

**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	15,737	6,076.1	256

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	22	Increase	25	23	Very Good	6	6	Likely	3	3
Hickory	4			Medium	37	No Change	15	13	Good	18	18	Infill	32	30
Maple	6	Abundant	2	Low	36	Decrease	17	21	Fair	13	10	Migrate	12	14
Oak	11	Common	22	FIA	8	New	28	30	Poor	6	8		47	47
Pine	6	Rare	41			Unknown	18	16	Very Poor	14	15			
Other	35	Absent	36				103	103	FIA Only	3	3			
	65		101						Unknown	10	8			
										70	68			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	52.2	54.0	56.0	56.3	
	CCSM85	52.2	54.4	56.8	59.7	
	GFDL45	52.2	56.7	57.7	58.8	
	GFDL85	52.2	55.3	58.9	62.8	
	HAD45	52.2	54.6	57.9	59.4	
	HAD85	52.2	54.6	58.6	63.1	
Growing Season (May—Sep)	CCSM45	68.1	70.0	71.7	72.2	
	CCSM85	68.1	70.2	72.7	76.2	
	GFDL45	68.1	73.2	74.3	75.5	
	GFDL85	68.1	71.7	75.7	79.7	
	HAD45	68.1	70.8	73.7	75.5	
	HAD85	68.1	70.1	74.6	79.4	
Coldest Month (Average)	CCSM45	28.3	30.1	31.7	32.2	
	CCSM85	28.3	30.8	32.0	33.9	
	GFDL45	28.3	31.6	32.7	33.5	
	GFDL85	28.3	31.5	32.9	34.8	
	HAD45	28.3	29.5	32.0	32.3	
	HAD85	28.3	30.6	32.4	35.0	
Warmest Month (Average)	CCSM45	74.3	76.4	77.4	77.4	
	CCSM85	74.3	76.6	78.2	79.9	
	GFDL45	74.3	77.1	78.9	80.0	
	GFDL85	74.3	78.1	80.4	83.0	
	HAD45	74.3	77.3	78.7	79.6	
	HAD85	74.3	76.8	79.0	82.1	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	48.2	50.4	51.4	55.7	
	CCSM85	48.2	51.3	54.0	57.3	
	GFDL45	48.2	54.0	57.8	56.8	
	GFDL85	48.2	52.4	56.8	59.9	
	HAD45	48.2	50.7	52.6	52.5	
	HAD85	48.2	54.1	52.1	54.5	
Growing Season (May—Sep)	CCSM45	21.2	25.0	24.7	26.7	
	CCSM85	21.2	23.6	25.5	25.5	
	GFDL45	21.2	22.7	23.5	24.9	
	GFDL85	21.2	22.3	23.7	25.0	
	HAD45	21.2	22.7	21.2	20.7	
	HAD85	21.2	22.8	20.7	20.7	

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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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
pitch pine	Pinus rigida	NSH	High	25	784.9	38.7	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair	Infill +	Infill +	0	1
red maple	Acer rubrum	WDH	High	68.7	752.2	14.3	No change	Sm. dec.	High	Abundant	Very Good	Good	Infill ++	Infill ++	1	2
white ash	Fraxinus americana	WDL	Medium	43.4	386.8	12.2	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	0	3
chestnut oak	Quercus prinus	NDH	High	30.8	354.8	14.2	No change	Sm. dec.	High	Common	Good	Fair	Infill ++	Infill +	1	4
northern red oak	Quercus rubra	WDH	Medium	46	343.9	11.1	No change	Sm. dec.	High	Common	Good	Fair	Infill ++	Infill +	1	5
sweet birch	Betula lenta	NDH	High	35.2	276.2	10.3	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	6
sugar maple	Acer saccharum	WDH	High	35	273.1	10.2	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	7
white oak	Quercus alba	WDH	Medium	52.1	252.6	7.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	8
black cherry	Prunus serotina	WDL	Medium	48.7	217.1	10.1	Sm. inc.	No change	Low	Common	Fair	Poor	Infill +	Infill +	1	9
yellow-poplar	Liriodendron tulipifera	WDH	High	25.3	207.4	11.6	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	10
black oak	Quercus velutina	WDH	High	39.8	191.5	6.9	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good	Infill ++	Infill ++	1	11
eastern redcedar	Juniperus virginiana	WDH	Medium	27.8	177.5	9.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	12
scarlet oak	Quercus coccinea	WDL	Medium	33.3	176.3	8.5	Sm. inc.	No change	Medium	Common	Good	Fair	Infill ++	Infill +	1	13
blackgum	Nyssa sylvatica	WDL	Medium	31.8	138.9	7.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	14
sweetgum	Liquidambar styraciflua	WDH	High	10.5	113.0	19.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			2	15
black locust	Robinia pseudoacacia	NDH	Low	18.1	94.3	11.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	2	16
American elm	Ulmus americana	WDH	Medium	23.6	84.6	5.7	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	17
sassafras	Sassafras albidum	WSL	Low	30.7	82.3	3.7	Sm. inc.	No change	Medium	Common	Good	Fair	Infill ++	Infill +	1	18
American beech	Fagus grandifolia	WDH	High	19.8	69.0	4.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	2	19
shagbark hickory	Carya ovata	WSL	Medium	17.2	59.7	5.9	No change	Sm. dec.	Medium	Common	Fair	Poor	Infill +	Infill +	2	20
pin oak	Quercus palustris	NSH	Low	8.6	59.4	12.6	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	2	21
green ash	Fraxinus pennsylvanica	WDL	Low	5.7	59.3	9.3	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	22
flowering dogwood	Cornus florida	WDL	Medium	11.6	53.3	7.7	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor		Infill +	2	23
yellow birch	Betula alleghaniensis	NDL	High	8.9	50.2	6.5	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	24
American basswood	Tilia americana	WSL	Medium	4.4	49.7	10.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	25
pignut hickory	Carya glabra	WDL	Medium	29.2	48.2	2.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	26
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	3.4	43.5	15.4	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	27
bigtooth aspen	Populus grandidentata	NSL	Medium	9.2	38.7	6.5	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	28
eastern hemlock	Tsuga canadensis	NSH	High	9.5	36.8	4.4	No change	No change	Low	Rare	Very Poor	Very Poor			2	29
black walnut	Juglans nigra	WDH	Low	12.9	34.5	6.6	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	30
eastern white pine	Pinus strobus	WDH	High	19.8	34.5	7.5	Lg. inc.	Sm. dec.	Low	Rare	Fair	Very Poor	Infill +		2	31
swamp white oak	Quercus bicolor	NSL	Low	3.2	23.5	6.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	32
Scots pine	Pinus sylvestris	NSH	FIA	0.6	18.4	26.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	33
mockernut hickory	Carya alba	WDL	Medium	14.2	15.9	2.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	34
ailanthus	Ailanthus altissima	NSL	FIA	11.6	15.6	6.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	35
Norway maple	Acer platanoides	NSL	FIA	13.8	15.4	2.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	36
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	12.7	13.1	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	37
serviceberry	Amelanchier spp.	NSL	Low	9.5	13.0	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	38
red pine	Pinus resinosa	NSH	Medium	3.3	12.0	5.9	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	39
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	8.8	10.3	1.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	40
bitternut hickory	Carya cordiformis	WSL	Low	11.9	9.1	2.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	41
boxelder	Acer negundo	WSH	Low	6.4	7.9	5.3	No change	No change	High	Rare	Fair	Fair		Infill +	2	42
blackjack oak	Quercus marilandica	NSL	Medium	2.5	7.7	2.7	No change	Lg. inc.	High	Rare	Fair	Good	Infill +		2	43
sycamore	Platanus occidentalis	NSL	Low	3.2	7.4	6.2	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	44
shortleaf pine	Pinus echinata	WDH	High	1.3	7.0	4.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	45
Norway spruce	Picea abies	NSH	FIA	7	6.2	2.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	46
slippery elm	Ulmus rubra	WSL	Low	5.1	5.7	1.8	No change	No change	Medium	Rare	Poor	Poor			0	47



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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
black willow	Salix nigra	NSH	Low	1.9	5.7	2.7	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			2	48
American holly	Ilex opaca	NSL	Medium	1.8	5.1	6.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	49
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	8.3	4.8	1.1	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	50
gray birch	Betula populifolia	NSL	Low	5.7	3.6	2.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	51
silver maple	Acer saccharinum	NSH	Low	3.2	3.4	3.2	No change	Sm. inc.	High	Rare	Fair	Good	Infill +		2	52
sweetbay	Magnolia virginiana	NSL	Medium	3.8	3.2	1.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	53
black ash	Fraxinus nigra	WSH	Medium	1.9	3.1	1.5	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	54
river birch	Betula nigra	NSL	Low	5.7	2.9	3.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	55
red mulberry	Morus rubra	NSL	Low	0.6	2.7	3.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	56
post oak	Quercus stellata	WDH	High	6.3	2.4	1.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	57
Virginia pine	Pinus virginiana	NDH	High	0.6	1.4	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	58
Osage-orange	Maclura pomifera	NDH	Medium	0.6	1.4	2.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	59
white mulberry	Morus alba	NSL	FIA	2.5	1.3	7.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	60
American chestnut	Castanea dentata	NSLX	FIA	1.3	0.9	0.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	61
butternut	Juglans cinerea	NSLX	FIA	0.6	0.9	1.2	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	62
striped maple	Acer pensylvanicum	NSL	Medium	0.6	0.6	0.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	63
quaking aspen	Populus tremuloides	WDH	High	2.5	0.5	2.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	64
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0.6	0.4	0.6	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			2	65
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	66
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	67
Table Mountain pine	Pinus pungens	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	68
pond pine	Pinus serotina	NSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate ++	Migrate +	3	69
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	70
bald cypress	Taxodium distichum	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	71
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	72
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	73
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	74
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			0	75
water hickory	Carya aquatica	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	76
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	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			0	78
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	79
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	80
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	81
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	82
loblolly-bay	Gordonia lasianthus	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	83
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	84
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	85
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	86
water tupelo	Nyssa aquatica	NSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	87
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	88
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	89
redbay	Persea borbonia	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	90
eastern cottonwood	Populus deltoides	NSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	91
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	92
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	93
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	94

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turkey oak	Quercus laevis	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	95
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	96
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	97
swamp chestnut oak	Quercus michauxii	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	98
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	99
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	100
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	101
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	102
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	103