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U.S. Census Bureau Urban Areas
Climate Change Atlas Tree Species
Current and Potential Future Habitat, Capability, and Migration

USDA Forest Service
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Iverson, Peters, Prasad, Matthews

	sq. km	sq. mi	FIA Plots
Area of Region	8,717.4	3,365.8	237

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
Ash	4
Hickory	3
Maple	1
Oak	8
Pine	5
Other	22
	43

Abundance	
Abundant	4
Common	15
Rare	24
Absent	12
	55

	Model Reliability	Adaptability
High	9	13
Medium	30	37
Low	19	8
FIA	3	
	61	**58**

Potential Change in Habitat Suitability	Scenario RCP45	Scenario RCP85
Increase	12	14
No Change	11	10
Decrease	17	16
New	2	4
Unknown	19	17
	61	**61**

Capability to Cope or Persist	Scenario RCP45	Scenario RCP85
Very Good	7	8
Good	5	4
Fair	8	10
Poor	7	6
Very Poor	11	10
FIA Only	3	3
Unknown	16	14
	57	**55**

Migration Potential	SHIFT RCP45	SHIFT RCP85
Likely	0	0
Infill	3	4
Migrate	0	2
	3	**6**

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099
Annual Average	CCSM45	70.9	72.3	73.7	73.7
	CCSM85	70.9	72.4	74.5	76.6
	GFDL45	70.9	73.6	75.1	75.9
	GFDL85	70.9	73.2	76.1	79.4
	HAD45	70.9	72.4	74.5	75.7
	HAD85	70.9	73.0	75.3	78.6
Growing Season May—Sep	CCSM45	79.9	81.0	82.1	82.3
	CCSM85	79.9	81.1	83.2	85.5
	GFDL45	79.9	82.5	83.8	84.9
	GFDL85	79.9	82.2	85.0	88.5
	HAD45	79.9	82.0	83.7	84.9
	HAD85	79.9	82.4	85.2	88.2
Coldest Month Average	CCSM45	56.4	58.4	59.3	59.0
	CCSM85	56.4	57.8	58.7	60.2
	GFDL45	56.4	59.0	59.4	60.0
	GFDL85	56.4	58.5	59.7	60.7
	HAD45	56.4	56.2	57.4	58.0
	HAD85	56.4	56.8	57.6	59.4
Warmest Month Average	CCSM45	82.2	83.3	84.1	84.1
	CCSM85	82.2	83.4	84.6	86.0
	GFDL45	82.2	84.3	85.1	85.8
	GFDL85	82.2	84.4	85.9	87.8
	HAD45	82.2	84.5	85.2	85.8
	HAD85	82.2	84.5	86.2	87.4

Precipitation (in)

	Scenario	2009	2039	2069	2099
Annual Total	CCSM45	51.0	54.1	55.0	56.1
	CCSM85	51.0	53.4	53.5	53.2
	GFDL45	51.0	60.4	61.4	63.3
	GFDL85	51.0	55.4	64.4	61.6
	HAD45	51.0	49.2	47.3	50.5
	HAD85	51.0	47.0	47.3	44.5
Growing Season May—Sep	CCSM45	30.4	32.5	31.6	32.9
	CCSM85	30.4	32.1	31.8	30.1
	GFDL45	30.4	36.0	36.2	36.3
	GFDL85	30.4	33.7	38.2	36.9
	HAD45	30.4	29.5	27.7	26.9
	HAD85	30.4	27.2	24.7	23.1

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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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	74.8	3320.7	40.7	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
cabbage palmetto	Sabal palmetto	NDH	Medium	47	977.9	20.2	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			0	2
pond cypress	Taxodium ascendens	NSH	Medium	38.5	573.5	15.2	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	3
red maple	Acer rubrum	WDH	High	50.7	533.7	9.9	No change	No change	High	Abundant	Very Good	Very Good			1	4
sand pine	Pinus clausa	NDH	High	14.8	461.5	25.4	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	5
laurel oak	Quercus laurifolia	NDH	Medium	55	449.2	7.7	Sm. inc.	No change	Medium	Common	Good	Fair			1	6
loblolly-bay	Gordonia lasianthus	NSH	Medium	43.3	409.9	9.2	No change	No change	Medium	Common	Fair	Fair			1	7
longleaf pine	Pinus palustris	NSH	Medium	20.1	393.3	17.1	Sm. inc.	No change	Medium	Common	Good	Fair			1	8
live oak	Quercus virginiana	NDH	High	49.6	318.5	6.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	9
swamp tupelo	Nyssa biflora	NDH	Medium	44.2	281.7	6.2	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	10
sweetgum	Liquidambar styraciflua	WDH	High	34.9	253.5	6.4	No change	No change	Medium	Common	Fair	Fair			1	11
loblolly pine	Pinus taeda	WDH	High	17.8	207.9	10.4	No change	Sm. inc.	Medium	Common	Fair	Good			1	12
sweetbay	Magnolia virginiana	NSL	Medium	27.8	135.2	4.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	13
pond pine	Pinus serotina	NSH	Medium	14.9	109.5	10.0	No change	Sm. inc.	Low	Common	Poor	Fair			1	14
bald cypress	Taxodium distichum	NSH	Medium	14.2	109.5	6.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	15
green ash	Fraxinus pennsylvanica	WSH	Low	9.3	101.0	7.9	No change	No change	Medium	Common	Fair	Fair			1	16
redbay	Persea borbonia	NSL	Low	39.1	87.9	2.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	17
American elm	Ulmus americana	WDH	Medium	32.9	60.3	2.0	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	18
water oak	Quercus nigra	WDH	High	20.5	58.5	2.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	19
black cherry	Prunus serotina	WDL	Medium	4.4	45.6	8.8	No change	No change	Low	Rare	Very Poor	Very Poor			0	20
pumpkin ash	Fraxinus profunda	NSH	FIA	6.1	44.7	7.4	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	21
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	10.4	36.3	2.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	22
sugarberry	Celtis laevigata	NDH	Medium	8.9	31.2	4.1	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	23
southern magnolia	Magnolia grandiflora	NSL	Low	9.4	28.3	2.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	24
eastern redcedar	Juniperus virginiana	WDH	Medium	9.2	27.0	4.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	25
pignut hickory	Carya glabra	WDL	Medium	4.4	26.5	5.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	26
turkey oak	Quercus laevis	NSH	Medium	6.4	17.6	6.3	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	27
Carolina ash	Fraxinus caroliniana	NSL	FIA	4.9	13.2	2.7	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	28
hackberry	Celtis occidentalis	WDH	Medium	2.6	12.6	2.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	29
bluejack oak	Quercus incana	NSL	Low	2.2	10.4	4.1	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	30
blackgum	Nyssa sylvatica	WDL	Medium	4.2	10.3	1.9	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	31
water hickory	Carya aquatica	NSL	Medium	2.3	6.1	2.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	32
common persimmon	Diospyros virginiana	NSL	Low	5.6	6.0	1.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	33
water tupelo	Nyssa aquatica	NSH	Medium	1.1	5.4	4.5	No change	No change	Low	Rare	Very Poor	Very Poor			0	34
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	0.7	3.0	1.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	35
swamp chestnut oak	Quercus michauxii	NSL	Low	1.1	2.1	1.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	36
American holly	Ilex opaca	NSL	Medium	3	1.9	0.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	37
yellow-poplar	Liriodendron tulipifera	WDH	High	1.1	1.5	1.1	Sm. dec.	Lg. dec.	High	Rare	Poor	Poor			0	38
blackjack oak	Quercus marilandica	NSL	Medium	1	1.5	1.1	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	39
red mulberry	Morus rubra	NSL	Low	1.1	1.2	1.0	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	40
southern red oak	Quercus falcata	WDL	Medium	1.1	0.7	0.6	No change	Lg. inc.	High	Rare	Fair	Good			2	41
sand hickory	Carya pallida	NSL	FIA	1.1	0.5	0.4	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	42
white ash	Fraxinus americana	WDL	Medium	3.4	0.4	0.9	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	43
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	44
pecan	Carya illinoinensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	45
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	46
mockernut hickory	Carya alba	WDL	Medium	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	47

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flowering dogwood	Cornus florida	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	48
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	49
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	50
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	51
water elm	Planera aquatica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	52
sycamore	Platanus occidentalis	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	53
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	54
willow oak	Quercus phellos	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	55
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	56
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	57
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	58
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			0	59
American basswood	Tilia americana	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	60
winged elm	Ulmus alata	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	61