19
shortleaf pine	Pinus echinata	WDH	High	28	106.9	3.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	20
slippery elm	Ulmus rubra	WSL	Low	22	102.2	4.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	21
pignut hickory	Carya glabra	WDL	Medium	37.8	97.3	2.5	No change	No change	Medium	Common	Fair	Fair			1	22
post oak	Quercus stellata	WDH	High	31.7	87.2	2.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	23
pecan	Carya illinoensis	NSH	Low	12.2	85.6	6.9	Sm. inc.	Lg. inc.	Low	Common	Fair	Good	Infill +	Infill ++	1	24
sycamore	Platanus occidentalis	NSL	Low	15.9	70.3	4.4	No change	Sm. inc.	Medium	Common	Fair	Good			1	25
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	26.8	66.7	2.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	26
American beech	Fagus grandifolia	WDH	High	22	55.7	2.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	27
spruce pine	Pinus glabra	NSL	Low	13.4	54.4	4.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	28
common persimmon	Diospyros virginiana	NSL	Low	45.1	52.5	1.3	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	29
eastern cottonwood	Populus deltoides	NSH	Low	3.7	48.7	13.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	30
flowering dogwood	Cornus florida	WDL	Medium	34.1	46.2	1.3	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	31
swamp chestnut oak	Quercus michauxii	NSL	Low	14.6	36.3	2.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	32
sassafras	Sassafras albidum	WSL	Low	20.7	36.2	1.7	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	33
bald cypress	Taxodium distichum	NSH	Medium	4.9	36.0	7.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	34
Shumard oak	Quercus shumardii	NSL	Low	17.1	32.7	1.9	Sm. inc.	Sm. inc.	High	Rare	Good	Good			1	35
water hickory	Carya aquatica	NSL	Medium	8.5	29.7	3.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	36
white ash	Fraxinus americana	WDL	Medium	18.3	28.5	1.5	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1	37
honeylocust	Gleditsia triacanthos	NSH	Low	1.2	26.9	21.8	No change	Sm. inc.	High	Rare	Fair	Good		Infill ++	2	38
sourwood	Oxydendrum arboreum	NDL	High	11	23.9	2.2	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	39
black oak	Quercus velutina	WDH	High	18.3	19.1	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	40
Osage-orange	Maclura pomifera	NDH	Medium	7.3	18.9	2.6	No change	No change	High	Rare	Fair	Fair		Infill +	1	41
black locust	Robinia pseudoacacia	NDH	Low	4.9	17.8	3.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	42
black willow	Salix nigra	NSH	Low	11	14.5	1.3	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1	43
red mulberry	Morus rubra	NSL	Low	12.2	14.0	1.1	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	44
live oak	Quercus virginiana	NDH	High	2.4	13.6	5.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	45
overcup oak	Quercus lyrata	NSL	Medium	7.3	13.5	1.8	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	1	46
shagbark hickory	Carya ovata	WSL	Medium	3.7	13.4	3.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
shellbark hickory	Carya laciniosa	NSL	Low	4.9	10.9	2.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	48
cucumber tree	Magnolia acuminata	NSL	Low	4.9	9.4	1.9	No change	No change	Medium	Rare	Poor	Poor			0	49
laurel oak	Quercus laurifolia	NDH	Medium	4.9	8.8	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	50
Nuttall oak	Quercus texana	NSH	Medium	2.4	8.3	3.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	51
eastern redbud	Cercis canadensis	NSL	Low	9.8	7.8	0.8	No change	No change	Medium	Rare	Poor	Poor			1	52
bitternut hickory	Carya cordiformis	WSL	Low	9.8	6.5	0.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	53
florida maple	Acer barbatum	NSL	Low	4.9	6.3	1.3	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	54
northern red oak	Quercus rubra	WDH	Medium	2.4	6.0	2.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	55
American holly	Ilex opaca	NSL	Medium	4.9	5.8	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	56
scarlet oak	Quercus coccinea	WDL	Medium	6.1	5.4	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	57
sweetbay	Magnolia virginiana	NSL	Medium	4.9	5.2	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	58
water elm	Planera aquatica	NSL	Low	1.2	5.0	4.0	No change	Sm. inc.	Medium	Rare	Poor	Fair		Infill +	2	59
water tupelo	Nyssa aquatica	NSH	Medium	1.2	4.8	3.9	No change	No change	Low	Rare	Very Poor	Very Poor			2	60
black walnut	Juglans nigra	WDH	Low	2.4	3.5	1.4	No change	No change	Medium	Rare	Poor	Poor			0	61
blackjack oak	Quercus marilandica	NSL	Medium	8.5	3.4	0.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	62
southern magnolia	Magnolia grandiflora	NSL	Low	6.1	3.4	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	63
cedar elm	Ulmus crassifolia	NDH	Medium	2.4	3.0	1.2	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	64
slash pine	Pinus elliotii	NDH	High	1.2	2.1	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	65
chinkapin oak	Quercus muehlenbergii	NSL	Medium	1.2	1.6	1.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	66
pawpaw	Asimina triloba	NSL	Low	1.2	1.2	1.0	No change	No change	Medium	Rare	Poor	Poor			0	67
redbay	Persea borbonia	NSL	Low	1.2	0.8	0.7	No change	No change	High	Rare	Fair	Fair			0	68
chokecherry	Prunus virginiana	NSLX	FIA	2.4	0.8	0.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	69
longleaf pine	Pinus palustris	NSH	Medium	1.2	0.6	0.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	70
serviceberry	Amelanchier spp.	NSL	Low	1.2	0.4	0.3	Sm. inc.	No change	Medium	Rare	Fair	Poor			0	71
durand oak	Quercus sinuata var. sinuata	NSL	FIA	1.2	0.3	0.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	72
Virginia pine	Pinus virginiana	NDH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	73
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	74
river birch	Betula nigra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	75
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	76
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	77
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	78
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	Unknown	Low	Absent	New Habitat	Unknown			3	79
silverbell	Halesia spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	80
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	81
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	82
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	83
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	84
turkey oak	Quercus laevis	NSH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	85
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	86
American basswood	Tilia americana	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	87