

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	8,300.0	3,204.6	152

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	22	24	Increase	21	25	Very Good	9	9	Likely	3	3
Hickory	4			Medium	25	46	No Change	13	12	Good	15	21	Infill	10	14
Maple	6	Abundant	3	Low	31	11	Decrease	19	16	Fair	10	7	Migrate	8	11
Oak	10	Common	27	FIA	7		New	21	22	Poor	7	6			
Pine	7	Rare	30				Unknown	11	10	Very Poor	12	10			
Other	31	Absent	23							FIA Only	3	3			
	60		83		85	81		85	85	Unknown	4	3			
											60	59			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	53.1	54.9	57.1	57.4	
	CCSM85	53.1	55.3	57.8	61.0	
	GFDL45	53.1	56.6	58.8	60.0	
	GFDL85	53.1	56.5	60.0	64.1	
	HAD45	53.1	55.8	59.2	60.7	
	HAD85	53.1	56.0	60.2	64.9	
Growing Season May—Sep	CCSM45	69.0	70.9	72.8	73.3	
	CCSM85	69.0	71.1	73.8	77.7	
	GFDL45	69.0	73.1	75.8	77.4	
	GFDL85	69.0	73.3	77.3	81.8	
	HAD45	69.0	72.1	75.3	77.3	
	HAD85	69.0	72.0	77.0	82.3	
Coldest Month Average	CCSM45	29.2	30.9	32.6	33.0	
	CCSM85	29.2	31.5	32.8	34.5	
	GFDL45	29.2	32.4	33.0	33.7	
	GFDL85	29.2	32.1	33.2	34.7	
	HAD45	29.2	30.9	33.2	33.3	
	HAD85	29.2	31.4	33.2	35.2	
Warmest Month Average	CCSM45	74.8	77.0	77.9	78.3	
	CCSM85	74.8	77.2	79.1	80.8	
	GFDL45	74.8	77.9	80.0	81.4	
	GFDL85	74.8	79.6	81.9	84.8	
	HAD45	74.8	78.3	80.4	81.7	
	HAD85	74.8	78.7	82.0	85.6	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	40.3	43.6	44.3	46.2	
	CCSM85	40.3	43.8	45.2	50.5	
	GFDL45	40.3	45.1	47.3	47.5	
	GFDL85	40.3	41.4	47.4	48.8	
	HAD45	40.3	43.2	43.8	43.2	
	HAD85	40.3	45.6	41.6	45.2	
Growing Season May—Sep	CCSM45	18.3	21.0	21.4	21.8	
	CCSM85	18.3	20.9	21.0	23.2	
	GFDL45	18.3	19.3	19.7	19.8	
	GFDL85	18.3	17.3	19.4	19.7	
	HAD45	18.3	19.7	18.2	17.9	
	HAD85	18.3	19.9	17.2	18.2	

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
chestnut oak	Quercus prinus	NDH	High	63.9	897.7	16.4	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
white oak	Quercus alba	WDH	Medium	56.6	627.6	12.8	Sm. inc.	No change	High	Abundant	Very Good	Very Good			1	2
red maple	Acer rubrum	WDH	High	56.6	572.4	10.1	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
yellow-poplar	Liriodendron tulipifera	WDH	High	44.6	470.7	11.3	Sm. dec.	Lg. dec.	High	Common	Fair	Fair			1	4
black cherry	Prunus serotina	WDL	Medium	56.6	388.8	7.7	No change	No change	Low	Common	Poor	Poor			0	5
white ash	Fraxinus americana	WDL	Medium	53	385.8	7.3	No change	No change	Low	Common	Poor	Poor			0	6
black locust	Robinia pseudoacacia	NDH	Low	47	383.3	8.3	Sm. dec.	No change	Medium	Common	Poor	Fair			1	7
northern red oak	Quercus rubra	WDH	Medium	54.2	332.1	7.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	8
pignut hickory	Carya glabra	WDL	Medium	56.6	319.7	7.1	No change	Sm. dec.	Medium	Common	Fair	Poor			1	9
sweet birch	Betula lenta	NDH	High	26.5	270.9	8.7	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	10
black walnut	Juglans nigra	WDH	Low	42.2	243.9	7.0	No change	No change	Medium	Common	Fair	Fair			1	11
black oak	Quercus velutina	WDH	High	53	231.5	6.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	12
eastern redcedar	Juniperus virginiana	WDH	Medium	14.5	220.3	17.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	13
ailanthus	Ailanthus altissima	NSL	FIA	43.4	212.9	5.8	Unknown	Unknown	NA	Common	NNIS	NNIS			0	14
Virginia pine	Pinus virginiana	NDH	High	33.7	200.3	8.0	No change	No change	Medium	Common	Fair	Fair			1	15
blackgum	Nyssa sylvatica	WDL	Medium	41	177.6	4.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	16
scarlet oak	Quercus coccinea	WDL	Medium	30.1	174.9	6.2	No change	Sm. dec.	Medium	Common	Fair	Poor			1	17
hackberry	Celtis occidentalis	WDH	Medium	28.9	171.9	5.8	Sm. dec.	No change	High	Common	Fair	Good			1	18
mockernut hickory	Carya alba	WDL	Medium	34.9	130.2	4.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	19
shagbark hickory	Carya ovata	WSL	Medium	31.3	123.3	4.0	No change	No change	Medium	Common	Fair	Fair			1	20
loblolly pine	Pinus taeda	WDH	High	6	121.7	17.3	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +	Infill ++	1	21
sassafras	Sassafras albidum	WSL	Low	32.5	115.1	3.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	22
eastern white pine	Pinus strobus	WDH	High	13.3	106.2	6.9	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	23
boxelder	Acer negundo	WSH	Low	9.6	99.3	8.8	No change	No change	High	Common	Good	Good			1	24
sugar maple	Acer saccharum	WDH	High	13.3	88.4	5.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	25
sycamore	Platanus occidentalis	NSL	Low	20.5	85.1	5.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	26
American beech	Fagus grandifolia	WDH	High	10.8	83.6	6.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	27
bitternut hickory	Carya cordiformis	WSL	Low	26.5	80.7	5.3	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	28
American basswood	Tilia americana	WSL	Medium	10.8	54.9	4.3	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	29
silver maple	Acer saccharinum	NSH	Low	3.6	54.7	12.9	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	30
Norway maple	Acer platanoides	NSL	FIA	2.4	36.9	13.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	31
eastern hemlock	Tsuga canadensis	NSH	High	6	36.0	5.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	32
serviceberry	Amelanchier spp.	NSL	Low	15.7	35.5	1.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	33
red mulberry	Morus rubra	NSL	Low	7.2	25.4	11.0	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	34
eastern redbud	Cercis canadensis	NSL	Low	18.1	21.9	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	35
American elm	Ulmus americana	WDH	Medium	19.3	21.3	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	36
pitch pine	Pinus rigida	NSH	High	10.8	18.8	2.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	37
pawpaw	Asimina triloba	NSL	Low	10.8	18.0	2.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	38
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	13.3	17.0	1.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	39
flowering dogwood	Cornus florida	WDL	Medium	24.1	14.6	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	40
slippery elm	Ulmus rubra	WSL	Low	10.8	14.5	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	41
yellow birch	Betula alleghaniensis	NDH	High	1.2	13.9	9.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	42
Osage-orange	Maclura pomifera	NDH	Medium	2.4	13.6	4.8	Sm. dec.	Sm. inc.	High	Rare	Poor	Good		Infill ++	2	43
pin oak	Quercus palustris	NSH	Low	10.8	10.7	8.0	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair		Infill +	1	44
white mulberry	Morus alba	NSL	FIA	2.4	9.9	3.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	45
honeylocust	Gleditsia triacanthos	NSH	Low	2.4	9.5	3.4	No change	Lg. inc.	High	Rare	Fair	Good			2	46
cucumbertree	Magnolia acuminata	NSL	Low	3.6	9.2	2.2	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
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
butternut	Juglans cinerea	NSLX	FIA	6	7.8	3.7	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	48
Scots pine	Pinus sylvestris	NSH	FIA	3.6	5.8	1.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	49
striped maple	Acer pensylvanicum	NSL	Medium	1.2	4.8	3.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	50
Table Mountain pine	Pinus pungens	NSL	Low	1.2	4.7	3.3	No change	No change	High	Rare	Fair	Fair		Infill +	2	51
swamp chestnut oak	Quercus michauxii	NSL	Low	1.2	4.4	3.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	52
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	6	3.8	1.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	53
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	3.6	3.5	0.8	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +	Infill ++	1	54
chinkapin oak	Quercus muehlenbergii	NSL	Medium	1.2	3.5	2.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	55
chokecherry	Prunus virginiana	NSLX	FIA	2.4	2.8	1.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	56
shortleaf pine	Pinus echinata	WDH	High	1.2	2.3	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	57
river birch	Betula nigra	NSL	Low	1.2	2.3	1.6	Sm. dec.	Lg. inc.	Medium	Rare	Very Poor	Good			2	58
green ash	Fraxinus pennsylvanica	WSH	Low	6	1.6	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	59
southern red oak	Quercus falcata	WDL	Medium	4.8	0.7	2.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	60
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	61
bald cypress	Taxodium distichum	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	62
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	63
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	64
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	65
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	66
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	67
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	68
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	69
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	70
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	71
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	72
quaking aspen	Populus tremuloides	WDH	High	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	73
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	74
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	75
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	76
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	77
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	78
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	79
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	80
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	81
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	82
black willow	Salix nigra	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	83
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	84
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	85