

Benefits from Trees

Water harvesting can have a significant positive impact on both stormwater quality and quantity issues, especially when the harvested water is used to support vegetation. Trees in particular can help effectively and cheaply deal with runoff. Trees can not only store hundreds of gallons of runoff within their root systems, but also act as bioremediators for many of the pollutants found in stormwater. In addition to these benefits, trees make the urban environment more livable. They can provide shade to residences and businesses, helping to reduce their cooling costs. In colder months, trees can act as wind blocks, thus lowering heating requirements. If properly placed on a property, just three trees can reduce energy use by \$100-250 annually.ⁱ In addition, studies have shown that shaded asphalt lasts longer than unshaded asphalt, with an associated savings of \$7.13/m² over a 30-year period.ⁱⁱ

Trees can also have a positive economic impact. They can improve property values, even by as much as \$8,870 per tree.ⁱⁱⁱ Furthermore, the Tucson Audubon Society found that birding and other forms of watchable wildlife contribute \$1.4 billion annually to Arizona's economy.^{iv} Though green infrastructure practices like reconstructed wetlands more directly contribute to this figure, urban forestry also provides wildlife habitat within a city. Surveys have shown that consumers are willing to pay more money for the same item in a tree-shaded shopping environment than an unshaded one.^v Perhaps most importantly, trees can help mitigate the urban heat island effect—a phenomenon that results from built-up areas absorbing warmth during the day and releasing it slowly at night—through shading and increasing evapotranspiration. Native trees in most cases are the best option, since they are adapted to a locality's climate and rainfall patterns. In general, native trees can subsist on rainfall alone after a 2-3 year establishment period. Trees irrigated with harvested rainwater often grow more quickly than trees irrigated with potable water.

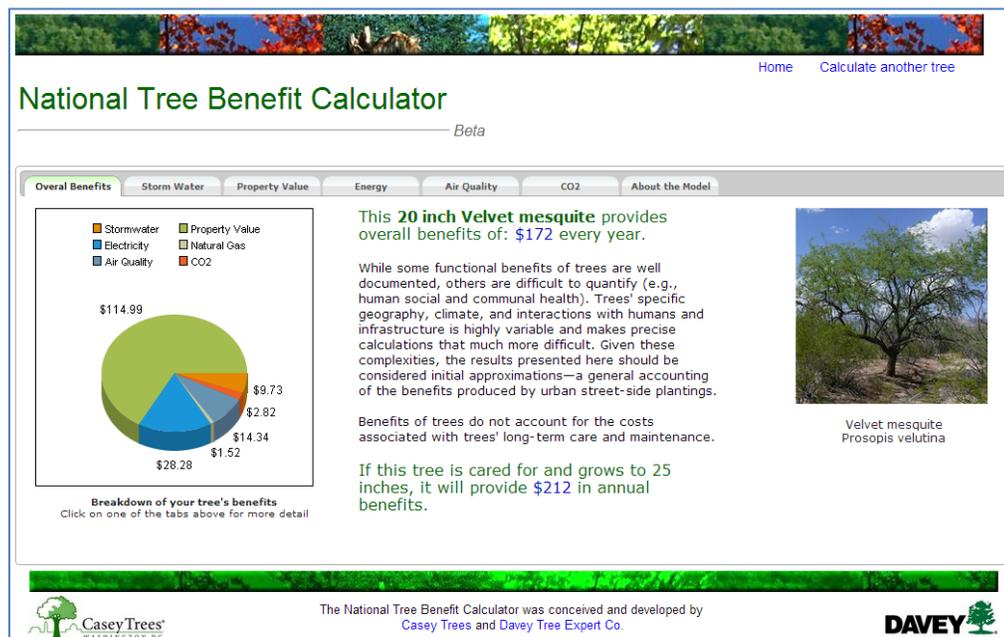


Figure 1: Benefits provided by a mesquite tree in Tucson, AZ

A cooperative group including the U.S. Forest Service, the Arbor Day Foundation, the Society of Municipal Arborists, and others has developed the iTree toolbox to help planners, landscape managers, non-profits, and other



interested parties calculate the benefits that trees provide. The iTree toolbox includes several different applications, including urban canopy cover, street trees, and a beta-version tool to help analyze various green infrastructure practices. iTree Design gives users a simple snapshot of the benefits of an individual tree depending on the species, where the tree is located, how large it is, and what condition it is in. A simplified version of the iTree Streets tool, the National Tree Benefit Calculator, provides a similar estimation with the input of a zip code, tree species, trunk diameter, and nearest land use type. The tool then gives a dollar value for the stormwater, electricity, air quality, property value, natural gas, and CO2 benefits provided by that tree (Figure 1, above).

Further reading and resources:

<http://www.itreetools.org/index.php>

<http://treebenefits.com/calculator/index.cfm>

<http://www.arborday.org/trees/benefits.cfm>

<http://www.treepeople.org/top-22-benefits-trees>

ⁱ <http://www.dvrpc.org/green/pdf/ValueofTreesStatsSheet.pdf>; http://www.hged.com/energysavers_34430.pdf

ⁱⁱ http://www.treebenefits.terrasummit.com/Documents/Business/psw_2005_mcperson001_joa_1105.pdf

ⁱⁱⁱ http://www.fs.fed.us/pnw/research/gcra/pdfs/pnw_2010_donovan001.pdf

^{iv} <http://www.tucsonaudubon.org/images/stories/News/TAS-AZ-WildlifeWatching-Analysis-2011-130718.pdf>

^v <http://www.dvrpc.org/green/pdf/ValueofTreesStatsSheet.pdf>; http://www.naturewithin.info/CityBiz/BizTreesAll_JFor.pdf

