

# Kennesaw Mountain

## National Park

### 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	8,000.0	3,088.8	176

### 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	2			High	19	21	Increase	24	29	Very Good	10	10	Likely	2	2
Hickory	5			Medium	28	46	No Change	17	12	Good	11	17	Infill	12	16
Maple	3	Abundant	3	Low	32	12	Decrease	19	19	Fair	14	10	Migrate	4	6
Oak	12	Common	19	FIA	3		New	12	13	Poor	13	11		<b>18</b>	<b>24</b>
Pine	5	Rare	41				Unknown	10	9	Very Poor	11	11			
Other	36	Absent	19					<b>82</b>	<b>82</b>	FIA Only	0	0			
	<b>63</b>		<b>82</b>		<b>82</b>	<b>79</b>				Unknown	7	6			
											<b>66</b>	<b>65</b>			

### Potential Changes in Climate Variables

#### Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	60.6	62.5	64.5	64.6	
	CCSM85	60.6	62.8	65.3	67.9	
	GFDL45	60.6	63.8	65.5	66.2	
	GFDL85	60.6	63.3	66.6	70.1	
	HAD45	60.6	62.9	65.8	67.2	
	HAD85	60.6	63.2	67.4	71.3	
Growing Season May—Sep	CCSM45	74.3	76.0	77.8	78.3	
	CCSM85	74.3	76.2	78.8	82.2	
	GFDL45	74.3	77.8	79.5	80.8	
	GFDL85	74.3	77.3	81.0	85.1	
	HAD45	74.3	77.5	80.0	81.7	
	HAD85	74.3	77.4	83.5	87.1	
Coldest Month Average	CCSM45	40.2	42.7	43.5	43.5	
	CCSM85	40.2	42.7	43.8	45.0	
	GFDL45	40.2	43.4	43.6	44.0	
	GFDL85	40.2	42.0	43.1	43.5	
	HAD45	40.2	40.1	42.0	42.4	
	HAD85	40.2	41.3	42.5	44.1	
Warmest Month Average	CCSM45	79.0	81.0	81.8	81.8	
	CCSM85	79.0	81.1	82.5	84.4	
	GFDL45	79.0	81.8	82.8	83.6	
	GFDL85	79.0	82.0	83.9	86.0	
	HAD45	79.0	83.0	84.8	85.4	
	HAD85	79.0	83.3	87.3	89.0	

#### Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	50.5	52.8	56.1	56.2	
	CCSM85	50.5	53.6	56.2	62.5	
	GFDL45	50.5	56.7	59.6	63.5	
	GFDL85	50.5	56.3	60.0	61.4	
	HAD45	50.5	49.3	54.1	55.3	
	HAD85	50.5	55.3	49.5	53.8	
Growing Season May—Sep	CCSM45	20.7	22.2	23.6	24.1	
	CCSM85	20.7	22.1	22.5	24.9	
	GFDL45	20.7	25.5	27.4	28.4	
	GFDL85	20.7	24.9	27.7	28.7	
	HAD45	20.7	20.4	21.6	21.1	
	HAD85	20.7	22.9	17.4	19.2	

**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
loblolly pine	Pinus taeda	WDH	High	87.5	2516.5	34.3	No change	No change	Medium	Abundant	Good	Good			1	1
yellow-poplar	Liriodendron tulipifera	WDH	High	81.2	814.4	12.1	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	2
sweetgum	Liquidambar styraciflua	WDH	High	76.2	776.5	12.5	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	3
white oak	Quercus alba	WDH	Medium	63.7	380.9	6.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	4
red maple	Acer rubrum	WDH	High	61.2	306.7	5.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	5
southern red oak	Quercus falcata	WDL	Medium	60	228.7	4.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	6
mockernut hickory	Carya alba	WDL	Medium	40	216.2	6.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	7
chestnut oak	Quercus prinus	NDH	High	18.7	194.5	10.4	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	8
water oak	Quercus nigra	WDH	High	53.8	183.0	4.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	9
sourwood	Oxydendrum arboreum	NDL	High	58.8	177.3	3.7	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	10
Virginia pine	Pinus virginiana	NDH	High	27.5	176.6	6.4	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	11
shortleaf pine	Pinus echinata	WDH	High	50	171.8	4.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	12
scarlet oak	Quercus coccinea	WDL	Medium	40	171.5	5.8	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	13
pignut hickory	Carya glabra	WDL	Medium	47.5	159.0	3.7	No change	Sm. dec.	Medium	Common	Fair	Poor			1	14
black cherry	Prunus serotina	WDL	Medium	45	150.0	4.1	Sm. inc.	Lg. inc.	Low	Common	Fair	Good			1	15
blackgum	Nyssa sylvatica	WDL	Medium	57.5	128.0	2.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	16
green ash	Fraxinus pennsylvanica	WSH	Low	16.3	124.5	7.7	No change	Sm. inc.	Medium	Common	Fair	Good			1	17
flowering dogwood	Cornus florida	WDL	Medium	51.3	121.1	2.6	No change	No change	Medium	Common	Fair	Fair			1	18
post oak	Quercus stellata	WDH	High	51.3	118.4	2.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	19
black oak	Quercus velutina	WDH	High	36.3	118.2	3.7	No change	No change	Medium	Common	Fair	Fair			1	20
boxelder	Acer negundo	WSH	Low	13.8	106.9	7.8	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	21
northern red oak	Quercus rubra	WDH	Medium	33.8	76.1	3.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	22
black willow	Salix nigra	NSH	Low	2.5	36.1	14.4	No change	No change	Low	Rare	Very Poor	Very Poor			0	23
blackjack oak	Quercus marilandica	NSL	Medium	12.5	31.2	2.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	24
common persimmon	Diospyros virginiana	NSL	Low	25	31.0	1.9	No change	Sm. inc.	High	Rare	Fair	Good			1	25
florida maple	Acer barbatum	NSL	Low	16.2	28.2	2.3	No change	Sm. inc.	High	Rare	Fair	Good			1	26
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	13.7	24.1	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	27
winged elm	Ulmus alata	WDL	Medium	15	21.1	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	28
American beech	Fagus grandifolia	WDH	High	12.5	21.0	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	29
river birch	Betula nigra	NSL	Low	3.8	20.8	5.6	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	30
eastern redcedar	Juniperus virginiana	WDH	Medium	10	20.6	2.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	31
black walnut	Juglans nigra	WDH	Low	3.8	19.8	5.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	32
sycamore	Platanus occidentalis	NSL	Low	7.5	19.3	2.6	No change	No change	Medium	Rare	Poor	Poor		Infill +	1	33
red mulberry	Morus rubra	NSL	Low	6.2	19.0	3.0	No change	No change	Medium	Rare	Poor	Poor			1	34
longleaf pine	Pinus palustris	NSH	Medium	5	17.3	3.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	35
sweetbay	Magnolia virginiana	NSL	Medium	1.2	15.1	12.1	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	36
southern magnolia	Magnolia grandiflora	NSL	Low	6.3	14.3	8.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	37
willow oak	Quercus phellos	NSL	Low	3.8	14.3	3.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	38
bitternut hickory	Carya cordiformis	WSL	Low	3.7	12.4	3.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	39
American elm	Ulmus americana	WDH	Medium	7.5	10.4	1.4	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good		Infill ++	2	40
sugarberry	Celtis laevigata	NDH	Medium	3.8	10.1	2.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	41
sassafras	Sassafras albidum	WSL	Low	10	9.5	1.0	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	42
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	10	8.8	1.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	43
honeylocust	Gleditsia triacanthos	NSH	Low	3.7	7.4	2.0	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	44
cucumbertree	Magnolia acuminata	NSL	Low	3.7	7.3	2.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	45
American basswood	Tilia americana	WSL	Medium	2.5	5.6	2.2	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	46
ailanthus	Ailanthus altissima	NSL	FIA	1.3	5.3	4.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			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
slippery elm	Ulmus rubra	WSL	Low	3.8	4.9	1.3	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				2 48
white ash	Fraxinus americana	WDL	Medium	2.5	4.5	1.8	No change	No change	Low	Rare	Very Poor	Very Poor				2 49
eastern white pine	Pinus strobus	WDH	High	1.3	4.1	3.3	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				0 50
bigleaf magnolia	Magnolia macrophylla	NSL	Low	2.5	3.1	1.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 51
paulownia	Paulownia tomentosa	NSL	FIA	2.5	3.0	1.2	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 52
shellbark hickory	Carya laciniosa	NSL	Low	2.5	2.8	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 53
eastern redbud	Cercis canadensis	NSL	Low	3.8	2.6	0.7	No change	Sm. inc.	Medium	Rare	Poor	Fair		Infill +		1 54
swamp tupelo	Nyssa biflora	NDH	Medium	2.5	2.3	0.9	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +		2 55
black locust	Robinia pseudoacacia	NDH	Low	1.2	2.1	1.7	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0 56
shagbark hickory	Carya ovata	WSL	Medium	2.5	1.9	0.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +		2 57
yellow buckeye	Aesculus flava	NSL	Low	1.2	1.9	1.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				0 58
American holly	Ilex opaca	NSL	Medium	2.5	1.3	0.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		2 59
white mulberry	Morus alba	NSL	FIA	1.2	0.9	0.8	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 60
swamp chestnut oak	Quercus michauxii	NSL	Low	1.2	0.6	0.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 61
Nuttall oak	Quercus texana	NSH	Medium	1.3	0.5	0.4	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor				0 62
yellow birch	Betula alleghaniensis	NDL	High	1.2	0.4	0.3	No change	No change	Medium	Rare	Poor	Poor				0 63
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 64
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 65
Table Mountain pine	Pinus pungens	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 66
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				3 67
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 68
sweet birch	Betula lenta	NDH	High	0	0	0	Unknown	Unknown	Low	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
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate ++		3 71
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 72
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +		3 73
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 74
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 75
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 76
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 77
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 78
pin oak	Quercus palustris	NSH	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 79
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 80
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 81
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 82