

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	8,338.9	3,219.7	201

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	Scenario	Scenario	Scenario	SHIFT	SHIFT				
						RCP45	RCP85	RCP45	RCP85	RCP45	RCP85				
Ash	3			High	16	20	Increase	16	17	Very Good	5	5	Likely	0	0
Hickory	2			Medium	24	34	No Change	7	5	Good	10	10	Infill	18	18
Maple	5	Abundant	4	Low	23	12	Decrease	21	22	Fair	10	10	Migrate	6	14
Oak	6	Common	19	FIA	5		New	18	18	Poor	8	7			
Pine	4	Rare	26				Unknown	6	6	Very Poor	9	10			
Other	29	Absent	19							FIA Only	3	3			
	49		68		68	66		68	68	Unknown	1	1			
											46	46			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	44.7	46.6	49.7	49.6	
	CCSM85	44.7	47.4	50.3	53.7	
	GFDL45	44.7	49.2	50.5	51.9	
	GFDL85	44.7	48.1	51.7	56.6	
	HAD45	44.7	47.9	51.2	53.1	
HAD85	44.7	48.2	52.5	58.1		
Growing Season (May—Sep)	CCSM45	63.6	65.4	67.9	68.0	
	CCSM85	63.6	66.1	68.7	72.6	
	GFDL45	63.6	69.2	70.8	72.8	
	GFDL85	63.6	67.8	72.2	77.8	
	HAD45	63.6	66.8	68.9	71.1	
HAD85	63.6	66.5	70.4	75.9		
Coldest Month Average	CCSM45	15.2	16.7	19.7	19.6	
	CCSM85	15.2	17.7	20.0	22.3	
	GFDL45	15.2	18.0	19.8	20.2	
	GFDL85	15.2	19.1	20.6	23.1	
	HAD45	15.2	16.7	20.7	20.9	
HAD85	15.2	19.4	22.9	27.0		
Warmest Month Average	CCSM45	69.8	72.1	73.5	73.9	
	CCSM85	69.8	73.0	74.8	76.8	
	GFDL45	69.8	73.6	75.3	76.7	
	GFDL85	69.8	74.5	76.8	79.9	
	HAD45	69.8	73.0	74.0	75.7	
HAD85	69.8	73.5	75.6	79.4		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	30.3	30.2	29.8	30.6	
	CCSM85	30.3	30.8	30.8	31.6	
	GFDL45	30.3	32.5	34.9	34.1	
	GFDL85	30.3	33.3	36.1	36.2	
	HAD45	30.3	30.7	32.3	32.8	
HAD85	30.3	31.9	32.6	34.4		
Growing Season (May—Sep)	CCSM45	17.0	16.8	16.1	17.1	
	CCSM85	17.0	17.2	16.9	16.3	
	GFDL45	17.0	17.7	18.9	18.2	
	GFDL85	17.0	18.6	18.7	18.1	
	HAD45	17.0	16.3	15.7	16.2	
HAD85	17.0	17.0	14.9	15.3		

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
green ash	Fraxinus pennsylvanica	WSH	Low	86.5	1450.0	20.7	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
northern white-cedar	Thuja occidentalis	WSH	High	47.8	646.7	16.1	Sm. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	2
red maple	Acer rubrum	WDH	High	56.5	578.4	10.7	No change	Sm. dec.	High	Abundant	Very Good	Good			1	3
quaking aspen	Populus tremuloides	WDH	High	46.8	551.1	10.4	Sm. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	4
American elm	Ulmus americana	WDH	Medium	80.2	461.9	7.3	No change	No change	Medium	Common	Fair	Fair			1	5
eastern white pine	Pinus strobus	WDH	High	28.9	325.3	12.5	Sm. dec.	Lg. dec.	Low	Common	Poor	Very Poor			0	6
black ash	Fraxinus nigra	WSH	Medium	58	304.7	5.8	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	7
white ash	Fraxinus americana	WDL	Medium	49.4	252.5	6.6	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	8
American basswood	Tilia americana	WSL	Medium	46.3	249.4	6.7	No change	Sm. dec.	Medium	Common	Fair	Poor			1	9
sugar maple	Acer saccharum	WDH	High	31.2	220.7	7.5	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	10
paper birch	Betula papyrifera	WDH	High	51.8	188.1	4.3	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	11
boxelder	Acer negundo	WSH	Low	34.5	168.5	7.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	12
northern red oak	Quercus rubra	WDH	Medium	31.2	158.4	5.6	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	13
silver maple	Acer saccharinum	NSH	Low	22.4	154.1	10.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	14
eastern cottonwood	Populus deltoides	NSH	Low	16.2	126.2	8.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good	Infill ++	Infill ++	1	15
black cherry	Prunus serotina	WDL	Medium	37	125.9	3.8	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	16
tamarack (native)	Larix laricina	NSH	High	17.4	125.7	8.6	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	17
bur oak	Quercus macrocarpa	NDH	Medium	22.7	121.0	7.4	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	18
red pine	Pinus resinosa	NSH	Medium	15.3	95.7	8.2	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	19
northern pin oak	Quercus ellipsoidalis	NSH	Medium	10.4	73.0	4.8	Lg. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	20
white spruce	Picea glauca	NSL	Medium	11.6	63.6	6.4	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	21
Scots pine	Pinus sylvestris	NSH	FIA	5.9	63.6	9.4	Unknown	Unknown	NA	Common	NNIS	NNIS			0	22
black willow	Salix nigra	NSH	Low	25.9	63.1	8.5	Sm. dec.	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	23
bigtooth aspen	Populus grandidentata	NSL	Medium	11.2	49.7	3.0	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	24
yellow birch	Betula alleghaniensis	NDL	High	28.4	47.8	2.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	25
bitternut hickory	Carya cordiformis	WSL	Low	10.2	42.6	3.5	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	26
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	24.2	38.1	2.0	Lg. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	27
peachleaf willow	Salix amygdaloides	NSLX	FIA	3.7	34.2	5.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	28
eastern hemlock	Tsuga canadensis	NSH	High	21.6	33.9	2.7	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	29
slippery elm	Ulmus rubra	WSL	Low	10.8	32.1	4.1	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	30
American beech	Fagus grandifolia	WDH	High	23.6	29.9	2.6	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	31
honeylocust	Gleditsia triacanthos	NSH	Low	1.2	25.8	19.4	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	32
jack pine	Pinus banksiana	NSH	Medium	2.4	25.6	9.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	33
white oak	Quercus alba	WDH	Medium	22.5	25.2	2.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	34
swamp white oak	Quercus bicolor	NSL	Low	6.5	22.1	4.8	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	35
shagbark hickory	Carya ovata	WSL	Medium	18.7	13.3	10.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	36
Siberian elm	Ulmus pumila	NDH	FIA	1.2	10.7	8.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	37
balsam poplar	Populus balsamifera	NSH	Medium	5.4	10.5	2.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	38
serviceberry	Amelanchier spp.	NSL	Low	9.2	9.8	0.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	39
eastern redcedar	Juniperus virginiana	WDH	Medium	4.3	9.6	25.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	40
balsam fir	Abies balsamea	NDH	High	10.1	8.4	0.8	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			2	41
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	14.1	6.9	0.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	42
chokecherry	Prunus virginiana	NSLX	FIA	5.6	4.6	0.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	43
black oak	Quercus velutina	WDH	High	1.2	4.0	3.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	44
pin cherry	Prunus pensylvanica	NSL	Low	2.3	2.9	1.1	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	45
hackberry	Celtis occidentalis	WDH	Medium	1.2	1.5	1.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	46
black spruce	Picea mariana	NSH	High	4.3	1.1	0.3	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			2	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCI45	ChngCI85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
mountain maple	Acer spicatum	NSL	Low	2.3	1.0	1.4	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	48
rock elm	Ulmus thomasii	NSLX	FIA	4.8	0.5	1.4	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	49
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	50
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	51
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	52
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	53
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	54
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	55
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	56
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	57
red mulberry	Morus rubra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	58
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	59
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	60
shingle oak	Quercus imbricaria	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	61
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	62
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	63
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	64
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	65
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	66
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	67
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	68