

**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	8,800.0	3,397.7	168

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	14	22	Increase	27	28	Very Good	9	11	Likely	4	4
Hickory	5			Medium	25	35	No Change	4	6	Good	17	18	Infill	9	10
Maple	4	Abundant	4	Low	26	9	Decrease	15	12	Fair	6	6	Migrate	3	7
Oak	10	Common	19	FIA	2		New	16	16	Poor	7	4		16	21
Pine	2	Rare	25				Unknown	5	5	Very Poor	6	6			
Other	24	Absent	18					67	67	FIA Only	1	1			
	48		66		67	66				Unknown	3	3			
											49	49			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	55.7	57.6	59.5	59.9	
	CCSM85	55.7	58.2	60.5	63.7	
	GFDL45	55.7	59.6	60.8	61.9	
	GFDL85	55.7	58.6	61.5	65.4	
	HAD45	55.7	58.3	61.2	62.6	
	HAD85	55.7	58.4	63.2	66.8	
Growing Season May—Sep	CCSM45	71.8	74.0	75.5	76.1	
	CCSM85	71.8	74.7	77.0	81.0	
	GFDL45	71.8	76.6	78.0	79.9	
	GFDL85	71.8	75.6	78.9	83.9	
	HAD45	71.8	74.7	77.3	78.8	
	HAD85	71.8	75.0	80.8	84.1	
Coldest Month Average	CCSM45	30.5	32.9	34.1	34.6	
	CCSM85	30.5	33.7	34.7	36.5	
	GFDL45	30.5	35.0	35.3	35.3	
	GFDL85	30.5	32.9	34.2	34.9	
	HAD45	30.5	31.7	34.2	34.2	
	HAD85	30.5	33.3	35.5	37.4	
Warmest Month Average	CCSM45	77.9	80.4	81.4	81.8	
	CCSM85	77.9	81.4	82.4	84.2	
	GFDL45	77.9	82.6	83.9	85.3	
	GFDL85	77.9	82.4	84.0	87.6	
	HAD45	77.9	81.3	83.1	83.8	
	HAD85	77.9	82.4	85.5	87.0	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	45.0	43.7	47.0	46.0	
	CCSM85	45.0	45.0	46.5	46.6	
	GFDL45	45.0	48.9	50.5	49.5	
	GFDL85	45.0	49.0	55.7	54.7	
	HAD45	45.0	44.6	47.1	47.8	
	HAD85	45.0	47.8	43.2	45.9	
Growing Season May—Sep	CCSM45	21.2	19.6	20.9	20.4	
	CCSM85	21.2	20.7	19.5	19.9	
	GFDL45	21.2	23.5	22.3	23.0	
	GFDL85	21.2	23.1	25.7	24.5	
	HAD45	21.2	20.5	21.1	21.1	
	HAD85	21.2	22.0	17.7	18.4	

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-DGP30 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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Landscape Change Research Group
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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 oak	Quercus velutina	WDH	High	85.2	1285.7	20.5	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
post oak	Quercus stellata	WDH	High	77.3	953.3	18.6	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	2
white oak	Quercus alba	WDH	Medium	58	770.1	15.4	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
eastern redcedar	Juniperus virginiana	WDH	Medium	64.8	574.2	14.6	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	4
black walnut	Juglans nigra	WDH	Low	69.3	331.4	8.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	5
American elm	Ulmus americana	WDH	Medium	72.7	316.5	6.0	No change	Sm. inc.	Medium	Common	Fair	Good			1	6
northern red oak	Quercus rubra	WDH	Medium	38.6	273.7	9.5	No change	No change	High	Common	Good	Good			1	7
black hickory	Carya texana	NDL	High	56.8	223.1	5.2	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	8
bitternut hickory	Carya cordiformis	WSL	Low	42	222.8	8.8	No change	No change	High	Common	Good	Good			1	9
mockernut hickory	Carya alba	WDL	Medium	60.2	194.6	5.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	10
honeylocust	Gleditsia triacanthos	NSH	Low	44.3	137.5	6.6	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	11
hackberry	Celtis occidentalis	WDH	Medium	44.3	129.7	5.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	12
shagbark hickory	Carya ovata	WSL	Medium	45.5	108.7	4.3	Sm. dec.	No change	Medium	Common	Poor	Fair			1	13
sassafras	Sassafras albidum	WSL	Low	47.7	102.4	3.5	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	14
black cherry	Prunus serotina	WDL	Medium	26.1	95.7	5.6	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	15
common persimmon	Diospyros virginiana	NSL	Low	35.2	91.0	4.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	16
chinkapin oak	Quercus muehlenbergii	NSL	Medium	35.2	90.4	4.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	17
white ash	Fraxinus americana	WDL	Medium	45.5	80.6	2.8	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	18
blackjack oak	Quercus marilandica	NSL	Medium	27.3	68.2	3.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	19
slippery elm	Ulmus rubra	WSL	Low	39.8	61.7	2.5	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	20
red mulberry	Morus rubra	NSL	Low	45.5	61.0	2.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	21
Shumard oak	Quercus shumardii	NSL	Low	17	56.7	3.9	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	22
sycamore	Platanus occidentalis	NSL	Low	17	50.7	3.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	23
flowering dogwood	Cornus florida	WDL	Medium	21.6	48.8	2.1	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	24
boxelder	Acer negundo	WSH	Low	2.3	44.7	18.3	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2	25
sugar maple	Acer saccharum	WDH	High	17	38.5	2.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	26
Osage-orange	Maclura pomifera	NDH	Medium	20.5	34.1	4.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	27
winged elm	Ulmus alata	WDL	Medium	19.3	32.5	1.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	28
eastern redbud	Cercis canadensis	NSL	Low	17	30.2	2.1	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	29
eastern white pine	Pinus strobus	WDH	High	1.1	18.9	15.5	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	30
blackgum	Nyssa sylvatica	WDL	Medium	8	17.8	2.1	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	31
pignut hickory	Carya glabra	WDL	Medium	5.7	17.8	8.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	32
green ash	Fraxinus pennsylvanica	WSH	Low	1.1	16.7	13.7	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	33
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	10.2	14.3	1.3	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	34
wild plum	Prunus americana	NSLX	FIA	5.7	13.4	2.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	35
shortleaf pine	Pinus echinata	WDH	High	2.3	12.0	4.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	36
red maple	Acer rubrum	WDH	High	3.4	11.8	3.2	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	37
Ohio buckeye	Aesculus glabra	NSL	Low	3.4	10.0	2.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	38
blue ash	Fraxinus quadrangulata	NSL	Low	4.5	6.0	1.2	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	39
silver maple	Acer saccharinum	NSH	Low	1.1	5.7	4.6	Sm. dec.	No change	High	Rare	Poor	Fair			0	40
serviceberry	Amelanchier spp.	NSL	Low	5.7	4.3	0.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	41
bur oak	Quercus macrocarpa	NDH	Medium	2.3	4.0	1.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	42
southern red oak	Quercus falcata	WDL	Medium	1.1	3.3	2.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	43
ailanthus	Ailanthus altissima	NSL	FIA	1.1	2.9	2.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	44
shingle oak	Quercus imbricaria	NDH	Medium	10.2	2.8	1.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	45
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	8	2.8	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good		Infill ++	1	46
American basswood	Tilia americana	WSL	Medium	1.1	1.6	1.3	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			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	
pawpaw	Asimina triloba	NSL	Low	1.1	0.5	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0	48
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0	49
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3	50
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3	51
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3	52
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++		3	53
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3	54
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3	55
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0	56
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3	57
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0	58
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0	59
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3	60
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3	61
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3	62
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3	63
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3	64
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3	65
black willow	Salix nigra	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +		3	66
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate ++		3	67