

**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  
 8,100.0      3,127.4      196

**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	13	20	Increase	15	25	Very Good	4	8	Likely	2	2
Hickory	6			Medium	32	48	No Change	27	21	Good	11	14	Infill	20	24
Maple	2	Abundant	6	Low	32	10	Decrease	19	15	Fair	19	16	Migrate	0	1
Oak	13	Common	19	FIA	1		New	10	9	Poor	16	15			
Pine	5	Rare	37				Unknown	7	8	Very Poor	9	6			
Other	34	Absent	15							FIA Only	1	1			
	<b>62</b>		<b>77</b>		<b>78</b>	<b>78</b>		<b>78</b>	<b>78</b>	Unknown	6	7			
											<b>66</b>	<b>67</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

Scenario	2009	2039	2069	2099	
Annual	67.4	69.0	70.6	70.8	
Average	67.4	69.2	71.5	73.7	
GFDL45	67.4	70.4	71.5	72.4	
GFDL85	67.4	69.8	72.8	76.1	
HAD45	67.4	69.6	72.2	73.3	
HAD85	67.4	69.8	73.2	76.8	
Growing Season	79.2	80.5	81.7	82.1	
May—Sep	79.2	80.6	82.8	85.3	
GFDL45	79.2	82.4	83.4	85.0	
GFDL85	79.2	81.9	85.0	88.8	
HAD45	79.2	81.9	84.3	85.0	
HAD85	79.2	82.0	86.4	89.4	
Coldest Month	49.3	51.6	52.5	52.4	
Average	49.3	52.1	53.3	54.4	
GFDL45	49.3	52.6	52.8	52.8	
GFDL85	49.3	50.6	51.5	52.3	
HAD45	49.3	49.9	51.5	52.4	
HAD85	49.3	51.3	52.5	54.3	
Warmest Month	82.3	83.3	83.6	83.9	
Average	82.3	83.5	84.4	85.8	
GFDL45	82.3	85.3	85.4	86.6	
GFDL85	82.3	85.1	86.4	88.7	
HAD45	82.3	85.5	86.8	87.0	
HAD85	82.3	85.8	88.3	89.3	

**Precipitation (in)**

Scenario	2009	2039	2069	2099	
Annual	62.1	64.3	70.0	67.4	
Total	62.1	64.2	66.2	68.4	
GFDL45	62.1	67.7	74.1	68.8	
GFDL85	62.1	66.2	67.4	67.9	
HAD45	62.1	59.9	61.8	65.3	
HAD85	62.1	65.9	58.7	62.8	
Growing Season	27.5	28.6	30.0	29.4	
May—Sep	27.5	27.1	28.3	28.1	
GFDL45	27.5	31.3	36.2	31.3	
GFDL85	27.5	31.0	33.1	34.7	
HAD45	27.5	27.2	27.3	28.5	
HAD85	27.5	27.5	23.4	24.0	

**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
loblolly pine	Pinus taeda	WDH	High	32.1	1225.5	36.8	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	66.7	734.2	11.3	No change	No change	Medium	Abundant	Good	Good			1	2
bald cypress	Taxodium distichum	NSH	Medium	43.2	669.3	18.8	No change	Sm. inc.	Medium	Abundant	Good	Very Good			1	3
water oak	Quercus nigra	WDH	High	74.1	654.1	10.3	No change	Sm. inc.	Medium	Abundant	Good	Very Good			1	4
sugarberry	Celtis laevigata	NDH	Medium	46.9	567.7	14.6	No change	No change	Medium	Abundant	Good	Good			1	5
water tupelo	Nyssa aquatica	NSH	Medium	29.6	558.8	22.2	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	6
red maple	Acer rubrum	WDH	High	70.4	484.7	7.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	7
green ash	Fraxinus pennsylvanica	WDH	Low	65.4	416.7	7.4	No change	No change	Medium	Common	Fair	Fair			1	8
American elm	Ulmus americana	WDH	Medium	59.3	358.1	7.9	No change	No change	Medium	Common	Fair	Fair			1	9
boxelder	Acer negundo	WSH	Low	29.6	226.5	8.5	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	10
laurel oak	Quercus laurifolia	NDH	Medium	37	195.6	5.7	No change	Sm. dec.	Medium	Common	Fair	Poor			1	11
black willow	Salix nigra	NSH	Low	29.6	182.5	9.6	Sm. inc.	Lg. inc.	Low	Common	Fair	Good			1	12
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	32.1	169.0	5.1	No change	No change	Medium	Common	Fair	Fair			1	13
pecan	Carya illinoensis	NSH	Low	19.8	148.0	9.3	No change	Sm. inc.	Low	Common	Poor	Fair			1	14
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	30.9	146.2	5.6	No change	Sm. inc.	Medium	Common	Fair	Good			1	15
Nuttall oak	Quercus texana	NSH	Medium	28.4	137.9	5.4	No change	Sm. inc.	High	Common	Good	Very Good			0	16
spruce pine	Pinus glabra	NSL	Low	16	137.0	8.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	17
blackgum	Nyssa sylvatica	WDL	Medium	34.6	108.0	3.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	18
swamp chestnut oak	Quercus michauxii	NSL	Low	21	95.5	4.4	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	19
water hickory	Carya aquatica	NSL	Medium	37	82.7	3.0	No change	Sm. inc.	Medium	Common	Fair	Good			1	20
sycamore	Platanus occidentalis	NSL	Low	21	81.7	4.9	Sm. dec.	No change	Medium	Common	Poor	Fair			1	21
yellow-poplar	Liriodendron tulipifera	WDH	High	13.6	73.4	5.2	Sm. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	22
American beech	Fagus grandifolia	WDH	High	17.3	67.3	3.8	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	23
winged elm	Ulmus alata	WDL	Medium	29.6	61.0	2.3	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	24
willow oak	Quercus phellos	NSL	Low	12.3	54.5	4.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	25
overcup oak	Quercus lyrata	NSL	Medium	18.5	46.2	3.5	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1	26
swamp tupelo	Nyssa biflora	NDH	Medium	7.4	40.2	5.2	No change	No change	Low	Rare	Very Poor	Very Poor			0	27
southern magnolia	Magnolia grandiflora	NSL	Low	9.9	36.7	3.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	28
slippery elm	Ulmus rubra	WSL	Low	21	29.8	1.7	No change	Lg. inc.	Medium	Rare	Poor	Good			1	29
white oak	Quercus alba	WDH	Medium	9.9	29.8	2.9	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	30
honeylocust	Gleditsia triacanthos	NSH	Low	14.8	29.4	3.1	Sm. dec.	Sm. inc.	High	Rare	Poor	Good			1	31
post oak	Quercus stellata	WDH	High	6.2	28.8	4.5	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	32
bitternut hickory	Carya cordiformis	WSL	Low	1.2	27.3	21.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	33
common persimmon	Diospyros virginiana	NSL	Low	22.2	22.7	1.2	Lg. dec.	Sm. dec.	High	Rare	Poor	Poor			1	34
live oak	Quercus virginiana	NDH	High	7.4	22.0	2.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	35
southern red oak	Quercus falcata	WDL	Medium	8.6	22.0	2.4	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	36
slash pine	Pinus elliotii	NDH	High	1.2	21.4	16.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	37
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	16	18.1	1.5	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1	38
mockernut hickory	Carya alba	WDL	Medium	8.6	16.1	1.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	39
black cherry	Prunus serotina	WDL	Medium	7.4	15.6	2.0	No change	No change	Low	Rare	Very Poor	Very Poor			0	40
Shumard oak	Quercus shumardii	NSL	Low	3.7	15.4	4.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	41
water elm	Planera aquatica	NSL	Low	4.9	13.5	2.6	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	42
white ash	Fraxinus americana	WDL	Medium	2.5	10.9	4.3	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	43
sassafras	Sassafras albidum	WSL	Low	2.5	9.3	3.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	44
pignut hickory	Carya glabra	WDL	Medium	3.7	9.1	2.4	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	45
red mulberry	Morus rubra	NSL	Low	2.5	9.1	3.6	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	46
flowering dogwood	Cornus florida	WDL	Medium	8.6	8.3	0.9	No change	No change	Medium	Rare	Poor	Poor			1	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
sweetbay	Magnolia virginiana	NSL	Medium	4.9	7.6	1.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	48
American holly	Ilex opaca	NSL	Medium	6.2	6.6	1.0	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	49
sourwood	Oxydendrum arboreum	NDL	High	2.5	6.2	2.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +		2	50
river birch	Betula nigra	NSL	Low	2.5	5.7	2.2	No change	No change	Medium	Rare	Poor	Poor			0	51
black hickory	Carya texana	NDL	High	1.2	5.5	4.3	No change	No change	Medium	Rare	Poor	Poor		Infill +	2	52
silverbell	Halesia spp.	NSL	Low	3.7	5.4	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	53
shortleaf pine	Pinus echinata	WDH	High	1.2	5.1	4.0	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	54
eastern cottonwood	Populus deltoides	NSH	Low	7.4	5.0	1.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	55
waterlocust	Gleditsia aquatica	NSLX	FIA	1.2	2.1	1.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	56
longleaf pine	Pinus palustris	NSH	Medium	1.2	1.8	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	57
cedar elm	Ulmus crassifolia	NDH	Medium	1.2	1.4	1.1	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	58
black oak	Quercus velutina	WDH	High	2.5	1.2	0.5	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	59
American basswood	Tilia americana	WSL	Medium	1.2	0.8	0.7	No change	Sm. dec.	Medium	Rare	Poor	Very Poor			0	60
eastern redcedar	Juniperus virginiana	WDH	Medium	1.2	0.7	0.6	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	61
pond cypress	Taxodium ascendens	NSH	Medium	1.2	0.4	0.3	Lg. dec.	Lg. inc.	Medium	Rare	Very Poor	Good			0	62
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	63
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	64
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	65
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	66
pawpaw	Asimina triloba	NSL	Low	0	0	0	New Habitat	Unknown	Medium	Absent	New Habitat	Unknown			3	67
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	68
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	69
redbay	Persea borbonia	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	70
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	71
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	72
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	73
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	74
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	75
northern red oak	Quercus rubra	WDH	Medium	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	76
cabbage palmetto	Sabal palmetto	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	77
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	78