

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	10,066	3,886.5	287

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		
								RCP45	RCP85	RCP45	RCP85	RCP45	RCP85		
Ash	2			High	22	23	Increase	23	27	Very Good	13	13	Likely	0	0
Hickory	6			Medium	30	49	No Change	15	17	Good	12	15	Infill	11	19
Maple	5	Abundant	6	Low	32	14	Decrease	28	22	Fair	11	9	Migrate	4	7
Oak	11	Common	29	FIA	6		New	13	14	Poor	15	19			
Pine	6	Rare	37				Unknown	11	10	Very Poor	15	9			
Other	42	Absent	17							FIA Only	3	3			
	72		89		90	86		90	90	Unknown	5	4			
											74	72			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	58.6	60.5	62.5	62.6	
	CCSM85	58.6	60.9	63.2	66.1	
	GFDL45	58.6	61.4	63.7	64.5	
	GFDL85	58.6	61.6	64.9	68.6	
	HAD45	58.6	60.9	63.9	65.2	
HAD85	58.6	61.2	65.3	69.4		
Growing Season (May–Sep)	CCSM45	72.7	74.5	76.4	76.8	
	CCSM85	72.7	74.7	77.3	81.0	
	GFDL45	72.7	75.8	78.4	79.7	
	GFDL85	72.7	76.2	79.9	84.2	
	HAD45	72.7	75.8	78.6	80.1	
HAD85	72.7	75.7	81.3	85.5		
Coldest Month (Average)	CCSM45	38.0	40.3	41.2	41.2	
	CCSM85	38.0	40.6	41.6	42.6	
	GFDL45	38.0	41.2	41.5	42.2	
	GFDL85	38.0	40.1	41.0	41.9	
	HAD45	38.0	38.3	40.1	40.5	
HAD85	38.0	39.1	40.3	41.8		
Warmest Month (Average)	CCSM45	77.7	79.8	80.8	80.9	
	CCSM85	77.7	80.0	81.6	83.3	
	GFDL45	77.7	80.9	82.1	83.0	
	GFDL85	77.7	81.6	83.6	86.1	
	HAD45	77.7	81.3	83.2	83.9	
HAD85	77.7	82.0	85.5	87.9		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	47.2	51.1	53.7	55.0	
	CCSM85	47.2	51.8	54.5	59.9	
	GFDL45	47.2	52.9	56.3	59.0	
	GFDL85	47.2	51.4	57.6	57.6	
	HAD45	47.2	48.4	50.8	51.6	
HAD85	47.2	52.1	48.1	50.5		
Growing Season (May–Sep)	CCSM45	20.4	23.3	24.9	26.0	
	CCSM85	20.4	22.9	23.7	26.1	
	GFDL45	20.4	24.3	26.5	27.3	
	GFDL85	20.4	22.8	27.3	27.3	
	HAD45	20.4	20.6	20.9	21.8	
HAD85	20.4	23.4	19.8	20.0		

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
yellow-poplar	Liriodendron tulipifera	WDH	High	85.1	1317.4	11.5	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	1
Virginia pine	Pinus virginiana	NDH	High	73.4	1120.8	11.2	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	2
loblolly pine	Pinus taeda	WDH	High	38.2	994.7	17.6	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	3
red maple	Acer rubrum	WDH	High	85.7	869.9	7.2	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	4
white oak	Quercus alba	WDH	Medium	75.2	724.5	6.8	No change	No change	High	Abundant	Very Good	Very Good			1	5
sweetgum	Liquidambar styraciflua	WDH	High	54.9	611.1	7.5	Sm. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	6
black cherry	Prunus serotina	WDL	Medium	71.3	471.7	5.1	Sm. dec.	No change	Low	Common	Poor	Poor			0	7
chestnut oak	Quercus prinus	NDH	High	39.5	455.2	8.3	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	8
shortleaf pine	Pinus echinata	WDH	High	53.1	454.5	6.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	9
eastern white pine	Pinus strobus	WDH	High	33.8	436.3	10.8	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	10
sourwood	Oxydendrum arboreum	NDL	High	71	421.1	4.4	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	11
scarlet oak	Quercus coccinea	WDL	Medium	47.9	335.8	5.3	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	12
water oak	Quercus nigra	WDH	High	28.5	258.5	5.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	13
northern red oak	Quercus rubra	WDH	Medium	52.9	245.9	3.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	14
southern red oak	Quercus falcata	WDL	Medium	48.4	239.3	3.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	15
blackgum	Nyssa sylvatica	WDL	Medium	67.3	192.8	2.2	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	16
eastern redcedar	Juniperus virginiana	WDH	Medium	39.6	176.3	2.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	17
flowering dogwood	Cornus florida	WDL	Medium	67.6	169.9	1.8	No change	No change	Medium	Common	Fair	Fair			1	18
mockernut hickory	Carya alba	WDL	Medium	50.9	156.3	2.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	19
river birch	Betula nigra	NSL	Low	10.7	137.3	10.0	No change	Sm. inc.	Medium	Common	Fair	Good			1	20
pignut hickory	Carya glabra	WDL	Medium	45.6	130.7	1.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	21
American beech	Fagus grandifolia	WDH	High	32.3	104.5	2.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	22
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	25	98.0	3.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	23
winged elm	Ulmus alata	WDL	Medium	15.3	93.8	2.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	24
black oak	Quercus velutina	WDH	High	39.2	92.6	1.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	25
willow oak	Quercus phellos	NSL	Low	11	83.6	3.6	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	26
American holly	Ilex opaca	NSL	Medium	39.1	82.6	1.6	No change	Sm. inc.	Medium	Common	Fair	Good			1	27
white ash	Fraxinus americana	WDL	Medium	16.3	76.5	2.1	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	28
post oak	Quercus stellata	WDH	High	18	66.3	2.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	29
black walnut	Juglans nigra	WDH	Low	13.2	57.2	3.6	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	30
black locust	Robinia pseudoacacia	NDH	Low	14.5	56.6	2.7	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	31
pecan	Carya illinoensis	NSH	Low	1.2	55.3	25.7	Sm. dec.	No change	Low	Common	Poor	Poor		Infill +	2	32
pitch pine	Pinus rigida	NSH	High	12.1	51.0	3.3	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	33
sycamore	Platanus occidentalis	NSL	Low	9.9	51.0	3.0	No change	No change	Medium	Common	Fair	Fair			1	34
eastern hemlock	Tsuga canadensis	NSH	High	12.6	50.5	2.9	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	35
ailanthus	Ailanthus altissima	NSL	FIA	8.2	47.5	4.9	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	36
common persimmon	Diospyros virginiana	NSL	Low	17.3	45.4	2.1	Lg. dec.	Sm. dec.	High	Rare	Poor	Poor			1	37
green ash	Fraxinus pennsylvanica	WSH	Low	10.8	44.2	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	38
black willow	Salix nigra	NSH	Low	2.3	25.0	6.0	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	1	39
sweet birch	Betula lenta	NDH	High	12.1	24.9	1.3	No change	No change	Low	Rare	Very Poor	Very Poor			0	40
sassafras	Sassafras albidum	WSL	Low	14.2	23.3	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	41
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	8.7	23.3	1.6	No change	No change	Low	Rare	Very Poor	Very Poor			0	42
American elm	Ulmus americana	WDH	Medium	8.2	22.3	1.1	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +	Infill ++	2	43
eastern redbud	Cercis canadensis	NSL	Low	11.2	21.1	1.4	Lg. dec.	No change	Medium	Rare	Very Poor	Poor			1	44
red mulberry	Morus rubra	NSL	Low	4.6	17.1	1.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	45
shagbark hickory	Carya ovata	WSL	Medium	5.9	16.6	2.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	46
slippery elm	Ulmus rubra	WSL	Low	3.8	15.6	1.2	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	47



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Table Mountain pine	Pinus pungens	NSL	Low	1.7	15.2	7.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	48
blackjack oak	Quercus marilandica	NSL	Medium	2	12.0	6.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	49
honeylocust	Gleditsia triacanthos	NSH	Low	2	10.7	5.4	No change	No change	High	Rare	Fair	Fair		Infill +	2	50
serviceberry	Amelanchier spp.	NSL	Low	3.9	9.6	1.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	51
boxelder	Acer negundo	WSH	Low	1.7	8.9	2.0	No change	No change	High	Rare	Fair	Fair		Infill +	2	52
laurel oak	Quercus laurifolia	NDH	Medium	2.6	8.4	1.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	53
paulownia	Paulownia tomentosa	NSL	FIA	2	8.2	4.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	54
sugar maple	Acer saccharum	WDH	High	3.1	7.9	1.4	No change	Sm. dec.	High	Rare	Fair	Poor	Infill +	Infill +	2	55
hackberry	Celtis occidentalis	WDH	Medium	1.3	7.6	3.4	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2	56
bitternut hickory	Carya cordiformis	WSL	Low	4.7	7.1	0.6	Lg. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	57
florida maple	Acer barbatum	NSL	Low	2	7.1	1.1	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	58
sand hickory	Carya pallida	NSL	FIA	5.3	5.7	0.9	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	59
butternut	Juglans cinerea	NSLX	FIA	1	5.1	5.2	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	60
silverbell	Halesia spp.	NSL	Low	5.1	5.1	0.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	61
American basswood	Tilia americana	WSL	Medium	3.5	4.6	1.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	62
yellow birch	Betula alleghaniensis	NDL	High	1.2	4.4	1.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	63
sugarberry	Celtis laevigata	NDH	Medium	2.3	3.9	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	64
eastern cottonwood	Populus deltoides	NSH	Low	1	3.7	3.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	65
cucumbertree	Magnolia acuminata	NSL	Low	3.1	3.2	0.7	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	66
American chestnut	Castanea dentata	NSLX	FIA	1.7	1.2	0.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	67
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	1.3	1.2	0.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	68
striped maple	Acer pensylvanicum	NSL	Medium	1.7	0.8	0.3	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			0	69
pawpaw	Asimina triloba	NSL	Low	1.7	0.8	0.3	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	70
white mulberry	Morus alba	NSL	FIA	1	0.6	0.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	71
yellow buckeye	Aesculus flava	NSL	Low	0.7	0.5	0.4	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	72
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			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 +	Migrate +	3	75
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	76
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	77
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	78
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	79
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	80
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	81
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	82
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	83
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +		3	84
turkey oak	Quercus laevis	NSH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	85
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	86
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	87
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	88
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	89
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	90