

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
 8,882.6 3,429.6 83

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	16	21	Increase	11	9	Very Good	3	1	Likely	0	0
Hickory	3			Medium	26	38	No Change	14	11	Good	12	14	Infill	21	18
Maple	5	Abundant	2	Low	26	11	Decrease	21	26	Fair	10	8	Migrate	5	5
Oak	8	Common	26	FIA	6		New	18	18	Poor	9	10		26	23
Pine	3	Rare	24				Unknown	10	10	Very Poor	9	9			
Other	30	Absent	19					74	74	FIA Only	2	2			
	52		71		74	70				Unknown	4	4			
											49	48			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	48.7	50.6	53.4	53.4	
	CCSM85	48.7	51.2	54.0	57.3	
	GFDL45	48.7	52.9	54.4	55.5	
	GFDL85	48.7	51.9	55.5	59.9	
	HAD45	48.7	51.9	55.4	57.1	
	HAD85	48.7	52.1	56.5	61.8	
Growing Season (May—Sep)	CCSM45	66.3	68.1	70.5	70.8	
	CCSM85	66.3	68.8	71.3	75.3	
	GFDL45	66.3	71.3	73.3	74.7	
	GFDL85	66.3	70.3	74.5	79.6	
	HAD45	66.3	69.7	72.1	74.5	
	HAD85	66.3	69.3	74.0	79.4	
Coldest Month (Average)	CCSM45	21.9	23.5	26.2	26.0	
	CCSM85	21.9	24.5	26.4	28.5	
	GFDL45	21.9	24.8	26.1	26.6	
	GFDL85	21.9	25.3	26.7	28.7	
	HAD45	21.9	23.6	27.6	27.5	
	HAD85	21.9	25.6	28.6	32.2	
Warmest Month (Average)	CCSM45	72.4	74.6	76.2	76.4	
	CCSM85	72.4	75.6	77.2	79.5	
	GFDL45	72.4	75.5	77.3	78.3	
	GFDL85	72.4	76.4	78.6	81.7	
	HAD45	72.4	76.3	77.9	79.5	
	HAD85	72.4	76.7	79.8	83.6	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	32.9	32.9	32.2	33.8	
	CCSM85	32.9	33.6	33.7	33.8	
	GFDL45	32.9	35.7	39.3	39.3	
	GFDL85	32.9	35.6	39.5	41.1	
	HAD45	32.9	33.3	35.5	34.9	
	HAD85	32.9	35.2	33.1	35.9	
Growing Season (May—Sep)	CCSM45	16.2	16.2	15.5	15.9	
	CCSM85	16.2	15.8	16.0	15.0	
	GFDL45	16.2	17.2	18.5	18.7	
	GFDL85	16.2	17.5	17.9	18.2	
	HAD45	16.2	15.8	14.8	15.4	
	HAD85	16.2	16.0	12.8	13.9	

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>.

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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	37	699.1	20.8	Sm. dec.	Sm. dec.	High	Abundant	Good	Good	Infill ++	Infill ++	2	1
black cherry	Prunus serotina	WDL	Medium	34.7	501.2	13.5	No change	Sm. dec.	Low	Abundant	Fair	Fair	Infill +	Infill +	2	2
green ash	Fraxinus pennsylvanica	WSH	Low	37.7	443.4	12.3	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	3
American elm	Ulmus americana	WDH	Medium	43.9	409.9	9.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	2	4
black oak	Quercus velutina	WDH	High	20.1	402.7	16.3	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	5
white oak	Quercus alba	WDH	Medium	21.2	269.9	12.9	Sm. inc.	No change	High	Common	Very Good	Good			2	6
northern red oak	Quercus rubra	WDH	Medium	25.7	244.0	9.2	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	7
sugar maple	Acer saccharum	WDH	High	12.4	232.8	22.3	Sm. inc.	No change	High	Common	Very Good	Good	Infill ++	Infill ++	2	8
boxelder	Acer negundo	WSH	Low	10.7	196.6	22.3	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	9
shagbark hickory	Carya ovata	WSL	Medium	20.3	170.8	14.4	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	10
silver maple	Acer saccharinum	NSH	Low	7.9	156.1	16.8	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	11
American basswood	Tilia americana	WSL	Medium	18	140.8	8.4	No change	Sm. dec.	Medium	Common	Fair	Poor	Infill +	Infill +	2	12
black walnut	Juglans nigra	WDH	Low	3.4	133.0	33.4	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	13
scarlet oak	Quercus coccinea	WDL	Medium	1.1	132.7	100.0	Very Lg. dec.	Very Lg. dec.	Medium	Common	Lost	Lost			0	14
sassafras	Sassafras albidum	WSL	Low	12.2	114.4	7.7	No change	Lg. dec.	Medium	Common	Fair	Poor	Infill +		2	15
swamp white oak	Quercus bicolor	NSL	Low	11.3	111.6	8.4	Sm. inc.	Sm. dec.	Medium	Common	Good	Poor		Infill +	2	16
eastern cottonwood	Populus deltoides	NSH	Low	11.8	110.1	14.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	2	17
bur oak	Quercus macrocarpa	NDH	Medium	19.1	103.7	14.7	No change	No change	High	Common	Good	Good			2	18
quaking aspen	Populus tremuloides	WDH	High	9	82.8	13.8	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	19
black willow	Salix nigra	NSH	Low	5.6	75.8	11.4	Sm. dec.	No change	Low	Common	Poor	Poor		Infill +	2	20
white ash	Fraxinus americana	WDL	Medium	20.3	75.5	5.4	Lg. inc.	Lg. inc.	Low	Common	Good	Good	Infill ++	Infill ++	2	21
red pine	Pinus resinosa	NSH	Medium	3.4	65.9	16.6	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	22
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	6.8	64.9	8.2	Lg. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +		2	23
pignut hickory	Carya glabra	WDL	Medium	9	63.4	6.0	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	24
bitternut hickory	Carya cordiformis	WSL	Low	6.8	61.5	7.7	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	25
black ash	Fraxinus nigra	WSH	Medium	4.5	59.5	11.2	Very Lg. dec.	Very Lg. dec.	Low	Common	Lost	Lost			0	26
northern white-cedar	Thuja occidentalis	WSH	High	3.4	53.7	13.5	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	27
Scots pine	Pinus sylvestris	NSH	FIA	7.9	52.0	13.6	Unknown	Unknown	NA	Common	NNIS	NNIS			0	28
white spruce	Picea glauca	NSL	Medium	3.4	49.3	12.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	29
Norway spruce	Picea abies	NSH	FIA	2.3	47.4	17.9	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	30
tamarack (native)	Larix laricina	NSH	High	3.4	43.1	10.8	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	31
northern pin oak	Quercus ellipsoidalis	NSH	Medium	1.1	40.8	30.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +		2	32
American beech	Fagus grandifolia	WDH	High	4.5	39.5	7.4	No change	Sm. dec.	Medium	Rare	Poor	Very Poor	Infill +		2	33
bigtooth aspen	Populus grandidentata	NSL	Medium	10.1	34.5	5.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	34
yellow birch	Betula alleghaniensis	NDL	High	2.3	29.2	11.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	35
Shumard oak	Quercus shumardii	NSL	Low	1.1	26.4	19.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	36
Siberian elm	Ulmus pumila	NDH	FIA	3.4	24.6	6.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	37
chokecherry	Prunus virginiana	NSLX	FIA	3.4	16.0	4.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	38
eastern white pine	Pinus strobus	WDH	High	2.3	13.3	5.0	No change	Lg. dec.	Low	Rare	Very Poor	Very Poor			2	39
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	4.5	12.5	2.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	40
eastern redcedar	Juniperus virginiana	WDH	Medium	2.3	11.8	4.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	41
hackberry	Celtis occidentalis	WDH	Medium	5.1	11.4	12.0	Sm. inc.	Sm. inc.	High	Rare	Good	Good			2	42
white mulberry	Morus alba	NSL	FIA	3.4	11.1	2.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	43
black locust	Robinia pseudoacacia	NDH	Low	1.1	10.3	7.7	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	44
yellow-poplar	Liriodendron tulipifera	WDH	High	1.1	3.7	2.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			0	45
paper birch	Betula papyrifera	WDH	High	2.3	3.7	1.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	46
slippery elm	Ulmus rubra	WSL	Low	1.1	3.5	2.6	No change	Sm. inc.	Medium	Rare	Poor	Fair			2	47



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serviceberry	Amelanchier spp.	NSL	Low	2.3	2.4	0.9	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0	48	
butternut	Juglans cinerea	NSLX	FIA	1.1	2.1	1.6	Unknown	Unknown	Low	Rare	FIA Only	FIA Only					0	49
black maple	Acer nigrum	NSH	Low	1.1	1.7	1.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor					0	50
flowering dogwood	Cornus florida	WDL	Medium	1.1	1.6	1.2	Sm. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost					0	51
blackgum	Nyssa sylvatica	WDL	Medium	4.5	0.5	1.4	Sm. inc.	Lg. inc.	High	Rare	Good	Good					0	52
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat					0	53
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown					0	54
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown					0	55
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat					0	56
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat					0	57
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat					3	58
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat					0	59
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +				3	60
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat					3	61
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +			3	62
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +			3	63
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat					3	64
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown					0	65
red mulberry	Morus rubra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat					3	66
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +			3	67
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat					0	68
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +			3	69
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat					3	70
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat					0	71
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown					0	72
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +			3	73
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat					0	74