

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	8,500.0	3,281.9	199

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	18	25	Increase	24	26	Very Good	9	10	Likely	3	3
Hickory	5			Medium	27	45	No Change	14	15	Good	18	19	Infill	11	11
Maple	6	Abundant	3	Low	34	10	Decrease	22	19	Fair	10	10	Migrate	6	6
Oak	13	Common	28	FIA	3		New	14	15	Poor	12	10			
Pine	3	Rare	32				Unknown	8	7	Very Poor	10	10			
Other	33	Absent	19							FIA Only	1	1			
	63		82		82	80		82	82	Unknown	5	4			
											65	64			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	55.5	57.3	59.7	60.0	
	CCSM85	55.5	57.8	60.5	63.6	
	GFDL45	55.5	59.1	60.9	61.7	
	GFDL85	55.5	58.5	61.9	65.7	
	HAD45	55.5	58.2	61.7	63.1	
HAD85	55.5	58.7	63.3	67.6		
Growing Season (May—Sep)	CCSM45	71.5	73.3	75.4	76.1	
	CCSM85	71.5	73.8	76.7	80.7	
	GFDL45	71.5	75.7	77.9	79.3	
	GFDL85	71.5	75.2	79.3	83.8	
	HAD45	71.5	74.8	78.1	80.0	
HAD85	71.5	75.3	81.7	85.8		
Coldest Month Average	CCSM45	30.4	31.8	33.4	34.0	
	CCSM85	30.4	33.3	34.3	36.0	
	GFDL45	30.4	34.5	34.7	35.2	
	GFDL85	30.4	32.7	33.8	34.5	
	HAD45	30.4	31.7	34.1	34.3	
HAD85	30.4	32.9	35.0	36.8		
Warmest Month Average	CCSM45	77.0	78.6	79.9	80.4	
	CCSM85	77.0	79.3	81.2	83.0	
	GFDL45	77.0	80.3	82.1	83.0	
	GFDL85	77.0	80.8	83.3	85.9	
	HAD45	77.0	80.9	83.7	84.6	
HAD85	77.0	82.8	87.3	89.5		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	46.0	46.5	51.2	49.6	
	CCSM85	46.0	49.1	50.2	53.8	
	GFDL45	46.0	52.3	54.7	57.6	
	GFDL85	46.0	50.4	55.5	58.9	
	HAD45	46.0	47.5	49.8	49.0	
HAD85	46.0	47.3	45.1	49.4		
Growing Season (May—Sep)	CCSM45	19.9	19.2	21.1	20.2	
	CCSM85	19.9	19.9	19.1	20.1	
	GFDL45	19.9	22.7	21.9	22.7	
	GFDL85	19.9	21.3	21.9	22.5	
	HAD45	19.9	19.8	18.3	18.3	
HAD85	19.9	19.5	15.5	16.1		

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
sugar maple	Acer saccharum	WDH	High	80	868.0	14.0	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
eastern redcedar	Juniperus virginiana	WDH	Medium	57.6	659.5	13.7	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	2
yellow-poplar	Liriodendron tulipifera	WDH	High	61.2	507.9	11.1	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	3
white ash	Fraxinus americana	WDL	Medium	68.2	494.8	9.3	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	4
white oak	Quercus alba	WDH	Medium	44.7	375.6	8.8	No change	No change	High	Common	Good	Good			1	5
chestnut oak	Quercus prinus	NDH	High	24.7	284.5	13.2	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	6
red maple	Acer rubrum	WDH	High	51.8	252.6	6.9	Sm. dec.	No change	High	Common	Fair	Good			1	7
Virginia pine	Pinus virginiana	NDH	High	31.8	237.4	9.5	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	8
green ash	Fraxinus pennsylvanica	WSH	Low	38.8	235.6	9.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	9
pignut hickory	Carya glabra	WDL	Medium	44.7	233.3	5.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	10
hackberry	Celtis occidentalis	WDH	Medium	47.1	218.5	6.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	11
sassafras	Sassafras albidum	WSL	Low	49.4	202.7	5.2	No change	No change	Medium	Common	Fair	Fair			1	12
American elm	Ulmus americana	WDH	Medium	54.1	189.6	4.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	13
American beech	Fagus grandifolia	WDH	High	54.1	185.6	4.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	14
black locust	Robinia pseudoacacia	NDH	Low	25.9	179.6	10.0	No change	No change	Medium	Common	Fair	Fair			1	15
black oak	Quercus velutina	WDH	High	27.1	170.7	6.0	Lg. inc.	Sm. inc.	Medium	Common	Very Good	Good			1	16
black walnut	Juglans nigra	WDH	Low	54.1	163.3	4.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	17
black cherry	Prunus serotina	WDL	Medium	47.1	162.0	4.8	No change	No change	Low	Common	Poor	Poor			0	18
sycamore	Platanus occidentalis	NSL	Low	35.3	143.6	6.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	19
northern red oak	Quercus rubra	WDH	Medium	48.2	135.7	3.9	Sm. inc.	No change	High	Common	Very Good	Good			1	20
blackgum	Nyssa sylvatica	WDL	Medium	37.6	127.4	4.0	No change	Sm. inc.	High	Common	Good	Very Good			1	21
chinkapin oak	Quercus muehlenbergii	NSL	Medium	35.3	122.1	4.9	No change	No change	Medium	Common	Fair	Fair			1	22
bitternut hickory	Carya cordiformis	WSL	Low	37.6	114.9	5.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	23
shagbark hickory	Carya ovata	WSL	Medium	36.5	90.4	3.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	24
slippery elm	Ulmus rubra	WSL	Low	50.6	89.3	2.5	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	25
sweetgum	Liquidambar styraciflua	WDH	High	29.4	84.0	4.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	26
eastern redbud	Cercis canadensis	NSL	Low	38.8	79.9	2.2	Sm. dec.	No change	Medium	Common	Poor	Fair			1	27
boxelder	Acer negundo	WSH	Low	36.5	73.4	4.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	28
flowering dogwood	Cornus florida	WDL	Medium	32.9	60.9	2.0	No change	No change	Medium	Common	Fair	Fair			1	29
post oak	Quercus stellata	WDH	High	4.7	59.6	12.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	30
common persimmon	Diospyros virginiana	NSL	Low	22.4	56.8	2.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	31
Shumard oak	Quercus shumardii	NSL	Low	12.9	47.9	5.1	No change	Lg. inc.	High	Rare	Fair	Good			1	32
scarlet oak	Quercus coccinea	WDL	Medium	9.4	43.4	4.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	33
pin oak	Quercus palustris	NSH	Low	8.2	34.8	7.2	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	34
ailanthus	Ailanthus altissima	NSL	FIA	10.6	33.4	4.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	35
eastern white pine	Pinus strobus	WDH	High	1.2	33.2	26.9	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	36
silver maple	Acer saccharinum	NSH	Low	2.4	28.6	11.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	37
Ohio buckeye	Aesculus glabra	NSL	Low	9.4	27.7	2.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	38
red mulberry	Morus rubra	NSL	Low	17.6	23.0	1.6	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	39
Osage-orange	Maclura pomifera	NDH	Medium	14.1	22.8	6.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	40
shingle oak	Quercus imbricaria	NDH	Medium	5.9	21.3	3.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	41
mockernut hickory	Carya alba	WDL	Medium	8.2	15.7	1.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	42
eastern cottonwood	Populus deltoides	NSH	Low	3.5	12.1	3.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	43
northern catalpa	Catalpa speciosa	NSHX	FIA	1.2	11.7	9.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	44
honeylocust	Gleditsia triacanthos	NSH	Low	7.1	10.9	1.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	45
southern red oak	Quercus falcata	WDL	Medium	3.5	10.5	2.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	46
pawpaw	Asimina triloba	NSL	Low	5.9	10.0	1.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	15.3	9.6	1.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	48
sourwood	Oxydendrum arboreum	NDL	High	2.4	8.9	3.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	49
shellbark hickory	Carya laciniosa	NSL	Low	3.5	6.5	1.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	50
winged elm	Ulmus alata	WDL	Medium	4.7	5.7	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	51
bur oak	Quercus macrocarpa	NDH	Medium	2.4	5.5	2.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	52
American basswood	Tilia americana	WSL	Medium	3.5	5.2	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	53
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	12.9	5.2	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	54
swamp chestnut oak	Quercus michauxii	NSL	Low	1.2	4.9	4.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	55
black maple	Acer nigrum	NSH	Low	1.2	4.3	3.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	56
yellow buckeye	Aesculus flava	NSL	Low	5.9	3.4	1.7	Sm. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	57
blue ash	Fraxinus quadrangulata	NSL	Low	7.1	2.2	0.8	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			0	58
black willow	Salix nigra	NSH	Low	1.2	2.1	1.7	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	59
sugarberry	Celtis laevigata	NDH	Medium	1.2	1.5	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	60
bigtooth aspen	Populus grandidentata	NSL	Medium	1.2	1.1	0.9	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	61
striped maple	Acer pensylvanicum	NSL	Medium	1.2	0.6	0.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	62
Scots pine	Pinus sylvestris	NSH	FIA	1.2	0.5	0.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	63
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	64
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	65
slash pine	Pinus elliottii	NDH	High	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	66
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	67
mountain maple	Acer spicatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	68
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	69
river birch	Betula nigra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	70
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	71
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	72
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	73
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	74
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	75
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	76
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	77
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	78
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	79
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	80
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	81
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	82