

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	9,813.8	3,789.1	216

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	4			High	21	26	Increase	25	29	Very Good	11	10	Likely	0	0
Hickory	5			Medium	29	47	No Change	13	9	Good	17	21	Infill	11	11
Maple	5	Abundant	4	Low	33	13	Decrease	30	30	Fair	11	9	Migrate	5	6
Oak	14	Common	30	FIA	6		New	11	12	Poor	11	10		16	17
Pine	5	Rare	40				Unknown	10	9	Very Poor	13	14			
Other	41	Absent	14					89	89	FIA Only	3	3			
	74		88		89	86				Unknown	4	3			
											70	70			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	55.7	57.6	59.9	60.2	
	CCSM85	55.7	58.0	60.7	63.8	
	GFDL45	55.7	59.4	61.1	61.9	
	GFDL85	55.7	58.7	62.1	65.8	
	HAD45	55.7	58.3	61.6	62.9	
Growing Season (May—Sep)	CCSM45	70.9	72.8	74.9	75.5	
	CCSM85	70.9	73.2	76.0	80.1	
	GFDL45	70.9	75.4	77.5	78.7	
	GFDL85	70.9	74.6	78.9	83.0	
	HAD45	70.9	74.2	77.5	79.2	
Coldest Month (Average)	CCSM45	32.0	33.5	34.9	35.4	
	CCSM85	32.0	34.9	35.8	37.4	
	GFDL45	32.0	35.9	35.9	36.4	
	GFDL85	32.0	34.1	35.2	35.9	
	HAD45	32.0	32.6	34.9	35.2	
Warmest Month (Average)	CCSM45	76.2	78.0	79.4	79.7	
	CCSM85	76.2	78.5	80.3	82.1	
	GFDL45	76.2	79.8	81.7	82.5	
	GFDL85	76.2	80.2	83.1	85.4	
	HAD45	76.2	80.3	83.0	84.0	
HAD85	76.2	81.9	86.6	88.5		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	48.1	50.5	54.8	53.9	
	CCSM85	48.1	54.3	55.2	59.1	
	GFDL45	48.1	53.6	55.7	59.3	
	GFDL85	48.1	52.4	56.7	60.2	
	HAD45	48.1	48.0	50.8	50.5	
Growing Season (May—Sep)	CCSM45	21.3	21.4	23.1	22.5	
	CCSM85	21.3	22.9	21.5	23.0	
	GFDL45	21.3	24.0	23.1	24.1	
	GFDL85	21.3	22.8	23.3	24.1	
	HAD45	21.3	21.4	19.8	20.1	
HAD85	21.3	20.9	17.0	17.8		

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
yellow-poplar	Liriodendron tulipifera	WDH	High	65.7	761.6	9.4	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	1
white oak	Quercus alba	WDH	Medium	60.3	698.9	9.2	No change	Sm. dec.	High	Abundant	Very Good	Good			1	2
red maple	Acer rubrum	WDH	High	70.2	666.9	8.8	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	3
eastern redcedar	Juniperus virginiana	WDH	Medium	57.8	651.7	12.4	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	4
sugar maple	Acer saccharum	WDH	High	72.6	482.0	6.3	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	5
chestnut oak	Quercus prinus	NDH	High	46.2	440.8	7.9	Sm. dec.	Lg. dec.	High	Common	Fair	Fair			1	6
Virginia pine	Pinus virginiana	NDH	High	35.3	337.0	7.8	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	7
blackgum	Nyssa sylvatica	WDL	Medium	58.8	256.9	3.9	Sm. dec.	No change	High	Common	Fair	Good			1	8
white ash	Fraxinus americana	WDL	Medium	51	236.0	5.0	No change	No change	Low	Common	Poor	Poor			0	9
scarlet oak	Quercus coccinea	WDL	Medium	42.8	224.9	4.4	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	10
American beech	Fagus grandifolia	WDH	High	39.1	215.5	4.1	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	11
hackberry	Celtis occidentalis	WDH	Medium	33.9	208.2	10.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	12
sycamore	Platanus occidentalis	NSL	Low	29.4	199.8	6.6	No change	Sm. inc.	Medium	Common	Fair	Good			1	13
northern red oak	Quercus rubra	WDH	Medium	65.1	194.6	3.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	14
green ash	Fraxinus pennsylvanica	WSH	Low	50.7	191.3	4.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	15
chinkapin oak	Quercus muehlenbergii	NSL	Medium	41.5	175.9	4.6	No change	Sm. dec.	Medium	Common	Fair	Poor			1	16
pignut hickory	Carya glabra	WDL	Medium	58.3	175.2	2.5	No change	No change	Medium	Common	Fair	Fair			1	17
black oak	Quercus velutina	WDH	High	31.4	165.3	3.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	18
sourwood	Oxydendrum arboreum	NDL	High	50.4	164.4	2.6	Sm. dec.	Lg. dec.	High	Common	Fair	Fair			1	19
black cherry	Prunus serotina	WDL	Medium	55.5	162.2	3.1	No change	Sm. inc.	Low	Common	Poor	Fair			1	20
mockernut hickory	Carya alba	WDL	Medium	44.3	137.0	3.4	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	21
black locust	Robinia pseudoacacia	NDH	Low	47.7	135.6	3.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	22
sassafras	Sassafras albidum	WSL	Low	44.5	119.9	2.6	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	23
American elm	Ulmus americana	WDH	Medium	44.7	116.6	3.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	24
bitternut hickory	Carya cordiformis	WSL	Low	37.6	109.8	3.5	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	25
black walnut	Juglans nigra	WDH	Low	39.1	108.1	3.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	26
slippery elm	Ulmus rubra	WSL	Low	36.9	107.1	2.7	No change	Sm. inc.	Medium	Common	Fair	Good			1	27
shagbark hickory	Carya ovata	WSL	Medium	38.1	92.6	2.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	28
flowering dogwood	Cornus florida	WDL	Medium	52.6	88.1	1.3	No change	No change	Medium	Common	Fair	Fair			1	29
eastern redbud	Cercis canadensis	NSL	Low	48.4	84.2	1.6	No change	No change	Medium	Common	Fair	Fair			1	30
southern red oak	Quercus falcata	WDL	Medium	10.6	64.2	4.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	31
shortleaf pine	Pinus echinata	WDH	High	16.9	63.0	4.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	32
eastern hemlock	Tsuga canadensis	NSH	High	5	62.3	11.8	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	33
post oak	Quercus stellata	WDH	High	9.7	54.6	3.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	34
Osage-orange	Maclura pomifera	NDH	Medium	14.1	46.2	3.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	35
yellow buckeye	Aesculus flava	NSL	Low	23.2	44.3	1.8	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	36
boxelder	Acer negundo	WSH	Low	29	42.9	3.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	37
shellbark hickory	Carya laciniosa	NSL	Low	14.3	34.7	2.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	38
American basswood	Tilia americana	WSL	Medium	8.2	34.5	3.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	39
honeylocust	Gleditsia triacanthos	NSH	Low	18.9	34.1	3.2	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	40
sweetgum	Liquidambar styraciflua	WDH	High	8.6	31.9	2.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	41
blue ash	Fraxinus quadrangulata	NSL	Low	10	29.9	10.6	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	42
serviceberry	Amelanchier spp.	NSL	Low	11.5	23.1	1.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	43
ailanthus	Ailanthus altissima	NSL	FIA	15	22.7	2.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	44
American hornbeam; muscley	Carpinus caroliniana	WSL	Low	16.4	22.6	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	45
loblolly pine	Pinus taeda	WDH	High	0.6	20.4	12.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	46
pitch pine	Pinus rigida	NSH	High	7.2	19.7	2.1	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	47



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red mulberry	Morus rubra	NSL	Low	5.4	15.8	1.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	48
winged elm	Ulmus alata	WDL	Medium	12.8	15.3	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	49
Shumard oak	Quercus shumardii	NSL	Low	0.8	15.0	0.7	No change	Sm. inc.	High	Rare	Fair	Good	Infill +		2	50
eastern white pine	Pinus strobus	WDH	High	2	14.6	7.1	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	51
Ohio buckeye	Aesculus glabra	NSL	Low	17.1	14.5	1.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	52
common persimmon	Diospyros virginiana	NSL	Low	1.6	11.7	1.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	53
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	9.6	11.4	0.9	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	54
sweet birch	Betula lenta	NDH	High	5	10.8	2.1	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	55
shingle oak	Quercus imbricaria	NDH	Medium	4	9.9	2.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	56
cucumbertree	Magnolia acuminata	NSL	Low	3.3	5.4	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	57
bigleaf magnolia	Magnolia macrophylla	NSL	Low	2	4.8	2.3	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	58
bur oak	Quercus macrocarpa	NDH	Medium	0.3	4.4	1.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	59
willow oak	Quercus phellos	NSL	Low	0.3	4.0	1.2	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	60
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	4.9	2.4	3.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	61
pawpaw	Asimina triloba	NSL	Low	4.1	2.4	0.6	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	62
Siberian elm	Ulmus pumila	NDH	FIA	1	1.6	1.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	63
American holly	Ilex opaca	NSL	Medium	1	1.4	1.3	Very Lg. dec.	Sm. dec.	Medium	Rare	Lost	Very Poor			0	64
paulownia	Paulownia tomentosa	NSL	FIA	2	1.4	0.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	65
mountain maple	Acer spicatum	NSL	Low	0.4	0.9	0.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	66
northern catalpa	Catalpa speciosa	NSHX	FIA	4.1	0.7	2.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	67
pin oak	Quercus palustris	NSH	Low	4.1	0.7	2.7	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			0	68
blackjack oak	Quercus marilandica	NSL	Medium	1	0.6	0.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	69
black ash	Fraxinus nigra	WSH	Medium	0.7	0.5	0.3	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	70
butternut	Juglans cinerea	NSLX	FIA	4.1	0.5	1.8	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	71
river birch	Betula nigra	NSL	Low	0.6	0.4	0.3	No change	No change	Medium	Rare	Poor	Poor		Infill +	2	72
bigtooth aspen	Populus grandidentata	NSL	Medium	0.6	0.4	0.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	73
silver maple	Acer saccharinum	NSH	Low	4.1	0.2	0.8	Sm. inc.	No change	High	Rare	Good	Fair			0	74
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	75
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	76
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	77
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	78
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	79
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	80
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	81
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	82
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	83
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	84
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	85
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	86
nuttall oak	Quercus texana	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	87
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	88
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	89