

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	6,704.5	2,588.6	19

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	0			High	8	9	Increase	4	2	Very Good	0	0
Hickory	0			Medium	15	22	No Change	3	4	Good	1	2
Maple	0	Abundant	0	Low	12	4	Decrease	1	2	Fair	4	2
Oak	2	Common	1	FIA	0		New	20	19	Poor	3	3
Pine	1	Rare	7				Unknown	7	8	Very Poor	0	1
Other	5	Absent	24							FIA Only	0	0
	8		32		35	35		35	35	Unknown	7	8
											15	16

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	75.8	76.9	78.0	78.1	
	CCSM85	75.8	76.9	78.7	80.6	
	GFDL45	75.8	80.4	79.6	80.5	
	GFDL85	75.8	77.8	80.5	83.4	
	HAD45	75.8	77.1	78.8	79.8	
HAD85	75.8	77.5	79.5	82.4		
Growing Season (May—Sep)	CCSM45	81.6	82.5	83.4	83.6	
	CCSM85	81.6	82.6	84.4	86.3	
	GFDL45	81.6	86.3	85.3	86.4	
	GFDL85	81.6	83.6	86.3	89.3	
	HAD45	81.6	83.1	84.5	85.5	
HAD85	81.6	83.4	85.6	88.2		
Coldest Month Average	CCSM45	65.8	67.2	68.0	67.9	
	CCSM85	65.8	66.7	67.5	68.8	
	GFDL45	65.8	68.0	68.3	68.8	
	GFDL85	65.8	67.9	69.1	70.2	
	HAD45	65.8	66.3	67.4	67.8	
HAD85	65.8	66.7	67.4	69.2		
Warmest Month Average	CCSM45	83.3	84.2	84.7	84.8	
	CCSM85	83.3	84.5	85.4	86.4	
	GFDL45	83.3	85.3	86.3	86.9	
	GFDL85	83.3	85.4	87.0	88.6	
	HAD45	83.3	85.0	85.6	86.1	
HAD85	83.3	85.1	86.2	87.5		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	53.5	52.3	51.0	56.0	
	CCSM85	53.5	54.5	51.4	44.8	
	GFDL45	53.5	59.9	59.3	59.4	
	GFDL85	53.5	56.7	62.5	54.3	
	HAD45	53.5	56.5	57.4	54.3	
HAD85	53.5	52.3	53.0	49.1		
Growing Season (May—Sep)	CCSM45	36.6	35.5	34.3	37.7	
	CCSM85	36.6	37.0	35.1	29.4	
	GFDL45	36.6	39.0	37.1	34.5	
	GFDL85	36.6	37.1	37.5	31.5	
	HAD45	36.6	37.2	37.6	31.6	
HAD85	36.6	34.0	32.3	28.5		

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.

Cite as: Iverson, L.R.; Prasad, A.M.; Peters, M.P.; Matthews, S.N. 2019. Facilitating Adaptive Forest Management under Climate Change: A Spatially Specific Synthesis of 125 Species for Habitat Changes and Assisted Migration over the Eastern United States. *Forests*. 10(11): 989. <https://doi.org/10.3390/f10110989>.

One x One Degree
Climate Change Atlas Tree Species

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

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
pond cypress	Taxodium ascendens	NSH	Medium	10.7	332.8	48.2	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	1
cabbage palmetto	Sabal palmetto	NDH	Medium	4.8	48.3	8.3	No change	No change	Medium	Rare	Poor	Poor			0	2
slash pine	Pinus elliotii	NDH	High	10.2	43.0	35.4	Sm. inc.	Sm. dec.	Medium	Rare	Fair	Very Poor	Infill +		2	3
redbay	Persea borbonia	NSL	Low	12	12.1	4.8	Sm. inc.	No change	High	Rare	Good	Fair	Infill ++	Infill +	2	4
live oak	Quercus virginiana	NDH	High	0.7	7.5	2.4	No change	Lg. inc.	Medium	Rare	Poor	Good			2	5
bald cypress	Taxodium distichum	NSH	Medium	9.5	6.4	5.1	Sm. inc.	No change	Medium	Rare	Fair	Poor	Infill +	Infill +	2	6
common persimmon	Diospyros virginiana	NSL	Low	6	0.2	0.6	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	7
laurel oak	Quercus laurifolia	NDH	Medium	3.5	0.2	0.4	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	8
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	9
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	10
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	11
boxelder	Acer negundo	WSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	12
red maple	Acer rubrum	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	13
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	14
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	15
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	16
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	17
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	18
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	19
American beech	Fagus grandifolia	WDH	High	0	0	0	New Habitat	Unknown	Medium	Absent	New Habitat	Unknown			3	20
green ash	Fraxinus pennsylvanica	WSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	21
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	22
American holly	Ilex opaca	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	23
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	24
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++		3	25
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	26
water tupelo	Nyssa aquatica	NSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	27
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	28
swamp chestnut oak	Quercus michauxii	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	29
nuttall oak	Quercus texana	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	30
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	31
black willow	Salix nigra	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	32
winged elm	Ulmus alata	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	33
American elm	Ulmus americana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	34
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	35