

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

Area of Region sq. km sq. mi FIA Plots
 9,273.2 3,580.4 301

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	1			High	22	21	Increase	17	21	Very Good	7	9	Likely	2	2
Hickory	4			Medium	24	42	No Change	11	9	Good	11	13	Infill	6	8
Maple	5	Abundant	9	Low	24	10	Decrease	21	19	Fair	11	6	Migrate	2	11
Oak	8	Common	17	FIA	6		New	15	17	Poor	9	11			
Pine	5	Rare	29				Unknown	12	10	Very Poor	7	6			
Other	32	Absent	20							FIA Only	3	3			
	55		75		76	73		76	76	Unknown	6	4			
											54	52			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	46.3	48.2	50.7	50.8	
	CCSM85	46.3	48.6	51.2	54.5	
	GFDL45	46.3	49.2	52.4	53.6	
	GFDL85	46.3	49.8	53.6	58.1	
	HAD45	46.3	49.3	52.7	54.4	
	HAD85	46.3	49.4	53.7	58.9	
Growing Season (May—Sep)	CCSM45	62.8	64.8	66.9	67.3	
	CCSM85	62.8	65.0	67.7	71.7	
	GFDL45	62.8	65.9	70.1	71.7	
	GFDL85	62.8	67.3	71.6	76.5	
	HAD45	62.8	66.1	69.0	71.4	
	HAD85	62.8	65.7	70.8	76.6	
Coldest Month Average	CCSM45	21.0	23.0	25.0	25.2	
	CCSM85	21.0	23.8	25.0	26.9	
	GFDL45	21.0	24.2	25.5	26.2	
	GFDL85	21.0	24.5	26.0	27.9	
	HAD45	21.0	22.7	25.5	25.7	
	HAD85	21.0	23.7	25.9	28.8	
Warmest Month Average	CCSM45	68.5	70.8	72.1	72.4	
	CCSM85	68.5	71.2	72.9	75.2	
	GFDL45	68.5	71.5	73.9	75.3	
	GFDL85	68.5	73.1	75.7	78.9	
	HAD45	68.5	72.3	74.1	75.8	
	HAD85	68.5	72.5	75.7	80.0	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	40.6	41.7	41.5	44.4	
	CCSM85	40.6	42.0	43.5	44.9	
	GFDL45	40.6	44.9	46.5	46.0	
	GFDL85	40.6	42.1	46.2	47.5	
	HAD45	40.6	41.6	42.3	41.8	
	HAD85	40.6	43.5	40.8	44.4	
Growing Season (May—Sep)	CCSM45	19.7	20.3	20.1	21.3	
	CCSM85	19.7	19.9	20.7	20.3	
	GFDL45	19.7	20.8	20.4	20.3	
	GFDL85	19.7	19.3	20.1	19.7	
	HAD45	19.7	19.9	18.2	18.7	
	HAD85	19.7	20.1	17.6	18.9	

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
red maple	Acer rubrum	WDH	High	92.5	2210.2	16.3	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
sugar maple	Acer saccharum	WDH	High	64.6	1415.1	15.7	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	2
chestnut oak	Quercus prinus	NDH	High	52.8	868.6	12.0	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	3
sweet birch	Betula lenta	NDH	High	82	815.1	7.4	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor			0	4
northern red oak	Quercus rubra	WDH	Medium	71.6	768.3	7.4	No change	Sm. inc.	High	Abundant	Very Good	Very Good			1	5
eastern hemlock	Tsuga canadensis	NSH	High	59.6	763.5	8.3	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor			0	6
white ash	Fraxinus americana	WDL	Medium	64.7	573.9	5.9	No change	No change	Low	Abundant	Fair	Fair			0	7
American beech	Fagus grandifolia	WDH	High	54.2	572.9	7.7	Lg. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	8
white oak	Quercus alba	WDH	Medium	48.4	539.2	7.6	Sm. inc.	Lg. inc.	High	Abundant	Very Good	Very Good			1	9
eastern white pine	Pinus strobus	WDH	High	49.2	455.3	6.2	No change	Sm. dec.	Low	Common	Poor	Poor			0	10
black cherry	Prunus serotina	WDL	Medium	54	444.7	5.4	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	11
black oak	Quercus velutina	WDH	High	36.7	194.5	4.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	12
quaking aspen	Populus tremuloides	WDH	High	16.3	133.8	5.1	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	13
blackgum	Nyssa sylvatica	WDL	Medium	29.5	128.1	2.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	14
scarlet oak	Quercus coccinea	WDL	Medium	25.5	126.9	4.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	15
yellow birch	Betula alleghaniensis	NDL	High	36.1	125.5	3.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	16
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	33.9	125.3	2.7	Sm. dec.	No change	High	Common	Fair	Good			1	17
red pine	Pinus resinosa	NSH	Medium	7.9	124.4	12.6	Lg. dec.	Very Lg. dec.	Low	Common	Very Poor	Lost			0	18
American basswood	Tilia americana	WSL	Medium	34	115.1	2.9	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	19
paper birch	Betula papyrifera	WDH	High	22.2	109.1	3.8	Lg. dec.	Very Lg. dec.	Medium	Common	Poor	Lost			0	20
pin cherry	Prunus pensylvanica	NSL	Low	13.5	97.2	5.0	Very Lg. dec.	Very Lg. dec.	Medium	Common	Lost	Lost			0	21
black locust	Robinia pseudoacacia	NDH	Low	18.2	92.2	4.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	22
bigtooth aspen	Populus grandidentata	NSL	Medium	24.5	92.0	3.2	No change	Lg. dec.	Medium	Common	Fair	Poor			1	23
Virginia pine	Pinus virginiana	NDH	High	3.3	63.4	13.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	24
serviceberry	Amelanchier spp.	NSL	Low	36.6	57.2	1.1	No change	No change	Medium	Common	Fair	Fair			1	25
shagbark hickory	Carya ovata	WSL	Medium	11.9	52.7	2.3	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	26
striped maple	Acer pensylvanicum	NSL	Medium	22.4	47.8	1.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	27
American elm	Ulmus americana	WDH	Medium	9.9	45.7	2.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	28
Scots pine	Pinus sylvestris	NSH	FIA	1.2	45.4	11.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	29
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	10.9	43.3	2.7	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	30
pignut hickory	Carya glabra	WDL	Medium	18	37.6	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	31
pitch pine	Pinus rigida	NSH	High	10.5	37.3	3.0	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	32
sycamore	Platanus occidentalis	NSL	Low	2.2	37.0	17.1	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	33
yellow-poplar	Liriodendron tulipifera	WDH	High	11.7	34.3	1.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	34
sassafras	Sassafras albidum	WSL	Low	15.5	28.9	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	35
butternut	Juglans cinerea	NSL	FIA	1.1	27.0	25.0	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	36
mockernut hickory	Carya alba	WDL	Medium	7.9	25.6	1.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	37
white spruce	Picea glauca	NSL	Medium	0.3	23.8	5.9	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	38
bitternut hickory	Carya cordiformis	WSL	Low	4.4	22.4	3.2	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1	39
black walnut	Juglans nigra	WDH	Low	6.7	18.7	1.9	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	40
black willow	Salix nigra	NSH	Low	0.1	11.7	1.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	41
Norway spruce	Picea abies	NSH	FIA	5.1	10.7	1.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	42
cucumbertree	Magnolia acuminata	NSL	Low	4.3	10.7	2.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	43
gray birch	Betula populifolia	NSL	Low	1.1	7.3	6.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	44
Norway maple	Acer platanoides	NSL	FIA	0.5	6.1	0.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	45
flowering dogwood	Cornus florida	WDL	Medium	3.1	4.9	1.5	No change	No change	Medium	Rare	Poor	Poor		Infill +	1	46
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	1.1	3.3	3.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	47



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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
American chestnut	Castanea dentata	NSLX	FIA	2.4	1.7	0.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 48
pin oak	Quercus palustris	NSH	Low	0.2	1.1	0.2	Very Lg. dec.	No change	Low	Rare	Lost	Very Poor				2 49
hackberry	Celtis occidentalis	WDH	Medium	0.2	1.0	0.1	No change	Lg. inc.	High	Rare	Fair	Good				2 50
slippery elm	Ulmus rubra	WSL	Low	2	0.6	0.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 51
boxelder	Acer negundo	WSH	Low	0.9	0.6	0.4	Very Lg. dec.	No change	High	Rare	Lost	Fair		Infill +		2 52
northern pin oak	Quercus ellipsoidalis	NSH	Medium	0.9	0.5	0.4	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor				0 53
eastern redcedar	Juniperus virginiana	WDH	Medium	1	0.4	0.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 54
red spruce	Picea rubens	NDH	High	1	0.4	0.3	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor				0 55
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3 56
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3 57
northern white-cedar	Thuja occidentalis	WSH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 58
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3 59
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown				0 60
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat				0 61
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 62
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				0 63
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 64
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 65
green ash	Fraxinus pennsylvanica	WSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 66
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3 67
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 68
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 69
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 70
eastern cottonwood	Populus deltoides	NSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 71
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 72
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++		3 73
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 74
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++		3 75
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 76