

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
 8,489.8 3,277.9 190

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	4			10	11	Increase	16	19	Very Good	10	12	Likely	0	0
Hickory	3			28	38	No Change	11	8	Good	6	6	Infill	4	4
Maple	1	Abundant	6	20	9	Decrease	10	10	Fair	5	5	Migrate	0	0
Oak	8	Common	14	3		New	3	6	Poor	7	6			
Pine	5	Rare	20			Unknown	21	18	Very Poor	7	6			
Other	19	Absent	17	FIA	3				FIA Only	3	3			
	40		57				61	61	Unknown	18	15			
										56	53			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099	
Annual	71.2	72.6	74.1	74.1	
Average	71.2	72.7	74.9	77.0	
GFDL45	71.2	74.2	75.4	76.1	
GFDL85	71.2	73.5	76.4	79.7	
HAD45	71.2	72.8	75.0	76.2	
HAD85	71.2	73.4	75.8	79.3	
Growing Season	80.1	81.3	82.5	82.7	
May—Sep	80.1	81.4	83.5	85.9	
GFDL45	80.1	83.1	84.1	85.1	
GFDL85	80.1	82.5	85.2	88.8	
HAD45	80.1	82.4	84.2	85.4	
HAD85	80.1	82.8	85.8	89.0	
Coldest Month	56.6	58.8	59.7	59.5	
Average	56.6	58.3	59.2	60.6	
GFDL45	56.6	59.3	59.7	60.3	
GFDL85	56.6	59.0	60.1	61.1	
HAD45	56.6	56.5	57.7	58.3	
HAD85	56.6	57.3	57.9	59.8	
Warmest Month	82.2	83.5	84.2	84.3	
Average	82.2	83.5	84.8	86.2	
GFDL45	82.2	84.4	85.3	86.0	
GFDL85	82.2	84.6	86.1	87.9	
HAD45	82.2	84.7	85.4	86.0	
HAD85	82.2	84.7	86.4	87.7	

Precipitation (in)

Scenario	2009	2039	2069	2099	
Annual	50.9	54.4	55.7	56.9	
Total	50.9	53.6	54.5	54.2	
GFDL45	50.9	59.6	61.2	63.3	
GFDL85	50.9	55.2	64.2	61.0	
HAD45	50.9	50.2	49.8	52.6	
HAD85	50.9	48.2	48.6	47.0	
Growing Season	31.5	34.1	33.6	34.6	
May—Sep	31.5	33.2	33.8	32.2	
GFDL45	31.5	36.9	37.5	37.9	
GFDL85	31.5	35.1	39.7	37.8	
HAD45	31.5	31.4	30.8	29.5	
HAD85	31.5	28.9	26.5	25.5	

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-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.

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
slash pine	Pinus elliottii	NDH	High	49.3	1190.7	27.1	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			2	1
sand pine	Pinus clausa	NDH	High	29.2	1021.8	44.3	No change	Sm. dec.	Low	Abundant	Fair	Fair			0	2
live oak	Quercus virginiana	NDH	High	54.2	747.1	15.9	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			2	3
laurel oak	Quercus laurifolia	NDH	Medium	57.6	572.1	12.3	No change	No change	Medium	Abundant	Good	Good			2	4
red maple	Acer rubrum	WDH	High	48.2	549.7	15.3	No change	No change	High	Abundant	Very Good	Very Good			2	5
longleaf pine	Pinus palustris	NSH	Medium	37.7	506.2	22.4	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			0	6
cabbage palmetto	Sabal palmetto	NDH	Medium	28.1	340.7	11.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			0	7
pond cypress	Taxodium ascendens	NSH	Medium	14.1	262.5	22.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			2	8
bald cypress	Taxodium distichum	NSH	Medium	29.4	241.4	10.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			2	9
swamp tupelo	Nyssa biflora	NDH	Medium	36.4	239.3	8.9	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair	Infill +	Infill +	2	10
sweetgum	Liquidambar styraciflua	WDH	High	28.1	224.3	6.8	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	11
loblolly-bay	Gordonia lasianthus	NSH	Medium	22.4	132.1	9.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			2	12
loblolly pine	Pinus taeda	WDH	High	10.6	112.1	9.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			2	13
pond pine	Pinus serotina	NSH	Medium	11.8	108.3	12.1	No change	Sm. inc.	Low	Common	Poor	Fair	Infill +	Infill +	2	14
sweetbay	Magnolia virginiana	NSL	Medium	34.1	91.9	5.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			2	15
turkey oak	Quercus laevis	NSH	Medium	15.3	87.6	8.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			2	16
redbay	Persea borbonia	NSL	Low	31.7	77.9	3.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			2	17
water oak	Quercus nigra	WDH	High	21.2	73.3	3.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			2	18
pumpkin ash	Fraxinus profunda	NSH	FIA	8.1	66.7	7.4	Unknown	Unknown	NA	Common	FIA Only	FIA Only			0	19
American elm	Ulmus americana	WDH	Medium	20	65.5	2.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			2	20
pignut hickory	Carya glabra	WDL	Medium	10.5	49.2	6.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	21
green ash	Fraxinus pennsylvanica	WSH	Low	4.6	36.9	7.0	No change	No change	Medium	Rare	Poor	Poor			0	22
Carolina ash	Fraxinus caroliniana	NSL	FIA	7.1	19.6	5.8	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	23
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	7	19.1	2.5	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			0	24
sand hickory	Carya pallida	NSL	FIA	2.3	15.7	6.1	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	25
black cherry	Prunus serotina	WDL	Medium	12.8	15.1	3.4	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	26
sugarberry	Celtis laevigata	NDH	Medium	4.7	13.6	2.7	No change	Lg. inc.	Medium	Rare	Poor	Good			2	27
southern magnolia	Magnolia grandiflora	NSL	Low	3.5	10.5	2.7	No change	No change	Medium	Rare	Poor	Poor			0	28
blackgum	Nyssa sylvatica	WDL	Medium	8.2	7.9	2.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	29
bluejack oak	Quercus incana	NSL	Low	7.1	7.6	2.7	No change	No change	Medium	Rare	Poor	Poor			0	30
American holly	Ilex opaca	NSL	Medium	5.7	7.1	1.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	31
water tupelo	Nyssa aquatica	NSH	Medium	1.2	5.7	4.5	No change	No change	Low	Rare	Very Poor	Very Poor			0	32
white ash	Fraxinus americana	WDL	Medium	1.2	5.5	4.3	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	33
common persimmon	Diospyros virginiana	NSL	Low	4.7	4.0	0.8	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	34
post oak	Quercus stellata	WDH	High	1.2	3.0	2.3	No change	Lg. inc.	High	Rare	Fair	Good			2	35
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	1.2	1.1	0.9	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	36
swamp chestnut oak	Quercus michauxii	NSL	Low	1.2	1.1	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	37
water hickory	Carya aquatica	NSL	Medium	1.2	0.7	0.5	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	38
blackjack oak	Quercus marilandica	NSL	Medium	1.2	0.5	0.4	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	39
pawpaw	Asimina triloba	NSL	Low	1.2	0.4	0.3	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	40
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	41
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	42
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	43
river birch	Betula nigra	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	44
gray birch	Betula populifolia	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	45
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	46
mockernut hickory	Carya alba	WDL	Medium	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			3	47

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
eastern redbud	<i>Cercis canadensis</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 48
flowering dogwood	<i>Cornus florida</i>	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 49
silverbell	<i>Halesia spp.</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 50
cucumbertree	<i>Magnolia acuminata</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 51
bigleaf magnolia	<i>Magnolia macrophylla</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 52
sourwood	<i>Oxydendrum arboreum</i>	NDL	High	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 53
sycamore	<i>Platanus occidentalis</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 54
southern red oak	<i>Quercus falcata</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3 55
black locust	<i>Robinia pseudoacacia</i>	NDH	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 56
black willow	<i>Salix nigra</i>	NSH	Low	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat				3 57
American mountain-ash	<i>Sorbus americana</i>	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 58
American basswood	<i>Tilia americana</i>	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 59
winged elm	<i>Ulmus alata</i>	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 60
cedar elm	<i>Ulmus crassifolia</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				0 61