

U.S. Census Bureau Urban Areas
Climate Change Atlas Tree Species
 Current and Potential Future Habitat, Capability, and Migration

Area of Region sq. km sq. mi FIA Plots
 8,300.0 3,204.6 262

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	16	21	Increase	37	38	Very Good	15	17	Likely	0	0
Hickory	8			Medium	35	51	No Change	9	11	Good	18	16	Infill	12	17
Maple	3	Abundant	4	Low	32	12	Decrease	23	20	Fair	7	10	Migrate	3	4
Oak	17	Common	23	FIA	3		New	9	9	Poor	14	14			
Pine	6	Rare	45				Unknown	8	8	Very Poor	13	9			
Other	36	Absent	13							FIA Only	2	2			
	72		85		86	84		86	86	Unknown	5	5			
											74	73			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	62.7	64.5	66.5	66.6	
Average	CCSM85	62.7	64.8	67.2	70.0	
	GFDL45	62.7	65.6	67.5	68.3	
	GFDL85	62.7	65.5	68.6	72.2	
	HAD45	62.7	64.9	67.7	69.2	
	HAD85	62.7	65.2	69.1	73.2	
Growing Season	CCSM45	76.3	78.0	79.7	80.2	
	CCSM85	76.3	78.1	80.6	84.1	
May—Sep	GFDL45	76.3	79.5	81.2	82.6	
	GFDL85	76.3	79.4	82.7	86.8	
	HAD45	76.3	79.3	81.8	83.6	
	HAD85	76.3	79.2	84.6	88.7	
Coldest Month	CCSM45	42.5	45.0	45.7	45.7	
Average	CCSM85	42.5	44.8	45.9	47.1	
	GFDL45	42.5	45.5	45.8	46.4	
	GFDL85	42.5	44.5	45.5	46.3	
	HAD45	42.5	42.9	44.6	45.0	
	HAD85	42.5	43.6	44.6	46.2	
Warmest Month	CCSM45	81.1	83.0	84.0	84.1	
Average	CCSM85	81.1	83.3	84.8	86.5	
	GFDL45	81.1	83.6	84.4	85.4	
	GFDL85	81.1	84.0	85.6	88.0	
	HAD45	81.1	84.6	86.0	86.7	
	HAD85	81.1	85.0	88.3	90.5	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	44.6	48.5	50.3	52.4	
Total	CCSM85	44.6	48.7	52.0	57.9	
	GFDL45	44.6	49.9	54.1	56.7	
	GFDL85	44.6	49.5	56.0	55.8	
	HAD45	44.6	45.1	47.9	48.5	
	HAD85	44.6	48.9	44.5	46.3	
Growing Season	CCSM45	20.4	23.6	25.1	26.0	
	CCSM85	20.4	22.9	24.7	27.5	
May—Sep	GFDL45	20.4	25.2	28.1	28.9	
	GFDL85	20.4	24.4	29.7	30.0	
	HAD45	20.4	20.5	21.1	21.3	
	HAD85	20.4	22.6	18.6	18.0	

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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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	3746.4	42.5	No change	Sm. dec.	Medium	Abundant	Good	Fair			1	1
sweetgum	Liquidambar styraciflua	WDH	High	77.1	756.5	10.9	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	2
longleaf pine	Pinus palustris	NSH	Medium	37.3	658.5	19.9	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	3
water oak	Quercus nigra	WDH	High	83.1	559.8	7.5	Sm. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	4
red maple	Acer rubrum	WDH	High	75.9	323.3	4.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	5
turkey oak	Quercus laevis	NSH	Medium	30.1	263.0	10.0	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	6
yellow-poplar	Liriodendron tulipifera	WDH	High	36.1	205.4	6.4	Sm. dec.	Lg. dec.	High	Common	Fair	Fair			1	7
white oak	Quercus alba	WDH	Medium	45.8	186.3	4.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	8
black cherry	Prunus serotina	WDL	Medium	63.9	155.6	2.8	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	9
eastern redcedar	Juniperus virginiana	WDH	Medium	42.2	152.7	4.0	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	10
post oak	Quercus stellata	WDH	High	55.4	145.9	3.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	11
mockernut hickory	Carya alba	WDL	Medium	49.4	133.5	3.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	12
southern red oak	Quercus falcata	WDL	Medium	51.8	98.6	2.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	13
winged elm	Ulmus alata	WDL	Medium	41	97.5	2.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	14
slash pine	Pinus elliotii	NDH	High	19.3	89.4	8.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	15
green ash	Fraxinus pennsylvanica	WSH	Low	22.9	83.6	3.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
willow oak	Quercus phellos	NSL	Low	33.7	82.4	2.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	17
pignut hickory	Carya glabra	WDL	Medium	25.3	82.2	3.3	No change	No change	Medium	Common	Fair	Fair			1	18
swamp tupelo	Nyssa biflora	NDH	Medium	19.3	78.8	5.3	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	19
blackgum	Nyssa sylvatica	WDL	Medium	44.6	78.3	2.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	20
scarlet oak	Quercus coccinea	WDL	Medium	24.1	68.6	3.4	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	21
flowering dogwood	Cornus florida	WDL	Medium	42.2	64.6	1.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	22
shortleaf pine	Pinus echinata	WDH	High	28.9	62.2	2.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	23
black oak	Quercus velutina	WDH	High	27.7	60.4	2.5	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	24
sugarberry	Celtis laevigata	NDH	Medium	19.3	59.0	4.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	25
American holly	Ilex opaca	NSL	Medium	36.1	57.7	1.8	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	26
American elm	Ulmus americana	WDH	Medium	24.1	53.3	2.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	27
blackjack oak	Quercus marilandica	NSL	Medium	27.7	47.5	2.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	28
northern red oak	Quercus rubra	WDH	Medium	15.7	38.7	2.5	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	29
common persimmon	Diospyros virginiana	NSL	Low	27.7	35.5	1.3	Sm. dec.	No change	High	Rare	Poor	Fair			1	30
redbay	Persea borbonia	NSL	Low	8.4	34.3	4.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			1	31
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	16.9	32.7	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	32
laurel oak	Quercus laurifolia	NDH	Medium	13.3	32.7	2.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	33
black willow	Salix nigra	NSH	Low	13.3	32.2	4.0	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1	34
sassafras	Sassafras albidum	WSL	Low	24.1	29.8	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	35
sycamore	Platanus occidentalis	NSL	Low	6	27.1	4.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	36
sourwood	Oxydendrum arboreum	NDL	High	18.1	25.4	1.4	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	37
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	14.5	24.3	2.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	38
water tupelo	Nyssa aquatica	NSH	Medium	4.8	21.2	4.4	No change	No change	Low	Rare	Very Poor	Very Poor			2	39
boxelder	Acer negundo	WSH	Low	8.4	19.1	5.0	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	1	40
white ash	Fraxinus americana	WDL	Medium	10.8	16.2	1.5	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	1	41
sand hickory	Carya pallida	NSL	FIA	12	14.3	1.7	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	42
shagbark hickory	Carya ovata	WSL	Medium	9.6	13.8	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	43
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	7.2	12.7	1.8	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	44
river birch	Betula nigra	NSL	Low	3.6	9.5	2.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	45
sweetbay	Magnolia virginiana	NSL	Medium	13.3	9.2	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	46
American beech	Fagus grandifolia	WDH	High	8.4	9.1	1.1	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	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
overcup oak	Quercus lyrata	NSL	Medium	2.4	8.2	3.4	No change	No change	Low	Rare	Very Poor	Very Poor			2	48
bitternut hickory	Carya cordiformis	WSL	Low	7.2	8.2	1.1	Lg. dec.	Sm. dec.	High	Rare	Poor	Poor			0	49
slippery elm	Ulmus rubra	WSL	Low	9.6	8.0	0.8	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	50
pawpaw	Asimina triloba	NSL	Low	8.4	6.9	1.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	51
water hickory	Carya aquatica	NSL	Medium	8.4	6.6	1.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	52
bluejack oak	Quercus incana	NSL	Low	3.6	6.3	1.7	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	53
hackberry	Celtis occidentalis	WDH	Medium	3.6	6.2	1.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	54
live oak	Quercus virginiana	NDH	High	2.4	5.7	2.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	55
eastern redbud	Cercis canadensis	NSL	Low	7.2	5.3	0.7	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	56
pond pine	Pinus serotina	NSH	Medium	8.4	4.6	1.2	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	57
pecan	Carya illinoensis	NSH	Low	1.2	3.9	3.3	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	58
swamp chestnut oak	Quercus michauxii	NSL	Low	2.4	3.8	1.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	59
red mulberry	Morus rubra	NSL	Low	3.6	3.6	1.0	No change	No change	Medium	Rare	Poor	Poor		Infill +	1	60
bald cypress	Taxodium distichum	NSH	Medium	2.4	2.7	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	61
silverbell	Halesia spp.	NSL	Low	2.4	2.5	1.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	62
black walnut	Juglans nigra	WDH	Low	2.4	2.2	0.9	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	63
shellbark hickory	Carya laciniosa	NSL	Low	1.2	2.1	1.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	64
eastern cottonwood	Populus deltoides	NSH	Low	6	1.9	2.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	65
Virginia pine	Pinus virginiana	NDH	High	1.2	1.6	1.4	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	66
loblolly-bay	Gordonia lasianthus	NSH	Medium	1.2	1.4	1.1	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	67
florida maple	Acer barbatum	NSL	Low	2.4	1.1	0.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	68
ailanthus	Ailanthus altissima	NSL	FIA	2.4	0.7	0.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	69
yellow buckeye	Aesculus flava	NSL	Low	1.2	0.5	0.4	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	70
chestnut oak	Quercus prinus	NDH	High	1.2	0.3	0.3	Sm. inc.	Sm. inc.	High	Rare	Good	Good			2	71
wild plum	Prunus americana	NSLX	FIA	1.2	0.2	0.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	72
sand pine	Pinus clausa	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate ++	Migrate +	3	73
pond cypress	Taxodium ascendens	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	74
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	75
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	76
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	77
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	78
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	79
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	80
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	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
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	83
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	84
American basswood	Tilia americana	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	85
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	86