S30 E99

One x One Degree
Climate Change Atlas Tree Species
Current and Potential Future Habitat, Capability, and Migration

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

	sq. km	sq. mi	FIA Plots
Area of Region	10,642	4,108.9	248

Species Information

The columns below provide breif 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
Ash	0
Hickory	2
Maple	0
Oak	7
Pine	0
Other	9
	18

Abundance	
Abundant	2
Common	3
Rare	13
Absent	2
	20

	Model Reliability	Adaptability
High	4	6
Medium	7	9
Low	7	5
FIA	2	
	20	**20**

Potential Change in Habitat Suitability	Scenario RCP45	Scenario RCP85
Increase	2	2
No Change	4	4
Decrease	10	10
New	1	1
Unknown	3	3
	20	**20**

Capability to Cope or Persist	Scenario RCP45	Scenario RCP85
Very Good	0	0
Good	3	3
Fair	4	4
Poor	2	2
Very Poor	7	6
FIA Only	2	2
Unknown	1	1
	19	**18**

Migration Potential	SHIFT RCP45	SHIFT RCP85
Likely	1	1
Infill	1	1
Migrate	0	0
	2	**2**

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099
Annual Average	CCSM45	64.6	66.0	67.4	68.2
	CCSM85	64.6	66.6	68.6	71.2
	GFDL45	64.6	68.6	69.0	70.8
	GFDL85	64.6	67.6	70.7	74.6
	HAD45	64.6	66.8	69.2	69.9
	HAD85	64.6	67.5	70.7	73.6
Growing Season May—Sep	CCSM45	77.6	78.7	80.1	80.8
	CCSM85	77.6	79.6	81.6	84.5
	GFDL45	77.6	82.4	83.0	85.6
	GFDL85	77.6	81.6	85.1	90.0
	HAD45	77.6	79.7	81.6	82.0
	HAD85	77.6	80.4	83.7	86.3
Coldest Month Average	CCSM45	45.1	47.4	48.0	48.5
	CCSM85	45.1	47.1	48.0	49.4
	GFDL45	45.1	48.5	48.5	48.6
	GFDL85	45.1	46.3	47.3	47.7
	HAD45	45.1	45.9	47.4	47.7
	HAD85	45.1	48.5	49.9	51.4
Warmest Month Average	CCSM45	82.0	83.1	84.1	84.2
	CCSM85	82.0	84.0	84.7	86.2
	GFDL45	82.0	86.9	87.3	88.8
	GFDL85	82.0	87.2	88.8	92.0
	HAD45	82.0	84.2	85.1	85.4
	HAD85	82.0	85.0	86.8	87.9

Precipitation (in)

	Scenario	2009	2039	2069	2099
Annual Total	CCSM45	26.6	30.1	29.0	26.4
	CCSM85	26.6	27.0	29.6	28.6
	GFDL45	26.6	25.2	29.3	23.0
	GFDL85	26.6	24.6	25.8	23.9
	HAD45	26.6	28.0	26.3	29.8
	HAD85	26.6	26.0	24.5	27.8
Growing Season May—Sep	CCSM45	13.7	16.7	14.9	14.3
	CCSM85	13.7	15.0	15.3	14.5
	GFDL45	13.7	12.9	15.1	11.8
	GFDL85	13.7	12.9	13.2	11.9
	HAD45	13.7	13.5	13.5	15.9
	HAD85	13.7	13.0	12.0	14.0

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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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
live oak	Quercus virginiana	NDH	High	92	4074.5	41.1	No change	No change	Medium	Abundant	Good	Good			1	1
ashe juniper	Juniperus ashei	NDH	High	74.4	2880.3	38.7	No change	No change	Medium	Abundant	Good	Good			0	2
post oak	Quercus stellata	WDH	High	16.4	255.1	14.4	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	3
cedar elm	Ulmus crassifolia	NDH	Medium	7.5	98.7	7.1	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	4
sugarberry	Celtis laevigata	NDH	Medium	8.9	51.1	4.8	No change	No change	Medium	Common	Fair	Fair			1	5
black walnut	Juglans nigra	WDH	Low	4	35.2	7.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	6
southern red oak	Quercus falcata	WDL	Medium	2.2	19.3	10.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	7
pecan	Carya illinoinensis	NSH	Low	6	11.0	4.2	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	8
blackjack oak	Quercus marilandica	NSL	Medium	3.9	9.7	2.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	9
durand oak	Quercus sinuata var. sinuata	NSL	FIA	5.6	7.8	2.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	10
black cherry	Prunus serotina	WDL	Medium	3	5.6	2.2	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	11
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	8.6	4.5	0.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	12
American elm	Ulmus americana	WDH	Medium	4.7	3.3	3.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	13
eastern redbud	Cercis canadensis	NSL	Low	0.9	1.7	1.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	14
Shumard oak	Quercus shumardii	NSL	Low	0.9	1.6	1.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	15
wild plum	Prunus americana	NSLX	FIA	0.9	1.5	1.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	16
pin oak	Quercus palustris	NSH	Low	0.9	1.3	1.4	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	17
black hickory	Carya texana	NDL	High	0.3	1.2	0.4	Sm. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	18
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	19
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	20