

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	9,549.4	3,687.0	268

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	Scenario	Scenario	Scenario	SHIFT	SHIFT				
						RCP45	RCP85	RCP45	RCP85	RCP45	RCP85				
Ash	2			High	20	26	Increase	12	18	Very Good	5	6	Likely	2	2
Hickory	5			Medium	25	44	No Change	13	12	Good	14	18	Infill	2	6
Maple	5	Abundant	7	Low	33	11	Decrease	35	30	Fair	12	9	Migrate	3	8
Oak	11	Common	25	FIA	7		New	12	12	Poor	11	10			
Pine	6	Rare	35				Unknown	13	13	Very Poor	15	10			
Other	38	Absent	17							FIA Only	3	3			
	67		84		85	81		85	85	Unknown	6	6			
											66	62			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	52.4	54.2	56.7	56.9	
	CCSM85	52.4	54.8	57.2	60.4	
	GFDL45	52.4	55.1	58.1	59.1	
	GFDL85	52.4	55.7	59.2	63.3	
	HAD45	52.4	55.1	58.6	60.0	
HAD85	52.4	55.5	60.0	64.6		
Growing Season (May—Sep)	CCSM45	68.2	70.1	72.4	72.9	
	CCSM85	68.2	70.6	73.2	77.2	
	GFDL45	68.2	71.4	75.3	76.6	
	GFDL85	68.2	72.3	76.7	81.4	
	HAD45	68.2	71.6	74.9	76.8	
HAD85	68.2	71.7	77.6	82.5		
Coldest Month Average	CCSM45	27.6	29.2	30.9	31.3	
	CCSM85	27.6	30.4	31.5	33.1	
	GFDL45	27.6	31.1	31.8	32.6	
	GFDL85	27.6	30.7	31.7	32.9	
	HAD45	27.6	28.4	30.9	31.0	
HAD85	27.6	29.4	31.3	33.5		
Warmest Month Average	CCSM45	73.7	75.5	76.8	77.3	
	CCSM85	73.7	76.2	77.8	79.9	
	GFDL45	73.7	76.9	79.2	80.3	
	GFDL85	73.7	78.1	80.7	83.4	
	HAD45	73.7	77.5	80.1	81.5	
HAD85	73.7	78.8	82.8	86.0		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	41.4	44.3	44.5	46.0	
	CCSM85	41.4	43.9	45.6	48.6	
	GFDL45	41.4	45.3	46.6	48.5	
	GFDL85	41.4	42.7	47.5	49.5	
	HAD45	41.4	42.9	43.0	42.7	
HAD85	41.4	43.1	40.2	43.3		
Growing Season (May—Sep)	CCSM45	19.4	20.8	20.5	21.2	
	CCSM85	19.4	19.6	20.0	20.4	
	GFDL45	19.4	21.1	20.4	21.3	
	GFDL85	19.4	19.1	19.9	20.3	
	HAD45	19.4	20.8	17.8	18.9	
HAD85	19.4	19.6	16.6	17.4		

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
sugar maple	Acer saccharum	WDH	High	85.5	1084.4	10.4	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
red maple	Acer rubrum	WDH	High	87.1	939.2	8.6	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	2
white oak	Quercus alba	WDH	Medium	71.7	878.1	10.2	No change	Sm. dec.	High	Abundant	Very Good	Good			1	3
black cherry	Prunus serotina	WDL	Medium	69.3	670.0	6.6	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	4
yellow-poplar	Liriodendron tulipifera	WDH	High	69.6	630.9	7.4	Sm. dec.	Lg. dec.	High	Abundant	Good	Good			1	5
American elm	Ulmus americana	WDH	Medium	69.3	580.5	6.0	Sm. dec.	No change	Medium	Abundant	Fair	Good			1	6
white ash	Fraxinus americana	WDL	Medium	72.6	564.8	6.1	No change	No change	Low	Abundant	Fair	Fair			0	7
black oak	Quercus velutina	WDH	High	62.2	380.8	4.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	8
black locust	Robinia pseudoacacia	NDH	Low	42	377.8	6.7	Sm. dec.	No change	Medium	Common	Poor	Fair			1	9
northern red oak	Quercus rubra	WDH	Medium	60.9	359.7	5.4	No change	No change	High	Common	Good	Good			1	10
black walnut	Juglans nigra	WDH	Low	56.4	322.1	4.7	No change	No change	Medium	Common	Fair	Fair			1	11
sassafras	Sassafras albidum	WSL	Low	58.3	302.3	4.1	No change	No change	Medium	Common	Fair	Fair			1	12
eastern white pine	Pinus strobus	WDH	High	19.2	298.7	13.7	Lg. dec.	Very Lg. dec.	Low	Common	Very Poor	Lost			0	13
Virginia pine	Pinus virginiana	NDH	High	28.6	268.4	8.9	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	14
shagbark hickory	Carya ovata	WSL	Medium	51.2	254.1	3.6	No change	Sm. dec.	Medium	Common	Fair	Poor			1	15
slippery elm	Ulmus rubra	WSL	Low	59.2	249.0	3.3	No change	No change	Medium	Common	Fair	Fair			1	16
American beech	Fagus grandifolia	WDH	High	51.3	248.2	4.4	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	17
pignut hickory	Carya glabra	WDL	Medium	51.9	225.1	3.8	Sm. inc.	No change	Medium	Common	Good	Fair			1	18
chestnut oak	Quercus prinus	NDH	High	30.9	216.4	6.3	Sm. dec.	Lg. dec.	High	Common	Fair	Fair			1	19
yellow buckeye	Aesculus flava	NSL	Low	33.6	204.5	5.3	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	20
sycamore	Platanus occidentalis	NSL	Low	28.6	186.2	5.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	21
mockernut hickory	Carya alba	WDL	Medium	39.2	180.5	3.8	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	22
bitternut hickory	Carya cordiformis	WSL	Low	30.9	176.7	3.8	No change	Sm. inc.	High	Common	Good	Very Good			1	23
bigtooth aspen	Populus grandidentata	NSL	Medium	23.5	157.7	5.1	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	24
boxelder	Acer negundo	WSH	Low	29.7	155.3	4.5	No change	Sm. inc.	High	Common	Good	Very Good			1	25
scarlet oak	Quercus coccinea	WDL	Medium	21	107.3	4.8	No change	Sm. dec.	Medium	Common	Fair	Poor			1	26
ailanthus	Ailanthus altissima	NSL	FIA	23.8	101.8	3.3	Unknown	Unknown	NA	Common	NNIS	NNIS			0	27
blackgum	Nyssa sylvatica	WDL	Medium	36.3	89.9	2.0	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	28
green ash	Fraxinus pennsylvanica	WSH	Low	23.5	77.7	1.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	29
loblolly pine	Pinus taeda	WDH	High	6.2	72.1	11.4	No change	Sm. inc.	Medium	Common	Fair	Good		Infill ++	1	30
silver maple	Acer saccharinum	NSH	Low	5.3	57.4	6.4	Sm. dec.	No change	High	Common	Fair	Good			1	31
flowering dogwood	Cornus florida	WDL	Medium	29.7	52.0	1.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	32
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	26.3	48.0	1.3	Lg. dec.	No change	High	Rare	Poor	Fair			1	33
Siberian elm	Ulmus pumila	NDH	FIA	1	45.0	43.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	34
American basswood	Tilia americana	WSL	Medium	17.2	44.3	2.4	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	35
pitch pine	Pinus rigida	NSH	High	9.3	42.0	4.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	36
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	25.9	39.5	1.4	Lg. dec.	No change	Medium	Rare	Very Poor	Poor			1	37
wild plum	Prunus americana	NSLX	FIA	1	34.9	33.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	38
sourwood	Oxydendrum arboreum	NDL	High	10.3	31.3	3.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			1	39
honeylocust	Gleditsia triacanthos	NSH	Low	5	30.9	3.2	Sm. dec.	Sm. inc.	High	Rare	Poor	Good		Infill ++	1	40
Ohio buckeye	Aesculus glabra	NSL	Low	11.2	30.3	2.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	41
eastern cottonwood	Populus deltoides	NSH	Low	3.3	26.9	4.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	42
Osage-orange	Maclura pomifera	NDH	Medium	5.2	25.8	4.9	Sm. dec.	Sm. inc.	High	Rare	Poor	Good		Infill ++	1	43
hackberry	Celtis occidentalis	WDH	Medium	9.1	25.7	2.6	Sm. inc.	Lg. inc.	High	Rare	Good	Good		Infill ++	1	44
black maple	Acer nigrum	NSH	Low	7	24.0	3.2	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	45
eastern redbud	Cercis canadensis	NSL	Low	14.1	21.9	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	46
pawpaw	Asimina triloba	NSL	Low	11.4	20.0	1.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	47



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pin oak	Quercus palustris	NSH	Low	1.3	15.2	1.3	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			2	48
shellbark hickory	Carya laciniosa	NSL	Low	0.8	13.4	3.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	49
common persimmon	Diospyros virginiana	NSL	Low	5.2	13.4	2.6	No change	Lg. inc.	High	Rare	Fair	Good			1	50
red pine	Pinus resinosa	NSH	Medium	4.2	12.4	3.0	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	51
shingle oak	Quercus imbricaria	NDH	Medium	2.2	9.0	1.1	No change	Sm. dec.	Medium	Rare	Poor	Very Poor			2	52
Scots pine	Pinus sylvestris	NSH	FIA	2	7.6	1.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	53
black willow	Salix nigra	NSH	Low	1.2	7.0	1.2	Sm. dec.	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	54
cucumbertree	Magnolia acuminata	NSL	Low	6	6.5	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	55
chinkapin oak	Quercus muehlenbergii	NSL	Medium	2.1	5.5	2.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	56
serviceberry	Amelanchier spp.	NSL	Low	6.1	5.4	0.8	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	57
sweet birch	Betula lenta	NDH	High	2	4.0	1.9	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	58
post oak	Quercus stellata	WDH	High	2.1	3.5	1.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	59
butternut	Juglans cinerea	NSLX	FIA	1	2.5	2.4	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	60
eastern hemlock	Tsuga canadensis	NSH	High	2.1	1.9	0.9	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	61
swamp white oak	Quercus bicolor	NSL	Low	1	1.6	1.5	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	62
paulownia	Paulownia tomentosa	NSL	FIA	1	1.2	1.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	63
northern catalpa	Catalpa speciosa	NSHX	FIA	0.7	1.1	0.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	64
bald cypress	Taxodium distichum	NSH	Medium	1	1.1	1.0	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	65
bur oak	Quercus macrocarpa	NDH	Medium	0.7	0.5	0.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	66
eastern redcedar	Juniperus virginiana	WDH	Medium	1	0.4	0.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	67
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	68
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	69
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	70
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	71
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate ++	3	72
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	73
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	74
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	75
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	76
red mulberry	Morus rubra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	77
redbay	Persea borbonia	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	78
quaking aspen	Populus tremuloides	WDH	High	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	79
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	80
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	81
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	82
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	83
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	84
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	85