

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
 9,606.8 3,709.2 173

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	22	24	Increase	22	24	Very Good	5	8	Likely	3	3
Hickory	4			Medium	34	53	No Change	8	9	Good	20	19	Infill	9	10
Maple	5	Abundant	4	Low	33	13	Decrease	30	27	Fair	8	10	Migrate	8	10
Oak	13	Common	28	FIA	6		New	22	24	Poor	15	11			
Pine	4	Rare	34				Unknown	13	11	Very Poor	10	10			
Other	38	Absent	29							FIA Only	1	1			
	66		95		95	90		95	95	Unknown	7	5			
											66	64			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099	
Annual	55.4	57.1	59.3	59.6	
Average	55.4	57.5	60.0	63.1	
GFDL45	55.4	59.0	60.9	62.0	
GFDL85	55.4	58.7	62.1	66.1	
HAD45	55.4	57.9	61.3	62.7	
HAD85	55.4	58.2	62.2	66.7	
Growing Season	71.1	72.9	74.7	75.2	
May—Sep	71.1	73.2	75.8	79.5	
GFDL45	71.1	75.2	77.5	79.1	
GFDL85	71.1	75.2	79.0	83.4	
HAD45	71.1	74.0	77.2	79.0	
HAD85	71.1	73.9	78.7	83.7	
Coldest Month	31.8	33.8	35.2	35.6	
Average	31.8	34.3	35.6	37.1	
GFDL45	31.8	35.0	35.5	36.2	
GFDL85	31.8	34.6	35.7	37.1	
HAD45	31.8	33.5	35.6	35.8	
HAD85	31.8	33.9	35.7	37.5	
Warmest Month	76.9	79.1	79.9	80.2	
Average	76.9	79.1	81.1	82.6	
GFDL45	76.9	80.0	81.7	83.1	
GFDL85	76.9	81.5	83.6	86.3	
HAD45	76.9	80.3	82.3	83.3	
HAD85	76.9	80.6	83.6	87.0	

Precipitation (in)

Scenario	2009	2039	2069	2099	
Annual	42.6	46.2	48.7	49.5	
Total	42.6	46.9	48.2	55.0	
GFDL45	42.6	47.7	50.9	51.5	
GFDL85	42.6	44.2	50.8	52.0	
HAD45	42.6	45.3	46.5	45.3	
HAD85	42.6	49.0	44.3	47.9	
Growing Season	19.4	22.7	24.1	24.5	
May—Sep	19.4	22.7	23.1	26.5	
GFDL45	19.4	20.6	22.2	22.6	
GFDL85	19.4	18.9	21.8	22.2	
HAD45	19.4	21.2	19.9	18.7	
HAD85	19.4	21.7	18.4	19.6	

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
yellow-poplar	Liriodendron tulipifera	WDH	High	69.8	866.6	14.2	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	1
red maple	Acer rubrum	WDH	High	75.5	828.4	12.4	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
white oak	Quercus alba	WDH	Medium	63.7	768.2	12.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
chestnut oak	Quercus prinus	NDH	High	41.5	512.1	17.6	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	4
Virginia pine	Pinus virginiana	NDH	High	40.8	392.7	10.1	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	5
sweetgum	Liquidambar styraciflua	WDH	High	27.6	347.8	12.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	6
American beech	Fagus grandifolia	WDH	High	43.8	327.5	8.1	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	7
blackgum	Nyssa sylvatica	WDL	Medium	60.9	263.8	4.7	No change	No change	High	Common	Good	Good			1	8
mockernut hickory	Carya alba	WDL	Medium	42.2	250.8	6.0	No change	No change	High	Common	Good	Good			1	9
black oak	Quercus velutina	WDH	High	43.3	232.5	5.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	10
pignut hickory	Carya glabra	WDL	Medium	43.2	227.2	5.4	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	11
northern red oak	Quercus rubra	WDH	Medium	45.9	225.3	5.9	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	12
eastern redcedar	Juniperus virginiana	WDH	Medium	30.1	201.1	8.2	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	13
southern red oak	Quercus falcata	WDL	Medium	26.6	195.4	6.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	14
black cherry	Prunus serotina	WDL	Medium	41.6	164.5	5.0	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	15
black locust	Robinia pseudoacacia	NDH	Low	26.9	157.9	10.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	16
scarlet oak	Quercus coccinea	WDL	Medium	31.3	134.1	5.1	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	17
white ash	Fraxinus americana	WDL	Medium	32.7	125.6	5.8	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	18
bitternut hickory	Carya cordiformis	WSL	Low	11.5	116.5	14.0	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	19
American holly	Ilex opaca	NSL	Medium	22.8	102.1	3.7	No change	No change	Medium	Common	Fair	Fair			1	20
sassafras	Sassafras albidum	WSL	Low	25.7	98.7	5.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	21
boxelder	Acer negundo	WDH	Low	15.2	91.5	7.0	Sm. dec.	No change	High	Common	Fair	Good			1	22
American elm	Ulmus americana	WDH	Medium	27.6	88.3	4.8	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	23
black walnut	Juglans nigra	WDH	Low	20.8	82.4	4.5	No change	Sm. dec.	Medium	Common	Fair	Poor			1	24
sycamore	Platanus occidentalis	NSL	Low	23.5	82.4	7.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	25
loblolly pine	Pinus taeda	WDH	High	5.2	74.9	13.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	26
pin oak	Quercus palustris	NSH	Low	10.4	65.6	8.7	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	0	27
green ash	Fraxinus pennsylvanica	WSH	Low	12.1	63.8	6.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	28
eastern cottonwood	Populus deltoides	NSH	Low	1	61.2	55.7	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	29
American hornbeam; muscley	Carpinus caroliniana	WSL	Low	23.4	60.5	2.8	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	30
flowering dogwood	Cornus florida	WDL	Medium	26.3	59.2	2.5	No change	No change	Medium	Common	Fair	Fair			1	31
Norway spruce	Picea abies	NSH	FIA	1	54.9	50.0	Unknown	Unknown	NA	Common	NNIS	NNIS			0	32
hackberry	Celtis occidentalis	WDH	Medium	13.2	48.4	4.5	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	1	33
eastern redbud	Cercis canadensis	NSL	Low	10.4	46.6	6.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	34
willow oak	Quercus phellos	NSL	Low	11.1	44.0	3.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	35
post oak	Quercus stellata	WDH	High	4.6	36.3	5.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	36
bigtooth aspen	Populus grandidentata	NSL	Medium	7.3	34.6	4.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	37
slippery elm	Ulmus rubra	WSL	Low	9.4	31.8	3.2	No change	No change	Medium	Rare	Poor	Poor			1	38
silver maple	Acer saccharinum	NSH	Low	3.1	31.6	9.6	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	39
common persimmon	Diospyros virginiana	NSL	Low	12	23.9	2.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	40
pawpaw	Asimina triloba	NSL	Low	10	22.5	2.9	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	41
river birch	Betula nigra	NSL	Low	6.2	18.2	2.8	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	42
swamp chestnut oak	Quercus michauxii	NSL	Low	2.1	14.1	6.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	43
shortleaf pine	Pinus echinata	WDH	High	3.1	13.0	3.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	44
ailanthus	Ailanthus altissima	NSL	FIA	12.1	12.7	2.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	45
sweet birch	Betula lenta	NDH	High	4.2	9.8	2.2	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	46
eastern white pine	Pinus strobus	WDH	High	1	8.6	7.8	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			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
red mulberry	Morus rubra	NSL	Low	5.2	8.1	11.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	48
white mulberry	Morus alba	NSL	FIA	5.2	8.1	9.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	49
sugar maple	Acer saccharum	WDH	High	2.1	7.4	3.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	50
black willow	Salix nigra	NSH	Low	2.1	7.0	3.2	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	2	51
shingle oak	Quercus imbricaria	NDH	Medium	2.1	5.7	2.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	52
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	1	5.2	4.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	53
shagbark hickory	Carya ovata	WSL	Medium	2.1	4.5	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	54
serviceberry	Amelanchier spp.	NSL	Low	2.1	3.2	1.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	55
paulownia	Paulownia tomentosa	NSL	FIA	2.1	2.7	1.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	56
blackjack oak	Quercus marilandica	NSL	Medium	2.1	2.4	1.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	57
eastern hemlock	Tsuga canadensis	NSH	High	1	1.5	1.4	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	58
pin cherry	Prunus pensylvanica	NSL	Low	1	1.5	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	59
Norway maple	Acer platanoides	NSL	FIA	4.2	1.4	5.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	60
honeylocust	Gleditsia triacanthos	NSH	Low	1	1.2	1.1	Sm. dec.	Lg. inc.	High	Rare	Poor	Good			2	61
quaking aspen	Populus tremuloides	WDH	High	1	1.0	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	62
yellow birch	Betula alleghaniensis	NDL	High	1	1.0	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	63
laurel oak	Quercus laurifolia	NDH	Medium	1	0.6	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	64
American chestnut	Castanea dentata	NSLX	FIA	1	0.6	0.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	65
winged elm	Ulmus alata	WDL	Medium	1	0.3	0.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	66
red spruce	Picea rubens	NDH	High	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	67
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	68
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	69
bald cypress	Taxodium distichum	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	70
pond cypress	Taxodium ascendens	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	71
florida maple	Acer barbatum	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat		Migrate +	3	72
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	73
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	74
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	75
water hickory	Carya aquatica	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	76
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	77
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	78
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	79
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	80
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	81
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	82
water tupelo	Nyssa aquatica	NSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	83
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	84
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++		3	85
redbay	Persea borbonia	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +		3	86
water elm	Planera aquatica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	87
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	88
turkey oak	Quercus laevis	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	89
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	90
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	91
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	92
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	93
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	94

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Climate Change Atlas Tree Species

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	FIAlv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	95