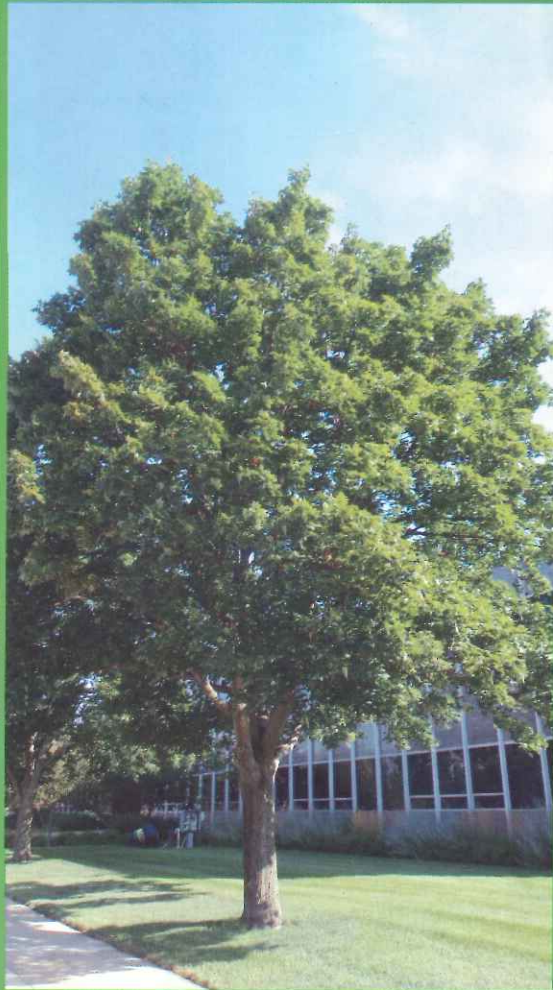


Trees and our waters

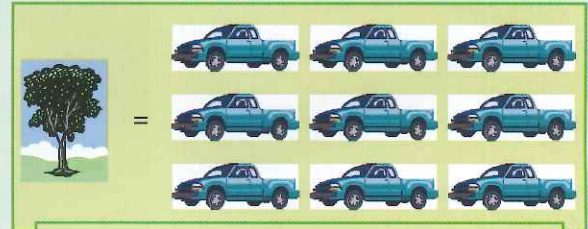


Trees mitigate water quantity and reduce flooding

Trees provide us with many benefits. They provide shade in the summer, and protect us from the wind in the winter. Their aesthetic benefits help to beautify our community. The impact that trees have on water quality, however, gets far less attention. Trees help to reduce the amount of storm water runoff from urban areas. Through a process known as evapotranspiration, trees soak up and evaporate large volumes of water. In fact, a medium-sized tree can capture as much as 2,380 gallons of stormwater annually*. That's enough to fill roughly 9 pickup-truck beds! In addition, the growth and decomposition of root structures improves soil structure, adding porosity and thereby increasing water storage capacity and infiltration rates. The tree also serves to store water above ground. The leaves and branches in the canopy work as mini reservoirs, intercepting this rainfall and delaying the onset of peak flows, which reduces channel erosion in our rivers and streams. According to Waterloo City Forester Todd Derfield, the City of Waterloo maintains 24,989 trees along city owned street rights-of-way and in 52 parks and 3 municipal golf courses. All of these trees together intercept 47,008,052 gallons of rainfall each year. This benefit is valued at \$1,274,007 per year according to the National Tree Benefit Calculator developed by Davey Resource Group.

Ways trees reduce stormwater runoff*:

- Leaves and branch surfaces intercept and store rainfall, reducing runoff volumes and delaying the onset of peak flows.
- Roots increase the rate at which rainfall infiltrates soil and allow the soil to store more water
- Tree canopies reduce soil erosion by diminishing the impact of raindrops on barren surfaces.
- Transpiration through tree leaves reduces soil moisture, increasing the soil's capacity to store rainfall.



One medium sized tree can absorb enough water annually to fill 9 pickup beds

Trees build healthy soils and improve water quality

Trees also have a positive impact on our water quality. Trees can reduce soil erosion by substantially dispersing raindrop energy. They also take in and process excess nutrients, which they use to enhance growth. Trees are also an effective method of removing other pollutants from the soils. The process of using trees and other plants to remove toxins from the soils has been implemented to clean up metals, pesticides, solvents, crude oil, and landfill leachates**. Trees such as mulberry, poplar, and willow are well adapted for this use due to their deep root systems.

Sources:

*McPherson, E.G., J.R. Simpson, P.J. Peper, S.E. Maco, S.L. Gardner, S.K. Cozad, and Q. Xiao..2006. Midwest Community Tree Guide: Benefits, Costs and Strategic Planting PSW-GTR-199. USDA Forest Service, Pacific Southwest Research Station, Albany, CA

**Capiella, K. T. Schueler, and T. Wright. 2005. Urban Watershed Forestry Manual. Part 1: Methods for Increasing Forest Cover in a Watershed. U.S. Department of Agriculture. U.S. Forest Service. Newtown Square, PA.