

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	9,412.7	3,634.3	165

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	23	24	Increase	22	22	Very Good	9	10	Likely	2	2
Hickory	4			Medium	38	55	No Change	10	11	Good	13	14	Infill	12	12
Maple	6	Abundant	2	Low	31	18	Decrease	23	22	Fair	7	6	Migrate	20	18
Oak	9	Common	26	FIA	11		New	30	32	Poor	11	9		34	32
Pine	6	Rare	38				Unknown	18	16	Very Poor	12	13			
Other	38	Absent	35					103	103	FIA Only	5	5			
	66		101		103	97				Unknown	7	5			
											64	62			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	51.4	53.2	55.4	55.7	
	CCSM85	51.4	53.6	56.1	59.2	
	GFDL45	51.4	56.1	57.0	58.2	
	GFDL85	51.4	54.6	58.3	62.4	
	HAD45	51.4	54.1	57.4	59.0	
HAD85	51.4	54.2	58.3	63.1		
Growing Season (May—Sep)	CCSM45	67.7	69.6	71.5	72.0	
	CCSM85	67.7	69.9	72.4	76.2	
	GFDL45	67.7	73.0	74.2	75.6	
	GFDL85	67.7	71.7	75.7	80.1	
	HAD45	67.7	70.8	73.7	75.7	
HAD85	67.7	70.3	75.1	80.3		
Coldest Month (Average)	CCSM45	26.9	28.9	30.5	31.0	
	CCSM85	26.9	29.3	30.6	32.4	
	GFDL45	26.9	30.3	31.2	31.9	
	GFDL85	26.9	30.2	31.5	33.3	
	HAD45	26.9	28.6	31.0	31.3	
HAD85	26.9	29.4	31.3	33.7		
Warmest Month (Average)	CCSM45	73.7	75.9	76.9	77.1	
	CCSM85	73.7	76.2	77.9	79.8	
	GFDL45	73.7	76.6	78.6	79.8	
	GFDL85	73.7	77.9	80.2	83.1	
	HAD45	73.7	77.2	78.8	80.0	
HAD85	73.7	77.0	79.7	83.3		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	48.1	50.7	52.4	56.1	
	CCSM85	48.1	51.1	54.0	57.8	
	GFDL45	48.1	53.7	57.2	57.0	
	GFDL85	48.1	51.1	56.7	59.2	
	HAD45	48.1	51.0	51.8	51.8	
HAD85	48.1	53.4	50.7	53.7		
Growing Season (May—Sep)	CCSM45	22.1	25.5	26.0	27.9	
	CCSM85	22.1	24.4	26.3	27.0	
	GFDL45	22.1	23.4	24.5	25.7	
	GFDL85	22.1	22.3	24.3	25.2	
	HAD45	22.1	23.6	21.7	21.4	
HAD85	22.1	23.3	21.1	21.3		

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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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
red maple	Acer rubrum	WDH	High	80.3	889.5	10.2	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
white ash	Fraxinus americana	WDL	Medium	72.7	630.4	13.1	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	2
chestnut oak	Quercus prinus	NDH	High	56.5	466.4	8.9	No change	No change	High	Common	Good	Good			1	3
northern red oak	Quercus rubra	WDH	Medium	62.9	390.7	6.3	No change	No change	High	Common	Good	Good			1	4
yellow-poplar	Liriodendron tulipifera	WDH	High	59.4	372.3	9.9	Sm. inc.	No change	High	Common	Very Good	Good			1	5
black cherry	Prunus serotina	WDL	Medium	71.1	309.5	7.0	No change	No change	Low	Common	Poor	Poor			0	6
white oak	Quercus alba	WDH	Medium	29.5	304.5	6.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	7
black walnut	Juglans nigra	WDH	Low	50	246.5	10.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	8
sweet birch	Betula lenta	NDH	High	47	242.2	6.7	Sm. dec.	Lg. dec.	Low	Common	Poor	Very Poor			0	9
black oak	Quercus velutina	WDH	High	47.3	210.5	5.8	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	10
sassafras	Sassafras albidum	WSL	Low	64.9	160.5	3.7	Sm. inc.	No change	Medium	Common	Good	Fair			1	11
blackgum	Nyssa sylvatica	WDL	Medium	35.8	134.7	2.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	12
green ash	Fraxinus pennsylvanica	WSH	Low	17.9	118.7	10.3	No change	No change	Medium	Common	Fair	Fair			1	13
mockernut hickory	Carya alba	WDL	Medium	25	114.4	6.1	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	14
sugar maple	Acer saccharum	WDH	High	22.2	107.9	6.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	15
scarlet oak	Quercus coccinea	WDL	Medium	22.9	106.5	3.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	16
eastern redcedar	Juniperus virginiana	WDH	Medium	18.1	105.5	6.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	17
Norway maple	Acer platanoides	NSL	FIA	24	102.4	9.3	Unknown	Unknown	NA	Common	NNIS	NNIS			0	18
eastern hemlock	Tsuga canadensis	NSH	High	19.6	85.7	4.5	No change	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	0	19
shagbark hickory	Carya ovata	WSL	Medium	30.7	83.7	3.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	20
pignut hickory	Carya glabra	WDL	Medium	24.4	80.0	2.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	21
black locust	Robinia pseudoacacia	NDH	Low	17	72.5	8.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	22
boxelder	Acer negundo	WSH	Low	25.2	70.8	8.3	No change	Sm. inc.	High	Common	Good	Very Good			1	23
hackberry	Celtis occidentalis	WDH	Medium	4.7	58.8	14.1	Sm. dec.	No change	High	Common	Fair	Good	Infill +	Infill ++	2	24
American beech	Fagus grandifolia	WDH	High	35.6	58.1	1.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	25
eastern white pine	Pinus strobus	WDH	High	21.2	58.0	3.4	Sm. inc.	No change	Low	Common	Fair	Poor			1	26
red pine	Pinus resinosa	NSH	Medium	5.3	53.2	24.0	Very Lg. dec.	Very Lg. dec.	Low	Common	Lost	Lost			0	27
black willow	Salix nigra	NSH	Low	4.2	50.4	11.9	Sm. dec.	No change	Low	Common	Poor	Poor		Infill +	2	28
American elm	Ulmus americana	WDH	Medium	21.3	49.7	2.4	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	29
swamp white oak	Quercus bicolor	NSL	Low	2.8	39.8	10.5	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	30
bigtooth aspen	Populus grandidentata	NSL	Medium	17.8	38.1	2.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	31
pin oak	Quercus palustris	NSH	Low	21.7	35.7	4.1	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor			1	32
ailanthus	Ailanthus altissima	NSL	FIA	14.6	33.0	4.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	33
gray birch	Betula populifolia	NSL	Low	5.9	21.6	1.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	34
pitch pine	Pinus rigida	NSH	High	12.4	20.8	1.5	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	35
silver maple	Acer saccharinum	NSH	Low	4.7	20.4	4.9	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	36
American basswood	Tilia americana	WSL	Medium	8.2	19.3	1.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	37
serviceberry	Amelanchier spp.	NSL	Low	21.1	19.0	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	38
flowering dogwood	Cornus florida	WDL	Medium	23.6	18.2	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	39
paulownia	Paulownia tomentosa	NSL	FIA	1.5	15.1	20.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	40
tamarack (native)	Larix laricina	NSH	High	4.5	13.4	2.8	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	41
bitternut hickory	Carya cordiformis	WSL	Low	12.7	12.0	2.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	42
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	13.2	11.5	1.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	43
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	7	10.3	0.9	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	44
Osage-orange	Maclura pomifera	NDH	Medium	7.6	9.2	6.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +		1	45
red mulberry	Morus rubra	NSL	Low	5.8	8.0	6.5	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	46
yellow birch	Betula alleghaniensis	NDL	High	9.3	7.1	1.5	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	47



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slippery elm	Ulmus rubra	WSL	Low	6.4	6.9	3.5	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	48
white spruce	Picea glauca	NSL	Medium	0.9	6.5	5.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	49
striped maple	Acer pensylvanicum	NSL	Medium	1.3	6.5	2.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	50
Norway spruce	Picea abies	NSH	FIA	3	6.3	1.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	51
Scots pine	Pinus sylvestris	NSH	FIA	5.3	4.5	2.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	52
eastern cottonwood	Populus deltoides	NSH	Low	1.8	3.6	5.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	53
white mulberry	Morus alba	NSL	FIA	0.9	3.4	2.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	54
Virginia pine	Pinus virginiana	NDH	High	2.1	3.1	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	55
red spruce	Picea rubens	NDH	High	1.3	2.8	0.7	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	56
black ash	Fraxinus nigra	WSH	Medium	0.3	2.4	0.6	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	57
sycamore	Platanus occidentalis	NSL	Low	15	2.3	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	58
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	1.1	2.3	2.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	59
jack pine	Pinus banksiana	NSH	Medium	1.1	2.2	2.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	60
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	1.2	2.0	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	61
American chestnut	Castanea dentata	NSLX	FIA	6.4	1.6	0.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	62
chokecherry	Prunus virginiana	NSLX	FIA	1.1	1.4	1.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	63
butternut	Juglans cinerea	NSLX	FIA	4.2	0.6	2.4	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	64
paper birch	Betula papyrifera	WDH	High	0.2	0.6	0.1	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	65
laurel oak	Quercus laurifolia	NDH	Medium	0.6	0.3	0.2	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			2	66
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	67
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	68
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	69
pond pine	Pinus serotina	NSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +		3	70
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	71
bald cypress	Taxodium distichum	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	72
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	73
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	74
yellow buckeye	Aesculus flava	NSL	Low	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	75
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			0	76
water hickory	Carya aquatica	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	77
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	78
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	79
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	80
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	81
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	82
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	83
American holly	Ilex opaca	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	84
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	85
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +		3	86
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	87
water tupelo	Nyssa aquatica	NSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	88
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	89
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	90
redbay	Persea borbonia	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			3	91
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	92
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	93
shingle oak	Quercus imbricaria	NDH	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	94

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overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	95
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	96
swamp chestnut oak	Quercus michauxii	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate +	3	97
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	98
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	99
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	100
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	101
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	102
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	103