

One x One Degree
Climate Change Atlas Tree Species
 Current and Potential Future Habitat, Capability, and Migration

	sq. km	sq. mi	FIA Plots
Area of Region	9,549.4	3,687.0	263

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	2			High	21	27	Increase	20	27	Very Good	8	9	Likely	0	0
Hickory	4			Medium	26	47	No Change	18	16	Good	17	21	Infill	7	10
Maple	6	Abundant	6	Low	36	13	Decrease	19	14	Fair	9	9	Migrate	6	10
Oak	10	Common	24	FIA	8		New	13	16	Poor	13	10		13	20
Pine	8	Rare	35				Unknown	21	18	Very Poor	7	5			
Other	35	Absent	24							FIA Only	4	4			
	65		89		91	87		91	91	Unknown	13	10			
											71	68			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	51.4	53.2	55.5	55.8	
	CCSM85	51.4	53.6	56.2	59.3	
	GFDL45	51.4	54.3	57.2	58.3	
	GFDL85	51.4	54.9	58.3	62.4	
	HAD45	51.4	54.0	57.5	58.9	
	HAD85	51.4	54.3	58.5	63.2	
Growing Season (May—Sep)	CCSM45	67.0	69.0	71.0	71.6	
	CCSM85	67.0	69.3	72.0	75.9	
	GFDL45	67.0	70.4	74.1	75.7	
	GFDL85	67.0	71.5	75.5	80.1	
	HAD45	67.0	70.2	73.4	75.3	
	HAD85	67.0	70.1	75.3	80.5	
Coldest Month (Average)	CCSM45	27.7	29.6	31.2	31.6	
	CCSM85	27.7	30.2	31.5	33.1	
	GFDL45	27.7	30.9	31.6	32.3	
	GFDL85	27.7	30.6	31.7	33.2	
	HAD45	27.7	29.2	31.5	31.6	
	HAD85	27.7	29.8	31.6	33.6	
Warmest Month (Average)	CCSM45	72.7	74.9	76.0	76.4	
	CCSM85	72.7	75.1	77.0	79.0	
	GFDL45	72.7	76.1	78.3	79.7	
	GFDL85	72.7	77.7	80.2	83.0	
	HAD45	72.7	76.3	78.5	79.8	
	HAD85	72.7	76.9	80.2	83.8	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	38.4	41.6	41.8	43.4	
	CCSM85	38.4	41.5	42.6	47.6	
	GFDL45	38.4	42.6	44.1	44.3	
	GFDL85	38.4	39.2	44.7	45.7	
	HAD45	38.4	41.1	41.3	41.0	
	HAD85	38.4	42.7	39.2	42.3	
Growing Season (May—Sep)	CCSM45	17.8	20.0	20.3	20.4	
	CCSM85	17.8	19.8	19.9	21.7	
	GFDL45	17.8	18.8	18.7	18.7	
	GFDL85	17.8	16.9	18.7	18.8	
	HAD45	17.8	19.4	17.7	17.9	
	HAD85	17.8	19.3	16.8	17.6	

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>.

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
chestnut oak	Quercus prinus	NDH	High	83.1	1471.6	14.3	No change	Sm. dec.	High	Abundant	Very Good	Good			1	1
white oak	Quercus alba	WDH	Medium	76.2	1119.1	12.9	No change	No change	High	Abundant	Very Good	Very Good			1	2
red maple	Acer rubrum	WDH	High	76.8	970.5	10.2	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
northern red oak	Quercus rubra	WDH	Medium	69	642.0	6.9	No change	Sm. inc.	High	Abundant	Very Good	Very Good			1	4
black oak	Quercus velutina	WDH	High	68.6	516.0	6.1	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	5
sugar maple	Acer saccharum	WDH	High	44.3	511.2	9.5	No change	No change	High	Abundant	Very Good	Very Good			1	6
scarlet oak	Quercus coccinea	WDL	Medium	57.2	477.6	6.2	No change	Sm. dec.	Medium	Common	Fair	Poor			1	7
black locust	Robinia pseudoacacia	NDH	Low	63.3	465.6	5.6	Sm. dec.	No change	Medium	Common	Poor	Fair			1	8
Virginia pine	Pinus virginiana	NDH	High	52.1	429.4	7.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	9
black cherry	Prunus serotina	WDL	Medium	63.2	402.5	5.1	No change	No change	Low	Common	Poor	Poor			0	10
blackgum	Nyssa sylvatica	WDL	Medium	64	378.9	4.5	No change	No change	High	Common	Good	Good			1	11
pignut hickory	Carya glabra	WDL	Medium	66.1	355.6	4.7	No change	No change	Medium	Common	Fair	Fair			1	12
yellow-poplar	Liriodendron tulipifera	WDH	High	33.8	292.0	6.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	13
eastern white pine	Pinus strobus	WDH	High	33.9	280.5	6.8	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	14
white ash	Fraxinus americana	WDL	Medium	51.7	275.6	3.7	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	15
sweet birch	Betula lenta	NDH	High	36.6	262.4	4.9	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	16
sassafras	Sassafras albidum	WSL	Low	47.6	238.7	3.9	No change	No change	Medium	Common	Fair	Fair			1	17
eastern redcedar	Juniperus virginiana	WDH	Medium	10.8	134.5	8.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	18
mockernut hickory	Carya alba	WDL	Medium	39.5	113.8	2.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	19
black walnut	Juglans nigra	WDH	Low	23.9	110.6	3.4	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	20
pitch pine	Pinus rigida	NSH	High	25.3	105.5	3.4	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	21
loblolly pine	Pinus taeda	WDH	High	7.3	105.4	14.4	No change	Lg. inc.	Medium	Common	Fair	Very Good	Infill +	Infill ++	1	22
shagbark hickory	Carya ovata	WSL	Medium	29.6	100.0	3.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	23
ailanthus	Ailanthus altissima	NSL	FIA	18.8	83.2	3.4	Unknown	Unknown	NA	Common	NNIS	NNIS			0	24
American basswood	Tilia americana	WSL	Medium	12.3	78.0	4.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	25
serviceberry	Amelanchier spp.	NSL	Low	35	74.5	1.6	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	26
eastern hemlock	Tsuga canadensis	NSH	High	9.6	62.2	5.5	No change	No change	Low	Common	Poor	Poor			0	27
Norway spruce	Picea abies	NSH	FIA	0.1	58.4	3.2	Unknown	Unknown	NA	Common	NNIS	NNIS			0	28
bitternut hickory	Carya cordiformis	WSL	Low	9	57.3	3.3	No change	No change	High	Common	Good	Good			1	29
sycamore	Platanus occidentalis	NSL	Low	6.7	53.4	5.8	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +	Infill ++	1	30
boxelder	Acer negundo	WSH	Low	6.3	47.0	7.5	Sm. dec.	No change	High	Rare	Poor	Fair			1	31
hackberry	Celtis occidentalis	WDH	Medium	10.3	46.5	2.4	Sm. dec.	Sm. inc.	High	Rare	Poor	Good	Infill +	Infill ++	1	32
slippery elm	Ulmus rubra	WSL	Low	10.1	43.1	3.5	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	33
eastern redbud	Cercis canadensis	NSL	Low	17.2	39.5	1.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	34
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	17.9	38.4	1.8	No change	Sm. inc.	High	Rare	Fair	Good			1	35
flowering dogwood	Cornus florida	WDL	Medium	25.3	32.5	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	36
American elm	Ulmus americana	WDH	Medium	11.9	32.0	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	37
Table Mountain pine	Pinus pungens	NSL	Low	9.4	27.6	2.9	No change	No change	High	Rare	Fair	Fair			1	38
American beech	Fagus grandifolia	WDH	High	7.3	25.7	2.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	39
Osage-orange	Maclura pomifera	NDH	Medium	1.8	23.1	10.8	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	40
striped maple	Acer pensylvanicum	NSL	Medium	6.5	22.0	2.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	41
cucumbertree	Magnolia acuminata	NSL	Low	5.4	13.3	1.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	42
Scots pine	Pinus sylvestris	NSH	FIA	2.9	11.5	1.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	43
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	5.8	11.5	1.8	No change	No change	Medium	Rare	Poor	Poor			1	44
red pine	Pinus resinosa	NSH	Medium	0.1	8.3	0.5	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	45
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	4.7	7.0	1.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	46
pawpaw	Asimina triloba	NSL	Low	2.1	6.3	3.0	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	47



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bigtooth aspen	Populus grandidentata	NSL	Medium	5.2	5.8	1.1	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0 48
butternut	Juglans cinerea	NSLX	FIA	5.6	5.6	1.9	Unknown	Unknown	Low	Rare	FIA Only	FIA Only				0 49
common persimmon	Diospyros virginiana	NSL	Low	1.8	5.5	2.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++		1 50
honeylocust	Gleditsia triacanthos	NSH	Low	1.8	4.7	1.7	Sm. dec.	Sm. inc.	High	Rare	Poor	Good				2 51
swamp chestnut oak	Quercus michauxii	NSL	Low	0.6	3.3	1.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 52
Norway maple	Acer platanoides	NSL	FIA	0.7	2.9	1.7	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 53
chinkapin oak	Quercus muehlenbergii	NSL	Medium	1	2.9	2.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 54
shortleaf pine	Pinus echinata	WDH	High	1.6	2.7	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 55
pin cherry	Prunus pensylvanica	NSL	Low	0.6	2.7	1.5	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0 56
American chestnut	Castanea dentata	NSLX	FIA	3.6	2.7	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 57
red mulberry	Morus rubra	NSL	Low	0.8	2.3	1.7	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +		2 58
pin oak	Quercus palustris	NSH	Low	1	2.2	2.1	No change	No change	Low	Rare	Very Poor	Very Poor				2 59
post oak	Quercus stellata	WDH	High	0.4	1.7	0.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good				2 60
river birch	Betula nigra	NSL	Low	1	1.7	1.6	Sm. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair		Infill +		2 61
chokecherry	Prunus virginiana	NSLX	FIA	3	1.6	0.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 62
green ash	Fraxinus pennsylvanica	WSH	Low	1	0.7	0.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 63
yellow birch	Betula alleghaniensis	NDL	High	1	0.6	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 64
silver maple	Acer saccharinum	NSH	Low	1	0.3	0.3	Sm. inc.	Lg. inc.	High	Rare	Good	Good				2 65
northern white-cedar	Thuja occidentalis	WSH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 66
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 67
black maple	Acer nigrum	NSH	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 68
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat				0 69
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 70
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 71
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 72
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 73
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 74
blue ash	Fraxinus quadrangulata	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 75
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 76
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 77
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 78
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				0 79
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 80
redbay	Persea borbonia	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 81
quaking aspen	Populus tremuloides	WDH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 82
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 83
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 84
bur oak	Quercus macrocarpa	NDH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown				0 85
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 86
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3 87
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 88
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				3 89
black willow	Salix nigra	NSH	Low	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat		Migrate ++		3 90
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 91