

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
 8,100.0 3,127.4 162

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	19	25	Increase	33	35	Very Good	17	19	Likely	1	1
Hickory	5			Medium	31	48	No Change	8	9	Good	13	13	Infill	8	8
Maple	5	Abundant	2	Low	33	12	Decrease	21	18	Fair	12	12	Migrate	5	8
Oak	13	Common	37	FIA	4		New	13	14	Poor	11	10			
Pine	3	Rare	27				Unknown	12	11	Very Poor	9	8			
Other	37	Absent	20							FIA Only	2	2			
	66		86		87	85		87	87	Unknown	8	7			
											72	71			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	59.9	61.6	63.8	63.9	
Average	CCSM85	59.9	62.0	64.5	67.3	
	GFDL45	59.9	63.2	64.6	65.4	
	GFDL85	59.9	62.4	65.7	69.1	
	HAD45	59.9	62.2	65.3	66.5	
	HAD85	59.9	62.6	67.0	70.8	
Growing Season	CCSM45	74.2	75.8	77.7	78.3	
	CCSM85	74.2	76.1	78.8	82.3	
May—Sep	GFDL45	74.2	78.0	79.4	80.8	
	GFDL85	74.2	77.0	80.9	84.8	
	HAD45	74.2	77.6	80.4	81.9	
	HAD85	74.2	77.7	84.3	87.6	
Coldest Month	CCSM45	38.2	40.3	41.4	41.5	
Average	CCSM85	38.2	41.1	42.2	43.5	
	GFDL45	38.2	41.8	41.8	42.2	
	GFDL85	38.2	39.9	41.1	41.5	
	HAD45	38.2	38.1	40.2	40.7	
	HAD85	38.2	39.5	41.0	42.6	
Warmest Month	CCSM45	79.1	80.7	81.6	81.8	
Average	CCSM85	79.1	80.9	82.4	84.3	
	GFDL45	79.1	81.9	83.2	84.1	
	GFDL85	79.1	81.9	84.2	86.1	
	HAD45	79.1	83.5	85.9	86.4	
	HAD85	79.1	84.3	88.9	90.1	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	55.2	57.4	61.6	60.0	
Total	CCSM85	55.2	59.4	60.5	66.1	
	GFDL45	55.2	62.6	65.2	68.5	
	GFDL85	55.2	62.7	65.2	68.7	
	HAD45	55.2	52.9	58.9	59.6	
	HAD85	55.2	56.9	51.5	57.2	
Growing Season	CCSM45	21.4	21.3	21.6	22.2	
	CCSM85	21.4	21.4	20.5	22.5	
May—Sep	GFDL45	21.4	25.5	26.6	27.1	
	GFDL85	21.4	25.8	27.0	28.3	
	HAD45	21.4	20.1	21.5	20.8	
	HAD85	21.4	22.0	16.2	18.3	

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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Northern Research Station
Landscape Change Research Group
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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	51.9	722.8	17.5	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	69.1	624.8	12.8	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	2
eastern redcedar	Juniperus virginiana	WDH	Medium	65.4	424.3	8.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	3
yellow-poplar	Liriodendron tulipifera	WDH	High	60.5	391.7	9.2	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	4
white oak	Quercus alba	WDH	Medium	55.6	344.0	8.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	5
shagbark hickory	Carya ovata	WSL	Medium	49.4	284.3	6.5	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	6
pignut hickory	Carya glabra	WDL	Medium	67.9	263.1	5.5	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	7
winged elm	Ulmus alata	WDL	Medium	71.6	231.8	4.2	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	8
white ash	Fraxinus americana	WDL	Medium	42	221.2	6.1	Sm. dec.	No change	Low	Common	Poor	Poor			0	9
chinkapin oak	Quercus muehlenbergii	NSL	Medium	39.5	202.7	5.3	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	10
red maple	Acer rubrum	WDH	High	48.1	192.6	5.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	11
chestnut oak	Quercus prinus	NDH	High	33.3	191.9	7.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	12
southern red oak	Quercus falcata	WDL	Medium	32.1	188.6	7.3	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	13
florida maple	Acer barbatum	NSL	Low	38.3	182.3	6.1	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	14
northern red oak	Quercus rubra	WDH	Medium	39.5	167.3	6.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	15
sugarberry	Celtis laevigata	NDH	Medium	28.4	163.3	9.2	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	16
blackgum	Nyssa sylvatica	WDL	Medium	45.7	142.3	3.7	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	17
black cherry	Prunus serotina	WDL	Medium	54.3	134.2	3.4	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	18
mockernut hickory	Carya alba	WDL	Medium	37	120.4	4.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	19
hackberry	Celtis occidentalis	WDH	Medium	34.6	118.2	4.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	20
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	21	108.7	5.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	21
post oak	Quercus stellata	WDH	High	35.8	108.6	3.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	22
sassafras	Sassafras albidum	WSL	Low	40.7	107.7	4.4	Sm. dec.	No change	Medium	Common	Poor	Fair			1	23
green ash	Fraxinus pennsylvanica	WSH	Low	42	102.2	3.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	24
black oak	Quercus velutina	WDH	High	37	100.9	3.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	25
scarlet oak	Quercus coccinea	WDL	Medium	37	95.3	3.8	No change	No change	Medium	Common	Fair	Fair			1	26
Virginia pine	Pinus virginiana	NDH	High	8.6	93.4	10.0	No change	No change	Medium	Common	Fair	Fair			1	27
water oak	Quercus nigra	WDH	High	32.1	89.0	4.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	28
black willow	Salix nigra	NSH	Low	14.8	87.2	7.7	No change	Sm. inc.	Low	Common	Poor	Fair			1	29
sugar maple	Acer saccharum	WDH	High	24.7	77.0	4.3	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	30
black locust	Robinia pseudoacacia	NDH	Low	23.5	72.2	4.3	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	31
black walnut	Juglans nigra	WDH	Low	23.5	70.3	5.0	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	32
Osage-orange	Maclura pomifera	NDH	Medium	7.4	65.6	8.2	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	33
common persimmon	Diospyros virginiana	NSL	Low	40.7	64.0	1.8	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	34
willow oak	Quercus phellos	NSL	Low	8.6	60.6	6.5	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	35
shortleaf pine	Pinus echinata	WDH	High	16	58.8	4.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	36
honeylocust	Gleditsia triacanthos	NSH	Low	18.5	58.8	3.7	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	37
sycamore	Platanus occidentalis	NSL	Low	7.4	57.3	7.2	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	38
sourwood	Oxydendrum arboreum	NDL	High	27.2	50.1	2.6	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	39
American elm	Ulmus americana	WDH	Medium	35.8	48.9	2.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	40
flowering dogwood	Cornus florida	WDL	Medium	34.6	47.3	1.7	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	41
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	30.9	44.2	1.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	42
eastern redbud	Cercis canadensis	NSL	Low	39.5	43.2	1.8	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	43
boxelder	Acer negundo	WSH	Low	18.5	41.7	4.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	44
slippery elm	Ulmus rubra	WSL	Low	32.1	38.3	2.0	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	45
bitternut hickory	Carya cordiformis	WSL	Low	7.4	38.1	4.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	46
American beech	Fagus grandifolia	WDH	High	22.2	36.4	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	47



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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	17.3	28.2	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	48
cucumbertree	Magnolia acuminata	NSL	Low	4.9	20.1	3.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	49
American basswood	Tilia americana	WSL	Medium	8.6	18.7	4.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	50
yellow buckeye	Aesculus flava	NSL	Low	17.3	16.4	2.4	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	51
water tupelo	Nyssa aquatica	NSH	Medium	1.2	12.2	9.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	52
ailanthus	Ailanthus altissima	NSL	FIA	11.1	9.7	3.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	53
river birch	Betula nigra	NSL	Low	7.4	8.6	2.9	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	54
bald cypress	Taxodium distichum	NSH	Medium	1.2	7.4	5.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	55
butternut	Juglans cinerea	NSLX	FIA	3.7	6.7	1.7	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	56
pawpaw	Asimina triloba	NSL	Low	2.5	5.2	2.0	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	57
Shumard oak	Quercus shumardii	NSL	Low	3.7	4.8	1.2	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	58
shellbark hickory	Carya laciniosa	NSL	Low	6.2	4.0	1.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	59
red mulberry	Morus rubra	NSL	Low	8.6	3.4	0.9	Lg. dec.	No change	Medium	Rare	Very Poor	Poor			1	60
laurel oak	Quercus laurifolia	NDH	Medium	2.5	2.3	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	61
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	1.2	1.5	1.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	62
blue ash	Fraxinus quadrangulata	NSL	Low	1.2	1.5	1.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	63
silver maple	Acer saccharinum	NSH	Low	4.9	1.3	3.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	64
wild plum	Prunus americana	NSLX	FIA	6.2	1.2	0.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	65
paulownia	Paulownia tomentosa	NSL	FIA	1.2	0.4	0.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	66
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	67
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	68
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	69
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	70
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	71
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	72
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	73
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	74
sweet birch	Betula lenta	NDH	High	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	75
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	76
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	77
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	78
silverbell	Halesia spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	79
American holly	Ilex opaca	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	80
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	81
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	82
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	83
bur oak	Quercus macrocarpa	NDH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	84
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	85
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	86
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate ++	3	87