

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	302

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		RCP45	RCP85	RCP45	RCP85	RCP45	RCP85				
Ash	1			16	22	Increase	28	31	Very Good	10	12	Likely	2	2	
Hickory	5			31	48	No Change	9	9	Good	16	17	Infill	33	36	
Maple	3	Abundant	3	Low	32	10	Decrease	26	23	Fair	7	10	Migrate	1	4
Oak	15	Common	22	FIA	2		New	11	13	Poor	15	10			
Pine	5	Rare	40				Unknown	7	5	Very Poor	13	12			
Other	36	Absent	16							FIA Only	1	1			
										Unknown	5	3			
	65		81		81	80		81	81		67	65		36	42

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	63.8	65.5	67.5	67.6	
	CCSM85	63.8	65.8	68.2	70.9	
	GFDL45	63.8	66.7	68.6	69.3	
	GFDL85	63.8	66.5	69.7	73.3	
	HAD45	63.8	66.1	68.8	70.4	
HAD85	63.8	66.3	70.3	74.2		
Growing Season (May—Sep)	CCSM45	76.9	78.4	80.1	80.6	
	CCSM85	76.9	78.5	81.0	84.4	
	GFDL45	76.9	80.0	81.8	83.0	
	GFDL85	76.9	79.9	83.3	87.4	
	HAD45	76.9	80.1	82.4	84.3	
HAD85	76.9	79.9	85.7	89.4		
Coldest Month Average	CCSM45	44.4	46.8	47.6	47.5	
	CCSM85	44.4	46.6	47.7	48.9	
	GFDL45	44.4	47.5	47.7	48.1	
	GFDL85	44.4	46.3	47.3	47.7	
	HAD45	44.4	44.7	46.3	46.9	
HAD85	44.4	45.6	46.6	48.3		
Warmest Month Average	CCSM45	81.3	82.9	83.8	84.0	
	CCSM85	81.3	83.1	84.4	86.3	
	GFDL45	81.3	84.2	84.9	85.6	
	GFDL85	81.3	84.4	85.9	88.2	
	HAD45	81.3	85.2	86.7	87.5	
HAD85	81.3	85.4	88.9	90.7		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	45.7	48.4	50.7	52.1	
	CCSM85	45.7	48.5	52.2	57.8	
	GFDL45	45.7	50.4	53.1	56.7	
	GFDL85	45.7	50.3	54.3	53.2	
	HAD45	45.7	43.8	47.5	48.7	
HAD85	45.7	48.6	44.5	47.4		
Growing Season (May—Sep)	CCSM45	19.0	21.4	22.8	24.0	
	CCSM85	19.0	20.6	22.6	24.8	
	GFDL45	19.0	23.3	25.2	26.1	
	GFDL85	19.0	22.8	26.1	26.1	
	HAD45	19.0	18.7	19.3	19.1	
HAD85	19.0	20.2	16.4	16.9		

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	97.6	4077.4	43.0	No change	Sm. dec.	Medium	Abundant	Good	Fair			1	1
sweetgum	Liquidambar styraciflua	WDH	High	98.8	1170.2	12.3	No change	No change	Medium	Abundant	Good	Good			1	2
water oak	Quercus nigra	WDH	High	95.3	800.5	8.7	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good	Infill ++	Infill ++	1	3
red maple	Acer rubrum	WDH	High	67.1	313.7	4.6	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	4
southern red oak	Quercus falcata	WDL	Medium	69.4	259.5	4.1	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	5
white oak	Quercus alba	WDH	Medium	57.6	255.9	4.7	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	6
laurel oak	Quercus laurifolia	NDH	Medium	36.5	209.2	5.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	7
yellow-poplar	Liriodendron tulipifera	WDH	High	52.9	185.6	3.5	Sm. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	8
winged elm	Ulmus alata	WDL	Medium	58.8	182.5	3.1	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good	Infill ++	Infill ++	1	9
swamp tupelo	Nyssa biflora	NDH	Medium	23.5	172.9	8.9	No change	Sm. inc.	Low	Common	Poor	Fair	Infill +	Infill +	1	10
shortleaf pine	Pinus echinata	WDH	High	48.2	121.0	2.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	11
green ash	Fraxinus pennsylvanica	WSH	Low	37.6	110.0	2.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	12
flowering dogwood	Cornus florida	WDL	Medium	55.3	108.6	1.9	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	13
mockernut hickory	Carya alba	WDL	Medium	43.5	103.1	2.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	14
pignut hickory	Carya glabra	WDL	Medium	47.1	102.1	2.1	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	15
black cherry	Prunus serotina	WDL	Medium	58.8	90.6	1.8	Lg. inc.	Lg. inc.	Low	Common	Good	Good	Infill ++	Infill ++	1	16
American elm	Ulmus americana	WDH	Medium	31.8	84.2	2.6	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good	Infill ++	Infill ++	1	17
post oak	Quercus stellata	WDH	High	36.5	65.5	2.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	18
sugarberry	Celtis laevigata	NDH	Medium	14.1	60.9	4.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	2	19
longleaf pine	Pinus palustris	NSH	Medium	15.3	58.5	5.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			2	20
American holly	Ilex opaca	NSL	Medium	23.5	56.4	2.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	21
blackgum	Nyssa sylvatica	WDL	Medium	38.8	54.7	1.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	22
pecan	Carya illinoensis	NSH	Low	4.7	53.8	11.3	Sm. dec.	No change	Low	Common	Poor	Poor		Infill +	2	23
willow oak	Quercus phellos	NSL	Low	15.3	53.4	3.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	2	24
slash pine	Pinus elliottii	NDH	High	12.9	52.2	5.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			2	25
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	27.1	46.6	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	26
common persimmon	Diospyros virginiana	NSL	Low	30.6	39.5	1.5	Lg. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	27
sand pine	Pinus clausa	NDH	High	1.2	37.5	31.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	28
black oak	Quercus velutina	WDH	High	16.5	36.7	2.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	29
turkey oak	Quercus laevis	NSH	Medium	4.7	36.5	7.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	30
sweetbay	Magnolia virginiana	NSL	Medium	10.6	34.1	3.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	31
florida maple	Acer barbatum	NSL	Low	21.2	28.1	1.3	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	1	32
sycamore	Platanus occidentalis	NSL	Low	9.4	27.0	2.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	33
red mulberry	Morus rubra	NSL	Low	20	26.0	1.3	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	34
eastern redcedar	Juniperus virginiana	WDH	Medium	16.5	25.2	2.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	35
overcup oak	Quercus lyrata	NSL	Medium	4.7	24.4	5.1	No change	No change	Low	Rare	Very Poor	Very Poor			2	36
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	15.3	21.8	1.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	37
swamp chestnut oak	Quercus michauxii	NSL	Low	9.4	21.4	2.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	38
black willow	Salix nigra	NSH	Low	9.4	20.9	2.2	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	2	39
boxelder	Acer negundo	WSH	Low	9.4	20.0	2.1	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	1	40
chestnut oak	Quercus prinus	NDH	High	5.9	18.0	3.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	41
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	7.1	17.7	2.5	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	42
river birch	Betula nigra	NSL	Low	8.2	17.3	2.1	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	43
northern red oak	Quercus rubra	WDH	Medium	11.8	15.0	1.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	44
sourwood	Oxydendrum arboreum	NDL	High	12.9	14.4	1.1	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	1	45
shagbark hickory	Carya ovata	WSL	Medium	9.4	14.2	1.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	46
bald cypress	Taxodium distichum	NSH	Medium	2.4	13.4	5.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	47

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USDA Forest Service
Northern Research Station
Landscape Change Research Group
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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
scarlet oak	Quercus coccinea	WDL	Medium	9.4	12.9	1.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 48
American beech	Fagus grandifolia	WDH	High	7.1	11.9	1.7	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +			2 49
slippery elm	Ulmus rubra	WSL	Low	9.4	11.7	1.2	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +		2 50
bitternut hickory	Carya cordiformis	WSL	Low	2.4	11.1	4.7	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor				0 51
hackberry	Celtis occidentalis	WDH	Medium	5.9	10.6	1.8	Lg. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +		2 52
sassafras	Sassafras albidum	WSL	Low	8.2	10.4	1.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +			2 53
eastern redbud	Cercis canadensis	NSL	Low	10.6	7.9	0.7	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good		Infill ++		1 54
blackjack oak	Quercus marilandica	NSL	Medium	3.5	6.3	1.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good				2 55
black locust	Robinia pseudoacacia	NDH	Low	2.4	6.2	2.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 56
black walnut	Juglans nigra	WDH	Low	2.4	5.6	2.4	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0 57
water tupelo	Nyssa aquatica	NSH	Medium	3.5	4.7	1.3	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				0 58
wild plum	Prunus americana	NSLX	FIA	2.4	4.6	1.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 59
paulownia	Paulownia tomentosa	NSL	FIA	2.4	4.3	1.8	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 60
redbay	Persea borbonia	NSL	Low	1.2	3.5	3.0	No change	Sm. dec.	High	Rare	Fair	Poor				0 61
southern magnolia	Magnolia grandiflora	NSL	Low	3.5	2.0	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 62
American basswood	Tilia americana	WSL	Medium	1.2	1.7	1.4	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 63
eastern cottonwood	Populus deltoides	NSH	Low	1.2	1.2	1.0	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0 64
pawpaw	Asimina triloba	NSL	Low	1.2	0.6	0.5	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 65
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 66
pond cypress	Taxodium ascendens	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 67
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 68
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3 69
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 70
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 71
white ash	Fraxinus americana	WDL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +		3 72
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat				0 73
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 74
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 75
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 76
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 77
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat				3 78
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 79
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 80
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				0 81