

**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  
 8,875.4    3,426.8    268

**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	
				High	12	16	Increase	21	26	Very Good	7	9
Ash	1			Medium	34	50	No Change	16	19	Good	14	16
Hickory	4			Low	29	10	Decrease	18	10	Fair	7	8
Maple	1	Abundant	5	FIA	1		New	6	8	Poor	13	12
Oak	13	Common	13				Unknown	15	13	Very Poor	13	8
Pine	7	Rare	38							FIA Only	1	1
Other	30	Absent	16							Unknown	14	12
	<b>56</b>		<b>72</b>		<b>76</b>	<b>76</b>		<b>76</b>	<b>76</b>		<b>69</b>	<b>66</b>

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	66.6	68.1	69.9	69.9	
	CCSM85	66.6	68.3	70.5	73.0	
	GFDL45	66.6	69.5	71.1	71.8	
	GFDL85	66.6	69.1	72.1	75.6	
	HAD45	66.6	68.5	70.8	72.1	
Growing Season (May—Sep)	CCSM45	78.6	79.9	81.3	81.7	
	CCSM85	78.6	80.0	82.2	85.1	
	GFDL45	78.6	81.5	83.0	84.2	
	GFDL85	78.6	81.3	84.3	88.1	
	HAD45	78.6	81.2	83.2	84.6	
Coldest Month Average	CCSM45	48.3	50.6	51.4	51.2	
	CCSM85	48.3	50.3	51.4	52.6	
	GFDL45	48.3	51.1	51.4	52.0	
	GFDL85	48.3	50.4	51.5	52.2	
	HAD45	48.3	48.4	49.8	50.6	
Warmest Month Average	CCSM45	82.6	83.9	84.8	84.9	
	CCSM85	82.6	84.0	85.4	87.0	
	GFDL45	82.6	84.5	85.2	86.1	
	GFDL85	82.6	84.8	86.2	88.3	
	HAD45	82.6	85.4	86.4	87.0	
HAD85	82.6	85.6	88.0	89.4		

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	47.4	50.6	52.6	53.5	
	CCSM85	47.4	49.7	53.6	55.5	
	GFDL45	47.4	54.6	56.5	58.6	
	GFDL85	47.4	53.1	59.1	58.7	
	HAD45	47.4	45.0	45.1	47.7	
Growing Season (May—Sep)	CCSM45	24.4	27.8	28.8	28.6	
	CCSM85	24.4	26.0	29.4	29.5	
	GFDL45	24.4	31.2	32.3	33.3	
	GFDL85	24.4	30.0	35.0	35.2	
	HAD45	24.4	23.7	22.9	23.0	
HAD85	24.4	23.9	20.3	19.7		

**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	87.7	3263.2	36.6	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
slash pine	Pinus elliotii	NDH	High	59.6	1208.0	20.4	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	2
sweetgum	Liquidambar styraciflua	WDH	High	80.3	749.7	9.1	No change	No change	Medium	Abundant	Good	Good			1	3
red maple	Acer rubrum	WDH	High	69.7	586.0	7.9	No change	No change	High	Abundant	Very Good	Very Good			1	4
water oak	Quercus nigra	WDH	High	71.2	583.1	7.5	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	5
swamp tupelo	Nyssa biflora	NDH	Medium	65	496.7	7.2	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	6
laurel oak	Quercus laurifolia	NDH	Medium	59	380.6	6.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	7
longleaf pine	Pinus palustris	NSH	Medium	26.9	254.7	8.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	8
pond pine	Pinus serotina	NSH	Medium	18.8	178.1	8.7	No change	No change	Low	Common	Poor	Poor			0	9
pond cypress	Taxodium ascendens	NSH	Medium	22.4	177.4	7.4	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	10
live oak	Quercus virginiana	NDH	High	41.7	154.0	4.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	11
redbay	Persea borbonia	NSL	Low	44.1	115.5	2.5	No change	No change	High	Common	Good	Good			1	12
willow oak	Quercus phellos	NSL	Low	18	106.6	5.6	No change	Sm. inc.	Medium	Common	Fair	Good			1	13
loblolly-bay	Gordonia lasianthus	NSH	Medium	16.8	88.1	4.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	14
cabbage palmetto	Sabal palmetto	NDH	Medium	10	81.6	23.8	No change	No change	Medium	Common	Fair	Fair			0	15
sweetbay	Magnolia virginiana	NSL	Medium	27	74.0	2.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
bald cypress	Taxodium distichum	NSH	Medium	11.3	73.1	6.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	17
southern red oak	Quercus falcata	WDL	Medium	15.3	67.5	4.8	No change	Lg. inc.	High	Common	Good	Very Good			1	18
black willow	Salix nigra	NSH	Low	9.2	47.4	4.2	No change	No change	Low	Rare	Very Poor	Very Poor			0	19
blackgum	Nyssa sylvatica	WDL	Medium	20	42.0	1.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	20
green ash	Fraxinus pennsylvanica	WSH	Low	14.6	38.5	2.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	21
turkey oak	Quercus laevis	NSH	Medium	5.6	33.0	5.6	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	1	22
water tupelo	Nyssa aquatica	NSH	Medium	7.9	32.1	3.9	No change	No change	Low	Rare	Very Poor	Very Poor			2	23
yellow-poplar	Liriodendron tulipifera	WDH	High	10.1	28.5	2.7	Sm. dec.	Sm. inc.	High	Rare	Poor	Good			1	24
common persimmon	Diospyros virginiana	NSL	Low	10.4	26.5	2.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	25
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	5.6	23.9	4.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	26
southern magnolia	Magnolia grandiflora	NSL	Low	5.6	20.6	3.5	No change	No change	Medium	Rare	Poor	Poor			1	27
post oak	Quercus stellata	WDH	High	9	19.0	2.0	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	28
black cherry	Prunus serotina	WDL	Medium	11.3	17.6	1.5	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1	29
ogeechee tupelo	Nyssa ogeche	NSLX	FIA	4.5	17.4	3.7	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	30
American holly	Ilex opaca	NSL	Medium	13.4	16.7	1.2	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	31
eastern redcedar	Juniperus virginiana	WDH	Medium	9.4	16.0	4.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	32
swamp chestnut oak	Quercus michauxii	NSL	Low	5.6	14.0	2.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	33
American elm	Ulmus americana	WDH	Medium	6.7	12.6	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	34
mockernut hickory	Carya alba	WDL	Medium	4.2	10.8	1.9	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	35
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	6.8	7.0	1.0	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	36
water hickory	Carya aquatica	NSL	Medium	3.4	6.4	1.8	No change	No change	Medium	Rare	Poor	Poor		Infill +	2	37
pecan	Carya illinoensis	NSH	Low	4	5.8	3.3	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			2	38
overcup oak	Quercus lyrata	NSL	Medium	2.3	5.5	2.3	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	39
flowering dogwood	Cornus florida	WDL	Medium	4.5	4.7	1.0	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	40
pignut hickory	Carya glabra	WDL	Medium	3.3	3.9	1.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	41
sassafras	Sassafras albidum	WSL	Low	7.3	3.8	0.7	Lg. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	42
slippery elm	Ulmus rubra	WSL	Low	3.4	3.7	1.0	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	43
sugarberry	Celtis laevigata	NDH	Medium	3.4	3.4	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	44
red mulberry	Morus rubra	NSL	Low	5.1	3.3	1.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	45
spruce pine	Pinus glabra	NSL	Low	2.3	3.2	1.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	46
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	2.2	3.1	1.3	Sm. dec.	Sm. dec.	High	Rare	Poor	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
white oak	Quercus alba	WDH	Medium	3.4	2.3	0.6	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +		2	48
shortleaf pine	Pinus echinata	WDH	High	1.1	2.2	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	49
eastern cottonwood	Populus deltoides	NSH	Low	1.1	1.6	1.4	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	50
bluejack oak	Quercus incana	NSL	Low	2.3	1.3	0.6	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			2	51
winged elm	Ulmus alata	WDL	Medium	2.3	1.2	0.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	52
sycamore	Platanus occidentalis	NSL	Low	1.1	1.1	1.0	No change	No change	Medium	Rare	Poor	Poor	Infill +		2	53
river birch	Betula nigra	NSL	Low	1.1	0.7	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	54
black oak	Quercus velutina	WDH	High	1.1	0.6	0.5	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	55
Virginia pine	Pinus virginiana	NDH	High	1.1	0.4	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	56
boxelder	Acer negundo	WSH	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat	Migrate +		3	57
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	58
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	59
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	60
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	61
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	62
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	63
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	64
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	65
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	66
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	67
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	68
water elm	Planera aquatica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +		3	69
pin cherry	Prunus pennsylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	70
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	71
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	72
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	73
Nuttall oak	Quercus texana	NSH	Medium	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			0	74
American basswood	Tilia americana	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	75
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	76