

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

	sq. km	sq. mi	FIA Plots
Area of Region	8,800.0	3,397.7	77

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	Scenario	Scenario	Scenario	SHIFT	SHIFT				
						RCP45	RCP85	RCP45	RCP85	RCP45	RCP85				
Ash	2			High	7	14	Increase	11	11	Very Good	0	0	Likely	4	4
Hickory	3			Medium	15	23	No Change	4	5	Good	6	7	Infill	11	13
Maple	1	Abundant	0	Low	16	4	Decrease	13	12	Fair	9	8	Migrate	3	3
Oak	4	Common	5	FIA	4		New	9	9	Poor	6	7		18	20
Pine	1	Rare	27				Unknown	5	5	Very Poor	7	6			
Other	21	Absent	10							FIA Only	3	3			
	32		42		42	41		42	42	Unknown	1	1			
											32	32			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	60.7	62.5	64.1	64.8	
	CCSM85	60.7	63.1	65.1	67.8	
	GFDL45	60.7	66.7	65.5	66.8	
	GFDL85	60.7	63.6	66.6	70.6	
	HAD45	60.7	62.9	65.5	66.5	
	HAD85	60.7	63.2	67.7	70.7	
Growing Season May—Sep	CCSM45	76.7	78.6	80.3	81.1	
	CCSM85	76.7	79.4	81.4	84.8	
	GFDL45	76.7	84.9	82.7	85.1	
	GFDL85	76.7	80.7	84.3	89.3	
	HAD45	76.7	78.8	81.0	81.7	
	HAD85	76.7	79.3	84.3	86.8	
Coldest Month Average	CCSM45	36.5	39.1	39.9	40.7	
	CCSM85	36.5	39.1	39.7	41.5	
	GFDL45	36.5	40.1	40.2	40.3	
	GFDL85	36.5	37.4	38.8	39.4	
	HAD45	36.5	37.4	39.7	39.9	
	HAD85	36.5	39.6	41.5	43.3	
Warmest Month Average	CCSM45	83.1	85.0	86.2	86.7	
	CCSM85	83.1	85.8	86.7	88.6	
	GFDL45	83.1	88.2	89.0	91.0	
	GFDL85	83.1	88.1	90.0	94.3	
	HAD45	83.1	85.0	86.5	86.7	
	HAD85	83.1	86.3	88.7	89.7	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	36.4	35.8	37.2	35.3	
	CCSM85	36.4	35.3	36.8	37.2	
	GFDL45	36.4	37.5	41.9	37.9	
	GFDL85	36.4	38.5	41.9	40.5	
	HAD45	36.4	37.5	37.7	39.3	
	HAD85	36.4	38.1	33.2	37.6	
Growing Season May—Sep	CCSM45	19.3	18.0	18.5	17.9	
	CCSM85	19.3	18.4	18.0	18.2	
	GFDL45	19.3	19.8	22.1	20.4	
	GFDL85	19.3	21.1	23.1	21.5	
	HAD45	19.3	19.8	20.0	20.2	
	HAD85	19.3	19.6	16.1	18.3	

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
post oak	Quercus stellata	WDH	High	63.6	392.3	29.0	No change	No change	High	Common	Good	Good			1	1
eastern redcedar	Juniperus virginiana	WDH	Medium	80.7	232.3	19.1	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	2
blackjack oak	Quercus marilandica	NSL	Medium	63.6	226.0	19.2	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	3
American elm	Ulmus americana	WDH	Medium	58	102.3	11.5	No change	No change	Medium	Common	Fair	Fair			1	4
hackberry	Celtis occidentalis	WDH	Medium	60.2	92.3	16.3	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	5
ashe juniper	Juniperus ashei	NDH	High	1.1	39.9	25.2	No change	No change	Medium	Rare	Poor	Poor			0	6
boxelder	Acer negundo	WSH	Low	15.9	32.5	13.6	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor		Infill +	1	7
pecan	Carya illinoensis	NSH	Low	26.1	28.3	6.6	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1	8
black oak	Quercus velutina	WDH	High	23.9	23.5	9.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	9
eastern cottonwood	Populus deltoides	NSH	Low	18.2	22.3	14.1	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	10
sugarberry	Celtis laevigata	NDH	Medium	22.7	21.8	11.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	11
common persimmon	Diospyros virginiana	NSL	Low	28.4	20.1	5.5	Lg. dec.	Sm. dec.	High	Rare	Poor	Poor			1	12
black hickory	Carya texana	NDL	High	18.2	18.1	11.4	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	13
Siberian elm	Ulmus pumila	NDH	FIA	14.8	17.1	8.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	14
chinkapin oak	Quercus muehlenbergii	NSL	Medium	20.5	14.5	3.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	15
black walnut	Juglans nigra	WDL	Low	18.2	11.5	7.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	16
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	23.9	10.4	3.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	17
black locust	Robinia pseudoacacia	NDH	Low	13.6	9.7	8.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	18
black willow	Salix nigra	NSH	Low	18.2	9.5	6.0	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1	19
loblolly pine	Pinus taeda	WDH	High	4.5	8.6	21.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	20
eastern redbud	Cercis canadensis	NSL	Low	33	6.2	1.2	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	21
slippery elm	Ulmus rubra	WSL	Low	18.2	4.4	2.8	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	22
winged elm	Ulmus alata	WDL	Medium	5.7	2.6	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	23
northern catalpa	Catalpa speciosa	NSHX	FIA	4.5	2.2	5.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	24
wild plum	Prunus americana	NSLX	FIA	5.7	2.0	1.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	25
green ash	Fraxinus pennsylvanica	WSH	Low	13.6	1.8	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	26
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	4.5	1.7	4.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	27
red mulberry	Morus rubra	NSL	Low	13.6	1.3	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	28
Osage-orange	Maclura pomifera	NDH	Medium	4.5	1.2	2.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	29
bitternut hickory	Carya cordiformis	WSL	Low	4.5	1.1	2.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	30
white ash	Fraxinus americana	WDL	Medium	4.5	0.8	2.1	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	31
flowering dogwood	Cornus florida	WDL	Medium	4.5	0.7	1.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	32
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	33
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	34
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	35
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	36
bur oak	Quercus macrocarpa	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	37
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	38
northern red oak	Quercus rubra	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	39
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	40
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	41
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	42