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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	8,300.0	3,204.6	97

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	2
Hickory	1
Maple	1
Oak	5
Pine	0
Other	9
	18

Abundance	
Abundant	2
Common	3
Rare	13
Absent	3
	21

	Model Reliability	Adaptability
High	3	7
Medium	10	11
Low	7	3
FIA	2	
	22	**21**

Potential Change in Habitat Suitability	Scenario RCP45	Scenario RCP85
Increase	4	4
No Change	5	6
Decrease	7	6
New	0	0
Unknown	6	6
	22	**22**

Capability to Cope or Persist	Scenario RCP45	Scenario RCP85
Very Good	0	0
Good	4	4
Fair	3	4
Poor	8	8
Very Poor	1	0
FIA Only	2	2
Unknown	4	4
	22	**22**

Migration Potential	SHIFT RCP45	SHIFT RCP85
Likely	0	0
Infill	4	5
Migrate	0	0
	4	**5**

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099
Annual Average	CCSM45	67.5	69.1	70.2	70.8
	CCSM85	67.5	69.4	71.5	73.8
	GFDL45	67.5	72.3	71.6	73.2
	GFDL85	67.5	70.2	73.3	76.8
	HAD45	67.5	69.5	72.0	72.9
	HAD85	67.5	70.0	73.3	76.5
Growing Season May—Sep	CCSM45	80.3	81.8	82.6	83.4
	CCSM85	80.3	82.3	84.2	86.9
	GFDL45	80.3	86.3	85.2	87.6
	GFDL85	80.3	83.8	87.3	91.7
	HAD45	80.3	82.5	84.4	85.2
	HAD85	80.3	83.0	86.6	89.3
Coldest Month Average	CCSM45	47.7	49.9	50.5	50.8
	CCSM85	47.7	49.9	50.9	52.2
	GFDL45	47.7	51.4	51.3	51.4
	GFDL85	47.7	48.8	49.8	50.3
	HAD45	47.7	48.1	49.7	50.2
	HAD85	47.7	50.6	52.0	53.6
Warmest Month Average	CCSM45	84.7	85.9	86.5	86.9
	CCSM85	84.7	86.6	87.3	88.8
	GFDL45	84.7	89.2	89.6	91.0
	GFDL85	84.7	89.4	90.9	93.9
	HAD45	84.7	87.1	88.0	88.4
	HAD85	84.7	87.7	89.5	90.5

Precipitation (in)

	Scenario	2009	2039	2069	2099
Annual Total	CCSM45	33.6	33.8	37.0	33.6
	CCSM85	33.6	34.1	36.9	35.9
	GFDL45	33.6	33.0	38.5	30.9
	GFDL85	33.6	32.4	34.3	32.2
	HAD45	33.6	35.0	33.8	34.6
	HAD85	33.6	34.7	30.9	33.0
Growing Season May—Sep	CCSM45	15.1	16.2	16.6	15.4
	CCSM85	15.1	15.6	16.2	14.5
	GFDL45	15.1	15.3	19.1	14.3
	GFDL85	15.1	15.5	16.3	15.3
	HAD45	15.1	15.3	14.7	15.8
	HAD85	15.1	15.3	13.4	14.3

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	65.1	1878.4	57.3	No change	No change	Medium	Abundant	Good	Good			0	1
live oak	Quercus virginiana	NDH	High	50.6	1110.2	34.4	No change	No change	Medium	Abundant	Good	Good			1	2
cedar elm	Ulmus crassifolia	NDH	Medium	59	272.0	15.7	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	3
post oak	Quercus stellata	WDH	High	18.1	72.7	16.1	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	4
green ash	Fraxinus pennsylvanica	WSH	Low	12	58.5	10.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	5
eastern redcedar	Juniperus virginiana	WDH	Medium	16.9	37.9	13.0	No change	No change	Medium	Rare	Poor	Poor			1	6
pecan	Carya illinoinensis	NSH	Low	24.1	32.9	17.1	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair			1	7
sugarberry	Celtis laevigata	NDH	Medium	18.1	28.8	7.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	8
hackberry	Celtis occidentalis	WDH	Medium	26.5	22.7	7.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	9
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	34.9	13.7	4.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			1	10
American elm	Ulmus americana	WDH	Medium	1.2	10.0	6.5	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			0	11
Osage-orange	Maclura pomifera	NDH	Medium	6	9.3	7.5	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	12
Shumard oak	Quercus shumardii	NSL	Low	6	9.0	3.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	13
blackjack oak	Quercus marilandica	NSL	Medium	10.8	8.4	6.1	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor		Infill +	1	14
Texas ash	Fraxinus texensis	NDH	FIA	6	7.0	3.7	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	15
boxelder	Acer negundo	WSH	Low	4.8	3.6	9.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	16
winged elm	Ulmus alata	WDL	Medium	4.8	1.6	4.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	17
durand oak	Quercus sinuata var. sinuata	NSL	FIA	1.2	0.5	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	18
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	19
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	20
flowering dogwood	Cornus florida	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	21
black cherry	Prunus serotina	WDL	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	22