

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
 8,477.8 3,273.3 199

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	3			High	16	22	Increase	22	24	Very Good	7	7	Likely	2	3
Hickory	4			Medium	36	52	No Change	9	8	Good	14	16	Infill	9	13
Maple	2	Abundant	4	Low	34	14	Decrease	29	28	Fair	8	7	Migrate	5	9
Oak	16	Common	16	FIA	6		New	17	18	Poor	12	13			
Pine	4	Rare	46				Unknown	15	14	Very Poor	14	11			
Other	37	Absent	23							FIA Only	3	3			
	66		89		92	88		92	92	Unknown	9	8			
											67	65			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099	
Annual	59.6	61.2	63.1	63.2	
Average	59.6	61.5	63.8	66.4	
GFDL45	59.6	63.0	64.5	65.5	
GFDL85	59.6	62.5	65.7	69.4	
HAD45	59.6	61.4	64.2	65.5	
HAD85	59.6	61.7	64.9	68.7	
Growing Season	73.9	75.4	77.0	77.4	
May—Sep	73.9	75.6	78.0	81.1	
GFDL45	73.9	77.7	79.4	80.8	
GFDL85	73.9	77.3	80.8	84.8	
HAD45	73.9	76.0	78.4	79.8	
HAD85	73.9	76.0	79.6	83.3	
Coldest Month	38.3	40.4	41.4	41.7	
Average	38.3	40.8	41.7	43.1	
GFDL45	38.3	41.3	41.8	42.5	
GFDL85	38.3	40.4	41.5	42.8	
HAD45	38.3	39.0	40.8	41.2	
HAD85	38.3	39.4	40.8	42.5	
Warmest Month	79.4	81.0	81.9	81.9	
Average	79.4	81.1	82.7	83.9	
GFDL45	79.4	82.1	83.2	84.4	
GFDL85	79.4	82.9	84.6	87.0	
HAD45	79.4	81.7	83.2	83.7	
HAD85	79.4	82.0	84.1	86.3	

Precipitation (in)

Scenario	2009	2039	2069	2099	
Annual	47.3	52.4	54.6	53.6	
Total	47.3	52.2	53.9	60.3	
GFDL45	47.3	51.5	55.0	57.0	
GFDL85	47.3	50.4	54.8	56.2	
HAD45	47.3	51.7	51.6	49.2	
HAD85	47.3	54.6	49.4	48.3	
Growing Season	22.4	27.9	28.7	28.4	
May—Sep	22.4	26.2	27.4	31.0	
GFDL45	22.4	24.4	26.6	28.1	
GFDL85	22.4	23.6	26.9	27.8	
HAD45	22.4	25.5	23.9	21.6	
HAD85	22.4	26.3	22.6	20.2	

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	90.7	3173.1	35.3	No change	No change	Medium	Abundant	Good	Good			1	1
red maple	Acer rubrum	WDH	High	88.1	1139.6	14.2	No change	No change	High	Abundant	Very Good	Very Good			1	2
sweetgum	Liquidambar styraciflua	WDH	High	80.6	780.9	10.2	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	3
yellow-poplar	Liriodendron tulipifera	WDH	High	69.9	621.2	9.3	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	4
swamp tupelo	Nyssa biflora	NDH	Medium	37.8	351.6	9.9	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	5
American holly	Ilex opaca	NSL	Medium	58.5	312.7	4.4	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	6
white oak	Quercus alba	WDH	Medium	42.2	275.0	5.1	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	7
blackgum	Nyssa sylvatica	WDL	Medium	49.9	135.2	2.3	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	8
American beech	Fagus grandifolia	WDH	High	39.8	134.5	3.7	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	9
water oak	Quercus nigra	WDH	High	40.9	132.6	3.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	10
Virginia pine	Pinus virginiana	NDH	High	14.5	99.9	4.4	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	11
sassafras	Sassafras albidum	WSL	Low	13.7	96.6	6.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	12
swamp chestnut oak	Quercus michauxii	NSL	Low	18.9	71.5	3.9	No change	No change	Medium	Common	Fair	Fair			1	13
southern red oak	Quercus falcata	WDL	Medium	30.8	67.5	1.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	14
sourwood	Oxydendrum arboreum	NDL	High	35.4	60.6	2.0	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	15
redbay	Persea borbonia	NSL	Low	17.6	54.6	3.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	16
northern red oak	Quercus rubra	WDH	Medium	10.3	54.6	3.6	Very Lg. dec.	Very Lg. dec.	High	Common	Lost	Lost			0	17
pond pine	Pinus serotina	NSH	Medium	7	53.0	14.1	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	18
black cherry	Prunus serotina	WDL	Medium	30.4	52.1	1.4	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	19
willow oak	Quercus phellos	NSL	Low	17.7	50.4	2.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	20
bald cypress	Taxodium distichum	NSH	Medium	14.1	48.0	4.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	21
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	9.1	47.7	7.6	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	22
scarlet oak	Quercus coccinea	WDL	Medium	15.6	46.7	2.5	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	23
sweetbay	Magnolia virginiana	NSL	Medium	35.6	46.0	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	24
American hornbeam; muscley	Carpinus caroliniana	WSL	Low	32.1	40.7	1.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	25
green ash	Fraxinus pennsylvanica	WSH	Low	21	39.2	3.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	26
black oak	Quercus velutina	WDH	High	23.5	39.0	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	27
water tupelo	Nyssa aquatica	NSH	Medium	2.4	37.1	14.5	No change	No change	Low	Rare	Very Poor	Very Poor			2	28
chestnut oak	Quercus prinus	NDH	High	2.9	28.6	4.8	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	29
mockernut hickory	Carya alba	WDL	Medium	20.3	28.4	1.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	30
American elm	Ulmus americana	WDH	Medium	18.1	25.1	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	31
hackberry	Celtis occidentalis	WDH	Medium	1.1	22.8	16.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	32
flowering dogwood	Cornus florida	WDL	Medium	20.5	22.2	1.1	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	33
pignut hickory	Carya glabra	WDL	Medium	10.7	20.6	1.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	34
sycamore	Platanus occidentalis	NSL	Low	10	18.3	1.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	35
eastern redcedar	Juniperus virginiana	WDH	Medium	9.4	14.1	1.1	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	36
black walnut	Juglans nigra	WDH	Low	3.9	13.3	1.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	37
black locust	Robinia pseudoacacia	NDH	Low	3	12.7	2.2	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	38
pin oak	Quercus palustris	NSH	Low	1.2	12.1	9.3	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	39
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	13.1	11.9	1.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	40
butternut	Juglans cinerea	NSLX	FIA	2.4	10.8	4.3	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	41
bitternut hickory	Carya cordiformis	WSL	Low	4.7	10.7	2.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	42
river birch	Betula nigra	NSL	Low	5.9	9.9	1.6	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	43
white ash	Fraxinus americana	WDL	Medium	11.7	8.3	1.0	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	44
post oak	Quercus stellata	WDH	High	4.4	5.6	1.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	45
ailanthus	Ailanthus altissima	NSL	FIA	4.6	4.9	1.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	46
slippery elm	Ulmus rubra	WSL	Low	8.2	4.5	1.6	No change	No change	Medium	Rare	Poor	Poor	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
shortleaf pine	Pinus echinata	WDH	High	1.2	3.4	2.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 48
common persimmon	Diospyros virginiana	NSL	Low	3.3	3.1	0.8	Very Lg. dec.	Sm. dec.	High	Rare	Lost	Poor		Infill +		2 49
overcup oak	Quercus lyrata	NSL	Medium	5.9	3.0	1.4	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair		Infill +		2 50
winged elm	Ulmus alata	WDL	Medium	2.4	3.0	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good		Infill ++		2 51
laurel oak	Quercus laurifolia	NDH	Medium	7	2.8	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		2 52
florida maple	Acer barbatum	NSL	Low	1.1	2.0	1.6	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor				0 53
paulownia	Paulownia tomentosa	NSL	FIA	0.8	1.6	0.9	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 54
pawpaw	Asimina triloba	NSL	Low	2.3	1.6	0.6	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0 55
red mulberry	Morus rubra	NSL	Low	1.2	1.4	1.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 56
shagbark hickory	Carya ovata	WSL	Medium	0.7	1.0	0.4	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0 57
serviceberry	Amelanchier spp.	NSL	Low	5.8	0.9	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 58
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	3	0.8	1.6	No change	Lg. inc.	High	Rare	Fair	Good				2 59
chokecherry	Prunus virginiana	NSLX	FIA	1.2	0.7	0.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 60
Shumard oak	Quercus shumardii	NSL	Low	1.1	0.7	0.5	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost				0 61
southern magnolia	Magnolia grandiflora	NSL	Low	0.8	0.6	0.3	No change	Sm. inc.	Medium	Rare	Poor	Fair				0 62
Carolina ash	Fraxinus caroliniana	NSL	FIA	4.7	0.6	2.0	Unknown	Unknown	NA	Rare	FIA Only	FIA Only				0 63
white mulberry	Morus alba	NSL	FIA	2.2	0.5	0.7	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 64
swamp white oak	Quercus bicolor	NSL	Low	1.1	0.4	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 65
bigtooth aspen	Populus grandidentata	NSL	Medium	1.2	0.3	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 66
sand pine	Pinus clausa	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				0 67
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		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	Likely +	Likely +		3 70
boxelder	Acer negundo	WSH	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown				0 71
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 72
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				0 73
water hickory	Carya aquatica	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 74
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +		3 75
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 76
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 77
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 78
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 79
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 80
loblolly-bay	Gordonia lasianthus	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate +		3 81
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 82
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 83
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 84
water elm	Planera aquatica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 85
turkey oak	Quercus laevis	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 86
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat		Likely +		3 87
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 88
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 89
black willow	Salix nigra	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +		3 90
American basswood	Tilia americana	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 91
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				0 92