

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	10,306	3,979.1	320

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	2			High	14	23	Increase	29	34	Very Good	9	11
Hickory	7			Medium	33	52	No Change	14	12	Good	18	20
Maple	4	Abundant	2	Low	35	9	Decrease	20	17	Fair	11	11
Oak	15	Common	25	FIA	3		New	11	12	Poor	12	11
Pine	2	Rare	39				Unknown	11	10	Very Poor	12	10
Other	36	Absent	17							FIA Only	2	2
	66		83		85	84		85	85	Unknown	8	7
											17	21
											72	72

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	63.0	64.7	66.6	66.9	
	CCSM85	63.0	65.1	67.5	70.2	
	GFDL45	63.0	66.2	67.4	68.6	
	GFDL85	63.0	65.9	68.6	72.1	
	HAD45	63.0	65.4	68.3	69.4	
HAD85	63.0	65.7	70.1	73.7		
Growing Season (May—Sep)	CCSM45	77.2	78.9	80.4	80.8	
	CCSM85	77.2	79.4	81.6	85.1	
	GFDL45	77.2	81.0	82.1	84.4	
	GFDL85	77.2	80.9	83.9	88.3	
	HAD45	77.2	80.2	83.1	83.8	
HAD85	77.2	80.6	86.4	89.5		
Coldest Month (Average)	CCSM45	41.8	44.2	45.2	45.3	
	CCSM85	41.8	44.4	45.5	47.0	
	GFDL45	41.8	45.7	45.9	45.9	
	GFDL85	41.8	43.1	44.4	44.9	
	HAD45	41.8	42.8	44.5	45.1	
HAD85	41.8	43.8	45.5	47.3		
Warmest Month (Average)	CCSM45	82.5	83.9	84.5	84.6	
	CCSM85	82.5	84.5	85.2	87.0	
	GFDL45	82.5	87.3	87.5	89.1	
	GFDL85	82.5	86.8	88.2	91.5	
	HAD45	82.5	86.3	87.8	88.0	
HAD85	82.5	87.1	90.2	91.2		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	52.4	52.6	56.5	55.4	
	CCSM85	52.4	54.2	57.5	58.5	
	GFDL45	52.4	55.5	63.2	56.7	
	GFDL85	52.4	55.1	59.5	59.8	
	HAD45	52.4	52.0	54.4	58.1	
HAD85	52.4	56.5	48.7	52.8		
Growing Season (May—Sep)	CCSM45	19.7	20.4	19.7	20.0	
	CCSM85	19.7	19.4	18.7	19.4	
	GFDL45	19.7	21.4	25.0	22.0	
	GFDL85	19.7	21.6	23.3	23.1	
	HAD45	19.7	18.8	18.6	18.8	
HAD85	19.7	20.0	14.5	14.8		

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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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	93.9	4002.1	34.5	No change	No change	Medium	Abundant	Good	Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	93	1595.8	12.9	No change	No change	Medium	Abundant	Good	Good			1	2
water oak	Quercus nigra	WDH	High	79.5	481.3	4.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	3
white oak	Quercus alba	WDH	Medium	66.6	349.2	3.8	No change	No change	High	Common	Good	Good			1	4
southern red oak	Quercus falcata	WDL	Medium	68.5	335.5	3.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	5
winged elm	Ulmus alata	WDL	Medium	80.4	334.2	3.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
red maple	Acer rubrum	WDH	High	62.5	277.4	3.2	No change	Sm. inc.	High	Common	Good	Very Good			1	7
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	58	268.4	3.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	8
shortleaf pine	Pinus echinata	WDH	High	47.6	255.4	4.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	9
willow oak	Quercus phellos	NSL	Low	53.1	239.1	3.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	10
green ash	Fraxinus pennsylvanica	WSH	Low	51.9	220.9	3.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	11
blackgum	Nyssa sylvatica	WDL	Medium	68.9	219.7	2.5	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	12
post oak	Quercus stellata	WDH	High	53.5	219.3	3.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	13
mockernut hickory	Carya alba	WDL	Medium	52.3	171.9	3.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	14
sugarberry	Celtis laevigata	NDH	Medium	21.3	150.7	5.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	15
overcup oak	Quercus lyrata	NSL	Medium	12.5	146.2	10.2	No change	Sm. inc.	Low	Common	Poor	Fair			1	16
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	39.9	140.3	2.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	17
American holly	Ilex opaca	NSL	Medium	40.9	122.5	1.9	No change	No change	Medium	Common	Fair	Fair			1	18
water hickory	Carya aquatica	NSL	Medium	5.1	83.1	9.0	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	19
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	33.6	81.2	1.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	20
American elm	Ulmus americana	WDH	Medium	25.5	75.1	2.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	21
bald cypress	Taxodium distichum	NSH	Medium	8.8	71.2	7.1	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	22
flowering dogwood	Cornus florida	WDL	Medium	38.9	62.5	0.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	23
boxelder	Acer negundo	WSH	Low	8.9	56.5	1.4	Sm. dec.	Sm. dec.	High	Common	Fair	Fair		Infill +	1	24
black cherry	Prunus serotina	WDL	Medium	37.8	53.3	1.3	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	25
black willow	Salix nigra	NSH	Low	10.5	52.2	5.3	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	26
black hickory	Carya texana	NDL	High	25.8	52.1	1.2	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	27
slippery elm	Ulmus rubra	WSL	Low	21.8	42.6	1.8	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	28
Osage-orange	Maclura pomifera	NDH	Medium	8	40.9	6.2	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	29
common persimmon	Diospyros virginiana	NSL	Low	26.8	33.7	1.2	No change	Sm. inc.	High	Rare	Fair	Good			1	30
eastern redcedar	Juniperus virginiana	WDH	Medium	14.7	30.5	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	31
silver maple	Acer saccharinum	NSH	Low	1.5	28.6	8.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	32
sweetbay	Magnolia virginiana	NSL	Medium	8.8	28.0	1.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	33
swamp chestnut oak	Quercus michauxii	NSL	Low	16	27.2	1.7	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	34
black oak	Quercus velutina	WDH	High	17	26.8	1.4	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	35
white ash	Fraxinus americana	WDL	Medium	15	26.3	2.0	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	1	36
water elm	Planera aquatica	NSL	Low	8.3	26.3	4.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	37
American beech	Fagus grandifolia	WDH	High	8.8	24.2	1.5	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	38
shagbark hickory	Carya ovata	WSL	Medium	9.1	24.0	2.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	39
pignut hickory	Carya glabra	WDL	Medium	11.4	19.9	1.5	Lg. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	40
eastern cottonwood	Populus deltoides	NSH	Low	1	19.4	20.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	41
honeylocust	Gleditsia triacanthos	NSH	Low	7.5	17.8	1.4	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1	42
sycamore	Platanus occidentalis	NSL	Low	7.8	17.6	2.3	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	43
sassafras	Sassafras albidum	WSL	Low	13.9	16.6	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	44
hackberry	Celtis occidentalis	WDH	Medium	3.3	16.0	3.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	45
eastern redbud	Cercis canadensis	NSL	Low	4.9	15.5	3.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	46
nuttall oak	Quercus texana	NSH	Medium	3.8	11.9	1.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	47

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pecan	<i>Carya illinoensis</i>	NSH	Low	6.9	9.9	2.4	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	2	48
northern red oak	<i>Quercus rubra</i>	WDH	Medium	4.9	9.6	1.5	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	49
bitternut hickory	<i>Carya cordiformis</i>	WSL	Low	5	9.5	0.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	50
black locust	<i>Robinia pseudoacacia</i>	NDH	Low	0.6	8.2	5.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	51
red mulberry	<i>Morus rubra</i>	NSL	Low	12.1	8.0	0.6	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	52
blackjack oak	<i>Quercus marilandica</i>	NSL	Medium	5.8	6.8	1.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	53
waterlocust	<i>Gleditsia aquatica</i>	NSLX	FIA	1.8	5.6	2.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	54
cedar elm	<i>Ulmus crassifolia</i>	NDH	Medium	5.2	5.1	1.6	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	55
water tupelo	<i>Nyssa aquatica</i>	NSH	Medium	1	4.9	5.0	No change	No change	Low	Rare	Very Poor	Very Poor			2	56
American basswood	<i>Tilia americana</i>	WSL	Medium	0.8	3.4	2.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	57
Shumard oak	<i>Quercus shumardii</i>	NSL	Low	1.9	2.8	1.5	No change	Sm. inc.	High	Rare	Fair	Good			2	58
wild plum	<i>Prunus americana</i>	NSLX	FIA	2.2	2.5	0.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	59
chinkapin oak	<i>Quercus muehlenbergii</i>	NSL	Medium	1.2	2.5	0.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	60
river birch	<i>Betula nigra</i>	NSL	Low	0.7	2.5	0.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	61
Ohio buckeye	<i>Aesculus glabra</i>	NSL	Low	0.4	1.3	0.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	62
florida maple	<i>Acer barbatum</i>	NSL	Low	1	0.8	0.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	63
redbay	<i>Persea borbonia</i>	NSL	Low	0.7	0.6	0.5	Very Lg. dec.	No change	High	Rare	Lost	Fair			0	64
live oak	<i>Quercus virginiana</i>	NDH	High	0.2	0.5	0.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	65
ailanthus	<i>Ailanthus altissima</i>	NSL	FIA	0.5	0.4	0.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	66
ashe juniper	<i>Juniperus ashei</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	67
slash pine	<i>Pinus elliotii</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	68
longleaf pine	<i>Pinus palustris</i>	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	69
striped maple	<i>Acer pensylvanicum</i>	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	70
serviceberry	<i>Amelanchier spp.</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	71
cittamwood/gum bumelia	<i>Sideroxylon lanuginosum ssp.</i>	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	72
shellbark hickory	<i>Carya laciniosa</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	73
black ash	<i>Fraxinus nigra</i>	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	74
silverbell	<i>Halesia spp.</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	75
black walnut	<i>Juglans nigra</i>	WDH	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	76
cucumbertree	<i>Magnolia acuminata</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	77
southern magnolia	<i>Magnolia grandiflora</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	78
bigleaf magnolia	<i>Magnolia macrophylla</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	79
swamp tupelo	<i>Nyssa biflora</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	80
sourwood	<i>Oxydendrum arboreum</i>	NDL	High	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	81
pin cherry	<i>Prunus pensylvanica</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	82
laurel oak	<i>Quercus laurifolia</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	83
chestnut oak	<i>Quercus prinus</i>	NDH	High	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	84
bluejack oak	<i>Quercus incana</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	85