

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	8,200.0	3,166.0	117

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	17	19	Increase	19	20	Very Good	1	2	Likely	0	0
Hickory	4			Medium	24	39	No Change	10	7	Good	20	19	Infill	29	32
Maple	4	Abundant	2	Low	27	11	Decrease	22	24	Fair	9	8	Migrate	4	8
Oak	8	Common	18	FIA	4		New	12	12	Poor	8	10		33	40
Pine	4	Rare	35				Unknown	9	9	Very Poor	11	8			
Other	32	Absent	14							FIA Only	1	1			
	55		69		72	69		72	72	Unknown	5	5			
											55	53			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	50.1	51.9	54.5	54.6	
	CCSM85	50.1	52.5	55.0	58.2	
	GFDL45	50.1	54.9	55.9	56.9	
	GFDL85	50.1	53.4	57.0	61.3	
	HAD45	50.1	53.1	56.7	58.3	
HAD85	50.1	53.4	58.0	62.9		
Growing Season May—Sep	CCSM45	66.7	68.4	70.8	71.2	
	CCSM85	66.7	69.0	71.5	75.6	
	GFDL45	66.7	72.5	73.8	75.2	
	GFDL85	66.7	70.8	75.1	79.9	
	HAD45	66.7	70.2	73.4	75.6	
HAD85	66.7	70.1	75.8	81.2		
Coldest Month Average	CCSM45	24.3	26.0	27.8	28.1	
	CCSM85	24.3	27.0	28.1	30.1	
	GFDL45	24.3	27.4	28.4	29.2	
	GFDL85	24.3	27.7	28.8	30.3	
	HAD45	24.3	25.4	28.4	28.5	
HAD85	24.3	26.7	29.1	31.7		
Warmest Month Average	CCSM45	72.5	74.4	75.7	76.2	
	CCSM85	72.5	75.2	76.8	79.1	
	GFDL45	72.5	75.6	77.7	78.7	
	GFDL85	72.5	76.6	78.9	81.7	
	HAD45	72.5	76.4	78.6	80.1	
HAD85	72.5	77.3	81.2	84.9		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	38.5	40.1	39.9	41.5	
	CCSM85	38.5	40.2	41.1	42.8	
	GFDL45	38.5	42.6	45.1	46.1	
	GFDL85	38.5	40.3	45.7	47.9	
	HAD45	38.5	39.6	40.2	40.0	
HAD85	38.5	40.6	37.5	40.8		
Growing Season May—Sep	CCSM45	19.0	19.7	19.3	19.9	
	CCSM85	19.0	18.9	19.4	18.9	
	GFDL45	19.0	21.0	21.4	21.9	
	GFDL85	19.0	19.6	21.1	21.4	
	HAD45	19.0	19.8	17.6	18.5	
HAD85	19.0	19.2	15.7	16.4		

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
red maple	Acer rubrum	WDH	High	86.6	823.1	17.5	Lg. dec.	Lg. dec.	High	Abundant	Good	Good	Infill ++	Infill ++	1	1
black cherry	Prunus serotina	WDL	Medium	86.6	726.3	16.9	Lg. dec.	Lg. dec.	Low	Abundant	Poor	Poor	Infill +	Infill +	0	2
sugar maple	Acer saccharum	WDH	High	50	322.7	12.5	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	3
yellow-poplar	Liriodendron tulipifera	WDH	High	35.4	318.7	12.6	No change	Sm. dec.	High	Common	Good	Fair	Infill ++	Infill +	1	4
American elm	Ulmus americana	WDH	Medium	76.8	303.6	8.0	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +	Infill ++	1	5
northern red oak	Quercus rubra	WDH	Medium	59.8	218.2	6.8	No change	Sm. dec.	High	Common	Good	Fair	Infill ++	Infill +	1	6
blackgum	Nyssa sylvatica	WDL	Medium	28	213.6	12.3	Lg. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	7
American beech	Fagus grandifolia	WDH	High	37.8	209.7	9.6	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	8
bigtooth aspen	Populus grandidentata	NSL	Medium	28	175.2	10.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	9
silver maple	Acer saccharinum	NSH	Low	25.6	169.0	17.2	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	10
white ash	Fraxinus americana	WDL	Medium	59.8	167.7	6.3	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair	Infill +	Infill +	1	11
white oak	Quercus alba	WDH	Medium	37.8	165.9	8.3	Lg. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	12
sassafras	Sassafras albidum	WSL	Low	36.6	141.1	6.7	No change	Sm. dec.	Medium	Common	Fair	Poor	Infill +	Infill +	1	13
pin oak	Quercus palustris	NSH	Low	23.2	126.2	9.8	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor		Infill +	0	14
green ash	Fraxinus pennsylvanica	WSL	Low	50	110.2	6.5	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good	Infill ++	Infill ++	1	15
shagbark hickory	Carya ovata	WSL	Medium	36.6	103.1	6.7	Sm. inc.	No change	Medium	Common	Good	Fair	Infill ++	Infill +	1	16
black locust	Robinia pseudoacacia	NDH	Low	19.5	87.4	7.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	17
black willow	Salix nigra	NSH	Low	13.4	74.6	14.9	Lg. dec.	No change	Low	Common	Very Poor	Poor		Infill +	0	18
eastern cottonwood	Populus deltoides	NSH	Low	9.8	66.3	10.5	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor		Infill +	0	19
chestnut oak	Quercus prinus	NDH	High	6.1	56.5	8.5	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	20
black oak	Quercus velutina	WDH	High	19.5	49.1	6.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	21
eastern white pine	Pinus strobus	WDH	High	14.6	47.8	6.5	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	22
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	30.5	45.6	3.3	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	23
slippery elm	Ulmus rubra	WSL	Low	18.3	40.8	3.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	24
sycamore	Platanus occidentalis	NSL	Low	17.1	37.2	7.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	25
American basswood	Tilia americana	WSL	Medium	29.3	27.3	3.2	No change	Sm. dec.	Medium	Rare	Poor	Very Poor	Infill +		1	26
boxelder	Acer negundo	WSH	Low	12.2	22.9	6.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	27
red mulberry	Morus rubra	NSL	Low	1.2	22.5	16.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	28
black walnut	Juglans nigra	WDH	Low	23.2	22.4	3.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	29
Scots pine	Pinus sylvestris	NSH	FIA	9.8	16.5	24.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	30
bitternut hickory	Carya cordiformis	WSL	Low	34.1	15.6	2.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	31
swamp white oak	Quercus bicolor	NSL	Low	8.5	15.3	4.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	32
pignut hickory	Carya glabra	WDL	Medium	12.2	14.7	3.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	33
cucumbertree	Magnolia acuminata	NSL	Low	8.5	13.3	2.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	34
ailanthus	Ailanthus altissima	NSL	FIA	8.5	13.1	2.9	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	35
sweetgum	Liquidambar styraciflua	WDH	High	1.2	12.8	9.6	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			2	36
shingle oak	Quercus imbricaria	NDH	Medium	2.4	12.6	4.7	No change	No change	Medium	Rare	Poor	Poor			0	37
mockernut hickory	Carya alba	WDL	Medium	7.3	10.3	5.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	38
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	4.9	9.7	1.8	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	39
red pine	Pinus resinosa	NSH	Medium	3.7	9.5	2.4	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	40
chokecherry	Prunus virginiana	NSLX	FIA	6.1	8.9	6.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	41
Osage-orange	Maclura pomifera	NDH	Medium	1.2	7.6	5.7	No change	Lg. inc.	High	Rare	Fair	Good			2	42
yellow birch	Betula alleghaniensis	NDL	High	1.2	6.1	4.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	43
eastern redbud	Cercis canadensis	NSL	Low	1.2	5.7	4.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	44
flowering dogwood	Cornus florida	WDL	Medium	13.4	5.6	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	45
quaking aspen	Populus tremuloides	WDH	High	6.1	5.2	3.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	46
hackberry	Celtis occidentalis	WDH	Medium	12.2	3.9	0.9	Lg. inc.	Lg. inc.	High	Rare	Good	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
black ash	Fraxinus nigra	WSH	Medium	1.2	2.4	1.8	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	48
eastern hemlock	Tsuga canadensis	NSH	High	4.9	1.2	3.7	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	49
Ohio buckeye	Aesculus glabra	NSL	Low	4.9	1.1	3.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	50
sweet birch	Betula lenta	NDH	High	9.8	0.6	0.9	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	51
honeylocust	Gleditsia triacanthos	NSH	Low	4.9	0.4	1.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	52
scarlet oak	Quercus coccinea	WDL	Medium	4.9	0.3	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	53
Norway spruce	Picea abies	NSH	FIA	4.9	0.3	0.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	54
Virginia pine	Pinus virginiana	NDH	High	4.9	0.2	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	55
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	56
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	57
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	58
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	59
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	60
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	61
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	62
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	63
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	64
blue ash	Fraxinus quadrangulata	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	65
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	66
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	67
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	68
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	69
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	70
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	71
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	72