

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 8,166.9 3,153.2 134

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	21	Increase	17	16	Very Good	5	4	Likely	0	0
Hickory	4			Medium	25	41	No Change	11	9	Good	16	14	Infill	24	25
Maple	5	Abundant	2	Low	30	11	Decrease	22	25	Fair	6	8	Migrate	4	12
Oak	9	Common	21	FIA	4		New	18	19	Poor	9	8			
Pine	3	Rare	31				Unknown	8	7	Very Poor	11	11			
Other	30	Absent	21							FIA Only	1	1			
	54		75		76	73		76	76	Unknown	4	3			
											52	49			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	49.9	51.7	54.3	54.3	
	CCSM85	49.9	52.2	54.8	58.1	
	GFDL45	49.9	54.2	55.7	56.7	
	GFDL85	49.9	53.1	56.7	61.0	
	HAD45	49.9	52.9	56.5	58.2	
	HAD85	49.9	53.2	57.7	62.8	
Growing Season (May—Sep)	CCSM45	66.5	68.3	70.6	71.0	
	CCSM85	66.5	68.8	71.3	75.3	
	GFDL45	66.5	71.8	73.6	75.1	
	GFDL85	66.5	70.6	74.9	79.8	
	HAD45	66.5	70.1	73.1	75.4	
	HAD85	66.5	69.8	75.4	80.9	
Coldest Month Average	CCSM45	24.0	25.8	27.8	27.9	
	CCSM85	24.0	26.8	28.1	30.2	
	GFDL45	24.0	27.0	28.0	28.7	
	GFDL85	24.0	27.5	28.7	30.4	
	HAD45	24.0	25.3	28.5	28.6	
	HAD85	24.0	26.7	29.3	32.2	
Warmest Month Average	CCSM45	72.4	74.3	75.7	76.1	
	CCSM85	72.4	75.1	76.6	78.9	
	GFDL45	72.4	75.4	77.5	78.5	
	GFDL85	72.4	76.5	78.7	81.5	
	HAD45	72.4	76.3	78.4	80.0	
	HAD85	72.4	77.1	80.9	84.8	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	39.3	40.3	40.2	42.0	
	CCSM85	39.3	40.9	41.5	42.5	
	GFDL45	39.3	43.3	46.3	47.1	
	GFDL85	39.3	41.5	46.9	49.2	
	HAD45	39.3	39.8	40.9	40.8	
	HAD85	39.3	41.4	38.3	41.9	
Growing Season (May—Sep)	CCSM45	18.7	18.9	18.5	19.0	
	CCSM85	18.7	18.3	18.7	17.9	
	GFDL45	18.7	20.5	21.3	21.8	
	GFDL85	18.7	19.6	21.1	21.4	
	HAD45	18.7	18.9	17.2	18.0	
	HAD85	18.7	18.6	15.2	16.0	

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
red maple	Acer rubrum	WDH	High	84.8	1252.1	19.3	Lg. dec.	Lg. dec.	High	Abundant	Good	Good	Infill ++	Infill ++	2	1
sugar maple	Acer saccharum	WDH	High	50.9	581.9	12.7	No change	Sm. dec.	High	Abundant	Very Good	Good	Infill ++	Infill ++	2	2
black cherry	Prunus serotina	WDL	Medium	70.2	492.6	11.6	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	2	3
American elm	Ulmus americana	WDH	Medium	70.8	400.4	8.0	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	4
green ash	Fraxinus pennsylvanica	WSH	Low	59.9	366.9	8.6	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	5
yellow-poplar	Liriodendron tulipifera	WDH	High	34	364.1	12.4	No change	Sm. dec.	High	Common	Good	Fair	Infill ++	Infill +	2	6
white ash	Fraxinus americana	WDL	Medium	63.8	335.7	8.7	Sm. inc.	No change	Low	Common	Fair	Poor	Infill +	Infill +	2	7
northern red oak	Quercus rubra	WDH	Medium	59.3	319.4	7.5	No change	Sm. dec.	High	Common	Good	Fair	Infill ++	Infill +	2	8
American beech	Fagus grandifolia	WDH	High	48.9	261.8	8.1	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	9
silver maple	Acer saccharinum	NSH	Low	32.1	152.0	8.4	No change	Sm. inc.	High	Common	Good	Very Good	Infill ++	Infill ++	2	10
shagbark hickory	Carya ovata	WSL	Medium	33.4	147.2	6.0	Sm. inc.	No change	Medium	Common	Good	Fair	Infill ++	Infill +	2	11
American basswood	Tilia americana	WSL	Medium	47.7	140.3	5.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	12
bitternut hickory	Carya cordiformis	WSL	Low	32.9	136.6	6.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	13
pin oak	Quercus palustris	NSH	Low	24.1	112.7	8.2	No change	Sm. inc.	Low	Common	Poor	Fair	Infill +	Infill +	2	14
eastern cottonwood	Populus deltoides	NSH	Low	26.1	105.1	7.6	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor		Infill +	2	15
eastern white pine	Pinus strobus	WDH	High	19.6	95.9	7.4	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			2	16
swamp white oak	Quercus bicolor	NSL	Low	13.5	81.6	8.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +		2	17
sycamore	Platanus occidentalis	NSL	Low	9.4	77.7	12.7	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	18
Norway spruce	Picea abies	NSH	FIA	9	74.9	11.2	Unknown	Unknown	NA	Common	NNIS	NNIS			0	19
blackgum	Nyssa sylvatica	WDL	Medium	29.3	67.7	2.8	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	20
white oak	Quercus alba	WDH	Medium	18.8	53.9	4.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	21
sassafras	Sassafras albidum	WSL	Low	14.6	50.8	4.2	Lg. inc.	Sm. inc.	Medium	Common	Very Good	Good	Infill ++	Infill ++	2	22
black locust	Robinia pseudoacacia	NDH	Low	13.9	50.5	7.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	2	23
ailanthus	Ailanthus altissima	NSL	FIA	2.4	49.3	18.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	24
boxelder	Acer negundo	WSH	Low	10.1	48.2	4.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	25
black willow	Salix nigra	NSH	Low	10.3	46.3	4.3	Lg. dec.	No change	Low	Rare	Very Poor	Very Poor			2	26
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	21.1	41.5	2.1	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	27
Osage-orange	Maclura pomifera	NDH	Medium	3.7	41.1	10.1	No change	No change	High	Rare	Fair	Fair		Infill +	2	28
bigtooth aspen	Populus grandidentata	NSL	Medium	20	39.5	3.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	29
quaking aspen	Populus tremuloides	WDH	High	7.1	35.6	4.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	30
slippery elm	Ulmus rubra	WSL	Low	13	30.2	2.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	31
Scots pine	Pinus sylvestris	NSH	FIA	2.4	28.9	10.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	32
black walnut	Juglans nigra	WDH	Low	14.7	27.2	3.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	33
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	12.2	24.2	1.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	34
black oak	Quercus velutina	WDH	High	1.2	23.4	17.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	35
bur oak	Quercus macrocarpa	NDH	Medium	3.6	20.7	4.9	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	36
cucumber tree	Magnolia acuminata	NSL	Low	12.2	18.3	2.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	37
yellow birch	Betula alleghaniensis	NDL	High	3.7	13.6	3.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	38
chokecherry	Prunus virginiana	NSLX	FIA	7.3	13.5	5.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	39
eastern hemlock	Tsuga canadensis	NSH	High	2.4	9.0	3.3	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	40
serviceberry	Amelanchier spp.	NSL	Low	3.7	7.8	1.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	41
pignut hickory	Carya glabra	WDL	Medium	3.9	6.0	3.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	42
chinkapin oak	Quercus muehlenbergii	NSL	Medium	1.2	4.0	3.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	43
black maple	Acer nigrum	NSH	Low	1.2	3.6	2.7	Lg. dec.	Very Lg. dec.	High	Rare	Poor	Lost			0	44
flowering dogwood	Cornus florida	WDL	Medium	4.7	3.3	0.7	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	45
swamp chestnut oak	Quercus michauxii	NSL	Low	1.2	2.2	1.6	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	46
black ash	Fraxinus nigra	WSH	Medium	6.1	1.8	0.9	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			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
sweetgum	Liquidambar styraciflua	WDH	High	5.4	1.1	0.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	48
pin cherry	Prunus pensylvanica	NSL	Low	1.2	1.0	0.8	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	49
scarlet oak	Quercus coccinea	WDL	Medium	7.6	0.7	0.7	No change	No change	Medium	Rare	Poor	Poor			0	50
mockernut hickory	Carya alba	WDL	Medium	2.7	0.5	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	51
sweet birch	Betula lenta	NDH	High	4.9	0.2	0.6	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	52
hackberry	Celtis occidentalis	WDH	Medium	4.9	0.2	0.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	53
Virginia pine	Pinus virginiana	NDH	High	4.9	0.2	0.6	Sm. inc.	Lg. dec.	Medium	Rare	Fair	Very Poor			2	54
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	55
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	56
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	57
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	58
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	59
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	60
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	61
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	62
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	63
blue ash	Fraxinus quadrangulata	NSL	Low	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	Migrate +	Migrate +	3	65
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	66
red mulberry	Morus rubra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	67
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	68
shingle oak	Quercus imbricaria	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	69
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	70
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	71
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	72
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	73
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	74
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	75
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	76