

**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  
 8,012.4    3,093.6    75

**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	10	21	Increase	15	14	Very Good	1	0	Likely	1	1
Hickory	2			Medium	22	28	No Change	5	6	Good	13	12	Infill	20	21
Maple	6	Abundant	0	Low	24	9	Decrease	15	15	Fair	5	7	Migrate	7	14
Oak	6	Common	13	FIA	7		New	19	19	Poor	7	8			
Pine	4	Rare	29				Unknown	9	9	Very Poor	9	8			
Other	21	Absent	21							FIA Only	2	2			
	<b>42</b>		<b>63</b>		<b>63</b>	<b>58</b>		<b>63</b>	<b>63</b>	Unknown	2	2			
											<b>39</b>	<b>39</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

Scenario	2009	2039	2069	2099		
Annual	CCSM45	48.0	50.0	52.7	52.7	
Average	CCSM85	48.0	50.6	53.4	56.5	
	GFDL45	48.0	54.1	53.6	54.7	
	GFDL85	48.0	51.2	54.6	59.1	
	HAD45	48.0	51.0	54.5	56.3	
	HAD85	48.0	51.3	56.0	61.0	
Growing Season	CCSM45	66.3	68.4	70.6	71.0	
	CCSM85	66.3	69.1	71.5	75.1	
May—Sep	GFDL45	66.3	73.8	72.8	74.6	
	GFDL85	66.3	70.2	74.2	79.4	
	HAD45	66.3	69.4	71.9	74.0	
	HAD85	66.3	69.3	74.0	79.0	
Coldest Month	CCSM45	19.1	20.6	23.3	23.3	
Average	CCSM85	19.1	21.7	23.6	25.6	
	GFDL45	19.1	22.7	24.1	24.4	
	GFDL85	19.1	22.9	24.4	26.2	
	HAD45	19.1	20.3	24.5	24.6	
	HAD85	19.1	23.2	26.7	29.8	
Warmest Month	CCSM45	72.6	74.9	76.3	76.9	
Average	CCSM85	72.6	76.1	77.9	79.6	
	GFDL45	72.6	75.8	77.4	78.7	
	GFDL85	72.6	77.0	78.8	82.0	
	HAD45	72.6	75.8	77.5	78.8	
	HAD85	72.6	76.7	79.6	83.1	

**Precipitation (in)**

Scenario	2009	2039	2069	2099		
Annual	CCSM45	35.3	35.3	34.6	35.3	
Total	CCSM85	35.3	35.3	35.3	35.6	
	GFDL45	35.3	37.7	42.1	41.8	
	GFDL85	35.3	39.0	43.7	43.7	
	HAD45	35.3	36.6	38.2	37.6	
	HAD85	35.3	37.7	35.4	37.9	
Growing Season	CCSM45	18.9	19.5	18.7	18.8	
Season	CCSM85	18.9	18.4	18.5	17.6	
May—Sep	GFDL45	18.9	19.3	22.2	21.8	
	GFDL85	18.9	20.8	22.1	21.5	
	HAD45	18.9	18.8	17.6	18.3	
	HAD85	18.9	18.9	15.5	15.9	

**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
black cherry	Prunus serotina	WDL	Medium	84.9	359.0	20.6	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	1
boxelder	Acer negundo	WSH	Low	74.9	234.5	13.9	Lg. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	2
bur oak	Quercus macrocarpa	NDH	Medium	65.4	188.2	17.0	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	3
white oak	Quercus alba	WDH	Medium	62.6	153.7	12.6	No change	Sm. dec.	High	Common	Good	Fair	Infill ++	Infill +	1	4
black walnut	Juglans nigra	WDH	Low	43.9	119.8	11.1	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	5
American basswood	Tilia americana	WSL	Medium	45	110.4	15.4	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	6
American elm	Ulmus americana	WDH	Medium	47.8	108.4	7.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	7
red pine	Pinus resinosa	NSH	Medium	16.2	90.4	12.6	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	8
green ash	Fraxinus pennsylvanica	WSH	Low	39.1	78.0	11.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	9
Norway spruce	Picea abies	NSH	FIA	12.7	63.8	13.3	Unknown	Unknown	NA	Common	NNIS	NNIS			0	10
northern red oak	Quercus rubra	WDH	Medium	51.8	60.1	6.3	Sm. inc.	No change	High	Common	Very Good	Good	Infill ++	Infill ++	1	11
eastern white pine	Pinus strobus	WDH	High	16	57.4	11.0	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	12
shagbark hickory	Carya ovata	WSL	Medium	43.7	51.2	6.5	Sm. inc.	No change	Medium	Common	Good	Fair	Infill ++	Infill +	1	13
white ash	Fraxinus americana	WDL	Medium	44.7	47.4	8.1	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	1	14
quaking aspen	Populus tremuloides	WDH	High	15	44.1	7.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	15
sugar maple	Acer saccharum	WDH	High	26.1	39.2	8.3	Lg. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	16
Scots pine	Pinus sylvestris	NSH	FIA	6.2	37.8	17.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	17
black locust	Robinia pseudoacacia	NDH	Low	6.2	29.8	18.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	18
northern pin oak	Quercus ellipsoidalis	NSH	Medium	16.2	25.9	6.8	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	19
black willow	Salix nigra	NSH	Low	11.2	24.4	9.0	Sm. dec.	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	20
black oak	Quercus velutina	WDH	High	6.2	22.3	12.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	21
eastern cottonwood	Populus deltoides	NSH	Low	27.4	21.6	9.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	22
eastern redcedar	Juniperus virginiana	WDH	Medium	20.2	20.3	5.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	23
red maple	Acer rubrum	WDH	High	5.2	11.7	12.0	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	24
hackberry	Celtis occidentalis	WDH	Medium	2.5	9.0	3.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	25
black ash	Fraxinus nigra	WSH	Medium	5.1	9.0	8.2	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	26
white mulberry	Morus alba	NSL	FIA	14.8	8.3	3.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	27
bitternut hickory	Carya cordiformis	WSL	Low	21.2	7.4	2.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	28
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	1.2	7.3	5.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	29
slippery elm	Ulmus rubra	WSL	Low	11.2	6.6	2.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	30
silver maple	Acer saccharinum	NSH	Low	11.2	6.3	4.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	31
swamp white oak	Quercus bicolor	NSL	Low	1.2	3.5	2.6	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	32
black maple	Acer nigrum	NSH	Low	5	3.4	10.2	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	33
jack pine	Pinus banksiana	NSH	Medium	3.6	3.1	6.5	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	34
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	18.9	3.1	2.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	35
honeylocust	Gleditsia triacanthos	NSH	Low	8.9	2.8	3.9	Lg. inc.	Sm. inc.	High	Rare	Good	Good			2	36
white spruce	Picea glauca	NSL	Medium	7.5	2.8	3.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	37
northern white-cedar	Thuja occidentalis	WSH	High	5	1.9	5.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	38
Siberian elm	Ulmus pumila	NDH	FIA	4	1.1	2.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	39
peachleaf willow	Salix amygdaloides	NSLX	FIA	5	1.0	2.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	40
chokecherry	Prunus virginiana	NSLX	FIA	5	0.5	1.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	41
Norway maple	Acer platanoides	NSL	FIA	3.6	0.2	0.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	42
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +		3	43
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate ++	3	44
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	45
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	46
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
eastern redbud	<i>Cercis canadensis</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	48
common persimmon	<i>Diospyros virginiana</i>	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	49
American beech	<i>Fagus grandifolia</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	50
yellow-poplar	<i>Liriodendron tulipifera</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	51
Osage-orange	<i>Maclura pomifera</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	52
cucumbertree	<i>Magnolia acuminata</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	53
red mulberry	<i>Morus rubra</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	54
sycamore	<i>Platanus occidentalis</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	55
shingle oak	<i>Quercus imbricaria</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	56
blackjack oak	<i>Quercus marilandica</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	57
chinkapin oak	<i>Quercus muehlenbergii</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	58
pin oak	<i>Quercus palustris</i>	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	59
Shumard oak	<i>Quercus shumardii</i>	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	60
post oak	<i>Quercus stellata</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	61
sassafras	<i>Sassafras albidum</i>	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +		3	62
American mountain-ash	<i>Sorbus americana</i>	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	63