

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	10,066	3,886.5	288

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	22	25	Increase	27	34	Very Good	11	12	Likely	0	0
Hickory	6			Medium	32	54	No Change	12	7	Good	17	20	Infill	8	11
Maple	6	Abundant	6	Low	40	17	Decrease	34	32	Fair	13	14	Migrate	2	9
Oak	15	Common	31	FIA	5		New	13	13	Poor	14	12			
Pine	5	Rare	41				Unknown	13	13	Very Poor	17	11			
Other	43	Absent	19							FIA Only	3	3			
	78		97		99	96		99	99	Unknown	8	8			
											83	80			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	57.3	59.1	61.4	61.5	
	CCSM85	57.3	59.5	62.1	64.9	
	GFDL45	57.3	60.1	62.2	63.0	
	GFDL85	57.3	60.0	63.3	66.8	
	HAD45	57.3	59.6	62.7	64.0	
	HAD85	57.3	60.0	64.4	68.2	
Growing Season May—Sep	CCSM45	71.5	73.2	75.2	75.7	
	CCSM85	71.5	73.5	76.3	79.9	
	GFDL45	71.5	74.7	77.1	78.4	
	GFDL85	71.5	74.5	78.6	82.6	
	HAD45	71.5	74.7	77.6	79.1	
	HAD85	71.5	74.8	81.3	84.8	
Coldest Month Average	CCSM45	35.6	37.8	38.8	39.0	
	CCSM85	35.6	38.5	39.5	40.8	
	GFDL45	35.6	39.2	39.1	39.5	
	GFDL85	35.6	37.3	38.4	38.9	
	HAD45	35.6	35.4	37.6	37.9	
	HAD85	35.6	36.8	38.3	39.9	
Warmest Month Average	CCSM45	76.3	78.1	79.2	79.3	
	CCSM85	76.3	78.3	80.0	81.7	
	GFDL45	76.3	79.1	80.6	81.5	
	GFDL85	76.3	79.4	81.9	84.0	
	HAD45	76.3	80.6	82.9	83.6	
	HAD85	76.3	81.5	86.0	87.5	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	55.9	58.5	62.8	60.8	
	CCSM85	55.9	61.2	62.2	67.5	
	GFDL45	55.9	63.2	65.3	69.9	
	GFDL85	55.9	63.3	66.6	69.1	
	HAD45	55.9	53.7	58.9	59.7	
	HAD85	55.9	57.4	52.4	57.6	
Growing Season May—Sep	CCSM45	22.4	22.6	23.6	23.5	
	CCSM85	22.4	23.4	21.9	24.2	
	GFDL45	22.4	26.5	26.8	27.9	
	GFDL85	22.4	26.1	27.5	28.3	
	HAD45	22.4	21.5	21.8	21.9	
	HAD85	22.4	23.0	17.5	19.8	

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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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAir	ChngCI45	ChngCI85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
white oak	Quercus alba	WDH	Medium	84.2	1015.8	8.9	No change	No change	High	Abundant	Very Good	Very Good			1	1
red maple	Acer rubrum	WDH	High	88.9	864.6	7.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
chestnut oak	Quercus prinus	NDH	High	63.2	770.4	9.3	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
yellow-poplar	Liriodendron tulipifera	WDH	High	78.3	715.7	6.8	Sm. dec.	Lg. dec.	High	Abundant	Good	Good			1	4
loblolly pine	Pinus taeda	WDH	High	32	673.6	18.3	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	5
Virginia pine	Pinus virginiana	NDH	High	54.9	630.7	9.5	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	6
sourwood	Oxydendrum arboreum	NDL	High	79.7	438.0	4.4	Sm. dec.	Lg. dec.	High	Common	Fair	Fair			1	7
sugar maple	Acer saccharum	WDH	High	45.8	412.9	6.7	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	8
scarlet oak	Quercus coccinea	WDL	Medium	55.6	405.1	5.4	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	9
sweetgum	Liquidambar styraciflua	WDH	High	41.8	371.5	8.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	10
pignut hickory	Carya glabra	WDL	Medium	69.4	349.8	4.0	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	11
eastern redcedar	Juniperus virginiana	WDH	Medium	36.5	313.0	6.5	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	12
blackgum	Nyssa sylvatica	WDL	Medium	85.2	304.5	2.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	13
black oak	Quercus velutina	WDH	High	62	266.4	3.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	14
southern red oak	Quercus falcata	WDL	Medium	40.3	254.1	5.6	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	15
mockernut hickory	Carya alba	WDL	Medium	64.9	235.1	3.0	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	16
post oak	Quercus stellata	WDH	High	39.5	179.3	3.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	17
shortleaf pine	Pinus echinata	WDH	High	32.3	160.7	4.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	18
black cherry	Prunus serotina	WDL	Medium	50.2	160.1	2.8	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	19
northern red oak	Quercus rubra	WDH	Medium	50.1	159.1	2.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	20
shagbark hickory	Carya ovata	WSL	Medium	43.6	155.5	2.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	21
sassafras	Sassafras albidum	WDL	Low	53.3	128.5	2.1	Sm. dec.	No change	Medium	Common	Poor	Fair			1	22
American beech	Fagus grandifolia	WDH	High	21.7	124.9	4.1	No change	No change	Medium	Common	Fair	Fair			1	23
white ash	Fraxinus americana	WDL	Medium	34.3	114.5	2.6	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	24
flowering dogwood	Cornus florida	WDL	Medium	50.1	109.2	1.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	25
eastern hemlock	Tsuga canadensis	NSH	High	14	89.0	3.5	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	26
chinkapin oak	Quercus muehlenbergii	NSL	Medium	17.9	86.9	2.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	27
winged elm	Ulmus alata	WDL	Medium	30	86.7	2.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	28
green ash	Fraxinus pennsylvanica	WSH	Low	26.5	85.6	2.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	29
black locust	Robinia pseudoacacia	NDH	Low	22.8	77.9	2.5	No change	Sm. dec.	Medium	Common	Fair	Poor			1	30
black walnut	Juglans nigra	WDH	Low	20.8	71.0	2.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	31
bitternut hickory	Carya cordiformis	WSL	Low	16.8	70.3	3.6	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	32
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	12.2	65.3	5.5	No change	Sm. inc.	Medium	Common	Fair	Good			1	33
ailanthus	Ailanthus altissima	NSL	FIA	14.2	63.6	2.6	Unknown	Unknown	NA	Common	NNIS	NNIS			0	34
eastern white pine	Pinus strobus	WDH	High	12.6	62.4	3.4	No change	Sm. dec.	Low	Common	Poor	Poor			0	35
American basswood	Tilia americana	WSL	Medium	10.8	52.6	4.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	36
willow oak	Quercus phellos	NSL	Low	9.8	51.7	2.4	Sm. dec.	No change	Medium	Common	Poor	Fair	Infill +	Infill +	1	37
sycamore	Platanus occidentalis	NSL	Low	14.2	48.7	4.1	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	38
slippery elm	Ulmus rubra	WSL	Low	15.3	48.4	2.1	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	39
common persimmon	Diospyros virginiana	NSL	Low	11.7	48.0	2.9	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	40
hackberry	Celtis occidentalis	WDH	Medium	10.2	46.9	3.3	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	41
American elm	Ulmus americana	WDH	Medium	16.5	46.7	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	42
eastern redbud	Cercis canadensis	NSL	Low	25.2	35.8	1.2	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	43
blackjack oak	Quercus marilandica	NSL	Medium	5.7	33.2	5.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	44
yellow buckeye	Aesculus flava	NSL	Low	11.5	30.2	2.0	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	45
silver maple	Acer saccharinum	NSH	Low	1.8	29.4	12.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	46
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	14.5	24.8	1.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	47



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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
cucumbertree	Magnolia acuminata	NSL	Low	8.6	19.2	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 48
sand hickory	Carya pallida	NSL	FIA	7.1	16.4	2.0	Unknown	Unknown	NA	Rare	FIA Only	FIA Only				0 49
sugarberry	Celtis laevigata	NDH	Medium	6	14.6	5.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		2 50
boxelder	Acer negundo	WSH	Low	9.6	14.6	1.7	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++		1 51
water tupelo	Nyssa aquatica	NSH	Medium	0.7	13.8	9.2	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				0 52
water oak	Quercus nigra	WDH	High	4.7	13.5	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		2 53
American holly	Ilex opaca	NSL	Medium	6.6	13.1	0.7	No change	No change	Medium	Rare	Poor	Poor				1 54
red mulberry	Morus rubra	NSL	Low	11.8	12.1	1.4	Lg. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair				1 55
blue ash	Fraxinus quadrangulata	NSL	Low	3.5	9.2	1.3	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				0 56
eastern cottonwood	Populus deltoides	NSH	Low	0.4	8.9	3.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 57
Shumard oak	Quercus shumardii	NSL	Low	2	6.8	3.4	No change	No change	High	Rare	Fair	Fair		Infill +		2 58
pitch pine	Pinus rigida	NSH	High	0.8	6.3	5.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				2 59
shellbark hickory	Carya laciniosa	NSL	Low	1.3	5.9	2.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 60
florida maple	Acer barbatum	NSL	Low	1.2	5.7	1.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++		2 61
paulownia	Paulownia tomentosa	NSL	FIA	3.9	5.6	0.7	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 62
pawpaw	Asimina triloba	NSL	Low	3.5	4.1	0.5	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost				0 63
wild plum	Prunus americana	NSLX	FIA	0.4	3.6	1.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 64
river birch	Betula nigra	NSL	Low	2	3.4	1.7	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +		2 65
serviceberry	Amelanchier spp.	NSL	Low	3.2	3.2	0.4	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0 66
honeylocust	Gleditsia triacanthos	NSH	Low	2.1	3.1	0.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++		2 67
black willow	Salix nigra	NSH	Low	1.5	2.6	1.0	No change	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +		2 68
sweet birch	Betula lenta	NDH	High	2	2.6	0.5	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor				0 69
bigleaf magnolia	Magnolia macrophylla	NSL	Low	3.4	2.5	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 70
Osage-orange	Maclura pomifera	NDH	Medium	1.7	2.5	0.4	No change	Lg. inc.	High	Rare	Fair	Good				2 71
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	2.6	1.6	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 72
yellow birch	Betula alleghaniensis	NDL	High	2	1.3	0.7	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost				0 73
pin oak	Quercus palustris	NSH	Low	1	1.2	1.2	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost				0 74
striped maple	Acer pensylvanicum	NSL	Medium	2	1.1	0.5	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 75
laurel oak	Quercus laurifolia	NDH	Medium	2.4	1.0	2.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good		Infill ++		2 76
rock elm	Ulmus thomasii	NSLX	FIA	0.6	0.7	0.4	Unknown	Unknown	Low	Rare	FIA Only	FIA Only				0 77
bigtooth aspen	Populus grandidentata	NSL	Medium	1	0.6	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 78
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 79
slash pine	Pinus elliottii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3 80
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 81
black maple	Acer nigrum	NSH	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 82
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 83
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 84
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++		3 85
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +		3 86
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 87
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 88
silverbell	Halesia spp.	NSL	Low	0	0	0	New Habitat	Unknown	Medium	Absent	New Habitat	Unknown				3 89
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 90
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 91
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 92
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 93
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 94

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overcup oak	Quercus lyrata	NSL	Medium	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	95
swamp chestnut oak	Quercus michauxii	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	96
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	97
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat		Migrate +	3	98
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	99