

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	9,273.2	3,580.4	324

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	20	Increase	20	21	Very Good	12	13	Likely	1	1
Hickory	4			Medium	27	No Change	6	5	Good	8	9	Infill	7	9
Maple	4	Abundant	8	Low	21	Decrease	22	22	Fair	8	6	Migrate	3	12
Oak	7	Common	25	FIA	5	New	15	17	Poor	12	12			
Pine	6	Rare	20			Unknown	10	8	Very Poor	5	2			
Other	30	Absent	20				73	73	FIA Only	3	3			
	53		73						Unknown	5	3			
										53	48			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	46.8	48.6	51.2	51.3	
	CCSM85	46.8	49.1	51.8	55.0	
	GFDL45	46.8	49.6	52.8	54.0	
	GFDL85	46.8	50.2	54.0	58.4	
	HAD45	46.8	49.8	53.2	55.0	
	HAD85	46.8	49.9	54.3	59.6	
Growing Season (May—Sep)	CCSM45	63.1	65.0	67.3	67.7	
	CCSM85	63.1	65.4	68.0	72.0	
	GFDL45	63.1	66.3	70.5	72.2	
	GFDL85	63.1	67.6	71.9	76.9	
	HAD45	63.1	66.6	69.6	72.0	
	HAD85	63.1	66.3	71.6	77.4	
Coldest Month Average	CCSM45	21.5	23.5	25.5	25.7	
	CCSM85	21.5	24.5	25.8	27.8	
	GFDL45	21.5	24.3	25.5	26.2	
	GFDL85	21.5	24.9	26.2	28.1	
	HAD45	21.5	22.8	25.9	26.1	
	HAD85	21.5	24.0	26.4	29.4	
Warmest Month Average	CCSM45	68.9	71.1	72.4	72.8	
	CCSM85	68.9	71.7	73.2	75.6	
	GFDL45	68.9	71.9	74.3	75.5	
	GFDL85	68.9	73.6	76.0	79.0	
	HAD45	68.9	72.8	74.7	76.4	
	HAD85	68.9	73.3	76.9	81.0	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	45.0	46.2	45.8	48.0	
	CCSM85	45.0	46.4	47.5	49.3	
	GFDL45	45.0	49.7	51.3	51.0	
	GFDL85	45.0	47.0	51.5	52.6	
	HAD45	45.0	45.6	46.5	46.4	
	HAD85	45.0	47.1	44.2	47.9	
Growing Season (May—Sep)	CCSM45	21.9	22.2	21.7	22.6	
	CCSM85	21.9	21.3	22.0	21.8	
	GFDL45	21.9	23.6	23.3	22.8	
	GFDL85	21.9	21.9	22.8	22.3	
	HAD45	21.9	22.0	20.3	21.0	
	HAD85	21.9	22.0	18.7	19.5	

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	94	2824.7	20.6	Sm. dec.	Lg. dec.	High	Abundant	Good	Good			1	1
black cherry	Prunus serotina	WDL	Medium	85.5	1587.3	11.8	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	2
eastern hemlock	Tsuga canadensis	NSH	High	53.4	879.5	11.9	Lg. dec.	Lg. dec.	Low	Abundant	Poor	Poor			0	3
northern red oak	Quercus rubra	WDH	Medium	71.3	794.8	8.6	No change	No change	High	Abundant	Very Good	Very Good			1	4
sugar maple	Acer saccharum	WDH	High	51.6	634.6	7.7	No change	No change	High	Abundant	Very Good	Very Good			1	5
white oak	Quercus alba	WDH	Medium	56.1	531.0	7.8	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	6
sweet birch	Betula lenta	NDH	High	59	526.4	6.7	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor			0	7
American beech	Fagus grandifolia	WDH	High	55.1	515.0	6.3	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	8
white ash	Fraxinus americana	WDL	Medium	60.1	404.3	4.2	No change	No change	Low	Common	Poor	Poor			0	9
quaking aspen	Populus tremuloides	WDH	High	30.8	337.8	5.8	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	10
black oak	Quercus velutina	WDH	High	33.6	216.2	4.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	11
bigtooth aspen	Populus grandidentata	NSL	Medium	27.6	216.0	5.4	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	12
eastern white pine	Pinus strobus	WDH	High	26	201.3	5.3	Sm. inc.	Sm. dec.	Low	Common	Fair	Poor			1	13
yellow birch	Betula alleghaniensis	NDL	High	37.7	200.7	3.8	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	14
Scots pine	Pinus sylvestris	NSH	FIA	9.3	150.7	11.1	Unknown	Unknown	NA	Common	NNIS	NNIS			0	15
yellow-poplar	Liriodendron tulipifera	WDH	High	14.8	145.8	6.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	16
black willow	Salix nigra	NSH	Low	2.7	90.6	21.7	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	0	17
shagbark hickory	Carya ovata	WSL	Medium	17.5	89.4	3.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	18
scarlet oak	Quercus coccinea	WDL	Medium	18.4	87.2	4.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	19
shingle oak	Quercus imbricaria	NDH	Medium	6.4	86.7	11.1	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	20
sassafras	Sassafras albidum	WSL	Low	20.4	85.5	3.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	21
serviceberry	Amelanchier spp.	NSL	Low	34.1	75.4	1.7	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	22
cucumber tree	Magnolia acuminata	NSL	Low	25.6	74.9	2.0	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	23
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	28.5	71.9	2.1	Sm. dec.	No change	Medium	Common	Poor	Fair			1	24
American elm	Ulmus americana	WDH	Medium	14.5	69.8	3.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	25
chestnut oak	Quercus prinus	NDH	High	15.5	66.3	3.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	26
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	31.5	65.7	1.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	27
black locust	Robinia pseudoacacia	NDH	Low	6.1	61.6	5.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	28
blackgum	Nyssa sylvatica	WDL	Medium	30.1	60.8	1.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	29
pignut hickory	Carya glabra	WDL	Medium	19.8	60.0	2.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	30
American basswood	Tilia americana	WSL	Medium	17.1	59.2	2.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	31
red pine	Pinus resinosa	NSH	Medium	6.8	56.1	6.8	Lg. dec.	Very Lg. dec.	Low	Common	Very Poor	Lost			0	32
pin cherry	Prunus pensylvanica	NSL	Low	15.4	54.3	2.5	Very Lg. dec.	Very Lg. dec.	Medium	Common	Lost	Lost			0	33
Norway spruce	Picea abies	NSH	FIA	5.3	38.9	3.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	34
black walnut	Juglans nigra	WDH	Low	2.2	31.7	8.7	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	35
jack pine	Pinus banksiana	NSH	Medium	0.5	21.8	9.9	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	36
butternut	Juglans cinerea	NSLX	FIA	1.1	21.6	20.0	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	37
sycamore	Platanus occidentalis	NSL	Low	1.1	20.1	18.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	38
white spruce	Picea glauca	NSL	Medium	1.5	15.0	6.2	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	39
bitternut hickory	Carya cordiformis	WSL	Low	2.8	14.9	1.6	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	40
green ash	Fraxinus pennsylvanica	WSH	Low	1.1	12.4	11.5	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +	Infill ++	1	41
Virginia pine	Pinus virginiana	NDH	High	0.5	10.4	4.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	42
slippery elm	Ulmus rubra	WSL	Low	3.2	8.6	2.6	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	43
striped maple	Acer pensylvanicum	NSL	Medium	5.8	7.5	0.5	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	44
red spruce	Picea rubens	NDH	High	1.1	5.0	4.6	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	45
silver maple	Acer saccharinum	NSH	Low	0.6	3.8	1.8	No change	No change	High	Rare	Fair	Fair		Infill +	2	46
gray birch	Betula populifolia	NSL	Low	1.6	3.7	1.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	47



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mockernut hickory	<i>Carya alba</i>	WDL	Medium	4.3	3.5	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	48
American chestnut	<i>Castanea dentata</i>	NSLX	FIA	3.4	3.3	0.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	49
pitch pine	<i>Pinus rigida</i>	NSH	High	1.1	2.9	2.7	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	50
swamp white oak	<i>Quercus bicolor</i>	NSL	Low	1.1	2.3	2.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	51
chokecherry	<i>Prunus virginiana</i>	NSLX	FIA	2.1	2.0	0.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	52
flowering dogwood	<i>Cornus florida</i>	WDL	Medium	1.1	0.9	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good		Infill ++	2	53
Atlantic white-cedar	<i>Chamaecyparis thyoides</i>	NSH	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	54
eastern redcedar	<i>Juniperus virginiana</i>	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	55
shortleaf pine	<i>Pinus echinata</i>	NSLX	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	56
loblolly pine	<i>Pinus taeda</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	57
boxelder	<i>Acer negundo</i>	WSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	58
cittamwood/gum bumelia	<i>Sideroxylon lanuginosum ssp.</i>	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			0	59
black hickory	<i>Carya texana</i>	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	60
sugarberry	<i>Celtis laevigata</i>	NDH	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	61
hackberry	<i>Celtis occidentalis</i>	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	62
eastern redbud	<i>Cercis canadensis</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	63
common persimmon	<i>Diospyros virginiana</i>	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	64
American holly	<i>Ilex opaca</i>	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	65
sweetgum	<i>Liquidambar styraciflua</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	66
sourwood	<i>Oxydendrum arboreum</i>	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	67
southern red oak	<i>Quercus falcata</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	68
cherrybark oak; swamp red o.	<i>Quercus pagoda</i>	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	69
blackjack oak	<i>Quercus marilandica</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	70
chinkapin oak	<i>Quercus muehlenbergii</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	71
post oak	<i>Quercus stellata</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	72
winged elm	<i>Ulmus alata</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	73