

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	8,400.0	3,243.3	250

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					
		Abundant	Common	High	Medium	Reliability	Adaptability	Scenario	Scenario	Scenario	Scenario	SHIFT	SHIFT		
						RCP45	RCP85	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85		
Ash	3					Increase	22	30	Very Good	3	6	Likely	0	0	
Hickory	5					No Change	9	5	Good	25	27	Infill	3	7	
Maple	4	Abundant	5	High	18	24	Decrease	31	27	Fair	7	7	Migrate	2	4
Oak	11	Common	25	Medium	26	42	New	7	8	Poor	8	7			
Pine	6	Rare	39	Low	35	16	Unknown	17	16	Very Poor	16	9			
Other	40	Absent	16	FIA	7					FIA Only	3	3			
	69		85		86	82		86	86						
										Unknown	10	9			
										72	68				

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	54.3	56.2	58.6	58.9	
Average	CCSM85	54.3	56.7	59.2	62.4	
	GFDL45	54.3	57.1	60.0	60.8	
	GFDL85	54.3	57.6	61.1	65.0	
	HAD45	54.3	56.9	60.4	61.7	
	HAD85	54.3	57.4	61.8	66.2	
Growing Season	CCSM45	69.8	71.8	74.0	74.6	
	CCSM85	69.8	72.2	74.8	78.9	
May—Sep	GFDL45	69.8	73.0	76.7	78.0	
	GFDL85	69.8	73.8	78.2	82.6	
	HAD45	69.8	73.0	76.4	78.2	
	HAD85	69.8	73.4	79.5	83.9	
Coldest Month	CCSM45	30.5	32.2	33.6	34.1	
	CCSM85	30.5	33.4	34.3	35.8	
Average	GFDL45	30.5	34.3	34.8	35.4	
	GFDL85	30.5	33.1	34.1	35.1	
	HAD45	30.5	31.1	33.4	33.6	
	HAD85	30.5	32.0	33.8	35.7	
Warmest Month	CCSM45	75.2	77.2	78.5	78.9	
	CCSM85	75.2	77.7	79.4	81.4	
Average	GFDL45	75.2	78.8	80.9	81.9	
	GFDL85	75.2	79.8	82.5	85.0	
	HAD45	75.2	79.1	81.8	83.0	
	HAD85	75.2	80.6	85.0	87.6	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	43.0	45.7	48.2	48.7	
Total	CCSM85	43.0	47.7	49.1	53.0	
	GFDL45	43.0	47.1	48.3	51.6	
	GFDL85	43.0	44.7	49.6	51.7	
	HAD45	43.0	43.8	44.7	43.8	
	HAD85	43.0	43.7	41.1	44.2	
Growing Season	CCSM45	19.9	20.9	21.7	21.7	
	CCSM85	19.9	20.9	20.4	21.9	
May—Sep	GFDL45	19.9	21.9	20.9	22.2	
	GFDL85	19.9	19.9	20.6	21.1	
	HAD45	19.9	20.5	18.4	18.9	
	HAD85	19.9	19.8	16.8	17.9	

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
white oak	Quercus alba	WDH	Medium	85.7	1386.6	16.0	Sm. dec.	Lg. dec.	High	Abundant	Good	Good			1	1
yellow-poplar	Liriodendron tulipifera	WDH	High	79.8	945.0	11.7	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	2
red maple	Acer rubrum	WDH	High	83.3	816.9	9.7	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
sugar maple	Acer saccharum	WDH	High	76.2	735.3	9.5	No change	Sm. dec.	High	Abundant	Very Good	Good			1	4
chestnut oak	Quercus prinus	NDH	High	61.9	502.8	8.0	Sm. dec.	Lg. dec.	High	Abundant	Good	Good			1	5
Virginia pine	Pinus virginiana	NDH	High	47.6	418.8	8.7	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	6
black oak	Quercus velutina	WDH	High	75	409.1	5.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	7
pignut hickory	Carya glabra	WDL	Medium	71.4	377.3	5.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	8
American beech	Fagus grandifolia	WDH	High	58.3	351.8	6.0	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	9
mockernut hickory	Carya alba	WDL	Medium	73.8	331.8	4.4	No change	Sm. inc.	High	Common	Good	Very Good			1	10
white ash	Fraxinus americana	WDL	Medium	60.7	306.2	5.0	No change	No change	Low	Common	Poor	Poor			0	11
northern red oak	Quercus rubra	WDH	Medium	60.7	268.2	4.4	Sm. inc.	No change	High	Common	Very Good	Good			1	12
blackgum	Nyssa sylvatica	WDL	Medium	61.9	223.2	3.6	No change	Sm. inc.	High	Common	Good	Very Good			1	13
boxelder	Acer negundo	WSH	Low	25	195.9	7.7	No change	Sm. inc.	High	Common	Good	Very Good			1	14
black locust	Robinia pseudoacacia	NDH	Low	42.9	192.4	4.4	Sm. dec.	Sm. inc.	Medium	Common	Poor	Good			1	15
sassafras	Sassafras albidum	WSL	Low	50	185.9	3.7	No change	No change	Medium	Common	Fair	Fair			1	16
black walnut	Juglans nigra	WDH	Low	29.8	176.2	5.9	No change	Sm. inc.	Medium	Common	Fair	Good			1	17
scarlet oak	Quercus coccinea	WDL	Medium	34.5	171.0	4.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	18
yellow buckeye	Aesculus flava	NSL	Low	26.2	152.1	5.7	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	19
eastern redbud	Cercis canadensis	NSL	Low	57.1	152.0	2.6	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	20
black cherry	Prunus serotina	WDL	Medium	38.1	148.5	3.9	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	21
sycamore	Platanus occidentalis	NSL	Low	33.3	143.5	4.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	22
shagbark hickory	Carya ovata	WSL	Medium	57.1	142.1	2.5	No change	No change	Medium	Common	Fair	Fair			1	23
sourwood	Oxydendrum arboreum	NDL	High	40.5	133.6	3.3	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	24
American elm	Ulmus americana	WDH	Medium	35.7	118.6	3.3	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	25
silver maple	Acer saccharinum	NSH	Low	7.1	107.1	14.8	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	26
flowering dogwood	Cornus florida	WDL	Medium	44	94.3	2.1	No change	Sm. inc.	Medium	Common	Fair	Good			1	27
slippery elm	Ulmus rubra	WSL	Low	40.5	68.7	1.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	28
post oak	Quercus stellata	WDH	High	16.7	68.5	4.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	29
ailanthus	Ailanthus altissima	NSL	FIA	19	67.5	3.5	Unknown	Unknown	NA	Common	NNIS	NNIS			0	30
green ash	Fraxinus pennsylvanica	WSH	Low	15.5	49.3	3.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	31
shortleaf pine	Pinus echinata	WDH	High	13.1	44.6	3.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	32
bitternut hickory	Carya cordiformis	WSL	Low	20.2	44.2	2.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	33
common persimmon	Diospyros virginiana	NSL	Low	14.3	27.3	1.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	34
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	22.6	26.2	1.2	Sm. dec.	Lg. inc.	Medium	Rare	Very Poor	Good			1	35
pitch pine	Pinus rigida	NSH	High	9.5	25.1	2.6	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	36
shellbark hickory	Carya laciniosa	NSL	Low	8.3	22.4	2.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	37
bigtooth aspen	Populus grandidentata	NSL	Medium	6	21.2	3.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	38
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	15.5	20.8	1.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	39
American basswood	Tilia americana	WSL	Medium	7.1	17.4	2.4	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	40
eastern redcedar	Juniperus virginiana	WDH	Medium	8.3	14.9	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	41
cucumbertree	Magnolia acuminata	NSL	Low	6	14.2	2.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	42
eastern white pine	Pinus strobus	WDH	High	4.8	12.7	2.6	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	43
hackberry	Celtis occidentalis	WDH	Medium	9.5	11.8	1.2	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	44
serviceberry	Amelanchier spp.	NSL	Low	11.9	11.1	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	45
white mulberry	Morus alba	NSL	FIA	2.4	10.4	4.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	46
river birch	Betula nigra	NSL	Low	1.2	8.5	7.1	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
sweet birch	Betula lenta	NDH	High	3.6	8.1	2.3	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	48
paulownia	Paulownia tomentosa	NSL	FIA	3.6	7.4	2.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	49
butternut	Juglans cinerea	NSLX	FIA	2.4	7.2	3.0	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	50
pawpaw	Asimina triloba	NSL	Low	6	7.0	1.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	51
black willow	Salix nigra	NSH	Low	1.2	6.3	5.2	Sm. dec.	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	52
shingle oak	Quercus imbricaria	NDH	Medium	3.6	5.6	1.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	53
sweetgum	Liquidambar styraciflua	WDH	High	1.2	5.3	4.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	54
Scots pine	Pinus sylvestris	NSH	FIA	1.2	4.7	3.9	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	55
chinkapin oak	Quercus muehlenbergii	NSL	Medium	3.6	3.8	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	56
loblolly pine	Pinus taeda	WDH	High	1.2	3.0	2.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	57
honeylocust	Gleditsia triacanthos	NSH	Low	1.2	2.9	2.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	58
southern red oak	Quercus falcata	WDL	Medium	2.4	2.2	0.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	59
Ohio buckeye	Aesculus glabra	NSL	Low	1.2	1.9	1.6	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	60
sugarberry	Celtis laevigata	NDH	Medium	1.2	1.8	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	61
blue ash	Fraxinus quadrangulata	NSL	Low	1.2	1.8	1.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	62
chokecherry	Prunus virginiana	NSLX	FIA	1.2	1.6	1.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	63
red mulberry	Morus rubra	NSL	Low	1.2	1.5	1.2	Sm. dec.	Lg. inc.	Medium	Rare	Very Poor	Good		Infill ++	2	64
pin oak	Quercus palustris	NSH	Low	1.2	1.4	1.2	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair		Infill +	2	65
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	1.2	1.1	0.9	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	66
blackjack oak	Quercus marilandica	NSL	Medium	1.2	1.1	0.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	67
eastern hemlock	Tsuga canadensis	NSH	High	1.2	1.0	0.8	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	68
American chestnut	Castanea dentata	NSLX	FIA	1.2	0.6	0.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	69
red pine	Pinus resinosa	NSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	70
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	71
black maple	Acer nigrum	NSH	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	72
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	73
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	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			3	75
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	76
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	77
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	78
American holly	Ilex opaca	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	79
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	80
redbay	Persea borbonia	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	81
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	82
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	83
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	84
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	85
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	86