

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	9,683.1	3,738.7	261

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	2			High	21	27	Increase	22	30	Very Good	9	8	Likely	1	1
Hickory	4			Medium	28	50	No Change	22	15	Good	17	23	Infill	17	19
Maple	4	Abundant	6	Low	40	15	Decrease	21	20	Fair	11	11	Migrate	5	8
Oak	15	Common	26	FIA	6		New	14	17	Poor	15	12			
Pine	6	Rare	39				Unknown	16	13	Very Poor	10	9			
Other	40	Absent	23							FIA Only	3	3			
	71		94		95	92		95	95	Unknown	10	7			
											75	73			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	53.7	55.6	57.8	58.0	
	CCSM85	53.7	55.9	58.5	61.6	
	GFDL45	53.7	56.5	59.3	60.4	
	GFDL85	53.7	57.1	60.4	64.4	
	HAD45	53.7	56.2	59.6	61.0	
HAD85	53.7	56.5	60.6	65.1		
Growing Season (May—Sep)	CCSM45	68.8	70.7	72.8	73.3	
	CCSM85	68.8	71.0	73.7	77.6	
	GFDL45	68.8	72.0	75.5	77.0	
	GFDL85	68.8	73.0	76.9	81.3	
	HAD45	68.8	71.8	75.0	76.7	
HAD85	68.8	71.8	76.8	81.8		
Coldest Month Average	CCSM45	31.0	33.0	34.3	34.8	
	CCSM85	31.0	33.6	34.8	36.2	
	GFDL45	31.0	34.2	34.7	35.4	
	GFDL85	31.0	33.7	34.6	36.1	
	HAD45	31.0	32.5	34.5	34.6	
HAD85	31.0	32.8	34.5	36.2		
Warmest Month Average	CCSM45	74.3	76.5	77.6	77.9	
	CCSM85	74.3	76.6	78.5	80.2	
	GFDL45	74.3	77.6	79.5	80.9	
	GFDL85	74.3	79.0	81.3	83.9	
	HAD45	74.3	77.7	79.9	81.0	
HAD85	74.3	78.3	81.5	84.9		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	42.1	46.0	48.0	48.1	
	CCSM85	42.1	46.7	47.9	54.3	
	GFDL45	42.1	46.7	48.9	49.7	
	GFDL85	42.1	43.2	49.5	50.5	
	HAD45	42.1	44.8	45.9	44.6	
HAD85	42.1	47.6	44.4	47.2		
Growing Season (May—Sep)	CCSM45	20.2	23.5	24.6	24.2	
	CCSM85	20.2	23.5	23.6	26.4	
	GFDL45	20.2	21.4	21.9	22.2	
	GFDL85	20.2	19.5	22.2	22.4	
	HAD45	20.2	22.2	21.3	20.2	
HAD85	20.2	22.4	20.1	21.1		

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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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
chestnut oak	Quercus prinus	NDH	High	65.1	1601.0	17.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
yellow-poplar	Liriodendron tulipifera	WDH	High	62.5	1107.4	11.6	Sm. dec.	Lg. dec.	High	Abundant	Good	Good			1	2
white oak	Quercus alba	WDH	Medium	72.1	904.1	7.8	No change	No change	High	Abundant	Very Good	Very Good			1	3
red maple	Acer rubrum	WDH	High	84.6	844.8	7.0	No change	Sm. dec.	High	Abundant	Very Good	Good			1	4
Virginia pine	Pinus virginiana	NDH	High	54.8	551.3	6.4	No change	Sm. dec.	Medium	Abundant	Good	Fair			1	5
northern red oak	Quercus rubra	WDH	Medium	64.5	532.0	6.0	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	6
blackgum	Nyssa sylvatica	WDL	Medium	71.4	467.2	4.5	No change	No change	High	Common	Good	Good			1	7
scarlet oak	Quercus coccinea	WDL	Medium	50.6	419.3	5.0	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	8
eastern redcedar	Juniperus virginiana	WDH	Medium	37.4	380.2	6.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	9
black oak	Quercus velutina	WDH	High	56.5	374.8	4.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	10
black locust	Robinia pseudoacacia	NDH	Low	57.9	359.1	4.6	Sm. dec.	No change	Medium	Common	Poor	Fair			1	11
pignut hickory	Carya glabra	WDL	Medium	71.6	346.4	3.4	No change	Sm. dec.	Medium	Common	Fair	Poor			1	12
eastern white pine	Pinus strobus	WDH	High	36.1	342.5	7.9	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	13
black cherry	Prunus serotina	WDL	Medium	43.5	307.9	4.9	No change	No change	Low	Common	Poor	Poor			0	14
loblolly pine	Pinus taeda	WDH	High	7.3	298.1	16.4	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +	Infill ++	1	15
white ash	Fraxinus americana	WDL	Medium	52.6	250.3	3.6	No change	Sm. inc.	Low	Common	Poor	Fair			1	16
mockernut hickory	Carya alba	WDL	Medium	44.1	219.2	3.9	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	17
ailanthus	Ailanthus altissima	NSL	FIA	36.3	209.0	4.6	Unknown	Unknown	NA	Common	NNIS	NNIS			0	18
sweet birch	Betula lenta	NDH	High	36.2	179.7	4.1	Sm. dec.	Lg. dec.	Low	Common	Poor	Very Poor			0	19
sycamore	Platanus occidentalis	NSL	Low	15.1	168.5	8.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	20
southern red oak	Quercus falcata	WDL	Medium	11.7	138.2	9.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	21
black walnut	Juglans nigra	WDL	Low	27.6	128.4	3.2	No change	Sm. inc.	Medium	Common	Fair	Good			1	22
sassafras	Sassafras albidum	WSL	Low	32.6	121.0	2.9	No change	No change	Medium	Common	Fair	Fair			1	23
American basswood	Tilia americana	WSL	Medium	18.6	103.8	4.6	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	24
pitch pine	Pinus rigida	NSH	High	22.3	102.9	3.0	No change	No change	Medium	Common	Fair	Fair			1	25
green ash	Fraxinus pennsylvanica	WSH	Low	7.5	88.6	7.1	No change	No change	Medium	Common	Fair	Fair			1	26
eastern hemlock	Tsuga canadensis	NSH	High	14.9	82.4	4.7	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	27
sugar maple	Acer saccharum	WDH	High	15.4	78.7	3.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	28
American beech	Fagus grandifolia	WDH	High	10	60.5	3.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	29
striped maple	Acer pensylvanicum	NSL	Medium	21.5	56.8	2.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	30
flowering dogwood	Cornus florida	WDL	Medium	32.6	56.4	1.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	31
eastern redbud	Cercis canadensis	NSL	Low	24.5	51.0	1.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	32
boxelder	Acer negundo	WSH	Low	7.7	48.1	5.5	Sm. dec.	No change	High	Rare	Poor	Fair			1	33
American elm	Ulmus americana	WDH	Medium	19.1	47.4	1.9	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	34
bitternut hickory	Carya cordiformis	WSL	Low	10.6	44.7	1.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	35
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	9	37.9	2.0	No change	No change	Medium	Rare	Poor	Poor			1	36
hackberry	Celtis occidentalis	WDH	Medium	14.8	36.8	2.1	No change	Lg. inc.	High	Rare	Fair	Good			1	37
common persimmon	Diospyros virginiana	NSL	Low	13.5	33.3	1.7	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	38
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	14.6	30.0	1.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	39
post oak	Quercus stellata	WDH	High	7.7	29.4	1.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	40
paulownia	Paulownia tomentosa	NSL	FIA	6.9	28.6	3.9	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	41
serviceberry	Amelanchier spp.	NSL	Low	18.8	28.5	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	42
river birch	Betula nigra	NSL	Low	1.9	20.3	2.4	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	43
cucumbertree	Magnolia acuminata	NSL	Low	4.3	18.5	3.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	44
chinkapin oak	Quercus muehlenbergii	NSL	Medium	1.9	17.3	8.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	45
sweetgum	Liquidambar styraciflua	WDH	High	3	16.5	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	46
shagbark hickory	Carya ovata	WSL	Medium	12	15.4	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	47



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pin oak	Quercus palustris	NSH	Low	2.3	15.2	2.8	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	48
shortleaf pine	Pinus echinata	WDH	High	6.8	13.9	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	49
red spruce	Picea rubens	NDH	High	1	13.2	12.8	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	50
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	2.3	12.8	3.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	51
pin cherry	Prunus pensylvanica	NSL	Low	3.9	12.7	3.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	52
willow oak	Quercus phellos	NSL	Low	2.5	11.7	1.0	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	53
bigtooth aspen	Populus grandidentata	NSL	Medium	2.6	10.6	3.3	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	54
Table Mountain pine	Pinus pungens	NSL	Low	2.3	9.4	2.1	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	55
slippery elm	Ulmus rubra	WSL	Low	6.5	9.1	1.2	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	56
yellow birch	Betula alleghaniensis	NDL	High	3.8	6.0	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	57
white mulberry	Morus alba	NSL	FIA	1	4.5	4.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	58
black willow	Salix nigra	NSH	Low	2.1	4.5	2.2	No change	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	59
American chestnut	Castanea dentata	NSLX	FIA	5.7	4.2	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	60
sourwood	Oxydendrum arboreum	NDL	High	1	4.0	3.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	61
swamp chestnut oak	Quercus michauxii	NSL	Low	1	3.9	3.8	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	62
honeylocust	Gleditsia triacanthos	NSH	Low	1	3.7	3.6	No change	Lg. inc.	High	Rare	Fair	Good			2	63
butternut	Juglans cinerea	NSLX	FIA	2.1	2.9	1.4	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	64
pawpaw	Asimina triloba	NSL	Low	2.1	2.8	1.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	65
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	1	2.7	2.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	66
red mulberry	Morus rubra	NSL	Low	0.2	2.6	0.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	67
Osage-orange	Maclura pomifera	NDH	Medium	1	1.3	1.3	Very Lg. dec.	Sm. inc.	High	Rare	Lost	Good			2	68
blackjack oak	Quercus marilandica	NSL	Medium	1	1.3	1.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	69
bur oak	Quercus macrocarpa	NDH	Medium	0.6	0.6	0.3	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	70
gray birch	Betula populifolia	NSL	Low	1	0.6	0.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	71
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	72
northern white-cedar	Thuja occidentalis	WSH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	73
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	74
black maple	Acer nigrum	NSH	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	75
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	76
yellow buckeye	Aesculus flava	NSL	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +		3	77
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			0	78
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	79
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	80
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	81
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	82
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			3	83
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	84
American holly	Ilex opaca	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	85
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	86
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	87
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	88
redbay	Persea borbonia	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	89
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	90
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	91
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	92
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	93
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	94



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winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	95