

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	12,500	4,826.3	291

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	2			High	19	22	Increase	25	32	Very Good	7	8	Likely	0	0
Hickory	7			Medium	28	48	No Change	22	14	Good	21	21	Infill	14	17
Maple	5	Abundant	3	Low	35	12	Decrease	21	22	Fair	9	13	Migrate	2	3
Oak	15	Common	19	FIA	4		New	7	8	Poor	14	10		16	20
Pine	6	Rare	50				Unknown	11	10	Very Poor	15	13			
Other	37	Absent	14					86	86	FIA Only	1	1			
	72		86		86	82				Unknown	7	6			
											74	72			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	60.9	62.7	64.8	64.8	
	CCSM85	60.9	63.0	65.5	68.2	
	GFDL45	60.9	63.9	65.8	66.5	
	GFDL85	60.9	63.6	66.9	70.4	
	HAD45	60.9	63.2	66.0	67.5	
HAD85	60.9	63.5	67.7	71.5		
Growing Season (May—Sep)	CCSM45	74.5	76.2	78.0	78.4	
	CCSM85	74.5	76.4	79.0	82.4	
	GFDL45	74.5	77.8	79.7	80.9	
	GFDL85	74.5	77.5	81.2	85.3	
	HAD45	74.5	77.7	80.2	81.9	
HAD85	74.5	77.6	83.6	87.2		
Coldest Month (Average)	CCSM45	40.7	43.2	44.0	43.9	
	CCSM85	40.7	43.1	44.2	45.4	
	GFDL45	40.7	43.9	44.1	44.5	
	GFDL85	40.7	42.5	43.5	43.9	
	HAD45	40.7	40.7	42.5	43.0	
HAD85	40.7	41.9	43.0	44.7		
Warmest Month (Average)	CCSM45	79.2	81.1	82.0	82.0	
	CCSM85	79.2	81.3	82.7	84.6	
	GFDL45	79.2	82.1	83.0	83.8	
	GFDL85	79.2	82.2	84.1	86.2	
	HAD45	79.2	83.2	84.9	85.6	
HAD85	79.2	83.5	87.3	89.1		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	50.2	52.5	55.9	56.1	
	CCSM85	50.2	53.3	56.1	62.5	
	GFDL45	50.2	56.0	59.0	62.9	
	GFDL85	50.2	55.6	59.6	60.5	
	HAD45	50.2	48.9	53.6	54.9	
HAD85	50.2	55.0	49.4	53.5		
Growing Season (May—Sep)	CCSM45	20.5	22.2	23.8	24.4	
	CCSM85	20.5	22.1	22.8	25.2	
	GFDL45	20.5	25.2	27.4	28.3	
	GFDL85	20.5	24.6	27.7	28.6	
	HAD45	20.5	20.2	21.3	21.0	
HAD85	20.5	22.7	17.5	19.0		

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	88.8	2459.4	29.9	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	85.6	1225.3	15.4	No change	No change	Medium	Abundant	Good	Good			1	2
yellow-poplar	Liriodendron tulipifera	WDH	High	82.4	906.6	11.9	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	3
water oak	Quercus nigra	WDH	High	68	486.8	7.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	4
white oak	Quercus alba	WDH	Medium	69.6	467.4	7.1	No change	No change	High	Common	Good	Good			1	5
red maple	Acer rubrum	WDH	High	63.2	381.6	6.1	No change	Sm. inc.	High	Common	Good	Very Good			1	6
southern red oak	Quercus falcata	WDL	Medium	60	270.6	4.9	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	7
mockernut hickory	Carya alba	WDL	Medium	37.6	209.0	5.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	8
black cherry	Prunus serotina	WDL	Medium	45.6	177.6	4.2	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	9
pignut hickory	Carya glabra	WDL	Medium	48.8	170.2	3.6	No change	No change	Medium	Common	Fair	Fair			1	10
shortleaf pine	Pinus echinata	WDH	High	48	166.6	3.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	11
sourwood	Oxydendrum arboreum	NDL	High	50.4	163.0	3.6	No change	Sm. dec.	High	Common	Good	Fair			1	12
scarlet oak	Quercus coccinea	WDL	Medium	32	153.4	5.8	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	13
blackgum	Nyssa sylvatica	WDL	Medium	52.8	137.3	2.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	14
flowering dogwood	Cornus florida	WDL	Medium	55.2	133.3	2.5	No change	No change	Medium	Common	Fair	Fair			1	15
post oak	Quercus stellata	WDH	High	43.2	126.1	3.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	16
green ash	Fraxinus pennsylvanica	WSH	Low	17.6	110.6	6.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	17
boxelder	Acer negundo	WSH	Low	13.6	103.8	7.4	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	18
northern red oak	Quercus rubra	WDH	Medium	32.8	102.5	3.7	No change	No change	High	Common	Good	Good			1	19
chestnut oak	Quercus prinus	NDH	High	10.4	97.8	9.1	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	20
black oak	Quercus velutina	WDH	High	29.6	95.8	3.5	No change	No change	Medium	Common	Fair	Fair			1	21
Virginia pine	Pinus virginiana	NDH	High	17.6	91.9	5.1	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +		0	22
winged elm	Ulmus alata	WDL	Medium	18.4	47.6	2.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	23
American beech	Fagus grandifolia	WDH	High	18.4	43.3	2.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	24
eastern redcedar	Juniperus virginiana	WDH	Medium	12	37.3	3.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	25
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	16	32.3	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	26
black willow	Salix nigra	NSH	Low	4	31.4	7.6	No change	No change	Low	Rare	Very Poor	Very Poor			0	27
common persimmon	Diospyros virginiana	NSL	Low	24.8	30.3	1.5	No change	No change	High	Rare	Fair	Fair			1	28
sweetbay	Magnolia virginiana	NSL	Medium	1.6	27.7	16.8	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	29
blackjack oak	Quercus marilandica	NSL	Medium	4	26.2	6.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	30
florida maple	Acer barbatum	NSL	Low	14.4	23.5	1.9	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	31
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	12.8	23.4	2.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	32
river birch	Betula nigra	NSL	Low	5.6	21.8	3.8	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	33
black walnut	Juglans nigra	WDH	Low	2.4	20.2	8.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	34
red mulberry	Morus rubra	NSL	Low	8.8	18.0	2.0	No change	No change	Medium	Rare	Poor	Poor			1	35
sugar maple	Acer saccharum	WDH	High	0.8	17.3	20.9	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	36
pecan	Carya illinoensis	NSH	Low	4	17.1	4.1	No change	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	37
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	3.2	16.9	5.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	38
swamp tupelo	Nyssa biflora	NDH	Medium	5.6	15.6	2.7	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	1	39
sassafras	Sassafras albidum	WSL	Low	13.6	11.7	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	40
willow oak	Quercus phellos	NSL	Low	4.8	11.7	2.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	41
American elm	Ulmus americana	WDH	Medium	8	11.4	1.4	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	42
sycamore	Platanus occidentalis	NSL	Low	4	11.2	2.7	No change	Sm. inc.	Medium	Rare	Poor	Fair		Infill +	2	43
southern magnolia	Magnolia grandiflora	NSL	Low	4.8	10.2	5.8	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	44
slippery elm	Ulmus rubra	WSL	Low	4.8	9.1	1.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	45
longleaf pine	Pinus palustris	NSH	Medium	1.6	8.6	5.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	46
bitternut hickory	Carya cordiformis	WSL	Low	2.4	8.2	3.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	47

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USDA Forest Service
Northern Research Station
Landscape Change Research Group
Iverson, Peters, Prasad, Matthews

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
sugarberry	Celtis laevigata	NDH	Medium	2.4	8.0	3.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	48
American holly	Ilex opaca	NSL	Medium	3.2	7.6	2.3	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	49
paulownia	Paulownia tomentosa	NSL	FIA	2.4	6.1	2.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	50
eastern white pine	Pinus strobus	WDH	High	0.8	5.3	6.4	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	51
cucumbertree	Magnolia acuminata	NSL	Low	2.4	4.9	2.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	52
black locust	Robinia pseudoacacia	NDH	Low	1.6	4.2	2.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	53
swamp chestnut oak	Quercus michauxii	NSL	Low	2.4	3.9	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	54
American basswood	Tilia americana	WSL	Medium	1.6	3.7	2.2	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	55
ailanthus	Ailanthus altissima	NSL	FIA	0.8	3.5	4.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	56
white ash	Fraxinus americana	WDL	Medium	1.6	3.0	1.8	No change	No change	Low	Rare	Very Poor	Very Poor			2	57
sand hickory	Carya pallida	NSL	FIA	0.8	2.8	3.4	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	58
slash pine	Pinus elliottii	NDH	High	0.8	2.2	2.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	59
eastern redbud	Cercis canadensis	NSL	Low	2.4	1.7	0.7	No change	Sm. inc.	Medium	Rare	Poor	Fair		Infill +	1	60
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0.8	1.3	1.6	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	61
shagbark hickory	Carya ovata	WSL	Medium	1.6	1.0	0.6	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	62
serviceberry	Amelanchier spp.	NSL	Low	1.6	1.0	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	63
silver maple	Acer saccharinum	NSH	Low	0.8	1.0	1.2	Sm. dec.	Very Lg. dec.	High	Rare	Poor	Lost			0	64
overcup oak	Quercus lyrata	NSL	Medium	0.8	0.9	1.1	Very Lg. dec.	Sm. dec.	Low	Rare	Lost	Very Poor			0	65
shellbark hickory	Carya laciniosa	NSL	Low	0.8	0.8	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	66
silverbell	Halesia spp.	NSL	Low	0.8	0.8	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	67
white mulberry	Morus alba	NSL	FIA	0.8	0.6	0.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	68
laurel oak	Quercus laurifolia	NDH	Medium	0.8	0.6	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	69
honeylocust	Gleditsia triacanthos	NSH	Low	0.8	0.4	0.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	70
Nuttall oak	Quercus texana	NSH	Medium	0.8	0.4	0.4	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	71
yellow birch	Betula alleghaniensis	NDL	High	0.8	0.3	0.3	No change	No change	Medium	Rare	Poor	Poor			0	72
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	73
Table Mountain pine	Pinus pungens	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	74
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	75
yellow buckeye	Aesculus flava	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	76
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	77
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	78
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	79
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	80
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	81
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	82
pin oak	Quercus palustris	NSH	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	83
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	84
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	85
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	86