

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

	sq. km	sq. mi	FIA Plots
Area of Region	9,100.0	3,513.5	139

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	22	Increase	20	23	Very Good	4	4	Likely	0	0
Hickory	4			Medium	25	No Change	9	7	Good	17	21	Infill	30	31
Maple	6	Abundant	2	Low	28	Decrease	23	22	Fair	8	5	Migrate	7	13
Oak	9	Common	22	FIA	9	New	18	19	Poor	5	5			
Pine	5	Rare	37			Unknown	14	13	Very Poor	16	14			
Other	34	Absent	22						FIA Only	3	3			
	61		83		84		84	84	Unknown	5	4			
										58	56			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	51.8	53.5	55.8	56.1	
	CCSM85	51.8	53.9	56.5	59.6	
	GFDL45	51.8	56.5	57.5	58.7	
	GFDL85	51.8	55.2	58.7	63.0	
	HAD45	51.8	54.5	57.9	59.5	
	HAD85	51.8	54.6	58.9	63.7	
Growing Season May—Sep	CCSM45	68.0	69.9	71.8	72.3	
	CCSM85	68.0	70.1	72.7	76.6	
	GFDL45	68.0	73.6	74.8	76.4	
	GFDL85	68.0	72.3	76.3	81.0	
	HAD45	68.0	71.2	74.3	76.4	
	HAD85	68.0	70.8	75.9	81.3	
Coldest Month Average	CCSM45	27.3	29.1	30.8	31.2	
	CCSM85	27.3	29.5	30.8	32.7	
	GFDL45	27.3	30.5	31.4	32.0	
	GFDL85	27.3	30.4	31.7	33.3	
	HAD45	27.3	29.1	31.5	31.7	
	HAD85	27.3	29.7	31.6	33.9	
Warmest Month Average	CCSM45	73.9	76.2	77.2	77.5	
	CCSM85	73.9	76.4	78.2	80.1	
	GFDL45	73.9	77.0	79.1	80.5	
	GFDL85	73.9	78.5	80.9	83.9	
	HAD45	73.9	77.6	79.5	80.8	
	HAD85	73.9	77.7	80.8	84.6	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	43.2	45.8	46.7	49.9	
	CCSM85	43.2	46.2	48.1	52.0	
	GFDL45	43.2	48.2	51.1	50.8	
	GFDL85	43.2	44.9	50.7	52.3	
	HAD45	43.2	45.6	46.7	46.1	
	HAD85	43.2	48.3	44.8	48.2	
Growing Season May—Sep	CCSM45	19.9	22.2	22.7	24.1	
	CCSM85	19.9	22.0	22.8	24.0	
	GFDL45	19.9	20.8	21.6	21.9	
	GFDL85	19.9	19.1	21.1	21.4	
	HAD45	19.9	20.8	19.4	19.1	
	HAD85	19.9	21.1	18.8	19.4	

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
chestnut oak	Quercus prinus	NDH	High	62.6	822.8	17.5	Sm. dec.	Sm. dec.	High	Abundant	Good	Good	Infill ++	Infill ++	1	1
red maple	Acer rubrum	WDH	High	72.5	643.1	13.2	Sm. dec.	Sm. dec.	High	Abundant	Good	Good	Infill ++	Infill ++	1	2
northern red oak	Quercus rubra	WDH	Medium	64.8	417.7	10.6	Sm. dec.	No change	High	Common	Fair	Good	Infill +	Infill ++	1	3
sweet birch	Betula lenta	NDH	High	53.8	318.0	8.5	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	4
black oak	Quercus velutina	WDH	High	59.3	313.3	9.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	5
black cherry	Prunus serotina	WDL	Medium	64.8	304.1	10.1	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	6
yellow-poplar	Liriodendron tulipifera	WDH	High	56	262.0	12.2	Sm. inc.	Sm. dec.	High	Common	Very Good	Fair	Infill ++	Infill +	1	7
blackgum	Nyssa sylvatica	WDL	Medium	52.7	252.5	7.0	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	8
white oak	Quercus alba	WDH	Medium	60.4	244.2	6.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	9
eastern white pine	Pinus strobus	WDH	High	26.4	184.0	8.8	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	10
eastern hemlock	Tsuga canadensis	NSH	High	28.6	141.9	6.1	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	11
sassafras	Sassafras albidum	WSL	Low	57.1	132.7	3.6	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +	Infill ++	1	12
white ash	Fraxinus americana	WDL	Medium	46.2	131.4	8.3	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair	Infill +	Infill +	1	13
pignut hickory	Carya glabra	WDL	Medium	52.7	126.1	4.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	14
black locust	Robinia pseudoacacia	NDH	Low	20.9	99.5	12.3	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +	Infill ++	1	15
scarlet oak	Quercus coccinea	WDL	Medium	29.7	98.6	4.9	Sm. inc.	No change	Medium	Common	Good	Fair	Infill ++	Infill +	1	16
sugar maple	Acer saccharum	WDH	High	11	98.0	11.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	17
silver maple	Acer saccharinum	NSH	Low	7.7	86.5	22.4	Sm. dec.	Sm. dec.	High	Common	Fair	Fair		Infill +	2	18
black walnut	Juglans nigra	WDH	Low	22	83.9	7.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	19
pitch pine	Pinus rigida	NSH	High	11	83.5	6.9	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	20
bitternut hickory	Carya cordiformis	WSL	Low	22	75.8	6.0	No change	Sm. inc.	High	Common	Good	Very Good	Infill ++	Infill ++	2	21
mockernut hickory	Carya alba	WDL	Medium	26.4	69.1	5.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	22
ailanthus	Ailanthus altissima	NSL	FIA	29.7	58.3	7.3	Unknown	Unknown	NA	Common	NNIS	NNIS			0	23
shagbark hickory	Carya ovata	WSL	Medium	23.1	53.9	5.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	24
American beech	Fagus grandifolia	WDH	High	29.7	47.6	4.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	25
American basswood	Tilia americana	WSL	Medium	18.7	46.0	4.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	26
hackberry	Celtis occidentalis	WDH	Medium	17.6	33.0	4.8	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	27
Virginia pine	Pinus virginiana	NDH	High	8.8	28.7	4.9	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	28
American elm	Ulmus americana	WDH	Medium	18.7	24.1	3.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	29
sycamore	Platanus occidentalis	NSL	Low	2.2	22.0	9.1	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	30
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	7.7	13.5	3.3	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	31
green ash	Fraxinus pennsylvanica	WSH	Low	6.6	13.5	4.5	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	32
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	16.5	13.0	1.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	33
white spruce	Picea glauca	NSL	Medium	5.5	12.8	5.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	34
yellow birch	Betula alleghaniensis	NDL	High	2.2	11.9	4.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	35
serviceberry	Amelanchier spp.	NSL	Low	17.6	11.8	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	36
pin oak	Quercus palustris	NSH	Low	2.2	11.0	4.6	No change	No change	Low	Rare	Very Poor	Very Poor			0	37
bigtooth aspen	Populus grandidentata	NSL	Medium	7.7	8.9	2.4	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	38
tamarack (native)	Larix laricina	NSH	High	1.1	8.5	7.1	Sm. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	39
red mulberry	Morus rubra	NSL	Low	5.5	8.4	3.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	40
Scots pine	Pinus sylvestris	NSH	FIA	2.2	8.0	3.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	41
striped maple	Acer pensylvanicum	NSL	Medium	7.7	7.8	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	42
boxelder	Acer negundo	WSH	Low	22	7.8	5.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	43
Norway maple	Acer platanoides	NSL	FIA	18.7	7.7	3.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	44
eastern redcedar	Juniperus virginiana	WDH	Medium	13.2	7.7	8.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	45
flowering dogwood	Cornus florida	WDL	Medium	11	6.2	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	46
swamp white oak	Quercus bicolor	NSL	Low	4.4	4.9	16.3	Lg. dec.	Lg. 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
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	1.1	3.8	3.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	48
Norway spruce	Picea abies	NSH	FIA	4.4	2.0	6.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	49
Table Mountain pine	Pinus pungens	NSL	Low	1.1	1.8	1.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	50
northern catalpa	Catalpa speciosa	NSHX	FIA	4.4	1.8	5.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	51
slippery elm	Ulmus rubra	WSL	Low	1.1	1.7	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	52
pawpaw	Asimina triloba	NSL	Low	5.5	1.6	1.0	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	53
eastern redbud	Cercis canadensis	NSL	Low	9.9	1.2	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	54
American chestnut	Castanea dentata	NSLX	FIA	5.5	1.1	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	55
black ash	Fraxinus nigra	WSH	Medium	1.1	1.1	0.9	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	56
paulownia	Paulownia tomentosa	NSL	FIA	4.4	0.5	1.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	57
pin cherry	Prunus pensylvanica	NSL	Low	4.4	0.4	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	58
swamp chestnut oak	Quercus michauxii	NSL	Low	4.4	0.4	1.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	59
quaking aspen	Populus tremuloides	WDH	High	4.4	0.3	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	60
white mulberry	Morus alba	NSL	FIA	4.4	0.3	0.9	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	61
red spruce	Picea rubens	NDH	High	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	62
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	63
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	64
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	65
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			0	66
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	67
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	68
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	69
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	70
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	71
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	72
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	73
redbay	Persea borbonia	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	74
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	75
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	76
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	77
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	78
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	79
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	80
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	81
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	82
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	83
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	84