

**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  
 8,004.9    3,090.7    225

**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	23	16	Increase	15	18	Very Good	3	4
Hickory	3			Medium	23	40	No Change	7	2	Good	11	14
Maple	5	Abundant	4	Low	20	12	Decrease	21	23	Fair	7	3
Oak	6	Common	19	FIA	4		New	17	19	Poor	11	10
Pine	3	Rare	24				Unknown	10	8	Very Poor	9	9
Other	27	Absent	23							FIA Only	2	2
	<b>47</b>		<b>70</b>		<b>70</b>	<b>68</b>		<b>70</b>	<b>70</b>	Unknown	6	4
											<b>49</b>	<b>46</b>

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099
Annual Average	CCSM45	47.3	49.1	51.3	51.5
	CCSM85	47.3	49.7	52.1	55.1
	GFDL45	47.3	50.3	53.1	54.4
	GFDL85	47.3	50.5	54.5	59.0
	HAD45	47.3	50.2	53.3	55.0
HAD85	47.3	50.3	54.5	59.7	
Growing Season (May—Sep)	CCSM45	64.2	66.2	68.0	68.3
	CCSM85	64.2	66.5	68.8	72.2
	GFDL45	64.2	67.4	70.4	71.9
	GFDL85	64.2	67.5	71.9	76.6
	HAD45	64.2	67.0	69.7	72.0
HAD85	64.2	66.6	71.3	76.9	
Coldest Month (Average)	CCSM45	21.4	22.9	24.6	25.3
	CCSM85	21.4	24.0	25.1	27.3
	GFDL45	21.4	24.6	26.4	27.7
	GFDL85	21.4	25.2	27.2	29.7
	HAD45	21.4	23.9	26.5	26.7
HAD85	21.4	25.1	27.3	30.5	
Warmest Month (Average)	CCSM45	70.6	72.9	73.9	73.9
	CCSM85	70.6	73.2	74.7	76.4
	GFDL45	70.6	73.3	75.0	76.3
	GFDL85	70.6	73.9	76.5	79.2
	HAD45	70.6	73.6	75.0	76.3
HAD85	70.6	73.1	75.7	79.4	

**Precipitation (in)**

	Scenario	2009	2039	2069	2099
Annual Total	CCSM45	47.4	46.2	44.0	50.4
	CCSM85	47.4	46.2	48.6	52.0
	GFDL45	47.4	51.1	53.7	52.4
	GFDL85	47.4	49.5	52.1	54.8
	HAD45	47.4	49.8	53.3	51.7
HAD85	47.4	51.6	51.5	53.2	
Growing Season (May—Sep)	CCSM45	19.3	20.0	17.8	19.6
	CCSM85	19.3	18.5	19.9	20.0
	GFDL45	19.3	18.8	18.2	18.3
	GFDL85	19.3	19.4	18.0	17.8
	HAD45	19.3	20.5	20.7	20.4
HAD85	19.3	19.6	19.4	20.5	

**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	93.9	2569.8	25.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
eastern white pine	Pinus strobus	WDH	High	93.4	2310.5	23.2	Lg. dec.	Lg. dec.	Low	Abundant	Poor	Poor			0	2
northern red oak	Quercus rubra	WDH	Medium	84	1157.4	12.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
eastern hemlock	Tsuga canadensis	NSH	High	69.6	902.5	12.7	Lg. dec.	Lg. dec.	Low	Abundant	Poor	Poor			0	4
black oak	Quercus velutina	WDH	High	48	324.9	6.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	5
sweet birch	Betula lenta	NDH	High	50.8	265.1	4.9	No change	Sm. dec.	Low	Common	Poor	Poor			0	6
white ash	Fraxinus americana	WDL	Medium	52.3	248.3	4.7	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	7
white oak	Quercus alba	WDH	Medium	51.4	223.9	4.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	8
American beech	Fagus grandifolia	WDH	High	44.1	216.9	4.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	9
sugar maple	Acer saccharum	WDH	High	32.7	172.8	5.2	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	10
bigtooth aspen	Populus grandidentata	NSL	Medium	19.2	158.7	5.1	No change	Sm. dec.	Medium	Common	Fair	Poor			1	11
American elm	Ulmus americana	WDH	Medium	33	156.1	4.6	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	12
quaking aspen	Populus tremuloides	WDH	High	26.3	144.1	3.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	13
yellow birch	Betula alleghaniensis	NDL	High	36.6	130.6	3.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	14
paper birch	Betula papyrifera	WDH	High	54.3	119.1	2.1	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	15
balsam fir	Abies balsamea	NDH	High	13.9	95.4	5.5	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	16
pignut hickory	Carya glabra	WDL	Medium	11.2	81.2	7.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	17
red pine	Pinus resinosa	NSH	Medium	9.7	76.2	7.0	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	18
swamp white oak	Quercus bicolor	NSL	Low	6.2	70.0	10.8	Sm. dec.	No change	Medium	Common	Poor	Fair	Infill +	Infill +	2	19
gray birch	Betula populifolia	NSL	Low	29.3	67.2	2.1	No change	Sm. inc.	Medium	Common	Fair	Good			1	20
black cherry	Prunus serotina	WDL	Medium	24.5	62.0	2.6	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	21
scarlet oak	Quercus coccinea	WDL	Medium	10	55.3	5.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	22
shagbark hickory	Carya ovata	WSL	Medium	20.6	52.7	2.6	No change	Sm. inc.	Medium	Common	Fair	Good			1	23
Siberian elm	Ulmus pumila	NDH	FIA	1.2	43.2	33.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	24
American basswood	Tilia americana	WSL	Medium	13.6	35.9	2.5	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	25
pitch pine	Pinus rigida	NSH	High	12.1	34.0	2.4	No change	Lg. dec.	Medium	Rare	Poor	Very Poor			1	26
white spruce	Picea glauca	NSL	Medium	3.6	33.1	7.9	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	27
black spruce	Picea mariana	NSH	High	2.5	30.6	11.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	28
red spruce	Picea rubens	NDH	High	15.4	21.5	1.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	29
black willow	Salix nigra	NSH	Low	1.2	18.5	14.3	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	30
black locust	Robinia pseudoacacia	NDH	Low	2.3	12.9	4.5	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	31
serviceberry	Amelanchier spp.	NSL	Low	3.7	12.6	3.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	32
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	8.7	12.0	1.3	No change	Sm. inc.	High	Rare	Fair	Good			1	33
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	6.2	10.7	1.7	No change	No change	Medium	Rare	Poor	Poor		Infill +	1	34
tamarack (native)	Larix laricina	NSH	High	3.7	10.1	2.6	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	35
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	1.2	8.2	6.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	36
blackgum	Nyssa sylvatica	WDL	Medium	7.6	5.0	0.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	37
eastern redcedar	Juniperus virginiana	WDH	Medium	6.5	4.7	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	38
black ash	Fraxinus nigra	WSH	Medium	2.5	4.5	1.7	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	39
Norway maple	Acer platanoides	NSL	FIA	1.2	1.3	1.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	40
American chestnut	Castanea dentata	NSLX	FIA	1.2	1.2	0.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	41
green ash	Fraxinus pennsylvanica	WSH	Low	1.2	1.1	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	42
sassafras	Sassafras albidum	WSL	Low	1.1	0.9	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	43
mountain maple	Acer spicatum	NSL	Low	1.2	0.8	0.6	Sm. dec.	Lg. dec.	High	Rare	Poor	Poor			0	44
striped maple	Acer pensylvanicum	NSL	Medium	1.2	0.8	0.6	Sm. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	45
bitternut hickory	Carya cordiformis	WSL	Low	1.2	0.7	0.5	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	46
pin cherry	Prunus pensylvanica	NSL	Low	1.2	0.4	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very 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
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	48
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	49
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	50
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	51
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	52
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	53
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	54
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	55
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	56
flowering dogwood	Cornus florida	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	57
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			3	58
American holly	Ilex opaca	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	59
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	60
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	61
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	62
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	63
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	64
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	65
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	66
chestnut oak	Quercus prinus	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	67
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	68
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	69
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	70