

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	411

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	25	Increase	25	38	Very Good	8	10	Likely	1	1
Hickory	4			Medium	24	46	No Change	24	11	Good	19	27	Infill	9	10
Maple	6	Abundant	6	Low	37	15	Decrease	15	15	Fair	14	9	Migrate	3	7
Oak	11	Common	25	FIA	4		New	10	12	Poor	12	9			
Pine	6	Rare	37				Unknown	13	11	Very Poor	9	7			
Other	39	Absent	18							FIA Only	3	3			
	68		86		87	86		87	87	Unknown	9	7			
											74	72			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	49.1	51.0	53.2	53.5	
	CCSM85	49.1	51.4	53.9	57.0	
	GFDL45	49.1	52.0	54.7	55.7	
	GFDL85	49.1	52.4	55.9	59.9	
	HAD45	49.1	51.6	55.1	56.4	
HAD85	49.1	51.9	56.1	60.6		
Growing Season (May—Sep)	CCSM45	63.9	65.9	68.0	68.6	
	CCSM85	63.9	66.3	68.9	72.9	
	GFDL45	63.9	67.3	70.8	72.2	
	GFDL85	63.9	68.2	72.2	76.6	
	HAD45	63.9	67.0	70.4	72.0	
HAD85	63.9	67.2	72.4	77.4		
Coldest Month Average	CCSM45	26.5	28.5	29.9	30.4	
	CCSM85	26.5	29.2	30.3	31.7	
	GFDL45	26.5	29.9	30.4	31.1	
	GFDL85	26.5	29.2	30.2	31.4	
	HAD45	26.5	27.6	29.7	29.9	
HAD85	26.5	28.1	29.8	31.5		
Warmest Month Average	CCSM45	69.2	71.4	72.6	72.9	
	CCSM85	69.2	71.6	73.4	75.3	
	GFDL45	69.2	72.7	74.7	76.0	
	GFDL85	69.2	74.1	76.6	79.2	
	HAD45	69.2	72.8	75.2	76.3	
HAD85	69.2	73.6	77.0	80.3		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	43.6	47.1	48.1	48.7	
	CCSM85	43.6	47.6	48.7	53.9	
	GFDL45	43.6	47.9	49.2	50.6	
	GFDL85	43.6	44.9	50.2	51.3	
	HAD45	43.6	45.8	46.3	45.6	
HAD85	43.6	47.5	44.9	47.1		
Growing Season (May—Sep)	CCSM45	20.5	23.3	23.9	23.6	
	CCSM85	20.5	23.1	22.8	24.9	
	GFDL45	20.5	22.0	21.9	22.5	
	GFDL85	20.5	20.2	22.0	22.2	
	HAD45	20.5	22.4	20.8	20.9	
HAD85	20.5	22.2	20.1	20.9		

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
chestnut oak	Quercus prinus	NDH	High	82.9	1739.0	14.4	No change	No change	High	Abundant	Very Good	Very Good			1	1
red maple	Acer rubrum	WDH	High	97.9	1377.2	9.5	No change	Sm. dec.	High	Abundant	Very Good	Good			1	2
northern red oak	Quercus rubra	WDH	Medium	84.2	878.5	7.2	No change	No change	High	Abundant	Very Good	Very Good			1	3
sugar maple	Acer saccharum	WDH	High	66.3	779.8	7.1	No change	No change	High	Abundant	Very Good	Very Good			1	4
white oak	Quercus alba	WDH	Medium	66.9	587.8	5.8	Sm. inc.	Lg. inc.	High	Abundant	Very Good	Very Good			1	5
eastern white pine	Pinus strobus	WDH	High	50.3	571.1	9.6	No change	No change	Low	Abundant	Fair	Fair			0	6
black locust	Robinia pseudoacacia	NDH	Low	77.4	456.1	4.0	No change	Sm. inc.	Medium	Common	Fair	Good			1	7
sweet birch	Betula lenta	NDH	High	65.7	399.1	4.3	No change	Sm. dec.	Low	Common	Poor	Poor			0	8
scarlet oak	Quercus coccinea	WDL	Medium	55.7	384.9	4.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	9
eastern hemlock	Tsuga canadensis	NSH	High	54.3	350.1	4.8	No change	No change	Low	Common	Poor	Poor			0	10
American beech	Fagus grandifolia	WDH	High	33.7	334.4	6.3	No change	Sm. inc.	Medium	Common	Fair	Good			1	11
black oak	Quercus velutina	WDH	High	63	332.3	4.3	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	12
black cherry	Prunus serotina	WDL	Medium	54.2	324.1	4.3	No change	Sm. inc.	Low	Common	Poor	Fair			1	13
pignut hickory	Carya glabra	WDL	Medium	67	306.1	2.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	14
yellow-poplar	Liriodendron tulipifera	WDH	High	32.2	294.8	4.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	15
yellow birch	Betula alleghaniensis	NDL	High	30	275.4	5.9	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	16
red spruce	Picea rubens	NDH	High	21.1	270.2	8.9	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	17
blackgum	Nyssa sylvatica	WDL	Medium	68.1	268.4	2.6	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	18
Virginia pine	Pinus virginiana	NDH	High	34.7	255.1	5.6	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	19
pitch pine	Pinus rigida	NSH	High	35.8	191.6	3.8	No change	Sm. inc.	Medium	Common	Fair	Good			1	20
American basswood	Tilia americana	WSL	Medium	39.3	173.1	2.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	21
white ash	Fraxinus americana	WDL	Medium	51.8	151.1	1.8	Sm. inc.	Lg. inc.	Low	Common	Fair	Good			1	22
eastern redcedar	Juniperus virginiana	WDH	Medium	9	144.3	8.2	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +	Infill ++	1	23
striped maple	Acer pensylvanicum	NSL	Medium	49	107.2	1.4	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	24
Table Mountain pine	Pinus pungens	NSL	Low	22.8	98.9	3.5	No change	No change	High	Common	Good	Good			1	25
shagbark hickory	Carya ovata	WSL	Medium	35.7	93.0	1.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	26
mockernut hickory	Carya alba	WDL	Medium	39.4	92.0	1.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	27
serviceberry	Amelanchier spp.	NSL	Low	52.7	79.2	1.1	No change	No change	Medium	Common	Fair	Fair			1	28
sourwood	Oxydendrum arboreum	NDL	High	8.3	66.4	3.2	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	29
black walnut	Juglans nigra	WDH	Low	16.4	59.9	2.6	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	30
cucumbertree	Magnolia acuminata	NSL	Low	31.1	59.1	1.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	31
sassafras	Sassafras albidum	WSL	Low	25	49.9	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	32
bitternut hickory	Carya cordiformis	WSL	Low	22.1	49.4	1.6	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	33
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	33.8	41.8	0.9	No change	Lg. inc.	High	Rare	Fair	Good			1	34
sycamore	Platanus occidentalis	NSL	Low	9.8	41.1	2.1	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	35
pin cherry	Prunus pensylvanica	NSL	Low	18.7	39.5	2.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	36
ailanthus	Ailanthus altissima	NSL	FIA	7.5	25.3	3.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	37
slippery elm	Ulmus rubra	WSL	Low	16.9	24.5	1.0	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	38
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	6.8	20.2	1.5	No change	Sm. inc.	Low	Rare	Very Poor	Poor			0	39
flowering dogwood	Cornus florida	WDL	Medium	27.8	20.1	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	40
eastern redbud	Cercis canadensis	NSL	Low	7.2	10.3	1.4	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	41
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	6.7	8.9	0.9	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	42
loblolly pine	Pinus taeda	WDH	High	0.9	8.3	6.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	43
American chestnut	Castanea dentata	NSLX	FIA	10.3	7.8	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	44
shortleaf pine	Pinus echinata	WDH	High	3.1	7.5	2.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	45
American elm	Ulmus americana	WDH	Medium	5.7	6.9	0.8	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	46
butternut	Juglans cinerea	NSLX	FIA	4.1	6.6	1.6	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	47



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common persimmon	Diospyros virginiana	NSL	Low	1.3	6.5	1.8	No change	Lg. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	48
balsam fir	Abies balsamea	NDH	High	0.3	5.5	1.7	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	49
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	4.9	5.2	0.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	50
bigtooth aspen	Populus grandidentata	NSL	Medium	3.1	4.7	1.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	51
American mountain-ash	Sorbus americana	NSL	Low	4.4	4.7	0.9	Sm. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	52
boxelder	Acer negundo	WSH	Low	0.5	4.5	2.3	No change	No change	High	Rare	Fair	Fair		Infill +	2	53
chinkapin oak	Quercus muehlenbergii	NSL	Medium	4.3	4.4	2.6	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +	Infill ++	2	54
black maple	Acer nigrum	NSH	Low	2.1	3.4	1.7	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	55
green ash	Fraxinus pennsylvanica	WSH	Low	2.6	2.8	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	56
blackjack oak	Quercus marilandica	NSL	Medium	0.8	2.7	2.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	57
hackberry	Celtis occidentalis	WDH	Medium	2.4	2.5	0.7	No change	Lg. inc.	High	Rare	Fair	Good	Infill +		2	58
mountain maple	Acer spicatum	NSL	Low	4.1	1.8	0.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			1	59
winged elm	Ulmus alata	WDL	Medium	0.8	1.2	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	60
post oak	Quercus stellata	WDH	High	1	0.8	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	61
yellow buckeye	Aesculus flava	NSL	Low	1	0.7	0.6	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	62
black willow	Salix nigra	NSH	Low	1	0.6	0.6	Very Lg. dec.	Lg. inc.	Low	Rare	Lost	Fair		Infill +	2	63
bur oak	Quercus macrocarpa	NDH	Medium	0.5	0.6	0.3	Lg. dec.	Very Lg. dec.	High	Rare	Poor	Lost			0	64
pin oak	Quercus palustris	NSH	Low	1	0.5	0.5	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	65
eastern cottonwood	Populus deltoides	NSH	Low	1	0.4	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	66
river birch	Betula nigra	NSL	Low	1	0.3	0.3	Lg. dec.	No change	Medium	Rare	Very Poor	Poor			0	67
pawpaw	Asimina triloba	NSL	Low	0.8	0.3	0.2	No change	Lg. dec.	Medium	Rare	Poor	Very Poor			0	68
northern white-cedar	Thuja occidentalis	WSH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	69
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	70
silver maple	Acer saccharinum	NSH	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	71
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	72
gray birch	Betula populifolia	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	73
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			0	74
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	75
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	76
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	77
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	78
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	79
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat		Migrate ++	3	80
American holly	Ilex opaca	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	81
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	82
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	83
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	84
red mulberry	Morus rubra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	85
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	86
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	87