

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	312

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	3			High	16	23	Increase	29	32	Very Good	12	14	Likely	2	2
Hickory	7			Medium	36	53	No Change	13	14	Good	20	19	Infill	7	9
Maple	3	Abundant	4	Low	35	12	Decrease	26	22	Fair	4	6	Migrate	1	1
Oak	16	Common	22	FIA	3		New	8	10	Poor	11	12			
Pine	6	Rare	45				Unknown	14	12	Very Poor	19	15			
Other	36	Absent	15							FIA Only	3	3			
	71		86		90	88		90	90	Unknown	11	9			
											80	78			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	65.5	67.1	69.0	69.1	
	CCSM85	65.5	67.3	69.8	72.3	
	GFDL45	65.5	68.2	70.1	70.8	
	GFDL85	65.5	68.1	71.2	74.7	
	HAD45	65.5	67.7	70.3	71.9	
HAD85	65.5	68.0	71.7	75.5		
Growing Season (May—Sep)	CCSM45	77.9	79.2	80.8	81.2	
	CCSM85	77.9	79.3	81.7	84.8	
	GFDL45	77.9	80.5	82.4	83.5	
	GFDL85	77.9	80.4	83.5	87.6	
	HAD45	77.9	81.1	83.2	85.0	
HAD85	77.9	80.9	86.2	89.7		
Coldest Month Average	CCSM45	46.8	49.1	49.9	49.6	
	CCSM85	46.8	48.8	50.1	51.2	
	GFDL45	46.8	49.8	50.0	50.4	
	GFDL85	46.8	48.8	49.8	50.4	
	HAD45	46.8	46.7	48.1	48.9	
HAD85	46.8	47.8	48.9	50.6		
Warmest Month Average	CCSM45	81.5	82.9	83.5	83.9	
	CCSM85	81.5	82.8	84.1	85.9	
	GFDL45	81.5	84.0	84.7	85.4	
	GFDL85	81.5	83.7	85.1	87.4	
	HAD45	81.5	85.4	86.8	87.6	
HAD85	81.5	85.5	88.7	90.3		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	53.4	55.6	58.3	58.6	
	CCSM85	53.4	56.0	58.6	64.1	
	GFDL45	53.4	58.6	62.0	64.2	
	GFDL85	53.4	58.7	62.2	61.0	
	HAD45	53.4	50.9	56.5	57.2	
HAD85	53.4	56.7	51.4	53.8		
Growing Season (May—Sep)	CCSM45	22.2	24.2	25.4	25.5	
	CCSM85	22.2	23.0	24.8	26.7	
	GFDL45	22.2	27.0	29.0	28.8	
	GFDL85	22.2	27.5	30.6	30.4	
	HAD45	22.2	21.2	22.8	22.5	
HAD85	22.2	23.0	18.6	19.4		

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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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	86.7	3736.2	28.7	No change	No change	Medium	Abundant	Good	Good			1	1
water oak	Quercus nigra	WDH	High	86.5	1307.3	10.4	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	2
sweetgum	Liquidambar styraciflua	WDH	High	81.3	1039.8	9.1	No change	No change	Medium	Abundant	Good	Good			1	3
laurel oak	Quercus laurifolia	NDH	Medium	67.3	815.8	9.5	No change	No change	Medium	Abundant	Good	Good			1	4
longleaf pine	Pinus palustris	NSH	Medium	25.3	462.9	13.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	5
yellow-poplar	Liriodendron tulipifera	WDH	High	56.4	349.6	4.9	No change	Sm. dec.	High	Common	Good	Fair			1	6
shortleaf pine	Pinus echinata	WDH	High	44.6	298.2	5.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	7
blackgum	Nyssa sylvatica	WDL	Medium	60.3	295.6	3.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	8
slash pine	Pinus elliotii	NDH	High	19.7	285.2	8.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	9
sweetbay	Magnolia virginiana	NSL	Medium	48.5	261.7	3.9	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	10
red maple	Acer rubrum	WDH	High	58.3	250.1	3.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	11
swamp tupelo	Nyssa biflora	NDH	Medium	21.3	190.5	6.7	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	12
southern magnolia	Magnolia grandiflora	NSL	Low	28.5	133.2	4.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	13
white oak	Quercus alba	WDH	Medium	38.7	131.8	2.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	14
sugarberry	Celtis laevigata	NDH	Medium	10.8	124.9	9.4	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	15
black cherry	Prunus serotina	WDL	Medium	52.7	124.3	1.7	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	16
pignut hickory	Carya glabra	WDL	Medium	29.5	121.0	3.6	Sm. dec.	No change	Medium	Common	Poor	Fair			1	17
southern red oak	Quercus falcata	WDL	Medium	32.3	107.8	2.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	18
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	27.5	89.7	2.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	19
bald cypress	Taxodium distichum	NSH	Medium	4.5	79.7	13.6	Sm. dec.	No change	Medium	Common	Poor	Fair	Infill +	Infill +	1	20
post oak	Quercus stellata	WDH	High	27.6	78.8	2.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	21
flowering dogwood	Cornus florida	WDL	Medium	41.4	73.9	1.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	22
green ash	Fraxinus pennsylvanica	WSH	Low	11.8	68.9	4.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	23
mockernut hickory	Carya alba	WDL	Medium	28.1	68.3	1.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	24
spruce pine	Pinus glabra	NSL	Low	17.9	57.3	2.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	25
American holly	Ilex opaca	NSL	Medium	33.3	54.7	1.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	26
live oak	Quercus virginiana	NDH	High	4	42.0	4.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	27
river birch	Betula nigra	NSL	Low	6.5	40.5	3.1	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	28
eastern redcedar	Juniperus virginiana	WDH	Medium	21.3	39.9	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	29
black willow	Salix nigra	NSH	Low	9.3	39.6	3.1	No change	Sm. inc.	Low	Rare	Very Poor	Poor			1	30
American elm	Ulmus americana	WDH	Medium	16.4	37.4	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	31
American beech	Fagus grandifolia	WDH	High	12	31.2	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	32
common persimmon	Diospyros virginiana	NSL	Low	19.1	28.0	0.9	Sm. dec.	Sm. inc.	High	Rare	Poor	Good			1	33
water tupelo	Nyssa aquatica	NSH	Medium	2.1	26.1	5.3	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	34
sassafras	Sassafras albidum	WSL	Low	14	25.9	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	35
sycamore	Platanus occidentalis	NSL	Low	4.1	22.3	2.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	36
pecan	Carya illinoensis	NSH	Low	3.4	21.4	4.1	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			2	37
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	14.3	21.3	1.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	38
florida maple	Acer barbatum	NSL	Low	10.3	20.2	1.2	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	39
American basswood	Tilia americana	WSL	Medium	2.8	16.9	5.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	40
sourwood	Oxydendrum arboreum	NDL	High	12	15.0	0.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			1	41
blackjack oak	Quercus marilandica	NSL	Medium	6.4	14.2	1.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	42
winged elm	Ulmus alata	WDL	Medium	10.6	13.2	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	43
black oak	Quercus velutina	WDH	High	6.9	11.6	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	44
red mulberry	Morus rubra	NSL	Low	5.9	11.5	1.3	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	45
pond cypress	Taxodium ascendens	NSH	Medium	0.7	11.1	8.1	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	46
turkey oak	Quercus laevis	NSH	Medium	5.3	9.2	1.2	No change	No change	High	Rare	Fair	Fair			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	2.3	8.5	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				2	48
slippery elm	Ulmus rubra	WSL	Low	5.4	6.4	1.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +		1	49
wild plum	Prunus americana	NSLX	FIA	5	5.8	1.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0	50
eastern redbud	Cercis canadensis	NSL	Low	4.4	5.7	1.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0	51
redbay	Persea borbonia	NSL	Low	2.8	5.1	1.8	No change	Sm. dec.	High	Rare	Fair	Poor	Infill +			1	52
white ash	Fraxinus americana	WDL	Medium	2.5	4.5	1.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				2	53
black walnut	Juglans nigra	WDH	Low	0.9	3.9	4.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0	54
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	3.3	3.5	0.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +		2	55
boxelder	Acer negundo	WSH	Low	1.2	3.3	1.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor				0	56
sand hickory	Carya pallida	NSL	FIA	1.5	3.1	1.3	Unknown	Unknown	NA	Rare	FIA Only	FIA Only				0	57
willow oak	Quercus phellos	NSL	Low	3	2.7	0.7	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good		Infill ++		2	58
Shumard oak	Quercus shumardii	NSL	Low	0.3	2.7	1.0	No change	No change	High	Rare	Fair	Fair				0	59
Carolina ash	Fraxinus caroliniana	NSL	FIA	0.9	1.8	1.9	Unknown	Unknown	NA	Rare	FIA Only	FIA Only				0	60
water hickory	Carya aquatica	NSL	Medium	1.7	1.6	0.7	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost				0	61
overcup oak	Quercus lyrata	NSL	Medium	0.9	1.4	1.4	No change	No change	Low	Rare	Very Poor	Very Poor				2	62
bluejack oak	Quercus incana	NSL	Low	1.9	1.3	0.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2	63
chestnut oak	Quercus prinus	NDH	High	2.2	1.3	0.4	Very Lg. dec.	Lg. dec.	High	Rare	Lost	Poor				0	64
bitternut hickory	Carya cordiformis	WSL	Low	0.6	0.8	0.5	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost				0	65
Virginia pine	Pinus virginiana	NDH	High	0.8	0.7	0.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0	66
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0.9	0.7	0.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0	67
serviceberry	Amelanchier spp.	NSL	Low	0.9	0.6	0.6	No change	No change	Medium	Rare	Poor	Poor				0	68
eastern cottonwood	Populus deltoides	NSH	Low	0.2	0.4	0.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0	69
shagbark hickory	Carya ovata	WSL	Medium	0.6	0.3	0.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0	70
pin cherry	Prunus pensylvanica	NSL	Low	0.9	0.3	0.3	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0	71
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3	72
sand pine	Pinus clausa	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +		3	73
pond pine	Pinus serotina	NSH	Medium	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown				0	74
silver maple	Acer saccharinum	NSH	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0	75
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				3	76
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3	77
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				3	78
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3	79
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +		3	80
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				0	81
loblolly-bay	Gordonia lasianthus	NSH	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0	82
silverbell	Halesia spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3	83
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0	84
water elm	Planera aquatica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0	85
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0	86
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0	87
nuttall oak	Quercus texana	NSH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown				0	88
northern red oak	Quercus rubra	WDH	Medium	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0	89
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3	90