

**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	9,280.6	3,583.2	229

**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	22	24	Increase	22	27	Very Good	8	12	Likely	0	0
Hickory	4			Medium	34	52	No Change	13	12	Good	18	18	Infill	9	11
Maple	5	Abundant	6	Low	34	14	Decrease	30	26	Fair	12	12	Migrate	9	12
Oak	14	Common	27	FIA	3		New	18	20	Poor	12	9		<b>18</b>	<b>23</b>
Pine	6	Rare	35				Unknown	10	8	Very Poor	12	10			
Other	37	Absent	24					<b>93</b>	<b>93</b>	FIA Only	0	0			
	<b>68</b>		<b>92</b>		<b>93</b>	<b>90</b>				Unknown	7	5			
											<b>69</b>	<b>66</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	56.0	57.7	59.9	60.1	
	CCSM85	56.0	58.1	60.6	63.6	
	GFDL45	56.0	58.9	61.4	62.5	
	GFDL85	56.0	59.2	62.5	66.5	
	HAD45	56.0	58.4	61.7	63.1	
HAD85	56.0	58.7	62.6	67.1		
Growing Season (May—Sep)	CCSM45	71.4	73.2	75.1	75.6	
	CCSM85	71.4	73.5	76.2	79.9	
	GFDL45	71.4	74.7	77.7	79.3	
	GFDL85	71.4	75.4	79.2	83.6	
	HAD45	71.4	74.3	77.4	79.1	
HAD85	71.4	74.2	79.0	83.9		
Coldest Month (Average)	CCSM45	32.8	34.8	36.1	36.5	
	CCSM85	32.8	35.4	36.6	38.0	
	GFDL45	32.8	36.0	36.5	37.2	
	GFDL85	32.8	35.4	36.5	37.9	
	HAD45	32.8	34.3	36.3	36.5	
HAD85	32.8	34.7	36.4	38.1		
Warmest Month (Average)	CCSM45	77.2	79.3	80.2	80.4	
	CCSM85	77.2	79.4	81.3	82.8	
	GFDL45	77.2	80.2	81.9	83.3	
	GFDL85	77.2	81.6	83.8	86.4	
	HAD45	77.2	80.4	82.5	83.5	
HAD85	77.2	80.8	83.8	87.0		

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	42.7	46.5	49.5	49.5	
	CCSM85	42.7	47.3	48.7	55.8	
	GFDL45	42.7	47.6	50.8	51.6	
	GFDL85	42.7	44.4	50.9	52.1	
	HAD45	42.7	45.4	46.5	45.2	
HAD85	42.7	49.1	44.6	47.8		
Growing Season (May—Sep)	CCSM45	19.5	23.1	24.6	24.6	
	CCSM85	19.5	22.9	23.5	27.1	
	GFDL45	19.5	20.8	22.5	22.8	
	GFDL85	19.5	19.2	22.2	22.6	
	HAD45	19.5	21.6	20.4	19.0	
HAD85	19.5	22.0	18.9	20.0		

**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
yellow-poplar	<i>Liriodendron tulipifera</i>	WDH	High	79.3	1327.6	13.0	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	1
white oak	<i>Quercus alba</i>	WDH	Medium	71.5	1256.7	12.8	Sm. dec.	Lg. dec.	High	Abundant	Good	Good			1	2
Virginia pine	<i>Pinus virginiana</i>	NDH	High	65.9	900.5	10.2	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	3
loblolly pine	<i>Pinus taeda</i>	WDH	High	29	850.4	18.5	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	4
red maple	<i>Acer rubrum</i>	WDH	High	76.6	796.9	7.9	No change	No change	High	Abundant	Very Good	Very Good			1	5
sweetgum	<i>Liquidambar styraciflua</i>	WDH	High	42.2	643.2	8.4	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	6
eastern redcedar	<i>Juniperus virginiana</i>	WDH	Medium	52.5	430.8	7.0	No change	No change	Medium	Common	Fair	Fair			1	7
American beech	<i>Fagus grandifolia</i>	WDH	High	49.6	401.7	5.6	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	8
southern red oak	<i>Quercus falcata</i>	WDL	Medium	45.2	373.8	4.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	9
blackgum	<i>Nyssa sylvatica</i>	WDL	Medium	69.3	312.8	3.3	No change	Sm. inc.	High	Common	Good	Very Good			1	10
black oak	<i>Quercus velutina</i>	WDH	High	49.4	305.9	5.0	No change	No change	Medium	Common	Fair	Fair			1	11
pignut hickory	<i>Carya glabra</i>	WDL	Medium	58.4	299.8	4.1	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	12
chestnut oak	<i>Quercus prinus</i>	NDH	High	25.7	298.1	9.5	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	13
mockernut hickory	<i>Carya alba</i>	WDL	Medium	56	284.1	4.4	No change	Sm. inc.	High	Common	Good	Very Good			1	14
northern red oak	<i>Quercus rubra</i>	WDH	Medium	45.4	214.5	3.7	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	15
American holly	<i>Ilex opaca</i>	NSL	Medium	40.6	211.3	3.4	Sm. dec.	No change	Medium	Common	Poor	Fair			1	16
white ash	<i>Fraxinus americana</i>	WDL	Medium	35.9	136.0	3.9	No change	Sm. inc.	Low	Common	Poor	Fair			1	17
scarlet oak	<i>Quercus coccinea</i>	WDL	Medium	35.7	135.6	2.9	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	18
black cherry	<i>Prunus serotina</i>	WDL	Medium	40.8	123.1	2.3	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	19
green ash	<i>Fraxinus pennsylvanica</i>	WSH	Low	14.5	106.3	6.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	20
black locust	<i>Robinia pseudoacacia</i>	NDH	Low	21.7	105.1	6.6	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	21
American hornbeam; muscley	<i>Carpinus caroliniana</i>	WSL	Low	28.3	94.5	2.6	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	22
black walnut	<i>Juglans nigra</i>	WDL	Low	17.4	90.6	4.1	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	23
post oak	<i>Quercus stellata</i>	WDH	High	17.2	86.7	3.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	24
flowering dogwood	<i>Cornus florida</i>	WDL	Medium	34.5	86.0	2.1	No change	No change	Medium	Common	Fair	Fair			1	25
willow oak	<i>Quercus phellos</i>	NSL	Low	22.8	84.1	2.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	26
pin oak	<i>Quercus palustris</i>	NSH	Low	11.3	80.2	6.5	Lg. dec.	Sm. dec.	Low	Common	Very Poor	Poor			0	27
American elm	<i>Ulmus americana</i>	WDL	Medium	19.6	79.4	3.2	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	28
bitternut hickory	<i>Carya cordiformis</i>	WSL	Low	8.1	64.3	6.7	No change	No change	High	Common	Good	Good			1	29
eastern cottonwood	<i>Populus deltoides</i>	NSH	Low	0.2	60.0	7.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	30
hackberry	<i>Celtis occidentalis</i>	WDH	Medium	13.6	57.8	3.6	Sm. dec.	No change	High	Common	Fair	Good	Infill +	Infill ++	1	31
boxelder	<i>Acer negundo</i>	WSH	Low	6.5	53.8	3.8	No change	No change	High	Common	Good	Good			1	32
sycamore	<i>Platanus occidentalis</i>	NSL	Low	12	52.3	2.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	33
bigtooth aspen	<i>Populus grandidentata</i>	NSL	Medium	16.2	49.8	2.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	34
sassafras	<i>Sassafras albidum</i>	WSL	Low	23.8	48.6	2.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	35
eastern redbud	<i>Cercis canadensis</i>	NSL	Low	7.3	44.6	5.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	36
river birch	<i>Betula nigra</i>	NSL	Low	14.6	41.1	2.5	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	37
slippery elm	<i>Ulmus rubra</i>	WSL	Low	9.4	34.9	1.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	38
common persimmon	<i>Diospyros virginiana</i>	NSL	Low	15.2	32.8	1.6	No change	Lg. inc.	High	Rare	Fair	Good			1	39
shortleaf pine	<i>Pinus echinata</i>	WDH	High	11.6	31.7	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	40
ailanthus	<i>Ailanthus altissima</i>	NSL	FIA	8.5	30.3	2.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	41
pawpaw	<i>Asimina triloba</i>	NSL	Low	6.7	19.5	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	42
sweet birch	<i>Betula lenta</i>	NDH	High	5.2	16.2	3.0	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	43
silver maple	<i>Acer saccharinum</i>	NSH	Low	0.2	14.8	1.9	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	44
cherrybark oak; swamp red o	<i>Quercus pagoda</i>	NSL	Medium	2.6	13.3	2.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	45
eastern white pine	<i>Pinus strobus</i>	WDH	High	3.2	12.6	3.9	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			2	46
swamp chestnut oak	<i>Quercus michauxii</i>	NSL	Low	1.8	11.5	4.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	47

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Table with 17 columns: Common Name, Scientific Name, Range, MR, %Cell, FIAsum, FIAiv, ChngCI45, ChngCI85, Adap, Abund, Capabil45, Capabil85, SHIFT45, SHIFT85, SSO, N. Rows include species like sourwood, shagbark hickory, pin cherry, eastern hophornbeam, etc.