

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	313

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			
						Scenario	Scenario	Scenario	Scenario	SHIFT	SHIFT		
				Reliability	Adaptability	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85		
Ash	3			High	19	25	Increase	29	31	Very Good	16	17	
Hickory	6			Medium	36	53	No Change	16	17	Good	18	18	
Maple	5	Abundant	6	Low	33	13	Decrease	24	21	Fair	9	10	
Oak	17	Common	29	FIA	7		New	12	12	Poor	10	11	
Pine	6	Rare	41					Unknown	14	14	Very Poor	13	10
Other	39	Absent	15							FIA Only	5	5	
	76	91								Unknown	7	7	
								95	95		78	78	
											20	23	

Potential Changes in Climate Variables

Temperature (°F)						Precipitation (in)						
	Scenario	2009	2039	2069	2099		Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	60.1	61.9	64.0	64.1		Annual Total	CCSM45	45.8	51.0	52.9	55.0
	CCSM85	60.1	62.2	64.6	67.6			CCSM85	45.8	51.2	54.4	60.6
	GFDL45	60.1	62.8	65.1	66.0			GFDL45	45.8	50.8	55.1	58.3
	GFDL85	60.1	63.0	66.2	70.0			GFDL85	45.8	50.1	56.7	57.6
	HAD45	60.1	62.3	65.3	66.7			HAD45	45.8	48.8	50.1	49.7
	HAD85	60.1	62.6	66.5	70.8			HAD85	45.8	51.2	47.6	48.7
Growing Season	CCSM45	74.3	76.1	77.9	78.3		Growing Season	CCSM45	21.2	25.3	26.7	28.3
	CCSM85	74.3	76.2	78.8	82.4			CCSM85	21.2	24.4	26.1	29.5
	GFDL45	74.3	77.2	79.8	81.1			GFDL45	21.2	24.9	27.8	29.2
	GFDL85	74.3	77.6	81.2	85.4			GFDL85	21.2	24.0	29.3	29.8
	HAD45	74.3	77.2	80.0	81.7			HAD45	21.2	22.3	22.4	22.8
	HAD85	74.3	77.2	82.3	86.9			HAD85	21.2	24.6	21.7	20.6
Coldest Month	CCSM45	39.0	41.2	42.0	42.1		May-Sep	CCSM45	21.2	25.3	26.7	28.3
	CCSM85	39.0	41.3	42.3	43.5			CCSM85	21.2	24.4	26.1	29.5
	GFDL45	39.0	42.4	42.6	43.4			GFDL45	21.2	24.9	27.8	29.2
	GFDL85	39.0	41.2	42.1	43.1			GFDL85	21.2	24.0	29.3	29.8
	HAD45	39.0	39.6	41.3	41.6			HAD45	21.2	22.3	22.4	22.8
	HAD85	39.0	40.1	41.3	42.8			HAD85	21.2	24.6	21.7	20.6
Warmest Month	CCSM45	79.6	81.6	82.6	82.7		Average	CCSM45	79.6	81.6	82.6	82.7
	CCSM85	79.6	81.8	83.4	85.0			CCSM85	79.6	82.3	83.3	84.4
	GFDL45	79.6	82.3	83.3	84.4			GFDL45	79.6	82.9	84.7	87.2
	GFDL85	79.6	82.9	84.7	87.2			GFDL85	79.6	82.9	84.6	85.4
	HAD45	79.6	82.9	84.6	85.4			HAD45	79.6	82.9	84.6	85.4
	HAD85	79.6	83.5	86.7	89.4			HAD85	79.6	83.5	86.7	89.4

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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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
loblolly pine	Pinus taeda	WDH	High	83.2	3094.2	26.5	No change	No change	Medium	Abundant	Good	Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	87.6	1213.9	9.6	No change	No change	Medium	Abundant	Good	Good			1	2
red maple	Acer rubrum	WDH	High	88.7	962.2	7.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
yellow-poplar	Liriodendron tulipifera	WDH	High	78.9	823.2	6.8	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	4
white oak	Quercus alba	WDH	Medium	77.7	687.0	6.6	No change	No change	High	Abundant	Very Good	Very Good			1	5
longleaf pine	Pinus palustris	NSH	Medium	24.3	541.8	17.2	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	6
shortleaf pine	Pinus echinata	WDH	High	50.3	306.9	4.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	7
southern red oak	Quercus falcata	WDL	Medium	62.4	249.0	2.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	8
eastern redcedar	Juniperus virginiana	WDH	Medium	53.1	248.2	3.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	9
pignut hickory	Carya glabra	WDL	Medium	59.7	201.3	2.6	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	10
water oak	Quercus nigra	WDH	High	35.9	197.4	3.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	11
sourwood	Oxydendrum arboreum	NDL	High	56.4	193.7	2.6	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	12
post oak	Quercus stellata	WDH	High	51.3	177.6	3.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	13
Virginia pine	Pinus virginiana	NDH	High	28.7	171.8	3.6	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	14
blackgum	Nyssa sylvatica	WDL	Medium	56.2	161.0	2.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	15
turkey oak	Quercus laevis	NSH	Medium	18.5	143.1	5.8	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	16
black cherry	Prunus serotina	WDL	Medium	56.7	140.7	1.6	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	17
blackjack oak	Quercus marilandica	NSL	Medium	22.5	132.9	4.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	18
American holly	Ilex opaca	NSL	Medium	52.6	130.9	1.9	No change	No change	Medium	Common	Fair	Fair			1	19
flowering dogwood	Cornus florida	WDL	Medium	62.2	129.0	1.4	No change	No change	Medium	Common	Fair	Fair			1	20
mockernut hickory	Carya alba	WDL	Medium	55.6	128.5	1.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	21
winged elm	Ulmus alata	WDL	Medium	36.3	128.4	2.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	22
chestnut oak	Quercus prinus	NDH	High	11.9	124.7	7.0	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	23
northern red oak	Quercus rubra	WDH	Medium	39.9	120.8	1.8	No change	No change	High	Common	Good	Good			1	24
black oak	Quercus velutina	WDH	High	36	99.6	1.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	25
scarlet oak	Quercus coccinea	WDL	Medium	33.7	98.3	2.3	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	26
willow oak	Quercus phellos	NSL	Low	23.5	83.5	2.5	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	27
white ash	Fraxinus americana	WDL	Medium	31.5	79.7	1.8	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	28
American elm	Ulmus americana	WDH	Medium	25.4	79.2	2.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	29
slash pine	Pinus elliotii	NDH	High	3.7	75.1	13.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	2	30
American hornbeam; muscley	Carpinus caroliniana	WSL	Low	26.9	71.7	1.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	31
hackberry	Celtis occidentalis	WDH	Medium	8.1	71.2	5.3	No change	No change	High	Common	Good	Good			1	32
boxelder	Acer negundo	WSH	Low	7.4	59.8	6.0	Sm. dec.	No change	High	Common	Fair	Good			1	33
American beech	Fagus grandifolia	WDH	High	20.1	56.5	1.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	34
swamp tupelo	Nyssa biflora	NDH	Medium	9.1	51.3	4.9	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	35
green ash	Fraxinus pennsylvanica	WSH	Low	15.9	37.6	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	36
eastern redbud	Cercis canadensis	NSL	Low	18.7	30.4	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	37
pond pine	Pinus serotina	NSH	Medium	6.6	21.5	3.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	38
common persimmon	Diospyros virginiana	NSL	Low	16.8	20.9	0.8	Lg. dec.	Sm. dec.	High	Rare	Poor	Poor			1	39
black walnut	Juglans nigra	WDH	Low	10.5	20.6	1.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	40
shagbark hickory	Carya ovata	WSL	Medium	10.4	20.6	1.4	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	41
pecan	Carya illinoensis	NSH	Low	2.5	19.2	5.9	No change	Sm. inc.	Low	Rare	Very Poor	Poor			2	42
sycamore	Platanus occidentalis	NSL	Low	5.6	18.3	2.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	43
florida maple	Acer barbatum	NSL	Low	6.6	18.3	1.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	44
slippery elm	Ulmus rubra	WSL	Low	8.3	17.8	1.2	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	45
laurel oak	Quercus laurifolia	NDH	Medium	7.5	17.3	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	46
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	5.5	16.4	2.0	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	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
river birch	Betula nigra	NSL	Low	2.9	13.7	2.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	48
sugarberry	Celtis laevigata	NDH	Medium	3	11.6	3.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	49
black willow	Salix nigra	NSH	Low	3.5	10.3	2.5	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	2	50
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	2.4	8.5	2.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	51
red mulberry	Morus rubra	NSL	Low	4.3	7.6	1.4	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	52
ailanthus	Ailanthus altissima	NSL	FIA	3	7.3	2.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	53
overcup oak	Quercus lyrata	NSL	Medium	0.4	7.3	2.9	No change	No change	Low	Rare	Very Poor	Very Poor			2	54
sassafras	Sassafras albidum	WSL	Low	6.5	6.0	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	55
bluejack oak	Quercus incana	NSL	Low	2.8	5.6	1.1	No change	Sm. inc.	Medium	Rare	Poor	Fair		Infill +	2	56
swamp chestnut oak	Quercus michauxii	NSL	Low	1.5	4.7	0.6	No change	No change	Medium	Rare	Poor	Poor	Infill +		2	57
sweetbay	Magnolia virginiana	NSL	Medium	5.6	4.0	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	58
sugar maple	Acer saccharum	WDH	High	3.9	4.0	1.0	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	59
bitternut hickory	Carya cordiformis	WSL	Low	2.5	3.5	1.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	60
black locust	Robinia pseudoacacia	NDH	Low	2.9	3.3	1.1	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	61
redbay	Persea borbonia	NSL	Low	1.9	2.8	1.4	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	62
sweet birch	Betula lenta	NDH	High	0.4	2.6	1.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	63
Carolina ash	Fraxinus caroliniana	NSL	FIA	1	1.8	1.8	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	64
butternut	Juglans cinerea	NSLX	FIA	1	1.6	1.6	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	65
American basswood	Tilia americana	WSL	Medium	0.1	0.9	0.1	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	66
sand hickory	Carya pallida	NSL	FIA	1	0.8	0.8	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	67
striped maple	Acer pensylvanicum	NSL	Medium	1	0.7	0.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	68
honeylocust	Gleditsia triacanthos	NSH	Low	0.1	0.7	0.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	69
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	1	0.5	0.5	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	70
serviceberry	Amelanchier spp.	NSL	Low	1	0.5	0.5	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	71
pawpaw	Asimina triloba	NSL	Low	1	0.3	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	72
white mulberry	Morus alba	NSL	FIA	0.6	0.3	0.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	73
wild plum	Prunus americana	NSLX	FIA	0.6	0.3	0.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	74
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	1	0.2	0.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	75
loblolly-bay	Gordonia lasianthus	NSH	Medium	1	0.1	0.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	76
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	77
sand pine	Pinus clausa	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	78
spruce pine	Pinus glabra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	79
bald cypress	Taxodium distichum	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	80
pond cypress	Taxodium ascendens	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	81
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	82
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	83
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	84
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	85
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	86
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	87
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	88
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate +	3	89
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	90
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	91
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	92
nuttall oak	Quercus texana	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	93
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	94



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cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	95