

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 10,533 4,066.9 271

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			High	15	22	Increase	32	32	Very Good	13	13	Likely	0	0
Hickory	4			Medium	33	50	No Change	9	14	Good	15	21	Infill	17	12
Maple	3	Abundant	7	Low	32	11	Decrease	23	18	Fair	10	7	Migrate	1	1
Oak	18	Common	16	FIA	4		New	7	8	Poor	13	11		18	13
Pine	6	Rare	45				Unknown	13	12	Very Poor	13	11			
Other	36	Absent	13							FIA Only	3	3			
	68		81		84	83		84	84	Unknown	9	8			
											76	74			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	66.1	67.7	69.6	69.7	
	CCSM85	66.1	67.9	70.3	72.9	
	GFDL45	66.1	68.8	70.8	71.5	
	GFDL85	66.1	68.7	71.8	75.4	
	HAD45	66.1	68.4	70.9	72.5	
HAD85	66.1	68.6	72.3	76.2		
Growing Season May—Sep	CCSM45	78.3	79.6	81.2	81.6	
	CCSM85	78.3	79.7	82.1	85.2	
	GFDL45	78.3	81.0	82.9	84.0	
	GFDL85	78.3	81.0	84.1	88.2	
	HAD45	78.3	81.6	83.7	85.5	
HAD85	78.3	81.4	86.7	90.3		
Coldest Month Average	CCSM45	47.6	49.9	50.8	50.4	
	CCSM85	47.6	49.6	50.8	52.0	
	GFDL45	47.6	50.5	50.8	51.2	
	GFDL85	47.6	49.6	50.7	51.3	
	HAD45	47.6	47.7	49.1	49.9	
HAD85	47.6	48.6	49.6	51.4		
Warmest Month Average	CCSM45	81.9	83.3	84.0	84.4	
	CCSM85	81.9	83.3	84.6	86.5	
	GFDL45	81.9	84.5	85.2	85.9	
	GFDL85	81.9	84.4	85.8	88.1	
	HAD45	81.9	85.8	87.2	88.1	
HAD85	81.9	85.9	89.1	90.8		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	50.2	53.0	54.5	56.1	
	CCSM85	50.2	52.8	56.2	60.4	
	GFDL45	50.2	55.1	57.9	60.6	
	GFDL85	50.2	54.9	59.1	57.1	
	HAD45	50.2	47.3	52.0	53.0	
HAD85	50.2	52.1	47.6	50.3		
Growing Season May—Sep	CCSM45	21.7	24.2	24.7	25.7	
	CCSM85	21.7	22.8	25.3	26.6	
	GFDL45	21.7	26.4	28.1	28.5	
	GFDL85	21.7	26.3	30.0	29.4	
	HAD45	21.7	20.9	22.1	21.6	
HAD85	21.7	21.9	18.6	19.1		

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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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	79.5	3272.5	28.9	No change	No change	Medium	Abundant	Good	Good			1	1
slash pine	Pinus elliotii	NDH	High	53.2	1631.8	20.0	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	2
laurel oak	Quercus laurifolia	NDH	Medium	65	926.3	10.6	No change	No change	Medium	Abundant	Good	Good			1	3
water oak	Quercus nigra	WDH	High	70.8	915.5	8.6	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	4
longleaf pine	Pinus palustris	NSH	Medium	23.8	567.0	15.6	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	5
live oak	Quercus virginiana	NDH	High	37.7	566.6	12.0	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	6
sweetgum	Liquidambar styraciflua	WDH	High	57.2	530.4	7.0	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	7
swamp tupelo	Nyssa biflora	NDH	Medium	39	436.5	8.8	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	8
red maple	Acer rubrum	WDH	High	46.6	234.9	3.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	9
shortleaf pine	Pinus echinata	WDH	High	21	185.6	7.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	10
black cherry	Prunus serotina	WDL	Medium	43.4	166.4	2.9	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	11
yellow-poplar	Liriodendron tulipifera	WDH	High	20.7	152.3	5.4	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	12
southern red oak	Quercus falcata	WDL	Medium	26.9	146.4	4.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	13
willow oak	Quercus phellos	NSL	Low	10.4	145.2	11.5	Sm. dec.	No change	Medium	Common	Poor	Fair			1	14
pond cypress	Taxodium ascendens	NSH	Medium	9.9	123.3	10.2	Sm. dec.	No change	Medium	Common	Poor	Fair	Infill +	Infill +	1	15
sweetbay	Magnolia virginiana	NSL	Medium	24.8	102.9	3.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
blackgum	Nyssa sylvatica	WDL	Medium	30.4	97.2	2.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	17
green ash	Fraxinus pennsylvanica	WSH	Low	12.6	79.1	4.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	18
pignut hickory	Carya glabra	WDL	Medium	16.9	74.7	3.6	Sm. dec.	No change	Medium	Common	Poor	Fair			1	19
white oak	Quercus alba	WDH	Medium	17.9	72.0	3.3	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	20
sugarberry	Celtis laevigata	NDH	Medium	13.4	69.2	3.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	21
common persimmon	Diospyros virginiana	NSL	Low	24.7	55.7	1.5	Sm. dec.	No change	High	Common	Fair	Good			1	22
black willow	Salix nigra	NSH	Low	8.8	54.0	4.8	No change	No change	Low	Common	Poor	Poor			0	23
post oak	Quercus stellata	WDH	High	11.8	49.5	4.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	24
bald cypress	Taxodium distichum	NSH	Medium	6.1	46.8	6.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	25
winged elm	Ulmus alata	WDL	Medium	14.1	42.7	2.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	26
southern magnolia	Magnolia grandiflora	NSL	Low	15.5	41.6	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	27
American elm	Ulmus americana	WDH	Medium	10.7	40.5	3.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	28
overcup oak	Quercus lyrata	NSL	Medium	7.8	37.5	3.9	No change	No change	Low	Rare	Very Poor	Very Poor			0	29
water tupelo	Nyssa aquatica	NSH	Medium	3.9	32.9	6.7	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	30
pecan	Carya illinoensis	NSH	Low	5.5	31.7	2.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	31
spruce pine	Pinus glabra	NSL	Low	8.8	28.8	2.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	32
river birch	Betula nigra	NSL	Low	6.1	27.6	2.7	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	33
eastern redcedar	Juniperus virginiana	WDH	Medium	13.8	26.8	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	34
hackberry	Celtis occidentalis	WDH	Medium	5.9	23.1	3.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +		1	35
florida maple	Acer barbatum	NSL	Low	6.8	20.1	1.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +		1	36
American hornbeam; muscley	Carpinus caroliniana	WSL	Low	8.8	19.3	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	37
flowering dogwood	Cornus florida	WDL	Medium	13.1	18.7	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	38
sycamore	Platanus occidentalis	NSL	Low	3.5	18.3	2.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	39
sassafras	Sassafras albidum	WSL	Low	11.7	17.8	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	40
redbay	Persea borbonia	NSL	Low	5.7	14.5	2.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			1	41
mockernut hickory	Carya alba	WDL	Medium	7	13.3	1.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	42
turkey oak	Quercus laevis	NSH	Medium	1.3	12.9	5.0	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	43
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	3.9	10.0	1.2	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	44
water hickory	Carya aquatica	NSL	Medium	0.9	9.4	9.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	45
sourwood	Oxydendrum arboreum	NDL	High	5	9.1	1.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	46
durand oak	Quercus sinuata var. sinuata	NSL	FIA	0.9	8.9	9.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	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	3.8	7.5	2.0	No change	No change	Medium	Rare	Poor	Poor	Infill +		2	48
wild plum	Prunus americana	NSLX	FIA	5.3	7.3	0.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	49
American beech	Fagus grandifolia	WDH	High	2.3	6.7	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	50
blackjack oak	Quercus marilandica	NSL	Medium	1.2	6.6	3.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	51
eastern redbud	Cercis canadensis	NSL	Low	6.9	6.2	0.7	No change	No change	Medium	Rare	Poor	Poor			1	52
red mulberry	Morus rubra	NSL	Low	3.8	5.9	1.5	Sm. dec.	No change	Medium	Rare	Very Poor	Poor	Infill +		1	53
American holly	Ilex opaca	NSL	Medium	4.8	5.2	0.9	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	54
loblolly-bay	Gordonia lasianthus	NSH	Medium	1.9	4.5	2.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	55
water elm	Planera aquatica	NSL	Low	1.9	4.4	2.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	56
bluejack oak	Quercus incana	NSL	Low	0.1	3.8	0.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	57
slippery elm	Ulmus rubra	WSL	Low	0.5	3.6	0.5	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	58
black oak	Quercus velutina	WDH	High	3.5	3.5	0.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	59
Shumard oak	Quercus shumardii	NSL	Low	0.6	2.7	1.7	No change	No change	High	Rare	Fair	Fair			0	60
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	1.5	2.3	0.9	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	61
eastern cottonwood	Populus deltoides	NSH	Low	0.9	2.1	2.2	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	62
pond pine	Pinus serotina	NSH	Medium	0.9	1.8	1.9	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	63
white mulberry	Morus alba	NSL	FIA	0.9	1.7	1.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	64
northern red oak	Quercus rubra	WDH	Medium	0.9	1.7	1.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	65
waterlocust	Gleditsia aquatica	NSLX	FIA	0.9	1.2	1.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	66
scarlet oak	Quercus coccinea	WDL	Medium	1.9	1.1	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	67
boxelder	Acer negundo	WSH	Low	0.9	0.2	0.2	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	68
sand pine	Pinus clausa	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	69
Table Mountain pine	Pinus pungens	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	70
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	71
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	72
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	73
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	74
bitternut hickory	Carya cordiformis	WSL	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	75
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	76
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	77
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	78
white ash	Fraxinus americana	WDL	Medium	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	79
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			0	80
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	81
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	82
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	83
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	84