

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
 8,775.6 3,388.3 260

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	16	Increase	18	19	Very Good	6	5	Likely	0	0
Hickory	3			Medium	23	38	No Change	3	5	Good	11	15	Infill	15	18
Maple	4	Abundant	4	Low	20	12	Decrease	19	16	Fair	4	3	Migrate	3	7
Oak	6	Common	15	FIA	4		New	17	20	Poor	8	7			
Pine	3	Rare	25				Unknown	12	9	Very Poor	9	6			
Other	26	Absent	25							FIA Only	1	1			
	44		69		69	66		69	69	Unknown	8	5			
											47	42			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	46.8	48.7	50.9	51.1	
Average	CCSM85	46.8	49.2	51.7	54.8	
	GFDL45	46.8	49.5	52.7	54.1	
	GFDL85	46.8	50.0	54.1	58.6	
	HAD45	46.8	49.7	52.8	54.5	
	HAD85	46.8	49.9	54.0	59.3	
Growing Season	CCSM45	63.9	66.1	67.8	68.3	
	CCSM85	63.9	66.3	68.7	72.3	
May—Sep	GFDL45	63.9	66.8	70.3	71.8	
	GFDL85	63.9	67.3	71.8	76.6	
	HAD45	63.9	66.8	69.5	71.8	
	HAD85	63.9	66.4	71.1	76.8	
Coldest Month	CCSM45	20.5	22.1	23.9	24.5	
	CCSM85	20.5	23.3	24.3	26.6	
Average	GFDL45	20.5	23.8	25.6	26.9	
	GFDL85	20.5	24.4	26.4	28.9	
	HAD45	20.5	23.1	25.8	26.0	
	HAD85	20.5	24.2	26.5	29.7	
Warmest Month	CCSM45	70.3	72.8	73.8	73.8	
	CCSM85	70.3	73.1	74.6	76.4	
Average	GFDL45	70.3	73.0	74.8	76.1	
	GFDL85	70.3	73.7	76.4	79.1	
	HAD45	70.3	73.4	74.8	76.1	
	HAD85	70.3	72.8	75.4	79.4	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	47.0	46.0	43.9	50.1	
Total	CCSM85	47.0	46.0	48.5	51.9	
	GFDL45	47.0	50.9	53.4	52.0	
	GFDL85	47.0	49.2	51.9	54.7	
	HAD45	47.0	49.5	52.5	51.1	
	HAD85	47.0	50.9	51.1	52.8	
Growing Season	CCSM45	19.7	20.4	18.4	20.2	
	CCSM85	19.7	19.0	20.5	20.5	
May—Sep	GFDL45	19.7	19.6	18.8	19.0	
	GFDL85	19.7	19.9	18.7	18.6	
	HAD45	19.7	21.1	21.0	21.0	
	HAD85	19.7	19.9	19.8	20.9	

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
eastern white pine	Pinus strobus	WDH	High	94.4	2680.1	27.7	Lg. dec.	Lg. dec.	Low	Abundant	Poor	Poor	Infill +	Infill +	2	1
red maple	Acer rubrum	WDH	High	96.7	2393.4	24.2	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			0	2
northern red oak	Quercus rubra	WDH	Medium	89.9	1161.4	12.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			0	3
eastern hemlock	Tsuga canadensis	NSH	High	71.6	1005.2	13.7	Lg. dec.	Lg. dec.	Low	Abundant	Poor	Poor	Infill +	Infill +	2	4
black oak	Quercus velutina	WDH	High	45.4	371.2	8.0	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good	Infill ++	Infill ++	2	5
white ash	Fraxinus americana	WDL	Medium	62.5	332.0	5.2	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair	Infill +	Infill +	2	6
sweet birch	Betula lenta	NDH	High	65.9	301.9	4.4	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	2	7
American beech	Fagus grandifolia	WDH	High	54.7	281.3	5.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	2	8
white oak	Quercus alba	WDH	Medium	50	240.9	4.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	9
paper birch	Betula papyrifera	WDH	High	66.1	183.0	2.7	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	10
sugar maple	Acer saccharum	WDH	High	49	162.8	3.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	11
yellow birch	Betula alleghaniensis	NDL	High	42.2	159.3	3.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	2	12
black cherry	Prunus serotina	WDL	Medium	38.6	99.1	2.5	Lg. inc.	Lg. inc.	Low	Common	Good	Good	Infill ++	Infill ++	2	13
American elm	Ulmus americana	WDH	Medium	26.1	84.8	3.2	Sm. dec.	No change	Medium	Common	Poor	Fair			0	14
scarlet oak	Quercus coccinea	WDL	Medium	13.7	62.6	4.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			2	15
pignut hickory	Carya glabra	WDL	Medium	11.4	61.9	5.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			2	16
swamp white oak	Quercus bicolor	NSL	Low	4.6	60.9	13.1	Sm. dec.	No change	Medium	Common	Poor	Fair			2	17
bigtooth aspen	Populus grandidentata	NSL	Medium	12.5	60.6	4.7	Lg. inc.	Sm. inc.	Medium	Common	Very Good	Good	Infill ++	Infill ++	2	18
quaking aspen	Populus tremuloides	WDH	High	23.8	59.0	2.4	Lg. inc.	Sm. inc.	Medium	Common	Very Good	Good	Infill ++	Infill ++	2	19
shagbark hickory	Carya ovata	WSL	Medium	13.5	45.6	3.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			2	20
American basswood	Tilia americana	WSL	Medium	16	45.2	2.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good		Infill ++	2	21
red spruce	Picea rubens	NDH	High	20.5	44.8	2.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	22
Siberian elm	Ulmus pumila	NDH	FIA	1.1	38.8	33.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	23
red pine	Pinus resinosa	NSH	Medium	13.5	33.4	2.3	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			2	24
balsam fir	Abies balsamea	NDH	High	9.1	32.0	3.4	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	25
gray birch	Betula populifolia	NSL	Low	21.7	28.2	1.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good		Infill ++	2	26
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	12.5	17.5	1.4	No change	Lg. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	27
pitch pine	Pinus rigida	NSH	High	9.1	12.4	1.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	28
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	8	11.4	1.4	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	29
striped maple	Acer pensylvanicum	NSL	Medium	10.3	10.6	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	30
white spruce	Picea glauca	NSL	Medium	2.3	8.3	3.6	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	31
black locust	Robinia pseudoacacia	NDH	Low	1	7.4	5.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	32
pin cherry	Prunus pensylvanica	NSL	Low	4.6	6.1	1.3	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	33
tamarack (native)	Larix laricina	NSH	High	3.4	5.4	1.6	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	34
blackgum	Nyssa sylvatica	WDL	Medium	3.4	4.3	1.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	35
serviceberry	Amelanchier spp.	NSL	Low	2.3	4.2	1.8	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	36
eastern redcedar	Juniperus virginiana	WDH	Medium	3.4	3.9	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	37
chestnut oak	Quercus prinus	NDH	High	1.1	2.3	2.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	38
American chestnut	Castanea dentata	NSLX	FIA	3.4	2.0	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	39
black willow	Salix nigra	NSH	Low	1.1	1.6	1.4	Sm. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	40
Norway maple	Acer platanoides	NSL	FIA	1.1	1.2	1.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	41
Norway spruce	Picea abies	NSH	FIA	1.1	0.9	0.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	42
black ash	Fraxinus nigra	WSH	Medium	1.1	0.6	0.5	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	43
bitternut hickory	Carya cordiformis	WSL	Low	1.1	0.6	0.5	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	44
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	45
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	46
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			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
mountain maple	<i>Acer spicatum</i>	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	48
Ohio buckeye	<i>Aesculus glabra</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	49
cittamwood/gum bumelia	<i>Sideroxylon lanuginosum</i> ssp. NSL	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	50
black hickory	<i>Carya texana</i>	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	51
mockernut hickory	<i>Carya alba</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	52
sugarberry	<i>Celtis laevigata</i>	NDH	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	53
eastern redbud	<i>Cercis canadensis</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	54
flowering dogwood	<i>Cornus florida</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	55
common persimmon	<i>Diospyros virginiana</i>	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			3	56
green ash	<i>Fraxinus pennsylvanica</i>	WSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	57
American holly	<i>Ilex opaca</i>	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	58
sweetgum	<i>Liquidambar styraciflua</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	59
yellow-poplar	<i>Liriodendron tulipifera</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	60
bigleaf magnolia	<i>Magnolia macrophylla</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	61
sycamore	<i>Platanus occidentalis</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	62
southern red oak	<i>Quercus falcata</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	63
blackjack oak	<i>Quercus marilandica</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	64
willow oak	<i>Quercus phellos</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	65
post oak	<i>Quercus stellata</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	66
sassafras	<i>Sassafras albidum</i>	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	67
American mountain-ash	<i>Sorbus americana</i>	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	68
winged elm	<i>Ulmus alata</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	69