

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

	sq. km	sq. mi	FIA Plots
Area of Region	394,225	152,211	5,129

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	Scenario	Scenario	Scenario	SHIFT	SHIFT			
				High	26	Increase	12	13	Very Good	1	2	Likely	0	0
Ash	4			Medium	39	No Change	43	48	Good	11	10	Infill	48	50
Hickory	8	Abundant	1	Low	40	Decrease	20	14	Fair	13	16	Migrate	1	1
Maple	3	Common	11	FIA	9	New	9	10	Poor	30	31			
Oak	22	Rare	72			Unknown	20	19	Very Poor	19	15			
Pine	4	Absent	19				104	104	FIA Only	7	7			
Other	43								Unknown	12	11			
	84		103							93	92			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	67.2	68.7	70.1	70.6	
	CCSM85	67.2	69.2	71.3	73.7	
	GFDL45	67.2	71.7	71.5	73.0	
	GFDL85	67.2	69.9	73.0	76.6	
	HAD45	67.2	69.3	71.8	72.7	
	HAD85	67.2	69.7	73.1	76.4	
Growing Season (May—Sep)	CCSM45	80.1	81.4	82.6	83.2	
	CCSM85	80.1	82.0	84.0	86.8	
	GFDL45	80.1	85.6	85.0	87.4	
	GFDL85	80.1	83.6	87.1	91.5	
	HAD45	80.1	82.3	84.4	85.0	
	HAD85	80.1	82.7	86.5	89.3	
Coldest Month (Average)	CCSM45	47.4	49.7	50.4	50.8	
	CCSM85	47.4	49.7	50.7	52.0	
	GFDL45	47.4	50.8	50.9	51.0	
	GFDL85	47.4	48.5	49.7	50.2	
	HAD45	47.4	48.1	49.8	50.3	
	HAD85	47.4	50.4	51.8	53.5	
Warmest Month (Average)	CCSM45	84.5	85.6	86.3	86.5	
	CCSM85	84.5	86.4	87.0	88.5	
	GFDL45	84.5	89.0	89.4	90.9	
	GFDL85	84.5	89.1	90.7	93.8	
	HAD45	84.5	86.9	87.9	88.2	
	HAD85	84.5	87.5	89.5	90.5	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	35.9	37.3	39.2	37.0	
	CCSM85	35.9	36.8	39.2	38.2	
	GFDL45	35.9	36.1	41.9	34.3	
	GFDL85	35.9	35.7	37.5	36.0	
	HAD45	35.9	36.9	35.7	38.1	
	HAD85	35.9	37.5	33.9	36.2	
Growing Season (May—Sep)	CCSM45	16.4	18.0	17.8	17.0	
	CCSM85	16.4	17.2	17.2	16.1	
	GFDL45	16.4	17.0	20.9	16.2	
	GFDL85	16.4	17.3	18.0	17.3	
	HAD45	16.4	16.2	15.8	17.1	
	HAD85	16.4	16.7	14.4	15.3	

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	18.4	670.6	39.1	No change	No change	Medium	Abundant	Good	Good	Infill ++	Infill ++	2	1
ashe juniper	Juniperus ashei	NDH	High	17.4	467.5	46.0	No change	No change	NA	Common	Unknown	Unknown			0	2
live oak	Quercus virginiana	NDH	High	25.3	374.3	33.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	3
post oak	Quercus stellata	WDH	High	32.2	359.4	20.3	No change	No change	High	Common	Good	Good			1	4
sweetgum	Liquidambar styraciflua	WDH	High	17.6	205.6	12.1	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	5
water oak	Quercus nigra	WDH	High	23.5	146.2	8.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good	Infill ++	Infill ++	1	6
cedar elm	Ulmus crassifolia	NDH	Medium	28.6	125.3	14.9	Lg. inc.	Lg. inc.	Low	Common	Good	Good	Infill ++	Infill ++	1	7
winged elm	Ulmus alata	WDL	Medium	21.3	99.7	6.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	8
sugarberry	Celtis laevigata	NDH	Medium	30	95.9	10.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	9
shortleaf pine	Pinus echinata	WDH	High	9.8	79.7	8.1	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	10
southern red oak	Quercus falcata	WDL	Medium	14.8	70.3	5.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	11
eastern redcedar	Juniperus virginiana	WDH	Medium	18.2	68.5	8.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	12
American elm	Ulmus americana	WDH	Medium	17	48.2	6.0	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	13
blackjack oak	Quercus marilandica	NSL	Medium	13.4	48.0	8.0	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	14
green ash	Fraxinus pennsylvanica	WSH	Low	15.7	46.0	7.6	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	15
willow oak	Quercus phellos	NSL	Low	8.4	40.2	5.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	16
pecan	Carya illinoensis	NSH	Low	11.1	37.2	11.3	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	1	17
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	14.1	32.1	6.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	18
blackgum	Nyssa sylvatica	WDL	Medium	9.9	29.6	3.0	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	19
white oak	Quercus alba	WDH	Medium	6.7	26.2	3.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	20
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	7.2	23.7	3.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	21
red maple	Acer rubrum	WDH	High	8.3	21.1	2.5	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	22
black hickory	Carya texana	NDL	High	7.3	19.6	3.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	23
Osage-orange	Maclura pomifera	NDH	Medium	9	19.1	9.0	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	24
mockernut hickory	Carya alba	WDL	Medium	7.5	19.0	3.0	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	25
black willow	Salix nigra	NSH	Low	5.8	19.0	8.5	No change	No change	Low	Rare	Very Poor	Very Poor			2	26
hackberry	Celtis occidentalis	WDH	Medium	8.9	18.3	9.7	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	1	27
slash pine	Pinus elliotii	NDH	High	1.8	18.0	9.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	28
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	5.1	16.4	3.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	29
honeylocust	Gleditsia triacanthos	NSH	Low	7.9	14.9	6.3	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	30
laurel oak	Quercus laurifolia	NDH	Medium	3.1	14.0	4.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	31
white ash	Fraxinus americana	WDL	Medium	6.6	13.2	2.7	No change	No change	Low	Rare	Very Poor	Very Poor			2	32
American holly	Ilex opaca	NSL	Medium	6	12.1	2.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	33
overcup oak	Quercus lyrata	NSL	Medium	2.2	11.6	5.5	No change	No change	Low	Rare	Very Poor	Very Poor			2	34
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	4.7	10.6	2.2	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	35
bald cypress	Taxodium distichum	NSH	Medium	1.2	9.1	7.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	36
river birch	Betula nigra	NSL	Low	1.7	8.9	5.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	37
black walnut	Juglans nigra	WDH	Low	2	8.7	8.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	38
longleaf pine	Pinus palustris	NSH	Medium	1.1	8.2	6.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	39
common persimmon	Diospyros virginiana	NSL	Low	4.4	7.8	2.5	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2	40
black cherry	Prunus serotina	WDL	Medium	5.8	7.4	1.6	No change	No change	Low	Rare	Very Poor	Very Poor			2	41
Texas ash	Fraxinus texensis	NDH	FIA	2.9	7.3	6.6	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	42
Shumard oak	Quercus shumardii	NSL	Low	3.7	6.7	3.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	43
sassafras	Sassafras albidum	WSL	Low	4.2	6.5	1.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	44
sweetbay	Magnolia virginiana	NSL	Medium	1.8	6.3	3.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	45
flowering dogwood	Cornus florida	WDL	Medium	4.8	6.2	1.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	46
sycamore	Platanus occidentalis	NSL	Low	1.3	5.5	6.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
red mulberry	Morus rubra	NSL	Low	5.1	5.3	2.4	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	48
boxelder	Acer negundo	WSH	Low	3.5	4.7	4.9	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	49
water elm	Planera aquatica	NSL	Low	1.1	4.4	5.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	50
slippery elm	Ulmus rubra	WSL	Low	3.6	4.4	3.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	51
swamp chestnut oak	Quercus michauxii	NSL	Low	1.4	4.2	2.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	52
American beech	Fagus grandifolia	WDH	High	1.3	4.0	2.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	53
bur oak	Quercus macrocarpa	NDH	Medium	1.7	3.9	7.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +		2	54
bluejack oak	Quercus incana	NSL	Low	1.4	3.9	3.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	55
eastern cottonwood	Populus deltoides	NSH	Low	1.9	3.8	8.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	56
water hickory	Carya aquatica	NSL	Medium	1.8	3.6	2.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	57
southern magnolia	Magnolia grandiflora	NSL	Low	1.5	3.5	2.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	58
bitternut hickory	Carya cordiformis	WSL	Low	1.5	3.3	3.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	59
black oak	Quercus velutina	WDH	High	1	3.1	3.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	60
florida maple	Acer barbatum	NSL	Low	1.6	3.0	1.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	61
eastern redbud	Cercis canadensis	NSL	Low	2.5	2.3	1.6	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			0	62
redbay	Persea borbonia	NSL	Low	1.6	2.3	1.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	63
water tupelo	Nyssa aquatica	NSH	Medium	0.3	2.1	6.4	No change	No change	Low	Rare	Very Poor	Very Poor			2	64
durand oak	Quercus sinuata var. sinuata	NSL	FIA	1	1.7	4.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	65
shagbark hickory	Carya ovata	WSL	Medium	0.9	1.5	2.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	66
Nuttall oak	Quercus texana	NSH	Medium	0.3	1.0	3.5	Sm. dec.	No change	High	Rare	Poor	Fair			0	67
pignut hickory	Carya glabra	WDL	Medium	0.7	1.0	2.5	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	68
swamp tupelo	Nyssa biflora	NDH	Medium	0.2	0.8	2.1	No change	No change	Low	Rare	Very Poor	Very Poor			2	69
wild plum	Prunus americana	NSLX	FIA	0.7	0.7	2.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	70
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0.3	0.7	4.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	71
waterlocust	Gleditsia aquatica	NSLX	FIA	0.3	0.5	6.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	72
American basswood	Tilia americana	WSL	Medium	0.4	0.5	1.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	73
Siberian elm	Ulmus pumila	NDH	FIA	0	0.4	13.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	74
Carolina ash	Fraxinus caroliniana	NSL	FIA	0.2	0.1	4.2	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	75
black locust	Robinia pseudoacacia	NDH	Low	0.3	0.1	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	76
pin oak	Quercus laeustris	NSH	Low	0.1	0.1	2.3	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	77
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	0.1	0.1	2.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	78
peachleaf willow	Salix amygdaloides	NSLX	FIA	0.1	0.1	2.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	79
northern red oak	Quercus rubra	WDH	Medium	0.1	0.1	0.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	80
shellbark hickory	Carya laciniosa	NSL	Low	0	0.0	0.7	No change	No change	Medium	Rare	Poor	Poor			0	81
white mulberry	Morus alba	NSL	FIA	0	0.0	0.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	82
pawpaw	Asimina triloba	NSL	Low	0	0.0	0.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	83
turkey oak	Quercus laevis	NSH	Medium	0	0.0	0.5	Sm. inc.	Lg. inc.	High	Rare	Good	Good			2	84
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	85
jack pine	Pinus banksiana	NSH	Medium	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	86
Virginia pine	Pinus virginiana	NDH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	87
pond cypress	Taxodium ascendens	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	88
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	89
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	90
yellow buckeye	Aesculus flava	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	91
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	92
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	93
blue ash	Fraxinus quadrangulata	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	94

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIaiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
silverbell	Halesia spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	95
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	96
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	97
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	98
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	99
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	100
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	101
chestnut oak	Quercus prinus	NDH	High	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	102
cabbage palmetto	Sabal palmetto	NDH	Medium	0	0	0	New Habitat	New Habitat	NA	Absent	New Habitat	New Habitat			0	103
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	104