

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	8,940.0	3,451.7	51

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	4			High	10	20	Increase	12	13	Very Good	0	0	Likely	3	3
Hickory	4			Medium	25	32	No Change	13	6	Good	12	10	Infill	25	24
Maple	4	Abundant	0	Low	27	11	Decrease	18	24	Fair	8	10	Migrate	3	4
Oak	9	Common	12	FIA	4		New	15	15	Poor	11	10			
Pine	3	Rare	35				Unknown	8	8	Very Poor	12	13			
Other	23	Absent	16							FIA Only	1	1			
	47		63		66	63		66	66	Unknown	4	4			
											48	48			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	49.8	51.6	54.2	54.3	
	CCSM85	49.8	52.2	54.9	58.1	
	GFDL45	49.8	55.9	55.5	56.4	
	GFDL85	49.8	52.9	56.5	60.8	
	HAD45	49.8	52.9	56.4	58.1	
	HAD85	49.8	53.1	57.7	62.8	
Growing Season May—Sep	CCSM45	67.3	69.1	71.4	71.9	
	CCSM85	67.3	69.9	72.4	76.2	
	GFDL45	67.3	74.8	74.2	75.6	
	GFDL85	67.3	71.2	75.4	80.5	
	HAD45	67.3	70.8	73.6	75.9	
	HAD85	67.3	70.5	76.0	81.3	
Coldest Month Average	CCSM45	22.6	24.2	26.5	26.5	
	CCSM85	22.6	25.2	26.8	28.7	
	GFDL45	22.6	25.8	26.8	27.4	
	GFDL85	22.6	25.8	27.1	28.8	
	HAD45	22.6	24.2	27.8	27.7	
	HAD85	22.6	26.0	28.8	31.8	
Warmest Month Average	CCSM45	73.3	75.2	76.8	77.2	
	CCSM85	73.3	76.5	78.2	80.3	
	GFDL45	73.3	76.3	78.3	79.1	
	GFDL85	73.3	77.2	79.3	82.5	
	HAD45	73.3	77.1	79.2	80.8	
	HAD85	73.3	77.9	81.8	85.5	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	35.0	35.3	35.0	36.3	
	CCSM85	35.0	36.0	36.1	37.1	
	GFDL45	35.0	37.7	41.6	42.4	
	GFDL85	35.0	37.2	42.2	43.9	
	HAD45	35.0	35.5	37.2	37.1	
	HAD85	35.0	37.5	34.8	37.9	
Growing Season May—Sep	CCSM45	17.3	17.3	16.7	16.8	
	CCSM85	17.3	16.6	16.8	16.2	
	GFDL45	17.3	18.3	19.4	20.1	
	GFDL85	17.3	18.3	19.3	19.4	
	HAD45	17.3	17.3	16.0	16.8	
	HAD85	17.3	17.1	13.8	14.9	

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
American basswood	Tilia americana	WSL	Medium	51.7	285.9	18.8	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	1
red maple	Acer rubrum	WDH	High	47.3	228.0	17.5	Lg. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	2
shagbark hickory	Carya ovata	WSL	Medium	44	152.1	14.1	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	3
black cherry	Prunus serotina	WDL	Medium	37.3	104.7	11.0	No change	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	2	4
American elm	Ulmus americana	WDH	Medium	66.3	103.9	6.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	2	5
eastern cottonwood	Populus deltoides	NSH	Low	16.8	103.5	15.2	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	6
sugar maple	Acer saccharum	WDH	High	35	92.4	9.6	No change	Sm. dec.	High	Common	Good	Fair	Infill ++	Infill +	2	7
bur oak	Quercus macrocarpa	NDH	Medium	29	81.2	21.0	Lg. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	8
northern red oak	Quercus rubra	WDH	Medium	37	70.5	5.5	No change	Sm. dec.	High	Common	Good	Fair	Infill ++	Infill +	2	9
green ash	Fraxinus pennsylvanica	WSH	Low	49.5	69.9	11.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	2	10
white ash	Fraxinus americana	WDL	Medium	52.8	56.6	8.1	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair	Infill +	Infill +	2	11
slippery elm	Ulmus rubra	WSL	Low	32.8	54.9	7.7	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	12
bitternut hickory	Carya cordiformis	WSL	Low	39.4	44.8	5.9	No change	Sm. dec.	High	Rare	Fair	Poor	Infill +	Infill +	2	13
swamp white oak	Quercus bicolor	NSL	Low	6.7	40.5	10.9	No change	Sm. dec.	Medium	Rare	Poor	Very Poor	Infill +		2	14
silver maple	Acer saccharinum	NSH	Low	6.7	39.7	11.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	15
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	25.8	34.7	3.6	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	16
black walnut	Juglans nigra	WDH	Low	31.6	26.8	6.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	17
sassafras	Sassafras albidum	WSL	Low	15.7	25.8	6.5	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	18
northern pin oak	Quercus ellipsoidalis	NSH	Medium	2.2	15.4	5.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	19
white mulberry	Morus alba	NSL	FIA	14.5	15.1	6.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	20
pignut hickory	Carya glabra	WDL	Medium	5.9	14.0	3.8	No change	Sm. dec.	Medium	Rare	Poor	Very Poor	Infill +		2	21
boxelder	Acer negundo	WSH	Low	10.1	13.1	8.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	22
honeylocust	Gleditsia triacanthos	NSH	Low	10.1	11.5	10.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	23
hackberry	Celtis occidentalis	WDH	Medium	30.2	9.3	3.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	24
sycamore	Platanus occidentalis	NSL	Low	16.8	9.2	6.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	25
Scots pine	Pinus sylvestris	NSH	FIA	5.6	9.1	9.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	26
black oak	Quercus velutina	WDH	High	10.1	7.6	3.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	27
American beech	Fagus grandifolia	WDH	High	13.4	7.5	7.6	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	28
black ash	Fraxinus nigra	WSH	Medium	8.1	6.5	9.6	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	29
pin oak	Quercus palustris	NSH	Low	12.6	5.9	5.7	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	30
white oak	Quercus alba	WDH	Medium	16.8	5.1	3.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	31
flowering dogwood	Cornus florida	WDL	Medium	10.1	4.8	1.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	32
eastern redcedar	Juniperus virginiana	WDH	Medium	1.1	3.7	2.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	33
Ohio buckeye	Aesculus glabra	NSL	Low	8.9	3.5	5.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	34
butternut	Juglans cinerea	NSLX	FIA	1.1	3.4	2.6	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	35
mockernut hickory	Carya alba	WDL	Medium	1.1	3.3	2.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	36
Norway spruce	Picea abies	NSH	FIA	4.5	3.1	9.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	37
eastern redbud	Cercis canadensis	NSL	Low	7.9	2.9	3.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	38
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	8.2	2.7	1.2	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	39
red pine	Pinus resinosa	NSH	Medium	4.5	2.6	7.9	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	40
black willow	Salix nigra	NSH	Low	4.5	2.5	7.7	No change	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	41
blue ash	Fraxinus quadrangulata	NSL	Low	4.5	2.3	6.9	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	42
red mulberry	Morus rubra	NSL	Low	4.5	2.2	6.8	No change	No change	Medium	Rare	Poor	Poor		Infill +	2	43
scarlet oak	Quercus coccinea	WDL	Medium	13.4	1.8	1.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	44
chinkapin oak	Quercus muehlenbergii	NSL	Medium	4.5	1.0	3.1	No change	No change	Medium	Rare	Poor	Poor	Infill +		2	45
quaking aspen	Populus tremuloides	WDH	High	13.4	0.9	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	46
eastern white pine	Pinus strobus	WDH	High	4.5	0.4	1.3	Lg. dec.	Lg. dec.	Low	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
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	48
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	49
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	50
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	51
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	52
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	53
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +		3	54
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	55
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	56
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	57
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	58
shingle oak	Quercus imbricaria	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	59
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	60
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	61
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	62
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	63
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	64
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	65
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	66