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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 8,985.5 3,469.3 6

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						Potentia	al Change	in Habitat Suitability	Capability	to Cope o	r Persist	Migratio	n Poten	ial
Ash	1			N	Model			Scenario	Scenario		Scenario	Scenario		SHIFT	SHIFT
Hickory	0	Abu	ndance	F	Reliability	Adaptability		RCP45	RCP85		RCP45	RCP85		RCP45	RCP85
Maple	2	Abundant	0	High	0	7	Increase	3	4	Very Good	0	0	Likely	0	0
Oak	1	Common	0	Medium	7	9	No Change	2	2	Good	1	1	Infill	5	6
Pine	1	Rare	11	Low	9	1	Decrease	4	3	Fair	3	4	Migrate	2	2
Other	6	Absent	7	FIA	2		New	7	7	Poor	3	3	•	7	8
•	11		18	_	18	17	Unknown	2	2	Very Poor	1	0			
							-	18	18	FIA Only	1	1			
										Unknown	0	0			
Potentia	Potential Changes in Climate Variables											0			

Potential Changes in Climate Variables

Temperatu	ıre (°F)				
	Scenario	2009	2039	2069	2099
Annual	CCSM45	45.8	47.8	50.3	51.0
Average	CCSM85	45.8	48.4	51.2	54.6
	GFDL45	45.8	52.0	50.7	52.0
	GFDL85	45.8	48.7	51.9	56.5
	HAD45	45.8	48.8	52.5	54.0
	HAD85	45.8	49.3	54.1	58.5
Growing	CCSM45	66.3	68.4	71.1	71.7
Season	CCSM85	66.3	69.2	71.9	76.1
May—Sep	GFDL45	66.3	74.2	72.3	74.2
	GFDL85	66.3	69.8	73.5	79.1
	HAD45	66.3	68.7	71.8	73.4
	HAD85	66.3	69.4	73.7	77.8
Coldest	CCSM45	13.5	16.1	17.8	18.8
Month	CCSM85	13.5	15.7	17.5	19.6
Average	GFDL45	13.5	17.0	18.0	18.3 ◆◆◆◆
	GFDL85	13.5	16.6	18.2	20.4
	HAD45	13.5	16.0	19.8	19.4
	HAD85	13.5	19.0	23.5	26.2
Warmest	CCSM45	72.8	75.6	77.2	78.1
Month	CCSM85	72.8	77.1	78.7	81.6
Average	GFDL45	72.8	76.3	77.7	79.0
	GFDL85	72.8	77.0	78.6	82.3
	HAD45	72.8	75.1	77.1	77.9
	HAD85	72.8	76.7	79.0	81.9

Precipitation (in)												
	Scenario	2009	2039	2069	2099							
Annual	CCSM45	27.0	27.5	26.7	26.9							
Total	CCSM85	27.0	27.4	27.9	28.1							
	GFDL45	27.0	30.3	33.3	31.7							
	GFDL85	27.0	30.8	33.5	32.9							
	HAD45	27.0	30.6	28.7	29.1							
	HAD85	27.0	28.0	29.2	32.4							
Growing	CCSM45	16.9	16.5	15.5	15.5							
Season	CCSM85	16.9	16.0	15.7	15.2							
May—Sep	GFDL45	16.9	19.2	20.8	19.0							
	GFDL85	16.9	19.8	20.2	18.9							
	HAD45	16.9	18.2	16.4	16.4							
	HAD85	16.9	16.2	15.9	15.5							

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
red pine	Pinus resinosa	NSH	Medium	1.4	27.8	31.8	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0 1
red mulberry	Morus rubra	NSL	Low	4.2	18.8	63.8	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2 2
bur oak	Quercus macrocarpa	NDH	Medium	4.5	17.4	62.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2 3
boxelder	Acer negundo	WSH	Low	8.9	15.6	27.9	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2 4
silver maple	Acer saccharinum	NSH	Low	2.5	15.5	31.0	Sm. dec.	Lg. dec.	High	Rare	Poor	Poor			0 5
chokecherry	Prunus virginiana	NSLX	FIA	4.5	12.8	46.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0 6
eastern cottonwood	Populus deltoides	NSH	Low	4.2	9.1	30.7	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2 7
Siberian elm	Ulmus pumila	NDH	FIA	2.5	8.6	17.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0 8
green ash	Fraxinus pennsylvanica	WSH	Low	6.9	7.6	10.8	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2 9
American elm	Ulmus americana	WDH	Medium	4.5	4.8	17.4	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2 10
eastern redcedar	Juniperus virginiana	WDH	Medium	4.5	1.1	4.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2 11
hackberry	Celtis occidentalis	WDH	Medium	0	0	C	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3 12
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	C	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3 13
black walnut	Juglans nigra	WDH	Low	0	0	C	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3 14
Osage-orange	Maclura pomifera	NDH	Medium	0	0	C	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3 15
eastern hophornbeam; iro	nw Ostrya virginiana	WSL	Low	0	0	C	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3 16
American basswood	Tilia americana	WSL	Medium	0	0	C	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +		3 17
slippery elm	Ulmus rubra	WSL	Low	0	0	C	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3 18

