

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	8,189.5	3,162.0	99

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	17	21	Very Good	3	4	Likely	2	2
Hickory	3			Medium	31	No Change	14	11	Good	17	17	Infill	13	12
Maple	5	Abundant	2	Low	31	Decrease	21	20	Fair	10	13	Migrate	9	11
Oak	11	Common	22	FIA	5	New	27	28	Poor	12	7			
Pine	4	Rare	33			Unknown	10	9	Very Poor	9	10			
Other	31	Absent	30						FIA Only	1	1			
	57		87		89		89	89	Unknown	5	4		24	25
										57	56			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	54.5	56.2	58.4	58.7	
	CCSM85	54.5	56.6	59.1	62.1	
	GFDL45	54.5	59.0	60.0	61.1	
	GFDL85	54.5	57.8	61.2	65.3	
	HAD45	54.5	57.1	60.4	61.9	
	HAD85	54.5	57.2	61.2	65.8	
Growing Season (May—Sep)	CCSM45	70.5	72.3	74.1	74.5	
	CCSM85	70.5	72.5	75.0	78.7	
	GFDL45	70.5	75.7	76.9	78.4	
	GFDL85	70.5	74.5	78.4	82.8	
	HAD45	70.5	73.5	76.5	78.4	
	HAD85	70.5	73.1	77.8	82.8	
Coldest Month (Average)	CCSM45	30.6	32.6	34.1	34.6	
	CCSM85	30.6	33.0	34.2	36.0	
	GFDL45	30.6	33.8	34.4	35.1	
	GFDL85	30.6	33.6	34.8	36.3	
	HAD45	30.6	32.2	34.5	34.7	
	HAD85	30.6	32.8	34.6	36.7	
Warmest Month (Average)	CCSM45	76.4	78.5	79.4	79.6	
	CCSM85	76.4	78.6	80.4	82.0	
	GFDL45	76.4	79.4	81.1	82.4	
	GFDL85	76.4	80.8	82.9	85.7	
	HAD45	76.4	79.7	81.5	82.5	
	HAD85	76.4	79.8	82.6	85.9	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	45.1	48.3	50.7	53.0	
	CCSM85	45.1	48.9	50.8	56.5	
	GFDL45	45.1	50.6	54.4	54.4	
	GFDL85	45.1	47.3	54.1	55.3	
	HAD45	45.1	47.6	49.2	48.4	
	HAD85	45.1	51.6	47.1	50.8	
Growing Season (May—Sep)	CCSM45	20.2	23.6	24.8	26.3	
	CCSM85	20.2	23.2	23.9	26.6	
	GFDL45	20.2	21.5	23.5	24.0	
	GFDL85	20.2	20.1	22.9	23.3	
	HAD45	20.2	21.4	20.2	19.1	
	HAD85	20.2	22.4	19.0	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	65.8	868.5	21.6	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			2	1
red maple	Acer rubrum	WDH	High	72	820.7	16.7	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			2	2
black cherry	Prunus serotina	WDL	Medium	49.1	407.8	13.3	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	2	3
blackgum	Nyssa sylvatica	WDL	Medium	59.7	271.9	7.5	Sm. dec.	No change	High	Common	Fair	Good	Infill +		2	4
sweetgum	Liquidambar styraciflua	WDH	High	15	234.1	18.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			2	5
black oak	Quercus velutina	WDH	High	45.7	218.1	8.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			2	6
black locust	Robinia pseudoacacia	NDH	Low	27.6	214.7	15.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	7
chestnut oak	Quercus prinus	NDH	High	36.2	196.1	15.8	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +		2	8
American beech	Fagus grandifolia	WDH	High	39.7	195.5	7.8	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	9
northern red oak	Quercus rubra	WDH	Medium	47.1	191.9	8.2	No change	Sm. dec.	High	Common	Good	Fair		Infill +	2	10
black walnut	Juglans nigra	WDH	Low	30.1	177.1	9.5	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +		2	11
white oak	Quercus alba	WDH	Medium	46.4	167.9	7.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			2	12
pignut hickory	Carya glabra	WDL	Medium	43.4	152.2	6.8	No change	Sm. dec.	Medium	Common	Fair	Poor	Infill +	Infill +	2	13
Virginia pine	Pinus virginiana	NDH	High	8.5	150.2	18.0	No change	No change	Medium	Common	Fair	Fair	Infill +		2	14
mockernut hickory	Carya alba	WDL	Medium	24.4	125.0	7.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			2	15
eastern redcedar	Juniperus virginiana	WDH	Medium	7.3	98.1	13.7	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	16
scarlet oak	Quercus coccinea	WDL	Medium	29.2	92.9	6.4	No change	Sm. dec.	Medium	Common	Fair	Poor	Infill +		2	17
sassafras	Sassafras albidum	WSL	Low	34.9	75.6	3.4	No change	No change	Medium	Common	Fair	Fair			0	18
eastern white pine	Pinus strobus	WDH	High	2.4	74.1	26.5	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	19
pin oak	Quercus palustris	NSH	Low	12.2	72.8	8.2	Sm. dec.	Lg. dec.	Low	Common	Poor	Very Poor			2	20
boxelder	Acer negundo	WSH	Low	22.1	66.1	6.2	No change	Sm. inc.	High	Common	Good	Very Good			2	21
white ash	Fraxinus americana	WDL	Medium	25.1	56.0	4.1	Lg. inc.	Lg. inc.	Low	Common	Good	Good			0	22
slippery elm	Ulmus rubra	WSL	Low	3.6	53.0	12.4	Sm. dec.	No change	Medium	Common	Poor	Fair			0	23
willow oak	Quercus phellos	NSL	Low	7.7	51.4	6.1	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	24
sycamore	Platanus occidentalis	NSL	Low	12.3	44.9	10.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	25
silver maple	Acer saccharinum	NSH	Low	1.2	41.2	29.5	No change	No change	High	Rare	Fair	Fair		Infill +	2	26
bitternut hickory	Carya cordiformis	WSL	Low	18.1	40.7	5.9	Sm. inc.	Sm. inc.	High	Rare	Good	Good			2	27
ailanthus	Ailanthus altissima	NSL	FIA	12.2	34.1	6.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	28
sweet birch	Betula lenta	NDH	High	12.2	31.5	13.5	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	29
Norway maple	Acer platanoides	NSL	FIA	4.9	30.5	5.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	30
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	7.9	25.0	3.0	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	31
American holly	Ilex opaca	NSL	Medium	4.3	24.7	6.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	32
common persimmon	Diospyros virginiana	NSL	Low	11	21.9	3.5	Sm. dec.	Lg. inc.	High	Rare	Poor	Good			0	33
loblolly pine	Pinus taeda	WDH	High	6.2	12.2	11.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	34
flowering dogwood	Cornus florida	WDL	Medium	15.9	10.1	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			0	35
river birch	Betula nigra	NSL	Low	6.1	9.5	4.7	No change	Sm. inc.	Medium	Rare	Poor	Fair		Infill +	2	36
pawpaw	Asimina triloba	NSL	Low	2.3	9.2	3.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	37
shingle oak	Quercus imbricaria	NDH	Medium	1.2	8.3	6.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	38
wild plum	Prunus americana	NSLX	FIA	1.2	6.9	4.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	39
southern red oak	Quercus falcata	WDL	Medium	5.5	5.9	5.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	40
black willow	Salix nigra	NSH	Low	1.2	5.5	4.0	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair		Infill +	2	41
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	1.2	5.4	3.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	42
white mulberry	Morus alba	NSL	FIA	5	4.4	2.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	43
paulownia	Paulownia tomentosa	NSL	FIA	6.1	3.2	1.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	44
black ash	Fraxinus nigra	WSH	Medium	5.6	3.0	1.7	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	45
quaking aspen	Populus tremuloides	WDH	High	1.2	2.6	1.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	46
red mulberry	Morus rubra	NSL	Low	1.2	2.4	1.7	No change	No change	Medium	Rare	Poor	Poor			0	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
swamp white oak	Quercus bicolor	NSL	Low	3.8	1.6	3.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 48
Osage-orange	Maclura pomifera	NDH	Medium	2.5	1.5	2.3	Sm. dec.	No change	High	Rare	Poor	Fair				0 49
eastern-hornbeam; ironw	Ostrya virginiana	WSL	Low	6.1	1.5	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good				2 50
pitch pine	Pinus rigida	NSH	High	1.2	1.1	0.7	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0 51
hackberry	Celtis occidentalis	WDH	Medium	7.4	0.7	0.6	Sm. inc.	Lg. inc.	High	Rare	Good	Good				0 52
sugar maple	Acer saccharum	WDH	High	3.8	0.6	1.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good				2 53
green ash	Fraxinus pennsylvanica	WSH	Low	1.8	0.6	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 54
eastern cottonwood	Populus deltoides	NSH	Low	1.8	0.4	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 55
American elm	Ulmus americana	WDH	Medium	4.9	0.2	0.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 56
eastern hemlock	Tsuga canadensis	NSH	High	4.9	0.2	0.6	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor				0 57
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 58
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 59
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 60
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 61
bald cypress	Taxodium distichum	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 62
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 63
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 64
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				0 65
water hickory	Carya aquatica	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 66
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 67
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 68
black hickory	Carya texana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 69
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 70
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 71
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 72
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 73
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 74
water tupelo	Nyssa aquatica	NSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 75
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 76
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +			3 77
redbay	Persea borbonia	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +			3 78
water elm	Planera aquatica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 79
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 80
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +		3 81
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 82
swamp chestnut oak	Quercus michauxii	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 83
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 84
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 85
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 86
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				0 87
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 88
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				0 89