

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 3,243.3 248

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	21	Increase	RCP45	RCP85	Very Good	11	12	Likely	2	3
Ash	2			Medium	33	No Change	15	13	Good	12	15	Infill	13	15
Hickory	7			Low	32	Decrease	25	21	Fair	11	13	Migrate	1	1
Maple	4	Abundant	3	FIA	2	New	5	6	Poor	18	14			
Oak	16	Common	23			Unknown	8	7	Very Poor	13	11			
Pine	3	Rare	43						FIA Only	2	2			
Other	37	Absent	11						Unknown	6	5			
	69		80		80		80	80		73	72		16	19

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099	
Annual	64.7	66.4	68.2	68.4	
Average	64.7	66.8	69.2	71.8	
GFDL45	64.7	67.7	68.9	70.1	
GFDL85	64.7	67.5	70.3	73.7	
HAD45	64.7	67.1	70.1	71.0	
HAD85	64.7	67.4	71.5	75.2	
Growing Season	78.5	80.2	81.5	81.9	
May—Sep	78.5	82.1	83.1	85.5	
GFDL45	78.5	82.0	85.0	89.3	
GFDL85	78.5	82.0	85.0	89.3	
HAD45	78.5	81.6	84.4	84.8	
HAD85	78.5	81.9	87.1	90.3	
Coldest Month	44.3	47.0	47.9	48.0	
Average	44.3	48.1	48.2	48.1	
GFDL45	44.3	48.1	48.2	48.1	
GFDL85	44.3	45.3	46.5	47.1	
HAD45	44.3	45.3	47.0	47.7	
HAD85	44.3	46.5	48.2	50.0	
Warmest Month	83.4	84.7	85.1	85.3	
Average	83.4	85.2	86.0	87.6	
GFDL45	83.4	88.0	87.8	89.6	
GFDL85	83.4	87.4	88.8	91.8	
HAD45	83.4	87.2	88.5	88.4	
HAD85	83.4	87.9	90.6	91.5	

Precipitation (in)

Scenario	2009	2039	2069	2099	
Annual	51.9	52.0	57.4	56.3	
Total	51.9	53.8	57.8	58.5	
GFDL45	51.9	55.0	64.2	56.3	
GFDL85	51.9	54.6	58.1	59.0	
HAD45	51.9	51.3	52.0	56.4	
HAD85	51.9	54.2	47.5	51.1	
Growing Season	19.2	19.4	20.2	20.2	
May—Sep	19.2	21.2	26.7	21.7	
GFDL45	19.2	21.4	23.3	23.8	
GFDL85	19.2	21.4	23.3	23.8	
HAD45	19.2	18.5	18.3	18.7	
HAD85	19.2	19.2	14.6	15.0	

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	90.5	3425.6	39.7	No change	No change	Medium	Abundant	Good	Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	90.5	982.3	11.3	No change	No change	Medium	Abundant	Good	Good			1	2
water oak	Quercus nigra	WDH	High	78.6	623.8	8.3	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	3
willow oak	Quercus phellos	NSL	Low	45.2	433.7	10.4	No change	No change	Medium	Common	Fair	Fair			1	4
shortleaf pine	Pinus echinata	WDH	High	53.6	384.3	7.2	No change	No change	Medium	Common	Fair	Fair			1	5
southern red oak	Quercus falcata	WDL	Medium	75	374.0	5.3	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	6
winged elm	Ulmus alata	WDL	Medium	75	356.2	4.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	7
post oak	Quercus stellata	WDH	High	54.8	281.1	5.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	8
sugarberry	Celtis laevigata	NDH	Medium	26.2	210.3	9.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	9
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	53.6	180.8	3.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	10
white oak	Quercus alba	WDH	Medium	45.2	166.2	3.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	11
green ash	Fraxinus pennsylvanica	WSH	Low	42.9	152.4	4.0	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	12
bald cypress	Taxodium distichum	NSH	Medium	8.3	145.8	17.5	No change	No change	Medium	Common	Fair	Fair			1	13
red maple	Acer rubrum	WDH	High	45.2	141.0	3.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	14
honeylocust	Gleditsia triacanthos	NSH	Low	16.7	115.0	6.9	No change	No change	High	Common	Good	Good			1	15
blackgum	Nyssa sylvatica	WDL	Medium	46.4	109.1	2.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	16
American elm	Ulmus americana	WDH	Medium	27.4	107.4	4.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	17
Osage-orange	Maclura pomifera	NDH	Medium	8.3	97.3	20.9	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	18
pecan	Carya illinoensis	NSH	Low	9.5	95.7	10.1	No change	No change	Low	Common	Poor	Poor			0	19
eastern cottonwood	Populus deltoides	NSH	Low	3.6	69.9	19.6	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	20
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	23.8	66.8	2.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	21
mockernut hickory	Carya alba	WDL	Medium	35.7	65.4	1.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	22
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	25	62.7	3.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	23
Nuttall oak	Quercus texana	NSH	Medium	10.7	59.5	8.8	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			0	24
water elm	Planera aquatica	NSL	Low	3.6	56.6	15.9	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor		Infill +	0	25
black willow	Salix nigra	NSH	Low	3.6	52.3	14.6	No change	Sm. inc.	Low	Common	Poor	Fair			1	26
overcup oak	Quercus lyrata	NSL	Medium	16.7	47.9	3.9	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair			1	27
waterlocust	Gleditsia aquatica	NSLX	FIA	7.1	44.1	6.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	28
Shumard oak	Quercus shumardii	NSL	Low	9.5	38.7	4.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	29
florida maple	Acer barbatum	NSL	Low	11.9	38.2	3.2	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	30
water hickory	Carya aquatica	NSL	Medium	15.5	34.3	3.1	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	31
cedar elm	Ulmus crassifolia	NDH	Medium	8.3	33.1	4.0	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	32
white ash	Fraxinus americana	WDL	Medium	27.4	31.7	1.4	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor			1	33
flowering dogwood	Cornus florida	WDL	Medium	26.2	28.2	1.1	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	34
common persimmon	Diospyros virginiana	NSL	Low	22.6	27.2	1.2	Sm. dec.	Sm. inc.	High	Rare	Poor	Good			1	35
black cherry	Prunus serotina	WDL	Medium	28.6	23.9	0.8	Sm. dec.	Sm. inc.	Low	Rare	Very Poor	Poor			1	36
sycamore	Platanus occidentalis	NSL	Low	6	23.4	11.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	37
eastern redcedar	Juniperus virginiana	WDH	Medium	6	18.5	3.1	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	38
swamp chestnut oak	Quercus michauxii	NSL	Low	7.1	16.9	2.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	39
shagbark hickory	Carya ovata	WSL	Medium	9.5	16.6	1.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	40
slippery elm	Ulmus rubra	WSL	Low	8.3	15.9	1.9	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	41
sweetbay	Magnolia virginiana	NSL	Medium	3.6	14.7	4.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	42
bitternut hickory	Carya cordiformis	WSL	Low	4.8	14.1	3.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	43
sassafras	Sassafras albidum	WSL	Low	13.1	12.8	1.0	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	44
American holly	Ilex opaca	NSL	Medium	8.3	11.6	1.4	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	45
pignut hickory	Carya glabra	WDL	Medium	8.3	10.7	1.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	46
blackjack oak	Quercus marilandica	NSL	Medium	7.1	10.1	1.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	47

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USDA Forest Service
Northern Research Station
Landscape Change Research Group
Iverson, Peters, Prasad, Matthews

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
eastern redbud	Cercis canadensis	NSL	Low	3.6	7.6	2.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 48
black hickory	Carya texana	NDL	High	3.6	7.4	2.1	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +	Infill ++		2 49
American beech	Fagus grandifolia	WDH	High	4.8	7.1	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		2 50
boxelder	Acer negundo	WSH	Low	7.1	7.0	2.4	No change	No change	High	Rare	Fair	Fair		Infill +		1 51
water tupelo	Nyssa aquatica	NSH	Medium	2.4	5.3	2.2	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				0 52
black walnut	Juglans nigra	WDH	Low	1.2	4.7	4.0	Sm. dec.	No change	Medium	Rare	Very Poor	Poor				0 53
red mulberry	Morus rubra	NSL	Low	4.8	4.7	1.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 54
laurel oak	Quercus laurifolia	NDH	Medium	3.6	4.2	1.2	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +	Infill ++		2 55
black locust	Robinia pseudoacacia	NDH	Low	2.4	3.8	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 56
bluejack oak	Quercus incana	NSL	Low	1.2	3.7	3.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 57
black oak	Quercus velutina	WDH	High	3.6	3.5	1.0	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0 58
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	2.4	3.3	1.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++		2 59
swamp tupelo	Nyssa biflora	NDH	Medium	1.2	2.1	1.8	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor				0 60
pin cherry	Prunus pensylvanica	NSL	Low	3.6	1.9	0.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 61
sourwood	Oxydendrum arboreum	NDL	High	1.2	1.9	1.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor				0 62
sugar maple	Acer saccharum	WDH	High	1.2	1.5	1.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor				0 63
slash pine	Pinus elliotii	NDH	High	2.4	1.3	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 64
live oak	Quercus virginiana	NDH	High	1.2	0.8	0.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 65
wild plum	Prunus americana	NSLX	FIA	1.2	0.8	0.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 66
American basswood	Tilia americana	WSL	Medium	1.2	0.7	0.6	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0 67
pawpaw	Asimina triloba	NSL	Low	1.2	0.3	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 68
northern red oak	Quercus rubra	WDH	Medium	1.2	0.2	0.2	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor				0 69
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate +		3 70
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 71
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 72
river birch	Betula nigra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 73
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 74
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 75
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 76
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 77
redbay	Persea borbonia	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat		Likely +		3 78
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 79
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 80