

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	250

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	22	24	Increase	16	21	Very Good	8	8	Likely	0	0
Hickory	4			Medium	27	42	No Change	8	10	Good	10	16	Infill	4	9
Maple	6	Abundant	6	Low	25	11	Decrease	29	22	Fair	6	8	Migrate	3	11
Oak	6	Common	24	FIA	8		New	13	15	Poor	17	9		7	20
Pine	6	Rare	31				Unknown	16	14	Very Poor	5	5			
Other	37	Absent	20					82	82	FIA Only	3	3			
	61		81		82	77				Unknown	8	6			
											57	55			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	48.4	50.2	52.6	52.9	
	CCSM85	48.4	50.7	53.3	56.4	
	GFDL45	48.4	51.2	54.4	55.6	
	GFDL85	48.4	52.0	55.6	59.9	
	HAD45	48.4	51.2	54.6	56.2	
	HAD85	48.4	51.3	55.7	60.6	
Growing Season (May—Sep)	CCSM45	64.5	66.4	68.5	69.1	
	CCSM85	64.5	66.8	69.4	73.4	
	GFDL45	64.5	67.6	71.8	73.5	
	GFDL85	64.5	69.1	73.2	78.0	
	HAD45	64.5	67.7	70.8	73.0	
	HAD85	64.5	67.5	72.7	78.3	
Coldest Month (Average)	CCSM45	23.7	25.5	27.2	27.7	
	CCSM85	23.7	26.1	27.4	29.2	
	GFDL45	23.7	26.8	27.7	28.4	
	GFDL85	23.7	26.9	28.1	29.8	
	HAD45	23.7	24.9	27.5	27.7	
	HAD85	23.7	25.9	27.9	30.3	
Warmest Month (Average)	CCSM45	70.2	72.3	73.5	73.9	
	CCSM85	70.2	72.7	74.4	76.7	
	GFDL45	70.2	73.3	75.7	77.2	
	GFDL85	70.2	75.2	77.7	80.7	
	HAD45	70.2	73.8	75.9	77.4	
	HAD85	70.2	74.4	77.8	81.7	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	41.9	44.4	43.9	46.4	
	CCSM85	41.9	44.1	45.7	48.8	
	GFDL45	41.9	45.9	47.4	47.2	
	GFDL85	41.9	42.8	48.0	48.8	
	HAD45	41.9	43.9	44.2	44.0	
	HAD85	41.9	45.1	41.8	45.0	
Growing Season (May—Sep)	CCSM45	19.4	20.8	20.4	21.1	
	CCSM85	19.4	20.3	20.7	21.5	
	GFDL45	19.4	20.4	19.9	19.6	
	GFDL85	19.4	18.3	19.8	19.3	
	HAD45	19.4	20.5	18.4	19.0	
	HAD85	19.4	20.2	17.5	18.1	

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
red maple	Acer rubrum	WDH	High	93.8	2032.7	15.0	Sm. dec.	Lg. dec.	High	Abundant	Good	Good			1	1
black cherry	Prunus serotina	WDL	Medium	80.7	1364.1	10.9	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	2
northern red oak	Quercus rubra	WDH	Medium	76	1110.8	8.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
chestnut oak	Quercus prinus	NDH	High	52	790.2	9.1	Sm. inc.	No change	High	Abundant	Very Good	Very Good			1	4
sugar maple	Acer saccharum	WDH	High	61.1	790.0	9.1	No change	Sm. dec.	High	Abundant	Very Good	Good			1	5
sweet birch	Betula lenta	NDH	High	73.7	774.5	6.5	Lg. dec.	Lg. dec.	Low	Abundant	Poor	Poor			0	6
eastern hemlock	Tsuga canadensis	NSH	High	31.6	443.1	11.4	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	7
white oak	Quercus alba	WDH	Medium	34.1	421.1	6.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	8
black locust	Robinia pseudoacacia	NDH	Low	50.5	403.8	5.3	No change	No change	Medium	Common	Fair	Fair			1	9
eastern white pine	Pinus strobus	WDH	High	36.8	389.1	6.8	Sm. dec.	Lg. dec.	Low	Common	Poor	Very Poor			0	10
white ash	Fraxinus americana	WDL	Medium	54.8	346.5	4.3	No change	No change	Low	Common	Poor	Poor			0	11
black oak	Quercus velutina	WDH	High	28.7	216.1	3.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	12
yellow-poplar	Liriodendron tulipifera	WDH	High	24.6	194.4	3.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	13
Virginia pine	Pinus virginiana	NDH	High	8.1	178.5	16.1	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	14
blackgum	Nyssa sylvatica	WDL	Medium	33.4	168.1	3.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	15
scarlet oak	Quercus coccinea	WDL	Medium	26.5	166.5	3.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
bigtooth aspen	Populus grandidentata	NSL	Medium	23.8	160.9	5.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	17
American beech	Fagus grandifolia	WDH	High	27.4	159.5	4.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	18
sassafras	Sassafras albidum	WSL	Low	34.2	149.3	2.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	19
quaking aspen	Populus tremuloides	WDH	High	18.2	130.2	6.6	Very Lg. dec.	Very Lg. dec.	Medium	Common	Lost	Lost			0	20
yellow birch	Betula alleghaniensis	NDL	High	19.8	108.9	4.2	Very Lg. dec.	Very Lg. dec.	Medium	Common	Lost	Lost			0	21
pignut hickory	Carya glabra	WDL	Medium	21.6	102.5	2.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	22
American basswood	Tilia americana	WSL	Medium	18.5	99.6	3.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	23
cucumbertree	Magnolia acuminata	NSL	Low	23	77.5	2.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	24
Norway spruce	Picea abies	NSH	FIA	7.1	72.2	9.6	Unknown	Unknown	NA	Common	NNIS	NNIS			0	25
shagbark hickory	Carya ovata	WSL	Medium	20.6	68.3	2.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	26
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	15.5	61.6	1.6	Sm. dec.	Sm. inc.	High	Common	Fair	Very Good			1	27
serviceberry	Amelanchier spp.	NSL	Low	22.3	58.8	1.5	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	28
striped maple	Acer pensylvanicum	NSL	Medium	27.8	54.1	1.7	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	29
slippery elm	Ulmus rubra	WSL	Low	16.2	50.7	2.2	Sm. dec.	No change	Medium	Common	Poor	Fair			1	30
mockernut hickory	Carya alba	WDL	Medium	10.3	47.4	2.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	31
American elm	Ulmus americana	WDH	Medium	13.2	45.7	2.9	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +	Infill ++	1	32
black walnut	Juglans nigra	WDH	Low	12.3	44.1	2.2	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	33
red pine	Pinus resinosa	NSH	Medium	8.7	37.1	2.8	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	34
bitternut hickory	Carya cordiformis	WSL	Low	8.7	36.1	2.1	No change	Sm. inc.	High	Rare	Fair	Good			1	35
pin cherry	Prunus pensylvanica	NSL	Low	13	36.0	2.2	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	36
Scots pine	Pinus sylvestris	NSH	FIA	5.1	35.1	3.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	37
pitch pine	Pinus rigida	NSH	High	6.1	27.2	2.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	38
ailanthus	Ailanthus altissima	NSL	FIA	5.3	19.4	3.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	39
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	7.2	18.8	2.0	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	40
Norway maple	Acer platanoides	NSL	FIA	0.9	17.8	13.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	41
eastern redbud	Cercis canadensis	NSL	Low	3.6	15.7	1.8	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	42
Table Mountain pine	Pinus pungens	NSL	Low	3.2	9.0	2.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	43
chokecherry	Prunus virginiana	NSLX	FIA	2.4	7.8	1.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	44
hackberry	Celtis occidentalis	WDH	Medium	2.1	7.3	3.4	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	45
butternut	Juglans cinerea	NSLX	FIA	2.5	7.1	1.3	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	46
balsam poplar	Populus balsamifera	NSH	Medium	0.4	5.6	1.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	47



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bur oak	Quercus macrocarpa	NDH	Medium	1.1	5.0	4.7	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor				0 48
flowering dogwood	Cornus florida	WDL	Medium	2.1	4.8	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		2 49
honeylocust	Gleditsia triacanthos	NSH	Low	1.4	4.7	1.1	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +		2 50
eastern redcedar	Juniperus virginiana	WDH	Medium	2.4	4.7	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 51
green ash	Fraxinus pennsylvanica	WSH	Low	2.1	4.4	2.1	No change	Lg. inc.	Medium	Rare	Poor	Good		Infill ++		2 52
white spruce	Picea glauca	NSL	Medium	1.4	4.1	1.2	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0 53
Osage-orange	Maclura pomifera	NDH	Medium	1.1	3.2	3.0	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +		2 54
black willow	Salix nigra	NSH	Low	1.1	2.6	2.5	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor				2 55
boxelder	Acer negundo	WSH	Low	2.1	2.1	1.0	Sm. dec.	Sm. inc.	High	Rare	Poor	Good				2 56
paper birch	Betula papyrifera	WDH	High	1.1	1.9	1.8	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0 57
silver maple	Acer saccharinum	NSH	Low	1.1	1.1	1.1	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost				0 58
sycamore	Platanus occidentalis	NSL	Low	1.1	1.1	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 59
white mulberry	Morus alba	NSL	FIA	1.1	0.6	0.6	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 60
American chestnut	Castanea dentata	NSLX	FIA	1.1	0.3	0.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 61
red spruce	Picea rubens	NDH	High	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown				0 62
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 63
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3 64
northern white-cedar	Thuja occidentalis	WSH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 65
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 66
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat				0 67
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 68
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				3 69
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 70
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 71
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3 72
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 73
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 74
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				0 75
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 76
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++		3 77
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++		3 78
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 79
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 80
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 81
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3 82