

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	315

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	17	25	Increase	29	33	Very Good	15	16	Likely	1	1
Hickory	7			Medium	34	52	No Change	12	11	Good	15	17	Infill	4	7
Maple	4	Abundant	2	Low	34	9	Decrease	25	22	Fair	7	6	Migrate	4	6
Oak	17	Common	25	FIA	3		New	12	13	Poor	11	13			
Pine	5	Rare	42				Unknown	10	9	Very Poor	14	10			
Other	34	Absent	17							FIA Only	2	2			
	69		86		88	86		88	88	Unknown	7	6			
											71	70			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	63.0	64.7	66.8	66.9	
	CCSM85	63.0	65.0	67.6	70.2	
	GFDL45	63.0	65.8	67.6	68.4	
	GFDL85	63.0	65.5	68.7	72.0	
	HAD45	63.0	65.3	68.2	69.6	
	HAD85	63.0	65.6	69.9	73.6	
Growing Season (May—Sep)	CCSM45	76.7	78.4	80.1	80.6	
	CCSM85	76.7	78.5	81.1	84.4	
	GFDL45	76.7	79.7	81.5	83.0	
	GFDL85	76.7	79.3	82.9	86.8	
	HAD45	76.7	80.1	82.7	84.1	
	HAD85	76.7	80.1	86.3	89.7	
Coldest Month (Average)	CCSM45	42.4	44.6	45.4	45.4	
	CCSM85	42.4	44.9	46.2	47.4	
	GFDL45	42.4	46.2	46.2	46.4	
	GFDL85	42.4	44.3	45.4	45.8	
	HAD45	42.4	42.3	44.1	44.7	
	HAD85	42.4	43.6	44.9	46.6	
Warmest Month (Average)	CCSM45	81.2	82.8	83.6	83.7	
	CCSM85	81.2	82.9	84.3	86.1	
	GFDL45	81.2	84.1	84.9	85.8	
	GFDL85	81.2	83.6	85.2	87.4	
	HAD45	81.2	85.6	87.5	88.0	
	HAD85	81.2	85.9	90.1	91.3	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	54.4	56.1	61.3	59.8	
	CCSM85	54.4	57.0	58.8	65.0	
	GFDL45	54.4	61.6	65.0	67.1	
	GFDL85	54.4	61.2	64.1	66.1	
	HAD45	54.4	52.7	59.3	59.1	
	HAD85	54.4	57.4	51.6	55.6	
Growing Season (May—Sep)	CCSM45	20.8	20.9	22.2	22.3	
	CCSM85	20.8	19.9	20.4	22.3	
	GFDL45	20.8	25.5	27.1	26.9	
	GFDL85	20.8	26.0	28.0	29.0	
	HAD45	20.8	19.5	22.0	20.4	
	HAD85	20.8	21.8	16.0	17.5	

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	100	3457.8	36.2	No change	No change	Medium	Abundant	Good	Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	100	961.9	10.1	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	2
water oak	Quercus nigra	WDH	High	83.5	463.0	5.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	3
red maple	Acer rubrum	WDH	High	90.6	406.0	4.7	No change	Sm. inc.	High	Common	Good	Very Good			1	4
Virginia pine	Pinus virginiana	NDH	High	36.5	400.1	11.0	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	5
yellow-poplar	Liriodendron tulipifera	WDH	High	77.6	357.2	4.6	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	6
southern red oak	Quercus falcata	WDL	Medium	78.8	351.6	4.5	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	7
white oak	Quercus alba	WDH	Medium	78.8	323.8	4.3	No change	No change	High	Common	Good	Good			1	8
mockernut hickory	Carya alba	WDL	Medium	64.7	198.0	3.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	9
blackgum	Nyssa sylvatica	WDL	Medium	83.5	181.8	2.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	10
shortleaf pine	Pinus echinata	WDH	High	54.1	175.6	3.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	11
longleaf pine	Pinus palustris	NSH	Medium	22.4	166.0	7.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	12
pignut hickory	Carya glabra	WDL	Medium	61.2	152.9	2.5	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	13
post oak	Quercus stellata	WDH	High	50.6	151.1	3.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	14
sourwood	Oxydendrum arboreum	NDL	High	60	141.9	2.4	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	15
flowering dogwood	Cornus florida	WDL	Medium	70.6	111.2	1.6	No change	No change	Medium	Common	Fair	Fair			1	16
chestnut oak	Quercus prinus	NDH	High	31.8	106.6	3.4	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	17
eastern redcedar	Juniperus virginiana	WDH	Medium	40	102.7	2.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	18
black cherry	Prunus serotina	WDL	Medium	60	100.5	1.7	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	19
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	42.4	87.6	2.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	20
sweetbay	Magnolia virginiana	NSL	Medium	25.9	80.4	3.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	21
willow oak	Quercus phellos	NSL	Low	29.4	77.4	3.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	22
green ash	Fraxinus pennsylvanica	WSH	Low	30.6	73.5	3.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	23
swamp tupelo	Nyssa biflora	NDH	Medium	8.2	72.7	8.8	No change	No change	Low	Common	Poor	Poor			0	24
winged elm	Ulmus alata	WDL	Medium	54.1	60.0	1.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	25
American beech	Fagus grandifolia	WDH	High	30.6	59.0	1.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	26
black oak	Quercus velutina	WDH	High	32.9	56.7	1.7	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	27
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	32.9	49.4	1.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	28
northern red oak	Quercus rubra	WDH	Medium	28.2	47.2	1.7	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	29
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	15.3	44.7	2.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	30
laurel oak	Quercus laurifolia	NDH	Medium	25.9	44.7	2.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	31
sugarberry	Celtis laevigata	NDH	Medium	14.1	29.5	3.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	32
blackjack oak	Quercus marilandica	NSL	Medium	16.5	29.4	1.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	33
florida maple	Acer barbatum	NSL	Low	28.2	28.8	1.2	Sm. dec.	No change	High	Rare	Poor	Fair			1	34
water tupelo	Nyssa aquatica	NSH	Medium	7.1	25.2	3.6	No change	No change	Low	Rare	Very Poor	Very Poor			0	35
red mulberry	Morus rubra	NSL	Low	16.5	23.3	1.4	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	36
American holly	Ilex opaca	NSL	Medium	20	22.9	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	37
common persimmon	Diospyros virginiana	NSL	Low	25.9	22.7	0.9	No change	Sm. inc.	High	Rare	Fair	Good			1	38
scarlet oak	Quercus coccinea	WDL	Medium	12.9	21.5	1.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	39
American elm	Ulmus americana	WDH	Medium	11.8	21.4	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	40
bigleaf magnolia	Magnolia macrophylla	NSL	Low	10.6	20.3	1.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	41
river birch	Betula nigra	NSL	Low	4.7	18.7	4.0	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	42
overcup oak	Quercus lyrata	NSL	Medium	5.9	18.3	3.1	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	1	43
boxelder	Acer negundo	WSH	Low	7.1	17.1	5.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	44
sassafras	Sassafras albidum	WSL	Low	20	16.8	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	45
slash pine	Pinus elliotii	NDH	High	1.2	16.0	13.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	46
sycamore	Platanus occidentalis	NSL	Low	10.6	16.0	1.5	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +	Infill ++	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
pecan	Carya illinoensis	NSH	Low	1.2	15.5	13.2	No change	No change	Low	Rare	Very Poor	Very Poor			2	48
Shumard oak	Quercus shumardii	NSL	Low	2.4	13.0	5.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	49
swamp chestnut oak	Quercus michauxii	NSL	Low	12.9	12.0	1.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	50
bald cypress	Taxodium distichum	NSH	Medium	1.2	11.1	9.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	51
shagbark hickory	Carya ovata	WSL	Medium	8.2	10.2	1.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	52
black willow	Salix nigra	NSH	Low	10.6	7.3	0.7	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1	53
wild plum	Prunus americana	NSLX	FIA	5.9	7.1	1.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	54
white ash	Fraxinus americana	WDL	Medium	8.2	6.2	0.8	No change	No change	Low	Rare	Very Poor	Very Poor			0	55
bitternut hickory	Carya cordiformis	WSL	Low	7.1	6.1	0.9	Very Lg. dec.	Lg. dec.	High	Rare	Lost	Poor			0	56
slippery elm	Ulmus rubra	WSL	Low	3.5	4.7	1.3	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	57
sand hickory	Carya pallida	NSL	FIA	1.2	4.4	3.8	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	58
eastern redbud	Cercis canadensis	NSL	Low	3.5	4.4	1.3	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	59
water elm	Planera aquatica	NSL	Low	1.2	3.7	3.1	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	60
serviceberry	Amelanchier spp.	NSL	Low	7.1	3.5	0.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	61
black hickory	Carya texana	NDL	High	1.2	2.3	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	62
Osage-orange	Maclura pomifera	NDH	Medium	1.2	2.0	1.7	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	63
turkey oak	Quercus laevis	NSH	Medium	2.4	1.8	0.8	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	64
silver maple	Acer saccharinum	NSH	Low	2.4	1.5	0.6	Sm. dec.	Lg. dec.	High	Rare	Poor	Poor			0	65
American basswood	Tilia americana	WSL	Medium	1.2	1.1	1.0	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	66
cucumbertree	Magnolia acuminata	NSL	Low	2.4	0.7	0.3	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	67
paulownia	Paulownia tomentosa	NSL	FIA	1.2	0.5	0.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	68
chinkapin oak	Quercus muehlenbergii	NSL	Medium	1.2	0.5	0.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	69
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	70
spruce pine	Pinus glabra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +		3	71
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	72
sugar maple	Acer saccharum	WDH	High	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	73
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	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		Migrate +	3	75
water hickory	Carya aquatica	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	76
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	77
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	78
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	79
silverbell	Halesia spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	80
black walnut	Juglans nigra	WDH	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	81
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	82
redbay	Persea borbonia	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	83
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	84
Nuttall oak	Quercus texana	NSH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	85
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	86
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	87
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate ++	3	88