

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
 8,600.0 3,320.5 195

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	
		Abundant	Common	High	Low	Scenario	Scenario	Scenario	Scenario	SHIFT	SHIFT
				Reliability	Adaptability	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85
Ash	3										
Hickory	7										
Maple	5	4		16	24	Increase	29	34	Very Good	7	9
Oak	12	24		28	44	No Change	11	7	Good	22	25
Pine	2	36		29	9	Decrease	17	16	Fair	13	9
Other	35	15		7		New	10	12	Poor	7	7
	64	79		80	77	Unknown	13	11	Very Poor	7	6
							80	80	FIA Only	4	4
									Unknown	6	4
										66	64

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099	
Annual	57.5	59.4	61.3	61.7	
Average	57.5	60.0	62.3	65.2	
GFDL45	57.5	61.1	62.5	63.6	
GFDL85	57.5	60.5	63.3	67.2	
HAD45	57.5	60.0	62.8	64.3	
HAD85	57.5	60.2	64.8	68.4	
Growing Season	72.8	74.9	76.5	77.1	
May—Sep	72.8	75.7	77.9	81.6	
GFDL45	72.8	77.3	78.9	80.9	
GFDL85	72.8	76.7	79.9	84.8	
HAD45	72.8	75.6	78.2	79.6	
HAD85	72.8	75.9	81.7	84.8	
Coldest Month	33.8	36.1	37.3	37.7	
Average	33.8	36.7	37.6	39.3	
GFDL45	33.8	37.9	38.3	38.2	
GFDL85	33.8	35.6	37.0	37.6	
HAD45	33.8	34.7	37.2	37.3	
HAD85	33.8	36.5	38.5	40.2	
Warmest Month	78.9	81.1	82.1	82.5	
Average	78.9	82.2	83.0	84.9	
GFDL45	78.9	83.9	85.2	86.5	
GFDL85	78.9	83.6	85.2	89.0	
HAD45	78.9	82.0	83.7	84.4	
HAD85	78.9	83.2	86.3	87.6	

Precipitation (in)

Scenario	2009	2039	2069	2099	
Annual	47.1	45.2	47.9	46.9	
Total	47.1	46.2	48.2	48.3	
GFDL45	47.1	50.4	53.5	50.5	
GFDL85	47.1	50.7	57.4	56.3	
HAD45	47.1	47.2	50.2	51.2	
HAD85	47.1	50.9	45.0	48.1	
Growing Season	21.6	19.5	20.0	19.8	
May—Sep	21.6	20.6	19.2	19.9	
GFDL45	21.6	23.4	23.3	23.2	
GFDL85	21.6	23.4	26.6	24.8	
HAD45	21.6	21.2	21.6	21.7	
HAD85	21.6	22.6	17.5	18.5	

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-DGP30 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.

Cite as: Iverson, L.R.; Prasad, A.M.; Peters, M.P.; Matthews, S.N. 2019. Facilitating Adaptive Forest Management under Climate Change: A Spatially Specific Synthesis of 125 Species for Habitat Changes and Assisted Migration over the Eastern United States. *Forests*. 10(11): 989. <https://doi.org/10.3390/f10110989>.

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
white oak	Quercus alba	WDH	Medium	84.9	1151.5	17.7	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
post oak	Quercus stellata	WDH	High	77.9	960.2	15.0	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	2
black oak	Quercus velutina	WDH	High	83.7	835.2	13.7	No change	No change	Medium	Abundant	Good	Good			1	3
northern red oak	Quercus rubra	WDH	Medium	79.1	510.5	8.4	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	4
eastern redcedar	Juniperus virginiana	WDH	Medium	54.7	422.0	9.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	5
black hickory	Carya texana	NDL	High	67.4	371.3	6.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
mockernut hickory	Carya alba	WDL	Medium	69.8	243.9	4.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	7
winged elm	Ulmus alata	WDL	Medium	65.1	221.6	4.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	8
blackgum	Nyssa sylvatica	WDL	Medium	58.1	198.5	4.3	No change	Sm. inc.	High	Common	Good	Very Good			1	9
sassafras	Sassafras albidum	WSL	Low	55.8	193.2	5.0	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	10
black walnut	Juglans nigra	WDH	Low	51.2	169.8	5.0	No change	No change	Medium	Common	Fair	Fair			1	11
American elm	Ulmus americana	WDH	Medium	58.1	163.2	4.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	12
florida maple	Acer barbatum	NSL	Low	25.6	153.2	6.8	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	13
blackjack oak	Quercus marilandica	NSL	Medium	47.7	145.9	4.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	14
flowering dogwood	Cornus florida	WDL	Medium	68.6	143.8	3.0	Sm. dec.	No change	Medium	Common	Poor	Fair			1	15
bitternut hickory	Carya cordiformis	WSL	Low	59.3	134.1	3.6	No change	No change	High	Common	Good	Good			1	16
slippery elm	Ulmus rubra	WSL	Low	62.8	129.9	3.0	No change	Sm. inc.	Medium	Common	Fair	Good			1	17
chinkapin oak	Quercus muehlenbergii	NSL	Medium	51.2	117.9	3.0	No change	No change	Medium	Common	Fair	Fair			1	18
shortleaf pine	Pinus echinata	WDH	High	12.8	110.9	8.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	19
sycamore	Platanus occidentalis	NSL	Low	29.1	108.6	6.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	20
white ash	Fraxinus americana	WDL	Medium	48.8	99.5	2.9	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	21
common persimmon	Diospyros virginiana	NSL	Low	22.1	92.6	4.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	22
red maple	Acer rubrum	WDH	High	40.7	90.0	3.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	23
black locust	Robinia pseudoacacia	NDH	Low	18.6	88.8	4.7	No change	Sm. dec.	Medium	Common	Fair	Poor			1	24
black cherry	Prunus serotina	WDL	Medium	41.9	88.1	3.1	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	25
boxelder	Acer negundo	WSH	Low	15.1	67.4	5.8	No change	Lg. inc.	High	Common	Good	Very Good			1	26
hackberry	Celtis occidentalis	WDH	Medium	41.9	51.4	1.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	27
shagbark hickory	Carya ovata	WSL	Medium	23.3	50.6	2.7	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	28
red mulberry	Morus rubra	NSL	Low	40.7	49.5	2.2	No change	No change	Medium	Rare	Poor	Poor			1	29
eastern redbud	Cercis canadensis	NSL	Low	32.6	49.3	1.9	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	30
silver maple	Acer saccharinum	NSH	Low	2.3	46.2	19.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	31
southern red oak	Quercus falcata	WDL	Medium	15.1	44.5	4.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	32
loblolly pine	Pinus taeda	WDH	High	1.2	37.3	31.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	33
sweetgum	Liquidambar styraciflua	WDH	High	10.5	34.7	5.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	34
sugar maple	Acer saccharum	WDH	High	12.8	27.6	3.3	Lg. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +		2	35
green ash	Fraxinus pennsylvanica	WSH	Low	11.6	25.6	3.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	36
pignut hickory	Carya glabra	WDL	Medium	11.6	21.6	3.1	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	37
honeylocust	Gleditsia triacanthos	NSH	Low	14	20.6	2.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	38
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	24.4	20.6	1.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	39
American basswood	Tilia americana	WSL	Medium	24.4	18.8	1.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	40
serviceberry	Amelanchier spp.	NSL	Low	22.1	17.9	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	41
Osage-orange	Maclura pomifera	NDH	Medium	8.1	16.4	7.5	No change	No change	High	Rare	Fair	Fair		Infill +	1	42
sugarberry	Celtis laevigata	NDH	Medium	5.8	13.2	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	43
ashe juniper	Juniperus ashei	NDH	High	1.2	8.4	7.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			0	44
pawpaw	Asimina triloba	NSL	Low	5.8	8.4	1.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	45
paulownia	Paulownia tomentosa	NSL	FIA	2.3	7.8	3.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	46
bur oak	Quercus macrocarpa	NDH	Medium	1.2	5.6	4.7	Sm. dec.	Sm. dec.	High	Rare	Poor	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
Shumard oak	Quercus shumardii	NSL	Low	4.7	4.7	1.0	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	48
swamp chestnut oak	Quercus michauxii	NSL	Low	1.2	3.7	3.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	49
ailanthus	Ailanthus altissima	NSL	FIA	7	2.9	1.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	50
cedar elm	Ulmus crassifolia	NDH	Medium	1.2	2.9	2.5	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	51
wild plum	Prunus americana	NSLX	FIA	1.2	2.7	2.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	52
waterlocust	Gleditsia aquatica	NSLX	FIA	1.2	2.7	2.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	53
white mulberry	Morus alba	NSL	FIA	1.2	2.6	2.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	54
blue ash	Fraxinus quadrangulata	NSL	Low	5.8	2.3	1.8	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	55
shellbark hickory	Carya laciniosa	NSL	Low	5.8	2.1	1.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	56
pecan	Carya illinoensis	NSH	Low	1.2	1.9	1.6	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	57
butternut	Juglans cinerea	NSLX	FIA	1.2	1.6	1.3	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	58
overcup oak	Quercus lyrata	NSL	Medium	1.2	1.4	1.2	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	59
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	2.3	1.3	0.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	60
yellow-poplar	Liriodendron tulipifera	WDH	High	4.7	0.9	3.0	No change	Lg. inc.	High	Rare	Fair	Good	Infill +		2	61
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	1.2	0.8	0.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	62
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	1.2	0.5	0.4	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			2	63
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	4.7	0.1	0.5	Lg. dec.	Lg. inc.	Medium	Rare	Very Poor	Good			2	64
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	65
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	66
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	67
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	68
American beech	Fagus grandifolia	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	69
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			3	70
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	71
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	72
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	73
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	74
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat		Migrate +	3	75
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	76
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	77
chestnut oak	Quercus prinus	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	78
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	79
black willow	Salix nigra	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	80