

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	8,800.0	3,397.7	233

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	33	33	Very Good	12	12	Likely	1	1
Hickory	6		Medium	30	52	No Change	17	17	Good	17	20	Infill	45	45
Maple	4	Abundant	Low	36	13	Decrease	12	12	Fair	11	9	Migrate	6	6
Oak	13	Common	FIA	4		New	14	15	Poor	15	15			
Pine	6	Rare				Unknown	16	15	Very Poor	6	6			
Other	35	Absent							FIA Only	2	2			
	66	89		92	89		92	92	Unknown	12	11			
										75	75			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	60.0	61.8	63.8	63.9	
	CCSM85	60.0	62.2	64.6	67.3	
	GFDL45	60.0	63.1	64.9	65.7	
	GFDL85	60.0	62.8	66.1	69.8	
	HAD45	60.0	62.3	65.1	66.5	
	HAD85	60.0	62.5	66.6	70.6	
Growing Season (May—Sep)	CCSM45	73.7	75.4	77.3	77.7	
	CCSM85	73.7	75.6	78.2	81.8	
	GFDL45	73.7	77.2	79.2	80.5	
	GFDL85	73.7	77.0	80.7	84.9	
	HAD45	73.7	76.8	79.4	81.0	
	HAD85	73.7	76.7	82.4	86.4	
Coldest Month Average	CCSM45	39.8	42.2	43.0	42.9	
	CCSM85	39.8	42.4	43.4	44.5	
	GFDL45	39.8	43.0	43.2	43.7	
	GFDL85	39.8	41.7	42.7	43.4	
	HAD45	39.8	39.9	41.7	42.1	
	HAD85	39.8	40.9	42.0	43.6	
Warmest Month Average	CCSM45	78.5	80.6	81.6	81.5	
	CCSM85	78.5	80.8	82.3	84.1	
	GFDL45	78.5	81.6	82.5	83.5	
	GFDL85	78.5	82.1	84.0	86.3	
	HAD45	78.5	82.2	84.0	84.7	
	HAD85	78.5	82.8	86.4	88.5	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	53.0	56.8	60.1	60.8	
	CCSM85	53.0	57.2	60.4	66.9	
	GFDL45	53.0	59.4	63.0	66.7	
	GFDL85	53.0	58.1	64.7	64.9	
	HAD45	53.0	52.7	56.5	58.2	
	HAD85	53.0	59.1	53.9	57.0	
Growing Season (May—Sep)	CCSM45	21.8	24.4	26.5	27.2	
	CCSM85	21.8	24.0	25.0	27.9	
	GFDL45	21.8	26.5	29.2	30.1	
	GFDL85	21.8	25.1	30.1	30.5	
	HAD45	21.8	21.6	22.1	23.2	
	HAD85	21.8	25.3	20.5	21.0	

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

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	55.7	972.9	18.4	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good	Infill ++	Infill ++	1	1
yellow-poplar	Liriodendron tulipifera	WDH	High	84.1	776.9	10.9	Sm. dec.	Sm. dec.	High	Abundant	Good	Good	Infill ++	Infill ++	1	2
Virginia pine	Pinus virginiana	NDH	High	61.4	763.8	12.9	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair	Infill +	Infill +	0	3
white oak	Quercus alba	WDH	Medium	78.4	643.4	8.9	No change	No change	High	Abundant	Very Good	Very Good	Infill ++	Infill ++	1	4
sweetgum	Liquidambar styraciflua	WDH	High	70.5	618.9	10.1	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good	Infill ++	Infill ++	1	5
red maple	Acer rubrum	WDH	High	81.8	586.4	7.7	No change	No change	High	Abundant	Very Good	Very Good	Infill ++	Infill ++	1	6
water oak	Quercus nigra	WDH	High	59.1	502.3	10.8	Sm. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good	Infill ++	Infill ++	1	7
shortleaf pine	Pinus echinata	WDH	High	60.2	422.4	7.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	8
sourwood	Oxydendrum arboreum	NDL	High	65.9	334.6	5.2	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	9
southern red oak	Quercus falcata	WDL	Medium	59.1	316.5	7.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	10
scarlet oak	Quercus coccinea	WDL	Medium	53.4	290.6	5.7	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	11
chestnut oak	Quercus prinus	NDH	High	29.5	287.9	9.5	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	12
black cherry	Prunus serotina	WDL	Medium	70.5	257.1	4.0	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair	Infill +	Infill +	1	13
eastern white pine	Pinus strobus	WDH	High	21.6	187.9	8.5	No change	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	0	14
blackgum	Nyssa sylvatica	WDL	Medium	54.5	165.3	3.2	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	15
mockernut hickory	Carya alba	WDL	Medium	58	157.7	3.1	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	16
black oak	Quercus velutina	WDH	High	53.4	133.3	2.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	17
pignut hickory	Carya glabra	WDL	Medium	53.4	120.2	2.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	18
eastern redcedar	Juniperus virginiana	WDH	Medium	36.4	116.5	3.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	2	19
northern red oak	Quercus rubra	WDH	Medium	34.1	115.8	3.7	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	20
flowering dogwood	Cornus florida	WDL	Medium	60.2	94.3	1.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	21
post oak	Quercus stellata	WDH	High	31.8	82.3	2.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	22
river birch	Betula nigra	NSL	Low	9.1	78.6	8.5	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	23
black locust	Robinia pseudoacacia	NDH	Low	15.9	73.7	4.5	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	24
black willow	Salix nigra	NSH	Low	4.5	57.1	12.3	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	2	25
sycamore	Platanus occidentalis	NSL	Low	9.1	53.8	5.8	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	26
American holly	Ilex opaca	NSL	Medium	29.5	52.8	2.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	27
green ash	Fraxinus pennsylvanica	WSH	Low	19.3	48.1	3.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	28
eastern hemlock	Tsuga canadensis	NSH	High	14.8	44.1	2.9	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	2	29
American hornbeam; muscley	Carpinus caroliniana	WSL	Low	18.2	40.5	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	30
American beech	Fagus grandifolia	WDH	High	33	38.4	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	31
common persimmon	Diospyros virginiana	NSL	Low	19.3	31.8	2.0	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	32
winged elm	Ulmus alata	WDL	Medium	10.2	27.9	2.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	33
sweet birch	Betula lenta	NDH	High	8	27.8	3.4	No change	No change	Low	Rare	Very Poor	Very Poor			2	34
black walnut	Juglans nigra	WDH	Low	6.8	25.6	3.7	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	35
pitch pine	Pinus rigida	NSH	High	12.5	25.5	2.9	Sm. inc.	No change	Medium	Rare	Fair	Poor	Infill +	Infill +	2	36
sand hickory	Carya pallida	NSL	FIA	5.7	19.5	3.4	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	37
white ash	Fraxinus americana	WDL	Medium	12.5	18.7	2.1	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	2	38
red mulberry	Morus rubra	NSL	Low	5.7	17.6	3.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	39
boxelder	Acer negundo	WSH	Low	8	13.2	5.9	No change	No change	High	Rare	Fair	Fair		Infill +	2	40
paulownia	Paulownia tomentosa	NSL	FIA	3.4	12.6	3.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	41
bitternut hickory	Carya cordiformis	WSL	Low	4.5	12.0	2.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	42
sassafras	Sassafras albidum	WSL	Low	9.1	11.5	1.2	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	43
willow oak	Quercus phellos	NSL	Low	15.9	9.6	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	44
ailanthus	Ailanthus altissima	NSL	FIA	2.3	9.4	4.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	45
shagbark hickory	Carya ovata	WSL	Medium	6.8	9.1	8.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	46
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	4.5	9.1	2.0	No change	No change	Low	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
pecan	Carya illinoensis	NSH	Low	3.4	7.9	2.3	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	2	48
cucumber tree	Magnolia acuminata	NSL	Low	4.5	7.9	1.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	49
swamp tupelo	Nyssa biflora	NDH	Medium	2.3	7.7	3.3	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	50
honeylocust	Gleditsia triacanthos	NSH	Low	1.1	7.6	6.6	No change	Sm. inc.	High	Rare	Fair	Good			2	51
silverbell	Halesia spp.	NSL	Low	5.7	7.0	1.2	No change	No change	Medium	Rare	Poor	Poor	Infill +		2	52
sugar maple	Acer saccharum	WDH	High	1.1	5.7	4.9	Sm. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +		2	53
swamp chestnut oak	Quercus michauxii	NSL	Low	1.1	5.3	4.6	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			0	54
blackjack oak	Quercus marilandica	NSL	Medium	2.3	4.5	1.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	55
slash pine	Pinus elliotii	NDH	High	1.1	4.5	3.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	56
chinkapin oak	Quercus muehlenbergii	NSL	Medium	2.3	3.7	1.6	No change	Sm. dec.	Medium	Rare	Poor	Very Poor			0	57
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	2.3	3.6	1.6	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	58
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	3.4	3.2	0.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	59
yellow birch	Betula alleghaniensis	NDL	High	2.3	2.9	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	60
serviceberry	Amelanchier spp.	NSL	Low	2.3	2.8	1.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	61
wild plum	Prunus americana	NSLX	FIA	6.8	2.5	1.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	62
sugarberry	Celtis laevigata	NDH	Medium	2.3	1.3	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	63
American basswood	Tilia americana	WSL	Medium	1.1	1.1	1.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	64
eastern redbud	Cercis canadensis	NSL	Low	2.3	1.1	0.5	Very Lg. dec.	No change	Medium	Rare	Lost	Poor		Infill +	2	65
florida maple	Acer barbatum	NSL	Low	1.1	1.0	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	66
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	67
spruce pine	Pinus glabra	NSL	Low	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
pond cypress	Taxodium ascendens	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++		3	70
black maple	Acer nigrum	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	71
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	72
silver maple	Acer saccharinum	NSH	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	73
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	74
yellow buckeye	Aesculus flava	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	75
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	76
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			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			3	79
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			3	80
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	81
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	82
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	83
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	84
turkey oak	Quercus laevis	NSH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	85
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	86
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	87
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	88
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	89
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	90
American elm	Ulmus americana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	91
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	92