

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
 8,300.0 3,204.6 101

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	17	23	Increase	21	21	Very Good	5	5
Hickory	5			Medium	25	40	No Change	10	12	Good	16	17
Maple	4	Abundant	1	Low	28	10	Decrease	24	22	Fair	7	7
Oak	12	Common	20	FIA	5		New	12	12	Poor	14	12
Pine	2	Rare	39				Unknown	8	8	Very Poor	11	13
Other	34	Absent	14							FIA Only	3	3
	60		74		75	73		75	75	Unknown	3	3
											59	60

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	55.4	57.2	59.6	59.8	
Average	CCSM85	55.4	57.7	60.4	63.5	
	GFDL45	55.4	60.4	60.9	61.7	
	GFDL85	55.4	58.4	61.9	65.7	
	HAD45	55.4	58.0	61.5	62.8	
	HAD85	55.4	58.5	63.1	67.3	
Growing Season	CCSM45	71.1	72.9	75.0	75.6	
	CCSM85	71.1	73.4	76.2	80.3	
May—Sep	GFDL45	71.1	77.2	77.7	79.0	
	GFDL85	71.1	74.9	79.1	83.4	
	HAD45	71.1	74.4	77.7	79.5	
	HAD85	71.1	74.8	81.2	85.3	
Coldest Month	CCSM45	30.9	32.3	33.9	34.4	
Average	CCSM85	30.9	33.8	34.7	36.4	
	GFDL45	30.9	34.9	35.0	35.6	
	GFDL85	30.9	33.3	34.3	35.1	
	HAD45	30.9	31.7	34.2	34.4	
	HAD85	30.9	33.1	35.0	36.8	
Warmest Month	CCSM45	76.5	78.2	79.5	79.9	
Average	CCSM85	76.5	78.8	80.6	82.4	
	GFDL45	76.5	79.9	81.9	82.8	
	GFDL85	76.5	80.5	83.3	85.7	
	HAD45	76.5	80.4	83.2	84.3	
	HAD85	76.5	82.2	86.8	89.0	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	45.8	47.4	51.6	50.6	
Total	CCSM85	45.8	50.3	51.4	55.1	
	GFDL45	45.8	51.1	53.0	56.5	
	GFDL85	45.8	49.2	54.1	57.5	
	HAD45	45.8	46.8	49.1	48.4	
	HAD85	45.8	46.4	44.3	48.0	
Growing Season	CCSM45	20.4	20.2	22.0	21.3	
	CCSM85	20.4	21.1	20.2	21.5	
May—Sep	GFDL45	20.4	23.0	21.9	23.0	
	GFDL85	20.4	21.5	22.0	22.7	
	HAD45	20.4	20.8	19.1	19.3	
	HAD85	20.4	20.0	16.3	17.0	

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
eastern redcedar	Juniperus virginiana	WDH	Medium	65.1	815.8	23.0	No change	No change	Medium	Abundant	Good	Good			1	1
white ash	Fraxinus americana	WDL	Medium	61.4	310.5	8.9	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	2
black walnut	Juglans nigra	WDH	Low	65.1	301.2	8.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	3
hackberry	Celtis occidentalis	WDH	Medium	63.9	278.5	10.7	No change	No change	High	Common	Good	Good			1	4
black locust	Robinia pseudoacacia	NDH	Low	66.3	231.6	9.6	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	5
chinkapin oak	Quercus muehlenbergii	NSL	Medium	57.8	229.9	8.3	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	6
green ash	Fraxinus pennsylvanica	WSH	Low	53	168.4	7.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	7
American elm	Ulmus americana	WDH	Medium	67.5	154.9	5.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	8
honeylocust	Gleditsia triacanthos	NSH	Low	39.8	135.5	6.6	No change	No change	High	Common	Good	Good			1	9
slippery elm	Ulmus rubra	WSL	Low	44.6	133.2	4.7	No change	No change	Medium	Common	Fair	Fair			1	10
shagbark hickory	Carya ovata	WSL	Medium	37.3	131.0	5.1	No change	No change	Medium	Common	Fair	Fair			1	11
sugar maple	Acer saccharum	WDH	High	56.6	127.4	4.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	12
bitternut hickory	Carya cordiformis	WSL	Low	44.6	101.1	5.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	13
sycamore	Platanus occidentalis	NSL	Low	21.7	99.7	8.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	14
black cherry	Prunus serotina	WDL	Medium	55.4	94.3	4.7	Sm. dec.	Lg. dec.	Low	Common	Poor	Very Poor			0	15
scarlet oak	Quercus coccinea	WDL	Medium	27.7	83.4	4.6	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	16
sassafras	Sassafras albidum	WSL	Low	25.3	72.6	4.4	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	17
white oak	Quercus alba	WDH	Medium	18.1	67.5	6.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	18
eastern redbud	Cercis canadensis	NSL	Low	53	64.8	2.3	Sm. dec.	No change	Medium	Common	Poor	Fair			1	19
northern red oak	Quercus rubra	WDH	Medium	48.2	60.8	3.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	20
boxelder	Acer negundo	WSH	Low	49.4	56.8	4.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	21
red maple	Acer rubrum	WDH	High	22.9	43.2	6.0	Lg. dec.	Sm. dec.	High	Rare	Poor	Poor			1	22
Shumard oak	Quercus shumardii	NSL	Low	9.6	41.0	6.0	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	23
Virginia pine	Pinus virginiana	NDH	High	8.4	37.5	7.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	24
Ohio buckeye	Aesculus glabra	NSL	Low	28.9	34.4	2.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	25
shellbark hickory	Carya laciniosa	NSL	Low	14.5	33.6	4.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	26
Osage-orange	Maclura pomifera	NDH	Medium	31.3	27.2	3.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	27
chestnut oak	Quercus prinus	NDH	High	14.5	27.2	4.5	Sm. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +		1	28
flowering dogwood	Cornus florida	WDL	Medium	20.5	25.1	2.5	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	29
mockernut hickory	Carya alba	WDL	Medium	25.3	22.5	2.3	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	30
yellow-poplar	Liriodendron tulipifera	WDH	High	19.3	22.4	4.7	Sm. inc.	No change	High	Rare	Good	Fair			1	31
black oak	Quercus velutina	WDH	High	6	18.3	2.6	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	32
pignut hickory	Carya glabra	WDL	Medium	27.7	16.6	1.5	Lg. inc.	Sm. inc.	Medium	Rare	Good	Fair			1	33
blue ash	Fraxinus quadrangulata	NSL	Low	14.5	10.5	10.0	No change	No change	Low	Rare	Very Poor	Very Poor			0	34
yellow buckeye	Aesculus flava	NSL	Low	7.2	10.2	3.0	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	35
American beech	Fagus grandifolia	WDH	High	6	10.0	4.7	No change	No change	Medium	Rare	Poor	Poor	Infill +		2	36
post oak	Quercus stellata	WDH	High	2.4	8.9	3.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	37
sweetgum	Liquidambar styraciflua	WDH	High	1.2	8.8	6.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	38
shingle oak	Quercus imbricaria	NDH	Medium	6	8.5	3.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	39
sourwood	Oxydendrum arboreum	NDL	High	16.9	7.3	1.6	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +		1	40
red mulberry	Morus rubra	NSL	Low	2.4	7.0	2.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	41
blackgum	Nyssa sylvatica	WDL	Medium	19.3	6.3	1.0	No change	Lg. inc.	High	Rare	Fair	Good			1	42
bur oak	Quercus macrocarpa	NDH	Medium	1.2	6.1	4.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	43
American basswood	Tilia americana	WSL	Medium	4.8	4.6	13.1	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	44
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	10.8	4.2	3.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	45
black willow	Salix nigra	NSH	Low	1.2	3.7	2.7	Lg. dec.	No change	Low	Rare	Very Poor	Very Poor			2	46
cucumbertree	Magnolia acuminata	NSL	Low	4.8	3.7	10.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very 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
Siberian elm	Ulmus pumila	NDH	FIA	1.2	2.2	1.6	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 48
pawpaw	Asimina triloba	NSL	Low	1.2	1.9	1.3	Very Lg. dec.	Lg. dec.	Medium	Rare	Lost	Very Poor				0 49
butternut	Juglans cinerea	NSLX	FIA	6	1.5	1.2	Unknown	Unknown	Low	Rare	FIA Only	FIA Only				0 50
ailanthus	Ailanthus altissima	NSL	FIA	14.5	1.4	1.3	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 51
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	9.6	1.3	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				1 52
northern catalpa	Catalpa speciosa	NSHX	FIA	4.8	1.0	2.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 53
pin oak	Quercus palustris	NSH	Low	4.8	1.0	2.7	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				0 54
shortleaf pine	Pinus echinata	WDH	High	4.8	0.8	2.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good				2 55
southern red oak	Quercus falcata	WDL	Medium	1.2	0.7	0.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good				2 56
winged elm	Ulmus alata	WDL	Medium	9.6	0.6	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		2 57
serviceberry	Amelanchier spp.	NSL	Low	1.2	0.5	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 58
silver maple	Acer saccharinum	NSH	Low	4.8	0.3	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good				0 59
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	4.8	0.2	0.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++		2 60
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 61
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 62
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 63
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3 64
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	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
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 67
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +		3 68
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 69
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 70
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				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 +		3 73
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 74
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				0 75