

**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    200

**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	18	19	Increase	25	29	Very Good	11	13	Likely	1	1
Ash	2			Medium	29	45	No Change	10	8	Good	16	17	Infill	33	38
Hickory	4			Low	26	9	Decrease	22	20	Fair	8	7	Migrate	0	3
Maple	4	Abundant	5	FIA	2		New	10	10	Poor	10	11			
Oak	13	Common	22				Unknown	8	8	Very Poor	9	6			
Pine	4	Rare	32							FIA Only	0	0			
Other	32	Absent	14							Unknown	6	6			
	<b>59</b>		<b>73</b>		<b>75</b>	<b>73</b>		<b>75</b>	<b>75</b>		<b>60</b>	<b>60</b>		<b>34</b>	<b>42</b>

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	59.2	61.0	63.1	63.2	
	CCSM85	59.2	61.3	63.8	66.7	
	GFDL45	59.2	62.2	64.3	65.1	
	GFDL85	59.2	62.1	65.4	69.2	
	HAD45	59.2	61.4	64.5	65.9	
	HAD85	59.2	61.7	65.6	70.0	
Growing Season—Sep	CCSM45	73.6	75.4	77.2	77.7	
	CCSM85	73.6	75.5	78.1	81.8	
	GFDL45	73.6	76.9	79.2	80.5	
	GFDL85	73.6	77.0	80.6	84.8	
	HAD45	73.6	76.4	79.3	81.0	
	HAD85	73.6	76.4	81.5	86.2	
Coldest Month Average	CCSM45	37.8	40.1	40.9	41.0	
	CCSM85	37.8	40.2	41.2	42.5	
	GFDL45	37.8	41.3	41.6	42.3	
	GFDL85	37.8	40.2	41.1	42.2	
	HAD45	37.8	38.6	40.4	40.7	
	HAD85	37.8	39.0	40.3	41.8	
Warmest Month Average	CCSM45	79.0	81.1	82.1	82.1	
	CCSM85	79.0	81.2	83.0	84.5	
	GFDL45	79.0	81.8	82.9	84.0	
	GFDL85	79.0	82.5	84.3	86.8	
	HAD45	79.0	82.2	84.1	84.9	
	HAD85	79.0	82.9	86.1	89.0	

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	45.4	50.2	52.8	54.2	
	CCSM85	45.4	51.1	53.9	60.2	
	GFDL45	45.4	50.3	54.5	57.3	
	GFDL85	45.4	49.5	55.7	56.9	
	HAD45	45.4	49.3	50.3	49.4	
	HAD85	45.4	51.7	48.1	49.3	
Growing Season—May—Sep	CCSM45	20.7	24.7	26.4	27.6	
	CCSM85	20.7	24.2	25.9	29.2	
	GFDL45	20.7	24.0	26.7	28.1	
	GFDL85	20.7	23.1	27.8	28.5	
	HAD45	20.7	22.5	22.2	22.2	
	HAD85	20.7	24.7	22.1	21.3	

**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	82.9	2232.2	29.0	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good	Infill ++	Infill ++	1	1
sweetgum	Liquidambar styraciflua	WDH	High	92.7	1266.1	14.7	No change	No change	Medium	Abundant	Good	Good	Infill ++	Infill ++	1	2
yellow-poplar	Liriodendron tulipifera	WDH	High	86.6	941.0	11.8	Lg. dec.	Lg. dec.	High	Abundant	Good	Good	Infill ++	Infill ++	1	3
red maple	Acer rubrum	WDH	High	87.8	795.7	9.7	Sm. dec.	Sm. dec.	High	Abundant	Good	Good	Infill ++	Infill ++	1	4
white oak	Quercus alba	WDH	Medium	78	556.1	7.8	No change	No change	High	Abundant	Very Good	Very Good	Infill ++	Infill ++	1	5
Virginia pine	Pinus virginiana	NDH	High	41.5	275.3	7.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +		0	6
eastern redcedar	Juniperus virginiana	WDH	Medium	57.3	258.7	4.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good	Infill ++	Infill ++	1	7
shortleaf pine	Pinus echinata	WDH	High	57.3	254.2	4.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	8
pignut hickory	Carya glabra	WDL	Medium	56.1	178.0	3.6	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	9
northern red oak	Quercus rubra	WDH	Medium	50	164.2	3.8	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	10
mockernut hickory	Carya alba	WDL	Medium	57.3	140.1	2.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	11
sourwood	Oxydendrum arboreum	NDL	High	53.7	136.2	3.0	Lg. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	12
American elm	Ulmus americana	WDH	Medium	54.9	133.1	2.8	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +	Infill ++	1	13
blackgum	Nyssa sylvatica	WDL	Medium	56.1	126.2	2.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	14
southern red oak	Quercus falcata	WDL	Medium	51.2	121.6	2.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	15
winged elm	Ulmus alata	WDL	Medium	41.5	112.6	2.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	16
willow oak	Quercus phellos	NSL	Low	36.6	108.6	2.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	17
white ash	Fraxinus americana	WDL	Medium	34.1	102.5	2.9	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	18
American hornbeam; muscley	Carpinus caroliniana	WSL	Low	35.4	101.2	3.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	19
flowering dogwood	Cornus florida	WDL	Medium	62.2	93.8	1.7	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	20
black cherry	Prunus serotina	WDL	Medium	46.3	85.1	2.2	Lg. inc.	Lg. inc.	Low	Common	Good	Good	Infill ++	Infill ++	1	21
post oak	Quercus stellata	WDH	High	32.9	80.2	2.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	22
black oak	Quercus velutina	WDH	High	32.9	78.6	3.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	23
scarlet oak	Quercus coccinea	WDL	Medium	29.3	76.4	3.5	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	24
American beech	Fagus grandifolia	WDH	High	19.5	55.1	3.4	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good	Infill ++	Infill ++	2	25
water oak	Quercus nigra	WDH	High	19.5	52.3	4.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			2	26
green ash	Fraxinus pennsylvanica	WSH	Low	20.7	51.2	2.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	27
hackberry	Celtis occidentalis	WDH	Medium	6.1	48.7	7.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	28
slippery elm	Ulmus rubra	WSL	Low	15.9	46.9	2.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	29
sycamore	Platanus occidentalis	NSL	Low	9.8	44.0	4.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	30
common persimmon	Diospyros virginiana	NSL	Low	12.2	42.5	3.4	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +		1	31
river birch	Betula nigra	NSL	Low	9.8	36.7	3.6	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	32
boxelder	Acer negundo	WSH	Low	3.7	34.8	9.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	33
American holly	Ilex opaca	NSL	Medium	32.9	30.3	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	34
eastern redbud	Cercis canadensis	NSL	Low	20.7	24.8	1.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	35
pecan	Carya illinoensis	NSH	Low	12.2	22.3	4.5	Lg. dec.	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	36
shagbark hickory	Carya ovata	WSL	Medium	8.5	18.6	2.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	37
ailanthus	Ailanthus altissima	NSL	FIA	3.7	17.6	4.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	38
florida maple	Acer barbatum	NSL	Low	7.3	16.0	2.1	No change	No change	High	Rare	Fair	Fair		Infill +	2	39
black willow	Salix nigra	NSH	Low	4.9	12.1	2.4	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	40
sugarberry	Celtis laevigata	NDH	Medium	2.4	11.8	4.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	41
black walnut	Juglans nigra	WDH	Low	7.3	10.9	1.4	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	42
sassafras	Sassafras albidum	WSL	Low	4.9	6.9	1.4	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good		Infill ++	2	43
red mulberry	Morus rubra	NSL	Low	6.1	6.6	1.0	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	44
chestnut oak	Quercus prinus	NDH	High	3.7	6.3	1.7	No change	Sm. dec.	High	Rare	Fair	Poor	Infill +		2	45
white mulberry	Morus alba	NSL	FIA	1.2	5.4	4.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	46
honeylocust	Gleditsia triacanthos	NSH	Low	2.4	4.6	1.8	Sm. dec.	No change	High	Rare	Poor	Fair		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
blackjack oak	Quercus marilandica	NSL	Medium	2.4	4.0	1.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	48
sweet birch	Betula lenta	NDH	High	2.4	3.8	1.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	49
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	8.5	3.7	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	50
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	2.4	3.0	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	51
longleaf pine	Pinus palustris	NSH	Medium	1.2	2.5	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	52
sugar maple	Acer saccharum	WDH	High	2.4	1.5	0.6	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	53
laurel oak	Quercus laurifolia	NDH	Medium	2.4	1.3	0.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	54
swamp chestnut oak	Quercus michauxii	NSL	Low	2.4	1.3	0.5	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			0	55
black locust	Robinia pseudoacacia	NDH	Low	1.2	0.9	0.7	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	56
yellow birch	Betula alleghaniensis	NDL	High	1.2	0.5	0.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	57
pawpaw	Asimina triloba	NSL	Low	1.2	0.4	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	58
sweetbay	Magnolia virginiana	NSL	Medium	4.9	0.0	0.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	59
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	60
bald cypress	Taxodium distichum	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	61
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	62
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	63
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	64
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	65
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	66
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	67
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	68
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	69
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	70
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	71
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	72
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	73
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	74
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	75