

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	8,500.0	3,281.9	250

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	24	Increase	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85		
Ash	2			Medium	35	No Change	11	12	Good	17	20	Likely	1	1
Hickory	7			Low	35	Decrease	27	21	Fair	9	11	Infill	7	10
Maple	4	Abundant	3	FIA	2	New	10	11	Poor	14	12	Migrate	3	4
Oak	18	Common	27			Unknown	6	5	Very Poor	16	12		11	15
Pine	6	Rare	44						FIA Only	2	2			
Other	37	Absent	14						Unknown	4	3			
	74		88		88		88	88		77	76			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	64.3	66.0	67.9	68.0	
	CCSM85	64.3	66.2	68.7	71.3	
	GFDL45	64.3	67.1	68.9	69.6	
	GFDL85	64.3	66.8	69.9	73.4	
	HAD45	64.3	66.5	69.2	70.8	
	HAD85	64.3	66.7	70.8	74.6	
Growing Season (May—Sep)	CCSM45	77.3	78.9	80.5	81.0	
	CCSM85	77.3	78.9	81.5	84.7	
	GFDL45	77.3	80.1	81.9	83.2	
	GFDL85	77.3	79.8	83.2	87.2	
	HAD45	77.3	80.6	83.0	84.7	
	HAD85	77.3	80.5	86.4	89.8	
Coldest Month Average	CCSM45	44.6	46.8	47.6	47.5	
	CCSM85	44.6	46.7	47.9	49.1	
	GFDL45	44.6	48.0	48.2	48.5	
	GFDL85	44.6	46.6	47.7	48.0	
	HAD45	44.6	44.7	46.3	46.9	
	HAD85	44.6	45.8	47.0	48.7	
Warmest Month Average	CCSM45	81.4	82.9	83.6	83.8	
	CCSM85	81.4	82.9	84.3	86.1	
	GFDL45	81.4	83.8	84.6	85.4	
	GFDL85	81.4	83.5	85.0	87.2	
	HAD45	81.4	85.6	87.4	88.1	
	HAD85	81.4	85.8	89.5	91.0	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	52.4	53.9	58.9	57.5	
	CCSM85	52.4	55.4	57.5	64.0	
	GFDL45	52.4	58.7	62.1	64.8	
	GFDL85	52.4	58.7	61.3	61.6	
	HAD45	52.4	50.6	56.2	56.5	
	HAD85	52.4	55.4	50.6	54.1	
Growing Season (May—Sep)	CCSM45	20.5	21.8	23.8	23.2	
	CCSM85	20.5	21.2	22.1	24.3	
	GFDL45	20.5	25.2	27.4	27.2	
	GFDL85	20.5	25.6	28.0	28.5	
	HAD45	20.5	19.6	21.4	20.5	
	HAD85	20.5	21.6	16.7	17.8	

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	90.6	3521.0	39.4	No change	No change	Medium	Abundant	Good	Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	89.4	1033.8	11.6	No change	No change	Medium	Abundant	Good	Good			1	2
water oak	Quercus nigra	WDH	High	85.9	778.0	9.2	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	3
southern red oak	Quercus falcata	WDL	Medium	50.6	311.1	5.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	4
yellow-poplar	Liriodendron tulipifera	WDH	High	49.4	205.6	4.4	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	5
white oak	Quercus alba	WDH	Medium	42.4	205.0	4.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	6
shortleaf pine	Pinus echinata	WDH	High	43.5	203.9	4.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	7
green ash	Fraxinus pennsylvanica	WSH	Low	34.1	178.6	5.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	8
red maple	Acer rubrum	WDH	High	56.5	175.6	3.3	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	9
pinnut hickory	Carya glabra	WDL	Medium	47.1	154.9	3.2	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	10
winged elm	Ulmus alata	WDL	Medium	51.8	152.9	3.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	11
post oak	Quercus stellata	WDH	High	47.1	145.8	3.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	12
sugarberry	Celtis laevigata	NDH	Medium	30.6	145.0	5.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	13
laurel oak	Quercus laurifolia	NDH	Medium	41.2	144.5	3.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	14
mockernut hickory	Carya alba	WDL	Medium	43.5	140.4	3.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	15
blackgum	Nyssa sylvatica	WDL	Medium	47.1	131.5	2.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	16
flowering dogwood	Cornus florida	WDL	Medium	43.5	114.7	2.5	No change	No change	Medium	Common	Fair	Fair			1	17
boxelder	Acer negundo	WSH	Low	15.3	95.5	6.0	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	18
sweetbay	Magnolia virginiana	NSL	Medium	18.8	94.7	4.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	19
American elm	Ulmus americana	WDH	Medium	27.1	88.2	3.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	20
swamp tupelo	Nyssa biflora	NDH	Medium	10.6	87.0	12.3	No change	Sm. inc.	Low	Common	Poor	Fair			1	21
black cherry	Prunus serotina	WDL	Medium	41.2	84.6	2.2	Sm. inc.	Lg. inc.	Low	Common	Fair	Good			1	22
longleaf pine	Pinus palustris	NSH	Medium	18.8	83.2	4.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	23
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	30.6	71.2	2.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	24
common persimmon	Diospyros virginiana	NSL	Low	45.9	69.6	1.6	Lg. dec.	No change	High	Common	Fair	Good			1	25
sycamore	Platanus occidentalis	NSL	Low	11.8	67.1	5.5	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	26
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	10.6	64.1	5.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	27
Osage-orange	Maclura pomifera	NDH	Medium	12.9	53.1	6.3	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	28
water hickory	Carya aquatica	NSL	Medium	7.1	51.8	7.1	Sm. dec.	No change	Medium	Common	Poor	Fair	Infill +	Infill +	1	29
river birch	Betula nigra	NSL	Low	10.6	51.5	4.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	30
willow oak	Quercus phellos	NSL	Low	15.3	45.6	2.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	31
American beech	Fagus grandifolia	WDH	High	18.8	45.4	2.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	32
sourwood	Oxydendrum arboreum	NDL	High	25.9	45.4	1.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			1	33
eastern cottonwood	Populus deltoides	NSH	Low	4.7	42.8	8.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	34
honeylocust	Gleditsia triacanthos	NSH	Low	7.1	42.1	11.6	No change	No change	High	Rare	Fair	Fair		Infill +	2	35
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	14.1	41.7	2.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	36
black oak	Quercus velutina	WDH	High	12.9	40.5	3.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	37
water tupelo	Nyssa aquatica	NSH	Medium	2.4	33.3	13.7	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	38
pecan	Carya illinoensis	NSH	Low	8.2	30.8	3.6	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	1	39
eastern redcedar	Juniperus virginiana	WDH	Medium	17.6	30.3	2.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	40
black willow	Salix nigra	NSH	Low	15.3	29.3	2.6	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1	41
bald cypress	Taxodium distichum	NSH	Medium	7.1	28.2	7.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	42
shagbark hickory	Carya ovata	WSL	Medium	10.6	27.6	2.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	43
blackjack oak	Quercus marilandica	NSL	Medium	15.3	25.6	1.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	44
swamp chestnut oak	Quercus michauxii	NSL	Low	8.2	24.3	2.9	No change	No change	Medium	Rare	Poor	Poor			1	45
turkey oak	Quercus laevis	NSH	Medium	5.9	21.5	3.5	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2	46
sassafras	Sassafras albidum	WSL	Low	14.1	21.1	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	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
Virginia pine	Pinus virginiana	NDH	High	5.9	20.7	3.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	48
American basswood	Tilia americana	WDL	Medium	8.2	17.0	2.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	49
scarlet oak	Quercus coccinea	WDL	Medium	7.1	14.7	2.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	50
northern red oak	Quercus rubra	WDH	Medium	7.1	14.7	2.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	51
chestnut oak	Quercus prinus	NDH	High	4.7	14.4	2.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +		2	52
spruce pine	Pinus glabra	NSL	Low	5.9	14.2	2.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	53
overcup oak	Quercus lyrata	NSL	Medium	5.9	13.9	2.3	No change	Sm. inc.	Low	Rare	Very Poor	Poor	Infill +		2	54
red mulberry	Morus rubra	NSL	Low	10.6	13.6	1.2	Sm. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair			1	55
durand oak	Quercus sinuata var. sinuata	NSL	FIA	2.4	13.5	5.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	56
florida maple	Acer barbatum	NSL	Low	11.8	13.2	1.1	Sm. dec.	No change	High	Rare	Poor	Fair			1	57
black walnut	Juglans nigra	WDH	Low	4.7	12.4	2.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	58
slash pine	Pinus elliotii	NDH	High	1.2	11.4	9.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	59
black locust	Robinia pseudoacacia	NDH	Low	3.5	10.4	2.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	60
bigleaf magnolia	Magnolia macrophylla	NSL	Low	3.5	9.5	2.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	61
white ash	Fraxinus americana	WDL	Medium	4.7	9.4	1.9	No change	Sm. inc.	Low	Rare	Very Poor	Poor	Infill +		2	62
black hickory	Carya texana	NDL	High	1.2	8.8	7.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	63
slippery elm	Ulmus rubra	WSL	Low	12.9	8.7	1.0	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill ++		1	64
American holly	Ilex opaca	NSL	Medium	5.9	7.7	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	65
cucumbertree	Magnolia acuminata	NSL	Low	3.5	5.2	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	66
eastern redbud	Cercis canadensis	NSL	Low	4.7	5.0	1.0	No change	No change	Medium	Rare	Poor	Poor			1	67
Shumard oak	Quercus shumardii	NSL	Low	2.4	4.9	2.0	Sm. dec.	No change	High	Rare	Poor	Fair			0	68
bitternut hickory	Carya cordiformis	WSL	Low	3.5	3.3	0.9	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	69
wild plum	Prunus americana	NSLX	FIA	8.2	2.8	1.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	70
southern magnolia	Magnolia grandiflora	NSL	Low	1.2	1.7	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	71
silver maple	Acer saccharinum	NSH	Low	1.2	1.3	1.0	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	72
bluejack oak	Quercus incana	NSL	Low	1.2	0.6	0.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	73
hackberry	Celtis occidentalis	WDH	Medium	1.2	0.2	0.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	74
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	75
pond cypress	Taxodium ascendens	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	76
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	77
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	78
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	79
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	80
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	81
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	82
silverbell	Halesia spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	83
redbay	Persea borbonia	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	84
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	85
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	86
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	87
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	88