

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
 9,500.0 3,668.0 99

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	22	Increase	24	26	Very Good	5	6	Likely	3	3
Hickory	7			Medium	26	43	No Change	10	10	Good	14	17	Infill	16	18
Maple	4	Abundant	0	Low	32	7	Decrease	18	16	Fair	15	12	Migrate	6	7
Oak	13	Common	22	FIA	3		New	13	13	Poor	7	7			
Pine	1	Rare	33				Unknown	9	9	Very Poor	11	10			
Other	28	Absent	19							FIA Only	1	1			
	55		74		74	72		74	74	Unknown	6	6			
											59	59			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099	
Annual	55.6	57.5	59.4	59.7	
Average	55.6	57.9	60.4	63.4	
GFDL45	55.6	60.4	60.9	61.8	
GFDL85	55.6	58.5	61.7	65.6	
HAD45	55.6	58.4	61.6	63.2	
HAD85	55.6	58.7	63.4	67.5	
Growing Season	72.6	74.6	76.1	76.8	
May—Sep	72.6	78.3	78.8	80.2	
GFDL45	72.6	76.1	79.9	84.7	
GFDL85	72.6	76.1	79.9	84.7	
HAD45	72.6	75.7	78.6	80.7	
HAD85	72.6	76.1	82.1	85.9	
Coldest Month	28.7	30.7	32.2	32.6	
Average	28.7	31.7	32.7	34.3	
GFDL45	28.7	33.5	33.8	34.3	
GFDL85	28.7	31.8	33.1	33.9	
HAD45	28.7	30.3	32.9	33.0	
HAD85	28.7	31.6	34.1	36.0	
Warmest Month	78.7	80.9	81.9	82.5	
Average	78.7	81.8	83.4	85.1	
GFDL45	78.7	82.1	83.6	84.5	
GFDL85	78.7	82.5	84.3	87.4	
HAD45	78.7	82.2	84.3	85.2	
HAD85	78.7	83.9	87.5	89.5	

Precipitation (in)

Scenario	2009	2039	2069	2099	
Annual	41.6	40.4	45.1	43.8	
Total	41.6	43.4	44.6	45.5	
GFDL45	41.6	47.1	49.3	50.3	
GFDL85	41.6	46.6	52.8	54.1	
HAD45	41.6	42.6	44.8	44.6	
HAD85	41.6	44.2	42.3	45.4	
Growing Season	19.3	18.3	20.4	19.0	
May—Sep	19.3	19.3	19.1	19.2	
GFDL45	19.3	21.5	21.4	22.2	
GFDL85	19.3	21.6	22.9	23.2	
HAD45	19.3	19.0	18.2	18.3	
HAD85	19.3	19.1	16.2	16.5	

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
post oak	Quercus stellata	WDH	High	25.3	419.1	21.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	1
white oak	Quercus alba	WDH	Medium	43.2	410.9	14.8	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	2
eastern redcedar	Juniperus virginiana	WDH	Medium	20	380.9	17.0	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	3
hackberry	Celtis occidentalis	WDH	Medium	63.2	331.8	12.4	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	4
northern red oak	Quercus rubra	WDH	Medium	41.1	212.0	7.9	Sm. dec.	Lg. dec.	High	Common	Fair	Fair			1	5
American elm	Ulmus americana	WDH	Medium	64.2	201.5	7.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
sugar maple	Acer saccharum	WDH	High	22.1	183.9	8.7	Sm. inc.	No change	High	Common	Very Good	Good	Infill ++	Infill ++	1	7
boxelder	Acer negundo	WSH	Low	60	152.5	13.4	Sm. dec.	No change	High	Common	Fair	Good			1	8
black oak	Quercus velutina	WDH	High	32.6	147.5	7.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	9
black willow	Salix nigra	NSH	Low	7.4	140.7	30.7	Sm. dec.	No change	Low	Common	Poor	Poor	Infill +	Infill +	2	10
shagbark hickory	Carya ovata	WSL	Medium	44.2	112.9	4.3	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	11
black walnut	Juglans nigra	WDH	Low	31.6	104.6	6.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	12
white ash	Fraxinus americana	WDL	Medium	34.7	99.0	5.1	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	13
green ash	Fraxinus pennsylvanica	WSH	Low	35.8	84.1	6.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	14
silver maple	Acer saccharinum	NSH	Low	33.7	84.0	12.3	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	15
sassafras	Sassafras albidum	WSL	Low	43.2	80.7	5.5	No change	No change	Medium	Common	Fair	Fair			1	16
chinkapin oak	Quercus muehlenbergii	NSL	Medium	22.1	78.0	5.8	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	17
slippery elm	Ulmus rubra	WSL	Low	41.1	72.7	3.8	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	18
sycamore	Platanus occidentalis	NSL	Low	26.3	65.9	10.2	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good	Infill ++	Infill ++	1	19
red mulberry	Morus rubra	NSL	Low	32.6	63.8	5.9	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	20
black cherry	Prunus serotina	WDL	Medium	41.1	54.8	3.8	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	21
black hickory	Carya texana	NDL	High	15.8	53.8	4.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	22
shingle oak	Quercus imbricaria	NDH	Medium	24.2	44.0	5.0	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	23
sugarberry	Celtis laevigata	NDH	Medium	1.1	42.5	36.1	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	24
bitternut hickory	Carya cordiformis	WSL	Low	15.8	41.0	4.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	25
eastern redbud	Cercis canadensis	NSL	Low	27.4	38.8	5.7	No change	No change	Medium	Rare	Poor	Poor			1	26
eastern cottonwood	Populus deltoides	NSH	Low	27.4	37.0	12.2	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	27
common persimmon	Diospyros virginiana	NSL	Low	28.4	34.3	5.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	28
pignut hickory	Carya glabra	WDL	Medium	18.9	31.7	2.8	No change	No change	Medium	Rare	Poor	Poor			1	29
honeylocust	Gleditsia triacanthos	NSH	Low	7.4	31.4	3.8	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1	30
mockernut hickory	Carya alba	WDL	Medium	24.2	30.8	2.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	31
scarlet oak	Quercus coccinea	WDL	Medium	5.3	28.6	4.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	32
shortleaf pine	Pinus echinata	WDH	High	1.1	27.8	23.7	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	33
flowering dogwood	Cornus florida	WDL	Medium	31.6	27.2	1.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	34
winged elm	Ulmus alata	WDL	Medium	4.2	22.7	4.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	35
pin oak	Quercus palustris	NSH	Low	14.7	21.8	10.0	No change	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	36
Ohio buckeye	Aesculus glabra	NSL	Low	1.1	20.5	17.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	37
bur oak	Quercus macrocarpa	NDH	Medium	5.3	12.2	6.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	38
pawpaw	Asimina triloba	NSL	Low	3.2	10.4	3.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	39
Osage-orange	Maclura pomifera	NDH	Medium	6.3	10.4	4.2	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	40
blackjack oak	Quercus marilandica	NSL	Medium	7.4	10.1	2.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	41
southern red oak	Quercus falcata	WDL	Medium	1.1	9.5	8.1	Sm. inc.	Lg. inc.	High	Rare	Good	Good			2	42
shellbark hickory	Carya laciniosa	NSL	Low	7.4	6.7	1.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	43
Shumard oak	Quercus shumardii	NSL	Low	2.1	6.6	2.8	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	44
black locust	Robinia pseudoacacia	NDH	Low	5.3	6.4	3.5	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	45
ailanthus	Ailanthus altissima	NSL	FIA	5.3	6.1	5.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	46
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	2.1	5.6	2.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			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
American basswood	Tilia americana	WSL	Medium	11.6	5.3	1.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	48
pecan	Carya illinoensis	NSH	Low	1.1	3.9	3.4	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	49
serviceberry	Amelanchier spp.	NSL	Low	7.4	3.7	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	50
white mulberry	Morus alba	NSL	FIA	8.4	3.5	6.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	51
red maple	Acer rubrum	WDH	High	6.3	3.4	1.3	No change	No change	High	Rare	Fair	Fair		Infill +	2	52
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	4.2	3.2	0.7	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	53
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	1.1	0.5	0.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	54
swamp white oak	Quercus bicolor	NSL	Low	4.2	0.2	0.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	55
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	56
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	57
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	58
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	59
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	60
American beech	Fagus grandifolia	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	61
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	62
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	63
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	64
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	65
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	66
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	67
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	68
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	69
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	70
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	71
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	72
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	73
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate ++	3	74