

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 10,306 3,979.1 364

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	1											
Hickory	7											
Maple	3	Abundant	4	High	16	22	Increase	28	30	Very Good	9	11
Oak	16	Common	17	Medium	29	48	No Change	10	10	Good	19	18
Pine	5	Rare	46	Low	33	10	Decrease	25	23	Fair	8	10
Other	35	Absent	15	FIA	4		New	10	10	Poor	10	9
	67		82		82	80	Unknown	9	9	Very Poor	15	13
								82	82	FIA Only	3	3
										Unknown	5	5
											69	69

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	62.3	64.1	66.1	66.1	
	CCSM85	62.3	64.4	66.8	69.5	
	GFDL45	62.3	65.1	67.2	67.9	
	GFDL85	62.3	65.1	68.3	71.9	
	HAD45	62.3	64.6	67.4	68.9	
	HAD85	62.3	64.9	69.0	72.9	
Growing Season (May-Sep)	CCSM45	75.7	77.4	79.2	79.6	
	CCSM85	75.7	77.5	80.1	83.5	
	GFDL45	75.7	78.7	80.9	82.1	
	GFDL85	75.7	78.9	82.4	86.5	
	HAD45	75.7	78.9	81.4	83.2	
	HAD85	75.7	78.8	84.7	88.5	
Coldest Month Average	CCSM45	42.5	45.0	45.8	45.7	
	CCSM85	42.5	44.9	46.0	47.1	
	GFDL45	42.5	45.6	45.8	46.2	
	GFDL85	42.5	44.3	45.3	45.7	
	HAD45	42.5	42.8	44.5	45.0	
	HAD85	42.5	43.8	44.8	46.5	
Warmest Month Average	CCSM45	80.4	82.2	83.1	83.1	
	CCSM85	80.4	82.4	83.8	85.7	
	GFDL45	80.4	83.3	84.1	84.9	
	GFDL85	80.4	83.5	85.2	87.4	
	HAD45	80.4	84.2	85.8	86.6	
	HAD85	80.4	84.5	88.2	90.1	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	46.5	49.2	52.2	53.0	
	CCSM85	46.5	49.3	53.0	59.3	
	GFDL45	46.5	51.6	54.6	58.4	
	GFDL85	46.5	51.2	55.8	55.5	
	HAD45	46.5	45.3	49.2	50.7	
	HAD85	46.5	51.2	46.3	49.4	
Growing Season (May-Sep)	CCSM45	19.2	21.2	23.2	23.8	
	CCSM85	19.2	20.8	22.3	24.9	
	GFDL45	19.2	23.6	25.9	26.9	
	GFDL85	19.2	22.9	26.5	26.9	
	HAD45	19.2	19.0	19.7	19.8	
	HAD85	19.2	21.3	16.7	17.5	

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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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	96.8	4921.8	37.8	No change	Sm. dec.	Medium	Abundant	Good	Fair			1	1
sweetgum	Liquidambar styraciflua	WDH	High	97.8	1642.4	12.5	No change	No change	Medium	Abundant	Good	Good			1	2
water oak	Quercus nigra	WDH	High	91.4	727.5	5.6	Sm. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	3
white oak	Quercus alba	WDH	Medium	76.7	614.6	6.2	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	4
yellow-poplar	Liriodendron tulipifera	WDH	High	74.9	463.4	4.4	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	5
southern red oak	Quercus falcata	WDL	Medium	70.4	329.3	3.2	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	6
winged elm	Ulmus alata	WDL	Medium	76.1	259.3	2.8	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	7
shortleaf pine	Pinus echinata	WDH	High	57.8	230.8	3.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	8
red maple	Acer rubrum	WDH	High	67.8	221.1	2.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	9
pignut hickory	Carya glabra	WDL	Medium	62.6	168.9	2.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	10
black cherry	Prunus serotina	WDL	Medium	65.2	158.3	1.7	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	11
flowering dogwood	Cornus florida	WDL	Medium	68.4	150.5	1.7	No change	No change	Medium	Common	Fair	Fair			1	12
green ash	Fraxinus pennsylvanica	WSH	Low	35.5	136.1	3.4	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	13
post oak	Quercus stellata	WDH	High	48.9	122.5	2.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	14
boxelder	Acer negundo	WSH	Low	17.6	104.9	3.8	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	15
eastern redcedar	Juniperus virginiana	WDH	Medium	33.4	98.6	2.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
northern red oak	Quercus rubra	WDH	Medium	28	86.2	2.1	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	17
blackgum	Nyssa sylvatica	WDL	Medium	40.3	82.2	1.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	18
black oak	Quercus velutina	WDH	High	22.6	67.4	2.3	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	19
mockernut hickory	Carya alba	WDL	Medium	30.1	60.7	1.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	20
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	25	53.1	1.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	21
pecan	Carya illinoensis	NSH	Low	7	49.9	6.2	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			0	22
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	24.4	46.7	1.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	23
sourwood	Oxydendrum arboreum	NDL	High	22.3	45.6	1.2	No change	No change	High	Rare	Fair	Fair			1	24
common persimmon	Diospyros virginiana	NSL	Low	26.2	37.3	1.0	Sm. dec.	No change	High	Rare	Poor	Fair			1	25
American elm	Ulmus americana	WDH	Medium	15.3	36.1	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	26
slippery elm	Ulmus rubra	WSL	Low	19.6	36.1	1.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	27
florida maple	Acer barbatum	NSL	Low	22.9	34.2	1.3	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	28
American beech	Fagus grandifolia	WDH	High	15.5	33.3	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	29
sycamore	Platanus occidentalis	NSL	Low	6.3	32.7	3.7	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	30
river birch	Betula nigra	NSL	Low	6.8	32.0	3.8	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	31
laurel oak	Quercus laurifolia	NDH	Medium	16.4	31.9	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	32
scarlet oak	Quercus coccinea	WDL	Medium	17.8	31.3	1.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	33
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	11.6	27.8	2.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	34
sugarberry	Celtis laevigata	NDH	Medium	6.4	22.5	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	35
swamp tupelo	Nyssa biflora	NDH	Medium	2.7	18.0	2.0	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	36
red mulberry	Morus rubra	NSL	Low	15.8	17.9	0.6	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	37
willow oak	Quercus phellos	NSL	Low	7.1	17.2	1.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	38
black walnut	Juglans nigra	WDH	Low	5.8	14.7	2.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	39
American holly	Ilex opaca	NSL	Medium	4.6	13.3	0.9	No change	No change	Medium	Rare	Poor	Poor			1	40
bitternut hickory	Carya cordiformis	WSL	Low	3.9	11.6	3.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	41
eastern redbud	Cercis canadensis	NSL	Low	10.9	11.3	0.9	No change	Lg. inc.	Medium	Rare	Poor	Good			1	42
black willow	Salix nigra	NSH	Low	3	10.4	1.5	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	2	43
shagbark hickory	Carya ovata	WSL	Medium	6.2	10.0	1.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	44
slash pine	Pinus elliottii	NDH	High	1.7	9.9	2.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	45
hackberry	Celtis occidentalis	WDH	Medium	3.9	8.1	1.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	46
sweetbay	Magnolia virginiana	NSL	Medium	1	6.9	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	47

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USDA Forest Service
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	
swamp chestnut oak	Quercus michauxii	NSL	Low	3	6.9	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				2	48
sassafras	Sassafras albidum	WSL	Low	6.1	5.3	0.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		1	49
eastern cottonwood	Populus deltoides	NSH	Low	1.9	3.1	1.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0	50
American basswood	Tilia americana	WSL	Medium	1.9	2.9	1.5	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0	51
longleaf pine	Pinus palustris	NSH	Medium	0.3	2.8	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2	52
black locust	Robinia pseudoacacia	NDH	Low	1	1.4	1.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0	53
serviceberry	Amelanchier spp.	NSL	Low	1.9	1.4	0.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0	54
Virginia pine	Pinus virginiana	NDH	High	1	1.3	1.3	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0	55
paulownia	Paulownia tomentosa	NSL	FIA	2.8	1.2	0.4	Unknown	Unknown	NA	Rare	NNIS	NNIS				0	56
overcup oak	Quercus lyrata	NSL	Medium	1	1.1	1.1	No change	No change	Low	Rare	Very Poor	Very Poor				2	57
bluejack oak	Quercus incana	NSL	Low	0.9	1.1	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2	58
shellbark hickory	Carya laciniosa	NSL	Low	1	0.9	0.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0	59
sand hickory	Carya pallida	NSL	FIA	1	0.8	0.8	Unknown	Unknown	NA	Rare	FIA Only	FIA Only				0	60
chestnut oak	Quercus prinus	NDH	High	1.1	0.7	0.2	No change	No change	High	Rare	Fair	Fair				0	61
yellow buckeye	Aesculus flava	NSL	Low	1	0.6	0.6	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				0	62
turkey oak	Quercus laevis	NSH	Medium	0.9	0.5	0.5	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost				0	63
blackjack oak	Quercus marilandica	NSL	Medium	1	0.5	0.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good				2	64
butternut	Juglans cinerea	NSLX	FIA	0.9	0.4	0.4	Unknown	Unknown	Low	Rare	FIA Only	FIA Only				0	65
Osage-orange	Maclura pomifera	NDH	Medium	1	0.2	0.2	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor				0	66
wild plum	Prunus americana	NSLX	FIA	1	0.2	0.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0	67
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0	68
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	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				3	70
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3	71
white ash	Fraxinus americana	WDL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +		3	72
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				0	73
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +		3	74
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0	75
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0	76
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3	77
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0	78
redbay	Persea borbonia	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3	79
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0	80
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3	81
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3	82