

# HUC 070101 Mississippi Headwaters

## HUC 6 Watershed Climate Change Atlas Tree Species

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

### Current and Potential Future Habitat, Capability, and Migration

	sq. km	sq. mi	FIA Plots
Area of Region	29,973	11,573	1,401

### 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			
				High	Low	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85			
Ash	2			16	18	Increase	18	18	Very Good	9	10	Likely	1	1
Hickory	1			21	35	No Change	10	10	Good	10	8	Infill	4	6
Maple	5	Abundant	8	23	12	Decrease	9	9	Fair	9	11	Migrate	6	8
Oak	4	Common	15	7		New	19	21	Poor	4	5			
Pine	4	Rare	21			Unknown	11	9	Very Poor	5	2			
Other	28	Absent	23						FIA Only	5	5			
	<b>44</b>		<b>67</b>	<b>67</b>	<b>65</b>		<b>67</b>	<b>67</b>	Unknown	4	2			
										<b>46</b>	<b>43</b>			

### Potential Changes in Climate Variables

#### Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	39.1	40.4	42.9	43.2	
	CCSM85	39.1	41.1	43.9	47.0	
	GFDL45	39.1	41.5	43.6	45.0	
	GFDL85	39.1	41.8	44.7	48.9	
	HAD45	39.1	41.6	44.7	46.3	
	HAD85	39.1	42.1	45.7	50.5	
Growing Season (May-Sep)	CCSM45	56.7	58.2	60.3	60.7	
	CCSM85	56.7	59.0	61.5	64.9	
	GFDL45	56.7	59.4	62.1	63.9	
	GFDL85	56.7	59.9	63.0	67.8	
	HAD45	56.7	59.3	61.8	63.6	
	HAD85	56.7	59.2	62.7	67.7	
Coldest Month Average	CCSM45	10.4	12.0	13.8	14.1	
	CCSM85	10.4	11.6	13.8	15.8	
	GFDL45	10.4	13.5	15.0	15.5	
	GFDL85	10.4	14.0	15.5	18.2	
	HAD45	10.4	12.0	15.5	15.3	
	HAD85	10.4	15.0	17.8	21.1	
Warmest Month Average	CCSM45	62.3	64.0	65.2	65.7	
	CCSM85	62.3	65.1	66.9	69.0	
	GFDL45	62.3	65.2	66.4	67.8	
	GFDL85	62.3	65.7	67.5	70.1	
	HAD45	62.3	65.0	66.3	67.8	
	HAD85	62.3	65.2	67.2	70.5	

#### Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	22.5	23.2	23.3	22.7	
	CCSM85	22.5	22.6	22.6	22.6	
	GFDL45	22.5	25.1	26.4	24.5	
	GFDL85	22.5	25.4	27.5	26.8	
	HAD45	22.5	24.1	22.5	24.1	
	HAD85	22.5	24.1	23.4	24.9	
Growing Season (May-Sep)	CCSM45	14.7	14.6	14.2	14.1	
	CCSM85	14.7	14.1	13.5	12.9	
	GFDL45	14.7	16.6	16.9	15.6	
	GFDL85	14.7	16.6	17.4	16.2	
	HAD45	14.7	15.0	13.5	13.9	
	HAD85	14.7	14.8	13.0	12.8	

**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
quaking aspen	Populus tremuloides	WDH	High	91	2516.1	21.9	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
bur oak	Quercus macrocarpa	NDH	Medium	77.7	896.2	9.2	No change	No change	High	Abundant	Very Good	Very Good			1	2
tamarack (native)	Larix laricina	NSH	High	39.8	708.7	12.3	Sm. inc.	No change	Low	Abundant	Good	Fair			1	3
black ash	Fraxinus nigra	WSH	Medium	69.5	703.2	7.3	No change	No change	Low	Abundant	Fair	Fair			0	4
paper birch	Betula papyrifera	WDH	High	78.3	681.7	6.7	No change	Sm. dec.	Medium	Abundant	Good	Fair			1	5
red pine	Pinus resinosa	NSH	Medium	40.5	581.8	12.4	No change	No change	Low	Abundant	Fair	Fair			0	6
American basswood	Tilia americana	WSL	Medium	56.2	575.7	7.2	No change	No change	Medium	Abundant	Good	Good			1	7
northern red oak	Quercus rubra	WDH	Medium	58.2	511.6	7.3	Sm. inc.	No change	High	Abundant	Very Good	Very Good			1	8
red maple	Acer rubrum	WDH	High	67.1	453.7	5.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	9
balsam fir	Abies balsamea	NDH	High	50.6	389.7	5.4	No change	No change	Low	Common	Poor	Poor			0	10
sugar maple	Acer saccharum	WDH	High	45.3	377.9	5.5	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	11
green ash	Fraxinus pennsylvanica	WSH	Low	60.9	362.2	4.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	12
jack pine	Pinus banksiana	NSH	Medium	35.6	357.8	9.3	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	13
black spruce	Picea mariana	NSH	High	30	345.4	7.1	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	14
American elm	Ulmus americana	WDH	Medium	61.3	255.7	3.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	15
bigtooth aspen	Populus grandidentata	NSL	Medium	42.3	251.7	4.8	No change	No change	Medium	Common	Fair	Fair			1	16
northern white-cedar	Thuja occidentalis	WSH	High	17	241.1	10.1	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good	Infill ++	Infill ++	1	17
balsam poplar	Populus balsamifera	NSH	Medium	38	177.1	3.6	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	18
northern pin oak	Quercus ellipsoidalis	NSH	Medium	24	143.3	5.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	19
eastern white pine	Pinus strobus	WDH	High	23.7	140.1	4.3	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	20
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	44.8	131.7	2.4	Lg. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	21
boxelder	Acer negundo	WSH	Low	12.5	104.1	4.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	22
white spruce	Picea glauca	NSL	Medium	33.2	99.4	2.2	No change	Sm. inc.	Medium	Common	Fair	Good			1	23
silver maple	Acer saccharinum	NSH	Low	4.3	41.2	9.5	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	24
black cherry	Prunus serotina	WDL	Medium	20.8	40.9	1.3	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1	25
yellow birch	Betula alleghaniensis	NDL	High	10.5	22.4	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	26
chokecherry	Prunus virginiana	NSLX	FIA	24.4	16.3	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	27
pin cherry	Prunus pensylvanica	NSL	Low	11.3	14.9	1.0	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	28
mountain maple	Acer spicatum	NSL	Low	15.1	12.1	0.7	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	29
butternut	Juglans cinerea	NSLX	FIA	2.4	10.9	2.2	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	30
serviceberry	Amelanchier spp.	NSL	Low	11.6	9.8	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	31
slippery elm	Ulmus rubra	WSL	Low	2.3	6.3	2.1	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	32
black willow	Salix nigra	NSH	Low	0.6	4.3	3.8	No change	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	33
Scots pine	Pinus sylvestris	NSH	FIA	0	4.2	1.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	34
white oak	Quercus alba	WDH	Medium	2.2	3.6	1.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	35
Siberian elm	Ulmus pumila	NDH	FIA	0.4	3.3	2.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	36
eastern cottonwood	Populus deltoides	NSH	Low	1	2.9	2.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	37
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	2.9	2.0	0.6	Lg. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	38
peachleaf willow	Salix amygdaloides	NSLX	FIA	0.4	1.3	0.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	39
American mountain-ash	Sorbus americana	NSL	Low	0.7	0.7	1.0	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	40
hackberry	Celtis occidentalis	WDH	Medium	0.3	0.3	0.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	41
bitternut hickory	Carya cordiformis	WSL	Low	0.1	0.2	0.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	42
rock elm	Ulmus thomasii	NSLX	FIA	0	0.1	0.0	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	43
wild plum	Prunus americana	NSLX	FIA	0	0.1	0.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	44
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	45
eastern hemlock	Tsuga canadensis	NSH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +		3	46
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	47



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Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	48
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	49
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	50
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	51
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	52
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	53
American beech	Fagus grandifolia	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	54
white ash	Fraxinus americana	WDL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	55
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	56
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	57
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	58
red mulberry	Morus rubra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	59
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	60
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	61
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	62
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	63
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	64
black oak	Quercus velutina	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	65
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	66
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	67