

**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	8,600.0	3,320.5	111

**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	15	23	Increase	20	23	Very Good	1	3
Hickory	7			Medium	27	43	No Change	12	12	Good	19	19
Maple	4	Abundant	0	Low	31	8	Decrease	22	19	Fair	9	10
Oak	12	Common	23	FIA	5		New	16	17	Poor	14	13
Pine	3	Rare	36				Unknown	8	7	Very Poor	11	9
Other	30	Absent	19							FIA Only	2	2
	<b>59</b>		<b>78</b>		<b>78</b>	<b>74</b>		<b>78</b>	<b>78</b>	Unknown	3	2
											<b>59</b>	<b>58</b>

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	56.7	58.5	60.7	61.0	
	CCSM85	56.7	58.9	61.6	64.6	
	GFDL45	56.7	61.4	61.9	62.7	
	GFDL85	56.7	59.6	62.9	66.6	
	HAD45	56.7	59.4	62.8	64.2	
	HAD85	56.7	59.9	64.5	68.6	
Growing Season (May—Sep)	CCSM45	73.1	75.0	76.7	77.5	
	CCSM85	73.1	75.4	78.2	82.0	
	GFDL45	73.1	78.8	79.2	80.5	
	GFDL85	73.1	76.6	80.6	85.1	
	HAD45	73.1	76.5	79.7	81.5	
	HAD85	73.1	77.0	83.3	87.3	
Coldest Month (Average)	CCSM45	30.9	32.3	33.9	34.3	
	CCSM85	30.9	33.8	34.8	36.5	
	GFDL45	30.9	35.3	35.4	35.8	
	GFDL85	30.9	33.3	34.4	35.0	
	HAD45	30.9	32.3	34.6	34.7	
	HAD85	30.9	33.3	35.5	37.3	
Warmest Month (Average)	CCSM45	78.7	80.5	81.6	82.1	
	CCSM85	78.7	81.2	82.9	84.7	
	GFDL45	78.7	81.8	83.3	84.2	
	GFDL85	78.7	82.3	84.5	87.2	
	HAD45	78.7	82.7	85.2	86.1	
	HAD85	78.7	84.5	88.7	90.8	

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	46.1	45.3	50.6	49.2	
	CCSM85	46.1	49.0	49.7	52.7	
	GFDL45	46.1	53.5	56.1	58.2	
	GFDL85	46.1	52.4	57.5	60.6	
	HAD45	46.1	46.4	49.6	49.3	
	HAD85	46.1	47.3	45.2	49.9	
Growing Season (May—Sep)	CCSM45	19.1	17.8	19.3	18.8	
	CCSM85	19.1	19.3	18.0	19.0	
	GFDL45	19.1	22.2	22.1	22.7	
	GFDL85	19.1	21.6	22.2	23.0	
	HAD45	19.1	18.1	17.2	17.0	
	HAD85	19.1	18.2	14.7	15.1	

**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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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
sweetgum	Liquidambar styraciflua	WDH	High	69.8	349.3	10.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	1
silver maple	Acer saccharinum	NSH	Low	30.2	337.4	30.0	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	2
sassafras	Sassafras albidum	WSL	Low	67.4	246.7	8.9	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	3
sugar maple	Acer saccharum	WDH	High	59.3	246.4	12.2	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	4
white ash	Fraxinus americana	WDL	Medium	48.8	224.4	8.4	No change	No change	Low	Common	Poor	Poor			0	5
yellow-poplar	Liriodendron tulipifera	WDH	High	45.3	193.9	8.5	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	6
white oak	Quercus alba	WDH	Medium	34.9	186.3	13.2	No change	No change	High	Common	Good	Good			1	7
hackberry	Celtis occidentalis	WDH	Medium	61.6	159.3	8.3	No change	No change	High	Common	Good	Good			1	8
green ash	Fraxinus pennsylvanica	WSH	Low	54.7	159.0	7.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	9
shingle oak	Quercus imbricaria	NDH	Medium	14	134.0	11.9	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	10
American elm	Ulmus americana	WDH	Medium	72.1	133.4	5.1	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	11
red maple	Acer rubrum	WDH	High	36	131.3	8.8	No change	No change	High	Common	Good	Good			1	12
black cherry	Prunus serotina	WDL	Medium	34.9	120.3	4.9	No change	No change	Low	Common	Poor	Poor			0	13
blackgum	Nyssa sylvatica	WDL	Medium	29.1	109.8	6.9	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	14
sycamore	Platanus occidentalis	NSL	Low	39.5	108.7	7.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	15
shagbark hickory	Carya ovata	WSL	Medium	43	102.5	6.9	Sm. dec.	No change	Medium	Common	Poor	Fair			1	16
black locust	Robinia pseudoacacia	NDH	Low	29.1	101.2	12.6	No change	Sm. inc.	Medium	Common	Fair	Good			1	17
black oak	Quercus velutina	WDH	High	37.2	95.7	6.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	18
pin oak	Quercus palustris	NSH	Low	26.7	81.3	7.4	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	19
flowering dogwood	Cornus florida	WDL	Medium	52.3	65.4	3.0	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	20
pignut hickory	Carya glabra	WDL	Medium	33.7	56.5	4.7	No change	No change	Medium	Common	Fair	Fair			1	21
slippery elm	Ulmus rubra	WSL	Low	31.4	53.4	3.4	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	22
common persimmon	Diospyros virginiana	NSL	Low	40.7	52.0	3.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	23
boxelder	Acer negundo	WSH	Low	41.9	44.1	4.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	24
northern red oak	Quercus rubra	WDH	Medium	30.2	43.8	5.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	25
pawpaw	Asimina triloba	NSL	Low	22.1	42.3	4.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	26
shortleaf pine	Pinus echinata	WDH	High	4.7	40.9	7.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	27
Virginia pine	Pinus virginiana	NDH	High	4.7	40.3	7.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	28
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	23.3	37.0	6.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	29
bitternut hickory	Carya cordiformis	WSL	Low	25.6	36.3	3.7	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	30
black walnut	Juglans nigra	WDH	Low	24.4	35.3	4.7	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	31
winged elm	Ulmus alata	WDL	Medium	24.4	31.3	3.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	32
eastern redbud	Cercis canadensis	NSL	Low	23.3	30.3	2.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	33
chinkapin oak	Quercus muehlenbergii	NSL	Medium	9.3	28.7	5.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	34
river birch	Betula nigra	NSL	Low	7	27.8	8.2	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	35
eastern cottonwood	Populus deltoides	NSH	Low	9.3	27.7	6.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	36
shellbark hickory	Carya laciniosa	NSL	Low	10.5	25.4	7.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	37
black willow	Salix nigra	NSH	Low	15.1	25.2	12.1	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1	38
pecan	Carya illinoensis	NSH	Low	8.1	21.7	4.8	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	2	39
white mulberry	Morus alba	NSL	FIA	3.5	21.6	5.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	40
eastern redcedar	Juniperus virginiana	WDH	Medium	14	20.5	2.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	41
post oak	Quercus stellata	WDH	High	11.6	19.1	2.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	42
mockernut hickory	Carya alba	WDL	Medium	12.8	18.8	3.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	43
scarlet oak	Quercus coccinea	WDL	Medium	8.1	18.5	3.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	44
eastern white pine	Pinus strobus	WDH	High	3.5	17.8	4.6	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	45
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	5.8	17.5	7.1	No change	No change	Medium	Rare	Poor	Poor		Infill +	2	46
honeylocust	Gleditsia triacanthos	NSH	Low	5.8	13.4	5.5	No change	Sm. inc.	High	Rare	Fair	Good		Infill ++	2	47



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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
ailanthus	Ailanthus altissima	NSL	FIA	8.1	12.8	2.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	48
red mulberry	Morus rubra	NSL	Low	24.4	11.8	1.6	Sm. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair			1	49
swamp white oak	Quercus bicolor	NSL	Low	10.5	6.1	3.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	50
swamp chestnut oak	Quercus michauxii	NSL	Low	5.8	5.3	2.5	No change	No change	Medium	Rare	Poor	Poor			0	51
pumpkin ash	Fraxinus profunda	NSH	FIA	1.2	3.5	2.7	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	52
northern catalpa	Catalpa speciosa	NSHX	FIA	11.6	3.0	0.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	53
water hickory	Carya aquatica	NSL	Medium	9.3	2.8	4.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	54
American beech	Fagus grandifolia	WDH	High	14	2.6	2.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good		Infill ++	2	55
Osage-orange	Maclura pomifera	NDH	Medium	1.2	2.3	1.8	Sm. inc.	Lg. inc.	High	Rare	Good	Good			2	56
bur oak	Quercus macrocarpa	NDH	Medium	5.8	2.2	1.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	57
sugarberry	Celtis laevigata	NDH	Medium	9.3	1.5	2.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	58
paulownia	Paulownia tomentosa	NSL	FIA	4.7	0.1	0.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	59
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	60
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	61
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	62
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	63
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	64
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	65
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	66
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	67
water elm	Planera aquatica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	68
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	69
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	70
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	71
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	72
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	73
Nuttall oak	Quercus texana	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	74
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	75
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	76
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	77
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	78