

**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  
 8,400.0    3,243.3    234

**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	3			High	21	26	Increase	21	26	Very Good	6	10	Likely	4	5
Hickory	5			Medium	26	44	No Change	11	8	Good	20	18	Infill	5	6
Maple	5	Abundant	5	Low	34	14	Decrease	25	23	Fair	6	7	Migrate	3	10
Oak	9	Common	29	FIA	5		New	19	19	Poor	11	10			
Pine	3	Rare	28				Unknown	10	10	Very Poor	13	10			
Other	37	Absent	24							FIA Only	3	3			
	<b>62</b>		<b>86</b>		<b>86</b>	<b>84</b>		<b>86</b>	<b>86</b>	Unknown	5	5			
											<b>64</b>	<b>63</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

Scenario	2009	2039	2069	2099	
Annual	54.1	56.1	58.4	58.6	
Average	54.1	56.6	59.0	62.1	
GFDL45	54.1	56.9	59.8	60.7	
GFDL85	54.1	57.4	60.9	64.9	
HAD45	54.1	56.7	60.2	61.5	
HAD85	54.1	57.1	61.5	65.9	
Growing Season	69.3	71.3	73.5	74.1	
May—Sep	69.3	71.8	74.3	78.4	
GFDL45	69.3	72.5	76.2	77.5	
GFDL85	69.3	73.4	77.7	82.2	
HAD45	69.3	72.6	75.9	77.7	
HAD85	69.3	72.9	78.7	83.3	
Coldest Month	30.8	32.7	34.0	34.4	
Average	30.8	33.7	34.7	36.1	
GFDL45	30.8	34.5	35.0	35.7	
GFDL85	30.8	33.5	34.4	35.5	
HAD45	30.8	31.4	33.6	33.9	
HAD85	30.8	32.2	33.8	35.7	
Warmest Month	74.8	76.8	78.1	78.5	
Average	74.8	77.1	78.9	80.8	
GFDL45	74.8	78.3	80.5	81.4	
GFDL85	74.8	79.6	82.3	84.8	
HAD45	74.8	78.6	81.2	82.4	
HAD85	74.8	80.0	84.1	86.8	

**Precipitation (in)**

Scenario	2009	2039	2069	2099	
Annual	44.9	47.9	49.7	50.6	
Total	44.9	49.4	50.7	55.0	
GFDL45	44.9	48.8	49.8	52.9	
GFDL85	44.9	46.5	51.3	52.9	
HAD45	44.9	45.8	46.4	45.6	
HAD85	44.9	46.1	43.5	45.9	
Growing Season	21.2	22.8	23.3	23.6	
May—Sep	21.2	22.8	22.1	24.1	
GFDL45	21.2	23.0	22.1	23.5	
GFDL85	21.2	21.0	21.8	22.4	
HAD45	21.2	22.1	19.9	20.4	
HAD85	21.2	21.4	18.6	19.7	

**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	81	1045.4	12.9	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	1
white oak	Quercus alba	WDH	Medium	75	981.4	13.1	No change	No change	High	Abundant	Very Good	Very Good			1	2
red maple	Acer rubrum	WDH	High	85.7	911.6	10.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
sugar maple	Acer saccharum	WDH	High	82.1	824.5	10.0	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	4
chestnut oak	Quercus prinus	NDH	High	69	596.9	8.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	5
American beech	Fagus grandifolia	WDH	High	69	459.7	6.7	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	6
black oak	Quercus velutina	WDH	High	71.4	390.6	5.5	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	7
white ash	Fraxinus americana	WDL	Medium	66.7	290.7	4.4	No change	Sm. inc.	Low	Common	Poor	Fair			1	8
Virginia pine	Pinus virginiana	NDH	High	32.1	290.6	9.0	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	9
pignut hickory	Carya glabra	WDL	Medium	66.7	264.8	4.0	No change	No change	Medium	Common	Fair	Fair			1	10
northern red oak	Quercus rubra	WDH	Medium	60.7	254.4	4.2	Lg. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	11
mockernut hickory	Carya alba	WDL	Medium	65.5	243.8	3.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	12
scarlet oak	Quercus coccinea	WDL	Medium	40.5	237.8	5.9	No change	Sm. dec.	Medium	Common	Fair	Poor			1	13
black locust	Robinia pseudoacacia	NDH	Low	39.3	213.2	5.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	14
blackgum	Nyssa sylvatica	WDL	Medium	60.7	211.8	3.5	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	15
sycamore	Platanus occidentalis	NSL	Low	29.8	189.2	6.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	16
sourwood	Oxydendrum arboreum	NDL	High	51.2	173.3	3.4	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	17
black cherry	Prunus serotina	WDL	Medium	32.1	169.3	5.3	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	18
yellow buckeye	Aesculus flava	NSL	Low	31	166.9	5.4	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	19
sassafras	Sassafras albidum	WSL	Low	41.7	149.6	3.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	20
American basswood	Tilia americana	WSL	Medium	26.2	148.5	5.7	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	21
slippery elm	Ulmus rubra	WSL	Low	39.3	129.9	3.3	No change	Sm. inc.	Medium	Common	Fair	Good			1	22
shagbark hickory	Carya ovata	WSL	Medium	46.4	127.6	2.8	No change	No change	Medium	Common	Fair	Fair			1	23
boxelder	Acer negundo	WSH	Low	15.5	126.2	8.2	No change	Sm. inc.	High	Common	Good	Very Good	Infill ++	Infill ++	1	24
sweet birch	Betula lenta	NDH	High	28.6	123.6	4.3	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	25
black walnut	Juglans nigra	WDH	Low	21.4	100.6	4.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	26
cucumbertree	Magnolia acuminata	NSL	Low	31	97.8	3.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	27
American elm	Ulmus americana	WDH	Medium	28.6	87.0	3.0	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	28
eastern hemlock	Tsuga canadensis	NSH	High	17.9	83.4	4.7	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	0	29
bitternut hickory	Carya cordiformis	WSL	Low	28.6	75.0	2.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	30
post oak	Quercus stellata	WDH	High	8.3	74.8	9.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			2	31
eastern redbud	Cercis canadensis	NSL	Low	35.7	63.3	1.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	32
pitch pine	Pinus rigida	NSH	High	11.9	62.2	5.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	33
ailanthus	Ailanthus altissima	NSL	FIA	19	60.5	3.2	Unknown	Unknown	NA	Common	NNIS	NNIS			0	34
flowering dogwood	Cornus florida	WDL	Medium	29.8	46.3	1.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	35
eastern white pine	Pinus strobus	WDH	High	4.8	41.5	8.7	No change	No change	Low	Rare	Very Poor	Very Poor			2	36
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	23.8	41.3	1.7	No change	Lg. inc.	Medium	Rare	Poor	Good			1	37
pawpaw	Asimina triloba	NSL	Low	16.7	28.1	1.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	38
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	19	23.7	1.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	39
paulownia	Paulownia tomentosa	NSL	FIA	7.1	20.9	2.9	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	40
silver maple	Acer saccharinum	NSH	Low	1.2	19.9	16.8	Sm. dec.	No change	High	Rare	Poor	Fair			2	41
yellow birch	Betula alleghaniensis	NDL	High	6	16.7	2.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	42
eastern redcedar	Juniperus virginiana	WDH	Medium	7.1	13.7	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	43
bigtooth aspen	Populus grandidentata	NSL	Medium	6	12.1	2.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	44
hackberry	Celtis occidentalis	WDH	Medium	1.2	8.2	6.9	Sm. inc.	Lg. inc.	High	Rare	Good	Good			2	45
common persimmon	Diospyros virginiana	NSL	Low	6	7.8	1.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	46
river birch	Betula nigra	NSL	Low	1.2	6.0	5.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	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
serviceberry	Amelanchier spp.	NSL	Low	7.1	5.8	0.8	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	48
butternut	Juglans cinerea	NSLX	FIA	4.8	5.4	1.1	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	49
striped maple	Acer pensylvanicum	NSL	Medium	2.4	2.8	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	50
green ash	Fraxinus pennsylvanica	WSH	Low	3.6	2.4	0.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	51
shellbark hickory	Carya laciniosa	NSL	Low	1.2	2.3	2.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	52
shingle oak	Quercus imbricaria	NDH	Medium	1.2	1.6	1.4	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	53
chokecherry	Prunus virginiana	NSLX	FIA	1.2	1.6	1.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	54
American chestnut	Castanea dentata	NSLX	FIA	2.4	1.3	0.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	55
blackjack oak	Quercus marilandica	NSL	Medium	1.2	1.1	0.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	56
pin cherry	Prunus pensylvanica	NSL	Low	1.2	1.0	0.8	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	57
black ash	Fraxinus nigra	WSH	Medium	1.2	0.8	0.7	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	58
southern red oak	Quercus falcata	WDL	Medium	1.2	0.8	0.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	59
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	1.2	0.7	0.6	No change	No change	Low	Rare	Very Poor	Very Poor			0	60
black willow	Salix nigra	NSH	Low	1.2	0.5	0.4	Lg. dec.	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	61
American holly	Ilex opaca	NSL	Medium	1.2	0.4	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	62
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	0	0	0	New Habitat	Unknown	Low	Absent	New Habitat	Unknown			3	63
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	64
Table Mountain pine	Pinus pungens	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	65
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	66
northern white-cedar	Thuja occidentalis	WSH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	67
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	68
black maple	Acer nigrum	NSH	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	69
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	70
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	71
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	72
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	73
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	74
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	75
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	76
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat		Likely +	3	77
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	78
red mulberry	Morus rubra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	79
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	80
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	81
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	82
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	83
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	84
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	85
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	86