

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	9,941.4	3,838.4	241

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	19	24	Increase	30	33	Very Good	14	18	Likely	0	0
Hickory	5			Medium	33	52	No Change	9	9	Good	19	15	Infill	5	7
Maple	4	Abundant	4	Low	34	13	Decrease	25	22	Fair	9	11	Migrate	3	9
Oak	16	Common	31	FIA	7		New	18	19	Poor	9	9		8	16
Pine	4	Rare	36				Unknown	11	10	Very Poor	12	10			
Other	39	Absent	21							FIA Only	3	3			
	71		92		93	89		93	93	Unknown	4	3			
											70	69			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	58.0	59.7	62.0	62.3	
	CCSM85	58.0	60.2	63.0	66.0	
	GFDL45	58.0	61.1	63.0	63.7	
	GFDL85	58.0	60.7	64.0	67.5	
	HAD45	58.0	60.6	63.8	65.1	
HAD85	58.0	61.0	65.6	69.5		
Growing Season (May—Sep)	CCSM45	73.3	75.0	77.0	77.6	
	CCSM85	73.3	75.4	78.5	82.3	
	GFDL45	73.3	76.9	79.0	80.4	
	GFDL85	73.3	76.5	80.5	84.7	
	HAD45	73.3	76.7	79.9	81.4	
HAD85	73.3	77.2	83.8	87.4		
Coldest Month Average	CCSM45	34.2	35.9	37.5	37.9	
	CCSM85	34.2	37.3	38.4	40.1	
	GFDL45	34.2	37.9	37.9	38.2	
	GFDL85	34.2	35.7	36.9	37.4	
	HAD45	34.2	34.9	37.2	37.5	
HAD85	34.2	36.2	38.1	39.8		
Warmest Month Average	CCSM45	78.7	80.2	81.4	81.6	
	CCSM85	78.7	80.8	82.4	84.2	
	GFDL45	78.7	82.0	83.2	84.1	
	GFDL85	78.7	82.0	84.2	86.6	
	HAD45	78.7	83.1	85.7	86.3	
HAD85	78.7	84.7	89.3	90.8		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	50.7	51.3	57.1	55.4	
	CCSM85	50.7	56.1	56.3	59.8	
	GFDL45	50.7	58.0	61.4	63.8	
	GFDL85	50.7	58.2	62.2	65.9	
	HAD45	50.7	48.7	52.8	53.0	
HAD85	50.7	50.6	47.6	52.6		
Growing Season (May—Sep)	CCSM45	20.5	19.4	20.6	20.2	
	CCSM85	20.5	21.4	18.9	20.4	
	GFDL45	20.5	23.5	24.1	24.9	
	GFDL85	20.5	23.7	24.4	25.4	
	HAD45	20.5	19.0	18.3	18.1	
HAD85	20.5	19.4	15.1	15.9		

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
white oak	Quercus alba	WDH	Medium	70.3	1159.1	10.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
sugar maple	Acer saccharum	WDH	High	75.2	908.5	8.8	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	2
yellow-poplar	Liriodendron tulipifera	WDH	High	68.5	736.1	8.4	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	3
pignut hickory	Carya glabra	WDL	Medium	64.9	635.7	6.6	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	4
post oak	Quercus stellata	WDH	High	50.7	397.5	5.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	5
black oak	Quercus velutina	WDH	High	59	381.7	4.5	No change	No change	Medium	Common	Fair	Fair			1	6
black cherry	Prunus serotina	WDL	Medium	61.4	367.5	5.6	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	7
eastern redcedar	Juniperus virginiana	WDH	Medium	56.3	344.4	5.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	8
blackgum	Nyssa sylvatica	WDL	Medium	69.2	323.6	3.4	No change	Sm. inc.	High	Common	Good	Very Good			1	9
sweetgum	Liquidambar styraciflua	WDH	High	41.8	297.4	5.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	10
winged elm	Ulmus alata	WDL	Medium	67	294.5	3.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	11
chestnut oak	Quercus prinus	NDH	High	17.8	276.3	6.6	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	12
sassafras	Sassafras albidum	WSL	Low	60.3	262.3	3.7	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	13
American beech	Fagus grandifolia	WDH	High	52.5	259.6	4.0	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	14
southern red oak	Quercus falcata	WDL	Medium	47.3	248.9	5.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	15
moccernut hickory	Carya alba	WDL	Medium	53.2	242.7	4.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	16
loblolly pine	Pinus taeda	WDH	High	11.4	240.9	16.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	17
red maple	Acer rubrum	WDH	High	34.6	234.9	5.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	18
scarlet oak	Quercus coccinea	WDL	Medium	41.6	184.3	2.9	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	19
northern red oak	Quercus rubra	WDH	Medium	44.4	181.9	3.1	No change	No change	High	Common	Good	Good			1	20
green ash	Fraxinus pennsylvanica	WSH	Low	48.5	177.9	3.3	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	21
sourwood	Oxydendrum arboreum	NDL	High	29.7	149.0	2.5	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	22
American elm	Ulmus americana	WDH	Medium	41.6	143.2	3.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	23
flowering dogwood	Cornus florida	WDL	Medium	52.3	139.5	1.9	No change	No change	Medium	Common	Fair	Fair			1	24
shagbark hickory	Carya ovata	WSL	Medium	47.8	137.5	2.6	No change	No change	Medium	Common	Fair	Fair			1	25
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	41	136.9	2.3	No change	Sm. inc.	High	Common	Good	Very Good			1	26
common persimmon	Diospyros virginiana	NSL	Low	32.7	117.6	2.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	27
sycamore	Platanus occidentalis	NSL	Low	29.7	115.4	3.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	28
boxelder	Acer negundo	WSH	Low	20.1	111.2	4.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	29
white ash	Fraxinus americana	WDL	Medium	37.3	109.0	2.3	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	30
slippery elm	Ulmus rubra	WSL	Low	23.8	107.4	3.0	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	31
black walnut	Juglans nigra	WDH	Low	37.2	97.1	2.5	Sm. dec.	No change	Medium	Common	Poor	Fair			1	32
hackberry	Celtis occidentalis	WDH	Medium	25.6	88.1	5.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	33
bitternut hickory	Carya cordiformis	WSL	Low	25	81.6	3.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	34
chinkapin oak	Quercus muehlenbergii	NSL	Medium	25.9	54.8	1.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	35
eastern redbud	Cercis canadensis	NSL	Low	29.5	45.0	1.3	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	36
honeylocust	Gleditsia triacanthos	NSH	Low	13.3	34.1	3.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	37
Virginia pine	Pinus virginiana	NDH	High	4.3	33.7	3.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	38
sugarberry	Celtis laevigata	NDH	Medium	15	32.4	2.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	39
shellbark hickory	Carya laciniosa	NSL	Low	11	28.5	2.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	40
silver maple	Acer saccharinum	NSH	Low	3	27.4	9.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	41
shingle oak	Quercus imbricaria	NDH	Medium	11.4	26.5	2.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	42
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	5.5	25.4	2.3	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	43
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	15.4	20.0	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	44
serviceberry	Amelanchier spp.	NSL	Low	9.7	19.9	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	45
black locust	Robinia pseudoacacia	NDH	Low	8.5	19.5	3.4	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	46
red mulberry	Morus rubra	NSL	Low	16.6	19.2	1.2	Sm. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair			1	47



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blackjack oak	Quercus marilandica	NSL	Medium	4.7	15.4	2.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	48
Osage-orange	Maclura pomifera	NDH	Medium	10.1	12.2	4.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	49
pawpaw	Asimina triloba	NSL	Low	7	10.6	1.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	50
swamp chestnut oak	Quercus michauxii	NSL	Low	2.4	9.8	2.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	51
bigtooth aspen	Populus grandidentata	NSL	Medium	1	9.3	9.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	52
ailanthus	Ailanthus altissima	NSL	FIA	8.7	8.6	0.9	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	53
paulownia	Paulownia tomentosa	NSL	FIA	3	5.8	1.9	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	54
rock elm	Ulmus thomasii	NSLX	FIA	0.8	4.6	3.6	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	55
Shumard oak	Quercus shumardii	NSL	Low	0.9	4.5	4.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	56
eastern cottonwood	Populus deltoides	NSH	Low	0.2	3.7	0.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	57
Ohio buckeye	Aesculus glabra	NSL	Low	2	3.6	1.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	58
black willow	Salix nigra	NSH	Low	1.7	3.3	1.2	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair		Infill +	2	59
bur oak	Quercus macrocarpa	NDH	Medium	1	2.7	2.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	60
shortleaf pine	Pinus echinata	WDH	High	0.5	2.7	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	61
American basswood	Tilia americana	WSL	Medium	1	2.4	2.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	62
willow oak	Quercus phellos	NSL	Low	1	2.3	2.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	63
overcup oak	Quercus lyrata	NSL	Medium	1	1.8	1.8	No change	No change	Low	Rare	Very Poor	Very Poor			2	64
wild plum	Prunus americana	NSLX	FIA	0.7	1.4	1.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	65
eastern white pine	Pinus strobus	WDH	High	0.1	1.1	0.1	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	66
river birch	Betula nigra	NSL	Low	1	0.8	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good		Infill ++	2	67
butternut	Juglans cinerea	NSLX	FIA	4	0.7	2.9	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	68
white mulberry	Morus alba	NSL	FIA	1	0.7	0.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	69
blue ash	Fraxinus quadrangulata	NSL	Low	1.1	0.7	0.8	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	70
Siberian elm	Ulmus pumila	NDH	FIA	0.6	0.6	0.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	71
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	72
red spruce	Picea rubens	NDH	High	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	73
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	74
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	75
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	76
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	77
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	78
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	79
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	80
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			3	81
American holly	Ilex opaca	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	82
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	83
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	84
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	85
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	86
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	87
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	88
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	89
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	90
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	91
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	92
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	93