

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

| | | | |
|----------------|---------|---------|-----------|
| | sq. km | sq. mi | FIA Plots |
| Area of Region | 8,376.7 | 3,234.3 | 41 |

Species Information

The columns below provide brief 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 | Abundance | | Model | | Potential Change in Habitat Suitability | | Capability to Cope or Persist | | Migration Potential | | | | | |
|---------|-----------|-----------|-----------|-------------|--------------|---|----------------|-------------------------------|----------------|---------------------|-------------|-----------|---------|-----------|-----------|
| | | | | Reliability | Adaptability | Scenario RCP45 | Scenario RCP85 | Scenario RCP45 | Scenario RCP85 | SHIFT RCP45 | SHIFT RCP85 | | | | |
| Ash | 2 | | | High | 8 | 12 | Increase | 5 | 6 | Very Good | 0 | 0 | Likely | 1 | 1 |
| Hickory | 0 | | | Medium | 12 | 18 | No Change | 6 | 5 | Good | 5 | 6 | Infill | 9 | 9 |
| Maple | 2 | Abundant | 0 | Low | 16 | 8 | Decrease | 7 | 7 | Fair | 6 | 5 | Migrate | 3 | 7 |
| Oak | 2 | Common | 6 | FIA | 3 | | New | 15 | 15 | Poor | 2 | 2 | | 13 | 17 |
| Pine | 0 | Rare | 15 | | | | Unknown | 6 | 6 | Very Poor | 4 | 4 | | | |
| Other | 15 | Absent | 16 | | | | | 39 | 39 | FIA Only | 2 | 2 | | | |
| | 21 | | 37 | | 39 | 38 | | | | Unknown | 3 | 3 | | | |
| | | | | | | | | | | | 22 | 22 | | | |

Potential Changes in Climate Variables

Temperature (°F)

| | Scenario | 2009 | 2039 | 2069 | 2099 | |
|--------------------------|----------|------|------|------|------|--|
| Annual Average | CCSM45 | 40.8 | 42.4 | 45.3 | 45.9 | |
| | CCSM85 | 40.8 | 43.2 | 46.7 | 50.4 | |
| | GFDL45 | 40.8 | 47.2 | 45.8 | 47.4 | |
| | GFDL85 | 40.8 | 43.7 | 47.2 | 52.1 | |
| | HAD45 | 40.8 | 44.1 | 47.9 | 49.8 | |
| | HAD85 | 40.8 | 44.6 | 49.1 | 55.0 | |
| Growing Season (May—Sep) | CCSM45 | 63.2 | 65.0 | 67.5 | 68.1 | |
| | CCSM85 | 63.2 | 65.8 | 69.0 | 73.0 | |
| | GFDL45 | 63.2 | 70.8 | 69.1 | 71.1 | |
| | GFDL85 | 63.2 | 66.5 | 70.2 | 75.9 | |
| | HAD45 | 63.2 | 66.3 | 69.2 | 71.4 | |
| | HAD85 | 63.2 | 66.1 | 70.1 | 75.9 | |
| Coldest Month (Average) | CCSM45 | 4.8 | 6.4 | 8.7 | 8.9 | |
| | CCSM85 | 4.8 | 5.9 | 8.7 | 11.3 | |
| | GFDL45 | 4.8 | 8.2 | 9.7 | 10.2 | |
| | GFDL85 | 4.8 | 8.9 | 10.5 | 13.6 | |
| | HAD45 | 4.8 | 7.3 | 11.3 | 11.0 | |
| | HAD85 | 4.8 | 10.2 | 14.2 | 18.0 | |
| Warmest Month (Average) | CCSM45 | 69.8 | 72.3 | 73.8 | 74.3 | |
| | CCSM85 | 69.8 | 73.4 | 75.6 | 78.0 | |
| | GFDL45 | 69.8 | 73.3 | 74.8 | 76.4 | |
| | GFDL85 | 69.8 | 73.6 | 75.7 | 79.0 | |
| | HAD45 | 69.8 | 73.4 | 74.8 | 76.8 | |
| | HAD85 | 69.8 | 73.4 | 75.8 | 79.5 | |

Precipitation (in)

| | Scenario | 2009 | 2039 | 2069 | 2099 | |
|--------------------------|----------|------|------|------|------|--|
| Annual Total | CCSM45 | 23.2 | 23.6 | 23.9 | 22.9 | |
| | CCSM85 | 23.2 | 23.1 | 23.2 | 23.5 | |
| | GFDL45 | 23.2 | 26.1 | 27.8 | 26.4 | |
| | GFDL85 | 23.2 | 26.8 | 28.5 | 28.1 | |
| | HAD45 | 23.2 | 24.2 | 22.8 | 24.2 | |
| | HAD85 | 23.2 | 24.4 | 23.5 | 25.8 | |
| Growing Season (May—Sep) | CCSM45 | 15.8 | 15.6 | 15.3 | 14.9 | |
| | CCSM85 | 15.8 | 15.0 | 15.0 | 14.4 | |
| | GFDL45 | 15.8 | 18.0 | 18.9 | 17.6 | |
| | GFDL85 | 15.8 | 18.1 | 19.1 | 18.2 | |
| | HAD45 | 15.8 | 15.8 | 14.4 | 14.5 | |
| | HAD85 | 15.8 | 15.5 | 13.8 | 13.9 | |

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 |
|----------------------------|------------------------|-------|--------|-------|--------|-------|---------------|---------------|--------|---------|-------------|-------------|------------|------------|-----|----|
| quaking aspen | Populus tremuloides | WDH | High | 24.2 | 481.3 | 32.4 | Lg. dec. | Lg. dec. | Medium | Common | Poor | Poor | Infill + | Infill + | 2 | 1 |
| bur oak | Quercus macrocarpa | NDH | Medium | 36.9 | 221.7 | 18.1 | Sm. dec. | Sm. dec. | High | Common | Fair | Fair | Infill + | Infill + | 2 | 2 |
| boxelder | Acer negundo | WSH | Low | 38.5 | 167.2 | 11.8 | No change | Sm. dec. | High | Common | Good | Fair | Infill ++ | Infill + | 2 | 3 |
| green ash | Fraxinus pennsylvanica | WSH | Low | 45.4 | 96.5 | 10.6 | Sm. inc. | Sm. inc. | Medium | Common | Good | Good | Infill ++ | Infill ++ | 2 | 4 |
| American basswood | Tilia americana | WSL | Medium | 35.5 | 67.5 | 10.2 | No change | No change | Medium | Common | Fair | Fair | Infill + | Infill + | 2 | 5 |
| American elm | Ulmus americana | WDH | Medium | 40.7 | 64.4 | 9.6 | No change | Sm. inc. | Medium | Common | Fair | Good | Infill + | Infill ++ | 2 | 6 |
| eastern cottonwood | Populus deltoides | NSH | Low | 10.7 | 40.1 | 28.5 | Sm. inc. | Lg. inc. | Medium | Rare | Fair | Good | Infill + | | 2 | 7 |
| balsam poplar | Populus balsamifera | NSH | Medium | 7.6 | 31.5 | 4.8 | Very Lg. dec. | Very Lg. dec. | Medium | Rare | Lost | Lost | | | 0 | 8 |
| black ash | Fraxinus nigra | WSH | Medium | 14.6 | 18.2 | 6.2 | Lg. dec. | Lg. dec. | Low | Rare | Very Poor | Very Poor | | | 2 | 9 |
| eastern hophornbeam; ironw | Ostrya virginiana | WSL | Low | 13.7 | 10.1 | 3.4 | Sm. inc. | Sm. inc. | High | Rare | Good | Good | Infill ++ | Infill ++ | 2 | 10 |
| chokecherry | Prunus virginiana | NSLX | FIA | 20.9 | 8.0 | 1.6 | Unknown | Unknown | Medium | Rare | FIA Only | FIA Only | | | 0 | 11 |
| northern red oak | Quercus rubra | WDH | Medium | 4.6 | 5.1 | 4.9 | No change | No change | High | Rare | Fair | Fair | | Infill + | 2 | 12 |
| Siberian elm | Ulmus pumila | NDH | FIA | 2 | 4.5 | 6.4 | Unknown | Unknown | NA | Rare | NNIS | NNIS | | | 0 | 13 |
| sugar maple | Acer saccharum | WDH | High | 3.3 | 4.4 | 10.1 | No change | No change | High | Rare | Fair | Fair | Infill + | Infill + | 2 | 14 |
| black cherry | Prunus serotina | WDL | Medium | 8.6 | 0.9 | 0.8 | Sm. dec. | No change | Low | Rare | Very Poor | Very Poor | | | 2 | 15 |
| hackberry | Celtis occidentalis | WDH | Medium | 1.8 | 0.7 | 0.9 | Lg. inc. | Lg. inc. | High | Rare | Good | Good | | | 2 | 16 |
| peachleaf willow | Salix amygdaloides | NSLX | FIA | 4.8 | 0.5 | 1.6 | Unknown | Unknown | Medium | Rare | FIA Only | FIA Only | | | 0 | 17 |
| balsam fir | Abies balsamea | NDH | High | 3.3 | 0.3 | 0.7 | Lg. dec. | Lg. dec. | Low | Rare | Very Poor | Very Poor | | | 0 | 18 |
| paper birch | Betula papyrifera | WDH | High | 0.5 | 0.2 | 0.1 | No change | No change | Medium | Rare | Poor | Poor | | | 0 | 19 |
| serviceberry | Amelanchier spp. | NSL | Low | 0.4 | 0.1 | 0.0 | Lg. dec. | Lg. dec. | Medium | Rare | Very Poor | Very Poor | | | 0 | 20 |
| slippery elm | Ulmus rubra | WSL | Low | 0.5 | 0.1 | 0.0 | Lg. inc. | Lg. inc. | Medium | Rare | Good | Good | | | 2 | 21 |
| eastern redcedar | Juniperus virginiana | WDH | Medium | 0 | 0 | 0 | New Habitat | New Habitat | Medium | Absent | New Habitat | New Habitat | Migrate ++ | Migrate ++ | 3 | 22 |
| tamarack (native) | Larix laricina | NSH | High | 0 | 0 | 0 | New Habitat | New Habitat | Low | Absent | New Habitat | New Habitat | Likely + | Likely + | 3 | 23 |
| eastern white pine | Pinus strobus | WDH | High | 0 | 0 | 0 | New Habitat | New Habitat | Low | Absent | New Habitat | New Habitat | | | 3 | 24 |
| northern white-cedar | Thuja occidentalis | WSH | High | 0 | 0 | 0 | New Habitat | New Habitat | Medium | Absent | New Habitat | New Habitat | | | 3 | 25 |
| silver maple | Acer saccharinum | NSH | Low | 0 | 0 | 0 | New Habitat | New Habitat | High | Absent | New Habitat | New Habitat | Migrate + | Migrate ++ | 3 | 26 |
| mountain maple | Acer spicatum | NSL | Low | 0 | 0 | 0 | Unknown | Unknown | High | Modeled | Unknown | Unknown | | | 0 | 27 |
| honeylocust | Gleditsia triacanthos | NSH | Low | 0 | 0 | 0 | New Habitat | New Habitat | High | Absent | New Habitat | New Habitat | | | 0 | 28 |
| black walnut | Juglans nigra | WDL | Low | 0 | 0 | 0 | New Habitat | New Habitat | Medium | Absent | New Habitat | New Habitat | | Migrate + | 3 | 29 |
| red mulberry | Morus rubra | NSL | Low | 0 | 0 | 0 | New Habitat | New Habitat | Medium | Absent | New Habitat | New Habitat | | | 3 | 30 |
| pin cherry | Prunus pensylvanica | NSL | Low | 0 | 0 | 0 | Unknown | Unknown | Medium | Absent | Unknown | Unknown | | | 0 | 31 |
| white oak | Quercus alba | WDH | Medium | 0 | 0 | 0 | New Habitat | New Habitat | High | Absent | New Habitat | New Habitat | | Migrate + | 3 | 32 |
| swamp white oak | Quercus bicolor | NSL | Low | 0 | 0 | 0 | New Habitat | New Habitat | Medium | Absent | New Habitat | New Habitat | | | 3 | 33 |
| northern pin oak | Quercus ellipsoidalis | NSH | Medium | 0 | 0 | 0 | New Habitat | New Habitat | High | Absent | New Habitat | New Habitat | Migrate + | Migrate + | 3 | 34 |
| post oak | Quercus stellata | WDH | High | 0 | 0 | 0 | New Habitat | New Habitat | High | Absent | New Habitat | New Habitat | | | 0 | 35 |
| black locust | Robinia pseudoacacia | NDH | Low | 0 | 0 | 0 | New Habitat | New Habitat | Medium | Absent | New Habitat | New Habitat | | Migrate + | 3 | 36 |
| black willow | Salix nigra | NSH | Low | 0 | 0 | 0 | New Habitat | New Habitat | Low | Absent | New Habitat | New Habitat | | Migrate + | 3 | 37 |
| American mountain-ash | Sorbus americana | NSL | Low | 0 | 0 | 0 | Unknown | Unknown | Low | Modeled | Unknown | Unknown | | | 0 | 38 |
| cedar elm | Ulmus crassifolia | NDH | Medium | 0 | 0 | 0 | New Habitat | New Habitat | Low | Absent | New Habitat | New Habitat | | | 0 | 39 |