

Climate Adapted Urban Trees

Climate Change	Impact	Resilient Quality Desired	Climate Adapted Trees
Increased temperatures	<p>Greater number of tree pests and pathogens</p> <p>Increased stressed on trees that cannot tolerate higher temps (boreal trees)</p>	<p>Live in a wide variety of climates</p> <p>No major pests or disease issues</p> <p>Pollution tolerant</p>	<p>Allegheny serviceberry - tolerates drought</p> <p>American basswood – tolerates occasional drought</p> <p>American elm (DED resistant variety) – grows in a variety of sites, drought and heat tolerant</p> <p>Black cherry – tolerates some drought</p> <p>Black oak – tolerates drought</p> <p>Downy serviceberry – wide temperature tolerance</p> <p>Eastern red cedar – tolerates a wide range of temperatures</p> <p>Hackberry – tolerates drought</p> <p>Ironwood – grows in a variety of sites, wide range of temperature tolerances</p> <p>Kentucky coffeetree – no major pests, wide range of habitats, drought tolerant when established</p> <p>Red maple – wide range of habitats</p> <p>Sugar maple – grows in a variety of sites</p> <p>White oak – grows in a variety of sites</p>

<p>Increased winter temperatures</p>	<p>More frequent winter kills due to freezing and thawing</p> <p>Increased survival of trees that cannot tolerate colder temps (temperate trees)</p>	<p>Live in a wide variety of climates</p> <p>No major pests or disease issues</p>	<p>American elm (DED resistant) – grows in a variety of sites</p> <p>Downy serviceberry – wide temperature tolerance</p> <p>Ironwood – grows in a variety of sites, wide range of temperature tolerances, no major pests, deer resistant</p> <p>Kentucky coffeetree – no major pests, wide range of habitats</p> <p>Red maple – wide range of habitats</p> <p>Sugar maple – grows in a variety of sites</p> <p>White oak – grows in a variety of sites</p> <p>White pine – grows in a variety of sites</p>
<p>More frequent summer drought</p>	<p>Water-stress = more susceptible to insects and diseases</p>	<p>No major pests or disease issues</p> <p>Tolerant of drought</p>	<p>American elm (DED resistant) – grows in a variety of sites, drought and heat tolerant</p> <p>American basswood – tolerates occasional drought</p> <p>Black cherry – tolerates some drought</p> <p>Black oak – tolerates drought</p> <p>Bur oak – drought tolerant</p> <p>Chinkapin oak – tolerates drought</p> <p>Hackberry – drought tolerant</p> <p>Honeylocust – drought tolerant</p> <p>Ironwood – drought tolerant when established, no major pests</p> <p>Kentucky coffeetree – drought tolerant when established, not major pests</p>

			<p>Red maple – drought tolerant</p> <p>River birch – drought tolerant</p> <p>Swamp white oak – drought tolerant</p>
Increased winter precipitation	Damage due to increased snow and ice loading	<p>Wind and ice tolerant</p> <p>Salt tolerant</p> <p>Requires less pruning or maintenance</p>	<p>American elm (DED resistant) – salt tolerant</p> <p>Bitternut hickory – salt tolerant and ice storm tolerant</p> <p>Black walnut – salt tolerant and ice storm tolerant</p> <p>Bur oak – moderate salt tolerance and ice storm tolerant</p> <p>Hackberry – moderate salt tolerance</p> <p>Honeylocust – salt tolerant</p> <p>Ironwood – moderate salt tolerance and ice storm tolerant</p> <p>Kentucky coffeetree – salt tolerant and ice storm tolerant</p> <p>River birch – moderate salt tolerance</p> <p>Shagbark hickory – salt tolerant and ice storm tolerant</p> <p>Swamp white oak - moderate salt tolerance and ice storm tolerant</p> <p>White oak – salt tolerant and ice storm tolerant</p>
More frequent weather extremes	Stronger storms = more uprooted trees and canopy damage	<p>Tolerant of flooding</p> <p>Requires less pruning or maintenance</p>	<p>American elm (DED resistant) – flood tolerant</p> <p>Northern white cedar - tolerates season flooding</p> <p>River birch – tolerates season flooding</p>

	<p>Increased rain amounts = root damage from waterlogging</p> <p>Flooding</p>	<p>Strong branch union to main or lateral stems = broad branch angle ('U' shaped union)</p> <p>Roots well in confined, compacted, or often saturated soils</p> <p>Slow to moderate growth rate with dense wood and decay resistance</p> <p>Tendency to develop dominant central leader</p> <p>Moderate foliage</p> <p>Coarse branch texture (stoutness of branches in the crown) have less surface areas = better able to accommodate snow, ice, and rain</p>	<p>Swamp white oak – tolerates season flooding</p>
<p>Longer growing season with earlier springs and shorter winters</p>	<p>Early bud break = frost damage</p> <p>Less cold hardening = winter kill</p>	<p>Live in a wide variety of climates</p>	<p>Red maple – wide range of habitats</p> <p>Ironwood – wide range of habitats</p> <p>Kentucky coffeetree – no major pests, wide range of habitats</p>

Resources:

[Recommended trees for Minnesota | UMN Extension](#)
[Tough Trees for Tough Sites UMN Extension](#)

[The Best Plants for 30 Tough Sites UMN Extension](#)
[Vulnerability of Street Trees in Upper Midwest Cities to Climate Change paper](#)