EcoMap 2007
Climate Change Atlas Tree Species
Current and Potential Future Habitat, Capability, and Migration

USDA Forest Service
Northern Research Station
Landscape Change Research Group
Iverson, Peters, Prasad, Matthews

	sq. km	sq. mi	FIA Plots
Area of Region	26,209	10,119	415

Species Information

The columns below provide breif 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 Reliability	Adaptability		Potential Change in Habitat Suitability Scenario RCP45	Scenario RCP85		Capability to Cope or Persist Scenario RCP45	Scenario RCP85		Migration Potential SHIFT RCP45	SHIFT RCP85
Ash	3														
Hickory	3														
Maple	2	Abundant	4	High	10	19	Increase	12	15	Very Good	5	4	Likely	2	2
Oak	11	Common	11	Medium	37	47	No Change	18	13	Good	7	9	Infill	14	16
Pine	6	Rare	38	Low	29	11	Decrease	20	22	Fair	7	9	Migrate	0	1
Other	28	Absent	21	FIA	3		New	6	7	Poor	15	13		**16**	**19**
	53		**74**		**79**	**77**	Unknown	23	22	Very Poor	14	12			
								79	**79**	FIA Only	3	3			
										Unknown	20	19			
											71	**69**			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual	CCSM45	72.5	73.9	75.3	75.3	
Average	CCSM85	72.5	74.0	76.1	78.3	
	GFDL45	72.5	76.3	76.6	77.4	
	GFDL85	72.5	74.8	77.6	80.9	
	HAD45	72.5	74.0	76.1	77.3	
	HAD85	72.5	74.6	76.9	80.3	
Growing	CCSM45	80.5	81.7	82.8	83.0	
Season	CCSM85	80.5	81.7	83.9	86.2	
May—Sep	GFDL45	80.5	84.2	84.4	85.5	
	GFDL85	80.5	82.8	85.5	89.0	
	HAD45	80.5	82.6	84.2	85.4	
	HAD85	80.5	82.9	85.7	88.7	
Coldest	CCSM45	59.4	61.5	62.3	62.1	
Month	CCSM85	59.4	60.9	61.8	63.3	
Average	GFDL45	59.4	62.0	62.4	63.0	
	GFDL85	59.4	61.8	62.9	64.0	
	HAD45	59.4	59.5	60.7	61.3	
	HAD85	59.4	60.3	61.0	62.9	
Warmest	CCSM45	82.3	83.6	84.3	84.3	
Month	CCSM85	82.3	83.7	84.9	86.3	
Average	GFDL45	82.3	84.5	85.5	86.1	
	GFDL85	82.3	84.7	86.3	88.1	
	HAD45	82.3	84.5	85.2	85.8	
	HAD85	82.3	84.5	86.1	87.5	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual	CCSM45	50.9	53.5	53.5	56.5	
Total	CCSM85	50.9	52.9	53.1	50.9	
	GFDL45	50.9	58.5	60.0	61.7	
	GFDL85	50.9	55.2	63.4	57.9	
	HAD45	50.9	52.8	53.2	54.1	
	HAD85	50.9	49.1	51.1	49.6	
Growing	CCSM45	33.3	35.4	34.6	36.6	
Season	CCSM85	33.3	34.6	35.3	32.3	
May—Sep	GFDL45	33.3	37.5	37.7	37.2	
	GFDL85	33.3	36.1	39.5	35.4	
	HAD45	33.3	34.2	34.8	32.3	
	HAD85	33.3	31.8	30.1	28.9	

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
slash pine	Pinus elliottii	NDH	High	63.9	1522.4	28.8	No change	No change	Medium	Abundant	Good	Good			1	1
live oak	Quercus virginiana	NDH	High	64	645.1	14.2	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	2
cabbage palmetto	Sabal palmetto	NDH	Medium	52.7	589.9	16.9	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			0	3
laurel oak	Quercus laurifolia	NDH	Medium	63.7	518.9	8.4	No change	Sm. dec.	Medium	Abundant	Good	Fair			1	4
pond cypress	Taxodium ascendens	NSH	Medium	25.6	477.5	15.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	5
longleaf pine	Pinus palustris	NSH	Medium	19.8	319.0	15.1	No change	No change	Medium	Common	Fair	Fair			1	6
red maple	Acer rubrum	WDH	High	37.8	231.5	7.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	7
bald cypress	Taxodium distichum	NSH	Medium	18.4	149.8	8.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	8
water oak	Quercus nigra	WDH	High	25	139.7	6.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	9
turkey oak	Quercus laevis	NSH	Medium	5.2	121.9	8.2	No change	Sm. dec.	High	Common	Good	Fair	Infill ++	Infill +	2	10
swamp tupelo	Nyssa biflora	NDH	Medium	24.1	120.0	5.3	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	11
loblolly pine	Pinus taeda	WDH	High	7.4	109.7	13.2	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	12
sweetgum	Liquidambar styraciflua	WDH	High	13.8	98.8	4.5	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	13
sand pine	Pinus clausa	NDH	High	2.2	82.3	14.0	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	2	14
sweetbay	Magnolia virginiana	NSL	Medium	24.9	61.9	4.0	Lg. inc.	Sm. inc.	Medium	Common	Very Good	Good			1	15
redbay	Persea borbonia	NSL	Low	19.4	47.1	2.0	Sm. inc.	Sm. inc.	High	Rare	Good	Good			1	16
loblolly-bay	Gordonia lasianthus	NSH	Medium	6.4	43.7	8.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	17
black cherry	Prunus serotina	WDL	Medium	6.6	42.5	3.7	No change	No change	Low	Rare	Very Poor	Very Poor			0	18
American elm	Ulmus americana	WDH	Medium	17.5	35.1	2.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	19
American hornbeam; muscle\	Carpinus caroliniana	WSL	Low	5.5	23.7	2.5	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	20
Carolina ash	Fraxinus caroliniana	NSL	FIA	13	19.8	2.7	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	21
bluejack oak	Quercus incana	NSL	Low	3.3	16.8	3.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	22
pignut hickory	Carya glabra	WDL	Medium	2.6	13.4	0.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	23
pumpkin ash	Fraxinus profunda	NSH	FIA	4.5	12.2	2.0	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	24
water tupelo	Nyssa aquatica	NSH	Medium	0.4	12.2	2.8	No change	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	25
florida maple	Acer barbatum	NSL	Low	1.1	8.4	7.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	26
sugarberry	Celtis laevigata	NDH	Medium	8.8	8.2	1.7	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +	Infill ++	2	27
green ash	Fraxinus pennsylvanica	WSH	Low	2.8	8.0	1.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	28
post oak	Quercus stellata	WDH	High	1.3	6.9	0.6	No change	Sm. inc.	High	Rare	Fair	Good	Infill +		2	29
eastern redcedar	Juniperus virginiana	WDH	Medium	3.7	5.7	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	30
common persimmon	Diospyros virginiana	NSL	Low	7	4.6	1.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			1	31
southern magnolia	Magnolia grandiflora	NSL	Low	2.1	3.8	0.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	32
blackjack oak	Quercus marilandica	NSL	Medium	0.2	3.3	5.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	33
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	1.8	3.0	1.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	34
hackberry	Celtis occidentalis	WDH	Medium	1.2	2.5	2.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	35
blackgum	Nyssa sylvatica	WDL	Medium	1.2	2.3	0.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	36
water hickory	Carya aquatica	NSL	Medium	0.7	2.2	2.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	37
red mulberry	Morus rubra	NSL	Low	1.1	2.1	1.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	38
American holly	Ilex opaca	NSL	Medium	0.3	2.0	1.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	39
Shumard oak	Quercus shumardii	NSL	Low	0.7	1.8	2.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	40
swamp chestnut oak	Quercus michauxii	NSL	Low	0.4	1.5	3.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	41
winged elm	Ulmus alata	WDL	Medium	1.8	0.9	0.3	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			2	42
American beech	Fagus grandifolia	WDH	High	0.4	0.9	2.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	43
flowering dogwood	Cornus florida	WDL	Medium	0.8	0.9	0.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	44
pond pine	Pinus serotina	NSH	Medium	0.3	0.9	1.9	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	45
waterlocust	Gleditsia aquatica	NSLX	FIA	1	0.8	1.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	46
spruce pine	Pinus glabra	NSL	Low	0.4	0.7	1.9	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
mockernut hickory	Carya alba	WDL	Medium	0.4	0.6	1.5	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	48
cedar elm	Ulmus crassifolia	NDH	Medium	0.4	0.4	1.0	No change	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	49
willow oak	Quercus phellos	NSL	Low	1.6	0.3	0.6	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	50
American basswood	Tilia americana	WSL	Medium	0.3	0.1	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	51
eastern redbud	Cercis canadensis	NSL	Low	0.4	0.1	0.2	No change	Lg. dec.	Medium	Rare	Poor	Very Poor			0	52
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	0.9	0.0	0.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	53
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	54
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	55
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	56
silver maple	Acer saccharinum	NSH	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	57
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	58
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	59
river birch	Betula nigra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	60
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			0	61
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	62
white ash	Fraxinus americana	WDL	Medium	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	63
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	64
silverbell	Halesia spp.	NSL	Low	0	0	0	New Habitat	Unknown	Medium	Absent	New Habitat	Unknown			0	65
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	66
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	67
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	68
water elm	Planera aquatica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	69
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	70
white oak	Quercus alba	WDH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	71
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	72
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	73
bur oak	Quercus macrocarpa	NDH	Medium	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	74
Nuttall oak	Quercus texana	NSH	Medium	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	75
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	Unknown	Medium	Absent	New Habitat	Unknown			3	76
sassafras	Sassafras albidum	WSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	77
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			0	78
slippery elm	Ulmus rubra	WSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	79