

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

Area of Region    sq. km    sq. mi    FIA Plots  
 8,100.0    3,127.4    190

**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	3			High	23	21	Increase	15	15	Very Good	5	5	Likely	2	2
Hickory	4			Medium	24	43	No Change	13	11	Good	13	14	Infill	9	10
Maple	5	Abundant	7	Low	28	15	Decrease	21	23	Fair	10	8	Migrate	4	11
Oak	8	Common	21	FIA	7		New	20	23	Poor	9	9			
Pine	4	Rare	28				Unknown	13	10	Very Poor	10	9			
Other	32	Absent	26							FIA Only	4	4			
	<b>56</b>		<b>82</b>		<b>82</b>	<b>79</b>		<b>82</b>	<b>82</b>	Unknown	6	3			
											<b>57</b>	<b>52</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

Scenario	2009	2039	2069	2099		
Annual	CCSM45	46.6	48.6	50.9	51.1	
Average	CCSM85	46.6	49.0	51.6	54.9	
	GFDL45	46.6	49.5	53.0	54.4	
	GFDL85	46.6	50.2	54.4	59.1	
	HAD45	46.6	49.7	52.9	54.6	
	HAD85	46.6	49.8	54.0	59.4	
Growing Season	CCSM45	64.1	66.3	68.0	68.6	
	CCSM85	64.1	66.5	68.9	72.8	
May—Sep	GFDL45	64.1	67.1	71.2	72.8	
	GFDL85	64.1	68.2	72.7	77.8	
	HAD45	64.1	67.2	69.9	72.3	
	HAD85	64.1	66.8	71.4	77.5	
Coldest Month	CCSM45	19.5	21.4	23.5	23.8	
Average	CCSM85	19.5	22.2	23.5	25.8	
	GFDL45	19.5	22.8	24.8	25.8	
	GFDL85	19.5	23.5	25.5	28.0	
	HAD45	19.5	22.0	25.0	25.2	
	HAD85	19.5	23.1	25.7	29.1	
Warmest Month	CCSM45	70.1	72.8	73.9	74.1	
Average	CCSM85	70.1	73.2	74.7	76.8	
	GFDL45	70.1	73.1	75.3	76.7	
	GFDL85	70.1	74.5	77.4	80.1	
	HAD45	70.1	73.5	75.0	76.5	
	HAD85	70.1	73.3	76.0	80.4	

**Precipitation (in)**

Scenario	2009	2039	2069	2099		
Annual	CCSM45	42.0	41.7	40.3	44.5	
Total	CCSM85	42.0	42.0	43.8	45.9	
	GFDL45	42.0	46.0	47.4	46.2	
	GFDL85	42.0	43.9	46.8	49.0	
	HAD45	42.0	43.9	45.1	44.6	
	HAD85	42.0	44.7	45.1	47.2	
Growing Season	CCSM45	19.6	19.9	18.7	20.1	
May—Sep	CCSM85	19.6	19.3	20.6	19.6	
	GFDL45	19.6	20.0	19.0	19.4	
	GFDL85	19.6	19.5	19.3	18.9	
	HAD45	19.6	20.9	19.7	20.4	
	HAD85	19.6	19.7	19.8	20.6	

**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-DGP30 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
red maple	Acer rubrum	WDH	High	84	1407.6	15.5	No change	Sm. dec.	High	Abundant	Very Good	Good			1	1
eastern white pine	Pinus strobus	WDH	High	72.8	1304.1	16.6	Lg. dec.	Lg. dec.	Low	Abundant	Poor	Poor			0	2
sugar maple	Acer saccharum	WDH	High	71.6	1069.3	13.8	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
white ash	Fraxinus americana	WDL	Medium	67.9	711.0	9.7	No change	No change	Low	Abundant	Fair	Fair			0	4
eastern hemlock	Tsuga canadensis	NSH	High	49.4	691.7	13.0	Lg. dec.	Lg. dec.	Low	Abundant	Poor	Poor			0	5
northern red oak	Quercus rubra	WDH	Medium	58	593.8	9.5	No change	No change	High	Abundant	Very Good	Very Good			1	6
black cherry	Prunus serotina	WDL	Medium	61.7	514.7	7.7	No change	No change	Low	Abundant	Fair	Fair			0	7
American elm	Ulmus americana	WDH	Medium	55.6	410.0	6.8	No change	No change	Medium	Common	Fair	Fair			1	8
quaking aspen	Populus tremuloides	WDH	High	43.2	354.0	7.6	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	9
American beech	Fagus grandifolia	WDH	High	45.7	335.2	6.8	No change	No change	Medium	Common	Fair	Fair			1	10
sweet birch	Betula lenta	NDH	High	37	235.1	5.9	No change	Sm. dec.	Low	Common	Poor	Poor			0	11
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	44.4	177.9	3.7	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	12
yellow birch	Betula alleghaniensis	NDL	High	27.2	168.0	5.7	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	13
American basswood	Tilia americana	WSL	Medium	33.3	148.6	4.1	Sm. inc.	No change	Medium	Common	Good	Fair			1	14
bitternut hickory	Carya cordiformis	WSL	Low	19.8	148.0	6.9	Sm. dec.	Sm. inc.	High	Common	Fair	Very Good			1	15
white oak	Quercus alba	WDH	Medium	24.7	146.8	5.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	16
black oak	Quercus velutina	WDH	High	17.3	144.0	7.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	17
shagbark hickory	Carya ovata	WSL	Medium	29.6	134.4	4.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	18
chestnut oak	Quercus prinus	NDH	High	13.6	108.4	7.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	19
black locust	Robinia pseudoacacia	NDH	Low	8.6	108.4	11.6	No change	No change	Medium	Common	Fair	Fair			1	20
paper birch	Betula papyrifera	WDH	High	29.6	100.6	3.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	21
eastern cottonwood	Populus deltoides	NSH	Low	4.9	89.4	16.8	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	22
red pine	Pinus resinosa	NSH	Medium	4.9	88.4	16.6	Lg. dec.	Very Lg. dec.	Low	Common	Very Poor	Lost			0	23
tamarack (native)	Larix laricina	NSH	High	4.9	83.6	15.7	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	24
pitch pine	Pinus rigida	NSH	High	4.9	79.5	14.9	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	25
green ash	Fraxinus pennsylvanica	WSH	Low	8.6	67.4	7.2	No change	Sm. inc.	Medium	Common	Fair	Good			1	26
red spruce	Picea rubens	NDH	High	7.4	60.9	7.6	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	27
boxelder	Acer negundo	WSH	Low	7.4	60.6	7.6	No change	No change	High	Common	Good	Good			1	28
Norway maple	Acer platanoides	NSL	FIA	4.9	48.9	9.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	29
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	24.7	45.3	1.7	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	30
serviceberry	Amelanchier spp.	NSL	Low	21	44.9	2.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	31
Scots pine	Pinus sylvestris	NSH	FIA	4.9	44.2	8.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	32
pignut hickory	Carya glabra	WDL	Medium	14.8	40.5	2.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	33
black ash	Fraxinus nigra	WSH	Medium	11.1	35.1	2.9	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	34
bigtooth aspen	Populus grandidentata	NSL	Medium	13.6	34.4	2.3	Sm. inc.	Lg. dec.	Medium	Rare	Fair	Very Poor			1	35
yellow-poplar	Liriodendron tulipifera	WDH	High	2.5	30.8	11.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	36
black willow	Salix nigra	NSH	Low	2.5	26.7	10.0	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	37
eastern redcedar	Juniperus virginiana	WDH	Medium	7.4	25.9	3.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	38
gray birch	Betula populifolia	NSL	Low	9.9	25.9	2.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	39
Norway spruce	Picea abies	NSH	FIA	2.5	20.0	7.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	40
swamp white oak	Quercus bicolor	NSL	Low	2.5	19.0	7.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	41
striped maple	Acer pensylvanicum	NSL	Medium	16	17.9	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	42
butternut	Juglans cinerea	NSLX	FIA	6.2	14.3	2.2	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	43
sycamore	Platanus occidentalis	NSL	Low	1.2	7.1	5.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	44
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	1.2	6.1	4.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	45
bur oak	Quercus macrocarpa	NDH	Medium	1.2	5.9	4.4	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	46
sassafras	Sassafras albidum	WSL	Low	1.2	5.5	4.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	47



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

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N	
pin cherry	Prunus pensylvanica	NSL	Low	3.7	5.1	1.3	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost				0	48
black walnut	Juglans nigra	WDH	Low	2.5	4.9	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		1	49
balsam fir	Abies balsamea	NDH	High	3.7	4.5	1.1	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost				0	50
flowering dogwood	Cornus florida	WDL	Medium	2.5	3.6	1.3	No change	No change	Medium	Rare	Poor	Poor		Infill +		2	51
slippery elm	Ulmus rubra	WSL	Low	2.5	3.5	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		2	52
scarlet oak	Quercus coccinea	WDL	Medium	2.5	3.1	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		2	53
mockernut hickory	Carya alba	WDL	Medium	1.2	1.2	0.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++		2	54
wild plum	Prunus americana	NSLX	FIA	1.2	0.9	0.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0	55
American chestnut	Castanea dentata	NSLX	FIA	1.2	0.5	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0	56
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3	57
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3	58
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3	59
silver maple	Acer saccharinum	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3	60
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0	61
yellow buckeye	Aesculus flava	NSL	Low	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat				3	62
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat				0	63
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0	64
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0	65
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3	66
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3	67
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3	68
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3	69
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				3	70
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0	71
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0	72
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3	73
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3	74
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3	75
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3	76
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3	77
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +		3	78
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3	79
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				0	80
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3	81
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0	82