

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 10,188 3,933.4 318

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	24	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85			
Ash	2			Medium	34	Increase	35	35	16	18	Likely	0	0	
Hickory	8			Low	35	No Change	17	18	21	19	Infill	18	19	
Maple	4	Abundant	4	FIA	2	Decrease	13	12	7	7	Migrate	7	10	
Oak	15	Common	27			New	15	15	11	12			25	29
Pine	2	Rare	36			Unknown	7	7	10	9				
Other	36	Absent	19							1	1			
67		86		87		87		71		71				

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	61.9	63.7	65.7	66.0	
	CCSM85	61.9	64.0	66.5	69.2	
	GFDL45	61.9	64.9	66.6	67.7	
	GFDL85	61.9	64.8	67.7	71.3	
	HAD45	61.9	64.4	67.4	68.6	
	HAD85	61.9	64.7	69.3	72.9	
Growing Season (May-Sep)	CCSM45	76.6	78.4	80.0	80.6	
	CCSM85	76.6	78.8	81.2	84.6	
	GFDL45	76.6	80.3	82.0	84.0	
	GFDL85	76.6	80.4	83.6	88.1	
	HAD45	76.6	79.8	82.6	83.7	
	HAD85	76.6	80.1	86.3	89.6	
Coldest Month Average	CCSM45	39.6	42.1	43.2	43.3	
	CCSM85	39.6	42.2	43.3	44.7	
	GFDL45	39.6	43.5	43.8	43.8	
	GFDL85	39.6	40.8	42.2	42.8	
	HAD45	39.6	40.6	42.5	42.9	
	HAD85	39.6	41.8	43.6	45.3	
Warmest Month Average	CCSM45	82.2	83.8	84.8	84.9	
	CCSM85	82.2	84.4	85.2	87.1	
	GFDL45	82.2	86.9	87.5	88.8	
	GFDL85	82.2	86.5	88.1	91.3	
	HAD45	82.2	86.2	87.9	88.2	
	HAD85	82.2	87.1	90.8	91.8	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	51.7	51.7	56.1	54.8	
	CCSM85	51.7	53.5	56.9	58.2	
	GFDL45	51.7	55.7	61.5	57.6	
	GFDL85	51.7	55.9	60.4	61.4	
	HAD45	51.7	50.4	54.5	57.0	
	HAD85	51.7	55.6	48.2	53.0	
Growing Season (May-Sep)	CCSM45	18.9	18.4	18.6	18.5	
	CCSM85	18.9	18.3	17.5	18.5	
	GFDL45	18.9	20.3	22.0	21.3	
	GFDL85	18.9	21.3	22.9	22.5	
	HAD45	18.9	17.5	18.0	17.2	
	HAD85	18.9	18.7	13.5	14.0	

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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Current and Potential Future Habitat, Capability, and Migration

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	79	3716.2	37.1	No change	No change	Medium	Abundant	Good	Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	83.1	1099.5	9.5	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	2
shortleaf pine	Pinus echinata	WDH	High	52.3	908.4	11.4	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	3
white oak	Quercus alba	WDH	Medium	74.9	757.0	7.4	No change	No change	High	Abundant	Very Good	Very Good			1	4
post oak	Quercus stellata	WDH	High	58	481.2	5.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	5
southern red oak	Quercus falcata	WDL	Medium	60.5	297.4	4.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	6
black hickory	Carya texana	NDL	High	51	289.1	3.9	No change	No change	Medium	Common	Fair	Fair			1	7
water oak	Quercus nigra	WDH	High	47.1	276.6	4.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	8
red maple	Acer rubrum	WDH	High	64.1	237.3	2.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	9
willow oak	Quercus phellos	NSL	Low	35.3	224.8	3.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	10
winged elm	Ulmus alata	WDL	Medium	63.9	214.9	2.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	11
blackgum	Nyssa sylvatica	WDL	Medium	73.1	209.8	2.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	12
mockernut hickory	Carya alba	WDL	Medium	60.1	198.9	2.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	13
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	37.4	145.6	2.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	14
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	36	121.0	2.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	15
green ash	Fraxinus pennsylvanica	WSH	Low	41.7	121.0	2.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
black oak	Quercus velutina	WDH	High	31	118.8	2.7	Sm. inc.	No change	Medium	Common	Good	Fair			1	17
eastern redcedar	Juniperus virginiana	WDH	Medium	17.7	111.8	2.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	18
black cherry	Prunus serotina	WDL	Medium	42.7	97.9	1.7	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	19
sugarberry	Celtis laevigata	NDH	Medium	16.2	96.5	6.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	20
northern red oak	Quercus rubra	WDH	Medium	25.2	93.8	2.8	No change	No change	High	Common	Good	Good			1	21
pecan	Carya illinoensis	NSH	Low	2.2	84.1	20.0	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	2	22
common persimmon	Diospyros virginiana	NSL	Low	16	81.7	4.0	No change	Sm. inc.	High	Common	Good	Very Good			1	23
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	32.1	69.5	1.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	24
black willow	Salix nigra	NSH	Low	3.3	67.7	13.0	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	25
boxelder	Acer negundo	WSH	Low	10	65.4	7.3	No change	No change	High	Common	Good	Good			1	26
American holly	Ilex opaca	NSL	Medium	31.2	62.7	1.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	27
honeylocust	Gleditsia triacanthos	NSH	Low	9.2	62.2	6.7	No change	No change	High	Common	Good	Good			1	28
flowering dogwood	Cornus florida	WDL	Medium	44.5	57.8	1.0	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	29
blackjack oak	Quercus marilandica	NSL	Medium	17.2	54.2	2.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	30
sycamore	Platanus occidentalis	NSL	Low	10.3	53.7	4.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	31
American elm	Ulmus americana	WDH	Medium	22.6	48.0	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	32
bald cypress	Taxodium distichum	NSH	Medium	1.9	41.3	6.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	33
slippery elm	Ulmus rubra	WSL	Low	10.5	33.7	3.5	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	34
shagbark hickory	Carya ovata	WSL	Medium	11.4	32.1	2.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	35
overcup oak	Quercus lyrata	NSL	Medium	10.3	30.1	3.5	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1	36
hackberry	Celtis occidentalis	WDH	Medium	5.5	29.4	4.0	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	37
silver maple	Acer saccharinum	NSH	Low	1	28.4	28.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	38
swamp chestnut oak	Quercus michauxii	NSL	Low	9.2	26.5	2.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	39
eastern cottonwood	Populus deltoides	NSH	Low	2	24.5	12.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	40
bitternut hickory	Carya cordiformis	WSL	Low	10.2	24.5	1.9	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	41
red mulberry	Morus rubra	NSL	Low	8.4	22.5	2.5	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	42
nuttall oak	Quercus texana	NSH	Medium	4.8	22.5	4.6	No change	No change	High	Rare	Fair	Fair			0	43
sassafras	Sassafras albidum	WSL	Low	13.3	17.1	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	44
pignut hickory	Carya glabra	WDL	Medium	10.5	16.8	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	45
water hickory	Carya aquatica	NSL	Medium	5.5	15.1	3.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	46
river birch	Betula nigra	NSL	Low	2.6	13.7	4.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	47

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Northern Research Station
Landscape Change Research Group
Iverson, Peters, Prasad, Matthews

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
black walnut	Juglans nigra	WDH	Low	2.9	10.1	3.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 48
Shumard oak	Quercus shumardii	NSL	Low	6.5	10.1	1.1	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +		1 49
water tupelo	Nyssa aquatica	NSH	Medium	2.9	7.4	2.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				0 50
chinkapin oak	Quercus muehlenbergii	NSL	Medium	2.6	7.3	2.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 51
white ash	Fraxinus americana	WDL	Medium	8.4	7.2	0.8	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +		1 52
water elm	Planera aquatica	NSL	Low	2	7.1	3.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +		2 53
Osage-orange	Maclura pomifera	NDH	Medium	1	6.9	7.1	Sm. inc.	Lg. inc.	High	Rare	Good	Good				2 54
American basswood	Tilia americana	WSL	Medium	5.5	6.3	1.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 55
eastern redbud	Cercis canadensis	NSL	Low	4.6	6.3	1.2	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +		1 56
American beech	Fagus grandifolia	WDH	High	3.4	6.0	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 57
shellbark hickory	Carya laciniosa	NSL	Low	0.2	5.1	0.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 58
serviceberry	Amelanchier spp.	NSL	Low	6.6	4.5	0.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 59
sweetbay	Magnolia virginiana	NSL	Medium	5.9	4.1	0.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		2 60
black locust	Robinia pseudoacacia	NDH	Low	2.4	2.9	0.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 61
cedar elm	Ulmus crassifolia	NDH	Medium	3	2.1	1.9	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +		2 62
florida maple	Acer barbatum	NSL	Low	2	1.2	0.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good				2 63
laurel oak	Quercus laurifolia	NDH	Medium	2	1.2	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 64
paulownia	Paulownia tomentosa	NSL	FIA	0.9	0.9	0.8	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 65
wild plum	Prunus americana	NSLX	FIA	3.3	0.8	0.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 66
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	1	0.6	0.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good				2 67
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 68
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 69
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 70
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 71
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 72
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 73
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 74
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 75
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 76
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 77
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 78
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 79
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 80
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +		3 81
sourwood	Oxydendron arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 82
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 83
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 84
chestnut oak	Quercus prinus	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 85
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 86
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 87