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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 8,686.5 3,353.9 3

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			1	Model			Scenario	Scenario		Scenario	Scenario		SHIFT	SHIFT
Hickory	0	Abu	ndance	F	Reliability	Adaptability		RCP45	RCP85		RCP45	RCP85		RCP45	RCP85
Maple	1	Abundant	0	High	1	5	Increase	0	0	Very Good	0	0	Likely	0	0
Oak	0	Common	1	Medium	5	6	No Change	1	2	Good	0	0	Infill	1	2
Pine	0	Rare	2	Low	5	0	Decrease	1	0	Fair	1	1	Migrate	3	5
Other	1	Absent	9	FIA	1		New	8	8	Poor	0	1	•	4	7
•	3	_	12	_	12	11	Unknown	2	2	Very Poor	1	0			
							-	12	12	FIA Only	0	0			
										Unknown	1	1			
Potentia	l Chang	es in Climate Var	iahlac								٠.				

Potential Changes in Climate Variables

Temperatu	ıre (°F)				
	Scenario	2009	2039	2069	2099
Annual	CCSM45	43.5	45.3	47.9	48.6
Average	CCSM85	43.5	46.0	49.1	52.5
	GFDL45	43.5	49.5	48.1	49.5
	GFDL85	43.5	46.2	49.4	54.1
	HAD45	43.5	46.7	50.6	52.4
	HAD85	43.5	47.3	52.4	57.3
Growing	CCSM45	64.8	67.0	69.4	70.1
Season	CCSM85	64.8	67.8	70.7	74.9
May—Sep		64.8	72.4	70.6	72.4
,	GFDL85	64.8	68.2	71.8	77.5
	HAD45	64.8	67.7	70.7	72.7
	HAD85	64.8	67.7	72.0	77.0
Coldest	CCSM45	10.1	11.9	14.0	14.3
Month	CCSM85	10.1	11.1	13.2	15.5
Average	GFDL45	10.1	13.7	14.6	15.1 ◆◆◆◆
	GFDL85	10.1	13.5	15.0	17.5
	HAD45	10.1	13.2	17.0	16.4
	HAD85	10.1	16.0	21.1	23.4
Warmest	CCSM45	72.1	75.0	76.5	77.4
Month	CCSM85	72.1	76.2	78.3	81.0
Average	GFDL45	72.1	75.8	77.4	78.5
	GFDL85	72.1	76.2	78.0	81.6
	HAD45	72.1	75.5	76.9	78.4
	HAD85	72.1	75.6	78.1	81.5

Precipitati	on (in)				
	Scenario	2009	2039	2069	2099
Annual	CCSM45	21.1	21.7	21.7	20.7
Total	CCSM85	21.1	20.9	20.5	21.4
	GFDL45	21.1	24.4	26.7	25.1
	GFDL85	21.1	24.6	27.2	26.6
	HAD45	21.1	22.9	22.1	22.8
	HAD85	21.1	23.0	23.1	24.8
Growing	CCSM45	14.2	13.7	13.6	12.8 • • •
Season	CCSM85	14.2	13.0	12.8	12.1
May—Sep	GFDL45	14.2	16.6	18.0	16.4
	GFDL85	14.2	16.2	17.6	16.6
	HAD45	14.2	14.2	13.5	13.1 •••
	HAD85	14.2	14.3	13.2	12.3 •••

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
Siberian elm	Ulmus pumila	NDH	FIA	8.4	52.4	84.0	Unknown	Unknown	NA	Common	NNIS	NNIS			0 1
green ash	Fraxinus pennsylvanica	WSH	Low	8.5	31.8	53.9	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2 2
boxelder	Acer negundo	WSH	Low	4.6	2.1	7.4	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2 3
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0 4
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	- 3 5
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0 6
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3 7
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0 8
eastern cottonwood	Populus deltoides	NSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3 9
bur oak	Quercus macrocarpa	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3 10
American basswood	Tilia americana	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3 11
American elm	Ulmus americana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3 12

