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The State Of Chesapeake's Urban Forest
Assessing Tree Cover and Developing Goals
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Introduction

This is a report on the state of the urban forest in the City of Chesapeake, Virginia. It provides an inventory of tree canopy cover (tree canopy meaning the actual area of land covered with tree foliage), and associated benefits, both in monetary and functional terms. The report also provides recommendations for establishing canopy goals. The purpose of this report is to provide urban forest management information to city leaders, to help recognize and maximize financial and other benefits, and to minimize degradation of these benefits.

The quantified benefit of Chesapeake's urban forest is approximately 1.5 billion dollars (table 1). The unquantified benefits may exceed that figure. Without this resource the city would have to raise additional money to provide all the urban forest's social, aesthetic, functional, environmental and recreational benefits that the community needs and desires (encl.1).

Background

Healthy urban forest ecosystems include a mix of tree species and sizes, and having enough soil available to grow large trees. When urban forests are healthy, they provide communities with many valuable services that can be measured in dollar benefits. The value of trees for storm water management is a good example. Trees slow storm water runoff and reduce peak flows, and absorb water, nutrients and pollution. Additional ecological benefits provided by urban forests including improved air and water quality, energy conservation, and wildlife habitat enhancement—increase the importance of preserving and enhancing the green canopy infrastructure of our city. (ref. 1)

Findings

Chesapeake's total tree canopy cover based on 2005 data is 50% (encl. 2). Based on quantified values of storm water management, pollution storage, and energy conservation, for Chesapeake's 353 square miles of territory, this canopy is worth \$1.479 billion dollars on a one time basis, and \$100 million on an annual basis. (table 1) The remainder of the findings are based on the City of Chesapeake's square mileage of 353 square miles excluding the Great Dismal Swamp National Wildlife Refuge (GDSNWR) area of 78.6 square miles. The GDSNWR is not subject to development and should be considered separately from areas subject to development and depletion of tree canopy (table 2 and 3).

Chesapeake's total tree canopy cover (excluding the (GDSNWR) based on 2005 data is 36%. This is an approximate 2% decrease in canopy cover from the (approximate date)1995 38%

canopy cover (encl. 2,3, table 2), resulting in a net loss in quantified value of approximately \$49.6 million.

If development continues at the current rate, it is likely that the city of Chesapeake will continue losing an average of 2% of canopy cover every decade, along with associated monetary increases in storm water management, pollution control and energy conservation. This trend can be reversed by preservation, by establishing canopy goals and supporting sustainable urban forest management(ref. 1,2).

Table 1. The Value of Chesapeake’s Urban Forest 2005 (Including total territory)

Ecological Benefits	
Stormwater mgmt. (one time)	\$1.479 billion
Stormwater mgmt. (annual)	\$71.9 million
Air Pollution Stored (annual)	\$26.7 million
Energy Conserved (annual)	\$1.5 million
Totals: (one time)	\$1.479 billion
(annual)	\$100 million

Quantified values of storm water management, air pollution storage, and energy conservation are based on data from American Forest Urban Ecosystem Analysis, August 2001 (Ref.3)

Table 2. The Value of Chesapeake’s Urban Forest 1995-2005
(Excluding the Great Dismal Swamp National Wildlife Refuge)

Ecological Benefits	1995 value at 38% canopy	2005 value at 36% canopy
Stormwater mgmt. (one time)	\$872.7 million	\$826.8 million
Stormwater mgmt. (annual)	\$42.4 million	\$40.2 million
Air Pollution Stored (annual)	\$15.7 million	\$14.9 million
Energy Conserved (annual)	\$1.52million	\$ 1.52 million
Totals: (one time)	\$872.7million	\$826.8 million
(annual)	\$59.6 million	\$55.9 million
grand totals	\$932.3 million	\$ 882.7 million

Quantified values of storm water management, air pollution storage and energy conservation are based on data from American Forest Urban Ecosystem Analysis, August 2001 (Ref.3, encl 2,3)

Table 3. City of Chesapeake Benefits of Increasing Canopy Cover to 40% (2007 +)
(Excluding the Great Dismal Swamp National Wildlife Refuge)

	2005 value (36% canopy)	Value at 40%	Benefit
Stormwater mgmt.(one time)	\$826.8 million	\$918.6 million	\$96.8 million
Stormwater mgmt. (annual)	\$40.2 million	\$44.7 million	\$4.5 million
Air Pollution Stored (annual)	\$14.9 million	\$16.6 million	\$1.7 million
Energy Conserved (annual)	\$1.52 million	\$1.52 million	\$. no data
Totals: (one time)	\$826.8 million	\$918.6 million	\$91.8 million
(annual)	\$55.9 million	\$62.8 million	\$6.2 million

Quantified values of storm water management, air pollution storage and energy conservation are based on data from American Forest Urban Ecosystem Analysis, August 2001 (ref. 3)

Recommendations

1. To retain valuable urban forest resources, the City of Chesapeake should strive to reverse tree canopy cover depletion, as experienced over the last ten years. Further, following the recommendation by American Forest (ref. 1,2,3,4), in the areas subject to development, or redevelopment, the City should strive to increase Chesapeake’s urban forest canopy cover to an average of 40% to produce additional dollar benefits estimated at \$91.8 million on a one time basis and \$6 million on an annual basis (table 3) An example of potential canopy restoration areas are newly constructed road medians, clover leaf interchanges along the Chesapeake Expressway, school grounds, municipal sites, and preservation of wooded areas in new developments.
2. To optimize the benefits of the urban forest, and to reach and maintain canopy goals, the City of Chesapeake should implement an urban forest master plan to coordinate urban forestry efforts (tree planting/ reforestation, preservation, removal, maintenance) currently spread out among at least five departments (Parks, General Services, Public Works, Utilities, and Schools,).
3. To monitor the state of Chesapeake’s urban forest resources, an annual State of The Urban Forest report should be prepared, with updated satellite urban tree canopy coverage statistics prepared every five years.

Enclosures:

1. Benefits of the Urban Forest (SAFER)
2. City of Chesapeake Forest Cover Analysis based on Virginia Forest Cover Map 2005 (prepared by City of Chesapeake Information and Technology)
3. City of Chesapeake Forest Cover Analysis based on Virginia Forest Cover Map 2005, Excluding Great Dismal Swamp National Wildlife Refuge. (Prepared by City of Chesapeake Information and Technology)
4. City of Chesapeake Woody and Wetlands Cover Early 1990's based on National Land Cover Sheet, Excluding Great Dismal Swamp National Wildlife Refuge.(Prepared by City of Chesapeake Information Technology)

Reference Notes:

1. Guidelines For Implementing the Chesapeake Bay Program's Urban and Community Canopy Goals March 2005. Chesapeake Bay Program Directive 03-01.
2. Chesapeake Bay Urban Tree Canopy Goals 2007 Maryland Department of Natural Resources (www.dnr.state.md.us/forests/programs/urban//urbantreecanopygoals.asp)
3. Urban Ecosystem Analysis Atlanta Metro Area by American Forests 2001 (www.americanforests.org/downloads/rea/AF_Atlanta.pdf)
4. American Forests, The State of Our Urban Forest: Assessing Tree Cover and Developing Goals. September 1997. American Forests P.O. Box 2000 Washington DC 20013.

