

**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  
 8,500.0    3,281.9    195

**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	18	22	Increase	24	29	Very Good	6	11	Likely	4	4
Hickory	6			Medium	28	45	No Change	10	7	Good	19	19	Infill	17	16
Maple	4	Abundant	4	Low	32	12	Decrease	26	24	Fair	12	8	Migrate	3	4
Oak	14	Common	29	FIA	3		New	13	14	Poor	13	13			
Pine	5	Rare	30				Unknown	8	7	Very Poor	8	7			
Other	32	Absent	18							FIA Only	2	2			
	<b>63</b>		<b>81</b>		<b>81</b>	<b>79</b>		<b>81</b>	<b>81</b>	Unknown	5	4			
											<b>65</b>	<b>64</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

Scenario	2009	2039	2069	2099	
Annual	60.1	61.9	63.9	64.0	
Average	60.1	62.3	64.6	67.5	
GFDL45	60.1	63.4	65.1	65.9	
GFDL85	60.1	63.0	66.2	70.0	
HAD45	60.1	62.3	65.3	66.7	
HAD85	60.1	62.6	66.7	70.8	
Growing Season	74.2	76.0	77.8	78.3	
May—Sep	74.2	76.2	78.8	82.4	
GFDL45	74.2	78.0	79.7	81.1	
GFDL85	74.2	77.6	81.2	85.5	
HAD45	74.2	77.3	80.1	81.7	
HAD85	74.2	77.2	82.7	87.1	
Coldest Month	39.2	41.5	42.4	42.4	
Average	39.2	41.7	42.6	43.8	
GFDL45	39.2	42.4	42.6	43.4	
GFDL85	39.2	41.3	42.2	43.1	
HAD45	39.2	39.6	41.4	41.8	
HAD85	39.2	40.3	41.5	43.0	
Warmest Month	79.3	81.4	82.4	82.5	
Average	79.3	81.6	83.2	84.9	
GFDL45	79.3	82.3	83.3	84.3	
GFDL85	79.3	82.9	84.8	87.3	
HAD45	79.3	82.8	84.6	85.3	
HAD85	79.3	83.5	86.8	89.4	

**Precipitation (in)**

Scenario	2009	2039	2069	2099	
Annual	44.4	48.4	50.7	52.4	
Total	44.4	48.9	51.8	57.4	
GFDL45	44.4	49.5	53.4	56.1	
GFDL85	44.4	48.6	54.9	55.1	
HAD45	44.4	46.3	48.1	48.4	
HAD85	44.4	48.8	45.2	47.2	
Growing Season	19.6	22.7	24.1	25.4	
May—Sep	19.6	22.1	23.1	25.8	
GFDL45	19.6	23.4	26.0	26.9	
GFDL85	19.6	22.3	27.2	27.2	
HAD45	19.6	20.0	20.3	21.0	
HAD85	19.6	22.2	19.0	18.6	

**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
sweetgum	Liquidambar styraciflua	WDH	High	81.2	935.5	14.0	No change	Sm. inc.	Medium	Abundant	Good	Very Good				2 1
loblolly pine	Pinus taeda	WDH	High	41.2	762.5	19.5	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good				2 2
yellow-poplar	Liriodendron tulipifera	WDH	High	69.4	681.7	11.6	Lg. dec.	Lg. dec.	High	Abundant	Good	Good				2 3
red maple	Acer rubrum	WDH	High	81.2	609.0	8.9	Sm. dec.	Sm. dec.	High	Abundant	Good	Good				2 4
white oak	Quercus alba	WDH	Medium	71.8	445.2	8.1	No change	No change	High	Common	Good	Good				2 5
Virginia pine	Pinus virginiana	NDH	High	55.3	445.1	9.7	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +		2 6
shortleaf pine	Pinus echinata	WDH	High	62.4	428.6	9.1	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good				2 7
eastern redcedar	Juniperus virginiana	WDH	Medium	75.3	401.5	6.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good				2 8
southern red oak	Quercus falcata	WDL	Medium	67.1	342.2	6.5	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good				2 9
white ash	Fraxinus americana	WDL	Medium	40	234.5	7.7	Lg. dec.	Sm. dec.	Low	Common	Very Poor	Poor		Infill +		2 10
winged elm	Ulmus alata	WDL	Medium	51.8	191.3	4.6	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good				2 11
pignut hickory	Carya glabra	WDL	Medium	60	175.1	4.1	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +		2 12
black cherry	Prunus serotina	WDL	Medium	69.4	168.8	3.0	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair	Infill +	Infill +		2 13
post oak	Quercus stellata	WDH	High	43.5	160.2	5.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good				2 14
northern red oak	Quercus rubra	WDH	Medium	54.1	154.3	3.9	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +		2 15
flowering dogwood	Cornus florida	WDL	Medium	74.1	145.0	2.5	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +		2 16
mockernut hickory	Carya alba	WDL	Medium	54.1	137.9	3.1	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good				2 17
sourwood	Oxydendrum arboreum	NDL	High	47.1	132.5	3.6	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +		2 18
willow oak	Quercus phellos	NSL	Low	43.5	130.4	3.9	Sm. dec.	No change	Medium	Common	Poor	Fair	Infill +	Infill +		2 19
water oak	Quercus nigra	WDH	High	22.4	128.9	5.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good				2 20
green ash	Fraxinus pennsylvanica	WSH	Low	20	119.8	5.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good				2 21
chestnut oak	Quercus prinus	NDH	High	14.1	91.7	8.6	Lg. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +			2 22
American beech	Fagus grandifolia	WDH	High	35.3	89.2	3.7	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +			2 23
shagbark hickory	Carya ovata	WSL	Medium	14.1	82.0	5.5	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +		2 24
American elm	Ulmus americana	WDH	Medium	43.5	81.1	2.8	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good				2 25
black walnut	Juglans nigra	WDH	Low	22.4	74.1	3.9	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor				0 26
American hornbeam; muscley	Carpinus caroliniana	WSL	Low	23.5	71.4	2.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good				2 27
ailanthus	Ailanthus altissima	NSL	FIA	11.8	70.3	8.2	Unknown	Unknown	NA	Common	NNIS	NNIS				0 28
scarlet oak	Quercus coccinea	WDL	Medium	32.9	68.4	3.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +		2 29
blackgum	Nyssa sylvatica	WDL	Medium	54.1	67.8	1.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good				2 30
boxelder	Acer negundo	WSH	Low	11.8	61.0	4.9	Sm. dec.	No change	High	Common	Fair	Good	Infill +			2 31
sycamore	Platanus occidentalis	NSL	Low	12.9	60.6	4.5	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +			2 32
slippery elm	Ulmus rubra	WSL	Low	18.8	58.6	3.8	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor				0 33
common persimmon	Diospyros virginiana	NSL	Low	16.5	37.3	2.8	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor		Infill +		2 34
hackberry	Celtis occidentalis	WDH	Medium	14.1	37.0	3.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +		2 35
sugarberry	Celtis laevigata	NDH	Medium	4.7	36.1	7.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +			2 36
black oak	Quercus velutina	WDH	High	31.8	30.2	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 37
American holly	Ilex opaca	NSL	Medium	17.6	24.6	1.7	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +		2 38
red mulberry	Morus rubra	NSL	Low	9.4	22.9	2.3	No change	No change	Medium	Rare	Poor	Poor		Infill +		2 39
black willow	Salix nigra	NSH	Low	1.2	21.8	17.6	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +		2 40
eastern redbud	Cercis canadensis	NSL	Low	17.6	20.0	1.1	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				2 41
florida maple	Acer barbatum	NSL	Low	5.9	17.5	2.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +		2 42
black locust	Robinia pseudoacacia	NDH	Low	12.9	16.0	3.3	Very Lg. dec.	Lg. dec.	Medium	Rare	Lost	Very Poor				0 43
blackjack oak	Quercus marilandica	NSL	Medium	5.9	15.2	2.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good				2 44
sugar maple	Acer saccharum	WDH	High	4.7	14.2	2.9	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor				0 45
river birch	Betula nigra	NSL	Low	5.9	11.8	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 46
laurel oak	Quercus laurifolia	NDH	Medium	3.5	7.4	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				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
American basswood	Tilia americana	WSL	Medium	2.4	3.6	1.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	48
sand hickory	Carya pallida	NSL	FIA	1.2	3.4	2.7	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			2	49
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	5.9	2.7	1.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	50
pawpaw	Asimina triloba	NSL	Low	2.4	2.6	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	51
eastern white pine	Pinus strobus	WDH	High	2.4	2.5	1.0	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	52
shellbark hickory	Carya laciniosa	NSL	Low	1.2	2.2	1.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	53
bitternut hickory	Carya cordiformis	WSL	Low	5.9	1.7	0.8	Lg. dec.	Very Lg. dec.	High	Rare	Poor	Lost			0	54
longleaf pine	Pinus palustris	NSH	Medium	2.4	1.4	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	55
butternut	Juglans cinerea	NSLX	FIA	1.2	1.4	1.1	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	56
honeylocust	Gleditsia triacanthos	NSH	Low	1.2	0.6	0.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	57
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	1.2	0.5	0.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	58
cucumbertree	Magnolia acuminata	NSL	Low	1.2	0.4	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	59
Shumard oak	Quercus shumardii	NSL	Low	1.2	0.3	0.2	No change	Sm. inc.	High	Rare	Fair	Good			2	60
swamp chestnut oak	Quercus michauxii	NSL	Low	1.2	0.2	0.2	No change	No change	Medium	Rare	Poor	Poor			0	61
serviceberry	Amelanchier spp.	NSL	Low	4.7	0.2	0.5	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	62
sassafras	Sassafras albidum	WSL	Low	4.7	0.1	0.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	63
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	64
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate +	3	65
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	66
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	67
yellow buckeye	Aesculus flava	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	68
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	69
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	70
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	71
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			3	72
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	73
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +		3	74
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	75
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	76
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	77
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	78
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	79
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	80
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	81