

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	143

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			
				High		Increase	RCP45	RCP85	Very Good	RCP45	RCP85	Likely	RCP45	RCP85
Ash	3			16	23	21	25	1	4	1	4	1	1	
Hickory	6			29	45	12	12	21	23	17	24	17	24	
Maple	4	Abundant	0	32	11	24	20	11	8	7	9	7	9	
Oak	13	Common	27	5		15	16	13	13	25	34	25	34	
Pine	4	Rare	35			10	9	11	9					
Other	32	Absent	18			82	82	3	3					
	62		80					5	4					
								65	64					

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	55.4	57.2	59.3	59.6	
	CCSM85	55.4	57.6	60.2	63.1	
	GFDL45	55.4	60.1	60.6	61.5	
	GFDL85	55.4	58.3	61.6	65.5	
	HAD45	55.4	58.1	61.5	63.0	
	HAD85	55.4	58.6	63.2	67.4	
Growing Season (May—Sep)	CCSM45	72.2	74.1	75.7	76.6	
	CCSM85	72.2	74.6	77.1	80.8	
	GFDL45	72.2	77.8	78.3	79.7	
	GFDL85	72.2	75.7	79.7	84.3	
	HAD45	72.2	75.5	78.6	80.6	
	HAD85	72.2	76.0	82.2	86.3	
Coldest Month (Average)	CCSM45	28.8	30.2	31.8	32.2	
	CCSM85	28.8	31.8	32.7	34.4	
	GFDL45	28.8	33.4	33.6	34.0	
	GFDL85	28.8	31.6	32.7	33.4	
	HAD45	28.8	30.4	32.8	32.9	
	HAD85	28.8	31.5	33.8	35.7	
Warmest Month (Average)	CCSM45	77.8	79.6	80.7	81.4	
	CCSM85	77.8	80.4	82.1	83.9	
	GFDL45	77.8	81.0	82.5	83.5	
	GFDL85	77.8	81.5	83.7	86.5	
	HAD45	77.8	81.7	84.1	85.1	
	HAD85	77.8	83.4	87.5	89.8	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	45.7	44.4	49.3	47.8	
	CCSM85	45.7	47.6	48.3	51.4	
	GFDL45	45.7	53.1	55.4	57.5	
	GFDL85	45.7	51.4	57.1	59.5	
	HAD45	45.7	46.6	49.4	49.1	
	HAD85	45.7	47.4	45.3	49.5	
Growing Season (May—Sep)	CCSM45	20.0	18.6	20.2	19.2	
	CCSM85	20.0	19.3	18.7	19.6	
	GFDL45	20.0	23.1	22.9	23.5	
	GFDL85	20.0	22.1	23.0	23.4	
	HAD45	20.0	19.2	18.3	18.1	
	HAD85	20.0	19.3	15.8	16.1	

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
sugar maple	Acer saccharum	WDH	High	45	295.8	10.2	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	1
sassafras	Sassafras albidum	WSL	Low	54.1	242.0	7.0	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	2
sweetgum	Liquidambar styraciflua	WDH	High	42.5	241.7	7.5	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	3
white ash	Fraxinus americana	WDL	Medium	43.9	232.9	7.1	No change	No change	Low	Common	Poor	Poor			0	4
silver maple	Acer saccharinum	NSH	Low	44.2	183.7	12.8	No change	Sm. inc.	High	Common	Good	Very Good			1	5
hackberry	Celtis occidentalis	WDH	Medium	40.9	174.7	6.9	Sm. dec.	No change	High	Common	Fair	Good			1	6
red maple	Acer rubrum	WDH	High	45.6	167.7	6.6	No change	No change	High	Common	Good	Good			1	7
white oak	Quercus alba	WDH	Medium	35.4	166.8	7.0	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	8
shingle oak	Quercus imbricaria	NDH	Medium	40.3	166.2	7.1	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	9
American elm	Ulmus americana	WDH	Medium	73.6	160.2	5.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	10
black willow	Salix nigra	NSH	Low	20.5	145.2	21.2	No change	Sm. inc.	Low	Common	Poor	Fair	Infill +	Infill +	1	11
black cherry	Prunus serotina	WDL	Medium	61.4	145.1	4.2	No change	Sm. dec.	Low	Common	Poor	Poor			0	12
sycamore	Platanus occidentalis	NSL	Low	36.8	135.5	5.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	13
shagbark hickory	Carya ovata	WSL	Medium	49.1	132.5	5.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	14
black locust	Robinia pseudoacacia	NDH	Low	12.9	127.3	7.5	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +	Infill ++	1	15
green ash	Fraxinus pennsylvanica	WSH	Low	50.9	124.4	6.1	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	16
yellow-poplar	Liriodendron tulipifera	WDH	High	33.5	116.4	5.1	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	17
black oak	Quercus velutina	WDH	High	44.1	109.9	5.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	18
blackgum	Nyssa sylvatica	WDL	Medium	17.4	106.8	6.1	Sm. dec.	No change	High	Common	Fair	Good	Infill +	Infill ++	1	19
pin oak	Quercus palustris	NSH	Low	33.1	94.2	5.1	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	0	20
eastern cottonwood	Populus deltoides	NSH	Low	29.4	92.7	6.7	Sm. dec.	No change	Medium	Common	Poor	Fair	Infill +	Infill +	1	21
black walnut	Juglans nigra	WDH	Low	29.8	72.3	3.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	22
northern red oak	Quercus rubra	WDH	Medium	32.2	70.9	4.1	Lg. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	23
pignut hickory	Carya glabra	WDL	Medium	35.9	70.4	3.7	No change	No change	Medium	Common	Fair	Fair			1	24
Virginia pine	Pinus virginiana	NDH	High	10.3	67.5	6.1	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor		Infill +	2	25
river birch	Betula nigra	NSL	Low	17.3	59.4	4.7	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	26
boxelder	Acer negundo	WSH	Low	33.9	53.6	5.2	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	27
flowering dogwood	Cornus florida	WDL	Medium	28.2	47.8	2.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	28
common persimmon	Diospyros virginiana	NSL	Low	33.5	45.3	3.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	29
slippery elm	Ulmus rubra	WSL	Low	30.8	44.0	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	30
shortleaf pine	Pinus echinata	WDH	High	5.9	38.2	5.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	31
bitternut hickory	Carya cordiformis	WSL	Low	22.2	32.7	2.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	32
chinkapin oak	Quercus muehlenbergii	NSL	Medium	10.3	25.9	3.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	33
eastern white pine	Pinus strobus	WDH	High	9.1	23.7	4.4	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	34
pawpaw	Asimina triloba	NSL	Low	15.9	20.7	1.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	35
eastern redbud	Cercis canadensis	NSL	Low	21.1	20.2	1.3	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	36
eastern redcedar	Juniperus virginiana	WDH	Medium	7.9	19.6	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	37
post oak	Quercus stellata	WDH	High	9.9	18.2	3.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	38
honeylocust	Gleditsia triacanthos	NSH	Low	4.6	17.9	7.7	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	39
American beech	Fagus grandifolia	WDH	High	11.5	16.1	2.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good		Infill ++	2	40
swamp white oak	Quercus bicolor	NSL	Low	11	15.2	3.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	41
red mulberry	Morus rubra	NSL	Low	15.9	15.1	1.8	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	42
pecan	Carya illinoensis	NSH	Low	2.1	13.0	6.3	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	43
red pine	Pinus resinosa	NSH	Medium	0.4	12.9	4.4	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	44
Shumard oak	Quercus shumardii	NSL	Low	1.2	12.4	2.7	No change	No change	High	Rare	Fair	Fair		Infill +	2	45
white mulberry	Morus alba	NSL	FIA	4.3	12.2	2.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	46
scarlet oak	Quercus coccinea	WDL	Medium	6.4	12.0	3.0	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	47



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ailanthus	Ailanthus altissima	NSL	FIA	7.2	10.2	2.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	48
mockernut hickory	Carya alba	WDL	Medium	16.5	8.3	3.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	49
bur oak	Quercus macrocarpa	NDH	Medium	12	7.2	1.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	50
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	1	7.1	2.1	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good		Infill ++	2	51
northern catalpa	Catalpa speciosa	NSHX	FIA	7.8	5.6	1.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	52
winged elm	Ulmus alata	WDL	Medium	3.1	5.5	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	53
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	1.9	4.0	1.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	54
Osage-orange	Maclura pomifera	NDH	Medium	10.9	3.8	1.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good		Infill ++	2	55
swamp chestnut oak	Quercus michauxii	NSL	Low	0.4	3.2	1.1	No change	No change	Medium	Rare	Poor	Poor			0	56
pumpkin ash	Fraxinus profunda	NSH	FIA	0.7	2.8	1.9	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	57
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0.7	2.7	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	58
shellbark hickory	Carya laciniosa	NSL	Low	11.6	1.8	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good		Infill ++	2	59
bald cypress	Taxodium distichum	NSH	Medium	2.6	0.3	0.7	Lg. dec.	No change	Medium	Rare	Very Poor	Poor			0	60
American basswood	Tilia americana	WSL	Medium	3.4	0.2	0.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	61
butternut	Juglans cinerea	NSLX	FIA	4.1	0.1	0.3	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	62
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	63
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	64
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	65
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	66
yellow buckeye	Aesculus flava	NSL	Low	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	67
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	68
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	69
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	70
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	71
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	72
water elm	Planera aquatica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	73
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	74
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	75
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	76
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	77
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	78
nuttall oak	Quercus texana	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	79
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	80
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	81
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	82