

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

sq. km sq. mi FIA Plots
Area of Region 133,746 51,640 4,263

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	5			High	23	30	Increase	31	40	Very Good	16	19	Likely	1	0
Hickory	9			Medium	39	61	No Change	30	26	Good	18	16	Infill	26	29
Maple	5	Abundant	3	Low	44	18	Decrease	31	26	Fair	12	18	Migrate	1	1
Oak	22	Common	27	FIA	12		New	7	7	Poor	18	16			
Pine	7	Rare	74				Unknown	19	19	Very Poor	28	23			
Other	56	Absent	13							FIA Only	9	9			
	104		117		118	109		118	118	Unknown	7	7			
											108	108			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	63.1	64.8	66.8	66.8	
Average	CCSM85	63.1	65.0	67.5	70.1	
	GFDL45	63.1	65.8	67.7	68.4	
	GFDL85	63.1	65.6	68.7	72.1	
	HAD45	63.1	65.3	68.1	69.5	
	HAD85	63.1	65.6	69.7	73.5	
Growing Season	CCSM45	76.3	77.9	79.5	80.0	
	CCSM85	76.3	78.0	80.6	83.8	
May—Sep	GFDL45	76.3	79.2	81.0	82.4	
	GFDL85	76.3	78.9	82.3	86.3	
	HAD45	76.3	79.5	82.0	83.5	
	HAD85	76.3	79.5	85.4	88.8	
Coldest Month	CCSM45	43.1	45.3	46.2	46.1	
Average	CCSM85	43.1	45.5	46.7	47.9	
	GFDL45	43.1	46.5	46.7	46.9	
	GFDL85	43.1	44.9	46.0	46.4	
	HAD45	43.1	43.0	44.8	45.4	
	HAD85	43.1	44.3	45.6	47.2	
Warmest Month	CCSM45	80.5	82.1	82.8	83.0	
Average	CCSM85	80.5	82.1	83.5	85.3	
	GFDL45	80.5	83.3	84.1	84.9	
	GFDL85	80.5	82.9	84.5	86.7	
	HAD45	80.5	84.7	86.5	87.1	
	HAD85	80.5	85.0	88.8	90.2	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	55.6	57.6	62.0	61.0	
Total	CCSM85	55.6	58.8	60.6	66.6	
	GFDL45	55.6	62.3	65.8	67.9	
	GFDL85	55.6	62.2	65.0	66.2	
	HAD45	55.6	53.8	59.7	60.2	
	HAD85	55.6	59.0	53.1	56.9	
Growing Season	CCSM45	22.3	23.2	24.4	24.5	
Season	CCSM85	22.3	22.4	23.0	24.9	
May—Sep	GFDL45	22.3	27.0	29.0	28.7	
	GFDL85	22.3	27.4	29.7	30.4	
	HAD45	22.3	21.3	23.2	22.3	
	HAD85	22.3	23.5	17.8	19.1	

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	87.5	3272.6	35.0	No change	No change	Medium	Abundant	Good	Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	84.5	895.2	10.1	No change	Sm. inc.	Medium	Abundant	Good	Very Good			1	2
water oak	Quercus nigra	WDH	High	72.6	575.1	7.4	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	3
yellow-poplar	Liriodendron tulipifera	WDH	High	60.1	354.5	5.4	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	4
red maple	Acer rubrum	WDH	High	70.7	285.3	3.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	5
longleaf pine	Pinus palustris	NSH	Medium	20.7	283.0	11.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	6
white oak	Quercus alba	WDH	Medium	53.3	277.2	4.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	7
slash pine	Pinus elliottii	NDH	High	12	235.3	15.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	8
southern red oak	Quercus falcata	WDL	Medium	54.3	234.2	3.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	9
shortleaf pine	Pinus echinata	WDH	High	45.2	207.7	4.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	10
blackgum	Nyssa sylvatica	WDL	Medium	64.4	203.5	2.9	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	11
laurel oak	Quercus laurifolia	NDH	Medium	28.7	171.2	5.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	12
Virginia pine	Pinus virginiana	NDH	High	18.6	170.7	8.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	13
mockernut hickory	Carya alba	WDL	Medium	46.2	165.5	3.3	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	14
pignut hickory	Carya glabra	WDL	Medium	47.4	162.6	3.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	15
chestnut oak	Quercus prinus	NDH	High	21.1	153.3	6.7	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	16
post oak	Quercus stellata	WDH	High	42.5	138.1	3.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	17
sweetbay	Magnolia virginiana	NSL	Medium	24.5	134.9	4.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	18
black cherry	Prunus serotina	WDL	Medium	56.1	131.6	2.2	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	19
eastern redcedar	Juniperus virginiana	WDH	Medium	29.2	125.8	4.2	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	20
green ash	Fraxinus pennsylvanica	WSH	Low	27.8	111.6	3.9	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	21
flowering dogwood	Cornus florida	WDL	Medium	51	106.4	1.9	No change	No change	Medium	Common	Fair	Fair			1	22
winged elm	Ulmus alata	WDL	Medium	40.2	97.6	2.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	23
sourwood	Oxydendrum arboreum	NDL	High	35.2	90.2	2.3	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	24
sugarberry	Celtis laevigata	NDH	Medium	16.1	88.4	5.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	25
swamp tupelo	Nyssa biflora	NDH	Medium	10.8	72.5	5.6	Lg. inc.	Lg. inc.	Low	Common	Good	Good	Infill ++	Infill ++	1	26
American hornbeam; muscley	Carpinus caroliniana	WSL	Low	28.5	71.9	2.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	27
black oak	Quercus velutina	WDH	High	23.1	63.3	2.5	No change	No change	Medium	Common	Fair	Fair			1	28
northern red oak	Quercus rubra	WDH	Medium	19	51.1	2.6	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	29
willow oak	Quercus phellos	NSL	Low	13.3	50.8	3.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	30
scarlet oak	Quercus coccinea	WDL	Medium	16.1	49.6	2.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	31
American beech	Fagus grandifolia	WDH	High	21.9	47.3	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	32
common persimmon	Diospyros virginiana	NSL	Low	32.4	46.3	1.4	No change	Sm. inc.	High	Rare	Fair	Good			1	33
shagbark hickory	Carya ovata	WSL	Medium	13.5	43.6	3.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	34
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	13.3	40.6	2.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	35
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	20.4	38.2	1.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	36
American elm	Ulmus americana	WDH	Medium	18.5	37.6	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	37
boxelder	Acer negundo	WSH	Low	7.6	35.6	5.0	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	38
florida maple	Acer barbatum	NSL	Low	15.5	33.6	2.0	Sm. dec.	No change	High	Rare	Poor	Fair			1	39
water tupelo	Nyssa aquatica	NSH	Medium	3.5	31.0	8.0	No change	No change	Low	Rare	Very Poor	Very Poor			2	40
bald cypress	Taxodium distichum	NSH	Medium	4.6	30.6	6.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	41
black willow	Salix nigra	NSH	Low	8.1	29.3	3.6	No change	Sm. inc.	Low	Rare	Very Poor	Poor			1	42
sycamore	Platanus occidentalis	NSL	Low	8.6	28.2	3.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	43
American holly	Ilex opaca	NSL	Medium	17.9	27.9	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	44
white ash	Fraxinus americana	WDL	Medium	9.8	27.6	2.7	No change	No change	Low	Rare	Very Poor	Very Poor			0	45
southern magnolia	Magnolia grandiflora	NSL	Low	8.6	27.3	2.8	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	46
spruce pine	Pinus glabra	NSL	Low	9.7	27.0	2.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCI45	ChngCI85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
sassafras	Sassafras albidum	WSL	Low	18.8	26.0	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	48
blackjack oak	Quercus marilandica	NSL	Medium	11	24.0	2.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	49
river birch	Betula nigra	NSL	Low	5.3	22.9	4.0	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	50
Osage-orange	Maclura pomifera	NDH	Medium	2.6	20.1	7.4	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	51
chinkapin oak	Quercus muehlenbergii	NSL	Medium	5.1	18.9	3.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	52
swamp chestnut oak	Quercus michauxii	NSL	Low	8.2	15.3	1.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	53
red mulberry	Morus rubra	NSL	Low	10.1	14.4	1.4	Sm. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair			1	54
hackberry	Celtis occidentalis	WDH	Medium	4.1	13.8	4.0	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	55
overcup oak	Quercus lyrata	NSL	Medium	4	13.6	3.2	No change	No change	Low	Rare	Very Poor	Very Poor			2	56
pecan	Carya illinoensis	NSH	Low	4.3	13.0	2.9	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	57
black walnut	Juglans nigra	WDH	Low	4.4	12.6	2.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	58
eastern redbud	Cercis canadensis	NSL	Low	10	12.4	1.2	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			0	59
bigleaf magnolia	Magnolia macrophylla	NSL	Low	5.7	12.4	2.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	60
live oak	Quercus virginiana	NDH	High	2.2	11.8	4.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	61
slippery elm	Ulmus rubra	WSL	Low	8.2	11.6	1.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	62
water hickory	Carya aquatica	NSL	Medium	2.3	9.5	4.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	63
honeylocust	Gleditsia triacanthos	NSH	Low	2.8	9.2	3.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	64
turkey oak	Quercus laevis	NSH	Medium	2.6	7.8	2.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	65
eastern cottonwood	Populus deltoides	NSH	Low	1.3	7.2	5.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	66
Shumard oak	Quercus shumardii	NSL	Low	2.5	7.0	1.9	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2	67
bitternut hickory	Carya cordiformis	WSL	Low	3.2	6.8	2.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	68
American basswood	Tilia americana	WSL	Medium	3.4	6.6	2.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	69
redbay	Persea borbonia	NSL	Low	4.4	6.1	1.2	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	70
black locust	Robinia pseudoacacia	NDH	Low	2.2	5.6	2.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	71
sugar maple	Acer saccharum	WDH	High	2.1	5.3	2.2	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +		2	72
eastern hemlock	Tsuga canadensis	NSH	High	0.7	4.7	6.9	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	73
cucumbertree	Magnolia acuminata	NSL	Low	2.9	4.5	1.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	74
pond cypress	Taxodium ascendens	NSH	Medium	0.7	4.4	5.4	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	75
durand oak	Quercus sinuata var. sinuata	NSL	FIA	1.6	4.4	2.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	76
bluejack oak	Quercus incana	NSL	Low	1.3	3.9	2.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	77
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	0.5	3.8	5.4	No change	No change	Low	Rare	Very Poor	Very Poor			2	78
paulownia	Paulownia tomentosa	NSL	FIA	0.9	3.7	3.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	79
Nuttall oak	Quercus texana	NSH	Medium	0.8	3.7	4.4	No change	No change	High	Rare	Fair	Fair			0	80
serviceberry	Amelanchier spp.	NSL	Low	2.4	2.3	0.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	81
wild plum	Prunus americana	NSLX	FIA	3.5	2.0	0.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	82
yellow buckeye	Aesculus flava	NSL	Low	1.2	1.8	1.7	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	83
shellbark hickory	Carya laciniosa	NSL	Low	0.8	1.5	1.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	84
sand hickory	Carya pallida	NSL	FIA	0.5	1.3	2.3	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	85
butternut	Juglans cinerea	NSLX	FIA	0.7	1.1	1.5	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	86
white mulberry	Morus alba	NSL	FIA	0.3	0.9	2.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	87
black hickory	Carya texana	NDL	High	0.2	0.8	3.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	88
ailanthus	Ailanthus altissima	NSL	FIA	0.9	0.7	2.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	89
pin cherry	Prunus pensylvanica	NSL	Low	0.4	0.7	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	90
water elm	Planera aquatica	NSL	Low	0.4	0.6	1.7	No change	Sm. inc.	Medium	Rare	Poor	Fair		Infill +	2	91
silver maple	Acer saccharinum	NSH	Low	0.8	0.6	1.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	92
waterlocust	Gleditsia aquatica	NSLX	FIA	0.1	0.5	3.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	93
blue ash	Fraxinus quadrangulata	NSL	Low	0.1	0.3	0.6	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	94

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sweet birch	Betula lenta	NDH	High	0.1	0.3	2.0	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	95
pawpaw	Asimina triloba	NSL	Low	0.4	0.3	0.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	96
pumpkin ash	Fraxinus profunda	NSH	FIA	0.1	0.2	2.6	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	97
sand pine	Pinus clausa	NDH	High	0.1	0.2	2.4	No change	No change	Low	Rare	Very Poor	Very Poor			2	98
Carolina ash	Fraxinus caroliniana	NSL	FIA	0.1	0.1	1.9	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	99
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0.1	0.1	0.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	100
loblolly-bay	Gordonia lasianthus	NSH	Medium	0.1	0.1	0.6	Lg. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	101
rock elm	Ulmus thomasii	NSLX	FIA	0	0.1	0.2	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	102
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	0.1	0.0	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	103
bur oak	Quercus macrocarpa	NDH	Medium	0.1	0.0	0.3	Sm. dec.	Lg. dec.	High	Rare	Poor	Poor			0	104
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	NA	Absent	New Habitat	New Habitat			0	105
Table Mountain pine	Pinus pungens	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	106
pitch pine	Pinus rigida	NSH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	107
eastern white pine	Pinus strobus	WDH	High	0	0	0	New Habitat	Unknown	Low	Absent	New Habitat	Unknown		Likely +	3	108
black maple	Acer nigrum	NSH	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	109
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	110
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			3	111
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	112
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	113
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	114
silverbell	Halesia spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	115
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	Unknown	NA	Absent	Unknown	Unknown			0	116
cabbage palmetto	Sabal palmetto	NDH	Medium	0	0	0	New Habitat	New Habitat	NA	Absent	New Habitat	New Habitat			0	117
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	118