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U.S. Census Bureau Urban Areas
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	8,100.0	3,127.4	77

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	3
Pine	0
Other	10
	15

Abundance	
Abundant	1
Common	2
Rare	12
Absent	2
	17

	Model Reliability	Adaptability
High	4	4
Medium	7	9
Low	6	4
FIA	0	
	17	**17**

Potential Change in Habitat Suitability	Scenario RCP45	Scenario RCP85
Increase	4	6
No Change	5	3
Decrease	6	6
New	2	2
Unknown	0	0
	17	**17**

Capability to Cope or Persist	Scenario RCP45	Scenario RCP85
Very Good	0	0
Good	4	4
Fair	3	5
Poor	2	0
Very Poor	6	6
FIA Only	0	0
Unknown	0	0
	15	**15**

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

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099
Annual Average	CCSM45	68.5	70.0	71.1	71.8
	CCSM85	68.5	70.3	72.4	74.8
	GFDL45	68.5	74.0	72.8	74.5
	GFDL85	68.5	71.3	74.5	78.2
	HAD45	68.5	70.5	73.0	73.8
	HAD85	68.5	71.1	74.2	77.3
Growing Season May—Sep	CCSM45	80.7	82.0	82.9	83.7
	CCSM85	80.7	82.5	84.4	87.1
	GFDL45	80.7	87.7	85.9	88.3
	GFDL85	80.7	84.3	87.9	92.4
	HAD45	80.7	82.9	84.8	85.4
	HAD85	80.7	83.3	86.6	89.4
Coldest Month Average	CCSM45	49.5	51.9	52.4	52.8
	CCSM85	49.5	51.6	52.6	53.9
	GFDL45	49.5	53.1	52.9	53.1
	GFDL85	49.5	50.5	51.6	52.1
	HAD45	49.5	50.2	51.6	52.1
	HAD85	49.5	52.7	54.0	55.6
Warmest Month Average	CCSM45	84.7	85.8	86.5	86.7
	CCSM85	84.7	86.5	87.2	88.5
	GFDL45	84.7	89.2	89.8	91.0
	GFDL85	84.7	89.4	90.9	93.8
	HAD45	84.7	87.2	88.0	88.5
	HAD85	84.7	87.7	89.4	90.5

Precipitation (in)

	Scenario	2009	2039	2069	2099
Annual Total	CCSM45	31.9	34.4	36.6	31.9
	CCSM85	31.9	33.7	35.4	34.7
	GFDL45	31.9	30.0	35.7	28.0
	GFDL85	31.9	30.2	31.4	29.5
	HAD45	31.9	33.0	31.4	33.4
	HAD85	31.9	32.1	29.8	32.0
Growing Season May—Sep	CCSM45	15.4	17.7	17.9	15.9
	CCSM85	15.4	17.1	16.6	15.9
	GFDL45	15.4	14.4	18.6	13.9
	GFDL85	15.4	15.1	15.6	14.6
	HAD45	15.4	15.0	14.9	16.5
	HAD85	15.4	15.4	14.1	15.2

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
ashe juniper	Juniperus ashei	NDH	High	48.1	781.5	57.1	No change	No change	Medium	Abundant	Good	Good			0	1
live oak	Quercus virginiana	NDH	High	66.7	338.0	27.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	2
blackjack oak	Quercus marilandica	NSL	Medium	22.2	179.4	34.3	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	3
cedar elm	Ulmus crassifolia	NDH	Medium	45.7	39.7	9.6	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1	4
hackberry	Celtis occidentalis	WDH	Medium	39.5	28.6	10.2	No change	No change	High	Rare	Fair	Fair			1	5
sugarberry	Celtis laevigata	NDH	Medium	27.2	27.2	5.0	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	6
post oak	Quercus stellata	WDH	High	16	16.2	8.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	7
black willow	Salix nigra	NSH	Low	6.2	15.8	6.4	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	8
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	11.1	13.7	3.7	Sm. inc.	Sm. inc.	High	Rare	Good	Good			1	9
pecan	Carya illinoinensis	NSH	Low	4.9	8.4	23.9	No change	No change	Low	Rare	Very Poor	Very Poor			0	10
black cherry	Prunus serotina	WDL	Medium	7.4	7.9	1.9	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	11
black hickory	Carya texana	NDL	High	4.9	5.7	16.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	12
eastern redcedar	Juniperus virginiana	WDH	Medium	4.9	1.4	3.9	No change	Sm. inc.	Medium	Rare	Poor	Fair			0	13
red mulberry	Morus rubra	NSL	Low	4.9	0.4	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	14
black walnut	Juglans nigra	WDH	Low	4.9	0.4	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	15
green ash	Fraxinus pennsylvanica	WSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	16
American elm	Ulmus americana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	17