

**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	9,941.4	3,838.4	315

**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	17	20	Increase	24	27	Very Good	8	13
Hickory	5			Medium	30	46	No Change	7	10	Good	18	17
Maple	4	Abundant	5	Low	30	11	Decrease	28	22	Fair	7	7
Oak	14	Common	24	FIA	2		New	10	10	Poor	10	10
Pine	4	Rare	32				Unknown	10	10	Very Poor	11	8
Other	32	Absent	14							FIA Only	0	0
	<b>61</b>		<b>75</b>		<b>79</b>	<b>77</b>		<b>79</b>	<b>79</b>	Unknown	8	8
											<b>62</b>	<b>63</b>

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	58.2	60.0	62.1	62.2	
	CCSM85	58.2	60.3	62.8	65.8	
	GFDL45	58.2	60.9	63.3	64.2	
	GFDL85	58.2	61.1	64.4	68.2	
	HAD45	58.2	60.4	63.5	64.9	
HAD85	58.2	60.7	64.6	68.9		
Growing Season (May—Sep)	CCSM45	72.9	74.7	76.5	77.0	
	CCSM85	72.9	74.9	77.5	81.2	
	GFDL45	72.9	75.8	78.6	80.0	
	GFDL85	72.9	76.3	80.0	84.2	
	HAD45	72.9	75.6	78.5	80.2	
HAD85	72.9	75.6	80.5	85.3		
Coldest Month (Average)	CCSM45	36.5	38.8	39.7	39.9	
	CCSM85	36.5	39.0	40.0	41.3	
	GFDL45	36.5	40.0	40.3	41.0	
	GFDL85	36.5	38.8	39.7	40.9	
	HAD45	36.5	37.5	39.3	39.6	
HAD85	36.5	37.8	39.1	40.7		
Warmest Month (Average)	CCSM45	78.5	80.6	81.6	81.6	
	CCSM85	78.5	80.8	82.6	84.1	
	GFDL45	78.5	81.4	82.6	83.7	
	GFDL85	78.5	82.3	84.1	86.5	
	HAD45	78.5	81.6	83.5	84.3	
HAD85	78.5	82.2	85.3	88.3		

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	44.4	48.9	52.0	52.6	
	CCSM85	44.4	50.1	52.5	58.6	
	GFDL45	44.4	49.2	53.3	55.3	
	GFDL85	44.4	48.1	53.8	55.4	
	HAD45	44.4	48.9	49.5	48.2	
HAD85	44.4	51.0	47.6	49.0		
Growing Season (May—Sep)	CCSM45	20.2	24.2	26.1	26.9	
	CCSM85	20.2	23.9	25.3	28.7	
	GFDL45	20.2	22.9	25.4	26.6	
	GFDL85	20.2	22.0	26.1	27.1	
	HAD45	20.2	22.6	21.9	21.2	
HAD85	20.2	24.1	22.0	21.5		

**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
loblolly pine	Pinus taeda	WDH	High	90.9	3739.0	29.8	No change	No change	Medium	Abundant	Good	Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	97.8	1492.1	11.3	No change	No change	Medium	Abundant	Good	Good			1	2
yellow-poplar	Liriodendron tulipifera	WDH	High	88.1	994.9	7.9	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	3
red maple	Acer rubrum	WDH	High	93.8	834.6	6.3	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	4
white oak	Quercus alba	WDH	Medium	81.1	627.8	5.7	No change	No change	High	Abundant	Very Good	Very Good			1	5
shortleaf pine	Pinus echinata	WDH	High	66	497.0	6.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
Virginia pine	Pinus virginiana	NDH	High	46.8	373.6	6.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	7
eastern redcedar	Juniperus virginiana	WDH	Medium	68.8	232.9	2.5	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	8
mockernut hickory	Carya alba	WDL	Medium	66.3	197.2	2.3	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	9
sourwood	Oxydendrum arboreum	NDL	High	61.6	195.0	2.1	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	10
southern red oak	Quercus falcata	WDL	Medium	62.3	172.0	2.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	11
northern red oak	Quercus rubra	WDH	Medium	51.5	156.0	2.3	Sm. dec.	Lg. dec.	High	Common	Fair	Fair			1	12
black cherry	Prunus serotina	WDL	Medium	64.3	139.6	1.7	Sm. inc.	Lg. inc.	Low	Common	Fair	Good			1	13
blackgum	Nyssa sylvatica	WDL	Medium	66.7	125.8	1.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	14
pignut hickory	Carya glabra	WDL	Medium	51.6	123.0	1.7	No change	No change	Medium	Common	Fair	Fair			1	15
American beech	Fagus grandifolia	WDH	High	31.7	118.2	2.7	No change	Sm. inc.	Medium	Common	Fair	Good			1	16
willow oak	Quercus phellos	NSL	Low	39.2	115.1	1.8	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	17
winged elm	Ulmus alata	WDL	Medium	54.9	113.4	1.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	18
American elm	Ulmus americana	WDH	Medium	45.7	104.8	1.9	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	19
sycamore	Platanus occidentalis	NSL	Low	25.6	102.5	3.0	Sm. dec.	No change	Medium	Common	Poor	Fair			1	20
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	46.2	97.2	1.5	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	21
scarlet oak	Quercus coccinea	WDL	Medium	35.2	93.1	1.9	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	22
post oak	Quercus stellata	WDH	High	32.3	87.6	2.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	23
green ash	Fraxinus pennsylvanica	WSH	Low	28.1	85.9	2.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	24
black oak	Quercus velutina	WDH	High	44.3	85.3	1.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	25
river birch	Betula nigra	NSL	Low	21	78.5	2.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	26
flowering dogwood	Cornus florida	WDL	Medium	57.1	73.2	0.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	27
American holly	Ilex opaca	NSL	Medium	34.6	67.3	1.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	28
white ash	Fraxinus americana	WDL	Medium	27.4	50.6	1.5	Sm. inc.	Lg. inc.	Low	Common	Fair	Good			1	29
black walnut	Juglans nigra	WDH	Low	9	48.9	5.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	30
swamp tupelo	Nyssa biflora	NDH	Medium	3.6	44.1	10.8	No change	No change	Low	Rare	Very Poor	Very Poor			0	31
slippery elm	Ulmus rubra	WSL	Low	21	34.9	1.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	32
common persimmon	Diospyros virginiana	NSL	Low	15.5	31.9	0.9	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	33
florida maple	Acer barbatum	NSL	Low	19.2	27.5	1.3	Lg. dec.	No change	High	Rare	Poor	Fair			1	34
chestnut oak	Quercus prinus	NDH	High	7.6	23.9	2.4	Very Lg. dec.	Lg. dec.	High	Rare	Lost	Poor			1	35
hackberry	Celtis occidentalis	WDH	Medium	8.8	23.3	2.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	1	36
eastern redbud	Cercis canadensis	NSL	Low	19.3	21.8	0.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	37
black willow	Salix nigra	NSH	Low	6.6	21.6	2.2	Sm. dec.	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	1	38
boxelder	Acer negundo	WSH	Low	8.8	20.7	1.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			1	39
shagbark hickory	Carya ovata	WSL	Medium	13.2	13.1	0.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	40
ailanthus	Ailanthus altissima	NSL	FIA	3.4	12.6	2.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	41
bitternut hickory	Carya cordiformis	WSL	Low	9.6	12.3	1.2	Lg. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	1	42
water oak	Quercus nigra	WDH	High	7.7	8.9	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	43
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	2.6	8.2	1.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	44
honeylocust	Gleditsia triacanthos	NSH	Low	4.7	7.8	1.4	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	45
black locust	Robinia pseudoacacia	NDH	Low	4.7	7.7	0.9	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	46
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	7.5	7.3	1.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	47



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sweetbay	Magnolia virginiana	NSL	Medium	2	5.9	2.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	48
sassafras	Sassafras albidum	WSL	Low	6.8	5.3	0.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	49
shingle oak	Quercus imbricaria	NDH	Medium	3.3	5.1	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	50
red mulberry	Morus rubra	NSL	Low	4.8	4.3	0.8	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	51
pecan	Carya illinoensis	NSH	Low	3.5	4.1	1.4	Sm. dec.	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	52
blackjack oak	Quercus marilandica	NSL	Medium	1.1	2.4	0.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	53
sugar maple	Acer saccharum	WDH	High	3.2	2.1	0.4	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	54
longleaf pine	Pinus palustris	NSH	Medium	0.5	2.0	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	55
paulownia	Paulownia tomentosa	NSL	FIA	2	1.5	0.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	56
swamp chestnut oak	Quercus michauxii	NSL	Low	1.2	1.2	0.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	57
pawpaw	Asimina triloba	NSL	Low	1.9	0.7	0.3	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	58
pin oak	Quercus palustris	NSH	Low	1	0.6	0.6	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	59
yellow buckeye	Aesculus flava	NSL	Low	1	0.4	0.4	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	60
sweet birch	Betula lenta	NDH	High	0.7	0.4	0.3	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	61
slash pine	Pinus elliottii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	62
pitch pine	Pinus rigida	NSH	High	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	63
bald cypress	Taxodium distichum	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	64
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	65
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	66
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	67
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	68
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	69
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	70
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	71
loblolly-bay	Gordonia lasianthus	NSH	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	72
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	73
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	74
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	75
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	76
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	77
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	78
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	79